Newsletter of the Performance Corvair Group (PCG)

CORVAIR RACER UPDATE

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CORVAIR ALLEY NEWS, by Rick Norris

I finally dropped the drivetrain out of the race car to change out the 3:89 diff to the 3:55 for Road Atlanta. Also it is race engine tear down and inspection time. So far I have not found anything I wasn't expecting to. I hope to just clean stuff up and reassemble but I also have a vertical fan kit to install and as we all know there is no such thing as "bolt on". It is especially so with race modified engines in old Corvairs.

Saturday was a good day as I got the engine completely apart and did not find anything amiss. It is now a matter of cleaning everything and getting it all back together before I decide to change something!

I did have to do some repairs to two spark plug thread inserts which stuck to the plug and backed out with the plug when I tried to remove them. I have found a kit that is the best on the market as far as I'm concerned. It's called Full Torque by Lock-n-Stitch. Check them out here:

http://castingrepair.locknstitch.com/viewitems/spark-plug-hole-thread-inserts/ir-insert-kits-for-ford-modular-and-triton-engines

Corvair Racer Update is published by the Performance Corvair Group (PCG). We accept articles of interest to Corvair owners who are interested in extracting high performance from their classic Corvair cars and trucks. Classified advertising is available free of charge to all persons. Commercial advertising is also available on a fee basis. For details, email our club President. Email address shown in the Officers section on the back page of this newsletter.

PCG is one of the many regional chapters of the Corvair Society of America (CORSA), a non-profit organization that was incorporated to satisfy the common needs of individuals interested in the preservation, restoration, and operation of the Chevrolet Corvair. Membership is free of charge. To join, please use the handy form on our website: www.corvair.org/chapters/pcg.

MITTY UPDATE:

The 2017 Mitty race car line up to date;

1. LeVeque, Michael
2. Levine, Mike
3. Norris, Rick
4. Reeve, James
5. Clemens, David.

David will co-drive with Michael LeVeque in the B.R.M. Vintage Enduro Challenge. There are three Enduros for different cars but they will run the Vintage Enduro on Sunday at 8:00 AM on Sunday morning I believe. The B.R.M. Sponsored Enduro is a one hour race with a mandatory 5 minute pit stop and driver changes. Mike Levine has entered his car in this event before.

Here's HSR's blurb on it:

A key component to the heritage of sports car racing is the endurance event. Great motorsports events such as the 24 Hours of Le Mans have been in existence almost as long as the automobile, and many of the race cars entered in HSR competition were originally campaigned in endurance racing. To keep the spirit of endurance racing alive for these cars, their drivers and mechanics, HSR has created the Endurance Challenge, sponsored by B.R.M Chronographs.

Representing the only true historic endurance series in the United States, the B.R.M. Chronographs Endurance Challenge consists of five separate groups, Vintage, GT Classic, GT Modern, Historic and Prototype. Cars are classed based on the model year and type of the race car. The Endurance Challenge is a one hour endurance race, with a 5 minute required pit stop.

This year the Friday Bob Woodman International Challenge is broken up into two groups, RACE A for the Group 5 big bore faster cars and RACE B for the small bore Group 2 & 3 slower cars. I am thinking about doing this event as well. The B Race is at 3:35 PM according to the preliminary schedule which is always subject to change.

Of course there are the two Weathertech Sprint Races, one Saturday and one Sunday. We meaning the non-V8 powered Corvairs are in Group 2. Our Sprint Race times are 3:25 for Saturday and 2:10 on Sunday. You can get the latest updates and schedule on the HSR web page: http://hsrrace.com/events/2017-events-page/40th-anniversary-of-the-mitty/

MOMENT OF INTERTIA

Article from Enginelabs on racing flywheels and clutch kits.

When it comes to developing a clutch kit for racing applications at Tilton, the company's team of engineers knows how important it is to take into account the total mass of the flywheel. The term most commonly associated with this measurement is the Moment of Inertia (MOI). We sat down with Jason Wahl, President and CEO of Tilton Engineering, to learn more about how Tilton approaches the research and development side of clutch assembly and flywheel rotational mass. Wahl is a mechanical engineer by trade, so he was more than happy to fill us in.

Why Moment of Inertia Matters. If we go back to basic physics and look at Sir Isaac Newton's second law for rotation, it states that an object's angular acceleration is proportional to the net force (energy) and inversely proportional to the Moment of Inertia.

The Moment of Inertia, also commonly referred to as the Mass Moment of Inertia, is a rotational objects natural resistance to a change in speed or direction exerted by a force (energy), as a function of its mass and how that mass is distributed. The heavier and/or larger in diameter (volume) the object is the more energy it will require to change its state of motion.

In our case, the object is our flywheel and the goal is to reduce the MOI of the flywheel by utilizing high quality lightweight materials and some precision machine work to reduce weight, and limiting its overall diameter (volume) when possible. These will in-turn reduces the amount of energy required to accelerate the flywheel. From an engineering perspective, the flywheel in your manual transmission vehicle is an energy storage device. Steel flywheels, like those found in your average manual transmission vehicle, are generally heavy and have a relatively large diameter, requiring more energy to accelerate or decelerate the flywheel to the desired speed.

"The lower the MOI, the less energy will be required to accelerate or decelerate the flywheel," states Wahl. "The less energy wasted in accelerating or decelerating the drivetrain, the more you will have available at the wheels.

Lowering the MOI of the driveline allows the car to speed up and come to a stop faster."

For most applications the flywheel is connected to the rear flange of the crankshaft, meaning that this energy is produced by the engine in the form of torque. When accelerating an engine, every lb-ft of torque that it takes to accelerate the flywheel assembly to the required speed is energy that is not transferred to the drive wheels to accelerate the car.

Since the flywheel is an energy storage device, it's important to remember that the only opportunity for it to rapidly release this stored up energy is when you apply the brakes — outside of the minimal drag and friction experienced at the flywheel naturally, of course. As you apply the brakes, that stored energy is transferred into the drivetrain in an attempt to maintain its current state of motion.

Determining the Moment Of Inertia. To determine the MOI of a clutch and flywheel assembly you have to find the weight and its location from the flywheel's axis of rotation (where it bolts to the crankshaft flange). The MOI is most often denoted in lb-in². "Moment of Inertia is a function of the objects mass multiplied by the square of the radius; so physically reducing the diameter of the assembly is one of the biggest advantages we have found," explains Wahl. "Since it isn't always possible or practical to reduce the diameter of a flywheel, removing as much mass [volume] as possible from the largest diameter portions is important when a low inertia design is called for."

"Although, for certain applications a very low MOI can be detrimental to the launch of the car — since the flywheel is storing less energy — and this can be an important aspect to consider for drag racing applications. But it does not really apply to other forms of motorsports like oval track or road racing, where a lighter clutch and flywheel assembly is always preferred. It all comes down to the specific application," states Wahl.

When comparing two different flywheels, you should make your decision based on which design has a lower MOI in combination with your clutch assembly — not necessarily the lowest overall weight, because the flywheel and clutch with the lower MOI will be the one that absorbs the least amount of torque during acceleration.

"Think about it this way, if you increased the total weight of a flywheel by exactly double, without changing how the mass is distributed around its axis of rotation, it would double the MOI. If you instead doubled the weight's distance from the axis of rotation as well, it would quadruple the MOI," states Wahl. "Since the flywheel's weight now spans twice the distance, its linear speed must be twice as fast to reach the same RPM as before. In order to do that at the same rate it will require twice the linear acceleration."

How great of an effect the diameter of an object has is proven when you look at that the MOI of a 153-tooth Chevy flexplate and a 102-tooth Chevy flywheel. The weight between the two is almost identical while the diameter of the flexplate is much greater, greatly increasing the MOI.

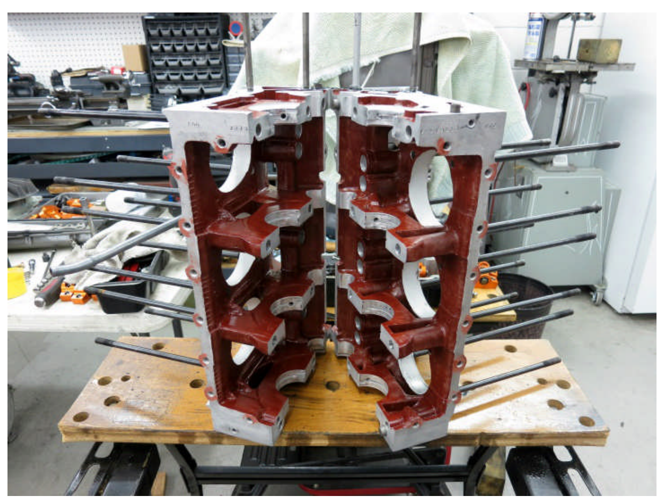
Another important factor to take into account is leverage. For example, a contestant on Wheel of Fortune has to exert much more force to spin The Wheel than they would if it were the size of a bicycle wheel. So, now that the weight of our flywheel is twice the distance from the axis of rotation we will lose half of the leverage we had before, requiring twice as much torque to achieve the same linear acceleration — this would then quadruple the MOI of the flywheel. If we transferred the weight three times as far from the axis of rotation, the MOI would be multiplied by nine!

Additionally, it should also be noted that, similar to drag racing, if your racecar also doubles as your daily driver — or is frequently driven on the street in general — a clutch and flywheel assembly with a very low MOI may negatively affect drivability when accelerating slowly from a stop or when stuck in stop-and-go traffic. Remember, less mass means less energy will be required to change the flywheels state of motion. Which means less than perfect clutch engagement will more easily jar the flywheel to a stop — stalling the engine.

Back in the heyday of SCCA D Production racing and Corvair Stingers. There are two in this photo.

Mike Levine's 1980's Plymouth Arrow race car he ran in IMSA.

Split personality.



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