

SECTION O

THE WHEELS AND TYRES

- Section No. O.1 **General.**
- Section No. O.2 **Tyre removal.**
- Section No. O.3 **Importance of balance.**
- Section No. O.4 **Fitting tyres and tubes.**
- Section No. O.5 **Tubeless tyres.**
- Section No. O.6 **Tubeless tyre valves.**

Section O.1

GENERAL

Tyre pressures

It is of the utmost importance that the tyres be carefully maintained at the following recommended pressures:

Front: 22 lb./sq. in. (1.6 kg./cm.²).

Rear (normal): 22 lb./sq. in. (1.6 kg./cm.²).

When carrying four passengers and luggage the rear tyres should be inflated to 24 lb./sq. in. (1.7 kg./cm.²).

Spare wheel

The spare wheel is carried in a separate compartment beneath the trunk lid and is secured in position by a special bolt and clamp plate which must be removed before the wheel can be withdrawn. Keep the tyre inflated to 24 lb./sq. in. (1.7 kg./cm.²).

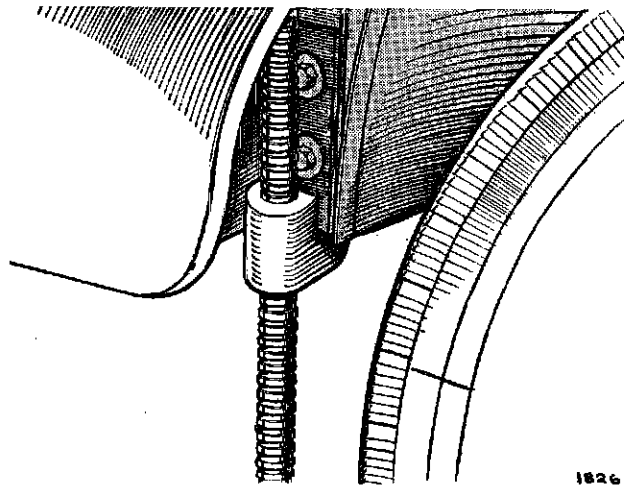


Fig. O.1

When using the jack to raise a front wheel make sure that the claw of the jack is in proper engagement with the bottom of the special jacking plate

Jack

When using the special jack apply the hand brake and place chocks on each side of two wheels which are not to be raised from the ground.

To raise a front wheel engage the jack immediately below the two bolt heads visible inside the rear of the front wheel arch. Place the jack in position and turn the shaft by hand until the claw is engaged. Insert the tommy-bar in the hole provided in the lower end of the shaft and continue to turn until the wheel is clear of the ground.

To raise a rear wheel the jack must engage the special plate on the chassis beneath the wheel arch to the rear of the wheel.

O.2

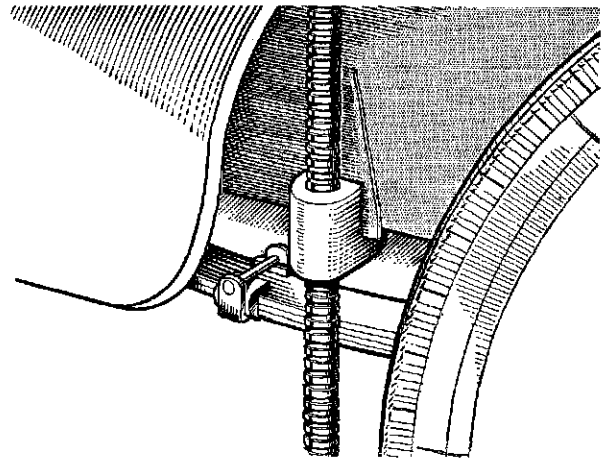


Fig. O.2

In the case of the rear wheel similar precautions must be taken. In this case the special jacking plate is more obvious

Road wheels—removal and replacement

Remove the hub cover by inserting the flattened end of the wheel nut spanner in the recess provided adjacent to the retaining studs and giving it a sideways twist.

Remove the four bolts securing the road wheels to the hub. The wheel bolts have right-hand threads, i.e. turn clockwise to tighten and anti-clockwise to remove. Lift the road wheel from the hub.

Reverse the procedure when replacing the road wheel and ensure that the wheel bolts are tight. This is important.

To refit the hub disc the rim should be placed over two of the buttons on the wheel centre and the outer face given a sharp blow of the fist over the third button.

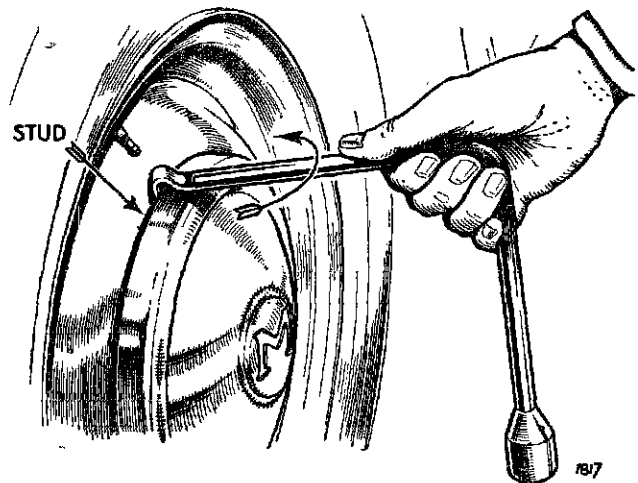


Fig. O.3

The wheel hub disc is removed by using the flattened end of the wheel nut brace and giving it a sideways motion

Valves

Valve caps, in addition to preventing dirt from entering the valve, form a secondary air seal and should always be fitted. The valves may be tested for air-tightness by rotating the wheel until the valve is at the top and inserting its end in water. If bubbles appear the seating is faulty and should be removed and replaced by a new one. It is advisable to change the valve interiors every 12 months.

Tyre wear

Even tyre wear is promoted by changing the positions of the wheels and tyres on the car at intervals (Fig. O.18).

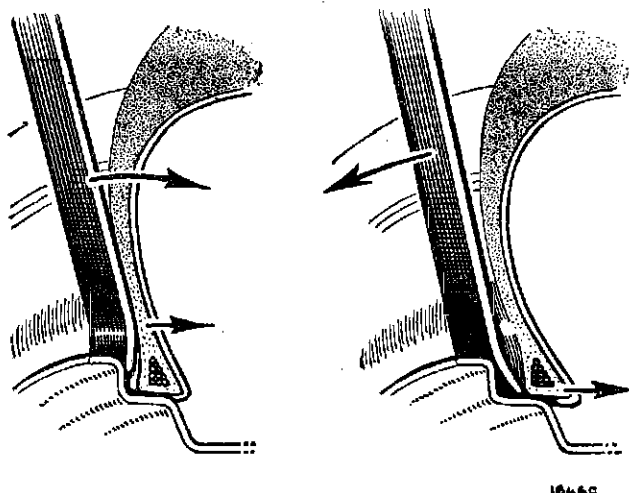


Fig. O.4

In cases where difficulty is encountered in moving the bead into the well-base the tyre lever should be inserted between the rim edge and the bead as indicated in Fig. O.4 and the lever pushed towards the tyre as indicated. A second tyre lever should now be inserted next to the first in the space between the rim edge and the bead, with its curved end against the rim, and pulled outwards

Attention should be paid to the following points with a view to obtaining the maximum mileage from the tyre equipment of the vehicle.

Test the pressures of the tyres daily by means of a suitable gauge and restore any air lost. It is not sufficient to make a visual examination of the tyre for correct inflation. Inflate the spare wheel to the correct rear wheel pressure at the same time.

Should any tyre appear to lose an appreciable amount of air between short intervals, have it removed and checked for air leaks.

Regularly remove and examine covers and tubes. Keep the treads free from grit and stones and arrange for any repairs to be carried out. Clean the wheel rims and keep them free of rust.

Paint the wheels if required, and replace the tyres and tubes. Keep the brakes and clutch adjusted correctly and in good order. Fierceness or uneven action in either of these units has a destructive effect on the tyres.

Misalignment is a very costly error. Suspect it if rapid wear of the front tyres is noticed and correct the fault at once. See Section J for details of front wheel alignment.

Keep oil and grease off the tyres. Should the tyres get oily, petrol should be applied sparingly and wiped off at once.

NOTE.—Inextensible wires are incorporated in the edges of wired-type tyres. Do not, therefore, attempt to stretch edges of the tyres cover over the rim edge.

Force is entirely unnecessary and detrimental as it tends to damage the wire edges and serves no useful purpose. Fitting or removing is quite easy if the wire edges are carefully adjusted into the rim base; if it is found to be difficult the operation is not being performed correctly.

Section O.2

TYRE REMOVAL

Remove all valve parts to completely deflate the tyre, and free the bead from the rim in the following manner: (1) Insert a tyre lever between the rim and the bead with the curved end against the tyre and push

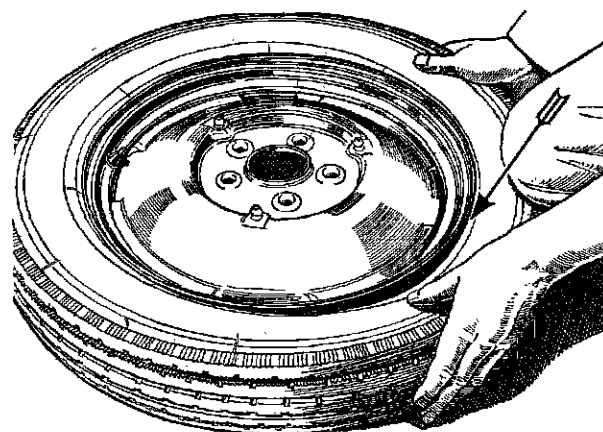


Fig. O.5

The first step in tyre removal is the pushing of the bead into the well of the rim opposite the tyre valve

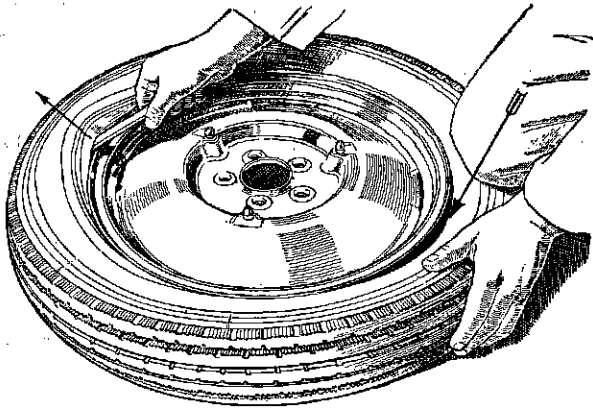


Fig. O.6

Tyre levers can then be inserted close to the tyre valve and the tyre lifted over the rim without difficulty

the lever towards the tyre. This will push the bead away from the rim edge; (2) Insert a second lever in the space provided, but with the curved end outwards, and pull this lever away from the tyre to push the bead inwards; (3) Repeat this process right round the tyre until the bead is free. Two or three circuits round the tyre may be necessary to free the bead completely. Push both edges into the base of the rim at a point diametrically opposite the valve, then lever the cover edge near the valve over the rim of the wheel (see Fig. O.6), using two levers placed about 6 in. (15 cm.) apart. Remove the tube carefully—do not pull on the valve. Stand the tyre and wheel upright, keeping the bead on the base of the rim. Lever the bead over the rim flange, and at the same time push the wheel away from the cover with the other hand.

Section O.3

IMPORTANCE OF BALANCE

In order to obtain good steering it is of importance to ensure that the wheels, with tyres fitted, are in good balance. To assist this the tyre manufacturers are now marking their tyres with white, pink, or yellow spots of the neighbourhood of the bead at the lightest point in the cover; similarly, they are marking the inner tubes with a group of coloured spots to indicate their heaviest point. When tyres are assembled care must therefore be taken to see that they are assembled with the coloured spots on the cover coinciding with the coloured spots on the tube, and not opposite to the valve as recommended hitherto.

It must be noted, in addition, that special balancing discs are sometimes fitted to the inside of the cover

O.4

casing and that these should on no account be removed, as the tyre balance will be upset if this is done. These balance discs are not repair patches and do not indicate any fault in the tyre.

The maximum out-of-balance permissible on Morris Minor tyre and wheel assemblies is 28 in./oz., and rim weights to Dunlop Part Nos. WBW/1 to 7 (providing a range of weights up to 3½ oz. in steps of ½ oz.) must be added as required in order to bring the wheel assembly below this figure.

Section O.4

FITTING TYRES AND TUBES

The following procedure is recommended when fitting tyres and tubes to well-base rims:

- (1) Inspect the inside of the cover carefully and remove all dirt. Inspect the wheel rim, which must be clean, free of rust, and undamaged.
- (2) Dust the inside of the cover evenly with french chalk.
- (3) Inflate the tube until it begins to round out, then insert it in the cover.
- (4) Apply a frothy solution of soap and water generously around the entire base of the tube, extending upwards between the tyre beads and the tube itself for at least 2 in. (50 mm.) on both sides. also apply the solution to the bottom and outside of the tyre beads. Do not allow the solution to run into the crown of the tyre. The solution must be strong enough to feel slippery when the fingers are wetted with the solution and rubbed together.

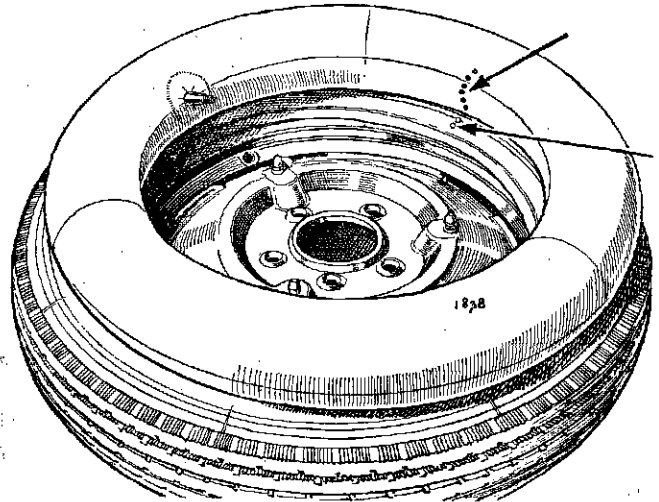


Fig. O.7

When replacing a cover and tube make sure that the balance marks on the tube and cover coincide

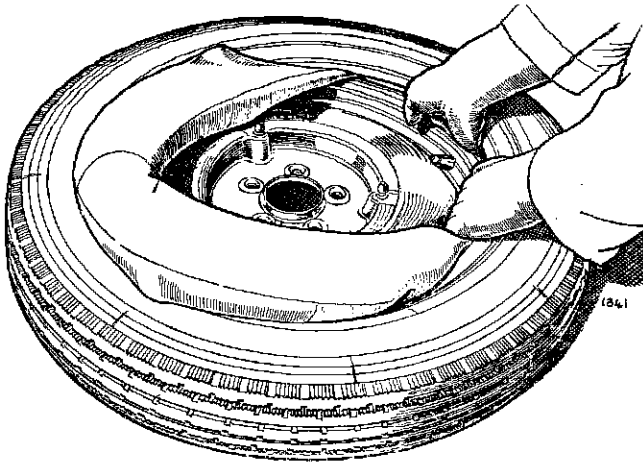


Fig. O.8

After slight inflation the tube is introduced into the cover, fitting the valve in position first

- (5) Mount the tyre on the rim immediately, whilst the soap solution is still wet.

Push one edge of the cover over the edge of the rim. It will go quite easily if the part first put on is fitted on the opposite side of the valve and is pushed right down into the rim base. Move it round so that its balance spots coincide with those of the inner tube when it is inserted with the valve passing through the hole in the rim. (Take care that the valve, which is fitted in the side of the tube, is on the correct side of the rim.)

- (6) Before inflating be sure that the tyre beads are clear of the well of the rim all the way round,

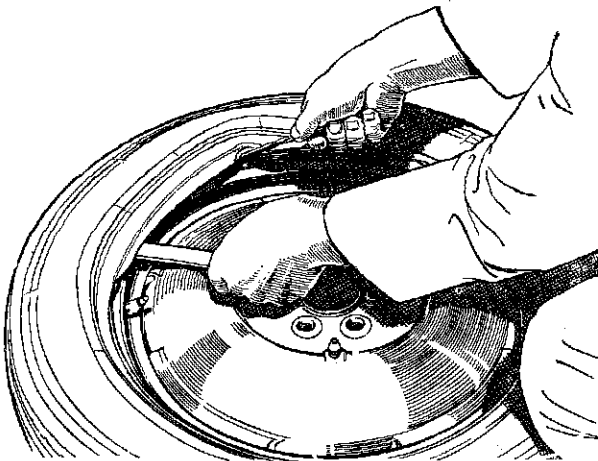


Fig. O.9

When refitting the cover start at a point diametrically opposite to the valve and finish at the valve

and that the tube is not trapped between the tyre edge and the rim adjacent to the valve. To guard against this push the valve into the tyre as far as it will go before inflating.

- (7) Inflate slowly until the beads are fully seated.
- (8) Remove the valve core to deflate the tube completely.
- (9) Reinflate to the correct working pressure (see page O.2). This procedure must be followed whenever a tube is fitted.

The object of the double inflation is to permit any stretched portions of the tube to readjust themselves in the cover and thus relieve any local strains in the tube.

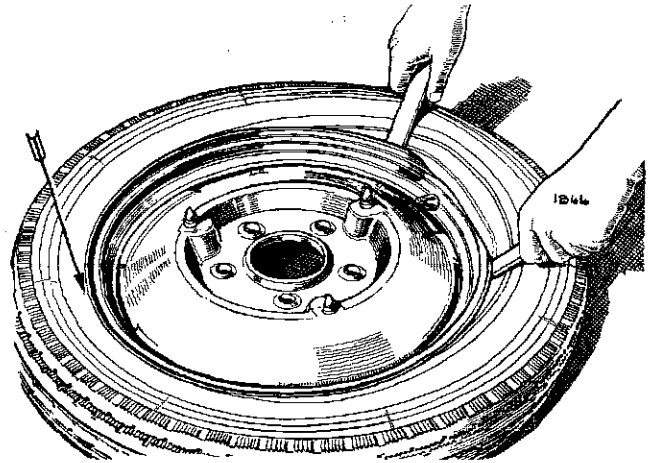


Fig. O.10

If the portion of the cover first fitted is kept in the well of the rim no difficulty will be encountered in replacing the last portion of the cover

In an emergency french chalk may be used as a substitute for the soap solution provided it is evenly and generously applied. This practice, however, is not recommended.

Repairing tubes

Punctures or injuries must be vulcanized. Ordinary patches should only be used for emergencies and cannot be relied upon.

Patches are quite useless in the case of synthetic tubes. These must be vulcanized if punctured or otherwise damaged.

Section O.5

TUBELESS TYRES

Vehicles now fitted with tubeless tyres, and which primarily were fitted with ordinary tyres, have a metal valve holder (see Fig. O.11). When tubeless tyres are

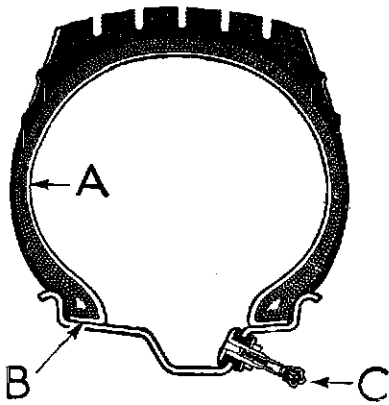


Fig. O.11

A section through a tubeless tyre

- A. Air-retaining liner. B. Rubber air seal.
C. Rubber-sealed valve.

fitted as standard equipment an all-rubber valve holder (Part No. 1D 8038), together with a modified wheel, is fitted.

The tubeless tyre relies primarily on a good air seal between the tyre bead and the rim and also between the rim and the valve; the following instructions are therefore of great importance.

Rim preparation

- (1) Remove by careful hammering any dents in the flange visible to the eye.
- (2) Clean the flange and rim seat with steel wool, emery, or other cleaning medium and remove all foreign matter, rust, rubber, etc. Paint need not be removed, but irregularities in the surface should be smoothed out. In extreme cases of rusting it may be necessary to use a wire brush or a file.
- (3) File or buff away any high-spot at the butt-weld joint.
- (4) Wipe the flange and bead seat with a water-moistened cloth.

Valve fitting

Insert the valve and tighten the nut until the rubber outside the rim extends $\frac{1}{16}$ in. (1.6 mm.) beyond the metal washer between the nut and the rubber washer. Do not fit the internal parts of the valve until the tyre has been fitted to the rim.

Tyre fitting

The operations of fitting and removing the tubeless tyre to the rim are carried out in exactly the same manner as in the conventional tyre, except that there is no tube.

Much greater care is necessary to avoid the slightest damage to the tyre bead.

- (1) Before fitting moisten the beads of the tyre, the rim flange, and the tyre levers with water. **Do not use petrol.**
- (2) Use thin, narrow levers in good condition, without rust and burrs. Do not widely space the levers.
- (3) Finish fitting at the valve position.
- (4) White balance spots on the tyre should be in line with the valve.
- (5) Before inflation bounce the crown of the tyre on the ground at various points to snap the beads home against the rim and provide a partial seal.
- (6) With the wheel in the upright position, inflate the tyre. If a seal cannot be obtained at the first rush of air bounce the tyre again with the air-line attached. In cases of difficulty apply a tourniquet of strong cord round the circumference of the tread and tighten.
- (7) When a seal is obtained inflate until the beads are completely forced against both rim flanges. Remove the air-line, insert the valve interior, and inflate to 50 lb./sq. in. (3.52 kg./cm.²) for testing.

Allow the tyre to stand for a few minutes so that any free air trapped between the flange and the bead clinch can escape. Test the complete assembly in a water tank, paying special attention to the areas at the beads, valve, and wheel rivets.

Sealing leaks located during testing

Loss of air may occur at any or all of the following points:

- (1) The area of the bead seat, showing as a leak at the top of the flange.

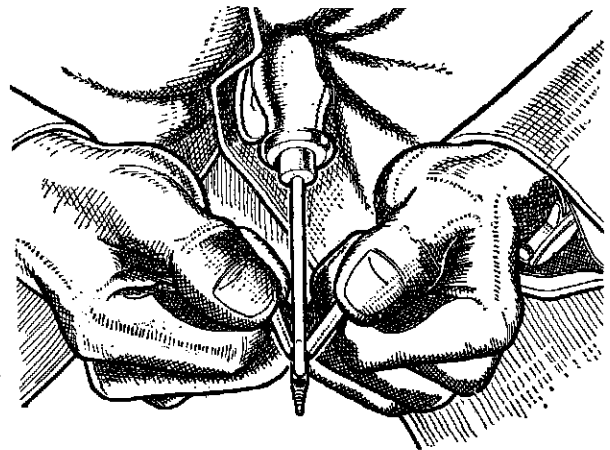


Fig. O.12

Rolling the plug into the needle eye

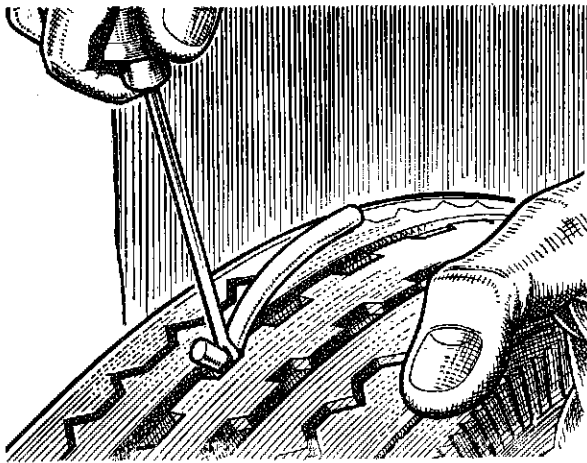
This is usually due to a high-spot on the rim and can often be cured by holding the bead away from the rim to allow further cleaning.

- (2) The wheel rivets. In this case, and in extreme cases of leakage in the area of the bead seat (1) it is necessary to remove the tyre. Before doing so mark the position of the leak on the tyre and rim.

Loss of air at the rivets can be cured by peening over the rivet heads.

- (3) The base of the valve or valve interior. Provided the valve is correctly fitted, this can be rectified by tightening the valve nut slightly.

Inflate the tyres to the correct pressure before running on the road.



4331BW

Fig. O.13

Inserting the plug and needle through the hole in the tyre

Tyre removing

The operation does not differ from the removal of the conventional tyre and tube assembly, except that there is no tube.

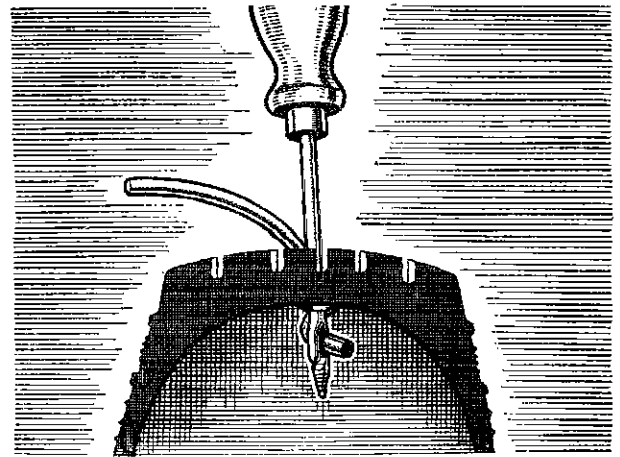
Do not damage the bead.

Penetrations

Normally a tubeless tyre will not leak as the result of penetration by a nail or other puncturing object, provided that it is left in the tyre. It is, however, necessary to examine the tyres periodically and to withdraw such objects at a time when loss of air will cause least inconvenience.

Use of plugging kit. Location and preparation

If a hole fails to seal mark the spot and extract the puncturing object, taking note of the direction of penetration. If the tyre is leaking and the puncturing object



4331CW

Fig. O.14

The inserted plug prior to withdrawing the needle

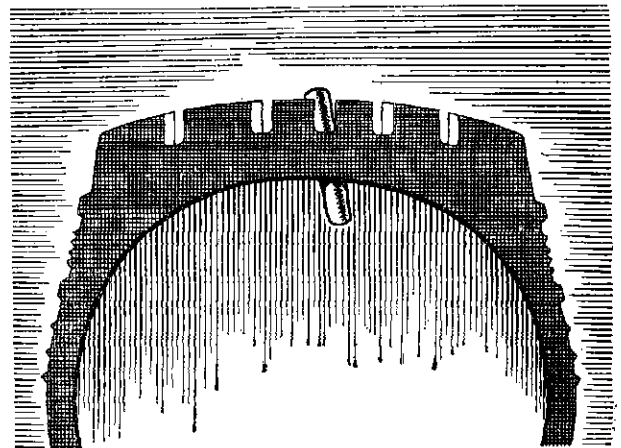
cannot be located by sight it is necessary to immerse the inflated tyre in water.

Dip the needle into the flask of solution and insert through the hole, following the same direction as the penetration.

Repeat until the hole is well lubricated with solution.

Repair

Select a plug about twice the diameter of the puncturing object, stretch it, and roll it into the eye of the needle $\frac{1}{4}$ in. (6.35 mm.) from the end (Fig. O.12). After dipping the plug into the solution insert the needle into the hole and push the plug through the tyre (Figs. O.13 and O.14).



4331DW

Fig. O.15

Plug inserted into the tyre and cut off to the correct length

Withdraw the needle and cut off surplus plug about $\frac{1}{8}$ in. (3.18 mm.) from the surface of the tread. The tyre can now be inflated and used immediately. More severe injuries which are outside the scope of simple puncture repair methods are dealt with in nearly the same way as similar injuries to conventional covers.

If the tyre deflates on the road following an unusually large penetration a tube can be fitted to enable the owner to remain on the road until it is convenient for the necessary repairs to be carried out. (The valve used for the tubeless tyre must be removed before the fitting of the tube.)

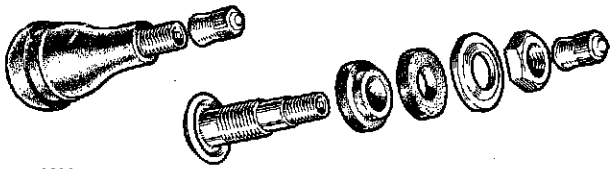
Section O.6

TUBELESS TYRE VALVES

There are two types of valve used in conjunction with tubeless tyres. The first type (Fig. O.16) is a steel one which is secured in the rim by a nut tightened down onto the convex side of a steel washer which in turn compresses the sealing rubbers. The use of soapy water or other lubricant will not assist the assembly of this valve and must be avoided.

The second type (Fig. O.16) is fitted on later wheels where the valve hole has been drilled diametrically opposite to the wheel welding, and a mushroom-headed rubber valve is utilized which must be drawn through the valve hole with the assistance of a special tool.

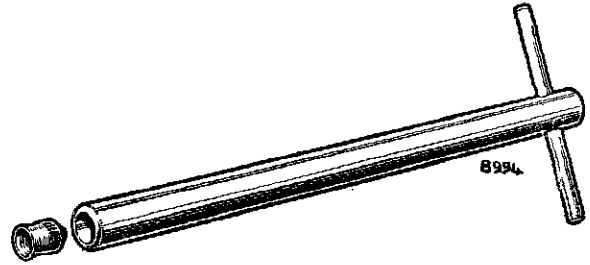
The valve is secured in the wheel by a small stepped flange on the rubber valve and the pressure of air inside the tyre.



9009

Fig. O.16

Valves for tubeless tyres



8994

Fig. O.17

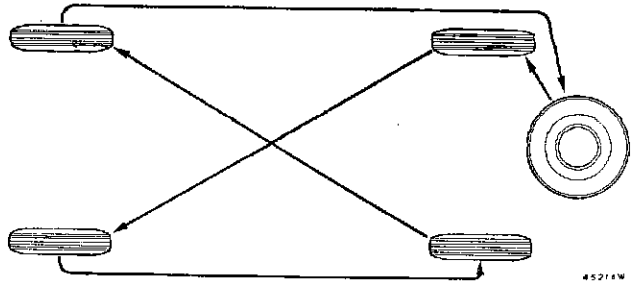
Simple tool for fitting tubeless tyre valves

A simple but effective tool (Fig. O.17) for fitting the valve can be made up from a 7 in. (177.8 mm.) length of $\frac{1}{2}$ in. (12.7 mm.) steel bar or 13 S.W.G. steel tubing. Using a letter 'S' drill, in one end drill a hole to a depth of approximately $\frac{3}{8}$ in. (15.87 mm.).

Obtain an ordinary valve dust cap and solder the cap into the drilled hole.

The opposite end of the tool requires a hole drilled about $\frac{1}{2}$ in. (12.7 mm.) from the end to accept a short piece of $\frac{1}{4}$ in. (6.35 mm.) diameter rod to provide a handle.

To fit the second-type valve with the aid of the tool first liberally coat the rubber valve and the perimeter of the valve hole in the wheel with soapy water. Insert the valve into the hole and screw on the special tool. A sharp pull will seat the valve correctly.



45711W

Fig. O.18

Interchanging road wheels to regularize tyre wear