



Drive\$SMART

W I S C O N S I N

Toyota Prius – Initial Stages of Warm-up

As presented by Wayne Mitchell, Chicago Prius Group
To a Milwaukee Hybrid Group Meet 6-21-08

This is a recap of a presentation that Wayne gave to 42 members of the MiHG at their meet on Saturday June 21, 2008. This recap is taken from my personal notes during the presentation and is not intended to be the definitive description of this process. I've included several other links that are more technical in nature but provides detailed support evidence. Since Prius owners' do not currently have the EV Switch, this recap will not include how the EV Switch can mitigate these stages of warm-up. A properly calibrated ScanGauge 2 with XGauge is considered a required tool to monitor these various stages. An EBH will also speed up the warm-up stages by raising water temps much quicker from Stage One. This handout is intended to be cut and used in your vehicle for quick reference until its processes becomes second nature.

STAGE ONE: Water temp from *ambient to 104 degrees*

Part One

- A. Push the Start Button, it will take about **7-8 seconds** to boot up the computer and perform a self check
- B. You will here the relay switches begin to open during these 7-8 seconds
- C. You will be **unable to drive during these initial 7-8 seconds**

Part Two

- A. After part one is complete, the engine will start and begin to warm up the catalytic convertor for about **56 seconds**
- B. At this stage the engine runs at it's richest to activate pollution control systems and will not power the car unless the computer detects a need for extra power
- C. **If you need to drive, do so easily and know that most of the power is coming from the battery, not the engine**
- D. You will **not have Auto Stop and will not be able to Glide**

STAGE TWO: Water temp from *104 to 157 degrees*

- A. The catalytic convertor and the engine are now warmed
- B. The engine will shut off, if not needed to provide power or cabin heat. You will **have Auto Stop when stopped but still no Glide**
- C. You **cannot drive with battery power alone. The battery will operate along with the engine**

STAGE THREE: Water temp from *157 and above*

- A. The engine will not go to Auto Stop unless you come to a **complete stop for 5-10 seconds**

- B. The engine will shut down, in a rough or jerky manner, indicating that the car is going into Stage 4
- C. You are ***able to Glide if you start your Glide over 34 mph, but not under***

Stage Four:

- A. To reach this Stage, your car must ***have come to a complete stop for 5-10 seconds in Stage 3***
- B. Your car is now in ***full and complete hybrid mode, with Auto Stop and complete Glide capabilities***

Once your Prius had gone through all stages of warm-up, every time you turn your car off and then restart it, your commuter will reboot from Stage 1 and go through all the Stages once again. Since the water temperature will be quite warm, the process will be much shorter though.

If your stop will be relatively short in nature (no more than 1 hour) you may want to place the car in Park. This will prevent the car going through a complete 4 Stage warm-up when you're ready to leave. If you do this you may want to lock the car using your mechanical key. (Have a spare made with the Bland #3 blank)

<http://priuschat.com/forums/knowledge-base-articles-discussion/43356-prius-stages-operation-operating-mode-availability-reference-aid.html>

<http://techno-fandom.org/~hobbit/cars/five-stages.txt>

<http://www.cleanmpg.com/forums/showthread.php?t=1224>

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