

# The '66 Corvette Challenge

## Part 4

### Where the fun begins.....

*By Pat Cavanagh NCRS #57907*

In Part 3 of the '66 *Corvette Challenge*, I provided the reader with a sense of the originality and condition of my "66 Corvette Convertible. This was the starting point for my build. My vision is to turn the car into a true multi-purpose hi-performance C2 Corvette, but not a resto-mod. I want this car to look and handle like a vintage B production Corvette road racer but also be tame enough to be street driven and capable enough to autocross or enjoy on an occasional track day. Maybe someday I might take the final step and turn it into a not-so-serious vintage racer.

My inspiration for this build was the '67 L-88 Corvette that Cliff Gottlieb raced at the 24 hours of Daytona in 1970. Gottlieb drove the '67 Corvette from Kansas to Daytona, took 2<sup>nd</sup> place in the GT class and 11<sup>th</sup> overall and then drove it home. This was a 1600-mile trip each way. In the book "*Against All Odds*" by Stephen

Cox told the story of young Cliff Gottlieb and his '67 Corvette Daytona odyssey.

My car will have similar graphics to the '67 L-88 Rally Red road racecar I saw last spring at Fabulous Restorations in Fort Lauderdale, Florida. I plan to install a '67 big block hood, a roll bar and a vintage low-back racing seat with 5 point racing belts.

The drivetrain will consist of a very healthy 327 small block, aggressive gearing and an upgraded suspension to complete the package.

My '66 Corvette was a nice driver with an L-79 (327ci/350hp) engine that had been rebuilt several thousand miles before I bought the car in 2013. Unfortunately, it had a rather mild stock replacement cam and flat top TRW low compression pistons. I



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rebuilt by *Axles, Transmissions and Transfers* on North Lewis Ave in Tulsa. A new 3.73:1 ring and pinion was installed in place of the 3.31:1 gear during the rebuild. The trailing arms were also rebuilt by *V-Tech Corvettes* in Rockford, Ill.. I added a ¾-inch anti-roll bar with factory brackets, aluminum stiffing disks over the rubber mounting donuts, an F-41 seven leaf rear spring, adjustable camber struts and HD Bilstein shocks to complete the rear end rebuild.

I also rebuilt the front suspension with new Moog components, larger C3 spindles/bearings, offset and slotted A-arm cross shafts, an adjustable A-arm brace, C3 HD drag link, HD Bilstein shocks and a 1 ¼ inch roll bar. I am also adding Borgeson power steering.



For brakes, I am using a '67 manual dual master cylinder, Hawk HPS brake pads, stainless

steel sleeved calipers, O-ring piston seals and new stainless steel brake lines.

To enhance the performance of my 327 and retain the original look I purchased a '69 Z-28 aluminum high-rise manifold. It was modified by removing 1 inch from the center divider below the carburetor as described in the *Chevrolet Performance Power Manual*. I also purchased a factory Chevrolet LS-6, 780 CFM Holley with vacuum secondaries and center pivot floats. This carburetor came with the stock choke mechanism that mated directly to the choke stove on the Z-28 manifold.

During the rebuild of the carburetor, I installed road race phenolic floats, fuel bowl vent baffles, extended jet tubes and Viton seats to help facilitate hard cornering and braking without fuel



starvation. I used #76 jets on the primary side, #85 jets on the secondary side. 8.5 inch power valves

were used on both the primary and secondary sides. A yellow spring was installed in the vacuum diaphragm to facilitate early opening of the secondaries. Finally, I used a very nice quick-disconnect fuel line from Summit on the dual inlet Holley.

In my pursuit of more power I pulled the L79- 327 out of the car and removed the heads and other components from the engine compartment. I took the heads and short block to Kent Cannady at K & S Engines & Machine Works. I asked Kent to rebuild the engine, increase the compression and add a performance oriented hydraulic cam. I also decided to break in the engine on his dyno and work out any issues before I installed the engine back in the car.



The stock fuelie heads received a performance valve job and were machined for screw in rocker studs and guide plates. Finally they were machine surfaced and hot

tanked before assembly.

New Sealed Power valve springs (VS-677), Comp Cams roller tip rockers (RP1412-16), along with performance hydraulic lifters and HD pushrods were installed. Low profile locking rocker arm nuts with extra thick valve cover gaskets were used to clear the stock aluminum Corvette valve covers for that nostalgia look.

The block was disassembled, hot tanked, decked, line bored and honed. The old TRW pistons were replaced with lightweight forged aluminum RaceTec pistons with an 11:1 compression ratio. Total Seal piston rings, Scat I-beam forged rods and ARP fasteners made up the rest of the short block.

Kent then balance the assembled rotating assembly. Since this car is going to be frequently street driven, I wanted a hydraulic cam with decent street manners. I decided to use the GM L-82/L-46 performance hydraulic camshaft. The cam was installed, 4 degrees advanced with a HD truck timing set. On the bottom end I used a Melling hi-volume oil pump and an Aviad road race 7-quart oil pan with built in oil scrapper.

On the exhaust side I purchased a set of Hedman headers that were designed for use with C2 side pipes. They have a 1 5/8 inch primary tubes and 3 inch collectors. We plan to fabricate side



pipes with internal mufflers that have a similar look to the L-88 car shown above.

Once the engine was fully assembled, we moved it to the dyno room and installed the 780 CFM Holley and headers. The dyno headers had the same size primary tubes and collectors as the Hedman headers I

purchased for the car. I plan to run 100 octane low lead fuel in the car so I brought 10 gallons to K & S for the break in and power runs. We filled the engine with 7 quarts of Champion, 30-weight break in oil and installed Autolite, AR-72 non-resistor racing spark plugs gapped at .035. My distributor was rebuilt several years ago and runs a Crane XR-I ignition module with a rev limiter set at 6500 RPM. 7mm black Pertronics plug wires were used add to the vintage look.



We primed the oil pump and carburetor and the engine fired up immediately. We set the timing and ran the engine for 30 minutes at 3500 RPM. It

sounded healthy and was very responsive to throttle inputs. I was surprised at how smoothly it idled at 750 RPM.

We made several runs on the Dyno up to 6000 RPM's. The engine sounded great, the air/fuel ratio was close to stoichiometric with the 76 primary and 85 secondary jets. 36 degrees of total advance yielded the best power and torque. We

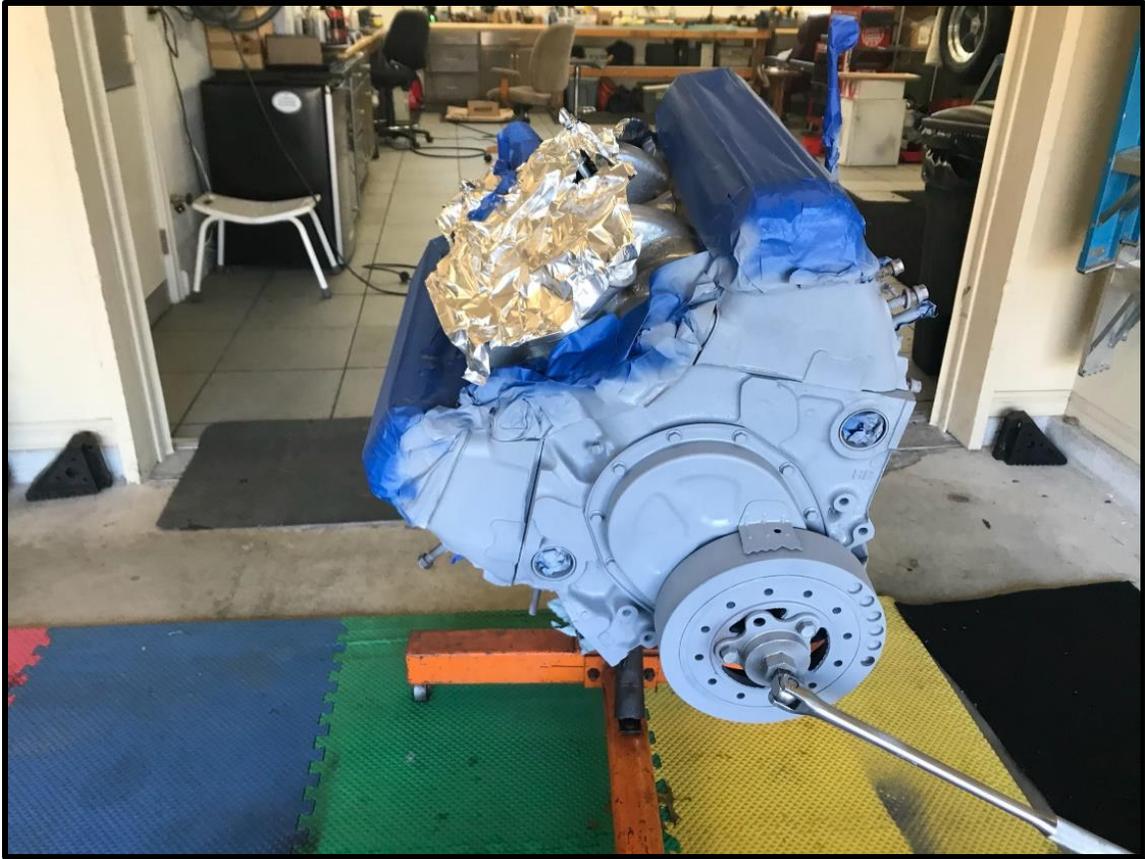
ran the engine without the vacuum advance connected on the dyno.

The 327 delivered 390 horsepower at 5800 RPM and 389 foot-pounds of torque at 4500 RPM. The engine delivered over 350 foot-pounds of torque from 3000 RPM to 5800 RPM. There may be even more power on tap with some additional tuning. I believe that this will make a very reliable and potent combination with a that classic small block appearance.

The dyno results are below:

<b>RPM</b>	<b>Torque</b>	<b>HP</b>
3200	360.7	219.8
3400	371.7	240.6
3600	366.9	251.5
3800	371.3	268.6
4000	372.5	283.7
4200	379.7	303.6
4400	383.6	321.4
4600	389.2	340.9
4800	384.2	351.1
5000	380.9	362.6
5200	370.9	367.2
5400	362.1	372.3
5600	357.5	381.2
5800	353.2	390.1
6000	336.1	384.0

When we finished the dyno work I brought the engine home and began preparing to reinstall it in the car.

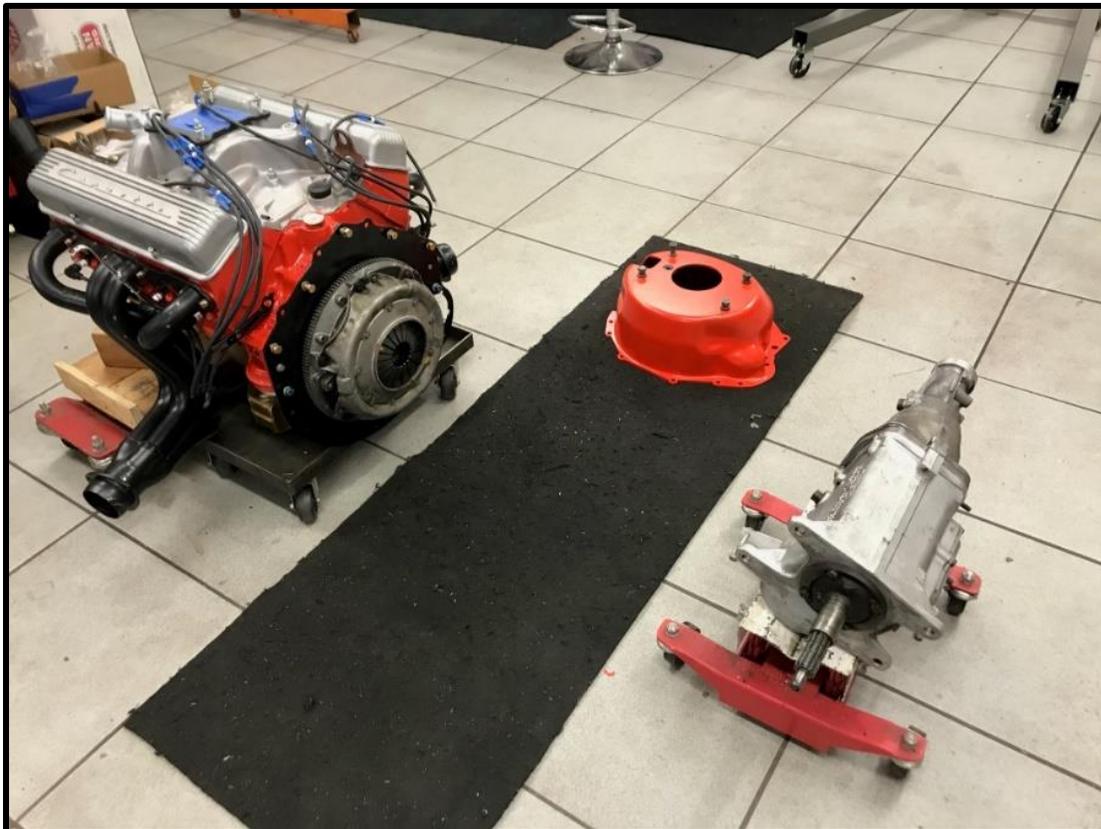


I applied two coats of Duplicolor engine primer and then applied three coats of Duplicolor Chevrolet Orange-Red engine enamel.

After the engine was painted, we installed a new oil impregnated crank pilot bushing, a lightweight 15 pound, L-88 (GM) flywheel with a McLeod performance clutch assembly and a Lakewood Safety bellhousing. My wide ratio Muncie transmission completed the drivetrain.

Earlier, I had taken the transmission to Lester's Gears on Lewis Ave. to have it inspected and resealed. I also rebuilt the stock shifter with new bushings, rods, pins, springs and C-locks. When

the



transmission was back, I fitted and adjusted the shifter to the transmission. This will make shifter installation easy when the transmission is back in the car.

I am optimistic that this drive train combination; high performance 327, wide ratio transmission and a 3.73:1 rear end ratio will provide spirited performance while being well mannered on the street. This combination is comparable to a close ratio transmission with a 4.11:1 rear gear!

To minimize engine movement in the chassis we installed solid steel motor mounts on the engine and prepared to drop it in the car. This is where the real fun began.....The engine would not fit back in the car? When the engine was installed on the motor mounts, the transmission was four inches to the passenger side of the transmission mount on the frame? No amount of persuasion would get the transmission to line up with the frame.



As always, I am so grateful to Scott Pfuehler and Kelly Bolton for their expert advice and immense help with this project. When I say we....read

Scott and Kelly.

Stay tuned for Part 5 of the '66 Corvette Challenge!

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