

# TIP-TOP TIPS

FAMOUS RIDERS PASS ON THE  
GEN YOU NEED TO GET THE  
BEST FROM YOUR BIKE

FREE WITH  
**Motor  
Cycle**  
20 MAY



## Motor Cycle

**HULLO** YOU couldn't have better advice. Collected into this booklet are hints, dodges and short cuts of every kind—tried and proved, every one of them.

To get them, we went right to the top. Ace tuners and road racers, scrambles and trials king-pins, all of them household names in the motor-cycling game, have provided a wealth of wisdom based on long experience. Factory service experts have added their quota. And we have included some hints of our own.

Even so, we can't cover every point. There could be times when you are stuck. Never mind; write to *Motor Cycle* about it.

Our Help Club requires no membership fee, just a stamped, addressed envelope. If we can assist you in any way, we'll be glad to do so.

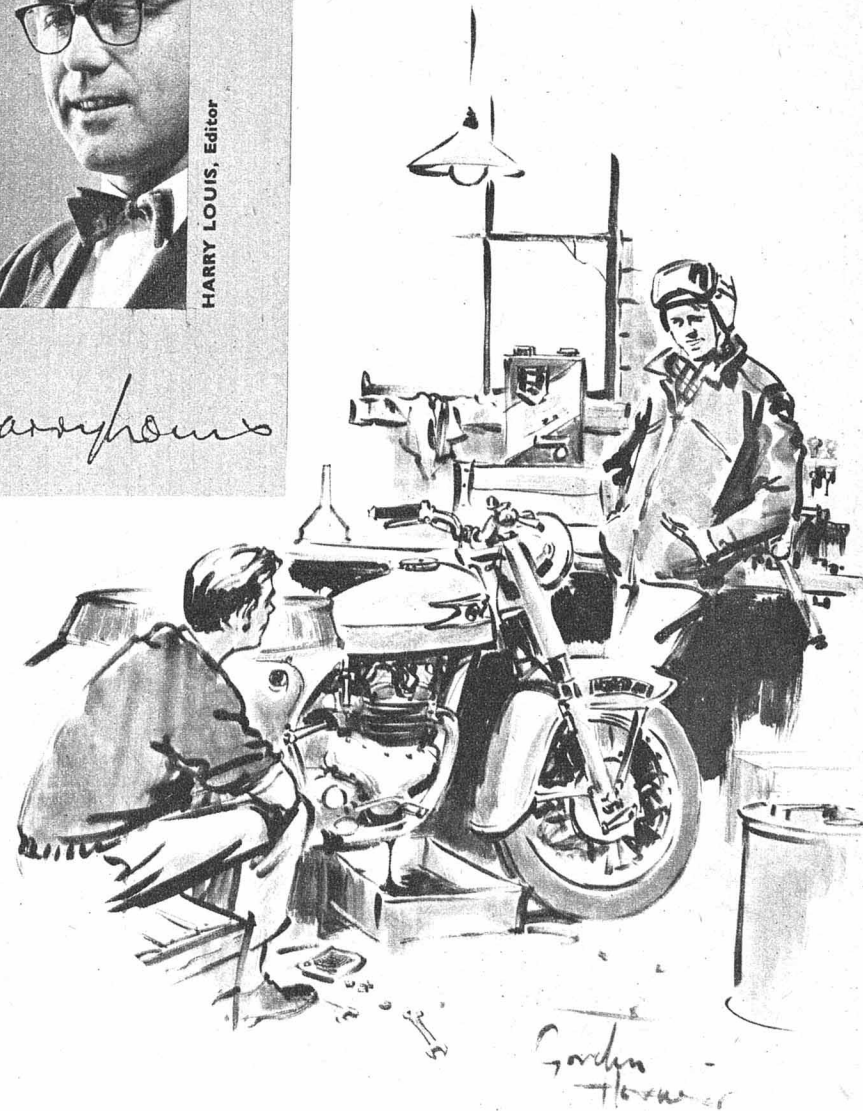
You can get more gen, also, by reading *Motor Cycle* each week. We cover every slant that helps you to look after your bike and enjoy riding it.

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*Harry Louis*



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## FORK FREE

WHERE a front wheel is held to the fork by a spindle which passes through an eye on one fork leg and is screwed into the other, the fork must be allowed to align itself on the wheel spindle before final tightening of the fork-eye pinch bolt is undertaken.

Leave the pinch bolt slack, sit astride the machine, then operate the fork up and down a few times.

This applies to BSA models such as the Gold Star, Lightning and Cyclone, some Triumphs and four-stroke Ariels.



# WHEELS and FORKS CHAPTER ONE

## REBUSHING

WITH PIVOTED or leading-link front forks, it is usual to employ a floating brake-shoe plate, the torque arm of which is provided with limited-movement bushes.

These are commonly of nylon or similar plastic.

Under severe usage, as on a trials or scrambles model, where such bearings are subjected to liberal quantities of grit and water, the bushes can wear rapidly.

A substitute can be found in the rubber bush of the pattern used in the anchorage of the suspension units.

Select a bush of as near as possible to the diameter of the torque arm eye, and trim it to a tight press fit.

## GRITTY

THOUGH a quickly detachable rear wheel can be a blessing, do remember to stuff the spindle bore with rag or

clean paper before lying the wheel on its side—especially if you have had the misfortune to strike trouble at the roadside.

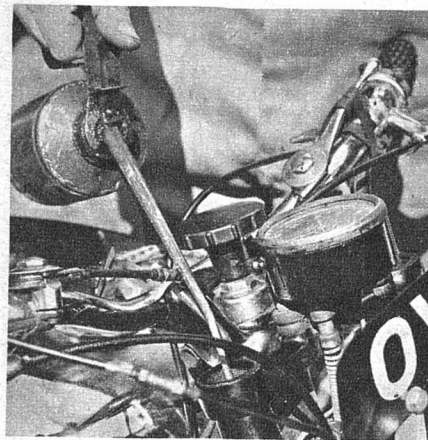
The danger is that, unless precautions are taken, dirt in the bore can be forced into the threads of the driving-side assembly when the spindle is replaced.

Superfluous advice? Well, it was for this very reason that one British ISDT team man had to retire, some while back.

## HUB GREASE

VERY FEW machines, these days, are provided with grease nipples in the wheel hubs. Instead, the bearings should be repacked with medium or heavy grease at intervals of about 10,000 miles.

Where nipples are provided, never go rash with the grease gun, for should



## REFILL

WHEN a front fork is to be drained and refilled with oil, make sure all the old oil is extracted by removing the fork base plugs and pumping the fork up and down a few times.

The refill can be tricky on some models, either because the filling orifices are difficult of access or because the openings are small. Best to use a force-feed oil can. Empty the can completely, then pour into it the exact quantity of oil specified for each leg.

excess grease find its way past the bearings into the brake drums, the shoe linings will be ruined.

A couple of strokes of the pump, every 5,000 miles, should be ample.

## BOUNCE

MACHINE manufacturers usually offer stronger front-fork springs for sidecar work, and most owners take advantage of this. However, the rear springing, too, should usually be stiffened up, or the outfit will wallow on corners.

Girlings can supply springs of sufficient strength to meet any need; these can be used with your existing damper units.

## REAR WHEEL

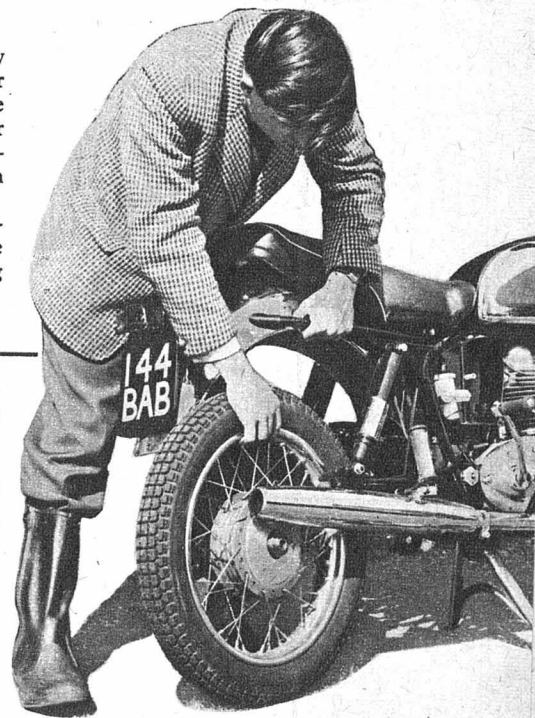
TAKING out a non-quickly detachable rear wheel? Find the connecting link and part the chain before disconnecting the rear-brake rod or cable.

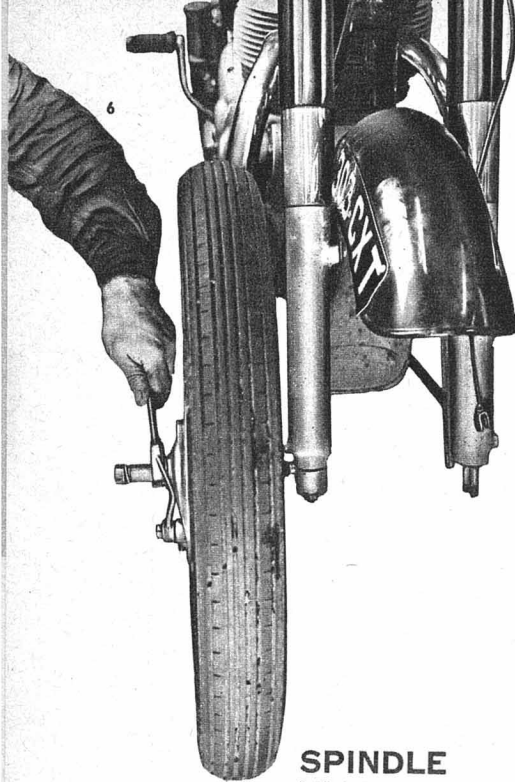
Reason is that otherwise the return spring could apply the brake and you may have trouble in turning the wheel to find the link.

Often, you can avoid having to dismantle part of the rear mudguard by parking the bike, on its centre stand, with the wheel overhanging a highish

kerb; alternatively, put a piece of wood under the stand legs.

Another way is to tilt the bike towards you, and wiggle the wheel out between the silencer and the edge of the guard from the other side.





## SPINDLE VICE

SEVERAL makers (including AJS, Matchless, Royal Enfield and Triumph) use a front fork in which the wheel spindle is retained by end caps. This can be useful, should you need to budge a tight shoe-plate retaining nut.

Extract the wheel completely, place it alongside the fork and just clamp the spindle end, opposite the brake plate, to the base of a fork leg. If necessary, apply the brake by means of a spanner on the cam lever.

## LEVERAGE

ON ANY bike, the front brake should be the more effective stopper of the two (with the weight of the machine behind it, the tendency is to drive the tyre harder against the road and more adhesion results).

If this is not the case, find out why. Check that the cable is sound and well lubricated (a frayed cable can absorb quite a lot of braking effort, and runs in an easy sweep).

Take out the cam spindle occasionally and grease it lightly. Should there be plenty of life in the shoes, the angle between the brake cable or rod and the cam lever could be more than 90 degrees—which means you are losing leverage.

Some machines (AMC, for instance) have adjustable pads on the shoes to overcome this; on other makes, the cam lever may be mounted on splines, in which case it may be possible to reset it (turn it over if necessary, for finer adjustment) so that the cam-lever-to-cable angle and hence, the leverage is regained.

## SQUEAKY SPRINGS

OFTEN neglected, the springs of the rear damper units can go rusty and give rise to irritating squeaks. The remedy is to coat the springs with grease—but to do this there may be no need to dismantle the units from the bike completely.

Deal with them one at a time. First, remove the upper mounting bolt from one unit, leaving the lower mounting still attached. Swing the unit forward or backward, clear of the upper mounting; grasp the top cover firmly in both hands and jerk it downwards, compressing the spring.

This should permit the upper collets to come free (you will need a mate to lift them out), after which the spring cover can be removed revealing the spring.

Reassemble the damper and replace it, before tackling the one on the other side of the bike.



## SHOE CHECK

BRAKES not up to scratch, though the linings look okay? Lightly chalk the faces of the shoes, reassemble the brake in the drum, spin the wheel then apply the brake.

Any high spots can be eased down with a fine file, and the chalking process repeated until the linings are making full contact.

## BRAKE GRAB

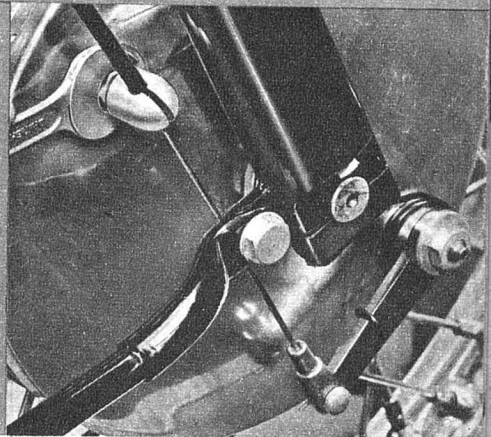
GRABBING or squeaky brakes generally indicate that the shoes are not making full contact with the brake drum—probably because the shoes were not centralized when the wheel was last replaced.

Nearly all brake plates have some means of permitting the shoes to find their own alignment.

On a Triumph, for instance, the fulcrum pin has clearance in the shoe plate; Royal Enfields provide similar clearance in the bolts which secure the cam-spindle bearing.

Other machines may simply have a shoe plate with excess clearance on the wheel spindle.

Whatever the method, the brakes are centralized by applying them, hard, while the appropriate bolts or nuts are tightened.



## WALLOWY PROGRESS

DOES YOUR bike do the samba on a corner? Wallowy progress is a pretty clear pointer to loss of the hydraulic damping from the rear suspension units.

To check, take off just one damper unit. Now press down on the rear mudguard and release. The movement in the upward direction should be smooth, not floppy.

Replace the missing unit, remove the other and check again, comparing reactions.

Damper units have sealed hydraulic compartments. Replacement is the only cure for a unit which has gone on strike.

Incidentally, the makers can offer various spring strengths; the springs normally fitted are suitable for riders of average size and weight.

If you are bigger or smaller than average, it could be worth-while trying the effect of stronger or weaker springs, respectively, on general handling.

## SPLINES IN LINE

SOME rear wheels may be quickly detachable, but they can be awkward to replace unless the pegs or splines of the hub are exactly in line with the corresponding parts of the brake drum.

Save fiddling by leaving out the wheel spacer and pushing the spindle through the hub and into the brake drum.

The wheel will then be free to turn until the splines or pegs come into line. Push the hub home, extract the spindle, then replace it, this time with the spacer in its rightful position.

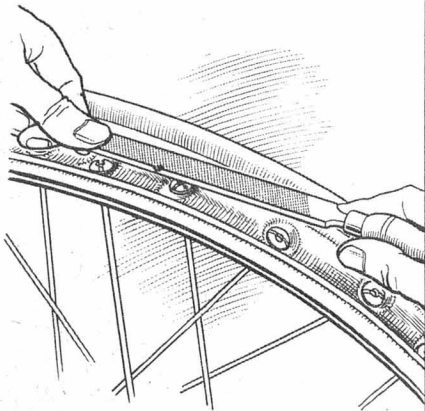
## SPOKE LORE

SPOKES of a new model tend to settle down, as with any other part of the machine, and should be checked after approximately 1,000 miles.

Spin the wheel and let a screwdriver or spanner dangle against the spokes. They should all give the same highish note; those that are loose will have a duller sound.

Tighten loose spokes by giving the nipple a quarter-turn, between tests for tension—but don't overdo it.

Should a nipple have to be tightened by more than a full turn, there is a danger that the screwed end of the spoke will protrude through the nipple head and puncture the tyre; better remove the tyre and rim tape in this case, and file down any spoke ends which may be sticking through.



# Carburettor

## CARE CHAPTER TWO

### LOW-SPEED RICHNESS

**TOO RICH** a mixture at low engine speeds can point to a loose pilot jet. The jet (you'll find it under the throat of an Amal Monobloc) is a taper fit on its seat.

Any slackness will permit fuel to pass in addition to that governed by the actual jet.

The screwdriver slot in the jet base will be seen after the small cover nut is removed. Steady on, though; the jet should be tight, but no more than that.

### GLUB-GLUB

**HEAVY** fuel consumption? Very last thing to suspect is the main jet; if it was right in the first instance, the petrol flow will never wear it larger.

A gradual rise in consumption during average running would indicate a worn needle jet. Contributory cause could be a throttle needle clip which is too sloppy a fit.

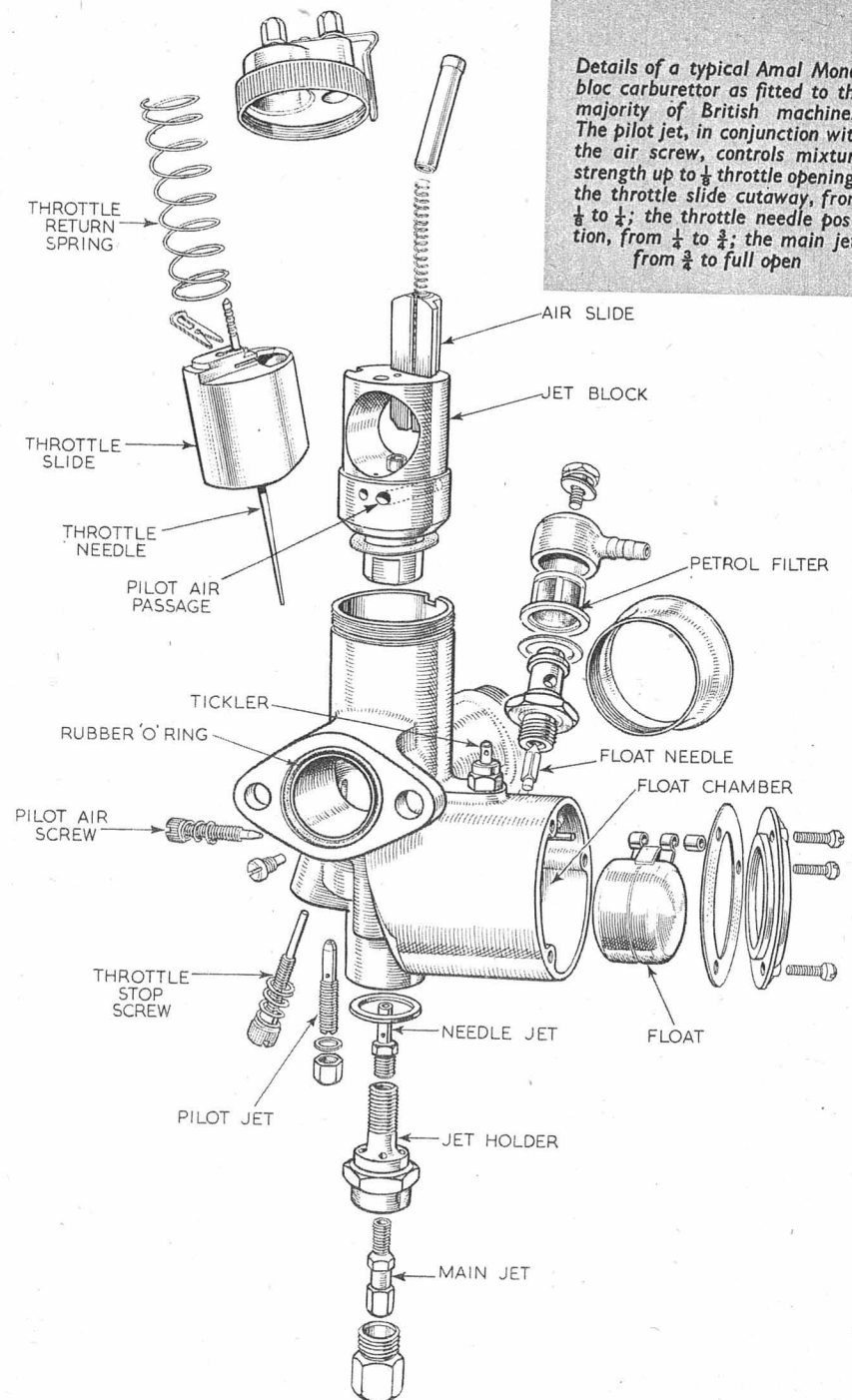
Check and, if necessary, fit a new clip at the same time that you replace the needle jet.

The throttle needle is not likely to wear.

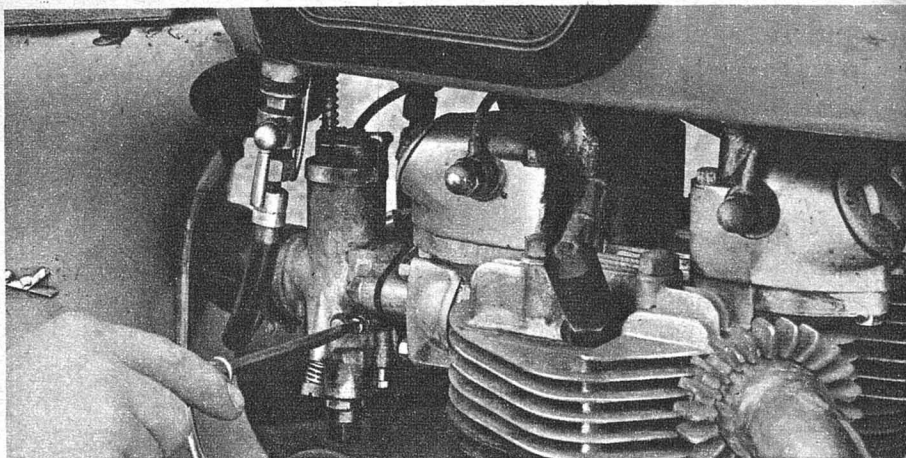
### CARB FLANGE

**AT THE** joint with the engine it is easy to distort the carburettor flange by over-tightening the retaining nuts. Use the shortest spanner you can find.

If a gasket is fitted, be sure you have the correct one. A thicker-than-standard gasket is inviting trouble. It will compress as you tighten the nuts and the flange will bow.



Details of a typical Amal Monobloc carburettor as fitted to the majority of British machines. The pilot jet, in conjunction with the air screw, controls mixture strength up to  $\frac{1}{4}$  throttle opening; the throttle slide cutaway, from  $\frac{1}{4}$  to  $\frac{1}{2}$ ; the throttle needle position, from  $\frac{1}{2}$  to  $\frac{3}{4}$ ; the main jet, from  $\frac{3}{4}$  to full open



## SLOW TICK-OVER

**WHEN** you adjust the slow-running mixture, remember to finish the job by resetting the throttle stop.

Although the setting for slow running affects mixture strength only at low speeds, so much mileage is usually covered in towns that unnecessary pilot-jet richness makes a big contribution to heavy fuel consumption.

## BLOW, DON'T POKE

**NEVER** poke pieces of wire through the drillways or jets of a carburettor. Instead, blow through them in the reverse direction to the petrol flow.

Any grit which has floated in with the petrol will only lodge more firmly if you blow the wrong way.

Use an air line, if you have access to one; if not, an ordinary tyre pump will do.

## TOO RICH

**ONE** CARBURATION both which seems to affect scrambles two-strokes with Monobloc instruments is over-richness immediately the engine is started. Recognized antidote is to cant the machine over to the left for a few seconds until the richness wears off.

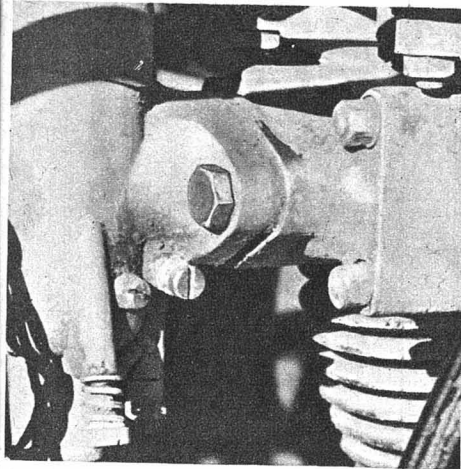
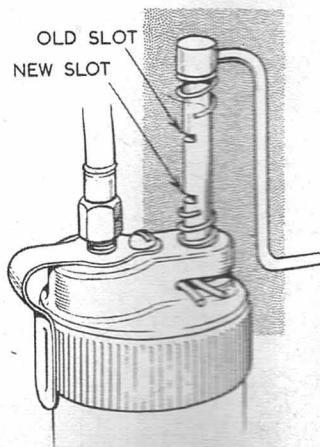
However (says Monty Banks) the trouble can sometimes be overcome by fitting a size 20 pilot jet, or even by removing the pilot air screw and running without it.

## HALF WAY

**TROUBLE** with the standard type of plunger-operated carburettor air slide is that there are no half measures. Your engine is either choked—or it isn't.

But there are occasions when you could do with a part-way position, so that the engine is warming up on half choke.

Way to obtain this is to cut a second notch in the air-slide plunger.



## SLIDE OUT

**OCCASIONALLY**, there may be insufficient room between the top of the carburettor and the frame top tube to allow the throttle slide to be extracted easily.

A way round the problem is to replace one of the carburettor mounting studs by a setscrew.

Thereafter, you remove this screw, slacken the remaining flange nut and the carburettor body will pivot round sufficiently for the slide to be lifted out easily.

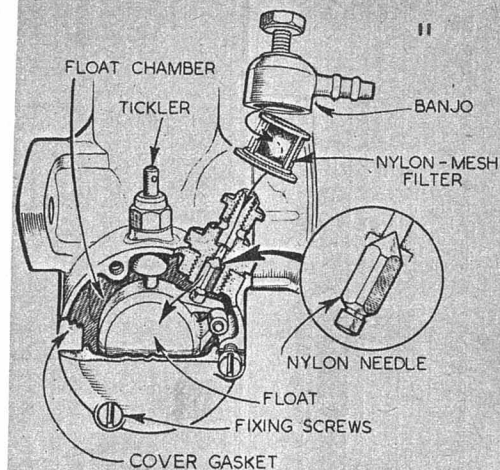
## HIGHER AND HIGHER

**ONE** for the Alpine tourist. At high altitudes an engine will show signs of rich mixture and the rarefied air will result in loss of power.

For normal pass storming there is no need to make carburettor adjustments and the power drop is not enough to worry about.

As a point of interest, though, note that at 3,000ft the mixture should be about 5 per cent weaker than at sea level; at 6,000ft, about 9 per cent; at 9,000ft, about 13 per cent.

Power loss is about 10 per cent at 3,000ft; 20 per cent at 6,000ft; 30 per cent at 9,000ft.



## FLOAT NEEDLE

**PRESENT-DAY** float needles are of nylon and, unlike the brass needles of earlier-type carburettors, are unlikely to wear.

For that reason, no attempt should be made to "grind in" a needle to its seating. This would only break through the tough skin of the nylon moulding, and the needle would be ruined.

## STARVATION

**PLENTY** of fuel in the feed pipe, yet the float chamber remains dry? Cause is probably a sticking float needle.

In the current Amal carburettor the nylon needle is located by three bearing edges on the shank.

The trouble is easily cured by easing off the three edges slightly, using a very fine file or emery cloth.

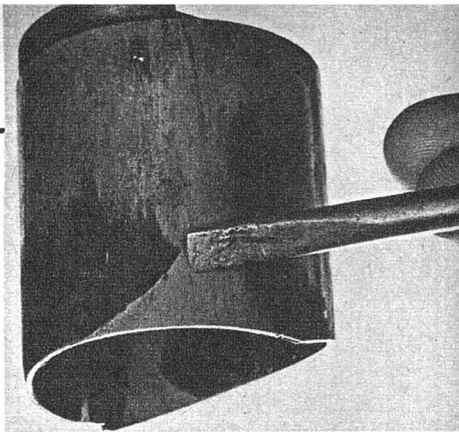
## STOPPING LEAKS

**CARBURETTOR** washers and gaskets are cheap. As they tend to harden in use fit a new set when a carburettor is overhauled.

## SCORED OR WORN?

SCORE marks on a throttle slide are nothing to worry about. What can cause trouble is wear at the bottom of the slide (recognizable as a wafer-thin edge), allowing air to pass and upset mixture strength.

This is not likely to occur on a reasonably new machine, but it is a point to check on an old model.

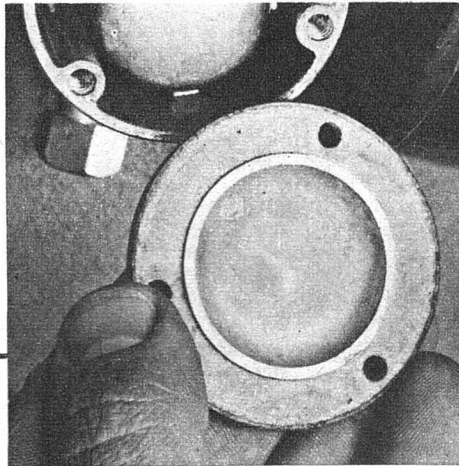


## RICH AND WEAK

MIXTURE adjustment is easy if you can recognize the symptoms of richness and weakness.

Heavy "lumpy" running of the engine with, usually, black smoke (not the blue of too much oil) from the exhaust indicates richness.

When the mixture is weak, the running is erratic, and may be accompanied by spitting-back through the carburettor. Another indication—firing in the silencer with the throttle closed and the engine on the over-run.

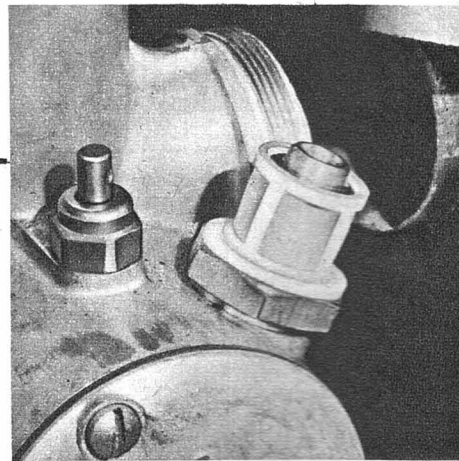


## EASY DOES IT

AVOID overtightening the three screws retaining the float-chamber cover of a Monobloc carburettor.

If the gasket is in good condition normal tightening is enough to give a sound joint.

Over-enthusiasm with the screw-driver will bend the cover and the joint is then certain to leak.

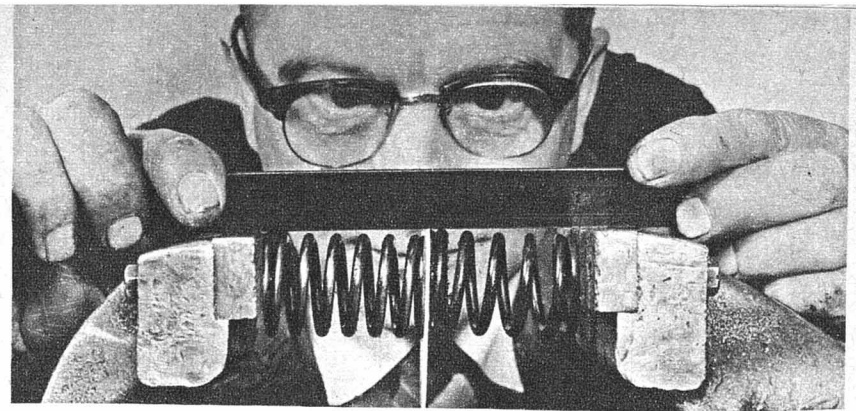


## FUEL FILTER

MONOBLOC carburettors of current type have a little moulded-nylon filter in the banjo union, and this moulding is given rigidity by vertical ribs.

It is possible to replace the filter in such a way that the ribs are obscuring the feed holes.

This could reduce the petrol flow sufficiently to cause a slight degree of starvation, giving rise to a misfire at high speed.



## CHAPTER THREE

# Around the ENGINE

## SPRING CHECK

COMPARE the free length of a used valve spring against a new one and scrap the old spring if it is shorter by more than one-eighth; that's the usual rule—but it isn't infallible.

A spring could be okay on length, yet still have lost its energy.

Best method of checking is to place two springs—new and old—end to end in the vice and compress them until they or one of them is showing signs of becoming coil-bound.

Now measure the compressed lengths. That'll give you a better indication of the suspect spring's worth.

## HEAD GASKETRY

CYLINDER HEAD gaskets of solid copper, provided they are not too misshapen and the bolt holes are not elongated, can be used several times over.

Heat the gasket over a gas ring until it is cherry red, then plunge it straight into a bucket of cold water; this cleans and softens the copper.

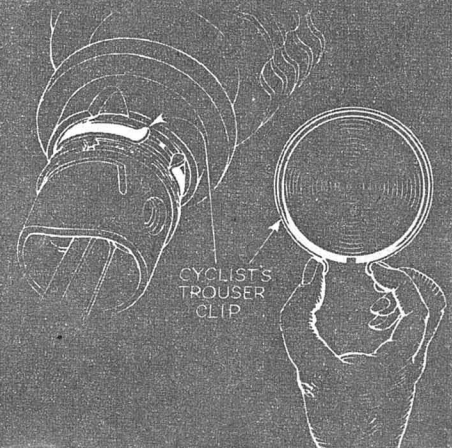
However, a copper-and-asbestos sandwich gasket cannot be treated in the same way, and should be replaced by a new one.

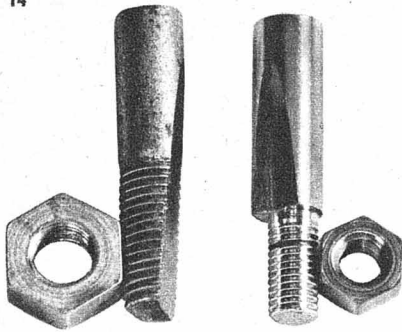
It is best not to use jointing compound on a cylinder-head gasket, but if you feel it is necessary, apply the compound to one side of the gasket only, preferably the side facing the cylinder barrel.

Be careful not to clog up any passages in the gasket through which oil must pass to the rocker gear.

## RING CLIP

DEPENDS on the size of the piston, naturally, but quite often a cyclist's trouser clip, of the flat, spring-steel pattern, can serve as a useful substitute for a piston-ring clamp.





## TOUGHER COTTER

THE COTTER pin which, on some models, secures the kick-starter pedal to its shaft, can give trouble once a little wear has taken place.

One answer is to replace the standard pin by a  $\frac{3}{8}$  in high-tensile steel bolt, with its head cut off and a tapered flat filed on the shank.

The nut, larger than that of the standard cotter, enables the pin to be pulled home really tight.

## IS THERE ROOM?

HOW FAR can compression ratio be raised before the piston hits the head, or the valves the piston?

Simplest way of finding out is to coat the piston crown lightly with oil then stick little knobs of Plasticine

around the areas most likely to be affected (valve cutaways, or the highest point of the piston).

Replace the head and turn the engine shaft once or twice by hand. Remove the head and examine the impressions made.

By measuring the thickness of the squashed Plasticine, clearances can be assessed precisely.

## CHAIN WEAR

WHERE an engine has chain-driven timing gear, and the drive has a slipper tensioner, examine the edges of the chain side plates.

Constant rubbing leaves a shiny surface, and this is quite normal; but if the plate edges are noticeably scooped, instead of straight, it is time to fit a new chain.

## GARTER SEALS

SHOULD ANY garter seal operate on a revolving shaft or bush, examine the mating part for signs of wear—in particular, for an annular groove worn on the shaft.

If such wear is present, a new seal alone will not cure an oil leak.

When fitting a new seal of this type, smear the feather edges with light oil or thin grease before insertion, so that the edges are not torn.

## GOOD JOINT

TO MAKE a sound, leakproof joint every scrap of the old gasket must be removed before the new one is put in place.

Take an old razor blade and clear up the scraps of old gasket which may linger around the bases of any projecting studs.

Another obstacle to the perfectly flat joint face can sometimes be found where a stud or bolt screws into a tapped hole in one of the joint faces.

In time, there could be a lip of raised metal around the hole; remove this by slightly countersinking the hole edge, using a rose bit.

## BANJO LEAK

AFTER considerable service, the copper or fibre washers of a banjo union (such as are used on an external oil feed to the rocker gear) tend to harden and should be renewed.

Any attempt to cure a leak by tightening the union really hard will merely result in damage to the union or its clamp bolt.

At the lower end of such a feed pipe, make sure that the union is tight in the crankcase before trying to tighten the pipe nut.

If it isn't, you could twist or break the pipe.

## BROKEN SPRING

COULD be a disaster, should a valve spring break when miles from anywhere. But it is possible to jog along at slow speed, until one can reach civilization.

The dodge is to extract the broken spring, then turn the broken bits so that they are end-for-end, the two squared-off parts meeting in the middle and the jagged ends to the outside.

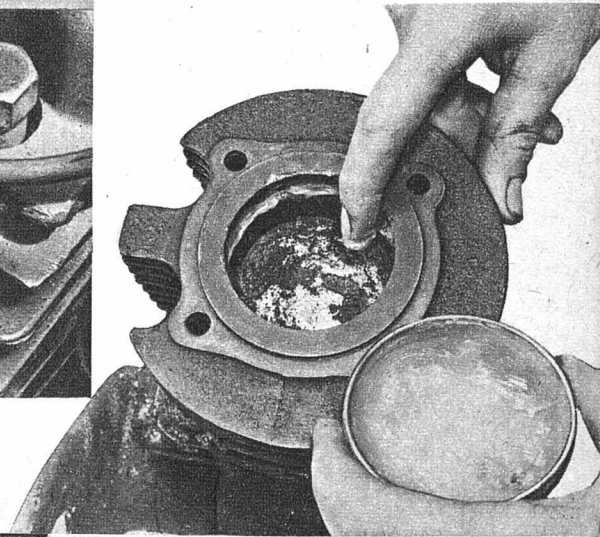
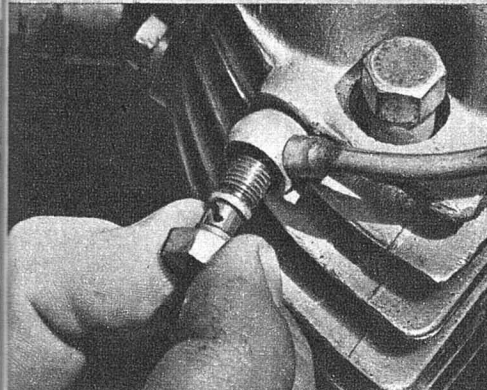
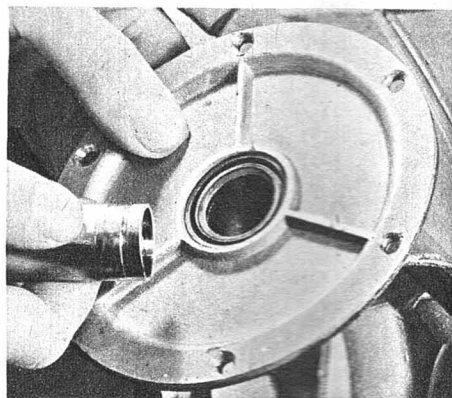
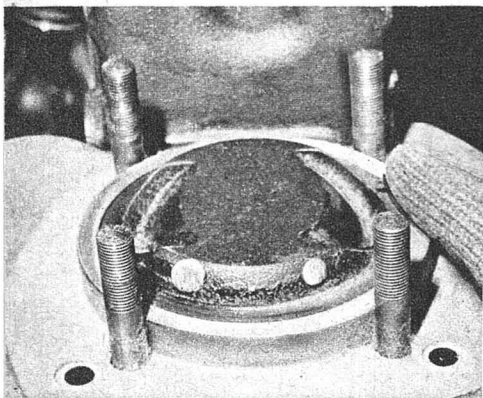
## DECOKE DRILL

REMOVE the carbon from the underside of a four-stroke cylinder head while the valves are still in place. That way, you don't damage the valve seat faces.

If the cylinder is not being removed, smear a ridge of grease around the lip of the bore before cleaning the piston top; carbon scraped from the piston will stick to the grease and can be readily wiped away.

When a valve has been replaced in the head and the springs, collars and collets are again in place, give the tip of the valve stem a firm and true tap with a hammer.

This ensures that the collets bed down fully; then there is no chance of one coming adrift when the engine is restarted.





## OIL PUMP

IF A MODEL is equipped with a plunger-type oil pump, and you have had occasion to remove this, the following technique is advisable.

After replacing the pump, fill the tank and let oil run out of the open end of the supply line before coupling it to the crankcase union; in this way, an air lock is avoided.

Connect the feed pipe, start the engine and allow it to run slowly until clean oil is seen to emerge from the return union. The return pipe to the tank can then be reconnected. This ensures that any dirty oil in the system has been removed.

## ALL-OVER WARMTH

MOST RIDERS know that when a bearing is to be removed from a light-alloy casting (such as a crankcase or gear box) the casting should first be expanded by being warmed.

However, it is important that the casting be heated uniformly, not just in the region of the bearing.

If you use a blowlamp, "dust" the flame over the whole surface. If you are doing the job with the aid of a gas ring, keep the flame low and move the casting around every few minutes.

Perhaps the best solution is to put the entire casting into an oven for a while.

## CIRCLIP

BEFORE starting to strip an engine, have a look at the parts lists, or at an exploded drawing.

Sometimes, a circlip is employed between pairs of crankcase bearings, and this may not be visible until one bearing is extracted.

If you warm the crankcase, the bearings should drop out—so don't start tapping a reluctant bearing until you are sure no circlip is present.

## PATIENCE

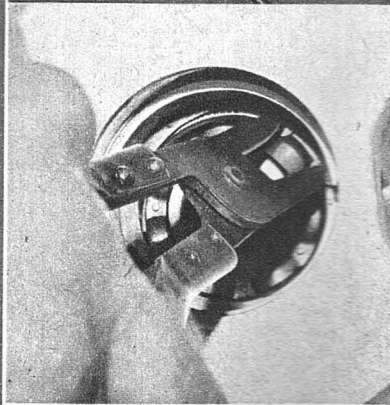
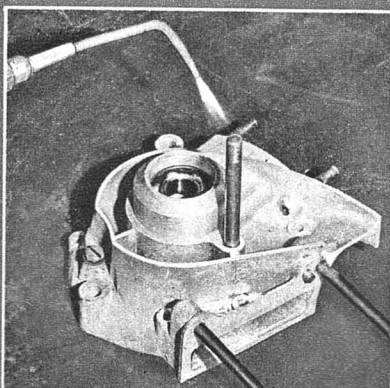
NATURAL enough, if something has gone wrong with the engine or gear box, to want to start tearing it apart to get at the root of the trouble.

But don't be too hasty; remember that you'll want all the bits again when the time comes for reassembly.

Before starting the strip, get a clean tin tray (a baking tin, for instance) or, even, a cardboard box.

As parts are removed, put them all in it.

An exercise book in which you have jotted down notes when dismantling can be quite a help when putting everything back again.



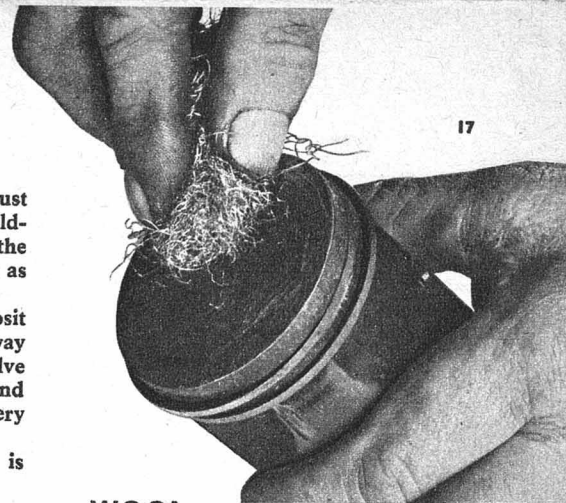
## STICKING VALVE

A STICKING or "lazy" exhaust valve is usually the result of a build-up of hard carbon on the stem of the valve; this is rare, but can occur in as little as 2,000 miles from new.

The cure is to get rid of the deposit and polish the stem, and the best way to achieve this is to mount the valve in the chuck of an electric drill and burnish the stem with a strip of emery cloth.

In so doing, the metal itself is eased down slightly.

This should ensure that future deposits never build up sufficiently to cause jamming.



## WOOL

PISTON crowns and combustion chambers are easily scored, unless care is taken when decoking. One excellent way to remove carbon without damage is by means of a pad of steel wool (a scouring pad, for instance) soaked in oil.

Do make sure, though, that all particles of steel wool are washed away before re-assembling the engine.

If the carbon is very hard and steel wool will not remove it, use an old, BLUNT screwdriver or chisel.

## CARBON COPY

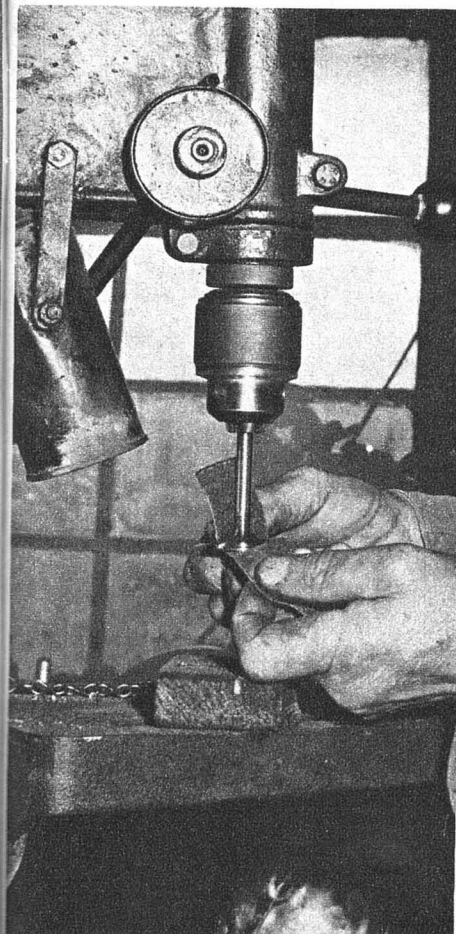
ACCEPTED way of making a brown-paper gasket is to place the paper on the joint face and tap lightly around the edge of the facing with a hammer.

However, this could bruise or chip the machined face; a better plot is to tap round with the wooden or plastic handle of a screwdriver or similar tool.

Another idea is to lay a sheet of carbon paper over the joint, carbon side up, with brown paper on top of that. Now rub a finger all round the joint edge and press the ball of the thumb into any bolt holes.

The carbon will leave a clear impression on the underside of the brown paper.

The gasket can then be clipped out with scissors.



## KNOCK

**BIG-END** going home? But are you sure the trouble is nothing more than an exhaust pipe which is loose in the cylinder head?

Surprising how alike big-end knock and loose-pipe knock can sound.

Cure for trouble of this nature is to make up a wooden drift and tap this into the open end of the pipe to expand it slightly.

Note that the word is tap, not bash!



## WASH DAY

**WHEN** washing bearings or other engine internals over a tray of petrol, use a clean paint brush.

Don't let the brush touch the bottom of the tray, or you will simply be replacing one lot of dirt with another.

By the way, for cleaning of this kind, petrol is preferable to paraffin because it evaporates quickly; paraffin doesn't.

Put that cigarette out before you start, of course!



## FIRST TIME

**CLASSIC** method of obtaining a first-kick start with a four-stroke single is this. Ignition off, flood the float chamber, then give three gentle swings of the kick-starter to draw gas into the cylinder.

Now, feel for compression and ease the pedal just past this point (use the valve-lifter or decompression valve, if fitted).

Switch on ignition and give one long, swinging kick.

If your machine has coil-ignition and the ammeter is readily visible, watch the needle; as soon as it swings back to the zero position, *that's* the time for that first-time, swinging starting kick.

## HARSH

**SHOULD** a parallel twin (or, to a somewhat lesser degree, a four-stroke single) start to run harshly—and especially if, at the same time, smooth gear changing becomes difficult—suspect number one should be the primary chain.

Excess play in the drive will create a roughness felt throughout the machine.

Correct adjustment may vary slightly according to make, but will generally be around  $\frac{1}{8}$  in, measured at the tightest stretch of the chain.

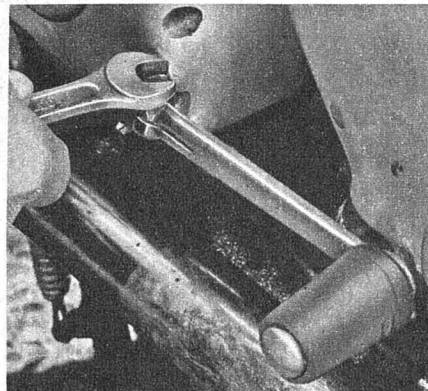
## PINCH

**OVERTIGHTENING** a gear or kick-starter pedal can cause the slot of the clamp to close up.

In other words, the eye of the pedal may not be gripping the splined shaft, even though the bolt is tight.

Moral, of course, is not to overdo the strong-arm stuff with the spanner; but if the pedal boss has distorted, all may not be lost.

Widen the slot with a hacksaw.

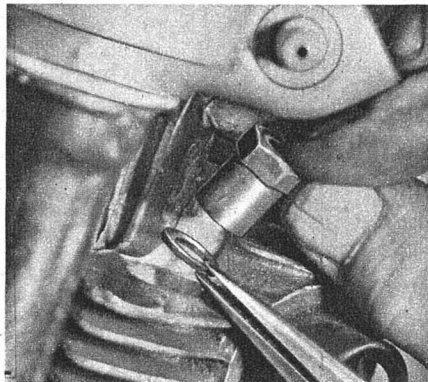


## ANTI-SQUASH

**THESE DAYS**, cylinder heads are usually of light-alloy. It is essential that plain steel washers are used under the cylinder-head nuts, otherwise the soft aluminium may be squeezed inward until it grips the shank of the bolt or stud.

If this happens, subsequent removal of the head could prove difficult.

Use the right washers for the job—a fairly close fit on the bolt or stud, a comfortable fit in the head recess and substantial enough to resist warping.



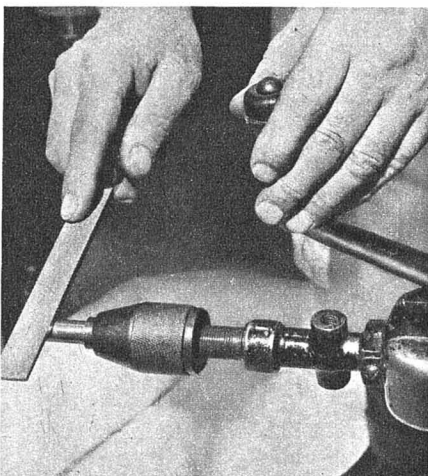
## GUIDE DODGE

**THAT** section of a valve guide which projects into a port is nearly always tapered, or reduced in diameter.

There is usually a sharp edge where the section changes; this can hinder fitting and, in time, the cylinder-head hole may become enlarged; then the guide will be a sloppy fit.

Famous tuner Allen Dudley-Ward advises chamfering off this change of section, so that fitting is made easier, with no fear of damaging the soft alloy of the head.

A way to chamfer the guide is to mount it in a large hand drill clamped in a vice, while a file is used to take off the sharp edge.





## MATING

ON AN overhead-valve twin with separate cylinder heads, or a two-stroke twin with separate barrels, fit the induction manifold and lightly tighten its retaining studs or nuts before attempting to tighten the cylinder-head or cylinder nuts.

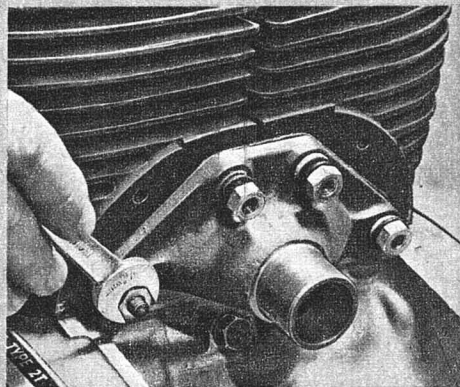
This ensures that the manifold mates properly with the faces on the heads or barrels.

Avoid excessive tightening of the manifold nuts; this could cause distortion.

## BLACK

IT PAYS to keep the cylinder fins of your engine free from mud, rust, oil or scale. Brush them thoroughly, then give them an occasional going-over with the special cylinder-black paint sold by all accessory dealers.

This not only keeps the engine looking young but helps it perform more efficiently, because black dissipates heat better than any other finish. It's a scientific fact!



## BALL OUT

TRICKY job, trying to extract a ball from a deep seating (for example, from the depths of a pressure-release valve recess).

Easy way out is to hold a magnet against the side of a steel rod, such as a clutch thrust rod.

Withdraw the rod and the ball will come with it.

## BLOWN GASKET

THIS IS one way in which a roll of soft copper wire can prove invaluable. Should the cylinder-head gasket blow miles from anywhere, make up an overlapping ring (or rings) of copper

wire and use this between the head and barrel.

A temporary measure, certainly, but it will see you home or to the nearest town where a gasket of correct type can be obtained.

## OVER-GENEROUS

TWO-STROKES will often run quite happily on rather less oil than the maker recommends. If your engine accumulates carbon more quickly than it should, you are probably being over-generous.

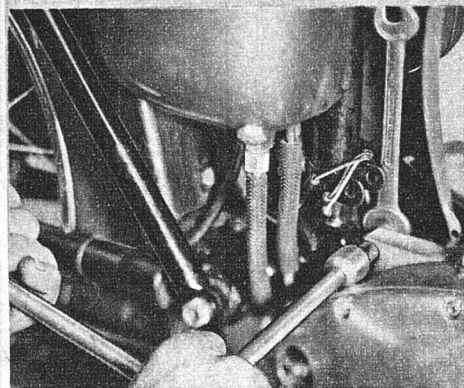
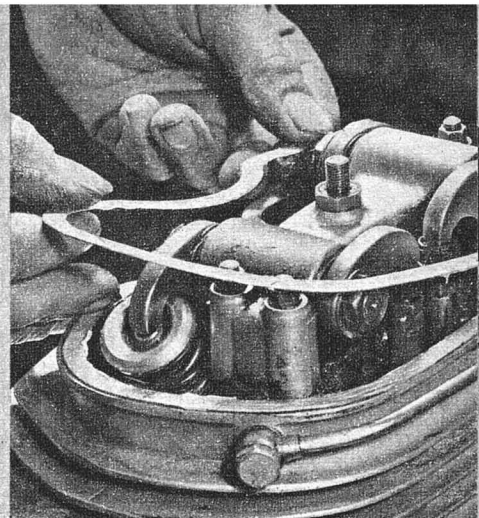
For the average engine, a 32 to 1 petrol ratio ( $\frac{1}{4}$  pt of oil to a gallon of petrol) should be fine.

However, if you feel timid about

## VIBRATION

MOST common cause of excessive vibration is slackness of the engine-mounting bolts—particularly those at the rear of the gear box, often overlooked because they are difficult to reach.

There may be other reasons. A tank mounting rubber which has moved out of place, allowing the metal of the tank to make contact with the frame top tube, can produce alarming symptoms; so can a too-tight primary chain.



## DOUBLE

IF A JOINT cover is secured by only one nut in the middle, an oil leak can often be cured by employing two gaskets instead of one.

Note, though, that where a joint is clamped by two or more nuts, extra gasket thickness may in fact distort one face and cause or accentuate a leak.

Never overtighten securing units or the cover may be warped even when only the standard gasket is used.

using so lean a ratio, 24 to 1 ( $\frac{1}{2}$  pt oil to  $1\frac{1}{2}$  gallons petrol) should be completely safe, provided the bike is fully run in.

## SLUDGE

MERELY to top-up a primary chaincase with oil is not enough.

On the majority of present-day machines, the alternator unit is housed in the chaincase—and the sludge (which can contain metal particles from the chain or sprockets) accumulating in the bottom of the case might affect the working of the alternator.

The metallic content of the sludge, by being magnetically attracted to the coils, can reduce current output.

## CLEARANCE

AGREED, rattle from the valve gear can be annoying, but it is rarely good policy to set the valve clearances below those recommended by the maker, in an effort to reduce the noise.

For one thing, with little or no clearance the tappet could be in constant contact with its cam; this is likely to cause premature wear.

Again, when the engine warms up the valve may not even have a chance to close on its seating; this will almost certainly result in burning of the valve.

If high-speed work is in view, better to err on the side of slightly more clearance than the handbook indicates, rather than the other way round.

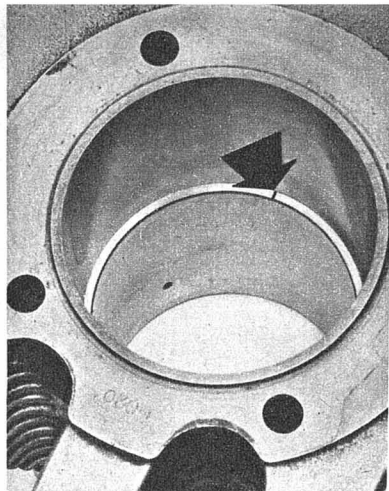
## PISTON-RING GAP

**ALWAYS** measure a piston-ring gap on the least-worn part of the cylinder bore, usually at the bottom of ring travel.

You can use the base of the piston as a pusher to ensure the ring is square in the bore.

The gap should be at least 0.001in for every 5mm of bore diameter—more for a racing engine.

With a two-stroke, the width of the ring peg must be taken into account, and due allowance made.



## PEEL OFF

**PISTON** ring removal is a delicate operation but not a difficult one. One way is to thread a 0.012in feeler gauge blade under the open end of a ring and gradually peel it off.

For the middle or bottom rings, move each ring up one groove at a time, repeating the process.

This method ensures that the ring is expanded by the minimum amount necessary to remove it, so lessening the possibility of breakage.



## CLOSING UP

**ASSUMING** the adjuster lock nuts are not slackening off, the need for frequent resetting of the valve clearances is a danger sign.

Should the clearances be closing up, it is an indication of a stretching valve, or of a pocketing valve seat.

Beware! A stretched valve is just about ready to drop its head into the cylinder.

Growing clearances without loss of compression can suggest rapid wear in the cam mechanism (possibly the follower has worn through the case-hardening of the cam surface—and, in time, you will end up with a completely circular cam and no valve movement at all!).

## AIR LOCK

**AFTER AN** engine overhaul, make certain there are no air locks in the feed pipe from the oil tank.

Leave the pipe uncoupled at the engine end and fill the tank with oil to the correct level.

The head of oil in the tank should clear any air lock; if it doesn't use a pressure can to force oil into the feed pipe from the lower end.

Clear-plastic pipes are an advantage, since an air pocket can then be seen.

If you do decide to use a plastic hose, remember to fit a security clip at each end. Plastic hardens with age and, in time, the pipe could come adrift—result, a seize-up.

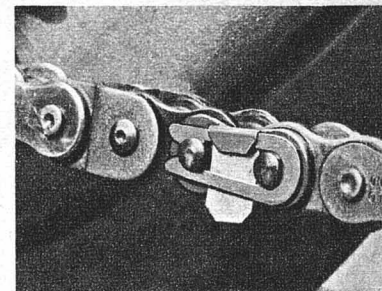
# CHAPTER FOUR TRANSMISSION

## SECURE

**IF** the spring clip on a chain connecting link ever comes adrift, you could be in trouble—especially if you use the machine for racing.

Cut a strip from thin (about 0.015in) steel shim, pass it between the spring clip and the outer link plate and wrap the ends over the sides of the spring.

This will lock the clips in place



## LAY DOWN

**MANY CLUTCH** drums run on crowded, uncaged roller bearings and, when replacing the drum, it can be quite a fiddle to get the rollers to stay in place.

You will find the job much simpler if you lay the bike flat on its side.

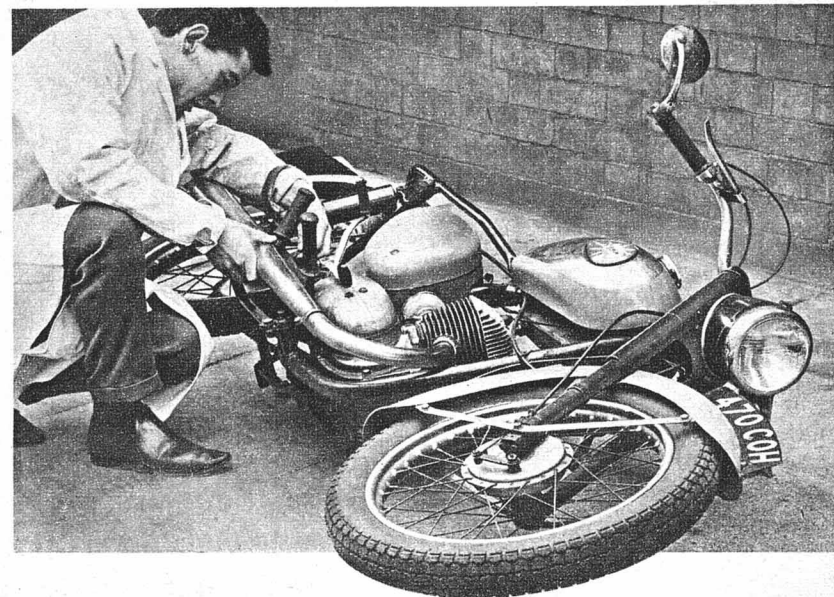
One point worth remembering when stripping the clutch; if you press stiff grease between the rollers before you lift off the drum, there is less likelihood of scattering them.

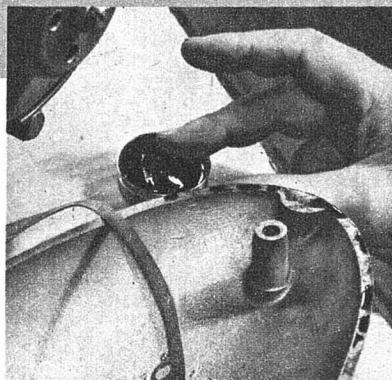
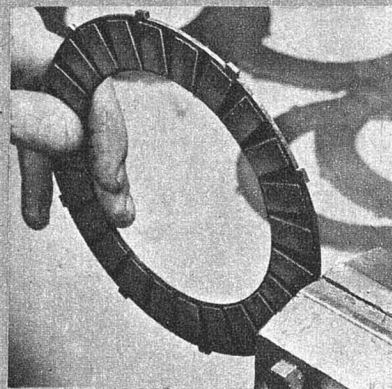
On a BSA Bantam, the lay-down technique will ensure that the oil is retained in the gear box. Saves having to drain, then refill!

## COVER DODGE

**ON SOME** machines, removal of the gear-box end cover is made easier if the clutch cable is left connected until all the cover retaining screws are removed.

Gentle pressure on the clutch lever will then have the effect of easing the cover away from the gear-box casing.





## CHATTER

**WORN TONGUES** on the clutch plates, or worn slots in the clutch drum, can cause a lot of unwanted noise and make clutch operation rough.

Notched slots in the drum can be trued up with a file. As for the plate tongues, these can be gripped, in turn, in the jaws of a vice and squeezed gently. This should spread the metal outward enough to compensate for any wear.

Don't overdo the squeezing; the plates should remain free to slide in the slots of the drum without binding.

## HEAVY CLUTCH

**WHEN** clutch operation is heavy, re-routing the cable in an easier sweep can provide a remedy.

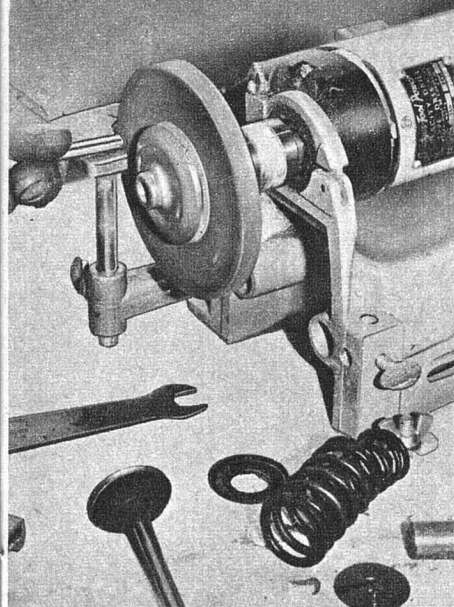
If this fails to improve matters try using a lighter gauge inner wire in the heavy gauge outer. There is less friction and more room for lubricant.

## CHAINCASE JOINT

**TO MAKE** a primary chaincase joint so that it is oiltight and the gasket is not damaged by the fixing screws, may not be easy.

One good dodge is to smear one side of the gasket with jointing compound, then stick this side to the facing of the chaincase cover, ensuring that the screw holes line up.

That way, you can take off the cover frequently without damaging the gasket.



## FREE BALL

**CERTAIN** gear-box designs (for example, Albion and some BSA patterns) employ an adjuster screw with a steel ball in the clutch operating arm. It is essential that the ball, which bears against the end of the clutch thrust rod, be kept free-running.

If neglected, the ball will seize in its housing, develop flats—and indent the end of the thrust rod; this is one common cause of heavy clutch operation.

Withdraw the adjuster screw occasionally, grease the ball and, if necessary, grind the end of the thrust rod flat, as shown in the picture.

Worth noting; some BSA and Royal Enfield adjuster screws are interchangeable. Could be handy in an emergency.

## TENSION

**GREATEST** pull on a separately mounted gear box is toward the rear and the effect is to tighten the primary chain.

To counteract this, when adjusting the primary drive first set the chain tension a little tighter than necessary. Now operate the tensioning screw—so that the gear box is pushed forward until chain tension is correct. Tighten all locknuts. Check tension again before riding away—just to be sure.

## CENTRE NUT

**UNDOING** the clutch centre retaining nut? You'll find the job easier if you first engage top gear and apply the rear brake.

Top cog is preferable because with a higher gear ratio, less brake-pedal pressure is needed to prevent the clutch centre from turning.

It's an old dodge, but one often forgotten.

## VENT

**UNLESS** a primary chaincase has an air vent condensation may take place, diluting the oil and causing rust on the primary chain.

If this happens, drill a hole in the cap. Alternatively, change the oil as frequently as necessary to keep it clean-looking and free from sludge.

## OILED CORK

**SOME** clutch plates employ cork-composition inserts—or bonded-on segments. Where such a clutch has been relined or renewed it is important to ensure that the plates are soaked in thin oil before assembly and that the oil level in the primary chaincase is maintained.

Clutch operating mechanisms vary from make to make, but whatever the system adopted, cable adjustment should always be carried out last, otherwise the plates may not separate properly.

## CHAPTER FIVE ELECTRICS

### SWAP

**THIS COMES** from an RAC patrolman. One Sunday he spotted a solo towing another and, on investigating, he found that the broken-down machine was an alternator-equipped job on which the battery had packed up.

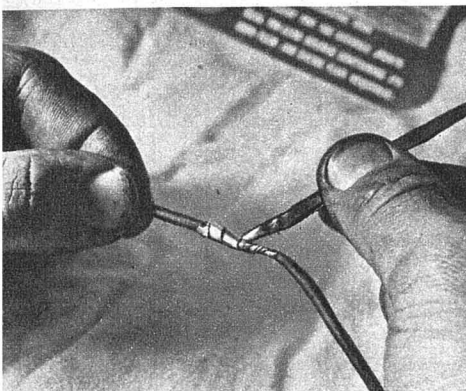
Funny thing was that the model doing the towing had a magneto—and neither rider had thought of swapping the perfectly good battery from that one to the other, so making both machines mobile again!

### QUICK JOIN

**EFFECTIVE** and simple way to connect two electric wires is by using tape solder. This comes as a thin strip and contains its own resin flux.

Twist the cleaned, bared ends of the wires together and wrap the joint in a piece of tape solder.

Apply a little heat—a match will do the trick—and cover the joint with insulating tape.



### BLACKER

**PLUG-READING** is something best left to the experts. To an unpractised eye the indications could be completely false. For instance, by examining the plugs of a parallel twin, it might appear that the right-hand cylinder is running slightly richer than the left.

On a twin-carb engine this could be so—but there is another factor to be considered. On most twins the main oil feed to the crankshaft is from the timing side and, consequently, the cylinder on that side is likely to get a shade more oil than the other.

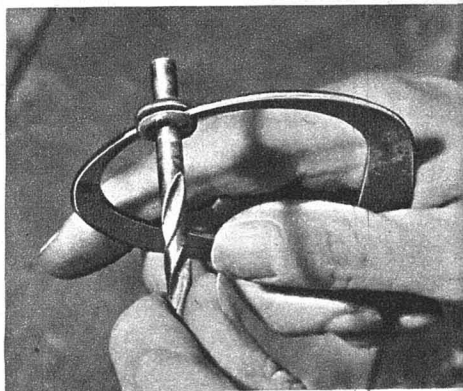
The plug deposit, therefore, is possibly the dark carbon of burnt oil, rather than the soot of richness.

### GROMMET

**WHERE AN** electric wire passes through a metal panel such as in a sidecar body, a rubber grommet should always be used to prevent chafing through the insulation.

Here's how to find out what size of hole to drill in the panel.

Slip the grommet over the shank of a drill or piece of metal rod which is the same diameter as the grommet bore. Then measure the diameter of the grommet at the bottom of the groove, using calipers.



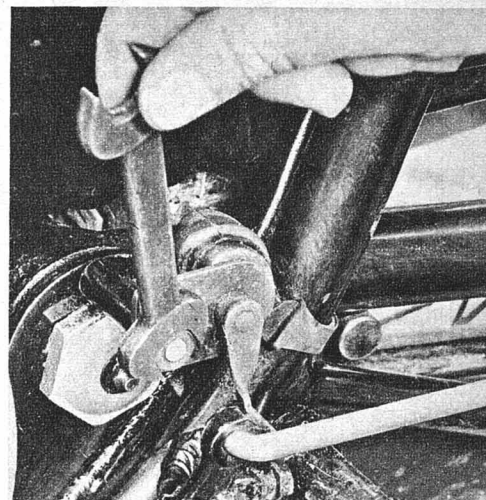
### BULBS

**EXISTING** regulations demand that the rear bulb of an over-250 cc machine must be of at least six watts; where a sidecar is fitted, the rule is extended to the sidecar rear lamp also.

Should a rear bulb blow, it is usually possible, as a get-you-home measure, to adjust the stop-lamp switch in such a way that the stop filament is permanently on.

Be sure that this is a temporary arrangement only; the brighter, hotter stop filament could burn a hole in the lens plastic if left on too long.

Even if it still gives a reasonable beam, the headlamp main bulb should be renewed occasionally. Reason is that the heating and cooling of the filament, caused by switching on and off, causes it to stretch and sag—upsetting the beam focus.

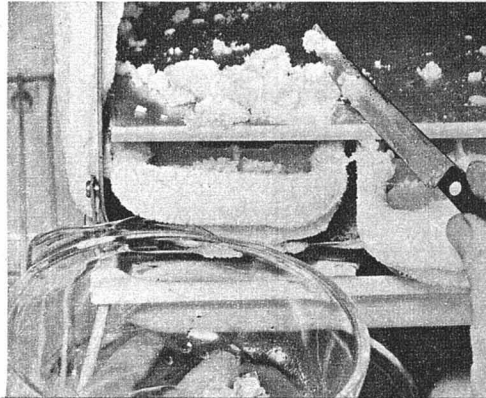


### FREE FILL

**BATTERIES** should be topped-up with distilled water, that's elementary.

Here's one useful—and free—source of distilled water. If you have access to a domestic refrigerator, collect the water resulting from the next defrosting operation.

Though not chemically pure, it is quite good enough for use in a battery.

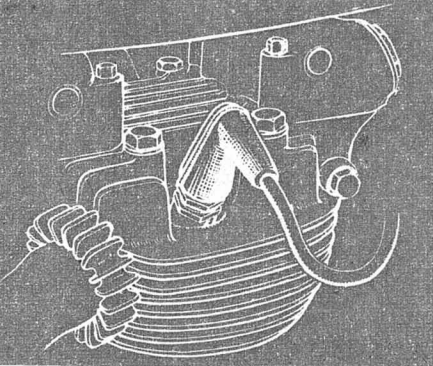


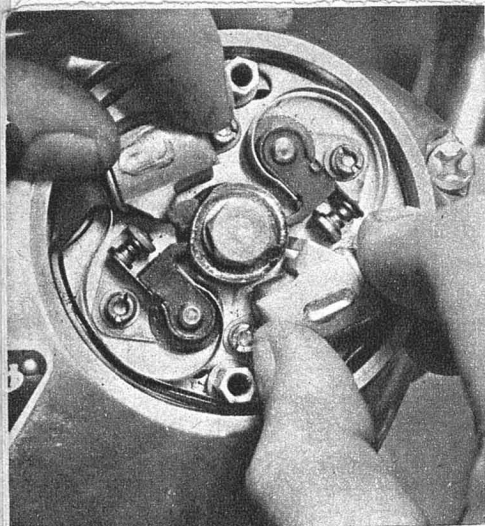
### DROOP

**IF YOUR** plug lead swoops downward toward the plug terminal, it is an invitation for rain to run down the lead and cause a short.

Best to arrange the lead so that it loops down, then up to the plug.

Incidentally, the lead should never be clipped tightly to a metal part such as a frame tube. This, too, could cause a short.





## TWIN POINTS

TRIUMPH and BSA parallel twins are fitted with twin contact-breaker assemblies mounted in the timing chests; a similar device is fitted to Ariel two-strokes.

Main point to note is that it is *not* absolutely essential that the two contact-breaker gaps are equal.

It is far more important that both sets of points should start to open at the correct moment in relation to piston position.

Sequence is to set each gap to the nominal 0.015in. This should be done when the points are only just fully opened by the cam.

If necessary, slacken the screws securing the backplate and rotate the plate slightly until one set of points begins to open when the piston is in the correct position.

Tighten the backplate screws, then turn the engine shaft one complete revolution. Ideally, the second set of points should now be starting to open.

If not spot on, adjust the gap between the limits of 0.013in to 0.017in until the points are beginning to open.



## ACID SPLASHES

ACID splashes on the metalwork around the battery compartment, or on the top of the rear chainguard, can eat into the metal unless dealt with rapidly.

Wash them off with ammonia, or with a strong solution of household soda.

## SPARE FUSE

SEVERAL bikes (among them Triumphs and some Japanese makes) have a fuse in the wiring circuit. Should this blow, a roll of cigarette-packet silver foil will get you home.

But be careful; a short might have caused the fuse to blow in the first place. Have a good look round the wiring before adopting this tip.

## CROSS THREAD

IN A light-alloy cylinder head, care is necessary when replacing a sparking plug, or the result could be a crossed or stripped thread.

Usual cause of such trouble is trying to start the thread with the aid of a box or plug spanner. Wrong. The plug should be started by hand (use a rag or glove if it is hot) and the spanner reserved for the final tightening only.

## PLUG SNAG

THOUGH it is common practice to check for a spark by coupling the ht cable to a spare plug, it could bring trouble.

That single, confirmatory kick could be enough to foul the plug left in the head.

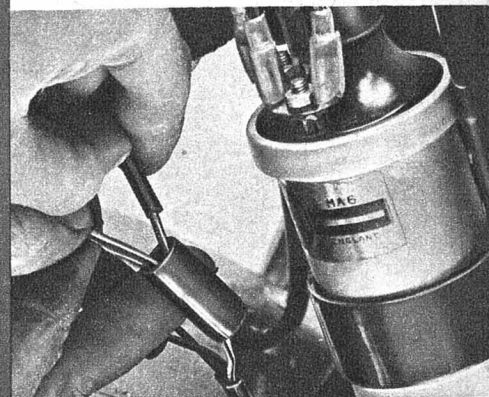
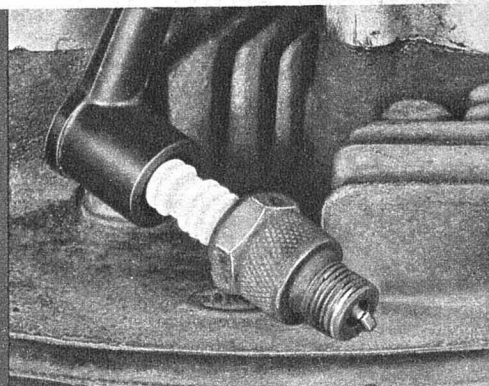
Play safe, even if it does take a few seconds longer, by whipping out the in-use plug and checking the spark with that.

## REDUCED CHARGE

SUMMER RIDES can result in a boiled (overcharged) battery. Here is a way out in the case of Lucas alternator equipment.

Replace the snap connector in the white-and-green lead from the alternator by a double connector (Lucas Part No 850641) and take a wire from this new connector to the No 4 position on the underside of the lighting switch.

This will give you a reduced charge rate while the lights are not switched on.



## SPRING REPAIR

BROKEN contact-breaker spring—and no replacement immediately available? If the spring is of the flat type, remember that a watch and clock repairer may be able to help.

One reader, stuck on tour in the wilds of France, found a village clock repairer who was able to make up an excellent replacement, using a piece of alarm-clock spring steel.

## HOT PLUG

PRE-IGNITION, bringing a rise in cylinder temperature which could result in burnt-out valves or pistons,

can often be caused by faulty or unsuitable sparking plugs.

Check the pre-ignition by pressing the cut-out button or switching off the ignition. The engine should cut cleanly, without any tendency to "run on."

## DIAGRAM

WHEN electrical trouble strikes, it is inevitably out on the road somewhere, not in the garage—and very few riders carry their handbooks about with them.

At times like this, a real headache-saver is a spare wiring diagram, pasted inside the toolbox lid.

## COVER TROUBLE

**RAIN CAN** find its way into a number of unlikely places. For example, it can get into moulded-plastic plug covers and cause shorting.

Check here, before deciding that there is a fault elsewhere in the ignition system.

Rubber plug covers, secured to the ht leads by metal clips, are a better bet—but make sure that, after long service, they are still a good fit around the plug insulator.

## BRUSH BEDDING

**AFTER** fitting new carbon brushes to a dynamo, and before replacing the dynamo end cover, start the engine and allow it to tick over. Press down very lightly on the brushes with a screwdriver for a few moments.

This will ensure good contact with the commutator.

## SOOTY

**FOULED** plugs are more common in winter than in summer. This is because, in cold weather, there is greater need for carburettor flooding.

If traffic halts follow soon after a cold start, the rich-starting mixture doesn't have a chance to burn off the plug points.

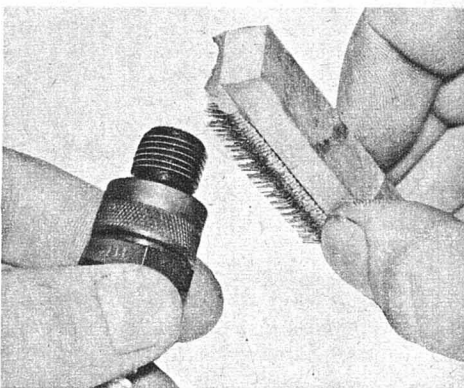
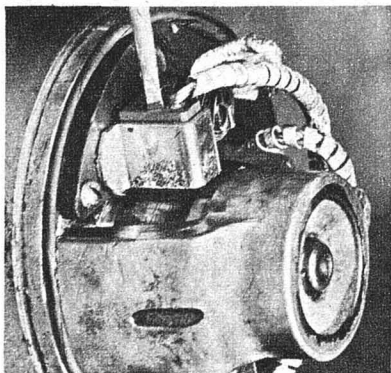
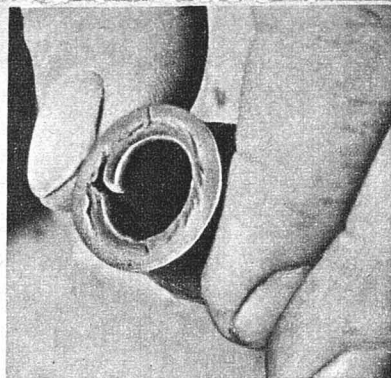
Usual symptoms of a sooty plug are banging and cracking in the exhaust system with, possibly, spasms of spitting back through the carburettor.

Best quick method of cleaning a fouled plug is by a file card or a small wire brush as supplied in some puncture outfits.

## COIL FAILURE

**THE STRAP** which secures an ignition coil should be just tight enough for the purpose—and no more.

Reason is that the coil windings are enclosed in an aluminium casing and should the casing be distorted it could cause an internal short.



## WRONG PLUG

**WHEN A** short-reach plug has been used in a cylinder head which should have a long-reach version (done only in an emergency) it is essential to clean the female thread before refitting a long-reach plug.

Strictly, the tool to use is a 14mm tap, the flutes of which should be smeared with grease to collect carbon.

At a pinch, you can use a discarded long-reach plug with longitudinal grooves filed in the threaded portion.

## CHECK AGAIN

**ENGINES** with chain-driven dc dynamos (for example, BSA twins with separate gear box) require a re-check after adjusting dynamo-chain up-and-down play.

This is because the action of tightening the dynamo clamp can turn the unit slightly in its housing—and the chain tension may be upset.

## POWER CUT

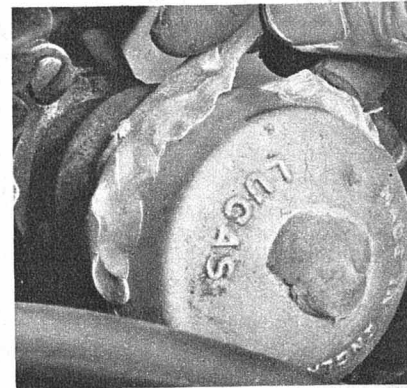
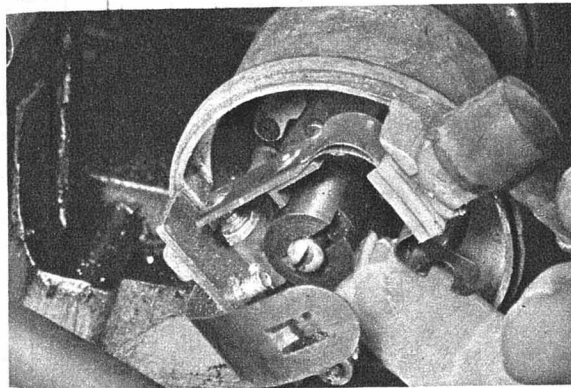
**SHOULD THE** battery be flat and the generator not charging, a quick way of getting by is to make use of a six-volt electric lantern battery.

Wire one terminal to earth and the other to the switch-wire terminal of the ignition coil. This dodge helped Bill Faulkner to complete a day's run in the 1964 Scottish Six Days Trial.

## NO EARTH

**YOU MAY** not believe it, but one dealer swears it happened. Into his showroom came a chap who complained that the sidcar-wheel lamp of his new chair wouldn't function; not surprising—he'd tried to earth the lamp body to the glass-fibre mudguard!

Perhaps that is an extreme case. But remember, a metal guard is usually rubber-mounted. You should take your return lead direct to the chassis or to the frame of the bike.



## CAM SQUEAK

**PUZZLED** by a high-pitched squeak when the bike is running? Likely cause is a dry contact-breaker cam.

The cure is a very thin smear of high-melting-point grease (not ordinary grease) on the surface of the cam.

## MUST BREATHE

**CERTAINLY** you can waterproof a magneto or contact-breaker assembly with Plasticine or insulating tape.

However, the unit must never be sealed off completely. Some ventilation is necessary, otherwise condensation will develop.



## DIPSWITCH

**DURING** the summer, the dip-switch is rarely used. Consequently you might be caught out, when the darker nights return, by a switch which is slow in action—or, worse still, sticks halfway when used for the first time.

Correct lubrication of the switch internals is Vaseline (*not* grease or oil).

## WELL MIXED

**DURING** winter time, the bike should be taken for a run immediately after the battery has been topped-up. Reason is that, in frosty weather, the pure water may freeze and crack the battery casing.

A run ensures that the water becomes mixed with the acid in the battery and the chance of a freeze-up is lessened.

## SWITCH SWITCH

**WIPAC** electrics are used on a number of up-to-250 cc machine, with a plug-and-socket connection of the wiring loom to the ignition and lighting switches.

These switches are identical and, should a faulty switch be suspected, it is an easy matter to check by swapping the socket connections in the headlamp shell.

# TYRE TOPICS

## CHAPTER SIX

## BALANCE

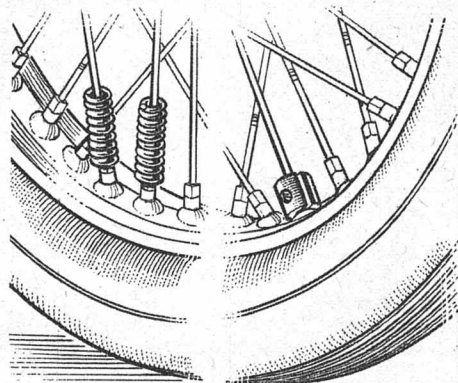
**IF** the front wheel is out of balance, wear of the tyre is increased—especially if you do much high-speed work. Not only that, but at around 65 mph and upward fork hop might upset steering.

One way to balance a wheel is to spin it slowly, see where it comes to rest and mark the tyre wall at the heaviest spot.

Diametrically opposite this point, wrap a pair of adjoining spoke nipples with lead strip or wire, finishing off the job with a turn or two of insulating tape.

Neater still is to employ chromium-plated "acorns," as sold by most accessory dealers. These are slotted at one side and are slipped over the spokes and tapped into place on the nipples.

Remember to rebalance the wheel after fitting a new tyre.



## DUSTBIN

**TROUBLE** on the road, and you may have no alternative but to lay the wheel on its side when a tyre has to be taken off—but this means that dirt may enter the wheel bearings unless care is taken.

If, however, you are doing the job at home, a better proposition is to place the wheel across the open mouth of a dustbin.

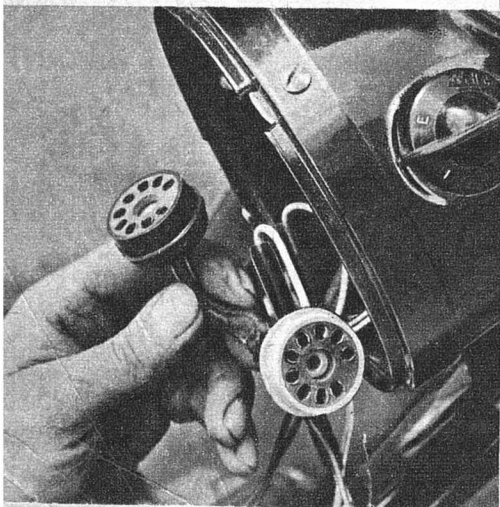
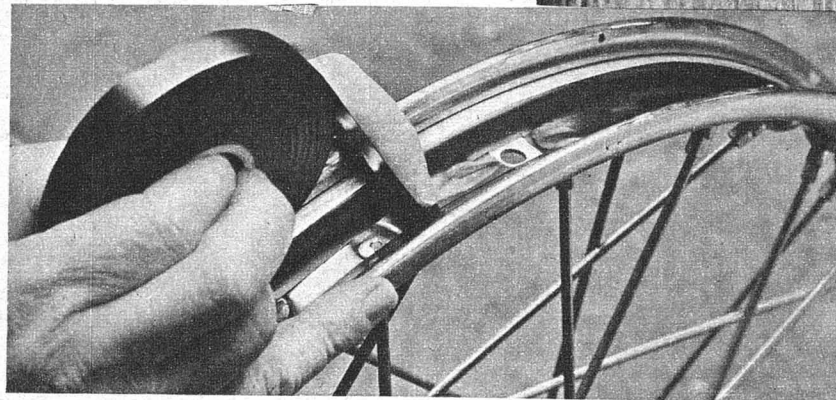
In any case, it is more convenient to have the wheel at a reasonable working height.

## TAPED

**TRIALS** riders are often pushed for time—and if a puncture has to be tackled, minutes can be lost in trying to locate the valve hole in a wheel-rim tape.

Charlie Rogers (who prepares Royal Enfield models for the ISDT) gums the tape of each wheel into the well, so that it cannot creep in use and partly obscure the valve hole in the rim.

Sammy Miller has a different plan; he dispenses with the tape entirely and, instead, wraps the well of the wheel with electrician's plastic tape. This serves the same purpose very nicely. Insulating tape can be used if well dusted with french chalk.



## HANDY CAP

**SURPRISING** how many riders throw away the dust caps of their tyre valves and ride around with the valves uncovered. Yet a cap does more than prevent dust reaching the valve core.

At high speeds, centrifugal force has been known to throw a core clear of its seating, so allowing air to escape.

Why throw away an insurance policy?

## SLIPPERY

**TYRE** fitting and, especially, the seating of the tyre on the rim is simplified if a lubricant of some kind is applied to the beads, so that they slip

into place. Soapy water is often used. Alternatively, Rozalex hand cleaner, suggests trials ace John Brittain, does the job perfectly.

This is fine if you are fitting a tyre in the workshop, but a puncture on the road may be another matter.

One tip: carry a tin of french chalk or a piece of candle in the tool box and rub that round the beads.

## NO BLOOD

**WHEN** taking off a rear tyre (on a wheel of non qd type), lay the wheel down with the sprocket side underneath. That way you will not scrape your knuckles, or damage the inner tube, on the sprocket teeth.

## BLOW!

**WITH** a motor-cycle type wheel it is always better to have just a little air in the inner tube before stuffing it inside the cover when replacing a tyre—but just how much air is “a little?”

Here's a dodge practised by trials aces; they extract the valve core entirely then blow up the tyre by mouth. You won't get much pressure in the tube in this fashion, but it will be enough for the job.

Press the tube with your thumb, so that the base of the valve is covered, while you replace the valve core.

## PAY LATER?

**TIME-HONOURED**, maybe, but that advice about spinning each wheel once a week, and digging out embedded shreds of glass, metal or flint from the tread is still sound.

Look at it this way. A tyre doesn't necessarily go flat immediately you ride over a nail. But the false sense of security you enjoy while the nail works its way through the cover won't help you when the tyre goes flat!

## TUBELESS

**MOTOR-CYCLE** wheels cannot accept tubeless tyres, but these are sometimes fitted to pressed-steel wheels of scooters or sidecars.

If the wheel is of split-rim type, inflation of a newly fitted tyre can be a problem.

Main object is to ensure that the tyre beads are right home and making a good seal against the edges of the sealing band. This is done by wrapping a length of stout cord tightly round the circumference of the tyre.

Next, insert a stout bar between the cord and the tyre surface and twist several times, to tighten the cord and apply a tourniquet.

## PUNCTURE

**SURE IT** is a puncture? Best check first by removing the valve dust cap and testing the valve for leakage.

Spit on your finger tip and spread the spittle over the top of the valve; any bubbles will be a dead giveaway.

Assuming the valve is in order, look all round the tyre to find the nail or flint which has caused the trouble; mark the spot, in chalk, on the tyre wall to save time later in locating the hole in the tube.

## MORE ROOM

**ESPECIALLY** with a narrow-section rim, persuading the tyre valve through its hole in the rim can produce sore knuckles and an interesting flow of language.

Try this, instead; insert a lever under both edges of the tyre and, using the far edge of the rim as a pivot, heave both clear of the rim well.

The valve can now be slipped through its hole and kept in place by the collar wound on a few turns.

On releasing the lever, the remainder of the tube can be tucked in.

While the pressure is applied, pump up the tyre to about 5 psi.

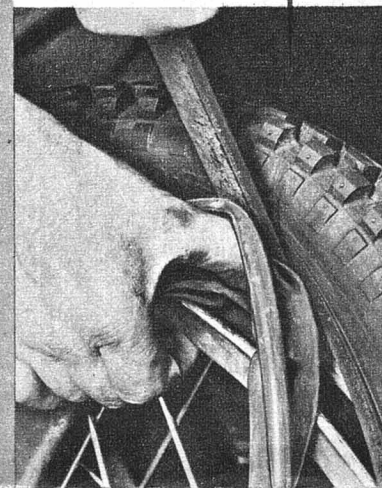
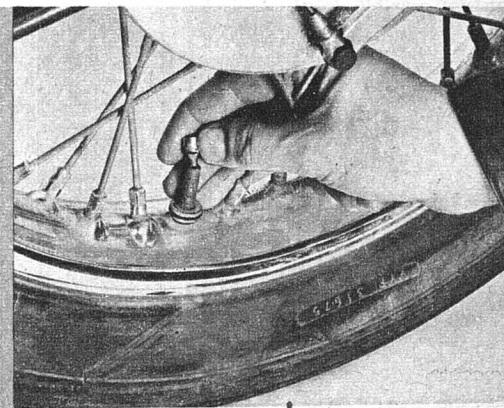
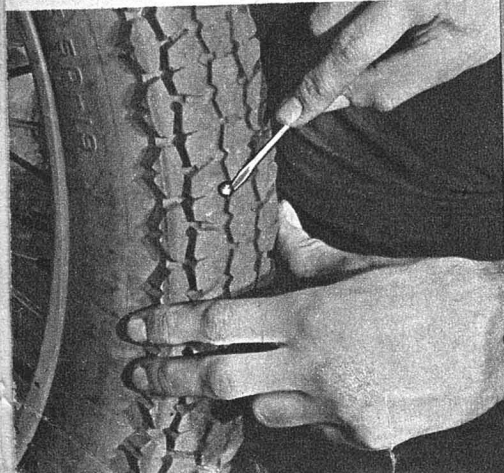
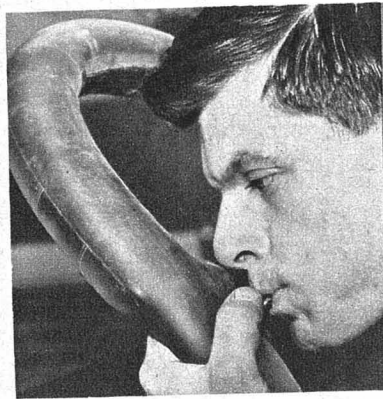
After that, the cord can be released and inflation continued.

## SECURITY

**WHEN** a new rim tape is bought, it will usually have no provision for a security bolt. Any attempt to cut a hole for the bolt with scissors or a penknife is likely to produce a jagged tear when the tape is stretched into position.

Answer is to punch the hole, using (for instance) a  $\frac{3}{8}$ in-diameter bolt, preferably with a convex end.

Incidentally, go easy with the spanner when tightening a security bolt.



## PRESSURE RIGHT?

A TYRE which wears faster in the middle of the tread than at the sides indicates that too high a pressure is being used.

Conversely, if the sides wear faster than the middle—and this is more usually the case—pressure is too low.

(On the same theme, a tyre which wears quicker at one side than at the other points pretty definitely to an out-of-line frame, or to very unequal settings of the rear-wheel chain adjusters.)

As a rough guide, when carrying a pillion passenger it is best to increase front-tyre pressure by 2 lb, and that at the rear by about 8 lb.

## SPLIT RIMS

MOST SCOOTERS are fitted with split-rim wheels. Before trying to separate the two parts be sure the tyre is absolutely flat, then force the tyre beading away from the rim walls all the way round—on both sides.

To refit, insert the inner tube into the cover, and pump in a little air (about 2 lb pressure is sufficient) to keep the tube in place.

Pass the valve through the hole in the wheel pressing and place the tyre on that half of the wheel; finally, slip the remaining half of the wheel into position.

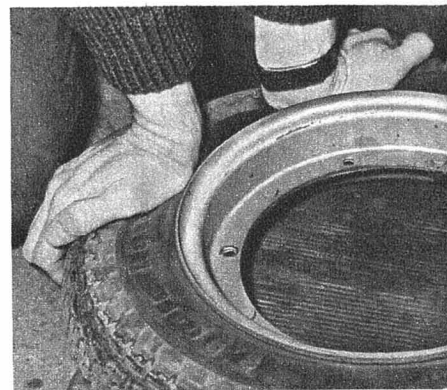
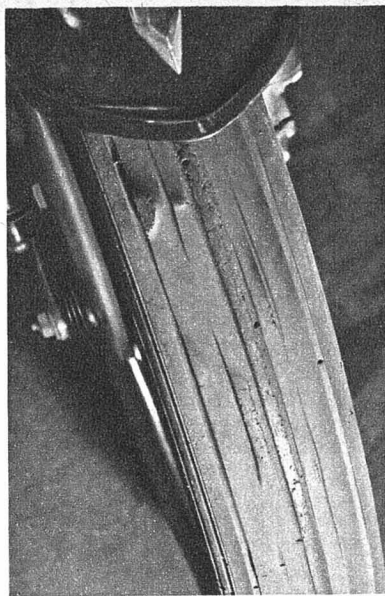
Do not try to fit the half-rim with the tyre-valve hole last, or the wheel studs may not line up with their holes.

## LAST ON, FIRST OFF

DIFFICULT to remember, perhaps, whether the area of cover near the valve should be tackled last, or first.

Think of the lucky chap stowing his bike on an Isle of Man steamer, suggests Roy Peplow. Last on, he will probably be first off.

In other words, if you are putting a tyre on the rim, deal with the valve area last. If you are taking one off, tackle it first.



## TRUE RUN

IT'S WORTH taking the trouble to fit tyres so that they are true-running. A wobbly tyre will certainly affect steering, will wear unevenly and never again run true.

Make sure the moulded line on each wall is equidistant from the rim all the way round. If it isn't, blowing up the tyre to a pressure of, say, 35 to 40 lb may persuade the beads into position.

Or make a note of the point at which the moulded line is too close to the rim, and wallop that part of the tyre with a heavy piece of wood or a mallet.

# CHAPTER SEVEN CONTROLS

## LEVERAGE

IF YOU ride a machine in solo trim, then add a sidecar, you will probably continue to use the same handlebar. However, you could save yourself some tired, aching muscles by trying a wider bar.

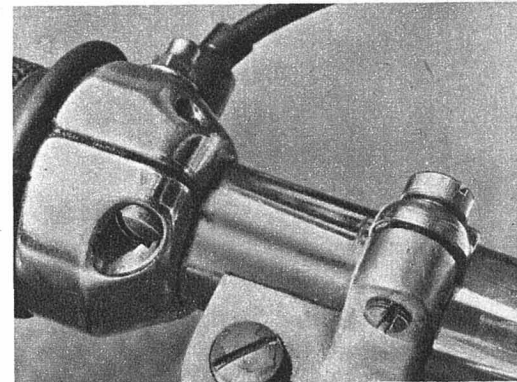
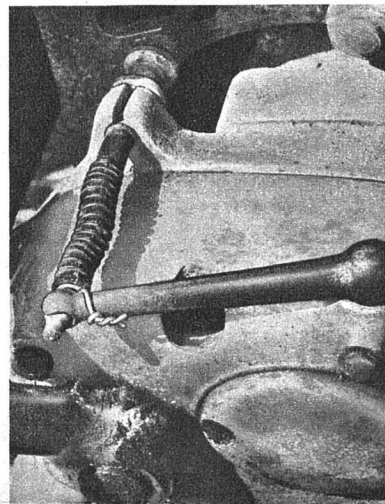
More than likely, you will find what you need among the selection of handlebars marketed for trials models.

These are often 30in wide or more, and are reasonably easy to bend to the shape of your liking.

## CABLE SLEEVE

BEST WAY to keep an exposed length of control cable clean and well-lubricated is to enclose it in a bellow-type sleeve in rubber or plastic.

Bellows suitable for the purpose are sold by accessory dealers. Alternatively those fitted as standard on some machines (Lambretta scooters, the front brake cables of DMW and certain Japanese models) may be suitable for yours.



## SCREW TIP

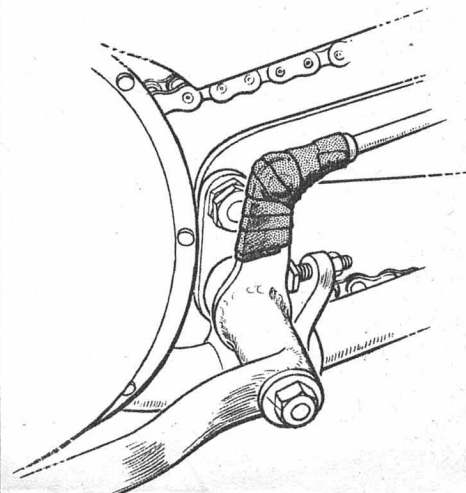
SHOULD a machine be dropped, there is a possibility of snapping one of the handlebar-lever clamp screws—and a screw broken off flush with the clamp can be awkward to extract.

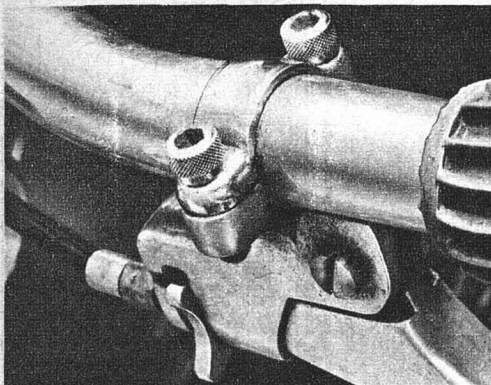
If, however, a saw-cut is made across the threaded end of each screw, any broken piece can be removed with a screwdriver.

## WRAPPED UP

OLD TIMERS know this hint well, but it is worth remembering. Smear brake clevis joints with oil or grease, then wrap them in insulating tape.

The action will then remain smooth even in heavy rain, while the salt used on snow-bound roads cannot get in.





## TIGHTER

**SOCKET-HEAD** screws have two main advantages; they are less likely to break and they can be tightened more than ordinary slotted screws.

For competition work especially, it is essential that handlebar lever clamps do not come adrift and swivel round out of reach.

Substituting socket-head screws here will put an end to that bother!

## TOO MUCH

**CONTROL CABLES** made up on a production line are usually fitted with nipples and the ends are then plunged into a solder bath. The consequence is that the nipple gets a coating of solder on the outside.

Unless this is eased off with a file before fitting the cable to its socket the nipple will not work freely; the result could be premature cable breakage.

## CHAINED UP

**IN ONE** national trial, Allan Jeffries had the ill-luck to wipe off his rear-brake pedal pivot against a large rock. Not wanting to ride all the way home without a rear brake, he fastened a length of bicycle chain to the left footrest and to the brake cam lever.

By putting his foot on the chain, part-way along its length, he applied the brake. There's always a way. . . .

## RAINPROOF

**EXPOSED** control-cable adjusters, such as are sometimes incorporated in a throttle cable, tend to allow rain-water to enter; this results in stiff and jerky operation.

It is only rarely that you need to adjust the cable, so waterproof the adjuster by wrapping it in insulating or plastic tape.

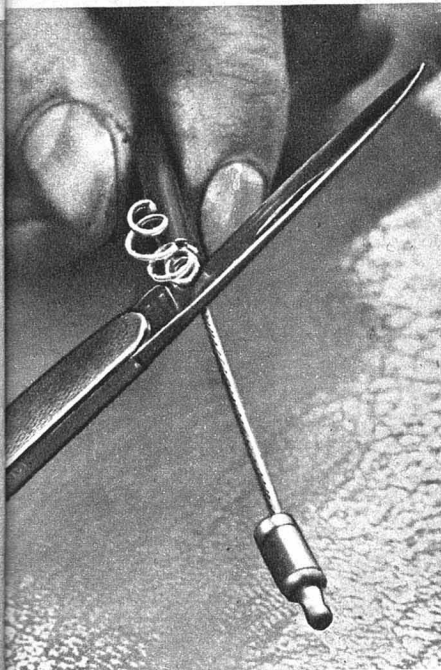
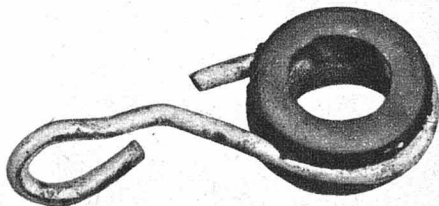
## CABLE CLEAT

**CHAFED** control-cable outer casings will let in water. The front-brake cable is particularly liable to such damage because of fork action, and a bracket to keep the cable clear of the mudguard can be worth while.

Form a loop at each end of a piece of stout wire (about 2in long).

In one loop can be mounted a rubber grommet through which the cable passes.

The other loop can be located on any convenient bolt.



## SHORTENING CABLES

**BEST** practice, of course, is to use a control cable of the correct length—but, occasionally, you may have to make do with one in which the wire is a fraction too short; the answer is to shorten the casing.

This is done by first easing the ferrule from the casing end and slipping it up the wire out of harm's way.

Next, with a penknife peel away the casing cover as necessary, to expose the coils.

Slip the knife blade between the outermost pair of coils, twist the blade to separate them, then run the cover round and round between the fingers so that the unwanted coils peel away.

When enough coils are peeled, snip them off with sharp cutting pliers, slip the ferrule back into place and that should be that.

## NON SLIP

**ESPECIALLY** on a competition mount, the handlebar must be firm in its clamps—and chromium plating offers a pretty poor surface for clamps to bite on.

Whenever Sammy Miller fits a new handlebar, he first notes where the clamps will come, then roughens those sections of the bar surface with emery tape.

## JERKY

**NEVER** jump to the conclusion that the speedometer head is causing jerky or wavering movement of the needle. Often this bother can be traced to a faulty drive cable.

Make certain the cable has not been trapped under (say) the tank nose, and that there are no excessively sharp bends in the cable run.

Don't neglect the take-off gearing, if your model is the type with the speedometer driven from the front or rear wheel; keep this well greased.

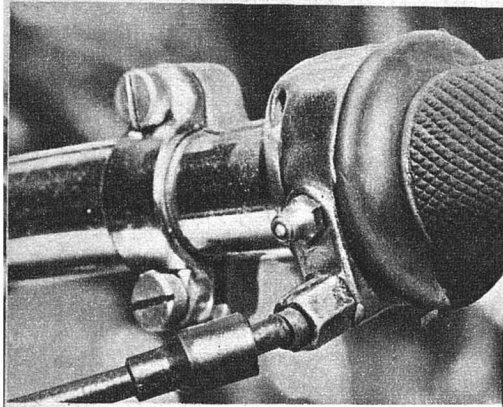
Better still, take off the housing occasionally, disconnect the cable and turn the driving dogs by hand to check that the movement is free-running.

## METAL CLIPS

**MANY** riders adopt the trials rider's dodge of taping spare throttle, clutch and front-brake cables alongside those in use. This is practical, but not especially neat.

A more attractive way of doing the same job is to use, instead of insulating tape, small metal clips to couple together the cables.

These are used on some bicycles, and can be obtained from most cycle dealers.



## SNAP SHUT

A **TWISTGRIP** which closes when released is essential wear in many branches of motor-cycle sport. It is also well liked by many trials riders and by some road-going types.

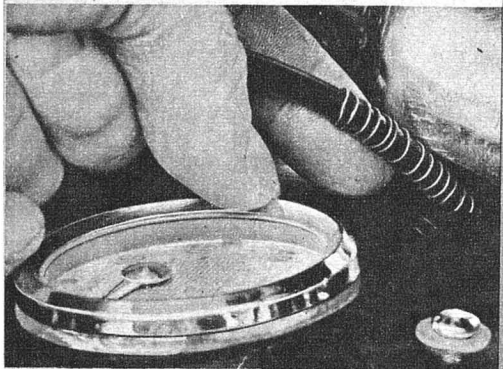
Instead of just slackening off the throttle-drum friction screw, replace it by a grease nipple and you will have a handy means of keeping the grip silky in operation.

## ANTI-HEAT

**TRIALS** riders know this one well enough—but it has its uses on roadsters, too. When a control cable, or the speedometer drive, passes near a source of heat (such as the cylinder barrel or an exhaust pipe) it can suffer damage by burning.

The answer is to coil copper wire round the outside of the cable for a length of about 6in, wherever the risk is likely to arise.

The copper dissipates the heat while keeping the actual cover from making contact with the hot surface.



## GET-YOU-HOME

**THROTTLE** cables do break occasionally—and generally at the twist-grip end. This doesn't necessarily mean a long push home. On some machines, it may be possible to use the air cable as a substitute (best to remove the air slide entirely, in this case).

Another scheme is to strap one end of a pencil to the handlebar by means of a rubber band, and tie the broken end of the cable to the other end of the pencil.

Working the pencil to and fro with the thumb gives acceptable throttle control.

Where did the rubber band come

from? Experienced riders always carry two or three of these, cut from an old inner tube, in the tool box.

## SPEEDO CABLE

**PROPERLY** fitted and lubricated, a speedometer drive cable will last for years—but far too few riders take the trouble to lubricate the cable.

From time to time, disconnect the drive from the speedometer head and pull the cable right out. Grease it very lightly, especially at the lower end where it is most likely to rust up.

Never use oil, for this could work its way up the cable and into the mechanism of the head.

# DO YOU KNOW?

■ **BY COUNTING** the number of teeth on the various sprockets, top gear ratio can be obtained by:

clutch sprocket × rear sprocket

engine sprocket × gear-box sprocket

This is assuming a one-to-one gear box internal ratio in top gear; intermediate ratios are obtained by multiplying the top gear ratio by the gear box internal reduction in the various gears.

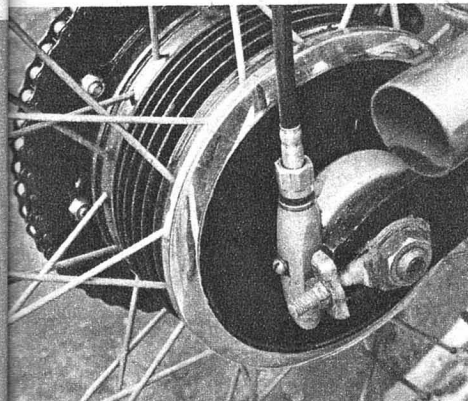
■ **WHEN** a battery is fully-charged, it should show a reading of between 1.27 and 1.29 on a hydrometer scale; a discharged battery would read between 1.11 and 1.13.

■ **WHERE** the bore and stroke dimensions of an engine are known (in mm) the exact cubic capacity equals  $\frac{\pi R^2 H \times N}{1,000}$  where R is the radius (that is, half the diameter of the bore), H the length of stroke and N the number of cylinders.

■ **WEIGHT** of one gallon of petrol is approximately 7lb 4oz; a fully loaded four-gallon tank is therefore carrying 29 lb top weight.

■ **STRICTLY** speaking, one kilometre equals 0.62137 of a mile—but for touring purposes, or rough calculations,  $\frac{5}{8}$  of a mile is near enough. Speed limit in continental built-up areas is usually shown as "50"; this is approximately 31 mph and corresponds to our own 30-limit.

A quick calculation is to halve the figure in kilometres and add a quarter of the result. Thus 80km=40+10: total, 50km.



## NEW ROUTE

**USUALLY**, on models with rear-wheel speedometer drive, the drive housing is so positioned that the cable take-off is horizontal.

The nut securing the cable to the drive unit is between the fork arm and the wheel spokes, and is often difficult to reach.

The nut becomes more accessible if the drive housing is turned so that the cable emerges vertically, with the cable re-routed.

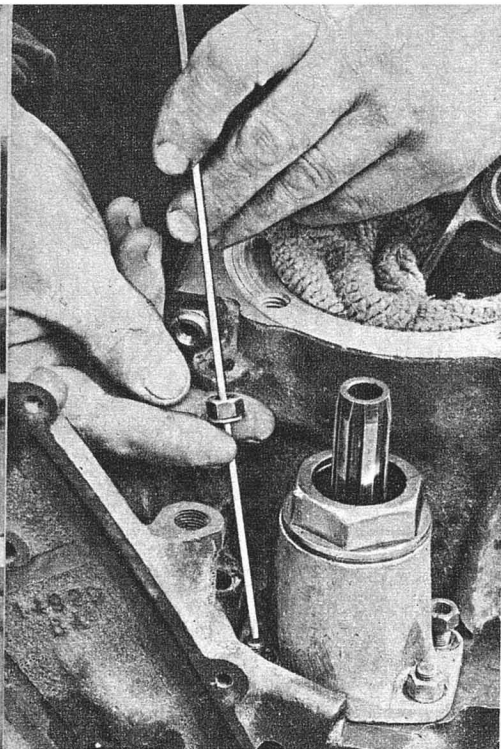
## GRIPS

**HANDLEBAR** grips, whether of plastic or rubber, will slide into place more easily if a little petrol is first tipped into each grip and swished around to lubricate the interior.

The petrol, of course, will evaporate quickly, leaving the grip nice and tight.

In cold weather, plastic grips may need to be warmed to soften the material, and this is best done by dipping them into a bowl of hot water for a few seconds.

Similarly, the removal of a plastic grip on a cold day is simplified if the grip is first wrapped in a rag soaked in hot water.



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## TRICKY NUTS

**SOMETIMES** a nut or washer has to be replaced on an awkwardly located stud or bolt. One way is to place a length of stiff wire hard against the end of the stud, then thread the washer or nut (or both) over the wire so that it slides into place.

Keep the wire in position while you start the nut on its thread, so that it doesn't drop into a tiny crevice.

## TURNING BOLT

**ANNOYING**, when you are trying to tighten a nut and the bolt turns also—especially if the bolt head is at the far side of the bike—and your arms aren't *that* long.

The remedy is to clamp two hacksaw blades side-by-side in the same frame and cut a slot across the bolt end. You can then hold the bolt from the "nut" side of the model, using a screwdriver, while the nut is tightened.

# WORKSHOP

## CHAPTER EIGHT

### SERVICE EXCHANGE

**SAVE MONEY** and, possibly, a deal of work by finding out whether or not there is a service-exchange scheme in operation for the parts you need.

Most electrical components—dynamos, cvc units, magnetos—can be exchanged for factory-guaranteed, rebuilt items under the Lucas B90 scheme.

In the same way, the bigger motorcycle factories will supply service-exchange clutch plates, brake shoes, speedometer heads and other items.

Some firms can supply reconditioned crankshafts, cylinder barrels—even complete engines and gear boxes.

Worth investigating, surely?

### CHAIN PEG

**MOUNT** a small-diameter bolt so that it protrudes vertically from the upper rear end of the chainguard, and you will have a handy peg on which to hang one end of the chain when the rear wheel is removed.

This simplifies the job of refitting the chain when the wheel is put back.

### WIRE BRUSH

**NEED** a stiff wire brush? Cram some short lengths of discarded control cable into a piece of copper tubing, then hammer the end of the tubing flat so that it grips the wires firmly.

Unravel the strands of cable and trim the ends to shape with a chisel.

## PUSHOVER ONE

**PLASTIC** fuel pipes will push home more readily over their unions if the ends are first softened by warming.

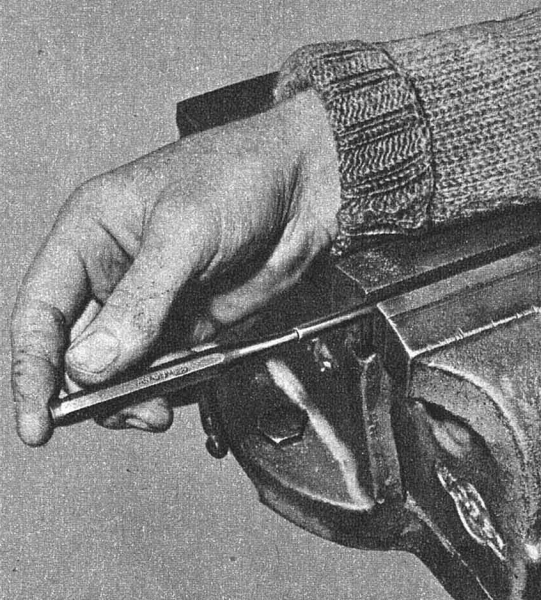
Best to do this by immersing each end of the pipe in a cup of hot water; at a pinch, you could pass a lighted match over the plastic—but be careful, for you could burn the pipe.

Warming, however, is not a cure for an age-hardened pipe. The only remedy is to fit new.

## PUSHOVER TWO

**COULD** be, of course, that a plastic or rubber pipe pushes over a copper tube in a fuel or oil system too easily, allowing a leak.

To overcome this, bell out the end of the copper pipe by gently working a taper punch with a circular motion in the open end.



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## PAINT TIP

**WHEN** repainting a tank, mudguard or sidecar body—particularly in black paint—it is sometimes hard to tell whether the second coat has completely covered the first.

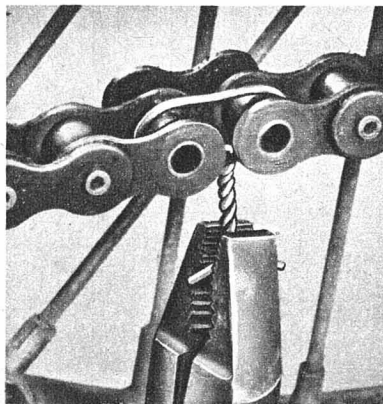
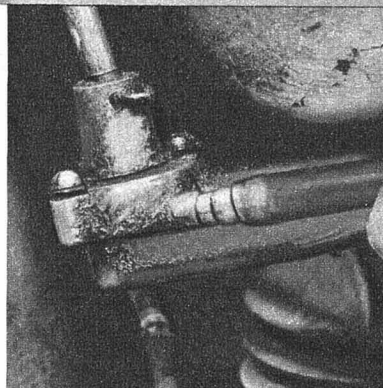
To check, breathe lightly on the work. The fresh paint will stay bright, but the first coat will show up momentarily as a dull patch.

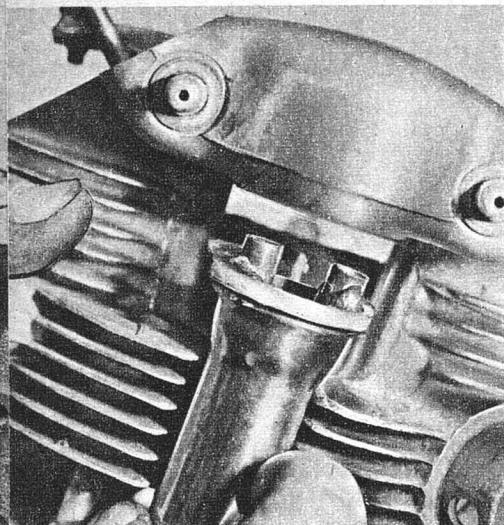
## HANDY

**COPPER** wire has a multitude of uses in the workshop and around the model—so many that no self-respecting rider should be without a coil in his tool box.

However, the copper hardens in the course of time and becomes less easy to manipulate.

Every now and again, put your roll of wire on a gas ring until it glows red, then soften it by dropping it into a bucket of cold water.





## GREASE BLOBS

**THICK** grease is useful stuff to have around in the workshop. For instance, the lower ends of the push rods will stay in place on the tappets if grease is used as a temporary adhesive.

If the push rods are enclosed in a tube, as on the Triumph Tiger Cub, a thick blob at each side of the top of the tube will keep the rods separated while the cylinder head is lowered into place.

A screwdriver, or metal rod, to which heavy grease has been applied can be invaluable in fishing out odd items from awkward corners—a washer, say, or a ball bearing which has slipped out of place.

## MoT TEST

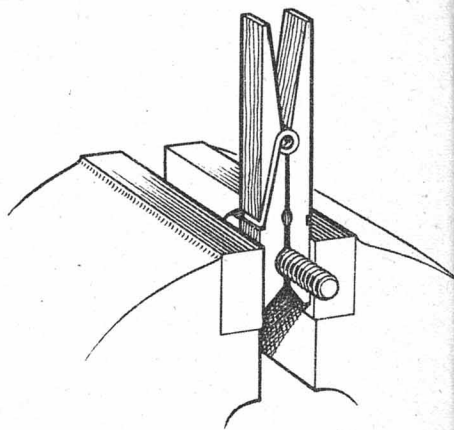
**SOME RIDERS** worry unduly about the requirements of the MoT fitness test for old models. If it *doesn't* pass the test, the machine is in such a state that no self-respecting rider would want to use it, anyway. Engine condition doesn't come into it. Road fitness alone counts.

For example, a solo must have a front brake of at least 30 per cent efficiency and a rear-brake efficiency of 25 per cent.

These figures are by no means high and should certainly be handsomely bettered by an average bike at an average level of maintenance.

Front and tail lights should work when requested—no specific requirements beyond that, except that the dipped beam should not dazzle on-coming traffic.

Check that there is no play in the steering head, wheel bearings and fork bushes, that your handlebar is tight in its clamps, that your tyres have sound treads and that the wheels are in line; and that's about all you have to think of.

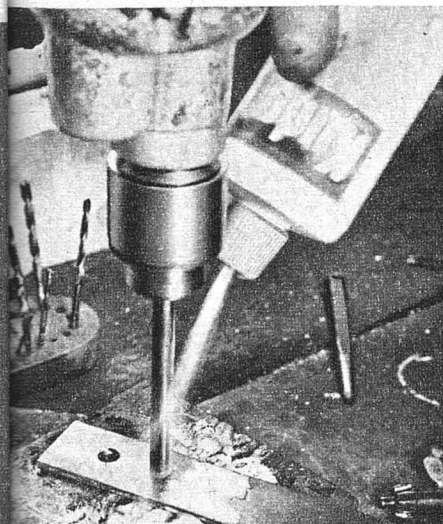


## BOLT GRIP

**SHOULD** you need to shorten a bolt, you may find difficulty in holding the bolt in the vice jaws.

This is one rather neat way of doing the job; the bolt won't twist when you start to cut it, neither will the threads be damaged.

Simply grip the shank of the bolt in a spring-type wooden clothes peg, and close the vice jaws on the sides of the peg.



## BOTTLED

**HOUSEHOLD** washing-up liquid usually comes in plastic squeeze bottles. These, when empty, can be mighty useful in the workshop.

Fill one with light oil or cutting oil, and use it to cool a drill bit.

Cut the base off a second and you have a neat little funnel.

Take a third bottle, push a length of small-bore plastic tubing (this can be bought from a model-aircraft shop) into the cap; result—a battery topper-upper.

Unscrew the cap from yet another, fit a rubber cork drilled through the middle and cut in half, and you have a cable oiler.

## ZIP FASTENERS

**MANY TYPES** of riding suit are fitted with zip-fasteners and, in the course of time, these can become stiff and jerky in action.

Don't use oil as a zip lubricant, for it can spread and stain your shirt or jacket. Instead, get the proper white zinc-base grease.

As a stand-by alternative, rub along the teeth of the fasteners with a greasy finger—or, even, with a stub of candle.

## STICK ON

**LOOSE** rubber buffers can be a nuisance. Take off the fuel tank, and they slip out of place or drop to the floor and roll away out of sight.

Best plan is to stick them in place on the underside of the tank using Bostik.

The same applies to the type of rubber buffer which wraps around the frame top tube; in this case you can use insulating tape.

Don't wrap too tightly or you will rob the rubber of its shock-absorbing qualities.

## SALT MENACE

**USED BY** most highway authorities in snowy or frosty weather, salt is a mixed blessing. It helps keep the roadway-clear—but it also plays havoc with light-alloy or plated parts.

If you use the bike in salty snow, wash it down with warm, soapy water whenever possible; twice a week is not too often.

Salt is likely to work its way into chains, brake-linkage joints and any other mechanical parts at a low level.

In winter, therefore, it is more than ever important that these items be kept well greased or oiled.

## MEASURER

**PROBABLY** your instruction book will specify a certain number of fluid ounces of oil to be used in each front-fork leg.

Well, a medicine bottle calibrated in tablespoonfuls is easy enough to obtain. Remember that two tablespoons equal one fluid ounce. Ten fluid ounces equal a half-pint; as a point of interest, they also equal (near enough) 250 cc.

## STUCK CAP

**YOU CAN'T** shift the screw cap of an oil canister, or other container. So you obtain a length of stout string, make it into a loop and wrap the loop round the cap.

Now, push a piece of stick through the spare end of the string; you'll find the leverage so obtained is quite enough to move the most stubborn of caps.

## OVERNIGHT

**NATURALLY** a bike is at its best in the morning if it has had the benefit of shelter for the night. But there are times—TT-week in the Isle of Man, for instance—when there is nothing for it but to leave the machine in the open overnight.

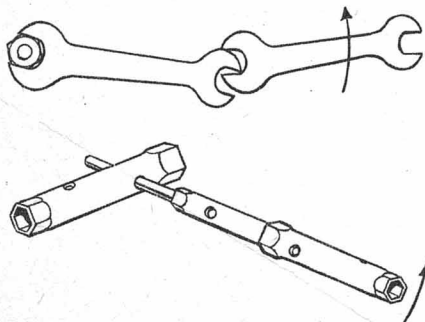
Well, here's an ISDT dodge to prevent rain from working its way in; tear off a couple of short pieces of adhesive tape and use them to cover the carburettor tickler and the vent hole in the tank cap.

## PURCHASE

**CRUDE**, but effective if done carefully. There may be an occasion when a tight nut has to be undone and you just haven't a spanner of sufficient length with you.

The answer is to use a pair of open-end spanners in tandem, as shown; but do beware of a slip which could cause grazed knuckles.

Remember, too, that extra purchase can be obtained on a box spanner if a smaller-size box spanner (two, if necessary) is slipped over one end of the tommy bar.



## PAPER FUNNEL

**SIMPLE** method of getting oil into a gear box or primary chaincase when you haven't a funnel handy—snip the corner from a stout envelope, and there you are.

Or you could fashion a funnel from household foil wrapping (the stuff used when roasting a chicken).

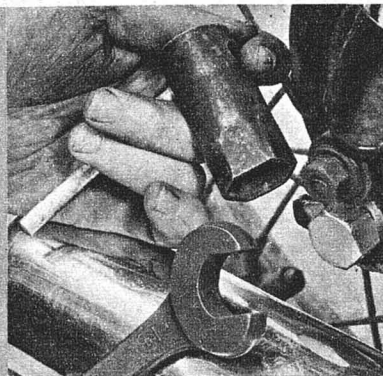
Remember, too, that a twist of paper, or a pipe cleaner, will serve to place a spot of oil or touch-up enamel exactly where it is needed.

## ON TOW

**READERS** often ask *Motor Cycle* whether or not it is legal for one solo machine to tow another. Quick answer is—yes, it is; but only if the bike on tow is taxed (and insured) and has genuinely broken down.

Definitely against the law, therefore, for you to tow a pal's scrambler to a meeting in this way—or to tow home a secondhand, "snip for mechanic" bargain last taxed a couple of years back.

Never tie the rope to the towed machine. Instead, pass it once or twice round the middle of the handlebar, if possible, and let the rider hold



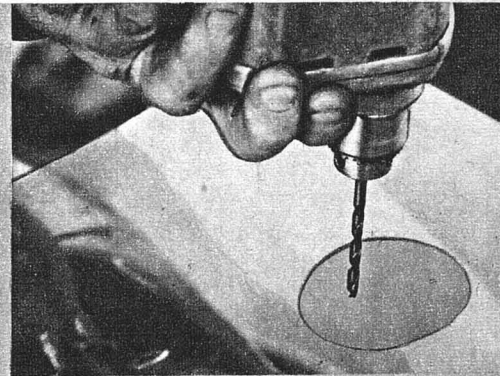
## CAN DO ?

**DOESN'T** matter whether you are a trials type or an average tourist, make sure the tools you carry are capable of doing the job.

Perhaps you have a really hefty fly spanner at home, just right for, say, getting the rear-wheel nuts tight.

But what's the point of that, if you can't undo those same nuts with the model's tool kit?

Punctures happen out on the road, not in the garden shed!



## SCREEN CUT

**PERHAPS** some reshaping of a Perspex windscreen is required, or you may want to cut a slot or hole in such material.

A good way of doing this is to mount a 1/4-in-diameter bit in an electric drill, and use the side of the drill as though it were a milling cutter.

Take care not to press too hard against the Perspex or something might break—either the drill or the screen.

the end of the rope firmly against the left-hand grip.

Then, if he finds himself in difficulty, it is an easy matter to cast off.

No rope? As a last resource, more than one breakdown has been towed to a garage by the aid of two Barbour-jacket belts buckled together.

## POCKET KIT

**LOT OF** bother, sometimes, to have to unpack the main tool kit just for the sake of a minor roadside adjustment.

Here's a useful little kit which can be slipped into the pocket of a riding jacket.

Buy a plastic tobacco pouch for a small kit comprising tyre-pressure gauge, magneto spanner, small adjustable spanner, miniature pliers and electrician's screwdriver.

## THINNER WASHER

**COULD BE** that you need a rather thinner washer than the only one you possess of the right diameter. Answer, of course, is to file one face.

Here's one way. Put the washer, and a block of wood, side by side in a vice and apply pressure.

When the jaws are opened again, you should find that the washer has partly embedded itself in the wood.



## LINING OUT

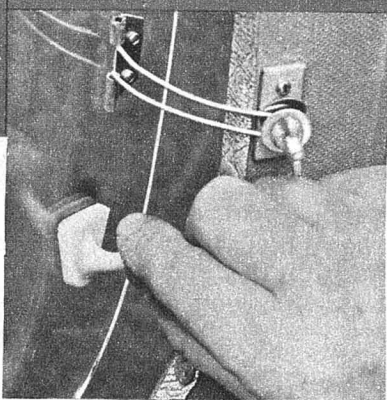
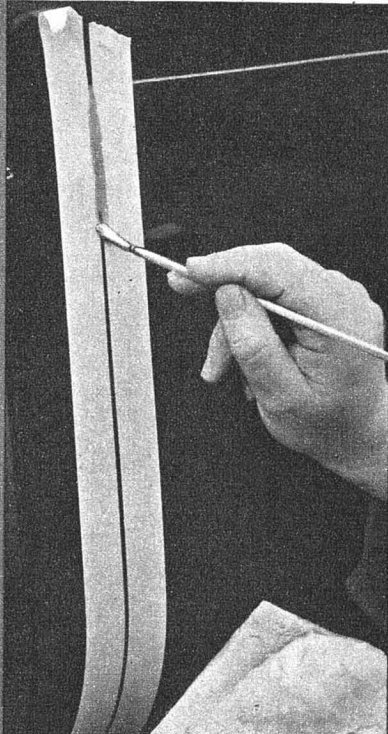
VERY FEW of us have hands as steady as those of the painters who add gold lining to tanks or sidecar bodies.

However, if a small patch of lining is to be renewed, quite a reasonable result can be obtained if two strips of masking tape (cellulose tape will do as second choice, but don't try this with insulating tape) are stuck to the component in such a way as to leave a narrow gap.

Now all you do is paint between the tapes—doesn't matter if any stray paint gets on to the tapes themselves.

Don't pull the tapes away until the paint is really dry, but if all has gone well you should have a neat, straight-edge piece of lining-out.

You can add a contrasting band of colour down the middle of your helmet in this way, too.



## KNOB

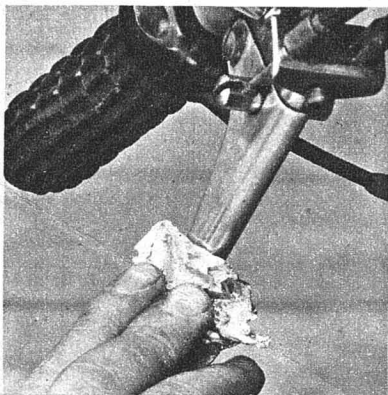
**MOST** sidecars employ a hinged Perspex ventilating panel in the right-hand window. Want a neat knob, so that the panel can be opened more easily?

Pop into Woolworths for one of those plastic, adhesive-backed tea-towel hooks and stick that to the panel. Price, about 6d.

## CHROME CLEANER

**SHORT** of chromium-plate polish and the shops are shut? Try the effect of foil ("silver paper") from a cigarette packet.

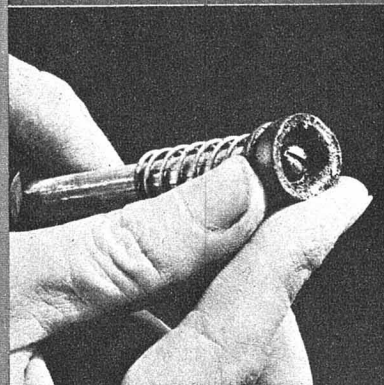
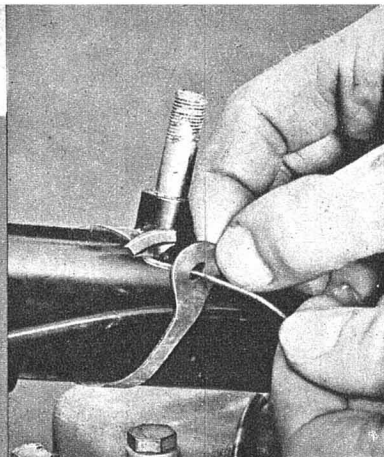
This will often bring up plating like new—provided, of course, that it has not started to peel.



## RUBBER CLIP

**CONTROL** cables and wiring looms are often clipped to frame tubes by neat, rubber buckles. Unfastening a buckle is easy enough—but replacement can be a fiddling business.

Simplest solution is to make up a little hook from a piece of stout wire and use this to thread the tab of the buckle through the eye.



## PUMP CHECK

**IN HOT** weather especially, the leather washer of a tyre pump tends to become dry—with the result that, when you need the pump, it scarcely works.

Don't use petrol or oil to soften the leather; that way, you'll rot the material in no time.

Soft soap is the stuff; even plain water is better than nothing.

## MAGNET

**USEFUL** gadget to have around the workshop is a screwdriver with a magnetized blade.

By this means you can hold a small screw on the end of the blade while you guide it into place; and the screwdriver can come in handy for retrieving small metal parts which have dropped into inaccessible places.

Any steel-blade screwdriver can be magnetized by stroking the blade (in the same direction, a number of times) with a magnet.

Disadvantage is that wherever you lay the screwdriver down, it will attract metal filings, small nails and nuts.

So, fit the shank of the tool with a rubber or plastic sleeve. This will

serve as a pusher-off of unwanted bits when next you come to use the blade.

## JUNK BIN

**WASHERS**, nuts, bolts and any other odd items which "may come in handy some day" tend to accumulate in the garage.

If you simply dump them in a tin you can spend ages hunting around for the bit you need.

Better to place the assortment in the middle of a large piece of plastic (the bag in which some laundries return dry-cleaned clothes is ideal).

Twist this into a ball and then put it in the tin. Next time you need a nut, it is an easy matter to haul the bag from the tin and open it out.

## CLEAN SEAT

**DON'T USE** petrol or detergents for cleaning a dual-seat cover; you could make the plastic soft and tacky.

Warm, soapy water—or one of the special preparations sold for the purpose—will do the trick.

## CHAPTER NINE SHORTIES



## TAR OFF

**TAR SPOTS** on clothing or paintwork can be removed with carbon tetrachloride; this is employed in many small-size fire extinguishers. It is also sold under the proprietary name of Thawpit.

As an alternative, try eucalyptus oil, obtainable from a chemist.

## FUEL TRANSFER

**OUT OF** petrol—and no means of transferring any from your pal's tank.

As a last resource, you can always use a riding glove (it'll dry out quickly enough).

Better pop a plastic bag in your tool box next time, just as an insurance.

## CHEAP PETROL

**MOST** two-strokes run quite happily on commercial-grade fuel. The more expensive grades are usually unnecessary, so why pay more than you need?

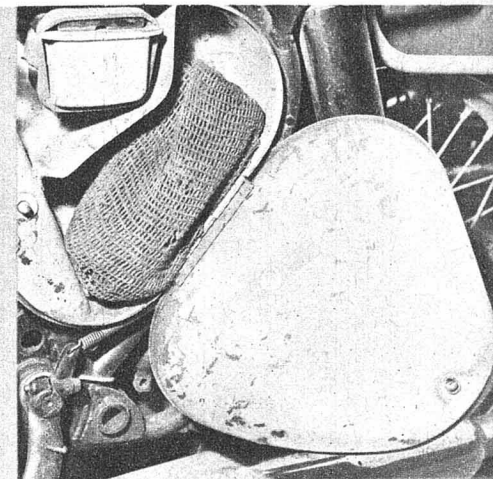
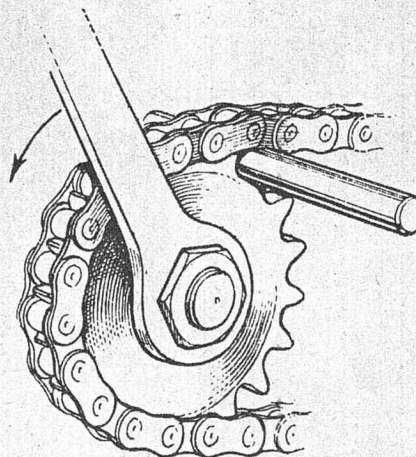
## CLEAN-UP

**CHEAPEST** possible hand cleanser—but very effective. Collect all those slivers of soap from the bathroom and kitchen, shred them through a cheese grater and mix with an equal quantity of sawdust.

If you decide to buy a tin of hand cleaner, any of the well-known brands can be recommended—they are excellent.

## HOLDFAST

**SIMPLE** way of locking a sprocket, when removing the shaft nut, is to slip a length of rod between the sprocket and the chain.



## SAFE

**NEVER** know when you might need a spare ignition or steering-lock key.

Tape spares inside the headlamp shell (you can always use a sixpence to get the lamp rim off), or tool-box lid.

Clean engine oil rubbed well into the hands before starting a job forms a barrier and prevents grime getting into the nails and pores of the skin.

## HARD FELT

**FELT** seals in wheel bearings don't last forever; they tend to harden after considerable use. Should this happen, the only cure is renewal.

## DUFF PLUG

**SPARKING** plug packed up on a twin—but you're not sure which one?

Easy answer is to touch each exhaust pipe; the cooler gives the clue.

## CONTINENTAL PETROL PRICES

■ To help you keep check on the expenses of a continental tour, here are some sterling equivalents for a gallon of petrol.

Austria: regular grade, 4s, premium 4s 7d; Belgium: 5s and 5s 4d; France: 6s 4d and 6s 11d; West Germany: 4s 7d and 5s 2d; Holland: 4s 8d and 4s 10d; Italy: 3s 11d and 4s 5d; Spain: 5s and 5s 5d; Switzerland: 4s 1d and 4s 6d.

The prices shown for Italy are at the special rate for tourists.

All prices are applicable at May, 1965.

# WITH YOUR CAMERA

CHAPTER  
TEN

## ROAD RACES

PERHAPS the most difficult photographic subject of all for the amateur is racing. Trouble is that the crowd fences are, of necessity, well back from the track. A telephoto lens is the real answer.

Without such a desirable aid, you can still get respectable shots if you choose your position well.

A bunch of riders always make an impressive picture, so select a spot fairly near the start; for preference, on the inside of the first bend.

## BE READY

**YOU NEVER** know when a chance subject for a picture may present itself—and by the time you have fiddled around with the focus, stops and speeds of the camera the opportunity may be lost.

The experienced tourist keeps his camera set up at 30-foot focus and with the shutter at either the  $f/11$  or  $f/16$  stop.

This gives a good depth of focus and ensures that everything from about 12ft in front of the lens will be sharp.

## SCENIC

**FOR AN** attractive souvenir picture—of an old house, castle, village stocks or whatever takes your fancy—try to include your bike.

This should be parked to one side and pointing towards the main item of interest, so that it leads the viewer's eye into the shot.

A high viewpoint is an advantage; if necessary, don't be afraid to ask a nearby householder for permission to take your picture from his upstairs window.

## RIDING-SHOT

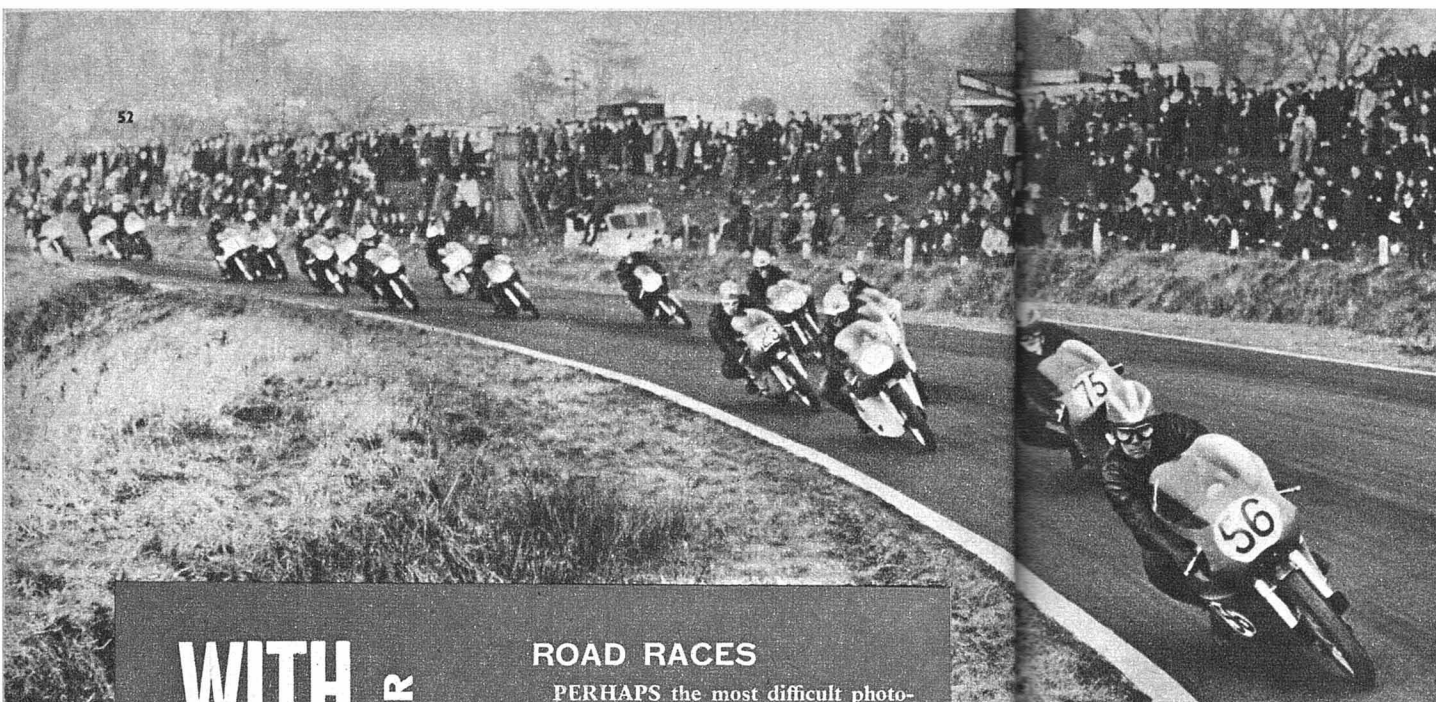
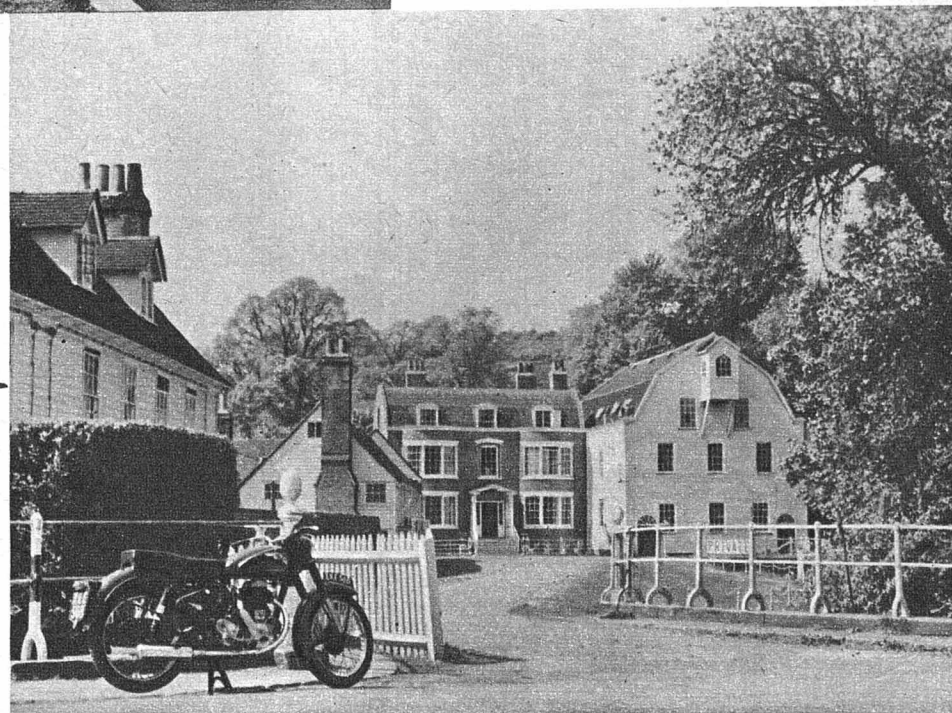
**IT MAKES** a pleasant change to include, among your holiday pictures, one of yourself on the bike and on the move. For this, though, you will need the assistance of a companion.

First, choose a location where your machine will be set against distant rising ground; adjust the focus to 30ft, the aperture as necessary, and set the shutter at  $\frac{1}{100}$ s.

Now hand over the camera, get on the bike and go back down the road a little way.

The picture should be taken when you are riding towards the camera (don't look at it) at about 10 to 15 mph and about 30ft from the lens.

At that, you, the machine and the background should all be in focus.



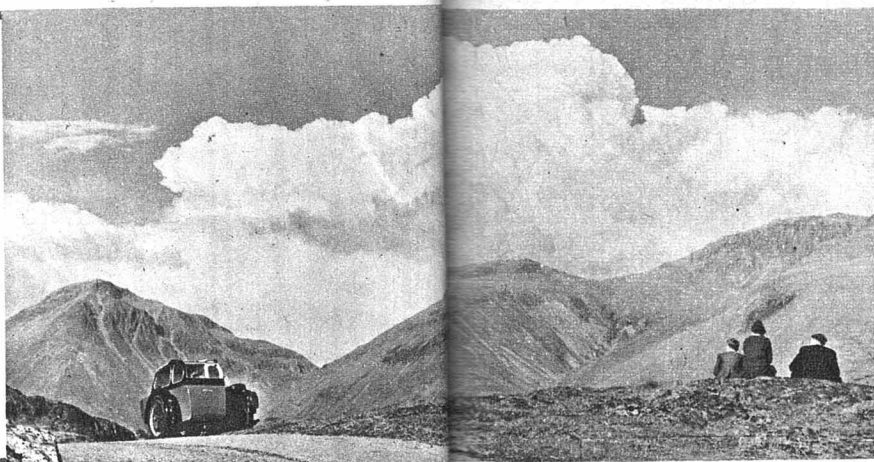
## FILTERS

**DISTANT** views are often rather disappointing when your prints come back from processing.

Next time, try the effect of a light-yellow filter; this not only sharpens definition of distant hills, but accentuates cloud effects.

When using colour film for water scenes—lakeland or seaside—in bright sunshine, a violet filter is advisable.

The effect is to reduce the unnaturally blue tint caused by the reflection of the sky in the water.



## MACHINE

**WANT A** straightforward, broadside view of your own bike—or, say, of some interesting job seen in a race paddock?

The temptation is to shoot in direct sunlight, but the results could well be disappointing; all “soot and white-wash.”

Much better to cock an eye skyward and wait for a patch of thin cloud to pass across the sun.

In that way, you avoid deep shadows and your print can show far more detail.

## SCRAMBLES

**SCRAMBLES** photographs should show plenty of action if they are to make the racing come to life.

Walk round the course while practising is on the go, making mental notes of the places where the most action will be seen—a jump, a water crossing and so on.

A sharp shot of your favourite competitor with the front wheel off the deck, or with the whole machine in mid-air, is far preferable to one of a model travelling on fairly level ground, even if it is of Jeff Smith or Don Rickman!



## TRIALS

**MOST** trials take place in winter, when light is at a premium. Choose an open section if you want a reasonable picture—not one which is under trees or in a deep gully.

Before the riders arrive, select your viewpoint and focus on some recognizable marker—a large stone or rock step, for example.

Now wait for your man to make his way towards you and shoot as his front wheel reaches your focusing point.

A three-quarter front view is best as this will show facial expression.

Not only that but, since the bike is coming towards you, you have a better chance of getting a sharp picture.



## CHAPTER ELEVEN

# OUT and ABOUT

### WET LININGS

**DEEP WATER**—a ford or a flooded road—will almost certainly affect your brake linings. As soon as you get back to dry land, apply both brakes hard—and ride on until you feel the grip coming back.

Release the brakes at this stage and, a couple of minutes later, apply them again. Repeat as necessary to complete the dry-out.

### NARROW LANES

**HALF THE** fun of a countryside tour lies in exploring the smaller, off-the-beaten-track lanes. All the same, take it slowly and be prepared for the unexpected.

For instance, should there be little groups of people every now and again, waiting on the opposite side of the road, that could point to the imminent appearance of an oncoming bus!

Milking-time is another likely hazard. Approaching a farm, be particularly alert for cows between the hours of 5 to 8.30 am and 3.30 to 6.30 pm.

### LODGINGS

**IN ANY** strange town, at home or abroad, make for the area near the railway station if you are looking for cheaper digs.

Rooms are nearly always cheaper here than those in the town centre.



### PARKING

**SELECT** where you park your model on a hot day. Choose a shady spot—but keep an eye on the direction of the sun's travel, so that the shade becomes deeper as time goes by.

Unless you take this precaution, the stand legs may sink into the hot tarmac and the bike could topple over. If possible, choose a brick, concrete or cobbled surface.

### SLIPPERY

**BEWARE** particularly of the light summer shower, for roads are at their slippiest when rain falls after a dry spell.

Unless the rain is heavy, it will not wash away the accumulated rubber dust and oil drippings—it will merely lubricate them.

In autumn, watch out for damp leaves under roadside trees. And remember that a road drying off after rain can be tricky.

### SHIRTS

**COLOURED** shirts can be worn longer before they start to look grubby.

The best shirts to take on a touring holiday are the drip-dry type, which can be washed out at night and will be dry enough to wear in the morning.

### GLOVES

**HEAVY** gauntlets can be uncomfortable in the warm summer. All the same, hands need some sort of protection, whatever the weather, if only from grubby handlebar rubbers.

Take a tip from the sporting motorists and use a pair of string-backed gloves.

These are cool and pleasant in use and not over-expensive.

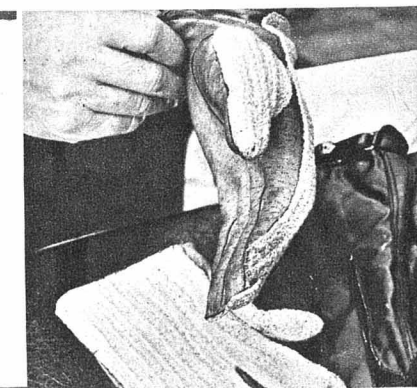
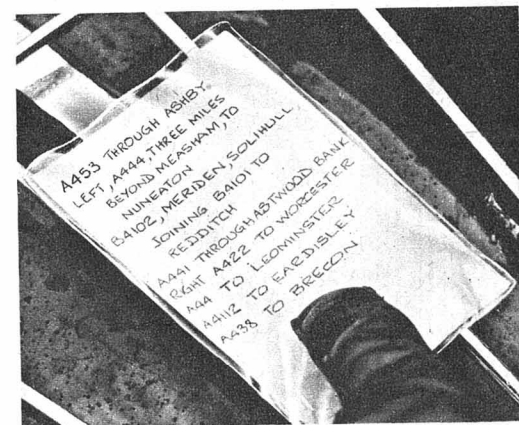
### PLASTIC BAGS

**THE TOURIST** can find endless uses for a supply of plastic bags. One suggestion is to make out a route-card, pop this into a plastic bag and tape it to the tank top.

When packing panniers or a haversack, put breakables, such as a bottle of sun-tan oil, that could damage other items in the packs, in plastic bags.

Clean shirts go into bigger bags—dust has a habit of working its way into every nook and cranny.

If the panniers are of non-detachable type, pack everything into a large bag and put that into the pannier box. Saves having to unload bit by bit when you reach your destination.

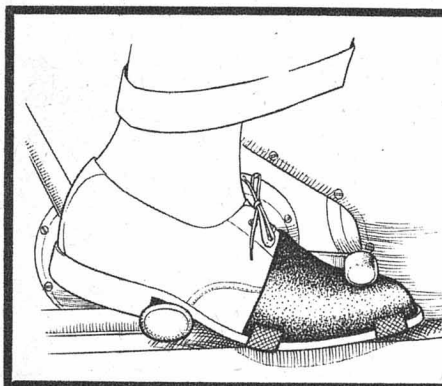


## TASTY

**OBSERVING** or spectating at a trial or winter scramble can be mighty chilly. Carry a vacuum flask of coffee, by all means; but as a tasty change why not try filling the flask with hot soup, such as tomato or oxtail?

Remember that a vacuum flask will keep liquids cool, too. On a summer ride, fill the flask with orangeade and pop in a cube of ice from the refrigerator. Very refreshing!

Carry the flask in a small haversack *not* in a pannier or on the rear carrier where it might be damaged.



## SHOE CARE

**IN WARM**, sunny weather, who wants to ride in overboots? But ordinary walking shoes can be scuffed and damaged through contact with the gear pedal.

One idea is to make up a protective spat for the right shoe. A piece of tough felt from an old hat would be a suitable material.

Sew on a couple of loops of elastic to pass under the sole of the shoe and keep the spat in place.

## CHILLER

**EVEN THOUGH** a pillion passenger is shielded from the wind to some extent by the rider's body, he or she will probably be the first to complain of feeling chilly.

According to the *Dunlop Book of Facts*, the heat generated by the human body, rated in calories per hour, is as follows:

Lying motionless	90
Sitting still	108
Riding a motor cycle	204

So the pillionist, sitting still, is generating only half as many calories as the rider. Obvious answer is to wrap up more warmly.

## SITE

**MAXIM** of the confirmed camper is to select a site with a natural wind-break, such as a stone wall or clump of trees.

However, don't pitch a tent *under* trees; long after the rain is over there will be a steady dripping of water from the branches on to the tent—and there is always the chance that a rotten branch might break off.

Though a hollow may seem inviting, a few hours of rain could turn this into a miniature lake. Keep to highish, gently sloping ground.

If the ground is soft, use more than one tent peg for each main guy line.

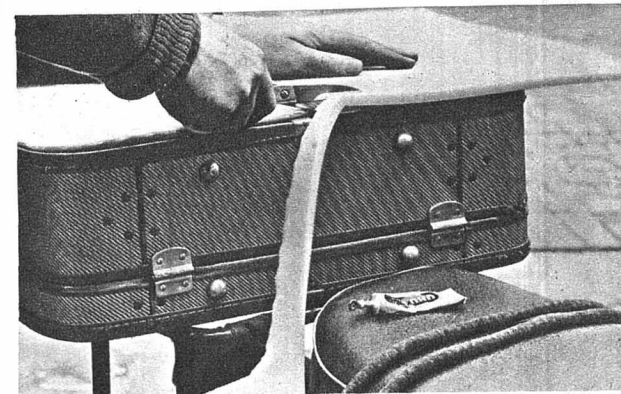
## PAPER VEST

**YOU'RE** out on the road, when down comes a chilly mist—and you have only a lightweight riding suit with you.

Well, tramps are well acquainted with this dodge which, though rather tatty, is quite practical.

Wrap a sheet of brown paper, or a couple of sheets of newspaper, around your chest, between your jacket and pullover or shirt.

The paper may crackle and feel stiff, but, being a poor conductor, it will keep in body warmth.



## CHIPS

**MID-DAY** meals, when touring on the Continent, can be a real extravagance. Usual advice is to shop around for food which can be carried—salad stuffs and bread rolls—and settle for a roadside picnic.

However, in Belgium or France, look for small shops labelled "Friture." These are fish-and-chip shops and the food is good and cheap.

Some believe the Belgians make the crispest, tastiest chips in the world and can give even Lancastrians a pointer or two!

## CAMP FIRE

**DO TAKE** care, when setting up a camp fire, that it cannot get out of hand and cause damage.

Check the wind and site the fire so that smoke doesn't blow back into the tent.

For quick kindling, choose dry thorn twigs or birch bark. Pine is quite good, though this does tend to give off showers of sparks. Alternatively set a tablet of solid fuel among the twigs and light that.

Best wood to use for the fire is oak or beech, but turn up your nose at elm; that does nothing much except smoulder and smoke.

## SUITCASE

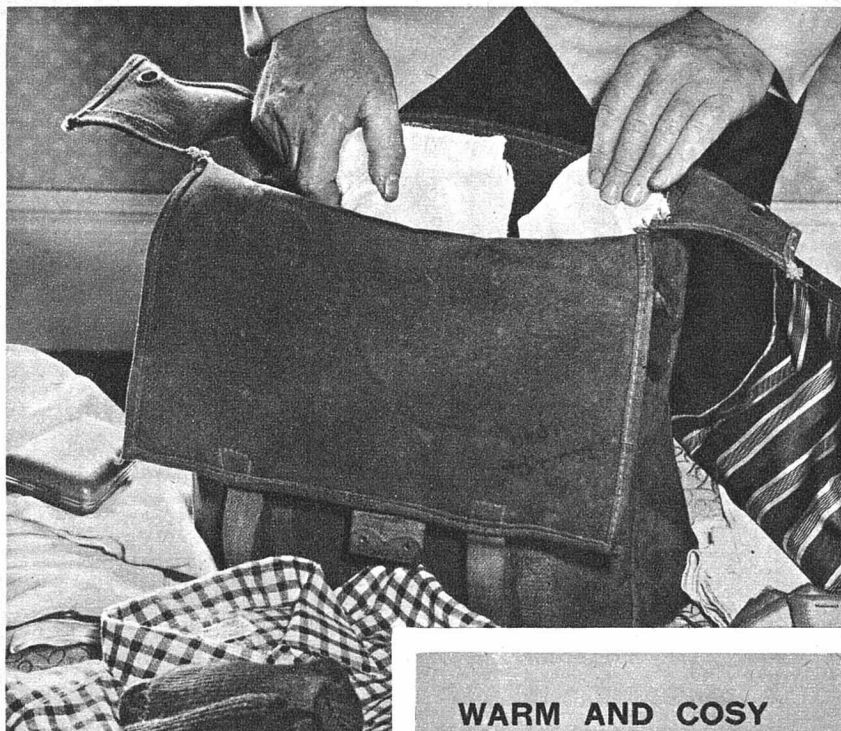
**WHEN** a case is carried on a rear carrier, it is apt to slide about, even if held by three or four elastic straps.

One way out of the difficulty is to stick a slab of foamed plastic or rubber to the underside of the case.

## BACK AGAIN

**IN ALL** the bustle of getting things together and getting under way, don't overlook the fact that your return from holiday may be after the shops have shut for the day.

If necessary, leave enough tinned food in the house for a meal.



## LEAVE ROOM

NEVER pack a pannier bag or haversack right to the brim when going on holiday.

You'll want some room in which to carry sandwiches and so on; besides, what about the presents and souvenirs which you will be bringing back?

## ANIMALS

SHOULD YOU have the misfortune to hit and injure a dog, the police must be notified within 24 hours. That's the law—and it applies equally to a horse, cow, donkey, pig, sheep or goat.

A cat is not subject to the same regulations, but it is only common decency to stop and inform the owner, if he or she can be located.

## WARM AND COSY

COLD DAY? Wear a loose, chunky, fisherman's-knit pullover—but though a roll-neck sweater is pleasantly cosy, it can be a liability if the neck gets soaked.

Best answer to neck-sealing is a towel (or a towelling scarf, specially made for the job) over which the riding-suit collar is buckled.

## WASP PROOF

EVEN IN the warmest weather, it is better to ride wearing a light scarf, rather than an open-neck shirt. A wasp down the neck of a shirt can cause a sudden swerve and a spill.

Wear goggles, too; a fly in the eye can be painful and dangerous. Staff-man John Ebbrell suggests a further tip—never yawn at high speeds!

# DO YOU KNOW?

■ There are only three taxation classes for motor-cycle-type vehicles.

For solos and sidecar outfits of up to 150 cc, the annual rate is £2.

Solos and sidecars from 151 to 250 cc are charged £4.

Solos and sidecars over 250 cc, and three-wheelers irrespective of capacity, are rated at £8.

■ ENGINE revs for a given road speed are obtained from the formula:

$$\frac{336 \times \text{mph} \times \text{gear ratio}}{\text{wheel diameter in inches}}$$

Note, though, that wheel diameter should be taken inclusive of tyre.

For example, overall diameter of a wheel with 19×3.50in tyre is 26in; of a wheel with 18×3.25in tyre, 24.5in.

■ THEORETICAL road speed at any given rpm can be obtained by the calculation:

$$\frac{\text{rpm} \times \text{wheel diameter}}{336 \times \text{gear ratio}}$$

To take a practical example, let's assume that an engine is running at 7,000 rpm, top gear ratio is 6 to 1, and the overall wheel diameter is 24.5in.

From the formula, top speed would work out at 85 mph.

■ BUYING fruit from a market stall? Remember that 500 grammes is just over 1lb—to be exact, 1lb 1½oz; a kilogramme is 2lb 3¼oz.

If you are measuring: a metre is just under 3ft 3½in.

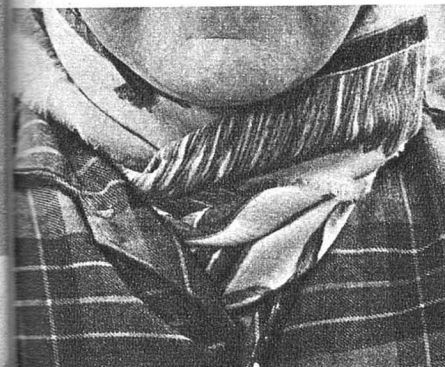
■ WANT to check tyre pressures at a continental garage? For 22 lb per sq in, their figure is 1.55 kg per sq cm; 24 equals 1.69; 26 equals 1.83; 28 equals 1.97; 30 equals 2.11.

For any other pressures, take 5lb sq in as being equivalent to 0.35 kg per sq cm.

■ LUBRICATING oil in continental countries is sold in litre cans or half-litre and smaller measures. One litre is equivalent to 1¾ pints; a half-litre to ⅞.

Putting it the other way round, if you need an extra pint of oil, you'll have to ask for 0.57 litres—garage hands are not likely to service it that accurately!

Petrol is almost invariably supplied ready-mixed. The oil content is shown as a percentage; for example, 20 to 1 is 5 per cent.



# YOUR TELEPHONE GUIDE

<b>Aermacchi</b>	Southampton 27744	<b>Kerry</b>	Lndn Maryland 6611
<b>AJS</b>	Woolwich 1223	<b>Kreidler</b>	Addiscombe 7181
<b>Albion</b>	B'ham Victoria 4064	<b>Lambretta</b>	Lndn Municipal 2499
<b>Alpha</b>	Dudley 55151	<b>Laverda</b>	Nottingham 44609
<b>Amal</b>	B'ham Birchfields 4571	<b>Lucas</b>	B'ham Central 5050
<b>Ambassador</b>	Sedgley 3051	<b>Matchless</b>	Woolwich 1223
<b>Ariel</b>	B'ham Victoria 5642	<b>Metisse</b>	New Milton 1755
<b>Blacknell</b>	Nottingham 79826	<b>Miller</b>	B'ham Aston Cross 1575
<b>BMW</b>	Brighton 47814	<b>Mobylette</b>	Lndn Redpost 3344
<b>Bond</b>	Preston 54002	<b>Motobi</b>	Pangbourne 482
<b>BSA</b>	B'ham Victoria 2381	<b>Moto-Guzzi</b>	Lndn Brixton 6251
<b>Bultaco</b>	New Milton 1755	<b>Norton</b>	Woolwich 1223
<b>Burman</b>	Kings Norton 3201	<b>NSU</b>	Lndn Riverside 3000
<b>Busmar</b>	Blackpool 51046	<b>Pannonia</b>	Lndn Brixton 6251
<b>Butler</b>	Haverhill 2711	<b>Panther</b>	Cleckheaton 2544
<b>Capriolo</b>	Southampton 21081	<b>Parilla</b>	Southampton 21081
<b>Clarke, George</b>	Lndn Tulse Hill 3211	<b>Phoenix</b>	Tottenham 0571
<b>Cotton</b>	Gloucester 22303	<b>Peel</b>	IoM Peel 590
<b>CZ</b>	Lndn North 8261	<b>Pride and Clarke</b>	Lndn Brixton 6251
<b>DMW</b>	Sedgley 3051	<b>Puch</b>	L'pool Bootle 2781
<b>Dot</b>	M'ter Blackfriars 5472	<b>Raleigh</b>	Nottingham 77761
<b>Ducati</b>	M'ter Longford 4674	<b>Reliant</b>	Tamworth 3761
<b>Dunstall, Paul</b>	Lndn Eltham 2020	<b>Royal Enfield</b>	Redditch 4222
<b>Excelsior</b>	B'ham Acocks Green 1677	<b>Scoutacar</b>	Leeds 32261
<b>Francis-Barnett</b>	B'ham Victoria 2211	<b>Scott</b>	B'ham Central 6544
<b>Garelli</b>	Nottingham 50616	<b>Sprite</b>	B'ham Broadwell 3406
<b>Garrard</b>	Bletchley 2548	<b>Smiths</b>	Lndn Gladstone 6671
<b>Gilera</b>	Lndn Tulse Hill 3211	<b>Surrey</b>	Uplands 8752
<b>Girling</b>	B'ham Acocks Green 3371	<b>Suzuki</b>	B'ham Victoria 0991
<b>Greeves</b>	South Benfleet 2761	<b>Triumph</b>	Meriden 331
<b>Harley-Davidson</b>	Lndn Renown 2934	<b>Trojan</b>	Lndn Municipal 2499
<b>Heinkel</b>	Addiscombe 7181	<b>Velocette</b>	B'ham Springfield 1145
<b>Hillsborough</b>	Sheffield 343025	<b>Vespa</b>	Bristol 671881
<b>Honda (sales)</b>	Lndn Turnham Green 9381	<b>Victoria</b>	Reading 84393
<b>Honda (service)</b>	Nottingham 282181	<b>Villiers</b>	Wolverhampton 22399
<b>Itom</b>	Lndn Kipling 4908	<b>Watsonian</b>	B'ham Victoria 1987
<b>James</b>	B'ham Victoria 2211	<b>Wipac</b>	Buckingham 3031
<b>Jawa</b>	Lndn North 8261	<b>Yamaha</b>	Lndn Redpost 3321

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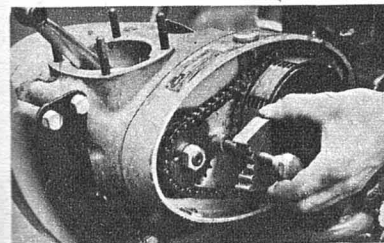
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