

Backyard Big-Block Swap

A PV4 reader makes a change for the better



BY JOHN OSGOOD

Editor's Note: There is little doubt that the street truck performance industry began in the backyards and garages around the country. Understanding wives and friends who make late afternoon runs to parts stores and sons and daughters who hand a wrench to the greasy paw sticking out from under the truck are all a part of street trucking's roots. And despite the advanced technology of today's machinery, there is still a place for the weekend mechanic and the backyard engine swap. The following story traces the progress of one PV4 reader, John Osgood, a government attorney and avid street truck buff from Kansas City, Missouri, who decided to undertake a backyard engine swap of his own, relying on a good set of hand tools, good ole American ingenuity and an average bank balance.

Have you ever tried to merge into 55mph traffic from a slow-moving freeway entrance ramp or pass someone going 40 on a two-lane, particularly if you're carrying a payload? If you have, then you know that the little 200ci Chevy 90-degree V-6 is a

woefully inadequate powerplant—even for the new-generation, smaller, lighter El Camino pickup. And, unless you are willing to suffer the aggravation of an outrageously lumpy idle, detonation and all the other drawbacks of trying to coax a little more usable torque and horsepower from Chevy's new mini-Mouse, the only solution is a transplant.

With this in mind, John undertook the task of stoking power to the El Camino as befits its proud heritage. The subject Chevy El Camino is 1979 vintage and came factory equipped with the 200ci V-6 backed up by a Saginaw three-speed and 10-bolt rearend. In 1979, Chevrolet offered its high-torque 305ci V-8 as an optional engine package for the El Camino. For reasons that will become apparent, the most practical choice for a swap, particularly from an economic standpoint, is probably a late-model small-block V-8 with side engine mounts. However, subscribing to the theory that "there is no substitute for cubic inches," John opted for Mark IV Rat power.

There still are literally thousands of low-performance Rat motors in sal-

vage yards all over the country. Most of these oval-port motors can be picked up for a reasonable price, and compared to today's engines, offer me-

COST CHART

| | |
|---|-------|
| Salvage engine | \$100 |
| Cam and lifters | \$135 |
| Machine shop work and labor | \$180 |
| Parts | \$120 |
| Used bellhousing | \$ 35 |
| New flywheel..... | \$ 90 |
| Clutch assembly | \$ 85 |
| Clutch fork..... | \$ 15 |
| Starter | \$ 38 |
| Radiator (exchange)..... | \$ 35 |
| Torch work | \$ 15 |
| Hoist rental (twice) | \$ 30 |
| Motor mounts..... | \$ 30 |
| Misc. gaskets, hoses, clamps, carb kit, fuel lines, etc. | \$ 75 |

SUB TOTAL **\$983**

Commercial dual-exhaust system

.....**\$205**

(included modification of cross member)

GRAND TOTAL**\$1188**

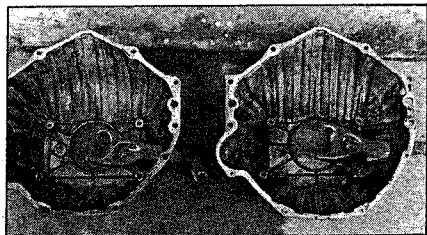
Profit from sale of V-6**\$300**

NET COST OF CONVERSION**\$888**

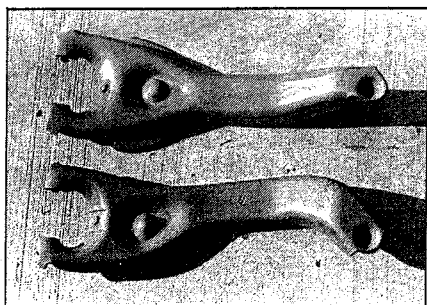
John's El Camino now uses a 1981 Chevrolet 1-ton truck bellhousing (Part No. 464697, a salvage piece), which is large enough to clear the Mark IV flywheel. Fortunately, unlike the older Rat motor bellhousings, this 1981 truck piece has material cast in a position so that the stud can be relocated to the offset position!

Rather than relocating the stud, John chose to use the existing center stud and stronger Camaro-style straight clutch arm. This necessitated drilling a hole one and seven-eighths inches above the existing hole for the adjustment rod on the cross-shaft. This decreased the radius of travel of the adjustment rod during activation of the clutch; however, according to John, adjustment and clearance were no problem. Should this cause any unexpected throwout bearing wear, he intends to relocate the clutch fork stud on the truck housing and use the stock clutch fork and linkage from the El Camino.

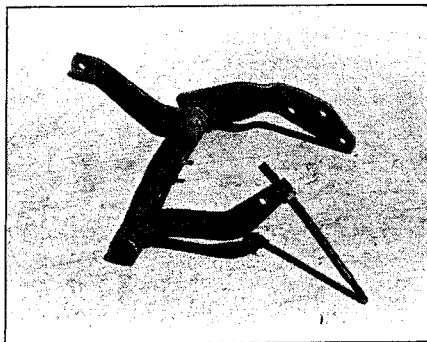
The Rat was fitted with a rebuilt OEM-type 11-inch clutch and a new "externally balanced" 14-inch



6. The stock El Camino housing (left) has the stud for the clutch arm off-center, and the arm has been redesigned to provide more under-car clearance. The larger housing on the right is from a Chevy 1-ton, and it is stamped with Part No. 464697. The clutch arm, Part No. 340278, is in the straight style used almost universally on the older Chevrolet supercars.

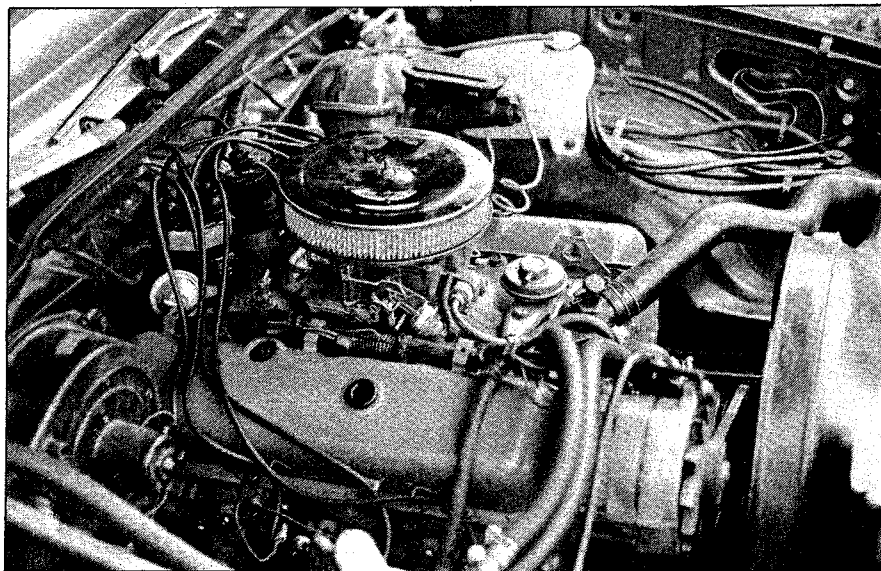


7. Above—clutch arm from older supercars, Part No. 340278. Below—clutch arm from the El Camino, designed for an offset stud and bent to provide more clearance for the adjustment rod.



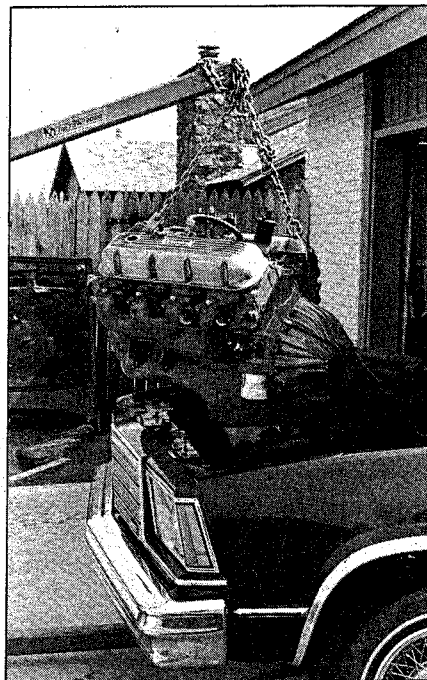
8. Cross-shaft with adjustment rod in place. Hole immediately above the adjustment rod nut is a calibration hole. An additional hole was drilled one and seven-eighths inches above the stock hole to work in conjunction with the different clutch arm used in this swap.

flywheel, and it was mated to the factory Saginaw three-speed. TRW Chevy V-8 small-block motor mounts were bolted to the frame using the existing predrilled V-8 frame holes. Small-block engine stands, Part No. 3993722, were bolted to the Rat for a test fitting. The engine refused to sit fully on the frame mounts by about one-eighth of an inch, so the V-8 frame holes were slotted to give approximately one-eighth inch of adjustment on each side. The 454 was then dropped into place and the frame mounts tightened. The fit was perfect and the transmission, clutch shaft and other parts lined up for a factory fit. John said that if you are fortunate enough to find big-block cups and frame mounts to match, the slotting procedure is probably unnecessary, but some experimentation would be in order.



10. The motor is a perfect fit, and with the low-profile stock intake, hood clearance is no problem. With the Rat tucked away, a sleeper is born.

Minor adjustments were made, hoses and idiot lights connected, a fuel pump return line fabricated, and the engine came to life. The motor now has about 900 miles on it and the little red El Camino is rapidly earning a reputation as a real "sleeper" on the Kansas City cruise circuit. The total cost for the project, including the engine rebuild and a new dual-exhaust system, was kept under the one thousand-dollar mark. Not bad for 350-plus horsepower at the flywheel and a machine that should turn the quarter-mile in the mid-fourteens with street tires! •

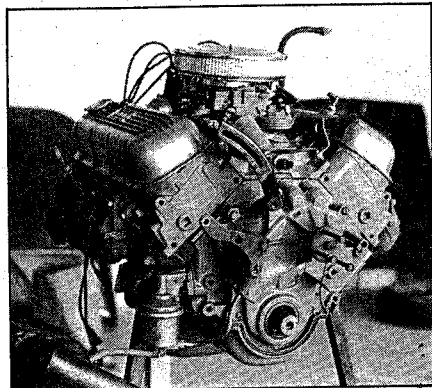


9. The moment of truth. The big Mark IV is lowered into the engine bay of the El Camino for a test fit. The Saginaw three-speed is mounted behind a rebuilt 11-inch factory clutch.

BIG-BLOCK ENGINE SWAP

continued

ga horsepower and torque, a smooth idle and good, dependable service if kept within reasonable rpm limits. John shopped around and was lucky enough to find a 454 "smoker," which he liberated for \$100. Teardown of the engine was an additional surprise—cylinder wall wear was negligible (broken rings accounted for the smoking), and the crank did not require grinding. The short-block was professionally assembled by a local speed shop, which also ground the valves. New hydraulic lifters and a 272-degree cam with slightly more-than-stock lift were installed for fresh performance, making the engine "think" more compression. Actual compression was left at a modest 8.25:1 by using the original pistons



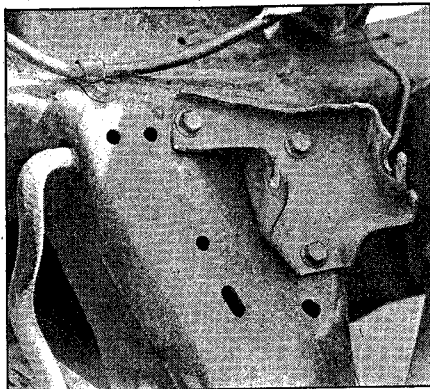
1. A \$100 "smoker" from the salvage yard, that, except for a slightly warmed-up camshaft, is stock down to its low-profile intake and Rochester Q-Jet. But don't let that fool you, because by today's standards, it will still pump out neck-jerking horsepower.

and Fel-Pro gaskets. The remainder of the engine is stock, including the factory exhaust manifolds.

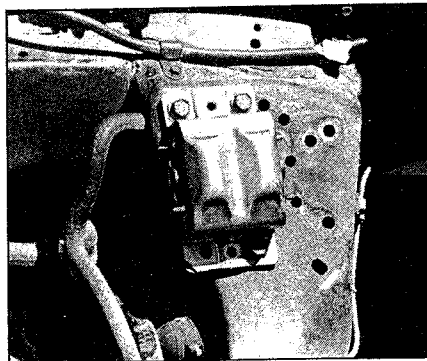
Every engine swapper knows that a critical step in the process is the taking of very accurate measurements. John spec'd everything and also consulted the engine blueprints for the V-6, the small-block V-8 and the Rat, which appear in the current edition of the "Chevy Power" manual. He found that the distance from the rear face of the block to the engine mounting bosses for the front mount on the big- and small-block V-8s were the same. All three blocks are tapped at the same location, relative to the rear face of the block, for a clutch cross-shaft stud. To compensate for the much shorter length of the V-6, Chevy uses an entirely new style of side engine mount,

obviously designed to utilize existing frame position and design, while still placing the little V-6 in the same relative position to the firewall and transmission as its bigger brothers. With this information in hand, John examined another '79 El Camino equipped with a small-block V-8 to determine which predrilled frame holes to use.

Removal of the V-6 was straightforward. It presented no problems and was accomplished with the aid of a rented hoist. The single-core V-6 radiator was removed and exchanged for a four-core unit to provide adequate cooling. The stock radiator shroud is a two-piece affair and is stapled together. The V-6 shroud is instantly transformed into a V-8 shroud by removing the staples and eliminating about six inches or more of shrouding.



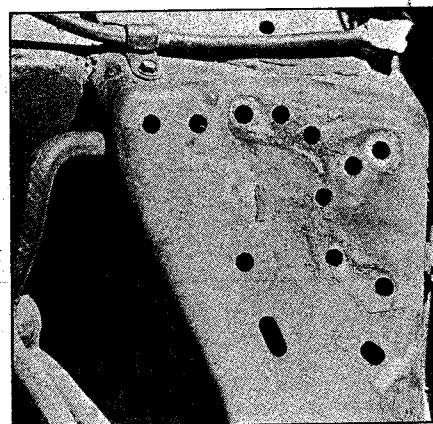
2. Chevy has sufficiently offset the frame mounts for the little V-6 so that the engine has the same relative position in the engine bay as the V-8. This eliminates any transmission/clutch alignment problems. It also makes for universal positioning of the clutch cross-shaft stud on the various blocks.



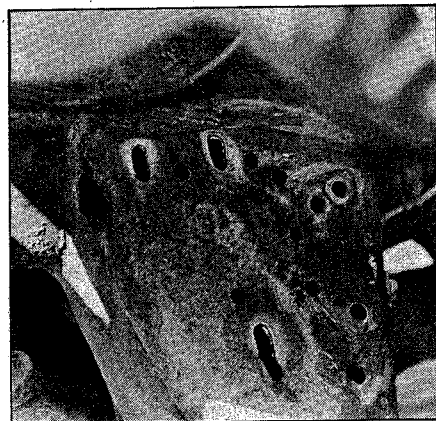
3. The stock small-block V-8 mount positioned in the factory mounting holes prior to slotting of the holes. When the big Rat was lowered into position, it failed to rest fully on the mounts, but rather than waste time looking for different motor mount cups, the holes were slotted to give the additional clearance the big-block needed.

The original bellhousing on the 90-degree V-6 has the same bolt pattern as the V-8's, but unfortunately, it is not large enough to clear the 14-inch flywheel required for the 454. The significance of this, however, is that a small-block V-8 is a direct replacement for the little V-6. The swap allows you to use the existing bellhousing and clutch assembly and requires only a motor mount change, all for a substantial dollar savings.

One notable difference between the new Chevy V-6 housing and older V-8 housings is the placement of the stud for the clutch arm. The V-6 stud is offset from center and the clutch arm has been redesigned. The net effect is to provide more under-car clearance for the clutch adjustment rod on smaller-bodied cars such as the El Camino.



4. Chevrolet engineers are apparently not taking any chances on not having sufficient mounting holes. The frame is predrilled for a number of potential applications. Here the frame mounts have been removed but the stock fuel line is still in place.



5. After removing the fuel line, the stock small-block motor mount holes were slotted to give additional adjustment for side-to-side clearance. This may not be necessary in every instance, depending on the particular shape of the motor mount cup used.