

CORVETTE CHRONOLOGY

IN THE BEGINNING: SOLID AXLES, POWERGLIDE AND ESTABLISHMENT OF A HIGH-PERFORMANCE FAMILY . . .

BY JON MCKIBBEN

IN LATE 1953, staid, conservative Chevrolet stunned the U.S. automotive world with the announcement of the 1954 Corvette, slickest stovebolt of its time. The 1954 Corvette was an honest-to-Duntov 2-seater, and featured advanced styling, a fiberglass body, triple carburetion and dual exhausts. Purists were drawn to the sleek-looking Corvette like opposite magnetic poles, and repelled with equal force upon inspection of the car's mechanical specifications. Under the dream car's inspired white (only color available) shell lurked a 1954 Chevrolet sedan, shortened, supertuned, and fitted with an open drive line and Hotchkiss rear suspension. Chief source of purist horror, incredible as it seems, was incorporation of the 2-speed Powerglide automatic transmission.

In an October, 1953, SAE presentation, Maurice Olley of Chevrolet justified Powerglide in the Corvette as

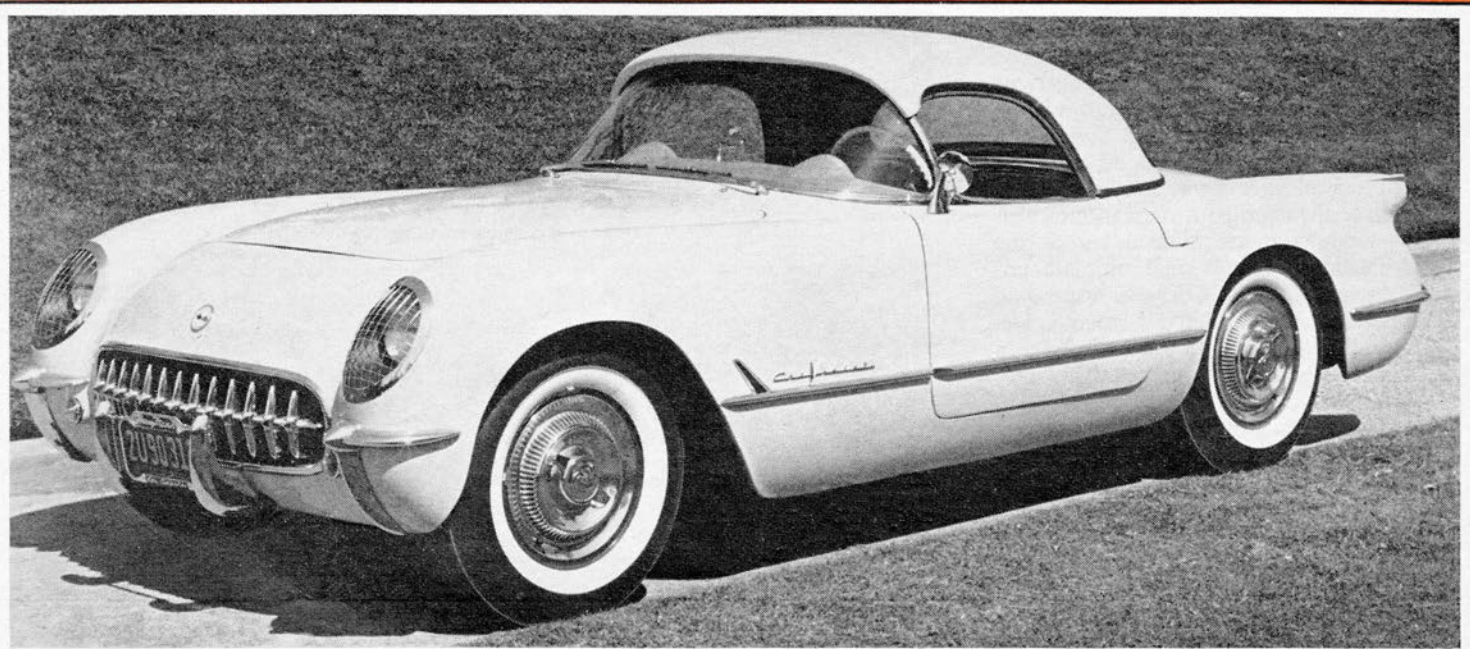
follows: "... as the sports car appeals to a wider and wider section of the public, the center of gravity of this theoretical individual is shifting from the austerity of the pioneer towards the luxury of modern ideas. . . ."

PERHAPS THE use of an automatic transmission prompted some new converts to discover the joy of 2-seater operation. More likely, many sales were lost because of Chevrolet's exclusion of manual transmissions from the option list. Not only did the automatic-only philosophy hinder sales, but it created a reputation among enthusiasts that lingered for many years. The Corvette was considered a sporty car, rather than a true sports car, a vehicle to be seen in, rather than to really drive.

Chassis specifications for the 1954 Corvette look, today, pathetically unsophisticated and inadequate for a high-performance automobile. However, one must translate such judg-

ments into mid-1950 perspective. Although 1954 Chevrolet sedan suspension and steering components appear clumsy, in the light of modern technology, the vehicle was quite roadable, and compared favorably in performance and handling with popular sports cars of the time. While not competitive as a racing car, even in 1954, brakes, suspension system and rather slow steering combined to create a semi-luxurious high-speed cruiser which Chevrolet firmly believed was a near-optimum compromise for the American market.

The 1954 Corvette engine was a modified version of Chevrolet's Six of 235-cubic inch piston displacement. Three sidedraft Carter carburetors, high-performance camshaft, high (8:1) compression and dual-outlet exhaust manifold combined to produce 150 bhp at 4200 rpm. Dual concentric valve springs permitted 5500 rpm, a speed which could easily be attained in



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Low range. With the standard 3.55:1 rear axle ratio, top speed of the Corvette was near 110 mph, a velocity that placed the 1954 Corvette among the fastest production sports cars on the market.

With a weight of just under 3000 lb., including driver, the Corvette had a power-to-weight ratio of approximately 20 lb./bhp. Acceleration times of 11 sec., 0-60 mph, and 18 sec. for quarter-mile time placed the 1954 Corvette ahead of most popular imported and domestic cars of that year. The 1953 Jaguar XK120 was only slightly superior in acceleration and top speed.

BECAUSE OF its popularity among sports car enthusiasts, the Jaguar was selected by Chevrolet as its product goal. This was one of the most unfortunate phases of the Corvette program, for in choosing the Jaguar, Chevrolet picked a car with poor wheel-in-the-chest driving position, mediocre handling quality and borderline brakes. It is not surprising, then, that the 1954 Corvette shared these faults. Had a Ferrari, Maserati, Alfa Romeo, Mercedes-Benz or Porsche been thoroughly examined, the Corvette could have started life as a much more satisfactory vehicle, more enjoyable to drive and capable of superior road performance. Through 1962, Corvettes remained grossly inferior in driving position and control layout to the majority of Italian and German sports cars.

To further its "dual-purpose" concept for the Corvette, Chevrolet elected to fit rather soft springs on front and rear. Ride rates of 105 and 112 lb./in., front and rear, respectively, while stiffer than typical passenger car rates, were considerably softer than most 1950-era sports cars. Suspension geometry was designed to produce substantial understeer, another concession to the average American motorist. A large diameter antiroll bar at the front insured additional ultimate understeer. In 1954, Corvette suspension provided a firm, relatively smooth ride. Handling, though not outstanding in ultimate adhesion, was relatively safe and forgiving.

Corvette's only significant change for 1955 was the adoption of Chevrolet's then-new 265-cid V-8 engine. Passenger car versions of this engine produced 150 or 180 bhp, depending on options, but a special camshaft was installed in Corvette engines, raising power rating to 195 bhp at 4600 rpm. With this option, Corvette stepped into the big league of high-performance

cars. Unfortunately, 2-speed Powerglide remained the only transmission offered for Corvette. Other unfortunate circumstances were that no suspension or brake changes accompanied the new powerplant option. Thus, the 1955 Corvette was an outstanding performer in a straight line, but no threat for road racing laurels.

Another 1955 announcement that

probably had more impact on future Corvettes than anything from GM was the introduction of a 1955 Ford Thunderbird. A 2-seater, similar in concept to the Corvette, but with styling closer to the passenger car line, the Thunderbird featured V-8 engines of up to 292 cid. More important, Thunderbird option lists included three transmissions: 3-speed automatic, 3-speed manual



THE 1956 Corvette marked the first use of the inset side panel, and manual 3-speed transmission was optional for first time.



DUAL HEADLIGHTS appeared in 1958 and the Corvette started to show the character that was to typify it in later years.

PROGRESS IN PERFORMANCE

Listed below is an accumulation of performance data gathered from reputable sources which covers significant high-performance Corvettes since 1953. For brevity, only those models incorporating top factory-installed performance options are included.

Year	Wheel-base	Curb weight	Weight distribution (w/driver) %f/r	Engine type/cid	Bhp/rpm	Transmission	Axle ratio	0-60 mph (sec.)	1/4 Mile (sec.-mph)	Top speed
1954	102	2890	53/47	IL6/235	150/4200	2-speed Powerglide	3.55:1	11.0	18.1-76	110
1955	102	2880	52/48	V-8/265	195/4600	2-speed Powerglide	3.55:1	8.7	16.5-84	119
1956	102	2980	51/49	V-8/265	225/5200	3-spd. close ratio man.	3.55:1	7.3	15.8-89	129
1957	102	2880	53/47	V-8/283	283/6200	4-spd. close ratio man.	4.11:1	5.7	14.3-93	132
1961	102	3040	53/47	V-8/283	315/6200	as above	4.11:1	5.5	14.2-99	128
1963	98	3030	48/52	V-8/327	360/6000	as above	3.70:1	5.9	14.9-95	142
1965	98	3260	51/49	V-8/396	425/6400	as above	3.70:1	6.0	14.1-104	140
1966	98	3270	52/48	V-8/427	425/5600	as above	3.36:1	5.7	14.0-102	135

and 3-speed manual with overdrive. Although the new Corvette engine was sufficiently powerful to provide straightline performance at least equal to the best Thunderbird power train, the need of a manual transmission for vigorous driving cost Chevrolet sales.

A little-known piece of Corvette history is that Chevrolet built, in late 1955, some 25 3-speed manual transmission V-8 Corvettes. The transmission in these cars was the same close-ratio unit to be seen in production 1956 Corvettes.

AMERICAN MOTORISTS were now presented with a delightful situation. The two largest U.S. automobile manufacturers were competing for sports car sales. Obviously, better products would have to be developed if sales successes were to be obtained. Chevrolet had no intention of losing ground, and in 1956, it showed enthusiasts that complaints had not fallen on deaf ears.

Corvette specifications for 1956 spelled out one thing above all: Chevrolet intended to maintain the top position in domestic automobile performance. The most obvious evidence of this intent was the release of a 3-speed, close ratio manual transmission (finally!). Gear ratios were 2.20:1, 1.31:1 and 1.00:1, first to top. Though only second and top gears were synchronized, first could be engaged at speeds up to 50-60 mph without perfectly executed double-clutching. Powerglide remained available, but was no longer a mandatory handicap.

Engine options ranged from a base 210-bhp V-8 (6-cyl. engines were dropped after 1955), through a 225-bhp high-performance option, to a 240-bhp version intended for "racing purposes only," according to factory literature. The latter engine was the 225-bhp (at 5200 rpm) high-performance powerplant with a high lift, long-duration camshaft. With standard 3.55:1 axle gearing, the 225-bhp Corvette could easily reach 60 mph in first gear, and in approximately 7 sec. Top speed was near 130 mph, and quarter-mile e.t. figures of under 16 sec. were easily attained.

For the first time, Corvettes appeared at major road races and, to the amazement of import-biased enthusiasts, started to beat the heretofore invincible Mercedes 300 SL coupes in production class races. When Corvettes were defeated in races, it was generally the result of a failure in the brake system, Achilles' heel of the 1956 Corvette. Acceleration was superior to any high-volume production sports car then built. Handling was considered adequate, and the increased power available in the 1956 engines cancelled most of the undesirable understeer of the suspension system with

proper use of the accelerator.

By 1957, the pattern for Corvette's future was firmly established. A new 4-speed manual transmission, more powerful engines and improved braking systems promised overall road performance at a level never before achieved in a vehicle of the Corvette's price class. Indeed, the 1957 Corvette was faster than all but a high-priced handful of thinly disguised racing machines.

Engine options available in 1957 Corvettes enabled purchasers to tailor their automobile to any reasonable application. Starting at the bottom of the performance range, a 220-bhp, single 4-barrel 283-cid V-8 provided adequate performance and exceptional economy, and was an ideal choice for mating with the optional Powerglide transmission, creating a refined piece of sporty-looking transportation. The next two engines were identical to the 220-bhp unit except for induction systems. A 245-bhp version came equipped with two 4-barrel carburetors. This engine, fitted with Chevrolet's most dramatic engineering advance of 1957, fuel injection, was rated at 250 bhp.

APORT injection system, the 1957 Chevrolet layout incorporated a high, cast "dog house" manifold, on which were mounted air and fuel meters. Fuel was metered in proportion to air flow, and was injected in constant-flow fashion. Fuel injection was not a major power increase factor. It did become almost universal on 1957 Corvettes entered in road races, however, because of improved throttle response, increased mid-range torque output and insensitivity to acceleration and cornering inertia.

Top performance engines for 1957 Corvettes were the 270-bhp, two 4-barrel, and 283-bhp fuel injected units, identical except for induction system and compression ratio. Because of improved fuel distribution, the fuel injected engine had a compression ratio of 10.5:1, instead of the 9.5:1 ratio incorporated in carbureted derivations. Both of these engines featured very long-duration camshafts, and were unpleasant to drive in traffic or sustained low speed operation. Peak power occurred at 6200 rpm in the 283-bhp engine, and valve train dynamics permitted over 7000 rpm for brief periods.

To complement the new high-performance engines and 4-speed transmission, a complete package of suspension and brake modifications was available at a list price of \$725. Included in this obviously for racing package were higher rate front and rear springs, larger diameter antiroll bar, stiffer shock absorbers, fast-

steering adapter plate, limited-slip differential with optional ratios, finned cast iron brake drums, vented and scooped backing plates and cerametalix brake linings. With these options fitted, 1957 Corvettes became the scourge of production sports car racing.

ALSO IN 1957, Chevrolet built the Corvette SS, a highly refined sports racing car with performance potential to win any major sports car race in the world. The Automobile Manufacturers Association ban on factory racing participation killed the SS immediately after its lone race appearance at Sebring in 1957. The SS had done its part of the job, however, and racing performances by standard 1957 Corvettes convinced even the most narrow-minded purists that the Chevrolet Corvette was indeed a genuine sports car.

The year 1958 saw what was, for many, a step in the wrong direction. Styling changes violated the commendable simplicity of the 1957 model. Weight increased, chassis specification essentially remained unchanged, and racing options released in 1957 continued for 1958 models. Top horsepower rating was up to 290 bhp, but performance level remained very close to the lighter 1957 Corvette.

Technically, the 1959 Corvette was not significantly changed. Popular rumors were that 1960 would see an all-new Corvette. This was not to be. The only change of any importance for 1960 was the introduction of aluminum cylinder heads on high-performance fuel injection engines. These heads featured larger valves and ports, compression ratio increased to 11:1 and reduced weight. Fuel injection system modifications increased air flow capacity and improved high speed output. Performance increase, though small (rated power was raised from 290 to 315 bhp at 6200 rpm), was significant, and speeds increased on dragstrips and road courses.

A "Sting Ray" rear body configuration gave the 1961 Corvette a new appearance and provided forecasters with a clue to future Corvette style. The reworked body was not accompanied by significant power train changes.

Though enthusiasts anxiously awaited the "all-new" Corvette, the 1961 version continued to prove its performance in major sports car races in the U.S. The Elkhart Lake June Sprints, premier production sports car event of 1961, saw Corvettes finish first and second, ahead of two Ferraris well over twice the cost of the race-prepared Corvettes.

The year 1962 was the year of the 327-cid Chevrolet engine. Corvettes featured the new engine in 250-, 300-,

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340- and 360-bhp versions. The top rated unit featured Chevrolet fuel injection. Corvette chassis and body modifications were almost nonexistent, aside from the new powerplants. Again, the "wait until next year" rumors were circulated. This time these rumors carried truth.

The Sting Ray was introduced to the public for 1963. For the first time, since Corvette introduction in 1954, a new chassis was released. The Corvette Sting Ray featured independent rear suspension, ball-jointed front suspension with brake antitive, and optional steering ratio. A 98-in. wheelbase (compared with 102 for all previous

Corvettes) improved agility. Component relocation resulted in weight distribution of 48/52%, front/rear, instead of the 53% front weight bias of earlier Corvettes. The new independent rear suspension system incorporated transverse leaf spring and fixed-length axle shafts, a system first used by Colin Chapman's successful Lotus sports and formula cars.

LARGER BRAKES, suspension geometry which combined with improved weight distribution to produce near-neutral handling, and a power-increasing enlarged fuel injection manifold all spelled trouble for Sting Ray's road-racing competitors. Chevrolet may not have changed the basic Corvette chassis for 10 years, but when it decided to make a change it was dras-

tic, sweeping, and commendably progressive. Not only was Corvette performance greatly improved, but comfort level increased to a point considered unbelievable by owners of earlier Corvettes. Seating position and ride quality were obvious points on which Chevrolet engineers lavished considerable effort.

As luck would have it, although the 1963 Sting Ray was far and away the finest road racing machine produced in quantity by Chevrolet, it was to be one of the least successful. Another sports car was introduced in the U. S. in 1963—Cobras—and the Ford-powered snakes proved superior in this zoological fight for survival. Although much more refined, the 3000-lb. Sting Ray was no match for Carroll Shelby's 2000-lb. racing machine.

Competition success may have been few in number, but purchasers were plentiful. The Sting Ray was, and is, a superb dual-purpose sports car. Well finished, luxuriously appointed and capable of extremely high speeds on less-than-perfect roads, the Sting Ray has been called America's answer to Ferrari. This is not the place to answer such a statement, except to point out that Chevrolet has produced a car worthy of comparison with the world's finest sports and Grand Touring cars, and sells this car at less than half the cost of comparable vehicles.

THE NEXT noteworthy alteration, or addition, to the Sting Ray's chassis was carried out in 1965. Disc brakes on all four wheels eliminated the last major complaint in regard to overall road performance of the standard Sting Ray package. Engine output was increased to 375 bhp at 6200 rpm through detail changes to fuel injection, camshaft and cylinder heads.

Chevrolet's 396-cid/425-bhp "semi-hemi" engine was added to Sting Ray option lists in 1965, but was very hard to obtain until late in the year. This engine increased straightline performance of the car, but did little for road course potential. A larger front antiroll bar, along with a rear antiroll bar, improved handling, and compensated for increased front end weight. So, while sports car enthusiasts viewed the large displacement engine with less than wholehearted approval, acceleration-oriented American motorists were completely satisfied. Showroom stock, the 396-cid/425-bhp Sting Ray was capable of well over 100 mph in a quarter-mile, with elapsed times around 14 sec. flat. Perhaps most important, this performance was achieved with rear axle gearing suitable for everyday driving with top speed near 140 mph.

The 396-cid/425-bhp Sting Ray engine was superseded by a 427-cid ver-

IN THE CRYSTAL BALL

The Forecast Is For Mid-Engined Supercars With Hydra-Matic Transaxles

AFTER SURVEYING 15 years of Corvette development, it seems logical to make some projection of future Corvette design. Obviously, a forecast of this sort reflects the personal desires of the prognosticator. Rather than predict what the Corvette will be like in, say, five years, this is a description of the Corvette this writer wishes to see evolve.

First, and most critical to the concept of the vehicle, the 19— Corvette would be a mid-engined 2-seater, built on a 90-in. wheelbase, with no more than 2500 lb. curb weight. The car would utilize the small-block Chevrolet engine of 350-cubic inch piston displacement, in approximately 350-bhp trim. Transmission/rear axle would be a unit derived from the present Muncie gearbox, with four fully synchronized forward speeds. A Turbo Hydra-Matic transaxle unit would be a very desirable option.

Chassis configuration would include independent suspension all around, with coil springs and telescopic shock absorbers. Rear suspension would retain the present fixed-length axle shafts with single lower control arms. Vehicle minimum ground clearance would be 6 in., and free suspension jounce travel would be at least 4.5 in. Front suspension and steering systems would

remain similar to present layout, except for the lack of necessity for power-assisted steering.

Brakes could be retained almost unchanged from the present system, except for variation of the front-to-rear braking effectiveness proportioning to reflect the weight distribution changes inherent in the proposed design. The future Corvette would carry about 55-58% of its laden weight on the rear wheels. Tires and wheels would be similar to 1968 Corvette options, with appropriate tire pressures for the substantial rear weight bias.

This proposed Corvette represents much of what has been learned from sports/racing cars in recent years. The rearward weight bias and central location of major masses in all probability would result in superb handling and agility. Power-to-weight ratio would remain very high, even with the smaller powerplant. Modern design would permit vehicle rigidity superior to the present Corvette, with substantially less total weight. Improved traction should increase low speed acceleration. Braking would benefit from the rearward weight bias, because forward weight transfer would more nearly equalize tire loading under heavy deceleration.

sion of the same engine, with similar power rating. Surprisingly, the new engine was a milder engine, more suited to street operation than its smaller-displacement predecessor. Low speed torque more than made up for slight losses in high speed output, and Sting Ray performance improved. Fuel injection had been dropped as an accessory for 327-cid Sting Ray engines, but the single 4-barrel, 350-bhp 327 still was more than adequate for truly sporting performance, and remained the sports car enthusiast's choice. The larger engines, while faster, were heavier, and caused front/rear weight distribution of approximately 52/48%. Despite less-than-ideal weight bias, the 427 Sting Ray, replete with competition options, was an extremely fast sports car on faster road circuits. The 1966 Daytona Continental saw a 427 Sting Ray finish first in GT category, a thorough demonstration of speed, roadability and reliability.

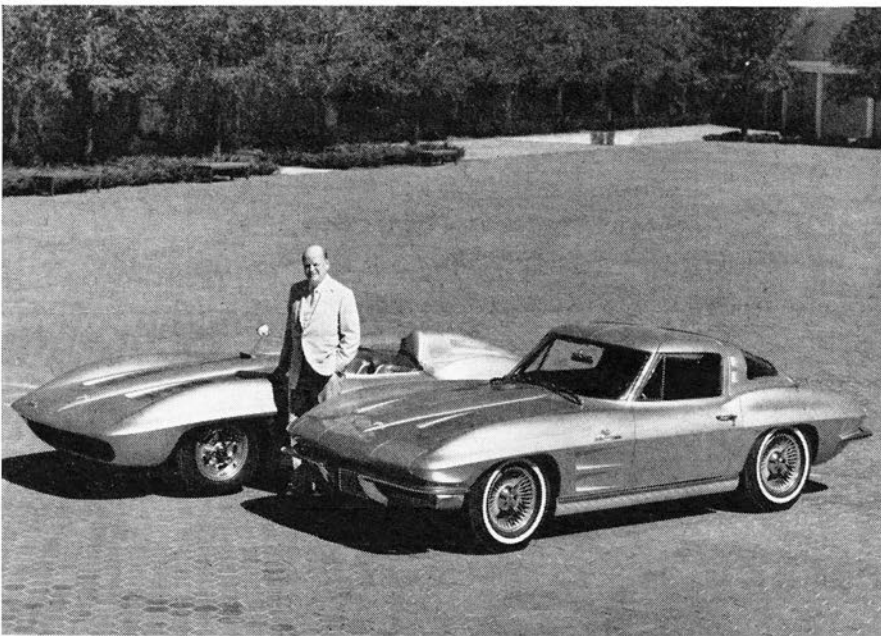
The 1967 Sting Ray was essentially unchanged, but the late-introduced L88 option showed that Chevrolet had not forgotten the performance enthusiast. This option, including large-port aluminum cylinder heads for the 427-cid engine, high-performance camshaft, large passage single 4-barrel intake system, and premium internal components for improved reliability, substantially increased Sting Ray performance. Not only was power increased, but handling improved as a direct result of engine weight reduction. Aluminum cylinder heads reduced weight of the 427 to near that of the 327-cid small-block engine. Because of poor low speed characteristics, the L88 engine was cataloged by Chevrolet "for racing purposes only."

Rumors preceding the 1968 Corvette ranged from conservative to absurd. One of the most popular rumors, dating back to 1964, concerned engine location in the new Sting Ray. Because of Chevrolet's disclaimed, but apparent, association with Jim Hall's Chaparral sports-racing car project, many forecasters were predicting mid-engine configuration for the new Sting Ray chassis.

From an esthetic standpoint, the 1968 Corvette (no longer called the Sting Ray) is all-new. From a technical standpoint, no significant changes have been made, except for the addition of 15 x 7-in. rims and F70-15 tires. Rear suspension geometry has been altered slightly to provide a better camber change pattern through jounce and rebound, to keep the new wide section tires in full contact with the road surface. Turbo Hydra-Matic 3-speed automatic transmission is now available. This option offers city traffic convenience without the tremendous performance sacrifice inherent in pre-



STING RAY rear treatment came in 1961 and has continued with minor "tail lifting" through the 1967 Sting Ray models.



ORIGINAL STING RAY was a combination show and go car which did some racing and was the style-setter for production Sting Rays.

vious Powerglide installations. Engine options for 1968 include 300- and 350-bhp versions of the venerable 327-cid V-8. The 427-cid engines are available in 390-, 400- and 435-bhp trim, the latter two equipped with triple carburetion.

What hath 15 years of Corvette development wrought? From a 2-seat stylists' toy, the Corvette has progressed to a deserved position among the finest high-performance sports/GT automobiles in the world. If acceleration and top speed are required criteria, Corvette option lists include engines of tremendous power and torque. Any Corvette, from standard to fully competition prepared, handles excep-

tionally well. A blend of handling and ride comfort unobtainable anywhere else in the domestic automotive market highlights Corvette's many desirable features. Standard 4-wheel disc brakes are adequate for even the most vigorous highway operation.

Corvette power has increased dramatically. Chassis technology has improved to a point well beyond other domestic automobiles. Cost has risen, but remains very reasonable in comparison to other world vehicles of similar performance and chassis refinement. Comfort and driving position are exceeded only by a handful of over-\$10,000 limited production cars in the high-performance category. ■