

Prius II (2004-2008)
Stages of Operation (Warm-up) indexed to Operating Modes

Red = mode not available in this stage
Green = mode available in this stage

	Stage	0	1a	1b	2	3	4 (Normal operation)
Triggers							
Duration from Ready Mode (absent acceleration)		7-12 sec					
Duration from ICE(Internal Combustion Engine) ignition			56 sec				
Coolant Temperature (ScanGauge)					40C(104F)	73C(163.4F)	
Stage 3 to 4 transition stop time while NOT in EV mode (idle check)							5-10 sec stop ends Stage 3
How do you know stage 1a is over?							
Ignition Timing (IGN)(ScanGauge)			-10	>0	>0	>0	>0
Absent ScanGauge listen for... (credit hobbit)				Audible change in running vs 1a			
	Stage	0	1a	1b	2	3	4
Mode Availability							
No arrow GLIDE (<42 MPH) (Not in EV mode)		n/a				Note A	
High Speed (>41 MPH) Warp-Stealth (pack assist)		n/a		?	?		
Warp-Neutral (enter N below 42mph, coast up to 62 mph)		n/a		?	?		
Super-Highway Mode (ScanGauge low IGN ~13-15) (SHM)		n/a		?	Note B		
ICE-off at stop (Not in EV mode)				?	Smooth	Rough	Smooth
EV Mode (requires EV mod in N America)							

EV Mode conditions:

Not in Stage 1a
SoC(High Voltage Battery State of Charge) >= 50% (middle of 3rd bar)
IF in Stage 1b, SoC >= 6 bars, Ambient Temp >=0C(32F)
Speed <= 34 MPH
0C(32F) <= Battery Temp <= 45C(113F)
Defroster OFF
Not accelerating

Temper expectations: EV mode does not a PHEV or EV make (very limiting range/conditions)
N American Prius does NOT come with an EV button (mods are available)

EV Mode Terminating conditions:

Speed > 34 MPH
SoC = 2 bars
Battery Temp excessive
Acceleration demands ICE

Note A: In Stage 3, Glide (no arrows) is available if 34<MPH<42 upon entering the glide. (efusco) Metric 55<kph<68

Note B: In Stage 2, SHM is available, but will not hold speed optimally until the transaxle is fully warmed (douglas001001).

Stage 1b is that time (if any) after the end of Stage 1a and before coolant reaches 40C(104F)

Japanese hypermile technique: Stage 1a: Sit & charge OR N-ICE-on coast; Stage 1b: ICE-ON accelerate, EV Mode glide

(Most in U.S. just drive through Stage 1a, while the Japanese point out that the ECU resists using ICE for propulsion in Stage 1a.

Therefore, the pack is supplying power and cannot simultaneously receive power from the ICE. The Stage 1a excess ICE energy is wasted unless you let the pack receive the charge with their Stage 1a techniques. ECU = Engine Control Unit (the car's main computer)

Normal Coolant Temp = 85C(185F) (Somewhat higher temps are observed with grill blocking. ScanGauge highly recommended with grill blocking.)

ICE runs about a minute upon reaching this temp in order to cycle coolant through the thermostats (hobbit)

ICE will run if coolant temp drops to 63C(145.4F) until 73C(163.4F) is reached. No transition stop is required(?) to then resume Stage 4 operation.

Friction braking used below 8 mph and in hard braking (pedal force). Other braking is regenerative.

One should still seek to minimize regenerative braking because of the energy losses upon conversion to and from the HV battery.

I refer to this as the Hybrid Paradox: You bought the car for the economy of the battery, but must minimize use of the battery for optimal economy.

I regard Stage 3 as a single stage (3a=speed below 42mph, 3b above 42mph)

I refer to the brief time before ICE-on at Ready mode as Stage 0

Stage 1 divided a/b based on feedback from Ken@Japan who also provided several of the specific temps for EV, etc.

Daniel authored the 5 stages article. He believes things are more complex than the article suggests. So, lets enhance this further.

ScanGauge means you need after-market instrumentation to measure the item.

BobWilson4web of GreenHybrid believes 42 mph is inherently inefficient & advises minimizing time at or transiting that speed.

He also points out that the modes above can be overused compared to steady-state driving; comparisons should be at AVERAGE speed of a segment.

Be opportunistic in applying Pulse & Glide and Warp Stealth: Your Prius ECU doesn't know you are exiting the freeway or descending a hill...

xcel of CleanMPG advises Pulses should stay below 'loop current' (pack assist) in intensity. Others allow for harder acceleration. Stay tuned.

Authorized by ksstathead (I had a test drive, but no Prius owned yet. Ergo, please reply with errors/refinements so I can revise for us all)

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This reference aid is not a substitute for studying various threads on Priuschat, CleanMPG, etc, and members' sites (hobbit, John1701a, etc).

Links to key threads detailing the above: (partially done)

Daniel's 5 stages article archived at hobbit's site...

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

Pulse & Glide and Warp Stealth article at CleanMPG (xcel)

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

Superhighway Mode threads at PriusChat and CleanMPG (xcel, dan, JimboK ...)

<http://www.cleanmpg.com/forums/showthread.php?t=6179>

Highway driving Prius II (Douglas001001)

<http://priuschat.com/forums/fuel-economy/38590-highway-driving-prius-ii.html>

Why don't I get the EPA (Tideland Prius) <http://priuschat.com/forums/knowledge-base-articles-discussion/37214-why-don-t-i-get-epa-mileage.html>

Warp Stealth - A Prius Driver's Guide at hobbit's site

<http://techno-fandom.org/~hobbit/cars/warpstealth.html>

Comparison of Highway Driving Methods (JimboK) PC knowledge base: /40966-comparison-highway-driving-methods-toyota-nhw20-prius.html

Whys and Hows of Hypermiling at CleanMPG (xcel)

<http://www.cleanmpg.com/forums/showthread.php?t=1510>

Grill Blocking Summary (efusco) <http://priuschat.com/forums/knowledge-base-articles-discussion/39901-grill-blocking-summary-article.html>

Engine Block Heater (Green Hokie) priuschat.com/forums/prius-modifications/35035-want-install-engine-block-heater-yourself-guide-may-help.html

GreenHybrid Prius FAQ (BobWilson4web)

<http://www.greenhybrid.com/discuss/55101-post1.html>

EV Button install (one way) <http://jaygroh.dreamhost.com/prius/Prius%20Info/Bonus%20Stuff/Mods/EV%20Button%20Install/prius-evbutton-install.pdf>