

*- Dan Gurney Was A Step Or Two Ahead Of The Pack In Aerodynamics -*

# The 'Gurney Flap', The '61 Chevy British Saloon Racing Car

By HERB ANASTOR

Before he retired as a driver in 1970, Dan Gurney (1931-2018) won races in Formula 1, Indy Car, NASCAR, Canadian-American Challenge Cup and Trans-Am Series competition. But the versatile competitor was more than just an outstanding racer - a lot more.

As a race-car builder, Gurney was usually a step or two ahead of the pack as from 1965-2012 his Santa Ana, California-based All American Racers produced 158 Eagle Race Cars that won in Formula 1, the Indy 500, the 12 Hours of Sebring and the 24 Hours of Daytona. And AAR is also the only constructor in the United States which has designed and built a winning Formula 1 Car, a winning Indy 500 Car and a winning Sports Car.

In addition to this, Gurney was a successful team owner in USAC and CART Championship Car Racing, the IMSA GTP Sports Car Series and the Toyota Atlantic Formula Series. And the 66 drivers that raced for his AAR factory teams recorded 78 victories - including the 1975 Indy 500 with Bobby Unser in the light-blue Jorgensen Steel Corporation-sponsored No. 48 turbocharged Offy/Eagle - as well as 83 pole positions and eight series championships.

A résumé like this indicates nothing less than a hall-of-fame career and a common Gurney trait was that he always thought outside of the box no matter what problem was presented to him.

A good example of this took place in early 1971 when Gurney was evaluating the aerodynamics of Unser's white and blue Olsonite-sponsored No. 2 Eagle that was powered by a turbocharged 158-cubic-inch/820-horsepower DOHC in-line 4-cylinder Offenhauser engine during a pre-season USAC test at the 1-mile Phoenix (Arizona) International Raceway.

And while doing so he recalled that Californian Richie Ginther had considerable success in 1961 experimenting with spoilers on Ferrari's first mid-engined Sports Car - the bright-red, right-hand-drive 246 SP (Sports Prototype) powered by a 2.4-liter (146.4-cubic-inch)/270-horsepower DOHC V-6 engine with three 2-



1 barrel/downdraft Weber 42 DCN carburetors.

The diminutive Ginther was a top driver for Ferrari, BRM and Honda, but his cockpit skills - including Honda and Goodyear's first Formula 1 wins in the white and red 1.5-liter (91.5-cubic-inch)/V-12 No. 11 Honda RA27 at the 1965 Mexican Grand Prix - also saw him as an excellent development and test driver with a great deal of mechanical knowledge. And his fruitful effort of almost 60 years ago to adapt the use of a spoiler on a racing car was the first work of its kind.

In thinking back on this breakthrough that was accomplished by his friend and former AAR driver, Gurney wondered what would happen if a small spoiler was fitted along a wing's trailing edge. So he resourcefully took about 45 minutes to design, make and rigidly-mount an upward-pointing, right-angle piece of aluminum to the top trailing edge of the No. 2 Eagle's rear wing and the "Gurney Flap" was created.

When asked about the wing's strange addition, Gurney said it was just used to strengthen the piece. But he also knew that with this "wickerbill" in place the downforce generated by it improved traction and allowed for greater straightaway speeds; something that everyone else soon realized.

The Gurney Flap - which in some applications now is made of carbon fiber - can be fashioned in various heights to fine-tune a wing's performance, but its most-effective size has been found to be two percent of the chord of a wing, the imaginary straight line joining the leading



and trailing edges of an airfoil. And due to a trio of easily-applied factors - it is simple, inexpensive and effective - this unassuming aerodynamic device was quickly adopted by the motorsports community.

But racing cars were not the only things to take advantage of this ingenious item as it also found use in the aircraft industry: on helicopter horizontal stabilizers as such multi-use rotorcraft operate over a very wide range of both positive and negative angles of attack; and, on banner-towing airplanes where it is pointed downward to increase high lift, which is essential in this kind of flight.

However, what might be an even more-remarkable illustration of this unconventional type of thinking took place in late 1960 as Gurney - who was then in the early stages of his Formula 1 career - was watching the British Saloon Car Championship.

While assessing that year's competition he noticed five of seven wins in the 1.600cc+ Class (1.6-liters/97.6-cubic-inches and up) were scored by four-door/right-hand-drive Jaguars powered by 3.8-liter (231.8-cubic-inch)/220-horsepower DOHC in-line 6-cylinder engines with twin SU HD6 single-barrel/side-draft carburetors. But he was sure he could beat those 180-inch-long/107-inch-wheelbase cars - which cost about £1,800 or \$4,800 (£39,000 or \$41,000 in today's money) - with a good old American Chevrolet Impala.

British Saloon Racing is a form of basic Stock Car competition as a "saloon" in British parlance is "an automobile having a closed body and a closed trunk separated from the part in which the driver and passengers sit; a sedan." And when such vehicles raced in the early 1960s, their incidental race track duty belied the fact that they were licensed machines normally driven on the street.

Established in 1958, the British Saloon Car Championship often attracted some of Europe's top Formula 1 and Sports Car drivers and each car's engine cylinder block, rear-axle casing, gearbox casing, wheelbase and rim diameter and overall appearance had to remain standard.

So, with these guidelines in mind, Gurney ordered one of the first 1961 Chevrolet Impalas

to come off General Motors' old Van Nuys, California, assembly line equipped with Chevrolet's new high-performance Turbo Fire 360-horsepower/409-cubic-inch V-8 that was produced at the GM Tonawanda Engine Plant in Tonawanda, New York.

The 409 engine was first offered in January 1961 as a \$484 upgrade (\$4,152.98) and only 142 1961 Chevrolets were built with it. And while Gurney took delivery of his Midnight Blue 409 Impala with Ermine White angular side accents in February from Don Steves Chevrolet in La Habra, California, a fascinating detail is that its approximate cost of \$3,800 (\$32,606.03) was close to the \$3,934 (\$33,755.83) base price of a 1961 Corvette with a 283-cubic-inch/230-horsepower V-8.

At first glance Gurney's 209.3-inch-long/119-inch-wheelbase car seemed quite ordinary as it had windshield wipers, a thin-rimmed steering wheel, two-tone-blue-upholstered front and rear bench seats, a heater, an AM radio, an in-dash cigarette lighter and full carpeting - all of which were in place when the car was raced. But it was under the hood where things got exciting.

The cast-iron 409 engine produced 409-foot-pounds of torque and it was built using Chevrolet's "W-Series" platform; the company's first Big-Block Overhead-Valve V-8 that was introduced in 1958 with 348-cubic-inches of displacement, offset valves and uniquely-scaled rocker-arm covers which thus gave it a distinctive appearance. And in early-1961 form the 409 had: forged aluminum pistons; a more-aggressive camshaft; solid valve lifters; an 11.25:1 compression ratio; an aluminum high-rise intake manifold; and, a single "D" Series Carter AFB (Aluminum Four Barrel)/500 CFM carburetor (Number 3270) manufactured just for this engine.

In addition to this, Gurney's Impala came with: dual exhausts; a beefy Borg-Warner aluminum T-10 4-speed transmission; a Positraction rear end; and, a severe-service Police-Taxi Cab suspension package that included a stiffer front anti-roller bar, firmer springs and shocks, and sintered metal brake shoes with corresponding drums.

Also, in an unusual situation, the car had a "Chevrolet-required" 7,000 RPM Sun Electric Tachometer on the right side of the steering column. This state-of-the-art piece was a \$48.45 (\$415.73) "option" and the idea was that Chevrolet was serious about the 409's performance and it made the company the first modern car manufacturer to offer an optional tachometer.

To get the big two-door sedan ready for racing Gurney sent it to Bill Thomas Race Cars in Anaheim, California, where Chevrolet specialist Bill Thomas and top-flight racing mechanic Bill Fowler: disassembled and "blueprinted" the engine; added a Corvette anti-roller bar to the rear suspension; created flexible ducts for the front brakes with screen-covered heater hose; and, fitted its white 15-inch wheels with blackwall 7.60x15 Goodyear Blue Streak Racing Tires.

The car's manual steering was retained, but its box was replaced with a power-steering unit that had 3.5-turns lock-to-lock. And the stock dual exhaust system was changed to headers with straight-through pipes that expelled their contents just in front of their corresponding rear tires.

When the race set-up work was finished, Gurney took the 3,500-pound car - which had no seat belts or roll cage - to the old 3.725-mile Riverside (CA) International Raceway for a shakedown run and in the process he recorded a lap of 2 minutes 16.6 seconds around the clockwise circuit that was 0.8-seconds faster than the Corvette lap-record set by Dave MacDonald in his white and blue No. 00 fuel-injected 283-cubic-inch/283-horsepower 1957 racer on February 25, 1961.

Then the car - that had yellow-with-black-lettering California VHX 874 license plates from Southampton, England, where Gurney picked it up at the dock on May 4 and drove it 95 miles north to the Silverstone Circuit where he would race it in Round 4 of the British Saloon Car Championship at the 13th Annual International Trophy Meeting on Saturday May 6.

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The 760-acre Silverstone Circuit is owned by the British Racing Drivers' Club and it

straddles the Northamptonshire and Buckinghamshire border in the East Midlands of England. It also is one of the most-historic layouts in international motor racing as it hosted the first race in the Formula One World Championship; the 1950 British Grand Prix that was won by pole-sitter Giuseppe "Nino" Farina in the red No. 2 supercharged 1.5-liter (91.5-cubic-inch)/300-horsepower DOHC straight-8 Alfa Romeo 158 that was built in 1937.

But even more than that, the track's location is one of great importance as during World War II the huge grounds were RAF Silverstone, a Royal Air Force Bomber Station that opened in 1943. And when a permanent road course was built there in 1948, the airfield's three runways - which were designed in a classic WW II triangle format - were left intact within the outline of the track.

Silverstone is a special place for the British people and the 13th Annual International Trophy Meeting there was also held in that regard. And the day of racing on that cloudy and sometimes rainy afternoon featured five events: an International Sports Car Race; an International Formula Junior Race; an International Production Touring Car Race; the 13th International Trophy Race; and, a Historic Racing Car Race.

Four of these races produced popular winners as: pole-sitter Stirling Moss won the Sports Car race in the light green No. 12 right-hand-drive Lotus 19 Monte Carlo with a 2.5-liter (152.5-cubic-inch)/239-horsepower DOHC in-line 4-cylinder Coventry Climax FPF engine; outside pole-sitter Jim Russell won the Formula Junior event in the No. 28 Lotus with a 1-liter (61-cubic-inch)/90-horsepower DOHC in-line 4-cylinder Ford engine; pole-sitter Moss won the International Trophy Race in the green and white No. 4 Formula 1 Cooper T53 with a 1.5-liter (91.5-cubic-inch)/151-horsepower DOHC in-line 4-cylinder Coventry Climax FPF Mk. II engine; and, Dan Margulies won the Historic Race in the red No. 31 1939 Maserati 4CL with a supercharged 2.9-liter (176.9-cubic-inch)/240-horsepower DOHC in-line 8-cylinder engine.

But the International Production Touring Car Race grabbed the most attention as it included an early version of an American "muscle car" that had never before been tested in this manner.

This British Saloon Car Championship races saw 21 cars entered in four categories based on engine displacement in liters (1,000cc or 61 cubic inches). And there were: nine cars in Class A (0-1,000 cc) - three 85-liter Austin Mini Sevens, three 85-liter Morris Mini Minors and three 981-liter Auto Union 1000s; four cars in Class B (1,000-2,000cc) - two 1.5-liter Rileys and two 1.5-liter Sunbeam Rapiers; one car in Class C (2,000-3,000cc) - a 2.4-liter Jaguar; and, seven cars in Class D (3,000cc and up) - six



AUTO RACING LEGEND 1) Dan Gurney often thought "outside the box" in his Hall of Fame career as a driver, car builder and team owner in major international motorsports competition; 2) Gurney and his No. 37 409-powered 1961 Chevrolet Impala leads the 3.8-liter Jaguar Mark 2's of Mike Parkes (No. 34) and Roy Salvadori (No. 32) in the British Saloon Car Championship race in May 1961; 3) Indy 500 winner Dario Franchitti drove some exhibition laps, with his wife Eleanor, in the restored Gurney Impala at Goodwood in 2018.

(Photo 1 from All American Racers Archives; No. 2: Silverstone Circuit photo; No. 3 by Tom Shaxon)