

NY MACHINE which is essentially different in concept pays the price of outstanding gains of performance in certain areas with unexpected losses in others. In the case of the Porsche, the major effort in the past nine year's development has been to reduce these losses rather than to extend the gains. The latter course has not been neglected, witness the Carrera, but what is to be made clear here is the sometimes subtle path of design development of this amazing car. The aim of Ferry Porsche and his father, Ferdinand, in building the original Type 356 was to supply a connoisseur's automobile, something in the Bugatti tradition of perfection. They innocently thought that a total of fifty to one hundred cars would saturate the world market for such cars! This sincere, if mistaken, belief may explain why Porsche production has always lagged behind demand. Management, even today, is incredulous at the manner in which the world, and America especially, soaks up their output. Today the story of the post-war prosperity is old stuff to us, but remember, to the Germans it came as pretty much of a surprise.

The earliest Porsches were not much more than hotrodded, custom-bodied short-chassis Volkswagens. The connoisseurs turned out in numbers, both with money and with advice for improvements. Instead of the reduced-bore 1086 cc VW plant, it was enlarged to 1286, and, since the well-streamlined coupe body would do naught to slow the coupe, aluminum muffs were shrunk onto the VW brake drums so that they could. In 1951, the engine was further enlarged to 1488 cc, in '53 Alfin bonded aluminum-steel drums of eleven inches diameter were fitted. While making these improvements, the factory had discovered that their "Businessman's Express" wasn't half bad as a sports-racing car. Efforts in this

direction soon led to a more specialized car, the Type 550 Spyder, and from this point on (1953), with but one exception, the aim was to make the 356 go better, not just faster. In 1955 an all-new three-piece crankcase was inaugurated, severing still another tie with the original VW. At the same time an anti-roll or "stabilizer" bar was fitted to the lower front trailing arms to reduce the Dreaded Oversteer. Previously, and some maintain subsequently too, the fastest method of pushing a Porsche around a corner involved the technique of "wischening" or wiping.

Many climbed to fame on the early Porsches, but the fact remains that a good many others thought the car was just plain squirrelly. Whether this was to cover up their personal inadequacies or not would be a rude question to pursue.

Now this anti-roll bar did not completely answer the problem at hand, namely to make the Porsche handle more like other cars, so during 1955 some more research was conducted on the *autobahnen* that nearly encircle Stuttgart and in the Alpine foothills not far to the south. As this year marked the return to the Porsche company of its pre-war building across the street, doubling working area, the changes in front end geometry were incorporated simultaneously with a major redesign of the frame-less structure's innards. This made the Type 356A, as it was now called, much more suited to series production. At the same time, the cylinder bore was increased from 80 to 82.5 mm bringing the displacement that much closer to the newly current FIA class limits. For the serious lead-foots, a detuned Spyder engine was available in the Carrera models.

Well, if the factory's aim was to eliminate "Wischening: Pro and Con" from the list of hotly debated topics among sports car initiates, they had certainly succeeded. But more

(Continued on page 59)

PERFORMANCE

Two-way average
ACCELERATION:
From zero to Seconds
30 mph 5.4
40 mph 7.4
50 mph
60 mph
70 mph18.3
Standing 1/4 mile
Speed at end of quarter 72 mph
Speed at end of quarter 72 mpn
SPEED RANGES IN GEARS: (1500-5000 rpm)
I 0-24
1114-47
III
IV32-top

### SPEEDOMETER CORRECTION:

Indicated	Actual	Indicated	Actual
30		60	55
40	37	70	65
50	46	80	74

## FUEL CONSUMPTION:

TOP SPEED.

Hard driving in 20°F, weather ... 22 mpg

#### BRAKING EFFICIENCY:

10 successive emergency stops from 60 mph, just short of locking wheels were made at 24 g. More pedal pressure would lock the right rear wheel. At end of test, there was 31/2 inches clearance between the floor and the bottom of the depressed pedal.

### SPECIFICATIONS

#### POWER UNIT:

	Air-cooled flat four
Bore & Stroke	3.25 x 2.91 in (82.5 x 74mm)
Stroke/Bore Ratio	3.25 x 2.91 in (82.5 x 74mm) 0.89/1
Displacement	96.5 cu in (1582 cc)
Compression Ratio	
Carburetion by	Two Zenith twin-choke NDIX-32-36
Max. Power	60 hp (DIN) @ 4500 rpm
	(70 bhp SAE)
Max. Torque	82 ft-lbs @ 2700 rpm
Idle Speed	700 rpm

#### DRIVE TRAIN:

Transmission ratios

3.09

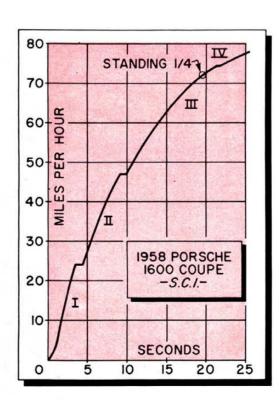
iv	
Final drive ratio (test car)	4.43 (etandard)
Other available final drive ratio	ne 4 86 5 18
Axle torque taken by	genther once
Axie torque taken by.,	gearbox case
CHASSIS:	
Frame	Pressed steel panels welded into box sections, integral with body panels
Wheelbase	83 in
Front Tread	51 in
Rear Tread	
	Trailing arms, laminated torsion bars, anti-roll bar
Suspension, rear	Swing axles, flexible trailing arm, adjustable torsion bars
Shock absorbers	Telescopic hydramatic
Steering type	Z-F made Ross-type worm and roller, steering damper
Steering wheel turns L to L	2.7
Turning diameter	
	2LS front, single leading and trail- ing shoes at rear
Brake lining area	
Tire size	5.60 x 15
GENERAL.	

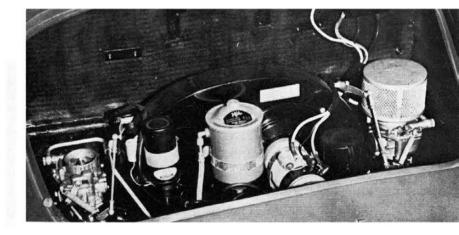
## 

Fuel capacity-U. S. gallons	U. S.	gallons	(including	11/3 re-
ATING FACTORS:	2 (0,000)			
Bhp per cu in (SAE) Bhp per sq in piston area				

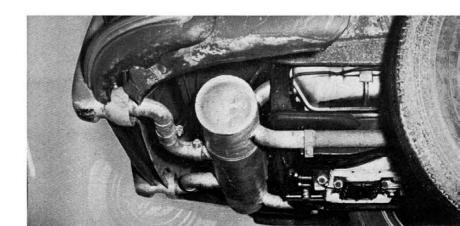
Torque	e (lb-ft per cu in)0.85	
Pound	s per bhp-test car 26.8	
Piston	speed @ 60 mph	m
	speed @ max power 2180 fg	
Brake	lining area per ton (test	ICON.
		in

Price	\$3700
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While engine lid's shape nicely suits window outline, access to forward plugs is cramped. However, engine removal is easy, even at home. New linkage, dual-throats are welcome features of new Zenith carburetors. Exhausts zig-zags to shrouded openings in bumper guards, like Detroit!



## **PORSCHE**

(Continued from page 39)

than one rabid Porsche owner objected to being forcibly civilized in the name of Progress and Stability, complaining that the 356A, far from being in the Bugatti tradition, now seemed to be descended from one of W. O. Bentley's smaller lorries. When pressed for reasons, sources at Zuffenhausen took refuge behind references to the demands of the American market (!) or else insisted that this represented a real improvement in handling and was, in fact, necessary with the added power of the Carrera. Be that as it may, the Porsche-pushers at SCI all drive the earlier 1500s and like them. One thing we will admit is that the 356A series certainly rides better, being nowhere near as choppy as the Type 356s.

The 1958 1600 coupe which we have tested seems to nicely combine the best of its predecessors' advantages. The ride is comfortable and yet the steering is delightfully sensitive and light, requiring only fingertip control. Speeding down long straights with severely undulating surfaces again brings up that fascinating phenomenon of going straight on in a car which alternately points a degree or two to one side and then to the other. The value of independent rear suspension in soaking up roughness must become obvious to anyone who rides in a Porsche on bad surfaces. The wheels may go pitter-patter but the occupants are thoroughly insulated from

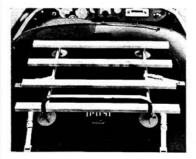
While its performance is no longer considered shattering, it certainly is a delectable car for serious cross-country touring. Though the Porsche's trunk is hardly cavernous, there is plenty of luggage space available in the back seat. The logic here seems irrefutable: if you've a back-seat passenger or two, you won't be going far because it's not that comfortable back there; if you haven't one, then the jumpseat may be folded to provide a wide, flat loading platform. A supplementary piece of fabric covers the gap through which small objects could fall, while a lip on the upper or forward edge of the seat back will keep parcels from sliding off under sudden braking.

Much of the well-scaled trunk itself is occupied by the spare wheel and the gas tank. The latter is to the rear, the former to the front with luggage space in the middle. Worries of ruptured gas tanks can be put to rest. The VW-like front suspension beam, the spare wheel and the welded body-frame add up to an impressively non-resilient structure in the event of a head-on collision, all of them well ahead of the gas tank. Inside, the dash board crash padding looks good but we doubt if Dr. Snively would be impressed.

Visibility is very good but in the rain it seems the wiper blades could be usefully pivoted one or two inches further outboard. The instrument panel is simple and straight forward; so much so one staff member likened it to the Henry J. (?) Keen rallyists will welcome the odometer with tenths and the speedo unit's position (Continued on page 60)



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## SAAB

(Continued from page 52)

Leaving the Thruway, we had forty miles of twisty, treacherous road to go. We made excellent time, held up only by the few who feel the purchase price of their car entitles them to the middle half of the road. We hesitated to pass one new sedan, of a make held in considerable esteem by those who own them, because it was wallowing and sliding so badly that we were afraid he would break loose and slide into us as we passed. This fellow, with about 300 inches of displacement and almost 200 horses per passenger, was holding up our Saab!

Arriving at the approach to the ski slopes—a mile-long upgrade with a base of ice covered by several inches of snow—we were confronted by a myriad of cars in different states of immobility. We picked our way between them, frequently stopping and restarting on the slick surface. At one point, where two cars were stuck on the two-lane road, we took to the edges. The two right wheels dropped off in the deep snow, sliding us on the belly pan, but we pulled back on the road and drove up the rest of the way.

The Saab is obviously a remarkably well-built car. The gauge of the body metal is heavy, with many of the stress areas, such as at edges of the windows, welded. There is a tubular steel roll bar across the roof and each car is undercoated in sections during assembly. The dash panel is metal, stressed in such a way that it will collapse upon impact from inside the cockpit. I was told that the fiancee of a Saab engineer in Sweden slammed into the panel, leaving the imprint of her nose in the metal, but her nose didn't break! She should have taken the time to fasten the excellent and very comfortable safety belt.

Saab's safety belts fasten to the body frame; they're sturdy, not the kind that you snap on to the upholstery. The belt passes over the left shoulder of the driver (the right shoulder of the passenger), joining the buckle section that comes up from between the bucket seats. This belt secures the shoulders as well as the waist, and is installed so that it never touches the floor. It's an extra, but Saab extras come easy.

For example: How about a nice quick hop-up, for five more horses? Various size carburetor venturi inserts and high-speed jets are available, and can be changed in ten minutes by anyone who owns a wrench and a screwdriver. By installing bigger passages, the richness of the mixture is unchanged, however more of it can be introduced. Cost: two dollars for the venturi, fifty cents for the jet!

When we discussed this with Chris Custer, Saab service representative, we explored the possibilities of a man installing a high-economy setup for his wife to take shopping during the week, and on Friday night, before he packed off on a 400 mile ski trip, changing back to a larger venturi and bigger jet for more go. We asked him if this was feasible.

Chris drove into the garage and took off his tie, but he left his white shirt on merely rolling up his sleeves. He timed the car, adjusted the points, changed the plugs, and installed and removed two or three different venturi-jet combinations. (We kept the "regular" combination for performance testing). When finished, he washed his hands and rolled down his sleeves. His shirt wasn't soiled.

However, the Saab is not designed as a do-it-yourself-service car. Timing is critical on a two-stroke engine, and unless it is hitting "on the head", fuel consumption will suffer tremendously. The Saab is timed by measuring the hundredths of a millimeter the piston is below top-dead-center. The #2 spark plug is replaced by a metal insert with a hole drilled through the center. A gauge with a rod, the same diameter as the drilled hole, seats on the insert, and the rod, hitting the top of the piston records the distance. Since this method overcomes errors due to wear, it is extremely accurate.

The Saab merchandising program is built on solid service. Once a dealer is franchised, he must send a mechanic to Saab service school at Hingham, Mass. If he doesn't, he doesn't receive any more cars. This depot also stocks spares for several hundred cars, available quickly and at moderate cost. A rebuilt block, including crank, pistons and head, costs \$149.50; a factory-warranted block, complete as before but also with carburetor, distributor and manifolds, cost's \$299.50 exchange.

All in all, the 93B incorporates an awful lot of things that most small car owners like to have in their cars. The \$1895 purchase price gives you room for four full-size people, massive stowage space, heater, comfortable seats, durability, and plenty of outright economy. And if you want to race in the 750 cc class you can probably win, unless another Saab beats you.

-Len Griffing

# **PORSCHE**

(Continued from page 59)

at the right.

The offending interior light has been removed from top dead center on the dash board, leaving it with a somewhat blank look. Now there are two of them, individually controlled and/or automatic, one above each door post. Sealed beams do not seem really at home in their containers either here or in the VW. The pattern ahead seems fuzzier while light to the

side is much reduced. Full positive marks for the headlight flasher button in the horn ring, an idea others should copy.

The fully reclining seats always win praise—and perhaps a few cries of surprise from the unwary. This year they are much firmer than before—less opulent, but with better lateral support. This pleased most yet annoyed others. Leg room can still be a bit of a problem for the driver. Here's how. Though the long seat travel assures plenty of fore and aft room (is there any other car where a six footer can't even reach the toe board?), the driver's left foot has only a small space for resting and even this is too far to the right.

A rather rare right-hand-drive Porsche, sampled some time ago, was infinitely better in this respect, especially when navigating hard right bends. It's all caused by the short wheelbase and the way the front wheel-well encroaches on the driving compartment.

In view of the fine new Ross steering gears, developed on the Spyder, the provision for the first time of a 17 inch diameter steering wheel seems unnecessary. The old 16 incher is available on special order and we definitely recommend it. It gives less interference with the driver's entrance to the car at the cost of 6% more force required at the rim.

In this day and age, the provision of a hand throttle comes as a bit of a surprise, especially on a rear-engined car. It connects ingeniously to the foot pedal and it locks at any desired idle (up to about 3500). This permits that second cup of coffee to be followed by a ride in a warm Porsche. In fact, the factory recommends a warm-up at 1700 for a minute followed by not over 3000 rpm driving until the oil reaches running temperature. Numbers no longer appear on the oil temp gauge though, only a wide green band with a narrow red one to the right. It seems that the numbers on the older gauges were more detailed than the gauges were accurate and many customers were worried because their car ran consistently at 140° F or 220° F - not very close to the 180° which is average, but not to be worried about either. The factory's cure - take off the numbers. We're lucky to have the gauge, I suppose.

The other minor gauge shows the gas level in the tank, but there certainly aren't any baffles in the tank, for this needle swings back and forth most erratically. So much so that we pretty much ignored it, much to our embarrassment late one night when we went a nervous 16 miles on the reserve tank before finding an open station.

The gearshift lever has been moved back several inches, changing places with the heater twist-knob. At the same time, the Mickey Mouse linkage (under the back seat bulge) has been usefully modified to reduce the travel. This reduction in mechanical advantage ups the forces involved a bit, but it's a small price to pay for the big gains.

The engine features several changes. Dual choke Zeniths replace the single throat Solesexes, permitting a throttle linkage less sensitive to engine temperature (what odd problems designers have with unorthodox layouts!) as well as vastly improving the low speed smoothness. Full throttle in fourth is smooth even below 1500 rpm.

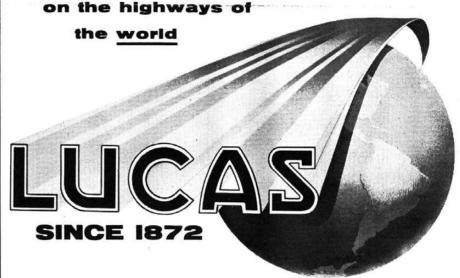
The chrome plated aluminum cylinder barrels have been replaced with cast iron ones. When worn, these may be rebored and fitted with oversize pistons, which is much cheaper than buying a set of matched barrels and pistons. Presumably the factory is convinced heat dissipation is still satisfactory.

The heater, usually a bugbear on air cooled cars, is more than satisfactory even in extremes of cold. But three people leaping into a cold Porsche can get a headstart on the windshield. Small gates can completely close the heater outlet, deflecting all the air into the defroster ducts, which

(Continued on page 65)

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### PORSCHE

(Continued from page 60)

quickly clears it.

Noise, also a serious problem on aircooled engines, is combatted by many layers of insulation. Though adequately subdued, it's still noticeable.

Engine accessibility, as before, is great for minor operations but a real pain in the neck for changing spark plugs and adjusting valves. The latter involves lying on the ground and there's not much that can be done about it. But why can't the engine lid be made larger, especially at the forward end? Reaching the torward two plugs takes an acquired knack and the only solace is that it's tougher on a Carrera (twin ignition and the same lid.)

Otherwise, maintenance is a Greasing involves but twelve fittings on the trailing like i.f.s. and the unequally divided track rod steering (every 1500 miles) with rarer attention to clutch and hand-brake cables.

Brakes scored highly on our test. Though helped in avoiding fade by the extreme cold, they are good brakes and well predate domestic efforts in the same direction. The Porsche's drums are of aluminum which is cast onto a ferrous braking surface (and a splined hub, at the rear). Similar, if not identical, to Fairchild's Alfin process, there is an intermolecular bond between the two metals which gives additional strength and better heat conductivity than the Buick system of cast-in dowels.

Bumpers are much in the European tradition being lightly made of thin gauge body steel. Their weakness in American parking traditions is overcome by an extensive system of bumper guards and bars. Ideal for hanging badges on though, if pure aerodynamics bore you.

It's very hard to write a road test on a car which has remained essentially the same for so long, especially when you've been driving one of them yourself for three years. So I will add a purely personal note, full perhaps of prejudices. I like my '54 Super coupe very much indeed (although roller-bearing crankshaft are expensive) and I probably will continue to drive it for quite a while longer. But the improvements of the '58 are indeed tempting. especially since the car handles so much more lightly and smoothly than all the 1600s which preceded it. Porsches have always been delectable motor cars, and in this one they have reached a new peak. If you've ever liked the Porsche before, then I can recommend the '58s without reservation. If you demand more acceleration than is offered by this model, then the new Supers (which no longer have roller cranks) appear to be very good bets, although at a hefty price increase for a power-pack. Those who feel Porsches are too expensive should give one a careful looking over to realize the amount of value

If you pride yourself on knowing your way around sports cars, then you owe it to yourself to try a Porsche.

Stephen F. Wilder





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