

NO PART OF THIS DOCUMENT MAY BE REPRODUCED WITHOUT PRIOR AGREEMENT AND WRITTEN PERMISSION OF FORD RACING PERFORMANCE PARTS.

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

### ProCal II 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 Racing 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 RACING 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 RACING RECOMMENDS THE USE OF 93 OCTANE FUEL IF AVAILABLE IN YOUR AREA

This ProCal II 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 pack for any reason. The tool will be locked to your vehicle until the original stock calibration has been restored. Once the original calibration has been restored to your vehicle, the performance calibration and corresponding hardware can be installed on another vehicle of the same year, make, model and PCM part number.

Carefully follow each of the steps below.

### **RECALIBRATION PROCEDURE**

### Before you begin, verify your Vehicle Identification Number (VIN):

Verify your vehicle's VIN matches the VIN recorded on the label of the ProCal II box (VIN is located directly above your name on a 1.25" wide x 1" tall label on the box). If the VIN is not correct, contact the Ford Racing Techline at 1-800-367-3788. **DO NOT ATTEMPT TO REPROGRAM YOUR PCM.** 

### Verify Package Contents:

Memory Card:	Housed within a small plastic case, packed in cardboard tote at end of the ProCal II box
ProCal II Unit:	Blue handheld device
J1962 Cable:	DB25 (25 pin) connector on one end, OBDII connector on opposite end

If your package contents do not consist of the above items, contact the Ford Racing Techline at 1-800-367-3788 for resolution.

# Techline 1-800-367-3788

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IS-1850-0422



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### Prepare ProCal II:

**STEP 1:** Peel back the rubber boot from the lower portion of the ProCal II to expose the memory card socket.

Remove the memory card from its plastic case and insert into the socket of the ProCal II with the card label facing the same direction as the ProCal II display screen. Return the rubber boot to its original position to cover the memory card socket.

**STEP 2:** Insert the DB25 connector of the J1962 cable into the top of the ProCal II. Finger-tighten the retaining screws of the DB25 so that it is firmly fastened to the ProCal II.

### Prepare Vehicle:

**STEP 3:** Make sure your vehicle's battery is fully charged (at least 12.0 volts) and all accessories (radio, interior fan, headlights, etc.) are 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 II aborts programming due to low voltage or if the programming process is interrupted for any reason, you may need to send your PCM back to Ford Racing for repair before the vehicle will start.

- **STEP 4:** Locate the onboard Diagnostic Link Connector (DLC) beneath the driver side dashboard. The exact location of the DLC will vary with vehicle model and year but will always be on the driver's side. For 2005 and newer Mustangs, it is located under the dashboard directly above the driver's left knee.
- **STEP 5:** Hold down the ENTER button on the Procal II while inserting the OBDII connector into the vehicle DLC, then let go of the ENTER button. The tool will update itself with the software from the memory card. Do not continue to the next step until the red error light goes out and a menu appears that says "Programming / Diagnostics / Setup". Note that holding down the ENTER button is only necessary the very first time you use a particular memory card. For every subsequent use of the same card, you do not need to hold down the ENTER button while inserting the Procal II connector into the DLC.
- **STEP 6:** Turn the ignition key of your vehicle to the ON (not start) position.
- **STEP 7:** If the vehicle you are working on is a Lightning truck or a Ford GT (**NOT** a Mustang GT), you must perform the following steps in order for the ProCal II tool to communicate with the vehicle's PCM:
  - 1. Scroll down to "Diagnostics" and press ENTER.
  - 2. Highlight "Select Protocol" and press ENTER.
  - 3. Scroll to "SCP" and press ENTER.

You are now ready to reprogram your Lightning truck or Ford GT with the Ford Racing calibration. Again, do NOT perform this step if your vehicle is a Mustang.

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**STEP 8:** Use the Down arrow key to highlight "Diagnostics" and press ENTER to select. Highlight "Read DTCs" and press ENTER to select.

Diagnostic Trouble Codes that exist for your vehicle are displayed.

Causes of all existing Trouble Codes (other than P1000) must be resolved prior to proceeding with installation of your performance calibration. Write down the code numbers and contact the Ford Racing Techline at 1-800-367-3788 for assistance with resolution of existing Trouble Codes **before** continuing.

- **STEP 9:** Press the ESC key to return to the previous menu.
- **STEP 10:** Resolve causes of all existing Trouble Codes and clear DTCs by selecting "Clear DTCs" from the "Diagnostics" menu.
- **STEP 11:** Select "Read DTCs" again to verify all issues have been resolved.
- **STEP 12:** Verify no Trouble Codes exist as explained in STEPS 8 through 11. If none exist, continue to step 13.
- **STEP 13:** Turn ignition key to ON position.
- **STEP 14:** Select "Programming" by pressing ENTER.
- **STEP 15:** Select "Performance Cal" by pressing ENTER. Display will show "An updated software version is available, Press enter to proceed."
- **STEP 16:** Press ENTER to proceed.
- **STEP 17:** Turn ignition key to OFF position, Press ENTER. "Turn Key On" will be displayed.
- **STEP 18:** Wait at least 5 seconds, then turn ignition key to the ON (not start) position. Programming process will begin. The first time the tool is used with a particular vehicle, it will upload the stock calibration for later use prior to beginning the programming process. This process may take several minutes. Please be patient and do not disconnect the tool or turn the ignition key off. The tool will display "Edit Config Data" when the uploading process is complete.

For 2010 and older vehicles, continue with step 19A below. 2011 and newer vehicles, skip to step 19B under "Reprogram PCM (2011 and newer vehicles)" on page 5.

Reprogram PCM (2010 and older vehicles only):

**STEP 19A:** Select ENTER to View/Edit the Configuration Data.

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STEP 20A:	Write down the values displayed for tire and axle for future reference in the event it is ever desired to return the vehicle to the stock calibration. If the vehicle has stock tires on the drive wheels and a stock axle ratio, skip to step 25A.		
	Use the Up/Down arrow keys to change tire revolutions per mile and press ENTER when desired revolutions per mile is obtained.		
	<b>Note:</b> 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.		
	Another way to calculate this number 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 21A:	Use Down arrow key to highlight "Axle" and press ENTER to select.		
STEP 22A:	Use Up/Down arrow keys to obtain desired axle ratio and press ENTER when complete.		
STEP 23A:	Use Down arrow key to highlight "Octane Adjust" and press ENTER to select.		
STEP 24A:	Use Up/Down arrow keys to toggle between Y or N and press ENTER to complete.		
	<b>Important Note:</b> Set this parameter to N initially. If you experience audible spark knock after programming your PCM with this setting, reprogram your PCM (steps 13 – 27A) and change this parameter to Y as soon as possible. If audible spark knock continues after setting this parameter to Y, call the Techline for assistance.		
STEP 25A:	Use Down arrow key to highlight "SAVE CHANGES" and press ENTER to select and initiate programming.		
	ProCal II will initiate programming and display % complete for each reprogramming step. Please be patient and <b>do NOT disconnect power, turn the ignition key off, or unplug the tool or you may need to send your PCM back to Ford Racing for repair before the vehicle will start.</b> "Update Complete" will be displayed for successful programming.		
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**STEP 26A:** Press ENTER once "Update Complete" is displayed.

ProCal II will display "The performance calibration install is done!"

**STEP 27A:** Press ENTER three times to clear DTC's and return to the main menu. Programming process is complete. Disconnect tool, start engine, and enjoy.

### Changing Tire Size, Axle Ratio or Octane Adjust after initial programming (2010 and older vehicles only):

Repeat steps 3 – 27A above. Enter changes to Tire Size, Axle Ratio or Octane Adjust as required.

### Returning to Original Stock Calibration (2010 and older vehicles only):

Repeat steps 3 - 27A above. At step 15, select "Restore Original" instead of "Performance Cal". Note that you may need to enter the stock tire size and axle ratio values in steps 20A through 22A (if they have been changed) or a P1635 code may be set indicating tire size or axle ratio is out of limits.

### Reprogram PCM (2011 and newer vehicles only):

- **STEP 19B:** Turn ignition key to the ON position. Programming process will begin. The first time the tool is used with a particular vehicle, it will upload the stock calibration for later use prior to beginning the programming process. Total time for uploading, checking data, and programming is approximately 16 minutes. Please be patient and do NOT disconnect power, turn the ignition key off, or unplug the tool or you may need to send your PCM back to Ford Racing for repair before the vehicle will start.
- **STEP 20B:** When "Update complete. Cycle key and press <enter>" is displayed, turn ignition key to the OFF position for at least 5 seconds, then turn it back to the ON position and press ENTER.

ProCal II will display "The performance calibration install is done!"

- **STEP 21B:** Press ENTER three times to clear DTC's and return to the main menu.
- **STEP 22B:** If the vehicle has stock sized tires on the drive wheels and a stock axle ratio, 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 23B.
- **STEP 23B:** From the "Programming" menu, select "Edit Config".

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STEP 24B:	Write down the values displayed for tire and axle for future reference in the event it is ever desired to return the vehicle to the stock calibration.	
	Use the Up/Down arrow keys to change tire revolutions per mile and press ENTER when desired revolutions per mile is obtained.	
	<b>Note:</b> 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.	
	Another way to calculate this number 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 25B:	Use Down arrow key to highlight "Axle" and press ENTER to select.	
STEP 26B:	Use Up/Down arrow keys to obtain desired axle ratio and press ENTER when complete.	
STEP 27B:	Use Down arrow key to highlight "Octane Adjust" and press ENTER to select.	
STEP 28B:	Use Up/Down arrow keys to toggle between Y or N and press ENTER to complete.	
	<b>Important Note (All kits except M-6066-MSVT29D / PD and M-6066-MGT624D / PD):</b> Set this parameter to N initially. If you experience audible spark knock after programming your PCM with this setting, go back to step 21B and change this parameter to Y as soon as possible. If audible spark knock continues after setting this parameter to Y, call the techline for assistance.	
	<b>Important Note (Kits M-6066-MSVT29D / PD and M-6066-MGT624D / PD only):</b> Set this parameter to Y if you are using 91 octane fuel. Set this parameter to N initially if you are using 93 or higher octane fuel. If you experience audible spark knock after programming your PCM with this setting, go back to step 21B and change this parameter to Y as soon as possible. If audible spark knock continues after setting this parameter to Y, call the techline for assistance	
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# **STEP 29B:** Use Down arrow key to highlight "SAVE CHANGES" and press ENTER to save the parameters in the PCM. The tool may now be disconnected, and the vehicle is ready to drive.

### Changing Tire Size, Axle Ratio or Octane Adjust after initial programming (2011 and newer vehicles only):

Turn ignition key ON and complete steps 23B through 29B.

### Returning to Original Stock Calibration (2011 and newer vehicles only):

Repeat STEPS 3 – 29B above. At STEP 15, select "Restore Original" instead of "Performance Cal". Note that you may need to enter the stock tire size and axle ratio values in steps 24B through 26B (if they have been changed) or a P1635 code may be set indicating tire size or axle ratio is out of limits.

### Notes (All vehicle model years):

Vehicles equipped with Tire Pressure Monitoring may illuminate the TPMS warning lamp after PCM reprogramming. Provided the lamp was not illuminated prior to beginning the programming process, it will turn off after 10 miles or so of normal driving.

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