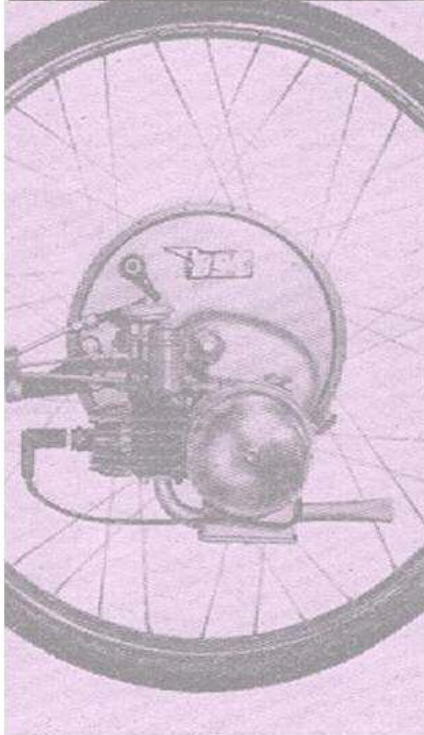


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**Motor Cycle & Cycle**  
**TRADER**

**TRADER AID SERIES**

**Servicing Data Sheet No. 21**

**PHILLIPS GADABOUT 49 cc MOPED**

Manufacturer: Phillips Cycles Ltd.,  
Credenda Works, Smethwick, Birmingham,  
40.

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The Phillips Gadabout is an attractive, economical and reliable moped. The frame is of strong tubular construction; it is fitted with telescopic front forks; and the power unit, of Continental manufacture, delivers its high-power output very smoothly. Front and rear wheels are fitted with internal-expanding hub-brakes—the front cable-operated and the rear rod-operated by a back-peddalling mechanism.

**USEFUL DATA**  
**Engine gear-unit**

The engine is an air-cooled, single-cylinder two-stroke, with a two-speed gearbox, incorporating pedal-drive, freewheel and back-peddalling trip-action for rear-brake operation, built in unit. Bore—40 mm.; stroke—39.5 mm.; cubic capacity—49 c.c.; compression ratio—6.8 to 1; BHP—2.1 at 6,000 r.p.m. The cylinder is chill-cast aluminium-alloy with a cast-iron liner and a detachable aluminium-alloy head. The light-alloy piston carries two pegged piston-rings with standard dimensions of 40 mm. outside diameter; 36.8 mm. inside diameter and 2.5 mm. width. The normal ring end gap is .007 in., but this may be increased to .020 in. without loss of performance.

Cylinder rebore sizes	1st rebore		2nd rebore
	Standard	mm.	
Diameter of cylinder bore	40.00	40.25	40.50
Diameter of piston	39.97	40.22	40.47

The connecting-rod small-end is fitted with a phosphor-bronze bush and the big-end runs on roller-bearings. Note: The crankshaft is supplied as an assembly only. The crankshaft runs on ball-journal bearings (see Bearings

Table) and oil and compression seals are fitted to maintain crankcase compression (clutch-side seal 35 mm. by 17 mm. by 7 mm., and magneto side 24 mm. by 15 mm. by 7 mm.). Petroil lubrication is used (see Lubrication).

**Carburettor.** Of Pallas manufacture, it is very simple in design. No throttle-needle is fitted; instead, a spray-tube projects upwards inside the throttle-slide, and slide movement covers or uncovers holes in the tube. The standard main jet size is No. 52. An oil-wetted air-cleaner is incorporated.

**Flywheel magneto.** Up to June, 1957, a Bosch instrument was fitted. After this date, a Miller flywheel-magneto is fitted. The lighting output of both types is 6 volts 17 watts. Headlamp bulb—6V 15/15W. Tail lamp bulb—6V 2W. Contact-breaker points gap—.015 in. to .020 in., fully open.

**Ignition timing.**  $\frac{1}{8}$  in. (3.2 mm.) BTDC.

**Spark plug.** 14 mm. Bosch W175/T1; Lodge CN; Champion L10 or XL10; KLG. F50. Points gap—.020 in.

**Gearbox and clutch.** Two-speed gearbox. Internal reductions, bottom gear 2.73 to 1 and top gear 1.8 to 1. Overall gear ratios, bottom gear 22.6 to 1 and top gear 14.9 to 1. The primary drive is by single helical gears giving a reduction of 3.82 to 1. The clutch, mounted on the engine mainshaft, has two friction plates and runs in oil. The pedal mechanism is contained inside the engine-gear unit casing and a roller/wedge type of freewheel is fitted to the axle-shaft which is sealed at each end by oil-seals 22 mm. outside diameter by 16 mm. inside diameter by 4 mm. wide. The pedal drive is transmitted through the same gears and final drive chain that transmit the engine power,

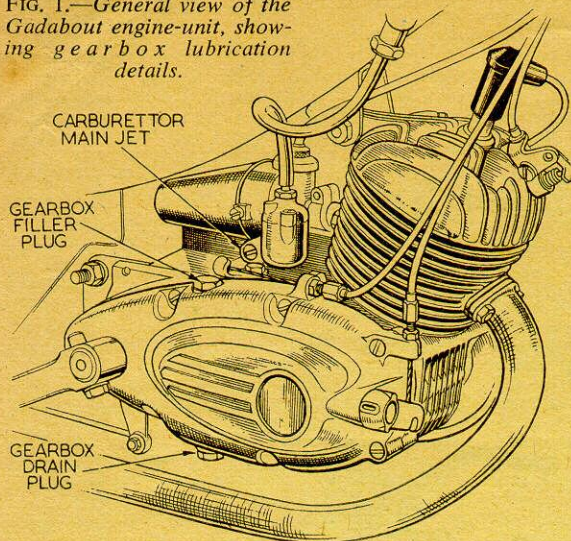
**ENGINE-UNIT BALL-BEARING TABLE (Sizes in mm.)**

Location	Part No.	Outer	Inner	Width	Type
Crankshaft (clutch side)	2022	32	12	10	6201
Crankshaft (magneto side)	2041	35	15	11	6202
Gear countershaft (clutch side)	2023	35	15	11	6202
Gear countershaft (magneto side)	2042	32	12	10	6201
Indexing gear shaft (clutch side)	2024	28	12	8	6001
Indexing gear shaft (magneto side)	2043	28	12	8	6001

# PHILLIPS GADABOUT 49 cc MOPED

Supplement to Motor Cycle & Cycle Trader.  
14 September, 1957

FIG. 1.—General view of the Gadabout engine-unit, showing gearbox lubrication details.



the power output shaft being sealed on the drive side by an oil-seal 22 mm. outside diameter by 12 mm. inside diameter by 7 mm. wide.

**Drive chain.** Heavy duty roller type. 100 pitches of  $\frac{1}{2}$  in. pitch by  $\frac{3}{8}$  in. wide.

## WHEELS

### Wheel data table

**Tyre size.** Front and rear—23 in. by 2 in. Number and sizes of spokes. Front and rear—36 off,  $8\frac{1}{8}$  in. by 13 swg. (per wheel).

**Brake lining sizes.** Front and rear— $3\frac{1}{2}$  in. by  $\frac{1}{8}$  in. by  $\frac{1}{4}$  in. (two per wheel).

Schrader-type valves are fitted to inner tubes. Tyre pressures (in lbs. per sq. in.):

Rider's weight (stones)

	Over 10	11	12	13	14
Front	25	27	29	31	33
Rear	36	40	44	48	52

**Dimensions, etc.** Wheelbase 44 in., length 70 in., height 37 in. Weight (dry) 96 lb. Fuel-tank capacity  $9\frac{1}{2}$  pints (including reserve).

**Engine number.** Stamped on plate on engine immediately above RH pedal crank spindle.

**Frame number.** Stamped on offside of steering head.

## LUBRICATION

**Engine.** Pre-mixed petrol mixture of one of the following ratios must be used:

(1) One part of self-mixing two-stroke oil to 16 parts of top-grade petrol ( $\frac{1}{2}$  pint of oil to one gallon petrol).

(2) One part of SAE 20 oil to 20 parts of top-grade petrol.

(3) One part of SAE 30/40 oil to 24 parts of top-grade petrol.

For running-in, increase the proportions of oil by 20 per cent for the first 600 miles.

**Gearbox and clutch.** Capacity,  $\frac{1}{2}$  pint of SAE 30 gear oil. The level is shown by dipstick attached to hexagon-headed filler-plug (see Fig. 1). The gearbox drain plug (14 mm.) is situated on the underside of the clutch cover (see Fig. 1). Note: the drain-plug must not be confused with the 11 mm. hexagon head bolt for the gear-selector fork, which is located near the middle of the underside of the engine gearbox casing. The gearbox oil should be changed after the first 600 miles, and thereafter at every 1,000 miles.

**Drive chain.** Keep lubricated with engine oil. Every 3,000 miles, remove, wash in

paraffin, immerse in warm chain grease, remove surplus grease then refit to machine. Note: Refit chain-link with closed end facing direction of travel.

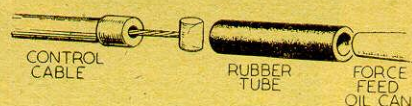
**Air-filter.** According to conditions, remove every 1,000 to 3,000 miles, wash in petrol, immerse in engine-oil, drain and then refit.

**Cables and controls.** Lubricate monthly, with light oil, using (if necessary) a force-feed oil can with a rubber sleeve to force oil along cables (see Fig. 2).

**Wheel hubs.** Front and rear hubs are packed with grease on assembly. Every 3,000 to 5,000 miles, dismantle the hubs, clean out and repack with grease.

**Front forks.** Lubricate as necessary, via the grease nipples fitted.

FIG. 2.—Method of lubricating cables and controls.



## ELECTRICAL SYSTEM

High tension current for ignition and low tension current for lighting and electric horn are provided by a flywheel magneto. It consists of a stationary armature plate (or stator) carrying the magneto and dynamo armatures, and a rotating flywheel (or rotor) with cast-in steel permanent magnets. The armature-plate carries the ignition-coil, condenser, contact-breaker and the lighting coil. The centre-boss of the flywheel acts as the contact breaker cam, and it is tapered internally to mate with the tapered engine-mainshaft. A location peg in the mainshaft engages with a keyway in the flywheel to give approximate ignition timing. The exact timing is obtained by slightly rotating the armature-plate (after slackening the two securing screws) clockwise to advance, and anti-clockwise to retard. The flywheel face is slotted to provide access to contact-breaker adjustment and to the armature-plate securing screws. Note: Up to June, 1957, the flywheel magneto was of Bosch manufacture. After this number a Miller instrument is fitted.

## MAINTENANCE OF IGNITION SYSTEM

**Resetting contact points gap.** After the first 500 miles running, and thereafter as necessary, check the contact-breaker points gap and reset, if required, as follows:

Remove LH crank. Remove front portion of chainguard. Remove magneto cover (secured by three screws, including long screw also securing front chainguard). Turn the flywheel until the fibre-heel of the contact-breaker rocker arm is on highest point of cam, and the points are fully open and the points adjustment accessible. Then, for: (a) **Bosch** magneto, slightly slacken the fixed contact point clamping screw. The points gap will tend to close, so use a screw-driver to ease back the fixed point. Insert a .020 in. feeler-gauge between the points. With the feeler nipped, re-

tighten the fixed point clamping screw and remove the feeler gauge. (b) **Miller** magneto, slacken the fixed point securing screw. Turn the eccentric adjuster until the gap is .018 in. Re-tighten the securing screw and re-check gap.

The contact points should be kept clean and free from oil and grease. Use fine emery cloth to clean, finally wiping with a petrol-dampened clean cloth. The rocker arm must be free to pivot and the points must seat squarely over their whole surface. The c/b. cam felt-pad should be kept moistened with oil.

**Re-timing ignition.** After resetting contact points as above, remove the spark-plug. Slacken—but do not remove—the two screws which secure the armature-plate. Turn the flywheel, in the normal direction of rotation, until the piston is  $\frac{1}{8}$  in. (3.2 mm.) before TDC, checked through the spark-plug hole. Gaining access through the flywheel slots, rotate the armature-plate (clockwise to advance and anti-clockwise to retard), until the contact points are just breaking. Re-tighten the two securing screws and refit the spark-plug.

**Dismantling the flywheel magneto** (see Dismantling engine, etc.).

**Spark-plug.** Clean on sand-blast cleaner, and check points gap after the first 500 miles and thereafter every 1,000 miles. Should the plug persistently "oil-up", fit the next "softer" grade of plug. Should it over-heat sufficiently to cause pre-ignition, fit the next "harder" grade of plug.

**Maintenance of lighting system.** To check LT output, disconnect the lighting output cable from its terminal on the LH crankcase. Connect an AC moving coil voltmeter (with a 1 ohm. load resistor) between the terminal and earth. Run the engine at half-throttle, and a reading of at least three volts should be obtained.

The standard bulb sizes of 6V 15/15W head and 6V 2W. tail should be adhered to, but if longer bulb life (at the cost of reduced lighting) is required the tail bulb may be increased to 6V 3W., or to 6V 6W.

The wiring must be firmly fixed to the frame and all connections must be secure. The headlamp, tail-lamp, handlebar switch, horn push, etc., must make good electrical contact to earth, through the frame of the machine.

## CARBURETTOR

**Dismantling.** (Note: The main jet, situated in the right-hand side of the carburettor, close to the float chamber, may be removed for cleaning without removing or dismantling the carburettor—see Fig. 1). Turn off petrol (tap at Z position) and pull off the petrol pipe from the carburettor-union. Slacken clamping screw securing carburettor to induction pipe stub, and pull carburettor off with a twisting movement. The insulating sleeve usually stays on stub. After removing the counter-sunk screw from the top cap of the carburettor, lift off the cap and withdraw the slide complete with spring. Remove the wire-gauze air-filter after slackening the attachment screw on the side of the air-intake. Removal of the air-strangler shutter is effected by removing the shouldered pivot-screw and spring washer inside the air intake.

Unscrew the fuel-pipe union from the top of the float-chamber, noting that a fibre-washer is fitted. The gauze fuel-filter should be carefully removed from the union. Remove the two countersunk screws from the float-chamber top, lift off the cover complete with gasket and needle valve seating, and then lift out float.

Both the main jet, screwed into the right-hand side of the carburettor, and the centre spray-tube, screwed into the bottom of the carburettor, carry rubber sealing-rings which must be renewed if damaged. The main jet and the centre spray-tube should be cleaned

out by air pressure. Note: A small cheese-head screw may be removed from the end of the spray-tube for cleaning purposes. The slide stop-screw, complete with retainer-spring, may be unscrewed from alongside the spray-tube boss.

All parts should be rinsed in clean petrol and ducts, float chamber, etc., blown out with compressed air. The slide, float-needle and seating should be checked for wear and the float examined for leaks allowing the entry of petrol. The fuel-filters (in petrol-tap and in fuel-pipe union) should be cleaned.

Re-assembling is done in reverse order of dismantling, paying particular attention to the condition of gaskets, seals, etc. When fitting float-chamber cover, ensure that tapered end of float-needle fits into needle seating in cover.

**ADJUSTING AND TUNING CARBURETTOR**

The engine tick-over is set by varying the position of the slide stop-screw. Note: A small amount of slack must be kept in the control-cable (cable-adjuster situated at handlebar end of cable). Mixture strength is varied by fitting a larger or a smaller main jet (size 50, 52 or 55).

**Carburation faults. Rich mixture**, indicated by four-stroking, black exhaust smoke, poor mileage per gallon, and difficult starting when hot. It can be caused by: (1) blocked air-filter; (2) punctured float; (3) main jet loose or too large; or (4) damaged float-needle or seating.

**Weak mixture**, indicated by poor tick-over, overheating, lack of power, and spitting back through carburettor. It can be caused by:

bolt mounting cylinder-head to frame. Undo four cylinder-head nuts (10 mm.) and lift off head and gasket. Hold down the cylinder-barrel and turn the engine until the piston top is just below the exhaust port. Carefully scrape the carbon deposit from the port, ensuring that all loose particles are removed. Hold down the cylinder barrel and bring the piston up to the top of its stroke also carefully scrape the carbon from the piston-top.

Carefully scrape the carbon from the cylinder-head. The decompressor valve should be dismantled (compress spring and washer, then remove split-pin from valve) and the valve, port and seating cleaned. If the valve head is burned or pitted, replace with new part.

The silencer should be dismantled (remove the nut from the screwed centre rod). Clean all the internal parts and re-assemble the silencer, using new asbestos packing.

Thoroughly clean the spark-plug (preferably on a sand-blast cleaner) and set the points gap to .020 in.

Refit the cylinder-head to the cylinder using a new head-gasket. Tighten down the four nuts diagonally, and re-assemble the remainder of the parts in the reverse order of dismantling, paying particular attention to allowing a perceptible amount of slackness in the decompressor operating cable. Check all nuts and bolts for tightness after running the engine.

**DISMANTLING OF ENGINE GEARBOX UNIT**

**Removing engine from frame.** Turn off petrol tap. Remove petrol-pipe from carburettor. Remove front chainguard, uncouple chain and remove from machine. Disconnect

Remove clutch thrust-pin and thrust bearing, carefully noting position of any shim washers fitted between these parts. They must be replaced the same way on re-assembly. If engine unit is to be completely dismantled, remove the primary-drive gear-wheel nut at this stage. Remove clutch nut (RH thread) and spring washer. A clutch anchor-plate should be used to prevent movement of the clutch, etc. The complete clutch, the clutch-centre drive-pinion

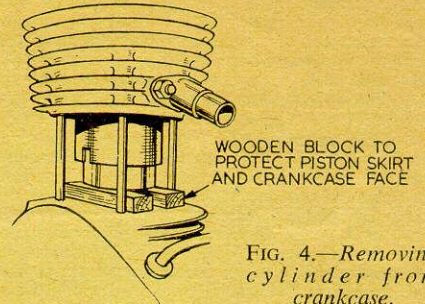


FIG. 4.—Removing cylinder from crankcase.

and the free bush (fitted between crankshaft and centre drive-pinion) may be withdrawn from the crankshaft.

To dismantle the clutch, use a round ring (2- to 2½ in. in diameter) to seat upon the first clutch-plate, clearing the clutch circlip. Lightly clamp clutch and ring together in vice, sufficiently only to take pressure off the circlip, and then remove the circlip. On removal from vice, the clutch plates, drive-plate and spring can be removed from clutch body.

**Dismantling flywheel magneto.** Remove LH crank. Undo three screws and lift off magneto cover. Hold the flywheel from rotating and undo the flywheel locknut (RH thread) with a 14 mm. box spanner, and remove the spring washer. Withdraw the flywheel from the crankshaft, using the special extractor (flywheel threaded 22 mm. by 1.5 mm.). Lay the flywheel on a clean sheet of paper, well away from any ferrous-metal filings or particles. To save re-setting ignition timing on re-assembly, scribe the armature-plate and the housing before removing the securing screws. Disconnect the terminals of the lighting cable socket and re-assemble socket parts to prevent loss. Remove plug-cap from ignition-cable. Moisten the cable with soapy water and draw the lead in through the magneto-housing aperture. Lift out the armature-plate. This must be done to avoid damage to coils, etc.

**Removing cylinder and piston.** Unscrew the clip-screw attaching the decompressor unit to the cylinder-head and remove decompressor. If not already done, unscrew spark-plug. Remove carburettor from induction pipe. Using a 10 mm. tubular spanner remove the four cylinder-head nuts and washers and lift the head from barrel. Lift off gasket. If the head is difficult to remove, do not use unnecessary force. Ease the cylinder-barrel upwards on the holding-down studs for some two inches, carrying the piston upwards also. Slip a piece of wood (approximately 1½ in. wide, ¾ in. thick, and slotted to take the con-rod), under the piston and barrel with the con-rod in the slot (see Fig 4). This will protect the piston-skirt and the crankcase upper-face and will also prevent ingress of foreign matter into crankcase. Lift off cylinder-barrel. Mark the inside of the front of the piston to ensure that it is fitted in same position on re-assembly. With a pair of circlip pliers, remove one gudgeon-pin circlip. Trickle near-boiling water onto the piston, avoiding the gudgeon-pin and not allowing any to get into the crankcase. Push

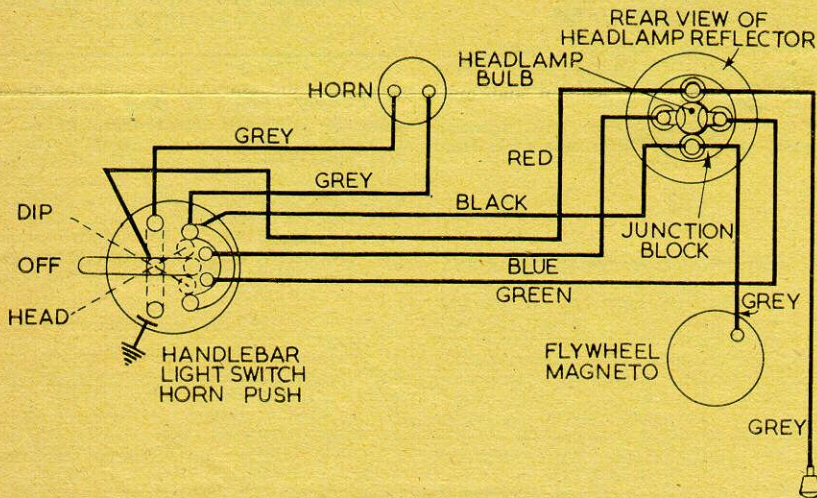


Fig. 3.—Lighting circuit.

- (1) dirty fuel-filters; (2) obstructed fuel-pipe; (3) main-jet too small or partially blocked; (4) blocked vent in petrol-tank cap; or (5) air-leak at carburettor joint. Note: An ignition fault or a faulty crankcase oilseal (allowing an air-leak) can give symptoms similar to a carburation fault.

**DECARBONISING**

This should only be necessary every 2,000 to 3,000 miles, and the need for it is shown by sluggish engine performance, overheating, difficult starting and a muffled exhaust note.

Remove decompressor actuating unit from cylinder head. Disconnect HT lead and remove spark-plug. Disconnect exhaust pipe from cylinder and remove complete exhaust-pipe and silencer assembly from machine. Remove

rear-brake operating-rod from the back-peddalling actuator arm, and remove the rod from the machine. Disconnect control cables from (1) decompressor unit (at cylinder head); (2) gear selector arm (on top of gearbox); and (3) clutch operating arm (at clutch cover). Remove countersunk screw from carburettor top and withdraw cable, top-cap and slide. Disconnect lighting-output cable from terminal on top of LH crankcase. Disconnect exhaust-pipe from cylinder. Unscrew the three engine mounting-bolts and nuts (14 mm. hex.), leaving the upper mounting-bolt until last (connected to the lifting handle).

**Removing and dismantling clutch.** Remove RH crank. Drain oil from gearbox (see Lubrication). Unscrew the seven countersunk screws and remove clutch-cover and gasket.

out the gudgeon-pin sufficiently to clear con-rod small-end. Note: Do not use excessive pressure—otherwise con-rod may be bent. Lift off piston.

**Removing chain drive sprocket, primary drive gear wheel and rear brake actuating unit.** The primary drive gear wheel nut has already been removed (see Removing clutch). Using gear wheel and sprocket remover (puller SP1) withdraw the gear wheel from the counter shaft. The rear brake actuating unit is a keyed sliding fit on the pedal-drive axle and may be pulled straight off. Lift the Woodruff key from the axle and retain. Lock the chain drive sprocket (a piece of chain around the sprocket attached to a metal hook around the LH pedal axle is suitable). Unscrew and remove the sprocket nut and washer. Withdraw sprocket from output shaft using puller SP1.

**Splitting of crankcase and gearbox.** Slacken by three or four threads the 12 countersunk-head screws clamping the crankcase (six within the magneto housing recess and six around the chain drive/pedal drive area). These screws will be very tight and an exact fitting screwdriver blade fitted into a brace must be used. A few sharp light blows on the die-cast crankcase (avoiding the edges) or on the end of the pedal axle (using a wooden or raw-hide mallet) should separate the crankcase halves. Do not use excessive force. Remove the screws and lay the engine with its right side downwards. Lift off the left half of the crankcase, pushing the pedal axle down so that it stays in the right-hand half of the casing. Clean off the gasket from the joint faces.

**Dismantling the gears and crankshaft.** Withdraw the double-g geared countershaft, carefully noting the position of the shim washers for re-assembly. Lift out the pedal axle complete with free-wheeling unit. To prevent the five small rollers falling out of the roller/wedge freewheel, ease the drag-spring upwards from its anchorage recess with a screwdriver and hold it up firmly against the large geared freewheel body on the pedal axle. Note the position of the shim washers for re-assembly. Remove the top-gear pinion, withdraw the

splined output shaft, remove the selector-sleeve and the two small selector-guides. Lift out the bottom gearwheel and pinion, and note the position of the shim washers for re-assembly. The gear selector unit may now be dismantled. Slacken off (but do not completely remove) the upper fulcrum-bolt. Screw out the lower fulcrum-bolt and support the gear return spring to prevent it flying out. Unscrew the upper fulcrum-bolt from the selector fork and withdraw it from the top of the gearbox together with shakeproof washer and the outer gear selector arm. Lift out the spring, selector fork, and gear stop-plate, together with the fulcrum bush.

Note: Retain the small rubber sealing ring which is fitted between upper surface of stop-plate and the fulcrum bush. It prevents oil creeping up the fulcrum bush bore, around the upper fulcrum bolt. Do not omit on re-assembly. A rubber/metal oil seal is pressed into the top of the gearbox casing to prevent oil creeping up the outside of the fulcrum bush. Do not remove unless damaged.

Remove crankshaft (if tight in main bearing tap gently with wooden or rawhide mallet). Do not attempt to separate the two halves of the crankshaft as the assembly of these is a specialised factory operation.

**Re-assembling engine gear unit.** Re-assembly is the reverse of dismantling, paying particular attention to: The removal of all old gaskets from joint faces, the replacement of oil seals and rings, the replacement of packing shims, the use of correctly fitting tools (especially for the crankcase countersunk screws), and the fitting of the piston and gudgeon-pin in their original position (mark inside piston-skirt to front).

#### WORKSHOP TOOLS

**Flywheel extractor.** Tubular spanner for cylinder-head nuts (V7372), obtainable from J. A. Phillips and Co. Ltd., Bridge Street, Smethwick, Birmingham, 40.

**Puller** for removing engine drive sprocket and primary gear wheel (SP1) obtainable from

M.C.A. (Aston) Ltd., 10 Aston Road North, Birmingham, 6.

**Circclip pliers** (S.I.S.) for gudgeon-pin, **circclip pliers** (S.E.B.) for clutch shaft, obtainable from Buck and Hickman Ltd., 29-32 Whittall Street, Birmingham, 4.

Double offset ring spanner, 10 mm. by 11 mm. (DDM210).

Combination spanner, 14 mm. (CTM214).

Combination spanner, 17 mm. (CTM217).

Double open-ended spanner, 8 mm. by 9 mm. (ODM208).

Double open-ended spanner, 10 mm. by 11 mm. (ODM210).

Socket 14 mm. 1/4 in. sq. drive (HSM214).

Socket 14 mm. plug, 1/4 in. sq. drive (HSS214).

Double open-ended spanner, .340 in. by .445 in. (ODM202).

Double open-ended spanner, .525 in. by .600 in. (ODW204).

Double open-ended spanner, .710 in. by .920 in. (ODW2067).

Double open-ended spanner, 1.300 in. by 1.480 in. (OCW212).

Cranked driver, for 1/4 in. sq. drive sockets (SLS208).

Adjustable spanner (AKD204).

Pliers (KDP206).

(Obtainable from Abingdon King Dick Ltd., Kings Road, Birmingham, 11).

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

#### BSA DANDY LIGHTWEIGHT SCOOTER

and will be included in the issue dated  
9 NOVEMBER, 1957

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