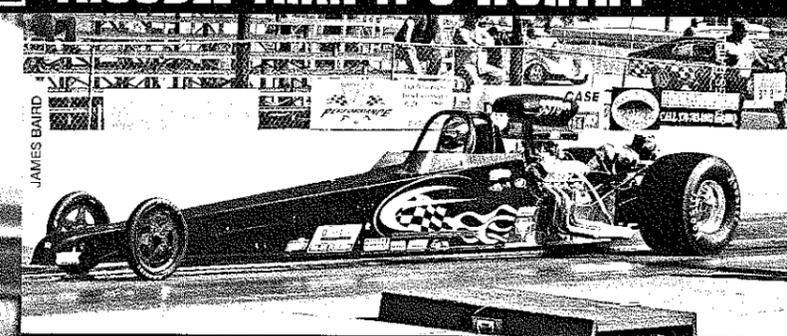


FUEL FOR THOUGHT

IS E85 THE FUTURE, OR MORE TROUBLE THAN IT'S WORTH?



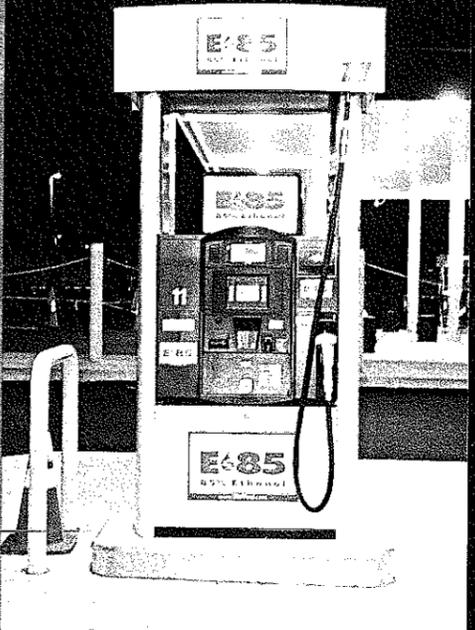
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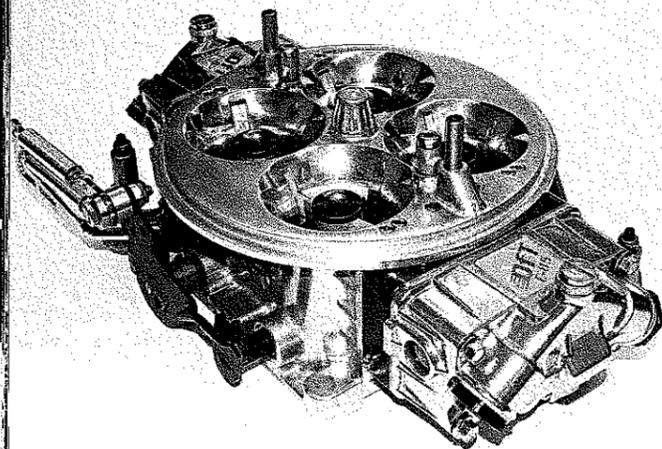
With environmental concerns popping up all over the place, one of the popular ones has been the use of oil-based fuels such as gasoline. It has long been known of the emissions problems related to gasoline and the car manufacturers have attempted to curtail the problems with a moderate amount of success. However, in the search for alternative sources of power for our future, one type of fuel has been making headway. And while most high-horsepower race engines will use a specifically manufactured "race fuel", E-85, or ethanol, has been used with some success in the lower classes. But is it really worth looking into?

Ethanol differs from Methanol, which is the type fuel used when we describe an engine as being run on alcohol. While Methanol is manufactured from natural gas, Ethanol is derived from the fermentation of corn and is best known as the type of alcohol used in alcoholic beverages.

For now, E-85 seems to stay front and center in the news. Often blamed for the run up of corn and grain prices thereby driving up the price of virtually every grocery item worldwide, it has its proponents

Forty-three states in the USA presently have E-85 (ethanol) refueling stations, with the majority located in the Midwest. Where E-85 is available it's an extremely attractive low-cost alternative to racing fuel. While the pricing closely resembles gasoline market prices, it's still cheaper than race fuel, unless you realize you'll be using approximately 30-percent more fuel. And of course, purchase at the pump rather than in bulk can cause a variation in blend percentages, which ultimately affects carburetor calibration.

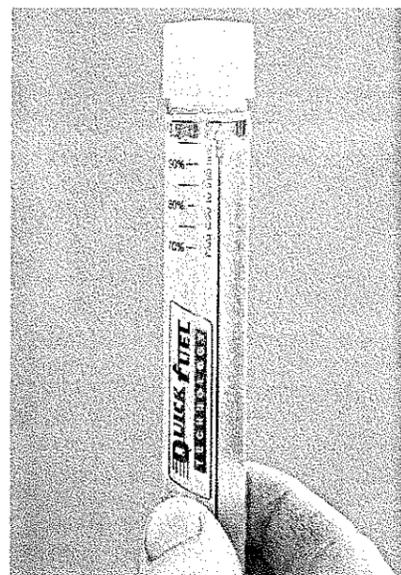




Because ethanol is as corrosive as methanol, the same corrosion protection necessary for methanol is required for ethanol. Quick Fuel Technology's E-85 line of carburetors utilize green anodizing on certain components to indicate their compatibility with ethanol.



In addition to offering complete E-85 carburetors, Quick Fuel has a couple of conversion kits, specifically designed for race only carburetors. They also offer a pair of metering blocks that can be used as the foundation for converting existing gasoline carburetors if an individual is so inclined.



E-85 describes the fuel content as 85-percent ethanol and 15-percent gasoline, but a common misconception is that is the normal ratio, while in truth it's actually the maximum percentage. This handy tester from Quick Fuel will measure the real percentage and in the case of the fuel we tested, showed the ethanol percentage to be over 90, leading credence to the fact of variations in blend percentages. This can cause calibration problems for carburetors.

and an increasing share of detractors. Many have drawn a direct correlation to the escalating use of E-85 to an increase in the cost of corn. Like most other crops, there are several gradations of corn. The production of ethanol, contrary to popular belief, should have zero impact on corn supply for human consumption because it uses feed stock grade of corn.

Still, leaving politics and the environmental elitists out of the equation for the moment, it would appear that at least

for the next several years the E-85 fuel program is going to continue to receive subsidies from Federal and State Governments to expand the production of this alternative fuel. That means more production and, at least for now, a lower price-per-gallon contrary to the cost of the raw materials.

Boiled down to the simplest elements, E-85 describes the fuel content: 85-percent Ethanol, 15-percent Gasoline. A common misconception however is that is the normal ratio, quite the contrary.

E-85 indicates the *maximum* Ethanol percentage at 85. It can be lower, and in some cases much lower than the stated 85-percent. The percent of gasoline can increase for any number of reasons with the most often cited being better starting during cold weather. But there does seem to be quite a bit of variation in blend percentages (as monitored at retail pump locations) and that would suggest at least for now there are likely some transportation and distribution issues keeping the mix ratio in the correct relationship.

Steve Burns of VP Racing Fuels said, "Fuels containing ethanol cannot be pushed thru pipe line systems. The mixing must be done at the terminal." Which could partially account for the variances.

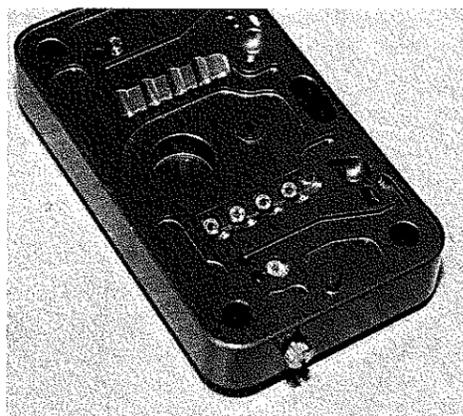
"At VP," added Burns, "we've been working on ethanol-based fuels for the American LeMans series for four years now in both a 15- and 85-percent blend. As of yet, neither has been able to perform with any of our current racing fuels."

Quick Fuel Technology has been one of the carburetor companies gearing up to supply aftermarket car-

buretors and components to utilize E-85. They also have available a kit to enable you to accurately determine what the Ethanol/Gasoline ratio actually is to take some of the potential guess work out of using this fuel full time for a specific application.

Marty Brown of Quick Fuel says, "A change in ethanol percentage can and will, if it deviates far enough, change the engine's calibration requirement. As the ethanol percent goes down below the baseline 85-percent, the engine sees a richer mixture due to more gasoline and less ethanol."

The "music" to any performance enthusiast's ears might be this: When everything is correct, E-85 using conventional unleaded pump gas has an octane rating of 105. It's been a long, long time since you could drive into a gas station and actually pump a product that contains



All the internal fuel passages within the carburetor must be larger. However, that fact isn't limited to just jets and emulsion bleeds. Larger needle and seats with stainless steel tips must be utilized to keep the carburetor bowls full of fuel. In addition, the entire fuel delivery system must be capable of the increased fuel requirement.

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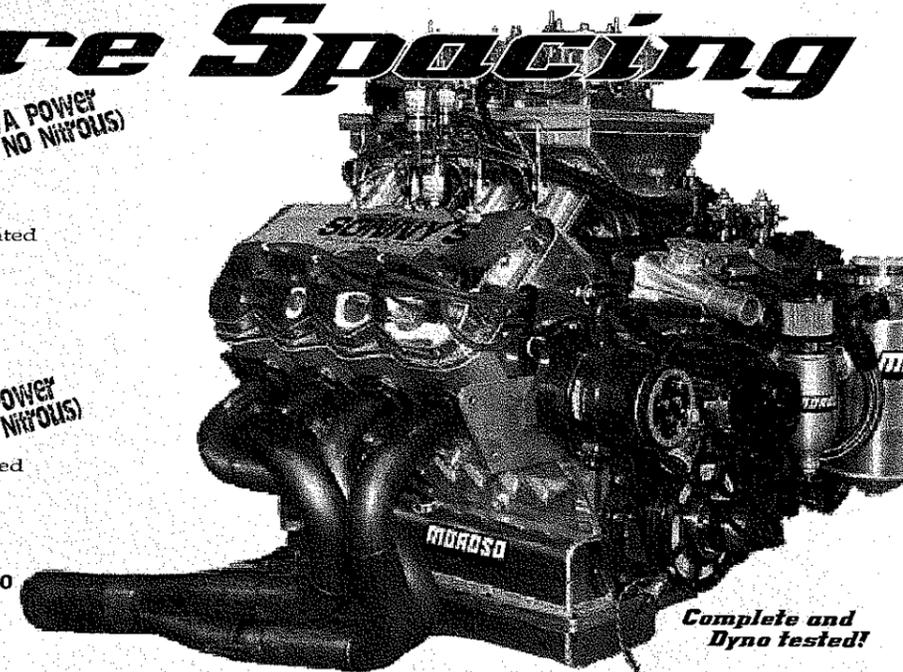
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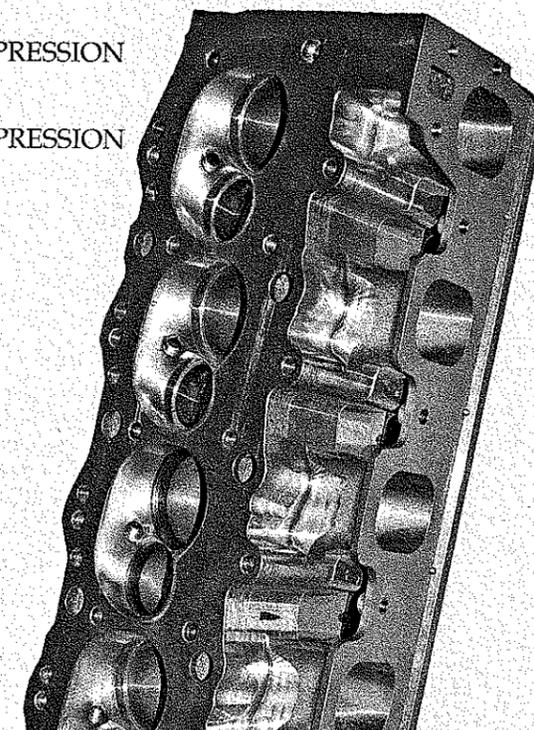
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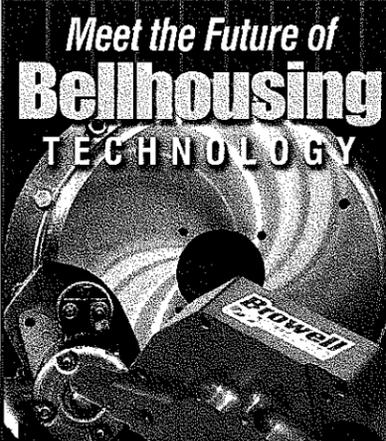


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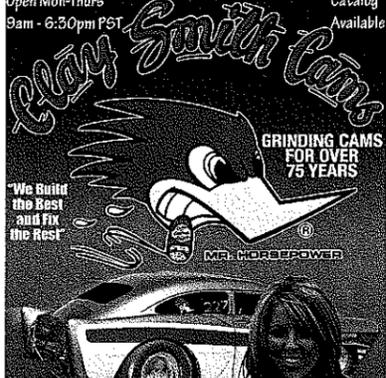
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For specialty applications that require more compression like pre-'73 muscle cars, street performance cars with modified engines or local racing classes it looks inviting. E-85, where available, is a low cost alternative to increasingly more expensive racing fuel or at the very least, a host of additives necessary to keep the octane level high enough to keep the engine parts happy.

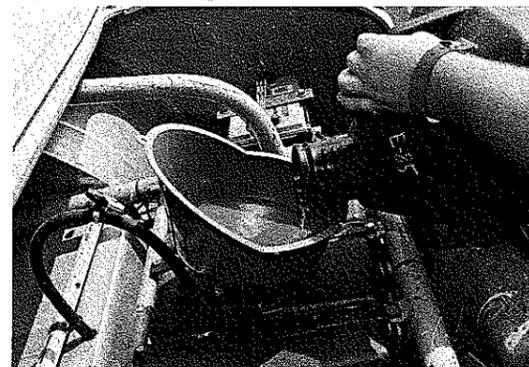
Burns says, "E-85 is a very slowing burning fuel, even as opposed to straight methanol. And of course you have the uncertainty of the mixture itself. E-85 is meant to vary between 70- and 85-percent, but our testing at stations in Texas and Indiana show the real world differences to be much greater than that. Current production cars capable of accepting E-85 are able to change the fuel mixture for varying percentages, but a carburetor is a different animal."

As with any alcohol-based fuels there are some issues to deal with. First, the engine will consume approximately 30-percent more fuel than with gasoline. This requires that all the components in the fuel delivery system must be equal to the higher fuel volume demand.

Second, all the internal fuel passages within the carburetor must be larger. This includes some things you might not usually think about like large needle and seats with a stainless steel needle tip. Likewise, the Nitrophyl (black cellular construction) floats will eventually absorb fuel and then sink, resulting in flooding. Any of the accelerator pump diaphragms should be exchanged, discarding the black rubber diaphragms in favor of the green GFLT (a type of Viton material) diaphragm material that holds up far better to alcohol-based fuels. Finally, never use a paper filter in the fuel system as the Ethanol will destroy it in short order, plugging up the whole system.

Burns says, "Ethanol is as corrosive as methanol. Most of the same corrosion protection needed for methanol is needed for ethanol. The new factory production cars come equipped for this protection, but our current racing fuel systems will need the methanol upgrades."

Brown says, "We've been working with a number of racers who are using E-85 with a good amount of success. That's the



Regardless of the type of fuel you use, cleanliness is an important facet. A clean jug and only a screen-type filter however, is a must with E-85.



Ethanol carries an octane reading of 105, certainly "music" to any enthusiast's ears. However, while it's possible to make very impressive horsepower numbers with low compression, compatible with today's pump gas, it's usually far more cost effective, horsepower vs. dollars spent, to increase the compression ratio and use a high octane fuel.

reason we came out with a whole variety of E-85 components. It's definitely not for everyone, but it's a good alternative."

Obviously it's difficult to cover both the fuel and the parts needed to take advantage of E-85, but clearly there is a great deal of information available on it and the flow of new information as our look for alternative fuels seems endless. **DRA**



SOURCES

QUICK FUEL TECHNOLOGIES
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If engine parts were labeled like breakfast cereals, you'd see the ingredients that set Dart apart from the competition. Our recipe for performance includes premium quality alloys: C355-T61 cast aluminum, 6061 billet aluminum, and compacted graphite iron.

You can't judge an alloy by eye. That's why we have our own metallurgist on staff who makes sure that the materials in Dart engine blocks, cylinder heads, and intake manifolds meet our specifications and standards. We use only virgin, aerospace quality alloys. If the metal's not good enough for Dart, the foundry sells it to someone else.

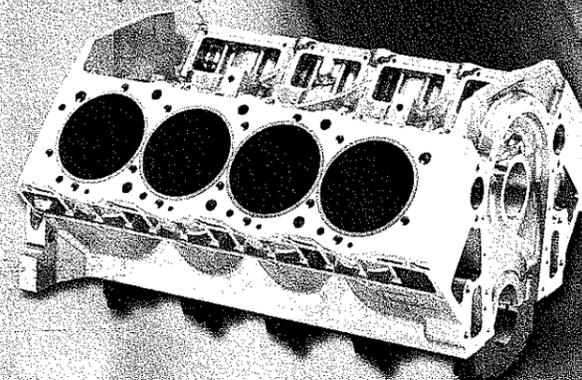
What's this mean to Dart customers? Our cast aluminum components have higher yield strength and more ultimate strength at elevated temperatures, greater purity, more resistance to cracking, better pressure tightness, and are easier to repair than cheaper alloys. Our optional compacted graphite iron (CGI) engine blocks are stronger and have more fatigue resistance than gray iron, at no increase in weight. Our CNCmachined forged aluminum billet blocks are heat-treated to withstand the extreme stress produced by superchargers, nitrous oxide, and outrageous power adders.

When it comes to engine components, it's what's inside that counts. And you can count on Dart to use the best materials available.



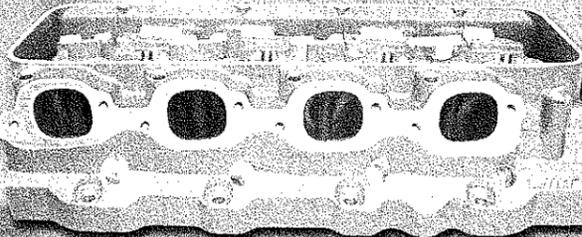
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Machined on precision CNC equipment from a solid billet of aerospace aluminum, Dart billet blocks offer virtually unlimited choices in bore centerline, deck height, bore diameter, and lifter and cam options. After machining, the block is heat treated for strength and reliability. The Dart billet block is available with or without water jackets. The only limitation is your imagination.

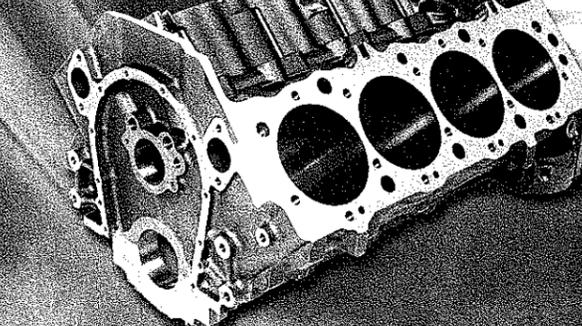


Big Chief Heads

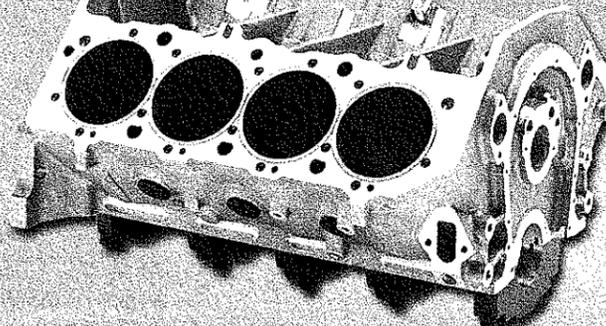
The original Dart Big Chief put the spread-port design on the map, winning three NHRA Pro Stock championships before being banned from the class. They have since dominated in sportsman classes since their introduction, and we have continued to revise the design with the latest Pro Stock technology.



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