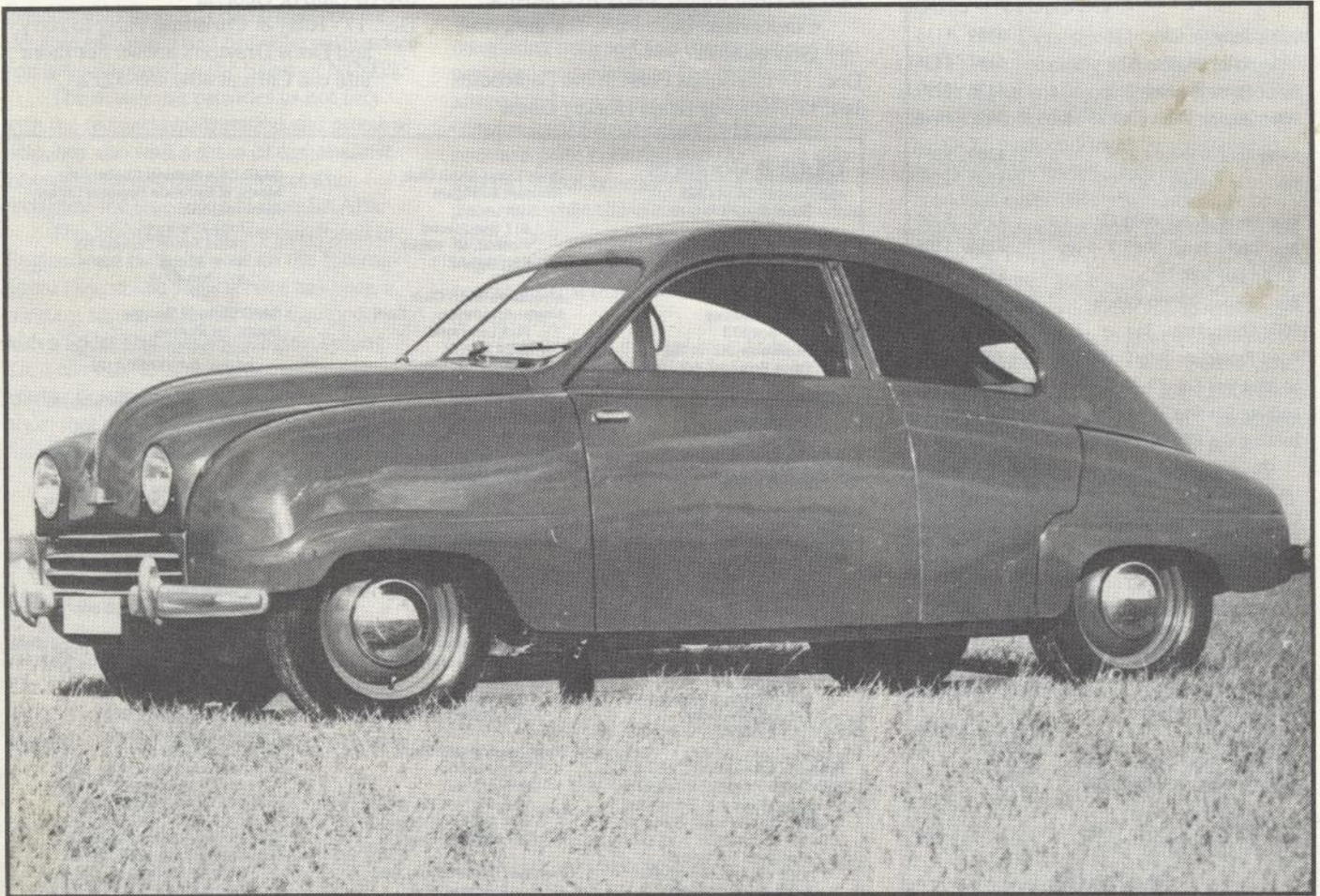




NINES

THE SAAB CLUB NEWSLETTER

\$2.25
December
1989
no. 187



SAAB's first car, the 92 De Luxe, went into production 40 years ago this month. Story on page 8.

Latest Rumor: Saab/Lancia merger

page 7

Will future Saabs be electric? *Some old Saabs already are.*

page 9

Road Blueprinting - Updating for Roadtrips or Rallyes

page 10

Sonett 3.5 - In which the fiberglass hood is constructed

page 12

Tech Tips: 2-stroke touring and a 16-valve engine swap

page 14

New Saab factory opens in Malmö

page 22



9000 Rally Headlite	\$195	\$150
9000 Engine Tuning Kit	\$559	\$450
9000 Sport Exhaust 5 dr. 89	\$311	\$250
9000 Sport Exhaust 5 dr. 86-88	\$327	\$260
9000 Handling Package	\$946	\$760
900 Rally Headlite - 87	\$159	\$135
900 Rally Headlite 87 -	\$187	\$145
900 Sport Exhaust 87 -	\$376	\$299
900 Engine Tuning Kit 86	\$559	\$450
Super Inca Wheels - 87	\$209	\$165
Silverstar Wheels - 87	\$209	\$125
Rear Decor Panel 9000 CD	\$245	\$200
Rear Decor Panel 9000 T	\$236	\$195
Whale Tail 900 3dr.	\$556	\$489
Rear Spoiler 99/900 Combi	\$230	\$175
9000 Sheepskins - Tan	\$462.50	\$175
Hood Protection Strip - 900	\$34.40	\$28.50
Locking Gas Cap 79-80 900	\$19.55	\$13.50
Locking Gas Cap V-4 - 69	\$19.55	\$13.50
Locking Gas Cap 96/99 70 - 76	\$19.55	\$13.50
Locking Gas Cap 99/900 76-80	\$19.55	\$13.50
Grille Center 99 75-80	\$90.20	\$67.50
Sonett III Service Manual	\$7.00	\$6.00
V-4 Drivetrain Manual	\$15.50	\$12.50
96 Front Fender - 68	\$138.50	\$100.00
Sonett History Book	\$16.65	\$12.95
96 Tan Sisal Mat Set	\$79.00	\$49.00
Sisal Mats 900 79-83	\$79.00	\$49.00
"Saab Turbo" Nylon Winter Coat	\$123.50	\$60.00
Tri-Color "Saab" Nylon Vest	\$57.20	\$29.00
Headlamp Covers 900, 9000	\$49.50	\$39.95
Moto-Meter Tach 96/99	\$79.95	\$49.00
V-4 Bal. Shaft Brngs. (set)	\$49.95	\$29.50

CATALOG

V-4, 99, 900, 9000\$5.00

(206) 328-2303

PARTS INFORMATION

1-800-537-9635

PARTS ORDERING

Bayside SAAB

A Division of Bayside Automobile Group
517 East Pike St. • Seattle, WA 98122

Regional Club News

Calendar of Events

Appalachian SAAB Club

Dec. 9 - Christmas Party at Wendell and Carolyn Francis' home, 5pm.

Central Penn SAAB Club

Dec. 10 - Fun Rallye, starts 1pm at New Cumberland Boro Park. For info, call George at 717/944-2915.

Dec. 17 - Christmas Feast in the Catacombs

Jan. 13 - Hershey Bears Hockey Game

Milwaukee SAAB Club

Jan. 5 - Christmas Party at the Miller Brewery, 7pm.

Jan 21 - Ice race school and practice

SAAB Club of Georgia

Dec. 17 - Rally & Christmas Party to Jerry and Doris Drayton's house. For more info call Chris at 404/ 469-7222.

Clubs & Contacts

Appalachian SAAB Club

Steve & Aline Phipps
104 Ontario Lane
Oak Ridge, TN 37830
615/ 482-1500.

SAAB Club of Arizona

Meets: 2nd Saturday
P.O. Box 573
Scottsdale, AZ 85252
Steve Bolander, 602/ 946-1865.

Central Illiana SAAB Club

Margrit Adler
1507 W. University Ave.
Champaign, IL 61821
217/ 356-9244.

Central Penn SAAB Club

Meets: 1st Tuesday, Bube's Brewery, Mt Joy, PA. Social hour at 6:30pm, Meeting at 8:00pm.
George Basehore
477 E. Main St.
Middletown, PA 17057
717/ 944-2915.

Central New York SAAB Club

Eileen Kolynich
102 Armstrong Road
Lansing, NY 14882
607/ 533-4073.

Delaware Valley SAAB Club

Meets: 2nd Thursday, 7:30pm
Hennessy's Tavern & Restaurant
Chester Pike, Prospect Park, PA.
Jenny Trostel
c/o Sports Car Service
3500 Governor Printz Blvd.
Wilmington, DE 19802
302/ 764-SAAB days

Great Lakes SAAB Club

(Western Michigan)
Jim Laman
617 Beechwood
Holland, MI 49423
616/ 335-5215.

Milwaukee SAAB Club

Meets: 4th Monday, 7:30pm
Rick Lemerond
3324 20th St.
Racine, WI 53405
414/ 634-5735, leave message.

Minnesota SAAB Club

Meets: 1st Thur, 8pm, Broadway Pizza, US10 & University Ave., Coon Rapids.
Dean Nelson
612/ 636-3771.

Montreal SAAB Club

E. Peter McLoughlin
c/o Dormer Laboratories
6600 Trans Canada Hwy
Pointe Claire, Quebec H9R 4S2
514/ 451-5165.

New England Sonett Club

Meets: 1st weekend in March, June, Sept. & Dec.
P.O. Box 4362
Manchester, NH 03108.

New Jersey SAAB Club

Herb Hirsch
34 Paul Ave.
Kendall Park, NJ 08824.
201/ 560-5760 days
201/ 821-8284 eves.

Northern Illinois SAAB Club

24 hour Events Hotline:
312/ 763-4752.

SAAB Club National Capital Area
Meets: at Bethesda Regional Library, Bethesda, MD.

Toby Turpin
14901 Peach Orchard Rd.
Silver Spring, MD 20904
301/ 384-6732.

SAAB Clubs of Georgia

Meets: 1st Monday.
P.O. Box 52122
Atlanta, GA 30355-2122

SAAB Owners Club of Canada, Inc.

P.O. Box 578
Bradford, Ontario L3Z 2B1
Chris Teixeira, 416/ 737-5827.

Southern California SAAB Club

Paul Florance
126-1/2 Main St.
Seal Beach, CA 90740
213/ 493-6707.

Tulsa SAAB Club

Jim Glavas, 918/ 663-8087.

Vintage SAAB Club of Washington State

Rich Roberts, 206/ 771-7100 days
Skip Schott, 206/ 486-1351.

West Mountain SAAB Club

(New England/New York)
David Sullivan
314 Union Ave.
Framingham, MA 01701-6319
617/ 879-8288 after 6pm.

Western Pennsylvania SAAB Club

Andy Bittenbinder
9433 Katherine Dr.
Allison Park, PA 15101
412/ 364-4780.

SAAB Club of North America

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Letters to NINES

Fan mail

I send you the enclosed check for renewing my subscription to NINES. I must tell you that your newsletter has been most helpful in understanding the car we own and one of the most eagerly awaited items in my mailbox. I commend you for the able editorship and unfailing enthusiasm you have displayed in the pages of NINES.

The newsletter provides us not only with the technical information and practical help, but also with a sense of camaraderie among the proud SAAB owners who recognize the true value of their SAABs.

The '88 9000 Turbo we purchased in England and brought here on the International Diplomatic Sales service has been a constant source of joy for us. Equipped with a Sport Exhaust and Engine Tuning Kit, I can't think of any other car in the market that is more worthy in value and price, that also has a distinctively appealing character.

Jin Whee Hong
Irvington, NY

Aux air valve fixed, thanks to NINES

Following the article on "Auxiliary air valve function" in the October NINES, I decided to try an adjustment before a replacement. If the valve opening is too small, hold it open with a small screwdriver and release, then tighten the adjustment nut.

I managed to restore proper function on my '83 900 Turbo and my '78 VW Beetle in this manner. It may be only a temporary fix, but it did work!

I can always find information in NINES to save money and learn about my SAAB. Keep up the good work.

Larry Tractenberg
Lawrenceville, NJ

Defending the 96

So, a 96 doesn't measure up to a VW Beetle or a Datsun 510, except in the eyes of a few zealots. The same charge, except comparing a 900 with a VW Jetta, or a 9000 with a Nissan Maxima, could be leveled, just as offensively.

If old SAABs are worth no more than a mass produced, rather unimaginative Japanese sedan, why should we not "drive them into the ground"? Did I miss a step?

As for reliability and parts availability; no problems thus far. Of course, I haven't needed many. I do take long (1500+ mile round trip) voyages in the Armadillo of Iron, and have never been stranded. The only time I was left to walk, fortunately about one-quarter mile from home, I was without the car about 28 hours. One of the actuating fingers on the pressure plate had fatigued and broken, making some truly fascinating noises. I had the engine out and prepared that evening. The following afternoon I visited my favorite parts house (*not* the local SAAB dealer) where the pressure plate I needed and the clutch disc and throw-out bearing I felt would be appropriate while the creature was apart, were on the shelf waiting for me. By eleven that evening the car was ready for the road. Of course it helps that the 96 is such a breeze to work on.

I realize that it might have been a freak accident that the only major part I have needed over the years was in stock, and I certainly appreciate my luck in having a parts house that regularly stocks tune-up and other comestible parts for a 20 year old car. If, however, this were not the case, the Blaab would keep on keeping on. Maintaining an aged Italian motorcycle has taught me that if the local people can't or won't get pieces in a reasonable space of time, there is always someone, somewhere, that is doing a good job. This is 1989, I have a telephone and a credit card; the world is my parts house. Anybody that waits weeks for SAAB bits is simply not availing themselves of one of those few advantages of the modern age.

My renewal accompanies this letter. Obviously my pique is not terminal. The newsletter has improved a great deal since I wrote last. My point is simply that the old cars are good cars, designed to be driven. It is not abusive to use a machine within its designed purpose, given that appropriate maintenance is rigorously applied. Those of us that like the old cars tend to be fiercely loyal to them, and apt to be sensitive to the suggestion that they are unreliable museum pieces, fit only to be paraded on Sundays as curiosities from the past.

Bruce Hibbs
Boise, ID

Based on ads in collector publications like Hemmings Motor News, the Beetle and

510 are considered more collectible than the 96. Based on sales, the car-buying public considers the Jetta and Maxima to be superior to the 900 and 9000. Those of us who own SAABs know better.

If you are willing to spend the time and money to rigorously maintain an older SAAB, or any older car, that is not driving it into the ground. Cars don't wear out, people neglect them to death. - TW.

Safety reduced, costs increased

A 1984 Department of Transportation (DOT) rule requiring carmakers to begin installing automatic occupant protection in the front seats of all cars is now permanent. The DOT rule, endorsed by a misguided American Automobile Association (AAA), stated that automatic restraints must be standard equipment in *all* cars made in the USA after 1 Sep 89.

Our rented 1990 Chevrolet Corsica, a 2-liter 4-cylinder with automatic transmission, very satisfactory in general, was cursed with door-mounted front safety belts. The four of us who used the car for 1,800 miles, ranging in height from 5'2" to 6'7", all found the belts uncomfortable because they rubbed on the side of the head and neck. All of us found that getting in and out with the belt fastened was awkward, and all of us buckled and unbuckled after the first few tries. Since it is possible to ride with the belts unused, it is obvious that belt-haters will do just that. So far as safety is concerned, it is obvious that the forward mounting points will reduce the safety of these belts relative to B-pillar mounted belts. Furthermore, vision to either side is blocked by the 4" wide swath of doubled webbing, which effectively more than doubles the visual width of the B-pillar!

Two months later, a rented 1990 Ford Tempo presented another set of problems. It was equipped with an automatic 2-point diagonal belt and a manual 2-point lap belt. While the belts were comfortable and did not block vision, and seemed as safe as a 1959 Volvo 3-point belt; the electric motor for the diagonal belt must fail some time, or be activated to undo the belt when the door opens in a collision, removing the protection of the diagonal belt. Furthermore, if belt-haters fail to fasten the lap belt, their protection (not that I care) might be less than with no belt at all. You see, the State of New Jersey considered 2-point diagonal

belts so unsafe - worse than no belt at all - that their use was outlawed in New Jersey in the 1960s! The added expense of the motor gives me absolutely nothing.

Now airbags are another story. Tests show that air bags *used in combination with seat belts* are the most effective means of preventing critical injuries and loss of life in auto crashes. An increasing number of models of passenger cars have them - mostly the larger cars which need them the least. Their cost and size have limited their use in smaller cars which need them most.

Cost may come down. The Breed Corporation of Lincoln Park, New Jersey, a military contractor that makes firing devices, has built a relatively inexpensive passive restraint based upon the firing principle of a hand-grenade. The \$50 air bag is activated when a sensing mass located in the steering wheel hub is subjected to a deceleration exceeding 4g's. When that happens, a firing pin ignites sodium azide tablets, which blast nitrogen gas into the air bag. The potentially dangerous tablets would have to be removed from the vehicle when it is ready for the scrap yard. (I wonder whether Chemical Waste Management, Inc. would do this for less than the original cost of the air bags?)

The canister in automobile protective air bags is said to contain 3/4 pound (340 grams) of sodium azide. When a researcher accidentally swallowed a 5-10 milligram tablet of sodium azide, symptoms similar to those caused by strychnine developed. The maximum *nonlethal* dose is probably about 150 milligrams. If such a reagent is poured, as a water solution, down a drain, it might accumulate in traps and form explosive copper and lead azides, which might be detonated by plumbers. The largest supplier of laboratory reagents in the USA marks the catalog entry for sodium azide "HIGHLY TOXIC - EXPLODES WHEN HEATED". One can picture one of the safety-hyperconscious ignoramuses who would force these devices on the rest of us seeing a bottle of sodium azide on his desk and evacuating a square mile while a bomb disposal squad removes the "life-saving" reagent!

For a few short years, implementation of the National Traffic and Motor Vehicle Safety Act of 1966 gave us usable and safe 3-point safety belts, after the long period where 2 separate belts not intended to be used were provided at our expense solely to satisfy the law. During the fun-and-games

period I could and did install Volvo-style belts from Sears, Roebuck in a 1967 American car for both comfort and safety, using some of the existing mounting points. But now? Is it a Federal offense to remove door-mounted belts and install better ones?

It is time for Road & Track (or another responsible publication) to use its influence again to promote real safety for those who want it. Those who do not want it will defeat any efforts on their own behalf. My former landlord cut off all the belts in his 1975 Volare with scissors! Not exactly freedom of choice for his passengers.

Joel M. Kauffman
Wayne, PA

Seeking parts unknown

Do you have any information on a removable hardtop for the 900 convertible?
N. H. Ellingsen
Lexington, KY

I have a 1978 99 Turbo and am looking for a center console. There is one in a 1985 Swedish SAAB accessories catalog, part number 204-607-006. Is it available here?

Billy Graham
Swedish Auto Inc.
1236 41st Ave.
Oakland, CA 94623

'Intro Rumours'

Both during and after the launch of the new 9500/9600 car family the talk was about other developments at The Factory. In fact, there was lots to overhear. Hear are some of the bits and pieces:

The LeMans project, though still not announced officially, is going ahead at full speed. When it was mentioned, every bigwig there said nothing and looked deep into his drink. But overheard was a quiet discussion between the Competition Director and one of the 'guests' tipped to be one of the LeMans team drivers! It's definitely on!

Some interesting things are going on in the Engine Engineering Dep't. as well. Would you believe, triple exhausts for the LeMans entry cars? It then follows that the 200 cars built to meet the regulations will carry the same! There was lots of talk of a Tuning Parts Department, too. Putting two and two together, it is probably to exploit the new and expensive technology and hardware research that the LeMans work must surely be spinning off.

There was no talk at all about the licencing of the famous 'free-wheel' technology so that issue is either concluded or dead.

There is already talk about the future of the new body, a four-door 9500 wagon, a convertible 9600(!), and at the end, after a few Swedish saunas-in-a-glass too many, there was even talk of a sports car based on the same mechanicals! It has obviously been thought about seriously as the project even has a name: 'Sonnett' or thereabouts. An interesting future for our new friends!

There was lots of talk about the future of the 95/96 family. It was freely admitted that the original idea was to replace them but they are considered 'classic exotics' so they will remain in production.

We will check out the really too wild talk. Until then, best wishes.

Simon Du Stroke

Doktor Nio's SAAB Klinik

Submit your questions with as complete information on the problem as possible, also giving the year and model of SAAB. Problems of general interest will be answered here. No requests for personal replies please. Questions which would require modification of, or would defeat Federally required emissions systems will not be answered. For a proper diagnosis, it is recommended that you contact an authorized SAAB dealer or repair shop.

Send your questions to:
SAAB KLINIK
c/o The SAAB Club
2416 London Road, Unit 900
Duluth, MN 55812-2221

My '83 900 with 118,000 miles has a couple of mystifying and annoying problems. The instrument illumination is relatively dim, at least compared with my newer 900. I have tried replacing the bulbs, cleaning everything and checking with multi-meters, without any success.

For the last 40,000 miles, the car has popped out of reverse unless the clutch is released with some degree of finesse. Forward gears are fine, in fact they seem on par with the transmission of my new one. A general consensus among fellow SAAB fanatics and independent SAAB mechanics is that reverse gear is probably damaged, but that it doesn't make sense to explore the problem further until the transmission has to be removed for some other reason. Since I am fairly gentle with clutches and transmissions, I wonder if the problem could be in the shift linkage?

Robert Conklin
Ocean, NJ

Since you did not mention the rheostat for dimming the lamps, try by-passing the 'stat by connecting all the wires that plug into it together. If all else fails, compare yours with another '83 to see if there is a difference. Using a higher wattage bulb could damage the printed circuits.

As to your reverse problem, it probably is a result of badly worn gear teeth. If the linkage were at fault, second and fourth would also tend to fall out of engagement on acceleration. If the idler and reverse gear become damaged to the extreme, it will be next to impossible to even hold the shifter in reverse.

We have experienced three major problems with our 1986 900S 16-valve since its purchase:

1. After backing and turning, both wheels "POP" loudly when starting forward, especially when turning in the opposite direction. The dealer says it's the tie rod ends "torquing up" and it is common. It's annoying! Is it destructive and is there a solution?
2. After 36,000 miles, the engine was

making a loud clacking noise at idle which would fade and stop at about 1,100+ RPM. I attributed it to the timing chain tensioner but the noise stopped after I changed the fuel filter. Now at 42,000 miles its starting to come back. Any ideas, could it be related to the FI solenoids and some kind of fuel restriction at low RPMs?

3. At night, both headlights and the instrument lights remain dim until the engine reaches 2,000+ RPM. Then everything brightens up and remains so even at idle. Is there some kind of two-step system in the voltage regulator and could this have something to do with No. 2?

Warren J. Merritt
McMurray, PA

Assuming all ball joints and rod ends are free of play, the noise may be coming from the front brake calipers. The caliper sliding yokes will snap in their grooves when changing direction. The noise can be subdued by bending the U-shaped spring retains the pads. Try this the next time you replace the pads.

It's unlikely the injectors would make such a clacking noise. You're right in attributing the racket at idle to the chain tensioner. A replacement tensioner with a finer ratchet is available to keep better slack adjustment. The part number is 75-85-086.

The current surge you've experienced is normal. In some 900 models the charge lamp will even remain on until the RPMs are first raised above idle speed. Then the alternator is sufficiently excited and will maintain the proper charge rate.

I have a 1985 900 Turbo and the 20-30 second idle down period before shutting off is a nuisance when driving around town. I have heard about turbo oilers that will keep a flow of oil to the turbo for a time period after shutting the engine off, but have been unable to find one. Any recommendations?

Is there any way to increase the torque in the low RPM range without sacrificing power at the high end or affecting engine reliability? The problem may be worse here

because of high elevations (above 5,000 feet). It seems that all the control circuitry for the ignition timing, turbo boost, APC system, fuel injection, etc. which make it impossible for the average owner to service, should allow great flexibility for someone who knows what they are doing to address problems like this.

Frank H. Ingham
Casper, WY

Some of our SAABs have almost 200,000 miles on the original turbo units without the aid of an "oiler". Gentle warm ups and clean fresh oil will insure long life from your turbo unit. If you really want an oiler, contact Turbo City in Orange, California at 714/639-4933.

As for lack of low end power in your area, I can only recommend checking the cam and ignition timing to insure that it is set properly. A free spinning turbo should develop positive manifold pressure at a fairly low RPM. Might your turbo be lethargic?

My '72 model 95 SAAB recently developed a severe leak at the water pump shaft seal. When replacing the pump, I noticed that the rear pump housing, a cast aluminum plate, is heavily pitted in the area near the impeller. What caused this erosion? Is there any way to prevent it?

Eric Johnson
Pardeeville, WI

It looks like a classic case of aluminum erosion from a lack of fresh antifreeze with corrosion inhibitors. Hard water can contribute to this erosion, too.

I recently came across an electrical problem on my '77 99EMS that has me fooled. The idiot light for the brake comes on only unit the oil lamp goes off, then it goes off (grounding through the oil circuit?) regardless if the hand brake is on or not. Can this be resolved or do I live with it?

David Mondecarr

It's normal for both the brake and oil pressure warning lamps to light when the pressure is low on later 99 models.



V4 HEADS RECONDITIONED

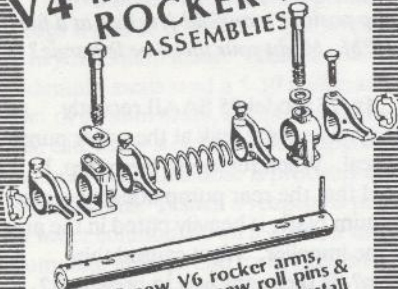


Includes new hard exhaust valves & seats, new intake valves, valve springs & keepers, and new valve guides if required, on 2 Saab V4 heads. Heads OK for unleaded gas.

\$295

Exchange, plus shipping. \$50 core charge per head if your head is not re-buildable.

V4 RECONDITIONED ROCKER ARM ASSEMBLIES



Includes 8 new V6 rocker arms, modified V6 shafts, new roll pins & tension washers. Ready to reinstall on your heads. Don't overlook this important part of a top overhaul!

\$225

Exchange. Send your complete assemblies for rebuild. Shipping and any other parts required are extra cost.

SAVE! SAVE! SAVE!
Do both jobs, only **\$495**

Offer good only thru 31 Dec 89.

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2201 WOODLAWN DRIVE
MEDFORD, OR 97504

503-779-0731

SERVICE SUBJECTS



FROM SAAB

Saab Service Information updates are provided to NINES as a courtesy to Saab owners by Daniel L. David, Manager of Technical services, and Robert Sinclair, President of Saab-Scania of America, Inc.

900 Service Manuals

For those interested in obtaining the "Official" service manuals for 900s as used in Saab dealerships, here is a listing of current part numbers. The complete service manual or individual sections can be ordered through a Saab dealership's parts department.

900 Service Manual, Complete 5 volume set

03 20 051

Complete sets are preassembled. Some recently published editions of section booklets may need to be ordered separately to make the set current.

Current Individual Sections - 900

		Part Number
0	News, M 1990	03 39 838
0	Technical Data, 79-80	03 36 727
0	Technical Data, -88	03 38 509
1	Service, 79-83	03 24 210
1:1	PDI/Break-In, 89	03 19 624
1:1	PDI/Break-In, 90-	03 40 216
1:2	Service, 85-88	03 38 525
1:2	Service, 90-	03 40 224
2	"B" Engine, 79-80	03 21 265
2:1	1981-88 Basic Engine	03 38 533
2:3	Fuel System, 81-88	03 38 541
2:4	Exhaust, Cooling Systems, Turbo, 81-86	03 31 058
3:1	Electrical Systems, Instruments, 79-86	03 31 066
3:1	Electrical Systems, Instruments, 87	03 35 455
3:2	Electrical System Wiring Diagrams, 84-86	03 31 074
3:2	Electrical System, Diagrams, 87-88	03 38 558
3:2	Electrical System, 89	03 19 673
3:4	Wiring Diagrams, 87-88	03 38 632
3:4	Wiring Diagrams, 89	03 19 681
4	Manual Transmission, 79-85	03 26 959
4:1	Manual Gearbox, 89-	03 19 772
4:2	Automatic Transmission, 79-	03 28 930
5	Brakes, 79-	03 31 082
5:2	ABS	TBA
6	Front end, 79-88	03 38 574
7	Suspension, 79-	03 26 967
8	Body	03 25 365
8:2	Interior, 79-86-	03 35 505
8:3	Heating, AC, 79-86-	03 35 513
8:5	Convertible, 86	03 27 981
8:6	Airbag	TBA
9:1	Accessories, 79-83	03 14 278
9:1	Accessories, 84-88	03 38 608

Obsolete Individual Sections - 900

These sections are available while supplies last for customers with older cars for which they are applicable. They do not contain the latest information and should not be used in the dealership context.

News M 1988		03 36 628
News M 1989		03 19 608
1:1	PDI/Break-In, 85-86	03 31 017
1:1	PDI/Break-In, 87	03 35 414
1:1	PDI/Break-In, 88	03 38 517
3:2	Wiring Diagrams, 87	03 35 463

SAAB NEWS

"Saab to become Fiat subsidiary" - Part II

Speculation on the future of the Saab Car Division of Saab-Scania AB continues. *Automotive News* in its November 13 edition claims that Saab will merge with Lancia. *AN* says a public announcement to clarify details will be made on December 15. Lancia is owned by Fiat Auto S.p.A. of Italy.

According to *AN*, the Lancia Thema would be built in Sweden alongside the Saab 9000, which shares the same platform. A replacement for the 900 would be produced in Italy on the same platform as the Lancia Tipo 2L, code name for the successor to the Lancia Delta, currently under development.

Robert J. Sinclair, president of Saab-Scania of America, in a letter to U.S. Saab dealers, acknowledges that discussions do include Fiat/Lancia, but the speculative article in *Automotive News* was just that. Sinclair wrote, "The aim of the discussions, should they develop further, are to strengthen Saab's position in the upscale segments of the world car market, to ensure a strong future for Saab cars with new models and more efficient production methodology, and to strengthen the competitiveness of the Saab marque."

Fiat and Saab have admitted that talks are going on, but that they have been going on for some time, even prior to the rumors regarding a takeover of Saab Car by the Ford Motor Company. Spokesmen for both Saab and Fiat have said only that current talks are aimed at "broader than simple technical cooperation".

The *AN* article suggests a Saab/Lancia merger would occur in three phases. In the first step, Lancia and Saab would become autonomous companies with their own capital and manufacturing plants. In stage two, Fiat and Saab-Scania would become partners in a new financial holding company which would be responsible for the two car companies.

Under stage three, it is assumed that Fiat may eventually become the majority owner of the holding company.

Saab aircraft sales soar

Express Airlines 1 is the first U.S. carrier to place a firm order for the Saab 2000, a 50-seat regional transport that will fly higher, faster and farther than its predecessor, the Saab 340. Express Airlines 1, a Northwest Airlink partner, ordered 10 Saab 2000s and 15 Saab 340Bs for a planned expansion from Northwest's hubs, Memphis and Minneapolis. Total value of the order was over \$300 million. The carrier has also taken options on an additional 10 340Bs.

Other orders recently by Switzerland's Crossair, France's Air Vendee and Sweden's Salenia Aviation have raised the orders for the 340 during 1989 to 99, 276 since the plane was introduced in 1982. 156 340s are already in service around the world. Firm orders and paid options on the Saab 2000 now total 124.

Express Airlines 1 Saab 340Bs will be delivered between 1991 and 1993, with the Saab 2000s to be delivered over a four-year period beginning in 1993. The Northwest Airlink commuter now operates a fleet of 13 Saab 340As and 25 British Aerospace Jetstream 31s. It serves 40 cities in 15 states.

Aviation Week & Space Technology, 11/6/89

480 tied on for MADD

Thomas P. Reis, Human Resources Director of Saab-Scania of America, Inc.,



recently kicked off Saab-Scania employee participation in Mothers Against Drunk Driving's (MADD) annual "Project Red Ribbon". Public Relations Clerk Carol A. Cummings ties to a SAAB 9000 the first of 480 ribbons Reis distributed to Saab's U.S. employees in support of MADD's important safety message.

BOSCH

69-74 99E	99EMS All	Fuel Pump	\$141.19
75-81 99	and 900 All	Fuel Pump	\$141.19
82-86 900	Turbo -84	Fuel Pump	\$225.06
78-81 99	900 Turbo	Fuel Dist	\$238.47
78-81 99	900 NonTurbo	Fuel Dist	\$215.30
78-80 w/	Turbo 051	Warmup Reg	\$106.22
78-80 w/o	Turbo 020	Warmup Reg	\$81.06
81-83 A11	0438140084	Warmup Reg	\$153.71
75-80 A11	0437502004	Injectors	\$20.81
81-86 A11	0437502012	Injectors	\$22.50
77-86 A11		Lambda Sensor	\$38.95
75-80 A11		Cold Start Valve	\$41.85
69-74 A11		Trigger Contacts	\$43.10
74-4/78	NonTurbo	Alternator	\$97.85
5/78-80 99	Turbo	Alternator	\$143.33
79-80 900	NonTurbo	Alternator	\$101.15
75-84 99	900 A11	SR78X Starter	\$93.45

KYB

GAS-A-JUST	Shocks for Import & Domestic Cars and Trucks.	\$21.95ea
Strut	Cartridges	\$24.95ea
Gas Strut	Cartridges	\$29.95ea

BILSTEIN

69-85	99,900	Front Shock	\$66.03ea
8/78-85	99, 900	Rear Shock	\$66.03ea

OEM PARTS

Saab #	Description	Price
75 40 487	Radiator 900 NoTurbo	\$169.95
75 40 503	Radiator 77-80 99 NT	\$169.95
75 41 071	Radiator 900 Turbo	\$179.95
78 71 403	72-80 Timing chain	\$24.95
83 46 785	72-80 Crank gear 2.0	\$29.95
83 46 793	72-80 Idler gear 2.0	\$33.95
83 46 801	72-80 Cam gear 2.0	\$41.25
83 47 874	72-80 Tensioner 2.0	\$23.95
83 58 509	2.0 All Countershaft	\$215.00
87 22 209	76&on Clutch slave cy	\$71.95
89 21 728	75-80 Outer Cv Joint	\$135.00
89 39 589	LH 75on Brake Caliper	\$169.95
89 39 597	RH 75on Brake Caliper	\$169.95
89 45 735	69-84 Inner CV Joint	\$49.95
89 96 861	75-80 Heater Valve	\$42.95

SPECIALS

69&on	99&900	NonTurbo New Plate	\$38.95
77-	99&900	Turbo New Plate	\$49.95
69&on	99&900	NonTbo New 4spDisc	\$34.95
76-86	99&900	NonTbo New 5spDisc	\$59.95
77-	99&900	Turbo New 4sp Disc	\$44.95
77-	99&900	Turbo New 5sp Disc	\$46.95
69-75 99	A11	30-29110 Brg.	\$30.10
76&on	99&900	A11 30-29115 Brg.	\$14.99
82-84 W/	APC	Turbocharger	\$439.95
79-85	Rack & Pinion unit (w/PS)		\$169.00
78-80 99,900	Rebuilt Distributor		\$115.00
69-74 96V4 & 99		Master Cyl	\$99.95
75-84 99 & 900		Master Cyl	\$138.25
75-80 99 & 900		Brake Rotor	\$34.95
81-85 900		Brake Rotor	\$36.95
75-85	Fr Repco Metal	Master Pads	\$21.95
76-85	Rr Repco Metal	Master Pads	\$19.95
69-76 99(8 cog gear)		Water Pump	\$69.13
77-80 99 & 900 A11		Water Pump	\$69.95
79-84 900 & Turbo		Wolf Bra	\$77.50
12/76-84	Sachs Rear	Lift Shock	\$26.95
Most Saab		Plastic Louvers	\$139.95

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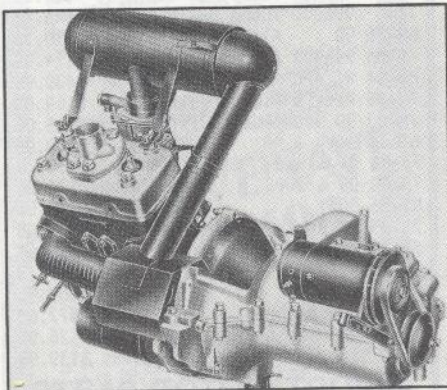
1950-1990, 40 years on the road for SAAB

Production of SAAB's first car, the SAAB 92, began in mid-December of 1949. At least one car was completed before the end of the year. The first production models were shipped to the sales agents, Philipsons, in mid-January, 1950. So began the saga of Svenska Aeroplan Aktiebolaget, the Swedish aircraft company, as a manufacturer of automobiles.

SAAB had been founded in 1937 to manufacture military aircraft to help maintain Sweden's neutrality. With the end of World War II, the company knew it had to diversify to stay in business. There would be little need for the aircraft production that had kept SAAB going during the war. That would mean massive layoffs and idle production facilities. The decision was made to enter the automobile market, particularly the small car market which was rapidly growing in Sweden prior to the war.

In the autumn of 1945, a team headed by Gunnar Ljungström was given the task of designing a car. Of the 20 people on the design staff, only two had driver's licenses. Less than a year later, a running prototype, designated 92.001, made its debut. Though aerodynamic, the prototype was not practical for production, having thick, heavy doors among other potential problems. (Projects in the '90' series were developed for civilian use. The Saab 90 "Scandia" was a commercial airliner, the Saab 91 "Safir" was a single-engined executive and sports aircraft.)

Ljungström called on Sixten Sason to redesign the vehicle. Sason's work, the 92.002, was much closer to what the first production car would actually look like. In



The 2-cylinder engine as used in the 92. The carburetor preheater, a SAAB innovation, was introduced on the '54 92.



The original 92 prototype stills runs; now in the Saab Museum in Trollhattan.

June of 1947, the first prototype 92.002 was completed and shown to the press. Three prototypes were built in Trollhättan that year and were driven over 200,000 miles.

A 2-stroke engine was the simplest design for a fledgling automobile company to build. A two-cylinder design by Germany's DKW, a popular front-wheel-drive car in Sweden at that time, was the model for the engine that finally made its way into the SAAB 92. Patent rights for this engine design expired in 1945, so SAAB engineers took advantage of existing technology without fear of lawsuit. Unlike the DKW, where the engine sat behind the transaxle, the SAAB drivetrain was transverse, like most front drive cars of today, including the SAAB 9000.

The engine size was 764cc (bore, 80mm; stroke, 76mm) and output was 25 bhp at 3,800 RPM. The 3-speed gearbox featured synchronized 2nd and 3rd gears. Estimated top speed for the new SAAB was 65 mph.

The ignition system consisted of two coils, one for each cylinder, mounted on the inside fender well, with contact breaker points operating directly off the crankshaft. Forty years later, a similar, though very technologically advanced system called Direct Ignition is used in Saab's four-stroke, 16-valve engine.

Other features of the 92 included a unitized construction for lighter weight and greater strength, and a flat floorpan for decreased air drag and easier going on unplowed winter roads. The air drag coefficient was only 0.35.

All of the early SAAB cars, officially designated the SAAB 92 De Luxe (a

stripped down Standard model was planned, but never produced), came in only one color -- an olive green shade. With its bulbous shape, big round headlights and odd coloring, the SAAB had a very frog-like appearance.

A SAAB 92 took its first rally victory in the Winter of 1950 on the Tour of Östergötland, with K. G. Svedberg driving. Later that year, two SAABs, chassis numbers 007 and 008, were prepared for the Monte Carlo Rallye by Rolf Mellde, one of SAAB's engine designers. He was able to coax 35 horsepower from the little engines. One car, driven by Svedberg and Mellde, finished 69th overall among the 135 who reached Monte Carlo. The other, driven by Greta Molander and Margaretha von Essen, was 55th overall, eighth in class, and second in the ladies' category. Two years later, Molander won the ladies title on the Monte Carlo in a 92.

The 92B appeared in the autumn of 1952 as a 1953 model. Improvements included a larger rear window, the fuel tank was relocated between the rear wheels, and access to the storage area behind the rear seat was now made through a regular trunk lid. The earlier 92 had the fuel filler located in the middle of the rear deck. SAAB buyers also had a choice of colors for the first time.

Production of the 92 continued into early 1957, although the model 93 had been introduced in late 1955. (Once the 93 was in production, only about 500 more 92s were built to use up parts remaining in the factory's inventory.) 5,300 92s and 14,828 92Bs were built over the seven years the model was produced.

Electro-95

When I first heard of C. J. Borkowski's electric car, I thought, "Here's another nut riding around in a souped up golfcart." Nothing could be further from the truth. Casimer is definitely not a nut and his electric-powered SAAB 95 is much, much more than a souped up golfcart.

The Electro-95's story starts in 1972, when OPEC made sure we saw the last of gas at 29.9 cents a gallon. Casimer, who was Director of Instrumentation and Controls at Oak Ridge National Lab from 1954 through 1977, decided to build an electric car. He already had a couple of two-stroke SAAB 95s. (These two cars were bought several hundred miles and months apart, but they have consecutive serial numbers.)

He purchased a government surplus aircraft starter/generator for about \$75. This motor puts out 25 hp with a peak power of about 45 hp. The motor has a maximum voltage rating of 120 volts and is 90 percent efficient; years later this can't really be improved on effectively.

Cas then stripped out all components of the gasoline engine. He designed and had machined an adaptor to mate the electric motor through the standard 95 clutch and gearbox. Cas points out that if he lived in Florida or some other flat place, he could get away without a gearbox and use direct drive, but in Tennessee it is just too hilly not to have one.

The control system uses only relays and contactors and switches, no SCRs or rheostats which waste energy by generating heat. Fourteen 6-volt batteries were installed which gave the car 84 volts, with a top speed of 65 mph and a range of about 75 miles in this area. If the number of batteries were increased to twenty, for an output of 120 volts, the projected speed would be over 100 mph!

The Electro-95 has been running since it was built 17 years ago with no breakdowns or repairs to the drivetrain. New batteries have been installed; that and tires have been the only capital expenses. At today's electric rates a recharge costs less than half-a-dollar. Compared to the normal 300 mile running range of a gasoline-powered car, the cost to power the Electro-95 is less than two bucks!

The only difference between the Electro-95 and the experimental electric cars that the U.S. government paid millions of dollars to contractors for is *millions of our tax dollars*. The Electro-95 cost less

than \$2500, not counting the original cost of the car. These big buck experimental cars are no more efficient, and to SAAB lovers, not nearly as good looking.

The only limiting factor of Casimer's car is the batteries. The lead/acid battery has been around for generations with little or no improvement in the amp-hour/weight ratio. The place where the government should spend research dollars is to speed the development of new battery design. The likely replacement for the lead/acid battery is the revolutionary nickel/iron battery. It promises a 100 percent increase in the amp-hour-to-weight ratio. This would boost the Electro-95's range to about 150 miles in the East Tennessee area. Most experts feel that an electric car won't be feasible until a range of 200 miles is reached. That nickel/iron battery about fits the bill. By the way, the nickel/iron battery's original name was the Edison Battery and it was invented in 1909.

Cas feels a hybrid car using an improved fuel cell or diesel generator might be the answer to the electric car's future. After all with a few exceptions, all trains in this country are electric. Those that aren't pure electric are diesel/electric hybrids. With an on board source of electricity to help charge the batteries, the range between fillup and recharge would be very high.

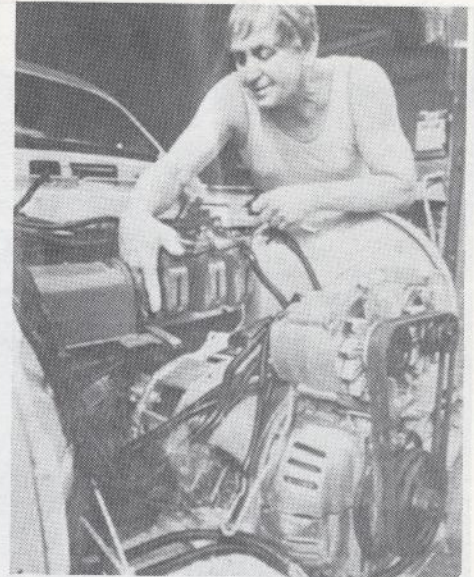
A final word about the environment: Electric cars would help the environment to recover from the industrial revolution. With no exhaust and little noise, these cars of the future would be almost a pleasure to have around. A hybrid methanol fuel-cell/battery car's exhaust would be pure water. Who couldn't use that?

Steve Phipps
Oak Ridge, TN

Ex-miner builds electric auto

Black lung disease prompted former coal miner Bill Drumheller to seek a non-polluting alternative to the internal combustion powerplants in today's automobiles. He has succeeded by replacing the engine in a 1962 SAAB 96 with a home-built generator.

Drumheller is a self-made engineer and inventor who spent two intensive months building the electric car. Five massive batteries in the interior leave room for only two people. The motor puts out 60 volts and can cruise at up to 51 mph. The range is about five hours before recharging.



The powertrain is designed to recharge the batteries under braking, using the pull of the generator to slow the vehicle. Since the motor/generator are much longer than the original SAAB three-cylinder engine, the hood had to be modified with about a one foot extension.

Drumheller has shown his electric 96 to potential developers, but despite interest, none have taken any moves toward production.

(from the Beckley, WV, Register/Herald, October 4, 1989)

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Road Blueprinting

"High Noon" on a deserted road in south central Washington state. In my mirror was the grille of a modified 16-valve Scirocco that I'd seen glimpses of most of the morning. The high desert air was cool and still this second day of the road rallye -- The Evergreen State 1000. This two day, 1000 km event, run half on pavement, half on dirt, was always fast. Now we were halted at the only stop signed intersection within thirty miles of anywhere.

With the motor ticking over at a steady 900 RPM, my navigator strained in his racing harness to peer over his left shoulder.

"That Scirocco is right on our butt!"

"Yeah," I replied quietly.

He had been passing cars all morning, always edging closer. We had been gridded 10th, his number was 14. We had passed cars 9, 8, 7 and 6. He had gotten by 13, 12 and 11, plus all those we had gotten by. He was *really* moving.

"I think he's too fast or maybe taking chances. I'll wave him on past us."

My navigator reeled in disgust. "You aren't going to let him pass us, are you?"

"Well," I reminded him, "this is just a *fun* rallye."

We slowly drove through the intersection, sunlight bouncing off our hood, heat waves on the pavement ahead. I brought the RPMs up and shifted to second, pausing, giving him an opportunity to pass -- but he didn't.

In my mirror the Scirocco looked like a shark moving in for the kill. My navigator

gave me one final pleading look.

"What the hell, this *is* one of the last great American road races. Roll up the windows, tighten your belts, give me a reading on the next 15 miles. Let's give this guy a run he'll never forget!"

My navigator quickly briefed me -- very few side roads, few farms, many straights connected with easy curves, all over rolling hills for the next 15 miles. I accelerated hard to 6500 RPM in second and third gears. Into 4th gear and the Scirocco started to slip from view.

Throughout the 15 miles he chased hard, but continued to lose ground to our speeding SAAB. When we eased into the next T.S.D. start point, car 14 was nowhere in sight.

I idled the motor for a few moments, then shut it off. The water temperature had barely gone above normal, and the oil pressure stayed at 60 p.s.i. Sixty-five seconds later the Scirocco pulled up. My navigator was out of the car. "Nice run, huh?" he said to the Scirocco driver.

The only reply was a feeble grunt.

What kind of SAAB can outrun a hot 16-valve Scirocco? An SPG Turbo 900? An ex-full rallye 99?

No. A 1971 99 with a '73 99 engine and transmission. True, this 99 is in excellent condition and is what I call "Road Blueprinted".

If you are taking a long trip or are competing in a road rallye, Road Blueprinting may be for you. Basically this process in-

volves bringing your older SAAB up to reasonable new car specs, plus a little extra. Most SAABs are extremely sturdy if treated correctly, and with a little extra "polish", they can really perform.

I have owned my 99 since it was new, purchased in November of 1970. The chassis has 105,000 miles, with 165,000 miles on the engine and gearbox (from a wrecked '73 99). The engine has all the original fuel injection components except the F.I. points and the throttle valve switch. The head has a mild porting, the valves have been carefully hand ground, and factory headers have been installed. I have also fitted a factory Stage-I rallye exhaust. The fuel pressure is set to 31 pounds, the timing at 14 degrees. I use NGK BP7ES spark plugs with solid core plug wires. (I know solid core wires are not supposed to work with electronic fuel injection, but they do very well for this car.) A Bosch "Blue" coil is used with standard Bosch points. A specially modified Filtron air filter assembly is utilized. The only failure in four 1000 km rallyes has been one broken odometer trip reset knob -- I now carry a spare.

The key to solid, reliable performance is careful preparation -- or Road Blueprinting. It's easiest to think of preparation in three different areas; drive train, suspension/brakes, and interior.

Drive train

I will assume your engine, transmission and clutch are already in good working order. A complete engine oil, oil filter and gearbox oil change needs to be done. Your drive train needs the protection of fresh lubricants. Do a complete tune-up on your engine. Replace the points/condenser (if your car has them), rotor, cap and spark plugs. I gap the points exactly to the thousandth of the specification and set the dwell to the exact degree the manual calls for. I do set the timing to 14 degrees, which works fine for my engine, but may be too much for others, especially depending on fuel quality in your area. The spark plug wires should be replaced if more than two years old. Make sure the boots fit tightly on the plugs, ditto on the distributor cap. I have been known to use a small plastic wire tie to secure a loose boot to the distributor cap. Carrying a spare ignition coil is a good idea. An even better one is to mount it next to the original. Then in case of failure you simply move the wire connections to the new coil.

The spark plugs I use are one heat

range colder than normal. My "street" plug is the NGK BP6ES, but for rallies I switch to the BP7ES. Gap to factory spec, and use a torque wrench to properly tighten those new plugs.

Next, check and adjust valve clearances. Again, adjust to exact thousandths; a much smoother engine will result. With a torque wrench, tighten all intake and exhaust manifold nuts and bolts. Tighten all muffler clamps and check or replace the rubber muffler hangers. Check all the motor mounts and bolts. Pay special attention to the front motor mount under the radiator; it is usually the first to go. If weak, replace it now.

Check the vacuum hoses for cracks. Check all water hoses and tighten up the hose clamps (but not too tight!). Check the radiator mountings and change the coolant if it is more than two years old. The thermostat should also be renewed if older than three years. Check all fuel lines, check any fuel line clamps and don't forget the lines at the fuel tank itself.

With your battery disconnected (to clean terminals), check the connections at the back of the starter. Adjust the alternator belt(s), or replace if over three years old. Adjust the clutch and check the hydraulics for leakage. Check all lights for correct operation and don't forget the horn.

Suspension and Brakes

Put the car up on jack stands and remove the wheels and tires. Inspect the wheels for cracks or bends. Check the tires for cuts or other damage. Tire pressure can vary greatly depending on road surface and speed. I generally run four to six pounds over "street" pressures. Wipe a thin smear of anti-seize on each wheel stud to facilitate easy removal of the wheels (if necessary) during the event.

Inspect the brake pads (or shoes) for wear and renew if necessary. Tighten the bolts which hold the calipers in place. Inspect the flexible brake lines for cracks or leakage. A brake system hydraulic flush is in order if not done in the last three years. I use standard factory brake pads and Castrol LMA brake fluid.

Next inspect and tighten every nut and bolt on the suspension that isn't locked down with a cotter key. This includes the nuts which hold the lower A-arms to the body. Inspect, as well as possible, the suspension bushings for cracks or outright deterioration.



Check the shocks carefully for correct operation and leakage. The shock mount bushings may be cracked or have gone soft after three to four years. Try to double-nut all shock mounting bolts. You don't want a shock to come loose during your "run". If your car has sway bars, check those bushings and lock nuts also.

My choice for shock absorbers are the Koni gas adjustables. I found the Bilsteins a little too stiff for my kind of rallying. The Koni's also seem to transmit more "road feel". The rear shocks are set two notches stiffer than the fronts. I also use an Addco sway bar on the rear only.

My current tire is the Goodyear European NCT mud and snow, 185/65-15. They are a bit expensive, but grip like crazy on pavement and are even better on dirt. You get what you pay for. The tires are mounted on late 900 5½" steel wheels.

Interior

The interior of the car has received several minor modifications also. The navigator's seat is pushed all the way back on its tracks. This keeps the navigator from rubbing elbows with the driver (unless the driver's legs are extremely long). For safety I have added a rollbar. Both front seats are also equipped with 5-point racing harnesses. Close at hand, a Halon fire extinguisher is firmly mounted.

You will need a tachometer if your SAAB is not so equipped. I also have oil pressure, oil temperature, and voltage gauges. As we run SOP (seat-of-the-pants), no special timing equipment is used.

Pull out the carpets -- they will stay much cleaner in your garage than on a dusty or muddy rallye. "Duct tape" down any loose speaker wires or heater ducts. Be sure there is absolutely no clutter of any kind left loose in the car. Nothing can be left on the dash, back package shelf or back seat.

Another important part of the interior is the navigator. A few questions are in order: Can the two of you get along for one or two days trapped together in a steel box

rolling down the road? Does he/she get car sick? Does this person have confidence in your driving ability? Can you speak to each other clearly? This is important in transmitting instructions, especially at critical turns or changes in direction.

After "motoring" through several navigators, I've found my eighteen year old son, Scott, to be the best. He never has given me an incorrect instruction, and he yells "Faster!" every ten minutes.

One final word -- have all this work completed two weeks in advance of the event. This allows you rest before the event and time for re-adjustments.

Next year I plan to run my restored ex-factory 1967 SAAB Monte Carlo V4 with 125 HP motor and nitrous-oxide. More on that another time.

Rich Roberts
Bothell, WA

NICHOLAS PELLEGRINO
FOREIGN MOTOR REPAIR

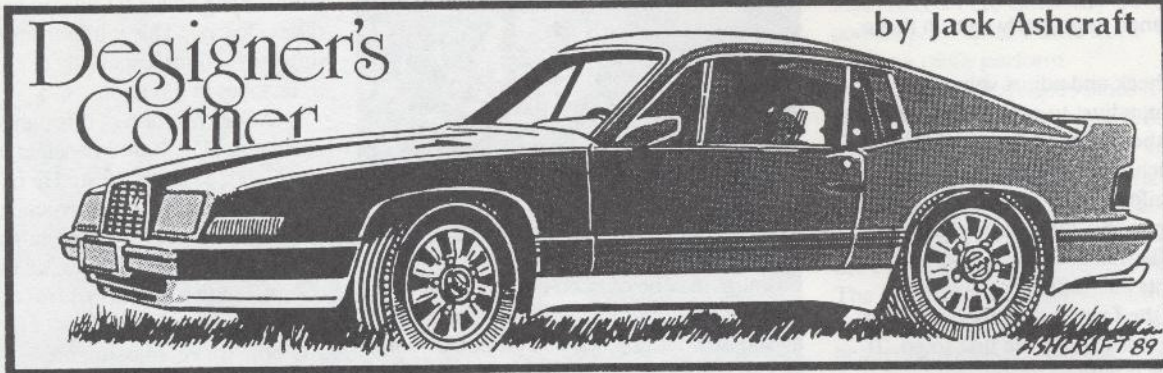
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'GLASSING THE OUTER SKIN

Figure 1

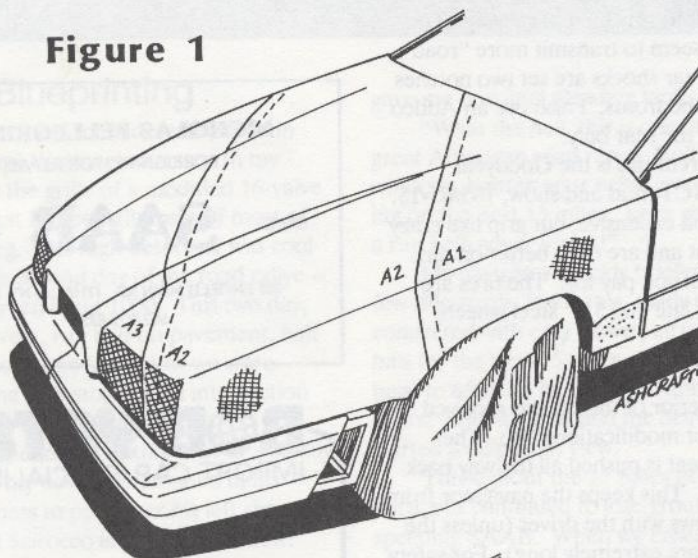
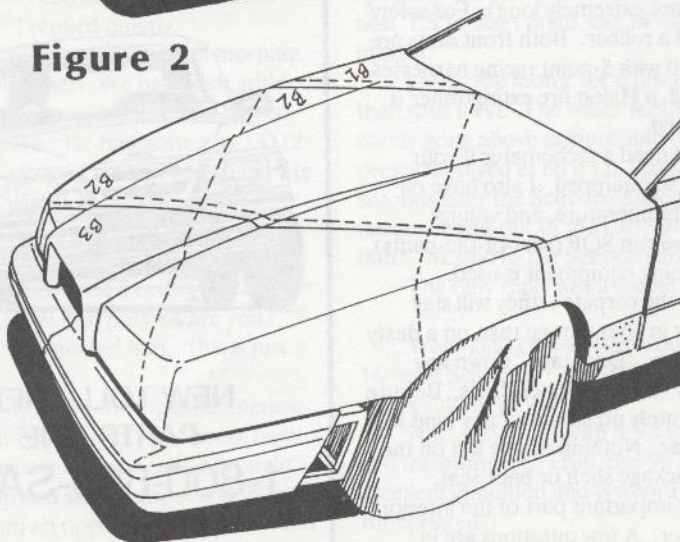


Figure 2



Fiberglass cloth comes in a variety of dimensions, weights, weaves and bindings. The material I use is 8 Ounce (per square yard), aircraft spec Bi-directional weave with binding compatible with epoxy resins. Binding is the coating on the cloth itself that keeps the fine strands of fiberglass from fraying. Bi-directional (BID) cloth has, in addition to exceptional strength, the property of accepting 3 dimensional bends, such as around the front corner of the hood near the headlights and around the grille opening.

Fig 1 shows the first layer of cloth layed out on the hood and trimmed. I use a 2" overlap where the sections of cloth join. Note that the cloth is put on at 45 degrees to the direction the car travels. This makes the cloth lay down better at the corners of the hood. I mark where the edge of the cloth goes (on the foam), and also mark the cloth piece so there is no confusion once the lay-up process begins.

Fig 2 shows the second layer of cloth, put on at 90 degrees to the first layer and trimmed to fit.

There are actually 4 layers of cloth used in the outer skin lay up. I put them on the car and cut everything to fit, marking each layer and each piece as I go. The first three layers are 8 ounce BID cloth. The final layer is 4 ounce unidirectional cloth used mostly as a finish surface layer since the weave is 50% finer and there will be less filling on the surface to get a smooth finish.

Layer 3 is a repeat of layer 1 except that the overlap must be moved over a few inches so the overlaps don't stack up and make a bump in the surface. Layer 4 is a repeat of layer 2, again with the overlaps moved over a bit.

Fig 3 shows the start of the lay up process. All of the hood is wetted out with resin from the drivers door to the edge of the grey area just past the cup that is sitting on the hood. The first piece of cloth has been put in place and wetted out by stippling the surface with the brush to work the resin thoroughly through the cloth.

The grey area has been wetted with resin and is ready for that piece of cloth to be put in place and wetted out.

The area near the right front corner of the car is the bare finished foam with no resin yet applied.

Several things are important here. First the foam must be carefully vacuumed for the last time before resin is brushed on. Rubber surgical gloves must be worn to keep the epoxy off the skin. The shop must be well ventilated. Once

the cloth is put in place and wetted out, care has to be taken to get all the air bubbles out and to see that the entire surface has been wetted out with resin. Slick or runny areas (too much resin) must be lightly squeegeed off with a plastic auto body squeegee.

Aircraft Safe-T-Poxy is mixed in a precision mixer (see Fig 4) with the ratio of 44 parts catalyst to 100 parts resin. The mixer insures that the mix is correct every time. I use the mixer pump to fill a plastic cup about 3/4 full and then stir with an ice cream stick. It is amazing how much surface you can wet out with 5-6 ounces of resin.

At 70 degrees F, there is about 45 minutes of working time for the lay up process. In this layup, with three of us working, all 4 layers of cloth were down and wetted out in about 35 minutes. When the resin just begins to stiffen, usually at about 1 1/2 hours, I go back and trim the excess cloth at the edges with a good sharp pair of industrial Weiss shears. It is a lot easier to do it at this stage with Weiss shears than later with a sabre saw.

After that, you just sit back and grin and let it cure. The layup is safe to handle at 24 hours and gets its full strength at 48 hours, given a 70 degree F shop.

I put in two extra layers of cloth in the areas immediately around the headlights and grille opening, around the wheel house openings, ahead of the doors and across the cowl at the base of the windshield. These smaller pieces go in between the regular layers of cloth, during the lay up process.

This is a very strong, very light lay up. It will be reinforced in a few places inside with foam and more cloth and we'll talk about that next time.

Figure 3

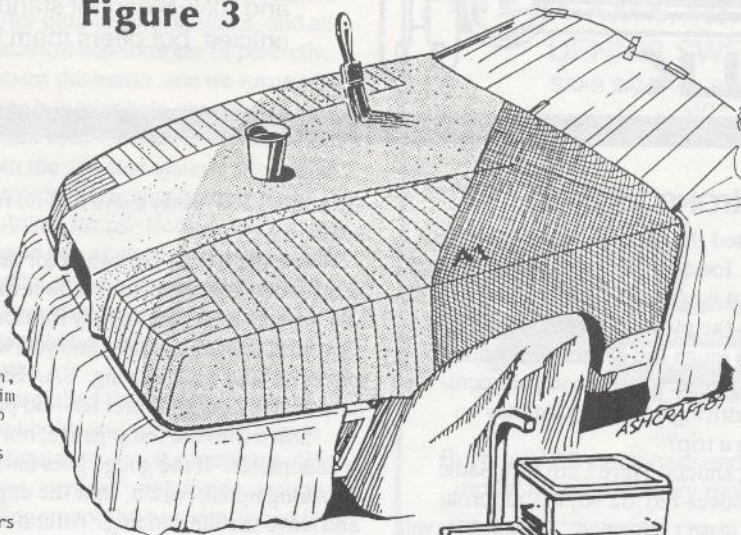
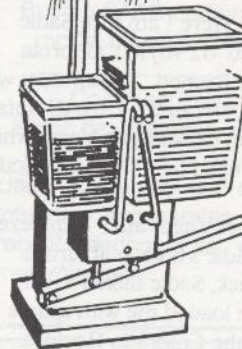


Figure 4



Mr Paul Becker takes the somewhat elitist attitude that modifications to my Sonett 3.5 (Letters to NINES, Oct 89) have somehow turned it into a "Kit Car", with the inference that that genre of automobiles was third rate and certainly not anything to be given serious consideration by a gentleman of his station.

Had Mr Becker done his homework he would have found that a Saab Sonett IS, by any definition I can think of, a kit car in its own right, being derived from a production automobile, the Saab 96, and using as many already-manufactured parts as possible to keep the final price of the car somewhat within reason.

Further homework would have shown Mr Becker that some rather well respected sports cars were once sold as kits (first series Lotus Elites and Eians) and that a number of currently produced "Kit Cars", notably Cobra replicas, are far superior to the originals.

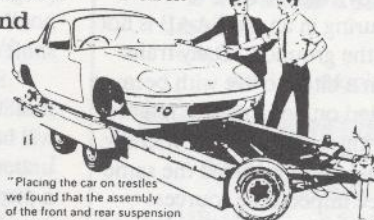
Even with a factory kit car there is such a thing as product improvement. Things the factory might have done had they continued production. Tilt forward hood for better mechanical access, electric fans for quieter operation and more efficient cooling, strengthened bumpers, better cabin ventilation, improved road holding, better performance and overall improvement in the car's reliability.

Perhaps by relegating the whole concept to a perceived lessor niche, Mr Becker can avoid trying to come to grips with the concept that even factory built cars can often be improved by thoughtful design and the use of good engineering and construction standards.

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"Placing the car on trestles we found that the assembly of the front and rear suspension was quite simple. In went the propeller shaft and drive shafts and it was time for lunch..."



"We fitted the engine and gearbox with the aid of a light-weight pulley and chain. Then in went the radiator, exhaust system and all the main connections were checked. Then it was time for dinner..."



"On Sunday morning we fitted the number plate, checked the tyre pressures, filled up with oil, petrol and water and were driving down to the local by opening time..."



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TECHNICAL TALK



Technical articles written by subscribers may recommend procedures or parts not approved by Saab-Scania of America, Inc. The SAAB Club and NINES cannot stand behind the correctness of information in these articles, but offers them based solely on the experiences of the writers.

Two-stroke touring

I missed the October issue of NINES since I left Iowa for the convention before it arrived, but it arrived in time for the wife to bring it on the plane to Vegas. And I was having too much fun at the convention to read Paul Becker's letter and your comments on driving 96s, i.e. "Can they be trusted on a trip?"

Well, shucks! Here I am with Sadie (my white-over-red '62 96) in California because I wasn't informed. I'm afraid it will happen again, too, because us SAAB nuts only play with a full deck in Las Vegas which is behind me. I'll need help from the God of 2-Stroke.

The truth is, in Vegas after I squeezed three people in Sadie's back seat, drove downtown and back, Sadie talked to me. She said, "You've loaded me with spares and run me over the Colorado Rockies. You've chased me across desert and over-filled me with people. Now let's go to the beach where I can cool my wheels." Who am I to argue with a lady?

Actually touring in an old SAAB is not "running it into the ground". Daily transport makes them a bitch to live with because you can get behind on preventative maintenance. City driving is also not user friendly.

In my *touring* use, I received the same advice from three impeccable sources -- Jerry "Meyer Garage" Adams, Eric "On his head" Carlsson, and Bud "Quantum" Clark. They all said, "Just add more oil and stand on it!"

Some tips to prepare a two-stroker for touring:

Install an electric radiator fan that will draw on the back of your back radiator 96. I picked, for size, a Subaru unit with metal shrouding. It also has the motor tucked inside the fan for added clearance.

Pull the radiator first so you can do things in a workmanship-like manner. Simple L-shape metal and some screws will mate the shroud to you radiator side rails. You may have to trim the shroud 1/4 of an inch next to the heater blower housing.

Give that cut a pretty curve and no raggedy edges.

Use the heater fan switch for fan control because the heater blower motor will have to come out anyway for clearance. Cover the blower opening and you will get plenty of heat while driving. SAABs never stop or get stuck in winter so -- no problem.

Drive with the temp gauge, not the speedometer. If the gauge goes into the red on a long uphill, park it, shut the engine off, and leave the fan running. After a couple minutes start the engine to circulate the coolant; the temp will come down quickly, but repeat if necessary. You should be on your way in less than five minutes. (If you were really in a hurry, you would have driven your Turbo, right?) This happened twice on this trip because I was pushy and didn't run the hill in the cool of the A.M.

Last year I installed a 1965 engine with the water pump up front (along with the extra plumbing) in the 96. I toured with that combination to Wilmington at 75 to 80 (degrees and mph) with the temp gauge holding 1/2 to 3/4. Conclusion: The fan shaft engine needs more water pump.

Skirt the area from the bottom of the radiator to the firewall. The air coming in will have to go through the radiator, not under it and out the pie plate holes. I used a piece of soft plastic fender protector.

Install the 4-speed gearbox in place of the 3-speed. 4th brings the RPM down for steady cruising and 3rd is a useable gear for pulling hills if you inadvertently get "off the pipe". When I changed the trans, I kept the 3-speed shifter. 1st and 2nd are on the right of the H-pattern, and 3rd and 4th are on the left side of the H. Reverse is far right and back. Pull the swivel joint off the bottom of the shifter column and remove the spring. Add a spring to the transmission shifter tube, approximately 95 to 100mm long. The spring diameter should be big enough to slide over the shifter tube, but not big enough to jump over the swivel. Now the gear lever is spring loaded *up* because the spring pulls the tube *out* of the trans. If

necessary adjust the steering under the dash per the good book.

The reason for this screwy idea is I still like the 3-speed for high gear performance, so this makes it easy to change back. A bonus is the 3-speed setup shifts the 4-speed better than any 4-speed shifter I've used.

I had a ball driving through the foothills -- Palmdale to Frazier Park, following my nose to 166. There's a 6 mile, 7 percent downhill to remind you that freewheel makes your eyes get real big. With drum brakes it's two quick macho applications of pedal to slow it down, then let go 'til your eyes get big again. By then the drums are cooled down and ready.

You can still drive a car on Pismo Beach, but if you bring a 96, be prepared -- beach bunnies will attach themselves and it takes time to peel them off.

When I left the beach I washed the salt from Sadie's undersides but I left the sand between her treads. She smiled.

Larry "Stroker" Williams
Waterloo, IA

New synthetic oil?

A recent issue of Science (October 27, 1989) has an article about synthetic oil being developed for use in new internal combustion engines designed to operate at 700° F.

This is interesting because the new oil is described as being "far superior to conventional oils" when used in today's engines.

The manufacturer is AKZO Chemical, Dobb's Ferry, New York. The oil is not yet on the market, however, it may be available commercially in a few years.

When this oil is overheated in the presence of oxygen, it volatilizes directly into gaseous combustion products, without forming solids or gums that can accumulate in an engine. Piston rings, especially the top one, remain clean.

Eric Johnson
Pardeeville, WI

16-valve engine swap into an earlier 900 Turbo

As I get deeper into the "street tested" parts business, one of the needs that I am having difficulty meeting is providing nice low mileage engines for older cars. "B" engines are now at least ten years old and the last 8-valve Turbo was produced six years ago.

For several years I have been contemplating a 16-valve swap for an 8-valve APC turbo. I reasoned that by converting the engine to run on the existing CIS fuel injection system, instead of converting the entire chassis wiring, plumbing and computers of the LH system, I could save a hundred or more hours of labor. In addition the CIS components are more common and easier to tinker with.

I started with a Cherry Red/tan leather high miles '84 900 Turbo 3-door with light damage on the right front. After the 8-valve drive line was removed I sent the car to the body shop for straightening, fender replacement and paint.

Meanwhile, we put fresh bearings, seals and gaskets in the '84 5-speed transmission and bolted an '85 16-valve turbo engine to it, mated with a rebuilt clutch and pressure plate. (My "conservative" philosophy inclines me to use rebuilt rather than new parts, and save energy, materials and money.) The engine had 35,000 miles on it and had been in my warehouse since January '88.

When the car came back we installed upper and lower control arms, springs, shocks, rear axle and sway bars from a 5,000 mile '88 900S. Since 100,000 mile-plus steering racks are prone to "morning sickness" and leaks, we also installed a rebuilt rack. We retained the 16-valve alternator, power steering pump and air conditioning compressor; obviously they fit and are as young as the engine. The hardest part of the job was done!

While my assistant, Larry Roddy, was bolting the engine/trans-axle in place, I fabricated two brackets to hold the fuel injectors and 4 spacers to stand the injectors about 2 inches out from their normal seating place. Since the CIS injector seals are the same diameter as on the electronic injectors, and the throttle housing bolts the same way, no modifications were necessary

on the 16-valve intake manifold.

I had to lengthen the wiring to the starter, and the CIS temperature senders. Distributor plug-in, knock sensor, and all other electrical connections, fit perfectly.

Also on the intake side we turned the air cleaner box inlet hole towards the firewall and used the inlet-over-the-fender pipe from the 16-valve system. We found the intercooler mounting bracket holes already drilled for us. Because we retained the 16-valve power steering pump, we also had to add a remote fender reservoir for same. Downstream, the 8-valve exhaust header pipe bolted right up to the 16-valve turbo outlet.

We prelubed the cylinders through the spark plug holes and cranked the engine several minutes to get oil circulating. After that, it was "contact" and one revolution till it was idling smoothly (but with lots of lifter clatter till they got pumped up).

The day after we got done "inventing this wheel", one of my customers, Walter Straus from Irvine, California, called to order some leather seats. In the conversation, he told me he had been terrorizing Corvettes and Porsches with his similiarly equipped '80 for quite some time.

He is running an Audi five-cylinder fuel distributor and 15 pounds of boost! He claims 0 to 60 in 6.5 seconds, at which point it really gets strong!

My car is sweet, but since the 16-valve flows about 30 percent more air, it does seem to run out of fuel at more than 3/4 throttle and above 5,000 RPM. One solution is to wire the cold start valve with a pressure switch and a couple of relays so it injects more fuel above 7 pounds of boost. I think the best answer, however, is a bigger fuel distributor.

For those with a high mileage, lazy 8-valve, non-turbo, the 16-valve naturally aspired engine should make a pleasing and uncomplicated change. A 16-valve head pipe would be required, probably bolting up at the catalytic converter.

I'll generate some performance data as I get the high end fuel delivery worked out. In the meantime pick up the phone and order one or two for yourself, I've got plenty in stock!

Dennis Sweeney
Ligonier, PA

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Proud of SAABs

I have owned and driven SAABs since 1977, when I was almost killed in a Fiat 128 and decided to drive a safer vehicle. Currently we own a '72 99E with over 170,000 miles on an engine that's all original except the clutch, a '75 99GLE and two '79 900EMSs. The reason for two EMSs is that my wife was so impressed with my '79 that she wanted one. My brother and his wife own a 1978 99 Turbo, an '80 900 Turbo and a 1985 Turbo. They are just as pleased and proud of theirs as we are.

My brother has been a gear-head for the last 30 years. In 1967 he was 2/10ths of a second away from the national quarter mile speed record in his stock 1963 Dodge Polara with a 426 wedge engine. Now he's becoming interested in Ferraris. It's a strong testament to SAABs to know this power car buff has driven his '80 Turbo since new and loves it. However, being the type who always wants more guts, he has made many improvements and experiments to improve performance.

Let me share a few things that have improved my '79 EMS without having to go wild (like my brother).

Tires. I have read much in NINES about tires without a mention of a fantastic tire named Falken, made in Japan. We have them on three of the above mentioned SAABs. My hard driving brother has had his for three seasons, my wife and I for two. They ride and handle better than the Pirellis, Michelins, Semperits or Klebers I've used, and at about \$60 a tire are a great value. I used the FX-60 195/60R15 RLS-85H on my EMS, which have improved the looks as well as the ride. Although they are very good in all weather, we all switch to Nokia snows in the front for that extra grip. Falkens can be ordered through most mail order tire companies, including the Tire Rack, in the major car magazines.

Exhaust systems. I replaced my stock EMS exhaust with a SAAB Turbo exhaust from the bottom half of the exhaust flange all the way back. There was need for a very slight adjustment of the tailpipe, otherwise it fit like a glove. The larger diameter of the Turbo exhaust allows for better breathing and less back pressure resistance. Not only did I find better gas mileage but a notable improvement in performance. It also gave me that deep gutty sound of a Turbo but just a little louder. I love it.

Water-vapor systems. We have found

that by introducing a fine water vapor mist into the intake mixture of our SAABs, we are getting more power and better gas mileage. This has something to do with cooling, condensing the mixture, in turn increasing compression slightly. This has the added benefit of keeping the valves clean.

I have an old Eakart Water Vapor system which I have connected to a vacuum line just ahead of the throttle plate. The more air that is drawn into the intake, the more water vapor is added to the mixture. I'm not sure of the numbers on the unit, but they are all pretty much the same. A little "dry gas" added in the winter keeps the water from freezing and adds some zoom in summer, but I wouldn't add it all the time.

These are just a few tricks we've tried and found to work. I won't tell you about the ones that didn't. By the way, what does "EMS" stand for, anyway?

Dave Nobili
Bridgeport, CT

(EMS stands for Electronic/Manual/Special. Prior to the introduction of the EMS in 1972, you had to take the automatic transmission in order to get the higher horsepower of electronic fuel injection on a 99. The 99EMS came with the manual transmission only, and offered more sporting amenities such as a leather covered steering wheel, a tachometer, alloy wheels with steel belted radial tires, metallic paint, black grille, and SAAB's new 2.0 liter, 110 hp engine. - TW)

Catalytic convert

I had the Monolith-1 catalytic converter installed on my 1986 9000 Turbo after reading Marshall Pruett's letter in the March 1989 issue. It has significantly improved the performance of my car. I felt the \$160 cost was quite reasonable considering the increase in performance.

While I have no quantitative measures of improvement, the car definitely breathes better. The improvement in performance is much more pronounced than it was with the addition of the SAAB Sport exhaust system. This may have something to do with the age of my old stock catalytic converter because my car now has 52,000 miles on it.

The converter does not just bolt in to replace the old one. A muffler shop will need to make some simple brackets so the new converter will fit where the old one was. It took my muffler shop less than an hour.

You can find a local distributor for the Monolith-1 by contacting Products for

Power at 312/543-4800. The part number for the SAAB 9000 Turbo is 61-15.

Steve Fechner
Torrance, CA

A clean car is...

During a phone conversation with fellow SAAB owner and NINES reader, Larry Swanson of Michigan, he told me about some excellent products for keeping my '85 SPG looking sharp.

I had seen Meguiars products in my local automotive shop and have used them with satisfaction (the ones in the red containers). They also make a line of products for "the professional", (in tan containers) available in certain body shop supply houses. WOW! This stuff really works. We've all tried the Blue Coral and the Simonize, etc., but I've never had anyone stop me on the street and ask "How do you keep your car looking so good?" after using those items.

The professional products are called "Meguiars Mirror Glaze" and are numbered 00 through 42. I use "Professional Sealer & Reseal Glaze No. 7" to polish out every imperfection and end up with a swirl free job bursting with color.

On top of that I put "Professional Poly-sealant No. 20" which not only protects the finish but does so for much longer time than anything I've ever used.

Lots of work? No! The first time it took me about three hours to get the last winter's serious grime and numerous tiny abrasions and swirls out. Follow up jobs through the summer take only about 2 hours. I also use their "Professional Rubber Bumper Treatment No. 42" on the rubber spoiler, bumpers and side mirrors. There is no dust catching oily sheen left like Armor-All and the bumpers look great for numerous washings.

Speaking of washing, I use "00 Professional High Tech Wash" designed to foam away dirt and grime while actually adding a great gloss to the finish and not taking away any of the other products you worked so hard putting on.

If your local shops don't carry Mirror Glaze, write to Meguiars at One Newport Place, Newport Beach, California 92660.

After using these products I'll never use anything else. They are easy to use and produce the best results I have ever seen.

Alan Snelson
Mountaintop, PA

Another happy Tufoil user

I drive a 1985 900 hatchback and after 60,000 miles and experiencing all the common SAAB manual transmission problems, I decided to try some of the other SAABers' recommendations that I had read about in NINES.

First, I changed the transmission oil.

This was the first change and the oil was black. I put in Castrol GTX 10W-30. I also added 4 to 6 ounces of Tufoil, a product that seems to produce miracles. There is a significant difference in shifting. While I cannot call it silky smooth, neutral-to-first and neutral-to-reverse are greatly improved. At the next engine oil change, which in this climate will call for 5W-30, I'll try some Tufoil in the engine.

I had to change the catalytic converter heat shield some 10,000 miles ago as the handbrake cables had melted and seized. At the same time the steering had become quite heavy when cold. The dealer changed the entire steering rack at no charge for parts; I paid the labour. He said SAAB won't try to repair the steering, it being far safer to install a new rack.

Locating the heated seat thermostats on top of the seat cushion was a poor choice. I have re-wired the thermostats twice and they seem to have broken again.

Robert Dupuis
St. Lambert, Quebec

Wired for fog

I believe Doktor Nio too quickly brushed off Brian Beaver's question in the September column on wiring fog lights.

Like Brian, I wanted to add fog lights to my car using the SAAB switch. I am a careful and considerate driver and only use the extra lights with the regular low beams. But I also wanted the factory switch to glow dimly with the other switches when on standby, and to illuminate fully when power is applied to the fog lights.

On the back of the switch are four tabs. The one standing all alone is for illumination from the rheostat (brown wire at the rotary control for dimming the dash lights).

The other three tabs are for ground, power in and power out. A continuity tester will help, but I believe the tab below the illumination tab is ground. I wired a fuse in the power input to protect the switch and lights.

Seth Bengelsdorf
Norwalk, CT

As the 9000 ages

This letter summarizes the experiences I have had working on my 1986 9000 Turbo with 65,000 miles.

I have found three vacuum leaks. The first was in the hose that runs from the turbo to the PCV fitting on the left side of the valve cover. The symptom was the boost wasn't coming on until 3,000 RPM and had trouble developing full boost going up a steep hill. The dealer performed a basic engine tune-up after replacing the hose. Now boost came on at 2,500 RPM, but going up the hill the engine knocked.

I found the hose from the check valve to the vacuum advance was loose on the check valve. Replacing the hose stopped most of the knocking.

The last leak was the hose from the intake manifold to the check valve in the line running to the PCV valve. I replaced the two sections of hose here. This cured the rest of the knocking. It looks like the hose loses its elasticity after awhile. I recommend replacing the other vacuum hoses that push on while you are at it.

The rear defroster didn't seem to work very well. The spade connector was loose and one of the two copper pads was broken off. In my case it was on the passenger side, which is ground. I tightened the connector and found the grid worked much better. If you need more electrical info, the manual says the grid is 300W +/-30% at 13 V.

I, too, had the misfortune of having my antenna mast broken clean off at the base. Here are some more hints to add to the article in the July/August 1989 issue.

The antenna motor is easily accessible in the hatch, but be careful when you pull the mast housing out of the fender because there is a toothed washer which can fall off the end. The sleeve talked about in step 2 was slightly distorted on my assembly. I straightened it with a Hanson drill bit gauge. Also the large end of the mast was horribly crimped. The heavy duty fiberglass cutoff wheel in a Dremel Tool made a clean cut through the thin-walled tubing. I had trouble getting the new mast to fully retract. I just put the seal, base plate and nut on hand tight and turned the radio on and off. Magic! The mast goes all the way down. However, I found water in the hatch area there so I spread silicone sealant around the mast housing where it sticks through the body in hopes of stopping the leak.

The 9000 manuals are a tremendous

improvement over the 900 manuals. Pay the money for them! There are a few corrections which should be noted, however:

In book 3:1 Electrical (part number 326488), on page 364-11, the top picture omits the plug covering a Torx screw in the middle of the console. This plug is *very* hard to remove.

On page 351-21, the lamp holder is shown with a long set of wires hanging out. This was *not* the case on my car. To change the center console bulb, gently pry out the driver's side of the plastic cover. If you are unfortunate, you will find it is real tough to replace the lamp holder. You may find it easier to work on the light if you push the passenger's seat all the way back and kneel in the foot well with your feet pointing to the front of the car.

Saab put a switch on the glove compartment light. Why couldn't there be a switch on the center console so the bulb would last longer!?

I hardwired the radar detector by going off the cigarette lighter. Once you remove the glove compartment, look for a blue wire from fuse 9 stamped 214 to splice into. An important check before you reassemble the dash is to make sure the defroster vent at the back of the distribution box has not been dislodged. You need a light to check this out.

On to disconnecting the key-in-ignition buzzer, which I find really annoying. Remove the relay which is second from the front of the distribution panel all the way on the right. Pry on the case on the small edge where the score line is to remove the innards. Remove diode D1, which is marked on the printed circuit board. At this point the seat belt unfastened buzzer still works. If you don't like that buzzer, bend the contact on the relay out of the way.

David Gabbé
Brookline, MA


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Improved exhaust breathing for 8-valve 900

Anyone who has owned and/or driven both a SAAB 99 and an 8-valve, non-turbo 900 knows which one is quicker. No doubt the 900 is a bit heavier, and 4th gear is direct in the 99, while the gear reduction in the 5-speed means that 4th on the 900s will definitely suffer by comparison. I find that they pull in 5th above about 50 as well as they do in 4th. Still, there is more lost performance than is accounted for by all of the above.

I have verified that the cam lift and duration for both the pre-catalyst and catalyst versions are the same, meaning that the power shortage comes about from exhaust back pressure due to the catalytic converter and single branch exhaust manifold. (Note that a micro-switch operates a lambda system override at full throttle.) It is my professional opinion (I am a licensed engineer) that the manifold is more responsible than the catalytic converter for the back pressure. On this basis, I present this modification which should not alter the cars' emission characteristics.

First, let me describe certain other power-enhancing steps, all of which are completely legal and some of which I have tried:

1) **Proper break-in procedure.** In my experience, a SAAB engine cannot be considered fully broken in before 50,000 miles. I make this assertion because in carefully conducted monitoring of mileage, I find that it continues to improve for about that length of useage. Proper procedure -- follow the Owners Manual instructions for the first 1,500 miles, change the oil regularly, and don't hit anything. Driving like a normal human being and not a crazed teenager also helps. With a fully broken-in engine there is definitely more pep. (Or is it by then you have forgotten how quick the old 99 was?)

2) **Air conditioner cut-off.** If the SAAB in question is a 1980 model, it has a monstrous GM compressor and no built-in compressor cut-out. I have installed a J. C. Whitney supplied vacuum-activated compressor cut-out. Whenever manifold vacuum pressure drops below a preset level, the compressor cuts out. I have no experience with the Japanese compressors on the non-turbo 900s, but on the 8-valve Turbo, its drag seems to be negligible.

3) **Reduced engine friction.** I have experimented with Tufoil and found a measurable fuel economy improvement. Since it has to come from somewhere, it must be friction reduction. This should also increase engine output slightly.

4) **Reduced gearbox friction.** Even with direct drive 5th and a chain drive primary, the final drive and bearings eat up energy. The same Tufoil which people are using to make the shifting "feel better" should also reduce the gearbox friction. This should have a greater effect in the lower gears.

Saab allows 10W-30 or 10W-40 motor oil in the gearbox. 10W-30 will obviously generate less drag at operating temperatures. SAE 75 gear oil has about the same viscosity as straight SAE 20 motor oil, and so should be even better but at the expense of cold shifting. Watch out for synthetics -- with the higher viscosity index characteristics of synthetic oils, you may be looking at a 75W-90 gear oil, which is fine for transmission life, but which would be more like a 20W-50 motor oil in terms of viscosity and therefore, drag.

Note that the famous Consumer Reports study on oil and oil filters reported that Valvoline Turbo V 10W-30 was a little low on the viscosity scale. This may make it a good choice for minimizing losses.

All of the above measures will make the most of what you have. If this still isn't to your liking, the next step is to clean up the exhaust back pressure. The 900 exhaust system from the catalytic converter to the muffler has two connector pipes. This arrangement allows a lot of flexibility when it comes to making modifications, as the rear pipe is a straight shot with no unusual end fittings, just a little flip at the end to match up to the muffler. The front pipe must fit into the converter. The main thing to change is the head pipe leading into the converter.

The newer 16-valve 900s have a bifurcated head pipe, complete with a fitting for the oxygen sensor, and a 1976 99 style twin branch manifold with no EGR or air injection fittings. I will guess that buying these two parts outright from Saab will cost more than buying a complete 8-valve turbo or 16-valve engine from one of the several recyclers who advertise in this newsletter. However, you may be able to find the parts at a recycler. In particular, any twin branch manifold can be used. If it has EGR and AI ports, these can be blocked.

Replace the air injection tubes with solid 5/16" rod, re-using the existing fittings. The EGR opening is a 19mm thread. There are spark plugs made for industrial engines which are this size and they are no further away than your full service auto parts store (the discount stores won't have it). It looks a little goofy, but it works fine. The advantage of the old manifolds is that they are already drilled for the manifold heated air intake. The 16-valve doesn't seem to use manifold heated air, but I would hesitate to try driving an 8-valve outside the sun belt without it.

The only hitch in changing the manifold is that you have to remove an engine mount to get at the last manifold bolt. You also have to remove the air conditioning compressor from the 1980 models to get at the last engine mount bolt. At least, it gives you the perfect opportunity to renew the air conditioner drive belt along with the alternator and power steering belts which require removal of the air conditioner belt.

One risk is that a manifold stud could break. It is probably better to use a nut cracker on the manifold nuts and replace them with new ones. It wouldn't hurt to simply remove all the studs and replace them too, if you want to be doubly sure.

What reward do you get for your effort? First of all, don't try it unless you really like to do stuff like this. Also, the cost/benefit ratio improves considerably if the head pipe has just cracked and needs to be replaced anyway. That said, be advised that the car should run like a 99. The improvement is most noticeable at high RPM, as you might expect from the reduced back pressure. Finally, what can you expect from, say, a 5 percent increase in power? Remember, it is not SAE net power which is accelerating you. At modest highway speeds, perhaps 15 percent of the power is lost to drag and another 35 percent is lost to friction in the drive mechanisms. (We are at this point over 4,000 RPM and in 3rd gear.) Thus, the 5 percent increase in total power is equal to a 10 percent increase in acceleration, which means "noticeably peppier". If the car was already marginal in terms of contemporary performance levels, the mild boost is quite welcome, and the ability to get another 500 to 1,000 RPM of useful power band can make a very big difference in passing times.

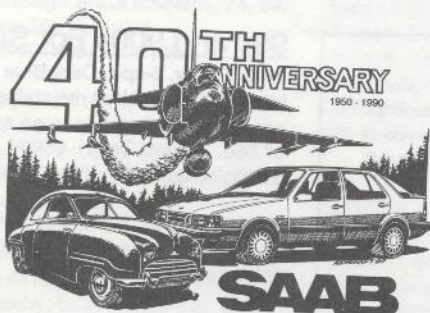
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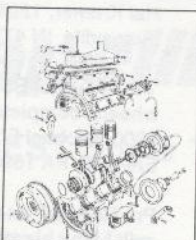
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- B. - Short nose 95 (1959-64), four views
- C. - Exploded view, three cylinder engine
- D. - SAAB Airplane logo



96, 4 views
(95 is similar)



3-cylinder engine



Airplane Logo

Back Issues of NINES

The following back issues are still available. The supply of those marked with an asterisk (*) is very limited.

<u>Cover date</u>	<u>Price</u>	<u>Cover date</u>	<u>Price</u>
December 1985*	\$1.50	April 1988*	\$1.50
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November 1987	\$1.50	October 1988	\$2.25
December 1987	\$1.50	November 1988	\$2.25
January 1988*	\$1.50	December 1988	\$2.25
February 1988*	\$1.50	All 1989 issues	\$2.50 each.

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DISCOUNT BOOKS

SAAB: The First 40 Years of Saab Cars - by Björn-Eric Lindh (1987)
The most complete history of Saab available. Covers every model from the earliest design sketches and prototypes through the luxury 9000. Also covers Saab's motorsports activities. 200 pages, 500 illustrations. **\$29.50**

THE SAAB-SCANIA STORY - Pictorial history of SAAB beginning in 1937 with the formation of Svenska Aeroplan AB. Covers aircraft, cars, trucks, plus the Combitech and Eneritech divisions. 168 pages, 322 illustrations. **\$14.50**

Brooklands Books - Collections of magazine articles, road tests, new model reports, specs and comparison tests.

- SAAB SONETT 1966 - 1974 **\$9.50**
- SAAB TURBO 1976 - 1983 **\$12.50**
- CAR and DRIVER ON SAAB 1956 - 1985 **\$12.50**
- ROAD & TRACK ON SAAB 1955 - 1984 **\$12.50**

THE SONETT and All Other SAAB Sports Cars, by Björn Svalner (1983). Printed in Swedish, with English translation. List price, \$24.95 **CLUB PRICE \$20.00**

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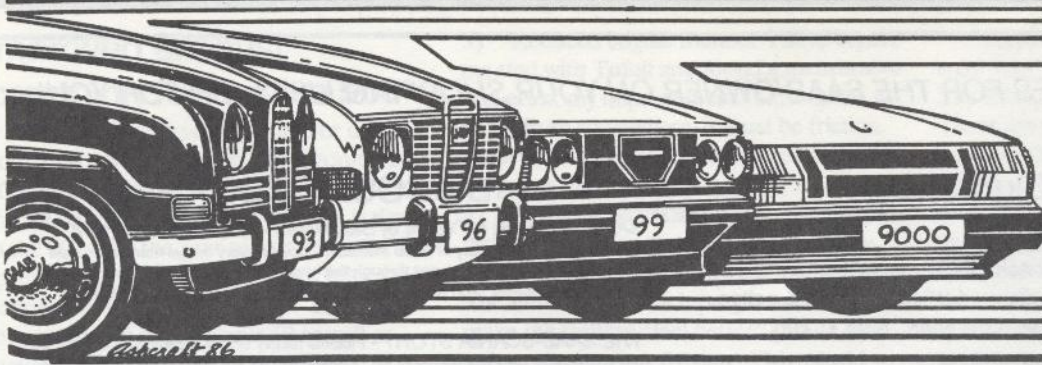
SAAB TURBO, by Graham Robson (1983). AutoHistory on the 99 & 900 Turbos. List price, \$19.95 **SPECIAL PRICE \$6.00**

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DEADLINE: The 15th of each month for the following month's issue, e.g. January 15th for the February issue. Newsletters are mailed the first week of the cover month.

COMMERCIAL DISPLAY ADS: Contact the editor for rates and info. Deadline, the 10th of each month for the following month's issue.

Sonett For Sale

'74 Sonett III, Blue, rebuilt rally engine, 40 DFI Weber, ported heads, oversize valves, 3/4 cam, MSS exhaust. New paint, completely restored, many extras. \$5,300 obo. Michael D'Aleo, 65 Hollow Horn Rd, Erwinna, PA 18920. 215/294-9589.

'74 Sonett III, good looker, Royal Blue. New valve seats, wood window sills, two snow spares, extra lights. Some repairable rust. Photos available, send SASE. \$2,800. Howard Cummins, 5806 N. Woodland, Kansas City, MO 64118. 816/452-7423.

'73 Sonett III, MSS carb & exhaust, steel timing gear, good tires, new brake rotors. Runs but needs rebuilding. Some rust, needs some fiberglass work. \$1,200. Roger Libby, 830 Greenwood Ave, #6, Atlanta, GA 30306. 404/892-8102.

'72 Sonett III, new paint, new interior, hood modified to open like Sonett II, Excellent engine & tranny, body superb. Weber carb, driving & fog lights. \$4,000 firm. Mick Nordquist, 520 Oakhurst Dr, Knoxville, TN 37919. 615/523-7651.

93s, 95s & 96s For Sale

96 IMSA Baby Grand Sedan. Roll cage, 4-bolt hubs, flared fenders, new engine. Best offer or trade for '64 Monte Carlo 850. Steve Dougherty, Stroudsburg, PA. 717/421-0715 or 302/658-6194.

'73 96, Lemon Yellow, 170k mi, relatively clean, body fair. Weber, radials, good compression, stainless mufflers, recent work, extra parts car. Drive it home! \$1,000 obo. Peter Reimuller, Box 4, Point Arena, CA 95468. 707/882-2001.

'70 96, Light Blue, newly painted. Trans & engine very good. Have all receipts and excellent mechanic. Runs strong, very solid. \$1,100 obo. Bond Wright, 2636-7th St, Santa Monica, CA 90404. 213/399-1899.

2-Stroke & V4 Parts For Sale

96 doors, hoods, fenders, radiator, bumpers, trunk lids, hubcaps, wheels, etc. 99 bumpers, steel wheels. Will sell separately or whole, will trade for Alfa parts, electronics or shop equipment. Charlie Dodson, Annapolis, MD. 301/267-9245.

Sonett parts: Transmission, \$225. 4 early style optional alloys, \$275. Rear fiberglass, \$125. '72 dashboard, \$50. Other parts available. Michael D'Aleo, 65 Hollow Horn Rd, Erwinna, PA 18920. 215/294-9589.

99s and 900s For Sale

'87 900 4-dr, 5-spd, Dark Blue w/Lt Blue interior, 54k mi. Well maintained, excellent condition, car is ready to go anywhere. \$7,650. Dennis Tobin, 959 N. LaFox St, So Elgin, IL 60177. 708/931-1555.

'87 900, 70k mi. Front end damage, still runs. \$5,000. George Arp, W. Palm Beach, FL. 407/471-3999.

'84 900 Turbo, White, 4-dr, sunroof, AC, radio/tape. Excellent condition. \$6,600. Gordon Smith, Rm 1700, 475 Riverside Dr, New York, NY 10115. 212/870-3056 or 212/865-2766.*

'84 900 Turbo, 5-spd, 145k mi, Burgundy. Excellent condition, maintenance log. \$5,200. Hal Kramer, 12018 Lake Ridge Dr., Evansville, IN 47712.

'78 99 Turbo, Body in excellent condition, Inca wheels, complete car. Needs idler shaft to run. \$800. Michael D'Aleo, 65 Hollow Horn Rd, Erwinna, PA 18920. 215/294-9589.

Pro Rally 99, ex-Swedish Motors car, priced to sell. Many hi-performance 99 parts also. David McHugh, Fairfield, CT. 203/334-4344.

99, 900 and 9000

Parts and Accessories

900 stuff: 4 175/70R15 Gislaved summer tires on 5" steel rims, and 2 175/70R15 Gislaved Frost snows, \$325 or offer. Set of 4 blue carpet floor mats, \$20. Shadow louvers, \$40. David Gabbé, 38 Winchester St #7, Brookline, MA 02146.

99 parts: 4 EMS alloys, \$30 ea. 99 rear lens, \$8. Windshield, \$40. Burgundy interior from '78 Turbo, very good condition, \$125. Tachometer, \$35. Michael D'Aleo, 65 Hollow Horn Rd, Erwinna, PA 18920. 215/294-9589.

99 & 900 engines, transmissions, rotors, mags, gauges, other mechanical and body parts, 10% off list on all new and used stock Saab parts. Rear spoilers, \$178.00. Parts list available. Trollhattan Motors, 310 George Ave, Baltimore, MD 21221. 301/686-2446.

Clarion AM/FM cassette w/equalizer from '84 Turbo. New tape player. AM & equalizer work great, FM needs repair. \$100 obo, incl shpg. Brent Amundson, Virginia Beach, VA. 804/467-3106.

"B" blocks and heads; early, late and Turbo. '82 H-head & block, 4-spd trans, 99 hood, alloy & steel wheels, much more... T. Haussner, NJ. 201/615-4495, 9-5 M-F or leave message.

SAAB Club Newsletters, #18 - #185 (7/74 thru 10/89), missing #86 (10/80). 170 issues, \$170. SAAB Club of Chicago brass emblem, '74, \$9. Mark Headington, 258 Kevin Ct, Onalaska, WI 54650. 608/781-3106.

Parting out: 3 99s and 8 900s, 1976 thru 1985 (two 16v Turbo 3-drs). New OE sunroof deflectors for 99, 900 or 9000, \$39.50. Rod Beckner, 604 E 1st, Albany OR 97321. 503/928-6351 eves & wknds.

Pulse Relation Meters made to order, \$50.00 incl. shpg. Saab 4x10 3-driver speakers, one perfect, one scratchy, both \$20.00 incl. shpg. Factory Service Manual sections: #0 Tech Data 79-80, #1 Service 79-83, #2 Engine 79-80, all for \$5+UPS; #8 Convertible, \$5+UPS. Joel Schneid, 59 Sylvester Rd, Northampton, MA 01060. 413/584-2511 eves.

Two 10" subwoofers in sealed enclosure, mounted in rear deck replacement panel for 900 hatchback. Never used. Upholster yourself. \$75 incl shpg. Bill Goosby, Danville, IL 217/446-4600 days, 217/443-7045 eves/wknds.

Zemco driving computer, mounted in 11"Wx28"L overhead console. Calculates speed, mpg, etc. Designed for carbureted engines. Never used. Includes instructions & hardware. \$85. Bill Goosby, Danville, IL. 217/446-4600 days, 217/443-7045 eves/wknds.

Large inventory of 99, 900 & 9000 parts, new & used. Engines, 5-spd transmissions, etc. Rebuilt units & installation available. Saab Master Technician on duty. Independent Auto Craft, 6207 Factory Rd, Crystal Lake, IL 60014. 815/455-4030.

Parting out: '86 900S 16v, '87 900 16v Turbo, '86 900 SPG, '86 900 base, '85 900 16v Turbo, '84 900, '82 900 Turbo, '79 900. Drivetrains, interiors, body suspension, wheels, rebuilt transmissions and more. Mike Caro, Wallingford, CT. 203/284-8989.

Tons of 99 & 900 parts - Cheap! Alloys, heads, short blocks, panels, you name it. Installation available. Andrew Stohr Repair, Spofford, NH. 603/363-4453.

RGA rear spoiler for 900 sedan, new, \$99. 32/36 Weber adapter, 99 carb manifold, \$50. Heavy duty 99/900 clutch kits, \$95 to \$105. Swedish Express, 335 Canal Park Drive, Duluth, MN 55802. 218/722-1530.

900 leather seat covers, OEM, burgundy, front only, excellent condition. \$250. George Arp, W Palm Beach, FL. 407/471-3999.

99 Factory shop manual, 69-74, \$29. Headrest inserts for '73 99 (unused), \$29. Mark Headington, 258 Kevin Ct, Onalaska, WI 54650. 608/781-3106.

900 wheels: Shelby Silvervane alloy wheels, 4 new, 4 used. 4 alloys for '88 900, one new '78 99 Turbo Inca wheel. Independent Auto Craft, 6207 Factory Rd, Crystal Lake, IL 60014. 815/455-4030.

Wanted, All Models

2-stroke 0.5 "A" piston, or complete crank with pistons. Dick Landon, Santa Cruz, CA. 408/459-8010.*

Nice 95-V4 wanted. Larry Naar, 71 East 7th St, New York, NY 10003. 212/254-1884.*

Set of Black corduroy seat covers for 900 3-dr. Also "Blue Fox" carpet mat set for 81-83 900, p/n 02-41-893. Art Levy, 588 Madison Ave, Albany, NY 12208. 518/449-7077 eves.

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New production facility opens in Malmö

The Saab Car Division of Saab-Scania AB has unveiled a new production plant in Malmö, Sweden, that effectively combines technological and human capabilities to produce Saab 900 and 9000 passenger cars for its worldwide markets.

Saab's Malmö factory is designed with high quality, excellent productivity through employee involvement, pleasant working conditions, and a flexible production system as its cornerstones.

"In addition to the workplace, the way of working at Saab's new factory is improved," stated Alf Olsson, a material handler at the new passenger car factory. Olsson and his co-workers recently helped dedicate the new production plant, attesting to the high degree of input Malmö-based employees have in business matters. He added, "Each of us has more responsibility and influence, and we know we're doing something that Saab customers will ultimately appreciate. That makes our job much more interesting and rewarding."

Teamwork at all levels is key to auto assembly at the Malmö production facility. Workers are assigned to eight production workshops, which are further divided into smaller teams. Management, both on the shop floor and within the plant's administration, is similarly organized to produce short and consistent communication lines. The Swedish automaker believes that quick decision and information paths are vitally important to production efficiency and serve to instill a concern for quality and personal respon-

sibility among workers.

Additionally, priority is placed on skill sharing and overlapping roles throughout the work force, with all specialist functions divided into groups and teams, each with responsibility for quality, quantity, maintenance of production equipment, materials handling, and economic follow-up.

Eight production workshops correspond to the functional makeup of the car and include two chassis stations, an engine area, glazing, interior, instrument panel, door, and finishing workshops. A ninth area is set aside for material handling and receiving. Each workshop is comprised of teams of 8 to 10 men and women that function as both assembly and business management teams; setting their own agendas for production, training, inventory, and even vacations. The teams are also profit centers which monitor their performance through routine analysis.

The Malmö production facility contains both line assembly and parallel production areas. Line assembly is to accommodate heavy production demands such as is the area of engine and powertrain installation, and also where robots and semi-automatic machinery is required. Operations which require chemical handling including lubricants, fuel, and adhesives are also performed in the line areas since special hardware such as ventilation equipment is needed.

The majority of construction takes place in the parallel assembly areas, where the lighter subassembly functions are performed. In a parallel assembly area, a chassis for example, is placed on a jig which is secured to the floor and all functions are performed around that site until the sub-assembly is

completed. As in the line functions, team members rotate throughout all parallel stations in pace with their expanding knowledge of each production routine, which ensures that all workers are well suited to perform any task specified by the team leader. Job rotation and familiarization with a variety of duties allows each worker a greater opportunity for personal involvement. Individuals also exercise their influence by selecting team leaders, again on a rotating basis.

Maximum assembly flexibility can be maintained to accommodate changing production demands by carefully utilizing the two assembly strategies. Changes in manufacturing tooling can also be met with a minimum of in-house adjustment.

Saab has long known that a first-class car cannot be constructed by workers who feel that they have a second-class job. The high-technology automaker has already been successful in replacing traditional assembly line methods to eliminate monotonous and repetitive activities. This gives workers the responsibility for their own day-to-day operations, reduces absenteeism and personnel turnover, broadens workers' knowledge, and improves overall product quality.

Saab's team concept was first employed in 1972 at the Scania engine facility in Södertälje, Sweden. Since then, the concept has been expanded to include all body shop activities existing in the Trollhättan production site. The Malmö production plant represents Saab's latest and most aggressive advance in the team assembly concept, so much so that some of the production teams were instrumental in the basic planning of the new factory.

A subtle advantage to the team technique is the assurance that Saab's high quality standards will not only be maintained, but extended. Saab has integrated its past findings -- that production quality is enhanced through employee involvement and initiative -- into the new Malmö method. The team approach allows workers to assume responsibilities normally found on higher levels in traditional manufacturing organizations and actually stimulates in-house competition among groups. Teams diligently strive to maximize efficiency and optimize quality control methods and their competence level contributes to their ultimate salary structure.

The majority of Malmö production volume is destined for the United States, and Saab models produced at the factory are already making their way to Saab-Scania of America's 371 dealers, nationwide.

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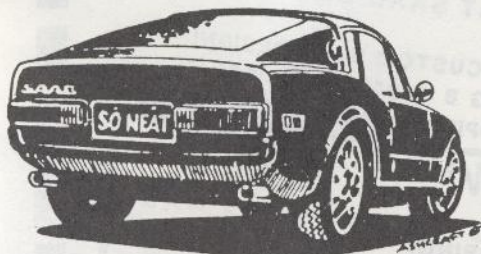
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FROM THE BACKSIDE

By the time you read this, everything may have changed. This month the rumor is that Saab will merge with Lancia. There is probably some truth to the stories, after all Saab and Lancia have collaborated in the past, most notably on the Saab 9000 and the Lancia Thema.

Saab-Ana, the dealership network that sells Saabs in Sweden, also markets Lancia in that country. Did you know that the mid-sized Lancia Delta was redesigned by Saab to handle Swedish winters and sold as the Saab-Lancia 600?

Although some of the basic chassis work on the 9000 and Thema was a joint effort, engineering and marketing differences caused Saab and Lancia to end their collaboration in 1981. Fiat, which owns Lancia, continued the project in Italy, and developed the Fiat Chroma and Alfa Romeo 164 to share the Thema chassis.

Saab has often required assistance from other companies due to its small size. Who can forget that the SAAB 96 was kept alive in the late 1960s by dropping in a Ford V4 engine? The 99 initially came with a Triumph engine. The engine in the first SAAB, the 92, was a copy of a DKW design. And if it weren't for the merger with truck-builder Scania-Vabis in 1968, would there

ever have been a turbocharged Saab car?

The prototype for the Sonett II, the MFI-13, was designed by Malmö Flygindustri; chosen over the "Catherina" penned by Saab's own designer, Sixten Sason. Saab turned to Italian designer Sergio Coggiola for the Sonett III. Another Italian firm, Giorgetto Giugiaro's Ital Design, was responsible for the shape of the 9000.

Even today, the Saab 900s built in Finland come from the Saab-Valmet factory, jointly owned by Saab-Scania and Oy Valmet AB.

Other divisions of Saab-Scania have sought outside help on projects as well. The SF340 commuter plane was a cooperative venture of Saab and Fairchild Industries. The JAS 39 Gripen, a military interceptor, strike and reconnaissance jet currently undergoing testing, is the result of a consortium of four companies: Saab Aircraft Division, Volvo Flygmotor, Ericsson Radar Electronics and FFV Aerotech.

It is difficult to believe that Saab-Scania AB would sell its car division after one year of red ink, when there were so many years in the black. The company has weathered slow sales periods before; production was cut back 20 percent in 1966 due to the "antiquated" two-stroke engine, there was a recession in Europe in the early 1970s, and the oil crisis and resulting worldwide recession of the mid-70s. At least twice in the past there have been rumors of a merger with Volvo, in 1963 and 1977.

The opening of the new factory in Malmö gives Saab more capacity than they need right now; expected 1989 sales will be around 120,000, while production capacity is now 140,000 annually. Ten years ago (1979), 83,758 Saabs were built. In 1980 that dropped to 65,754 cars, utilizing only 75 percent of factory capacity. Saab recovered to nearly double output and sales over the

next six years.

Many automotive analysts are now saying that Saab should replace the "aging" 900. Within the past year, Saab's U.S. president Bob Sinclair has continued to state "there is plenty of life left in the 900" Despite strong sales in the U.S., Saab was ready a couple of years ago to get moving on a new model to replace the 900 in the early 1990s. I believe that there is a new model in the works, and that it will be introduced within two years.

Would an alliance with Lancia be so bad? After all, Lancia has given the world some wonderful cars, such as the Stratos. Lancia has also been the World Rally Champion for the past several years, most recently with the turbocharged four-wheel-drive Delta HF Integrale.

Based on history, Saab should come out of this rough spot just fine. The other divisions of Saab-Scania are profitable, and can fill in where the car division is short. Unlike Chrysler, they won't need a government bailout to stay afloat.

There is a SAAB in the future. When (if?) you go to see "Back to the Future - Part 2" look for the SAAB EV-1 among the vehicles driving around the town square. The movie's producers gathered as many futuristic show cars and experimental models as they could for scenes that take place in the year 2015. An exception was the use of Citroen DS-21s as taxicabs.

A happy and safe holiday season to all from the staff at the SAAB Club:

Casey & Viggen - *Security* (mostly barking and looking fierce)

Nancy Winker - *Membership/Business Manager*

Tim Winker - *Editor/Publisher*

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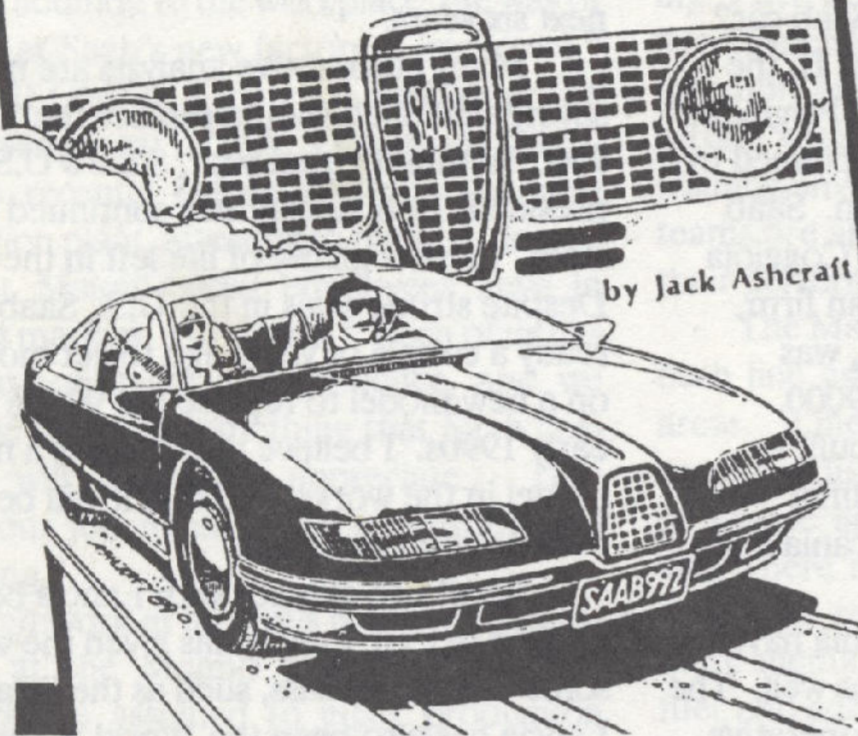
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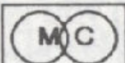
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