

FORMULA MAZDA - FMzR Specifications

1. Eligibility

Only cars homologated as MSR - FMzR are eligible for competition in this class.

2. FMzR Description

One design, fixed specifications, open cockpit, single seat Formula car with Mazda (MZR) 2.0 engine. The Stock Cam shafts have been replaced with a Moses Smith Racing proprietary cam shaft profile. Engines are sealed by Moses Smith Racing. Cars are packaged and sold by Moses Smith Racing (MSR). All replacement parts are supplied through MSR and shall be official FMzR parts. No modifications may be made to any part or system unless specifically permitted in these rules.

3. Safety Requirements

Car will be delivered from the manufacturer with approved safety equipment. Replaced items shall be supplied through MSR, except safety harnesses and fire suppression system may be replaced/serviced by any other that conforms to GCR Section 9

4. Electrical System-

NO MODIFICATIONS ALLOWED, except as described within these rules.

- 4.1. Wiring harnesses must remain as delivered.
- 4.2. Required battery P/N 080-720 and must remain in the original location and securely fastened using battery box P/N 080-702.
- 4.3. Battery, alternator, Starter and ground wires P/Ns 080-710, 080-711, 080-712, 080-713 are required.
- 4.4. Car must shut off when any of the (3) master buttons are pressed.
- 4.5. Jump battery quick connect plug P/N 080-730 is allowed.
- 4.6. AiM instrumentation MSR P/N 095-715 is required.
- 4.7. Telemetry is not allowed.
- 4.8. Rain/Hazard light P/N 080-721 is Required
- 4.9. AEM ECU MSR P/N 095-701 is required. Modification of the ECU, ECU program, wiring or sensors is prohibited. Calibration of the Pedal Position Sensor is allowed.
- 4.10. Alternator P/N 080-706 is required and is required to be in working order.
- 4.11. Air Inlet Temperature + Pressure Sensor P/N 095-705 is required
- 4.12. Oil/Water temp sensor P/N 095-704 is required for Oil and Water temperature
- 4.13. Fuel/Oil Pressure sensor P/N 095-707 is required for Fuel and Oil Pressure
- 4.14. Lambda (Air/Fuel Ratio) Sensor P/N 095-703 is required

5. Radiators and Plumbing

- 5.1. Radiator P/N 100-706 is required within the Right Side pod
- 5.2. Radiator P/N 100-701 is required within the Left Side pod
- 5.3. Air to Oil Cooler P/N 100-730 is required within the Left side pod
- 5.4. Plumbing and routing, may not be modified, bypassed, or changed in any way.

- 5.5. All cars must be equipped with oil and coolant catch tanks per GCR Section 9.3 Oil Catch Tanks, Filters, and Breathers.
- 5.6. Radiator Screen assembly P/N 110-747 and P/N 110-748 may be used. No part of the Radiator Screen Assembly may protrude outside the vertical plane of the side pod.

6. Engine

- 6.1. NO MODIFICATIONS ARE ALLOWED EXCEPT WHERE SPECIFICALLY AUTHORIZED WITHIN THESE RULES. This includes all fuel injection and engine management components, including exhaust, cooling, electrical and lubrication systems. All systems are subject to test procedures and must conform to OEM specifications as stated and supplied by MSR. All fluids, except fuel, are unrestricted.
- 6.2. MSR and Elan Power Product (EPP) seals on the engine, and other components shall remain in place at all times. All engines shall be rebuilt, checked on an engine dynamometer, and sealed through MSR and EPP.
- 6.3. Engine maintenance, which is permitted, includes the replacement, but not modification of external engine and engine systems parts.
- 6.4. There are two seals on the engine. One (1) on the timing cover, and one (1) on the top of the valve cover. They may not be removed or tampered with.
- 6.5. Intake manifold P/N 050-742 is required. No modifications are allowed. Absolutely no porting or the addition of material is allowed. No coating or painting is allowed on the exterior or interior of the intake manifold.
- 6.6. Modification to the crankshaft dampener is not allowed.
- 6.7. The Following parts must be used, and not modified in any way
 - 6.7.1. Flywheel P/N 060-703, Pressure Plate P/N 060-705, Clutch Pack P/N 060-707, Throw Out Bearing P/N 060-708
 - 6.7.2. Throttle Body P/N 050-744
 - 6.7.3. Air Filter P/N 050-727
 - 6.7.4. Header P/N 05-731 Collector P/N 050-732, Muffler P/N 050-736 and Exhaust Tail Pipe P/N 050-733 must be used
- 6.8. Oil Lines P/N 050-713, P/N 050-714, P/N 050-715, and P/N 050-716 are Mandatory

7. Fuel System

- 7.1. Fuel Pump P/N 070-712 is Mandatory
- 7.2. Fuel Filter P/N 070-733
- 7.3. Fuel Injectors P/N 070-744
- 7.4. Fuel Lines P/N 070-745, P/N 070-746, and P/N 070-747 are mandatory
- 7.5. Fuel Cell must be replaced (5) years after manufacture date or on "Expiration" date, or "Not valid after date"

8. Transmission

- 8.1. The SADEV SL-82LW 6 speed sequential transaxle, paddle shift actuated, supplied by MSR is the only permitted transmission. No internal or external modification (including lightening) other than normal racing repair or as noted below:

- 8.2. Transmission servicing, replacement of internal components is permitted by the competitor.
 - 8.2.1. Only internal parts manufactured by SADEV may be used that are specified and sold by MSR.
- 8.3. All components must be ferrous metal, except for bearing retainers and bearing cages.
- 8.4. Polishing of driveline components is permissible through either conventional mechanical polishing techniques or by way of chemically assisted systems such as the REM Isotropic finishing system. Coatings are not permitted.
- 8.5. Paddle Shift system and components are specified.
- 8.6. Modification of the GCU, GCU program, wiring or sensors is prohibited. Calibration of the Gear Position Sensor is allowed.

9. Weight

- 9.1. Minimum weight with driver = 1300 lbs
- 9.2. Ballasting is permitted. Ballast must be mounted forward of the fuel cell but aft of the instrument panel bulkhead.
- 9.3. Ballast must be mounted securely to the floor in this specified area.

10. Suspension

Suspension is defined as the system of springs, control arms, links, etc., supporting the vehicle on its axles.

NO MODIFICATIONS ALLOWED. Adjustments are permitted within the limits of the suspension and steering components.

- 10.1. Competitors may use the entire travel of all suspension adjusted components as delivered.
- 10.2. Rod ends and sphericals may be replaced with rod ends or sphericals having specifications equal to or greater than the OEM supplied rod ends. This includes dimensional material and strength specifications. Replacement rod ends shall be capable of being installed with no modifications to any original components.
- 10.3. Anti-roll bars (sway bars) may be run disconnected, but not removed. One anti-roll bar link may be removed from the front, rear, or both ends of the chassis for safety reasons, but no modification of the link or attachments is permitted.
- 10.4. Ride height is unrestricted within the standard adjustment range. Droop limiters are not allowed.
- 10.5. Camber, caster, toe-in/out, bump steer, are unrestricted within the adjustment range using Camber Shims P/N 000-731 and Caster Shims P/N 000-732.
- 10.6. All suspension parts are specified, and sold by MSR.
- 10.7. Springs shall be steel only. ID of spring must be 2.25" Length and Rate is unrestricted

11. Shock Absorbers

- 11.1. NO MODIFICATIONS ALLOWED. P/N 000-736 on all 4 corners.
- 11.2. Bump Rubbers P/N 000-737 are mandatory
- 11.3. All shock absorbers must be sealed by MSR or Penske Racing Shocks.

12. Wings

- 12.1. The front and rear wing assembly and its related mounting components must be used as delivered. P/N 110-701 and P/N 110-702
- 12.2. Wing "angle of attack" (front and rear) is unrestricted within the un-modified adjustment range.
- 12.3. Gurney flaps for wings are permitted, provided they are mounted on the upper surface of the wing. Quick change attachment is prohibited, must be bolted or riveted only. Gurney flaps are bent or formed 90 degrees. "Saw toothed" Gurney flaps are not permitted.

13. Brakes

NO MODIFICATIONS ALLOWED, except as described within these rules. Only the 4 PISTON CALIPER BRAKE SYSTEM and VENTED ROTORS as supplied by MSR shall be used

- 13.1. Brake pads P/N 040-710 and P/N 040-711 supplied from MSR.
- 13.2. Brake rotors P/N 040-720 are used as delivered, no drilling or lightening is allowed.
- 13.3. Master cylinders: Front master cylinder is 3/4" piston diameter, P/N 040-702. Rear master cylinder is 15/16" piston diameter, P/N 040-703
- 13.4. Front and Rear Calipers must be P/N 040-722
- 13.5. Front Brake Lines P/N 040-715 are mandatory. Rear Brake Lines P/N 040-716 are mandatory
- 13.6. Driver adjustable manual brake bias is allowed P/N 040-704

14. Tires

- 14.1. Dry Tire -
 - 14.1.1. Manufacturer, size, and compound are unrestricted
 - 14.1.2. Cantilevered tires are not allowed
 - 14.1.3. Any type of grooving is not allowed
 - 14.1.4. Any type of modification is not allowed
 - 14.1.5. Any type of chemical treatment is not allowed
- 14.2. Rain/Wet Tires -
 - 14.2.1. Manufacturer, size, and compound are unrestricted
 - 14.2.2. Cantilevered tires are not allowed
 - 14.2.3. Hand grooving is not allowed
 - 14.2.4. Any type of modification is not allowed
 - 14.2.5. Any type of chemical treatment is not allowed
- 14.3. Use of tire warmers or cooling methods other than natural air convection or conduction is prohibited. The penalty for violation will be the loss of qualifying times and/or the disqualification of race results

15. Wheels (Only wheels supplied by MSR)

NO MODIFICATIONS or MACHINING ALLOWED Aluminum racing wheel supplied from MSR with FM logo.

- 15.1. Front: 8 in X 13 in P/N 000-712 or P/N 000-713
- 15.2. Rear: 10 in X 13 in P/N 020-712 or P/N 020-713

- 15.3. Wheel Spacers are not allowed

16. Bodywork

NO MODIFICATIONS ALLOWED (except as specified). All Body work supplied by MSR is mandatory.

- 16.1. Bodywork shall remain unmodified with the exception of holes for a jumper battery plug, trackside beacon receiver, data (ECU,GCU,AIM) download port and tow hooks. All repair work must match original body dimensions and contours.
- 16.2. Mirrors P/Ns 110-741 and 110-742 are mandatory

17. Cockpit

Definition of cockpit is: area between the front bulkhead and rear roll hoop.

- 17.1. Cockpit controls and mechanisms may be adjusted to fit driver comfort so long as it does not hinder the driver's egress from the cockpit.
- 17.2. The size of the head surround may be adjusted to improve head support, provided the adjustment serves no other purpose.
- 17.3. An SFI rated foam seat is recommended.
- 17.4. No part of the seat shall extend forward of the front roll hoop bulk head
- 17.5. Panels inside the cockpit may be attached to the chassis as long as the points of attachment are no closer than 2 inches apart. No welding or gluing of the seat or panels to the structure/chassis of the car is allowed.

18. Chassis

NO MODIFICATIONS ALLOWED except as noted in these rules.

- 18.1. All cars shall use the stock, as delivered by MSR, wood floor of 6mm, with an allowable deviation of 3 mm across the surface for wear.
- 18.2. Front Impact attenuator P/N 030-720 must be installed, and with less than 25% structural deformation and with all four (4) mounting points intact.

19. Hardware, and Fluids

- 19.1. Titanium hardware is not permitted.
- 19.2. Lubricants and fluids, except fuel, are unrestricted.
- 19.3. "93" Octane Premium Unleaded Fuel is recommended
- 19.4. Ceramic bearings are not permitted. All bearing components must be ferrous metal, except for bearing retainers and bearing cages. This specification is applicable to all bearings, including, but not limited to, wheel bearings and transmission / gearbox bearings.