



Dynolicious User's Manual

Version 1.0

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Thank you for your purchase of Dynolicious. You are now the proud owner of the first and best vehicle performance meter for iPhone and iPod Touch. Dynolicious is designed to be intuitive and easy-to-use, but the tips in this manual will help you achieve the maximum accuracy possible out of your Dynolicious experience.

Disclaimer

Dynolicious software is intended for experienced drivers in a suitable location. The developers and distributors of Dynolicious are not responsible for any accidents, injuries, or property damage that may occur during its use. Always drive safely and obey traffic laws.

Quick-Start Guide

For those who hate to RTFM, here's the quick version:

1. **Setup Your Ride:** If you want to measure estimated horsepower, go to the My Ride tab, and create a vehicle. Make sure you specify weight and drivetrain loss. If you just want 0-60 and quarter mile times, you may skip this step.
2. **Run Calibration:** From the Setup tab, select "Perform Calibration". Click "Start Calibration" and follow the instructions on screen.
3. **Mount the iPhone:** Place your iPhone or iPod Touch in a cupholder, cradle, or other mounting device. It must be aligned with the direction of travel, and not turned left or right. It may be tilted up or down.
4. **Perform a Timed Run:** Go to the "Timed Run" tab. Press the "Start Run" button. The round indicator will turn yellow for a second while Dynolicious orients itself, and then will turn green, indicating that you may start the test run. Start accelerating, and the test will start automatically. The test will automatically stop when you reach 1/4 mile, or when you decelerate.
5. **View Results:** Press the "View Results" button. Scroll up and down the list with your finger to see the results from the test run.

Description of Operation

Dynolicious uses the accelerometers built-in to your iPhone or iPod Touch to measure G-forces acting on the phone. Just as you feel pushed-back in your seat under quick acceleration, the device is able to “feel” the acceleration of the car. The measured G-forces are fed into a vehicle dynamics model, which is used to determine the motion of the vehicle, taking into account the action of the suspension and other factors. This then allows Dynolicious to compute the rate of acceleration, and from this a current speed and distance travelled.

Configuring Your Ride

Dynolicious allows you to configure a vehicle profile. This not only is a fun way to show off to your friends, but provides a valuable way to organize vehicle information and test results.

Creating Your Ride

To get started, click on the “My Ride” tab. To create a new vehicle profile, click the “+” button in the upper right corner. This creates an empty vehicle profile. To enter the description and parameters for your vehicle, click the “Edit” button in the top right corner. You may now configure the following parameters:

- To choose an icon for your ride, click on the box to the left of “Unnamed Vehicle”. This will open your photo library, and allow you to select, resize, and crop an image to use as an icon.
- To enter the name and description for your ride, click on “Unnamed Vehicle”.
 - Enter a nickname for your vehicle, such as “Justin’s Mini”
 - Enter the Year of your vehicle (optional)
 - Enter the Make of your vehicle (optional)
 - Enter the Model of your vehicle (optional)
 - When done, either hit return after entering Model, or click the “My Ride” button in the top right of the screen.





- Enter Weight and Drivetrain loss by clicking on either of these items. These parameters are used in horsepower calculations.
- Enter the weight of your vehicle, including occupants and cargo. The units for this default to lbs, but if you prefer to use kg, this can be selected from the setup screen.
- Enter a value for drivetrain loss. Drivetrain loss is a value which is used to generate an estimated engine horsepower figure from the measured wheel horsepower. This number varies by vehicle and is not generally published anywhere, as it is just an estimate and dependent on many factors. A value of 20% is fairly accurate for most vehicles. However, if you are interested in a more specific value for your vehicle, the best place to look is online forums related to your specific vehicle.

Often, another owner of a car similar to yours will have done dyno testing and have a more accurate value you can use.

- If you would like, you may enter any modifications you have made to your vehicle. This is purely optional at this point

Selecting Your Ride

Before performing test runs, make sure your ride is selected. From the “Select Ride” screen, the entry for your vehicle should be highlighted in blue.

Deleting Your Ride

Ok, so you made an entry for your grandfather’s ‘79 Cordoba. And as sweet as that ride is, you don’t want it cluttering up your ride selection screen. To delete a ride, go to the “Select Ride” screen and swipe your finger across the vehicle name. A red delete button will appear. Press this button, and *poof*, no more Cordoba.

Mounting

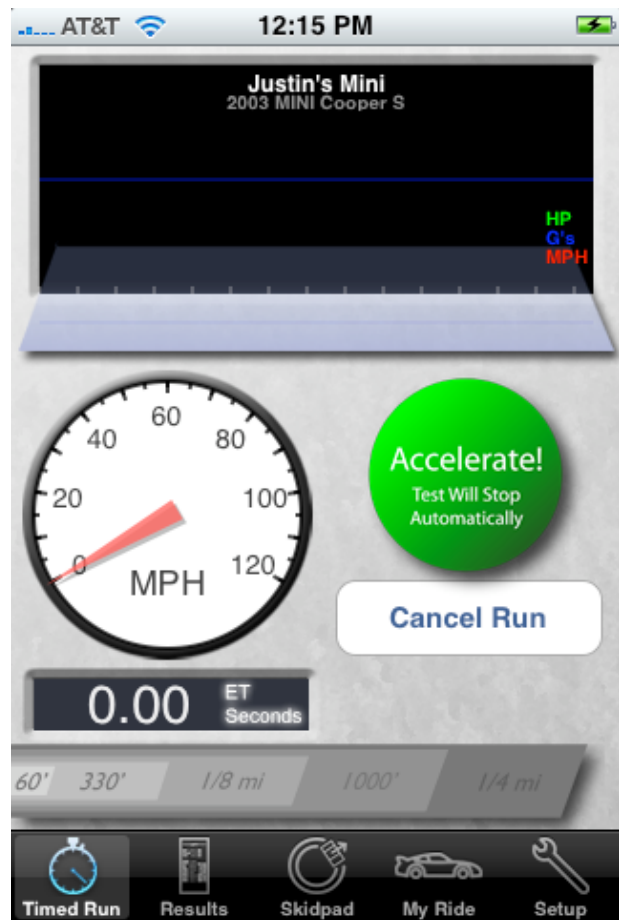
Proper mounting of the iPhone within the vehicle is critical for accurate results. Please use the following guidelines when selecting a mounting location and method:

- The iPhone or iPod Touch must be aligned with the direction of travel. This means the screen must face toward the back of the vehicle, and the device may not be turned left or right. It may, however, be tilted up or down, at any angle from horizontal (screen facing up) to vertical (screen facing towards taillights).
- The iPhone must not be allowed to move independently of the vehicle. This applies to flopping around in a cupholder, sliding on the passenger seat, or bouncing on a loose cradle.
- If using a cradle, make sure it does not bounce or vibrate as the car moves. Cradles which have a long arm or weak attachment tend to provide worse results than simply placing the iPhone in a cupholder.
- If using a cupholder, make sure the iPhone is secure and cannot tilt back under acceleration. If need be, wedge a cloth or piece of foam around the iPhone to prevent movement.

Performing a Timed Run

After configuring and selecting your ride, you are ready to make a timed run. This is the basic test which generates all of the results Dynolicious records for your vehicle.

1. Go to the “Timed Run” tab.
2. With your hone properly mounted as described above, press the “Start Run” button.
3. The round indicator will briefly turn yellow and say “Calibrating”. During this stage, Dynolicious is determining the orientation of the device. It is critical that you do not move the device during this step.
4. The round indicator will turn green and say “Accelerate!”. You may now start your test at any time.
5. Upon accelerating, the test will start. You will see the Elapsed Time indicator counting, and your current speed displayed on the speedometer.
6. The graph provides a visual display of Horsepower, Speed, and Acceleration. If the green Horsepower line is flatlined, it most likely means you did not configure a weight in you vehicle profile.
7. The bar at the bottom of the screen indicates the distance travelled. As times are recorded for 60 feet, 330 feet, 1/8 mile, 1000 feet, and 1/4 mile, the corresponding segments will light up.
8. The test ends when you reach 1/4 mile, when you decelerate by 10 MPH, when you press the “Cancel Run” button, or when 30 second has elapsed.



Tips for Accurate Results

For most accurate test results, please adhere to the following guidelines:

- Follow the mounting guidelines provided above. Mounting is the most critical aspect to achieving accurate results.
- Run calibration from the setup menu. The accelerometers in the iPhone are temperature sensitive, so it is best to run calibration in your car, with the engine off (for vibration), under the same temperature conditions as you perform the test run.
- Make sure that your test surface is fairly level. If you start or end facing uphill or downhill, this will significantly affect your numbers.
- If your aim is to measure HP, try not to jerk the car at takeoff. A smooth acceleration at takeoff and then wide open throttle will generate the most consistent results. Our next version of software should be more resilient against rough takeoffs and provide better HP results.
- Make sure that the weight specified includes all passengers, cargo, accessories, etc.
- Make sure the iPhone is mounted so that it cannot move relative to the car. Cradles that bounce while driving have a serious effect on accuracy.
- If you believe you are getting false triggering, meaning that the timer starts before you start accelerating, please increase the trigger value in the settings.

Using The Skidpad

The skidpad screen presents a realtime view of acceleration, cornering, and braking G-forces.

Mount the iPhone as described in the Mounting section.

Go to the Skidpad tab.

With the vehicle at a complete stop, press the “Zero” button.

Start driving. As you drive, the current G-forces will be shown as red and blue arrows. The peak g-forces are displayed as a green box. The maximum G-forces are also scrolled across the bottom of the screen.

At any time while driving, you may press the “Reset Max” button to reset the maximum values. The Zero button re-calibrates the orientation of the phone, so it should only be pressed when the vehicle is at a complete stop.



Viewing Results

Results from previous runs may be viewed from the Results tab. A variety of results can be viewed.

Current Results

The following Current Results can be displayed for the currently selected vehicle:

- Latest Run - This displays the results from the most recent test run.
- Today's Average - This displays the average of all test runs performed on the currently selected vehicle since midnight.
- Vehicle Average - This displays the average of all test runs performed for the currently selected vehicle.

Comparisons

Comparisons may be performed to see before-and-after results based on vehicle modifications. To perform a comparison, do the following:

1. Perform one or more Timed Runs to generate your baseline test results.
2. Modify your vehicle
3. Edit your vehicle profile on the My Ride tab and add the mod. Simply enter description of the mod.
4. Perform one or more Timed Runs to generate your modified results
5. From the Results tab, select Modifications
6. Select the modification(s) to include in the comparison by touching them. A checkmark will appear next to selected mods.
7. Press the arrow button in the top right of the screen to view the results.

Saved Runs

The results for any individual run may be selected and viewed under Saved Runs. To delete a saved run, swipe your finger across the run date/time. A Delete button will appear. Click this to delete the run results. The results will no longer be applied to any averages or comparisons.

Setup

Several settings are available in the Setup screen which allow you to configure Dynolicious. These settings are described below:

Rollout

Rollout is the distance the car travels before the timer is started. This is derived from the timing equipment at a dragstrip, where the wheel typically needs to move about 12 inches before the light beam is cleared which starts the timer. This effectively gives a bit of a rolling start, which affects the test results.

If you are a drag racer looking to simulate "deep staging", or you testing against other equipment which uses different settings, then the rollout parameters can be changed. Otherwise, the default values are generally accepted, and should be correct for most purposes.

Rollout (speed tests) applies to all of the 0-60 MPH type tests.

Rollout (distance tests) applies to all the quarter-mile type tests.

Rollout has no effect on horsepower calculation/

Trigger

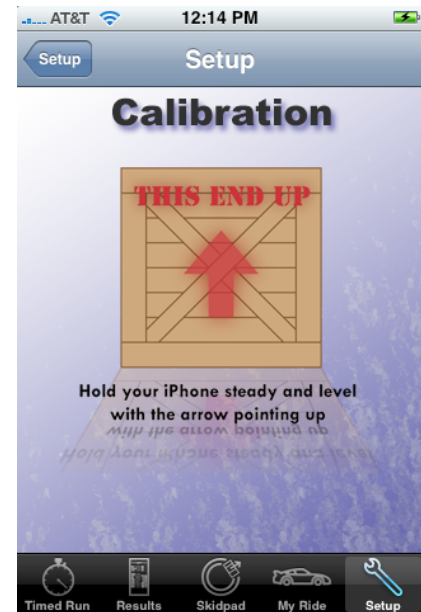
The trigger setting specifies the level of acceleration that Dynolicious must see before it starts timing a test run. If you are experiencing false triggering, which can sometime be caused by vehicle vibration, you may increase this value. The default setting will be appropriate for most users.

Calibration

The iPhone's accelerometers are not calibrated from the factory. For any given axis, the value returned from the accelerometer may be off by as much as 15%. The calibration function allows Dynolicious to compensate for this error and generate accurate results.

To perform calibration, press "Perform Calibration" from the Setup screen, then perform the following:

- Hold the phone in the orientation shown on screen.
For each direction, the phone should be held as level and steady as possible. Best results will be achieved by resting the phone on a level surface during the test. Hold the phone in the orientation until you hear a beep and the screen changes.
- Once all six orientations have been calibrated, you will see "Calibration Successful" on the screen. You may now use the button in the top left to return to the Setup screen.



The accelerometers in the iPhone are somewhat temperature sensitive. For best results, calibration should be performed in the same environment in which the test will be performed.

Units

The user can select between SAE (Imperial) and Metric units for several of the software features:

- Speed (mph or km/h) - Affects the speedometer display and all recorded results.
- Power (HP or kW) - Selects which whether power is presented in Horsepower or kilowatts.
- Weight (lbs or kg) - Selects units for entering vehicle weight.

Manual

Currently, the manual section simply contains instructions for mounting the iPhone for testing. The images may be helpful if the description is not clear. In a coming update, the contents of this document will also be available.