New Pressure & Vacuum Tester's Innovative Design Simplifies Crack Testing For Engine Reconditioners

by Paul Sanderman BSc

Author's note: I have been an avid motorsport and classic car enthusiast all my life and was approached by a friend of mine, Paul Barbé of Technical Motor Industries, to write an unbiased review of what, in his words, is an "innovative, fast and efficient crack testing machine" which he designed and developed 10 years ago as there was nothing that met his requirements on the market, either then or since. He redeveloped this machine further in the last year, and now believes it to be second to none. Knowing of my technical interest in cars, and my lifetime work in print and publishing, Paul thought I was the ideal candidate to write an unbiased review.

A new test bench incorporating clever and innovative design features aimed at simplifying crack testing for any size of engine has been introduced into the market place.
Such is the versatility of the bench, virtually any common size head or block can be mounted with ease and without the restriction of a cage, and associated visual impairment, simpliflies crack testing in every way, enabling the operative to complete a much more comprehensive test in a fraction of the usual time.
When demonstrated to me by Mitch, I was astonished that an Astra head could be mounted on the bench, pressure (incorporating thermal shock test) & vacuum tested, with the whole procedure being completed in just 15 minutes.
Mitch said that in all the years he's spent testing this was by far the easiest rig he'd used, and couldn't recollect any head taking longer than 15 minutes. He also said that in the seven months he had been using this rig, he'd never had to make a blanking plate.
Not only was the testing far more comprehensive, not solely relying on a pressure or vacuum test as is the norm, it obviates any doubt about the existence of cracks, overcoming the uncertainty experienced when undertaking just one test, this point being emphasised by Mitch who was originally sceptical of the need for more than one test until experiencing heads failing one of them but passing the other.
Without constraints of a cage the head (or block) is held in place by adjustable clamps, both horizontally and vertically, and once secured can be rotated 360°, providing easy access for pouring boiling water into ports thus giving a much greater temperature differentiation in comparison to complete submersion, and making it easy to detect bubbles indicating a crack.
Loading the head on the bench
The head is placed on two steel bars positioned across the rig and a lubricated rubber seal placed on top followed by a sheet of perspex (enabling the cylinder bores to be seen clearly), with a further two steel bars, placed either side of the head, on top of that. This is then held in place with adjustable clamps positioned towards either end of the head.
Apertures on the end of the head are covered by a rubber seal and steel blanking plate, from the range of available. and clamped horizontally. The head, now secured to the bench; is connected to the air supply and pressure increased to 80psi to ensure no leaks in readiness for thermal shock testing.
Boiling water is poured into exhaust ports enabling easy observation for bubbles indicating a crack, the clamped head rotated and inlets filled. As the head is not submerged, maximum temperature differentiation is achieved. Once satisfied that no cracks are detected the head is drained and the pipe changed from air supply to vacuum generator, and vacuum tested to -23in Hg. This will remain constant (or rise) if ok but will fall if a crack is detected.
This whole bench has been thought out extremely well and designed with simplicity in mind, accepting that although no two heads are the same, they are equally simple to mount.
Blocks present no problem either as simple vertical adjustment ensures centre of gravity is easily achieved providing easy rotation, thus making mounting virtually any size of engine equally easy.
Paul Barbé MIDiagE, designer and manufacturer of the test bench came up with the idea of both pressure and vacuum testing after experiencing a head passing a vacuum test but failing pressure testing after a core plug leak was exposed.
Unlike other test benches that claim to be truly universal, this one actually is. By subjecting the head to both pressure and vacuum testing it removes any chance of missing a crack, however minute it may be, and without a cage obstructing you it is far easier to mount the unit in the first place, and the ease of operation from start to finish exemplifies the simplicity of the design.
It is more than apparent that Paul's lifetime of experience in engineering has been utilised well in the design of this test bench, and with the range of blanking plates and seals available ensures every aspect associated with it's use is considered to be equally as important to that of obviating the possibility of missing cracks, making it a valuable asset to engine reconditioners everywhere.
Further information or enquiries about the test bench can be obtained from Paul Barbé, Technical Motor Industries Ltd, Unit 20 Harmill Ind Estate, Grovebury Road, Leighton Buzzard LU7 4FF.
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