

X30 125cc Spec. USA

ASSEMBLY INSTRUCTIONS AND USER MANUAL

FEEDING

Fuel mixture **98 RON** and oil **5%** (20:1) minimum. Engine oil CIK homologated.

Our experience dictates use of oils, such as:

- WLADOIL K 2T;
- ELF HTX 909;
- ELF HTX 976;
- LEXOIL 996.

LUBRIFICATION GEARS



GEARS OIL CHARGING

Before use, remove the breather plug and add oil through the hole on the crankcase (A) about 40ml with specific EP 100, as WLADOIL IAME GEAR OIL or generic motor oil SAE 30.

In order to check the prescribed correct quantity of oil in the crankcase, unscrew the screw (B) from the engine as shown in the picture, if the oil slightly flows out, the quantity is correct.

A complete oil change is recommended after **5 hours** of operation.

GEARS OIL DISCHARGING

Remove the drain plug (B) to discharge oil.





COOLING SYSTEM CONNECTIONS

CONNECT THE SYSTEM AS SHOWN IN FIGURE



Once the system is filled (with pure water), provide to the proper air venting.

We recommend the use of a 2 way-thermostat (opening temperature **48°C±2**), as shown on the drawing, especially during the wintertime.

It is though possible to make a direct connection, removing the thermostat.

The presence of the thermostat doesn't eliminate the need for adequate partialization of the radiant surface and for protective spoilers on the cylinder during the cold season (temperature \leq 5°C).



ATTENTION: water cooling operation temperature limits: min. 45°C / max. 65°C

ELECTRIC SYSTEM

The engine mounts ignition of the digital type with fixed advance at **22°**. When the piston is at T.D.C. the notches of the rotor and stator coincide.





ATTENTION: VERY IMPORTANT IS CONNECT TO CRANKCASE THE COPPER WIRE TO ENGINE AND COIL'S BODY.

INSTALLATION START / STOP KIT BUTTONS IN POSITION OF KEY BLOCK

ASSEMBLY ESPLODED VIEW





Normally the correct setting of the mixture screws, after engine run-in, is the following:

- L (close the screw completely and then open): 1 T.O. (1 turn)
- H (close the screw completely and then open): 1T.O. + 3/5 (1 turn and 35')

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



EXHAUST GAS TEMPERATURE PROBE

The header exhaust supplied with the motor does not have a socket for the temperature sensor, but it is possible to weld it to the position indicated in the figure and subsequently drilling / threading in order to connect the probe to the exhaust.

Whenever you wish to employ the probe, please proceed as shown in the figure below.



EXHAUST LENGTH SETTING

Always make sure that the springs are well hooked and in place. In case of breakage, replace the broken spring.

Never race the kart without the 3 springs in place, as otherwise the exhaust pipe could vibrate beyond control.

Every **10 |15 hours**, open the exhaust cover and make sure that the holes on the internal counter cone are not obstructed.

The best performance is achieved with a total exhaust length of:

 L = 430 ÷ 440 mm, is measured from the flange on the exhaust header up to the first welding on the first cone of the exhaust muffler (see drawing).



To achieve this dimension, the flexible (supplied with the engine) must be cut at a length of **50÷60mm** (flexible completely closed).

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 exhaust length.

In general, by shortening the total exhaust length the low RPM an improvement at high RPM is achieved and vice versa, by lengthening the exhaust length the low RPM is improved.

When testing, never exceed in lengthening or shortening the flexible by more than 5mm a time.

MAIN ENGINE COMPONENTS AVERAGE ESTIMATED LIFE

The estimated life of the different components, of the engine, changes according to the use and to the desired performance.

PISTON / CYLINDER MATCHING

The piston replacement must take place within specific intervals, measured through used mixture liters and it changes depending of the engine use, if for competitive use (so to reach the better performance) or not competitive. IAME suggests to replace the piston during the competitive use any **100lt**, or before whenever the clearance between piston and cylinder exceeds **0.14mm**.

For NOT competitive use the replacement must take place any **150lt** of mixture or whenever the clearance between piston and cylinder exceeds **0.14mm**.

The prescribed clearance between cylinder and new piston, is **0.11÷0.12mm**. The effective piston diameter has to be verified at **17.5mm** from the base, perpendicularly to the piston pin.



If the size on piston top is marked with:

- a **GREEN** dot or letter **V**; add **0,01mm** to size marked on the piston to match the liner size.

-a **RED** dot or letter **R**; add **0,02mm** to size marked on the piston to match the liner size

Moreover, the clearance between the piston ring tips (installed in the cylinder) must be between **0.35÷0.40 mm**. The clearance can be checked with a feeler gauge, by inserting the ring in the cylinder

CONROD SMALL END CAGE

During the competitive use we suggest the replacement every **100lt**. For NOT competitive use the replacement can be made about every **150lt**.

CONROD BIG END CAGE, CRANKPIN, SHIM AND MAIN BEARING

During the competitive use we suggest the replacement every **200lt**. For NOT competitive use the replacement can be made about every **300lt**.

MAIN BEARING

During the competitive use we suggest the replacement every **200lt**. For NOT competitive use the replacement can be made about every **300lt**.

CONROD

During the competitive use we suggest the replacement every **400lt**.

For NOT competitive use the replacement can be made every **600lt**.

Anyway it must be replaced whenever the big end hole ovalization exceeds **0.01mm**. This value is the difference between the diameter measured in "A" and "B" as below indicated.



WEAR STATUS EVALUATION TABLE – BEARINGS AND HALFCRANKSHAFT



NOTE:

ALWAYS CHECK DIMENSIONS IN DIFFERENT POINTS ON CIRCUMFERENCE, LOOKING FOR EVENTUAL OVALIZATIONS.

ON THE FOLLOWING TABLE ARE SHOWN THE OVALIZATION LIMITS ABOVE WHICH <u>REPLACEMENT IS</u> MUST REQUIRED.

MEASURED PART (MEASURING INSTRUMENT)	LIMITS	
CRANKSHAFT – BEARING SEAT (MICROMETER 25÷50 1/100)	MIN. Ø29.96	
BALANCE SHAFT – EXTERNAL BEARING SEAT (MICROMETER 0÷25 1/100)	MIN. Ø24.96	
BALANCE SHAFT – INTERNAL BEARING SEAT (MICROMETER 0÷25 1/100)	MIN. Ø14.95	
CRANKSHAFT BEARINGS (1/100 BORE GAUGE WITH CHECK RING Ø30)	* MAX. Ø30.03	
BALANCE SHAFT - EXTERNAL BEARING (1/100 BORE GAUGE WITH CHECK RING Ø25)	* MAX. Ø25.03	
BALANCE SHAFT – INTERNAL BEARING (BORE GAUGE 1/100 WITH CHECK RING Ø15)	* MAX. Ø15.03	

THE MEASURED VALUE ON THE BEARING MUST ALWAYS BE COMPARED WITH THE SEAT VALUE (ON SHAFT AND/OR BALANCE SHAFT), TO CHECK THAT PLAY, BETWEEN SHAFT AND BEARING DOES NOT EXCEED THE LIMIT VALUE OF 0.05mm.

BALANCER SHAFT GEARS TIMING SCHEME

In the event of disassembling the balancer shaft gears, they must be reassembled in the correct position respecting the correct timing, as described in the following scheme and according to the instructions indicated in the next page.

NARNING <u>A wrong position of the gears generates a malfunctioning of the vibrations</u> <u>reduction system.</u>



BALANCER SHAFT GEARS MOUNTING

1- ROTATE THE CRANKSHAFT AND THE BALANCER SHAFT SO THAT THE REFERENCE NOTCHES HEAD UP









2- POSITION THE GEAR ON THE **BALANCER SHAFT** SO THAT YOU CAN READ THE LETTER **"C"** ON THE SURFACE AND ALIGN THE MARKED SEAT ON GEAR (1) WITH THE MARKED TOOTH ON THE BALANCER SHAFT (2).





3- POSITION THE GEAR ON THE CRANKSHAFT SO THAT YOU CAN READ LETTER **"A"** ON THE SURFACE AND ALIGN THE MARKED SEAT ON THE GEAR (3) WITH THE MARKED TOOTH ON THE CRANKSHAFT (4). MAKE SURE THE GEARS TEETH ARE IN CORRECT POSITION BY CHECKING THAT THE TWO REFERENCE





5- BEFORE APPLYING THE SEEGER, CHECK THE POSITION OF ALL GEARS AND THAT ALL REFERENCE MARKINGS ARE ALIGNED CORRECTLY.

4- CHECK THAT THE GEARS SURFACES ARE ON THE SAME PLANE.

IF A STEP IS FELT AMONG THE TWO GEARS, THE ASSEMBLING IS NOT CORRECT, REPEAT THE PROCEDURE.





ENGINE PRESERVATION

When engine is to remain inoperative for a long period it must be preserved as follow:

Disconnect the battery and charge it periodically. Disconnect carburetor and clean it. Seal with tape the engine inlet and exhaust.

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

In the event of a long inoperative period of the engine, release the hose fixed between the water pump inlet and the radiator outlet (as shown in the picture) and empty the water circuit to avoid damages to the engine and the accessories due to freezing.



TROUBLESHOOTING

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

	· •	00 7	
FAULTS	PROBABLE CAUSES	REMEDY	
Starter will not crank when	Bad connections on starter cables	Check and tighten	
turning the key to RUN position (K)	Bad grounding of wiring loom	Check connections and tighten	
or pushing START button. (S)	Interruption on fuse (K)	Replace 5A strip fuse, after checking for eventual reversal of battery polarity.	
	Damaged cables	Replace	
	Battery connection loose	Check and tighten	
	Battery discharged	Recharge or replace battery	
	Starter failure	Overhaul starter	
	Electronic box or relay failure (K)	Replace / Authorized Service C.	
	Damage START button (S)	Replace	
Starter cranks but engine won't	Bad cable connections	Check connectors	
start when turning the key in RUN	Bad H.T. coil connections or coil failure	Check/ Replace	
position (K) or pushing START	Bad H.T. coil grounding	Check grounding	
button (S).	Electronic box or ignition failure	Replace	
	Wet or damage spark plug	Replace	
	Malfunction on feed 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	Bad cable connections	Check stator connector	
few seconds when turning the key in KEY position (K) or released START	Electronic box failure	Apply to Authorized Service Centres	
button (S)	Bad carburettor adjustment (screw L)	Check carburettor adjustment	
	Insufficient gas fuel flow	Check fuel flow lines and inlet filter	
The starter cranks also after the engine is running.	Electronic box failure (K)	Apply to Authorized Service Centres	
	Relay failure	Replace	
	START button failure	Replace	
Rough idle	Bad carburettor adjustment (screw L)	Check carburettor adjustment	
Drop in engine performance	Bad compression	Check piston	
	Bad carburettor adjustment	Check carburettor adjustment	
	Insufficient fuel flow	Check fuel flow lines and inlet filter	
	Dirty inlet silencer and filter	Check and clean	
Burning smell, smoke	Clutch overheating	Check clutch	
Clutch engages at too high RPM	Excessive wear of friction material	Check clutch / Replace	
	Oil or grease into the clutch drum	Check clutch / Replace	
Exhaust too noisy	Damaged flexible	Check and replace if necessary	
	Springs damaged or lost		
	Damaged insulating sleeve		
	Damaged exhaust header		

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MENT OF THE STARTER BRUSHES

DISASSEMBLE THE STARTER

- UNSCREW N°2 SCREWS M6x35 REMOVE STARTER

(5mm ALLEN WRENCH – T TYPE)



NOTE:

ON THE ENGINES MANUFACTURED AFTER SEPTEMBER '05, THE STARTER CAN BE REMOVED WITHOUT TAKING AWAY THE GEARS COVER BUT SIMPLY BY REMOVING THE COVER CLAMP.





OPENING THE STARTER

UNSCREW 3 SCREWS M5 "C"

REMOVE THE PLASTIC CLAMP AND UNSCREW THE SCREW M4 FIXING THE INPUT CABLE TO THE STARTER.

(PHILLIPS SCREWDRIVER)



(PHILLIPS SCREWDRIVER)



REMOVE DRUM FROM STARTERREMOVE ROTOR FROM STARTER HEADKEEPING ROTOR IN ITS SEATATT ION:(BE SURE TO HOLD THE ROTOR ON ITSWHEN EXTRACTING ROTOR,TOOTHED SIDE TO PREVENT BRUSHESTHE BRUSHES MAY SPRING OUT FROMFALLING OUT FROM THEIR SEAT)FROMTHEIR SEATS.



REPLACING THE BRUSH "A"

UNSCREW THE 2 SCREWS M4 "D" REMOVE THE LITTLE RUBBER CAP "F" RETAINING THE PLATE "E" OUR SUGGESTION: SLIGHTLY OIL THE TIN PLATE TERMINAL END, TO MAKE EASIER THE EXTRACTION OF THE LITTLE RUBBER CAP.

(PHILLIPS SCREWDRIVER)

(PLIERS)



REMOVE SILICONE FROM BRUSHES WITH A SCREWDRIVER. T

MAKING PRESSURE EXTERNALLY ON THE TIN PLATE TERMINAL.

REMOVE SPRINGS

REMOVE BRUSH





INSTALL NEW BRUSH TERMINAL INSIDE REINSTALL THE PLATE AND FIXE IT PLACE LITTLE RUBBER CAP ON THE WITH THE 2 SCREWS M4 TERMINAL. (PHILLIPS SCREWDRIVER)



REPLACEMENT OF THE BRUSH "B"

UNLOOSE THE SCREW M3 "G" EXTRACT THE BRUSH FIX THE NEW BRUSH WITH SCREW M3

(PHILLIPS SCREWDRIVER)



CLOSING THE STARTER

INSERT THE NEW BRUSH SPRING "A" INSTALL THE STARTER ROTOR INTO ITS SEAT. INSTALL THE BRUSH .

BETWEEN THE BRUSHES AND CHECK. THAT THEY ARE ALWAYS KEEP THE BRUSH IN PLACE BY PRESSING IN CONTACT WITH THE CYLINDRIC

TOWARDS THE OUTER AND CLAMP IT COPPER PART OF THE ROTOR, WITH AN IRON WIRE BENT AS A HOOK EVEN WHEN THEY ARE RELEASED

REPEAT THE SAME PROCEDURE TO **INSTALL THE BRUSH "B"**





OUR SUGGESTION: TO IMPROVE THE BRUSHES LIFE, ON THE STARTER HEAD. SILICONE

CHECK THAT O-RING "H" IS INSTALLED **SECURE THE LITTLE WIRES WITH** INSERT STARTER DRUM ON THE HEAD **BEING CAREFUL TO PREVENT ROTOR** FROM ROTATING AND TO PREVENT THE BRUSHES FROM FALLING OUT OF THEIR SEAT



SCREW THE 3 SCREWS M5

CONNECT THE INPUT WIRING TO THE STARTER WITH THE SCREW M4

CHECK THAT THE STARTER ROTOR ROTATES FREELY

(PHILLIPS SCREWDRIVER)

(PHILLIPS SCREWDRIVER)



SECURE THE WIRE TO THE STARTER BY MEANS OF A PLASTIC CLAMP



ASSEMBLING THE STARTER

PLACE THE STARTER INTO THE CRANKCASE

OIL O-RING TO MAKE EASIER INSTALLATION.

N°2 SCREWS TCH M6x35 TIGHTEN AT A 8÷10 Nm (70÷90 in-lb)

(5mm WRENCH – T TYPE)



TECHNICAL DATA ENGINE SUMMARY TABLE

DESCRIPTION	DATA	NOTES
FUEL MIXTURE / FUEL	5% min. OF OIL	98 RON Oil CIK homologated
GEARBOX OIL	40 ml	advised: EP 100 (WLADOIL IAME GEAR OIL) or motor oil SAE 30
OPERATING TEMPERATURE ENGINE	min.45°C / max.65°C	
EXHAUST ANGLES TIMING REFERENCE	177.5°±2°	Feeler gauge 0.2x5mm
TIMING ADVANCE	22° FIXED	
COMBUSTION CHAMBER VOLUME	10.15 cm³	9.7 cm³ min.
SQUISH	1.0 mm	Measured with single wire from 1.5mm
CORRECT MEASURE TIPS PISTON RING	0.35 ÷ 0.40 mm	installed in the cylinder
SPARKPLUG TYPE USE IN STANDARD WEATHER CONDITIONS	NGK BR 10 EG NGK R 6252K-105 NKG R 6254E-105	
SPARKPLUG TYPE USE IN RAIN ATMOSPHERIC CONDITIONS	NGK BR 9 EG	

Caution should be taken when installing the spark plug. Always clean and inspect the spark plug threads before installation. Always apply anti seize compound, grease or oil.

- NEVER INSTALL THE SPARK PLUG WITHOUT SOME LUBRICATION -

You should be able to freely turn the plug into the head using only your fingers to turn the plug. Do not force the plug with a tool or damage will occur. After rotating the plug into the head by hand only. Torque to 175-230 lbs-in (20÷26 Nm).