MGS-01 CORSA

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0 FOREWORD

NOTE *The content of this Manual is not binding and GUZZI reserves the right to make alterations, if and when required, of components, accessories, tooling, etc. which are deemed suitable for the purpose of improvement or for any technical - commercial requirement, or in order to comply with law provisions in the different countries, without however undertaking to promptly update this Manual.*

- The purpose of this manual is to give the necessary instructions to rationally carry out the overhaul and repair operations.
- The mentioned data are specified to give overall knowledge of the main inspections to be carried out while overhauling the various assemblies.
- For this reason, the manual contains pictures, drawings and diagrams, necessary for the operations of removal, inspection and installation.
- The manual is also a guide for the people who want to know the parts of the vehicle under exam: knowing these parts is an essential feature for doing a good repair job.

NOTE *The following information should be intended as variant to the Workshop manual - engine - for version V10 Centauro.*

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2 GENERAL FEATURES

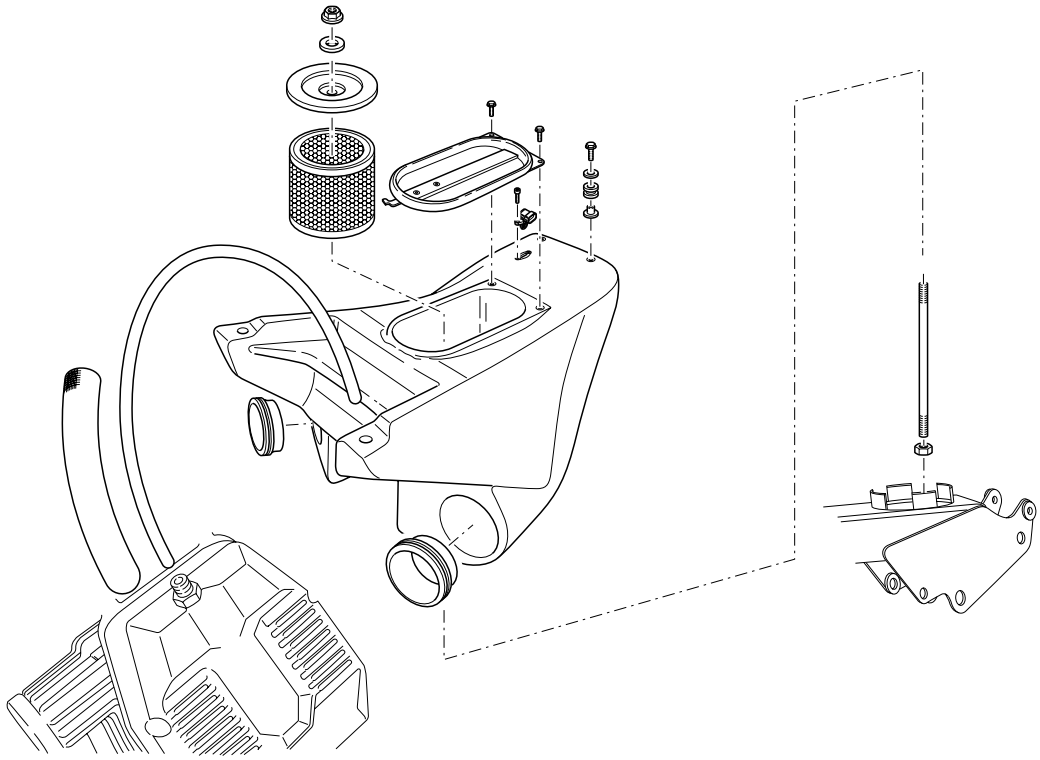
ENGINE	
Bore	100 [mm]
Stroke	78 [mm]
Total displacement	1225 [cu. cm]
Compression ratio	11.6 : 1
Maximum torque	112 [Nm] (11.4 [Kgm]) at 6400 [rpm]
Maximum power	90.2 [Kw] (122.7 [HP]) at 8000 [rpm]
TIMING SYSTEM	
Overhead camshaft and 4 valves per cylinder. Primary control with duplex chain, automatic tensioner and toothed belt. For the primary chain installation and setting data, see version V11. Timing system data (referred to tappet lift of 1 [mm]) are the following:	
Intake	
opens at	36° before TDC
closes at	69° 30' after BDC.
Exhaust	
opens at	64° before BDC
closes at	38° after TDC.
Operating clearance with cold engine	
intake valve	0.10 [mm]
exhaust valve	0.15 [mm]
LUBRICATION	
There is no thermostatic valve.	
GENERATOR	
See model V11	
TRANSMISSION	
Primary transmission	With gears, ratio 1:1.55 (Z=20/31)
Ignition	Spark plug: Champion RA59GC
Gearbox	The following information should be intended as variant to the Workshop manual - gearbox - for version V11 With six speeds, with constant mesh gears and front clutch dogs. Integrated cush drive damper. Control through a pedal on vehicle left side.
Final transmission	The following information should be intended as variant to the Workshop manual - rear transmission shaft and box - for version V11.
Total ratios (engine wheel)	
1st gear	1:10.821 (Z=15/36)
2nd	1:8.017 (Z=18/32)
3rd	1:6.150 (Z=22/30)
4th	1:5.009 (Z=27/30)
5th	1:4.355 (Z=29/28)
6th	1:3.841 (Z=27/23)
PERFORMANCE	
Maximum speed	255 [km/h]
TOP-UPS	
Engine sump	
Oil type:	AGIP Racing 4T 5W40
Quantity:	3.5 [l] check level
Gearbox	
Oil type:	AGIP Rotra MPS 85W90
Quantity:	0.85 [l] check level
Bevel gears	
Oil type:	AGIP Rotra Truck Gear 85W140
Quantity:	0.37 [l] check level

5 MAINTENANCE AND SETTINGS

5.7.1 CHANGING THE AIR FILTER

Diagrams 05-12 and 05-13 are no longer valid.

See update



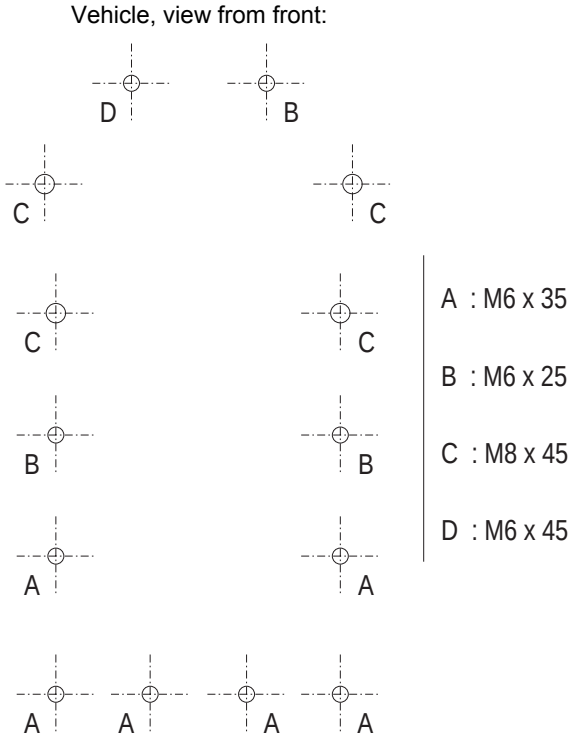
7 TIGHTENING TORQUE SETTINGS

Description	Q.ty	Measurement	Torque Nm	Note
ENGINE				
Nuts for head-cylinder linkages, thread lubricated with SAE 85W90 oil		M10	32-35	
Nut for support securing stud bolt		M8	28-32	
Spark plugs				
Drilled screws securing the head oil delivery hoses		M10x1.25	18-20	
Head temperature sensor box		M10x1.25	12-15	(Loctite 648)
Head temperature sensor		M12x1.25	12-15	(Loctite 243)
Screw securing crankshaft flanges		M8	25-28	(Loctite 243)
Bolt securing con-rod cap, thread lubricated with SAE 85W90		5/16 UNF	57-62	
Screws securing flywheel/crankshaft		M8	42-45	(Loctite 243)
Screws securing flywheel crown		M6	18-20	(Loctite 243)
Nut securing crankshaft sprocket		M25x1.5	120-125	
Generator locking nut		M16x1.5	60-65	
Nut securing shaft pulleys		M16x1.5	115-120	(Loctite 243)
Nut securing camshafts pulleys		M14x1.5	70-75	(Loctite 243)
Nut securing oil pump gear		M8x1	22-25	(Loctite 243)
Oil pressure regulating valve		M14x1.5	65-70	(Loctite 648)
Cam housing bushing screw		M6	12-15	(Loctite 243)
Screws securing intake manifold lugs		M6	12-15	(Loctite 243)
Crank pin plug on crankshaft		M24x1.5	20-22	(Loctite 648)
Breather fitting from timing chain area		M22x1	30-35	(Loctite 243)
Breather nozzle from heads		M10x1	10-12	(Loctite 243)
Nut securing piston coolant nozzles		M10x1	10-13	(Loctite 243)
Double screw securing oil nozzle hoses		M10x1	10-12	
Oil filter			15-20	
Oil filter plug			40-45	
Stud bolts tightening				
Cylinder/head stud bolts on crankcase		M10	32-35	
Crankcase/gearbox stud bolts		M8	28-30	
Support/head stud bolts		M8	28-30	
Stud bolts securing exhaust to head		M8	28-30	(Loctite 648)
Gearbox				
Primary shaft ring nut on clutch side		M25x1.5	100-105	(Loctite 648)
Primary shaft ring nut on cardan joint side		M20x1	75-80	(Loctite 648)
Gearbox secondary shaft nut		M17x1	90-95	(Loctite 648 on spline and thread + riveting)
Lower setting bushing (snug only)		M20x1.5	10	
Setting bushing locking ring nut		M20x1.5	50-55	
Screw securing linkage under gearbox		M10	50-55	
Bevel gears				
Nut securing sprocket to bevel bearing			190-195	
Fastening screws for cardan joint to transmission shaft		M8	40-45	

11 ENGINE UNIT

11.2 REFITTING THE ENGINE

- Diagram 11-32 page 78: holes **D** and **E** are no longer there; alignment should be obtained by matching oil delivery holes to the main bearings.
- Diagram 11-34 page 79: is no longer valid; following is the updated version.



11.3 CAM TIMING

Condition

- Engine assembled up to the buckets (no rocker arms).
- Camshaft driving pulleys free to turn on the shaft.

Reference position:

Conventions:
- Right and left cylinder, with engine set in the riding direction
- Crankshaft rotating counter clockwise, looking to the clutch
- Camshaft rotating in the opposite direction with respect to crankshaft
- Timing to be performed with no rocker arms; the indicated movements are to be meant as measured on the buckets, preloaded with their load

Left cylinder:
1LH) Left cylinder at TDC
2LH) Left camshaft in position with valves closed
3LH) Lay shaft with "notch" facing the timing sensor. This notch was made on the facing of the lay shaft threaded end.
4LH) Turn the crankshaft by 69°30’ in the direction opposite to operating direction of rotation.
5LH) Turn the camshaft in the operating direction of rotation up to the intake closing position, then turn in the opposite direction until reaching a lift of 1 [mm].
6LH) Insert the nonius to measure pulley / cam coupling without moving the positions set for crankshaft and camshaft.

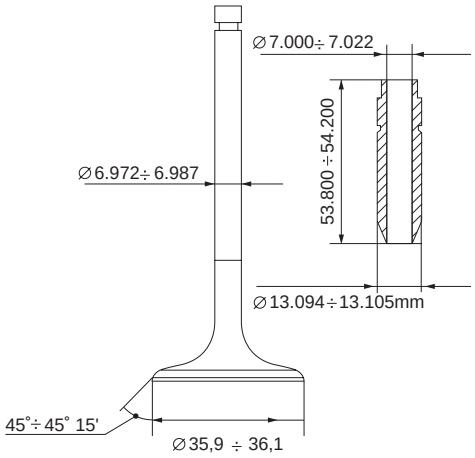
Right cylinder:
1RH) From position 1S) turn the crankshaft by 270°, in the operating direction of rotation, thus taking the right piston to TDC.
2RH) Right camshaft in position with valves closed
3RH) Turn the crankshaft by 69°30' in the direction opposite to operating direction of rotation.
4RH) Turn the camshaft in the operating direction of rotation up to the intake closing position, then turn in the opposite direction until reaching a lift of 1 [mm].
5RH) Insert the nonius to measure pulley / cam coupling without moving the positions set for crankshaft and camshaft.

11.4 INSPECTIONS

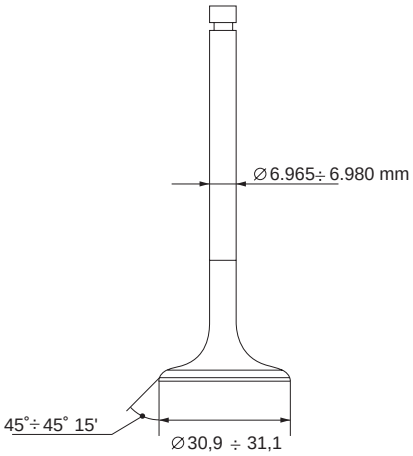
Heads

Diagram 11-63 is to be updated as follows:

Intake



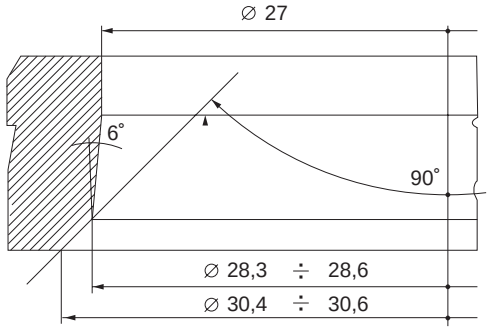
Exhaust



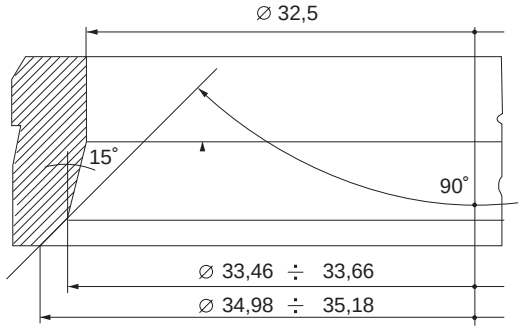
Valve seats

Diagram 11-64 is to be updated as follows:

Detail of exhaust valve seat



Detail of exhaust valve seat

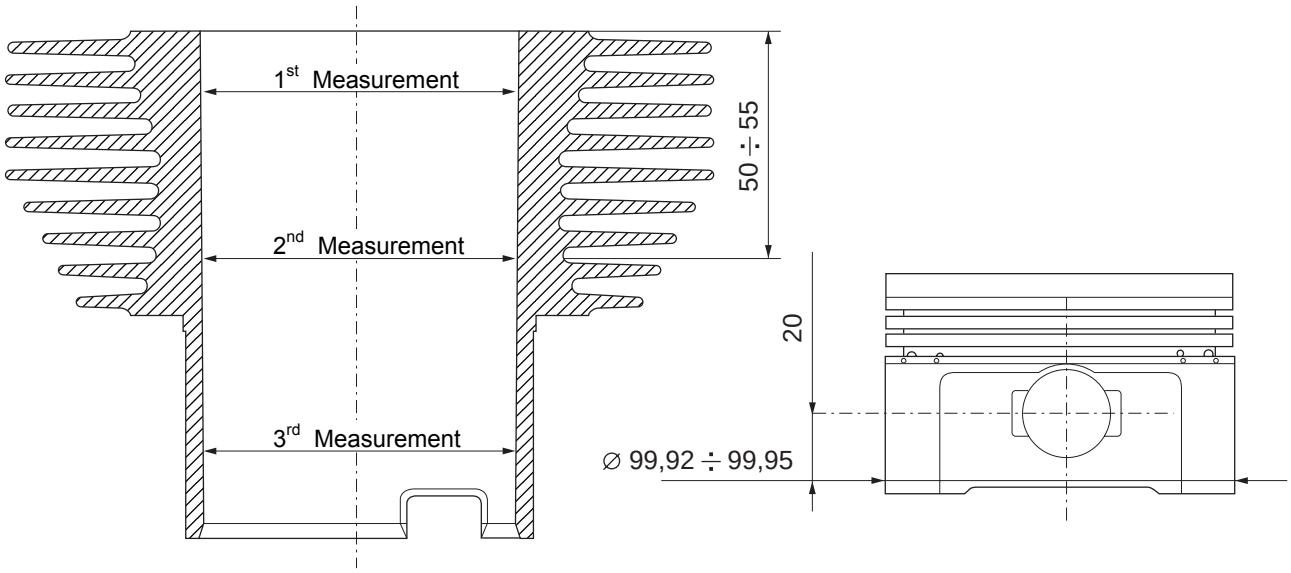


Timing data

- The timing diagram 11-67 on page 89 is no longer valid, please refer to timing values specified in chapter 2.

Checking cylinder wear

The diagram for cylinders / pistons inspection, i.e. 11-77, is to be updated as follows:



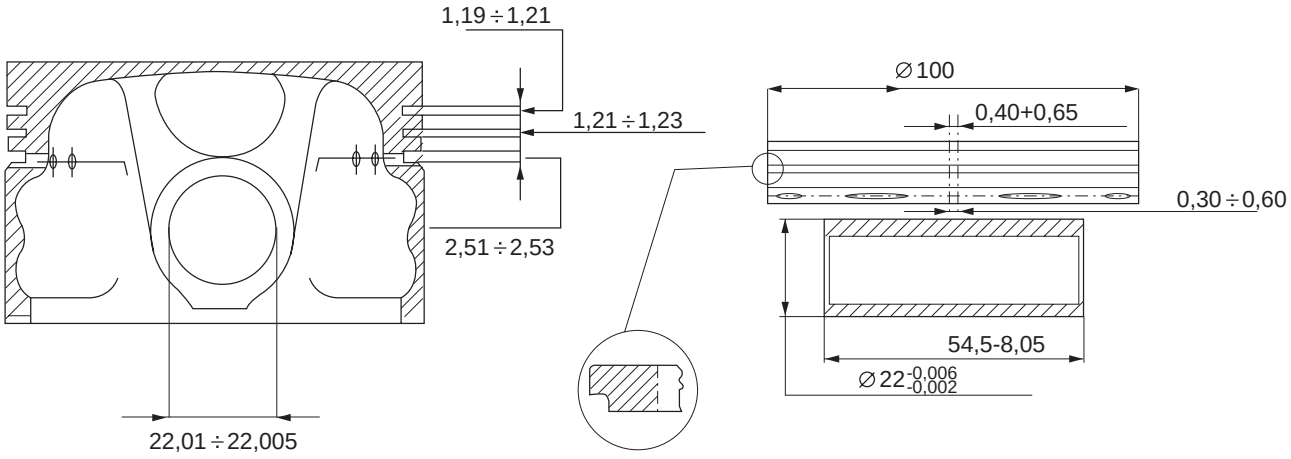
- There is no class division.
- The cylinder dimensions should be between:

2nd Measurement	DN = 100 – 100.02
1st Measurement	DN 0 / -0.01
3rd Measurement	DN + 0.01 / 0

- Clearance measured at the 2nd measurement, should be between 0.056 / 0.085.

Pistons

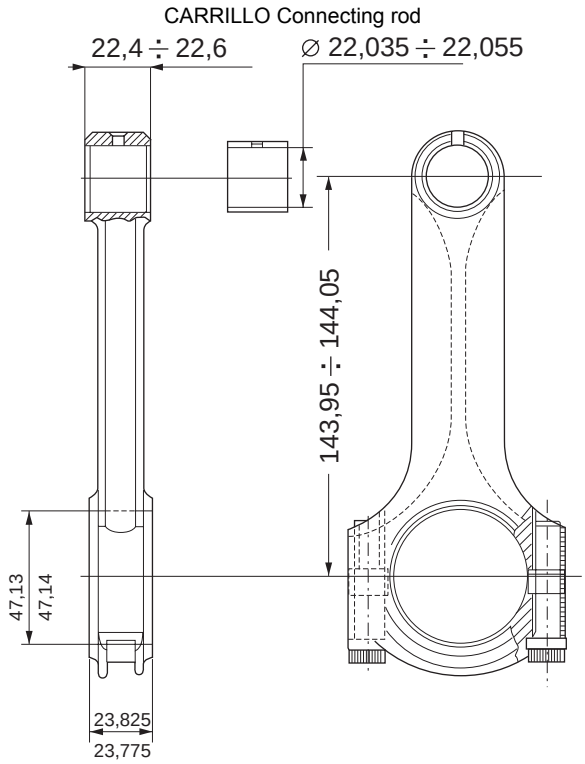
Diagram 11-78 is to be updated as follows:



- The piston is to be installed with the "small" valve pockets on the exhaust side

Connecting rods

Diagram 11-80 is to be updated as follows:



- Diagram 11-80/A: the value 47.13 – 47.14 for bearing bore is no longer valid.
- Con-rod bearings thickness: no bearing with oversized thickness is available.
- Crank pin diameter: only the standard size is available.

Values for gudgeon pin and bushing clearance:

Installed bushing inside diameter:	22.035-22.055 [mm]
Gudgeon pin diameter	21.994-21.998 [mm]
Clearance	0.037- 0.061 [mm]

- Assembling the connecting rods to the crankshaft: tightening to 8.5-9.3 [kgm] is no longer valid; see Torque figure table.

Crankshaft

- No undersizes are available.
- Checking the weight for crankshaft balancing: no checks for balancing are scheduled outside the parent company.

Thermostatic valve

- Diagram 11-89 page 98 is no longer valid; no thermostat is to be installed.

A pressure reducing valve is installed, opening at 5.5 [bar].

Diagram 11-94 is to be updated as follows:

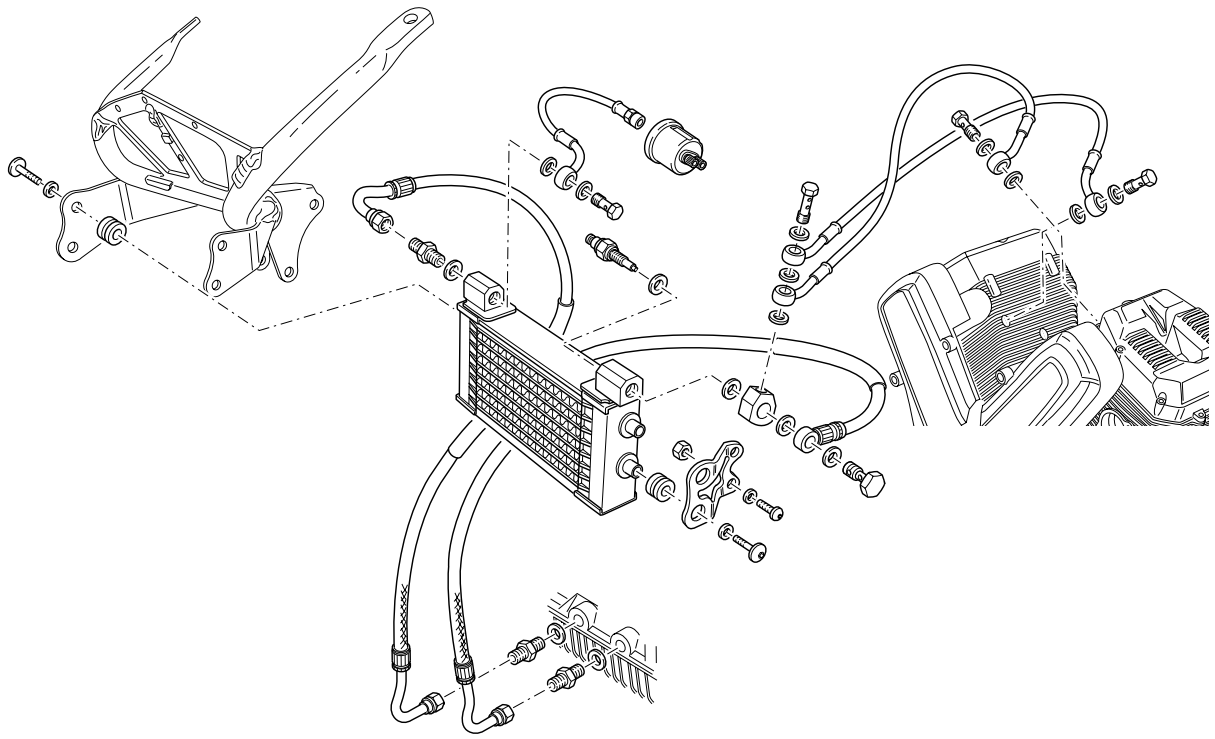
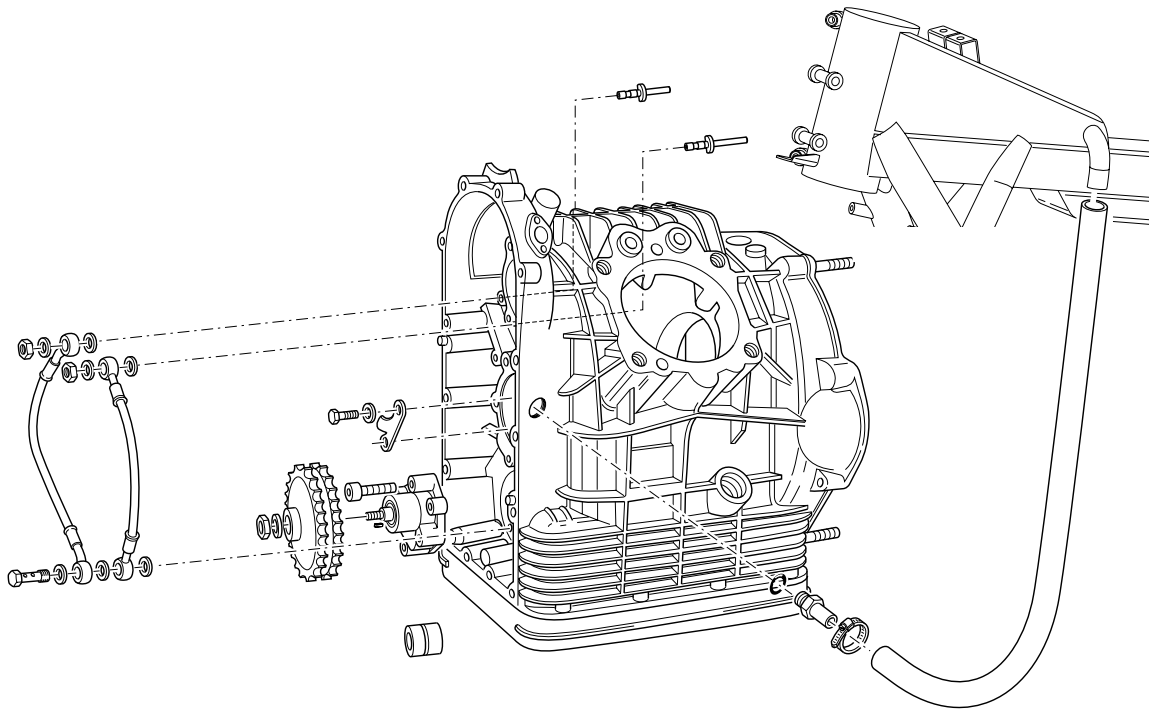


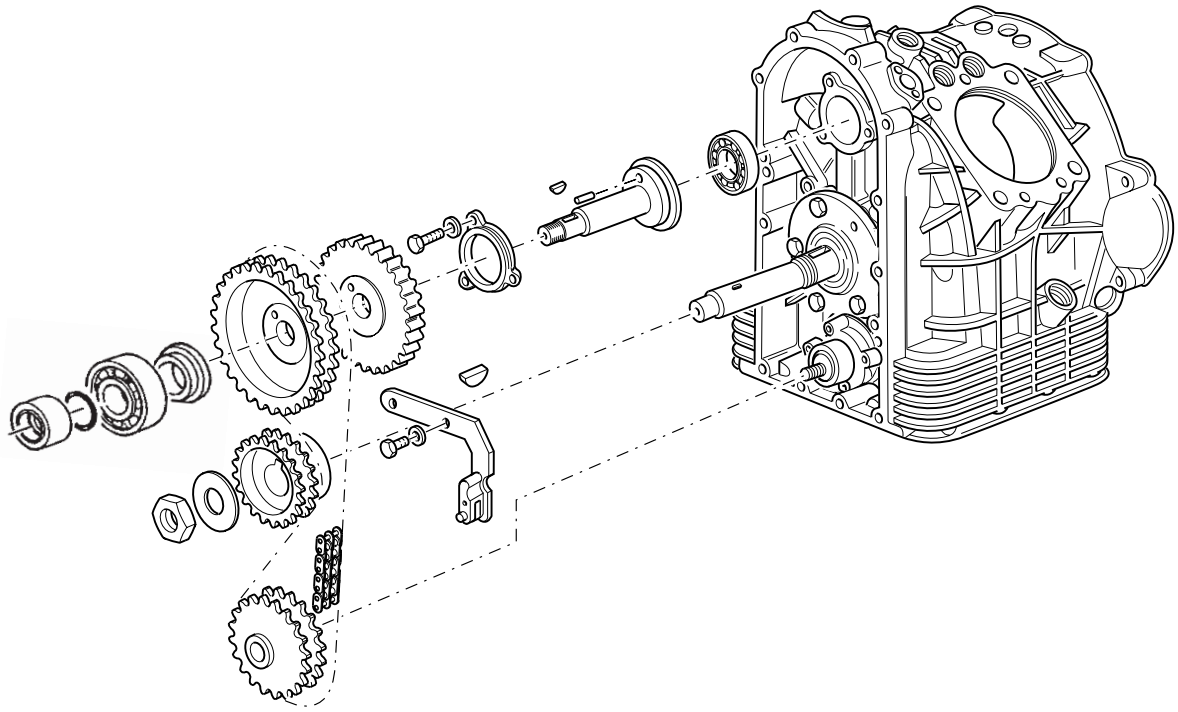
Diagram of the blow-by and piston cooling circuit



The sump layout is the same as the Centauro one

Timing system

- Table 4: Update of the primary timing as in Breva 1100 version.



12 INJECTION – IGNITION SYSTEM

12.1 INTAKE AIR CIRCUIT

- The absolute pressure sensor is integrated in the control unit.
- The "N.B" indication for the air temperature sensor position is no longer valid.
- The air temperature sensor is positioned in the filter box.
- Starting stage: no mixture enrichment is set depending on oil temperature, only depending on head temperature.

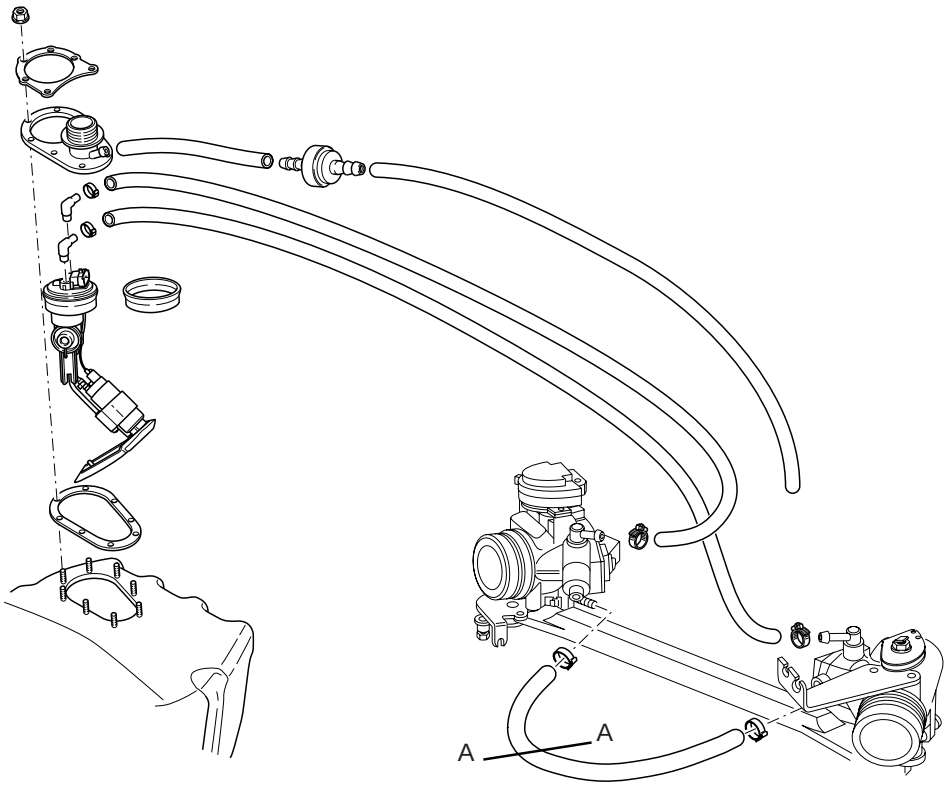
12.3 FUEL CIRCUIT

Fuel electric pump

- Feeding pressure 4 + - 0.2 [bar] , measured at AA

Fuel filter

- Integrated in the module inside the tank.

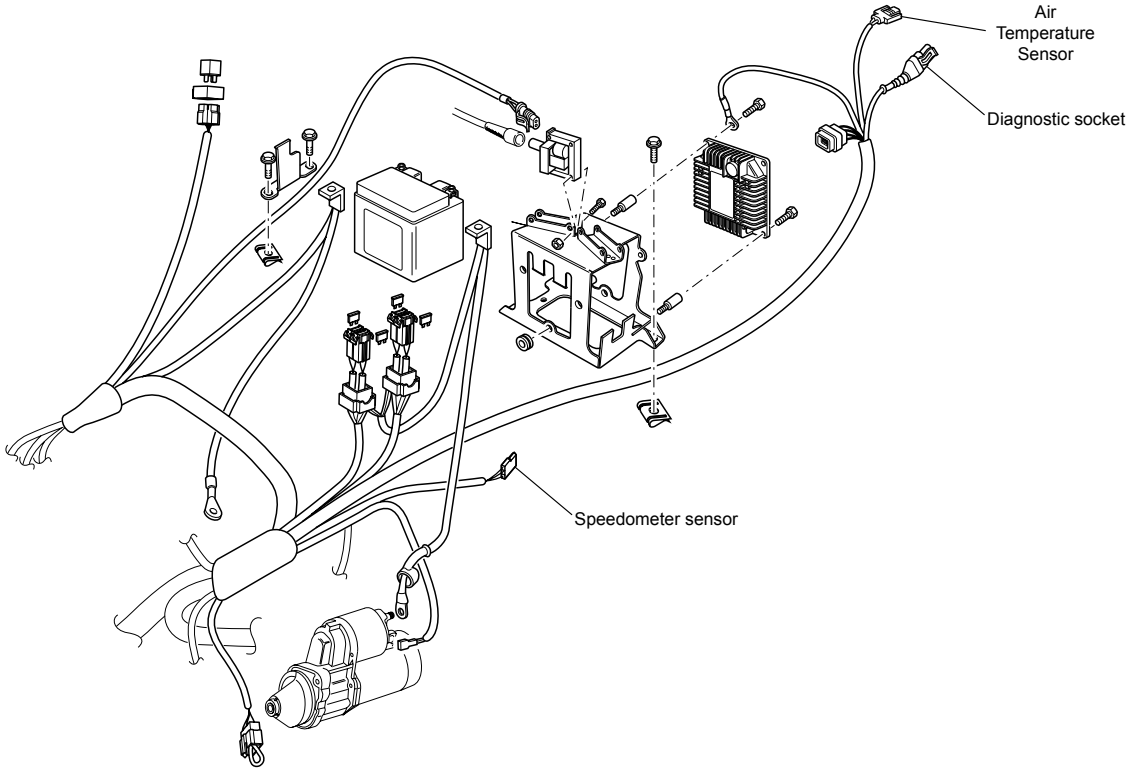


12.4 AIR CIRCUIT

- Diagram 12-04 is no longer valid. See air filter change diagram

12.5 ELECTRIC CIRCUIT

- Diagram 12-05 is no longer valid.



Electronic control unit I.A.W. 16M

- Superseded by **I.A.W. 15M**

12.6 CALIBRATION STANDARDS FOR CHECKING AND SETTING CARBURETION

Setting

- Vehicle off - key ON.
- Connect the diagnosis tester “Axone” to diagnostic socket and vacuum gauge.
- Remove the right throttle body rod.
- Using the throttle adjuster dowel, set throttle position sensor -on right throttle body- to 2.9°/3°.

NOTE *Turn the key to off before disconnecting the throttle position sensor.*

- Start the engine and take engine temperature at least to 50° (engine temperature is the temperature reading taken with “Axone”)

- Completely close the by-pass screws
- Connect the throttle body rod, check that the throttle body on TPS side is fully home, then ensure -not at idle speed (2000/3000 RPM)- that vacuum is balanced in the two cylinders. In case of unbalance, work the wing nut of the linkage to balance the two throttle bodies.

NOTE *Disconnect the vacuum gauge.*

NOTE *From this step on, the engine temperature should be between 70° and 80° (in any case, let the engine run for at least 3 minutes before checking the CO)*

- Using the by-pass screws, set idle speed at 1450 +/-50 rpm.

NOTE *After this procedure, if idle speed does not fall within recommended range, check the throttle position sensor by inserting the suitable cable connected to the digital tester and closing the throttle completely on the duct (throttle angle: 0°). The tester reading should be 150 mV +/-15 mV; if not, reposition the throttle sensor until reading 150 mV and report the problem to the quality manager.*

- Using the control unit trimmer, set the CO to 4% +/-0.5.

NOTE *The Trimmer value can be set to any value as far as it allows you to reach the desired CO level.*

- Check that the CO of the right cylinder is at the same level as in the left cylinder (+/- 0.2); if not, take the CO value within the specified range using the right By-pass screw.

Setting summary sheet

Throttle position at idle speed	2.9° /3° (+/- 0.1)
By-pass setting	Balance the two cylinders, approx. 1 turn (the value can be different on any motorcycle)
Nominal rpm at idle speed	1450 tolerance +/-50rpm with vehicle warm at least at 80°C
CO value at exhaust	4% tolerance +/-0.5

NOTE *Finally balance the CO level in both cylinders using the by-pass screws.*

12.11 FUNCTION OF THE "CHECK LAMP" FOR FAULT DIAGNOSIS

- Not set.

12.12 CONTROL UNIT RESET PROCEDURE

- Functions 12.11 and 12.12 are realised through the same procedures specified for the V11 Sport version.
- The manual concerning the tool that can communicate with the control unit is available on www.servicemoto.it

12.13 SPARK PLUGS

- Spark plug Champion RA59GC

12.14 FUEL VAPOUR RECYCLING SYSTEM

- No vapour recycling system is foreseen.

13 CLUTCH

Clutch springs

- A 1 [mm] shim is to be installed under each spring, on crankshaft side.

14 GEARBOX

- See model V11

15 REAR TRANSMISSION SHAFT AND BOX

- See model V11

21 BATTERY

21.1 BATTERY

The battery's voltage is 12 V with a capacity of 13 Ah; it is charged by the generator.
The battery used on the motorbike is a sealed type battery (without maintenance) which does not require any checks.

Charging instructions

NOTE *It contains toxic substances (Pb and H2 SO4); extremely high currents, avoid short circuits; do not recharge in the sealed container; using different battery chargers will cause irreparable damage to the battery.*

General notes

Charging pure-tin sealed accumulators, just as other re-chargable accumulators, is a matter of saving the energy supplied during discharge. As this process is in some ways inefficient, it is necessary to bring back to the accumulator from 105% to 110% of the amperes-hour supplied during discharge. The quality of the power necessary to completely recharge the battery depends on the flatness of the accumulator, on the method, recharging time and temperature.

It is important that the battery is capable of supplying all or nearly all of its capacity before receiving the required over-charging. However, to obtain an optimal duration in terms of cycle numbers, the battery must periodically receive the required over-charging.

Charging can be carried out in different ways.
The aim is to convey current through the battery in the direction opposite to the discharge. Constant voltage charging is the standard method used to charge lead acid typeaccumulators.

Constant voltage charging:
The voltage charging method is the most efficient for charging sealed lead- acid pure-tin accumulators.
Using
this charging method, it is not necessary to limit the maximum current supplied by the charger. The voltage must however be adjusted so that it is within the values prescribed below. This feature is due to the internal resistance of the battery. It is extremely low and features a high recombination efficiency during charging. We recommend to observe the following values for constant voltage charging:

Cyclic use:
- from 14.7V to 15.0V for battery at 25°C. No current limit requested.

Buffer use:
- from 13.50V to 13.80V for battery at 25°C. No current limit requested.

Removal:
- Remove the fairings;
- Release the locking belt;
- Disconnect the negative terminal, then the positive one by unscrewing the nuts;
- Remove the battery from the motorbike.

NOTE *Always disconnect the negative terminal first then the positive one.*

NOTE *The negative terminal is black, while the positive one is red.*

Refitting:
- Apply protective spray for electrical contacts on the battery terminals;
- Insert the battery in its seat on the motorbike;
- Connect the positive terminal then the negative one;
- Hook the locking belt once again.
- Refit the fairings.

PROCEDURE FOR ROAD RUNNING-IN

Correct engine running-in is essential to ensuring proper performance and durability.

Follow these recommendations:

- Warm up engine oil over 50°C (the instrument panel alarm goes off)
- Vary speed frequently during the running-in period.
- First step: run 20 Km, engine at max. 5000 rpm, throttle max. at 40%
- After about 5 / 6 Km stop for an overall check for possible leaks or loose parts
- Second step: during the next 30 Km, never exceed 6000 rpm with throttle maximum at 50%
- For another 30 Km, take the engine up to 7000 rpm with throttle maximum at 80%
- While it is important to put some stress on engine components during running-in, it is equally important to avoid extreme load conditions.

 **It is possible to obtain the best performance from your engine only after the first 100 Km, i.e. at the end of running-in.**

NOTE *At this point, it is a good rule to change the engine oil and the gearbox fluid and perform an overall check of the correct tightening of the vehicle nuts and bolts.*

NOTE *The table containing the mileage intervals for service coupons is to be considered after running-in*

SCHEDULED MAINTENANCE

Legend:

R Check parts and change if they no longer meet the specifications
C Change

Operations that do not require removal of main engine parts
Maintenance operations that do not require removal from vehicle
Maintenance operations requiring removal from vehicle

	Pre delivery	After	Intervention	Every	Intervention	Every	Change	Notes
Engine								
Nuts and bolts tightening	R							
Spark plugs		2000	C			2000	C	
Throttle body	R	1000	R	2000	R			
Throttle body (synchronisation)		1000	R	2000	R			
Air filter		2000	C			2000	C	
Oil filter		4000	C			4000	C	
Engine oil	R	4000	C			4000	C	
Fuel filter		4000	C			4000	C	
Valve clearance		1000	R	2000	R			
Spark plug cables		2000	R	2000	R	6000	C	
Valve seats		4000	R	4000	R	12000	C	"R" lap upon each inspection
Valve guides		4000	R	4000	R	12000	C	"R" dimensional check
Head structural analysis		8000	R	4000	R			"R" part must be free from cracks
Camshafts		4000	R	4000	R			"R" visual and dimensional inspection
Retainers		4000	R	4000	R	6000	C	"R" visual and dimensional inspection
Intake valves and collets		2000	C			2000	C	
Exhaust valves and collets		2000	C			2000	C	
Valve seals		2000	C			2000	C	
Valve springs		4000	C			4000	C	
Valve to shim clearance adjusting screws		2000	C			2000	C	
Timing belt		1000	R	1000	R	4000	C	"R" belt tension check and visual inspection
Belt tensioner bearings		4000	C			4000	C	"R" check for proper operation
Valve timing		4000	R	4000	R			"R" restore correct timing
Complete piston		1000	C			1000	C	
Cilinder		3000	C			3000	C	
Cylinder stud bolt nuts		2000	C			2000	C	
Head gaskets		2000	C			2000	C	
Oil pump		6000	R	6000	R	18000	C	"R" visual inspection of aluminium pump body
Oil press. valve		18000	C			18000	C	
Exhaust pipe		4000	R	2000	R	8000	C	"R" visual inspection for structural damage
Silencer		2000	R			4000	C	"R" change sound-deadening material
Timing chain		4000	C			4000	C	
Crankshaft		4000	R	4000	R			"R" visual inspection of shafts and shims for wear and analysis with crack detector
Connecting rods		4000	R	4000	R			"R" visual and dimensional inspection of piston pin bearing and connecting rod bearings; bearing parallelism; crack detector
Connecting rod bearings		4000	C			4000	C	
Crankshaft rotary seals		4000	C			4000	C	
Crankcase		12000	R	4000	R			"R" part must be free from cracks
Crankshaft bearings		12000	R	4000	R			"R" visual and dimensional inspection of bearings
Timing cover		12000	R	4000	R			"R" part must be free from cracks
Clutch								
System fluid	R	6000	C			6000	C	
Clutch pushrod		6000	R	6000	R			"R" check for wear
Clutch plates		2000	R	2000	R	3000	C	"R" check thickness
Gearbox								
Fluid	R	3000	C			3000	C	
Primary transmission		4000	R	4000	R			"R" check teeth for wear and Wildaber test
Gears		4000	R	4000	R			"R" check teeth for wear and Wildaber test
Bearings		4000	R	4000	R	8000	C	"R" check for proper operation
Secondary shaft nuts		2000	R	2000	R	4000	C	"R" check nuts angle position
Transmission								
Crosses		4000	R	4000	R	8000	C	"R" check clearance and smooth movement
Complete transmission shaft		8000	C			8000	C	
Bevel gears								
Bevel gears oil	R	3000	C			3000	C	
Gears		4000	R	4000	R			"R" check teeth for wear
Bearings		4000	R	4000	R	8000	C	"R" check for proper operation