

# FORMULA CAR CHALLENGE

presented by: **GOODYEAR**

## Supplemental National Rules for Formula Car Challenge

**UPDATED 02.25.16** Recent major updates highlighted in **YELLOW**

### **SERIES OVERVIEW:**

The Formula Car Challenge is a multi-regional series, with a NASA sanctioned national championship. The series features three types of Formula Mazda open wheel racing cars. They are the Pro Formula Mazda (PFM), the Formula Mazda (FM), and the FormulaSPEED (FS). As a NASA Sanctioned series all participants must operate under current NASA Club Codes and Regulations: <http://www.nasaproracing.com/rules/ccr.pdf>

### **TECHNICAL**

Every car running in NASA events must have a current NASA logbook, must be a NASA member, hold a current NASA competition license or NASA accepted license, and have a NASA Annual Car Inspection. NASA events require a NASA Annual Inspection. The process to receive the NASA Annual Inspection is to fill out the Race Car Inspection document (found in the Competitors section of the FCC website) and have the car and your driver gear inspected at tech at your first NASA event of the season. NASA tech normally opens at 6am on Saturday. To save time racers can have the process done in advance by an Official NASA Formula Car Inspection center.

World Speed Motorsports & Pro Sport Engineering are certified to complete the NASA Annual Techs for PFM FS, and FM cars. World Speed Motorsports: [parts@worldspeed.com](mailto:parts@worldspeed.com) 707.935.9761  
Pro Sport Engineering: Derry O'Donovan [DerryOD@aol.com](mailto:DerryOD@aol.com) evening phone# 707 226-1556. Cell 707 812-2745

### **TESTING**

Exclusive testing will be available at some events. Drivers competing for points may ONLY run in series sessions during these days or they will be ineligible for points for the following race weekend. Team test days the week of the event are acceptable if they are announced with 30 days notice, and open to all competitors.

### **POINTS**

Points are awarded in the Series based on the finishing order of each race, counting only the Series Competitors starting each event. Series competitors need only take the green flag to earn series points.

### **SAFETY**

In addition to NASA Club safety regulations a HANS device and arm restraints are mandatory during all sessions. All cars must have an on-board fire extinguisher system.

### **CAR COUNT**

A total of only 35 entries will be accepted per race. This is a total of ALL car types combined. First come first served. Should 2 drivers sign up at the exact same time, the driver who has attended more events will receive the entry. Indy GP of Sonoma and NASA National Championship events may allow up to 5 additional cars if paddock space is available.

### **BLOCKING**

Any driver who, in the sole opinion of the Race Director and/or Stewards, alters their racing line based on the actions of pursuing competitors, or uses an abnormal racing line to inhibit or prevent passing may be considered to be "blocking" and will be warned or penalized.

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**PRE-GRID RULE** If you arrive to pre-grid after the first car leaves the grid you start at the back of the entire field (regardless of class)

## **PRACTICE & QUALIFYING PRE-GRIDS**

After the first race weekend the practice and qualifying grids for the remainder of the season will be determined by points. Grids will be split into 2 groups. Pro FM will be in the first group, and FM and FS will be in the second. A grid sheet will be generated for Saturday morning, and will remain in effect for the entire event. Cars must be on the grid prior to the 3 minute board to secure their spot, or they will be placed at the back of their group.

## **TIRE SCRUBBING**

Drivers should take care when weaving to warm up tires (a.k.a. "scrubbing tires"). Scrubbing of tires is **ONLY** permitted while following a pace car that has its lights on, as conditions allow.

## **FORMATION LAP**

Drivers must take their position on the formation lap when the Race Director determines the field to exit pit road. If a driver is not in their position, or loses his position due to a mechanical issue or driver error, the driver must start the race from the rear of the field. The driver may NOT reassume their position.

If a grid position is left open due to a competitor not being in their proper location, the field/column may move forward to claim the position that is forfeited.

## **DRIVER CAUSING RED/BLACK FLAG**

If a Car causes a Red/Black Condition or otherwise interferes with qualifications as determined by the Competition Director, the Car's best timed lap of the session may be disallowed. If a Car causes two Red/Black Conditions or otherwise interferes with qualifications as determined by the Competition Director, all session times may be voided and the Car may not be permitted to participate in the remainder of qualifying.

## **QUALIFYING**

Competitors should never leave the pit lane until the session is over. Doing so may result in a loss of qualifying times. Series officials will decide who needs to report to tech/impound after the qualifying session is complete. Any cars that have gone back to the paddock may have their times disqualified.

In compliance with NASA Regulations (20.3.2), the pole winner may choose what side to start from. The declaration must be made prior to the 3 minute board in pre-grid. It will be assumed the pole will be the inside of the first corner. The pole sitter decision will only affect the front row; positions 3 onward will be grid based on inside of first corner.

## **TIRE CARE**

Use of tire warmers or cooling methods other than natural air convection or conduction is prohibited.

## **HARDWARE**

Fasteners, links, and rod ends may be either metric or standard threads, but shall be at least grade five (5). No titanium or other exotic materials are permitted in the series.

## **DROP RACES FOR 2016**

West Coast Regional FCC Champion is determined by the total points tally after all region events have been completed in the season with 2 race drops.

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## **SERIES PARTNERS DECALS AND DRIVER SUIT PATCHES**

Cars must install Series partners decals in official mandated locations. Cars and driver suits that are not in compliance will not be awarded points, and may not be permitted on track. The Race Car Inspection document found on the Competitor section of the FCC website lists the required decals and driver suit patches for the series.

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## DETAILED CAR TECHNICAL SPECIFICATIONS BY CLASS:

### FORMULA MAZDA (FM) –

#### Manufacturer Moses Smith Racing ([www.formulamazda.com](http://www.formulamazda.com))

The Formula Mazda is a 13B powered 5 speed H pattern tube frame car first designed in 1984. The car has been manufactured by Hayashi, Russell Racing, Star Race Cars, Fab Works, and the current manufacturer Moses Smith Racing. Any Formula Mazda from these builders will be allowed to compete if they meet the following rules.

**FM.1** Every FM must meet SCCA GCR Technical requirements for the FM class which can be found here: <http://www.scca.com/pages/cars-and-rules>

**FM.2 Fuel:** Only the Series-designated fuel may be used.

**FM.3 Tires:** Goodyear 470 compound tires (D2660 rear / D2659 front) – Competitors may use only one set (two fronts and two rears) of official tires per weekend (including doubles) during all qualify & race sessions. These tires must be declared by competitors and marked by the series. No other tires may be used during qualify & race sessions. It is the responsibility of the competitor to ensure their tires are marked appropriately. If after the start of any qualify or race session a single marked tire is damaged, defective, or otherwise unfit for use, once per weekend the competitor may be allowed to replace that tire with another tire upon verification and approval by the Race Director. If after the start of a qualify or race session for any reason (damage, defect, etc.) a competitor must change more than one, or a second, marked tire the competitor will start the next race from the back of the entire field, and will also be penalized one finishing position at race end. Race Director may increase these penalties at his discretion. Tires may not be changed for the purpose of gaining an advantage. Rain tires may be used at any time.

#### **FM.4 Transponder location:**

The center of the transponder should be mounted 2.5" from the front bulkhead on the left side skin. There is no height requirement.

**FM.5 Exhaust:** All FM cars must have 18 Supertrapp plates (or less if needed to meet sound) and an end cap installed. Supertrapp plates must be installed correctly, be unmodified, and not use any additional spacers.

**FM.6 Weight:** Minimum weight with driver = 1350 lbs w/ 6 port 13B, 1400 lbs w/ 4 port Renesis.

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## FormulaSPEED (FS)

### Manufacturer World Speed, Inc. ([www.FormulaSPEED.us](http://www.FormulaSPEED.us))

The FormulaSPEED2.0 is a Mazda MZR powered 6 speed sequential car. Cars and parts are available through World Speed Incorporated 707.935.9761

**FS.1 Weight:** 1335lbs minimum with driver (Note: At SCCA non-exclusive FCC events 1350 as per SCCA GCR)

**FS.2 Fuel:** Only the Series-designated fuel may be used.

**FS.3 Tires:** Goodyear 470 compound tires (D2660 rear / D2659 front) – Competitors may use only one set (two fronts and two rears) of official tires per weekend (including doubles) during all qualify & race sessions. These tires must be declared by competitors and marked by the series. No other tires may be used during qualify & race sessions. It is the responsibility of the competitor to ensure their tires are marked appropriately. If after the start of any qualify or race session a single marked tire is damaged, defective, or otherwise unfit for use, once per weekend the competitor may be allowed to replace that tire with another tire upon verification and approval by the Race Director. If after the start of a qualify or race session for any reason (damage, defect, etc.) a competitor must change more than one, or a second, marked tire the competitor will start the next race from the back of the entire field, and will also be penalized one finishing position at race end. Race Director may increase these penalties at his discretion. Tires may not be changed for the purpose of gaining an advantage. Rain tires may be used at any time.

**FS.4 Upgrades:** The only allowable upgrades to the FormulaSPEED2.0 is the addition of on board cameras, a steering sensor, and two brake pressure sensors.

### FS.5 The Intent of the FS Class

It is the explicit intention of these rules and regulations to prohibit innovation and alteration of the cars except as provided by these regulations, or event supplementals.

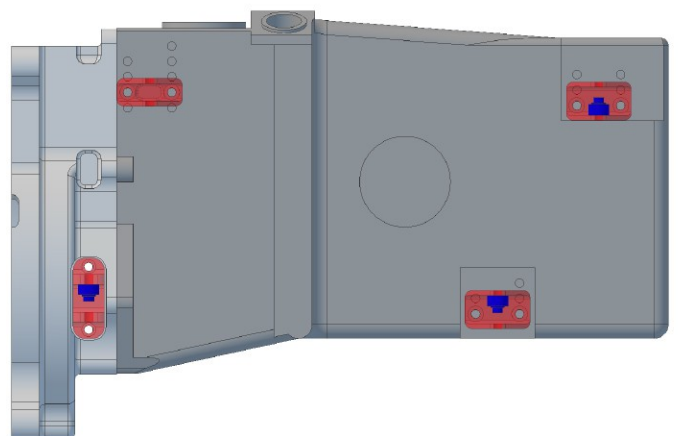
**FS.6 Exhaust:** FormulaSPEED spec header, and FormulaSPEED Phase9 Muffler part#05-059 with no modifications

**FS.7 Suspension:** Suspension arms are marked with FS hologram decals, no modification to any suspension is allowed. Only the stock location for the rear pickup points are permitted to be used, and large spacers installed per this diagram (spacers in blue.) Spec springs are 400# front, and 600# rear.

**FS.8 Anti Roll Bars:** Spec anti roll bars may be adjusted within their range, or disconnected completely.

**FS.9 Brake Pads:** Only series-designated FS brake pads may be used.

**FS.10 Transponder:** An AMB transponder must be fitted in the provided location on the rear wing upright.



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**FS.11 Clutch:** The clutch disc and pressure plate must be bolted directly to an unmodified stock flywheel, or optional 2016 upgraded spec lightened flywheel part # 06-006.

Clutch Disc: MAZDASPEED 0000-02-5415-AC

Pressure Plate: Mazda LF04-16-410A

**Part Diameters & Weights**

Clutch disc: 8.5" min. weight 1.7lbs

Pressure Plate: 9.875" min. weight 9.4lbs

Flywheel: 11.0" min. weight 16.0lbs

Car	Engine	Wheels & Tires	Aero	Transmission	Weight	Notes
Formula Speed2.0 (FS)	2.0 Liter Mazda MZR	(F) 8" (R) 10"  Goodyear 470 compound tires (D2660 rear / D2659 front)  Wheels must be 3 piece FS wheels with FS logo, or 2016 one piece FS wheels with FS logo.	Dual rear adjustable main planes. Front main plane is fixed. Front winglets are adjustable. Wings and bodywork are delivered with an FS marking that is to remain visible for scrutineering.  1/8" Gurneys on front flaps, and 1/2" Gurneys on rear upper and lower wings are mandatory. Wings can be adjusted within stock adjustable range.	6 forward speeds and reverse with an open differential. No lift shift system. Spec gears are as follows:  12/29 15/29 17/26 18/22 24/26 24/24  Ring & Pinion 9:31	1335 with driver	ECU map and engine shall be sealed by Hasselgren Engineering. FS hologram sealed Ohlins TTX dampers. Hasselgren Engineering spec FS intake must be used. No part of the car shall be altered from FS original parts except for repairs that do not affect performance. Spec springs are 400# front, and 600# rear.

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## PRO FORMULA MAZDA (PFM)

**Manufacturer Star Race Cars (www.starracecars.com)** The Pro Formula Mazda is the same RX8 powered 6 speed sequential racecar used in the Star Mazda Championship from 2004-2012, and the Pro Mazda Championship from 2013 - 2017. All PFM cars competing in the Formula Car Challenge must comply with the 2012 Star Mazda Rules as available below except where stricken through or otherwise stated herein – where otherwise stated herein these rules supersede Star Mazda rules. Where “Star” and or “IndyCar” are mentioned in the 2012 Star Mazda Rules it should be assumed that the Formula Car Challenge and NASA (or whichever sanctioning body an event is held under) will do the same.

2012 Star Mazda Rules available here:

[http://formulacarchallenge.com/Documents/2012 Star Technical Rules Excerpt 4.10.14.pdf](http://formulacarchallenge.com/Documents/2012%20Star%20Technical%20Rules%20Excerpt%204.10.14.pdf)

### PFM.1 Engine:

- 1.A Engines must be built and have official motor seals from an approved builder. Approved engine builders are:
- o Star Race Cars (motors built or sealed by Star Race Cars prior to 1.1.13)
  - o Daryl Drummond Enterprises, Inc. (SCCA PFM FA spec) 541-761-5520.
  - o Speed Source (Pro Mazda Championship spec) 954-578-7071.
- 1.B Engine ECU map may be Star or Pro Mazda Championship.
- 1.C Specified air filter is K&N Filter P/N 050-539 only with original air box P/N 050-560.
- 1.D Option air filter is Pro Mazda Championship Spec Air Filter (Mazda PN: N3H1-13-Z40) in combination with “Speed Source Reset Airbox” (P/N RESET Air Box).

**PFM.2 Fuel:** Only the Series-designated fuel may be used.

**PFM.3 Gears:** Competitors have a choice of two sets of gears.

3.A Set “A” shall consist of: 12/29,15/30,15/25,19/27,20/25,19/21

3.B Set “B” shall consist of: 12/29,17/30,19/27,18/22,24/26,24/24

### PFM.4 Weight:

4.A Minimum weight with driver – 1350 lbs.

### PFM.5 Electrical and Instrumentation:

5.A. Battery shall be securely mounted in standard, left side pod position. Size and type are unrestricted provided it is a 12 Volt rated gel cell. Car may have connections fitted for auxiliary battery. Auxiliary battery is permitted for starting the motor only, and may not be permanently attached to the vehicle.

5.E. ECUs are serviceable only through the manufacturer Star Race Cars or Pro Mazda Championship.

### PFM.6 Bodywork and wings:

Bodywork and Crash Structure

6.A. Numbers: Use of Series issued numbers and number panels on nose and rear wing endplates is required, in the Series specified locations. Must be black with white background.

### PFM.7 Car Configurations, Updates:

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The following car configurations are legal in the FCC series.

1. Current PFM spec car as described in Star Mazda Rules referenced herein, with these additions: original Steering (Ackerman) Arm P/N 010-503 may be used, original Track Rod P/N 110-506 may be used.
2. Original PFM spec car as delivered in 2004. 2004 spec cars may have updated the following components only to be considered a 2004 car: traction control switch and fuel trim switch to 11 position P/N 095-538, rear clevis to upright P/N 020-531. 2004 spec cars must use the two piece upper nose bracket: Upper Nose Mount-Nose Side (P/N 030-565), Upper Nose Mount-Tub Side (P/N 030-566)
3. 2006 rear attenuators are optional but highly recommended.
4. Components made for the Pro Mazda Championship - and sold by Carl Haas Auto - which are in all functional ways identical to Star parts and use the same part number with a Carl Haas Auto prefix may be used in the originally designed and intended location.

**PFM.8 Cooling:** As delivered. Optional additional volume World Speed Inc. pipe kit is permitted. Star Race Cars water radiator Fan Kit is permitted consisting of the following P/N:

8.A Electric Fan Sub harness P/N 080-568.

8.B Automatic Electric Cooling an P/N 100-539.

8.C Cooling Fan Brackets and Studs (if using radiator not delivered with mounts) P/Ns 100-540 and 100-541.

**PFM.9 Suspension:**

9.A. Only shock absorbers serviced and sealed by Star Racecars or Carl Haas for the Pro Mazda Championship are allowed.

**PFM.10 Brakes:**

10.A. Brake pads: Only Performance Friction PFC01 or PFC05 or PFC07 or PFC13.

**PFM.11 Clutch:**

11.A. Original spec clutch discs P/N 060-539 may be used.

**PFM.12 Exhaust**

All cars must be fitted with World Speed Inc. or Star Mazda club muffler system with a Supertrapp flange. The series will determine if plates will need to be used on a race by race basis. Competitors are encouraged to have 18 plates and an end cap available should noise abatement be deemed necessary. Supertrapp plates must be installed correctly, be unmodified, and not use any additional spacers. Single muffler 'Pro' pipe may be specified in supplemental event regulations for events without sound restrictions.

**PFM.13 Bypassing Oil Temp Condition**

It is acceptable to circumvent the "Cold Oil/Rev-Limit" condition built into current PFM engine mapping, however, competitors should note that this condition was designed to prolong engine life and by circumventing it they may be jeopardizing engine longevity and take this action at their own risk. Competitor must inform FCC officials if this feature is being by passed and by what method. Bypassed cars must have a label on the airbox stating "Cold Oil Bypass."

**PFM.14 Tires:** Goodyear 465 compound radial dry tires (4541 rear / 4540 front) – Competitors may use only one set (two fronts and two rears) of official tires per weekend (including doubles) during all qualify & race sessions. These tires must be declared by competitors and marked by the series. No other tires may be used during qualify & race sessions. It is the responsibility of the competitor to ensure their tires are marked appropriately. If after the start of any qualify or race session a single marked tire is damaged, defective, or otherwise unfit for use, once per weekend the competitor may be allowed to replace that tire with another tire upon verification and

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