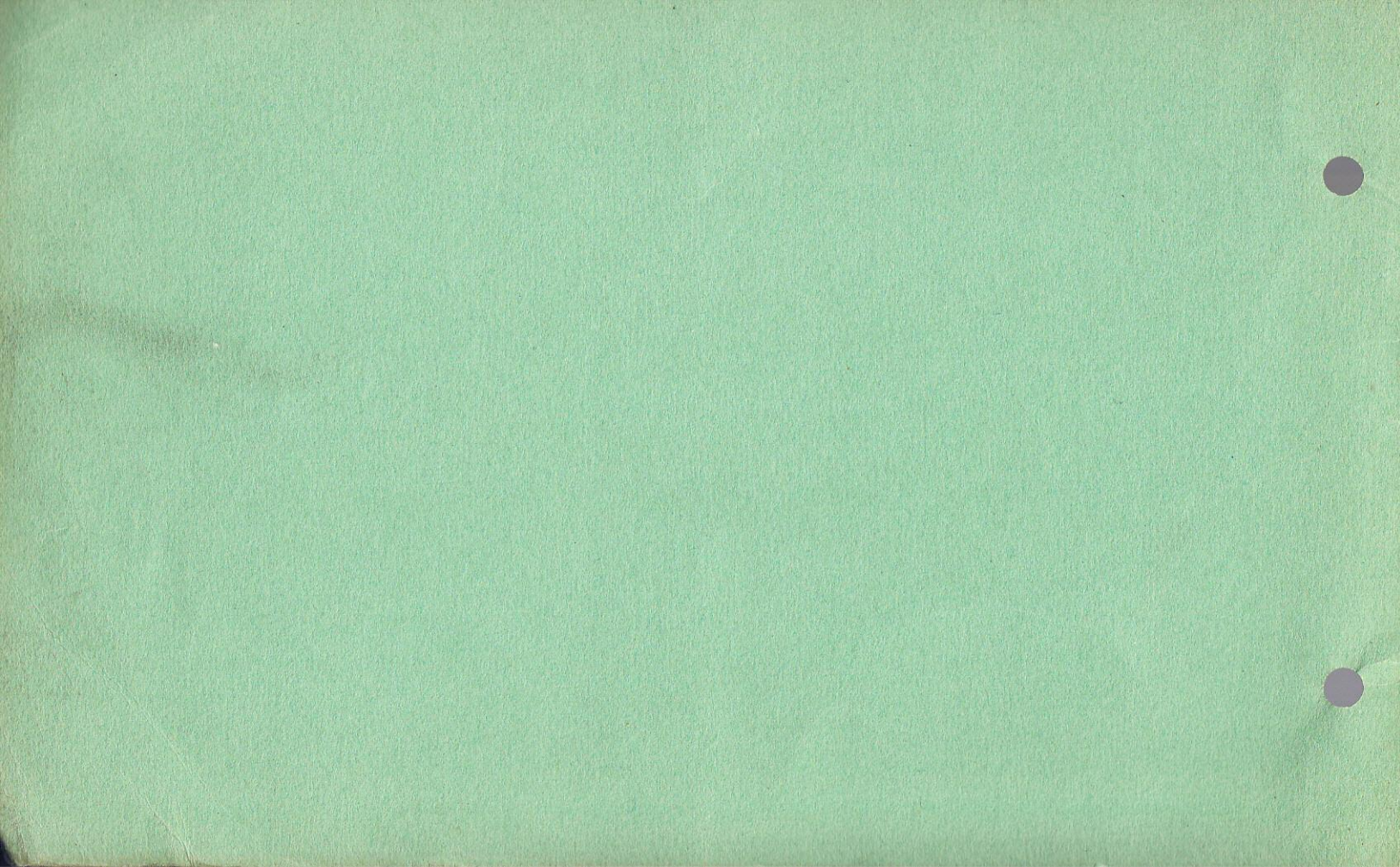


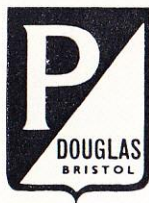
**Vespa 90**

**Model V9A1**

**SERVICE STATION MANUAL**







**Vespa 90**

**Model V9A1**

## **SERVICE STATION MANUAL**

**DOUGLAS (SALES & SERVICE) LTD., KINGSWOOD, BRISTOL**

Telephone **67-1881**

DIVISION OF THE WESTINGHOUSE BRAKE AND SIGNAL COMPANY LIMITED



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*In accordance with the Douglas policy of progressive improvement, the right is reserved to alter any details of price, specification, accessories, and equipment, without notice, and without incurring any obligation.*



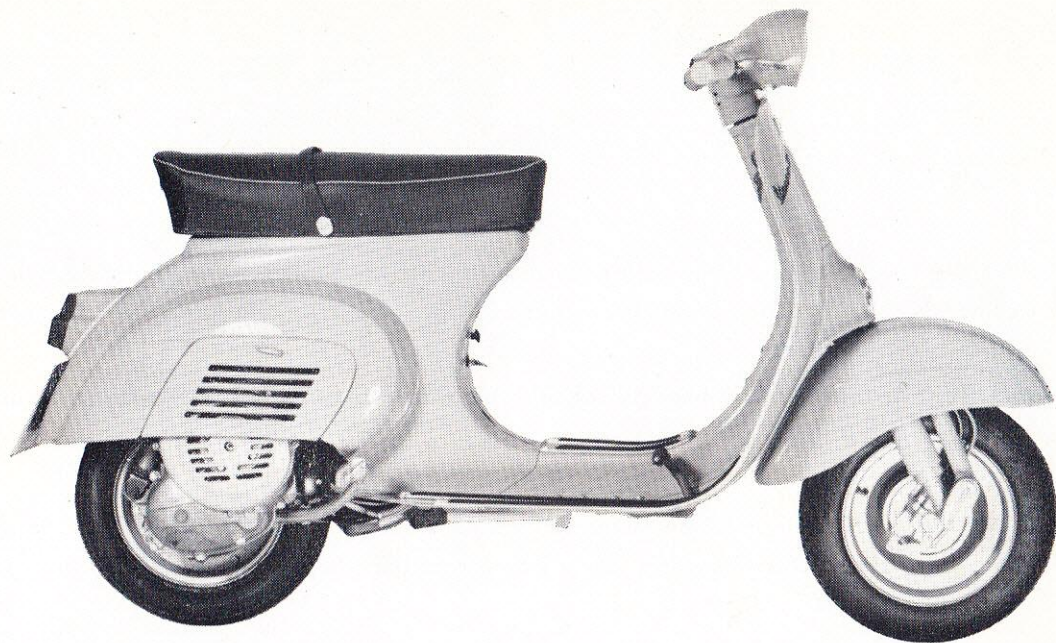


Fig. 1 - Vespa 90

This Manual has been issued to enable Service Stations to give first-class service to the Vespa owner.

They should, therefore, follow the detailed instructions carefully, particularly the sections concerning fault finding and remedies, this should help them to carry out servicing and overhauling operations more efficiently.

**It is essential that dismantling, re-assembling and inspections are carried out with suitable tools listed in a section of the manual.**

We remind the Dealers that, in order to obtain the best performance of the **Vespa**, faulty parts must be replaced with genuine **Vespa Douglas** spares. The use of spares from other sources invalidates the guarantee.



## TECHNICAL DATA—DESCRIPTION

Fuel consumption (CUNA Standards)	156 m.p.g. approx.	Wheel base	... ..	45.2"
Max. speed (CUNA Standards)	... 43.5 m.p.h.	Handlebar width	... ..	23.9"
Carrying capacity	... .. 2 persons	Total length	... ..	64.9"
Operating range	... .. 174 miles	Maximum height	... ..	39.17"
Max. fuel tank capacity	1.15 galls.	Ground clearance	... ..	8.85"
Reserve fuel (included)	... .. 0.15 galls.	Min. turning radius	... ..	64.9"
<p>Note: The fuel consumption and maximum speed figures must not be accepted as binding. Many factors outside our control can considerably affect them once the machine is in the hands of the owner and in service.</p>		Weight (dry)	... ..	157 lbs.
		<b>Engine</b>		
		Displacement	... ..	88.5 c.c.
		Bore	... ..	47 mm.
		Stroke	... ..	51 mm.
		Compression ratio	... ..	7.2-1
		(Two-stroke rotary distribution)		

## IDENTIFICATION DETAIL

Each machine bears Serial Numbers with the prefix V9A1 stamped on both engine and frame in the following positions. *Engine Number*: This will be found on the crankcase immediately below the rear suspension unit. *Frame Number*: This will be found beneath the inspection plate which must be removed to gain access to the engine. Such numbers and prefix identify the Vespa as prescribed by law and are repeated on the test card and other documents of the scooter.

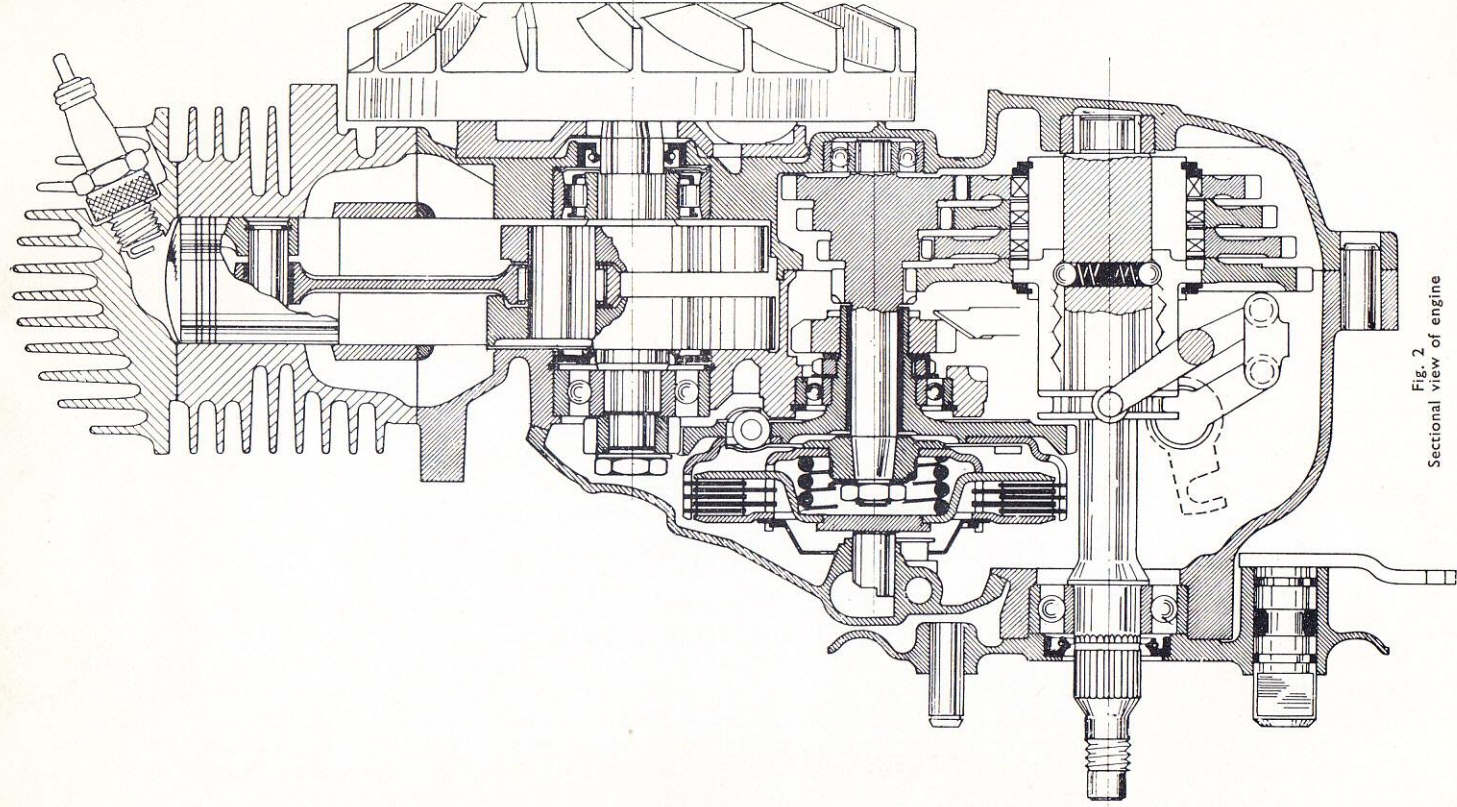


Fig. 2  
Sectional view of engine



**LIST OF TOOLS, COMMON TO OTHER VESPA MODELS FOR DISMANTLING,  
REASSEMBLY WHICH CAN BE USED WITH THIS PARTICULAR MODEL**

Tool No.	Description	NOTES
T.0014499 0014566	Bearing extractor Hook wrench for upper steering column ring nut	
T.0016029	Tool for assy. of lower track on lower steering column bearing	
T.0016561	Tool for removing lower track of lower steering column bearing	
0017004	Special screwdriver	
T.0022465	Long nose pliers for dismantling circlip	
T.0022467	Base plate for crankcase, flywheel side	
+ T.0022472	Tool for assy. oil seal	+ Reduce dia. from 33.5 to 32.5 mm.
(0) T.0022480	Punch for extracting bearings	
T.0023465	Graduated disc for timing	
T.0023590	Tool for assy. windshield beading	
0023638	Long nose pliers for circlips	(0) To modify as per Fig. 11/B.
T.0025095	Engine base plate	
T.0025127	Wedge for operations on crankshaft	
T.0027341	Extractor for oil seal for main bearing, flywheel side	
T.0027348	Punch for assy. bearings	
T.0027533	Apparatus for engine timing	
T.0020837	Punch for extracting mainshaft	

Tool No.	Description	NOTES
T.0020842	Punch for dismantling lower track of upper steering column bearing	
T.0021064	Wrench for fuel tap	
T.0021265	Flywheel extractor	
T.0021330	Tool for assy. of tracks of steering column bearing	
T.0021467	Bearing extractor	
T.0018119	Tool for assy. of shafts and axles	
0019978	Heater (220 V or 260 V)	
T.0020097	Punch for oil seal for main bearing flywheel side	
T.0020185	Fuel tank for consumption test	
T.0020322	Tool for dismantling and re-assembly of clutch	
T.0020781	Punch for assy. oil seal for main bearing, clutch side	



## TOOLS SPECIFICALLY DESIGNED FOR VESPA MOD. V9AI, FOR DISMANTLING

Tool No.	Description	Page	NOTES
T.0029534	Face-Pin wrench for front wheel hub bearing retainer ring nut		
T.0029535	Tool for assy. oil seal and bearing on front wheel hub		
T.0029538	Extractor for outer ball bearing on front wheel hub		
T.0029551	Clutch extractor		
T.0029565	"C" wrench for holding fly-wheel		
T.0029567	Tool for holding clutch housing		
T.0029568	Face-pin wrench for helical gear retainer ring nut		
T.0029569	Pliers for assembling the gearshift balls		
T.0029570	Extractor external track of mainshaft roller bearing	(*)	(*) Use with extractor T.0021467
T.0029571	Punch for assy. external track of mainshaft roller bearing		

## GENERAL SPECIFICATION

Installation of engine (see fig. 4). The engine is pivoted to the chassis of the machine through the crankcase swinging arm (clutch side). The rear wheel is fitted on the outer side of the mainshaft.

Lubrication of engine (piston, cylinder, crankshaft, mainbearing—flywheel side) is effected by the oil in the fuel mixture.

The clutch, the main bearing—clutch side, and gearbox function in an oil bath.

Fuel supply (see fig. 9): gravity feed with mixture of oil and petrol.

Carburettor provided with a throttle slide.

Three way tap ("closed," "open," "reserve").

Clutch (fig. 2): multiplate on the layshaft. The unit is operated by lever located on L.H. handlebars and adjustable cable.

Gearbox (see fig. 10): three speed drive with constant mesh gears. Operated by the twist grip on L.H. handlebar which functions in conjunction with the clutch control lever.

Transmission ratio engine to driving wheels:

Bottom gear	...	...	...	1: 17.18
2nd gear	...	...	...	1: 9.66
3rd gear	...	...	...	1: 6.12
Spark Plugs.				
Bosch; W240 T1			K.L.G. F 80	
Lodge 2 H.N.			Champion L.81	

Starting by means of a kick-starter on the R.H. side of the machine.

Cooling: at all speeds by means of a centrifugal fan.

Air intake: situated inside the frame.

Exhaust silencer: combined expansion and absorption type.

Integral chassis (see fig. 1): of pressed sheet steel with streamlined monocoque type structure.

Handlebars: Light alloy casting incorporating speedometer. All transmission cables and various controls are enclosed.



Steering column, suspension: On the lower end of the steering column is pivoted the front wheel swinging hub: front and rear suspensions with helical spring and hydraulic damper.

Wheels: Interchangeable and made up of 10" dia. pressed steel flanges fitted with 3.00-10" tyres.

Brakes: Cable operated expanding type. Front brake is operated by hand-lever (R.H. handlebars); the rear brake is pedal operated on R.H. footboard.

Parking stand: a two legged stand with a central return spring.

Steering lock: the locking device operates by means of a sliding bar acting on the steering column.

### **Standard Tool Kit**

Wrenches: 1 box wrench (11-17-21 mm.); 2 single open-ended wrenches (7-8 mm.).

Screwdriver: 1 item.

These tools are contained in a canvas roll together with this booklet which is placed in a tool box located under the dual seat.

### **ELECTRICAL EQUIPMENT**

A six pole flywheel magneto – nominal voltage 6 V – supplies alternating current to the electrical equipment.

The main switch unit is installed on the handlebars (fig. 6).

Following groups are fed:

- **The headlamp**, dia. 105 mm. (4.15") has a 25/25W bulb (main and dipped beam) and a 5W (Pilot light bulb).
- **The rear lamp** is provided with a 5W bulb (red pilot light and white light for registration plate) and a Stop light (10W).
- **Horn**

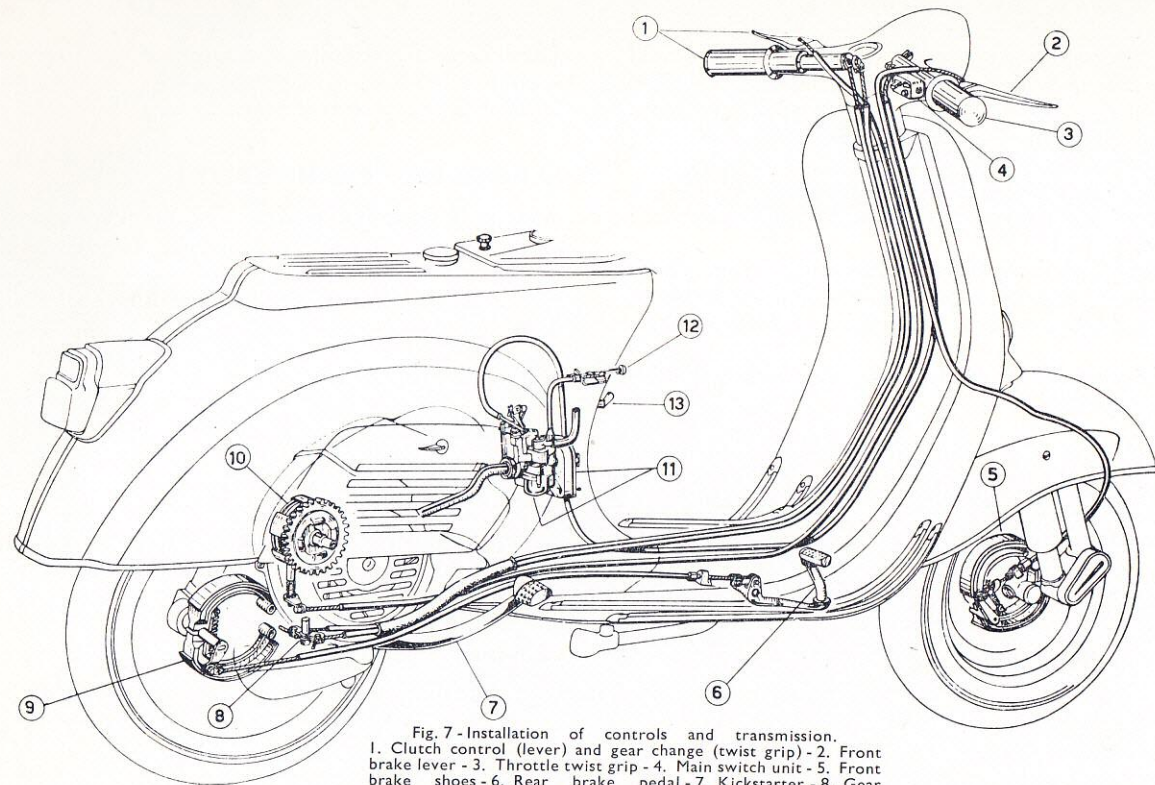


Fig. 7 - Installation of controls and transmission.  
 1. Clutch control (lever) and gear change (twist grip) - 2. Front brake lever - 3. Throttle twist grip - 4. Main switch unit - 5. Front brake shoes - 6. Rear brake pedal - 7. Kickstarter - 8. Gear selector and gear control adjusting screws - 9. Rear brake shoes - 10. Clutch - 11. Carburettor and air cleaner - 12. Choke control - 13. Fuel tap.



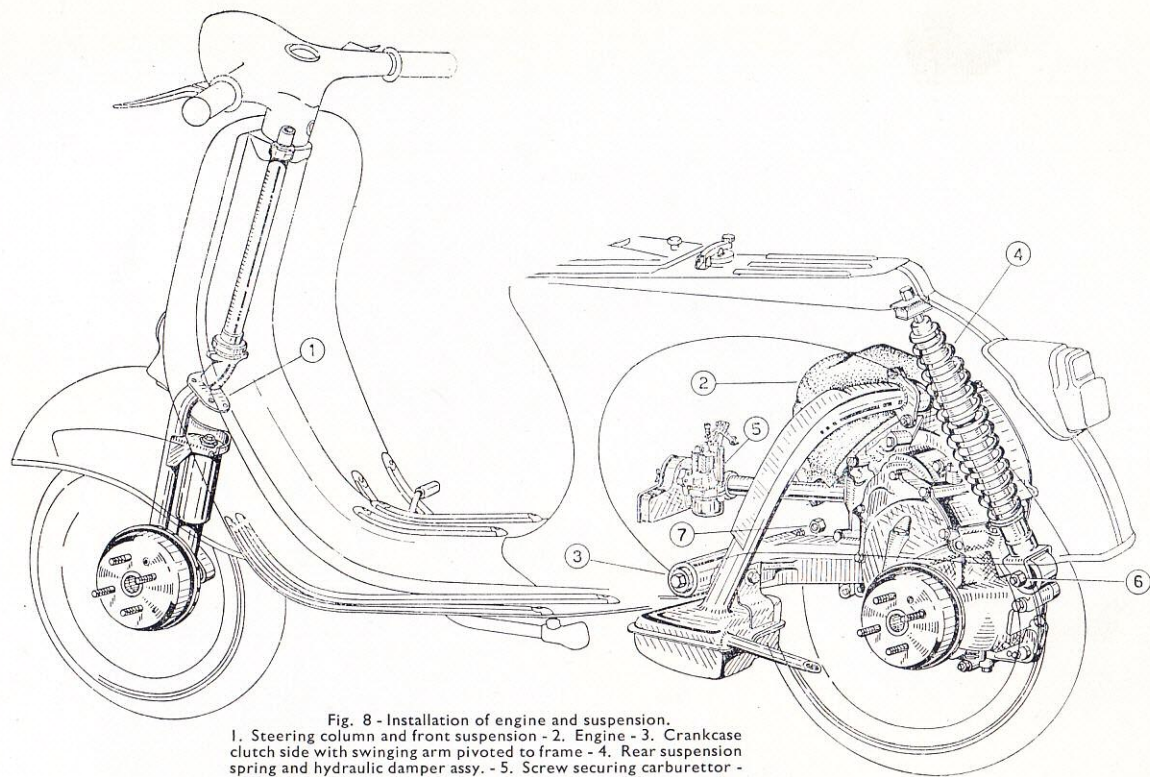
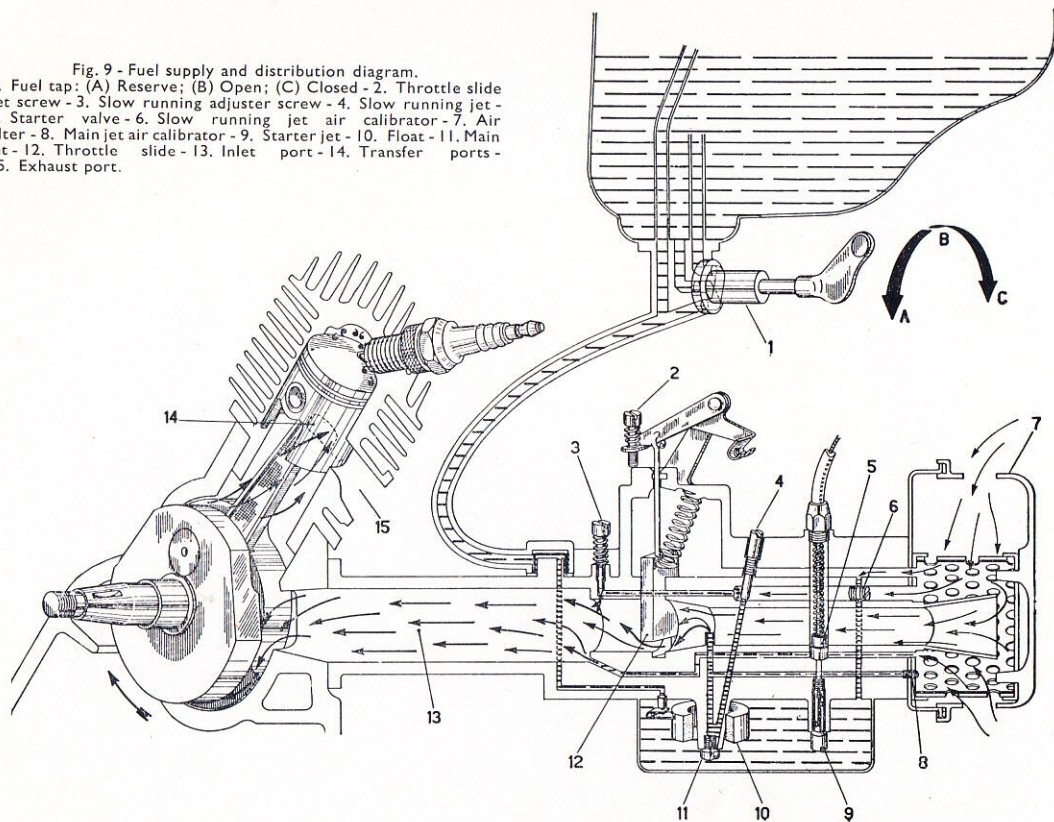


Fig. 8 - Installation of engine and suspension.

1. Steering column and front suspension - 2. Engine - 3. Crankcase clutch side with swinging arm pivoted to frame - 4. Rear suspension spring and hydraulic damper assy. - 5. Screw securing carburettor - 6. Bolt securing damper of rear suspension - 7. Nut securing engine.

Fig. 9 - Fuel supply and distribution diagram.  
 1. Fuel tap: (A) Reserve; (B) Open; (C) Closed - 2. Throttle slide set screw - 3. Slow running adjuster screw - 4. Slow running jet - 5. Starter valve - 6. Slow running jet air calibrator - 7. Air filter - 8. Main jet air calibrator - 9. Starter jet - 10. Float - 11. Main jet - 12. Throttle slide - 13. Inlet port - 14. Transfer ports - 15. Exhaust port.





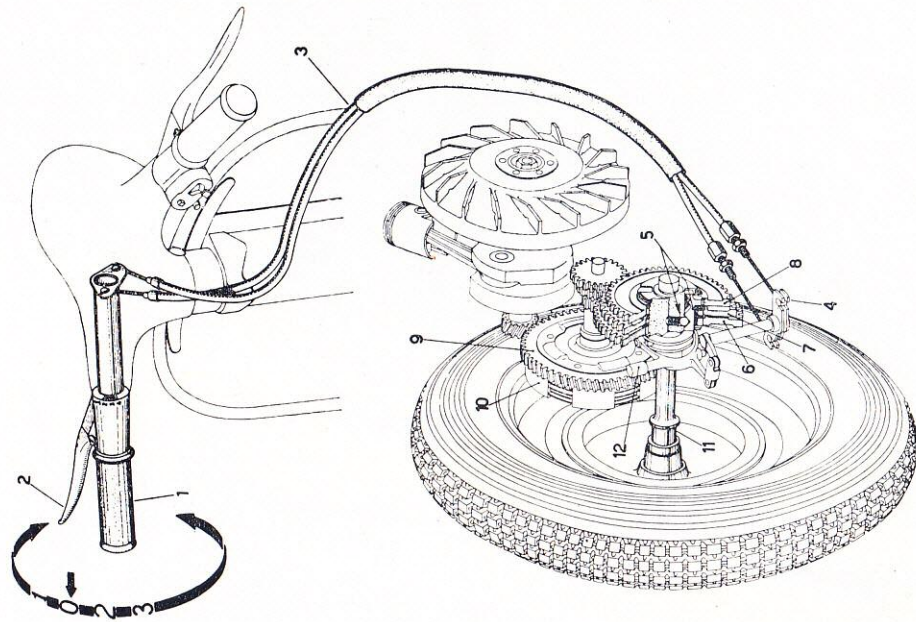
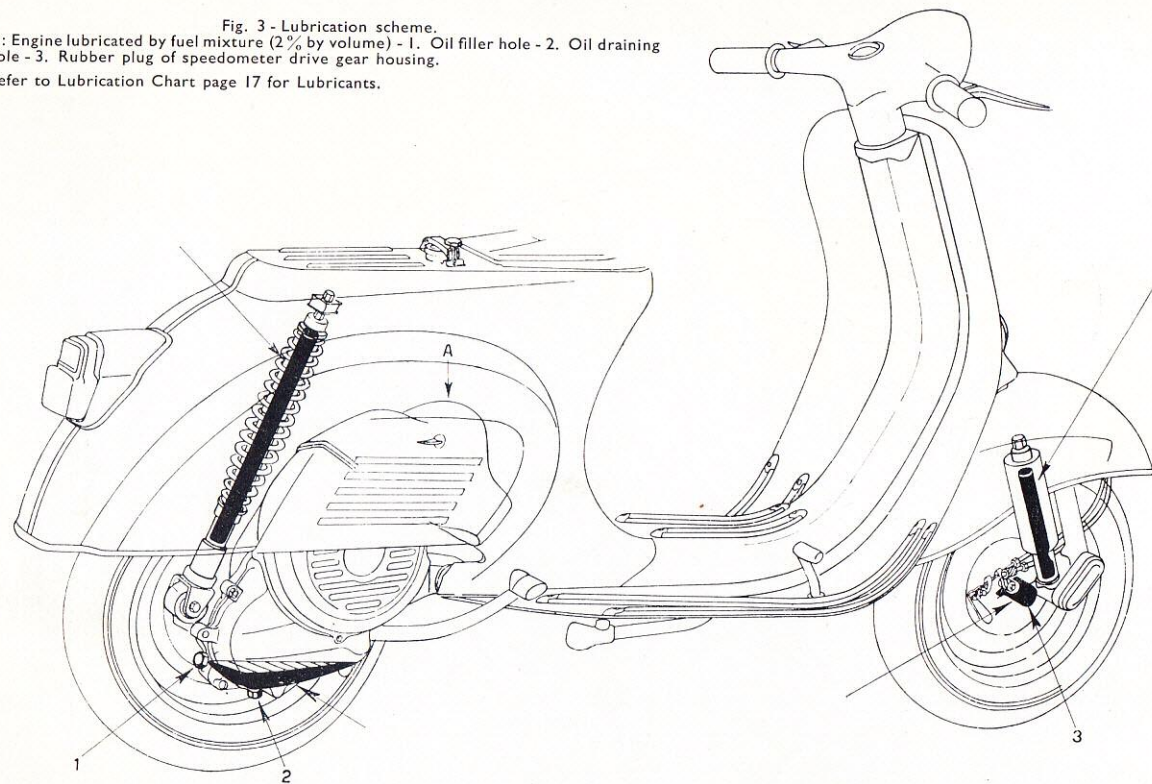


Fig. 10 - Gear Operation  
 1. Gear change twist grip - 2. Clutch control lever - 3. Gear change cables - 4. Gear shifter - 5. Selector group - 6. 1st gear - 7. 2nd gear - 8. Top gear - 9. Helical gear - 10. Clutch - 11. Main shaft - 12. Gear change twist grip.  
 N.B. - The position 1 - 2 - 3 on the gear change twist grip correspond respectively to bottom, 2nd and 3rd gear: the "0" indicates neutral.

Fig. 3 - Lubrication scheme.

A: Engine lubricated by fuel mixture (2% by volume) - 1. Oil filler hole - 2. Oil draining hole - 3. Rubber plug of speedometer drive gear housing.

Refer to Lubrication Chart page 17 for Lubricants.





## LUBRICATION CHART

Part to be lubricated		Lubrication				
Every 2,500	Every 5,000	*Shell	*B.P.	Esso	Wakefield	Mobil
Gear-box topping-up	Gearbox change oil	Shell 2T Two-Stroke Oil or Shell X-100 30	Energol Two-Stroke Oil or Energol SAE 30	Esso Extra Motor Oil 20W/30	Castrol XL	Mobiloil A
Front suspension Felt pad on flywheel cam Joints on brake control Speedo flexible drive	Control cables  Gear-change quadrant	Retinax A	Energrease L.2.	Esso Multi-purpose Grease H	Castrollease L.M.	Mobilgrease M.P.
Engine at each re-fuelling		Shell 2T Two-Stroke Oil in ratio of 2% or $\frac{1}{4}$ pint to $1\frac{1}{2}$ galls. petrol	Energol Two-Stroke Oil in ratio of 2% or $\frac{1}{4}$ pint to $1\frac{1}{2}$ galls. petrol	Essolube 30 in ratio of 2% or $\frac{1}{4}$ pint to $1\frac{1}{2}$ galls. petrol. Esso Two-Stroke Motor Oil in ratio of $\frac{1}{4}$ pint to 1 gall. petrol	Castrol XL in ratio of 2% or $\frac{1}{4}$ pint to $1\frac{1}{2}$ galls. petrol. Castrol Two-Stroke Oil in ratio of $\frac{1}{4}$ pint to 1 gall. petrol	Mobiloil A in ratio of 2% or $\frac{1}{4}$ pint to $1\frac{1}{2}$ galls. petrol or Mobil-Mix in ratio of $\frac{1}{4}$ pint to 1 gall. petrol

\*Marketed also by National Benzole Co. Ltd., by arrangement with Shell-Mex & B.P. Ltd.

After first 600 miles change **Gearbox Oil**.

### APPROVED PETROL/OIL MIXTURE

Make	Description
Shell	2T Two-Stroke Mixture
B.P.	B.P.-Zoom
National Benzole Co. Ltd.	Hi-Fli

To be used with equal parts of neat petrol.

Hydraulic Dampers

When not working efficiently, consult your Dealer. If servicing is required, they should always be returned to the Works.

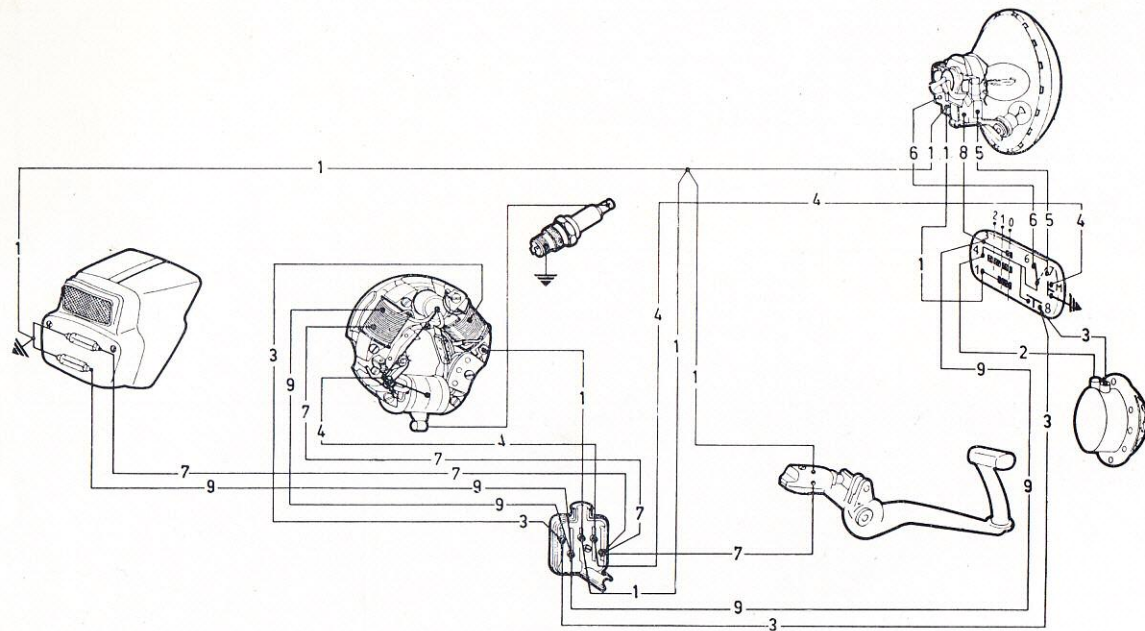


Fig. 4 - 1. Black - 2. White - 3. Green - 4. Red - 5. Violet - 6. Brown - 7. Blue - 8. Pink - 9. Yellow.



Fig. 5 - Installation of electrical equipment - see Fig. at page 18 and electrical connections - see Fig. at the present page.

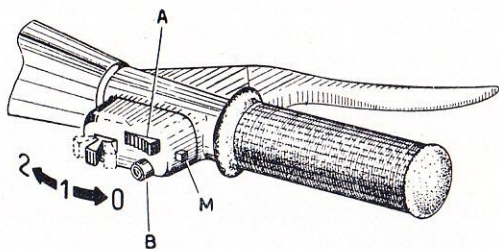
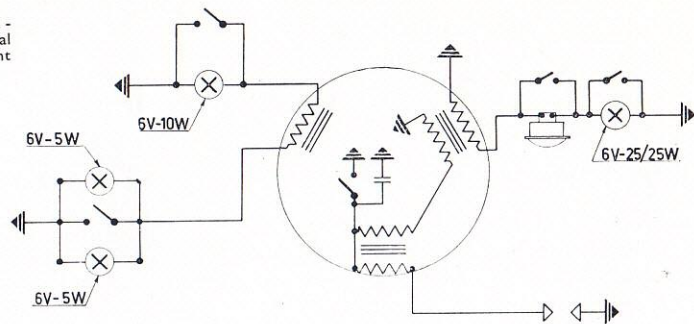


Fig. 6 - Light and dip switch.  
0 - 1 - 2: Switching lever positions - 0. Lights off; 1. Pilot light and tail lamp on; - 2. Head light, front parking light and tail lamp on - A: Main and dipped beam switch - B: Horn button - M: Engine cut-out.

## NOTES ON THE DISMANTLING AND ASSEMBLING OPERATIONS

Should it be necessary to dismantle the machine special attention must be paid to the following points.

### (a) ENGINE COMPONENTS

(1) **Clutch.** Remove the nut and washer securing the clutch unit to the multiple gear shaft. Using special extractor (Part No. T.0029551) the clutch assembly can be withdrawn.

(2) **Flywheel:** To remove this unit hold flywheel using "C" wrench (Part No. T.0029565) unscrew flanged nut located in centre of flywheel until it comes firmly into contact with the retaining circlip. A sharp blow on this nut will release the flywheel cam from the crankshaft taper. Further rotation of nut will withdraw flywheel from crankshaft. Should this method prove unsuccessful the flywheel extractor (Part No. T.0021265) can be used, providing the diameter of the legs are reduced from 17 mm. to 15.8 mm.

(3) **Crankcase:** The crankcase halves can be separated and the crankshaft removed in a similar

manner to previous Vespa models using Tool Part No. T.0023745 with component No. 20.

(4) **Crankshaft drive gear:** To remove this gear unscrew securing nut and withdraw lock washer. Rotate clutch housing (fixed to the helical assembly) until the deepest slot corresponds with the clutch gear which can then be removed.

(5) **Mainshaft:** The removal of the main shaft and pinion assembly can be accomplished as follows: Withdraw multiple gear assembly, rotate helical gear until the deepest slot of the clutch housing corresponds with the mainshaft. Using a suitable drift to prevent damage to the threads drive the mainshaft through the outer bearing at the same time lifting the shaft so as to disengage the trunnions on the gear selector fork from the gear selector.

**"B" Front Suspension:** The speedometer drive gear is screwed on to the end of the front wheel axle and incorporates a *LEFT-HAND THREAD*.



## DISMANTLING (SPECIAL INSTRUCTIONS)

Description	Tool Drg. No.	Notes
Securing the engine to bench support. (The engine should be without kickstarter).	T.0025095	In order to utilise this tool the following new components must be obtained, Nos. 22, 23, 24, 25, 26, 27, 28. Furthermore it is necessary to obtain an additional part No. 3. Remove the threaded spindle indicated by the arrow on Fig. 11a and substitute with component 22.
Clutch - Drive gear - Flywheel magneto	—	See instruction at page 20.
Inner track of main roller bearing (with dismantled shaft).	T.0014499	The tool must be used with half-rings, component No. 16.
Extraction of flywheel magneto by means of extractor	T.0021265	To use the existing tool reduce the diameter of the legs from 17 mm. to 15.8 mm.
Main shaft roller bearing	T.0021467	Use component No. 6 of Tool Part No. T.0021467 with relevant lock nut, bolt and taper spindle in conjunction with component No. 10 of Tool Part No. T.0018119.
Axle front wheel	—	Refer to Spare Parts List. Remove slotted plug and withdraw speedometer pinion. Remove the rubber dust cover located at the opposite end of the axle flange, next, release the speedometer drive gear screwed on to the axle. (Note. Left-hand Thread). The axle can now be driven out of the hub using a hammer and suitable soft metal drift.
Outer ball bearing of front wheel hub	T.0029538	Use with tool T.0021467
Ring nut of wheel hub	T.0029534	
Inner ball bearing of front wheel hub	—	Use a punch Ø 30 and 80 ÷ 99 mm. long.
Rear brake pedal	—	To remove the pedal it is necessary to remove the rubber foot pad.
Fuel Tap	T.0021064	In order to use the wrench, additional component No. 13 required.

Note. For dismantling operations appertaining to bearings, shafts, oil seals, etc. see the General Service Station Manual for Vespa.

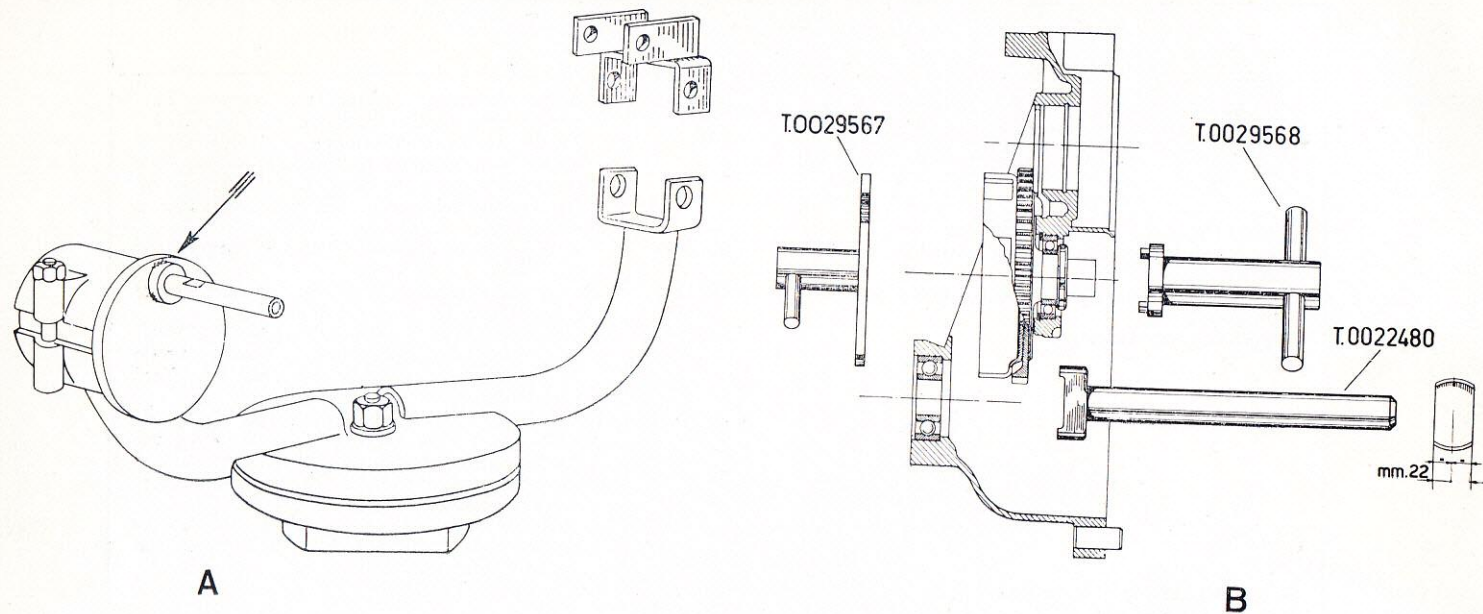


Fig. 11.

A. Modification of bench support.  
T.0025095

B. Dismantling of helical gear and modification of tool T.0022480.



# **ASSEMBLY TOLERANCES** **CYLINDER - PISTON**

Part Name	Normal dimensions mm.	Clearance "A" on assy.	Clearance "A" admissible after use
	Mod. V9A		
Normal cylinder	E = 47 $-0.005$ $+0.025$	0.06	0.10
Normal piston	C = 46.94 $\pm 0.0025$		
Cylinder 1st o/s	E = 47.2 $-0$ $+0.025$		
Piston 1st o/s	C = 47.14 $\pm 0.0025$		
Cylinder 2nd o/s	E = 47.4 $-0$ $+0.020$		
Piston 2nd o/s	C = 47.34 $\pm 0.0025$		
Cylinder 3rd o/s	E = 47.6 $-0$ $+0.020$		
Piston 3rd o/s	C = 47.54 $\pm 0.0025$		
Cylinder 4th o/s	E = 47.8 $-0$ $+0.020$		
Piston 4th o/s	C = 47.74 $\pm 0.0025$		

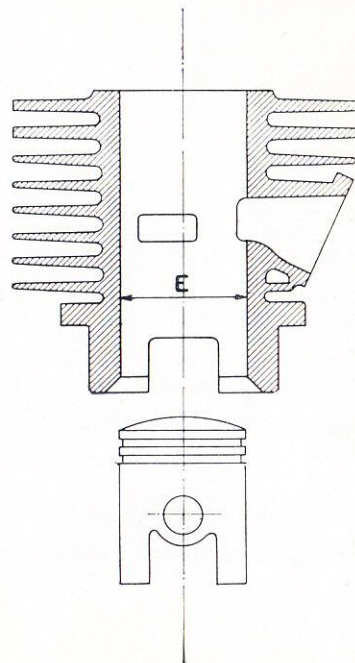


Fig. 12

**Notice**—The dimension "C" is measured at 12 mm. ( $\approx 1/2"$ ) from the bottom of the piston.

## CYLINDER—PISTON

### **Notice**

Pistons and cylinders supplied by the factory as spares are marked with letters of the alphabet. In the case where a cylinder or a piston is to be replaced it should bear the same letter as the mating component.

In the case of a rebored cylinder, the dimension "E" should exceed the dimension "C" on the piston to be fitted (marked on the piston itself), by the value indicated in the column: clearance "A" in assy.

**When assembling the piston into the cylinder ensure that the arrow stamped on the piston crown is facing towards the exhaust port.**

# CON-ROD GUDGEON PIN

Part Name	Normal dimensions mm.	Clearance "I" on assy.	Clearance "I" admissible after use
	Mod. V9A		
Normal con-rod	G = 14      +0.005 +0.018	0.014 ÷ 0.035	5/100
Normal gudgeon pin	H = 14      -0.009 +0.017		
Con-rod 1st o/s	G = 14.05   +0.005 +0.018		
Gudgeon pin 1st o/s	H = 14.05   -0.009 +0.017		
Con-rod 2nd o/s	G = 14.10   +0.005 +0.018		
Gudgeon pin 2nd o/s	H = 14.10   -0.009 +0.017		

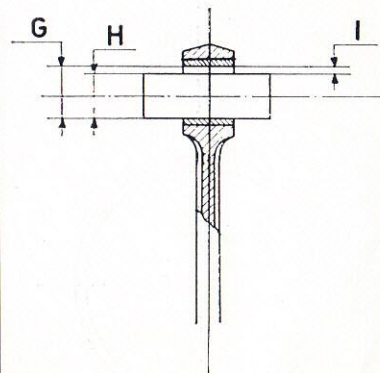


Fig. 13



## PISTON RING

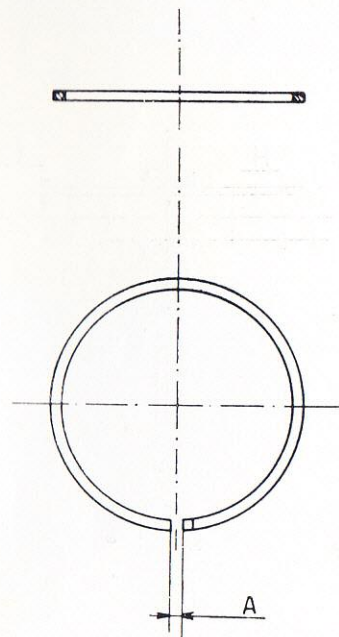


Fig. 14

Part Name	Normal dimensions	Clearance "A" on assy.	Max. clearance admissible after use
	Mod. V9A		
Piston ring normal (upper and lower)	47	0.2 ÷ 0.35	2 mm.
Piston ring 1st o/s	47.2		
Piston ring 2nd o/s	47.4		
Piston ring 3rd o/s	47.6		
Piston ring 4th o/s	47.8		

## PISTON AND GUDGEON PIN

Part Name	Normal dimensions		Clearance“R” on assy.	Max. clearance “R”admissible after use
	Mod. V9A			
Normal piston	P = 14	-0.005 -0.016	0	2/100
Gudgeon pin normal	Q = 14	-0.009 +0.017		
Piston 1st o/s	P = 14.05	-0.005 -0.016		
Gudgeon pin 1st o/s	Q = 14.05	-0.009 +0.017		
Piston 2nd o/s	P = 14.10	-0.005 -0.016		
Gudgeon pin 2nd o/s	Q = 14.10	-0.009 +0.017		

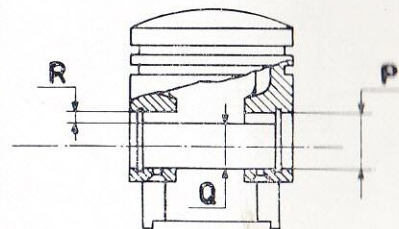


Fig. 15

# MAINSHAFT PINIONS—SPACER WASHER

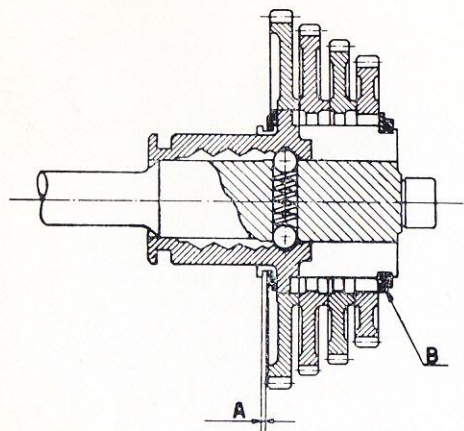


Fig. 16

Part Name—B	Normal dimensions	Clearance "A" on assy.	Max. clearance "A" admissible after use
Spacer washer normal	1.5 $\begin{smallmatrix} + 0 \\ - 0.06 \end{smallmatrix}$	0.05 $\div$ 0.30	0.40
Spacer washer, 1st o/s	1.6 $\begin{smallmatrix} + 0 \\ - 0.06 \end{smallmatrix}$		
Spacer washer, 2nd o/s	1.7 $\begin{smallmatrix} + 0 \\ - 0.06 \end{smallmatrix}$		
Spacer washer, 3rd o/s	1.8 $\begin{smallmatrix} + 0 \\ - 0.06 \end{smallmatrix}$		
Spacer washer, 4th o/s	2 $\begin{smallmatrix} + 0 \\ - 0.06 \end{smallmatrix}$		

**Notice**—If the clearance "A" is not obtained using the normal spacer washer, substitute the latter with a suitable oversized washer so as to obtain the prescribed clearance. For inspection use a feeler gauge.



## REASSEMBLY

### INSTRUCTIONS FOR REASSEMBLY

When reassembling pay special attention to the following instructions.

- **Outer track of main roller bearing on crankcase half flywheel side:** First heat the crankcase housing using heater 0019978, about 80° C, then mount the washer with the side on which **the bosses show the profile in relief, facing towards the bearing.**

Mount the track of bearing by means of tool T.0029571 until it butts, Peen over at the Three points previously used.

- **Main roller bearings on helical gear and on the mainshaft.**

Heat the housing on the crankcase half to about 80° C, with the heater 0019978.

- **Mainshaft:** Ensure the trunnions of the gear-shift fork properly locate in their track before mounting the mainshaft by means of tool T.0018119.

The mainshaft should be mounted with the gears already assembled.

- **Crankshaft:** For assembling the internal track of the roller bearing first heat it in oil bath to 100° C, next mount it so that the exposed face of the cage is facing towards the inside of the engine (as is the case for the Vespa G.S./VSB I). Use wedge tool T.0025127.

- **Drive gear, on the crankshaft:** To position drive gear on to the crankshaft, rotate clutch housing fitted to helical gear so that the deepest slot corresponds with the driving gear. Fit lock washer and retaining nut tightening the latter. Secure by means of the lug provided on the lock washer.

- **Front wheel axle:** The ring locking the wheel axle is left hand threaded. The tool for assembly T.0018119 should be used with the new component No. 13.

- **Roller Bearing Bush on Front Wheel Hub:** Use a punch 23 mm. diameter reduced at one end to 17.5 mm. diameter for a distance of 10 to 15 mm.

**Notice:** The bush must be assembled into its housing so that the marked surface is facing towards the outside.

## SPECIAL INSTRUCTIONS FOR REASSEMBLY

Description	Tool Drg. No.	Notes
Helical gear	T.0018119	For carrying out this operation, components 11 and 12 are required.
Ring nut securing helical gear	T.0029568	See fig. 11b.
Roller bearing on mainshaft	T.0029571	Note. Ensure Spacer is inserted before Bearing is mounted.
Front wheel axle	T.0018119	To be used in conjunction with component 13 of the tool.
Oil seal on the rear brake	—	Use a punch Ø 36. If the cam has been dismantled, when reassembling refill the central groove with grease ESSO MULTI PURPOSE GREASE H — SHELL RETINAX A — MOBILEGREASE MP.
Inner bearing on the wheel hub	—	Use an aluminium punch Ø 30.

*Notice*—For assembly operation regarding bearings, shafts, oil seals, etc., see the General Vespa Service Station Manual.

## ENGINE TIMING, Fig. 17

This operation can be carried out in a similar manner to other Vespa models using timing apparatus Part No. T.0027533/T.0029631. Obtain a suitable piston stop "A" as illustrated and screw into cylinder head as shown. Fit graduated timing disc "D" (Part No. T.0023465) to flywheel and a pointer "B" to crankcase. Rotate flywheel in a clockwise direction until the piston comes into contact with the stop. Mark the disc to correspond with the pointer. Rotate flywheel in anti-clockwise direction marking the disc as before. T.D.C. is obtained by making a third mark exactly half-way between the two previous readings.

The contact breaker points should be clean and adjusted to 0.011" to 0.019". The stator plate should then be positioned so that the contact breaker points separate when the piston is  $19^{\circ} \pm 1^{\circ}$  B.T.D.C. measured with the timing disc. Rotation of the stator plate can be accomplished when the screws securing same to the crankcase are slackened.

**NOTICE: Contact breaker adjustment.**

**VESPA Mod. V9A1:** Loosen the screw "S" and act on the eccentric "T". Tighten screw "S" when the operation is completed.



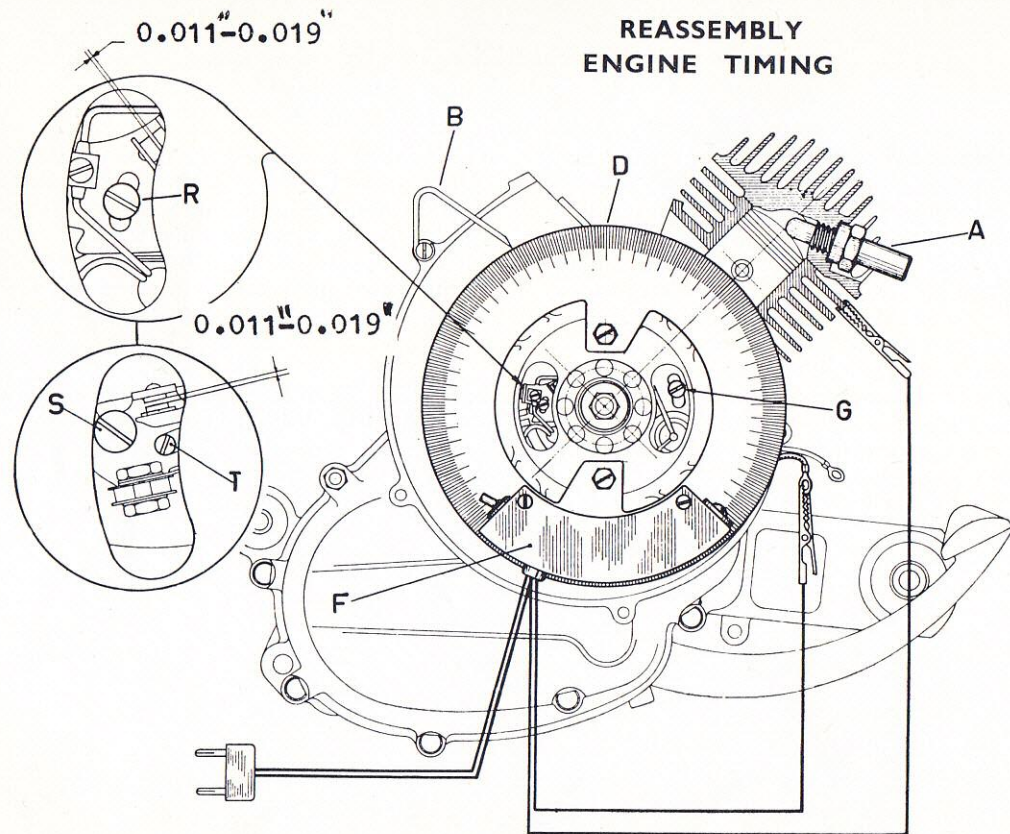


Fig. 18

Timing of the 6 pole flywheel magneto (Mod. V9A).

## FUEL CONSUMPTION TEST

Use auxiliary tank of known capacity (T.0020185) which can be inserted and disconnected from the circuit, respectively at the start and finish of the test.

- (a) The test should be carried out with only one up, riding in top gear and seated in an upright position. The driver should be at least 5' 3" tall.

- (b) Distance of test run 24 miles (12 miles going, 12 miles return) on a dry and level road.

- (c) Max. admissible wind speed: (6.55 feet sec.)  
air temperature  $5 \div 25^{\circ}$  C.

- (d) Tyre pressures:

**Vespa Mod. V9A:**

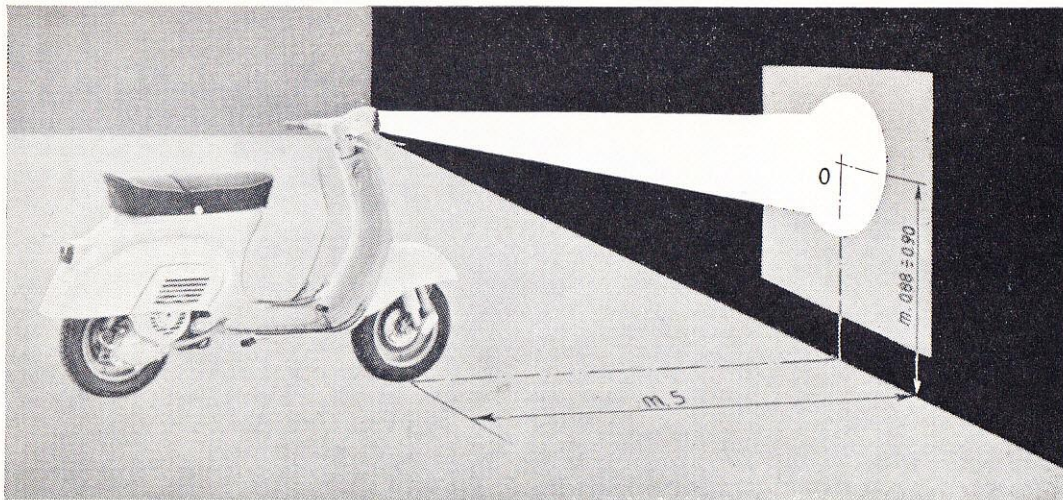
Front: (17 lbs./sq. in.);

Rear: (27 lbs./sq. in.).

## MAINTENANCE

**Setting the head lamp.** The correct orientation of the main beam can be obtained both horizontally and vertically as follows:  
Check that both front and rear tyres are inflated to correct pressures.

Place the scooter on a level floor in front of a white wall as seen in Fig. 19. Start the engine, hold the throttle control twistgrip at about  $1/3$  and set the switch on "main beam".



N.B. - Dimension "O" corresponds to adjustment carried out with driver and passenger on the machine.

Fig. 19



With two persons on the Vespa, slacken the set screw securing the head lamp, then move the latter as required in order that the beam axis coincides with point "O" on the wall.

Tighten the screw firmly.

This operation can be carried out also with the driver only sitting on the saddle.

In this case, of course, the beam alignment should be altered whenever the scooter is being ridden by both driver and passenger.

If necessary, blow the head lamp reflector clean or wipe off dust with a very soft feather duster. Do not use a cloth and keep fingers off the reflector surface.

Should difficulties of starting or running occur, check the spark plug:

Clean the spark plug electrodes with a wire brush or emery cloth and adjust the gap. Check porcelain insulation: if cracked or broken change the plug. Clean in neat petrol. Plug gaps all makes 0.023".

Every 2,400 miles:

- (1) Check oil level in gear case.
- (2) De-coke the engine, cylinder head, piston crown and cylinder ports. Ensure that residual carbon deposits do not remain inside the cylinder. Clean the exhaust pipe using a suitable scraper.

Every 4,800 miles:

- (1) Change oil in gear case (see lubrication chart).
- (2) Remove the rubber plug on front suspension (No. 3, fig. 3) and refill the front hub with grease.
- (3) Remove the air filter, clean by agitating in an oil petrol bath and if possible air blast dry.
- (4) Lubricate control cables transmissions and felt lubricating pad on flywheel.
- (5) Clean, and if necessary, adjust the contact breaker points (fig. 21).

## LAYING UP

We recommend that the following operations be carried out:

- (1) Clean down the machine.
- (2) With the engine stationary, piston at the bottom dead centre position, remove the spark plug, next, introduce through the plug hole 10 to 15 c.c. of 30 S.A.E. oil. After said

operation depress the kickstarter three or four times.

- (3) Drain off all fuel contained in the fuel tank; then grease over all unpainted metallic parts; next raise the wheel off the ground by placing wooden chocks under the footboard.

## **CLEANING THE MACHINE**

For cleaning the exposed surface of the engine use paraffin, a brush and clean rags. The painted surfaces of the machine should be sponged down with water and dried off with a chamois leather. Do not use paraffin for washing down painted surfaces.

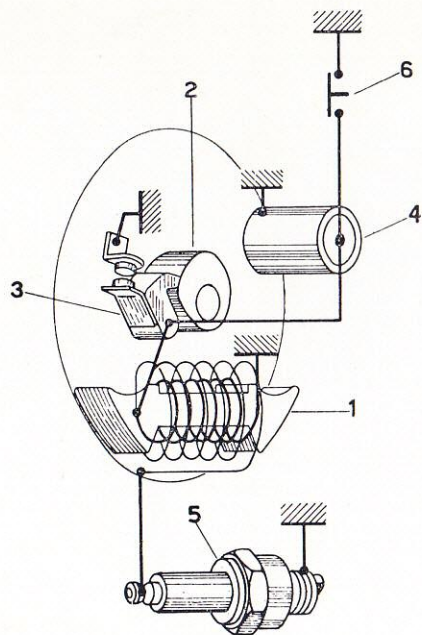


Fig. 20 – Ignition circuit

1. Flywheel coil – 2. Flywheel cam – 3. Contact breaker – 4. Condenser – 5- Sparking plug – 6. Engine cut-out switch.

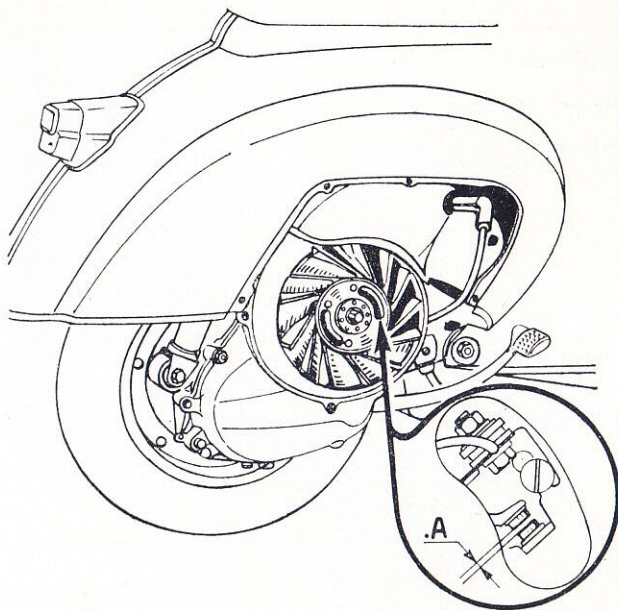


Fig. 21 – Setting contact breaker points

A – (Max gap) = (0.011" to 0.019").



## SPECIAL OPERATING INSTRUCTIONS

Operation	Instructions	Notes
<b>STEERING LOCK</b> Locking the scooter	To lock the vehicle it is necessary to turn the handlebars in an anticlockwise direction up to the limit stop; rotate the key and push inwards, so that it thrusts the sliding bar against the steering column. To ease the insertion of the sliding bar into the hole of the steering column, slightly turn the handlebars from the limit stop clockwise.	When the handlebars are locked the key will now spring back to its original position and can be extracted. It can be extracted from the lock even if the handlebars are free.
<b>Unlocking the scooter</b>	To release the handlebars, insert the key in the lock, turn it to the left and pull it back; then turn the handlebars in the normal position	The steering lock should not be lubricated.
<b>FUEL SUPPLY</b>	See Lubrication Chart page 17. To remove the fuel tank cap, turn to the left and extract it. For access to fuel tank pivot the dual saddle on its forward edge, after having released the rear attachment.	Ensure that the fuel tank breather is always clean. Use a mixture 2 per cent by volume during and after running-in.

Before operating the vehicle: unscrew the plug on the gear box marked "OLIO" (fig. 3) and check that the oil is level with the hole when the vehicle is standing upright.

—Check tyre pressures:

Front 17 p.s.i. : Rear 23 p.s.i. Solo.

Rear 33 p.s.i. with pillion passenger.

Operation	Instructions	Notes
<b>DISMANTLING CYLINDER HEAD</b>	Remove the carburettor (screw No. 5, fig. 8). Remove silencer. Loosen bolt connecting engine to bearer bracket (fig. 8, No. 7), detach rear damper (fig. 8, No. 6) and swivel the engine down on its own bearer bracket. The cylinder head can then be removed by unscrewing the 4 securing bolts by means of a box wrench.	It is advisable when carrying out this operation to place a wooden platform underneath the rear end of the chassis footboard, so as to obtain greater wheel lift than is possible by the use of the stand and, at the same time, adequate stability.
<b>AIR CLEANER</b>	To dismantle the air cleaner it is necessary to remove the end of the choke cable by disconnecting the end ring. Then remove the fuel tap control rod and unscrew the two wing nuts securing the air filter case.	

Note. When reassembling the carburettor care should be taken that the float chamber is vertical.

### **RUNNING-IN PERIOD**

Up to 1,000 miles the machine should never be driven at a speed exceeding 35 m.p.h. It is important, of course, at all times never to let the engine labour but during its early life it is doubly important. Use your gearbox freely; never, under any circumstances, allow the motor to work hard.

After the first 600 miles change the oil in the gearbox (see fig. 3) and check that all nuts and bolts are not slack.

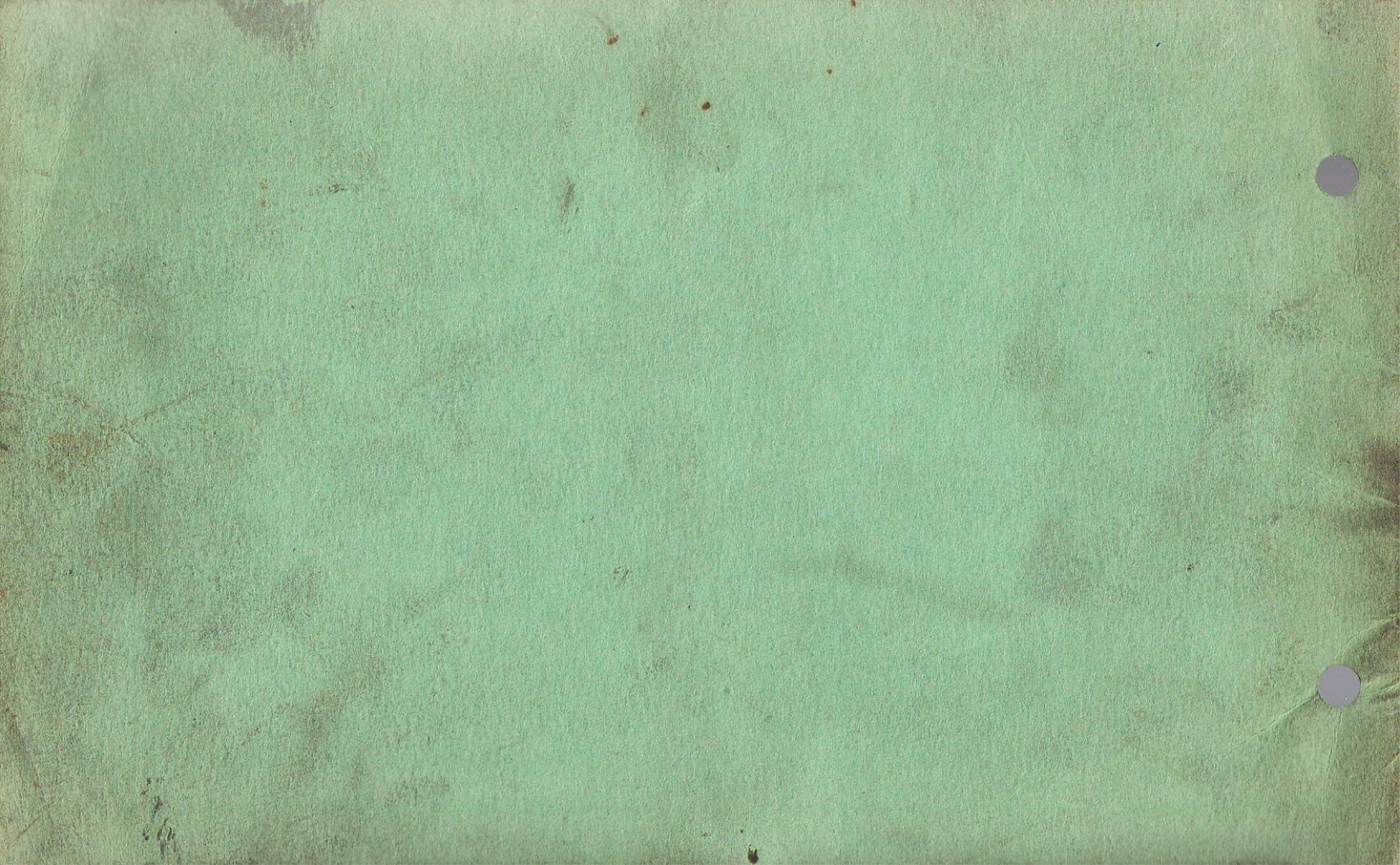
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