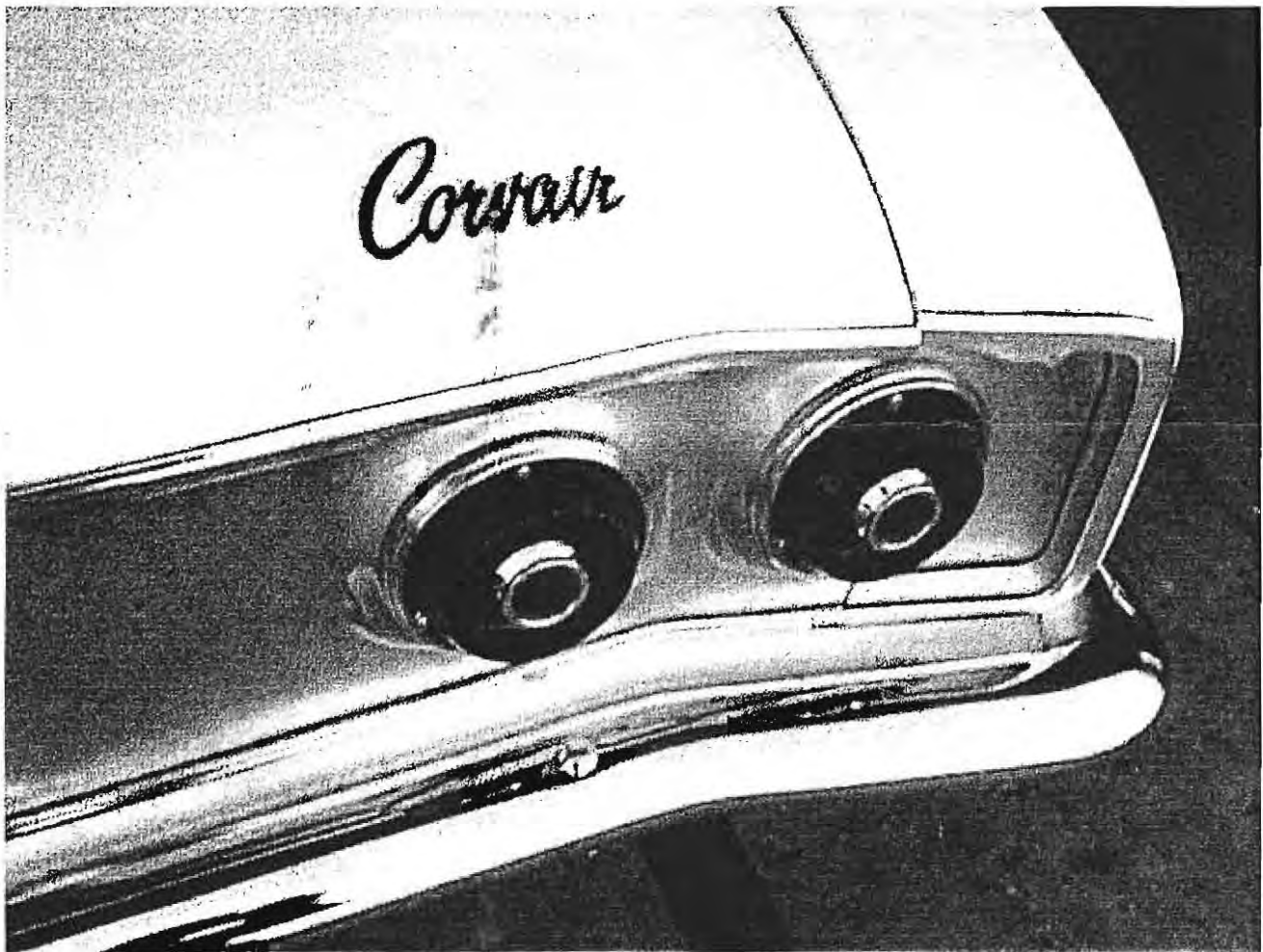


Corvairisation

www.corvairs.org

Tucson Corvair Association
Volume 26, Number 8

Tucson, Arizona
August 2000



IT'S TUCSON CORVAIR ASSOCIATION'S 25TH ANNIVERSARY YEAR

Tucson Corvair Association
Established 1975

Corvairsation is a monthly publication of the Tucson Corvair Association, which is dedicated to the preservation of the Corvair model of the Chevrolet Motor Division of General Motors. The Tucson Corvair Association is a chartered member of the Corvair Society of American (CORSA), Chapter 857.

Monthly Meetings are held on the fourth Wednesday of each month, except December. One technical/social event is planned for each month except August.

Membership Dues are \$15 per year for singles and \$18 per year for families. Initial dues are \$15 for singles and \$22 for families (includes name tags). Make checks payable to Tucson Corvair Association.

Change of Address: Report any change of address or phone number to the Membership Chairperson. Do not report such changes to the Corvairsation Editor.

CORSA Membership Dues are \$27 per year and include a subscription to the CORSA Communique, a monthly publication. CORSA membership is not required for membership in the TCA, but is highly recommended. See any TCA officer for more information.

Classified Ads are free to members and \$2.50 per 4-line ad to all others.

Deadline for all materials submitted for publication in the Corvairsation is the 10th for that month's issue. Mail or deliver all materials to the Corvairsation Editor.

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PREZ SAYS

Hope everyone is staying cool! It's not too hot to come out and attend our monthly meeting with air-conditioning and cold beer on hand. We have had a very slim turnout at the last couple of meetings. It sure would be nice to see more of your smiling faces.

There is always lots of good tech information, as well as parts being shown for your benefit. We have lots of good prizes for you to win in the raffle. We need your participation to make this a complete club. So join us for a guaranteed good time.

We're looking for volunteers to enter their Corvairs in the upcoming car shows/displays. Your Corvair doesn't have to be perfect show condition, we're looking for quantity rather than quality. So come on out and have a good time with us! See you at the meeting. Thank you very much.

Barry



from the editor.....

Are you ready? Three big shows coming up for our Corvairs— of course we are. See the back cover for dates and places. No matter where I go I see a Corvair or two. In fact, last month I saw two (a late and an early coupe) while riding my bike across Iowa. I have had my Greenbrier on that bike trip and it is amazing the comments you get every day. My fellow bikers (the Tucson Tortoises) have prevailed and ruled out non-air -conditioned support vehicles, so no Greenbrier!

Hope to see you at the meeting Wednesday night! Herb Berkman and Gordon Cauble will be reporting on the many activities that transpired at the National Convention in Daytona Beach. Wait 'til you hear where the 2002 Convention will be!

Cooling fans.

From Bryan's Autocross Page (www.geocities.com/motorcity/9164/fan.html)

First a few quick FAQs:

Yes, electric fans have been tried on Corvairs. No, they don't work very well.

The stock fan will not keep a high power Corvair engine cool for long at WOT.

Fortunately, unless you're road racing this isn't usually an issue.

The late fan is better than the early because it's lighter and the belt stays on better. The '64 fans are the magnesium style and fit the early bearing. '65 - '69 fans are all the same.

The stock fan isn't very efficient above 4000 rpm.

Keeping the hot air from recirculating to the fan is very important. Don't remove *any* of the shrouds unless you understand how they work.

General Operation.

Let's cover how to keep the stock system together. You should be able to keep the belt on up to 6k RPMs with the following setup:

- Don't put the belt on too tight. A too tight belt will just wear out bearings faster, and it won't be able to slip when the relative speeds of the pulleys is changing quickly. You should be able to turn the alternator pulley with one hand if the belt is properly tensioned. Do not use a pry bar to pull the idler pulley tight, just pull on it with one hand and tighten the front nut with the other, then tighten the rear bolt.
- Use a fully wrapped belt (available from any of the vendors) instead of one of the cut belts. The wrapped style are more expensive, but they stay on much better. Wider than stock (3/8") or cheap stretchy belts tend to come off more often. Be aware also that what works well for one Corvair owner doesn't always work for another, oftentimes folks have a favorite so if you're having problems and you've gone over the rest of this list, try a different belt.
- Make sure that all the bearings are ok. Idler, fan, and alternator should all turn freely without very much sound. Check to be sure the fan bearing is not installed too high. The belt is meant to come off the pulleys in a straight line, if it's running at much of an angle you have some adjusting to do.
- Also check that the pulleys run true, and aren't rusty or heavily pitted. File off any gouges and sand the pulleys smooth. Check to be sure your harmonic balancer is not separating. The large washer for the idler pulley is just that, a washer, not a spacer, it goes between the nut and the pulley bracket.
- For early owners, use the '64 and later magnesium fan and belt guides, adjust the guides so they are about 1/8" away from the belt. Some amount of contact while the engine is running is normal. Be aware that the early fan bearings are different from later fans, you'll either need a '64 fan, or swap a late bearing and fan onto an early engine.
- If your car has an alternator, watch out for rebuilt alternators with non-Corvair (wrong diameter) pulleys (and fans), and on earlies make sure that the mount casting is for an alternator, not a generator (the giveaway is the pulleys don't line up).

HiPo Operation.

For higher RPM use, you start to run into the limits of the stock system, but there are some things that can help:

- Better pulleys. Ray Sedman makes billet pulleys for the fan and idler, they run **much** more true, the fan pulley is lighter, and the idler pulley is equipped with larger sealed bearings. Bob Coffin offers an SFI quality steel balancer, with a deeper groove, and again it's far more accurate than the stock piece.
- Seth Emerson has found that spraying the belt with silicone lube to help it slip when the engine changes RPM works well.
- A cut down fan will reduce the inertia, and the airflow won't stall at high RPMs.
- Some racers have had success with a spring loaded idler, however it only seems to help if the pivot is bushed to provide accurate movement.
- There's an article in the Tech Guide on making an additional belt guide that attaches to the oil cooler and helps keep the belt on the balancer.

There have been a number of very informative posts on the technical specs of the Corvair's main cooling fan on Virtual Vairs. I've condensed a couple from Rad Davis and Ray Sedman to give you an idea of what the requirements are:

The Corvair engine design requires approximately 18 cubic feet of air per minute (CFM) per indicated horsepower and a system pressure of 7 inches of water at 4,000 rpm (see SAE 140C "The Chevrolet Corvair"). This works out to 80 hp and 1800 cfm on the '60, which represents a 20% safety factor. Note, that the temperature curve is quite close to the indicated mean effective pressure (IMEP) curve. The peak is about 2,600 rpm. At this rpm, temperature will be 30 degrees F hotter than at maximum speed. If the power output of the engine is increased by shifting the IMEP to a higher speed, the same temperature levels will follow. No change in fan or speed ratio is required to cool the higher output engine, however there is the problem that the fan starts to stall above 4K rpms (oil temperature is a different beast).

The GM Stock Engine Test Reports (reprints available from Clark's, "GM Restricted") show fan power consumption curves as part of Standard Test 1. Airflow over the engine was also measured, and is cited, as were delta-t and plenum pressure. These data are shown on the panel for Standard Test 9a. Note that these are observed values, not theoretical.

RPM	1960 Fan			1964-69 Fan		
	hp	cfm	cfm/hr	hp	cfm	cfm/hr
1k	.4	450	1125	.1	380	3800
2k	1.0	950	950	1.1	740	673
3k	4.0	1350	337	3.5	1115	319
4k	9.0	1800	200	8.2	1500	183
5k				15.2	1680*	111

*= Note: the airflow curve is starting to flatten out on the 140 test. The HP demand curve isn't, though.

Allowing for graphical error, the 1960 fan is always more efficient than the magnesium fan, at least to 4K rpm. The one number I have for the 61-63 fan is 1460 cfm at 4k rpm. This would make it pretty close to identical to the magnesium fan as an air pump. At 2-3K rpm, where most 2-carb engines live,

the '60 fan is functionally the best. It does have shortcomings of noise and belt jumping problems, however.

But I think these data make it pretty clear that a) any stock fan starts to suck up a LOT of hp at rpm above about 3500, b) an axial flow fan's linear power demand curve is really much better for an engine with a wide rpm range like a 140 or turbo.

In another post, Andrew Berg asked:

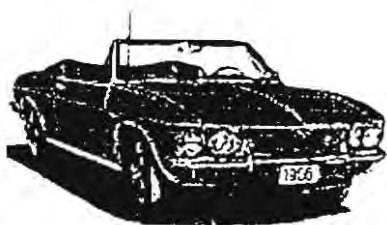
> I'm not much of an expert, but do Corvair engines really generate that much more heat than another engine? I know that mine (when it's running) didn't seem to.

And Rad replied:

No. They generate the same amount of heat as any other engine of similar volumetric efficiency, combustion efficiency, and horsepower output. The critical difference is that the medium used to carry the heat away from its point of generation is much less dense than the water/glycol mixtures commonly used. Water pumpers actually have a worse time getting rid of the heat to air, because the difference in temperature between air and heated surface at the heat exchanger is much less than it is with a Corvair.

The major difference in requirement as far as airflow is concerned is not the total mass airflow, but the pressure required to push that mass of air over the cooling surface in the required amount of time. Water pumpers use a radiator with a pretty low pressure drop at rated airflows, which means that ram air is sufficient above about 30 mph, and an auxiliary cooling fan need only move the air against a slight pressure gradient at speeds below this. Corvair engines are in fact pretty much self-cooling at speeds above 30 if properly ducted (4-inch dryer hose from the headlight buckets works nicely). Unfortunately, there are circumstances in car operation where the car simply doesn't go fast enough long enough to use this "free" cooling. The stock early model air ducting is adequate; the stock late-model is much more optimized, but both are compromises between the need for interior space, clean dry air, lack of noise, and as much pressure differential across the engine as possible from vehicle motion.

At steady state cruise at, say, 45 mph, a Corvair engine in a coupe or sedan is pretty much wasting the power used to turn the fan, provided that the various fins, shrouds, and seals are where they should be and doing as they should do. But who actually spends a majority of their drive cycle at 45 without speeding or slowing? Convertibles have a less optimized plumbing arrangement, and suffer considerably with the top down. Forward controls are actually pretty well plumbed for cooling air, but generate more engine heat because they're pushing a heavier vehicle with more frontal area.



Vairs & Spares

For Sale: 1962 4-Door Monza, Automatic, Factory air conditioning, 85K original miles. \$3250. Call Dick (520) 299-4723.

For Sale: Corvair parts- Large outdoor yard full of Corvairs and Parts, Call Barry Cunningham at (520) 747-9028.

For Sale: Corvair engine (RA) 95 hp no carb or sheet metal , Partly disassembled \$100. Also 110 hp engine parts. Cheap. Don (520) 297-1356.

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TUCSON CORVAIR ASSOCIATION REGULAR MONTHLY MEETINGS
FOURTH WEDNESDAY of each month (except December)

DENNY'S RESTAURANT 6484 E.BROADWAY. Tucson,Az.

6:00 pm: Parking Lot Bull Session

6:30 pm: Dinner (optional)

7:30 pm: Meeting starts

COMING EVENTS

PLEASE CONTACT A
BOARD MEMBER WITH
ANY SUGGESTIONS

Sep 16 Car show at Pep Boys 3787 N. Oracle Rd.
Oct 14 Casa de las Ninos Car Show at Tucson Electric Park
Nov 3-5 Great Wester Fan Belt Toss & Swap Meet in Palm Springs
Nov 11 Host of Little Anthony's Car Show at 7010 E. Broadway Blvd.
Dec 13 Christmas Party at Davis Monthan O Club

Regular Monthly Meeting, Wednesday Aug. 23,2000
TCA Executive Board Meeting: Wednesday, Sept. 13,2000
DENNY'S RESTAURANT 6484 E.BROADWAY



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