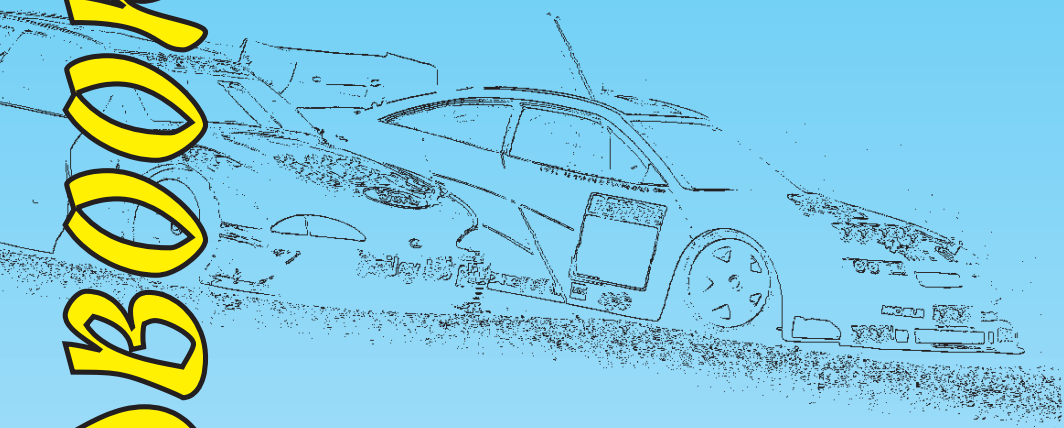


# HANDBOOK 2009



## *Appendix 8*



*European Federation of  
Radio-Operated  
Model Automobiles*

# APPENDIX 8

## HOMOLOGATION OF MUFFLERS

### 1. GENERAL

Each motor must be equipped with an exhaust system and an inlet silencer to reduce the amount of noise generated by the car.

The maximum noise level for a muffler with INS box is 83 dB's, measured at ten (10) metres distance and one (1) metre high for a single car.

EFRA's definition of a noise level is always final.

Only EFRA homologated 3-chamber mufflers are allowed on EFRA sanctioned events. The EFRA homologation number must be engraved on the sidewall of the muffler.

The use of the 3000 series of mufflers is allowed, the manifolds are free.

The use of partly the mufflers of the 2007 list, from i.e. EFRA2040 till 2060, with or without an extra silencing unit. EFRA will do some tests to search for the better mufflers and give a list for the season 2009.

Use of any new 3100 series of a minimum of 2-chamber mufflers which are equipped with an extra silencer or comply to a far better noise level as the 3000 series.

### 2. HOMOLOGATION FEE

will be: see General Rules 3.5.7.

If a second test is necessary an additional cost of: see General Rules 3.5.7..

### 3. HOMOLOGATION NUMBER:

every accepted muffler is issued with an EFRA homologation-number which must be indelibly marked on the side wall.

### 4. TECHNICAL DETAILS

A very important factor in the control of the noise level of a muffler is the design of the mandatory 2nd chamber and the total length of the outlet pipe.

The first cone may be trimmed by the individual user within a small range to set up the best total system length.

The first cone may be trimmed by the individual user within a small range (max. 5 mm) to set up the best total system length.

### 5. TOLERANCES

Recognising that the component parts of a muffler are joined together, it is quite clear, that there may be some slight differences in total measurements. This will not lead to dramatic noise level variation, but one important point must be mentioned:

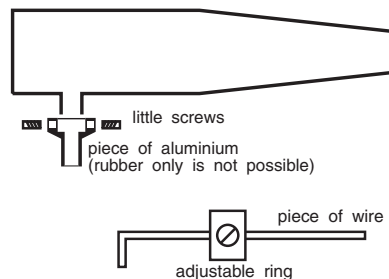
The 2nd cone must be in line with the outlet pipe, if this is a feature of the original design. To check this, refer to the drawings.

The outlet pipe may have a minus-tolerance of 2 mm.

To the total length of the outlet pipe use a tool similar to that shown below.

### 6. PRACTICAL TIP

Some drivers cut the outlet pipe, because they fear damage during the race. Of course this is not allowed. To help in such a case, here is a tip:



7. **EFRA APPROVED MUFFLER**

Updated lists of mufflers which do comply with the noise rules 2008 will be found on the EFRA-website.

8. **INS box dimensions.**

The performance of the INS box is based on its form and measurements. Therefore it is strictly forbidden to change anything on its internal dimensions. The INS box for 1:8 and 1:10 are the same, only the foam filter has another dimension to fit the carburettor. Homologated INS boxes:

Serpent box

Picco box

Mielke box

NovaRossi box

Mielke modified (modified with 2 x 4 holes 4mm inside)

8.1 **Definitions:**

The "Serpent" INS box has the following dimensions:

The box has 30 holes inside. There are 2 different holes: 1 straight hole with a diameter of 2.4 mm and then 2 holes where the smallest diameter is also 2.4 mm but on the bottom it is wider.

The Picco INS box has the following dimensions

The box has 26 holes inside with a diameter of 2.8/2.9 mm

The MID/Mugen INS Box has the following dimensions:

2 tubes with a internal diameter of 8.8mm, +/- 0.1mm.

The average length of both tubes is 29mm.

Total height of the box 40mm, +/- 0.5mm, diameter 43 mm, +/- 0.5mm

9. **Muffler lists**

Lists of the approved mufflers will be published on the EFRA webpage.