

TESTS: TWO VERSIONS VEGA 2300, DATSUN 1200
JEEP WAGONEER, QUASAR-FORD SPORTS RACING CAR

ROAD & TRACK

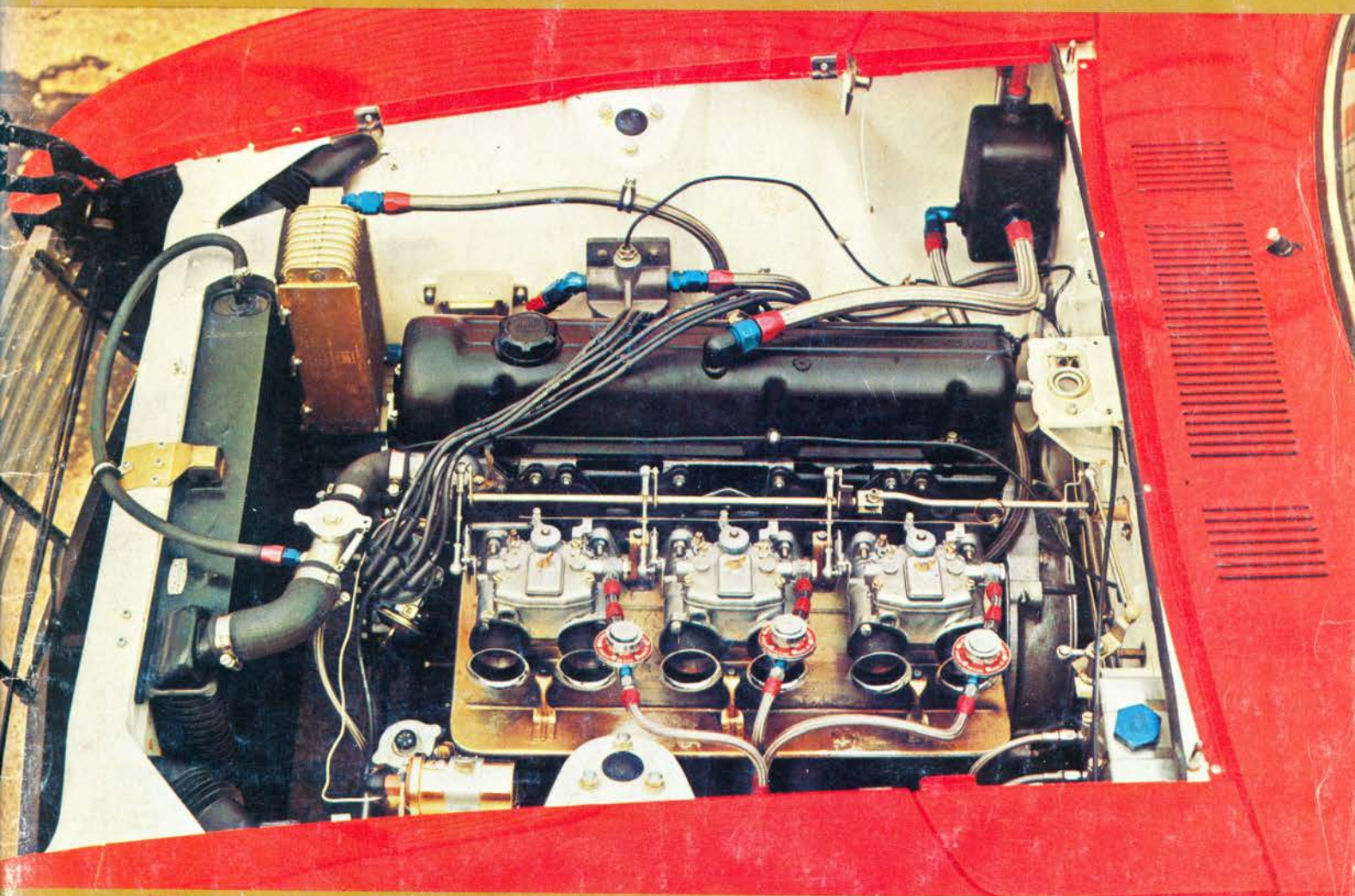
NOVEMBER 1970

UK 5/-

SWEDEN KR. 6. INKL. MOMS

SEVENTY-FIVE CENTS

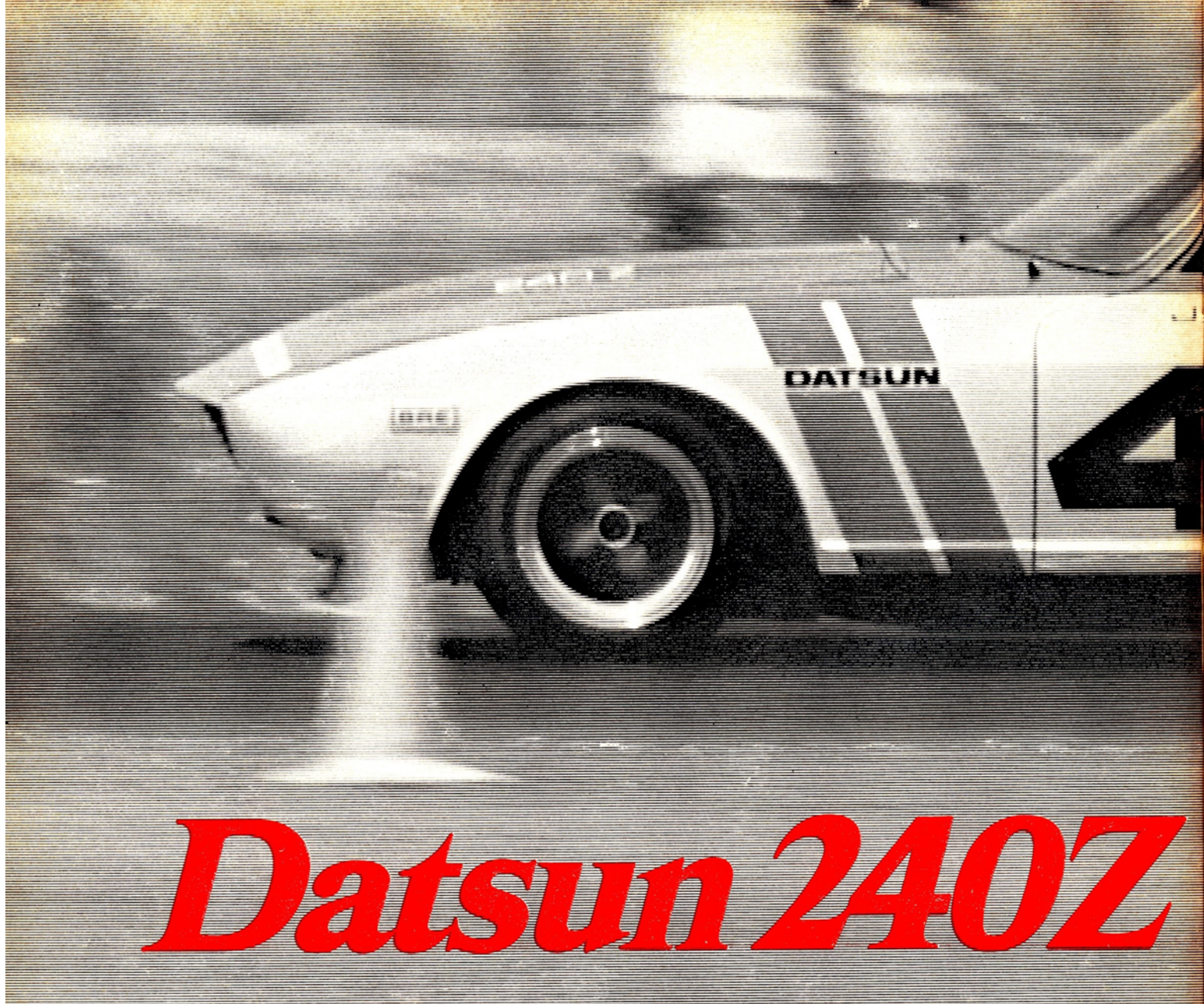
ROVER 2000TC-REVEALING REPORT FROM OWNERS
MEASURE YOUR HORSEPOWER WITH A STOPWATCH



*Datsun
240Z*

Goes Racing





Datsun 240Z

Pete Brock gets the sleek new GT ready to do battle in SCCA competition

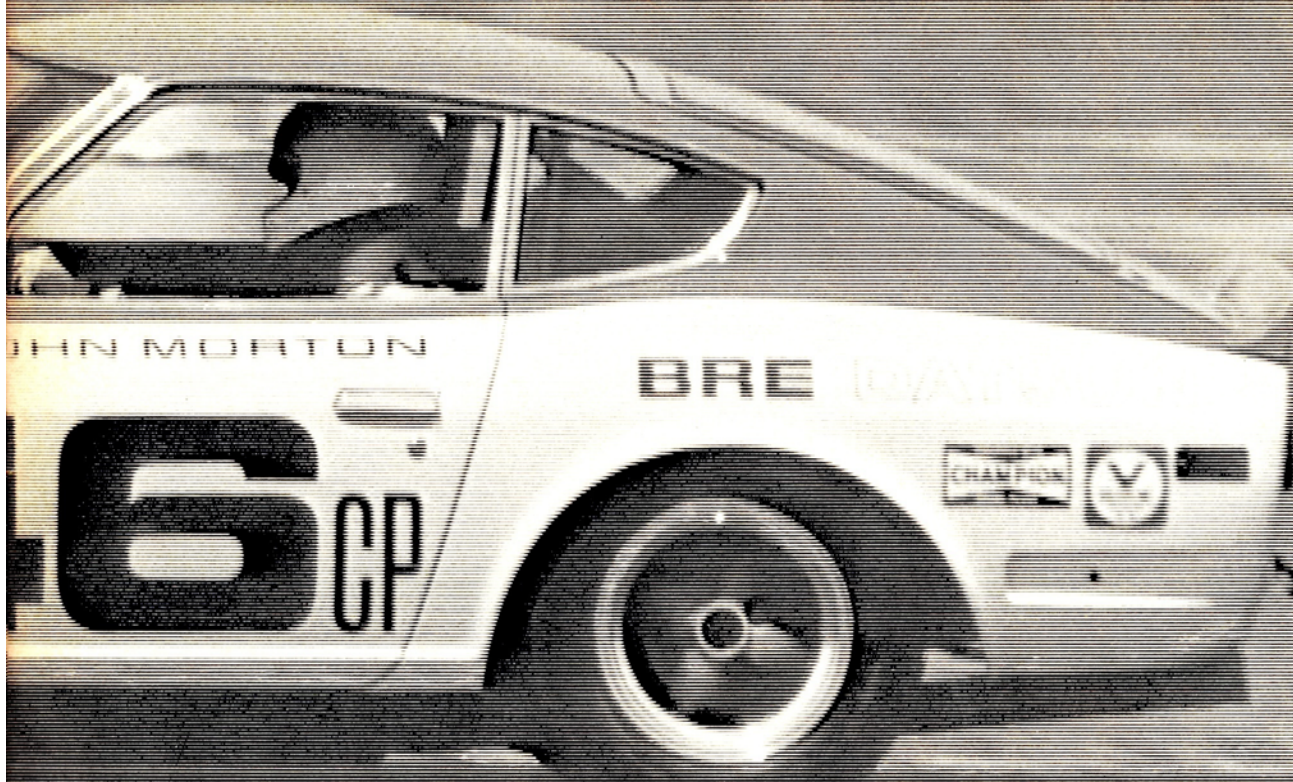
BY JAMES T. CROW

PETE BROCK knows what he's doing. Let's start with that. First, he's a designer/stylist. He went to Art Center School and later worked for two years in General Motors' Styling. After that he was with Shelby American and there his best known work was the very successful Cobra Daytona coupe. And since then he has been responsible for the exciting Ghia-DeTomaso racing car, the neat Hino Samurai experimental and the styled-up Triumph TR-250K. He's also done a lot of projects that have become familiar and accepted parts of the scene; things like the emblem at Riverside Raceway and the whole line of Shelby American accessories that ranged from T-shirts to valve covers. He's probably America's best-known stylist of high-performance parts and products. A tremendous talent.

Undoubtedly one of the reasons he has done so much good work during his 33 years is that he hasn't been secluded in a styling studio during his career. His designs have been

consistently appropriate and vital because he has been involved with the objects he's worked on. He raced his own Cooper and Lotus sports cars, had a go or two in NASCAR stockers and spent two years as chief instructor for Shelby's School of High Performance Driving. Later he became involved with production car racing, first with Hino (which came to a disappointing end when Hino merged with Toyota and didn't enter the U.S. market) and now with Datsun. At the present time his firm, BRE (for Brock Racing Enterprises), is developing the Datsun 240Z for racing and it is typical of Pete that not only is the car fast and competitive but the machine itself is a pleasure to the eye all the way from the smart red and white paint to the beautiful engine detailing under the hood.

His association with Datsun began about two and a half years ago when BRE was asked to undertake a high-performance development program for the Datsun 2000. This



Goes Racing

GORDON CHITTENDEN PHOTOS

project led to a pair of Datsun 2000s being campaigned in SCCA club racing and the cars set lap records wherever they raced. During 1969 they won the Southern Pacific Division title in DP and only a freak circumstance of momentary fuel starvation on the bankings at Daytona which led to melted pistons kept them out of the winner's circle at the American Road Race of Champions. This year, driving one of the same cars, John McComb of Wichita has already clinched the 1970 Midwest Divisional title by winning eight races in a row and seems a sure thing for the ARRC.

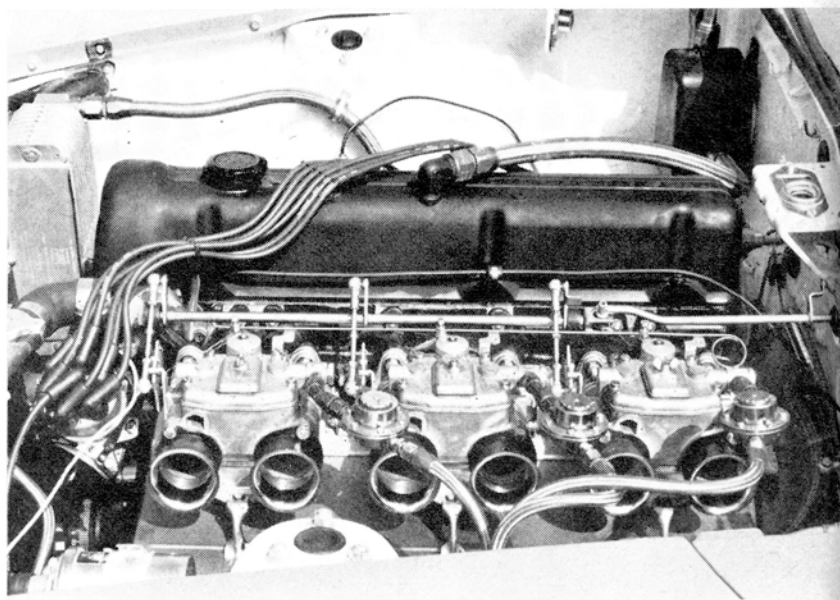
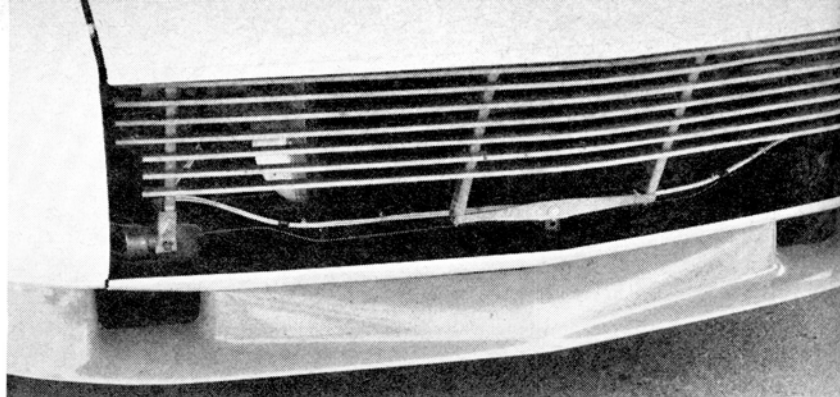
Although BRE is an independent company working under contract to Nissan Motor Corporation's western office, Pete works in close liaison with Datsun national service manager Lee Wylie and under the benevolent eye of Datsun West's highly enthusiastic president, Yutaka Katayama. Contrary to outward appearances, such an operation as BRE does not operate with unlimited funds. In fact, Pete says that without the support they receive from other sponsors such as Champion, Goodyear, Valvoline and Fram, they could not exist. The high-performance parts they develop for sale to Datsun owners is also an important factor in their economic life (their contract specifies that all parts developed by BRE must be made available to any Datsun owner who wants to buy them) and Pete anticipates that the sale of such parts

will enable his company to be completely self-sufficient within a couple years.

Pete saw a picture of the 240Z in late summer 1969 and finally got his hands on a car to start the development program in late January 1970. This was a pure production model straight from the first boat shipment of 20 cars and not anything specially prepared by the factory.

The coupe's first stop was the BRE shop in El Segundo, Calif. This facility, which covers about 10,000 sq ft, is a bit more complete than most pure racing shops and includes a dynamometer and engine assembly rooms as well as a machine shop and the usual welding and fabricating equipment. They aren't equipped to do forging, casting, gear cutting or cam grinding but just about everything else can be done in-house. In addition to their Datsun projects they specialize in dyno tuning of competition engines up to about five liters' displacement and will, on demand, design and fabricate special components for other competitors. Their whole capability is summed up by Pete as "Design, fabrication and development of high performance components."

In addition to Pete and the office girl there are seven other employees at BRE. As in most racing shops these men are not only specialists in one particular area but can also turn their hands to whatever needs doing. Mac Tilton, for ➡



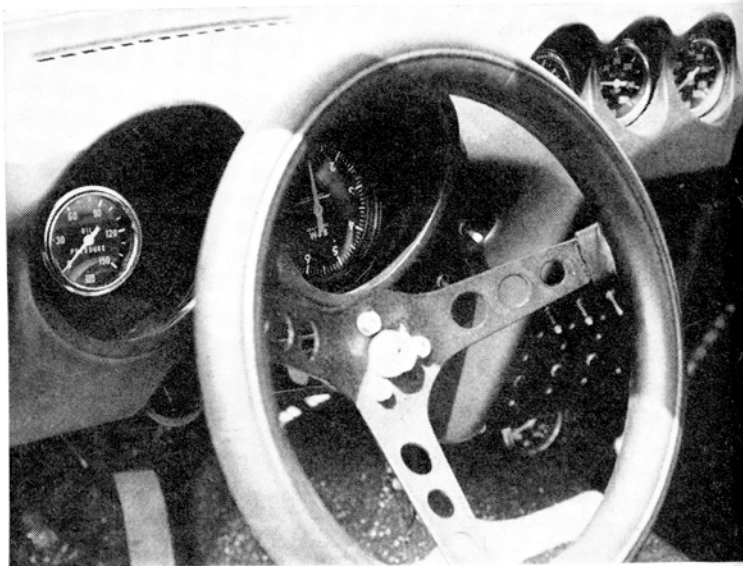
Datsun 240Z

instance, is not only the racing crew chief but is also an expert machinist. John Morton, driver of the Z car, is also an expert fabricator. John Caldwell, Floyd Link and Ray Gruss have engines as their main responsibility but also pitch in on other projects. George Boskoff, Pete's oldest employee, was formerly with Shelby and Bruce Meyers and can do anything. John Knepp is in charge of the electrics and transmissions but also handles the transporter. And Kirk Allegro specializes in versatility since he is mechanic, general helper and chief gopher.

When the 240Z arrived at BRE it was first of all stripped to the bare chassis. This was done not only to enable them to minutely examine every seam and weld but also as a part of the educational process for becoming intimately familiar with the new car. Some wires and some plumbing were relocated for more convenient access or for safety and as far as possible everything was made convenient for adjustment or replacement. The chassis did not require any trick beefing up to take the additional stresses that would be placed on it in competition and it was not necessary to reweld the chassis/body unit as is required on NASCAR or Trans-Am sedans to aid in stiffness.

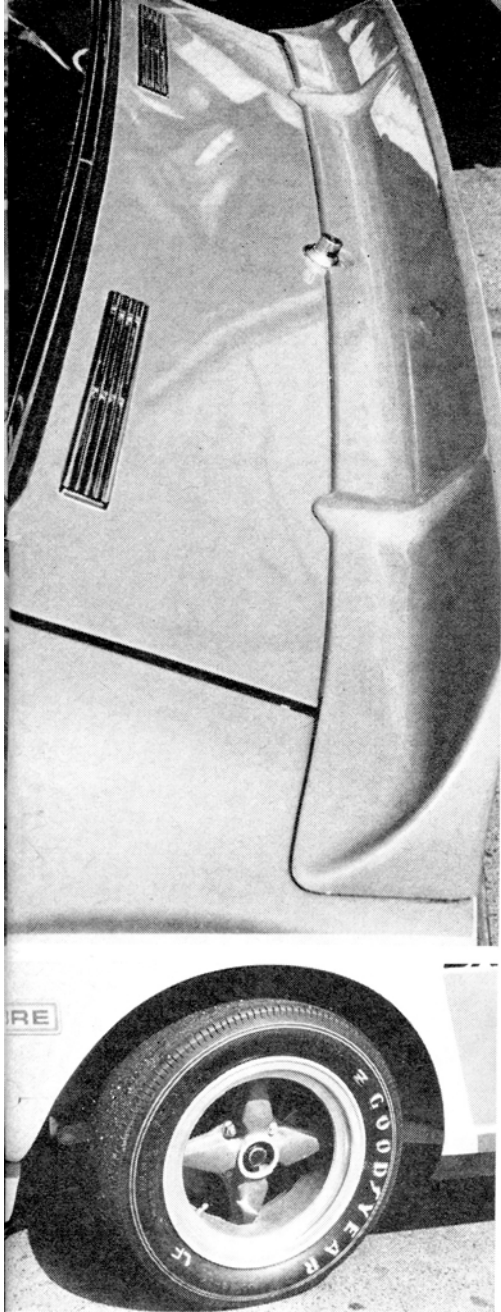
As the car was reassembled, a number of special competition parts were installed; heavier springs, adjustable shocks, thicker swaybars, a limited slip rear end. A balance bar was added to the brake system so front and rear braking could be adjusted as needed; an aluminum radiator was installed, as were coolers for engine, gearbox and differential.

The shock absorbers that were used were a combination of Koni and Tokiko parts combined with special valving to achieve the bump and rebound control BRE wanted. They



use Goodyear racing tires and the 7-in.-wide alloy wheels cast by American Mag to Pete's design weigh 12 lb each. Brake pads are Raybestos. They are now using a Detroit Locker in place of the clutch-type limited slip differential available from Datsun. With the locker the lubricants run at a lower temperature and this will allow them to run without the differential oil cooler in the future. The engine is equipped with Echlin ignition components. Oil coolers are Stewart Warner parts.

In the cockpit the stock instruments were replaced with those that would be needed on the development car—10,000-rpm tachometer plus gauges to monitor the engine oil temperature both in and out of the block, oil pressure,



coolant temperature, gearbox lube temperature, differential lube temperature and alternator output. Once the development phase is complete they will be able to dispense with some of these. The driver's seat was replaced by a high-sided, completely adjustable competition bucket and all the electrical control switches were relocated to the driveshaft tunnel where the belted-in driver could reach them. The pedals were relocated to driver John Morton's dimensions and preferences, a rollbar was installed along with a Wink wide-angle mirror and the interior neatened up and painted with Zolatone for the sake of appearance. Pete likes his cars to look good too, remember?

Because the engine in the 240Z is basically that of the 4-cyl 510 with two more cylinders added, they were able to use the 510 engine for development and thus get started early. In this way everything they could learn about the combustion chamber shape, valve timing, breathing characteristics and so on would be directly applicable to the 6-cyl engine when it arrived.

The lower half of the engine is little altered. They use forged aluminum pistons that are machined by Venolia to BRE design but the rods are simply balanced, neither lightened nor polished. They have found that stronger rod bolts offer added reliability, however, and special 20-percent-stronger ones have been made for this purpose. A special oil pan has been fabricated to increase engine lubricant capacity and six "mouse traps" have been built in to direct (and keep) the oil in the area of the oil pickup.

The top end of the engine is considerably reworked. As Pete points out, "The added power comes from better breathing and better combustion; the other changes are made simply to let the engine live." They do a lot of flow bench work at BRE, studying engine breathing in order to understand how much is enough and, equally important, how much is too much.

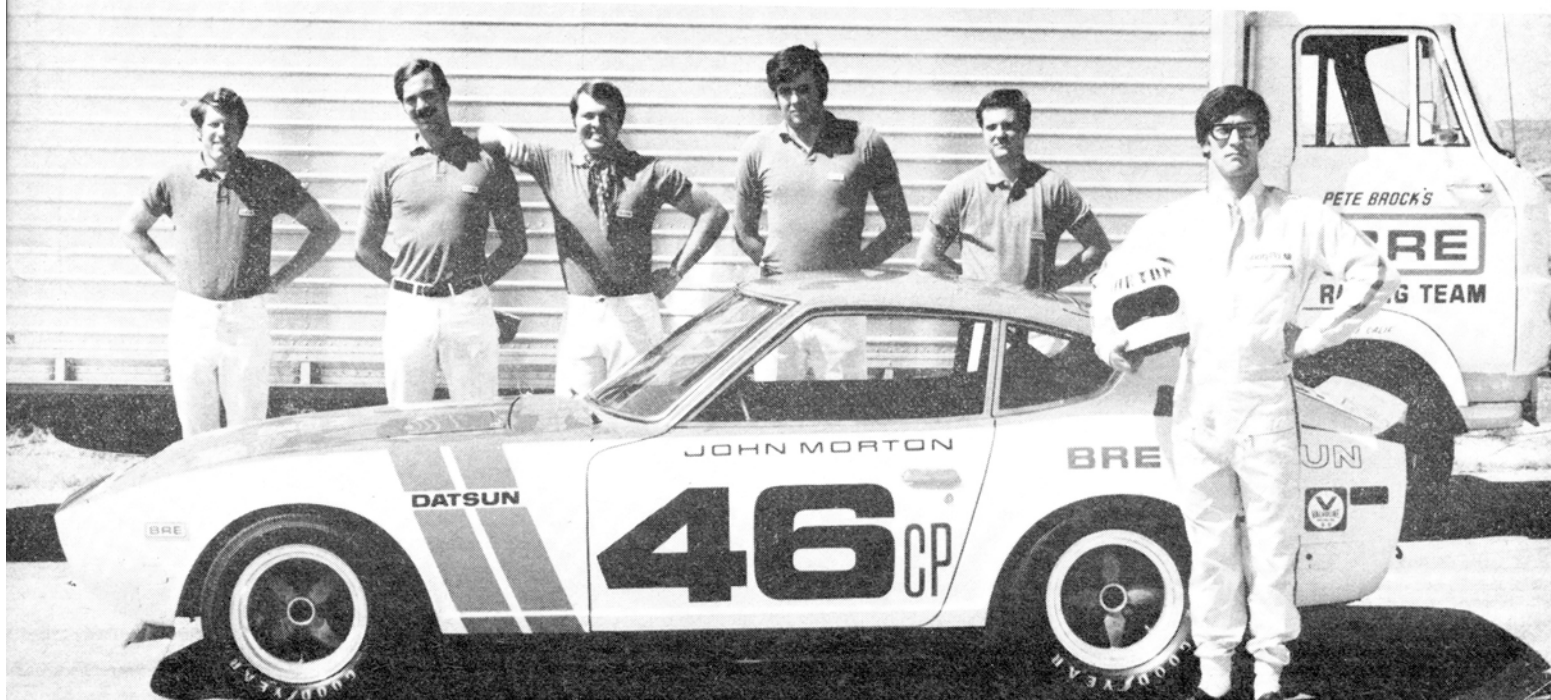
The pistons, slightly domed and with light reliefs cut into the top for valve clearance, give a compression ratio of 12:1. The ports are opened up and smoothed, the valves lightened and polished; stock outer and special inner valve springs are used.

On the racing engine three Mikuni-Solex PPH-44 carburetors with 40-mm chokes replace the original Hitachi-SUs and these are altered only by such normal production category racing practices as tapering the butterflies, thinning the shafts and polishing the throats for better airflow. Feeding the carburetors are two Conelec pumps and a pressure regulator is used at each carburetor to assure even fuel delivery throughout the rev range. Also assisting in uninterrupted fuel delivery are molded soft rubber blocks between the carburetors and intake ports to isolate engine vibration and avoid frothing the fuel in the float bowls. The exhaust system, fabricated to BRE specs, consists of two sets of three headers collected into two tailpipes.

Pete prefers not to talk about cam timing and overlap but he will say they are using about 0.530 in. lift compared to 0.478 for the standard engine.

The only serious problem they have encountered with the engine thus far resulted from a high-frequency vibration from the 6-counterweight crankshaft with which the early engine was delivered. This curious harmonic (responsible for roughness at high speeds we noted in our 240Z road test) came in at just about ➡

The BRE race crew. From left: John Knepp, Kirk Allegro, Pete Brock, Mac Tilton, John Caldwell and driver John Morton.





BILL HALL PHOTO

Bob Sharp's 240Z is already doing well in eastern SCCA racing.

Datsun 240Z

7000 rpm, right in the rev range they wanted to use, and did all sorts of strange things like breaking up the clutch after only brief periods of hard running. An 8-counterweight crank, ironically standard on all 240Zs since that first shipment, seems to have solved this problem.

The stock 240Z engine output is 150 horsepower at 6000 rpm and is safe to rev to 7000. The BRE racing engine develops more than 240 hp at 7600 and is now redlined at 8300. Pete declines to say how much more than 240 hp they are getting but as this represents a fairly mild 100 hp/liter, it is probably safe to assume there is more power to be had.

The completed BRE Datsun 240Z is aerodynamically very clean. A factory spoiler is used on the trunk lid and at the front there is a BRE "spook," Pete's contraction of its combined function as a spoiler and scoop. Pete says these devices are of little value except on the longest circuits where the speeds are such that aerodynamic aids are needed.

They have made no changes in the drive line and so far nothing has broken or fallen apart. They have three sets of ratios for the 5-speed gearbox from the 2000 roadster and they are as follows:

Gear	Standard	Optional	Optional
5th	0.85	0.85	0.85
4th	1.00	1.00	1.00
3rd	1.31	1.28	1.26
2nd	1.86	1.39	1.70
1st	2.96	1.86	2.68

These are combined with a 4.8 or 5.1:1 final drive ratio depending on the circuit and the size tires used.

HIGH PERFORMANCE PARTS

AN IMPORTANT part of the BRE program—perhaps the most important part—is building high performance components to sell to Datsun owners who want something more from their cars. There's a large selection of performance equipment for the 510 sedans as well as for the two roadsters and now the equipment list for the 240Z is growing almost day by day. For the 240Z at the present time BRE has 7-in. mag wheels (\$92 each), front spook (\$32), oil filter remote block (\$18), camshaft kit with springs, rockers, etc. (\$280), forged 12:1 CR pistons (\$210 per set), roll-bar kit (\$52), fuel cell (\$375), fuel pumps (\$37 each), pressure regulators (\$8.50) and so on. The only item offered at present that is tailored to the street trade or for slalom and autocross competition is the "Mulholland" spring kit (\$68) which lowers the car 1.625 in. All these BRE parts, as well as the special Datsun parts (such as the deck lid spoiler) can be ordered through Datsun dealers or through BRE. (Quicker through BRE, of course.) BRE has a parts and price list and you can get one by sending 25¢ to cover postage to BRE, 137 Oregon St., El Segundo, Calif. 90245.

The fuel is carried in a special tank that replaces the spare tire at the rear and this cell, which includes safety foam inside, has a capacity of 15 gal. Oil capacity is 10 qt and straight ethylene glycol is used in the engine for coolant.

The current car weighs just about 1960 lb in official racing trim (water and oil but no fuel) and it's likely that future 240Zs from BRE will be slightly lighter.

That the 240Z is going to be thoroughly competitive in its class in SCCA club racing has already been demonstrated in an SCCA national at Riverside when the five factory-supported team cars (two Porsche 914/6s from Richie Ginther, two TR-6s from Kas Kastner and the 240Z) all qualified within 0.6 second of each other. The showdown is yet to come, however, as the Z car dropped out of its first race with clutch failure from the crankshaft vibration and crippled home to a sixth place in the next outing with the same trouble since the new 8-counterweight crank still wasn't available.

In all-out top speed the Z car does about 130 mph on the long backstretch at Riverside and Pete expects it would be capable of about 155 on a longer circuit such as the high banking at Daytona.

Pete is very high on driver John Morton, not only for his ability as a competitive driver but also as a very sensitive and observant development driver. Morton says that he has found the 240Z to be a far different car to drive than the Datsun roadsters he has driven in the past: much more power, for one thing, but the handling is also considerably different because of the more sophisticated suspension, the wider track, the wider tires and greater bulk. It is very solid and smooth, it sticks better and because of its greater potential is that much more challenging to drive to its limit.

For other forms of competition, Pete is sanguine about the 240Z's chances. He expects it would do very well in the rugged European rally events, for example, because of its excellent suspension. In fact, he is so enthusiastic about the Z's suspension—a very simple but effective independent system at both ends—that he is building it into a single-seater mid-engine car to run in the Mexican 1000 race from Ensenada to La Paz this fall. With very few changes from stock, the 240Z should also be highly competitive in slalom or autocross competition, Pete says.

Though the final prices for all the competition components have not been settled yet because of the difficulty in separating development costs from production costs, Pete estimates that one of BRE's Datsun 240Zs, ready to race, would cost between \$9500 and \$11,000. Few competitors would desire, or even need, to buy a complete ready-to-race car and by buying the necessary components from BRE, including a race-prepared engine, most could probably field a potential winner for two or three thousand dollars less.

In the east there is a similar program being carried on by Bob Sharp in Darien, Conn. These are completely separate operations, you understand; Sharp working through Nissan Motor Corporation's eastern office and Pete through Datsun West. Sharp got his first 240Z somewhat earlier than BRE and was earlier into competition with it. The Sharp car has a better record in SCCA racing than the BRE 240Z and it is going to be extremely interesting to see the head-to-head results when the two cars meet at this year's national championships at Road Atlanta—providing John Morton can get enough CP points to qualify after BRE's late start.

A few other 240Zs are being raced around the country but these are privately entered cars and as such cannot be expected to have the muscle of the factory-supported teams. Next year, judging by the interest the BRE and the Sharp cars are generating this year among both competitors and dealers, there will undoubtedly be well prepared Z cars running in every division of SCCA.

So the Datsun 240Z, SCCA racing version, is well on its way and is going to do well. Watch for it. It will be worth seeing.

