

## SECTION O

### THE WHEELS AND TYRES

#### General

Section No. O.1	The importance of balance.
Section No. O.2	Tyre removal.
Section No. O.3	Fitting tyres and tubes.
Section No. O.4	Tubeless tyres.
Section No. O.5	Tubeless tyre valves.

#### GENERAL

##### *Tyre pressures*

It is of the utmost importance that the tyres be carefully maintained at the recommended pressures given in General Data.

##### *Tyre sizes*

Early models were fitted with 6.70×16 tyres. From Car No. RMH.1170 the tyre size is 6.00×16.

##### *Spare wheel*

The spare wheel is carried below the luggage compartment. To remove, rotate the hexagon-headed securing bolt accessible inside the luggage compartment.

##### *The jack*

When using the special jack, apply the hand brake and insert the jack into the special jacking point at either of the four bumper brackets.

##### *Road wheel removal and replacement*

Remove the hub cover by inserting the flattened end of the wheel nut spanner adjacent to the retaining studs, then give the spanner a sideways twist.

Clean the wheel rims and keep them free from 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 K for details of front wheel alignment.

Use petrol (gasoline) sparingly to remove any oil from the tyres, and then remove all traces of petrol immediately.

**Note.**—*Inextensible wires are incorporated in the edges of the tyres. Do not, therefore, attempt to stretch the edges of the tyre 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.*

##### *The valves*

Valve caps, in addition to preventing dirt from entering the valves, form a secondary air seal and should always be fitted. The valves may be tested for airtightness by rotating the wheel until the valve is at the top and inserting its end in an egg-cup full of water.

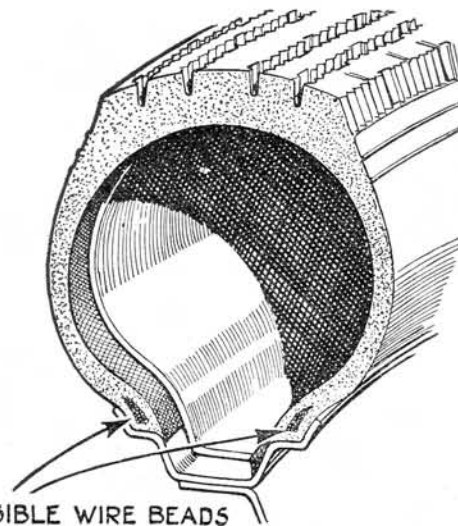


Fig. O.1.

The Dunlop tyres fitted as standard to Riley cars have wired edges and no attempt must be made to stretch them.

# 0 THE WHEELS AND TYRES

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 twelve months.

## Tyre wear

Even tyre wear is promoted by changing the positions of the tyres on the car at intervals of about 2,000 miles (3200 km.).

Attention should be paid to the following points, with a view to obtaining the maximum mileage from the tyres fitted to the car :—

Test the tyre pressures 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 require inflation at short intervals, have it removed and checked for air leaks.

Regularly remove and examine both covers and tubes. Keep the tread free from grit and stones.

## Section 0.1

### THE 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 a white spot or spots in the neighbourhood of the bead at the lightest point of the cover; similarly, they are marking the inner tubes with a group of coloured spots to indicate their heaviest point. When tyres are assembled the white spots on the cover must coincide with the coloured spots on the tube, and not opposite the valve as recommended hitherto.

It must be noted, in addition, that special balancing discs are fitted to the inside of the cover casing in some cases 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 of the tyre and wheel assembly permissible to ensure good steering is 12 in./oz. (.009 m./kg.). Assemblies which are out of balance beyond this amount should be balanced by means of special rim weights obtainable from Messrs. Dunlop Rubber Co., Part Nos. WBW/1 to 7, which cover a range of weights weighing from  $\frac{1}{2}$  oz. to  $3\frac{1}{2}$  oz. in steps of  $\frac{1}{2}$  oz. **On no account must balance weights be placed on the inner rim of the wheel.**

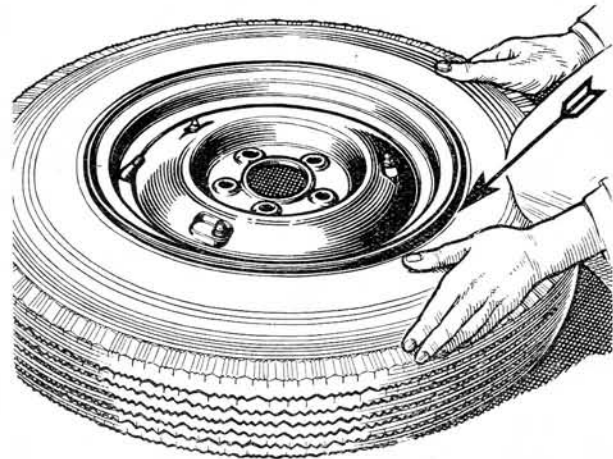


Fig. O.2.  
Commence by pushing the bead into the rim opposite the valve.

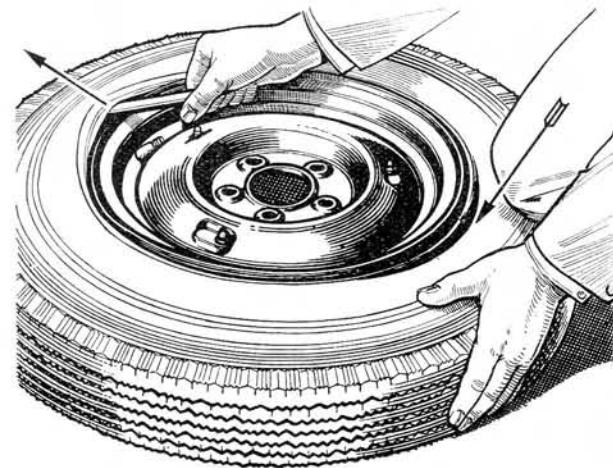


Fig. O.3.  
Insert a lever close to the valve and lift the tyre over the rim.

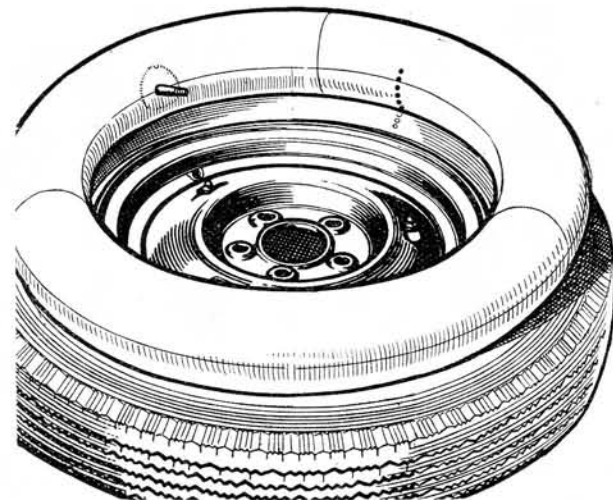


Fig. O.4.  
When refitting, balance marks on tube and cover must coincide.

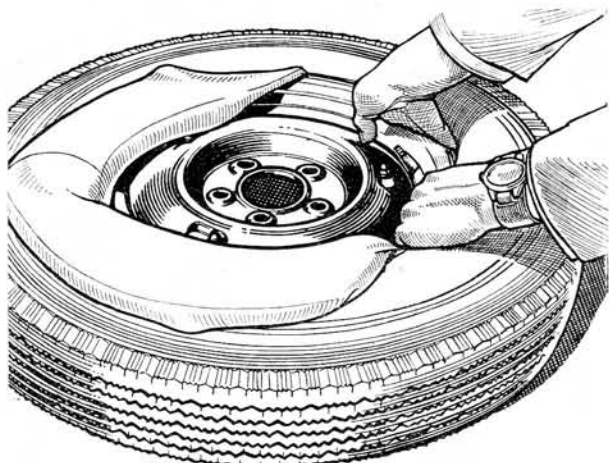


Fig. O.5.

Slightly inflate the tube before inserting it into the cover.

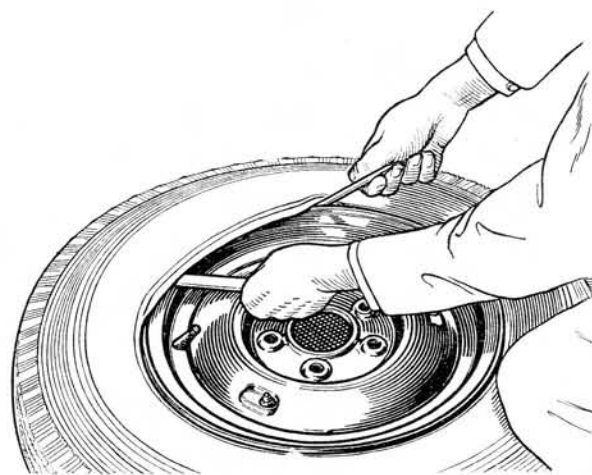


Fig. O.6.

Start to refit the cover at a point opposite the valve and finish at the valve.

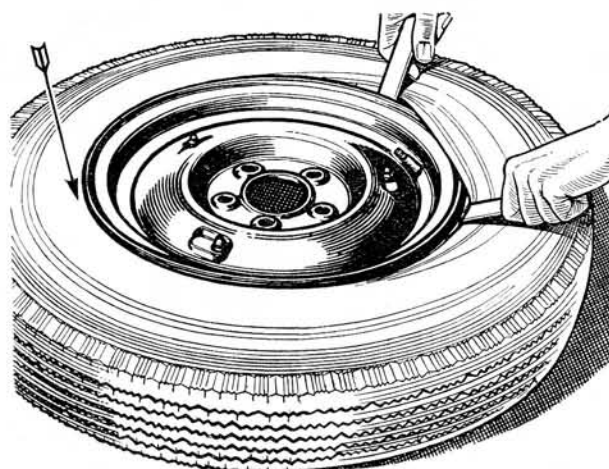


Fig. O.7.

The tyre opposite the valve must be kept pressed into the well of the rim.

## Section 0.2

### TYRE REMOVAL

Remove all valve parts to deflate the tyre completely and 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 A, Fig. O.3), using two levers at intervals of 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 0.3

### 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. The wheel rim must be clean, free from 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 at least 2 in. (5.0 cm.) 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.
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.
7. Inflate slowly until the beads are fully seated.
8. Remove the valve core to **deflate the tube completely**.

# 0 THE WHEELS AND TYRES

9. Re-inflate to the correct working pressure (see page O.1). 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 relieve any local strains in the tube.

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 vulcanised. Ordinary patches should only be used for emergencies and cannot be relied upon.

## Section O.4

### TUBELESS TYRES

Tubeless tyres may have been fitted on some vehicles and can be recognised by the metal valve holder which is sealed on the rim by rubber washers as shown by "C" in Fig. O.8. The outer covers are also marked "Tubeless."

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

- (a) Remove any dents in the flange visible to the eye by careful hammering.
- (b) 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.
- (c) File or buff away any high-spot at the butt-weld joint.
- (d) 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. 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.

- (a) Before fitting, moisten the beads of the tyre, the rim flange and the tyre levers with water.

### Do not use petrol.

- (b) Use thin, narrow levers in good condition, without rust and burrs. Do not widely space the levers.
- (c) Finish fitting at the valve position.
- (d) White, pink or yellow balance spots on the tyre should be in line with the valve.
- (e) 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.

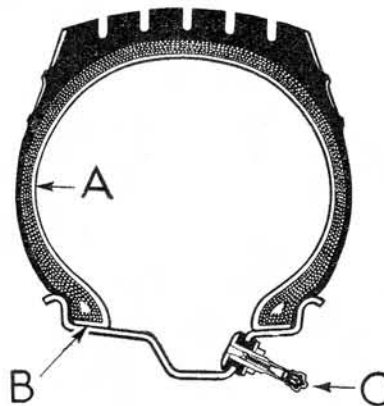


Fig. O.8.

A section through a tubeless tyre.

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

- (f) 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.
- (g) 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.<sup>2</sup>) 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:—

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

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.

- (b) The wheel rivets. In this case, and in extreme cases of leakage in the area of the bead seat (a) 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.

- (c) 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 tyre to the correct pressure before running on the road.**

### 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 after every 2,000 miles (3200 km.) and to withdraw such objects at a time when loss of air pressure will cause least inconvenience.

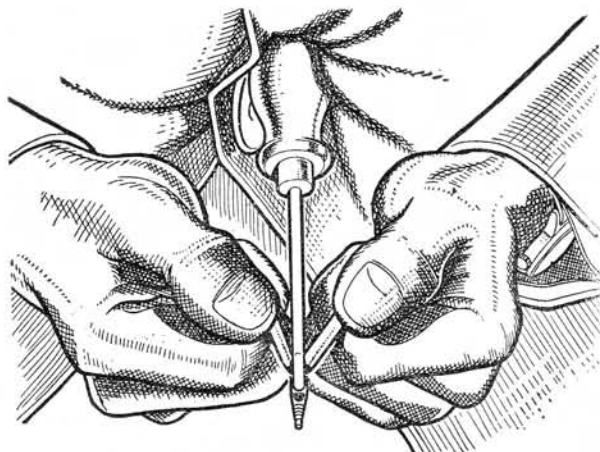


Fig. O.9.

Rolling the plug into the needle eye.

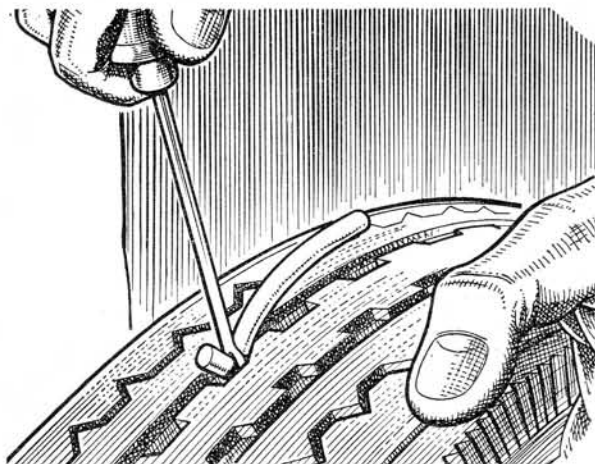


Fig. O.10.

Inserting the plug and needle through the hole in the tyre.

### 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 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 and roll it into the eye of the needle  $\frac{1}{4}$  in. (6.35 mm.) from the end. (Fig. O.9.) After dipping the plug into the solution, insert the needle into the hole and push the plug through the tyre (Figs. O.10 and O.11.).

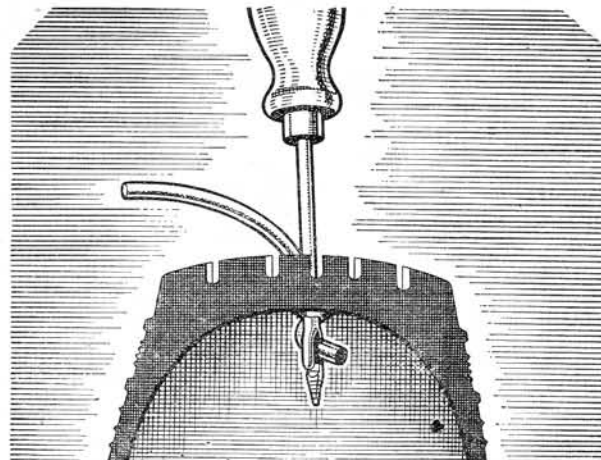


Fig. O.11.

The inserted plug prior to withdrawing the needle.

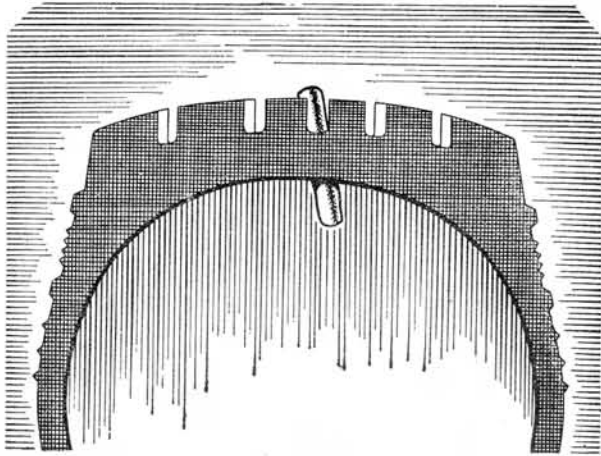


Fig. O.12.

Plug inserted in the tyre and cut off to 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 0.5

### TUBELESS TYRE VALVES

There are two types of valves used in conjunction with tubeless tyres. The first type (Fig. O.13) 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.13) 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 utilised 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.

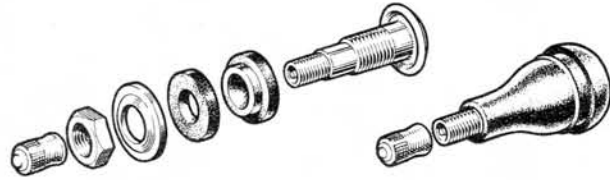


Fig. O.13.

Types of tubeless valves.

A simple but effective tool (Fig. O.14) 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  $\frac{5}{8}$  in. (15.87 mm.).

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

The opposite end of the tool requires a hole drilling 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.

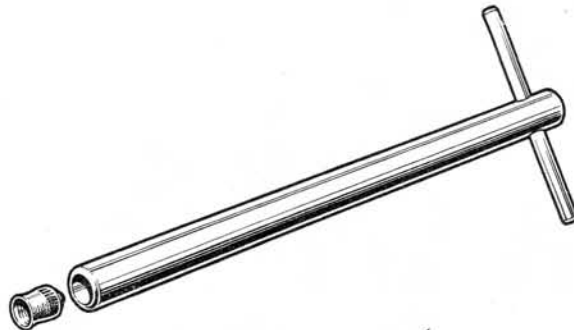


Fig. O.14.

Simple tool for fitting tubeless tyre valves.

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.