BRP-ROTAX Junior MAX ENGINE

TECHNICAL SPECIFICATIONS

Preamble:

The following are the Technical Specifications for the BRP-ROTAX Junior MAX engine, as approved by the Australian Karting Association.

This engine is approved for use in the following classes.

- Formula Junior Max
- Junior Performance
- Restricted 125
- Open Performance

Unless otherwise specified, the engines must be original in all their components according to the Rotax Junior MAX drawings.

Any removal, addition or polishing of material is strictly forbidden.

Sandblasting, glass bead blasting, peening, acid etching, spark eroding and/or any other method of metal removal or displacement is not allowed.

ANY ALTERATIONS / MODIFICATIONS ARE STRICTLY PROHIBITED EXCEPT AS SPECIFICALLY AUTHORISED WITHIN THESE SPECIFICATIONS.

IF THESE SPECIFICATIONS DO NOT SAY YOU CAN MAKE A MODIFICATION, THEN YOU CANNOT.

JMAX 1.01 Engines:

1. Only genuine ROTAX components that are specifically designed and supplied for the Rotax 125 Junior MAX engine are legal, unless otherwise specified.
   Neither the engine nor any of its ancillaries may be modified in any way. "Modified" is defined as any change in form, content or function that represents a condition of difference from that originally designed. This is to include the addition and/or omission of parts and/or material from the engine package assembly unless specifically allowed within these rules. The adjustment of elements specifically designed for that purpose shall not be classified as modifications, i.e. carburettor and exhaust adjustment screws.
   Internal additions: no additional material may be added except in the case of engine repairs and shall only restore the engine or components to original specifications.

- The use of thermal barrier coatings/ceramic coatings on or in the engine and on or in the exhaust system is prohibited.
- The use of anti-friction coatings in or on the engine/engine components is prohibited.

Legal additions: Chain guard, engine mount, temperature gauge and tachometer/hour meter, inline fuel filter, catch can mounting brackets and supplemental ignition coil mounting brackets, within the limits specified in this document.

“Non-tech items: non-original fasteners, circlips, washers, bearings, throttle cable and housing, fuel and pulse line (type and size), gaskets, are allowed unless otherwise specified.”

For sealing purposes, the engine is to be fitted with “fit for purpose” sealing nuts with minimum 3mm holes. The engine is sealed using a single AKA seal through appropriate sealing nuts fitted at three (3) locations;

1. The cylinder head water jacket
2. The upper gearbox case
3. The reed block.

JMAX 1.02 Squish Gap:

The squish gap must be measured using 2mm tin (core solder) wire. The crankshaft must be turned by hand slowly over TDC to squeeze the tin wire. The squish gap must be measured on the left and right side, in the direction of the piston pin.

The average value of the two measurements shall be:

Minimum 1.20mm – Maximum 1.80mm

JMAX 1.03 Combustion Chamber Insert:

1. Identification code has to be 223 389 (4) or 223 389 1 or 223 389 2 (4A)
2. Name ROTAX (5) or “MADE IN AUSTRIA” (5A) has to be cast.
3. Height of combustion chamber insert have to be 27,55 mm with a tolerance of +0,0/-0, 1 mm (6) and 28,80 mm with a tolerance of +/-0,2 mm (8), see illustration 1.
4. The profile of the combustion chamber insert has to be checked with the combustion chamber insert template (ROTAX part no. 277 390). The crack of light between the template and the profile of the combustion chamber insert has to be the same over the whole profile.

JMAX 1.04 Piston:

1. Original, coated or uncoated, aluminium, cast piston only with one, original, magnetic, 1mm-rectangular-piston ring, with 'E CRY K' or ROTAX 215 547 marked on the ring. The piston has to show on the inside the words 'ELKO' and 'MADE IN AUSTRIA' in casting."
2. Machined areas are: Top end of piston, outside diameter, groove for the piston ring, bore for piston pin, inside diameter at bottom end of piston. All other surfaces are not machined and have cast surface.

JMAX 1.05 Gudgeon Pin:

1. Gudgeon pin has to be made out of magnetic steel.
2. Must be as per illustration 4.1

JMAX 1.06 Cylinder:

1. Light-alloy-cylinder with GILNISIL-plating, configuration with one main exhaust port. Any re-plating is not allowed.
2. Maximum bore: 54,035 mm (measured 10 mm above the exhaust port).
3. Cylinder has to be marked with ROTAX-Logo (1), see illustration 2 or 2.1.
4. 125 Junior MAX:
5. Cylinder has to be marked with identification code 223998 or 223994 See illustration 2 or 2.1.
6. Height of cylinder has to be 87 mm with a tolerance of –0,05/+0,1 mm (3), see illustration 3.
7. All transfer ports and passages are cast finish except some pre-existing, factory removal of flashing from inlet and exhaust port and passages. All ports have chamfered edges to prevent ring snagging. Any additional machining is not permitted."
8. The "exhaust port timing" (distance from the top of the cylinder to the top of the exhaust port) has to be checked by means of a template (ROTAX part no. 277 395). Insert the template into the cylinder bore (until it stops at the top of the cylinder). Align the template in centreline from inlet to exhaust port and move the template towards the exhaust port until it stops at the cylinder wall.

Attention: Take care to use the corresponding side of the template to check the exhaust port timing of a MAX or Junior/Mini MAX cylinder. The groove in the template must align with the grove for the o-ring in the cylinder.

9. The official Formula Rotax Australia stamp must be present on the reed block face.
10. Due to manufacturing procedures, some cylinders may have been machined on the exhaust flange.
11. Junior Max must use genuine Rotax gaskets only, dimensions 0.2mm, 0.3mm, 0.4mm, 0.5mm and 0.8mm. No aftermarket gaskets are permissible.

JMAX 1.07 Inlet System:

1. Intake manifold is marked with the name ROTAX and the identification code 267 915. Some factory flash removal may be present at the junction of the inside contour and the carburettor stop mounting face. This is a manual trimming operation consisting of a small corner break of less than 1 mm in width. No additional grinding or machining is permitted.
2. The reed valve assy is equipped with 2 petal stops and 2 reeds, each having 3 petals.
3. The thickness of the reeds is 0,6 mm, +/- 0,08 mm.
4. The addition of one Rotax reed block gasket, maximum thickness 1.0mm between the carburettor manifold and the reed block is permitted.

JMAX 1.08 Crankshaft:

1. Stroke: 54,5mm +/- 0,1 mm.
2. Conrod (7) has to show forged number "213" "365" or "367" on shaft (see ill. no. 4)
3. Shaft of con rod is not machined (copper plated). Grinding or polishing of shaft of con rod is not permitted.

JMAX 1.09 Balance Shaft:

1. Balance shaft must be installed and operational.
2. Part Numbers. 237 945 and 237 949 (equal to 237 948) are legal (see ill. no. 4.2)
3. Surface (1) is not machined and must be cast finish
4. Measurement from centre of balance shaft to outer diameter of flyweight of balance shaft at a defined length must not be lower than specified (see ill. no. 4.2).
5. The minimum weight of the dry balance shaft must not be lower than 355 grams for balance shaft ROTAX part no. 237 945 and 255 grams for balance shaft ROTAX part no. 237 949 (equal to 237 948).
6. Both the plastic Balance gears (Rotax Part #234431) or the Steel Balance Gears (Rotax Part #234436 and 234435) are permitted.
7. Balance gears must be installed and must be correctly aligned according to the instruction in the repair manual

JMAX 1.10 Crankcase:

1. As supplied by the manufacturer. No grinding/polishing is permitted in the two main

transfer passages.

2. The official Formula Rotax Australia stamp must be present on the crankcase.
3. Either sand-cast gearbox cover (part no. 211870) or pressure diecast gearbox cover (part no. 211871) is permitted.

JMAX 1.11 Ignition Unit:

1. DENSO digital battery ignition, variable ignition timing, no adjustment necessary and possible.
2. Race officials may request at any time that the competitor replace the ignition coil with a new unit, provided by race administration.
3. The casing of the ignition coil has to show following castings "129000 -" and "DENSO". Ignition coil must show 3 pins at the terminal.
4. The ignition coil has to be fixed by means of 2 original silent blocks to the gearbox cover. Only in cases of chassis component interference with the original mounting location of the ignition coil, a supplemental extension bracket, rigidly constructed and fabricated of solid metal, of minimum dimensions and attached to the original case mounting holes, is permitted for mounting of the coil.
5. Spark plug. Maximum spark plug thread length shall be 20mm.
6. Spark plug cap must be marked with "NGK TB05EMA".
7. The ignition pickup must be marked with the numbers 029600-0710, followed by a variable production code in the second line.
8. Wiring looms and Harnesses are allowed to be repaired.

JMAX 1.12 Carburettor:

1. DELL'ORTO carburettor.
2. "VHSB 34" cast in the housing of the carburettor
3. QD" or "QS" stamped in the housing of the carburettor.
4. The complete inlet bore in the casing of the carburettor must show cast surface
5. Jet needle housing/atomiser tube stamped with FN 266 or 266 FN
6. The carburettor slide must show with size "40" in casting and the bottom end of the slide must show cast surface.
7. Jet needle stamped with K27 or K98
8. The size of any hole in any of the following is unregulated. Main jet, needle and seat, pilot jet, pilot jet emulsion insert, choke jet. The position of the float/float arms and the weight of the floats are unregulated. All items (jets, needles, etc) referred to above must be present and operational.
9. Settings of the carburettor adjustment screws are free.
10. Main jets smaller than size 160 or bigger than 200 are not recommended by ROTAX
11. Main jets smaller than size 160 and bigger than size 200 are legal also if they are not available from ROTAX
12. A minimum required size of main jet may be determined for each race event by a "Supplementary Regulation".

JMAX 1.13 Fuel Pump:

MIKUNI diaphragm pump, must be placed on bottom of support bracket for intake silencer

JMAX 1.14 Radiator:

1. Single aluminium radiator as shown in illustration 5.
2. Cooling area: Height = 290 mm, width = 133 mm
3. Thickness of radiator = 32 mm
4. Place of fixing the radiator is on right side of engine.
5. Radiator must be mounted with all components shown either like in illustration 5 or like in illustration 5.1
6. No additional cooling device is allowed. Tape applied to the face of the radiator only is allowed as an airflow control means. All other means of airflow control through the radiator are prohibited.
7. The removal of the thermostat from the cylinder head cover is acceptable.

JMAX 1.15 Radiator Coolant:

Refer to rules 25.18 B and 25.18 C of the 2010 AKA Karting Manual.

JMAX 1.16 Clutch:

1. Dry centrifugal clutch, engagement r.p.m. maximum at 3.000 r.p.m.
2. That means, that the kart (with driver in kart) has to start to move when the engine speed reaches 3.000 r.p.m. or less
3. The use of the Rotax clutch pin support plate is permitted.
4. Only genuine Rotax clutches are permitted (Rotax Part #659902 and #65907).

JMAX 1.17 Intake Silencer:

1. Intake silencer with integrated, washable air cleaner has to be used with all parts as shown at illustration 6 and has to be mounted on the support bracket with two screws (in dry and wet race condition).
2. Air filter must be installed as shown in illustration 6.

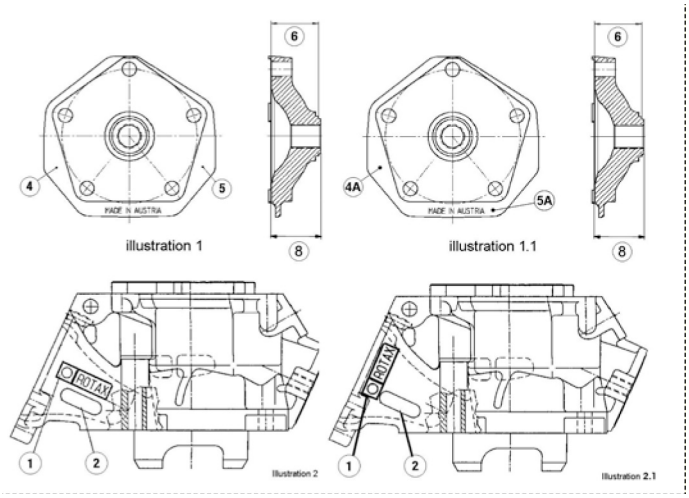
3. It is permissible to drill a 5mm hole in the airbox to allow the draining of water in wet conditions
4. Either type of airbox as shown in Illustration 6 or Evolution type (part numbers 225025 and 225015, which incorporates a 8mm drain hole) is permitted.

JMAX 1.18 Exhaust System:

1. Must be as supplied by ROTAX and cannot be modified except for;
   a) The replacement of the silencer matting material with one piece of genuine Rotax matting, approximate size is 480mm x 280mm. (The fitting of additional matting material is not allowed.)
   b) The use of threaded fasteners in place of rivets for securing the silencer end cap.
   c) Modifications to fit an exhaust probe are permissible as per Rule 25.09.7
2. Standard exhaust socket must be used.
3. Exhaust pipe with after muffler as shown in illustration 7:
4. Length of inlet cone: 592 mm +/-5 mm (measured on outside from beginning of exhaust pipe until beginning of cylindrical part).
5. Length of cylindrical part of exhaust pipe: 125 mm +/-5 mm.
6. Length of end cone: 225 mm, +/-5 mm (measurement, see illustration 8).
7. Outside diameter of 180° bent tube: 41mm +1,5 mm/–1,0 mm (measured at beginning and end of bend).
8. Diameter of hole of end cap of (illustration 7, pos. 3 or 6): 21 mm +/-0,2 mm.
9. Deleted (February 2010).
10. A welded on socket (for exhaust temperature measurement) on top of the exhaust in the position 50 mm from the flange of the exhaust is allowed.
11. The use of maximum 4 pieces of original ROTAX exhaust springs to fix the exhaust to the cylinder is allowed
12. Only one exhaust gasket is permitted, maximum thickness of 2mm

JMAX 1.19 Noise Emissions

1. Noise isolating mat (illustration 7, pos. 5) has to be replaced by the original ROTAX spare part.
2. Refer Rule 24.2.1 2010 AKA Karting Manual for noise limit.



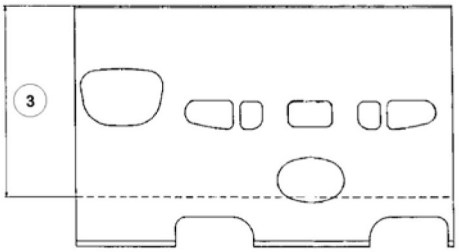


Illustration 3

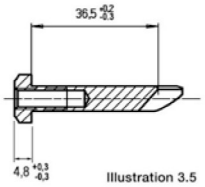


Illustration 3.5

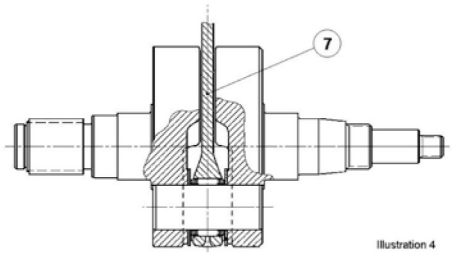


Illustration 4

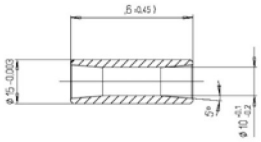


Illustration 4.1

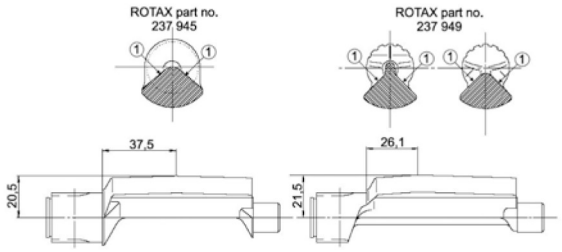


Illustration 4.2

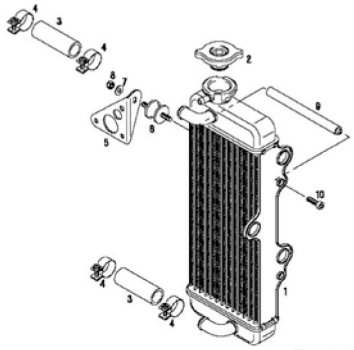


Illustration 5

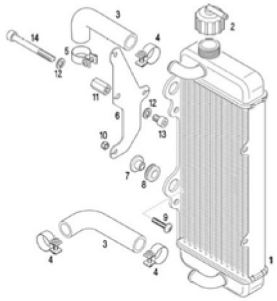


Illustration 5.1

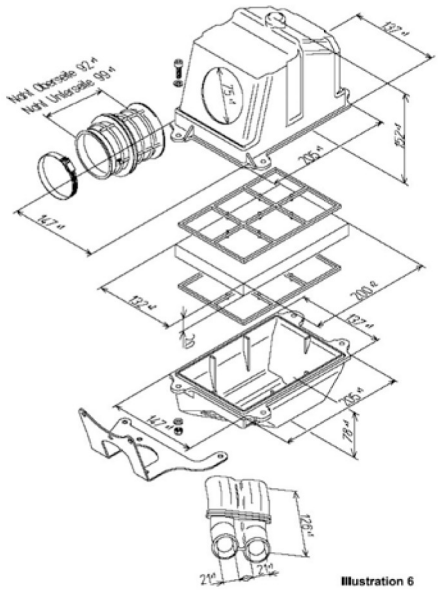


Illustration 6

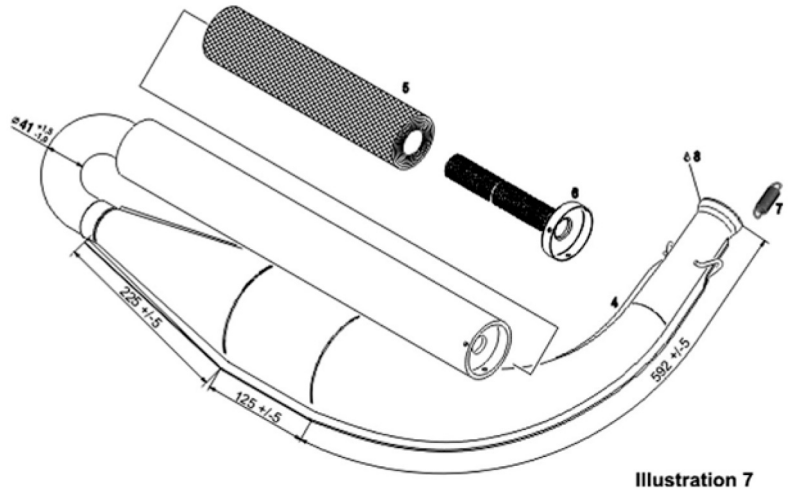


Illustration 7