

Waterloo Regional Kart Club

Technical Rules for Honda Engines

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Introduction

The Waterloo Regional Kart Club has allowed Honda engines to compete for over 25 years in all classes. Both the Honda GX 160 and GX 200 engines were sanctioned for competition, and the specifications were outlined in the various iterations of the Waterloo Regional Kart Club Rule Books.

As WRKC has transitioned to Briggs and Stratton engines in some capacity in all classes, it became apparent that the Honda technical rules and specifications should be made supplemental to the primary rule book. Please refer to the WRKC Rule Book, General Competition Rules, Technical Rules, and Procedures, to determine what engines are eligible for each class.

Engine Specifications

1. General Engine Specifications

- 1.1 These specifications are for reference to prevent disqualification. Machining to these specifications is not allowed, unless otherwise stated in this manual, and will result in disqualification. In general, removal of any metal from any engine part in any manner is illegal and will result in disqualification. The cylinder head gasket surface and block deck surfaces are the **ONLY** exception to this rule but must still be within states specs after machining – see sections **Cylinder Block** and **Cylinder Heads**. Any part, hole, shape dimension or measurement not listed in these regulations, whether mentioned specifically or not in this rulebook, is subject to inspection.
- 1.2 ALL engine parts must be standard, unaltered, genuine Honda parts:
 - I. available in Canada through Honda Canada. or
 - II. approved by the WRKC executive a minimum of 30 days prior to use and.
 - III. manufactured for the particular engine unless otherwise stated in this manual.
- 1.3 The 2011 or newer Honda GX160 engines and parts thereof are not permitted to be used.
- 1.4 The 2011 or newer Honda GX200 engines and parts thereof are not permitted to be used.
- 1.5 The Technical Committee will decide the legality of any engine part that does not conform to the specifications stated in this manual. All engine parts will be compared to genuine Honda parts purchased through Honda Canada.
- 1.6 Any repair or damage to the engine block or components must be inspected and approved by the technical inspector before the engine can be used for the competition. This approval must be in writing. This approval must be drawn to the attention of the inspector before post-race inspection on that engine begins.

2. Cylinder Block

- 2.1 ALL engine parts must be standard, unaltered, genuine Honda parts, manufactured for the particular engine, unless otherwise stated in this manual.
- 2.2 **Bore Sizes:**

GX160(K1, T1)	2.677" (68mm) min. – 2.720" (69mm) max.
GX200	2.677" (68mm) min. – 2.720" (69mm) max.

The only standard overbore sizes allowed are: 0.25, 0.50, 0.75mm.
- 2.3 **Fasteners:** Any bolt hole, except ignition, may be rethreaded and/or fitted with a helicoil or thread insert. Any bolt may be replaced with a stud or socket head cap screw.
- 2.4 **Governor Holes:** Holes left by the removal of the governor must be plugged.
- 2.5 **Fuel Impulse Fitting:** Block may be drilled and tapped for one (1) fuel impulse fitting, maximum size being 1/8" pipe thread.

- 2.6 **Fuel Tank Mounting Ears:** May be machined flat.
- 2.7 **Paint:** The cylinder block, head, and side cover must be in “as cast” condition. No painting, coating, anodizing, or any other coating.
- 2.8 **Shroud:** All pieces of the factory supplied stock Honda cooling shroud must be present and properly installed. Shrouds must not be altered in any way to alter the airflow or change appearance, except for chrome plating or painting. Covered fan shroud intakes are allowed only in the pit lane and must be removed prior to entry onto the racing surface. No enclosed recoils may be used.
- 2.9 **Block and Deck:** Block height shall be 4.620” min. as measured between the deck surface and the surface of a 25.0mm (.983” min.) shaft inserted through the crankcase bearings. Side cover, dowel pins and gasket must be used and bolted tight. This measurement is for 5.5 HP engines. There is no tech on this machined surface.
- 2.10 **Cylinder Deck Height (GX200):** 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.

3. Crankshaft and Bearings

- 3.1 **ALL** engine parts must be standard, unaltered, genuine Honda parts, manufactured for the particular engine, unless otherwise stated in this manual.
- 3.2 **Stroke:**

GX160	1.758" min. – 1.776” max.
GX200	2.120” min. – 2.130” max.
- 3.3 **Crankshaft Rod Journal:** 1.174" min. - 1.180" max.
- 3.4 **PTO Shaft:** The power take-off end of the crankshaft may be machined to accommodate the clutch hub.
- 3.5 **Camshaft Gear:** the camshaft drive gear may be rotated to change camshaft timing.
- 3.6 **Main bearings** must remain as a press fit after engine has reached ambient temperature. No locking material may be used as an aid. Main bearings must be standard, unaltered, genuine Honda parts manufactured and listed for the particular model of engine being inspected. The bearing part # must be legible on the bearing surface.

4. Connecting Rod

- 4.1 **ALL** engine parts must be standard, unaltered, genuine Honda parts, manufactured for the particular engine, unless otherwise stated in this manual.
- 4.2 **Rod Length:** 2.350" min. - 2.370" max.
- 4.3 **Rod Big End Bore:** 1.177" min. - 1.184" max.
- 4.4 **Wrist Pin:**
 - Outside diameter: 0.705" min. - 0.712” max.

Inside diameter: 0.557" (14mm+) max.
Length: 2.120" min.

5. Piston and Rings

- 5.1 ALL engine parts must be standard, unaltered, genuine Honda parts, manufactured for the particular engine, unless otherwise stated in this manual.
- 5.2 **Piston:** Re-sizing, knurling or lightening of the piston is not allowed. The use of Teflon, or other material "buttons" is not permitted. Coating the piston with Teflon or other substances is not allowed. The piston must be properly installed, with the indicator mark pointing towards the lifter gallery.
- 5.3 **Piston Length:** Long - 2.102" min. Short - 1.920" min.
- 5.4 **Pistons:** Unaltered stock, flat or dished type Honda pistons, must be used.
- 5.5 **Rings:**
- I. All three piston rings must be used and properly installed.
 - II. Rings must be installed with the identification marks toward the head.
 - III. Ring expanders must not be used under the top two rings.
 - IV. Only Honda factory supplied expanders may be used under the three-piece oil rings.
 - V. Ring tension may not be increased or decreased by heating or other means.
 - VI. Ring gaps may be altered, and any ring gap may be used however the ends of each ring may only be altered in a way that appears in the same known unaltered stock Honda ring for the appropriate type/model Honda engine.
 - VII. The oil control ring (3rd ring) may be of either single or 3 piece design provided that it is a stock GX series ring, appropriate and approved for the type/model of engine used.

6. Camshaft

- 6.1 ALL engine parts must be standard, unaltered, genuine Honda parts, manufactured for the particular engine, unless otherwise stated in this manual.
- 6.2 General rules
- I. No alterations, additions, removal of material, modifications, or machining of any kind are allowed, apart from the removal or partial removal of the governor apparatus.
 - II. Camshaft must be installed properly with the timing marks aligned.
 - III. All camshafts must fall within the profile limit parameters listed below.
 - IV. All measurements are after top dead centre. A variant from allowable specification of more than one degree is allowed only twice on each lobe.
 - V. 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 be visually checked.

6.3 GX160 Camshafts:

Lobe heights:	Exhaust: 1.085" min. – 1.095" max Inlet: 1.085" min. – 1.092" max.	
Overlap:	8 Min – 15 Max	
Duration:	Exhaust: 231 – 237 degrees 225 + * (in table below) Inlet 215 – 220 degrees 003 + ** (in table below)	
LIFT	EXHAUST *	INLET **
0.000"	065-070	288-304
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
Max 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	074 - 081	274 - 285

6.4 GX200 Camshafts:

Lobe heights:	Exhaust: 1.085" min. – 1.095" max. Inlet: 1.085" min. – 1.092" max.	
Overlap:	21 Min – 28 Max	
Duration:	240 – 245 degrees	
LIFT	EXHAUST *	INLET **
0.010"	105 - 113	329 - 340
0.020"	135	357
0.050"	150 - 157	013 - 019
0.100"	169 - 174	032 - 037
0.200"	215 - 223	080 - 086
Max 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

7.

Cylinder Heads

- 7.1 Port Machining: Certain cylinder heads are slightly machined at the outside edge of the ports and/or in the valve guide area for flash removal. Heads with excessive machining will be considered unacceptable manufacturer's deviations. Decision on legality by the technical inspector is final!

NOTE: GX160 engine must use a GX160 cylinder head.

Port diameters	K-1 / T-1
Intake	0.920" max.
Exhaust	0.870" max.

- 7.2 **Thickness:** Thickness as measured from machined head gasket surface to factory machined valve cover gasket surface:
- I. All other, GX160(K-1, T-1), GX200 2.880" min.
 - II. There is no tech on this machined surface.

8. Combustion Chamber Volume

Engine	Head	Minimum volume
GX160	Any pre 2011	21.00 cc
GX200	Old style- ZLO #1,2,3,4	29.00 cc
	New style- ZOV or other pre 2011	28.00 cc

9. Valve Seats

- 9.1 The valve-seating surface of the seats may be re-ground or cut, but that surface must remain at an angle of 45 degrees.
- 9.2 The upper edge of that surface may be machined at an angle of 30 degrees; the lower edge may be machined to an angle to 60 degrees to reduce seat width.

Valve Seat diameters	GX200 / GX160 / K-1
Intake	0.910" max.
Exhaust	0.872" max.

10. Valves and Valve Springs

- 10.1 **Valves:** Stock GX160 (K-1, T-1), GX200 valves must be used. Stellite exhaust valves #14721-ZH8-810 are allowed.
- 10.2 **Valves must not be altered,** polished, lightened, welded, brazed or machined in any way except as allowed in valve refacing.

- 10.3 **Valve Refacing:** Refacing of valves and lapping of valves is allowed. The stock 45-degree angle must be retained.
- 10.4 **Valve Keepers:** Only stock valve keepers may be used. The keepers may not be altered or modified in any way, and they must be properly installed.
- 10.5 **Valve Springs:** Only stock, unaltered Honda valve springs are allowed. The correct valve spring part number to be used is 14751-883-000 available through Honda Canada. When sourced through Honda Canada the label and package will state “Made in JAPAN”.

Warning: There are other springs in Honda packaging with the same part number that are entering Canada through different suppliers and look very similar, except that the package will state: “Made in THAILAND”. These springs are not available through Honda Canada and are therefore illegal.

- 10.6 **Valve springs** may not be heated and/or stretched in any way. Shimming of valve springs is not allowed. The technical measurements for ALL Honda valve springs must meet either Spec A or Spec B below:

Spec A	Minimum	Maximum
Wire Diameter	.075”	.081”
Coil Diameter	.790”	.820”
Post race free Length		1.455”
Spec B	Minimum	Maximum
Wire Diameter	.068”	.073”
Coil Diameter	.775”	.790”
Post race free Length		1.450”

- 10.7 **Valve Spring Tension** shall be no more than 94% of a new spec A or spec B valve spring (i.e. if a new spring requires 10.25 psig to compress it an additional .200" over static compressed length, then the spring in tech must not require more than 9.7 psig)

- 10.8 **Valve Guides:** The stock Honda valve guides may be knurled.

- 10.9 **Valve Stem Oil Seal:** must be removed.

- 10.10 **Valve Lifters**

Engine		Minimum	Maximum
GX160	Height	1.165”	1.210”

GX200	Height	1.355''	1.370''
	Base width	0.935''	0.945''
	Base thickness	0.073''	0.083''

11.

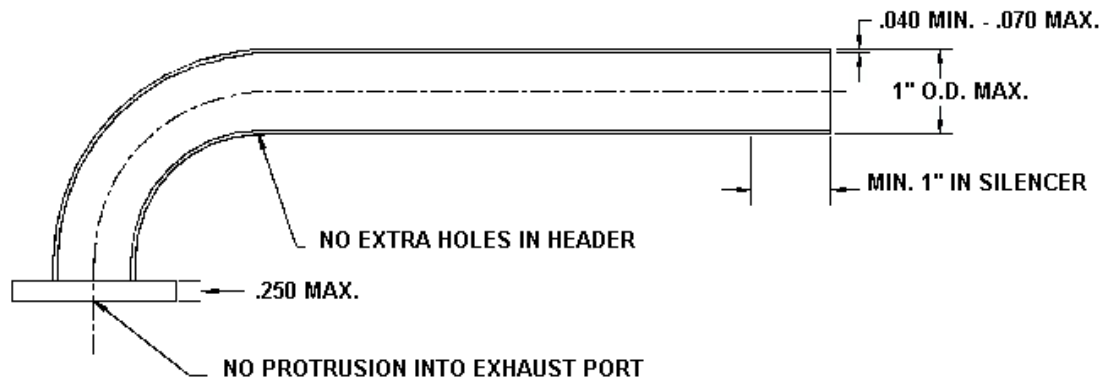
Muffler

- 11.1 **Muffler:** Muffler must be stock, unaltered part. All baffles must be intact. Exhaust gases from the engine may only exit through the outlet opening of the muffler and the OEM sized, unaltered drain slot.
- 11.2 **Heat Shield:** Heat shield bolt holes may not be left open. The muffler must have the muffler shield installed, either screwed or bolted on in an approved safe manner.
- 11.3 **Bracket:** Optional muffler bracket hole must be closed by using a fastener to fill the holes. A brace may be fastened to the muffler and then supported from the engine to eliminate breakage. This must be done in an approved fashion to eliminate a performance gain. The Technical Committee reserves the right to disqualify a muffler if it is deemed to have excessive welding.
- 11.4 **Welding:** No welding of any form is allowed on the muffler except for up to 3 small spot welds to hold the plug in the muffler.
- 11.5 **Mounting:** Muffler mounting nuts must be tight, and the gasket properly installed, such that the exhaust gases do not leak. Similarly, the muffler base flange must be flat. Leakage is acceptable from $\frac{1}{4}$ or less of the circumference of the centre orifice of the intact, unaltered, stock exhaust gasket.
- 11.6 **Inserts:** Exhaust port inserts may not be used.
- 11.7 **The legal standard mufflers are:**
- #18310-ZE1-010
 - #183A1-ZE1-811

12. Header and Silencer

12.1 Header:

- I. Length: 8.0" - 12.0" (with silencer removed).
- II. Header tube must have a constant diameter of .925" min. – 1.005" max., except in the bend area the diameter will be .900" min. – 1.050" max.
- III. Header tube must be installed a minimum of 1.0" inside the silencer.
- IV. Header tube must point rearward as installed
- V. Tubing wall thickness must be .040" min. - .070" max.
- VI. Port matching is allowed.
- VII. Maximum header flange thickness is .255"
- VIII. Header must also have an additional approved bracket to secure the header to the motor.
- IX. External welding of a bracket or tab to the header or silencer is permitted.
- X. It is also permitted, to weld a washer onto the header at a distance of 1" or greater from the end of the header to permit safety wiring of the silencer.



NOTE: A header that is broken, kinked or cracked in the tubing may be replaced at any time during the event under the supervision of a Technical Official. A header damaged during the event may pass post race inspection and the competitor will not be penalized, assuming the broken header/silencer remains attached to the kart (safety wire, bracket, etc). Any header/silencer not attached to the kart cannot be inspected by a technical official, resulting in exclusion from the event.

12.2 **Silencer:** Must use an unaltered RLV B-91 silencer and, when installed, must not exceed a height of 20" off the ground. All baffles must be stock, and in place. A minimum of 1" of the header must be inside the silencer at all times.

NOTE: Specified silencer must be installed on header pipe in such a manner as to prevent exhaust discharge from being diverted to any point except the unmodified discharge of the silencer. Any obvious attempt by the competitor to install the silencer so exhaust gases will be diverted from the designed discharge point will be cause for disqualification from the heat.

12.3 Coating of the header tube is allowed. RLV silencer may NOT be coated.

12.4 Heat protective wrapping of the header pipe and silencer is permitted and encouraged. Wrapping must be securely fastened to prevent loss during an event.

13. Carburetor and Fuel System

13.1 **Primary Jet:** A stock Honda main jet must be used. The jet may be drilled but must conform to the appropriate NOGO size. The jet must be tight.

GX160/K-1/T-1: 0.031" NOGO.

GX200: 0.035" NOGO

13.2 **Idle Control Jet:** The idle control jet may be drilled to any size.

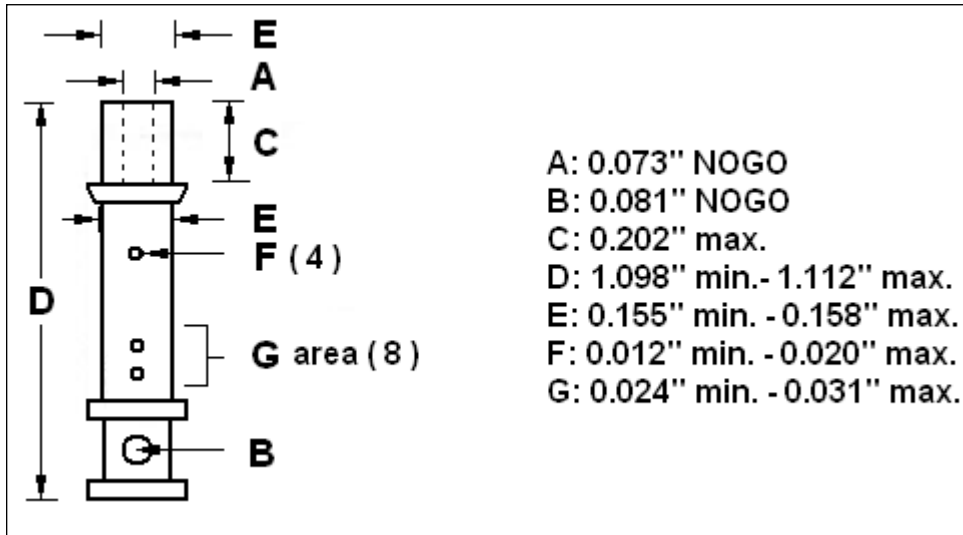
13.3 **Throttle Butterfly:** The throttle butterfly & screw must remain stock. The portion of the throttle shaft within any part of the body of the carburetor conform to the measurements of a stock unaltered shaft for the appropriate engine. The throttle plate retaining screw may be replaced by a fuel 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.

13.4 **Choke Assembly:** The choke assembly must remain completely intact and stock.

13.5 **Emulsion Tube:** The stock Honda emulsions tube, part number 16166-ZE1-005 must be used in all classes. Emulsion tube height measures the installed height of the tube in an unmodified venturi.

13.6 **Emulsion Tube Height:**

GX160(K-1, T-1)	0.408" GO, 0.432" NOGO
GX200:	0.436" GO, 0.462" NO GO



13.7 **Venturi Size:** The venturi must remain stock

GX160(K-1, T-1)	0.525" NOGO, 0.515" GO
GX200	0.575" NOGO

13.8 **California carburetors:** All rules regarding modifications to California emissions carburetors for GX160/K1/T1, GX200 motors will apply.

NOTE: The Carburetor may be modified for use with any permitted Honda engine as follows:

- I. Install an Allen set screw, not any other type of plug, to be threaded into the outer opening of the main metering air bleed hole. This set screw must be removable. It must be drilled longitudinally through its centre only, with a minimum #57 drill bit (.042" GO). The main metering air bleed hole must be .042" minimum. (.042" GO)
- II. Install an Allen set screw, maximum length 0.510", into the idle air bleed hole. It must be drilled longitudinally through its centre only and may be drilled to a minimum 0.036" (.036" GO).

13.9 **Air Filter and Adapters:** Stock Honda air filters and or adapters may not be modified to become air scoops or velocity stacks. The stock Honda air filter and adapter may be replaced with any aftermarket air filter and adapter that conforms to the following specifications:

- I. All aftermarket air filter adapters must be of one-piece design, and manufactured from billet, cast or molded material.
- II. No welding is allowed anywhere on the adapter.

- III. 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.
- IV. No portion of the adapter may extend beyond the face of the flanged mounting portion into the carburetor opening. The flanged mounting surface must be flat.
- V. The centerline of the adapter and the filter shall be perpendicular to the mounting face in its entirety.
- VI. The only holes allowed are the two mounting holes and the central normal airflow hole.
- VII. The maximum length of any aftermarket air filter adapter is 2.310”.
- VIII. 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 and must be installed properly.
- IX. The filter may not be used as a tract lengthener, air flow diffuser, or air flow director, and must be approved by the Technical Inspector.
- X. Air filters shall have a maximum length of 7” and width of 4”. Maximum length of rubber flanged area is 2” Air filters must be straight.

13.10 Carburetor and air filter assembly must be attached using a standard nut.

Use of prevailing torque nuts i.e. nyloc etc. are not permitted.

13.11 **Phenolic Spacer:** Stock, except the fuel line guide may be trimmed to facilitate inspection.

I. A GX160 spacer must be used on a GX160.

II. A GX200 may use either spacer (GX160 or GX200).

13.12 **Restrictor Plate:** Restrictors must conform to WRKC specifications. Restrictors are issued by the WRKC. The current restrictor is black anodized. The \$15.00 cost is non-refundable. No modifications are allowed unless approved by the technical committee. If you are not sure whether your restrictor plate is legal have it checked by the Technical Committee. Just because a restrictor plate passes the go/no go test doesn’t mean it is legal.

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

II. The restrictor plate shall be flat, as measured on a glass plate.

III. Restrictor plate must be of steel construction.

IV. Restrictor plate is to be placed between the engine block and the phenolic spacer with an intake gasket on each side of the plate.

V. Restrictor plate must be installed properly.

VI. Mounting holes must be round and may not be larger than 0.270” on any axis.

VII. The thickness of the restrictor plate shall be 0.055” min. - .065” max.

a) Cadet 0.350" NOGO

b) Novice 0.500” NOGO

14. Ignition

14.1 **Flywheel:** stock unaltered Flywheel must be used.

14.2 **Flywheel Key:** The flywheel key may be offset by filing, grinding, or machining to obtain the desired ignition timing. Aftermarket key is permitted.

14.3 **Cooling Fan:** Stock unaltered Fan must be used. Only PT#19511-ZE1-000 will be permitted. All

nylon blades must be intact.

14.4 Enlargement of coil mounting holes and/or resizing of mounting bolt diameter is not permitted.

14.5 Spark Plug

- I. The spark plug may be of any manufacturer
- II. Spark plug is to be standard reach ¾” plug
- III. Measurement from seat of the spark plug, not including gasket, to the end of the 14mm threaded area, to be .770” maximum.
- IV. Ground electrode extending past the last thread will be single-wire side electrode type. No multiple electrodes or full circumference ground electrodes will be permitted. This rule is to eliminate the intent to defeat the CC rule, by displacing more combustion space with the spark plug.
- V. A plug gasket must be used unless the engine is equipped with a temperature gauge sensor installed in place of the gasket.
- VI. Different thickness gaskets may be used to index (position) the spark plug in its hole.
- VII. The gasket/sensor must be greater than .003” thick.

14.6 **Ignition Switch:** 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.

15. Engine Gaskets

15.1 **Induction Gaskets:** Must remain stock (2 carburetor gaskets).

15.2 **Side Cover Gasket:** Must be stock appearing.

15.3 **Exhaust Gasket:** Must be stock appearing with a max. 0.125” thickness.

15.4 **Carburetor Bowl Gaskets:** Must be stock appearing.

15.5 **Head Gasket:** Any thickness of head gasket may be used.

15.6 **Valve Cover Gasket:** The stock Honda valve cover gasket may be replaced with any gasket of the same basic shape as the stock Honda gasket.

15.7 **Air Filter Adapter Gasket:** 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.

16. Miscellaneous

16.1 Unaltered bolt-on aftermarket recoil and starter cup of similar appearance must be entirely in place on all Honda engines, and must be the only method of starting the engine.

16.2 **Governor:** The governor apparatus may be removed from the engine, and any holes caused by this removal must be plugged.

Technical Inspection Procedures

17. Camshaft

17.1 Measuring procedures

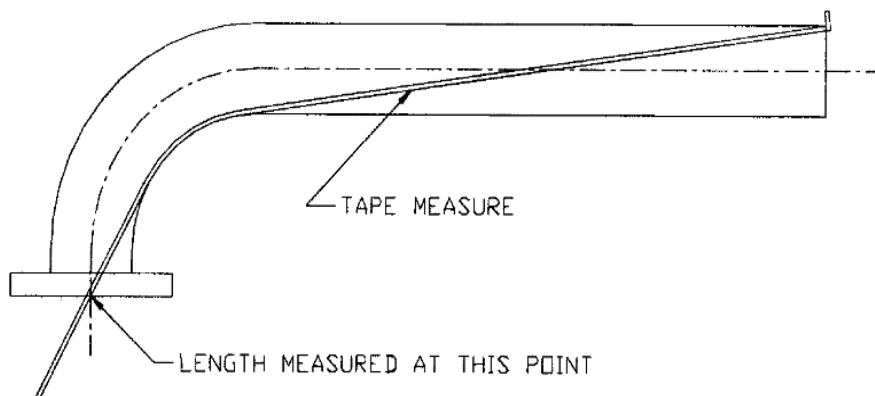
- I. With head removed, attach dial indicator holder to block.
- II. Place the dial indicator over the exhaust lobe.
- III. Position the crankshaft so that the exhaust lobe is up 0.020" and set the degree wheel pointer at 135 degrees.
- IV. Turn the wheel to TDC. Read the appropriate lifts.
- V. Switch the dial indicator to the intake lobe, set the lobe up 0.020", and read. This is done to determine overlap.
- VI. Change the degree wheel to read 357 degrees, and take the intake readings.
- VII. A variant from allowable specifications of more than one degree is allowed only twice on each lobe.
- VIII. 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, and the camshaft should be visually checked.
- IX. Camshafts may be further checked using a lobe base circle, on a centering device, especially if a ramp is on the edge of the specification.

17.2 Checking rocker arm ratio:

- I. Actual valve lift at the retainer with zero lash may be determined using the appropriate tool.
- II. Maximum valve movement must be:
 - 0.248" or less on the Intake valve
 - 0.256" or less on the Exhaust valve.

18. Header / Silencer

18.1 Header length is to be measured as shown in diagram.



18.2 RLV B-91 silencer internal baffle holes are to be checked with a .1285" NOGO.

19. Combustion Chamber

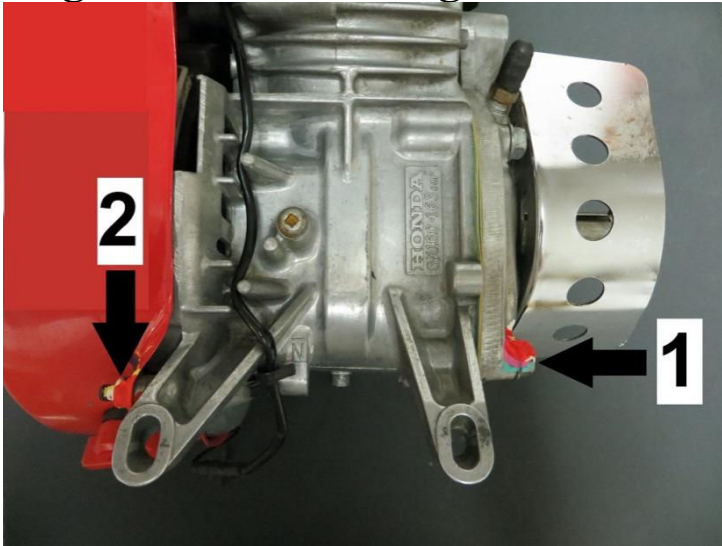
19.1 Measuring Combustion Chamber Volume: Mastercraft Dextron 3 transmission fluid is the only liquid acceptable for this test. Conduct the test only after the engine has cooled to approaching ambient temperature. No cleaning of the head or piston is allowed. The test must be performed with a graduated Grade A, GLASS burette and stopcock.

- I. Remove the spark plug.
- II. Remove pushrods.
- III. Place the engine in a position such that the machined top surface of the spark plug hole is level on both horizontal axes.
- IV. If an approved Technical spark plug adapter is NOT used for the measurement the technical inspector should ensure that the spark plug thread in the head is STOCK and unaltered, with all threads present and no extra chamfer. If a thread-saving device is used it must be installed so that at its upper end there is no volume gain over a stock thread.
- V. If an approved Technical spark plug adapter is used, the checks in “a)” may be omitted for measurement purposes but are still relevant for determination of non-stock, out of specification, machining, etc.
- VI. The machined spark plug seal surface and/or adapter top surface should be relatively clean and dry.
- VII. Fill the burette with transmission fluid to approximately 0.5 cc above the “0” mark, carefully minimizing the amount of air bubbles formed during the filling process.
- VIII. Bleed all air from the stopcock and outlet stem. Run fluid from the burette until the top of the meniscus curve is on the “0” mark. Residual fluid remaining on the tip of the outlet stem should be removed.

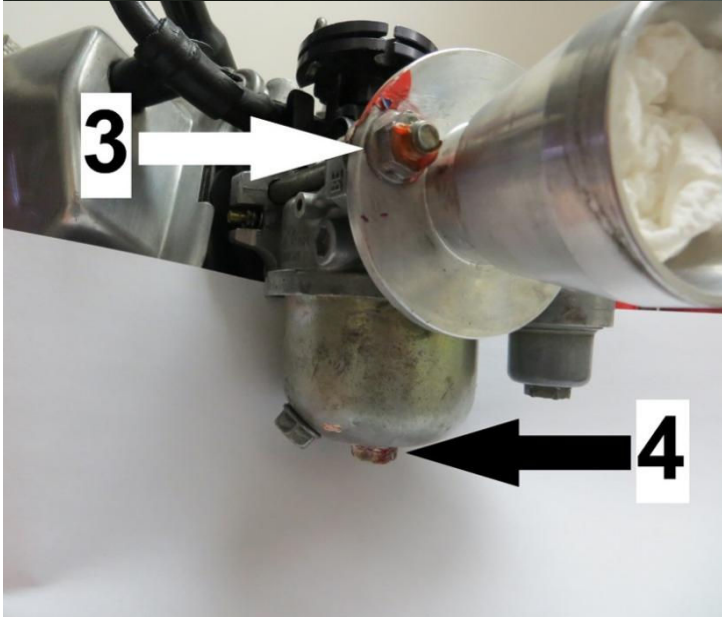
NOTE: The reason for using the top of the curve is that any lateral variation in the handling of the burette can be corrected instantly as the same reading must be obtained on the left and right side of the mark. A variation in the burette front to back also has less influence on the sighted level when using the top rather than using the bottom of the curve which can change considerably.

- IX. Turn the crankshaft in its normal rotation so that the piston is approaching TDC (approx. 15 degrees or 1 mm) BTDC or ATDC.
- X. Dispense the specified amount of fluid except for approximately 1 cc through the spark plug hole or adapter into the combustion chamber. The inspector should rock the engine slightly on both axes to allow any trapped air to escape.
- XI. Wait approximately 30 seconds after the addition for the fluid level in the burette to stabilize.
- XII. Dispense the remainder of the required amount of fluid into the spark plug opening or adapter. Any residual fluid remaining on the outlet stem should be added to the fluid dispensed.
- XIII. Slowly turn the crankshaft back and forth over TDC to determine the highest level for the fluid.
- XIV. When using the spark plug land as the determining level, if any fluid rises above the level of the top of the spark plug thread hole, the engine is not within specification.
- XV. When using the adapter as the determining level, if any fluid rises above the level of the top of the adapter, the engine is not within specification.

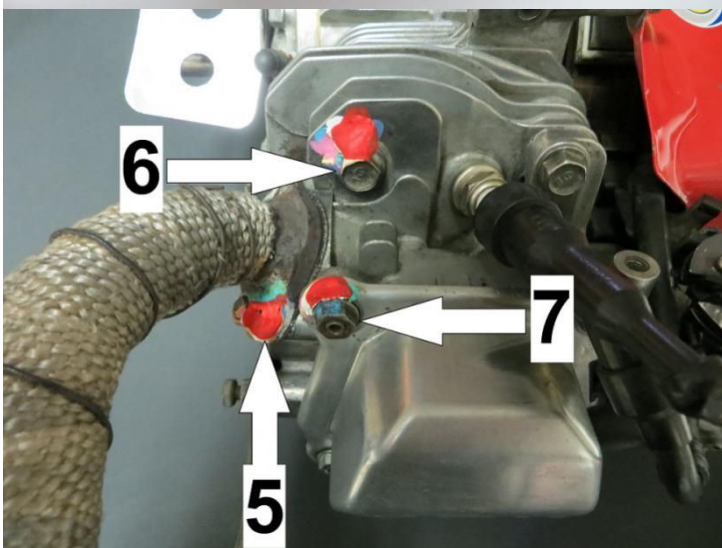
Engine Paint Marking – Honda



- 1) Crankcase side cover to crankcase side cover nut
- 2) Flywheel shroud bolt to shroud



- 3) Carburetor retainer nut to air filter adaptor
- 4) Carburetor float bowl retainer nut to bowl



- 5) Exhaust nut to exhaust flange
- 6) One exposed head bolt to head
- 7) Valve cover bolt to valve cover