

**CLYNO**  
CARS

*Instructions for*

THE LUBRICATION  
MAINTENANCE  
AND DRIVING OF  
CLYNO CARS



# CLYNO CARS

*Instructions for*  
THE LUBRICATION  
MAINTENANCE  
AND DRIVING OF  
CLYNO CARS

THE CLYNO ENGINEERING CO.  
(1922) LTD.  
PELHAM STREET  
WOLVERHAMPTON  
ENGLAND

*Telephone :*

1741 (5 lines)—Head Offices.  
362—Service and Repair Depot.

*Telegrams :*

CLYNO Wolverhampton.—Head Offices.  
CLYSER Wolverhampton.—Service.

# Lubrication.

## *LUBRICATION OF THE ENGINE.*

**A** SUBMERGED plunger pump, driven direct by an eccentric on the camshaft, supplies oil from the sump at the base of the engine to four pressed steel troughs into which the connecting rods dip. The height of the troughs is carefully arranged in our Test Department to give full lubrication without any possibility of smoking, and the ends of the connecting rods are fitted with small scoops which pick up the correct quantity of oil, some of which is forced through the small hole in each scoop on to the big end journal, the remainder being splashed on to the pistons, gudgeon pins, and valve gear. The troughs are always full, because the pump delivers more than the required quantity of oil at any speed, the excess simply running over the sides of the troughs and through a large and accessible oil filter back into the sump, to be used again. The oil pump also supplies oil under pressure direct to the large plain bearings supporting the crankshaft, the overflow from the front bearing being carefully trapped and carried to a well in the timing chain case. The chain driving the camshaft, magneto and dynamo spindle passes through this well of oil and carries the lubricant along to galleries which connect up with the camshaft and magneto shaft bearings.

On the offside of the crankcase is bolted a very accessible oil filler, provided with a filter for straining the oil as it is passed into the engine. From the filter the lubricant passes into the crankcase, and so through the large filter into the sump. Projecting from the side of the sump is an oil level rod, which can be withdrawn to test the height of the oil in the engine. On this rod are two marks representing a maximum and minimum level, and it is essential that the height of the oil be within the limits of these two marks; when it falls low fresh lubricant must be poured through the filler until it reaches the top mark. This should be checked every 250 miles.

It is advisable to run off the old oil periodically, say once every 2,000 miles, by removing the plug or small cover at the base of the sump. Replace the plug or small cover and pour in through the filler sufficient clean paraffin to reach the bottom mark on the oil level rod, after which turn the engine with starting handle a few revolutions, and then empty the paraffin, allowing time for it to drain through. Afterwards fill up to the maximum height with clean lubricating oil.

### *LUBRICATION OF THE GEARBOX.*

By removing the floor-board immediately in front of the driving seat the gearbox is exposed to view. On the top of the gearbox will be found the oil filler plug, while towards the bottom, on the near side of the box, a small oil level plug is located. When charging up with oil it is necessary to remove these two plugs, the oil being poured in at the top until it begins to overflow from the hole in the side. Overfilling of the box is not to be recommended on any account, and for this reason it is most important that the instructions with regard to the oil level be strictly adhered to. Care must be taken to screw the two plugs absolutely tight home when the oiling process is finished. The drain plug in the base of the gearbox should be occasionally removed, the box swilled out with paraffin and recharged with oil. The lubrication should be attended to at least every 500 miles.

### *LUBRICATION OF BACK AXLE.*

On the side of the back axle casing, and just below the centre of the axle shaft, is a similar plug to the one on the gearbox : this acts as a filler and oil level plug combined, oil being poured in until it begins to run over. The wheel bearings are lubricated by a slight excess of oil from the axle casing. Lubrication of the axle should be attended to at least every 1,000 miles.

### *LUBRICATION OF THE STEERING BOX.*

By raising the offside half of the bonnet the steering box at the base of the column is exposed to view. The plug in the top of the box must be removed and a charge of lubricant poured

in until it is level with the bottom of the plug hole. The operation should be performed at least every 1,000 miles.

### *LUBRICATION OF FRONT HUBS.*

After removing the wheel nuts and hub cap, but not the wheel itself, the end of the hub shell is exposed, showing a small plug, which must be removed and a charge of oil injected. This operation should be attended to at least every 1,000 miles.

### *LUBRICATION OF CLUTCH THRUST BEARING.*

On the clutch shaft, immediately behind the front flexible disc, is a ball bearing, which takes the thrust when the clutch is disengaged. To ensure a smooth and easy operation, this race must be well lubricated. A charge of lubricant should be injected every 250 miles by means of the grease gun through the adapter on the shaft.

### *LUBRICATION OF GEAR CONTROL MECHANISM.*

The mechanism for the right-hand control to the gearbox may be exposed by removing the floor-board immediately in front of the driver's seat. An occasional drop of thin oil is required on this control, injected through the small oilers, one in the centre and one on the right-hand swivel bearing.

### *LUBRICATION BY GREASE GUN.*

As indicated with a letter "F" on the oiling diagram, a number of parts are provided with adaptors for grease gun lubrication. Grease should be injected from the gun through the adaptors until it commences to force its way out at the various joints. By this means the old lubricant, and any foreign substance which may have collected, may be displaced by the new grease. When lubricating the four brake cam spindle bearings on the back axle and the two on the front axle, care should be taken not to force too much grease through, otherwise it might possibly find its way on to the brake shoe linings. The greasing of such parts should be attended to every 250 miles.

### *LUBRICATION OF PEDALS, LEVERS, Etc.*

All rotating and rubbing surfaces of the car require lubrication, with the exception of the actual braking surfaces of the brakes and the exhaust and inlet valve stems. Do not wait for a squeak to develop, as this is proof positive of previous neglect. Work a drop of oil periodically into all the moving parts of the various controls and between the blades of the main suspension springs. This will ensure freedom of movement, highest efficiency, absence of noise, and longer life for the working parts. This also applies to the bonnet fasteners, door hinges, screen fittings, door locks and hood joints, which tend to get stiff in their action, due to rain and washing down.

### *LUBRICATION OF MAGNETO, DYNAMO & STARTER.*

For particulars with regard to these units please refer to pages Nos. 21 and 22.

### *LUBRICATION OF BRAKE CONTROL MECHANISM.*

It is very essential that all the bearings and joints on the front and rear controls to the brakes are kept in good condition and well lubricated. Failure to observe this rule will conduce to a heavy operation and probable loss of power due to the brakes failing to thoroughly free themselves. The brake pedal should return under spring pressure to its free position when the brakes are not in use. This position is determined by the pedal stop (see page 9) which allows the pedal to come back until it almost touches the front of the toe board. The brake cam spindles on front and rear axles must be kept free by regular attention to the lubrication (see note on page 5).

## Maintenance.

### BRAKES.

THE brakes are of the internal expanding type, two pairs of Ferodo-lined shoes operating inside each of the rear axle-drums and, on cars having four-wheel brakes, one pair inside each drum on the front axle. To operate the four wheel brakes the foot pedal is connected through a compensating mechanism to independent cross shafts and from there through suitable levers to the brake cam operating mechanism. Although the front and rear brakes are compensated so that each set does its correct proportion of braking, the independent brakes on each axle are not compensated. This has been found to be the best practice but greater care has to be taken with the adjustment to ensure that each brake does its share of the work. The adjustment and care of the brakes is one of the most important matters in the maintenance of a car. It is essential to remember that the foot-pedal or hand brake lever should not be at the limit of its travel, even when the brakes are hard on, and that the braking surfaces should not be rubbing when the brakes are off. To adjust the brakes, wing nuts are provided at the ends of the six brake rods, two over the front axle and four behind the openings in the side valances above the running boards. Of the latter two pairs the outer or nearer nut on each side is for the adjustment of the hand brakes, while the inner ones are for the rear foot brakes.

When adjusting it is advisable to jack up the front axle until both wheels are well clear of the ground. Have an assistant to press the foot brake pedal *partly on* and adjust the front wing nuts until the hand pressure required to turn each of the front wheels is equal. The same operation must then be repeated on the back brakes with the hand brake off. As a check that the brake surfaces are not rubbing when both brake controls are in the disengaged position, a light tap with a hammer or spanner on the circumference of the drums should produce a clear bell-like note. When correctly adjusted the

small compensating bar (marked "X" in illustration on page 10) should be as near as possible to the vertical when the brakes are applied.

For quicker but not such accurate results, without jacking up the car, the assistant should press the pedal down about 1" and the tap of a spanner on the drum circumference should produce a similar sound in each separate pair when correctly adjusted. If the application of the brakes tends to pull the car to one side it is a sure sign that on that side one or both brakes are coming into action before the others and adjustment should be made accordingly.

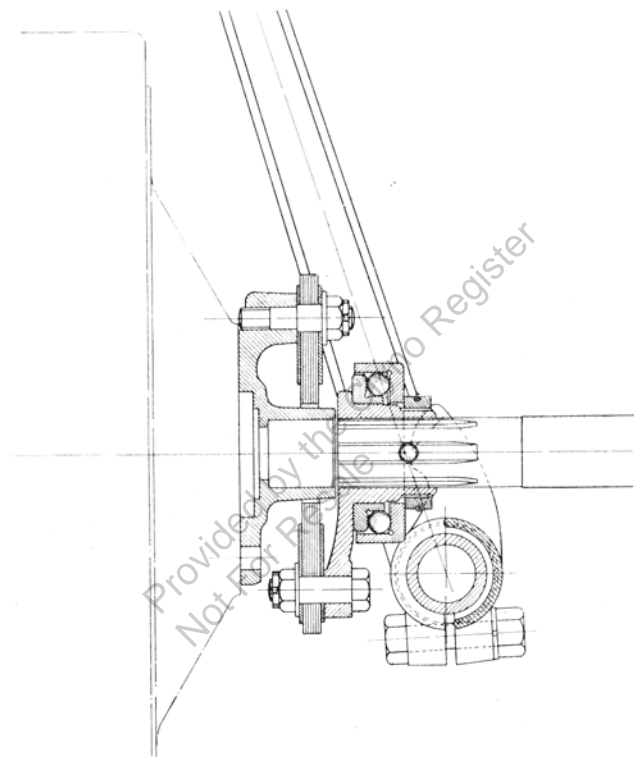
The separate adjuster screw which operates against the face of the front brake cam lever may be used only occasionally to adjust the long levers on the axle back to normal, after considerable wear has taken place on the brake liners. Should it be necessary to examine the brake shoes and linings, the brake drums may be easily detached after removing the wheels and the two screws holding each drum in position. A drop of engine oil on the moving parts not provided with greasers is a great essential towards efficient brakes.

### *CLUTCH AND CONTROL.*

The clutch is of the "inverted" cone type, lined with a special fabric giving good engagement and long life, with a minimum of attention. The application of pressure to the clutch pedal disengages the clutch faces through the medium of a forked lever on the pedal shaft, which operates against a ball-bearing thrust race on the end of the clutch shaft. This operation moves the clutch shaft forward a very short distance, and to prevent strain coming on the universal joints the rear end of the shaft is a sliding fit on the splined shaft projecting from the gearbox, being lubricated through an oilway from the latter. Once the clutch face is bedded down very little attention is required with the exception of an occasional charge of lubricant injected into the bearing, and on the face of the thrust bearing forked lever and pedal shaft bearings. The ball thrust bearing is adjustable for wear, a serrated lock-nut being provided which, on removal of the spring steel locking ring, may be screwed up until only sufficient play is left to ensure free running. Care must be taken that the projecting tongue on the lock ring engages in a hole in the nut and in the screwed centre piece; also that the ring



lies embedded in the annular groove. When correctly adjusted there should be  $\frac{1}{16}$ " gap between the operating fork and the ball thrust race when the pedal is right back against the stop. As the clutch lining beds down it will be necessary to make an occasional adjustment to the stop to ensure that the gap has

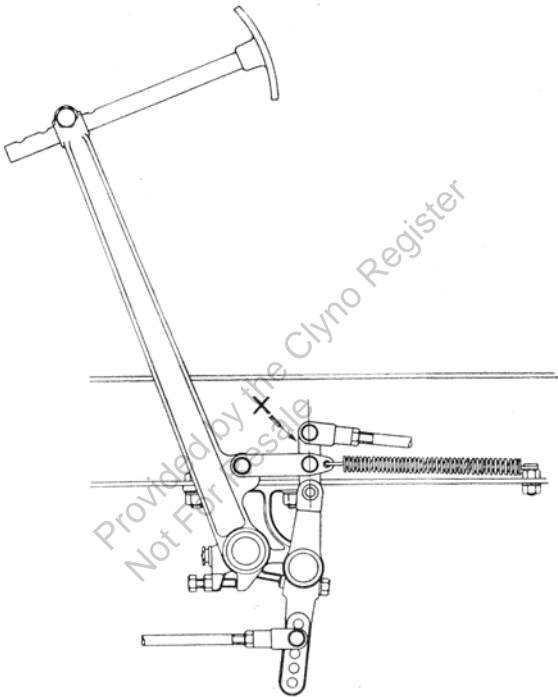


CLUTCH WITHDRAWAL FORK AND THRUST RACE.

not been closed up. The pedal stop is an adjustable screw with lock-nut incorporated in the near-side pedal shaft bracket under the chassis frame, and by releasing the lock-nut and screwing in or out the gap can be varied at will. A similar stop is provided for the brake pedal, but this should require no attention, as it is correctly adjusted before leaving the factory.

### FOOT CONTROL PEDAL TREADS.

The position of the clutch and brake pedal foot-treads may be altered to suit the individual driver by withdrawing the bolt in the top of the pedals, and adjusting the tread backwards or

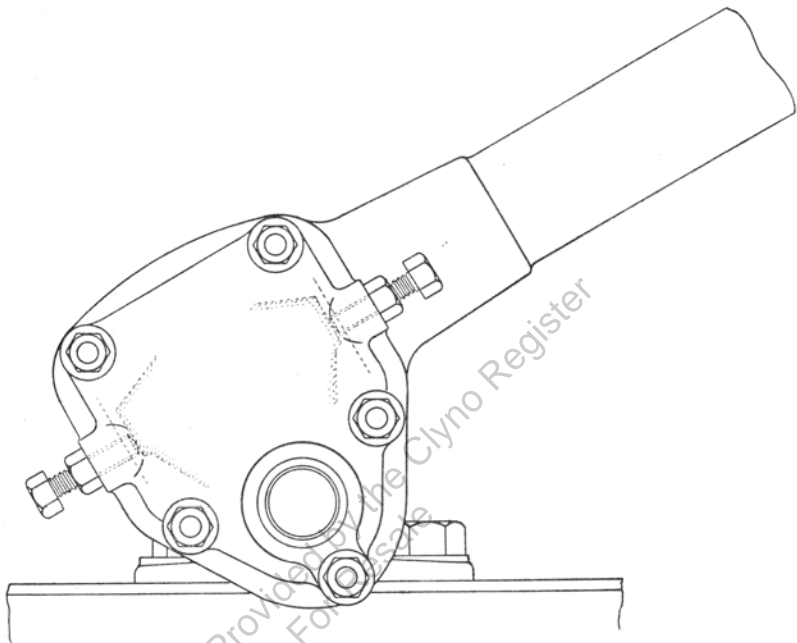


FOOT BRAKE ADJUSTABLE PEDAL

forwards another notch, afterwards replacing the bolt and pulling up tight with the nut. In a similar manner the accelerator pedal may be adjusted by passing the fulcrum pin at its forward end through a different hole in the rod. Care should be taken to ensure that full throttle opening is obtainable if this adjustment is made.

## STEERING GEAR.

With the exception of the lubrication very little attention is required to this component, the necessary adjustments being made before the car leaves the factory. An adjustable steering

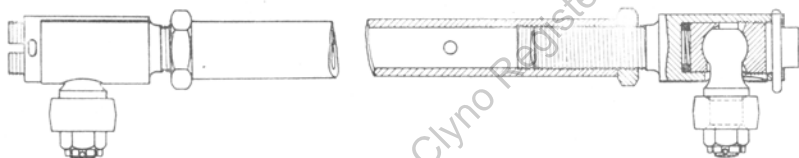


STEERING BOX AND ADJUSTABLE STEERING LOCK STOPS

lock is provided on the steering box, in the form of two screws with lock-nuts, but these should not be altered except in case of necessity. To take up wear, and to reduce the strain thrown on the steering when the road wheels hit some obstruction, the blocks on either side of the ball at the front and rear end of the steering connecting rod are spring loaded. One of the most frequent causes of damaged steering gear is due to running too closely to the kerb when pulling up, and trying to steer away too quickly when moving again. It should be borne in mind that one is able to exert enormous power through the leverage of the steering wheel and gear. For this reason, never attempt to turn the steering wheel while the car is stationary unless someone helps by pulling one of the road wheels round at the same time.

## FRONT WHEEL ALIGNMENT.

To prevent undue wear on the front tyres it is advisable to occasionally check the alignment of the wheels and if necessary adjust the track rod which couples the steering arms on the stub axles. When the front wheels are pointing straight ahead the distance between the inner edges of the wheel rims at the height of the hub centres should be  $\frac{1}{8}$ " to  $\frac{1}{4}$ " less at the front than at the back. Should adjustment be necessary the track rod is provided with a right and left hand thread at the separate ends which automatically adjusts the centres when the tube is revolved by a  $\frac{3}{16}$ " tommy bar inserted in the hole at the



ADJUSTABLE TRACK ROD.

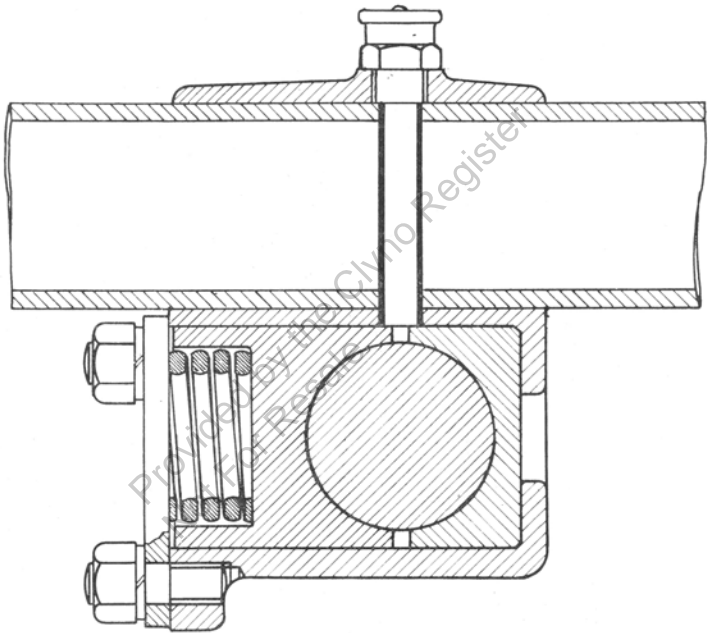
one end of same. Care should be taken to release the lock-nuts before attempting adjustment, and to tighten same again when the operation is completed. Should end play develop in the ball joint at each end of the track rod it must be eliminated by tightening up the screwed ball sockets at the extremities of the rod so that a bare running clearance remains which will not bind in any position. The split pin locking the screwed socket in position must be replaced when the adjustment is complete.

## CHANGING WHEELS.

The wheels are readily detachable for tyre repairs, etc., by removing the wheel nuts (for which purpose we provide a special brace), when the wheels and cover plates easily slide off without disturbing the hub. It is, of course, necessary to raise the wheels from the ground before commencing, by lifting the axle with the "lifter jack." The wheel nuts are made of special brass to prevent them rusting to the wheel studs.

*GEARBOX.*

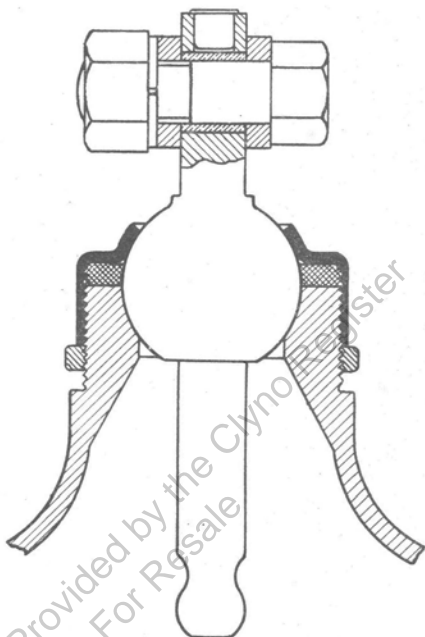
The gearbox is mounted on the front end of the torque tube, the rear end of the latter being attached to the axle casing. At the front of the gearbox is a high tensile steel support ball, which acts as a connection to the chassis frame while allowing for free movement of the whole unit.



GEARBOX PIVOT SUPPORT.

This support ball is enclosed in a pair of spring loaded phosphor bronze sockets, which are self-adjusting for wear, and require no attention other than occasional lubrication by means of the grease gun. The change-speed gearbox lever is mounted in a ball socket, having an adjustable cap and screwed lock-ring.

To adjust to give the lever the correct amount of freedom without rattle, slack back the lock-ring and screw the cap down the required distance, afterwards locking the ring back in position.



CHANGE-SPEED LEVER BALL SOCKET ADJUSTMENT.

It is most important that the gear control shaft be kept clean and well oiled where it passes through the swivel bracket on the frame at the right hand end, otherwise considerable binding may be set up which would have an effect on the gear changing.

#### *DECARBONIZING THE ENGINE.*

It is advisable, say every 2,000 to 3,000 miles, to clean the deposit of burnt oil out of the combustion chambers. This should not be undertaken by the novice, but should the owner possess some expert knowledge he can proceed by draining off the water from the radiator, releasing the top hose clips, and sliding the hose up the radiator pipe. The cylinder head,

which is detachable, can now be removed by unscrewing the nuts which hold it on and slowly turning the engine over by hand. By this means the compression will be sufficient to raise the head slightly, making it a very easy matter to remove it by hand. Care must be taken that the gasket or cylinder joint washer is not damaged, otherwise it will be impossible to produce a gas-tight joint when the head is replaced. The carbon may now be scraped from the top of the pistons and the inside of the head, and after examining carefully to be sure no particles remain on the valve seats or cylinder walls the head may be replaced and tightened down. After running the engine a short time give the nuts a final tighten. A coating of shellac or goldsize on both faces of the gasket ensures a perfect gas-tight joint.

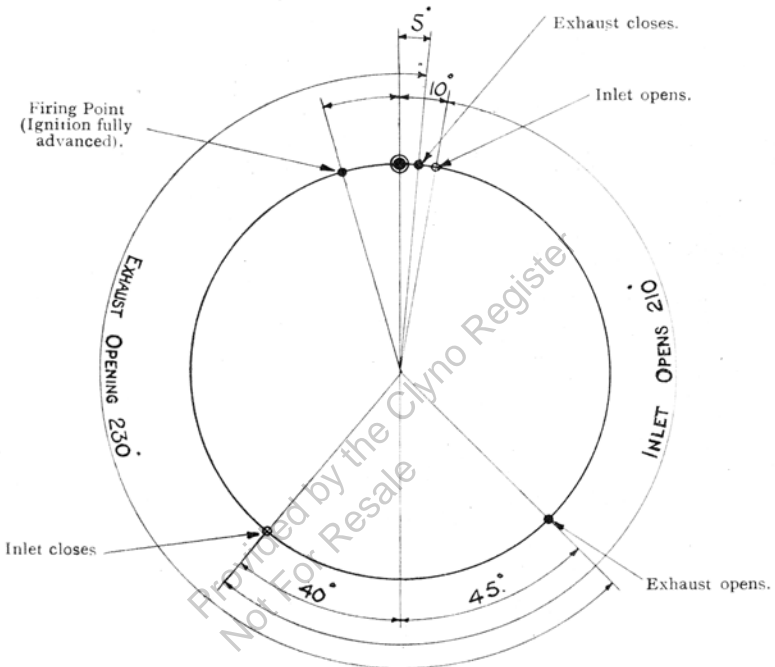
### TO REMOVE THE MAGNETO.

Should it be necessary to dismantle the magneto from its platform it is advisable to do so in such a manner that it can be replaced later without alteration to the relative positions of the flywheel and contact breaker. *On the 11 h.p. engine* after releasing the screw at the top of the magneto strap, and removing the set-screw from under the rear end of the platform, the magneto can be detached from the engine, providing the control and H.T. wires have been previously disconnected. *On the 13 h.p. engine* it is also necessary to remove the two bolts from the flexible coupling but the bolt clipping the steel driving arms to the shaft must not be interfered with unless it is necessary to alter the timing. Should it be desired to leave the H.T. wires in position, the distributor cover may be unclipped from the magneto. Great care must be taken that the magneto is correctly in line when replacing, and that the driving coupling is assembled in the same condition and position as before dismantling. After the other parts are in place the set-screw must be finally tightened down.

### TIMING THE ENGINE.

If the chain driving the magneto and the camshaft has been removed, making it necessary to re-time the engine, the following procedure must be carefully followed. Turn the flywheel until No. 1 piston (nearest the radiator) is at the top of its stroke, in which position a mark on the flywheel rim will be found to register with the pointer on the crankcase. Now move

the flywheel in its normal direction of rotation until the mark on the rim is approximately  $\frac{1}{2}$ " from the pointer. The camshaft must now be rotated until the exhaust valve has just closed and the inlet valve is just about to open on No. 1 cylinder, in



TIMING DIAGRAM.

(One inch on circumference of flywheel is approx.  $100^\circ$ )

which position the chain may be refitted. To re-time the magneto, turn the spindle until the distributor carbon brush is on No. 1 segment (*i.e.*, the lower metal insert which lies on the "near-side" of the magneto). With the timing lever of the magneto set fully advanced, the contact breaker points should be just about to break when No. 1 piston is nearing the top of the compression stroke, in a position equivalent to  $1\frac{7}{8}$ " on 11 h.p. and  $2\frac{1}{2}$ " on 13 h.p. models, on the circumference of the flywheel rim, from the dead-centre mark to the pointer, a line to correspond with this position will be found on the flywheel. Should



it be necessary to detach the H.T. wires, care must be taken to replace them in the same position. For this purpose it is useful to remember that the firing order is 1, 2, 4, 3, and that the near-side wire on the magneto connects up to No. 1 plug (nearest the radiator); the next one across the top of the distributor to No. 2 plug, the next to No. 4 and so on.

#### *TIMING CHAIN ADJUSTMENT (11 H.P. Models only).*

The adjustment of the chain to give the correct tension is a very delicate operation, and should only be performed by a person possessing expert knowledge. The adjustment is made by moving the magneto platform, a special screw with lock-nut being provided for this purpose. First slack back the nuts on the two bearing flanges at the front and rear of the timing cover; the latter is integral with the magneto platform. When adjusting, care must be taken that the front bearing is correctly aligned with the shaft; also that the small screw underneath the magneto platform is adjusted down to touch the flange on the side of the crankcase. For this purpose it is necessary to remove the magneto.

#### *TIMING CHAIN ADJUSTMENT (13 H.P. Models only).*

This is also a delicate operation for the expert only to perform. The timing chain passes over a jockey pulley or sprocket in the lower half of the timing case on the near side of the engine. This jockey pulley takes up the slackness in the chain by the simple adjustment of the screw projecting from the under side of the crankcase, which when screwed inwards forces the pulley further into mesh, tightening the chain automatically. Care must be taken to tighten home the locknut after adjustment.

#### *DYNAMO DRIVING CHAIN ADJUSTMENT.*

To allow for the adjustment of the chain, the dynamo flange is attached to the engine case by three bolts, two of which pass through slots in the flange, while the third passes through a plain hole. After slacking back the two first-mentioned bolts the dynamo may be raised slightly until the chain slackness has been reduced, care being taken that the chain is not too tight, otherwise undue wear and noise will result.

## TAPPET ADJUSTMENT.

To adjust the tappets to give the correct clearance off the valve stems of six-thousandths exhaust and four-thousandths of an inch inlet, it is necessary to remove the valve cover plates, taking care that the distance pieces and springs inside the valve chamber on 11 h.p. Models are not detached from the two studs. After releasing the lock-nut at the top of each tappet, the screws may be adjusted until the desired clearance is obtained, care being taken that the lock-nuts are tightened up again. The small screws with locknuts, projecting from the side of the cylinder below the tappets *on the 11 h.p. Engine* are for location of the tappets and to prevent them from turning in their guides. These screws, which have a small steel ball at their inner end locating in the groove in the tappets, should not be interfered with except when replacing tappets.

## THE COX "ATMOS," MODEL "B" CARBURETTER.

After very exhaustive tests of various makes of Carburetters, the Cox "Atmos," Model "B," has been found to be the most suitable instrument for our engines.

It is also the most suitable carburetter from the user's view point, as there is nothing in it to vibrate or wear out of adjustment, and in the event of either the pilot or main jet becoming dirt-choked, they can be cleared of such obstruction in a few seconds without the use of special tools or even turning off the main fuel supply.

## INSTRUCTIONS FOR CLEANING THE COX "ATMOS," MODEL "B" CARBURETTER.

The Carburetter as fitted to the 1926 Model Car, has a *non-adjustable* main jet, as distinct from the adjustable main jet fitted on earlier cars.

The pilot jet air regulating cap is *adjustable* in place of the fixed size of orifice or non-adjustable type, previously fitted on "B" Type Carburetters.

Figures 1, 2, 3 and 4, show how to clear a choked main jet, or pilot jet, also how to clean the filter, and if desired, how to remove the float chamber.

**TO CLEAR CHOKED PILOT JET**

WITH FINGERS. UNSCREW **CAP G<sup>1</sup>**. ATTACH TYRE PUMP, OR SUITABLE LENGTH OF RUBBER TUBE TO THREAD **G**. A FEW STROKES OF THE PUMP OR A SHARP BLOW OR SO WITH THE MOUTH THROUGH RUBBER TUBE WILL EFFECTUALLY CLEAR **JET**.

REPLACE **CAP G<sup>1</sup>** AND SCREW TIGHT DOWN.

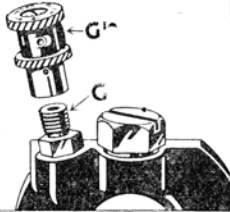


Fig. 1.

**TO CLEAR MAIN JET**

WITH EDGE OF COIN OR SPANNER UNSCREW NUT **L** AS SHOWN. LIFT OUT **JET CARRIER M** **JET** WILL BE FOUND FIXED IN BOTTOM OF **CARRIER** AS SHOWN **M<sup>1</sup>**. BLOW **JET** CLEAR OF OBSTRUCTION AND REPLACE.

WHEN REPLACING SEE THAT **FEATHER PEG N** ENGAGES WITH SLOT, REPLACE **CAP** AND TIGHTEN WELL DOWN. DO NOT POKE **JET** WITH ANY METAL INSTRUMENT.

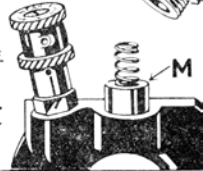


Fig. 2.

**TO REMOVE FLOAT CHAMBER**

UNSREW **PETROL PIPE UNION D** THEN REMOVE **JET BODY NUT C** **FLOAT CHAMBER** CAN THEN BE REMOVED. NOTE CAREFULLY NUMBER OF **PACKING WASHERS** AT **J<sup>1</sup>** AND SEE THAT **SAME** NUMBER ARE RETAINED WHEN REPLACING **CHAMBER**, NUMBER OF **WASHERS** AT **POSITION J<sup>2</sup>** ARE IMMATERIAL, PROVIDING THERE IS AT LEAST ONE. DONT WIPE INSIDE OF **CHAMBER** WITH ANYTHING LINTY.

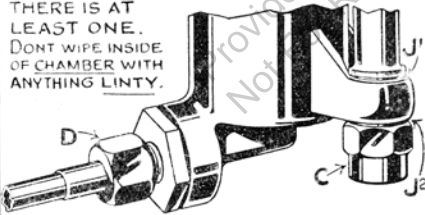


Fig. 3.

**TO CLEAN FILTER**

REMOVE **PETROL PIPE UNION D**. THEN REMOVE **GLAND NUT R**. **FILTER GAUZE S** CAN THEN BE TAKEN OUT FOR CLEANING BY REMOVAL OF **BRASS SPRING RING T**.

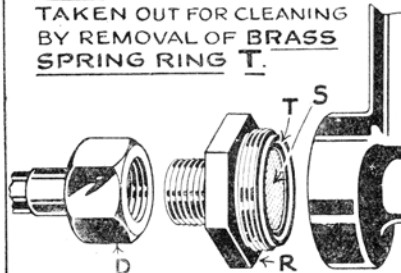


Fig. 4.

If the filter receives periodic attention, say every 400 or 500 miles, very little if any, trouble will ever occur, in the way of choked jets. Nevertheless, it is quite good practice to remove the main jet, and to blow through it, say, once per month, as an occasional clean keeps it up to concert pitch, and the Engine up to its full power.

The jet is located in the bottom of the carrier plug as shown M.1. fig. 2, and the figures on the side of the plug indicate its calibrated size. This jet is not removable from the carrier plug.

When cleaning, on no account must any metal instrument or piece of wire be poked into the jet.

### CARBURETTER ADJUSTMENTS.

Referring to fig. 5, the screw "G" provides an adjustment for the slow running of the Engine when idling; by screwing inwards or outwards the engine runs faster or slower. The lock nut should be tightened after adjustment. While the screw "G" only provides an adjustment for the quantity of the mixture, the adjustable air cap for the pilot jet "G1" governs the quality of the idling engine mixture. Turning the slotted screw with a small screw-driver, a click or so to left or right will weaken or enrich the mixture, the best position being obtained by trial and error so that the engine given an even beat on each cylinder without intermittent firing. The Diffuser tube "H" held in position by the spring clip "H1" need never be removed, otherwise than for changing the choke tube.

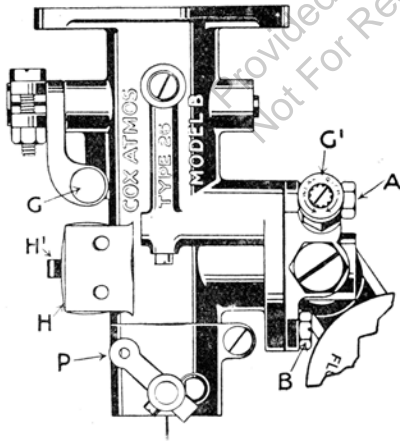


Fig. 5.

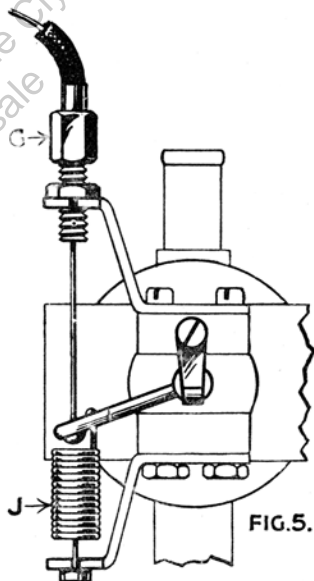


Fig. 6.

FIG.5.

## SPECIAL FITTINGS FOR CARBURETTER.

For those who prefer to carry spare jets of different sizes, interchangeable carrier plugs complete with jets, can be supplied (price 2/6 each). The jet sizes run in differences of 5, i.e. 90, 95, 100, etc; the higher the number the larger the jet.

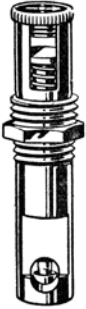


Fig. 7.

For those who prefer a jet which is adjustable, an interchangeable carrier plug, *Fig. 7*, can be supplied (price 5/- each). The jet is regulated in this instance by means of a taper needle, and can of course, be set to any desired size. This fitting is particularly useful for anyone touring the Continent, especially the high passes of the Alps, etc., as it provides instant re-adjustment of the Carburetter, which may be required for altitudes over 3,000 feet, or for the extreme variation of fuel character met with in various parts.

For those who like to be able to control the mixture character from the driving seat, or cut the fuel supply completely off so that open throttle can be used to pass the full volume of pure air to the Engine, when the latter is used as a brake for descending steep hills, an attachment shown in *fig. 6* can be supplied. This attachment which is supplied with the correct length of Bowden Cable, and a lever to attach to the Steering Column, is very easily fitted. (Price complete with full fitting and working instructions 30/-).

## MAGNETO.

The front bearing requires a spot of light oil every 1000 miles in the lubricator provided for this purpose, otherwise the lubrication is automatic and need not concern the driver in any way. To inspect the contact breaker remove the small end cover by sliding the spring clip to one side. The gap between the two platinum contacts should be .018 of an inch when fully opened, and a gauge for measuring same is to be found on the small magneto spanner included in the tool kit. If necessary, the gap may be adjusted with this spanner by means of the screwed contact. See that the platinum contact surfaces are clean and free from oil. Should it be necessary to remove the contact breaker from the magneto, care must be taken that it is refitted with the key properly engaging the keyway, and the centre screw tightened up with the magneto spanner without using too much force. The distributor cover should be occasionally removed and cleaned internally with a rag soaked in petrol.

## DYNAMO.

The bearings should be lubricated about every 1,000 miles with a drop of thin oil, injected through the oilers. In order to obtain satisfactory running it is advisable to remove the end cover occasionally for an inspection of the commutator and brush gear. Should the surface of the former be discoloured it should be cleaned with fine glass paper (not emery cloth), and any dust which may have collected must be removed. All the brushes should slide quite freely in their holders, and should "bed" over the whole surface in contact with the commutator. Badly worn brushes should be replaced by new ones. On no account must the position of the brush holders be altered; the output from the dynamo is regulated by the relative position of the brushes, and alteration might cause considerable damage. Where 6 volt. sets are fitted the normal output indicated on the ammeter should be 10 amps. Should it fall below 6 amps., or rise above 12 amps., even after the above attention has been given, it is necessary to have the dynamo regulated by a skilled electrician. With 12 volt. sets the normal output is 9 amps and it should not fall below 6 amps., nor rise above 12 amps.

## STARTER.

The remarks under "Dynamo," with regard to lubrication and attention to commutator and brush gear, also apply to the starter. No lubrication of the Bendix Drive pinion and pinion shaft is required, but they should be cleaned occasionally with a petrol soaked rag to remove any dirt which may have collected and which may tend to clog the action of the pinion.

## BATTERY.

Regular attention should be given to the battery, as neglect will cause unsatisfactory results and also materially affect the plates. The level of the electrolyte (pure dilute sulphuric acid) should be checked at least once a month, the correct height being approximately  $\frac{1}{4}$ " over the top of the plates. Replace shortage by *distilled water only*, unless the loss is due to spilling of the electrolyte, in which case it must be made up by a dilute acid solution of strength indicated on battery label. Under no circumstances should the electrolyte be removed from the battery and the plates allowed to dry. Keep terminals clean and tight, and smear with vaseline to prevent corrosion.

## TYRES.

Correct inflation, particularly with low pressure tyres, is one of the greatest essentials for obtaining good tyre mileage. The weight per axle determines the pressure to which the tyres should be inflated. Low pressure tyres 715×115 m/m or 27"×4.4" should be inflated to a pressure of 22½ lbs. on the front and 27 lbs. on the back wheels. The larger tyres, 28"×4.95", should be at pressures of 20 lbs. and 24 lbs. respectively. These pressures are for the normal weights carried by the four-seater cars and it must be clearly understood that heavier loads require a corresponding increase in tyre pressures to prevent excessive bending and consequent fatigue of the casing. The pressures should be tested occasionally by applying a gauge to the tyre valve. The wheels should not be washed if the tyres are deflated, otherwise water and grit will penetrate to the inside of the tyres. Great care should be taken to prevent oil coming in contact with the tyres. Even though it may not be necessary to change the wheels, it is very advisable not to leave the spare tyre unused for more than two or three months, but to bring it into service in rotation, by changing the wheels from time to time. When removing or re-fitting a tyre cover do not use force or attempt to stretch the edges of same over the rim edge. By pushing the tyre edge down off the rim shoulder into the depressed centre of the wheel, the edge of the tyre can easily be lifted over the edge of the wheel rim at another point.

To drive a car on a deflated tyre is ruinous to both cover and tube. Directly a tyre goes down the car should be stopped and the cause ascertained. If in doubt reinflate the tyre and test the valve by means of a film of moisture over the open end of same. Should this be the seat of the trouble tighten up or repair as the case may require. To tighten use the slotted end of the small inner cap.

## RADIATOR.

It is better, if possible, to always fill the radiator with soft water to within two inches of the top of the filler, and to replace from time to time any which may have evaporated. In frosty weather it is advisable to drain off all water if the car has to be stored overnight in a cold place, refilling with a fresh supply before running the engine again. A drain plug for this purpose is provided at the bottom of the radiator. Never move the car by pushing or pulling at the radiator: a weakness might develop in the casing which would eventually cause a water leak.

## BODY WORK AND FITTINGS.

To keep the paintwork and varnish in the best of condition it is essential that the car be cleaned down properly as soon as possible after becoming dirty. For this purpose a plentiful supply of cold water at a moderate pressure is necessary to loosen and wash off the mud without damage to the varnish. It will be necessary to use a sponge in the stream of water to finally remove the last traces of mud and grit, but it should be used carefully to ensure that no scratches are made by solid lumps of dirt embedded in its surface. When the car has been thoroughly washed down, and all dirt removed, leathering down with a chamois leather is necessary to soak up all the water on the varnish. The chamois leather should be washed out in clean water and wrung nearly dry for this operation. A soft leather smeared with a little pure vaseline can be used for removing tar spots from the body. Petrol or paraffin must not be used for this purpose, Dust should never be wiped off dry, but always washed off; a plentiful application of cold water improves and hardens the varnish. A newly finished car should not be left standing in the sun on a hot day, as the heat may blister the varnish. The hood should not be left in the folded condition when damp, leave it up until it is dry.

Do not try to clean the upholstery or hood with petrol or any similar substance; use soap and water, and at once thoroughly dry.

The metal fittings, *with the exception of the lamp reflectors*, may be cleaned with any good brand of metal polish. It is not advisable to polish the lamp reflectors unless absolutely necessary, and then it is only to be done with a very fine chamois cloth used lightly with, but preferably without, jewellers' rouge, damped with petrol.

The instrument board, and other French-polished surfaces, should never be washed with water and should be protected from rain. To revive the brilliancy of these parts use linseed oil.

Drops of water left to dry on the varnish cause a spotty surface, which can only be removed by subsequent washing. For this reason washing the car in the sun is not to be recommended.

When using the hose, care should be taken to allow no water to get into the interior of the bonnet through the radiator or bonnet louvres. It is also desirable to allow no water to pass into the interior of the brake drums.



# Driving.

## TO START THE ENGINE.

See that there is oil in the crankcase, as per instructions on page 3; that there is petrol in the tank, and water to the top of the radiator. Make certain that the change-speed gear lever is in the neutral position, where it can be moved from side to side; that the petrol tap is turned on, and the magneto switched on. Slightly flood the carburetter, close the air strangler by means of the control on the instrument board, adjust the throttle control on the steering column to open the throttle only the smallest amount, and start the engine by pressing the starter switch on the dashboard below the petrol tank with the ball of the foot. The strangler control should be immediately released when the engine starts, otherwise the over-rich mixture will probably cause it to stop again. Once the engine is warmed up it is unnecessary to flood the carburetter when restarting. On a cold morning, when the engine is very stiff, it is advisable to start the engine up with a turn of the hand-lever, to prevent excessive load on the battery and starter. Before doing so, the magneto control should be partly retarded, to prevent a back-fire, which might cause bodily injury. Otherwise this control should always be in the *full advanced position* except on hills where it may be advisable to gradually retard the ignition as the engine revolutions fall.

## TO START THE CAR FROM REST.

Withdraw the clutch by depressing the left foot-pedal and, after waiting a moment, pull the gear lever inwards and backward into first speed. Release the hand-brake, and gently engage the clutch by relieving the pressure on the clutch pedal, at the same time gradually accelerating the engine by depressing the small middle foot-pedal slightly with the right foot.

## CHANGING GEAR WITH THE RIGHT-HAND GEAR CONTROL.

The car being now under way, speed it up to about 8 miles per hour by depressing the accelerator pedal, and then change into second speed as follows. Release the accelerator pedal and withdraw the clutch; push the gear lever into second speed, which lies outwards and forward, making a slight pause in neutral, and let the clutch in again, finally depressing the accelerator pedal. When it is desired to change into top speed

follow out the previous instructions, but pull the gear lever straight back, allowing it to dwell in neutral slightly longer than before. "Changing down" correctly requires slightly more skill than "changing up"; it is assisted very materially by what is commonly termed "double de-clutching." The correct time to change is when the engine begins to show signs of labouring, or preferably just before, the best results being obtained by changing down early. When changing, slightly depress the clutch pedal, push the gear lever into neutral, let the clutch in again, and accelerate the engine momentarily, immediately de clutch again, at the same time pushing the gear lever into the required position. By letting in the clutch and accelerating the engine while in neutral, the gears to be engaged are brought to an equal speed, and clashing teeth are avoided. Another method of changing to a lower gear is to very slightly depress the clutch pedal, allowing the clutch to slip momentarily, and keeping the throttle open while, at the same time, the gear lever is moved smartly into the required position.

To engage reverse, follow the same procedure as when starting the car from rest, but move the lever inwards and forward. Never attempt to get into reverse until the car is *absolutely* stationary, and after reversing do likewise before attempting first speed.

When making a change of gear, don't use force on the gear lever; cultivate a sense of touch which with the least effort will bring about the desired effect without noise or damage to the gears.

## BRAKING.

Before starting on a run the brakes should be tested, and if adjustment be necessary it should be attended to immediately. Various down grades call for different treatment; some may be toured down with the throttle quite closed, while others call for the *alternate use* of the hand and foot brakes, or in emergency both brakes combined. At all times the car should be kept well in hand, particularly on very steep gradients. If necessary the engine may be converted into a very efficient auxiliary brake, by placing the low gear in mesh before starting the descent of a bad hill, leaving the throttle closed and the ignition switched off. Only in emergency should the brakes be applied violently.

## GENERAL HINTS TO DRIVERS.

Don't take risks on corners, at cross roads, or when entering a main road. It is at these places that most of the serious accidents occur.

Don't overtake and try to pass slower moving cars when driving round a bend in the road.

Don't leave the car on a bend or anywhere where it may be an obstruction to other traffic.

Don't apply the brakes suddenly, stop or turn, without due warning of your intentions to traffic which may be following immediately behind.

Remember that the silence of the Clyno Car makes the speed seem much less than it actually is, and make allowances accordingly.

Use everything on the car as gently as possible. Never push the accelerator down suddenly, or violently apply the brakes, except in an emergency. Don't wrench the car round corners. Careful observance of these rules will mean increased life of the tyres, and will avoid undue strain on the axles, steering, etc.

Don't drive on the clutch; even when cornering control the speed of the car entirely by the throttle instead.

Don't try to change speed without using the clutch, otherwise considerable damage may be done to the gear wheels.

When the car is left standing on a hill for any length of time leave it with bottom gear engaged and the magneto switched off, or better still, scotch the wheels. Needless to say, the hand brake must also be used.

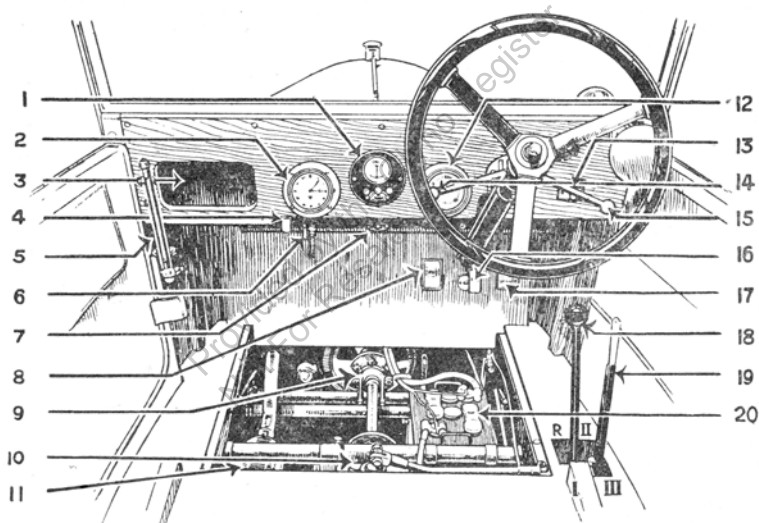
Use only the best brands of oil; a slight additional cost will be more than repaid by the longer life of the car and reduced upkeep charges.

Don't open the throttle too far when attempting to start the engine, and don't race the engine as soon as it has started.

Avoid sudden acceleration or violent braking when driving over greasy roads. If skidding occurs, disengage the clutch, and instantly turn the steering wheel in the direction that the rear of the car is swinging, until the tendency has been overcome. Do not apply the brakes unless absolutely necessary, otherwise the skid may be prolonged.

Cultivate the utmost courtesy towards other users of the road, and remember that one mark of the good driver is that he gets to his destination with least inconvenience to other people.

## Controls.

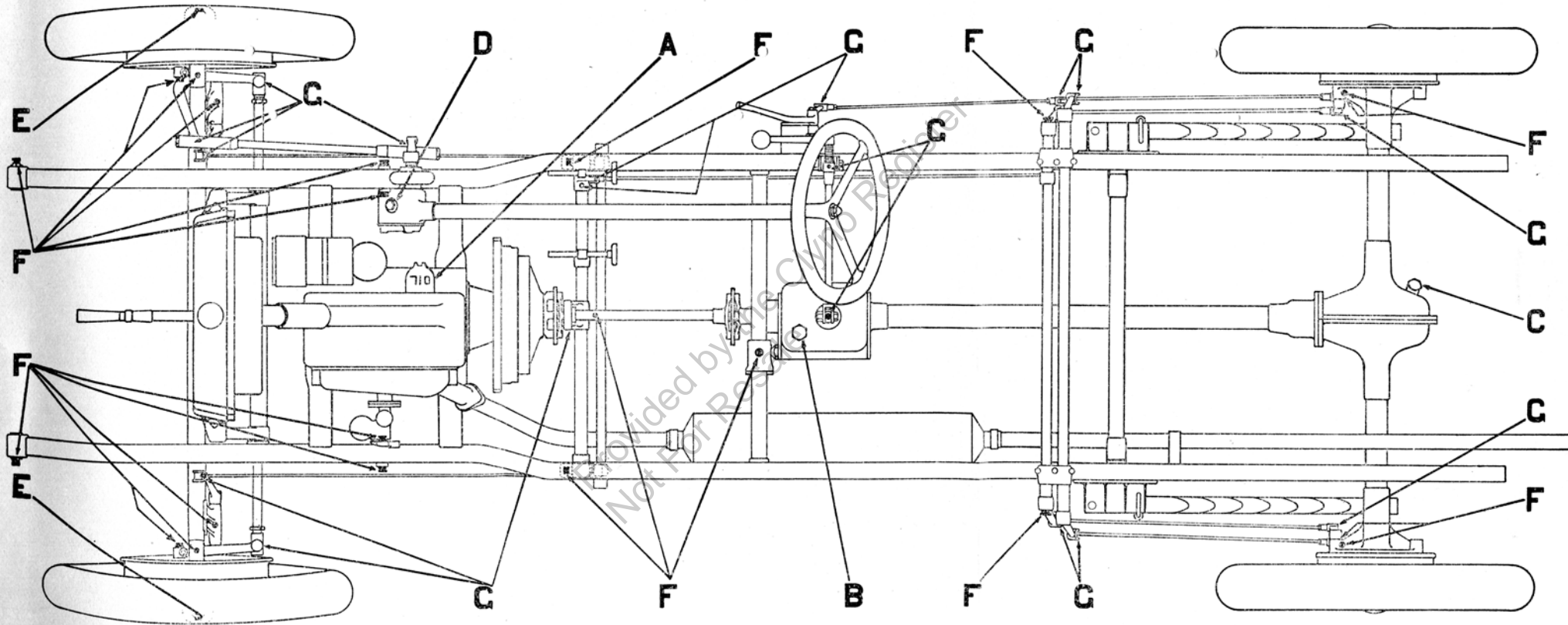


- |                          |                                |                         |
|--------------------------|--------------------------------|-------------------------|
| 1. Ammeter and Switches  | 8. Clutch Pedal                | 14. Magneto Control     |
| 2. Clock                 | 9. Clutch Withdrawal Mechanism | 15. Carburettor Control |
| 3. Glove Box             | 10. Gearbox Filler Plug        | 16. Accelerator Pedal   |
| 4. Carburettor Strangler | 11. Silencer                   | 17. Brake Pedal         |
| 5. Petrol Gauge          | 12. Speedometer                | 18. Change-Speed Lever  |
| 6. Petrol Tap            | 13. Magneto Switch             | 19. Hand Brake Lever    |
| 7. Starter Switch        |                                | 20. Battery             |

### GEAR POSITIONS

I. First Gear    II. Second Gear    III. Top Gear    R. Reverse.

# OILING DIAGRAM OF THE CLYNO LIGHT CAR.



A.—Level to be checked every 250 miles to ensure that it does not fall below the bottom mark on rod, and filled up when necessary to top mark with Castrol "XL" or any good brand of water-cooled oil.

B.—Fill up to plug level on side of box every 500 miles with Castrol "D" or "S," or any good brand of gear oil, and drain thoroughly through base plug every 2,000 miles.

C.—Fill up to level of hole every 1,000 miles with Castrol "D" or "S," or any good brand of gear oil, and drain thoroughly through base plug every 2,000 miles.

D.—Remove plug and fill to base of hole with Castrol "D" every 1,000 miles.

E.—Remove hub cap and plug, and charge with Castrol "D" every 1,000 miles.

F.—Using grease gun, charge with Castrolum (Medium), or any good brand of grease, every 250 miles.

G.—All joints to be lubricated periodically with machine or engine oil.