

HIGHER ENERGY

Skunk2 K20A Camshaft Testing

Text By Robert Choo • Photos By Skunk2 and Robert Choo

Research, design,
manufacture, test;
research, design,

manufacture, test; research,

design, manufacture, test. This repetitious process is necessary

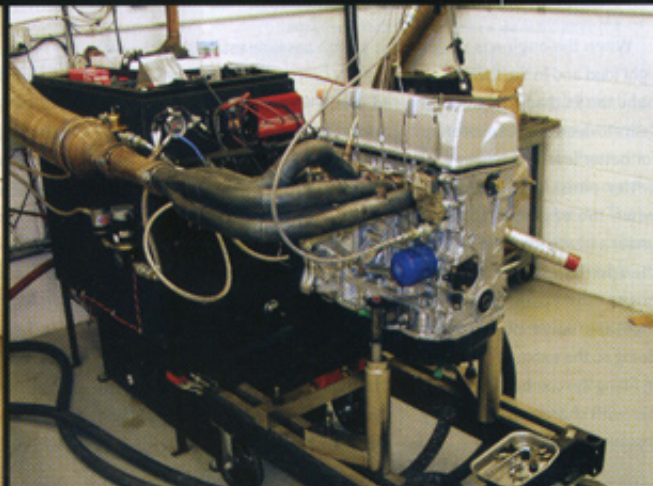
to develop the highest quality product. For Skunk2, this is a normal way of life. Each and every product Skunk2 produces goes through a rigorous process of researching, designing, manufacturing and testing. Once the product meets the company's very strict standards it is then, and only then, that the product will be given the go-ahead for production. This commitment to quality is why Skunk2 products are used in high-powered street and race cars throughout the world.

When it comes to designing new camshafts for the K20A engine hundreds of hours of research and development are performed before any product is even tested on Skunk2's in-house DTS engine dyno.

We paid a visit to Skunk2 to check out the company's camshaft testing procedure. The engine on the DTS dyno was completely stock with the exception of a 3-inch intake, Skunk2 race header and Hondata S200 engine management. The combination was good for 244.49 horsepower and 182.14 lb-ft of torque at the flywheel.

One of the biggest challenges the Skunk2 crew faced when designing the K20A camshafts was how well the factory bumpsticks already performed. Unlike the B-series camshafts where there was much room for improvement, the K-series camshafts are fairly well optimized from the factory. The second challenge Skunk2 had to consider was the K20A2 variable cam timing. Besides the increased valve lift from VTEC, the cam gears on the K20A2 engine are constantly being adjusted by the ECU for maximum performance.

Our K20A male engine was completely bone stock internally with the exception of a set of Skunk2 valve springs and titanium retainers. Skunk2 also bolted on their 4-2-1 dyno header and a three-inch air intake. For engine management, a Hondata S200 ECU controls fuel and ignition maps.



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The doctor is in. Skunk2 uses a cam measurement doctor to check profiles on their cams to ensure quality. The cam doctor can measure differences to within 0.000001 inches between each lobe.

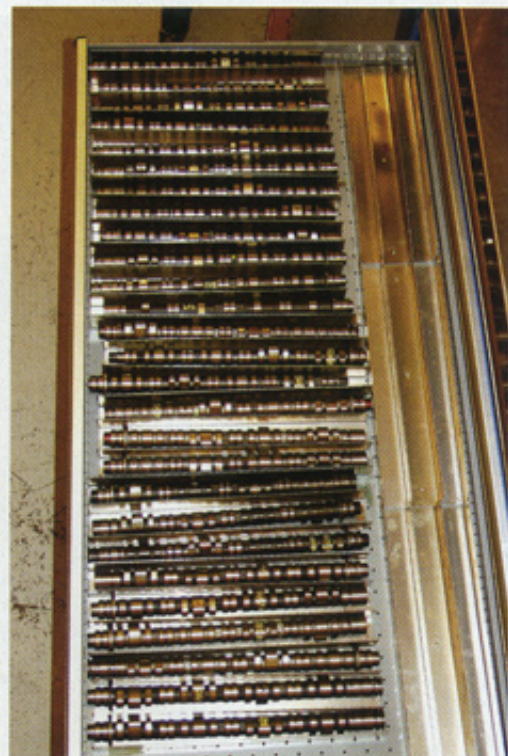


When the engine is under light load and in the lower rpm band the ECU adjusts the cam gears to decrease valve overlap for better low-end power and better emissions. However, when the engine is running under a heavy load and high in the rpm band the ECU optimizes the cam gears to increase valve overlap. By doing so the exhaust gases aid in filling the combustion chamber with charge air caused by a scavenging effect.

With a baseline established, the first camshafts Skunk2 tested was a pair of JDM Type-R camshafts. The camshafts were tested in two stages; the first stage was just running the primary lobes and the second stage just running the secondary lobes (VTEC).

The DTS dyno graph clearly shows the Type-R camshafts performing better throughout the power band when VTEC is engaged, but unfortunately, the increase

was only minimal. The factory Type-S camshafts actually performed better until 6300 rpm when the Type-Rs put up better numbers. The Type-Rs only registered a peak gain of 1.79 horsepower more than the stock Type-S camshafts. Although we were happy to see for the first time the USD market was not getting jacked compared to the JDM market, we were hoping to see the Type-R cams perform much better than what



Cams, cams, cams. Skunk2 tested dozens of different cam combinations before selecting the one best for the end user.



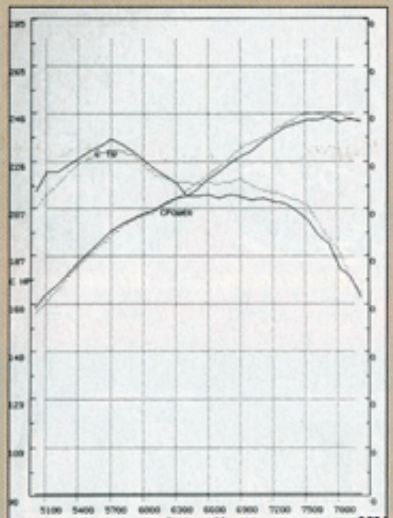
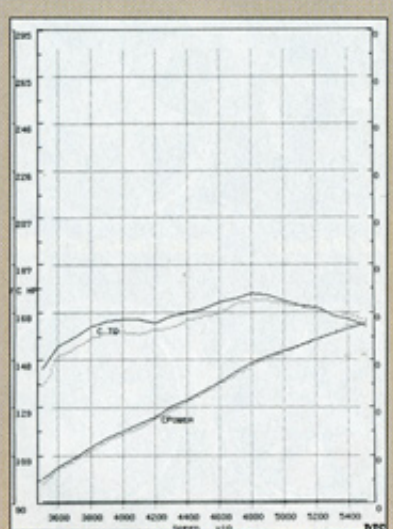
we witnessed.

The second set of camshafts Skunk2 tried out was a set of their own Stage 1s. The Stage 1 camshafts are designed for enthusiasts who want a little more than factory, but don't plan on porting and polishing the cylinder head.

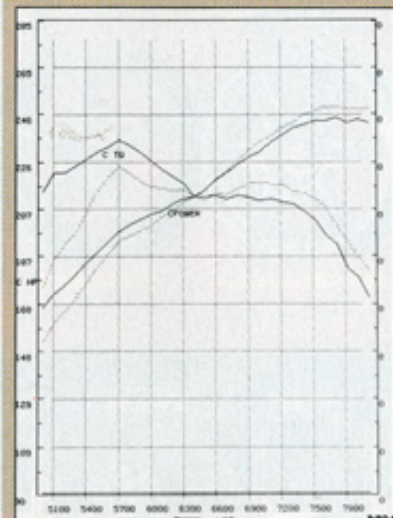
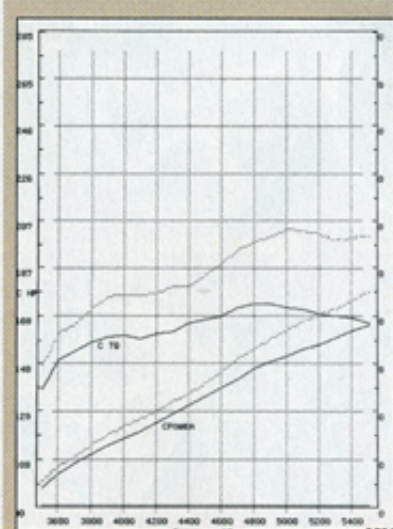
On the DTS, the Stage 1 cams generated huge gains on the primary lobes, as high as 13.6 horsepower over the Type-S cams. When the secondary lobes come into play the Type-

S bumpsticks actually perform better than the Stage 1 cams until 6400 rpm, where the Stage 1 take over again. The Stage 1 camshafts generated 248.1 peak horsepower, an increase of 6.1 horsepower over stock.

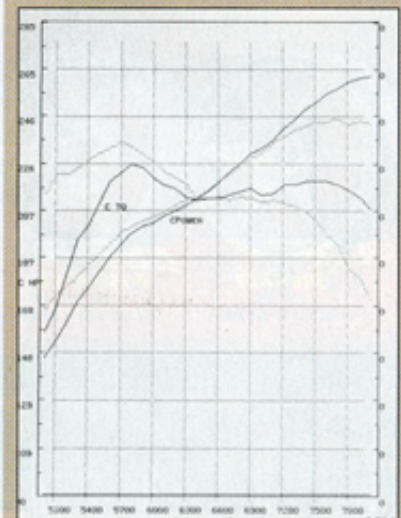
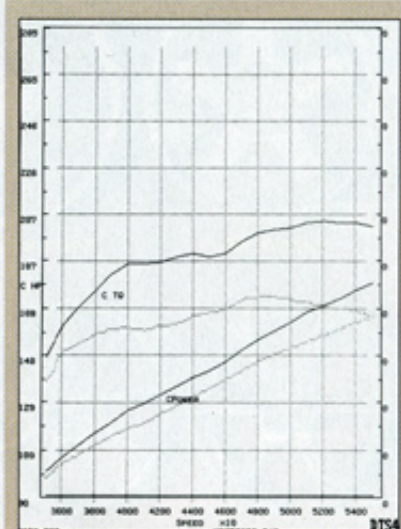
The last set of camshafts tested for the day were a set of Skunk2 Stage 2 cams. The Stage 2 camshafts are designed more for the serious enthusiasts. The camshafts are designed for consumers who



We were surprised to see the factory RSX Type-S cams perform so well against the JDM Type-R set. The Type-R cams were only able to better the Type-S cams by 1.79 horsepower.



The second test is a comparison between the Type-S camshafts and the Skunk2 Stage 1s. Before VTEC activation, the Stage 1 camshafts performed extremely well, generating 13.64 peak horsepower more than the Type-S cams. After VTEC the Type-S camshafts performed better than the Stage 1s until 6375 rpm, from there the Stage 1s took over again, generating 4.49 horsepower more than the Type-S cams.



The last set of camshafts tested were the Skunk2 Stage 2 camshafts. The Stage 2s are designed for serious performance enthusiasts. For maximum performance, cylinder head porting and polishing is recommended as well as higher compression or more displacement. On the primary lobe (before VTEC) the Stage 2 generated 14.04 more horsepower than the Type-S cams. After VTEC engagement the Stage 2 camshafts made an additional 17.8 horsepower over the Type-S units.

plan on building their engine and performing headwork. On the primary lobes the Stage 2 camshafts torched Type-S camshafts by 14.04 horsepower, generating 178.09 horsepower at peak. On the secondary lobes we saw the same issues found in the Stage

1 camshafts. But this time the Type-S camshafts performed better than the Stage 2 until 6600 rpm. The Stage 2 camshaft made a dramatic improvement over the stock Type-S camshaft registering 262.29 horsepower, an increase of 17.8. By reviewing

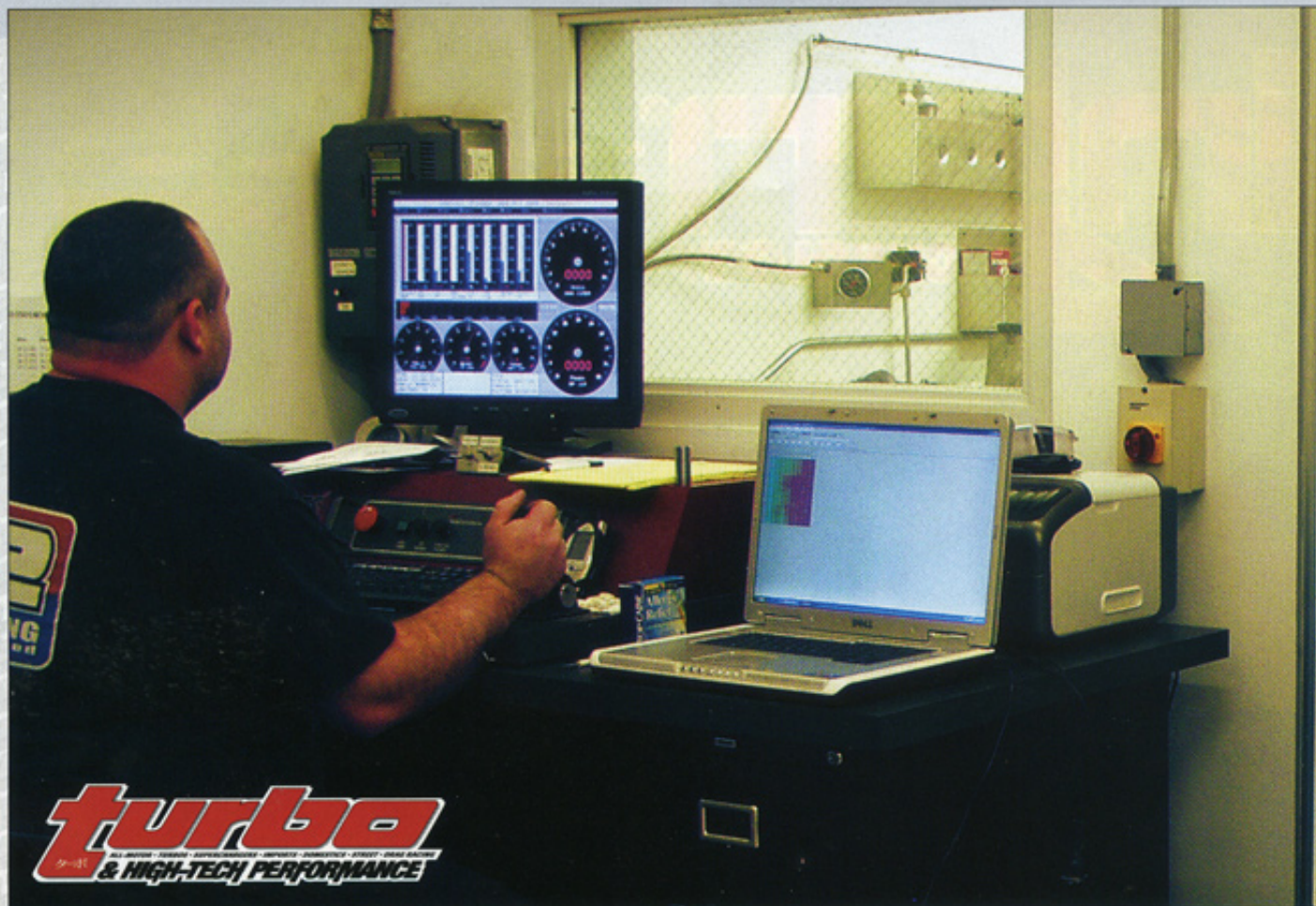
the dyno charts you can clearly see the Stage 2 camshafts would have continued to make more power but we didn't rev the stock Type-S camshafts past 8,000 rpm so we weren't able to reference the numbers any higher than that. This sort of dyno-proven

evidence is what consumers should expect out of all performance products they purchase. You want to know your money is being well-spent and that the purported horsepower gains are real. Skunk2's many hours and resources spent on researching, design-

ing, manufacturing and testing these bumpsticks has paid off. The dyno graphs here are proof positive of their product's worth and merit. They have set the bar high for other manufacturer's to follow, but it is a trend that you, the consumers, will benefit from.

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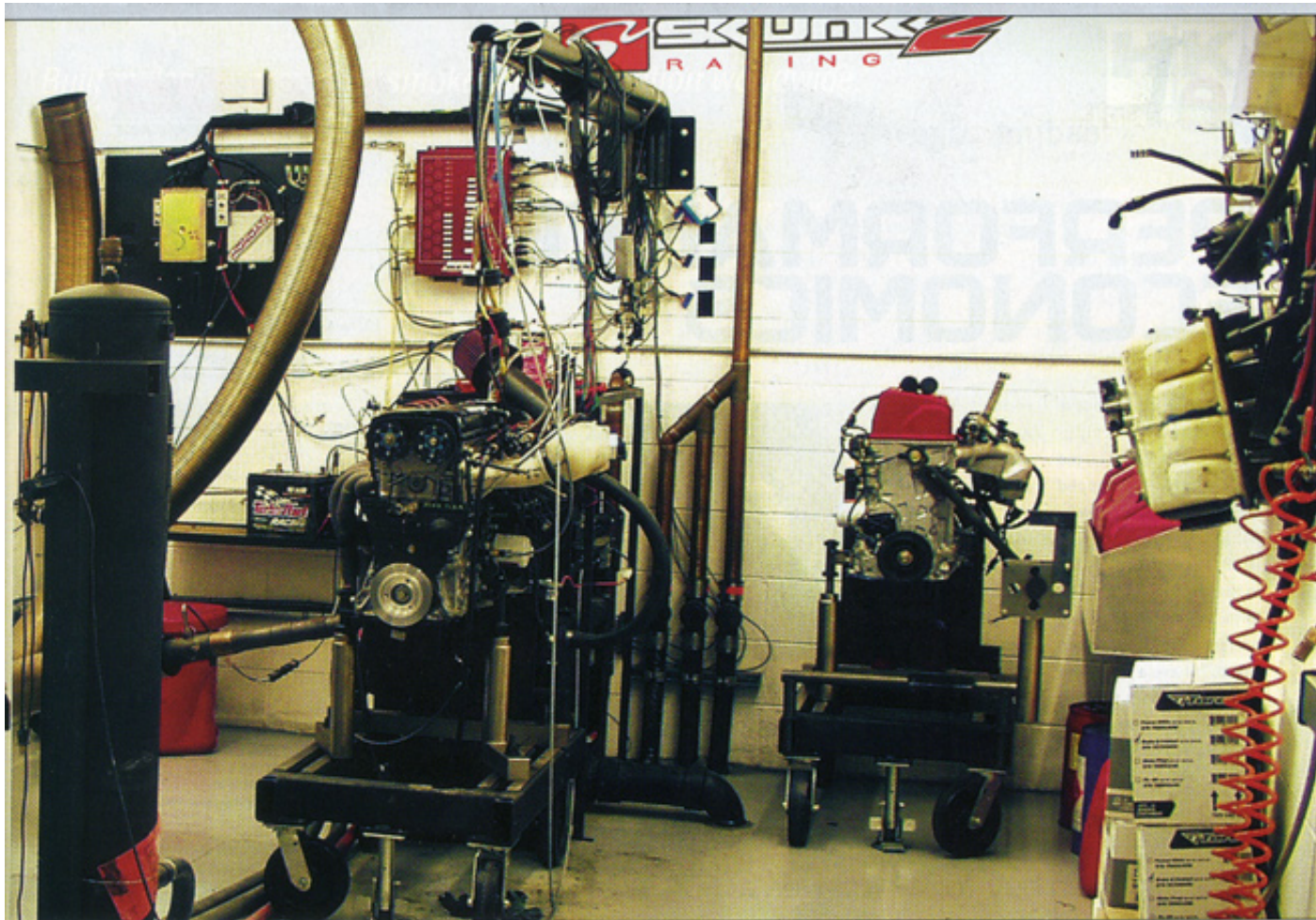
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