



Part Number 92-2158

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INTRODUCTION

The Norton Commander is designed and constructed to fulfil the two primary needs of the modern motorcyclist – sporting excitement plus the pleasures of touring.

The smooth, turbine like power of the rotary engine, and the streamlined bodywork means that the Commander can cover mile after mile in maximum comfort, and in the minimum time.

Although the Rotary engine represents an advanced new technology the machine is simple to maintain and the time required to carry out the routine maintenance is shorter than that required for conventional motorcycles.

This manual is designed to help you to ride safely, and to obtain the maximum pleasure from ownership, and to provide the information on the care and attention necessary to maintain the reliability and service we have designed into the machine.

The first section of the book describes and illustrates the operation of the controls, switches and accessories, and provides the necessary information on driving and using the vehicle.

The second section summarises the Recommended Service Schedules into the recommended periodic maintenance requirements, the third section covering the General Service Operations that may be required from time to time. Certain operations require special tools, equipment and expert knowledge which the

average owner will not possess, and these tasks should be entrusted to your nearest Authorised Norton Service Dealer or the Factory Service Department.

The Daily Checks and Periodic Maintenance Schedules should, however, be scrupulously followed. High standards of workmanship in these tasks will be rewarded by superior reliability and longevity of the machine.

If you are in any doubt whatsoever about any aspect of the maintenance ask your local Authorised Norton Service Dealer or contact the Service Department, Norton Motors Ltd. Lynn Lane Shenstone Staffs, Tel. Shenstone (0543)480101 for advice.

Failure to carry out maintenance at the specified intervals in accordance with the manufacturers instructions or the use of non-genuine Norton Parts may invalidate the warranty and may put the riders safety at risk.

The Norton Warranty given for the Commander is for a period of 12 months from the date of original purchase.

See the Warranty Statement for full details of the warranty on this machine and the specific exclusions and limitations applied.

The Warranty does not affect any statutory rights.

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CONSUMER PROTECTION

Throughout this manual we have attempted to bring to the users and riders notice those functions on the motorcycle that may be critical to his safety or well being if they are not attended to in the correct and recommended manner or at the prescribed intervals.

In order to standardise these notices, we have categorised as follows: –

Explanation of Terms used in this Publication

WARNING: A warning is given where failure to observe the recommended procedures could result in danger to the rider.

CAUTION: A caution is given where failure to observe the recommended procedures may lead to extensive damage to the machine or possible injury to the rider.

NOTE: A note is intended to give guidance to the rider and prevent possible expensive repairs by emphasising the recommended procedures.

It is strongly recommended that only genuine Norton replacement parts (parts manufactured and supplied by Norton Motors Ltd) are used when parts are needed. Where a warranty claim is involved, your local Authorised Norton Service Dealer or the service department of Norton Motors Ltd. should be contacted.

When ordering replacement parts or requesting service information always quote the engine and frame numbers to permit correct and positive identification.

Norton Motors Ltd reserve the right to vary the specification of all Motorcycles and Spare Parts without notice, and this information does not therefore constitute a term of any sale. All descriptions and claims are given and made in good faith, but are intended to apply generally. Variations in performance and construction of individual machines may occur. In particular, performance will be affected by conditions, circumstances and the rider.

WARNING

This motorcycle has been designed and manufactured for use on the road by an experienced rider, and to be ridden in a reasonable and prudent manner.

TECHNICAL SPECIFICATION

Engine	TYPE	Twin chamber liquid coded Norton rotary	Transmission	PRIMARY CHAIN	92 link 3/8" pitch x 7/16" Duplex
	CHAMBER CAPACITY	588cc			30 tooth engine sprocket with hydraulic tensioner
	COMPRESSION RATIO	9.0:1		CAPACITY	250cc
	POWER OUTPUT Kw.	63.4		REAR CHAIN	112 link 5/16" x 3/8" single row chain
	BHP	85			17 tooth gearbox sprocket operating in a fully sealed oil bath, 43 tooth rear wheel sprocket
	at R.P.M.	9,000		CAPACITY – initial fill	175cc
	MAXIMUM TORQUE	75.4 Nm		refill	75cc
	at R.P.M.	7000		OVERALL GEAR	4.8:1
				RATIO	15.6 m.p.h. at 1,000 m.p.h. in 5th gear
	FUEL – OCTANE	95 RON Leaded or unleaded			
Lubrication	TYPE	Total loss system	Clutch	TYPE	Multi-plate diaphragm spring type
	OIL TANK CAPACITY	4 Litres (7 Imp. pints)		NUMBER OF PLATES	9 Friction. 9 Plain
				MATERIAL	sintered bronze – engaging with steel intermediate plates
Cooling system	TYPE	Forced circulation with thermostat control and by-pass system for reduced warm-up time. Electric fan for circulation of ducted cooling air.		SPROCKET	57 Teeth
	COOLANT	50/50 Glycol/Water			
	THERMOSTAT	Opening temperature 85°C			
	FILLER CAP	Operating pressure 1.1 Bar	Ignition	TYPE	Electronic Inductive with contactless trigger unit and electronic revolution limiter
Carburettors	TYPE	SUH1 F4 constant vacuum		TRIGGER UNIT	Variable Reluctance electromagnetic pulse generator
	NEEDLE	NZX 4030			
	SPRING	Red		PLUGS	10mm surface gap non-adjustable with platinum centre electrode
	CHOKE SIZE	38mm. diameter		TYPE	CHAMPION U.G. 80 P.V./501 P.V.
				COILS	Two 6 volt coils
				IGNITION UNIT	Electronic Inductive with internal distributor switching and external ballast resistor
Gearbox	TYPE	5-Speed constant mesh			
	GEAR RATIOS	1st 1:2.58			
		2nd 1:1.83			
		3rd 1:1.40			
		4th 1:1.19			
		5th 1:1			
	CAPACITY	1 Litre			

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TECHNICAL SPECIFICATION

Suspension	FRONT	TELESCOPIC FORKS 37 mm dia. tubes with 145 mm travel	
	OIL CAPACITY	250cc each leg	
Brakes	REAR	Koni adjustable 3 position spring – 4 position damping	
	DIAMETER	Twin front disc 265 mm Single rear disc 265 mm	
	HYD-FLUID	Min Spec D.O.T.4	
	CALIPERS	Opposed piston	
Wheels	TYPE	Three spoke cast aluminium – quickly detachable rear Front MT 2 15 x 18 tubeless Rear MT 2 75 x 18 tubeless	
Tyres	TYPE	Front 100/90V18 Pirelli Phantom MT29 Rear 110/90V18 Pirelli Phantom MT28	
Electrical Equipment	BATTERY	12v28a.h.	
	ALTERNATOR	3ph.370W	
	HORNS	Twin Electromagnetic	
	VOLTAGE REGULATOR	Electronic 3 phase-370W	
Fuses	RATING	Main	30 amp (Green)
		Fan	15 amp (Blue)
		Auxiliaries	30 amp (Green)
		Ignition	15 amp (Blue)
		Direction Indicators	10 amp (Red)
		Ignition Unit	10 amp (Red)
		Headlamp	15 amp (Blue)
		Spare	30 amp (Green)

Bulbs	Qty.	Description	
Headlamp (main)	1	Quartz Halogen Dual Filament	
		12V. 60/55W	OH 472
(pilot)	1	12V. 4W	233
Daylight	2	12V. Sealed units	
Instrument panel	11	12V. Capless 2.5W	512
Temperature gauge	1	12V. 2W	643
Front Indicator	2	12V. 21W	382
Stop/Tail	2	12V. 21/5W	380
Rear Indicator	2	12V. 21W	382
Rear Fog	2	12V. 21W	382
Number plate	1	12V. 4W	207

General Data	Kerb Weight	235KG
	Fuel Tank Capacity	23 Litres
	Length	2220 mm
	Wheelbase	1486 mm
	Overall Width	880 mm
	Overall Height	1470 mm
	Ground Clearance	180 mm

Instrumentation	Analogue Speedometer
	Electronic Tachometer
	Temperature Gauge
	Digital Clock
	Fuel level gauge
	Headlamp main beam indicator lamp
	Oil level warning lamp
	Direction indicator repeater lamps
	Neutral indicator lamp

ENGINE AND FRAME NUMBERS

Engine and Frame Numbers

Engine Serial Number The engine serial number is stamped on a cast-in raised platform near the primary drive case filler cap on top of the right-hand main engine casting.

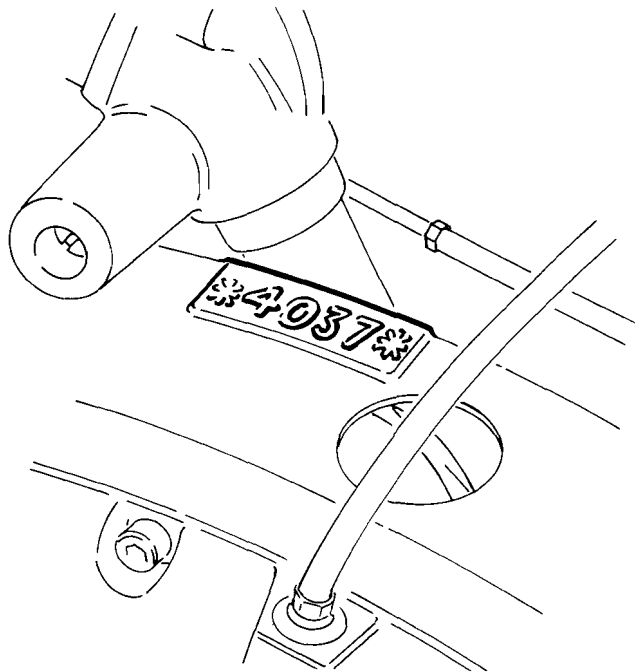


Figure 1 Engine Number Location

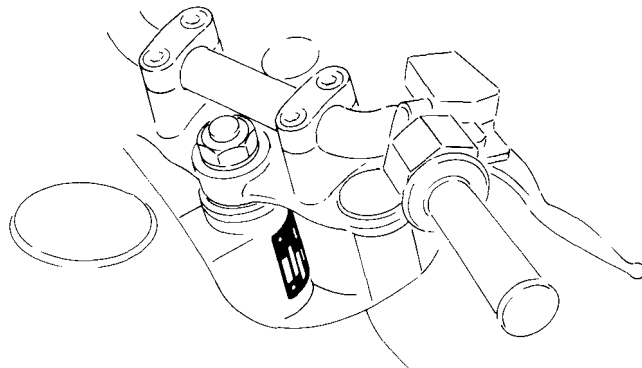


figure 2 Frame Number Location

Frame Serial Number The frame serial number is stamped on the Frame Certification Label plate, which is rivetted in position at the front of the steering head tube.

THE CONTROLS

- 1 Seat Lock
- 2 Fuel Tap
- 3 Footchange Pedal
- 4 Direction Indicator Switch
- 5 Horn
- 6 Headlamp Dip Switch
- 7 Headlamp Flasher Switch
- 8 Clutch Operating Lever
- 9 Clutch Cable Adjuster
- 10 Speedometer
- 11 Ignition Switch/Steering Lock
- 12 Temperature Gauge
- 13 Electronic Tachometer
- 14 Fuel Gauge
- 15 Clock
- 16 Choke
- 17 Front Brake Lever
- 18 Engine 'KILL' Switch
- 19 Throttle Twist Grip
- 20 Starter Button
- 21 Lights On/Off Switch
- 22 Petrol Filler Cap
- 23 Rear Brake Pedal
- 24 Oil Tank Filler Cap and Level Dipstick
- 25 Rear Fog Light Switch (only functions in conjunction with Headlamp Lo-Beam)
- 26 Fairing and Pannier Lid Locks

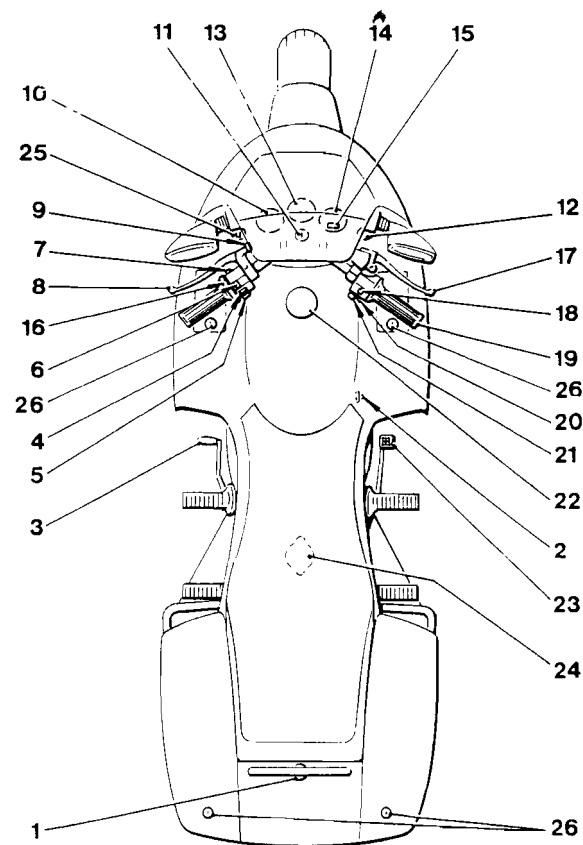


Figure 3 The Controls

THE CONTROLS

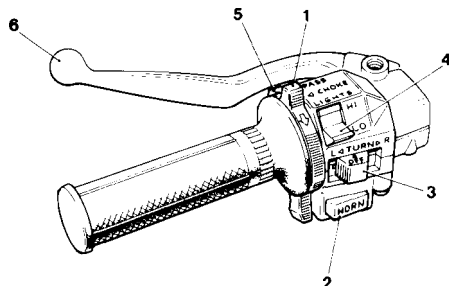


Figure 4 Left Handlebar Controls

L.H. Handlebar

item 1 Choke – 4 'click' positions

0) off – rotate away from rider

1) $\frac{1}{4}$ on

2) $\frac{1}{2}$ on

3) $\frac{3}{4}$ on

4) fully on

item 2 Horn (red)

item 3 Direction Indicator Switch
(central position – off)

item 4 Hi-Lo Main Beam Switch

item 5 Headlamp Flasher Switch

item 6 Clutch Operating Lever

Handlebar Controls

To Adjust the Brake and Clutch Lever Assemblies – for rider accessibility and comfort.

1. Slacken the clamping screws
2. Rotate lever assembly to desired angle.
3. Tighten screws.
4. CHECK FOR FREE UNOBSTRUCTED OPERATION ON EACH LOCK

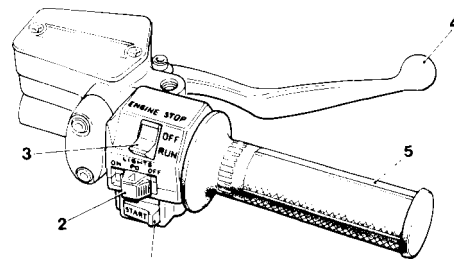


Figure 5 Right Handlebar Controls

R.H. Handlebar

item 1 START Pushbutton (grey)

item 2 Lights ON/OFF Selector Switch

OFF – lights off

P.O. – parking lights and panel lights

ON – head, tail and panel lights

item 3 Engine Kill Switch (red) – 'OFF'
'RUN'

item 4 Front Brake Lever

item 5 Throttle Twist Grip

WARNING

FRONT BRAKE LEVER STOP ADJUSTMENT SCREW
Under no circumstances should the user attempt to adjust the clearance between the front brake lever and the master cylinder operating piston. Maladjustment of the stop adjustment screw could result in faulty front brake operation and possible accident.

Any adjustment should be entrusted to an approved workshop.

FOOTRESTS

Each footrest arm can be turned and relocated on its splined shaft for fine adjustment.

Assemble all fastenings with 4.2 Kg/m torque.

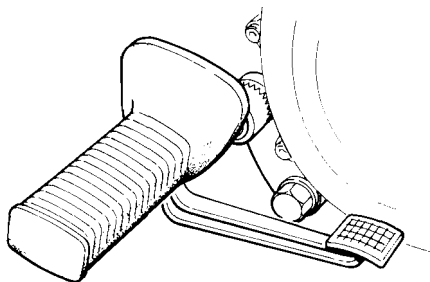


Figure 6 Right footrest and footbrake pedal

Foot-Brake Pedal (R.H. side)

Downward pressure applies the rear brake. Please read the warning notice regarding any attempt at adjustment of the rear foot-brake pedal mechanism.

WARNING

After altering footrest positions, always check (before moving off) that the Gear Change Lever does not foul the Left Hand Footrest and that the Rear Brake Pedal Lever, over the full length of its travel, does not foul the Heat Shield or the Right Hand Footrest.

WARNING

ADJUSTABLE LINK ROD REAR BRAKE PEDAL

Under no circumstances should the user attempt to adjust the rear brake pedal rod. The only attention necessary is periodic lubrication of the pivot pins (see fig 28 – page 33). Any maladjustment could affect the operation of the rear brake master cylinder, and could result in a possible accident.

Any adjustment should be entrusted to an approved workshop.

Gear Change Pedal L.H. Side

From the lowest position (1st gear) the pedal is moved upwards to NEUTRAL; 2nd; 3rd; 4th; 5th.

If gearchange selection is not positive and reliable, check that the pedal mechanism does not foul the exhaust system. Adjust as required.

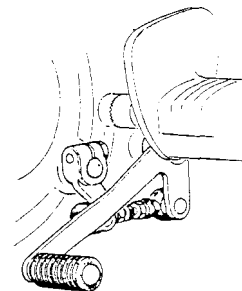


Figure 7 Illustrating the adjustable gear-change pedal mechanism

A neutral warning light is incorporated. To find neutral, push the gear change pedal progressively down through each gear to 1st, then lift once. (Note: A fast idle can cause neutral finding difficulties – See page 25 – Engine idle adjustment)

THE CONTROLS

To Adjust the Handlebar Position

1. Slacken the four socket head screws of the two clamps (note that the arrow on the top of each clamp must face to the front of the machine)
2. Rotate the bar to the required angle of hand grip.
3. Tighten clamp-screws (Torque to 2.5Kg.m) **Front screws first**. Then tighten the two rear bolts to 2.5 KgM.
4. Always ensure adequate freedom of control cables and hydraulic lines after any handle-bar adjustment.

WARNING

The hydraulic pipe must not be stretched or kinked.

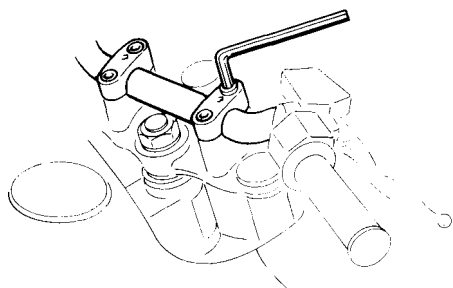


Figure 8 Handlebar Adjustment

Rear Suspension Units

Both the pre-load and the damping rate are adjustable to compensate for load conditions and road surface quality.

CAUTION

Both suspension units must be set to corresponding pre-load and damping rate positions otherwise the handling of the machine will be adversely affected.

1. Using the C-spanner provided in the toolkit turn the nut clockwise to increase the pre-load. There are three alternative loading positions.
2. Lift the rubber cover at the top of the unit to reveal the damping adjuster. Rotate the numbered wheel clockwise to increase damping. There are four alternative positions.
3. Set the other suspension unit to equivalent settings.

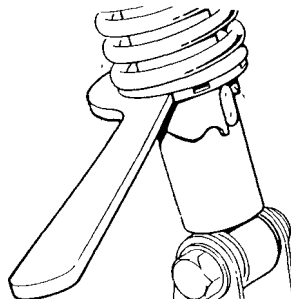


Figure 9 Adjusting Rear Suspension Spring Settings

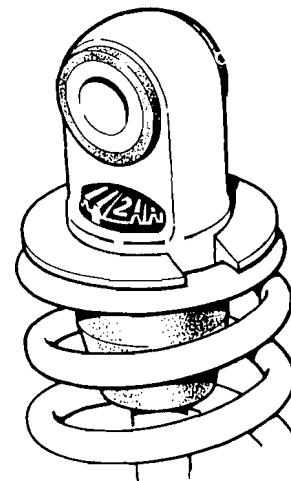


Figure 70 Adjusting the damping setting

WARNING

Following any adjustments, the rider must check that he is comfortable and able to operate all the controls throughout their full movement. This applies particularly to brake lever settings.

Key and Locks

Three sets of keys are provided. The ignition switch which also functions as the steering column lock in the two selected positions. The second key is used for the fuel filler cap. The third is for the seat lock, the fairing inspection lids, and the pannier box lids.

Instruments

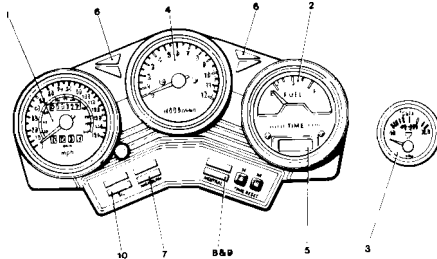


Figure 77 Instruments and Panel Warning Lights

Instrument Panel

- item 1 Speedometer with odometer and trip facility (Press the knob beneath the instrument to zero reading)
- item 2 Fuel gauge (Empty/Full – red last $\frac{1}{4}$)
- item 3 Temperature Gauge
- item 4 Electric Tachometer
- item 5 Digital Clock (Reset with ignition 'on')

Visual Indication and Warning Lamps

- item 6 Turn Direction Indicator
- item 7 High Beam Indicator
- item 8 Ignition 'on'. Operates in conjunction with item 9.
- item 9 Neutral Gear Selected Indicator
- item 10 Low Engine Oil Level Warning

Ignition Switch

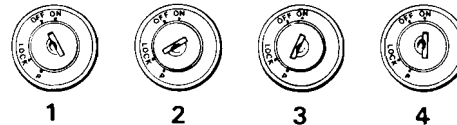


Figure 72 Ignition Switch Key Positions

The switch has four positions i.e.

1. Key at 11 o'clock. All services OFF and key may be removed.
2. First key position to left – depress key – (anti-clockwise) – with front forks turned fully left or right. Forks locked and allows key removal for security.
3. Second key position to left (anti-clockwise) – with front forks turned to left or right, secures forks, illuminates parking and instrument lights and allows key removal for security.

4. Turn key to right (clockwise) – straight ahead – switches both ignition and daylight lights 'on' and energises lighting and warning light switch circuits.

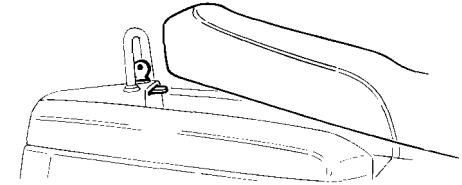


Figure 13 Seat mechanism

Seat and Seat Lock

To release the seat, insert the glove box/seat key into the lock to the rear of the seat in the upper fairing and rotate in an anti-clockwise direction, at the same time depressing the rear of the seat.

When the key has released the seat catch, lift the rear of the seat, and withdraw towards the rear of the motorcycle. Take care not to place the seat against the hot exhaust system

To replace the seat, offer the forward nose of the seat downwards towards the tank recess – carefully lower the rear of the seat. Turn the key clockwise to re-engage the latch, and withdraw the key.

THE CONTROLS

Fuel System

Fuel level is indicated by the gauge to the right of the speedometer in the instrument panel, showing 'FULL', $\frac{3}{4}$, $\frac{1}{2}$, $\frac{1}{4}$ and 'EMPTY,' the last quarter marked in red. The fuel tank capacity is 23 litres, including the 3 litres in reserve.

ALWAYS REFUEL BEFORE THE GAUGE APPROACHES THE 'E' EMPTY MARK.

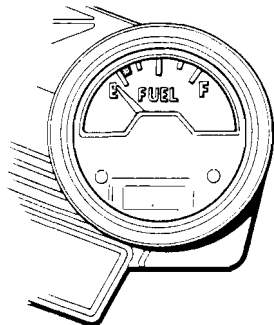


Fig 14 Fuelgauge

Operation of the Reserve Fuel Tap.

Should the need arise, proceed as follows:

Fuel Tap — fitted to the right side of the fuel tank, accessible following the removal of the right side body panel (see fig 16) When the gauge indicates 'EMPTY,' and the reserve fuel supply is required, detach the right side body panel and operate the fuel tap (fig 15)

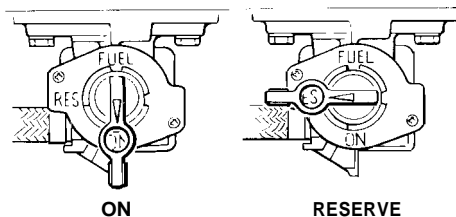


Figure 15 Fuel Tap

There are two lever positions:

1. MAIN — lever downwards — allows main fuel supply, but only functions after engine has started to run thereby creating the necessary vacuum to operate the feed diaphragm.
2. RESERVE — lever pointing rearward allows reserve fuel to be used. (approximately 3 litres when gauge initially indicates 'EMPTY')

Always re-set to MAIN following replenishment after using RESERVE

Body Panel removal

It will prove necessary to detach the left and right side body panels in order to undertake the scheduled maintenance procedures. The panels are securely fixed into position, each with five spring loaded DZUS 'push-tum' type fasteners. To prevent any damage occurring to the external paintwork during removal or

replacement, the use is recommended of a large coin or a flat bladed screwdriver. Press lightly, but firmly, and turn through 90° anti-clockwise to release the fastener, detaching the lower fixings first. Carefully support the body panel as the last fastener is released, and lift away taking care not to damage the main bodywork.

Replacement is the reverse of the above.

The DZUS fastener screw is self aligning within the fastener body on the fairing. Once entered, a positive 90° turn clockwise will be felt to have locked the fastener into position.

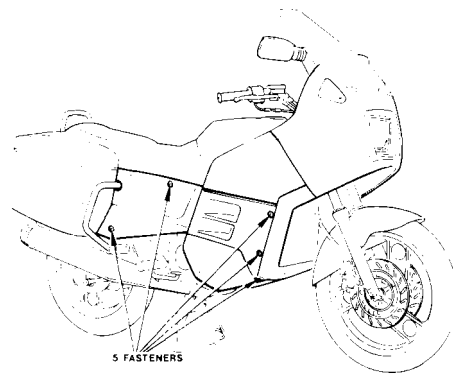


Fig 16 Showing body side panel detachment using DZUS type fasteners

WARNING

Before riding, check:

- 1) Engine oil level,
- 2) Oil level warning system,
- 3) All light bulbs,
- 4) Tyres and wheels
- 5) Oil, petrol or hydraulic fluid leaks. (See page 25).

Starting the Machine

1. Ensure that the engine stop/run switch is in the 'RUN' position.
2. Turn ignition to 'ON' and rotate choke control fully clockwise (towards rider)
3. Check gears are in neutral position and side stand retracted.
4. Press starter button until engine fires. (When starting a warm engine, the choke is not necessary. Use only a little throttle). As soon as the engine has started, return the choke control to $\frac{1}{2}$ to $\frac{1}{4}$ of its travel, allowing the engine to run smoothly.
5. When the engine has warmed up sufficiently to run smoothly, push the choke fully home.

If the engine fails to start, refer to 'Fault Finding' – page 62.

WARNING

This motorcycle features a sidestand engine cut-out switch. The stand must be retracted before attempting to start the engine.

Any malfunction must be investigated and rectified before attempting to ride the machine.

Riding

The Norton rotary engine gives an extremely smooth power delivery since there are no reciprocating parts to cause vibration. The engine is very flexible and those riders accustomed to other two and four stroke machines will be surprised to find that the engine will pull strongly from low engine speeds.

Optimum fuel consumption will always be achieved by using the highest gear available for the performance required and the chosen riding conditions. Use of a higher gear

will improve the fuel consumption, reduce wear in the engine, gearbox, final drive, tyres etc and will provide for quieter motoring.

The ignition system incorporates a rev-limiter. This is set by the factory to operate at 9500 r.p.m., some 500 r.p.m. above the speed at which maximum power is developed.

9500 r.p.m. marks the upper rev. limit, and no attempt should be made to exceed this limitation. Maximum engine torque is achieved at 7,000 engine r.p.m, and keeping below this speed will ensure maximum engine life.

WARNING

Never allow the engine to run for more than a few minutes with the clutch pulled in. Prolonged running with the clutch pulled in may damage the engine.

RIDING

WARNING

On no account must the engine temperature be allowed to exceed the 120°C reading.

If the temperature is seen to rise above the normal 80-110°C indicated, the engine should be stopped, allowed to cool down, and the problem investigated and rectified before proceeding any further — otherwise severe engine damage may occur, putting the rider at risk.

The only other operational point for the **Norton** concerns the oil content of the engine oil tank. It is sensible to establish the **routine** of checking the oil level every time you fill up with petrol. In this way you can be sure of not damaging the engine through lack of oil. Ensure that absolutely no dirt or dust is allowed to enter the tank during filling operation.

Use only the listed APPROVED LUBRICANTS. Under no circumstances whatsoever should a multigrade oil be used as the engine lubricant. (See page 64 for approved lubricants).

WARNING

Never let the engine oil tank run dry. To do so may put the rider at risk.

Running in

In the process of manufacture of this machine the most suitable materials are used and *all* components are machined to very close tolerances. It is, however, necessary to allow the moving parts to 'bed-in' before subjecting the engine to hard usage. The period of 'running in' is the most important part of your Norton's life, and the treatment it receives during this brief period will have a direct bearing on the life and performance of the components parts of the machine. The Norton Commander will not give of its best until the engine and gearbox are thoroughly bedded in.

During the first 500 miles do not let the engine labour, always change down a gear when negotiating hills etc, and keep the engine spinning freely. For the first 250 miles do not exceed 4000rpm in *any* gear. For the next 250 miles, do not exceed 5000 r.p.m. in *any* gear. After 500 miles the performance can be progressively increased until, at 1000 miles, the full performance of the machine should be usable. Avoid violent acceleration and make good use of the five-

speed gearbox, and during the first 1000 miles of the machine's life, use the gears freely, and maintain the engine r.p.m. above 2000 when the engine is under load.

CAUTION

It is most important that the engine idle speed during running in is not allowed to rise so that the engine is racing. Should it rise unduly (when the engine is warm), adjust per instructions. (Page 25)

Loading

As carrying luggage or a passenger will increase the weight over the rear wheel of the machine, the rear suspension should be adjusted up one or two positions on both sides. An increase in tyre pressures is also recommended (see tyre pressure chart — page 26).

Pannier Capacity

The Commander pannier compartments are designed to carry a maximum loading of 7Kg per pannier. Always ensure the weight is evenly distributed.

WARNING

Do not attempt to ride the machine with a key still retained in the seat, pannier or fairing lid locks. The lids are not secured and could become detached until firmly locked and the key removed.

REGULAR MAINTENANCE

Cleaning

The good looks and efficiency of the machine will be preserved by good and regular care, especially during the months of inclement weather.

A weekly cleaning and checking routine will ensure a long and trouble free machine life with all the satisfaction and confidence that results from regular care and attention.

The use of a high pressure hose or jet-wash is not recommended on this motor-cycle.

Fairing, Forks and Frame

1. Regularly wipe over to keep free of dirt and grime. If washing with soapy water, take care to avoid wetting instruments, electric switches etc., and keyholes. These should be covered with tape or P.V.C. sheet. Avoid getting water into control cables.
2. Touch up any chipped paintwork.
3. Check the tightness of all visible fasteners.

Caution

Allow a hot engine to cool before cleaning.

WARNING

Never use polishes on brake discs or lubricate the brake discs. This could cause loss of braking power and may result in an accident. Consult your nearest authorised Dealer regarding brake adjustment and rectification.

CAUTION

Always park the motorcycle out of the reach of children. A motorcycle with hot exhausts and left on the side stand can be a hazard to a child.

REGULAR MAINTENANCE

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WARNING

Severe burns can occur if care is not taken when attempting maintenance work or adjustments on a hot motorcycle.

REGULAR MAINTENANCE

LUBRICATION CHART

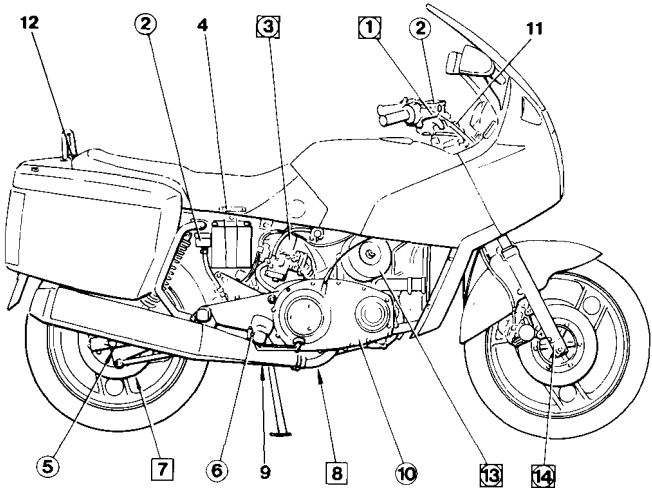


Figure 1 / Lubrication Chart

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Refer to page 21 for Servicing Schedule and page 64 for approved lubricants.

Figures within squares – left hand side.
Figures within circles – right hand side.

ROUTINE SERVICING SCHEDULE

WHICHEVER COMES FIRST		MILEAGE INTERVALS			Page
OPERATION	FREQUENCY	First 1000 Miles Service (1,600 Km)	Every 6000M (10,000 Km)	Every 12,000M (20,000 Km)	
Engine oil level check	Daily				24
Engine oil level warning system	Daily				24
Engine coolant level check	Daily				24
Engine idle adjustment	Daily				25
Light bulbs and electrical equipment	Daily				25
Oil/hydraulic fluid leak check	Daily				25
Wheels & Tyres — Examine	Daily				26
Throttle cable adjustment at handlebar	Daily				26
Clutch cable adjustment at handlebar	Daily				27
Battery electrolyte	3 Monthly	*			30
Brake hydraulic check	3 Monthly	*			31
Brake and clutch lever lubricate	3 Monthly	•			31
Brake pads check	3 Monthly	*			31/2
Brake caliper mounting plate grease	3 Monthly	*			33
Brake pedal and side stand pivot oil	3 Monthly	•			33
Carburettor damper piston oil level check	3 Monthly	•			33
Coolant hydrometer check	3 Monthly	•			34
Gearbox oil level check	3 Monthly	*			34
Oil pump check	3 Monthly	•			35
Primary oil level check	3 Monthly	*			35
Sparking plugs — inspect and clean	3 Monthly	•			36
Throttle and clutch cable check	3 Monthly	•			36
Rear chain tension check	3 Monthly	•	•		47
Air filter element — replace	*Annually			•	38
Brake hydraulic oil change	Annually				38/9
Clean carburettors	Annually				40
Fork oil change	Annually				41
Gearbox oil change	Annually				42
Primary oil change	Annually				43
Rear drive chain — oil change	Annually				43
Steering head bearing check	Annually				44

• Monthly in dusty conditions

This servicing schedule details the systematic service requirements based on mileage achieved. Should the rider not achieve these mileages before the period indicated the alternative periodic servicing should not be exceeded ie "whichever comes first"

INSPECTION AND ADJUSTMENTS

DAILY INSPECTION

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REGULAR MAINTENANCE

Engine Oil

Check level before riding and every time petrol tank is re-filled. The oil tank filler cap is located beneath the seat (for instruction on how to remove see page 13)

Check and maintain the oil level to the 'H' (high) mark on the dipstick attached to the filler cap. The 'L' (low) mark indicates the oil tank is less than half full and should be replenished at the first opportunity only with a recommended engine lubricant (see page 64)

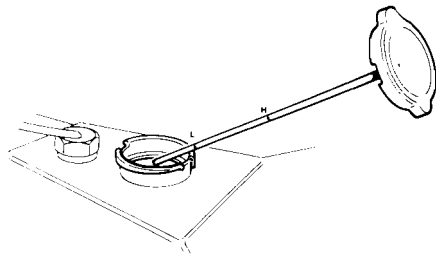


Fig 18 Oil tank filler cap and dipstick indicating oil tank oil level

Checking oil level warning system

- 1 Unlock and lift the seat (for instructions how to remove — page 13)
- 2 Switch on the ignition (page 13)
- 3 Remove the oil reservoir filler cap.

Daily Inspection

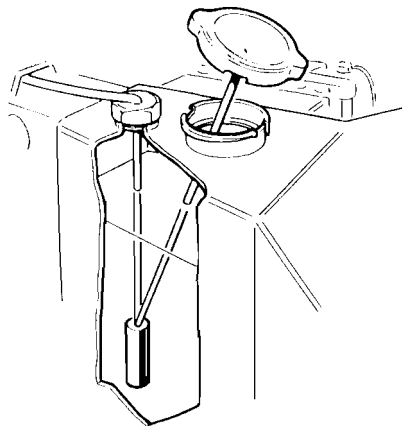


Figure 19 Checking the Oil Level Switch Float Action

- 4 Push the indicator float down with the dip-stick. The float is positioned beneath the electric cable outlet and will normally be completely submerged by the oil.
- 5 Check that oil level warning bulb lights when the float is deflected downwards.

Note: When the oil warning light comes on whilst riding the machine — this indicates that there is approximately one litre of oil left in the tank. Refill as soon as possible.

Engine Coolant

WARNING

As injury could be caused by escaping steam and boiling water, the pressure cap should not be removed whilst the system is hot.

The coolant header tank filler cap is located beneath a panel on the top left side of the fairing.

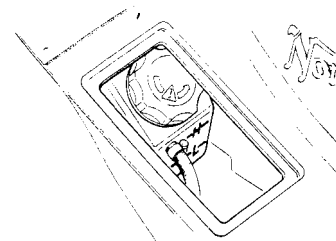


Fig 20 Checking the engine coolant level in the reservoir

The correct coolant level viewed through the temperature tank is: —

- 'H' level when hot
- 'L' level when cold

Do not attempt to remove the filler cap to top-up when the engine is hot. Wait until cold. If necessary top up with a 50/50 glycol anti-freeze/water solution containing a corrosion inhibitor.

REGULAR MAINTENANCE

Daily Inspection

Engine Idle Adjustment

During the first few hundred miles of running in, it is likely that the idling speed of the engine will increase as it runs more freely. It is important that the idling speed be kept as low as possible during running in. Should it rise above 800 r.p.m. (when warm), adjust as follows. (Fig 21)

1. Allow engine temperature to reach normal running temperature (80-110°C)
2. Ensure that the choke is 'OFF', and the throttle cable is slack.
3. The two idle speed adjustment screws are located just in front of the carburettor flanges on each induction manifold. If the engine is running irregularly, adjust one side only until the engine will run evenly. Then, to reduce the idling speed turn one screw through a quarter turn clockwise. Turn the other screw by EXACTLY THE SAME AMOUNT.
4. Rev the engine and then allow it to idle again.
5. If the idling speed is still above 800 r.p.m. repeat steps (3) and (4).
6. At the first 1000 mile service the idle speed will be adjusted according to the above procedure.

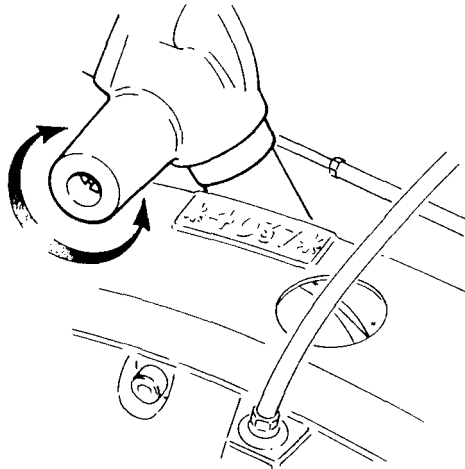


Fig. 21 Engine Idle Adjustment

Electrical Equipment

1. With the ignition switched to 'ON', check all lights and indicators function. Also check brightness, and if dull, clean lenses. Replace bulbs as necessary.
2. Check horns function

Oil and Hydraulic leak checks

Brakes

Front: Check the front brake master cylinder for oil leaks, following down the hydraulic feed pipe lines down to each caliper. Check the calipers for signs of any oil seepage.

Rear: It should not be necessary to detach the right side panel to check from the rear of the machine that hydraulic oil is not leaking from the hydraulic feed lines or caliper seals.

The slightest sign of an oil leak from either system should be immediately investigated.

Oil leak check

The total oil supply system to the engine unit should remain oil tight through the machine's life. Any sign of oil seepage anywhere on the machine should be investigated and rectified prior to further machine usage.

REGULAR MAINTENANCE

Daily Inspection

Wheels and Tyres

1. Check the tyre pressures are in accordance with the recommended pressures.
2. Examine tyre walls for bulges, cracking or perishing.
3. Remove stones from tyre treads and check for embedded bodies liable to cause punctures.
4. Examine tread for evenness of wear. Scrubbing of the tread will indicate a buckled tyre or wheel (or harshness of braking) or mis-aligned swinging arm.
5. Check for buckles by rotating wheels.
6. Check for play in wheel bearings.
7. Check wheel alignment.
8. Check tyre run-out.
9. Always ensure the valve caps are in place.

WARNING

Under no circumstances should tubes be fitted in conjunction with tubeless tyres.

Tyres and Tyre Pressures

The tyres specified for this machine

have been selected to provide optimum handling characteristics.

For further information regarding Tyre Replacement see TECHNICAL SPECIFICATION.

WARNING

It is important that the tyres are correctly inflated according to the loading and type of riding being undertaken, and that the metal sealing valve caps are regularly checked to be firmly in place. These Caps have been specially selected and specified by Norton for your protection and to obviate any problems of sudden tyre deflation.

Tyre Pressures

Tyre pressures should be tested when the tyres are cold.

For solo riding	Front	32 p.s.i. (2.25Kg/cm ²)
	Rear	36 p.s.i. (2.53Kg/cm ²)
With pillion passenger	Rear	40 p.s.i. (2.81 Kg/cm ²)

NOTE

The maximum wheel loading permitted on original equipment tyres is:—

Maximum	Front	224 Kg
	Rear	265 Kg

Throttle Cable Adjustment

There is a throttle cable adjuster fitted at the twist grip end. This can be set to give the minimum required back-lash in the throttle control as follows:

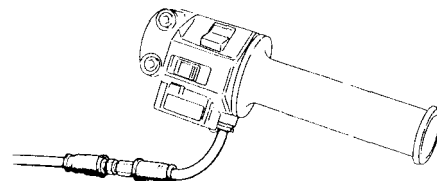


Fig 22 Throttle cable adjuster at handlebar

1. Warm up the engine and allow to idle with throttle fully closed and choke IN.
2. Loosen the locknut and screw the adjuster out slowly until the engine revs just begin to rise again.
3. Screw the adjuster in again by one full turn. (This will provide the recommended 2.5mm max. free play at the handlebar end of the cable). Tighten the locknut.
4. Check that idling speed is not affected by turning bars from lock to lock.

REGULAR MAINTENANCE

Daily Inspection

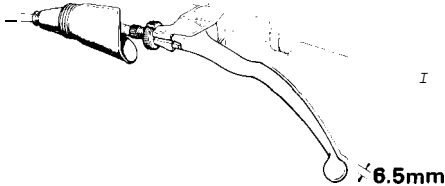


Fig 23 Knurled type clutch cable adjuster at left handlebar

Clutch Cable adjustment

Check the cable for dry, tight or frayed inner cable. If the cable requires replacement, proceed as detailed in General Servicing Operations (Page 52).

The cable should be adjusted by means of the knurled adjuster to provide a maximum of 65mm free play of the clutch operating lever at the ball end.

Replace the protective rubber gaiter following adjustment.

INSPECTION AND ADJUSTMENTS

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REGULAR MAINTENANCE

Batteries

The Norton Commander is equipped with two 12 volt batteries connected in parallel, located one each side of the main frame of the motorcycle beneath the seat.

Access is achieved by removal of both body panels and seat (see pages 13 and 14)

Both 12 volt negative earthed batteries have a capacity of 14 ampere/ hours. At three monthly intervals, more frequently in hot climates, the level of the electrolyte should be checked. If necessary, add distilled water to maintain the level indicated on the side of the transparent battery case. Do not use tap water as this may contain impurities harmful to the battery. Never use a naked light when examining the cells.

If the machine is to be out of use for a lengthy period, have the batteries fully charged and each given short refreshing charge at 1 ampere about every two weeks. This will suffice to keep the battery in serviceable condition. When a battery is fully charged, the specific gravity of the electrolyte should be 1.270/1.290 at 60°F (16°C).

WARNING

Batteries give off hydrogen gas which is explosive when in contact with a naked flame.

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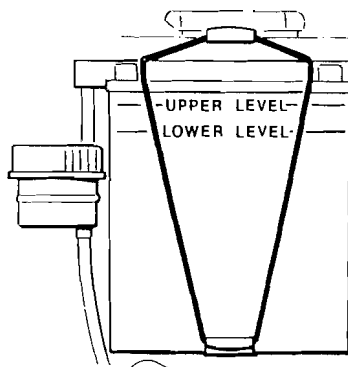


Figure 24 Battery and Brake fluid reservoir

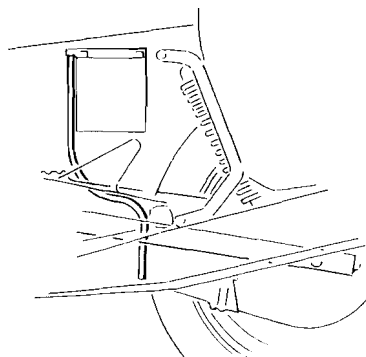


Figure 25 Recommended routing of left battery overflow vent pipe

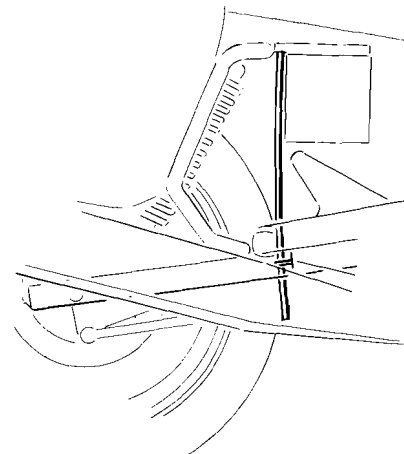


Figure 26 Recommended routing of right battery overflow vent pipe

The battery terminals (red positive – black negative/earth) must never be reversed otherwise the equipment will be damaged.

WARNING

Remove both black –VE leads from the battery terminals before removing either red lead – Refit both red leads before reconnecting the black.

Norton Motors Limited and its distributors cannot accept responsibility for damage to parts caused by overfilling with acid, or incorrect terminal connection. The vent pipes must be kept connected to the batteries and positioned to breathe below the rear swinging arm, routed as shown in figures 25 and 26.

Hydraulic fluid levels

The hydraulic reservoirs are on the right handlebar and under the rear of the seat at the right side behind the right body panel. (fig 24). The front brake master cylinder incorporates its own visual level indicator, the rear brake master cylinder being translucent and incorporating level marks for quick checking.

CAUTION

If fluid level is low, first check the brake pads for excessive wear.

Topping up

If topping up is necessary proceed as follows:

Three Monthly Inspection

Front master cylinder reservoir.

Position the handle bars straight ahead and carefully clean off any external dirt from the reservoir body and top. Remove the two Philips headed screws, and carefully protecting the bodywork from any possible spillage, top-up with the recommended grade of hydraulic fluid. Carefully clean the lid joint face and seal. Refit and tighten the two Philips screws.

Rear brake master cylinder, reservoir

Detach the right side body panel and seat (fig 16). Carefully clean off any external dirt and remove the cap and rubber diaphragm. Add the specified grade of hydraulic fluid up to the maximum mark. Carefully clean the diaphragm and cap and replace.

See Lubricant Specifications (page 22) for hydraulic fluid specification.

Front brake and Clutch lever

The pivots of the handlebar lever should be lubricated at three monthly intervals with one or two drops of oil to ensure continued smooth operation. (See Controls — figs 4 & 5)

Checking the brake pads

To Check the Pads

1. Lever off the plastic cover from the caliper.
2. Visually check the amount of material remaining on each pad.

WARNING

The pads should be checked monthly in winter or dusty conditions, and replaced when the thickness of the friction material has worn to within $\frac{1}{2}$ mm. of the bottom of the central groove (See above)

Always change both pads in a caliper together.

Always change the pads in both front calipers together.

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CAUTION

If the thickness of the brake pad wears to less than $\frac{1}{2}$ mm in the central groove overheating is liable to occur under heavy braking due to the inability of the remaining material to dispose of the heat quickly enough.

This will cause overheating of the caliper piston and the brake fluid. There is also a danger of the excessive heat causing the face of the pads to glaze, thereby reducing brake power.

Brake Pads – Removal and Replacement

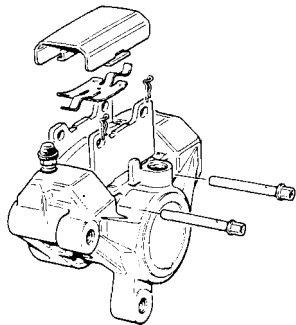


Figure 27 Removal of Brake Pads

To Change the Pads

Changing the brake pads on the front and rear calipers is straight forward, but it is advisable to first remove the rear wheel and lower the caliper plate to inspect and replace the brake pads on the rear caliper. (See page 49 for rear wheel removal)

1. Flip off the pad cover and extract both retaining pins, releasing the clamp springs.
2. Remove the reservoir cap, and carefully decant the excess fluid, protecting all nearby paintwork from spillage, as the level will rise as replacement pads are fitted.
3. Gently lever the pads apart to allow for removal and fitting of new components. Return the pistons into their bores, checking the fluid level in the reservoir.
4. Extract the worn pads – carefully collecting the anti-squeal shims (rear brake only)

5. Using a proprietary brake cleaner, clean out any residual dust from inside the caliper.
6. Fit the new replacement pads carefully re-inserting the anti-squeal shims between the pad backplate and piston. (rear only)
7. Reposition and pre-load the brake pad spring and insert both retaining pins.
8. Replace the plastic cover plate. In the case of the rear caliper, the rear wheel and caliper plate will require refitting (see page 49).
9. Prior to checking the brake fluid level, several applications of the brake lever will be required to correctly position the pistons and pads within the caliper.
10. Top up the brake fluid level to the upper mark on the reservoir body. If the brake application feels 'spongy' refer to Service Operations Section 'Bleeding the Brakes' – page 38.

REGULAR MAINTENANCE

Three Monthly Inspection

Greasing

There is only one grease nipple on the machine — on the right of the rear spindle for the brake caliper mounting plate. Any lithium based high melting point grease is suitable.

Wipe away any surplus grease to prevent any possible contamination of the brake pads.

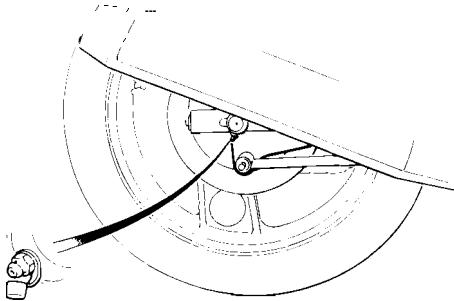


Figure 28 Rear brake caliper plate grease nipple

Oiling

The pivots of the footbrake pedal and gearchange linkage, and of the side stand should be oiled at the same time.

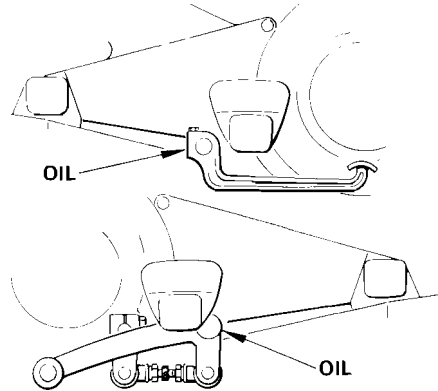


Fig 29 Footbrake pedal and gearchange linkage

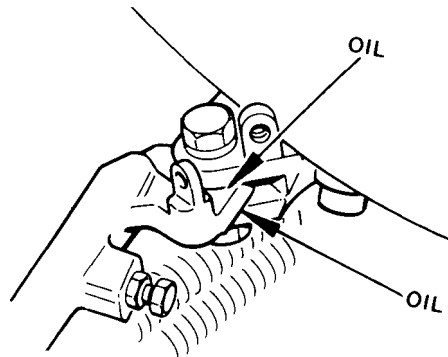


Figure 30 Side stand pivot lubrication

Topping up the Carburettor Damper

1. Remove the left and right side body panels and seat (see pages 13 and 14)
2. Unscrew the cap and withdraw the damper. Top up with lubricating oil (see page 64 — Approved Lubricants) until the level is approximately 13mm above the top of the hollow piston rod, refit the damper and 'screw the cap firmly into the suction chamber

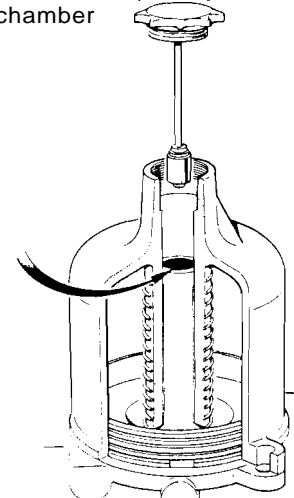


Figure 31 Topping up the oil level in the Carburettor Damper

REGULAR MAINTENANCE

Three Monthly Inspection

Coolant hydrometer check

Remove the panel in the left side of the fairing and the coolant header tank filler cap and remove for inspection as described in 'Daily Inspection' (Page 24)

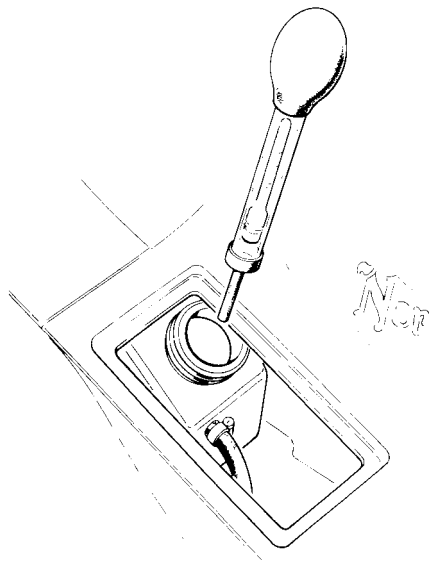


Fig 32 Checking the engine coolant

WARNING

Do not remove the coolant header tank filler cap when the engine is hot. Injury could be caused by escaping steam or boiling water.

Using an hydrometer, sample the coolant in the header tank and confirm the specific gravity is within the recommended limits of 50/50 Glycol/Water solution (1.075 at 15°C (60°F))

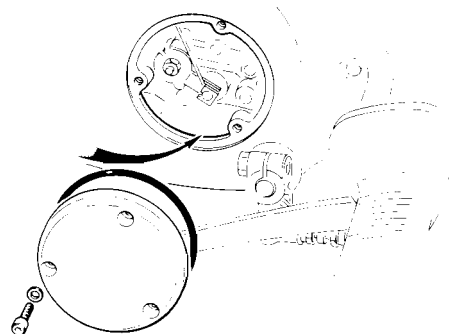


fig 33 Inspecting gearbox oil level

Gearbox oil level check

- 1 Place the machine on its centre stand on level ground
- 2 Remove the left side gearbox cover plate (3 screws) (See fig 33)
3. Check the oil level in the gearbox — after allowing time for oil to settle — is within 3mm below the edge of the casting.
4. If topping up is required use only oil recommended and listed in the APPROVED LUBRICANT chart on page 64.
5. Replace the gearbox cover plate, ensuring the cover 'O' ring is in good condition and in place — and that new nylon washers are used under the heads of the three socket cap screws.

REGULAR MAINTENANCE

Three Monthly Inspection

Oil Pump check

Remove the inspection cover from the left hand gearbox end cover casting by undoing the three socket headed screws. Be careful not to lose the sealing washers from under the screw heads. Adjust the oil pump setting by means of the cable adjuster, when the engine is running and warm.

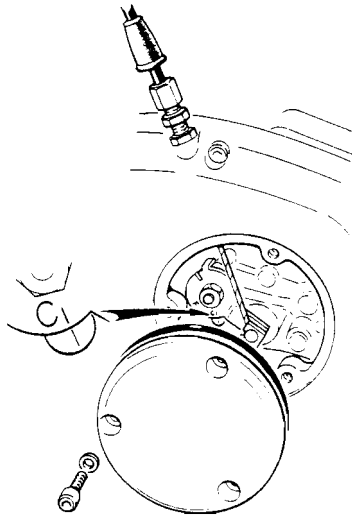


Figure 34 Checking the oil pump setting.

The cable should be adjusted to just position the pump lever as shown in fig 34

Engine speed 2000rpm – align 'C' mark
For further information regarding cable replacement and initial set-up, refer to 'General Servicing Operations, page 51)

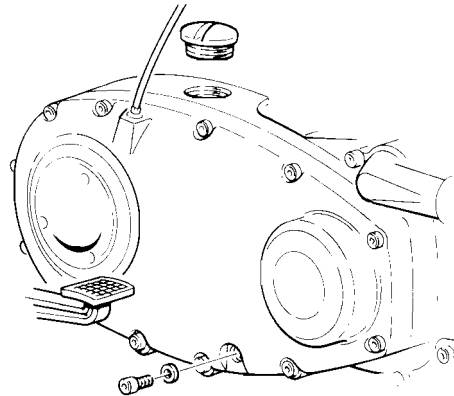


Figure 35 Checking chaincase oil level

Primary chaincase oil level check

1. Place the machine on its centre stand on level ground.
2. Remove the right side body panel
3. Remove and clean the level plug (see fig 35)
4. Gently top up with additional oil through the filler plug hole. Allow the oil to settle to the correct level (for recommended lubricant see page 64)
5. When the oil stops flowing from the level hole, wipe clear any surplus and replace the level screw, complete with its copper sealing washer. Replace the filler plug.

REGULAR MAINTENANCE

Sparking plugs

To safeguard removal and replacement during inspection, use a 16mm or $\frac{5}{8}$ in. AF hex cranked ring spanner to obviate operator damage to the plug, in particular, possible cracking of the porcelain electrode.

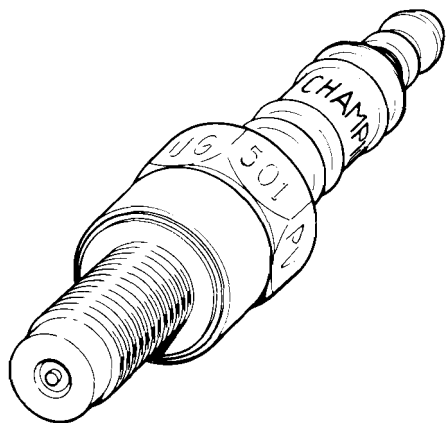


Fig 36 Surface discharge type sparking plug

Three Monthly Inspection

WARNING

Always check the plug washer is in place on the body of the plug prior to replacement.

The use of any Sparking Plug other than those specified on page 6 will cause serious damage to the engine putting the safety of the rider at risk.

Clean the plugs when necessary, by scraping the annular earth ring with a penknife or scraper. The nose may then be polished clean with a soft brass 'suede cleaner' type brush to advantage. Do not use a sand or grit blaster under any circumstances whatsoever.

Never pull on the carbon fibre H.T. plug leads to remove the plug caps. Prise off the plug caps complete with lead.

Throttle and Clutch cable check

Every three months the throttle and clutch cables should be checked for operation, frayed wires and general security. The clutch cable is nylon lined and should need no maintenance, but the throttle cable should be regularly lubricated, particularly at the twist grip end.

If there is any question of lack of reliability due to deterioration, the cable should be replaced as described in 'GENERAL SERVICING OPERATIONS.' (Pages 50 & 52).

REGULAR MAINTENANCE

INSPECTION AND ADJUSTMENTS

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Replacing the Air Filter Element

The machine is equipped with two dry element filters which should be removed and replaced at 12,000 mile intervals (monthly in dusty climates)

To gain access to both air filters, both body panels must first be detached (see page 14)

To remove the air filter element, unscrew the air filter cover wing nut, detach the cover and withdraw the old element.

Place the new element in position, carefully replace the air filter cover and retain in position by replacing and tightening the wing nut. Replace both body panels.

Air Filter Element

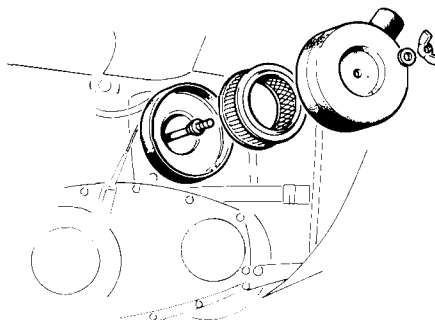


Figure 37 Replacing the Air Filter Element

Brakes-fluid change and bleeding
To change the fluid in the braking system it is simply necessary to remove both master cylinder covers (see page 31 "Hydraulic fluid levels"), connect the respective caliper bleed nipples to a suitable jar, open each bleed nipple at a time and pump the old fluid from the system.

Close the bleed nipples, refill with D.O.T. 4 fluid as specified in "LUBRICATION SPECIFICATIONS" on page 22. The system will then require bleeding to exclude all air.

Bleeding the Brakes

Bleeding is only necessary when air has been introduced into the brake system in one of the following ways.

1. A leak in the hydraulic line.
2. Faulty seal rubber on either the master cylinder or the caliper pistons.
3. Failure to expel all air properly from a system in the course of servicing, or use of aerated fluid, or allowing the reservoir to empty.

If the system is leaking then the fault must be rectified before proceeding to bleed.

Air in the system can be detected by a sponginess in the brake which is temporarily reduced by several rapid operations of the brake. This condition must be remedied immediately.

The operation is simplified by the purchase of a bleed hose incorporating a non-return valve, which eliminates the need to undo and retighten the bleed nipple at each operation of the brake, making it a 'one man' job.

REGULAR MAINTENANCE

Annual Inspection

Otherwise it is best carried out by two people as follows.

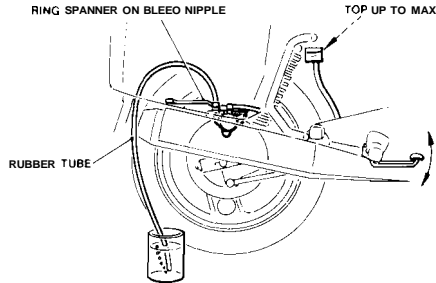


Figure 38 Bleeding the Rear Brake

Front and Rear Brakes:

1. Use a ring spanner to open one bleed nipple on one caliper. Leave the ring spanner on the nipple and fit a rubber tube over the nipple. Place the other end into a jar with enough hydraulic fluid in to submerge the end.
2. Top up the hydraulic reservoir to the MAX mark.

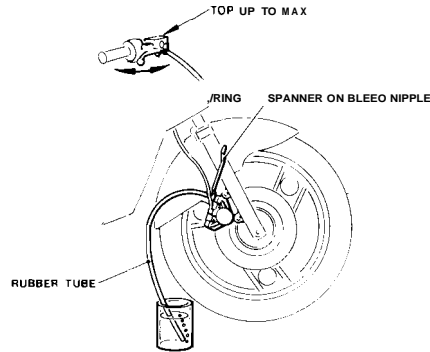


Figure 39 Bleeding the Front Brake.

3. Operate the brake lever or pedal and hold.
4. Tighten the bleed nipple and release the lever or pedal.
5. Repeat operations 2-4 until no bubbles are evidenced in the jar when the brake is operated and sufficient fluid has been passed into the jar to ensure complete replacement.

NOTE: Use only new fluid (see Lubricant Specification – p 22) and take care that no foreign bodies are admitted. Throw away the fluid expelled into the jar. Protect all painted surfaces from contact with fluid, which is highly corrosive.

6. Remove the hose from the nipple and refit cover. Top up the reservoir and fit cap.
7. Repeat procedure on second caliper on the front brake until all traces of fluid bubbles have been eliminated.

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Carburettors

Cleaning the Carburettor Suction Chambers and Pistons

1. Remove the left and right side body panels as described on page 14. Remove both batteries (see page 30). Disconnect both v e and +ve leads.
2. Disconnect the fuel feed pipe at the vacuum fuel tap, disconnect also the connecting fuel pipe between the left and right carburettors at the right carburettor inlet union.

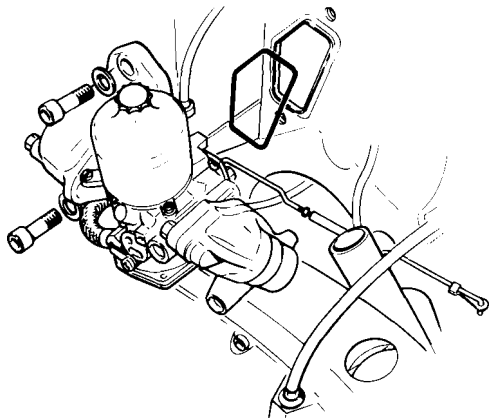


Fig 40 Removal of right carburettor

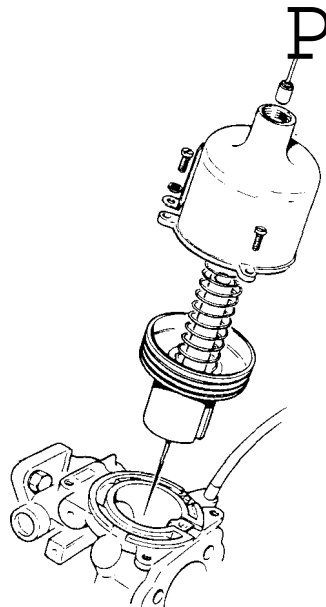


Figure 41 Removal of Suction Chambers.

NOTE

DO NOT ATTEMPT TO RE-SET CARBURETTOR SETTINGS. THIS IS FULLY DESCRIBED IN THE WORKSHOP MANUAL.

3. Remove the clip on the front end of the fast idle rod (right carburettor)
4. Undo the 13mm bolt locating the wiring harness clip (right side of machine).
5. Detach both carburettors by removing the two 6mm socket screws attaching the carburettor inlet castings to the frame on each side.
6. Pull out both carburettors (rearwards) complete with inlet and idle pipes.
7. Support each carburettor in turn, rotate outwards, and undo the three screws holding the suction chamber to the carburettor body (fig 41)
8. Lift the suction chamber complete with piston.
9. Wash in clean petrol or white spirit, dry and re-assemble, topping up oil level in the piston damper with engine grade oil (page 64)

Reassembly is the exact reverse of the above, but great care must be taken to ensure the carburettor inlet adaptor casting 'O' rings, located at the frame inlet

REGULAR MAINTENANCE

Annual Inspection

flange are seated firmly and squarely. (They may require accurately positioning using a contact adhesive or similar to ensure they do not move during carburettor reassembly)

NOTE ALSO When refitting the carburetors, lightly oil the end of the inlet pipes. This will permit the 'O' ring in the manifold to locate more easily.

IT IS RECOMMENDED THIS TASK IS UNDERTAKEN ONLY BY A QUALIFIED AND EXPERIENCED FITTER.

Front Forks

The only routine service necessary on the front forks is regular fork oil changes at 12000 miles (20000 km) intervals.

To drain the oil from the front forks, with the machine on the centre stand, place oil drain receptacles under each fork leg and remove the two outward facing drain plugs (posi-drive head screws) at the base of each leg. Allow each leg to drain. To expel any remaining oil, push the machine off the centre stand and 'pump' the forks up and down a number of times. Replace both drain plugs (complete with sealing washer) and fully tighten, and again place the machine on the centre stand.

CAUTION

Remember when removing the fork plugs that each is under 38mm compression loading. Press down on the plug as the last few threads are revealed to prevent sudden expansion of the spring, and possible damage.

Place a thick protective cover over the fuel tank. Detach the handlebars (Fig 8) by removing the four (6mm) socket headed screws from the two handlebar clamps. Slacken the two 12mm pinch bolts that clamp the fork stanchion tubes in the top fork lug (this now allows removal of the fork stanchion top plugs). Prise off the two sealing caps from the stanchion tube top plugs and, using a special 17mm hex. removal tool, carefully remove each fork top plug. (The spring has 38mm pre-compression on release).

Replenish each fork leg with 250cc of the recommended lubricant (Page 64)

Replace each fork top plug carefully, compressing the spring whilst entering

the first thread, having examined and replaced if necessary the plug 'O' ring to ensure complete oil tightness.

Tighten the top plug, using the special hexagonal tool to a torque of 9 KgM.

Retighten both stanchion tube pinch bolts in the fork top lug (2.5 KgM torque). Refit the top plug sealing caps. Replace the handlebars using the two clamps and the four (6mm) socket screws. (Fig. 8).

Adjust the handlebar position to suit the rider and final torque the screws to 2.5 KgM.

Check the handlebar and control freedom from lock to lock.

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Oil Changing

Gearbox

CAUTION

Do not attempt to remove the gearbox drain plug whilst the exhaust system is hot. Leave the machine to cool for half an hour after use.

1. Place the machine on its centre stand on level ground.
2. Remove the left side body panel (see page 14)
3. Place a 1 1/2 litre (min) open receptacle beneath the gearbox drain plug and remove the plug. (fig 42)
4. Remove the L.H. gearbox cover plate (3 screws). See Fig. 43
5. Ensure all oil is drained by gently rocking the machine, then clean and replace the drain plug, after applying 'Loctite' 270. Tighten to a torque of 2 KgM.

WARNING

When filling the gearbox, ensure the drain plug is firmly screwed into place. (See para 5 opposite). Refill through the cover plate as the plug on the top of the gearbox is the *Rear Drive Chain Filler Plug*.

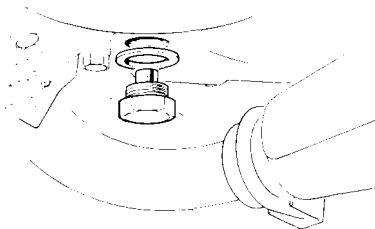


Figure 42 Draining the Gearbox.

7. Replace gearbox cover plate, ensuring the cover 'O' ring is in good condition and in place, and that the new nylon sealing washers are used under the heads of the three socket cap screws.

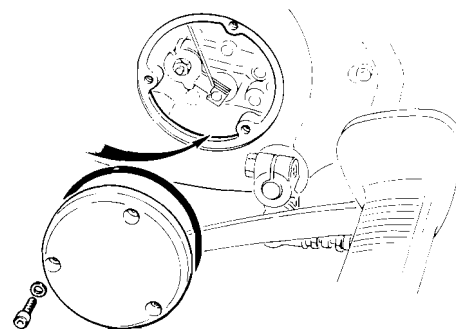


Figure 43 Refilling the gearbox to the indicated level

6. Refill gearbox with approximately 1 litre of oil (Recommended Lubricants, page 64). Fill gently and allow time for oil to settle to correct level with machine level. 3mm below edge of casting. (Fig 43)

REGULAR MAINTENANCE

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flange are seated firmly and squarely. (They may require accurately positioning using a contact adhesive or similar to ensure they do not move during carburettor reassembly)

NOTE ALSO When refitting the carburetors, lightly oil the end of the inlet pipes. This will permit the 'O' ring in the manifold to locate more easily.

IT IS RECOMMENDED THIS TASK IS UNDERTAKEN ONLY BY A QUALIFIED AND EXPERIENCED FITTER.

Front Forks

The only routine service necessary on the front forks is regular fork oil changes at 12000 miles (20000km) intervals.

To drain the oil from the front forks, with the machine on the centre stand, place oil drain receptacles under each fork leg and remove the two outward facing drain plugs (posi-drive head screws) at the base of each leg. Allow each leg to drain. To expel any remaining oil, push the machine off the centre stand and 'pump' the forks up and down a number of times. Replace both drain plugs (complete with sealing washer) and fully tighten, and again place the machine on the centre stand.

CAUTION

Remember when removing the fork plugs that each is under 38mm compression loading. Press down on the plug as the last few threads are revealed to prevent sudden expansion of the spring, and possible damage.

Place a thick protective cover over the fuel tank. Detach the handlebars (Fig 8) by removing the four (6mm) socket headed screws from the two handlebar clamps. Slacken the two 12mm pinch bolts that clamp the fork stanchion tubes in the top fork lug (this now allows removal of the fork stanchion top plugs). Prise off the two sealing caps from the stanchion tube top plugs and, using a special 17mm hex. removal tool, carefully remove each fork top plug. (The spring has 38mm pre-compression on release).

Replenish each fork leg with 250cc of the recommended lubricant (Page 64)

Replace each fork top plug carefully, compressing the spring whilst entering

the first thread, having examined and replaced if necessary the plug 'O' ring to ensure complete oil tightness.

Tighten the top plug, using the special hexagonal tool to a torque of 9 KgM.

Retighten both stanchion tube pinch bolts in the fork top lug (2.5 KgM torque).

Refit the top plug sealing caps. Replace the handlebars using the two clamps and the four (6mm) socket screws. (Fig. 8).

Adjust the handlebar position to suit the rider and final torque the screws to 2.5 KgM.

Check the handlebar and control freedom from lock to lock.

Annual Inspection

Primary Chaincase

Caution

When draining and refilling the primary chaincase make sure that the drain and level plugs are correctly identified.

1. Place the machine on its centre stand on level ground.
2. Remove the right side body panel (see page 14)

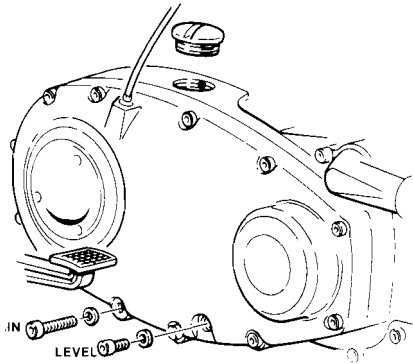


Figure 44 Replenishing Oil in Primary Chaincase.

3. Place a $\frac{1}{2}$ litre receptacle beneath the drain plug on the R.H. side.
 4. Remove the plug and allow to drain. Remove the filler plug and level screw to assist draining. Clean the drain plug.
 5. When draining is complete, replace drain plug tightly, making sure the copper sealing washer is seated properly.
 6. Squeeze in fresh oil (approx. 250cc) through the filler plug hole from a plastic container to allow oil to settle to correct level. (For recommended lubricant see Page 64)
 7. When oil stops flowing from level hole, wipe clear any surplus, and replace level screw, complete with its copper sealing washer.
- Replace the filler plug.

3. Remove the filler plug above the gearbox sprocket just in front of the rubber gaiter.
4. When all oil is drained replace drain plug securely (Loctite 270)
5. Replenish with 75cc of oil (Recommended Lubricants, page 64)

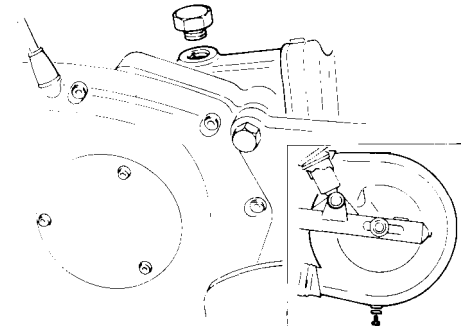


Figure 45 Drain and Refill Rear Chaincase.

Rear Chaincase

1. Place the machine on its centre stand on level ground.
2. Place a $\frac{1}{4}$ litre receptacle beneath the drain plug at the bottom of the chaincase at the rear. Remove the drain plug.

REGULAR MAINTENANCE

NOTE

Leakage of oil from the rear chaincase or damage to the rubber gaiters should be rectified without delay. Provided the chaincase oil level and chain adjustment are maintained as recommended, the rear chain may be expected to last the life of the machine.

Steering Head Bearings (fig. 46)

The taper roller bearings will bed down from new and should be checked for excessive play. Place the machine on its centre stand, preferably placing a box or wooden support under the engine to raise the front wheel off the ground, kneel in front of it, and push and pull the bottom of the fork fore and aft with the wheel off the ground to see if excessive play can be detected. To adjust:

1. Slacken the head spindle lock-nut.
2. Slacken the two leg-pinch bolts in the top yoke.
3. Using a suitable C spanner, screw down the two ring nuts sufficiently to eliminate all but the slightest play.
4. Retighten the locking nut, to 11.2 KgM, and the tube pinch bolts to a torque of 1.9 Kg.M
5. Recheck for required minimal play and free movement.

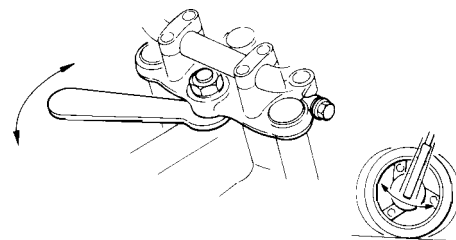


Figure46 *Steering Head Bearing Adjustment*

REPLACEMENT & OVERHAUL

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Rear Wheel – Remove and Replace	49
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GENERAL SERVICE OPERATIONS

Tyres (see also Regular Maintenance Section – Daily Inspection, 'Wheels, Tyres and Tyre Pressure' on page 26).

Replacement Tyres

When the time comes for selecting replacement tyres for this machine, it is important to remember the performance capabilities inherent in the design. **This machine is a high performance vehicle** and it is essential to use only 'V' rated tyres. Note: We recommend any tyre used on this machine is replaced when the minimum tread depth reaches 2mm.

Tyre Matching

In view of the performance capabilities of this machine it is essential that only matched pairs of tyres be fitted. Some high speed tyres, although of good quality and performance may not give their best when fitted to a machine which does not have a matching tyre. 'Mis-matching' of tyres can result in instability at high speeds and a general loss in handling performance.

Balancing

When new tyres have been fitted, the wheels should be re-balanced as an out of balance tyre can adversely affect the handling qualities of the machine.

WARNING

Use only tyres specified by Norton Motors Limited.

See page 7 for recommended tyres and page 26 for pressures.

Load Carrying Capacity

Refer to page 26 for maximum load carrying capacity on front and rear wheel tyre equipment.

If any doubt remains after reading the foregoing regarding all aspects of tyre maintenance and replacement, we recommend you consult the Service Department of Norton Motors Limited.

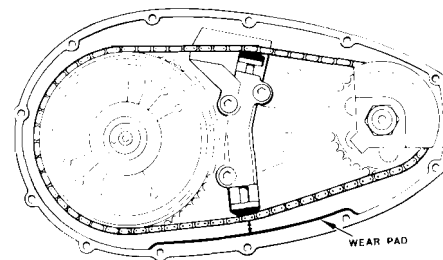


Figure 47 Primary Chain Inspection illustrating the wear pad.

Primary Chain

During normal wear of the chain, the slack is taken up by the hydraulic tensioner.

When the chain is eventually worn to the end of its recommended life, its increased length will allow it to contact a wear pad adjacent to the lower run of the chain. The mechanical noise resulting from this contact is a sign that the chain requires replacement.

This should be done at the earliest convenient opportunity.

WARNING

No attempt should be made to dismantle or re-assemble the primary chain tensioner without reference to the Workshop Manual. Incorrect assembly can be dangerous.

Inspection and Adjustments

Rear Chain Tension (fig.48)

This should be checked at the first 1000 miles service, and at every 6000 miles thereafter.

To check whether adjustment is necessary, apply a force of approx. 4 kg in the centre of the top run of the synthetic rubber chain gaiter (with machine on the centre stand on firm level ground) with the chain at its tightest point, the top run of the rubber chain gaiter should just touch the swinging arm at the box section when pressed down (equivalent to 40mm up and down movement)

Adjust as follows:

1. Slacken the R.H. rear wheel spindle bolt, then the L.H. spindle nut. (Prevent the L.H. spindle turning with the nut by using the appropriate socket wrench provided in the tool kit).

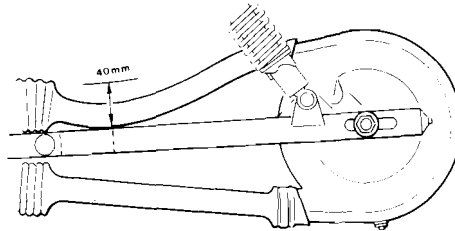


Figure 48 Rear Chain Tension Adjustment

2. Using a socket wrench, turn the adjusters in the rear ends of the fork tubes clockwise to tighten. Turn each adjuster $\frac{1}{8}$ turn at a time correspondingly. Take great care to avoid L.H. and R.H. adjusters moving by different amounts as this will put the rear wheel out of line.
3. When the total up and down chain movement is reduced to 40 mm the chain tension is correct. Do not over-tighten the chain. It will cause rough running and may damage the gearbox sprocket bearings.
4. Check that the spindle marks on each side line up with the corresponding marks on the respective scales.

IT IS IMPORTANT THAT THEY DO SO.

The markers also act as chain wear indicators. Silver Area – Normal
Red Area – Replace Chain

5. Apply a downward pressure on the top run of the chain whilst nipping up the L.H. spindle nut and R.H. bolt to ensure the wheel does not move during tightening.
6. Tighten the R.H. spindle bolt and L.H. nut to a torque of 13.8 KgM.
7. The adjusters now require re-tightening until the end caps re-engage. Tighten a further $\frac{1}{8}$ turn.

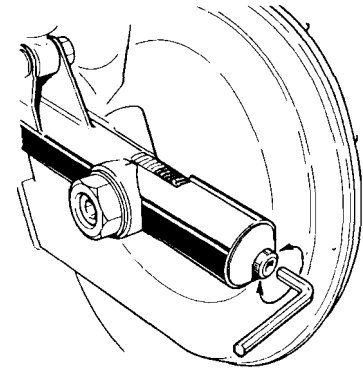


Figure 49 Adjusting the Rear Wheel Spindle Setting

WARNING

Operating the machine with pointer adjustment beyond the red sector is DANGEROUS.

GENERAL SERVICE OPERATIONS

Removing the Front Wheel

1. Place the machine on its centre stand. It is essential, when removing the front wheel, to support the front of the engine with a stand or block to prevent the machine tipping forward. Failure to follow this procedure may result in machine damage and/or personal injury.
2. Disconnect the speedometer cable from the LH side of the hub.
3. Remove the four bolts securing both LH and RH brake calipers to the fork legs.
4. In order to allow tyre clearance during wheel removal, suspend the two calipers over the front mudguard with a luggage strap, and place flexible packing (or a sliver of wood) between the brake pads to prevent these from closing up.
5. Remove the nut on the end of the spindle
6. Slacken the clamping bolt at the bottom of both fork legs.
7. Pull out the spindle and remove the wheel.

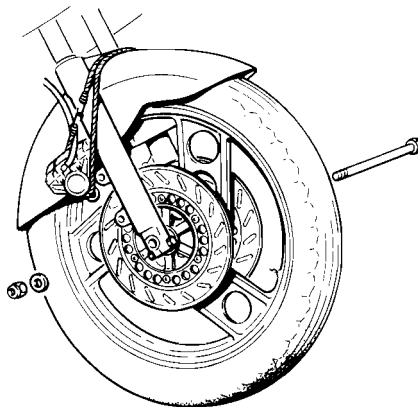


Figure 50 Removing Front Wheel

Note: Remember to protect the forks and mudguard paintwork with a cloth or similar whilst undertaking this operation.

WARNING

Do not operate front brake while wheel and calipers are removed.

To replace the wheel

1. Ensure the wheel bearings and spindle are clean before refitting. Smear the spindle lightly with grease to ease reassembly and subsequent removal.
2. Reposition the wheel and insert the spindle from the LH side. Ensure it goes fully home through the speedo drive gearbox on the LH side. The groove incorporated in the body of the speedometer drive gearbox must be aligned with the location peg on the inside of the left fork leg.
3. Fit the nut on the RH end of the spindle and tighten to a torque of 7 KgM.
4. Remove separators from calipers, refit to fork legs, and tighten bolts to 4.2 KgM. Adjust hydraulic pipe in clip.
5. Replace on stand and tighten both the clamping bolts to a torque of 2.75 KgM.
6. Reconnect the speedometer cable and spin the wheel forwards to check its functioning. Operate the front brake several times to check it functions normally.

GENERAL SERVICE OPERATIONS

Removing the Rear Wheel

1. Place the machine on its centre stand.
2. Detach the rear number plate by removing the four plastic retaining screws (the top two have their own plastic retaining nuts underneath) — retain carefully for replacement. Now detach the rear number plate complete with rear mudflap.
3. Disconnect the torque rod from the caliper carrier plate by detaching the spring securing clip and pivot bolt nut.
4. Unscrew the spindle from the RH side.
5. Rotate forwards and carefully support the caliper and its carrier.
6. Remove the three distance pieces (note order for refitting).
7. Pull the wheel to the right to disengage from the drive spline in the hub, then roll out the wheel.

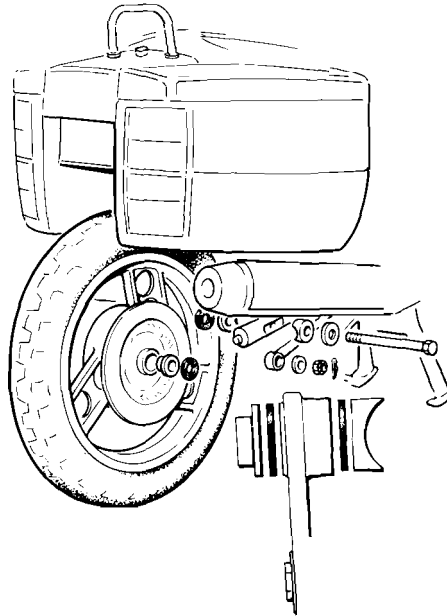


figure 51 *Removing Rear Wheel.*

To Replace the Rear Wheel

1. Ensure wheel bearing, spindle and distance pieces are clean.
2. Replace the rear wheel and re-locate the hub drive splines.
3. Reposition the caliper and caliper plate.
4. Replace the three distance pieces correctly and refit the spindle. Torque to 13.8 KgM.
5. Reconnect the torque rod to the caliper carrier. Do not forget to place the flat plain spacer washer against the aluminium caliper plate before fitting the torque arm. Refit the spigotted thrust washer under the retaining nut.
Torque to 4.2 – 4.8 KgM
Refit the spring securing clip, head uppermost.
6. Replace the rear number plate, complete with mudflap. The two upper plastic screws are assembled with their own plastic nuts inside the fairing. The two lower screws engage in pre-formed threads within the body shell.

GENERAL SERVICE OPERATIONS

Throttle Cable – Removal

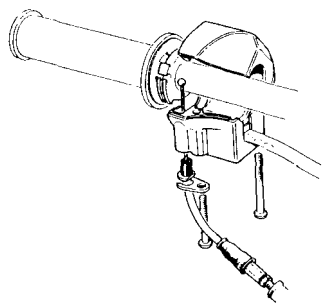


Figure 52 Right Handlebar Twistgrip.

Handlebar End

1. Remove the left side body panel.
2. Remove the two screws from the base of the right hand switch cluster. Separate the two halves and unhook the upper cable nipple from the twist grip drum. (Fig. 52)

Removing the lower end

1. Lift the cable outer ferrule (A) from the bracket on the back of the LH rotor housing (Fig 53)
2. Allow cable outer to drop down cable inner
3. This will allow the end nipple to be removed from the throttle linkage at the rear of the rotor housing

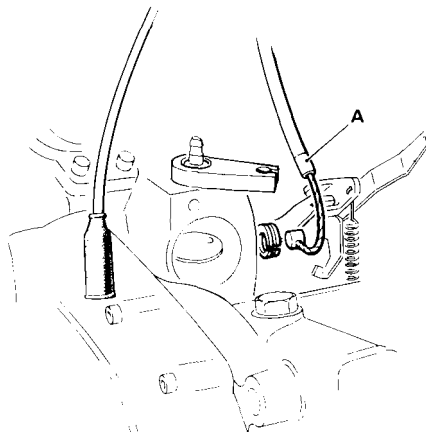


Figure 53 Removing the lower throttle cable

4. Using a pair of long nosed pliers, gently bow the freed inner cable at the nipple end towards the rear of the motorcycle, when the nipple will disengage allowing the cable to be lifted from the clevis.

Removing Oil Pump Cable

1. Remove inspection cover from left hand gearbox end cover casting by undoing the three socket headed screws. Be careful not to lose the nylon sealing washers under the screw heads.

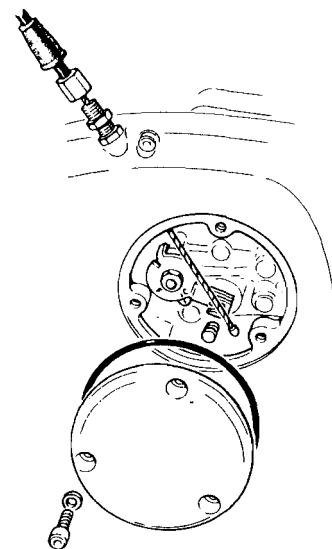


Figure 54 Oil pump cable

2. Unhook the cable from the oil pump lever whilst pushing the lever upwards and lifting the slack cable out of engagement. Take care not to lose roller (fig 54)
3. Remove upper hexagon nut from adjuster assembly, being careful not to disturb adjustment. The cable may now be removed from the gearbox end cover casting.

GENERAL SERVICE OPERATIONS

Throttle Cable – Replacement and Adjustment

Replacement of Complete Throttle Cable Assembly

Removal and replacement of the complete throttle cable assembly is best undertaken as follows: –

1. Thread the twistgrip end of the new cable up through the left side of the fuel tank continuing up through the left side of the forks, round the front of the right fork leg, and through to the twistgrip.
2. Replace the lower cable nipple into the throttle linkage at the rear of the left housing, then lift the outer cable into position into the insulated abutment.
3. Assemble the oil pump control cable section by inserting the inner down through the brass hexagon adjuster and locating into the slot and counterbore of the nylon roller now replaced into the oil pump operating lever. Ensure the roller slot faces forwards (i.e. towards the pump lever spindle) and the cable nipple counterbore faces downwards (fig 54)

4. Finally, refit the twistgrip end cable nipple up through the twistgrip lower half. engage in the twistgrip barrel and reassemble the two halves of the twist grip body.



Figure 55 Throttle Cable Junction Box.

Adjustment of Throttle Cable After Refitting

1. The cable should be adjusted by means of the cable adjuster in the cable at the twistgrip end so as to leave 2.5 mm free play at the handle-bar end.
2. Check adjustment when motor is running and warm by turning handle-bars slowly from lock to lock to discover whether the idling speeding is affected.
3. Correct as required.

Adjustment of Oil Pump Cable After Refitting (fig 54)

Final adjustment of the oil pump setting should be done with the engine running and warm.

The cable should be adjusted by means of the brass hexagon adjuster and lock-nut to provide the result as shown, with the engine running. (Fig 54)

WARNING

Adjustment of the engine oil pump unit is critical. Maladjustment could cause engine seizure.

The accurate setting of the oil pump is best achieved with the aid of an assistant. Set the engine to run at a constant 2000 indicated engine R.P.M. Adjust the oil pump cable length at the brass hexagon adjuster to exactly align the 'C' mark on the pump lever with the fixed alignment mark on the pump body. Before locking the adjuster ferrule in position, operate the throttle a number of times to ensure the adjustment is correct and stable. (See fig 34 page 35) When replacing inspection cover and socket screws, remember to refit the O-ring and Nylon Washers. Do not over-tighten the socket screws.

GENERAL SERVICE OPERATIONS

Control Cable Replacement and Adjustment

Clutch Cable

Removing the Cable

1. Remove the right side body panel (Page 14)
2. Slacken the adjuster at the handlebar end and remove the cable from the lever assembly. (See Fig. 56)
3. Remove the inspection cover from the primary chain case by undoing the three socket headed screws with the key provided.
4. If the cover is tight, it can be removed by inserting an 8mm screw into one of the three cover fixing screw holes.
5. Unhook the cable end from the operating lever with long nosed pliers.
6. Remove the cable from the machine.
7. It is now necessary to release the clutch mechanism by releasing the pull rod locknuts (see fig 57) and detaching the outer plate. Remember to collect the three 8mm balls as the thrust plate is released.

Fitting the cable

Fitting the cable is the reverse of the procedure described above.

Re-thread the replacement cable between the front fork stanchion tubes and under the fuel tank to the top of the primary chaincase. Inspect the cable 'O' ring, replacing where necessary, and insert the adjuster assembly through the cover. Take care to ensure that the cable end is inserted into the thrust mechanism lever with the cable and nylon trunnion 'inboard' (towards the clutch adjuster pull-rod), and that the nipple is seating correctly in the trunnion.

Apply grease to the mechanism back plate and place the three 8mm balls into their position. Carefully replace the outer thrust plate checking the cable and trunnion remain seated correctly. Refit the two locknuts and proceed to adjust the clutch (see fig 57).

Adjusting the Clutch

1. Slacken the adjustment at the clutch lever.
2. Remove the inspection cover from the primary case.
3. Check the slotted pull rod for correct adjustment. The lift bearing at the inner end of the pull rod should be

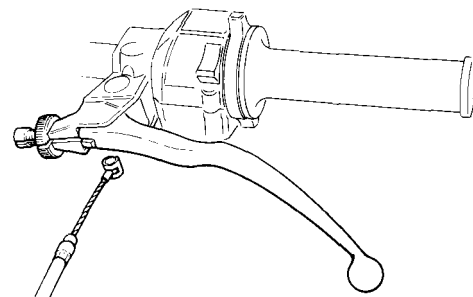


Figure 56 Removal of Clutch Cable at Handlebars.

lightly pre-loaded. The pre-loading is correct when there is no end float on the pull rod, but it can still just be rotated by gripping the adjusting nuts with the fingers.

4. If there is backlash, slacken the lock nut and screw *out* the stud until the backlash just disappears.
5. Tighten the inner ring nut whilst holding the stud, then tighten the lock nut whilst holding the inner nut. (See Fig. 57)
6. Recheck for backlash after tightening lock nut.
7. Readjust at the clutch lever to just provide 6mm play at the operating lever ball end.

GENERAL SERVICE OPERATIONS

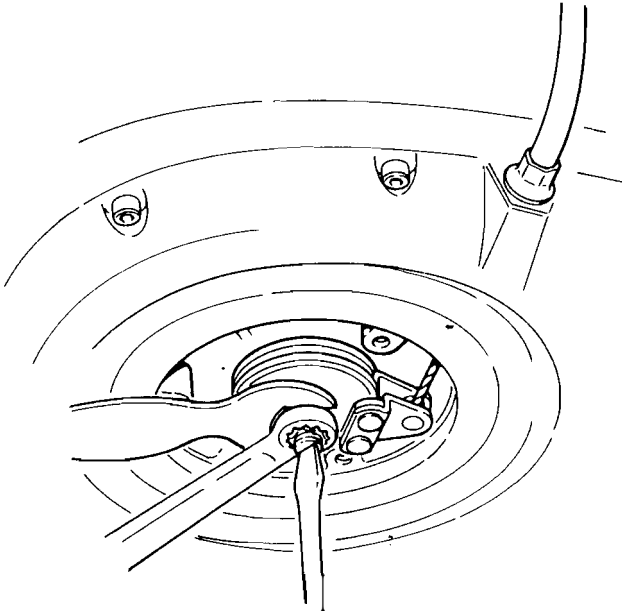


Figure 57 *The Clutch Lift Mechanism*

NOTE

If the clutch has any tendency to slip when the clutch lever is fully released, it is a sign that the clutch pull rod (or the cable) is pre-loaded excessively.

If, on the other hand, the clutch fails to free completely when the clutch lever is fully compressed, it is a sign that too much backlash (or free play) exists in the cable or pull rod.

When re-fitting a clutch cable, always ensure the cable slot in the lower clutch operating lever trunnion is facing inwards (towards the clutch adjuster pull rod). Insert the end of the cable through the ears of the lever before engaging the cable and entering the cable nipple into the trunnion slot. This will ensure safe retention of the inner cable at the trunnion should the adjuster at the handlebar inadvertently be excessively slackened off, thereby relieving all the tension in the inner cable.

GENERAL SERVICE OPERATIONS

Choke Cable – Replacement and Adjustment

1. Remove the left and right side body panels as described on page 14. Remove both batteries (see page 30). Disconnect both -ve and +ve leads.
2. Disconnect the fuel feed pipe at the vacuum tap, disconnect also the connecting fuel pipe between the left and right carburettors at the right carburettor inlet union.
3. Detach both carburettors by removing the two 6mm socket screws attaching the carburettor inlet castings to the frame.
4. Release the $\frac{1}{2}$ in. AF bolt locating the wiring harness to the right side of

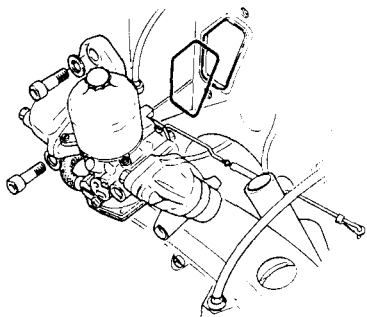


Figure 58 Removal of Right Carburettor

- the machine, and detach right hand engine cover.
5. Remove the clip on the front end of the fast idle rod (right carburettor)
6. Pull out both carburettors (rearwards) complete with inlet and idle pipes.
7. Release the solderless nipples from the choke cable and operating levers.

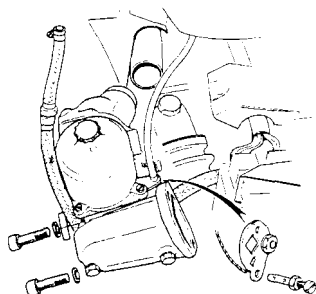


Figure 59 Removal of Left Carburettor

CAUTION

Do not disturb the adjustment of the fast idle operating rod length – this is factory set, and should not be altered.

WARNING

Do not attempt to run the engine with the carburettor manifold(s) detached or incorrectly fitted to the frame location ports. Engine seizure will result.

Fitting and Adjustment of the Cable

1. Fitting is the reverse of the procedure described above. (Note that the left hand choke cable is the longer of the two).
2. When refitting the solderless nipples at the end of the choke cables, allow 2.5mm free movement of the inner cables before the choke begins to function.
3. Replace the carburettors as described in Regular Maintenance – page 40.

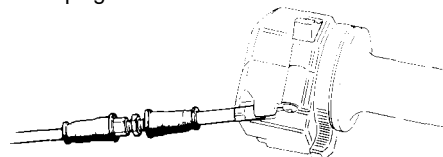


Figure 60 Choke cable at handlebar

Choke cable replacement at handlebar

1. Pull back the left handlebar grip
2. Remove the switch body front screw and detach retaining guide wedge.
3. Pull back cable outer out of engagement
4. With inner cable now vertical rotate choke lever one extra click, until the plunger is visible.
5. Lift choke lever out of engagement and unhook the old cable.

Re-fitting is the exact reverse of the above.

ELECTRICAL EQUIPMENT

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ELECTRICAL EQUIPMENT

Description

The system is 12-volt negative earth, supplied by two 14 Ampere hour batteries fitted on each side of the frame. The batteries are charged by a 370 Watt 3-phase alternator housed under the LH engine cover plate. Its output is controlled by an electronic voltage regulator which maintains the correct charge to battery.

WARNING

The voltages generated by ignition systems can be dangerous — investigatory work should only be undertaken by trained personnel. Ensure the ignition system is 'Off' before working on any part of the ignition system.

CAUTION

1. The battery terminals must not be disconnected whilst the engine is running as this will damage the voltage regulator unit.
2. Both batteries, regulator and ignition unit must be disconnected if any electric welding is to be performed on the machine.
3. Do not cover battery incorrectly — it is Negative Earth on this machine.

The electric starter motor is fitted behind and above the gearbox, and is energized by the starter pushbutton which controls a solenoid switch situated beneath the right side battery tray.

Electrical Equipment

To gain access to the batteries, both left and right body panels require removal, each retained by five slot headed DZUS fasteners to the main body of the machine (seepage 14)

The major electrical and ignition components are housed in the right side front fairing panel, access to which is gained by removal of the lockable lid.

Included are the following components: —

- Direction indicator flasher relay
- Direction indicator cancel unit
- Horn relay
- Ignition relay
- Daylamps relay
- Electronic Ignition unit
- Voltage regulator unit
- Fuses

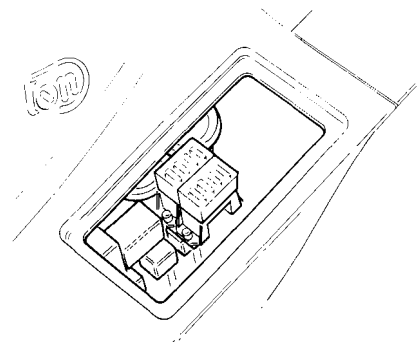


Fig 61 Illustrating the electrical equipment layout

Each fuse box carries four fuses, the capacity and location of which is indicated on the fuse box lid.

Left bank (inboard)

Main	30 amp	Green
Fan	15 amp	Blue
Auxiliaries	30 amp	Green
Ignition	15 amp	Blue

Right bank (outboard)

Direction indicators	10 amp	Red
Ignition unit	10 amp	Red
Headlight	15 amp	Blue
Spare	30 amp	Green

ELECTRICAL EQUIPMENT

Headlamp

To gain access to the headlamp and headlamp bulbs it is first necessary to detach the front headlamp glass.

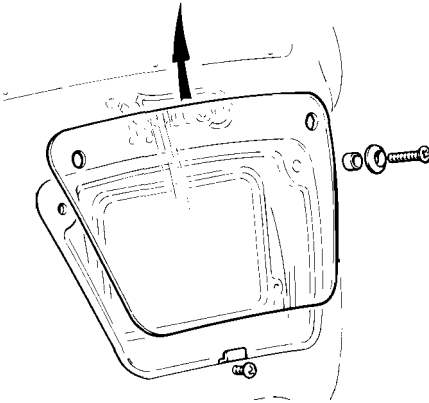


Figure 62 Removing the headlamp glass

First remove the two upper screws and washers, slacken the lower screw, releasing the bottom clamp and lift away the headlamp glass, carefully retaining the top glass spacer washers. Replacement is the reverse of the above.

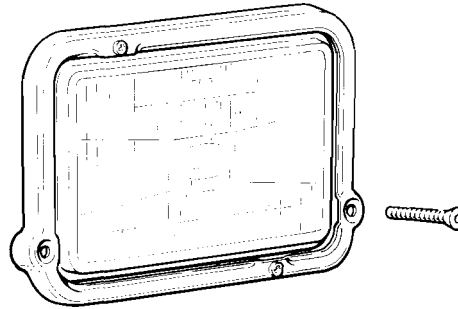


Figure 63 Removal of headlamp mountings

To remove the lamp unit

Unscrew the two countersunk socket head screws retaining the headlamp and rim assembly. Lift out the light unit.

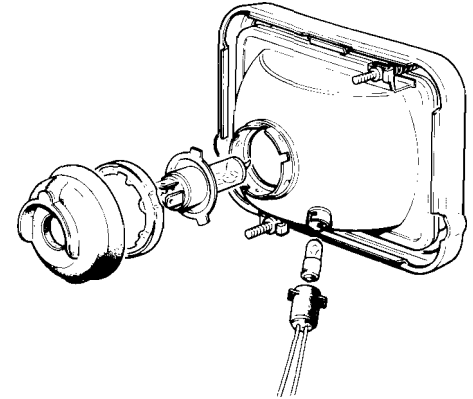


Figure 64 Headlamp bulb replacement

Replacing the headlamp bulbs

Release both main and pilot bulb holder fittings and detach the bulbs. When fitting a new headlamp bulb be careful not to touch the glass surface. If the bulb is inadvertently marked with a fingerprint, or otherwise soiled, clean it with methylated spirit and a clean cloth. To re-assemble, reverse the above procedure.

ELECTRICAL EQUIPMENT

Headlamp beam adjustment

Place the machine on the centre stand 5.6 metres from a vertical wall on which is marked a horizontal line 0.6 metres from the ground. Adjust the main beam height by means of the lower adjusting screw (A) to position the beam on the marker line.

The upper adjuster screw (B) regulates the direction of the beam from right to left. Adjust as required.

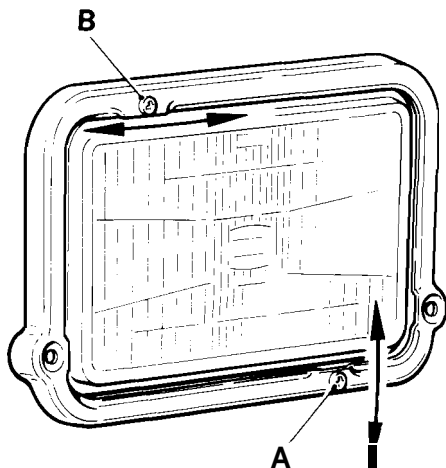


Figure 65 Headlamp beam adjustment

Instrument panel

Access to the instrument panel is gained following removal of the windscreen and inner lighting panel.

Instrument panel removal

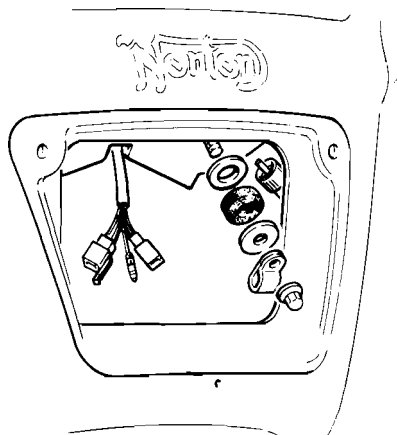


Figure 66 Instrument panel removal

Remove the seven plastic pan head screws holding the windscreen and lighting panel in place. Lift off the windscreen – the lighting panel will come away with it. Part the two items and store carefully.

To assist in the removal and replacement of the instrument panel, it is also advisable to remove the headlamp unit (page 57) to gain maximum access.

Centralise the handlebars, protect the tank top with thick protective cloth and slacken the handlebars (page 12)

Unscrew and detach the speedometer drive cable. Disconnect the red and black 6 way connector blocks and, supporting the instrument panel, remove both domed nuts. Carefully withdraw the instrument panel to the rear of the motorcycle

Carefully, store the plain washers, spigot rubbers, rubber buffers and domed nuts. Note the location of the main wiring harness 'p' clips.

Replacement is the reverse of the above.

Instrument panel bulb replacement

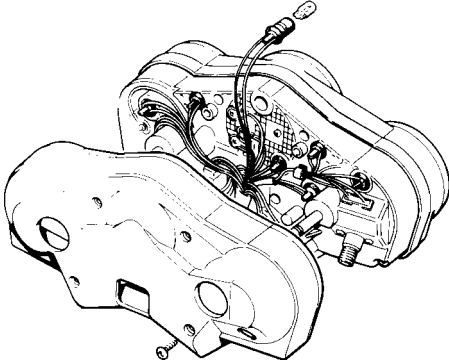


Figure 67 Instrument panel bulb replacement

Remove the four Philips pan head screws from the back of the instrument panel, revealing the 11 rubber bulb holders. To remove pull out with the tag provided.

Pull the capless-type bulb from the bulb holder and replace. Insert and press the bulb holder into the instrument panel location. Refit the back panel and locate with the four Posidriv pan head screws.

Refit the instrument panel taking care to replace the spigot washer, large plain washer, damper rubber, small plain

washer, harness 'p' clip and domed nut – in that order.

Daylight riding lights

Each daylight riding lamp is located in the inner lighting panel with four pan head slotted screws with nyloc nuts at the rear.

Each must be replaced as a complete unit.

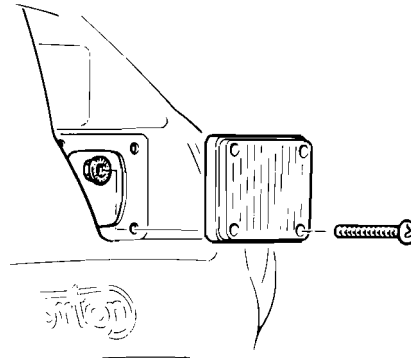


Figure 68 Daylight riding lights

Front direction indicator lamps

These lamps are mounted internally within the fairing. To gain access for bulb replacement, remove the windscreen and lighting panel as previously described. From inside the fairing detach the indicator complete (2 screws) – remove the lens (1 screw) and replace the bulb.

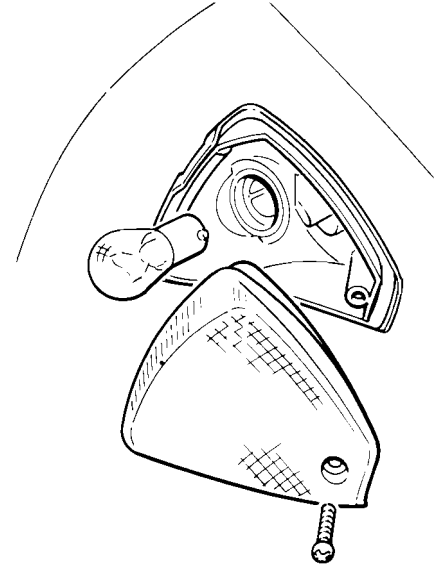


Figure 69 Access to the front direction indicator bulbs

Temperature gauge bulb replacement

Access is achieved following removal of the windscreen and inner lighting panel (see previous page). Simply pull out the bulb holder from the back of the Instrument, remove the bayonet fitting bulb and replace as necessary.

ELECTRICAL EQUIPMENT

Rear Light Consoles

Each pannier compartment incorporates a rear light console comprising stop/tail, rear indicator and rear fog lamp.

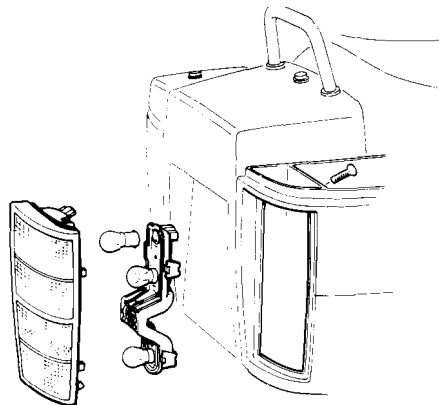


Figure 70 Rear lamp cluster

To replace rear light console bulbs

Remove the four screws inside the rear pannier retaining the light console in position. Detach the bulb carrier by squeezing the two retaining catches, and slide carrier out of engagement. Replace bulbs as necessary and refit the console unit following replacement of the bulb carrier.

Rear number plate illumination bulb

The light unit is located by two philips headed screws. Remove and collect the screws and cover. Peel back the holder and remove the glass. Replace bulb as necessary. Reverse the above procedure to refit.

Fuse renewal

1. Unlock and raise the right side fairing panel lid.
2. Remove fuse box lids, identify and remove blown fuse (see page 56)
3. Replace with new fuse of same type and same rating (see lid)
4. If the fuse blows again, investigate the cause and rectify.
5. Replace fuse box and fairing panel lids.

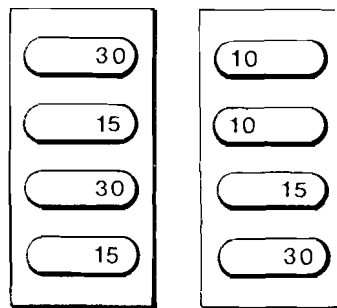


Figure 71 Fuse box layout

Resist the temptation to replace a blown fuse with one of a higher value. It could seriously damage the wiring.

Ignition Pick-up Air Gap Setting

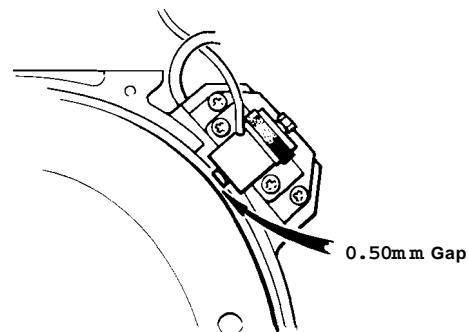


Figure 72 Ignition Pick-up Air Gap

Since there is no wear taking place, the gap does not require any adjustment unless the pick-up fixing screws have at some time been loosened.

Ignition coils

The two six volt ignition coils are mounted in tandem inboard and alongside the fuse boxes and are accessible only from below the fairing.

ELECTRICAL EQUIPMENT

Bulb Specification

LOCATION	TYPE	BASE	RATING
Headlamp	QH472	H4	12v 60/55W
Pilot	233	SCC BA9s	12v 4W
Daylight running light		Sealed units Micro-Max Halogen	
Indicator – front	382	SCC BA1 5s	12v 21w
Instrument panel		capless	12v 2.5w
Stop/tail	380	SBC BAY1 5d	12v 5/21w
Rear fog	382	SCC BA1 5s	12v 21W
Rear number plate	233	SCC BA9s	12V 4W
Temperature gauge	643	MCC	12V 2W

FAULT FINDING

THIS CHART IS INTENDED AS A 'FIRST-AID' GUIDE TO RESOLVING AN IMMEDIATE PROBLEM. WE RECOMMEND THE USER SEEKS THE ADVICE AND ASSISTANCE OF HIS LOCAL NORTON DEALER FOR ANY PROBLEM BEYOND THE SCOPE OF THIS FAULT FINDING GUIDE. ALTERNATIVELY TELEPHONE NORTON MOTORS FOR ADVICE. SHENSTONE (0543) 480101

SYMPTOM	POSSIBLE CAUSES	ACTION TO TAKE
Starter does not turn engine	Kill Switch	Move to 'ON' Position
	Flat batteries	Have battery condition checked. If faulty, replace batteries. If one battery is found to be faulty, replace both.
		If good, check alternator and check for open circuit.
Starter turns engine very slowly Engine turns but does not start	Poor connections	Check battery terminals and starter motor terminals.
	Faulty starter motor	Check. Refer to Workshop Manual.
	Faulty starter circuit	Check starter button and solenoid function.
	Battery charge low	Start by push or clutch start (downhill if possible).
	Side stand down	Retract side stand
	No fuel in tank	Refill
	Choke not operated	Check choke position and that chokes operate
	Contaminated fuel	Check for water in fuel
	Ignition system fault	Remove one H.T lead from a plug and using a spare plug check for ignition spark when engine cranked over.
	Ignition circuit broken	Check main fuse Check ignition switch Check contacts in ignition circuit

FAULT FINDING

Engine starts but does not continue running or runs unevenly	Incorrect choke operation	Check choke position. Check that chokes are operating
	Air leak on induction side	Check security of carburettors and induction manifolds Refer to Workshop Manual
	Carburettors not adjusted correctly Pistons and suction chambers dirty causing pistons to stick in chambers Contaminated fuel line Fuel starvation	Remove and clean suction chambers and pistons; check needle position and reassemble Check for water in fuel line Check for blockage in fuel tank vent.
Engine runs but lacks power	Insufficient fuel delivery	Throttle not operating. Check. Float needles sticking. Check. Check fuel tap for blockage. Check for partially blocked fuel line. Check for adequate fuel tank filler cap venting Disconnect blue lead on sender
	Faulty temperature sender Wheels not running freely	Check brakes not binding Check wheel bearings
	Engine lubricant fault	Check oil consumption normal. If low check metering pump and oil feed line for blockage. Check and rectify
Poor handling, steering heavy	Steering head bearings too tight or bearings dry or damaged	Check and rectify
Wheel wobble	Faulty wheel bearings	Check tyre pressures
	Incorrect inflation	Check
	Buckled wheel or tyre fitted incorrectly Faulty wheel bearing	Check
Machine pulls to one side	Swing arm pivot bearings worn, or incorrectly adjusted	Check. (Re-shim bearings if required — refer to Dealer)
	Wheels out of alignment	Check spindle adjusters correspond Check front forks not bent
	Faulty suspension	Check units and settings
Wheel 'patter' at speed	Wheel and tyre assembly out of balance	Check and rectify
Brake 'judder'	No oil in front fork	Check both legs and rectify
	Discs worn or buckled Head bearings loose	Refer to Workshop Manual Refer to page 44

APPROVED LUBRICANTS

DO NOT USE MULTIGRADE OILS AS ENGINE LUBRICANTS

	Preferred SAE Rating	B.P.	Castrol	Chevron	Conoco	Duckhams	Esso	Filtrate	Fina	Gulf	Shell	Silkolene	Texaco
ENGINE	40	Vanellus 40	CR1 40	Delo 100 40	HD 40	Fleetol HDX 40	HDX 40	HD 111 40	DILANO HPD 40	XHD 40	Rotella 40	Comp-2* Pre-Mix 40	Ursatex 40
GEARBOX	85W/ 140	Motor- cycle Oil 801140	Gear Oil EP85/140	Universal Gear Lubricant 80W/140	—		GP85W/ 140 or GX85W/ 140	Hypoid EP 80W/140	Pontonic MP 85W/ 140	Multi-pur- pose Gear Lube 85W/140	Spirax HD85W/ 140	Silkolene 901140	Fleetgear Oil 85W/140
PRIMARY CHAINCASE	20150	Super- Visco 2000 or Visco- Static	GTX 20W/ 50 or 15W/50	Supreme 20W/50	20W/50	Hyper- grade 15W/50	Plus 20W/50	Super 20W/50	DELTA 20W/50	Multi-G	All Seasons Motor Oil	Perma- visco 20W/50	Eurotex HD 15W/50
REAR CHAINCASE	20/50	Super Visco 2000 or Visco Static	GTX 20W/ 50 or 15W/50	Supreme 20W/50	20W/50	Hyper- grade 15W/50	Plus 20W/50	Super 20W/50	DELTA 20W/50	Multi G	All Seasons Motor Oil	Perma- visco 20W/50	Eurotex HD 15W/50
CARBURETTOR DASHPOTS	AS ENGINE OIL												
FRONT FORKS	10	Motor cycle Fork Oil	Castrol Fork Oil	EP Hydraulic Oil 32	Hyd SP 32	Duckhams Fork Oil	Glide G Nuto H32 Univis J32	Filtrate Fork Oil	Hydran 32	Hydrasil 32	Donax TF or Dextron 2	Silkolene SAE10 Fork Oil or Derwent 32	Rando HD32
GREASE POINTS		B P Eng Grease L2	Castrol LM Grease	Duralith Grease EP2	H M P Grease	Duckhams LB 10 Grease	Beacon 2 or 3	Super Lithium Grease	Marston HTL2 Lithium Grease	Gulf Crown No 2 EP	H M P Grease	Silkolene G55/T Grease	Martak All Purpose
OIL POINTS	20/50	Super Visco 2000 or Visco- Static	GTX 20W/50 or 15W/50	Supreme 20W/50	20W/50	Hyper- grade 15W/50	Plus 20W/50	Super 20W/50	DELTA 20W/50	Multi-G	All Seasons Motor Oil	Perma- visco 20W/50	Eurotex HD 15W/50

IF THE BRAND OF ENGINE OIL IN USE IS NOT OBTAINABLE IT IS PERMISSIBLE TO TOP UP WITH ONE OF THE OTHER RECOMMENDED BRANDS.

'Except in the case of Silkolene Comp-2 Pre-mix 40, which is a synthetic oil, and not miscible with normal mineral oils.