

9 H.P. MODELS

CLYNO
CARS

Instructions for

THE LUBRICATION
MAINTENANCE
AND DRIVING OF
CLYNO CARS



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— 9 H.P. —
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THE CLYNO ENGINEERING CO.
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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.

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 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, and by means of an oil pipe in the timing case, to the magneto driving shaft. Surplus oil overflows into a well at the front of the engine and lubricates the gears driving the camshaft, magneto shaft and dynamo.

On the nearside of the timing case is a very accessible oil filler (A), provided with a filter for straining the oil as it is passed into the engine. From the timing case 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 a 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 $\frac{3}{4}$ inch 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 plug at the base of the sump. Replace the plug and pour in through the filler a small quantity of thin lubricating oil, after which sway the car gently from side to side to produce a scouring effect and then empty, allowing time for the oil to thoroughly drain away. Afterwards fill up to the maximum height with clean engine oil.

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

On the top of the gearbox will be found the oil filler plug (B), and 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 behind the flange on the axle end brackets. 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 OPERATION.

On an extension of the gearbox inside the bell-housing is a ball thrust race, mounted in a cast iron shell,

which takes the thrust when the clutch is disengaged. This is easily accessible when the small cover on the top side of the bell-housing is removed. A charge of thin oil should be injected through the small oil hole every 1,000 miles. It is advisable, at the same time, to drop a few spots of oil on the faces of the operating forks and in the oil holes on the pedal shaft bosses.

LUBRICATION BY GREASE GUN.

As indicated with a letter "F" on the oiling diagram, a number of parts are provided with adapters 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 21, 22 and 23.

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 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.

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.

Completely enclosed brakes, of Clyno patented design, are fitted to all four wheels of the car. Ferodo-lined internal expanding shoes 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. The brakes 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.

When adjusting 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, but this time the assistant should press the pedal down very slightly more than he did when the rear brakes were adjusted. The adjustment of the hand brake is automatic owing to the interconnection of the foot and hand controls to the rear brake set.

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.

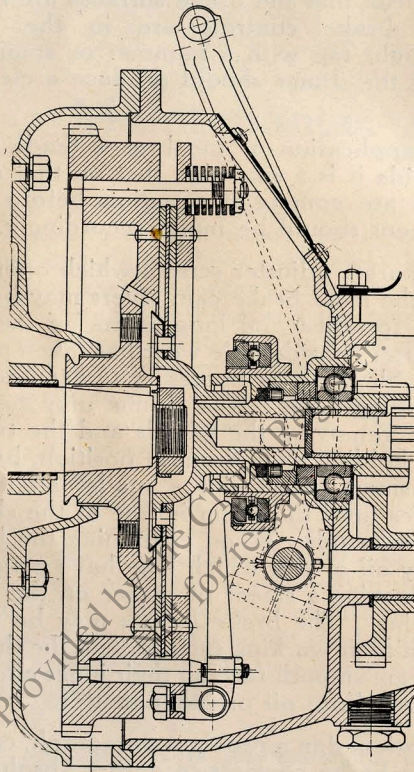
If the application of the brakes tends to pull the car to one side it is a sure sign that on that side one or both brakes are coming into action before the others and adjustment should be made accordingly.

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 counter-sunk screws holding each drum in position, by giving the flat face a smart blow with a mallet alternatively 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 single dry plate type lined with a die-pressed fabric giving good engagement and long life with a minimum of attention. The application of pressure to the clutch pedal disengages the clutch through the medium of a fork lever operating on the clutch thrust race and finally through three multiplying levers provided with hardened adjustable screws which press against the driving pins and release the pressure on the inner plate.



FLYWHEEL, CLUTCH AND CLUTCH CONTROL.

The adjustable screws and also the six adjustable collars retaining the clutch springs, are set in the correct position before the car leaves the factory, and these should not be altered except in cases of necessity. Should adjustment become necessary, care should be taken to give an equal number of turns to each to ensure even pressure. When adjusting the screws maintain at least $\frac{3}{8}$ in. clearance between the shoulder on the gearbox front cover and the rear end of the sliding member which houses the clutch thrust race.

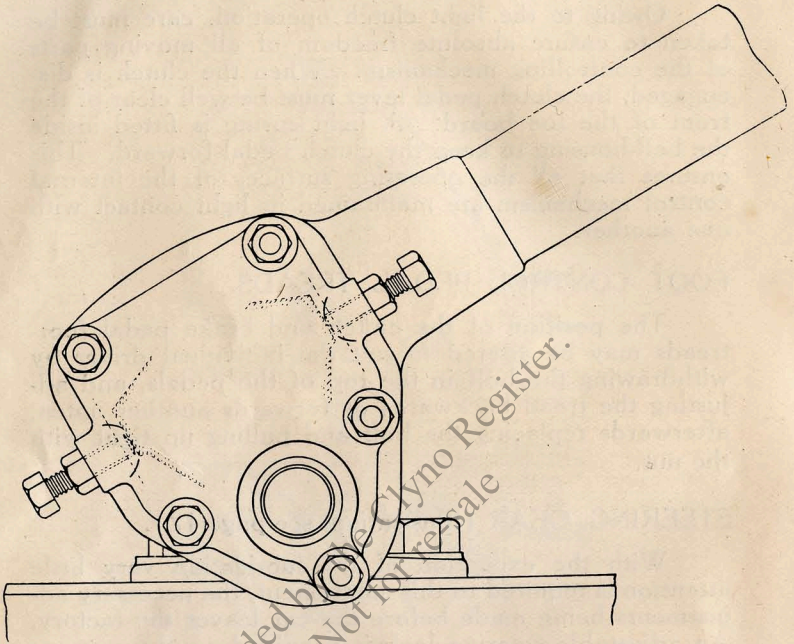
Owing to the light clutch operation, care must be taken to ensure absolute freedom of all moving parts of the controlling mechanism. When the clutch is disengaged, the clutch pedal lever must be well clear of the front of the toe board. A light spring is fitted inside the bell-housing to keep the clutch pedal forward. This ensures that all the operating surfaces of the internal control mechanism are maintained in light contact with one another.

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 forwards another notch, afterwards replacing the bolt and pulling up tight with the nut.

STEERING GEAR (Illustration, see page 12).

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. 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.

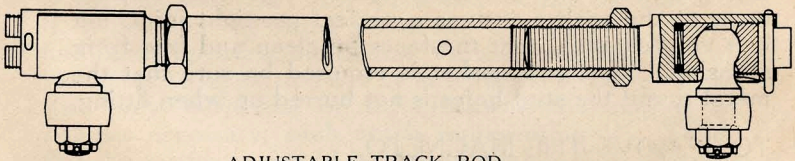


STEERING BOX AND ADJUSTABLE STEERING LOCK STOPS.

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 overlap 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, or in the ball joints on the side steering rod, it must be eliminated by tightening up the screwed ball sockets at the extremities of the rods 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.

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.

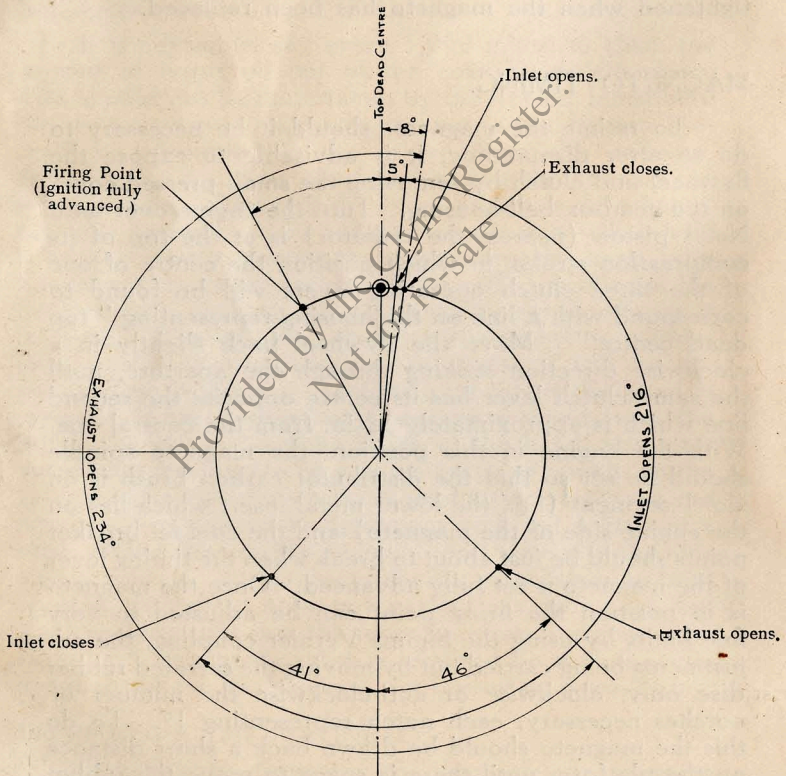
Should it be necessary to dismantle the magneto from its platform, it is advisable to do so in such a manner that it can be replaced without alteration to the relative positions of the flywheel and the contact breaker.

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.

MAGNETO TIMING.

To retime the magneto, should it be necessary to do so after dismantling, it is advisable to expose the flywheel and clutch by removing the small pressed cover on the gearbox bell-housing. Turn the engine over until No. 1 piston (nearest the radiator) is at the top of its **compression** stroke, in which position the centre of one of the three clutch operating levers will be found to correspond with a line on the housing representing "top dead centre." Move the flywheel **back** slightly in a clockwise direction looking through the aperture, until the same clutch lever has its centre opposite the second line which is approximately $1\frac{3}{4}$ -in. from the central one. With the engine in this position, the magneto spindle should be set so that the distributor carbon brush is on No. 1 segment (i.e., the lower metal insert which lies on the engine side of the magneto) and the contact breaker points should be just about to break when the timing lever of the magneto is set fully advanced. Once the magneto is in position the firing point can be adjusted to very fine limits by using the Simms Vernier coupling, the adjustments being carried out by moving the serrated rubber disc only, clockwise or anti-clockwise the number of notches necessary, each notch representing 1° . To do this the magneto should be drawn back a short distance on the platform until there is space to move the rubber freely. Care should be taken to maintain the two serrated discs in the same stationary position while the rubber is disengaged and moved in the desired direction

one notch at a time. By moving this disc clockwise looking from behind the contact breaker end, the spark will be retarded and vice versa. 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 rear wire on the magneto distributor connects up to No. 1 plug (nearest radiator), the next one



TIMING DIAGRAM.

forward across the top connects up to No. 3 plug, the next one to No. 4 and the front one to No. 2.

VALVE TIMING.

If the timing gears in the front of the engine have been dismantled and it is necessary to re-time the engine, the following procedure must be carefully adhered to:— Turn the flywheel until No. 1 piston (nearest the radiator) is at the top of its stroke. With the engine in this position the correct timing as indicated in the diagram will be obtained when the marked teeth on the gears mesh together. It will be noticed that two of the teeth on the crankshaft gear are dotted and one tooth on the camshaft wheel. Also, a mark will be found against one of the keyways into which the key on the camshaft must fit.

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. It will greatly facilitate this operation if the carburetter and the lower part of the induction pipe be removed as a unit, but this is not absolutely essential.

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.

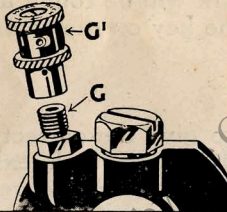
It is also the most suitable carburetter from the user's viewpoint, as there is nothing in it to vibrate or wear out of adjustment, and in the event of either the pilot or main jet becoming dirt-choked, they can be cleared of such obstruction in a few seconds without the use of special tools or even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

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

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'.
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' 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'. 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.

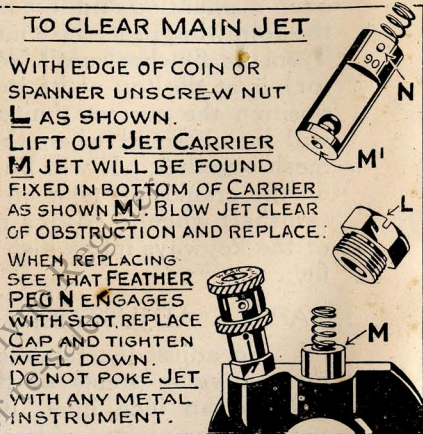


Fig. 2

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 J¹ AND SEE THAT SAME
NUMBER ARE RETAINED WHEN REPLACING
CHAMBER. NUMBER OF WASHERS AT
POSITION J² ARE IMMATERIAL, PROVIDING
THERE IS AT
LEAST ONE.
DONT WIPE INSIDE
OF CHAMBER WITH
ANYTHING LINTY.

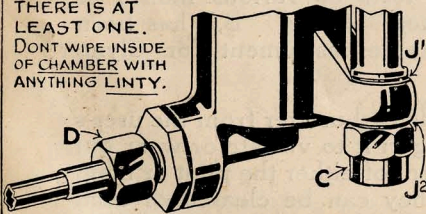


Fig. 3

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.

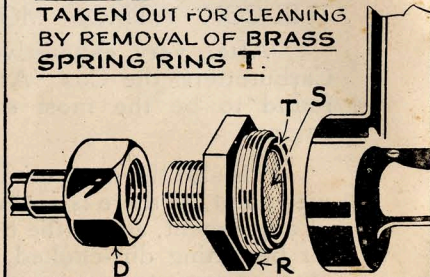


Fig. 4

If the filter receives periodic attention, 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 the main jet attention should also be paid to both the pilot jet and its cap. The cap may be thoroughly washed in petrol without removing the slotted screw, but better results will be obtained if the latter is carefully removed. When doing this first screw down home the slotted screw, counting the number of clicks to obtain this position so that when the parts are re-assembled the same setting may be obtained.

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. 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

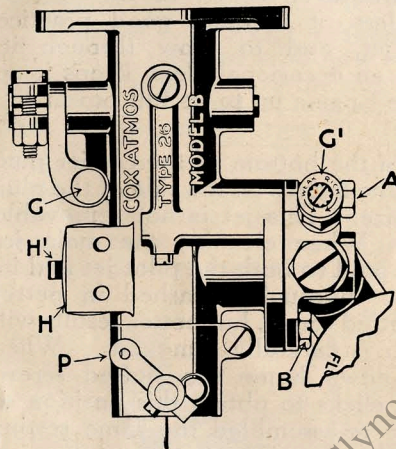


Fig. 5

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.

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 **2s. 6d.** each). The jet sizes run in differences of 5, i.e., 85, 90, 95, etc.; the higher the number the larger the jet.

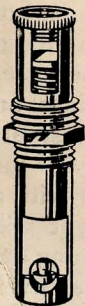


Fig 7

For those who prefer a jet which is adjustable, an interchangeable carrier plug, **Fig. 7**, can be supplied (price **5s.** 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 in the high passes of the Alps, etc., as it provides instant readjustment 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.

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. 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 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, injected through the oilers. Access to the front oiler may be obtained by removing the screwed brass plug on the side of the timing case. 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. When the lights are not in use, the 6 volt dynamo fitted to 9 h.p. 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 a few drops of engine oil may be placed on the gear teeth only. Should the pinion, as sometimes happens, become stuck in engagement with the gear ring on the flywheel, a turn of the starting handle will generally release it. If this is not effective, engage top gear and gently push the car if it is on level ground. 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 overcharging 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 on the front cross bar 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.

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

Type of Car.	Axle.	Laden Axle Weight in Cwts.	Tyres 27 × 4.00. Pressure in lbs.
Four Seater (4 passengers)	Front	7	22
	Rear	9	26
Saloon (4 passengers)	Front	7½	23
	Rear	10	28

nor too low. The table on page 26 shows the approximate laden axle weights when the car is carrying 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 13.

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. 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. 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.

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 Clyno 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 (above the toe board) 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.

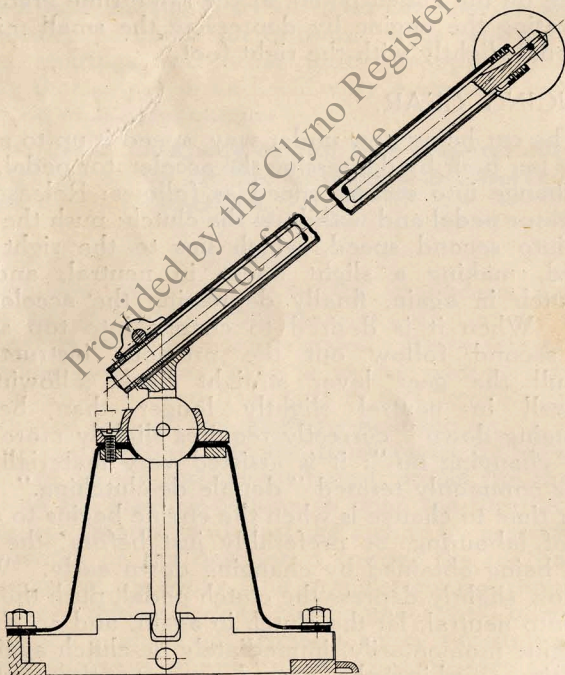
Withdraw the clutch by depressing the left foot-pedal, and after waiting a moment, pull the gear lever to the left and backward into first speed. Release the hand brake, and gently engage the clutch by relieving the pressure on the clutch pedal, at the same time gradually accelerating the engine by depressing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

CHANGING GEAR.

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 to the right 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 from second 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 to the left and forward. Never attempt to get into reverse until the car is **absolutely stationary**, and after reversing do likewise before attempting first speed. The reverse stop on the gear lever is operated by rotating the knob in a clockwise direction.



GEAR CHANGE LEVER.

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.

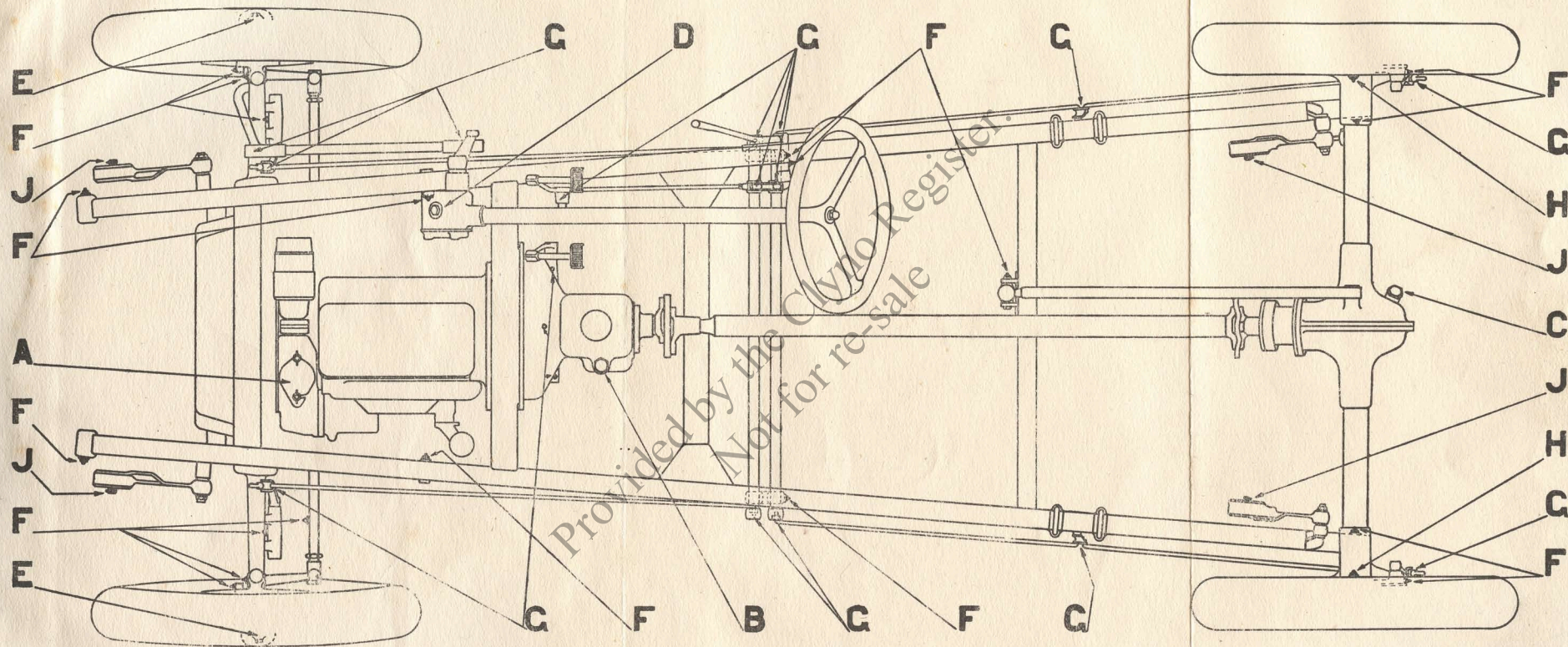
Don't open the throttle too far when attempting to start the engine, and don't race the engine as soon as it has started.

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.

OILING DIAGRAM

9 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.