FKR TECHNICAL REGULATIONS

125cc SHIFTER ENGINE

INDEX – FKR TECHNICAL REGULATIONS

125cc SHIFTER ENGINE

1. SCOPE AND APPLICATION

These regulations apply to all 125cc Shifter Engine classes competing under the authority of Motorsport South Africa (MSA) and administered in accordance with the **General Competition Rules (GCR)** and **FIA Karting Technical Regulations**.

2. GENERAL ENGINE REQUIREMENTS

2.1. Engines shall be **water-cooled, single-cylinder, reed-valve induction engines**, homologated by FIA Karting.

2.2. Maximum engine capacity shall be **125 cc**.

2.3. Carburettor shall be **Dell'Orto VHSH 30**, float-type, as per homologation.

2.4. Polishing of the carburettor throat is permitted **provided no material is removed** and all homologated dimensions are strictly retained.

2.5. Gearbox shall remain **as supplied by the manufacturer** and as homologated by FIA Karting.

2.5.1. Gear selection shall be **hand-operated and mechanically actuated only**.
Any form of servo assistance, ignition cut, ignition retard, or electronic shifting aid is **prohibited**.

2.6. Maximum exhaust port duration shall not exceed **198 degrees**.

2.7. Engine identification shall be by **engine serial number** as recorded during scrutineering.

2.8. Exhaust systems shall be homologated. The minimum thickness of magnetic steel sheet metal shall be **0.75 mm**.

2.9. TM-stamped exhausts corresponding to the correct engine model are permitted in accordance with TM homologation, unless otherwise specified herein.

3. ELIGIBLE ENGINES (HOMOLOGATION)

3.1. The following engines are permitted:

TM KZ10 Homologation Form No. 49/M/18 VERSION 1.3 – (2012)

TM KZ10C Homologation Form No. 32/M/24 VERSION 1.2 – (2016)

TM KZ-R1 Homologation Form No. 041-EZ-75 VERSION – (2020)

TM KZ-R2 – Homologation Form No. 041-EZ-02 (2022)

TM KZ-R3 – Homologation Form No. 041-EZ-60 (2026)

Vortex RSZ – Homologation Form No. 012-EZ-76, Version 1 (2019)

IAME Screamer Shifter – Homologation Form No. 040-EZ-99 (2022)

3.2. Engines shall be raced **complete**, including carburettor, exhaust, and ignition, exactly as specified on the homologation form.

3.3. Only **original manufacturer components** may be used:

a) TM Racing components as per the homologated TM spare parts list, supplied by Formula-K South Africa
b) Vortex components as per the Vortex homologated spare parts list
c) IAME components as per the IAME homologated spare parts list

3.4. No modification to any engine component, carburettor, or exhaust is permitted **unless explicitly authorised** by these regulations or FIA Karting regulations.

3.5. Polishing and port matching are permitted **provided no material is removed** and original volumes, profiles, and dimensions are maintained.

3.6. Any modification, addition, or adjustment not expressly authorised is **strictly prohibited** (refer GCR 226).

3.7. The competitor is solely responsible for ensuring the conformity of their engine and equipment at all times (GCR 121).

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4. ENGINE SEALING

4.1. All engines shall be sealed prior to qualifying and shall remain sealed for the duration of the meeting.

4.2. The seal shall be positioned between the cylinder head fastener and the reed valve cover/manifold and shall be secured to the satisfaction of the Scrutineer.

4.3. Removal or replacement of an engine seal is permitted **only with prior written or verbal authorisation** from the Scrutineer/Technical Controller, in consultation with the Clerk of the Course, and shall be carried out in **Parc Fermé** under supervision.

4.4. A maximum of **two (2) engines per competitor per event** is permitted.
All engine and seal numbers must be declared on the official scrutineering documentation.

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5. CYLINDER AND CYLINDER HEAD

5.1. Nikasil-plated cylinders may be repaired by **addition of material only**. Removal of material is prohibited.

5.2. Cylinder head spark plug threads may be repaired using a heli-coil or threaded insert, provided factory dimensions are maintained.

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6. COOLING SYSTEM

6.1. Only **water (H_2O)** is permitted as a cooling medium.
Glycol-based antifreeze is prohibited.

6.2. **Aqua Clear PX** is the only permitted cooling additive.

6.3. Mechanical by-pass (thermostat-type) systems and by-pass lines are permitted.

6.4. In-line heat exchangers in cooling hoses are permitted.

6.5. The water pump shall be mechanically driven by the engine or rear axle only.

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7. CARBURETTION AND INLET SYSTEM

7.1. Fuel injection systems are prohibited.

7.2. Spraying of any substance other than fuel into the inlet system is prohibited.

7.3. The inlet duct assembly shall consist only of:

- Homologated inlet silencer (airbox)
- Carburettor
- Reed block and reed block cover
- Approved adaptors, spacers, and gaskets

No additional components are permitted.

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8. IGNITION SYSTEM

8.1. Only FIA Karting homologated ignition systems may be used.

8.2. For Shifter classes, the ignition system shall be **analogue only**, as specified on the homologation form.

8.3. Variable ignition systems, including progressive advance or retard, are prohibited.

8.4. Any electronic system capable of automatically controlling, modifying, or adjusting engine parameters while the kart is in motion is prohibited (GCR 226).

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9. SPARK PLUG

9.1. Spark plug make is free, provided it is mass-produced and unmodified.

9.2. Spark plug thread specifications:

- Length: **18.5 (eighteen point five) mm**
- Thread: **M14**

9.3. The spark plug body shall not protrude beyond the combustion chamber dome.

9.4. Spark plugs shall be fitted with a gasket or washer.

9.5. Spark plug temperature sensors are permitted, minimum thickness **1.2 (one point two) mm**, and may replace the washer provided total plug length does not exceed **18.5 (eighteen point five) mm**.

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10. INLET SILENCER (AIRBOX)

10.1. Only FIA Karting homologated inlet silencers are permitted.

10.2. In wet conditions, a securely mounted protective device may be fitted. Tape may be used for securing purposes.

10.3. Maximum ram tube internal diameter shall be **30 (thirty) mm**, verified with a no-go gauge.

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11. EXHAUST SYSTEM

11.1. Exhaust systems shall be homologated and engine-specific where applicable.

11.2. Exhaust gases shall discharge rearwards of the driver and not exceed **450 (forty five) mm above ground level**.

11.3. The silencer outlet shall have a minimum external diameter of **30 (thirty) mm** and shall not protrude beyond the bodywork or rear bumper.

11.4. KZ10C, R1, R2, R3 exhaust segments are deemed equivalent.
A KZ10C cylinder head insert may be replaced with an R1 3.3 insert to accommodate 10085 flat-top pistons. In this case both KZ10C or R1 exhaust can be used.

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12. EXHAUST SILENCER

12.1. Exhaust silencers shall be FIA Karting homologated in accordance with the current homologation list.

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13. FUEL AND AIR

13.1. Fuel shall comply with GCR 240 and shall consist predominantly of compounds found in commercially available fuel.

13.2. Only **commercially available 95 RON pump fuel** is permitted.

13.3. Only ambient air may be mixed with fuel.

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14. SQUISH CLEARANCE

14.1. A squish test may be used as an alternative to volume testing.

14.2. Minimum permitted squish clearance shall be **1.0 (one) mm**.

14.3. Measurement shall be taken using a digital vernier at the minimum clearance point, on both sides of the piston parallel to the gaugeon pin.

14.4. Approved solder wire: **National Solder 97/3, 2.0 (two)mm**, tolerance ±0.1 (zero point one) mm.

14.5. The average of the two measurements shall determine compliance.

14.6. A calibrated micrometre may be requested if results are borderline.

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15. PERMITTED AND PROHIBITED MODIFICATIONS

15.1. Permitted

- Reed manifold polishing (no material addition), max diameter **31.5 (thirty one point five) mm**
- Crankcase cleaning and polishing (no material removal)
- Static crankshaft balancing only
- Polishing of standard homologated conrods (no lightening)
- Carburettor polishing, venturi max **30 (thirty) mm**
- Removal and sealing of external water “U” tube for seat clearance

15.2. Prohibited

- Changes to bore, stroke, port numbers, or port geometry
- Dynamic crankshaft balancing
- Machining of reed valves
- Non-homologated clutch components
- Alteration of homologated external appearance

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16. GEAR SHIFTING

16.1. Only hand-operated mechanical gear shifting is permitted.

16.2. Paddle shift systems using push-pull cables are permitted.

16.3. Any form of ignition cut or retard is prohibited.

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17. REAR AXLE

17.1. Rear axle inserts for keyway reinforcement are permitted.

17.2. Maximum rear track width shall be **1400 (one thousand four hundred) mm**, measured outermost tyre to outermost tyre.

18. PARITY AND COST CONTROL

18.1. To ensure cost control and parity, all TM spares shall be sourced through **TM South Africa**.

18.2. KZ10C, R1, R2 and R3 engines shall use the following mandatory components:

- Piston: **10085 flat-top**, 0.8 (zero point eight) mm ring only
- Conrod: **18125.2**, polishing permitted only
- Crankshaft: Standard homologated unit, no material removal
- The KZ10C engines are allowed to replace the cylinder head insert from C1 3.3 to R1 3.3 insert, to accommodate the R1 flat top piston.

19. AMENDMENT OF REGULATIONS

19.1. The GP 125 Shifter Association Committee reserves the right to amend these regulations in accordance with GCR procedures.

19.2. FKR shall be notified a minimum of **seven (7) working days** prior to an event for ratification.

20. GREY IMPORTS

20.1. Previously grey-imported equipment must be inspected, registered with the official importer, and accompanied by written approval.

20.2. **No new grey-imported equipment shall be permitted.**