

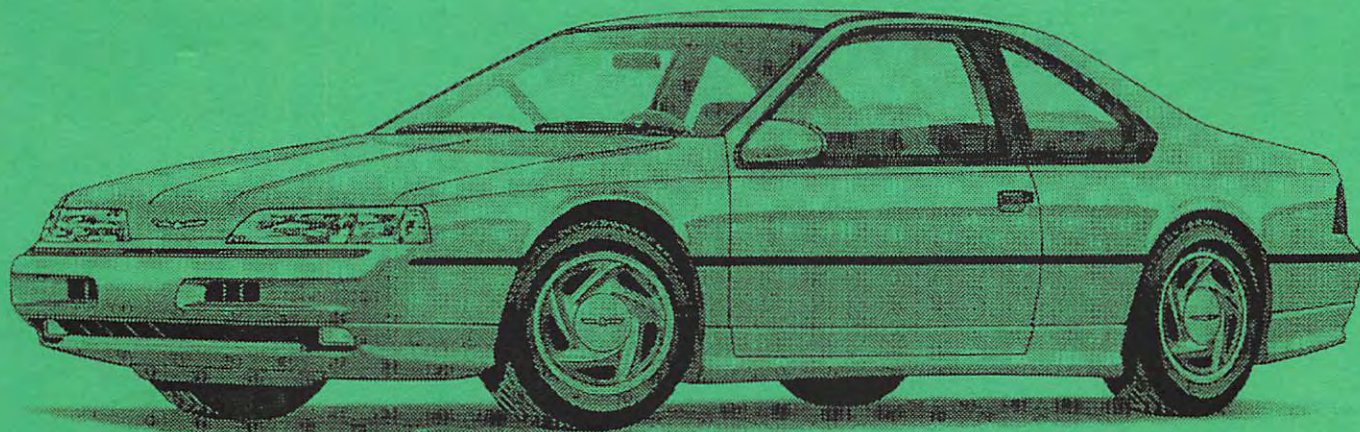
# CHARGIN' THUNDER

VOLUME III

DECEMBER 1998

## THE OFFICIAL NEWSLETTER OF THE SUPER COUPE CLUB OF AMERICA

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*Dedicated to the Preservation and Performance  
of the Thunderbird Super Coupe  
1989 - 1995*

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*President*

**Bill Evanoff**  
*Editor*

*Super Coupe Club of America  
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## FROM SCCOA "GROUND-ZERO" - By Bill Hull

Here it is, almost Christmas time with the New Year just around the corner! I am sitting in the "eye of the storm", with enough time to write just a page or two as introduction to our "new" Chargin' Thunder format, complete with our new editor.

1998 has been a banner year for the SCCoA! The volume of parts sales has been over 4 times what it was in 1997, causing numerous delays, both in delivery to me & in deliveries to Club members. New members still join at the rate of one per day! The total number of people who have joined the SCCoA since it's inception in March 1996 is approaching 900 - with the current membership list close to 600! I receive an average of 40 phone calls per day, plus numerous e-mails, fax's, & letters - much more than one person can handle. I am continuously behind & do not have an easy solution. Even if I hired a full-time secretary to help me with the phone, most people would ask to speak to me personally anyway. Finding a person who is knowledgeable enough about our beloved SC's to be of any assistance would be impossible - even to help me package & ship parts (a big part of my day). I have been told, & I tend to agree, that the SCCoA is too small to be BIG, yet too big to remain SMALL! I have already outgrown my basement, but do not have time to even begin to move into larger quarters. I began renting a storage unit over one year ago, in order to store some of the larger items we stock (wheels, etc.), but still need more room. Suggestions?

To the (partial) rescue comes Sir William Evanoff, a Knight riding in a bright-red Super Coupe! Bill has agreed to edit Chargin' Thunder, removing one duty from my crowded schedule. Thank you, Sir William!

We are beginning to feature member SC's in each issue of C.T. - all of you who wish to see YOUR baby included in Your Club newsletter, type up a page or two about your SC, any mods you have made, include a picture, & it will become part of Super Coupe history!

In closing, for all of you who have had to wait for parts deliveries, have wondered about your issues of Chargin' Thunder, have not had your phone calls returned promptly, I sincerely apologize. Hopefully, I will be better able to keep up with business, as this Club just continues to get bigger & better!

Bill Hull, President  
SCCoA

Tel: 804-974-6659, fax: 804-974-9965



Bill Evanoff

# *From The Birds Nest*

**H**ello Everyone,  
You're wondering, "Where the heck  
is Bill Hull, and who is this other  
Bill?"

Bill Hull has finally acknowledged that he cannot run this club all by himself. There are now too many members, and the club has become too successful for just one individual to handle. He ALONE cannot answer the phone that rings off the hook all day (AND NIGHT) long, he ALONE cannot answer the volumes of e-mail he receives every week, he ALONE cannot perform and oversee R&D on new products, nor purchase, pack, and ship for customers the numerous SCCoA parts, and he ALONE cannot be 100% responsible for publishing a full blown Chargin' Thunder magazine every two to three months. If you think that is a run-on sentence, that is exactly what Bill Hull has felt like every day the past year. **Run-on, run-over, run-around and run-down!**

Hull called me recently, and the first thing he asked was "Bill, would you take over the Chargin' Thunder magazine?" I had offered to do just that several times over the past year but was always turned down because he felt he could do it all. It must have been a weak day for him because he was finally ready to turn loose of one of his previously favorite things to work on. He used to relish sitting down at his word processor and crank out pages of SC technical information along with facetious comments about Bill Clinton, Monica, Jamie Turvie, Bubba Ledbetter, Rufus & Dufus, and a host of other half-baked characters that made the

CT magazines fun and interesting. But in the past year, he actually said, "I have nothing more to say". Which is a remarkable comment from him, as he **ALWAYS** has had something to say about everything. It is for this reason that the CT issues have been so slow in coming in '98.

The SCCoA performance parts aspect of the club will remain Hull's full time job. He will remain as President of the SCCoA also. Neither he nor I see anyone else stepping forward to perform this duty. I have volunteered to become the editor of the CT magazine and the SCCoA web site is also under new direction. Ron DiPaola of Endicott, NY was shanghaied (whoops, I mean he willingly volunteered) to completely revamp the admittedly stagnant old site. I will also be helping Ron with his duties as the primary SCCoA webmaster. For all our membership, I encourage you to visit the new site at its same old address of <http://www.scco.com>.

I have contributed articles during the past three years several times to the Chargin' Thunder magazine but this is my first FULL magazine as Editor. I wish to say a few things about the direction of the SCCoA, past Chargin' Thunder magazines, and where I would like to see the Chargin' Thunder magazines and the SCCoA web site go in the future.

## SCCoA Direction:



First, I want to discuss the future direction of the SCCoA. This club now has now been blessed with over 550 current members. The total actual member numbers that are outstanding though is over 865. This means that there are some people who join for a period of time, then do not rejoin for the next year. This is certainly understandable as some SC owners sell their cars, others have accidents or total their cars, some loose interest and some

are dissatisfied with the club. The first two reasons, we cannot control, but the last two we can have an effect upon by offering every member reasons to STAY in the club year after year. I would not rejoin myself if there were not a good reason to do so. So we will strive to better serve the needs of the members by giving them what they cannot find elsewhere. That is, the most accurate, dependable, and reliable information about SCs, and what it will take to keep your car in its best running stock or modified condition. There is NO reason why this club should not continue to grow and flourish despite the fact that there is also now another fine club for '89 + Thunderbird and Cougar owners. I feel we have the most to offer a Super Coupe owner because we are focused upon one specific vehicle and also are a "one stop shopping" type of club for those who also wish to modify their cars with SCCoA aftermarket performance parts. The club also offers those simply wishing to maintain their cars, numerous high quality replacement parts that exceed the performance capabilities of the OEM Ford parts.

### **SCCoA Chapters:**

A major issue, that I'm sure many SCCoA members West of the Mississippi have felt, is the lack of club activities in their area. For

the past few years, all club events have been primarily in the Midwest and the East Coast. Involvement in these activities has either meant a plane trip or a three-day drive. Obviously, no one has done either to come to Carlisle PA, Columbus OH, Rockingham NC, or Bowling Green KY from the west coast. The club has taken the first steps toward forming a network of regional SCCoA chapters. There must be more opportunities for members everywhere to get together with each other locally. Below, there is a list of the new regional chapters that are now forming. I would encourage those members that live within the states mentioned to contact the chapter organizer and let them know you wish to be signed up as a local club member. I want to point out that **ALL THE REGIONAL CHAPTERS WILL NOT HAVE ANY DUES, WHAT-SO-EVER!** If you're interested in starting a chapter in your area, contact Bill Hull or myself.

Until recently there were only two active SCCoA chapters: The Midwest and Ontario chapters. The Midwest SCCoA serves members in Ohio, Michigan, Kentucky, and Indiana.

The SC Club of Ontario serves members residing in/around the province of Ontario, Canada.

### **Here is a list of *NEW* SCCoA Chapters and the contact information:**

**Gateway Super Coupe Club**      Kurt Krietz      314-846-2402 (H)      gateway\_sc@hotmail.com  
314-553-4559 (W)

Serving members living in/near Missouri and Central/Southern Illinois

**Northwest Super Coupe Club**      Tim Mendoza      425-353-0405 x 234 (W)      tdm@giddens.com  
425-335-3668 (H)

Serving members living in/near Washington State, Oregon, and British Columbia

**Super Coupe Club of the South**      Brad Klein      941-364-9398 (4 - 10 p.m.)      tbirdsc@home.com  
Serving members living in/near Florida, Georgia, Alabama, and Mississippi

**SC Club of Central New York**      Ron DiPaola      607-748-0581(6-10 p.m.)      dipaola@us.ibm.com  
Serving members living in/near central New York State

<b>SC Club of the Carolinas</b> Serving members living in/near North and South Carolina	Dick Adams	252-537-8300	djadams@3rddoor.com
<b>Super Coupe Club of Wisconsin</b> Serving members living in/near Wisconsin and Northern Illinois	Joe Baldazzi	608-862-1596	sbalz@tds.net
<b>SC Club of Northern California</b>	Eddie Espitia Rob Whitt	E-mail only available E-mail only avail.	eddie5178@aol.com ctx15@aol.com
<b>SC Club of Southern California</b>	Tony Carraway Anthony Rufo	E-mail only avail. E-mail only avail.	tcgolden@dreamsoft.com Aruf@proamics.com
<b>Super Coupe Club of Iowa</b>	Brock Banks	712-568-3074 (H) 1-800-846-4510 x 24392 (W)	banbro@heartlandtel.com
<b>SC Club of New England</b>  Serving members living in/near MA, RI, CT, ME, VT, & NH	Steve Darosa Greg Koester Brian Oatway	E-mail only avail. 781-273-2044 E-mail only avail.	testament@webtv.net gkoester@baynetworks.com briano@bvheng.com
<b>Mid Atlantic Super Coupe club</b> Serving members living in/near southeast PA, MD, southeast NJ, & DE	Pat DiPersa	610-358-8453	pat@techie.com
<b>SC Club of Greater New York</b>  Serving members living in NY, NJ, CT	Chris Yaegel Dennis ?	E-mail only avail. E-mail only avail.	cyaegel@corp.ltd.net kwiksc@aol.com

I realize that to many of you an E-mail address means nothing, as you may not have a computer. I fully plan to get additional contact information from the chapter coordinators shown here for the next issue.

**If you're interested in starting a SCCoA chapter in your area, contact Bill Hull @ 804-974-6659 or myself @ 513-697-6501 (e-mail: xs\_tork@usa.net)**

### **Existing SCCoA Chapters:**

<b>Super Coupe Club of Ontario</b> Serving members living in/near Ontario Canada	Wayne Ing	416-571-2823	sccoo@shaw.wave.ca
<b>Midwest Super Coupe Club</b> Serving members living in/near Ohio, Michigan, Kentucky, and Indiana	Bill Evanoff	513-697-6501 (6-9 p.m.)	xs_tork@usa.net

The events for these SCCoA chapters will be announced and covered within the CT magazine and also on the SCCoA web site under the "Chapters" and "Events" sections. Because printing color pictures within the CT magazine is very expensive, I would again encourage everyone to visit the web site for viewing the tremendous amount of great SC pictures available there. If you do not have a home computer, try viewing the site at work (at lunch of course) or even going to your local library where most now have free World Wide Web access terminals.

### **CT Past Issues:**

Secondly, I wish to discuss a past issue of CT. The June '98 issue contained several reprints of past automotive press articles about pure stock and slightly modified Supercoupes. On the old SCCoA web site BBS and other BBS pages, this issue was panned by a few members for its lack of information. To some knowledgeable individuals that may have been the case, but the issue was specifically made to help answer the tremendous volume of questions that Bill Hull was receiving at that time specifically targeted at the specifications and performance capabilities of what a "as new" SC should perform at. I would like to remind everyone that as the price of good used SCs drop, more and more young buyers will be purchasing them from their first or second owners. These young SC enthusiasts may have been only ten or twelve years old when these cars were first introduced in 1989. They were more interested in Mattel's Hot Wheels cars at that time than the Thunderbirds and Cougars being produced by Ford Motor Company. Now that these younger buyers own these cars they are searching for these articles and I know most appreciated them being reproduced in the June CT. If you didn't like the issue, that's unfortunate, but try to understand who may have found it invaluable.

### **Web Site and CT Contents:**

I have already explained why the Chargin' Thunder magazines have been so slow in coming this year. Bill Hulls lack of anything more to say is certainly justifiable. In the past few years he has covered, in detail, most all aspects of a Super Coupe. There has been articles about engines, suspensions, transmissions, rear ends, electronics, and of course, the many "bolt on" aftermarket items available for the SC. I ask you, "how much more is there to report on"?

Now I'm not about to suggest that these topics have been covered so thoroughly and in-depth that there is no more to be reported or learned, because that is not the case. But, this magazine has offered its readers a very compressive overview, or "executive summary" as its often referred to in business, of all these subjects. I remind you that the CT staff (or rather its LACK of staff) dictates that we hit a subject hard and fast with the most important details given to the readership and that's all we have time for. We all have other jobs, other interests and family to occupy our time as well.

What's my point for these comments? I'm bringing them forward for several reasons. First, since there really is not much more to be reported regarding technical information about these cars, the obvious questions you may have are:

**"Should the CT magazine continue at all"? &  
"If it continues, what will we report on"?**

### **Continue??**

This club magazine can certainly be discontinued and the SCCoA dues dropped to practically \$10 per year. Hull has stated many times previously that the \$40 membership dues barely cover the printing, material (paper/envelopes/stickers/etc.), and mailing costs of producing this magazine. IT IS NOT A PROFIT CENTER FOR HIM! Therefore, it would not break his heart if it were discontinued. Since the dues could be substantially dropped, this may attract more to join the club and increase membership. But why would new members join if they receive nothing for joining? Possibly a strong regional chapter may entice them into joining and that is exactly why we are stressing the growth of our chapters! Also, the chapters may decide to create their own magazines catering to their local interests

and events. But this would necessitate that the local chapters then begin charging membership dues, which may reduce membership.

### **Carry On - How??**

As you can likely already tell, I am almost as full of hot air and sarcasm as Hull was. I have YET to run out of things to say, therefore I have many different ideas of what future Chargin' Thunders will offer.

Once you get through looking at this issue, you will realize that although the cars have now been out of production for over three years, there are still new aftermarket parts coming out for them. Owners continue to find many unique and creative ways to modify their cars that were unheard of only a short time ago.

This is where I see the Chargin' Thunder magazine heading in the future. It will cover the new parts still coming out of the aftermarket, cover readers' cars in detail and hopefully include some pictures of them. As the SCCoA chapters gain membership and begin having local events, they will have much to report regarding their activities. Also, as these cars get older and begin wearing out, we must find the best and most inexpensive ways to keep them running in top form. The SC was quite technologically advanced in 1989 and included some very expensive items that will eventually need repair. They include the ABS system, the ride control system, the independent rear suspension and a host of other systems that will need accurate trouble-shooting information. The CT will be your best source of information for keeping your car running as inexpensively as possible!

It's a sorry state of affairs across the country that most Ford dealerships don't even know how to pop the hood on a SC let alone how to diagnose and repair the ABS system. The SCCoA web site has taken the first steps toward developing a

"Qualified SC Mechanics" list. There is a state by state list with members' recommendations of mechanics that have repaired their cars successfully and properly. This list will be an asset to the club as time goes on. I encourage members to add to this list by sending an

E-mail to "scguys@usa.net" or mail a note to Bill Hull at his home address with the shops name, address, city, state and contact name and number of the mechanic you wish to recommend.

### **YOU DECIDE!**

As you can see, I would have no problem carrying on the CT magazine with new and interesting subjects **FOUR TIMES A YEAR.**

Doing six issues is simply too many and too much work. Also, don't expect any repeats of articles that were included in previous issues. If you missed any issues, I suggest you buy them, because they are full of valuable information.

***If you want this magazine to continue...let Bill Hull know.***

***If you wish to have it stopped and dues reduced, then let Bill Hull know.***

**Contact him at 804-974-6659 or write him at 2239 Banbury Street, Charlottesville, VA 22901**

I'll give the results in a few months time let the club know the results. Also, if you wish to respond to this question on the SCCoA BBS, please do so. We are starting a new year and now is the time for renewal of membership dues. If you want them reduced and the CT magazine eliminated please say so.

# ***What's New?***

**M**uch has been happening in the aftermarket regarding Super Coupe parts. Here are a few of the important items of interest to SCCoA members.

## **Ripper Shifter Coming!**

Good News for you 5-speed owners who love bangin' shifts all day long! SCCoA member, Scott Shockley, is now working for B&M Racing. Scott is fortunate to own two five-speed Super Coupes and wasted no time in convincing his employer to produce a "Ripper" style shifter for the Mazda M5R2 transmission in our cars. He was so enthusiastic about this item that he even brought up the idea during his job interview! Scott reports that this shifter will be available sometime during the late part of the first quarter of '99. It will be priced similar to the Mustang "Ripper" shifter and will be a fairly easy bolt in. Scott has had prototypes in each of his cars and says the difference is night vs. day! Look for an install and driving impression report in a future issue of CT.

## **'99 Cobra Rear End:**

The 1999 Mustang Cobra is finally getting the much-anticipated independent rear suspension that has been talked about for several years. The good news for Super Coupe owners is that it will be utilizing the SAME all aluminum center gear housing as was used on the Lincoln Mark VIII from '93 to '98. This unit is a bolt in for an SC. It weighs approx. twenty pounds less than the factory cast iron housing. What's nice about the '99 Cobra unit though is it will have a factory traction-lok which the Mark VIII never had due to its electronic "traction

assist". The Cobra will supposedly have 3.27:1 ratio gears that will be a perfect bolt in for manual transmission cars. Also, SVO is said to be offering the Cobra rear housing through its catalog with 3.73:1 ratio gears which is what the automatic cars need.

A potential weak point for those growing numbers of extremely fast SCs out there has always been the stock rear end. With the Cobra getting this housing, it will surely create interest in aftermarket parts that will strengthen this housing. Perhaps 31-tooth spline half-shafts that would be adaptable to the SC may be offered.

## **"S" Model Superchargers:**

Bill Hull reported awhile back that the "S" model Magnuson Products supercharger was not going to be available for long. That is STILL the case, but Eaton has found a few remaining late model inlet plenums to continue production for awhile longer. The superchargers themselves will continue to be available, but Eaton has ceased production of the plenums. If you want a "S" model, Hull suggests you buy one ASAP as the last of the plenums are now being used at Magnuson.

## **Cast Raised/Enlarged Supercharger Tops:**

The SCCoA is now offering a brand new sand-cast raised/enlarged supercharger top that requires no welding. Although tooling costs were expensive, the purchase price will remain at \$450. The labor savings that Bill Hull was putting into the welded tops will slowly recoup the tooling costs. The tops are all 3/4" raised and are identical to the stealth tops that were sold previously but the finish inside and out is much improved over the spacer welded tops that the club has been selling for the past few years. The "Beware of massive hole...your foot or hand may get caught inside" warning is STILL APPLICABLE. The opening on these new tops offers twice the flow area of a stock supercharger top!



### **Fiberglass Hoods:**

It has been reported on the SCCoA web site that a fiberglass hood manufacturer is seriously investigating producing a look-alike of the 1995 Cobra R hood for early and late model Thunderbirds. Prototypes will supposedly be ready by March of '99 and production parts available shortly after that. As more information about these hoods becomes available we'll let you know.

### **Edelbrock 70mm Throttle Body:**

Edelbrock finally came out with the 70mm throttle body that has the correct linkage for a SC at the November SEMA show. Unfortunately, their expected pricing is even higher than what the SCCoA sells it's "modified" unit for. As a true bolt on though, this piece is sorely needed by anyone wanting to make some serious HP.

### **Pro-M MAFS:**

Although not a new product, the SCCoA has changed its mind regarding the merits of Pro-M products. Coy Miller has found that while running his highly tuned engines on the dyno that the Pro-M 77mm air meters are better able to control the air/fuel ratio at high rpm than the C&L meters which were recommended for all applications. This is of-course not saying anything bad about the C&L's ability to perform perfectly for all but the highest output 3.8L SC engines. If you are considering building your engine to horsepower levels over 350 or simply want the "best" SC meter we know of, then the more expensive Pro-M is recommended. Anything less, the C&L will work wonderfully. The 75mm Bullet sold by Pro-M is also an excellent meter.

### **SCCoA Web Site:**

As I have mentioned in the Birds Nest section of this magazine, the SCCoA web site has been dramatically upgraded and many new features have been added. The new site went live on November 17<sup>th</sup>,

1998 and within one month received nearly 11,000 hits. Ron DiPaola deserves our thanks for his efforts as the head SCCoA computer jock.

The favorite aspect of the site seems to be the active question and answer BBS. Within the first month there were over 1200 postings on the BBS. If you're considering making changes to your car or need assistance in any way, this is a great place to get it. Bill Hull continues to get numerous calls from SC owners asking the craziest questions. He repeatedly gets questions like, "My car is making a chunka chunka noise. What is that and how do I fix it"? His answer is always...."I'm not a mechanic, and I can't diagnose your car over the phone"! People, the SCCoA BBS is the place to ask these types of questions! This BBS is dedicated to SC questions and one does not have to sort through literally hundreds of other inapplicable non-SC postings like other Thunderbird BBS boards also available on the web. There are many knowledgeable people who monitor the board and volunteer answers freely. Its very likely you will get your questions answered and your problems solved by utilizing the SCCoA BBS.

The new site also has a Members Cars section that features, well...you guessed it...members cars. Numerous pictures of their car are available for viewing along with a detailed description of the modifications made. Drag strip times are available for the cars if they have been run and also some personal information about each member is given so you may contact them if you wish to e-mail them. There is also a SC of the Month, which is a specially featured member's car with extra photos and a more detailed write up.

Coming soon will be a "Buy/Sell" section for cars and parts. This was a very popular section of the old web site, but due to some glitches, it is not working at this time. The site also has a very detailed SCCoA parts list with many pictures of the items for sale and also any SCCoA specials that may be available.

# **SCCoA Big Events for 1999**

The SCCoA will again be attending many shows next year. These are just two events that are early in the year and we have made a group hotel booking for members wishing to plan ahead. Look to future CT issues for additional shows in your area. Since the SCCoA Chapters are gaining strength, we plan to attend and advertise for many more "local" shows for members to attend than in the past.

## **Mobil 1 Ford Challenge:**

The Mobil One Ford Challenge has changed venues this year and will be held at Route 66 Raceway in Joliet, IL on May 13, 14, 15, & 16. For info. about this event you may contact World Racing Events @ 305-436-0996.

### **Hotel Info. for this event:**

The SCCoA has 26 rooms booked at the Days Inn for May 12, 13, 14, & 15

These rooms will be held until April 15<sup>TH</sup>, 1999. After that, we loose our lock.

The reservation NAME IS: "SCCoA"... YOU MUST MENTION THIS TO THEM

Call them @ 800-782-6752

DO NOT call the Days Inn national 800 number, as they are not aware of each hotels room booking agreements!

This hotel is an older Days Inn, but is undergoing renovation this winter...and the price is the lowest we could find!

The room rate is \$40 + tax per night for either one or two persons. Add \$6 for three or more persons in a room.

They are less than 10 minutes from Route 66 Raceway and located near exit 253 on Interstate 55. They are also one of the three "Host" Hotels for the Mobil 1 Ford Challenge.

## **Carlisle All-Ford Nationals**

The Carlisle event has proven to always be the biggest draw of SCs across the country. The last few years there has been over 30 SCs present at this event. In '99, the show will be June 4, 5, & 6. You are able to preregister for this event and save \$10. To do so, call Carlisle Productions @ 717-243-7855

### **Hotel Info. for this event:**

The SCCoA has 35 rooms booked at the Super 8 Motel for June 3, 4 & 5

These rooms will be held until May 4<sup>Th</sup> 1999. After that, we loose our lock.

The reservation NAME IS: "SCCoA"... YOU MUST MENTION THIS TO THEM

Call them @ 717-245-9898

DO NOT call the Super 8 national 800 number, as they are not aware of each hotels room booking agreements!

This hotel is nine years old, and will be undergoing a renovation program this winter.

The room rate is \$59.38 + tax per night.

They are less than 10 minutes from the Carlisle show grounds and are located at exit 13 off of Interstate 81. Their address is 100 Alexander Spring Rd., Carlisle PA

NOTE: As of 12/1/98, there were 27 of these rooms left.

## How To Put The "SUPER" Into Your *Super Coupe*!

By Micah Miller

I'm not gonna tell you how to build a 500+ HP Super Coupe that can scream down the quarter mile in the low 11's, but I am gonna tell you what performance modifications I have done to my SC. These improvements not only made the car faster, but more enjoyable to drive. So lets jump right in and begin with my pride and joy.

I have owned my '89 SC for almost 3 years now. It is titanium in color and is equipped with a 5-speed, grey cloth interior, and a couple dings on the body. On the date of purchase it had just turned over 60,000 miles and I was able to snag it from the owner for \$7500...that ain't too bad! So naturally I was impressed with the quality of ride, powerful engine, and all the other goodies that make us frown on the Mustangs, but after a while I reached that inevitable point where it was time to do some modifications and increase the performance. I was getting a little fed up with those darn Mustangs always being just a tad faster.

I have never run my SC (when it was stock) down the quarter or on a G-Tech (1/4 mile calculation device) so I cannot tell you exactly how fast it was, but I can make the very safe assumption that I was pulling anywhere from a 15.8 to a 16.0 in the 1/4 mile and a 7.0 to a 7.2 in the 0-60. This isn't bad at all, but I was looking to make those times drop a little bit more. So lets start the list of mods and the improvements in the order that they were done.

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**\* Custom Exhaust** -> This was the first place I started. I did not purchase a kit because I was just looking to get rid of my plugged up catalytic converter...as a side effect I got bit by the performance bug and had the rest of it worked on. The exhaust work started where the cats are...or should I say, were. I had both cats and the resonator removed and then replaced with 2.5 inch pipe. The two pipes ran straight back to where the resonator was and then merged into a "Y". From there I kept the stock single 2.5 inch piece, that wraps around the gas tank, and had the rear of the exhaust replaced. Where the single 2.5 inch pipe exits, right behind the gas tank, there is another "Y" and two 2.5 inch pipes split off. These two pipes then run into two cheap (\$35 a piece) Turbo mufflers. The Turbo mufflers sit in the location where the stock ones did, are 14 inches long, and have the center/center inlet and outlet....they fit *GREAT*!

So I took the Bird out for a spin to see how much faster it was..."WOW"! I couldn't believe it. The car was just so much faster. The only problem was that there was a buzzing (rice rocket) sound at 2000-2500 rpms. This noise was the result of having straight pipe from the cats to the "Y" without having a resonator or any other muffler to soak up the noise. So I went back to the shop and had one 12 inch glass pack put in each side of the pipe in the mid section. This did the trick and kept me from having to pay for a resonator. The exhaust now had a nice throaty sound, the car moved faster, and boy was I happy. I also noticed that the boost gauge dropped a little. It used to max out at 12 psi under wide open throttle. It was now maxing out at 10psi and would slowly climb up to 11 psi under wide open throttle. The drop in boost did not negatively



affect performance though, it was just the side effect of having a less restrictive exhaust system. The total cost came to \$280 and as for the results...well this is what the G-Tech had to say. (I didn't include mph because it was never a reliable figure on this device)

- *1/4 mile*: 15.55                      - *0-60*: 6.93

\* **Filter and MAF**→ I ordered a K&N 9 inch cone filter and a C&L Vortech 73mm MAF from the SCCoA. These items cost about \$250 and made the car a little more responsive. Also, when I first installed these items I had no source of fresh air for the filter. Since the stock air box was no longer present the filter simply stuck out from the MAF. This meant that it was exposed to the engine compartment heat with no source of fresh air. Even though the filter was pulling in hot air, it still made a difference. The increase of air to the engine did not affect the boost gauge other than the fact that the gauge hit 11 psi much quicker. As for the times:

- *1/4 mile*: 15.43                      - *0-60*: 6.87

\* **SC top and Throttle Body**→ Next I ordered the 3/4 inch raised supercharger outlet and the BBK 70mm throttle body from the SCCoA for \$650. The stock supercharger outlet has a really vicious bottle neck where temperatures can be superheated thus allowing less air to be crammed into the motor which equals less HP! The raised top features a neck which has been built to be over twice as big as the stock neck. This really helps decrease temperatures thus making cooler, denser air which helps increase HP. The combination of the wider opening and the raise to the top showed up as an increase in boost. The boost gauge now maxed out at 12 psi and slowly climbed to 13 psi under wide open throttle. The times sure show it too.

- *1/4 mile*: 15.22                      - *0-60*: 6.73

I did install the BBK throttle body at the same time, but I attribute all of the performance gain to the raised top since I wasn't making enough HP for the stock throttle body to be of any restriction. The BBK throttle body looks great, though, and will definitely help out when the HP levels get higher.

\* **Underdrive pulleys**→ I was interested in a set of underdrive pulleys because it is an excellent way to increase HP without making the engine work harder. It is hard to comprehend exactly how they work, but I have an easy explanation that all can understand. Think of how much slower your car runs when you have the AC on. Now imagine how much better it would run if you could turn off the AC three times to get that increase in power. The gains are not as easy to feel as they are to see. The car may not feel that much faster, but if you run it down the quarter mile you will definitely see a considerable drop in time. When I was looking for a set, ASP was back ordered for a month or so and I didn't want to wait, so I got mine used for \$100. The price of them new is under \$200, though, so it still isn't that bad of a price. Some disadvantages to slowing down the accessory speed is that since the alternator will now turn slower it will also not charge as well. Some people have seen the headlights and/or dash lights dim slightly when coming to a dead stop. I do not experience any charging problems with the slower accessory speed, but I also don't have an 800+watt stereo system. Also, the water pump will turn slower and will not circulate coolant as quickly which can make the car run warmer. My car does run a tad hotter with the slower turning water pump, but it does not run dangerously hot. A cooler thermostat will easily take care of this problem. As for the times:

- *1/4 mile*: 15.01                      - *0-60*: 6.60

\* **Overdrive pulley**→ At this time I had close to 90,000 miles on my SC and was regularly keeping an eye on the supercharger because it had developed a bit of a leak behind the pulley. It was not a bad leak, but I didn't think it would be wise to install an overdrive pulley which would spin the supercharger faster and cause worse damage to the seal. I did eventually look for a solution to this problem...it wasn't getting any better. I always told myself that when this blower goes out I was gonna purchase an "S" model blower (the upgraded version of ours). This "S" model is worth an additional 20-30 HP due to it's high flow design, increased efficiency, and a host of other tweaks...but it goes for over \$1500! I obviously wasn't ready to spend that kind of money so I found another solution. I eventually bought a rebuilt nose drive and an SVO pulley (5%) from Magnuson Products for \$460 (the pulley was only \$60). It was easy to replace the front of the supercharger, I had spent less money than I thought I would, and I now felt safe with an overdrive pulley, but I didn't want to spin the supercharger too fast so I stuck with the 5% pulley and not the more popular 10%. The pulley was good for about a 1 to 1.5 psi gain. The boost gauge was now maxing out at 14 psi and on real cold nights I could bury it at 15 psi. As for the gains:

-1/4 mile: 14.91

- 0-60: sorry, didn't do one

\* **Gears and Drag Radials**→ I now felt that it was time to put some snap into the ole' SC. Our editor was nice enough to have this 3.27 rear end (out of an auto SC) laying around and well, I just had to have it. I had put off a gear upgrade for a while because a few of my friends had bad experiences. Don't get me wrong, their cars were faster, but the rear end now had a horrible whine whenever it was spinning. I don't know if it was a bad installation, poor choice of gears, or just fate, but I definitely did not want my Bird to sound like that. So I figured that if I just bought the whole rear end with the gears already factory installed I would not have to worry about this. Hey, there's more than one way to rope a goat! So before I had the gears installed I came to the revelation that I wouldn't be able to obtain faster 1/4 mile times if the car couldn't get traction anymore. I know, I know...it's cool to spin your tires through 3 gears, but it doesn't make you any faster. So I ordered a set of BF Goodrich Comp T/A drag radials. I liked them because they were not as soft as most drag radials, which means they will last longer, and also because I was able to get a pair of 255 50's for just under \$300. So I got the tires put on and promptly put them to the test. "WOW"! The car really hooked up now. When speed shifting to 2<sup>nd</sup> gear I couldn't get the tires to break loose. This was gonna be my winning ticket to traction.

Well, the next day I had a local shop put the differential in. The gear swap turned out great. The gear ratios are shorter, but not too terribly. In my opinion, it is more fun to drive the car now. It really revs out faster. So I put the tires to the test and laid into the throttle. I was pleasantly surprised. Even with the quicker gears the tires were holding. I still couldn't break the tires loose while shifting to 2<sup>nd</sup> gear. I was now able to really feel the improvement that the gears made. Are you ready for the time drop....

- 1/4 mile: 14.43

- 0-60 time: 6.01

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So this is the last run I have made. If I tried a few more times I'm sure I could get the 0-60 times in the 5's and also bring the 1/4 mile down to the 14.3's. With this documented information you all can see which modification made the most difference. It is so hard to always trust an advertisement's claim when it comes to added HP and torque and sometimes the most expensive things don't offer the biggest gains. I hope that this information can benefit some of you out there who own Super Coupes and are starting to explore the aftermarket. And remember that the exhaust is always the first place to start when modifying your car. Most other modifications will work better when this area is first addressed. Additionally I want you all to keep a few things in mind. First, even though these times were taken on a G-Tech and not at a strip they do accurately document the improvements that each modification has made. Secondly these times were taken on a street and not a drag strip. A strip would offer **MUCH** better traction and probably cause all of these times to drop even more. There are also various other tricks that can be done to make the car faster:

- \* Raise the pressure in the front tires to 40+ pounds to make them skinnier. This should slightly lower your coefficient of drag and make it easier to cut through the air. If you lower the pressure in the rear tires to about 18 pounds they will become fatter and offer a little better traction. (This will be of more benefit to those who have drag radials.)
- \* Place bags of ice all over the intercooler, piping, and supercharger. This will chill the air and has been known to knock off .1 or more in the 1/4 mile. Be careful to keep water off of the electronics though.
- \* Only reserve a few gallons of gas in the tank to ditch further weight. Gas weighs about 7 lbs per gallon so it can add up.
- \* There are also other ways to ditch weight like removing the jack and spare tire from the trunk, removing any sub boxes, and some people have even been known to remove the back seats (not as hard as it sounds). Anything that will make you lighter can only help.

If I do all of these tricks to my car, am able to get excellent traction, and am blessed with a nice cool day to make my run I believe I will be able to pull a VERY low 14 and quite possibly break into the 13's on a drag strip. That is always nice for bragging rights. So as you can see, you don't have to do major internal work, invest in expensive heads and cam packages, or even use nitrous oxide to get impressive numbers. The key is to utilize the power you have through improved traction and efficiency. I estimate these gains to be worth an additional 60-65 HP at the flywheel and I have only begun with a handful of bolt-on's...these engines have got real potential! Good luck to all!



# **Flamed '95 SC**

By Brad Klein

**I**'m the proud owner of a 1995 Thunderbird Super Coupe. I bought the car in completely stock condition during October of '95 with 19000 miles on it. The car has everything but the JBL sound system, keyless entry, and a sunroof. Within three months I had added a competition stereo system and was participating in car audio events. I did this for about a year but got bored with it.

In March of '98 it was time for something new. Work started to get slow, so I had free weekends to modify the car. With the help of my friend Bob Bennett, changes started with the removal of the door handles. We put trunk lid solenoids in each door, which are operated by a four-button alarm remote and one hidden button on the car just in case the others fail. The next thing to be addressed was the ugly stock radio antenna location. We removed the antenna and found a new spot in the driver's quarter panel and frenched it in at an angle so when its down you can't see it. The trunk lock and Ford oval were next for removal. The trunk now has an exterior opener in case the battery goes dead. It can be charged from the trunk through the stereo cables. The door guards were also removed to give the sides a smooth look.

A lot of thought went into the paint job. I wanted the car mostly black and wanted to use the new House Of Kolor, Kameleon Kolors but which one and how. I finally decided to go with flames and the Magenta to Gold color was the only logical choice. The car went into the spray booth and received three coats of Sikkens black, three coats of Sikkens clear and was wet sanded smooth. The flames were then drawn out, masked off, and five coats of the Kameleon Kolor were sprayed and the car was unmasked and four additional coats of Sikkens clear were sprayed over the entire car.

While the bodywork was nearing completion I ordered a new set of wheels. I went with TSW Hockenheim R's 17"x8" with 245x45x17 Nitto tires. The car also received a 1 1/2" drop by using Eibach springs, and handling was improved by adding a Addco rear sway bar. The interior was left mostly stock except for the eight-speaker 400 watt stereo. The system consists of Soundstream SPL 6.5 woofers in each door with the tweeters in each corner of the dash and two Clarion Pro Audio tweeters in the center, two Soundstream SPL 10's in a V shaped box with mirrors to look like there is more there. The system is powered by a Soundstream Reference 405 which receive its signal from an Alpine 7831 and a Clarion Pro Audio 920 EQ. The trunk floor was raised 3/8 of an inch to make room for two boxes. One for tools and one for the power distribution blocks. I can still fit the spare tire in. The interior also has aluminum inserts in the trunk and center console which has the EQ and gauges for the battery and amp temperature.

In the engine compartment I added the SCCoA fresh air intake with ram air and gutted the stock MAF. I also have the MN12 Performance downtubes and resonator with the Dynomax cat back system. I have also polished the 3.8L and the Supercharged lettering on the supercharger top and upper IC tube.

As for future plans I want to do a lot more to the engine for both performance and looks. I plan on getting a Bauman shift kit soon for the 4R70W transmission. I have taken the Supercoupe to many shows and have received a lot of positive feed. I have scored two first places, three seconds, one third, and a fourth that I am most proud of since there were over sixty cars in my class at that show.

I recently volunteered to become the organizer of a SCCoA chapter that I'm calling the Super Coupe Club of the South. If you live in Florida, Georgia, Alabama, or Mississippi and are interested in joining the SCCOS you may contact me at 941-364-9398 (between 4 - 10 p.m.) or e-mail at "tbirdsc@home.com". I live in Sarasota Florida.

# Eaton Boosts Engine Aspirations

**Supercharging is enjoying a comeback, for many good reasons. Here's why Eaton Corp. is adding plant capacity.**

■ by Don Sherman

**A**t first glance, the M20 hardly looks like a secret weapon. But this miniature supercharger — about the size of two packs of cigarettes — that's now being developed by Eaton Corp. may allow automakers to keep pistons and crankshafts in production a few more years, before the transportation world takes the leap to electric propulsion.

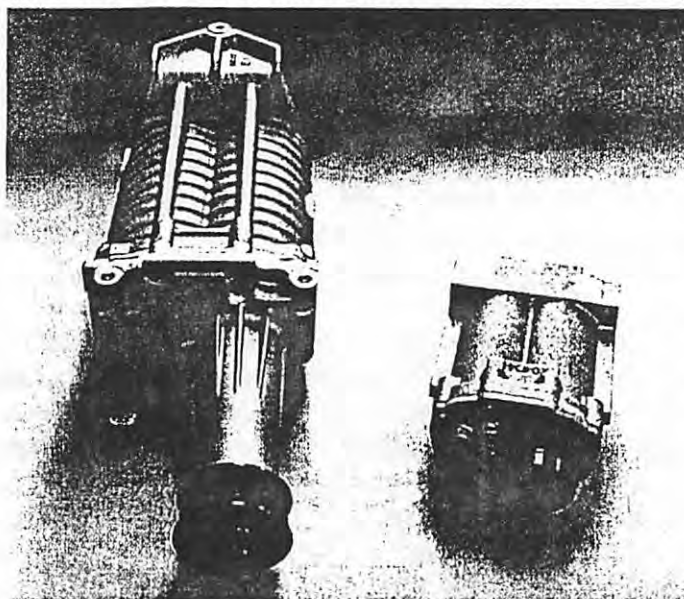
The M20 is aimed at the new wave of A-class, or "city" cars, with engines in the 600cc to 1.3L range, entering production in Europe and Japan. With help from the M20, these small engines can deliver the flexibility — particularly meaty mid-range torque — of much bigger powerplants. And with tall gearing, their efficiency gain can be skewed towards improved gas mileage.

As 1999 begins, the prospects for supercharging are excellent, and the M20 is just the latest side of the story. Last year GM sold over 100,000 Buicks, Oldsmobiles, and Pontiacs equipped with the supercharged 3.8L ohv V-6. Four import brands (see chart) are now offering supercharged

engines in low-volume, high-performance applications. And next spring Ford's SVT

century, adding a supercharger to boost engine output — whether in Grand Prix cars, military aircraft, or earthmovers — has been the most direct solution. And the variety of supercharged cars now on the

market seems to be continuing that history. Yet to sustain their popularity, superchargers are evolving in parallel with powertrain advancements. Reducing cost by molding all or part of the devices in plastic, and integrating the supercharger housing with the intake manifold and even



Eaton's supercharger range is tailored for all engine displacements. Miniature M20 (right), still in development, is dwarfed by M112 used on Jaguar V-8. M20 can move 20 cubic inches (340cc) of air per revolution, and is half the size of Eaton's smallest production blower.

the intercooler, are concepts Eaton is pursuing. So is downsizing the units, a la M20, to match the trend in engine displacements.

As the term suggests, the supercharged engine is simply force-fed with more air than it can naturally breathe during its intake stroke. Energy needed to drive the supercharger (actually an auxiliary air pump) is provided by the crankshaft. The resulting increase in air flow through the engine yields substantially more power.

Supercharging enjoys two key advantages over turbocharging, still used in roughly 20 car and truck lines. (Turbocharging taps the exhaust stream instead of the crankshaft for the energy needed to spin the air pump.) Unlike turbos, adding a supercharger doesn't disturb

skunkworks will produce a supercharged F-150 Lightning pickup truck for performance enthusiasts.

Eaton Corp., by far the industry's volume-producer of superchargers, expects demand to increase. The Cleveland, Ohio-based supplier is expanding its Athens, Ga., plant, raising its annual supercharger capacity from 210,000 units to 300,000 by spring '99.

As it has for most of this

## Supercharged Vehicles 1999

Model	Engine	Specific Power, hp/L	Specific Torque, lb-ft/L
Aston Martin DB7	3.2L I-6	103.4	111.5
Buick Regal, Park Avenue Ultra	3.8L V-6	63.3	73.9
Ford SVT F-150	5.4L V-8	64.8	83.3
Jaguar XJR	4.0L V-8	92.6	96.8
Mazda Millenia S	2.3L V-6	93.1	93.1
Mercedes SLK, CLK	2.3L I-4	80.6	87.1
Pontiac Grand Prix, Bonneville	3.8L V-6	63.3	73.9
Oldsmobile LSS	3.8L V-6	63.3	73.9

**SUPERCHARGING CHRONOLOGY**

*Engineers realized that force-feeding air to an engine improved power and efficiency well before the automobile was invented. That did not, however, avoid the following circuitous path to today's supercharger systems:*

**1860:** The Roots brothers of Connersville, Ind., receive a patent for an air blower consisting of two intermeshed, rotating lobes inside a sealed chamber.

**1885:** Gottlieb Daimler is issued the first (German) patent for an internal combustion engine with an auxiliary air pump.

**1902:** Louis Renault patents the centrifugal blower in France.

**1906:** Alfred Buechi, a Brown-Boveri engineer in Switzerland, combines an exhaust-driven turbine with a centrifugal blower to invent the turbocharger.

**1916:** French and German air forces use both supercharging and turbocharging.

**1921:** Gottlieb Daimler's son Paul initiates supercharged ("kompressor") car production as Mercedes' technical director. Mercedes scores first racing victory for a supercharged car.



1926 Mercedes model K touring car, with 6.2L power.

**1923:** Fiat scores the first Grand Prix win for a supercharged car.

**1924:** A supercharged Duesenberg Special wins the Indy 500.

**1930s:** A host of prestige makers in Europe and the U.S. add the distinctive supercharged appellation to their cars, including Alfa Romeo, Auburn, Bentley, Bugatti, Cord, Duesenberg, Graham, Mercedes, MG and Stutz. Mercedes and Auto-Union dominate Grand Prix racing with supercharged Silver Arrows.



1936 Mercedes W25 GP car — 475-hp from 4.75 liters.

**1937:** GM establishes Detroit Diesel division to produce two-stroke engines requiring a Roots-type blower for scavenging. Later, hot-rodders widely adapt these blowers for drag racing.

**1939-45:** Supercharging and turbocharging are standard practice for military aircraft engines aimed at high-altitude missions.



Curtiss P-40 fighter used 1,150-hp Allison V-12 with single-stage supercharger.

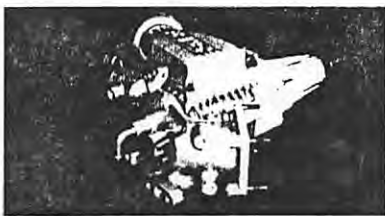
**1951:** GM Research Labs study supercharged car engines, and build LeSabre and SP300 dream cars with supercharged V-8s.

**1954:** Lacking a V-8, Kaiser in the U.S. supercharges its Manhattan inline six to 140 hp.

**1957:** Ford's Thunderbird and Studebaker's Golden Hawk offer superchargers supplied by Paxton Engineering.

**1977:** Eaton Corp. begins supercharger R&D in search of fuel savings.

**1989:** Ford switches the T-Bird from a turbocharged 4-cylinder to a supercharged V-6 with Eaton's assistance.



Ford 3.8L V-6 was first volume supercharger use since late '50s.

**1991:** Buick stays faithful to ohv V-6 power, but switches to supercharging and front-drive for its Park Avenue Ultra. Other GM car lines subsequently add the same Eaton-supercharged engine.

**1996-97:** Mercedes and Jaguar supercharge their 2.3L 4-cylinder SLK and 4.0L V-8 XJR, respectively.

**1999:** Ford adds Eaton blower to its 5.4L sohc V-8 to create F-150 Lightning pickup.

**2001:** Cadillac debuts supercharged sub-4.0L V-8 based on Northstar.

the exhaust side of the engine, so catalyst light-off time and other emission-related concerns aren't a problem. Also, the mechanical link between the crankshaft and the supercharger gives an immediate response when the driver nudges the throttle for passing.

Superchargers don't particularly care if their engine partner is a slow-turning pushrod design or a multi-valve screamer. All engines respond to a blower just as marathon runners and senior citizens alike thrive on pure oxygen. Superchargers are

**Superchargers don't particularly care if their engine partner is a slow-turning pushrod design or a multi-valve screamer.**

also highly tunable. By adjusting the crankshaft-to-supercharger drive ratio, OEMs can schedule air delivery low in the rpm range, for extra surge from a stoplight, or up-register for enhanced passing performance.

While turbodiesels are touted as the engines of the future, their nasty-smelling exhaust and tanking-up with the big rigs are still a tough sell to mainstream U.S. consumers. Most light-vehicle buyers prefer tried-and-true gasoline engines. Any underhood update must maintain the sacred balance between power, fuel efficiency, and initial cost. In this context, supercharging makes perfect sense.

Except for the Mazda Millennia S, which has to use an unusual, but highly-efficient Lysholm (screw type) supercharger to offset back pressure created by its Miller thermodynamic cycle, every current OEM has turned to Eaton for supercharger exper-



tise. According to Ken Streeter, Eaton's supercharger marketing manager, one reason why his company's Roots-type blowers (with twin counter-rotating impellers inside a sealed housing) are so attractive to OE makers is because they can be purchased like salami — in incremental sizes tailored for each application. The current product line includes four basic models comprised of two different rotor diameters and lengths; air delivery is 0.75L, 1.0L, 1.5L or 1.84L per revolution.

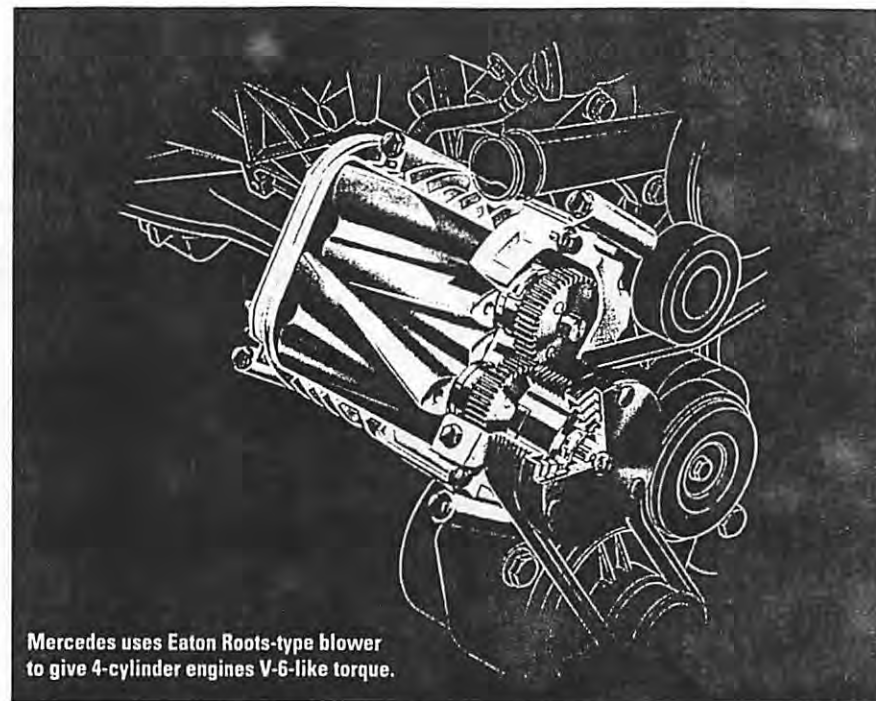
Streeter adds that input shaft housing lengths are selectable over a six-inch range for improved packaging in today's crowded engine compartments.

To date, the Eaton device has been applied to four, six and eight cylinders in both inline and Vee configurations. The Mercedes SLK, Jaguar XJR and Pontiac Bonneville SSEi illustrate three different approaches to supercharging.

The SLK assignment is sporting performance, with modest piston displacement and an automatic transmission. To deliver sprightly around-town acceleration, this powertrain is calibrated for maximum torque at minimum rpm. The torque "curve" is actually a straight line from 2,500 rpm to 4,800 rpm, thanks to a maximum 7 psi of supercharging and air-to-air intercooling. With 200 lb-ft of torque available throughout this broad range, the SLK accelerates to 60 mph in just over seven seconds. That's only half a second slower than a V-8, five-speed Mustang GT.

In contrast, Jaguar's XJR is a long-legged runner capable of stirring performance at all road speeds. The combination of 11.6 psi worth of supercharging and two massive air-to-water intercoolers delivers more torque by 1,600 rpm than the Jaguar XJ8's normally-aspirated 4.0L V-8 cranks out at its peak: 290 lb-ft at 4,250 rpm. At 3,600 rpm, the XJR pounds out a vigorous 387 lb-ft. This deep-breathing 32-valve dohc V-8 climbs willingly to a 370 horsepower peak at 6,150 rpm, where 82% of peak torque is still available. In fact, there's so much thrust at high engine speeds that an electronic governor kicks in at 155 mph.

The Bonneville SSEi, GM's most sporting supercharged model, offers V-8 perfor-



**Mercedes uses Eaton Roots-type blower to give 4-cylinder engines V-6-like torque.**

mance with six-cylinder fuel efficiency. There's also an order-of-magnitude difference in incremental cost to the consumer — an extra \$12,650 for the supercharged Jaguar versus a mere \$1,170 to add supercharging in the Bonneville SSEi. Baked into the Jaguar's cost is \$2,100 of gas-guzzler tax, a stigma not suffered by any of GM's supercharged models. Indeed, compared to investing millions to bring a state-of-the-art engine to market, adding a few hundred dollars of variable cost by supercharging an existing one is an attractive option.

Compared with supercharged engines offered by the imports, GM's Series II 3800 V-6 uses lower boost pressures and no intercooler, note GM Powertrain engineers Bill Owen and Robert Gardner. The GM engineers regard boost as a measure of inefficiency — GM uses 7.5 psi, only two-thirds as much as Jaguar. Boost is the pressure required, above atmospheric, to push the charge through the engine to make power. Less boost for a given amount of power means more efficient flow, because heat and parasitic losses both rise with boost pressure.

"You can make so much power in a supercharged two-valve engine that we don't believe the double-cost increment of four valves per cylinder is necessary," says

Gardner. "We anticipate that experimenting with flow patterns through the supercharger will yield even more power and performance, without any major changes in the 3800 V-6."

All of GM's supercharged models are front-wheel-drivers, so tight packaging is a necessity. Skipping an intercooler allows the Eaton blower to nestle low between the 3800 V-6's cylinder banks, yielding a cross-section barely larger than the normally-aspirated V-6. Gardner admits that while an intercooler (an air-to-air or air-to-water heat exchanger used to lower intake charge temperature) does add performance, it has a downside — potential leak points.

"We prefer to do without an intercooler to make the whole installation more robust," he says. However, GM is studying intercoolers for future installations. Owens and Gardner reveal that every new engine passing through GM Powertrain's launch center has a supercharged variant. Intercoolers might be employed to permit the engines to run on lower octane gasoline — allowing GM to drop the premium fuel requirement it now has in all of its supercharged cars.

Secret weapon? Maybe. Or simply a case of a good old idea being reinvented for the next century.

# Mandrel Tube Bending Machinery Basics

## PRINCIPLES OF TUBE BENDING

There are several methods of bending tube, pipe, or extruded shapes. However, the economic productivity of a bending facility depends not only on the selection of the most effective method but also on the use of proper tooling and proven techniques. Of course, the operator is a factor, but the right equipment and tooling minimize the degree of craftsmanship and expertise required.

Two principles apply to all three primary methods - compression (Fig. 1), press (Fig. 2), and rotary bending (Fig. 3). First, the material on the inside of the bend must compress. Second, the material on the outside of the bend must stretch (Fig. 4). A fourth method, crush bending, uses press bending to achieve bends.

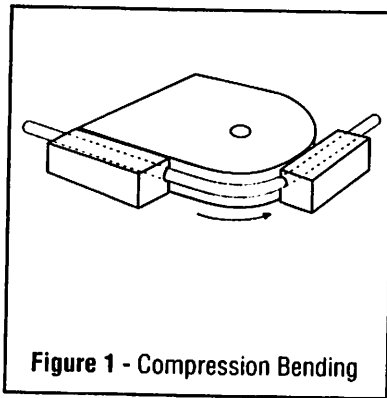


Figure 1 - Compression Bending

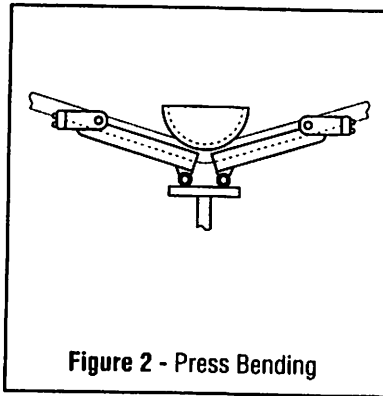


Figure 2 - Press Bending

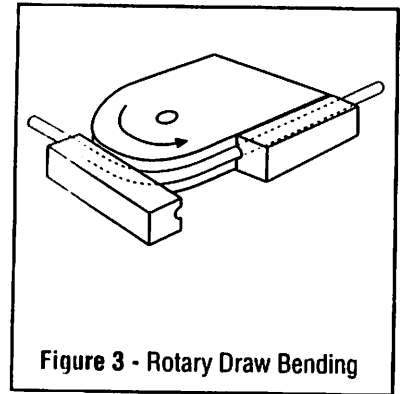


Figure 3 - Rotary Draw Bending

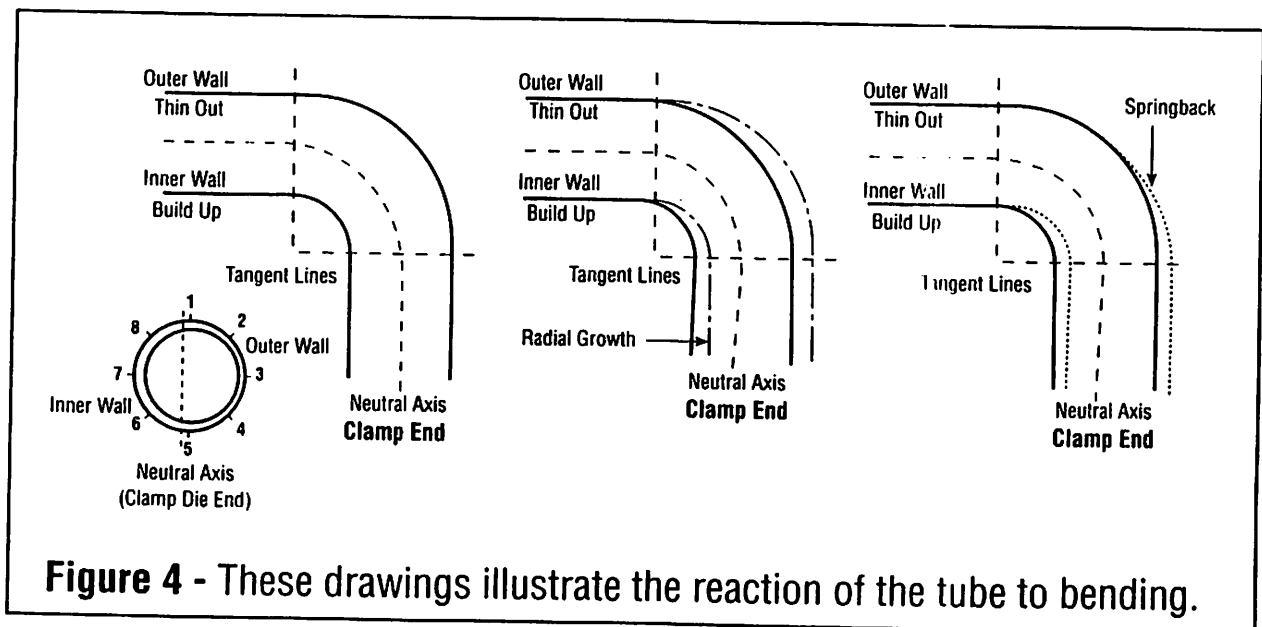


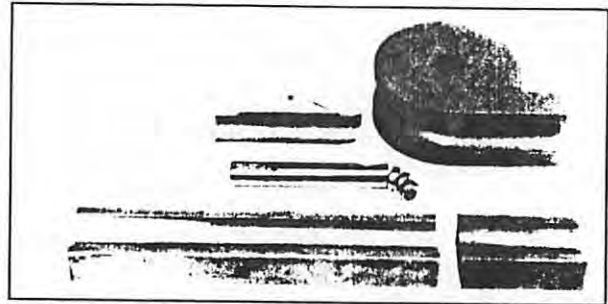
Figure 4 - These drawings illustrate the reaction of the tube to bending.

Little or no support is needed within the tube when the tube diameter is small and the wall is relatively thick. Tubes become weaker when the tube diameter increases or wall thickness decreases. In addition, when the bend radius decreases, the forces acting on the tube are effectively increased.

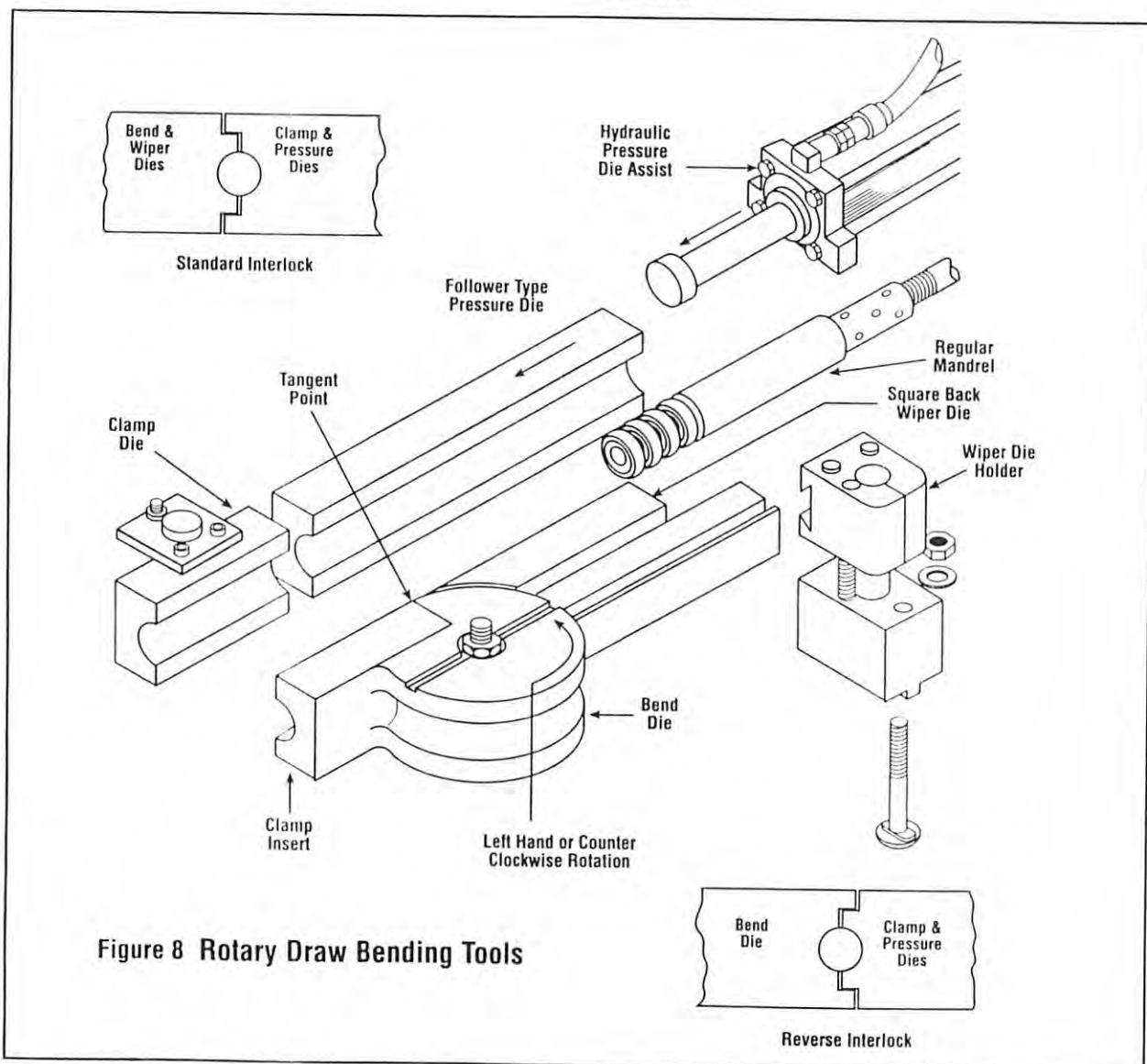
## Rotary Draw Bending (Fig. 8)

This is probably the most versatile and precise bending method. It consistently produces high-quality bends, even with tight radii and thin tube walls. Only three tools are required for bending heavy-walled tube to a generous radius:

- (1) The work piece is locked to the bend die by the clamp die.
- (2) As the bend rotates, the follower type pressure die advances with the tube.
- (3) As the wall of the tube becomes thinner and/or the radius of bend is reduced, a mandrel and/or wiper are required\* (Reference Tooling Selection Guide).



*5 piece set rotary bending tools. Bend die, removable grit blasted clamping insert, clamp die, grit blasted surface, pressure die mirrored surface 180° of travel with 3 x O.D. mandrel chrome 3 balls "H" regular pitch wiper die square back 4130 with lube holes top and bottom.*





# Carlisle All Ford Nationals '98 Report

By Bill Evanoff

This year's event took place on June 5, 6, & 7<sup>th</sup>. The weather was superb on Friday and Saturday, but a light rain dampened things a bit during the award ceremonies late on Sunday afternoon. The SCCoA had a strong turn out with over thirty SCs present on Saturday and likely over forty different SCs present during the three-day event. I don't think I've seen that many Supercoupes in one spot since I drove by the Lorain, Ohio Assembly plant back in 1989. At that time I was considering buying a SC and saw literally hundreds of them lined up prior to shipment to dealers inside the fenced off staging area. At Carlisle, the sight was similar, but better because now many of these cars had been modified to the taste of the owner and therefore seemed less alike and sterile.

The show has a **MAJOR** swap meet area. If you're looking for something for your old Ford, then you will likely find it here. As usual, there was little to be had for a late model SC owner, but was interesting to roam about the hundreds of booths that sell everything from rusted-out parts that you can't imagine who would want, to OEM show quality restoration parts in their original Ford packaging. Of course, there were a few worthless craft booths (which my wife loves though), the neon spark plug wire booths, and the "latest in sunglasses" booths but they are by far the minority. If you have been looking unsuccessfully for anything unusual automotive-wise...it's likely to be found among the swap meet vendors at Carlisle somewhere!

The swap meet provides a distraction from the real reason everyone comes to Carlisle, and that is all the beautiful cars. Do you like Mustangs? Then you'll see hundreds of them. Like Shelby's?...you'll see probably twenty. Like old Boss Mustangs?...again probably over 20. When is the last time you

saw a hot Merkur? At Carlisle this year, there were over 100 Merkurs! Want to see an original GT40 racecar?...no problem. There were two present. How about original AC Cobras?...several were there along with numerous very convincing Cobra kit cars. Do you like Galaxies, Fairlanes, Comets, Lincolns, Cyclones, Torinos, Mavericks, LTDs, Falcons, or old Thunderbirds? Whatever you like, there were rows and rows of them present. It really was an amazing place to go and look at great old and new Ford vehicles. I am happy to report that I DID NOT see any Pintos!

The Supercoupe parking area on the show field at Carlisle has been expanded every year since the club began coming three years ago. We now have nearly a whole row to ourselves



that is probably 80 yards long. This year we only shared it with a few other late model SHOs. The SCCoA was fortunate to have a 20 x 20 tent provided to us as a gathering place for members and a respite from the sun. Bill Hull had a booth with all the club go-fast goodies laid out for inspection and purchase underneath one of the few shade trees in the whole place a short walk away.

This year there were a large amount of the cars that had been customized to some extent by their owners. It seems that most everyone can not leave well enough alone with his or her SC. Aftermarket wheels continue to be a very popular modification. Going up in size to a 17" wheel has become the norm. I remember when I bought my car new and everyone was amazed that it actually had a "humungous" 16" wheel. Well, isn't it strange how times have progressed so quickly to where even 17

inchers are common place. This year marked the first appearance of a visually "hot-rodded" SC. Brad Klein from Florida has shaved his door handles and trunk lock, frenched the radio antenna into the rear fender, has a monster stereo inside the cabin, and painted a flame job to his front end with multi-color paint (similar to the "Mystic" paint on the Mustang Cobra). The look is simply stunning. Those taking home show



award honors in the two SC classes this year included Dick Adams, Brad Klein, Joe Baldazzi, Jimmy White, and Bill Evanoff

The after-hours events were also enjoyable. A group of about forty club members went out to eat at a local steak house on Friday evening. All joined in a mini-cruise on Saturday night to another local restaurant where we took over the entire balcony. The group's exit from the parking lot after dinner that evening could have been mistaken for a commercial for Joey Chitwood and his team of stunt drivers. One car after another, after another seemed to spontaneously lose traction with the road surface as they exited their parking positions and slid sideways toward the street. Luckily no damage was done except to the tread life of numerous rear tires. Once back at the hotel, several enthusiastic, younger club members, who pay no attention to the red line on their tachometers, put on another smoke show in the rear parking lot.

If you only can go to one SCCoA club outing next year, make it to the Carlisle All-Ford Nationals. The weekend is a BLAST. I traveled about 425 miles one-way to attend

and others likely traveled twice that far. **The show is THAT GOOD.** Don't miss another one. I hope to see YOU next year at this event during the first weekend in June!

# Columbus Ford Expo '98 Report

By Bill Evanoff

**T**his show, sponsored by the *Performance Ford Club of America*, is a treat to go to every year if you love drag racing, looking at fast cars, and being surrounded by the sights, sounds, and smells of burning rubber and loud racing engines. The car show is nothing to look down your nose at either, but **DRAG RACING** is the king for this three-day long Labor Day event.

The show is held at National Trails Raceway, which is about twenty-five miles East of downtown Columbus, Ohio. The SCCoA has been attending this event for the last three years now. Supercoupe attendance has grown every year with over twenty SCs present this year.

Many first-time cars were present this year. Unfortunately a few of the core group that usually attends every event were not present due to their cars being currently torn apart for performance enhancements. When these cars hit the road again, there are going to be **MANY**, seriously **FAST** SCs at Columbus next year. This outing could be called the SCCoA first internationally attended event since there were two members from Canada who drove the eight + hours to get there. Now **THAT'S DEDICATION!** Thanks for coming Wayne and Bill!

Only a few members were drag racing their cars this year. Times ranged from 14.1 to 14.9 seconds for the quarter mile track. Most elected to simply enter their cars in the "display only" area that held the other car

clubs present. The weather was rather hot but a breeze kept things comfortable and dispersed the tire smoke cloud that was ever present on the track.

Saturday evening, a group of thirty-plus members went to a local Max & Ermas for dinner. Afterwards, many attended a well-organized cruise-in at a nearby Sam's Club parking lot. The cruise was practically as good as the show at the track during the day except for those junky Chevys, and other makes that don't wear a blue oval that took up space in the Sam's lot.

Sunday was another beautiful day with most everyone coming back. Members, plan ahead now! Next years events will be better organized, better advertised, and we hope **BETTER ATTENDED!** These events are a blast, and one of your few opportunities a year to see more than one SC at a car show.

**SC owners...Come On Out to the shows in '99!**

# **November '98 Midwest SCCoA Maintenance/Performance Clinic Report**

By Bill Evanoff

**T**he Midwest SCCoA chapter held its first annual fall Clinic for its members at the Midwest Headquarters in Cincinnati, Ohio on November 14<sup>th</sup>. The weather cooperated wonderfully with temperatures in the low 60's and partly sunny skies. The members and guests started showing up around 10:30 in the morning and the day was non-stop till past 7:00 p.m.

Eighteen members and guests came from as far away as Grand Blanc Michigan. Ten Supercoupes were in attendance... and one member actually had the audacity to drive his Taurus. We will forgive him though because some vandals had recently done a number on his SCs paint and it was in the shop.

Very little work was actually performed on the group's cars that day. Only a few members were working and those jobs went quickly. The MAIN activity was talking about, gawking at, crawling under, and just simply looking over the ten cars present with a fine tooth comb. The Midwest HQ parts warehouse was perused by everyone and SC parts were sold, traded, and given away amongst the members. A Supercoupe commercial was viewed by the group, as well as a promotional video about Koni shock absorbers.

Around 3:00 p.m., the group went out for a cruise. It was quite a site seeing all the cars lined up going down the street. We certainly drew our share of stares from people along side the roads we went down. The funniest, was a group of young boys who were playing soccer in their yard. As our cars went past, all kicking stopped and the boys' jaws dropped as they stood dumbfounded facing the road.

Our group also did not escape the stares of a pair of Ohio State troopers either. Within two miles of starting the cruise, they nabbed the last two cars in our lineup on a trumped up charge of "rolling a stop sign". Both who received the

ticket claim they did NOT roll through the stop. I guess the officers figured we were up to no good.

Anyway, the group waited for the two who had their wallets lightened and proceeded unscathed throughout the rest of the cruise. The group really got a tour of some of the twistiest roads around the area. Tires were constantly screaming as they went around corners at way over the posted limits. We went up winding creek roads past broken down shacks, and also past multi-million dollar mansions during our 50-mile assault upon the roads around the rural East Side of Cincinnati. Surprisingly, we only lost one car during the drive and that was very near the end. He even made it to the restaurant before the rest of the group. After a fine meal, the group headed for home around 7:30 p.m.

## Those attending were:

Mark Sayers of Lexington KY  
Charles Markman of Grand Blanc MI  
Bill Schlabach of Canton MI  
Fred Peckral of Canton MI  
George O'Neill & three sons of Germantown OH  
Vic Lee of Norwood Ohio  
Curtis Hungerford of Columbus Ohio  
Keith King of Xenia Ohio  
Bob Noack of Amelia Ohio  
Scott Rigsby & wife Helena of New Vienna OH  
Stephen Butcher & wife Vivian of Columbus OH  
Bill Evanoff & wife Patty of Loveland OH

The Midwest chapter is for members living in or near Ohio, Michigan, Indiana, and Kentucky. Many more activities are planned next year. If you wish to join the Midwest SCCoA, contact Bill Evanoff at 513-697-6501 (6 - 9 p.m.) or E-mail at "xs\_tork@usa.net".



# **Northwest Chapter Mini-Meet Report**

November 15, 1998

By Tim Mendoza

**I**t was a very COLD, very WINDY, and very RAINY DAY. But the **DIEHARD SC FANATICS** were in attendance at the SCCoNW's last mini-meet of the year.

Not even the poor weather could keep us from a last opportunity to share our SC experiences. That, along with the chance to meet a HOOTER'S girl was enough to get 6 cars to attend.

We had representatives from all three regions of our Northwest area. The longest drive was made Joe Weekly and his wife in their '93 SC coming from Oregon. From British Columbia, Brad Fedoruk in his '94 SC was joined by two friends along with his Mom (Linda) and her husband in their '90 SC. To round out the group, Dan Worley in his 35th Anniversary Edition, Perrin Kusano in his '94 SC and myself and my son in my (U WISH) '91 SC.

It was so cold that we did not get to spend too much time checking out each other's cars. I did get a chance to at least show off the Kenny Brown Performance Strut Tower Brace (prototype). I could not get the Lower Engine Cradle Braces installed in time but had them in the trunk to show to everyone. I had the advantage of not having to drive very far and getting the morning to clean my car. After a brief picture taking session we opted for the

warmer digs of HOOTERS. We all got a chance to talk about modifications we had performed and what mods we wanted to do next. We shared our experiences and shouted across the table at each other since I forgot the Seattle Seahawks football game was on TV. We took a few more pictures and headed back outside around 3:30PM.

We got to chat a little more and check out Perrin Kusano's speaker system in his trunk. Man, was it cool. We checked out Joe Weekly's Ram-Air setup and my White Faced gauges. Then it really started to rain and we closed it up and took off for home.

What a GREAT time we had and I want to thank everyone who attended and we'll see you next spring.

The Northwest chapter is for members living in or near Washington State, Oregon, and British Columbia. Many more activities are planned next year. If you wish to join the Northwest SCCoA, contact Tim Mendoza at 425-335-3668 (home), or 425-353-0405 x 234 (work) or E-mail at "tdm@giddens.com".

# **Super Coupe Club of the South Outing Report**

By Brad Klein

**O**n November 22, 1998, the Super Coupe Club of the South held its first mini-meet. The meet took place at the Desoto Square Mall in Bradenton, Florida at the West Central Florida Mustang Club's 7th annual Super Ford Sunday which benefits the Hospice of Southwest Florida. We were lucky enough to have two Super Coupes in attendance. I came in my '95 SC and met another member, Doug, who brought his '90.

It was a fun day. Doug and I conversed about our future plans and what we had already done to our SCs. We wandered around the show and looked at over 120 cars. Most were Mustangs and all of them were beautiful. We had a couple of Thunderbird owners come up and chat with us but no SCs. At the end of the show we were both awarded a gold trophy for overall appearance. I'm sure with more advance notice and advertising we will have more SCs at the next meet which will most likely be next year at the Atlanta Dragway. Check the Super Coupe Club of the South Chapter page or the Events section on the SCCoA web site and future issues of Chargin' Thunder for more details.

The Supercoupe club of the South is for SC enthusiasts living in or near Florida, Georgia, Alabama, and Mississippi. Many more local activities are planned for next year. To join, contact Brad Klein of Sarasota, FL at (941) 364-9398 between 4-10 p.m. or via. E-mail at [tbirdsc@home.com](mailto:tbirdsc@home.com). As with all local SCCoA chapters, there are no dues required to join the "South" chapter.

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**SUPER COUPE CLUB OF AMERICA  
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**ELECTRONICS**

<b>MAGNECOR Competition 8.5mm Metal Core Sprial Wound Plug Wire Set</b>	<b>99.00</b>
<b>COMPETITION LIMITED High Performance Headlight kits w/ 2 80w, 2 100w</b>	
Halogen bulbs, wiring harness w/fuse link, instructions 89-93 T-Birds	139.00
94-95 T-Birds, same as above but w/ 2 80/100w 9007 halogen bulbs	129.00
Double your headlight power!	
50w Halogen back-up bulbs ea.	18.00

**ENGINE**

<b>K&amp;N Lifetime Panel Air Filter - drop-in replacement</b>	<b>42.00</b>
<b>K&amp;N 9" cone filter -</b>	<b>38.00</b>
<b>SCCoA fresh-air induction system, incl K&amp;N 9" cone filter, March Ram-Air box, 3" inlet tube w/pcv fitting, bolt-on 15HP</b>	<b>179.00</b>
<b>C&amp;L/Vortech 73mm Max-Flow Mass Air Meter w/30, 36, 38 or 42lb sampling tube</b>	<b>189.00</b>
Replacement sampling tubes	40.00
<b>Pro-M 77mm MAF, custom calibrated module, incl. inlet tube - for 350HP+ engines</b>	<b>429.00</b>
<b>Pro-M 75mm Bullet MAF, custom calilbrated module, bolt-on chrome</b>	<b>209.00</b>
black plastic	199.00
<b>EATON-MAGNUSON PRODUCTS S-Model Hi-Flow Supercharger - complete</b>	
w/custom inlet&outlet porting, matching inlet plenum, pulley of choice exchange	1550.00
<b>SCCoA Modified SC Adapter Air Outlet - ¾" raise, brand new castings</b>	<b>450.00</b>
<b>OTC Spanner Nut wrench for SC's - needed to switch SC tops</b>	<b>55.00</b>
<b>Blower Pulleys stock 89-93, or 94-95 SC</b>	<b>50.00</b>
SVO 5% or SCCoA 10% OD	60.00
<b>SCCoA 3-piece Accessory Underdrive Pulley set</b>	<b>179.00</b>
<b>SCCoA 10" Lo-Profile 900cfm Hi-Flo Intercooler Fan</b>	<b>99.00</b>
<b>SCCoA/Spearco Hi-Flo Intercooler - w/custom aluminum inlet duct - Exchange only</b>	<b>750.00</b>
<b>SCCoA "Double-Intercooler" w/ported inlet &amp; outlet flanges - Exchange only (2)</b>	<b>600.00</b>
with optional ice tray	750.00
<b>BBK Throttle Bodies - modified w/SC throttle linkage</b>	
65mm	249.00
70mm	259.00
75mm	269.00
<b>BBK custom SC Throttle Body - new production item</b>	<b>70mm only 299.00</b>

Griffin Hi-Capacity all aluminum radiators, race quality, direct fit, 50% increase in capacity, incl. SCCoA pressure release cap, Manual or AOD trans		595.00
Robert Shaw Hi-Po Thermostats 180 or 195 degree w/Fel-pro gasket		10.00
SCCoA Pressure-release radiator caps, a must for all SC's		12.00
SCCoA Roller-rocker set, 1.73 ratio, race quality extruded aluminum, bolt-on, non-adj.		299.00
SCCoA Roller-rocker set, 1.73 ratio, Stud mounted (ARP) adjustable, w/CMRE custom guideplates, polylocks - race-quality extruded aluminum or chrome-moly		499.00
SCCoA Hi-Flo fuel pumps w/filter screen, direct fit	155lph	99.00
	190lph	119.00
	250lph	149.00
SCCoA adjustable fuel pressure regulator, great tuning tool for hi-hp engines, bolt-on		89.00
Vortech T-Rex In-line pump 60 gal/hr @70psi w/wiring & instructions - a must for NO2		299.00
Hi-Flo fuel injectors, set of 6	Bosch 30lb/hr	299.00
	Bosch 36lb/hr	359.00
	Lucas 38lb/hr	399.00
	Lucas 42lb/hr	449.00
SCCoA/ARP Head Studs, 190,000psi, 11mm w/12pt nuts, HD washers set		119.00
SCCoA/ARP Rod bolts, 190,000psi, 9mm set		79.00
SCCoA/ARP Rocker studs, 170,000psi - 3/8" - 7/16" for stud mounted rockers		79.00
SCCoA/ARP Main studs, 190,000psi, 12mm, w/12pt nuts, HD washers, set		119.00
SCCoA/CMRE main stud support girdle, CNC'd billet steel, incl ARP main studs		469.00
SCCoA crankcase windage tray, prevents oil captivation & foaming, aids oil drain back		49.00
EXTRUDE-HONE Power Flow incl UPS to & from E/H inlet plenum		140.00
	manifold adapter	140.00
	upper I/C tube	140.00
	lower I/C tube	190.00
	complete set 10% discount	549.00
SCCoA custom porting	inlet plenum 70mm or 75mm	75.00
	intake manifold, inlet port & runners	95.00
Fel-Pro gasket sets, upper engine head set, w/late design head gaskets, all years		150.00
	lower engine set, all years	75.00
	complete upper & lower engine sets	215.00

## EXHAUST

All SCCoA cat-back exhaust systems are street legal. SCCoA headers & downtubes are sold "off-road" only (Too expensive to have EPA & CARB certified although the converters ARE EPA & CARB certified). The short tubes headers will pass emissions, even in CA.

SCCoA short-tube headers - 1-3/4" primaries, 2.4" I.D. collectors	304 Stainless	695.00
incl FelPro header gaskets & new 8mm bolts	16ga mild steel	595.00
SCCoA long-tube headers - 1-7/8" primaries, 3" 3 into 1 collectors	16ga mild steel	995.00
SCCoA 2-1/2" down-tubes for short-tube headers incl O2 fitting	w/hi-flo converters	300.00
	w/o converters	125.00
2-1/4" down-tubes for factory manifolds	prices same as 2-1/2"	

SCCoA 2 into 1 into 2 cat-back exhaust systems, , factory fit, dual 2-1/2" into 3' into



dual 2-1/2, incl Magnaflo resonator, 2 Dynamax or Magneflo Super Turbo's, uses factory hangers, etc Guaranteed to out-flow any other system on the market, except the "Big Dog" below!		749.00
Dual 2-1/2 into 3-1/2" into dual 2-1/2" "Big Dog" system w/o resonator for over 350HP applications incl 2 Dynamax Super Turbo's 92-up gas tanks only		749.00
Magneflo resonator dual-inlet, single outlet		119.00
Jet -Hot Metallic-Ceramic Thermal Coating, inside & out	short tube headers	180.00
	Down-tubes w/o cats	80.00
	Down-tubes w/cats	150.00
	Long-tube headers, inside & out	300.00

### TRANSMISSION/DRIVELINE

HD Aliminum driveshafts - all models - custom order only	AOD	499.00
	5-sp	449.00
Centerforce Dual-Friction Clutch Kit - a racing clutch-pressure plate for the street w/release bearing, 89-93 SC's only		449.00
Art Carr 10" HD Super Torque street converter, 2500rpm non-lock-up, AOD		529.00
High-tech valve body shift improver kit AOD or 4R70W		79.00
AOD or 4R70W HD rebuild kit		190.00
Billet steel 1-piece input shaft		280.00
Finned aluminum AOD pan w/magnetic drain plug, new metric bolts, filter		179.00
Trans-Go shift kit - fully adjustable, w/full-throttle 3-4 up-shifts, holds OD (AOD only) incl. Hi-Rev kit (6000rpm upshifts - a \$50 part if purchased separately) ,w/instructional video. Absolutely the best on the market - used by most major trans shops!		119.00
SVO AOD Wide-Ratio/Upgrade Kit - (factory installed on 94-95 SC 4R70W), incl. 2.84 1 <sup>st</sup> gear, HD planetary gear set w/higher torque capacity, sun shell assembly, reverse assembly w/HD 2" OD band, HD low inertia 6-plate direct-clutch assembly, reverse/forward clutch assembly, 6000rpm intermediate one-way clutch w/pressure plate, clutch steels & friction plates, & high rpm #2 thru #9 needle pinion bearing thrust washers. A high performance/durability upgrade for 89-93 factory AOD's.		645.00
Lakewood Hi-Po U-joints w/o grease fitting (not internally cross-drilled), super-strong, ea		42.00
Speedometer gears 21T for 3.73 AOD		12.00
23T for 3.55 5-sp		18.00
SCCoA custom urethane trans mounts NEW!		129.00

### CHAISSIS/SUSPENSION

Air Bag for rear coil springs - helps cure wheel hop in 5-sp cars ea.		55.00
	pair	95.00
SCCoA 1-1/8" rear sway bar w/new end links (all gold cadmium plated) & urethane bushings - bolt-on		199.00
Baer High Performance & Racing brake packages	call for prices	
Eibach Pro-kit 1-1/2" lowering springs		279.00
Tokico Illumina Electronic Adjustable Shocks - factory replacement -30% firmer 2 frt		295.00
	2 rear	245.00

Performance Friction brake pad sets front only	89-91	49.00
	92-95	59.00
Raybestos brake pads, rear, all years		49.00
KVR Carbon-Fiber Semi-Metallic, Rotor friendly, race quality, frt or rear, all years		69.00
Hi-Po cross-drilled rotors, factory replacement, front or rear, all years ea.		99.00
black, gold, or silver cadmium plated - no rust! Ea.		20.00
Cobra/SVT T-Bird wheels 17" X7.5"	ea.. silver painted	149.00
	ea. chromed	249.00
Cobra/SVT T-Bird wheels 17"X 9" NEW!	ea. silver painted	199.00
	ea. chromed	299.00
16"X 8" NEW! avail. Jan. 99	prices not yet released	
Incl with any 4 wheel purchase - SCCoA members only - free shipping (\$40-\$60 value), or a complete McGard locking lug, regular lug, & chrome valve stem package (\$50 value)!		
"Fat-shaft" the "Big-Dog" 5-sp right side half-shaft, ea. while they last, new, OEM		299.00
NEW ! Kenny Brown/SCCoA T-Bird strut-tower brace , avail. Jan. 99		129.00
Kenny Brown/SCCoA lower chassis (engine cradle) brace		99.00

### HIGH PERFORMANCE LUBRICANTS/FLUIDS

Entech Corp Energy Release for engines, transmissions, superchargers, power steering, many other uses 16oz bottle - enough for 2 oil changes, 1 oz for blower	24.00
Red Line Synthetic Racing AFT qt.	8.00
Red Line water-wetter 16 oz bottle ea	8.00
Eaton/Ford supercharger fluid 8oz	20.00
Haynes T-Bird/Cougar shop manual 89-96, all models incl/SC	15.00

### SCCoA SPECIALTY ITEMS

License plate bracket, black anodized aluminum, T-Bird wing & SCCoA engraved	40.00
Pen & pencil holder, 24k gold plated, solid-cherry base, T-Bird & SCCoA engraved	50.00
Tire guage w/pocket clip, w/ printed "T-bird wing" insignia & "Thunderbird" ea.	5.00
Key chain w/enclosed 6 ft ruler (standard & metric), T-Bird logo	5.00
SCCoA coffee mugs, "SCCoA & Thunderbird" printed on two sides, T-Bird wing printed around base ea.	6.00

### SCCOA PARTS PACKAGE DEALS (SCCoA members only)

SCCoA headers, downtubes, cat-back exhaust, & modified SC top combo - minimum 75 HP  
- \$100 off

Magnuson S-Model blower & SCCoA modified SC top combo minimum 50 HP - \$100 off

BBK Throttle body, C&L or Pro-M MAF, SCCoA fresh-air induction system - \$50 off

Eibach springs, Tokico shocks, SCCoA rear sway bar combo, -\$50 off

For the complete SCCoA 350HP bolt-on package, call for special pricing - For CMRE cams, head & engine work call Coy Miller @ 540-433-0545

## SUPER COUPE CLUB OF AMERICA "RULES AND BY-LAWS"

IF YOU THINK YOU ARE BEATEN, YOU ARE;

IF YOU THINK YOU DARE NOT, YOU DON'T.

IF YOU'D LIKE TO WIN BUT THINK YOU CAN'T, IT IS ALMOST A CINCH YOU WON'T.

IF YOU THINK YOU WILL LOSE, YOU'RE LOST;

FOR OUT IN THE WORLD WE FIND SUCCESS BEGINS WITH A PERSON'S WILL!

THEREFORE,

IF YOU THINK YOU WILL OUT-LAST, YOU WILL;

YOU'VE GOT TO THINK HIGH TO RISE,

YOU'VE GOT TO BE SURE OF YOURSELF BEFORE YOU CAN EVER WIN A PRIZE.

LIFE'S BATTLES DON'T ALWAYS GO TO THE STRONGEST OR FASTEST;

BUT SOONER OR LATER THE PERSON WHO WINS, IS THE PERSON WHO THINKS THEY CAN!





*Here are some common sense ways to  
unleash all of the horsepower you can  
...with DynoMax !*

*"Getting the most out of your exhaust system  
modifications is easy."*

### Restrictive Exhaust

A restrictive exhaust creates back pressure in the exhaust system that hurts your vehicle's performance in two ways:

1. The engine has to work harder to force exhaust gases out of the cylinders.
2. Engines cannot scavenge burned exhaust gases out of the cylinder efficiently. This leaves exhaust gases in the cylinder to dilute incoming air/fuel mixtures and rob your engine of horsepower.

### Pipe Diameter

A common misconception is that the larger the diameter, the better the system. But, bigger isn't always better. Systems that are too large in diameter can actually hurt performance.

As a general rule, switching to a performance system that is ¼" to ½" inch larger than stock will provide you with the *best* horsepower increases. To determine which pipe diameters will be best for your system, decide what RPM range your engine will operate at, most of the time. Smaller diameter pipes will produce low to mid RPM torque. Larger diameters produce mid to high RPM torque.

## HORSEPOWER DEPENDS ON FLOW

*(not pipe diameter alone)*

**Bigger isn't always better.  
Systems that are too large  
in diameter can actually hurt  
performance. Improved flow  
is what you need.**

**Having large diameter pipes  
isn't what's cool. Going fast  
and making horsepower is.**

Engine cid	Pipe Diameter (inches)		Horsepower
	Single	Dual	
150-200	2.00	2.00	100
	2.25	2.00	150
	2.50	2.00	200
200-250	2.25	2.00	150
	2.50	2.00	200
	2.50	2.25	250
250-300	2.50	2.00	200
	2.50	2.25	250
	3.00	2.50	300
300-350	3.00	2.25	250
	3.00	2.50	300
	3.50	2.50	350
350-400	3.30	2.50	300
	3.50	2.50	350
	3.50	2.50	400
400-450	3.50	2.50	350
	4.00	3.00	400
	4.00	3.00	450
450-500	4.50	3.50	400
	4.50	3.50	450
	4.50	3.50	500

### Balance Tubes

Balance Tubes (or 'H' pipes) help to even out the pulses in the exhaust gases and balance the back pressure between both banks of your engine. They not only help improve horsepower, but sound as well.

To find the right location to install your balance tube, apply a strip of paint down the front portion of the exhaust pipes. The balance tube should be placed where the paint burns off (bubbles) on the exhaust pipes. Generally, put the balance tubes as close to the headers as possible. The balance tube diameter should be at least 75% of the diameter of the pipes with which it connects.