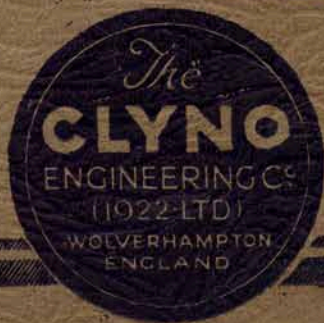


12-35 H.P. MODELS

CLYNO
CARS

Instructions for

THE LUBRICATION
MAINTENANCE
AND DRIVING OF
CLYNO CARS



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THE LUBRICATION
MAINTENANCE
AND DRIVING OF
—12-35 H.P.—
CLYNO CARS

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

In the following pages we have endeavoured to compile a book of reference which will, as far as possible, deal with the items likely to require the occasional or periodic attention of the owner or the mechanic. We realise that in an Instruction Book of this type it is not possible to cover all the details, which, from time to time will have to be dealt with. There are occasions when it may be difficult to diagnose some fault, and in such cases we are always pleased to give our clients information which may be of assistance to them.

Where difficulty is experienced with proprietary fittings, and the information required is not contained in the manufacturer's Instruction Booklet, we would advise our clients to get into direct communication with the makers whose addresses are as follows:—

CARBURETTER. Messrs. COX ATMOS CARBURETTERS LTD.,
Lower Essex Street, BIRMINGHAM.

**CLOCK AND
SPEEDOMETER.** Messrs. S. SMITH & SONS (M.A.) LTD.,
Cricklewood Works, LONDON, N.W.2.
or nearest Service Depot.

**LUCAS
MAGNETOS,
WINDSCREEN
WIPERS, LAMPS,
and ELECTRICAL
EQUIPMENT.** Messrs. JOSEPH LUCAS, LTD.,
Great King Street, BIRMINGHAM,
or nearest Service Depot.

TYRES. . . Messrs. DUNLOP RUBBER CO., LTD.,
Easy Row, Broad Street, BIRMINGHAM.

The condition of a car does not by any means depend entirely upon the care lavished on the bodywork and external fittings, although it is probable that in most cases these are the parts which receive the greatest attention. While it is certainly advisable to attend to the appearance of the car and to follow carefully the instructions in the ensuing pages devoted to the care of the bodywork, the equally important matter of the Lubrication and Maintenance of the chassis must not be overlooked if economical and satisfactory results are to be obtained.

Lubrication.

LUBRICATION OF THE ENGINE. See oiling diagram, letter A.

THE Clyno 12/35 h.p. engine has a force feed lubrication system, the oil being circulated at pressures ranging about 25 lbs. per square inch, by means of a gear pump situated at the rear end of the camshaft. Oil is drawn from the sump through a large diameter internal feed pipe, being filtered before entering same by an easily detachable oil filter of ample proportions, situated in, and bolted to the base of, the sump. The feed pipe has a non-return valve which ensures a supply of oil at all times without priming. From the pump, the oil is forced through oil galleries cast in the cylinder block to the three crankshaft main bearings, and from there through holes drilled in the crankshaft, to the big ends of the connecting rods. The pistons and small ends are lubricated by splash. The front end of the oil gallery, which runs through the cylinder block from end to end, is sealed by a ball type pressure release valve incorporated in the front camshaft bearing behind the chain wheel. This valve is carefully adjusted for pressure before the car leaves the factory, and requires no further attention. Excess oil passing through the release valve is carefully trapped and returned into a sealed and separate compartment containing the camshaft and tappets. The complete flooding of this compartment undoubtedly reduces camshaft and tappet noises and prolongs the life of the wearing parts. Having filled this, the excess supply is bi-passed into the front timing cover on to the chain and chain wheels which run in a perfect oil bath. Before returning to the sump, the oil flows over a large detachable filter which extends over the whole surface of the sump and also acts as a splash tray. Thus, during circulation the oil is filtered twice.

At the top right hand side of the front timing case is bolted a large and accessible oil filler and breather combined (marked "A" on Oiling diagram), which is provided with a filter for straining the oil as it is poured into the engine. From the filler the oil passes into the front timing case, through an aperture in 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. Overfilling of the engine will most probably lead to a smoky exhaust, excessive carbon deposit in the combustion heads, oil fouled sparking plugs and sticking valves. For this reason, if the high level mark on the dipper stick has accidentally been considerably exceeded it is advisable to drain away the excess oil. A plug is provided for this purpose on the offside of the sump about $1\frac{1}{2}$ in. from the top joint. After use the plug must be tightened right home again.

It is advisable to run off the old oil at the end of the first 500 miles, and then periodically, say once every 2,000 to 3,000 miles, by removing the filter in the base of the sump. This filter should be carefully cleaned when it is removed by washing in paraffin. It is not desirable to swill the sump out by pouring paraffin through the oil filler, as a certain quantity might be trapped in the oil wells in the front timing case. It would, however, be quite in order to swill through with thin lubricating oil, which would have the effect of scouring the oil sump. When replacing the filter, care should be taken to ensure that the leather washer on its upper surface slides freely into position on the oil feed tube inside the engine, and the fixing screws on the base should be very carefully tightened. When necessary to remove the old oil at the end of approximately 20,000 miles, it is desirable to drop the sump by removing the set screws around its flange. This will expose the upper filter or splash tray

which can be carefully removed and cleaned at the same time that the sump and the feed pipe filter are scoured. After cleaning and replacing all the various parts, fill up to the maximum height on the dipper stick with clean engine oil.

LUBRICATION OF THE GEARBOX. See oiling diagram, letter B.

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 (B), while 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. See oiling diagram, letters C and H.

On the side of the back axle differential casing, and just below the centre of the axle shaft, is a similar plug (C) 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 axle shaft bearings at the outer ends may be lubricated by means of the grease gun, the greaser adapters (H) being situated in the bearing housings inside the brake drums which must be removed when lubrication at these points is necessary. It is not advisable to give a large charge of grease to the axle bearings otherwise an excessive amount is liable to work out on to the brake linings. Lubrication of differential case and axle bearings should be attended to at least every 2,000 miles.

LUBRICATION OF THE STEERING BOX. See oiling diagram, letter D.

By raising the offside half of the bonnet the steering box at the base of the column is exposed to view. The plug (D) 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 THE FRONT HUBS. See oiling diagram, letter E.

During assembly the front hubs are charged with the correct quantity of lubricant, and it is essential that care should be taken not to overcharge afterwards, otherwise over-lubrication might lead to an escape of oil on to the front brake linings. To prevent overcharging by the owner who unwittingly uses the grease gun too freely at such points, the grease gun adapter is dispensed with and a screwed plug (E) is used, access to which may be obtained by removing the hub caps. A charge of fairly thick oil should be injected by means of an ordinary oil-can at least every 2,000 miles.

LUBRICATION OF THE CLUTCH SPIGOT BEARING (J).

Situated on the clutch member centre boss immediately behind the flywheel and between the spokes of the former, is a greaser (marked "J" on the Oiling Diagram), which feeds lubricant to the clutch spigot bearing. This should be given a small charge of grease every 1,000 miles. An excessive amount of lubricant injected at this point is unnecessary, and is liable to work out on to the clutch cone.

LUBRICATION OF THE CLUTCH THRUST BEARING. See oiling diagram letter F.

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.

See oiling diagram, letter G.

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. See oiling diagram, letter F.

A number of parts are provided with adapters (F) for grease gun lubrication. Grease should be injected from the gun through the adapters 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 two 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 friction 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 AND STARTER.

For particulars with regard to these units please refer to pages 27 to 30.

LUBRICATION OF BRAKE CONTROL MECHANISM.

See oiling diagram, letters F and G.

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 10) 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.

LUBRICATION OF SMITH SHOCK ABSORBERS.

See oiling diagram, letter J.

The charge of lubricant in the shock absorbers when they leave the works is sufficient for 1,000 miles. Afterwards they must be charged by means of the grease gun every 1,000 miles. Do not lubricate the flexible bearings.

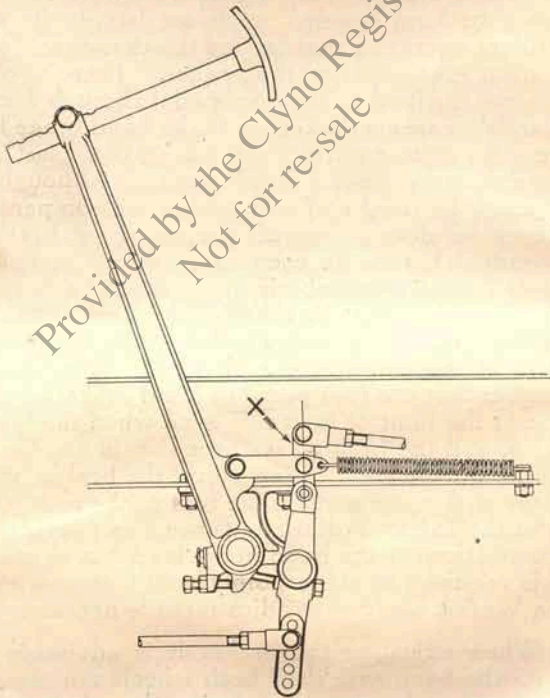
Maintenance.

BRAKES.

To satisfy the growing demand for more efficient brakes, the Clyno Company, in their new braking system have followed a practice now used on many present-day cars of interconnecting the hand and the foot controls to the same sets of brake shoes. That this practice gives the best results with a maximum of safety is proved by very extended and careful tests. Ferodo-lined internal expanding brake shoes of 12 in. diameter, and ample width maintain a large braking surface free from excessive wear and requiring a minimum of attention. The front brakes and the rear brakes constitute two entirely separate braking systems, each set having its own independent operating shaft across the chassis and separate rods from each shaft to the brakes. These two sets of brakes are coupled to the foot pedal through a compensater and they are also linked up to the hand brake lever by entirely separate control rods, but in this case the rods operate direct without a compensater. Although on the foot pedal 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, the best results being obtained by careful adjustment to ensure that each 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 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 four brake rods, two over each of the axles. Adjustments are also provided for on the connections to the hand brake lever but as one setting only is required at these points, and this is attended to at the Works, no further adjustment is necessary.

When adjusting the brakes it is advisable to first jack up the back axle until both wheels are clear of the ground and to be sure that during the whole operation

the hand brake lever is in the full **off** position. Have an assistant to press the foot brake pedal **partly on** and adjust the two rear wing nuts until an equal amount of hand pressure on each of the rear wheels will just turn them. The same operation should then be repeated on the front brakes. 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 periphery of the drums should produce a clear bell-like note. When the brakes are correctly adjusted the small compensating bar (marked "X" in illustration below) should automatically lie as near as possible in a vertical position.



FOOT BRAKE COMPENSATER AND ADJUSTABLE PEDAL.

For quicker but not such accurate results, without jacking up the car, pull the hand brake lever on to the extent of two of the notches on the ratchet 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.

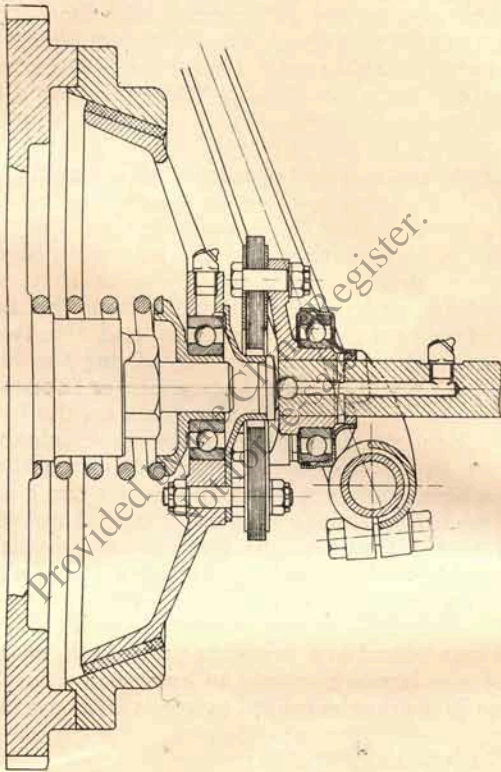
The separate adjuster screws which operate against the face of the front brake cam levers may be used only occasionally to adjust the long levers on the axle back to normal, after considerable wear has taken place on the brake liners. Should it be necessary to examine the brake shoes and linings, the brake drums may be easily detached, after removing the wheels and the two screws holding each drum in position, by giving the flat face a smart blow with a mallet alternately on opposite sides until the drum is free of the shoulders on the four wheel studs. When examining the brake shoes clean off any oil or dirt which may have penetrated into the drums, leaving a smear of grease on the brake cams and pivot pins. The brake linings may be roughed up with a file on their working surface, and the drums should present a clean, smooth face on their inner circumference, absolutely free from oil or other matter.

As mentioned in a previous paragraph, careful lubrication of the brake controls to ensure absolute freedom of action, 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 gear-box, being lubricated through an oilway from the latter.



CLUTCH AND OPERATION.

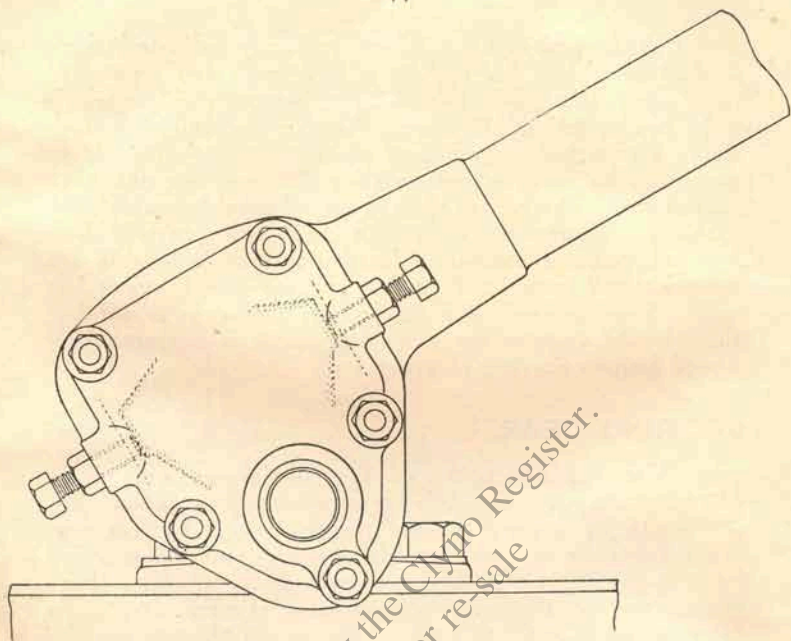
Once the clutch face is bedded down very little attention is required with the exception of an occasional charge of lubricant injected into the bearing, and on the face of the thrust bearing forked lever and

pedal shaft bearings. When correctly adjusted there should be $\frac{1}{16}$ of an inch 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 may be necessary to make an occasional adjustment to the stop to ensure that the gap has 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.

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 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.

For illustration of Steering Box, see page 14.

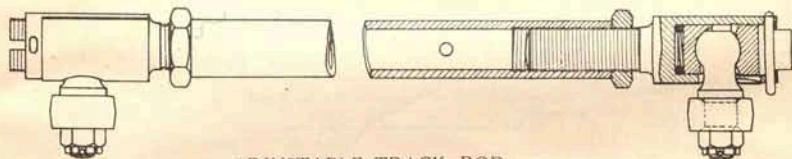


STEERING BOX AND ADJUSTABLE STEERING LOCK STOPS.

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 from nothing to $\frac{1}{8}$ less at the front than at the back. In these days of high speeds and low pressure tyres the old-fashioned method of using two lengths of string for checking the wheel alignment is not very satisfactory unless extreme care and precaution against error are exercised. Most garages use a very simple but effective instrument for this purpose, consisting of a telescopic tube bent at right angles to form two uprights, each upright extension having a horizontal

adjustable pointer at the height of the wheel centres. The instrument is placed across the front of the car, first behind the front tyres and then in front of them, and in each position, by using the pointers, lines are marked on the centres of the tread of both tyres. These lines coincide with one another when the wheels are dead parallel, and, as stated above, this position, with a maximum allowable error of $\frac{1}{8}$ inch *toe in*, is the correct setting. 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 rotated by a pair of large grips. 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. End play may be detected by gripping both wheels at the front and alternately pressing inwards and outwards in opposite directions. **Failure to observe the instructions laid down in this paragraph may lead to unsatisfactory steering and excessive tyre wear.**



ADJUSTABLE TRACK ROD.

CHANGING WHEELS.

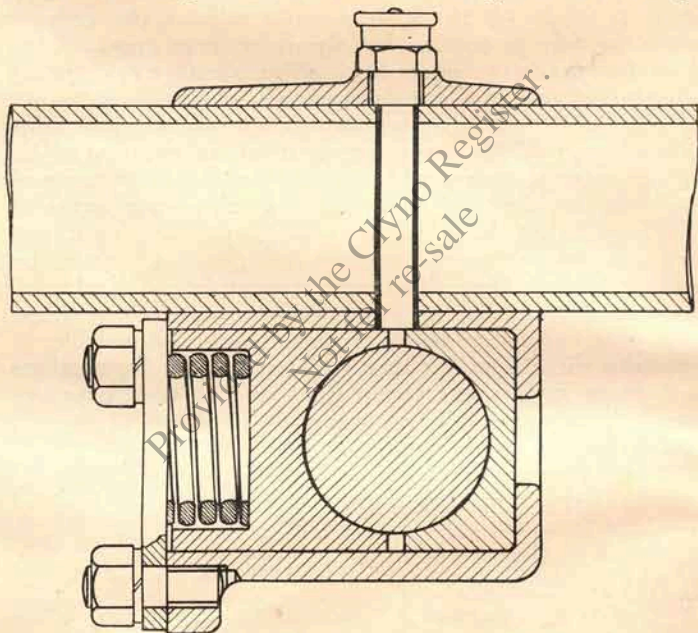
The wheels are readily detachable for tyre repairs, etc., by removing the wheel nuts (for which purpose we provide a special brace), when the wheels and cover plates easily slide off without disturbing the hub. It is of course, necessary to raise the wheels from the ground

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.

A smear of grease over the wheel studs and hub centres will very considerably facilitate wheel changing.

GEARBOX.

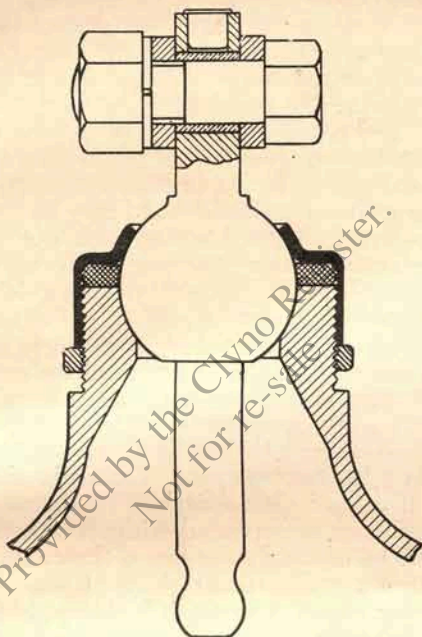
The gearbox is mounted on the front end of the torque tube, the rear end of the latter being attached to the axle casing. At the front of the gearbox is a high



GEARBOX PIVOT SUPPORT.

tensile steel support ball, which acts as a connection to the chassis frame while allowing for free movement of the whole unit. 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



CHANGE-SPEED LEVER BALL SOCKET ADJUSTMENT.

back in position. 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 5,000 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 nipped down evenly by tightening each nut a little at a time. 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, but it is very essential that the faces be clean and free from abrasion. If a new gasket is required be sure that the metal round the stud holes is not burred up when fitting.

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 without alteration to the relative positions of the flywheel and the contact breaker. To ensure that the Simms driving coupling will be re-assembled in the same position, it is desirable to carefully mark its periphery with a pencil line straight across the rubber and the two brass driving discs, and also to note the position of the distributor carbon brush. If it is desired to leave the high tension wires in position when the magneto is removed, the distributor cover may be unclipped and dismantled from the magneto. Great care must be taken that the holding down strap is carefully tightened when the magneto has been replaced, and that the set screw under the base is also pulled up tight.

MAGNETO TIMING.

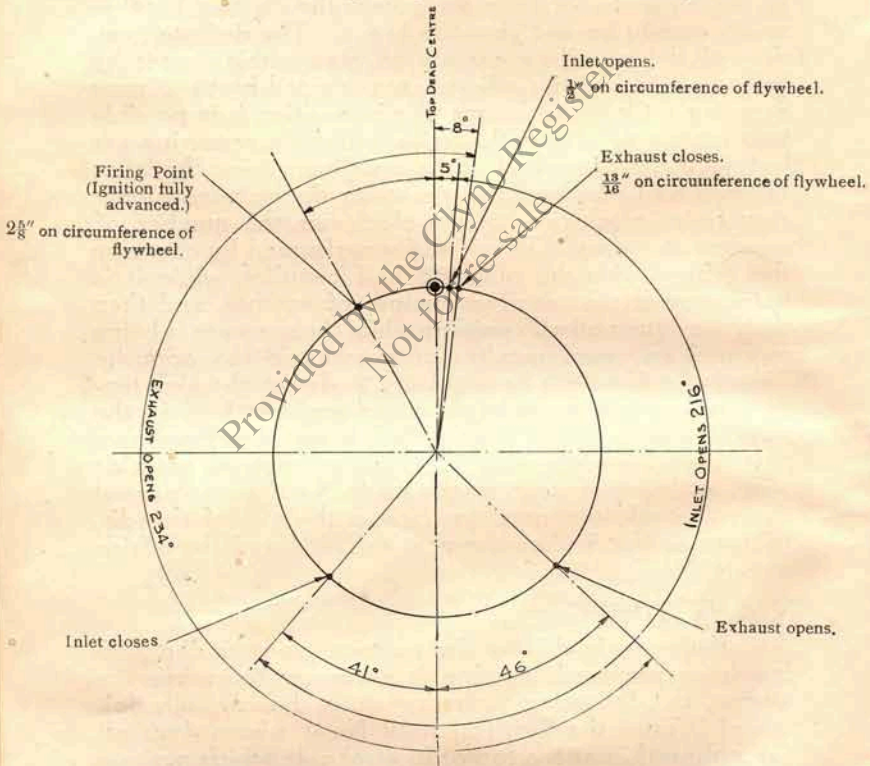
To retime the magneto, should it be necessary to do so after dismantling, turn the magneto spindle until

the distributor carbon brush is on No. 1 segment (i.e., the lower metal insert which lies on the "nearside" of the magneto). Set the flywheel so that No. 1 piston is nearing the top of the **compression stroke** in a position equivalent to between $2\frac{1}{8}$ in. and $2\frac{3}{4}$ in. measured 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. When measuring, use a flat steel rule which can be bent to the shape of the flywheel, and be sure that the measurement is taken dead opposite the pointer. With the flywheel in this position, the carbon brush in the position stated above and the timing lever of the magneto set fully advanced, the contact breaker points should be just about to break. The definite position of the spindle necessary to obtain this, is set by means of the Vernier adjustment provided by the Simms coupling. Once the magneto is in position it is possible to advance or retard the firing point by removing the bolt on the dynamo half of the coupling, sliding the latter forward and re-adjusting by moving the serrated rubber ring only, clockwise or anti-clockwise the number of notches necessary. This is easily performed by engaging the rubber with the magneto half coupling while it is being turned the required number of notches, and then with the dynamo half coupling while the magneto is being returned an equal number of notches in the opposite direction. Should it be necessary to detach the high tension 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, 3, 4, 2, and that the nearside wire on the magneto connects up to No. 1 plug (nearest the radiator), the next one across the top of the distributor to No. 3 plug, the next to No. 4 and the offside one to No. 2.

VALVE TIMING.

If the chain driving the magneto and the camshaft has been removed, making it necessary to retime 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 $\frac{3}{4}$ in. 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 which position the chain may be refitted. For very fine initial adjustment of the timing during the course of manufacture the camshaft chain wheel is gripped to its centre piece by four bolts with taper heads. Under no circumstances should it be necessary to alter the original position of this chain wheel relative to the camshaft during the process of re-assembly.



TIMING DIAGRAM.

(One inch on circumference of flywheel is approx. 10°)

TIMING CHAIN ADJUSTMENT.

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, otherwise considerable and costly damage may be done to the bearings and shafts with probable breakage of the chain which would ruin the front of the engine case. The chain is arranged in the form of a triangular drive passing round sprocket wheels on the crankshaft, camshaft and dynamo shaft respectively. Adjustment is made by moving the dynamo, and incidentally the magneto platform which is bolted to it, in such a way that the distance between the sprocket centres is increased or decreased. The dynamo is attached to the engine by three bolts, the upper two of which pass through slots in the flange while the lower one passes through a plain hole and acts as a fulcrum. Projecting from the walls of the crankcase underneath the rear of the magneto platform is a steady bracket clamped to the platform by a bolt. When adjusting the chain tension, slack off the two bolts in the slots and slightly free the bolts in the bottom of the flange and the magneto platform, taking care to rigidly tighten again when completed. By moving the dynamo away from the cylinder block, the chain is tightened, and as mentioned previously, care should be taken during this operation, otherwise its adjustment may be too tight.

TIMING CHAIN AND FAN BELT ADJUSTMENT ON ENGINES FITTED WITH FANS.

The fan pulley is carried on an extension of the dynamo chain wheel supported at the front end by a self-aligning ball bearing housed in a special bracket on the front timing cover. The bearing with its housing is centred in its correct position by the dynamo wheel before being bolted up to the timing cover. When adjusting the driving chain tension, follow the instructions in the previous paragraph and also free the two set screws holding the above bearing housing to the cover before

attempting to move the dynamo. Having completed the adjustment tighten up the dynamo and magneto bolts before attending to these two screws, thus allowing the housing to follow freely the movement of the dynamo.

To adjust the fan driving belt so that it is neither too tight nor too loose it is necessary to slack off the nut at the rear of the bracket supporting the fan spindle. The two eccentric discs, one on either side of the support bracket, should then be rotated in the desired direction until the fan belt can be pulled about $\frac{1}{2}$ in. out of straight on the application of light pressure in the middle of the span. When the limit of this adjustment is reached, remove one link from the belt and return the spindle to zero. A charge of light oil should be injected in the fan oiler every 1,000 miles.

TAPPET ADJUSTMENT.

To adjust the tappets to give the correct clearance off the valve stems of .006 of an inch exhaust and .004 of an inch inlet, it is necessary to remove the valve cover plates. 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.

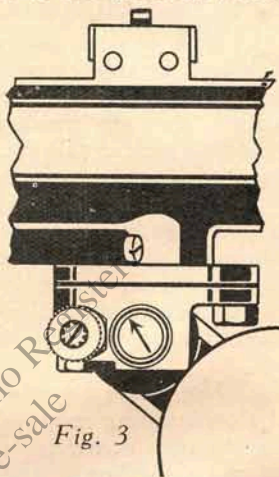
THE COX "ATMOS" MODEL " B " CARBURETTER.

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

It is also the most suitable carburetter from the user's viewpoint, 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.

TO RE-SET JET TO CORRECT POSITION. See Fig. 3.

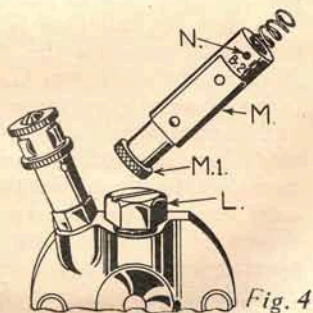
After screwing jet needle home till jet is completely shut off, open up until arrow points to the position which it originally pointed to before removal. The standard setting for the 12/35 Clyno is approximately one complete turn and a twelfth, or expressed another way, the equivalent of one hour five minutes movement of the minute hand of a clock visualised as moving in an anti-clock direction (the arrow position is shown in Fig. 3). Some engines will carry a slightly finer setting with advantage. Be sure that jet is completely closed before re-setting, if in doubt, do not use force and strain needle seat, hold float chamber needle off its seat until fuel flows from vent hole in lid, if jet needle is properly closing jet, no fuel will flow from the jet air intake.



The arrow should point to main body of carburettor when jet is at closed, or zero position.

IF JET IS OF NON-ADJUSTABLE TYPE. See Fig. 4.

To clear main jet in this case all that is necessary is to unscrew cap L (using either edge of coin or spanner) and lift out main jet assembly as shown M. Jet is located at M1. After clearing of any obstruction replace. When replacing see that feather peg N slides into groove formed in jet body for its reception, and tighten down retaining cap L.



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

TO CLEAN FILTER. See Fig. 5.

Unscrew petrol pipe union D, then unscrew gland nut R. The filter gauze S can then be taken out for cleaning by removal of brass spring ring T. The amount of attention this requires is dependent upon the amount of dirt in petrol tank.

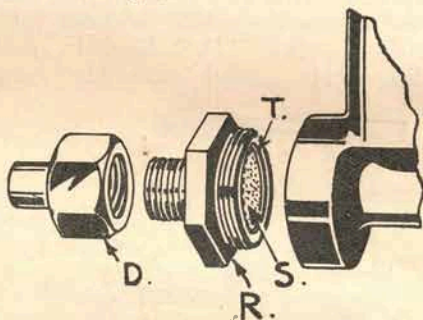


Fig. 5.

TO REMOVE FLOAT CHAMBER. See Fig. 6.

Disconnect petrol pipe union D then remove jet body nut C. When removing note carefully the packing washers at position J1 and J2 and see that they are replaced in same number and position when re-assembling. Upon no account use anything of a linty nature to wipe out inside of float chamber. If cleaning of float chamber is at any time found necessary, the best procedure is to rinse out with clean petrol.

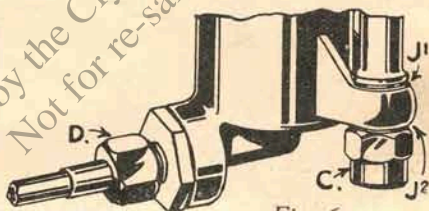


Fig. 6.

CARBURETTER ADJUSTMENTS. See Fig. 7 (page 26).

Referring to Fig. 7, 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. 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 gives 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, except when

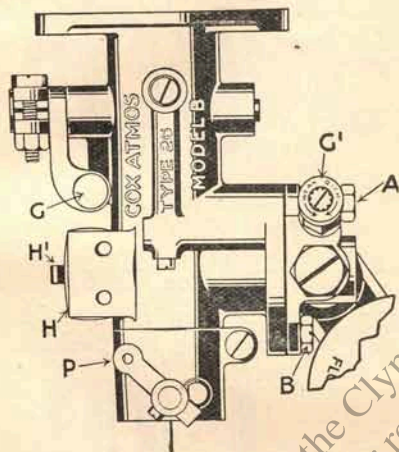


Fig. 7

changing the choke tube. The control pull and wire connection to the carburetter strangler valve, used for easy starting allows for the maximum opening in the intake pipe when not in use, while giving a fully closed position when required. Under no circumstances should the control be re-set in such a position that the maximum opening is unobtainable.

PETROL SUPPLY.

The Autovac Vacuum Fuel Feed Apparatus mounted on the dashboard under the bonnet, automatically elevates the petrol from the rear tank and delivers a steady flow to the carburetter. This apparatus is self-contained and entirely automatic, requiring no attention beyond occasional inspection of the filter (in the conical elbow of the main supply connection which is held in position by a clamping plate) and discharge of sediment through the drain tap. The system is operated by engine suction which creates a partial vacuum in the upper chamber of the Autovac, and for this reason all connections and joints must be kept absolutely air tight. The reserve chamber always contains a supply of petrol. Should it by any chance become entirely empty, a few turns of the engine with the starter or handle with the throttle

closed, will draw a sufficient supply from the main tank. When full, the Autovac holds approximately $2\frac{1}{2}$ pints of petrol.

A two-way petrol tap is fitted in the rear tank with control lever and markings indicating "main" and "reserve" supply. This tap should normally be set with the pointer over to "main," but in case of emergency it should be turned about, thus bringing in the reserve supply of approximately one gallon of petrol. Before the necessity for switching over to "reserve" is apparent, the draining of the Autovac may cause irregular running of the engine, which will disappear when the supply of petrol is back to normal. As the petrol flows from the tank to the Autovac it is displaced in the former by an equal volume of air which enters through the small vent hole in the filler cap. **It is imperative that this hole be kept clear of mud or foreign matter of any description, otherwise the petrol supply will be interfered with.**

SPARKING PLUGS.

The correct gap between the plug electrodes should be .020 of an inch. It is advisable to remove the plugs periodically, clean away deposits of carbon or half-burnt oil which may have formed, and, if necessary, adjust the terminals to the correct setting. When using a spanner on a plug or when cleaning it care should be taken not to damage the insulating material; careless handling may crack this and render the plug useless. Make sure that each high tension cable is replaced on its correct plug and that the free length of insulated wire is not in too close proximity to another plug.

MAGNETO.

A lubricating cap is provided on the top of the Magneto and into this about three drops of light oil should be added every 1,000 miles. A few drops of oil should also be placed every 5,000 miles on the length of felt inserted in a recess in the contact breaker housing. **Far more trouble has been caused by excessive oiling than by too little.** 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 .012 to .015 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 but it is not desirable to alter the setting unless the gap varies considerably from that of the gauge. See that the platinum contact surfaces are clean and free from oil. A small mirror will be found very useful for the purpose of inspection. Should it be necessary to remove the contact breaker from the magneto, care must be taken that it is re-fitted with the key properly engaging the key-way, and the centre screw tightened up with the magneto spanner without using too much force. The distributor cover should be detached periodically and cleaned internally, with a rag soaked in petrol, to remove any carbon which may have formed on the metal segments.

When the distributor cover is removed the rotating arm can be easily withdrawn by pulling it endwise in a backward direction. The brush in the rotating arm should work freely in its holder; if it is clogged, remove and clean it as well as the holder. Dirt, carbon or metal dust, and water in any form, are the enemies of good insulation, therefore keep the magneto clean and dry. **Failure to observe the instructions under this paragraph and those under the heading of "Sparking Plugs," may lead to irregular running of the engine which no amount of cleaning or re-adjustment of the carburetter can possibly eliminate.**

MAGNETO CONTROL.

Before the car leaves the works the magneto control is set to give full travel of the contact breaker arm, **particularly with regard to the full advanced position.** This last point is most important, as a magneto which is constantly running with a slightly retarded ignition will result in loss of engine efficiency and increased petrol consumption. It is therefore advisable, after carrying

out cleaning or adjusting operations on the magneto, to test the control mechanism to ensure that the full advanced position of the contact breaker arm is obtained when the control lever on the steering column is at the limit of its travel in the downward direction, which should be slightly below a horizontal position. The movement of the contact breaker is limited by a stop in the form of a small peg in the housing for the contact breaker cam ring

DYNAMO.

The bearings should be lubricated about every 1,000 miles with a drop of thin oil. An oil hole with spring cover will be found at the commutator end close to the magneto coupling. The remarks under magneto concerning overoiling also apply here. In order to obtain satisfactory running it is advisable to remove the band type 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. When the lights are not in use, the 12 volt dynamo fitted to Clyno cars should give a normal output, indicated on the ammeter on the instrument board, of 8 amps, and this should not fall below 6 amps nor rise above 10 amps. Should these figures be exceeded or should the normal output rise more than one point, even after the commutator and brush gear have received the above-mentioned attention, it is necessary to have the dynamo regulated by a skilled electrician. In this connection a lot also depends upon regular attention to the battery. Never run the dynamo with the battery disconnected.

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 centre 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. A few drops of engine oil may be placed on the gear teeth only, about every 500 miles. Should the pinion, as sometimes happens, become stuck in engagement with the gear ring on the flywheel, a turn of the starting handle will often release it. If this is not effective, lift the bonnet and tap the pinion backwards with a piece of brass or hard wood. The power of the starting motor depends upon the condition of the battery, and should the former become weaker in action it will most probably be due to the battery being run down or to loose or dirty cable terminals.

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 $\frac{1}{4}$ in. 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 lid. Under no circumstances should the electrolyte be removed from the battery and the plates allowed to dry, nor should the cells be washed out with water, always use dilute acid. Keep terminals clean and tight, and smear with vaseline to prevent corrosion. It should be remembered that serious damage is likely to occur to the battery if left in a run-down condition, and unless long runs are taken to restore the charge, it should be taken off the car and fully charged at a service station or by a competent electrician, in accordance with the instructions on the battery lid. There is no automatic device in the

system to cut out the dynamo when the battery is fully charged, this matter has to be left to the discretion of the driver who should use the switch according to the amount of work which has to be done. Under normal conditions in the summer when the battery is well charged, it is **not** necessary to keep the charging switch on the instrument board switched on all the time, except when the lamps are in commission. In the winter when the lamps and starter may be required to a greater extent the switch should be left on all the time.

CUTOUT AND FUSE BOX.

Both these parts are mounted on the same base and fixed to the dashboard. The automatic cut-out prevents discharge of the battery through the dynamo windings when the latter is stationary. It is **not**, as is sometimes mistakenly supposed, an instrument for preventing over-charging of the battery, neither is it a regulator for the charging output from the dynamo. To prevent interference with the interior adjustment a metal cover is provided, held in position by a sealed clip, and under no circumstances should this be removed except by the manufacturers of the electrical equipment.

The fuse, which prevents damage being done in the case of accidental short circuits, is mounted upon two brass pedestals under a separate cover, marked for identification purposes. The cover may be unclipped and removed if it is necessary to replace the fuse, spares for which will be found folded to one side on one of the pedestals. Before replacing a burnt fuse it is advisable to systematically examine all wires and wire connections in the **charging circuit**, and if these are satisfactory run over the brush gear in the dynamo and finally check the level of electrolyte in the battery in accordance with the instructions under separate headings. This may lead to the discovery and remedy of some fault which would otherwise cause further trouble. When replacing a burnt fuse care should be taken not to accidentally use two of the spares in its place and if all have been used replacements of the correct type should be obtained from the makers. Should a fuse wire of larger capacity be used serious

damage may be caused to the dynamo and other parts of the system. See that the fuse is held tightly by the knurled nuts; loose connections will interfere with the output from the dynamo.

ELECTRICAL WIRING AND CONNECTIONS.

A most fruitful cause of trouble in the electrical system is that which attends imperfect connections, particularly in the case of the battery cables. It is therefore necessary to see that all cable terminals are clean and securely clamped to their respective connectors. Another source of trouble is the chafing of wires which may cause a short circuit through a breakdown in the insulation material. For this reason care should be taken when wires are moved from their original position, to ensure that they are replaced correctly so that they are clear of moving parts and do not rub against sharp edges of the chassis, valances, etc. Should it be necessary to disconnect the wires at their terminals they must be replaced exactly as they were in the first place.

LAMPS.

To obtain the most effective light it is necessary to have the headlamps properly focussed and for this purpose the bulb holder is provided with three notches so that alternate positions may be tried and the best one used, generally the back position is most suitable.

The lamps are mounted on an adjustable base to ensure that the beam of light is at the right angle. To obtain the best illumination it is advisable to take the car on a straight level road and make the necessary adjustments under actual conditions. The front rim of the lamp may be removed by pressing it forward with the thumb and palm of the hands while the fingers hold the sides of the lamp shell, and rotating in an anticlockwise direction to free the bayonet joints. Care should be taken not to touch the reflectors unless they are tarnished, and then only with a fine chamois leather and rouge moistened with petrol.

The dipping and swivelling reflectors in the lamps are controlled by air suction and pressure, operating on a small piston working in an air-tight cylinder in the back of each headlamp. Each cylinder is connected by a tube to a master cylinder attached in an accessible position on the steering column, the necessary air pressure being induced by hand push or pull on the knob controlling the master piston. Care should be taken to ensure that all rubber connections are air-tight.

TYRES.

Correct inflation, particularly with low pressure tyres, is one of the greatest essentials for obtaining good tyre mileage, maximum riding comfort with freedom from concussion blows, and ease of steering. The weight per axle determines the pressure to which the tyres should be inflated and it is important that a periodic check should be made with a pressure gauge to ensure that all tyres have an inflation pressure which is neither too high nor too low. The following table shows the approximate laden axle weights for various models when the cars are

Type of Car	Axle.	Laden Axle Weight in Cwts.	Tyres 29 × 4.95. Pressure in lbs.
Two Seater (2 Passengers)	Front	10	24
	Rear	10½	24
Two Seater (4 Passengers)	Front	10	24
	Rear	13	26
Four Seater (4 passengers)	Front	10¼	24
	Rear	13¼	27
Saloon (4 passengers)	Front	11	24
	Rear	15	30

carrying their normal passenger loads. Any increase in weight over what may be considered a normal load must be compensated for by a corresponding rise in tyre pressure to prevent excessive bending and consequent fatigue of the casing. 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.

Avoid driving in tram lines. Apart from its danger, the upstanding edge often deeply cuts the loaded tyre. Do not leave flints, etc., imbedded in the tread. They will eventually work through, destroying the casing and puncturing the tube. 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 re-inflate 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. For remarks concerning tyre wear and front wheel alignment refer to paragraph on page 14.

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.

ADJUSTMENT OF SMITH SHOCK ABSORBERS.

To maintain uniform adjustment of the shock absorbers they are provided with indicators in the form of spring-loaded plungers with annular grooves. Each groove represents a higher or lower degree of friction, and the most satisfactory position is generally obtained when the second one from the top of each plunger is level with the bevel face of the plunger housing. During prolonged use any small amount of wear which may occur will reveal itself by an alteration in the position of the grooves, and this can be corrected by tightening the wing nuts.

CARE OF THE BODY WORK AND FITTINGS.

To keep the paintwork or fabric covering 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 surface. 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. 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 newly

painted 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.

It is not advisable to clean or polish the hoods and exterior of fabric covered bodies or of painted bodies with furniture cream, liquid wax, petrol or any similar substance. **Use good quality soap and water only; at once thoroughly dry and finally polish with a perfectly clean and dry soft selvyt cloth.** This also applies to the wings, valances and other enamelled parts.

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) jeweller's rouge dampened 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 or good furniture polish.

Drops of water left to dry on 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 or into the interior of saloon doors through the apertures in which the drop lights slide. It is also desirable to allow no water to pass into the interior of the brake drums.

Never place hard or bulky articles against the inside of the body panels behind the rear seat squab or in the door pockets. These are liable to cause damage to the panels due to violent contact with them on bad roads or

to excessive pressure from the passengers. In cases where a minor accident results in damage to the wings or bodywork it is advisable to obtain the services of a skilled man to remove the indentations.

When attending to the battery, be careful not to splash the acid about, and if a drop should accidentally fall on the car, wash it off immediately with a plentiful supply of clean water.

Don't lean on the doors of the car when open and handle the sidescreens at all times with care. See that door hinges, dovetails, locks and sidescreen sockets are lubricated occasionally to prevent rust, and ensure freedom of action. Always close the doors with sufficient smartness to allow the slam locks to fully engage. When leaving a saloon car in a garage shut all windows. In cars provided with instantly adjustable front seats on metal runners make sure that the location plunger engages in one of the holes before driving.

FOLDING THE HOOD.

When lowering and folding the hood see that the press studs on the side curtains are free, then pull the rearstick back and downwards until it lies on the hood rest. Afterwards break the joint on each side, halfway along the hood, by pressing downwards on the rail, and while closing the sticks into the flat position be careful to pull out all folds of the material towards the back, tucking them away at the same time between the rear and the main sticks. By following these instructions the hood material will be prevented from lying on the top of the rear squab or causing inconvenience to the rear passengers. It will also prevent tearing or cutting of the material on the curtains or between the hood fittings and will ensure the hood giving better service. Finally, the hood bag should be carefully pulled over the folded hood and clipped in position, and the hood sticks should be securely strapped down to prevent chafing. To ensure freedom of action a drop of oil should be used on the hood stick joints from time to time.

GENERAL REMARKS.

Nuts and screws will occasionally work loose, even on the most expensive cars, owing to the excessive vibrations and shocks produced by driving over bad roads. For this reason it is advisable to make a periodic inspection of such details, **particularly the wheel nuts**, tightening up where necessary. Even though the tool kit, lifter jack and tyre pump are not in constant use, they should always be carried on the car carefully packed away in the tool space, with a supply of clean rag, for emergencies.

When carrying out an adjustment or overhaul, never place dirty and greasy parts, tools or oil cans on the car or running boards unless an oilproof protecting cover is used.

WHEN ORDERING SPARE PARTS ALWAYS QUOTE THE CHASSIS NUMBER WHICH WILL BE FOUND STAMPED ON THE METAL PLATE FIXED TO THE DASH PANEL UNDER THE BONNET.

Provided by the Clydes Register
Not for re-sale

Driving.

SPECIAL PRECAUTIONS WITH A NEW CAR.

Freedom from trouble in the future depends largely upon the care which is exercised in the early stages of the car's life. During the **first 1,000 miles of running**, a new car should be treated very carefully and on no account should it be driven at greater speeds than **25 miles per hour on top gear, 12 miles per hour on second and 8 miles per hour on bottom.** This will give the pistons, bearings and other parts an opportunity of bedding themselves in and will very materially increase the life of such components.

The Clyno Company cannot take responsibility for damage done to the car due to neglect to observe these very important instructions.

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 the 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 outwards 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

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 use of the hand or 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. 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 and ease of control 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, or, if necessary, by the brakes.

Don't try to change speed without de-clutching, 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.

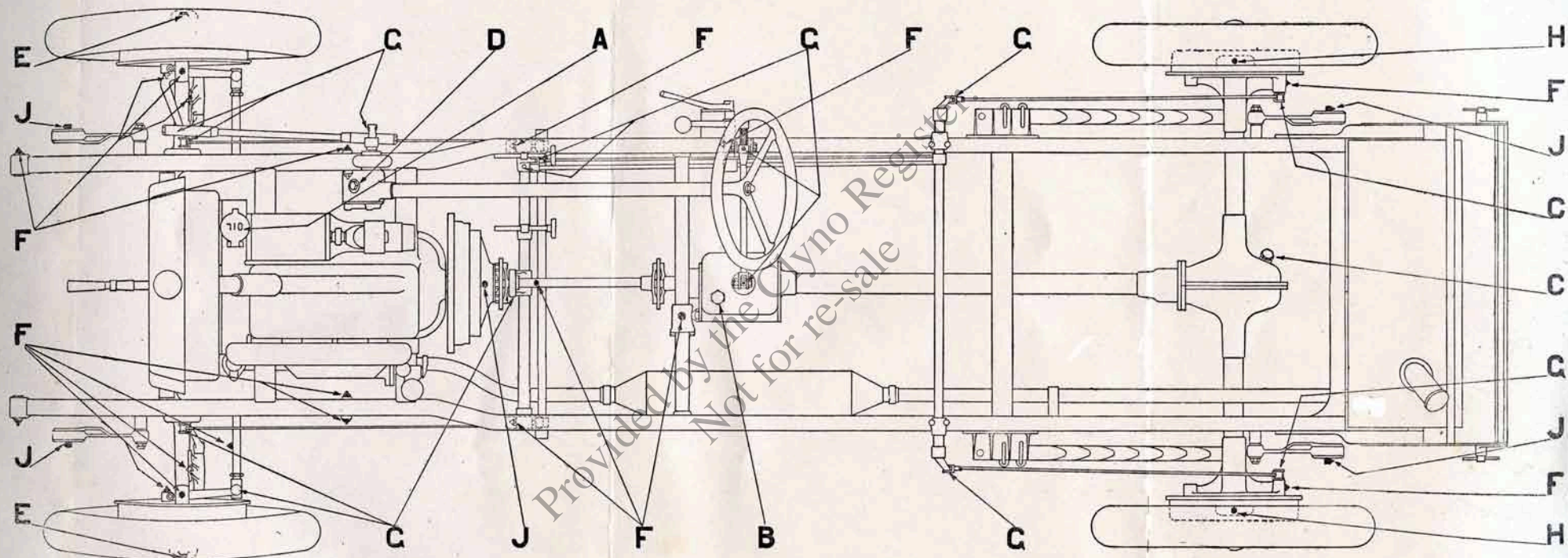
Avoid sudden acceleration or violent braking when driving over greasy roads. If skidding occurs, disengage the clutch, and instantly turn the steering wheel in the direction that the rear of the car is swinging, until the tendency has been overcome. Do not apply the brakes unless absolutely necessary,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

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

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OILING DIAGRAM

12-35 H.P. CLYNO 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. Drain thoroughly through base plug every 2,000 miles.

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 2,000 miles with Castrol "D" or "S," or any good brand of gear oil, and drain thoroughly through base plug every 5,000 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 2,000 miles.

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

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

H.—Using grease gun, inject small charge of Castrol (Medium) every 2,000 miles.

J.—Using grease gun, inject small charge of Castrol (medium) every 1,000 miles.