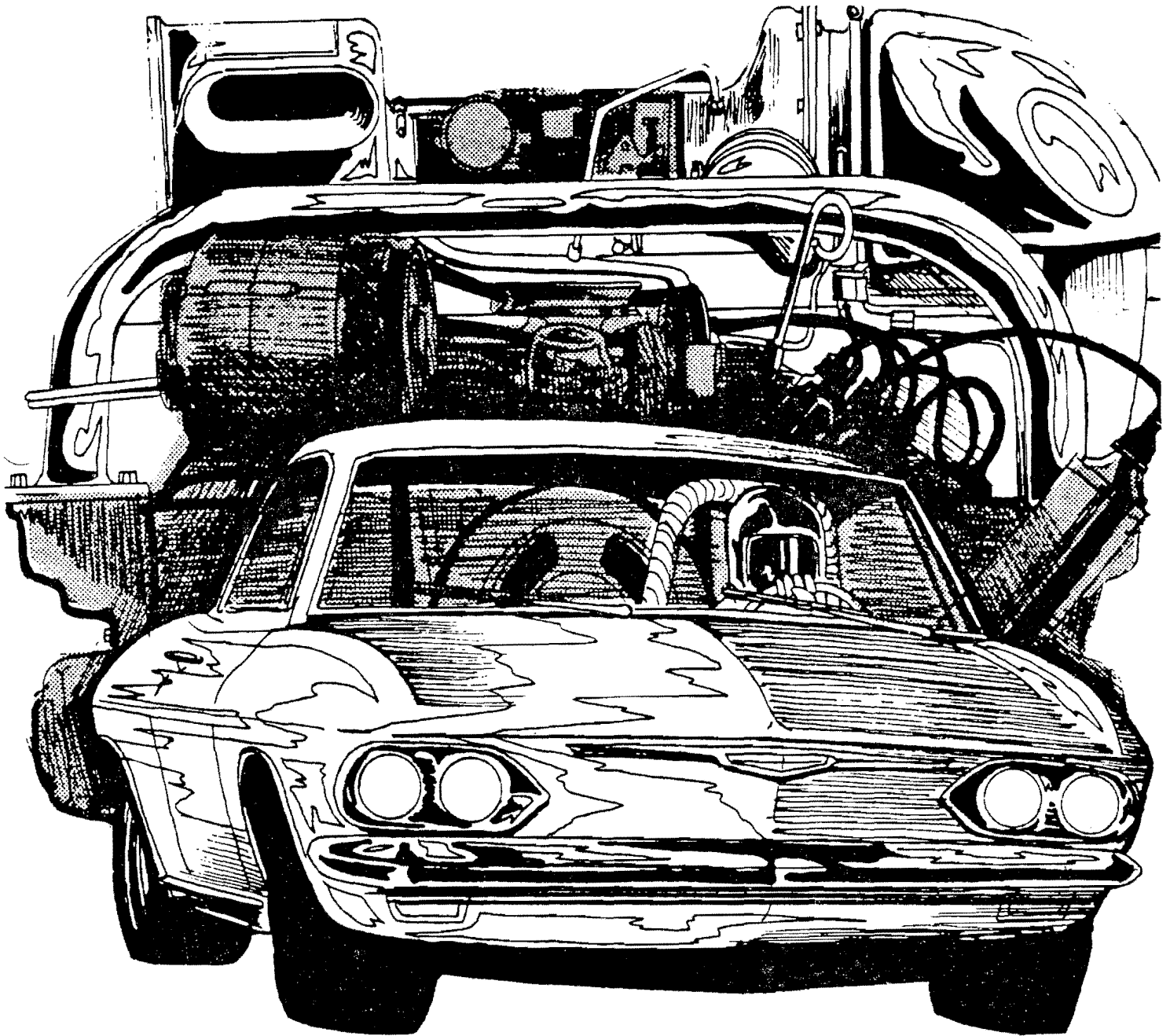


Don Barber

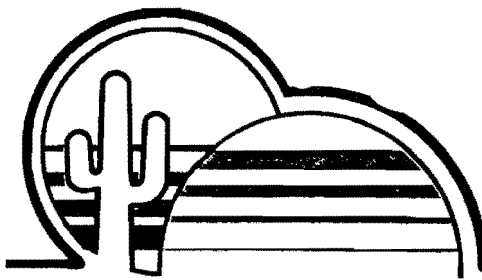
Continuation

TUCSON CORVAIR ASSOCIATION TUCSON, ARIZONA



JULY, 1983

Volume 9 Number 4



TUCSON CORVAIR ASSOCIATION

CORVAIRSATION IS A MONTHLY NEWSLETTER FOR THE MEMBERS OF THE TUCSON CORVAIR ASSOCIATION AND OTHERS INTERESTED IN THE PRESERVATION AND RESTORATION OF THE CORVAIR AUTOMOBILE. THE TUCSON CORVAIR ASSOCIATION IS A CHARTERED CHAPTER OF CORSA (CORVAIR SOCIETY OF AMERICA)

MONTHLY MEETINGS ARE HELD ON THE 4th WEDNESDAY OF EACH MONTH. ONE ADDITIONAL SOCIAL AND/OR TECHNICAL EVENT IS PLANNED AND SCHEDULED EACH MONTH. DETAILS ARE PUBLISHED IN THE NEWSLETTER.

DUES FOR TUCSON CORVAIR ASSOCIATION MEMBERSHIP ARE \$10.00 PER YEAR, PAYABLE TO THE MEMBERSHIP CHAIRMAN. ANY TCA MEMBER WHO IS A MEMBER OF CORSA RECEIVES A \$1.00 DISCOUNT ON THEIR TCA DUES. CORVAIR SOCIETY OF AMERICA (CORSA) MEMBERSHIP IS \$14.00 PER YEAR AND IS HANDLED DIRECTLY BETWEEN INDIVIDUALS AND CORSA AT, 2506 GROSS POINT ROAD, EVANSTON, IL. 60201.

DEADLINE FOR ALL MATERIAL FOR PUBLICATION IS THE 5th OF EACH MONTH. MATERIAL FOR PUBLICATION IS SOLICITED AND SHOULD BE TYPED IF AT ALL POSSIBLE. SEND ALL MATERIAL FOR PUBLICATION TO THE CORVAIRSATION EDITOR AT, 4471 E. 7th ST, TUCSON, AZ. 85711. PH. (602) 795-2639.

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PRESIDENT'S PAGE

It seems like in the winter I'm always complaining because I'm so busy - can't get anything done - I wish it was summer. And then summer comes and I find myself complaining about the same thing. Somehow I think that the season of the year has nothing to do with it. As you have no doubt read elsewhere in this publication, your board made a few interesting decisions last month. The initiation fee for new members was eliminated and all memberships are now family memberships and include all of the members of the immediate household with one vote per family. I think what this does more than anything is make the record keeping easy and simple. We also discussed the possibility of having a hayride as a mid-month activity. More about that later.

We had a real fun time last weekend installing new ball joints in the Corsa. While I had it apart I cut off one coil of each front spring a la Bill Fisher (How to Hot Rod Corvairs) and was quite surprised with the results. The difference in front end height is noticable, but just barely, but the way it goes around corners is great. I guess it doesn't take much to get some people excited!! I've owned lots of cars over the years and it seems like whatever car it happens to be at the time, it doesn't take too long for me to grow tired of it. Vega GTs, El Camonos, pick ups of all colors, Nova SSs and, yes, my lovely bride's 240Z. There's just something about taking the old Corsa over a winding mountain road when there's nobody in your way that makes me really feel sad that I can't go down to the Chevy dealer and buy a new one. I'm sure some day I won't be able to enjoy my Corvairs - I only hope that it's after I'm dead and not them!

A handwritten signature in cursive script, appearing to read "Tom", located at the bottom center of the page.

TCA REGULAR MEETING

Wednesday, June 22, 1983

The meeting was called to order by the President, Van Pershing, at 7:36 p.m., at the Filling Station Restaurant, 6934 E. Tanque Verde Road.

PRESENT: 34 CORVAIRS: 21

The minutes of May 25, 1983 regular meeting as published in the Corvairsation were approved.

Visitors and new members were introduced.

A "get well" card was circulated to the members to sign for Frank McKenna who was recently burned. Mark McKenna reported his Dad was improving and would not have to have any skin grafts.

A list of mid-month activities was published in the June issue of the Corvairsation. Any member wishing to add any input to the list please contact Bob Eggers, phone 885-4779.

Ed Sanford is the new TCA Can Chairman.

Van reported that Freidrich Metz contacted him to let him know the Chevy Show has been cancelled that he was trying to get a committee together to put on this Fall.

Need more members to help judge, chair and help in other ways at the Mini Convention in Phoenix next April.

Van reminded everyone that the deadline for articles in the Corvairsation is the 5th of each month. Send to: Dave Thompson, Corvairsation Editor, 4471 E. 7th St., Tucson, AZ 85711.

The June issue of CORSA had the statements for CORSA Board nominations for holding a position on the CORSA Board of Directors. TCA members would cast their ballot for the Western Division candidates.

Anyone interested may send for a 1983 CORSA Travel Roster for \$3.00 which is a listing of all CORSA members arranged alphabetically by state, town, then by last name.

Ed Sanford will have information in the Corvairsation in regards to the cost and date for members to attend a dinner theater show this summer. He also announced the Con-course results have been duplicated and turned over to the Cactus Club.

An updated Roster was included in the June issue of the Corvairsation.

Following break, grab bag and door prizes were won by Bob Thompson, Leon Mazza, Lee Vader and Ernie Aloy. Donors were TCA and Barney's Auto Service.

Sale items and technical tip sessions followed.

Meeting adjourned at 8:40 p.m.

Respectfully submitted,

Lucy Post
Lucy Post
Recording Secretary

The Corvair develops a fever!

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Operating temperatures for Corvair engines have always been higher than those of water-cooled cars. And it's expected that air-cooled engines would operate at temperatures that disregard the artificial limit imposed by boiling points. The Corvair is fortunate in those respects. The designers could allow for a large range of temperatures in the Corvair engine, and still achieve completely satisfactory operation. All, of course, assuming that certain maximum temperatures were never exceeded.

The original 1960 80HP engine was described in the Society Of Automotive Engineers' Report 140C by Bob Benzinger. He stated that the worst road load cooling condition of maximum speed produced peak cylinder head temperatures of about 435°F in 100°F ambient air. Similarly, full throttle operation at speeds near 60 mph produced worst case cylinder head temperatures of approximately 465°F in 100° ambient air. This was in an engine displacing 140 cubic inches with a blower fan capable of producing 1850 cubic feet

per minute (cfm) of cooling air at an engine speed of 4000 rpm. To cool the engine oil, a separate folded-fin cooler was used which dissipated about 160 BTUs per minute. This oil cooler kept the lubricating oil down to 280°F when the engine was operated at worst case conditions (for oil temperature) of maximum vehicle speed in an ambient air temperature of 100°F.

While the 465°F maximum cylinder head temperature appears safe enough, the 280° oil temperature is cause for concern. Oil tends to thin out and oxidize very rapidly at higher temperatures with the rate of oxidation doubling for every 33°F rise in oil temperatures. Many experts recommend an absolute maximum oil temperature of 250°F with a preferred operational temperature of about 220°F.

The Corvair operational oil temperatures were about 230°F and 240° for speeds of 60 mph and 70 mph respectively in 100°F ambient air. So the oil temperatures at conservative speeds were within satisfactory limits for long engine life in the 1960 Corvair.

From these cylinder head and oil temperatures defined in SAE 140C, operational temperatures started to increase as yearly model changes heaped more burdens on the cooling system. First there was the air conditioning option in 1961 that raised operating temperatures. This was followed in 1963 by a change in the oil cooler to a less effective design. 1964 brought a larger displacement engine which required more cooling since it developed more horsepower within the same overall size as before. But instead of additional cooling, the air volume capacity was decreased from 1850 cfm to 1460 cfm by a new fan design. In 1966 the Air Injection Reactor (A. I. R.) option, K19, (sometimes called a smog pump) was added to all Corvairs delivered in California (except those with turbocharged engines) to lower exhaust emissions. The A. I. R. option also included specially calibrated lean carburetors and revised distributor calibrations.

The A. I. R. option lowered exhaust emissions by burning excessive hydrocarbons in the exhaust manifolds as they leave the engine. This was done by pumping air into the exhaust manifolds, and producing an effect similar to blowing on campfire embers. When these hydrocarbons burn in the exhaust system, they produce significant temperature increases. One Corvair tested by Chevrolet with the A. I. R. option developed an exhaust gas temperature in the muffler of 1720°F while pulling a long grade at

Mike Helt artwork

58 mph with wide open throttle (W.O.T.). Muffler temperatures of 1600°F were quite common under W.O.T. conditions at 100°F ambient air with the A.I.R., causing the muffler hangers to burn through.

Although the A.I.R. was optional in 1966 and 1967, except for California cars, government mandated emission requirements forced the use of the Air Injection Reactor on all 1968 and 1969 Corvairs.

During mid 1966, Chevrolet engineers, realizing the temperature problems caused by the A.I.R., embarked on a 4762-mile shake-down test with a fleet of Corvairs, Chevy II s, Chevelles and full size Chevrolets. The trip was intended to be a general evaluation of the A.I.R. systems under desert, high altitude and other driving conditions. All of the cars were equipped with the A.I.R. There were two 1967 prototype Corvairs that made the complete trip: a 95 HP 3-speed, and a 110 Hp with Powerglide and air conditioning. For the desert testing a third Corvair with 95 HP, Powerglide and air conditioning was also used.

The test results for the Corvairs showed excessive operating temperatures during the desert testing. These excessive temperatures manifested themselves in several ways. Severe part throttle and high speed W.O.T. detonation was encountered using premium gas. Serious vapor lock problems developed with the two air conditioned Corvairs during the tests. Once vapor lock occurred, it became impossible to start the engines normally. Vapor lock problems also caused surging and speed loss when the engines were running. The critical soak period appeared to be 30-60 minutes. On shut-off some dieseling also occurred.

High speed runs at the Desert Proving Ground were made with an ambient air temperatures of 100-107°F. During the first of these tests at a constant 80 mph, cylinder head temperatures reached a maximum of 565°F with an average head temperature of 515°F being common. Oil temperatures under these conditions were all well over 300°F with an average temperature of about 315°F and a peak of 329°F. Oil temperatures even exceeded 300°F during prolonged idle at 100°F ambient.

Wide open throttle tests on the Corvairs were a total disaster! The air conditioned Corvairs would not stabilize temperatures! i.e., the operating temperatures just continued to climb. Each test was terminated when the cylinder head temperature reached 590°F to prevent melting the engine. Oil temperatures soared to 345°F. Even the non-air conditioned Corvair ran excessive temperatures with a head temperature of 550°F and oil temperature of 335°F. Muffler temperatures were well above 1600°F. Clearly all these temperatures were excessive and meant real problems for the Corvair.

Temperature tests run on five other Corvairs produced similar results to the desert testing, and an engine temperature summary chart was prepared for Chevrolet management analysis. Recommendations were made to delete the air conditioning option on all A.I.R. equipped Corvairs, and to use the 12 plate oil cooler on all A.I.R. equipped Corvairs. (air conditioned Corvairs already used the 12 plate oil cooler) An aluminized muffler was already standard on the

A.I.R. cars due to the high exhaust temperatures.

No further development programs were initiated on the Corvair to resolve the temperature problems due to its status with Chevrolet management by late 1966.

These changes still left the Corvair running

excessively hot at speeds of 80 mph and above, but did avoid the extreme conditions encountered during the desert tests.

Temperature tests run at the Desert Proving Ground by making changes to the same engine are shown in the table below:

EFFECT ON OPERATING TEMPERATURE			
Change	speed in mph	Change in oil temperature °F	Change in head temperature °F
A.I.R. option	80	+22	+22
Air conditioning in 100°F ambient with 1966 style condenser	60	+30	+36
	80	+23	+30
Early model 1850 cfm fan	W.O.T.	+28	+35
	60	-9	-15
	80	-11	-13
12 plate oil cooler instead of 8 plate	W.O.T.	-4	-5
	80	-16	---
Oil cooler side shields	80	-7	-10
Louvers in lower shrouds	60	-7	-14
	80	-9	-13
Remove lower shrouds	60	-14	-24
	80	-18	-28
	W.O.T.	-18	-24

From the table above, you can evaluate the different ways available to make your Corvair run cooler. Also, since oil temperature extremes are most likely to occur compared to head temperature extremes, satisfactory oil cooling can be achieved by using an external high capacity oil cooler along with a larger capacity finned oil pan. One Corvair test engineer noted that using this set up, along with a 1.2 to 1 ratio blower pulley instead of the stock 1.58 to 1, hurt engine cooling somewhat (due to the slower turning fan) but held oil temperatures to a safe level. He also stated that oil temperatures were sufficiently low during engine dynamometer tests to permit an entire power run without backing off to cool the oil as was necessary in other 164 CID special high performance programs.

There was one Corvair development program however that was just being concluded in the later part of 1966. This was the development of the open chamber cylinder heads. These new heads were designed to lower exhaust emissions and replace the conventional quench chamber heads starting on the 1968 models, along with the mandatory use of the A.I.R.

These open chamber heads had a larger combustion chamber volume since part of the quench area was eliminated. To keep overall compression ratios the same as with the quench chamber heads, pop up pistons were used which protruded into the head chamber. This reduced the combustion volume with the piston at top dead center and maintained compression ratios as before. By reducing the quench area, the volume of unburned fuel mixture normally trapped in the quench area is reduced, and thus hydro-carbon emissions are decreased.

During the test program on the open chamber heads, it was found that they actually ran cooler than the quench chamber heads. Using the same 95 HP engine with A.I.R., the open chamber heads were found to run about 15° cooler at

nearly all speeds. No mention was made of oil temperatures.

Although no further test results are known, it seems safe to assume that the open chamber heads were able to achieve an in-car cylinder head temperature reduction to offset the increased temperature effects of the A.I.R. It's not known whether oil temperatures were reduced. We know that the A.I.R. raised oil temperatures but there is no data to indicate that the open chamber heads caused a compensating oil temperature reduction.

So we have seen how the Corvair head and oil temperatures have climbed as yearly model changes compounded the cooling problem. Ultimately, the worst combination seems to be the A.I.R. and air conditioning on a car with the late style blower fan being driven in a hot climate.

It's interesting to note that the Corvair is not alone with the excessive oil temperature problem. The air-cooled VW was faced with similar problems. One test described in *Dune Buggies and Hot VWs* monitored the following oil temperatures at only 85°F ambient air in a 1970 Squareback.

VW OIL TEMPERATURES

Speed in mph	Oil Temperature in °F
65	245
75	265
85	280

The Corvair excessive temperature problems had no easy solutions. A really large oil cooler would have reduced the oil temperatures significantly, but considerable design effort would probably have been required to lower head temperatures. A larger capacity blower fan might have been a partial solution, but this would have sapped considerable horsepower, and may also have caused more fan belt problems.

It's interesting to consider the idea that excessive operating temperatures were a large factor in the demise of the Corvair.

Classified Ads

WANTED: Rampside Door for '61 pickup. Call Lee Miller 1-398-2050 Any day 6am til 10pm

FOR SALE: 1965 Corsa 140, new carpet (not installed), misc. N.O.S. items, good radials, recent valve-job, 20-mpg in town. \$1400 or offer. Call Dave Tait at 578-0089 after 4 p.m.

FOR SALE: '66 Monza 2 door automatic \$750. Contact Don Bortle 298-4166

FOR SALE: Early and late Rear lenses - Tail & Back-up; Guide(GM) or Glo-Brite. Gordon Cauble 299-1122

FOR SALE: 1965 White Monza Coupe. Call Gordon Cauble for all the details at 299-1122.

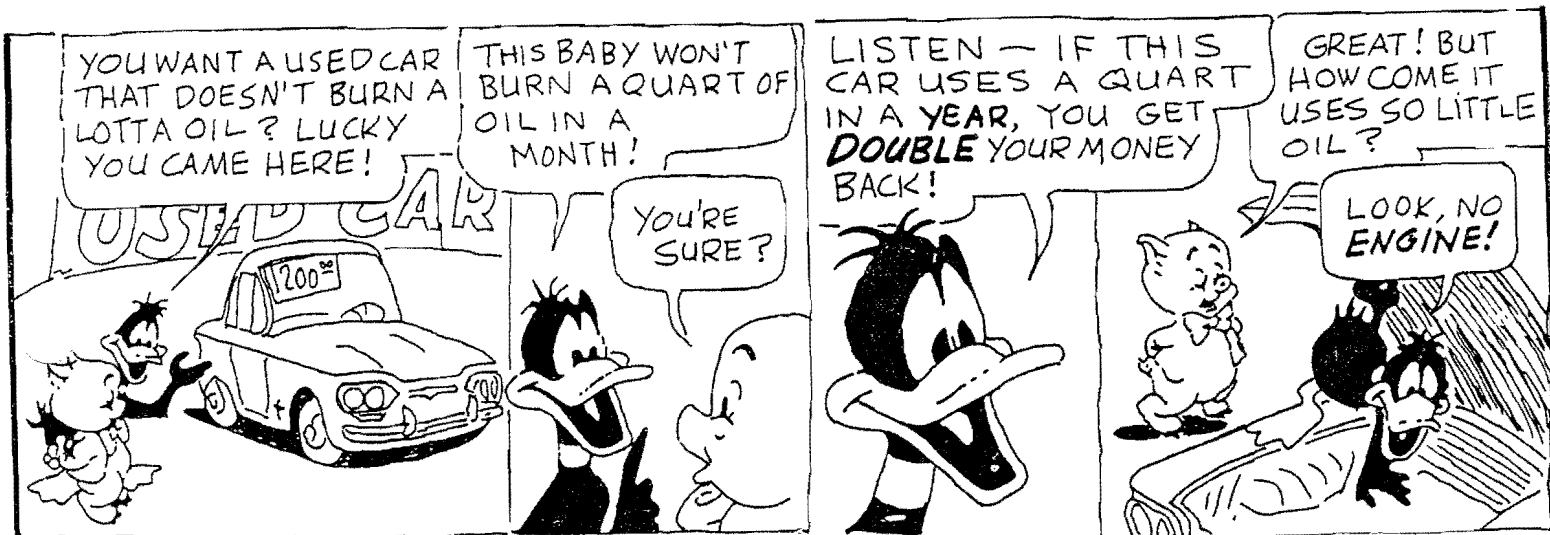
FOR SALE: 1969 Convertible. Rebuilt '66 motor. Good paint, top, and original interior. \$4500 contact Neil Clements at 298-9633.

FOR SALE: New wheel cylinders, early and late, \$10 ea; also many master cylinders. Large supply must sell. Frank McKenna 885-8571

FOR SALE: Vinton "O" rings to seal the oil leaks in your engine, \$9.50/set. Air & oil filters. Weather strip for trunk & engine lid. Early & late shocks plus other hard to find parts for your Corvair. Gordon Cauble 299-1122

TREASURER'S REPORT

Balance 6/1/83.....	\$1643.35
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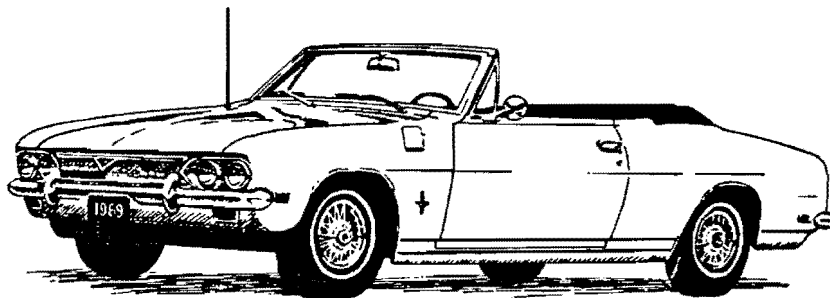


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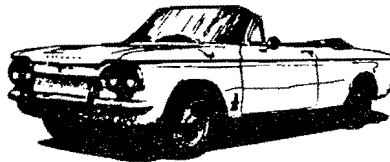
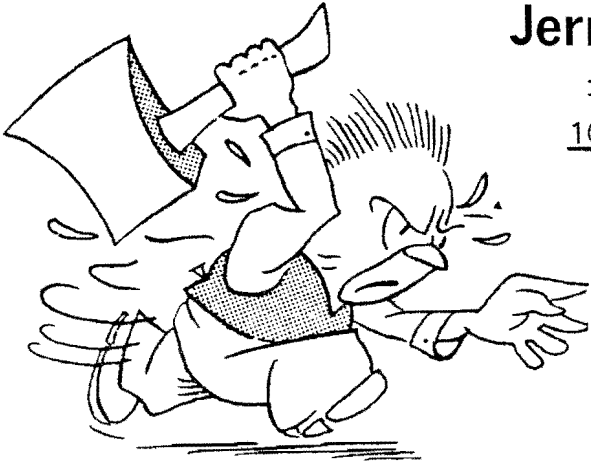
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PATRICIA & MILTON STANFILL

LARRY DANDRIDGE

DON HOOKS

Send dues to Bob Thompson, 619 S. Mountvale Dr., Tucson, Az., 85710.

TUCSON CORVAIR ASSOCIATION REGULAR MONTHLY MEETING

- * THE TIME: Fourth Wednesday of each month, 6:30 pm
- * THE PLACE: The Filling Station, 6934 E. Tanque Verde Rd.
- * THE MENU: An All-You-Can-Eat Buffet, Including Salad Bar
- * THE COST (for the meal): \$3.99 plus drinks.

COMING
EVENTS

SEPTEMBER 1983: Still up for grabs; What would you
like to see the T.C.A. do this month?

The Tucson Corvair Association is a chartered chapter of the Corvair Society of America (CORSA). Monthly meetings are held on the 4th Wednesday of each month.

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