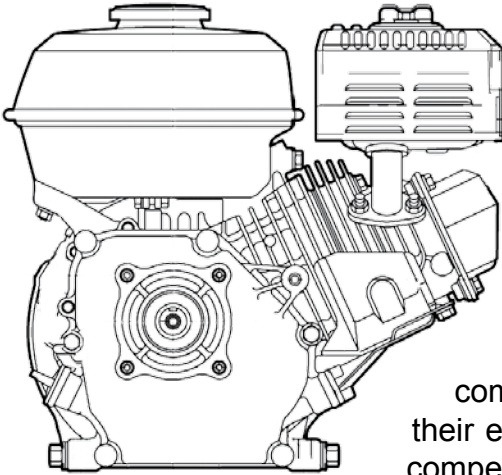


# Honda GX 160 Technical Regulations



## 1. GENERAL

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 competitors have gone out of their way to source alternative parts, their engines should automatically comply with this rule. Furthermore, competitors should note that the term "standard" refers not only to the components used but also to the number used, their position and

function 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 and 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. The fasteners on the engines may be drilled for the purposes of lock wiring, as can drain and filling plugs. 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, or alter the position of the original fixing. Engine measurements must be taken with the engine in a "just-raced" condition, i.e. with no removal of carbon residue or in any other way altered from the condition in which it was last used.

## 2. DEFINITIONS

### 2a. 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 (except as noted in these regulations). It will be of the same, original material. Where appropriate, it should have the manufacturer's original manufacturing process or machining marks on it. It is the component defined as being applicable to the particular engine type. If it does not say you can do it, you cannot do it.

### 2b. Engine types

The original QHQ4 engine, to engine number 7664037, was known as the K engine. The QHQ4 engine from engine number 7664037 onwards was known as the E engine. The QHQ4 engine with suffix T, from engine number 1000000 onwards was known as the T engine. That also included all unified specification engines (GX160UT1 QHQ4 and QHG4). GX160UT2 QHQ4 and GX160RT2-QHG4 engines (T2) All these engine types are eligible (when supplied through HME-L European Engine Centre), with exceptions as notified in the following document.

These regulations relate specifically to the T2 engine, references to all previous engine types have been withdrawn. Previous engine types are subject to the regulations V11a of May 2016.

### 2c. 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. (<http://www.honda-engines-eu.com/en/welcome.html>)

shaded area denotes text amended from previous version

## COMPONENT BY COMPONENT

### 3. The fuel tank

It is strongly urged that the engine's integral fuel tank be removed. If this is done then the engine must be fitted with a suitable cover. A standard centrally-mounted fuel tank should then be used unmodified, and this tank and its mounting must be in accordance with manufacturer's instructions. The capacity of this tank must not exceed 7.5 litres, when used for endurance events. Ballast may be added to the tank in order to maintain the maximum capacity. In this instance the kart may be fitted with a pulsed fuel pump(s), which will take a vacuum feed from either the governor rod hole or one drilled in the inlet manifold, tapped to accept a vacuum fitting. Fuel pipes must take a direct route to the carburettor and be safely secured. An extra loop of fuel pipe may be used as a return feed to the tank. One in-line fuel filter of nominal capacity per engine may be fitted, the dimensions of which do not exceed circumference of 10cms and a length (excluding stubs) of 5cms.

### 4. Exhaust

For Honda Cadet the only exhaust permitted is the DEP001. The use of the upgraded item of July 2016 is mandatory, together with the DEP-supplied tether secured to the flange mounting stud. When using this exhaust it is recommended that a captive nut type of fixing be used to



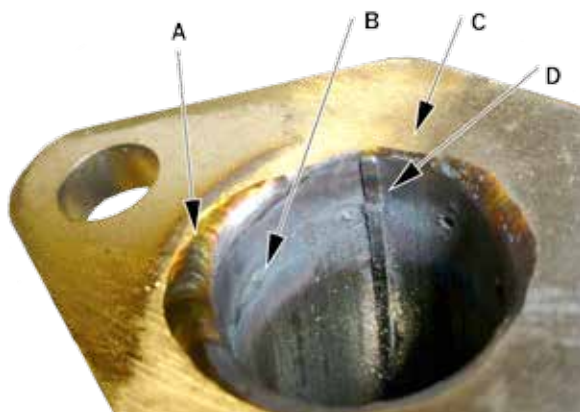
secure the exhaust. The use of the additional support bracket and vibration washer is not mandatory but is advised, and non-use of this bracket will invalidate any manufacturer's warranty. No attempt should be made to alter the appearance of the exhaust unit, it must have the same textures and manufacturing marks on it as originally supplied. The flange plate must be a minimum of 4.5mm at all points. The heat shield is an integral part of the exhaust and must be in place at all times.

With this exhaust only, sealant may be used with a single gasket, or alternatively two gaskets without sealant.

For Honda Senior, the standard exhaust must be used but a unit modified and sealed by an *Agent* may also be used. In this case, the unit will bear a seal applied by an *Agent* and it is the competitor's responsibility to ensure this seal is in place at all times. At any time the modified unit on the engine can be exchanged with one held by the scrutineer, who will then send the competitor's exhaust back to an *Agent* for inspection. If this unit is found to have been tampered with in any way, then the competitor will be penalised retrospectively. No other repair or modification is allowed. Exhaust, Part No 18310-ZH7-V90 or 18310-Z4M-010 can also be used, and modified as above.

The *Agents* currently are: Focus Racing (0178 737 6655) and 7Kart (0192 083 1000)

The heat shield should be in place at all times. Where the original fixings have failed, they can be replaced with a rivet-type thread repair, which can alternatively be welded, in original position.



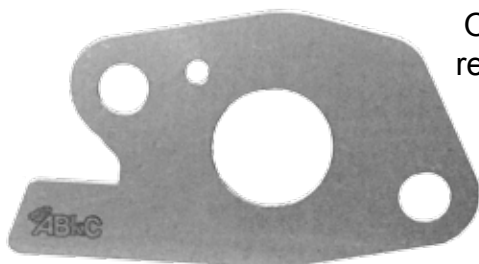
The rippled weld (A) should be clearly visible around the complete inside of the flange, and only be violated or interrupted where linishing has taken place across the flange plate (C). Outer weld penetration (B) should also be visible. The inner seam of the exhaust tube (D) should be visible, original and undamaged.

The ABkC identification tag should be complete, undamaged and in place across the end cap seam weld.



## 5. Carburettor

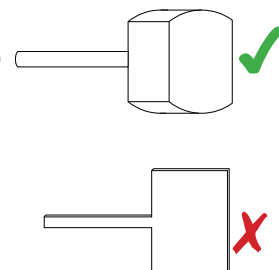
The T2 carburettor must be standard and unmodified. Overall length (manifold face to airbox face) is 53.9mm min and the bore go / no go gauge is 13.2mm / 13.3mm (see note 1). Pilot jet size marked 35 and not exceeding 0.35mm only, the mixture screw tang can be removed. When used as a Cadet or Junior engine, only the official ABkC restrictor plate (which may be de burred) must be fitted between the carburettor and insulator with a gasket on either side and have an opening of no more than 16mm diameter. This size may be altered during the year (see notes page 8). A 2mm hole may be drilled in the tag on the restrictor for the purpose of affixing an official seal. This restrictor is not permitted in Senior engines.



Official ABkC restrictor plate

### Note 1

In some carbs the bore is cast, (and in others machined), and therefore can be a little out of true. If measuring this bore, it is safest to use a semi circular gauge, rather than a flat plate gauge.



PN 16166-ZH8-W50

PN 16166-ZH8-810

PN 16166-Z4M-922

## 6. Permitted main jets

size 65 (PN 99101-ZK7-0650)

size 68 (PN 99101-ZK7-0680)

size 70 (PN 99101-ZK7-0700)

size 72 (PN 99101-ZK7-0720)

(jets may be brass or silver in colour)

It is permitted to drill or ream these jets to improve their accuracy.

Emulsion tube must be either part number 16166-ZH8-W50, 16166-ZH-810 or 16166-Z4M-922 (see drawing 1 in Appendix 1). The throttle-actuating arm can be modified to accept an actuating rod onto the throttle butterfly, and a method of mounting a throttle actuating cable. Further a method of mounting a throttle return spring only.

## 7. Carburettor air box

Must be standard and unmodified. The additional silencer, part number 17235-ZE1-831 may be used.

## 8. Air filter

The original air filter, if used, can have its paper and or foam element removed. Alternatively it can be omitted completely or be substituted for another filter. In any case, the plastic outer cover must remain as standard, unmodified and securely fixed in its original position.

## 9. Spark plugs

Must be standard and unmodified from the following list only, no other can be used. Electrode gap measurement is free. However, the electrode should still conform in shape and relative position to an original item by way of comparison. The standard Honda resistor spark plug cap must be used where a non-resistor spark plug is used, otherwise plug cap is free.

### Permitted spark plugs

NGK	BPR6ES	BP6ES	BP5ES	BPR5ES
Nippondenso	W20EP-U	W20EPR-U	W16EP-U	W16EPR-U

## 10. Bodywork / ducting

All of the engine bodywork and ducting must be standard and unmodified except for the drilling of a small hole to accept one end of a throttle return spring or security fixing. The pull-cord mechanism must be standard and unmodified, although the pull-cord starter may be rotated on its standard mounting holes. The on/off switch must be fitted and be capable of stopping the engine when operated as intended. A shroud may be attached to the casing to protect the switch, if required. All or any of the bodywork / ducting can be painted or chromed.

## 11. Rocker cover

Rocker cover must be standard and 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, it must be securely fixed in both the rocker cover and the outlet of the airbox, and have no perforations or leakage points.

## 12. Valve Gear

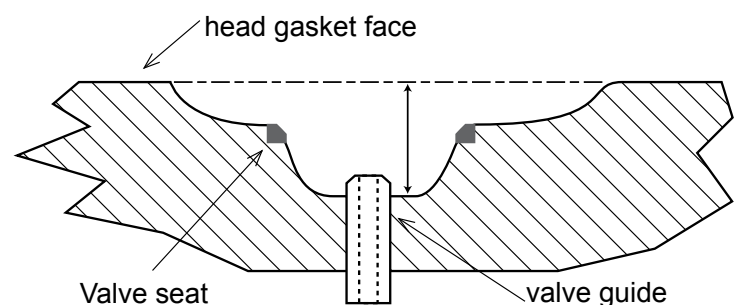
The valve rocker studs must be standard and unmodified. The valve spring used must offer no mechanical advantage over a standard GX140 valve spring (PN14751-ZE1-000) i.e. a force of 5 kg will compress the spring to less than 25mm overall length, or a spring which offers no mechanical advantage over a standard QHG4 spring (PN 14751-ZH8-9400) i.e. a force of 8 kg will compress the spring to less than 18.5mm overall length. Valve rockers, cam followers and pushrods must be standard and unmodified.

## 13. Valves

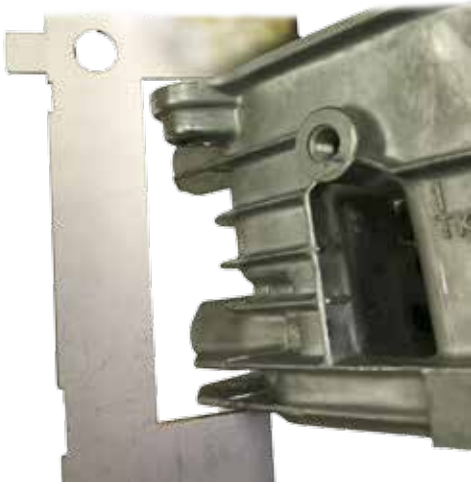
Valves will be standard and unmodified. Valve-seat grinding and cutting is allowed, to the single standard profile only (45°) but with upper and lower restorative cuts allowed, a maximum of three angles in total.

## 14. Cylinder head

Will be standard and unmodified with a minimum measurement of 73.80mm from the rocker cover gasket face to the cylinder head gasket face. The ABkC CPO gauge can be used to check this. Ports must be standard and 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 between the cylinder head gasket face and the land surrounding the valve guide. The ABkC Inlet/Exhaust gauge can be used to check this. The ABkC Head gauge is used to check the distance between the cylinder head face and the land between the valves, which must be a minimum of 6.6mm. The ABkC spark plug insert must be used to check plug depth. A standard volume check can be carried out, in which case you would expect to read a minimum of 21.2cc. If this value is not obtained then a full inspection would be needed using the gauges and measuring methods to decide the eligibility of the engine. The head gasket face may be machined, but the



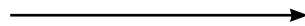
cylinder head must at all times comply with all of the gauges and dimensions.



When placing the CPO gauge over the rocker cover face, the lower lip must not engage over the cylinder mating face



With the lug sitting above the land between the valves, this gauge must sit flush on the cylinder head face.



The spark plug insert must show a clearance to the CPO gauge, which must be flush on the cylinder face



With the lug sitting on the land around the valve guide, the Inlet/Exhaust gauge must NOT sit flush on the cylinder head face, but rock



15. Head gasket

Must be standard and unmodified and will at all times have a minimum thickness at all points of minimum 0.20mm.

16. Piston

Piston rings will be standard and unmodified. Only standard size rings, (marked 1R, R, T, 1T, NT, 1N/T or N on top ring) can be used. The rings must always be free in their grooves and function as designed. All dimensions on the piston must comply with the ABkC piston gauge.

At both sides, this gauge must NOT fit over ends of piston skirt



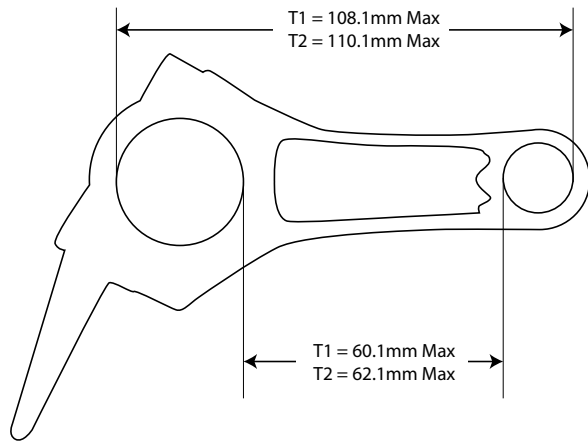
At both sides, this point must sit outside of piston skirt



This lip must NOT engage over end of piston skirt

## 17. Connecting Rod

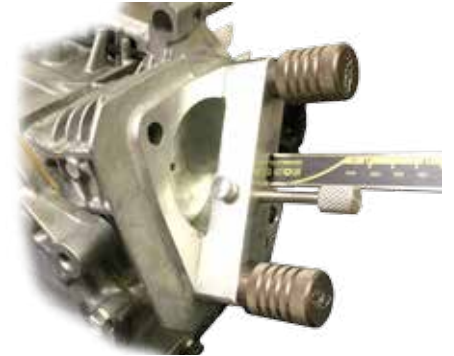
The connecting rod must remain standard and unmodified.



Connecting rod maximum dimensions

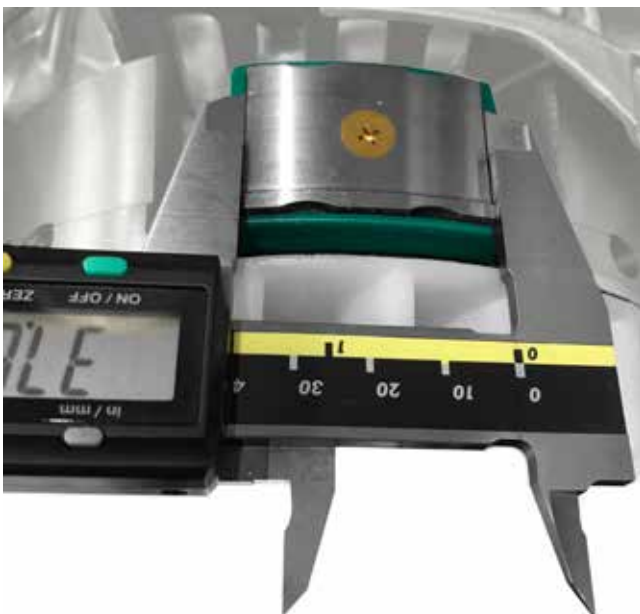
## 18. Crankshaft

The governor gear on the T2 crankshaft can be removed. The position of the cam gear wheel is free. The standard key must be used, but may be modified in accordance with item 19. In all instances, the final stroke must not exceed 45.08mm. This measurement should be taken after the crankshaft has been rotated two complete revolutions in a forward direction. In this instance no pressure may be applied to the piston. The bridge tool can be used to determine deck height and stroke.



## 19. Flywheel

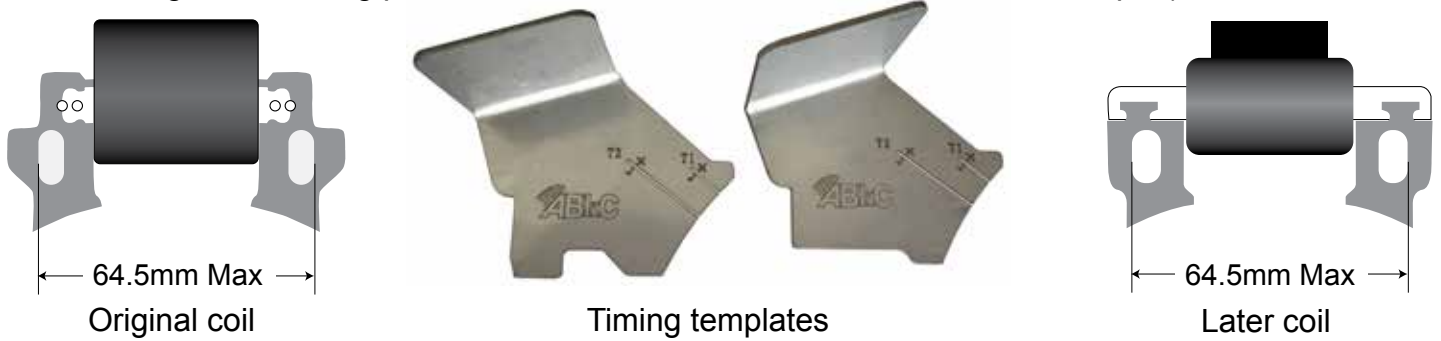
The flywheel must be standard and unmodified and have a weight of between 2.2 - 2.5 kgs. The key may be reduced in width or otherwise modified, but not omitted. The ignition timing must be set/checked in the following manner. Remove spark plug and rotate engine in its forward direction of travel a minimum of two complete crankshaft revolutions, before inserting the ABkC - marked piston stop in the spark plug hole. Rotate the engine against its natural travel direction until the piston meets the stop. Zero your digital rotary meter (or any suitable protractor). Rotate the engine forward until it meets the piston stop once more. Note that reading. Subtract that reading from 360 and bisect the remainder. Release the piston stop and continue to



advance the flywheel in the forward direction by that amount. At this point, measure the ignition timing, using the correct ABkC-marked template tool in place (type 1 shown). The edge of the magnet must not intrude into the split marking the go (✓) and no-go (✗) area of the template (for the particular engine type). If in doubt, a 0.2mm feeler gauge inserted into the split should have its edge resting on the magnet mounting. If it rests on the magnet, it is non-compliant. If using the bridge tool, set your piston stop depth to 25mm from the deck face. In this instance no pressure may be applied to the piston. The ABkC-marked location tool can be used to assist with the setting. The standard and unmodified fan must be used, with all fins in place. The flywheel magnet can be reduced to a minimum chord dimension of 37mm, measured as in the accompanying photograph.

## 20. Ignition coil

The ignition coil (including ignition lead) will be the standard and unmodified unit. Either original or later type coil can be used. The coil mounting bolts must be standard and unmodified and use the original mounting positions (see also section 23 concerning welded repair).



## 21. Camshaft

The standard and unmodified camshaft must be used, the service limit is 27.45mm for both lobes. The cam is easily inspected using the ABkC cam inspection tool, which will not fit any other cam type. All three segments of the cam check gauge must fit symmetrically and the alignment marks be within range of guide marks.

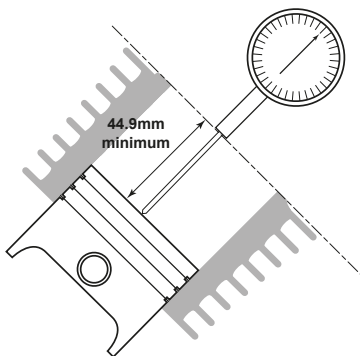


## 22. Push rods

The push rods must be the standard and unmodified units.  
Pushrod length 133.6mm ± 0.5mm.

## 23. Crankcase

The crankcase can only be modified by the removal of the governor mechanism and in all other respects must be standard and unmodified. If completely removed, the hole in the crankcase must be sealed to prevent oil leakage (unless a suitable pulse take-off is used in its place). The crankcase bearings and seals must be standard and 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 may be machined to achieve a minimum deck height of 44.9mm (read between the cylinder mating face and the cast face of the piston, in line with the piston pin, with the piston at BDC. It is permitted to push down on the piston, centrally, before taking this measurement). The ABkC block tool may be used to check this dimension. Welded repairs are allowed to the engine mounting area at the crankcase base and additionally to the ignition coil mounting posts, provided that this does not change the position or thread size of the post. No other welded repairs are permitted. It is permitted to introduce a magnet into the crankcase area, by fixation into either the sump drain plug or oil filler plug. Manufactured items that follow this pattern are included.



With the piston at BDC, this gauge must sit flush on the deck face



Using the CPO gauge to zero a caliper prior to its use for stroke and deck height measurements

#### 24. Crankcase side cover

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

#### 25. Gaskets

All gaskets must be standard and 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.

#### 26. Clutch

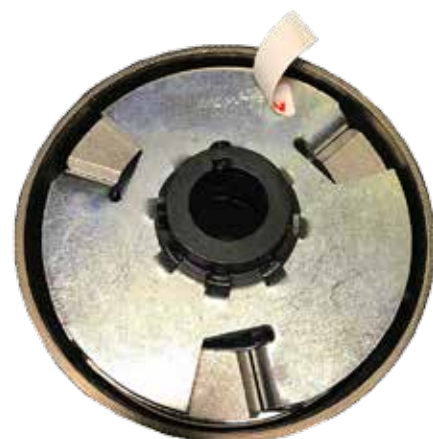
A dry, air-cooled centrifugal clutch of Magnum, Maxtorque or Quantum manufacture only must be used to transmit the drive. The clutch should be in standard form (as supplied), be incapable of adjustment in position and have a maximum engagement speed of no more than 2,500 rpm engine speed. Only metal to metal contact is allowed, no use of friction materials. For clarification, shoe and drum type clutches only are permitted, plate clutches are not allowed.



Magnum ✓



Example of plate-type clutch ✗



Maxtorque ✓



Quantum ✓





## 27. Scrutineering

To keep the class as economic as possible, the cost of an engine rebuild following a scrutineering inspection will be no more than £100.00, (plus any parts, carriage and VAT).

Where a component, following any inspection or examination, is no longer serviceable or is rendered unusable, the cost of a replacement of that component will be limited to the manufacturer's inclusive recommended retail price for that component. This will also hold true for any transit or insurance value.

The ABkC may introduce new check tools or inspection methods at any time during the year in order to maintain the integrity of these regulations. Any new regulation will come into force one month after the publication of updated regulations, subject to MSA approval.

A master set of dimensionally accurate gauges are held by the ABkC for verification purposes.

Where specified, officially sanctioned and nominated Honda gauges and measurement devices should always be used when checking engine measurements. In the case of any doubt or dispute, only these specified and approved items must be used and the results taken as definitive and final.

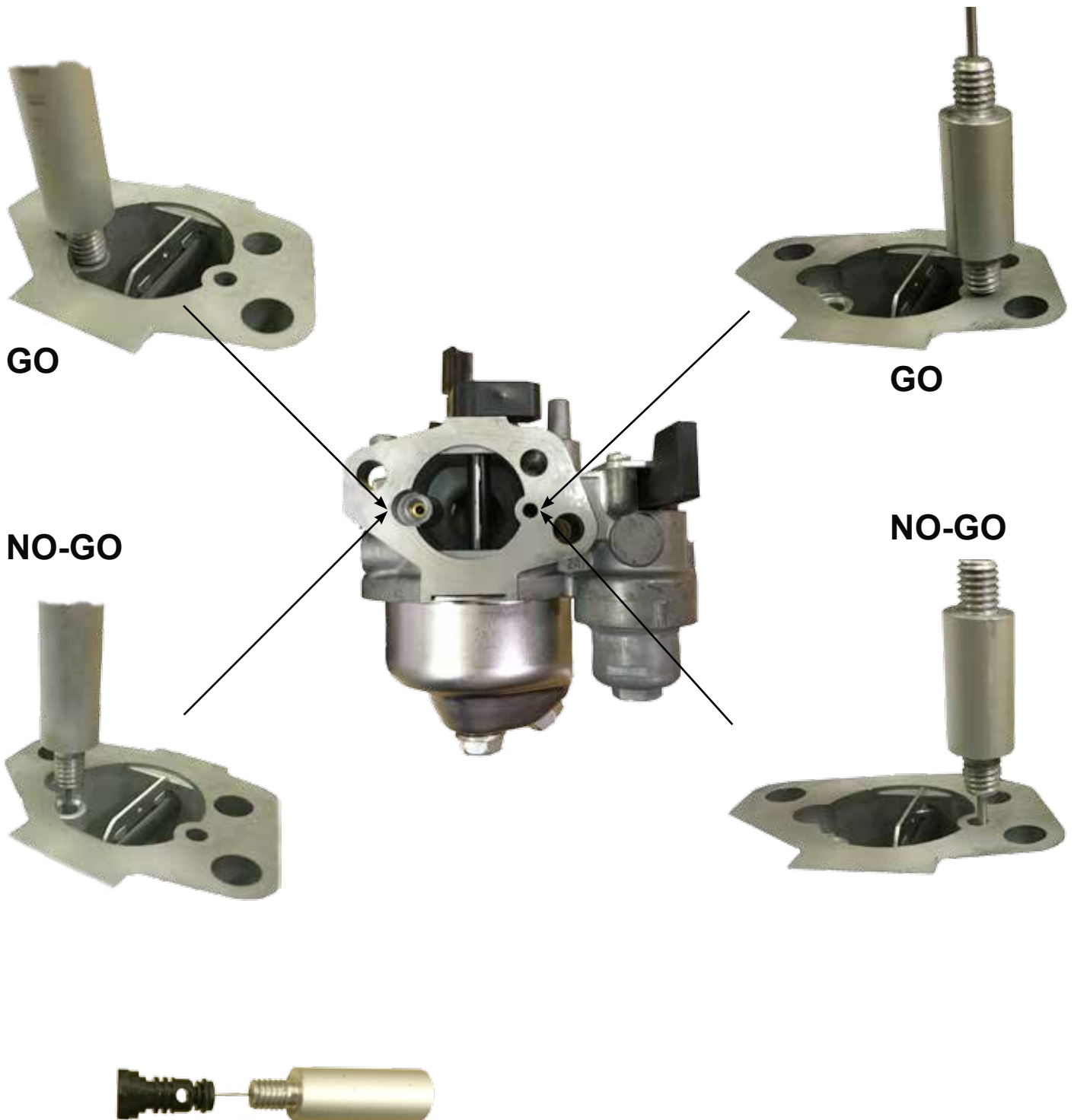
Samples can be taken at any point during an event to investigate the presence of any combustion-enhancing additive to the lubricant or fuel, all of which are not permitted in this class.

*The ABkC reserves the right to make amendments at any time during the year in order to adjust the performance of this engine type. Any new regulation will come into force one month after the publication of updated regulations, subject to Motorsport UK approval.*

## NOTES

Users of earlier engine types are strongly recommended to read these regulations alongside a copy of the Honda Technical Regulations version 11a May 2016.

# Appendix 1

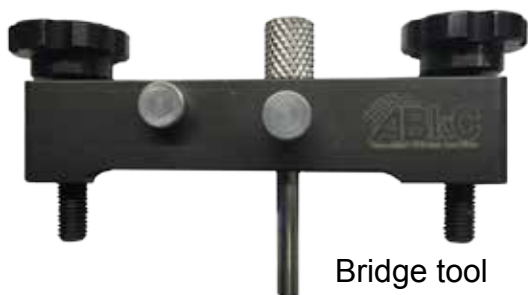


Gauge	Go Dia	Go Length	No-go Dia	No-go Length
brass jet	0.96	19.00	1.20	12.00
airway	1.20	28.00	1.50	28.00
Pilot	0.20	10.00	0.36	10.00

n.b. the pictures of the prototype gauges used here might vary with the appearance of the production items. However their dimensions and function will be the same

# Appendix 2

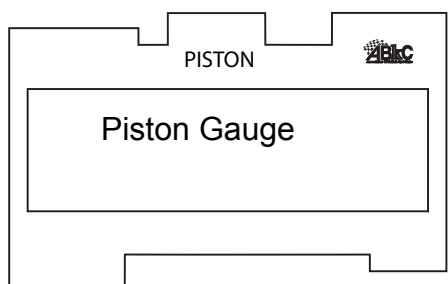
## MotorsportUK/ABkC approved tools



Bridge tool



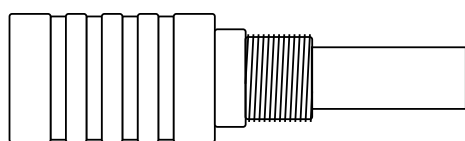
Template tools



Piston Gauge



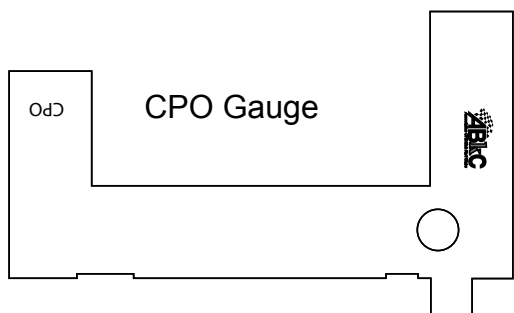
Cam inspection tool



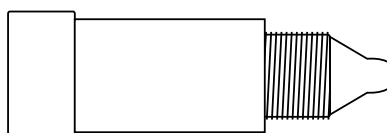
Piston stop



Location tool



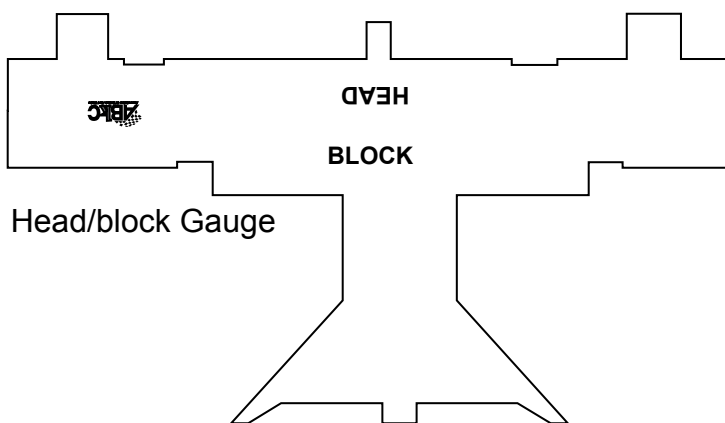
CPO Gauge



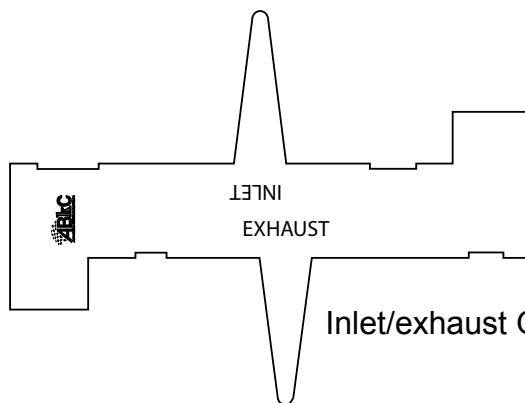
Spark plug insert



Digital angle gauge



Head/block Gauge



Inlet/exhaust Gauge

**All tools available at [www.kartstore.co.uk](http://www.kartstore.co.uk)**