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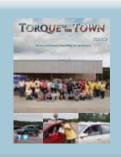
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Jim Robinson

A special thanks to Blake and all the contributors in support of the newsletter. Becoming a born again Texan and other musings.

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Teen Street Survival Class and Volunteers



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**Dennis Nowak**President - Houston Chapter

I get a lot of unsolicited emails through the president@houston-bmwcca. com email alias. Everything from the run of the mill muscle car/hot rod show invites, to the discount Canadian pharmacies, where one can buy pills/potions that guarantee male "enhancement" and yes, even the "I am a Nigerian Prince send me money and I will transfer hundreds of thousands of dollars into your account" email. Needless to say that my delete button gets used excessively, as I sift my way through the legitimate email, trying to sort out the garbage. Most of the legitimate email is mundane, usually requests for repair shops or membership procedures from folks I do not know. Occasionally though, I get one that peeks my interest.

A couple months ago I received an email that intrigued me just by the subject line. It read, 'Message from BMW Club Western Australia.' "Hum, this is different," I thought. I don't know anyone from Australia, but the subject line was enough to make me curious enough to open it and I am glad I did. It was from a gentleman by the name of John Slade, who introduced himself as

the President of the BMW Club Western Australia, informing me he was to be in Houston soon and asked if I would be up to meeting for coffee. John explained he is part of a trade delegation that would be visiting Houston for OTC the first week of May, although he would only have the morning of Sunday, May 3rd, available to meet. After several email exchanges with John to gather detailed information, it was decided that we would meet for breakfast and I asked him if he would be open to attending our Wash, Wax and Tech event at BMW of Houston North that morning as well. When the day came, Sarah and I drove our '84 M635csi to pick up John at his hotel. Following us were Adriana and Tor driving their two M6's. (Yes it was a good excuse to get all 3 generations of the M6's out to play again) After a quick greeting and photos we all proceeded to a local restaurant for typical American fare and great conversation.

During our breakfast we all convinced John that he must go with us to the Wash Wax and Tech event. Arriving at BMW North we skipped the wash area (no water for the M635) and drove into the service bay area to park the car in one of the bays. There were already many folks hard at work polishing and detailing

a vast array of BMW's making them shine under the bright shop lights. I took the opportunity to introduce John to many of the members, who struck up brief conversations, before I ushered John to the next person, trying to make the most of our time. One of the items I wanted to send John home with was the Texas roundel overlay that so many of us have on our cars. I thought it would be a unique gift for John to add to his E46 M3 back in Australia. Ken Finley supplied the overlays and John

seemed thrilled to have them. Shortly after lunch it was time to drive John back to his hotel to attend other scheduled functions for his delegation later that day, ending our brief, but very enjoyable visit.

Meeting John was such a thrill. He is a tall, well spoken, educated, debonair type of a gentleman, well-mannered and very personable. I was honored to be able to host a brief insight into our humble car club during his visit to Houston. This was John's first visit to Houston and although he hadn't seen much the city before our meeting he commented on how green and well-manicured the city looked. He also mentioned how friendly Texans were and how nice the weather was. (This is before all rains came and flooded everything!)





I received another intriguing email from John shortly after he returned home to Perth. It seems that Houston and Perth, in 1983 established a sister-city relationship which I find quite interesting. Here is the link to an informative website and video explaining the association: http://aacc-houston.org/sister-

cities-houston-perth/

In that spirit of formal relationships linking entities with mutual interests, John and I are in talks to create a sister-cities relationship with our respective car clubs, the BMW Car Club of America Houston Chapter and the BMW Club Western Australia. Since the precedent has been set between the cities of Houston and Perth is seems logical that we as car clubs could follow suit. John and I both agree that this initiative is a good one and will be sharing details as we progress the relationship between our clubs.

As we head into the summer months, please pay attentions to the needs of your car. Worn tires and weak batteries tend to fail quicker as the temperature rises. It is wise to inspect your vehicle before heading out on a family vacation to prevent issues of being stranded somewhere. Also, be aware that hurricane season has started, so pay attention to weather warnings.

We have had some great events already this year and have many more planned for the summer. Keep your eyes on our website calendar for upcoming events and if you haven't signed up to get on the eblast list, why not? You are missing out on important notices. As always, I hope to see you at the events, you can find me

in the driver's seat.....

#### MEMBER SPOTLIGHT



#### **LeAnn Stokes**

If you go to autocross you know our autocross chair Chris Stokes. This member spotlight isn't about him, it's about his wife LeAnn.

She is the quieter member of the Stokes family. LeAnn is active in our club. She attends the Saturday Morning Coffees and is always ready to say hello and visit with our members.

LeAnn is one of the Road Monkeys and has been on several of the O'fest trips I've taken with the Road Monkeys. If you haven't been to Saturday Morning Coffee, come join us and meet LeAnn.

Nominated by Diane Albrecht

To nominate a member for the Spotlight email: president@houston-bmwcca.com. Include the member's name a photo and a note about their outstanding contributions.



#### Stay Informed!! - eBlast Signup

Once a month the Chapter emails an eBlast to all members who have indicated that they want to be kept informed about Chapter activities and events, as well as news and information involving the Chapter.

If you wish to receive this information and are not already signed up you may do so on the website at www.houston-bmwcca.com.

The eBlast request is located at the lower left on the front page.

## 2015 BLUEBONNET DRIVE



Thanks to everyone for signing up for this year's Bluebonnet drive.

We had about 50 participants so we had to break up into three groups. I led a group and we had otherss to lead or ride shotgun to shepherd the lost souls. There were lots of flowers out there, although the biggest fields were along US 290 providing a lot of those "Kodak" moments.

We visited Brenham & Bluebell before the plant was shut down. Let's hope the recover soon so we can again enjoy their wonderful ice cream.

Lunch was good. That place worked out very well. And when we got to Brenham they had a fire drill at Bluebell. They stayed open later so we all enjoyed some fresh ice cream.

All in all it was good.

The weather turned out to be sunny and mild. Real good turnout. Lots of nice flowers along the way. We stopped at a field that was loaded and took some pics.

Very good run today. Nice day. Thanks for your time and effort.

Jim Goldmeyer

Yesterday was fantastic fun! Thank you for doing such a bang-up job with it!

Pam Johnson

Neil understated the drive. It was great. I heard nothing but good comments. We had a lot of people (a hand full of new members) and cars and the weather did not hamper attendance. Folks were happy to get their flower photos for the year and the restaurant was fantastic. I think they need to be a fixture for the bluebonnet drive. The fire alarm at Blue Bell only deterred a few folks and most stayed to enjoy the creamy delights. All in all it was a great day!

Dennis

Thanks for organizing another great event! :-)

Tor

We thank you and we had a great time, bumped in to a large field on the way home! Hope you had success!

Clinton Host

Thanks for organizing a fabulous day.

Rachel Kelesoglou

That was a terrific route and lunch selection. We wish we could have made the after lunch portion.

Chris and Leann Stokes





#### 2015 Texas Trifecta

Ricardo Barnes - Photos by Leann Stokes



I want to thank the Lone Star **BMW CCA** for the support that they have given us over the years with their equipment. I also want to thank the Tejas BMW CCA for their logistical support and volunteers. Above all I want to thank my good friend Roger Johnson for pulling a rabbit out of the hat. It goes without mention that the volunteers from the Houston BMW CCA were also fundamental in making this event possible.

The original site location that we had used the previous two years was not in our contract as we found out when we arrived on site Friday. Lucky for the Houston Chapter, Roger Johnson was on staff to help us build a national level course in mere hours on the Friday before the event. Roger "the real" Johnson is an internationally renowned course designer and has designed many of the National SCCA AX courses over the years. He was recently inducted into the SCCA Hall of Fame in 2015. With this bit of background, you'll understand why we were very happy to have him assisting the Houston BMW AX group with this event. The resulting course was challenging, safe, and fun. What more could you ask for? Okay, so maybe less sprinkles on Saturday.

Even after having to adjust to a new site, designing a new course in a very short amount of time then setting it up during a downpour on Friday we had fun doing it. But, the last minute site change provided us with a pickle of a challenge.

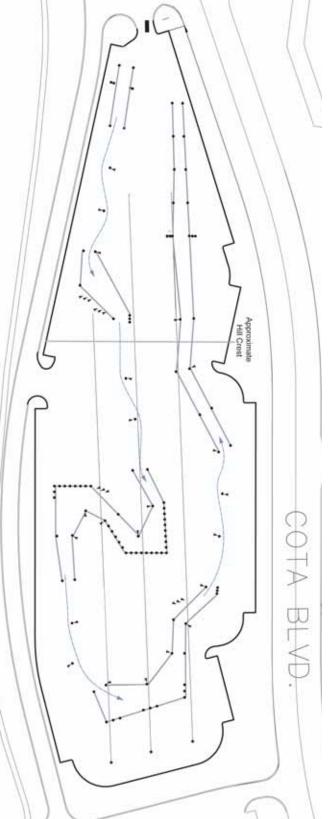
How do we communicate the track location change to those travelling? With several volunteers shipped out to several locations around COTA to disseminate the venue change and being lax with our start time, everyone that came to

attend was able to find the location.

This year's course surface was somewhat downhill (remember we were in Austin, not Houston). It was an amazing course, making full use of the surface area and variances. Can you say slick skid pad in the middle of the lot? The course designed by internationally acclaimed Roger Johnson ended up

being a blast to drive and presented many challenges. The results are posted on the Houston BMWCAA website as well as the Texas Trifecta

As bragging rights go, the spirited Texas chapters' competition returns back to the Houston BMW CCA thanks to Chris Stokes, who drove the tires off his White 2011 BMW 135i. For those of you who are keeping score over the years the current count is Houston 1, Dallas 2. I hope that the spirit completion continues over the years.









▶ We presented John Slade, President of the BMW Club, Western Australia, his very own set of Texas Roundel overlays for his E46 M3. It should be one heck of a conversation piece in John's hometown of Perth. (pictured L to R: Ken Finley, John Slade, Dennis Nowak, Sarah Nowak)

▼ Photo sent in by Valerie Baker at the Wash, Wax and Tech event at BMW of Houston North.





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Sent in by Valerie Baker:

Proud grandpa Warren Campbell, longtime club member and his new granddaughter Eliza, future Road Monkey.



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#### M3 LSD Differential Rebuild with 4-Plates Part 2

BMW no longer sells outer discs. Originally they were offered in 1.90mm, 2.00mm, and 2.10mm thickness. The 2.00 plate is the nominal plate, so the differential can be shimmed from -.2mm to +.2mm. The plates always seem to be very close to 2.00mm. So only 2.00mm plates were ordered. If the stack is too loose, a shim would be cut (.004, .007, and .010" was on hand) from shim stock and placed under the passenger side outside disc. Too tight, lap some more from flange.



Figure 1 Porsche Outer Disc or dog ear plate

The Porsche part number used is 91733255211 which is the 2.00mm plate from a 944. The Porsche differential was similar to BMW's, but did not use the large Bellville springs at each end, and had additional plates in the stack.

The next step is to determine the stack height of the new plates. Remove the three shaft washers (shown in Figure 16) from each end and stack the internals back in the housing. Measure as shown in Figures 20 and 21.

For the two (2) old plates fixed plates, I lapped the worn side quickly on a granite piece and 600 wet paper. The key in hand lapping is to keep the surface flat. This is done by having a stable flat



Figure 2 Depth measurement of flange



Figure 3 Depth measurement of plate stack up in body

Measure the Bellville springs to determine the thickness of both. This is somewhat difficult and has to be done as close to the outer edge as possible. Measure in several places to get an average. Using a digital caliper is the easiest. This differential measured .197" for the two springs. Typically the springs seem to be about .098" each. I noticed a slight burr on the edges, so did a quick sand with 600 wet paper on a flat surface, to make sure they sit flat. Subtract the flange height from the body height plus the Bellville height to get the clearance.

BMW says the clearance in the stack height should be .1mm to .4mm. (.004 to .016"). I recommend aiming for .008 to .012". Note that it isn't that important to get this super tight, as the Belville washer compensates by controlling the preload on the plates, and has the characteristic of an almost flat spring force over a range of deflection.

Measurement of the depth gave .598". So .598-.197 = .401. This is the needed depth of the flange, **for zero clearance**. We want a nominal clearance of about .010", so the flange depth needs to be .401-.010=.391". However the guess done previously was .403, so that won't work, .012 need to be removed from the fixed plates or the flange.

At this point, going back to the machine shop would take too long. Lapping with 220 wet sandpaper on the granite, the face of the flange was lapped. Pretty quickly the surface can be improved, removing about .002. After that the progress really slows. A faster method was needed for this amount of removal. Using a belt sander with 100 grit, material removal is faster. Then back to the hand lapping with 220 paper and 600 paper for a final finish. I got the part to about .398, and decided to do a torque

The torque required to slip the LSD as recommended by BMW is 50 to 75 Nm or 37 to 55 ft-lbs. In the TIS these torques are tested with the differential horizontal. I set the differential up vertical using a bench vise, and have tested several that have all worked well and have read 60 - 65 ft-lbs for the normal 2-plate configuration. With doubling the plates in theory the lockup could be as much as double, but my thought was it should be less than double. I searched forums and found little information on the static break out. On the Metric Mechanic site (www.metricmechanic.com) they have a PDF file on differential rebuilds, and state a stock 188 breaks out at 58 ft-lbs, and their 3 or 4-plate breaks out at 45 ft-lbs with 30 degree ramp angle. This seems contrary to what I wanted to achieve, but remember that most of the lock up occurs when the center sections are driven out by the ramp angle. Lower static lockup will make the car a little more compatible with everyday driving.

To do the torque test the differential must be fully assembled. No Loctite for now as the will likely be removed to further tweak the spacing. Also the plates and all surfaces must be fully oiled or the torque will be high. Use the same oil that will be run, I prefer Redlne, but have also used the Mobil 1 differential oil. Note that these oils already contain an LSD additive, so no additional friction reducing additive is needed.



Figure 4 Differential body with shaft washers, large Bellville washer installed

The assembly in Figure 23 can be easily be slid in be supporting through the side slots, or holes if non-M body. BMW or ZF apparently tried to create more oil flow, or simply lighten the body, on the M car differential body. Otherwise the M and non-M bodies function the same.



Figure 5 Stack up ready to be installed, used plate surfaces on top and bottom

Two checks need to be done before tightening the end flange. The gap of the ends of the splined shafts and the gap at the end flange the body.

Assemble the differential leaving the two large Bellville springs out, this will make the end flange bear on the spline shafts and the washers at each end. Make sure the spider gears are fully in their correct position by turning and holding together as they are inserted in the body. If the spider gears are not seated fully the stack height will be off. Then put the end flange on the body holding the three washers in place. This can be done easily by holding the differential horizontally. With the flange in place there should be a small gap. The gap is created by the small Bellville washers at each end. The BMW TIS only states that there should be a gap, but provides no dimension. Figure 6 shows measurement. Don't bother measuring exactly, just look for about .004 or more.



Figure 6 Check of shaft Bellville washer spacing w/.005 feeler gauge

Two checks need to be done before tightening the end flange. The gap of the ends of the splined shafts and the gap at the end flange the body.

Assemble the differential leaving the two large Bellville springs out, this will make the end flange bear on the spline shafts and the washers at each end. Make sure the spider gears are fully in their correct position by turning and holding together as they are inserted in the body. If the spider gears are not seated fully the stack height will be off. Then put the end flange on the body holding the three washers in place. This can be done easily by holding the differential horizontally. With the flange in place there should be a small gap. The gap is created by the small Bellville washers at each end. The BMW TIS only states that there should be a gap, but provides no dimension. Figure 6 shows measurement. Don't bother measuring exactly, just look for about .004 or more.

With the differential fully assembled, there is a gap on the end flange. We just need a rough check, expect about a 5mm gap. This is close to 3/16" (.1875) so just test for fit with a drill bit. This is just doing a quick check of the full height of the two large Bellville washers and the collapsed height.



Figure 7 Drill bit check of flange to body gap

Install the eight (8) flange cover bolts and tighten in a cross pattern. Do not use Loctite on the bolts at this time, after the torque is confirmed, Loctite will be used and is required. The flange bolts can be reused, but be aware the low height head socket screws can have the hex yielded by the hex bit. Full torque on the factory screws is 25 ft-lbs. For this step a torque of about 20 ft-lbs is sufficient (especially for factory low head screws), as a change in stack height is likely. Remember all plates and spider gears should be well lubed for this step. A recommended change is to purchase full height socket screws in grade 12.9. Factory low head screws are grade 10.9. This means the 12.9 screws have a minimum strength 20% greater than the factory screw. In addition the full height screw develops full strength of the screw, whereas the low head is only about 80%. Net effect is that the full height screw provides about 50% more strength. The only concern might be clearance of the additional head height, but this is not a problem. The screw needed is 8mm x 1.0mm thread x 16mm long. A 1.0mm pitch is not the standard for 8mm screws, so these will not be found at places like Ace Hardware or local auto parts. McMaster-Carr or Fastenal are potential sources.



Figure 8 Low head screw on right, full head replacement on left, 10 pack from McMaster-Carr

Assemble the drive flanges into each end of the LSD. Put screws into the bottom side, and mount the torque adapter to the top side. A bench vice can then support the assembly.

(Continued on page 16)





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Figure 9 Stackup for torque test

Use a pick and check for movement of the tab washer at both ends. It should move with slight pressure, if it is bound solid, the washers will have to be sanded down.



Figure 10 Checking free movement of keyed washer

Using a torque wrench turn the LSD so the clutch plates slip. The first time a "breakout" value should be ignored. Use a beam type wrench and try to read the running torque, only turn a little, 30-45 degrees or so is enough. The Harbor Freight digital torque gauge is ideal for this, because it stores the peak value. If all you have is a clicker, start by setting high, maybe 100 ft-lbs then adjust to bracket the torque.

For the first check, the stack was very tight, with the minimum clearance. The torque was about 109 ft-lbs. This seemed too high. If the differential is too tight, the differential may chatter on low speed turns and wear will be excessive. Disassembly and additional sanding/lapping of the end flange and re-measurement brought the clearance to about .008. Lube again and reassemble brought the torque to about 89 ft-lbs. I still thought it was maybe a little tight, as there is error in the stack height measurements despite being careful. With more sanding lapping and slight lap of spring disc edges, the clearance was about .010".

Lube again, reassemble, and torque test, gave 85 ft-lbs. A very small change from the previous test, indicating the preload is in the right range.

Now the flange bolts need to be re-installed with blue Loctite. Remove them one at a time and install. This time bring the torque to 30 ft-lbs for full height screws. BMW bolt table in TIS says the torque is 33 ft-lbs on this size and grade screw. Use only 25 ft-lbs on the original screws. Mark the starting point and work around tightening to about 20 ft-lbs, then finalize with 30 ft-lbs. Re-check the breakout torque a final time, and use the pick and confirm the stepped washers turn.

For this build no additional shims were needed to get the correct stack height.

The LSD unit is now done. The output bearings need to be fitted next and the assembly fitted to the housing. This will be covered in the next article.

#### Jeff Otten

Technical Advisor technical Advisor@houston-bmwcca.com



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I wanted to thank you for the great group of volunteers that helped us make Saturday's TSS so successful. It's not just me saying this, either. I heard from a lot of my instructors that this was the best group of volunteers, ever. They had amazing energy and enthusiasm all day long! The standing ovations from the lane change crew(and the brake-and-turn crew), the thumbs up from slalom and brake and turn crews, the positive words from the group leaders, the speed that cones got reset. All of that worked together to make a great impression on our students as well as making it easier on our instructors. It was really nice to be able to tell that all of the volunteers were so into what was going on. Their efforts meant that our students got extra runs on some of the exercises. Extra runs mean a chance for them to build more confidence in their abilities. Please pass this along to all of the volunteers to make sure to let them know how much their efforts meant and how much we appreciate them!

Regards,
Walt Phillips
Instructor Lead

Thanks for the kind words Walter, yes we are so proud of the volunteers and the enthusiasm they approach this event and share with the participants. What a committed group and it easy to see they are having fun with their roles. How motivating is that.

Volunteers, You Rule! Jim Iden



Sergio's daughter Lauren was driving the red Mustang. It became apparent on the lane change that the car did not have ABS (which surprised me for something as recent as a 2005). I was able to get her comfortable with threshold braking with surprising ease. She applied her newfound knowledge to good effect on both the lane change and brake & turn, especially during the wet afternoon sessions.

Ken, hats off to you as well. This seemed like the best organized TSS to date. Splitting the road course exercises into two makes a lot of sense.

#### **Jeff Thomson**

Ken Findley,

I want to thank you and the volunteer staff of Street Survival for putting on an outstanding program.

In one day I saw my daughter's confidence grow tenfold. She's only had her license for two months and went into this class lacking confidence in her driving ability; to the point that I felt she was dangerous on the road and especially on the freeway.

I drove home with her after the class and I was amazed at her improvement in just one day. She felt more confident on the freeway and dealing with the heavy traffic. I can't begin to tell you what a sense of relief that gave me as a parent of a new driver.

I especially want to thank Jeff, her driving instructor, for his patients and calm demeanor which made my daughter feel comfortable in what could have been a very uncomfortable situation for her. Jeff knew exactly how much to push her without crossing the line and scarring her. Please pass my gratitude on to Jeff. When we got home I asked her if she wanted to take the class again next time it's available, and her response was a resounding "YES!".

Thank you again and we will be seeing you at your next Street Survival class, Sergio Fernandez

#### **Volunteer Assignments:**

John Galbraith - 60' straight slalom Chet Vlaun John Sykes Ken Helm Stanley Byers

Bill Elwell - Break and Turn Monique Byers David Kaczynski John Cairns David Eberly Mike Jones

Dennis Nowak - Lane Change David Cain Nikola Dragojlovic Asbjørn L. Johansen CV Rao

**Don Galbraith - Front Gate** 

Jim Moffitt - Skid Pad Neil Bear Raymond Stanley Mike Buskmiller

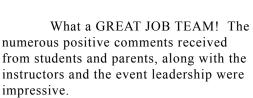
Valerie Baker - Concierge Blake LaGrone

Sarah Nowak – Registration Linda Sykes Nancy Cameron Kathy Lee Lisa Jones Gay Eberly









You guys rocked from setting up registration and the exercises, maintaining the courses, allowing the students to capitalize on run repetitions to maximize their learning curve.



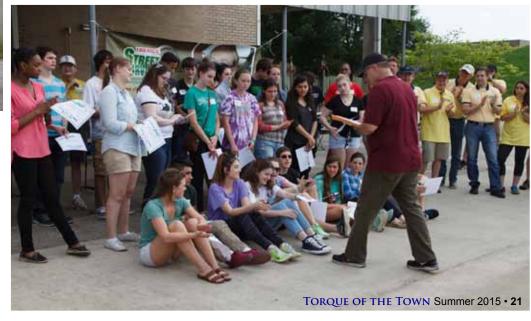
Your no excuse willingness to jump in and help no matter the call was key to the success of the school.

Thank you for coming out and ignoring the threat of inclement weather. Okay, did anyone get over four drops of rain on them? No matter, the day was cool with a nice breeze that everyone seemed to enjoy.

How can I say thanks enough? This event could not have run so well without you. Best, Jim Iden









#### Editor's Corner Jim Robinson

I'd like to offer a special thanks to **Blake LaGrone** for the decals shown above.

I've been in and out of Texas several times over the years. When I was a kid we lived in Orange and Liberty, Texas. Then when I was in the USAF my first duty station was Bergstrom AFB near Austin. While stationed there I learned to drink Tequila - a LOT of Tequila. We used to got to all the clubs over there and during those escapades I remember some of the musicians I saw were; Asleep at the Wheel, Steven Fromholtz, Jerry Jeff Walker - "The Man With The Big Hat Is Buying" and most notably Frank Zappa at Armadillo World Headquarters. I was there for the "Bongo Fury" album.

Since moving to Houston about five years ago, in addition to the Houston Auto Shows and Houston Grand Prix, I saw Dweezel Zappa at The House of Blues, it was great to hear him play his father's music.

My point is that I'm wondering if all this activity qualifies me for being a Born Again Texan? I have to say I was a little peeved when I crossed the state line from Louisiana that I wasn't provide with a pair of boots with spurs. But then I heard someone say; "Don't call him a cowboy until you've seen him ride."

Well now that might be a problem because there never was a horse or mule that didn't bump me off. I guess it's true what they say about them being able to smell fear.

Another blight on my record is; I think it was M-m-Mel T-t-t-Tillis that sang the song "Coca-Cola Cowboy". You reckon somebody could write a song about a Vodka Cowboy?

Anyway, somebody tell me where I stand on this.

Anyway, I'd like to thank everyone that contributed to this issue. It's your pictures and text that make this publication what it is. I'm just the guy that clicks and drags and shoehorns everything together. Each quarterly edition I start with a clean slate and as the stories you write and the terrific pictures you send makes the task of editing The Torque Of The Town a real joy.

Once again, I invite all club members to submit material whether it's pictures of your car(s), emails or comments about your experieces with our chapter. If any of you take off on your own adventure to scenic places or maybe you just have a picture of your car in a unique spot; send it in and share it with other members.

Also, if you have ideas about places you frequent, you might ask them about advertising in our newsletter.

Speaking of advertising, I want to take a moment to thank our advertisers for their support. If you'd like to update your ad send me an email and I'll get on it. I try to make it around to see as many of you as possible to provide fresh opies. But if I've missed you please let me know and I'll add you to my route.

And now for something completely different: (from Monty Python) I've been pondering lately about when the first images of the M1 homage came out. I think we all had supercar fever more so than we do now because of the plethora of supercar offerings these days. The McLaren F1 was still at the top of the heep and I was dazzled by the idea of an 8 series with a V12 mounted aft. Just looking at those pictures tended to make you think of being pressed back into the seat accellerating past 200mph.

Well, I know a little about Photo-Shop and with BMW making M versions of just about their whole line up, I thought I'd do my own design study. Obviously I'm no automotive engineer. But as a motto I submit: Why dream when you can hallucinate! So, I began to meditate with copious amounts of medicinal meneral spirits and I came up with a couple of images to express my thoughts on the subject.

Now, what did I do with that tankard of **Stolichnaya**?







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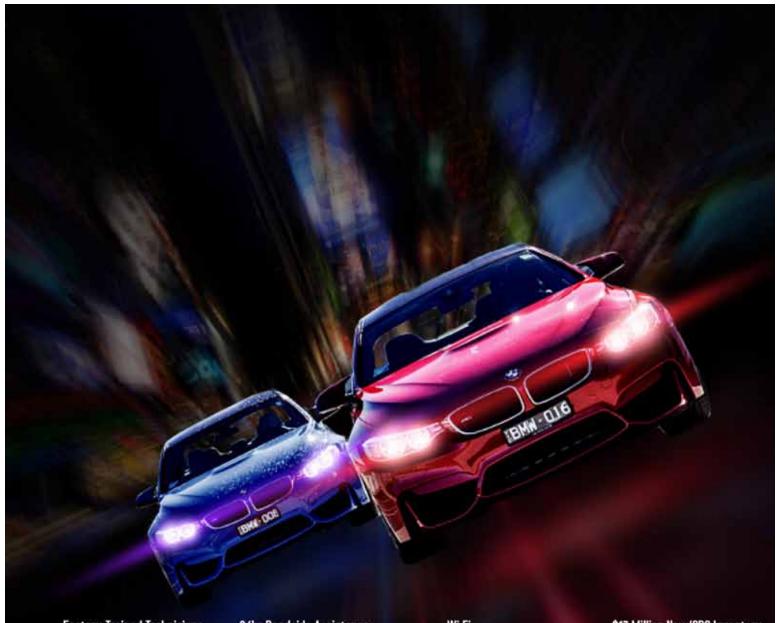
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