ProCal 3
Instructions

Table of Contents

Table of Contents 1
Getting Started 2
ProCal Calibration Flash Tool Instructions 2
Verify Package Contents 2
Getting to Know the ProCal Software 3
Prepare Vehicle for Flashing 4
Download Calibration File 6
Programming Your Vehicle 7
Restore Previous Calibration 9
Addition Vehicle Configuration Instructions 10
When to use Octane Adjust and Profile Learning 11
Changing Tire Size, Axle Ratio or Octane Adjust After Initial Programming 11
TPMS Notes 11

ProCal 3
Instructions

Getting Started

Please visit www.fordracingparts.com for the most current instruction information.

! ! ! PLEASE READ ALL OF THE FOLLOWING INSTRUCTIONS CAREFULLY PRIOR TO INSTALLATION. AT ANY TIME YOU DO NOT UNDERSTAND THE INSTRUCTIONS, PLEASE CALL THE FORD PERFORMANCE TECHLINE AT 1-800-367-3788 ! ! !

ProCal Calibration Flash Tool Instructions

Read the instructions below in their entirety prior to beginning the flash procedure. If you have questions or concerns after reading these instructions, call the Ford Performance Techline at 1-800-367-3788.

CAUTION! NEVER OPERATE THE ENGINE UNTIL PROGRAMMING OF YOUR PERFORMANCE CALIBRATION HAS COMPLETED SUCCESSFULLY. OPERATION WHILE USING THE WRONG CALIBRATION MAY RESULT IN PERMANENT ENGINE DAMAGE AND WILL VOID ANY WARRANTY (IF APPLICABLE).

FORD PERFORMANCE CALIBRATIONS ARE DESIGNED FOR 91 OR HIGHER OCTANE FUEL. IF YOU HAVE LOWER THAN 91 OCTANE FUEL IN THE TANK, TRY TO WAIT UNTIL YOU ARE ABLE TO PUT 91 OR HIGHER OCTANE FUEL IN THE TANK PRIOR TO PROGRAMMING. FORD PERFORMANCE RECOMMENDS THE USE OF 93 OCTANE FUEL IF AVAILABLE IN YOUR AREA

This ProCal tool has been designed to deliver a performance calibration to your vehicle and will preserve a copy of your vehicle's stock calibration, should you decide to remove the performance calibration for any reason. The tool and performance calibration are locked to your vehicle and therefore cannot be used on a different vehicle.

Verify Package Contents

ProCal Unit

Mini-USB Cable

TAKE EXTREME CARE THAT YOUR PROCAL VEHICLE INTERFACE UNIT AND THE STOCK CALIBRATION FILE DOWNLOADED FROM YOUR VEHICLE IN THE FOLLOWING STEPS IS NOT LOST OR DAMAGED; REPLACEMENTS WILL NOT BE GIVEN

Getting to Know the ProCal Software

Navigating the ProCal 3 Menus:

On the **HOME** screen, note the following:

a. **Battery gauge** in the top left-hand corner of the screen displays the current battery voltage in Volts.
   i. Located directly below the "Battery [v]" text on the **Battery gauge** is a sequence of numbers:
      1. The first four digits are the **ProCal 3 Customer Number**
      2. The next four digits are the **ProCal 3 Vehicle Interface Serial Number**

b. **Vehicle specific data** located in the top-center of the screen is automatically populated when ProCal 3 is plugged-in.

b. **Progress gauge** in the top right-hand corner of the screen displays the % complete of the current task

c. Four tabs located below the Battery gauge:

- **Programming**
  - **Open File Button** – Click this button to navigate to and open a calibration file.
  - **Close File Button** – Click this button to close the calibration file that is currently open.
  - **Program Button** – Click this button to flash the currently open calibration file to your vehicle's PCM.
  - **Restore –** Only visible after initial programming has taken place; clicking this button will restore the calibration that was on your vehicle before it was flashed with a performance calibration.
- **Diagnostics**
  - **Read DTCs Button** – Click this button to read all Diagnostic Trouble Codes currently being sent by your vehicle's PCM.
  - **Clear DTCs Button** – Click this button to clear all Diagnostic Trouble Codes currently set in your vehicle's PCM.
  - **KOEO Self-Test Button** – Click this button to perform a Key-On, Engine-Off diagnostic self-test.
  - **KOER Self-Test Button** – Click this button to perform a Key-On, Engine-Running diagnostic self-test.
- **Downloader**
  - **VIN** – This field automatically populates with your Vehicle Identification Number when the ProCal 3 unit is plugged-in and the vehicle is powered.
  - **Module Part Number** – This field automatically populates with your Powertrain Control Module's part number when the ProCal 3 unit is plugged-in and the vehicle is powered.
  - **User Name** – This field automatically populates with your User name when the ProCal 3 unit is plugged-in and the vehicle is powered.
  - **Password** – Enter the password associated with your user name in this field to continue.
  - **Voucher Number** – Enter the voucher number you received in this field to continue.
  - Download Button – Click this button to download the appropriate calibration file associated with your specific User Name, VIN, Module Part Number, and Voucher Number.
- **Configuration**
  - **Octane Adjust –** Switch to "ON" if spark retardation is desired
  - **Profile Learning** – Switching to "ON" initiates a misfire monitoring relearning sequence
  - **Axle Ratio –** ratio of driveshaft revolutions per minute to rear axle revolutions per minute
  - **Tire Size –** see calculation in Step 33

!!! SUBSEQUENT STEPS REQUIRE AN INTERNET CONNECTION IN ORDER TO COMPLETE THE INSTALLATION OF YOUR PERFORMANCE CALIBRATION ONTO YOUR VEHICLE'S PCM; IF YOUR VEHICLE IS LOCATED SOMEWHERE WITHOUT AN INTERNET CONNECTION, PLEASE COMPLETE STEPS 18 THROUGH 21 BEFORE LEAVING THE INTERNET CONNECTED AREA !!!

Prepare Vehicle for Flashing

STEP 1: Make sure your vehicle's battery is fully charged (at least 12.0 volts) and all accessories (radio, interior fan, headlights, etc.) are off. Headlights on 'auto' will turn on during programming, so make sure the lights are fully off. If you are unsure if your vehicle's battery is fully charged, connect a battery charger prior to beginning the programming process.

CAUTION: If your ProCal aborts programming due to low voltage or if the programming process is interrupted for any reason, you can simply repeat the flash process, however, it will require 2 consecutive flash cycles to complete.

STEP 2: Locate the onboard Diagnostic Link Connector (DLC) beneath the driver side dashboard.

STEP 3: Plug your ProCal 3 box into the DLC.

STEP 4: If your vehicle has a key fob (instead of a physical key), with your foot OFF of the brake pedal, press the ignition button once.
If your vehicle has a physical key, turn the ignition key of your vehicle to the ON (not start) position.

STEP 5: If the ProCal 3 box is properly connected, the **HOME** screen should now be similar to this:

STEP 6: Navigate to the "Diagnostics" tab and click on the "Read DTCs" Button

Diagnostic trouble codes that exist for your vehicle are displayed.

Causes of all existing trouble codes must be resolved prior to proceeding with installation of your performance calibration. Write down the code numbers and contact the Ford Performance Techline at 1-800-367-3788 for assistance with resolution of existing trouble codes **before** continuing.

STEP 7: Resolve causes of all existing trouble codes then clear DTCs by clicking the “Clear DTCs” button on the “Diagnostics” tab.

STEP 8: Click “Read DTCs” again to verify all issues have been resolved.

Download Calibration File

!!! Your computer must be connected to the internet in order to download the performance calibration. If your vehicle is not located in an area where internet access is available, you can unplug your computer from the vehicle, but do not shutdown the ProCal 3 application. Do NOT disconnect the ProCal 3 Vehicle Interface unit from your computer—this is required to be connected for downloading !!!

STEP 1: Navigate to the “Downloader” tab and verify that the proper VIN is displayed and Module Part Number field is populated. NOTE: If working from a previously obtained calibration file, skip to STEP 22.

STEP 2: Enter your user name, password, and voucher number; all fields on the “Downloader” tab should now be populated.

STEP 3: Click the “Download” button to begin downloading your performance calibration.

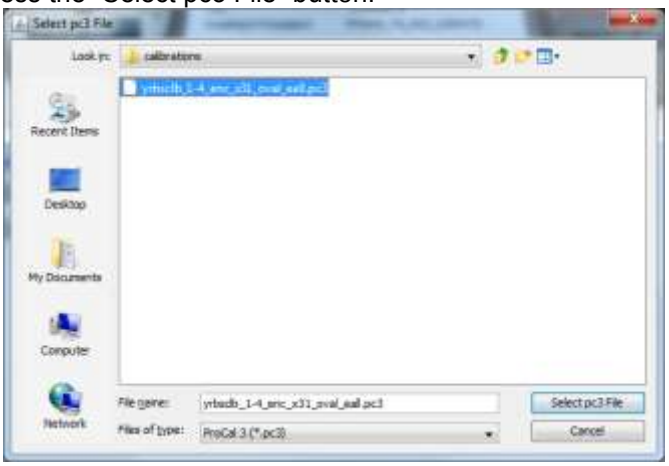
STEP 4: Upon successfully downloading the performance calibration, ProCal 3 will automatically open the downloaded file and switch to the programming tab. The downloaded file will be saved for future reference in your “documents/micromotive/calibrations” folder. The following text should appear on the Downloader tab:

NOTE: If flashing vehicle now, skip to STEP 7. If flashing will be completed later, start at STEP 22.

Programming Your Vehicle

STEP 1: Navigate to the “Programming” tab, and click on the “Open File” button.

STEP 2: Navigate to the performance calibration file that you downloaded in STEP 20. By default, ProCal 3 will look in the “documents/micromotive/calibrations” folder on Windows PC’s or the <user_home>/micromotive/calibrations folder on a MAC that was created the first time you ran the ProCal 3 application. Double-click on the performance calibration file (should have a .pc3 extension) or single-click and then press the “Select pc3 File” button.



STEP 3: The “Description” field on the “Programming” tab should now display a short description of your performance calibration, similar to what is shown below.

STEP 4: Once the performance calibration file is open and all DTCs have been fixed and cleared, the vehicle is ready to be programmed; On the “Programming” tab, click “Program” to begin installation of your performance calibration.

STEP 5: When programming is complete, your screen should appear similar to the one shown below:

STEP 6: Once the display shows “Successfully programmed!” turn ignition key to OFF position. Wait at least 15 seconds, then turn ignition key to the ON (not start) position.

CAUTION: If your ProCal aborts programming due to low voltage or if the programming process is interrupted for any reason, you can simply repeat the flash process, however, it will require 2 consecutive flash cycles to complete.

STEP 7: If the vehicle has stock sized tires on the drive wheels, a stock axle ratio, and no need to modify the octane adjust parameter, the programming process is complete, the tool may be disconnected, and the vehicle is ready to drive. If the tires or axle ratio are not stock, then proceed to STEP 29.

Restore Previous Calibration

Repeat the process for Programming Your Vehicle. Once at the **HOME** screen, click the “Open File” button and select the performance calibration file that you downloaded.

Note that you may need to enter the stock tire size and axle ratio values (if they have been changed) or a P1635 code may be set indicating tire size or axle ratio is out of limits.

Addition Vehicle Configuration Instructions

STEP 1: Navigate to the “Configuration” tab; this tab will only show up if a calibration file is open.

STEP 2: Write down the values displayed for tire and axle for future reference.

STEP 3: Once you’ve recorded the initial values for both, click anywhere on the Axle Ratio gauge on the left-hand side of the screen and enter the value of the new Axle Ratio.

Note: Values less than the minimum value shown on the gauge or exceeding the maximum value on the gauge will not be accepted.

STEP 4: If your vehicle tire size is different from the value shown on the Tire Size gauge on the right-hand side of the screen, click anywhere on the Tire Size gauge and enter the value of the new Tire Size.

Note: Calculate revolutions per mile by dividing 63360 inches/mile (5280 feet/mile x 12 inches/foot) by the measured circumference of your tire (in inches).

For example, if the measured circumference of a tire on one of the vehicle's driven wheels is 84 inches, revolutions per mile for your tire size would be 754. Note that circumference should be measured as rolling circumference to account for asymmetry when the tire is loaded with the vehicle’s weight. To do this, mark the bottom edge of the tire and the ground where the marked tire edge sits. Then roll/drive the car forward or backward until the tire mark is against the ground after one revolution. Measure the distance passed on the ground to determine the rolling circumference.

Another way to calculate revolutions per mile is by utilizing the sizing information written on the side of the tire. For a tire of the size P285/35-19, calculate tire revolutions per mile as follows:

Revs per mile = 20850 / { [(2 * **285** * **35**) / 2540] + **19** } = 776.4 which rounds down to 776.

After programming, if the speedometer indicates a different vehicle speed than a GPS unit, the programmed tire revolutions per mile can be tweaked to increase speedometer accuracy. For example, If the calculated tire size is 776 revolutions per mile and a GPS unit says the vehicle is traveling 70 mph while the speedometer says 75 mph, simply multiply the calculated tire size by 75 / 70 to give 776 * (75 / 70) = 831 revolutions per mile.

STEP 5: Configuration of your vehicle is now complete.

When to use Octane Adjust and Profile Learning

The Octane Adjust switch should only be switched to “ON” when spark retardation is desired. Some engines have increased octane sensitivity and require spark table adjustment. By switching the Ocatne Adjust switch to “ON” you are telling the PCM to reference a different spark table. Normally, this is only necessary if your engine is knocking.

The Profile Learning switch should only be switched to “ON” when the engine is reporting a misfire DTC such as P0300-P0316. By enabling this switch, the engine will prompt the driver to rev the engine to a specific rpm until the PCM relearns the fire pattern characteristics of the trigger wheel.

Changing Tire Size, Axle Ratio or Octane Adjust After Initial Programming

Turn ignition key ON, plug in the ProCal and complete Steps 29 through 33.

TPMS Notes

Vehicles equipped with Tire Pressure Monitoring may illuminate the TPMS warning lamp after reprogramming. Unless the lamp was illuminated prior to the programming process, it will turn off after about 10 miles of driving.