



By raising the intake ports on their High-Port heads, Kauffman Racing Equipment was able to straighten out the intake port and dramatically improve airflow to the back of the valve. Better flow is essential to making power, and these heads can flow: how's 630- horses on a pump-gas 467-inch Pontiac sound to you?

HIGH ON LIFE

Switching to high-port cylinder heads is easier – and less costly – than you might think.

By Jason Scott / Photography by Kevin Swaney

It's long been known that good cylinder head design is essential for maximum engine efficiency. The quest for improved flow was what led Chrysler to develop its famous "Hemi" head, which debuted in the 1950s. Ford was playing head games in 1964 when it released its "Cammer" 427 with its Single Over-Head Cam cylinder heads. And Pontiac's sister division, Chevrolet, made headlines in 1965 when it debuted its "porcupine head" Mark IV big-block, with its canted valves.

Pontiac didn't really start getting its head in the game (if you'll pardon the pun) until the 1968 introduction of the Ram Air II round-port heads, and the

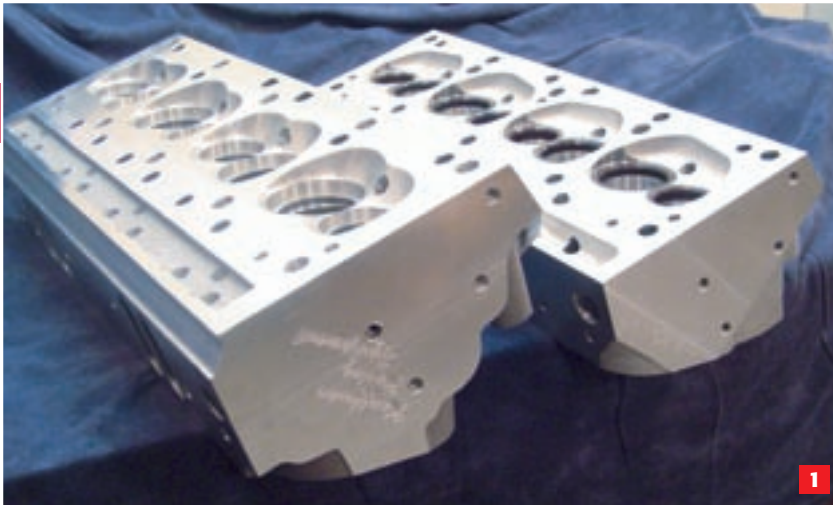
outrageous Ram Air V "tunnel-port" heads that arrived in 1969.

But a lot has been learned since those early days. One company that

has done a lot of pioneering work on Pontiac head design is Kauffman Racing Equipment, of Glenmont, Ohio.

The "Kauffman klan" had modified Pontiac heads for years, in their quest for ever more power, before they ultimately decided to create their own heads.

Their aluminum "high-port" head, which came out in 2005, features revised port designs to improve the line-of-site flow from the intake to the back-side of



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1 Here you can see the High-Port head (left) next to KRE's standard-height aluminum D-port head. The extra height is what makes it possible to lessen the curvature in the intake port, thereby improving the path to the valve.



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2 KRE's high-port heads are fully CNC machined to provide identical runner and chamber shapes and volumes. Out of the box, the heads will flow 330 cfm - about 15% more than typical aftermarket heads. They can be optionally CNC'd to flow 400 cfm, though that's really suitable only for racing conditions.



3

3 A full package includes the heads, stud kit, gaskets, oversize pushrods, rocker stud girdles, springs, spring cups, retainers and locks, valves, guides, and seats, plus some miscellaneous items.

the valve and ultimately into the cylinder. In "stock" trim, straight out of the box, the high-port heads flow approximately 330 cfm – a dramatic improvement compared to low-200 figures for most stock Pontiac heads. Or put in layman's terms: on a .030"-inch over 455 (463 cid), the high-port heads helped it develop 700 horsepower and an amaz-

ing 628 pounds-feet of torque. Sure, that's a race engine. But on a pump-gas powered 467-inch, a stock set of high-ports netted 632 horsepower at 5,900 rpm.

The benefits of high-port heads are pretty clear: more power.

Unfortunately, the drawbacks of raised-port heads are usually pretty

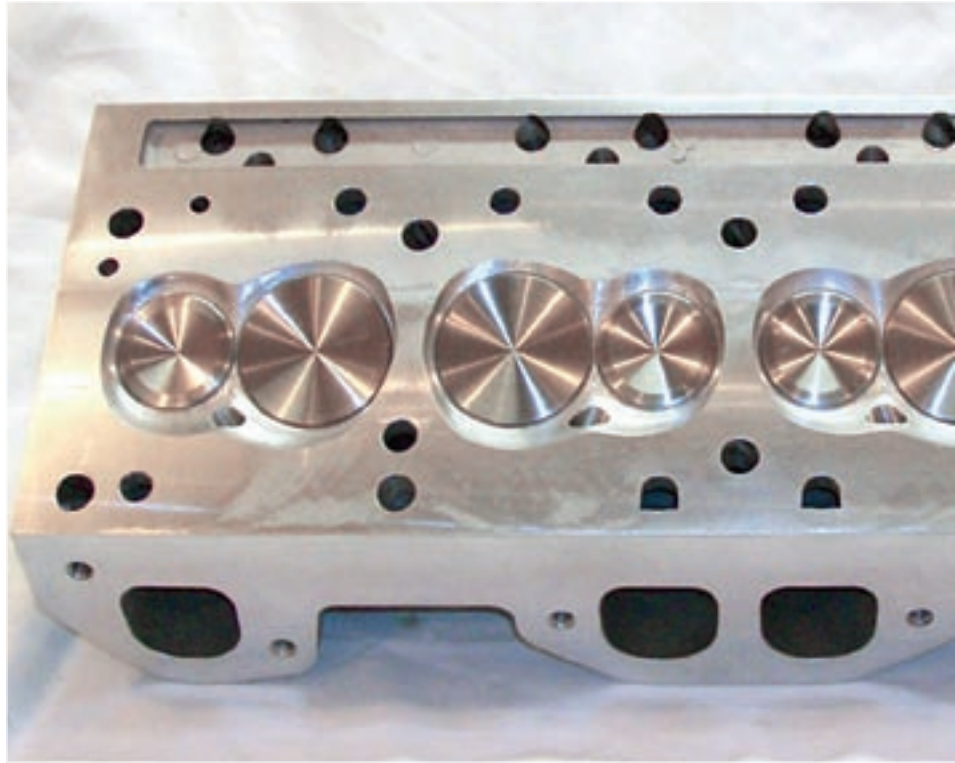
clear, too: they're a pain to install because they require a bunch of engine mods to function and a ton of custom parts to even fit. But not so with the KRE high-ports.

While raised port designs typically spread the intake mounting flanges farther apart, requiring custom intake manifolds to match, KRE compensated for this effect by casting the intake flanges to accept a standard intake, or any of the usual aftermarket models, like Edelbrock's Victor series that's a favorite with countless Pontiac racers.

We wanted to find out just what was involved in upgrading to a set of KRE high-port cylinder heads, so we checked in with the folks at Tin Indian Performance who took us through the process.

The Specs

KRE high-port heads come in three CNC'd chamber volumes: 56cc, 64cc and 80cc. The 55cc versions are ultra high-compression pieces, probably not well suited for the street. But the 64cc



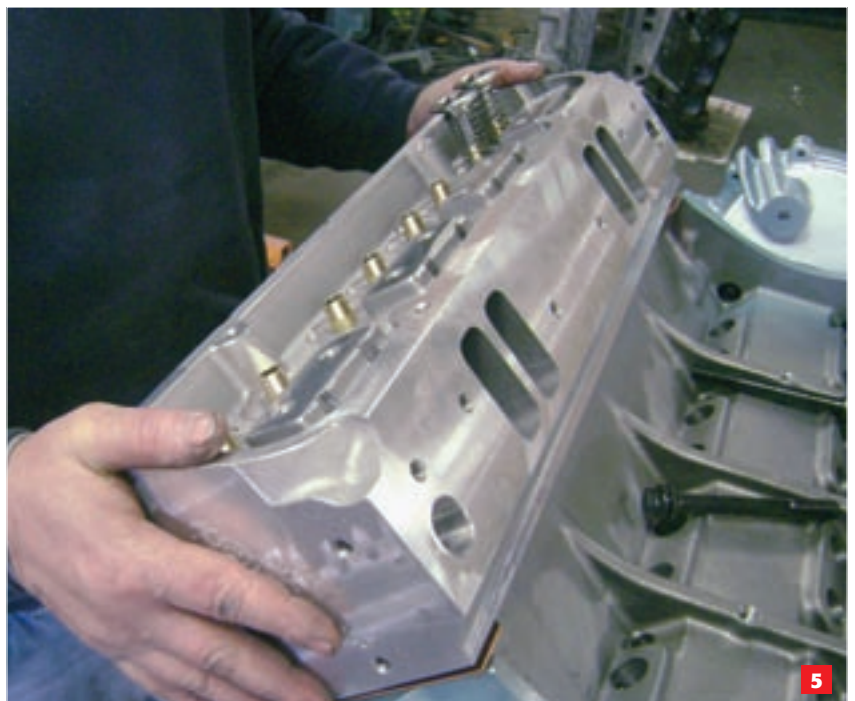
versions are similar to the volume of stock Pontiac heads from the muscle car era, and the 84cc version is intended for turbocharged or supercharged applications.

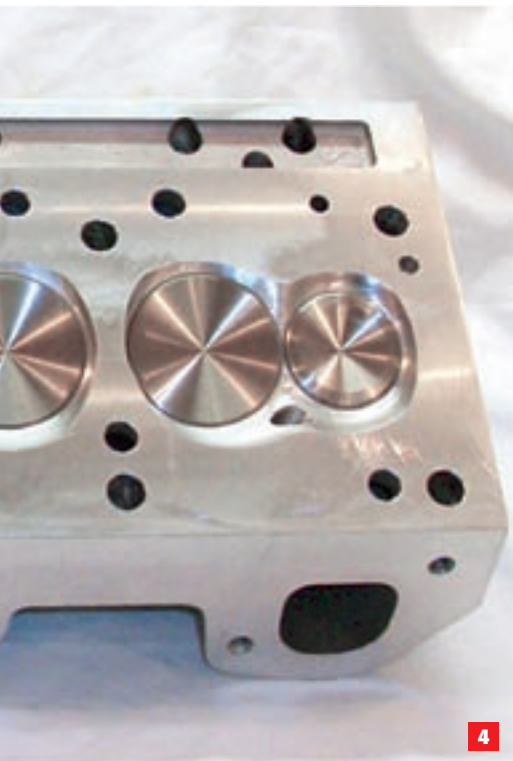
Fully assembled heads ship with Ferrea 1200 series valves that are 6.200-inch long, 2.20-inch diameter for the intake, 1.70-inch for the exhaust and they lay at a 14-degree angle. As a result of the valve sizes and chambers, they require a 4.150-inch bore diameter

– which is conveniently a stock 455 or a .030-inch over-bored 400.

As mentioned, right out of the box, they'll flow about 330 cfm at .700-inch of lift at 28 inches of pressure through the 277-cc intake runners. They've been modified to flow more than 400 cfm for all-out race applications.

A standard Pontiac round port exhaust configuration is used, to minimize exhaust system hassles.





4 The High-Port heads are available in several different chamber sizes to meet your target compression goals. Again, the chambers are fully CNC-machined and the valves are Ferrea 1200 series 2.20/1.70-inch pieces, and the spark plug angles are slightly revised. Note the exhaust ports, which are based on standard Pontiac port configurations to minimize exhaust system mating hassles.

5 To simplify intake selection, the KRE High-Port heads feature a cast-in intake spacer, which you can see here as the “overhanging” intake gasket surface. The extra material compensates for the increased height of the heads, which normally spreads the gasket surfaces farther apart. As a result, you can run pretty much any Pontiac intake on the heads, though KRE recommends an Edelbrock Victor series intake for series track action.

Doing the Math

The bottom line on the heads is \$2,400 per pair, complete – only about 25% more than other aftermarket heads on the market.

Bare versions (with seats and guides) are available for about \$1,500, but you should note that they require extension modification to be usable, not to mention all the parts and pieces to fill



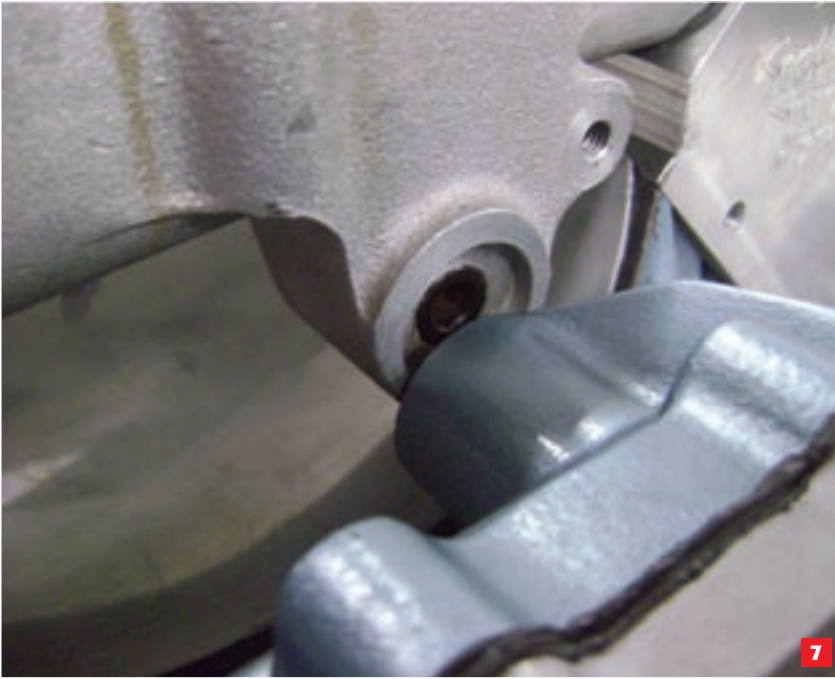
6 In fully-assembled form, the heads are ready to bolt on. The stud girdle kit is available as an option, but is recommended.

them.

Those prices, however, are not all-inclusive. There are a few other items that are needed, which do drive the cost up. Specifically, you'll need a KRE's High Port Stud Kit (\$155) as well as appropriate gaskets, like FelPro 1016's (\$74).

Due to the revised height of the high-port heads, you'll also need new pushrods. Without delving into the finer points of rocker arm geometry, many factors affect rocker arm geometry and pushrod length, so your engine builder will need to mock up all of the parts

before final assembly to determine the correct pushrod length needed, but in general it'll be between 10.000-10.450 inches, which will require at least .080-inch thick 3/8-inch diameter pushrods. Expect to drop about \$150 more on the custom pushrods.



7 While a standard intake will bolt up to the heads, it will no longer match up to the water pump cross-over in the timing cover, so you'll need to install one of the included pipe plugs in the intake and the other in the timing cover. Edelbrock's Victor series intake is already tapped to accept the plug, but other intakes and your timing cover may need to be tapped ... unless you use KRE's new aluminum timing cover, which is already tapped. The cross-over isn't really needed after the engine warms up.

Aside from a few miscellaneous items, like a couple pipe plugs to plug up the water pump cross-over, that's pretty much everything you'll need.

There are, however, a few recommended upgrades worth considering, namely KRE's stud girdle (\$140) to keep the valve train stable, and a set of lash caps (\$37), especially for solid-roller cam applications.

Even with all the accessories, the final cost of the heads and hardware is just under \$3,000 – or about half-again the cost of typical aftermarket aluminum heads.

But given the performance potential – which can easily be 150 horses or more than other aftermarket heads, the question boils down to: how fast do you want to go? ■

SOURCES:

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