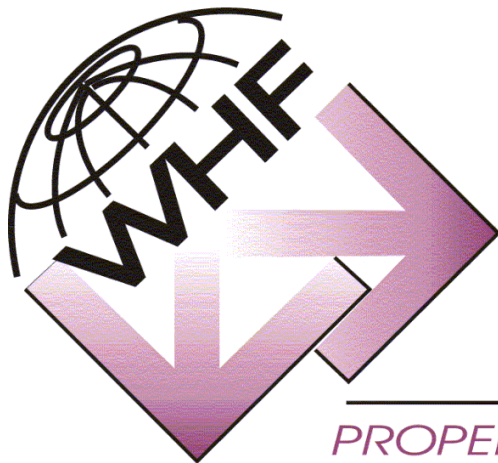


# WHF004

## Speed Record Competition Regulations



WORLD  
**HOVERCRAFT**  
FEDERATION

*PROPELLING GLOBAL HOVERSPORT*

[www.worldhovercraftfederation.org](http://www.worldhovercraftfederation.org)

World Hovercraft Federation

22 July 2014

**Whilst every effort is made to ensure the accuracy of the information contained in these regulations, the World Hovercraft Federation cannot accept responsibility for any injury or damage resulting from this information**

Publication Reference		WHF004
Issue	Date of Issue	Changes
1	2002	
2	July 2014	

© World Hovercraft Federation

The information contained within this publication must not be copied or duplicated without prior permission of the World Hovercraft Federation (WHF).  
The WHF gives express permission for member countries to adopt these procedures in all, or in part, or integrate into their own regulations.

For further information regarding this publication, please contact the Secretary:

Christel Martens  
World Hovercraft Federation  
Franciscusstraat 41  
6681 VP Bemmell  
The Netherlands  
[Tel:+31-481-450471](tel:+31-481-450471)

Email: [worldhovercraftfederation@planet.nl](mailto:worldhovercraftfederation@planet.nl)

## CONTENTS

1.	Introduction .....	3
1.1	Foreword .....	3
1.2	Associated Publications .....	3
2.	Hovercraft Meeting Officials .....	4
2.1	Competition Director .....	4
2.2	Other Officials .....	4
3.	Craft .....	5
3.1	Eligibility .....	5
3.2	Craft Formula Classification .....	5
3.3	Scrutineering .....	6
3.4	Noise Limits .....	6
4.	Driver .....	7
4.1	Eligibility .....	7
4.2	Protective Wear .....	7
4.3	Drugs and Alcohol .....	7
4.4	Junior Drivers .....	7
4.5	Driver Numbers .....	7
5.	Insurance .....	8
6.	The Competition Course .....	8
6.1	The Course .....	8
6.2	Timing Systems .....	8
7.	Competition Procedures .....	9
7.1	Flags .....	9
7.2	Timing and Results .....	9
7.3	Lanyard Kill Switch .....	9
7.4	Speed Record Attempts .....	10
7.5	Awards .....	10
7.6	Protest Procedure .....	10
8.	Anti-Social Behaviour .....	10

## 1. Introduction

### 1.1 Foreword

- A. These Competition Rules have been formulated by the Governing Board of the World Hovercraft Federation (WHF) and are to be followed for the running of all designated World Hovercraft Speed Record Meetings.
- B. The WHF takes no responsibility for the organisation of Speed Record Meetings. This responsibility is with the organising National Body.
- C. These rules are the copyright of the WHF but permission is given to National Governing Bodies to reproduce these rules in their own language.
- D. It is the responsibility of all National Governing Bodies to ensure that copies of these rules are available to all Competitors and Officials.
- E. The WHF Secretary will be in charge of the use of these regulations and will be able to delegate his powers to a deputy.

### 1.2 Associated Publications

Ref No.	Title	Issuing Organisation
WHF001	Competition Regulations for Racing Hovercraft	World Hovercraft Federation
WHF002	Construction Regulations for Racing Hovercraft	World Hovercraft Federation
WHF007	Appeals Procedures for WHF Events	World Hovercraft Federation
WHF008	Scrutiny and Compliance Procedure for Racing Hovercraft	World Hovercraft Federation

## 2. Hovercraft Meeting Officials

### 2.1 Competition Director

- A. The Competition Director has overall control of the meeting and his/her word is final, subject to protest.
- B. The Competition Director or appointed deputy will conduct a briefing with all Drivers and Marshals before the start of operating and at other times as necessary.
- C. The Competition Director may prohibit a Driver from taking part in a speed record attempt if he/she considers the Driver is not competent to drive safely.

### 2.2 Other Officials

- A. The number of officials will vary with the size and type of meeting but overall responsibility will rest with the Competition Director.
- B. Competition Meeting Officials should carry easy means of identification.
- C. A Doctor or recognised Paramedical Team and an Ambulance shall be on site for all practice and speed attempts.
- D. Organisers on duty shall not be under the influence of intoxicating substances. The limit shall be equal to the Host Country's regulations.
- E. A set of these regulations shall be issued to all Officials.
- F. In extreme circumstances Competition Meeting Officials can be removed from duty. The decision will be taken by a special committee, comprising one representative from each National Body, present at the meeting.

### 3. Craft

#### 3.1 Eligibility

- A. All craft shall be constructed in accordance with WHF002:- Construction Regulations for racing hovercraft.
- B. The requirement to be less than 300kg may be waived on application to the WHF.
- C. All other requirements shall be met where specified.

#### 3.2 Craft Formula Classification

- A. The following Formulas shall apply:

Formula	Engine Capacity	
	Two Stroke	Four Stroke
<b>Formula 1</b>	Over 600 cm <sup>3</sup>	over 750 cm <sup>3</sup>
<b>Formula 2</b>	Over F3 as defined below. Under 600 cm <sup>3</sup> two stroke (See 3.2Bc below)	Over F3 as defined below. under 750 cc four stroke (See 3.2Bc below)
<b>Formula 3</b>	Under 250 cm <sup>3</sup>	under 500 cm <sup>3</sup>
<b>Formula S</b>	Unlimited engine capacity, single engine, single duct	
<b>Formula 50</b>	<p><b>Single fan</b>, single duct integrated craft (Fans of less than 300mm used solely for engine cooling will not be counted).</p> <p><b>Single engine</b>, either:</p> <ul style="list-style-type: none"> <li>• Standard Rotax 503 engine                             <ul style="list-style-type: none"> <li>○ <b>Carburetter:</b> Single or twin, maximum diameter of 37mm</li> <li>○ <b>Exhaust:</b> Any exhaust system may be used, but when tested with the craft static, the engine at full throttle must not exceed 200 RPM more than when compared to running the engine full throttle with standard Rotax 503 exhaust (Part number: 973275), Standard Rotax 503 exhaust manifold (Part number: 878937) and Standard Rotax connecting section (Part number: 973182). No adjustments may be made during this test.</li> <li>○ The removal of the Rotax 503 cooling fan and subsequent head rotation is permitted.</li> </ul> </li> <li>• Standard Hirth 2703V                             <ul style="list-style-type: none"> <li>○ <b>Carburetter:</b> Single, maximum diameter 38mm</li> <li>○ <b>Exhaust:</b> Manufacturers standard two into one exhaust. Any of the options given in Appendix E of competition regulations WHF001.</li> </ul> </li> <li>• No other engines will be permitted.</li> </ul>	
<b>Formula 35</b>	Single or multiple four stroke air cooled industrial engines with a total horse power not exceeding 35hp as specified on the manufacturer's engine label(s) / name plate(s) and operating within the manufactures engine speed range. If this information is not available it is the drivers' responsibility to provide documentary evidence to the satisfaction of the WHF Technical Director, or his representative, that engines meet these requirements.	

- B. Formula 2 Engine Capacities limits and calculation

Where a Formula 2 craft has a combination of engines the “effective” capacity shall be determined as follows: The reference limit for Formula 2 is a total two stroke engine capacity of 600 cm<sup>3</sup>. The two stroke or equivalent two stroke value will be the total sum as calculated by using the following rules:

- a) The capacity of any two stroke engine shall be its actual capacity unless it falls into one of the categories below.
- b) The capacity of any four stroke engines shall be divided by 1.25 unless it falls into one of the categories below.

- c) The capacity of any rotary engine shall be rated as 3.2D below.
  - d) The capacity of any two stroke engine used exclusively for lift where the fan is directly coupled to the crankshaft shall be its actual capacity divided by 2.
  - e) The capacity of any 4 stroke or rotary engine used exclusively for lift where the fan is directly coupled to the crankshaft shall be its equivalent capacity as calculated in 3.2B.b) or 3.2B.c) above divided by 2.
- C. Engine re-bores for maintenance:
- Engines are classed according to the standard  $\text{cm}^2$  when new. Re-bores are allowed to the following oversize:
- Formula 3                      256  $\text{cm}^3$  two stroke                      512  $\text{cm}^3$  four stroke
  - Formula 2                      Two stroke reference limit of 610  $\text{cm}^3$
  - Formula 50                      508  $\text{cm}^3$ .
- Standard engines bored outside these limits will be classed at their measured capacity.
- D. Wankel engines are rated as twice the swept volume per chamber, times the number of rotors, with the exception of engines where all the induction air is passed through the rotor, in which case the engine will be rated as swept volume per chamber times the number of rotors. Engine details will be as per engine manufacturer specifications and in any dispute the driver must make the original specifications available.
  - E. Gas turbine powered craft shall be categorised as Formula 1.
  - F. Pressure charged engines (supercharged or turbo-charged) shall be rated at twice their swept volume.

### 3.3 Scrutineering

- A. All craft must be presented for scrutineering and must comply with the WHF Construction Regulations WHF00 and any supplementary regulations that may in force. It is the craft owners' responsibility to ensure and check for conformance.
- B. A scrutineer, appointed by the host country, and approved by the WHF will carry out an examination of the craft for any obvious defects. If a craft is found not to comply with the WHF Construction Regulations it will not be allowed to operate.
- C. A current craft log book must be presented to the scrutineer. If the log book is not available a full scrutiny I.A.W WHF008 may be called for and an appropriate fee charged.
- D. Any damage or modification to the craft, including ballast, which occur during the Competition meeting, must be reported to the designated Scrutineer for inspection, prior to further operation.
- E. Scrutineers shall not verify craft they have personally constructed.

### 3.4 Noise Limits

- A. The maximum noise level is 93dBA
- B. Flyby sound measurements will be taken during racing at a distance of 25 metres, with an instrument at a height of 1.2 metres (+/- 1 metre) above the ground. Any craft exceeding the noise level stated must take a static noise test.
- C. Static noise measurements shall be made at a distance from the craft of 25 metres with an instrument set 1.2 meters (+/- 1 metre) above the ground. The craft will be positioned in a fixed position on flat open grassland with all engines on maximum power. Measurements will be taken on all four corners of the craft.
- D. Any craft exceeding the maximum noise level will be reported to the Competition Director who may prevent the craft from further operation until remedial action has been taken and a subsequent noise test shows that the craft is below the maximum noise level.

## 4. Driver

### 4.1 Eligibility

- A. All drivers must be a member of a National Governing Body which is a member of the WHF.
- B. All drivers must present a qualified National Licence appropriate to the formula they are entering issued by a National Governing Body. (A novice licence is not acceptable).
- C. The driver must be 16 years of age or over unless a competition is especially designated otherwise.
- D. All drivers must attend the Competition Director's formal briefing except under exceptional circumstances in which case they must report to the Competition Director before operating.
- E. All drivers must have read the current regulations and any supplementary rules published by the WHF Secretary and sign to that effect at the Competition Director's formal briefing. A signing on sheet shall be provided for this purpose by the organisers.

### 4.2 Protective Wear

- A. All drivers must wear a crash helmet and life jacket, at all times when operating. Crash helmets should be of very bright colour such that they can, depending on the nature of the racing environment, be very easily seen. Reflecting (fluorescent) colours are highly recommended. If relevant any countries legal requirements will take precedence over this rule but event Organisers will be required to make this known twelve months in advance.
- B. Suitable protective clothing covering hands and arms, legs feet and torso must be worn during racing, practice and time trials.

### 4.3 Drugs and Alcohol

- A. Drivers will be banned from competing in the competition meeting if they are found to be under the influence of alcohol or illegal substances.
- B. The limit shall be equal to the competition meeting Host Country's regulations.
- C. Testing for alcohol will be done by breath testing.
- D. All drivers shall submit samples for drug testing if required to do so by an official of the World Hovercraft Federation.

### 4.4 Junior Drivers

- A. Drivers must be aged between 11 and 16 years (The driver must not be more than 16 years of age before the start of the World Championship event).
- B. The craft must not exceed 250 cm<sup>3</sup> two stroke to a maximum of 50 horsepower, F35 or Formula 50 specification – including the Rotax 447, using the same criteria as the F50 engine (refer to rule 3.2A). Maintenance re-bores will be allowed as 3.2C.
- C. A responsible adult shall supervise the Junior drivers and be present during scrutineering and briefings.

### 4.5 Driver Numbers

- A. Driver numbers are specific to drivers and will be issued by the Host country. No driver is to run on any other number than the one issued to him.
- B. Drivers numbers must be displayed on both sides of the craft on fan ducts or on boards fixed to the duct. Driver numbers shall be black or white on a contrasting background and have minimum dimensions of 250mm high x 25mm line thickness.
- C. Numbers incorporating a sponsor may be provided by the WHF or organising National Body.

## 5. Insurance

- A. All Drivers must insure their craft according to National regulations. No craft can operate without insurance.
- B. The receiving National Body must insure itself against all non-racing third party risks.
- C. Where possible the organising National Body should attempt to arrange an overall racing insurance policy.

## 6. The Competition Course

### 6.1 The Course

- A. The course will be 1 kilometre in length, surveyed to within 100mm (100 parts per million) by a certified survey company. This company shall provide documentation to verify the course length.
- B. The course may be entirely on land, water or a combination thereof, but any record reported shall be established for that running surface.
- C. There shall be sufficient 'run-up' area to allow craft to reach full speed prior to the start line.
- D. There shall be sufficient 'shut-down' area provided on EACH end of the course to allow the competitors to safely slow down from their maximum speed AFTER completing the measured kilometre course.
- E. The public will be banned from the course whilst craft are operating.
- F. All marshalling posts shall be equipped with fire extinguishers of 5kg minimum weight.

### 6.2 Timing Systems

- A. The Timing Standard used shall have a time base of better than 20 parts per million.
- B. Accuracy certification documentation dated within 24-months shall be provided for all timing devices. Through-beam sensors accurate to at least 0.001 second (1 millisecond) repeatability shall be used.
- C. Example: Banner emitter SMA30PEL Freq A Part# 27287 & receiver SM30PRL Freq A Part# 27291.
- D. Other equipment may be used providing the accuracy given above is met.
- E. All sensors shall be mounted the same distance above the course surface.

## 7. Competition Procedures

### 7.1 Flags

- A. All flags should be at least 450mm x 225mm and must be clearly visible from the course.

Flag in Use	Purpose
National Flag	Start of Run
Stationary Yellow	Warning of Danger
Waving Yellow	Slow down and Prepare to Stop
Red	Run Stopped - Craft Stop
Black & White Chequered	Finish of Run
Black together with Number Board	Craft Bearing that Number to return to paddock (only given by Competition Director, their Deputy or a designated Scrutineer)

**Table 7-1:- Flag Designations**

- B. Other flags may be used for other purposes but their use must be made clear at the Drivers briefing.
- C. Only Marshals designated by the Competition Director or Chief Marshal are permitted to use Course Flags during a run. Flag Marshals must ensure that neither spectators nor racing drivers pick up and use Course Flags during a run.
- D. A starting system of lights may be used.

### 7.2 Timing and Results

- A. Timing will be measured in two directions within one hour and the times will be added together.
- B. The resulting average speed in kilometres per hour will be determined by dividing 7200 by the total time in seconds. Resulting speed will be truncated after three decimal places.
- C.  $Average\ kph = \frac{7200}{Total\ Time}$
- D. Example:
- First run time 45.67895 seconds
  - Second run 44.23456 seconds
  - Total Time 89.91351 seconds
  - Calculated speed =  $7200 / 89.91351 = 80.076953$
  - Official speed 80.076 KPH
- E. Timing commences when the bow of the hovercraft enters the trap and stops when the bow leaves the trap.
- F. The craft MUST re-enter the trap from the other direction within one hour of the first entry for the run to be official.
- G. Results shall be displayed for public viewing either electronically during the competition or as soon as possible after the run and shall become final one hour after public release. The release time must be stated on the results. Protests as per section 9 must be made within this period.
- H. Representatives of National Governing Bodies will have access to official result calculations.

### 7.3 Lanyard Kill Switch

- A. All lanyard kill switches will be checked before each run.

#### **7.4 Speed Record Attempts**

- A. Each competitor must complete two runs on the course – one in either direction within one hour of each other.
- B. Only one competitor will be allowed on the course during a record attempt
- C. All lanyard kill switches will be checked before each record attempt.
- D. Additional regulations may be added and these will be given to the Drivers at a briefing or in writing.

#### **7.5 Awards**

- A. Prior to the start of an event, the organisers will display a list of the awards and runs which count towards the appropriate awards.

#### **7.6 Protest Procedure**

- A. Should any driver need to appeal or protest, he/she should refer to WHF007 Appeals Procedure.

### **8. Anti-Social Behaviour**

- A. It is the responsibility of National Governing Bodies to ensure the correct social behaviour of all their drivers, families and supporters and to penalise behaviour liable to bring the sport into disrepute.