

The



Instruction
Book

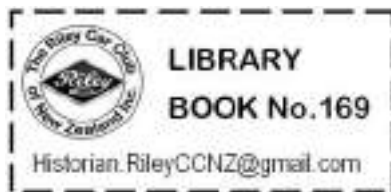
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BOOK No. 169

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Original supplied by
Paul Baée

The Riley Instruction Book

*Designed and compiled
in the interests of Drivers
and Owners of the
Riley "Twelve"*

.....

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Foreword



WITH the advent of the 1926 Riley Car, it has become necessary to compile a new Instruction Book, so that the various improvements will be brought to the notice of drivers and owners of the Riley.

After such perusal they will have a far better knowledge of the component parts, and when replacements are required a reference to that section of the book describing the part concerned will enable them to adopt the correct method of procedure, and thus ensure success.

When ordering spare parts, or when sending enquiries concerning the car, *the Chassis No. must be quoted.* It is stamped on the left side of the body name plate situated under each door of the body, and is also stamped on the right hand rear dumb iron. A body name plate is shown in Fig. 36, and the rear dumb iron in Fig. 24.

As we deal with each sub-assembly we also illustrate where each number is stamped, and if owners would also state this it would considerably help both themselves and our staff.

October 1925.



Fig. 1

Radiator

In Fig. 1 we illustrate the neat design of the Radiator, which is typical of the Riley Car.

Before starting the car, remove the filler cap B and ascertain that there is sufficient water. The correct height is just below the filter which is fitted inside the filler. If the level is low, fill up with soft, or rain water, as this does not fur the inside of the tubes, whereas hard tap water does.

During frosty weather, before leaving the car for the night, remove the drain plug A, and let all the water flow out, as if the water freezes, it is almost sure to crack the pipes, and probably also the cylinder, which is a costly replacement. Of course, this procedure is unnecessary if the garage is heated, or a heating lamp fitted to the Radiator, under the bonnet.

Engine Features

The engine has been well named the Heart of the Car, and it should be taken as much care of as that vital organ of the human body.

The "Twelve" RILEY Engine is a four cylinder, embracing a monobloc casting with a detachable head, the crank case and oil sump being of an aluminium alloy. The bore and stroke are respectively 69 m/m \times 110 m/m, giving a cubic capacity of 1,645 c.c.s. The R.A.C. rating is 11'9.

The sturdy and perfectly balanced crankshaft is supported in three white metal-lined bearings, as is also the camshaft, the cams being solid with the camshaft. One of the essentials for the best output from an engine,

is that it is kept clean, especially the magneto, terminals, and carburettor, in fact you should take as much pride in the cleanliness of the engine as you do of the bodywork of the car. When washing the car, see that no water obtains access to the magneto or high tension leads.

Examining Oil Indicator

Referring to Fig. 2, which shows the oil indicator being examined. Do not forget that this examination must only be made when the engine is stopped, and with the car on the level, not on a hill. If otherwise, an incorrect reading will result. It is not necessary to keep the level up to the maximum mark, but on no account should it be filled above this mark, hence it is wise when filling up to allow the oil to find its level first.

On examining the oil indicator after a run, as it will be covered with oil, owing to splash, first remove and wipe it clean, then take reading. This view also indicates the position of the engine number namely, on the right hand side of the crank case, near the cylinder base.

For particulars as to setting and jets on carburettor see the separate book supplied.

Fan Belt Adjustment.

If the fan belt stretches, the slackness can be taken up by unlocking the bolt A on the fan bracket, and twisting the whole bracket round, which, being mounted eccentric, varies the centres, thereby tightening the belt. When you have found the correct position, tighten the bolt which will lock the bracket in position.

Every 2,000 miles the fan should be filled with grease. For particulars see line drawing and list at rear of book.

After 2,000 miles your oil has usually lost its viscosity and oiling properties, and is of no further use, so it

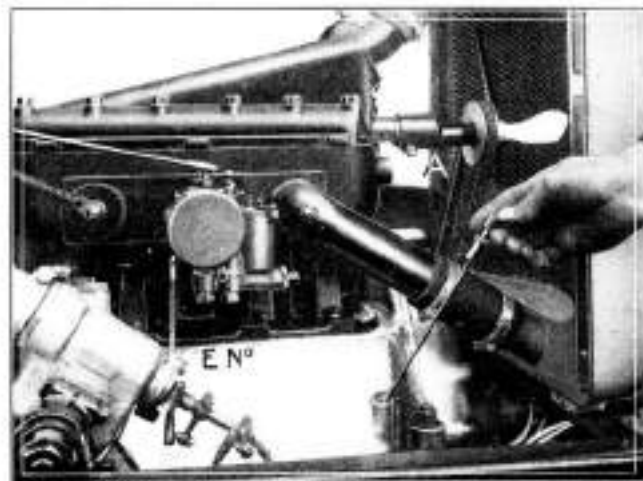


Fig. 2

Fig. 3

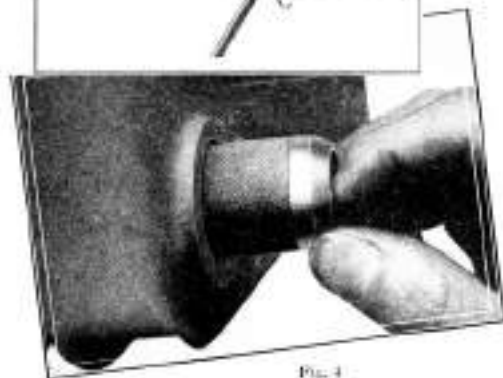
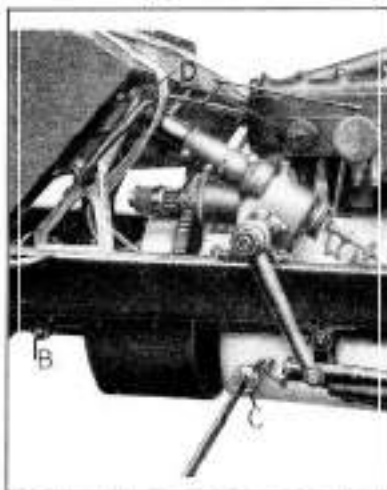


Fig. 4

must be removed and fresh oil added. (See paragraph under Oil Filler for other particulars concerning oil). Oils we can recommend are Wakefield's Castrol Excelsior XL Special, Price's Huile de Luxe, Speedwell Motor Oil Sans-equal.

Removing Oil Sump Plug.

Fig. 3 shows the position of the drain plug C, and also how the jack iron fits into the square recess for removing the plug. You will, of course, place a receptacle to catch the oil, as you do not want it over your garage floor. It is best to drain off the oil when the engine is warm, as the oil will flow easier. This view also shows the grease on the brake pedal B, and the accelerator control cross shaft oil holes D. See main diagram for oiling instructions.

The Steering box shown is the Marles type, particulars of which are given under that section.

Oil Filter.

When draining your oil sump take the opportunity of cleaning the oil filter, which can be removed as shown in Fig. 4. Do not clean with a piece of cloth, as this only clogs the gauze, but wash in petrol, using a small brush.

Timing Chain Adjustment.

A view illustrating the camshaft and dynamo drive, which is by a single silent chain, is given in Fig. 5.

Notice in this view the dynamo housing I, and how it is mounted eccentric for adjustment of the chain. When the chain wears, it is only necessary to unlock the clamping bolt J in Fig. 6, and twist

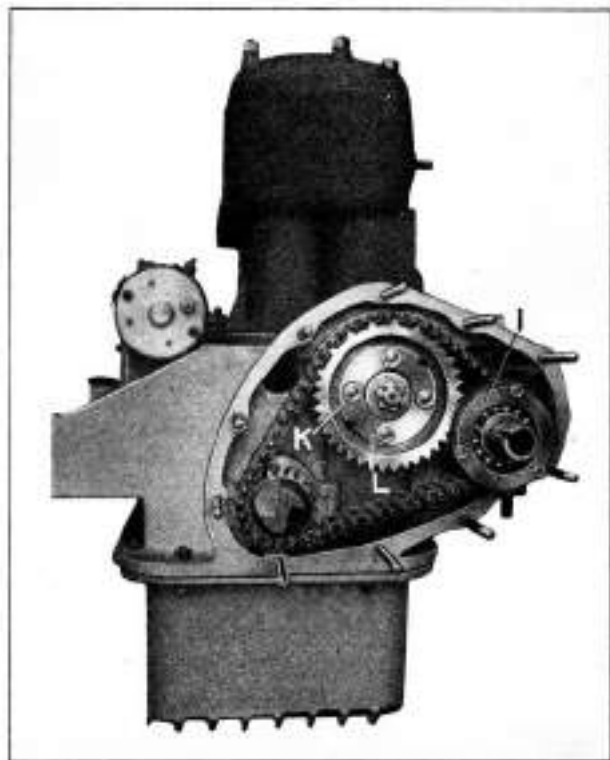
the dynamo and housing round in the direction of arrow to tighten the chain. Do not forget to relock the clamp bolt J, very little pressure is required to do this, and replace the split pin. It is quite unnecessary to remove the Timing Cover for this adjustment. Do not forget to retune the magneto after taking up this adjustment. See separate item.

Tappet Adjustment.

With regard to tappet clearance the amount we recommend for the best performance is '005 ins. on both inlet and exhaust valves, when engine is cold. The clearance should be checked occasionally, especially if engine begins to get noisy, as this is usually the cause.

First ascertain that the cam is not acting on the valve by turning the engine over, with starting handle, until the valve you are testing has dropped on its seating. The light tappet spring P, Fig. 6, holds the tappet close to the valve stem, and has been provided to make the engine as silent as possible. Therefore, to test clearance, the tappet must be pressed down with the finger and a '005 feeler, or a visiting card pushed between valve stem and tappet adjusting screw.

If the clearance is incorrect, the tappets must be adjusted. To accomplish this, first unlock the nut O, then adjust the bolt N, until the necessary clearance is obtained. Re-lock nut O, taking care that the adjusting bolt does not move during the operation.



Dynamo and Mag. Drive.

The complete Dynamo and Mag. Drive is illustrated in Fig. 6, and this also shows how the aid of a small looking glass helps in checking the timing. By holding the glass on an angle, you can see the reflection of the contact breaker.

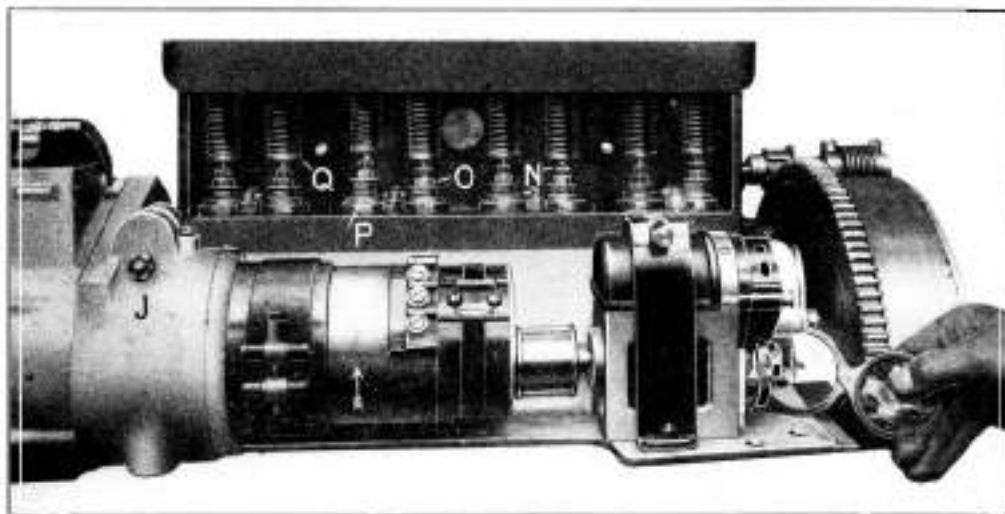


Fig. 6

The dynamo clamp bolt J should only be unlocked when adjusting Timing Chain. (See booklet on electric set for information regarding dynamo and for wiring diagram).

Fig. 7 is a line drawing of the complete drive of dynamo and magneto. All the symbols mentioned are the same as shown on the photos, so that either the photos or line drawing can be used for information.

Both the Dynamo and Magneto are driven by instantly detachable flexible couplings, the two components being held in position by steel straps.

Mag. Removal.

To remove the magneto, it is only necessary to unclamp the strap bolt F, when the magneto can be removed as shown in Fig. 8

Dynamo Removal.

To remove the dynamo is just as simple, unclamp the strap bolt M and remove as shown in Fig. 9.

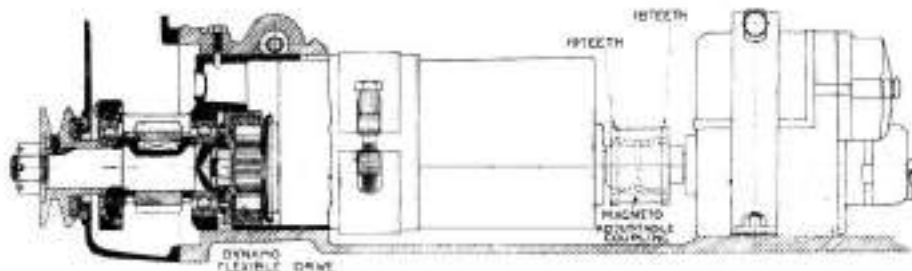


Fig 7

Mag. Timing.

To check the magneto timing, first rotate engine until the contact breaker points are just separating with the distributor arm over No. 1, and the mag. control lever on steering column is fully retard. (Fig. 34 shows mag. lever advanced). The engine should now be at top dead centre, which can be checked by the marks on flywheel. Fig. 14. On no account must the ignition be advanced further than this, or it will be firing too early.

Retiming.

If the timing is incorrect, leave the magneto in this position with the points just separating, and unclamp the strap bolt F. Slide back the magneto which releases the coupling as

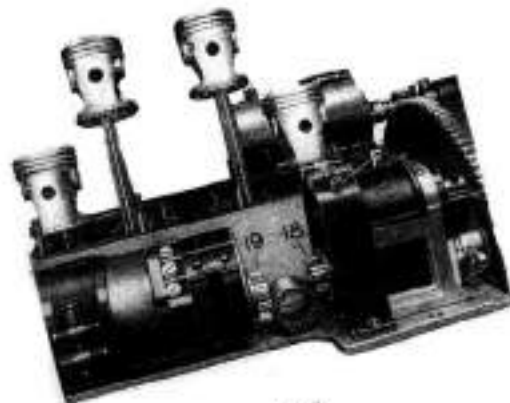


Fig 8

shown in Fig. 8. Turn engine over till the T.D.C. arrows on crankcase and flywheel are level. Replace the coupling and magneto without rotating the steel parts of the coupling on the dynamo and magneto.

The steel part on the dynamo has 19 teeth, and the one on the magneto has 18 teeth, therefore, by turning the centre piece only of the coupling on to the next tooth of the mag. steel part and then replacing on to the dynamo it will advance or retard the magneto by 1 degree according to the direction the coupling is turned.

To further explain this, if the coupling is moved 1 tooth forward on the 18 tooth gear, it will equal 20 degrees, and when the 19 tooth is moved forward it only equals 19 degrees, therefore, it actually advances 1 degree.

All the marks on the flywheel relate to No. 1 cylinder which is nearest the radiator. To check this, take off the Valve Cover Plate, then turn engine until the second valve opens and then closes. Then turn engine still more until arrow on flywheel is opposite arrow on crankcase.

The Firing order of the Riley engine is 1, 2, 4, 3.

A trouble likely to arise with the magneto is the fibre bush in the rocker arm swelling during damp weather, and thereby locking the breaker arm. This only requires easing with sandpaper. (For full information regarding Magneto, see the separate book on this part of the car).

Pistons.

In Fig. 9 the cylinder has been removed to show the pistons. It is as well to point out here, that the pistons are off set from the conn. rod so that if pistons are removed, care must be taken to see that they are assembled correctly.

By noting the position of the locking pin which fixes the gudgeon, no trouble will be experienced. The locking pin S, of the two centre pistons face each other, and those on the outside pistons project outwards as shown at T. Also the pistons are numbered 1, 2, 3, 4, and if the figures all read the right way up, the pistons are in the correct position.

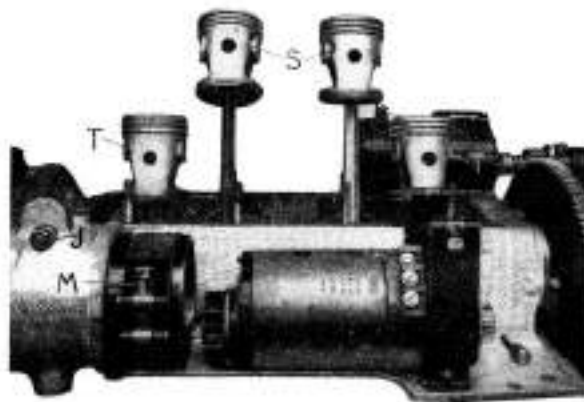


Fig. 9

Starting Handle Shaft.

Even though the starting handle is only occasionally used, it is best to keep it oiled. Engine oil should be applied to the shaft every 5,000 miles. In using the starting handle, see that the catch ball is on the same flat of the square as the hole in the handle, and there is then no fear of it slipping off. Being a loose tool, owners are liable to forget and leave it on the shaft, when, if it is not fitted on the ball catch, it will drop off and a replacement will be needed.

Oil Filler.

The oil filler lid V, is shown open in Fig. 13. In Winter a slightly thinner oil should be used than in Summer, but it is real economy to use at all times only the best oil procurable, also it is imperative that a mineral oil should never be mixed with a vegetable oil. If you have any doubt as to the quality, the best method is to drain the oil sump before filling with fresh oil. Oils we can recommend are Price's Huile de Luxe, Speedwell Motor Oil Sans-Egal, Wakefield's Castrol Excelsior XL Special. Do not put paraffin into oil filler to wash out engine, it is better to waste a drop of oil, as the paraffin is liable to get in the troughs, etc., instead of draining through the plug.

Oil Sump.

Fig. 10 is a view of the bottom of the crankcase with the oil sump removed. Notice the oil troughs W, from which the dippers X, obtain the supply of oil. Also the sturdy crankshaft in three large bearings, and the oil pump and filter which project into the oil sump.

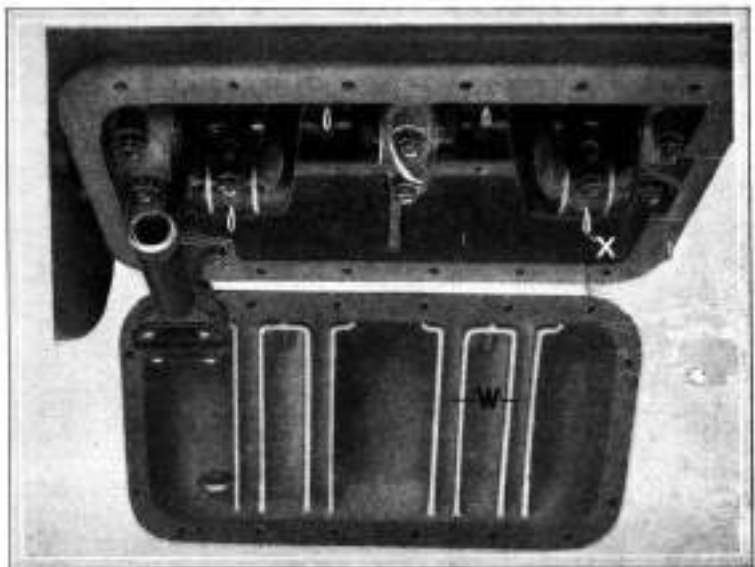


Fig. 10

Oil Circulation.

As the oiling of the engine is important, we have introduced a line drawing of the engine showing the oil distribution, so that the owners will the better understand the system.

The oil is contained in the oil sump, which has cooling fins cast on to help cool the oil.

The oil pump is driven from the camshaft by spiral gears; the pump itself is submerged in the oil, and therefore starts pumping as soon as the engine revolves.

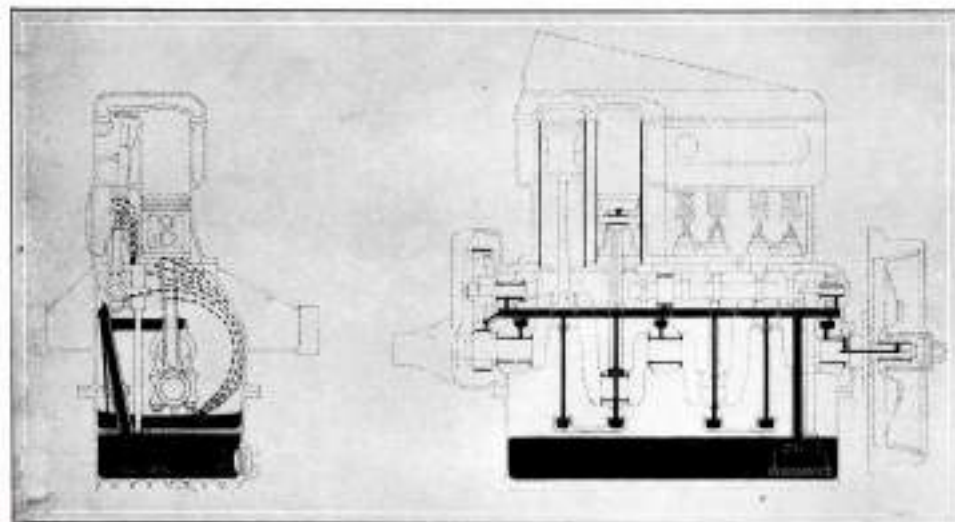


Fig. 11

The oil is drawn into the pump through the filter, hence there is no danger of any foreign matter obtaining access to the bearings. It is then pumped up the tube in the direction of the arrow to the main supply tube which runs lengthwise through the crankcase. From the main supply tube, the oil is pumped to the three channels over each of the crankshaft bearings, and also to the three camshaft bearings. It also directs a supply of oil into the timing chain gears, and also into the four dipper troughs in the oil sump. The clutch bush is lubricated through the hole drilled in the crankshaft, which obtains a supply of lubricant from the rear bearing.

All other parts of the engine are lubricated by splash.

The dippers attached to the connecting rods enter the oil troughs in the sump and throw the oil as shown diagrammatically in Fig. 11. With this type there is no need for an oil pressure gauge.

Decarbonizing.

The operation of decarbonizing is necessary when the engine commences to knock or pink. The mileage varies with individual driving, but should average about 5,000. Having a detachable head, the Twelve Riley possesses excellent features for the quick and easy execution of the necessary work.

Removing Cylinder Head.

First drain off the water by removing the plug at the bottom of the radiator, see Fig. 1, and also remove the bonnet and the sparking plug leads. Then unlock the two bolts Y, Fig. 12, which hold the water extension pipe to the cylinder head. This point will be appreciated by owners who have previously owned a car in which the rubber connections had to be broken, as they usually leak after having once been removed.

Now proceed to remove all the cylinder head nuts, and having done this, apply wedges or screw drivers between the projections provided for this purpose on the cylinder and cylinder head, and lever the head off. On no account press the screw driver on the Gasket (Copper asbestos washer), or a new one will be required.

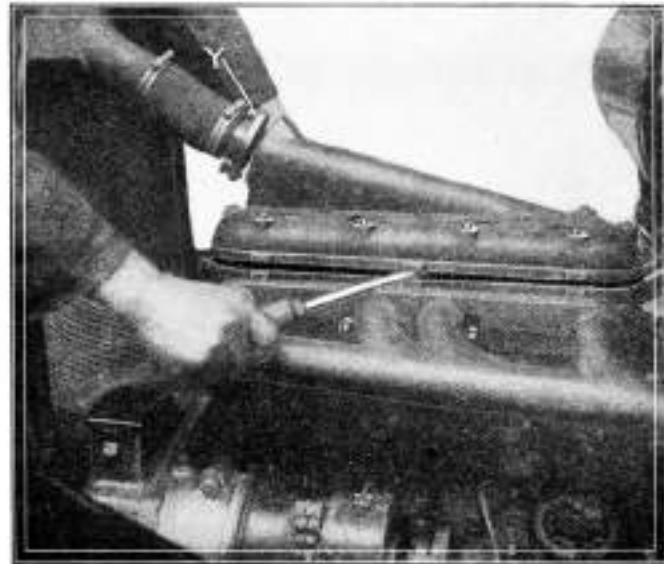


Fig. 12

Before proceeding to remove the carbon deposit from the cylinder head, top of pistons, and top of valves, etc., first plug with rag all the holes to which the carbon could obtain access, as none must fall into the cylinder or get into threaded holes, or trouble will be experienced when you start to assemble the engine.

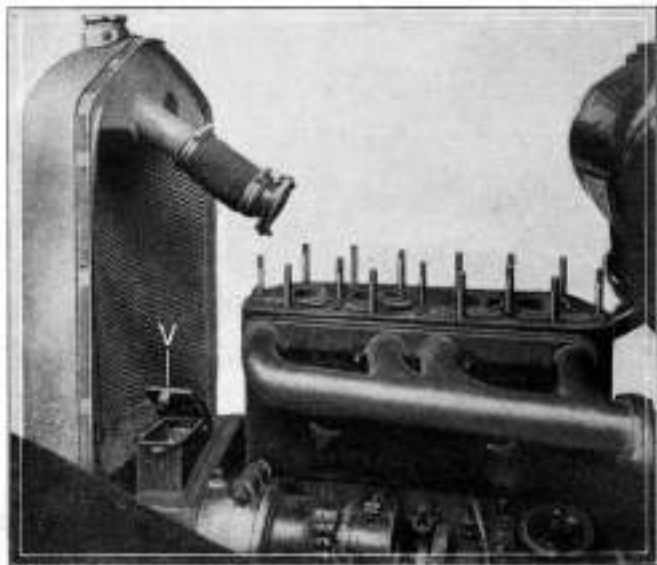


Fig. 19

Grind Valves.

While the head is down, always take the opportunity of grinding in valves, which will improve the slow running and also the power of the engine. There are plenty of tools on the market to enable an easy removal of valves. The main object is to lever up the valve spring and cup, Q, Fig. 6, so that the cotter can be extracted from the valve stem.

The process of grinding in a valve consists of smearing oil and fine emery (which can be obtained ready in a paste) on the valve seating, and rotating the valve by means of a screwdriver fixed in the slot on the head. When effecting this operation do not forget to lift the valve now and again, or the result will be grooves in the seat.

The operation can be made easier by slipping a spring under the valve head, which spring, when the pressure is released, will lift the valve automatically. Remove all traces of the grinding paste before replacing the valves.

Assembling Head.

Before assembling the head, examine the gasket and even if it is only slightly damaged, it will pay to fit a new one. The gasket should be smeared over

with shellac, varnish or Gold-size, so as to form a perfect joint. When pulling down head nuts, great care must be taken not to get uneven pressure on the head. Pull the nuts up diagonally with engine cold, then start the engine and when warm finish tightening the nuts, but do not over do it.

Valve Timing.

Fig. 14 illustrates the marked flywheel to assist owners in timing their engine.

As the cams are solid with the camshaft, it is only necessary to time one valve, when all the others must be correct. The marks are for No. 1 cylinder which is the one nearest the radiator.

The arrow on both crankcase and flywheel is top dead centre, in other words, when the arrows are in line with each other the piston of the No. 1 cylinder is at the top of the stroke. The mark IN O indicates that when this mark is in line with arrow on crankcase, the inlet valve of No. 1 cylinder (second valve from radiator) should be commencing to open. Of course this is on the suction stroke and not the firing stroke. The unmarked line is when the exhaust valve closes.

Timing Valves.

Although the owner will not require to retime his valves, we will describe the process of timing an engine, so that he will understand the functions of the parts concerned.

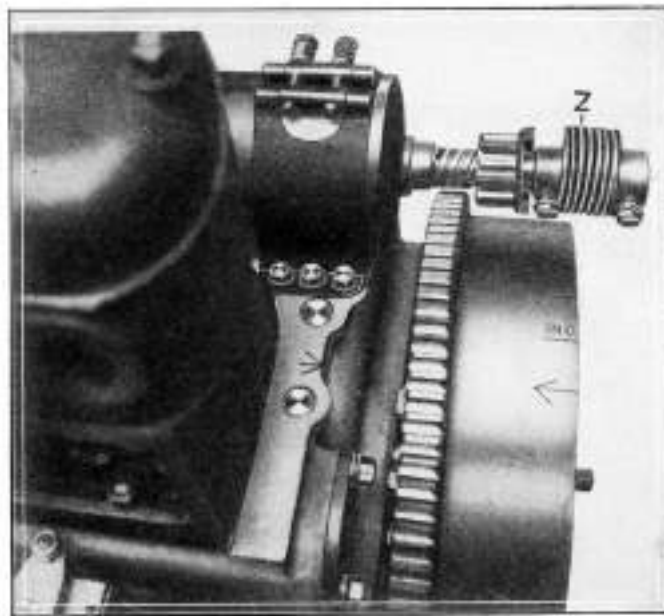


FIG. 14

The engine is assembled and the camshaft is arranged so that the No. 1 inlet valve is commencing to lift, and the crank in such a position that the mark IN O on flywheel is approximately in line with arrow on crankcase. Then the Timing Chain is fitted. The camshaft driving wheel is provided with adjustment for final setting, and when this is OK the locking plate L, Fig. 7, is fixed by the bolts K, and the two indents made which lock the drive in that position.

Starter Pinion.

The starter pinion is also shown in Fig. 14, the spring which takes the impact of the drive being marked Z. On no account oil the Helix drive for starter pinion, as the oil only collects the dust and grit, which results in the pinion being jammed. All that is necessary is to occasionally slightly smear with graphite or black lead. For further information required on electric starter see the Booklet on Electrical sets.

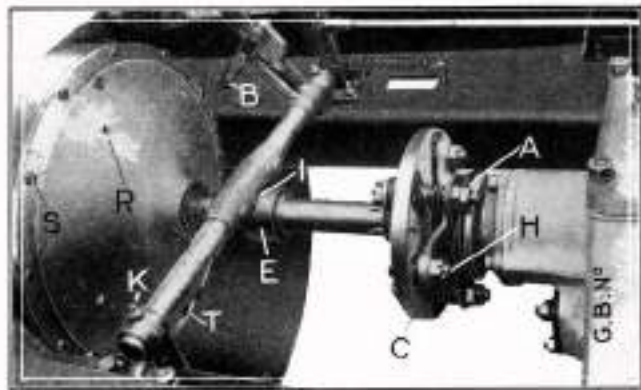


Fig. 14

Clutch.

The clutch of the Twelve Riley is a fabric covered cone, acting in the steel flywheel. The clutch bush is automatically oiled from the engine. A clutch stop is also fitted, the pressure of which can be adjusted to suit individual driving. Fig. 15 shows the general arrangement of the clutch and pedals.

Oil Bath.

The clutch is enclosed in an aluminium cover, and so as to ensure easy operation and sweet action runs in oil.

The clutch is filled by means of a squirt or small funnel inserted in one of the four holes R, only one to two egg-cupsfull being needed. Special thin oil should be used such as Oiline special anti-freezing clutch oil, or Sewing machine oil.

Clutch Link Adjustment.

The links marked B, are provided for adjustment of the stirrup arms F, in relation to thrust block E. Always adjust the links B, so that there is clearance between the release pins and the thrust block E. The only time the pins should come into contact with thrust block is when pushing out clutch.

Clutch Stop.

To adjust the pressure on the clutch stop, it is only necessary to unlock the lock nuts A, and then adjust the nuts to suit. As the nuts are tightened or loosened, more or less tension is put on the three springs. Adjust the three nuts equally, and when correct, tighten the lock nuts.

To remove Cone.

If the fabric on the cone requires examining or replacing, it is quite easy to remove the cone complete without dismantling the car. First remove the three bolts A, and also the three marked H, when the flexible coupling C, can be withdrawn.

Remove the twelve set pins S, holding cover, and undo the three nuts G, Fig. 16, and turn engine over until one of the three bolts are at the bottom, when, by a downward movement, the clutch shaft can be removed, as in Fig. 16. When examining Fig. 15, note the hole for the release thrust, marked I. The standard grease gun can be used with an adaptor fitted to end of nozzle.

By removing the clutch nut J, shown in position in Fig. 16, the clutch with spring, bushes and flexible coupling will come away complete. Note the clutch spring is held in a container, and will not fly out when the clutch nut is removed. The clutch release shafts brackets require greasing every 5,000 miles. This should be applied at greasers marked K, Fig. 15. If the clutch becomes greasy, the car will not give of its best by reason of the clutch slipping.

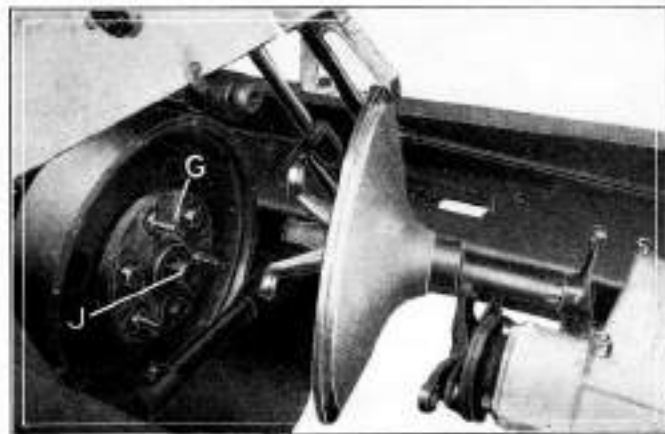


Fig. 16

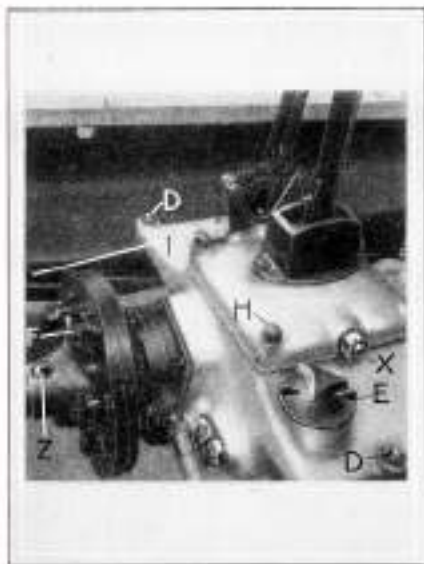


Fig. 17

Oil Filler.

The Oil Filler is on the right hand side marked E, in Fig. 17. The oil we recommend is best quality gear oil, and the box should be filled until oil is on a level, as shown in line drawing, Fig. 19. Too much oil is bad, and is only waste, as it will be forced out through the bearings at front and back of box and also out of the lid. The amount needed to fill to this level is 2½ pints when box is empty.

This can easily be cured by removing the bottom plug T, from clutch cover and draining out the oil. Then swill out with paraffin, and refill with fresh oil, as just described.

Gear Box.

Description.

The Gear Box of the "Twelve" Riley car comprises four speeds forward and one reverse. Either central, or right hand change can be fitted to customers' requirements. The constant, mainshaft, and also the layshaft run on ball bearings. The central change model is illustrated in Fig. 17. The G. B. No. is stamped on the left hand side of the case as shown in Fig. 15.

Brake Adjustment.

Note the two turn-buckles I and J, for adjusting the hand and foot brake respectively. Do not forget to tighten the lock-nuts after the necessary adjustment has been made.

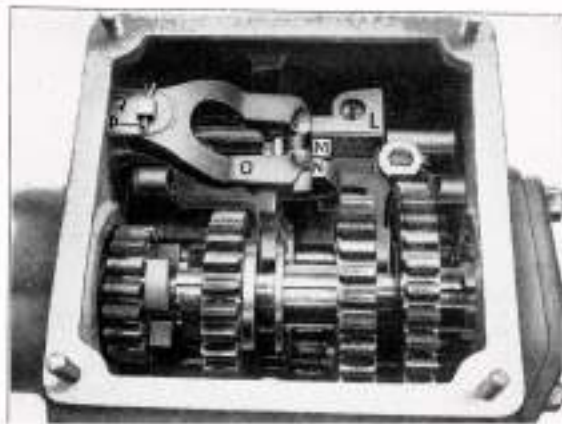


Fig. 19

The brake and reverse catch rods should be lubricated with engine oil every 5,000 miles.

Striker Adjustment.

The two nuts R, of which another pair are situated at the opposite end of box, are for adjusting the strikers so that all the three, L, M, and N, see Fig. 18, are perfectly in line, so that the change speed lever and interlocker do not foul them. The operation consists of slackening off the nuts on one side of box and tightening those opposite, thereby drawing the striker across the box.

Ratchet and Rack.

A part which with constant use is likely to need replacement is the Ratchet rod. In removing either this or the rack, do *not* undo the main-shaft nut X, as this locates the gear lever in correct position with regard to the strikers.

Remove Box.

To remove the box from the chassis, first take out the three bolts F, from rear end of box which hold the spiders to the flexible discs, which allows the prop shaft to drop. Then the three holding bolts D, and also disconnect the brake rod from lever when the box can be removed by sliding towards rear until the constant shaft has disengaged from the sliding coupling. The speedometer is driven by worm and worm wheel from rear of gear box, and the flexible drive must be disconnected before removing gear box.

Fig. 18

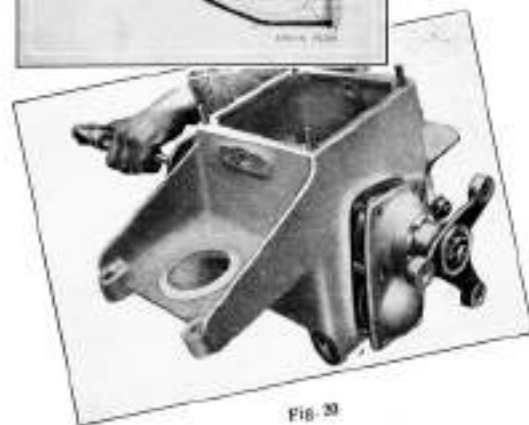
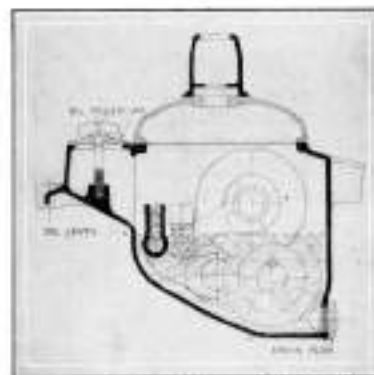


Fig. 20

Remove Lid.

If you wish to inspect the gears it is necessary to remove the lid. To accomplish this, remove the four nuts H, when the lid can be lifted off, complete with levers attached.

Fig. 18 illustrates the box with the lid and lever removed, and also shows the interlocker system. L is the reverse striker. M is the top and third speed, and N is the first and second speed striker. The interlocker O, locks the operating strikers of the gears not being used, so that it is impossible to get two lots of gears in at once. To remove the interlocker, detach the split pin P, lift off the lock washer Q, which leaves the interlocker free to be lifted out.

Dismantling Box.

The following instructions and illustrations are given in case the owner wishes to dismantle the box himself, although in case of gear trouble, we recommend that the box be forwarded to us complete. First remove the lid as directed above, then the interlocker and striker shafts.

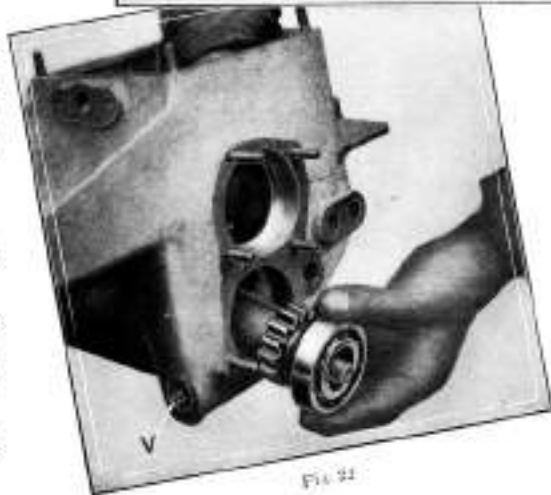
Remove Mainshaft.

Fig. 20 illustrates the operation of removing the mainshaft.

First remove the six nuts which hold the mainshaft cover to the case. Then remove a cork oil plug from the hollow constant shaft S, Fig. 21, when a $\frac{3}{4}$ in. bar can be pushed up constant shaft until it comes into contact with end of mainshaft.

The complete mainshaft, cover and coupling can be removed as shown in Fig. 20.

Fig. 21



Remove Constant Shaft.

Next remove the four nuts from Studs T, which allow the constant cover to be removed, and proceed to knock out the constant shaft as illustrated in Fig. 21.

Remove Layshaft.

The last part to be removed is the layshaft. First remove the Cover U, Fig. 21, and knock the shaft out till the bearing projects from opposite side, see Fig. 22. Then remove the bearing from end of shaft, when the complete shafts with gears mounted on can be withdrawn through the top of the box. This view also illustrates the position of the oil plug V, which can be removed with the jack-iron in the same manner as the engine oil sump plug shown in Fig. 3.

Every six months the oil should be drained off, the box swilled out with paraffin and refilled with fresh oil.

To remove reverse gear, first take out plug at front of box which is on a line with the reverse gear shaft. Through this hole a bar can be inserted to knock out the shaft.

Fig. 23 is a general view of the right hand change model. All the previous adjustments, etc., are exactly the same on this model.

To remove the lid and change speed mechanism, it is only necessary as in central model to undo the four nuts on top of lid. The oil drain plug V, and filler lid E, are as shown in this view.

Propeller Shaft.

The propeller shaft is centred at each end on hardened steel balls, and every twelve months the propeller shaft should be removed and these pivots filled with grease.

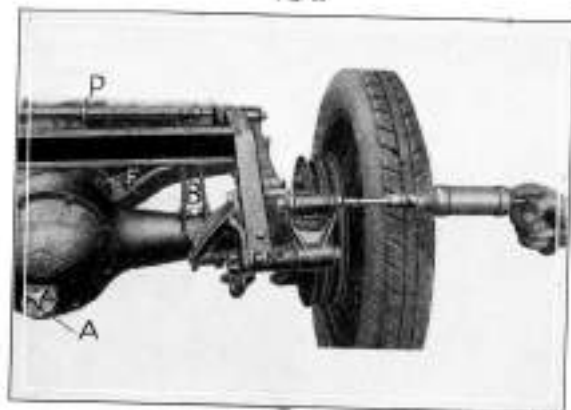
Undo the bolts from the back axle end of propeller shaft, when it can be removed by sliding it off the coupling at rear of gear box.

The Greaser Z for the sliding coupling is shown in Fig. 17.



FIG. 23

Fig. 24



Rear Axle.

Description. The Riley "Twelve" Rear Axle is of the semi-floating bridge type, the drive being conveyed by a spiral bevel. The brakes, both foot and hand, operate inside the large ribbed brake drums. Artillery wheels are fitted as standard, and Fig. 24 is a general view of the axle, and shows an owner using the grease gun supplied with tool kit greasing his rear spring shackles (see list). The nuts on all the wheels should be periodically tested for tightness, remembering that those on the right hand or offside wheels have a right hand thread, and those on the left hand or near side have a left hand thread. The nuts are marked respectively R and L.

This view also shows the position of the chassis number on the off side dumb iron. The oil cover on the compensating tube is shown at P (see list).

Inspecting Shoes.

Fig. 25 is a close-up view with car jacked up and the wheel and brake drum removed for inspection of the brake shoes. To remove the drum it is only necessary to unlock the six bolts from the brake drum centre D.

When using the jack for raising the axle, place it under the special bracket which has been provided for that purpose as shown.

On old type cars, where the boss is not in position, place the jack under the cam bracket, NOT UNDER THE CAM TUBES or they will bend and bind the brake work, as they are not designed to stand the strain.

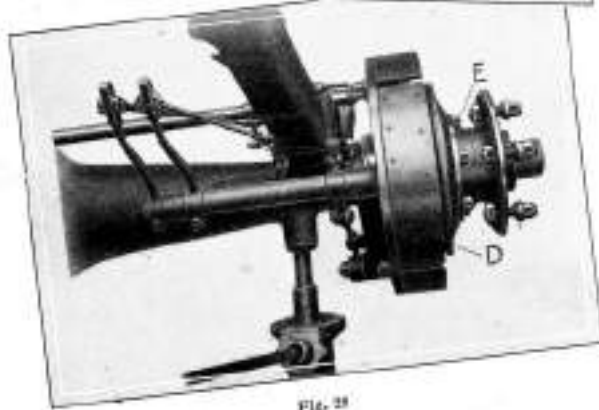


Fig. 25

Oil Filler.

The Oil Filler is marked A and should be filled level with the bottom of the filler opening. The case holds about half a gallon and the oil we recommend is best quality gear oil. The brake rod eye pins B and also the compensating lever eyes should be oiled with engine oil every 5,000 miles.

Road Springs.

Gaiters are supplied fitted on the road springs, and only need removing every 6,000 to 10,000 miles. Then the leaves of the springs require a mixture of graphite and oil or graphite and grease forced between them. Before replacing the gaiters put plenty of grease over the springs.

Remove Hub.

To remove the hub unlock the six nuts from studs E, Fig. 25, when the hub and axle shaft will come away complete. Never try to remove the hub from the axle shaft, as these are pressed on.

On Fig. 26 is shown the position of the back axle number on the right hand side of sleeve. The drain hole R must be kept clean so that any oil which obtains access to the shoes will drain out. Therefore, do not put too much oil in cam tube at S, as it will get into the brake work. For particulars of the greasers V, see list at rear of book.

Remove Drive Case.

To remove the Drive Case, first disconnect the propeller shaft by removing the three bolts F, Fig. 24, and withdrawing the two hubs and axle shafts. See Fig. 26.

The Drive Case, complete with bearings and drive, can now be withdrawn from the axle sleeve as shown in Fig. 27, by removing the eight bolts which hold it in position.

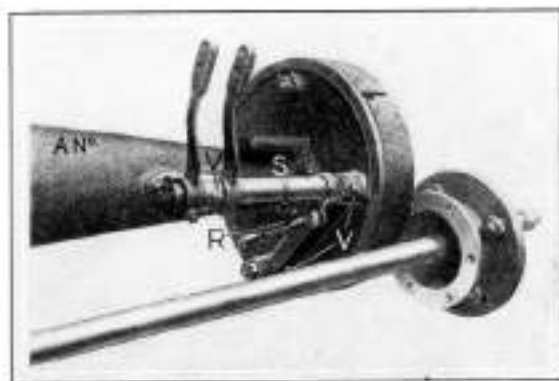


Fig. 26

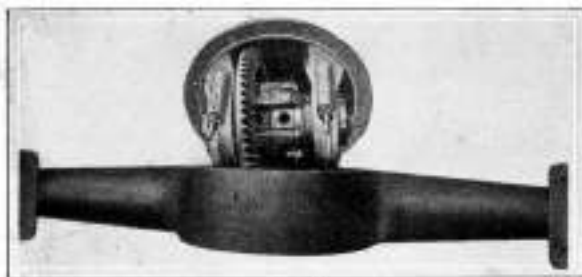


Fig. 27

of sleeve. Unscrew the large nut and remove the bearing I, and the brake drum centre D, which exposes the shoes.

Remove Shoes.

To remove the shoes, first take out the split pin K, and remove the plate from the pivot pin, when the shoes can be levered over the cam plate L.

Fig. 29 shows one shoe removed. Notice the steel slippers M, which can easily be replaced when worn.

Pinion Adjustment.

Fig. 30 is a photo of the driving pinion housing with the lock plate removed to show the adjusting sleeve inside. We do not advise owners to attempt adjusting this themselves, as they are assembled correct in a special fixture before delivery. The only

Renewing Brake Lining.

If upon inspection the Brake Linings are worn and require relining with fabric, it is necessary to remove the shoes. To accomplish this, take off the locking wire G, and remove the grub screw H, Fig. 28, from nut on end

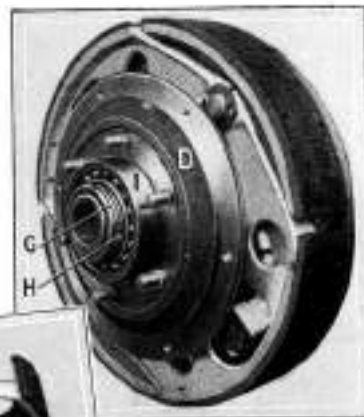


Fig. 28



Fig. 29

time it is necessary is after a general overhaul, and this is best done by a proper mechanic. The following is a description of the process. Remove the plate N, and with a tommy bar screw the inner sleeve O, right or left according to the direction

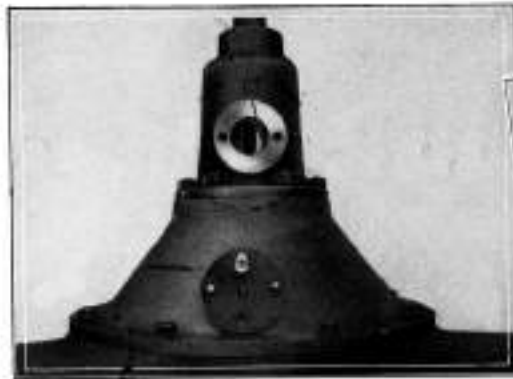


Fig. 30

the bevel pinion requires to go, viz., further into or out of mesh with the wheel. When you have obtained the correct position, replace the lock plate N, the projecting pin fitting into the slot in the sleeve. You will notice that four holes are drilled in the plate N, so that if the slot in the sleeve comes central with opening, the holes at right angles to the projecting pin are used, but if the slot happens to come at the sides of the opening, the holes in line with the pin are used. So that the mechanic will understand the mechanism we have included a line drawing of the rear axle drive in Fig. 31. As will be seen from the drawing, the operation of turning the inner sleeve here marked No. 5486, bodily moves the pinion complete with its bearings in whichever direction it is screwed.

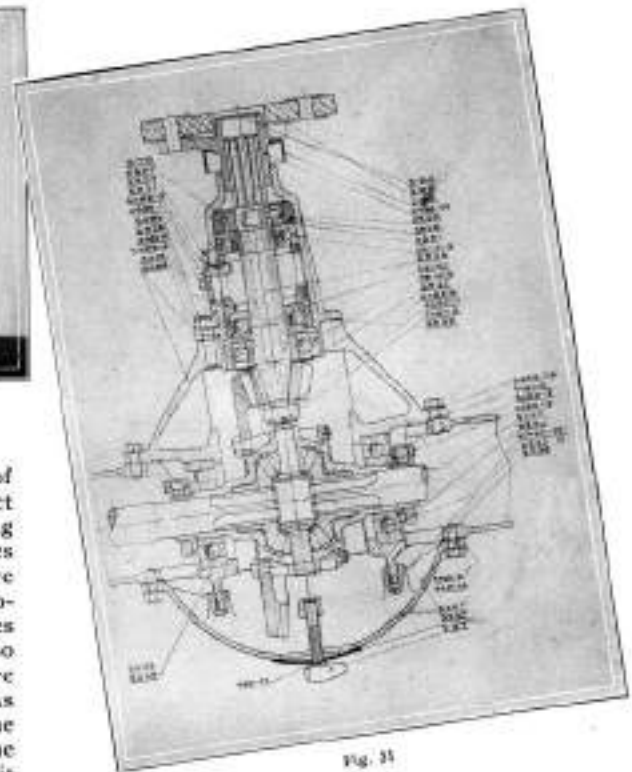


Fig. 31

Fig. 32

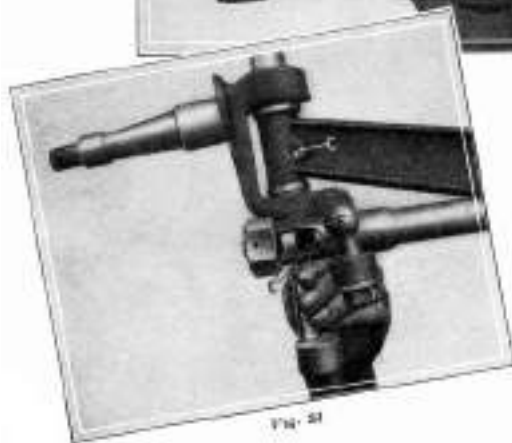
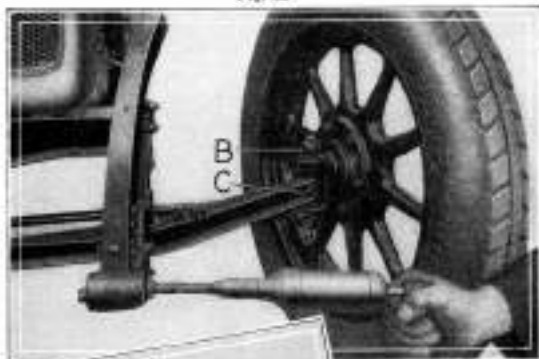


Fig. 33

Front Axle

The design of the TWELVE RILEY FRONT AXLE leaves only one point to be considered by the owner, and that is lubrication.

Fig. 32 depicts the arrangement of the axle. B is the oil chamber which should be filled every 2,000 miles with engine oil, NOT GREASE.

The swivel pin is hollow so as to communicate with the bottom bush.

The road springs require the same attention as mentioned in the part dealing with rear axle springs.

The axle number is stamped on the top of the left hand or off side axle bed as shown in Fig. 32, which also depicts the operation of greasing the front shackles.

Swivel Bushes.

If, after long service, play develops in the swivel, the bushes require replacing. First jack up car and remove the wheels and hubs, then unscrew the Top Oil Chamber B, and Bottom Cap, and also the cotter pin C. The swivel pin can now be knocked out in upward direction as shown in Fig. 33.

By disconnecting the Ball Joint, the swivel arm can be taken to the bench and the bushes pressed out.

Ball Joint.

In Fig. 33, the Tie Rod joint has been taken to pieces so as to illustrate the construction.

The two ball cups marked E, which clip the ball F, are lined with ferodo, and every twelve months should be smeared over with Graphite and grease. This also applies to the ball joints on the steering coupling rod.

Hub Caps. The Hub Caps fitted to standard Artillery wheels are held in position by the wheel. When removing these make sure that the small hole drilled in end is not stopped up, as if so it is impossible to remove them without damage, owing to the formation of a partial vacuum.

Every twelve months the wheels and caps should be removed and the hubs filled with grease.

Riley Steering Gear

The steering gear of the "Twelve" Riley is of the worm and worm wheel type, and the rake can be adjusted to suit individual requirements. The component number is stamped on the box.

The Control. The left hand control lever is the magneto control, and its position in Fig. 34 is full advance. The right hand lever is the throttle control, and the lever is in closed position.

Loose Column. If the whole column should develop play, it is probable that the split ring inside the mouth of the column bracket on the footboard is not in position, and that the clamping bolt has become slack.

Fig. 34

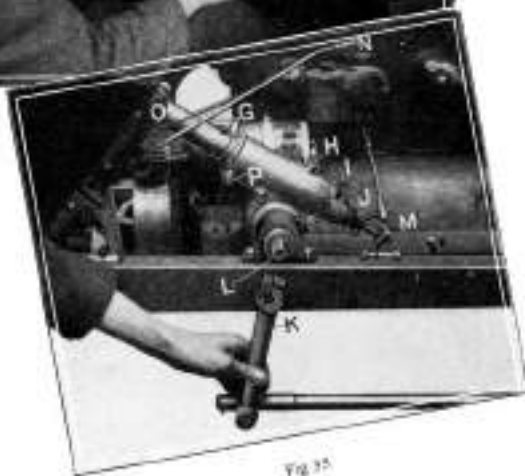


Fig. 35

If only the top of the column is slack, it is only necessary to tighten the nut on the clamp as shown in Fig. 34 until play has been taken up.

Oil Fillers.

There are two oil fillers on the steering, the plug H, and the spring clip G. Both these should have Engine oil added every 5,000 miles.

Removing Back Lash.

To take up the back lash of the steering worm, remove the locking wire, and unclamp the square head set-screw I, and screw up the adjuster J, until all the slackness has been taken up. Do not screw up too tight, as you will bind the steering.

Tighten the set-screw I, and replace the wire. The set-screw also clamps the complete controls, so that if control case on top of column is loose, the set-screw is not tight enough.

Worn Worm Wheel.

As mentioned in the description, a complete worm wheel is provided, so that in case of wear after much service, a fresh portion can be brought into use.

To accomplish this, remove the clamping bolt and take off the steering Lever K, as shown in Fig. 35. Then turn the steering wheel until the square shaft L has moved round to a fresh position. Replace the lever and locking bolt, not forgetting the lock washer, which goes in the slot in the lever.

Control Rods.

Every 5,000 miles oil all the control rod joints, M and N, and also the accelerator O, with Engine oil.

Adjusting Mesh of Worm.

The steering column is mounted eccentric in the box, so that the worm and worm wheel can be adjusted for correct mesh.

If this requires adjusting, it is only necessary to unclamp bolt P, when the whole column can be twisted round, and the worm either put further into or out of engagement with the worm wheel. Do not forget to tighten the clamp bolt P.

Marles Steering Gear



Fig. 36

Then remove the wheel by unlocking bolt T, Fig. 36. The adjustment can now be performed by unlocking the ring U and tightening the inner cone until play has been taken up. Re-lock the ring and then add the Steering Wheel and controls. The Oil Filler V needs the same attention as on the Riley column.

On some of our models we fit the new type Marles Steering Gear and it is therefore necessary to describe the main oiling and maintenance points.

Referring to Fig. 36 and 37, it will be seen that the controls used are the Riley Standard and have already been described under the Riley Steering Gear. The locking screw for the controls is marked Q and acts the same as the set screw 1 in Fig. 35.

Our component number is stamped on the box, the other number on the boss being the Marles Steering number.

If after about 12 months' use backlash should appear in the box, unlock the 3 bolts R and screw up the hexagon S, which can be done by hand without the use of a spanner and re-lock the bolts R.

Fig. 36 is a view of the top of the Marles column and also illustrates the Body Name Plate, on the door step. The Chassis number is on the right hand side and the Body number is on the left hand side.

If play at some future time develops at top of column it is necessary to first remove controls by unlocking bolt G at bottom of column, Fig. 37, and pulling complete controls with ease out (after removing control Levers at bottom).

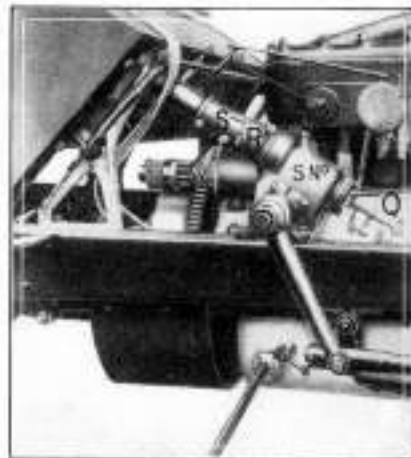


Fig. 37

Hints and Tips

Before attempting to start the car, make sure that there is plenty of petrol, that the radiator is full of water, and plenty of oil in the engine, and last but not least, that the gear lever is in neutral.

On cold mornings, swing the engine over with the starting handle, with the magneto switch off, before using the electric starter.

To start engine turn on petrol tap and switch on the Magneto. Close the air strangler by pulling the wire attached to the instrument board, and while holding out press starter switch. Remove foot from starter switch immediately engine fires.

To ease the work of the starter on cold mornings, press out the clutch pedal, which saves churning up the oil in the Gear Box. Also flood the Carburettor. If the battery is run down and engine has to be started by hand, a good tip is to provide a piece of wood cut to a length which will hold out the clutch and wedge against the instrument board.

Do not use force when changing gear. Do not skid your wheels, it only ruins your tyres. Do not run the engine unnecessarily fast when the car is at rest.

Providing the instructions given are carried out, you will find the services at your disposal all that can be desired.

Requests by letter for spares should be addressed to the Company, R. and S. Department.

In obtaining replacements or spares, do not forget to mention the Chassis number of your car, see Fig. 24 and 36, also component number if possible, and clearly state if you are claiming for a replacement under the Company Guarantee, in which case, the defective part should be returned at once.

Spare parts are despatched from the works per return, upon receipt of letter or telegram, any hour up till 5-30 p.m.

With such close tolerances it is essential that a little care should be exercised in driving a new engine, as racing the engine or revving up when cold are apt to cause, through lack of proper lubrication, overheating and the troubles which follow.

Table below gives the revolutions per minute of the engine, for given miles per hour.

With 29 x 4.95 Tyres. 4.7 ratio.

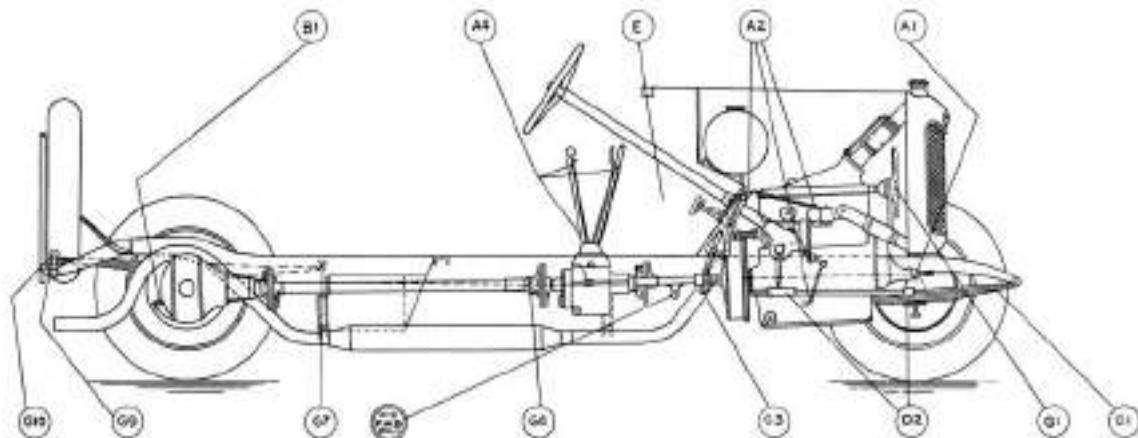
Miles per hour	1st	2nd	3rd	4th or top
10	2120	1322	852	545
30	—	3966	2556	1635
60	—	—	5112	3270

With 29 x 4.95 Tyres. 5 ratio.

Miles per hour	1st	2nd	3rd	4th or top
10	2556	1406	907	580
30	—	4218	2721	1740
60	—	—	5442	3480

To obtain intermediate figures, take the 10 miles per figure, divide by 10 and multiply by miles per hour required.

For instance, 2nd speed at 25 miles per hour, with 5 to 1 ratio = $\frac{1406 \times 25}{10} = 3513$



EVERY 2,000 MILES.

SYMBOL.

- G1. Grease Pan.
- G2. Grease Shackle Bolts.
- G3. Grease Brake Pedal Bolt.
- G4. Grease Clutch Release Shaft.
- G5. Grease Clutch Thrust Block.
- G6. Grease Sliding Coupling.
- G7. Grease Spring Shackle Bolts (fl.).
- G8. Grease Brake Cam.
- G9. Grease Rear Spring Shackles (top).

SYMBOL.

- G10. Grease Rear Spring Shackles (bottom).
- G11. Grease Long Brake Cam Bracket.
- G12. Grease P.W.B. Shaft Brackets (if fitted).
- G13. Grease Ball Joints and Tie Rod (P.W.B. if fitted).
- B1. Replenish Rear Axle with best quality Gear Oil.
- B2. Drain Oil Sump and refill with highest grade Engine Oil of summer density and in winter of winter density.

SYMBOL.

- B3. Replenish Gear Box with best quality Gear Oil.
- B4. Oil Front Axle Swivels with Engine Oil.
- B5. Oil Brake Cam Tubes with Engine Oil.
- B6. Oil Brake Compensating Tube with Engine Oil.
- E. When Clutch becomes fierce, fill to level of hole with very thin oil.

Oils we can recommend are Speedwell Motor Oil Same-qual, Wobbold's Castrol Excellent X.L. Special, Price's Hulle & Low.

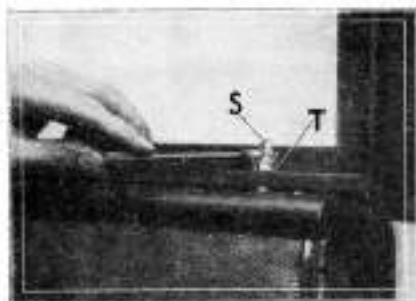


Fig. 38

Riley Side Curtains

To remove the Side Curtains of a Riley car is only a matter of a few seconds, yet when these are fixed in position they are very firm and substantial. The clamping action is by means of a split sleeve which is expanded by a tapered plug being pulled into it by means of tightening the domed nut, marked S in Fig. 38.

Removing Curtains.

When the curtains are not required it is only necessary to unslack the domed nut S, one or two turns, when the curtains can be lifted out, and placed in the receptacle provided.

If by any chance the curtains are hard to remove, just tap the head of the domed nut with the spanner, which will push the tapered plug out of the sleeve and allow it to relax.

On no account must the curtain frame nut marked T be unscrewed.

Riley Front Wheel Brakes

Lubrication. In Fig. 39 is a photo of the Riley Front Wheel Brake showing the lubrication points.

The Greaser marked K is for the swivel, and the one marked L is for lubricating the cam ball joint and action. The Tie Rod Greaser is marked M, and all these are duplicated on the other side, and require greasing every 2,000 miles.

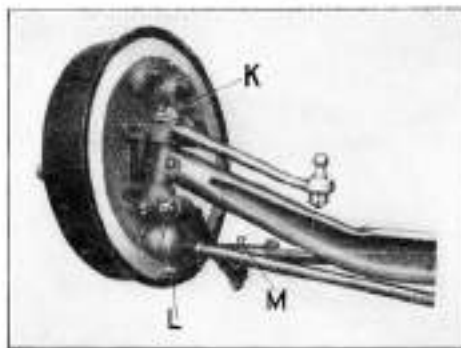


Fig. 39

CHART FOR LOCATING FAULTS

