



PROCAL MODULE



USER MANUAL
2007+ JK WRANGLER



AEV PROCAL MODULE USER MANUAL

**PLEASE CONSULT THE TROUBLESHOOTING GUIDE IF
YOU EXPERIENCE ANY ISSUES.**

INCLUDED PARTS	QTY	REQUIRED TOOLS
ProCal Module	1	Fine pointed instrument
Quick Reference Guide	1	for toggling switches

FEATURES OF THE MODULE

The ProCal Module allows the user to adjust several factory parameters including:

- Tire Size
- Gear Ratio
- Transfer Case Low Ratio
- One Touch Lane Change
- Daytime Running Lamps
- Low Tire Pressure Indicator
- Smart Bar Indicator Disable (after Smart Bar removal)

While the module is plugged into the OBD port, the ProCal Module can also:

- Set a Temporary Extended Idle
- Provide a Dead Center Steering Wheel Indication
- Clear Diagnostic Trouble Codes (DTGs)/Turn of Check Engine Lamp



For AEV HEMI Builders Kits, the ProCal Module will:

- Program the Vehicle's VIN into the new PCM controller (only required for older kits)
- Program the Pedal Calibration and Tolerance
- Adjust transmission settings for your 5.7L or 6.4L engine on 2012 or newer vehicles

The ProCal Module is only designed to be plugged into the vehicle during programming or activation of runtime features. Between uses AEV recommends storing the unit in the glove box or console. It is important to cycle the key OFF after any successful programming before starting/running the vehicle.

The module will lock to a vehicle's VIN number and may not be used on another vehicle until the "RESTORE" function is used on the original vehicle. The "RESTORE" function will reset a vehicle's default settings to stock and unlock the module for use in another vehicle. It IS NOT recommended to try and pull a vehicle's settings out before selling it. Because some transmissions require altered settings to use different physical axle ratios, the ProCal once used must remain with those new gears in the vehicle. It may seem tempting to keep the ProCal and use it on your new Jeep, but this often leads to incompatibility with the new or old vehicle. We highly recommend selling vehicles and including the ProCal attached to it.

Programming Procedure: Set the DIP switches accordingly using this User Guide or the Quick Reference Card. With the engine off and the ignition on, plug the module into the ODB port and wait for the horn to sound. If the horn does not sound, consult the troubleshooting section of these instructions. It is important to cycle the key OFF after any successful programming before starting/running the vehicle.

The ProCal is FAST. It will honk very soon after you plug it in. This is normal.

Unhooking the battery will not remove ProCal settings.



TIRE SIZE MODE

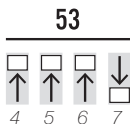
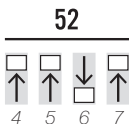
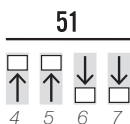
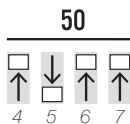
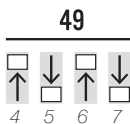
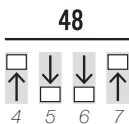
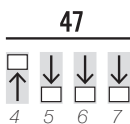
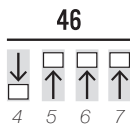
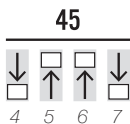
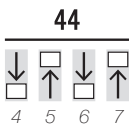
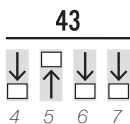
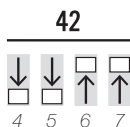
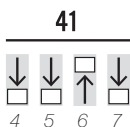
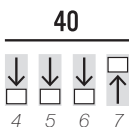
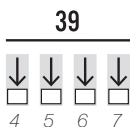
Description: This mode allows the user to adjust the tire size setting on the vehicle. This will ensure proper speedometer reading, odometer function, and automatic transmission shift points.

Note:

- In order to program the proper tire size, a measurement of the front tire will need to be taken on the vehicle under normal load and air pressure rounded down to the nearest quarter inch (1/4"). DO NOT use the manufacturers listed tire size.
- Because a correct speedometer is important, if possible we recommend using a handheld GPS device (phone apps work well) to confirm the speed once set. Using the cruise control, lock the speed to 60-70mph on the highway where safe and legal, have a passenger read the GPS at this speed. A correctly configured vehicle should be between 1-2 mph high or low at this speed. Feel free to make small adjustments using the ProCal as needed. A fast speedometer needs a smaller programmed tire value. The number you end up programming is unimportant to the measured tire size so long as the GPS speed matches.
- There are two tire size ranges, the first is for tires that are 24.00 inches to 38.75 inches (see Quick Reference Guide), and the second is for tires that are 39.00 inches to 53.75 inches in diameter. Begin by setting the first three switches to select the proper mode.

39-53.75"





AXLE RATIO MODE

Description: This mode allows the user to modify the gear ratio setting in the vehicle's computer. This will ensure proper automatic transmission shift points. On vehicles with A580 transmissions – it is imperative to correct function that the vehicle's computers match the actual ratio in the differentials.

Notes:

- There is a common decimal discrepancy in certain ratios, ignore minor conflicts in ratio value and select the closest ratio possible. For example, 4.10 and 4.11 are the same ratio.
- In some vehicles a HOT OIL message may flash on the dash after programming. This is normal. Just cycle the key off and on after the horn sounds.
- If you have not physically changed the gears in your vehicle, you do not need to go through this procedure.



- You must be VERY CAREFUL of the physical ratio before programming. Many people are told they have one ratio, or forget what ratio they have, or are told in is some ratio, when these people program that incorrect ratio – some vehicles (with A580 transmissions) will not shift at all. They will start and remain in second gear, this is called “Limp In” mode.
- “Limp In” can be diagnosed by trying to use the “auto stick” function, if the vehicle while driving does not allow you to select a specific gear, there is a good change this is Limp In. There are many other causes besides incorrectly programmed ratio. A dealer scan tool will read the diagnostic codes and this will explain to how fix.

TRANSFER CASE PROGRAMMING MODE

Description: This mode allows the user to modify the setting for the vehicle’s low range ratio. On vehicles with A580 transmissions – it is imperative to correct function that the vehicle’s computers match the actual ratio in the T-Case when in 4WD-Low.

Notes:

- The programmed ratio must match the vehicle’s **actual** transfer case ratio. The general rule for factory vehicles Rubicons have 4:1, and non-Rubicons have 2.72:1. If your vehicle shifts properly in 4Low, the correct setting is already programmed. You must change the transfer-case to use this setting.
- A common option is to use Advanced Adapter’s “ATLAS” T-case. It is imperative that only a t-case with a single low range ratio be used in 2012+ automatic vehicles. A vehicle with the A580 transmission will not work with a dual low speed case.



- If using an Advanced Adapter's product with an 2012+ Automatic (A580 transmission) using their accessory module that sends the correct 4WD Status single is required. If you shift into 4WD Low with this setup, and do not see "ESP OFF" on the dashboard, the system does not know it's in 4WD LOW and the transmission will not shift correctly even after the ProCal is used to program the proper value. Contact Advanced Adapters in this event.

ONE TOUCH LANE CHANGE (OTLC) MODE

Description: OTLC allows the driver to signal a lane change by moving the turn signal lever partially up or down without moving beyond the detent. The signal will light up three times for each activation. This is enabled by the factory on all 2007 and newer Chrysler vehicles.

TIRE PRESSURE MONITORING SYSTEM (TPMS) MODE

Description: This mode allows the user to modify the factory Tire Pressure Monitoring System (TPMS) low tire pressure threshold values. In stock configuration, when tire pressure drops below the factory threshold value, the TPMS warns the driver by illuminating a dash warning lamp. The ProCal Module can establish alternate threshold values so that low tire pressures can be utilized without triggering a warning. For a detailed description of TPMS functions please consult your vehicle Owner's Manual.

Notes:

- Disabling the factory TPMS should be used for off road use only and may not be legal to change in certain countries, please check local regulations. For on road use, please consult your tire manufacturer to determine an appropriate value for your vehicle's tires and gross vehicle weight (GVW).



- The TPMS sensors use timed and pressure-loss triggers to update the vehicle of tire pressures. This may require driving the vehicle around before the new setting “takes” or the indicator light turns off.

DAYTIME RUNNING LAMPS (DRL) MODE

Description: This mode allows the user to activate, deactivate, or change the vehicle’s Daytime Running Lamp (DRL) mode. If you live in a DRL regulated area (Canada and some parts of Europe), please check with your local laws prior to making any DRL changes.

- When DRL is enabled, the specified location’s lamps will light when the vehicle is in gear. The lamp location options are High Beams, Low Beams, Fog Lights, and Turn Signals. For most applications we recommend the low beam location. Fog lights in 2013+ vehicles are a higher wattage and will experience a lower life when used as DRLs.
- High and Low Beam lamps are fed half the normal voltage (roughly 6V) and will not affect normal operation of the vehicle’s lights. The DRL function is not a replacement for nighttime vehicle lighting.
- This 1/2 Voltage is a “PWM” (Pulsed light signal, used to get the same light but use less amperage to do so) is often incompatible or may cause flashing with LED headlight replacements. It is very unlikely this signal can damage the LED headlights, but we cannot confirm all applications.

AUTOMATIC SMARTBAR SYSTEM (ASBS) MODE

Description: This mode allows the user to activate or deactivate the vehicle’s Automatic Smartbar System (ASBS). The ASBS is an electronic module that disconnects the front sway bar. For vehicles that were



built with this feature (all Rubicons), removal of the module will constantly illuminate the “Sway Bar” lamp on the dash. For vehicles that were built without this feature, addition of the module will not by itself enable the system. For either circumstance, the AEV ProCal can activate or deactivate the ASBS.

Note: Installing or removing the module must be done prior to using the ProCal Module.

THROTTLE TOLERANCE PROGRAMMING MODE

Description: This mode allows the user to program throttle tolerance and effectively pair a PCM and pedal. When a new PCM or pedal has been installed, the previous values stored in the PCM may not match the specific tolerance of the pedal and need to be reprogrammed.

Notes:

- This mode requires simultaneous inputs from a user on the throttle pedal as well as the multifunction light stalk. When programming, follow the steps in a deliberate, but not rushed, manner. The entire process should take approximately 2-3 seconds. If the process is completed either too fast or too slow, the pairing will fail.
- The vehicle will honk once in the middle of the process, and twice when finished. If the vehicle has honked twice before you are finished try to go a little faster and vice versa.
- The timing and process take about the same amount of time to say as it does to actually do: *“Pedal Forward, Stalk Forward, Pedal Back, Stalk Back”*

Instructions:

1. Set the switches on the ProCal.
2. Turn the ignition to “RUN”, two clicks of the key.



3. Insert the ProCal.
4. When the module is ready to start, the Electronic Throttle (ETC) Indicator (a lightning bolt surrounded by two vertical lines) will flash on the dash.
5. To start the pedal routine, pull the headlight stalk back into the “Highbeam Flash” position, then release the headlight stalk allowing it to fall back into the “Highbeam Off” position. Just as if you were flashing another vehicle. The routine has now started.
6. **Press the pedal forward** all the way to the floor.
7. **Move the headlight stalk forward** to the “Highbeam On” position.
8. **Release the pedal back** completely.
9. Pull the stalk back to the “lowbeam” position.
10. With proper timing, the horn should now honk twice.
11. Turn the ignition off. Then start the engine. Test the pedal and verify that it is functioning properly. If not, repeat.
12. It may take multiple attempts.

NEW POWERTRAIN CONTROL MODULE (PCM) SETUP (AEV HEMI ONLY)

Description: This mode allows the user to program the vehicle’s VIN number into a new Powertrain Control Module (PCM). When installing an AEV HEMI Builder’s Kit with a new PCM, the new module will need to be initialized and paired with the vehicle’s VIN in order for it to function properly.

- After setting the ProCal module’s DIP switches to this mode, no further input is required from the user. The module will determine the vehicle’s VIN and initialize the new PCM accordingly. After programming, the vehicle will need to be cycled Off, then On.



- If you have a running/functioning vehicle, this setting will do nothing. Only vehicles with brand new PCM parts will work with this routine. Without initializing a new PCM, the vehicle's theft system will prevent the vehicle from running and possibly prevent the engine from cranking. This only applies to certain 2007-2011 AEV Hemi Builder Kits.

CLEAR DIAGNOSTIC TROUBLE CODES MODE

Description: This mode allows the user to turn off the Check Engine Light on the vehicle's dash.

- This function will attempt to clear any codes stored by the PCM and TIPM modules. Codes that are "Active" and still showing up from real issues will immediately return.
- In most cases this will turn off the MIL (Malfunction Indicator Lamp)/Check Engine Light on the dash, provided there are no active problems in any of the engine systems. Depending on Active and Stored DTC codes that exist in certain vehicle modules, the AEV ProCal may or may not honk the horn after successful clearing of DTC codes. This is normal.
- The ProCal will make an attempt at clearing codes in other modules but the focus is on errors that will turn the MIL on.

EXTENDED IDLE MODE

Description: This mode allows the user to set the vehicle's idle speed at a higher level than the stock level (up to 2000 rpm). The newer engine systems found in the latest Chrysler cars idle at a lower speed than previous generation vehicles. These lower idle speeds combined with an electronically sensitive vehicle network can create issues for power intensive tools such as winches and on-board welders.



- To prevent the vehicle from going into a lower power mode or presenting the user with a low power error lamp, the AEV ProCal should only be used while winching, using an on-board welder, or for other power intensive tools.
- This feature has a 10 minute timeout. The engine can safely be turned off at any time.
- The E-brake must be set while the function is active.
- This feature may or may not work on 2.8L Diesel manuals of certain years.

Instructions: To start the procedure, locate the dimmer switch on the multifunction light stalk. There is a ramp pictogram of brightness levels, put the switch anywhere in that ramp. Start the engine, set the switches on the proCals, and insert the module. The engine RPM should alter from its resting point, you can now use the dimmer switch to adjust the idle. New settings may take several seconds to adjust to and remain consistent. To turn the function off, it is typically best to just turn the engine off and remove the ProCal.

STEERING WHEEL CENTERING MODE

Description: The ESP system present on all newer Chrysler vehicles utilizes a digital sensor pack in the steering wheel to determine exactly where the user wants the vehicle to go. Disconnecting the steering, or replacing any of the related components (tie rod, front axle etc.) can cause this module to become out of correlation with the wheels. To center the wheels with the steering system, the AEV ProCal can indicate to the user exactly where zero is on the internal sensor.

By enabling the Steering Center mode, the ProCal module determines where the steering wheel is and lights up a corresponding turn signal lamp and turn signal indicator. If the wheel is too far to the right, the right indicator will



light. If the wheel is too far to the left, the left indicator will light. If the steering wheel is stopped exactly dead center, the highbeam indicator and both turn signal lamps will light.

- The ProCal module will allow the user to perform a proper alignment without having to use the dealer diagnostic tool.
- This feature is typically only used on an alignment rack. The only way to exactly correlate the wheels and the steering wheel is to complete the process when the tires are physically lined up.
- This feature will not “program” anything. It only shows you where 0° is on the actual sensor. Often times when the steering wheel is disconnected it will be reinstalled a complete revolution out, this routine will also help diagnose that.
- If the function is not terminated properly, the lights/indicators may remain stuck on or off. Be sure to exit the mode properly by enabling either turn signal before removing the module. If a clean exit does not occur, plug the module back in, enable the turn signals, and then remove the module. This can also be reset by removing and reconnecting the Positive (+) battery terminal.

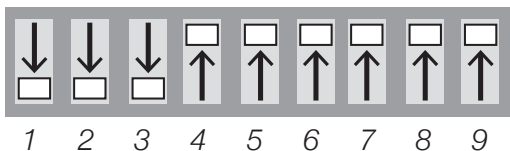
Instructions: Consult the Quick Reference Guide and set the DIP switches accordingly. With the ignition on and engine off, plug the module into the ODB port. Use the indications to center the wheel. To exit the mode, activate either the right or left turn signal, and then remove the module.



RESTORE MODE

Description: This module can be “restored” to work on new vehicles, but will set the paired vehicle back to the original settings first. Only one vehicle can be modified at a time.

- Do not use restore before going to the dealer. The ProCal is “Dealer Safe” and no issue will come from using the factory tools “on top of” the ProCal. That said, using the factory tools could overwrite the settings. In this case, just re-program the settings you need again. There is no need to restore first.
- Do not restore if you are getting an error, or if you aren’t seeing the desired effect. It’s likely the module is working as intended. Restoring could leave the module and vehicle in an undesired state in extremely rare situations.
- Some other companies suggest you remove the ProCal before using their modules. This is often just a marketing tactic, but in the case of some tools the ProCal could interfere with their Digital Rights Management (locking) scheme. So far as AEV or the ProCal cares, you are free to use any different module in conjunction.
- On a complete restore, the module will honk the horn 3 times. This is normal.





Instructions: Same as any other programming mode. Turn the vehicle's ignition to RUN, set the switching according to the value above, and insert the module. Restore may take a few seconds longer than other programming modes. The horn will honk three times on successful completion.

TROUBLESHOOTING

On occasion, the ProCal module may be unable to complete a desired request for a variety of reasons, including network errors, an invalid DIP switch setting, or a prohibited request. For example, if a user tries to set a TPMS low pressure threshold on a 2007 JK Wrangler, the module will abort and present an error code because the 2007 JK Wrangler does not have TPMS.

When in an error state, the ProCal module will flash a sequence on the dashboard of the vehicle, usually on the vehicle's theft system indicator (this is most commonly a red LED above the coolant gauge in the cluster). **This is a two stage display, where a sequence is flashed once, followed by a short pause, then another sequence, and finally a longer pause and the code will repeat.** Simply count the two sequences and refer to the list below. For example, if using an improper DIP switch combination the user may see 4 flashes followed by a short pause, then 6 more flashes, a longer pause and the sequence will repeat. This would be a 4-6 error.

TROUBLESHOOTING CODE LIST:

CODE	Description	Solution
1-x, 2-x, 3-x	Internal Error	Contact AEV
4-2	Wrong VIN	This module is locked to another vehicle's VIN. Use the module in the vehicle it is locked to.
4-3	Wrong Vehicle Type	Jeep Wrangler is the only currently supported vehicle.
4-5	Feature Not Supported	Feature is unavailable for your vehicle type, configuration or year.
4-6	Key In Wrong Position	Please make sure you have turned the key "two clicks" to ignition-RUN mode before inserting the ProCal. All of the lights will be on in the cluster and the HVAC system will be available.
5-x, 6-x, 7-x, 8-x	Internal Error	Contact AEV
No Code & No Honk	No Response	Contact AEV





COMMON ISSUES

- Set the switches. Turn the vehicle on. Then insert the ProCal. Always.
- It does not matter if you remove the ProCal then turn the vehicle off, or turn the vehicle off then remove the ProCal.
- To determine Up or Down, hold the module in your hand looking at the switches, with the connector by your thumb, this is "UP".
- If you feel the ProCal "isn't doing anything", please first read this:
 - If the ProCal honks the horn twice on a programming event, it IS working.
 - If you get no honk, check for the diagnostic light flashing on the dash.
 - If there is no flashing indicator error code, and no honk, contact AEV.
- The ProCal is honking, but you aren't seeing the effect, read the section in this guide for the function. In the case of Tire Size, use a GPS to verify and adjust as needed. In the case of TPMS, sometimes you just need to drive the vehicle a bit.

BEWARE OF KNOCKOFFS AND SCAMS

- As with many popular electronics, there may be knockoff versions of the ProCal. Always buy from actual AEV Dealers. Be cautious of any sales below MSRP, AEV runs an aggressive MAP policy so every dealer should be the same price. Be aware an emerging technique for knockoff manufactures to use is to sell at the same price, further removing the customer's ability to spot a knockoff or clone. Contact AEV if you are unsure about a dealer.



- Be **EXTREMELY** cautious of purchasing from places like Craigslist or Ebay or Forums. Very many times, a user will sell a module that is locked to their or some other VIN. There is no way to know if a module was actually released from its original vehicle before trying in your own. AEV never recommends buying a used module at all, it's very often a hassle for both private parties.

COMMENTS OR QUESTIONS?

American Expedition Vehicles

www.aev-conversions.com

email: tech@aev-conversions.com

ph: 248.926.0256



AEV-CONVERSIONS.COM