

I commissioned this English translation which has been taken from a copy of one of the original Italian editions of the factory's "Riders Handbook" It was undertaken in July 2002 by my good friend Laurie North - a retired London microbiologist. Laurie is not a Club member – he's not even a motorcyclist now though he did once own the most classy of all the 1950's scooters.... a 125cc twin cylinder Moto Rumi. Laurie has a deep affection for all things Italian and says that he did this translation for love - and as a companion piece to his earlier translation of Mario Colombo's book "FALCONE" copies of which may still be available from the U.K. Guzzi Club's PRO. I am therefore passing on Laurie's latest labour of love to all Moto Guzzi Singles riders and, as before, it comes without guarantees or undertakings of any sort. That disclaimer notwithstanding, all Falcone riders will drink to your health, Laurie, now and in years to come for giving us this indispensable work of reference. Copies of Laurie's translations are available, via the Guzzi Club, in return for a token contribution to Club funds.

Dave Thomas Bristol England . (8/8/2002)

PAGE 1

MOTO GUZZI

Motorcycle

FALCONE

500 cc.

INSTRUCTIONS

for use and maintenance

LIST OF TOOLS AND UTILITIES

Tyre pump

Universal pliers

Flat spanner 11 mm for adjusting front brakes, clutch, and removing the exhaust pipe

Box spanner 10 – 14 mm, with tommy bar. For removing crankcase nuts.

Box spanner 21 – 22 mm. with tommy bar for removing plug, engine from the frame.

Adjustable spanner

Tyre lever (3 pieces)

Ring spanner 17 – 19 to remove head, engine from frame, gear preselector and rear arms.

Screwdriver.

Flat spanner 8 – 10 mm. For removing crankcase nuts and other parts.

Magneto spanner. (Manual magneto only fitted from 1950 – late 1952)

Pipe spanner 11 mm. For adjustment between pushrods and rockers (valve clearances)

Grease gun.

Spare carburettor main jet (Summer 130 – Winter 135)

VARIATIONS FOR THE AUTOMATIC MAGNETO FITTED ON THE LATER FALCONE

- P.2. *List of spanners and utilities.* No magneto spanner.
- P.9 Delete No. 2 "ignition control lever".
- P 10 *Ignition.* Marelli Magneto, type MCR4-B with 15° of advance/retard movement. Rotation clockwise, viewed from flywheel side -controlled by gears - advance incorporated automatically using springs and bob-weights.
- P 19 *Starting the engine.* Remove script concerning the need to advance the magneto.
- P 21 The chapter *Use of the magneto advance control* is not applicable.
- P 33 On figure 5 bis should be shown the amendment (B = 21 to 22 mm.)
- P 34 *Timing the magneto.* When the engine is at the end of the compression stroke with the piston at TDC (i.e. both valves closed), the points of the rotor of the magneto must just start to open when the arrow on the fly wheel is 21 -22 mm. measured on the periphery, from that marked on the cover (see fig. 5 bis). The automatic timing device should be "closed" i.e. on full retard.
- P 34 *Ignition.* Is provided by the magneto Marelli type MCR4-B. Check the points of the contact breaker and, if necessary, clean them with a suitable file of the finest cut. The point gap must be 0.4 mm.; should it be a larger or smaller gap adjust as follows; remove the cover from the magneto, then with a screwdriver partially undo the screw that holds the plate that has the fixed contact. Move the plate by slowly turning the eccentric screw so as to obtain the prescribed gap for the points, finally tighten the securing screw. Carry out this adjustment with the heel of the fibre block positioned on the magneto camring in the position of maximum opening. Whilst carrying out this checking of the points take the opportunity to lubricate the felt pad set in the camring using a tiny quantity of suitable special oils.
- P 62 Delete "lubricate the surface of the cam and the guide ring in the head of the magneto".

INDEX

Control and accessories	p 9
General characteristics of the engine	p 10
Changing gear	p 11
General characteristics of the frame	p 13
Performance	p 14
Essential guidelines for use of the motorcycle	p 17
Acceleration of the engine unloaded	p 17
Normal use	p 17
Use of the ignition switch on the headlamp for lighting	p 18
Starting the engine	p 19
Starting the hot engine	p 20
Starting the motorcycle	p20
Use of gears	p 20
Use of the choke	p 21

Use of the magneto advance control	p 21
Stopping the motorcycle	p 21
Stopping the engine	p 22
Returning to the garage	p 22
Conservation of the motorcycle in the case of lengthy non-use	p 22
Defects in carburation and remedies	p 23
Defects in starting and remedies	p 23
Defects in compression	p 24
Overheating of the engine	p 25
Good use of the motorcycle	p 25
Important note	p 25
Instructions for the maintenance of the motorcycle	p 27
Lubrication of the engine and gearbox	p 27
Lubrication of other parts	p 31
Lubrication of the transmission chain	p 31
Valve timing	p 32
Timing the magneto	p 34
Adjustment between rockers and pushrods (valve clearances)	p 34
Ignition	p 34
Fuelling and exhaust	p 36
Adjusting the carburettor	p 38
Cleaning the exhaust pipe and silencer	p 39
Head and valves	p 40
Adjusting the clutch	p 42
Adjusting chain tension	p 44
Adjusting the telescopic forks	p 45
Adjusting the steering	p 47
Adjusting the swinging forks	p 47
Brake adjustment	p 52
Adjustment of the front hub	p 52
Removing the front wheel	p 52
Removing the rear wheel	p 56
Checking the shock absorber fluid in the telescopic forks	p 56
Electrical system	p 58
Dynamo	p 58
Battery	p 58
Wiring	p 59
Headlamp	p 59
Horn button and dipswitch	p 59
Electrical indicator	p 59
General maintenance	p 60
Periodical maintenance	p 62
Index of concessionaires	p 63
(Fig. 1 motorcycle flywheel side)	
(Fig. 2 motorcycle distributor side)	
(Fig. 3 motorcycle controls and accessories)	

CONTROLS AND ACCESSORIES (P 9)

(see Fig.3)

1. Clutch lever
2. Advance lever. Pulling retards. [Not applicable to the post-1952 Falcone]
3. Exhaust Valve lifter.
4. Rear brake pedal.
5. Kick-start.
6. Pillion seat.
7. Rear shock absorbers.
8. Ignition switch.
9. Lighting switch.
10. Front brake lever.
11. Choke lever.
12. Throttle.
13. Dipswitch and electric horn.
14. Steering damper knob.
15. Gear change lever.

GENERAL CHARACTERISTICS (P 10)

ENGINE

Engine: 4 stroke with overhead valves

Cylinder head: in light alloy with all valve gear fully enclosed and bathed in oil.

Number of cylinders: 1 horizontal, barrel in light alloy with special steel liner.

Bore: 88 mm.

Stroke 82 mm.

Capacity 500 cc.

Power at 4500 revs 23 HP

Compression ratio 1: 6.5

For timing, valve opening and closing, see the chapter "Timing"

For valve adjustment see the chapter "Adjustment between rockers and shafts"

Ignition:

The magneto is a **Marelli** type **MLA 53**, with a fixed magnet and rotating armature, platform mounted with base shim to regulate meshing of the driving gear. Clockwise rotation when viewed from flywheel side, driven by a gear (incorporating a detachable felt seal) direct from the camshaft gearwheel.

Advance is obtained with small lever on the left of the handlebar (pulling retards).

Maximum advance, measured on the crankshaft is 45 degrees BTDC [Not applicable to the later Falcone with Marelli Magneto, type MCR4-B with 15° automatic inbuilt advance/retard movement using springs and bob-weights – INBOARD OF THE CONTACT BREAKER ASSEMBLY. Same direction of rotation – also gear driven.

Plug:

Marelli type CW 225 B (now no longer available commercially - August 2002)

Fuel supply:

By gravity. Tank capacity 17 litres. (nearly 4 gallons) of which 2 litres are reserve.
For this engine the use of petrol with an octane number of at least 70 is recommended.

All Falcons to 1952 and all "Sports" models, thereafter were fitted with a "racing" type carburettor Dell'Orto 29 SS with air regulation by lever, fuel regulation by throttle. Normal setting for the 29 SS carburettor:

Choke tube	29mm	
Main jet	130/100 (summer)	135/100 (winter)
Idling jet	55/100	
Piston	N. 100	
Needle	N. 13	

Lubrication:

Forced with geared pump for sending, with recovery blades.

Carried at full flow circa. 60 litres per hour.

Capacity of oil tank circa. 3 litres

Quantity of oil needed

For lubricating the engine circa. 2.5 litres (5½ to 6 pints)

Cooling:

By air. Head and cylinder barrel are cast with fins disposed radially with respect to the axis of the cylinder to provide optimum cooling.

Clutch:

Dry. Multiple metal discs.

Number of discs 12 (5 in steel – 5 in bronze – 2 in "Ferodo" material)

CHANGE OF SPEED (P11)

By gears always engaged with front coupling; number of ratios 4.

Ratio in first 1 : 2.293

Ratio in second 1 : 1.732

Ratio in third 1 : 1.317

Ratio in fourth 1 : 1 direct drive.

Transmission:

By gears with helicoidal teeth between engine and gearbox.

By chain with rollers type 5/8 x 1/4 between gear sprocket and rear wheel sprocket .

Transmission ratios:

Between engine and gear box 1.77: 1 44 – 78

Between pinion and rear crown 2.25: 1 16 - 38

Total transmission ratios (engine and wheel):

In first gear 9.15: 1

In second gear 6.9: 1

In third gear 5.25: 1

In fourth gear 3.98: 1

GENERAL CHARACTERISTICS (P 13)

FRAME

Wheelbase	circa. 1.475 metres (4ft 10")
Size of vehicle:	
Length	2.240 metres (7ft 4")
Width	0.705 metres (2ft 4")
Height (unloaded)	circa. 0.945 metres (3ft 2")
Minimum clearance from the ground	circa. 0.150 metres corresponding to the lowest part (unloaded). (= 6")
Weight without petrol, oil and accessories	circa. 167 Kilograms. (= 367 lbs)

Suspension:

Front: telescopic forks with hydraulic shock absorbers.

Rear: swinging forks with spiral springs mounted horizontally under the engine block, and enclosed in twin spring boxes.

Rear shock absorbers:

By friction, adjustable.

Wheels:

Spoked front and rear with rims in light alloy 19 x 2.5.

Tyres:

Ribbed front tyre	3.25 – 19
Block-tread rear tyre	3.50 – 19

Inflation pressures:

Front tyre	1.5 BAR = Kilograms per sq. centimetre (22 p.s.i.)
Rear tyre	1.75 BAR = " " " (25 p.s.i.)

(Note : 1 Kg per sq. cm. equals 14.223 lbs per sq inch but also note that modern tyres should be inflated to the manufacturers recommended pressures)

Brakes:

Expansion type (in light alloy)

2 positions, one on the front wheel controlled by a lever on the right of the handlebars; one on the rear wheel controlled by a toe-operated pedal on the left of the motorcycle. (May be heel operated on the "Tourismo" models).

Electrics:

Lighting: consisting of Marelli dynamo type DN 19 G 30/6 2000D with voltage regulator 6V – 30W.

Rotation to the right, driven by a gear direct from clutch drum.

Ratio engine: dynamo 1: 1.33

Electric horn Marelli T 38

Headlamp with dipswitch and horn button on the handlebars.

Reflecting rear lamp and reflector type T. 16166
Battery with capacity of 12 Ah – (6 Volt)

PERFORMANCE (P 14)

Maximum gradient achievable in the gears on roads in well maintained state:

In 1st gear maximum gradient ca. 45%
In 2nd gear maximum gradient ca. 24%
In 3rd gear maximum gradient ca. 14%
In 4th gear maximum gradient ca. 6%

Maximum speeds in each gear at 4500 revs:

In 1 st	60 kph	= 38 mph	very approx.
In 2 nd	79.5 kph	= 50 mph	" "
In 3 rd	94.5 kph	= 60 mph	" "
In 4 th	ca. 135 kph	= 85 mph	" "

NB. – In the descriptions where it is written **right** or **left** it is meant as viewed when sitting in the saddle unless otherwise stated.

ESSENTIAL RULES FOR THE USE OF THE MOTORCYCLE (P17)

Acceleration of the unloaded engine

With gears in neutral, particularly with a cold engine, it is recommended that you do not over-rev the engine.

Normal use

The engine can be safely revved to 4500 rpm. It is recommended not to exceed this especially in lower gears. To check this you should refer to the maximum speeds in each gear (see the chapter on performance)

Before starting a journey: check that there is sufficient fuel to complete it; that there is sufficient oil in the tank and of the right type. Check, as soon as the engine starts, that the oil is circulating correctly by removing the oil cap, when you should see the oil coming out of the return pipe.

It is unwise to go down hills in neutral or with the clutch out, and it is advisable to always use the braking action of the engine holding the throttle closed. If the descent is steep it is a good idea to select a lower gear so as to avoid the excessive wear on brakes and the overheating of the drums.

On wet or icy roads you must drive with the utmost prudence trying to avoid sudden braking and rapid acceleration. It is advisable to lower the tyre pressure.

Going uphill it is a good idea to use the gears that allow the engine to rev normally so as to avoid labouring the engine. **It is extremely unwise to slip the clutch and risk deformation of the discs due to heat build up.** The valve lifter must be used only for starting and stopping the engine, and should never be used when riding along.

Use of the ignition key on the headlamp for the lighting system

To start up the system, push it right down. Warning: in order to start up the system before starting the engine, the ignition light must be lit. With the engine running, the light must go out, which indicates that the dynamo is producing the correct current. When you stop the engine you must remove the key from the working position (connected), otherwise the warning light would remain lit thereby draining the battery. *(Note that the "Ignition" key itself has no effect upon the ignition system as such – which utilises an entirely independent Marelli or Bosch magneto to provide sparks)*

Starting the engine

Ensure that the machine is safely mounted on its centre stand. Open the petrol tap on the right of the tank and check that the petrol is getting to the carburettor by momentarily pressing the tickler on the float chamber (for two or three seconds, no more).
Note : with the standard swing lever type of tap, a slack lever denotes petrol OFF and a tight lever indicates petrol ON. DO NOT DEPRESS THE TICKLER OF THE CARBURETTOR PRIOR TO STARTING A WARM / HOT ENGINE.

Check that the gears are in neutral by ensuring that the line scribed on the moving part of the external selector drum meets up with the line scribed on the fixed part of the mechanism. To avoid unpleasant "kick-back" from the kickstart lever, put the advance lever of the magneto in the semi-retarded position i.e. pulled back halfway , [not applicable to the later Falcons]. Now slowly turn the engine over via the kickstart until you feel the piston just passes TDC on the compression stroke - you may use the exhaust valve lifter to ease the piston just past T D C. Keep the air lever closed and on most machines it is important to have the throttle valve very slightly open. (Note : worn throttle slides and carb. bodies usually make for difficult starting).

Apply a strong downward thrust to the kick-start using your right foot. You may need to briefly "dab" the valve lifter at the same time to ease the operation. If so, note that well before the downward swing of the "kickstart" is completed you must release the valve lifter lever to maintain compression.

It is wise, especially in cold seasons, to let the engine tick over without load, for a few minutes. *(Much of today's advice suggests the exact opposite of this i.e. you should warm the engine by moving off immediately - and taking off the choke at the earliest opportunity).* You can, at the same time, open the choke about halfway and slowly advance the magneto. [This latter instruction does not apply to the Falcons fitted with the later "auto-advance/retard" magneto]. The petrol tap on the left must remain closed in normal operation because it serves for the use of the "reserve" petrol supply and should therefore be opened only when required.

Starting the hot engine (p 20)

It may be necessary to open the choke about half way; one must not tickle the carburettor. Starting hot invariably requires the throttle to be opened a couple of mm's.

Moving off

After having started the engine, push the motorcycle forward so as to take it off the stand, sit astride the machine and pull the clutch lever back fully, engage first (lowest) gear and slowly release the clutch lever whilst gently opening the throttle at the same time.

Use of the gears

To change from lower to higher gear you need to pull the clutch lever fully back at the same time closing the throttle and with the ball of your right foot move the gear pedal down slowly but firmly so as to engage the next highest gear, slowly release the clutch and at the same time accelerate. Continue until you reach top gear.

To change from higher to lower gears carry out the same manoeuvre except that you don't close the throttle completely. *(Downward changes, at speed, are invariably made easier- and quieter - when preceded by a blipped throttle)*. It is a good idea to change to a higher gear when the motor reaches higher revs. It is always a good idea to change to lower gears when the engine is labouring under load and losing revs. *(Note that a weak or broken gear selector spring (easily replaced) will often result in imprecise gear selection)*

Use of choke (p 21)

Since the carburettor is semi-automatic it is necessary to close the choke more or less according to the ambient temperature and loading conditions of the engine itself. It is obvious that closing it enrichens the mixture and vice versa. In practice it is useful to reduce the air opening to about half when the engine is under heavy load and low revs.

Use of the magneto advance

The normal running position is fully advanced; it is necessary to reduce the advance only when the engine is under heavy load or running at low revs – i.e. in slow urban traffic. [not applicable to the post-1952 Falcons with automatic advance / retard mechanisms].

Stopping the motorbike

Close the throttle. Press down on the rear brake pedal and pull on the front brake lever together. A few metres before the motorcycle stops, de-clutch and put gears into neutral. It is always a good idea to use the front and back brakes together. In case of sharp braking on the street it is advisable to use more front brake and to avoid locking the rear wheel thus being certain of obtaining good braking without danger of skidding.

Stopping the engine (p 22)

To stop the engine close the throttle and pull up the valve lifter lever. Close the petrol tap (check for "slack" lever) and put the machine on its stand.

Storing the machine

It is advisable to clean your Falcone immediately after use and give it a summary external inspection as soon as it is put away, especially after a journey carried out in bad weather.

Care of your motorcycle in the event of a long period of inactivity

1. Clean the motorbike (see chapter "General maintenance")
2. Introduce a little oil into the plughole and turn the engine over using the flywheel and valve lifter to produce a protective coating in the bore against rust.
3. Move the piston to TDC with valves closed. To do this turn the flywheel until the arrow shown on the flywheel coincides with that stamped on the crankcase cover; then undo the rocker box cover and check that the valves are closed by turning the flywheel a few centimetres when the rockers should remain closed. If this doesn't happen you are on the wrong stroke and must turn the flywheel again and repeat the operation.
4. With the machine on the stand lift the rear wheel from the ground especially if the ground is damp or oily.

Defects of carburation and remedies

If the engine doesn't start or stalls during running, the cause can be:

Lack of petrol; check that there is petrol in the tank and that the tap is open.

Obstruction of the petrol pipe or filter; clean it, blowing strongly to remove the blockage.

Dirty carburettor; remove it and clean it with clean petrol.

Water in the carburettor; close the tap, remove the carburettor and clean it well.

Flooding of the carburettor on starting; close the tap and allow the excess petrol to evaporate from the engine by repeatedly turning the engine over with the valve lifter pulled up.

Infiltration of air into the inlet pipe to cause an air leak between pipe and carburettor or between pipe and head. Check the tightness of the nuts, clean up the flanges and put new jointing compound on the head / inlet pipe flanges.

Defects in the spark and remedies

If the engine doesn't start and the cause cannot be traced to the fuel supply, search for the problem in the electrics.

The plug does not spark: remove the plug, place it on the cylinder, give the engine a few turns, and if it doesn't spark it can be due to a damp plug. If the motorcycle has been left in the rain there may be poor starting or none at all. If so, remove the plug and dry it.

Dirty plug; clean it with pure petrol and wire brush.

Broken insulator; change the plug.

Electrodes of the plug not properly set: check that the gap is 0.5 mm. (= 19 to 20 thou)

Plug lead: check that it is not broken or shorting out; check the attachment of the lead. If with a new plug there is still no spark, check the magneto points: they must open to 0.3 – 0.4 mm at the point of maximum lift (= 12 to 16 thou) If the points are dirty at the contact faces, they must be cleaned. If ignition is occurring too early or too late; check the magneto timing and, on later models, check that the automatic spring-loaded timing device is free to move fully in both directions.

Compression defects

Head and cylinder bolts loose.
Cylinder head / barrel sealing gasket defective.
Plug loose or plug washer deteriorated.
Compression rings on the piston worn or broken.
Ovalisation of the cylinder bore.
Poor valve seating. Pitted / burnt valve seats or the valves themselves.
Incorrect valve timing.

Overheating of the engine (p 25)

If the motor overheats the causes can be:
Oil pump not working, too little or old oil, filter or tubes blocked. ATTEND TO IMMEDIATELY
Timing too retarded.
Mixture too weak.
Cooling fins badly blocked with oil and dust.

Correct use of motorcycle

To use the motorcycle well avoid uneven running, sudden braking and rapid acceleration: and if possible - where circumstances permit - ride at a steady speed with consideration for others. This way of riding saves petrol and oil, reduces wear on tyres and on all the parts of the machine and the engine

Important notice

It is a good idea to check the tightness of all the nuts and bolts after the new motorcycle has covered the first 500 Km. (= 300 miles approximately)
Such a check is always wise and must be done periodically at least every 10,000 Km. (= 6250 miles)

Remember that the chance looseness of one nut can cause serious damage or an accident.

INSTRUCTIONS

FOR THE MAINTENANCE OF THE MOTORCYCLE (p 27)

The Falcone motorcycle does not require anything special for its maintenance. The rules that we give here are those that every good motorcyclist, caring for his machine, must bear in mind.

Lubrication of the engine-gearbox group

In this type of engine, the oil has not only the function of lubrication but also the important function of cooling the engine, carrying out the function of water in water-cooled engines. About 60 litres of oil (= 13+ gallons) during every hour of running pass from the tank to the engine and from the engine to the tank.

A geared pump draws oil from the tank and injects it into the crankshaft from the timing side. The oil is then forced along internal ducts of the crankshaft and escapes through holes found under the big end of the conrod. After having lubricated the big end, the oil passing across the rollers of the bearing at the small end of the conrod is projected onto the gudgeon pin, on to the piston and on to the walls of the cylinder. It then flows onto the gears, lubricating and cooling these items. The excess oil removed by the oil scraper rings is collected in the base of the crankcase. From here via a pump with vanes coaxial with the first pump the oil is drawn up and returned to the tank. We should note that the "backwards" rotation of the horizontally-inclined engine, favours the perfect lubrication of the cylinder. This is because oil droplets, moved by centrifugal force, are thrown on to the upper part of the cylinder wall and by gravity the oil descends to lubricate the lower part. If however, the engine were to turn in the same direction as other engines only the lower or anterior part of the cylinder would be perfectly lubricated since by centrifugal force the oil droplets would be projected only downwards.

Important note: for the lubrication of the engine use Shell oils of the following grades; under 10° C Double Shell or Shell X 100 SAE 30 mono-grade; above 10° C Triple Shell or Shell X 100 SAE 50 mono-grade.

Every 2000Km it is necessary to change the engine oil. This should be done when the engine is hot. Remove the filters from the tank removing the perforated bolt which fixes the tube (see Fig. 4 (P.29)) and the nut that holds the filters. Take these apart undoing the nut that holds the little filter inside the external one (see Fig. 4 bis (P.30)) and clean it carefully.

It is wise to clean the filter in the engine case and all the feed and return pipes. Take the greatest care in reassembly, so as to avoid the loss of oil or drawing in air that would cause defective functioning of the pump with serious damage to the engine.

An automatic anti-siphoning valve is mounted within the oil pump. It is inadvisable to interfere with this device as they were all pre-set at the factory.

NB. To ensure that the oil is flowing correctly, you must remove the oil tank cap whilst the engine is running, and check that the oil is issuing out of the correct tube.

The safest means of checking that there is no oil problem when running is to touch the return pipe near the oil tank. After a few minutes of running it should be warm.

Lubrication of other parts

It is recommended to frequently lubricate the pin of the rear fork bushes, using a suitable grease gun and similarly on the front forks the pins of the adjuster rollers and the bushes of the internal guides. For these Shell Retinax Grease CD is recommended.

It is a good idea to carry out this lubrication every 1000 Km.

Using Shell Retinax CD, every 1000 Km., you must also lubricate the cap of the thrust bearing and the tempered screw of the clutch actuator.

The hub bearings, the magneto, the dynamo require lubrication only at very long intervals. Such operations should be done with a major overhaul.

Lubricate, with Shell Retinax CD, twice a year the springs inside their covers and the hinges of the rear forks.

Lubrication of the transmission chain

Although the chain should receive constant 'engine oil' lubrication automatically via the vent hole that opens near the chain pinion, it is nevertheless recommended that the chain is thoroughly cleaned every 1000 Km. (= 625 miles) with petrol or naphtha and coated with grease, Shell Retinax CD, or proprietary chain lubricant.

Timing the valves (P.32)

Adjust the tappets so that the clearance is opened up to 0.20 for both valves.

Fix your attention on the point at which the inlet valve opens as this is the most significant part of the valve operating sequence. When the arrow on the flywheel is 112 to 115 mm. = 4.5 inches (measured on the periphery of the flywheel) from the arrow on the cover on the exhaust stroke (see Fig 5 bis A), the inlet valve should just start to open. Being on a common camshaft this sets in phase all other valve opening and closing points.

(Fig. 5)

The marked tooth on the engine pinion must engage between the marked teeth on the gear of the cam shaft, and the marked tooth of this latter must engage between the marked teeth on the magneto gear (see Fig. 5)

Timing the magneto (P.34)

When the piston is coming up to the top of the compression stroke and the engine moving in the normal direction of rotation, the points of the contact breaker in the manual magneto should just start to break when the arrow on the flywheel is 95 mm (= 3.75 inches or 39 degrees) measured on the periphery of the flywheel from the arrow on the cover - BEFORE the piston gets to the top of the stroke. The advance / retard lever must be in the fully advanced position during this operation.(see Fig. 5 bis B)]
Note : both valves will be closed when the piston reaches actual Top Dead Centre.

(Fig. 5 bis) [The Firing point / Contact breaker opening point for the later Falcone fitted with an automatic advance/retard instrument is : - 21mm - 22mm BTDC measured on the flywheel periphery (= 0.85 inches approximately) with the magneto's ADV / RET mechanism in the fully retarded (slack) position]

Valve clearance adjustment between push rods and rockers

Adjustment is carried out on the cold engine with valves closed and therefore with camfollowers resting on the base cam circle. Unscrew from the cylinder head the large plug with its sealing washer, then using the special tubular spanner and screwdriver (provided) undo the nut and tighten or loosen the screw so as to leave no discernible clearance except that the pushrod must be free to turn. Having made the adjustment, hold the screw firmly and tighten the nut (see Fig.6)

NB. Check again after this final tightening that the screw has not "nipped" the pushrod so altering the adjustment. The adjustment must be made with the piston at TDC, with valves closed, and precisely at the end of the compression stroke. *(A little play is preferable to a nipped valve train which will quickly produce difficult starting and eventually burnt valves and seats).*

Ignition

The magneto Marelli type MCR4-B provides the spark which ignites the petrol/air mixture. Check the points of the contact breaker; if necessary, clean them with a suitable file of the finest cut. The point gap must be 0.4 mm. (= 15 thou approximately) and should it be a larger or smaller gap go on to adjust as follows. For the auto advance/retard magneto remove the cover from the magneto, then with a screwdriver slightly loosen the screw that holds the plate that has the fixed contact. Move the plate by slowly turning the eccentric screw so as to obtain the prescribed gap for the points, finally tightening the retaining screw. For the manual magneto use a spanner of the appropriate size to loosen the outer locking nut of the 'fixed' contact and screw the contact in or out to obtain the desired gap. Re-tighten the locking nut when the correct gap is obtained - 15 thou, sliding fit. Carry out this adjustment with the fibre block resting on the camring in the position of maximum opening. Whilst carrying out this checking of the points gap, take the opportunity to lubricate the felt insert in the camring using a small quantity of suitable special oils.

(Fig. 6) (P.35)

If the points are worn replace then using only original materials. Every 5000 Km put a little oil on the cam and the ring guide of the head. Whenever the contact breaker is replaced ensure that it is seated properly. Check the points gap: they must be from 3 to 4 mm. (= 12 to 16 thou) The normal plug type is the Marelli CW 225 B. *(.. but no longer available commercially)* Check the insulator; if cracks are visible, change the plug. Set the electrodes at 0.5 mm (= 20 thou) to clean it use clean petrol. It is well not to change the type of plug fitted. Remember that many problems with the engine can be avoided with the regular use of the correct plug.

Fuel supply and exhaust

About every 2000 Km it is a good idea to clean the petrol filter and the carburettor. Remove the filter and check that it is complete *(see Fig. 7)*.

On 'lever' pattern taps, if a leak is found, lightly lap the conical surface, if necessary change the return spring. The original early Guzzi swing lever taps are effectively non-maintainable and should be replaced if faulty.

(Fig. 7) (P.37) Check that the breather hole in the petrol filler cap is not blocked.

Adjusting the carburettor

Carburettor Dell'Orto type SS 29

Carefully clean the float chamber and check that the petrol inlet to the jet is clean.

For cleaning all the holes and vents it is best to use compressed air. It is unwise to use wire, needles etc., that could alter the diameter of the holes and render adjustment of the carburettor difficult.

Normal jet sizes:

Main jet	Summer	130/100
	Winter	135/100
Idling jet		55/100

Adjustment for maximum performance and running:

This is done by using the diameter of the jet (changing it with one with a number greater or smaller) and on the position of the needle. Increasing the jet number and raising the needle enriches the mixture, the contrary happens when the jet is smaller and the needle lowered.

Too rich a mixture is indicated by black smoke from the exhaust, irregular running and firing, with the insulator of the plug dark and sooty.

Too weak a mixture causes backfiring: light coloured plug with pitted electrodes and, in extreme cases - a 'holed' piston.

Remember to enrichen the mixture when there is a drop in ambient temperature; and vice versa with a rise in temperature.

Adjustment of slow running:

This is carried with a hot engine and is done using the knurled cable adjuster, on top of the carburettor that regulates the position of the throttle valve; and using the horizontal volume control screw (placed directly next to the choke tube) that regulates the slow running. Turning this screw in enriches the mixture or vice versa.

Firstly adjust the throttle cable such that with the throttle closed the engine can still run at low revs. Screw in or out the horizontal screw to obtain the minimum revs desired.

N.B. carefully check that there is no air entering between the carburettor and pipe or between pipe and head.

Sometimes however - especially with the 'racing' type 29 mm SS carburettor - it is not always possible to obtain perfect slow running and completely clean carburation throughout the rev. range. One must accept a compromise on these occasions as one would with any similar 'racing' instrument.

Cleaning of the exhaust pipe and silencer

About every 10,000 Km, clean out the carbon deposit with wire brush and clean carefully. Remove the inner parts and check that the perforator sheet is not rusty or damaged.

Carefully clean the small exhaust holes

When re-assembling the exhaust system take care that the various pieces join perfectly to avoid escape of gas. Replace the sealing ring that sits between the exhaust port and the exhaust pipe flange.

Head and valves

About every 5,000 Km (= 3000 miles) it may be necessary to clean the combustion chamber and, if need be, re-seat the valves with light grinding-in.

To remove the head; remove the exhaust pipe, undo the two banjo bolts, which attach the oil tubes, the inlet manifold with the carburettor and loosen the nuts of the rocker box cover tube. Using the spanner provided in the tool kit, remove the four nuts on the cylinder studs (see Fig. 8) and remove the head sliding it forwards. If there is resistance carefully introduce a screwdriver between the fins of the cylinder head, levering gently and work your way around until the head separates from the cylinder. Having removed the head it is wise to check that the valves seal perfectly in their seats; to do this, pour a little paraffin in the inlet and outlet ports and check whether the liquid passes the valves. If you come across a leak it is necessary to continue dismantling of the valves in order to re-seat them with the standard lapping/grinding procedure. To dismantle the valves it is necessary to completely dismantle the cylinder head by removing the two rocker covers, the rockers themselves by removing their two bearing pins and finally the valve springs using the correct extractor before withdrawing the valves from their guides. To clean safely you should use blunt scrapers and wire brushes. For grinding in the valves it is advisable to use a paste of oil and fine grade carborundum. After re-seating it is necessary to wash the head carefully to be certain of (Fig 8 p. 41) removing every trace of carborundum abrasive. The cleaning of the upper part of the piston is done with a scraper and wire brush. If you remove the piston be careful not to move the rings on the piston itself. Remember to put a new paper gasket of circa. 0.3 mm between the cylinder and the engine base.

Adjustment of the clutch

In practical use three problems can arise:

I. The clutch snatches, that is the take-up is brusque and violent; this can be the result of overloaded springs. Remedy: loosen the knurled disc.

Worn or deformed discs: the only satisfactory remedy is to replace them.

Impurities between the discs are washed away by "purging" the clutch. To proceed, introduce a cupful of paraffin into the primary drive compartment. Access is through the plugged hole in the upper cover located in the middle of the left side of the crank case. Run the engine whilst repeatedly operating the clutch lever. Drain the resulting liquid after a few minutes, via the primary case drain plug just behind the flywheel. Repeat using fresh paraffin until the plates are 'purged' i.e. the drained paraffin is all but clean.

II. The clutch slips; which means that there is movement between the discs even when the lever is in fully engaged position. This results from the springs not being tight enough. Remedy; (after having removed the cover of the clutch springs) screw up the knurled disc and/or replace the springs (see Fig. 9).

Lack of play between the lever and the clutch rod; adjust the play to circa. 0.2 mm using the adjuster situated on the cover of the clutch cable.

(Fig. 9 p 43)

Excessive entry of oil into the clutch. Remedy: wash with petrol. A repeat of the problem should lead you to checking the state of the pressure valve and clean the duct in the crankcase that releases oil onto the chain.

III) The clutch does not disengage completely. Check the movement between the fixed clutch part and the movable, when the clutch lever is pulled fully back i.e. "completely disengaged". This causes starting difficulty and noisy gear change.

This problem can be the result of excessive play between the lever and internal pushrod, adjust the play (see above)

Excessive yielding of the sheathing of the clutch cable: remedy is to replace the cable.

Discs stuck: clean them (see above).

Adjustment of the tension of the chain

To do this adjustment it is necessary to slacken the nut on the wheel spindle on the right side and the locking nuts on the two bolts of the chain tensioners. Then working equally, to avoid uncentring the wheel, on the two tensioner bolts.

With the machine on its stand the chain should not be under excessive tightness (check that there is a play of between 25 and 30 mm (at least an inch) - at its tightest point! This is necessary because, if it were not so, there would be excessive tension when the swinging forks are at half way. After having made the adjustment to the chain it is absolutely essential to check the rear brake operation and adjust the pedal if necessary.

Adjustment of the telescopic forks (P. 45)

(See Fig. 10)

During normal use, at 1000 Km intervals (= 625 miles), it is a good idea to check the play between the sliding arms, sliding block and rollers. To do this lift the front of the machine sufficiently to allow the front wheel to revolve. Then grasp the two arms A, place the thumbs on the lower edge of the bracket B, and at the same time on on the sliding arms A, to feel play. Adjust the arms as follows: Loosen the bolt C on the guide disc D, then with a suitable spanner turn the flats of the pinion E clockwise for the right arm and the opposite for the left arm such as to bring the eccentric of the adjuster into a position that completely removes play In this situation the arm A cannot slide between the roller and slider. Rotate then the opposite way the flats of the pinion E, so as to move the disc D 3 or 4 mm. Measured on the edge of the disc. To do this it is necessary to mark the disc D and the cover of the bracket F before making the change.

On completing the adjustment tighten the bolt C on the disc D, and check, as mentioned above and as is shown in Fig.10, that there is minimal play between arms, slider and rollers, but not so much as to impede movement.

(Fig.10) (P.46)

It is absolutely necessary to keep the arms well adjusted, if not play will wear arms, sliders and rollers making every further adjustment difficult and unsatisfactory functioning.

Adjusting the steering head

If the steering has play the ball bearings and especially the races will be subject to damage. To adjust: loosen the clamp on the steering head then turn the locknut on the steering column under the steering damper knob of the head (see Fig. 11) enough to remove the play whilst maintaining free movement of the forks.
After adjustment remember to relock the clamp.

Adjustment of the forks

To adjust the swinging forks you must remove the exhaust pipe and slacken the two nuts. Then turn the pinion enough (to the right to loosen, to the left to tighten) using its squared end. (On the right). After adjustment tighten the nuts (see Fig. 12).

The springs come already correctly set up by the factory. It is therefore unwise to alter them. When you want to remove the spring set-up for cleaning, greasing or whatever, take careful note of the positions of the parts (see Fig.13) to ensure proper replacement. Don't forget the "Ferodo" washers (Fig 11) (P.48). When refitting the springs they must be compressed exactly equally on both sides, using the two coupled nuts (leave the machine on the stand, so as to keep the wheel raised) to about 23 mm. compared to their unloaded position

(Fig. 12) (P. 49)

(Fig. 13) (P. 50)

(Fig. 14) (P. 51)

Adjusting the brakes (P. 52)

To ensure good brake operation it is necessary that there is play (measured at the end of the pedal for the rear brake, and at the end of the handlebar lever for the front brake) of about 10-15 mm before the brake shoe linings make contact with the drums.

This play is regulated using the adjuster to be found on the brake plate on the right side of the forks for the front brake (see Fig.14), and using the wing nut on the brake-rod for the rear brake.

Adjustment of the front hub

The front hub, being provided with conical roller bearings is adjustable. Remove the dust cover on the left of the machine, take up the play by loosening the locknut, and tightening the nut adjust correctly, then tighten the locknut (*see Fig.15*) A little lateral play (rim shake) of about 0.01mm. must be present after tightening the lock nut; so one may be certain that that the rollers of the bearings are not under pressure causing resistance to rolling and rapid wear of the parts.

Removing the front wheel

Detach the brake cable from the lever, removing the pivot, the clevis pin and the adjustment bolt.

Remove the four bolts, the lower part of the left clamp and the wheel (*see Fig.16*)

(**Fig.15**) (P.53)

(**Fig.16**) (P.54)

(**Fig.17**) (P.55)

Removing the rear wheel (P.56)

To remove the rear wheel it is necessary to remove the tie rod of the brake lever.

Undo the nut on the right side (*see Fig.17*) and withdraw the spindle from the left side, then remove the wheel.

Checking the shock absorber liquid in the telescopic forks

(*see Fig.18*) (P.57)

Should there be abnormal functioning of the forks check first that the cause is not due to poor adjustment of the stanchions and sliders. After about 10,000 Km, (= 6250 miles) it is a good idea to check the level of the fork oil as follows. Undo the nut A and the upper cap B from the fork arm, remove the washer combined with the supplementary spring C and loosen the internal cap D using the special box spanner. Withdraw the body of the shock absorber and, slowly, having drained the liquid from inside the arm F remove completely the body E. Check the height of the liquid, which must be 26-28 cm. (= 10 to 11 inches) from the bottom of the inside of the sliding arms F. If necessary add liquid by introducing it into the sliding arms. It is a good idea to use a piece of tubing to ensure that the liquid does not enter between the sliding arm and the inside of the tube G. It is recommended that you use Shell Donax A1.

(**Fig. 18**) (P.57)

ELECTRICS

Dynamo

Every 3,000 Km or so (= 1875 miles) check the brushes. These must slide freely in their holders. If they are dirty, clean them, and if worn, replace them. The commutator: if blackened clean it with petrol (never use paraffin for this purpose). It is unwise to use emery paper even if it is very fine. Fine glass/sand paper is permitted followed by thorough cleaning.

The ball races require greasing only at very long intervals. Take them apart and fill the bearings with special mineral grease.

The setting of the automatic voltage regulator is done on a test bench; it is unwise to change it.

Battery

To gain access to the battery carry out the following:

Remove the two small bolts that hold the sprung saddle and turn it over, undo the bolts that hold the clamp of the battery and remove the cover.

To maintain and preserve the battery the following rules should be observed :

Periodically check the level of the electrolyte, adding distilled water so that the top edges of the plates are completely covered. Such checking should be done with greater frequency in the summer months (about every 30 days); whilst about every 60 days in the winter will suffice.

It is advisable to keep the top of the battery dry and clean.

Apply Vaseline to the threaded parts of the terminals.

The battery is low if, when not under load, the voltage is less than 5.4V.

Recharge at about 1.2A.

Wiring

Check the external appearance especially at those places where shorting could occur between metal and cable. Replace cables and connectors which are chafed, cracked or deteriorated in any way.

Headlamp

It is waterproof so an internal inspection is superfluous. Remember that the mirror surface of the reflector should not be cleaned because it scratches easily and loses reflectivity. The focus is fixed at the filament of the bulb. Use bulbs of the same size and power as that provided.

Horn button and dipswitch

The button and dipswitch do not require any adjustment being electrical contacts.

Electric warning system

With the horn it can happen that, either by the settling of some part or by wear of others, the sound has become enfeebled over time.

This makes adjustment necessary. After having ascertained that the battery is fully charged with a screwdriver turn the horn back and regulate the sound by adjusting the screw with the round head. This screw has knurled cone under the head, you can hear the clicking of the teeth. Remove the screwdriver, and the chosen position will remain where the sound was the best.

General maintenance

For good maintenance follow the general rules listed hereunder : -

Cleaning the motorcycle:

For cleaning metalwork it is advisable to use paraffin or some proprietary cleaning agent such as Gunk. Apply with a brush using several applications if required and wash with mild detergent to neutralise, followed by clean water and then dry with a clean lint-free cloth.

To clean painted parts spattered with dried mud it is necessary, so as to avoid deterioration of the paintwork, to wet it well with a sponge laden with water. Then wash with a jet of water to remove every trace of mud before drying with a chamois leather. To maintain a shine on the paintwork polish lightly with a cotton pad impregnated with a suitable polish.

Remember that petrol spills will eventually damage paintwork rendering it dull and causing it to deteriorate rapidly.

Retouching the paintwork:

The following are sprayed with nitro-cellulose and air-dried: mudguards, oil and petrol tanks, chain-guard, and toolbox.

The following are sprayed with enamel and baked: telescopic forks, frame, rear forks, pedal, brakes and flywheel.

When treating small sections, as a general rule, it is usually worth doing the whole part. After having completely cleaned the surface to be treated spray on an anti-rust paint that is dried in an oven at 90-100° for about 3 hours.

After this first general procedure and prior to the two abovementioned systems, proceed to fill and rub down the part to obtain a perfect surface for painting.

If the part is spray baked give it a first coat (opaque) and let it dry in a oven for 2 hours at 90-100°. Then spray on the first coat of varnish and let it dry for about 3 hours at 60-70°. Then apply the second, and final, coat drying it for about 3 hours at 60-70°.

If the part is sprayed with nitro-cellulose, after the application of the anti-rust paint, proceed to the filling and flatting, then spray on an isolator and leave to air dry for about 2 hours. Proceed then to spray the nitro-cellulose, allowing about 2 hours air-drying between each coat. It is recommended that you apply three coats of varnish for the best finish followed by polishing with a cotton pad impregnated with a suitable compound.

Decals:

The Eagle decals and the words "Moto Guzzi" are applied to the tank and to the mudguards with the particular varnish (flatting). After about an hour remove the paper with a damp sponge and remove the traces of varnish with white spirit and then wash with clean water.

Periodic maintenance

Every 1000 Km (= 625 miles) lubricate, using a grease pump, the joints of the swinging forks and the telescopic forks. Grease the cap of the clutch push rod and the hardened thrust screw in the clutch release arm. Clean and oil the chain. Adjust the telescopic forks.

Every 2000 Km (=1350 miles) Change the engine oil and clean both gauze filters. Check valve clearances by adjusting the play between rockers and push rods to "zero". Clean the carburettor and petrol line gauze filter.

Every 3000 Km (= 1875 miles) Clean the dynamo brushes.

Every 5000 Km (= 3125 miles). Decarbonise the cylinder head and re-seat the valves. Oil the cam surface and ring guide of the magneto head.

Every 10,000 Km (= 6250 miles) Adjust the brakes, clutch and hubs. Clean the exhaust pipe and silencer. Check the level of liquid in the telescopic forks.

CONCESSIONAIRES

DETAILS OF CONCESSIONAIRES AND AGENTS ARE OMITTED FROM THIS TRANSLATION BECAUSE THE ORIGINAL LIST WAS VERY LENGTHY, CERTAINLY WELL OUT OF DATE AND THEREFORE JUDGED TO BE OF LIMITED INTEREST TO OWNERS & RIDERS IN 2002.