

**\*\*Updates for 2018 are written in red\*\***

**Note: These kart rules are shared by LOORRS as well as all LORORS series. In addition to the kart specific rules herein, all general rules written for each applicable series apply as well. Please refer to the series general rule book for more information.**

## **LUCAS OIL OFF ROAD RACING SERIES KART RULES**

### **ADDENDUM TO THE GENERAL RULES**

#### **PREFACE**

The rules and/or regulations set forth herein are designed to provide for the orderly conduct of racing events and to establish minimum acceptable requirements for such events. These rules shall govern the condition of all Lucas Oil Off Road Racing Series (LOORRS) events, and, by participation in these events, all LOORRS members are deemed to have acknowledged, accepted and complied with these rules. No express or implied warranty of safety shall result from publications of, or compliance with these rules and/or regulations. The rules are intended as a guide for the conduct of the sport, and are in no way a guarantee against injury or death to participants, spectators or others.

**LOORRS rules are the sole property of the Lucas Oil Off Road Racing Series. Use of these rules by any other organization or individual is forbidden unless prior written consent is given by LOORRS.**

**LOORRS, its parent, affiliates, members, officers, directors or staff assumes no responsibility, legal or otherwise, for failure or malfunction of any products of manufacturers listed in this rulebook. LOORRS is NOT liable for actions or decisions made by individuals, promoters, or organizations, etc. using LOORRS rules.**

Specifications and/or suggested standards contained in this rule book are intended for use as a guide with respect to safety and for no other purpose either expressed or implied. The use of the specifications and/or suggested contained herein by any association, organization, manufacturer or individual is entirely voluntary and **LOORRS will NOT** accept any responsibility for consequences resulting from the application or said specifications and/or suggested standards.

The spirit and intent of the rules is going to be the standard by which Lucas Oil Off Road Racing Series is guided. **If this rule book does not specifically say that you can do something, then you must consider that the change is illegal.** It is the responsibility of each participant to ensure that his/her conduct and equipment complies with all applicable rules. **These rules are subject to amendment or change by Lucas Oil Off Road Racing Series headquarters at any time in the interest of competition.**

**This rule book is intended to serve as a guide for the conduct of short course racing and is in no way a guarantee against injury or death to participants, spectators, or others.**

## LUCAS OIL OFF ROAD RACING SERIES KART RULES

*The aforementioned rules will apply to the Junior 1, Junior 2, and Modified Kart classes.*

**Junior 1 Karts:** Custom built single seat mini race trucks with Subaru spec engine driven by children ranging in age from 8-15 years.

**Junior 2 Karts:** Custom built single seat mini race trucks with Honda spec engine driven by children ranging in age from 8-15 years.

**Modified Karts:** Custom built single seat mini race truck with 250 or 450 cc motor cycle/quad engines driven by children ranging in age from 10-15 years.

**All new karts must be of same basic design as current vehicles and must be approved by LOORRS prior to competition.**

NOTE: Any driver who has competed in 6 races in a pro class at any professional short course racing series may not compete in the Modified kart class. Any driver who has competed in 4 races in a pro class at any professional short course racing series may not compete in the Junior kart classes.

NOTE: Drivers who have competed in a pro class at any professional series are not eligible to act as substitute drivers in the kart classes.

### KR-1 MARKING AND IDENTIFICATION

- A. All vehicle numbering is subject to approval and is assigned by LOORRS.
- B. LOORRS officials may require a competitor to use a different number to avoid confusion or duplication at an event.
- C. In the event that a vehicle number is not visible from the timing and scoring area, the competitor will not be scored. It is the competitor's responsibility to make sure that the number is visible during all race conditions
- D. Advertising on race vehicles must be in good taste.
- E. Foil or reflective numbers are not permitted.
- F. All LOORRS vehicles are required to have LOORRS stickers on each side of the front of the door area, below the window opening.
- G. LOORRS may require the use of specific sponsor decals.
- H. Team vehicles with the same paint and colors must have distinguishing markings of some kind.

### KR-2 NUMBERS

- A. Kart numbers are designated by class:
  - 1. **Junior 1** – Ages 8-15 – Numbers 200-299
  - 2. **Junior 2** – Ages 8-15 – Numbers 400-499
  - 3. **Modified** – Ages 10-15 – Numbers 500-599
- B. All numbers must be block style only.

- C. Numbers must be side by side. No outlines, stacking or shadows allowed. Italic slant of 25 degrees or less is allowed.
- D. Fonts must be chosen from one of the below approved styles only:
  - 1. Impact
  - 2. Helvetica Black
  - 3. Mechanical Bold
- E. Numbers will be located in the following positions:
  - 1. (1) number plate on each side, high and close to the back of the cab
    - a. Number plates must be white and measure at least 8 inches high and 10 inches wide.
    - b. Numbers on plate must be solid black and measure at least 7 inches high.
  - 2. Roof -12 inch minimum height
  - 3. Driver's side visor – 4 inch minimum height
  - 4. (1) number plate on back of vehicle facing rear.
    - a. Number plate must be white and measure at least 7 inches high and 10 inches wide.
    - b. Number on plate must be solid black and measure at least 6 inches high.

### **KR-3 DRIVER MEDICAL ATTENTION**

- A. If a competitor requires medical attention, by track or other medical teams, the medical technician must release competitor before he/she may return to competition. Failure to comply with advice of the medical technician will result in disqualification from competition for the remainder of the event.
- B. If a driver loses consciousness at any time during an event, the driver cannot compete for at least 7 days or must be cleared by doctor before returning to competition.

### **KR-4 EQUIPMENT**

- A. No passenger is allowed on the race vehicle any time the vehicle is in motion.
- B. Race vehicles will not be allowed on the race track without safety and emergency equipment on the premises.
- C. No race vehicle is permitted on the track without approval from a LOORRS official.
- D. No driver will compete in any event with his/her head or arm extended outside of the vehicle.
- E. Additions to the body of the race vehicle, such as fins, scoops, wings, and other extruding additions will not be permitted.

### **KR-5 DRIVER'S WEAR**

- A. One-piece driver suits are required. The suits must cover from the neck to the ankles and to the wrists. All suits must have the SFI label attached and meet SFI Spec 3-2A/1 or higher.

- B. Drivers must wear gloves and driving shoes that meet SFI Spec 3.3/1 or higher and have the SFI label attached.
- C. Fire retardant socks, head sock and/or helmet skirt are required. Fire retardant underwear is highly recommended.
- D. All driver apparel must be clean, in good condition, and free from rips or worn areas.
- E. The designated LOORRS patch will be sewn to the suit on the upper front right breast area, no more than six inches from the top of driver's shoulder. No other racing sanctioning body patches or decals are to be worn on the suit.

#### **KR-6 HELMETS**

- A. Full face helmets with a Lexan shield are required.
- B. Helmets must be certified to one or more of the following standards:
  1. Snell Memorial Foundation SA 2010 or better with a legible Snell sticker attached.
  2. SFI Spec 31.1/2010 or Youth helmet SFI Spec 24.1 with a legible SFI sticker attached.
  3. FIA 8868 with a legible FIA sticker attached.

#### **KR-7 EYE PROTECTION**

- A. It is required that drivers wear eye protection in the form of Lexan shields.

#### **KR-8 SEATS**

- A. Only manufactured race seats are permitted. Full containment seats are highly recommended. Plastic seats are not allowed.
- B. Seats must be sized appropriately for driver's height and weight (ie. Child sized seats).
- C. All seats must be securely mounted to frame of vehicle and be properly reinforced in such a manner as to keep seat from moving in relationship to frame.
- D. Headrests designed and installed to prevent whiplash are mandatory on all vehicles. Headrest must be constructed of at least 2 inch thick resilient padding and be approximately 36 square inches in area.
- E. Seat must be centered in vehicle +/- 2 inches.
- F. If a footrest is used, it must support the whole shoe and have rounded edges. Short or single tubes are not permitted.

#### **KR-9 SEAT BELTS AND SHOULDER HARNESSSES**

- A. All vehicles must have a heavy-duty type five-point fast release latch 2 inch minimum width seat belt, anti-submarine strap, and 2 inch minimum width shoulder straps with metal-to metal buckles and connectors for each occupant. The five-point harness system shall consist of 1 anti-submarine strap, 1 seat belt, and 2 shoulder straps. Harness material shall be made of nylon or Dacron polyester.

- B. Shoulder straps must be mounted behind the driver's seat and be located a minimum of 4 inches below the top of the driver's shoulders. Seat belt should be mounted a minimum of 2.5 inches forward of the intersection of the back of the seat and the sitting portion of the seat. All adjustment buckles must be a minimum of 1.5 inches from the seat to prevent loosening or chafing. Mounting hardware must be a minimum of 3/8 inch grade 8 steel bolts.
- C. When bolting through the body or frame, flat washers, lock nuts, and cotter keys must be used. All harness hardware must be safety tied. If wrap around shoulder harnesses are used, care must be taken to prevent them from slipping and chafing on sharp frame components.
- D. Lap belts must be bolted or clipped in and cannot be looped around lower frame tube.
- E. No push button type harnesses permitted.
- F. Sternum straps are not allowed.
- G. No "Y" type shoulder belts permitted.
- H. Seat belts must be certified to SFI specs 16.1, 16.2 youth or 16.5 and dated by the manufacturer. Belts must not be used beyond two years after stated date.
- I. Seat belts may be rejected by LOORRS officials if dirty, frayed, oily, greasy, or otherwise considered unsafe by officials.

#### **KR-10 HEAD AND NECK RESTRAINTS**

- A. Head and neck restraints are mandatory for all classes any time a vehicle is on the track.
  1. D-Cell, R3 Hans Hybrid or other restraint certified to SFI Spec 38.1 with a legible sticker attached are allowed.
  2. The head and neck restraint, when connected, must be mounted, configured, maintained and used in accordance with manufacturer's instructions.
  3. It is the responsibility of the driver to ensure that his/her restraint is correctly installed, maintained and properly used.

#### **KR-11 ROLL BAR PADDING**

- A. Any roll bar that may come in contact with the driver must be covered with roll bar padding.
- B. LOORRS highly recommends that all roll bar padding be certified to SFI spec 45.1 or better.

#### **KR-12 SAFETY NETS**

- A. LOORRS approved window nets are mandatory on all karts and must cover the complete open area of the cockpit on both sides of the vehicle.
- B. Nets must be installed on the inside of the roll cage to prevent them from being damaged or coming off in the event of a roll over or slide. If nets are installed so that occupants can release the net from the inside, the latch must be located at the front top of the window opening.

- C. The net border and attachment must be made of materials that are as strong as or stronger than the net itself.
- D. Net attachments must be placed no more than every 5 inches apart. Acceptable attachments may include but are not limited to: hose clamps, heavy-duty nylon ties and steel rods. Steel rods are acceptable methods of bottom fastening.
- E. Triangle style roll cage (helmet) nets are required on both sides of the driver's seat.
- F. If a full containment seat is used with side helmet supports, the triangle helmet nets are not required.

### KR-13 ARM RESTRAINTS

- A. All karts must be equipped with LOORRS approved arm restraints. Restraints must meet SFI spec 3.3 or better and be utilized anytime the driver is in the kart.
- B. **Modified Karts:** If karts are equipped with A pillar nets, arm restraints are optional for this class. If A pillar nets are not used, arm restraints are required as stated above.

### KR-14 CHASSIS/ROLL CAGE

- A. **All new designs must be approved by LOORRS.**
- B. Chassis must be of a safe design and constructed with high quality welds.
- C. Roll-cages must be designed and constructed with 1 front vertical hoop, 1 rear vertical hoop, 2 interconnecting top bars, 2 rear down braces, 1 diagonal brace and all necessary gussets. The 2 top interconnecting bars must be placed as far to the outside of the top part of the front and rear hoops as possible.
- D. Optional: Top cage may use 2 vertical hoops on either side, 2 interconnecting top bars across the front and rear, and diagonal bracing.
- E. Rear down braces and diagonal brace must angle a minimum of 30 degrees from vertical. At the bottom of the diagonal brace there must be a cross member of the same tubing material and dimensions as the hoop.
- F. All roll-cage components (hoops, braces, gussets, etc.) must have a minimum of 3-inch clearance from the component to the driver's helmet when seated in the normal riding position.
- G. All intersecting points must be gusseted and braced. Roll cage terminal ends must be attached to a frame or body member that will support maximum impact and not shear or allow more than 1½ inches of movement in the cage terminal end.
- H. Gussets must be installed at all major intersections, including diagonal and rear down braces, where single weld fractures can affect occupant's safety.
- I. **1.250" x .083" ROLL BAR TUBES ARE REQUIRED IN THE MODIFIED CLASS AND ARE HIGHLY RECOMMENDED IN JUNIOR CLASSES.**
- J. No aluminum or other nonferrous materials are permitted.
- K. Roll cage construction material may be crew, dom, whr, wcr, mild carbon steel or 4130 chromoly.
- L. **LOORRS HIGHLY RECOMMENDS THE USE OF 4130 CHROMOLY or 1018/1012/ASTM/DOM.**

- M. All welds must be of high quality craftsmanship with good penetration and with no undercutting of parent material.
- N. Oxy-acetylene brazing on roll-cage is strictly forbidden
- O. The roof must be covered with sheet metal or .125" minimum aluminum. LOORRS recommends the use of T-6 aluminum.
- P. The roof sheet metal must be installed with a minimum of 6 evenly spaced 5/16 inch bolts, not protruding toward the driver.
- Q. Clamped on roofs are not allowed.
- R. All karts must be constructed with either an X roof or 2 bars extending from the A pillars to the center of the rear roll bar.
- S. **Modified Karts (also recommended for Jr 2 Karts):**
  1. 1.250" by .083" roll bar tubes are required on all new karts and on all karts that run a 450 cc engine.
  2. Roll cage construction material must be 4130 chromoly on all new karts and on all karts that run a 450 cc engine.

#### **KR-15 DOORS**

- A. All new karts must have 'X', 'A' or 'Ladder' design bracing in door area (designed to provide maximum protection to the driver).
- B. 'X' or 'A' designs must use a minimum 1.0" by .083" tube 4130 chromoly or 1018/1012CDS/DOM.
- C. 'Ladder' design must use a 1.0" by .083" tube for main rails and .750" by .083" for rungs.

#### **KR-16 DRIVER COMPARTMENT**

- A. The driver must be able to enter and exit, unassisted and with great ease, the driving compartment with the kart in any position.
- B. The interior of the race vehicle must be completely enclosed by metal with a minimum thickness of .040" from front to rear. This includes both front and rear fire walls.
- C. Floorboards must have a minimum thickness of .090" and must cover entire floor of driver compartment from pedals to back of seat. T-6 aluminum is recommended.
- D. Firewalls and/or bulkheads must separate the driving compartment from any fuels, engine fluids and acids. No holes or openings allowed.
- E. Battery must be completely covered if mounted in the driving compartment.
- F. **Modified Karts:**
  1. It is recommended that driver compartment side panels be made of .090" T-6 aluminum.

#### **KR-17 MEASUREMENTS & WEIGHT**

- A. Karts must race at a minimum 6 inch ride height.
- B. All measurements will be taken with driver in kart at post race technical inspection.

- C. Wheelbase will be measured on one side from center of the front wheel to the center of the rear wheel on the same side.
- D. Track width will be measured from outside of tire to outside of tire.
- E. Overall length is measured from outside of front bumper to outside of rear bumper. The maximum overall length is 120 inches.
- F. Additional weight may be added to meet minimum weight requirement.
  - 1. Any added weight must be painted white, marked with kart number, and bolted to the **frame** close to the seat.
  - 2. Weight may not be carried on driver's person.
- G. **Junior 1 Kart Measurements:**
  - 1. Maximum track width: 56¾ inches
  - 2. Maximum wheel base: 71 inches
  - 3. Minimum kart weight: 585 pounds
- H. **Junior 2 Kart Measurements:**
  - 1. Maximum track width: 58 ½ inches
  - 2. Maximum wheel base: 73 inches
  - 3. Minimum kart weight: 670 pounds
- I. **Modified Kart Measurements:**
  - 1. Maximum track width: 58 ½ inches
  - 2. Maximum wheel base: 73 inches
  - 3. Minimum kart weight-250 CC Engine: 690 pounds
  - 4. Minimum kart weight-450 CC Engine: 825 pounds

## KR-18 BODY & FENDERS

- A. A truck body is required and must be approved by LOORRS.
- B. Body can be multi piece **and may contain carbon fiber.**
- C. All fender and body mounts must have loop ends. No single tubes or long brackets may be used.
- D. The removal of fenders or body panels during competition for any reason other than damage incurred during the event will result in disqualification.

## KR-19 MUD FLAPS

- A. **Modified Karts:**
  - 1. All Modified Karts must run approved rear mud flaps made from 3/16 rubber or HDPE material (available from McMaster-Carr using pn# 9785T521-white or pn# 9785T522-black).
  - 2. Mud flaps must be at least 12 inches wide and cover the full width of the rear tire as viewed from directly behind the kart.
  - 3. Mud flaps must extend from the top of the tire to within 3 inches of the ground at ride height.
  - 4. Mud flaps must be securely mounted with bolts and fender washers to resist folding back or tearing and must keep the tire covered as viewed from behind, even when the body panels are removed.
  - 5. Mud flaps may not be attached with zip ties or chains.
  - 6. All mounting methods must be approved by LOORRS.



## KR-20 BUMPERS

- A. Must have front and rear bumper secured to frame. Ends must be looped, capped and rounded to prevent any sharp edges.
- B. Bumpers and nerf bars must be designed in a way as to reasonably inhibit two karts from becoming locked together.
- C. LOORRS recommends that bumper mount/brace tubes have a 30 degree bend located between bumper and frame.
- D. No hazardous front or rear bumpers, nerf bars, frame heads or other protruding objects from karts are permitted.
- E. Front bumpers must be at least 35 inches wide.
- F. Rear bumpers must be at least 40 inches wide.
- G. **Mod Karts (mandatory), Junior Karts (recommended):**
  - 1. Front bumper lower tube may be no higher than 19 inches from the ground. Upper tube must be a minimum of 23 inches from the ground.
  - 2. Rear bumper lower tube may be no higher than 17 inches from the ground. Upper tube must be a minimum of 25 inches from the ground.

## KR-21 SKID PLATES

- A. Skid plates designed to reasonably protect the front suspension, steering, and brake components are recommended on all karts.
- B. Skid plates must be made of metal and be securely attached.

## KR-22 FRONT SUSPENSION

- A. Front suspension must be an A arm type design.
- B. All four corners must have a single coil over shock.
- C. Secondary suspension is not allowed.
- D. **Junior Karts:**
  - 1. Suspension mounting points must be the same for all junior karts. Diagrams are available from LOORRS.

## KR-23 REAR SUSPENSION

- A. A-arms are not allowed in the rear.
- B. Sway bars are allowed.
- C. Secondary suspension is not allowed.
- D. No diffs allowed.
- E. **Junior Karts:**
  - 1. Suspension mounting points must be the same for all junior karts. Diagrams are available from LOORRS.

## KR-24 STEERING

- A. Steering geometry settings must be approved by LOORRS officials.
- B. System must work properly with all bolts and parts tightened.

- C. Power steering is allowed.
- D. Steering wheel pad is highly recommended.

#### KR-25 SHOCKS

- A. There must be at least one and only one shock absorber per wheel in working condition at the start of the race.
- B. No internal or external bypass shocks are allowed.
- C. Shock valving and fluid type are open.
- D. Air shocks are not allowed.
- E. Reservoirs are allowed with a maximum size of 2.0" x 8.0".
- F. Dual rate springs are allowed. A third tender spring is allowed.
- G. Shocks may not be adjusted while kart is in motion.
- H. Externally adjustable rebound and compression (clicker) shocks are allowed
- I. **Junior Karts**
  - 1. Shock must be a maximum of 2.0" x 6.0" travel.
- J. **Modified Karts:**
  - 1. Shock must be a maximum of 2.0" x 12.0" travel.

#### KR-26 BUMP STOPS

- A. Suspension bump stops must be of the solid type.
- B. Bump stops cannot be attached to any moving suspension parts.

#### KR-27 BRAKES AND HUBS

- A. Brakes must be in safe working condition and be able to apply adequate force to lock up tires. Turning or cutting brakes will not be permitted.
- B. Brakes must be in safe operating condition during the entire event. If brake system problems do occur during the event they must be repaired before continuing in competition.
- C. Front brakes are allowed.
- D. Brakes may be hydraulic or cable activated.
- E. Lug nuts must be steel.
- F. Wheel studs must be rounded and not of excessive length. Stud threads must extend past the end of the lugnut.

#### KR-28 ENGINE

- A. Engine must be located in the rear of the kart behind the driver.
- B. Any illegal engine modification will result in a disqualification for all rounds the engine was used during the current season.
- C. **Junior 1 Karts:**
  - 1. The mandated engine is the Subaru EX27 266 cc 4 stroke air cooled engine. The engine must remain sealed by Fleming Motorsports.
  - 2. No modifications may be made to this engine unless otherwise specified herein. This includes no modifications of any kind to the block, crankshaft,

- connecting rod, piston, cylinder head, valve train, cam shaft, flywheel, bearings, ignition system, governor, air cooling system, or oil system.
3. Fleming Motorsports installed reground crank and QRC billet rod is approved.
  4. No components may be added or removed.
  5. LOORRS recommends the use of a flywheel guard.
- D. **Junior 2 Karts:**
1. The mandated engine is the Honda GX390 with electric start. The engine must remain sealed by Fleming Motorsports.
  2. No modifications may be made to this engine unless otherwise specified herein. This includes modifications of any kind to the block, crankshaft, connecting rod piston, cylinder head, valve train, cam shaft, flywheel, bearings, ignition system, governor, air cooling system, or oil system.
  3. No components may be added or removed.
- E. **Modified Karts:**
1. Engine must be a production engine 250 cc or 450 cc four stroke. Other engines may be approved by LOORRS. The approved engines for this class are as follows:
    - a. 450 cc Quad Engines
      - Kawasaki KXF450
      - Honda TRX450
      - Suzuki LTR450
      - Yamaha YFZ450 & YFZ450R
    - b. 250 cc Motorcycle Engines
      - Kawasaki KX250F
      - Honda CR250F
      - Suzuki RMZ250F
      - Yamaha YFZ250F
  2. The following modifications are legal:
    - a. Honda TRX450R (2004-2005)-must use the round slide OEM carburetor.
    - b. Honda TRX450ER (2006-2014)- cases may be machined for a heavy duty crank bearing retaining plate. Transmission gears may have the dog teeth back-cut angle re-cut to aid in engagement/retention in gear.
    - c. Suzuki LT-R450 (2006-2010)-a shifter pin relocater bracket may be installed inside the clutch cover to prevent the case from cracking in the event of a missed shift. On 2008-2010 engines, 3<sup>rd</sup> gear can be replaced with a billet gear available from ATP.
    - d. Kawasaki KFX450 (2007-2014)-the connecting rod may be replaced with Carillo pn # KA-KFX45CA-2-04213N. Fuel injector may be replaced with Subaru pn#16611aa510.
    - e. Yamaha YFZ450R (2009-2014)-the crankshaft can be updated to the Yamaha pn#1TD-11400-00-00. 2014 engines can block off A/S with Yamaha #1TD-141B0-V0-00.
    - f. Yamaha YFZ450 (2004-2012)-the stator and rectifier may be replaced with Ricky Stator pn# RSYFZ450. 2006-2008 must run

the flat slide OEM carburetor. 2009-2012 must run the round slide OEM carburetor. MAY NOT upgrade to the Yamaha pn #1TD-11400-00-00 crank.

- g. Engine case welding repairs are allowed by approval only to repair external damage (ie. chain guide bosses, engine mounts).
  - h. External cylinder head welding repairs are allowed by approval only to repair external damage (ie. hold down bolt boss, exhaust stud boss).
  - i. Standard rebuild valve job is allowed. Valve seat angles are open. Only steel valve seat is allowed to be machined. No aluminum in head or around valve seat may be touched, machined, removed, blended, etc. or the head will be considered illegal.
  - j. Crankshaft connecting rod pin can be welded to the crank halves for increased reliability.
  - k. Cylinder walls can be re-plated.
  - l. 2004-2006 Yamaha YFZ450 engine case can be machined to use the 2007 or newer piston squirter and oil pump.
  - m. A LOORRS approved stock replacement JE piston will be allowed with no modifications. Approved JE part numbers for each engine brand are:
    - 1. Honda TRX450ER/TRX450R: 347644
    - 2. Suzuki LTR450: 347643
    - 3. Kawasaki KFX450: 347645
    - 4. Yamaha YFZ450R/YFZ450: 347646
3. Below are the minimum allowable measurements for cylinders and heads (these are OEM -.005"):
- a. Honda TRX450ER specs: cylinder 2.6630" thick, head 2.8470" thick
  - b. Suzuki LTR450 specs: cylinder 1.8780" thick, head XXX" thick (measurement TBD)
  - c. Kawasaki KFX450 specs: cylinder 2.1270" thick, head 4.1270" thick
  - d. Yamaha YFZ450 (EFI) specs: cylinder 3.0320" thick, head 3.6560" thick
4. No modifications may be made to this engine unless otherwise specified herein. This includes no modifications of any kind to the block, connecting rod, piston, valve train, cam shaft, flywheel, bearings, governor, or oil system.
5. All engine components must be OEM quad parts with the exception of OEM motorcycle cam shafts, and OEM motorcycle valves. Factory racing parts are not allowed (HRC, GYTR, KWI, Yoshimura, etc.).
6. Engine gaskets and seals are open.
7. Cam timing can be altered by rotating the stock gears. Decompression pin to gear and cam gear to cam may be tack welded.
8. No turbocharger, supercharger or any other form of pressurizing the inlet air will be allowed.

9. No nitrous oxide or other foreign chemicals may be injected into or near the inlet air.

## KR-29 ENGINE SEALS

- A. LOORRS utilizes a sealed engine program in all kart classes.
- B. All engine castings must have a clearly visible stamped serial number. Any engine without a serial number will not be considered legal for LOORRS and will be confiscated if used during an event.
- C. Tampering with, removing, or altering an engine seal or being in possession of an un-sealed or tampered with sealed engine will result in disqualification and confiscation of the engine as well as a loss of championship points accrued with said engine.
- D. Only a LOORRS official or Fleming Motorsports (Junior Karts only) may remove an engine seal at an event for the purpose of repairs and the official must witness the repairs being made.
- E. **Junior Karts:**
  1. Following the event, engines must be sent to Fleming Motorsports for inspection and resealing as determined by LOORRS officials.
  2. LOORRS at its discretion may at any time replace a competitor's sealed engine with another sealed engine from inventory.
- F. **Modified Karts:**
  1. All engine builders all required to register with LOORRS prior to the first event of the season to become an approved engine builder. If at any time during the season an engine is found to be illegal, the builder will be removed from the approved engine builder list for the remainder of the season and will be ineligible to build new engines.
  2. At no time will an engine be allowed to enter competition at an event without a completed and approved build sheet turned in to LOORRS officials.
  3. Engines must have a LOORRS engine seal looped through 1 head and 1 valve cover bolt installed by the approved builder.

## KR-30 ENGINE REPLACEMENT

- A. Engines may be replaced during a LOORRS event only with prior LOORRS authorization.
- B. An engine change may result in a starting position change.
- C. Both original and replacement engine serial numbers will be provided to LOORRS officials in writing before replacing the engine.
- D. Engines must be declared to officials before each event. LOORRS will mark/seal & certify each engine. Seals/marks may not be tampered with or removed for any reason by anyone other than a LOORRS official.
- E. Upon removal of an engine for any reason during an event, the sealed engine must be brought back to the tech area for inspection to ensure compliance with rules.

- F. Failure to return engine to officials immediately upon removal will result in disqualification. The disqualification will be retroactive for the entire race weekend.

### KR-31 ELECTRONICS, IGNITION AND COMPUTER

- A. Each vehicle must have a positive action on/off switch in good working order. The switch must be highlighted in red, be labeled "ignition on/off," and be located within easy reach of the driver and from the outside of vehicle.
  - 1. Any brand of spark plug may be used.
  - 2. Only approved electronic devices may be used.
  - 3. Data logging is not restricted other than sensors that may directly measure wheel speed.
  - 4. Data loggers may not be used to control or relay info to any other electronics on the vehicle.
  - 5. Electronic devices cannot be used to control any function of the vehicle outside of the engine ignition and/or fuel injection computer.
- B. **Junior Karts:**
  - 1. The ignition must remain stock as delivered by Subaru/Honda for this model of engine. No modifications of any kind may be made to the ignition system unless specified herein.
  - 2. No changes in timing may be made.
  - 3. Stock coil and spark system must be used.
  - 4. No modifications to the flywheel or magnets may be made.
- C. **Modified Karts:**
  - 1. Aftermarket ignitions must be readily available to the public and pre-approved by LOORRS.
  - 2. The following aftermarket ignition systems are currently pre-approved:
    - a. Honda TRX450ER
    - b. Suzuki LTR-450: Dynojet pn #20-019 & **Vortex X10**
    - c. Kawasaki KFX450: Dynojet pn #17-014 & pn #17-036
    - d. Yamaha YFZ450R: MSD pn #4247 & Vortex pn #ECU-6B
    - e. Yamaha YFZ450: Dynatek pn #DFS7-12P

### KR-32 COOLING

- A. **Junior Karts:**
  - 1. The air cooling system must remain stock as delivered by Subaru/Honda for this model of engine.
  - 2. No modifications of any kind may be made to the air cooling system.
  - 3. A fine metal screen may be added to deflect dirt.
  - 4. It is recommended that teams install a scatter shield between the driver and flywheel covering the front and top sides of the flywheel to protect the driver in the event of a flywheel explosion.
- B. **Modified Karts:**
  - 1. ¼ inch mesh or similar screen is required on front of radiator when radiator is mounted close to or behind driver.

## KR-33 LUBRICATION

- A. **Junior Karts:**
  - 1. The oil lubrication system must remain stock as delivered by Subaru/Honda for this model of engine.
  - 2. No modifications of any kind may be made to the oil lubrication system.
  - 3. Any brand and weight of oil may be used.
- B. **Modified Karts:**
  - 1. Fabricated or aftermarket oil tanks are allowed.

## KR-34 EXHAUST SYSTEM

- A. Exhaust systems are open.
- B. Mufflers are required.
  - 1. Muffler must meet a maximum decibel of 105 db measured from the spotter's stand.
    - a. Any kart with a db reading in excess of the 105 db limit as a first offense will incur a 25 lb. penalty to be added to the required minimum weight for the remainder of the race event where the offense occurred and the following 2 events attended.
    - b. Any kart with a db reading in excess of the 105 db limit as a second offense will receive the following penalties in addition to the above penalty:
      - 1. If infraction occurs during qualifying: 5 starting position penalty for any remaining main event races during the same event weekend.
      - 2. If infraction occurs during main event: 5 starting position penalty for any remaining main event races during the same event weekend.
      - 3. If infraction occurs during final main event of weekend: 10 point penalty.
    - c. Any kart with a db reading in excess of the 105 db limit at any additional time while already serving a penalty will be disqualified.

## KR-35 CARBURETOR

- A. The carburetion system must remain as delivered by the manufacturer (Fleming Motorsports for Junior Karts) for this model of engine.
- B. No modifications of any kind may be made to the carburetion system. No material may be added or removed.
- C. The carburetor bore, venturi, air or fuel passages may not be enlarged.
- D. Stock fuel bowl must be used.
- E. A larger carburetor may not be installed.
- F. Jetting is open.
- G. A throttle return spring must be used on the carburetor and at the foot pedal.
- H. **Junior 1 Karts:**

1. A hole no larger than .1875" may be drilled in the bottom half of the butterfly.
- I. **Modified Karts:**
1. Accelerator pump may be modified.

#### KR-36 AIR FILTER AND INLET

- A. The air filter and inlet are open.

#### KR-37 STARTER

- A. **Modified & Junior 2 Karts:**
1. A pull starter or electric system may be used.

#### KR-38 FUEL INJECTION

- A. **Modified Karts:**
1. Fuel injection is allowed if it was a stock system included with the engine.
  2. No modifications to the throttle body, manifold, injectors or sensors are allowed.
  3. Aftermarket controllers are allowed but must be approved by LOORRS.

#### KR-39 FUEL CELLS

- A. Safety fuel cells must be utilized for all vehicles. Steel fuel tanks are not allowed.
- B. All fuel tanks must be securely mounted behind the driver's compartment. There must be a substantial cross member and firewall between the fuel tank and the occupants.
- C. Safety fuel cells shall consist of a bladder enclosed in a smooth skinned container. The container shall be constructed of 20 gauge steel, 0.060-inch aluminum or 0.125-inch Marlex. Rotary molded polymer cells are acceptable. Magnesium is strictly prohibited.
- D. Container must be securely attached to vehicles with bolts or steel straps.
- E. All fittings must be built into the skin and bonded to the skin as an integral part of the tank or mechanically sealed by a ring and counter ring system by either flat joint or an "O" ring. Bolt in bulkhead fittings must be utilized when possible.
- F. Internal baffling is mandatory in all fuel cells. Bladder construction shall be of nylon or Dacron woven fabric impregnated and coated with a fuel resistant elastomer.
- G. Pressurizing of fuel tank is not allowed.
- H. Icing, Freon type chemicals, or refrigerants may not be used in or near the fuel system.
- I. A splash shield must be in place to direct any spill away from the driver, motor, and motor exhaust. If fuel cell is mounted above firewall paneling, a splash shield must extend a minimum of 2 inches beyond edges of gas tank to keep possible fuel splash away from driver.
- J. Fuel cell must be mounted in a position that is protected by the roll cage.



## KR-40 FUEL

- A. Spec fuel is required and must be purchased at the track. The spec fuel is **VP MS98L**.
- B. Fuel can be tested at any time during the event.
- C. Cooling of fuel is not permitted.
- D. Penalties for use of hazardous chemicals will be severe and may include a fine, and/or reduction of points, disqualification, and/or suspension.
- E. If LOORRS suspects maskers in fuel, chemical testing will be conducted at possible expense to competitor.

## KR-41 VENTS AND CAPS

- A. Positive-locking non-vented fuel filler caps must be located and secured in such a manner as to prevent being knocked off or opened during movement, rollover, or accidental impact.
- B. Design and installation must be done in such a manner to prevent fuel escaping from pickups, lines, fillers and breather vents if kart is partially or totally inverted.
- C. Fuel breather lines must have a rollover check valve incorporated in the fuel cell. The vent line must extend to the highest point of the roll-cage nearest the fuel cell, across the width of the vehicle, and down to below the belly pan of the vehicle or 3 inches below the fuel cell, whichever is lower and be routed away from exhaust.

## KR-42 CLUTCH

- A. The engine clutch must be mounted in the stock location.
- B. Clutch tuning is open providing that all tuning parts used are commercially available to the general public.
- C. **Junior 1 Kart:**
  - 1. All clutch springs must be pre-approved by LOORRS officials and be available to the general public for purchase by any competitor at any time. In the event that a spring becomes discontinued by the manufacturer, they will no longer be legal for use.
  - 2. Clutch tuning is limited to springs, weights, ramps, and sliders only.
  - 3. The mandated clutch is the Comet Series 20 (six inch diameter only).
  - 4. The Comet TAV2 Torque-A-Verter may also be used.
  - 5. The use of any other manufacturer's components is prohibited. Any non-mandated components will be confiscated.
  - 6. No modifications may be made to either system. This includes no modifications of any kind to the drive cones, plates, and shafts, including changes in profiles, diameters, or materials.
  - 7. No components may be added or removed.
  - 8. Any brand of replacement belt may be used.
  - 9. Clutch cover may be removed.
- D. **Junior 2 Kart:**
  - 1. All clutch springs must be pre-approved by LOORRS officials and be available to the general public for purchase by any competitor at any time.

- In the event that a spring becomes discontinued by the manufacturer, they will no longer be legal for use.
2. Clutch tuning is limited to springs and spring shimming only. No spacers, stops or spring stops are allowed.
  3. The mandated clutch is the CMI Billet Clutch
  4. The use of any other manufacturer's components is prohibited. Any non-mandated components will be confiscated.
  5. No modifications may be made to either system. This includes no modifications of any kind to the drive cones, plates, and shafts, including changes in profiles, diameters, or materials.
  6. No components may be added or removed.
  7. Any brand of replacement belt may be used.
  8. CMI clutch cover is mandatory.
- E. **Modified Karts:**
1. Clutch is open.

#### KR-43 TRANSMISSION & GEARING

- A. Final drive gearing is open.
- B. No reverse is allowed.
- C. Four wheel drive is not allowed.
- D. Chain drive is required.
- E. **Junior Karts:**
  1. No transmission allowed.
- F. **Modified Karts:**
  1. Transmission must remain stock as delivered by manufacturer for this model of engine.
  2. Reliability changes are allowed with LOORRS approval.

#### KR-44 DRIVE PARTS

- A. Rear drive must be spool type only.
- B. **Modified Karts:**
  1. Engine to transmission must be all one piece (as a factory motorcycle or quad).
  2. Chain drive is required from the driver to the driven sprocket.
  3. 1 constant velocity joint is allowed.
  4. Only 1 half shaft/drive shaft with 2 universal joints is allowed.

#### KR-45 WHEELS & TIRES

- A. Tires will be measured from their widest and highest point, inflated to 8 PSI.
- B. No inner liners allowed.
- C. Spare tire is optional.
- D. No multiple tires per corner permitted.
- E. Tires must be in good condition.
- F. Maximum wheel diameter is 10 inches.

- G. Plastic wheel covers are allowed and must be approved.
- H. **Junior Karts:**
  - 1. Maximum tire diameter is 21 inches.
- I. **Modified Karts:**
  - 1. Maximum tire diameter is 24 inches.
  - 2. All bead locks must have recessed bolts only that do not protrude past the face of the ring. Button head bolts may be used if bead lock bolt area cannot be recessed.

#### KR-46 FASTENERS

- A. All components and parts on the kart's suspension system, chassis, and running gear will be secured with SAE grade 8 or better nuts and bolts. Bolts must be secured with either lock nuts, lock washers, cotter pins, or safety wire and have at least one full thread showing through the nut.
- B. No aluminum or titanium fasteners allowed.

#### KR-47 EXOTIC MATERIALS

- A. No titanium or any other exotic materials may be used anywhere in the vehicle **except for the body as specified herein.**

#### KR-48 HOSES

- A. All fuel and brake line hoses including metal lines and fittings must be clamped and/or safety wired.

#### KR-49 RADIOS

- A. Radios must be of two-way voice communication type only. Each race team is responsible for meeting FCC requirements.
- B. Radio communication between drivers is not permitted.
- C. All radio frequencies must be approved and reported to LOORRS prior to their use.
- D. All race vehicle radio communication systems must be approved by LOORRS.
- E. See Section 5 of series General Rules for spotter requirements.
- F. Spotters are required for all race teams.
- G. **Mod Karts:** Each competitor race vehicle at the national series must use at all times while on the track an override race receiver to listen to race control that overrides any communication from the spotter when race control is transmitting to the vehicles. The receiver device must be approved by LOORRS and meet LOORRS standards at all times. Competitors will not be allowed on the track at any time without the race receiver installed and functional.

## **KR-50 TRANSPONDERS/TIMING**

- A. Remote score timing devices will not be permitted by teams, owners, or anyone associated with an entry, unless approved by LOORRS.
- B. All teams are required to purchase remote timing transponders. Transponders can only be purchased through LOORRS and numbers must be recorded with LOORRS officials.
- C. Drivers are responsible for the charging and installation of all transponders. Any entry without a properly charged, properly installed, functioning transponder may not be scored and may be subject to further penalty.
- D. Transponders must be mounted 55 inches back from the leading edge of the front bumper along the passenger side outer panel.