

THE POWER ALTERNATIVE: TURBOCHARGING

A comment frequently heard at Cortez gatherings, "We love our Cortez, it's just perfect, wouldn't sell it, wouldn't trade it, wouldn't...but it sure would be nice if it just had a little more horsepower". Well, with improvements, came the Cortez POWERPAC, 318's, 360's, Toronado 455's, Cadillac 500's and now turbocharging.

Here are the first two paragraphs from the Turbo Systems by B.A.E. brochure.

"For many years the word turbocharger (turbo) has been associated solely with high performance engines and racing. Poor engineering and improper installation have kept turbos out of the street scene and given them a bad name. As with all good things, turbos have overcome their negative image through expanded technical data and increased mechanical know-how.

The turbo is coming of age largely due to today's engines that are laden with smog devices and burdened with low compression ratios. Leading automotive manufacturers are jumping on the band wagon and turbochargers are now available as standard production line equipment. Makers of heavy duty industrial engines, aircraft manufacturers and the federal government all use turbochargers as a matter of routine to produce more tractable power or to compensate for altitude pressure."

If you feel that your Cortez is underpowered, you may want to consider giving it a bit of a "boost".

After reading a fine comparative article on turbocharging in the January 1978 issue of Motorhome Life, we contacted one of the two companies whose turbochargers were used in the test demonstration, B.A.E. of Torrance, California. Ted Carlson, their Director of Marketing, wrote the following in a letter to The Cortez National. "Please be advised that I have checked with our turbo engineer and he informs me that most 225 slant 6 Chrysler engines were low compression to start with, and would not require a piston change prior to turbocharging. Depending upon space available on your engine, turbocharging your motorhome should be a relatively simple installation."

If you want to know "all about it", contact Ted Carlson at B.A.E. He will be very happy to send you the brochures on turbocharging and answer any questions. The address is B.A.E., 3032 Kashiwa St., Torrance, California 90505, 213-530-4743. The other company involved in the test was R.V. Turbo Inc., 1656-D Townhurst Dr., Houston, Texas 77043, 713-932-0365.

Many of you will remember Norman Smith who showed and demonstrated his turbocharged /6 at The 3rd National Cortez Rally. He is still very much interested in doing other Cortezes and is available for consultation and answering questions. As the saying goes, ask the man who owns one. Norm's address is 945 Ward Dr. #133, Santa Barbara, California 93111, 805-964-4679.

Ted Carlson of B.A.E. says the cost of turbocharging a Cortez is about \$1500, more or less, depending on the specifics of your engines' condition, and if you do the work yourself, even less.

We suggest you contact Norm or either one of the two companies and discuss the specifics of your Cortez. Read the article in the January 1978 issue of Motorhome Life magazine, then decide if this is the way to get that increase in power and in the process a little better gas mileage.

Speaking of gas mileage, that same issue of Motorhome Life ran a story (page 43) titled "Improve Your Fuel Economy" and showed Cortez with a 13.13 mpg, best in its class.

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#### TURBO-CHARGING THE SLANT 6

In February we heard from two Cortezzers, Don Inman, Helena, MT and Howard Sanderson, Reno, NV, both of whom have turbo-charged their /6 engines. Don was preparing to leave on an extended trip so was unable to prepare an item for this issue, however here is Howard's reply.

"Thanks for your inquiry regarding turbo-charging the slant six in my 1965 Cortez. Yes, I owned the coach before turboing. The one who installed it on the engine is no longer in Nevada. I don't know where (Steve Hendrixson) is. We turboed the unit in 1975. I'll try and cover this installation. We used a Ray Jay Charger, an inline limiter (7 lbs boost), added an engine oil cooler, doubled the radiator core size, used one Rochester 2GC carb, fabricated a water jacket below the carb to warm the incoming air for quicker cold weather warm-up, increased exhaust pipe to 2 1/2" then split to two long glass mufflers 2 1/2" in and out, changed the advance curve in the distributor, used an exhaust temp. gauge and a vacuum boost gauge. We also used water injection to help control ping. Pinging was a problem, even more so now that octanes are lower.

Inside the engine--first it should be healthy. We used bronze valve guides, otherwise there will be a valve sticking problem. We used hard exhaust valves, used forged pistons (won't shatter like cast ones). The power increase, I would say, is at least 60% with this installation. There is a slight increase in gas mileage. Yes, I do think turboing will reduce the engine life expectancy. To cover some of my experience of about 55,000 miles with the turbo, (some of the problems could be the fault of machine shop or bad labor), valves sticking (before bronze guides), pistons hairlined on top (before forged ones), two burned exhaust valves, more recently Nov. 1980, cracked head, six cracked forged piston skirts (seems to be the result of too much pinging). On the Nov. 1980 work, I replaced all damaged parts, the only thing we did different, we ground and polished the interior domes of the head. As yet after 1400 miles, I don't seem to have the pinging problem, and I am using regular leaded gas. This installation sure makes a sweet powerful coach--but if I had it to do again, I would go for a bigger six, a big V-8 or diesel. It's apparent I cannot comment on a turbo installation with less options and refinements than my own experience. Just a hint or two before I go. The turbo is an air forcer. With that in mind, is the reason for larger carb and larger exhaust. Carb jet size will help determine the exhaust temp. (of which I don't like to see any higher than 1100° with the probe near the turbo on the exhaust side). Of course carb jet size will effect gas mileage also. A manual choke is desirable. With it the exhaust temp can be regulated on long upgrades or high speed driving."

Reprinted from April 1981 newsletter

## TURBO-CHARGING THE SLANT 6 (PART II)

Don Inman of Helena, MT writes - "Now that we're back home and have things under control, I thought that I would get with it and give you my comments on the turbo job.

When I became the fifth owner of the ole bus, it had 52,000 miles on it. My first trip of any consequence was to Seattle and Westport, WA. On the way home, I tried a short-cut in southeast Washington and learned all about Cortez brakes and power on some unbelievable grades. I got home convinced that something had to be done. For a while I was thinking that the 318 V-8 was the way to go, as Wally Grimstead of Twin Falls had such good luck with his. Then I got to read about Turbo-charging, and the more I read the better it looked.

I talked with several turbo kit manufacturers and settled on John Anderson of Napa, CA. He said that he had done a Cortez a while back with good results. He sells a kit which included a Ray Jay turbo, his own waste gate, combination turbo, vacuum, and exhaust temperature gauge, carburetor base, water injection kit, and all other required fittings.

My first step was to completely go thru my engine with new rod bearings, main bearings, cam shaft bearings, timing chain, oil pump, throw out bearing, and heavy duty valve springs. The machine work included a valve grind, true head (which was warped & allowed a leak from 5 & 6), true up pressure plate, overbore to .030 for new forged pistons. New heavy clutch plate installed. This engine has stellite valve seats, so all that was required to assure good positive valve seating without sticking, was heavy duty springs.

John Anderson recommends an exhaust manifold to turbo section of 14 gauge pipe. I couldn't find a muffler shop who would try to bend up what I needed, so I used 2 90° elbows & a tee of black gas (natural gas) pipe - 2 1/2". These three pipe pieces welded together just great and the tee between the elbows gave me a perfect spot for the waste gate. I blocked off the inlet of the stock intake manifold with a platform which holds the carburetor base. This base hooks into the water heater hose and preheats the fuel charge and prevents puddling of gas. The carburetor is a Carter AFB four barrel furnished by John Anderson & all set up for this engine. It has an electric choke and adapting the Cortez linkage was fairly simple to do.

Turbo installations can be either "draw through" or "blow through". I chose the draw through system as it is a little simpler to hook up and has less leak problems. I used a water injection system to hold down pre-ignition and maybe even use regular fuel. It consists of a pressure switch on the intake manifold & a pump (windshield washer) on the Cortez water tank. The kit comes with a little one gallon jug. I couldn't find room for it and didn't look forward to filling it with every tankful of gas anyway, so I just hooked into the main water system. The waste gate connects into the intake manifold and when the preset pressure is reached it opens and exhaust dumps before the turbo, thereby slowing the compressor down. One nice thing about John's waste gate is it is quick & easy to adjust. My exhaust from the turbo on back is 2 1/2" with no muffler. The turbo in the system takes out a surprising amount of the noise. This is a little louder than a regular system, but inside there is very little noise. I asked the muffler shop to run it as straight as possible and they did a fair job. Walker makes a muffler for this kind of a setup. It's #21348 but if you can get by with no restriction behind the turbo, it eliminates some turbo lag. It was necessary to go to electronic ignition but Mopar has the exact part for this engine. I placed my module and resistor out front to keep cool. I used Accel plug wires and hot coil.

My problems so far have been minor, mainly oil leaks. My turbo drain line has been a pain in the rear. First I used high pressure hose but that was too close to the hot stuff, so I changed to copper tube, but the vibration keeps causing leaks in the fittings. Now I'm going to use a section of braided metal hose as it should take the vibration, heat & pressure.

I had to modify the engine box cover to allow for the carburetor sticking up instead of side drafting the old way. I had a metal shop make a complete new one piece cover with the left front quarter raised 3" higher than the rest.

Now - the final analysis - My objective was power & I really have it. In 4th gear at 50 or 52 if I push the gas down & open the other two barrels she comes on like a Lear jet. On hills where I formerly crawled up in 2nd gear out in the median, I now find myself going 60 in 4th. It's unbelievable what this thing will do. I have my waste gate set at 8 lbs. and this gives me about 256 H.P. The 318 conversion would have given me 230 H.P. and the 360 engine would have been 265H.P. These H.P. ratings are on a fresh engine and compare to the stock slant 6 145 H.P.

My gas mileage has been from 11.9 to 13. I think I will be able to improve this on a test in flat country. Whenever the turbo kicks in, it blows gobs of air & gas, so it's no big gas saver, just power on tap.

I did about all of my own work except the machine work. My cost ran about \$1750, but a good share of this (maybe \$800) was in rebuilding my engine.

In my opinion this job should have no effect on the life of the engine as these Chrysler Industrials have a strong bottom end and all the turbo does is increase the volumetric efficiency."

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