



OWNER'S HANDBOOK

FOR

UNIT CONSTRUCTION

650 c.c. TWIN

FROM ENGINE No. DU.101

See Bookmarks

**TRIUMPH ENGINEERING CO. LTD.
MERIDEN WORKS · ALLESLEY · COVENTRY · ENGLAND**

TELEPHONE: MERIDEN 331

TELEGRAMS "TRUSTY, COVENTRY"

REF. 945/65

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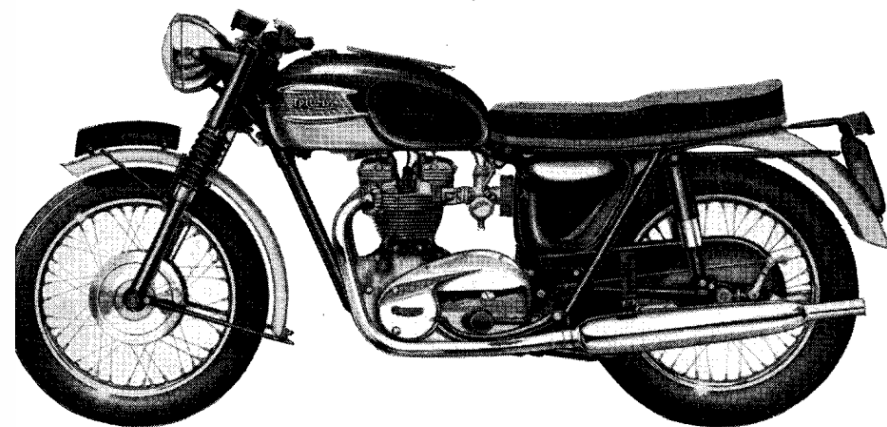
INTRODUCTION

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., King's Road, Tyseley, Birmingham, 11.
Sparking plugs: Champion Sparking Plug Co. Ltd., Feltham, Middlesex.
Speedometer: Smiths Motor Accessories 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. TRIUMPH TROPHY TR6.

USEFUL DATA

	6T	TR6	T120
ENGINE			
Bore and Stroke—mm.	71 x 82	71 x 82	71 x 82
Bore and Stroke—in.	2.79 x 3.23	2.79 x 3.23	2.79 x 3.23
Capacity—c.c.	649	649	649
Capacity—cub. in.	40	40	40
Compression Ratio	7.5 : 1	8.5 : 1	8.5 : 1
Power Output B.H.P. @ r.p.m.	34 @ 6,300	40 @ 6,500	46 @ 6,500
Tappet Clearance, Inlet and Exhaust			
—in. (Cold)	0.002, 0.004	0.002, 0.004	0.002, 0.004
Tappet Clearance—mm.	0.05, 0.10	0.05, 0.10	0.05, 0.10
Valve Timing			
@ 0.020 in. (0.50 mm.)	I.O.	25°	34°
	I.C.	52°	55°
	E.O.	60°	48°
	E.C.	17°	27°
Clearance for checking			

	6T	TR6	T120
IGNITION—Static Timing (Before top centre)			
Crankshaft position (Eng. No. DU101-5824)	7°	11°	11°
(After Eng. No. DU5825)	11°	15°	15°
Piston position—in. (Eng. No. DU101-5824)	1/64	1/32	1/32
	(0.4 mm)	(0.79 mm)	(0.79 mm)
(After Eng. No. DU5825)	1/32	1/16	1/16
	(0.79 mm)	(1.58 mm)	(1.58 mm)
Contact Breaker Gap—in. ...		0.014—0.016	
Contact Breaker Gap—mm. ...		0.35—0.40	

SPARKING PLUGS

Type ...	Champion N4
Point Gap ...	0.020 in. (0.50 mm.)

CAPACITIES

Fuel Tank ...	4 galls. (18 litres)
Oil Tank ...	5 pints (3 litres)
Gearbox ...	$\frac{7}{8}$ pint (500 c.c.)
Primary Chaincase ...	$\frac{3}{8}$ pint (350 c.c.)
Front Forks (each leg) Eng. No. DU101-5824	$\frac{1}{2}$ pint (150 c.c.)
Front Forks (each leg) After Eng. No. DU5825	$\frac{1}{3}$ pint (190 c.c.)

		TR6		T120	
CARBURETTER					
Amal Type ...	376	376	389	376	389
Main Jet ...	230	250	310	240	260
Needle Jet ...	.106	.106	.106	.106	.106
Needle Type ...	C	C	D	C	D
Needle Position ...	3	3	1	2	3
Throttle Valve ...	376/4	376/3 $\frac{1}{2}$	389/3 $\frac{1}{2}$	376/3 $\frac{1}{2}$	389/3
Pilot Jet ...	25	25	25	25	25

After Engine No. DU5825 TR6 and T120 have 389 type carburettors.

SPROCKETS

Gearbox, Solo ...	20	19	19
Gearbox, Sidecar ...	18	17	17
Rear Wheel ...	46	46	46

CHAINS

Primary $\frac{3}{8}$ in. pitch Duplex, links	84	84	84
Secondary $\frac{5}{8}$ in. pitch x $\frac{3}{8}$ in. wide, links solo ...	103	103	103
$\frac{5}{8}$ in. pitch x $\frac{3}{8}$ in. wide, links sidecar ...	102	102	102

	6T	TR6	T120
GEAR RATIOS			
	Solo Sidecar		Solo Sidecar
4th Top ...	4.60	5.11	4.84 5.41
3rd Third ...	5.47	6.08	5.76 6.44
2nd Second ...	7.77	8.64	8.17 9.15
1st Bottom ...	11.43	12.51	11.8 13.4
Engine R.P.M. @ 10 m.p.h. Top Gear	616	685	630 705

TYRE SIZE

Front ...	3.25 x 18	3.25 x 19	3.25 x 18
Rear ...	3.50 x 18	4.00 x 18	3.50 x 18

TYRE PRESSURE

Front lb./sq. in. (kg/sq. cm.) ...	20 (1.4)	20 (1.4)	20 (1.4)
Rear lb./sq. in. (kg/sq. cm.) ...	20 (1.4)	18 (1.3)	20 (1.4)

BULBS

Headlight 6v. 30/24W Pre-focus ...	Lucas 373	Lucas 312	Lucas 312
12v. 50/40W Pre-focus ...	Lucas 414	—	—
Parking Light 6v. 6W M.C.C. ...	Lucas 988	Lucas 988	Lucas 988
12v. 4W M.C.C. ...	Lucas 222	—	—
Stop & Tail Light 6v. 6/18W Offset pin	Lucas 384	Lucas 384	Lucas 384
12v. 6/21W Offset pin	Lucas 380	—	—
Speedometer 6v. 2W Special ...	Smiths P.52305	Smiths P.52305	Smiths P.52305
6v. 3W M.E.S. ...	—	Lucas 990	Lucas 990
12v. 2W M.E.S. ...	Lucas 987	—	—
Fuse rating (amperes)	25	25	25

OVERALL DIMENSIONS

Length—in. (cms.) ...	84 (213.5)	84 $\frac{1}{2}$ (214.5)	84 (213.5)
Width—in. (cms.) ...	27 $\frac{1}{2}$ (70)	27 (68.5)	27 (68.5)
Overall Height—in. (cms.) ...	38 (96.5)	38 (96.5)	38 (96.5)
Weight—lbs. (kg.) ...	370 (168)	363 (165)	363 (165)

COLOUR

... ..	Black/ Silver	Regal Purple/Silver	Alaskan White
After Eng. No. DU5825		Hi-Fi Scarlet/ Silver	Alaskan White/Gold
After Eng. No. DU13375		Burnished Gold/ Alaskan White	Pacific Blue/ Silver

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 m.m. (3.23 in.). The engine is lubricated by pressure through a plunger pump from a 5 pint (3 litre) tank on the frame, the oil draining to 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 wheel size is 18 in. (45.2 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 in. (8.9 cm.) section tyre with a 7 in. (17.8 cm.) diameter brake. The TR6 model has a 3.25 x 19 in. (8.25 x 48.3 cm.) front wheel with a 4.00 x 18 in. (10.2 x 45.2 cm.) rear wheel.

The electrical system is supplied from an alternating current generator contained in the primary chaincase and driven from the crankshaft. The output is controlled by the lighting and ignition switches and fed through a rectifier to a 6 volt battery or two 6 volt batteries in series on 12 volt models. Ignition is by two coils controlled by a double contact breaker driven off the exhaust camshaft.

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.

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

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

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

ON THE CENTRAL NACELLE

Speedometer. Indicates the speed and registers total and trip mileage. To set the trip indicator to zero twist the knob clockwise.

Ignition switch. On left side, operated by a key. Turn the key clockwise to switch on ignition. In an emergency, i.e. discharged battery, press in the key and turn it anti-clockwise; start the engine and switch to the normal ignition position.

Lighting switch. On right side, operated by a knob. Turn knob clockwise one notch for parking lights. Turn clockwise to second notch for full lights.

N.B.—TR6 and T120 have the lighting and ignition switches on the left side panel below the seat.

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

Steering damper. The large knob on the nacelle. Turn it clockwise to increase the friction on the steering for rough roads.

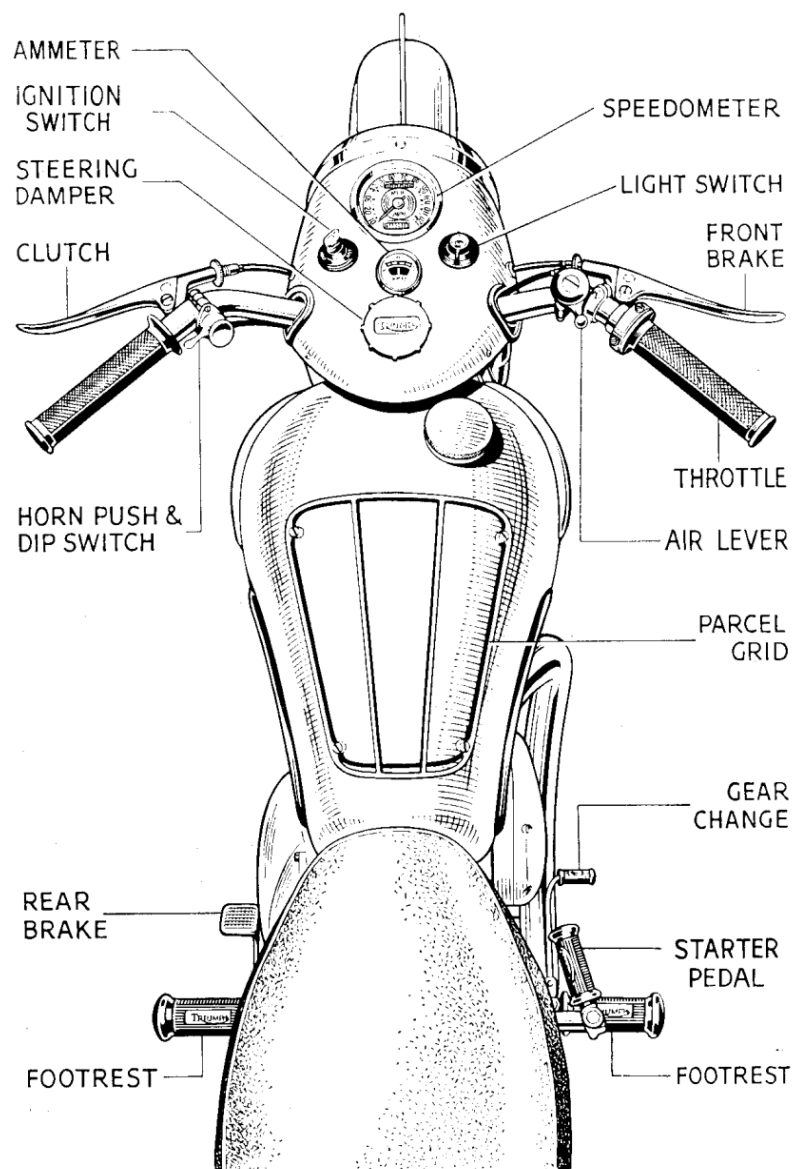


Fig. 1 Control Layout

ON THE MACHINE

Oil pressure indicator. (If fitted). At the front of the engine on the right side. The button should protrude about $\frac{1}{2}$ in. (1.2 cm.) when the engine is started from cold and about $\frac{1}{4}$ in. (0.6 cm.) at 2,000 r.p.m. (equivalent to 30 m.p.h. in top gear) when hot. When the engine is idling with the oil hot the button may not protrude at all.

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 (100 octane is not necessary) 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 carburettor 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.

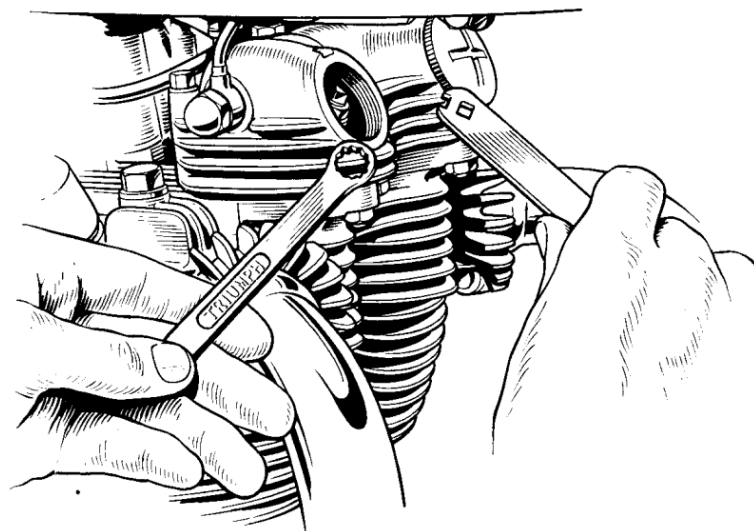


Fig. 2. To adjust the valve operating mechanism.

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.

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.

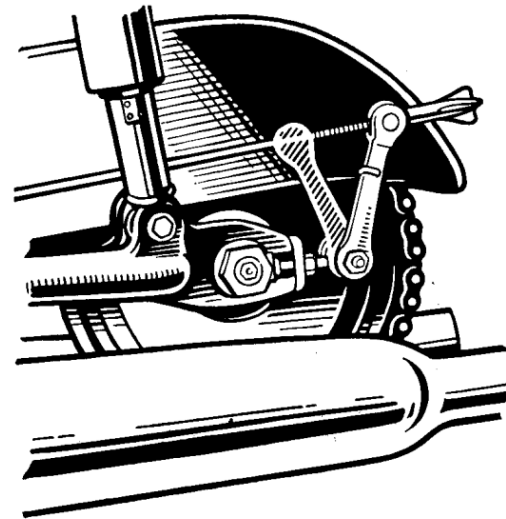
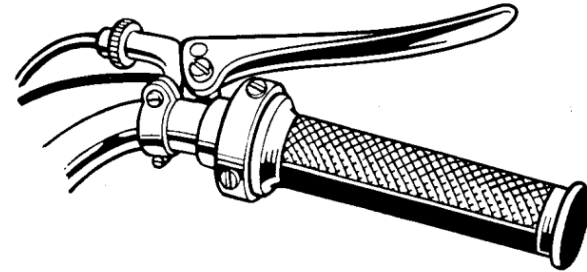


Fig. 3. To adjust the brakes.

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.

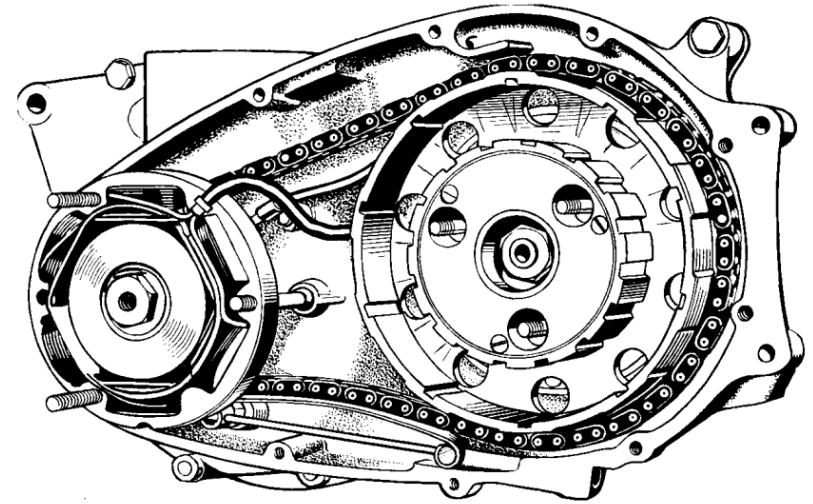


Fig. 4. To adjust the primary chain.

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 handle-bar 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.

To change the clutch cable

To remove the clutch cable slacken the adjustment at the handlebar abutment and then remove the pivot pin from the handlebar lever. Turn the lever and detach it from the cable. Slide the barrel nipple from the small nipple soldered to the cable and detach the cable completely from the abutment and adjuster. At the gearbox end of the cable slide the rubber cover upwards to give sufficient clearance and then lift the outer cover of the cable until the slotted ferrule can be removed. Unscrew the abutment from the gearbox outer cover and then lift it upwards until the cable can be detached from the slotted nipple.

To replace the clutch cable, first pass it through the rubber cover and bottom abutment complete with fibre washer. Engage the cable nipple with the slotted nipple and tighten the abutment. Replace the slotted ferrule and slide the rubber cover into position. Pass the cable through the adjuster and abutment at the handlebar end and fit the barrel nipple. Fit the lever to the nipple with the long part of the lever towards the front of the machine, then turn the lever to its normal position and fit the pivot pin and nut. Adjust the mechanism as described above.

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 reaching down behind the nacelle and 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 and unscrew the steering damper knob. Slacken the pinch bolt at the back of the fork top lug and tighten down the large adjusting 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 and replace the steering damper knob.

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 on the nacelle-equipped models remove the headlamp light unit and insert the oil through the small filler plugs, one in either fork leg, using an oil gun. The correct quantity for each leg is shown on page 6.

On the Sports models with separate headlamp it will be necessary to remove the large chromium plated nuts at the top of the fork, and this should be done on each side separately with the machine on the centre stand.

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 both bushes. 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 cam ring below the chromium plated dust cover 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.

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.

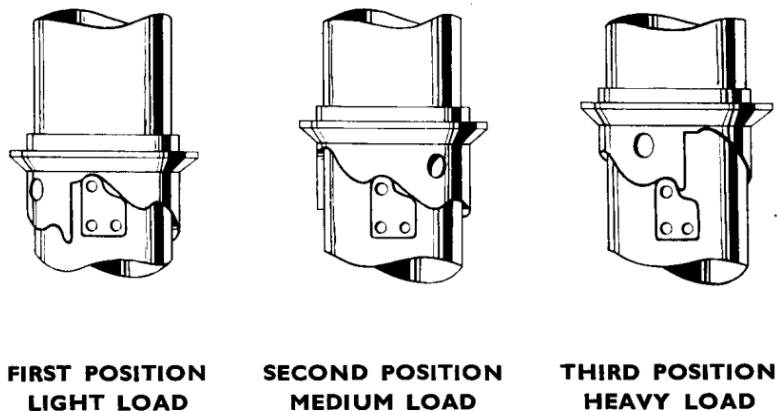


Fig. 5. To adjust the rear suspension springs.

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 split pin and clevis 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 four bolts a little at a time until they are fully home. Connect the brake cable and replace the clevis pin and split pin.

Slacken the nut on the brake plate near the anchor peg and apply the brake hard to centralise the shoes before tightening the nut.

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. With the exception of the bearings in some quickly detachable wheels all the bearings are of the non-adjustable ball journal type. The bearings in some quickly detachable wheels are of the taper roller type and are adjustable by means of two nuts close up against the wheel on the right side. The inner nut is the adjuster and the outer nut is the locknut. It is possible to spin taper roller bearings even when they are heavily pre-loaded and there must be about $\frac{1}{64}$ in. (0.4 mm.) side play at the wheel rim.

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 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. 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 18 or 3.25 x 19 front and 3.50 or 4.00 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			20	1.4
Rear	3.50			20	1.4
Rear	4.00			18	1.3

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 front and rear brake shoes are semi-floating to allow them to centralise themselves on the fulcrum pin. The liners are at the trailing end of the shoes and the shoes must be fitted to the plate with thrust pads against the fulcrum pin. See fig. 6.

When obtaining replacement brake shoes note that the leading and trailing shoes are not interchangeable in either the front or rear brake.

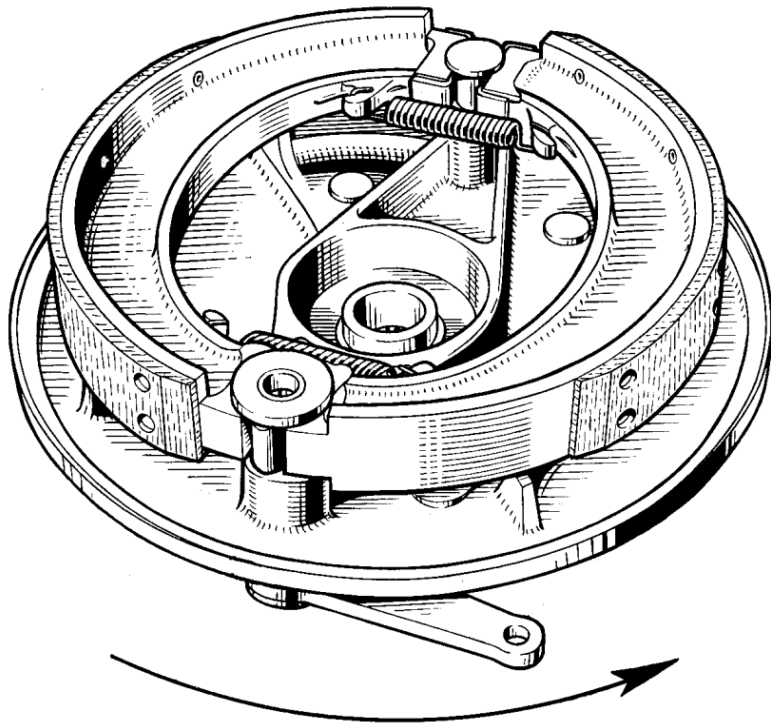


Fig. 6. To replace the brake shoes.

IGNITION TIMING

The ignition contact breaker is in the timing cover on the right of the engine, and is driven by the exhaust camshaft. There is a circular chromium-plated cover over it held by two screws. To remove the timing cover, for instance to examine the oil pump, the contact breaker must be released from the camshaft. To release the contact breaker remove the central bolt and screw in the extractor tool D484.

When replacing the contact breaker it must be positioned correctly relative to the exhaust camshaft. Current models have a peg in the exhaust camshaft and a slot in the contact breaker which serve as a location for the setting but the full procedure is detailed below for earlier models without the peg.

Select top gear and remove the sparking plugs and then turn the rear wheel until the piston in the right cylinder is almost at the top of its stroke with both valves closed. Set the piston accurately to the figure shown for the model in Useful Data, Page 6, and then when the rear contact breaker points are just about to open (camshaft turning clockwise viewed from this end) tighten the centre bolt. Set the points gap at 0.014—0.016 in. just after the points have opened. See page 31.

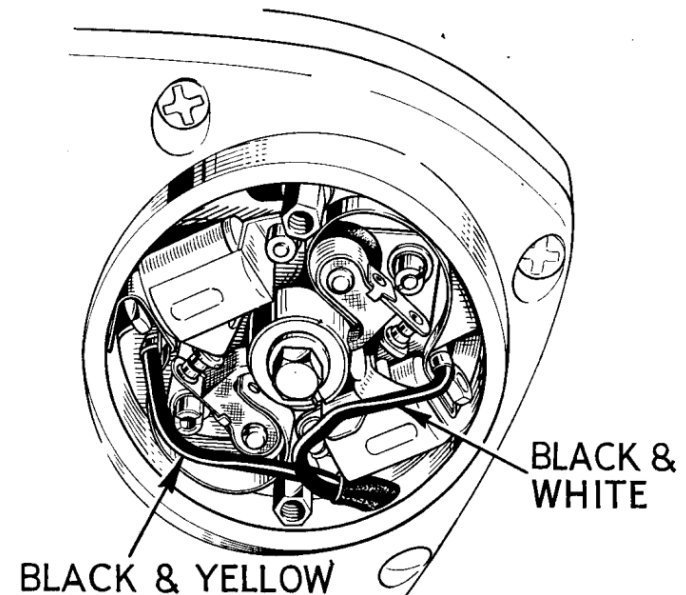


Fig. 7. Contact breaker, type 4 CA.

The final adjustment for the ignition timing is by slackening the two bolts which hold the contact breaker base plate and turning it as necessary. The fixing holes are slotted to allow this. If the ignition is switched on, the point of opening will be shown by the ammeter needle returning to zero. Remember to check the centre bolt and base plate bolts for tightness before replacing the cover.

Wired on the right cylinder and rear contact breaker points with black and yellow lead to the rear condenser, the black and yellow lead from the harness must be connected to the right ignition coil.

SPARKING PLUG

The sparking plugs are 14 mm. thread x $\frac{3}{4}$ in. reach. The standard grade is Champion N4. Do not vary the grade unless you are advised to do so by some qualified person such as your local Triumph dealer who 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 (5,000 Km.) 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 (15,000 Km.) fit new sparking plugs.

When replacing the plug smear a little graphite grease 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 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. On the Thunderbird model, it is first necessary to remove the right panel to drain the oil tank. 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 kerosine. 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 recommended amount of 5 pints (3 litres) should bring the level to $1\frac{1}{2}$ in. (4 cm.) below the filler. Start the engine and immediately check the oil pressure indicator.

GEARBOX

The drain and level plugs are situated underneath the gearbox, see Page 28. 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 and the gearbox should always be topped up until oil just begins to flow down the level plug whilst the drain plug is removed.

THE AMAL MONOBLOC 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 detachable for cleaning purposes and which when assembled into the carburetter body is sealed by a cover. 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 fourth notch from the top, and the needle should be lowered to the middle after 500 miles (800 Kms).

Throttle valve cut-away

The amount of cut-away is recorded by a number marked on the throttle, viz. 376/3 $\frac{1}{2}$ means throttle type 376 with No. 3 $\frac{1}{2}$ 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.

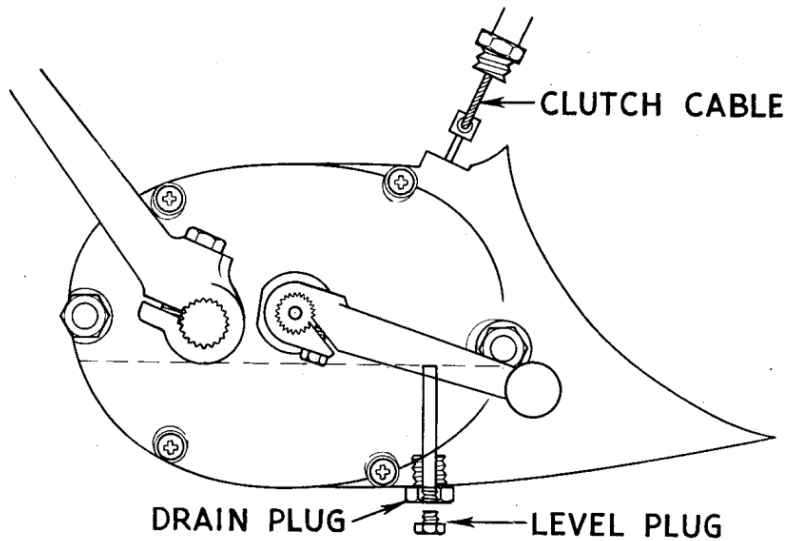


Fig. 8. Gearbox drain and level plugs.

PRIMARY CHAINCASE

The drain plug is in the bottom of the outer portion of the chaincase. It is easily identified by its sloping position and it also allows access to the primary chain tensioner adjuster. The level plug is at the rear of the outer portion of the chaincase just above the drain plug.

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 selected by the respective positions of the lighting and ignition switches and is then converted into direct current by a silicon diode rectifier. The direct current is supplied to the 12 ampere/hour battery equipment on 6 volt machines, or on 12 volt machines to two 6 volt 8 ampere/hour batteries connected in series, with a Zener diode in circuit to regulate the battery current.

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 case of a discharged battery the emergency position of the ignition switch supplies output direct from the generator through one pair of contacts and one ignition coil to enable the engine to be started. As soon as the engine has been started the ignition switch must be returned to the normal position or burning of the contact breaker points will take place.

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

Contact breaker unit, Type 4CA

The contact breaker is contained behind the circular chromium-plated cover held by two screws on the right side of the engine. See Fig. 7, Page 25. The fibre heel of the moving contact may settle down initially and it is necessary to check both contact breaker gaps after 500 miles (800 Km.). The correct gap is 0.014-0.016 in. (0.35-0.40 mm.)

To adjust the contact breaker gap turn the engine with the starter pedal until one pair of contacts have just opened. Measure the gap with feeler gauges. If it is 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 engine until the second pair of contacts have just opened and adjust them in the same way. If the gap becomes larger when the heel is on the back of the cam, this will not affect the running of the engine.

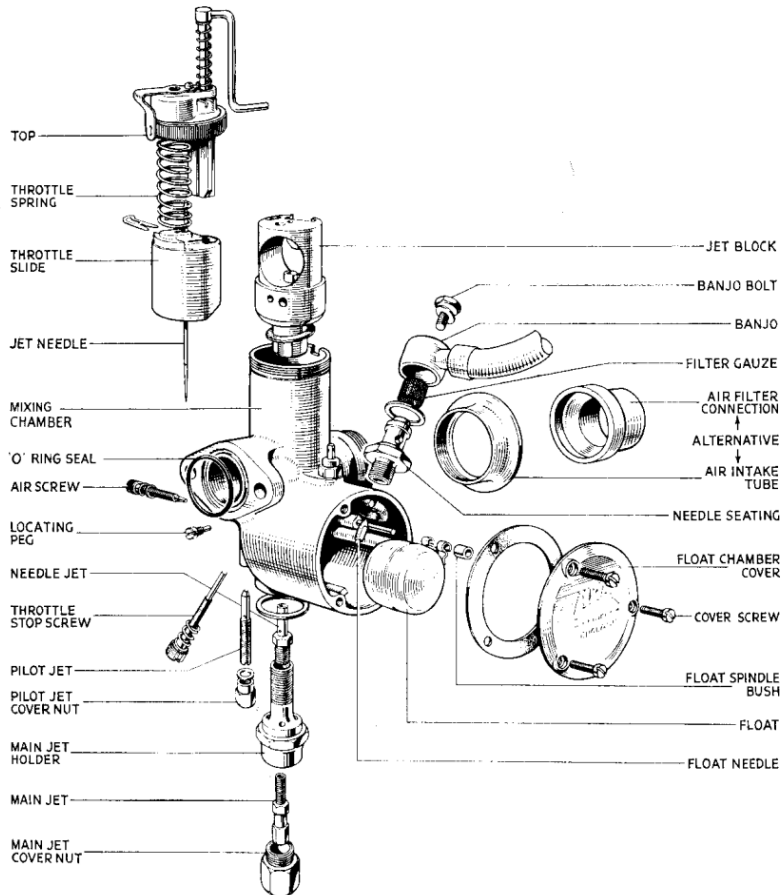


Fig. 9. Amal monobloc carburetter.

Air filter

The air filter on single carburettor machines has a dry felt element. To detach the element, release the clip on the perforated metal rim. Rinse the element in clean paraffin or kerosene and allow it to drain before replacing. Never oil the element in this type of filter.

The single large air filter fitted to some twin carburettor T120 models has a paper element, which should be dismantled, and the element blown clean or replaced as necessary. The paper element should not be washed or immersed in any liquid.

Every 3,000 miles (4,800 Km.) 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 pad which lubricates the cam. Do not allow any oil on the contacts.

Ignition coils, Type MA6

The twin ignition coils are rubber-mounted to the frame beneath the petrol tank. Keep the top of the coil clean particularly between the electrical terminals. Inspect the cables for frayed wires or damaged insulation. Any damaged section of cable must be replaced.

Battery, Type MLZ9E

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.

Do not overfill the battery. Lift it out of the carrier so that you can see the filling line moulded in the translucent casing. Add distilled water until the liquid reaches the line. With this type of battery the acid cannot be reached by a hydrometer, which would indicate the state of charge. If you suspect a faulty battery have it checked at a Lucas Depot or Agent. *When replacing the battery on the machine always connect the red (+) positive terminal to the frame of the machine (earth).*

Lighting and ignition switches, Type 88SA

The switches have multi-pin bases which snap into corresponding sockets in the wiring harness. The pins are spaced irregularly so that the switch can be fitted only in the correct position. The switches are sealed and if a fault is suspected, test by substituting another switch.

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 underneath the engine unit.

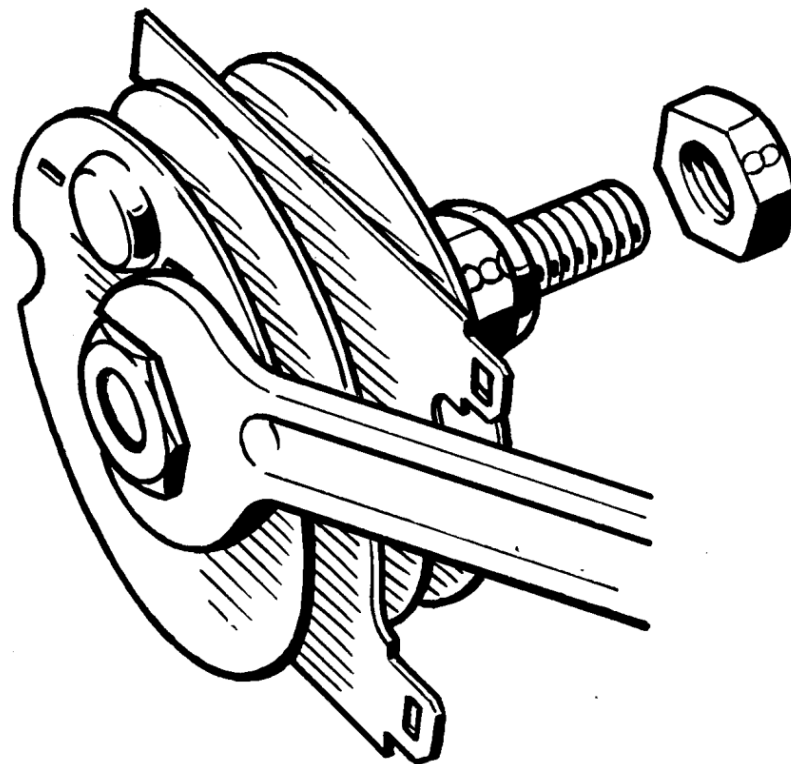


Fig. 10. To secure the rectifier.

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.

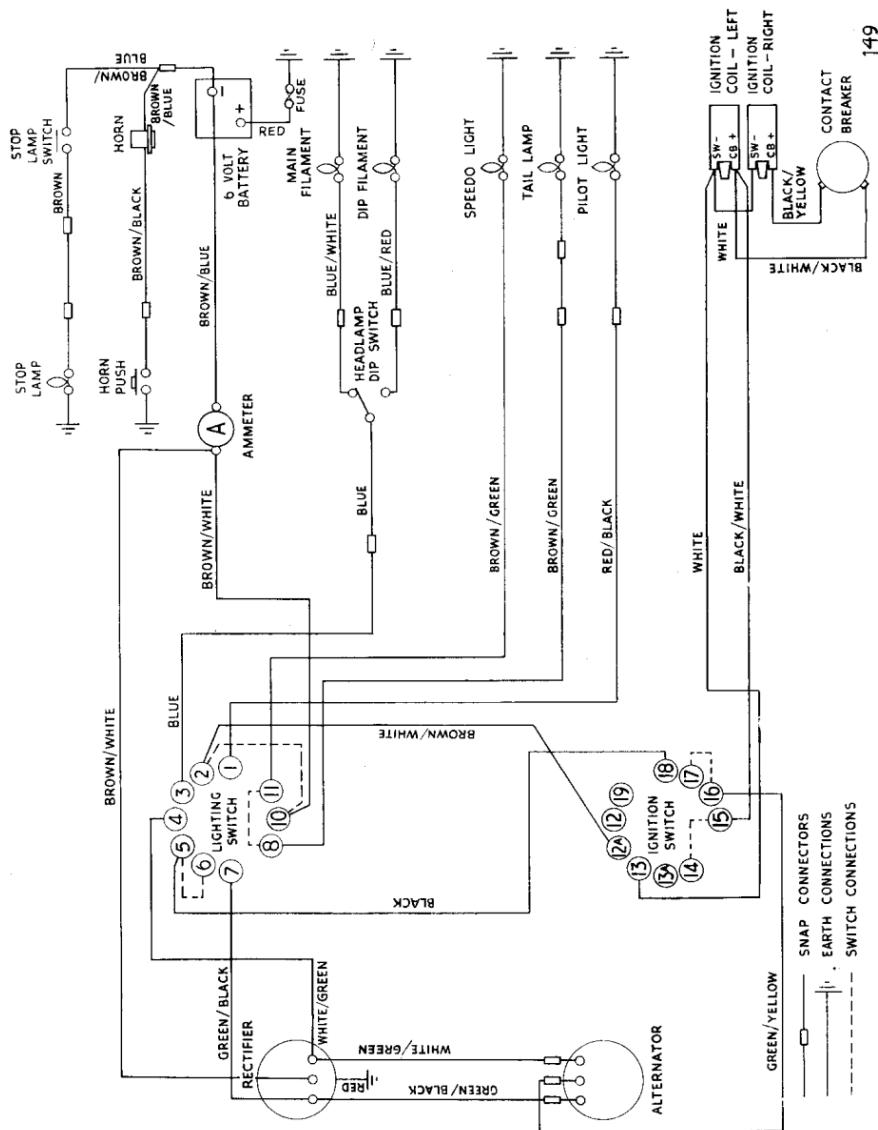


Fig. 11. Wiring diagram. 6 volt machines.

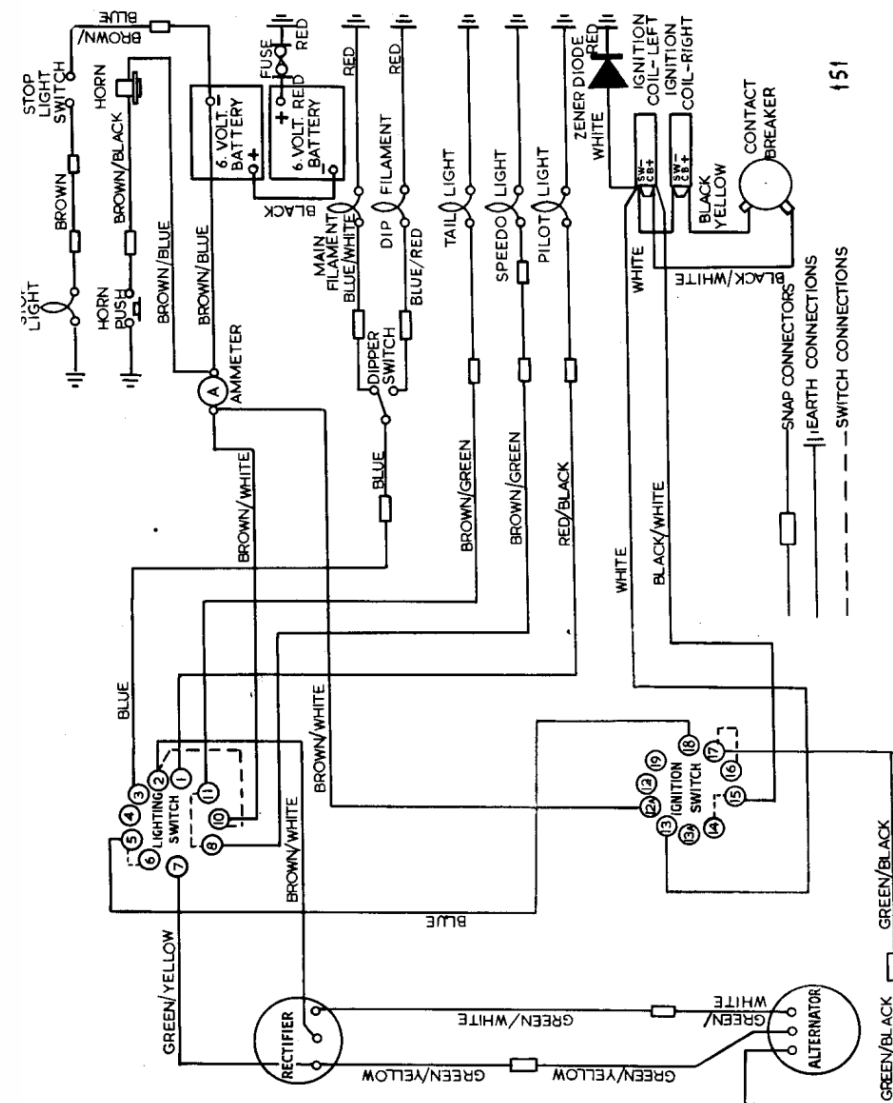


Fig. 12. Wiring diagram. 12 volt machines.

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 "heat sink" plate to ensure efficient cooling. Care must be taken therefore not to impair the flow of air around the heat sink.

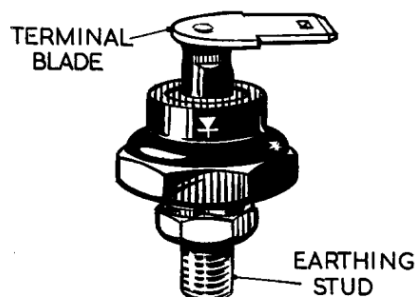


Fig. 13 Zener diode, Model ZD715

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 17 lb.in. (19.6 kg.cm)

Fuse

A line fuse is included in the electrical circuit on later machines, and is located in the battery to earth 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 runs erratically and may appear to seize, first check that the fuse has not blown.

ROUTINE MAINTENANCE

	Page
Every week. Check battery acid level	32
Every two weeks. Check tyre pressure	23
Every 250 miles (400 Kms.)	
Check level in oil tank	27
Check level in primary chaincase	28
Every 1,000 miles (1,600 Kms.)	
Change oil in primary chaincase	28
Lubricate and adjust control cables including brakes	General
Grease swinging fork pivot	20
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
Every 3,000 miles (4,800 Kms.)	
Check gearbox oil level	27
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	31
Clean air filter	30
Clean carburettor	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

RECOMMENDED LUBRICANTS

UNITED KINGDOM

UNIT	MOBIL	B.P.	CASTROL	ESSO	SHELL	REGENT
Engine—Summer ...	Mobiloil A	Energol SAE 30	Castrol XL	Eso Extra	Shell X-100 30	Havoline SAE.30
—Winter ...	Mobiloil Arctic	Energol SAE 20W	Castrolite	Motor Oil 20W/30	Shell X-100 20W	Havoline SAE.20W
Gearbox ...	Mobiloil D	Energol SAE 50	Castrol Grand Prix	Eso Extra Motor Oil 40/50	Shell X-100 50	Havoline SAE.50
Primary Chaincase ...	Mobiloil Arctic	Energol SAE 20	Castrolite	Eso Extra Motor Oil 20W/30	Shell X-100 20W	Havoline SAE. 20W
Telescopic Fork—Summer	Mobiloil A	Energol SAE 30	Castrol XL	Eso Extra Motor Oil 20W/30	Shell X-100 30	Havoline SAE.30
—Winter	Mobiloil Arctic	Energol SAE 20W	Castrolite	Motor Oil 20W/30	Shell X-100 20W	Havoline SAE.20W
Wheel Bearings ...	Mobilgrease M.P.	Energol L2	Castrol L.M.	Multipurpose Grease H	Shell Retinax A	Marfak Multipurpose 2
Swinging Fork ...						
Easing Rusted Parts ...	Mobil Spring Oil	Energol Penetrating Oil	Castrol Penetrating Oil	Eso Penetrating Oil	Shell Donax P	Graphited Penetrating Oil

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RECOMMENDED LUBRICANTS

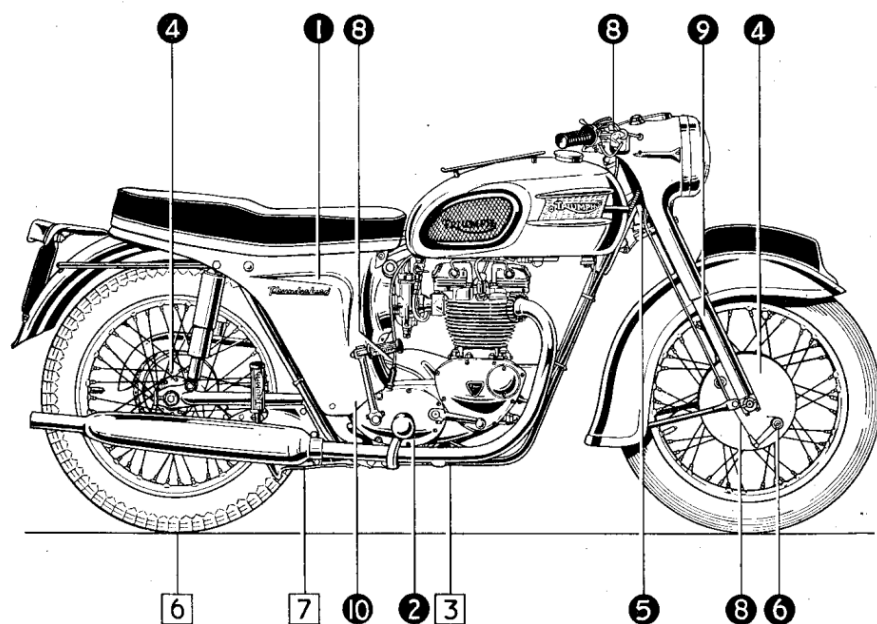
OVERSEAS

UNIT	MOBIL	B.P.	CASTROL	ESSO	SHELL	CALTEX
Engine—Above 90°F. ...	Mobiloil AF	Energol SAE 40	Castrol XXL	Eso Extra	Shell X-100 40	Caltex SAE.40
32°—90°F. ...	Mobiloil A	Energol SAE 30	Castrol XL	Motor Oil 20W/40	Shell X-100 30	Caltex SAE.30
Below 32°F. ...	Mobiloil Arctic	Energol SAE 20W	Castrolite	Motor Oil 20W/40	Shell X-100 20W	Caltex SAE.20W
Gearbox ...	Mobiloil D	Energol SAE 50	Castrol Grand Prix	Eso Extra Motor Oil 50	Shell X-100 50	Caltex SAE.50
Primary Chaincase ...	Mobiloil Arctic	Energol SAE 20W	Castrolite	Eso Extra Motor Oil 20W/40	Shell X-100 20W	Caltex SAE.20W
Telescopic Fork ...	Mobiloil D	Energol SAE 50	Castrol Grand Prix	Eso Extra Motor Oil 20W/40	Shell X-100 50	Caltex SAE.50
Above 90°F. ...	Mobiloil A	Energol SAE 30	Castrol XL	Motor Oil 20W/40	Shell X-100 30	Caltex SAE.30
60°—90°F. ...	Mobiloil Arctic	Energol SAE 20W	Castrolite	Motor Oil 20W/40	Shell X-100 20W	Caltex SAE.20W
Below 60°F. ...						
Wheel Bearings, Swinging Fork, Steering Races ...	Mobilgrease M.P.	Energol L2	Castrol L.M.	Multipurpose Grease H	Shell Retinax A	Marfak Multipurpose 2
Easing Rusted Parts ...	Mobil Spring Oil	Energol Penetrating Oil	Castrol Penetrating Oil	Eso Penetrating Oil	Shell Donax P	Caltex Penetrating Oil

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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
—	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. 14. Lubrication points.

Printed in England by
WARWICK PRINTING COMPANY LTD.
WARWICK