HONDA
TECH
MANUAL
GX 120

HONDA ENGINE RULES
FOR 120 HONDA CLASS ONLY

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HONDA SUSPENSIONS

All suspensions must follow procedure listed in QMA rulebook.

NOTE: All shipping is to Express Mail at the shipper's Expense

- For the purposes of this rule only, if a handler has multiple cars competing in the Honda class (GX120 or GX160) at one race event and more than one engine is found to be illegal at that event, it will be considered to be one offense.
- Refusal of tech shall be interpreted as an admission that the engine is illegal and a suspension from the Honda class will be immediate with all awards, qualifications being revoked.
- Confiscation of part or parts - only the illegal part and all related parts and not the whole motor will be confiscated. A full motor tear down is required if an illegal part is found.

General Rules FOR JAP,UT1,UT2 AND UT3 GX12O
JAP,UT1 AND UT2 PARTS ARE INTERCHANGABLE

1. The factory supplied Honda GX120 HX 2 engine and gearbox combination must be used. All parts must be factory supplied Honda parts, specifically made for the Honda GX120 UT3 HX2 unless otherwise specified. Honda OEM factory supplied 120 JAP, UT1,UT2 or UT3 replacement blocks may be used,UT1 and UT2 Honda cylinder block part number– 12000-Z0S-416, UT3 Honda cylinder block part number– 12000-Z4H-407. Aftermarket blocks or components will not be permitted. The part numbers, serial numbers, date codes or no markings at all on the front of the block are non tech items.
2. All factory supplied Honda parts must be used and properly installed with the following exceptions:
    a. The governor system may be partially or fully removed with the exception of the steel drive gear on the crankshaft. This gear must remain intact. If the shaft is removed the hole must be plugged. The hole can be tapped for thread or the use of epoxy is acceptable. Welding will not be permitted.
    b. The factory air cleaner must be removed. Any commercially available air filter may be attached to the outside of air filter adapter. Outerwear style or equivalent can be used over carburetor only with no adapter. The approved air filter adapter may be run with or without an air filter. Any air filter may be used with adapter as long as there are no device(s) used inside the air filter or adapter. Any device, manifold, tubing, etc connected between the air filter adapter and the air filter is not legal. (* "Outer Wear" defines a style not brand name). The spring in the UNI style air filters are allowed but cannot be altered and must use the OEM spring.
    c. The hose from the valve cover must go into a catch can.

Exhaust: Steel or Stainless are the only materials allowed for exhaust pipes.

a. Stock Honda muffler will be removed. Mounting flange may be cut off of muffler and used as adapter flange. Any transition from the "D" shape of the exhaust port to round must take place within the thickness (0.250" max.) of the flange. This applies to all exhaust systems. No steps or tapers allowed, grind marks are not allowed past 0.250" flange area. No suspension for exhaust flange or pipe infraction just disqualification. If an after market flange is used, maximum allowable flange thickness will be 0.250 inches. If slip on type flange assembly is used, pipe stub will be a maximum 0.880 inches outside diameter tubing with a maximum overall length of 1.500" inches. Pipe stub must be inserted into exhaust pipe at least 0.750 inches and will have minimal exhaust leakage. The cylinder head exhaust stud holes can be Heli coiled but must be in factory dimensional locations.
b. Muffler exhaust leakage- It is acceptable to have minor exhaust leakage at the muffler factory seam.
c. Muffler to be used will be 4 to 8 hp Briggs & Stratton, part number 294599 or equal equivalent. Muffler will be internally unaltered except that the round cup shaped baffle may be welded to the perforated baffle without moving its original location. Threads will not be removed from muffler.
d. Exhaust pipe will be a maximum of 1.000" inches outside diameter with a length of 19.0" to 26.0" including a threaded pipe coupler to welded to the end of the pipe in order to screw muffler in place so that muffler may be removed for inspection. Pipe must be one piece continuous pipe from flange or slip nipple to muffler coupler. No sections of pipe welded together (butt welds). Pipe coupler will be a standard, unaltered, 3⁄4" NP, threaded coupler. Length will be 1.000" inches minimum to 2.250" inches maximum.

e. There will be no steps or tapers in the exhaust pipe or flange assembly. Exhaust pipe length must be measured using a ¼" wide tape measure inserted through pipe to measure overall length. Flange and coupler will be included in the overall length when measuring the pipe. No coating of any type may be applied to the interior of any part of the exhaust system. The intent of this rule is to have all of the exhaust pass through the muffler exit hole. All measurements are to be taken with the component pieces in the same position as they were installed and on the car.

f. All 120 & 160 .25 QM mufflers must be Briggs & Stratton Part # 294599 or equivalent. No drilling holes in the baffles. Inside seam of baffle must be straight edged. (NOTE: Some seams may not be parallel in baffle) You cannot cut off the threaded flange if it is to be used in Honda. It is OK to weld a washer or nut on the flange for a place to connect safety wire or spring. Muffler cannot be more than 1/2 turn from being hand tight.

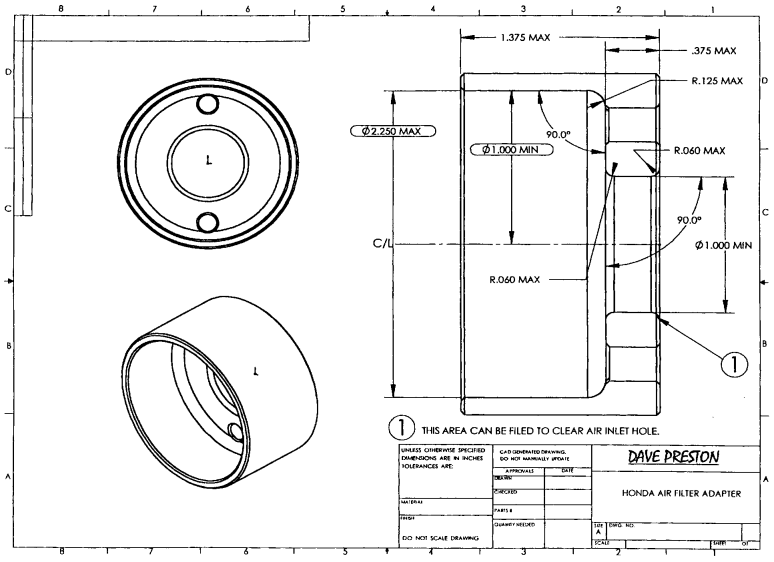
g. The use of air filters during qualifying at asphalt events is not permitted. USAC Officials reserve the right to allow filters at any event that it may be necessary.

Air Filter: Any QMA approved air filter may be attached to the outside of air filter adapter. The factory air cleaner must be removed. Any commercially available air filter may be attached to the outside of air filter adapter. Outerwear style or equivalent can be used over carburetor only with no adapter. The approved air filter adapter may be run with or without an air filter. Any air filter may be used with adapter as long as there are no device(s) used inside the air filter or adapter. Any device, manifold, tubing, etc connected between the air filter adapter and the air filter is not legal. (* "Outer Wear" defines a style not brand name). The spring in the UNI style air filters are allowed but cannot be altered and must use the OEM spring. The stock Honda air filter gasket may be used. Outer wear style or equivalent can be used over carburetor only with no adapter We are using "outerwear" to define a style not brand name). The approved air filter adapter may be run with or without an air filter. Any air filter may be used with adapter as long as there are no device(s) may be used inside the air filter or adapter that will alter the airflow into the carburetor; however, the anti-deformation spring that is supplied with the foam filters may be used.

(1) Air cleaner adapter will be maximum ID 2.250"and a maximum of 1.380" long in length, flange thickness 0.395" max. flange ID 1.000" minimum hole size straight walled, flat bottomed and parallel with carburetor using existing air cleaner mount holes.

(2) Honda air filter gasket- It is legal to use Honda air filter gasket part number 16269-ZE1-800 between the air filter cup and the carburetor mounting face. This OEM gasket is the only legal gasket that can be used. Gasket thickness is .020" Ref.

__UPDATE__ Air filter cup flange thickness maximum is now .395"



2) Any type throttle linkage may be utilized. Carburetor will be unaltered with the exception of the black plastic piece on upper end of throttle shaft. This is the only part in the carburetor that can be altered.

a. Material may not be added to throttle stop area of black plastic piece or carb body.
b. Rear mounting brackets for Honda fuel tank may be removed.
c. The starter cup that is behind the flywheel retaining nut can be cut away to leave only the flat washer back piece that retains cooling fan.
d. The keyed end of the ring gear shaft may be shortened, drilled and tapped or machined for snap ring.
e. All threaded holes may be Heli-Coiled but are not allowed to be relocated.

f. Honing and deglazing of the bore is allowed.
g. Lapping the valves is allowed.
h. Oil drain back hole between lifters may be enlarged
i. Aftermarket drain plug and fill plugs may be used
j. Aftermarket valve cover gaskets is legal.
    i. One gasket only
    ii. No silicone on gasket surface.

Blocking Air Flow: No device may be used that will/or appear that it may impede airflow into the engine cooling system. This may require that the engine be run at a speed above idle by the tech personnel at the scale after the car has qualified or raced.

1) The choke butterfly and shaft must be removed. The 2 vacant holes from the choke shaft may be filled and sealed with epoxy or silicone sealer. Old shaft may be cut down also as an option to plug holes. The addition or subtraction of material in the bore or venturi of the carburetor will not be permitted.
2) The oil level switch may be disconnected, but switch assembly must remain intact in the crankcase.
3) The gearbox may be rotated to any of the 4 positions.
4) The On-Off ignition switch may be removed. The vacant hole may be covered, but not welded closed.
5) Procedures that affect the molecular structure of metal of any Honda parts such as Cryogenics will not be permitted.
6) Taking parts out of service- Reference: Wear limits in Engine Block Internal section.
7) Infractions involving Air filter adapter, Exhaust, Spark plug and Ignition timing will result in disqualification only. In most cases additional penalties will not be accessed.
8) The Honda flywheel cover shroud can be any color. The valve cover and lower head heat shroud must be as factory produced and color.
9) All Lip seals must have the stock spring installed in the seal and in its proper location.
10) The oil filler caps are a non tech item. The use of any style plastic or billet filler plugs are legal.

TECH PROCEDURE

External visual check of engine for required components: muffler, shrouds and sheet metal, oil level sensor (this can be partially observed from outside).

CARBURETOR

GX160 CARBURETOR (BE54D) (BE65B) and (BE65Q) MAY BE USED IN HEAVY HONDA ONLY (SEE GX160 MANUAL FOR CARB SPECS)

1) Remove Carburetor:

a) Check for restrictor, if applicable, and placement. Restrictor must be installed between carburetor and carburetor insulator with stock Honda gasket on each side of restrictor. Only stock Honda insulator gasket between black plastic insulator and head. Air passageway in insulator will not be altered in anyway. All Junior Honda class engines must use the blue QMA approved slotted plate only. Failure to use proper restrictor plate, alteration of restrictor plate, or improper installation of plate in designated classes is cause for immediate DQ and all applicable suspensions will be applied.

b) Restrictor Plates: All restrictor plates must be measured with Pin Gauges.

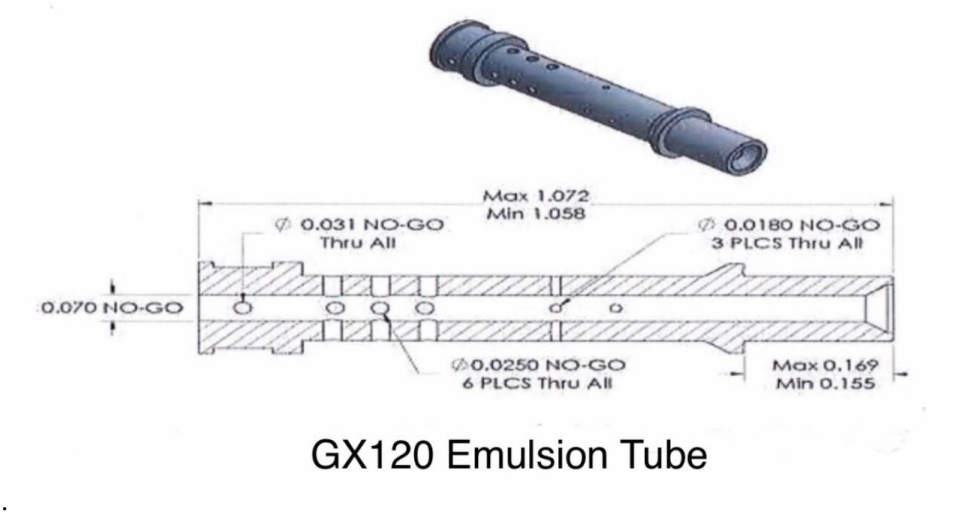
- Novice Restrictor (Honda)- Red plate with single hole .3125" Max– Use a .3135- diameter no-go pin gauge.
- Jr. Honda (Honda)- Blue plate with single hole .4375" Max– Use a .4385- diameter no-go pin gauge.
- Red and Blue QMA restrictor plates will be recommended. All blue restrictor plates must be dated 06/09 or newer.
- The use of POWRI or USAC restrictor plates are allowed but still must meet the QMA no/go gauge hole specifications as outlined above.
- (If the restrictor plate does not have a date on it confiscate the plate. If the plate is not legal DQ and any applicable suspensions will apply).

c) Restrictors will be checked by NO-GO gauges.

2) Check for any alterations or worn parts that would allow additional air into engine: holes, slots, perforations, spacers, loose bolts, warped flanges etc.
3) Carburetor identification number: BE 60 B, BE 60 R, BE99A, BE99L and BE99M
4) Check carburetor for alterations. Upper choke shaft hole may be sealed with silicone type sealer.
5) Two stock Honda intake gaskets may be used between Carburetor and plastic insulator.

6) Carburetor Bore:
   - Intake end: maximum diameter 0.951”
   - Throttle end: maximum diameter 0.632”

7) Carburetor venturi bore and nozzle height:
   a) BE60B, BE60R, BE99A, BE99L and BE99M: Shall be checked with a no-go gauge 0.452” diameter with a 0.429” flat. If the gauge passes through, then the carburetor shall be deemed illegal. Further venturi diameter check with a 0.456”- no-go gauge will determine the item for DQ.
   b) The butterfly screw, the butterfly, and the throttle shaft may not be removed from the carburetor. Any evidence of tampering will be a disqualification and suspension.
   c) Pilot Jet 0.015” No-Go Gauge
   d) Decimal equivalents of numbered size drills chart on page 12



GX120 Emulsion Tube

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ENGINE COOLING SHROUDS

A. All pieces of the stock engine-cooling shroud must be properly installed.
B. There must be no addition or subtraction of any material from the shrouding except for the covering of the switch hole (any material). Starter cup may be altered to be used as washer retainer for the cooling fan.
C. Fan shroud may be repainted any color. All other shrouds must remain as produced by Honda.

Zero Dial Indicator after exhaust bump. (0.050) ref.

Maximum valve lift will be checked from the top of valve spring retainer. Valves may be adjusted to zero clearance or shims may be installed to create zero clearance. This may dictate making special shims, as it is difficult to insert feeler gauge blades so as not to interfere with indicator contracts on retainer.

Valve lift:
- Intake: 0.245” maximum
- Exhaust: 0.255” maximum

CYLINDER HEAD, HEAD GASKET, VALVES, SPRINGS

A. Remove cylinder head.
   - Head gasket thickness: 0.040" minimum thickness of inner rim.
   - Head gasket thickness UT-3 engine: 0.008" minimum.

B. Remove valves: The use of valve seals is legal on the intake only.
C. Honda UT3: .030" max shim allowed on intake.
D. Honda UT3: may use one shim only (can not use valve seal and a shim)

VALVE SPRINGS

A. Valve springs will be stock Honda PN 14751-ZF1-000 or PN 14751-ZE1-000.
   - **No modifications allowed.**

B. The Honda GX120 or GX140 valve springs will be permitted for use. The Honda springs must be used as supplied without any modification.

120 Spring

A. Wire diameter: 0.071" Maximum
B. Outside diameter of spring: 0.790" Maximum
C. Number of total coils: 5.3
D. Spring pressure: 11 LBS max. at 0.812"
E. Stacked length will be: 0.394" Maximum

140 Spring

A. Wire diameter: 0.079" Maximum
B. Outside diameter of spring: 0.808" Maximum
C. Number of total coils: 7
D. Spring pressure: 16 LBS max. at 0.812"
E. Stacked length will be: 0.524" Maximum

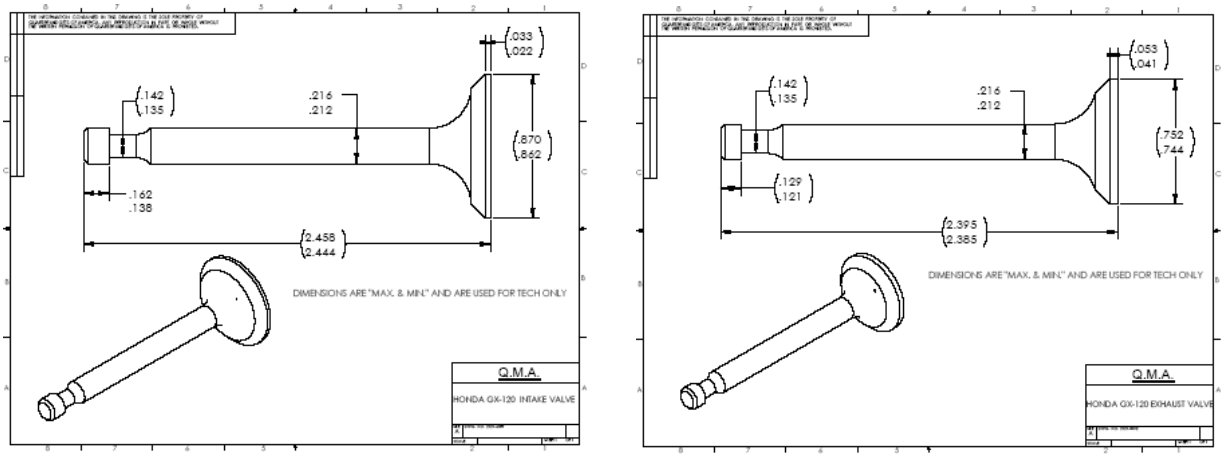
ROCKER ARMS - PUSH RODS – STUDS

Rocker arms will be stock Honda and will not be altered in any way. Rocker arm studs will be stock Honda. They or their mounting position may not be altered in any manner. No heli-coiling of mounting holes. No bending of studs. Push rods will be stock Honda and will not be altered in any way. Push rod maximum length 4.803 inches.

VALVES

A. Check valves for weight. Valve seating surface must be factory ground to a single angle only, 45 degrees. There will be no other angles ground on any part of valve. **Valves must not be polished, lightened or altered in any way.**
B. Valve Weight:
   - Intake: 18 grams minimum
   - Exhaust: 16 grams minimum
C. UT-3 Valve Weight:
   - Intake: 21 grams minimum
   - Exhaust 16 grams minimum
D. Valve Stem diameter intake 0.216" ± .0.001" exhaust 0.214" ±0.001"
E. UT3 Intake Valve
   - Inspect the valve for dimensions and weight. The valve seating surface must be factory ground using (1) one single 45 degree angle. Compound angles will not be permitted. The valve must not be polished, lightened, or modified in any way.
   - Intake valve length: 2.444" / 2.458"
   - Intake valve stem diameter .212" / .216"
   - Intake valve face diameter .978" / .986"
   - Intake valve weight 21 grams minimum
F. UT3 Exhaust Valve
   - Inspect the valve for dimensions and weight.
   - The valve seating surface must be factory ground using (1) one single 45 degree angle. Compound angles will not be permitted. The valves must not be polished, lightened, or modified in any way.
   - Exhaust valve length 2.461" / 2.475"
   - Exhaust valve stem diameter .212" / .216"
   - Exhaust valve face diameter .744" / .752"
   - Exhaust valve weight 16 grams minimum

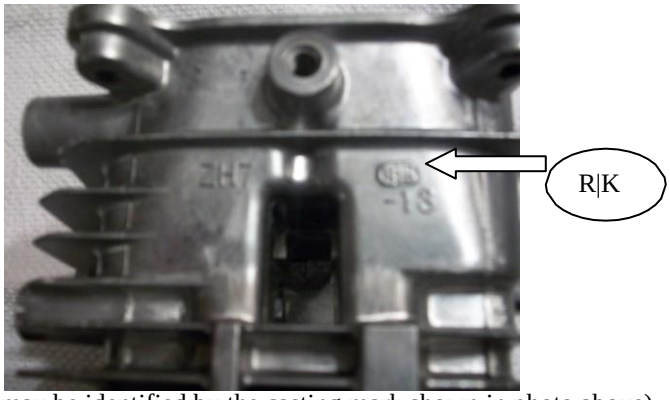
UT2:



Note: UT-1 (Current 120) ex valve part # 14721-ZF0-000 – Retainer # 14773-ZE1-000 and lash cap # 14781- ZE1-000 must be used in combination. UT-2 (New 120) ex valve part # 14721-Z4H-00 and –Retainer #14771- ZE1-000 must be used in combination (no mixing of old and new style parts) New style ex valve 14721-Z4H-000 measures 2.470 overall length

HEAD

Cylinder head will be in "as cast" and in factory machined condition and there must be no addition of metal or any other substance to the inside or outside of the cylinder head except the head gasket surface may be milled. Honda Racing HPD B000 and B100 may be used on UT1 and UT2 only. Inspect the head for any material removal or addition. Head gasket surface non-tech item. The only TKI head allowed on JAP, UT1 and UT2 engines is the HPD B000/B100 head. The UT3 engine may run an optional shim under the intake spring up to .030 in thickness.



(Japan heads may be identified by the casting mark shown in photo above)

Thickness of head. This will be measured from valve cover surface to head gasket surface at the side at a position in line with upper intake & exhaust flange bolt.

- UT1/UT2 Minimum 2.911”
- Honda Racing HPD heads have a minimum thickness of 2.900 measured as above.
- UT3 Minimum 2.938”

1. Measure from the head deck surface to the valve cover surface.
    a. Jap. RK Head 2.911 inches minimum
    b. HPD TKI9 Head 2.900 inches minimum
    c. UT3 Head 2.938 inches minimum
2. Measure from the head deck surface down to the top of the valve.
    a. Jap. RK Head intake and exhaust 0.178 inches minimum, 0.210 inches maximum.
    b. HPD TKI9 Head intake and exhaust 0.168 inches minimum, 0.210 maximum.
    c. UT3 Head intake 0.193 inches minimum, 0.215 inches maximum. Exhaust 0.173 inches minimum, 0.195 inches maximum.
3. Measure from the head deck surface down to the top of the valve seat.
    a. Jap. RK Head intake and exhaust 0.25 inches minimum, 0.265 maximum
    b. HPD TKI9 Head intake and exhaust 0.250 inches minimum, 0.265 maximum
    c. UT3 Head intake and exhaust 0.238 inches minimum, 0.260 inches maximum
4. Measure from the head deck surface down to the top of the valve guide.
    a. Jap. RK Head intake and exhaust 0.925 inches maximum
    b. HPD TKI9 Head intake and exhaust 0.925 inches maximum
    c. UT3 Head intake and exhaust 0.925 inches maximum
5. Measure from the head deck surface down to the lowest machined area of the bowl.
    a. Jap. RK Head intake 1.064 inches maximum, exhaust 1.010 inches maximum
    b. HPD TKI9 Head intake 1.042 inches maximum, exhaust 0.975 maximum
    c. UT3 Head intake 1.045 inches maximum, exhaust 0.975 maximum
6. Intake and exhaust port diameter at the valve.
    a. Jap. RK Head intake 0.745 inches minimum, 0.756 inches maximum. Exhaust 0.665 inches minimum, 0.675 inches maximum
    b. HPD TKI9 Head intake 0.745 inches minimum 0.753 inches maximum. Exhaust 0.665 inches minimum, 0.675 inches maximum
    c. UT3 Head intake 0.906 inches minimum 0.916 maximum. Exhaust inches 0.668 inches minimum, 0.678 inches maximum

**IT IS RECOMMENDED THAT WHEN MEASURING THEDEPTHOFTHEINTAKE & EXHAUST BOWL, THAT IT IS DONEASCLOSETOTHEVALVEGUIDEAS POSSIBLE. ON THE INTAKE BOWL, MEASURE ON THE SIDE THAT THE INTAKE RUNNER ENTERS THE BOWL.ON THE EXHAUST SIDE, MEASURE THE SIDE THAT THE EXHAUST RUNNEREXITS THEBOWL.

INTAKE AND EXHAUST PORTS

A. Ports will be “as cast” and in factory machined condition and there must be no addition or subtraction of metal or any other substance to the inside or outside of the cylinder head.
B. No alterations of any kind to be made to the intake or exhaust port.

C. This includes any grinding, polishing, etching, sand blasting or glass beading to interior surface.
D. Valve seats must be a stock single 45-degree angle. Multi angle valve seats are not permitted. Valve seats must not be replaced.
E. Intake and Exhaust ports at valve: UT1 and UT2:

Intake:	maximum 0.753"	minimum 0.745"
Exhaust:	maximum 0.675"	minimum 0.665"

UT3:

Intake:	maximum 0.916	minimum 0.906
Exhaust	maximum 0.678	minimum 0.668

F. Measurement from head gasket surface to top of valve guide:

Intake	maximum 0.925
Exhaust	maximum 0.925

Note: Cleaning of the combustion chamber or changing the finish of such chamber is illegal.

ENGINE BLOCK

Honda UT1, UT2 or UT3 block must be used and in "as cast" and factory machined with the exception of the deck surface, that may be machined to obtain proper deck clearance for the piston.

A. Cylinder bore will be 2.366" maximum. NOTE: All measurements taken at near the top of bore or very bottom of bore.
   a. "**Wear Limits/Parts Out of Service"** QMA reserves the right to confiscate 120 Honda engine parts deemed illegal or at QMA maximum wear limits. EXAMPLE: Cylinder Bore will be 2.366 Max. All measurements taken at top of bore or very bottom of bore parallel to crank, 90 degrees from crank. Any cylinder block that has one measurement over QMA maximum wear limits will be taken out of service. If no measurements exceed QMA maximum wear limits the part of block will not be confiscated. Handler has the right to have confiscated parts returned to them but will be rendered unusable.
B. Removal of rear gas tank brackets is permitted
C. Governor system may be removed in its entirety. Governor arm and shaft may be removed, and the hole plugged. The low oil sensor may be removed and the hole in the block plugged.
D. Addition of brackets, fittings etc. to accommodate throttle linkage, tachometer, temperature gauge is allowed.
E. Cylinder Block deck surface non tech
F. Check bore: 2.366" maximum
   a. *NOTE*: ***All measurements taken at top of bore and very bottom of bore. Do not use calipers, use only inside and outside micrometers to measure the bore.***

   b. Machined surface of block down to thrust face of cam boss: 3.226" minimum 3.240" maximum
   c. Machined surface of block down to bearing face: 3.427" minimum 3.442" maximum

G. Check stroke: UT-2 1.659" Maximum 1.640" Minimum
   UT-3 1.724" Maximum 1.700" Minimum

Inspect and Measure Piston to Cylinder Block Deck Clearance

A. Measure amount that piston is up or down from head gasket surface at T.D.C. This will be measured at edge or highest part of piston, not in center or relieved area on UT1 and UT2 engines.
B. Measure the amount that the piston is up or down from the block deck surface with the piston at top dead center (T.D.C.) This measurement will be measured from the Honda machined reference surface at the center of the piston to the cylinder block deck surface. The piston must not be above the deck surface. The Honda machined reference surface at the center of the top of the piston must remain unmodified and at least .001" above the piston surface adjacent to the machined center reference surface. (The .001" spec is absolute, no additional tolerance is permitted) Note: Carbon can be removed before making this measurement.

   a. UT3 engine will be measured from the machined spot face in the center of the piston. This dimension will be:

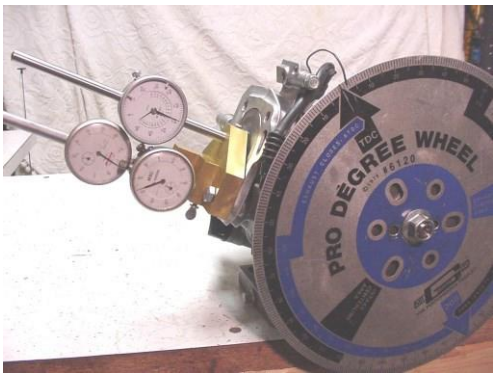
- 0.000” Max. – NO PISTON POP UP
- -0.001” Max to the right and left of the machined spot face in the center of the piston on the cast of face of piston
- All 3 measurements must be must be in spec to be legal

b. Install degree wheel on flywheel. Install pointer in order to read degrees. Locate accurate T.D.C. This should be done with a positive stop type fixture and not established with indicator alone.

CAMSHAFT

Recommended to use a 11” degree wheel

- Cam will be checked with indicator reading off the top end of tappets, which will provide zero clearance. The inverted radius of the top of the tappet presents some problem to get accurate readings and to prevent binding of indicator stem. Indicator holder and positions are very critical in this operation. When indicator is mounted on the top of lifters use a 3/16”or ¼” ball between lifter and dial indicator end.
- Zero indicator on base circle of cam. Be sure that compression release does not affect zeroing exhaust indicator. (Zero dial indicator after exhaust bump) ref.
- Turning engine in normal rotation, clockwise facing flywheel, take reading at specified opening. Readings must fall between specified degrees on the following chart.
- One profile check point on intake and one profile check point on exhaust may be out of spec, with the exception of the maximum camshaft lift. Maximum camshaft lift cannot exceed maximum spec.



CAMSHAFT: PROFILE LIMITS

Intake Degrees	Exhaust Degrees
0.050” 10 ½ - 14-1/2 ATDC	0.050” 206 – 210 ½ BTDC
0.100” 26 ½ - 30-1/2 ATDC	0.100” 189 -193 ½ BTDC
0.150” 44 – 49-1/2 ATDC	0.150” 170 - 174 ½ BTDC
0.200” 71 – 76 ATDC	0.200” 144 - 148 BTDC
MAX LIFT	**MAX LIFT**
0.227”	0.229”
0.200” 135-141 ATDC	0.200” 69 ½ - 74 ½ BTDC
0.150” 162 - 167 ATDC	0.150” 43 - 48 ½ BTDC
0.100” 180 - 185 ATDC	0.100” 24½ - 29 ½ BTDC
0.050” 197- 201 ATDC	0.050” 8 -1/2 – 12 ½ BTDC

FLYWHEEL, FAN AND IGNITION SYSTEM

Caution should be used when removing flywheel. Do not hit with hammer or other heavy objects. Service manual show flywheel to be removed with commercially available 6” puller. Another method is inertia type knocker that threads onto crankshaft end.

A. Use a suitable automotive timing light to check timing at a rotational speed of 800RPM through 900RPM. 22.5 degrees BTDC maximum for UT1/UT2. The UT-3 engine must be no more than 20.5° at 800RPM through 900RPM
    a. UT1/UT2: Timing must not exceed 22.5 degrees BTDC maximum at any point between 800RPM through 900RPM.
    b. UT3: Timing must not exceed 20.5 degrees BTDC maximum at any point between 800RPM through 900RPM.

- Magnet and its position may not be altered in any way.
- Magnet retaining screw may not be altered in any way. Screw may not be replaced with larger or smaller screw. No heli-coiling of mounting hole.

B. All of the nylon blades must be present on the cooling fan. If broken part must be taken out of service.

IGNITION SYSTEM

The transistorized magneto ignition is fixed at 20 degrees BTDC. Firing must not exceed 22.5 degrees BTDC for UT1/UT2. Firing must not exceed 20.5 degrees BTDC for UT3. Offset flywheel key is allowed. Either Honda or offset key must be used. Flywheel may also be lapped.

PROCEDURE FOR CHECKING TIMING
Recommend Using a 11" Degree Wheel
Use a suitable automotive timing light to check timing at a rotational speed of 800RPM through 900RPM. 22.5 degrees BTDC maximum for UT1/UT2. The UT-3 engine must be no more than 20.5° at 800 RPM through 900 RPM

A. With degree wheel and pointer installed use the positive stop method to find exact TDC
B. UT1/UT2: Timing must not exceed 22.5 degrees BTDC maximum at any point between 800 RPM through 900 RPM.
C. UT3: Timing must not exceed 20.5 degrees BTDC maximum at any point between 800 RPM through 900 RPM.

UT1 or UT2: Black only

UT3: Green (light or dark) only.

- Flywheel weight will be: 1550 grams minimum UT1/UT2. UT3 flywheel minimum is 1525 grams

Flywheel diameter

- Magnet area: 6.285' minimum
- Material removal not permitted.

A. A stock Honda spark plug cap, (wire end and resistor), must be used.
B. Any automotive type spark plugs with ¾" reach maximum is allowed.
C. Ignition coil air gap: Measure the air gap between the flywheel and the coil. The air gap must not exceed 0.035"
    a. Max air gap 0.035"- this can be accomplished with a set of feeler gauges.
        i. 0.36 No-Go recommended using Feeler Gauges .017, .015, .004 together.
    b. The gauge cant pass under the full length of each leg of the coil and the flywheel od at the magnet.
D. No plug-indexing washers allowed.
E. If temperature sensor is used under spark plug, factory washer may be removed.

GEAR BOX AND RING GEAR

A. Gear box may not be altered in any way. May be rotated to desired position.
B. Ring gear may not be altered in any way with the exception of the keyed end of shaft that may be shortened, drilled and tapped or machined for snap ring grove. No other machining, drilling, grinding etc. to ring gear. Keyway may be cut deeper.
C. Ring gear may not be altered in any way including polishing or use of any compound or abrasive on gear shaft where bearings ride.
D. Two gaskets maximum between gear box halves.

CRANKCASE COVER

Remove crankcase cover.

A. Cover must be "as cast" and in factory machined condition and there must be no addition or subtraction of metal or any other substance to crankcase cover.
B. Crankcase cover gasket must be stock Honda. Only one gasket may be installed with a maximum thickness of 0.025".
C. Critical dimensions are - thrust face of camshaft holder and position of crank bearing. Place a straight edge over crank bearing and cam boss thrust face. These surfaces should be level. Maximum tolerance will be ± 0.005". There will be no alterations to crankcase cover. This includes any alteration to crank bearing and camshaft holder position and height in an attempt to alter valve timing.

PISTON - WRIST PIN AND PISTON RINGS

Remove rod and piston – triangle or boss on top of piston must point toward push rods - piston, wrist pin and rings must be absolutely stock and not altered in any manner.

TIER III- Round Boss OLD STYLE- Triangle

PISTON NOTES

Piston will be stock Honda standard size and will not be altered in any way.

A. UT3 piston: The Honda machined reference surface at the center of the top of the piston must remain unmodified and at least .001" above the piston surface adjacent to the machined center reference surface. (The .001" spec is absolute, no additional tolerance is permitted) Note: Carbon can be removed before making this measurement.
B. Oversized pistons must not be used.
C. All three piston rings must be used and installed properly.
    - *Top ring:* Chrome compression ring installed with "N" or "T" on rail up. Thai rings are marked R. No expander under ring.
    - *Middle ring:* Oil scraper ring installed with "N" or "T" on rail up. Thai rings are marked R. No expander under ring.
    - *Bottom ring:* Three (3) piece oil rings are allowed. Check oil ring expander for alterations that will alter ring tension (cutting ends of expander etc.)
D. Piston may not be knurled, grooved or coated.
E. Piston weight:95 grams minimum.
F. Ut3 Total Piston weight with rings, pin, and clips: 130 grams minimum.
G. Ut1 and Ut2 Total Piston weight: With rings, pin, and clips - 118 grams minimum.
H. Total Piston weight with rings, retainers, complete with rod, pins and bolts 250 grams minimum.
I. See drawing for dimensions
J. Letters on rings may be worn off after run (not legible)

RINGS OLD STYLE

A. A.Must be stock Honda rings with stock size and configuration. Compression and scraper rings may not be collapsed in grove.
B. B.No decreasing of ring tension by heating, machining or any other means.

C. F.Ring thickness:

OLD STYLE:
Compression: 0.056”min.
Scraper: 0.056” min.

TIER III:
Compression: 0.036” min.
Scraper: 0.036” min.

Oil Ring:3 piece lower 0.095”min. 1 piece 0.097” min.

WRIST PIN

Stock Honda wrist pin and retainer	
OD:	0.511 ref. +/-
Length:	1.854” + 0.010”
ID:	0.354”
Weight:	23 grams minimum

CONNECTING ROD

Stock Honda rod with no alterations, except the big end of the rod may be honed for clearance.

A. Connecting rod big end size: 1.021” minimum - 1.0285” maximum
B. Pin end bore is 0.5111 ref.
C. Length from bottom of pin bore to top of big end bore will be:

- 2.111” maximum 2.101” minimum

D. Rod weight with bolts: 118 grams
E. No oil grooves on bearing surface of either end.

CRANKSHAFT

Stock Honda crankshaft with no alterations.

Notes:

A. No removal or addition of any metal from or to the crankshaft is allowed.
B. No balancing of the crank is allowed.
C. No oil grooving is allowed on the crank journal.
D. Camshaft drive gear should not be removed.
E. Keyway location must not be altered in any manner
F. Measure thrust to crank gear side: 3.340” minimum
G. The only cleaning method allowed is on the flywheel side of crankshaft for the purpose of removing calcium, rust etc. from the exposed end of the crankshaft. This Is permitted only from the seal groove out to the end of the thread of the crankshaft where the flywheel bolts on. Only a wire wheel may be used in the cleaning process. The use of Scotch brite, sandpaper or any other compounds or abrasives is illegal. No material may be added or removed from crankshaft. Crankshaft main journal at flywheel and gearbox ends may not be altered in any way. Heat treat rings on splined end of crank is no longer a tech item as long as crank still makes spec and has not been modified. Governor drive gear is optional

(may be removed).

CAMSHAFT

Camshaft must be stock Honda with no alteration of any kind.

Notes:

A. There will be no additions to or subtractions from any part of the camshaft.
B. Compression release will remain intact and unaltered.
C. Lobe center angle will not be altered by any means.
D. Lobe profile will not be altered in any way.

CAMSHAFT SPECIFICATIONS

INTAKE	EXHAUST
Heel to Heel 0.864" - 0.869"	Heel to Heel 0.865" - 0.870"
Heel to Peak 1.079" - 1.093"	Heel to Peak 1.081" - 1.095"

Length - thrust flange to thrust flange: 3.135" minimum 3.142" maximum

Cam bearings are 0.547" - 0.551" and unaltered (under .547 minimum take out of service no DQ)

TAPPETS

A. Tappets must be stock Honda with no alterations.
B. Base diameter: 0.909" minimum No maximum spec
C. Stem diameter: 0.312 minimum
D. Base thickness: 0.73" minimum 0.090" maximum
E. Length: 1.174"min 1.193"maximum
F. Weight: 16 grams minimum

Flywheel:

- Minimum weight 1550 grams UT1 and UT2. 1525 gram minimum for UT3
- Minimum diameter 6.285"
- Minimum Thickness 1.465"

Tech officials have the right to tech any or all cars in any class at their discretion. Tech Officials follow the same chain of command as all officers of QMA – as follows: Local/Regional – National. I.E.; Regional tech officials can tech at any event at their region and National Tech Officials can tech at any event in QMA. National Tech Director is final authority on all tech issues.

DECIMAL EQUIVALENTS OF NUMBER SIZE DRILLS

No.	Size in Decimals	No.	Size in Decimals	No.	Size in Decimals	No.	Size in Decimals
1	.2280	21	.1590	41	.0960	61	.0390
2	.2210	22	.1570	42	.0935	62	.0380
3	.2130	23	.1540	43	.0890	63	.0370
4	.2090	24	.1520	44	.0860	64	.0360
5	.2055	25	.1495	45	.0820	65	.0350
6	.2040	26	.1470	46	.0810	66	.0330
7	.2010	27	.1440	47	.0785	67	.0320
8	.1990	28	.1405	48	.0760	68	.0310
9	.1960	29	.1360	49	.0730	69	.0292
10	.1935	30	.1285	50	.0700	70	.0280
11	.1910	31	.1200	51	.0670	71	.0260
12	.1890	32	.1160	52	.0635	72	.0250
13	.1850	33	.1130	53	.0595	73	.0240
14	.1820	34	.1110	54	.0550	74	.0225
15	.1800	35	.1100	55	.0520	75	.0210
16	.1770	36	.1065	56	.0465	76	.0200
17	.1730	37	.1040	57	.0430	77	.0180
18	.1695	38	.1015	58	.0420	78	.0160
19	.1660	39	.0995	59	.0410	79	.0145
20	.1610	40	.0980	60	.0400	80	.0135

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