Cottin & Desgouttes

Car 15/20 H.P. Type M.

MAINTENANCE and LUBRICATION

HANDBOOK.

SOLE AUSTRALASIAN CONCESSIONARIES:

LAWRENCE MORTON & CO. PTY. LTD.

353 Flinders Lane, Melbourne.

Telephone: Central 2956.

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LYONS:
5 Place du Bachut.

PARIS:
5 Avenue Niel.

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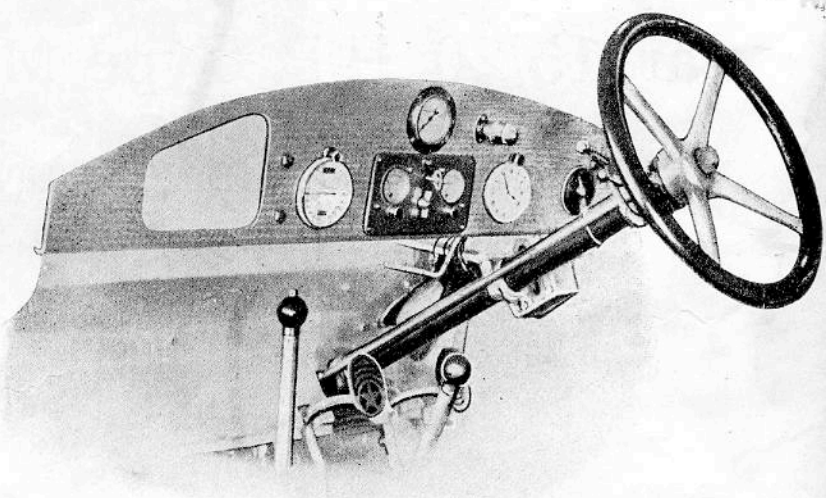


Showing Instrument Board of 15/20 H.P.

The 15/20 H.P.

COTTIN & DESGOUTTES.

DESCRIPTION.

Engine.

The engine is a four cylinder monobloc of 80 m/m bore and 130 m/m stroke. The crankshaft perfectly balanced with counterweights, is fitted on 5 main bearings, and rotates without vibration: the light connecting rods and alloy aluminium pistons permit high rotary speed.

The cast cylinder bloc is fitted with a cast detachable head, in which the valves, operated by rockers, are fitted. The distribution is adjusted by lengthening the threaded push rods, fitted with a lock nut; the usual clearance is 0 m/m.05 for the inlet and 0 m/m.1 for the exhaust valves.

Lubrication.

Lubrication is assured by a gear pump fitted at the bottom of the sump.

The oil is forced up:

(1) Into an oil trough communicating with each of the 5 main bearings. An oil channel is bored in the crankshaft through which, under pressure, the oil finds its way to the big end bearings.

(2) Into the lubrication oil pipe fitted above the rockers; a connecting tube is fitted to the pipe leading to the oil pressure gauge on the dash.

The surplus oil dripping from the rockers runs down the cylinder into the camshaft housing, and from thence to the timing gears.

An adjustable safety valve limits the oil pressure, which is indicated by the gauge.

A tap permits the draining of the sump and the maintenance of the oil level (14 pints).

The filling is effected by a cap fitted on the cylinder head.

Petrol Feed.

The carburetter is a triple diffusor Zenith: the admission is regulated by a butterfly throttle controlled by the accelerator pedal or by the lever fitted to the steering wheel. A special dispositive permits the adjustment of the air admission.

The petrol tank, with a capacity of approx. 14 gall., is fitted at the rear of the chassis; a vacuum feed supplies the carburetter.

A gauge fitted on the tank shows the petrol level.

Cooling.

This is assured by a water-jacket surrounding the cylinders, through which water is forced by a centrifugal pump; the outflow water passes through the radiator. A fan induces the air through the radiator, but it should only be fitted in hot or hilly countries; almost everywhere the car can be run all the year without a fan, as considerable cooling surface has been provided.

Ignition.

The ignition is dual and variable; each cylinder carrying two spark plugs on the offside: the plugs are sparked by a magneto current.

On the near side: the plugs are sparked by a coil and distributor transforming the current from the battery to high tension. The primary current make and break cam is fitted on the distributor's shaft.

Electric Equipment.

The 12 volt battery is placed under the driver's seat, and fitted to the chassis; its capacity is 48 amp. hour. A generating dynamo assures an adequate supply to the whole equipment, the battery intervening only during the stops.

The connecting and cutting of the current between the dynamo and battery is effected by a cut out, which prevents any return flow from the battery to the dynamo; the same dispositive serves as a switch when the starter knob on the dash is pressed.

The switchboard is fitted with two switches, starting and lighting. During normal running the two lighting knobs should be completely pushed in; during stops, the two knobs should always be pulled out.

The lighting switch assures the lighting of the head and side lights; a key locks the switchboard and disconnects the currents.

A main switch, fitted under the dash, on the driver's side, enables the batteries to be disconnected, thus preventing running down when the car is laid up for some time.

Starting.

An electric starter is fitted to the crank case. A Bendix gear engages with the teeth on the fly wheel and sets the engine in motion.

Lighting.

A pivot is fitted on the headlight bracket, which enables the focussing of the lamp at will. The head lights are of 65 candle power, and the sidelights 6 candle power. A dash lamp lights the instrument board.

To connect the accessories, the head light, klaxon, etc., a switch box is provided under the dash.

Clutch.

It is of the multiple disc type, steel and ferrodo alternating. The pressure is distributed over the surface by 9 springs; foot action is transmitted and increased by 3 levers turning with the fly wheel. The clutch is fitted with a fibre lined brake.

Gear-box.

The gear-box forming bloc with the engine, contains a set of gears fitted on two parallel shafts giving 4 speeds forward; the top is direct; the reverse is obtained by an intermediary gear. The 2 sliding gears are controlled by a ball joint lever fitted above the box.

Transmission.

The shaft with the driving pinion on one end has on the other end a cardan joint fitted to the rear of the gear-box. The conical gears are of the helicoidal Gleason type; the differential has 4 satellites.

Front Axle.

The axle is drop-forged and of double T form; the stub axles are dipped.

Chassis.

The frame is of pressed steel fitted together by 3 cross members and by the engine bloc.

Steering.

The steering is of the screw and nut type fitted by an axis to its support, which renders variable at will the rake of the column. An adjustment enables the taking up of the play of the spherical thrusts under the steering wheel. The ignition and throttle controls are fitted on the side of the steering column.

Brakes.

The brake pedal acts simultaneously on the 4 wheels by the rotation of an intermediary control bar.

The front brake control is of the Perrot system.

The hand lever operates on the rear wheels by special brake shoes and adjustable commanding rods; the rear wheels are fitted, then, with 2 concentric drums.

Instruments.

On an aluminium switch-board in front of the driver are fitted all the control instruments: oil pressure gauge, speedometer, clock, mixture adjustment, dashboard lamp and electric switch-board.

USAGE.

Starting the Engine.

Check water and oil levels (push the plunger and let it come back to the free position); as the oil filled through the filling cap takes a certain time to reach the sump, it is advisable to do the refilling slowly so as not to exceed the level. If the level be exceeded the oil tap must be put to the position "niveau" in order to drain off the surplus.

Make sure about the petrol in the tank, turn on the petrol tap on the vacuum tank, switch on the general switch (tighten up the winged nut).

Put in the switch key and give it half a turn so that the voltage be indicated on the voltmeter; push in the 2 knobs, magneto and coil; put the mixture adjustment lever in the position "depart" (when the engine is warm it will start at position "normal"); place the throttle control lever in the most favourable position, the ignition control lever half-way and push the starter knob.

If the engine does not start after a few revolutions, don't insist, but make sure that the petrol reaches the

carburetter by lifting its needle, and see if the plugs are firing. **Don't flood the carburetter.**

When the engine is started by hand, put the lever to full retard to avoid kicks. Take care to push the starting knob well home. A screwdriver fitted to the starting handle itself saves the trouble of opening the kit bag.

When the engine is running **the oil pressure** should never be below 0, 5 during slow running and 1, 5 during normal speed.

To check the oil level it is advisable not to trust to the float alone, but to see if the oil is flowing through the oil tap when put to position "niveau."

Starting Up:

Start up smoothly in second gear with throttle only slightly open, as soon as the car acquires momentum put in third, then 4th gear (top).

Running.

Check occasionally the two ignitions by cutting one of them. Set the ignition advance to the maximum, but avoid any knocking of the engine. To attain the minimum petrol consumption, the running must be fast with the weakest mixture possible.

Look at the ammeter; the charge current diminishes when the engine runs faster.

Use the brakes sparingly, so as to economize petrol and tyres.

When running fast the brakes should be put on without disengaging the clutch, the engine itself acts as a brake as soon as the throttle is closed; the clutch should be disengaged only at reduced speed to prevent stopping the engine.

Slow Running Device.

When the engine is warm, adjust occasionally the slow running device; the regime is 200 to 250 revolutions.

The throttle should be quite closed, the slow running device when warm is adjusted by the carburettor's knurled screw, the mixture adjustment being at the position "normal" (adjust the air inlet by the special screw).

When the engine is cold the quantity of gas should be increased by the lever and sometimes the mixture adjustment left in the position "depart."

During slow running the ignition control lever should be at full retard.

Stop.

The engine should be stopped by cutting the current, never by the throttle control. **Very important. Take care to disconnect the coil to avoid the running down of the battery. Turn the switch lock key until the voltmeter's hand returns to zero.**

Shut the petrol tap underneath the vacuum tank.

If the car is to be laid up for some time unscrew the general switch under the dash.

During the Cold Weather.

Run without the fan belt.

If the car has to remain in a place where the water might freeze drain off the water by the tap underneath the pump.

To prevent freezing it is advisable to add to the water 20 per cent. of neutral glycerine.

During the stops in the open, cover the radiator to prevent the water cooling. It is advisable to put a cover on the radiator to protect a part of the surface whilst running.

UPKEEP.

Every 300 Miles.

Give a few turns to the grease cups of the rear spring pivot bolts, the shackle bolts and plates; also those of the water pump; if they are screwed home refill them with grease; oil the steering ball joints and those of the distance rod; inject a syringe full of oil into the cardan after unscrewing the cap on the spherical housing behind the gear-box; clean with petrol and oil all the articulations of brake controls, particularly those of the intermediate brake control shaft behind the cross member of the chassis (a lubricating hole exists in each of its three supports); inject a syringe full of oil into each of the rear axle oil cups; a few drops of oil on the declutching sleeve. Check the level of the liquid in the batteries, keep it up to $\frac{3}{8}$ inch above the plates by adding distilled water.

Every 600 Miles.

Keep the oil level in the gear-box up to normal, as the oil lubricates also the cardan joint.

Every 1,200 Miles.

Oil the pedals, the accelerator controls, the fan.

Clean the carburetter's filter. Drain the engine and refill with fresh oil. Maintain the oil level in the back axle, but do not exceed it, as the surplus oil works through to the brakes and renders them unreliable.

Put the steering on full lock to the left, and put a syringe full of oil in the oil cups on the steering housing. Check the tightness of the spring pivots and shackle bolts. Clean the spark plugs and adjust the gap of the points. Adjust the brakes.

Every 3,000 Miles.

Drain the gear-box and refill to level.

Oil the dynamo and self-starter (a few drops of oil in each cup).

Jack up the wheels and see that there is no lateral play.

Rudge-Whitworth or R.A.F. Wire Wheels.

Before fitting a wheel, make sure that the hub and the wheel are clean.

Put grease in the fluting in order to prevent rusting and facilitate dissembling.

Screw up dead tight the wheel cap by hammering on the end of the spanner.

See occasionally if they are dead tight (never tighten the screw without jacking up the wheel).

Battery.

The level of the liquid should be always kept 1-3rd of an inch above the plates. If the level drops, which is the normal result of evaporation, and which can easily be seen by unscrewing the caps, distilled water must be added until the normal level is reached. Acidulated water should only be added when the liquid is spilt. It is advisable to test, now and again, the density of the electrolyte, which should be 28° to 31° Baume at full charge. If at full charge the density is inferior to 28° Baume, the liquid in the element should be poured out and the degree adjusted by adding a solution of sulphuric acid at 40° Baume.

If, on the contrary, the density of the electrolyte, at full charge, is above 30° Baume distilled water must be added.

To obviate sulphating or polarization, never leave a battery run down more than 24 hours without recharging.

A battery is run down when the voltage drops to 1.7 volt per element, with lights on, that is 10.2 volts for the battery. The lights are then burning dim.

The voltage of the battery should be tested at the time of discharge; when the current is cut the voltage is always a little higher.

Keep the connexions very clean, so as to avoid any bad contact which would prevent the lighting set, and especially the starter, from working properly. Grease the terminals with vaseline to prevent oxydation. The outside of the accumulator box should always be clean and dry. Liquid spilt on the sides causes discharge.

To avoid short circuits when disconnecting the wires, disconnect first the negative terminal.

If the car is laid up the battery should be put under charge 4 hours at least every three weeks.

ADJUSTMENTS.

Adjusting the Brakes.

Hand Brake.

Jack up the two rear wheels, they should lock when the lever is in the half-way on the sector; 2 adjustments are fitted on the rods leading from the intermediate brake control shaft to the rear axle.

Foot Brake.

The car must be jacked up. Lock steering to the right, screw up the adjustment of the right hand brake until the shoes are slightly touching the drums, which can be noticed when the wheels are turned by hand.

Straighten up the steering and apply the brake pedal in order to find the position where all four brakes begin to act, an assistant turning the wheel by hand in the meantime. The adjustments of the 4 brakes must be done to have them all acting simultaneously (keeping the same adjustment already done on the front wheels).

When the brakes are all adjusted together, tighten by a full turn the two front wheel brake adjustments so that they may act before the rear wheel brakes.

Screw dead tight all the lock nuts.

Distribution.

To examine the clearance of a valve, push the rocker down on the opposite side to the valve, and introduce the feeler between the rocker and the valve stem. The inlet clearance should be 5/100 of a m/m and the exhaust clearance 1/10 of a m/m; the adjustment is effected by the end of the push rod; screw dead tight the lock nut and check over the clearances.

Dynamo Driving Chain.

To tighten this chain unscrew the 3 nuts holding the dynamo, and rock over the dynamo on the lower bolt, thus moving it away from the engine; tighten up the 3 bolts.

Ignition Advance.

The sparks of the dual ignition should be simultaneous; this is easy to test by cutting successively the two ignitions. When the engine slows down by cutting one ignition, that particular ignition is in advance of the other. To adjust the ignition turn the engine by hand until the platinum points break, which should take place at the same time on the magneto and the distributor (remove the lid of the distributor by unscrewing the knurled cap).

The maximum advance should correspond with the mark on the fly-wheel.

The timing of the magneto is effected by the adjusstment fitted to the rubber coupling; to adjust the distributor deplace the brass ring which surrounds it.

Clutch.

The clutch pedal must have a play of about $\frac{1}{4}$in. when the clutch is engaged; this will correspond to a play of about 2 m/m on the declutching sleeve.

Through wear of the clutch plate this play will disappear, the pedal will oppose the action of the spring and the clutch will slip.

There are two ways of adjusting.

The first consists in shortening the rod which transmits the action of the pedal—this rod is adjustable lengthwise by a double-threated nut.

When this adjustment is made, it is necessary to make sure that when the clutch is engaged, the declutching sleeve bears on the two knobs operated by the pedal.

In this position the declutching sleeve must never bear between the 3 levers and the cover of the fly-wheel.

The second adjustment, which replaces the first consists in unscrewing of the same degree (essential) the 3 adjusting nuts.

This second adjustment has the advantage on the previous one of bringing the clutch brake in its original position, whilst the previous one diminishes the action of the brake with the wear of the disc, and might require the readjusting of the brake.

Spring Pressure.

When the clutch slips, the pedal having the necessary play as well as the declutching sleeve, as indicated above, screw up the 9 spring cups to the same degree, the tension of the springs will be increased, also the resistance of the pedal.

Clutch Brake.

If it does not work properly (the clutch keeps spinning, and the gear grating when passing from first to second gear) screw up the two adjusting guides after having unscrewed the lock-nut.

Do not adjust the brake too close, otherwise difficulty would be experienced on passing from fourth to third gear.

ASSEMBLING AND DISSEMBLING OF A FEW ORGANS.

Timing of the Distribution.

The timing gears are marked at the point of full advance.

The assembling must take place in the following order:

Pump and magneto gear.

Camshaft gear.

Crankshaft gear.

If this assembling is done correctly to the full advance of No. 1 cylinder, the mark advance on the fly-wheel can be seen, the exhaust cam of No. 4 cylinder will be right up, the magneto must show figure 1, and the marks M and V on the gears must face one another.

Dissembling of the Valve Spring.

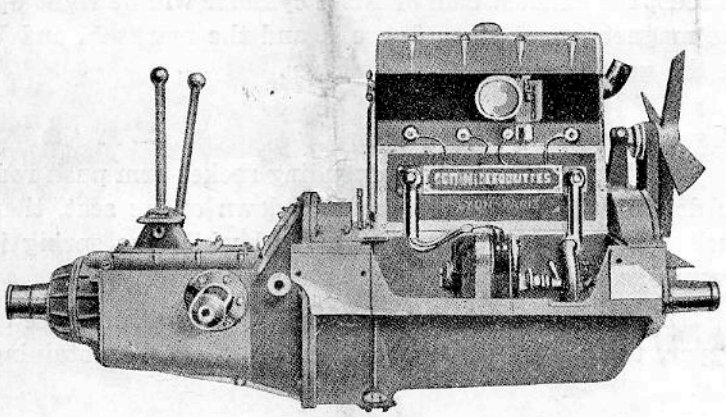
(1) Dissemble the corresponding rocker arm push rod. To do this the valve must be first down on its seat, then push down the rocker and valve, and while the spring is compressed remove the push rod vertically.

(2) Unscrew a plug and hold the valve with a piece of copper, thus enabling the removal of the split retaining ring.

To reassemble, proceed in the opposite way.

Connexion of the Back Axle with the Gear-box.

Place the transmission shaft and the cardan sleeve in accordance with their respective marks, then push the shaft well home. The aluminium cups covering the spherical joint must join together properly before the nuts are tightened up, otherwise they might be broken.

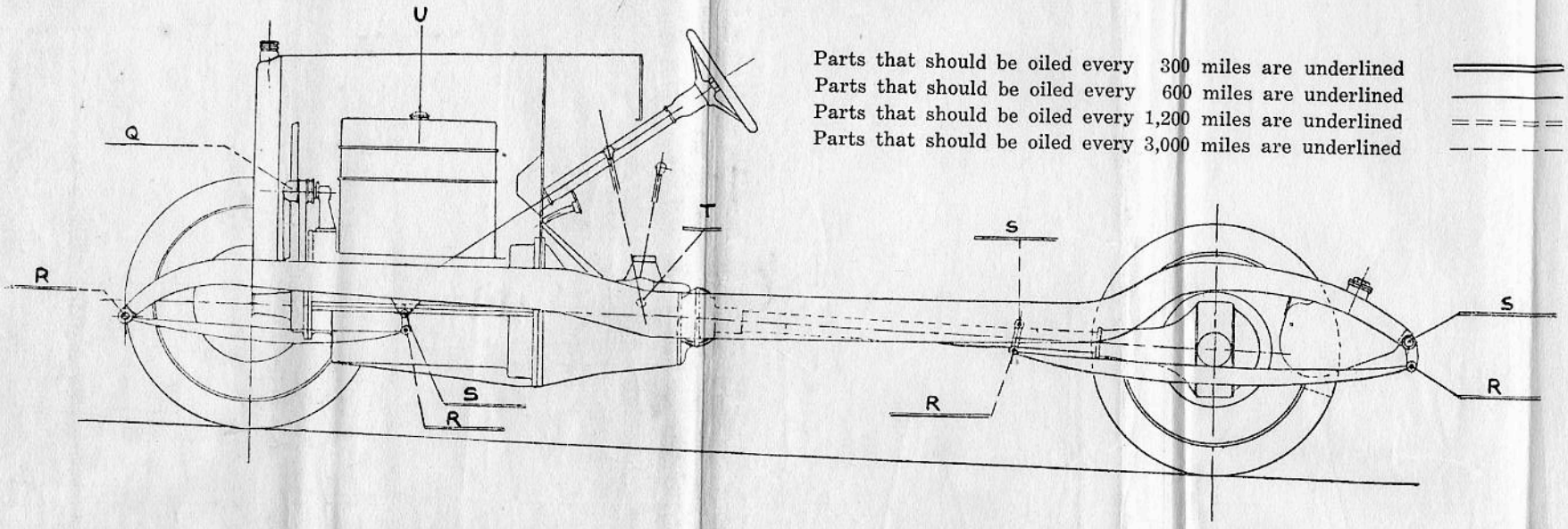


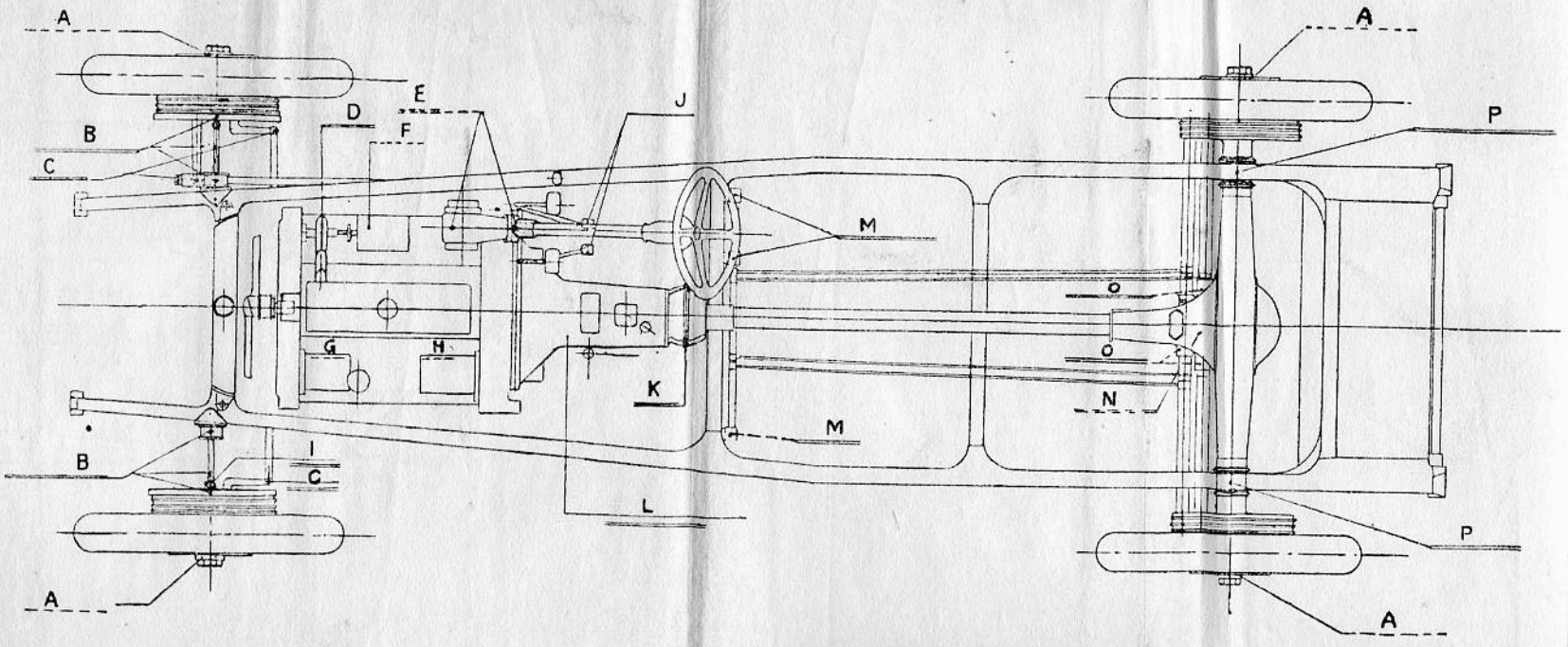
Showing Engine of 15/20 H.P.

The Imperial Press, Printers, 395 Elizabeth Street, Melbourne.

GENERAL LUBRICATION.

Parts that should be oiled every 300 miles are underlined
Parts that should be oiled every 600 miles are underlined
Parts that should be oiled every 1,200 miles are underlined
Parts that should be oiled every 3,000 miles are underlined

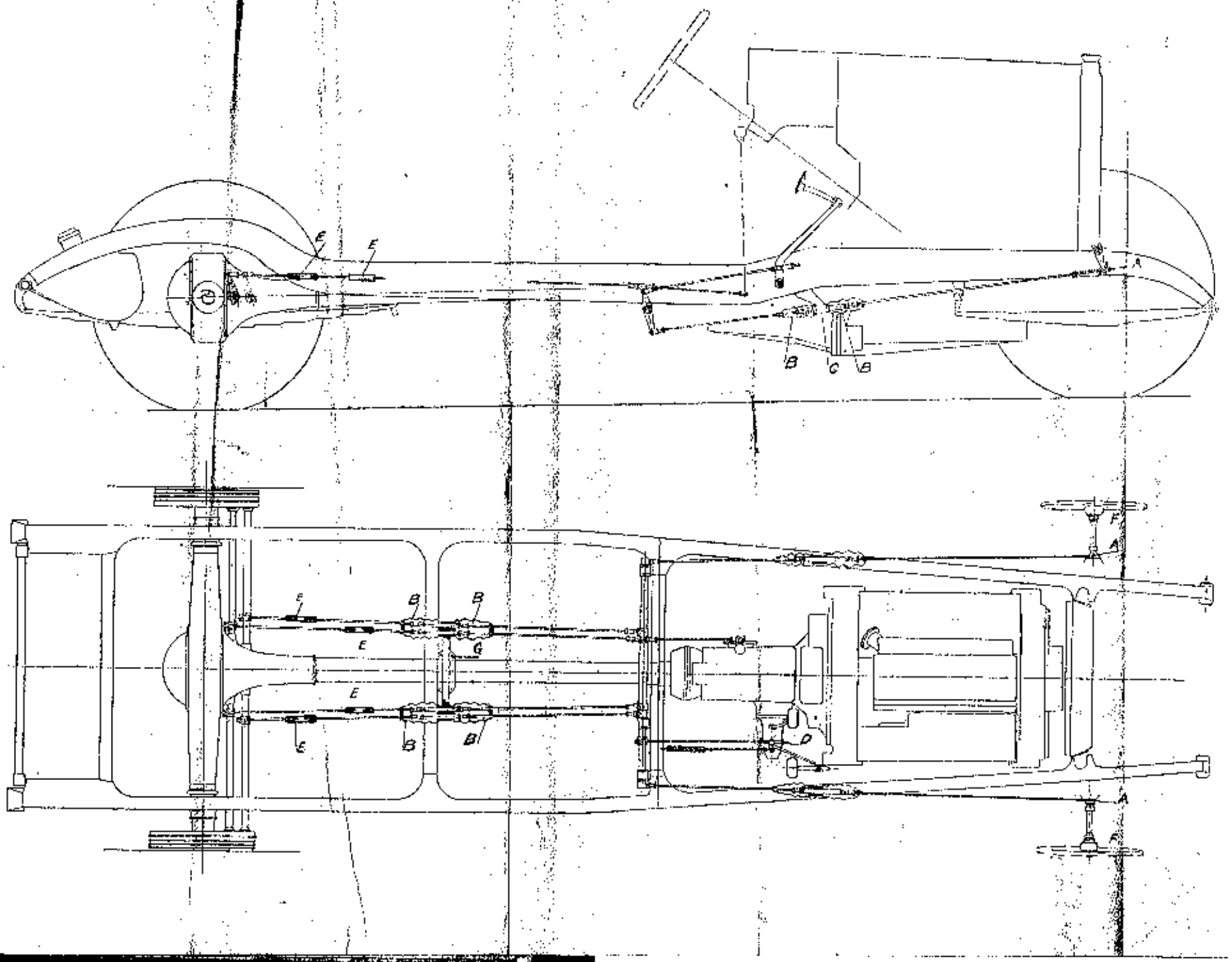




References.

A Hubs.
B Sliding shafts.
C Ball joints.
D Water pump.
E Steering.
F Magneto.
G Dynamo.
H Starter.
I Stub axle pivots.
J Pedal axis.
K Cardan joint.
L Gear-box.
M Supports of intermediate shaft.
N Back axle housing.
O Brake shaft bearings.
P Spring pivots.
Q Fan hub.
R Spring eyes.
S Shackle bolts.
T Brake hand lever axis.
U Engine oil filling cap.

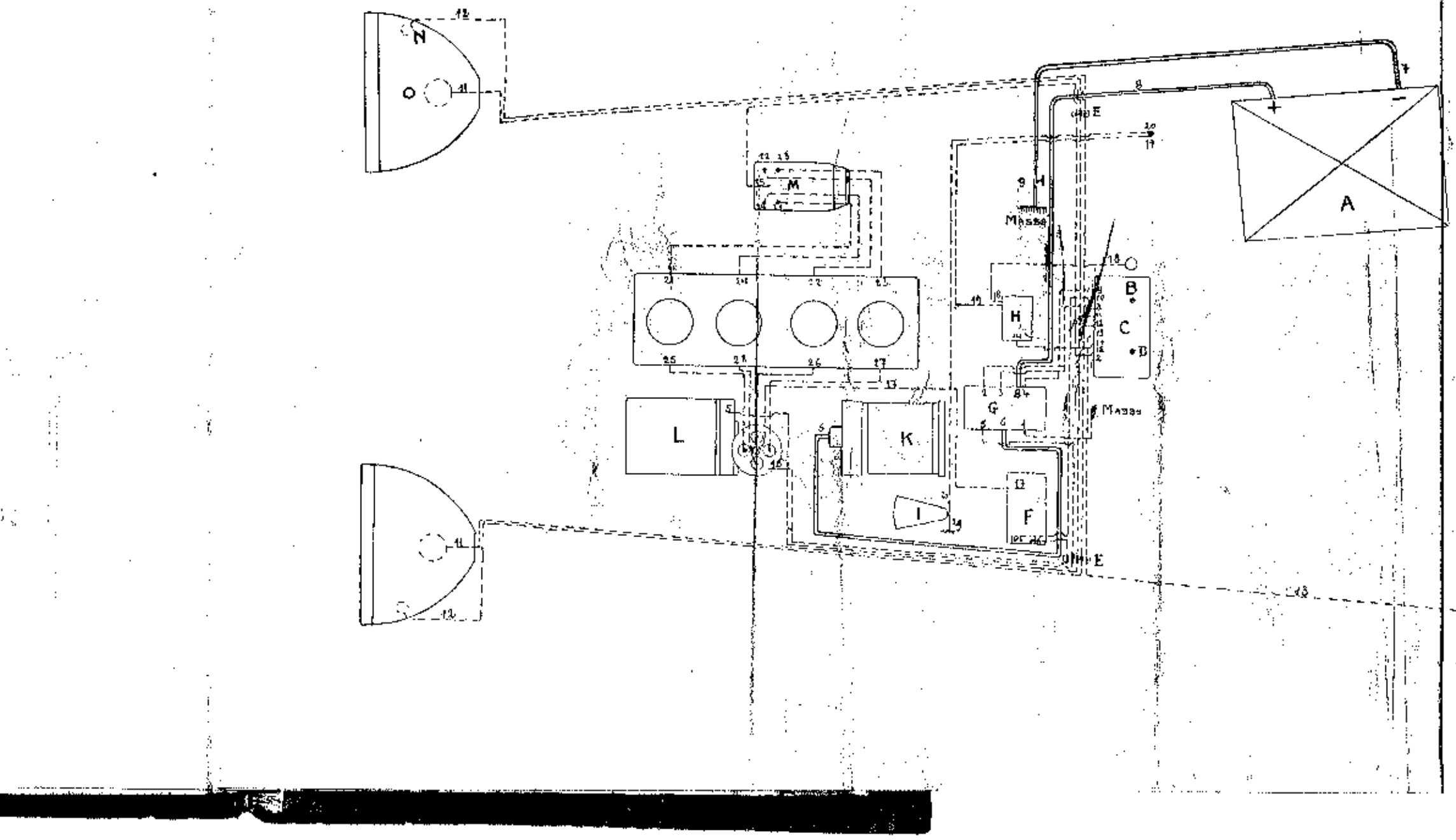
BRAKE ADJUSTMENTS.



References.

A Front brake adjustment nuts.
B Gaiters.
C Supports of brake rod guides.
D Brake pedal adjustment nut for rear wheels.
E Adjustment swivels for rear brakes.
F Front brake shoe cover.
G Brake rod guide support for rear brakes.

ELECTRIC EQUIPMENT.



References.

A Battery.
B Coil switch.
C Switch board "Paris-Rhone."
D Magneto switch.
E Current connexions.
F Coil.
G Cut-out.
H Box for accessories.
I Klaxon.
K Self starter.
L Dynamo (lighting and ignition).
M Magneto.
N Side lights (6 candle).
O Head lights (65 candle).
P Rear light (8 candle).

1 Wire cut-out to earth.
2 Starter wire from switchboard to cut-out.
3 Dynamo distribution wire (from cut-out to switchboard).
4 Battery distribution wire (from cut-out to switchboard).
5 Dynamo wire to cut-out.
6 Cable from cut-out to starter.
7 Cable from battery to switch.
8 Cable from battery to cut-out (same connexions as 4).
9 Main switch with earth to switchboard.
10 Wire from switchboard to coil.
11 Wire from switchboard to head lights.
12 Wire from switchboard to side lights.
13 Wire from switchboard to rear light.
14 Wire from switchboard to accessory box.
15 Wire from switchboard to magneto.
16 Wire from coil to magneto make and break.
17 Wire from coil to distributor.
18 Wire from accessory box to dash lamp.
19 Wire from accessory box to klaxon button.
20 Wire from button to klaxon.
21 Wire from magneto to plug of 1st cylinder.
22 Wire from magneto to plug of 3rd cylinder.
23 Wire from magneto to plug of 4th cylinder.
24 Wire from magneto to plug of 2nd cylinder.
25 Wire from distributor to plug of 1st cylinder.
26 Wire from distributor to plug of 3rd cylinder.
27 Wire from distributor to plug of 4th cylinder.
28 Wire from distributor to plug of 2nd cylinder.
29 Wire from klaxon to earth.

CHARTS FOR ORDERING SPARE PARTS.