ARIEL
3

£5

BSA

Owners' handbook

50 cm³ model

WARNING ! ! !

If it is required to run the engine above idling speed when stationary, the driving wheel must be raised clear of the ground

If the engine cover is open take great care that your fingers and loose clothing do not contact the rotating fan blades

The fan does not rotate when the engine is idling.

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Owners' handbook

50 cm³ model

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INTRODUCTION

The Ariel 3 has been designed specifically for inexperienced riders and hence to run for long periods without major attention. There are no greasing points and any maintenance that may be necessary is limited to a few items on which adjustment can be carried out with a minimum of mechanical knowledge.

Study this handbook carefully and carry out the few maintenance tasks with faithfull regularity, as detailed in the following chapters, in order to keep the machine in first-class condition.

By taking a pride in proper maintenance and in the appearance of your Ariel 3, it will give increased pleasure and retain its original finish and performance.

In any correspondence connected with your Ariel 3, please quote the engine and frame number, the former being stamped on the crankcase below the cylinder barrel, and the latter on the left side of the steering head.

RECOMMENDED ENGINE OILS

Castrol	Esso	Shell	Mobil	B.P.	Texaco
Two-stroke Oil	Two-stroke 2T	2T Two-stroke Oil	Mobil Mix TT	Energol Two-stroke	Motor Oil 2T

The above oils, specially prepared for use in two-stroke engines, must be used in the proportion of 1 part oil to 24 parts petrol equivalent to 1/3-pint of oil to 1 gallon of petrol (i.e. 4 per cent mixture).

For running-in purposes only (i.e. for about 1 month or 300 miles) the proportion should be 1 part oil to 20 parts petrol equivalent to 2/5-pint of oil to 1 gallon of petrol (i.e. 5 per cent mixture).

The following oils are also approved for use in the engine:-

Filtrate Plus 2-stroke oil; 1/4-pint of oil to 1 gallon of petrol (1/3-pint of oil to 1 gallon of petrol for running-in purposes).

Duckhams 2-stroke oil; 1/4-pint of oil to 1 gallon of petrol.

For non self-mixing oils use an S.A.E.40 grade in the proportion of 1/4-pint of oil to 1 gallon of petrol (see notes on page 4).

Throttle Control:—This operates the carburetter from the right handlebar grip. Twist in direction of arrow (*D*) Fig. 1, to increase the engine speed. The control may be adjusted for position after slackening the screws (*E*). The screw (*F*) controls the friction damping device within the body, so that the stiffness of rotation can be set to suit personal requirements.

Decompressor:—This device, used when starting or stopping the engine, is also operated by the twist grip on the right handlebar. Turn in the direction of the arrow (*G*) Fig. 1, to close the throttle and then rotate further in the same direction to operate the decompressor, when release of the compressed vapour will be audible.

THE LEFT HANDLEBAR

Headlight Switch:—The "on/off" switch (*K*) Fig. 2, can be moved after slackening screw (*L*).

Horn Button:—This is included in the same housing as the headlight switch, at (*M*).

Rear Brake Lever:—The position of this lever (*N*) Fig. 2, can be altered following the slackening of the screw (*P*). Tighten securely after adjustment. Grip the lever to operate the brake. The looseness of the lever is adjusted by rotation of the screw (*R*), after releasing its locknut.

Parking:—Whenever your Ariel 3 is left unattended, apply the rear brake and lock in position by means of the latch (*S*) Fig. 2. To release, grip the brake lever, withdraw the latch, and secure it in the "safe" position at (*T*).

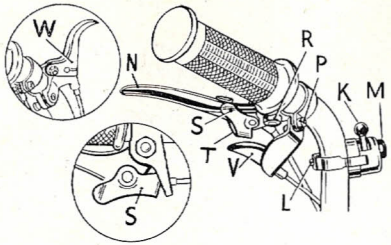


FIG. 2.
The controls on the left handlebar. Note that in the "safe" position, the latch (S) clips on to the brake lever. The inset shows brake applied and retained by the latch.

Carburetter Air Control (or "Choke"):—The trigger-type lever (*V*) Fig. 2, operates the shutter at the mouth of the carburetter and can be repositioned only in conjunction with the rear brake lever. This control provides a rich mixture for cold starting purposes only. Cable adjustment is described on page 12, and should be such that a small amount of slackness is present. NOTE:—The trigger lever (*W*) is sometimes provided as an alternative to lever (*V*).

RIDING

RIDING POSITION

Handlebar Height:—The handlebar stem telescopes into the steering head. It can be raised or lowered after slackening the expander bolt (*B*) Fig. 3, when it may also be necessary to tap the bolt head to free the expander cone (*C*). Tighten securely after adjustment.

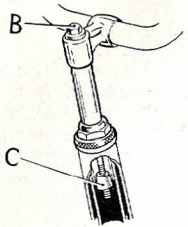
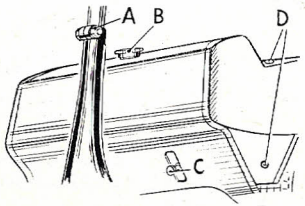


FIG. 3.
Handlebar height adjustment. If the assembly is dismantled it is most lmportant that the cone (C) is replaced.

Seat Height:—The seat stem telescopes into the frame pillar and is adjustable for height after slackening the clamping nut (*A*) Fig. 4. Tighten securely after adjustment.

FIG. 4.
Seat pillar height adjustment and petroil tap. The enginecover fasteners (D) *are released with the aid of a coin.*



RIDING

To Start Off:—Open the fuel tap (*C*) Fig. 4, and release the parking brake. Rotate the twist grip control to its limit in the direction of the arrow (*G*) Fig. 1, in order to operate the decompressor, and then pedal the machine in the normal manner. As soon as it is moving at a moderate speed, grip the air control lever (*V*) or (*W*), as the case may be, Fig. 2, and turn the twist grip in the direction of the arrow (*D*) Fig. 1, until the decompressor is inoperative and the throttle is partially opened, when the engine will start. Immediately the engine is running, release the air control lever, and cease pedalling. NOTE:—Excessive use of the air control may cause quantities of neat petrol to collect in the crankcase, making starting very difficult. If the engine is warm, do not operate the air control lever.

Running:—Control the speed of the machine by means of the twist grip.

To Slow Down:—Gradually close the throttle by turning the grip in the direction of the arrow (*G*) Fig. 1, (but not so far as to operate the decompressor), and apply the brakes gently. Do not apply the brakes sharply on wet roads.

To Stop:—Continue the slowing down procedure until the machine is at a standstill, with the engine running slowly.

To Restart:—Release the brakes and gently open the throttle control in the direction of the arrow (*D*) Fig. 1. Do not use the carburetter air control, which is for starting with a cold engine only.

To Stop the Engine:—When the machine is stationary, the engine is stopped by turning the twist grip control in the direction of the arrow (*G*) Fig. 1, to operate the decompressor.

Hill Climbing:—On steep hills, the centrifugal clutch allows the engine to run at its most suitable speed, but it may be necessary to provide pedal assistance if the gradient is severe.

Engine Failure:—If inadvertently running out of fuel, the drive to the rear wheel should be disengaged, to allow the machine to be pedalled without resistance from the engine. Pull out the spring-loaded sleeve (*S*) Fig. 5A (arrow 1) and rotate through 90° (arrow 2), where it will be retained automatically by a shallow slot, Fig. 5B.

To re-engage the drive, rotate the sleeve through a further 90° until the driving tongues are felt to engage with their corresponding pilot slots. It is then necessary for the machine to be moved forwards slowly, when the driving tongues will be heard to engage fully, and the sleeve will return to its normal position, Fig. 5A.

Check the operation and lubricate every three months (800 miles).

FIGS. 5A and 5B.
Disconnecting the drive to the rear wheel. The left illustration, Fig. 5A, shows the normal driving position and the right illustration, Fig. 5B, shows the free-pedalling position.

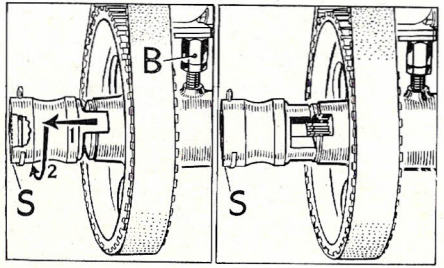


FIG. 5A FIG. 5B

MAINTENANCE AND ADJUSTMENTS

The whole engine unit is readily accessible for maintenance. First remove the petroil filter cap and release the fasteners (*D*) Fig. 4, (both sides) with the aid of a coin. Open the cover rearwards and retain with the support rod.

Driving Chain:—The slackness in the chain can be gauged with the fingers following removal of the rubber inspection cap (*T*) in the chaincase wall. To remove excessive slackness in the chain, first remove the outer chaincase cover, then slacken the pivot nut (*N*) and securing nut (*M*). Slacken the adjuster lock-nut (*P*) and then screw inwards the adjuster bolt (*R*) Fig. 6 (*i.e.*, turn clockwise). Total up and down play in the chain should be approximately ⅜″ (9·5 mm.). Retighten the securing nuts firmly. Thoroughly lubricate the chain at intervals of three months, or 800 miles, with Mobilplex Special.

NOTE:—The chain adjuster bolt (*R*) should not be confused with the adjuster (*B*) Fig. 5A, which is for factory purposes only.

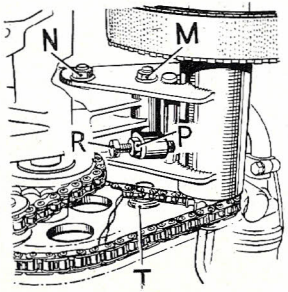


FIG. 6.
Adjustment of the chain drive to the rear wheel, (shown from below with chain-case removed for clarity). This operation will be simplified if the machine is laid on its right side.

Pedalling Chain:—Apart from lubrication with Mobilplex Special every three months or 800 miles, this chain does not require adjustment, any slackness being accommodated by spring-loaded auxiliary pulleys.

Control Cables:—Adjusters for all cables, *i.e.*, brakes, decompressor, "choke" and throttle, are grouped within a detachable box (*A*) mounted on the steering column (*E*) Fig. 7. To reduce slackness in a cable (*e.g.*, to adjust the brake operation) slacken the locknut (*B*), hold the body (*C*) of the adjuster and unscrew the sleeve nut (*D*) until the adjustment is correct. Tighten the locknut securely.

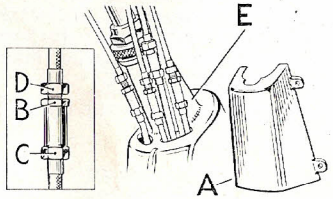


FIG. 7.
Adjustment of the length of a control cable.

Brake Cables:—All slackness should be eliminated so that the brake is applied immediately the lever is operated. Make sure that the wheel still spins freely when the adjustment is completed, and the lever is released.

Throttle Cable:—Adjustment should be such that when the throttle is closed there is a trace of slackness in the cable. The engine should still run slowly, but if not, screw the adjuster (*B*) Fig. 11, in or out by a quarter of a turn at a time, until this condition is achieved. This may require further cable readjustment.

Decompressor Cable:—A small amount of slackness must be present, otherwise the decompressor will be partially open, and starting will be difficult or impossible.

Removing and Replacing a Brake Cable:—To disconnect a front brake cable, first reset the adjuster so as to produce the maximum amount of slackness, and then withdraw the inner and outer casing from the abutment on the brake plate. At the brake lever (position 1, Fig. 8) rotate the cable and nipple until the cable is in line with the slot in the lever (position 2) and withdraw sideways (position 3). Use a similar procedure at the handlebar lever.

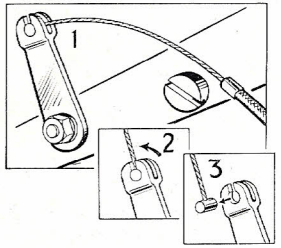


FIG. 8.
Removing a front brake cable.

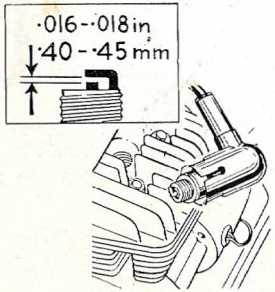
The method is the same for the rear brake cable except that the lever must be removed from the brake plate before the inner cable can be uncoupled.

NOTE—For smooth operation, all exposed inner cables must be oiled at weekly intervals.

To re-new an inner cable it will be necessary to replace the complete inner and outer cable assembly. Insert the cables through the aperture in the steering head and, for the rear brake cable, lift off the footplate to check that the new cable follows the same route as the one originally fitted. Adjust as required (see page 12).

Tyres and Pressures:—All tyres require a pressure of 28 lbs./sq. in. (2 Kg./sq. cm.) which must be checked at weekly intervals. Every three months or 800 miles, the wheels must be removed and replaced in a new position, *i.e.*, left side wheel is transferred to the right side, right side wheel is transferred to the front, and the front wheel is transferred to the left side.

Spark Plug:—To check the firing of the plug, disconnect the cable at the plug (it is a "snap" fit) and remove the plug. Reconnect the cable, lay the body of the plug on the cylinder head and push the machine forward for a short distance, when a spark should be seen at the plug points (Fig. 9). Do not open the throttle during this operation.



L81 OR B7HS.
0·65 ACCORDING TO WORKSHOP MANUAL

FIG. 9.
Checking the firing of the spark plug.

At intervals of three months or 800 miles, remove the sparking plug for cleaning on an abrasive blast machine (possessed by most garages) and have the points gap set to ·016—·018″ (·40—·45 mm.) by repositioning the side electrode (Fig. 9). Do not attempt to bend the centre electrode. When a replacement is necessary, fit Champion L81.

Petrol Supply:—In the event of suspected petrol starvation at the carburetter, as evidenced by misfiring and lack of power, check the supply of fuel by removal of the pipe connection at the carburetter, when the flow should be plentiful and continuous. This operation will be simplified if the bolt clamping the carburetter to the inlet pipe is slackened and the carburetter rotated as required. If the flow

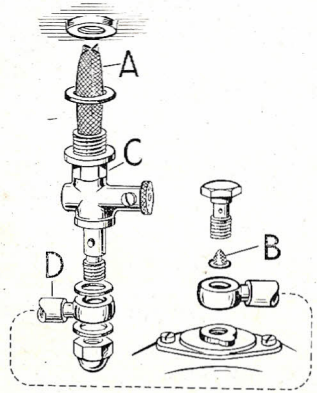


FIG. 10.
Checking the petrol supply.

is intermittent, or none at all, lay the Ariel 3 on its right side, disconnect the pipe at the tap and unscrew the tap complete. Clean the filters (*A*) and (*B*), tap (*C*), and pipe line (*D*) Fig. 10, and replace. (See also "Carburetter Jet").

Carburetter Jet:—The jet (*A*) Fig. 11, is readily accessible for cleaning in the event of blockage and consequent fuel starvation, and its removal does not necessitate dismantling the carburetter. Unscrew the jet with a suitable spanner and blow through the orifice until it is certain that it is clear of any obstruction. Make sure that the obstruction has not been transferred to the smaller side holes. Do not use any sharp implement for cleaning purposes and do not over-tighten when replacing.

The spring-loaded screw (*B*) should not be touched since it is concerned solely with adjustment of the throttle for satisfactory engine idling (see throttle control cable, page 12).

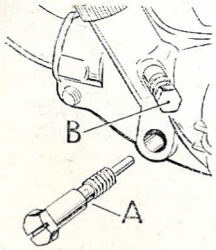


FIG. 11.
Removal of the carburetter jet for cleaning.

The Air Filter:—The carburetter air filter (Fig. 12) must be removed and thoroughly cleaned at intervals of not more than one month (or 300 miles), otherwise the air supply to the carburetter will be reduced, causing heavy fuel consumption and poor performance.

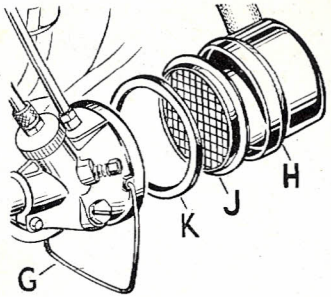


FIG. 12.
Dismantling the air filter.

Push aside the wire clip (*G*), and lift off the air silencer body (*H*). The air filter (*J*) and its sealing ring (*K*) can then be withdrawn. Wash the filter thoroughly in neat petrol, afterwards adding cycle oil sparingly. Clean the silencer and reassemble.

Wheel Removal:—The wheels are quickly detachable and also interchangeable. They are attached to the brake drum, but removal does not affect brake adjust-

ment. Unscrew the three nuts (*A*) Fig. 13, to release the wheel. Note that these nuts are of the self-locking type and any replacements must be of the same description.

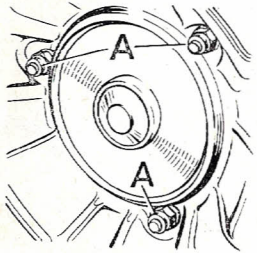


FIG. 13. *Removing one of the wheels.*

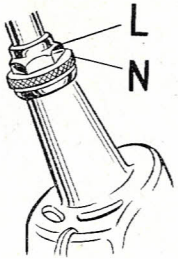


FIG. 14. *Adjustment of the steering head bearings.*

The Steering Head:—Check the head bearings regularly for slackness. The handlebars should rotate smoothly and freely, but without up and down play. If adjustment is necessary, slacken the locknut (*L*) Fig. 14, and tighten the ring nut (*N*), until the above condition is obtained, afterwards retightening the locknut. It is essential that the ring nut is not over-tightened otherwise the steering will become stiff and the ballraces damaged.

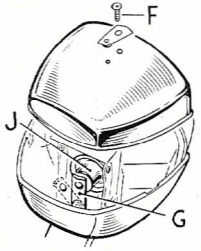
ELECTRICAL EQUIPMENT

Current for the lighting system and the horn is provided by the generator on the engine shaft and hence the lamps will not be illuminated nor the horn useable when the engine is stationary.

To adjust the vertical angle of the beam, slacken the screw beneath the lamp and tilt the lamp to obtain the correct setting.

NOTE:—Lighting regulations vary with different countries and it will be advisable to check that your beam setting complies with the requirements.

FIG. 15. *Replacing the headlight bulb.*



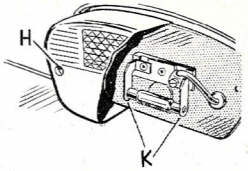


FIG. 16. *Replacing the tail light bulb.*

The headlight bulb is a C.E.V. 6 volt, 15 watts. To replace, remove the screw (*F*) Fig. 15, and take off the top cover of the lamp. The spring contact blade (*G*) can then be pushed aside and the bulb (*J*) withdrawn from its housing. Do not bend the blade backwards otherwise there will be faulty contact at the bulb.

The rear light bulb is a festoon type, 6 volt, 6 watt, type Alite A317. To replace, remove the screws (*H*) Fig. 16, and detach the lens. Take care not to strain the bulb holder strips (*K*), otherwise the electrical connection may become unsatisfactory.

Replacement bulbs can be obtained from your local B.S.A. Service Dealer.

The Contact Breaker Points:—The gap between the contacts tends to widen and the faces to become dirty. It is essential that these are kept clean, otherwise starting may become difficult. Attention is advisable at intervals not exceeding six months (or 1,500 miles).

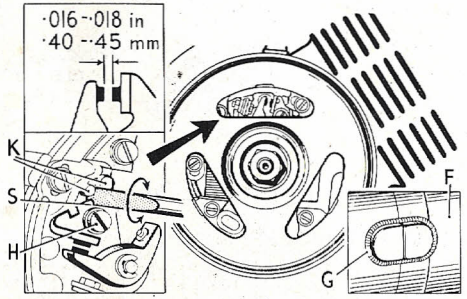


FIG. 17.
Adjustment of the contact breaker points.

Support the engine unit on a box, open the engine cover, and remove the right wheel. Alternatively, the machine may be laid on its left side.

Take off the flywheel cover (*F*) which is retained by two spring rings (*G*). Turn the flywheel until one of its apertures is opposite to the contact points and the gap between them is at its maximum (Fig. 17). Only one of the three apertures will meet this condition. Now clean the points with a cloth moistened in petrol.

If the required gap of ·016″—·018″ (·40—·45 mm.) is incorrect, slacken the fixing screw (*H*) by half a turn, insert a screwdriver blade between the two bosses (*K*) and into the slot (*S*) on the carrier plate and slightly twist the screwdriver to modify the gap to the above figures. Tighten the fixing screw and check the gap.

DEALER MAINTENANCE

Thirty days (or 300 miles) after you have taken delivery of your Ariel 3, return it to your B.S.A. dealer for inspection in accordance with the details given on the Guarantee (Warranty) Registration Card.

At intervals of not more than twelve months or 3,000 miles, it is suggested that the following maintenance work is carried out for you by a B.S.A. Service Dealer, but for owners who have some mechanical knowledge and wish to do the work themselves, no difficulties should be encountered if the instructions given in the Workshop Manual are closely followed.

Decarbonising:—This process concerns the removal of the carbon deposits inside the cylinder head, ports, exhaust system, etc., caused by combustion of the petroil mixture. If decarbonising and cleaning the silencer is neglected, excessive falling off in power, over-heating and other troubles will be caused.

Bearings:—For all wheels it will be necessary to dismantle the hub completely in order to replenish the bearing housing with grease. Similarly, the large pulley spindle assembly will require dismantling for attention to the bearings.

Ignition Timing:—This is set at 2—2·2 mm. before top dead centre. Renewal of the contact breaker set should be followed by a check on the ignition timing, for which purpose the contact assembly plate has a limited range of adjustment. In any case, the ignition timing should be checked at the above mileage.

Contact Breaker Cam:—The lubrication pad is thoroughly soaked in grease before assembly, but it will be advisable for it to be regreased when the ignition timing is checked.

Steering Head:—The assembly must be dismantled in order to re-grease the bearings. At the same time check the ball tracks, replacing the cups and cone if showing signs of indents.

FAULT-FINDING CHART (1)

Engine will not Start

Decompressor stuck open (audible; release and lubricate)

Petrol at Carburetter

No Spark at Plug

Plug oiled up (wash in petrol and dry out)

Plug points bridged with foreign matter (clean and retest)

Damp or cracked plug insulation (dry out; replace if cracked)

Dirty or incorrect contact points gap (clean and adjust; page 20)

Excessive use of carburetter air control causing neat petrol to enter crank-case

Chafed cable causing short circuit (replace cable)

Generator failure (replace generator)

Spark at Plug

Plug may not spark in situ. (Clean and retest, or fit new plug)

No Petrol at Carburetter

Tap closed (open tap)

Tank empty (replenish tank; page 4)

Choked filler cap vent (clear obstruction)

Choked pipe, tap or filter, (clear obstruction; page 15)

FAULT-FINDING CHART (2)

Faulty Running of Engine

Incorrect petroil mixture

Misfiring

- Dirty plug (clean or fit new plug)
- Dirty contact breaker points (clean and adjust gap, page 20)
- Incorrect opening of contact breaker points (adjust gap, page 20)
- Water on high-tension cable (dry out)
- Water in fuel (drain tank, strain, and replenish)
- Dirt in carburetter jet (dismantle and clean out, page 16)
- Partial fuel obstruction (dismantle fuel line, etc., and clean out, page 15)

Lack of Power

- Incorrect ignition timing (reset) page 22)
- Exhaust system choked (decarbonise, page 21)
- Fuel supply obstructed (dismantle fuel line or blocked carburetter jet and clean out, page 15 and 16)
- Brakes binding (readjust cables, page 12)
- Chain too tight (slacken off at adjuster, page 11)

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