

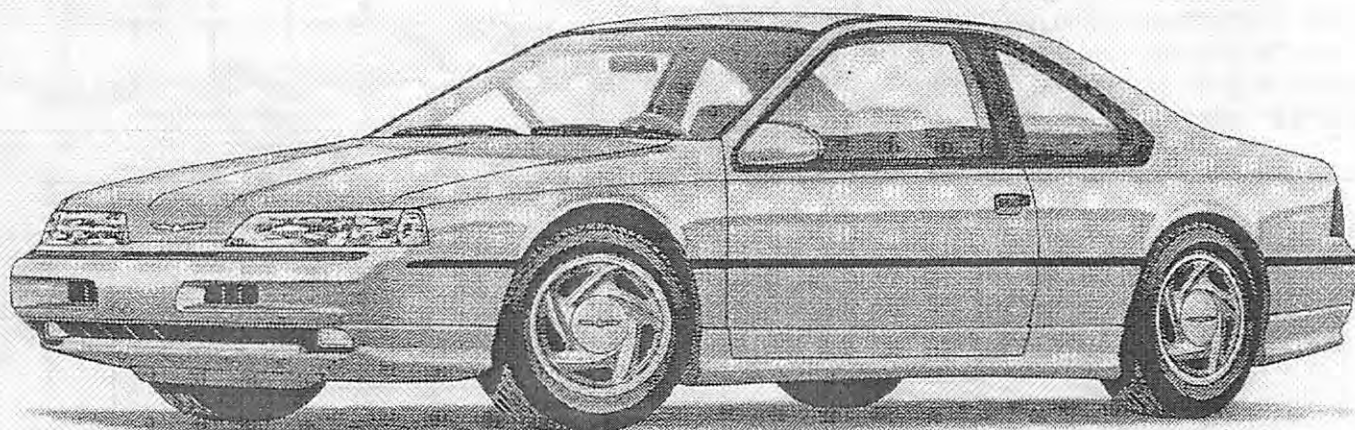
# CHARGIN' THUNDER

VOLUME III

JUNE 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*

**Bill Hull**  
*President & Editor*

*Super Coupe Club of America*  
*Phone: (804) 974-6659*  
*Fax (804) 974-9965*

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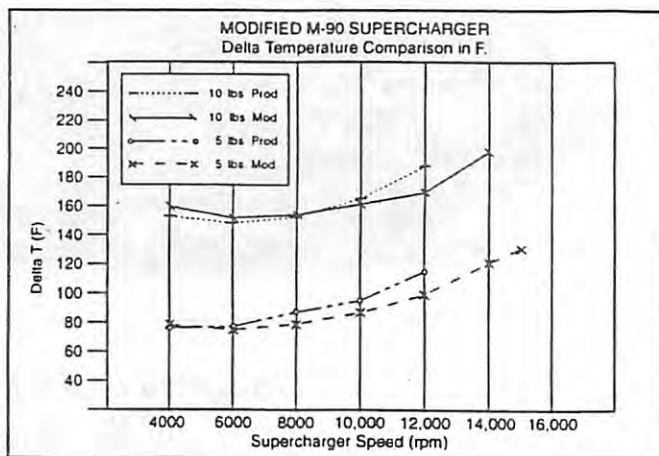
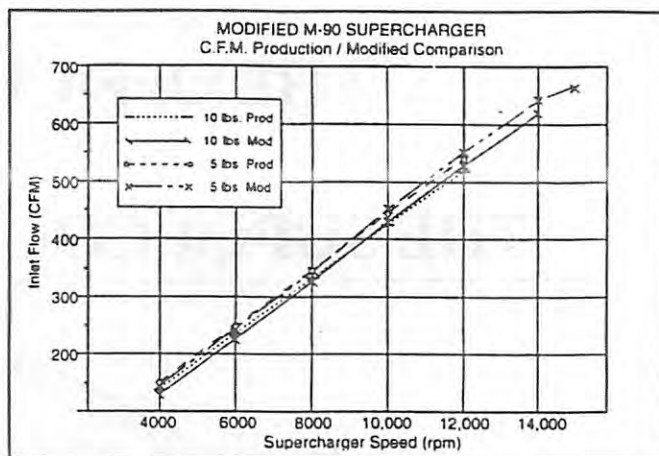
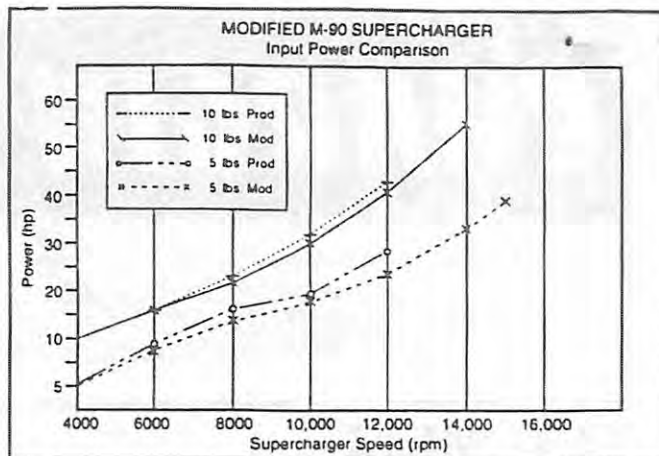
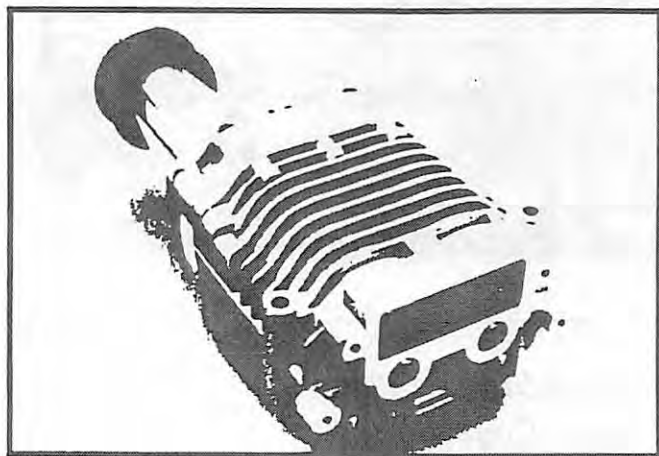
# "S" MODEL SUPERCHARGERS

**FOR THE PERFORMANCE MINDED  
ENTHUSIAST**

Try our high flow case with super modifications that gives better flow and higher output. For Ford product we take a '94-'95 high flow housing, massage all the flow areas of the inlet and outlet, and get more C.F.M. and blower speed than stock while the temperature and input horsepower come down. This all leads to better overall efficiency.

Ford and Mercury owners, with '89-'93 models wanting more power, may take advantage of upgrading their units by bolting on a '94-'95 high flow case and intake manifold. This gives about 18 h.p. Combine this with an "S" modification and you are looking at 25 to 30 h.p.

"S" modifications may be made to all Eaton Superchargers on the outlet side. Intake modifications are selected as to "type" on all others. Call for pricing on this super improvement.



## WARRANTY

Magnuson Products warrants and will repair or replace, at our option and after inspection in our facility, any new Eaton manufactured product found defective by means of material and/or workmanship for a period of one year from invoice date. This warranty does not cover products which fail because of accident, alteration, misuse, neglect, racing, improper installation, abuse, or when used in applications for which they were not designed

or approved. Removal, installation, transportation, labor, inconvenience, damage of other components, personal damage or injury and/or any injury or liability to other persons or property are not covered under this warranty. Magnuson Products shall not be liable for any and all consequential damages occasioned by the breach of any written or implied warranty pertaining to this sale in excess of the purchase price of the product sold.

**EATON SUPERCHARGERS**  
**MAGNUSON PRODUCTS (805) 642-8833**  
FOR SERVICE • NEW SALES • NEW APPLICATION R & D

## FROM THE BIRD'S NEST By BILL HULL

June 25<sup>th</sup>, 1998 - how times does fly when you're having fun! I know this issue of Chargin' Thunder is late - again - many of you must think I have died or run off with the piano player! Fact is - this Club is growing so fast, and so many members are ordering parts, I just cannot keep up! It is a pleasant dilemma, but I must do something so I can better keep up.

Parts orders have increased 4-5 times over a years ago! Since March of this year, 16 members have taken advantage of the 350HP package deal, an additional 18 sets of SCCoA short-tube headers & down-tubes have been shipped out, 44 modified SC tops have been ordered, 8 sets of SCCoA long-tube headers have been made (some are still waiting for 3" collectors), 42 SCCoA 2-1-2 cat-back exhaust systems have been shipped & literally hundreds of orders for our over 120 various parts have been placed! After a relatively slow winter, I have been absolutely swamped with demand for parts & new membership requests. I need a full-time secretary, packaging & shipping clerk, & errand runner! I just do not know who to hire who is knowledgeable enough to be of much help - but I must do something, and soon, as the problem will just become worse with the rapidly growing membership - over 800 & still growing about one per day! THANK YOU ALL FOR YOUR SUPPORT!

Compounding the problem of parts availability is the fact that BBK throttle bodies, especially the 70MM have been next to impossible to obtain. C&L mass air meters have been very scarce, so I have turned to Pro-M ( a much better piece, expecially for high HP applications, contrary to my previous opinion). The machine shop which modifies the SC tops is extremely busy & has a hard time keeping up with my demand. "S" model blowers have been hard to get, partly because of Eaton, partly because Magnuson is also swamped with orders - they ship out over 200 superchargers for many different applications each week! The matching plenums for the S-model are no longer available - Eaton lost the production blueprints & does not plan casting any more. The SCCoA has contracted to have new, improved-flow, late model plenums cast to accomodate the S-model blower - should be available by mid-August. In addition, we are having the SC tops cast, as opposed to having stock one's machined, as this will free up much time for me to spend doing other things. In order to keep up with demand, I have two different companies making short-tube headers for the SCCoA, & actually have headers in stock for a change! Over 80 SCCoA fresh-air induction systems have been purchased, only 4 of the "fatshafts" are left, 18 sets of SVT/Cobra R T-bird rims have been shipped to lucky owners, etc. My last excuse for being tardy on parts orders & Chargin' Thunder, etc, is the fact that I have attended two Club meets in the last month (Bowling Green & Carlisle), putting me 8 days behind returning phone calls & filling orders.

The big news since the March 98 newsletter is my Coy Miller engine - it dyno'ed 425HP @ 4800rpm & a monstrous 525lb/ft of TORK at only 3400rpm (see enclosed dyno sheet). We picked up over 40 ft/lb of torque with the long-tube headers & Pro-M mass air meter! The Pro-M was much more consistant than the C&L, & although the HP difference

Super Coupe Club of America

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was only 3HP, the A/F ratio was dead on with the Pro-M, whereas the C&L tended to go too rich & varied over a full point (see Joe Sarcona's dyno test in Mar 98 C.T.) We installed this engine in my 90 SC before the Bowling Green meet - it ran like a banshee - then developed an incooler system leak (custom 3" tubes). Anyway, I sold Joe Sarcona the double-intercooler system off my car, & am still in the process of installing a big Spearco air-to-air I/C behind my grill, PLUS a big Spearco air-liquid I/C complete with a Moroso Super-Cool-Can w/ a 7gpm marine pump to force minus60 degree dry-ice chilled coolant thru this monster! Cool is where the power is at! I still have the adjustable 50-150 nitrous kit if I need it! The only reason I have not taken this baby to the strip is because I literally have not had the spare time to complete the double I/C installation! I did not even take our annual vacation to the beach with the family this year - stayed home & worked on SC tops! What dedication!

The Bowling Green, KY "World Ford Challenge" was somewhat of a bust - it was not very well organized for the 1500 or so cars which showed up. We had to wait in line over two hours the first morning just to get in the gate! We had 10 or so Club members show up, another two people joined the SCCoA. Carlisle, PA, the site of our 3<sup>rd</sup> annual convention was the usual blast! Over 30 SC's lined up side by side - 8 new members joined our ranks over the 3-day event. We had members from as far away as Florida, New Hampshire, Wisconsin, Michigan, as well as all the surrounding states! The Kenny Holcolm "Civil Wars" shoot-out in April was rained out. It has been re-scheduled for July 17-18 - I am going to do my best to be there. Our 3<sup>rd</sup> annual drag meet/show in Columbus, OH will be over the Labor Day weekend - be there!

New Products - The HD aluminum drive-shafts have been proven to be at least as strong as the factory slip-joint steel piece, even though they only weight 9+ lbs. They actually start out as a Ford factory Crown-Vic "police" drive-shaft. They have to be lengthened for the SC AOD & R470W, & shortened for the SC 5-speed application. Ford dealers retail this unit for \$650, I have a wholesale source & even including the machine work, am selling them for \$449. Sub-frame connectors & chassis supports have been installed on my SC as well as on Joe Sarcona's. They are available for any 89-up T-Bird or Cougar - no welding required - \$349 plus shipping. Double I/C's are available for use with stock I/C tubes or custom 3" tubes - \$800, or \$900 w/ ice-tray. The SCCoA 2-1-2 cat-back exhaust has been reduced in price to \$799, incl. Megaflo resonator & 2 Dynamax Super Turbo's, - \$699 if you use your own mufflers. I have not included a price list in this newsletter as it is essentially unchanged from Mar '98. I have included several early magazine road-test articles & production figures as I get many requests for such, especially from new Club members. All of the previous 8 newsletter\tech magazines (average over 50 pages each) are still available for new members at half price - \$40 for over 400 pages of SC specific reading & tech info plus numerous "letters to the editor". Very informative reading & a bargain @ \$5 each!

My latest project is a Coy Miller 351W engine for my Ford pickup (the little 5.0L just not have enough grunt for towing). Designed for towing my SC, this engine should make 400+ lbs/ft of TORQUE @3000rpm & 350HP at 4500rpm - complete with big-valve,

ported heads, SVO camshaft w/roller rockers, Edlebrock Performer intake w/750cfm Holley, ARP studs & fasteners & BBK jet-hot coated headers plus the usual Coy Miller balance & blueprint - great for a tow vehicle. I am swapping the 4-speed manual tranny for a race-prepped C-6 auto complete w/ SVO wide-ratio gear-set (2.75-1 first gear), Art Carr heavy-duty rebuild kit & Trans-Go shift kit. The engine should be finished in about two weeks - now if I can just find the time to get my 90 SC back on the road! As this newsletter is late & must go to the printer's, I will not bore you all with any more of my driveline! I am just about caught up with club order's & promise to do better in the future! Thanks again for all of your patience & support!

Bill Hull

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COY MILLER RACE ENGINES  
DYNO SERVICE \ COMPETITION MACHINE SHOP  
1046 MOORE STREET  
HARRISONBURG, VA. 22802  
PHONE: 540-433-0545

Listing of memory data  
Printed on Apr 24, 1998 at 19:36:43  
Calibrated on -----  
Configuration name: SF901

# 0107  
Stored on Apr 24, 1998  
*oil temp 193°*  
*Boost 14 lbs*  
*Fuel Pres. 52 PSI*

Test Description:  
Test Description: 300 RPM Accel  
Job No.: 10229  
Test Operator: Coy  
Engine Owner: Bill Hull  
Engine: 3.8 SCF - Gas 8.7  
Clinder Head: CMRE Stage 2 SCF  
Induction System: SCF w\ Pro - M MAFM, 70 MM BBK  
Jets: Pri. 42#, Sec. NA, Power Valve NA, NO FMU  
Ignition Timing: 11 Deg. Spout out.  
Valve Lash: Int. -.050, Exh. -.050  
Cam: CMRE Stage 2 Hyd. Roller  
Cam Timing: 112 ICL  
Oiling System: Factory SC  
Test Fuel: Cam 2 & Pump Gas  
Oil: 10W30  
Plug Type 514 Accel  
Plug Gap: .045

Comments: 10% SC Pulley 16,120 SC RPM @ 5200 engine RPM

EngBor	3.841	inches	EngStr	3.390	inches
EngCyl	6	Number	CorTmp	60	Deg F
CorPrs	29.92	InHg	EngCyc	4	Cycles
SpdRat	1.00	Ratio	CorVap	0.0	InHg
FuelSG	0.750	Ratio	FuelHV	21000	BTU/lb
FuelLV	18000	BTU/lb	PmpRat	1.00	Ratio
VapPrs	0.4	InHg	WetBul	61	Deg F
DryBul	69	Deg F	ConRod	5.956	inches
InValD	1.850	In.Dia	ExValD	1.625	In.Dia
ExPipe	2.00	In.Dia	ExLong	36.0	Inches
IntLng	9.7	Inches	IntMCd	0.350	Ratio
StrTst	602	second			

Listing of memory data  
Channel Group: Corrected Power Page 1  
Printed on Apr 24, 1998 at 19:36:43

EngSpd RPM	STPTrq Clb-ft	STPPwr CHp	BSAC lb/hph	FulA+B lb/hr	A/F Ratio	Air 1 scfm	BSFC lb/hph	VolEff %
2800	513.6	273.8	5.70	78.4	18.34	314	0.311	177.3
2900	512.7	283.1	5.66	90.7	16.25	322	0.348	175.8
3000	513.5	293.3	5.71	102.0	15.10	336	0.378	177.6
3100	517.2	305.3	5.69	105.7	15.11	349	0.376	178.2
3200	518.6	316.0	5.73	112.7	14.78	364	0.387	179.7
3300	520.5	327.0	5.70	118.9	14.43	375	0.395	179.5
3400	<u>524.5</u>	339.6	5.75	125.4	14.34	393	0.401	182.6
3500	520.6	346.9	5.82	130.3	14.25	406	0.408	183.3
3600	515.7	353.5	5.88	137.6	13.91	418	0.423	183.5
3700	518.3	365.2	5.84	142.1	13.82	429	0.423	183.2
3800	518.4	375.1	5.89	146.6	13.86	444	0.425	184.6
3900	513.0	380.9	5.99	154.5	13.59	459	0.441	185.9
4000	513.6	391.1	5.98	155.1	13.87	470	0.431	185.7
4100	510.7	398.7	6.04	166.4	13.30	483	0.454	186.4
4200	505.0	403.9	6.06	169.7	13.23	491	0.458	185.3
4300	493.5	404.0	6.20	175.8	13.10	503	0.473	184.9
4400	489.8	410.4	6.23	184.1	12.74	512	0.489	184.4
4500	484.1	414.8	6.27	183.2	13.03	522	0.481	183.6
4600	476.5	417.3	6.35	185.3	13.12	531	0.484	182.9
4700	475.5	<u>425.5</u>	6.38	188.7	13.20	544	0.483	183.1
4800	460.9	421.2	6.50	188.1	13.37	549	0.487	180.9
4900	454.8	424.3	6.60	201.0	12.79	561	0.516	181.1
5000	438.9	417.8	6.78	201.8	12.90	569	0.525	179.1
5100	430.4	417.9	6.87	207.5	12.71	576	0.540	177.9
5200	410.9	406.8	7.14	212.8	12.53	582	0.570	176.4
5300	397.3	400.9	7.31	217.9	12.35	588	0.592	174.6
5400	380.5	391.2	7.54	215.4	12.56	591	0.600	172.4
5500	372.9	390.5	7.63	223.1	12.25	597	0.623	170.9

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Listing of memory data  
Channel Group: Exhaust Temperatures Page 1  
Printed on Apr 24, 1998 at 19:36:43

EngSpd RPM	Exh1 degF	Exh2 degF	Exh3 degF	Exh4 degF	Exh5 degF	Exh6 degF	Exh7 degF	Exh8 degF
2800	1140	1110	1110	1120	1130	1120	90	90
2900	1140	1120	1120	1130	1140	1130	90	90
3000	1150	1120	1120	1130	1150	1130	90	90
3100	1150	1130	1130	1140	1150	1130	90	90
3200	1160	1130	1130	1150	1160	1140	90	90
3300	1160	1140	1140	1150	1160	1140	90	90
3400	1160	1140	1140	1160	1170	1150	90	90
3500	1170	1140	1150	1160	1170	1150	90	90
3600	1170	1150	1150	1170	1170	1150	90	90
3700	1170	1150	1150	1170	1170	1160	90	90
3800	1180	1150	1160	1170	1170	1160	90	80
3900	1180	1160	1160	1180	1180	1170	90	90
4000	1180	1160	1170	1180	1190	1170	80	90
4100	1180	1170	1170	1190	1190	1180	80	80
4200	1190	1170	1180	1200	1200	1180	80	80
4300	1190	1180	1190	1210	1210	1190	80	80
4400	1200	1180	1200	1210	1220	1190	90	90
4500	1200	1180	1200	1220	1230	1200	90	90
4600	1210	1190	1210	1220	1230	1210	80	90
4700	1210	1190	1210	1230	1240	1220	80	80
4800	1210	1200	1220	1240	1240	1220	80	80
4900	1230	1210	1230	1250	1250	1230	80	80
5000	1230	1220	1240	1260	1260	1240	80	90
5100	1240	1220	1250	1260	1270	1250	80	90
5200	1240	1230	1250	1270	1280	1250	80	90
5300	1240	1240	1260	1280	1280	1260	80	90
5400	1250	1240	1260	1280	1280	1260	80	80
5500	1250	1240	1270	1280	1290	1260	80	90

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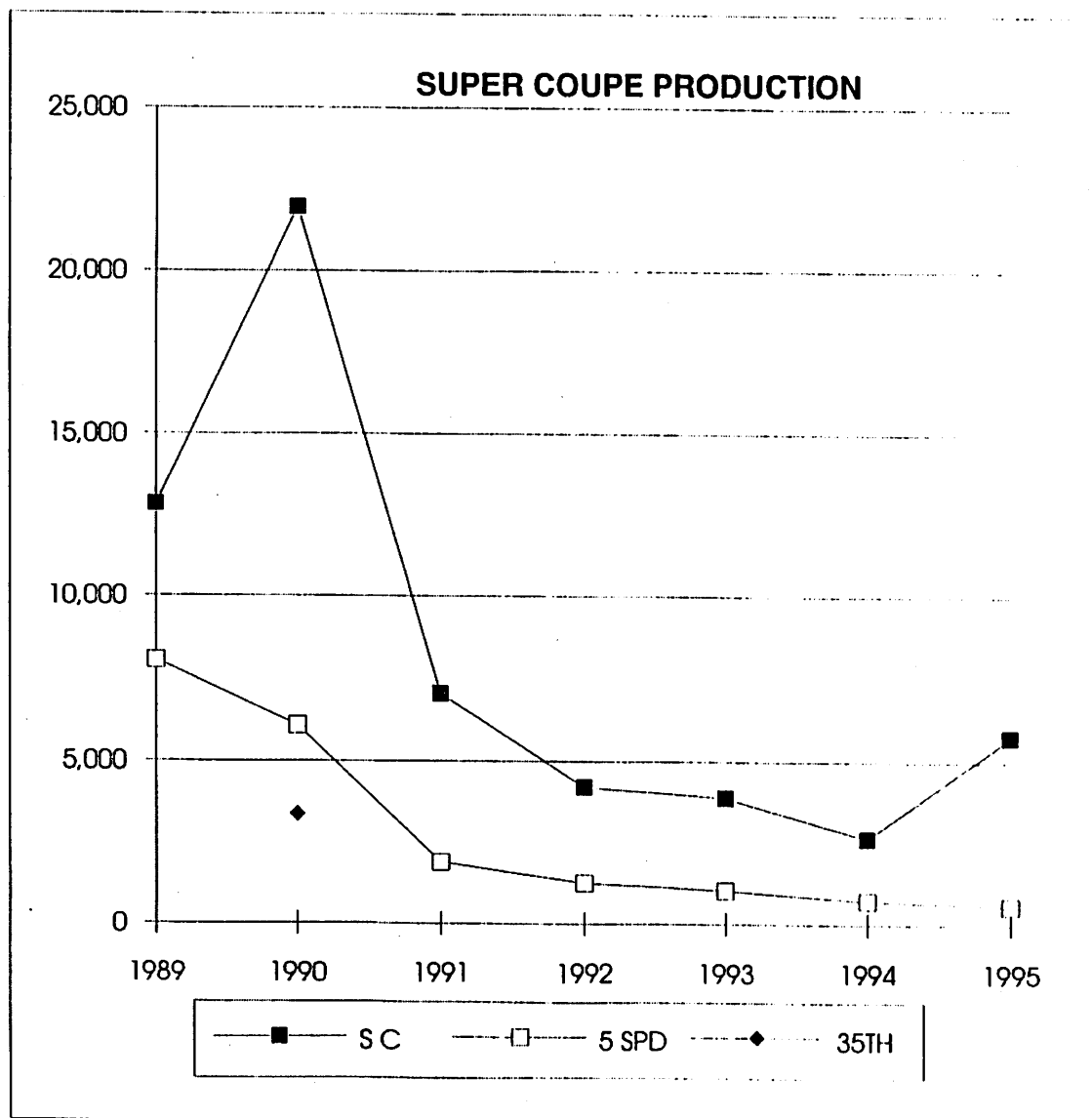
## THUNDERBIRD INFORMATION EXCHANGE

8421 EAST CORTEZ ST. SCOTTSDALE AZ 85260

602-948-3996

### RARE MN12s

	1989	1990	1991	1992	1993	1994	1995	TOTALS
S C	12,809	21,966	7,039	4,212	3,891	2,647	5,741	58,305
5 SPD	8,041	6,067	1,905	1,256	1,038	722	574	19,603
35TH		3,371						3,371



# THUNDERBIRD INFORMATION EXCHANGE

8421 EAST CORTEZ ST. SCOTTSDALE AZ 85260

602-948-3996

AUGUST 1996

## PRODUCTION STATISTICS

SOURCE: AUTOMOTIVE NEWS

NORTH AMERICAN PLANT LOCATION:

LORAIN, OHIO USA

FOR US&CANADA

ALL MN12	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
TBIRD V8	0	0	16,232	12,562	19,587	66,657	94,155				
V6	102,059	82,636	59,543	57,119	106,234	51,056	14,927				
V6 SUPERCHGD	12,809	21,966	7,039	4,212	3,891	2,647	5,741				
5 SPEED MAN.	8,041	6,067	1,905	1,256	1,038	722	574	N.O.			
TOTAL TBIRD	114,868	104,602	82,814	73,893	129,712	120,360	114,823	77,700			
COUGAR	102,275	76,467	63,701	49,254	79,700	71,026	60,201	40,700			
MN12 YEARLY TOTAL	217,143	181,069	146,515	123,147	209,412	191,386	175,024	118,400			
CUM TOTAL		398,212	544,727	667,874	877,286	1,068,672	1,243,696	1,362,096			

THUNDERBIRD	V8	V6	V6 SC	5 SPD	TOTAL
1989	0	102,059	12,809	8,041	114,868
1990	0	82,636	21,966	6,067	104,602
1991	16,232	59,543	7,039	1,905	82,814
1992	12,592	57,119	4,212	1,256	73,893
1993	19,587	106,234	3,891	1,038	129,712
1994	66,657	51,016	2,647	722	120,360
1995	94,155	14,927	5,741	574	114,823
1996			N.O.	N.O.	77,700
1997					
1998					
1999					
yearly cumulative total	209,223	473,534	58,305	19,603	818,772

N.O. = NOT OFFERED

NOTE: ALL 1996 FIGURES ARE ESTIMATES.

## Oil Pressure Gauge ... Or Is It?

*"When you see an oil pressure gauge, you just assume that it is indicating engine oil pressure ... right?"*

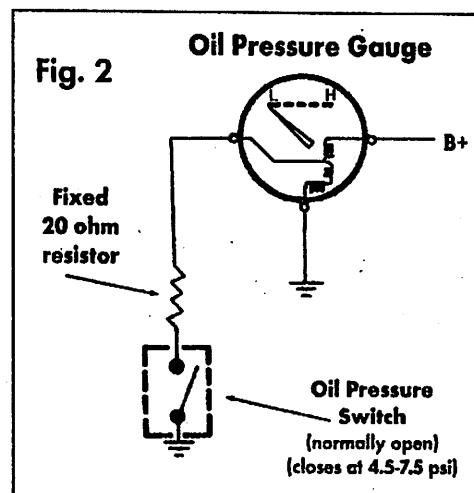
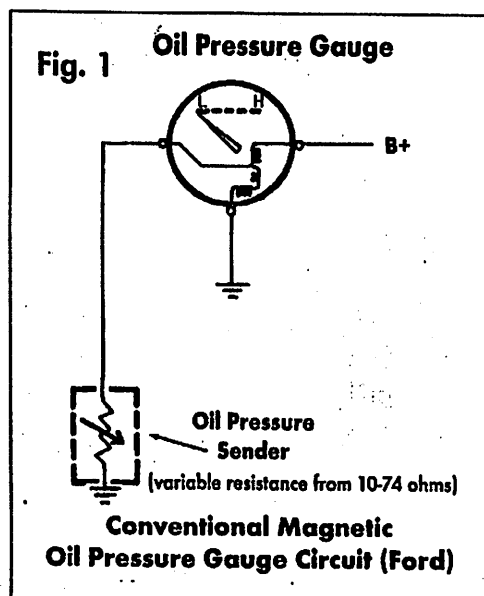
I have always viewed oil pressure, voltage and temperature gauges as nice features for monitoring the underhood conditions and trends of an automobile. The downfall of warning lights (also known as "idiot lights") is that they only alert you to a severe condition after the fact – the engine is extremely hot, or the oil pressure is extremely low – but nothing in between! When you see an oil pressure

gauge, you just assume that it is indicating engine oil pressure ... right?

In recent years, Ford Motor Company has been doing something I view as a bit sneaky. They have taken the oil pressure gauge and turned it into a glorified warning light. It says it's an oil pressure gauge, it looks like an oil pressure gauge, but in reality it is not.

A conventional magnetic oil pressure gauge on a Ford consists of a gauge and a variable resistive sending unit (Fig 1). As oil pressure changes, the resistance of the sending unit changes, which in turn causes the gauge needle to move.

This system worked well for years, but starting in 1986 a change was made on some models that altered the function of the oil pressure gauge as we knew it. The variable resistance sending unit was replaced with an open/closed switch and an in-line 20 ohm resistor was installed between the gauge and the switch (Fig 2). Anytime you have more than 4.5 psi of oil pressure, the switch closes, completing the circuit from the gauge (with the 20 ohm resistor in-line) to ground. This then results in a gauge that reads just above the middle. As you can see, there is no variation to the gauge needle in this circuit. It will either read no oil pressure or half-scale (normal oil pressure). On this style of gauge circuit, if the oil



***"To determine what style circuit you have, simply ground the sending unit wire with the key on. If the gauge reads exactly half-scale, you can be fairly sure you need a switch-style sender."***

pressure gauge reads in the middle, it is telling you only one thing – you have more than 4.5 psi of oil pressure. How much more is anyone's guess at that point. When oil pressure drops below 4.5 psi, the gauge will return to 0 and alert the driver of a problem. Didn't warning lights tell us that much?

Ford released a TSB (#88-5-14) for 1987-1988 F Series and Broncos that called for converting the variable resistive style oil pressure gauge circuit to the switch style circuit – if the customer complained of low or erratic oil pressure readings. The kit contains an oil pressure switch and an in-line 20 ohm resistor that is to be connected between the end of the existing sending unit signal wire and the new switch. The variable resistance oil pressure unit removed from the vehicle is then discarded.

I want to point out some diagnostic problems that can arise from this circuit. First, if you are working on this switch style oil pressure circuit (with the in-line 20 ohm resistor) and install a variable resistive sending unit in place of the oil pressure switch, the result will be a gauge that reads lower than normal due to having two resistors in series, the

fixed 20 ohm in-line resistor and the variable resistive sending unit. On the other hand, installing the open/closed switch on a vehicle that incorporates the conventional oil pressure gauge circuit will result in a pegged gauge needle after starting the engine.

Sometimes you can tell that you need a switch instead of the variable resistive sending unit by the presence of the in-line resistor a few inches from the switch connector. This is not a good rule of thumb though, since many vehicles have the fixed resistor on the back of the cluster, and some of the digital dashes have that circuit built into the cluster. To determine what style circuit you have, simply ground the sending unit wire with the key on. If the gauge reads exactly half-scale, you can be fairly sure you need a switch-style sender. If you ground the sender wire and the gauge pegs, a variable resistor-style sender is needed.



Jamie MacFarland is ASE master and L1 certified. He is an AutoLine Ford specialist with 13 years of experience.

Each month, technicians from AutoLine Telediagnosis share valuable TechTips with our readers. We print TechTips on heavier paper so you can three-hole punch them and save them for future reference. As an ASA member, you're already signed up to use the AutoLine technical diagnostic service at a discounted rate.

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**SCOTT SHOCKLEY**

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46070 Lake Villa Drive #107  
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April 8, 1998

Super Coupe Club of America  
2239 Banbury Street  
Charlottesville, Virginia 22901

Dear Bill:

I just received my latest news letter yesterday, and it jogged my memory that I haven't sent in my check for dues, please find my enclosed check for another year of entertainment and education.

Also I wanted to comment on a few issues myself. As for the news letters, I agree with the other members that they can be too full of information and I find myself unable to put it down until I have reached the back cover, no matter what time in the morning that may be. Keep up the good work.

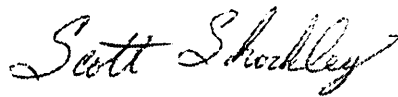
On another subject, the Mazda five speed transmission. I own a '92 and a '94 both with the Mazda units. The '92 was rebuilt last year because of the disease that infests them all, this one wouldn't go into second gear. It was rebuilt by a local shop with brass blocker rings from what I believe to be the M5OD-R2 trans from the truck line. I was also informed by D&D Performance in Wixom, Michigan to switch to the General Motors Syncromesh or equivalent trans fluid as it was more compatible with the brass components. My '92 now shifts sweeter than my '94 with half the mileage, and it goes into reverse every time. The '94 is headed in the same direction with becoming cantankerous, however I am gathering information on a possible T-56 swap, any information on the subject would be greatly appreciated.

I can hardly wait for your described book, I'll take two copies!! I was wondering if you could also include some production figures for all the years as well as a break down for each year. I joined the club this time last year, the best thing I could have done. Keep up the great work.

I am also enclosing some copies of press items from my collection on the SC and the supercharged XR-7. Maybe for future Superchargers or the upcoming book.

Thanks again have a **super** day!

Sincerely,



Scott Shockley  
Project Engineer

GM Powertrain  
ss

Enclosure: 12

# Motor Trend's Car of the Year Award.

The automotive industry has always taken it seriously. And three of the last four years, Ford has taken it home.

There are many automotive awards, but not many mean as much as *Motor Trend* Car of the Year. It's coveted by the automakers. It's important to consumers. And it's going home with us. Again.

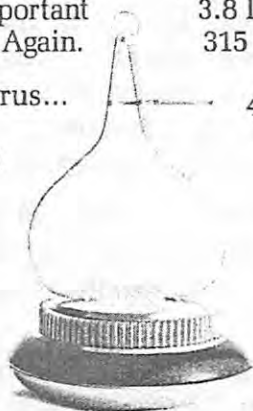
In 1986, Ford took the honors with Taurus... chosen for its innovative design and engineering. The next year, Thunderbird Turbo Coupe gave Ford a record second consecutive win.

Now the new Ford Thunderbird SC has been named the 1989 *Motor Trend* Car of the Year, and it's easy to see why.

Beneath this Thunderbird's sleek

exterior is the most powerful supercharged production engine in America: an intercooled, 3.8 liter V-6 that turns out 210 horsepower and 315 foot-pounds of torque. Four-wheel-disc anti-lock brakes are standard. And so is a 4-wheel independent suspension with automatic ride control.

It's that combination of outstanding styling and advanced technology that's earned Ford an unprecedented three *Motor Trend* Car of the Year awards in the last four years. And that kind of design leadership is the reason we're winning the world over.



Buckle up—together we can save lives.

Super Coupe Club of America  
Phone: 804-974-6659  
Fax: 804-974-9965

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## The Winner

In 1987, when we named the Thunderbird Turbo Coupe our Car of the Year, we called it the highest-flying Thunderbird ever produced. Little did we realize as we penned those words that Ford was, at the same moment, preparing a new supercharged vehicle that would take the Thunderbird name closer to the stratosphere.

The '89 Ford Thunderbird SC offers everything a personal luxury car buyer could ever want. It delivers speed, style, comfort, convenience, and value in prodigious quantities that belie its palatable under-\$20,000 base price. From the tip of its sharply styled prow to the tuck of its understated stern, the T-Bird is an exercise in world-class design and engineering.

It's hard to know where to start in describing the many fine qualities of the Thunderbird SC. One could logically begin with the exterior design, because the newest Thunderbird is certainly a car that says what it's all about from the first moment it rolls into view. Luxury and style, youth, and sophistication are melded into its design concept. Its expansive hood, sharply raked glass, and taut lines make its predecessor seem almost dowdy in comparison.

And then there are the Thunderbird's mechanical features, a laundry list of what should be in a car of this type. To Ford's credit, Thunderbird engineers have not slavishly followed the *au courant* thinking in the automotive world. Despite the current popularity of front-wheel drive, they have chosen to build their flagship model with powered rear wheels to give it a more sporting feel. Indeed, because of this drive system and the Thunderbird's electronically controlled all-independent suspension, our 1989 Car of the Year is one of the most balanced and controllable cars we've ever driven.

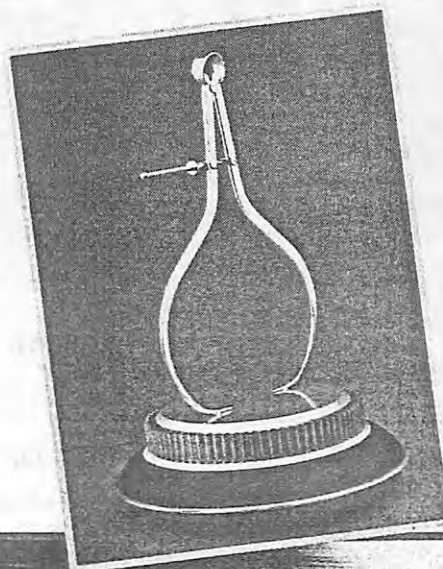
Of course, the driving is enhanced by the SC's wonderfully powerful and responsive engine. There is nothing inherently earth-shattering about the basic engine—Ford's 3.8-liter pushrod V-6—but the motor has been transformed by the addition of a Roots-type supercharger. In this trim, the V-6 offers 210 lag-free horsepower and gobs of useable torque with a peak figure of 315 lb-ft at a laudably low 2600 rpm. We do have a few quibbles with the gear splits in the manual transmission (thank you, CAFE), but there's no doubt the Thunderbird SC has the horses to keep even the most sporting driver interested.

When it comes time to stop, the

Thunderbird SC also has the goods with a computerized anti-lock braking system actuating its 4-wheel disc brakes. When combined with the anti-squat, anti-dive suspension, the Thunderbird is as secure as it is sporting.

As befits a luxury car, the Thunderbird SC offers its occupants quietly tasteful amenities, including some of the best sport seats we've ever encountered. The new instrument binnacle is stuffed with all the right gauges, and from steering wheel to shifter to heater controls, everything's arranged to put the driver in control.

All of these positives come from a commitment within Ford Motor Company to offer world-class products. This commitment starts with CEO Donald E. Petersen and extends throughout the far reaches of the corporation. We can only express our appreciation to all the people at Ford Motor Company for the Thunderbird SC. **MT**







# Supercharged Coupe

*The all-new 1989 Thunderbird Super Coupe* by Tom Wilson

Ford rumors have come in two varieties lately: Mustang and Thunderbird. The 25th Anniversary Mustang has provided so much grist for the mill it's amazing Rumor Inc. has time to grind up anything else. But the all-new Thunderbird has managed to find its way into early print numerous times as well. While the limited-edition Mustang may turn out to be more limited than we'd like, the '89 Thunderbird, along with its corporate cousin Cougar, has already flown the coupe and strutted its stuff in front of the gathered motoring press at Ford's Dearborn proving grounds. As for the strut, you bet we like it.

In starting with an all-new platform, Ford's goals were to replace the current Thunderbird series and move the top-of-the-line Super Coupe into the forefront of the mid-size performance car offerings. Because the current T-Bird had set the domestic mid-size market abuzz in 1983 with its aerodynamic styling and excellent value, its replacement would be forced into an aggressive, spearhead position if it was to move forward. Therefore, Ford engineers didn't waste any time making minor changes; they went straight to basics with a clean sheet of paper.

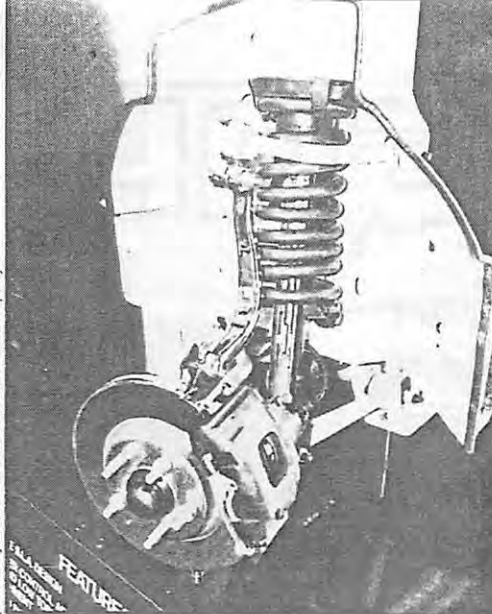
For starters, the Thunderbird wheelbase was stretched almost nine inches and overhang trimmed by almost 3-1/2 inches. The obvious result is a noticeably foreshortened beak. From a pure styling viewpoint, the reduced overhang is much more modern and looks great with the front wheelwells reaching almost to the top of the fenders. The new body looks sleek in the wind tunnel, too. The clean standard and LX versions measure Cd's of 0.31, while the more flamboyant SC's flares, dams and skirts bring the Cd to 0.35. But there are other ramifications to the longer wheelbase that don't show that easily. One is the vastly increased rear seat room. Now the Thunderbird is a true five-seat car because the rear wheel wells don't intrude into the passenger space, and there's more front seat room too. High-speed stability is also helped by the longer wheelbase with the current platform, and rear seat access is also improved.

On the minus side, moving the wheels closer to each end of the car adds weight. While it may seem like it makes no difference where on the platform the wheels go, the farther they spread, the less torsional rigidity is left in the chassis. This means more gus-

sets, thicker unit body material and increased use of stiffening members. It all adds up to more weight for the same torsional rigidity. Long wheelbase or no, the new Thunderbird appeared plenty stiff in our driving stints.

Weight in general is a concern, but without exotic materials or giving up structural integrity, there's little to do. Ford lists the curb weight at 3,542 pounds, and says the excess 300 pounds or so come from the aforementioned long wheelbase, passive restraints, extra side impact protection to be mandated later and the rear suspension subframe.

With the wheelbase set at 113 inches, the engineers turned to the suspension. World-class ride and handling were the goals, and to that end, MacPherson struts were ruled out; they would have been too tall for the projected low hood anyway. The design which met the requirements is a modification of the unequal length A-arm suspension so common before struts, which Ford calls SLA for Short/Long Arm. A single cast link connects the spindle to the chassis and provides a lower mount for the coil-over shock. Atop the tall spindle is an A-arm. Compression rods (tension struts) attach to the lower arm,



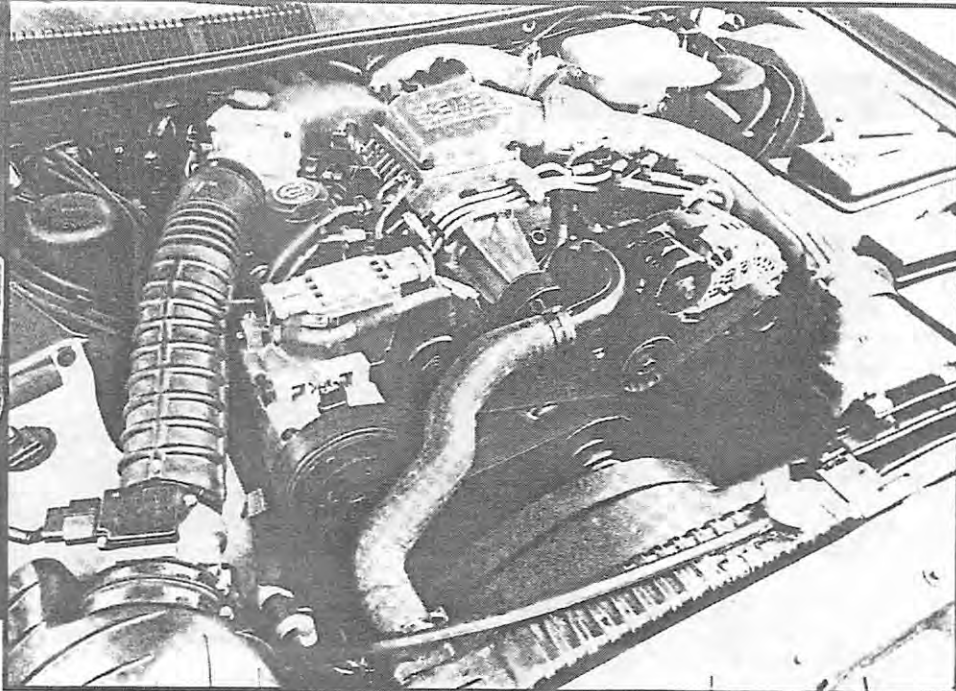
Low hood line mandated front suspension design: "SLA" as Ford calls it for "short/long arm." Sway bar is 1.2 inches thick (1.1 for standard 'Birds). The entire four-wheel independent system not only looks neat, it works.

as does the sway bar. Base models use a 1.1-inch bar, sport models 1.2-inch. Advantages of the SLA design are ease of alignment, tire wear and handling.

In back, an even more innovative suspension is used. Gone is the heavy, difficult-to-control live axle. Instead, a subframe-mounted independent suspension was designed for superior handling and reduced noise and vibration. Two locating arms and a spindle are used per wheel. The lower arm is a quite large "H," while the upper is a simple single link, curved to fit under the unit body's frame rails. Coil springs, gas shocks and sway bars are standard on all cars. Base suspensions use one-inch sway bars, sport models, 1.1-inch.



The Thunderbird Super Coupe interior is all new for 1989. Passive restraint shoulder belts are standard for all '89 Thunderbirds.



Supercharged 3.8-liter V-6 makes 210 horsepower. The supercharger actually blows up, not down, to route air through the intercooler and into the rear of the intake manifold.

Additionally, Ford has added a toe link between the frame and lower H-arm. As the suspension compresses, the toe link pulls the H-arm forward on its bushings, toeing-in that wheel. This promotes understeer at the front wheels, but because the entire suspension system has been designed for oversteer, the toe links actually make the Thunderbird handle neutrally. Call it poor man's four-wheel steering if you want, but the system is simple, inexpensive, lightweight and works well.

Ford literature also highlights some interesting suspension facts on the MN-12 series, as the new T-Bird and Cougar are known at the factory. Compared to the current 'Bird, the new suspension reduces roll 30 percent, and the roll center is parallel with the ground, so the nose doesn't "dig in" when rolled over in a turn. There is five times more anti-dive built into the front suspension for better braking, plus a reduced turning circle; a whopping 5.6 feet tighter. Ford has also

adopted the old European sedan trick of adding a bushel of caster to the front suspension for better camber rates during suspension compression. The old chassis used two degrees caster, the MN-12 geometry has 6.5 degrees. This keeps the outside front tire flatter on the ground while cornering, increases steering feel and provides straight-line stability. As for ride, there is 6.9 and 17 mm more suspension travel front/rear, variable-rate springs and gas shocks with hydraulic rebound stops. The '88 Turbo Coupe's automatic adjustable suspension has also been carried over to the SC and XR7 models.

In the brake department, the standard platform is power disc/drum, while the SC and XR7 boast four-wheel power discs and standard ABS. Luckily, ABS is optional on the standard cars. The engineers say the MN-12 brakes are larger than the current model, which combined with some master cylinder tweaks results in less pedal travel.

Inside, there is increased room front and rear. Every dimension has been increased, including an extra 1.5 inches of front seat travel, 7.1 inches of rear hip and 3.9 inches of rear shoulder room. The standard T-Bird interior uses analog instruments, a console with floor shifters (auto or manual), rear seat





## SPECIFICATIONS



### Thunderbird Super Coupe

Length (inches)	198.7
Width (inches)	72.7
Height (inches)	52.7
Wheelbase (inches)	113.0
Track (l/r inches)	61.4/60.2
Curb weight (lbs.)	3,542

### Engine:

Type	90-degree V-6 supercharged, intercooled
Valvetrain/Valves per cylinder	ohv, 2
Bore x stroke in./mm	3.81 x 3.39 (98 x 86)
Displacement cubic inches/cc	232 (3,800)
Compression ratio	8.2:1
Maximum boost	12 psi (approx.)
Fuel system	Sequential multi-port EFI (EEC-IV)
Fuel requirement	92 octane unleaded
Bhp	210 @ 4,000
Torque	315 @ 2,600

### Drivetrain:

Transmission type	Five-speed manual
Gear ratios (:1)	
1	3.75
2	2.32
3	1.43
4	1.00
5	0.75
Final drive ratio (:1)	2.73 w/Traction-Lok
Optional	Four-speed automatic w/overdrive
1	2.40
2	1.47
3	1.00
4	0.67
Final drive ratio (:1)	3.08 w/Traction-Lok
Optional final drive ratio (:1)	3.27 w/Traction-Lok

### Chassis:

Steering type	Rack and pinion w/speed variable power assist
Suspension front	Long spindle SLA using upper A-arm, single lower arm, coil-over shock, stabilizer bar
rear	Independent w/lower H-arm, single upper arm, coil springs, tube gas shocks, stabilizer bar
Brake type	Disc/disc, power assist
diameter (l/r)	10.8/10.0
Wheels	16 x 7.0 cast aluminum
Tires	Steel-belted radial, P225/60VR 16 BSW
Spare	T125/70D15 mini-spare

### Performance:

0-60	7.2 seconds
Standing 1/4-mile	15.83 seconds @ 90.2 mph



Cougar XR7 for '89 is Mercury's mirror image of the supercharged Super Coupe.

heat ducts and the same motorized shoulder belt system found in the Escort. Additionally, the steering wheel hub and dash have obviously been designed for air bags.

Naturally, the Super Coupe is our main interest, and it uses a simple, effective analog instrument cluster. All the expected instruments are there, and easy to read behind the leather-wrapped steering wheel. Where the SC panel fails, and to our thinking, the worst characteristic of the MN-12 series, is the remainder of the dash outside of the instrument cluster. The heater and ventilation controls are finished in chrome, as are the sound system knobs. Perhaps Ford just wanted to get away from so much black-out, but the chrome is too Kansas City for our tastes.

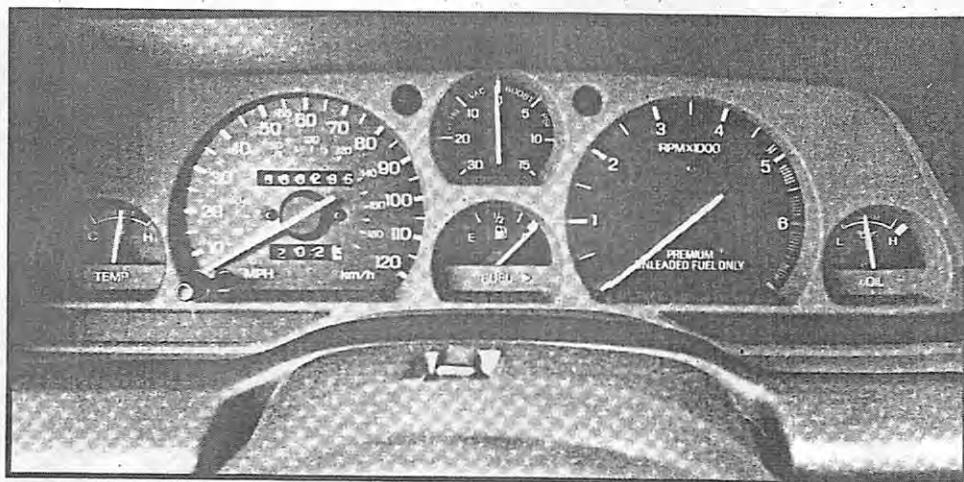
There's big news in the powertrain department, highlighted by the supercharged and intercooled 3.8-liter V-6, of course. For details, see the sidebar, but for now we should note the blown V-6's 315 ft.-lbs. of torque give the new 'Bird the relaxed muscle the old buzz box 2.3-liter turbo only dreamed of. The bottom line on engine performance is the Super Coupe feels just like it has the 5.0-liter HO V-8, but without all the weight over the front wheels.

Transmissions are the only major components carried over to the MN-12. Both the four-speed automatic and five-speed manual are shared with the Mustang and Lincoln LSC. All shifters are floor mounted.

Proof's in the driving, we say, and after lapping various MN-12s, we're sure Ford has another winner. The base version impresses with its not-too-soft, well-controlled ride, but for the slightest sporting intent, the



That's right — IRS for the first time in a rear-wheel-driven FoMoCo product! Four-wheel ABS discs are also part of the package, as are automatic adjustable shocks. The Super Coupe's rear sway bar measures 1.1 inches; standard 'Bird use one inch bar. The entire IRS system mounts on an independent subframe, enhancing NVH (noise, vibration and harshness) characteristics.



Super Coupe instruments are large and easy to read behind the leather-wrapped steering wheel.

Super Coupe/XR7 is the only choice. We cannot over-emphasize our appreciation for the immediate boost of the blower, or the earth-rotating torque thus produced. Power is immediate, swells up through the mid-range, then falls off. There's just enough whistle at high rpm to announce the blower's presence, otherwise the system is silent.

#### NEW THUNDERBIRD = NEW MUSTANG?

Once past the excitement of examining the MN-12, the obvious question is: can this platform be converted into the next Mustang? After all, the MN-12 is rear-wheel drive, strong enough to handle high-torque engines and designed with upcoming passive restraint legislation in mind.

In a word, Ford insiders think not. Perhaps as a long-term reaction to the Pinto fires, or maybe just for more trunk room, the MN-12 places the fuel tank underneath, ahead of the rear axle. Obviously, this isn't the roomiest location, and with some work, the engineers managed to squeeze 19 gallons down there. The second part of the tale is wheelbase. The current Mustang measures 100.5 inches between wheels, the MN-12 113.0 inches. About a foot of wheelbase would have to go to make a Mustang off the MN-12 platform. But to remove a foot of MN-12 inevitably means cutting down the fuel tank — and no one wants an eight-gallon Mustang.

Weight is also a consideration. A lighter Mustang is a better Mustang, and the MN-12 is not designed to minimize weight, what with its rear suspension subframe and generous interior room.

So what's a company to do. The engineers are hoping for a clean sheet of paper for the next Mustang chassis. The MN-12 might still be a used if money gets tight, but the chances are low. Better to hope for a second rear-wheel drive platform for America's pony car.

Handling is excellent, with less understeer than expected for a large car. The rear toe links really work, and rolled over into fast sweepers, the Super Coupe retains just a hint of understeer. Try as we might, oversteer could not be induced by tossing or full throttle. Sure, the most violent yanks at the wheel or stab at the brakes will bring the tail out, but just as quickly it tucks back in.

Full-throttle starts in the five-speed will hop the rear tires on Ford's concrete test surface, and it will take an experienced drag racer to get the last tenth out of the Super Coupe. The launch must be soft enough to avoid wheel hop, but hard enough not to bog the engine. We managed excellent times for a 3,500-pound car; 0-60 in 7.2 seconds and 15.83 at 90.2 mph for the quarter-mile.

So, yes, the new Thunderbird is an excellent car. Perhaps even more importantly, this new car follows impressive Taurus and Thunderbird predecessors, cars which built the current Ford reputation for content and quality. The new Thunderbird will only augment this reputation, reinforcing Ford's supremacy in the U.S. market. **SF**

#### ROOTING FOR SUPERCHARGERS

It's no surprise we've been nervously tapping our word processor for a peek at Ford's Roots supercharged engine. Well, we've had our peek and a drive, too, and now we're tapping the word processor waiting for our next stint behind the Super Coupe's wheel.

Ford started with the 3.8-liter pushrod V-6 found in the Taurus and base '89 Thunderbird for its supercharged project. Along the way, many parts were changed for longevity's sake, and engineers at Dearborn were quick to squash any ideas about adding blower bits to standard 3.8-liters already on the streets.

Both the block and heads have been stiffened for blower work, and the crankshaft is uprated, too. To offset the blower's 63 pounds, the heads are T-6 aluminum. The compression ratio is lowered through special pistons to 8.2:1 (9.0:1 is standard on the normally aspirated 3.8 liter), and the cam is different on manual trans engines, too. Automatic shift engines use the base 3.8-liter cam with its shorter intake and longer exhaust duration. The Super Coupe exhaust system is dual almost all of the way back. About mid-car, the fuel tank intrudes; the exhaust is routed into a single pipe, then split again at the tailpipes.

Ford found a novel way of getting around the supercharger drive/distributor clearance problem. They eliminated the distributor; the blown V-6 uses crankshaft damper position and rotation, along with EEC-IV electronics, to fire three coils in the Distributorless Ignition System (DIS). With three coils, each plug fires twice.

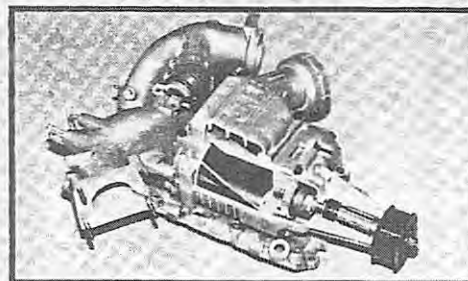
Several fuel system mods are necessary with the supercharger's increased air flow. First, a mass air flow meter is used to electronically sniff the air mass entering the engine. This information is relayed to the EEC-IV computer, then relayed to essentially the same EFI system found on the normally aspirated engines.

As for the supercharging system itself, there's a little more to it than bolting on the windmill. To run 12 pounds of boost, Ford realized intercooling was a necessity, and air routing became quite a maze. From the filter, air passes through the 60mm throttle body, then turns 90-degrees down into the bottom rear of the Eaton-built supercharger. Sweeping 90 cubic inches (1.5 liters) of air per revolution, the blower paddles the air upwards into the intercooler. Up to 150 degrees cooling can take place in the intercooler, which then routes the air to the rear of the intake manifold. The manifold is simple-looking in cutaways — a low, flat, open plenum — but a few ribs and deflectors make one assume precise air routing took some R&D. The engineers say air distribu-

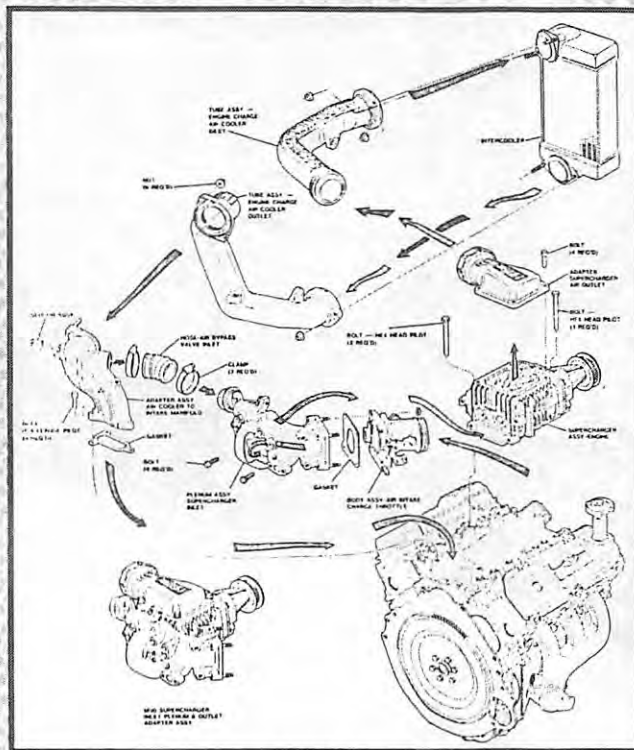
tion is very good, and not too difficult to achieve because the manifold handles dry flow only. Once past the manifold, the air heads down the ports where fuel is added.

To decrease drive losses under no-boost conditions, a by-pass valve is connected between the intercooler outlet and supercharger inlet. A vacuum motor powers the valve, which gradually closes as boost is needed. Maximum boost is limited by supercharger size and rotational speed, thus there is no wastegate.

Drive speed is 2.6 times crankshaft speed, which works out to 15,600 rpm maximum. Max boost is reached at 4,000 rpm, so the torque curve is nice and fat down low, while top end power trails off fairly fast past the power peak. Near 5,000 rpm the blower consumes 60 horsepower, but at a steady 55 mph, Ford claims only a 1/2 horsepower draw.



*Twisting the supercharger rotors 60 degrees gives optimum equalization between blower inlet and outlet volumes and reduces noise-inducing pressure pulses. Helically twisted rotors help reduce clearances. The chambers are formed by casting ribs inside the supercharger housing, and reduce noise an amazing 6 decibels.*



*Supercharger system operation*



**G**od bless Bruce Kopf. Back in 1984, Thunderbird/Cougar Program Planning Manager Bruce Kopf sat down with Ford and Lincoln-Mercury designers and engineers—even the frequently maligned marketing planners—to supervise the nucleus of a group that would redirect the future of two of Ford's most important vehicles. Codenamed the MN12 platform, it would be a complete redraft of the Thunderbird and Cougar only a brief two years after the previous freshening.

In the Cougar's case, the MN12 would mark the car's return to a performance arena abandoned when Mercury dropped the 2.3-liter turbocharged engine from the XR7's option list, replacing it with the milder 5-liter

V-8. This was an intentional diffusion of the current Mercury performance image. Mercury buyers were felt to be more interested in luxury/sport attributes, rather than the reverse.

Kopf's group had a formidable task: to differentiate the MN12 from the competition expected for 1989, as well as differentiating the Cougar from the Thunderbird in a brand new way. Cougar buyers are not Thunderbird buyers for a raft of reasons, but the absence of a genuine high-performance Cougar was a real one, one that ignored a Mercury and Cougar performance history that in some instances went back decades. The '89 Cougar XR7 should bring more to the party than tepid performance and be more than a pale shadow of the Thunderbird's distinctive silhouette.



**At full throttle, the driver  
can run away from friend  
or foe alike almost as fast  
as a bolt leaving a crossbow**



## It's as refined a world-class motor car as anything built in German factories

God bless Jim Kennedy. Kennedy is the manager of mid-size specialty car development engineering. It fell principally to him to implement the philosophy Bruce Kopf's think-tank handed down, to turn the ideas into hardware. The '89 Mercury Cougar XR7 is as refined a world-class motor car as anything built in German factories. For any automobile today, the federal government mandates where the bumpers, headlights, and taillights must be located. It's up to the designer to fill the gaping void between those rules.

The division between Thunderbird and Cougar fans has always been clear and distinct. In our experience, you either like one and dislike the other. The '89 XR7 will probably be the first truce in this long-standing conflict.

The supercharged XR7 is fresh and Cougar at the same time. It has the aero-look sleekness we've come to expect in new Ford products, yet it retains the Cougar-specific formal roofline, for a clientele who are often more formal themselves. The Thunderbird Super Coupe is the equivalent of a body-builder, a well-dressed but aggressive car with a subdued kind of "I dare you" chip on its shoulder. The Cougar XR7 is a steely eyed martial arts master in a Brooks Brothers suit, a lithe and powerful demonstrator of mature authority held in reserve until the need arises.

The supercharged powertrain options are identical to the Super Coupe's. Ford's 3.8-liter 90° V-6 is installed in a north-south configuration, bolted to either a Mazda high-torque 5-speed manual gear stirrer or a Ford 4-speed automatic transmission with overdrive and lockup torque converter. The automatic in our tester is well matched to the ten-

or and driving tempo of the XR7. Generally, the Cougar buyer will opt for the automatic, and we found the automatic smooth and tractable almost all the time.

Ours was one of the early "P4" prototypes, among the first permitted for a fully instrumented road test, and its prototype status was underscored by performance glitches we expect will be deleted from production cars. In routine driving, the torque converter in our early car locked up with an unusually audible authority for a sport/luxury car. An abrupt kick-down from full-throttle often resulted in a severe *clunk* as the automatic hurried to carry out its orders.

Unless the down-kick is for more than two gears, highway downshifting for passing or just fun is smoothly efficient. At full throttle, the driver runs away from friend or foe alike almost as fast as a bolt leaving a cross-bow.

Fit and finish was prototype-level, so we can't score demerits now for the poor fit of the early grille. Production cars are expected to have a uniformly better fit. Yet, despite its prototype status, the car was remarkably free of squeaks or rattles, and everything we touched functioned the way it was designed to function.

Driving the car around town proved Cougar buyers know their new model when they see it. We in-

variably encountered other Cougars on the street, and their drivers invariably accelerated to shadow us for a once-over. Every single one of them flashed an approving thumbs-up in a road-going opinion poll.

When we didn't have time for a parade route, simply depressing the accelerator generated instant boost from the XR7's Roots-type positive-displacement supercharger. The Eaton supercharger is a 1.5-liter (90 cu in.) unit belt-driven indirectly off the engine's crankshaft. The supercharger spins at 2.6 times the crankshaft speed, so boost is virtually instantaneous. Maximum boost pressure stabilizes around 12 psi at approximately 4000 rpm.

A full-throttle departure from rest brings back a welcome performance memory lost since the large-caliber Cougars of the late '60s. Brake-torquing the XR7 just before launch guarantees you'll belie the Mercury buyer profile for quiet restraint—because you're going to take off like a scalded dog. The car pushes your behind forward like it had the space shuttle's SRBs strapped to each side. Don't be intimidated by opponents with manual transmissions. When you light this Cougar's candle, the XR7's boost is sustained as long as your foot is in it, and we've never yet encountered a driver who can shift faster than an automatic.

When you desire to carry that power into and out of turns, the XR7 complies without missing a beat. An all-new fully independent front and rear Automatic Adjustable Suspension (AAS) can be set for Firm or Auto. In Auto setting, the Cougar provides the kind of compliant ride quality we associate with Mercury products.

But, like the Super Coupe, when any of a series of velocity-based al-

**The redesigned  
interior shows BMW  
what a functional  
interior a  
sport/luxury car  
can have**



## The '89 Cougar XR7 brings more to the party than tepid performance

gorithms in the AAS detects loading in excess of approximately 0.3 g, the EEC-IV black box immediately orders the suspension to switch to the Firm setting, where it remains until the tripping input subsides. Basically an automatic scheme brought over from the Thunderbird Turbo Coupe, the settings have been refined to be less soft in Auto and less harsh in Firm.

A special feature of the rear suspension is the toe link attached from each control arm to the subframe. When side loading or large bumps are encountered, it "steers" the rear wheels. Ford says the geometry permits the suspension to be tuned for neutral handling without a shift to oversteer.

Steering via rack and pinion is

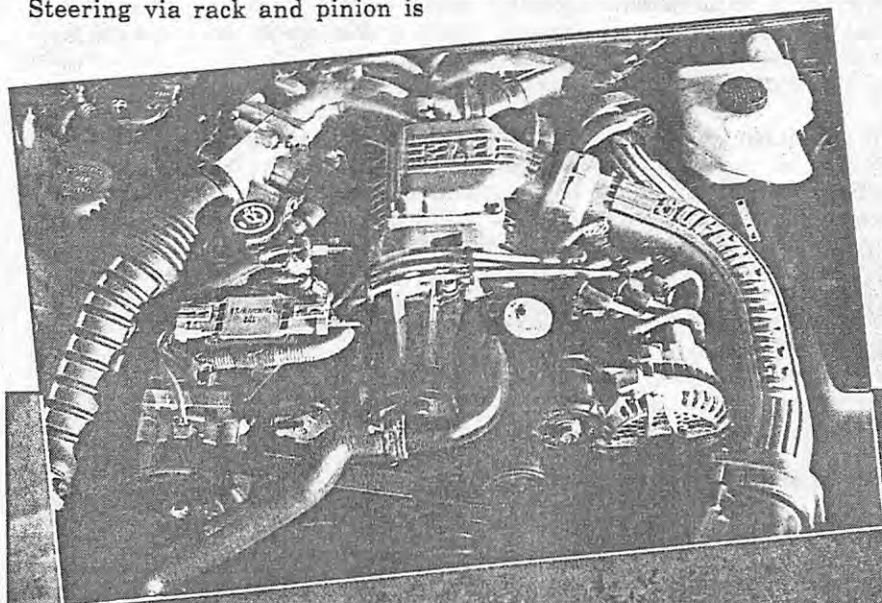
power-assisted using a speed-sensitive electronic variable-assist scheme. Essentially the same unit employed on last year's Lincoln Continental, it offers reduced steering effort at slow speeds and increased steering effort at higher speeds. The effort increases incrementally up to about 95 mph, where it becomes constant. The steering uses an electronically variable orifice (EVO) control within the power steering pump. The system monitors vehicle speed and adjusts the steering effort upward or downward as speed dictates. The great feedback at higher speed is reassuring, especially since the XR7 is capable of quickly attaining high speed. The reduction of power assist improves road feel, and abets the driver's feeling of a direct

connection to the road.

Hard cornering at high speed causes no undue concern. At the edge of traction, the car may signal an intention to swap ends, but that tendency is muted and predictable. The biggest emergency problem we had related to the power steering. Hard left/right transitions quickly overcame the assist. This resulted in a sudden disappointing loss of assist somewhere in the steering wheel's arc, under the conditions where quick reflexes must be a given. The car's power assist under such emergency conditions could be improved significantly.

The car is a stylistic success inside and out. From the low front end and cowl to its Mercury-signature full-width reflector and taillight panel, the XR7 is contemporary monochrome. Its overall length is shorter by about 3 in., but the wheelbase is extended about 7 in. over the previous Cougar. Moving the wheels toward the ends of the car improves ride and promotes stability.

The interior is completely new. A full set of instruments, including a supercharger boost gauge, is nestled into a deep-set instrument binnacle. The XR7's ergonomics are optimum: Controls are well identified and in places where you expect them. The





fat, leather-covered steering wheel tilts and won't block your view to the read-outs.

The shifter is located in a full-length console between two of the best power-operated bucket seats we've experienced. They offer adjustments in a full range, including lumbar, and have the most aggressive side bolsters since aftermarket Recaros. We put the supercharged XR7 through a series of simulated emergencies at our test site, and the car just flat gets the job done.

Also new this year is an automatic shoulder-belt passive-restraint system. The shoulder belt traverses an automatic route from the A-pillar to the B-pillar when the door is closed and the ignition switched on. The lap belt fastens manually. We'd much rather see a three-point belt and an airbag instead of this half-passive half-active method. Three-point belts are used for the outboard rear passengers. The space for three back there is fine, too, or very good for two, though knee room is at a premium. For times when long cargoes are more important than passengers, either or both seats can be folded down for access to the trunk. The folding seatbacks are lockable with a

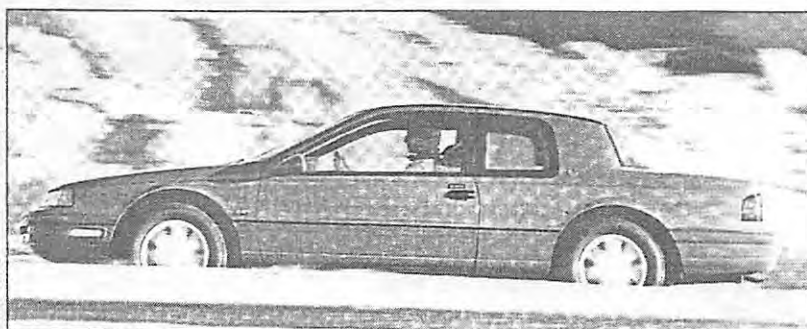


second key, so valet parkers can't get into the trunk.

The '89 Cougar XR7 demonstrates how much a car can change and still remain the same. By regaining a high-performance mantle it had discarded, the XR7 has all the aggressive authority of the Thunderbird Super Coupe, yet wraps it in an exterior that should still appeal to traditional Cougar buyers. The Cougar loses none of its luxury attributes in the performance model; indeed, the redesigned interior shows BMW what a functional interior a sport/luxury car can have. That's what the XR7 has become, you know. It's exchanged the luxury/sport past for a sport/luxury mission, sacrificing nothing in the transition.

MT

## TECH DATA



### Mercury Cougar XR7

#### GENERAL

Vehicle mfr.	Ford Motor Co., Dearborn, Mich.
Body type	5-pass., 2-dr.
Drive system	Front engine, rear drive
Base price	\$19,430
Price as tested	\$21,393

#### ENGINE

Type	90° V-6 liquid cooled, iron block, cast alloy heads
Displacement	3801 cc (232 cu in.)
Compression ratio	8.2:1
Induction system	Multi-port FI, supercharger and intercooler
Valvetrain	OHV, 2 valves/ cylinder
Max. power (SAE net)	210 hp @ 4000 rpm
Max. torque (SAE net)	315 lb-ft @ 2600 rpm
Emissions control	Dual catalytic converter
Recommended fuel	Unleaded premium

#### DRIVETRAIN

Transmission	4-sp. auto., O/D
Transmission ratios	
(1st)	2.40:1
(2nd)	1.47:1
(3rd)	1.00:1
(4th)	0.67:1
Axle ratio	3.08:1
Final drive ratio	2.06:1

#### CAPACITIES

Crankcase	4.3 L (4.5 qt)
Fuel tank	71.9 L (19 gal)
Luggage	416 L (14.7 cu ft)
Range (city/hwy.)	520/734 km (323/456 mi)

#### SUSPENSION

Front	Independent, long spindle short and long arms w/ upper A-arm, lower arm, tension strut, springs, automatic adjustable, gas-pressure shocks, anti-roll bar
Rear	Independent, lower H-arm, upper arm, variable-rate coil springs, automatic adjustable gas-pressure shocks, anti-roll bar

#### STEERING

Type	Rack and pinion, speed-sensitive electronic variable assist
Ratio	17.4:1
Turns (lock to lock)	2.8
Turning circle	10.9 m (35.6 ft)

#### BRAKES

Front	254 mm (10 in.), discs, power assist
Rear	274 mm (10.8 in.), discs, power assist
Anti-lock	Standard

#### WHEELS AND TIRES

Wheel size	16 x 7.0 in.
Wheel type	Cast alloy
Tire size & construction	P225/60VR16 steel-belted radial
Tire mfr. & model	Goodyear Eagle VR60

#### DIMENSIONS

Published curb weight	1683 kg (3710 lb)
Weight distribution, f/r	53/47%
Wheelbase	2870 mm (113.0 in.)
Overall length	5047 mm (198.7 in.)
Overall width	1847 mm (72.7 in.)
Overall height	1339 mm (52.7 in.)
Track, f/r	1560/1532 mm (61.4/60.2 in.)

#### SPECIFICATIONS

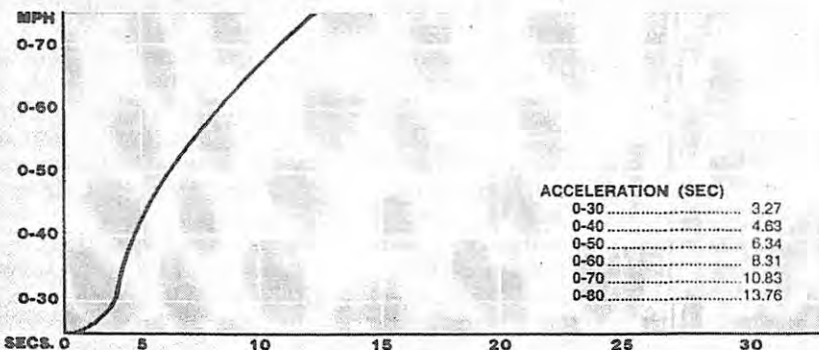
Power-to-weight ratio	16.9 lb/hp
Drag coefficient	0.37
EPA (city/hwy.)	17/24 mpg

#### MEASURED PERFORMANCE

QUARTER MILE	
TIME	16.45 sec
SPEED	87.8 mph
BRAKING	
60-0	130 ft
30-0	34 ft
SKIDPAD	0.83 g

#### SPEEDOMETER CALIBRATION

Indicated	30	40	50	60
Actual	28	38	48	58



# FORD'S HOT ONES FOR '90

## STARTING OFF THE DECADE WITH STYLE AND PERFORMANCE

By Ted Orme

**A**fter a rocky start in the grinding recession of the early Eighties and against a decade of the most dramatic change in the history of the auto industry, Ford Division went on a roll the likes of which haven't been seen since the Model T.

Ford began to turn its fortunes around with the introduction of the '81 Escort, a slick little subcompact that went on to become the world's best-selling car for seven years in a row. In 1983 an all-new Thunderbird solidly established the "aero look" as the company's signature for the rest of the decade. Last year Ford again revised the Thunderbird and earned *Motor Trend's* Car of the Year award for the third time in the Eighties. Nothing, however, rivaled the blockbuster effect of the '86 Taurus, which set a new standard for mid-size cars and easily dominated sales in its segment.

In the '89 Probe Ford and Mazda demonstrated the best relationship and product of any Japanese/American joint venture, while the romping, stomping Mustang continued its strong sales. To compete in the low-price market, Ford called on its South Korean partner, Kia, to produce the '88 Festiva, which helped Ford establish leadership in this segment.

In the light truck market there were the '83 compact Ranger pickup and its sport/utility sibling, the '84 Bronco II, both of which led their segments in sales. To do battle in the new minivan segment, Ford introduced the sleek Aerostar in 1986. Finally, if there were a "most popular vehicle award" for the Eighties it would go, hands down, to the full-size F-series pickup, which still outsells all car and truck models.

What all these new products did for Ford Division was something wonderful. In addition to increasing its market share during a decade in which GM took a beating, Ford snatched both car and truck sales leadership from Chevrolet in

1987 for the first time in 50 years.

As we begin the Nineties, there's no letting up. The big news at Ford this year is the debut of the all-new '91 Escort and Explorer models this spring. That's not the end of it, though. For 1990 Ford Division continues to focus on contemporary styling and value throughout its model lineup.

The Festiva gets several powertrain changes, and both the Festiva and Probe receive front and rear appearance changes. The Tempo continues to offer high value and versatility. The Mustang and Thunderbird, now in their 26th and 35th years, respectively, will offer special, limited-edition models in mid-model year to commemorate their American classic status.

## THUNDERBIRD: 35 YEARS YOUNG

Few enthusiasts who were alive and attuned to cars in 1955 will ever forget the sight of that first Thunderbird. Named by a Ford stylist who received a suit of clothes for winning a "name that car" contest, the rakish little two-seater turned heads in the street like Lady Godiva and single-handedly started the personal luxury-car segment of the U.S. market.

To commemorate this achievement Ford is building 5000 35th Anniversary Edition Thunderbird SC coupes this year. You will know them by a striking black and titanium two-tone paint treatment with blue accent stripes, black road wheels, commemorative fender badges and distinctive Thunderbird emblems on the car's taillights and hood. The interior will also be special with articulated sport seats in suede with leather side bolsters, a split fold-down rear seat and commemorative badges on door-trim panels.

Power and glory will also be part of the package. Last year *Motor Trend* editors fell in love with the SC's fluid styling, its 210hp, supercharged 3.8-

liter V6 with intercooler, its standard four-wheel disc brakes with ABS and its special handling suspension, and they made it *Motor Trend's* 1989 Car of the Year, the third time a T-Bird has won the honor.

Compared to today's sleek high-tech wonder, the 160hp, 102-inch wheelbase, 2833-pound original T-Bird was small and rather bare bones. However, power, style and innovation have been Thunderbird traditions throughout its evolution. In 1956 Ford went out on a limb by equipping the little roadster with a host of safety innovations, including energy-absorbing instrument panel padding, concave safety steering wheel, safety door latches, shatter-resistant mirror and optional seat belts. For some extra flair portholes were added to the detachable plastic hardtop—a portent of things to come.

America was a hungry nation in the late Fifties. Big was definitely better. So in 1958 Ford introduced the Square Bird, which started the upsizing trend in earnest. At 205 inches long with a 113-inch wheelbase, the new four-passenger T-Bird was bigger and more plush than its predecessor. Sales jumped to 48,482—nearly equaling total sales for the first three years of two-seaters. The T-Bird was named *Motor Trend's* 1958 Car of the Year.

The 1961-'63 Thunderbird carried the bullet-shaped projectile look, with a dual cockpit dash panel, the first swing-away steering wheel and a 390-cubic-inch, tri-carb, 340hp V8. In 1964, however, Ford went back to square one, so to speak, with a partially square design and wall-to-wall taillamps, thin-shell bucket seats with built-in headrests and pistol grip door handles. It was, alas, the last of the T-Bird convertibles.

From 1967 to 1970 Ford chose a jet aircraftlike design—long, thrusting hood and short rear deck—and, ye gads, introduced the first four-door, six-passenger T-Bird. That was followed by the last of the Big Birds in 1970-'76. These 4800-pound, 216-inch-long, 122-inch-wheelbase vehicles featured sharp noses and egg-crate



grilles, opera windows and standup hood ornaments.

In 1977, with the federal government's new fuel economy and emissions standards receiving top priority, Ford shaved more than six inches off the wheelbase and some 800 pounds off the new T-Bird. Buyers loved the trimmed-down model and bought 300,066 in 1977 and an all-time high of 352,750 in 1978. Ford continued downsizing with the 1980-'82 T-Birds, which featured a 108.4-inch wheelbase and a length of 200.4 inches.

The '83 T-Bird was a true milestone model for Ford. With a sloping hood, sharply raked windshield and backlight, and wrapover doors with concealed drip moldings, it achieved a Cd of 0.35—a new mark for cars in its class. The aero look became Ford's signature for the rest of the decade.

The '87 Turbo Coupe won *Motor Trend's* Car of the Year honors for its innovative 190hp, turbocharged and intercooled 2.3-liter engine, ABS brakes, auto ride control and 16-inch, VR-rated, unidirectional performance tires. The feat was matched on the race track when, in 1988, Bill Elliott won the NASCAR Winston Cup Championship in a race-prepared T-Bird.

The '89 Bird was not just another good-looking face. It also came with a much improved platform, four-wheel independent suspension and, for the SC, a supercharged V6 that outperforms most V8s—zero-60 mph in 7.8 seconds and the quarter-mile in 16.2 seconds—with a standard five-speed manual overdrive transmission. *Motor Trend* editors were thoroughly

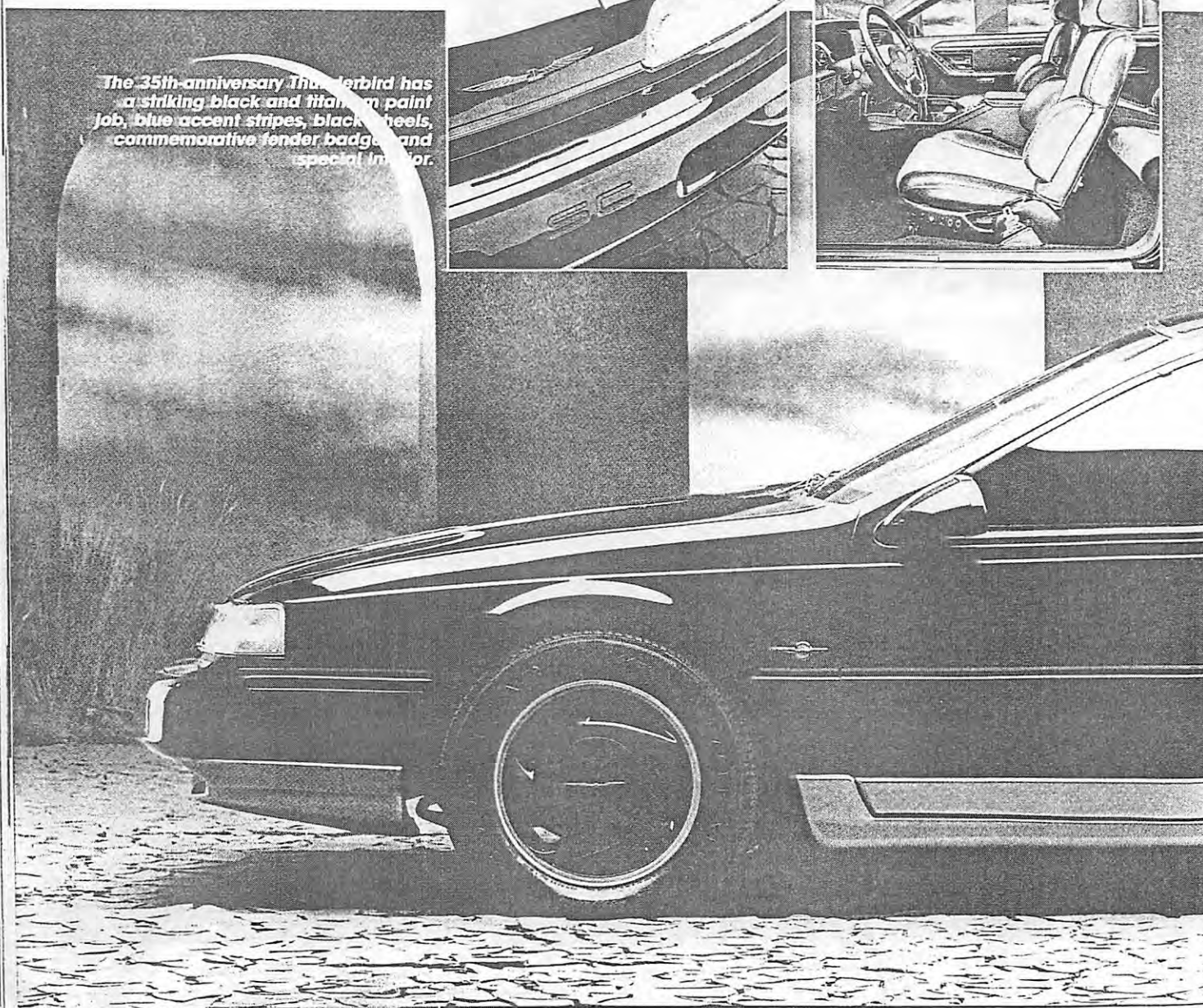
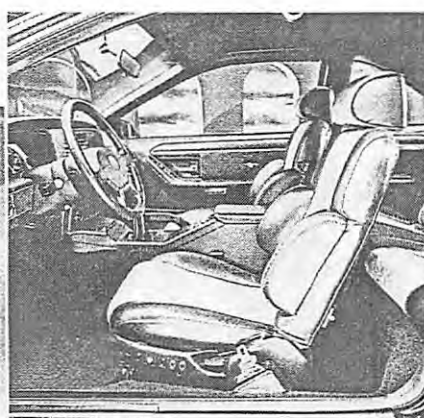
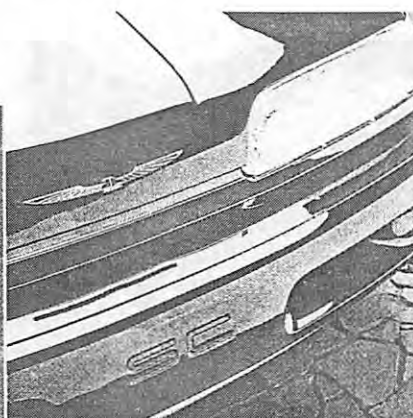
charmed and, once again, made the Thunderbird their Car of the Year.

Improved ride and handling were other major goals of the latest-generation Thunderbird, and for those reasons it's still rear-wheel drive. Although three inches shorter than the '88 model, the wheelbase is lengthened nearly nine inches, which also results in greater interior roominess, particularly for rear-seat passengers.

The compact front suspension consists of short upper A-arm/lower arm, double-isolated tension strut, coil/over struts and a sway bar. The rear suspension is built on an independent H-arm with coil springs, shock absorbers and a sway bar. The result is neutral handling with virtually no risk of sudden oversteer.

With the adjustable auto/firm

The 35th-anniversary Thunderbird has a striking black and titanium paint job, blue accent stripes, black wheels, commemorative fender badge and special interior.



strut control set on firm and the big P225/60R16 performance tires holding a tight grip on the skidpad, the SC was able to achieve a respectable 0.84 lateral acceleration in *Motor Trend* testing. It was a comfortable ride for the driver nestled in the SC's articulated sport seats.

Power in the Standard and LX models comes from a 3.8-liter, sequential electronically fuel-injected V6 engine that puts out 140 hp at 3800 rpm and 215 lbs.-ft. of torque at 2400 rpm. The engine is teamed with a four-speed automatic overdrive transmission for smooth operation. Standard equipment includes air conditioning, tinted glass, full-length console with floor-mounted shift, power front disc brakes, power rack and pinion steering (speed sensitive

on LX and SC), power windows, interval windshield wipers, front-seat motorized shoulder belts with manual lap belts, lap/shoulder belts for outboard rear-seat passengers and lap belt for the rear center seat. The LX comes with an upgraded sound system as well.

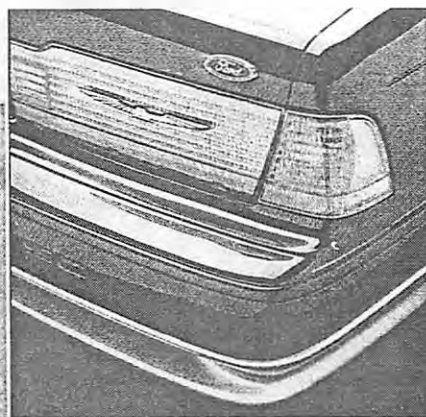
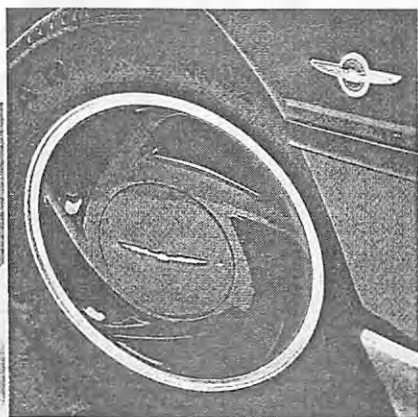
Other Thunderbird options include a Ford JBL audio system, digital compact disc player, anti-theft alarm system, keyless entry system, power moonroof, convenience light group, speed control, tilt wheel, power driver seat, power lock group and P225/60VR16 all-season performance tires.

Summing it up, *Motor Trend* said, "No other domestic car and damn few imports can offer the power, sophistication and pure statement of the 1989 Car of the Year."

## SPECIFICATIONS

### THUNDERBIRD

Type:	FE RWD two-door coupe
Engine:	OHV 3.8-liter V6, 3.8-liter V6 supercharged/intercooled
Horsepower:	140 at 3800 rpm, 210 at 4000 rpm
Torque:	215 lbs.-ft. at 2400 rpm, 315 lbs.-ft. at 2600 rpm
Transmission:	Five-speed manual, four-speed automatic
Length:	198.7 in.
Width:	72.7 in.
Height:	52.7 in.
Wheelbase:	113.0 in.
Track, f/r:	61.6/60.2 in.
Front suspension:	Independent upper and lower control arms, tension struts, coil springs, sway bar
Rear suspension:	Independent upper and lower control arms, coil springs, sway bar
Steering:	Power rack and pinion
Brakes, f/r:	Disc/drum, disc/disc (SC)
Wheels and tires:	Steel P205/70R-15; alloy P225/60VR-16
Base curb weight:	3577 lbs.
EPA MPG city/hwy:	19/27, 17/24 (SC, five-speed)
Base price:	\$14,980-\$20,390 (SC)





# PERFORMANCE REPORT

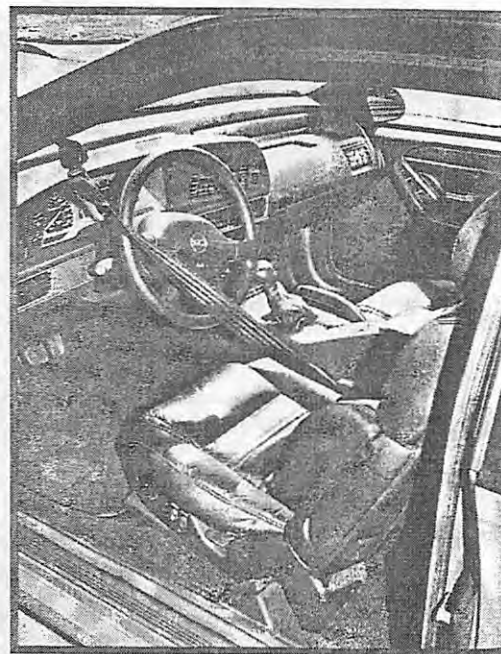
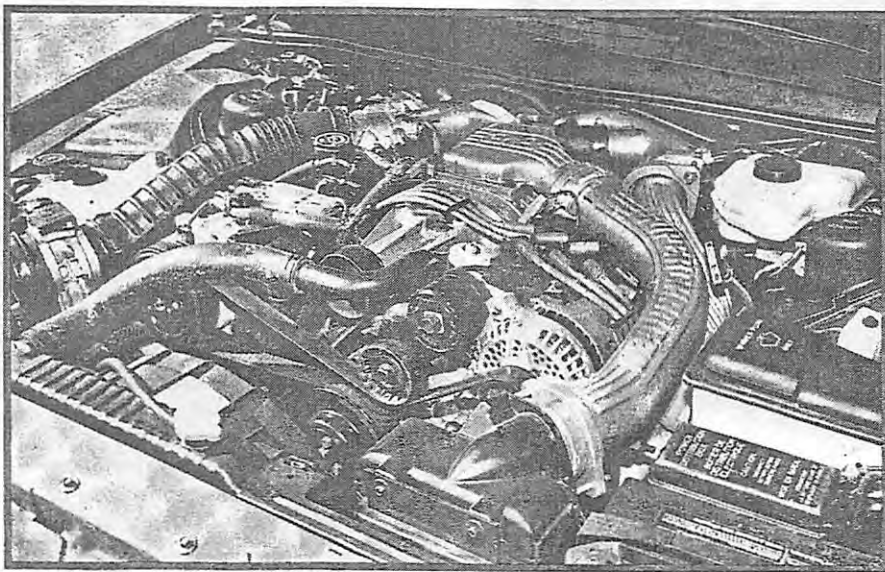
By Jeff Tann

**F**ord Thunderbird is celebrating its 35th anniversary this year. Introduced in 1955 as a luxury sports car, the Thunderbird has undergone many transitions: from two-seat sports roadster to mid-size four-passenger luxury sedan to luxury sedan rivaling the Lincoln Continental; and back to a mid-size sports sedan with excellent styling and agile handling. The history of the Thunderbird mimics art history: the Classical period, 1955-1966; the Dark Ages, 1967-1982; and the Renaissance, 1982 to the present.

Revitalized in 1983, the T-Bird once again became Ford's premier marque. The luxury market loved the standard T-Bird and LX models while the performance enthusiast market was captivated by the Turbo Coupe. The Ford engineering staff



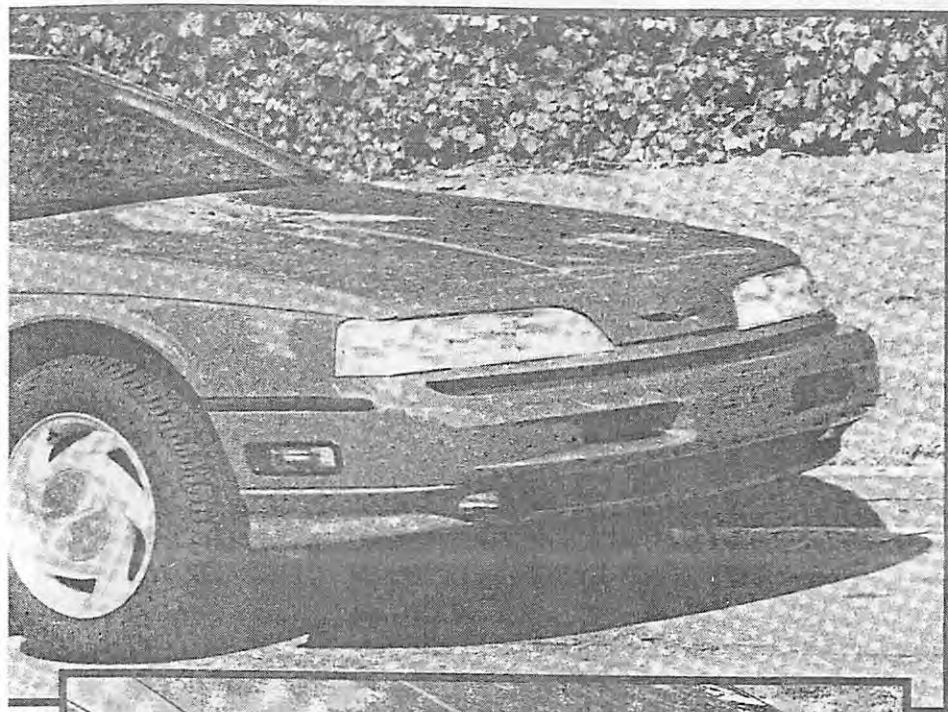
## Thunderbird Super Coupe



*This Thunderbird Super Coupe featured fully adjustable leather bucket seats, center console, and an AM/FM/cassette stereo system with a separate CD player and strategically-located speakers.*

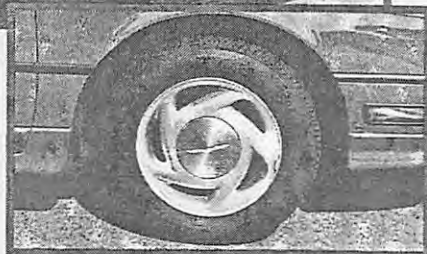
*Intercooled air enters the supercharger from this side and works in conjunction with the fuel-injection system. Ignition works off of a crank trigger instead of a standard distributor.*

Photo by Jeff Tann



Front styling is very aerodynamic with headlights and parking lights that conform to the sheet metal. Only identification is a small Thunderbird emblem on the nose and concave SC on the bumper.

Wheels are powder-coated 16-inches running Goodyear Eagle Gatorback uni-directional tires.



35th Anniversary Thunderbird is sure to become a collector's item. The car features special graphics and is loaded with special options.

worked hard to improve the car every year, and it paid off in car sales. After six successful years with the new body style, Ford redesigned the T-Bird once again, turning it into a world-class luxury performance sedan competing with the Mercedes, BMW, and Japanese luxury sedans.

Last year we tested the Super Coupe and were very impressed with the car. It was tight, solid and handled great. Power was adequate, although not overly exciting, due to the car's longer wheelbase and increased weight. Taking everything into account, the 1989 Thunderbird was an engineering marvel that deserved its Car of the Year award.

We recently road-tested the new 1990 Thunderbird, which is basically a carbon copy of last year's car except for option program changes. Two new option groups were added: the Power Equipment Group and the Luxury Group. When combined in

**The 1990 Thunderbird has an aerodynamic body design that looks great in red. Black trim adds a nice accent.**

groups, these options usually cost less than when they are ordered separately.

Thunderbird has a unique design that combines a certain amount of European styling with contemporary American design trends. The car has a sleek aerodynamic profile with clean, smooth lines. It's European to the extent that the styling is very refined, with a lack of emblems and performance graphics. The problem with that is the American Performance enthusiast likes a more aggressive-looking performance car. We feel the new Thunderbird Super Coupe needs bolder ground-effects and the addition of a rear spoiler, both of which are available from aftermarket suppliers. The Thunderbird could also take some styling ideas from the Probe. When we were growing up through the '50s and '60s, you could always tell a top-of-the-line car from a standard car by its side window post. Hardtops were always top-of-the-line; post models were second-class. Obviously, Thunderbird is Ford's top-of-the-line car and it was designed with a center post in the greenhouse that must be seven inches wide. We would like to see a return to the hardtop design by getting rid of the post or covering it with window glass like the Probe stylists did.

Over all, we really enjoyed driving the Super Coupe. The car is extremely quiet and comfortable, and offers superb handling. The T-Bird Super Coupe has Automatic Adjustable Suspension so the driver can choose between performance or luxury handling by the flick of a switch. When the car is in the luxury-handling mode, it will automatically switch to the

*Continued on page 71*



## **T-BIRD SUPER COUPE**

performance mode when it senses that it's under hard acceleration or on a twisty road. The difference between the two handling variations is not extreme, but just enough to make a difference.

Inside, the car is ergonomically efficient with comfortable leather-covered power seats, easy-to-read instrumentation and a stereo system any teenager would die for. The sound system consists of an AM/FM/cassette stereo with a separate CD player, and an array of speakers that turn the inside of the car into a concert hall. We were extremely impressed with it, wondering how they were able to put so much power into such a small system. Then we spotted a huge power amplifier in the trunk. Like our teenage friends would say: Awesome, dude!

The Thunderbird is an engineering marvel with its supercharged six-cylinder engine. With the use of a roots-style supercharger and intercooler, the 3.8-liter engine develops 210 horsepower at 4000 rpm and delivers 315 foot-pounds of torque at 2600 rpm. It comes standard with a five-speed manual transmission or can be ordered with an optional automatic. The engine provides smooth acceleration and has plenty of low-end torque, so it's a big improvement over the Turbo four-cylinder

engine in previous T-Birds. That power is important in handling situations when you need muscle to come out of corners without shifting all the way back down to first gear (like you had to do with the Turbo Coupe). Turbo lag is nonexistent, so the driver has power on demand. The Super Coupe also has brisk acceleration and good top-end speed. In fact, the car is so smooth and quiet on the freeway that you can lose track of how fast you are going. We caught ourselves traveling 85 mph several times when we thought we were only doing 60. There is very little wind or engine noise.

Ford engineered the engine with reliability and durability in mind. Features include a distributorless ignition system that uses a chopper wheel on the aluminum crankshaft damper to time spark plug firing, and also incorporates a knock sensor to monitor engine detonation. That feature is important with a supercharged engine to ensure mechanical longevity. If a knock is detected, a signal is sent to the EEC-IV computer module where adjustments can be made to control spark advance. This, in turn, will prevent engine damage. Durability is also increased by equipping the engine with platinum-tipped spark plugs that provide 60,000 miles of service. This was probably done because changing spark plugs in the Thunderbird's crowded

engine compartment has to be a major job.

The chassis is state-of-the-art with four-wheel independent suspension, four-wheel disc brakes, front and rear stabilizer bars, and Automatic Adjustable Suspension that uses electronically adjustable shock absorbers. Ford engineers have also isolated many suspension components for smooth and quiet operation. ABS braking is available for controlled stops in any situation.

When Ford designed the Thunderbird, nothing was overlooked. It's a world-class car in terms of design and engineering, and if we were in the market for a new car, it would be at the top of the list. In fact, we would be very interested in the 35th Anniversary Thunderbird special-edition model. It's based on the Super Coupe and features a special two-tone paint scheme, customized wheels and a long list of standard equipment.

The new Thunderbird combines luxury and performance in an attractive, high-quality package for an affordable price. If a person is in the market for a luxury sedan, the Thunderbird would be an excellent choice. In fact, there isn't a car that can equal it in the same price range. It's certainly nicer looking than the European and Japanese competition, and a better value dollar-for-dollar. Best of all, it's built in the good 'ol U.S.A. where our dollars should stay! **FM**

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Super Coupe Club of America  
Phone: 804-974-6659  
Fax: 804-974-9965

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# Bolt-On 'Bird

## J&M Performance takes the logical road to late-model Thunderbird SC performance

text and photography by Tom Wilson

We find it curious the current Thunderbird SC is not more popular than it is. Perhaps our thinking is simply too traditional, but the supercharged Thunderbird exemplifies much of what the domestic performance enthusiast is looking for, yet it has not sold in the numbers we had imagined.

While the engine may "only" be a V6, its roots supercharger is straight from hot rod Valhalla, and blesses the 3.8 liter with abundant torque. It's this 315 ft/lbs of torque, more than the Mustang GT's 5.0 HO can muster, that gives the Thunderbird its easy-going American speed. In direct opposition to the off-shore oriented, high-winding Taurus SHO which handily out-sells it, the Thunderbird SC grunts out its acceleration in short blasts of rpm, each gear seemingly lobbing the big two-door forward. It's the perfect powertrain for an automatic transmission, and the automatic transmission is the perfect gearbox for the luxury-performance coupe. In the urban settings it is normally sold in.

While such mainstream performance would seem a siren call to all those NASCAR fans out there, the SC soldiers on in smallish numbers, not attracting a huge showroom or aftermarket audience.

At least it doesn't take long to figure the lack of fanaticism for the blown V6. Crowded by accessories and plumbing, the supercharged V6 doesn't exactly beckon one underhood on Saturday morning, plus the upscale market which can readily afford Thunderbirds is likely more interested in vicariously following Mark Martin's progress than actively tracing a wiring diagram.

Most, but not all. John Cunningham, the J in J&M Performance, has had son Mike look into stepping up his white SC's throttle response. Not wanting or needing to embark on an engine-wide development program, Mike selected a sensible grouping of bolt-on parts to keep his dad entertained. Underhood he added a K&N air filter, 73mm C&L mass air meter, Auto Specialties underdrive pulleys, and

an Auto Specialties overdrive blower pulley. The very quiet stock exhaust was replaced by a Flowmaster system starting just aft of the catalytic converters. These come in a kit, with a new glasspack-style resonator located in the tunnel just behind the catalytic converter, along with two tailpipes and a pair of three-chamber Flowmasters. Getting the V6 to speak in a low voice like a V8 is tricky judging from our experience, but we found the J&M car pleasant-sounding on our test drive.

To get the big Thunderbird moving, Mike quickly reached for 3.55 gears while rebuilding the Traction Lok differential, and added the appropriate speedo gear to the five-speed gearbox to retain accurate speedometer readings.

Both for looks and handling, the car was lowered 1 1/2 inches via Suspension Techniques springs, and a flashy set of AZEV chrome wheels and BFGoodrich Comp TA tires fitted. The wheels are 17 x 8.5-inch all the way around, while the tires are 255/40ZR-17 in front and 275/40ZR-17 in back. As a finishing touch, the stock bodyside moldings were painted white and the side windows tinted.

Aftermarket shocks were considered to match the slightly higher-rate springs, but it was decided to stick with the stockers because of their electric adjustability.

With the wider tires and lowering springs, it was found the SC would lightly rub its rear fender lips on the tire sidewalls when the car was carrying four people. To raise the fenders off the tires and provide a little more spring rate in the process, J&M fitted Polyair air springs from Air Lift inside the Suspension Technique coil springs. These are simple air bag helper springs, and are manually filled from any normal compressed air supply. They can provide a couple of inches in increased ride height and a noticeable increase in carrying capacity. In the SC they're not working very hard to lightly pick up the fender, plus John now has the option of pumping them up hard should he take on a full load of people and heavy luggage.

As an aside, we had a set of these springs on a tow wagon once and liked them a lot. They don't degrade the ride unless pumped full, and they can transform the handling of older, softly sprung sedans and wagons. They're also a handy tuning tool at the dragstrip.

From a performance standpoint, the major

improvements to the J&M Thunderbird are the steeper rear gears and smaller blower pulley, especially the gears. The Thunderbird SC is a heavy car, and there's no getting around the fact that even with over 300 ft/lbs of torque, the engine needs some help getting the car off the dime. The 3.55s are right for the car, as they give the much-needed boost in leverage without raising engine rpm above acceptable levels. The car was still quiet at cruise, and we doubt fuel mileage is much affected by the change if any amount of stop and go driving is thrown into the equation. The extra acceleration should make up for the mileage loss the gears will inevitably cost at high cruising speeds.

Keeping an eye on the boost gauge showed that instead of the stock 12 psi, the V6 was ingesting 15 psi of charge air at full throttle, and the improvement was noticeable, especially near the top of the tach. Better yet, all the tuning is transparent until called upon, so the Thunderbird still easily fulfills its mission as luxurious transport.

Power-jaded gearheads might want more performance than these mild modifications offer, but huge performance boosts would be difficult and very expensive to come by considering the complexity of the SC's powertrain. Nitrous oxide would be the one other step we can think of which would give a big seat of the pants improvement, and with the introduction of progressive nitrous systems, it's an option worth considering for those who like felony-level speed and don't mind the filling the bottle occasionally. For an SC, we might add the abrupt power-delivery may be a bit too much boy racer for some, and the Thunderbird is not exactly overflowing with trunk space, so don't forget to consider the room taken up by the nitrous bottle.

Another SC power option would be the improved intercooler from Sparco. The all aluminum unit is a direct bolt-in, yet is 22 percent larger in face area, and boasts 48 percent more mass area. Sparco claims a 9 percent reduction in charger pressure drop compared to the stock intercooler, and an 11 percent increase in power at 3500 rpm. The unit also comes equipped with a new air duct, as Sparco believes the stock unit is a bit restrictive. With a retail price of \$655, the intercooler would seem a good performance building block. **SF**

### Source:

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Santa Maria, CA 93455  
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(805) 928-8767 fax



# 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,

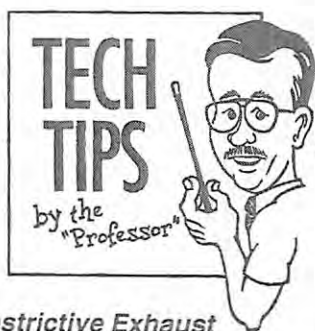
IF YOU THINK YOU WILL OUT-LAST, YOU WILL;

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 1/4" to 1/2" 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.