

Book No. 100/T.C.I.A

AIR PUBLICATION 2225
VOL. I. - PART I

DRIVER'S HANDBOOK
FOR
MOTOR CYCLE SOLO
350 c.c. O.H.V.

TRIUMPH

MODEL 3 HW

TRIUMPH ENGINEERING CO. LTD.
ENGLAND

BARNSTORMERS.CO.NZ



NA 66



NA 55



PA 56



PA 57



PA 60



DA 87



DA 21



DA 16



DA 72



KA 50



DA 5



NA 65

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TECHNICAL DETAILS.

Model		3 HW
Cubic Capacity		343 c.c.
Petrol Tank Capacity		3 $\frac{1}{8}$ Gallons
Oil Tank Capacity		$\frac{3}{4}$ "
Oil in Chaincase		$\frac{3}{4}$ Pint
Tappet. Clearance (Cold)	Inlet	1 Thous.
	Exhaust	1 Thous.
Tyre Sizes	Front	3.25-19
	Rear	3.25-19
Wheel Base		52 $\frac{1}{2}$ "
Overall Length		82"
Overall Width		28 $\frac{1}{2}$ "
Plug Point Gap		15-18 Thous.
Contact Breaker Point Gap		12 Thous.

CONTROLS—INSTRUMENTS.

(“ Left ” and “ Right ” assume that the rider is sitting on the machine)

CLUTCH. A hand lever on left portion of handlebar.

The clutch lever should not be touched when the machine is in motion except to change gear. Always select neutral and then release clutch when machine is stationary.

MAGNETO CONTROL. A finger lever on left portion of handlebar.

Pull the lever towards you for full advance. When engine has started always fully advance the ignition.

EXHAUST VALVE LIFTER. A finger lever under the left portion of the handlebar.

For starting and stopping the engine only. Do not drive the machine on the exhaust lifter.

STEERING DAMPER CONTROL. A large knob to the front of the handlebar.

Should be slacked right off except for fast work and rough going.

AIR CONTROL. A finger lever on the right portion of the handlebar.

Pull the lever towards you to open the air slide. Run the engine on full air as soon as it starts up. Close slightly until the engine warms up in very cold weather.

FRONT BRAKE. A hand lever on right portion of handlebar.

THROTTLE CONTROL. Twist grip for the right hand.

Twist the grip towards you to open the throttle — away from you to close it.

SPEEDOMETER. Registers speed and total mileage.

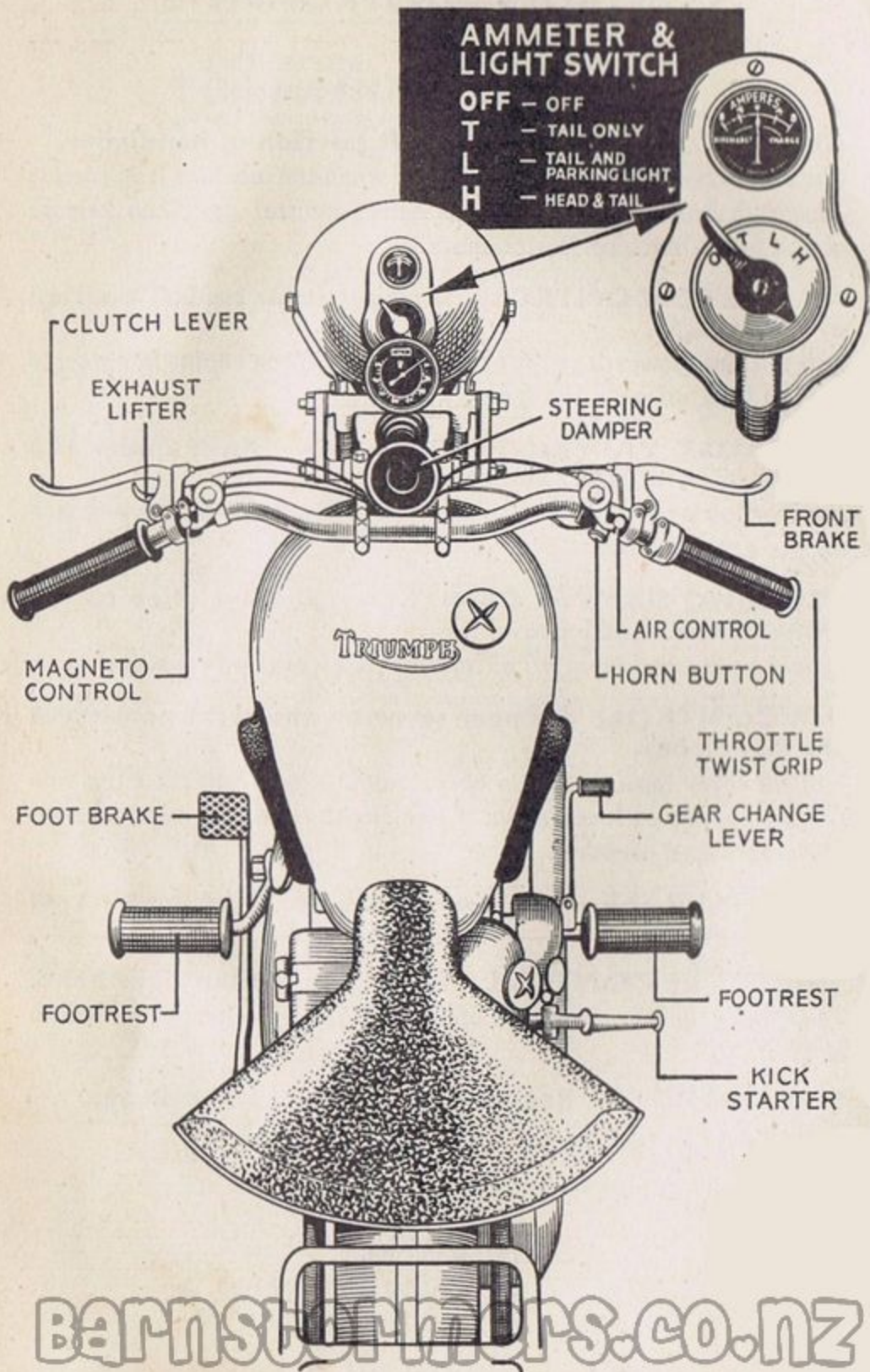
LIGHTING SWITCH. On back of headlamp.

The positions are as follows :—

OFF	...	All lights off.
T.	...	Tail lamp on.
L.	...	Tail and parking light on.
H.	...	Tail and headlight on.

AMMETER & LIGHT SWITCH

- OFF — OFF
- T — TAIL ONLY
- L — TAIL AND PARKING LIGHT
- H — HEAD & TAIL

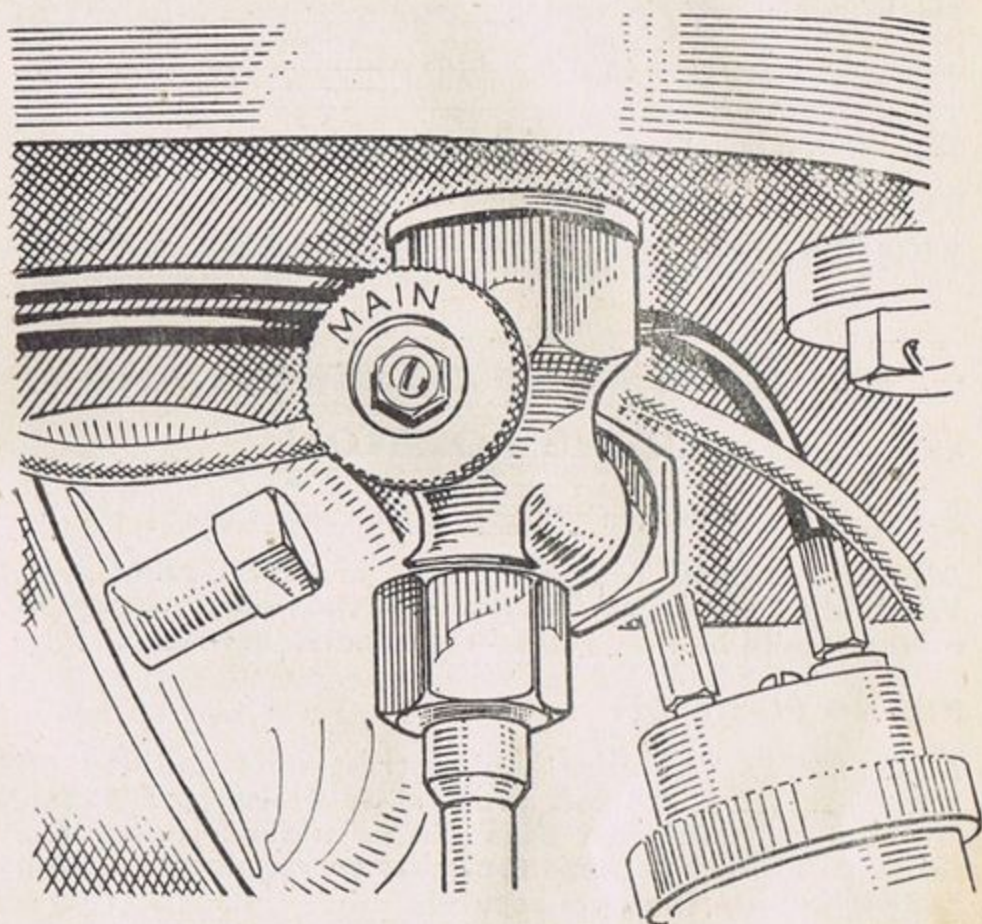


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AMMETER. Above switch at back of headlamp.

Indicates charging rate of the dynamo when the engine is running and the amount of discharge when the lights are "ON" and the engine stopped. The switch does not control the rate of charge which is governed automatically.

FOOT BRAKE. A flat pedal in front of the left footrest.



PETROL TAP.

Fitted under the rear end of the tank. The main petrol supply is tapped by pulling out the plunger with the circular end. When this supply is exhausted, there is a reserve sufficient for about 15 miles running still in the tank. This will feed to the carburettor if the hexagonal ended plunger is pulled out. Note that the "main" plunger must remain in the "on" position or the petrol will not flow from the reserve supply.

GEAR CHANGE. A small foot lever in front of the right footrest.

The lever should be moved down to change down and up to change up. To select neutral withdraw clutch and move the gear lever three movements down and half a movement up. To engage first gear from neutral fully withdraw clutch and press gear lever down one movement. To change up, close throttle, fully withdraw clutch, pause for a moment, and then move lever upwards gently as far as it will go with the toe. To change down, fully withdraw clutch, allow engine to speed up just a little and move gear lever downwards as far as it will go.

There is an indicator on the top of the gearbox to show the gear positions. This is for use only when the machine is stationary.

KICKSTARTER. Behind the right footrest.

ADJUSTMENT OF CONTROLS AND RIDING POSITION.

(See illustration of Tools inside Front Cover.)

All the controls, footrests, etc., are fully adjustable. When first taking over the machine the necessary adjustments should be made to suit the individual rider.

RIDING POSITION:

FOOTRESTS. Remove the footrest nuts and tap off the footrests. The left footrest is fitted to a taper, and the right footrest pegs can be moved round in a series of holes. Replace footrests in required position and tighten up the nuts securely.

GEAR CHANGE LEVER. Fitted to a serrated shaft. Slack off the set screw and tap the lever off the shaft. Replace in a position convenient for the rider's size of boot and tighten up the set screw.

FOOTBRAKE PEDAL. Adjust height from ground by means of the stop screw and lock nut in rear of the brake pedal spindle. After making this adjustment it may be necessary to adjust the rear brake. (See page 20 and illustration, page 37).

HANDLEBAR. The height of the handlebar arms can be adjusted by slacking off the bolts securing them to the head clip just beneath the steering damper knob. (Use spanner N.A.55.) If the bolts securing the caps to the arms are slacked off, the handlebar tube can be rotated to give a higher or lower position to the grips. (Use spanner N.A.55.)

LEVERS. If the clamping screws which secure the levers to the handlebar tube are slacked off the controls can be moved to suit the rider's preference. The ignition and air finger control levers should "stay put" in any position after use. If they do not do so, tighten the control bolt on the top of the lever body. If the lever is too stiff in action, slack off the control bolt a little.

SADDLE. Slack off the saddle bolt lock nuts, and adjust the height of the rear of the saddle as required.

STARTING THE ENGINE.

1. See that gear is located in neutral position. (See page 6, **GEAR CHANGE.**)
2. Lift clutch lever and depress kick starter two or three times to separate clutch plates.
3. Retard ignition very slightly by pushing lever about $\frac{1}{8}$ in. forward.
4. Completely close air control by pushing the lever forward as far as it will go.
5. Turn on petrol and flood carburetter a little by depressing the tickler on the top of the float chamber. Do not flood too much or starting may be difficult.
6. Open throttle by twisting grip toward the rider about $\frac{1}{4}$ in.
7. Turn engine over with kickstarter until compression is felt and then raise the exhaust lifter and turn engine just over compression. Release exhaust lifter.
8. Give kickstarter a long swinging kick when the engine should fire immediately. If the controls are not in the ideal position, a second or third kick may be necessary.
9. As soon as the engine starts, advance ignition and give the engine full air by pulling the ignition and air levers as far as they will go towards the rider.

10. Remove the oil tank cap and see that oil is returning to the tank. The return will be spasmodic—a spurt of oil and then a few bubbles of air. It is not necessary to carry out this inspection every time the engine is started. Once daily is sufficient. If no oil is being returned to the tank, stop the engine immediately and report.

RIDING THE MACHINE.

1. Start engine, gear in neutral.
2. Lift clutch and select first gear. (See page 6, GEAR CHANGE.)
3. Gradually let in the clutch, and at the same time speed up the engine.
4. When machine has travelled about 10 yards change up to second gear. (See page 6, GEAR CHANGE.) Accelerate in second gear to approximately 18 M.P.H. and change to third gear. Change to top at about 30 M.P.H.

Use the front brake as the main "stopper." Use the rear brake to assist the front one if necessary. Violent braking, except in an emergency, is a sign of bad riding. Don't let the engine "slog." Change down to a lower gear (see page 6, GEAR CHANGE) when necessary. For normal running the fork damper should be screwed up until there is a very slight degree of damping. More damping is required over rough ground. Slack the steering damper knob right off except for fast open road work and rough going. Always immediately select the neutral gear position when the machine is stationary with the engine running.

MAXIMUM PERMISSIBLE SPEEDS,

Gear	Top	3rd	2nd	Bottom
First 1,000 Miles	40 M.P.H.	28 M.P.H.	18 M.P.H.	12 M.P.H.
After completing 1,000 Miles ...	70 M.P.H.	45 M.P.H.	28 M.P.H.	16 M.P.H.

Road speeds are restricted by current A.C.I.

TRIUMPH MOTOR-CYCLE MAINTENANCE TASKS.

(All tools referred to are illustrated inside front cover)

It will not be possible to turn every nut and bolt every time it is tested for tightness. Place the specified spanner on the nut or bolt indicated and exert a normal pressure. Excessive pressure will cause damage. The rider is testing for tightness—not tightening up, unless he finds it necessary. The correct tool must be used.

TASK No. I.

Item A.

Inspect gas-tight joints and tighten if necessary.

i. Cylinder Head Joints.

Examine for leakage which will be indicated by the presence of oil at the point where the two faces are bolted together. The cylinder head is secured with four bolts which must be tightened evenly. (Use spanner PA60). A leaky joint is usually a workshop job.

ii. Cylinder holding down bolts.

Examine for leakage. There are four nuts to be checked. Engine should be hot. (Use spanners NA55 and NA66). If leakage still occurs after nuts have been tightened, report.

iii. Carburetter.

Secured direct to head with two bolts. (Test with spanner NA55). If leakage is suspected, place a few drops of engine oil on the joints with the engine running. Leakage will be indicated by the oil being drawn into the engine.

iv. Exhaust pipe.

Test for movement and security of fixing clip nuts. (Use spanners PA56 and NA66).

Item B.

Inspect engine mounting and tighten if necessary.

i. Engine plate bolts.

Test the nuts, using spanners NA66 and PA60.

- ii. **All crankcase bolts and timing case screws.**
Use screwdriver on timing case screws. The crankcase bolts also pass through the engine plates, so were attended to under i.
- iii. **All brackets mounted on engine.**

Item C.

START ENGINE.

- i. **Listen for knocks.**
With a cold engine there is frequently a slight amount of piston slap which disappears when the engine warms up.
- ii. **Uneven firing.**
- iii. **Examine exhaust smoke for correct mixture or excessive oil.**
The exhaust should be invisible except when the engine has been idling for a time and the throttle is opened. Blue smoke from the exhaust indicates that the engine is using too much oil. Black smoke indicates too rich a mixture. See that the air slide is opening fully. If so, the carburetter needs re-adjustment.

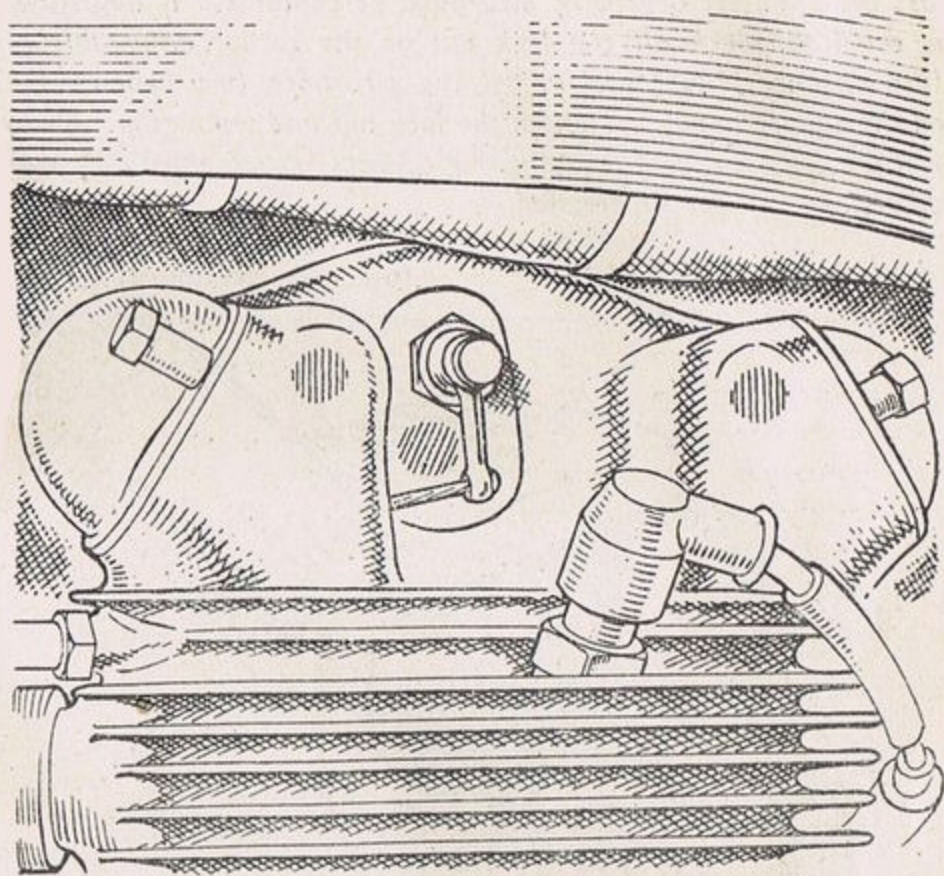
Item D.

SWITCH OFF.

- i. **Test for weak compression for**
 - (a) **Valve trouble.**
If compression is weak, check valve clearances. Incorrect adjustment may hold a valve off the seating. Test for clearance on the exhaust lifter, and adjust cable if necessary.
 - (b) **Piston trouble.**
Wear on the piston rings will cause oil to pass into the combustion chamber. If this is occurring the sparking plug will be encrusted with black burnt oil. A normal plug where the mixture is correct is a dark grey colour.
 - (c) **Gasket trouble.**
There is no cylinder head gasket in the engine. The cylinder head and barrel are ground together to make a gas tight joint. If the joint is leaking, it will be indicated by an oily

patch on the outside of the cylinder. Test the compression by turning the engine over with the kick starter.

Report any troubles found.

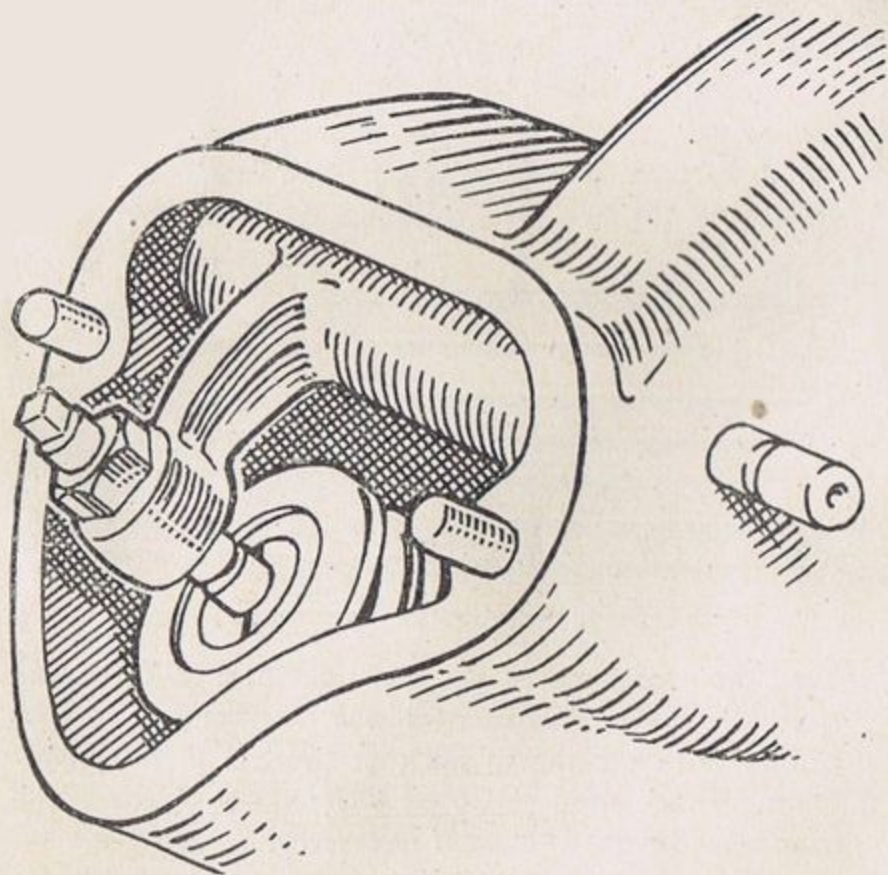


Test the clearance of the exhaust lifter by grasping the lifter lever, illustrated above, with the finger and thumb and checking to see that there is $\frac{1}{4}$ " free movement. There should also be $\frac{1}{8}$ " free movement at the handlebar lever. Adjust if necessary.

Item E.

Test tappet clearance when cold.

Remove the two rocker box covers after taking out two bolts securing each. (Use spanner PA60). Turn over the engine until it is against compression. Grip the rocker between the finger and thumb, and attempt to move it up and down. There should be just the slightest degree of clearance perceptible. If adjustment is required, slack off the lock nut on the rocker adjustable pin (use spanner NA65) and adjust the clearance (use spanner DA5 on the square head). Tighten the lock nut and test again. Always test the compression after adjusting tappets. Riders must only make adjustments under supervision.



The tappet adjustment is clearly seen in this illustration. After making an adjustment always see that the locknut is fully tightened up.

Item F.

Examine fins on the cylinder for cracks or choked with dirt.

Be careful when removing dried mud from between the fins. They are brittle and can easily be broken. It is advisable first to soften hard mud with water.

Item G.

Report defects.

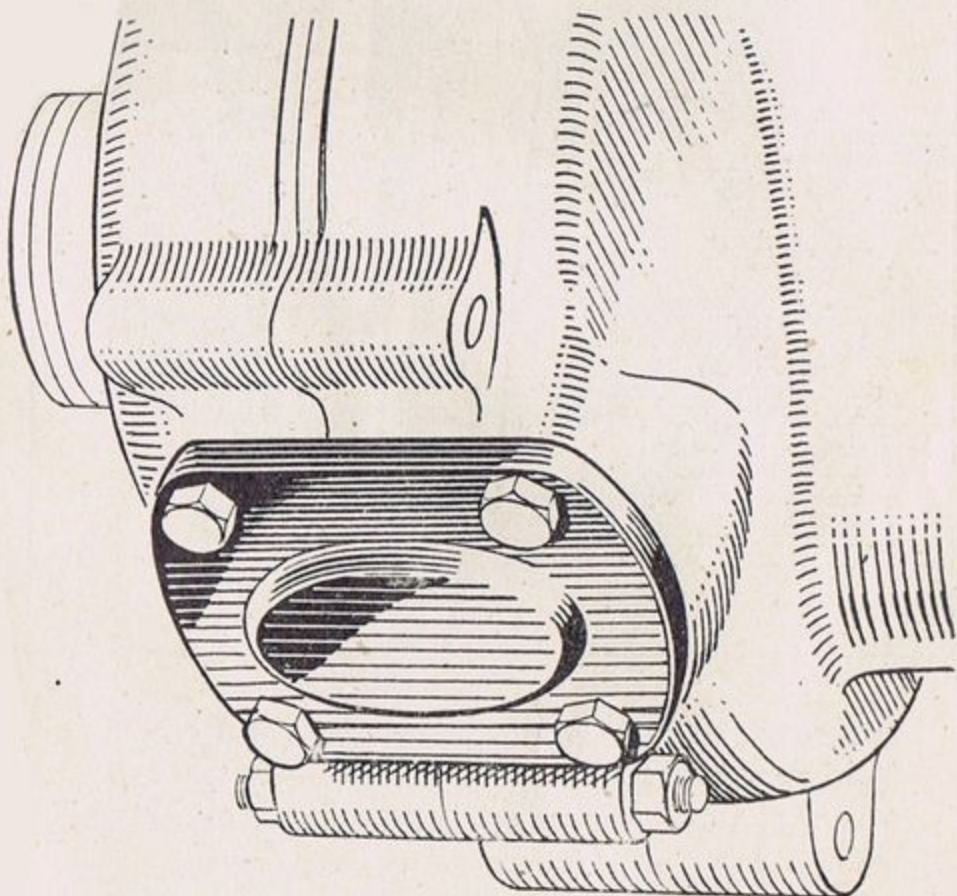
TASK No. 2.

ENGINE—LUBRICATION SYSTEM & FUEL SYSTEM.

Item A.

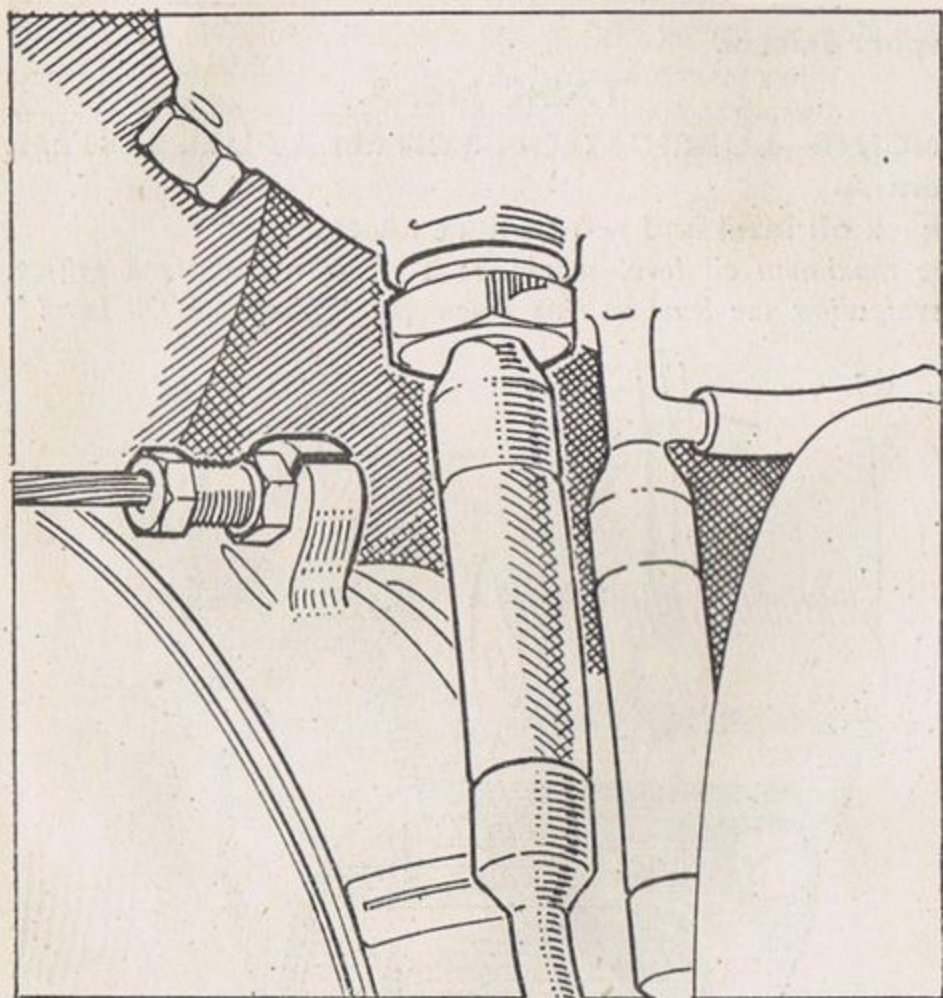
Check oil level and refill where necessary.

The maximum oil level should be 2" from the oil tank orifice. Never allow the level to sink below the "Minimum Oil Level"



Crankcase filter accessible after removing the crankcase shield.

mark. Report if oil level drops more than $\frac{1}{2}$ " per 100 miles. See that tops of drums, interiors of measures and other containers are spotlessly clean before use. Be careful not to introduce foreign matter with the oil.

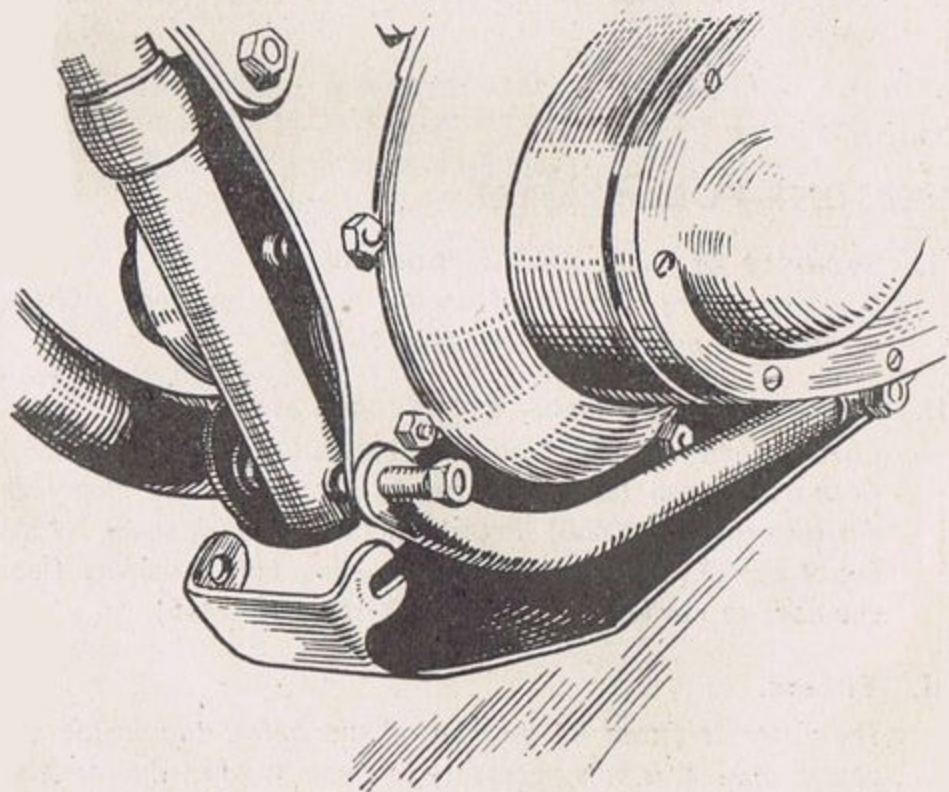


To remove oil tank filter, screw out the large nut fitted to the feed oil pipe. The filter will come away with it. (Illustrated also on page 24. Lubrication Diagram.)

Item B.

EXAMINE OIL. If black, drain tank, clean filters and refill with clean oil. See Periodical Attentions, page 40.

Drain tank by removing drain plug (use spanner NA55). Remove nut securing oil pipe block under timing case (use spanner PA60). Pull oil pipes out of rubber connections. Remove oil tank filter (use spanner DA72) and wash in petrol. When reassembling use a new washer on oil pipe block. (Washer Part No. E527). If rubber connections are hard, put in a paraffin bath for a few minutes. Remove crankcase filter (use spanner PA60) and wash in petrol. (Illustration page 13). Refill tank to within 2" of filler cap with engine oil 50HD.



To remove crankcase shield take off the nut on the offside of the front bolt on frame-to-engine-plate bolt and tap the bolt through to the near side until it is clear of the hole in the shield. The shield can now be pulled forward and will release. To refit reverse the above procedure.

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Item C.

INSPECT OIL-TIGHT JOINTS AND TIGHTEN IF NECESSARY.

i. Sump and crankcase plugs or drain cocks.

Check oil tank drain plug (Use spanner NA55.) Oil tank filler cap. Oil tank filter (Use spanner DA72.)

ii. Oil pipe unions.

There are no unions which require tightening on this engine.

iii. Valve Gear Cover Plates.

Four tappets cover bolts (use spanner PA60). Push rod location cover (round cover at top of push rod tube. Use spanner NA66.)

Item D.

EXAMINE FUEL SYSTEM.

i. Security of tank and carburetter.

Tank bolts are wired and should not be touched. Check carburetter nuts. (Use spanner NA55.)

ii. Leaks. Taps, unions, drain cocks and tank.

Check float chamber top lock nut. (Use spanner PA56.) Carburetter cap (should be hand-tight). Throttle stop lock nut (use spanner KA50) Petrol pipe nuts, (use spanner NA55) Petrol tap D.A.16. Carburetter holding bolt (securing float chamber to carburetter base. Use spanner DA16).

iii. Filters.

The filter is fitted at the top of the petrol tap inside the petrol tank. It is only necessary to clean it when the machine is new after the first 500 miles running. Cleaning is best carried out when the petrol in the tank is low. Arrange the machine facing down a very steep slope to raise the rear wheel so that the petrol will run to the front end of the tank. Remove the tap and clean the gauze (use spanner NA55 on pipe nuts, and DA16 on tap). At the same time remove the U connecting

pipe at the front of the tank (use spanner NA55) and blow air through it with the tyre pump. For this operation the front wheel should be raised to prevent loss of petrol.

iv. Rubbing and Kinked Pipes.

Examine the copper vent pipe fitted to the top of the oil tank and pushed into the frame under the saddle. See that it is not kinked or rubbing on the saddle frame as indicated by bright "rubs" on the tubes.

v. Flooding.

Turn on petrol and see that the carburetter does not flood. Machine should be vertical.

Item E.

START ENGINE. Set control for slow running. Drivers are not to alter jet settings or carburetter adjustments.

The engine must not be stone cold when making this test. The ignition should be retarded half way. If necessary, adjust the slow running screw on the side of the carburetter with a screwdriver.

Item F.

Report defects.

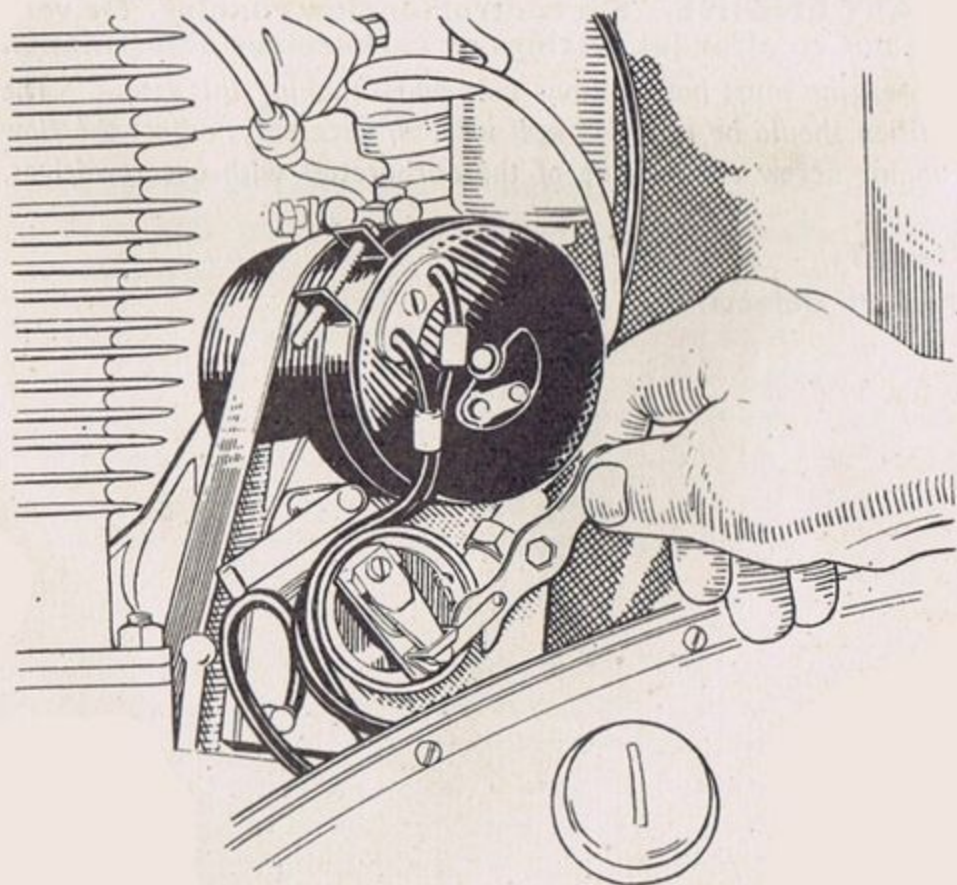
TASK No. 3.

IGNITION SYSTEM, SPARKING PLUGS, CHARGING SYSTEM, BATTERY.

Item A.

- i. **MAGNETO.** Inspect and tighten if necessary, magneto mounting. If chain-driven, examine chain for tension and lubrication. Inspect contact breaker for correct operation.

The magneto is gear-driven. Gears are automatically lubricated. Check magdyno clamp bolt (use spanner NA55). Remove contact breaker cap. Turn over engine until points are fully open. Test gap with gauge on magneto spanner. Report if incorrect.



Testing Contact Breaker Point Gap.

ii. Inspect insulated wires for

- (a) Shorts and cracks, frayed or rubbed portions.
 - (b) Contact with hot parts of the engine.
- Drivers are not to alter ignition settings.

Item B.

SPARKING PLUGS.

- i. Check for leaks and tighten if necessary.
- ii. Inspect for cleanliness and cracked insulators.
- iii. Inspect and adjust gaps 15 thousandths of an inch for magneto ignition.

To carry out the above, remove the plug (use box spanner DA87 and tommy bar). Examine and check points as instructed. Replace and tighten up. Refit H.T. lead.

Item C.

DYNAMO.

- i. Inspect and tighten, if necessary, mounting and assembly, cut-out mounting bolts and terminals. Dynamo is secured under clamp. Check the dynamo bolt nut at the drive end. (Use spanner KA50).
The regulator containing cutout is under the saddle. Check clamp screws with screwdriver.

Item D.

BATTERY.

- i. Clean battery vents.
Remove battery carrier bolt (use spanner NA55).
- ii. Clean, and smear lanoline or, if unobtainable, vaseline on terminals.
- iii. Inspect mounting and terminals and tighten if necessary.
Terminals cannot be tightened as these are soldered in position.
- iv. Top-up with distilled water ($\frac{1}{4}$ " only over top of plates).

Item E.

REPORT DEFECTS.

TASK No. 4.

STEERING, BRAKES, WHEELS, TYRES.

Item A.

EXAMINE CONTROLS,

- i. **Handlebars, fork links, steering head, front forks, springs, steering, and shock dampers, shock absorbers.**

Examine the above parts and see that they are not bent, cracked or otherwise unserviceable.

- ii. **Brake pedal adjustment, fouling any part of machine, lubrication.**

Use oil gun on the brake pedal spindle. The brake cam spindle should not be lubricated weekly, as if this is done the excess of grease will damage the brake linings. One stroke of the oil gun should be given to this part every time the engine oil is changed. (See page 38). Adjust foot brake, if necessary, by turning milled edge nut at end of brake rod. Wheel must be free with brake off.

- iii. **Hand brake lever, adjustment, lubrication and wear.**

See that the hand brake lever is not excessively worn at the fulcrum pin and the location hole for the cable nipples. Lubricate the pin with the oil can, and the exposed portion of the cable with oil C600. Clean the exposed portion of the brake spring plunger. and apply a thin film of oil C600. The brake cam spindle should only be lubricated when the engine oil is changed. (See Brake Cam spindles page 40). Check the brake anchor plate torque stay bolt between the fork tubes for tightness (use spanner NA66). Adjust hand brake, if necessary, by turning the milled edge adjuster on the front fork. Wheel must rotate freely with brake off.

Item B.

SECURITY.

- i. **Mountings on handlebars, front forks, springs, links.**

Check handlebar cap bolts (use spanner NA55). Check throttle friction control locknut (use spanner KA50). fork spring anchor bolt (use spanner NA55) (keep clear of speedometer glass). Fork spindle nuts (use spanner DA16). Steering damper anchor plate nut (use spanner NA55).

ii. Fixing of Controls, pedals.

Use screwdriver on handlebar control lever clamp screws. Check brake pedal spindle nut (use spanner DA16). Set screw on gear change lever (use spanner NA66). Nut on kick start crank cotter (use spanner NA66).

iii. Brake control adjustment, lock nuts.

Brake adjusters are always secure, and need no attention. Check lock nut on rear brake pedal stop (use spanner NA55). Examine front brake clevis pin at bottom of brake rod and see that split pin is secure.

iv. Hub bearing lock nuts.

It is not necessary to give these nuts any attention.

v. Wheel mounting nuts (axle nuts).

Check for security (use ring spanner PA57 on rear and DA16 in front). Check speedometer gear box lock nuts (use spanner DA72). Speedometer bracket bolts (use spanner PA56). Speedometer drive nut (lower end of drive). (Use spanner NA55). Drive casing connection to speedometer (screwdriver).

vi. Brake cable clamps and rods, frayed, rubbed or kinked cables or rods.

Item C.

LUBRICATION.

i. Wheel hubs well lubricated.

Though some of the earlier Triumph wheel hubs are provided with lubricators, the grease gun must not be used. Lubrication with the gun will force grease on to the brake linings and make the brakes ineffective. The bearings should be lubricated only when the hubs are stripped for cleaning every 10,000 miles.

ii. Links and steering head lubricated.

Use oil gun on the nipples, supplying lubricant to the two top and bottom rear spindles, until clean oil is seen to issue from the ends. All the dirty oil should be pushed out by the new. Do not do this with the front bottom spindle, or oil will make the shock absorber disc ineffective. Lubricate this

spindle with one stroke of the oil gun only. The nipple on the top back spindle supplies lubricant to the top steering race. The bottom race is lubricated through the nipple on the left side of the frame head tube.

iii. All joints well lubricated, no surplus oil near brake drum.

Clean off any surplus oil from rear wheel and brake parts. Oil on these parts usually means that there is too generous a supply to the rear chain. (See task 5C (1X) for adjustment).

iv. Examine for seized joints, brake rods and brake shafts.

v. Ensure freedom of action of all return springs.

Item D.

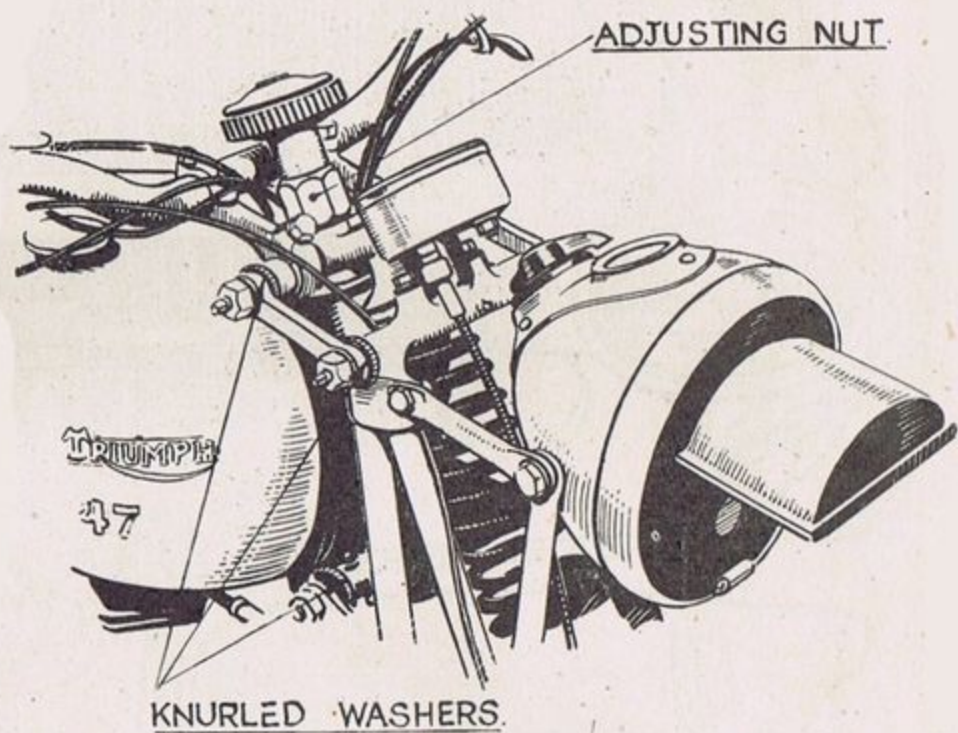
WEAR AND ADJUSTMENT.

i. Test for up and down play on steering head and fork spindle adjustment.

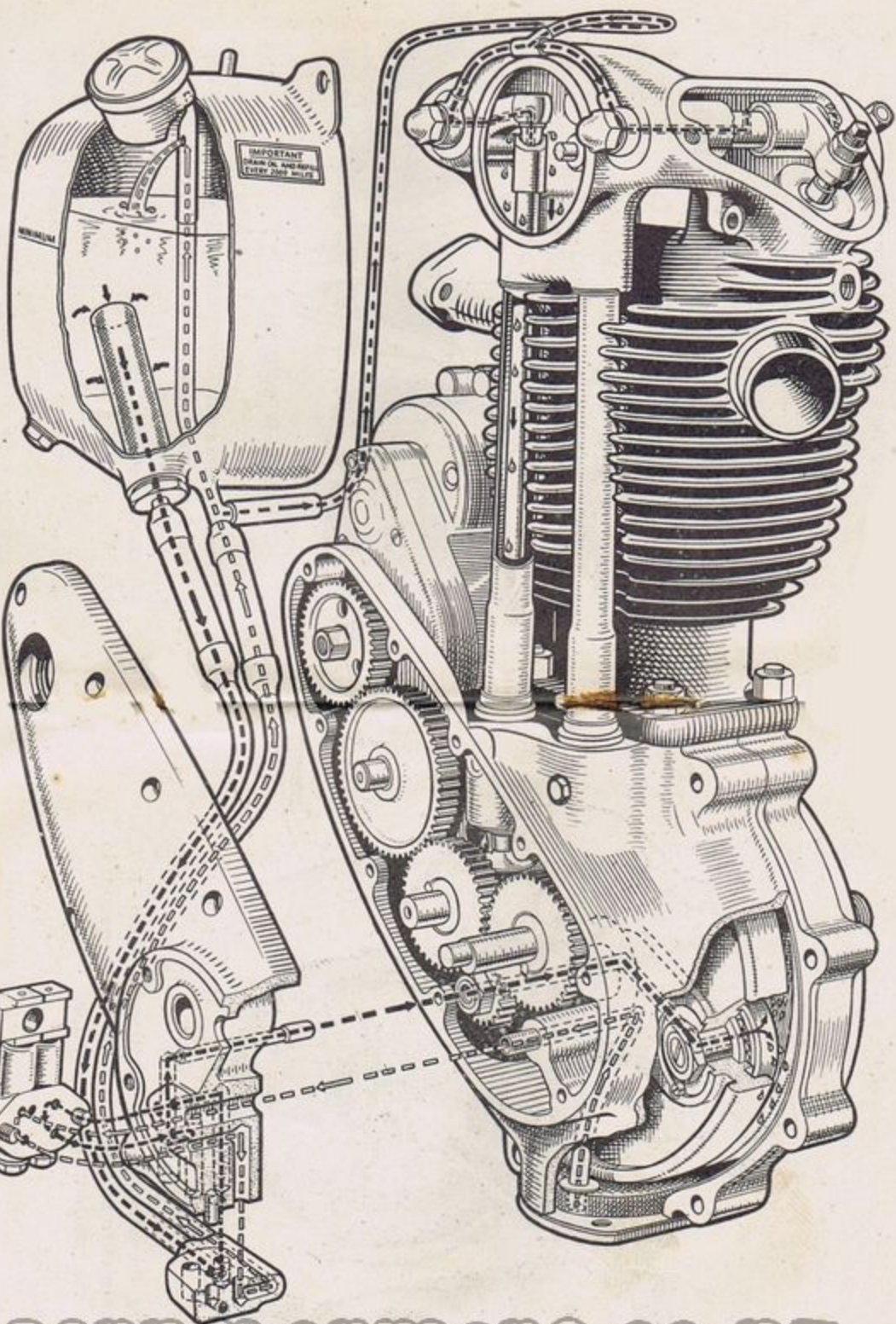
Tighten the fork damper and place the crankcase on a block of wood, bricks or a similar stand, so that the front wheel is off the ground. Take hold of the fork girder, and rock it backwards and forwards. Watch the steering head and any slackness will be easily seen. To adjust, slack off the pinch bolt nut (use spanner NA55) and turn the large nut (use adjustable spanner) underneath the damper knob. Tighten down gently until the nut will go no farther. Then slack off half-a-turn and tighten up the pinch bolt nut. Finally test for freedom by turning the steering to left and right full lock. The steering damper should be slacked right off.

If the steering is at all stiff, the large adjusting nut should be slacked off a very little at a time, until the fork assembly can be turned from side to side with no effort. The fork spindle knurled washers should be just free to turn, but should have no lateral movement. To adjust a spindle, slack off the two spindle nuts (use spanner DA16) and turn the spindle at the square end (use spanner DA5) until the washers are just free to turn with the lock nuts tightened up. After adjusting each spindle, test the fork for freedom by alternately pulling up and pushing down in the handlebar. The test must

be made after each spindle is adjusted, as otherwise, if it is found that the fork is not free, time is wasted in finding which spindle is too tight. (See also illustration on page 26).



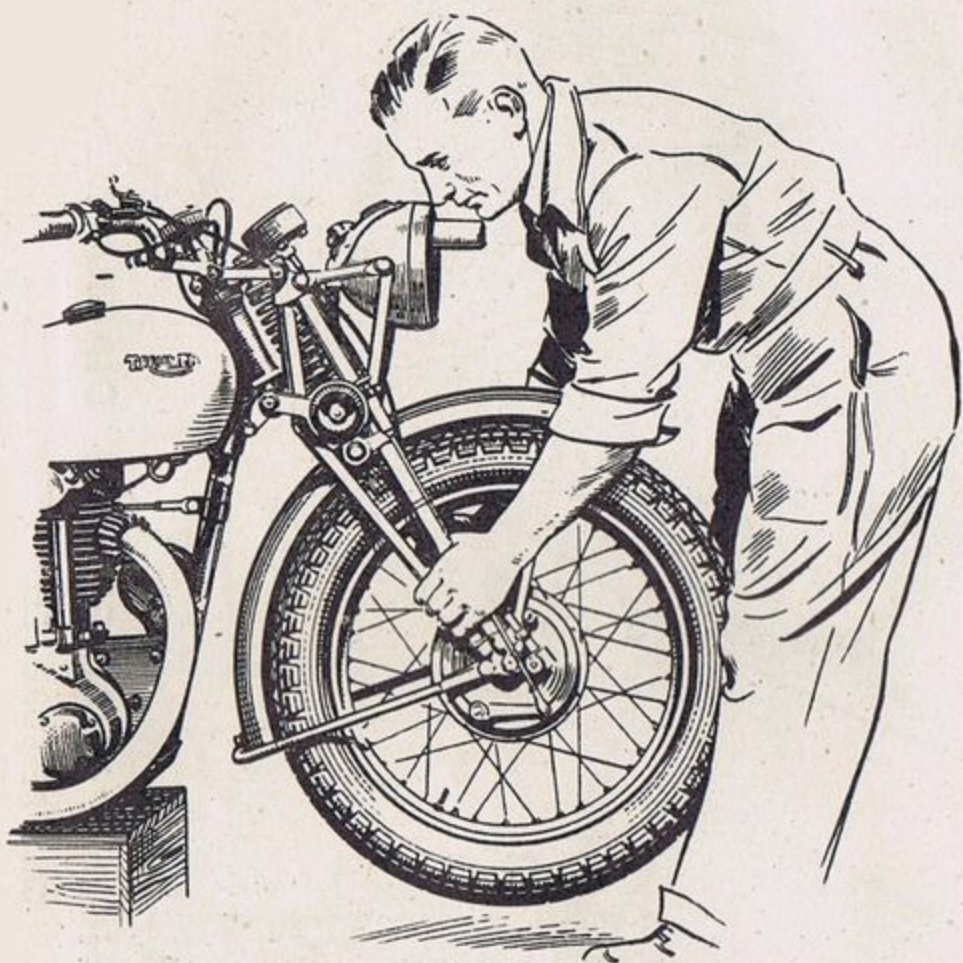
Steering head and forks showing large adjusting nut and fork spindle knurled washers.



ENGINE LUBRICATION DIAGRAM.

OIL PRESSURE FEED — — —

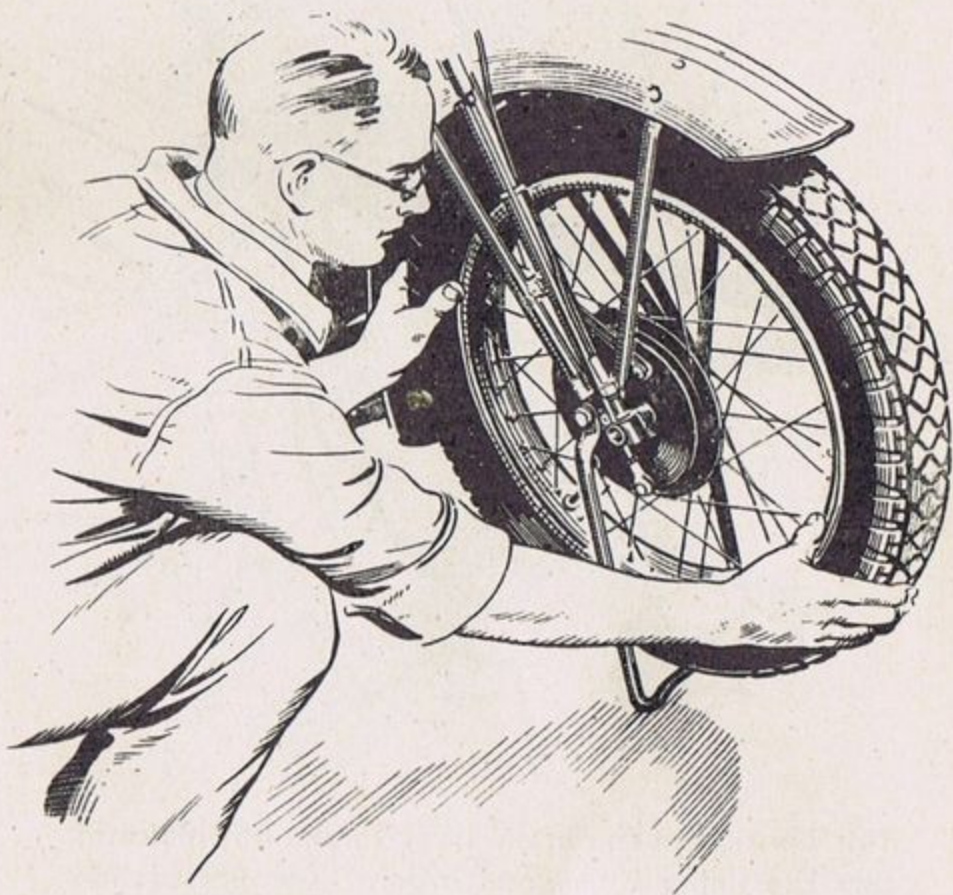
OIL RETURN - - -



Testing the adjustment of the steering head. It is convenient first to tighten up the fork dampers so as to retain the fork in its normal position.

ii. **Test for rim rock in the wheels.**

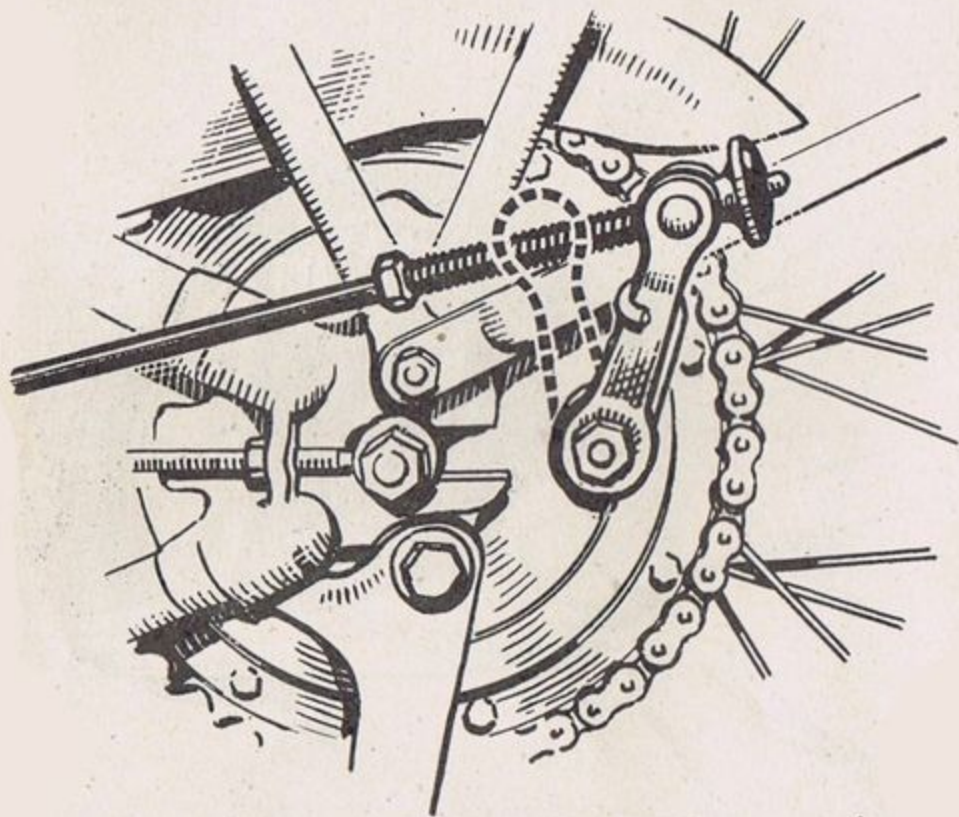
With the machine on the stand, take hold of the wheel with both hands, at points opposite to one another. Attempt to rock the wheel by pushing with one hand and pulling with the other. You should be able to feel a very slight amount of lateral movement. If there is a definite rock on the rim, it should be reported, the wheel taken out and the bearings examined. Wear, which requires readjustment, does not normally occur, even under adverse conditions.



Testing the adjustment of the wheel bearings.

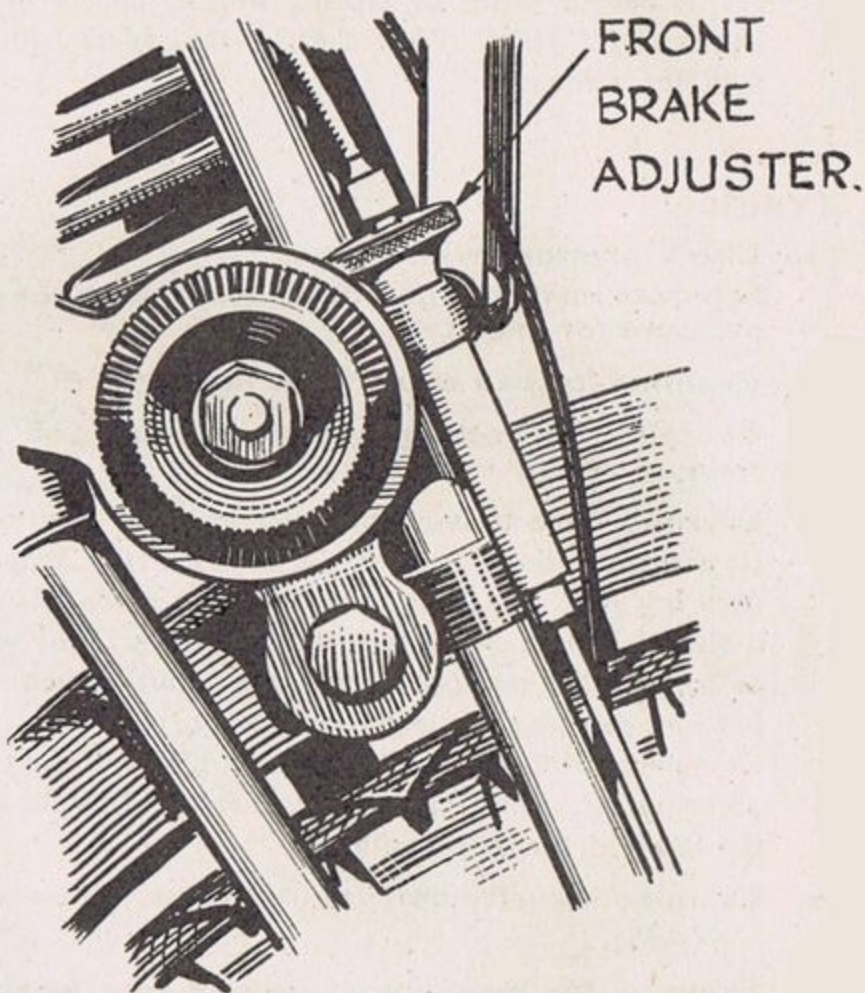
iii. **Examine for worn brake linings and brake adjustment, worn or stripped threads.**

With the rear brake "OFF," when the brake lining is new, the brake lever by the adjuster will point well to the rear with the wheel on the ground. As the lining wears, and the adjustment is taken up, the lever will take up a more vertical position. Watch the lever week by week and report when it approaches the vertical.



This position of the brake lever (brake off) indicates that the lining is in good order. The dotted line shows the lever position with badly worn linings.

Front brake lining wear can be estimated by the amount of thread exposed over the adjuster. When the front lining is new there will be no thread showing over the adjuster. As the adjustment is taken up, more and more thread will appear. Report when about $\frac{1}{2}$ " can be seen.



Knurled hand adjuster for the front brake. When the lining wears and the adjustment is taken up the thread will be seen just below the adjuster.

Item E.

TRACKING.

- i. **Examine for the correct toe-in of wheel (only applies when side-car fitted).**
Does not apply.
- ii. **Test wheels for signs of buckling or loose spokes.**
Spokes can be tested by tapping with a spanner and noting if any ring "flat." Note that all the spokes will not ring with the same note.

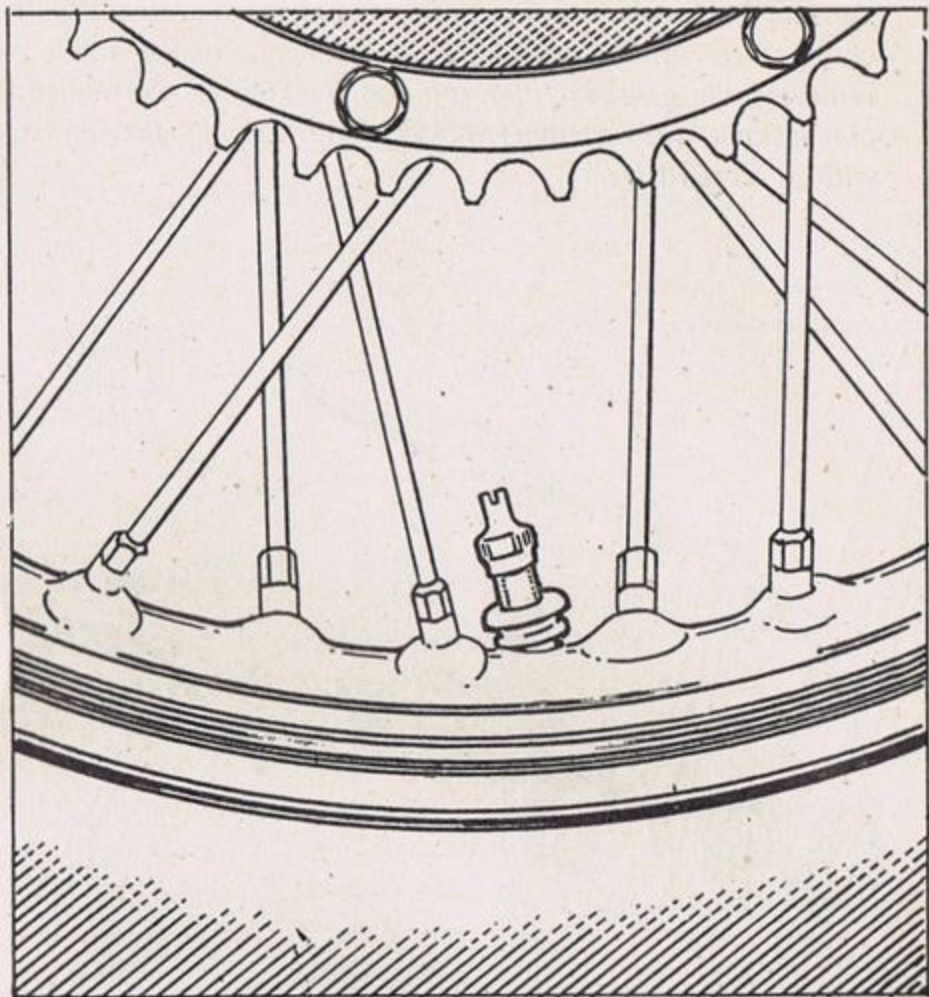
Item F.

TYRES.

- i. **Check pressure with gauge.**
Separate instructions will be issued as to the correct pressure for each tyre.
- ii. **Examine for bad cuts, flints, nails, etc.**
- iii. **Examine for rotting, grease, oil, tar and general wear of tread.**
- iv. **Examine tyre valves for missing caps and security.**
Do not tighten down the valve nut on to the rim. Screw it down until it is just clear. The reason of this procedure is that with a tight lock nut, if the tyre should "creep" the valve will be pulled out of the tube. With a slack nut the valve will tilt, but considerable tyre creep is necessary to pull it out of the tube. Examine the valve to see that it is not tilted. If it is, slack off security bolt, deflate tyre, and pull it round on the rim until the valve is properly positioned.
- v. **Examine security bolt for tightness. (Use spanner NA55).**
- vi. **Examine for pronounced uneven tyre wear. This may indicate bent forks, or wheel out of line.**
NOTE. See that any new tyres fitted have been recorded in A.B.412 with date, speedometer reading and serial numbers of old and new tyres.

Item G.

REPORT DEFECTS.



This illustration shows the position of the valve if the tyre has crept round on the rim.

TASK No. 5.

TRANSMISSION.

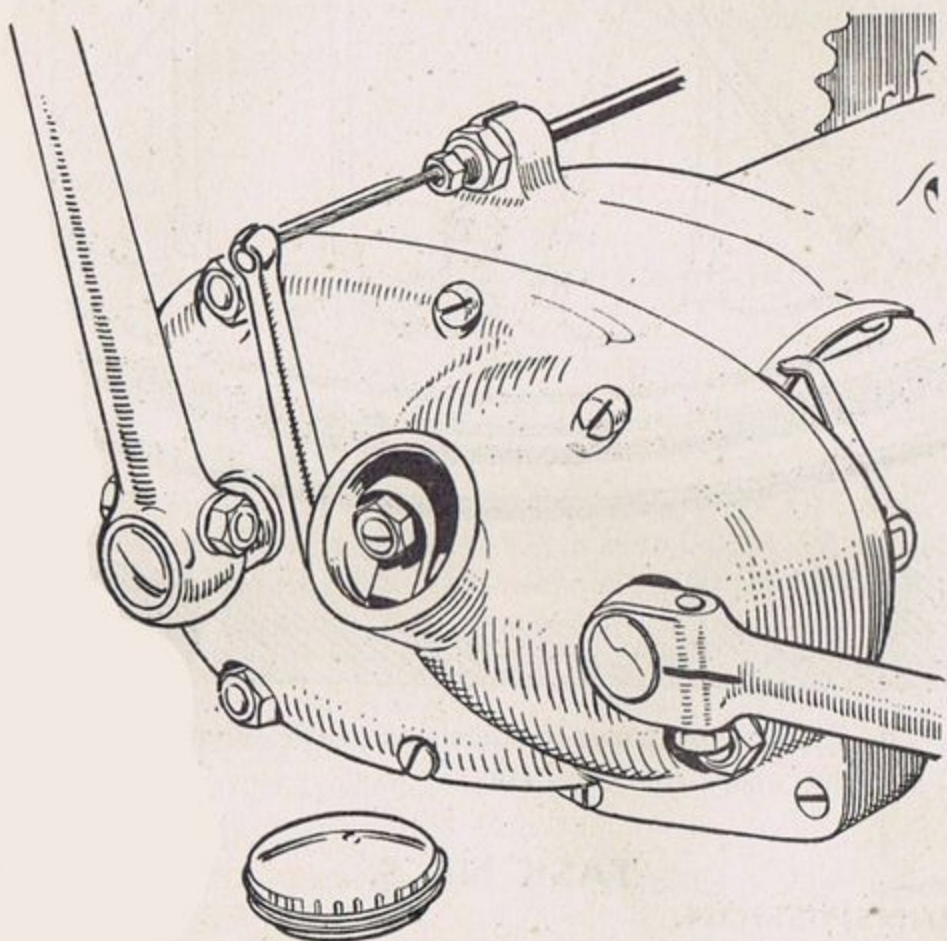
Item A.

EXAMINE CONTROLS.

i. **Check for requisite free movement of clutch lever.**

Check the free movement on the clutch lever at the handlebar end. It should be approximately $\frac{1}{16}$ ". Adjust if necessary with the adjuster on the top of the gearbox, first slacking off the lock nut (use spanner NA55 and PA56.) Do not allow the jaw of the spanner to lever up the adjuster or the gearbox

lug may be fractured. See there is $\frac{1}{16}$ " free movement at the clutch lever on the gearbox. Adjustment can be made by removing the gearbox filler cap and slacking off the adjusting pin locknut (use spanner NA55) and turning the adjuster with a screwdriver.



The clutch adjustment is inside the gear box, accessible after removing the filler cap. The cable adjustment is made by means of the adjuster on the top of the gearbox inner cover.

Are the clutch springs returning the lever to normal after operation ?

If not, look for cable not free in casing or bent clutch rod.

ii. Check gear lever for correct operation.

With the machine on the stand and the engine running select each gear in turn and also test the neutral position. If the machine has been ridden immediately prior to carrying out this task, the test can be made when on the road.

Item B.

LUBRICATION — GEARBOX.

i. Correct level and correct grade.

Engine oil 50HD should be used in the gearbox. It should be changed every 5000 miles. The drain plug is in the rear of the box (use spanner NA55). Do not drain by removing the acorn nut under the box, as this retains the camplate plunger and spring. The level plug is at the rear of the inner cover (use spanner NA55). The filler cap is on the right side of the box (no spanner required). The level is correct if oil just leaks out of the level plug orifice. Test with the oil hot after a run if possible. Always first remove the level plug before topping up the gearbox.

ii. Cleanliness and good condition.

Clean the exterior of the box with paraffin if necessary. Oil the exposed portion of the clutch cable. If the plugs or filler caps show signs of leakage, fit new washers. See that the cover joints are not leaking.

Item C.

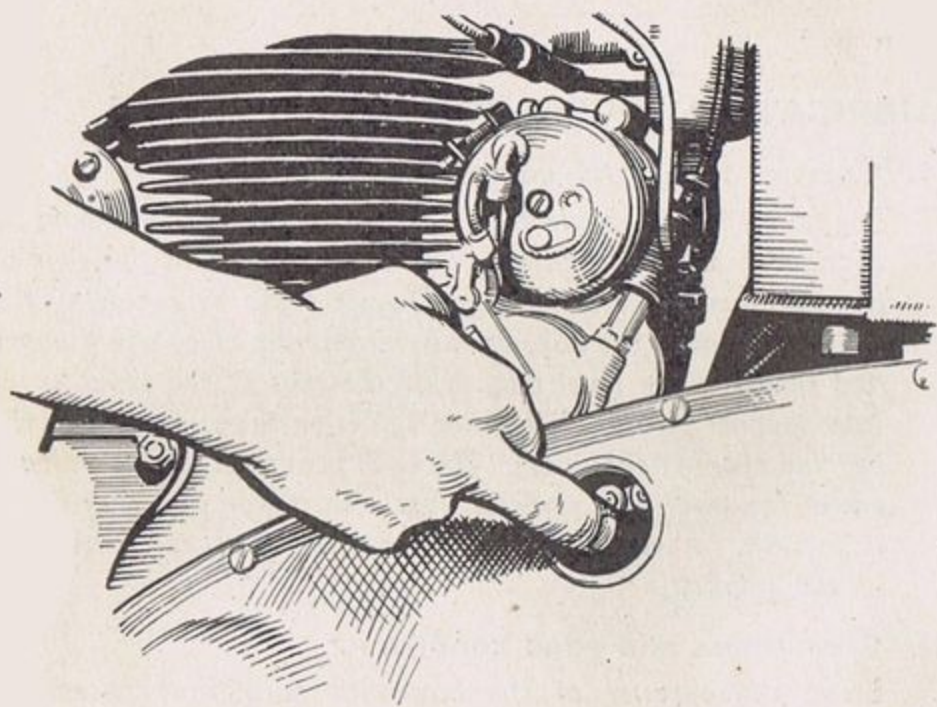
SECURITY, LUBRICATION AND WEAR.

i. Primary chain cover secure ?

Test screws with screwdriver.

ii. Primary chain not fouling, correct tension, correct lubrication.

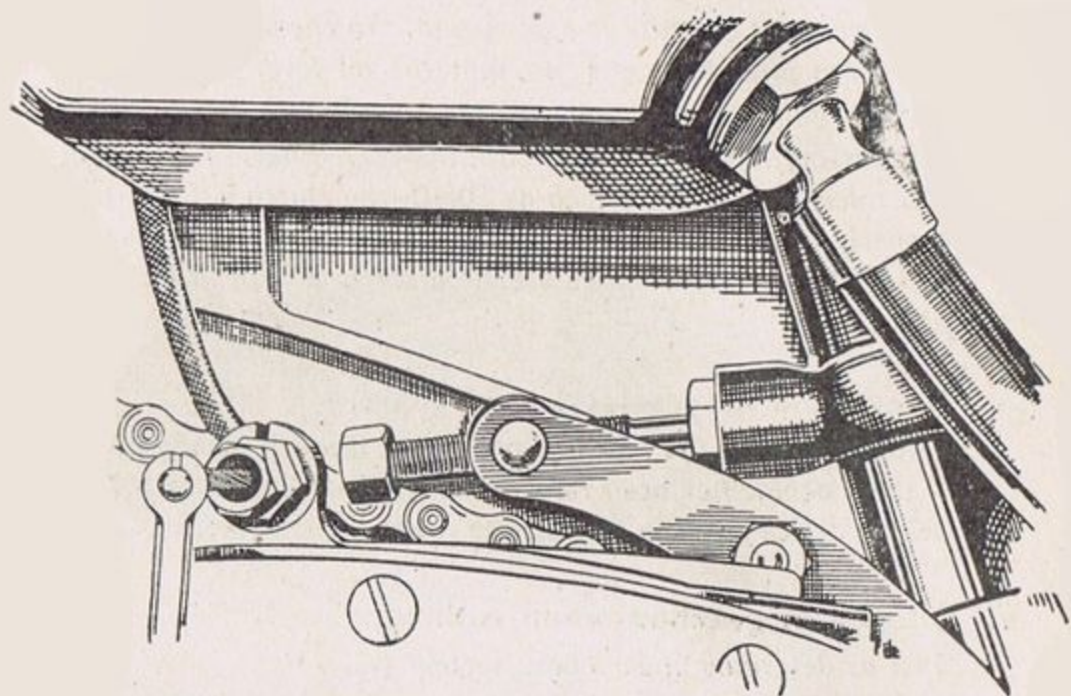
Remove chain cover filler plug (use spanner KA50 in slot). Insert finger and test up and down freedom of chain. Should be total of $\frac{1}{2}$ ". Turn engine over, and test chain in three or four different positions. If it is tight in any position, adjust until there is the required $\frac{1}{2}$ " of slack, even if this increases



Testing the adjustment of the primary chain.

the slackness in other positions. To adjust, the gearbox must be moved on the swivel. The gearbox clamping bolt nut must be slacked off (use spanner DA16) and the swivel bolt (use spanner NA66). The lock nut on the gearbox adjusting bolt should be slacked off (use spanner NA55) and the necessary

adjustment made in the adjusting bolt. Finally, tighten up adjusting bolt lock nut, the clamping bolt and the swivel bolt.



GEARBOX ADJUSTER WITH LOCK NUT.

Note that the Gearbox Pivot Bolt and Clamping Bolt must both be slacked off before the Adjuster is turned. Failure to do this will result in serious damage to the Gearbox Shell which will necessitate a replacement.

Adjustment of the primary chain makes necessary the re-adjustment of the rear chain (see Task 5c ix). Examine total length of chain through filler plug orifice. Watch for missing rollers. See fastener is secure. (See Task 5c xi).

iii. Gearbox secure.

Check tightness of gearbox clamping bolt nut (use spanner DA16) adjusting bolt locknut (use spanner NA55) and the swivel bolt (use spanner NA66).

iv. Clutch free from oil (correct level, correct grade on "run in oil" type).

The Triumph clutch is run in oil (correct grade 10HD). The oil should be changed every 1000 miles, by removing the drain plug at the bottom of the primary chain case (use spanner NA66) correct quantity to refill $\frac{3}{4}$ -pint. To check level remove chaincase filler plug and see that the oil level is up to the bottom run of the chain, though not covering it.

If necessary, add oil (10HD) until the correct level is reached. If a thicker oil is used, such as 50HD, the clutch will not free properly, and there will be difficulty with the gear change. If 10HD is not available, use a mixture of half 50HD and half paraffin.

v. Silent and easy selection of gears.

Check by riding the machine and going through all the gears. If the machine has been ridden to the point where this task is being carried out, the test can be made then.

vi. Silence in gearbox when running.

Test as described under above section (v).

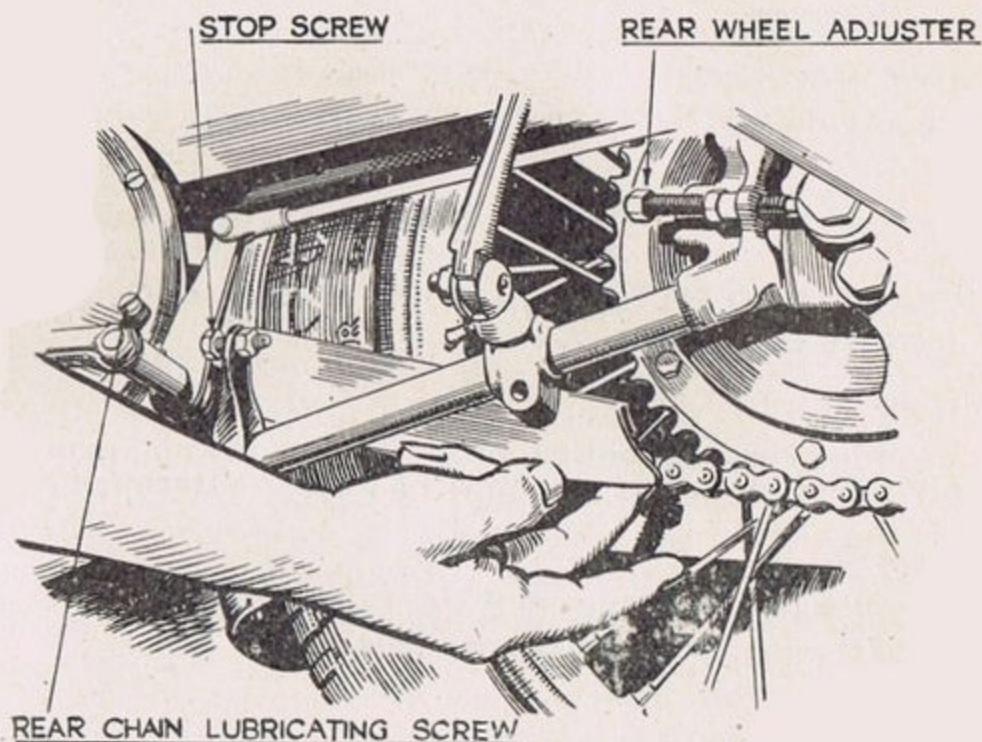
vii. Rear chain cover secure.

Check the bolts securing the chain guard (use spanners PA56 and NA66).

viii. Rear chain not fouling, correct tension, correct lubrication.

Check chain for tension. There should be $\frac{1}{2}$ " up and down movement in the middle of the run. To adjust, slack off the rear spindle nuts (use spanner NA66) and adjuster lock nuts (use spanner KA50), Illus. p. 32. Turn adjuster bolts to alter rear wheel position (use spanner NA55). Rotate each adjuster the same number of turns in order to keep the rear wheel in correct line. Make certain the axle collars are up against the ends of the adjusters by pushing the wheel forward. Tighten up the axle nuts and the adjuster lock nuts. Test chain again for tension. Finally readjust rear brake (see Task 4A ii.)

Examine chain for missing rollers. If lubrication is excessive screw in the adjuster a little at the rear of primary chain case. Screw out to increase oil supply. Adjust either way only a quarter turn at a time.



Testing the rear chain adjustment. Note also the adjuster for the rear chain lubrication in the primary chain case, the rear wheel adjusters and the brake pedal stop.

ix. Check chain sprockets for alignment and wear.

Only the rear chain sprocket can be examined. From the rear of the machine, view the sprocket in relation to the chain

line. Examine the teeth on the sprocket. Report if they show signs of wear and are becoming hooked.

x. If chains are very dirty or dry, remove to workshops for cleaning and lubrication.

Applies only to rear chain. Primary chain is fully enclosed. When refitting, take care to fit the spring fastener on the removable link correctly. A fish swims head first. Fit the spring plate so that it "swims" head first when the chain is moving.

Item D.

Report defects.

TASK No. 6.

FRAME AND FITTINGS, LAMPS, HORN, ETC., AND GENERAL ITEMS.

Item A.

Examine rivetted, bolted, or welded (or brazed) assembly joints for security, points of sidecar attachment.

Item B.

Examine for cracked members, especially :—

- i. Steering head cross members.**
- ii. Engine brackets.**
- iii. Front forks.**
- iv. Rear forks.**
- v. Head lamp carrier.**

Item C.

Examine frame for distortion. (Does frame look twisted, or is steering difficult ?)

If the frame or forks are out of line, the tyres will quickly show uneven wear on the treads. Uneven wear may be due to other causes also.

The wheel alignment should be checked by means of a piece of cord. If the stretched cord is placed alongside the two wheels, a few inches clear of the ground, it should make contact with the

walls of the tyres in four places, twice on the front tyre, and twice on the rear. If the contact is not made in all four places then it must be ascertained first if the rear wheel adjustment is at fault and then if the frame or forks or both require resetting. This is a workshop job.

Item D.

Examine security of all bolted and riveted stays, brackets, hangers, etc.

Check specially tail guard bolts (use spanner NA66). Silencer hanger bolts (use spanner NA55). Carrier (use spanner NA55), Headlamp brackets (use spanners NA66 and NA55).

Item E.

Examine general security and good order of mudguards, saddle, stands, tool boxes, battery.

Item F.

Lamps and horn.

i. Check headlamp for correct focus.

Can only be tested at night without special arrangements. Focussing is effected by removing the lamp front, slacking off the bulb holder clamping clip at the back of the reflector, and sliding the holder to the front or rear. After adjustment, see that the clamping screw is tight. To remove the lamp front, pull forward and down the clip at the bottom of the rim. The front assembly, consisting of the rim, mask, reflector and bulb assembly can then be removed by pulling the bottom of the rim forward.

ii. Check lamps and instruments for cracked glasses.

iii. Check light and horn switches for correct operation.

Test the lights on each position of the switch (see illustration on page 4). Test the horn for a clear uninterrupted note. If the note wavers, an adjustment is probably necessary, providing the battery is fully charged.

iv. Note if lamps conform to black-out orders.

Item G.

i. Check lubrication nipples for being clogged or oil ways choked.

- ii. **Lubricate any points that may have been overlooked in carrying out previous tasks.**

On the Triumph machine, providing that the previous tasks have been carried out, further lubrication should not be undertaken during this task. The lubrication advised during Tasks 1, 2, 3, 4 and 5 is sufficient to last for one week, or longer where stated. With a number of oil points, over-lubrication is detrimental.

Item H.

- i. **Check all tools. Report tools missing or damaged. Clean and lightly smear with oil.**

PERIODICAL ATTENTIONS.

EVERY 1,000 MILES.

CLUTCH.

Drain primary chain case by removing plug at the bottom. If machine is used under adverse conditions wash out the case by putting in a pint of paraffin and running the engine for approximately one minute. Drain and replace the plug, and refill with three-quarters of a pint of engine oil 10HD. *Do not use 50HD.* When 10HD is not available, use half 50HD and half paraffin.

EVERY 2,000 MILES.

ENGINE OIL.

Drain engine oil tank when the oil is warm after a run. Clean oil tank filter and crankcase filter by washing in petrol. Refill to within 2 ins. of the filler cap with engine oil 50HD. Oil should be changed more frequently if the machine is used in sandy or muddy country or if it is employed for a succession of short runs. If the machine is new or a replacement unit has been fitted, the first oil change should be at 500 miles. See page 15 for details of draining.

BRAKE CAM SPINDLES.

Each time the oil is drained the nipples on the ends of the front and rear brake cam spindles should receive one stroke from the oil gun. Do not give more than one stroke or the spindles may be over-lubricated and oil may penetrate to the brake linings.

EVERY 5,000 MILES.

GEARBOX.

Drain after a run when the oil is warm. The drain plug is located in rear of the gearbox. Do not drain by removing the domed nut under the gearbox casing. Refill with engine oil 50HD through the filler plug orifice. There is a level plug at the rear of the inner cover. If the machine is new or a replacement gearbox has been fitted, drain after 500 miles running.

MAGDYNO.

Lubricate contact breaker and dynamo commutator end bearing.

SPEEDOMETER DRIVE.

Remove the front wheel and take off the spindle nut and anchor plate. Thoroughly clean the speedometer drive pinions and lubricate with grease. Do not leave too much free grease on the gears. Lubricate the drive cable by detaching the top end and using the oil can.

EVERY 10,000 MILES.

DECARBONISING.

At this period the engine should be decarbonised and the valves ground in. It is normally unnecessary to do this at an earlier period. This attention should be carried out by workshops.

WHEEL BEARINGS.

Remove wheels and dismantle hubs. Wash bearings and other parts in paraffin and dry. Lubricate with grease No. 2., reassemble and adjust. On the earlier models a grease nipple was fitted to the hubs, but was discontinued later and, when provided, should not be used for lubricating the bearings. It is convenient to stop up the nipple, when fitted, by tapping a short length of wire into the hole in the mouth. This attention should be carried out by workshops.

DYNAMO.

Inspect commutator and clean if necessary.

EVERY 20,000 MILES.

MAGDYNO.

The magdyno should be removed from the machine and sent to workshops for thorough overhaul and lubrication.

REGULATOR.

The voltage control regulator should be sent to workshops for examination and adjustment if necessary.

WHEEL REMOVAL AND REPLACEMENT.

FRONT WHEEL REMOVAL AND REPLACEMENT.

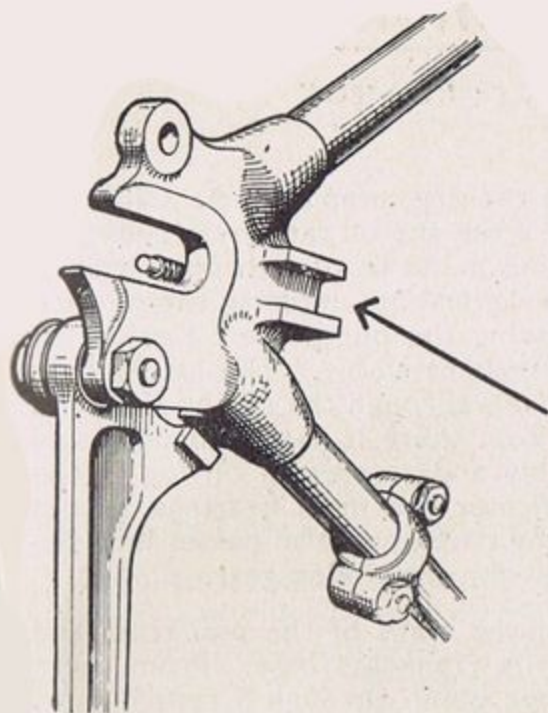
Disconnect the speedometer drive and front brake rod at the lower end. Remove the brake torque rod bolt. Lower the front stand and slack off the spindle nuts, when the wheel can be withdrawn. To replace, reverse the removal procedure.

REAR WHEEL REMOVAL.

Slack off the nuts securing the tailguard mudguard stays and remove the two hexagonal-headed screws securing the tailguard to the mudguard blade. Where pannier equipment is fitted the steady stay fitted to the tailguard should be detached from the pannier frame at each end. Remove the tailguard and place it at the side of the machine. It is not necessary to remove the rear lamp cable as there is sufficient slack to allow for the removal of the tailguard. Break the rear chain by removing the spring link. Be careful to see that the gearbox is not in the neutral position, as if the gearbox sprocket is free the weight of the chain may rotate it and the chain will then fall off. Screw off the brake adjusting nut. Slack off the two spindle nuts and withdraw the wheel from the fork.

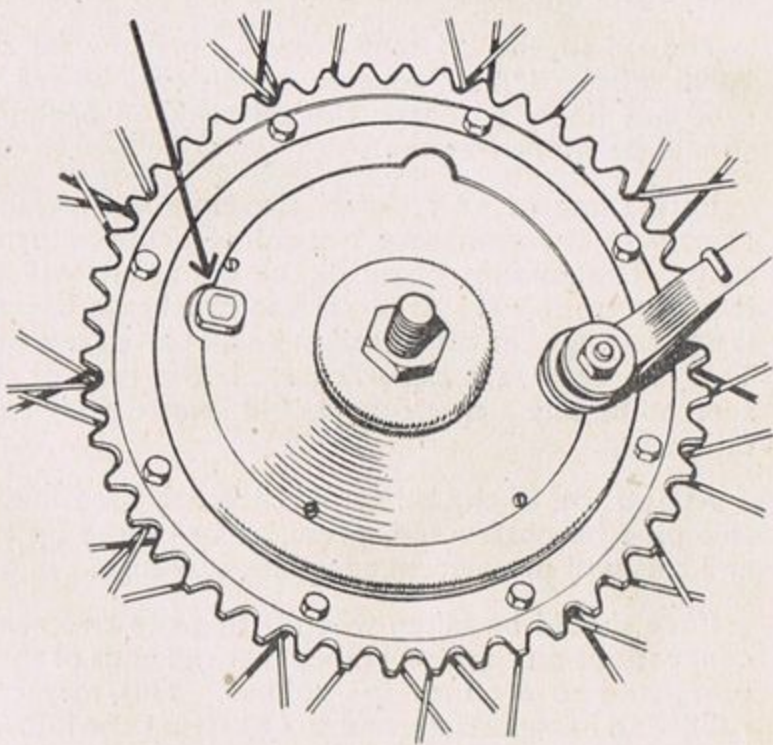
REAR WHEEL REPLACEMENT.

To replace the wheel, reverse the removal procedure. Note that there is a stud on the brake anchor plate which must be fitted into the locating channel on the inside of the rear fork.



**Locating Channel
inside
Rear Fork.**

**Stud on Rear
Brake
Anchor Plate
which must
be located
in Rear Fork
Channel.**



LUBRICATION.

(See diagram, centre pages).

ENGINE.

The engine is lubricated on the dry sump system. Oil is fed to the oil pump pressure side from the oil tank by gravity and suction. To reach the oil pump it has to pass through a filter which is fitted to the large hexagonal nut securing the oil pipe union to the tank. After leaving the pump the oil passes to the timing side of the crankshaft assembly. The assembly is suitably drilled and the oil travels through the timing shaft and into the crankpin oilways. From there it passes through and lubricates the big-end assembly and creates an oil fog in the crankcase. This oil fog lubricates the main bearings, piston and cylinder, and other moving parts, and also passes into the timing case to supply lubricant for the timing gear.

The surplus oil runs down the walls of the crankcase and drains through a filter into the crankcase base. From there it is picked up by the scavenge pump through a return pipe, the inlet of which is at the bottom of the crankcase. The scavenge pump returns the oil to the oil tank.

The oil in the oil tank should normally be changed every 2,000 miles. Under adverse conditions, where mud, dust or sand are likely to enter the oil tank or engine, the changes should be more frequent.

Entire loss of or reduced scavenge will mean that oil will remain in the crankcase instead of being returned to the oil tank. The amount of oil in the crankcase will build up until it starts to be exhausted *via* the crankcase breather. If there is no scavenge the oil will soon be all passed out of the breather. This is a very rare occurrence. If the rear of the machine is seen to be oily a check-up should immediately be made on the oil return.

At the top of the oil tank there is a breather pipe. Should this pipe be obstructed, pressure will build up in the oil tank and this will prevent an adequate scavenge.

Care should be taken when fitting the two synthetic rubber connections on to the oil pipes that the ends of the pipes are not permitted to dig into the rubber. This may cause pieces of rubber to become detached and obstruct the lubrication system. If the connections are hard, place them in paraffin for a few minutes.

GEAR BOX.

The gear box is lubricated with engine oil 50HD. Heavy gear oil as used on cars and trucks must not be used or serious damage will result.

The oil is put into the gear box by way of the filler cap orifice. There is a level plug at the rear of the inner cover and oil should be filled in until it runs out of the level plug hole. The oil should be warmed up before it is put into the box so that it will flow freely.

The drain plug will be found at the rear of the box and not on the bottom of it ; the oil must not be drained by removing the dome nut which retains the camplate plunger and spring.

PRIMARY CHAIN AND CLUTCH.

The primary chain and clutch are lubricated with 10HD oil, or a mixture of half engine oil 50HD and paraffin. This mixture should be employed only if 10HD oil is not available. The correct quantity is three-quarters of a pint. The oil should be changed every 1,000 miles.

FORK AND CYCLE PARTS.

All moving parts such as the head race, fork spindles, etc., are lubricated with oil C600 by means of the grease nipples provided. The hub bearings are lubricated with Grease No. 2, as described on page 41. Brake rod joints, pins, etc., should be lubricated with the oil can.

CHAINS.

ALTERATIONS AND REPAIRS.

If the chains have been correctly serviced very few repairs should be necessary. But should the occasion arise to repair, lengthen or shorten a chain, a rivet extractor and a few spare parts will cover all requirements.

To SHORTEN a chain containing AN EVEN NUMBER OF PITCHES remove the dark parts shown in Fig. 1, and replace by cranked double link and single connecting link as Fig. 2.

To SHORTEN a chain containing an ODD NUMBER OF PITCHES remove the dark parts shown in Fig. 3, and replace by single connecting link and inner link as Fig. 4.

To REPAIR a chain with a broken roller or inside link remove the dark parts in Fig. 5, and replace by two single connecting links and one inner link as Fig. 6.

RIVET EXTRACTOR.

The rivet extractor can be used on all motor cycle chains up to $\frac{3}{4}$ in. pitch whether the chains are on or off the wheels.

When using the extractor :—

1. Turn screw anti-clockwise to permit the punch end to clear the chain rivet.
2. Open the jaws by gripping tommy bar and handle together. (See Fig. 7, page 48.)
3. Pass jaws over chain and release grip. Jaws should rest on a chain roller free of chain link plates. (See Fig. 8, page 48.)
4. Turn screw clockwise until punch contacts with and pushes out rivet end through chain outer link plate.

Unscrew punch, withdraw extractor and repeat complete operation on the adjacent rivet in the same chain outer link plate.

The outer plate is then free and the two rivets can be withdrawn from opposite side with the opposite plate in position.

Do not use the removed part again.



Fig. 1.



Fig. 2.



Fig. 3.



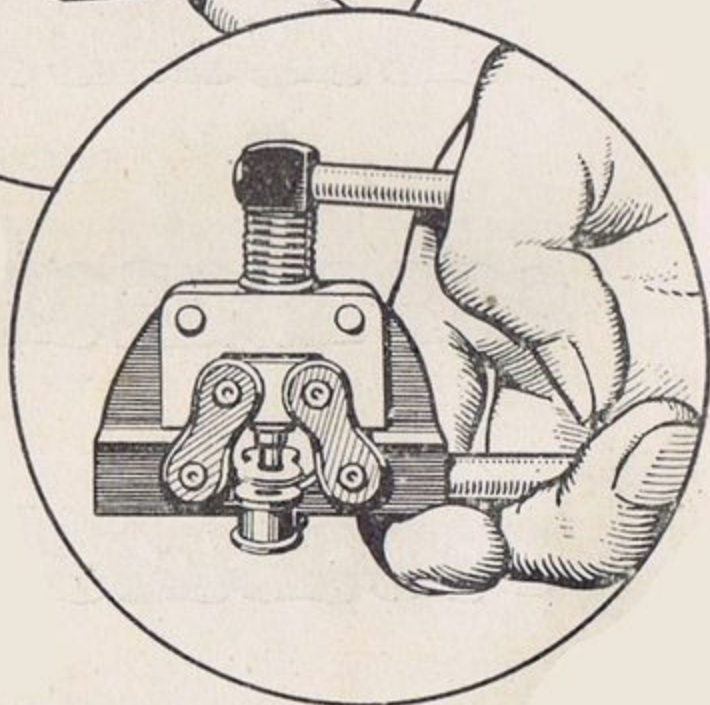
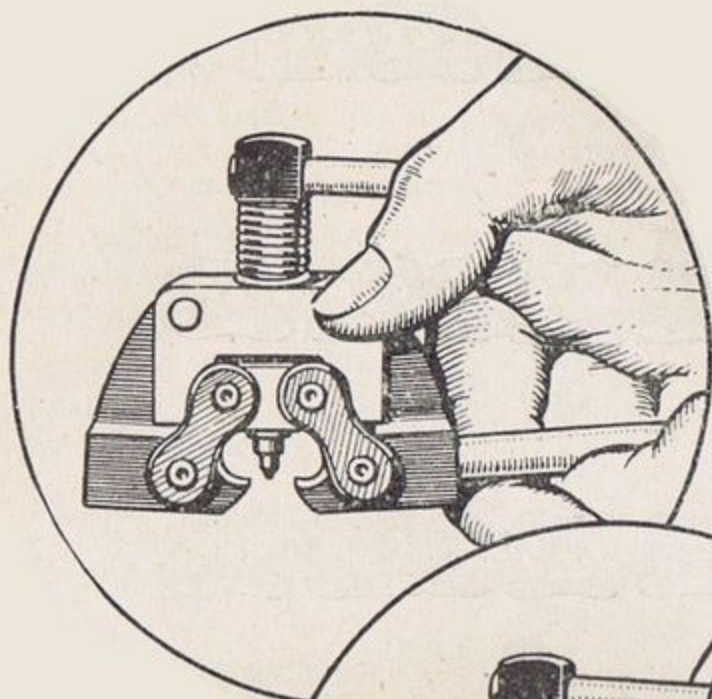
Fig. 4.



Fig. 5.



Fig. 6.



THE CHAIN RIVET EXTRACTOR.

See page 46 for instructions for use.

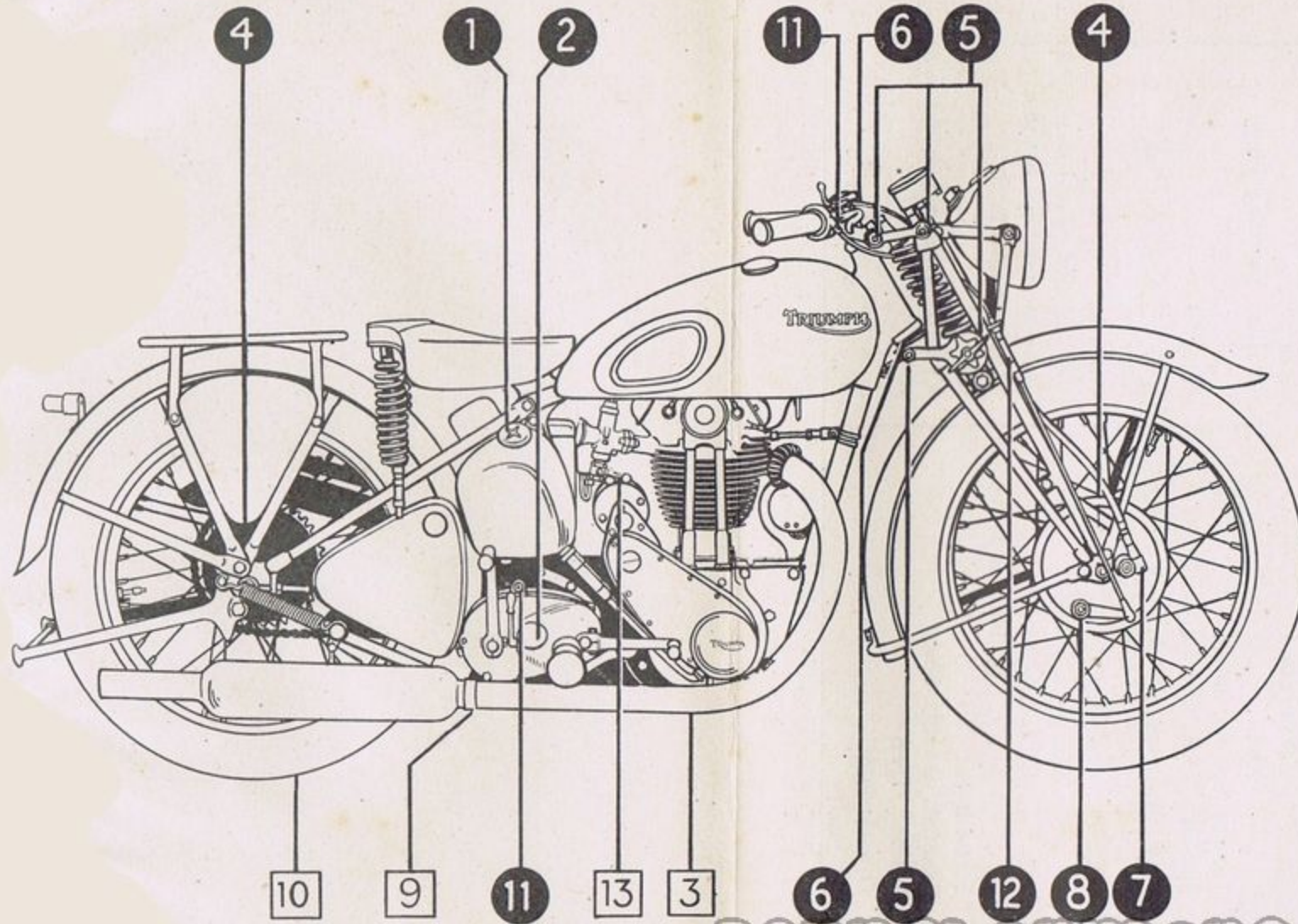
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TOOLS

MANUFACTURERS' TOOLS SUPPLIED WITH MODEL 3HW.

PART NO.	DESCRIPTION	PURPOSE
DA5	Spanner, .218 and .338 Square	Fork Spindles, Tappets
PA56	„ Combination	General
DA87	„ Box	14 m.m. Sparking Plug
DA21	Tommy Bar for above	
KA50	Spanner, D.E., .375 x $\frac{1}{8}$ "	General
NA55	„ „ $\frac{5}{16}$ " x $\frac{1}{4}$ "	General
DA16	„ „ $\frac{7}{16}$ " x $\frac{3}{8}$ "	General
NA66	„ Closed, $\frac{5}{16}$ " x $\frac{3}{16}$ "	General
DA72	„ D.E., .920 x 1.010	General and Wheel Bearing Adjustment
PA57	„ Closed, $\frac{9}{16}$ " x $\frac{1}{2}$ "	General and Rear Spindle Nuts
NA65	„ „ $\frac{3}{16}$ " Hex. and .218 Sq.	Tappet Adjustment
PA55	Screwdriver	General
PA60	Spanner, Double Box	Cylinder Head Bolts and General
D49	Inflator, Tyre	
NA12	Grease Gun	

Figures in Circles refer to Offside of Machine and those in Squares refer to points on Nearside not visible in illustration.



Loc. No.	PART	W.D. Lubricant	TASK No.
1	Engine Oil Tank (Capacity 6 pints)	50 HD	★
2	Gear Box - - -	50 HD	5
3	Primary Chain Case - - -	10 HD	★
4	Wheel Hubs - - -	GR. No. 2	★
5	Fork Spindles - - -	C 600	4
6	Steering Head - - -	do.	4
7	Speedometer Gear Box - - -	do.	★
8	Front Brake Cam Spindle - - -	GR. No. 2	★
9	Foot Brake Pedal Spindle - - -	C 600	4
10	Foot Brake Cam Spindle - - -	GR. No. 2	★
11	Exposed Cables - - -	50 HD	4
12	Brake Spring Box - - -	C 600	4
13	Dynamo - - -	10 HD	★
OIL CAN LUBRICATION.			
	All Brake Rod Joints and Pins - - -	50 HD	4

★ Periodical Maintenance as ordered.

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