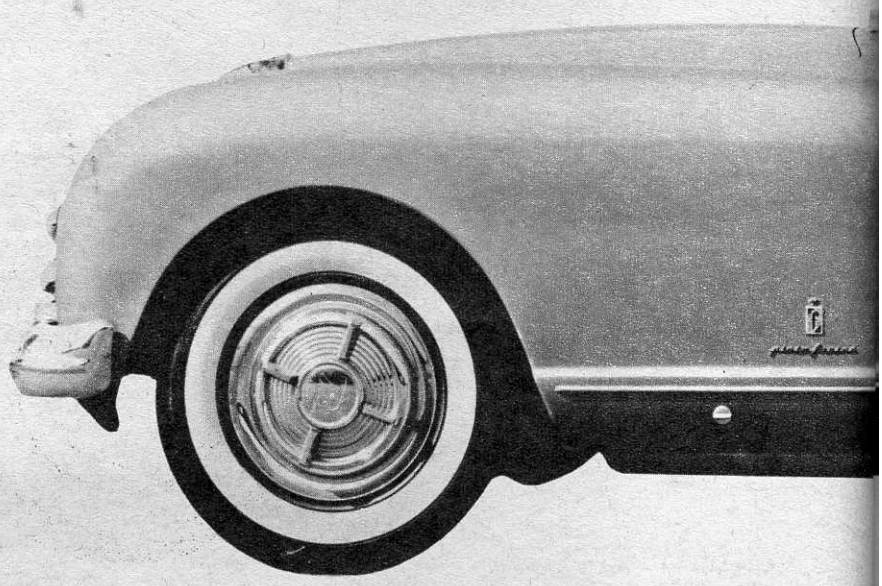
AMBASSADOR V8 INTO A NASH-HEALEY:



STRICTLY A FAMILY

BY JAMES MOORE

THE Nash-Healey, with its Pinin Farina body, has achieved a quiet reputation among connoisseurs as a classic example of the Italian school of automotive design. The car was the result of the fertile imagination of the late George W. Mason, who, as President of Nash Motors, not only foresaw the present trend to smaller cars over ten years ago, but also sensed the probable potential of the sports car in this country. Unfortunately, Mr. Mason's Nash-Healey never came close to approaching the smashing sales success of his Rambler. However, the unique combination of the Pinin Farina body, the rugged Ambassador 6 engine, and Donald Healey's race-bred chassis marks it as a most unusual car. Not only is it a thing of beauty, but it also possesses a proud pedigree established by amazing successes in several of the renowned 24-hour LeMans races.

It is little wonder then, that Les Viland (of Mobilgas Economy Run fame) and I quickly jumped at the opportunity to buy the last Nash-Healey roadster that American Motors put up for sale. This particular car had been used for exhibition purposes and had extremely low mileage. The body is identical in appearance to the "production" Nash-Healeys, as was the engine. However, all similarity ends underneath the car, for the chassis is frankly experimental, being specially built in Italy by the SIATA organization.

The car was purchased last spring, and we spent a pleasant summer dazzling native Detroiters with the sheer beauty of the Farina body. The car handled beautifully with light and precise steering that was a joy—even the exhaust had a pleasant note bespeaking power that wasn't there. Ay! there was the rub — the power that wasn't there! We could haughtily ignore the various Detroit "personal cars," but couldn't abide being stranded at stoplights by middle-aged businessmen in family sedans. Thus, we somewhat reluctantly concluded that a large V-8 was in our Nash-Healey's future.

Les Viland is a quiet perfectionist, and I prefer to plan ahead and get things done the easy way by anticipating situations before they arise. We knew that Ed Anderson and Carl Chakmakian, who are charter members of the American Motors' Nash-Healey Club, had already begun V-8 conversions. True to type, we very craftily decided to lay back in the weeds and benefit from their triumphs and mistakes. This plan was blown to smithereens when careful checking revealed that our experimental chassis presented a new set of problems peculiar to our car only. In other words, we couldn't borrow on the ex-

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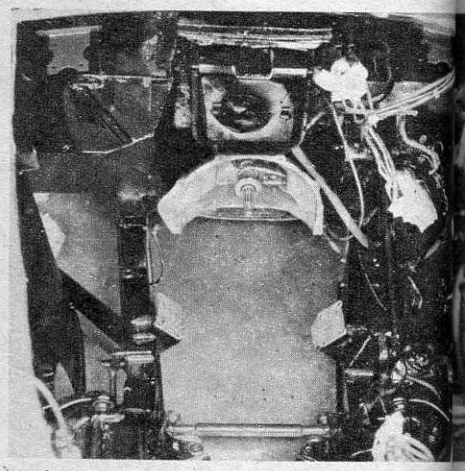
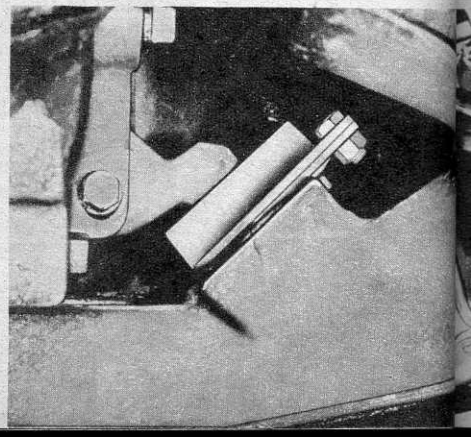


Nash-Healey's engine compartment yawns invitingly awaiting receipt of Ambassador V-8 mill.

Close-up shot from underneath looking forward shows the rear engine mount installation.



American Motors' Product Manager James Moore at the wheel of his revamped Nash-Healey.

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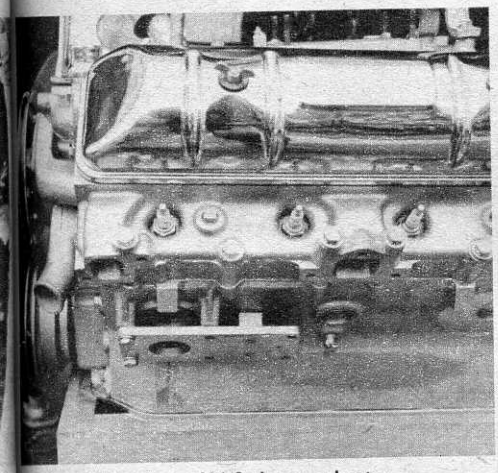
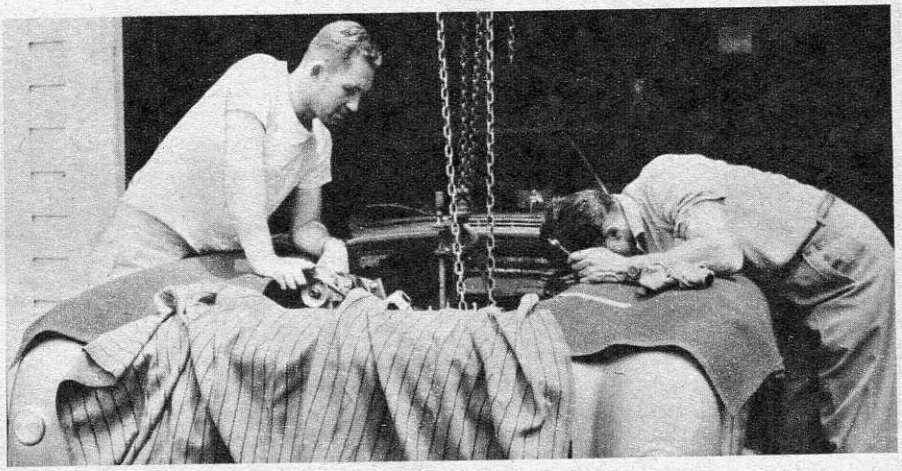
Local talent comes up with an all-American Motors engine swap.

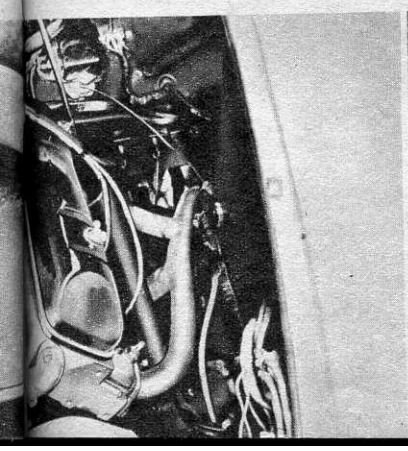


Side view of V-8 shows adaptor that let front engine mount brackets be moved to the rear.

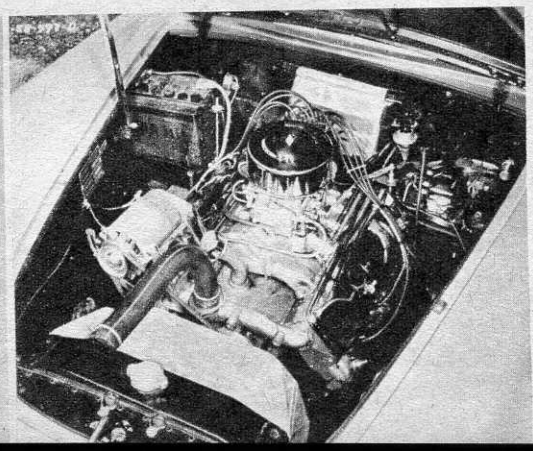


George Code, left, and Les Viland are shown at the crucial moment when they dropped the engine into place for the last time. Fit was touch and go for a while.

Fabrication of left header took careful fitting to clear steering shaft, pedals.



Completed installation shows room to spare in engine compartment. Note large fan shroud.



Front end shot shows that fine Farina touch. Nash-Healey now has power to match its looks.

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perience of others to the extent that we had hoped.

We therefore decided that the new powerplant would be somewhat experimental in character to match the one-of-a-kind chassis. Because of our respect for and familiarity with the AMC V-8 powerplant, and because we wished to avoid the problems of matching transmissions, bell-housings, and drive lines — the use of this basic engine was a foregone conclusion. The work began last winter on a standard block bored out to 4⅛" giving an increase in displacement from the standard 327 cubic inches to 347. In order to reduce reciprocating and rotating weight for better acceleration and to assure balance, the skirts of the pistons were cut down and excess material on the connecting rods was removed and each part matched in weight with a tolerance of less than .3 grams per assembly. The crankshaft was lightened and rebalanced to match the reduced piston-connecting rod weights. Next, the flywheel was lightened and balanced as an assembly with the clutch cover assembly. Because the lightening of the flywheel materially reduced the number of threads for the clutch-cover bolts, aircraft quality stop-nuts were added as safety measure.

The cylinder heads are truly works of art. It is too bad that the ports, which were beautifully enlarged and polished by Leo Gonzales, cannot be seen. The specially shaped combustion chambers have a 10.5:1 compression ratio (9.7:1 is standard), and the exhaust valves are increased to 1-9/16" diameter. Mechanical valve lifters are used in conjunction with special valve springs and an Iskenderian E-4 camshaft. Dynamometer tests indicate that this camshaft materially increases power and torque throughout the entire speed range, and the idle characteristics have proved to be very acceptable in the car. The intake manifold and single Holley four-barrel carburetor are standard at the present time, as is the 12-volt ignition system. The entire fuel induction system is scheduled to be revamped after the engine is run-in.

By late spring, the faithful old Ambassador 6 engine had been removed and the new V-8 was completely assembled. In anticipation of the difficult times ahead, we began looking for a particular person with equipment and experience to serve as "lead man" for the actual installation. We found such a man, George Code, in our own dynamometer department. George has that peculiar combination of ingenuity, stubborness, and daring that all successful engine-swappers seem to possess. I am convinced that George and his friends can do anything when they set their minds to it — our Sputniks could have been orbiting two years earlier if George had been there with his welding torch.

Actually, the installation proved to be far simpler than we thought. The engine compartment has ample length and width, and notching of the frame members was not required. As shown in the picture of the empty compartment, we did cut down a jutting portion of the firewall in order to provide ample clearance for the right cylinder head — no other reworking was necessary. The retaining of the original transmission and overdrive unit made possible the use of a standard Rambler Rebel aluminum bell-housing with no modifications required on the engine or transmission sides of the housing. However, the location of the rear mount stud holes in the new bell-housing is ⅜" forward of those in the old housing. Inasmuch as the rear cross-member is welded in place and clearance was limited, it appeared that we had quite a problem.

The solution was simple — as shown in the accompanying photographs. The rubber was removed from the bottom plates of two standard AMC front mounts. The two stripped plates were then bolted to two similar but unworked mounts, which were in turn threaded into the bell-housing stud holes. The new bell-housing was then fitted into place and the stripped plates tack-welded onto the cross-member. The standard front mounts

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were unbolted from the plates, which were then securely welded to the cross-member after the bell-housing had been removed. Ordinarily the use of front mounts at the rear would be questionable because these mounts are not designed to take shear loads imposed by the forward thrust of the torque tube drive line under acceleration. However, all Nash-Healeys are equipped with a stabilizer rod connecting the transmission to the frame — this was originally designed to prevent clutch chatter but it also permitted us to forget about the aforementioned shear loads.

Next, the bell-housing was replaced and the engine lowered into position to ascertain the location of the front mounts. Here we encountered another problem, for the mounting pads on the engine located the frame brackets directly on top of the idler arm bracket on the right side and the steering box bracket on the left. As shown by the photograph, this unhappy situation was neatly solved by fabricating two adapter plates from ⅜" steel. The front cushions were then bolted to the rearmost engine pads and to holes provided in the adapter. As shown by the photograph of the empty engine compartment, the frame brackets moved sufficiently rearward to permit ample clearance.

The engine was then lowered into place. The photographs indicate the ideally low and extreme rear location of the engine. The distributor clears the firewall by ½", and the front mounts are 15" to the rear of the original Ambassador 6 mounts. The use of standard exhaust manifolds was impossible due to clearance difficulties. In addition, we wanted the increased power output provided by individual headers. The difficult job of fabricating the headers was assumed by Foster Zang, a good friend of George Code. "Foss" is a master welder who actually enjoys doing the nearly impossible as shown by the photograph showing the left side headers passing over and under the steering column. The dual exhaust system employs reworked standard Nash-Healey straight-through mufflers.

The electrical system was a headache because the new engine required a change from 6 to 12 volts. With the exception of the instrument gauges (which now have a 25-ohm, 10-watt resistor), the horns, heater motor, and overdrive relay, all electrical components were changed; 12-volt battery, all bulbs, windshield wiper motor, overdrive solenoid, ignition system, turn signal flasher unit, voltage regulator, cigarette lighter, starter, and generator were installed. Inasmuch as we did not have a reliable wiring diagram, much of this work was accomplished on a cut-and-try basis — we are still cutting and trying on some minor items.

At the present writing, the car has only slightly over 700 miles on the odometer and we have therefore not performed full performance checks. However, acceleration is truly frightening — 0 to 60 in six seconds can be easily obtained! We are certain this can be considerably lowered with improved shifting technique and a tachometer of sufficient rpm range that works. Conservative theoretical top speed calculations indicate 145 mph can be obtained. At 70 mph and accelerating, the "Super-Healey" (as we now call it) is just beginning to come into its own. The car handles even better than before due to the 50-50 weight distribution. The following table indicates some of the reasons for the performance.

	Original Nash-Healey	*Converted Nash-Healey*
Horsepower	140 @ 4000	300 @ 5000 (Est.)
Torque	230 @ 2000	370 @ 2900 (Est.)
Displacement	252	347
Compression Ratio	8.1:1	10.5:1
Electrical System	6 volt	12 volt
Curb Weight (20 gals. gas)	2946	3008
Front Wt.	1480	1506
Rear Wt.	1466	1502
0-60 MPH Accel.	13.2 sec.	Under 6 sec.
Top Speed	102	145 (Est.)

Les Viland is extremely proud of the finished conversion — and it takes something approaching perfection to please him. Needless to say, I share his pride. We had hoped to accomplish a conversion that would do credit to the aesthetic beauty and craftsmanship of the Farina body, and we feel that we have succeeded in creating an "ensemble" in which the engine, body, and chassis complement each other. Aside from our personal satisfaction, there is another aspect that should be pointed out. The goal of most engine-swappers is increased performance through an improved power-weight ratio. This is fine, but often the desired end result is defeated by the means. It does not seem to make sense to drop a heavy brute of an engine in a lighter sedan type car which was not designed for performance. Weight distribution and handling are seriously affected, mechanical chassis components are often inadequate, and lastly, the very appearance of the car is not in keeping with the high performance of the powerplant. There are several sports cars, such as the Nash-Healey, which are highly adaptable to conversions, and have the appearance and chassis to match engine performance. Why settle for half a loaf when you can have the whole loaf in the form of an ensemble that looks like it goes and goes like it looks? ●

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Don Branson in the Hoover Motor Express Special. Len Sutton's Sumar Special was bumped by Johnnie Tolan's Casale Greenman Special and Gene Hartley bumped Shorty Templeman.

When qualifications ended, the field consisted of Larson and Bettenhausen in the front row with Thomson and Sachs directly behind. Rodger Ward was in with the Wolcott Special with Branson as his third row partner while Jimmy Reece placed the Bowes Seal Fast roadster in the lineup in seventh position. Earl Motter's Fullerton Special was next with Ed Elisian in the McNamara Special and Paul Russo in the Central Excavating Special next.

George Amick, heading the point chase for the 1958 national championship qualified for 11th starting position but mechanic Jack Beckley discovered a broken piston prior to the start. It was a tough break for Amick and his Hopkins crew. Schroeder, who had been bumped from the field offered to lend his engine and the crews attempted to make the switch but a difference in the size of the stud bolts prevented them from doing so.

With Amick out, Ralph Ligouri's Sumar Special which had qualified as first alternate was allowed to start in last position. Amick's berth was filled by Don Freeland in the Bob Estes Special with the other qualifiers moving up one spot in the lineup. They included Joe Barzda in the California Speed Shop Special, Tolan, A. J. Foyt in the Dean Van Lines Special which won all but one of the previous Hoosier Hundred events, Elmer George in the HOW Special, Hartley and Liguori.

The capacity crowd sent up a roar of approval as the cars lined up and prepared to take the green flag. Larson led them slowly out of the turn. Ten yards from the starting line he picked up the pace and the field followed suit. The flag fell and Jud raced Bettenhausen to the turn, getting in first to take the lead.

Going up the backstretch it was still Larson but Tony was nipping at his