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FRONT WHEEL

Front Wheel Removal

With the machine on its centre stand, place a box or small wooden trestle underneath the crankcase so that the front wheel is raised clear of the ground.

Detach the brake cable toggle (*A*) Fig. F1, from the operating lever on the brake cover plate and the brake plate from the right-hand fork leg.

There are two alternative brake plates fitted to the bantam to suit the two different designs of front fork.

Whilst supporting the wheel, take off the fork end caps (*B*), each being held by two bolts, and withdraw the wheel.

When replacing the wheel ensure that the spindle ends are level with the sides of the fork end caps.

Front Hub Dismantling

The Sports model has the same internal details as the other Bantams, but the hub is fitted with a full-width outer casing.

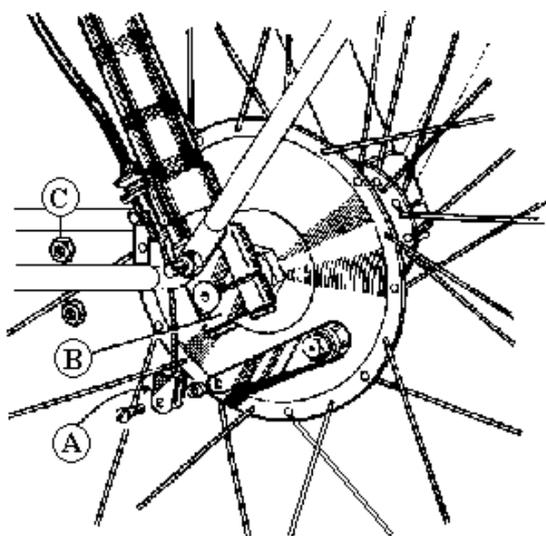


FIG. F1. *Front wheel removal.*

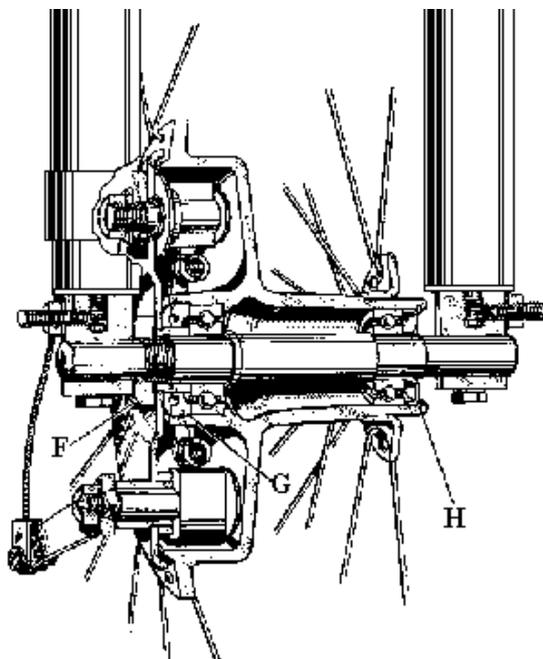


FIG. F2.

Unscrew the large nut (*F*) Fig. F2, from the wheel spindle. The spindle can be prevented from turning by applying the brake, using a short length of steel tubing over the operating lever.

Take off the cover plate complete with brake shoes, cam and fixed fulcrum pin, exposing the bearing retainer (*G*). This has a left-hand thread and is removed by unscrewing in a clockwise direction with a peg spanner (service tool No. 61-3644).

Having removed the retainer, drive out the right-hand or brake side bearing by striking the left-end on the spindle with a suitable mallet or copper hammer. If an ordinary hammer has to be used, protect the end of the spindle with a piece of hard wood. Note that a small shim is fitted between the bearing and the shoulder of the spindle.

To remove the left-hand bearing, first prise out the circlip (*H*), then insert the spindle from the right-hand side and drive out the bearing with its dust cover. Sports models will have a shim fitted between the dust cover and the bearing face.

Before checking the bearings, wash thoroughly in paraffin and, if possible, blow out with a high pressure air line. Examine carefully for signs of roughness and excessive play, indicating broken balls or damaged tracks.

Fitting New Bearings

Place the larger of the two bearings squarely in position on the right-hand side of the hub and, using a piece of tubing, drive in the bearing. It is essential that the force applied is on the outer ring of the bearing, not the inner ring. Screw in the bearing retainer in an anti-clockwise direction (left-hand thread), using a peg spanner.

Insert the wheel spindle, screwed end first with shim fitted, from the left-hand side and tap it gently home until the spindle shim rests on the inner ring of the bearing.

Apply a liberal coating of grease to the inner face of each bearing and fit the left-hand bearing over the spindle. Drive it into the housing until the dust cap will just clear the circlip groove and replace the dust cap and circlip. Do not omit to fit the shim between the dust cap and bearing (Sports models only).

Front Brake Shoes

After the brake plate has been removed from the wheel the brake shoes can be released by levering them outwards and upwards off the cam and fulcrum pin. The springs are very strong; so take care not to trap the fingers behind the shoes.

NOTE:—Avoid handling serviceable brake linings with greasy hands.

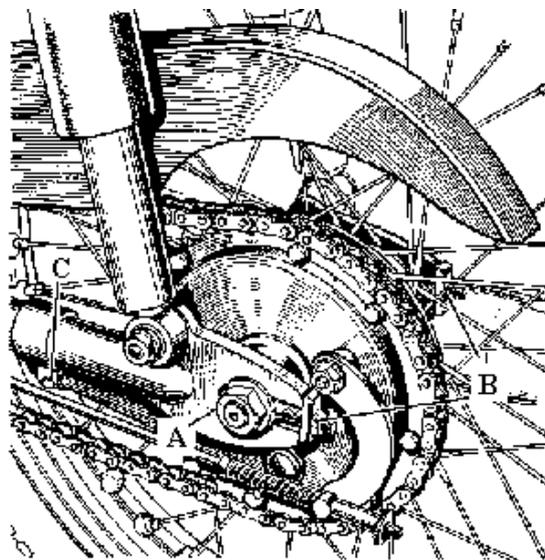


FIG. F3.

REAR WHEEL

Rear Wheel Removal

With the machine firmly supported on its centre stand, disconnect the rear chain at its spring link and unwind the chain off the rear wheel sprocket on to a sheet of clean paper. It is advisable to leave the chain in position on the gearbox sprocket.

Take off the brake rod adjuster, and unscrew the torque arm bolt (*C*) Fig. F3. Disconnect the speedometer cable from its drive unit and pull the inner cable clear.

Unscrew the spindle nuts (*A*) Fig. F3, and pull the wheel out of the fork ends, at the same time freeing the brake rod from the lever swivel pin. It may be found necessary to lean the machine slightly to the left to enable the wheel to be withdrawn from the right-hand side. Take care not to lose the distance piece fitted on the right-hand side of the spindle, next to the speedometer gearbox.

If possible, avoid disturbing the setting of the chain adjusters (*B*) while the wheel is out of the frame, and when replacing ensure that the adjusters are pressed firmly against the fork ends.

Check also that the spring clip of the chain connecting link is correctly fitted and has its closed end pointing in the direction of travel (*i.e.*, rearwards on the bottom run).

For details of chain adjustment, see page F5.

Rear Hub Dismantling

After first applying the brake to lock the spindle, unscrew the large nuts (*A*) Fig. F4, at each end of the spindle.

Take off the brake cover plate complete with brake shoes and then the speedometer drive gearbox, noting its distance piece and driving dogs.

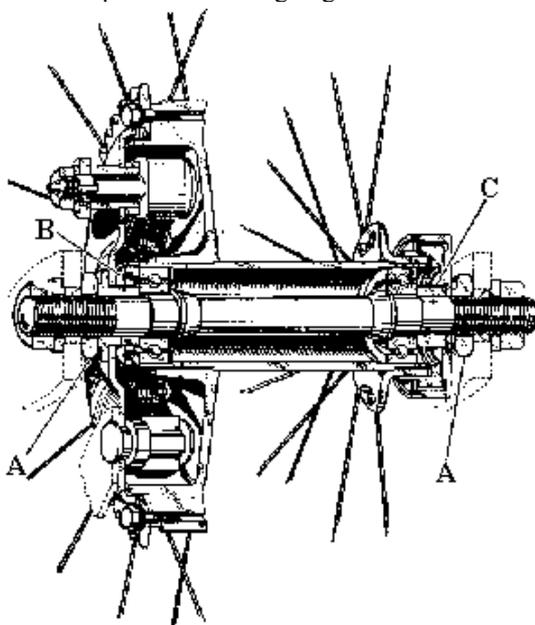


FIG. F4.

It will now be possible to unscrew the bearing retainer (*B*) which has a normal right-hand thread, using a peg spanner.

The wheel spindle should now be driven through the brake side bearing with a soft mallet, so pushing out the right-hand bearing.

The brake side bearing and thrust washer can now be driven out from the opposite side using a drift against the outer race of the bearing.

Fitting New Bearings

New bearings must be fitted in the reverse manner but care must be taken to see that the thrust washer is fitted behind the drive-side bearing and that the bearing is seated well up to the hub shell abutment and the shoulder on the spindle.

After fitting the drive-side bearing and its retainer, insert the spindle from the right-hand side and drive in the right-hand bearing to the spindle shoulder. Fit the distance piece (*C*) Fig. F4, on to the spindle, then the speedometer gearbox taking care to mesh the driving dogs.

When the brake cover plate has been fitted the spindle nuts (*A*) can be replaced and tightened.

Rear Brake Shoes

These are dealt with in the same manner as described for the front wheel on page F3, and are interchangeable with the front shoes.

Chainwheel

If the chainwheel teeth appear to be hooked or damaged in any way it is advisable to replace it, since excessive chain wear will occur.

The chainwheel is secured to the brake drum by eight bolts fitted with spring washers.

BRAKE ADJUSTMENTS

The brakes must be adjusted to give maximum efficiency at all times and for this to be maintained, the shoes should be just clear of the drum when the brake is off, and close enough for immediate contact when the brake is applied. The brakes must not be adjusted so closely, however, that they are in continual contact with the drum; excessive heat may be generated, resulting in deterioration of braking efficiency.

The front brake adjuster is situated on the lower right-hand fork leg. Rotation of the screwed sleeve alters the effective length of the cable so adjusting the position of the shoes in the drum. The locknut should be tightened after each adjustment.

The rear brake is adjusted by turning the self-locking sleeve. To open the shoes in the drum the effective length of the brake rod must be shortened by turning the sleeve in a clockwise direction (viewed from the rear of the machine).

Note that if maximum efficiency is to be obtained, the angle between the brake cable or rod should not exceed 90° when the brake is fully applied.

REAR CHAIN ADJUSTMENT

The chain should be adjusted with the machine on its centre stand so that the rear wheel is at its lowest position in the rear suspension travel.

Rotate the rear wheel slowly until the tightest point of the chain is found, then check that the total up and down movement is $\frac{3}{4}$ " in the centre of the chain run. If the chain tension requires adjustment first slacken off the brake adjuster sleeve, the wheel spindle nuts, and the bolt retaining the torque arm. Tighten both chain adjuster nuts evenly until the correct chain setting is obtained but make sure that the adjusters are pressed firmly against the fork ends.

After adjustment, tighten the wheel spindle nuts and the torque arm bolt. Re-check the setting of the chain and adjust the rear brake as described opposite.

NOTE:—It is strongly recommended that the wheel alignment is checked after any adjustment to the rear chain has been made; full details of this are given on page F7.

RENEWING BRAKE LININGS

Holding the brake shoe in a vice, cut off the peened-over portion of the rivet with a good sharp chisel, as shown below.

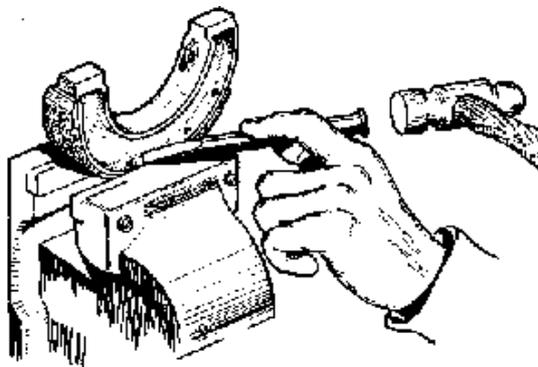


FIG. F5.

Drive out the rivets with a suitable pin punch and discard the old oil lining. Reverse the shoe in the vice and draw-file the face to remove any burrs.

Clamp the new lining tightly over the shoe and, using the shoe holes as a jig, drill straight through the lining with a No. 31 (.120") drill. Remove the clamps and, holding the lining carefully in a vice, counterbore each hole to no more than two-thirds the thickness of the lining, *i.e.*, if the lining is $\frac{3}{16}$ " thick, then the counterbore must not be deeper than $\frac{1}{8}$ ".

Having prepared the linings for riveting, start at the centre and position the lining with one or two rivets.

Place a suitable mandrel in the vice, clamp the linings to the shoes with either small "G" or tool-makers clamps and peen-over the rivets as shown in Fig. F6, working alternately outwards from the centre.

The mandrel used in the vice must be flat on one end, the diameter of which should be no more than that of the rivet head. It will also help if a hollow punch is used to bed the rivets down before peening.

NOTE:—Providing that the clamps are used correctly, that is, next to the rivet being worked on, the linings can be fitted tightly to the shoe. If this is not carried out correctly, a gap may occur between the lining and the shoe, resulting in inefficient or "spongy" braking.

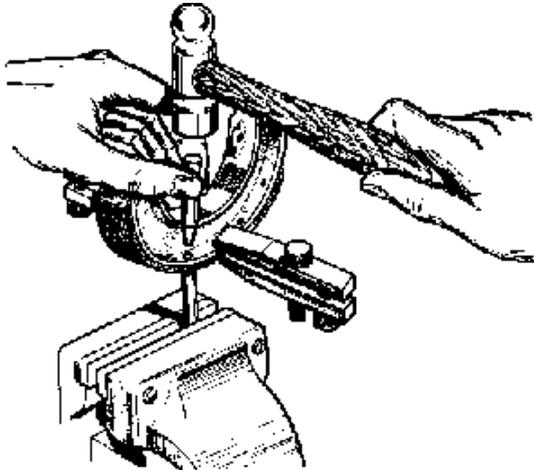


FIG. F6.

When the riveting is completed, file a good chamfer at each end of the lining to approximately half its depth and lightly draw-file the face of the lining to remove any fraze caused by the drilling.

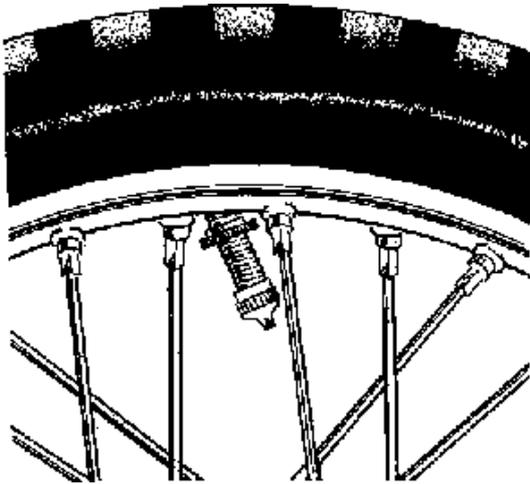


FIG. F7. Tyre creeping.

SECURITY BOLTS

Sometimes, particularly if a tyre is under-inflated, it will creep around the rim taking the tube with it. If this is not stopped, the valve will ultimately be pulled from the tube. It has been found necessary therefore, to fit a security bolt to the rim of each wheel on the Bushman models. Before attempting to remove or replace a tyre, the security bolts must be completely loosened.

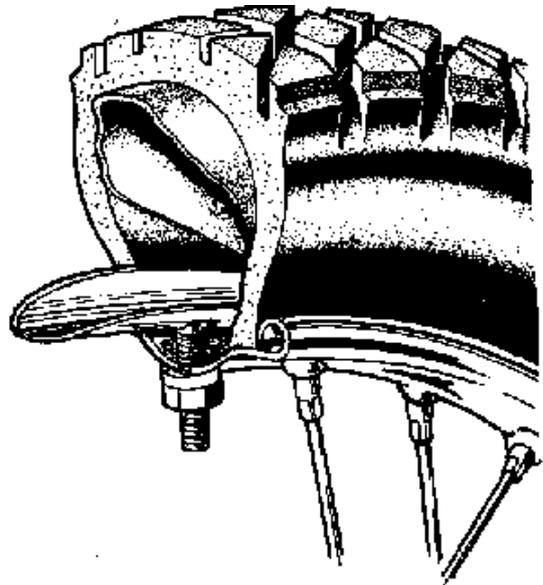


FIG. F8. Security bolt.

WHEEL BUILDING

This is a job which is best left to the specialist as it is essential that the wheel is laced correctly and that when truing, the spokes are correctly tensioned.

It is however, possible for the less experienced to avoid trouble by periodically examining the wheels. As spokes and nipples bed-down the tension will be lost and unless this is corrected the spokes will chafe and ultimately break.

Periodically test the tension either by "ringing", that is striking with a metal tool or by placing the finger and thumb of one hand over two spokes at a time and pressing them together.

If tension has been lost there will be no ringing tone and the spokes will move freely across each other.

When a spoke needs tensioning, the nipple through the rim must be screwed further on to the spoke but at the same time, the truth of the wheel must be checked and it may be necessary to ease the tension at another part of the wheel in order to maintain its truth.

It will therefore be obvious that spoke replacement, spoke tensioning or wheel truing are not operations to be treated lightly.

Careful examination of the wheel will show that for every spoke there is another pulling in the opposite direction and that the adjacent spoke goes to the opposite side of the hub.

Increasing the tension tends to pull the rim so, to counteract this, it is sometimes necessary to increase the tension on the spoke or spokes either side to maintain the truth of the wheel.

With a little care and patience it is possible for the unskilled to at least re-tension the spokes but, turn each nipple only a little at a time as, once the spoke is under tension only a fraction of a turn is sometimes sufficient to throw the rim badly out of truth.

WHEEL BALANCING

When a wheel is out of balance it means that there is more weight in one part than in another. This is very often due to variation in the tyre and at moderate speeds will not be noticed but at high speeds it can be very serious, particularly if the front wheel is affected.

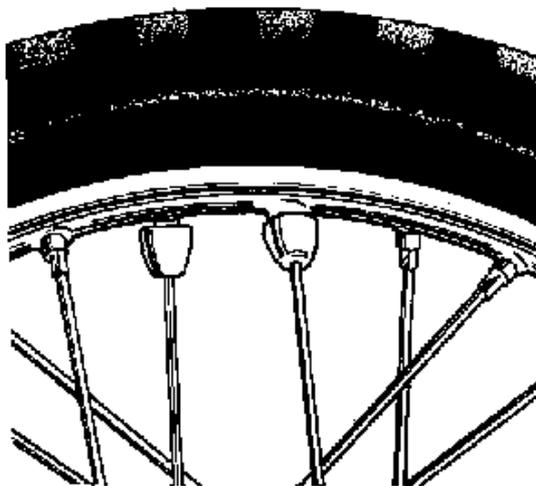


FIG. F9. *Balance weights.*

Weights are available for attaching to the spokes to counteract any out-of-balance but, before starting, ensure that the wheel is absolutely free and revolves quite easily. If the rear wheel is being treated remove the driving chain.

With the wheel clear of the ground spin it slowly and allow it to stop on its own. Now mark the top of the wheel or tyre and repeat two or three times to check.

If the wheel stops in the same place the extra weight must be added at the marked spot.

The next step is to ascertain how much weight is to be added, this can be done by sticking small pieces of plasticine to the nipples and re-checking until the wheel will stop in any position without moving.

Having ascertained how much weight is required, a balance weight of exactly the same amount must be attached to the spokes at the spot originally marked.

WHEEL ALIGNMENT

Steering will be affected if the wheels are the slightest bit out of alignment (out of track).

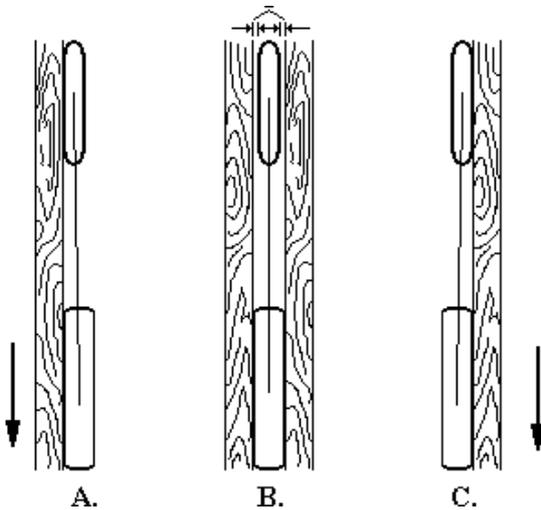


FIG. F10. *Checking alignment*

Since the front wheel cannot be adjusted in this respect, it is the rear wheel which must be aligned to the front wheel. This adjustment will be necessary whenever the chain is adjusted or the wheel removed. It is also necessary to adjust the rear brake whenever re-alignment has been carried out.

To check the alignment of the wheels a straight edge of timber or steel is required approximately 80" long.

The straight-edge should be laid on blocks four to six inches high (alternately) each side of the machine.

If the tyres are the same size and the wheels in alignment the straight-edge will be touching the tyres at four points on each side.

If the front tyre is of smaller section then it should be as drawing (B) Fig. F10.

If the alignment is as either (A) or (C) then the rear chain adjusters must be moved as indicated by the arrows to correct the alignment.

Assuming that the chain adjustment is correct the movement of the rear wheel will be made on the right-hand side chain adjuster which should be screwed in or out as necessary after the spindle nuts have been slackened off.

A machine suffering accidental damage may have wheels so out of alignment that they cannot be corrected in this way. Frame, fork or wheel geometry may be basically upset, in these cases a specialist repairer can probably reset any offending assembly using information in section "D."

TYRE REMOVAL

There are a few points about tyres which should be thoroughly understood.

- (1) The beads have wire cores which cannot be stretched over the rim flanges without damage.
- (2) Removal and replacement will be simpler if the beads are pressed right down into the well of the rim except at the point being "worked". The well is in the centre section.
- (3) The tyre beads will slip over the rim quicker and damage will be avoided if the beads and the levers are lubricated with soapy water.

Unscrew and remove the valve core to deflate the tyre.

Some valve caps are designed for this purpose but, if the cap is plain and a core removal tool is not available, depress the centre of the valve and keep "treading" the tyre to expel the air.

Press each bead off its seat into the well of the rim.

Insert the lever at the valve position, and while levering, press the bead into the well diametrically opposite the valve.

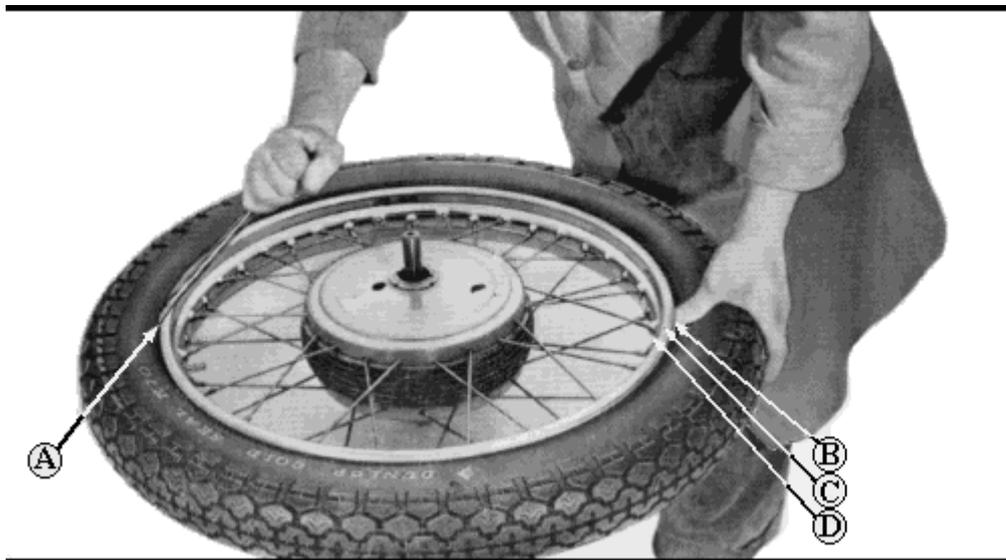


FIG. F11.

It will not be possible to pull the cover bead at (A) Fig. F11 over the rim flange until the cover bead at (B) is pushed off the bead seat (C) down into the well (D). Then the cover bead at (A) comes over the rim flange easily.

Insert a second lever close to the first and prise the bead over the flange holding the free part with the other lever.

Remove one lever and insert further along the tyre continuing every two to three inches until the bead is completely removed (see Fig. F12).

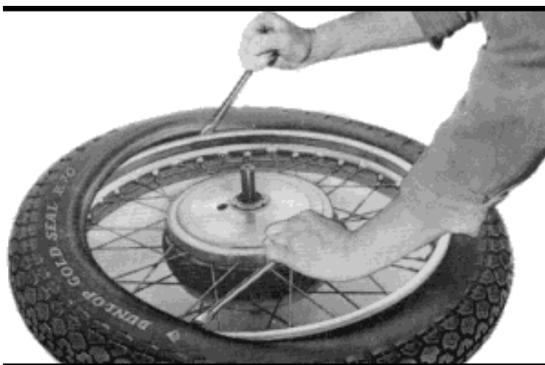
FIG. F12. *Removing the first bead.*

FIG. F13.

Take care when inserting levers not to pinch the inner tube as this will result in a puncture. Lift the valve out of the rim and remove the tube.

Stand the wheel upright, insert a lever between the remaining bead and the rim and pull the cover back over the flange as in Fig. F13. Do not forget to press the bead diametrically opposite the lever into the centre of the rim and to apply a soapy solution to the rim flange.

TYRE REPLACEMENT

Before a tyre, new or used, is replaced, it should be carefully checked inside and outside for loose objects or nails, flints, glass and cuts.

Do not forget that although there may be nothing visible outside there could be a nail projecting inside. When repairing a tyre or tube be patient and see that the area of the repair is absolutely clean before applying solution. A rag dampened with petrol will help to clean the area, but it must be completely dry before solution is applied.

Remember that when replacing the tyre, it is very easy to cause another puncture by nipping the inner tube with the levers.

Some new tyres have balance adjustment rubbers inside the casing, they are not patches and should not be disturbed.

When there is a white spot near the tyre bead it should be placed at the valve position. This will ensure a very high degree of tyre balance.

If the spokes have been tensioned, or replaced, see that they are not projecting through the nipples. File flush any that are showing through. Replace the rim tape with the rough side next to the rim.



FIG. F14.

Cover and tube assembled ready for fitting.

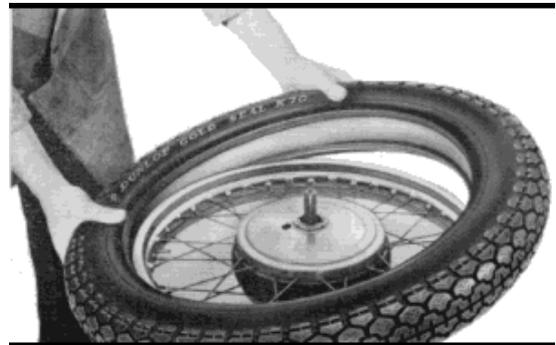


FIG. F15. *Commencing to fit the tyre.*

Fit the tube in the tyre and inflate just sufficient to round it out without stretch.

Too much air makes fitting difficult, and too little will make the tube more liable to be nipped by the levers. Dust the tube and inside the cover with dusting chalk.

Lubricate the cover beads and the rim flanges with a soap and water solution or liquid soap.

Pull the tube slightly out of the cover so that it protrudes about 1" beyond the beads for about 4—5" each side the valve as in Fig. F14.

Squeeze the beads together at the valve to prevent the tube slipping back and offer the cover to the rim as shown in Fig. F15, at the same time passing the valve through the holes in the tape and rim.

Allow the lower bead to go into the well of the rim and the upper bead to be above the rim flange.

Working from the valve outwards, press the lower bead over the rim flange by hand, moving along in short stretches, and ensuring that the bead lies right down in the well of the rim — this is most important (see Fig. F16). If necessary use a tyre lever for the last few inches as in Fig. F17.

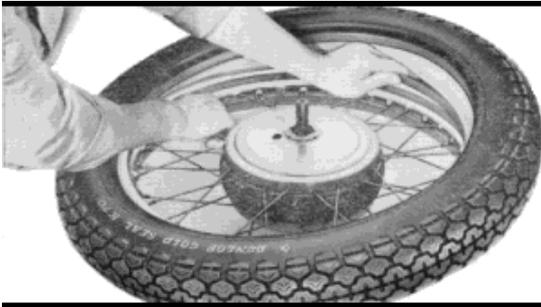


FIG. F16. *Fitting the first bead.*

Turn the wheel over and check that the bead is concentric with the rim before proceeding further.

Reverse the wheel again and press the upper bead into the well of the rim diametrically opposite the valve.

Insert a lever as close as possible to the point where the bead passes over the flange, and lever the bead over at the same time pressing a fitted portion into the well of the rim.

Repeat progressively round the tyre until the bead is completely over the flange, finishing at the valve (see Fig. F18).

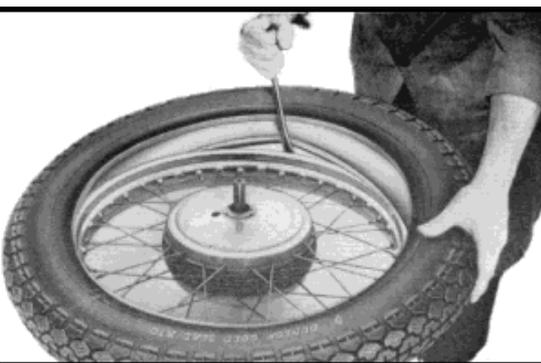


FIG. F17.
Completing the fitting of the first bead.

Push the valve inwards to ensure that the tube adjacent to the valve is not trapped under the bead, then pull the valve back firmly into position.

Before inflating, check that the fitting line on the tyre wall just above the bead on each side is concentric with the rim.

If necessary bounce the wheel to help seat the tyre but, see that there is adequate pressure to prevent damaging the tyre or tube and only use moderate force. If the tyre will not seat, it is better to release the pressure, apply soap solution to lubricate and re-inflate.

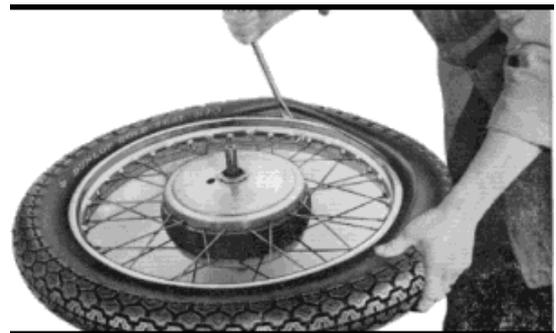


FIG. F18.
Completing the fitting of the second bead

Inflate to the required pressure and check fitting lines again. Inflation should not be too rapid, particularly at the commencement, to allow the beads to seat correctly on the rim.

See that the valve protrudes squarely through the valve hole before screwing down the knurled nut and replace the dust cap.

TYRE PRESSURES

The recommended inflation pressures of 17 p.s.i. for the front and 22 p.s.i. for the rear tyre, are based on a rider's weight of 140 lb. If the rider's weight exceeds 140 lb, the tyre pressures should be increased as follows:—

Front Tyre:

Add 1 lb. per square inch for every 28 lb. in excess of 140 lb.

Rear Tyre:

Add 1 lb. per square inch for every 14 lb. in excess of 140 lb.

If additional load such as a pillion passenger or luggage is to be carried, the actual load bearing upon each tyre should be determined and the inflation pressures increased in accordance with the Dunlop Load and Pressure Schedule.