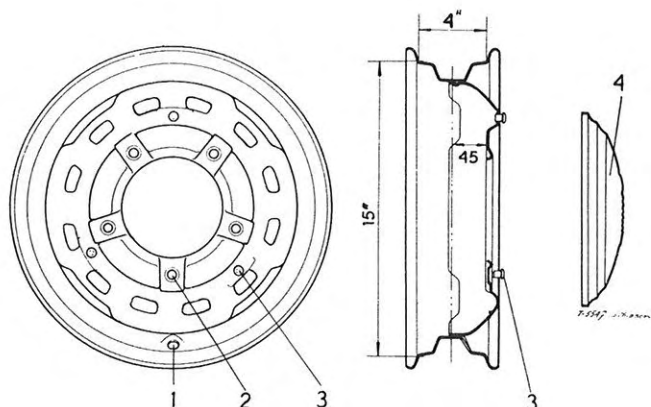


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I. DESCRIPTION



1. Valve hole
2. Wheel bolt hole
3. Hub cap retaining pin
4. Hub cap

Fig. 1. Rim with hub cap

I.1. Wheels

The car is fitted with disk wheels of so-called wide-base type. They are made from pressed steel in two parts, rim and disk, which are riveted together.

In the rim there is a hole 1, Fig. 1, for the valve, and the disk has five countersunk holes 2 for the hub bolts. It is also fitted with three pins 3, which retain the hub cap. Four pressed notches in the periphery of the disk form gaps between disk and rim for securing snow chains etc. In addition there are twelve ventilating and weight reducing holes in the disk.

I.2. Hub cap

The hub cap 4 is of the snap-on type. It is pressed from a sheet-steel and chromium plated. It is retained by three pins on the wheel disk.

I.3. Tires

The tubeless tires are of size 5.00 x 15" and the correct tire pressures are:

Front	kg/sq.cm	1.8
	(lbs/sq.in.)	26)
Rear	kg/sq.cm	1.4 - 1.7
	(lbs/sq.in.)	20 - 24)

Most tires are provided with balancing colour-marks, usually in the form of one round or one or more triangular marks on one side of the tire, see Fig. 2. A round mark indicates the lowest degree of accuracy and one or more triangular marks indicate increasing degrees of the accuracy with which the tire is balanced. The marking indicates the lightest side of the tire and should be placed at the valve when the tire is fitted.

Fig. 3 shows how the externally grooved beads of the tubeless tire seal against the inside of the rims, the bead seat.

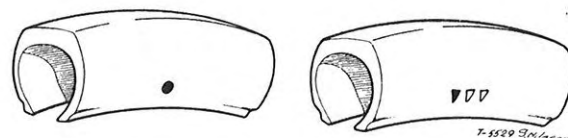


Fig. 2. Balancing marks on tires

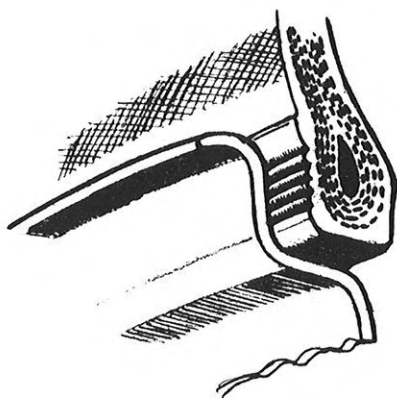


Fig. 3. Seal between tire and rim

1.4. Hubs

The wheel hubs are designed so that a slot seal 3 is obtained against the brake shield, which prevents water, sand etc. from getting into the hubs and brakes. See Fig. 4 and 5. The front wheel hubs are also provided with cooling fins.

Both front and rear hubs have five threaded holes 1, Fig. 4 and 5, for the wheel bolts, and a rim 2, which centres the wheel when it is being fitted.

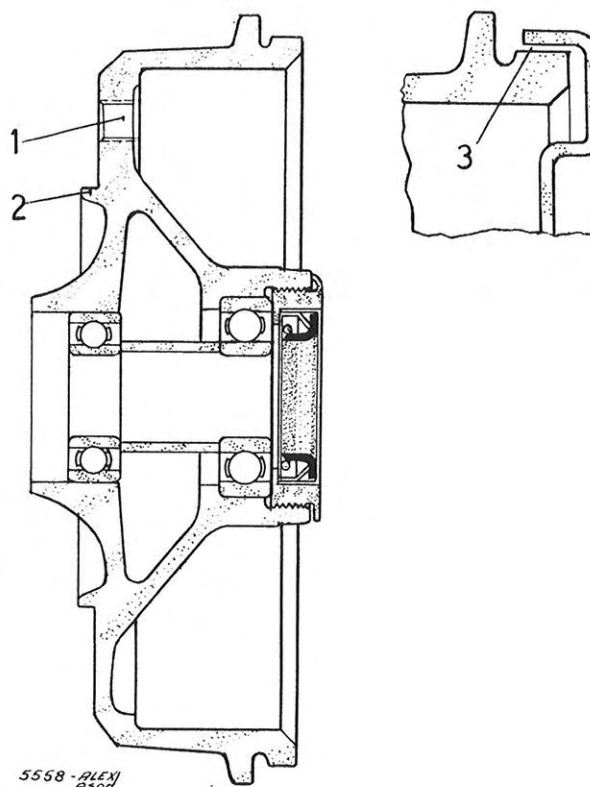
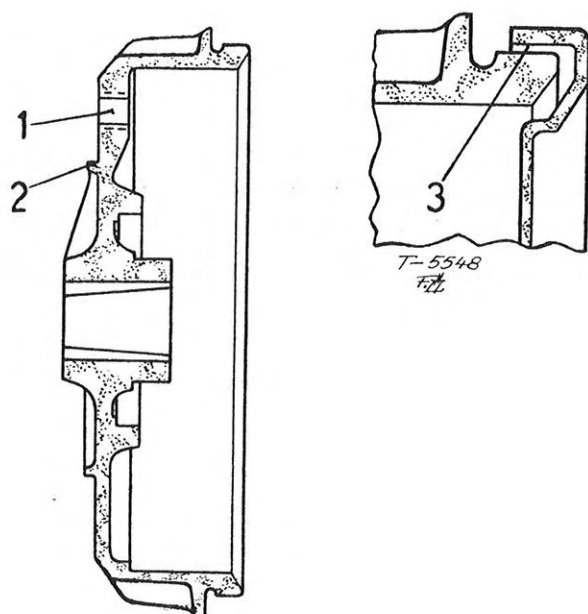


Fig. 5. Rear wheel hub



- 1. Wheel bolt hole
- 2. Support rim
- 3. Slot seal

Fig. 4. Front wheel hub

1.5. Wheel bolts

Each wheel is fitted with five bolts, which have 3/4 in. (19.05 mm) hexagonal heads, and the conical part of which fits into the countersunk holes of the wheel disk. Beyond the thread there is a short cylindrical pin which makes it easier to insert the bolt.

2. TECHNICAL DATA

2.1. Wheels

Type	wide-base
Size	4J x 15 in.
Depth of recess, Fig. 1	45 mm
Allowed out-of-round of rim, Fig. 6	2.5 mm
Allowed side throw of rim, Fig. 6	2.5 mm

2.2. Tires

Type	tubeless
Size	5.00 x 15 in.
Tire pressures:	
Front	kg/sq. cm 1.8 (lbs/sq. in. 26)
Rear	kg/sq. cm 1.4 - 1.7 (lbs/sq. in. 20 - 24)

2.3. Wheel bolts

Width across flats	3/4 in. (19.05 mm)
Thread	SAE 9/16 in. - 12 UNC-2
Wrench torque	8 - 10 kgm. (58 - 73 ft.-lbs)

2.4. Wheel hubs

New brake drum, internal diam., front and rear	203.2 mm + 0.15
--	-----------------

Wrench torque, crown nuts:

Front	kgm 17 - 20 (ft.-lbs 125 - 147)
Rear	kgm 9 - 10 (ft.-lbs 66 - 73)

2.5. Ball bearings

Front	SKF 3306
Rear: Inner bearing	SKF 6305
Outer bearing	SKF 6205

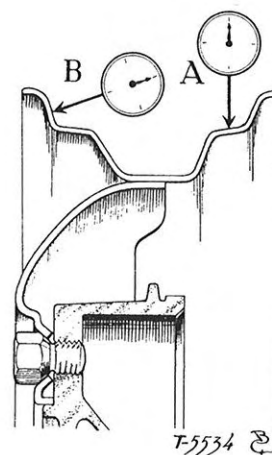


Fig. 6. Measuring points on rim

3. REPAIR AND INSPECTION

3.1. Changing wheels

3.1.1 Removal

1. Apply hand-brake and take out spare wheel.
2. Remove hub cap.
3. Loosen wheel bolts.
4. Jack up car. See Chapter 1, "General".
5. Screw out the bolts and remove wheel.

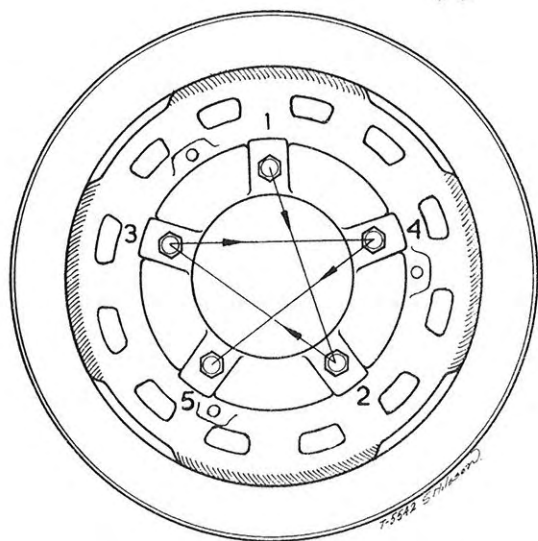


Fig. 7. Order for tightening wheel bolts

3.1.2. Fitting

1. Rest wheel against the support rim and turn it until the bolt holes match.
2. Support the top of the wheel with one hand and the bottom with one foot until two bolts have been inserted.
3. Screw in the remaining bolts and tighten them gradually in two or three stages, following the scheme shown in Fig. 7. Wrench torque 8 - 10 kgm (58 - 73 ft.-lbs). Before final tightening of the bolts it is best to lower the car so that it rests on the wheels.
4. Fit the hub cap. This is most easily done by resting the inside of the cap against two of the three retaining pins and then strike the cap into place with the palm.



Fig. 8. Straightening rim flange



Fig. 9. Freeing bead from rim flange

3.2. Adjustment and repair of rims

The rim may be damaged in a collision, a ditching or if the car is driven with too low tire pressures.

As the tubeless tire is to seal correctly against the rim, it is essential that the rim should not be deformed or otherwise damaged.

If there is air leakage or if the rim has been deformed, the tire should be removed (see point 3.2.2.) and the rim should be carefully inspected and adjusted.

If the bead seat of the rim is rusty, the rust should be removed by means of a steel brush or steel wool. If the rust has eaten into the rim, a file should be used. Minor pitting that remains after adjustment may be coated with thick rubber solution. Also the outside of the bead must be coated with rubber solution, and then the tire should be fitted before the solution has dried.

Check that the rim is not out-of-true or dented. If it is, adjust it, see Fig. 8. Badly deformed or broken rims must be replaced.

Any loose rivet can be tightened up with a ball peen hammer, using a dolly on the underside of the rivet. A few drops of rim sealing compound over the inside of the rivet will improve the seal. Never attempt to weld a leaky rivet.

After straightening a rim, check it for out-of-round and side throw, which must be kept within stated limits.

On a correctly fitted, rotating rim, the difference between the highest and lowest points, measured at A, Fig. 6, must not exceed 2.5 mm.

The side throw B, Fig. 6, is measured in a similar way and must not exceed 2.5 mm.

When being measured, the rim must be mounted either on a wheel hub or on a special device, so that it can be rotated.

3.2.1. Shifting of wheels and tires

The front tires are worn more rapidly than the rear ones, and right-hand and left-hand tires are also worn differently. The wheels should therefore be shifted according to the scheme shown in Fig. 10, so that all the tires will have approx. the same life. Shifting should be done every 4000 miles (6000 km).

NOTE. The scheme shown in Fig. 10 does not apply to snow tires, which should be fitted and shifted in accordance with each maker's special recommendations.

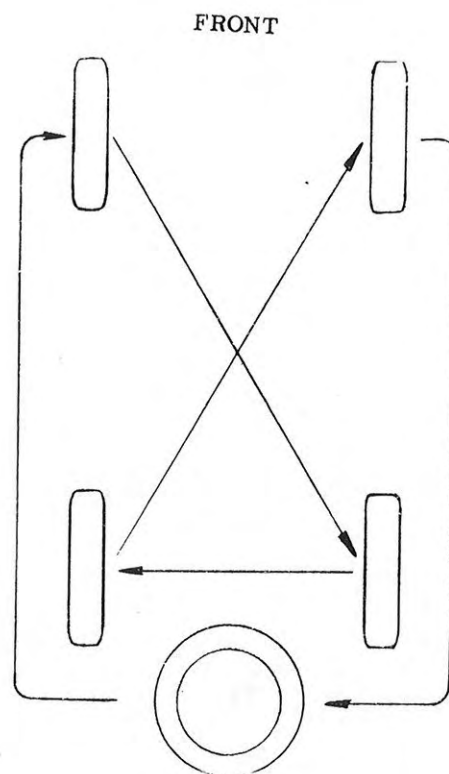


Fig. 10. Plan for shifting of wheels and tires

3.2.2. Removal of tires

1. Take off the wheel and deflate the tire.
2. Free the tire beads from the rim using a special tool, see Fig. 9, which does not damage the bead grooves, or by treading on the tire.
3. Place the wheel on a flat surface and press down the bead at the valve into the rim well so that the bead can be forced over the edge of the rim at the opposite side. Keep the valve side of the bead down with a knee or a foot.
4. Insert two tire irons between bead and rim about 20 cm (8 in.) apart opposite the point where the bead is pushed down. Lever the bead over the rim flange.
5. Hold one of the tire levers in place and move the other one along the rim in stages until the whole bead is free.
6. Turn the wheel over and push part of the bead into the rim well.
7. Insert the tire irons at the opposite side and force them down so that the rim comes up over the tire.
8. Hold the irons in place and lift the rim away.

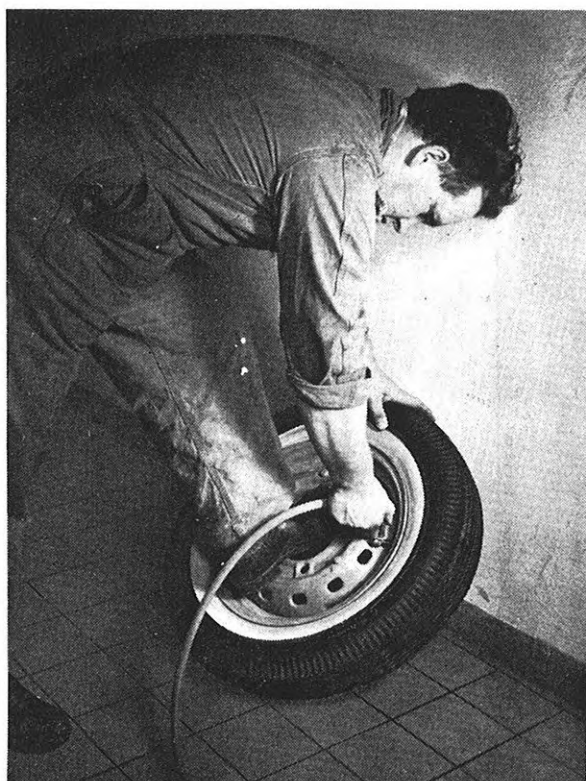


Fig. 11. Seating the beads in the rim

3.2.3. Fitting tires

1. Clean beads and rim. It is essential that the concentric grooves round the beads of the tire should be clean. Clean them with a rag moistened with clean water.
2. Force one of the beads over the rim flange. Note whether the direction of rotation is marked on the tire.
3. Rotate the tire so that the balancing marking comes at the valve hole. Check that the valve is correctly fitted.
4. Place the wheel on a flat surface and press the bead down into the rim well at the valve and keep it there with a knee or a foot.
5. Place a tire iron on each side where the bead comes up over the rim. Force the bead down over the edge of the rim step by step with one iron, keeping the other one still.
6. Inflate the tire as follows:
 - a. Take out the valve core.

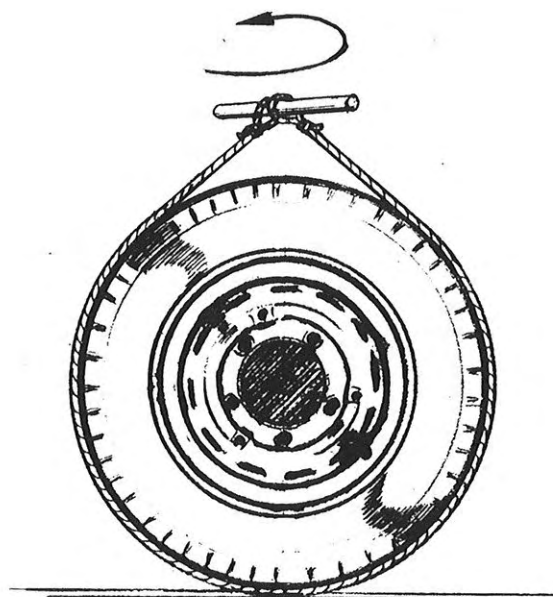


Fig. 12. Rope as bead spreader

- b. Place the wheel at 45° against a wall and push in the rim with the foot, see Fig. 11, in order to force the bead up onto the rim flanges. Then turn the wheel and repeat this with the other bead. Inflate the tire rapidly so that the beads are properly seated in the rim.

A rope and a stick can also be used for seating the beads if other equipment is not available, see Fig. 12, but the best method of inflating the tire is to use a special device, a so-called bead spreader.

- c. When the tire seals against the rim, insert the valve core and inflate the tire to about 60 lbs/sq.in. (4 kg/sq.cm), then until the prescribed tire pressure is obtained, viz.

Front	kg/sq.cm	1.8
	(lbs/sq.in.)	26)
Rear	kg/sq.cm	1.4 - 1.7
	(lbs/sq.in.)	20 - 24)

- d. Don't forget to screw on the valve cap.

3.2.4. Replacement of valves

The valve may be of either of two types: a metal valve with rubber washers (clamp-in), see Fig. 13, or an integral rubber valve with a metal stem (snap-in), see Fig. 14.

After removing the tire, replace the valve as follows.

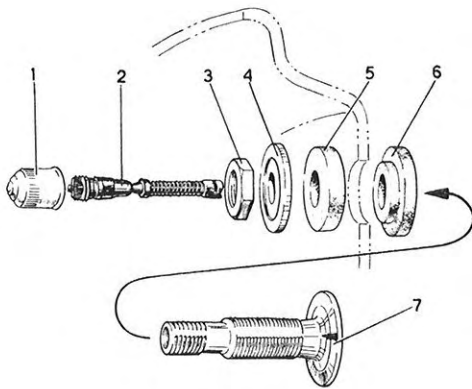


Fig. 13. Metal valve (clamp-in)

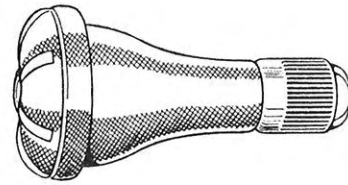


Fig. 14. Rubber valve (snap-in)

3.2.4.1. Removal of clamp-in valve

1. Remove nut on outside of rim.
2. Remove metal washer and outer rubber washer.
3. Remove valve and inner rubber washer.

3.2.4.2. Fitting clamp-in valve

1. Thoroughly clean inside of rim around valve hole with emery cloth or steel wool and outside with a damp rag. Make sure that the edge of the valve hole is even.
2. Place a round or oval shoulder-type rubber washer on the valve stem with the shoulder out.
3. Insert the valve with rubber washer into the valve hole.
4. Place the outer rubber washer on the valve outside the rim.
5. Slide on the metal washer with the concave side towards the rubber washer.
6. Screw on and tighten the nut sufficiently to press out the outer rubber washer about 1 mm under the metal washer.

3.2.4.3. Removal of snap-in valve

1. If snap-in valve has to be removed it must usually be cut loose from the rim.

3.2.4.4. Fitting snap-in valve

1. Thoroughly clean the inside of the rim around the valve hole with emery cloth or steel wool and the outside with a damp rag. Make sure that the edge of the valve hole is even.

2. Fit the valve, using a special tool, see Fig. 15. Push the valve into the hole by pressing the tool handle upwards. The valve must be pressed in so far that its inner flange seals against the inside of the rim, and the outer flange is entirely outside the rim.

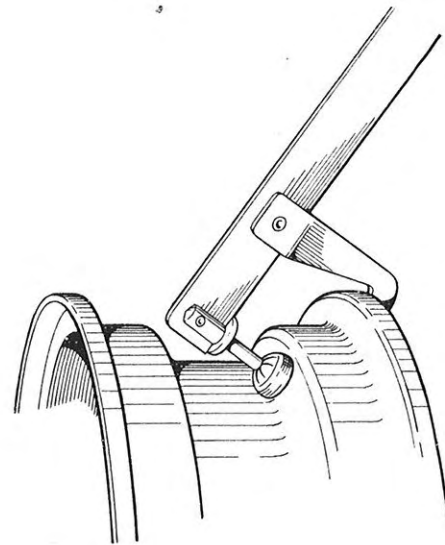


Fig. 15. Fitting snap-in valve

3.2.5. Care of tires

The life of the tires depends to a great extent upon the care they receive and on the way in which the car is driven. The tire expenses constitute a considerable part of the maintenance costs, and therefore it pays to treat the tires properly.

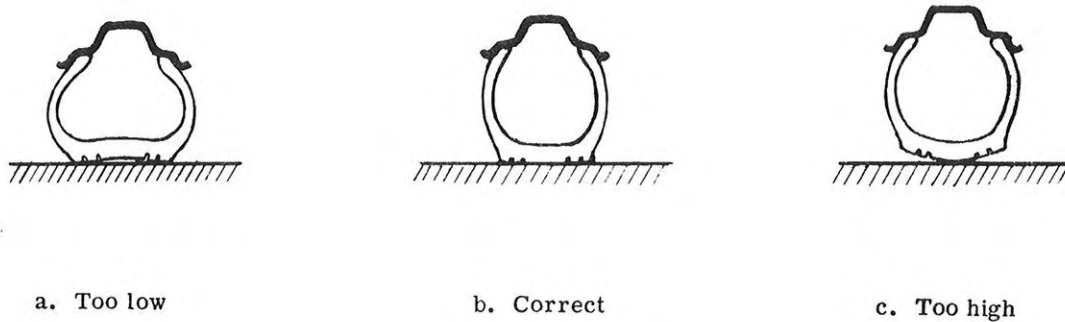


Fig. 16. Tire pressures.

3.2.5.1. Tire pressures

One of the necessary conditions for long tire life is that the tire pressure is always correct. Check it every week with a tire gauge. When the tire pressure is correct the whole tread of the tire makes contact with the road, gives a good grip, and is worn evenly, see Fig. 16 b.

Should the tire pressure be too low, the tire sinks down so that the tread wears more rapidly at the sides, see Fig. 16 a. The walls of the tire are subjected to an abnormal amount of bending and may crack. Cord rupture, which is very difficult to repair, may occur, and the cord layers may part from the tread. Too low tire pressure also causes a swaying tendency when rounding curves.

An overinflated tire, on the other hand, has a poor damping effect when driving on rough roads and causes the tire to swell up so that only the center of the tread makes contact with the road, see Fig. 16 c. As a result, the tire is worn rapidly, and the tread tends to crack, especially at the bottom of longitudinal grooves in the tread pattern, thus increasing the risk of a blow-out.

3.2.5.2. Additional advice and instructions for care of tires

1. Correct wheel alignment: In particular check the toe-in. See Chapter 7.
2. The same braking effect on all four wheels. See Chapter 9.
3. Round curves at moderate speed.
4. Avoid violent accelerations, brakings and all other kinds of abuses that cause increased wear and expenses.
5. Correctly balanced wheels, see 3.2.6.

6. Avoid driving over or against sharp objects, stones, curbs etc.

7. Make sure that oil or grease from garage or shop floors does not come into contact with the tires.

8. Protect the tires from bright sunshine and severe cold.

9. Use snow chains only in emergencies.

10. Shift wheels every 4000 miles (6000 km), see 3.2.1.

11. Entrust all tire repairs to an approved service station.

3.2.6. Balancing of wheels

In order to avoid vibrations and consequent wear it is essential that the wheels are balanced. Balancing should be done both statically and dynamically.

A statically balanced wheel should be able to stop in any position when it is suspended and allowed to rotate freely.

A dynamically balanced wheel should be able to rotate at right angles to the axis of rotation, that is, the wheel should have no tendency to wobble during rotation. Special equipment is required for dynamic balancing, and therefore it is usually necessary to make do with static balancing.

Static balancing can be carried out as follows: Mount the wheel on an axle which is carried in bearings with little friction or is placed on smooth, horizontal rails. The components should be thoroughly cleaned and the tire inflated to the correct pressure.

It is preferable to balance the complete wheel with hub, especially when balancing front wheels.

Satisfactory static balance can often be obtained if the tire is turned to a suitable position on the rim. On new tires, the lightest side is indicated, see 1.3.

Balancing weights of various sizes must be available, and one or more of them should be attached to the inner rim flange in the position where good static balance is achieved.

3.3. Hubs

Both front and rear wheel hubs are cast integral with the brake drums.

3.3.1. Removal of hubs

1. Make sure that the undersides of the fenders are thoroughly cleaned from dirt which might otherwise loosen and get into the bearings.
2. Take off the hub cap and loosen the wheel bolts.
3. Remove the dust cap 15, rear, Fig. 18, split pin 1, Fig. 17 and 18, and crown nut 2.
4. Jack up front or rear end of car.
5. Unscrew the wheel bolts and remove the wheel.
6. When removing a rear hub, check that the hand brake is released. Fit a hub extractor (tool Saab 92-3) as shown in Fig. 19, attaching it by means of the wheel bolts.
7. Pull off the hub. The same extractor is used for both front and rear hubs.
8. Prevent gravel and other foreign matters from getting into the hub seals and bearings by covering them with clean rags.

3.3.1.1. Front wheel hub

The front wheel hub is mounted on the outer drive shaft 4, Fig. 17, by means of a taper and two woodruff keys 5. The hub is secured by the crown nut 2 and split pin 1.

The seal surface A on the inside of the hub should be protected against scratches and similar damages when the hub has been removed. It must seal properly against the shaft seal 6. The rounded edge of the seal surface towards the end face must also be protected. If the seal surface is damaged, it must be smoothed and polished. This work should be done in a lathe, but the diameter of the seal surface must not be appreciably reduced.

It is important that these precautions are observed, otherwise the shaft seal will wear rapidly and grease from the ball bearings may leak into the brake drum and destroy the brake linings.

Together with the nut 7 which holds the shaft seal 6, the flange B forms a labyrinth seal which prevents water, sand and brake lining chips from getting into the shaft seal and ball bearings.

3.3.1.2. Rear wheel hub

The rear wheel hub with ball bearings is carried on the rear axle shaft 13, see Fig. 18. The ball bearings and shaft seal are removed together with the hub when it is removed.

3.3.1.3. Dismantling of rear wheel hub

1. Unscrew the nut 7, Fig. 18, in which the shaft seal is placed, but first open its locking with a drift. To screw out the nut use a hook wrench, tool Saab 92-19.
2. Press out the two bearings from the outside of the hub. Use tool Saab 92-34, see Chapter 7.

3.3.1.4. Assembly of rear wheel hub

Clean all components thoroughly. Replace any parts that are worn or damaged and pay particular attention to the shaft seal A, Fig. 18.

1. Pack the bearings with grease, see Chapter 15.
2. Press in the larger bearing 6, Fig. 18, using tool Saab 92-33, see Chapter 7.
3. Screw in and lock nut 7 with shaft seal 8.
4. Insert grease into the wheel hub so that the space between the bearings is half filled.

NOTE. If too much grease is inserted it may penetrate to the brake drum and destroy the brake linings.

5. Insert the spacer 5 and press in the smaller bearing 4 with tool Saab 92-34. See figure and description in Chapter 7.

3.3.2. Fitting hubs

Before fitting a wheel hub, inspect the wheel bearings to make sure that they are properly lubricated. See Chapter 15.

8 WHEELS AND HUBS

3.3.2.1. Assembly of front wheel hub

The wheel hub must be thoroughly cleaned. Make sure that the shaft seal 6, Fig. 17, is clean and undamaged.

1. Grease the shaft seal tongue and the seal surface A, Fig. 17, before assembling, see Chapter 15.
2. Make sure that the woodruff keys 5 are properly placed in their slots. Turn the hub so that its keyways match the keys and push the hub carefully onto the axle.
3. Fit washer 3, tighten crown nut 2 using a wrench torque of 17 - 20 kgm (125 - 145 ft. lbs) and lock with a split pin 1.
4. Fit wheel and hub cap.

3.3.2.2. Rear wheel hubs.

1. The axle shaft and the sliding surface A, Fig. 18, must be thoroughly cleaned and undamaged.
2. Grease the shaft seal tongue and seal surface A before assembling, see Chapter 15.
3. Push the hub carefully onto the axle shaft, taking care that the thread does not damage the

seal surface. Make sure that the spacer 5 is correctly positioned.

4. Fit washer 3 and tighten crown nut 2 with a torque of 9 - 10 kgm (65 - 73 ft. -lbs). Lock it with a split pin 1.
5. Fit dust cap 15 with tool Saab 92-37.
6. Fit wheel and hub cap.

3.4. Brake drums

The hub and brake drum are cast in one piece and are known as the front wheel hub and rear wheel hub. On a new wheel hub the internal diameter of the brake drum is 203.2 mm + 0.15.

If the wearing surface of the brake drum is badly scratched after long service, especially with badly worn brake linings, it may be cleaned up in a lathe.

It is recommended to use carbide tipped lathe tools in order to obtain a sufficiently smooth surface.

The hub must be very accurately centred when the brake drum is being turned in the lathe and the ball bearings should be removed from a rear wheel hub. See 3.3.1.3.

1. Split pin
2. Crown nut
3. Washer
4. Outer drive shaft
5. Woodruff key
6. Shaft seal
7. Nut
8. Ball bearing
9. Brake shoe
10. Brake shield
11. Steering knuckle casing
12. Seal ring
13. Spring

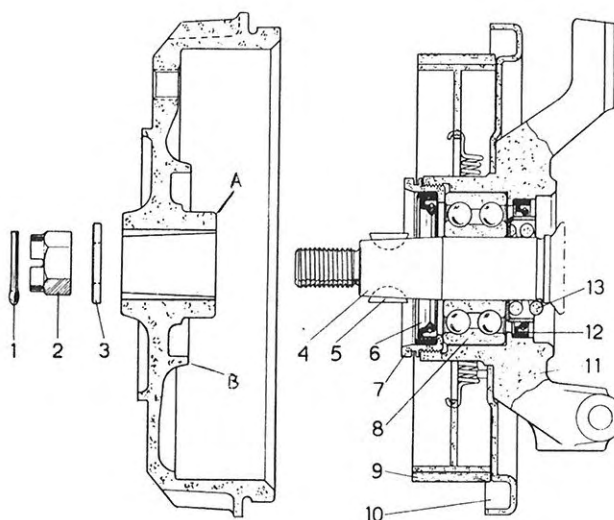


Fig. 17. Front wheel hub

1. Split pin
2. Crown nut
3. Washer
4. Ball bearing
5. Spacer
6. Ball bearing
7. Nut
8. Shaft seal
9. Brake shoe
10. Brake shield
11. Brake cylinder
12. Brake lever
13. Axle shaft
14. Rear axle
15. Dust cap

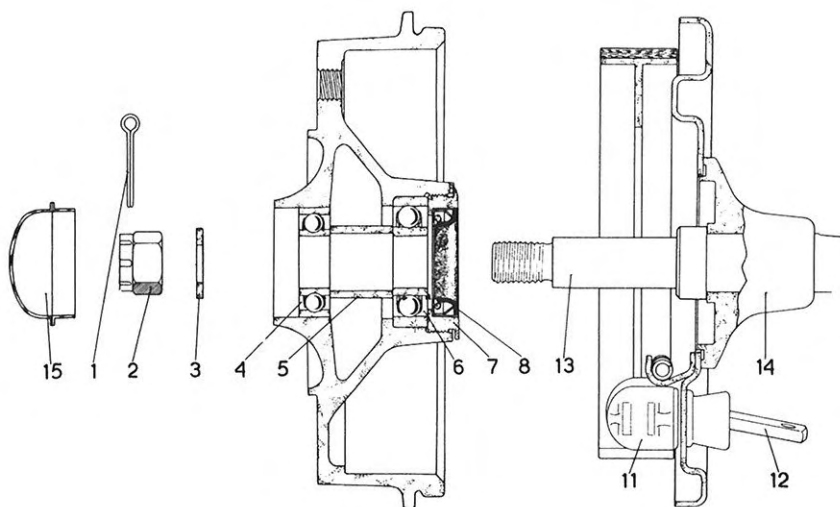


Fig. 18. Rear wheel hub

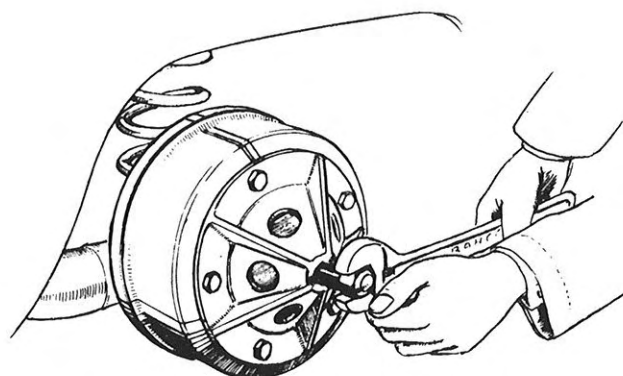


Fig. 19. Hub extractor