

# ZEDLINE

2021 SPRING EDITION



DEDICATED TO THE PRESERVATION & ENJOYMENT OF THE DATSUN/NISSAN Z CAR



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## 2021 OZC EXECUTIVES

### President:

Lou Pereira  
416-999-2819, Toronto  
loupaulo21@gmail.com

### Eastern VP

Nigel White  
416-452-1904, Brampton  
nigelwhite1971@gmail.com

### Western VP:

Brian Gracie  
519-842-7874, Tillsonburg  
bkgracie2@gmail.com

### Treasurer:

Howie Yoshida  
416-262-0020, Mississauga  
howieyoshida@gmail.com

### Art Director/Editor:

Rajinda Gunasena  
416-709-3383, Markham  
rajinda@graphitidesigns.com

### Website Administrator:

Eric Zondervan  
416-455-7445, Toronto  
zedfoot@rogers.com

### Membership Director:

Bob Chwalyk  
905-389-4024, Hamilton  
rchwalyk@rogers.com

### Merchandise Director:

Terry Weston  
905-388-5041, Hamilton  
terr.weston@gmail.com

### Web/Social Media Director:

Diane Dale  
416-580-8932, Toronto  
diane@movemotorsports.com

### Instagram Director:

Scott Robertson  
416-230-6703, Markham  
robertsonsc24@gmail.com

### Mailing Address:

Ontario Z-Car Owners Association  
PO Box 41034 Rockwood Mall  
Mississauga ON L4W 5C9

### General Inquiries:

info@ontariozcar.com



www.ontariozcar.com



facebook.com/OntarioZCar



@OntarioZCar



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# newcomers

**Guy Soucy**  
**Paul MacMillan**  
**Rick Miron**

On behalf of the Ontario Z-Car Owners Association, I'm pleased to welcome all our NEW members: I'd like to extend a cordial invitation to you to participate in club events, meetings, our website forum and the newsletter. Past members are also welcome to re-join OZC and be part of the largest, most exciting Z-Club in Canada!

**Bob Chwalyk**  
Membership Director

### Cover Photo Credit: Bianca Figueira from FotoZED

*"You may not know it by this photo. But there's a reason why I did the bumper delete and had a custom grill made. This is my most unforgettable incident. I may have gotten into a tiny accident.. my bumper was not salvageable. So voila! Face-lift!"*



"The Editor of Zedline and the Directors and Officers of the Ontario Z-Car Owners Association and the Ontario Z-Car Owners Association Inc. do not necessarily adopt to the views expressed in any letters to the Editor or articles published by our members. We intend to have the Zedline as an open forum available for members to express their views but retain the right to edit or not publish any letters which are deemed to be offensive, defamatory or slanderous. Further, with respect to any articles outlining mechanical modifications to any motor vehicle, the Editor, Directors and Officers, point out that said modifications need to be conducted under the supervision of a licensed mechanic in order to ensure owner and public safety."

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**I**s everyone gearing up for some good weather? I hope so because I know I am! Enough of this thing called Covid for crying out loud! Green zone, yellow zone, orange zone, red zone, lockdown and repeat! When will we ever get back to some normality? I know we are all looking forward to getting outdoors and have some fun driving our Z cars, enjoying roads somewhat less congested than we once knew. I guess that is one thing that Mr. Covid can take credit for: fewer vehicles on our highways due to many folks working from home now.

As far as activities are concerned, rest assured that your OZC executive committee has been working hard behind the scenes. We are all working hard to plan and schedule tentative events to take place over the next few months as things hopefully open up. Please check our club event calendar in this issue of Zedline and watch your email inboxes for reminders of these events. We will update and revise them as the dates approach.

I hope you have all taken the opportunity to participate in the OZC monthly club meetings. For those you who might not know, the OZC monthly club meetings have now been taking place online via ZOOM. These meetings take place the first Wednesday of every month and commence around 7:30pm. Some of us just can't wait so we log on at 7:15 to get a head start! We discuss all matters club related and thoroughly enjoy the banter back and forth.

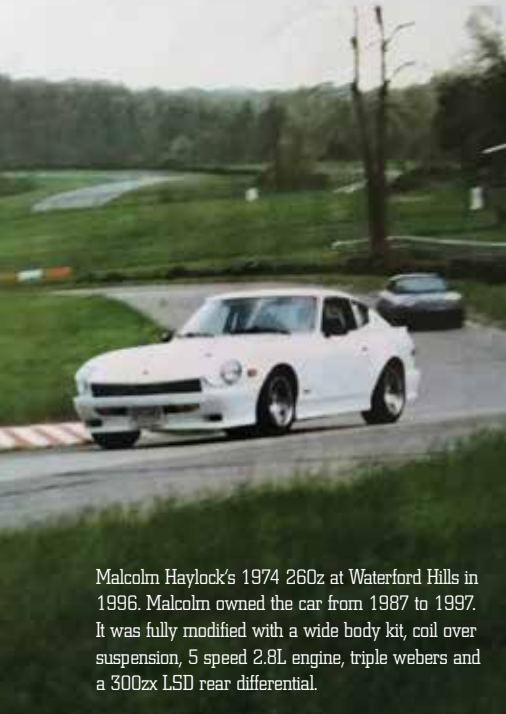
There is also the ZOOM meeting with ZCCQ which is the Z Car Club Queensland in Australia! Several of our members have joined on a couple of occasions. We hooked up with this wonderful bunch of Z car enthusiasts during the Z Proto type reveal. Our association with them has been absolutely amazing since they are basically the OZC counterpart in terms of club size, similar personalities, and shared love for the Z. I encourage everyone to try check in the next time we digitally rendezvous with these amazing "Auzzies"! They know us as the "Canucks"!

On another note, I hope you have all registered your Z car for the FotoZed online car show. This show will have both the OZC and ZCCQ club members as entrants and promises not to disappoint. It'll be a great way to get involved with the club and showcase your baby (or babies). We are excited to see our Zeds displayed on a digital stage and to enter some fun categories! Please do take part in our first ever online car show. I'm sure it will be a huge success! On behalf of the OZC Executive committee I would like to thank all those entrants who have registered for this historic event.

Until next time keep on Zedding and remember....Stay positive and test negative!

### **Lou Pereira**

President - Z32 Project Eternity, 350Z



Malcolm Haylock's 1974 260z at Waterford Hills in 1996. Malcolm owned the car from 1987 to 1997. It was fully modified with a wide body kit, coil over suspension, 5 speed 2.8L engine, triple webbers and a 300zx LSD rear differential.



Melanie and Barbara

# Barbara Barr-Haylock

Ontario Z Car is not just about shiny, cool cars. We'd suggest that it's actually more about the community we've formed and the life-long friendships that are established. Many of you know Malcolm Haylock. He was one of the early members, from sometime in the nineties until 2009 with his 1974 260z. He was the core of the tight-knit Western Breakfast Club that enjoyed great stories and laughter over the years. Despite no longer having a Z car in his name, he has stayed in touch with the OZC community. Malcolm is often sited at tracks or events, always with a smile on his face and a welcoming handshake or hug, and usually with his camera in hand (You should ask to see his collection of photos from the early days at Mossport!)

And those of us who knew Malcolm, also knew his lovely wife Barbara.

It is with great sadness that we share the news that Barbara passed away on February 10, 2021.

She had just celebrated her 70th birthday and she will be dearly missed by many.

What is amazing is Barbara's loving and kind nature in the face of adversity. After being diagnosed in 2010 with Interstitial Pulmonary Fibrosis (IPF) she dove in full speed to nurture and support others who were fighting the disease that she battled for 11 years. She enrolled in medical studies, drug trials and learned everything she could about IPF. Barb discovered the CPFF (Canadian Pulmonary Fibrosis Foundation of Canada) where she and Malcolm became active members. Barbara became a board member, and later Vice-Chair of the board.

Malcolm and Barbara spent many days doing various events in support of IPF. They attended the annual IPF Day at Queens Park, advocating for better understanding and support for IPF patients and lobbying MPP's to approve new drugs. They both participated in many fundraisers with Barbara starting the Toronto General Hospital local patient

support group and helping many other support groups across Canada.

Barbara was a wife, mother, aunt, grandmother, great grandmother, mentor, muse, educator, writer, leader, debater and a rock not only for her family, but for her extended medical family and fellow patients. She and Malcolm were also family to many dog guides in training (when they were lucky enough to find themselves hosted by the wonderful Haylock family). Barbara is survived by daughters Melanie Haylock and Jill Berwick; Melanie's son Kyle and his son Noah; Jill's daughter Jenn Miller Behie, her husband Chris, sons James and Clayton, and grandson Jamie; sister Shirley Oakley and husband Syd; brother Doug Barr; nieces Shana King, Cheryl Perera and Kayla Oakley.

To read more about Barb's journey with IPF or simply to connect with Malcolm, you can reach him on his facebook page at <https://www.facebook.com/MalcolmDHaylock>.

For those interested, consider donations to the CPFF ( <https://cpff.ca/> ) and/or the Lions Foundation of Canada Dog Guides ( <https://www.dogguides.com/donate.html> )

Credit/thanks to Malcolm for the pictures and captions.

**Diane Dale**

Social Media - 240 Z Track Diva



Malcolm, daughter Melanie and Barbara



E

verything changes, nothing is permanent!

This is the basic buddhist philosophy that I have been brought up my whole life, and I fully believe in. This is more than evident these last few years, based on the life-styles we have all endured with a pandemic. You can adjust, and go on. But ultimately change is inevitable, it's part of the universal nature.

I have been the editor/designer of the ZEDLINE since 2012, closing in on 10 years. It's a long time, but it's still under 50 editions if you consider we issue 4 per year (well, 3 issues in couple of year, as I am always reminded about getting side tracked or delayed). It was a lot of fun working with few different Presidents during this period, a huge ZCON success in 2016, changing the OZC logo/branding, building a new web site, involved in Social Media etc., with Diane Dale. But Zedline was my main project, one that enjoyed a lot. Recently I was reminded by Mauricio Gomez who posted on Facebook, one of his favourite covers I did, with cartoons of our club members, coming out of one of the worst Winter Freezes I could remember. Those were awesome times, when I had lots of free time on my hand and driving my Z was all I did (Other than Golf!).

The Z is a passion and a hobby, and doing the Zedline was always part of that passion. But lately I have had lot on my mind as well as on my plate. Other interests and concerns, more important than a Z! That's life! Priorities change, especially when confronted with an epidemic situation. That's why I am contemplating "if" I should continue to do the Zedline after this year. May be there's someone out there who can take over, make a change and make it better than what it is now. I urge anyone who can take over from me to please come forward and let us know.

We have 3 more issues to find someone, and familiarize them with whats involved for taking over the Zedline. Till then enjoy this issue which was put together with Eric, Diane and other's major effort to find articles during a season with no driving at all!

**Rajinda Gunasena**

Editor - Nothing but Z32

# Time For A Change?



# Xtreme Motorsports Takes on Super Production in 2021



**Diane Dale**

Social Media - 240 Z Track Diva



**X**treme Motorsports is the perfect name for Olivier Bédard's new racing project. Who else would dream of hosting a stable full of Nissan 370Z race cars, then actually make it happen?

If you love racing but you haven't heard of Olivier it's time to do some homework. He may only be 23 but he already has almost 15 years of very successful racing under his belt. Starting in karts at age 9, he quickly showed massive potential, competing first at the regional levels, then moving on to national and international ranks. In 2013 Olivier took his first steps into Formula 1600, nurturing more of his race talent. In his peak year he finished runner-up with nine podiums, two wins and no races outside the top 5. If you have ever witnessed the world-class talent in Formula 1600, you know that this is an incredible feat. In 2015 Olivier moved to the newly formed Nissan Micra Cup Series, and basically dominated the field. He re-ins as the 2015, 2017 and 2018 overall series champion and runner-up in 2016. Some of you may remember Olivier as the guest driver who came to speak with Ontario Z Car at the Nissan Micra Cup Corral at Canadian Tire Motorsport Park.

In 2020, Olivier started a very new and ambitious journey... one that we are all very excited about. Let's set the stage:

The Super Production Challenge Series is an "IMSA" inspired, ultra competitive race series that for nine seasons has offered both amateur and semi-professional drivers premium events to compete in across Quebec and Ontario. The championship is based on three classes: Compact – up to 100 hp, Production – up to 220 hp, and Super Production – up to 300 hp. The cars are "production based". They must be a current make and model offered in Canada within the past 15 years and the race cars must retain a readily identifiable similarity to their street counterparts. All cars run the BF Goodrich G-Force Rival S tires (BF Goodrich is an official sponsor of the series) and are allowed significant modifications to the suspension, brakes, chassis and engine.

The spirit of the Super Production Challenge Series (SPC)

## OZC and Xtreme Motorsports

*OZC hopes to visit with Xtreme Motorsports and their 370Z race cars at their Ontario SPC events currently scheduled for May 21-23 at Canadian Tire Motorsport Park and June 25-27 at Shannonville Motorsport Park. This will all depend on COVID-19 regulations. Stay tuned to our OZC event calendar at [www.ontariozcar.com](http://www.ontariozcar.com)*

### For more information you can visit

#### Xtreme Motorsports Facebook:

<https://www.facebook.com/XtremeMsports>

#### Xtreme Motorsports Website

<https://www.xtrememotorsports.com/>

#### Olivier's website

<https://www.olivierbedardracing.com/about>

#### Super Production Challenge Website

<http://superproductionchallenge.com/?lang=en>



that the term "affordable" and "racing" are unlikely partners, let's consider the options. If you're planning to compete in a GT4 or TCR class, you're looking at a race car that costs over \$200,000. You can build one yourself cheaper, but it requires a substantial amount of effort and experience to be competitive. Once you've got the car, you're then looking at entry fees, tires, fuel, brake pad/rotors and other consumables for each race weekend you enter. SPC offers lower fees than other similar series and has chosen a "street" tire that has a significantly longer life span than a true racing slick. It's a good choice for those with access to enough funds to support a racing habit.

With his new venture, Xtreme Motorsports, Olivier hopes to provide an alternative: a reliable, cost-effective, competitive race experience in an ultra cool car and with outstanding race team support. He works closely with his father, Robert Bedard, and maintains an engineering partnership with former Nissan Cup teammate Alex Habrich. Xtreme Motorsports offers a turnkey Super Production class Nissan 370z in the range of \$65,000 to \$75,000. One can also join the team with an "arrive and drive" program for



around \$60,000 a season. The huge advantage is that the team has done significant testing and improvements to the platform in 2020. They've ironed out many of the typical new-racecar issues and collected tons of data. They've

in business this fall). In addition to the 12 race, 5 event schedule of SPC, and depending on when the borders open and travel is allowed, Xtreme Motorsports would like to explore new series and tracks with the 370Zs, maybe even



learned the personality of the 370Z on track. They've listened, learned, and engineered proprietary parts and made specific adjustments. A critical service offering, they share their knowledge to provide racers with outstanding reaction and recovery times to issues encountered on race weekends. Olivier, Robert and Alex's own driving experience of the 370Z and the coaching they offer puts Xtreme Motorsports in a very solid position to offer exciting and fulfilling race experiences for its customers, and excellent opportunities for weekend podiums and series championships.

A popular question is always, "Why choose a Nissan 370Z as a race car?" For Olivier that's easy. It's a tried and true production model that's been around since 2009. While that may seem dated, it means any production bugs are worked out and raw chassis, parts and modifications are readily available and affordable. The design has stood the test of time and the car's power output and rear-wheel drive capabilities are highly desirable attributes for a race car.

When asked about the handling of the 370Z on track Olivier has raving reviews. He did a lot of testing with the 370Z on the track right out of the box. Even without aero and suspension modifications it handles exceptionally well, with just a little oversteer. He comments on how well designed and built the stock components of the 370Z are. While Xtreme Motorsports has added a number of modifications including coilovers, aero (wing, splitter, sway bars) and custom brake ducts, Olivier mentions that it was the addition of a limited-slip racing differential that made the biggest difference. Replacing the differential gave the car incredible traction and the confidence a driver needs for more throttle input.

Asking Olivier about what his aspirations and dreams are for Xtreme Motorsports he immediately responds that their goal is to have up to eight 370Zs on track in SPC this year. They have 5 confirmed already with a few in the wings, so this is actually not out of reach! You can tell that Olivier and Robert also truly care about the customer experience, wanting to excel at their team service and support offering as well – a refreshing perspective for the race scene. Olivier looks forward to this being his full-time job. (An exceptionally bright young man, he graduates with a degree

take on endurance racing, more like American Endurance Racing and World Racing League.

And what about the next generation Z car? As a former official Nissan Ambassador and an enthusiast extremely passionate about Z cars like us, he loves the look of it and can hardly wait to get his hands on it.

### **Xtreme Motorsports 370Z Nissan 370Z**

- Based on the Nissan 370Z production car
- Developed by Xtreme Motorsports during the 2020 season
- Compliant with Super Production Challenge technical specifications

#### **Engine & Transmission**

- Nissan VQ37VHR V6 3.7L
- Cold air intake system
- Reprogrammed ECU
- Engine oil cooler
- Custom race exhaust system
- Nissan 6-speed manual transmission
- Lightweight racing flywheel
- Limited-slip racing differential
- Differential oil cooler

#### **Suspension & Brakes**

- Motion Control Suspension and race coilovers
- Adjustable suspension arms
- Front and rear adjustable sway bars
- 18x9 racing wheels
- ARP racing studs
- NISMO 4 pot and 2 pot calipers
- Stainless steel braided brake lines
- Custom brake ducts

#### **Safety & Performance**

- OMP race seat and safety harness
- Sparco steering wheel with quick release
- OMP extinguisher system
- 6 pole killswitch
- Schroth window and center nets
- APR Performance rear spoiler
- Custom front splitter
- Nismo front bumper
- AIM Solo 2 DL

# How to Prevent Brake Vibrations

Article first published on **Crossroads Motorsports** June, 2005

**T**he year was 1962. The Beach Boys had just released "409," an all-American, high school tribute to four-speed transmissions, dual quads and Posi-Traction. Their follow-up 1963 hit, "Little Deuce Coupe," continued the band's celebration of mechanical speed. And in 1964 the same group brought us "Fun, Fun, Fun," clearly a lyrical homage to the Ford Thunderbird and the magical opposite-sex-attracting powers it possessed.

However, the title to their 1966 smash, "Good Vibrations," clearly indicated that Brian Wilson was not a brake engineer.

Quite simply, brake vibrations are never a good thing. In fact, a common saying in the brake industry is this: "The best brake system is an invisible brake system." Let's try to understand why this can sometimes be so difficult to achieve.

## Wouldn't It Be Nice?

You press the brake pedal, and your car slows down. There's no squealing, no shaking and no vibration. Please fasten your lap belts, close your tray tables, and return your seat backs to the upright and locked position—you have arrived at brake utopia.

Unfortunately, brake utopia can sometimes be in another ZIP code from you.

Pick your favorite brake system malady: brake roughness, pulsation, shudder, hot judder, shake, vibration, or the all-time favorite, rotor warping. To the brake engineer, these all have slightly different meanings, but to the average enthusiast they are all simply a pain in the—well, they're a pain and we'll leave it at that.

While usually not a detriment to brake system effectiveness at first, none of these conditions can be considered desirable. Few vehicle problems are as annoying as a pulsating brake system. And if they're ignored long enough, these problems can have legitimate performance impacts.

So what causes these conditions, and what can be done to prevent them in the first place? We'll get there, but first we have to go back to brake school for a quick refresher course.

## Be True to Your School

What does the brake system do? Put aside the small details, and you find that the brake system's primary responsibility is to convert the kinetic energy of the car in motion into thermal energy, also known as heat. If there is available tire friction (contact patch force), the car will certainly decelerate (this in response to the brake torque generated during the energy conversion). However, the brakes do not stop the car. That's the tires' job.

No tire friction, no tire force, no deceleration. Hello, tire wall. Thud!

If we now look in more detail at the brake pad and rotor interface, we discover that this is where most of the energy conversion takes place. It is the friction between the brake pad and the spinning rotor that creates heat while simultaneously building torque in the rotating assembly, and over the next few paragraphs we will be dissecting this dynamic interface.

## Round, Round, Get Around, I Get Around

Who takes the time to worry about how the stationary brake pad and the spinning rotor generate friction? Odds are this question has never passed through your head, but it is paramount to understanding brake vibrations.

Brake pads engage in two distinctly different types of dynamic friction: abrasive friction and adherent friction. The details should be left to the Ph.D. community, but in general the two modes operate as follows.

In the purely abrasive mode, friction is generated as a result of interference between the microscopic high and low spots on the brake pad face and the spinning rotor. In very gross terms, this is similar to holding a block of wood on a belt sander. As the high and low spots are slowly machined away (much slower than the wood on the belt sander, of course), the breaking of their molecular bonds creates a force that resists the rotation of the rotor. It also heats up the materials involved.



Presto! We have converted kinetic energy into thermal energy by breaking a bunch of molecular bonds. Not too surprisingly, this is the mode that most people naturally envision when asked to explain how brake pad friction “works.”

Adherent friction is quite different in nature. In the adherent mode, pressure and temperature collaborate to deposit a thin layer of brake pad material, or a transfer layer, on the rotor face. Subsequently, as the caliper squeezes the brake pads against the rotor, the pads contact the transfer layer, not the rotor itself.

As the pressure increases, molecular bonds are then very quickly formed between the similar materials of the brake pad and the transfer layer. Just as quickly, however, those very same bonds are broken as the rotor continues to move relative to the brake pad. As a result, heat is generated, and the brake pad material wears away.

While the concept of adherent friction may be difficult to grasp, just sing it to the tune of the Beach Boys 1964 hit “I Get Around” to permanently ingrain it in your subconscious: Bond-bond, form a bond, I break a bond, yeah, bond-bond, form a bond, I break a bond... I form a bond... I break a bond...

In summary, abrasive friction can be found between the brake pad and the rotor itself, slowly wearing away both materials, breaking bonds, and generating heat and torque in the process.

With adherent friction, however, the rotor never actually wears. Why? Because all of the bonding-breaking action is occurring between molecules of the brake pad material, only the pad itself wears away over time (in theory, anyway; see the adjacent sidebar for the rest of the story).

## Good Vibrations

So, now we can talk about brake vibration. As you read, you will find that the underlying theme will revolve around preventing brake vibration, not curing it. But first, let’s purge the phrase “warped rotors” from our vocabulary.

In nearly every single case, warped rotors are not physically warped at all. The common misconception is that the rotors get hot enough to distort and then, upon cooling, end up looking like a pretzel. Contrary to popular belief, rotors simply do not warp in this fashion.

The vibration that is felt in the steering wheel and floorboard is almost always caused by rotor thickness variation, also known as TV, and the physical pulsing in the brake pedal is nearly always a direct result of the caliper piston extending and retracting as it tries to follow a rotor of varying surface thickness.

Take a second and reread those last two paragraphs. It’s that important.

TV is generally created in one of three ways. For the enthusiast, the most common mode of TV is initiated by an uneven transfer layer of brake pad material on the rotor face.

Improper bed-in of new brake pads and rotors is usually the culprit here, but bringing a car in from the race track without cooling the brakes can also create this phenomenon. Given enough heat and time, most brake pads are more than willing to “go adherent” while at rest and will bond to the rotor in small, seemingly random spots. Overheating the pad compound can also generate an uneven transfer layer as the pad material breaks down and “splotches” (this is a highly technical term that one should not use without proper training and certification) on the rotor face.

In any case, the uneven transfer layer deposits will wear at a different rate than the surrounding rotor material. On and on it goes until the high spots and low spots on the rotor face are severe enough to be felt in the pedal. How much can be felt? In most cases, even less than 0.001 inch can be downright annoying.

The second most common source of TV begins with the overheating of the rotor itself. If a rotor gets really, really hot, it can develop evenly spaced, localized areas along its face that are much hotter than the surrounding rotor material. These “hot spots” will also wear more quickly, creating a thick and thin wear pattern on the rotor face. As the rotor cools, these thick and thin spots remain and felt by the driver.



Another, less glamorous method of initiating TV is to leave a car parked in the same place for an extended period of time. While it is sitting, a thin layer of corrosion—you know, ferrous oxide, or rust—can form between the brake pad surface and the rotor. As you can probably imagine, sitting in humid or damp environments combined with use of the parking brake can greatly accelerate the corrosion.

When the car is ultimately moved, there will be a localized high spot (an unintended transfer layer of corrosion) on the rotor that will wear at a different rate than the surrounding material. At first the condition is undetectable, but it will only get worse over time as the rotor wears unevenly, creating high spots (thicker areas) and low spots (thinner areas).

*Continued on page 20*

# FOTOZED

From the FroZen North to the SiZZling South

The Datsun/Nissan online car show co-hosted by the Ontario Z Car Owners Association in Canada and the Z Car Club of Queensland in Australia.

**ONLINE VOTING IS NOW OPEN!**

BEST LOOKING CAR

BEST LOOKING MODIFICATION

BEST PHOTO IN ITS ERA

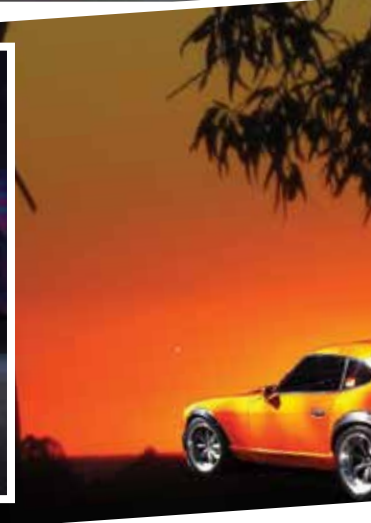
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FASTEST LOOKING RACECAR

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[www.ontariozcar.com /fotozed-2021-spring/](http://www.ontariozcar.com/fotozed-2021-spring/)

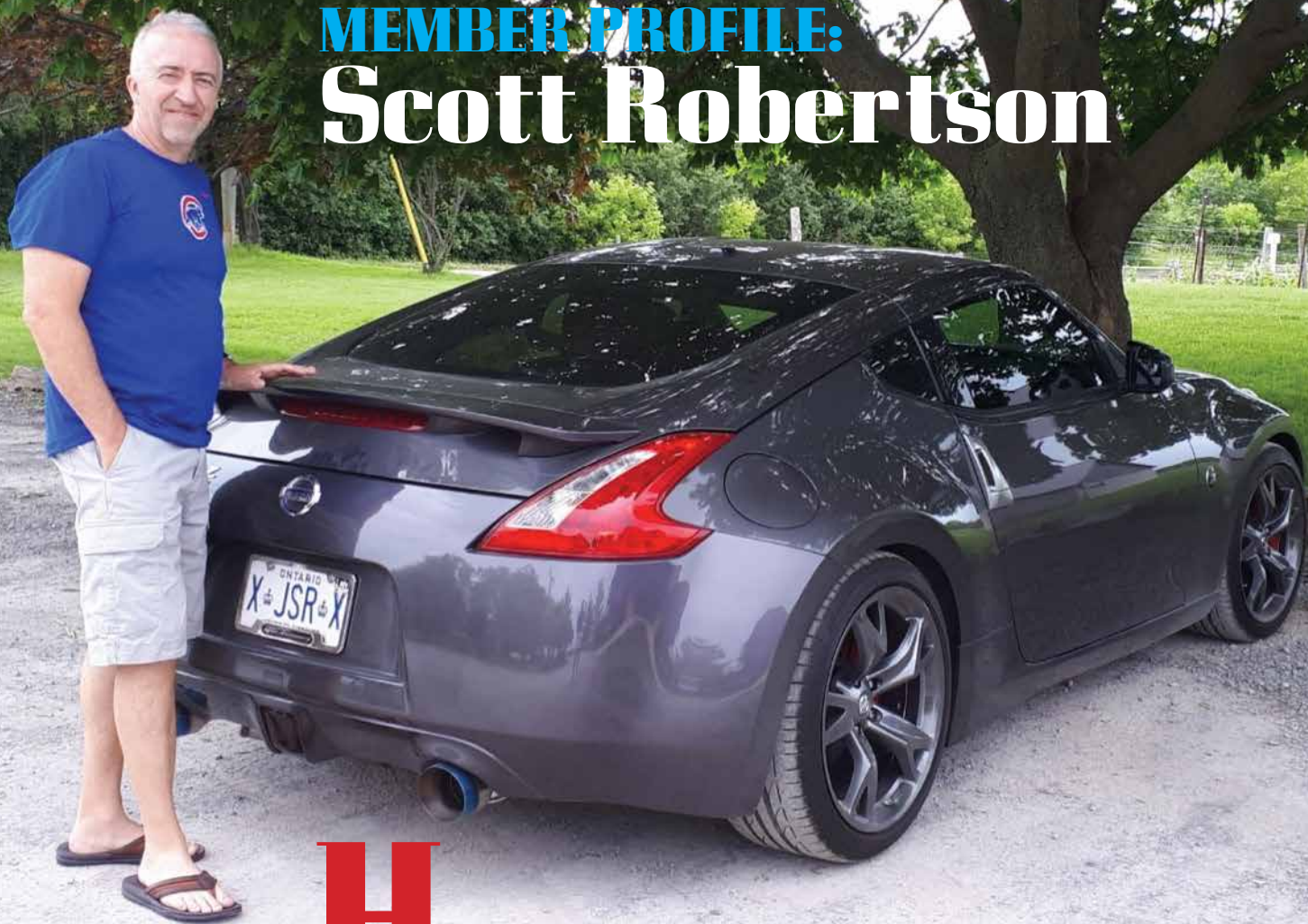








# MEMBER PROFILE: Scott Robertson



**H**ello fellow OZC members, I wanted to introduce myself.

I recently joined the OZC Executive Team as Instagram Director. I really enjoy posting and being active on our Instagram page. It is great to see all the awesome ZED Cars, that people are sharing on the web. I am amazed there are so many dedicated Z Car sites on Instagram. If you want to share pictures of your Z under our Instagram page, please reach out to me at [Robertsonsc24@gmail.com](mailto:Robertsonsc24@gmail.com). In a prior ZedLine, we have a full writeup on Instagram and the process to share photos with us.

So, a little about me and my love of Z Cars. The name, "Datsun", has been in my family for many years. I was 10 years old, when my brother, Glen, drove his new, 1971 Datsun 240Z on our Regina SK driveway. That shiny orange paint was so cool and mesmerizing! I remember bugging him about his pumpkin on wheels.

During our family years in Saskatchewan, I kept asking/telling my brother Glen, that someday, I would buy that 240Z from him. Well, my "dream" came true when I was 18 years old, now living in Ontario.

Glen was married with kids, had just got a work relocation

to Toronto. He no longer wanted his Z and asked, did I want to buy it from him??? ... Oh course, I said YES!! But there was a catch... I/we needed to get the 240Z from Saskatoon SK to Markham ON, where I was living with my parents. Road Trip to TO!!!

Another snag.... Glen needed to be in Toronto to start his new job in less than a week. This 240Z needed to move across Canada, ASAP, if I were to own it. I borrowed money from my parents and flew to Saskatoon. The very next day, early morning, Glen and I jumped into the Z and began our journey East with a packed lunch & cooler to boot. Glen & I took turns racing the Z across the flat plains of Saskatchewan and Manitoba. The plan was to drive non-stop from Saskatoon to Markham..... I am not sure why I ever agreed to it but .... we were on a mission ... The sunny weather on that June 1982 day was great! The hours driving the Z were fun, but it was getting tiring. 20+ hours later, and in Ontario north, with its winding roads and darkness it became a real challenge ... We both thought, MAYBE, we should look for hotel to get some rest. Just outside Sault Ste Marie, we stopped at this Truck Stop for coffee and food. We were so tired, our heads almost sleeping on the table.... The waitress comes over and said to us, "You boys look tired.....!!!" "Where are you headed? We laughed and said, "Toronto..."





She then laughed and said, "You still have ways to go.... I can help with that... Let me get some coffee and food in you..." "

Our meal comes with a "fresh brew of coffee". We ate it so fast, and that coffee was so good... Suddenly our energy and spirits were lifted like I never felt before.... We were now talking, laughing and excited to get back driving the Z home to TO.... As we drove away, we wondered what was in that Coffee???? We will never know for sure, but I have an idea....

The last 8 hours of driving were filled with fun, chatter, and laughs!! Glen, I and the 240Z finally arrived in Markham, 29+ hours later, safe and sound.

As life takes its many turns, my 240Z was always with me, during many moves and circumstances. Many Z modifications were done, some good and some bad unfortunately. Mechanical, carburetor and especially electrical issues were becoming way too troublesome and frustrating to fix by me initially, and my local mechanic.... I had to make a difficult decision near my 50th Birthday. It was time to sell my 240Z. Incredibly sad day, but was happy to sell my 240Z to Z lover in Nelson BC. Back out West the 240Z went, this time by train instead of driving!

After I sold, I immediately had seller's remorse .... Missing my Z, I quickly had to change this feeling. I did some research online and discovered the, 2010 40th Anniversary 370Z. This Z was celebrating the 240Z launch in 1970. I thought no better way to get my Z feeling again, with a more modern sleek looking car that honors the heritage of the initial 240Z... Only 1000 of these special 370Zs were made in USA and 200 for Canada, was a bonus for me. My 40th Anniversary Build # 76 (USA Car)

Today, I continue to be in love with my 370Z, and have done some slight modifications to it since I bought it. Ark exhaust, wheel spacers in front and back, and GTR Start Button. Planning on coilovers and upgraded suspension next.

Being part of OZC club and getting more involved is something I look forward to in 2021, and beyond. Hopefully, we meet at an upcoming event and on the roads again! Being Grateful

**Scott Robertson**

Instagrammer



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# Replacing a Glass Windshield With Plastic

## Project LS-Powered 350Z

Our LS-swapped 350Z was rapidly transitioning from a street car to a track car, and after removing the front windshield for better access, we finished and painted the interior. Next step? Put a windshield back in and go racing!

Of course, we weren't going to just glue the stock windshield back in. It was badly sandblasted and chipped even before we removed it, which meant we were, uh, less than careful during that extraction process. (Don't worry, we vacuumed up the broken glass afterward.)

Since we needed to order a new windshield anyway, we figured it made sense to use this opportunity to save some weight and add safety—two things we've never turned down when building race cars. Bye-bye, glass windshield. It's time to enter the world of plastic.

### Why Do Cars Have a Glass Windshield?

If you've ever held a drink in your hand, then you've probably noticed that glass cups are heavier than plastic ones. And if you've ever held a few too many drinks in your hand, you've probably noticed that the plastic cups don't shatter when dropped on the floor like glass.

Congratulations, you're now an expert on the weight and safety benefits of plastic windshields over their glass counterparts.

Okay, so that's a bit of an extreme oversimplification, but the bottom line is that glass is heavy and prone to breaking. Then why is it the right choice for a street car?

There are a few reasons: First and foremost, glass is extremely durable. And we know that we just said glass is prone to breaking, but that's on track, where it might end up deflecting loose car parts. For a street car, most of the abuse a windshield faces comes from rubbing windshield wipers and dirt kicked up by other cars. Glass is extremely hard, which makes it extremely abrasion-resistant.

Second: clarity. Factories have perfected large-scale production of glass that's optically correct—a term for which we don't have the advanced degrees necessary to really define. We'll put it this way: If you've ever looked through the windowpane of an old house, or through a cheap pair of glasses, then you've probably noticed unwanted color, refraction or distortion. Optically correct glass doesn't have any of these unwanted features, and it's about as close to looking through a perfectly clear window as possible.



And that brings us to the third reason glass is the default answer for cars: cost. All this expertise at making good glass at scale, along with the low cost of its primary ingredients (sand and heat), mean that glass is the least expensive way for drivers to easily see out of the 10,000,000 Corollas a carmaker builds.

But what if you're only building one car, and it's destined for a life on track? In our scenario, we realized that glass wasn't actually the best choice. Welcome to the world of replacement windshields made not of glass, but of more advanced materials. The benefits are obvious: improved strength and roughly half the weight of glass.

## What's the Difference Between Acrylic and Polycarbonate Windshields?

We'll start with the most common question we've heard: "Why can't I drive down to the home improvement store and buy a 4x8-foot sheet of plastic for \$200, screw it onto my car, and call it done?"

Well, you probably can't, actually. Look in the rulebook: The inexpensive sheets of clear plastic stocked on store shelves are acrylic, while almost every rulebook requires polycarbonate.

Acrylic can be found under these names and types: Plexiglas, plexiglass, Acrylite, Lucite and Perspex.

You'll find polycarbonate sold under names like Lexan and Makrolon.

What's the difference? Just like an LS3 and a Coyote are both American V8 engines, acrylic and polycarbonate are both clear plastics. But as with the V8s, that's pretty much where the similarities end.

Polycarbonate and acrylic are completely different materials, and just like the LS3, polycarbonate is a far better choice for your race car—V8 humor there, folks.

Those rules aren't around because Big Polycarbonate is sending lobbyists to the paddock. They exist because polycarbonate is much more resistant to chips, cracks and impacts. While acrylic is about 17 times more resistant to impact than glass, polycarbonate is 250 times more.

Rulebooks require polycarbonate because it's less likely to break and hurt the driver. Unfortunately, it's also a bit more expensive.

So you can go down to your local store and buy a sheet of polycarbonate for your car, but be warned: You'll probably need more than one.

Polycarbonate turns windshields into consumables. Why? Every material has tradeoffs, and one of polycarbonate's is its softness. In exchange for that high resilience to cracking, polycarbonate is much softer than acrylic. That means it's very easy to scratch. You have to be extremely careful with how you clean it (even paper towels are too rough), and don't even think about turning your windshield wipers on unless you want permanent streaks. Polycarbonate also

has poorer optical clarity than acrylic and will yellow over time with UV exposure.

## What Kind of Plastic Windshield Should Be Used in a Race Car?

All that glass found in production cars is starting to make sense, right? So if acrylic isn't safe and polycarbonate is a terrible choice for a windshield, how do you replace glass with plastic to save weight and add safety to your race car?

Simple: You throw science at the problem, which brings us to SHIELDS® Windshields. They make formed and coated optical polycarbonate for a lot of different cars, including our 350Z. They claim to be "the only manufacturer in the world that both forms and post-coats polycarbonate to the most demanding standards." Sounds like we're on the right track.

So, what's that mean in practice, and what sets apart a piece of plastic sourced from Shields from a piece of plastic bought at Home Depot? It starts in the Shields factory, which is designed to make windshields, not sheets of plastic for home improvement projects, which means there's a focus on optically correct parts from the start. Put simply, a Shields windshield has better optical quality than garden-variety polycarbonate.

And because Shields makes only one windshield at a time, the product can be tailored to the application. The brand's polycarbonate is formed and trimmed in the shape and curve of the OEM windshield, meaning you don't need to try to replicate a big, curved windshield with a big flat sheet, nor do you have to deal with the distortion that can often be a side effect of bending polycarbonate yourself.

But the key reason we chose a Shields product for our 350Z is the company's proprietary SUPERCOAT™ coating.

Remember that part about throwing science at the problem of soft plastic windshields? SUPERCOAT™ is that science. The coating is applied to each side of the windshield after it's formed and creates an extremely hard protective layer. SUPERCOAT™ is abrasion-resistant, solvent-resistant, UV-resistant, and basically everything else-resistant. It means you don't have to treat your new polycarbonate windshield as a consumable, or as something that can only be handled with kid gloves and a microfiber cloth.

## How Much Does a Plastic Windshield Cost?

By using a Shields Supercoated polycarbonate windshield, we'd theoretically have all the upsides of a plastic windshield without the downsides that come with DIY options. And we know what you're thinking: This is NASCAR-level tech with NASCAR-level pricing, right?

Actually, we were shocked at how affordable this project was. NASA Time Trial rules require front polycarbonate windshields to be at least 3/16-inch thick, which translates to about \$250 worth of polycarbonate sourced from a big-box store and a few hours of tracing/cutting to fit the car.

*Continued on page 18*

We decided to go with a slightly thicker, 1/4-inch windshield. That thickness would guarantee that we wouldn't need additional bracing to keep the windshield from flexing while on track, and would future-proof the car if we ever decided to run with an organization requiring thicker polycarbonate. The Shields option designed to perfectly fit our 350Z using the stock windshield trim cost \$547. You'll spend a bit less if your organization allows thinner replacements or you're comfortable ordering the windshield oversized and doing the final precise trimming yourself. (This option is the right choice if you're planning to bolt the windshield in place.) If you want extra features, like an anti-fog coating designed for rain racing or built-in window tint, you'll spend a bit more.

What about just replacing our glass with, well, glass? We found new OEM windshields listed online for \$850; aftermarket glass was listed for as little as \$116 on eBay Motors by a local glass shop. Generally, you'll spend \$300 to \$500 to have a local glass company come out and put a fresh windshield in your car.

Homework done, we placed the order for our 350Z: a quarter-inch-thick Supercoated Shields windshield for the front and an eighth-inch-thick Supercoated rear windshield.

Why such a thin rear window? Because we couldn't find a rule against it, and we're trying to save weight at every opportunity. At \$459, this wasn't the least expensive way to replace the rear glass, but the Shields coating should mean we won't be replacing cheap plastic every other season.



### How to Install the Shields Plastic Windshield

A few weeks later, the Shields plastics arrived, and our first stop was the scale: We knew we'd be saving weight, but we wanted to know exactly how much.

We weighed our broken aftermarket glass windshield at 25.5 pounds, while the Shields replacement weighed just 16.7 pounds. We'd saved 8.8 pounds while also making our car far, far safer. In the rear, the weight savings will be more drastic thanks to the thinner polycarbonate, but we'll cover that installation in a future update.

Time for the fun part: installation. And after some time on the phone with Shields experts, we settled on what we

figured would be the easiest, lightest and most durable method: gluing in the windshield, just like Nissan intended. The 350Z, like most modern cars, secures the glass with a 1-inch bead of urethane windshield adhesive. This makes a completely waterproof seal that also stiffens the chassis and the windshield by permanently bonding them together. It's also inexpensive and easy to do: We bought the tools (a special caulk gun and some suction cups are needed) and a few tubes of urethane for about \$80 online.

One problem, though: SUPERCOAT™ is resistant to all sorts of things, including glue, which literally won't stick to it.

Before we could glue in the polycarbonate, we needed a frit. If you're not a glass connoisseur, you'd probably refer to the frit as "that black band around the windshield." Its primary purpose is to give the urethane a good surface to bond to, so we needed to create one for our polycarbonate.

The first step? Figuring out where to put it. To do that, we set the windshield in the car, then traced around the sheet metal with a Sharpie. Leaving the protective shipping wrap applied gave us a convenient surface to mark.



Then, once we'd traced the car onto the windshield, we set the plastic on a stand and cleaned up our markings to create a smooth, tidy band of black around the windshield's perimeter. We trimmed away a strip of that shipping wrap, leaving most of the windshield masked off so we wouldn't damage it during the next step.







That next step? Sanding, of course. After all, SUPERCOAT™ doesn't remove itself, and Shields said we could just sand it off.

We attacked it with a dual-action sander and 80-grit sanding pads, sanding until we'd gotten through the SUPERCOAT™ and scuffed the raw polycarbonate underneath. We figured this step would take a few minutes, but we ended up sanding for hours.



We assumed SUPERCOAT™ was mostly marketing speak. Turns out that it's so darn hard that you can hold a sander on it for minutes at a time and still not see visible scratches. After lots of patience, we finally got it off, then went over the band of bare plastic with 220-grit to provide a smooth surface for paint.

What exotic coating do you need to paint a windshield frit? Turns out the answer is simple: flat-black spray paint.

We picked up a few cans of Krylon and sprayed light, even coats until we couldn't see the light of a flashlight through it. After letting everything dry overnight, the windshield was ready to install.



We cleaned the surface rust out of the 350Z's windshield channel while we were waiting, then treated the channel to a coat of that same flat-black paint to ensure a good bond.



We also ordered some universal rubber windshield edging online and glued it to the top of the windshield to replace the OEM trim that would normally bridge the gap between windshield and roofline.



Prep work complete, it was time for the moment of truth: Glue Day.

We watched some YouTube videos, then carefully cut our urethane tube's tip in a V-shape and spread a nice bead around the windshield frame. With our wife's assistance and those suction cups, the windshield dropped right in with zero trimming or adjustment. Plus, it mirrored the curvature of the OEM glass perfectly. After letting the urethane dry overnight, we hopped in and went for a drive.

And that drive was super weird. Why? After only ever driving this car with a worn glass windshield, the Shields polycarbonate was basically invisible, and we felt more exposed than usual. We've never seen this level of clarity in a plastic windshield before, and we're convinced it's worth every bit of its \$500 price tag.

**Tom Suddard**

<https://grassrootsmotorsports.com/project-cars/LS-Swapped-2003-Nissan-350z>



## Don't Worry Baby

So now that we know what causes TV and the ensuing brake vibration, what can be done to prevent it in the first place? Don't worry if you don't have the answer already—we're professionals and can help you through this.

First, be sure to follow your manufacturer's recommended procedure for bed-in when installing new brake pads and rotors. These processes have been developed to reduce the opportunity for uneven brake pad material deposition on the rotor face. See the handy sidebar for more details.

Second, make absolutely sure to run a cool-off lap or two before coming into the pits, and never come in hot and keep your foot on the brake pedal and/or set the parking brake. Any time hot brakes are allowed to sit motionless, molecular bonds may continue to form between the brake pad and the existing transfer layer material. The result is nearly instantaneous TV generation. Would you like fries with that?

Third, during aggressive driving, keep your brakes as cool as possible to reduce the opportunity for hot spots. A set of brake cooling ducts goes a long, long way in this regard. Remember, cool brakes are happy brakes.

Fourth, if your car is typically left outside for extended periods of time, it might be best to select a nonmetallic brake pad. Nonmetallic brake pads (also known as organic or ceramic brake pads) reduce the tendency to generate corrosion between the pad and the rotor. While they are not usually recommended for high-performance applications, they don't rust as quickly, and over time this may reduce the generation of TV on your garage queen.

Fifth, when installing your wheels and tires, be sure to tighten your wheel nuts in the manufacturer's recommended pattern and take several passes to reach maximum torque. In some applications, uneven tightening of the wheel nuts can physically distort the rotor enough that during normal driving thick and thin spots may develop on their own.

## Help Me, Rhonda

And what if brake vibration is already present in your car? Well, that's a different story.

In select cases where brake vibration has just begun, it may be possible to remove any uneven transfer layer deposits from the rotor face by using a super-abrasive brake pad for a short while. This is a hit-and-miss strategy, though, and if uneven rotor wear has already started,

then it's too late anyway. Remember, abrasive brake pads cannot make a rotor flat again—they can only smooth off uneven pad deposits.

Turning the rotors can also alleviate the vibration situation, but this may not be a viable long-term solution. If the rotor has been heated to the point that the chemistry of the rotor has changed (specifically, if localized areas of cementite have formed due to heat, yet another topic for the Ph.D.'s), then very quickly the vibration will come back as the softer areas of the rotor face wear away more quickly. (Note that in some cases even turning the rotors may not cure the vibration even for a short time, as the hard spots can deflect the cutting tool making for an uneven cut on the rotor face.)

Finally, the only known long-term solution to purging vibration is to replace the rotors themselves and properly bed-in the new parts, assuring an even transfer layer. It may sound like a brute-force approach, but desperate times call for desperate measures. Just be sure to learn from your mistakes to keep the vibration monster from rearing its ugly head again.

As with most things in life, in the war against brake vibrations, the best offense is a good defense. Good vibrations, indeed.

## Developing a Transfer Layer



**Q:** So if I'm putting new brake pads and rotors on my car, how do I properly develop a transfer layer? Is there a defined procedure I should be following?

**A:** The process of developing a transfer layer is typically referred to as brake pad bed-in. In general, bed-in consists of heating a brake system to its adherent temperature to allow the formation of a transfer layer.

The brake system is then allowed to cool without coming to rest, resulting in an even transfer layer deposition around the rotor circumference. This procedure is typically repeated two or three times in order to ensure that the entire rotor face is evenly covered with brake pad material.

The procedures that follow are generic and are only intended to introduce you to the theory of pad bed-in. As these procedures are not manufacturer specific, be sure to check with your brake pad supplier for any special considerations related to the bedding-in of your particular rotors and pads.



## Adherent vs. Abrasive, the Rest of the Story

Although we have talked about abrasive friction and adherent friction as if they were mutually exclusive, all brake pads operate in both modes, and sometimes simultaneously.

Typically, though, most pads will operate in a primarily abrasive mode when they are cold and will then transition to an adherent mode as the brake temperature increases. This is why some brake pads require warming before they will be operating properly on track—they need to “go adherent” before they exhibit their desired performance.

If you have ever used the ubiquitous Hawk Blue 9012 pads, then you know exactly what we’re saying here. This material operates like a brake lathe (mega-abrasive mode) until it gets hot enough to stop on a dime (ultra-adherent mode). It’s also why you shouldn’t run Hawk Blue brake pads on the street: The brake temperatures will never get hot enough to get out of the abrasive mode, and the rotors will pay the ultimate price.

A final interesting note on adherent friction: If you use primarily adherent pads on your race car, chances are that your rotors will actually be thicker than new when the time comes to replace them at the end of the season. Why? Because of the added thickness of the transfer layer material. The rotors may still need replacing due to cracking or other thermally induced maladies, but rarely are race rotors replaced because they have worn too thin.

## Bedding-in Street Performance Pads

For a typical brake system using stock-sized rotors and street performance pads, a series of six to eight partial-braking events from 60 mph down to 10 mph will typically get the brake components warm enough to be considered one bed-in cycle. Each of those six to eight partial-braking events should be made at moderate to high deceleration (about 75 percent of the deceleration required to lock up the brakes and/or engage ABS) and should be made one after the other without allowing the brakes to cool in-between.

Once the brakes have faded a bit and/or you smell friction material inside the car’s passenger compartment, the cycle is complete and you should allow the system to cool by driving at steady speeds without bringing the car to a complete stop.

After cooling, repeat the partial braking event procedure listed above one more time; cool down again, and you’re typically good to go. In some situations, a third cycle is beneficial, but two are usually sufficient.

## Bedding-In Club Race or Full-Race Pads

When bedding-in stock-sized rotors with typical race pads, the bed-in procedure needs to be run a bit more aggressively. Usually, a series of seven to 10 partial-braking events from 60 mph down to 10 mph is performed fol-

lowed immediately by three or four partial-braking events from 80 mph down to 10 mph.

As above, each of the partial braking events should be made at moderate to high deceleration (about 75 percent of the deceleration required to lock up the brakes and/or engage ABS) and should be made one after the other without allowing the brakes to cool in-between.

Once the brakes have faded a bit and/or you smell friction material in the passenger compartment, the cycle is complete and you should allow the system to cool by driving at steady speeds without bringing the car to a complete stop.

After cooling, repeat the partial braking event procedure listed above one more time, adding two or three additional partial braking events from 100 mph down to 10 mph. Follow up with a cooling run, and you’re typically good to go. In some situations, a third cycle is beneficial, but two are usually sufficient.

## And Now, a Word From the Lawyers

Note that these speeds are neither recommended nor condoned on public roads. This procedure is designed to be run in a controlled environment such as a race track. While you need to get heat into the system to achieve a proper bed-in, you also need to exercise common sense and take full responsibility for your actions.

**James Walker Jr.**

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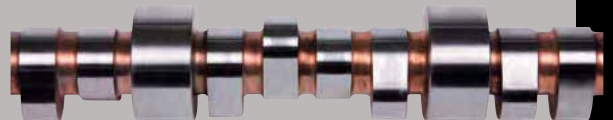
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