

Fault Finder 9

Where There's a Wheel

... there must be a way for things to go wrong. Merril Boulton finds out why.

WHEELS have to support the weight of the bike, as well as withstand road shocks, acceleration, braking and the lateral thrusts of cornering, so it's very foolish not to keep them in good order.

The tyre, rim, wheel hub and spokes are the main components of a wheel and if any of these parts are faulty, the bike's handling will be affected.

For some authoritative advice on wheels, we went along to Ron Compton's of Brownhill Road, Calford, to see what their wheel builder/truer extraordinaire Jim Munn had to say.

Jim has been building and truing wheels for over thirty years and has an indented thumb to prove it. He doesn't have any sophisticated machinery that simply goes click and the job's done — his only tools are a spoke key, his thumb and a great deal of patience. He reckons it takes him a couple of hours to build and true a wheel from scratch. The first bit's easy, simply positioning the spokes in the holes and screwing them into the rim. Then comes the real task — truing the wheel.

Wheels go out of true just through general wear and tear — the spoke screws can simply work loose; spokes can stretch or simply be



internal casing damage to the tyre. This leads to further trouble, for apart from impairing the handling and weakening the wheel, continued riding on a buckled rim can also distort the tyre.

Quite often, if a spoke is loose, simply tightening it up is just not good enough. It might be overtightened, which upsets the balance of the other spokes, or if it is adjusted with the tyre and inner tube still on the rim, the thread goes beyond the level of the rim and penetrates the inner tube to cause a puncture. Therefore, a tyre and inner tube must always be removed when a wheel is being trued to safeguard against this.

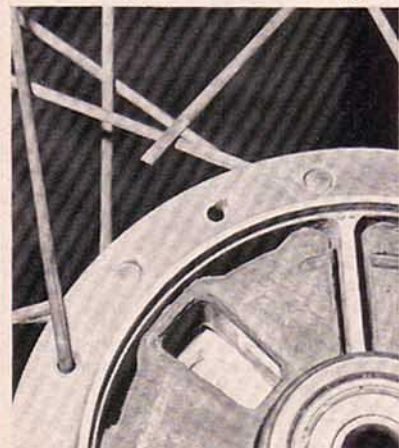
Also, with the rim exposed, a check can be made on the spoke nuts or nipples which

knows what they're doing and has the time and patience to do it properly. He has trued up many wheels that are in a worse mess where people have attempted to adjust them themselves than if they had left them alone.

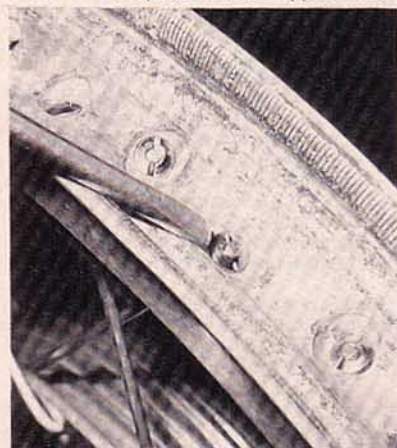
Wheel rims

The main purpose of the wheel rim is to support the tyre and keep it rigidly in place. The rim is supported by the spokes, so that if the spokes are loose or distorted, the rim itself will deform. If a wheel is slightly buckled, it can be corrected by centring the rim. This means loosening some spokes and tensioning others to true the rim.

This is the task that demands skill and

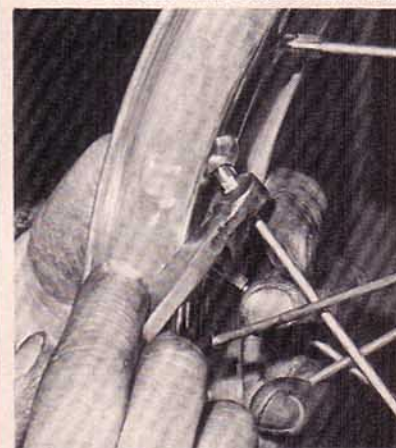


down in alloy hubs; they can become rusty and break off; spoke holes enlarge and therefore alter the spoke tension. Bumping up and down pavements doesn't do the wheel much good either, for this can encourage spokes to break and even the rim to buckle or cause



occasionally become rusted on to the spokes and therefore turn without tightening so that adjusting with a spanner on the inside of the rim is ineffective.

Jim's advice on wheel truing is basically not to attempt it unless the individual really



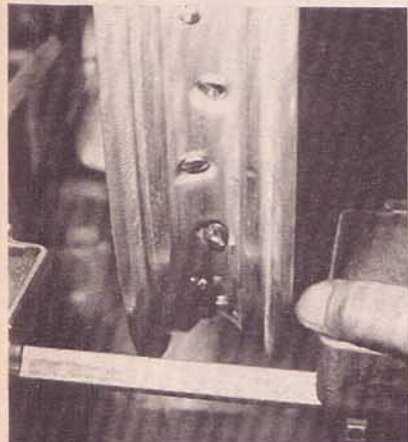
patience and involves spinning the wheel after each adjustment to make sure the rim is in line. Another thing to check is the condition of the rim tape, which might be worn or rusted away and not offer adequate protection to the inner tube.

Checking rims and spokes

Wheels are built on the principle of everything in tension — a wheel is hung from the top spokes, not supported by the bottom ones. It is therefore crucial that each one is tensioned equally and correctly and it takes an expert to do it.

Spoke tension should be inspected periodically, for if one or two spokes work loose, too much stress will be put on the rest of the wheel and force other spokes to go the same way. If this happens, the wheel will lose its rigidity and become wobbly and unstable.

Jim says that just because a wheel is new, doesn't mean it is automatically faultless; quite often a brand-new, mass-produced wheel has loose spokes and is not properly in true.



It doesn't take much to check if the spokes are loose by feeling with fingers or hitting each one gently with a spanner. A healthy spoke should 'ting' when it's hit, if it 'clacks' it's not tight enough.

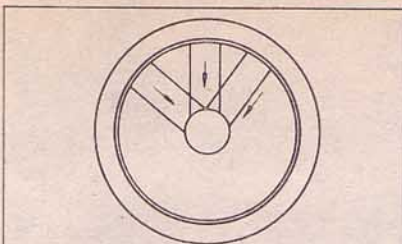
A buckled wheel can be visually checked by spinning the wheel alongside a fixed marker near the rim. If a wheel is true, the distance between the rim and marker should be the same throughout the perimeter of the rim. If spokes break frequently, for example, on off-

Wheel balancing

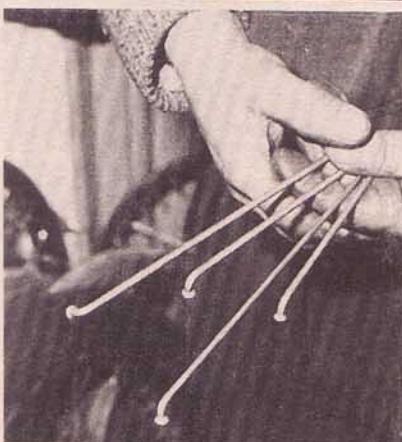
Ideally the wheel should be removed from the bike so that its free movement is not hindered. Remove pin, lock nut, spindle and disconnect speedo and brake cables to take out wheel.



Next, using its own spindle, support the wheel on a couple of stands of exactly the same height so that it turns freely. Spin the wheel and mark where it comes to rest at the lowest part of the rim.



Spokes which absorb shocks when the bike is advancing or when the brake is applied.

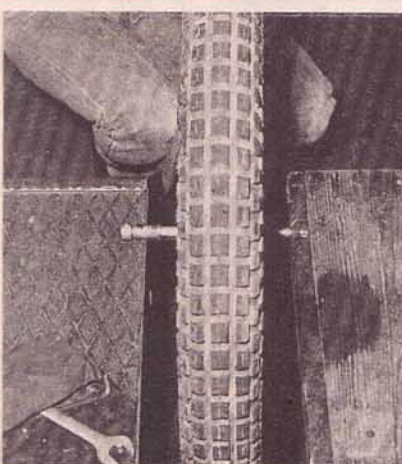


road machines, heavier gauge spokes should be fitted.

Replacing tyres

As a tyre wears out, its performance deteriorates and it becomes more vulnerable to punctures, so it is false economy not to replace the tyre as soon as the minimum tread depth is reached. But there are several things to watch out for when renewing for even new tyres can create their own problems. Firstly, make sure the tyre sizes are recommended for the machine — a very wide section rear tyre and narrow section front is not a good proposition, especially for cornering.

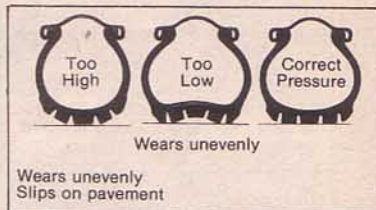
Strange things can happen with the wrong kind of tyre or an unsuitable tread pattern, such as fitting a sidecar tyre on to a solo



Spin the wheel again and if the mark returns to the same spot then this is the heaviest point and the wheel is out of balance. To balance it, place a weight opposite the mark.

Tyres

However obvious it may sound, tyre pressures must be checked regularly — it's too easy to put off doing them until tomorrow and then forget. Incorrect tyre pressures cause handling problems as well as damage to the tyre.



If tyres are under-inflated, the steering and general ride will feel stodgy and heavy. Not only that, but the tyre walls will flex and become weakened. If the situation persists, the tyres will wear mostly on the outside tread so they won't run properly, even when the pressures are corrected.

Over-inflation can result in tyre failure due to the decreased ability of the tyre to cushion road shocks. Uneven wear will also take place as the centre tread will become more worn than the outside tread.

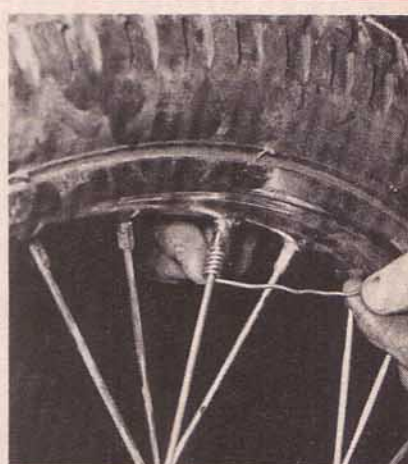
Pressures should be checked once a week when the tyres are cold — air expands when it gets hot and therefore distorts the reading. If you do have to adjust them when they are hot add about 3psi to the recommended pressures. If an inner tube is punctured it is advisable to replace it if possible, rather than run the risk of a repair patch not holding.

machine, or putting a rear wheel tyre on to the front and vice versa; or even that two chosen tread patterns don't complement each other's performance.

Check that the tyre has been fitted squarely on to the rim and the right way round — look for the direction arrows.

When checking pressures, give the tyre a quick look over for general wear and tear. For example; cracking on the tyre walls or undue wear in one spot which could be the result of a skid.

A new tyre can also cause a wheel to become unbalanced which results in wheel patter and steering wobble, particularly at high speeds.



Proper wheel weights are available or lead wire will suffice, wrapped around the spoke. When the wheel is correctly balanced it will come to rest of its own accord at a different spot each time.

N.B.

There are on average about 36-40 spokes to a wheel which should all be of the same size and strength. There are some wheels, however, that go against the basic principles of wheel structure and have offset hubs with longer spokes one side than the other to accommodate a disc brake such as on Triumphs.

Wheel alignment

Another reason for bad handling can be down to misaligned wheels. Many people depend on the notches on the rear wheel adjusters to check for alignment, but they are there primarily for chain adjustment.

To correctly line up the wheels, place a long straight rod, the length of the bike, alongside the wheels just below the hubs so that it touches each tyre in two places. Then

Wheel bearings

To check wheel bearings, support the bike so that the wheel is able to spin freely off the ground. Worn bearings will be evident by a rumbling or grating sound and excessive play at the wheel hub. When riding, a worn bearing will cause wheel judder when the brakes are applied and handling will lose its precision because of the side movement at the hub.



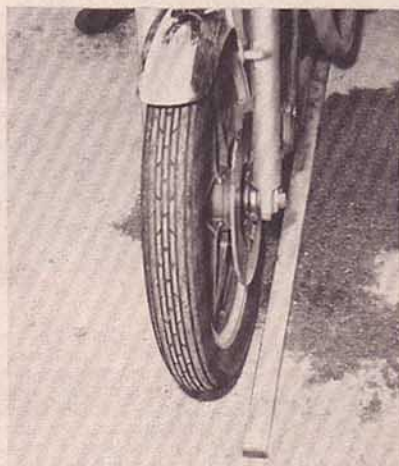
To change the wheel bearings, remove the wheel from the bike and support on a hollow stand. Remove the oil seal and check it for wear and tear. Drive the bearing out by tapping around the inside edge with a soft metal drift and hammer.



For our workshop picture, we used a DT100 which has a floating spacer between the bearings that can be pushed aside to expose the lip of the opposite bearing.



measure the distance from the rod to the rim at four points on each wheel — at the front and rear on each side. If alignment is correct the distances from rod to rim will be equal on each wheel.



distance between the rod and the narrower tyre measured at the front and rear of the wheel. This should be repeated on the other side and if the four distances measured are equal the wheels should be in line. Make sure



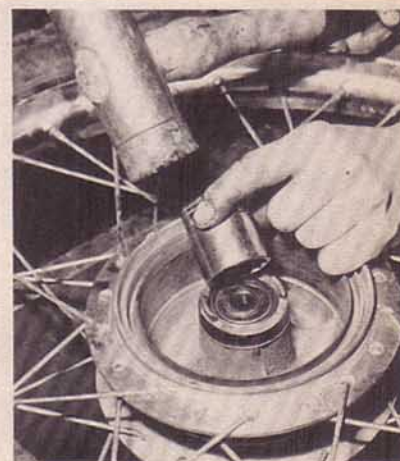
Replacing the bearings is an exact reversal of the above, but make sure they are well-lubricated with a high-melting-point grease.



If, however, the rear tyre is a different size to the front this method will not work. In this case a long straight rod should be laid squarely on the ground alongside the wheels so that it is touching the fatter tyre and the



the rod is exactly parallel to both wheels and double check measurements to make sure they are accurate. Remember you should always check the chain tensioner if any alterations to the alignment are necessary.



Use a socket that matches the outside bearing race as a tool to drive it in squarely, taking care not to damage the cover directly over the rolling balls.