

THE  
**BOND MINICAR**  
Mark "C"  
DE-LUXE  
INSTRUCTION BOOK

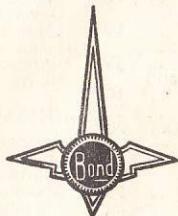


*Manufacturers & Sole Concessionaires:*  
**SHARP'S COMMERCIALS LTD.**  
PRESTON - LANCASHIRE - ENGLAND





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# FOREWORD

Progressive design and sturdy construction are combined to give distinction in appearance, performance and reliability to the Bond Minicar Mark 'C'; but it will be appreciated that these qualities can only be maintained by giving regular attention to those points which require periodic lubrication, and by effecting any minor adjustments from time to time

In the compilation of this instruction book an attempt has been made to give in concise form all the information normally required for the efficient maintenance of the car. The instructions and advice to be found in the following pages are provided to assist owners to run and maintain their cars to the best possible advantage, and can readily be carried out by the average motorist.

We know that every Bond Minicar which leaves our works can give absolute satisfaction if proper and regular attention is given to the essential maintenance features.

Read this book carefully, especially the points outlined under "Lubrication and Maintenance," and then make arrangements (if you do not desire to do this personally) to ensure that this programme is regularly carried out. In case of trouble first study this instruction book, then if still uncertain write to your dealer or to the works.

- This instruction book is made applicable to **left-hand** drive cars by substituting the word **off-side** for **near-side** and vice versa wherever it appears in the book.

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## CORRESPONDENCE WITH YOUR DEALER OR THE WORKS

At the head of every letter written to your dealer or to the works on Service Matters, Sales Enquiries, or when ordering any replacement part, the chassis and engine number of the car should be quoted, or possible delay in reply or despatch of parts may unavoidably result.

The chassis and engine number are to be found stamped on the data plate fitted to the nearside face of the bulkhead—beneath the bonnet.

To denote also to which department the correspondence is intended the word **SERVICE**, **SALES** or **SPARES** should be clearly printed in the top left hand corner of the envelope.

If communication with the works or dealer has already been established, mention this fact and quote the letter reference.

# FOR THE WORK

Progressive design and sturdy construction are combined to give  
distinction in appearance, performance and reliability to the Bond  
Master Blank C, but it will be appreciated that these qualities  
can only be explained by giving regard to these points  
which require periodic inspection and by effecting any minor  
adjustments from time to time.

In the operation of the instruction book an attempt has  
been made to give in concise form all the information normally  
required for the efficient maintenance of the car. The instructions  
and advice to be found in the left hand pages are provided to assist  
owners to use and maintain their cars to the best possible advantage  
and can readily be carried out by the average motorist.

We know that every motorist wishes to know what  
gives absolute satisfaction in proper and regular operation is given in  
the essential maintenance features.

Read this book carefully, especially the parts relating to  
Lubrication and Maintenance, and when necessary refer to the  
you do not desire to do this, it is necessary to ensure that the  
language is written in plain, simple, and to the point, and that the  
instruction book, when it will be found to give you the  
works.

The instruction book is made applicable to left-hand drive  
cars by substituting the word "right" for "left" and vice  
versa wherever it appears in the book.

## CORRESPONDENCE WITH YOUR DEALER ON THE WORKS

At the time of every letter written to your dealer or to the  
works on factory matters, please mention to whom you are  
addressing the letter, and give the name of the dealer to whom  
no question or possible delay in reply or dispatch of parts should  
be unavoidable result.

The check and engine number are to be found stamped on the  
dash plate (left) in the nearest corner of the instrument panel  
panel.

To locate also in which registered the car, the  
intended the word SERIAL on the dash plate, and in the  
printed in the top left hand corner of the work.

If communication with the works or dealer has already been  
established, mention the fact and quote the letter reference.



## SPECIFICATION OF THE CAR.

### BODY AND FRAME.

Specially designed body and frame combined into an extremely light structure of high torsional rigidity.

Constructed of aluminium alloy and steel.

### FRONT AXLE.

A separate stub axle firmly secured in the front trailing arm carries the front hub and drive assembly.

Bolted to the aluminium alloy hub is a detachable cast iron brake drum, and to the flange machined on the drum the front wheel drive sprocket is riveted.

An aluminium cover mounted on the stub axle fully protects the brake drum and brake shoe assembly from road dirt and water.

### REAR AXLE.

Rear stub axles fitted to separate trailing arms, and attached to bonded rubber suspension units, are bolted as independent assemblies to the rear triangular cross bracing member.

The trailing arms carry the brake assemblies, and the cast iron brake drums are integral with the aluminium alloy hubs.

### ENGINE AND FRONT WHEEL DRIVE UNIT.

A trailing arm (pivoted in phosphor bronze bearings inserted in the lower end of the main steel down tube) carries the front axle and drive assembly. Movement of the trailing arm is controlled by a coil spring and hydraulic shock absorber unit.

A torque reaction linkage interposed between the cylinder head and main tube, and steel shackle plates fitted to the rear of the gearbox and mounted in rubber bushes in the main tube, carry the engine and gearbox unit.

The complete unit which turns with the front wheel adds to the advantages of front wheel drive, and gives greater stability when cornering.

### ENGINE.

Villiers Mark 8E.

Single Cylinder—2 stroke.

Bore—59 mm.

Stroke—72 mm.

Cubic Capacity 197 c.c. = 11.71 cu. ins.

Engine Sprocket—23 teeth,  $\frac{1}{8}$  in. Pitch.

Sparking Plug—Lodge H.H.14.

Sparking Plug Gap—.018 in. —.025 in.

Spark Timing— $5/32$  in. before T.D.C.

Lubrication—Petrol Mixture. 1 part of the appropriate grade of oil to 16 parts petrol. (See recommended oil-chart, rear of Instruction Book.)

**CLUTCH.**

Driven from engine by endless roller chain in enclosed chain case.

Clutch sprocket 51 teeth,  $\frac{3}{8}$  in. pitch. Lubrication: Oil bath (recommended oil) filled to level plug.

**GEARBOX.**

3 Forward Speeds.

**GEARBOX RATIOS:**

1st Gear 3.25 — 1.

2nd Gear 1.7 — 1.

3rd Gear 1 — 1.

Drive Sprocket: 19 teeth  $\frac{1}{2}$  in. pitch for Renold Chain No. 110044.  
Lubrication: (See recommended oils). Capacity  $\frac{1}{4}$  pint (approx.).

**FINAL DRIVE.**

Roller Chain to front wheel.

Front wheel sprocket 42 teeth,  $\frac{1}{2}$  in. pitch.

Ratio of engine to front wheel, 4.9 — 1.

**CARBURETTOR.**

Villiers Type S.25.

Air cleaner fitted to air intake.

**IGNITION SYSTEM.**

Villiers flywheel magneto.

**ELECTRICAL SYSTEM.**

6 volt 10 amp./hour capacity battery with positive earth.

**STARTER MOTOR.**

Starter motor mounted on cylinder head. Adjustable vee belt drive to flywheel.

**CHARGING UNIT.**

Villiers magneto and generator combined.

Selenium type rectifier for conversion from A.C. to D.C. fitted in circuit from generator to battery.

**LIGHTING EQUIPMENT.**

Head and side lamps combined, fitted with double filament bulbs.

Twin tail lamps, fitted with single filament bulbs, plus twin reflectors.

Rear number plate illumination and stop lamp fitted with double filament bulb.

**FUEL SYSTEM.****FUEL TANK.**

Capacity  $2\frac{1}{2}$  gallons, located at rear of bulkhead, fitted with "on—off and reserve tap" unit. This unit is located under the bonnet, beneath the petrol tank platform.

Gravity feed from fuel tank to carburettor.



**FUEL**

Petrol mixture in the ratio of **16 parts petrol to 1 part oil** (SAE30).

The recommended mixture of 20 parts petrol to 1 part oil (SAE30) given in Villiers Handbook is not applicable to the engine when fitted in a Minicar.

**COOLING SYSTEM.**

Direct air.

**SUSPENSION.**

**Independent on all wheels.**

**FRONT**

Trailing arm controlled by coil spring incorporating a double acting hydraulic shock absorber unit.

**REAR**

Trailing arms attached to separate bonded rubber units.

**TYRES.****MICHELIN**

Size 4.00 — 8 low pressure.

Front — 28 lbs per square inch.

Rear — 22 lbs per square inch.

**WHEELS.**

“ Bolt-on ” with detachable split steel rims.

**STEERING.**

Worm and sector, with sufficient travel to enable the car to be turned round in its own diagonal length.

**BRAKES.**

Mechanically operated.

Footbrake connected direct to cross shaft. Handbrake connected by cable to separate intermediate lever.

**FRONT.**

Internal expanding, operated by cable via brake linkage to cross-shaft.

**REAR.**

Internal expanding, rod operated to cross-shaft.

Handbrake operates same shoes as footbrake on both front and rear wheels

**DIMENSIONS.**

	ft.	ins.
Wheel base .....	5	6
Track .....	4	5
Overall length .....	9	10
Overall width .....	4	9
Overall height .....	4	2

**GROUND CLEARANCE.**

7 ins.

**WEIGHT.**

460 lbs.

## INSTRUMENTS AND CONTROLS.

### HAND BRAKE LEVER.

This is of the pistol grip type and is situated below the instrument panel. It controls both front and rear wheel brakes, and is used mainly when parking.

When applying the hand brake, depress the foot brake pedal, squeeze the pistol grip trigger, pull lever towards you as far as possible, release trigger and finally the foot brake pedal.

This sequence of application minimises the wear on the hand brake ratchet.

When releasing the hand brake, apply pressure to the foot brake, pull lever back slightly, squeeze release trigger and push lever forward to its extreme position.

### FOOT BRAKE PEDAL.

This is the centre pedal and controls the brakes on both front and rear wheels. It also operates the rear "Stop" light.

### CLUTCH PEDAL.

This is the pedal on the left and is used for the engagement and disengagement of the clutch.

### ACCELERATOR PEDAL.

This is the pedal on the right and is for controlling the speed and pulling power of the engine.

### DECOMPRESSOR PEDAL.

This is the small pedal in the centre of the bulkhead which operates the decompressor unit for easy starting.

### GEAR CHANGE LEVER.

This is the lever protruding through the bracket directly at the side of the steering wheel.

The gear positions are obtained as follows:—

**First Gear.** Push the lever upwards.

**Second Gear.** Pull the lever downwards to a position below neutral.

**Top Gear.** Pull the lever downwards still further to a position below second gear.

**Note.** When pulling gear lever downwards from 1st to 2nd gear position, care must be taken to avoid pulling lever too far, or top gear will be engaged unintentionally.



**SPEEDOMETER.**

This is the instrument which registers the speed of the car and total mileage. It is located in the centre of the instrument panel.

**LOCK IGNITION AND LIGHTING SWITCH.**

This combined switch is positioned below the speedometer.

The lighting positions are as follows:—

“Off.” When the handle of the switch tumbler is vertical.

“Parking and Rear Lights.” Turn the handle in an anti-clockwise direction.

“Head and Rear Lights.” Turn the handle in an a clockwise direction.

The key in the centre of the switch controls the ignition circuit. When the key is in the vertical position the ignition is switched “off.” To switch “on” turn it in an anti-clockwise direction.

The key may be removed from the switch when the ignition is “off,” but remains fixed in position when the ignition is “on.”

**HEADLAMP ISOLATION SWITCH.**

A hand operated isolation switch which controls the offside headlamp (when the main lighting switch is in the head position) is situated close to the rim of the steering wheel.

**STARTER CONTROL.**

The starter pull out control is fitted above the headlamp isolation switch and is marked ‘S’.

**Note.**—A foot operated starter lever which is fitted to the offside of the engine is readily accessible for use in an emergency.

**HORN BUTTON.**

This is found in the centre of the steering wheel.

**DASH LIGHT.**

The switch controlling the dash light is fitted to the right of the speedometer. Pull for “on,” push for “off”; operative only in conjunction with either head or side lights.

**CHOKE CONTROL.**

This is located to the left of the speedometer and is marked “C.”

When starting the engine from cold pull out to fullest extent (approximately  $\frac{3}{4}$  in.) and lock in position by turning the knob in an anti-clockwise direction. This has the effect of blanking off the air intake thereby allowing a rich mixture to enter the crankcase of the engine.

**IMPORTANT.**

Return choke control knob to normal position as soon as practicable.

### ELECTRIC WINDSCREEN WIPER.

This is bolted to the lower edge of the windscreen directly above the steering wheel.

To set the wiper motor in motion, turn the switch in a clockwise direction.

### FUEL TAP UNIT.

This is fitted at the bottom of the fuel tank and is accessible from beneath the bonnet.

"On" and "Off" positions are marked clearly on the faces of the slide.

A reserve control is provided, and is operated by a small lever above the slide.

The normal place for the lever is in the extreme anti-clockwise position, as viewed from above.

When moved to the opposite position reserve fuel can be used.

## OPERATING INSTRUCTIONS.

### STARTING THE ENGINE.

1. Check quantity of fuel in tank and move fuel tap to the "on" position.
2. Be sure that the gear lever is in neutral position. Neutral is between 1st and 2nd gear.
3. When starting from cold see that the carburettor choke control is pulled out to its full extent and turned to wedge in position.

In very cold weather it may be of assistance to depress the tickler on the top of the carburettor until the float chamber is flooded.

**Note.** When starting a warm engine do not pull out the choke control or depress the tickler on the carburettor.

4. Turn the ignition key to the "on" position.
5. Slightly depress the accelerator pedal and pull out the starter control.

**Note.** At the same time the starter control is operated, momentarily depress the decompressor pedal. This action will reduce the initial load on the starter motor, and thereby conserve the battery current, besides obviating any tendency for the drive belt to slip when engaging the flywheel.

6. Release the starter control immediately the engine starts.



7. Do not forget to push the choke control home as soon as practicable.

**Warning.**

As lubrication of the crankshaft assembly and piston is dependent upon the petroil mixture, it is very important that when starting from cold, not to race the engine immediately, but allow a few moments for the petroil mixture to circulate the crankcase—otherwise, possible seizure of the crankshaft assembly or piston may result.

**Note.**

Should the engine fail to start within 5 or 6 pulls after following previous instructions, proceed as follows:—

- (a) Switch "off" ignition.
- (b) Push choke control right home.
- (c) Turn off fuel.
- (d) Press accelerator pedal to full open position and press decompressor pedal.
- (e) Turn the engine over a number of times to clear the excess mixture.
- (f) Now switch "on" ignition, turn on fuel and ease back accelerator pedal to starting position.
- (f) Now switch "on" ignition, turn on fuel and ease back accelerator pedal to starting position.

If an attempt is being made, with no avail, to start the engine after it has stopped of its own accord, first see—Fault Finding Chart—(page 39) and if possible, remedy the trouble, and then follow the previous instructions.

**DIFFICULT STARTING WHEN ENGINE IS HOT.**

To start a hot engine that is proving difficult, first follow the instructions already given and then if there is no sign of the engine starting, proceed as follows:—

1. Turn "off" the fuel, remove sparking plug and press accelerator pedal to the full open position. (In extremely bad cases, the crankcase drain plug which is screwed into the nearside half of the crankcase, should be removed).
2. Engage the starter and turn the engine over a number of times.
3. Examine the spark plug and check that the plug points are clean and dry.
4. Place the spark plug on the cylinder head fins; attach the high tension lead and turn the engine to see if a spark is occurring at the plug points. (If no spark—change the plug).

5. Replace crankcase drain plug and refit spark plug.
6. Turn "on" the fuel, press accelerator pedal to the best starting position, and start engine.

**Note.** The reason why a hot engine is sometimes difficult to start is mainly due to a rich mixture, and should the trouble persist, check and if necessary adjust or remedy the faults given for "Engine Four Strokes"—(see Fault Finding Chart).

In addition, check that the petrol mixture is correct, that the spark plug is as recommended, and that the plug and contact breaker points are clean and gapped correctly.

When the car is left overnight or standing for any lengthy period it is advisable to move the fuel tap to the "off" position.

### RUNNING-IN INSTRUCTIONS.

During the first 200 miles of the running-in period it is advisable to add a little extra oil to the recommended petrol mixture. This extra oil may result in sluggish starting, but this condition can be overcome by flooding the float chamber when starting from cold.

At the completion of this mileage the normal mixture of 16 parts petrol to 1 part oil may be used.

Also, for the first 500 to 1000 miles it may be noticed that the power is lacking; the reason for this being the extra oil in the petrol, and the close fitting parts of the engine unit settling down.

When the car is further used however, the lack of power will gradually disappear, and there will be a progressive improvement in the engine and the car generally if proper care is exercised and the engine kept in correct adjustment.

The car must not be driven in excess of the following speeds for the first 500 miles:—

1st Gear	10 m.p.h.	(16 k.p.h.)
2nd Gear	15 m.p.h.	(24 k.p.h.)
3rd Gear	25 m.p.h.	(40 k.p.h.)

The car should not be driven fast or hard, and the engine should not be allowed to "labour" up inclines in top gear. At the first sign of "labouring" the next lower gear should be engaged.

The performance and life of the car depends mainly on careful running-in, and the extra care shown during this period will greatly contribute to trouble-free running.

**Note.** Do not coast downhill, either by depressing the clutch pedal or engaging neutral, as possible damage to the clutch or gearbox can result.

**Coasting Is Not Good Practice and Should Be Avoided.**

## LUBRICATION AND MAINTENANCE.

Occasionally check for tightness the nuts and bolts on the engine and gearbox unit, body fittings and road wheel nuts.

Owners are recommended to use only well-known brands of lubricants.

The lubrication points mentioned under the following sub-headings should be closely studied, and the programme adhered to.

### Daily or After 200 Miles.

Check quantity of fuel in tank. Check that reserve lever is in normal position after refueling.

### Weekly.

Check tyre pressures. The correct pressure must be maintained if maximum tyre life and comfort are to be obtained.

Check level of acid in battery and fill up battery cells to just above the top of the plates with distilled water. (See page 32).

### After First 500 Miles.

During the early life of the car working parts "settle down," and the importance of the following points receiving attention together with those outlined on page 37 cannot be overstressed:—

Check and tighten cylinder head bolts and cylinder block base nuts. Check and tighten exhaust flange nut. Check and tighten wheel fixing nuts.

Check and adjust if necessary the following:—

Foot and hand brake	(See page 27).
Clutch	(See page 22).
Steering head spindle	(See page 24).
Steering worm shaft	(See page 25).
Driving Chain	(See page 23).

### EACH 500 MILES OR 200 DAYS.

(Whichever occurs first).

Apply grease gun to the nipples of the following, giving several strokes each:—

Component	Location	No. of nipples
Steering head spindle	Centre of Steering Head Bracket	1
Steering worm shaft bearings.	Each end of worm housing	2
Front trailing arm bearings	End of trailing arm where pivoted in main tube	1
Brake camshafts (rear)	Underside of trailing arms	2
(front)	End of camshaft	1
Front brake cable	Centre of cable	1
Handbrake cable	Centre of cable	1
Loose pulley bearing	End of crankshaft	1



Smear grease on the following points:—

1. Steering worm and teeth of sector.
2. Wipe driving chain free from road dirt and smear with graphite grease. Check adjustment (see page 24).

Oil the Following Points:—

1. Gear lever bearing (facia panel bracket).
2. Gear lever linkages (apart from rubber bushes fitted at rear end of swivel arm).
3. Starter lever fulcrum bearing.
4. Starter cable.
5. Clutch, and accelerator pedal spindle.
6. Decompressor pedal spindle.
7. Brake adjustment nuts and trunnions.
8. Brake cross-shaft bearings.
9. Brake rod levers and linkages.
10. Engine torque reaction linkage.

**EACH 1,000 MILES OR 40 DAYS.**

**(Whichever occurs first.)**

**GEARBOX.**

Check oil level by means of the dipstick in the top of the box. Remove filler plug and replenish with recommended oil to level marked on dip stick.

To facilitate the removal of the filler plug first withdraw the dip stick, and, if necessary, release the engine stay by removing the cylinder block base nut and slackening the nut securing the stay to the engine plate. The stay can then be raised well clear of the filler plug. Upon refitting the stay ensure that the nuts are securely tightened.

**CHAIN CASE.**

Remove filler plug near the top of the case and fill to level of lower plug.

Apply a little oil to the wiper arm spindle where it emerges from the lower edge of the windscreen.

Remove spark plug, clean points and adjust to .018" — .025" (see page 18 Instruction Book).

**EACH 5,000 MILES OR 200 DAYS.**

**(Whichever occurs first.)**

**CHAIN CASE.**

Remove cover by loosening off hexagon nut in the side of case. Allow oil to drain out. Replace cover, taking care to fit the joint gasket correctly. Fill to level of lower plug with correct grade oil.

**GEARBOX.**

Remove filler plug (situated at the side of the dip stick) and also drain plug from the bottom of the gearbox. Drain off the oil. Replace drain plug; fill to level as marked on dip stick, and refit filler plug.

The gearbox and chain case can be drained much better when the engine unit is warm.

**Warning.** Do not use paraffin to flush out.

**WHEEL BEARINGS.**

Remove hub caps, fill with good quality grease and replace.

**Note.** The speedometer drive spindle being secured to the near side hub cap is withdrawn from the axle spindle when the hub cap is removed, and to avoid any difficulty in re-coupling the drive spindle to the speedometer cable when re-fitting the hub cap, it is advisable to detach the cable from the axle spindle, refit the hub cap, and then re-couple the cable.

**AIR CLEANER.**

Remove from carburettor intake and rinse in petrol until perfectly clean.

Submerge in clean oil, allow to drain, and refit to carburettor.

**FLYWHEEL MAGNETO.**

Remove loose pulley adjacent to flywheel, clean and reset contact breaker points. (See page 19).

**CLUTCH.**

Check adjustment and adjust if necessary. (See page 22).

**STEERING HEAD SPINDLE.**

Check adjustment and adjust if necessary. (See page 24).

**STEERING WORM SHAFT.**

Check adjustment and adjust if necessary. (See page 25).

**FOOT AND HAND BRAKE.**

Check brake setting and adjust if necessary. (See page 27).

**CARBURETTOR.**

Strip down carburettor and clean out. Remove filter from banjo union and clean. See page 20 or Villiers Booklet).

## ENGINE.

### DECARBONIZING.

The mileage at which decarbonizing becomes necessary cannot definitely be stated, owing to the different fuels and the varying grades of oil used in the petrol mixture.

The usual indications that excessive carbon has formed are:—

1. Lack of power.
2. Overheating.
3. A tapping or light knocking sound when the engine is labouring, or when pulling hard up a hill in top gear.

When deciding that decarbonizing is necessary due to a tapping sound in the engine, care should be taken not to confuse this with an ignition "pink," or any mechanical fault that may have developed.

The cylinder block transfer ports and the silencer should also be cleaned out at this period.

There is no need to remove the engine unit from the frame to decarbonize; the procedure is as follows:—

### DISMANTLING.

1. Move the fuel tap to the "off" position.
2. Disconnect the high tension lead from the spark plug and then remove the plug.
3. Uncouple the operating cable from the decompressor unit and unscrew the unit out of the cylinder head.
4. Place a block of wood under the engine crankcase to support the unit and remove the starter motor drive belt. Disconnect the starter motor lead and unscrew the four nuts securing the torque reaction linkage and starter motor mounting plate to the cylinder head.
5. Release slightly the bolt securing the engine torque reaction linkage to the main tube and swivel the linkage clear of the starter motor. The starter motor with bracket attached can now be removed.
6. Unscrew the four long hexagon cylinder head nuts and remove the cylinder head.
7. Uncouple fuel pipe from carburettor and release the carburettor body clip set screw. Remove the carburettor and air cleaner from the inlet manifold and place in a safe position on the top of the gear box, still leaving the accelerator cable and choke cable attached.
8. With the "C" spanner, remove the exhaust pipe lock ring. Unscrew the silencer fixing bolts and remove the silencer unit.
9. Turn the engine until the piston is at the top of the cylinder bore. Release the four cylinder base nuts, raising the cylinder slightly in order to remove the nuts from the studs. Lift off the cylinder block vertically without turning it on the piston.



10. Remove the two piston rings from the piston by using three flat strips of thin brass as follows:—

Position the strips—lifting up one end of each ring to allow the insertion of the brass strip between the inside of rings and outside of piston; then work the strip about half way round the piston, following it with the other two strips. When all the strips are placed in position it will be found that the rings are free from their grooves, and they can then be withdrawn over the strip brass.

### REMOVAL OF CARBON.

Place a clean piece of rag round the connecting rod to prevent any carbon or dirt from entering the crankcase.

With a scraper made of soft material such as copper or brass remove the carbon from the piston crown. If any carbon has formed in the ring grooves this may be removed with a broken hacksaw blade but care must be taken not to mark or damage the piston.

Next remove the carbon from inside the cylinder head and from inside the sparking plug and decompressor unit housings.

Remove the carbon from the ports in the cylinder block (especially the exhaust port) without damaging or altering the shape of the ports.

Finally wash off the cylinder head and block in clean paraffin, and also wipe the piston and rings with a damp paraffin rag.

Before starting to re-assemble, examine all the joints and gaskets for any sign of damage; in which case they should be renewed.

### ASSEMBLY.

1. Replace the piston rings with the aid of the brass strips in the same grooves from which they were removed, radial location being made by the peg inserts.
2. Remove the cloth from around the connecting rod and fit new cylinder base joint if required on crankcase; no jointing solution being necessary.
3. Smear cylinder bore and piston with engine oil, and fit cylinder block over piston with the exhaust outlet to the front of the engine. Ensure that each piston ring is fully compressed in its groove in turn as the barrel passes over. Take care not to twist the cylinder block, or the piston ring ends may foul the ports.
4. Replace cylinder block holding down nuts and washers screwing each in turn until all are tight.
5. Before fitting cylinder head, ensure that the head and cylinder block faces are clean and dead flat. Fit new joint if necessary and place the cylinder head in position with the sparking plug to the offside of the engine. Replace the cylinder head nuts and washers, and screw down each nut a little at a time in turn until tight.

Refit and secure in position starter motor with bracket attached and torque reaction linkage.

The engine support block can now be removed.

6. Re-connect starter lead and refit drive belt. (For adjustment of drive belt—See page 33).
7. Clean sparking plug and decompressor unit and refit into cylinder head. (See page 18).
8. Attach the operating cable to the decompressor unit allowing approximately 1/32nd inch movement on the outer cable. After tightening the set screw, check that the valve can be operated freely in the decompressor body.
9. Refit carburettor and manifold, and couple up fuel pipe. (See page 20).

If the carbon deposit in the engine is excessive, it may be necessary before refitting the exhaust pipe and silencer, to clean out the unit.

This may be done by removing the exhaust pipe from the silencer, and with the aid of a rod scrape out the carbon deposit. Also scrape the carbon from the inlet aperture of the silencer.

Re-assemble the silencer unit and refit to engine, making sure that the exhaust pipe lock ring is tight, and the joint gasket is seated evenly in position.

Remove loose pulley, clean and reset contact breaker points. (See page 19).

Turn on fuel tap, depress tickler on the top of the carburettor until the float chamber is flooded, and then start engine.

### DECOMPRESSOR UNIT.

During decarbonizing it may be necessary to strip down and overhaul the unit.

To dismantle, unscrew the valve stem nut, remove spring and push the valve out. Remove carbon, and if the valve face or seating is pitted, grind in the valve with an abrasive paste; turning the valve head with a screwdriver.

Remove all traces of abrasive by cleaning in petrol or paraffin, and re-assemble the valve in body with a light coating of oil. Replace spring and finally the valve stem nut, making sure that it is screwed on tightly.

Apart from an occasional drop of oil on the valve stem and grinding in of the valve periodically, no attention to the decompressor unit is necessary.

### SPARKING PLUG.

The sparking plug recommended for the 197 c.c. Villiers engine is a Lodge H.H.14.

This plug can be dismantled, and by unscrewing the gland nut the centre electrode may be removed for cleaning.

The correct gap for the sparking plug points is .018" to .025", and the adjustment is made by moving the side points—not the centre electrode.

The plug insulator must always be kept clean as the presence of oil or dust may result in leakage of the spark, and in damp weather cause difficult starting.



### FLYWHEEL MAGNETO.

To obtain access to the flywheel and contact breaker assembly remove the loose pulley. (For removal of pulley—See page 33).

If the flywheel magneto has to be removed for any reason, such as resetting of the ignition timing, the procedure is as follows:—

Place the spanner on the centre nut and hammer round in an anti-clockwise direction—looking at the face of the flywheel.

After about one complete turn the nut will be found to tighten, because the flange of the nut is now pulling against the flywheel; resume hammering until the flywheel comes away from the shaft.

To reset the contact breaker points it is not necessary to remove the flywheel, as this can be carried out through the space between the flywheel arms.

### CONTACT BREAKER.

To adjust the contact breaker point gap, turn the flywheel clockwise until the rocker arm is fully raised and the point gap is at its maximum opening. (See Fig. 2 in the Villiers Handbook.)

With a screw-driver slacken the point bracket screw "A," then, by turning the cam adjuster "C," position the point bracket "B" until a .015" feeler gauge can be inserted between the contact points. When the correct setting is made, withdraw the feeler gauge and tighten screw "A" taking care not to overtighten and thereby stripping the threads.

### RE-FITTING THE FLYWHEEL AND TIMING THE IGNITION.

Remove the cylinder head and turn the engine with the starter lever until the piston is at the top of its stroke.

Place the flywheel loosely on the crankshaft taper, and rotate until the timing mark on the rim of the flywheel is dead opposite the mark on the edge of the armature plate.

The flywheel centre nut is then tightened, checking at the time that the piston is still at the top of its stroke.

Set the contact breaker points to .015".

A further check to ensure that the timing is correct, is to rotate the engine until the contact points commence to open, and then measure the distance between the top of the piston and the top of the bore, which should be  $7/32$ ".

Finally refit cylinder head, loose pulley and drive belt. (For adjustment of drive belt—See page 33).



### **CARBURETTOR.**

The type of carburettor fitted to the 197 c.c. Villiers Mark 8E engine is the Villiers Type S.25, which, apart from cleaning occasionally, requires very little attention. (See Villiers Handbook.)

Two control cables are fitted to the carburettor, the centre one being the throttle cable which is attached to carburettor slide, and the other the choke cable which operates a butterfly shutter in the air intake. Adjustment is provided at the carburettor end of each cable.

A taper needle is fitted in the slide, and the position of this needle in relation to the bottom of the slide, controls the mixture strength at all throttle openings.

The position of this needle can be altered by means of a special screw in the top of the slide, and this adjustment which is provided to suit the requirements of individual engines after a considerable mileage has been covered, should not be altered unnecessarily from the maker's standard setting,—this being 2.03 ins. from the bottom of the slide to the end of the taper needle.

Slow running adjustment is provided by the spring-loaded set screw in the body of the carburettor.

These are the only adjustment points on the carburettor.

#### **NOTE :**

Before deciding that the carburettor requires adjustment, make sure that no air is being sucked in around the carburettor body where the securing clip fits. Also check the crankcase and cylinder base joint bolts.

A drop of oil applied to the joints will show any signs of an air leak.

If a noticeable change of engine performance or general running takes place after a "fill up," do not assume that the adjustment is at fault, as the mixture of petrol and oil may have been supplied in incorrect quantities, or not thoroughly mixed.

Check that the air filter is perfectly clean and not restricting the air flow. Check that the ignition timing is correct; also that the spark plug and contact breaker points are clean and "gapped" as recommended. (See pages 18 and 19 Instruction Book).

### **ADJUSTMENT OF CARBURETTOR.**

Assuming that the carburettor requires resetting, the adjustment should be made when the engine is warm. The procedure being as follows:—

1. Check that the butterfly shutter fully opens and closes when the choke is operated.

2. Unscrew the annular ring from the top of the carburettor body, and remove the slide and needle.
3. Check the length of the needle from the base of the slide to the end of the taper, and, if necessary, adjust this length (adjusting screw in the top of the slide) to the standard setting of 2.03 ins.
4. Replace the slide in the body of the carburettor, and at the same time guide the taper needle into the centre piece.
5. Locate the disc in the top of the carburettor body and tighten the annular ring.

### **SLOW RUNNING ADJUSTMENT.**

1. Release the lock nut on the throttle adjuster in the top of the carburettor.
2. Start the engine, and when the engine is warm, slowly unscrew the throttle adjuster until the engine will run at a speed just sufficient to prevent stalling.
3. The spring-loaded set screw in the body of the carburettor should next be screwed in or out until the engine runs evenly. Should the engine be running too fast after this adjustment, re-adjust the throttle screw, followed by a further re-adjustment to the spring-loaded set screw. This operation should be repeated until a setting which gives a satisfactory idling speed without the engine stalling is arrived at.
4. Finally tighten the throttle adjuster lock nut.

### **NOTE :**

If the engine should have a tendency to fourstroke when on the road, the mixture strength can be weakened slightly by lengthening the taper needle in relation to the bottom of the slide. As a little variation in the length of the needle in relation to the slide makes an appreciable difference in the running and performance of the engine, it is advisable to move the adjuster only a quarter of a turn at a time.

Screwing the special adjusting screw into the body of the slide lengthens the needle and weakens the mixture, and vice versa.

### **WARNING :**

No attempt should be made to decrease fuel consumption by further weakening of the mixture, other than by the adjusting points mentioned, as lubrication of the crankshaft assembly and piston depends on the petrol mixture.

### **TORQUE REACTION LINKAGE.**

Increase of engine torque with throttle opening is controlled by the spring linkage fitted between the main tube and cylinder head



The springs are set to the required tension during assembly and should require no further adjustment unless the setting has been disturbed. The following check, and if necessary adjustment, can be made to ensure correct operation:—

1. Support the engine by placing a block of wood under the crankcase, and remove the two nuts and spring from the end of the spindle.
2. Reposition if necessary, the collar secured to the spindle by a set screw, to give a measurement of approximately  $3\frac{1}{2}$ " between the spindle end and the top side of the collar.
3. Supporting the front of the engine by hand, temporarily remove the block of wood, and by flexing the engine in the rubber mounting bushes, ensure that the reaction spindle is working freely in the top link.
4. Replace the block of wood whilst the spring and the two nuts are refitted, and lock the nuts in position level with the end of the spindle.

### Lubrication

Every 500 miles adequately lubricate the torque reaction spindle and springs with oil.

## TRANSMISSION.

### PRIMARY CHAIN.

The drive between the engine and gear box is by endless roller chain and requires no attention apart from checking the oil level in chaincase every 1,000 miles.

### CLUTCH.

As wear takes place on the clutch facings the free movement of the toggle lever is reduced, and should be adjusted at once if the clutch has a tendency to slip.

A better plan is to inspect at regular intervals and adjust before slipping is apparent. This simple operation can be done by anyone in a few moments.

Adjustment is provided at each end of the clutch cable, and also by the knurled nut on the end plate of the gearbox—above the starter arm shaft.

Only if the clutch cable has been replaced should any adjustment to the cable be necessary.

With the toggle arm between the thumb and forefinger of the left hand, turn the knurled nut with the right hand, until the arm has  $\frac{1}{8}$ " of free movement before the resistance of the clutch springs are felt. When this setting is made, ensure that the spring clip is seated in a groove on the knurled nut.



## GEARBOX.

The internal selection of gears in the gearbox require no adjustment. The only attention necessary is to check the oil level regularly, and keep the breather hole in the filler plug free from dirt.

### Adjustment of Rubber Bushes.

With frequent use of the gear change lever, a certain amount of slack may develop in the rubber bushes fitted in the rear end of the swivel arm attached to the main tube, and this play can be eliminated by the following adjustment :—

Slacken off the lock nut at the bottom end of the rod passing down the centre of the steering head spindle, tighten the pressure nut until all sign of end play in the bushes is removed, and re-tighten the lock nut.

### Lubrication.

Lubricate periodically all joints and linkages (apart from the rubber bushes) on the gear change mechanism, and check the gear change arm clamp bolt, and all lock nuts for tightness.

### Note.

If it is necessary at any time to dismantle the gear change mechanism it is advisable to note the relative position of the drop arm (this arm is secured on a taper machined on the end of gear change shaft) to the gear change lever, otherwise should the arm not be fitted in the same relative position when re-assembling, the neutral position of the gear lever will be altered.

## FINAL DRIVE.

The drive from the gearbox to the front wheel is by a roller chain fitted with a split link, and it is advisable to remove the chain periodically for a thorough cleaning in paraffin, and to immerse in oil before refitting.

When fitting the spring clip to the split link, the closed end of the clip should always face the direction of rotation of the chain.

Adjustment to the final drive chain is easily carried out from beneath the bonnet. The rear engine and gear box mounting bolt is movable in the steel shackle plates, and the setting of the chain is controlled by an adjuster fitted between the rear of the gearbox and the nearside shackle plate.

An engine attachment is fitted between the engine and the top bolt in the shackle plate, thereby ensuring that the load on the drive chain is evenly distributed to the rubber mounting bushes.

**Important.**

If sufficient care is not exercised when adjusting the drive chain the operation of the torque reaction linkage may possibly be disturbed,—resulting in excessive engine vibration.

Therefore the procedure and method of chain adjustment must be carefully followed.

**ADJUSTMENT OF DRIVE CHAIN.**

The weight of the car must be on all wheels when adjusting the chain.

1. Note the comparative lengths of the torque reaction springs.
2. Release the  $\frac{1}{2}$ " B.S.F. nut securing the engine attachment to the top bolt of the shackle plate.
3. Slacken off the  $\frac{7}{16}$ " B.S.F. nuts from each end of the rear engine and gearbox mounting bolt.
4. Release the adjuster lock nut, and in order to ensure that the comparative lengths of the torque reaction springs remain unaltered, compress slightly the lower reaction spring by lifting the front of the engine. Keeping the engine in this position, next unscrew the adjuster from the long hexagon nut at the rear of the gearbox, when, by means of the adjuster bearing against the location on the nearside shackle plate, the engine is moved forward, until, by placing the fingers on the underside of the chain about midway between the sprockets the chain can be 'sprung' approximately  $\frac{3}{8}$ ".

This is the correct tension for the chain.

**DO NOT OVERTIGHTEN.**

5. Finally, securely tighten the  $\frac{7}{16}$ " B.S.F. nuts on the engine bolt, the  $\frac{1}{2}$ " B.S.F. nut on the top shackle bolt, and the adjusting screw lock nut.

**NOTE.**

Only release the pressure on the lower torque reaction spring after the correct chain adjustment is obtained and the engine bolts have been securely tightened. The length of the springs should remain unaltered after the drive chain has been adjusted.

**STEERING.****STEERING HEAD SPINDLE.**

After a considerable mileage end play may develop in the steering head spindle, and the adjustment can be made as follows:—

1. Remove the cotter pin connecting the arm of the gear change lever to the control rod passing down the centre of the steering head spindle, and swing the arm to an upright position.

2. Using the special size of box spanner and tommy bar, place the end of the spanner over the steering head spindle and release the lock nut.
3. Turn the front wheel on approximately half right lock, and slacken off the top fork clamp screw (underside of sector) with the 5/16" box spanner.
4. Drop the special box spanner over the steering head spindle lock nut on to the adjusting nut, and screw the nut down until all the end play in the spindle is removed.
5. Tighten the top fork clamp screw, and finally the steering head spindle lock nut.
6. Refit the cotter pin in gearchange control.

### Lubrication

Grease the steering head spindle every 500 miles.

### STEERING GEAR.

The type of steering gear used is of the worm and sector form of construction. Briefly, it consists of a machine cut worm (supported on journal bearings in a separate housing) operating on a sector bolted to the face of the top fork which is clamped to the steering head spindle.

Both worm and sector are of ample proportions, the worm being provided with two adjustments; one for setting the worm in mesh with the sector, and the other for removing any end play in the worm shaft.

Before deciding at any time that the steering is in need of adjustment, first check for end play in the steering head spindle, and adjust this if necessary as previously outlined. Assuming the spindle to be in correct adjustment, any excessive slackness in the steering is due to lost motion between the worm and sector, or end play in the worm shaft.

#### Adjustment of Worm Shaft.

The presence of end play in the worm shaft can easily be ascertained by lifting the steering wheel in line with the shaft itself.

Any appreciable end play will be in the worm shaft, and this can be confirmed by placing the fingers on the worm shaft where it protrudes through the bulkhead above the petrol tank, whilst the steering wheel is being lifted. To eliminate this end-play the procedure is as follows:—

1. Slacken off the lock nut at the end of the worm housing with the special size of box spanner and tommy bar.



2. Using the 'C' spanner with the peg inserts, turn the adjusting screw sufficiently to remove the end play.
3. Noting the position of the adjusting screw, tighten the lock nut, and finally check that the setting has not been disturbed

#### **Engagement of Worm and Sector.**

Should steering slackness still be apparent after end play in the steering head spindle and worm shaft has been removed, lost motion between the worm and sector will be the reason. The method of adjustment is as follows:—

1. Slacken off the lower flange nut securing the worm housing to the steering head, and release slightly the top nut.
2. Slacken off the adjusting screw lock nut, screw in the adjuster (the end of which bears against the worm housing flange) when the worm and housing (pivoting on the top flange stud) can be moved towards the sector until the lost motion is reduced; care being taken to ensure that the worm is not tightly engaged, or the worm shaft bearings will be overloaded and heavy steering will result.
3. Tighten all nuts securely after the adjustment is made.

#### **Lubrication.**

A grease nipple is provided at each end of the worm housing, and at intervals of 500 miles the grease gun should be applied giving several strokes each. Also smear grease on the teeth of the sector.

**Note.** As the efficient functioning of the steering in addition to lubrication is dependent on the correct adjustment of the steering head spindle, worm shaft, etc., it is necessary when checking the reason for excessive steering slackness, that the sequence given below is followed:—

Check and adjust if necessary:

1. Steering head spindle.
2. End play in worm shaft.
3. Engagement of worm and sector.

Particular care should be taken when making any of the above adjustments not to overtighten the bearings or engage the worm and sector too deeply that tightness of the steering is noticed, or excessive wear of the parts over-tightened will occur.

The most common causes of hard steering apart from incorrect adjustment are:—

1. Lack of lubrication of the worm shaft, steering head spindle or steering shaft top bearing.
2. Brakes binding, or very low tyre pressure.

#### **BRAKES.**

The front and rear brakes are cable and rod operated and the footbrake is directly fixed to the brake cross-shaft. From the cross-shaft a tubular push rod is connected to the intermediate lever, and from this lever a cable (secured to the underside of the floor and to the front spring carrier plate) is attached to the front brake drop arm.

A central brake rod also connects the intermediate lever to the transfer lever in the centre of the rear axle channel, and from this point a separate rod is coupled to each bell crank lever on the rear trailing arms.

The handbrake which is connected via a cable to a separate lever operates the same brake shoes on both front and rear wheels as the footbrake.

The initial setting of the brake cross-shaft, intermediate lever, transfer lever and bell-crank levers is important, the position of which is governed by the length of the connecting brake rods.

The adjustment on the tubular push rod between the brake cross-shaft and the intermediate lever is used solely to set the position of the levers, and on no account should this rod or the other brake rods, which are not adjustable, be altered to compensate for wear on the brake shoe liners.

Each wheel has an independent brake adjuster. The rear wheel adjusters are to be found on the short rods between the bell-crank levers and the brake drop arms, and for the front wheel an adjuster is provided at each end of the outer brake cable.

If the system has been disturbed at any time the following procedure should be carried out :—

#### RE-SETTING SYSTEM.

Raise the car sufficiently clear of the floor to give easy access to the brake arrangement. (See lifting positions — Road Wheels Page 31).

1. Set the handbrake in the full "off" position. Release the lock nut on the cable adjuster and adjust the cable so that the lever which is connected to the inner cable is well clear of the intermediate lever.
2. Detach the rear brake rod pull-off springs, and release the independent adjuster on each wheel until the adjusters are free from contact with the brake drop arms.
3. Release the adjuster lock nuts on the front brake cable, and screw the adjusters equally into the cable stop blocks until the inner cable is slack and without tension.
4. Lift the footbrake pedal until the footbrake arm is in contact with the underside of the footwell panel.
5. Release the lock nut securing the tubular push rod to the trunnion in the cross-shaft, and, by screwing or unscrewing the push rod in or out of the trunnion as the case may be, adjust the push rod to give a measurement of  $6\frac{1}{2}$ " between the centre of the rod and the centre of the clevis pin in the intermediate lever. The cross-shaft and levers are now correctly positioned.

**NOTE.** Always ensure that the handbrake is in the full "off" position and the clevis end lock nut is firmly against the open end of the tubular push rod when checking the measurement.



6. Screw the rear independent brake adjusting nuts equally up the short brake rods, and unscrew the front brake cable adjusters equally from out of the cable stop blocks until the brake shoes are binding hard on both the front and rear brake drums. Then release the adjusters sufficiently to allow the drums to rotate freely.
7. Replace the rear brake rod pull-off springs and then adjust the handbrake cable so that the connecting lever is set approximately  $\frac{1}{4}$ " from contact with the intermediate lever.
8. As the adjustments to the rods and cables are now completed, check that all lock nuts are securely tightened.
9. Make sure that the tyres are inflated to the correct pressure, and finally check the brakes on the road. Should the braking be found to be uneven, slacken off the adjuster of the brakes which bind the harder; never tighten the adjustment of the less operative brakes or constant rubbing of the shoes may result.

#### **NORMAL ADJUSTMENT.**

When the travel of the foot pedal becomes excessive, adjust as outlined in paragraph (6), and make final adjustment during road test as given in paragraph (9).

#### **Note.**

On no account must an adjustment be made to the handbrake cable in an attempt to adjust the brakes as this will interfere with the setting of the brake levers and linkages.

#### **BRAKE SHOE ADJUSTMENT.**

An additional brake adjustment point is provided on each brake shoe, but is only used when it is observed that the lower end of each rear brake drop arm, or the top of the front brake arm, is past vertical (i.e. towards the front of the car) after normal adjustment has been carried out, and the brakes are in the full "on" position. No weight should be in the car when making this observation.

To carry out this adjustment release the adjusting nuts clear of the rear drop arms, detach the brake pull-off springs and slacken off the front brake cable. Remove the hubs and brake shoes (see removal of brake shoes—Page 29), and fit packing washers of equal thickness behind the detachable steel brake shoe pads.

Refit the brake shoes and hubs and reset the brakes as detailed previously.

#### **Lubrication.**

Every 500 miles apply grease gun to the brake camshafts and brake cables—giving several strokes each. Apply oil to the brake adjusting nuts, trunnions, cross-shaft bearings, and all linkages in the operating mechanism.

#### **Caution.**

When washing the underside of the car, water may find its way inside the brake drums which will temporarily impair the brake efficiency. It is wise therefore when driving the car after washing to apply the brake two or three times to dry off the brake linings.



**REMOVAL OF REAR HUBS.**

The rear hubs are mounted on ball journal races, and for the purpose of removal it is necessary to lift up the car, and first remove the road wheels (see page 31) and hub caps.

After removing the split pin securing the castellated nut at the end of the offside spindle, and straightening the lock washer on the nearside spindle, the nuts can be removed.

Slacken off the brake adjustment, and then by tapping lightly behind the wheel stud bosses on the hub (taking care not to damage the brake back plate) the hub can be removed from the spindle—thereby exposing the brake shoe assembly. (See Wheel Bearings—Page 15—for refitting nearside hub cap).

**REMOVAL OF FRONT HUB.**

After raising the front of the car and removing the front wheel (see Road Wheels—Page 31) disconnect the drive chain at the split link, and detach the chain from the hub drive sprocket.

Next remove the hub cap, split pin and castellated nut, when, after releasing the brake adjustment, the hub with brake drum attached can be removed from the axle spindle by use of a hard block of wood around the hub flange.

The same type of wheel bearings are used on the front as on the rear.

**REMOVAL OF BRAKE SHOES.**

Should the brake shoes require adjusting, or replacement brake shoes or brake linings are to be fitted, the procedure is as follows:—

1. Release the brakes and remove the wheels and hubs as outlined previously.
2. Grip the brake shoes as near the top as possible and lift clear of anchor pin, still leaving the pull-off springs attached to the shoes.
3. Remove springs in order to re-line shoes, or change them over to the replacements; securely clenching the spring ends around the centre rib of the brake shoes.
4. Slightly chamfer the ends of the linings with a file.
5. Lubricate anchor pin and camshaft faces with a little graphite grease before re-assembly.
6. Gripping the now assembled shoes with both hands, open the bottom of the shoes and place on camshaft; prise open the top and fit on anchor pin.
7. Clean out brake drum and refit hub on spindle, tapping into position with a hammer and a piece of hard wood.
8. Replace spindle nut and tighten securely before inserting split pin. (Prise lock plate against side of nut on nearside spindle).

9. Replace hub cap and securely tighten, having first filled with grease.
10. Finally, refit road wheels and adjust brakes as previously outlined for 'Normal Adjustment.'

#### **Lubrication.**

At intervals of 5,000 miles remove the hub caps and repack with good quality grease.

### **SUSPENSION.**

#### **FRONT—INDEPENDENT.**

A coil spring incorporating a double acting hydraulic shock absorber interposed between the front trailing arm and the main tube, controls the movement of the front wheel.

The unit is totally enclosed and the shock absorber which is filled with a special fluid is correctly adjusted during manufacture, the construction being such that no dismantling can be carried out.

#### **Note.**

The stability of the car to a certain extent is dependent upon the efficient operation of the shock absorber, and, should it be noticed at any time when driving, for the front of the car to continue an upwards and downwards swinging action after the front wheel had encountered any undulated or rough road surface, it is an indication that the shock absorber requires attention.

Therefore should the above symptoms ever present themselves a replacement unit should immediately be fitted.

#### **Lubrication.**

Every 500 miles lubricate the trailing arm bearings. (See Location of Grease Nipple—Page 13).

#### **REAR—INDEPENDENT.**

The bonded rubber rear suspension units are specially designed in conjunction with the front suspension to give a high standard of riding comfort and good stability, especially when cornering.

Each suspension carrier bracket is rigidly bolted to one end of the rear triangular cross bracing member, with the bonded rubber unit bolted to the underside of the bracket.

The trailing arm which carries a separate stub axle and the brake shoe assembly, is firmly secured and positioned on a taper and key to the centre shaft of the unit. Also attached to the trailing arm is an aluminium cover which fully protects the brake drum and shoes from road dirt and water.

Apart from occasionally checking the bolts in the carrier bracket and the bonded rubber unit, no maintenance nor lubrication to the suspension is necessary.

#### **SPEEDOMETER DRIVE.**

The speedometer drive is taken from the nearside rear hub. A spindle operating through the centre of the axle shaft is bolted to the hub cap, from which the drive is transmitted to the instrument by means of a flexible cable clipped to the underside of the body.



## ROAD WHEELS.

Both the front and rear wheels are of the split rim type and are interchangeable.

### REMOVING WHEELS.

1. Place the car on level ground and apply the handbrake.
2. (a) When removing either of the rear wheels, place lifting jack or stand under the rear corner of the body at the side from which the wheel is to be removed.  
(b) To remove the front wheel place a jack or stand under the trailing arm directly beneath the suspension spring or end of bolt securing suspension unit to mounting bracket.
3. Release the six inner wheel nuts, and remove the washers and complete wheel and tyre from the studs.

### REMOVAL AND REFITTING OF TYRE.

Before removing the tyre from the wheel rims, unscrew the valve cap and depress the centre valve stem to release the air pressure, after which, the nuts and bolts holding the two sections of the wheel together may be removed.

After replacing the tyre and tube and tightening up the wheel rim bolts, inflate the tyre to the correct pressure; at the same time see that the bead of the tyre is seated evenly around the rim.

**Caution.** Do not attempt to remove the outer ring of bolts before the tyre has been completely deflated.

### RE-FITTING WHEELS.

1. Ensure that the wheel is fitting correctly on the hub flange before replacing the wheel nuts and washers.
2. Tighten each nut a few turns at a time, then follow around the hub tightening each alternate nut until all are firm.

**Note.** Tighten all wheel nuts after first 500 miles and periodically thereafter, particularly after changing a wheel.

### TYRE PRESSURES.

Check pressures weekly using a reliable gauge, and keep both front and rear tyres inflated to the recommended pressure.

**Front** 28 lbs. per square inch.

**Rear** 22 lbs. per " "

As tyre pressures increase during a long run especially in hot weather, it is advisable to carry out the check after the car has been standing overnight.

Do not neglect the pressure until the tyres look as though they require inflating, because by that time irreparable damage may have been done.

During the weekly check, inspect the tyres for any pieces of sharp stone, etc. that may have become embedded in the covers.



### CARE OF TYRES.

To obtain the maximum tyre life it is recommended that the tyres be changed round every 3,000 miles, as this procedure ensures that the tyre wear will be equalized between the front and rear wheels.

The tyres should be re-positioned by moving the nearside rear wheel to the front—putting the front wheel on the offside rear hub—and the offside rear wheel on the nearside rear hub.

Although tyre change round is important, the most common cause of early tyre wear is due to under inflation. Other causes which contribute to short tyre life are as follows:—

1. Incorrectly adjusted brakes, causing increased friction between a particular tyre and the road.
2. Sharply applied brakes, causing skidding.
3. Fierce use of clutch with quick acceleration, causing wheel spin between the front tyre and the road.
4. Bumping the sides of the tyre against kerbs, etc.
5. Over inflation, which makes the tyre more prone to damage by sharp stones, etc.

Correct tyre pressure, periodic change round of wheels and early rectification or avoidance of the above mentioned points as the case may be, will ensure maximum tyre life being obtained.

### ELECTRICAL EQUIPMENT.

#### BATTERY.

The battery which is a 6 volt, 57 ampere/hour capacity, coupled POSITIVE to earth is mounted in a carrier bolted to the floor and side panel of the rear boot.

The importance of regular attention to the battery which is easily accessible cannot be over stressed.

An inspection should be made WEEKLY, and the points of maintenance are as follows:—

1. Keep the acid level above the top of the plates (approx  $\frac{1}{8}$ ").
2. Add only distilled water, never tap water.
3. Do not allow the battery to remain discharged. If run down through whatever cause, recharge at once.
4. Keep vent plugs tight, and surrounding parts of the battery clean and dry.
5. Keep the terminals tight and clean, applying a coating of vaseline to prevent corrosion.

#### CHARGING CURRENT.

The charging current for the battery is generated from the two lighting coils in the flywheel magneto.

These coils are static, and no adjustment can be made to the output of the generator.

The current generated is alternating, and a rectifier in the circuit is used to convert the A.C. current to D.C. for battery charging purposes.

#### STARTER MOTOR.

The starter motor which is attached to a bracket mounted on the cylinder head studs is operated by a pull-out control fitted on the facia panel directly above the headlamp isolation switch.

This pull-out control is connected by a cable to the starter switch, and this switch is located on the underside of the bulkhead panel.

The drive from the starter motor to the engine is effected by an endless vee-belt, and when the starter is operated the belt is moved from the loose pulley, and the drive transmitted via the belt onto the flywheel rim.

#### **Removal of Loose Pulley.**

To give access to the contact breaker assembly etc. the loose pulley can easily be removed by first moving the drive belt onto the rim of the flywheel, when, after unscrewing the centre nut and removing the washer, the pulley can be withdrawn by hand from the centre spigot.

Securely tighten the centre nut after replacing the loose pulley.

#### **Adjustment of Drive Belt.**

Slacken off the two bolts securing the starter motor to the bracket, and the cheese headed set screw which supports the rear—this allows the starter motor to pivot on the front bolt.

Raise the rear of the starter motor, and adjust the tension on the drive belt just sufficient to enable the engine to be turned when the starter is operated without the belt slipping on the flywheel.

Tighten the starter bolts and set screw after the correct belt tension is obtained.

#### **NOTE.**

Particular care should be given to this adjustment, as over tensioning of the belt will place undue load on the loose pulley bearing when the engine is running and the belt is stationary.

A grease nipple is fitted in the bearing cover plate and the grease gun should be applied every 500 miles.

#### **OPERATING THE STARTER.**

At the same time as the starter pull-out control is operated, momentarily depress the decompressor pedal. This action will reduce the initial load on the starter motor, and thereby conserve the battery current, besides obviating any tendency for the drive belt to slip when engaging the flywheel.

#### **RECTIFIER.**

The rectifier is positioned beneath the bulkhead, and secured to the underside of the fuel tank platform at the offside.

The case of the rectifier is earthed to the bulkhead.

#### **TERMINAL AND FUSE BLOCK.**

The terminal and fuse block is mounted on the bulkhead close to the rectifier.

To the terminal nearest the steering head is fitted a lead from the battery side of the starter switch. Connected to this terminal also, is the main supply lead from the lighting coils.

To the next terminal (which is joined via a 15 amp. fuse to the battery and main supply terminal) a lead from the main lighting switch is attached.

The ignition terminal follows, and this is the junction of the lead from the magneto to the ignition switch.



To the remaining terminal is attached a lead from the rectifier, and two leads from the lighting coils.

Coloured discs are fitted to the fuse block to denote to which terminal the various leads should be fitted.

#### **FUSE.**

A 15 amp. fuse protects the lighting, stop lamp, horn and wind-screen wiper circuit.

Before replacing a blown fuse, inspect the wiring of the components that have failed for evidence of a short circuit, or other faults that may have caused the fuse to blow, and rectify. Then replace the blown fuse with another one of the same rating i.e. 15 amps.

#### **LAMPS.**

The head and side lamps combined fitted with double filament bulbs are built into the front mudwings, and an adjustment for setting the headlamp beam is provided on the two set screws holding the rim and reflector in the lamp body. By slackening the lock nuts, the set screws can be adjusted to reposition the reflector.

#### **Adjustment.**

To move the beam to the left, slacken the left-hand set screw and tighten the right-hand set screw. To move the beam to the right, slacken the right-hand set screw and tighten the left-hand set screw. (Left and right hand is indicated viewing from the front of the lamps). To move the beam up or down, equally slacken or tighten both set screws respectively.

After the adjustment is made tighten the lock nuts.

Fitted in the number plate illumination and stop lamp is a double filament bulb, the second filament of which operates only when the footbrake is applied, thus providing a marked increase in the brightness of the lamp for warning purposes. The stop light switch is secured to the side of the body (beneath the offside front wing) and attached to an adjustable arm fitted on the end of the cross shaft.

#### **LAMP BULBS.**

All the bulbs have a voltage of 6 volts, with wattage as follows:—

##### **Head and Side Lamps.**

18 watt, 3 watt, double filament, with double contact base.

##### **Tail Lamps.**

6 watt single filament.

##### **Number Plate Illumination and Stop Lamp.**

12 watt, 3 watt, double filament, with double contact base.

##### **Dash Lamp.**

1.8 watt, miniature Edison screw type.

#### **REPLACEMENT OF LAMP BULBS.**

Access to the head and side lamp bulbs may be obtained by unscrewing the two adjustable set screws on the lamp rim, when the glass and reflector can be removed from the lamp body.

Release the bulb holder from the reflector by prising the indent out of its seating.



The bulb may then be taken out of the holder by simply disconnecting from the bayonet type socket.

Care should be taken when refitting the bulb to see that the head and side contacts in the holder are made to the head and side filaments of the bulb, and to also ensure that the "top" if marked on the bulb neck is in the correct position when refitting the holder into the reflector. The reflector position having been disturbed will now require resetting.

To remove a tail lamp bulb first detach the chromium surround, when, after removing the glass the bulb can be detached from its bayonet type holder.

The number plate illumination and stop lamp bulb is exposed by removing the lamp cover which is held in position by two slotted set screws. The bulb must be inserted in the holder the right way round, otherwise the brightness of the stop lamp filament will operate on the number plate illumination light, and vice versa.

#### **CLEANING LAMP REFLECTOR.**

Gently wiping with a soft cloth will remove any film of dust which may collect on the lamp reflector.

On no account whatsoever must the reflector be cleaned with anything abrasive.

#### **ELECTRIC WINDSCREEN WIPER.**

The windscreen wiper requires practically no attention; all moving parts are packed with grease during assembly, and no adjustment is required.

Occasionally lubricate the wiper spindle (where it emerges from the windscreen) with a drop of oil.

#### **HORN.**

As all horns are adjusted to give their best performance the adjusting screw should not unnecessarily be disturbed.

The performance of the horn is more likely to be upset by a dirty or loose wiring connection in the circuit or the fixing bolts working loose.

### **GENERAL.**

#### **CARE OF BODYWORK.**

Long life of bodywork can be assured if a little regular attention is given.

Body squeaks or rattles should be traced to their source, and eliminated as soon as possible.

A drop of oil on the bonnet hinges and fasteners, door hinges, lock, striker plate and dovetail, will prevent many rattles and squeaks developing.

Periodically check the tightness of the windscreen bolts and pillars, door hinges, bonnet hinges and all body fittings.

#### **CLEANING PAINTWORK.**

The finish of the bodywork improves with polishing, but for all ordinary purposes a rub down with a clean soft dry cloth after washing is sufficient to maintain a bright and attractive appearance. It is advisable to use only well known car polishes, and before application, the car should be thoroughly washed and any road tar removed with the aid of a little petrol.

### **CLEANING CHROME AND ALUMINIUM FITTINGS.**

Ordinary metal polishes should be rigorously avoided, but should these parts show signs of discolouration at any time, they should be washed with a little soap and warm water which will restore their bright appearance.

### **CLEANING UPHOLSTERY.**

The upholstery and trimming can be cleaned occasionally with a good quality soap. The soap should be applied sparingly with a flannel pad and afterwards polished with a soft polishing duster.

Rubber moulded parts and rubber strip can be cleaned and the appearance brightened by the careful use of a little glycerine ; wiping off any surplus with a cloth.

### **CLEANING WINDSCREEN.**

The dry dust which collects on the windscreen should be removed with plenty of water and not wiped off with a dry cloth, as any abrasive matter may scratch the safety glass.

Operation of the wiper on a dry screen should be avoided as this may mark the glass within the radius of the wiper blade.

### **CARE OF HOOD.**

Always see that the hood securing straps are fastened when the hood is down, and periodically clean the material in the same manner as the upholstery.

Also it is very important when folding the hood to ensure that the hood cover is not trapped in any way between the hood sticks, or chaffing of the material will take place.

It is advisable after a shower to leave the hood in the "up" position until dry.

## **The Bond Minicar Service.**

The word 'SERVICE' is one which is nowadays interpreted widely. Therefore it will be as well to explain that except for the '500 mile service' it is not necessarily gratuitous.

Rather it is a measure of the ability of the organization behind the car to foresee and meet all the normal requirements of Minicar owners who require prompt and effective repairs,, and the stocking of adequate supplies of parts for replacement purposes.

### **500 MILE FREE SERVICE.**

During the early life of the car after it has completed 500 miles you are entitled to have it inspected free of charge by the Bond Distributor or Dealer from whom it was purchased.

This attention given during the critical period in the life of the car makes all the difference to its subsequent performance.



**This Service Includes:—**

1. Check oil levels in chaincase and gearbox, and replenish with recommended oil.
2. Oil and grease car throughout with good quality lubricants.
3. Check and if necessary adjust:—
  - (a) Ignition timing and contact breaker points.
  - (b) Spark plug.
  - (c) Carburettor control gear, mixture setting and slow running.
  - (d) Clutch.
  - (e) Driving Chain.
  - (f) Steering head spindle.
  - (g) Steering gear (worm and sector).
  - (h) Gear change controls.
  - (i) Torque reaction linkage (engine).
  - (j) Decompressor.
  - (k) Foot and hand brake.
  - (l) Tyre pressures.
4. Check over and tighten all nuts, particularly engine mountings, cylinder head, cylinder base, exhaust flange and wheel nuts. Also check over all body fittings.
5. Top up battery and check working of electrical equipment.  
All this first service is free, only material and lubricants being charged for.

**REPAIRS AT YOUR DISTRIBUTOR OR DEALER.**

In a general way it is very desirable that Minicar owners shall take their repair work to the Bond Minicar Dealer from whom they purchased the car, or to the nearest Distributor, because our Authorised Distributors and Dealers are kept fully up-to-date on all matters appertaining to the Bond Minicar.

**REPAIRS AT THE WORKS.**

The repair shop at Preston is intended primarily for complete overhauls, and for repairs which for some reason are not amenable to Authorised Distributor or Dealer treatment.

**TAKING A CAR TO THE WORKS.**

If it desired to bring the car to the works for attention, it is advisable to arrange a definite appointment with the Service Department.

External examinations and minor adjustments can be done at almost any time, and at very short notice; but if it is found necessary to dismantle any unit the car must take its turn with work already in progress at the time, unless some definite arrangement to the contrary has been agreed to by the Company.

**WORKS OVERHAUL.**

In this connection it may be as well to point out what is meant at the works by a complete overhaul, as the term is one which is not always understood.



A complete overhaul at the works means a complete disassembly of every component part of the engine and chassis for thorough cleaning and examination, and the replacing of any worn component by a new part.

It will be seen, therefore, that the labour involved is practically the same whether a car has been in use for a short or long period.

### **MAKING A CLAIM UNDER GUARANTEE.**

Should it be necessary to claim for an alleged defective part, it is essential that the original part be returned for examination in accordance with the terms and conditions laid down in the guarantee, before any such claim can be considered; stating at the time the name and address of the owner, total mileage, and the chassis and engine number of the car. Also give the name and address of the Dealer from whom the car was purchased, together with the date of purchase.

At the same time outline a brief statement of the circumstances of the case, and clearly print "Guarantee Claim" on the outside of the envelope or package.

This does not mean, however, that the car must be laid up whilst the original part is being returned to the works for examination, but simply that the question of credit for the original part must remain pending.

Should it be necessary, therefore, to replace a part, obtain and have fitted a replacement part at an Authorised Distributor or Dealer so that the car is in service; in which event the Distributor or Dealer will make the claim for you.

Should the claim for a replacement part be made by the owner, it is usual for the original invoice (or copy of the invoice) which accompanied the replacement purchased from the Authorised Distributor or Dealer to be forwarded along with the old part to the works.

It should be borne in mind, however, that a claim is in no way prejudiced by the acceptance of an invoice in the first place, as the original part from which the claim arises offers of necessity, the most important evidence in arriving at a decision.

Where it is not essential that the car is kept in continual service, the owner may return the alleged faulty part (together with the information requested in the first two paragraphs) direct to the works, and should the claim be allowed a replacement part will be despatched direct to the owner's address.

Every claim is treated individually, and a final decision regarding a free replacement, or otherwise, must remain with the works.

Should the claim be disallowed, reasons will be given for this decision.

### **IMPORTANT TO NEW OWNER.**

In order to obtain the certificate of guarantee operative with your car, it is essential that you should fill-in the application card, which will be found with this Instruction Book.

## FAULT - FINDING CHART

### SEQUENCE OF TESTING.

Engine will not turn.

### POSSIBLE TROUBLE.

Dirty or loose wiring connections at battery, starter motor or switch.

Drive belt slipping.

Starter pinion sticking.

Foot depressing clutch pedal.

Starter lever return spring broken, and therefore not allowing lever to return to normal pulling position.

Seizure of piston or crankshaft assembly, caused by "racing" the engine immediately when starting from cold, or lack of lubrication —incorrect petrol mixture.

No free movement on clutch toggle arm.

Clutch corks worn.

### Engine will not start:

Depress tickler on carburettor to check whether fuel is reaching carburettor.

If no fuel, even when tap is on, and fuel is in tank.

No fuel reaching carburettor.  
Air lock in fuel pipe.

Choked fuel pipe or filter in banjo, choked fuel tap. Fuel needle sticking in seating.

Clean and tighten.

Adjust. (See page 33).

Clean and lubricate.

Remove foot from pedal.

Renew.

Dismantle and overhaul.

Correct mixture is 1 part oil—16 parts of petrol.

Adjust. (See page 22).

Renew.

Move tap to "on" position, refill tank, clear air vent in filler cap. Move reserve lever to "on" position.

Remove and clean out.  
Dismantle carburettor and fit new needle.

**SEQUENCE OF TESTING.**

Test for spark by holding sparking plug body on cylinder head.

If still no spark:

Test for spark at end of H.T.  
Lead held  $\frac{1}{8}$ " from cylinder.

**POSSIBLE TROUBLE.**

Leak along insulation of plug or high tension lead.

Plug points may be oily or sooted up. If no spark at end of H.T. lead, contact breaker point gap may be too narrow or points pitted, dirty or oily.

Moisture on insulation of Condenser box.

High tension pickup not making good contact on ignition coil due to corrosion or misplacement.

Cracked insulation of adjustable contact breaker point.

Damaged insulating sleeving on wires connecting contact breaker to coil or condenser.

Faulty connection to low tension wire of ignition coil.

Faulty condenser.

Faulty ignition coil.

Faulty ignition switch.

Mixture may be too rich due to use of choke control when engine is warm, or incorrect setting of taper needle.

**REMEDY.**

Try a new plug of the type recommended and/or new H.T. Lead.

Clean plug and fit new one.  
Adjust contact breaker point gap to .015".  
Clean.

Clean and dry out.

Clean and correct.

Renew.

Replace with new sleeving.

Correct.

Replace.

Replace.

Replace.

Open throttle wide, engage starter and turn the engine over several times to clear the excess mixture. Adjust taper needle.  
Drain crankcase.



## SEQUENCE OF TESTING

**Engine four strokes.**

Choke control may not be pushed fully home or butterfly shutter may be sticking in closed position in air intake. Air filter may need cleaning.

Check by watching for excessive smoke from tail pipe of silencer.

**Engine lacks power.**

## POSSIBLE TROUBLE

Air leak at carburettor stub causing weak mixture.

Incorrect ignition timing due to flywheel having slipped on driving shaft taper.

Mixture too rich.

Engine may four stroke for a little while after standing due to accumulation of oil in crankcase.

Flooding of carburettor.

Engine out of tune, bearings worn.

Unsuitable sparking plug.

Loss of compression.

## REMEDY

Correct.

Check ignition timing. (See page 19).

Push control fully home. Check operation of shutter. Check setting of taper needle and lower if necessary to weaken the mixture. (See Page 20.)

Usually ceases when engine has been running for a few minutes, unless too much oil has been mixed with the petrol.

Persistent flooding is usually due to dirt under fuel needle seating, or sticking fuel needle, or damaged seating or punctured float.

Overhaul.

Replace with recommended type.

Tighten cylinder head bolts. Replace worn piston rings. Renew cylinder head-joint.

Check seating in decompressor unit and reset end play in control cable. (See page 18).

Incorrect petrol mixture.

Correct mixture is 1 part oil—16 parts petrol.

Excessive carbon deposit on piston crown and cylinder head.

Decarbonize.

Exhaust system choked with carbon.

Clean out silencer, exhaust pipe, and port.

Incorrect carburettor setting.

Check. (Carburettor Adjustment Page 20).

Air cleaner choked.

Wash in petrol, drain and dip in thin oil, and allow oil to drain off before replacing.

Obstruction of fuel supply.

Clean out tap, fuel pipe and filters.

Incorrect ignition timing.

Check ignition timing (See page 19)

Brakes binding.

Adjust. (See page 27).

Driving chain too tight.

Adjust. (See page 24).

Weak mixture due to air leaks at carburettor stub, crankcase or cylinder base joints.

Tighten all joints, or renew.

Crankcase drain screw loose or missing.

Tighten or replace.

In correct setting of slow running or throttle controls.

Check. (Slow Running Adjustment Page 21).

Engine will not run slowly.

**SEQUENCE OF TESTING.**

**Engine suddenly stops firing.**

<b>POSSIBLE TROUBLE.</b>	<b>REMEDY.</b>
Worn crankshaft bearings or leaking compression gland.	Replace.
Ignition timing too far advanced.	Correct.
Sparking plug lead detached.	Replace and tighten terminal nut.
Plug points bridged by oil, carbon, or a deposit caused by hard driving.	Clean or replace.
Short circuit of high tension current by water on H.T. Lead.	Dry out.



# The Bond Minicar

## List of recommended Lubricants

	PRICE'S	SHELL	VACUUM	WAKEFIELD	ESSO	DUCKHAM'S
ENGINE ½ Pint Oil to 1 Gallon Petrol	ENERGOL SAE 40	X100 30	MOBILILUBE A	CASTROL XL	ESSOLUBE 40	DUCKHAM'S NOL Forty Engine Oil
GEARBOX & CHAIN CASE	ENERGOL SAE 140	SPIRAX 140 E.P.	MOBILILUBE C	CASTROL D	ESSO GEAR OIL 140	DUCKHAM'S N.2 Amber Gear Oil



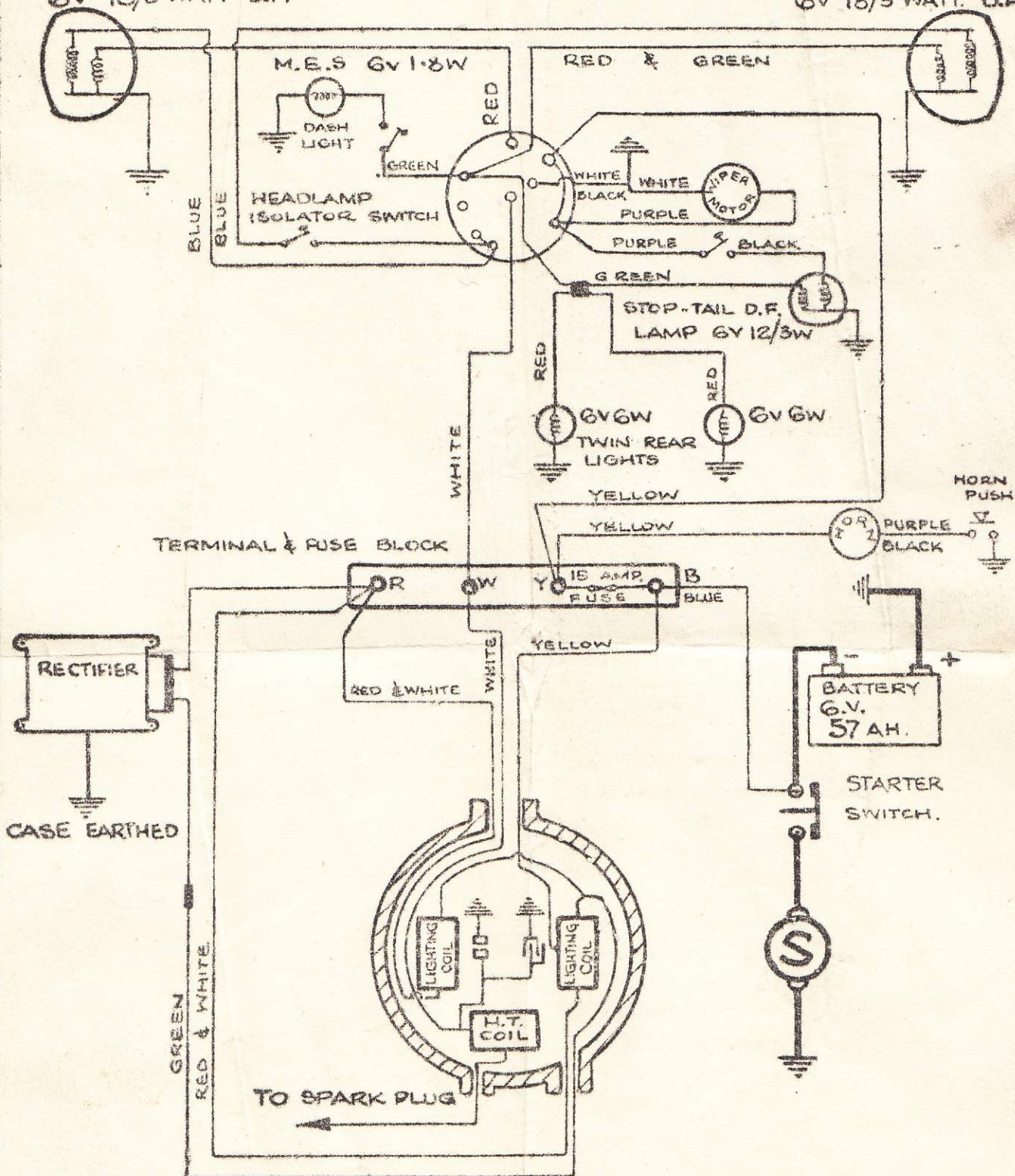






N/SIDE HEADLAMP  
6V 18/3 WATT D.F.

O/S HEADLAMP  
6V 18/3 WATT D.F.



WIRING DIAGRAM FOR MKC CARS  
FITTED WITH ELECTRIC STARTER  
FROM CHASSIS N<sup>o</sup> F/9/7414

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