

ASN CANADA FIA



Canadian Karting

Honda

Technical Regulations

To be read and applied in conjunction with:
Canadian Karting Regulations Book 1, Sporting Regulations and
Book 2 Technical Regulations

Effective January 1, 2014

LEGACY REGULATIONS. FINAL ISSUE JANUARY 1, 2014.

**ASN CANADA FIA IS THE GOVERNING BODY OF MOTORSPORT IN CANADA
APPOINTED BY
THE FÉDÉRATION INTERNATIONALE DE L'AUTOMOBILE**



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1. THESE HONDA TECHNICAL REGULATIONS

The Spirit and Intent will be the standard by which these Regulations are enforced.

Compliance with ASN Honda Technical Regulations does not necessarily ensure eligibility of Honda engines by other sanctioning bodies.

Should doubt exist in the mind of a competitor, manufacturer, distributor, or Official as to the interpretation or application of these Regulations, the competitor, manufacturer, distributor, or Official is encouraged to first communicate in writing, by fax or email to the ASN Canada FIA office. Verbal inquiries will not be considered.

In determining questions of eligibility of a Honda engine, or the presence, absence or condition of a component of a Honda engine, ASN licenced officials shall be guided by the principle:

“IF THE REGULATIONS DO NOT STATE THAT YOU CAN DO IT, YOU CAN NOT”

It is the entrant and/or driver's responsibility at all times to ensure the ongoing compliance with Honda engine technical eligibility. A claim of lack of knowledge in the event of a engine being found ineligible, will not be considered.

Out of compliance parts, equipment or configuration on the engine, are not deemed to have been authorized or approved by reason of having passed through the inspection process at any time or any number of times.

ASN affiliated Clubs and Regions may adopt these Honda Technical Regulations for use within their own organization.

These regulations are to be read in conjunction with Canadian Karting Regulations Book 1, Sporting Regulations and Book 2 Technical Regulations.

2. GENERAL HONDA FOUR-CYCLE ENGINE REGULATIONS

The Four-Cycle Honda Technical Regulations provide a uniform set of standards and procedures to establish the eligibility of the Honda engines used in an ASN sanctioned event.

These Regulations are intended to be a guide for Technical Inspectors, as well as providing assistance to commercial and private engine builders.

a) The following engines are eligible for competition:

Honda Original Equipment Manufacture: GX-160/K-1, GX-160/T-1, GX-160cc, GX-200, GX-200cc

The GX-140 and GX-160 are no longer eligible for competition.

New 2011 Honda GX Engine Family products and parts thereof are not permitted to be used.

- b) The only changes, additions, deletions or modifications allowed are contained in these Technical Regulations.
- c) All engine parts must be standard, unaltered, genuine Honda parts, manufactured for the particular engine, unless otherwise stated in these Regulations.
- d) Modification or machining of the engine block or any components is not permitted, unless otherwise stated in these Regulations.
- e) Interchangeability of parts: Any part conforming to the Technical Regulations for a GX-160/K-1 can be interchanged with any part conforming to the Technical Regulations for a GX-160/T-1 or GX-160cc. Any part conforming to the Technical Regulations for a GX-200 can be interchanged with any part conforming to the Technical Regulations for a GX-200cc. See the HONDA FOUR-CYCLE ENGINE PREPARATION section for piston and piston ring interchangeability limitations.

3. AUTHORIZED HONDA FOUR-CYCLE CHANGES AND ADDITIONS

3.1. Air Filters and Adapters

- a) Stock Honda air filters and/or adapters may not be modified to become air scoops or velocity stacks.
- b) The stock Honda air filter and adapter may be replaced with any aftermarket air filter and adapter that conform to the following specifications.
- c) All aftermarket air filter adapters must be of one-piece design, and manufactured from billet, cast or molded material. No welding is allowed anywhere on the adapter. If the material used is non-metallic, metal sleeves must be installed into the mounting holes, of the same length as the width of the mounting flange to avoid compression of the flange.
- d) No portion of the adapter may extend beyond the face of the flanged mounting portion into the carburetor opening. The flange surface must be flat in its entirety except for minimal clearancing for the idle air bleed orifice and the main metering air bleed orifice if required.
- e) The centerline of the adapter and the filter shall be perpendicular to the mounting face of the adapter in their entirety.
- f) The only holes allowed are the two mounting holes and the central normal air flow hole.
- g) The maximum length of any aftermarket air filter adapter is 2.310". This measurement does not include the one mandatory stock adapter gasket.
- h) An air filter adapter gasket must be used. A single, original type, Honda GX air filter adapter gasket for the appropriate engine, is the only gasket that can be used, but the minimum metal thickness is 0.090"
- i) The filter may not be used as a tract lengthener, air flow diffuser, or air flow director.
- j) The maximum length of the entire filter and boot is 7.0". The cross section diameter of any portion of the filter assembly shall not exceed 4.0". The length of the boot attachment shall not exceed 2.50" in length, as measured from its adapter end to its termination inside the element chamber.

3.2. Clutch

- a) All Honda engines must have an operational clutch that will allow the engine to idle without moving the Kart. The clutch must be an engine-mounted, centrifugal clutch, of the "dry" type, protected with an engine clutch guard.

3.3. Fasteners

- a) Any bolt-hole except the rocker stud bolt holes or the throttle shaft plate retainer may be re-threaded, and or fitted with a helicoil or thread insert.
- b) Any bolt except the carburetor throttle plate retaining bolt may be replaced with a stud or socket head cap screw.
- c) Locknuts must be installed appropriately as tight as a non-locking nut.
- d) Carburetor retention nuts may not be locking type.
- e) Carburetor retention studs must be Honda OEM diameter, length is non-tech. Thread locking products may not be used with the retention nuts. Threads cannot be knurled. Notching of the stud end is permitted.

3.4. Fittings

- a) The addition of a fitting to accommodate the fuel pump pulse line is permitted, with the maximum hole in the block accepting a 1/8" pipe thread.

3.5. Fuel Pump and Mounting Bracket

- a) Any vacuum operated fuel pump may be used.

There shall only be one continuous, unaltered piece of tubing connecting the fuel pump pulse fitting to the engine crankcase with a maximum nominal inside diameter of 0.250".

It shall be of the minimum length required to reach the pulse opening and the fuel pump.

There shall be a maximum of 2 openings on the pulse side of the fuel pump.

One shall be used for the connection to the engine and the other as a pulse chamber vent. The diameter of this orifice must conform to the normal size for that manufacture of pump.

- b) The fuel pump mounting apparatus must be fastened to the engine using only 1 or 2 fasteners. The mounting apparatus, or any material other than the bolts, shall have a maximum area of 25 square inches total. The area of any holes in the apparatus is not subtracted from the total. No part of the apparatus may be used for close proximity retention or deflection of air in the internal flywheel shroud area.
- c) The fuel delivery system includes only the normal reservoir tank, appropriate fittings, an optional normal fuel filter, fuel pump and pulse line, carburetor and all connecting tubing. All components of the fuel delivery system must be completely visible, and not covered by, or run through, any apparatus or materials other than the appropriate fastening devices. Excessive length of fuel line tubing is not permitted in any section of the fuel delivery system.

3.6. Fuel Tank

- a) The stock Honda fuel tank MUST be removed from the top of the engine, and should not be re-used. Fuel tank mounting ears may be removed.

3.7. Gaskets

- a) Sidecover gaskets, as well as carburetor bowl gaskets and o-rings must be of stock appearing shape.
- b) Maximum thickness of the exhaust gasket(s) is 0.125" as raced.
- c) Two induction gaskets are required - one on each side of the phenolic spacer. These induction gaskets shall be of stock appearing shape, and each shall have a maximum thickness of 0.030" compressed.

3.8. Governor

- a) The governor and decompression apparatus may be removed from the engine, including the portions attached to the camshaft. Any EXTERNAL holes caused by this removal MUST be plugged.

3.9. Coatings

- a) The cylinder block, side cover and head finish and texture must be AS CAST from Honda.

3.10. Recoil

- a) On all Honda engines, an unaltered, standard utility recoil and starter cup from GX160/K-1, GX160/T1, GX-160cc, GX200, GX-200cc utility engines or an unaltered, aftermarket, mass produced, non-Honda bolt-on recoil and starter cup of similar appearance (especially air inlet space area) must be entirely in place during competition, and must be the only method of starting the engine.

3.11. Shrouds

- a) Shrouds to replace the air passage of the stock fuel tank will NOT be permitted.
- b) Flywheel shrouds must not be altered in any way to alter the airflow or change appearance, except for chrome plating or painting.

- c) Covered fan intakes are allowed only in the pit lane and must be cleared BEFORE entry onto the racing surface.

3.12. Switch

- a) The ignition switch may NOT be removed, and must function.

A second, small, functioning, toggle switch may be installed on/in the front fairing panel or on the steering column support portion of the main frame in all classes.

3.13. Cooling Fan

- a) The only fan that is allowed is stock, unaltered Honda part # 19511-ZE1-000.

4. HONDA FOUR-CYCLE ENGINE PREPARATION

- a) **Bearings, main:** Main bearings must remain as a press fit in the block after the engine has attained ambient atmospheric temperature, and must not be removable by pulling tools that have no extra mechanical advantage/leverage over manual pulling.

Loctite type compounds, pocket dimpling/knurling, or any other form of retaining devices are NOT legal.

Main bearings must be standard, unaltered, genuine Honda parts, manufactured and listed for the particular model of engine being inspected.

- b) **Block:** Blocks must be original GX-120, GX-160/K-1, GX-160/T-1, GX-160cc, GX-200, GX-200cc.

The engine block must be in OEM as cast condition. There must be no machining, except as permitted in these Regulations.

Welding to repair cracks or breakage is allowed only in areas where the affected portion does not require re-machining, and not in areas where the welding may be construed as a performance gain.

Class structure determines which engine blocks that may compete in that class.

- c) **Cylinder Length:** On GX-160/K-1, GX-160/T-1, GX-160cc blocks - 4.620" MINIMUM.

- d) **Cylinder Head:** Certain GX heads are slightly machined at the outside edge of the ports and/or in the valve guide area for flash removal. No alteration, modification or machining is permitted to the head except for the head gasket surface. Valve seats may not be re-seated shallower in the head. Head interchange between GX-160/K-1, GX-160cc and GX-200 or GX-200cc is not permitted. GX-160/T-1 heads may be interchanged with GX-160/K-1 or GX-160cc heads. GX-200 heads may be interchanged with GX-200cc heads.

GX-160cc and GX-200cc heads which are marked differently from existing heads, or are designated as the "older" style but in fact are the T-type of combustion chamber are allowed.

The entire inlet and exhaust tract surfaces must remain STOCK as compared to other known stock heads. Minor as cast deviations are allowed. Minor "runaway" grinding is permitted.

Thread saving devices in the spark plug hole must be installed so that a Combustion Chamber Volume test will be the same as with the original thread.

- e) **Head Gasket:** Head gaskets for GX-160/K-1, GX-160/T-1, GX-160cc, GX-200, GX-200cc are not subject to Technical Inspection.

- f) **Valve Cover Gasket:** Stock Honda valve cover gaskets may be replaced with any gasket of the same basic shape as the stock Honda gasket. The thickness of the gasket must be within specifications listed for the engine model. The gasket may be affixed to the valve cover.

- g) **Valves:** Valves must not be altered, polished, lightened, welded, brazed, or machined in any way, except as permitted in these Regulations. Only stock, unmodified valve keepers may be used, installed properly on the appropriate valve. The skirt on the exhaust valve rotator may be shortened.

- h) **Valve Springs:** Valve springs must be of appropriate Honda manufacture and be unaltered. Shimming of valve springs is not permitted. Valve spring colour is a non-tech item.
Part # 14751-883-000 or part # 14751-ZE1-000
- i) **Pistons/Rings:** Re-sizing, knurling, or lightening of pistons is not permitted.
The use of piston button(s) is not permitted.
Coating of pistons is not permitted. Anodizing of pistons is not permitted.
All three piston rings must be used, installed correctly, with the identification marks toward the head. Ring tension may not be changed by heating or other means.
Ring gaps are not subject to Technical Inspection. The ends of each piston ring may only be altered in a way that appears to be the same as a known, stock, unaltered, Honda ring for the appropriate type/model of engine.
The piston oil control ring (third ring) may be either single or 3-piece design, provided that it (they) are stock OEM rings, appropriate for the type/model of engine used.
Piston rings and pistons (dished or flat top) are interchangeable between the GX-160/K-1, GX-160/T-1 and GX-200.
- j) **Camshaft:** No alteration, additions, removal of material, modifications or machining of any kind is permitted, with the exception of removal or partial removal of the decompression apparatus.
Each type of engine must use the camshaft designed and appropriate for that type of engine. (e.g. a GX-160/K-1 camshaft can only be used in a GX-160/K-1 engine)
- k) **Crankshaft Gear:** The crankshaft gear may be rotated to change the camshaft timing on all engines.
- l) **Flywheel:** Must be stock and unaltered.
A GX-160/K-1, GX-160/T-1, GX-160cc, GX-200, GX-200cc engine may have a flywheel from either a GX-160/K-1, GX-160/T-1, GX-160cc, GX-200 or a GX-200cc.
- m) **Shrouds:** The cooling shrouds must be present and unmodified.
- n) **Ignition:** Only OEM parts are permitted, except for the flywheel key, which may be aftermarket. No CDI.
Ignition timing in all classes is not subject to Technical Inspection, and can only be altered from stock in these classes by modification or removal of the flywheel key.
- o) **Muffler:** Dependant upon local Club Rules, a standard Honda muffler may be used in classes in which a restrictor plate of less than 0.500" is utilized.
In Senior classes, Junior classes with no restrictor plate, and Junior classes requiring a 0.500" restrictor plate, a header and silencer must be used.
- p) **Carburetor:** No alteration, modification, or machining of ANY kind is permitted to ANY part of the carburetor, unless specifically stated in these Regulations.
The choke assembly must remain completely intact, and stock.
The throttle plate and plate fastening apparatus must remain STOCK for the appropriate engine.
The throttle plate retaining screw may be replaced by a fuel shut off retaining screw (Part #93500-03008-OG). The threaded end of this screw must protrude through the throttle shaft by at least one thread.
The portion of the throttle shaft within any part of the body of the carburetor must conform to the measurements of a stock, unaltered shaft for the appropriate engine.
The EXTERIOR control linkage apparatus may be modified or replaced in a manner approved by the Technical Inspector.

q) **Spark Plug:** Spark plug may be of any manufacture, provided that it has the same reach as intended for the particular engine. In the Honda GX series of engine, a 0.750" reach is required. Reach is defined as 0.770" maximum, measured from the upper gasket surface of the spark plug to the parallel, lower, squared edge of the threaded portion of the plug.

r) **Spark plug gasket:** A gasket and/or a temperature gauge sensor must be installed under the upper gasket surface of the plug.

The height (thickness) of the gasket/sensor must be greater than 0.003"

s) **Spark Plug Cap:** Any spark plug cap may be used.

t) **Valve Guides:** The valve guides in GX-160/K-1, GX-160/T-1, GX-160cc, GX-200, GX-200cc may be pressed flush with the port floor.

u) **Block and Crankcase Integrity:** Blocks must be original GX-160/K-1, GX-160/T-1, GX-160cc, GX-200, GX-200cc.

The engine block must be in OEM "as cast" condition. There must be no machining, except as permitted in these Regulations

Welding to repair cracks or breakage is allowed only in areas where the affected portion does not require re-machining, and not in areas where the welding may be construed as a performance gain.

The crankcase may only be vented using the normal, stock, unaltered methods except for the allowance of the pulse hole fitting. The crankcase cannot be vented additionally through the plugged governor apparatus, the side cover gasket(s), main seals, valve cover gasket, valve cover check valve, or any other means.

5. HONDA GX-160/K-1, GX-160/T-1, GX-160CC SPECIFICATIONS

a) **Bore:** 2.677" (68mm) - 2.720" (69mm)

b) **Stroke:** 1.756" min. - 1.776" max.

c) **Piston Length:** 1.920" minimum.

d) **Piston Dish:** Dished pistons must remain as cast.

e) **Cylinder Height:** 4.620" minimum. Surface finish is not subject to Technical Inspection.

f) **Combustion Chamber Volume:** 21.00 cc. minimum.

g) **Head Height:** Measured from the head gasket surface to the unaltered valve cover surface.
2.880" minimum height.

Finish of head gasket surface is not subject to technical inspection.

h) **Port Diameters:** AS CAST, OEM. The entire inlet and exhaust tract surfaces must remain STOCK as compared to another known stock head.

GX-160/K-1 and GX-160/T-1: Exhaust: 0.920" maximum.

Inlet: 0.890" maximum.

i) **Valve Seat Diameters:** Exhaust: 0.872" maximum.

Inlet: 0.910" maximum.

j) **Valve Springs:** Unaltered, Honda GX, or G200 valve springs are permitted. Valve Springs must either conform to Specification A or Specification B.

k) **Valve Springs Spec A:** Free length, post race: 1.450" maximum

Wire Diameter: 0.075" - 0.081"

Coil Diameter: 0.790" - 0.815"

Part # 14571-883-000

- l) **Valve Springs Spec B:** Free length, post race: 1.450" maximum
Wire Diameter: 0.068" - 0.073"
Coil Diameter: 0.775" - 0.790"
Part # 14751-ZE1-000
- m) **Valves:** Stock GX-160/K-1, GX-160/T-1, GX-160cc valves must be used. Stellite exhaust valves, part #14721-ZH8-810 are allowed.
- n) **Ignition Timing:** Not subject to Technical Inspection.
- o) **Crankshaft Rod Journal:** 1.174" minimum.
- p) **Connecting Rod Length:** 2.350" minimum – 2.370" maximum, inside measurement, unaltered.
- q) **Connecting Rod Big End Bore:** 1.177" – 1.184"
- r) **Piston Pin:** 0.705" min. – 0.712" max. OD.
0.557" max. ID.
2.120" min. length.
- s) **Valve Cover Gasket Thickness:** 0.030" min. – 0.063" max. uncompressed.
- t) **Carburetor:** Venturi: 0.515" GO – 0.525" NOGO.
Emulsion Tube Heights: 0.408" GO – 0.432" NOGO.
Maximum main jet size: 0.031" NOGO
- u) **Flywheel:** Stock, unaltered GX-160/K-1, GX-160/T-1, GX-160cc, GX-200, GX-200cc flywheel.
- v) **Shroud:** Any approved GX series (GX-160/K-1, GX-160/T-1, GX-160cc, GX-200, GX-200cc) unaltered shroud may be used. No addition of material is allowed.
- w) **Phenolic Spacer:** Must be stock GX-160/K-1, GX-160/T-1, GX-160cc. The fuel line guide may be trimmed to facilitate inspection. The spark plug wire guide portion may be removed.
- x) **Valve Stem Oil Seal Assembly:** Must be removed.

6. HONDA GX-200, GX-200CC SPECIFICATIONS

- a) **Block:** The engine block must be in an "as cast" condition with no machining except where allowed by these Regulations. The only blocks that can be used are the GX-200, GX-200cc.
- b) **Bore:** 2.677" (68 mm) minimum - 2.720" (69 mm) maximum.
- c) **Stroke:** 2.118" minimum. – 2.130" maximum.
- d) **Piston:** Length 1.920" minimum.
- e) **Cylinder Deck Height:** Piston must remain 0.020" minimum below deck throughout the full rotation of the crankshaft.
The finish of the deck is not subject to Technical Inspection.
- f) **Combustion Chamber Volume:** 27.00 cc. minimum for "Thailand" heads with ATA or TKI designation.
29.00 cc minimum for "Japan" heads ZLO #1, #2, #3, #4 without ATA or TKI designation.
- g) **Head Height:** Measured from the head gasket surface to the unaltered valve cover surface: 2.880" minimum.
The finish of the head gasket surface is not subject to Technical Inspection.
- h) **Port Diameters:** Must be as cast.
Entire tracts must be STOCK when compared to a known stock head.

- i) **Valve Seat Diameters:** Same as GX-160/K-1, GX-160/T-1, GX-160cc.
- j) **Valve Springs:** Same as GX-160/K-1, GX-160/T-1, GX-160cc.
- k) **Valves:** GX-160/K-1, GX-160/T-1, GX-160cc, GX-200, GX-200cc valves must be used.
Stellite exhaust valves part # 14721-2H8-810 are permitted.
- l) **Valve Lifters:** Base width: 0.935" minimum, 0.945" maximum.
Height: 1.355" minimum, 1.370" maximum.
Base Thickness: 0.073" minimum, 0.083" maximum.
- m) **Ignition:** Ignition timing is not subject to Technical Inspection.
Ignition timing changes may be accomplished only by altering the width of the flywheel key, or by using no key.
- n) **Crankshaft Rod Journal:** 1.174" min.
- o) **Connecting Rod Length:** 2.350" min. – 2.370 max. inside, unaltered.
- p) **Connecting Rod Big End Bore:** 1.177" – 1.184" max.
- q) **Piston Pin:** Outside Diameter - 0.705" minimum, 0.712" maximum.
Inside diameter - 0.557" maximum.
Length: 2.120" minimum.
- r) **Carburetor:** Venturi: 0.575" NOGO
Jet: 0.035" NOGO
Emulsion Tube heights: 0.436" GO – 0.462" NOGO
California Carburetors: All rules regarding California emissions carburetors for GX-160/K-1 and GX-160/T-1 will apply.
- s) **Phenolic Spacer:** Must be stock GX-200, GX-200cc, GX-160/K-1, GX-160/T-1, GX-160cc. The fuel line guide may be trimmed. The spark plug wire guide tabs may be removed.
- t) **Exhaust system:** GX-160/K-1, GX-160/T-1, GX-160cc header rules apply.
- u) **Piston Rings:** Must be stock Honda rings for GX-200, GX-200cc, GX-160/K-1, GX-160/T-1, GX-160cc.
Rules under 4-CYCLE ENGINE PREPARATION GUIDELINES of these Regulations shall apply.
- v) **Valve Stem Oil Seal Assembly:** Must be removed.
- w) **Valve Cover Gasket Thickness:** 0.030" min. – 0.063" maximum uncompressed.
- x) **Recoil:** Any approved GX series (GX-160/K-1, GX-160/T-1, GX-160cc, GX-200, GX-200cc) utility motor recoil assembly may be utilized.
- y) **Shroud:** Any approved GX series (GX-160/K-1, GX-160/T-1, GX-160cc, GX-200, GX-200cc) unaltered shroud may be used. No addition of material is allowed.

7. HONDA EXHAUST SYSTEMS

7.1. Mufflers In Classes Requiring Stock Muffler

- a) Permitted small outlet mufflers are part # 18310-ZE1-01, and part # 183A1-ZE1-811.
- b) The muffler flange may not be matched to the exhaust port.
- c) Mounting nuts must be tight, and the intact STOCK gasket properly installed.

- d) Exhaust gases from the engine may only exit through the outlet opening of the muffler and the OEM sized, unaltered drain slot. Leakage is acceptable from 1/4 or less of the circumference of the center orifice of the intact, unaltered, stock exhaust gasket.
- e) The top muffler plug may be tig-type tack welded to the muffler body in 3 places spaced around the plug. The height of the plug in the muffler must compare to other mufflers and must be visible in the un-welded areas of the plug joint.

7.2. Exhaust Header/Silencer In All Other Cases

- a) A header and silencer must be used, according to the following regulations:
- b) The outside diameter of the header tubing throughout the entire length shall be 0.925" MINIMUM – 1.005" MAXIMUM with two exceptions:

The bend area where the diameter shall be 0.900" MINIMUM – 1.050" MAXIMUM.

Within the thickness of the flange.

- c) The flange may not be used as a restrictor plate. Any measurable cross section within the flange width must not be less than the smallest inside diameter of the tubing immediately after the flange.
- d) Header tube wall thickness shall be 0.040" min. – 0.070" maximum.
- e) The diameter of the header tube from the flange to the first bend is a non-specified item, BUT the entire header tube must be made from the same unaltered, undeformed relatively constant diameter, single piece of tubing. No crimping, swaging or section welding is allowed.
- f) There shall be no protrusion into the head exhaust opening.
- g) The length of the header shall be 8.000" min. – 12.000" maximum, not including the silencer. Measurement to be taken with a 1/4" (6 mm) maximum width cloth tape measure.

For single bend headers, insert the tape measure through the header toward the flanged end, hook it on the outside of the flange in the area toward the inside of the bend. Draw tightly toward the other end without twisting, and measure to the inside of the bend at the header outlet.

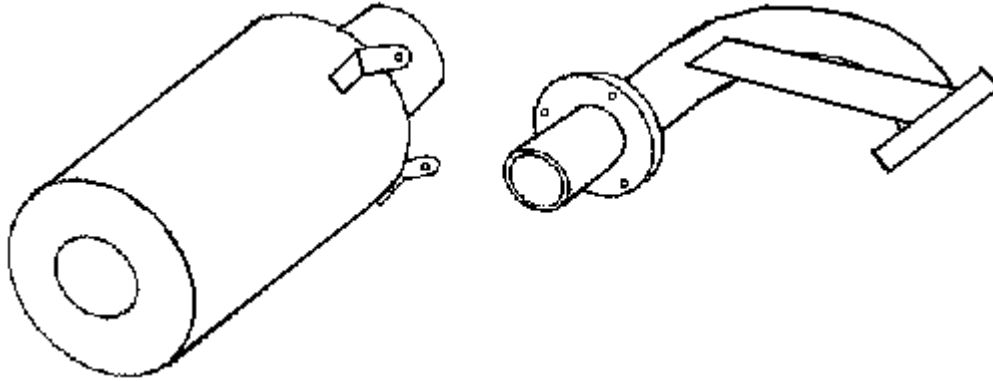
For multiple bend headers, insert the tape measure through the header toward the flanged end, hook it on the outside of the flange in the area toward the inside of the primary bend without twisting the tape measure. Draw tightly toward the header outlet end. The measurement at any point on the circumference of the header tubing outlet must be within the specified lengths listed above.

- h) Any support or brace must not make any part of the system out of specification.
- i) The header may have a brace/support welded to the outside of the header tubing after the bend area, and then welded to either the flange, another location on the tubing before the bend area, or bolted to the engine, to reinforce the bend area.

The silencer must have a support brace clamped to the silencer and clamped or bolted to an approved, appropriate location on the engine. It is recommended that an additional tether arrangement be utilized, joining the header/silencer to the engine or to the Kart.

- j) One washer (2.5" maximum OD, 0.150" maximum width) with utilized attachment holes may be welded around the pipe after the bend area to facilitate the addition of safety wire and/or springs to further attach the silencer to the header. (Installed one inch or more from the outer end of the header, it may also be used as a distance locator for the silencer). Tabs may be welded to the silencer in an appropriate location to utilize the washer on the header. The number of spring/safety wire attachment holes is limited to a maximum of 3.

The following illustration displays the intent of the regulation.



- k) The header must be pointed rearward when compared to a line parallel to the rear axle.
- l) No part of the exhaust system may be more than 20.0 inches from the racing surface, as raced.
- m) No portion of the exhaust system may protrude behind a vertical plane defined by the rear edge of the rear bumper.
- n) The silencer must be an unaltered RLV B-91.
- o) A minimum of 1.000" of the header must be inside the silencer at all times.
- p) Coating and/or painting of the header and silencer is not allowed. The mandatory heat protective wrapping of the header must be securely fastened to prevent loss. The silencer may be heat protective wrapped. Technical inspection of the silencer and/or header may require removal of the wrapping.
- q) There may be no extra holes in the header.
- r) Header material must be magnetic. It is recommended that a material superior to mild steel be used in its construction.
- s) The specified silencer must be installed in such a manner as to prevent exhaust discharge from being diverted to any point except the unmodified discharge of the silencer. Any attempt made by a competitor to install the silencer so that exhaust gases are diverted from the designated discharge point will be cause for Technical disqualification.
- t) The maximum engine flange thickness is 0.255".
- u) The cross section of the header must be basically round, except for port matching. Port matching at the flange area is not subject to technical inspection.
- v) A properly installed, completely intact, uniform thickness exhaust gasket(s) with a total thickness of 0.125" or less must be used and remain between the header and the exhaust port of the engine.
The header flange face must be relatively flat, and the affixation nuts and studs must be tight.
- w) **Kinked, cracked, loose or broken headers:** At any time during the event the entrant will NOT lose their starting position for the next session or the Final Race when any of the following procedures are accomplished under the scrutiny of the Technical Official, and the exhaust header retainer is re-sealed:
 - Replacement of a broken, kinked, or cracked header.
 - Re-tightening of the header retainer nuts.
 - Replacement of a stripped exhaust header stud or bolt.
 - Repair of the exhaust threads in the head.

A kink is defined as a sharp deflection of the normal configuration caused by contact during an on-track session, and does not include an oval bend manufactured into the header or a manual bend.

A cracked header is defined as one that contains a crack but still maintains its original configuration and specification.

A kinked or cracked header must still pass post-race Technical Inspection.

A kinked header is exempt from the bend area diameters in regulation 7.2.b) in the actual kinked area only, and from regulation 7.2.j) if bent upward.

A cracked header must still be in a condition that will pass all post-race Technical Inspection. If not, the entrant is excluded.

A broken header will pass post-race Technical inspection provided that the entire header/silencer is still attached to the Kart by the support brace and/or the tether, AND the entire exhaust system is in compliance with the Regulation. If the header and silencer are separated and cannot be presented as a complete unit to Technical inspection, the entrant is excluded.

8. HONDA FOUR-CYCLE CAMSHAFT SPECIFICATIONS

8.1. GX-160/K-1, GX-160/T-1, GX-160cc Camshafts

Lobe heights:	Exhaust: 1.085" min. – 1.095" max. Inlet: 1.085" min. - 1.092" max.
Overlap:	009 degrees minimum – 015 degrees maximum
Duration: See Next Table	Exhaust: 225 + * = 231 – 237 degrees Inlet: 003 + ** = 215 – 220 degrees

Lifts shown as 0.000" are for reference only.

LIFT	EXHAUST *	INLET **
0.000 inches	065-070 degrees	288-304 degrees
0.010"	110 - 113	332 - 339
0.020"	135	357
0.050"	151 - 154	012 - 015
0.100"	169 - 172	029 – 031
0.200"	215 - 217	073 - 077
Maximum lift:	0.230" @ 250 - 256 deg.	0.227" @ 105 – 108 deg.
0.200"	286 - 291	135 - 140
0.100"	332 - 336	181 - 184
0.050"	349 - 352	197 - 201
0.020"	006 - 012	212 – 217
0.000 inches	074 - 081	274 - 285

8.2. GX-200, GX-200cc Camshafts

Lobe heights:	Exhaust: 1.085" min. – 1.095" max. Inlet: 1.085" min. - 1.092" max.
Overlap:	21 – 28 degrees
Duration:	240 degrees – 245 degrees

LIFT	EXHAUST	INLET
0.010"	105 - 113 degrees	329 - 340 degrees
0.020"	135	357
0.050"	150 - 157	013 - 019
0.100"	169 - 174	032 - 037
0.200"	215 - 223	080 - 086
Maximum lift:	0.230"	0.225"
0.200"	293 - 298	152 - 158
0.100"	342 - 352	202 - 208
0.050"	000 - 004.5	220 - 226
0.020"	015 - 020	237 - 242

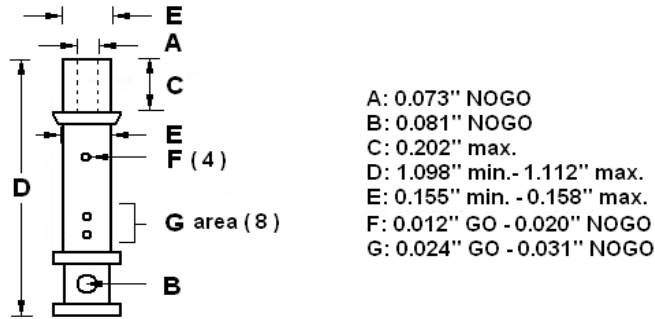
9. HONDA FOUR-CYCLE CARBURETOR AND RESTRICTORS

9.1. Carburetor Modifications

- a) A permissible modification for ALL GX-160/K-1, GX-160/T-1, GX-160cc, GX-200, GX-200cc carburetors is to install an Allen set screw, not any other type of plug, threaded into the outermost portion of the entrance to the main metering air bleed passage. This set screw must be REMOVABLE. It must be drilled longitudinally through its center only with a MINIMUM #57 drill bit (0.042"GO) and must be no longer than 0.510". The main metering air bleed passage must be 0.042" GO in its entirety.
- b) Another permissible modification for ALL GX-160/K-1, GX-160/T-1, GX-160cc, GX-200, GX-200cc engine carburetors is to install an Allen set screw, not any other type of plug, to be threaded into the outer opening of the idle air bleed hole. This set screw must be REMOVABLE. The set screw must be drilled longitudinally through its center only, to a minimum 0.036" GO size and can be no longer than 0.510".

9.2. Emulsion Tubes

The emulsion tube for the GX-160/K-1, GX-160/T-1, GX-160cc, GX-200, GX-200cc has the part number is 16166-ZE1-005. This applies to all Honda engines. The tube may be new or old, must conform to the dimensions listed and must comply with the configuration of a standard, new emulsion tube.



9.3. Honda Inlet Restrictor Plates

Restrictor plates may be required to be purchased from a designated source as listed in the Supplementary Regulations.

An appropriate NOGO tool must not even start to enter the fuel orifice from either side of the restrictor plate.

The restrictor plate must be flat and not have a venturi effect as measured on a flat glass plate.

Restrictor plate must be of steel construction.

The mounting holes must be round and may not be larger than 0.270" on any axis.

The vertical center of the fuel orifice must not be more than 0.010" vertically above or below a line drawn through the middle of the mounting holes.

The horizontal center of the fuel orifice must not be more than 0.010" horizontally beside a line drawn vertically through the centers of the mounting holes.

There are three types of restrictor plates. The type used to be specified in the Supplementary Regulations. The fuel orifices shall be 0.350" NOGO, 0.450 " NOGO or 0.500" NOGO at ANY point(s).

If plated, all plating must remain intact on all surfaces including the fuel orifice and the mounting holes.

The thickness of the restrictor plate shall be 0.055" minimum to 0.065" maximum. All restrictor plates specified for use in a class to have the same thickness.

The restrictor plates may be identified and differentiated by colour and/or label and/or year of manufacture.

The restrictor plate must be used and remain unaltered as received from the manufacturer.

Restrictor plates with fuel orifices that are more than 0.005" undersize should not be used and should be returned for exchange to the seller.

10. HONDA FOUR-CYCLE INSPECTION PROCEDURES

10.1. Carburetors

If the engine is a GX-160/K-1, GX-160/T-1, GX-160cc, GX-200, GX-200cc the inspector should measure the emulsion tube height immediately after removing the carburetor from the engine, as the first part of the inspection procedure. The tube height is measured from the top of the emulsion tube to the upper surface of the carburetor venturi.

For all engines, remove the carburetor bowl. Remove the main jet and the emulsion tube, making sure that the jet was installed tightly. Check the main jet for permitted size using the appropriate NOGO. The NOGO should not even start to go into either end of the jet. The use of glue or epoxy to fasten the emulsion tube to the body is not permitted. The tube must be held into the body of the carburetor by the main jet only. The emulsion tube must conform to the specifications and illustration in these Regulations.

Measure the venturi size, and ensure that it conforms to the appropriate Rule.

Using a GO gauge, measure the size of the main metering air bleed passage. (0.042" GO).

Using a GO gauge, measure the size of the opening of the idle air bleed hole. (0.036" GO).

10.2. Combustion Chamber Volume

Refer to checking procedures in the TECHNICAL INSPECTION PROCEDURES section of the Canadian Karting Regulations Book 2 Technical Regulations.

10.3. Engine Head Technical Inspection

Remove the head from the engine. Measure the head height using a vernier caliper. The measurement is taken from the head gasket surface to the unaltered valve cover surface. For close calls, use a micrometer.

Visually inspect the ports and measure them.

Measure the valve seat diameters and check for seats that are not recessed all the way into the head.

10.4. Measuring Cylinder Length

On GX-160/K-1, GX-160/T-1, GX-160cc blocks a measurement shall be taken between the deck surface and the surface of a 25.00 mm mandrel shaft, minimum diameter of 0.983", inserted through the crankcase bearings.

The side cover must be in place, utilizing the dowel pins and gasket, and bolted tight.

The distance from the deck surface to the mandrel shaft must be a minimum of 4.620". The length may be altered to specification. Surface finish is not subject to Technical Inspection.

10.5. Piston Top

The "dish" of a piston is measured from the top of the piston at the outer edge to the lower central point.

10.6. Valve Springs

a) Dimensions:

The technical linear measurements for valve springs must conform to the given measurements in the appropriate sections of the regulations, according to type.

b) Measuring Valve Springs:

Free length: Measured anywhere between the ends of the spring, with axis of measurement perpendicular to the centerline of the spring, using a vernier or approved tool.

Wire Diameter: Measured anywhere on the round portion of the spring wire using a vernier.

Coil diameter: Measured across the entire spring length at one time with a vernier. If there appears to be a lateral deformity in the spring during the measurement, the measurement will be taken across each individual coil using a vernier, micrometer, or other approved tool.

c) Valve Spring Tension:

Valve spring tension testing shall be done using any equipment deemed suitable by the Technical Inspector. The official ASN tool measures tension converted from "force in inches of water column".

For GX-160/K-1, GX-160/T-1, GX-160cc, GX-200, GX-200cc engines, spring tension, as tested after the event, shall not exceed the maximum allowed parameters when compared to a known, eligible, stock, unused Honda valve spring.

If 42 inches of water column is required to compress a new spring by 0.200" over its normal static compression (as installed in an engine, uncompressed), then the spring in tech must not require more than 38 inches of water column for the same 0.200" of compression (90%).

10.7. Camshaft Inspection

The crankshaft gear may be rotated to change the camshaft timing but the parameters listed in FOUR-CYCLE CAMSHAFT SPECIFICATIONS in these Regulations always stay the same as they are based on a fixed position of the camshaft at a given point (.020", valve UP)

a) Checking An Installed Camshaft:

Attach a dial indicator to the deck surface. Place the dial indicator over the exhaust camlift portion. Attach a degree wheel to the crankshaft loosely.

Position the crankshaft so that the exhaust lobe is UP 0.020", and set the degree wheel pointer at 135 degrees.

Turn the wheel to TDC, the indicator should read 0.000". Read the appropriate lifts.

Switch the dial indicator to the intake camlift portion. Set the lobe UP 0.020" and read. Determine overlap.

With the intake lobe still "UP" at 0.020", change the degree wheel to read 357 degrees and take the intake readings.

All readings should fall within the parameters set up in the FOUR-CYCLE CAMSHAFT SPECIFICATIONS in these Regulations. A variant from allowable specification of more than one degree is allowed only TWICE on each lobe. If one or more of the parameters including overlap, duration, and maximum lift are NOT met. This is a situation where Technical Inspection does not end when an illegality is found, and the camshaft should visually be checked.

b) Checking Rocker Arm Ratio:

Actual valve lift at the retainer with zero lash may be determined using the appropriate tool. All dimensional measurements of any parts in the valve train apparatus must conform to appropriate and comparable OEM standards and measurements. Maximum actual intake valve movement allowed is 0.248".

The maximum actual exhaust valve movement allowed is 0.256".

c) Checking A Removed Camshaft:

If the camshaft is removed from the engine for visual check, lobe height measurements, as found in the FOUR-CYCLE CAMSHAFT SPECIFICATIONS in these Regulations should be measured, as well. No tolerance is given on these measurements.

Camshafts may be further checked for standard lobe base circle, on a centering device, especially if a ramp is on the edge of the specification when checked within the engine.

11. HONDA FOUR-CYCLE REPAIR PROCEDURES

Allowable piston and ring overbore sizes for all eligible Honda GX series engines are: 0.25 mm, 0.50 mm and 0.75 mm either thick or thin ringed.

Lapping of valves, valve re-facing, and grinding are usual repair shop procedures allowed in a normal fashion for all the Honda engines.

The valve seating surface of the seats may be re-ground or cut, but that surface must retain an angle of 45 degrees and be wide enough to be EASILY MEASURABLE. The upper edge of that surface may be machined at an angle of 30 degrees to reduce seat width. The lower edge may be machined at an angle of 60 degrees.

Heads with excessive machining will be considered unacceptable manufacturer's deviations.

Valve guides may be knurled using normal repair shop procedures. Repair or alteration in the area of the cylinder head rocker arm stud threaded bore is not permitted.

12. HONDA ENGINE PAINT MARKING

Exhaust nut to exhaust flange.

Crankcase side cover to crankcase or cover bolt.

Flywheel shroud bolt to shroud (avoid throttle linkage).

One carburetor retainer nut to air filter adapter.

Centered carburetor bowl retainer bolt to bowl on all models (not the drain bolt).

Valve cover bolt to valve cover (one of upper two).

One exposed head bolt to the head.

13. FOUR-CYCLE FUEL REQUIREMENTS - GASOLINE TO BE USED

Four-cycle classes are required to use PREMIUM UNLEADED gasoline with a minimum octane rating of 91 obtained from a specified location for each event. The source shall be stated in the Supplementary Regulations and publicized at registration.