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100/EM1

Book No. 100/EM1

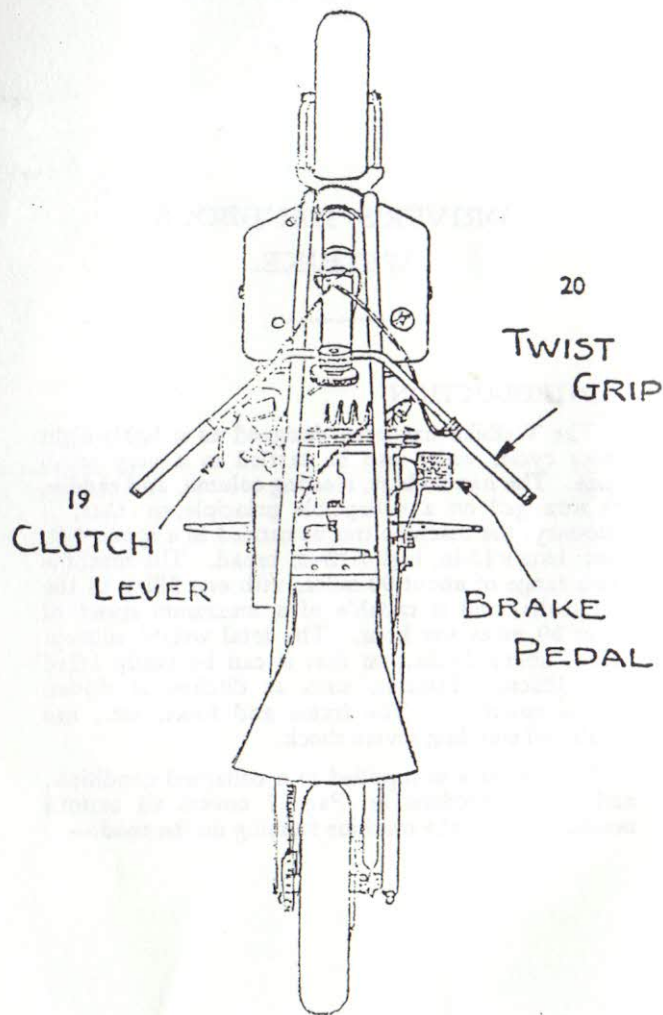
Driver's Handbook
for
EXCELSIOR
“WELBIKE”

DRIVER'S HANDBOOK. WELBIKE.

I. INTRODUCTION

The Welbike has been designed as a lightweight motor cycle, which can be carried in a very small space. The handle-bars, steering column, and saddle, are arranged on a collapsible principle, so that, if necessary, the machine can be carried in a space 4-ft. 3-ins. long \times 15-in. high \times 12-in. broad. The machine has a range of about 90 miles, with one filling of the fuel tanks, and is capable of a maximum speed of about 30 miles per hour. The total weight without fuel is about 70-lbs., so that it can be easily lifted over difficult obstacles, such as ditches, if ridden "cross country." The frame and forks, etc., are capable of standing severe shock.

The machine is supplied in a collapsed condition, and the instructions on Page 7 covers all actions necessary to get the machine running on the road:—



CAPACITIES.

Fuel Tanks.—Total capacity $6\frac{1}{2}$ pints.

Transmission Case.— $\frac{1}{4}$ pint (Lubricant M.160).

THE CONTROLS.

Handle-bar Control.

Throttle Control.—The right hand twist grip which controls the engine speed, also used for stopping engine.

To increase engine speed twist control inwards towards rider. The full movement is approximately $\frac{1}{4}$ turn.

To stop engine, close throttle by twisting control outwards away from the rider.

Hand Controls.

Combined air pressure pump and "Petroil" Tank Cap.

This is a small air pressure pump, screwed into the tank and forming a pressure tight joint by means of screwed cap at top; and is used for raising the pressure in fuel tank.

To operate pump; UNSCREW handle portion from filler cap.

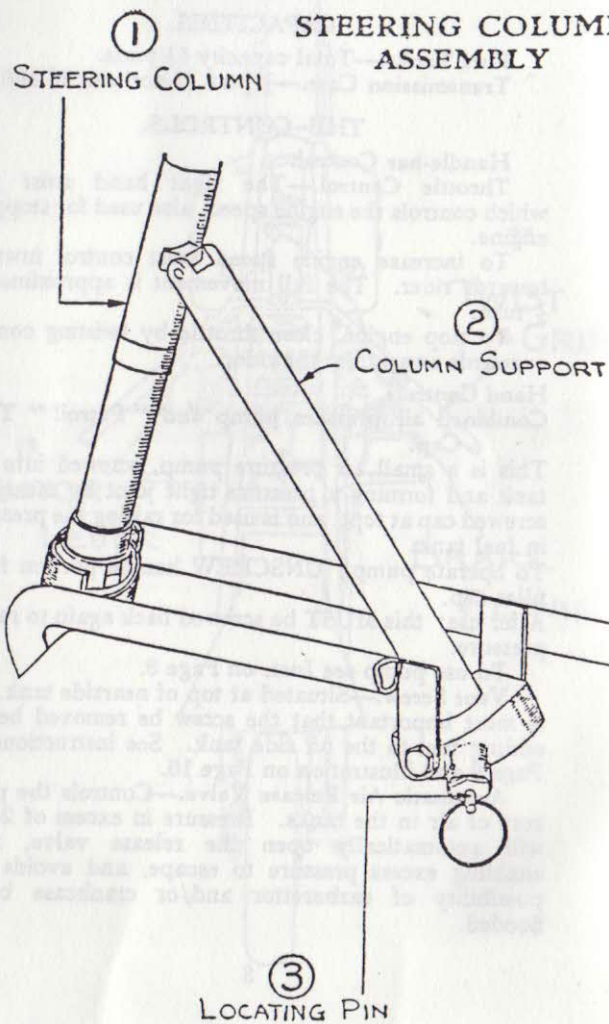
After use; this MUST be screwed back again to retain pressure.

To use pump see Inst. on Page 8.

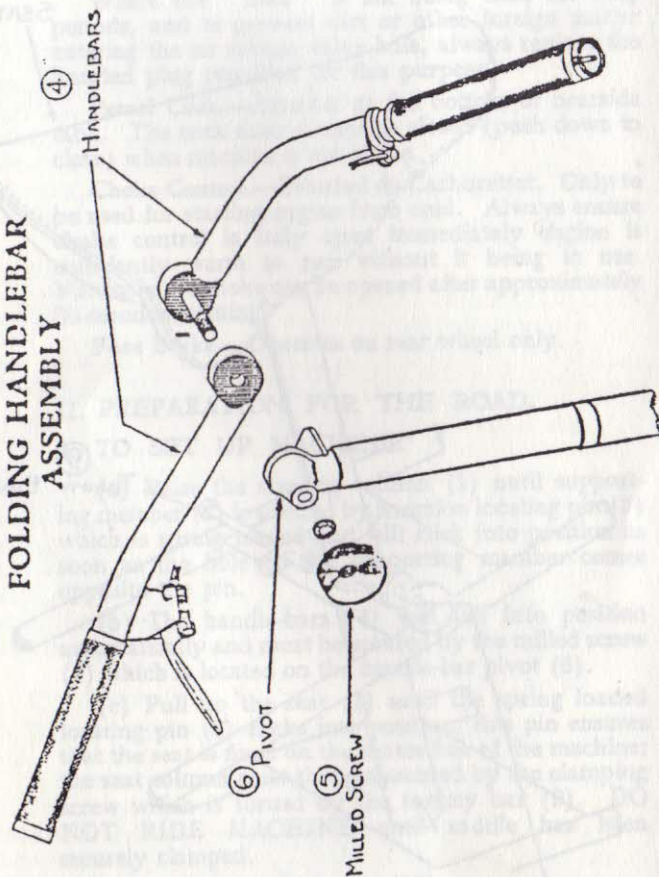
Vent Screw.—Situatd at top of nearside tank. It is most important that the screw be removed before adding fuel to the off side tank. See instructions on Page 8 and illustration on Page 16.

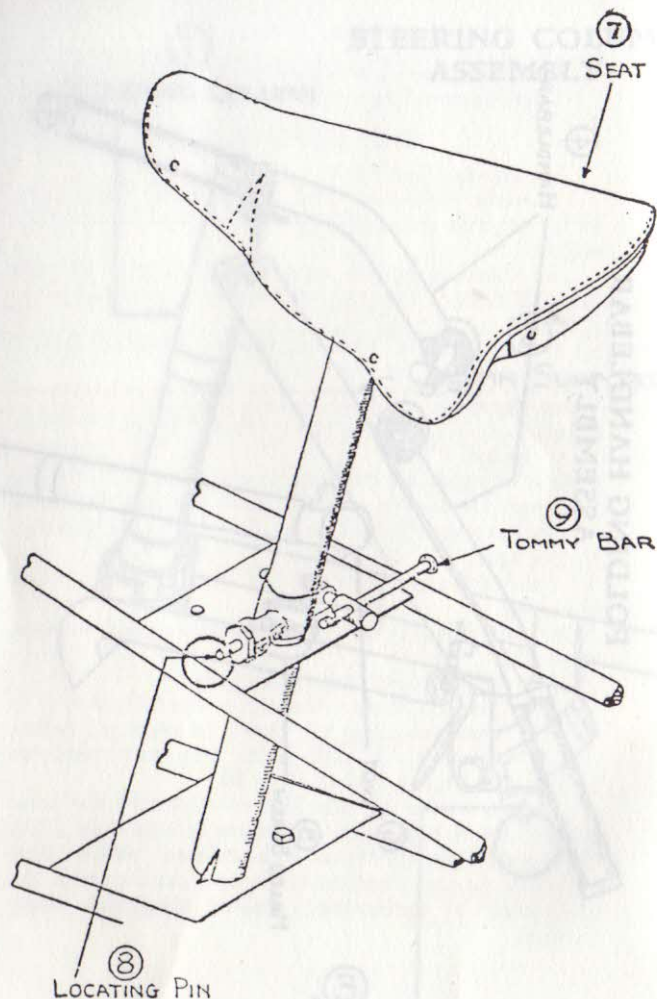
Automatic Air Release Valve.—Controls the pressure of air in the tanks. Pressure in excess of 2-lbs. will automatically open the release valve, thus enabling excess pressure to escape, and avoids the possibility of carburettor and/or crankcase being flooded.

STEERING COLUMN ASSEMBLY



FOLDING HANDLEBAR ASSEMBLY





Where the "bike" is not being used for long periods, and to prevent dirt or other foreign matter entering the air release valve hole, always replace the knurled plug provided for this purpose.

Petrol Cock.—Situated at the bottom of nearside tank. The cock must always be closed (push down to close) when machine is not in use.

Choke Control.—Situated on Carburettor. Only to be used for starting engine from cold. Always ensure choke control is fully open immediately engine is sufficiently warm to run without it being in use. Normally the choke can be opened after approximately 30 seconds running.

Foot Brake.—Operates on rear wheel only.

II. PREPARATION FOR THE ROAD.

A. TO SET UP MACHINE.

(a) Raise the steering column (1) until supporting member (2) is secured by trunnion locating pin (3) which is spring loaded and will click into position as soon as the hole on the supporting member comes opposite the pin.

(b) The handle-bars (4) will fall into position automatically and must be secured by the milled screw (5) which is located on the handle-bar pivot (6).

(c) Pull up the seat (7) until the spring loaded locating pin (8) clicks into position, this pin ensures that the seat is fixed on the centre line of the machine; the seat column must then be secured by the clamping screw which is turned by the tommy bar (9). **DO NOT RIDE MACHINE** until saddle has been securely clamped.

(d) Push down foot rests (10).

B. TO FILL TANK.

(a) Unscrew filler cap (11) on the off side tank with the special tool provided. This cap carries the pump for raising the pressure in the tanks. On later models special filler cap is provided on nearside tank in place of vent screw, and it is not necessary to remove the pump when filling tank—see illustration on Page 16.

(b) Remove vent screw (12) on the near side tank, a screwdriver blade will be found combined with the special tool provided for removing the filler cap. The purpose of this vent is to let the air escape from the near side tank while fuel is being poured into the off side tank (on off side tank in later models).

(c) Pour the fuel mixture slowly into the off side tank. The tanks will hold about $6\frac{1}{2}$ pints and the fuel should be a mixture of half a pint of best quality engine oil mixed with 1 gallon of petrol. The mixture should be well shaken before use and this also applies if the machine has been standing for some hours with the tanks filled, in which case the whole machine should be given a good shaking. ALWAYS mix the oil and petrol BEFORE putting into tanks.

(d) Replace vent (12) and screw tight.

(e) Replace filler cap (11) and screw tight.

(f) Unscrew pump plunger (13) which is located in the centre of the filler cap (11) and give about 6 sharp downward strokes to raise the air pressure in the tanks.

C. TO PREPARE FOR STARTING UP.

(a) Remove screw top (14) of automatic pressure valve on the near side tank and keep safe in pocket. The pressure in the tanks will now adjust itself automatically to the correct figure.

(b) Open stop valve (15) in the feed pipe coming from the near side tank, by lifting tap.

(c) Flood carburettor (16) by pushing down the spring loaded knob (17) until fuel is seen to drip down.

(d) Close the choke slide (18) which restricts the flow of air through the carburettor.

D. TO START UP.

i. (a) Press clutch lever (19) with the left hand, until it touches the handle bar.

(b) Open throttle a little, which is controlled by the twist grip on the right handle-bar (20).

ii. (c) Push the machine a few steps, throw the weight on the seat and release the clutch, when the engine will start. The clutch may now be lifted again to keep the engine running while the machine itself is brought to rest, or riding may continue.

(d) Open the choke slide (18), after engine has been running 30 seconds. There is only one fixed gear, the speed of the machine being controlled entirely by the throttle.

TO STOP THE MACHINE.

iii. (a) Close throttle by means of the twist grip (20).

(b) Press clutch lever (19) when the engine will stop.

(c) Push down petrol cock (15) in the feed pipe.

(d) Replace screw in top of the automatic air release valve (14).

TO PACK UP MACHINE.

(a) Release clamping screw on the seat column by means of the tommy bar (9), and pull out locating pin (8) and push seat down to its lowest position.

(b) Release milled screw (5) on the handle-bar pivot (3), pull out locating pin (3) on steering column support (2), when the steering column (1) can be pushed down to lie parallel to the main members of the frame, and the handle-bars will fold round the seat.

(c) Raise foot rests (10).

ENGINE NUMBER is stamped on the crankcase just below the point where cylinder is bolted to crankcase.

FRAME NUMBER is stamped on steering head.

ENGINE LUBRICATION. The engine is lubricated by means of oil carried in with the petrol—the "Petrol" system. The correct fuel mixture is 16 parts petrol to one part oil, i.e., one gallon petrol to $\frac{1}{2}$ pint oil.

Fuel and oil must be mixed before pouring into off side tank. The near side tank is automatically filled from the off side tank.

DRIVING INSTRUCTIONS.

(1) Having read carefully through the instructions for filling up the machine, and the instructions on how to start the machine, the following should be carefully noted.

(2) WHEN STARTING: As there is no compression release it must be understood that the rider's weight must be on the saddle before the clutch lever on the handle-bar is released and the clutch allowed to grip; or the back wheel will simply skid on the ground, and will not turn over the engine against the compression.

(3) The engine now having started, the throttle must be opened to obtain the desired speed, and when this speed is reached, ease back the throttle a little, and the machine should then maintain the required speed. In other words, don't run on full throttle for the whole time, unless absolutely necessary—such as climbing hills, etc.

(4) Read carefully the instructions on operating the air slide, or strangler, and as soon as the engine is warm enough open this to the full extent of its travel.

(5) When required to slow up do **not** draw the clutch by pressing the handle-bar lever inwards, BUT close the throttle, and allow the engine to act as a brake until the desired speed is reached, then draw the clutch by pressing the handle-bar lever inwards, and at the same time slightly open the throttle to keep the engine running free.

HERE ARE A FEW "DO'S" AND "DON'T'S."

(1) ALWAYS make a practice of turning off the fuel before you stop the engine for any length of time, so as to use up as much of the fuel in the float chamber as possible before you stop. This ensures an easy start.

(2) ALWAYS remove the knurled plug from air pressure release valve in the near-side tank before, and when using the machine.

(3) ALWAYS see that your fuel is mixed with the correct amount of oil BEFORE it is put into the tank.

(4) DON'T overflow carburettor, or a flooded engine will result, and the engine will NEVER start.

(5) DON'T free wheel down hill with the engine stopped and the clutch withdrawn—this wears out the clutch.

(6) DON'T alter the setting of the carburettor unless it is absolutely necessary.

(7) DON'T forget to keep the clutch wire in correct adjustment, or the rider will have no free engine position at all.

(8) DON'T allow the machine to stand still for lengthy periods with the clutch drawn and the engine running—this generates heat in the clutch, and can cause burnt inserts. Stop the engine. It is easy enough to start it again when necessary.

(9) DON'T ride the machine with the saddle post loose. There is a proper lever to tighten this up firmly.

(10) DON'T run with the handle-bars loose. The knurled nut if well screwed up will not come undone of its own accord.

(11) When starting the engine from cold ALWAYS use the strangler—when starting the engine hot NEVER use the strangler, and don't flood the carburettor.

FINALLY. The machine will operate much better if a few spots of oil are occasionally put on the various control wires, so as to keep them working freely in their outer covering.

Clutch Control. Mounted on left handle-bar.

To disengage drive, press control towards handle-bars.

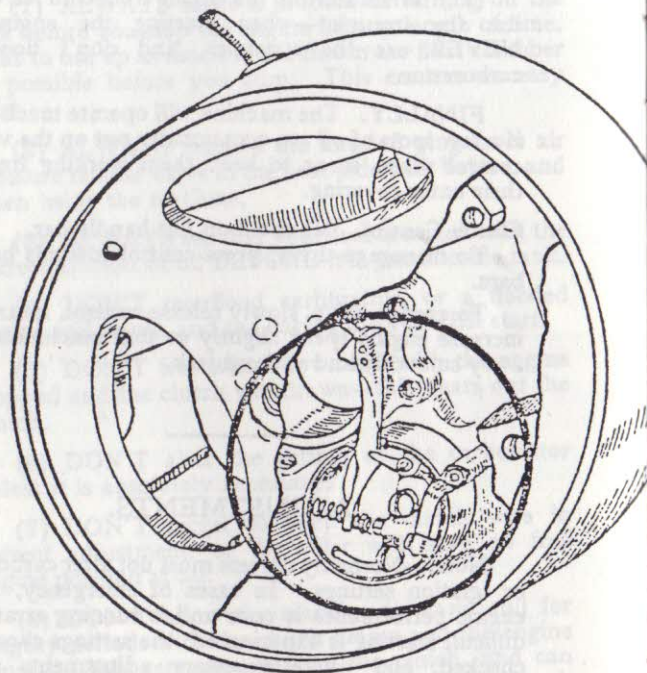
To engage drive, slowly release control, meanwhile increase engine speed slightly so that machine moves away smoothly and without jerk.

ADJUSTMENTS.

Note:—Normally drivers must not alter carburettor or ignition settings. In cases of emergency, where engine performance is poor and is running erratic, or difficult starting is experienced, the settings should be checked, and where necessary adjustments made, using the methods stated below.

Do not make haphazard adjustments. Complete each check before passing on to the next, proceeding in the order given below until the source of the trouble has been located.

MAGNETO FLYWHEEL



See pages 15 and 23.

1. SPARKING PLUGS.

Remove the plug and check gap, which should be .020" (20 thousandths of an inch).

It may be necessary to dismantle the plug and thoroughly clean the inside. This is most easily done by holding the body with the combination tool, using another spanner to unscrew the gland nut. If the centre electrode is mica, do not scrape with anything sharp or the mica will flake off and so affect the efficiency of the plug. Use only a clean rag moistened in petrol. Clean the carbon from inside the plug body with an old pen knife. When re-assembling do not forget to replace the copper gasket beneath the gland nuts; screw up the gland nut tightly and reset the gap to .020" (20 thousandths of an inch).

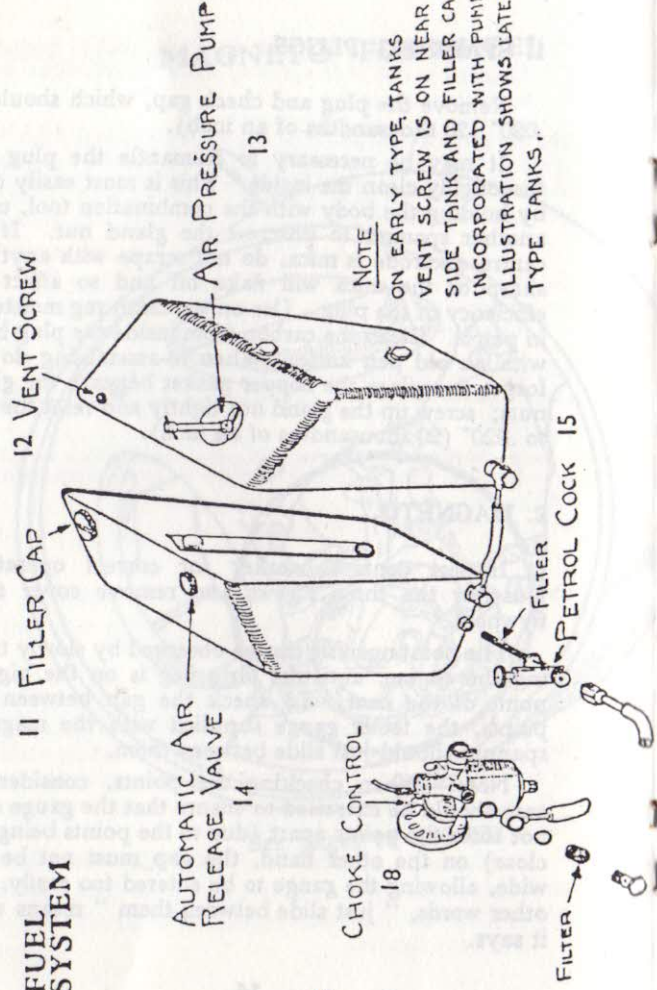
2. MAGNETO.

Inspect contact breaker for correct operation. Unscrew the three screws and remove cover from flywheel.

The point opening can be observed by slowly turning the engine, until the fibre peg is on the highest point of the cam. To check the gap between the points, the feeler gauge supplied with the magneto spanner should just slide between them.

Note:—When checking the points, considerable care should be exercised to ensure that the gauge does not force the points apart (due to the points being too close) on the other hand, the gap must not be too wide, allowing the gauge to be entered too easily. In other words, "just slide between them" means what it says.

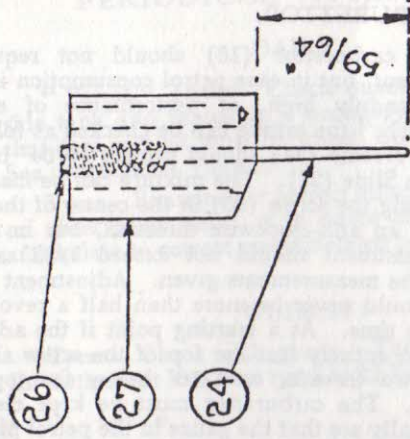
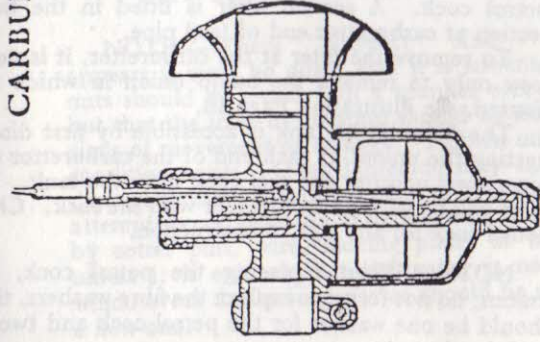
FUEL SYSTEM



NOTE

ON EARLY TYPE TANKS
VENT SCREW IS ON NEAR
SIDE TANK AND FILLER CAP
INCORPORATED WITH PUMP;
ILLUSTRATION SHOWS LATER
TYPE TANKS.

CARBURETTOR



THROTTLE SLIDE SHOWING
NEEDLE AND SCREW.

SECTION- CARBURETTOR

3. CARBURETTOR.

The carburettor (16) should not require any adjustment, but in case petrol consumption is noticed to be unduly high, or performance of engine is "sluggish," the setting can be checked as follows:—

The Needle (24) should project 59/64" below the Throttle Slide (27). The mixture can be made richer by turning the screw (26) in the centre of the throttle slide in an anti-clockwise direction, but in any case the adjustment should not exceed 1/32" above or below the measurements given. Adjustment of screw (26) should never be more than half a revolution at any one time. As a starting point if the adjustment has been entirely lost the top of the screw should be about two threads, or 1/16" below the top of the throttle. The carburettor must be kept clean, and periodically see that the gauze in the petrol pipe banjo connection "L" is free from dirt.

Examine Fuel System.

Examine and clean fuel filters. One filter is situated in the nearside tank and is attached to the petrol cock. A second filter is fitted in the banjo section at carburettor end of feed pipe.

To remove the filter at the carburettor, it is necessary only to remove the banjo union in which it is housed, see illustration Page 16.

The filter in the tank is accessible by first disconnecting the unions at each end of the carburettor feed pipe, then unscrew the fuel cock from the tank. The filter will be withdrawn together with the cock. Check petrol cock for any sign of obstruction.

NOTE:—When replacing the petrol cock, and unions, do not forget to replace the fibre washers, there should be one washer for the petrol cock and two for each banjo union.

PERIODICAL ATTENTIONS.

DAILY.

"Petrol" Tanks. Check quantity of fuel in oil side tank and replenish if necessary. Do not forget that fuel and oil must be mixed before filling tanks. See instructions, Page 8.

Tyres. Examine for correct inflation. Do not rely on observation only; if in doubt check with gauge and inflate to correct recommended pressure.

WEEKLY.

Tyres. Check with gauge. The correct pressure for both front and rear tyres is 22-lbs. per sq. inch.

SIX MAINTENANCE TASKS.

NOTE:—Where "Inspect" and "Tighten" appears it must be noted that it is not intended that nuts should be tested with a spanner every six days but that the joint in question should be examined for signs of movement or leakage. Tighten only if either condition exists. Over-tightening may cause serious damage through stripped threads or broken studs. No attempt should be made to tighten nuts that are locked by cotter pins, wire, locking plates or tab washers unless it is evident that tightening is necessary, in which event the locking device should be replaced by a new one.

TASK No. 1.

A. Inspect gas tight joints and tighten if necessary.

1. Cylinder Head Joints.

Examine for leakage which will be indicated by oiliness at the point where the two faces are bolted together. Report if joint leaks.

2. Cylinder base joint.

Examine for oil or gas leakage. There are four nuts to be checked. Should the joint continue to leak after the nuts have been evenly tightened, the cylinder base gasket may need renewal, in which case report.

3. Crankcase.

Examine for oil or gas leakage. There are six nuts to be checked. Report if joint continues to leak after the nuts have been evenly tightened.

4. Carburettor Manifold Joints.

Leakage at these joints will cause difficulty in starting the engine, or poor performance when driving. Tighten the nuts securing the top and bottom joints. Extra care must be taken to avoid over-tightening at these points. If tightening does not cure, report.

5. Exhaust Manifold Joints.

Examine the two joints, one on each side of the engine. Leakage will be evidenced by a "blowing" noise also by soot being deposited around the joints affected.

6. Sparking Plug Joints.

Leakage at the joint will be noticed by oiliness around the base of the plug. Should the gland nut joint leak, remove the plug and tighten by the aid of a vise or two spanners.

B. Inspect Engine Mountings and tighten, if necessary.

1. Cylinder Head Steady Bolt.

Test for movement. If loose, special care must be exercised to avoid straining. The correct method of

tightening is as follows:—

(a) Tighten the nut securing stay to cylinder head.

(b) This is the point where care must be taken; gently screw down the nut located on the upper side of the frame shock plate, so that it is just flat on the plate, then tighten the nuts on the underside of the shock plate, making sure that the upper or lower nuts are not straining the steady bolt either up or down.

2. Check the two bolts, one at rear on transmission case, and one located behind the flywheel.

3. All transmission case screws.

C. Start Engine.

With Clutch held out:—

1. Listen for knocks. Report any knock or unusual noises to Workshops.

2. Uneven firing.

Probably due to:—

(a) Dirty or defective spark plug.

(b) Carburettor adjusting screw out of adjustment (for correct adjustment, see Page 17).

(c) Oil content in petrol too great.

(d) Excessive air pressure in fuel tank causing flooding carburettor which may be caused by the air release valve sticking or rider forgetting to remove the knurled plug. (See Inst. Page 9.)

3. Examine exhaust for excessive smoke. Ignore the slight blue smoke, which is normal for a two stroke engine, and is due to oil burning. Black smoke indicates too rich a mixture. Make sure air shutter is fully open.

D. Stop Engine.

Test for Weak Compression.

With throttle fully open, turn rear wheel. Report uneven or weak compressions.

E. Examine fins on cylinders for cracks or choked with dirt.

Clear choked fins and report any found cracked.

F. Report defects.

TASK No. 2.

Engine "Petrol" Lubricating and Fuel System.

A. Check quantity of fuel in the tanks.

Note:—Do not forget that the fuel in the tanks also serve the purpose of lubricating all internal parts of the engine. On no account must petrol or oil in neat form be poured into the tank. The petrol and oil must be mixed in a container before filling the tanks, the correct mixture is 16 parts petrol to 1 part oil, i.e., 1 gall. of petrol to $\frac{1}{2}$ pint of oil.

B. Examine Fuel System for leaks and tighten if necessary.

B. Security of "Petrol" Tanks securing Bolts.

i. Check tightness of the four bolts, two for each tank.

ii. Leaks at Cock and Unions.

(a) Unions on feed pipe near side tank to carb.

(b) Petrol cock on near side tank.

(c) Unions on feed balance pipe, off side to near side tank.

Note:—When tightening union joints take care not to twist pipes.

iii. Rubbing or kinked pipes.

iv. Carburettor flooding.

As this may be caused by excessive air pressure in tanks, check the air release valve, see illustration, Page 16.

May also be caused by a punctured float, bent or dirty needle valve, which must be reported.

v. Check the pressure pump in off side tank for air leaks at (a) cap securing pump to tank, (b) cap

securing pump plunger to pump body. Normally six strokes of the air pressure pump should be sufficient to keep machine running for a considerable distance. In the event of it being found necessary to keep the machine running by repeating the pumping action, air leakage from the tanks is indicated. This may be caused by the pump not being securely screwed down. Air release valve sticking open, or the washer fitted inside the air pressure pump cap may be faulty. Having made sure the pump cap is securely screwed down, and if the condition still exists, drivers should report for further action to be taken by workshops.

Drivers must not interfere with the flywheel securing nut.

C. Start Engine

Set control for slow running. Except in cases of emergency drivers must not alter jet settings or carburettor adjustment.

D. Report Defects.

TASK No. 3.

Ignition System and Sparking Plug.

A. Magneto.

i. Inspect mounting and tighten if necessary.

The magneto is incorporated in the flywheel. Drivers must not interfere with air release valve.

ii. Inspect High Tension Lead for:—

(a) Cracks, frayed or rubbed portions. (Either of these conditions may lead to engine failing to start due to a short circuit.)

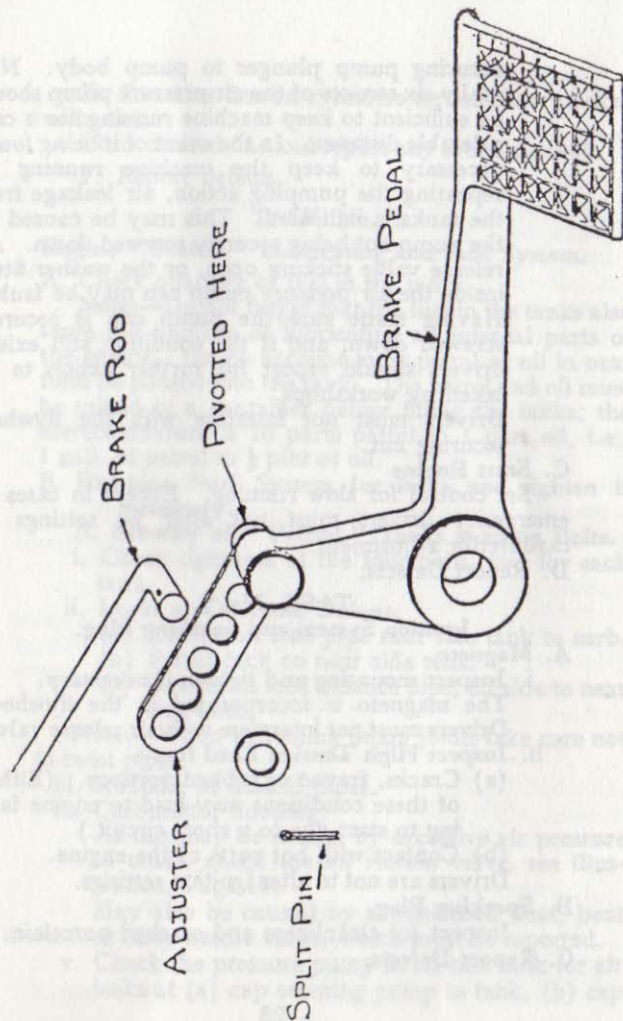
(b) Contact with hot parts of the engine.

Drivers are not to alter ignition settings.

B. Sparking Plug.

Inspect for cleanliness and cracked porcelain.

C. Report Defects.



TASK No. 4.

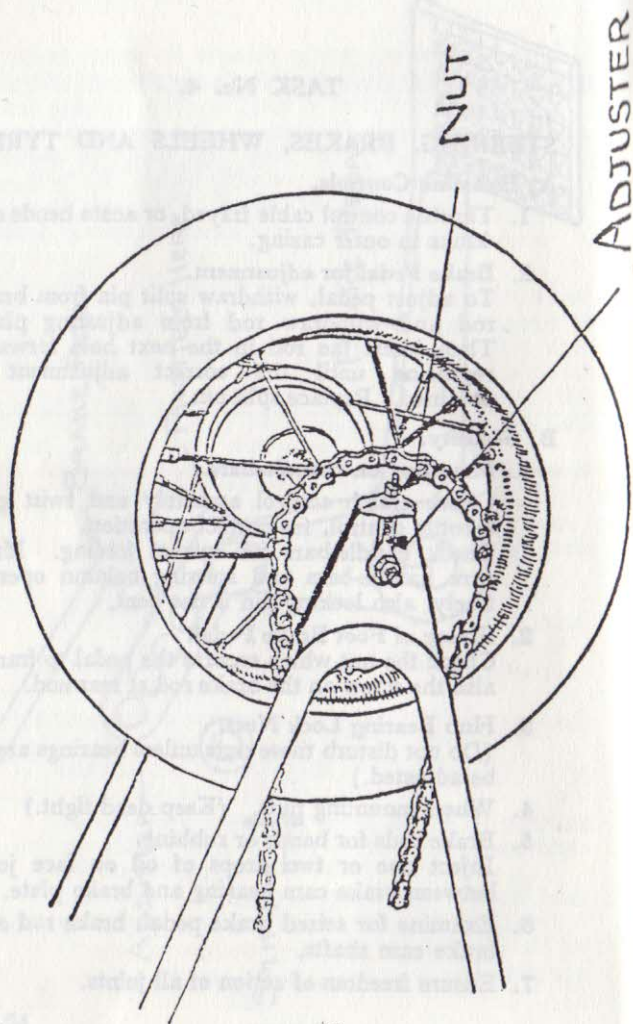
STEERING, BRAKES, WHEELS AND TYRES.

A. Examine Controls.

1. Throttle control cable frayed, or acute bends and kinks in outer casing.
2. **Brake Pedal for adjustment.**
To adjust pedal, withdraw split pin from brake rod and withdraw rod from adjusting plate. Then insert the rod in the next hole forward, repeating until the correct adjustment is obtained. Replace split pin.

B. Security.

1. **Mounting on Handle-bars.**
Check clutch control assembly and twist grip throttle control, for correct operation.
Check handle-bars for correct folding. Make sure handle-bars and steering column operate freely, also locking pin is not bent.
2. **Fixing of Foot Brake Pedal.**
Check the nut which secures the pedal to frame, also the screw on the brake rod at rear end.
3. **Hub Bearing Lock Nuts.**
(Do not disturb these nuts unless bearings are to be adjusted.)
4. **Wheel mounting nuts.** (Keep dead tight.)
5. **Brake rods for bends or rubbing.**
Inject one or two drops of oil on face joint between brake cam bearing and brake plate.
6. **Examine for seized brake pedal, brake rod and brake cam shafts.**
7. **Ensure freedom of action of all joints.**



D. Wear and Adjustment.

1. Test for up and down movement on steering head.

To check adjustments, lift handle-bars up, meanwhile observing if movement occurs at the steering head. Report if movement occurs.

2. Test for play in wheel bearings, by grasping rim and rocking sideways, slight play only should exist. If slight slackness cannot be felt or play is excessive, report.

Test for worn brake linings, brake adjustment, worn or stripped threads. If good brake operation cannot be obtained by the above adjustments (see item A2) the brake lining may be worn. Report such cases for Workshop attention.

E. Wheel Alignment.

1. Test alignment.

(If the steering appears at all unsteady or tyres show signs of wear on the sides of the tread, check the wheels either with a straight edge or piece of string drawn taut, so that it touches at two points on both the front and rear wheels. Check to be made on both sides of the wheels. If alignment is not correct, check the rear chain adjusters to ensure they are equally adjusted. otherwise report. (See Page 26).

C. Lubrication.

1. Lubricate steering head.
Insert oil-can nozzle in slot on steering crown.
2. Brake rod joints and pins.
Brake cam bearings.
(Do not allow oil to come in contact with brake drum.)

2. Test Wheels for signs of buckling or loose Spokes.

(Report if wheels are buckled or spokes loose.)

F. Tyres.

1. Check pressure with gauge.
2. Examine for bad cuts, flints, nails, etc.
3. Examine for rotting, grease, oil, tar.
4. Examine tyre valves for missing or loose caps and locking nuts for security.
5. Examine for pronounced or uneven wear.
(This condition may indicate bent forks, frame, or wheels out of line.)

G. Report Defects.

TASK No. 5.

Transmission.

A. Examine Controls.

Ensure that free movement of clutch does not exceed $1/32"$ measured at the withdrawal lever on transmission case between plunger and adjusting screw. This ensures that clutch springs are returning lever to normal position.

B. Lubrication.

1. Transmission Case.

Remove combined level and filler plug and top up with M.160 to level of hole. Replace plug.

2. Cleanliness and good condition.

C. Security, Lubrication and Wear.

1. Driving chain not fouling and correct tension. Keep chain and driving sprockets clean and free from dirt. (The correct tension is when the chain checked at the bottom midway between sprockets has approximately $\frac{1}{2}"$ lift.) To adjust the chain, release the rear wheel nuts and turn the chain adjuster nuts one on each side of the forks, and equal number of turns until the correct tension is obtained. Tighten wheel nuts and adjust brake if necessary.

2. Silence of Transmission.

Report any undue noise.

3. Examine chain sprockets for being true and in alignment.

4. Examine chain and sprockets for wear.

5. Clean chain and sprockets. Lubricate with oil M.160.

D. Report Defects.

TASK No. 6.

Frame and Fittings.

GENERAL ITEMS.

A. Examine riveted, bolted, welded, or brazed assembly joints for security.

B. Examine for cracked members especially:—

1. Steering heads.
2. Engine brackets.
3. Front forks.
4. Rear forks.
5. Rear wheel frame lugs.
6. Bottom shock plates.
7. Silencers and brackets.

C. Examine frame for distortion.

(Steering can be affected by rear wheel not being in correct alignment. Check this before deciding that frame or forks are bent.)

D. Examine security of saddle on post, check saddle, post and locking pin for freedom of operation.

E. GENERAL.

1. Check lubricator holes for being clogged.
2. Make sure the machine has been well lubricated throughout.

F. Report Defects.