Motor Cycle & Cycle TRADER

TRADER AID SERIES

Servicing Data Sheet No. 22

BSA DANDY LIGHT SCOOTER

Manufacturer: BSA Motor Cycles Ltd., Birmingham, 11.

THE BSA Dandy 70 was introduced at the 1956 Cycle and Motor Cycle Show, and was received in a most favourable manner. Leading-link front-forks and swinging-arm rear-suspension ensure maximum riding comfort, and amply proportioned legshields and rear mudguard give maximum weather protection. The compact engine gear unit (with two-speed pre-selector gears) is low-slung and gives the machine a low centre of gravity. The price of the machine is very reasonable in view of its up-to-the-minute specification.

USEFUL DATA

THE ENGINE is an air-cooled, single-cylinder, two-stroke, built in unit with a two-speed pre-selector gearbox. Bore — 45 mm.; stroke — 44 mm.; cubic capacity — 69.9 c.c.; compression ratio—7.25 to 1. The cast-iron cylinder has an aluminium-alloy cylinder-head. **Note:** Early machines were fitted with interchangeable alloy or cast-iron cylinders. Now cast-iron cylinder 64-31 has been introduced but if used on engines before DSE2501 new cylinder-head 64-29 must be used also. The aluminium-alloy piston carries two pegged piston rings, 45 mm. diameter by 3/32 in. width. The piston-ring end-gap is .009 in. to .013 in. The connecting-rod small-end is fitted with a bronze bush, and the big-end runs on 17 needle rollers. The crankpin is integral with the crankshaft assembly, which is of the "overhung" type. When it is necessary to replace the big-end bearing, a complete new crankshaft assembly must be used. Two ball-journal main-bearings are fitted (see Bearing Table), and an oil- and compression-seal is fitted to the crankshaft.

Petroil mixture. Engine is lubricated by petroil mixture. One part of self-mixing two-stroke oil to 16 parts of petrol, or one part of SAE 40 engine oil to 20 parts of petrol, is recommended as also is the use of Shell-BP Petroiler Mix No. 1.

Carburettor. Of Amal manufacture. Bore —½ in.; main jet—35 c.c.; throttle valve—No. 3; needle position—3; needle jet—.0745. An air strangler is fitted and a wire-gauze air-cleaner is fitted in carburettor coverplate.

Flywheel ignition-generator. On machines with L in engine number prefix, a Lucas 6F1 permanent magnet alternator is fitted. LT output at 6 volts is 18 watts. For bulb sizes, see wiring diagram. An Ever Ready 1289 pocket lamp dry battery is fitted in headlamp (short terminal, negative, locates on RH terminal looking into headlamp) for parking lights.

A Wico-Pacy ignition generator is fitted to machines without L in engine number prefix. Three types have been used to date. Up to engine DSE1307 type IG1477, from engine DSE1308 to DSE3701 type IG1493 and after engine DSE3701 type IG1501 is fitted. (See Wico-Pacy Equipment for interchangeability of contact-breaker sets, etc.). LT output at 6 volts is 21 watts. LT output tested by connecting leads of a Wilkson AC voltmeter (with 1 ohm resistance) across red output lead and earth should be 3.9 volts to 4.6 volts between 2,000 and 4,000 rpm. For bulb sizes, see wiring diagram. Two single-cell U2-type, dry batteries are fitted in headlamp for parking lights.

Contact-breaker gap. Lucas—.015 in.; Wico-Pacy .018 in.

Ignition timing. $\frac{5}{32}$ in. BTDC, contact-points just breaking. Limited adjustment of ignition timing within slots of stator-plate.

Spark-plug. Champion L10S. Points gap—.018 in. to .020 in.

Gearbox and clutch. The two-speed pre-selector gearbox and clutch are built in unit with engine. Operation of the gear control twistgrip pre-selects the gear required which engages when clutch lever is operated. Gear ratios are—top—9.7 to 1; first 21.2 to 1.

Drive chain and sprockets. 70 pitches of ½ in. by $\frac{5}{16}$ in. compose the drive chain. The gearbox output sprocket has 13 teeth and the rear chainwheel has 27 teeth.

WHEELS

Wheel data table

Tyre size. Front and rear—20 in. by 2½ in. (2.50 in. by 15).

Rims. Front and rear—G5-J.

Spokes. Front and rear—32 off 5¼ in. long by 12 swg per wheel (rear spokes butted to 11 swg).

Brake linings. Front and rear—4⅜ in. long by ⅞ in. wide by ⅛ in. thick.

Inner tubes have Schrader-type valves.

Tyre pressures. Front 18 lbs./sq. in. and rear 24 lbs./sq. in. for rider weight of 140 lbs. Add 2 lbs./sq. in. (front) and 4 lbs./sq. in. (rear) for every 14 lbs. extra weight.

Wheel bearings. Packed with Castrolease Heavy (or equivalent) grease on assembly. Both wheels have knock-out spindles, removal of which leave wheel bearings (mounted on

ENGINE-GEAR UNIT BALL BEARING TABLE

Location	Part No.	Outer Diam.	Inner Diam.	Width	Type
Crankshaft (Large)	24-4217	1⅞in.	¾in.	$\frac{5}{16}$in.	LS 8
Crankshaft (Small)	90-6063	35mm.	15mm.	11mm.	6202
Gearbox output shaft ..	90-6063	35mm.	15mm.	11mm.	6202
Gearbox input shaft ..	90-6063	35mm.	15mm.	11mm.	6202

hollow spindles) undisturbed. Adjust bearings to give 1/64 in. side play at wheel rims by slackening locknut (on hollow spindle end opposite to brake drum) and then turning adjusting cone by means of knurled adjusting ring. Fully re-tighten locknut and check side play. Cup and cone type bearings are used—12 steel balls of ¼ in. diameter are fitted to each bearing.

Steering head bearings. Cup-and-cone type using 24 steel balls of $\frac{3}{16}$ in. diameter in top race and 20 steel balls of ¼ in. diameter in bottom race.

General dimensions. Length—67 in; height —33½ in.; wheelbase—45 in.; ground clearance —4½ in.; saddle height — 28½ in.; handlebar width — 24 in.; weight — 100 lbs.; fuel-tank capacity—¾ gallon.

Engine number stamped on crankcase above petrol-pipe inlet.

Frame number stamped on flange at bottom of steering head.

LUBRICATION

Recommended grades

Component	Wakefield	Shell	Esso	Mobil	B.P.
Engine	Castrol 2 stroke (1 to 16) or Castrol XXL (1 to 20)	Petroiler Mix No. 1 or Shell X100/40 (1 to 20)	Esso 2 stroke (1 to 16) or Essolube 40 (1 to 20)	Mobilmix TT (1 to 16) or Mobiloil BB (1 to 20)	Petroiler Mix No. 1 or B.P. Energol SAE40 (1 to 20)
Gearbox (capacity ⅓ pint) or 190 c.c. ..	Castrol XXL	Shell X100/40	Esso Extra Motor Oil 40/50	Mobiloil D.	Energol SAE40
Wheel Bearings steering head and grease points	Castrolease Heavy	Shell Retinax A	Esso High Temperature Grease	Mobilgrease MP	Energrease C3

Gearbox. Drain and refill every 2,000 miles (see Fig. 3).

Steering head and wheel bearings. Pack with grease on assembly. Renew when overhauling bearings.

Control cables. Lubricate weekly with cycle oil.

Drive chain. Oil every 250 miles.

ELECTRICAL EQUIPMENT

(1) Lucas equipment

(fitted to machines with L in engine No. prefix)

The 6F1 generator is a permanent magnet alternator which supplies LT AC current for direct lighting, horn and for conversion to HT current for ignition. The flywheel consists of four alloy-steel magnets with laminated pole pieces and it is "self-keeping". It is a parallel fit on the main-shaft and is keyed in position. The laminated stator has four poles, wound with the two charging coils, and it carries the contact-breaker set and the condenser. The ignition coil is mounted behind the stator and the contact-breaker cam is keyed to the main-shaft and is a parallel fit. Two screws secure the stator plate, which is slotted to allow small variations of the ignition timing. (See Useful Data).

The wiring circuits used with this generator are unorthodox, inasmuch as that the full output current is always flowing. The lighting-switch and horn-push contacts are normally closed and the output current passes to earth (frame) through them. Operation of either of these switches opens the contacts and breaks the direct path to earth. The current then flows to earth through the bulb filaments or horn windings. The return to earth (frame) from the generator is by the contact-breaker points when they are closed, thus short-circuiting the ignition coil. When the c/b cam opens the contact points, however, the current passes through the coil and the rapid surge causes an HT spark to be induced in the ignition coil.

The head and tail bulbs are wired in parallel between the lighting-switch and earth. When the lighting-switch is in the HEAD position, the LT current passing through the ignition coil (or c/b points) also passes through the head and tail lamp bulbs.

The lighting-switch has three positions—OFF (centre), HEAD (right) and PARK (left). The circuits are as follows (see Fig. 1 also):

(1) **OFF** (ignition only). Generator—horn-push (or horn windings)—switch terminal 7—toggle arm—headlamp shell—frame—contact-breaker points (or coil)—generator.

(2) **HEAD** (ignition and lights). The circuit is as in (1) but, instead of passing from terminal 7 to the headlamp shell through the toggle-arm (which is now lifted from terminal 7) the current passes through the dipswitch and headlamp bulb filament to the shell and thence to contact-breaker, etc.

Switch terminal 5, which supplies the tail lamp, is connected internally with terminals 2 and 3, which, in turn, are connected by wire with terminal 7.

(3) **PARK** (parking lights). Negative side of dry battery — terminal 4 — parking bulb (also, via internal connection, to terminal 5 and tail bulb) — headlamp shell — second toggle arm—terminal 1—positive side of dry battery.

Current for ignition is supplied by the circuit given in (1).

TESTING

If engine will not start with lighting switch in OFF position, check that fuel is reaching carburettor, that compression, etc., is good and that spark-plug is serviceable. If no HT current is present at end of plug lead then:

(1) Disconnect generator output lead at snap connector inside frame (at toolbox). Earth the generator end of the output lead. If—

(a) Engine will not start then a fault in the generator assembly is indicated (contact-breaker, HT coil, LT windings, etc.).

(b) Engine starts then generator assembly is in order. Proceed to test remainder of circuit.

(2) Rejoin snap connector and detach horn. Bridge the two terminals and connect to earth. If—

(a) Engine will not start then wire between horn and snap connector must be broken.

(b) Engine starts—replace horn and proceed to:—

(3) Connect switch terminal 7 to earth. If—

(a) Engine fails to start then the wire between horn and terminal 7 is likely to be broken. Another, though unlikely, cause could be an open circuit in both horn-windings and horn-push. An open circuit in horn-windings only—engine would run but horn would not sound, and the engine would falter or stop when the horn push was pressed. An open circuit in the horn push only (or wiring)—horn would sound when engine is turned over and starting would likely be difficult.

(b) Engine starts, then look for poor connection between the following, in this order: Terminal 7 and toggle arm. Toggle arm and headlamp shell. Headlamp shell and handlebars. Handlebars and frame. Frame and engine unit.

If engine starts with lighting switch in OFF position, but will not in HEAD position, then the circuit must be in order up to terminal 7 and from headlamp shell back to generator. Check the following connections: Terminal 7 and dipswitch. Dipswitch itself (both positions). Dipswitch and headlamp bulb (both wires). Headlamp bulb (both filaments). Bulb holder and headlamp shell.

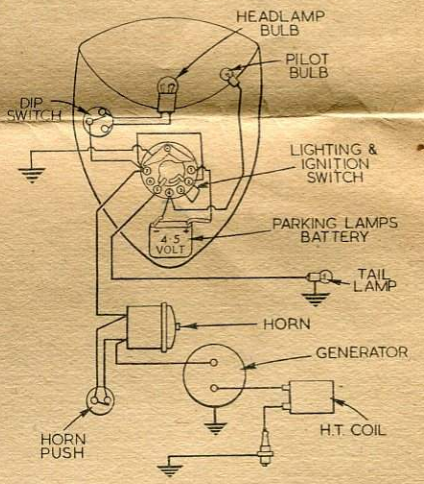
Notes: (1) Should a headlamp filament break then the tail bulb will burn out and the engine will stop. Operating the dipswitch (to bring on the other filament) or switching to OFF or PARK will enable the engine to start again.

(2) An "earth" between generator and terminal 7 will not affect the ignition but it would prevent the head and tail lamps from lighting.

(3) If the headlamp bulb lights in all switch positions, then toggle-arm earth lead may be disconnected.

If the parking battery fouls the lighting-switch then this could cause: (a) ignition failure, (b) burning out of parking bulb, (c) lights to remain on in OFF position. To rectify, remove headlamp switch and straighten out earth wire socket metal strip on toggle arm. Re-roll strip in opposite direction so that earth wire socket lies behind instead of below toggle. When refitting the battery, ensure that cardboard casing has not been chafed through. If necessary, reposition battery clip to give clearance.

FIG. 1—*Lucas wiring diagram and data.*



COMPONENT	TYPE	PART No.
Generator	6F1	047525A
Contact Set		468992
Contact Spring		468890
Condenser		421748
HT Coil		468603
C/B Cam		469034
Suppressor	WS5	78106A
Headlamp	MCH62	51955E
Rim		517187
Lens		656105
Seating Bead		656118
Reflector		517205
Bulb, Main	6v.15/15w.SBC	386
Bulb, Pilot	3.5v 0.15a MES	974
Switch, Main		31634
Switch, Knob		351788
Switch, Dip		31620
Tail Lamp	590	53555A/B
Lens		526563
Bulb	6v. 3w.	990
Harness		863745
Horn	HF 1950	70145D
Horn Push	40 SA	76232A

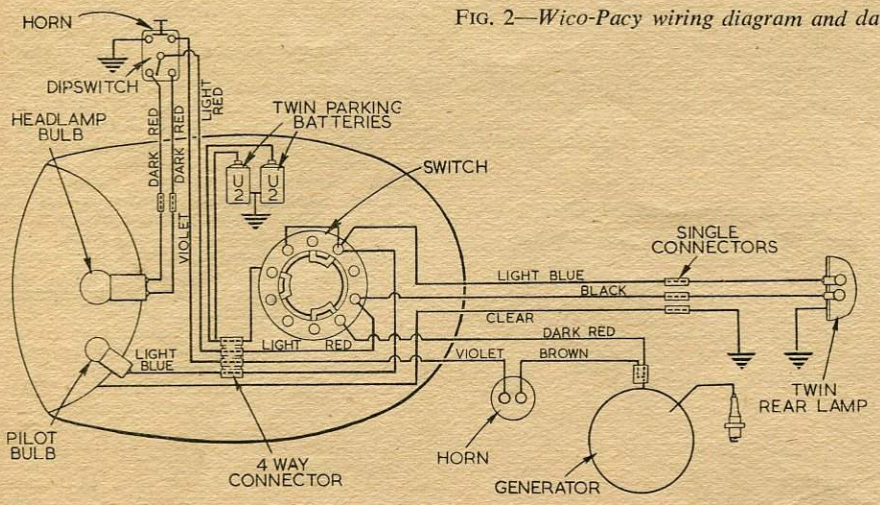


FIG. 2—*Wico-Pacy wiring diagram and data.*

COMPONENT	REMARKS	PART No.
Generator	up to Eng. DSE 1307	IG 1477
,,	Eng. DSE1308/3701	IG 1493
,,	after Eng. DSE 3701	IG 1501
Contact Set	for IG 1477	00695
,, ,,	for IG 1493/1501	S0275
CB/ Cam	for S0275	S0478
Headlamp	Complete	S0341
,,	Less Harness	S0342
,, Glass Set		S0348
,, Rim		S0349
,, Switch	Complete	06291
,, ,, Cover	With Knob	06588
Battery Clips	Set of 2	S0352
Harness	Main	S0344
Harness	Horn/Dip	S0345
Horn/dipswitch		06205
Stop/Rear Lamp	State Bulbs	S0213
Head Bulb	6v 18/18w SBC	
Pilot Bulb	2.5v., .2a MES	
Tail Bulbs		
(1) Driving	6v 3w MES	
(2) Parking	2.5v., .2a MES	

(2) Wico-Pacy equipment

The Wico-Pacy ignition generator IG1501 consists of an eight-magnet flywheel, keyed to the parallel mainshaft and a seven-pole laminated stator. On the stator are wound two LT coils and one HT ignition coil. The stator also carries the contact-breaker assembly and the condenser. The contact-breaker cam is keyed to the parallel mainshaft. Slight adjustment of the ignition timing is effected by slackening the two stator securing screws and rotating the slotted stator.

The lighting and ignition circuits are orthodox. Twin bulbs are used in the rear lamp. (See Fig. 2 for sizes). See Useful Data for generator output.

Three different types of Wico-Pacy generators have been fitted. Engines up to DSE1307 were fitted with IG1477 generators which had small fibre-heel type contact-breakers (Wico part No. 00695). Engines after DSE1307 and up to DSE3701 were fitted with IG1493 generators, and after DSE3701 the latest generator, IG1501, was used. Both IG1493 and IG1501 generators use the "large fibre-heel" type of contact breaker (Wico part No. S0275) and c/b cam S0478. Early-type contact-breakers must not be fitted to generators IG1493 and IG1501, but the latest type contact-breaker may be fitted to the early IG1477 generator, provided that the latest type cam (S0478) is also used.

Note: The special spring washer securing the contact-breaker rocker-arm is not detachable and must not be removed. Contact sets must always be replaced as an assembly.

Maintenance of Wico and Lucas sets

Both sets require very little maintenance. To gain access to the ignition system, the engine unit must first be removed from the frame, as described under Engine Overhaul. On both sets clean, check, and—if necessary—adjust, contact-breaker points every 5,000 miles. The Lucas points may be adjusted through the orifice in the flywheel, but before the Wico points can be inspected the flywheel must be removed (see under Engine Overhaul). The Lucas c/b points gap is .014 in. to .016 in. and the Wico c/b points gap is .018 in. to .020 in. To lubricate the c/b cam felt pad or to remove the c/b points assembly (Lucas and Wico-Pacy) the flywheel must be withdrawn. Every 5,000 miles the Lucas c/b cam felt pad should be impregnated with clean engine oil and the Wico Pacy c/b cam felt pad should have a small amount of motor transmission grease worked into it.

To check ignition-timing, remove the spark-plug. Check that c/b points gap (fully open) is correct. Position piston $\frac{5}{16}$ in. before TDC. The contact points should be just breaking. The c/b cam is keyed and cannot be moved, but a small adjustment of the timing can be made by slackening the two stator plate screws and moving the assembly either way. Re-tighten the screws firmly.

Spark-plug. Clean (on sand-blast machine) and test every 1,000 miles approximately. Set gap to .018 in. to .020 in. by bending side electrode.

DE-CARBONISING

This should be carried out every 1,500-2,000 miles, and the need is indicated by general loss of power, pinking, rough running of engine and muffled exhaust note.

Place a suitable piece of wood through frame under fuel-tank, raise rear of machine and support wood on trestles at either side of machine. With C spanner, unscrew silencer fixing-ring on cylinder, undo rear attachment bolt, remove silencer and place in hot caustic soda solution. Remove right-side rear spindle-nut, press spindle to left-side releasing distance piece. Remove two studs securing rear fork to swinging-arm plate. Remove spark-plug, undo four cylinder-head nuts and remove swinging-arm plate and cylinder-head. Slacken the two nuts on crankcase studs above and below cylinder spigot. Withdraw cylinder, catching piston to prevent possible damage. Carefully scrape all carbon from cylinder-head, piston-top and cylinder exhaust-port. Remove piston rings and check end-gaps in cylinder bore. End-gap limits given under Useful Data. Replace rings if worn. Genuine BSA replacement rings do not require gapping; other make of rings, if used, must be checked for end-gap and ring-peg clearance. If piston is removed, replace with side marked Exhaust next to exhaust port. Clean all joint faces, fit new cylinder-base washer, locate piston rings with ends over groove pegs, hold in place with fingers at cylinder cutaway sections, oil cylinder-bore and ease cylinder over piston. Fit cylinder-head and swinging-arm blade, tighten down four cylinder nuts evenly and, finally, tighten the two nuts at cylinder-spigot. Clean spark-plug, set gap .018 in. to .020 in. and refit. Wash out silencer and refit with new sealing-washer at cylinder. Refit wheel-spindle, distance-piece, nut and fork studs, ensuring that brake-anchor is tight and that the spindle-nut bears on adjuster screw.

ENGINE OVERHAUL

Dismantle rear-wheel spindle-nut, fork-bolts and silencer, as for Decarbonising. Remove three carburettor cover screws, pull off carburettor and tie up to saddle. Undo lighting-cable at snap-connector in toolbox and pull through frame. Remove three right-side engine plate nuts, pull off engine-plate. Remove remaining three nuts from studs securing crankcase to gearbox casing, and withdraw engine. Bend down mainshaft-nut washer, insert tool 61-3551 through clutch driving-cup holes, place tommybar through crankcase bolt-hole, rotate clutch till tool locks on tommybar, undo nut, remove tab washer. With tool 61-3540 or pullers 61-3548 (used with 61-3256), withdraw flywheel. Remove two stator holding-screws. Ease HT and LT leads from housing, withdraw assembly. With screwdriver lever off c/b cam, and remove key from shaft. Remove the swinging-arm blade, cylinder-head and cylinder, as for decarbonising. Remove one piston circlip, warm piston, support piston, and press out gudgeon pin. Remove five nuts within crankcase and two nuts at cylinder-base; withdraw outer crankcase. With hide mallet, tap crankshaft from crankcase. Heat inner crankcase, grip cylinder-bolts, tap on wood-block, releasing larger main bearing. Remove circlip, reheat crankcase, tap out smaller bearing, lever out oilseal and oilseal ring. Discard oilseal and tab washer. Clean all parts and examine for wear. If big-end worn, new crankshaft assembly must be fitted. Lightly oil all parts and re-build unit, using new oilseal and locking mainshaft nut with new tab washer. C/b points gap and ignition timing must be set before flywheel is fitted (see Electrical Equipment). Use tool 61-3536 to replace flywheel on mainshaft. Side of piston marked EXHAUST fits next to exhaust port. Assemble unit complete with swinging-arm blade on cylinder before refitting to machine. Tighten all bolts and nuts to frame, fork and wheel spindle. Replace two rubber rings on carburettor spigot, if loose fit in sleeve is suspected. Connect lighting cable in toolbox section of frame.

CLUTCH AND GEARBOX OVERHAUL

(1) REMOVAL FROM FRAME

Support machine on trestles and plank. Remove rear wheel and chain. Remove kick-start pedal and five screws securing gearbox cover. Place drip-tray under gearbox, withdraw cover, allow oil to drain out. Select second gear, operate clutch lever, move handlebar control to first gear, but do not operate clutch. Screw in gear-cable adjuster sufficiently to allow cable to be freed from anchor-plate on gearshift fork. Remove anchor-plate, unscrew cable-adjuster and withdraw cable from gearbox. Screw clutch-cable adjuster fully in, slacken locknut on pushrod adjusting screw, take screw fully out, hold first gear pinion in place on shaft, lever up clutch operating arm, unhook cable, remove cable adjuster and cable from gearbox. If unable to free cable from operating arm, unscrew two nuts holding gear-locking arm-spindle, to allow sufficient movement on assembly to unhook cable. Refit gearbox cover temporarily with two screws. Remove three bolts (one at-a-time) from engine-plates and fit through plates from opposite side of engine. Remove two bolts holding rear fork to chainguard and one bolt through chaincase into mudguard valance. Remove remaining three nuts holding gearbox to engine. Ease chainguard downwards over distance-piece on mudguard valance, withdraw gearbox from machine.

(2) CLUTCH—DISMANTLING AND REASSEMBLING

Press down spring-retaining cups by hand, one by one, withdraw pins, releasing cups, springs, pressure plate and drive plate. Bend down tab washer on centre nut, locate tool 61-3553 over six pins on back plate and two studs on gearbox, unscrew centre nut. Tap shaft with mallet to free back plate from splines. (Do not use extractor as this may distort backplate). If friction plate is glazed or burned due to incorrect cable or pushrod setting, replace friction plate. Also replace plain plates if scored. Clutch springs should always be replaced when clutch is dismantled. Reassemble clutch in reverse order of dismantling, fitting new tab-washer and using tool 61-3553 to hold back plate while centre nut is tightened.

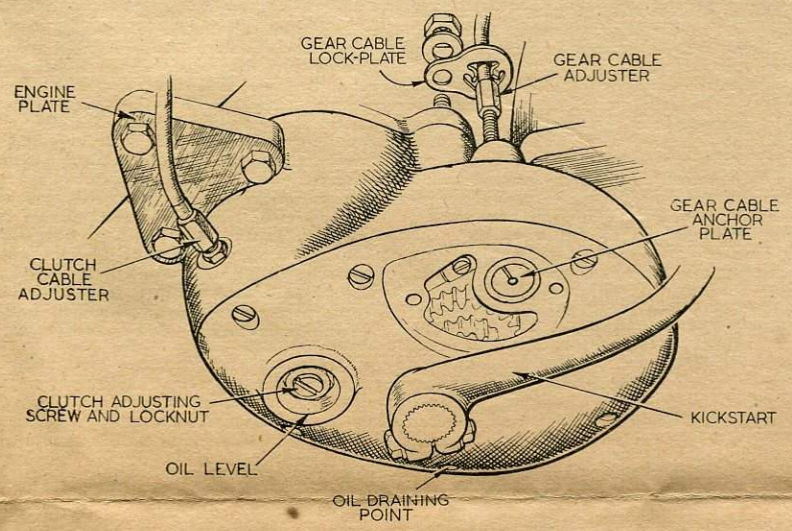


FIG. 3—*Gearbox end cover.*

(3) GEARBOX—DISMANTLING

Remove gearbox cover, note position of kick-start return-spring for re-assembly, withdraw quadrant. Pull first gear and ratchet pinion assembly from output shaft, then sliding dog and gearshift fork. Undo two nuts on locking-arm spindle-bearings, and withdraw this assembly. Dismantle clutch as described above. With small pin punch, tap slotted end of gear-cluster spindle (in clutch-housing), remove gear cluster and spindle. Bend down tab washer on sprocket securing-nut, lock sprocket using tool 61-3554, unscrew nut, withdraw sprocket, tap shaft into gearbox, releasing top-gear pinion. Clean and examine all pinions for wear, with particular attention to ratchet pinion and quadrant which can be damaged by incorrect usage. If bearings or bushes require renewal: (1) Output shaft bearing; tap inwards together with oilseal from its housing. (2) Input shaft-bearing; remove circlip in clutch-housing, press shaft, bearing, oilseal, oilseal ring from housing toward clutch side. (3) Input shaft needle bearing; press from housing either way. (4) Output shaft-bush; heat cover, tap on wooden block to release bush. (5) Quadrant bush; prise out oilseal and collar, heat cover and tap towards inside of cover.

(4) GEARBOX—REASSEMBLING

Fit new oilseals and tab washers throughout. Grease needle-bearing, place in housing, fit input shaft into needle-bearing, heat gearbox slightly, press ball-bearing over shaft and press into position. Fit oilseal ring, oilseal and circlip. Fit clutch assembly as described above. Press output shaft ballrace into steel-housing, pass the output-shaft through the second gear pinion and into the bearing (pinion sliding dog engagement holes facing outwards). Fit oilseal, sprocket, tab-washer and nut (using tool 61-3554 to hold sprocket). Coat the slotted end of the gear-cluster spindle with jointing compound, hold gear-cluster in position, and press home spindle—aligning slot with locating pin in housing. Place chain over sprocket, fit gearbox and wheel to machine, ensuring that nuts securing engine to gearbox are tightened evenly; that engine plate bolts are replaced correctly; and that closed end of chain connecting link is facing direction of travel. Fit sliding-dog and gear-shift assembly into gearbox, engaging sliding dog on output shaft splines and ensuring that cranked portion of gear shifter fork faces outwards and that shifter tube enters its housing. **Note:** If gear shifter springs are not marked with yellow paint, replace them with springs so marked (of longer type) and fit a modified inner-spring cover (with washer brazed to inner end to centralise the tube).

It may be necessary to ream out the housing to a depth of $3\frac{1}{16}$ in. using a $1\frac{13}{16}$ in. reamer, to allow modified spring cover to fit. Pass gear-cable into housing and screw cable-adjuster fully in. Engage first gear position on handlebar control, push gear shift-fork inwards until the sliding-dog engages second gear, then fit anchor-plate behind gear-cable nipple. Place clutch-cable into gearbox, and screw adjuster fully in. Grease long pushrod and ball and insert them into the hollow input shaft, followed by the short pushrod. Renew rubber oilseal on the short pushrod if damaged. Place gear-shifter fork, locking arm spindle bearings over mounting studs (with bent end of return spring in clutch-adjuster block-hole and other end under housing edge) and engage clutch-cable in lever slot. Slacken off clutch-adjuster screw and gearshift fork locking-arm pinch-screw. Lift locking-arm clear of gearshift fork. Tighten bearing-block stud-nuts. With clutch-cable adjuster fully in, screw in the operating arm adjusting screw until the clutch begins to disengage, then unscrew adjuster half a turn, tighten lock-nut and finally adjust on cable-adjuster to give $\frac{1}{8}$ in. free movement on cable at handlebar-control. Fit first gear and ratchet to output shaft. Fit quadrant and spring to gearbox cover. Using new gasket with jointing compound, fit cover to gearbox. Set handlebar gear-control to neutral, and operate gear-cable adjuster until end of gear-shifter outer-tube is $\frac{3}{16}$ in. from face of gearbox at machined inspection-cover surface. Tighten pinch-screw for locking-arm, making sure that there is little clearance between the locking-arm and the gear-shifter. Top up gearbox with one-third of a pint of SAE 40 oil. Fit starter pedal and tighten the pinch bolt.

CARBURETTOR—AMAL TYPE 365/1

The carburettor will require very little maintenance, other than periodic cleaning (e.g. when engine is being decarbonised).

The throttle needle-clip normally fits in third notch, but this may be altered to give mixture variation (up to $\frac{3}{4}$ throttle). To vary mixture strength at $\frac{3}{4}$ to full throttle, a larger or smaller main jet than the standard size (35) may be fitted. Before adjusting mixture strength, however, it is essential to ensure that:

(1) Ignition system is correct; (2) no air leak exists in induction system; (3) fuel is reaching carburettor; and (4) that engine compression, etc., is good.

The next servicing data sheet in this series will deal with the

VILLIERS 250 c.c. TWIN ENGINE

and will be included in the issue dated

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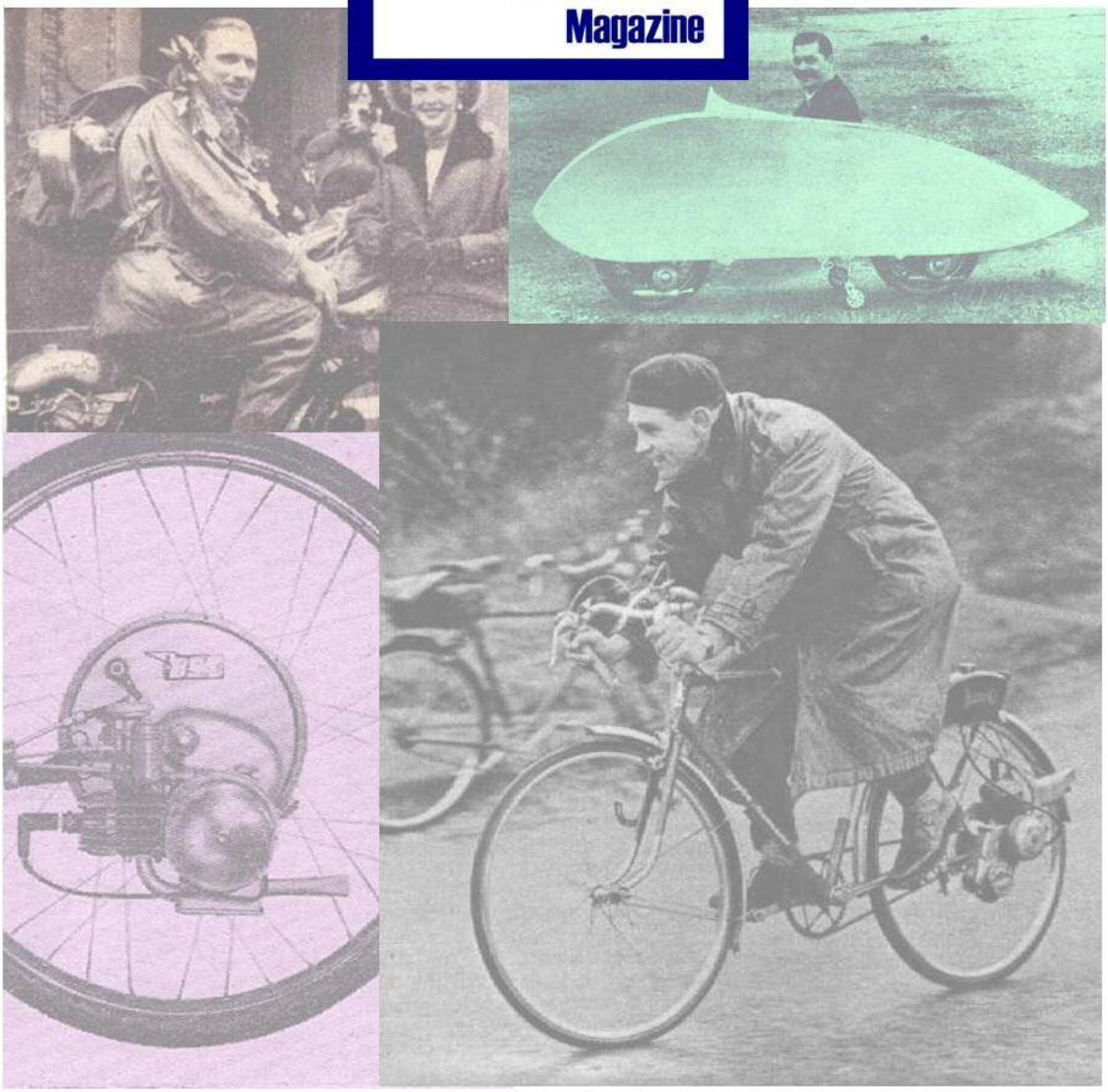

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