

J·A·P

34 c.c.
**TWO-STROKE
ENGINES**

MODELS

J.34

JR.34

JRS.34

JS.34

USER'S HANDBOOK

SB/P/03

6/61

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ENGINE STORAGE

To avoid oxidization of contact breaker points and also ensure that cylinder bore is protected, i.e., ports covered, it is essential that engine is stored with the piston approximately half way up the cylinder bore when the points will be in a closed position.

ENGINE DATA AND SERVICING INSTRUCTIONS

Air cooled two stroke engine.
Bore—35 millimetres. Stroke—35 millimetres.
Cubic Capacity—34 c.c.
Rotation—Anti-clockwise, looking at driving shaft.
Ignition—Wico-Type MF 1567. Flywheel magneto with large cooling fan. Timing $3/32$ " or 28° before top dead centre.
Carburettor—Amal 379 single lever control, Strangler integral with air filter.
Air Filter—Where AMAL oil bath filter is fitted, see instructions on page 8 **BEFORE USING ENGINE.**
Lubrication—Petrol mixture.

RECONDITIONING DIMENSIONS

Cylinder Bore—Diameter 1.398" or 1.418".
Oversize Pistons Available—+ .020" and + .040".

DESCRIPTION

Detachable aluminium alloy CYLINDER HEAD fixed to cast-iron CYLINDER by three high tensile steel bolts.

The PISTON is of low expansion aluminium alloy, fitted with two COMPRESSION RINGS, each secured in position by a peg. Fully floating GUDGEON PIN. The CONNECTING ROD is a steel stamping with phosphor bronze gudgeon pin bush and hardened BIG END for single track of $\frac{1}{8}$ " dia. \times $\frac{1}{4}$ " long rollers.

The CRANKSHAFT with balanced flywheel is mounted on ball bearings.

The CRANKCASE of aluminium alloy is fitted with two seals thus preventing any leakage.

IGNITION by flywheel magneto, with a built-in fan and cowling which directs the air round the cylinder and cylinder head.

NOTE.—ANY CORRESPONDENCE OR SPARE PARTS ORDERS MUST BE ACCOMPANIED BY THE COMPLETE ENGINE NUMBER WITH ALL PREFIXES, WHICH ARE STAMPED ON THE ENGINE CRANKCASE.

STARTING AND SERVICING INSTRUCTIONS

PETROL MIXTURE

Fill the petrol tank with a mixture of 32 parts petrol to one part Castrol XL (S.A.E. 30) lubricating oil (one filler cap measure of oil to one pint of petrol).

When using Castrol Two-Stroke self-mixing lubricating oil the mixture is 24 parts petrol to one part oil.

NOTE.—If it is not possible to mix the petrol and oil beforehand, pour the oil into the tank first and add the petrol afterwards, then stir the mixture or agitate the tank.

If a quantity of the mixture has been left in the tank for several hours, rock the machine or agitate the tank before using. This is not necessary when self-mixing lubricating oil is used.

STARTING ENGINE FROM COLD (see also page 6)

Turn the fuel tap to "ON" position.

Close strangler shutter, set throttle valve about 1/4 open.

Pull smartly on recoil starter handle where fitted.

The handle must be returned slowly and kept in a light grip until fully returned.

Where starting pulley is fitted, wind the cord around the pulley groove and pull sharply.

When engine commences firing open the strangler shutter and throttle down to an idling speed. If on opening the strangler the engine begins to falter, partly close again until engine runs regularly, then fully open strangler and leave open.

FAILURE TO START

If engine does not fire, slightly more throttle opening may be found necessary, the best position can only be determined by trial. Care must be taken not to overdose the engine and an inspection of the sparking plug will reveal fuel on the electrode when this occurs. To overcome this condition, turn "off" fuel, fully open throttle and strangler, with sparking plug still removed, revolve engine a few times. Refit the sparking plug, start the engine and when speed commences to pick up, the throttle should be eased and the fuel tap turned "ON".

STARTING WHEN ENGINE IS WARM (see also page 6)

The strangler shutter should be in its fully open position, the throttle should be slightly opened before starting engine.

STARTER FAILURE

If failure of the recoil starter should occur, an emergency means of starting is provided. Proceed as follows: Remove the starter mounting screws and the starter body complete. A length of cord may then be wrapped round the emergency starter pulley with the knotted end inserted in pulley notch.

Start the engine in the usual manner.

Do not allow the engine to "rev" unnecessarily or to race without load.

STOPPING ENGINE

In emergency, press the ignition earthing strip which is fitted to sparking plug. Never remove sparking plug terminal to stop engine as this may overload the magneto coil.

It is preferable to turn off the fuel supply and allow engine to idle to standstill, this prevents an accumulation of oil occurring in carburetter float chamber when petrol has evaporated.

IGNITION TIMING (with flywheel rim marked)

To check or obtain the correct timing of magneto, set the piston at top dead centre, line up the flywheel timing mark with mark on top of cowl backplate, lock the flywheel to the crankshaft in this position by tightening the securing nut.

IGNITION TIMING (with flywheel rim unmarked)

If at any time a new flywheel is fitted it is advisable to put a timing mark on flywheel rim to make future timing check easier. The procedure for this is as follows:—

1. Set piston at $3/32''$ or 28° before top dead centre.
2. Place flywheel loosely on shaft taper and turn until magneto points commence to open, ensuring that the crankshaft does not move.
3. Fit and tighten flywheel securing nut and washer. Re-check relative position of piston and breaker point opening.
4. Turn flywheel until piston reaches top dead centre, and place permanent mark on rim opposite fixed mark on top of backplate.

MAINTENANCE

Attention to the following details is all that is necessary to ensure satisfactory service from the engine.

1. **MAGNETO.** Periodically check the contact breaker points gap with the appropriate feeler gauge. (See Wico Magneto service instructions, pages 10 and 11.)
2. **SPARKING PLUG.** Periodically check points gap, clean plug and if necessary adjust gap to $.025''$.
3. **CARBURETTER AND AIR FILTER.** Periodically inspect and clean. (See Carburetter maintenance, pages 6 to 9.)
4. Periodically remove silencer, exhaust pipe, cylinder head, and cylinder for decarbonising. Symptoms that engine requires decarbonising are: loss of power and liability to four-stroke.

DECARBONISING

Occasionally the engine will require decarbonising. Remove silencer and exhaust pipe and clean internally.

The cylinder head and barrel should be carefully removed taking care that the barrel is kept straight to prevent damage to the piston rings and ports.

Remove carbon deposit from the cylinder head, piston crown and exhaust port with a suitable piece of soft aluminium or brass.

Gummed piston rings should be carefully eased free, removed and cleaned. The piston and ring grooves should be cleaned free of gummed or lacquer deposits by means of a petrol soaked wire brush.

Thoroughly clean parts and wash in clean petrol or paraffin. When re-fitting old piston rings, replace in the same groove from which they are removed. Take care that the recesses in end of piston rings engage the location pegs in the piston, compress rings with fingers and gently press cylinder barrel into place.

It is important that air leaks be avoided.

A new gasket should always be fitted at the cylinder base if the original gasket is damaged.

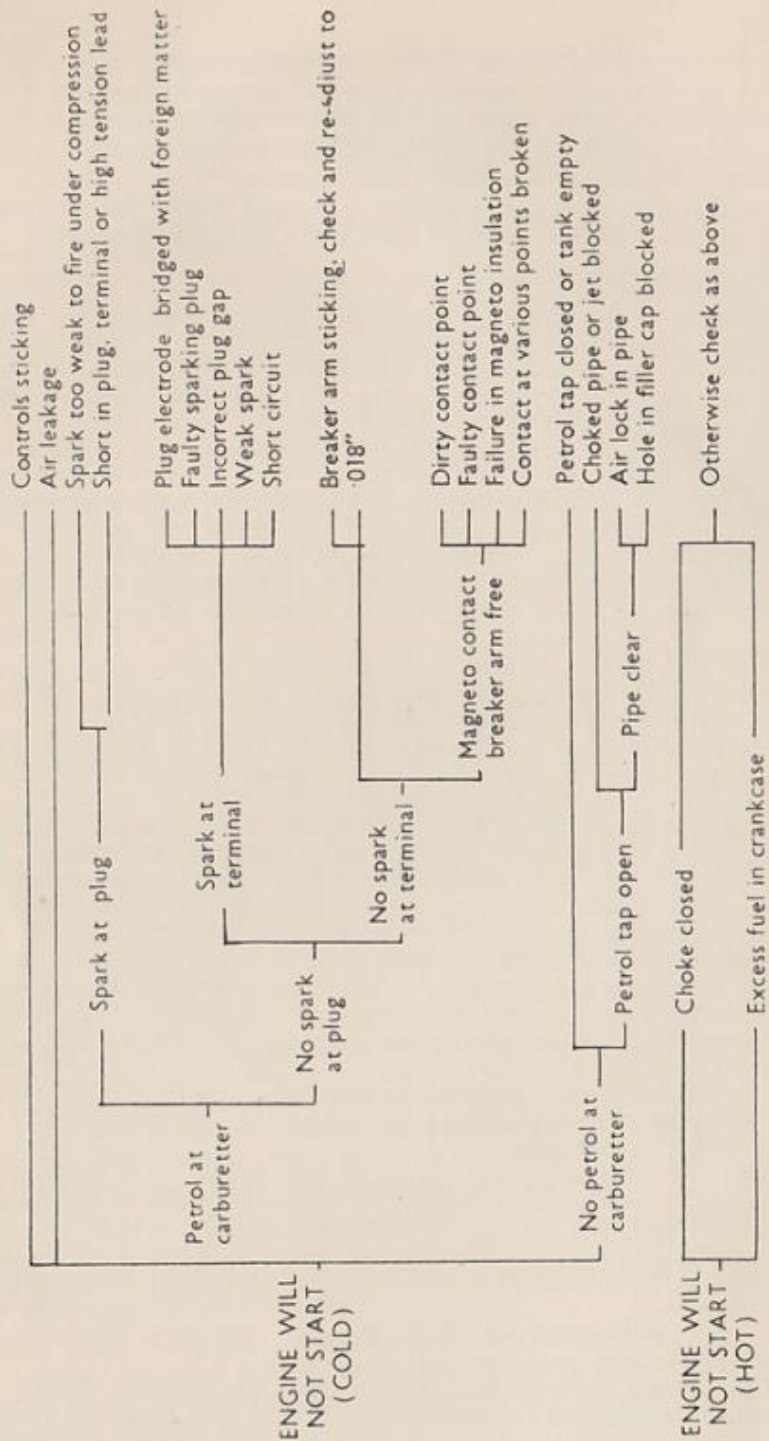
Before re-starting engine, insert a few drops of lubricating oil through the spark plug hole and rotate engine by hand to ensure that the engine is free and has been correctly assembled.

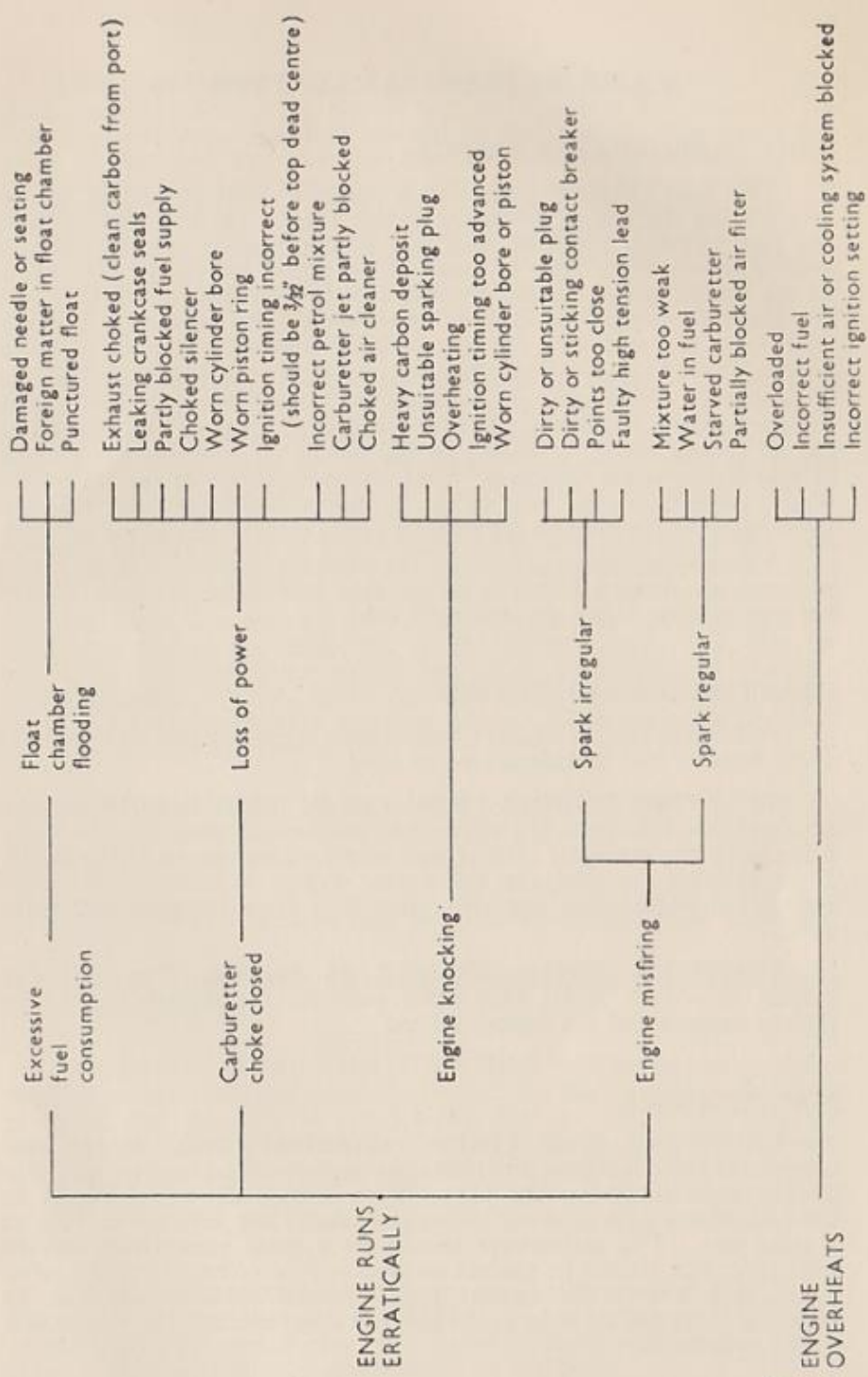
Charts on pages 4 and 5 enable any possible form of trouble with the engine to be located and cured. These charts are divided under two headings:—

1. Engine will not start. Page 4.
2. Engine runs erratically. Page 5.

If it should become necessary to use these charts, follow the instructions carefully and systematically, it will save time and trouble.

Page 3





ENGINE RUNS
ERRATICALLY

Page 5
ENGINE
OVERHEATS

CARBURETTER—AMAL TYPE 379

HOW CARBURETTER WORKS

The float chamber maintains a constant level of fuel at the jet and cuts off the supply when the engine stops. On fuel flowing from the float chamber the float falls, and its needle coming away from its seating allows fresh fuel to enter. Depression caused by movement of the engine piston causes, via the throttle opening, air to flow into the main air intake and fuel to flow through the needle jet into the cross bore and mix with the incoming air forming a fuel/air mixture.

Correct fuel/air proportions for various throttle openings are governed by: **The size of the main jet** which controls the amount of fuel fed to the needle jet at 3/4 to full open throttle. **The taper of the jet needle** which, operating in the needle jet, controls the amount of fuel fed at lesser openings. **The parallel portion of the jet needle** which, on entering the bore of the needle jet and in conjunction with the amount of cutaway on the throttle valve, controls the idling mixture.

A **Strangler** shutter is fitted to the main air intake and when closed prevents air flowing into the intake thus increasing the flow of fuel for easy starting when the engine is cold.

STARTING INSTRUCTIONS

Follow the Engine Maker's instructions regarding recommendations about type of fuel or mixture to be used.

STARTING ENGINE FROM COLD. Close strangler shutter, set throttle valve about 1/4 open, start engine and when it commences firing open the strangler shutter and throttle down to an idling speed. If on opening the strangler the engine begins to falter, partly close again until engine runs regularly, then fully open strangler and leave open.

STARTING WHEN ENGINE IS WARM. The strangler shutter should be in its fully open position, the throttle should be slightly opened and the engine started.

MAINTENANCE

REMOVING AND FIXING CARBURETTER. If the carburetter is removed from the induction pipe, see that on re-fixing it is pushed right home on the pipe before locking the clip. Never fit the carburetter to a pipe on which it is slack, nor ever drive it on to a tight one. The carburetter should be a good push fit on to the inlet pipe, and should be pushed on true with a screwing motion, after having put a little oil on the pipe. Erratic slow-running can be caused if there are air leaks at the point of attachment of the carburetter to the cylinder.

DISMANTLING WHEN INSPECTING OR TUNING. The float chamber, float or its needle may be inspected by removing the float chamber cover which is secured by two screws. The banjo bolt must be removed and then the float needle is removed by pushing the needle downwards through the float and extracting it through the needle seating in the base of the float chamber, on re-assembling see that the spring bow on the float engages with the groove in the needle. Ensure when replacing the cover that the joint washer is undamaged.

The throttle valve complete with jet needle and attached to the cable can be withdrawn from the carburetter after the knurled mixing chamber top has been unscrewed.

To separate the throttle valve and jet needle from the cable, release the cable at the control end and push the inner cable forward until the nipple in the throttle valve clears its hole, then withdraw the cable through the slot in the throttle valve, the nipple passing through the hole at the extreme end of the slot. On re-assembling pass the nipple through this hole via the inside of the throttle valve, ensure that the portion of the jet needle clip that falls in towards the jet needle is opposite the cable slot in the throttle valve, and then draw the cable forward until the nipple will pass over the end of the throttle valve and sink into its hole. On putting back this throttle valve assembly into the body, see that the key in the carburetter body engages the key-way opposite the cable slot in the throttle valve, and that the jet needle is entering the needle jet, before attempting to push the assembly home. Access to the main jet is by removing the main jet cover nut and withdrawing the filter gauze. When replacing the main jet take care not to over-tighten.

FILTER GAUZE. A filter gauze, which is a push fit over the main jet and needle jet, should be periodically examined and cleaned if necessary by washing in clean petrol.

FUEL FEED. Ensure that the fuel tap and pipe are kept clear.

FLOAT CHAMBER. Ensure that there is no continual flooding of the float chamber.

EXCESSIVE FUEL CONSUMPTION may be due to continual flooding of the float chamber: check that the float needle is not worn or bent, that the float is not leaking, that no impurities have got into the float chamber and lodged on the float needle seating. Nearly all flooding with new machines is due to impurities (grit, fluff, etc.) in the tank—so clean out the float chamber periodically until the trouble ceases. If the trouble persists, the fuel tank may be drained, swilled out, etc.

CABLE CONTROLS. See that the cable control fully opens and closes the throttle valve, a cable adjuster with locknut is provided in the top of the carburetter and can be adjusted until correct movement is obtained. Avoid sharp bends in the cable.

AIR FILTER MAINTENANCE. To ensure efficient air filtration it is important to periodically inspect and clean.

Where air filter is incorporated in carburetter the elements must be periodically removed and washed in petrol, then dipped in thin oil and allowed to drain before replacing in carburetter.

OIL BATH FILTER—TYPE 384/

Before using engine, remove filter top cover by inserting a coin between Top Cover and Boss on side of filter body. A slight twist will release.

Pour sufficient lubricating oil to cover the absorbent pad and retaining gauze—no more.

Saturate metal wool pack in top cover with lubricating oil, pour off surplus and replace top cover.

It is important that the small felt washer is fitted above the retaining gauze.

Under normal conditions the filter should be cleaned and lubricated, as above, after each eight to ten working hours, it may be necessary to reduce this time if conditions are very dusty or dirty.

After considerable usage it may be necessary to renew the felt absorbent pad.

CARBURATION FAULTS

There are only two possible faults in carburation, either richness or weakness of mixture.

INDICATIONS OF:—

RICHNESS	WEAKNESS
Black smoke in exhaust.	Spitting back in carburetter.
Petrol spraying out of carburetter.	Erratic slow-running.
Two-strokes, four-stroking.	Overheating.
Heavy, lumpy running.	Poor acceleration.
Sparking plug sooty.	Engine goes better if:—
	Throttle valve is not wide open, or if strangler is fitted this is partly closed.
	Choked filter gauze on main jet.
If richness or weakness is present, check if caused by:—	Check that the main jet, needle jet and passages are clear and that there is ample flow of fuel.
(1) Petrol feed.	Check there is no flooding of the float chamber.
	At the connection of the carburetter to the engine.
(2) Air leaks.	Has a loose-fitting throttle valve, worn needle jet, or loose needle jet or main jet.
(3) Defective or worn parts.	
(4) Air filter elements obstructed.	

PARTS WITH WHICH THE CARBURETTER IS ADJUSTED OR TUNED

The MAIN JET is calibrated and numbered, so that its exact discharge is known. Two main jets of the same number are alike, never reamer a main jet out, get another one of the right size, the bigger

the number the bigger the flow, the numbers varying, for example, 20, 22, 25, 27, 30, 32.

The **THROTTLE VALVE**. The slope is called the cutaway, and its number is stamped on the bottom. Throttle valves can be had with different cutaways—the bigger the cutaway and number, the weaker the mixture produced for small throttle openings.

The **JET NEEDLE** is positioned in the throttle valve by the jet needle clip. The top of the jet needle is grooved and by springing the clip off and springing it on again in another groove the position of the jet needle in the throttle valve is altered, either being raised or lowered.

ADJUSTMENT OR TUNING OF CARBURETTER

A certain amount of adjustment is provided for on the carburetter to ensure that a correct mixture is obtained. The correct mixture is one that is neither too rich nor too weak. See that there are no faults as outlined in "Maintenance" as these would affect the correct functioning and adjustment of the carburetter. Check that the ignition, timing, etc., is functioning correctly.

Carburetters as supplied by the makers for fitting to specific machines should under normal conditions only require adjustment of the position of the jet needle to ensure best general running with maximum fuel economy, the jet needle being raised if the mixture appears to be weak and lowered if the mixture is rich.

For special conditions or adaptations, or where it is suspected that the carburetter may have had an unsuitable throttle valve or main jet substituted, as these parts vary according to engine requirements it will be necessary to completely re-tune the carburetter. See "Complete Tuning of Carburetter."

COMPLETE TUNING OF CARBURETTER

To remedy weakness or richness, proceed as follows:—

Position of Throttle.	To cure richness.	To cure weakness.
At 3/4 to full throttle.	Fit smaller main jet.	Fit larger main jet.
At 1/4 to 3/4 open, as for general running.	Lower jet needle.	Raise jet needle.
Up to 1/4 opening, as for idling and light running.	Fit throttle valve with larger cutaway.	Fit throttle valve with smaller cutaway.

Finally, if any alteration has been made to the throttle valve cutaway, it may be necessary to alter the jet needle position again: putting in a throttle valve of smaller cutaway may require the jet needle lowering by a groove, and alternatively a larger cutaway may necessitate raising the jet needle.

WIPAC SERIES 161
SPECIFICATION No. MF 1567
MAGNETO SERVICE INSTRUCTIONS

CHECKING MAGNETO FOR SPARK

If the engine fails to start and there is indication that the magneto is at fault:—

- (a) Disconnect H.T. lead from the spark plug and hold it about $\frac{1}{8}$ " away from some unpainted portion of the frame or engine. Rotate the engine and a spark should jump this gap.
- (b) If no spark is visible:—
 1. Make sure H.T. lead is screwed right home into coil box.
 2. Check H.T. lead for continuity.
 3. Check contact breaker points for correct gap setting and see that they are clean. Do not file points, use fine emery paper and finally remove all traces of deposit by drawing a piece of stout paper between the points. Check breaker point adjustment screws for tightness (see page 11 for procedure).
 4. By removing the flywheel examine the internal leads for breaks and see they are all properly secured. Make sure covered leads are not chafed and earthing (see pages 2 and 3 for procedure).
 5. Make sure there are no metallic particles inside the unit.

FLYWHEEL

This flywheel is robustly constructed with the cam integral with the flywheel boss and it is unlikely to develop any faults in normal use. A KEEPER RING IS NOT NECESSARY WHEN WITHDRAWING IT FROM THE STATOR PLATE.

Removal of Flywheel

1. Where recoil starter is fitted, remove engine cowl with starter assembly intact, remove starter plate assembly and distance piece by releasing the six securing screws.

Where rope starter pulley is fitted, remove engine cowl and release the screws which secure the pulley to the flywheel.

2. Remove the flywheel fixing nut and washer.

3. Carefully remove the flywheel from the tapered shaft, it is advisable to use an extractor for this purpose which can be supplied. Failing this, grasp the flywheel firmly and whilst attempting to pull it off, tap the end of the crankshaft with a mallet or lead hammer, taking care not to damage the crankshaft thread. When replacing the flywheel make sure metallized dust or small steel items have not been attracted on to the magnets (see pages 2 and 3 for correct timing method).

CONDENSER

A weak or faulty condenser can be detected by badly burnt and pitted contacts.

The condenser can be removed by undoing the securing screw and releasing the lead from the terminal post.

H.T. COIL

Removal. First release coil primary leads, then with a gentle pull the coil can be withdrawn from the core. When replacing coil be sure the retainer clip is well down inside the coil, this will enable the small lip at the bottom of the retainer clip to engage under the cutaway section of the core, holding coil firmly in position.

CONTACT BREAKER POINTS (Checking)

1. When recoil starter is fitted, remove starter body by releasing three securing screws.
2. When starter pulley is fitted remove pulley and distance piece by releasing three securing screws.
3. Turn flywheel until contact breaker cover securing clip is visible through inspection cover hole. Push clip anti-clockwise to release cover. Slightly raise contact breaker cover and move in an anti-clockwise direction to expose contact breaker points. Ensure that points are fully open by turning flywheel. Check the gap with .018" feeler, if adjustment is necessary, slacken bottom screw and adjust by eccentric screw until correct gap is obtained, lock bottom screw securely. Replace contact breaker cover ensuring correct seating on rim, replace clip in central position. The breaker point setting should only be adjusted in the manner described and at no time should the breaker arm be bent to provide adjustment. If the contact points need replacing, the fixed and movable points must be replaced at the same time.
4. Replace starter parts.

LUBRICATION

After every 1,000 hours re-lubricate the cam grease pad. To do this slide the pad out from its holder and squeeze and work into it a Summer grade of motor transmission grease. Do not use ordinary grease.

GUARANTEE

WE give the following guarantee with J.A.P. Engines and Accessories in place of any implied guarantee by statute or otherwise, all such guarantees being in all cases excluded. No statement or representation contained in this catalogue shall be construed as enlarging or varying this guarantee. In the case of engines and accessories which have been used for "hiring out" purposes, or from which our trade mark, name, or manufacturing number has been removed, no guarantee of any kind is given or is to be implied.

We guarantee subject to the conditions mentioned below, that all precautions which are usual and reasonable have been taken by us to secure excellence of materials and workmanship. but this guarantee is to extend and to be in force for six months only from the date the engines or accessories are despatched by us, and the damages for which we make ourselves responsible under this guarantee are limited to the replacement of a part manufactured by us which may have proved defective. We cannot accept responsibility for the replacement of any proprietary articles or parts not manufactured by us, unless the makers of these parts agree to replacement.

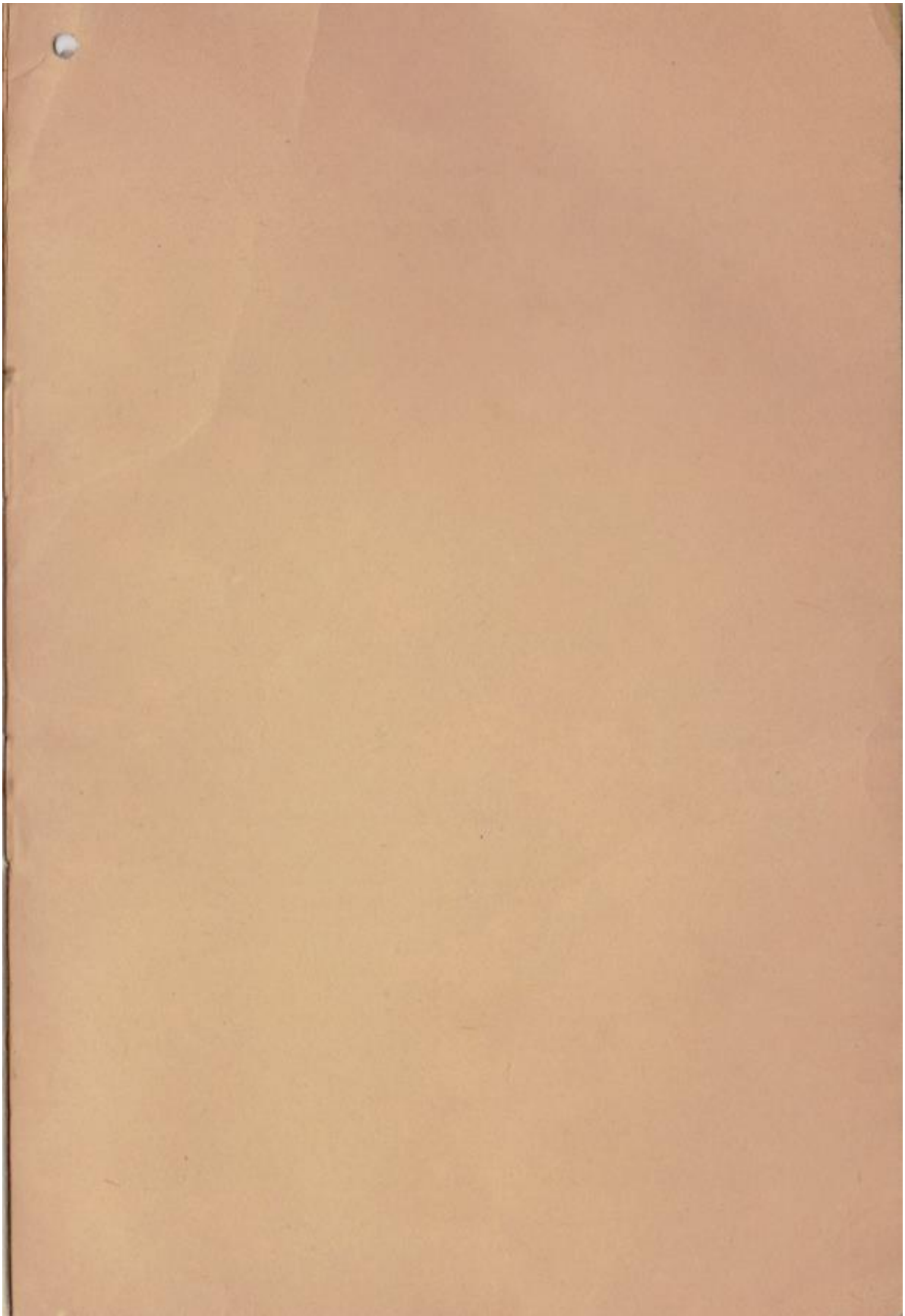
We do not undertake to refit or bear the cost of replacement or refitting such new part. We guarantee, subject to the conditions mentioned below, to make good at any time within six months any defects in these respects. As J.A.P. Engines and accessories are liable to derangement by neglect or misuse, this guarantee does not apply to defects caused by wear and tear, misuse and neglect.

CONDITIONS OF GUARANTEE

If a defective part should be found in our engines or accessories, it must be sent to us carriage paid and accompanied by an intimation from the sender that he desires to have it repaired free of charge, under our guarantee, and he must also furnish us at the same time with the number of the engine, and full particulars of purchase. Failing compliance with the above, no notice will be taken of anything that may arrive, but such articles will lie here at the risk of the sender, and this guarantee or any implied guarantee shall not be enforceable.

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**FOR QUICK REFERENCE AND
SPARE PARTS ORDERING, RECORD
ENGINE NUMBER WITH PREFIXES
HERE**

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