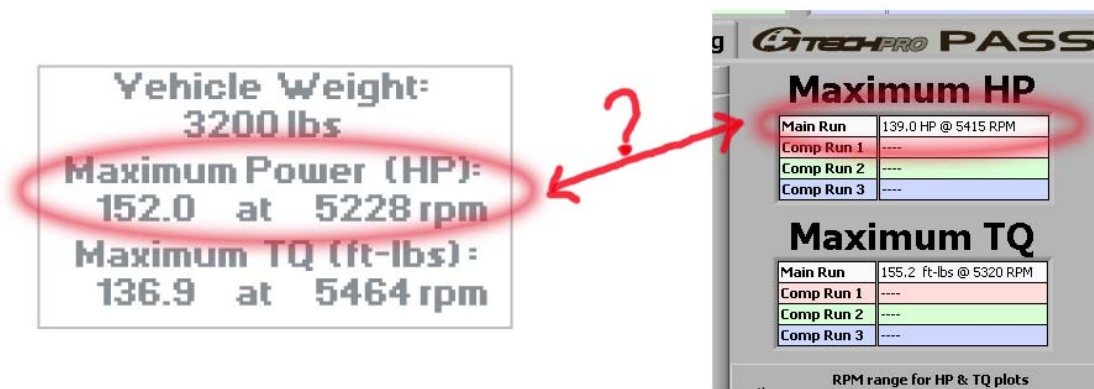


1 Understanding PASS version 1.1.1.

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Based on questions from G-tech users around the world.

1.1 What do you do when your G-tech screen gives you one set max HP and Torque values, and PASS gives you another set of values? Which one is right? Which one do you trust?



First of all, many of these issues will be resolved in the next version of PASS, but until that time, please follow these suggestions.

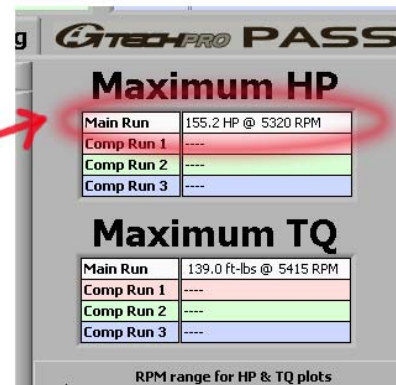
Usually the Gtech and PASS will be only slightly different. The reason is that PASS and the G-tech use different noise reducing techniques to produce accurate results. In general, PASS has more processing power and tries to do a better job at reducing noise. This causes the usual slight differences and usually PASS will be a tiny bit more accurate. Typically the differences are less than a percent and the G-tech and PASS will be equally useful in tuning your vehicle.

We always recommend doing several runs, maybe a half dozen. Then throw out the low and high values, and then average the remaining values together. When you do this, the differences between the G-tech and PASS will become even more insignificant.

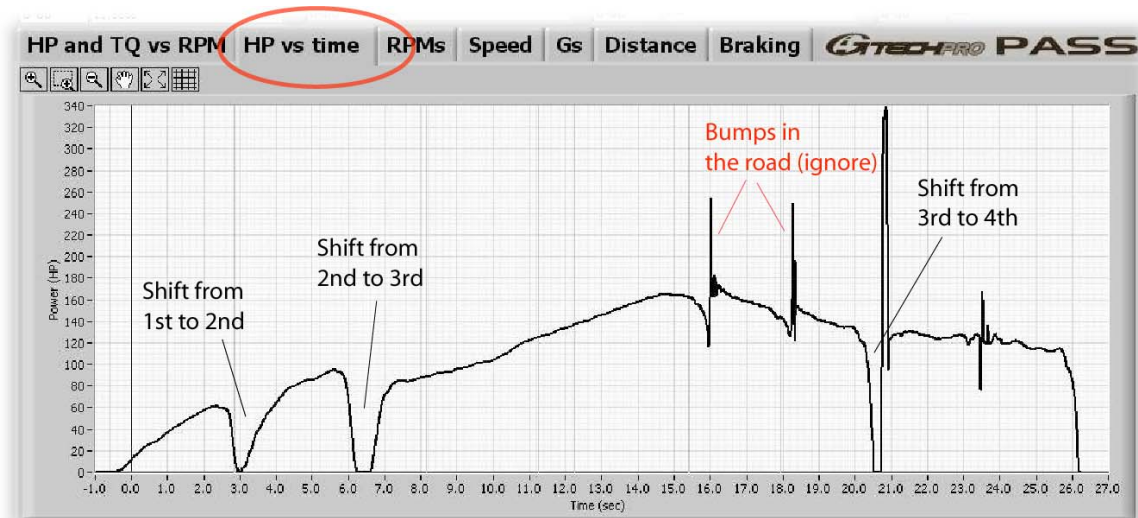
1.2 What do you do when the max HP values from G-tech and PASS differ by a huge amount? When the number you get makes no sense for your vehicle?

In this case, the noise reduction methods in PASS encountered a problem (which will be fixed in

Vehicle Weight:
3200 lbs
Maximum Power (HP):
152.0 at 5228 rpm
Maximum TQ (ft-lbs):
136.9 at 5464 rpm



the next version of PASS). PASS gets its max HP value from the HP versus time graph. When your car hits a large bump during a run, that shock translates to Gs which are picked up by the G-tech sensors. Since HP is calculated from Gs and speed, the bump will also show up as a jolt in HP. This jolt has nothing to do with your engine's performance and should be ignored when interpreting the data.

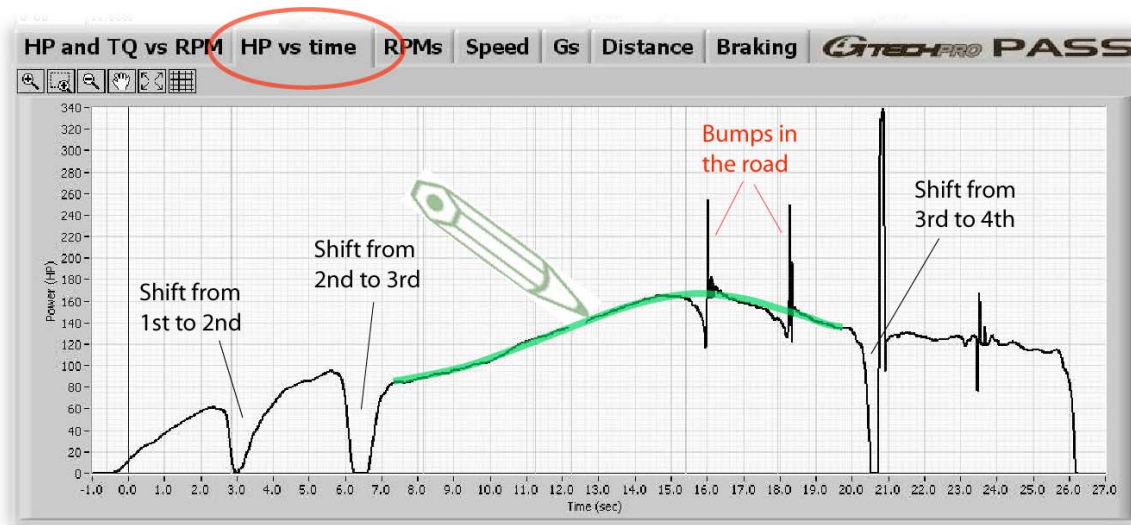


PASS will register the Max Gs (while you are in gear) as one of the peaks due to the bumps. So, in this case you should not trust the PASS max HP figure. BUT, the G-tech will also suffer from these bumps, though not as much.

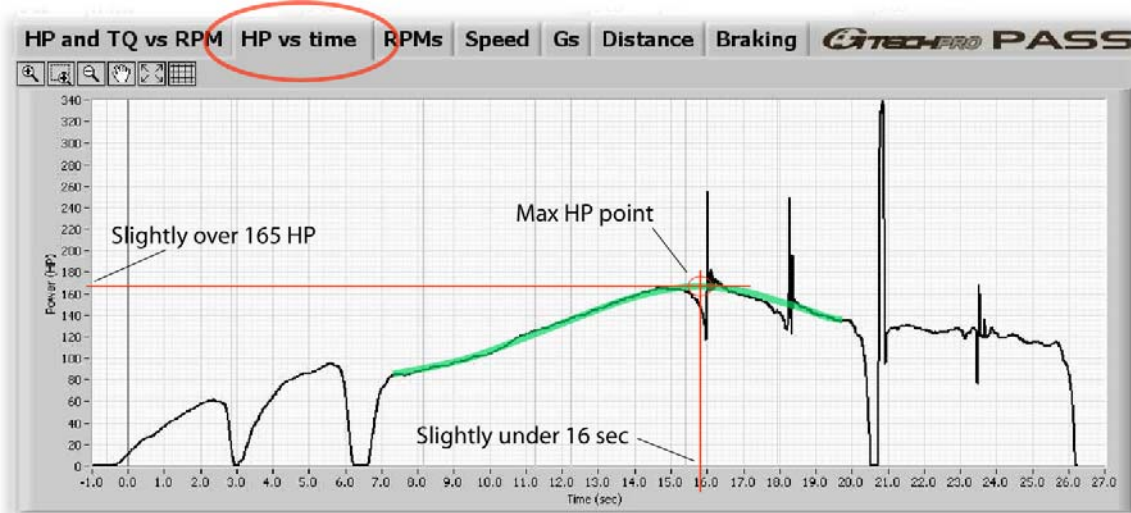
The best way to find your max HP is to use common sense and read the graphs for yourself.

Don't rely on the computer to get it right. It is almost impossible for a computer to make the right decision for ALL circumstances. With each version of PASS we'll take the data from our customers to improve our computer algorithms, but there will always be cases we could not have anticipated. Read ahead and learn how to become a horsepower data analysis expert yourself.

Print out your HP versus time graph and take a pencil and draw a SMOOTH line through your data. Ignore the spikes which may have happened when your car hit a bump. Your engine did not make this happen, it was always putting out smooth power.

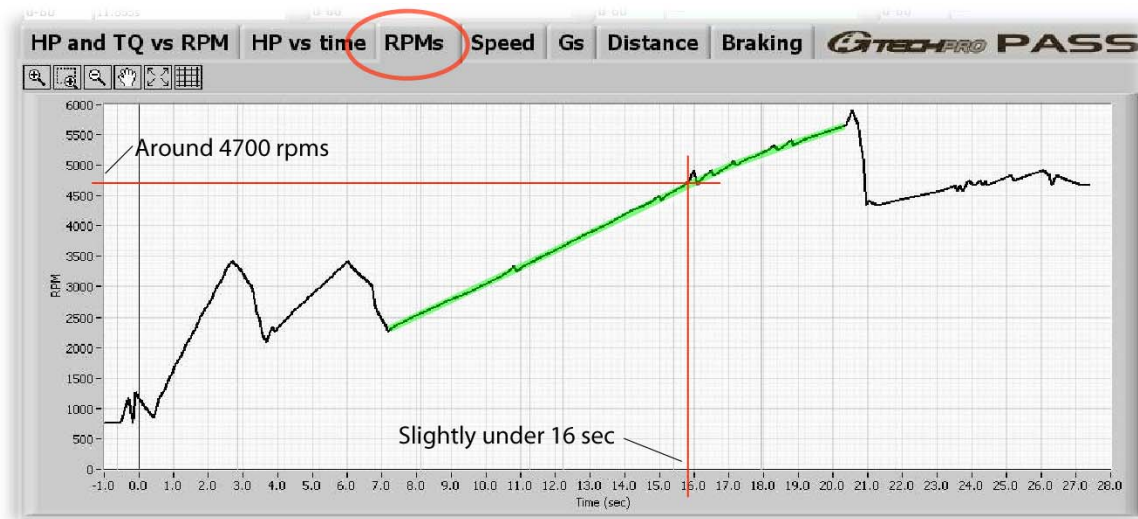


Now find the highest HP value on the graph.



Then read off the HP on the vertical axis. For this particular run, a little over 165 HP was left over after all frictional losses. On the horizontal axis we can read that this happened at around 16 seconds into the run.

To get the RPM value for the maximum HP, we go to the RPM versus time graph and see what the RPM level was at a little under 16 seconds into the run.

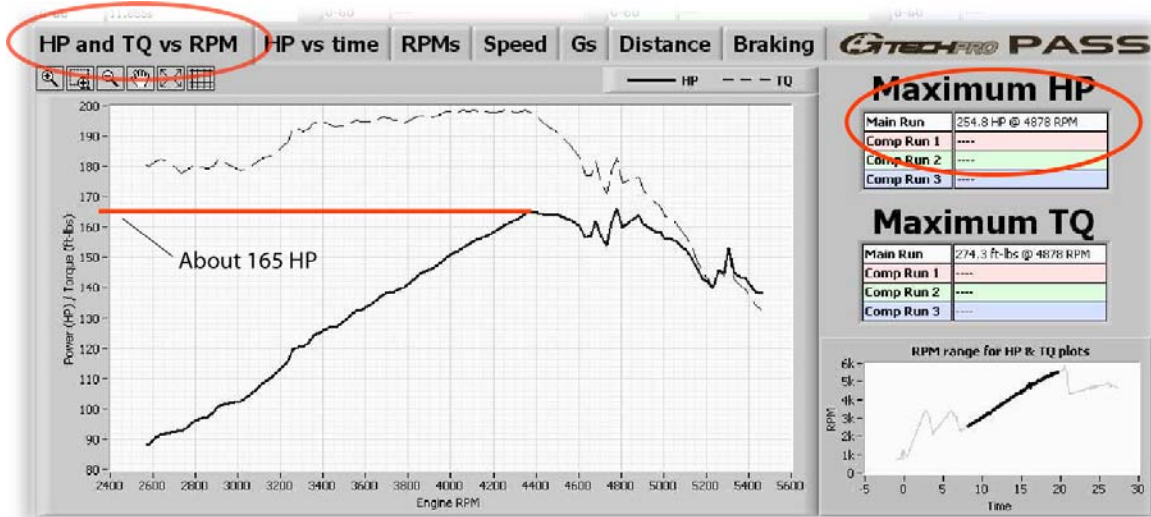


In this case there were some minor RPM glitches (maybe due to electrical pickup, maybe due to actual wheelspin due to bumps or potholes) so we draw a nice smooth line with a pencil on our printout.

Then draw a vertical line from the time of maximum HP (just under 16 seconds). At the point where this line crosses the RPM graph, move over to the left until you hit the vertical RPM axis. There you can read off the RPM at max HP, in this case about 4700 RPM.

Once you learn how to do this, you can quickly tabulate your maximum values for about half a dozen runs. When these values are averaged together you will have a number which is truly reliable.

1.3 What do you do when the max HP values shown in the PASS HP and TQ vs RPM graph differs a lot from the numbers shown at the left of the screen?

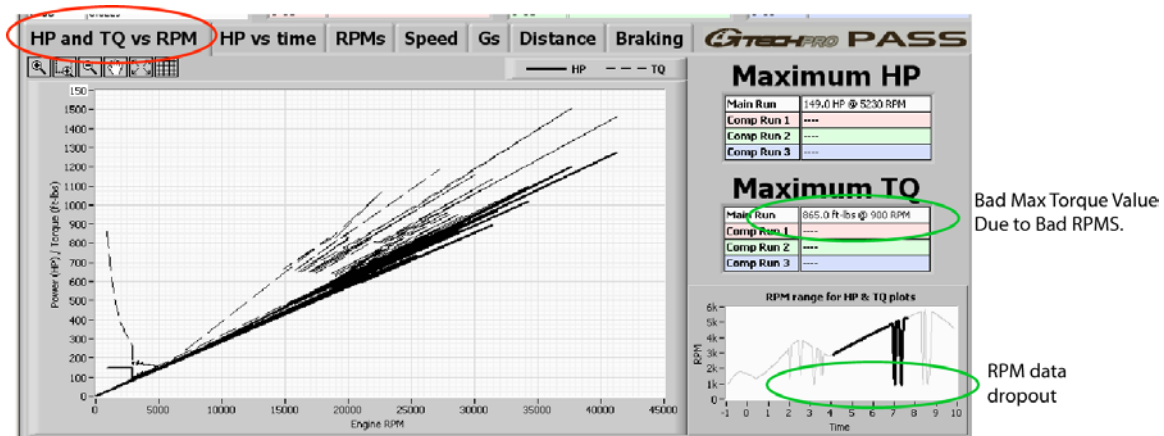


By reading the graph above, you see a max HP value of 165 HP. The box on the right, however, shows about 255 HP. The box on the right is not correct, since it was taken from the HP vs time curve, which, as you can see in the previous section, had glitches due to bumps in the road. By using our pencil and paper method, described in the previous section, we come to the same value of 165 HP.

So, if the number in the upper right hand corner surprises you, then look at the HP versus time graph and look between the lines a little and interpret the data correctly using your own judgment.

Along those lines, the kinks in the graph above are also due to the bumps in the road, and you may also want to use a pencil to draw a smoother line. If you keep a log your runs in a notebook, you can comment on how smooth it was. Then you can use these notes to decide if you need to smooth out the graphs yourself or not.

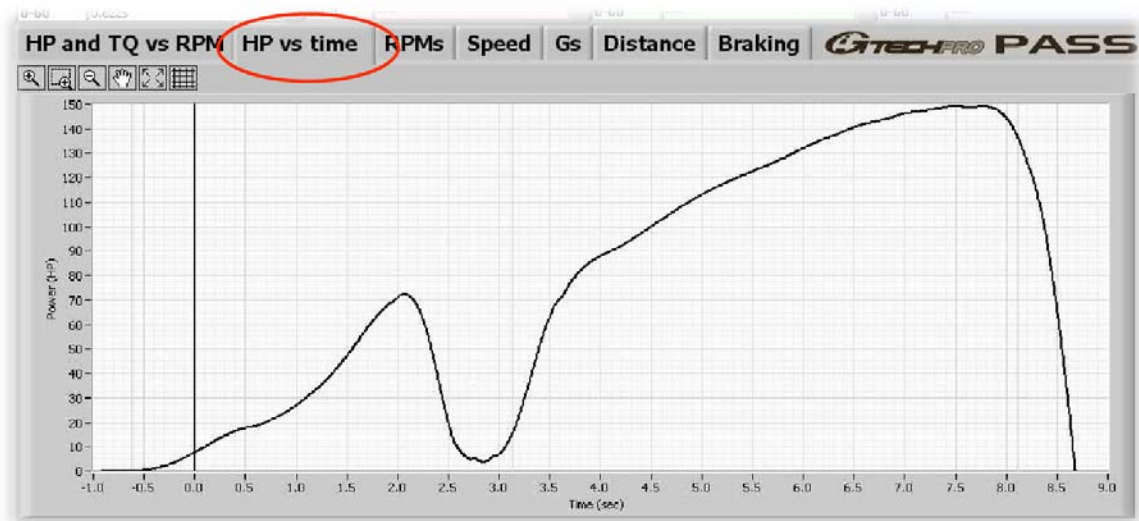
1.4 My HP and TQ vs RPM graphs look like a total mess. How do I make sense of this?



For this car, the RPM signal dropped out occasionally. Since this graph is plotted versus RPM, these erroneous values confused the graphing software and produced the big mess.

Our first suggestion is to do the run with some extra electrical accessories turned on (headlights) which can help boost the RPM signal.

The max HP value noted in the box on the upper right claims 149 HP at 5290 RPM. Since this value was taken from the HP versus time graph, there should be nothing wrong with it.

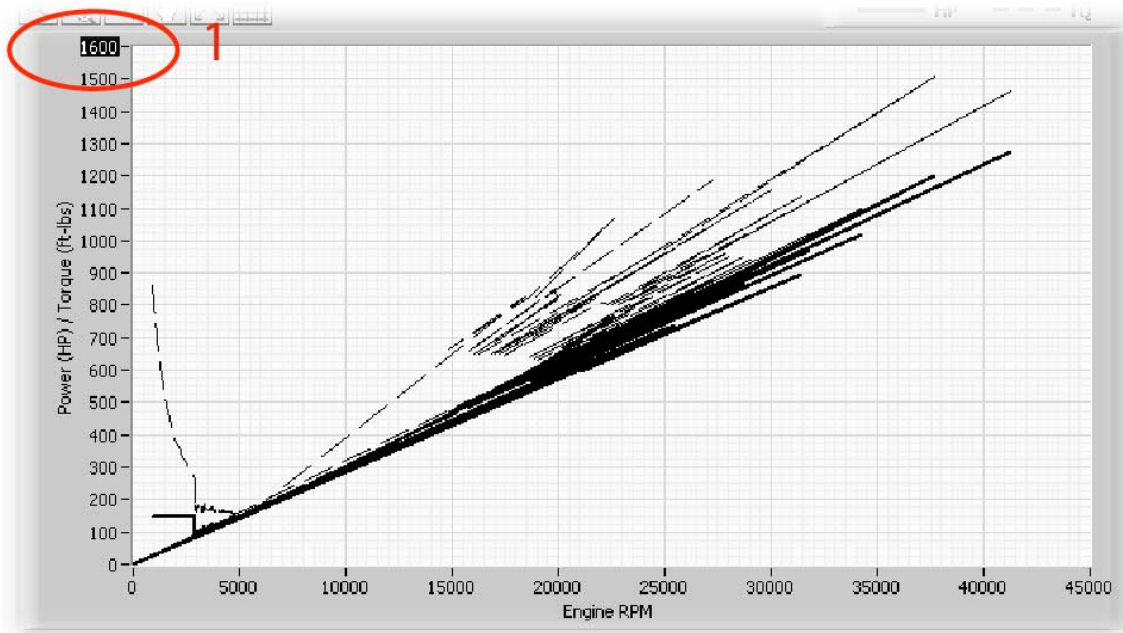


Indeed, the graph is very smooth and has a max just shy of 150 HP. This happened between 7.5 and 8 seconds into the run. Looking at the RPM graph for this car, we find that this occurs in the range of 5200-5500 RPM. With nice and smooth data such as this, the Max HP figure in the HP and TQ vs RPM figure will be trustworthy.

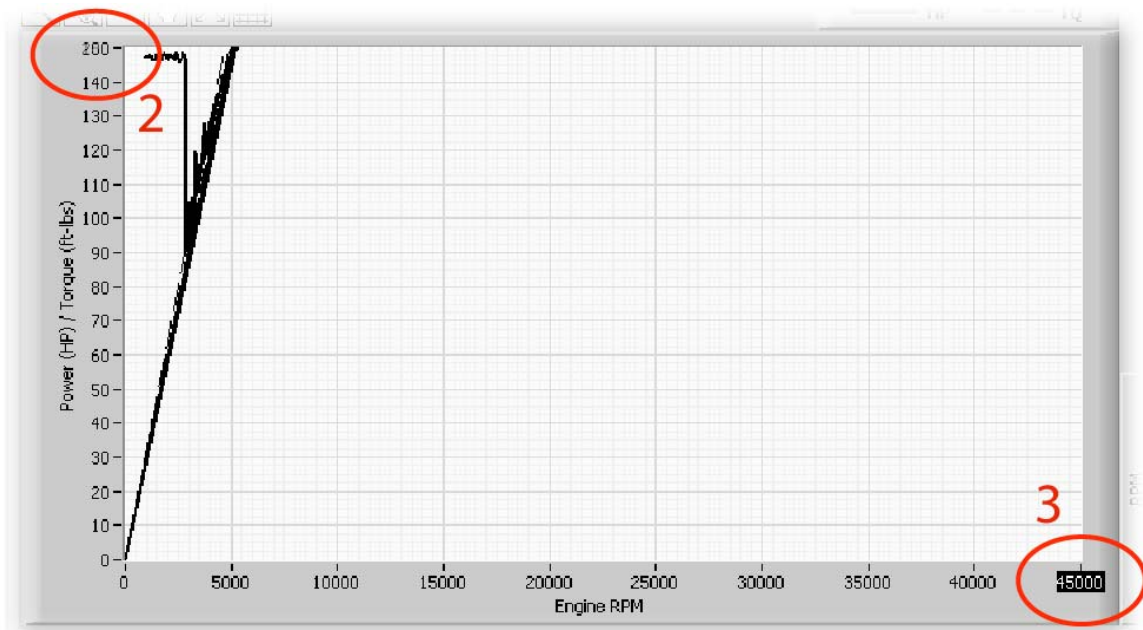
What about getting a decent HP vs RPM graph for these data. If you are experienced with graphing data in programs such as Excel, you can always export the raw data and make your plots for the range of time (probably 3.0 to 8.5 seconds for the data above) of interest.

You can try to use the G-tech PASS software to get the data out:

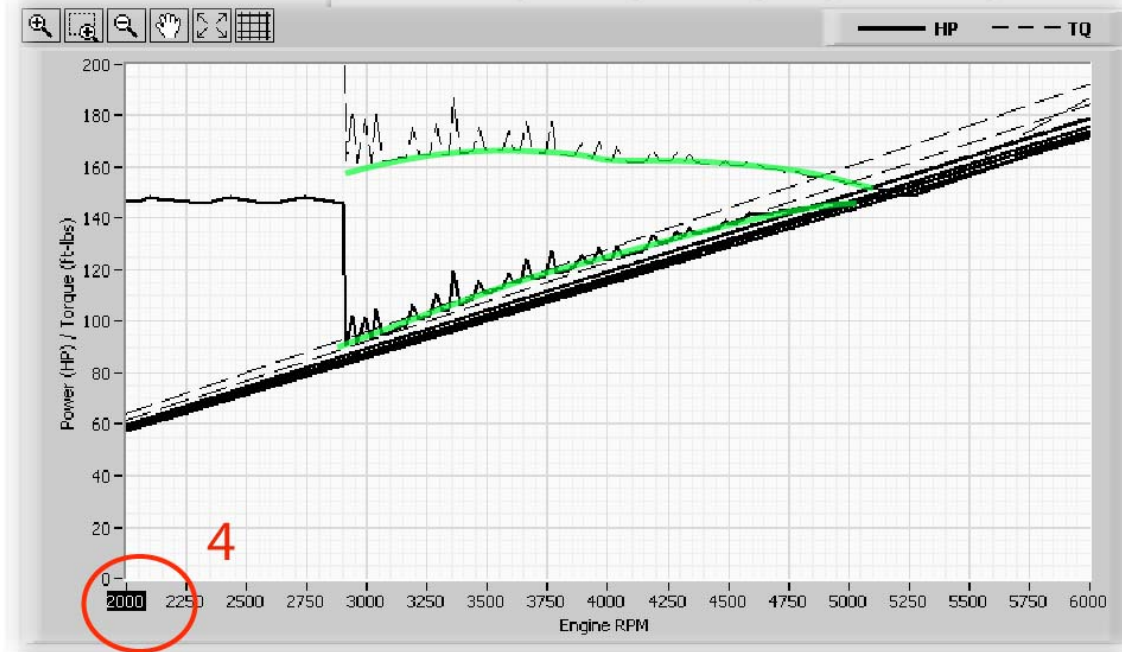
(1) Within PASS, call up the HP vs RPM graph and click with your cursor on to HP value of the HP axis. and then type in another value. In this case we'll typ 200, since it is close to the max HP of this vehicle.



(2) When you hit enter, the graph will redraw itself with the new maximum value.



(3) Now move the mouse to the max RPM value, and change it to the redline of the car (6000 in this case) and press enter.



(4) Finally, set the min RPM value to something close to where the engine starts producing power, 2000 was our choice in this case.

Now we can see the HP and TQ curves through the RPM spikes. Take a pen and draw a smooth curve on the printout.

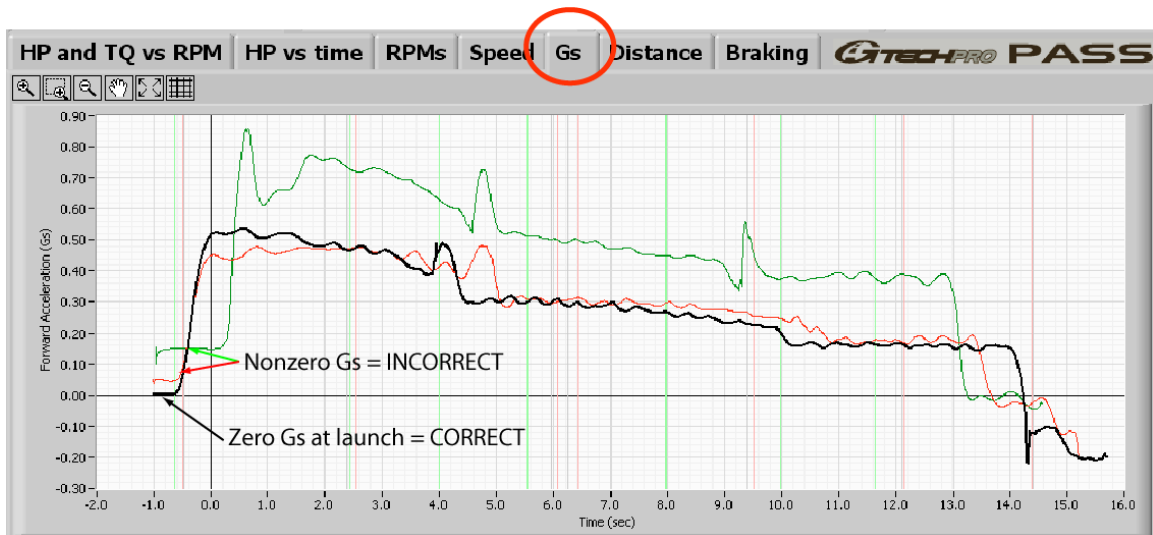
1.5 My G-tech times are inconsistent or much faster/slower than I know my car is.

This is usually caused by improper G-tech mounting. Your G-tech must be firmly mounted. It must not be able to budge even by a fraction of an inch before or during the run. The mount should be so tight that the mounting clip cannot be moved UNLESS you loosen the nuts on the mounting clip.

If the G-tech is mounted too loosely, it will typically budge by a few degrees or more during launch (when Gs are strongest). This leads to inaccurate results.

You can usually see that this happened using PASS.
First, download your run and look at the Gs versus time plot.

Just before launch, the Gs should be zero. If they are not, then you can be sure that your G-tech slipped during the run and the results cannot be trusted.



The black curve shows good ZERO Gs at launch.

The Red and Green curves are two runs where the G-tech clip moved before launch and will cause incorrect results. Since almost all measurements are dependent on Gs, speed, power, 0-60, quarter mile time, etc. will all be inaccurate.

THE SOLUTION:

Tighten up your G-tech mounting bracket so the clip CANNOT move during a run.

If you cannot tighten the clip, no matter how much you try, it may have been damaged and you should contact our technical support department.