

### Front and Rear Hubs.

Belmoline "C", Retinax "R.B"., or similar type of ball-bearing grease.

### Propeller Shaft, Contact Breaker Cam and Wheel Hub Shells.

Retinax C.D., Mobilgrease No. 2, or a similar type of grease.

**NOTE.- For the PROPELLER SHAFT of all chassis previous to GKC-22 use an oil of viscosity S.A.E. 80/90 as for "REAR AXLE" above.**

### Water Pump

Belmoline A, Retinax P, or a similar type of grease.

#### CAPACITIES

|                         |            |
|-------------------------|------------|
| Engine ... ..           | 1¼ gallons |
| Gearbox ... ..          | 5 pints    |
| Rear Axle ... ..        | 2 pints    |
| Chassis Oil Pump ... .. | pints      |
| Cooling System ... ..   | 3¾ gallons |
| Fuel Tank ... ..        | gallons    |

### CENTRALISED CHASSIS LUBRICATION SYSTEM

#### General

A foot-operated pump, with which is combined an oil reservoir, is located on the front of the dashboard, and supplies oil under pressure for chassis lubrication.

A diagram of the complete systems, Fig. 4, 5 and 6 with their relative chassis series, show the piping being coloured red with red discs to indicate the position of the drip plugs. The rating of the latter is given in parentheses against the description of the part lubricated.

It should be noted that Fig. 4 shows the Front and Rear Axle Systems coloured in Blue and Green, and that in the chassis series to which this applies these systems must be lubricated by means of the hand-operated Oil Gun.

### Foot-operated Oil Pump.

The chassis oil pump is shown in Fig 7. Normally no attention to the system is necessary beyond filling of the reservoir with oil "C" after removal of the filling plug A. This should be done every 2,500 miles, as directed on page 22.

When the reservoir is nearly empty it will be found that the pedal returns instantly after depression, due to the presence of air in the system.

On the other hand, if the pedal takes an abnormal length of time to return to its raised position, this may indicate that the felt strainer located at the bottom of the reservoir is choked.

Under these circumstances, the cap nut B should be unscrewed and the cover C removed. The felt strainer pad and its perforated backing plate can be taken out. The pad should be discarded and a new one fitted.

When replacing the parts the perforated plate should first be fitted on the stud, followed by the felt pad and then the distance piece. Care must be taken to see that the vellumoid packing washer is in position between the cover C and the casing, and also that the aluminium washer between the nut and the cover is replaced before tightening the nut.

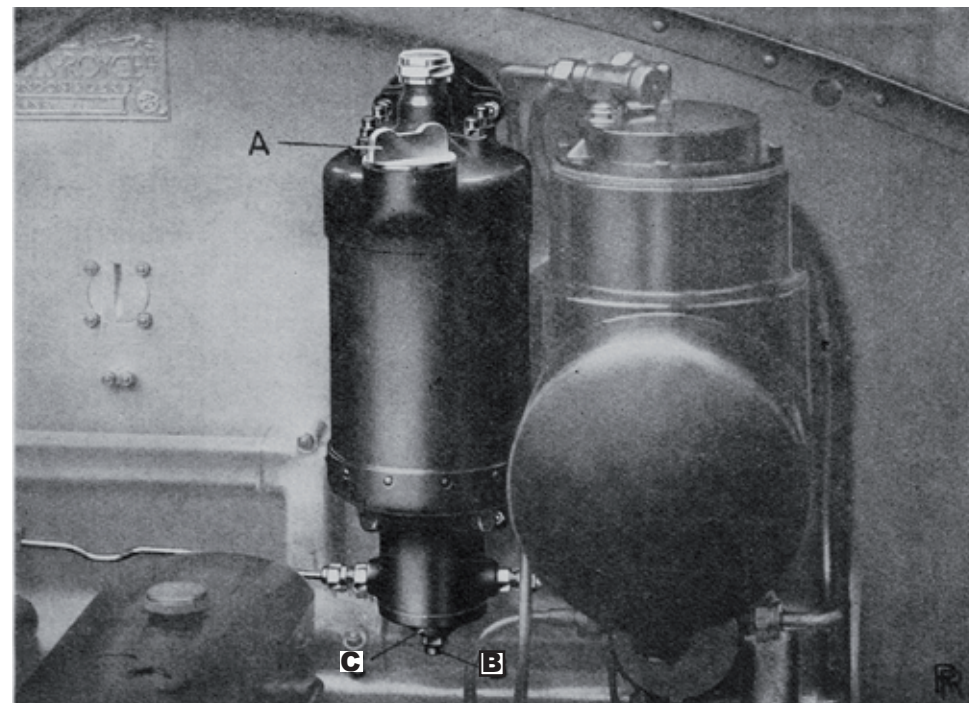


Fig. 7. - FOOT-OPERATED CHASSIS OIL PUMP  
A. Filler Plug                      C. Strainer Cover  
B. Cap Nut

Normally, the felt strainer pad should be discarded and a new one fitted every 20,000 miles, as directed on page 24.

*Under no circumstances must any attempt be made to further to dismantle the pump.* If any defect in operation should develop, which is not rectified by renewing the strainer pad as directed, the whole unit should be removed from the dashboard and returned to Rolls-Royce Ltd. for correction.

### Drip Plugs.

The drip plugs are non-adjustable and non-demountable, and are lettered and numbered to indicate their shapes and relative rates of oil emission respectively, a higher number indicating a greater rate.

The drip plugs never require cleaning, and, being non-demountable no attempt must be made to take them apart. If one is suspected of being defective, it should be replaced with a new plug of the same rating.

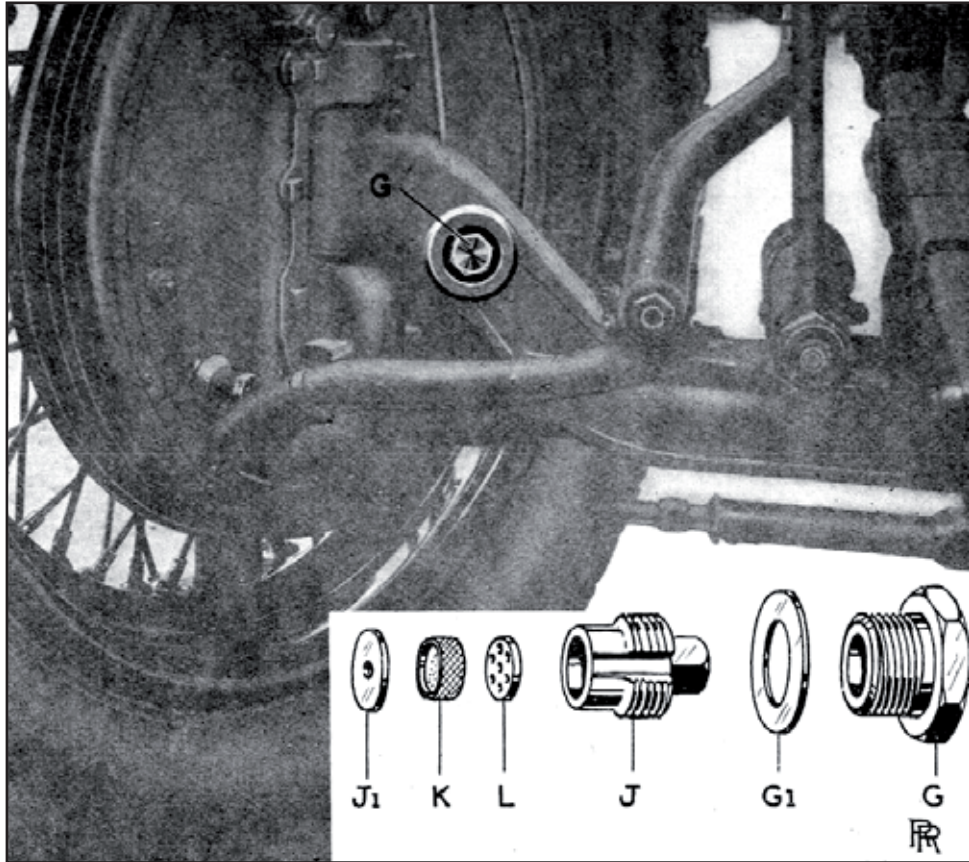


Fig. 8. - STRAINERS ON FRONT AXLE

- |                   |                    |
|-------------------|--------------------|
| G. Outer Plug.    | L. Backing Washer  |
| G1. Joint Washer. | K. Felt Strainer.  |
| J. Inner Plug     | J1. Packing Washer |

### Front Axle System.

The arrangement of the front axle system renders it necessary to provide separate strainers. For convenience these are located on the ends of the axle, as shown at **G** above, which also shows the component parts inset.

The felt strainers should be renewed every 20,000 miles, as directed on page 30, the procedure being as follows:-

1. Carefully clean the outsides of the fittings with a brush and paraffin to prevent the ingress of dirt during dismantling.
2. Unscrew the outer plug, **G**, with a box spanner.
3. Unscrew the inner plug, **J**, with a box spanner. This plug carries the felt strainer, **K**, which should be removed and discarded.

All parts should be carefully cleaned and freed of every trace of grit before replacing. The perforated backing washer, **L**, must be replaced in the inner plug, **J**, before fitting the new felt strainer, **K**, with its gauze-covered side towards the washer.

Two aluminium packing washers are provided, one, **J1**, between the inner plug, **J**, and the bottom of the recess in the axle, and the other, **G1**, under the shoulder of the outer plug, **G**. Care must be taken to replace these.

### LUBRICATION BY MEANS OF THE OIL GUN

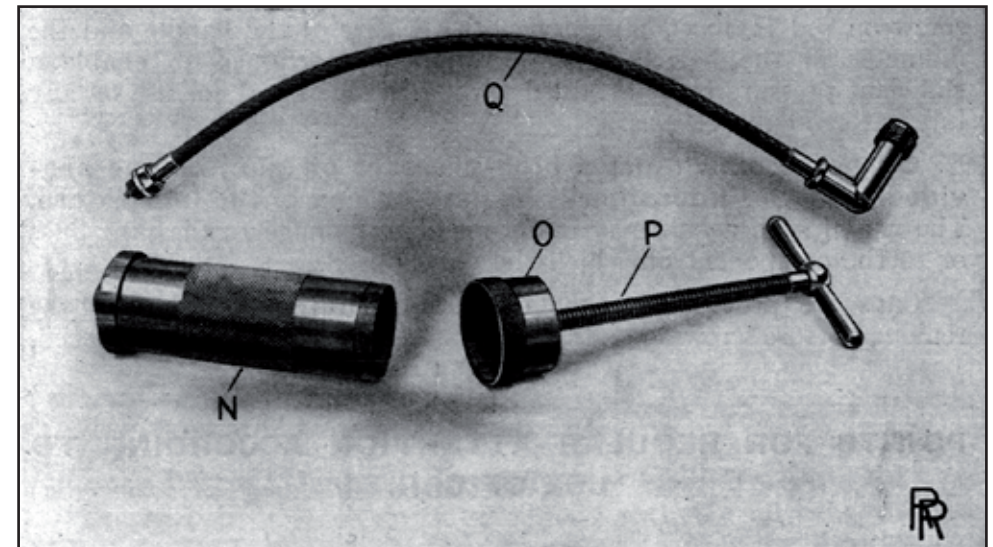


Fig. 9.- OIL GUN OPENED FOR FILLING

- |            |                |
|------------|----------------|
| N. Barrel. | P. Piston Rod. |
| O. Cap.    | Q. Connection. |

The oil gun is shown dismantled for filling in Fig. 9. It consists of a barrel **N** on to which is screwed the cap **O**. The rod **P**, carrying a cup leather, is threaded into the cap, therefore when this rod is screwed down by means of the handle, oil may be expelled from the barrel under considerable pressure.

The flexible connection **Q** is fitted with a non-return valve, which is closed with a spring, except when the connection is screwed on to one of the chassis adapters or lubricators. Consequently, no oil can be expelled through the connection until this is in position on the lubricator.

In addition, each lubricator on the chassis is equipped with a ball non-return valve, which is opened by the valve in the flexible connection when it is screwed on.

Only the recommended oils should be used in the oil gun.

The gun is filled by unscrewing and removing cap **O**, together with rod **P** and pouring oil into the barrel. To facilitate re-entry of the cup leather into the barrel, the cap **O** is formed with an internal diameter equal to that of the barrel, and before replacing the cap it should be screwed down on the rod as far as possible, as shown in Fig. **9**. The leather will then be contracted by the cap, and on replacement of the latter will enter the barrel freely. The gun is then ready for use.

Owing to the arrangement of the valve in connection **Q**, care must be taken that this is screwed well home on the lubricator, otherwise the gun will not work.

The oil gun is of a special low pressure type, the angle of the screw on rod **P**, in combination with the size of the handle and the diameter of the barrel, being carefully proportioned to enable a sufficient pressure to be attained without undue effort for use on any lubricator on the chassis.

**On no account must a high-pressure oil gun, or one provided with an "intensifier", be used on any of the lubricators.** The use of such a gun may easily result in damage to the pipe lines or to the component on which the gun is used.

Caps are provided on the oil gun lubricators, which must be removed before screwing on the connection and subsequently replaced.

## Points of Regular Attention according to use of Car

### DAILY.

#### Crankcase Oil.

The engine oil level indicator situated on the left-hand side of the crankcase should be inspected *daily*, and the quantity of oil maintained at about one gallon and a quarter, as shown by the indicator finger. The engine should never be run with less than three-quarters of a gallon of oil. The oil filler is on the left-hand side of the engine, the cap being provided with a bayonet joint.

#### Water in Radiator.

The radiator water level should be inspected *daily*. It should be maintained at about half-way across the upper radiator water pipe. (See Fig. **3**.)

#### Chassis Lubrication.

Depress oil pump pedal *once* while engine is being started for first time in the day, and subsequently *once* every 100 miles. Use the pump more frequently during bad weather.

### WEEKLY

#### Tyres.

Check the tyre pressures. These should be:-

|       |     |     |     |         |        |
|-------|-----|-----|-----|---------|--------|
| Front | ... | ... | ... | 35 lbs. | } Cold |
| Rear  | ... | ... | ... | 35 lbs. |        |

### EVERY 500 MILES.

#### Front Axle System. (See Fig. **4**.)

Oil should be injected by means of the oil gun into the lubricator situated towards the off-side end of the axle, the handle being turned until it becomes tight. The axle system is then charged.

### EVERY 1,000 MILES.

#### Rear Axle System.

Oil should be injected by means of the oil gun into the lubricator situated on the rear axle casing, access to which is obtained by removing the rear floor boards.

Turn the oil gun handle until it becomes tight, the axle system is then charged.

#### Battery.

Inspect the level of the acid in the cells, and if necessary, top up with distilled water so as to maintain the level at  $\frac{1}{2}$ " above the tops of the plates.

### EVERY 2,500 MILES

#### Starter Motor, Dynamo Bearings and Dynamo Coupling.

Inject two or three drops only of oil "C" with the oil can into each lubricator - one on the starter motor and two on the dynamo and oil hole in coupling.

#### Front Engine Support.

Inject oil "B" using oil gun, and screw down until oil exudes from the ends of bearing (one lubricator).

#### Carburetter (Chassis previous to GYD-25).

Remove and clean air valve and chamber. Use no lubricants on these parts.

**Battery Ignition Governor.**

Inject a few drops of oil "C" with the oil can into spring lid lubricator.

**Cam of Battery Ignition Contact Breaker.**

Smear a trace only of grease on cam surface.

**Water Pump Bearing and Gland.**

Remove lubricator cap, fill one-third full of recommended grease and screw right down, preferably when engine is warm.

**Steering Box.**

Remove plug and fill with oil of viscosity S.A.E. 40 as under "A" to mouth of plug orifice.

**Starter motor Switch** (Oil immersed type).

Remove filler plug and oil "C" if required; the switch should be kept full of oil.

**Chassis Lubrication.**

Inspect oil level in reservoir and add more oil if necessary.

**Brake Connections.** (Chassis Nos. see Fig. 4).

Lubricate with oil "C" by means of the oil can the points listed, the figures indicating the number of points requiring attention:-

- Fulcrum of brake actuating levers on the servo shaft (2).
- Servo shaft (1) oil hole.
- Servo engaging levers (1) - one or two drops in oil hole.
- Fulcrum of balancing lever (1).

**Propeller Shaft Sliding Joint.**

Remove plug and inject about one tablespoonful of oil "C", using the oil can.

**Spring Gaiters (where applicable).**

Lubricate by means of the oil gun using oil "C"; screw down three or four turns on each of the twelve lubricators.

**Fan**

Check the fan belt adjustment, and, if necessary, adjust so that at a point equidistant between the pulleys, the fan belt can be moved transversely with the fingers through the distance of  $\frac{3}{4}$ ".

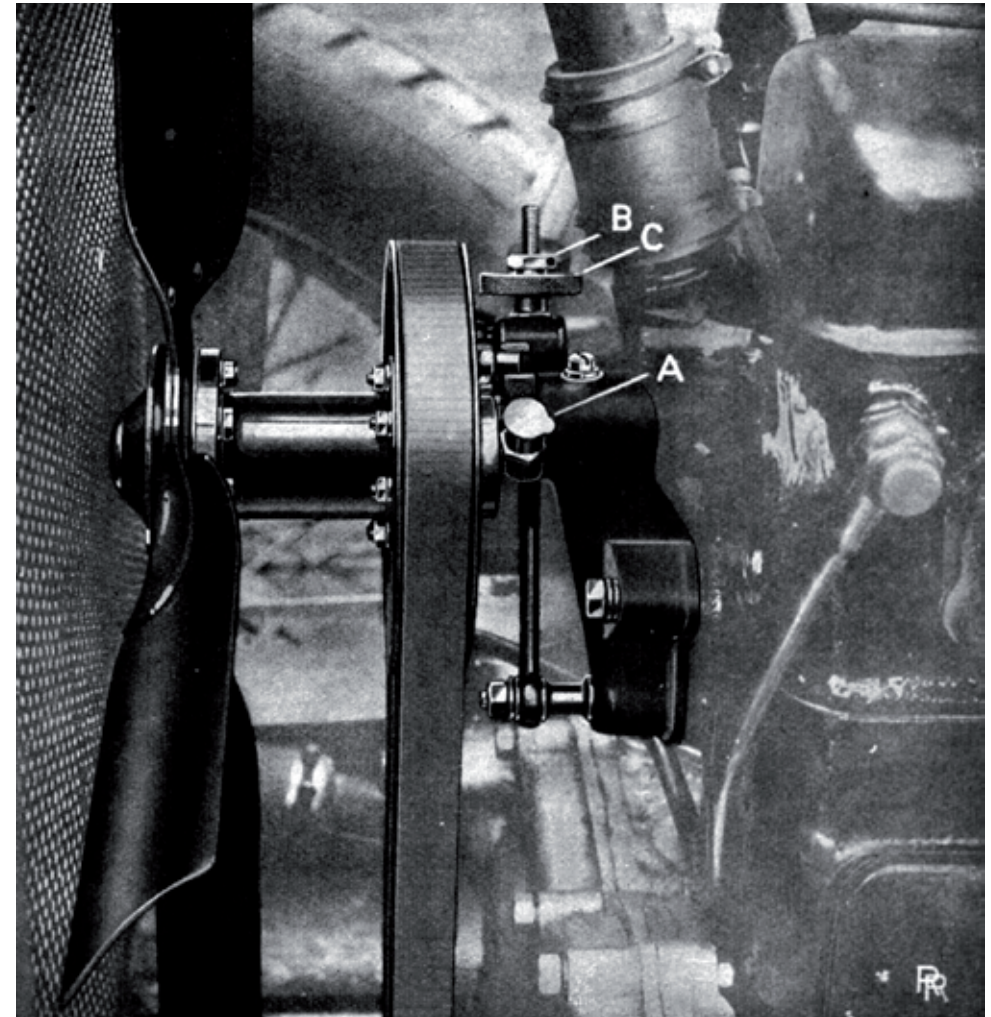


Fig. 10.- FAN BELT ADJUSTMENT.

A. Lubricator  
B. Lock Nut.

C. Adjusting nut.

**Brakes.**

Check and adjust if necessary.

**Wheels**

Test hub nuts for tightness with the spanner.

**Valve Rocker Clearances.**

Check and reset the valve rocker clearances if necessary; they should be .004" *with the engine cold.*

The method of adjusting the valve rocker clearances is illustrated in Fig. 11.

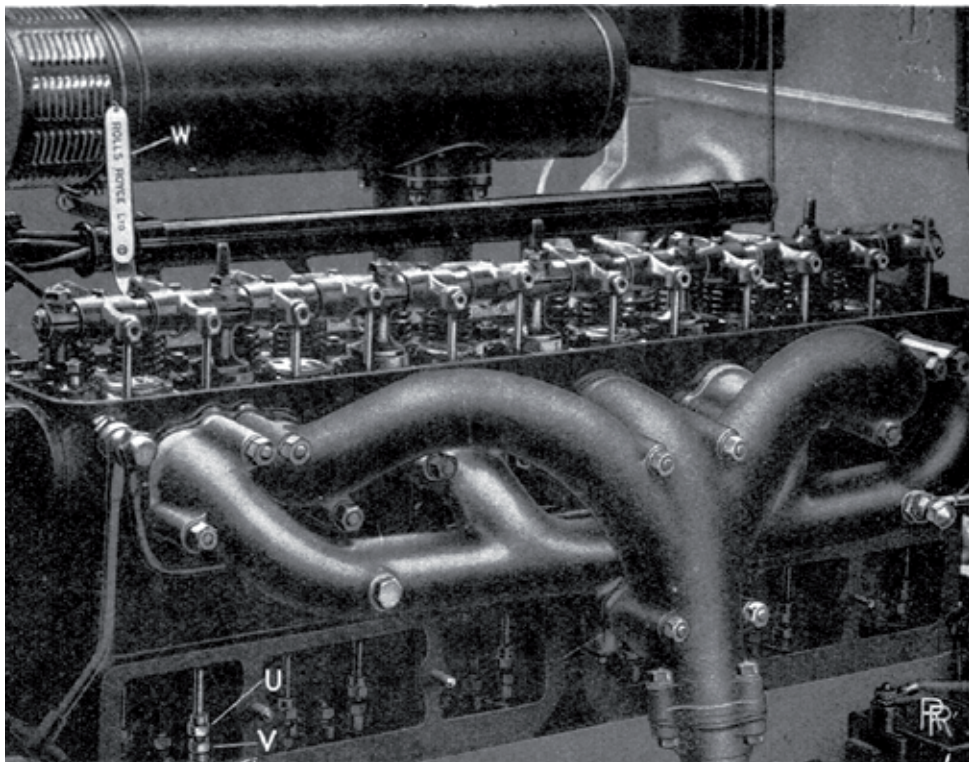


Fig. 11.- ADJUSTING THE TAPPETS.

U. Tappet head.

W. Feeler Gauge

V. Lock Nut

Remove the valve rocker cover and the two covers on the left-hand side of the engine as shown, taking care that when removing breather pipe from valve rocker cover to air silencer, the fingers only should be used when compressing its two ends against the spring.

The valve tappets are provided with adjustable heads, the tappet head **U** being screwed into the tappet and locked with a nut **V**. On releasing this nut the tappet can be screwed in or out as may be required.

With the engine cold and the valve roller on the base of the cam, a feeler gauge should be inserted as shown at **W**.

Before commencing to adjust a tappet, it should be ascertained that that particular tappet roller is well away from the cam, which is best done by turning the crankshaft by hand until the valve has opened and closed, and then cranking round half a revolution beyond this point.

As each tappet is adjusted, its locknut should be securely tightened up.

## EVERY 5,000 MILES

**Carburetter** (Chassis previous to GYD-25).

Remove cover and wipe out interior of float chamber. (See page 46).

**Guide of Carburetter Air valve** (Chassis GYD-25 and onwards.)

Inject one or two drops of oil "C" into small lubricator on side of carburetter. *Be certain afterwards to close the lubricator.* (See page 52.)

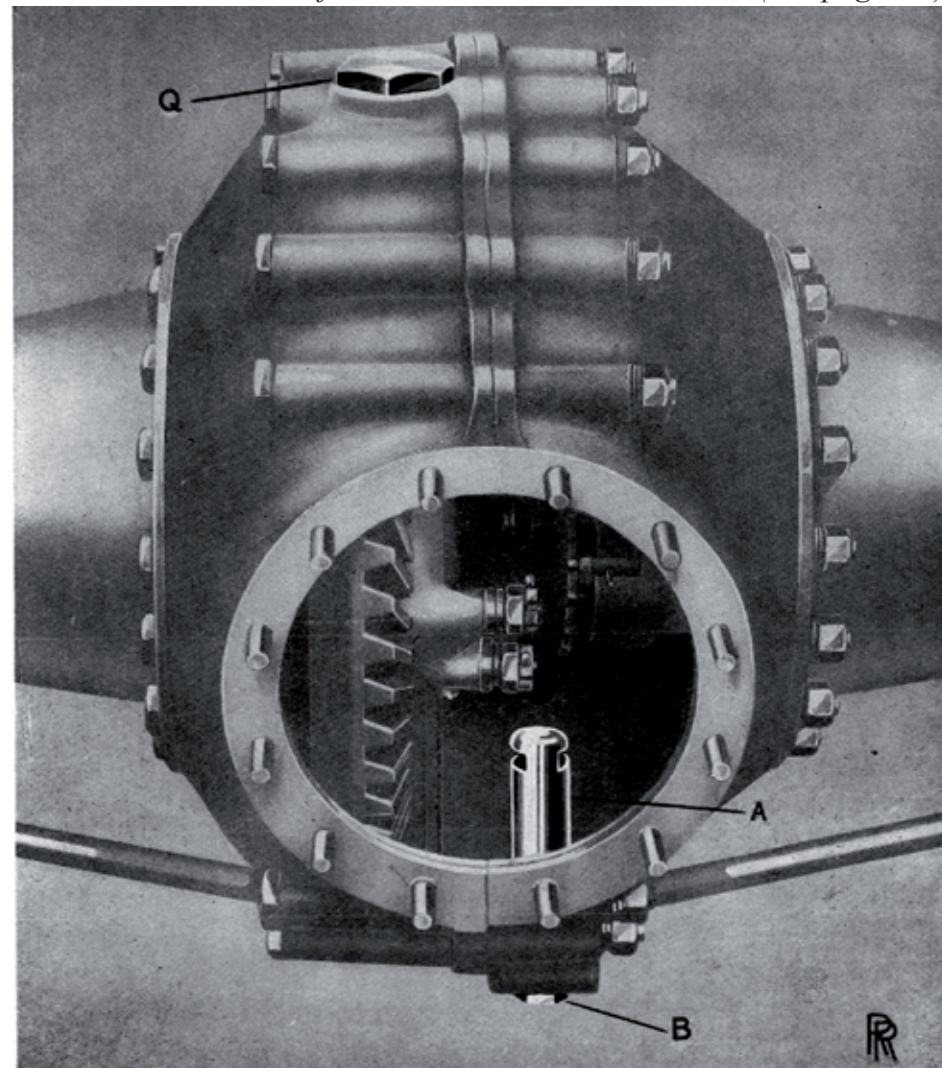


Fig. 12.- OIL PLUGS IN REAR AXLE CASING.

A. Stand Pipe

B. Level Plug and Drain.

Q. Filler Plug

### Clutch Shaft and Levers.

Remove Clutch pit cover, turn withdrawal sleeve with fingers until slot is at the top, then turn crankshaft until oil hole is visible. Inject a few drops of oil "C". Excess of oil will cause clutch trouble.

Also, lubricate fulcrum pins of clutch levers.

### Servo Bearing.

Inject one or two drops of oil "C" with the oil can into spring lid lubricator.

### Gearbox

Inspect oil level by means of dip stick when gearbox is warm. Level should stand at notch in flat of stick. Add oil "B" if necessary.

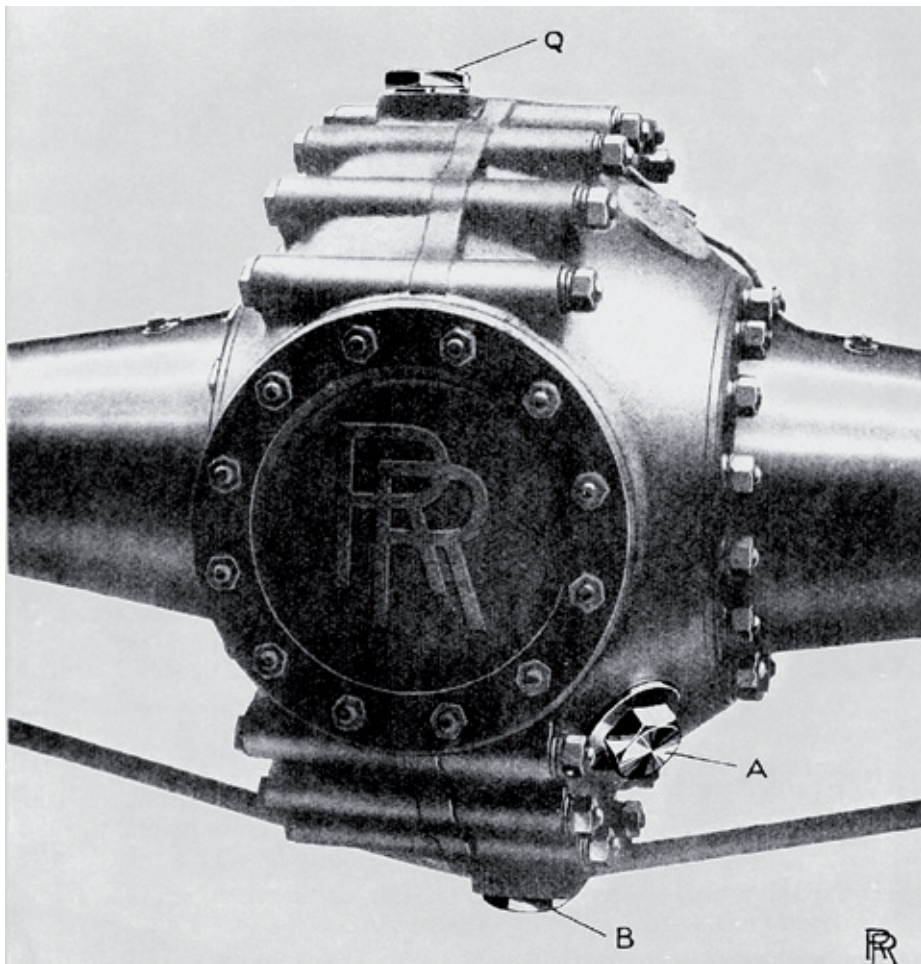


Fig. 13.- OIL PLUGS IN REAR AXLE CASING.  
A. Level Plug  
B. Drain Plug.  
Q. Filler Plug

### Rear Axle

Inspect oil level when axle is warm, and top up, if necessary with the recommended oil, through the filler plug **Q** at the top of the casing.

On chassis previous to GAU-1, the plug at the bottom of the casing (see Fig. **12**) communicates with the interior through a standpipe which projects inside the casing to act as an oil level indicator. This plug should be removed for testing the oil level, and one should not be deceived by the appearance of a small quantity of oil, which is possibly only what has lodged in the standpipe.

Chassis GAU-1 and onwards, the standpipe level is replaced by a level plug on the side of the casing (see Fig. **13**) and oil should be poured into the filler plug hole until it just commences to run out of the level plug hole.

### Fan

Inject a few drops of oil "C" into lubricator (**A** Fig. **10**).

### Contact Breaker of Battery Ignition

Move aside spring which retains rocker arm and lubricate pivot pin with one drop of oil "C".

### Bonnet Ventilators, Fasteners and Locks

Carefully lubricate with the oil can to avoid squeaks and rattles.

### Brake Connections etc.

Lubricate with oil "C" by means of the oil can, the points listed hereunder, the figures indicating the number of points requiring attention:-

- Jaws of brake ropes front and rear (12)
- Brake connections and adjustments on rear axle (12)
- Ball joints of front brake pull rods (4). (Remove leather stockings).
- Front brake adjustments (4).
- Jaws of brake rods between balancing lever and equalisers (front and rear) (4).
- Jaws of brake rod from servo to equaliser (2).
- Joints of coupling rods from servo to balancing lever (4).
- Joints of links between cross shaft and servo (2).
- Jaws of rod from pedal to cross shaft (2).
- Clutch pedal connection jaws (2).
- Accelerator pedal bearing (1).
- Jaws of rod from hand brake lever to equaliser (2).
- Hand brake pawl connections (4).
- Reverse catch of gear lever (3).

**Control Mechanism.**

On steering wheel, steering column, engine, carburetter, ignition tower and magneto; also radiator shutter control, shock damper controls. Apply a drop of oil "C" with the oil-can to each bearing and joint.

**Engine Oil Strainer**

When engine is warm, drain crankcase and remove and clean crankcase oil strainer. Refill with fresh oil to correct level.

**Fuel Filters.**

The petrol filter fitted on the front of the dashboard should be dismantled and cleaned, also those in the fuel tank, if fitted. (See Figs. 19 and 21).

The filter fitted in the supply pipe to the vacuum tank should also be removed and cleaned. (See page 37).

Similarly, if fitted, the filter arranged in the fuel inlet to the carburetter float chamber should also be cleaned. (See Fig. 20.)

**Air Cleaner.**

Remove cleaner element and carefully wash in petrol or paraffin. When touring on the Continent this should be done every 2,500 miles.

**Fuel Tank.**

*Release* (but do not *remove*) drain plug at bottom of main tank to allow any accumulated water to escape

**Spark Plugs.**

Remove and clean. Set gaps to .020".

**Contact Breaker.**

Inspect L.T. make and break contacts of battery ignition.

Set gaps to .017" to .021".

**Wheels.**

Remove , grease interiors and hubs, and replace.

**Steering Joints.**

Test steering joints and shock damper connections for play and adjust if necessary.

**EVERY 10,000 MILES****Hydraulic Shock Dampers.**

Inspect oil level and add more oil if necessary, using the small syringe. *Use only correct oil.* (See page 15.)

**Shock Damper Control.**

Inspect oil level by removing plug from filler spout. *Use only correct oil.* (See page 15.)

**Dynamo.**

Remove cover, clean away brush dust and inspect brushes.

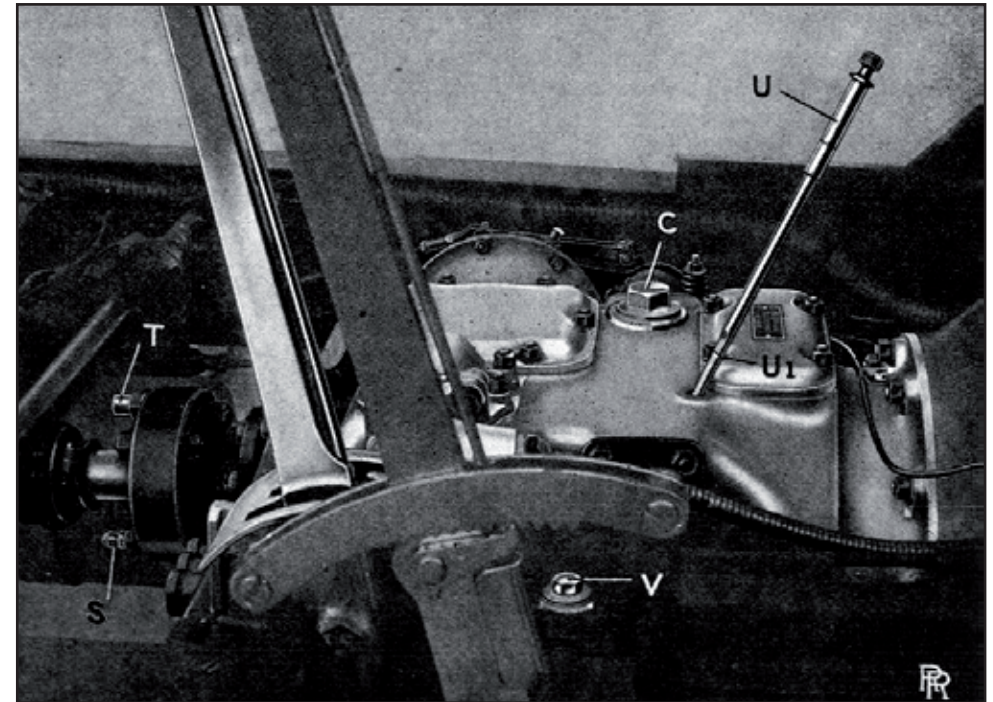


Fig. 14.- GEARBOX AND FORWARD UNIVERSAL JOINT

**Universal Joints.**

Turn propeller shaft so that lubricators **S** (Fig. 14) are at bottom and air release plugs **T** at top. Remove plugs then inject grease with gun until it commences to flow freely from plug hole. Carefully replace plugs. *On no account operate gun with vent plugs in position.*

**Crankcase Btreather Pipe to Carburetter.**

Remove and clean gauze between pipe flange and carburetter. (See page 47).

**EVERY 20,000 MILES****Gearbox and Rear Axle.**

Drain out all the oil when warm by removing drain plugs and filler plugs. (There are *two* drain plugs in gearbox.)

On chassis previous to GAU-1, remove stand pipe from the rear axle to drain (See Fig. 12).

Refill with fresh oil to correct level.

Use only correct oil for cleaning out casings. Do not use petrol, paraffin or other oil solvents.

### Chassis lubrication System.

Remove and discard three felt strainer pads located, respectively one at base of chassis oil pump and one at each end of front axle. Replace with new pads.

### Brake Servo.

Test adjustment and readjust if necessary.

### Air Cleaner.

Renew cleaner element.

## CARE OF DUNLOP WHEELS AND HUBS.

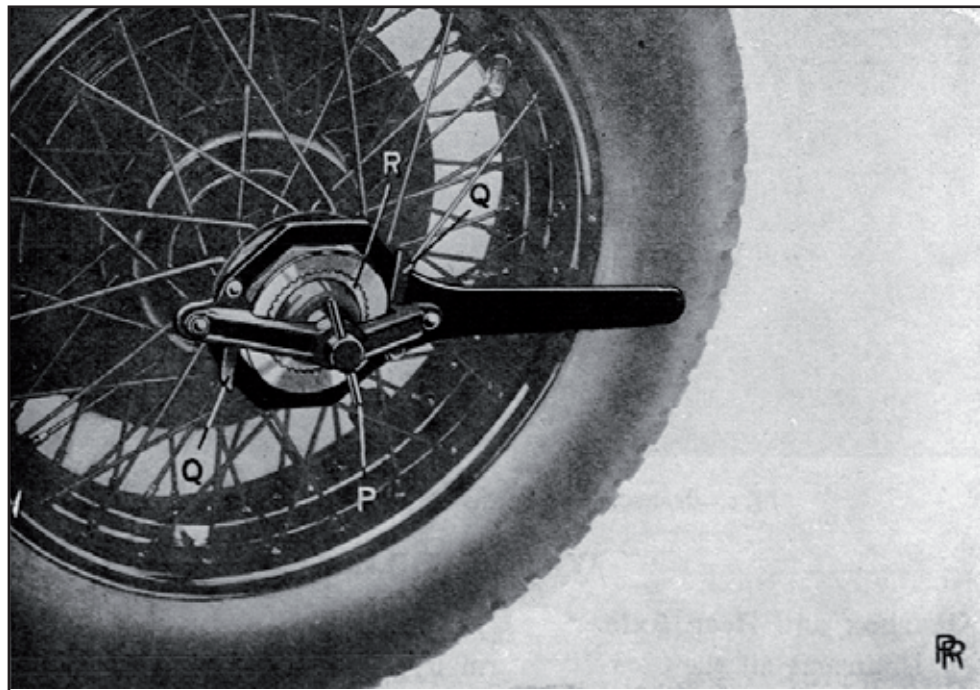


Fig. 15.- REMOVING DETACHABLE WHEEL.

### Removal of Wheel.

Dunlop detachable wire wheels are fitted, and a special spanner is provided in the tool-kit for removing and replacing them.

In Fig. 15 the spanner is shown in position on a wheel.

Before using the spanner, the central screw **P** must be unscrewed as far as possible. After jacking up the car, the spanner can be placed in position by pressing the levers **Q** to clear the shoulder on the hub

nut. On releasing these levers, it should be noticed that they fit correctly into the groove provided for the purpose.

Screw **P** should then be turned until the serrations of the locking plate **R**, are seen to be clear of those on the hub nut. The latter can then be turned in an anti-clockwise direction and the wheel withdrawn, the hub nut remaining in the spanner.

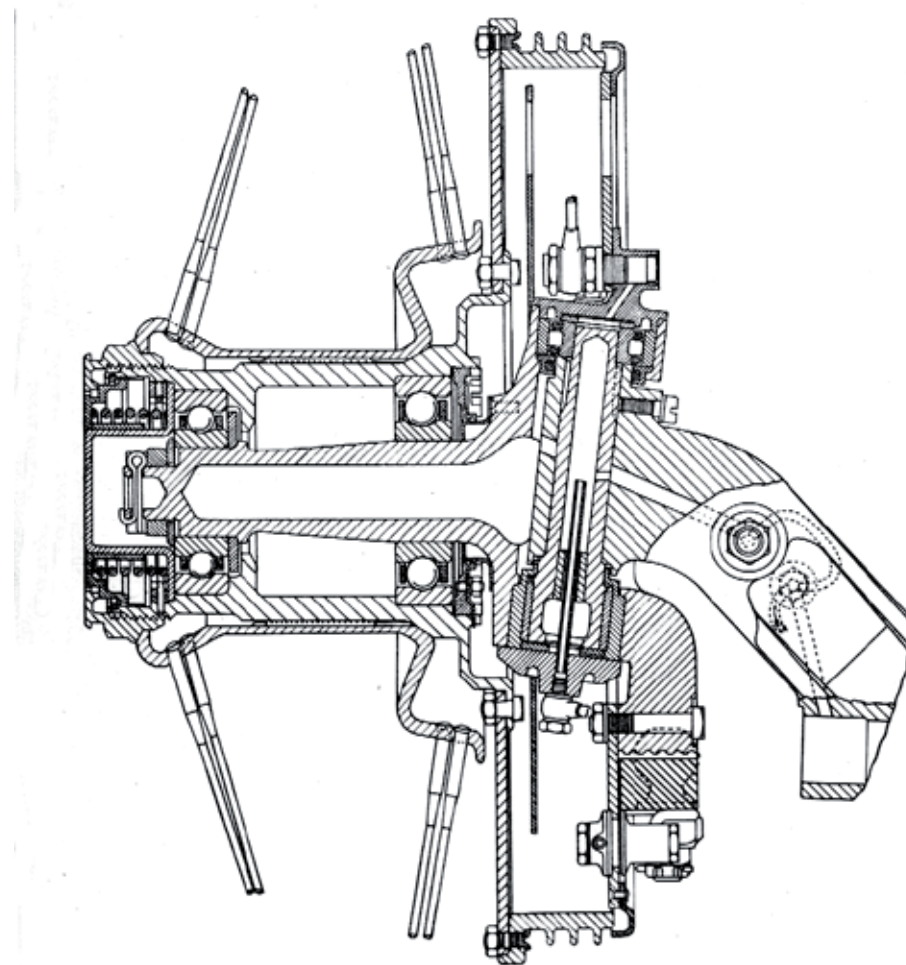


Fig. 16. - SECTION OF FRONT HUB

The thread of the hub nut is right-handed for all wheels

When replacing a wheel, care must be taken that the engaging surfaces, serrations and threads of both hub and wheel are free from road grit and other foreign matter. Preferably, they should be slightly greased.



The hub nuts must be tightly screwed up by means of the special spanner, and the use of the mallet in conjunction with it, to ensure absolute tightness.

The locking plate should now be allowed to come forward by turning the small lever, **P**, in an anti-clockwise direction, in order that its serrations shall engage those of the hub nut.

It should be observed that when jacking up a rear wheel, care is necessary that the head of the jack is arranged in the proper position. It should be immediately beneath the axle, between the two "U" bolts which secure the axle and spring together.

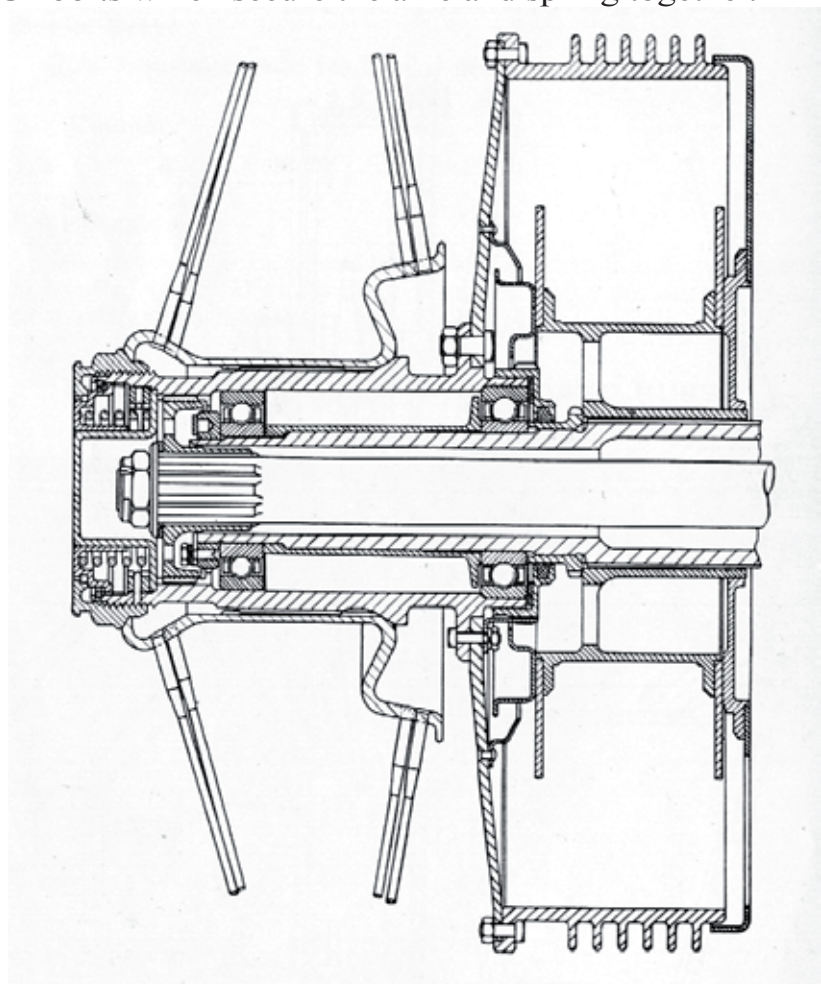


Fig. 17 - SECTION OF THE REAR HUB.

### Care of Wheels.

Every 2,000 miles, the hub nuts should be tested for tightness with the spanner.

On no account should the car ever be run with a wheel even slightly loose, as this will cause irreparable damage to the serrations and screw threads.

It is necessary to try each hub nut periodically with the spanner, and tighten if necessary. In order to tighten the hub nut, it is necessary for the locking plate to be forced back by means of rotation of the small lever **P** until its serrations are disengaged from those of the hub nut.

Care must be taken when driving close to a high curb to avoid catching the projecting spokes of wire wheels. Very serious damage may thus be done to the wheel.

### Lubrication of Wheel Bearings.

The wheel bearings are filled with ball-bearing grease in the first instance, and should run a long period without attention.

Sections of the front and rear hubs are given in Figs. **16** and **17** respectively.

### Replacement Tyres.

Either Dunlop "Fort" or India "Super", size 6.00" x 19" tyres are suitable.

When ordering new tyres, the above should be specified. With regard to the inner tubes, it is necessary to state the size and to mention "well-base".

Tubes made for flat-base rims should not be used.

### Balancing the Road Wheels.

It is most important, in view of the high speeds attainable, that the front road wheels should be properly balanced. Therefore it is necessary to have all wheels balanced and to re-balance a wheel after changing its tyre.

An out-of-balance effect is usually present in the complete wheel and tyre due to:-

- (a) The valve and its patch on the inner tube;
- (b) the joint of the inner tube; and
- (c) unavoidable irregularities in the outer cover due to movement of the material during vulcanising.

A red spot on the outer cover wall indicates its lightest part, and the cover should be fitted so that the red spot is at the valve position.

To correct such out-of-balance, three bolts are provided, spaced at equal intervals around the wheel rim, as shown at **S**, **T** and **U** in Fig. **18**, and each carries a number of lead washers, enclosed by a metal cover.

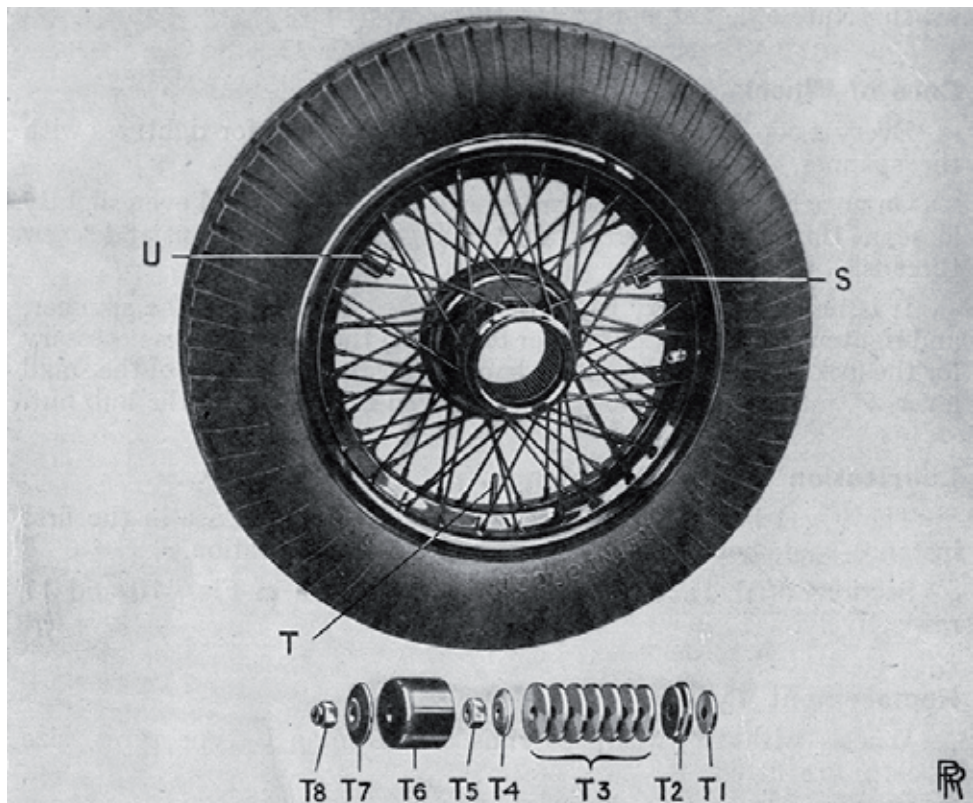


Fig. 18 - WIRE WHEEL WITH BALANCE WEIGHTS.

One of the bolts **T** is shown with its cover and washers dismantled. The parts are assembled on the bolt in the following order:-

1. Rubber washer **T1**, which acts as a seal against the ingress of water.
2. Special steel washer **T2** which forms a firm base for the cover and the lead washers.
3. Lead balancing washers **T3** up to seven in number on any one bolt.
4. Steel washer **T4**.
5. Nut, **T5** for retaining lead washers.
6. Cover, **T6**.
7. Steel Washer, **T7**.
8. Cap nut, **T8** for retaining cover.

To balance a wheel, all the lead washers should first be removed from each bolt, the other parts being fitted as indicated above.

The front axle being jacked up, the wheel must be turned gently and allowed to come to rest.

The lowest point of the tyre should then be marked.

The operation should be repeated, and if the original mark returns to the bottom position, one or more lead washers should be added to the bolt on the opposite side of the wheel.

If the mark made on the tyre is adjacent to the bolt, then one lead washer should be fitted on each of the other two bolts.

On the other hand, if no bolt should lie on the vertical centre line through the marked point on the tyre, the washers of the two bolts farthest from the mark must be altered, for instance, if the distance of one bolt from the centre line is approximately twice that of the other, two lead washers should be fitted on the bolt nearer to the centre line and one lead washer on the other bolt.

This process should be continued until the wheel will remain in any position in which it may be brought to rest, the number of lead washers being kept down to a minimum consistent with good balance of the wheel.