



OWNER'S HANDBOOK

FOR

UNIT CONSTRUCTION

650 c.c. TWIN

1970

MODELS

TRIUMPH ENGINEERING CO. LTD.

MERIDEN WORKS · ALLESLEY · COVENTRY ENGLAND

TELEPHONE: MERIDEN 331

TELEGRAMS "TRUSTY, COVENTRY"

REF. 99—0892

U.K. & GENERAL EXPORT EDITION

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INTRODUCTION

The Owner's Handbook includes all the information that the majority of owners will require. If you require more information for major repairs there is available a Workshop Manual but this is intended for those having basic mechanical knowledge and workshop facilities. To obtain the Workshop Manual order from your local Triumph dealer or distributor as we do not supply parts or service literature direct from the factory to individual customers.

Where specialised advice is required beyond the ability of the dealer or distributor, then you should write to the Service Department. Unless the full engine number is quoted it is often difficult to identify the type of motorcycle and give a helpful reply. Any information which may have a bearing on the subject should be included, particularly details of any additions or alterations to the standard equipment.

We do not accept motorcycles at the factory for any repair work unless a workshop appointment has been made. Where a guarantee claim is involved, consult your dealer or distributor who may be able to provide a replacement to enable your motorcycle to be used whilst the defective part is returned to the factory. Guarantee claims in respect of proprietary components should be forwarded by your dealer to the actual manufacturers or their local agents—not the Triumph factory.

Carburettors: Amal Ltd., Holdford Road, Witton, Birmingham, 6.

Chains: Renold Chains Ltd., Wythenshawe, Manchester.

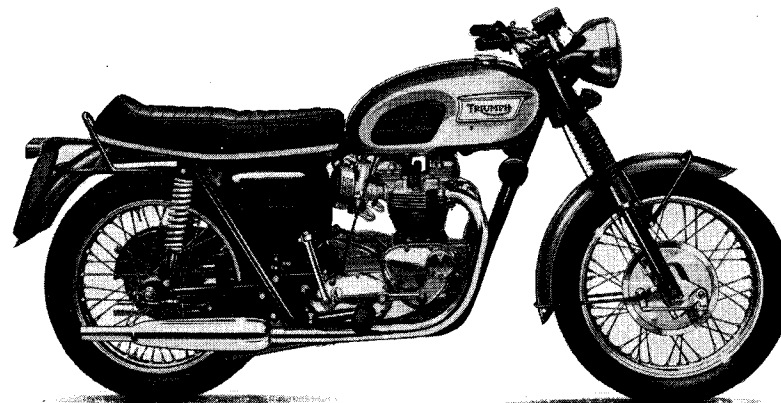
Electrical equipment: J. Lucas Ltd., Great Hampton Street, Birmingham, 18

Suspension units: Girling Ltd., Birmingham Road, West Bromwich, Staffordshire.

Sparking plugs: Champion Sparking Plug Co. Ltd., Feltham, Middlesex.

Speedometer: Smiths Industries Ltd., Cricklewood Works, London N.W.2.

Tyres: Dunlop Rubber Company Ltd., Fort Dunlop, Birmingham, 24.
The Avon India Rubber Co. Ltd., Melksham, Wiltshire.



650 c.c. Bonneville 120

USEFUL DATA

	TR6	T120
ENGINE		
Bore and Stroke—mm.	71 x 82	71 x 82
Bore and Stroke—in.	2.79 x 3.23	2.79 x 3.23
Capacity—c.c.	649	649
Capacity—cub. in.	40	40
Compression Ratio	9.0 : 1	9.0 : 1
Power Output B.H.P. @ r.p.m. ...	43 @ 6,500	47 @ 6,700
Tappet Clearance, Inlet and Exhaust		
—In. (Cold)	0.002, 0.004	0.002, 0.004
Tappet Clearance—mm.	0.05, 0.10	0.05, 0.10
Valve Timing	I.O. 34°	34°
@ 0.020 in. (0.50 mm.)	I.C. 55°	55°
Clearance for checking	E.O. 55°	55°
	E.C. 34°	34°

	TR6	T120
IGNITION—Timing (Before top centre)		
Crankshaft position (fully advanced)	38°	38°
Piston position—in.	1/16 (1.58 mm)	1/16 (1.58 mm)
Contact Breaker Gap—in.	0.014—0.016	
Contact Breaker Gap—mm.	0.35—0.40	

SPARKING PLUGS

Type	Champion N3
Point Gap	0.020 in. (0.50 mm.)

CAPACITIES

Fuel Tank	4 galls. (18 litres)
Oil Tank	6 pints (3.35 litres)
Gearbox	$\frac{7}{8}$ pint (500 c.c.)
Primary Chaincase (Initial fill only)	$\frac{5}{8}$ pint (350 c.c.)
Front Forks (each leg)	$\frac{1}{2}$ pint (200 c.c.)

CARBURETTER

	R930/23	L930/10 : R930/9
Amal Type	230	220
Main Jet ... ..	.107	.106
Needle Jet	STD	STD
Needle Type	2	2
Needle position	No. 4	No. 2 $\frac{1}{2}$
Throttle Valve		

SPROCKETS

Gearbox, Solo	19	19
Gearbox, Sidecar	17	17
Rear Wheel	46	46

CHAINS

Primary $\frac{3}{8}$ in. pitch Duplex, links	84	84
Secondary $\frac{5}{8}$ in. pitch x $\frac{3}{8}$ in. wide, links solo	104	104
$\frac{5}{8}$ in. pitch x $\frac{3}{8}$ in. wide, links sidecar	103	103

GEAR RATIOS

	Solo	Solo
4th Top	4.88	4.88
3rd Third	6.04	6.04
2nd Second	8.17	8.17
1st Bottom	11.8	11.8
Engine R.P.M. @ 10 m.p.h. Top Gear	663	663

TYRE SIZE

Front	3.25 x 19	3.00 x 19
Rear	3.50 x 18	3.50 x 18

TYRE PRESSURE

Front lb./sq. in. (kg/sq. cm.)	24 (1.7)
Rear lb./sq. in. (kg/sq. cm.)	24 (1.7)

BULBS

Headlight 12V.50/40W Pre-focus ...	Lucas 414	Lucas 414
Parking Light 12V. 4W M.C.C. ...	Lucas 222	Lucas 222
Stop/Tail Lamp 12V. 6/21 W. (Offset Pin)	Lucas 380	Lucas 380
Speedometer 12V. 3W. M.E.S. ...	Lucas 987	Lucas 987
Ignition Warning 12V. 2W. (BA7S)...	Lucas 281	Lucas 281
Main Beam Warning Lamp (BA7S)...	Lucas 281	Lucas 281
Fuse Rating (Amperes)	35	35

OVERALL DIMENSIONS

Length—in. (cms.)	84 (213.5)	84 (213.5)
Width—in. (cms.)	27 (68.5)	27 (68.5)
Overall Height—ins. (cms.)	38 (96.5)	38 (96.5)
Weight—lbs. (kg.)	365 (165.5)	365 (165.5)

COLOUR	Spring Gold	Astral Red/ Silver
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GENERAL DESCRIPTION

This handbook refers to the Triumph motorcycles having a combined engine/gearbox unit of 650 c.c. (40 cu.in.) capacity. The vertical, parallel twin-cylinder, air cooled engine has overhead valves operated by push rods and has a bore of 71 m.m. (2.79 in.) and a stroke of 82 mm. (3.23 in.). Lubricant is pressure fed to the big ends, valve gear and exhaust tappets through a plunger pump from a 6 pint (3.35 litres) tank on the frame, the oil draining through a gauze filter in the bottom of the crankcase where it is scavenged by the second part of the plunger pump and returned to the tank.

The primary drive is by Duplex chain and six-plate clutch contained in an oil bath chaincase. The four-speed foot-controlled gearbox is contained in the same housing as the engine but the lubrication systems are entirely separate. The gearbox is lubricated by oil contained in the housing. The final drive is by single chain.

The telescopic front forks are mounted in the frame by cup-and-cone ball bearings. The load is carried by two coil springs in compression and the movement is controlled by integral hydraulic damping which uses normal grade engine oil in each leg.

The rear suspension is a forked member pivoting on bronze bushes which are lubricated by periodical high-pressure greasing. The load is carried by Girling combined coil spring and hydraulic damper units. The spring is adjustable for load but the hydraulic system is completely sealed and needs no attention.

The front wheel size is 19 in. (48.3 cm.) rim diameter with a 3.25 in. (8.25 cm.) section front tyre and an 8 in. (20.3 cm.) diameter front brake. The rear wheel has a 3.50 x 18 (8.9 x 45.2 cm.) section tyre with a 7 inch (17.8 cm.) diameter brake.

The electrical system is supplied from an alternating current generator contained in the primary chaincase and driven from the crankshaft. The output is fed through a silicon diode bridge connected rectifier to a 12 volt lead-acid battery. The voltage is controlled by a Zener diode, mounted on a heat sink below the headlamp.

IMPORTANT NOTE

The positive side of the system is to earth

LAYOUT OF CONTROLS

ON THE HANDLEBAR

Clutch lever. On left handlebar. The clutch couples the engine drive to the gearbox and rear wheel. Pull the lever towards the handlebar to disengage the clutch.

Horn-push and dipper switch. On left handlebar. Use the lever to change the headlight beam between the main and dipped positions. Press the domed top to sound the horn.

Front brake lever. On right handlebar. Pull the lever towards the handlebar to apply the front brake.

Air control. On right handlebar. Close the lever to the stop to enrich the mixture only when starting a cold engine.

Throttle control. Twist the right handlebar grip towards you to increase the engine speed. Twist it away from you to reduce speed.

Speedometer. Indicates the speed and registers total and trip mileage. To set the trip indicator to zero twist the knob clockwise; do not pull the knob.

Parking Lock. Turn handlebar to full left lock before turning key clockwise to lock.

N.B.—Note ignition and parking lock key serial numbers in case of loss.

ON HEADLIGHT

Lighting switch. Operated by a three position switch. From "off" position on left, move switch right to first notch for parking lights and to second notch for full headlamp.

Ammeter. Indicates the rate of electrical current flow into or out of the battery.

Main beam warning lamp. (Green)

Oil pressure warning lamp. (Red). Remains lit so long as ignition is switched on and until the engine speed rises beyond tick over. If the light then remains on, stop the engine immediately and investigate.

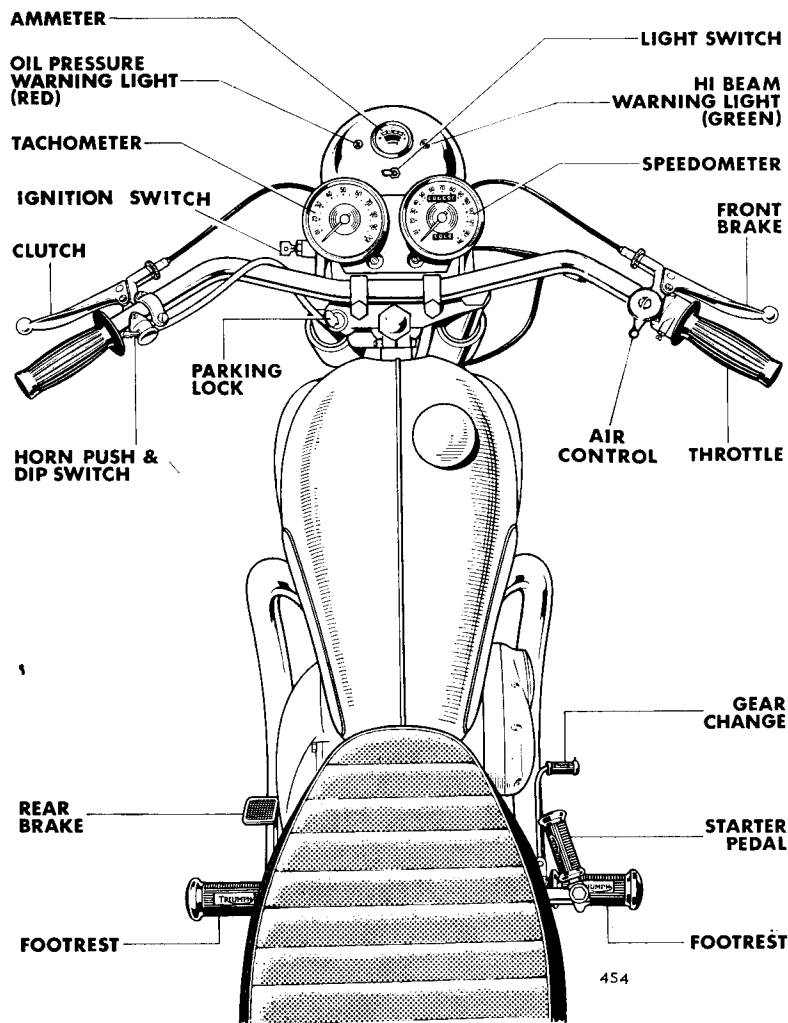


Fig. 1. Control Layout.

ON THE MACHINE

Ignition switch. On left hand headlamp bracket operated by a key. Turn the key clockwise to switch on ignition.

Petrol taps. At the rear underneath the tank. Turn down the lever on the right tap for normal running. When the reserve is required turn down the lever on the left tap. Always turn off both taps when parking.

FOOT CONTROLS

Brake pedal. In front of left footrest. Press down to apply the rear wheel brake.

Gearchange lever. In front of right footrest. Press down to change to a lower gear or pull up to change to a higher gear. The lever is spring loaded and always returns to the central position.

Starter pedal. The folding pedal behind the right footrest.

TAKING THE MOTORCYCLE ON THE ROAD FOR THE FIRST TIME

In most cases the dealer will have checked the oil levels in the gearbox, primary chaincase and oil tank, checked the tyre pressures and filled the dry-charged battery; if in doubt check them again. Replenish the petrol tank with a suitable grade of fuel and the motorcycle is ready for starting.

TO START THE ENGINE

1. Select the neutral position between first and second gear.
2. Pull in the clutch lever and operate the starter pedal several times to free the clutch.
3. Turn on the petrol tap and hold down for approx. 5 seconds the spring loaded tickler button which floods the carburetter(s) and enriches the mixture. In cold weather close the air lever to the stop.

4. Place the key in the ignition switch and turn clockwise.
5. Press down the starter pedal gently until you feel some resistance; then press harder with the throttle slightly open when the engine should start.
6. Open the air control as soon as the engine will allow it without stalling.

RUNNING IN YOUR NEW MOTORCYCLE

Although the new parts are machined as accurately as possible the moving parts need to mate with each other or become what is known as "run-in". At a low constant speed this would take a considerable mileage, therefore the ideal method of running-in is to increase progressively the load and length of time the load is maintained. These machines will travel at 50 m.p.h. (80 Km/h) with only a small throttle opening on a level road without harm when new but any use of a large throttle opening, even in a lower gear, other than for a very short time may cause damage.

Change gear frequently so that the engine is always working easily; neither pulling hard in a high gear nor revolving fast in a low gear. The extra use of the gearbox helps to run-in all the transmission parts. It is difficult to quote a set mileage but provided that the running-in is done intelligently it should be possible to use maximum performance after 1,500 miles (2,500 Km). Whenever the maximum performance is used it is a good plan to snap shut the throttle for a moment occasionally as this sucks a certain amount of oil up the cylinders.

TO ADJUST THE VALVE OPERATING MECHANISM

There are four adjusters on the rockers which are accessible after removing the four inspection caps from the rocker boxes. The clearance must always be checked when the engine is cold and the correct figures for your model are listed in the Useful Data, page 5. It will be easiest to find the correct point of the stroke to adjust the valve clearance if you put the machine on the centre stand, engage top gear, and then remove the sparking plugs. By turning the rear wheel you can then turn the crankshaft and position the valves.

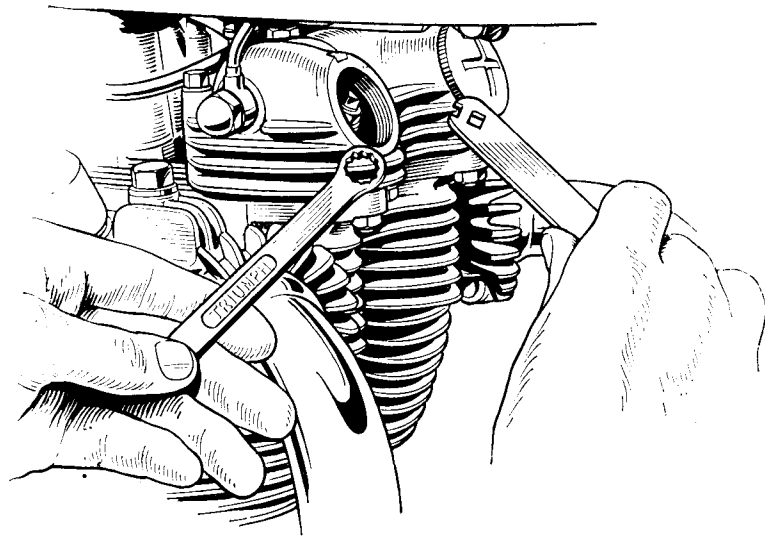


Fig. 2. To adjust the valve operating mechanism.

Inlet valves (Towards the rear of the engine)

Turn the rear wheel until one of the inlet rockers moves downwards, thus opening the valve. When this valve is fully open the operating mechanism of the other inlet valve will be seated on the base of the cam and the clearance can now be checked and adjusted if necessary. The clearance is 0.002 in. (0.05 mm.) and this means just the slightest perceptible movement of the rocker with a faint click when the clearance is taken up by moving the rocker with the fingers.

Having adjusted one inlet valve, turn the rear wheel until the valve which you have adjusted is now fully open and repeat the procedure for the other inlet valve.

Exhaust valves

Having adjusted the inlet valves proceed to the exhaust valves which are the ones at the front of the engine. Proceed in the same way as for the inlet valves and put one valve fully open whilst you check the clearance on the other. In this case the clearance will be 0.004 in. (0.10 mm.) To obtain this clearance adjust the tappet to give nil clearance and then turn back the adjuster one eighth of a turn (half a flat) on the squared adjuster. Hold the adjuster in this position whilst you tighten the lock nut. Repeat the procedure for the other exhaust valve.

Check that the inspection cap fibre washers are in good condition and replace the caps making sure that they are tight.

TO ADJUST THE BRAKES

Front brake

The adjustment of the front brake operating mechanism is by means of a knurled finger-operated nut incorporated in the handlebar abutment. Turn the nut anti-clockwise to take up the clearance in the operating cable. The exact setting will depend on the size of the rider's hand but the lever must not contact the handlebar when the brake is fully applied or the braking effect will be severely restricted.

NOTE. An alternative cable abutment is available to compensate for cable lengths that cannot be adequately catered for by the normal cable adjustment.

Rear brake

The rear brake pedal is adjustable for position and any adjustment for the pedal position should be made before adjusting the free movement. From the static position there should be about $\frac{1}{2}$ in. (1.2 cm.) of free movement before the brake starts to operate. The actual adjustment is by means of a finger operated nut on the rear end of the brake operating rod. Turn the nut clockwise to reduce the clearance.

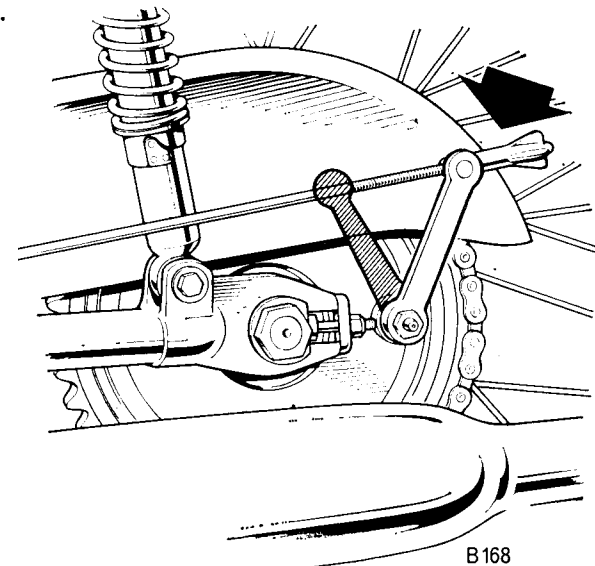
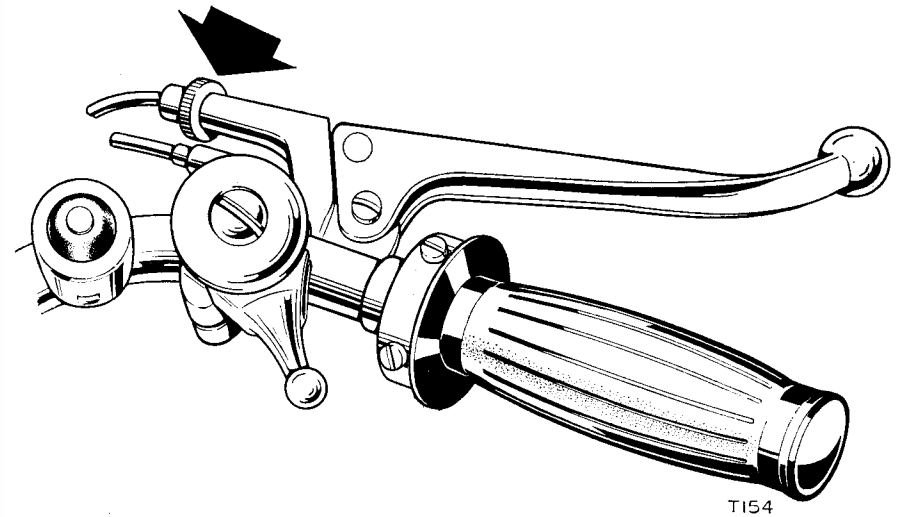


Fig. 3. Showing brake adjusters

TO ADJUST THE CHAINS

Primary chain

The primary chain is of the Duplex type and is not adjustable as the centres of the engine shaft and gearbox are fixed. Provision for the take-up of wear in the primary chain is made by means of a rubber-faced slipper blade below the bottom run of the chain. The free movement in the chain can be felt with a finger after removing the top inspection plug. Do not move the chain by using the starter pedal while your finger is inside the case. The correct chain adjustment is $\frac{1}{2}$ in. (1.2 cm.) free movement. To reduce the amount of slack remove the plug with the extended head from the bottom of the case and tighten the slotted adjuster nut at the rear end of the tensioner by using the short screwdriver No. D496 supplied in the toolkit. After replacing the plug in the bottom of the chaincase always remember to replenish the oil with $\frac{5}{8}$ pint (350 cc.) of SAE 20 grade.

Rear chain

The adjustment of the rear chain is controlled by draw bolts fitted to each end of the rear wheel spindle. The correct adjustment for the rear chain is $\frac{3}{4}$ in. (1.8 cm.) free movement with the machine on its wheels and the chain at its tightest point or $1\frac{3}{4}$ in. (4.3 cm.) with the machine on the stand and the chain at its slackest point. If the adjustment of the chain is outside these limits it should be corrected by loosening the wheel spindle nuts and the brake torque stay nut on the anchor plate and then adjusting the draw bolts an equal number of turns. Always apply the brake pedal to centralise the brake plate and keep it applied while you tighten the left spindle nut. Tighten the wheel spindle nuts and check the chain adjustment again. If the wheel alignment was correct originally the adjustment of the nuts by an equal number of turns should preserve that alignment but if you are doubtful whether the rear wheel is in line then you should use a straight edge or piece of string alongside the rear wheel, making allowance for the difference in section between the rear tyre and the front tyre and then tighten or loosen the draw bolt adjuster on the right side so that the rear wheel lines up with the front wheel. If the rear wheel is not in line the road holding of the machine will be adversely affected and the effect on the rear chain and rear wheel sprocket will cause rapid wear. When the adjustment is satisfactory check the tightness of the wheel spindle nuts, adjuster draw bolts and brake torque stay nuts. Finally check the adjustment of the brake operating rod.

A positive oil feed to the rear chain is taken from the return side of the oil tank. Provision for adjusting the rate of flow is made by removing the oil tank cap and operating a screw which will be observed in the oil tank neck. Turn the screw clockwise to reduce the flow and anti-clockwise to increase it.

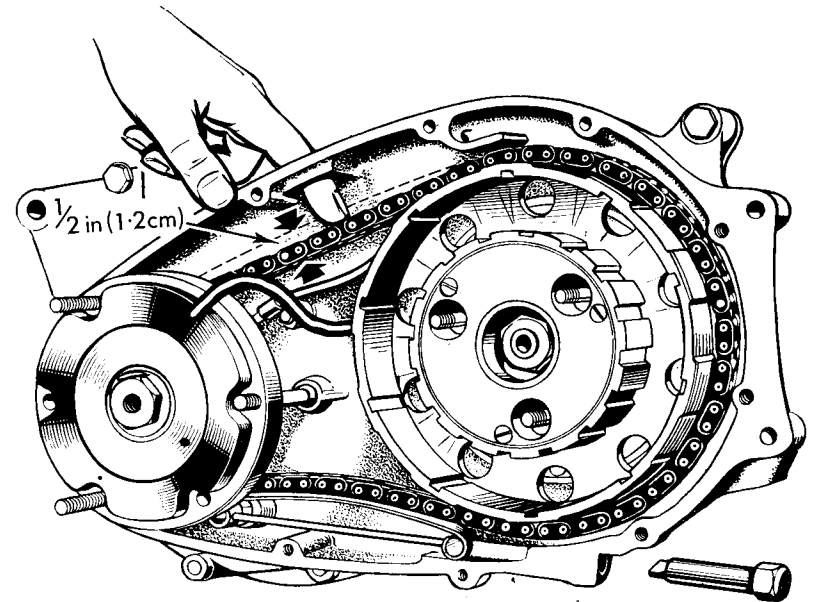


Fig. 4. To adjust the primary chain.

TO ADJUST THE CLUTCH AND THE CLUTCH OPERATING MECHANISM

The clutch is situated on the left side of the machine inside the primary chaincase. If the clutch is dragging and normal adjustment of the operating mechanism produces no improvement it will be necessary to remove the primary chaincase to adjust the three springs which provide the loading on the pressure plate. To remove the primary chaincase first take off the left exhaust pipe and swing the footrest and brake pedal out of the way. Place a tray underneath, and release the cover by unscrewing two domed nuts and eight screws. The three slotted nuts on the clutch should be tightened initially until the heads are flush with the end of the pins. The handlebar clutch lever should be pulled and the starter pedal operated whilst you watch the outermost plate of the clutch. This should lift

evenly and turn without wobbling. If one side of the plate is high the slotted nut nearest to it should be tightened as necessary until the pressure plate lifts and turns evenly. After replacing the cover replenish the oil with $\frac{5}{8}$ pint (350 cc.) of SAE 20 grade.

To adjust the clutch operating mechanism

When the clutch pressure plate lifts evenly it is then possible to adjust the clutch operating mechanism. Slacken off the adjustment at the handlebar end of the clutch cable and then screw in the adjuster situated in the centre of the pressure plate until the pressure plate just starts to lift. Screw back the adjuster one full turn and secure it with the locking nut. This adjustment can be carried out through the inspection hole in the primary chaincase if the chaincase has not been removed. Finally adjust the knurled nut at the handlebar abutment until there is approximately $\frac{1}{8}$ in. (3 mm.) free movement in the cable. If it is required to take up excessive cable slack, there is an adjuster fitted externally at the gearbox end of the cable.

To change the clutch cable

To remove the clutch cable slacken the adjustment at the handlebar and then at the gearbox end of the cable. Pull the upper end of the cable clear through the slotted adjuster and abutment of the handlebar lever and detach the nipple from the lever. At the gearbox end of the cable slide the rubber cover upwards clear of the adjuster and remove the large filler plug from the gearbox outer cover. With a finger through this orifice the clutch cable nipple can be pushed clear of the internal clutch lever.

To replace the clutch cable, first pass the lower end through the rubber cover. Screw the adjuster at the gearbox as far down as possible and engage the cable nipple with the internal clutch lever. Pass the upper end of the cable through the slotted adjuster and abutment of the handlebar lever and fit the cable nipple to the lever. Adjust the cable and finally slide the rubber cover over the adjuster at the gearbox end. Refit the filler plug.

TELESCOPIC FRONT FORKS

The only routine attention needed to the front forks is checking the adjustment of the steering head races and changing the oil. Use Summer or Winter grade as specified for the engine unit and change the oil in the Spring and Autumn even if the minimum mileage has not been covered.

To adjust the steering head races

The steering head races may require adjustment once or twice in the early stages of a machine's life but will rarely require attention after that. To check the adjustment, stand on the right side of the machine with the fingers of the left hand resting on the frame and the dust cover of the top bearing. With the right hand apply the front brake and rock the machine forward. Any play will be felt by the fingers of the left hand. To make the adjustment place the machine on the stand. Slacken the pinch bolt at the back of the fork top lug and tighten down the large sleeve nut on the fork stem until the play is just taken-up. The forks and wheel should turn freely from lock to lock without any dragging or hesitation. If the adjustment seems correct but the movement is rough or jerky then the steering head races are probably damaged and it will be necessary to replace them. When the adjustment is correct tighten the pinch bolt.

To change the oil in the telescopic forks

Remove the small sloping bolt immediately above the wheel spindle on the outside of each fork leg. Allow the oil to drain into a suitable container and then remove the last drops by pressing on the handlebars and pumping the forks up and down. Replace the drain bolts, making sure that the small fibre washers are in good condition. To replenish the fork legs remove the large chromium plated nuts at the top of the fork; this should be done on each side separately with the machine on the centre stand. The correct quantity for each leg is shown on page 6.

REAR SUSPENSION

The swinging fork pivots on bronze bushes which should be lubricated with a high pressure grease gun at least every 1,000 miles (1,600 Km) until grease is seen to be coming from the end of the left hand bush. There is one nipple only, beneath the centre of the fork bridge. If the mileage intervals are not convenient, for instance you may be away on holiday at the next time when greasing is due, then it is better to grease more frequently rather than to extend the interval. The movement is controlled by Girling combined coil spring and hydraulic damper units. The hydraulic damping mechanism is completely sealed but the static loading of the spring is adjustable. There is a three position castellated cam ring covered by a shroud below the chromium plated spring and a "C" spanner is provided in the toolkit. To increase the static loading of the spring, place the machine on the stand so that there is least load on the spring and use the "C" spanner to turn the cam; both units must be on the same notch whichever may be chosen.

A quick visual check can be made on this point from the rear of the machine as in Fig. 5. Comparing the exposed lengths of the units will establish that the loading is equal. To increase the static loading, turn the castellated cam ring in the direction shown.

The standard lowest position is for solo riding, the second position is for heavier solo riders or when luggage is carried on the rear of the machine and the third or highest position is for use when a pillion passenger is being carried.

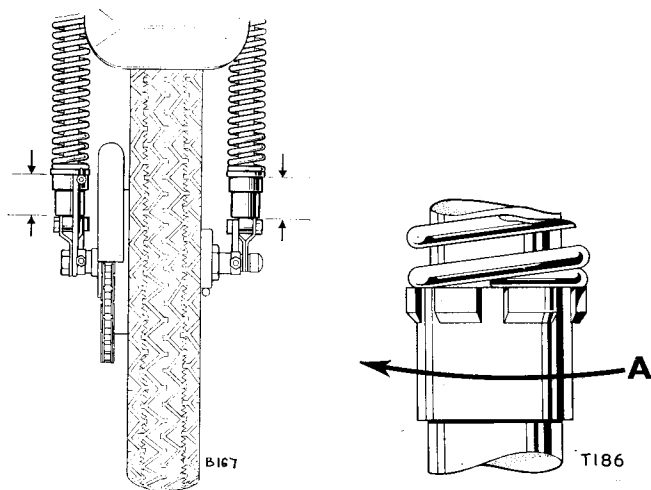


Fig. 5. To adjust the rear suspension springs.

WHEELS

The wheel bearings are filled with grease on assembly and this should be sufficient to last for approximately 12,000 miles (20,000 Km). In particularly dirty conditions it may be necessary to remove the bearings for cleaning and inspection at a lower mileage but this will usually be under cross-country conditions where the rider will be competent to take the decision to carry out this work. Always use the recommended grades of high melting point grease as hub temperatures rise during heavy braking and may cause a softer grease to melt and run into the brakes.

To remove the front wheel

Disconnect the brake operating cable by removing the spring pin at the bottom end. Unscrew the four bolts securing the two spindle caps to the fork legs, unscrewing each a little at a time until the four bolts are completely removed. By pressing down on the rear of the machine it will be possible to take out the wheel. To replace the front wheel engage the slot on the brake plate with the peg on the inside of the fork leg and place the spindle under the fork ends. Hold the caps in position and tighten the two bolts on the right hand leg completely before tightening on the left. This is to allow the end cap bolts to align properly in the wider left groove. Refit the brake cable and spring pin and adjust.

Rear wheel

There are two types of rear wheel; the standard type having the brake drum and sprocket bolted to the rear hub and the quickly detachable type where the wheel is splined to the brake drum and sprocket and can be removed leaving the chain and brake in position on the machine. All the bearings are of the non-adjustable ball journal type. The sprocket of the standard rear wheel is detachable and is held in place by eight bolts.

To remove the standard rear wheel

Slacken the bolt at the rear of the chainguard so that the chainguard can be swung upwards. Make sure that the machine is in gear so that the chain does not fall off the gearbox sprocket and then remove the connecting link. Unscrew the nut from the end of the brake operating rod and if necessary disconnect the snap connector in the lead to the brake stop light to ensure that the light does not remain on. Unscrew the nut which secures the brake torque stay to the anchor plate and finally unscrew the wheel spindle nuts and speedometer drive cable and remove the wheel.

Replacement is the exact reverse of the removal procedure but always check the chain adjustment and wheel alignment, see Page 16.

To remove the quickly detachable wheel

To remove the quickly detachable rear wheel unscrew the wheel spindle from the right side and drop out the distance piece between the wheel and the fork end and disconnect the speedometer cable. Pull the wheel clear of the splines on the brake drum and the wheel can then be removed. When replacing the wheel there may be a slight variation in the fit of the splines at various points. If time permits it is a good plan to select a position which is neither tight nor unduly loose and to mark this position with a small spot of paint on the brake drum and a corresponding spot on the hub. The wheel can then be easily replaced in this position at any future date.

There is also a rubber ring which is fitted over the splines on the wheel and is compressed slightly when the spindle is tightened. This ring keeps the splined joint clean and prevents backlash at the joint. If it is perished or damaged fit a new one.

Replacement of the quickly detachable wheel is the exact reverse of the removal procedure. If the right chain adjuster is not altered it will not be necessary to check the adjustment or wheel alignment, but if you have need to do so full instructions are on Page 16.

TYRES

The tyre size is 3.25 x 19 front and 3.50 x 18 in. rear. The pressure should be checked regularly, preferably every two weeks. After checking the pressure the metal cap should always be replaced as it forms a seal against dirt and also prevents accidental deflation of the tyre at high speeds.

The tyre pressures recommended below are suitable for a 12 stone (76 Kg.) rider and if a pillion passenger is carried the pressure in the rear tyre should be increased by 6 lbs./sq.in. and in the front tyre by 4 lbs./sq.in.

	Tyre size	Inflation pressure	
		lb./sq.in.	Kg./sq.cm.
Front	3.25	24	1.7
Rear	3.50	24	1.7

For further details consult the Dunlop or Avon booklet.

All front wheels are balanced complete with tyre and tube before leaving the factory and if the tyre is removed it should be replaced in the same position with the balancing spot level with the valve. If a new tyre is fitted the weights should be removed and the wheel re-balanced, adding weights as necessary until it will remain at rest in any position. Make sure that the brake is not binding while the balancing operation is being carried out.

BRAKES

The rear brake shoes are semi-floating to allow them to centralise themselves in the drum. In the case of the rear brake, the linings are at the trailing edges of the shoes and the shoes must be fitted to the anchor plate with the thrust pads against the fulcrum pin.

BRAKES—REAR

The rear brake shoes can be centralised by slackening the nut holding the brake plate, and applying the brake. The nut should then be tightened while still maintaining pressure on the brake. If a thin wrench is not available, it may be necessary to remove the wheel to carry out this operation by gripping the spindle in a vice fitted with soft jaw pads to prevent damage to the spindle threads. When obtaining replacement brake shoes note that the leading and trailing shoes are not interchangeable.

IGNITION TIMING

The ignition contact breaker is in the timing cover on the right of the motor, and is driven by the exhaust camshaft. There is a round chromium-plated cover over it held by two screws. To remove the timing cover, for instance to examine the oil pump, the contact breaker (cam and auto-advance assembly) must be released from the camshaft. To release the contact breaker remove the central bolt and use extractor tool D782 by screwing it into the end of the hollow spindle.

When replacing the contact breaker it must be positioned correctly relative to the exhaust camshaft. A pin is provided in the exhaust camshaft and a slot in the taper end of the auto advance spindle serves as a location. The average owner will find the following method the easiest when setting the ignition timing.

For timing purposes two alternative methods have been used for setting the engine in the 38° fully advanced position. The first utilises service tool D2195 and D572. By turning the engine over gently with the service tool fitted in place of the blanking plug at the top rear of the right hand crankcase, slight hand pressure on the plunger will enable this to locate with a slot cut into the flywheel for this purpose.

On later machines there are two slots in the flywheel, one at 38° and one at top dead centre (T.D.C.). When timing as above check with a sparking plug removed that the pistons are not at T.D.C. which would indicate the wrong slot being located. The T.D.C. plug is for degree plate use only.

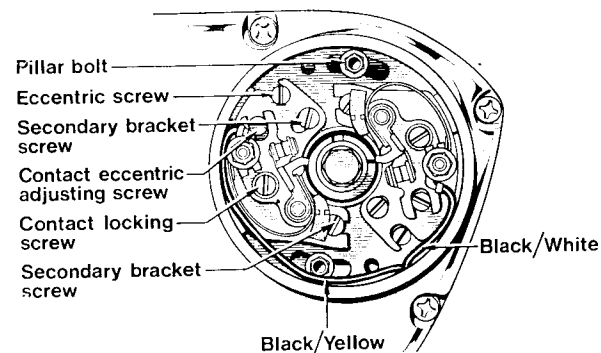


Fig. 6. Contact breaker, type 6CA.

The second method necessitates removal of the circular plate at the forward end of the primary chaincase. Through the aperture will be seen the timing marking on the rotor casting and this aligns with a pointer on the primary chaincase at the edge of the aperture. Placing the rotor marking in line with the pointer again gives the 38° timing position.

Remove both sparking plugs to facilitate turning over the engine. Set both sets of contact breaker gaps. (See Page 32). Set the engine at 38° B.T.D.C. with the contact breaker cam turned clockwise to the fully advanced position. Check the left hand points (Black and Yellow lead) which should just be starting to open. If they are not, slacken both the pillar bolts and turn the contact breaker main backplate. Turn clockwise if the points open too early and *vice versa*. When correct lock up the backplate, remove the flywheel locating plunger if used and turn the engine over slowly through 360° i.e. one revolution. Set the engine again at 38° B.T.D.C. Check the cam is still at the fully advanced position and check that the second set of contacts (Black and White lead) are just starting to open. If there is any discrepancy, slacken the secondary backplate top and bottom screws (Fig. 6) and using the eccentric adjuster screw move the backplate to achieve the correct opening point.

The timing is now correct. Re-lubricate the felts with 3 drops of clean engine oil and refit the cap.

SPARKING PLUG

The sparking plugs are 14 mm. thread x $\frac{3}{4}$ in. reach. The standard grade is Champion N3.

It may be advisable to consult your dealer before varying the grade of plugs, as he will know local conditions and your type of use. To remove a sparking plug use the box spanner and short tommy bar provided in the toolkit. If the plug is difficult to unscrew, pour some penetrating oil round the threads and allow it to soak before continuing.

Every 3,000 miles remove the sparking plugs and have them cleaned and tested on a plug cleaning machine. If there is no plug cleaning machine available use a penknife or wire brush to remove carbon deposit. Measure the gap with feeler gauges; the correct setting is 0.020 in. (0.50 mm.). To adjust the gap bend the side electrode but never the centre electrode. Every 10,000 miles fit new sparking plugs.

When replacing the plug smear a little graphite grease or engine oil round the threads and make sure the joint washer is in good condition. Tighten with the box spanner and short tommy bar provided in the toolkit.

TO CLEAN YOUR MOTORCYCLE

Do not attempt to remove dried road dirt from your motorcycle, but use a copious supply of water from a hose or bucket containing some proprietary cleaner. Do not direct the water into the electrical system, air cleaner or brakes. Do not use abrasive cleaners on chromium plating but treat it in the same way as the painted surfaces. When the motorcycle is clean and dry, apply a wax polish.

TO CHANGE THE OIL

Whilst the machine is new it is necessary to change the oil in the engine and oil tank, gearbox and primary chain case. The reason for this is that the running-in process previously mentioned is a type of controlled wearing and minute particles of metal are produced in this process particularly during the very early stages.

The Dealer will drain the engine and oil tank, and clean out the gauze filter in the tank during the 500 mile free service.

It is advisable to have this operation carried out again at 1,000 miles and at the same time have the gearbox and primary chaincase drained and flushed. Whenever the oil is changed it is advisable to do it when the oil is hot and when the majority of the foreign matter is in suspension.

ENGINE AND OIL TANK

There is a gauze strainer in the crankcase which is removable for cleaning by unscrewing the hexagon-headed plug which slopes from left to right under the engine. Remove the drain plug and disconnect the feed pipe at the threaded union and unscrew the upper part of the union which has attached to it the oil tank gauze filter. Rinse the filters in clean paraffin or kerosene. Remove all foreign matter from the inside of the tank and finally rinse it in the same way. Replace the filters, with new fibre washers when necessary, and replenish the oil tank. The oil tank filler cap has a dipstick indicating the "Full" position for refilling. Start the engine and immediately check that the oil is returning to the tank. The filler cap dipstick is calibrated "Add one pint" for topping up purposes.

GEARBOX

The drain and level plugs are situated underneath the gearbox. To drain the gearbox remove the assembly. When you are ready to replenish the gearbox replace only the drain plug with the level tube and then add oil to the gearbox through the top filler hole until oil just begins to flow down the level tube, then replace the level plug.

When checking the level remember that normally there will be some oil trapped in the level tube which should be allowed to drain before topping up commences.

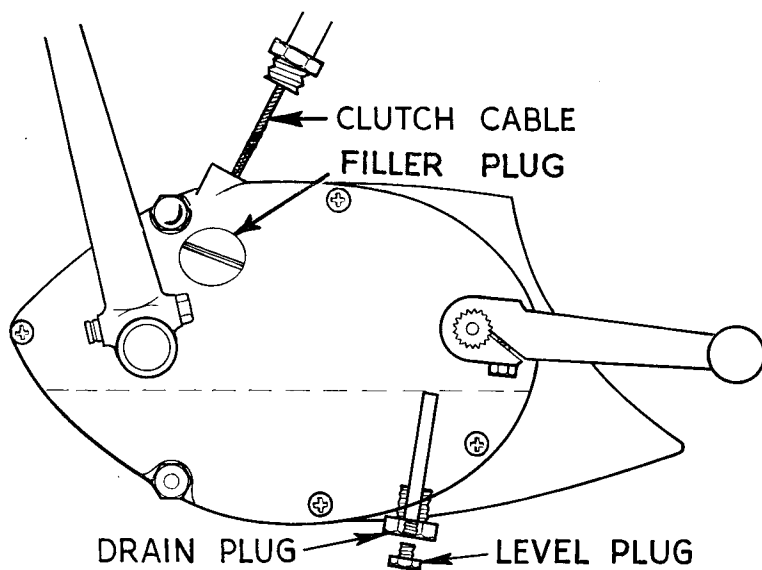


Fig. 7. Gearbox drain and level plugs.

PRIMARY CHAINCASE

The primary chaincase oil level is automatically maintained by the engine crankcase breathing system. Only after the lubricant has been drained off or lost during adjustment of the primary chain is it necessary to refill using the level plug at the front of the outer portion of the chaincase at the 7 o'clock position. The drain plug is in the bottom of the outer portion of the chaincase.

THE AMAL CONCENTRIC CARBURETTER

How it operates

When the engine is idling, mixture is supplied from the pilot jet system, then as the throttle slide is raised, via the pilot by-pass. The mixture is then controlled by the tapered needle working in the needle jet and finally by the size of the main jet. The pilot system is supplied by a pilot jet, which is not detachable and which is located in the float chamber. The main jet does not spray directly into the mixing chamber but discharges through the needle jet into the primary air chamber and the fuel goes from there as a rich petrol-air mixture through the primary air choke into the main air choke.

This primary air choke has a compensating action in conjunction with bleed holes in the needle jet, which serve the double purpose of air-compensating the mixture from the needle jet and allowing the fuel to provide a well, outside and around the needle jet, which is available for snap acceleration.

Adjustment of carburetter parts

Throttle stop screw. This screw should be set to open the throttle sufficiently to keep the engine running at a slow tick-over, when the twistgrip is closed.

Pilot air screw

To set the idling mixture, this screw should be set in to enrich or out to weaken, normal number of turns out from full in is about $2\frac{1}{2}$. The screw controls the suction on the pilot jet by metering the amount of air which mixes with the petrol.

Needle and needle jet

Machines are delivered from the factory with the needle in the correct location. Do not attempt to readjust the setting without expert advice.

Throttle valve cut-away

The amount of cut-away is recorded by a number marked on the throttle, viz. 928/ $2\frac{1}{2}$ means throttle type 928 with No. $2\frac{1}{2}$ cut-away; a larger cut-away such as 4 gives a weaker mixture or a smaller such as 3 gives a richer mixture.

For settings see Useful Data on Page 6.

Air filter

The air filter has a cloth and gauze element. To detach the element, release the clip on the perforated metal rim. Blow the element clean with compressed air whilst tapping it gently at the same time. Never oil the element in this type of filter.

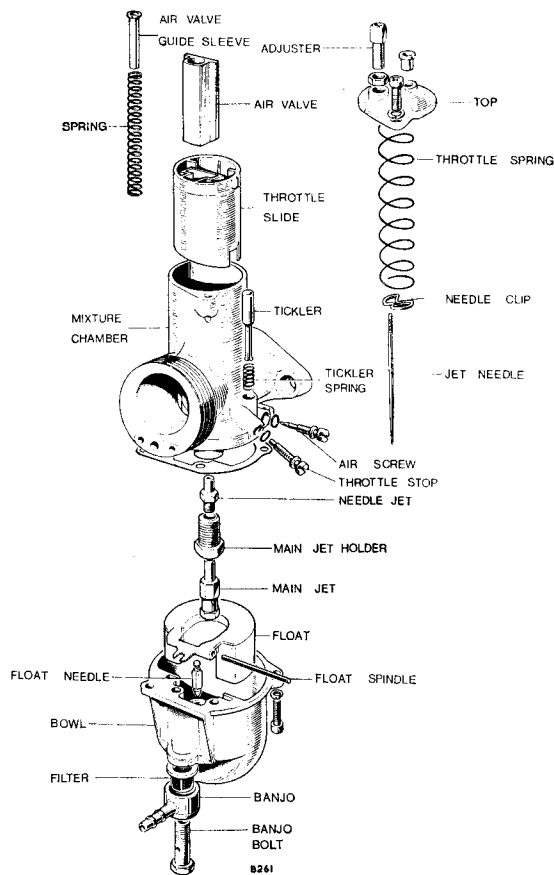


Fig. 8. Amal concentric carburettor.

Twin carburetters

The twin carburetters fitted to the T120 may require synchronisation and a simple method is as follows:—First adjust the cables from the junction box so that they have the minimum of free play. Now start the motor and take off one plug lead and then adjust the pilot air screw and throttle stop screw in the OPPOSITE carburettor until the motor runs regularly. Replace the plug lead and repeat the process similarly for the other carburettor. With both plug leads replaced the tickover will be too fast and the stop screws should be lowered simultaneously until correct. It is most important the throttle slides lift simultaneously or the motor will run roughly, particularly when accelerating.

Effect of altitude on carburation. Increased altitude tends to produce a rich mixture. The greater the altitude, the smaller the main jet required. As supplied from the factory, carburettor settings are suitable for altitudes of up to 3,000 feet approximately. Machines used constantly at altitudes between 3,000 and 6,000 feet should have the main jet size reduced by 5 per cent and thereafter for every 3,000 feet in excess of this, further reductions of 4 per cent should be made.

ELECTRICAL EQUIPMENT

The electrical system is supplied from an alternating current generator contained in the primary chaincase and driven from the crankshaft. The generator output is then converted into direct current by a silicon diode rectifier. Direct current is supplied to the battery with a Zener diode in circuit to regulate the current that the battery receives, this depending entirely on the state of charge of the battery.

The current is then supplied to the ignition system which is controlled by a double contact breaker driven direct from the exhaust camshaft. The contact breaker feeds two ignition coils, one for each cylinder. In the case of a flat battery the machine can still be started without difficulty by switching on the ignition as with the normal starting procedure.

The routine maintenance needed by the various components is set out in the following paragraphs. All electrical components and connections including the earth points to the frame of the machine must be CLEAN and TIGHT.

Contact breaker unit, Type 6CA

The contact breaker is contained behind the round chromium-plated cover held by two screws on the right side of the motor. See Fig. 6, Page 25. The nylon heels of the moving contacts may settle down initially and it is necessary to check both contact breaker gaps after 500 miles. After checking, apply 3 drops of engine oil to each lubricating wick.

To adjust the contact breaker gap, turn the motor with the starter pedal until the scribe mark on the cam aligns with the nylon heel of one set of points. Measure the gap (0.015 in.) with feeler gauges. If they are outside the limits, slacken the slotted nut which secures the stationary contact and move the contact until the gap is correct, then tighten the slotted nut. Turn the motor forward until the second pair of contacts just open and adjust them in the same way.

Every 3,000 miles subsequently, inspect the contact breaker points and if they are burnt or pitted remove them from the base plate and clean them with fine emery cloth. Wipe with a clean cloth moistened with petrol. Replace the contacts on the base plate making sure that any insulating washers are in their correct positions. Adjust the gap and then clean the second pair of contacts. Place a few drops of clean engine oil on the centrifugal automatic advance mechanism and one or two drops on the felt pads which lubricate the cam.

Two drops of oil should also be applied to the spindle which supports the cam to prevent subsequent corrosion. Do not allow any oil on the contacts. Initially the lubricating wicks are treated with Shell Retinax A grease and thereafter, 3 drops of engine oil should be added to the wicks at 1,500 mile intervals.

Ignition coils, Lucas type 17M12

The twin ignition coils are mounted to the frame beneath the petrol tank. Keep the tops of the coils clean particularly beneath the electrical terminals. Inspect the cables for frayed wires or

damaged insulation. Any damaged cable must be replaced. The coils should be positioned so they cannot short circuit against the petrol tank. Resistive H.T. leads are fitted. There is no wire core, and therefore the terminal ends must be carefully fitted.

Battery, Type PUZ5A (single 12 volt)

The lead/acid battery is carried beneath the hinged twin seat. Keep the top and the terminals clean. During charging the battery produces gas and this may carry some acid. Wipe up any liquid as it will cause corrosion if it is allowed to remain on metal parts. Check the acid level every week. This should be just above the plates. The negative (-ve) terminal of the battery passes battery voltage to the main harness through a 35 ampere line fuse.

Lighting switch, Type S45

The lighting switch is of the toggle type mounted in the headlamp shell. It is of the sealed variety and if a fault is suspected, test by substituting another switch.

Ignition switch, Type S45

It is of the barrel type using non-identical "Yale" type keys. The owner should make a note of the key number to ensure correct replacement in case of subsequent loss. No emergency start position is incorporated in the switch, as the machine will start with the switch in the normal ignition position, even with a "flat" battery.

Stoplamp switches

Switches are fitted front and rear. The front switch is fitted into the brake cable and the rear to the rear chainguard, operated by the rear brake rod. The switches are sealed units but the rear one can be adjusted for position.

Alternator, Type RM19

The alternator is contained in the primary chaincase and has no wearing parts. Check that the three snap connectors are clean and tight in the output cable to the rear of the engine unit.

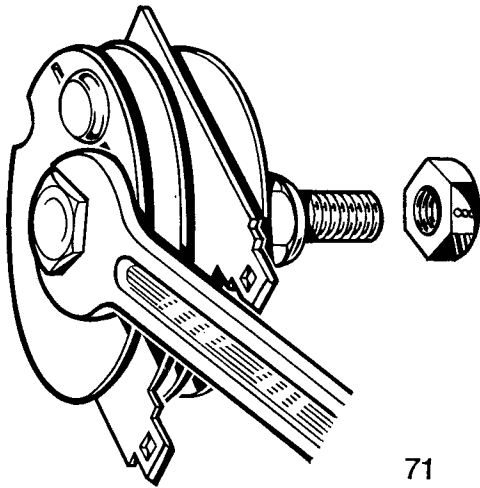


Fig. 9. To secure the rectifier.

Windtone horns T120 only.

Twin windtone horns are fitted beneath the front of the petrol tank. The relay is mounted beneath the tank. These units are non-adjustable and require no maintenance beyond an occasional check on the cleanliness and security of electrical connections.

Rectifier, Type 2DS506

The central fixing bolt of the rectifier must make electrical contact with the frame of the motorcycle. When tightening a rectifier hold the spanners as shown in the illustration above. Never disturb the self-locking nut which clamps the plates together. If the plates are twisted the internal electrical connections will be broken. Note that the fixing bolt and nut are $\frac{1}{4} \times 28$ U.N.F. thread and are both marked by circles to indicate this thread form.

ZENER DIODE

The Zener diode is a small electronic device that acts as a by-pass valve to divert surplus charging current away from the battery. It acts as a voltage regulator and controls the current into the battery, and is mounted on a finned "heat sink" below the headlamp to ensure efficient cooling. Care must be taken therefore not to impair the flow of air around the heat sink. Do not fit the tag on the red earthing wire between the diode and the heat sink.

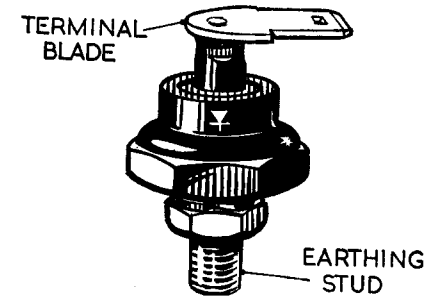


Fig. 10. Zener diode, Model ZD715

Providing the diode and its heat sink are kept clean, to ensure maximum efficiency, no maintenance will be necessary.

Caution. The body of the Zener diode is made of copper to ensure maximum heat conductivity. This means that the fixing stud has a relatively low tensile strength, and should not be subjected to a tightening torque greater than 2 lbs. ft. (27.6 kg.cm.).

Fuse

A line fuse is included in the electrical circuit and is located in the battery live lead. It consists of a plastic tubular holder with a standard 35 ampere rating fuse spring loaded and held in position by a bayonet type fixing cap on the end of the holder. It may be necessary to increase the fuse rating if additional electrical equipment is subsequently fitted to the machine.

If the motorcycle engine at any time appears to run erratically first check that the fuse has not blown, and then ascertain the cause before making a replacement.

ROUTINE MAINTENANCE

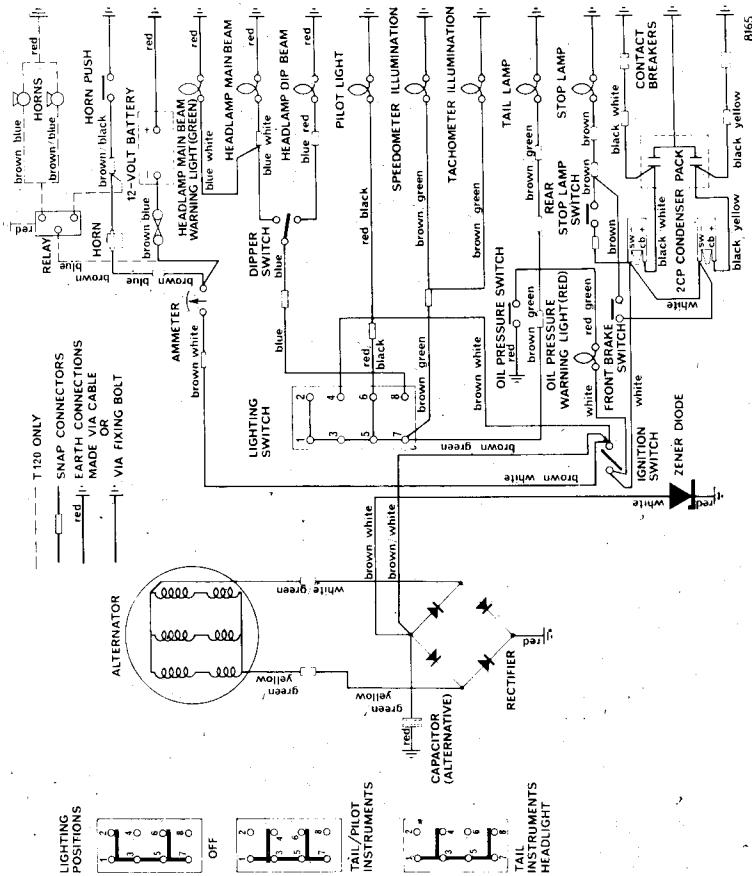
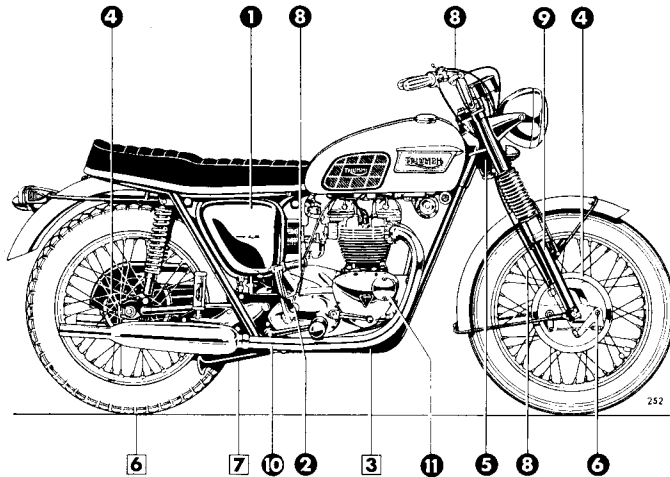


Fig. 11. Wiring Diagram

Every week. Check battery acid level	...	...	...	33
Every two weeks. Check tyre pressure	...	...	...	23
Every 250 miles (400 Kms.)				
Check level in oil tank	...	...	...	27
Every 1,000 miles (1,600 Kms.)				
Lubricate and adjust control cables including brakes	General			
Grease swinging fork pivot	...	...	...	19
Check front chain adjustment	...	...	...	16
Check rear chain adjustment	...	...	...	16
Check nuts, bolts and screws for tightness	General			
Every 1,500 miles (2,400 Kms.)				
Change engine oil	...	...	...	27
Lubricate contact breaker	...	...	...	32
Every 3,000 miles (4,800 Kms.)				
Check gearbox oil level	...	...	...	28
Check front forks for external oil leakage	...	...	...	19
Check adjustment of valve operating mechanism	...	...	...	12
Clean and adjust sparking plugs	...	...	...	26
Clean and adjust contact breaker	...	...	...	32
Clean air filter	...	...	...	30
Clean carburetter	...	...	...	29
Every 6,000 miles (9,600 Kms.)				
Change oil in gearbox	...	...	...	27
Change oil in front forks	...	...	...	19
Every 12,000 miles (19,200 Kms.)				
Grease wheel bearings	...	...	...	Workshop Manual
Grease steering head bearings	...	...	...	Workshop Manual

GUIDE TO LUBRICATION POINTS

Illustration No.	Description	SAE Oil grade
1	Engine oil tank	20 or 30
2	Gearbox	50
3	Primary chaincase	20
4	Wheel hubs	Grease
5	Steering head	Grease
6	Brake cam spindle	Grease
7	Brake pedal spindle	Grease
8	Exposed cables	20
9	Telescopic fork	20 or 30
10	Swinging fork pivot	Grease
11	Contact breaker	20
—	All brake rod joints and pins ...	20



Numbers in circles refer to right side of machine.
Numbers in squares refer to left side of machine.

Fig. 12. Lubrication points.

RECOMMENDED LUBRICANTS

UNITED KINGDOM

UNIT	MOBIL	B.P.	CASTROL	ESSO	SHELL	REGENT/ TEXACO
Engine and Primary Chaincase		B.P. Super Visco-Static 20W/50	Castrol GTX			Havoline 20W/50
Summer	Mobiloil Super 10W/50	10W/30	Castrolite	Uniflo	Shell Super 100 or Super Super 101	Havoline 20/20W
Winter						Multigear EP 90 Lubricant
Gearbox	Mobilube GX 90	B.P. Gear Oil 90 EP	Castrol Hypoy	Esso Gear Oil GX 90/140	Shell Spirax 90 EP	
Telescopic Fork—Summer	Mobiloil Super 10W/50	Energol SAE.30	Castrol XL Castrolite	Uniflo	Shell X-100 30 Shell X-100 20W	Havoline 30
—Winter		Energol SAE.20W					Havoline 20-20W
Wheel Bearings	Mobilgrease MP	Energrease L2	Castrol LM Grease	Multipurpose Grease H	Shell Retinax A	Marfak
Swinging Fork	Mobilgrease Special					
Easing Rusted Parts	Mobil Handy Oil	Energol Penetrating Oil	Castrol Penetrating Oil	Esso Penetrating Oil	Shell Donax P	Graphited Penetrating Oil

RECOMMENDED LUBRICANTS

OVERSEAS

UNIT	MOBIL	B.P.	CASTROL	ESSO	SHELL	TEXACO
Engine and Primary Chaincase Over 90°F. ... 32° to 90°F. ... Below 32°F. ...	Mobiloil Super 10W/50	B.P. Super Visco-Static 20W/50 10W/30	Castrol GTX or XL Castrolite	Uniflo	Shell Super 100 or Shell Super 101	Havoline 20W/50 Havoline 20/20W
Gearbox ...	Mobilube GX 90	B.P. Gear Oil 90 EP	Castrol Hypoy	Esso Gear Oil GP 90/140	Shell Spirax 90 EP	Multigear Lubricant EP 90
Telescopic Fork Above 90°F. ... Below 90°F. ...	Mobiloil Super 10W/50	Energol SAE 30 Energol SAE 20W	Castrol XL Castrolite	Uniflo	Shell X-100 30 Shell X-100 20W	Havoline 30 Havoline 20-20W
Wheel Bearings, Swinging Fork, Steering Races ...	Mobilgrease MP Mobilgrease Special	Energol L2	Castrol LM Grease	Multipurpose Grease H	Shell Retinax A	Marfak All Purpose
Easing Rusted Parts ...	Mobil Handy Oil	Energol Penetrating Oil	Castrol Penetrating Oil	Esso Penetrating Oil	Shell Donax P	Graphited Penetrating Oil

IMPORTANT NOTE

The fitting of components which are not approved by the manufacturer invalidates the guarantee.

The following additional publications are available for owners who wish to have more comprehensive information on their machines.

- (a) Fully comprehensive workshop manual covering the dismantling and reassembly of individual components. It also includes a "General Data" section giving all the information likely to be required by professional repairers or private owners.
- (b) Replacement Parts Catalogue No. 8.

The above publications must be obtained through local Triumph stockists.

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