IAME

The heart of kart

Parilla

REEDSTER 125cc

F1 - F2 - F3 - F4 Versions

ASSEMBLY INSTRUCTIONS
&
USER MANUAL

I N D E X

Section 1 - DESCRIPTION OF THE “Parilla REEDSTER 125cc”ENGINE

1.1 MAIN FEATURES

The “Parilla Reedster” engine is the result of the decennial racing experience of IAME and it contains many technological and construction innovations which enable the engine to achieve both high performance and guarantee excellent reliability and endurance characteristics.
This engine has been designed and tuned for powering the karts for both hobby and agonistic racing on closed tracks destined for this specific purposes.
When designing the engine we have considered the technical solutions already adopted for the high performance engines and the experience acquired with the "TaG" series engines (Touch and Go).

The “Reedster” engine has been homologated in 2006 according to the CIK/FIA international rules and it is available in 4 versions: F1, F2, F3 ed F4.
This engine is a 2 stroke single cylinder.
The thermic group and crankcase are in aluminium alloy.
The pressed-in liner is made of centrifuged cast iron and machined from the full to guarantee the best possible stability sliding homogeneity and precision.
The head is secured by 5 screws to the cylinder which is fitted to the crankcase by 4 studbolts.
The crankshaft is of the built up type and supported by two ball bearings. It is of steel alloy hardened and tempered, as is the connecting rod which is machined from the full. The rod runs on roller bearings on both ends.
The crankcase houses a balance shaft, driven by two gears, which rotates opposite to the crankshaft thus reducing the engine vibrations.

The digital ignition with capacitive discharge, is fed by a magneto which generates the spark energy for the starting of the engine, guarantees the advance timing through an integrated pick-up and recharges the battery.
The ignition includes a digital electronic unit, the stator-rotor, the starter relay, the H.T. coil, a switch key assembly, and of course the wiring harness (with a 5A fuse) which connects the whole system.

The electronic box, which controls the advance, the rev. limitation imposed by the CIK/FIA rules and the engine start/stop logic also integrates the voltage regulator and the ignition control circuit.
The starter relay (Solid type SSR), protected from short-circuits and overloads, supplies the power for the electric starter and is controlled by the electronic unit.
The spark is generated also without a battery; it is therefore possible, in case of emergency to start the engine with an external starter unit.
When the starter key is in the "RUN" position, the electric starter activates a Bendix type gear which engages the starter ring assembled on the clutch.
The engine is provided with a dry centrifugal clutch with low maintenance and with interchangeable sprocket.

The battery (12 V - 7.2Ah) is a sealed, no maintenance battery and is supplied already pre-assembled in a support box, which can be easily adapted to all existing chassis.

Both a throttle carburettor and a float chamber carburettor (on the F4 version), can be fitted on the engine. In this last case, the engine is provided with a fuel pump.

A power-valve is fitted on the cylinder exhaust duct (with the exception of the KF3 version) to optimize the low range performance. The exhaust system, included in the supply, is already tuned and optimized to guarantee the best efficiency.

The water-pump, is integrated in the engine and the water cooling system involves both the thermic group and the crankcase.
The engine (only F3 and F4) is supplied with a kit which includes the homologated radiator, the water hoses, the thermostat and the fixing supports on the chassis.

1.2 CHARACTERISTICS OF THE ENGINE – OPERATION LIMITS

The characteristics of the engine are the following:

- Cycle : OTTO / 2 stroke
- Original cubic capacity: 124.08 cc (125cc max.)
- Original bore: 53.89 mm
- Max. theoretical bore: 54.04 mm
- Stroke: 54.40 mm
- Lubrification: Fuel / oil mix 4% (25:1)
- Induction: Reed valve in the crankcase
- Carburettor: Diaphragm or float chamber (only F4)
- Cooling : Water, forced
- Ignition : Digital electronic / with integral rev. limiter
- Battery charge: With integral generator
- Electric start: 12V/0.30 Kw starter
- Clutch: Automatic, dry ,centrifugal

Operational limits:

- **Max. RPM:** 14000rpm (F3 e F4) / 15000rpm (F2) / 16000rpm (F1)
- **Min. water temperature:** 45°C
- **Max. water temperature:** 65°C

ATTENTION:
Never exceed the above limits; no obligation of IAME exists in case the above limits are exceeded.

1.3 CONTENTS OF THE PACKING

Each “Parilla Reedster 125cc” engine is supplied with the under shown components and accessories:

EXHAUST SYSTEM	Quantity
• Power valve on the exhaust duct	1 (excepted F3)
• Exhaust springs	2
• Exhaust fitting with spacer	1
• Exhaust system	1
• Additional exhaust silencer	1 (only F3)
INDUCTION SYSTEM	
• Dell’Orto VHSH30 CS carburettor	1 (only F4)
• Fuel pump	1 (only F4)
• Inlet silencer	1 (only F4)
ELECTRICAL SYSTEM	
• Battery 12 V	1
• Battery support	1
• Battery strip	1
• Battery fixing clamps	2
• Electronic box	1
• Starting relay	1
• H.T. coil	1
• Starting Key assembly	1
• Fixing clamps	8
• NGK BR 10 EG spark plug	1
• Spark plug cap	1
• Wiring harness	1
MISCELLANEOUS	
• Clutch cover	1
• Dual-Lock fixing strap	1
WATER COOLING SYSTEM	
• Homologated radiator	1 (only F3 e F4)
• Radiator support kit	1 (only F3 e F4)
• Water hoses kit	1 (only F3 e F4)
• Thermostat with three-way fitting	1 (only F3 e F4)

1.4 ACCESSORIES

EXHAUST SYSTEM

BATTERY WITH SUPPORT

NGK SPARK PLUG

COMPLETE ELECTRIC SYSTEM

CLUTCH COVER / H.T. COIL

THERMOSTAT

CARBURETTOR

FUEL PUMP

RADIATOR SUPPORT KIT

INLET SILENCER

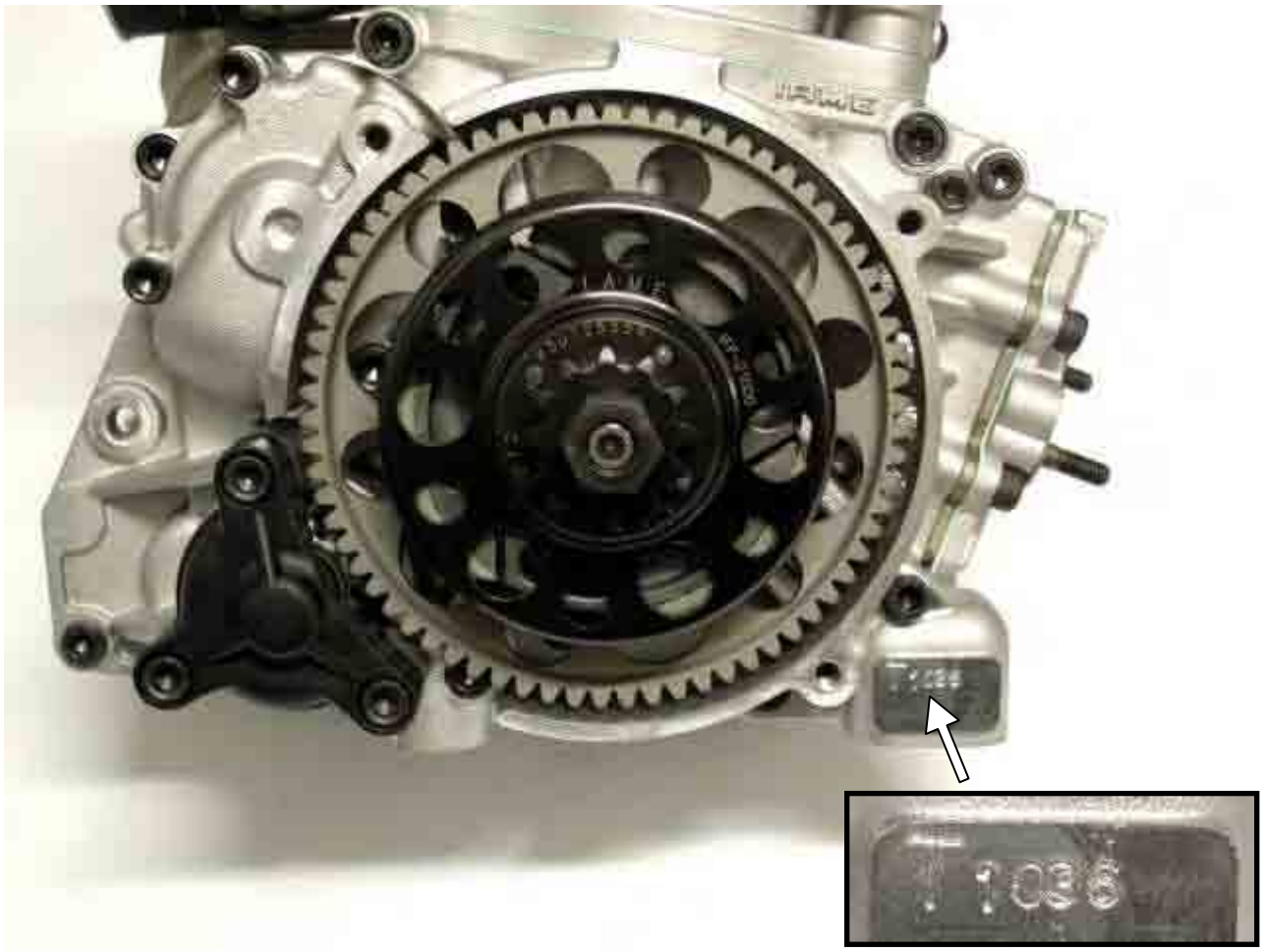
WATER HOSES KIT

RADIATOR

1.5 MOTOR IDENTIFICATION NUMBER

The official motor identification number can be found stamped on the lower front right part of the crankcase, near the reed group (see fig.). The number normally includes a letter followed by 4 digits (there can be exceptions in some special cases). Other numbers stamped on the crankcase or on other surfaces of the motor refer to various manufacturing processes and do not identify the engine.

NOTE:
In case of need for spares and when contacting the IAME Support Centers, please always refer to the Motor Identification Number and to the motor model.



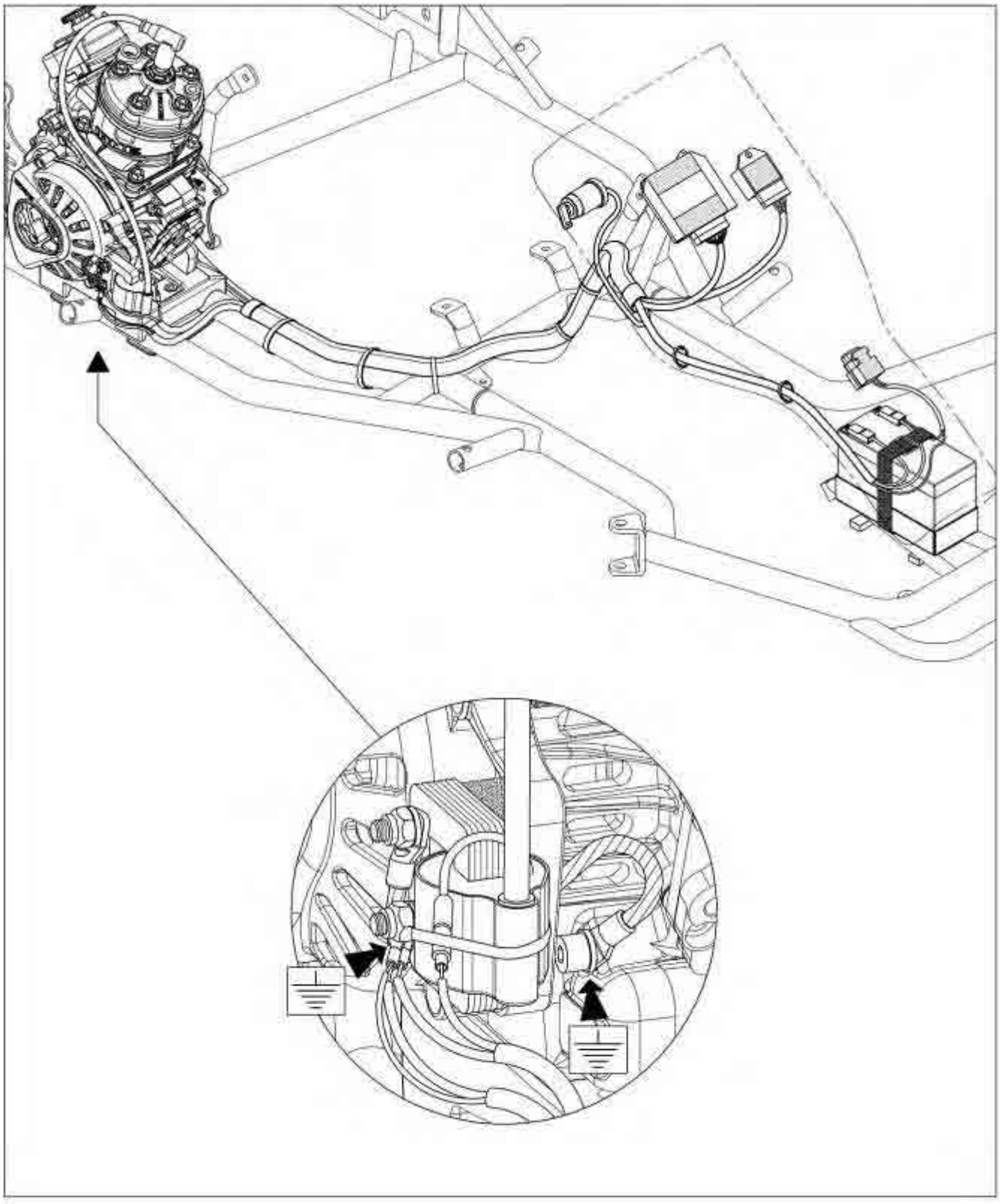
Section 2 - PREPARATION AND INSTALLATION OF THE ENGINE ON THE CHASSIS

NOTE:

In case the engine is supplied already assembled on the chassis, it is at care of the assembler to follow these instructions. The final customer, in this case, can skip this section and can start reading from section 3.

Whenever the engine or a component is disassembled, it is necessary to always follow the under shown instructions for proper reassembly.

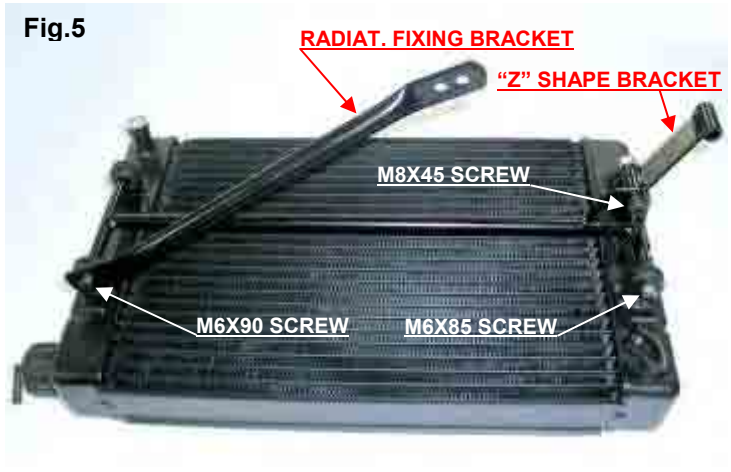
2.1 INSTALLATION SKETCH OF THE ENGINE ON THE CHASSIS

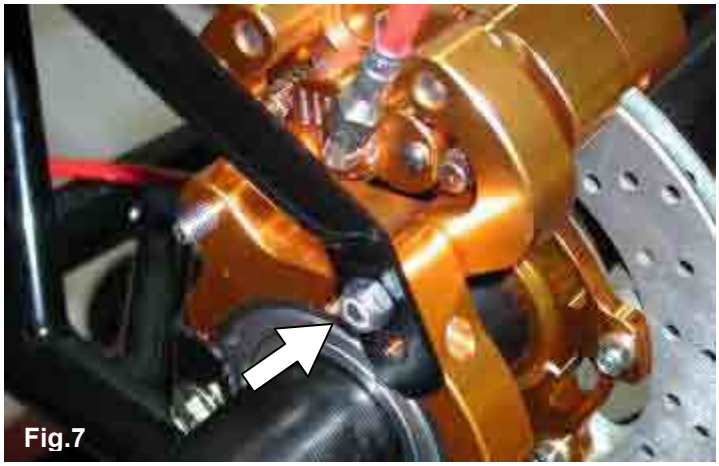
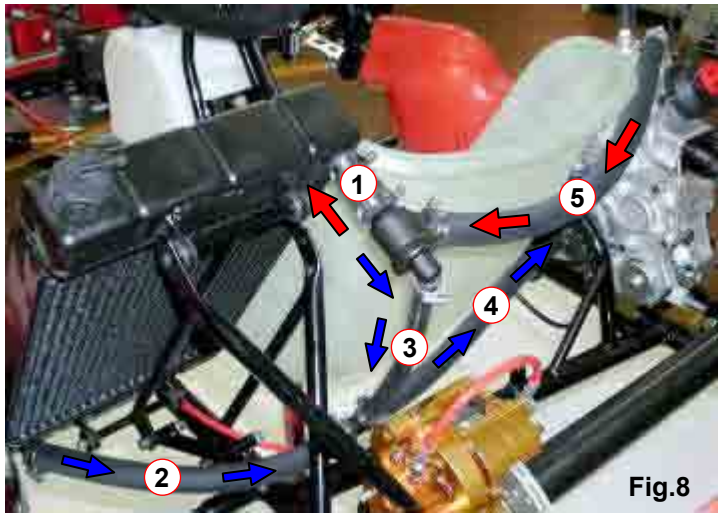
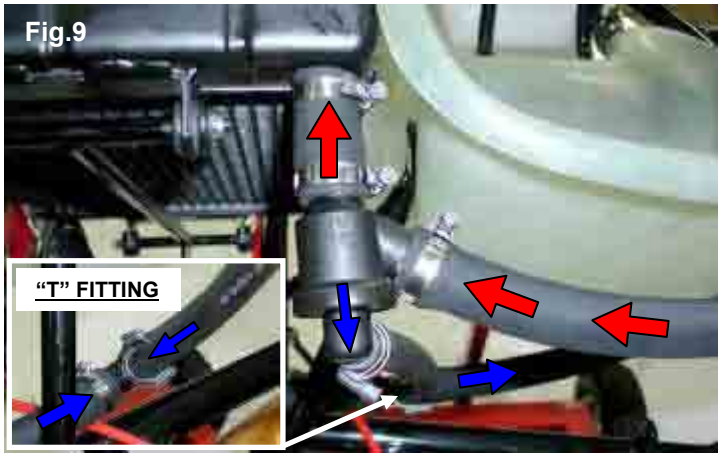


2.2 INSTALL THE WATER COOLING SYSTEM (only for F3 - F4)

BEFORE INSTALLING THE RADIATOR PREASSEMBLE THE FOLLOWING COMPONENTS

1	INSTALL THE 4 RUBBER DAMPENERS IN THE RADIATOR FIXING HOLES (SEE FIG.1).	 **Fig.1**
2	- PLACE THE RADIATOR SUPPORT BRACKET BETWEEN THE RADIATOR FIXINGS BY TILTING ONE END AND INSERTING IT THROUGH THE RUBBER DAMPENERS (SEE FIG.2) ***NOTE:*** ***OIL THE BRACKET ENDS AND THE DAMPENER HOLES FOR AN EASIER INSERTION.***	 **Fig.2**

	- COMPLETE INSERTION OF THE RADIATOR SUPPORT BRACKET IN THE RUBBER DAMPENERS (SEE FIG.3 AND 4).	Fig.3  Fig.4 
3	FIX THE RADIATOR SUPPORT BRACKET INSERTING ALSO THE RADIATOR FIXING BRACKET (RADIATOR CAP SIDE – N°1 SCREW M6x90 AND N°1 SCREW M6x85 WITH NUT). INSTALL THE "Z" SHAPE BRACKET ON THE RADIATOR SUPPORT BRACKET TONGUE (N°1 SCREW M8X45 WITH NUT). **DO NOT TIGHTEN THE SCREW** (SEE FIG.5).	Fig.5 
4	FIX THE RADIATOR "Z" SHAPE LOWER BRACKET ON THE CHASSIS RAIL FIXING (BRAKE SIDE) (N°1 M8x65 SCREW). **DO NOT TIGHTEN THE SCREW** (SEE FIG.6). N.B.: EVENTUALLY USE THE OUTFIT BUSHINGS TO ADJUST THE RADIATOR POSITION .	 Fig.6

5	PLACE THE RADIATOR SO THAT THE HOLE ON THE RADIATOR FIXING BRACKET MATCHES WITH ONE OF THE UPPER HOLES ON THE BEARING SUPPORT BOX (SEE FIG.7). **ONCE YOU FIND THE CORRECT POSITION, TIGHTEN THE M8x45 SCREW AND M8X65 ON THE LOWER "Z" SHAPE BRACKET THUS FIXING THE RADIATOR .** **TIGHTEN AT 8÷10 Nm (70÷ 90 in-lb)**	 Fig.7
6	**THE KIT INCLUDES TWO RUBBER HOSES OF WHICH THE LONGEST ONE HAS TO BE CUT IN 4 DIFFERENT LENGTH HOSES (SEE FIG.8).** - CONNECT THE "1" HOSE BETWEEN THE RADIATOR INLET AND THE THERMOSTAT OUTLET. - CONNECT THE "2" HOSE BETWEEN THE RADIATOR OUTLET AND THE "T" FITTING. - CONNECT THE "3" HOSE, THE SHORTEST ONE IN THE KIT, BETWEEN THE SMALLEST THERMOSTAT OUTLET AND THE "T" FITTING. - CONNECT THE "4" HOSE BETWEEN THE ENGINE INLET FITTING AND THE "T" FITTING. - CONNECT THE "5" HOSE BETWEEN THE ENGINE OUTLET AND THE THERMOSTAT INLET. FASTEN WITH STEEL CLAMPS ALL THE HOSE ENDS.	 Fig.8
7	THE THERMOSTAT MUST BE POSITIONED SO THAT THE REAR UNION FOR THE RECYCLING COOL WATER IS PROPERLY FIXED TO THE "T" FITTING ON THE HOSE CONNECTING THE RADIATOR OUTLET TO THE ENGINE INLET FITTING (SEE FIG.9).	 Fig.9

BEFORE STARTING THE ENGINE, FOLLOW THESE RECOMMENDATIONS:

- Unscrew the cap on the radiator and loosen the breather plug on the engine head.
- Fill the radiator until the water comes out from the plug (there is no air in the system now) and the radiator is completely filled. Tighten the cap (the system contains approx. 2 lt. of water).
- **It is advisable to put a small cup to recover water from the breather on the radiator cap to avoid fluid leakages on the track.**
- **After the engine run-in, check the water level in the radiator and top up if necessary.**

2.3 INITIAL PREPARATION OF THE ENGINE

2.3.1 ON THE EXHAUST POWER VALVE THERE IS A WARNING TAG TO REMIND THE USER THAT THE GEAR BOX MUST BE FILLED WITH OIL BEFORE STARTING THE ENGINE (SEE FIG.1).

NOTE:
THE ENGINE IS SUPPLIED WITH THE EXHAUST FITTING AND SPACER ALREADY PRE-INSTALLED.

Fig.1

2.3.2 WHEN THE SHIPMENT IS MADE, THE ENGINE INNER PARTS ARE PROTECTED BY PLASTIC PLUGS WHICH MUST BE REMOVED BEFORE INSTALLING THE ENGINE (SEE FIG.2).

- SPARK PLUG HOLE PLUG
- WATER FITTING PLUGS
- EXHAUST FITTING PLUG
- CARBURETTOR FITTING PLUG

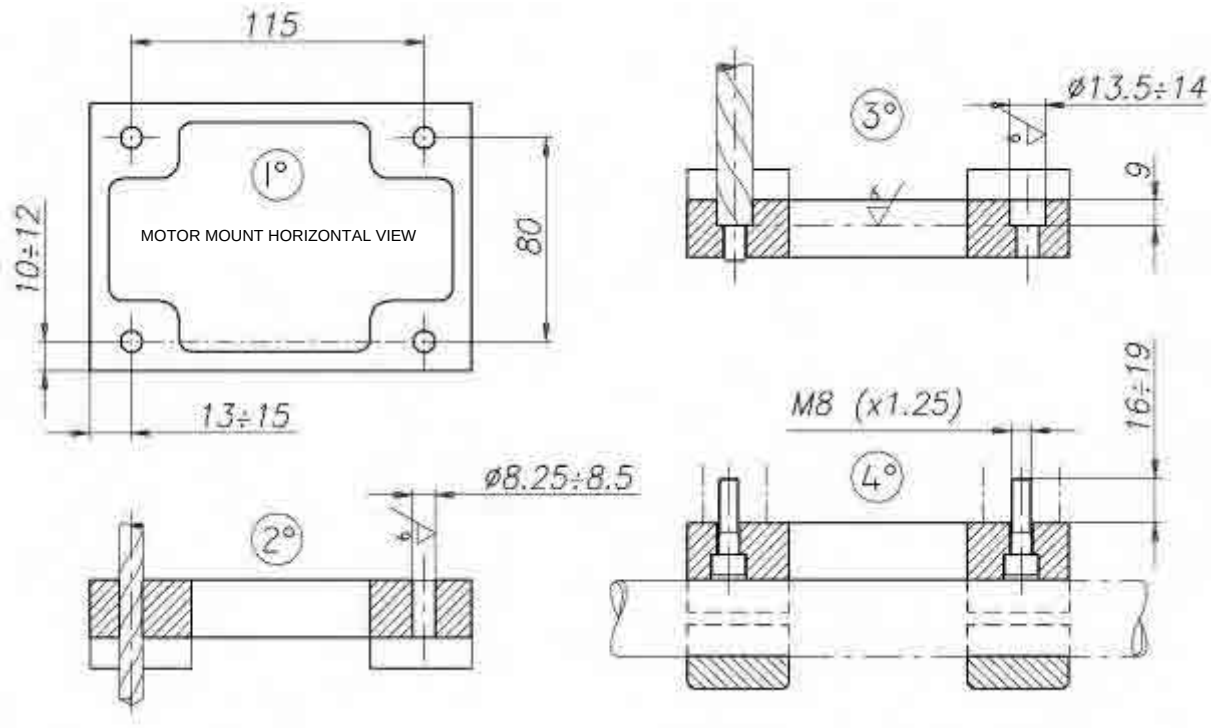
Fig.2

2.4 PREPARATION AND INSTALLATION OF THE MOTOR-MOUNT

NOTE: ***ALL DIMENSIONS ARE IN MILLIMETERS***

2.4.1 DRILL 4 HOLES (8.25÷8.5mm DIAM.) IN THE ENGINE MOUNT.

NOTE: ***PREFERABLY USE A FLAT MOTOR MOUNT.***



2.4.2 INSTALL THE MOTOR-MOUNT: MAKE SURE TO USE M8 ALLEN SCREWS WITH A LENGTH SUCH AS TO ENGAGÈ, IN THE CRANKCASE A THREADED LENGTH OF APPROX. 16÷19mm (THE SCREWS MUST PROTRUDE FROM THE PLATE FOR APPROX 16÷19mm - SEE FIG. 3 AND DRAWING PAGE 10)

4 M8 ALLEN SCREWS – TORQUE AT 22÷24 Nm (190 ÷ 210 in-lb)

6 mm HEXAGONAL WRENCH

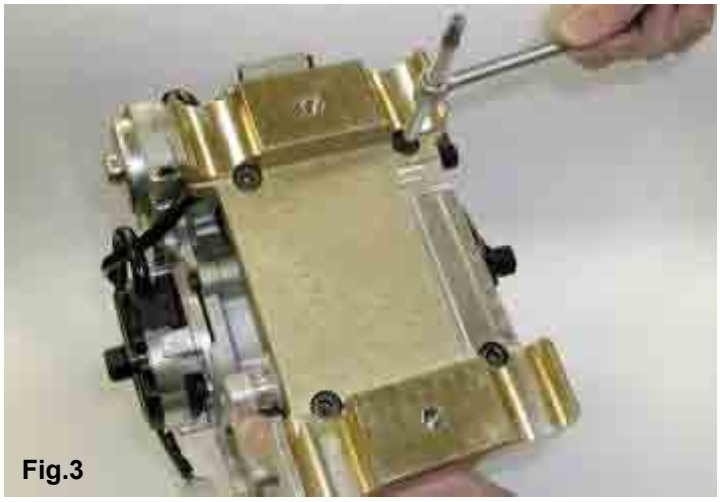


Fig.3

2.5 INSTALL THE CARBURETTOR

K F1 - F2 - F3 VERSIONS (THROTTLE CARB)

2.5.1 REMOVE THE PLASTIC PLUG FROM THE INLET MANIFOLD.

ATTENTON:
MAKE SURE THAT THE PRESSURE HOLE ON THE GASKET IS NOT PLUGGED.

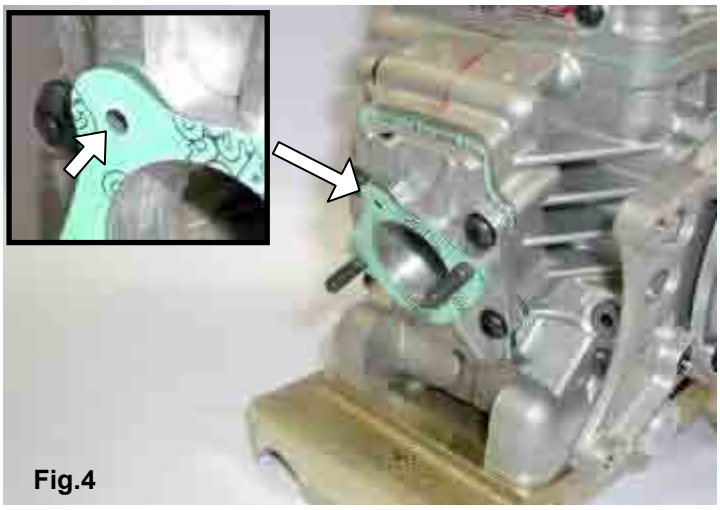


Fig.4

2.5.2 INSTALL THE CARBURETTOR.
N. 2 NUTS M6
TORQUE AT A 6 ÷ 10 Nm (50 ÷ 90 in-lb) (SEE FIG. 5).

HEXAGONAL WRENCH 5 mm

ATTENTION:
WHEN REPLACING THE CARB. GASKET ALWAYS MAKE SURE THAT THE GASKET IS INSTALLED SO THAT THE PRESSURE HOLES ON THE INLET MANIFOLD AND ON THE INLET CARB. ARE NOT PLUGGED AND MATCH. OTHERWISE THE ENGINE WON'T START.

NOTE:
WHEN USING CARBS. PROVIDED WITH AN EXTERNAL PRESSURE INTAKE (NOT ON THE FIXING FLANGE) IT WILL BE NECESSARY TO REMOVE THE "PLUGGING" SCREW ON THE LEFT SIDE OF THE INLET DUCT (SEE ARROW) AND INSTALL THE PROPER MANIFOLD.

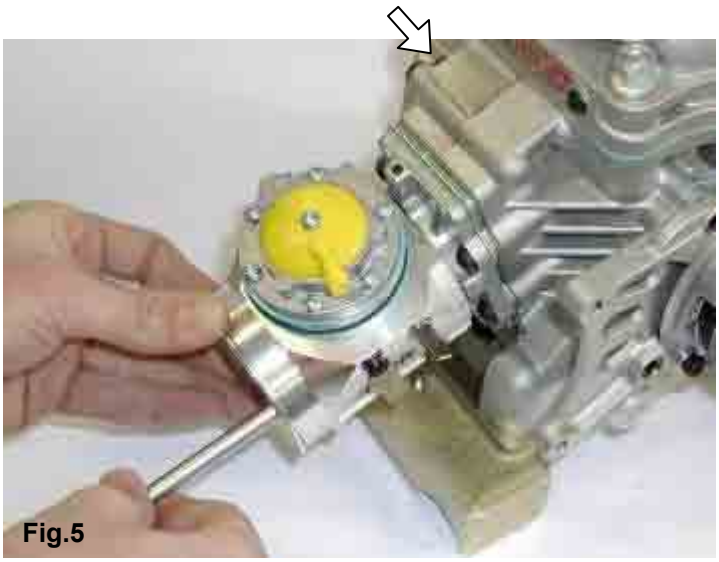


Fig.5

F4 VERSION (FLOAT CHAMBER CARB)

2.5.3 INSTALLATION OF THE FUEL PUMP (IF NOT ALREADY ASSEMBLED IN ORIGIN)

INSTALL THE VIBRATION DAMPENERS ON THE GEAR BOX COVER I (SEE FIG. 6).

Fig.6

PLACE THE FUEL PUMP WITH THE OUTLET FITTING TOWARDS THE UPPER SIDE AND TORQUE THE SELF-LOCKING NUTS M6. **TORQUE AT 6 ÷ 10 Nm (50 ÷ 90 in-lb)** (SEE FIG.7)

10mm PIPE WRENCH

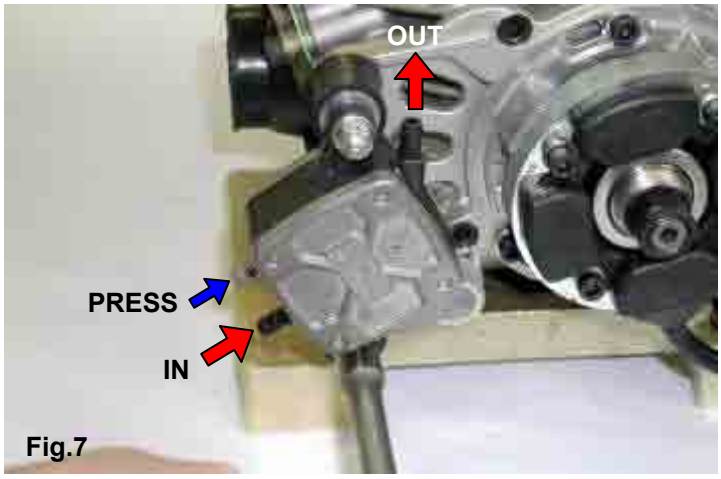


Fig.7

2.5.4 INSTALLATION OF THE CARBURETTOR

REMOVE THE PLASTIC PLUG FROM THE INLET MANIFOLD AND INSTALL THE CARB. THEN TIGHTEN THE STEEL CLAMP (SEE FIG. 8).

Fig.8

CONNECT BY MEANS OF A TUBE (FUEL PIPE TYPE) THE PRESSURE INTAKE FITTING ON THE CRANKCASE AND THE PUMP PRESSURE INTAKE.

BY MEANS OF ANOTHER TUBE CONNECT THE FUEL PUMP OUTLET TO THE CARB. MANIFOLD. (SEE FIG.9).

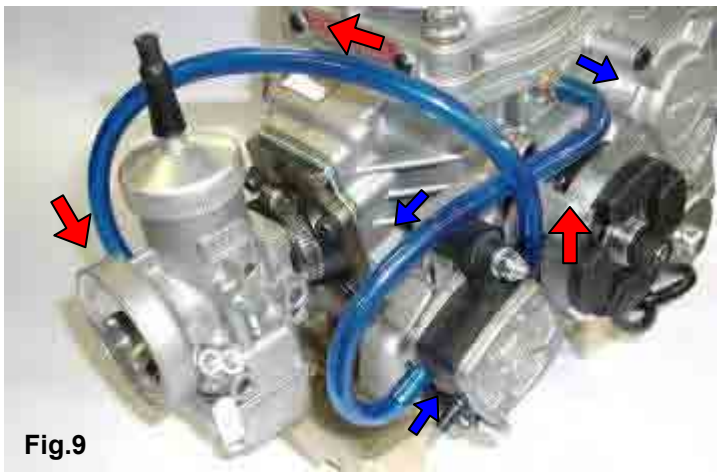


Fig.9

2.6 CHARGING THE OIL IN THE GEAR BOX

2.6.1 REMOVE THE OIL BREATHER PLUG (REAR PART OF THE ENGINE) (SEE FIG.10).

12 POINT WRENCH - 11mm

Fig.10

REMOVE THE OIL LEVEL PLUG (FRONT PART OF THE ENGINE)
(SEE FIG.11).

HEXAGONAL WRENCH - 4mm

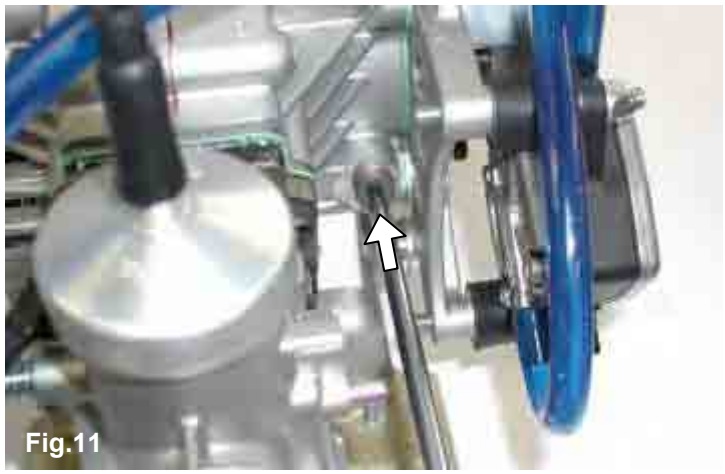


Fig.11

2.6.2 FILL WITH 33cc "IAME EP100"OIL THE GEAR BOX
(SEE FIG.12).

NOTE:
IF THE LEVEL IS CORRECT YOU WILL SEE A LIGHT OUTCOME OF OIL FROM THE OIL LEVEL PLUG.

INSTALL THE OIL LEVEL PLUG
TORQUE AT A 12 ÷ 15 Nm

INSTALL THE OIL BREATHER FITTING
TORQUE AT 12 ÷ 15 Nm

Fig.12

2.7 INSTALLATION OF THE ENGINE ON THE CHASSIS

2.7.1 PLACE THE ENGINE ON THE TWO SIDE RAILS AND SECURE THE MOTOR-MOUNT WITH THE TWO CLAMPS (SEE FIG.13)

SUGGESTION:
DO NOT TIGHTEN THOROUGHLY THE CLAMPS UNTIL THE CHAIN IS NOT INSTALLED AND PROPERLY ALIGNED .


Fig.13

2.7.2 CHECK THE ALIGNMENT OF THE ENGINE SPROCKET AND THE AXLE SPROCKET WITH A STRAIGHT EDGE (SEE FIG.14).


Fig.14

2.7.3 INSTALL THE CHAIN (PITCH: 7.775) (SEE FIG. 15).


Fig.15

2.7.4 MOVE THE ENGINE ON THE RAILS AND OPTIMIZE THE CHAIN TENSION .

ATTENTION:
THE CHAIN PLAY MUST BE OF APPROX. 15mm, MEASURED IN THE SHOWN POINT (SEE FIG. 16).

2.7.5 TIGHTEN THE CLAMP SCREWS

HEXAGONAL WRENCH 8mm

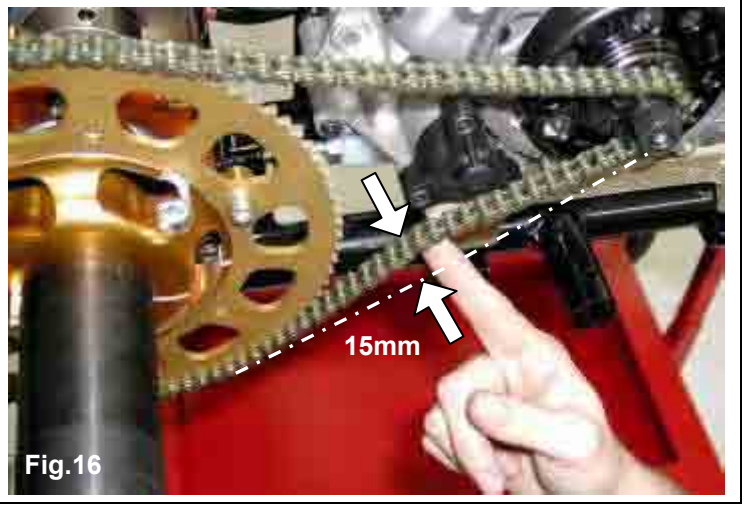


Fig.16

2.8 INSTALLATION OF THE CLUTCH COVER WITH H.T. COIL

2.8.1 CONNECT THE H.T. COIL GROUND CABLE TO THE CRANKCASE BY MEANS OF THE M6 SCREW ON THE FRONT FOOT (SEE FIG.17).

TORQUE AT 8 ÷ 10 Nm (70 ÷ 90 in. lb)

HEXAGONAL WRENCH - 5 mm

ATTENTION:
MAKE SURE THAT THE COPPER GROUND CABLE ALWAYS CONNECTS THE H.T. COIL WITH THE ENGINE. AN INADEQUATE GROUNDING COULD DAMAGE THE IGNITION SYSTEM BEYOND REPAIR.

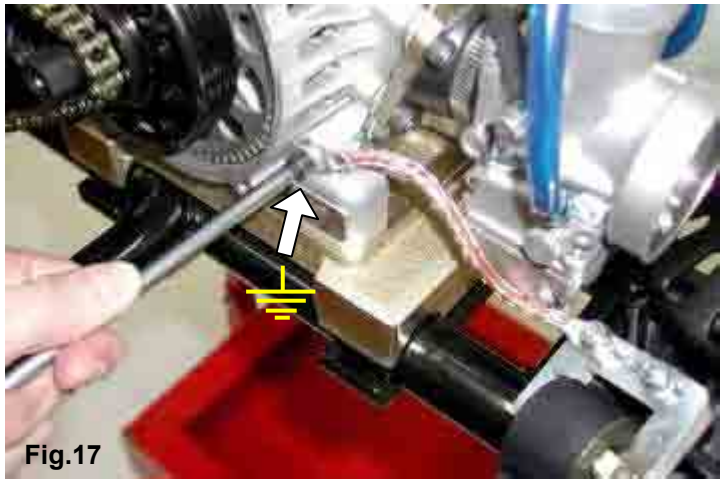


Fig.17

THE POSITION OF THE H.T. COIL HAS BEEN CHOSEN TO BE AS FAR AS POSSIBLE FROM THE EXHAUST AS THE EXCESSIVE HEAT COULD DAMAGE THE H.T. COIL, BEYOND REPAIR.

2.8.2 INSTALL THE CLUTCH COVER WITH H.T. COIL (SEE FIG.18).

TORQUE THE 3 SCREWS M6 AT 8 ÷ 10 Nm (70÷ 90 in .lb)

HEXAGONAL WRENCH - 5 mm

Fig.18

2.9

ELECTRICAL CONNECTIONS (refer to the attached electrical schematic)

NOTE :
For a correct installation follow the under shown instructions.

2.9.1 INSERT THE BATTERY STRAP IN THE BATTERY SUPPORT BOX (SEE FIG.19).

Fig.19

2.9.2 PLACE THE BATTERY SUPPORT BOX IN THE FRONT OF THE CHASSIS (UNDER THE FRONT PANEL FAIRING) AND FIX IT WITH THE CLAMPS TO THE LOWER STEERING COLUMN SUPPORT TUBES (M6x25 SCREWS - SEE FIG.20).
TORQUE AT 8 ÷ 10 Nm (70 ÷ 90 in. Lb)

PIPE WRENCH - 10mm

THE SUPPORT BOX MUST BE FIXED WITH AT LEAST ONE BOLT FOR EACH CLAMP. FIX THE BOX WITH MORE THAN ONE BOLT DEPENDING ON THE TYPE OF CHASSIS.

NOTE:
THE BOX AND CLAMPS ARE PROVIDED WITH VARIOUS HOLES TO ALLOW INSTALLATION ON ALL KIND OF CHASSIS.

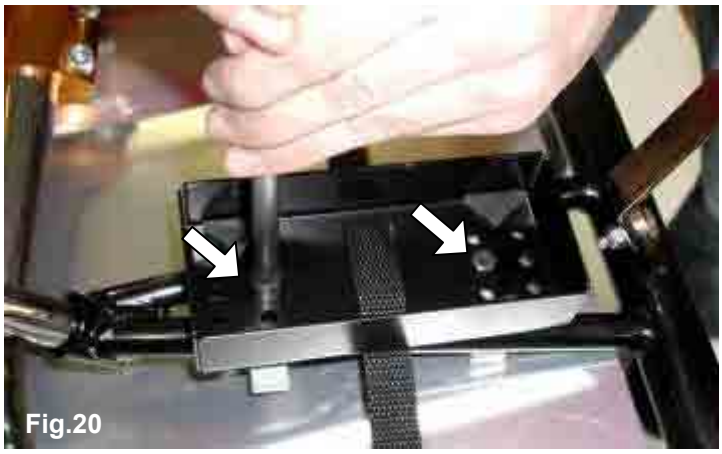


Fig.20

2.9.3 INSERT THE BATTERY IN THE BOX AND FASTEN IT WITH THE BATTERY STRAP (SEE FIG.21).
POSITION THE BATTERY TERMINALS AS SHOWN ON THE FIGURE.

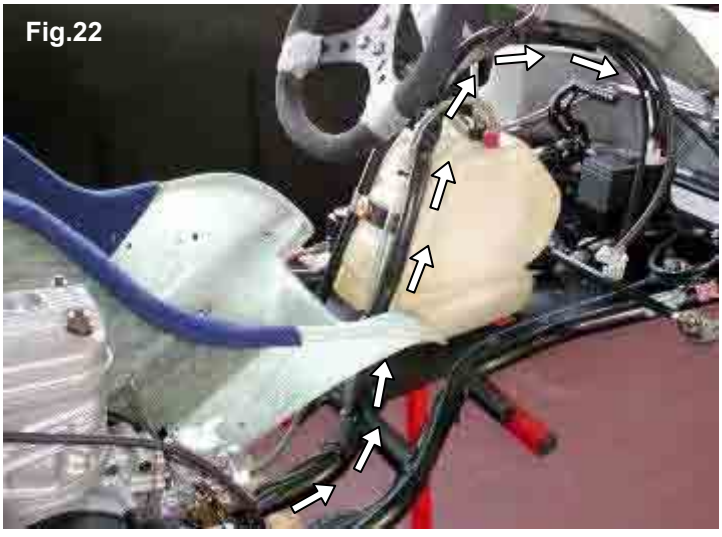
ATTENTION :
PAY ATTENTION NOT TO SHORT-CIRCUIT THE BATTERY TERMINALS AS THE BATTERY COULD BE DAMAGED BEYOND REPAIR.

Fig.21

2.9.4 PLACE THE WIRING HARNESS STARTING FROM THE ENGINE, ALONG THE RAILS, THE STEERING COLUMN AND UNDER THE FRONT PANEL FAIRING (SEE FIG.22).
TIGHTEN WITH PLASTIC CLAMPS.

ATTENTION:
NEVER LET THE HARNESS GET IN TOUCH WITH THE GROUND OR WITH ROTATING PARTS AS IT COULD BE DAMAGED BEYOND REPAIR.

Fig.22



2.9.5 –CONNECT THE TERMINAL FROM THE IGNITION WITH THE 8 POLES TERMINAL ON THE HARNESS (SEE FIG.23).

-CONNECT THE ONE WAY TERMINAL FROM THE ELECTRIC STARTER WITH THE ONE WAY TERMINAL ON THE HARNESS.
(SEE FIG.24).

ATTENTION:
MAKE SURE THAT THE FIXING TONGUES ARE PROPERLY INSERTED TO GUARANTEE THE BEST POSSIBLE CONNECTION OF THE TERMINALS.

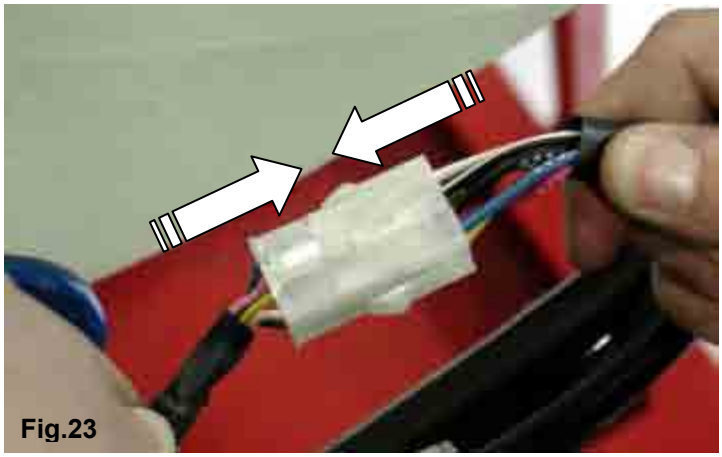


Fig.23

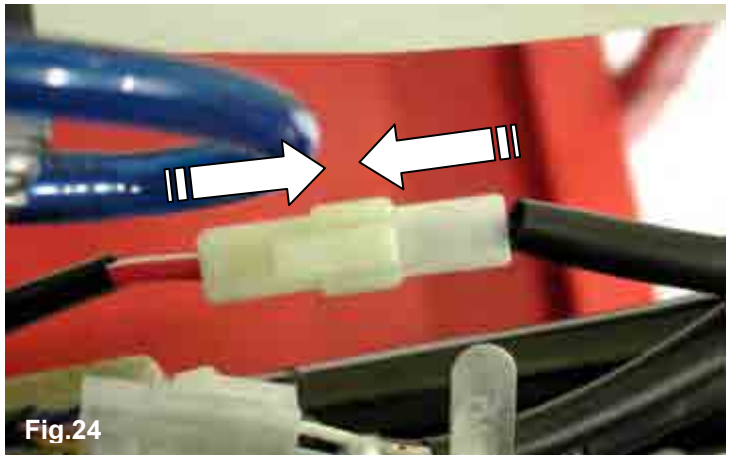


Fig.24

2.9.6 CHECK THAT THE PLASTIC CLAMP FASTENS THE CABLE FROM THE ELECTRIC STARTER TO THE STARTER BODY (SEE FIG.25)

ATTENTION:
THIS OPERATION IS VERY IMPORTANT, OTHERWISE THE RESIDUAL ENGINE VIBRATIONS COULD DAMAGE THE ELECTRIC STARTER INNER CONNECTIONS BEYOND REPAIR.

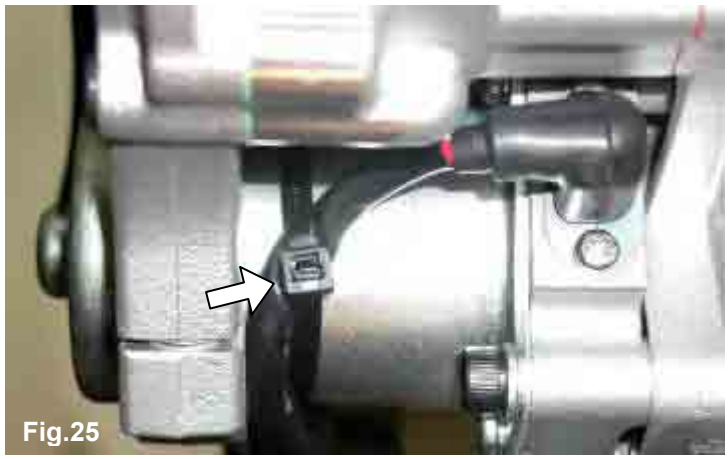


Fig.25

2.9.7 FASTEN THE 2 TERMINALS GROUND CABLES WITH EYELET, TO THE H.T. COIL WITH THE M6 FIXING NUT (SEE FIG.26).

TORQUE AT 8 ÷ 10 Nm (70 ÷ 90 in. lb)

PIPE WRENCH - 10mm

ATTENTION:
THIS OPERATION IS EXTREMELY IMPORTANT AS AN UNCERTAIN GROUNDING COULD DAMAGE THE ELECTRONIC BOX BEYOND REPAIR .

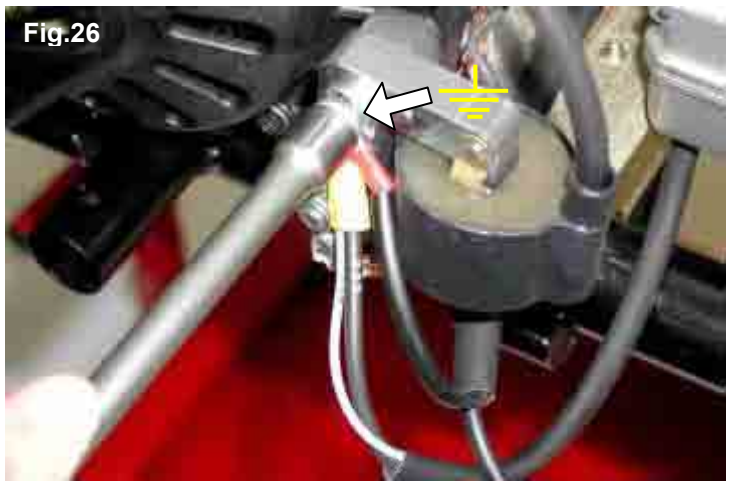


Fig.26

2.9.8 CONNECT THE H.T COIL CABLE TO THE HARNESS TERMINAL (SEE FIG.27).

ATTENTION:
FASTEN THE H.T. COIL CABLE WITH A PLASTIC CLAMP TO AVOID THAT EVENTUAL VIBRATIONS MIGHT DISCONNECT THE TERMINALS (SEE FIG.28).

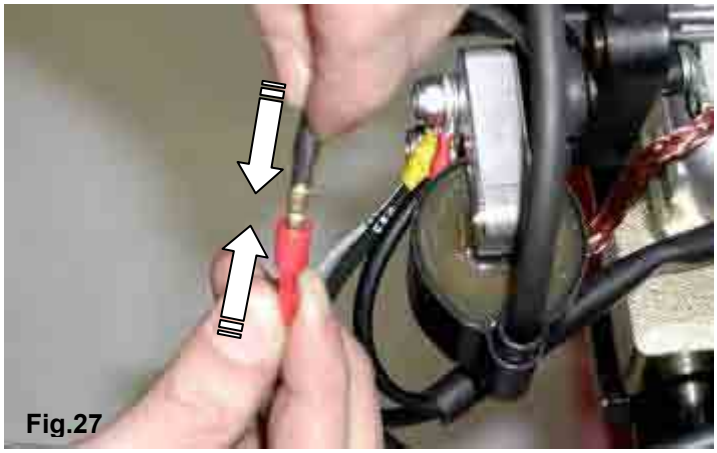


Fig.27

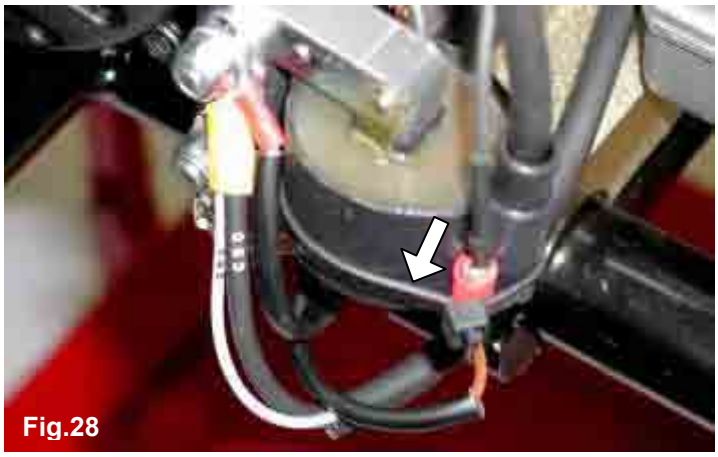


Fig.28

2.9.9 CUT THE DUAL-LOCK FIXING STRAP AND ATTACH IT TO THE REAR OF THE ELECTRONIC BOX, THE STARTER FUSE AND THE RELAY (SEE FIG.29).

NOTE:
THE COLOUR OF THE ELECTRONIC BOX CHANGES ACCORDING TO THE ENGINE VERSION AND TO THE REV. LIMITER SETTING:

- ***YELLOW = F4 vers. (14000 RPM max.)***
- ***BLUE = F3 vers. (14000 RPM max.)***
- ***GREEN = F2 vers. (15000 RPM max.)***
- ***RED = F1 vers. (16000 RPM max.)***

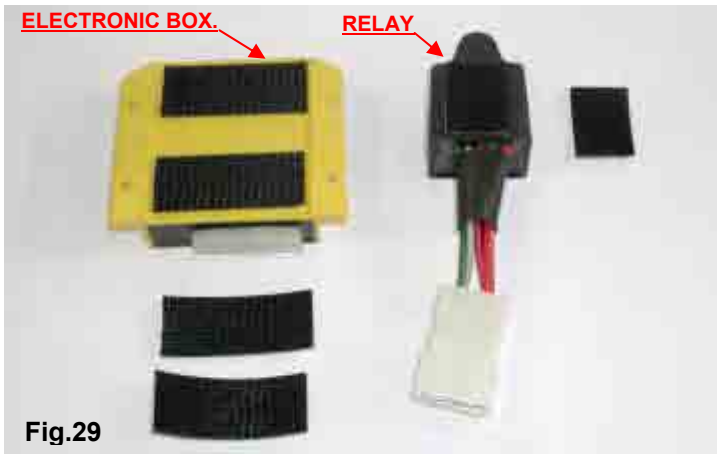


Fig.29

2.9.10 CONNECT THE ELECTRONIC BOX TO THE 20 POLE CONNECTOR ON THE HARNESS (SEE FIG.30).

ATTENTON:
MAKE SURE THAT THE FIXING TONGUES ARE PROPERLY INSERTED TO GUARANTEE THE BEST POSSIBLE CONNECTION OF THE TERMINALS.

Fig.30

2.9.11 CONNECT THE STARTER RELAY TO THE 4 POLES CONNECTOR ON THE HARNESS (SEE FIG.31).

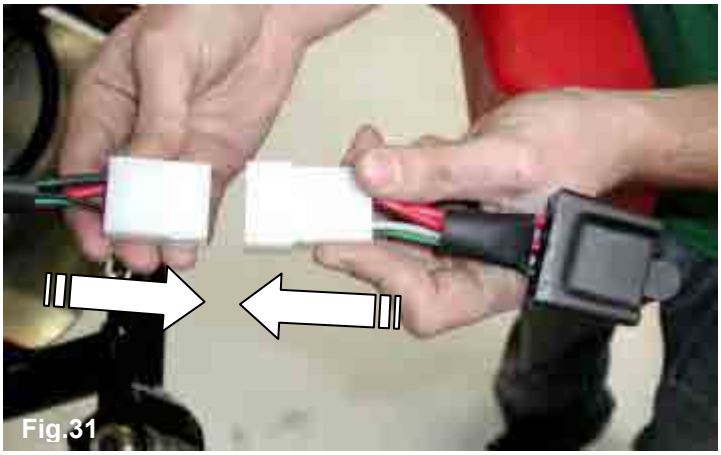


Fig.31

2.9.12 DRILL A Ø 22mm HOLE IN THE SIDE EDGE OF THE FRONT PANEL FAIRING (ENGINE SIDE); AND INSTALL THE STARTER ASSEMBLY (SEE FIG.32).
SECURE THE STARTER ASSEMBLY WITH THE THREADED LOCKING NUT.

Fig.32

2.9.13 CONNECT THE STARTER ASSEMBLY CONNECTOR TO THE 8 POLES CONNECTOR ON THE HARNESS (SEE FIG.33).

ATTENTION:
MAKE SURE THAT THE FIXING TONGUE OF THE CONNECTOR IS PROPERLY INSERTED TO GUARANTEE THE BEST POSSIBLE CONNECTION OF THE TERMINALS.

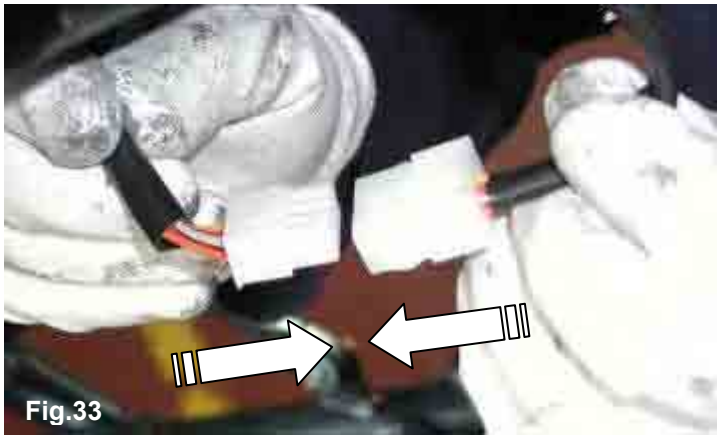


Fig.33

2.9.14 ATTACH THE DUAL-LOCK STRAP UNDER THE FAIRING (CLOSE TO THE STEERING COLUMN) AND INSTALL THE ELECTRONIC BOX AND THE STARTER RELAY (SEE FIG. 34).

NOTE:
CLEAN AND DEGREASE THE SURFACE WHERE THE STRAP IS TO BE PLACED TO GUARANTEE THE BEST POSSIBLE ATTACHMENT.

FOR A BETTER FASTENING, SECURE THE ELECTRONIC BOX AND RELAY WITH SCREWS, BY USING THE EXPRESSLY MADE HOLES FOR THIS PURPOSE.


Fig.34

2.9.15 DRILL THE FAIRING AND FASTEN THE HARNESS WITH PLASTIC CLAMPS (SEE FIG.35).


Fig.35

2.9.16 DRILL THE FAIRING (CLOSE TO THE BATTERY) AND PLACE THE FUSE-HOLDER BY MEANS OF THE 2 HOOKS OF THE JUNCTION BLOCK (SEE FIG.36).


Fig.36

2.9.17 PLACE THE BATTERY TERMINALS OF THE HARNESS UNDER THE STRAP (SEE FIG. 37).

SUGGESTION:
NEVER CONNECT THE BATTERY UNTIL YOU ARE READY TO START THE ENGINE.
SEAL THE BATTERY TERMINALS WITH PLASTIC TAPE TO AVOID THAT EVENTUAL VIBRATIONS MIGHT DISCONNECT THE TERMINALS.

Fig.37

2.9.18 SCREW THE SPARK CAP ON THE H.T. COIL CABLE (SEE FIG. 38).


Fig.38

2.9.19 FIX THE CAP TO THE H.T. CABLE WITH A PLASTIC CLAMP (SEE FIG.39).

- INSTALL THE SPARK PLUG. **TORQUE AT 20 ÷ 26 Nm (175 ÷ 230 in-lb)**
- INSTALL THE CAP ON THE SPARK PLUG.

NOTE:
FOR A CORRECT DIGITAL IGNITION OPERATION, THE CAP AND / OR THE SPARK PLUG, MUST BE OF THE RESISTIVE TYPE AND HAVE A RESISTIVITY OF 5 KΩ MIN.

Fig.39

2.10 **INSTALL THE INTAKE SILENCER**

-MAKE SURE THAT THE FILTER HAS THE INLET HOLES TOWARDS THE UPPER SIDE (SEE FIG.40) AND THAT THEY ARE NOT PLUGGED.

Fig.40

-TIGHTEN THE CLAMP ON THE CARB. AND FIX THE FILTER TO THE CHASSIS SIDE RAILS WITH A "CRADDLE" SHAPE SUPPORT (SEE FIG.41).

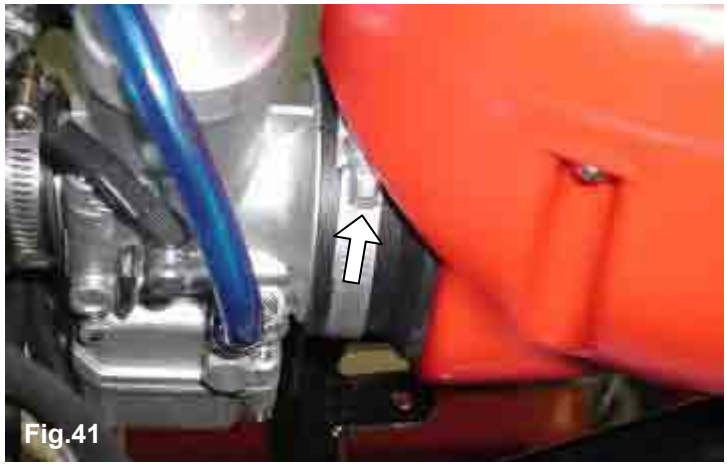


Fig.41

2.11 **INSTALL THE EXHAUST**

NOTE:
SEE SECTION 3.8 FOR RECOMMENDATIONS ON THE EXHAUST

- INSTALL THE EXHAUST SILENCER ON THE ENGINE FITTING AND SECURE IT WITH THE 2 SPRINGS (SEE FIG.42).

- FIX THE SILENCER ON THE CHASSIS "CRADDLE " SUPPORT.

Fig.42

THE ENGINE IS READY TO BE STARTED

Section 3 - USE OF THE ENGINE

3.1 CHARGING / DISCHARGING THE OIL IN THE GEARBOX

ATTENTION:

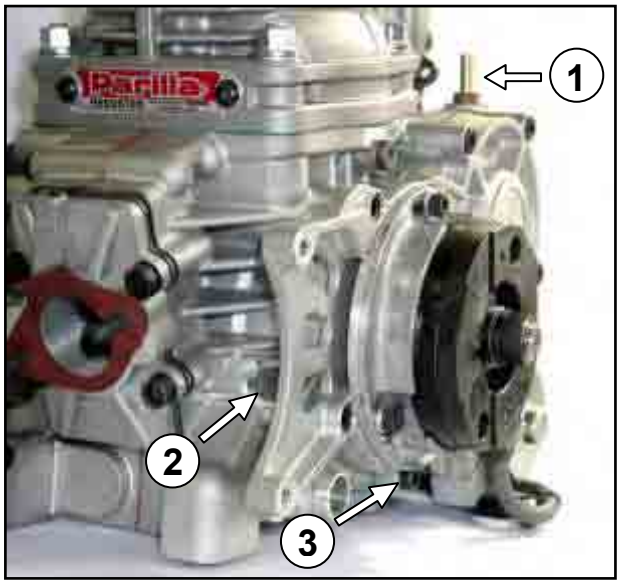
The engine is supplied without oil in the gearbox. Before starting the engine fill the gearbox with "IAME EP100" motor oil.

Starting the engine with a dry gearbox will damage the gears beyond repair

- charging the gearbox:

Put the engine in horizontal position, unscrew the oil plug (n°1 on the picture), and oil level plug (n°2 on the picture), fill with oil until it comes out from the oil level plug (approx. oil quantity in the gearbox = 33 cc).

Exclusively use "IAME EP100"motor oil



- check the oil level

The oil level can be checked by placing the engine in horizontal position and unscrewing the oil level plug. If the level is correct you should see a light outcome of oil, otherwise top up.

- discharge the oil

Unscrew the oil level plug (n°3 on the picture) and loosen the oil drain plug to let air in the gearbox.

3.2 GASOLINE AND OIL

Use leaded (super) or unleaded (green) gasoline, mixed with oil at 4%.

It is possible to use synthetic oils or oils containing Castor oil. As Castor Oils create gummy residues it is necessary to check and clean, at least every 10 hrs, the piston and the head.

Our experience dictates use of oils, such as:

- SHELL ADVANCE RACING X
- ELF HTX 909

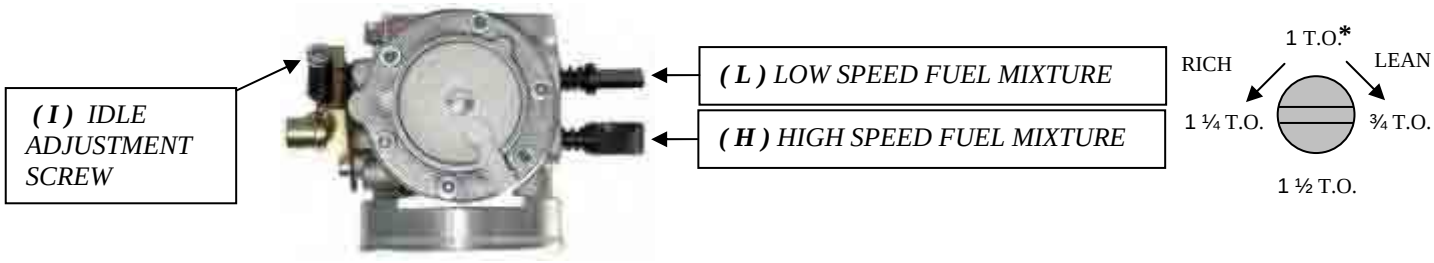
Once the fuel tank is filled, make sure that the gasoline reaches the carburettor (or the pump - F4 version -) before starting the engine.

Never use the electric starter to suck the gasoline as this could discharge the battery.

SUGGESTION:

Disconnect the plastic tube on the carb. and the vent tube on the tank and pressurize the vent tube, until the gasoline comes out from the tube on the carb. Make sure that there is no air in the tube. Connect the tube on the carb. and on the vent.

3.3 CARBURETTOR ADJUSTMENT GUIDE



* T.O. = TURNS OPEN

Hereinafter are shown some basic carbs. settings according to the engine version (after engine run-in):

F1 engine vers.: "IBEA L7" Ø30 carburettor	H = 1.10 (1 turn and 10')	L = 1.30 (1 turn and 30')
F2 engine vers.: "IBEA L6" Ø24 carburettor	H = 1.10 (1 turn and 10')	L = 1.25 (1 turn and 25')
F3 engine vers.: "TRYTON F3" Ø20 carburettor	H = 0.20 (20')	L = 1.30 (1 turn and 30')

Based on various factors as altitude, ambient temperature etc. it might be necessary to reset the carb. setting to optimize the performance of the engine.

ATTENTION:

- ***Never lean too much as lean mixture will overheat the engine and cause seizure.***
- ***Do not force H or L closed. It may damage the precision machined orifice and render the carb. inserviceable.***
- ***The adjustment of the screw must be performed with warm engine.***

F4 engine vers: "DELL'ORTO VHSH30 CS" CARBURETTOR

SETTINGS AND CHARACTERISTICS			
MAIN JET	125	NEEDLE JET	DP 264
IDLE JET	60	NEEDLE SEAT	300
STARTER JET	60	THROTTLE VALVE	50
EMULSION TUBE	B45	SEPARATE FLOATER	3.6 gr.
NEEDLE	K29 (3 notches)		

The above settings are those prescribed by IAME for the carb. Dell'Orto VHSH 30 CS, installed on the Parilla REEDSTER engine - in the F4 version.
The above table shows the reference setting, for the proper engine operation under different temperature, altitude and atmospheric pressure conditions
Should you need an optimized carb. setting, for all atmospheric conditions, it will be necessary to adjust the setting for a better mixture strength according to the track characteristics and ambient conditions.

In case of a high level setting, for which a specific experience is required, it is impossible to give instructions in a few words. Our target is to give here simple instructions for setting the best adjustment, according to the operation conditions.

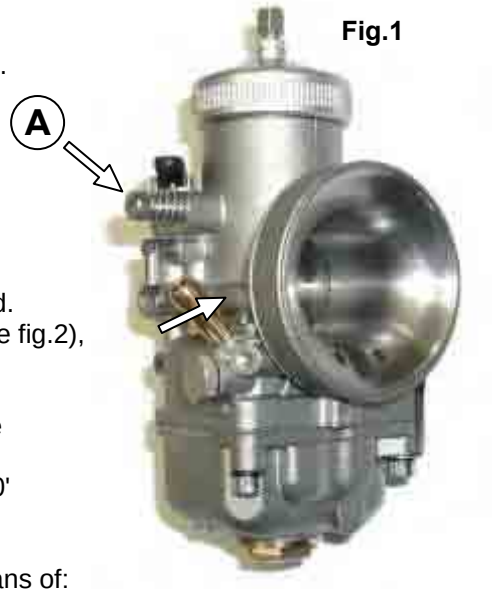
As a rule, we consider three ranges of operation: the idle RPM and low RPM, attainable with throttle lever slightly opened; the mid. RPM or intermediate RPM, attainable with intermediate opening of the throttle lever and the max RPM, attainable with max. opening throttle lever .
In a float chamber carburettor, such as this carburettor, specific devices are available to check the carburetion at each RPM range of operation; each of these devices intervenes on a specific area as described hereinafter, even if there is no clear distinction among the different areas.

The idle RPM can be adjusted by means of the "A screw " (see fig.1), which intervenes on the throttle valve by slightly lifting or and lowering it.
It is necessary to turn clockwise to increase the RPM, and turn counterclockwise to decrease it.
The carburetion at idle RPM can be set by means of :

- The idle jet in the float chamber
- The idle emulsion tube, located above the respective jet
- The air mixture idle screw

Generally, for standard adjustments, the emulsion tube is not concerned.
A richer mixture can be obtained by increasing the idle "L" jet size (see fig.2), and a leaner mixture by decreasing the above size.
The idle jet can be reached removing the carb. float chamber.
A richer carburetion is attainable by turning the air screw "B" clockwise (see fig.1); on the contrary, by unscrewing, you get a leaner carburetion. It is suggested to gradually perform the adjustment by 5÷10' turns per time. Then check the result.

Fig.1



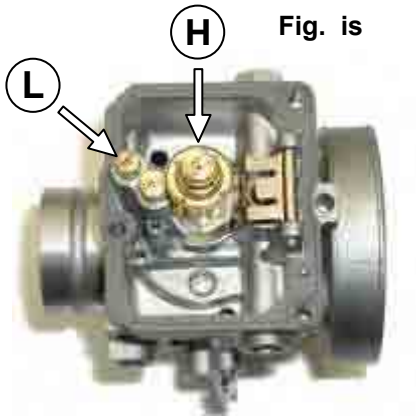
The adjustment of the carburation at mid range is performed by means of:

- The conical needle
- The needle jet

the conical needle acts as a shutter on the needle jet, and its axial position is determined by the throttle gas opening.
Thanks to its particular conical configuration, when the throttle opens gradually, the needle gradually releases the spray nozzle hole and regulates the gasoline flow.

The conical needle and the spray nozzle have been chosen to satisfy most of the conditions, and as a rule, it not necessary to replace them with others having different characteristics. The carburetion setting is performed by lifting or lowering the needle vs. the throttle gas.

Fig. is



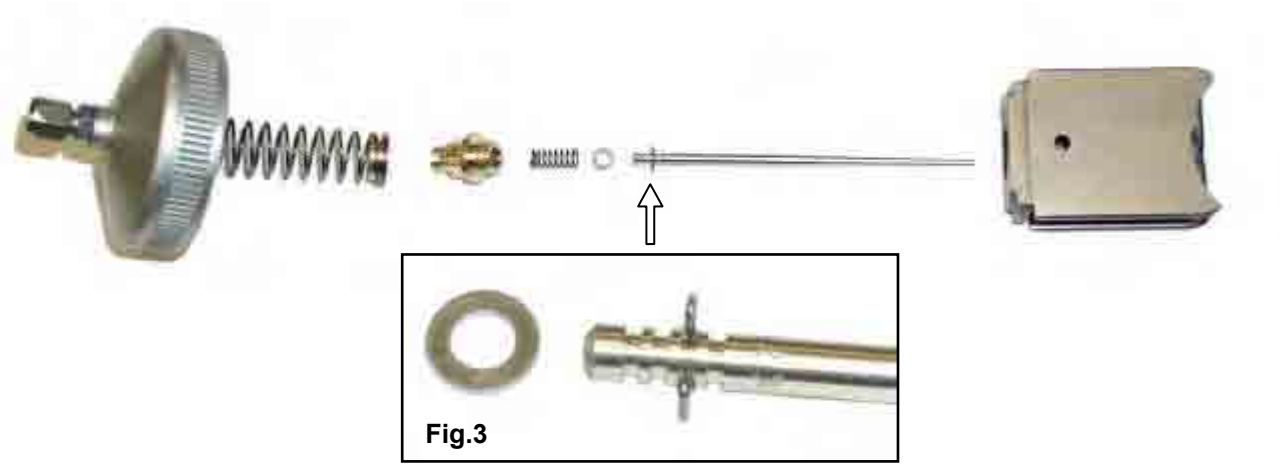


Fig.3

We will get a richer carburetion by lifting the needle, that is, by moving down the retainer clip to a lower notch; and on the contrary, a leaner carburetion is achieved lowering the needle, that is by lifting the retainer clip to a higher notch (see fig.3). On the picture is shown the basic needle adjustment.
To reach the conical needle proceed as follow: screw out the upper locking ring on the carb., then pull off the throttle gas together with the needle, release the throttle cable, and screw out the fixing screw on the throttle gas.

The adjustment of the carburetion at top RPM is mainly performed by means of:

- The max. jet

Fig.4

By increasing the "H" max jet size (see fig.2),
we get a richer carburetion, and vice versa, a leaner one,
by decreasing the jet size.

To reach to the max. Jet, screw out the central plug on the float chamber (see fig.4), or disassemble the float chamber itself.

As anticipated, there is no clear distinction among the areas of influence of the different components, as they interact and influence each other.
As a matter of fact, the max. jet affects, not only the carburetion, at wide open throttle gas, but also the whole mid range carburetion, even if less sensibly vs. the needle position;
indirectly, the needle position slightly influences the carburetion, at completely opened throttle.
In the same way, when the throttle is slightly opened, the effects of the min. jet and the air screw superimpose with the effect of the conical needle position.

To properly adjust the carburetion according to the ambient conditions, we are giving some indicative parameters, to adapt the max. jet size as a function of the variation of the ambient temperature and the altitude at which the engine is operating.
As you know, carburetion, that is, the exact quantity of fuel to be mixed to a given quantity of air, is influenced by atmospheric factors, such as temperature and pressure. The more the temperature drops, the more the air density increases and consequently, there will be more molecules of gas in the same volume. As the carb. mixes always the same fuel quantity this would be insufficient and the carb. will provide a leaner mixture. In these conditions, as you are aware, when operating with a leaner mixture, the engine runs the following risks: overheating, insufficient lubrication, detonation, seizure; for this reason the carburettor setting must be adjusted by increasing the max. jet size by about 2-3 points for every 6°C external temperature drop.
Of course, on the contrary, the more the temperature rises, the more the carburetion becomes richer and gives origin to less critical consequences than the ones experienced with a leaner carburetion. So, also in this case, it is suggested to optimize the carb. setting , by decreasing the max. jet size by about 2-3 points for every 6°C external temperature increase.
The variation of the atmospheric pressure, which is significant when varying the altitude at which the engine is operating, gives origin to such a phenomenon; by decreasing the altitude, the atmospheric pressure increases, consequently in the same air volume sucked by the engine, more molecules of gas are present Therefore, in this case too, a carb. adjustment is required; increase the max. jet size by about 2-3 points for every 350m altitude decrease.

On the contrary, by increasing the altitude it is necessary to reduce the max. jet size by about 2-3 points for every 350m altitude Increase.
The above data are only indicative, as many factors influence the carburetion and only a few among them are ponderable. With these indications we wish to give the owner a general guide line and avoid damaging the engine under variations of ambient conditions which make the carburetion substantially leaner.
A fine carb. adjustment will always have to be made according to the experience and to the tests performed on the track.

As completion of this guide line, here are a few general recommendations: . the carburettor is provided with an enrichment system for starting the engine ("C" lever - see fig.5) when the engine is cold and/or when the engine has been kept out of operation for a certain time. To get the max efficiency this device must be used with gas throttle closed or slightly opened. A few seconds after the engine has been started, shut the enrichment to avoid system to avoid flooding the carburettor.

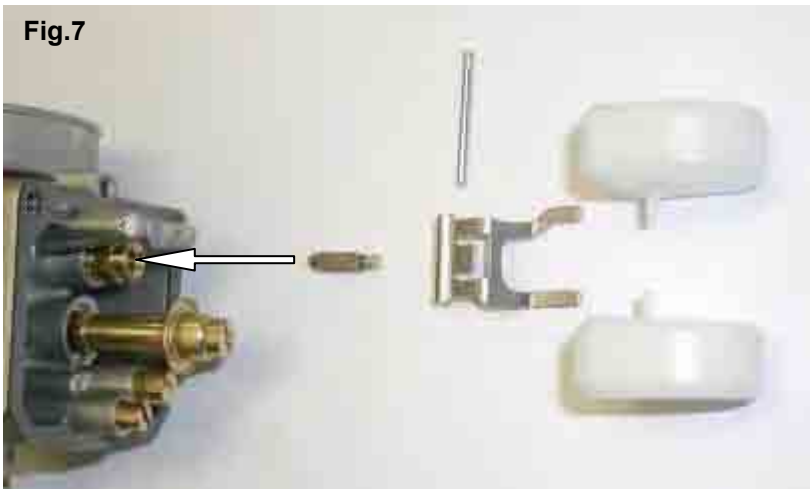
Fig.5

The real problems which could be experienced with these carburettors are exclusively connected to the fuel feeding.
The fuel feeding is regulated by the floater-valve system located in the float chamber.

- In case impurities (particles) are present in the fuel, these might prevent the admission valve from properly closing; the level in the float chamber will increase and the exceeding fuel is discharged through the carb. breather. In this case, it is necessary to disassemble the chamber, remove the floaters and the admission valve, then clean with compressed air (see fig.6 - 7).
- In case of puncture of one or both floaters, the admission valve cannot be closed, and so the exceeding fuel overflows through the breathers. In this case it is necessary to disassemble the float chamber, check the fuel feeding into the floaters and replace them with others with same weight.
  In case the engine has to remain out of operation for a long period, the fuel admission valve could get stuck (either on opening or on closing position) due to presence of incrustations.
  In the first case, the same fuel overflowing phenomenon from the carb. breathers is experienced, in the second, the engine does not start for insufficient feeding.
  It is therefore necessary to disassemble the float chamber, check if there is fuel inside, remove incrustations and re-establish the proper fuel admission through the floater-valve assembly.

Fig.6

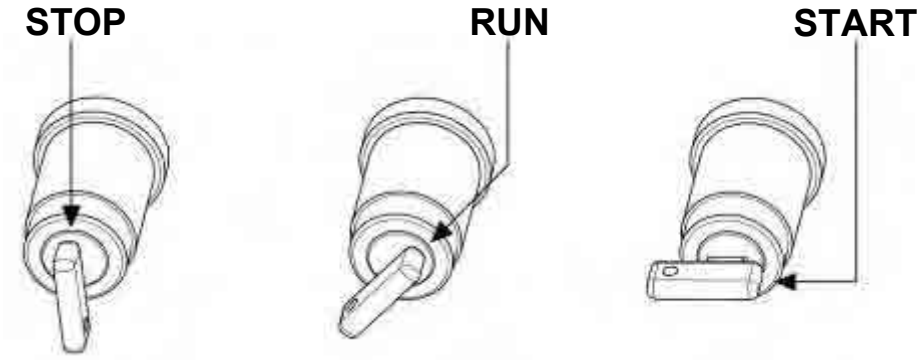
Fig.7



3.4 STARTING AND STOPPING THE ENGINE

Starting is achieved by the starting key.
This is a 3 position key:

1- STOP (key can be removed)
2- RUN
3- START



In STOP position, the battery is disconnected and the engine stop signal is sent to the electronic box.
In RUN position, the battery is connected to the system and the stop signal is removed.
In START position the battery is always connected and the electric starter operation signal is sent to the electronic box.

The START position can be stable or recovered by means of a return spring. In this case, once the engine is started, the spring automatically brings the key back to the RUN position.

ATTENTION:
The starting key assembly is provided with two original keys. It is recommended to separate the keys and to keep one in a protected place. In case of loss of both keys, it is necessary to replace the complete assembly.

The starting procedure, from STOP position, is as follows:

A) Turn the key to RUN position (this connects the battery).
B) Turn the key to START position to start the engine (the electric starter is immediately disengaged when turning the key to RUN position, or when the electronic box detects an engine RPM higher than 2000 RPM).
C) When the engine is started the key can be left both in START position (key assembly without return spring) or in RUN position. We suggest for practical reasons to always turn the key to RUN position; this allows with a single tripping to stop the engine (STOP position) or to restart it in case the engine is stopped (START position).

Note:
- in case the engine is stopped with the key in START position (key assembly without return spring), to restart it, turn the key in RUN position and then again to START position to activate the electric starter.
- with the key in RUN or START position and if the engine is stopped, to start the engine, an external starter unit can also be used.

In case the engine cannot be started within 5 seconds (check that fuel gets to the carb.) interrupt and try again after 15 seconds. Short and frequent tries are better than long ones.

To stop the engine, proceed as follows:

A) Turn the key in STOP position, both from RUN position (1 tripping) or from START position (2 trippings).

3.5 ENGINE BREAK-IN

The break-in of the engine must be performed following a few fundamental recommendations:

1. Adjust the carburetion. Start with a basic adjustment on the rich side.

2. Warm the engine gradually for about 5 minutes, at half throttle, making a few laps at low speed, gently closing and opening the carb. throttle (if a tachometer is installed never exceed 10.000 ÷ 11.000 RPM). **Never keep the same RPM for a long time.**

3. Increase the speed for 5 minutes (at throttle ¾ opening).
   Never keep the same RPM for a long time.

4. Increase the speed for 5 minutes at max. speed on the twisty parts and making the engine rich at half straight (cover with the hand, **for an instant,** the holes on the air filter, keeping the throttle wide open).

ATTENTION:
Once the break-in is over and the engine is cold, check the torque of the exhaust header nuts as , during the break-in, the nuts tend to become loose (refer to the attached table).

3.6 RPM LIMITATION

The electronic box integrates an RPM limiter which prevents the engine from exceeding 14000 RPMs for both F3 and F4 versions, 15000 RPM for F2 vers. and 16000 RPM for F1. vers.
The limit of 16000 RPMs cannot be exceeded, otherwise the engine could be damaged by the extremely high RPM.

ATTENTION:
Do not keep the engine for a long time at the RPM at which the limiter is operating. This would cause malfunctions on the induction and damage the reed valve. When choosing the sprocket ratio always refer to maximum limit so that the RPM limiter only intervenes on the longer straights on the track.

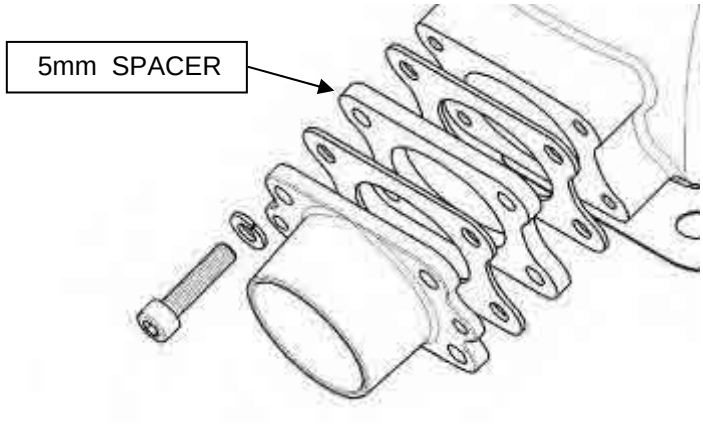
3.7 INLET SILENCER

Make sure that the inlet holes on the filter are towards the front side of kart and that they are not plugged. Make sure that the clamp on the carb. is not loose and that the filter is well fastened to the rail side chassis, by means of a ” craddle" support.

Once a while, clean the inside from oil deposits. If necessary remove the rubber filter union and clean it with gasoline or solvent.

3.8 EXHAUST SYSTEM

Before every test, make sure that the springs are well hooked and properly in place. In case of breakage, replace the broken spring. **Never race the kart without the 2 springs in place**, as otherwise the exhaust pipe could vibrate beyond control.
Every 10 ÷15 hrs, open the pipe end and make sure that the holes on the internal counter cone are not plugged.
The equipment muffler has already been tuned to achieve the best possible performance.
Having fixed a sprocket ratio, it could be necessary to improve the engine performance either at low or at high RPM. This could be achieved by modifying the suggested exhaust length, removing or adding the spacers placed behind the exhaust header.



In general, by shortening the total length, an improvement at high RPM is achieved, and vice versa, by lengthening it, the low RPM is improved.
When testing, though, never exceed in lengthening or shortening by more than 5mm per time.

3.9 EXHAUST VALVE ADJUSTMENT GUIDE (ONLY F1 - F2 - F4)

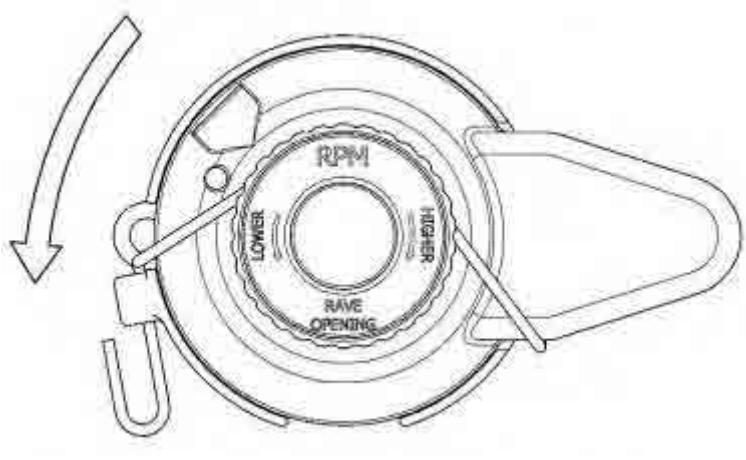
The engine is provided with a pneumatic power-valve on the exhaust duct to improve the performance at low RPM.
The power valve can be adjusted by turning the ring nut or by replacing the retaining spring inside the power valve.
The basic setting varies according to the spring type and is achieved by turning clockwise the ring nut until limit stop and then unscrewing and counting the number of notches necessary until you get an optimal setting.

- Ø 0.9mm / L=45mm spring wire: from the limit stop, unscrew the ring nut by 2 notches (all versions).

- Ø 1mm / L=43mm spring wire : from the limit stop, unscrew the ring nut by 15 notches (all versions).

Ø0.9mm / L=45mm
2 NOTCHES

Ø1mm / L=43mm
15 NOTCHES



NOTE ON THE PNEUMATIC POWER- VALVE OPERATION

The power-valve chokes the exhaust port opening at low RPM, and achieves a more limited port timing diagram and a reduced exhaust port. The power valve function is to optimize the engine performance up to a given RPM. Above this RPM, the power-valve will open to re-establish the original port timing, in the mid-top RPM range. For the REEDSTER engine, the opening RPM is set at approx. 9500 RPM.
In addition to the above, we can give a few recommendations to the driver for the proper adjustment of the power-valve. In any case, such a procedure can also be followed to for the best opening RPM setting.

- **If the power-valve opens too soon**, that is, below 9500 RPM, the driver will feel a power output discontinuity, just under this speed limit.
  In this case **screw (clockwise) the adjustment ring nut** on the power-valve, one notch at a time, until the phenomenon disappears.
- **If the power-valve opens too late**, that is, over 9500 RPM, the driver will feel a power output discontinuity, above this speed.
  In this case, **unscrew (ccw) the adjustment ring nut** on the power-valve, one notch at a time, until the phenomenon disappears.

The adjustment of the opening speed must be performed when the engine is warm and working at standard operation temperature.
When the engine is cold, as it normally happens between two working sessions, the oil residuals, which are present between the exhaust valve and its seat, reach a higher viscosity and this prevents the valve operation and delays its opening. This situation can be experienced when the engine has not reached its operating temperature, and this situation can be corrected, by slightly unscrewing the adjustment ring nut. We suggest though not to modify the setting, as, once the engine reaches the proper working temperature, the oil becomes more fluid and the valve starts working again properly ;no other intervention is required .

3.10 BATTERY

The battery (12 V – 7.2 Ah) is sealed and without maintenance.

In order to lengthen the battery life, it is necessary though to follow a few recommendations:

- When the tension drops below 12.6V it is necessary to recharge the battery
- Max. allowed recharging current is 1.8A.
- The ideal recharge is achieved with an average current of 0.8 ÷ 1 A. (recharging time approx. 10 hrs.) at an ambient temperature between 0° and 40°C.

ATTENTION:

An overcharge or an extremely quick charge with excessive current could damage the battery (the battery would tend to swell).

Choose a battery charger with the following characteristics:

- Feed tension: 90/250 Vac – 50/60 Hz
- Outlet tension: 15 V full charge – 13.8 stand-by
- Max. outlet tension: 2A full charge
- During transportation and/or storage the battery could loose its charge due to self discharge (0.1% max per day).
  Fully recharge battery before use.

ATTENTION:

Always connect the - (negative) terminal before and the pole + (positive terminal) after.

Always disconnect the battery in opposite order.

- Recharge the battery at least once every 6 months.
- Never put the battery in contact with solvents, oils, plastics, or rags containing such elements , as they may damage the external case.
- Never press or bend or overheat (by welding) the battery terminals.

Other recommendations

- Pay attention not to have free fires upon or around the battery.
- Never short-circuit the terminals.
- Never open the battery or throw it in the fire.
- In case the electrolyte (diluted with Sulphuric Acid) gets in contact with skin or clothes, wash immediately with water. In case it gets in touch with eyes, wash and apply for medical assistance.
- Carefully check the external case of battery and replace in case of breakages, swellings of the case or of battery cover.
- Before use, clean the battery from dust and check that the terminals are not oxidized or damaged.
- When the battery comes to an end never throw it in the garbage but deliver it to an authorized disposer.

3.11 WARNINGS ON THE ELECTRICAL SYSTEM

We are listing the main warnings on the electrical system.
Please keep this in mind during the whole life of the engine

ATTENTION:

If these prescriptions are not followed the electrical system and the engine could be damaged beyond repair. No obligation of IAME exists in this case.

1) Please turn the key to STOP position every time the engine is stopped. If the key is left in RUN position for a long time, even if the engine is stopped, the battery would be discharged completely.
2) Never disconnect the ground cables with eyelets (ground cables) when the engine is in operation.
3) Disconnecting the battery when the engine is in operation DOES NOT increase the engine performance. Vice versa, the ignition advance could become very irregular at low RPM thus reducing the performance.
4) To fasten the eyelet terminal (groundings) of the wiring harness always use flat or open washers. Never use tab washers.
5) When disconnecting the connectors, always press the fixing tongues. Always pull the connectors to disconnect. **NEVER PULL THE CABLES**.
6) The electronic box and the starting relay must always be installed with their connectors towards the bottom to avoid back water, dampness or dirt in the connector body.
7) Always correctly fix the H.T. coil with both screws, make sure that the laminations pack on the H.T. coil is connected to the engine with the grounding cable (copper cable or screws). The eyelet connector must be directly in contact with the lamination pack on the H.T. coil.
8) Never use H.T. coils different than the original coil on the engine. Use of a different coil may cause damages to the electronic box.
9) The digital assembly needs use of a resistive spark plug cap or spark plug. The resistor value must be equal or higher than 5 Kohm. Avoid use of resistive H.T. cables.
10) **The electric system is protected against the battery polarity reversal. When reversing the connectors on the battery, the protection circuit activates the fuse as soon as the key is in RUN o START position. The fuse must then be replaced.**
11) **Replace the fuse after having disconnected both terminals on the battery. Only use 5A strip fuse. Use of fuses with higher amperage might damage the electronic box whenever the battery polarity is reversed.**
12) Only use sealed lead type batteries as specified by IAME. Only use 12V. batteries.
13) Always disconnect the battery from the electrical system when recharging the battery with an external battery charger, otherwise the internal voltage regulator could be damaged.
14) DO NOT connect batteries in parallel; this might cause explosions and damages to the operator. The recharge of the battery, in normal conditions (battery charged, proper starting, etc…) is guaranteed by the electrical system. A few minutes of engine in operation is sufficient to recover the energy lost when starting the engine.
15) In case the battery must feed other users (tachometer telemetry, etc…),first contact IAME to check the recharge capacity of the system.
16) Modifications, interventions and additions to the original electric system might cause malfunctions. No obligation of IAME exists in this case.

3.12 SPARK PLUG AND THERMAL DEGREE

The engine is supplied with a standard **NGK BR10EG**, which represents a good compromise between the needs of a good break-in and the racing needs in normal conditions.
Use of different spark plugs is possible and, as a general information, we are attaching a correspondence list among spare plugs of other brands, based on **thermal degree** which represents the capacity of the spark plug to dissipate the internal heat.
The colour of the various parts of the spark plug more exposed to the combustion flames gives a good indication on the adequacy of the thermal degree and on the carburetion. It is necessary though to understand which of the two parameters has to be changed and only the experience tells how to identify the most proper thermal degree of a spark plug as lean or rich mixtures can generate the same final look which can also be achieved with a hot or cold spark plug.

See table:

An excessive warm spark plug shows the symptoms, listed aside. ***ATTENTION:*** ***Always use a warmer than standard spark plug with cold or rainy climate..***	▪ Extremely clear colour, porous look and calcification of the electrodes and of the internal insulation. ▪ Irregularities in the ignition, pre-ignition and detonation with tendency to perforate the top of the piston. ▪ ***Note: some of these symptoms can be achieved with lean mixtures.***
A correct thermal degree shows:	▪ Colour of the insulator end from yellow grey to dark brown for mixtures respectively lean or rich.
An excessively cold spark plug shows the symptoms, listed aside. ***ATTENTION:*** ***Always use a colder than standard spark plug with hot climates.***	▪ Insulator end and electrodes covered with black shady soot. ▪ Ignition difficulties. ▪ ***Note: a wet or oily electrode could also mean an excessively rich mixture.***

COMPARISON TABLE BASED ON THE THERMAL DEGREE

HOT

BOSCH	NGK	CHAMPION
WO8CS	BR9EG	N54R
WO7CS	BR10EG	N52R
WO6CS	BR11EG	

COLD

3.13 CHOICE OF THE BEST SPROCKET RATIO

The life of an engine depends on many factors but most of all, upon the speed at which the engine is operated. If an engine is normally operated at speed higher than what recommended by the manufacturer, the wears and stress of the various components (con-rod, roller cages, bearings etc.) will be such as to drastically reduce the life of the engine itself. It is therefore important that the user respect the operating limits imposed by the manufacturer.
The operation limit for the “Reedster” is 14000 RPM for F3 and F4, 15000 RPM for F2 and 16000 RPM for F1 (the RPM limiter is calibrated at these values).

ATTENTION:
Never exceed the above limit. No obligation of IAME exists in case the above limit is exceeded.

In case the user wishes to optimize, on the track, the sprocket ratio in order to achieve the best possible performance without abusing the engine, follow the under shown recommendations.

The engines are supplied with a 12 teeth sprocket (pitch 7.775 mm.), but 11 and 13 teeth sprockets are available as accessories. Table 1 shows the various ratios between the sprocket on the axle and the engine sprocket given the different axle and engine sprockets.

Tab.1

Sprocket ratio	Teeth n° - engine sprocket			Sprocket ratio	Teeth n° - engine sprocket		
Teeth n° axle sprocket	11	12	13	Teeth n° axle sprocket	11	12	13
72	6,55	6	5,54	83	7,55	6,92	6,38
73	6,64	6,08	5,61	84	7,64	7	6,46
74	6,73	6,17	5,69	85	7,73	7,08	6,54
75	6,82	6,25	5,77	86	7,82	7,17	6,61
76	6,91	6,33	5,85	87	7,91	7,25	6,69
77	7,00	6,42	5,92	88	8,00	7,33	6,77
78	7,09	6,5	6	89	8,09	7,42	6,85
79	7,18	6,58	6,08	90	8,18	7,5	6,92
80	7,27	6,67	6,15	91	8,27	7,58	7
81	7,36	6,75	6,23	92	8,36	7,67	7,08
82	7,45	6,83	6,3				

To achieve the max RPM speed of 13500 RPM, the table N°2 has been prepared.
To achieve the max RPM speed of 14500 RPM, the table N°3 has been prepared.
To achieve the max RPM speed of 15500 RPM, the table N°4 has been prepared.

SUGGESTION:

- **During the track tests we recommend use of a tachometer recording the max. obtained engine RPM.**
- **Use spark plug caps or spark plugs with a min. resistance of 5KΩ to avoid eventual interferences between the engine ignition and the tachometer and/or telemetry.**

The following example should clarify the procedure for optimization of sprocket ratio : assume to use an engine, in the F4 version with a Z=12 sprocket, and that during the preliminary track tests a Z=78 teeth axle sprocket has been used.

- From the table 1 with Z=12 as engine sprocket and Z=78 on the axle sprocket , a ratio of 6,5 is found.
- Make a few laps on the track and let us assume that you read a max. of 12500 engine RPM .
- From table 2, to achieve a max. RPM of 13500 (operating limit for F4 engine version) a sprocket ratio from 7,08 and 6,96 should be used (having used during the tests, a sprocket ratio of 6,5 and having achieved 12500 RPM).
- From table 1, with these values, a sprocket ratio of 12:85 or 12:83 should be used or having a Z=11 on the engine sprocket, a ratio of 11:77 should be used.

SPROCKET RATIO TO ACHIEVE MAX. 13500 RPM (F3 e F4) Tab. 2

Max Engine RPM during tests	Sprocket ratio																	
	5,5	5,7	5,9	6,1	6,3	6,5	6,7	6,9	7,1	7,3	7,5	7,7	7,9	8,1	8,3	8,5	8,7	8,9
12000	6,19	6,41	6,64	6,86	7,09	7,31	7,54	7,76	7,99	8,21	8,44	8,66	8,89	9,11	9,34	9,56	9,79	10,01
12200	6,09	6,31	6,53	6,75	6,97	7,19	7,41	7,64	7,86	8,08	8,30	8,52	8,74	8,96	9,18	9,41	9,63	9,85
12400	5,99	6,21	6,42	6,64	6,86	7,08	7,29	7,51	7,73	7,95	8,17	8,38	8,60	8,82	9,04	9,25	9,47	9,69
12600	5,89	6,11	6,32	6,54	6,75	6,96	7,18	7,39	7,61	7,82	8,04	8,25	8,46	8,68	8,89	9,11	9,32	9,54
12800	5,80	6,01	6,22	6,43	6,64	6,86	7,07	7,28	7,49	7,70	7,91	8,12	8,33	8,54	8,75	8,96	9,18	9,39
13000	5,71	5,92	6,13	6,33	6,54	6,75	6,96	7,17	7,37	7,58	7,79	8,00	8,20	8,41	8,62	8,83	9,03	9,24
13200	5,63	5,83	6,03	6,24	6,44	6,65	6,85	7,06	7,26	7,47	7,67	7,88	8,08	8,28	8,49	8,69	8,90	9,10
13400	5,54	5,74	5,94	6,15	6,35	6,55	6,75	6,95	7,15	7,35	7,56	7,76	7,96	8,16	8,36	8,56	8,76	8,97
13600	5,46	5,66	5,86	6,06	6,25	6,45	6,65	6,85	7,05	7,25	7,44	7,64	7,84	8,04	8,24	8,44	8,64	8,83
13800	5,38	5,58	5,77	5,97	6,16	6,36	6,55	6,75	6,95	7,14	7,34	7,53	7,73	7,92	8,12	8,32	8,51	8,71
14000	5,30	5,50	5,69	5,88	6,08	6,27	6,46	6,65	6,85	7,04	7,23	7,43	7,62	7,81	8,00	8,20	8,39	8,58
14200	5,23	5,42	5,61	5,80	5,99	6,18	6,37	6,56	6,75	6,94	7,13	7,32	7,51	7,70	7,89	8,08	8,27	8,46
14400	5,16	5,34	5,53	5,72	5,91	6,09	6,28	6,47	6,66	6,84	7,03	7,22	7,41	7,59	7,78	7,97	8,16	8,34
14600	5,09	5,27	5,46	5,64	5,83	6,01	6,20	6,38	6,57	6,75	6,93	7,12	7,30	7,49	7,67	7,86	8,04	8,23
14800	5,02	5,20	5,38	5,56	5,75	5,93	6,11	6,29	6,48	6,66	6,84	7,02	7,21	7,39	7,57	7,75	7,94	8,12
15000	4,95	5,13	5,31	5,49	5,67	5,85	6,03	6,21	6,39	6,57	6,75	6,93	7,11	7,29	7,47	7,65	7,83	8,01
15200	4,88	5,06	5,24	5,42	5,60	5,77	5,95	6,13	6,31	6,48	6,66	6,84	7,02	7,19	7,37	7,55	7,73	7,90
15400	4,82	5,00	5,17	5,35	5,52	5,70	5,87	6,05	6,22	6,40	6,57	6,75	6,93	7,10	7,28	7,45	7,63	7,80
15600	4,76	4,93	5,11	5,28	5,45	5,63	5,80	5,97	6,14	6,32	6,49	6,66	6,84	7,01	7,18	7,36	7,53	7,70
15800	4,70	4,87	5,04	5,21	5,38	5,55	5,72	5,90	6,07	6,24	6,41	6,58	6,75	6,92	7,09	7,26	7,43	7,60
16000	4,64	4,81	4,98	5,15	5,32	5,48	5,65	5,82	5,99	6,16	6,33	6,50	6,67	6,83	7,00	7,17	7,34	7,51

SPROCKET RATIO TO ACHIEVE MAX. 14500 RPM (F2)

Tab. 3

Max. engine RPM during tests	Sprocket ratio																	
	5,5	5,7	5,9	6,1	6,3	6,5	6,7	6,9	7,1	7,3	7,5	7,7	7,9	8,1	8,3	8,5	8,7	8,9
12000	6,65	6,89	7,13	7,37	7,61	7,85	8,10	8,34	8,58	8,82	9,06	9,30	9,55	9,79	10,03	10,27	10,51	10,75
12200	6,54	6,77	7,01	7,25	7,49	7,73	7,96	8,20	8,44	8,68	8,91	9,15	9,39	9,63	9,86	10,10	10,34	10,58
12400	6,43	6,67	6,90	7,13	7,37	7,60	7,83	8,07	8,30	8,54	8,77	9,00	9,24	9,47	9,71	9,94	10,17	10,41
12600	6,33	6,56	6,79	7,02	7,25	7,48	7,71	7,94	8,17	8,40	8,63	8,86	9,09	9,32	9,55	9,78	10,01	10,24
12800	6,23	6,46	6,68	6,91	7,14	7,36	7,59	7,82	8,04	8,27	8,50	8,72	8,95	9,18	9,40	9,63	9,86	10,08
13000	6,13	6,36	6,58	6,80	7,03	7,25	7,47	7,70	7,92	8,14	8,37	8,59	8,81	9,03	9,26	9,48	9,70	9,93
13200	6,04	6,26	6,48	6,70	6,92	7,14	7,36	7,58	7,80	8,02	8,24	8,46	8,68	8,90	9,12	9,34	9,56	9,78
13400	5,95	6,17	6,38	6,60	6,82	7,03	7,25	7,47	7,68	7,90	8,12	8,33	8,55	8,76	8,98	9,20	9,41	9,63
13600	5,86	6,08	6,29	6,50	6,72	6,93	7,14	7,36	7,57	7,78	8,00	8,21	8,42	8,64	8,85	9,06	9,28	9,49
13800	5,78	5,99	6,20	6,41	6,62	6,83	7,04	7,25	7,46	7,67	7,88	8,09	8,30	8,51	8,72	8,93	9,14	9,35
14000	5,70	5,90	6,11	6,32	6,53	6,73	6,94	7,15	7,35	7,56	7,77	7,98	8,18	8,39	8,60	8,80	9,01	9,22
14200	5,62	5,82	6,02	6,23	6,43	6,64	6,84	7,05	7,25	7,45	7,66	7,86	8,07	8,27	8,48	8,68	8,88	9,09
14400	5,54	5,74	5,94	6,14	6,34	6,55	6,75	6,95	7,15	7,35	7,55	7,75	7,95	8,16	8,36	8,56	8,76	8,96
14600	5,46	5,66	5,86	6,06	6,26	6,46	6,65	6,85	7,05	7,25	7,45	7,65	7,85	8,04	8,24	8,44	8,64	8,84
14800	5,39	5,58	5,78	5,98	6,17	6,37	6,56	6,76	6,96	7,15	7,35	7,54	7,74	7,94	8,13	8,33	8,52	8,72
15000	5,32	5,51	5,70	5,90	6,09	6,28	6,48	6,67	6,86	7,06	7,25	7,44	7,64	7,83	8,02	8,22	8,41	8,60
15200	5,25	5,44	5,63	5,82	6,01	6,20	6,39	6,58	6,77	6,96	7,15	7,35	7,54	7,73	7,92	8,11	8,30	8,49
15400	5,18	5,37	5,56	5,74	5,93	6,12	6,31	6,50	6,69	6,87	7,06	7,25	7,44	7,63	7,81	8,00	8,19	8,38
15600	5,11	5,30	5,48	5,67	5,86	6,04	6,23	6,41	6,60	6,79	6,97	7,16	7,34	7,53	7,71	7,90	8,09	8,27
15800	5,05	5,23	5,41	5,60	5,78	5,97	6,15	6,33	6,52	6,70	6,88	7,07	7,25	7,43	7,62	7,80	7,98	8,17
16000	4,98	5,17	5,35	5,53	5,71	5,89	6,07	6,25	6,43	6,62	6,80	6,98	7,16	7,34	7,52	7,70	7,88	8,07

SPROCKET RATIO TO ACHIEVE MAX. 15500 RPM (F1)

Tab. 4

Max. engine RPM during tests	Sprocket ratio																	
	5,5	5,7	5,9	6,1	6,3	6,5	6,7	6,9	7,1	7,3	7,5	7,7	7,9	8,1	8,3	8,5	8,7	8,9
12000	7,10	7,36	7,62	7,88	8,14	8,40	8,65	8,91	9,17	9,43	9,69	9,95	10,20	10,46	10,72	10,98	11,24	11,50
12200	6,99	7,24	7,50	7,75	8,00	8,26	8,51	8,77	9,02	9,27	9,53	9,78	10,04	10,29	10,55	10,80	11,05	11,31
12400	6,88	7,13	7,38	7,63	7,88	8,13	8,38	8,63	8,88	9,13	9,38	9,63	9,88	10,13	10,38	10,63	10,88	11,13
12600	6,77	7,01	7,26	7,50	7,75	8,00	8,24	8,49	8,73	8,98	9,23	9,47	9,72	9,96	10,21	10,46	10,70	10,95
12800	6,66	6,90	7,14	7,39	7,63	7,87	8,11	8,36	8,60	8,84	9,08	9,32	9,57	9,81	10,05	10,29	10,54	10,78
13000	6,56	6,80	7,03	7,27	7,51	7,75	7,99	8,23	8,47	8,70	8,94	9,18	9,42	9,66	9,90	10,13	10,37	10,61
13200	6,46	6,69	6,93	7,16	7,40	7,63	7,87	8,10	8,34	8,57	8,81	9,04	9,28	9,51	9,75	9,98	10,22	10,45
13400	6,36	6,59	6,82	7,06	7,29	7,52	7,75	7,98	8,21	8,44	8,68	8,91	9,14	9,37	9,60	9,83	10,06	10,29
13600	6,27	6,50	6,72	6,95	7,18	7,41	7,64	7,86	8,09	8,32	8,55	8,78	9,00	9,23	9,46	9,69	9,92	10,14
13800	6,18	6,40	6,63	6,85	7,08	7,30	7,53	7,75	7,97	8,20	8,42	8,65	8,87	9,10	9,32	9,55	9,77	10,00
14000	6,09	6,31	6,53	6,75	6,98	7,20	7,42	7,64	7,86	8,08	8,30	8,53	8,75	8,97	9,19	9,41	9,63	9,85
14200	6,00	6,22	6,44	6,66	6,88	7,10	7,31	7,53	7,75	7,97	8,19	8,40	8,62	8,84	9,06	9,28	9,50	9,71
14400	5,92	6,14	6,35	6,57	6,78	7,00	7,21	7,43	7,64	7,86	8,07	8,29	8,50	8,72	8,93	9,15	9,36	9,58
14600	5,84	6,05	6,26	6,48	6,69	6,90	7,11	7,33	7,54	7,75	7,96	8,17	8,39	8,60	8,81	9,02	9,24	9,45
14800	5,76	5,97	6,18	6,39	6,60	6,81	7,02	7,23	7,44	7,65	7,85	8,06	8,27	8,48	8,69	8,90	9,11	9,32
15000	5,68	5,89	6,10	6,30	6,51	6,72	6,92	7,13	7,34	7,54	7,75	7,96	8,16	8,37	8,58	8,78	8,99	9,20
15200	5,61	5,81	6,02	6,22	6,42	6,63	6,83	7,04	7,24	7,44	7,65	7,85	8,06	8,26	8,46	8,67	8,87	9,08
15400	5,54	5,74	5,94	6,14	6,34	6,54	6,74	6,94	7,15	7,35	7,55	7,75	7,95	8,15	8,35	8,56	8,76	8,96
15600	5,46	5,66	5,86	6,06	6,26	6,46	6,66	6,86	7,05	7,25	7,45	7,65	7,85	8,05	8,25	8,45	8,64	8,84
15800	5,40	5,59	5,79	5,98	6,18	6,38	6,57	6,77	6,97	7,16	7,36	7,55	7,75	7,95	8,14	8,34	8,53	8,73
16000	5,33	5,52	5,72	5,91	6,10	6,30	6,49	6,68	6,88	7,07	7,27	7,46	7,65	7,85	8,04	8,23	8,43	8,62

Section 4 - ENGINE BASIC MAINTENANCE

4.1 RECOMMENDATIONS ON CENTRIFUGAL CLUTCH

The engine has a low maintenance dry centrifugal clutch. The following prescriptions if carefully followed, will allow a long clutch life.
When starting the engine, make sure that the brake pedal is fully pressed to avoid sudden accelerations.

ATTENTION:

Once the kart is started, avoid useless accelerations which can overheat and deteriorate the clutch. Oil the chain before each test.
When lubricating the chain avoid the oil penetration through the lightening holes of the drum . Therefore do not spray oil close to the sprocket, but inside the lower branch of the chain near the sprocket on the axle.
In case of lubricant penetration into the clutch, the clutch dragging speed will slightly increase. This overheats and deteriorates the components of the clutch.
In case this happens by accident stop the engine immediately and, degrease the clutch drum and hub with specific solvents.
Check the sprocket status after each race or test and replace if necessary.
A bad alignment of the sprocket with the axle sprocket or the lack of oil will damage the sprocket beyond repair.

Check the clutch:

- Every 5 hours of use.
- When metallic noises are heard inside the clutch.
- If the kart dragging speed exceeds 5000 RPM.
- Every time the clutch has overheated (presence of smoke o smell of burning).

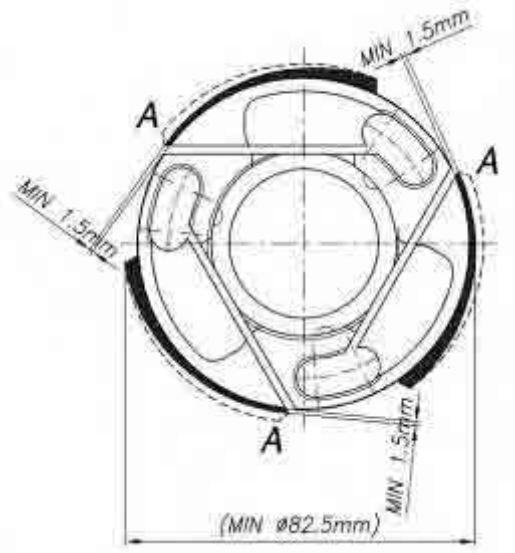
To check the clutch, you must remove the clutch cover and the clutch drum.

Replace the clutch:

- Whenever the thickness of the friction material (see drawing) is lower than 1.5mm on point A of the clutch , or, if the body diameter is lower than 82.5mm.
- Whenever the external friction material in the A portion of the clutch is very rough (wear or degradation of the friction material due to overheating).

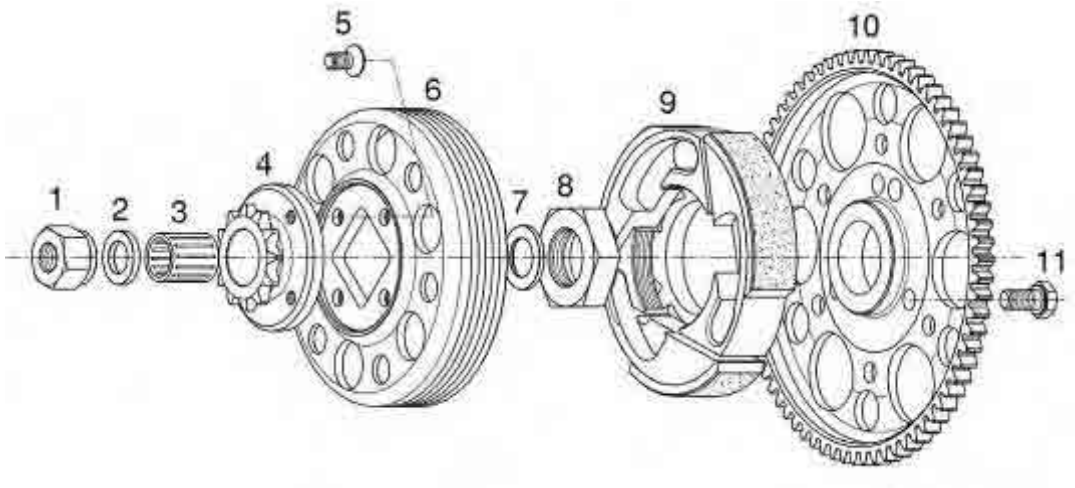
ATTENTION:

In case the friction material has been totally worn out and there has been a metal contact between the clutch body and the clutch drum, it is necessary to replace the clutch drum.



4.2 INSTRUCTIONS FOR THE DISASSEMBLY/ASSEMBLY OF THE CLUTCH

ATTENTION:
the following operations can be performed by a skilled mechanic, under the condition to have available the dedicated tools shown on the text; otherwise it is necessary to apply to an Authorized Service Center.
Refer to the following drawing during the operations.



1 Drum nut
2 External washer
3 Roller cage
4 Sprocket
5 Screw
6 Clutch drum
7 Internal washer
8 Locking nut
9 Clutch body
10 Starter ring
11 Screw

OPERATIONS	TOOLS
Clutch disassembly	
1. Remove the clutch cover (3 screws M6).	▪ Allen Wrench 5mm – T type
2. Remove the spark plug and replace with special tool to prevent crankshaft from turning.	▪ Piston fitting: P.N. 10271
3. Remove nut (1 screw M10x1).	▪ 12 point wrench 17 mm
4. Remove the external washer, the drum complete with roller cage, the internal washer.	
5. Remove the special tool from the head and using the clutch wrench, remove the 20x1 nut and the starter ring. ***ATTENTION: turn clockwise as the nut has the left thread.***	▪ Clutch wrench: P.N. S884 ▪ 30 mm socket
6. Apply the clutch puller on clutch and remove the clutch, with starter ring.	▪ Clutch puller :P.N. 10272-C ▪ 12 point wrench 19mm.
7. Remove the starter ring (3 screws M6)	▪ 12 point wrench 10 mm

Before assembling the clutch, wash with diluent the shaft taper, the connecting hole on the clutch body, the clutch drum and the starter ring.

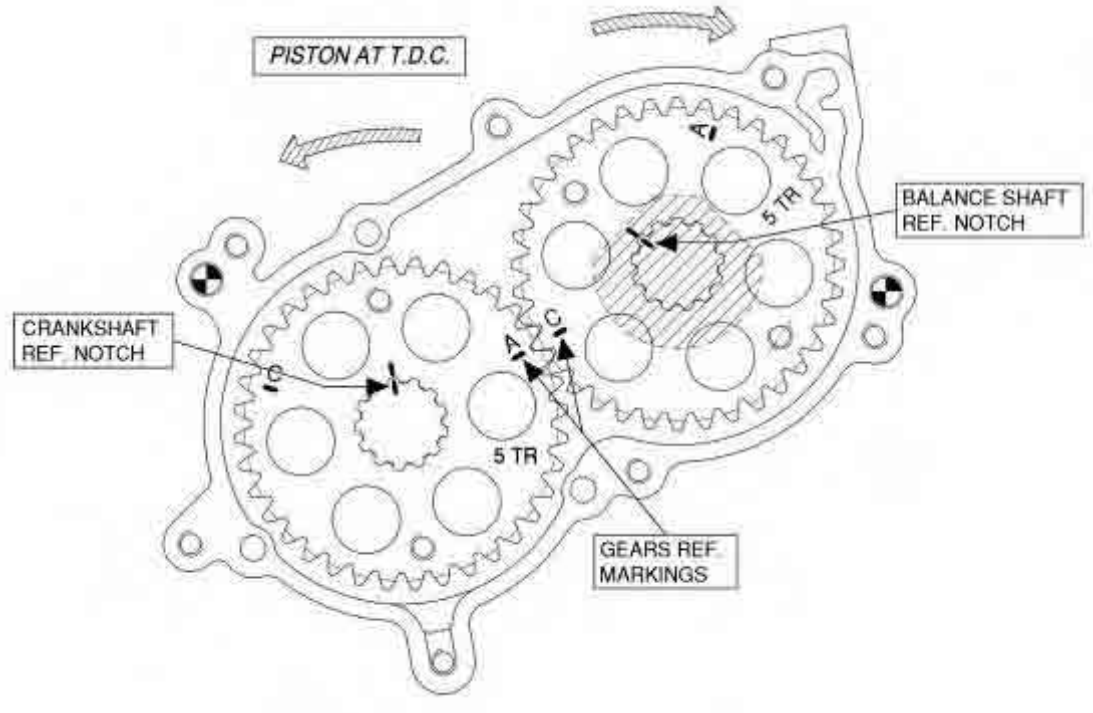
Install clutch	
1. Install the starter ring on the clutch body by matching the three holes and the dragging pin (3 screws TE M6) ⚠ ***ATTENTION: make sure to always install the Ø 7 mm dragging pin as otherwise, the eventual kick backs, could break the screws.***	▪ 12 point wrench 10 mm (Torque at 10 Nm) (90 in-lb) (apply "Loctite" on the threads)
2. Install the clutch body and the starter ring.	Apply "Loctite 641" for coaxial lockings.
3. Install the clutch body fixing nut and starter ring, using the clutch wrench. ⚠ ***ATTENTION: turn counterclockwise as nut has left thread.***	▪ Locking tool: P.N. S884 ▪ Allen wrench - 30 mm. (torque at 100 ÷ 120 Nm)
4. Install inner washer. ⚠ ***ATTENTION: install washer with bevel towards the crankshaft.*** Clean the roller cage and grease it before installing it on the crankshaft.	
5. Install the clutch drum and the external washer . ⚠ ***ATTENTION: install washer with bevel towards the crankshaft.***	
6. Install the piston fitting to prevent the shaft from turning and install the clutch cover (M10x1 nut)	▪ Piston fitting: P.N. 10271 ▪ 17 mm socket (torque at 30 ÷ 40 Nm) (265 ÷ 360 in-lb)
7. Install the clutch cover (3 screws M 6)	▪ Allen wrench 5 mm- T type. (torque at 8 ÷ 10 Nm) (70 ÷ 90 in÷lb)

4.3 GEAR TIMING SCHEMATIC

In case of assembly of the gears which drive the balance shaft, assembly must be performed following the timing schematic shown below.

⚠ ***ATTENTION:***

An incorrect assembly of the gears can cause a malfunction in the vibration reduction system and damage the engine beyond repair.



4.4 SCHEDULED MAINTENANCE

Following some simple maintenance recommendations will allow the engine to perform more reliably and have a longer life.

SCHEDULE	COMPONENTS	ACTIONS AND COMMENTS
Before using	Exhaust fitting springs	Check status
	Muffler	Check status and fixing
	Engine sprocket	Check wear Check alignment with axle sprocket
	Engine chain	Check wear, tensioning and oil chain
	Battery	Check status and charge
	Cables and connectors	Check status and connectors
	Grounding of cables and coil	Check status and connectors
	Engine mounts and clamps	Check torques
After use	Battery	disconnect
	Chain	Oil chain
	Engine	External cleaning
Every 4 hrs	Piston	Replace
Every 5 ÷ 10 hrs	Bendix assembly	Remove cover (see fig.) and clean internally
		
	Exhaust muffler	Remove muffler end, clean
	Inlet silencer	Open, clean
	Engine head	Open, clean
	Power-valve	Open, clean
	Clutch	Open check status of parts
Every 10 hrs.	Piston and con-rod assembly	Check and replace worn parts
	crankshaft	Check and replace worn parts
	Bearings	Check and replace worn parts
Every 20 hrs.	Bearings / balance shaft	Check and replace worn parts
	Gears	Check and replace worn parts
	Balance shaft	Check and replace worn parts

4.5 TROUBLESHOOTING

Below are some common faults, their probable causes and suggested remedy .

FAULTS	PROBABLE CAUSES	REMEDY
Starter will not crank when turning the key to RUN position	Bad connections on starter cables	Check and tighten
	Bad grounding	Check connections and tighten
	Interruption on fuse	Replace (5A) strip fuse, after checking for eventual reversal of battery polarity)
	Damaged cables	Replace
	Battery connections loose	Check and tighten
	Battery discharged	Recharge or replace battery
	Starter failure	Check
	Electronic box or relay failure	Apply to authorized Service Centers
Starter cranks but engine won't start when turning the key in RUN position.	Bad cable connection	Check connectors.
	Bad H.T coil connections or coil failure	Check / replace
	Bad H.T. coil grounding	Check grounding
	Electronic box or ignition failure	Apply to authorized Service Centers
	Wet spark plug	Replace
	Malfunction on induction system	Check status and connection on fuel pipe
		Replace gaskets and membranes on carburettor
		Check reed petals. Replace if necessary.
Engine starts but it stops after a few seconds when turning the key in RUN position.	Bad cable connection	Check stator connector
	Electronic box or ignition failure	Apply to authorized Service Centers
	Bad carburettor adjustment (screw l)	Check carburettor adjustment (see sect. 3.3)
The starter cranks also after the engine is running.	Electronic box failure	Apply to authorized Service Centers
	Starter relay remains excited	Replace starter relay
Rough idle	Bad carburettor adjustment (screw l)	Check carburettor adjustment (see sect. 3.3)
Drop in engine performance	Bad compression	Check piston
	Bad carb. adjustment	Check carburettor adjustment (see sect. 3.3)
	Insufficient fuel flow	Check fuel flow lines and inlet filter
	Dirty inlet silencer	Check and clean
Bruning smell, smoke	Clutch overheating	Check clutch (see sect. 4.1)
Clutch engages at too high RPM	Excessive wear of friction material	Check clutch (see sect. 4.1)
	Oil leakage between hub and drum	Clean and degrease carefully
Exhaust too noisy	Damaged muffler	Check and replace if necessary
	Damaged or lost springs	
	Damaged exhaust header	

4.6 ENGINE AND ACCESSORIES PRESERVATION

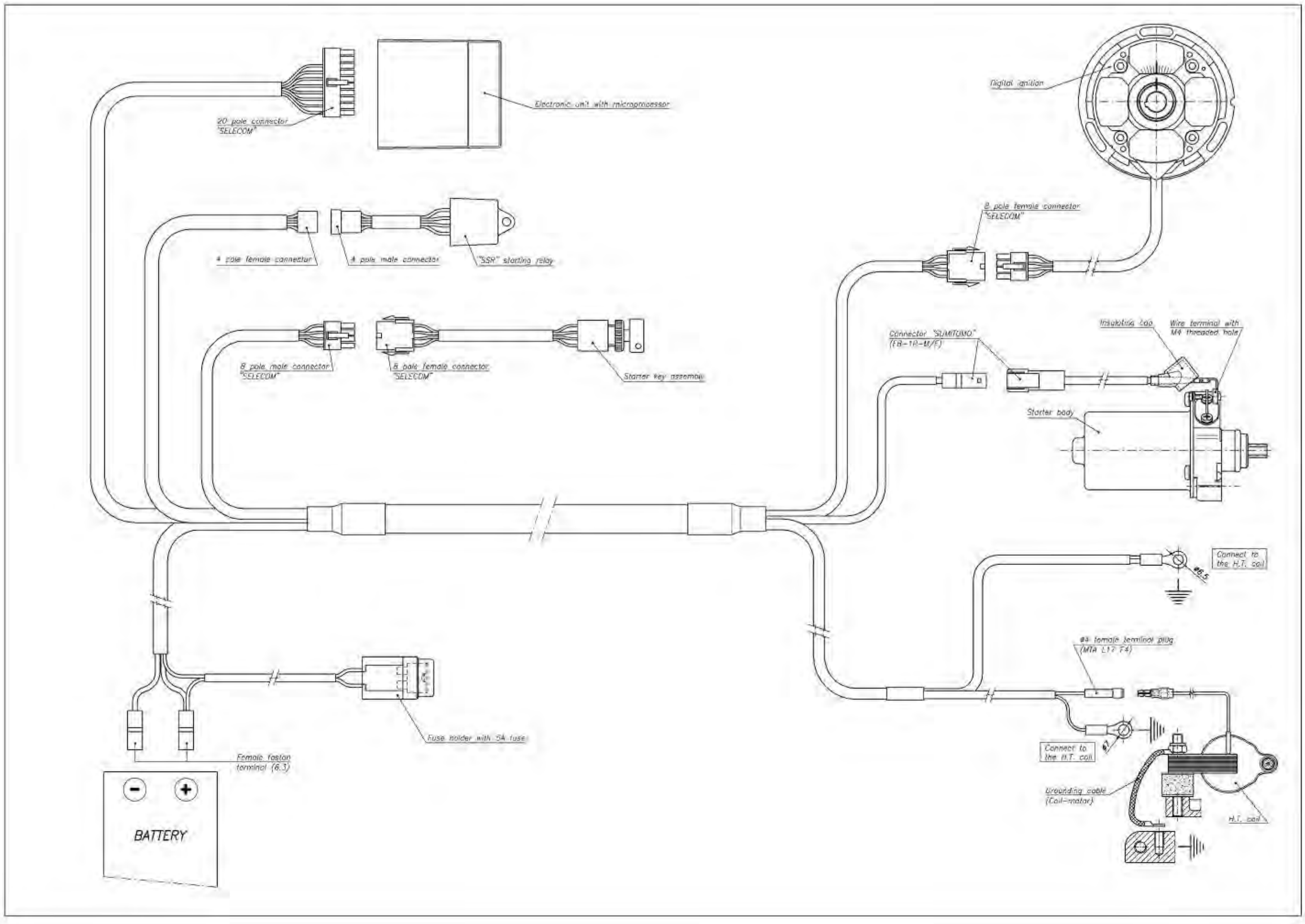
When engine is to remain out of operation for a long period it must be preserved as follows:

- Disconnect battery and recharge it periodically (see sect. 3.10)
- Disconnect carburettor and clean it
- Seal with tape the engine, inlet and exhaust

The external of the engine must be cleaned. Spray with protective oil, the steel parts subject to oxidation. Keep the engine in a dry ambient.

4.7 TORQUE VALUES

NOMINAL SIZE	Q.TY	FASTENER NAME	WRENCH	VALUES(Nm)	VALUES(in•lb)
M14 x 1.25	1	Spark plug	Hex. 20.8	20 – 26	175 – 230
M8 x 1.25	5	Head nut	Hex. 13	18 – 22	160 – 190
M8 x 1.25	4	Cylinder nut	Hex. 12	18 – 22	160 – 190
M6 x 1	4	Exhaust nut	Allen 5	8 – 10	70 – 90
M6 x 1	4	Reed group screw	Allen 5	8 – 10	70 – 90
M5 x 0.8	3	Ignition stator fixing screw	Allen 4	5 – 6	45 – 50
M12 x 1	1	Ignition rotor fixing nut	Hex. 17	20 – 26	175 – 230
M6 x 1	3	Countershaft support screw	Allen 5	6 – 8	50 – 70
M6 x 1	4	Starter fixing screw	Allen 5	8 – 10	70 – 90
M6 x 1	3	Clutch cover fixing screw	Allen 5	6 – 8	50 – 70
M10 x 1	1	Clutch drum holding nut	Hex. 17	30 – 40	265 – 350
M20 x 1	1	Starter ring and clutch fix. nut	Hex. 30	100–120	885–1060
M5 x 0.8	4	Engine sprocket fixing screw	Allen 3	6 – 8	50 – 70
M6 x 1	3	Clutch to the ring fix. screw	Hex. 10	10 – 12	90 – 105
M6 x 1	9	Crankcase fixing screw	Allen 5	10 – 12	90 – 105
M6 x 1	7	Gears cover fixing screw	Allen 5	8 – 10	70 – 90
M6 x 1	6	Bal. shaft supp. fix. screw	Allen 5	10 – 12	90 – 105
M6 x 1	2	Coil fixing nut	Hex. 10	8 – 10	70 – 90
M6 x 1	1	Coil/elec. box graund. screw	Allen 5	8 – 10	70 – 90
M8 x 1	2	Oil lev. plug/bal. shaft insp.	Allen 4	12 – 15	105 – 130
M8 x 1	2	Intake manifold / oil drain	Hex. 11	12 – 15	105 – 130
M18 x 1	1	Crankshaft gear fixing nut	Hex. 27	50 – 55	440 – 480
M6 x 1	4	Water pump cover fix. screw	Allen 5	8 – 10	70 – 90
M5 x 0.8	1	Water pump impeller screw	Hex. 8	5 – 6	45 – 50
M5 x 0.8	2	Plate fixing screw	Allen 3	5 – 6	45 – 50
M6 x 1	2	Power–valve fixing screw	Allen 5	8 – 10	70 – 90
M6 x 1	2	Starter clamp fixing screw	Allen 5	8 – 10	70 – 90
M6 x 1	2	Fuel pump fixing nut	Hex. 10	8 – 10	70 – 90


20 pole connector "SELECOM"
Electronic unit with microprocessor
Digital ignition
8 pole female connector "SELECOM"
4 pole female connector
4 pole male connector
"SSR" starting relay
8 pole male connector "SELECOM"
8 pole female connector "SELECOM"
Starter key assembly
Connector "SUMITOMO" (TS-1P-M/F)
Insulating cap
Wire terminal with M4 threaded hole
Starter body
Connect to the H.T. coil
ø6.5
ø4 female terminal plug (MTA L17 F4)
Connect to the H.T. coil
Grounding cable (Coil-motor)
H.T. coil
Fuse holder with 5A fuse
Female faston terminal (6.3)
BATTERY