

2014 MAZDA6 (LATE AVAILABILITY)

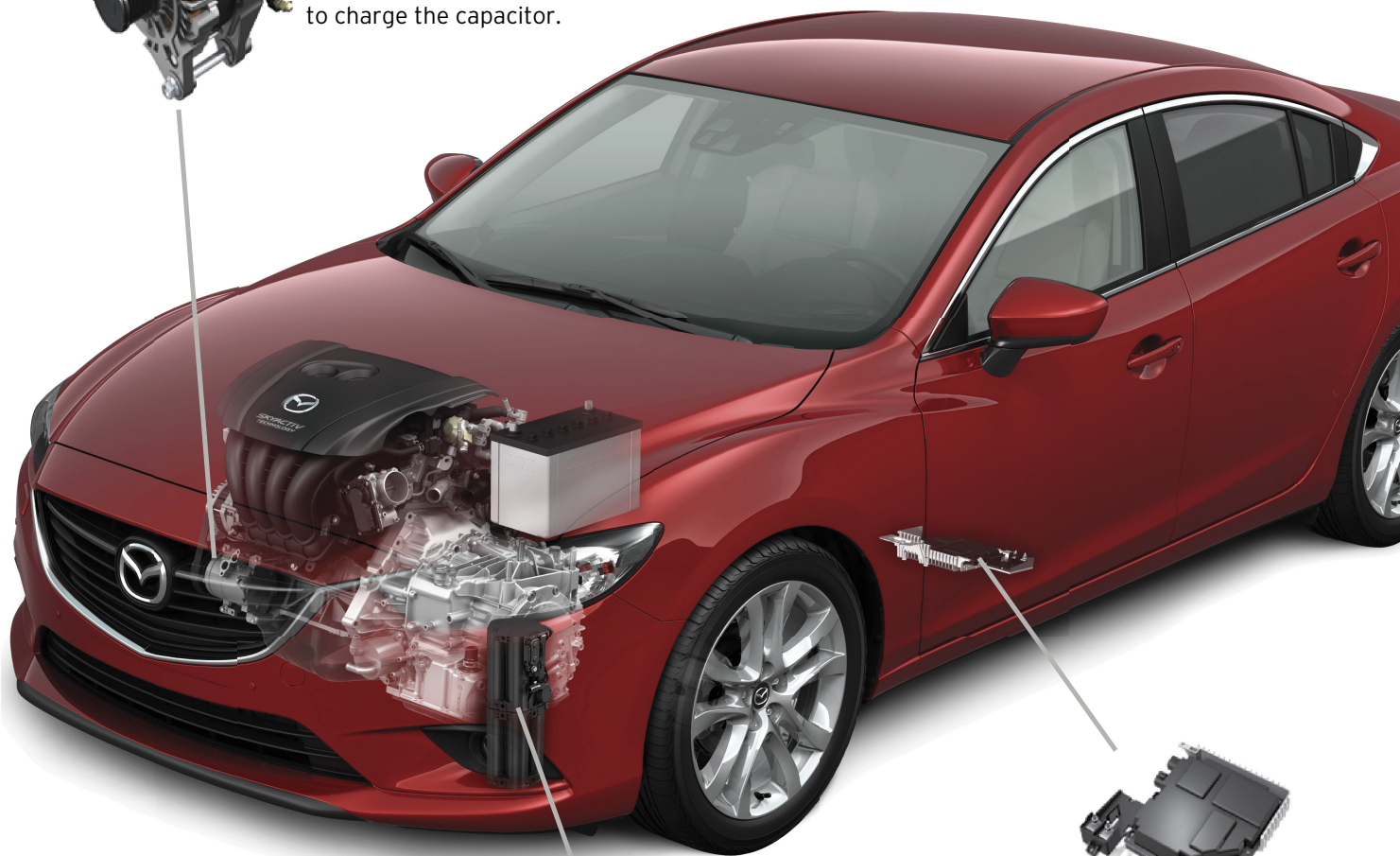
i-ELOOP

i-ELOOP is a Mazda-unique regenerative braking system that generates and stores electrical energy during deceleration. Through efficient energy regeneration, storage, and usage, fuel economy improvement is achieved while driving.



Generator

Variable-voltage generator that can generate a voltage of 12-25V during deceleration to charge the capacitor.



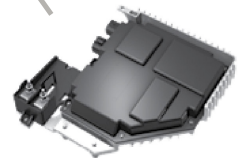
Capacitor

10 electrical accumulators (electrical double-layer capacitor) that can charge/discharge high current instantly are connected in series. 25V maximum charge can be physically stored.



DC-DC Converter

When the generator produces the maximum voltage (25V), voltage is reduced to 12V by the DC-DC converter for power supply to vehicle electrical devices.



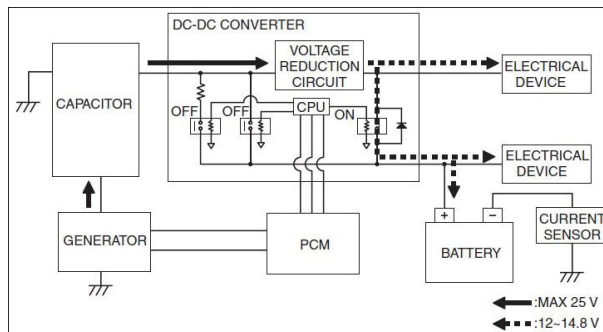
i-ELOOP CONT.

i-ELOOP OPERATING MODES

i-ELOOP operating modes vary depending on the vehicle driving conditions and the status of the i-ELOOP electrical devices. Below is a description of the seven i-ELOOP operating modes.

Regenerative Braking Mode

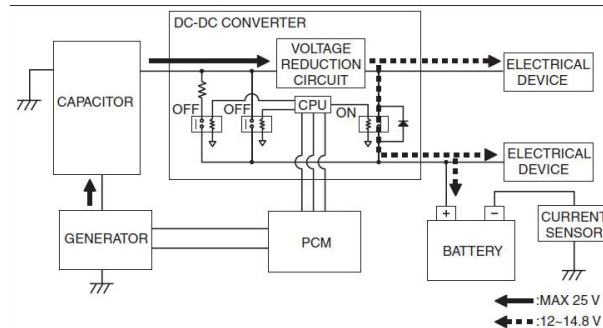
During fuel-cut (accelerator pedal released) and Torque Converter Clutch (TCC) engagement, the generator stores electricity in the capacitor. Voltage stored in the capacitor is reduced at the DC-DC converter for power supply to each electrical device. Power generation is controlled by the PCM.



Conventional Power Generation Mode

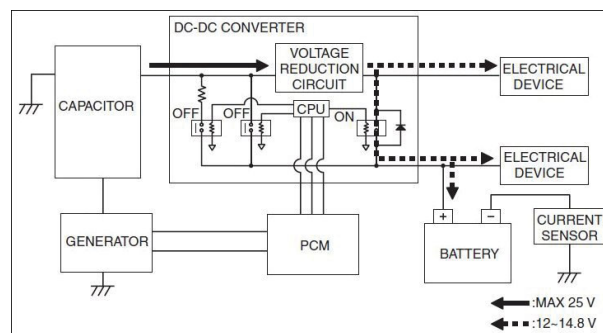
(no regenerative braking)

When battery voltage is 14V or less while the engine is running, the generator stores 12-25 volts of electricity in the capacitor. Voltage stored in the capacitor is reduced at the DC-DC converter for power supply to electrical devices. The generator's output is lower than that of regenerative power generation mode.



Capacitor (i-ELOOP) Power Supply Mode

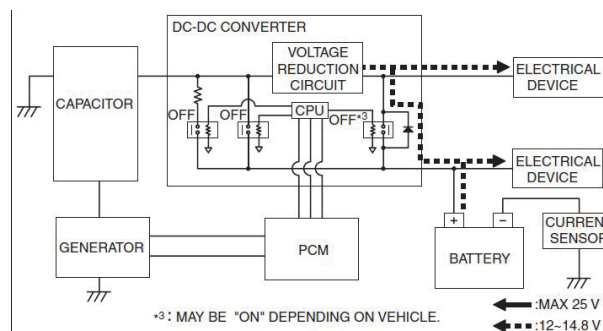
If capacitor voltage exceeds battery voltage, voltage stored in the capacitor is reduced by the DC-DC converter for applicable power supply to each electrical device on the vehicle.



Battery Power Supply Mode

If the capacitor voltage falls below the capacitor's minimum voltage (14-17.5V*) during cranking, electrical power is supplied from the battery to the vehicle electrical devices.

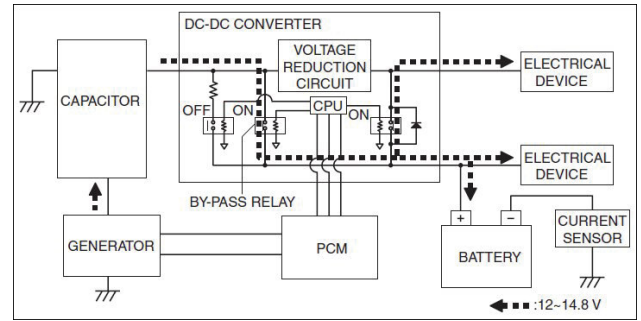
* Varies depending on the capacitor's degradation condition.



i-ELOOP CONT.

By-pass Mode

When vehicle electrical load (consumption current) exceeds 50A or more, a bypass relay within the DC-DC converter is energized to supply power generated by the generator directly to the vehicle electrical devices. If the DC-DC converter voltage reduction circuit malfunctions, or battery voltage is below 11V, the DC-DC converter switches to bypass mode.

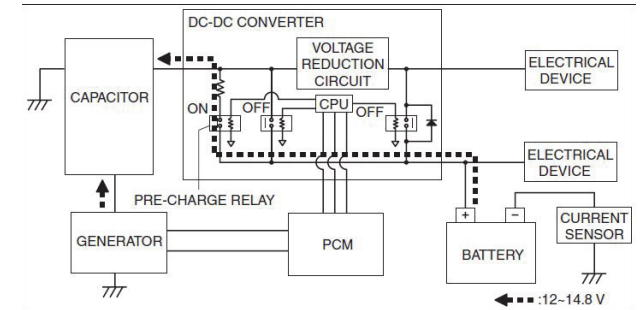


Pre-charge Mode

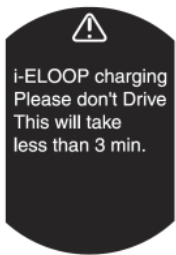
Electrical power is supplied from the battery or the generator to the capacitor when:

- There is excessive dark current.
- The capacitor's voltage decreases because the vehicle is stored for a long period without running the engine.

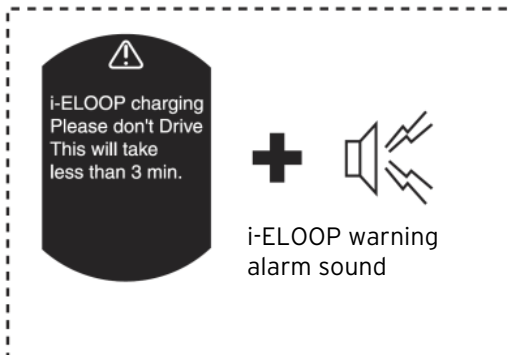
The Multi-Information Display will display an i-ELOOP warning message after engine startup.



In Pre-charge mode



Driving in Pre-charge mode

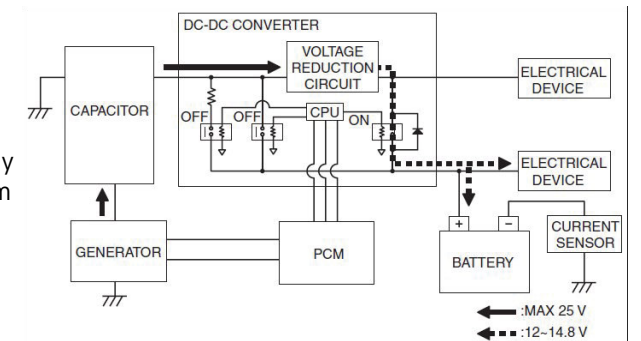


When the warning message is displayed, allow the engine to idle for 3 minutes. This time is needed to bring the capacitor up to operation. The vehicle may be driven when the message is no longer displayed.

Note: If the vehicle is jump started, leave the jumper connected until the warning message is no longer displayed.

Capacitor (i-ELOOP) Power Generation Mode

When capacitor voltage exceeds 20V or more (16V or more if battery output is decreased) with the ignition switch OFF, extra voltage from the capacitor is used to charge the battery.



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Mazda North American Operations (MNAO)
 Information & Publications
 1444 McGaw Ave., Irvine, CA 92614