



## Ninja-Kart Specification 2013

### Definition:

- To provide young children between 6 - 10 yrs (until 11<sup>th</sup> birthday) of age an entry into short circuit motor racing.
- It is primarily a kart based formula, but purpose built Ninja-Kart are allowed, providing they meet the criteria and specification below.

### Construction:

- It is required that chassis of both existing karts and purpose built Ninja-Karts are fully symmetrical, with symmetrical pivot/steering pick up points (i.e. both sides of the mini-sprint are identical). It is not permitted to run any off-set in the kart.
- The floor pan must be complete in the driver's compartment.
- The Drivers lower body must be covered by the body panels (no open sides). **The side bar must be a minimum of 14" from the bottom of the chassis to the top of the side rail.**
- The maximum overall track of the rear axle must be no greater than 1320mm (52") measured from outside of wheel to outside of wheel. The rear axle alignment will be measured from the inner edge of the rear wheel rim (with similar off-set wheels fitted) to the edge of the chassis rail which must be equal on each side with a tolerance either way of 10mm.
- The rear wheels must be protected from rear impact by a single hoop attached to the main chassis rail .
- In ALL Ninja-Karts the drivers feet (when pedals are depressed) MUST be back 12" from the front of the bumper.
- The roll cage must be constructed in such a manner that the driver is protected from side and head impact, minimum size tubing in the roll cage is 25mm/od x 3.0mm and must consist of four posts two hoops joined together. The minimum height of the roll-cage must be 800mm (32") from the bottom of the chassis to the lowest point of the cage, whilst maintaining a minimum of a 100mm (4") clearance between the top of the child's crash helmet and the top and/or any part of the roll-cage.
- You must use the kart side pods and front bumper, in addition a roof wing and rear engine pod must be used in the construction of your ninja-kart.
- The roof wing must be fitted and similar to a Sprint car design, it must measure 30" x 30" body, with side plates of 12" x 30" minimum and 16" x 30" maximum. The side plates of the wing MUST not be below the rollcage at any point. The scrutineer will pass a rod through the rollcage, from front to rear and this must not touch any part of the wing. Full access to the rollcage tubing must be achieved.
- No part of the driver's seat must be below the bottom of the chassis.
- Minimum weight of ready to race Ninja-Kart must be 100kg (without driver). Any additional weight required to achieve the minimum weight must be equally added to all 4 corners of the Ninja-Kart (Regular weight checks will be carried out).
- A cut out switch must be fitted and clearly marked ON/OFF and be within easy reach by the driver.
- Do not attempt the above construction if you have concerns as to your welding ability, your child's safety may depend on your skills.

### Safety Equipment

- You must use a 5 point safety harness.
- Neck Braces and Fire retardant gloves must be worn.
- A high back seat or a head restraint must be fitted. **The tops of the seat must be fully supported to prevent any seat collapse – this may be adjustable but must be secure at all times.**
- A window net must be fitted to the right-hand (fence) side of the kart.
- A Chain Guard must be fitted.
- The use of quick release steering hub is permitted.
- Helmets must be of a minimum standard as directed by British Oval Racing Safety Executive (B.O.R.S.E). These are FIA8860-2004, Snell SA2005, Snell SA2010, SFI Foundation 31.1A, SFI Foundation 31.2A. The E2205 European standard helmet may be used in Fibre-glass, Carbon or Tri-Composite form only i.e. NO POLYCARBONATE helmets are allowed. It is important that the helmet fits the driver correctly. Shatterproof goggles/visors must be worn although tinted visors are not advisable. Your helmet must display the current ORCi (ORC10) sticker.
- Drivers must wear bright coloured racing overall type of clothing and these must be maintained in a clean and tidy condition, to a minimum karting standard. N.B. If wet weather clothing is used this must be worn IN ADDITION TO AND NOT INSTEAD OF the regulation overall type clothing as described above.

### Tyres

Slick tyres must be used except when the race is declared a "wet race" by officials, then and only then may wet tyres be used. Rear Wheels must be a minimum of 175mm deep, with both wheels being the same depth. No stagger is permitted. **The Duro tyre is the only tyre permitted for use at Arena Essex. Drivers may use current tyre stock at Spedeworth circuits until July 2<sup>nd</sup> 2012 (from this point the Duro tyre will be the only tyre permitted for use at Spedeworth tracks as well as Arena Essex).**

## **ENGINE.**

### **General:**

- The only engine eligible for use is the Honda GX 160 5.5 with a fixed gear ratio of 70/20.
- The engine must be positioned behind the drivers seat and be +/- 50mm of the centerline of the frame.
- The scrutineer will pay special attention to ensure that the finish of all components match those of the standard unit and reserves the right to compare any part from competitors' engines directly with a standard part as supplied by Honda (UK). Unless parents have gone out of their way to source alternative parts, their engines should automatically comply with this rule. Furthermore, parents should note that the term "standard" refers not only to the components used but also to the number used and the manner in which the engines are assembled. Please remember that save for the changes specifically mentioned in these regulations the engines must be completely standard unmodified, and that all components will remain in place unless this document specifically states that they are allowed to be removed. No specific coating procedures are allowed on any internal or external surface of the engine. Carbon or gasket residue removal must be achieved by use of chemical agents only, to preserve original finishes. The fasteners on the engines may be drilled for the purposes of lock wiring. Replacement of external fasteners with non-Honda fasteners is only permitted when the replacement fastener improves safety or when the standard Honda fastener is not readily available. A thread recovery procedure is acceptable providing that the system and replacement fixing used are of no different size or pitch to the original and therefore offer no mechanical advantage over the original fixing.
- **DEFINITIONS** : "the standard, unmodified component" This means that the component has not had its substance altered in any way. It has had no material removed from it or added to it. It will be of the same, original material. Where appropriate, it should have the manufacturer's original manufacturing process or machining marks on it.
- **Engine types** : The original QHQ4 engine, to engine number 7664037, shall in this document be called the K engine. The QHQ4 engine from engine number 7664037 onwards shall in this document be called the E engine. The QHQ4 engine with suffix x T, from engine number 1000000 onwards shall in this document be called the T engine. This will also include all unified specification engines (GX160UT1 QHQ4), and the QHG4.
- **Legality limit** In general terms; and where not clarified or qualified elsewhere in this document, the legal limit for eligibility purposes shall be deemed to be the service limit as specified by Honda in the most up-to-date Honda Service manual for the particular engine. (www.honda-engines eu.com).
- **All engines must be dyno tested and sealed by RPM at a cost of £35 +VAT per engine. Seals will be numbered and logged with Arena Essex and Spedeworth. New engines can be supplied at £300 + VAT including oil and sealing. Spare engines will be kept in the event of failure or excessively fast cars – refusal to swap for a promoter-supplied engine will be treated in the same manner as being found illegal (your engine will be sent for checks and resealing).**
- **The engines will be sealed at 5BHP – when fully run in these engines will produce 5.2BHP.**

### **The Fuel Tank**

Either the engine's standard integral fuel tank in a un-modified form or alternatively an after-market purpose built tank maybe used. If a after-market type is used, then it MUST comply to these construction rules;

The tank must be made of aluminium or steel (min thickness 2mm), with a maximum capacity of 0.5 litres (example size, 100mmx100mmx50mm). The tank must have a metal screw-on type cap, no push-fit or half-turn type caps allowed. There must be a metal fuel shut-off tap fitted to the bottom of the tank. A breather-pipe complete with a one-way valve or loop of pipe must be fitted to the top of the tank, that terminates below the engine. It must have a positive means of fixing and MUST be fixed above the height of the engine and on the centerline of the kart. The fuel-line between the tank and the engine MUST be of the metal braided rubber type only, securely fixed at both ends. **Only the standard integral fuel tank will be permitted for use at Arena Essex.**

### **Exhaust**

**The standard exhaust must be used or a modified exhaust supplied by RPM at a cost of £25 + VAT (including fitting).**

### **Carburettor**

There is no restriction to the use of standard, unmodified A, B or C type carburettors with any of the engine types. However all carburettors are subject to normal dimensional criteria. Overall length (manifold face to air-box face) is 54mm and bore go / no go gauge is 13.2mm / 13.3mm.

### **Permitted main jets**

size 68 (PN 99101-ZF5-0680) size 70 (PN 99101-ZF5-0700)

size 72 (PN 99101 -ZF5-0720) size 75 (PN 99101 -ZF5-0750)

Emulsion tube can be either part number 16166-ZH8-W50 or part number 16166-ZH-810 (see drawing 1 in Appendix). The throttle-actuating arm can be modified to accept an actuating rod onto the throttle butterfly, a method of mounting a throttle actuating cable and a method of mounting a throttle return spring only.

### **Carburettor air box**

Must be standard unmodified.

### **Air filter**

Substitution or complete removal of the renewable paper/foam air filter is allowed, although the plastic outer cover must remain as standard unmodified and fixed securely in its original position.

### **Spark plugs**

Spark plugs fitted to the engines must be from the recommended list provided by Honda - please see below. No other spark plugs may be used. The plugs used must not be modified in any way whatsoever and must have a reach identical to that of the plugs listed. Resistor plugs will be used. The standard Honda resistor spark plug cap - as supplied with the engine - must be used. Permitted spark plugs

NGK BPR6ES BP6ES BP5ES BPR5ES

Nippondenso W20EP-U W20EPR-U W16EP-U W16EPR-U

### **Engine bodywork / ducting**

All of the bodywork and ducting must be standard unmodified except for the drilling of a small hole to accept one end of a throttle return spring. The pull-cord mechanism must be standard unmodified, although the pull-cord starter may be rotated on its standard mounting holes. All or any of the bodywork / ducting can be painted or chromed.

### **Rocker cover**

Rocker cover must be standard unmodified, although it may be painted or chromed. Its valve must be present and in working order. The breather pipe must be in position and intact, of suitable length that it is securely fixed in both the rocker cover and the outlet of the airbox, and have no perforations or leakage points.

### **Valve Gear**

The valve rocker studs must be standard unmodified. The inlet valve collet (PN 14771-ZE1-000) may be replaced with an exhaust valve collet (PN 14773-ZE1-000) and an exhaust valve rotator (PN 14781-ZE1-000). If this modification is performed to the inlet valve, it is permissible to fit one 8mm washer between the cylinder head and the base of the valve rocker post to raise the post and ensure that the adjuster locknut sits on a full thread. The valve spring used must offer no mechanical advantage over a standard GX140 valve spring (PN14751-ZE1-000) i.e. a force of 5 kg will compress the spring to less than 25mm overall length, or a spring which offers no mechanical advantage over a standard QHG4 spring (PN 14751-ZH8-9400) i.e: a force of 8kg will compress the spring to less than 18.5mm overall length. Valve rockers, cam followers and pushrods must be standard unmodified.

### **Valves**

Valves will be standard unmodified. Valve-seat grinding and cutting is allowed, to standard profiles (including seat width) as specified in the latest Honda manual for the engine type.

### **Cylinder head**

Will be standard unmodified and measure a minimum of 73.98mm from the rocker cover gasket face to the cylinder head gasket face. Ports must be standard unmodified. The standard de-burring marks and sharp edges should always be present. A maximum measurement of 29.25mm (inlet) and 28.25mm (exhaust) must be present the cylinder head gasket face and the land surrounding the valve guide.

### **Head gasket**

Must be standard unmodified and will at all times have a minimum thickness at all points of 1mm.

### **Piston**

The dished piston must only be used with the cylinder head from the K type engine. The flat-top pistons are interchangeable between the E and T type engines only and must not be used in the K type engine or with the K type head. Piston rings will be standard unmodified. Only standard size rings, marked R, T or N can be used. Either the single or three-piece oil control ring can be used on all engine types. The rings must always be free in their grooves to function as designed.

### **Connecting Rod**

The standard unmodified unit is interchangeable between all three engine types.

### **Crankshaft**

The governor gear can be removed. The position of the cam gear wheel is free. The standard key must be used. The crankshafts are different between all three engine types but are interchangeable between all three engine types.

### **Flywheel**

The flywheel will be standard unmodified and is interchangeable between all three engine types. It must have a minimum weight of 2.35kgs. The standard unmodified fan shall be used, with all fins in place.

### **Ignition coil**

The ignition coil (including ignition lead and plug cap) will be the standard unmodified unit and is interchangeable between all three engine types. The coil mounting bolts must be standard unmodified and use the original mounting positions.

### **Camshaft**

The standard unmodified camshaft must be used on the standard keyway which is interchangeable between all three engine types. The service limits are 13.916mm for the journals and 26.65mm for the exhaust and 27.60mm for the inlet lobes.

### **Crankcase**

The crankcase can only be modified by the removal of the governor mechanism and in all other respects must be standard unmodified. If completely removed, the hole in the crankcase must be sealed to prevent oil leakage (unless a suitable pulse take-off is used). The crankcase bearings and seals must be standard unmodified. The bore must be standard only, service limit 68.165mm at all points of the bore. No sleeving or surface material change to the cylinder bore is allowed but honing is permitted. The cylinder mating face should always have the manufacturer's original finishing marks visible. A deck height be 45.15mm +/- 0.2mm (read between the cylinder mating face and the cast face of the piston, in line with the piston pin, with the piston at BDC). Carbon removal is allowed as described previously. When measuring a K type engine, 1.3mm should be subtracted from the obtained reading, to accommodate the dish in the piston.

### **Crankcase Side Cover**

Must be standard unmodified and positioned with both standard dowels in place.

### **Gaskets**

All gaskets must be standard unmodified. Where there is any doubt about the eligibility or suitability of a particular gasket it should be compared with a new item from the manufacturer.

### **Clutch**

A dry, air-cooled centrifugal clutch of Noram, Horstman, Magnum, Maxtorque 1600 or 4000 series type must be used to transmit the drive. The clutch should be in standard form (as supplied), be incapable of adjustment in position and have a maximum engagement speed of no more than 2,500 rpm engine speed.

### **Fuel**

No additives of any kind may be used only petrol purchased at the roadside pump may be used.

### **USEFUL CONTACTS**

#### **RPM (Roger Pritchard)**

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