

Scrutineering guide for the new GX160 T2 engine

The GX160 T1 engine will be replaced for manufacture during 2012 with the GX160 T2 engine, and there are a lot of differences between these two engine types. In fact only a few components remain the same on this new engine, so the purpose of this guide is to forewarn you of what you might expect when you first encounter a T2 out in the field.

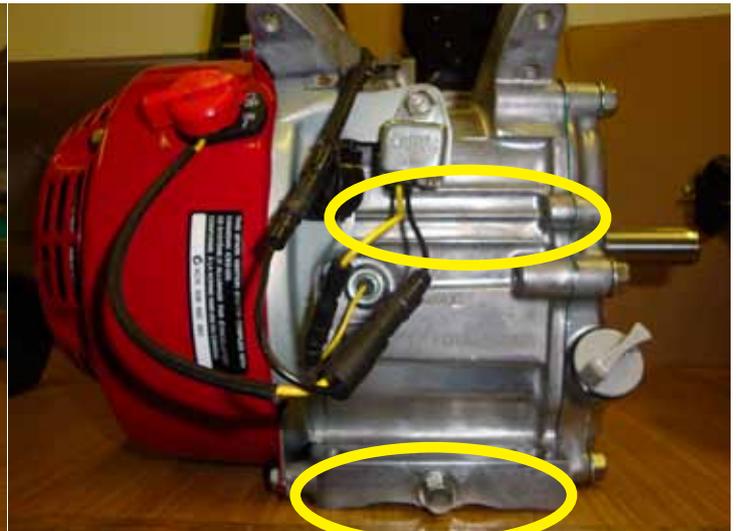
This document is for information purposes only, and the regulatory document for scrutineering purposes remains the Honda GX160 Technical Regulations, at latest issue, available on the ABkC website.

How to easily recognise a T2 engine

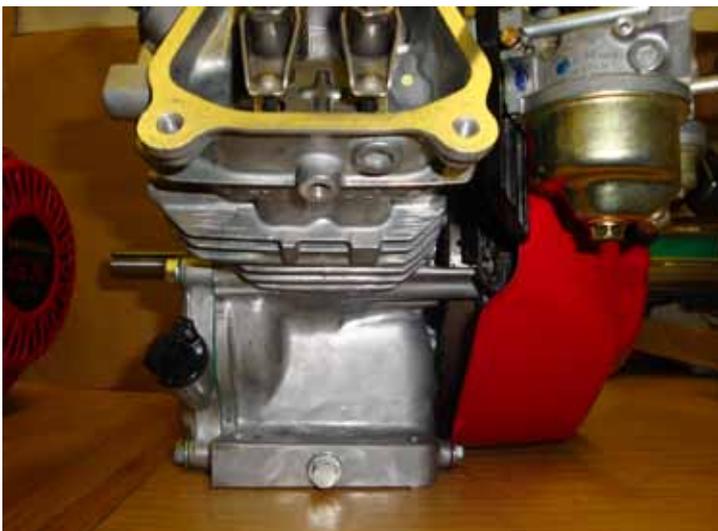
T1



T2

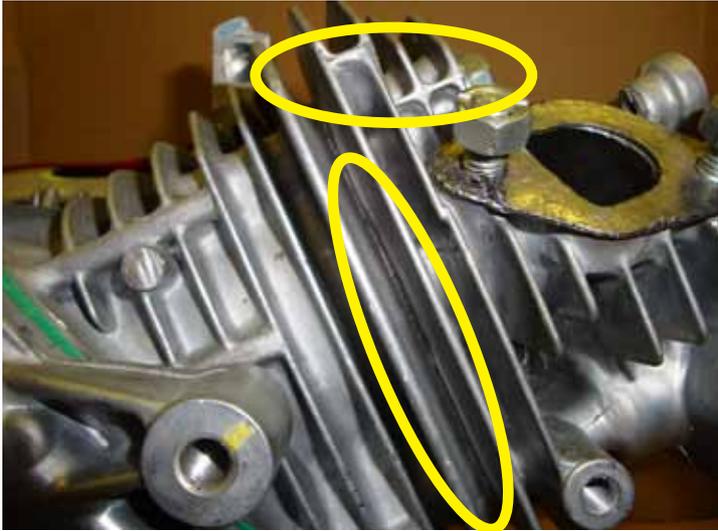


The engine base is scalloped and the crankcase has strengthening ribs



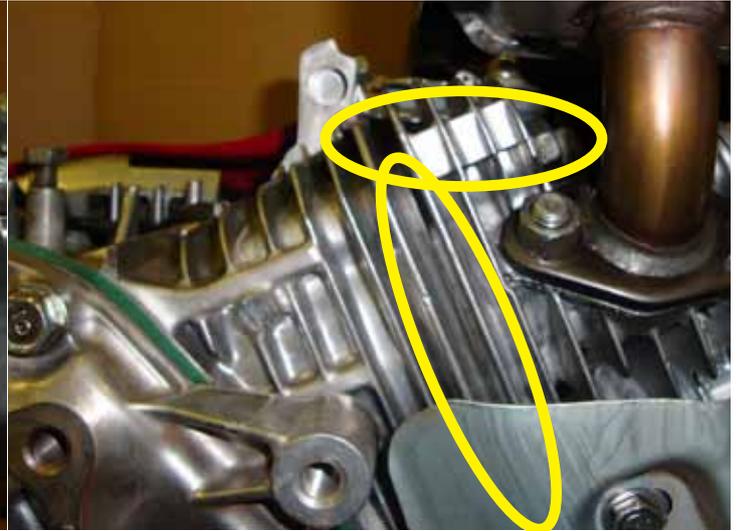
The pre-production engine supplied by Honda for these photographs was an “oil-alert” engine, so there are some other differences in the photographs that you will not see on the final version as raced. Only the highlighted parts are significant.

T1



The gap between the cylinder head and the crankcase is visibly smaller as there is a much thinner metallic head gasket used

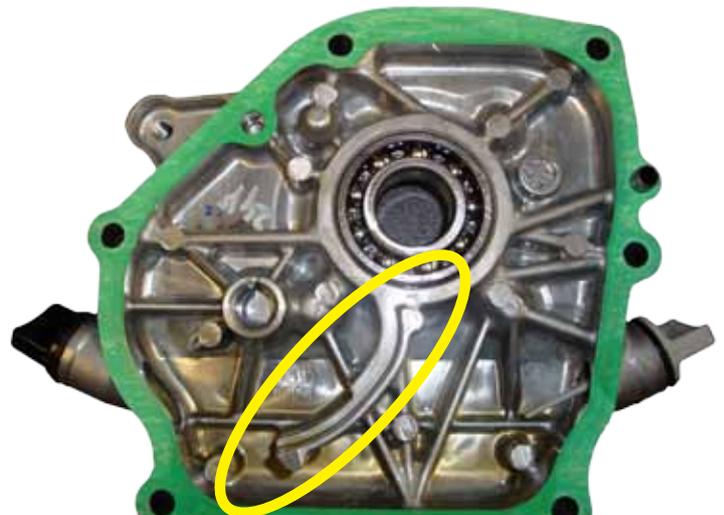
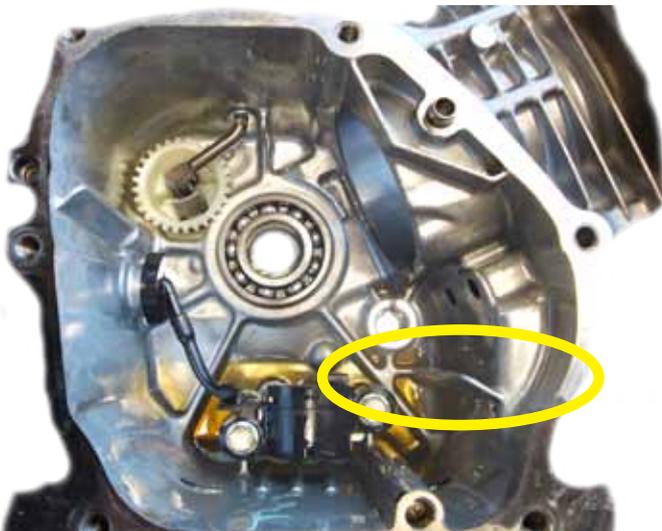
T2



The fins on the cylinder head have larger joining pieces

What's inside?

Just about every item inside and outside the engine is different.



The crankcase and side cover both have additional webs and rigidity braces inside them.



Externally the same, the bakelite valve of the T1 rocker cover has been replaced with a reed valve type on the T2. This was done to reduce noise primarily and has no effect on the performance of the engine. These parts are interchangeable.

T1



T2

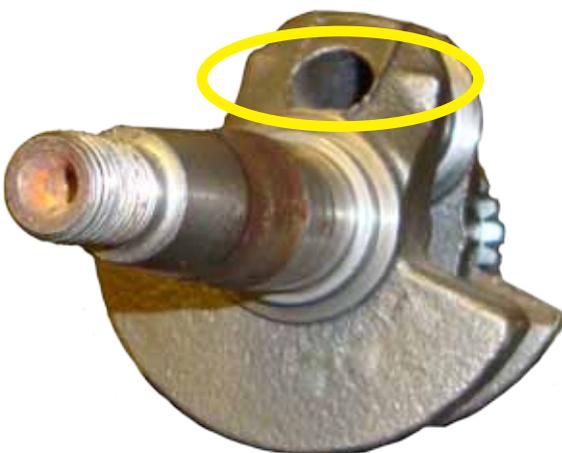


The T2 piston is shorter and has an additional curve under the oil ring. The top two piston rings are visually similar to the T1 but the oil control ring is thinner (2mm as against 2.5mm on the T1) and the ring groove in the piston is correspondingly smaller.

158gr
43gr
23.5mm
84mm
119gr
7mm
26gr

Piston weight
piston pin weight
piston height
con rod length
con rod weight
con rod bolt
con rod bolt weight

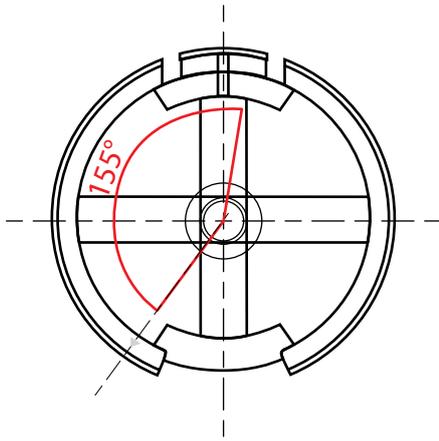
140gr
41gr
21.4mm
86mm
123gr
6mm
20gr



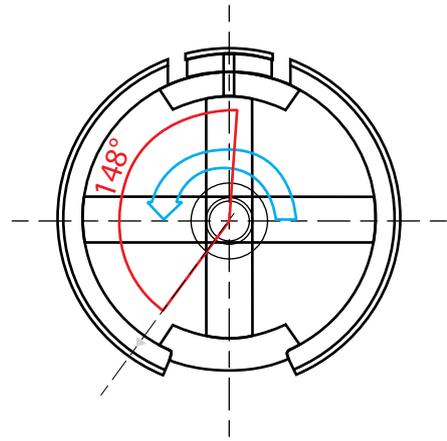
Crankshaft

Larger counterweights on the T2, and there is no bore in crank centre. The piston weight is less, the con rod heavier, and so the crankshaft web weights have been altered accordingly.

T1



T2



Flywheel and ignition timing

The ignition timing on the T2 has been retarded to 18° (from 25° on the T1). This has been achieved by moving the position of the keyway groove in the flywheel. There is no change in weight or moment of inertia of the flywheel for the T2. For competition purposes, the regulations allow the substitution of a stepped key, (marked by supplier and only available from one supplier) for use with the T2 flywheel to restore the ignition timing to 25°.

Checking ignition timing

For all practical purposes, checking the ignition timing on a T2 should prove no different to the method commonly used on the T1, i.e. provided that the stepped key has been used, a piston at TDC should place the flywheel in the position shown in this photograph.



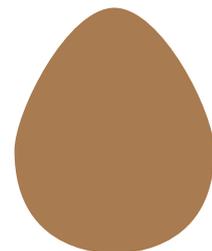
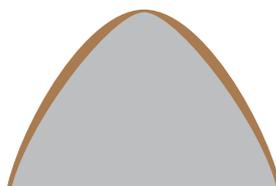
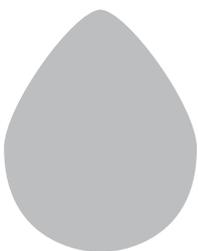
Push rods

The steel push rods of the T1 have been replaced with thicker aluminium units for the T2. Although interchangeable, the guide plate in the cylinder head also needs to be changed if using T2 push rods in the T1 engine.



Camshaft

The inlet profiles are different between T1 and T2, with the T2 resembling the GX200 profile. The difference is easily identifiable with profile gauges or by measuring the open period.



T1



T2



Cylinder head

Lots of changes here. Combustion chamber shape has changed but cylinder head volume also increased by about 3cc. Valve sizes and lengths have changed and there is no longer a rotator on the exhaust valve. The valve stem seal is also slightly different.

25mm	Inlet valve	26mm
24mm	exhaust valve	23mm
62.2mm	exhaust valve length	63.7mm



Head gasket

The composite head gasket of the T1 has been replaced on the T2 by a thin foil gasket, also used on the GX200. To allow some conformity and to anticipate that the composite gasket might be withdrawn at some point, the regulations not only observe that the T2 uses one of these much thinner gaskets, but that four of these gaskets can be used as a replacement for the T1 gasket.

Introducing this multiple gasket option will provide us with a path in the future if we are required to modify or adjust the output of these units. Any such adjustment would always be notified by way of an updated set of regulations.

T1

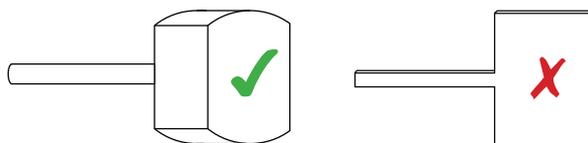


T2



Carburettor

The carbs are interchangeable, but recognisable. The T1 has 140 stamped on the throttle valve and four small holes just below the mixture screw point. The T2 has 150 stamped on it, with only three holes at the same point. In all the carbs the bore is cast, not 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.



The T2 uses a longer emulsion tube with groups of three holes, rather than the more familiar two and three hole variants used in the T1. The only other difference in the T2 carb is a fuel strainer, but that is not easily visible, being built in to the fuel on-off mechanism.



Other components

The air filter cover is a different shape, as is the exhaust. The exhaust's internals will be modified to suit by the two exhaust sealing agents, as previously. The throttle actuating arm has been beefed up in a couple of areas but is essentially the same. The pull cord and handle are slightly different, but work in the same fashion.