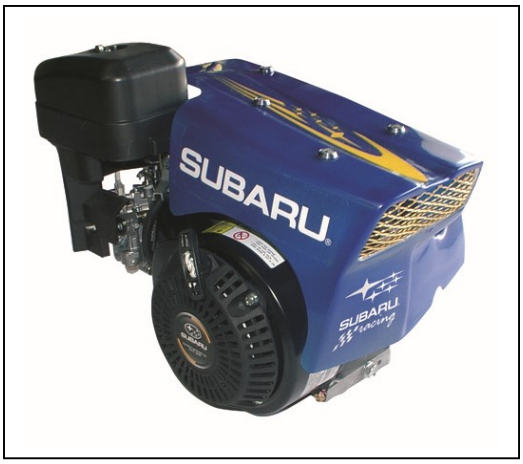
FICHE TECHNIQUE MOTEUR KART
SUBARU KX-21 - WORMS KX-21
MOTOR KART WORMS KX-21 HOMOLOGATION FORM

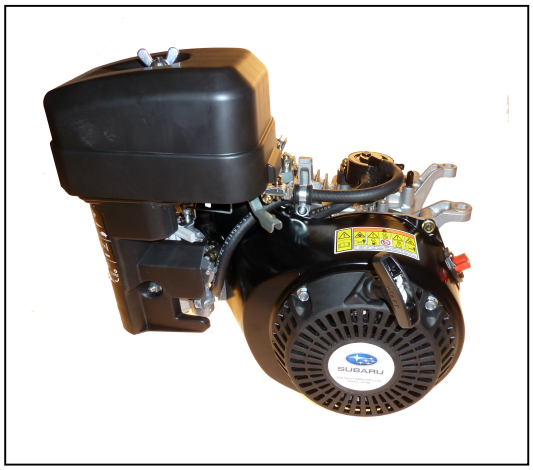
1. General

1.1	Manufacturer	**WORMS Entreprises**
1.2	Commercial name	**WORMS Sports Kart Engine KX-21**
1.3	Cilinder capacity	**211 cm³**
1.4	Foto's	

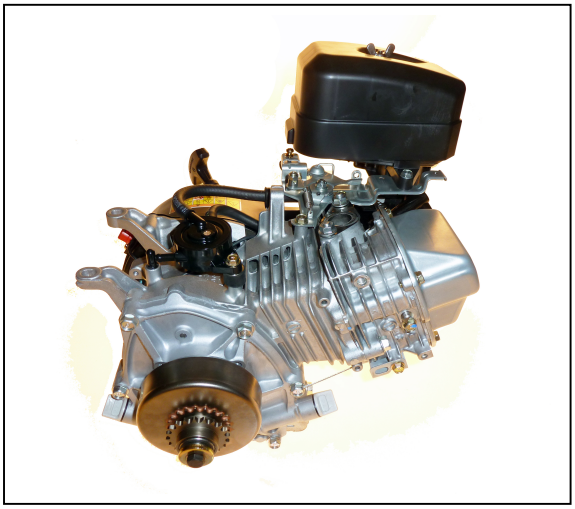
A



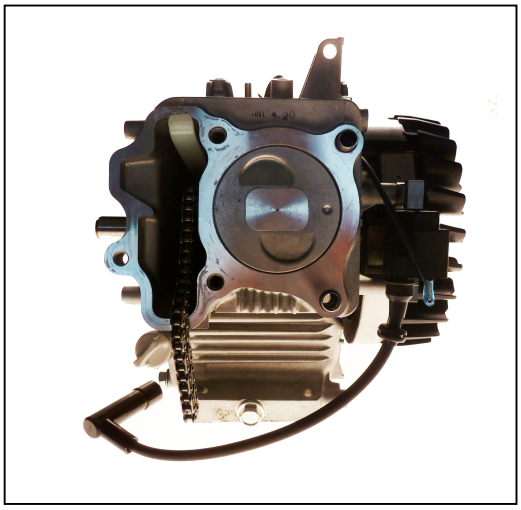
C



B



D



E



F



G



2.	**Dates of engine**	**See also drawings 1-5**
2.1	Cycle:	**4-stroke**
2.2	Number of cylinders:	**1**
2.3	Min. total volume of combustion chambre:	**21,60 cm³**
2.4	Min. total volume of combustion chambre in the cylinder head:	**cm³**
2.5	Maximum compression ratio:	**10.0**
2.6	Minimum heigt of cylinder Block:	**100,00 mm (measured from crankshaft center axle to cylinder head gasket surface)**
2.7	Material Cylinder block:	**Aluminium**

2.8	Sleeves	a)		**YES**
		c)	Material:	**cast iron sleeve**
2.9	Capacity per cylinder:	a)	Max. permitted capacity per cylinder:	**211 cm³**
	b) Bore: 67.0 mm	c)	Maximum permitted bore:	**67,019 mm**
		d)	Maximum stroke:	**60 mm**

2.10 Piston(s)

a) material: **Alum alloy** b) Number of rings: **3**

c) Minimum weight of the complete piston, including pin, clips, rings: **190 g**

d) Distance from gudgeon pin center line to highest point of piston: **36,00 +/- 0,1 mm**

e) Distance from gudgeon pin center line to edge of rotor contour: **40,00 +/- 0,1 mm**

f) Distance (+-) between the top of the piston at TDC and gasket plane of the cylinderblock: **0,1 +/- 0,2 mm**

g) minimum piston groove volume: **0,4 cc +/- 0,2 cc**

2.11 Connection Rod-mat

a) material: **Aluminium** b) Big end type: **diagonally divided**

c) Interior diameter of big end (without bearings): **30,1 mm+/- 1 %**

d) length between the axes: **68,50 mm+/- 0,05 mm**

e) minimum weight: **138 g**

2.12 Crankshaft

Tolerance:

+/- 1%

a)	Type of manufacture:	**Moulded**
b)	Material:	**Steel alloy**
c)	Number of crankshaft-bearings:	**2**
d)	Type of crankshaft-bearings:	**Radial**
e)	Ext. diameter of crankshaft-bearings:	**100 mm +/- 1 %**
f)	Bearings caps material:	/
g)	Minimum weight of the bare crankshaft	**1918 g with 2 tooth gear press fitted(timing ,governor)**

Pressed governor drive gear can be removed !

2.13 Flywheel

a) Material: **Steel**

b) Minimum weight of flywheel **2400 g**

2.14 Cylinder head

a) Material: **Aluminium**

b) Minimum height: **64,50 mm**

c) where measured: **From sealing – to sealing surface**

2.15 Thickness of lightened cylinder head gasket: **0,20 +/- 0,05 mm**

2.16 Camshaft

a) Number: **1** b) Location: **high**

b) Driving system: **(Timing chain system)**

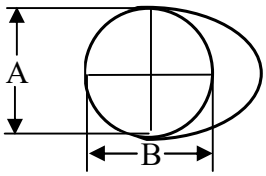
c) chain length : **281,7/284,9 mm**

d) Diameter of camshaft : **84,00mm +/- 2 %**

f) Type of valve operation: **chain-driven overhead cam and overhead valve construction, with a single cam**

g) Cam dimensions A= **24 mm +/- 1 %**

B= **29 mm +/- 1 %**



2.17 Timing

a) Theoret. Timing Clearance:

Inlet: **0,12/0,15 mm** Exhaust: **0,15 mm**

b) Valves open at: (with Theoret. Timing Clearance " . a"

Inlet: **135 ° ATDC** Exhaust: **162 ° BBDC**

c) Valves Closed at: (with Theoret. Timing Clearance "2.17a"

Inlet: **47 ° ABDC** Exhaust: **0 ° BTDC**

d) Maximum valve stroke (with Theoret. Timing Clearance " .a"

Inlet: **244 ° ATDC** Exhaust: **71 ° BTDC**

e)	Angel between inlet- and exhaust-valve(s):	**0°**

2.18 Inlet

a)	Material of the manifold:	**Steel**
b)	Number of manifold elements:	**1**
c)	Number of valves per cylinder:	**1**
d)	Maximum diameter of the valves head:	**28,50 mm.**
e)	Diameter of the valve stem:	**- 5,45 /- 0,5 mm**
f)	Interior cooling of valve	**NO**
g)	Length of the valve:	**67,80mm. +-1 %**
h)	Minimum weight of valve:	**27 g.**
i)	Type of valve springs:	**Coil spring**
k)	Number of springs per valve:	**1**
l)	Exterior diameter/ max length of springs:	**21, 50 +- 1 mm. / 27,40 mm.**
m)	Number of spring coils:	**5**
n)	Diameter of spring wire:	**2,30 mm + - 0,1 mm.**
o)	Valve spring washer :	**1**
p)	Valve spring washer thickness	**1,00 mm +- 0.05 mm**

2.19 Exhaust

a)	Material of the manifold:	**Steel**
b)	Number of manifold elements:	**1**
c)	Diameter of the outlet manifold:	**22 mm. +- 1 %**
d)	Number of valves per cylinder:	**1**
e)	Maximum diameter of the valves head:	**26,50 mm.**
f)	Diameter of the valves stem	**- 5,4 /-0,5 mm**
g)	Interior cooling of valve	**NO**
h)	Length of the valve:	**67,60 mm. +- 1 %**
i)	Minimum weight of valve:	**26 g.**
k)	Type of valve springs	**Coil spring**
l)	Number of springs per valve:	**1**

m)	Exterior diameter/ max length of springs:	21, 50 +- 1 mm. /27,40 mm.
n)	Number of spring coils:	5
o)	Diameter of spring wire:	2,30 mm + - 0,1 mm.
p)	Valve spring washer :	1
q)	Valve spring washer thickness	1,00 mm +- 0.05 mm

3. Carburettor

a) Number: **1**

b) Type: **side draft fixed venturi (butterfly)**

c) Mark and model: **MIKUNI (American Corporation)**

d) Number of throttles / slides per carburettor: **1**

e) Max diameter of flange hole of carburettor exit point: **22 mm**

f) Max diameter of the venturi at the narrowest point: **17 mm**

g) **Main Jet : 83.8**

h) **Pilot Jet : 41.3**

3.1 Intake silencer / air filter:

a) material: **Plastic/paper**

b) Dimensions: see drawing page 5 (9)

4. Electrical equipment

a) Starting system: **Recoil type**

b) Voltage: **12 V**

c) Capacity of battery: / AH

d) Generator: **NO**

Type: /

4.1 Ignition system

a) type: **Transistorized magneto**

b) Number of plugs per cylinder: **1**

Number of distributors: **0**

d) Number of coils: **1**

e) Number of contact breakers: **0**

f) Number of condensers: **0**

5. Engine cooling

a) Type : **Forced air cooling system**

b) Maximum capacity cooler: /

c)

6. Lubrification

a) System : **Splash lubrification**

system

b) Number of oil pumps: **0** c) Material of the sump: /

7. Clutch

a) Type: NORAM — **Centrifugal clutch**

b) Drive system: — **Mechanic**

c) Number of centrifugal weights: — **2 shoes**

d) Max. exterior diameter of the shoes: **106** — **mm +/- 1 mm**

8. Ratios of engine: permanent — **Permanent**

Ratio: **NO** Number of teeth:

9. Gearbox

9.1 Number of speeds: **NO**

9.2 Ratios:

	Ratio	Number of teeth	Synchro
1			
2			
3			
4			
5			
6			
Reverse			

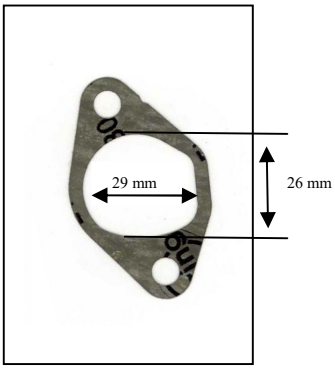
10. Additional information

11. Drawings

1)

Cylinder head inlet orifices on manifold side (tolerances on dimensions.: (-2%,+4%)

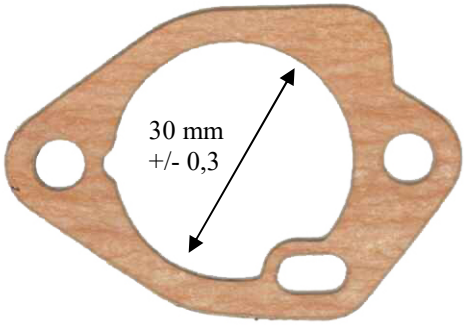
∅	→	-2% , +4%



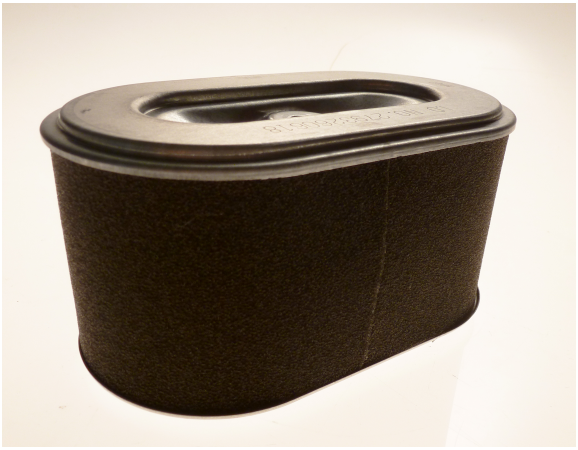
4) Intake silencer






30 mm
+/- 0,3





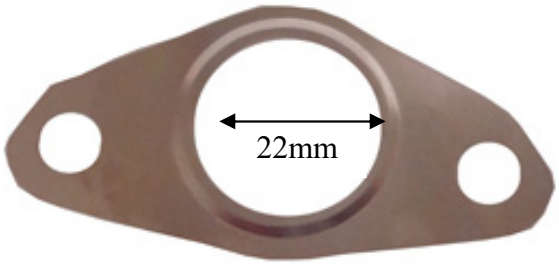




Cylinder head exhaust orifices on manifold
(tolerances on dimensions : (-2%, 4%)

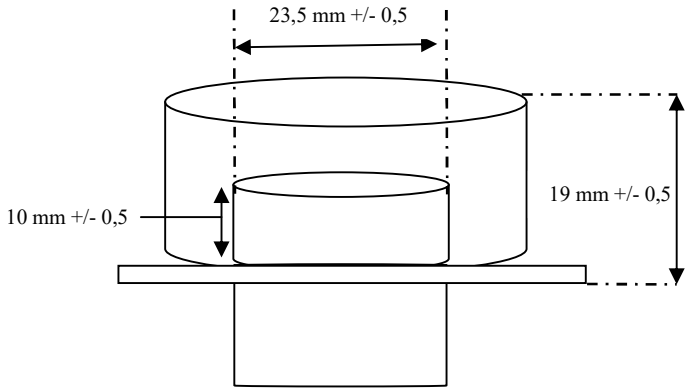




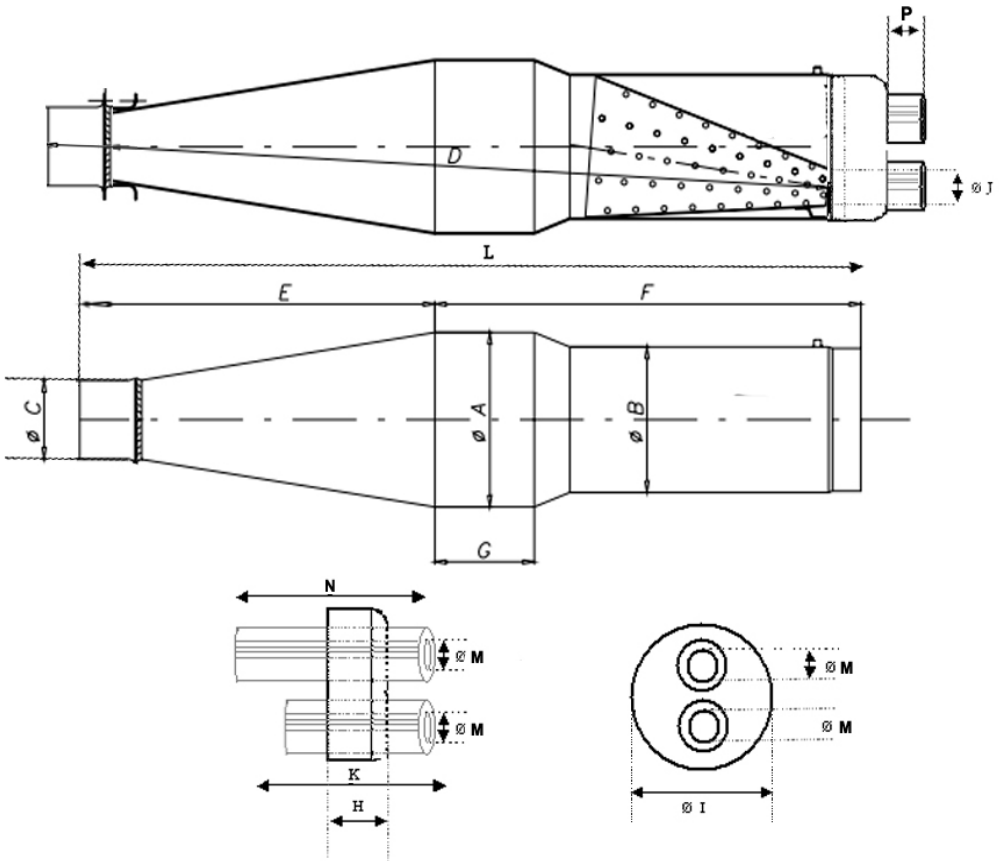








5) Muffler:



Ø A : 107,50 mm
Ø B : 100 mm
Ø C : 45,5 mm +/- 0,5
D : 40,00 mm +/- 0,5

E : 22,5 mm +/- 0,5
F : 20,5 mm +/- 0,5
Ø G : 4,00 mm +/- 0,5
H : 36,5 mm +/- 0,3 mm

Ø I: 101,0 mm +/- 3,5 mm
Ø J: 43,00 +/- 0,5
K : 84,5 mm +/- 0,3 mm
L : 43 mm +/- 0,5

Ø M: 21 mm +/- 0,2 mm
Ø N: 132 mm +/- 0,5 mm
P : 39,5 mm +/- 0,5

12. Other info

