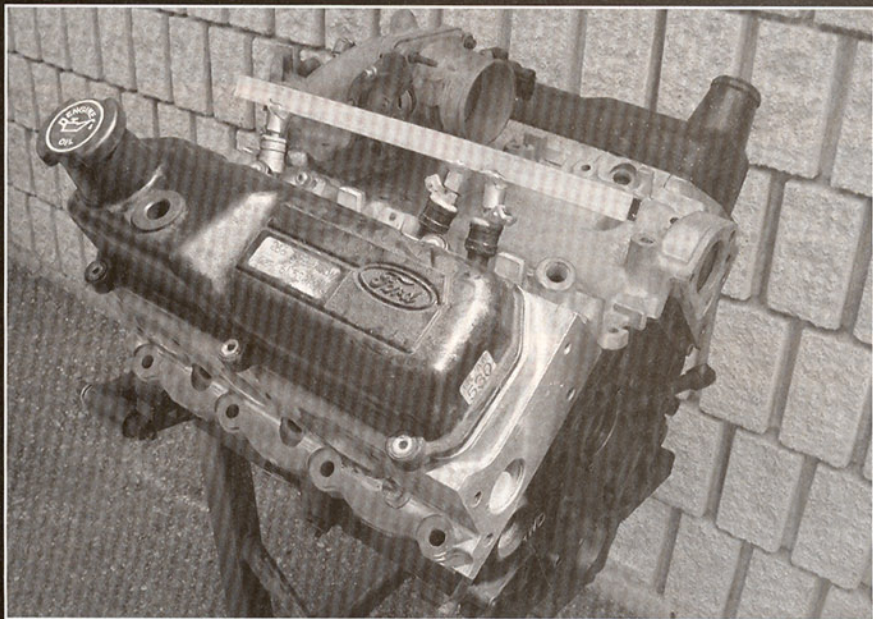


SIX therapist



Here's a dummed-up version of what Tom Morana's mind is capable of when it comes to spicing up the Mustang's 3.8 V6. How about a 4.4-liter short-block topped by wildy ported heads and a short-runner intake optimized for use with forced induction. He also has notably less radical options. If you have a 3.8 in need of energizing, you have a friend in Morana.

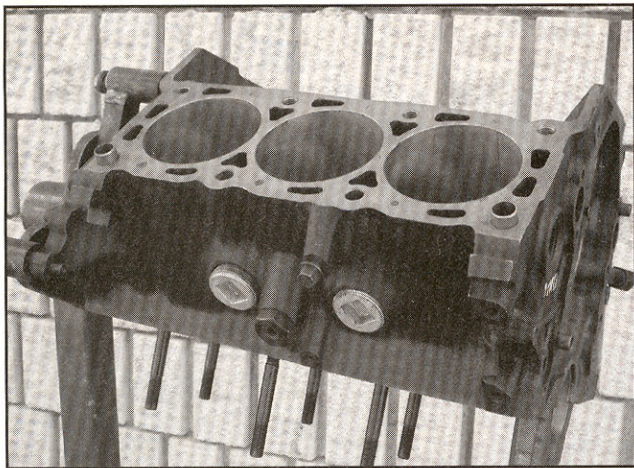
Is yours too small? Dr. Morana says stroking it helps. We're talking about your 3.8 V6, silly.

BY JACK RYAN
PHOTOGRAPHY BY THE AUTHOR

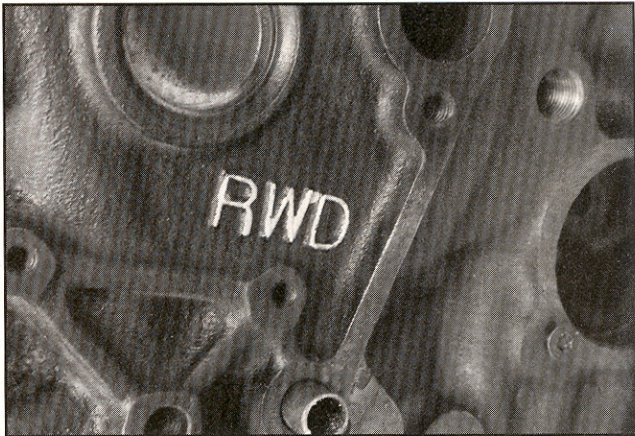
Let's face it: the Mustang's 3.8-liter V6 is an overlooked outcast when it comes to attracting aftermarket support. Other than the odd blower kit, and a few available bits that go upstream of the intake or downstream of the exhaust ports, there's generally not a whole lot out there to liven up those hundreds of thousands of base Mustangs roaming the planet. But fear not, six fiends, one man and his company specializes in the 3.8, and delve way beyond the bolt-ons to push the envelope of its performance. The man is Tom Morana, and his company is Morana Racing/Affordable Performance (moranav6racing.com), a place that is not afraid to mess with

six-cylinder mechanical innards. Morana is a huge fan of the iron-block/aluminum-head 3.8, and is, quite frankly, so obsessed with powering up both it and the 3.0 V6 that he is gradually trying to eliminate most other types of powerplants from his engine building and machining business.

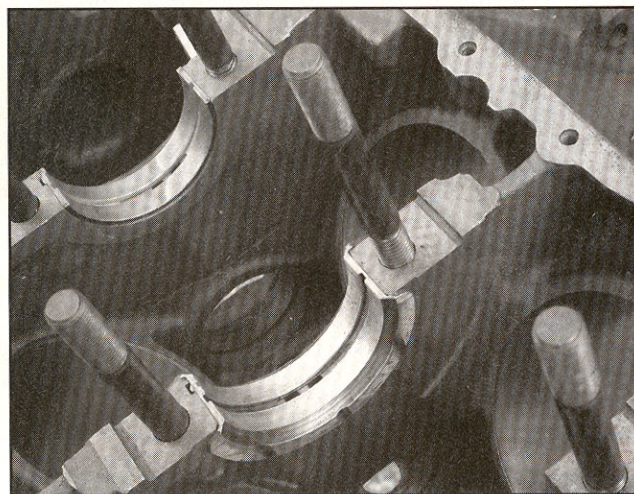
It's that extensive machining and assembly background that has given Morana an encyclopedic knowledge of such arcane data as rod lengths, journal diameter, compression heights, and rod/stroke ratios, and allowed him to concoct a horde of affordable stroker combinations for the 3.8, often based on off-the-shelf or modified components from a variety of auto manufacturers. He has variants for normal or forced induction, race or street use. His most recent experiments have resulted in no less than a 4.4-liter stroker, built around an offset-ground version of



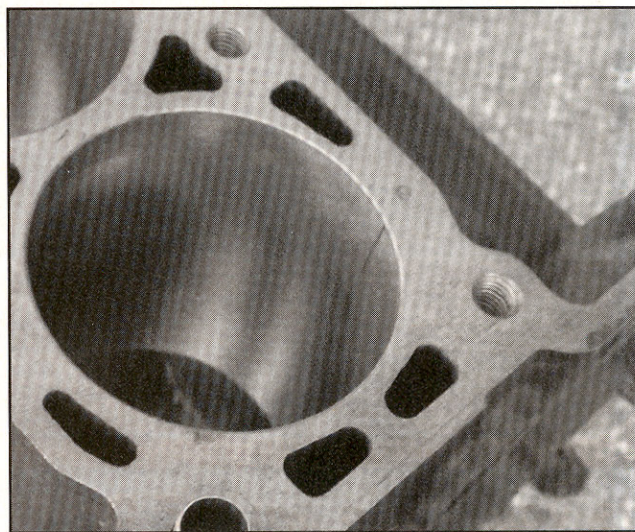
The starting point for a Morana Racing 4.4 stroker is an aligned and decked 3.8 block, preferably of '87 or newer vintage as these have a beefier bottom end and are configured for roller cams. Strongest of all are the ones fitted to the supercharged Thunderbird SC and Cougar XR-7, which wore gigantic main caps and steel cranks, but also had slightly different main journal diameter than run-of-the-mill 3.8s.



If searching the wrecking yards for a spare block, it's important to remember the 3.8 was also used extensively in front-wheel-drive applications like the Taurus. Though internally not much different than those found in a Mustang, FWD engines had different bell-housing bolt patterns and must therefore be avoided. Luckily they're easy to tell apart: the front of the blocks bear either RWD or FWD cast-in identification (Thunderbird Super Coupe blocks are marked "SC").



For the 4.4, Tom drills and taps the blocks for 1/2-inch ARP main studs, in place of the 11mm factory hardware. The stock main caps are then drilled to accommodate these larger studs. Though not yet done on the pictured block, the bottom of the cylinder bores also require some clearancing for the new crank/rod combination.



On top, the decks are likewise opened up to accept 1/2-inch ARP head studs (OEM is 11mm), and the cylinder bores are widened by 0.030 inches (about the limit of the 3.8's thin-wall construction) and finish-honed for moly rings.

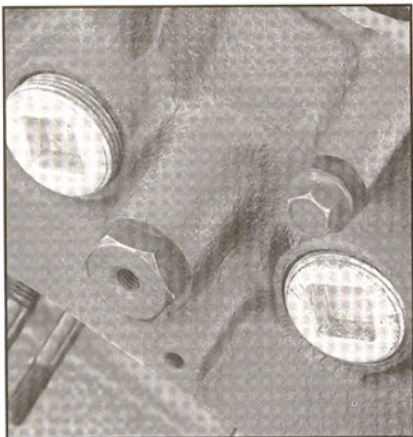
the cast-steel crank from the 4.2-liter pickup engine.

Though what goes into this 4.4 stroker is the main focus of our attention this time around, Morana's other specialty is whittling away on 3.8 heads and intakes—both the older conventional-port design as well as the '99-and-up split-port pieces. He offers a variety of porting and valve-size options from mild to pure race, and never tires of welding and grinding, and checking the results on a flow bench. Want numbers? Tom showed us intake ports said to flow well over 300 cfm, and he regularly hogs out the exhaust side to 200 cfm.

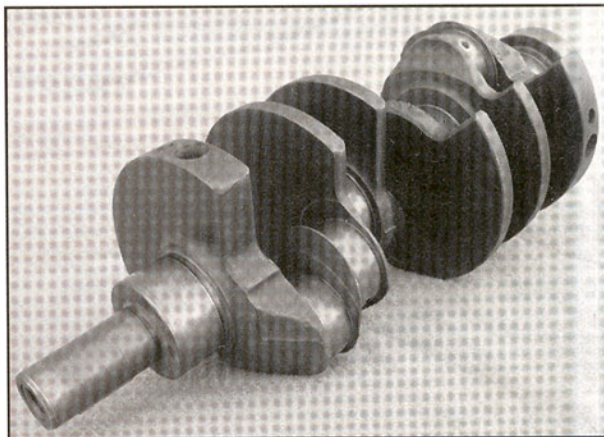
Morana also takes great pleasure in crafting the unexpected. Want to keep a stock appearance underhood but hide nitrous

nozzles beneath the manifold? No problem, Tom can fix you up. Got a high-boost blower lined up, and don't think you need or want all that stock intake plenum area and runner length? Just tell Tom and maybe he'll whip you up a short-runner intake combo like the one in our lead photo. Basically, if you've got a V6 project in mind, Tom's likely already thought or dreamt about how to make it happen.

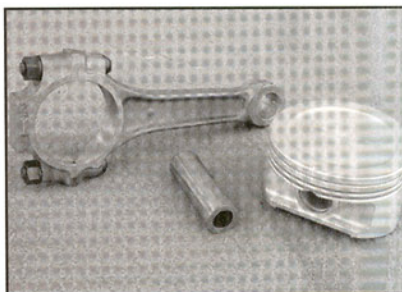
We're not here to try and convince you that the 3.8 is ever likely to power a contender in Pro 5.0 ranks, but if you've got one and would like to sharpen its reflexes either a little or a lot, a call to Tom Morana should be high on your priority list. Here's a brief sampling of what he offers. 🐾



(Left) In one final modification, Morana prepares the block to receive screw-in frost plugs (as found in the old Boss 302), preventing any unexpected coolant departure, but also providing just a bit more block rigidity.

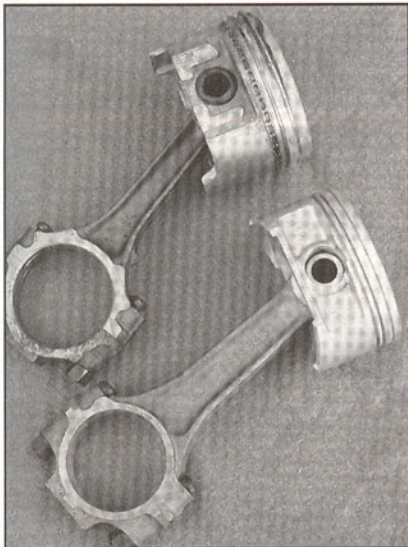
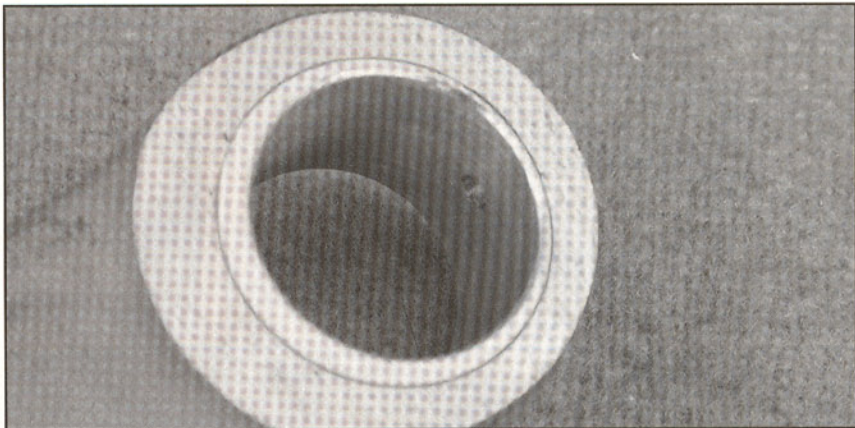


Normal 3.8 stroke is 3.390 inches. For his 4.4 stroker, Tom takes the cast-steel crank from the 4.2 truck engine (normally of 3.740-inch stroke) and offset-grinds it for a stroke of 3.925 inches. Another modification is widening the rod journal shoulders to accept a thicker rod. Normally internally balanced in the 4.2 engine, the assembly will be externally balanced when fitted to the 3.8 block.

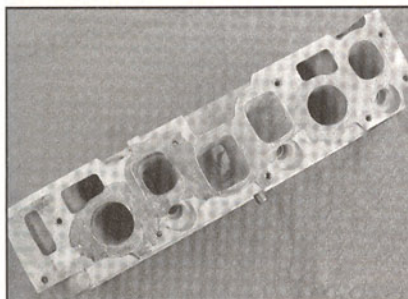


Tom strives to keep things affordable and one of the best ways to do this is to use factory parts whenever possible. His 4.4 reciprocating assembly combines 6.125-inch Chrysler rods with GM hypereutectic pistons as used in late-model supercharged Buicks (fly-cut, as necessary, for piston/valve clearance) rod bolts are replaced with ARP hardware. Of course, if you're planning a high-boost blower application and want custom rods and pistons, Morana can accommodate you.

The small ends of the rods are offset-bushed to achieve Morana's desired piston-to-deck clearance, and end-drilled for pin lubrication.

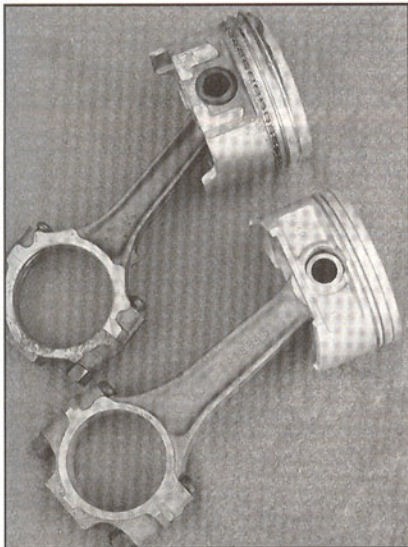
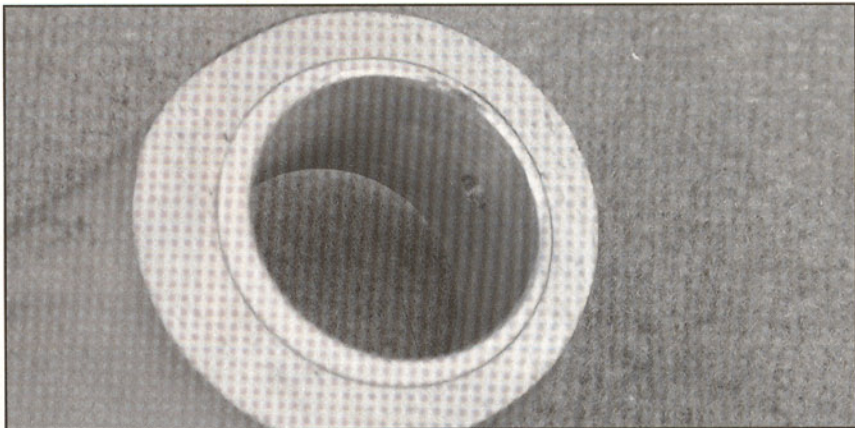


A stock 3.8 rod/piston combo is at the top, above Morana's pairing of Chryco rod and Buick blower piston. The stroker rod is not only wider, but also thicker at the journal end, requiring the crank mods we already mentioned. And it's not hard to see the GM piston has much less mass than the factory 3.8 version.

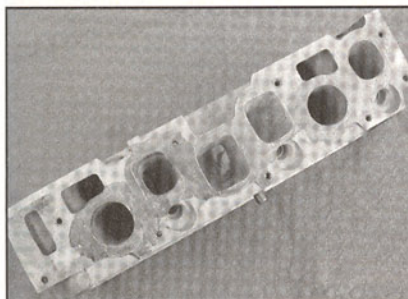


For any 3.8 variant, Morana offers both old-style and split-port heads ported to suit your requirements. On this split-port example, the two center intake ports have been opened up to flow over 280 cfm, in comparison to the as-yet-uncut outer ports, which Tom says flow about 170 cfm from the factory. When completed, this head will also improve from about 130 cfm on the exhaust side, to over 200 cfm.

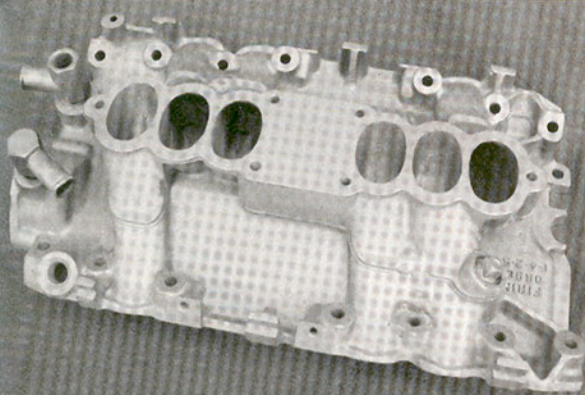
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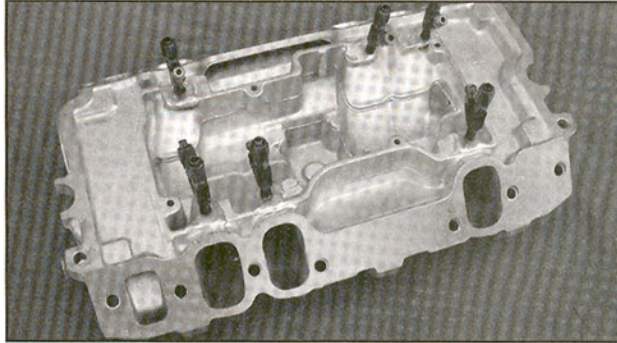
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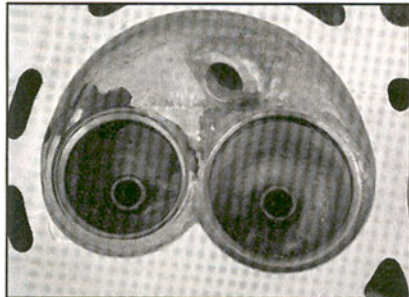
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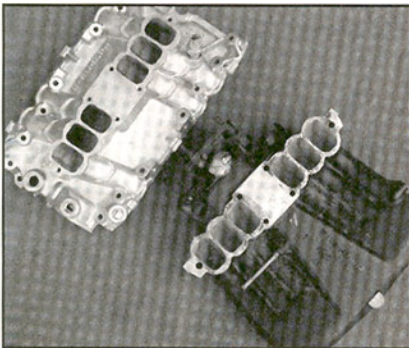
Here's a pre-'99 lower intake that has been ported, but still retains its oval port shape. Notice the presence of a little welding puddle here and there on the runners. We're not sure whether this was to support some runner reshaping ...



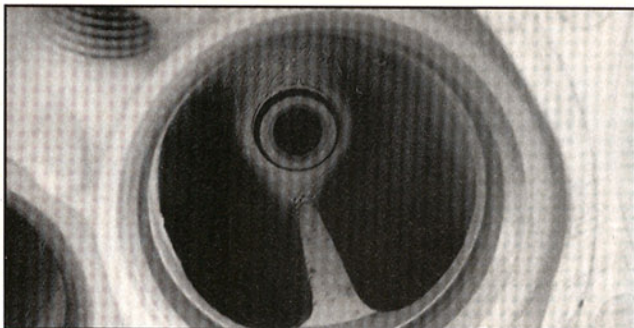
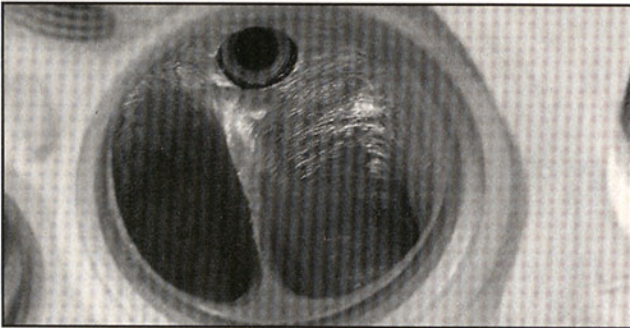
... or just to accommodate these nitrous jets hidden away on its underside. Interesting, yes?



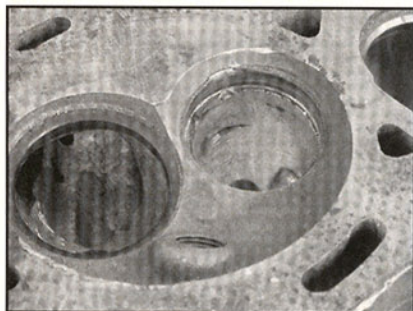
When it comes to valves, Morana likes to open the split-port's exhaust up to 1.65 inches (from the factory 1.45), but tends to leave the 1.86-inch intake valve alone. On the pre-'99 canted-valve heads, he can go as large as a 2.02/1.60 valve package, depending on application.



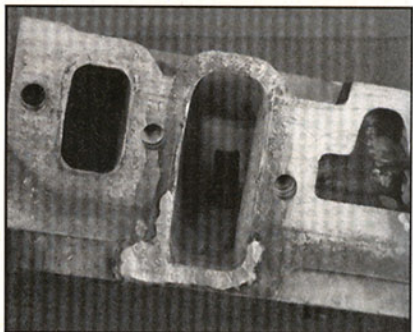
Another option for those needing maximum flow on the pre-split-port engines is to open up the intake combo to a rectangular port configuration, instead of the factory's oval shape. Morana offers a specific gasket for this pairing, and has phenolic-pacers for both rectangular and oval port configurations.



Looking through the intake valve opening on this same head, compare the (obviously unfinished) ported version on the left with the stock configuration on the right. Naturally, size isn't everything, which is why Morana will tailor his porting to your particular needs, be they blown or atmospheric, street or pure race.

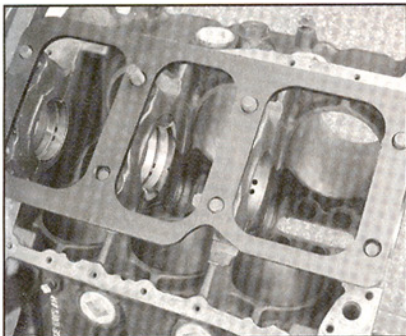
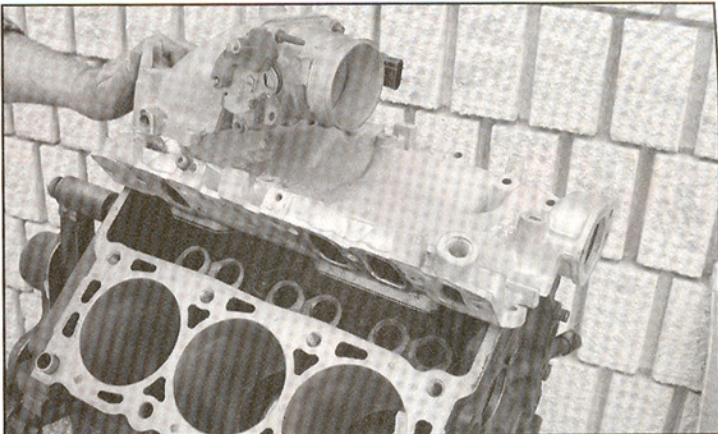


Alloy 3.8 heads are readily available in the scrapyard, so Tom likes to experiment. For instance, he got to wondering what would happen if you lowered the exhaust valve seat, as shown in this butchered trial version. In properly finished form, this experiment netted an additional 15-20 cfm. Is it something most people would bother with? Probably not, but this is the sort of thing that Tom just needs to know.

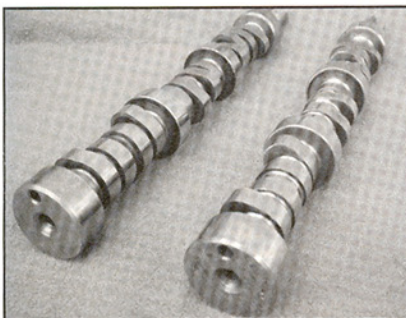


Here's another partially finished, and obviously wild, experiment, this time on an older conventional-port head. Looking for a place to park your Fiesta? This port is now so big and unobstructed you almost could. Tom doesn't limit his tool bench to just grinders; often, to get the configuration he wants, he has to first weld in some extra material to work with.

"The best thing that ever happened to the 3.8" is how Tom describes his latest intake setup, aimed at forced-induction users. A blower doesn't require much in the way of plenum area or runner length, so this idea combines a much-modified T-Bird Super Coupe lower and a 5.4-liter truck throttle-body elbow. Combined with Morana's new fuel rails (a single prototype of which is shown on our lead photo) this setup leaves everything very accessible, and loses about 30 pounds in the process. Call Morana for details.



Where else can you go to get a stud girder for your V6? Tom has 'em for both the 3.8 and 3.0 families.



When it comes to cams, Tom stocks no less than five separate hydraulic roller grinds for the 3.8 family, and can supply virtually anything a customer might want in a solid roller.

S O U R C E S

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