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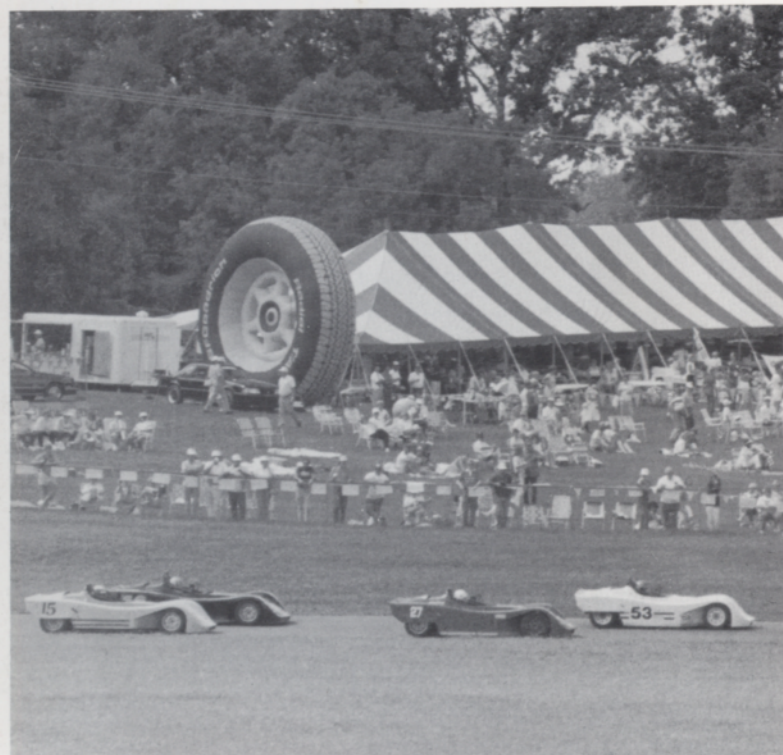
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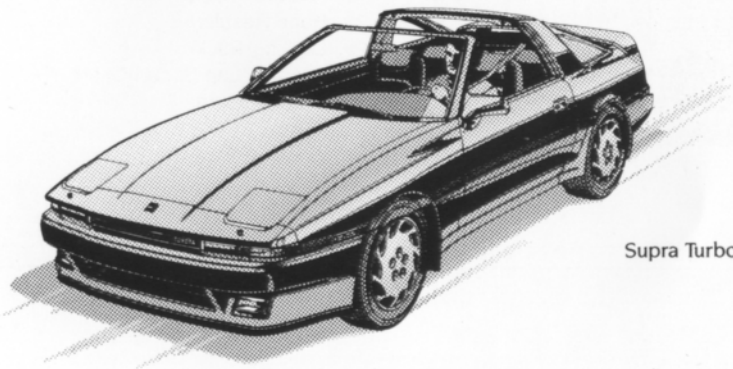
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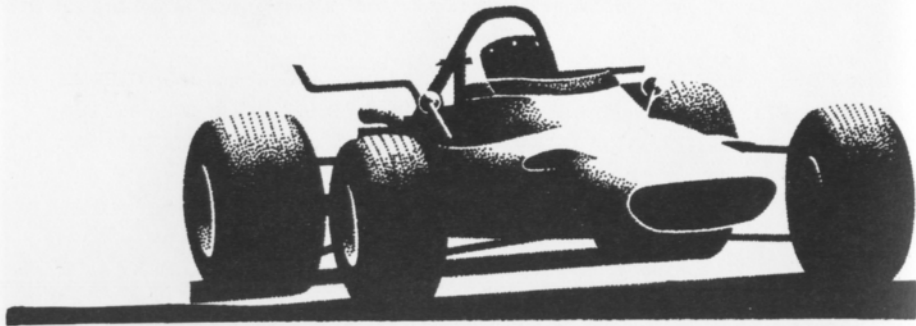


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Staff

Editor: *DAN HILL*
Design and Production: TAURUS ADVERTISING
Photographers: AL BIZER
DON CASTLE

Above Photo by DON CASTLE
Cover Photos by DON CASTLE



The Inside Line

Welcome to Waterford Hills Road Racing! Well, it's August again and you know what that means. You DO don't you? It means the possibility of hot weather, the likelihood of a substantial crowd on the Hill, and the CERTAINTY of plenty of action on the track. So find yourself a good spot and settle in. The fun's about to start.

We'd like to extend a special welcome to staff and clients of the Uniroyal-Goodrich Tire Company, here to enjoy their annual motorsports outing. Waterford style. Prior to the adoption of the Club Ford racing class by the Sports Car Club of America, B.F. Goodrich ran a contingency program to assist and award those racing in the Formula Ford Radial class. Following the deletion of that class, a plan was devised for last season to provide the same services to those using BFG tires in the Showroom Stock and Improved Touring groups here at Waterford Hills. The smiles seen last year when the checks were passed out are typical of racer response to BFG support throughout the country. Thanks folks! We're glad you're here. We hope you'll find your day enjoyable.

If your regular viewing spot is already taken today, I tried one for a while last race weekend that you might want to check out. The fence or stands along the short straight between Archers Corner and Paddock Curve (see the course map on page 35) gives a very different perspective from that of the Hill Side spectator area. For one thing, you are fairly close to the cars as they attain their highest speeds just before braking for Archers. Secondly, you will get to see many passing maneuvers (both successful and unsuccessful) undertaken here. Most significantly, however, you will once and for all solve for yourself the mystery of the source of those voluminous dust clouds which you have seen rising from behind the tower. Our answer to the Gobi Desert... and somebody WILL get there. Guaranteed!!

WATERFORD DIGEST

Don't miss our season finale, September 26-27. All the class championships and the Top Ten driver placings will be settled in our last run before the cars go up on jackstands until next year. Have a safe trip home. We hope to see you again in September.

Cal Cortright

PHOTO BY AL BIZER



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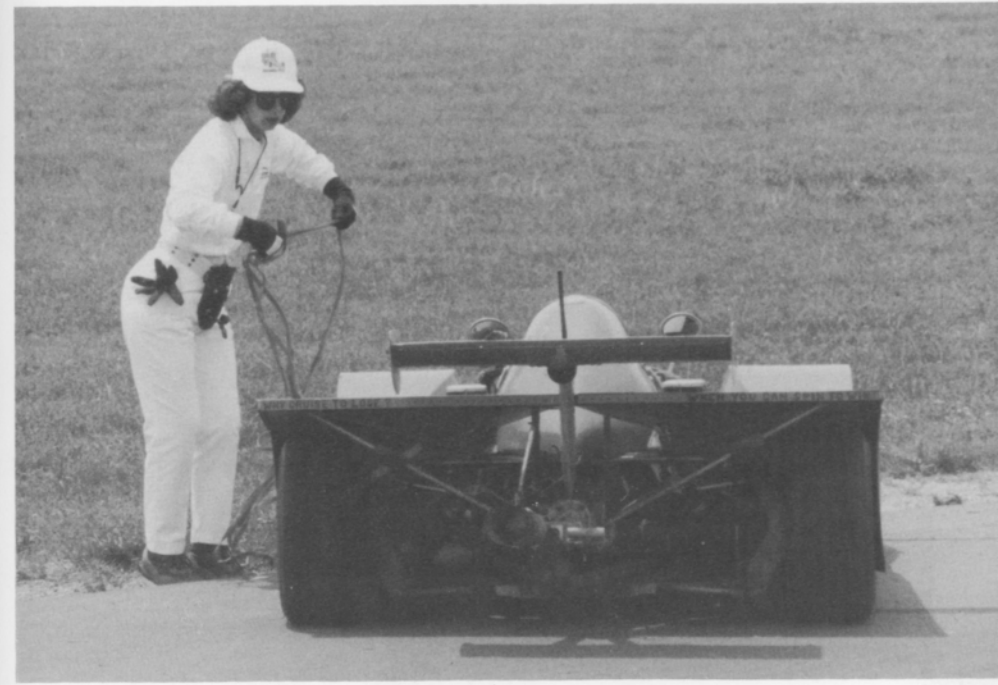
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Technically Speaking

Aspect ratio plays major role in footprint area, hydroplaning and plus sizing

By Dave McKibben,
Tire Development Engineer,
Tire and Vehicle Dynamics
BFGoodrich

Many people use low aspect ratio tires because they want to achieve a wide, high performance look. In fact, aspect ratio has a significant impact on tire performance.

In this article, I want to talk about aspect ratio in relation to a tire's footprint area, hydroplaning and "plus-sizing."

As an example, let's look at the P235/60R13 and the P205/70R13. Both of these tires have the same outside diameter and approximately the same total footprint, or contact area. However, the P205/70R13 has a long, narrow footprint area, while the P235/60R13 has a shorter, wider footprint. It is important to understand that each of these footprint shapes has its own unique performance characteristics.

When cornering at a large slip angle, a tire with a short, wide footprint holds a greater percentage of its tread elements to the road surface at the point of maximum

force. This is one of the primary reasons why a low-aspect-ratio tire corners significantly better than a higher-aspect-ratio tire.

On the other hand, a high-aspect-ratio tire, because it has a long, narrow footprint, does a better job of cutting through water and snow.

Here's why: A tire moves through water by pushing it ahead and away. Obviously, a tire with a narrower leading edge will have less water to move. The rest of the water is channeled into the grooves of the tread pattern and expelled at the trailing edge of the footprint or through the lateral grooves.

The process of the tread elements pushing the water out of the way in order to get to the pavement takes time to occur. This results in a lack of traction at the leading edge of the footprint. As the speed of the car increases and the water becomes deeper, the distance back into the footprint where

BFGoodrich

traction is lost becomes longer until it reaches the rear of the footprint and hydroplaning occurs.

As you can see, a high-aspect-ratio tire with its long, narrow footprint has a better chance of maintaining contact with the road surface. The length of the footprint gives the tread elements a longer time to maintain contact with the road surface as the tire rids itself of the water in its path.

Now we have a better understanding of aspect ratios, their effect on performance, load-carrying capacity and the footprint area. But how do we choose a replacement tire with a lower aspect ratio that has approximately the same overall diameter as the O.E. tire, that isn't too wide and has the same, or greater, load-carrying capacity? The answer is to choose another wheel size.

By checking the T/A data book, you will see that a P215/60R14 has approximately the same overall diameter as the P205/70R13.

This tire, the P215/60R14, is only 3/8 in. wider than the P205/70R13, so chances are good that it will fit the vehicle.

You still may have to physically check clearances on the car. Then, add one psi to adjust the load-carrying capacity upward. (Note that the one psi you're adding is one psi higher than the manufacturer's recommended inflation pressure for the 70-series tire. One pound of air pressure is required because, at the same pressure, the 60-series tire has a bit less load-carrying capacity than the 70-series tire.)

With the extra pound of inflation pressure, the 60-series tire will have a slightly higher load-carrying capacity than the 70-series tire it replaced.

Proper load-carrying capacities can be found in the tire load and inflation tables in the *Tire Inflation and Substitution Guide*.

This, of course, is a Plus 1 conversion. The rule of thumb for a plus conversion is to add one inch to the wheel diameter, subtract 10 from the aspect ratio and add 10 mm to the section width.

Applying this rule twice (or by reapplying the formula to the Plus 1 size) yields a Plus 2 conversion. The Plus 2 replacement size, for example, would be a P225/50R15.





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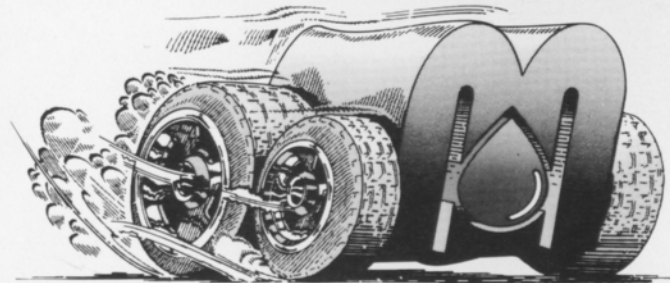
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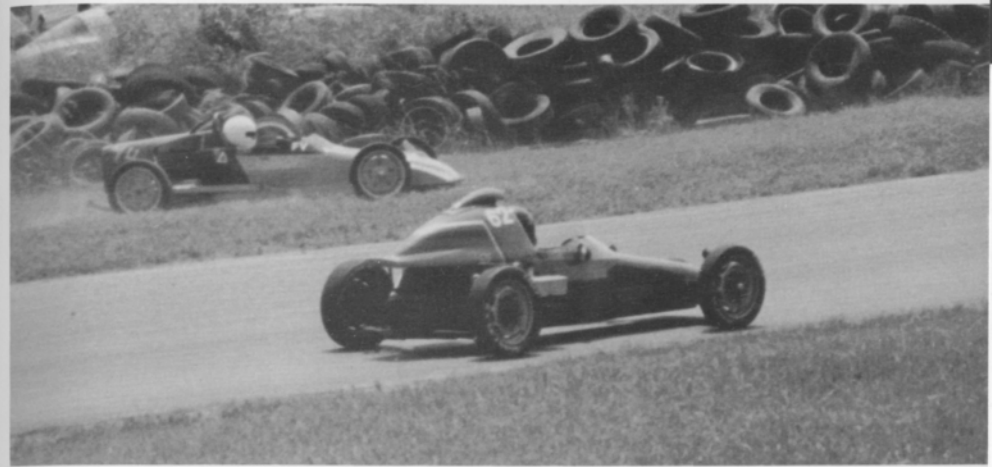


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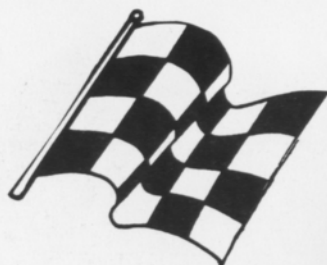
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RIDE	GOOD	VERY GOOD	VERY GOOD	EXCELLENT	SUPERIOR
TREAD LIFE	GOOD	EXCELLENT	EXCELLENT	SUPERIOR	VERY GOOD
WET & DRY TRACTION	SUPERIOR	EXCELLENT	VERY GOOD	GOOD	GOOD
SNOW TRACTION	GOOD	EXCELLENT	VERY GOOD	SUPERIOR	VERY GOOD
HANDLING	SUPERIOR	EXCELLENT	VERY GOOD	GOOD	VERY GOOD

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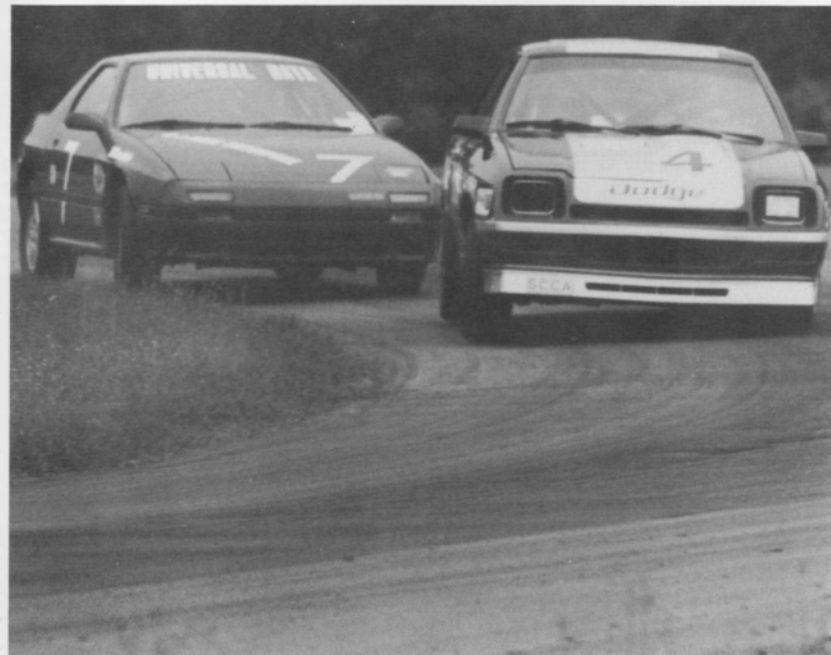
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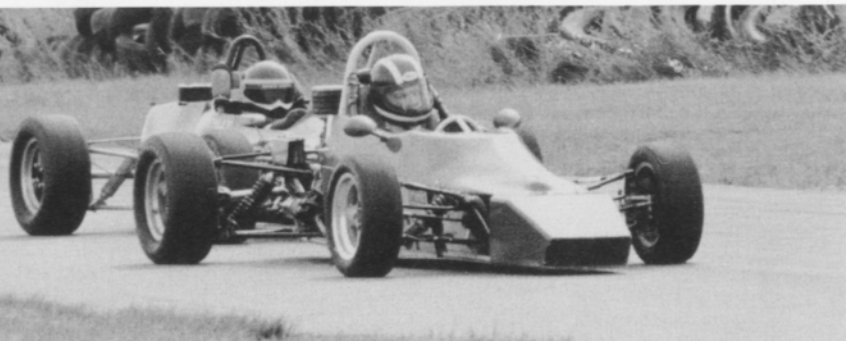
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SATURDAY CLASS RACES JULY 8 & 9 1989 CLASS WINNERS

CLASS	DRIVER	CAR	BEST LAP
RACE 1			
SREN	SEAN MACNEALY	SPEC RACER - RED	1:21.18
RACE 2			
ITA	JAMES MORRIS	BMW 2002 - SILVER	1:27.11
ITB	J DIXON HALL	CHARGER-LT BLUE	1:28.45
ITC	JERRY MORLEWSKI	COLT - GREEN	1:26.85
SSA	GARY RAY	MAZDA RX7 - RED	1:26.28
SSB	MICHAEL MEIMAR	SHELBY - SILVER/BLUE	1:26.16
SSC	ERIN PASSARELLI	TOYOTA MR2 - SILVER	1:29.56
RACE 3			
FA	ARMEN MEGREGIAN	LOLA - WHITE	1:12.92
FC	TERRY ABBOT	SWIFT - RED	1:08.59
CSR	GARY BENNETT	LOLA T328 - BLUE	1:13.85
S2	RON GRIFFIN	LOLA - YELLOW	1:12.32
RACE 4			
FP	JOHN KUBIAC	TRI. SPITFIRE - BLUE	1:20.73
GP	ROBERT OHNECK II	SPITFIRE - RD/SIL/BLK	1:20.53
HP	JIM MILLER	SPRITE - BL/GOLD	1:28.55
ITS	DION JOHNSTON	NISSAN 280Z - RED	1:23.35
SSX	GARY JOHNSON	DODGE GLH - YEL/WHT	1:23.76
SSGT	MICHEAL ST. LOUIS	CORVETTE - WHITE	1:20.37
RACE 5			
FF	LEW COOPER III	VAN DIEMAN - WHITE	1:13.52
CFF	TOM LEATHLEY	LOLA T204 - GREEN	1:15.06
RACE 6			
EP	JIM ARTHURS	ALFA - RED	1:19.47
GTX	PETE MORGAN	CORVETTE - ORANGE	1:17.27
GT1	DOUG BUIST	FIERO - RED/YEL	1:12.48
GT3	GARY HUMPHREYS	PORSCHE 911 - BLUE	1:17.50
GT4	DANIEL STRONG	SUNBIRD - WHT/RED	1:27.65



WATERFORD DIGEST

SUNDAY CLASS RACES JULY 8 & 9 1989 CLASS WINNERS

CLASS	DRIVER	CAR	BEST LAP
RACE 1			
SREN	SEAN MACNEALY	SPEC RACER - RED	1:20.25
RACE 2			
ITA	GREGORY MANKIN	MAZDA RX2 - BLUE	1:26.81
ITB	KEITH PRICE	OPEL - BRONZE	1:28.00
ITC	JERRY MORLEWSKI	COLT - GREEN	1:26.19
SSA	GARY RAY	MAZDA RX7 - RED	1:26.39
SSB	MICHAEL MEIMAR	SHELBY - SILVER/BLUE	1:26.52
SSC	ERIN PASSARELLI	TOYOTA MR2 - SILVER	1:29.44
RACE 3			
FA	ARMEN MEGREGIAN	LOLA - WHITE	1:11.01
FC	TERRY ABBOT	SWIFT - RED	1:08.20
S2	RON GRIFFIN	LOLA - YELLOW	1:12.00
RACE 4			
FP	CHRIS PIKU	ALFA GIULIA - RED	1:22.77
GP	ROBERT OHNECK II	SPITFIRE - RD/SIL/BLK	1:20.64
HP	STEVE STEEB	SPRITE - DK BLUE	1:22.99
ITS	DION JOHNSTON	NISSAN 280Z - RED	1:24.91
SSX	GARY JOHNSON	DODGE GLH - YEL/WHT	1:24.74
SSGT	MICHEAL ST. LOUIS	CORVETTE - WHITE	1:20.78
RACE 5			
FF	LEW COOPER III	VAN DIEMAN - WHITE	1:12.22
CFF	TOM LEATHLEY	LOLA T204 - GREEN	1:15.21
RACE 6			
EP	JIM ARTHURS	ALFA - RED	1:19.59
GTX	PETE MORGAN	CORVETTE - ORANGE	1:18.26
GT1	DOUG BUIST	FIERO - RED/YEL	1:13.11
GT3	GARY HUMPHREYS	PORSCHE 911 - BLUE	1:17.47
GT4	DANIEL STRONG	SUNBIRD - WHT/RED	1:28.61



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FEATURE RACES JULY 8 & 9 1989 TOP FIVE FINISHERS

CLASS	DRIVER	CAR	BEST LAP
FEATURE 1			
FEATURE 2			
SSGT	MICHEAL ST. LOUIS	CORVETTE - WHITE	1:21.90
SSGT	ROGER MIKULAS	TRANS AM - WHITE	1:24.10
ITS	DION JOHNSTON	NISSAN 280Z - RED	1:25.27
ITS	MIKE PINEGAR	MAZDA RX7 -	1:25.85
SSB	MICHAEL MEIMAR	SHELBY - SILVER/BLUE	1:26.91
FEATURE 3			
FC	KIP SHEWARD	SWIFT - RED	1:13.96
FC	ROD THOMPSON	VAN DIEMEN-WHITE	1:13.57
S2	RON GRIFFIN	LOLA - YELLOW	1:13.95
S2	DAVID STEVENS	LOLA	1:14.82
FC	RANDY TOLLIVER	REYNARD - WHITE	1:11.83
FEATURE 4			
GT1	DOUG BUIST	FIERO - RED/YEL	1:15.51
GT1	LOWELL JAMES	CORVETTE - WHITE	1:19.10
GTX	PETE MORGAN	CORVETTE - ORANGE	1:20.09
GT1	JACK PRINGLE	CAMERO - YEL/WH	1:18.96
GT3	GARY HUMPHREYS	PORSCHE 911 - BLUE	1:18.61
FEATURE 5			
FF	JEFF HORTON	SWIFT - BLUE/YELLOW	1:12.23
FF	LEW COOPER III	VAN DIEMAN - WHITE	1:13.20
FF	JOE COELHO	REYNARD - WHITE	1:14.11
CFF	TOM LEATHLEY	LOLA T204 - GREEN	1:15.68
CFF	TERRY JINKS	MERLYN MR11 - RED	1:16.15

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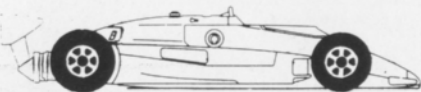
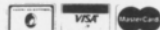
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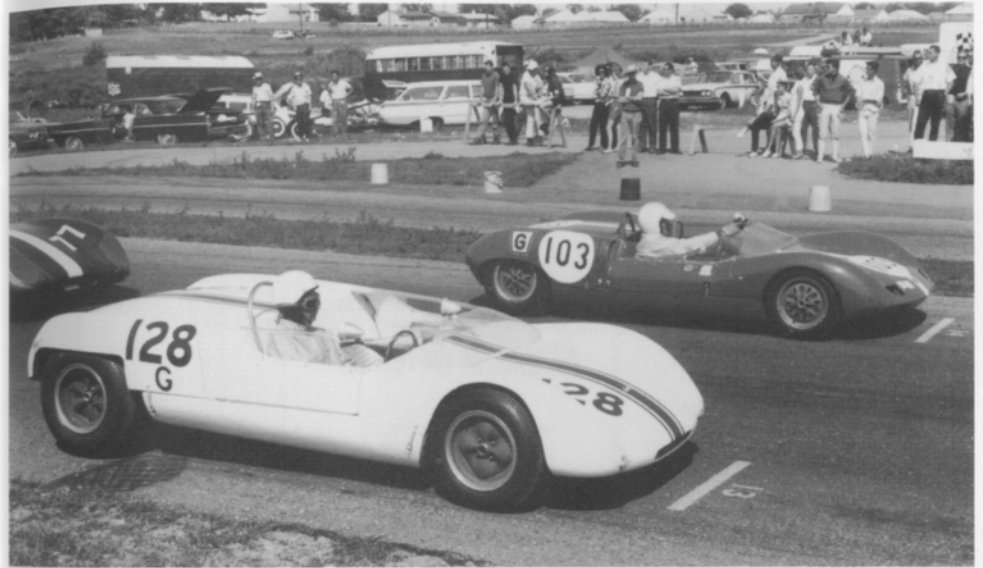
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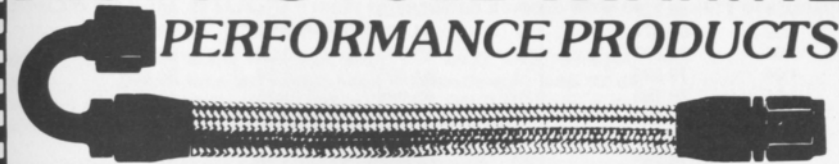
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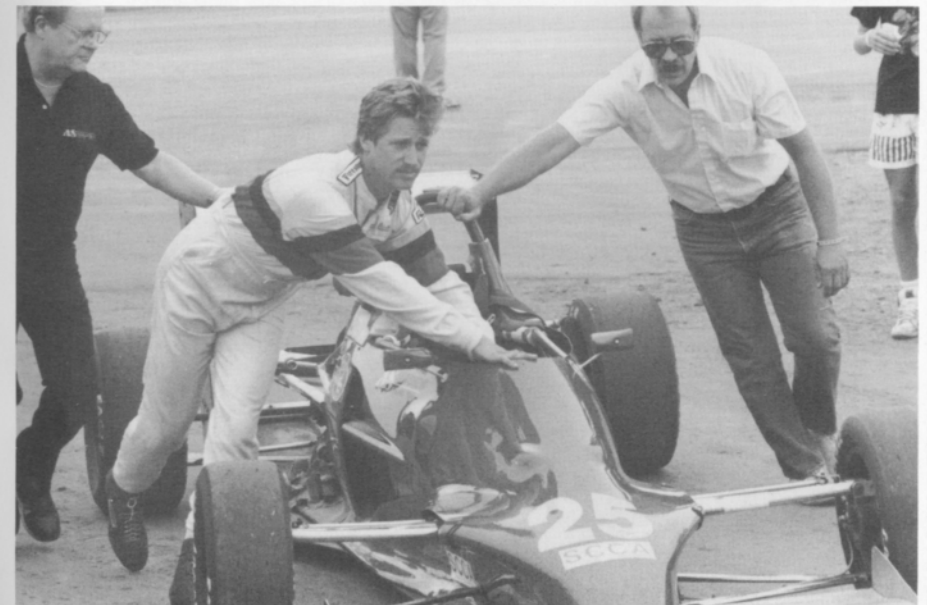
4940 Delemere, Royal Oak, MI 48073

Peter Betrus, Jr.

Catalog \$2

Thomas J. Betrus

AL BIZER



WATERFORD DIGEST

Average Lap Speed

Min/Sec	MPH	Min/Sec	MPH	Min/Sec	MPH
1:00	85.326	1:15	68.261	1:30	56.884
1:01	83.927	1:16	67.363	1:31	56.259
1:02	82.574	1:17	66.488	1:32	55.647
1:03	81.263	1:18	65.635	1:33	55.041
1:04	79.993	1:19	64.805	1:34	54.463
1:05	78.762	1:20	63.995	1:35	53.890
1:06	77.569	1:21	63.204	1:36	53.329
1:07	76.411	1:22	62.434	1:37	52.779
1:08	75.288	1:23	61.681	1:38	52.240
1:09	74.197	1:24	60.947	1:39	51.713
1:10	73.137	1:25	60.230	1:40	51.196
1:11	72.106	1:26	59.530	1:41	50.689
1:12	71.105	1:27	58.846	1:42	50.192
1:13	70.131	1:28	58.846	1:43	49.704
1:14	69.183	1:29	57.523	1:44	49.227

The Waterford Hills Road Course is 1.4221 miles long (7,509 ft. center line of track). To determine the speed of any individual car, time it for one complete lap and read off the speed from this table.

Class Records

JUNE 24 & 25 1989

CLASS	DRIVER	CAR	DATE	LAP TIME
FA	ANDY FALBO	MARCH	8/83	1:06.10
FC	DAVID BARNETT	REYNARD	9/88	1:06.80
FF	LEW COOPER III	VAN DIEMEN	9/88	1:09.30
CFF	MARK JAMES	LOLA	9/88	1:09.60
FFR	MARK DAVIDSON	CROSSLE 32	5/84	1:17.00
F4	STUART LAMONT	XPIT	7/83	1:12.50
FV	TERRY ABBOTT	ZINK	9/88	1:15.00
F440	DON GIBBONEY	NOVAKAR	9/88	1:13.20
ASR	ED MURRAY	CHEVRON	9/81	1:10.90
CSR	CRAIG BENNETT	RALT	7/88	1:09.90
DSR	ED MURRAY	JEDDI	9/85	1:12.80
S2	KEN WINTERS	LOLA	6/89	1:09.50
SREN	MIKE NEAL	SP RENAULT	9/88	1:19.60
EP	LOU LIVENGOD	PORSCHE 356	6/80	1:16.30
FP	BARRY HARTZEL	MG MIDGET	7/78	1:16.20
GP	KIRK CARLSON	MG MIDGET	8/81	1:17.00
HP	PAUL CAMERON	SPRITE	7/78	1:20.40
GT1	DOUG BUIST	FIERO	9/88	1:12.10
GT2	DAVID BOWER	DATSUN 280Z	6/89	1:20.90
GT3	CRAIG ALLEN	LOTUS ELAN	9/83	1:16.40
GT4	JERRY MORLEWSKI	FIAT 124	9/88	1:18.40
GT5	DICK NOONAN	TOYOTA	8/88	1:18.50
ITS	DION JOHNSTON	DATSUN	9/88	1:23.70
ITA	JAMES MORRIS	BMW 2002 TII	6/89	1:26.60
ITB	MIKE JONES	MUSTANG	8/88	1:24.70
ITC	ROBIN BURNETTE	FIESTA	5/89	1:25.90
RCUP	CHUCK LITTLE	RENAULT ENCORE	7/85	1:29.20
SSGT	MICHAEL ST. LOUIS	CORVETTE	9/88	1:20.40
SSA	BILL BAYLEY	FIREBIRD	8/88	1:25.10
SSB	MIKE MEIMAR	CHARGER	9/88	1:25.50
SSC	BILL ARTZBERGER	HONDA CIVIC SI	9/88	1:25.20

Racing Classes

To insure fairness in competition, all road racing cars are grouped into racing classes by the Sports Car Club of America in its General Competition Rulebook (GCR). Waterford Hills Road Racing observes the GCR regulations with some minor exceptions.

The cars listed below are representative of their racing classes and include most of those you will see at Waterford Hills.

SHOWROOM STOCK STREET CARS RACED AS SOLD WITH ONLY SAFETY MODIFICATIONS ALLOWED.

SSGT	Camaro IROC-Z, Firebird T/A, Mustang GT, 300 ZX, Turbo, Porsce 944, Supra,
SSA	Daytona Turbo, Mazda RX-7, Fiero 2.8, Starion/Conquest Turbo, 300 ZX,
SSB	Charger 2.2, Toyota MRZ, Spectrum, Honda CRX SL, GTI/Scirocco 16V Cavalier Z24
SSC	Civic, VW GTI, Chevy Sprint Turbo, Alliance GTA, Fiero

IMPROVED TOURING STREET CARS RACED AS SOLD EXCEPT WITH SUSPENSION AND OTHER MINOR MODIFICATIONS ALLOWED.

ITS	Datsun Z, Mazda RX-7, Porsche 914/924, Triumph TR8
ITA	Mustang/Capri V6, Mazda RX-2/RX-3, Corvair, Monza/Skyhawk V6, VW GTI
ITB	Mustang/Capri 2.3, Vega, Charger 2.2, Opel 1.9, Scirocco/Rabbit/Jetta
ITC	Alliance, Colt 1.6, Fiesta, Chevette, Arrow, Corolla, Datsun 510

PRODUCTION SPORTS CARS, MODIFIED FOR RACING.

EP	Porsche 356 1.6L, 914 1.8L, Datsun 2000, Alfa 1750, Triumph TR-4, Lotus Super 7
FP	Midget 1275/1500, Spitfire 1500, Sprite 1275, Fiat X1/9 1.5L, Lotus 7
GP	Midget/Sprite 1100, Fiat X1/9 1.3L, Datsun 1600, Spitfire, Alfa 1.3L, Porsche 356 1.3L
HP	Austin Healy Sprite Mk I and II, Fiat 850, MG Midget 948, Fiat Abarth

GT CLASSES CLOSED PRODUCTION CARS, MODIFIED FOR RACING.

GT-1	Corvette, Camaro, Ford Cobra II, Shelby GT-350, Porsche 911 SC, Dodge Aspen
GT-2	Datsun Z series, Mazda RX7, Porsche 914/6 & 924 Turbo, Sunbeam Tiger, Triumph TR-6 & TR-8
GT-3	Opel 1900, Datsun 510 1800, Mustang 2300, Pinto 2000 & 2300, Cosworth Vega
GT-4	Fiat 124 Sports Coupe, Pinto 1600, Toyota Cellica, Dodge Colt, Toyota Corolla 1600, Renault LeCar, Datsun 510 1600, Ford Escort/Lynx, VW Rabbit & Scirocco
GT-5	Datsun 200SX, Austin/Morris Mini Cooper, VW 1300, NSU TT, Honda Civic, Fiat 124 1200, Toyota Corolla 1200

SPORTS RACING OPEN COCKPIT, CLOSED WHEEL (BODY OVER TIRES) RACE CARS.

ASR	over 1300 cc but less than 6000cc
CSR	over 850 cc up to 1600 cc (with restrictions)
DSR	below or equal to 850cc
S/2000	uses Ford 2000 cc overhead cam engines only
S/R	spec racing - identical, restricted cars with 1.5L Renault engines

FORMULA SINGLE SEAT, OPEN WHEELED RACE CARS

F/ATLC	Formula Atlantic - choice of engines in over 1100 cc up to 16000 cc range, wings and other modifications allowed, not meant to be in an inexpensive race car
F/CNTL	Formula Continental - combines old Formula C (similar to Atlantic but engines less than 1100), Super Vee (VW 1600) and F2000 (Ford 2000 cc)
FF	Formula Ford - Cortina or Pinto 1600 cc engine, strict weight to engine ratio with driver's weight included in total legal weight, very equal class
CFF	Club Formula Ford - the cars are the same as the above class but with restricted suspension geometry and tires
FV	Formula Vee - all Volkswagon components, 1200 cc engine, driver's weight included in total legal weight, very competitive class
F440	Formula 440 - utilizes Fuji two-cycle snowmobile engines and drive train, rigid suspension, wings permitted
F4	Formula Four - Canadian class, motorcycle engine power plant, engine size determines weight and transmission allowed

Flags

yellow with red stripes



Take care, oil has been spilled or a slippery condition exists somewhere in your vicinity. Look at the track surface.

black



Sloppy or dangerous driving. Complete the lap you are on, stop at the Start/Finish line for consultation with Chief Steward. Waving Black Flag (displayed on all corner stations) means the race is stopped. Slow down immediately and proceed around the track with extreme caution to the pit lane for a re-start.

black with orange ball



(Meatball Black Flag) There is something mechanically wrong with your car. Proceed to your pits at reduced speed.

green



(Or no flag) Course is clear.

yellow



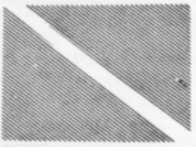
(Stationary) Take care, danger, no passing.
(Waving) Great danger, be prepared to stop, no passing.

red



Waving red (displayed by the Starter only) means the race is stopped, slow down immediately and proceed around the track with extreme caution to the pit lane.

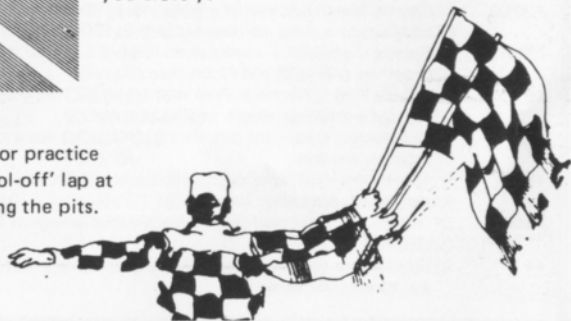
blue with diagonal yellow stripes



(Motionless) Another competitor is following you closely.

checkered

You have finished the race (or practice session). Complete one "cool-off" lap at reduced speed before entering the pits.



Waterford Hills Course Map

a 1.5 mile asphalt road course at waterford, michigan



