WELCOME TO ERA 2018 TRADE SHOW

Montgomery, Alabama

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Montgomery, AL 36109

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TOMORROW'S FUTURE HERE TODAY

OUTLINE

- Road Map of Voltage Regulator
- TESTER & METERS
- BSS (Bit Synchronous Single-wire)
- LIN (Local Internet Network)
- HONDA REGULATOR TESTING
- HONDA LVI (Live Vehicle Install)
- MAZDA i-ELOOP
- MOSFET RECTIFIER

Road Map of Voltage Regulator

Single Function

1.Voltage regulation.

→

Double Function

1.Voltage Regulation

2.High/low voltage warning.

→

MCU Function

1. Voltage regulation

2.High/low voltage warning.

3.LRC

4.Soft-start.

→

Multi Function

1.Regulate voltage in fixed frequency.

2.High/low voltage warning. 3. Short circuit protection.

4. LRC

5. Soft-start

6. Fix frequency residual current.

7. Over voltage protection.

8. Over temperature protection.

9. RVC.

→

Computer interface

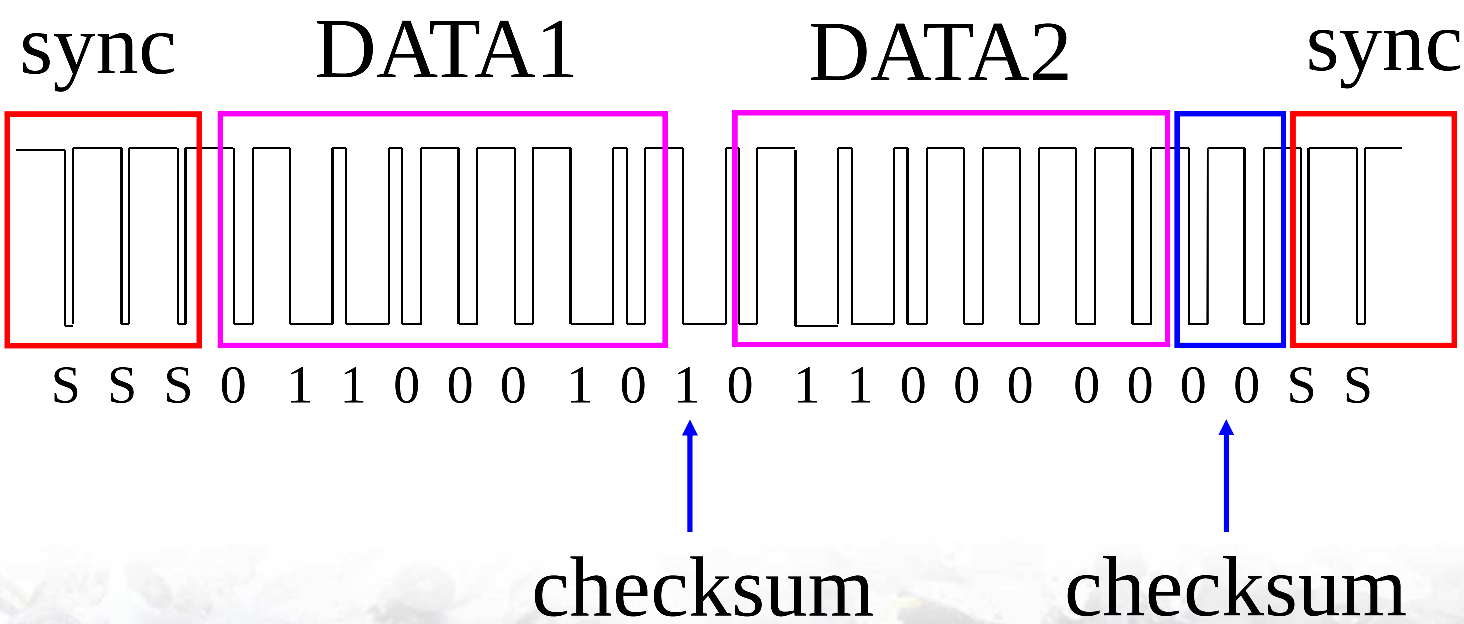
1. BSS

2. LIN BUS

TESTER of YESTERDAY –TODAY and TOMORROW

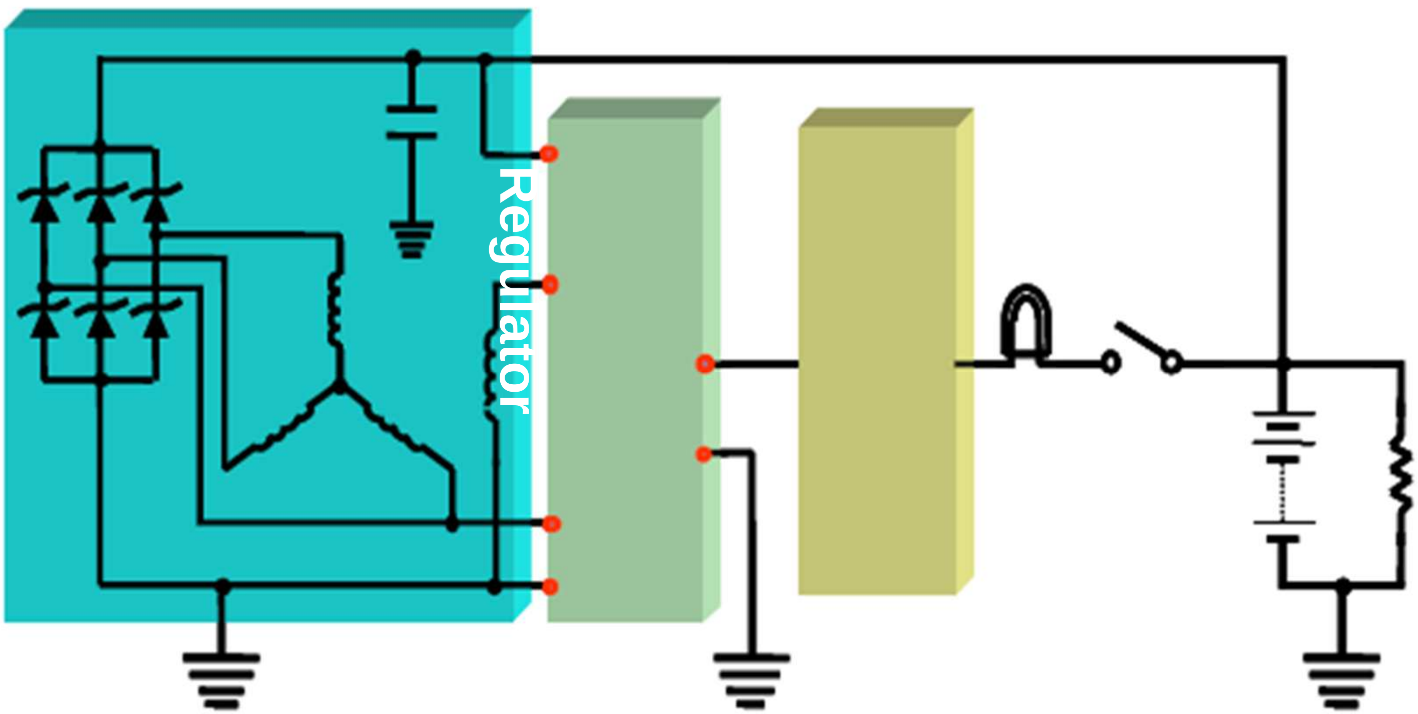
BSS (Bit Synchronous Single-wire)

Command Function:



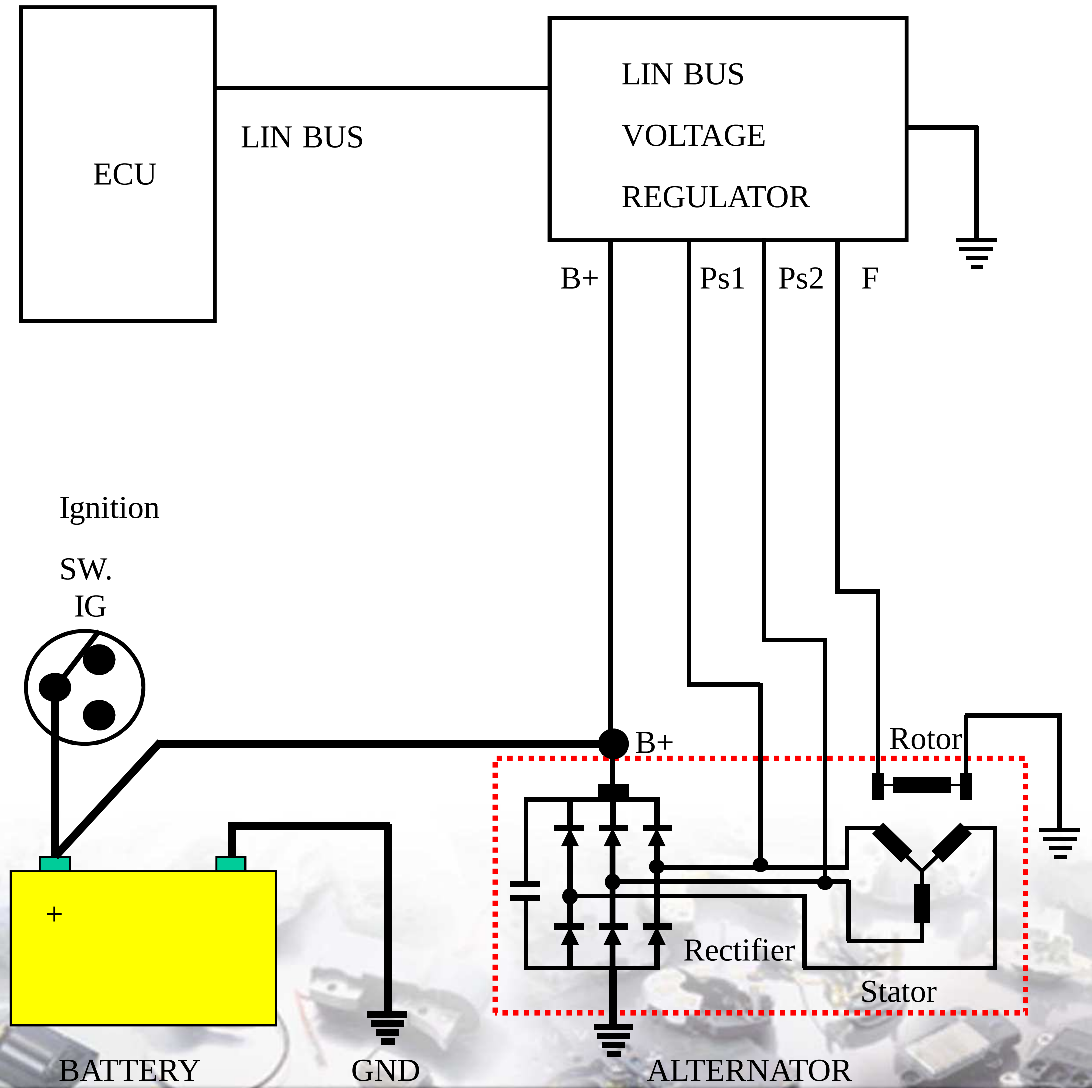
BSS System

Diagram:



LIN System

Diagram:




REGITAR USA RVC & COM DIGITAL
RVC TESTER
RC SIGNAL
LI SIGNAL
FORD
GM/BOSCH
SENSE OPEN
SENSE CLOSE
STOP
START/RUN
LOW
HIGH
REGULATED VOLTAGE
COM TESTER BOX
ON/OFF
E-03
E-02
E-01
E-00
SW1
SW2
SW3
NONE
14.5V
13.5V
15.5V
LAMP
IG
GND
COM
gnd
MOBILETRON™
REGITAR USA™
VR-COM02
Connector
RVC
SW1
SW2
V setting
COM
Ready
SW3
SW4
Find
COM type
Reset
USB
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WILL IDENTIFY PROTOCOL

UPDATE PORTAL

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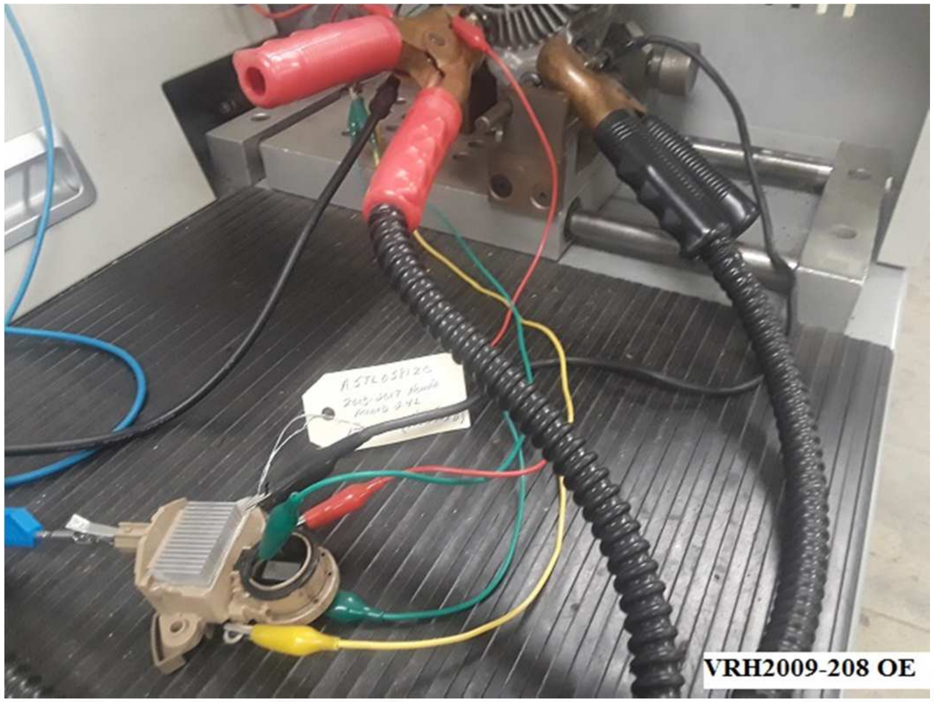
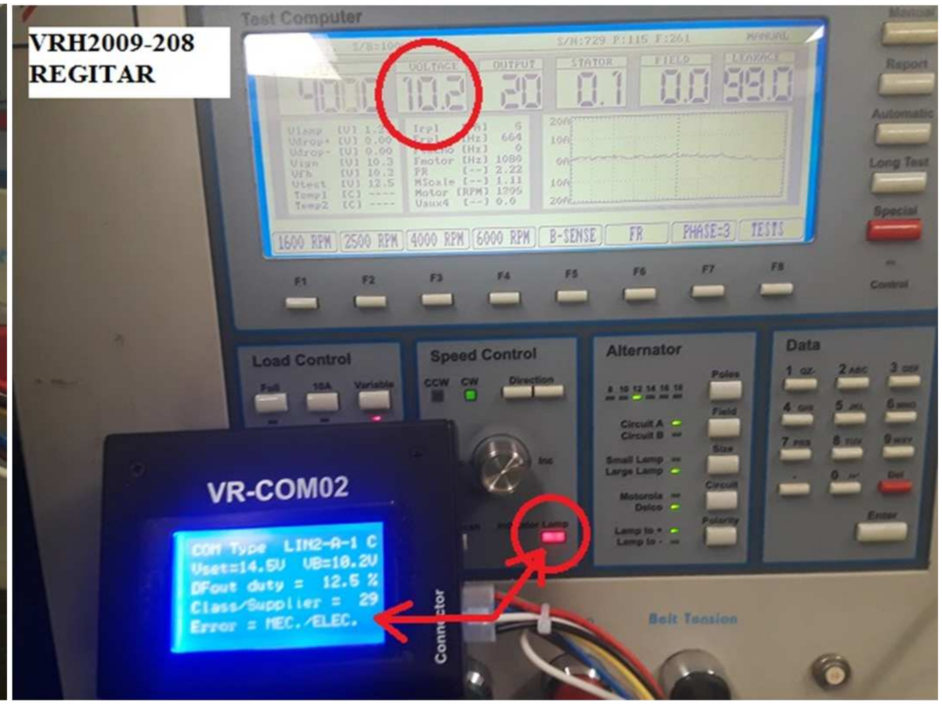
Honda Accord 2013-2017 2.4L

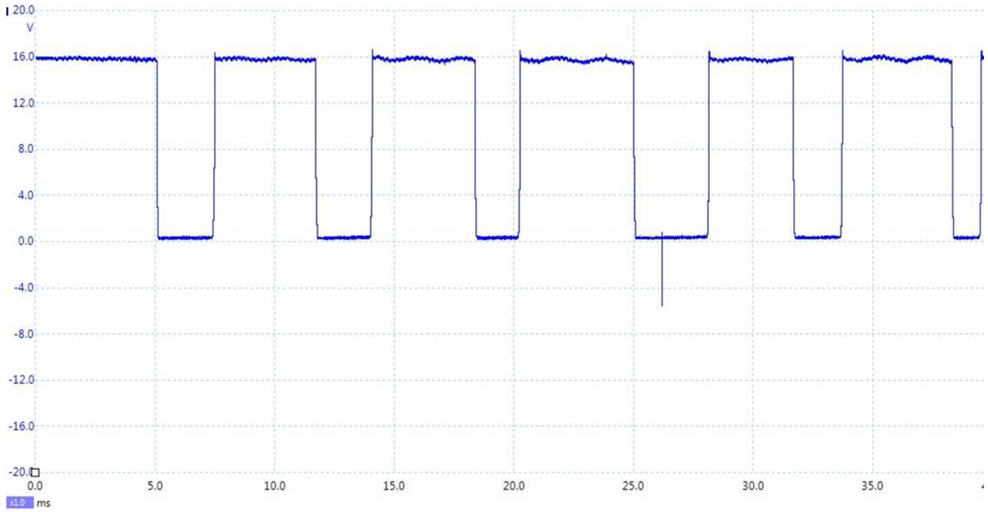


With Open Rotor or Phase

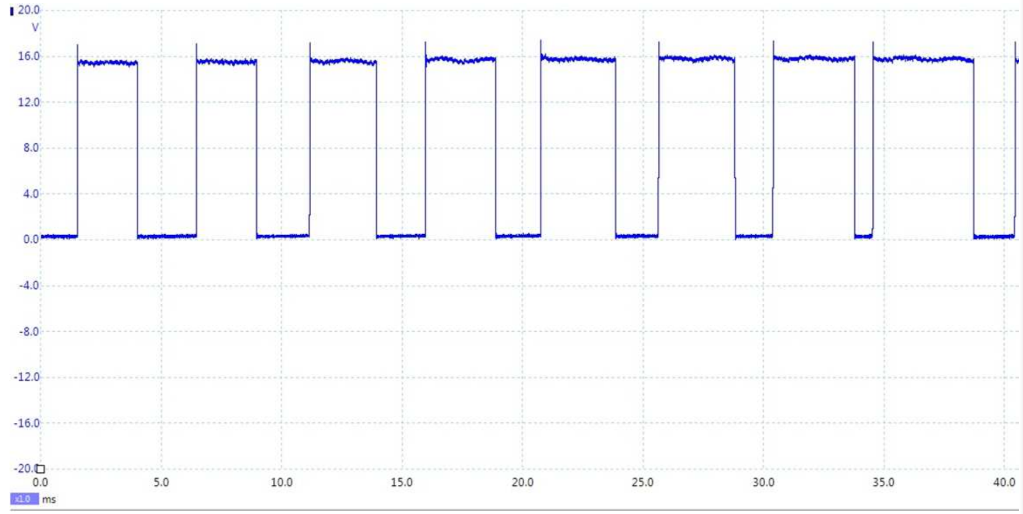


DUTY CYCLE OF OE & REGITAR VRH2009-208 REGULATOR

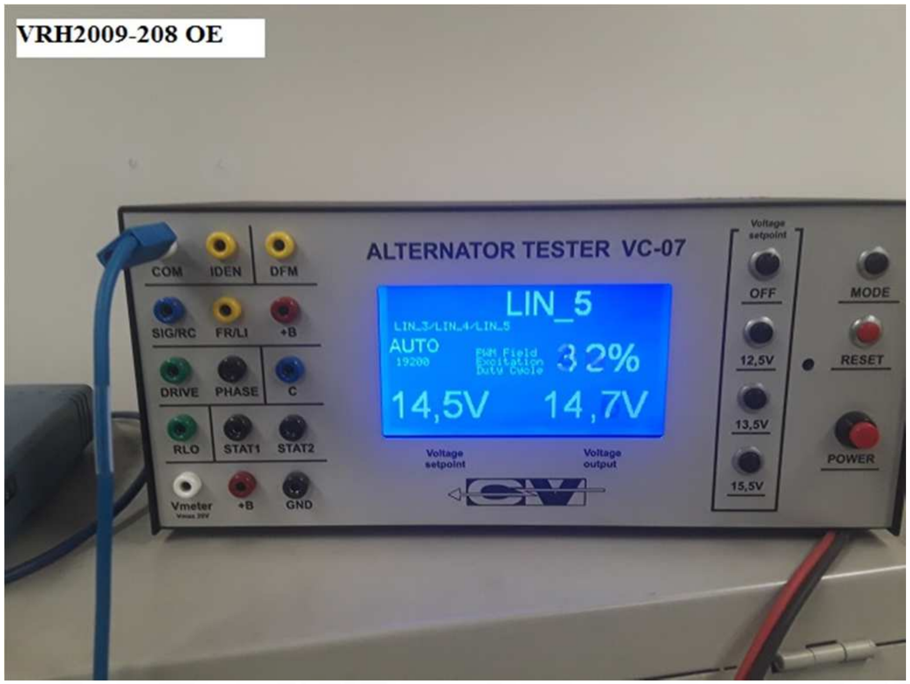
OE 30% Duty Cycle



Regitar 30% Duty Cycle



VRH2009-208 OE



VRH2009-208 REGITAR

instantly absorb or release high energy.

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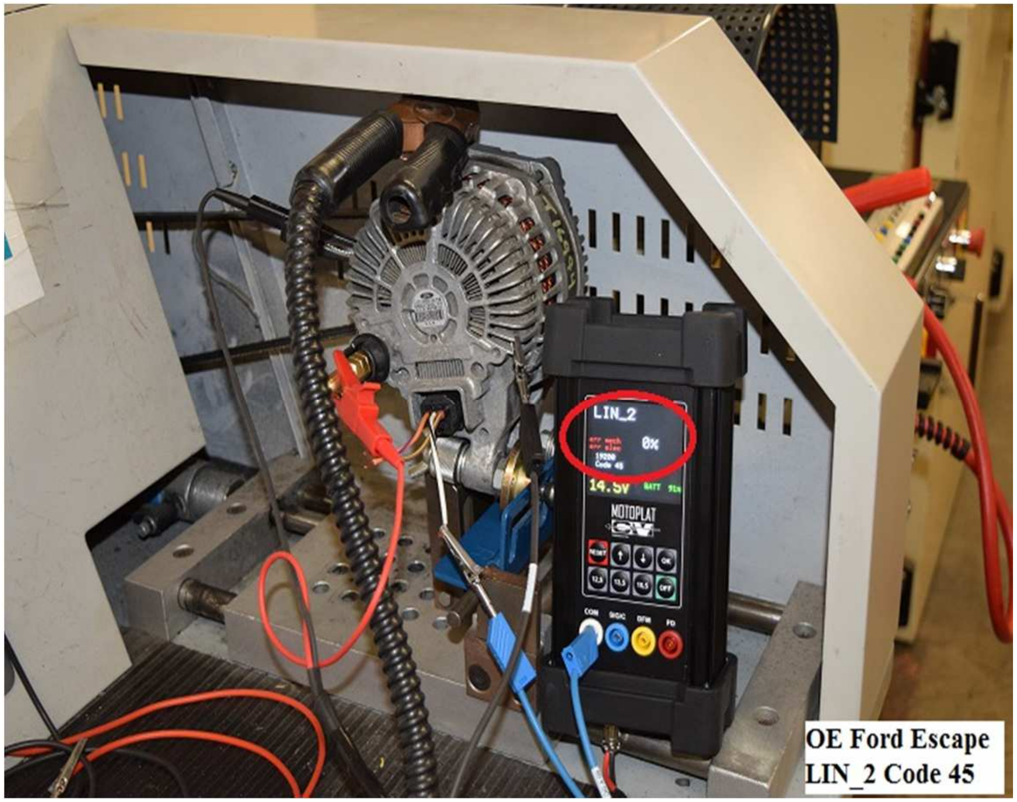

OE Ford Escape
LIN_2 Code 45

OE Ford Escape
LIN_2 Code 45

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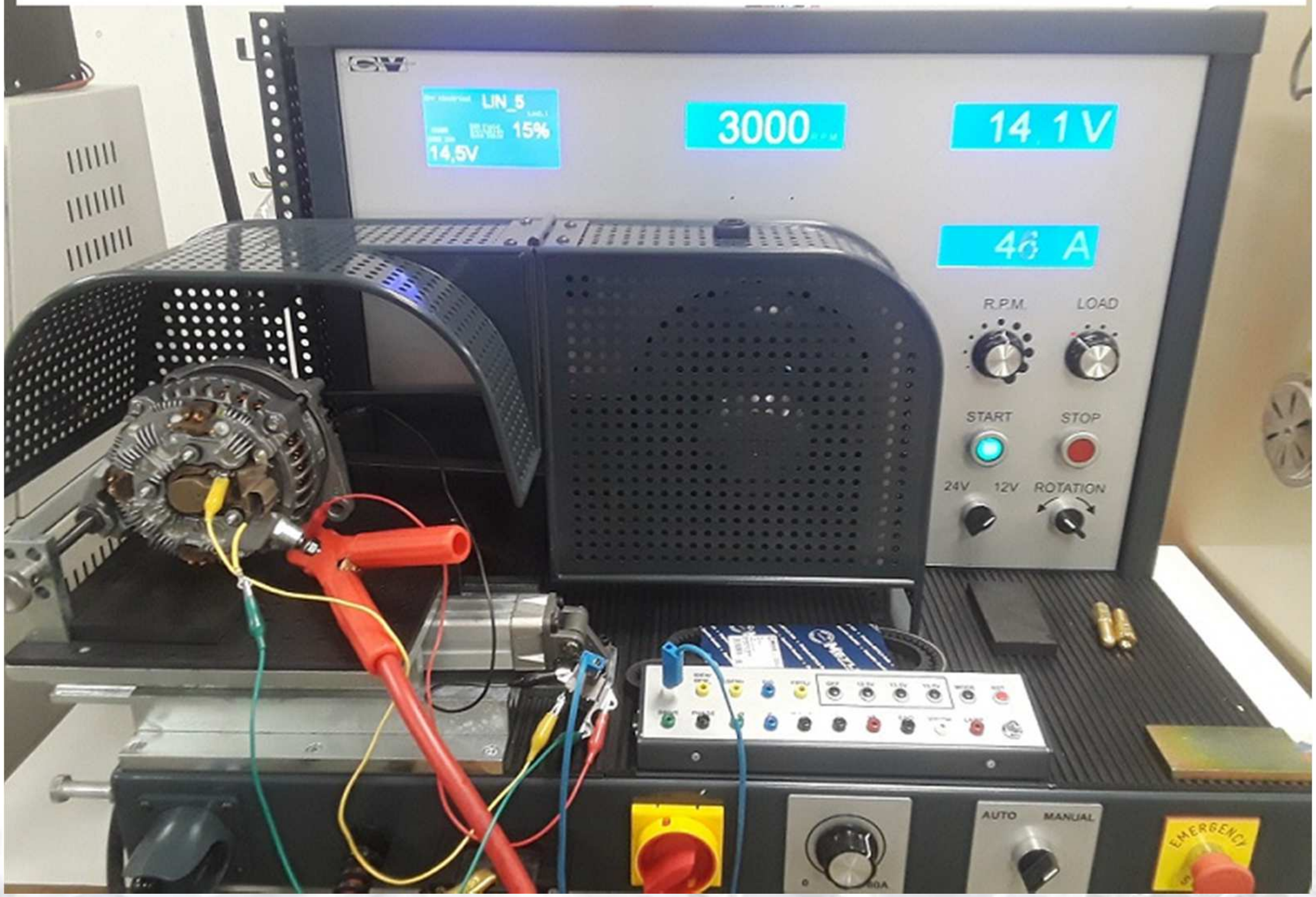
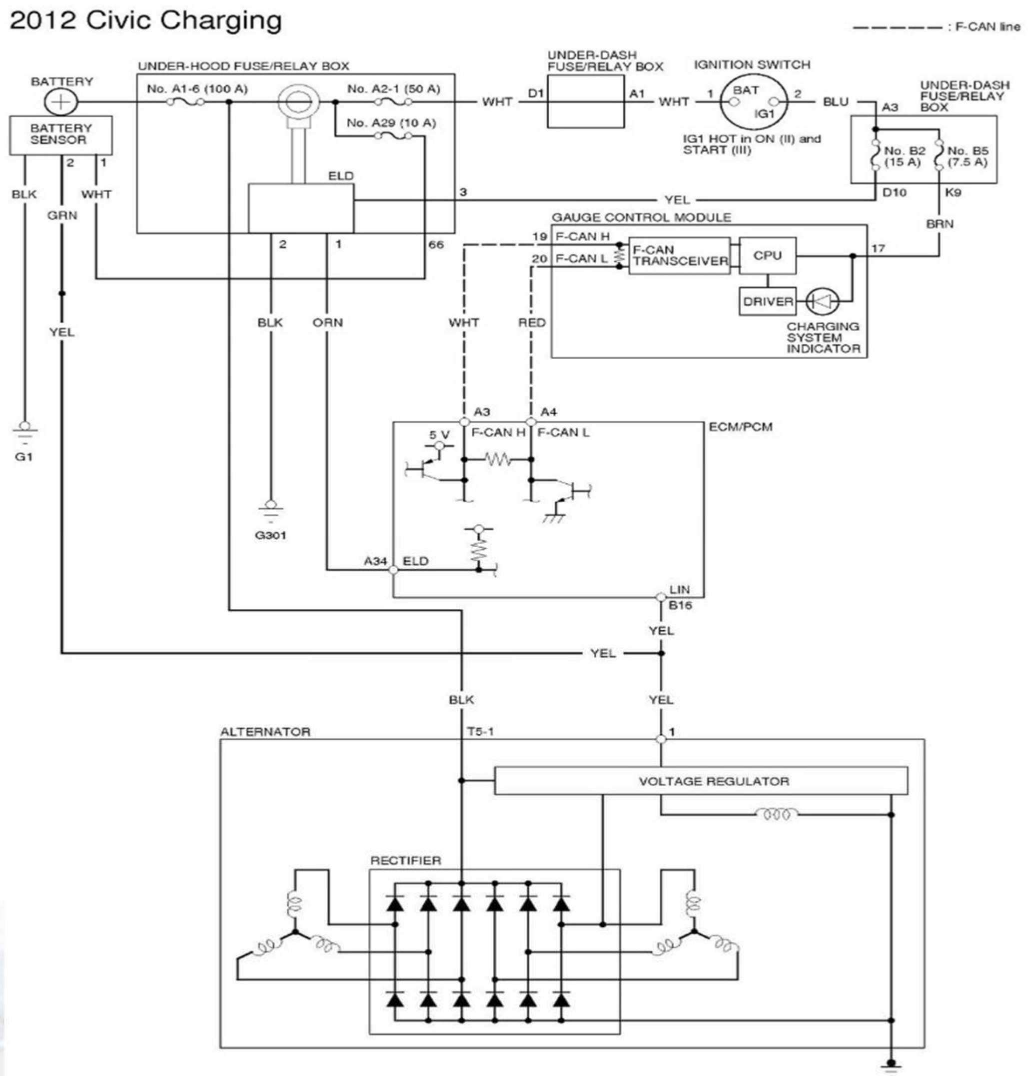
CV-307A MOTOPLAT ALTERNATOR & STARTER TESTER



Honda Civic & Accord LIN



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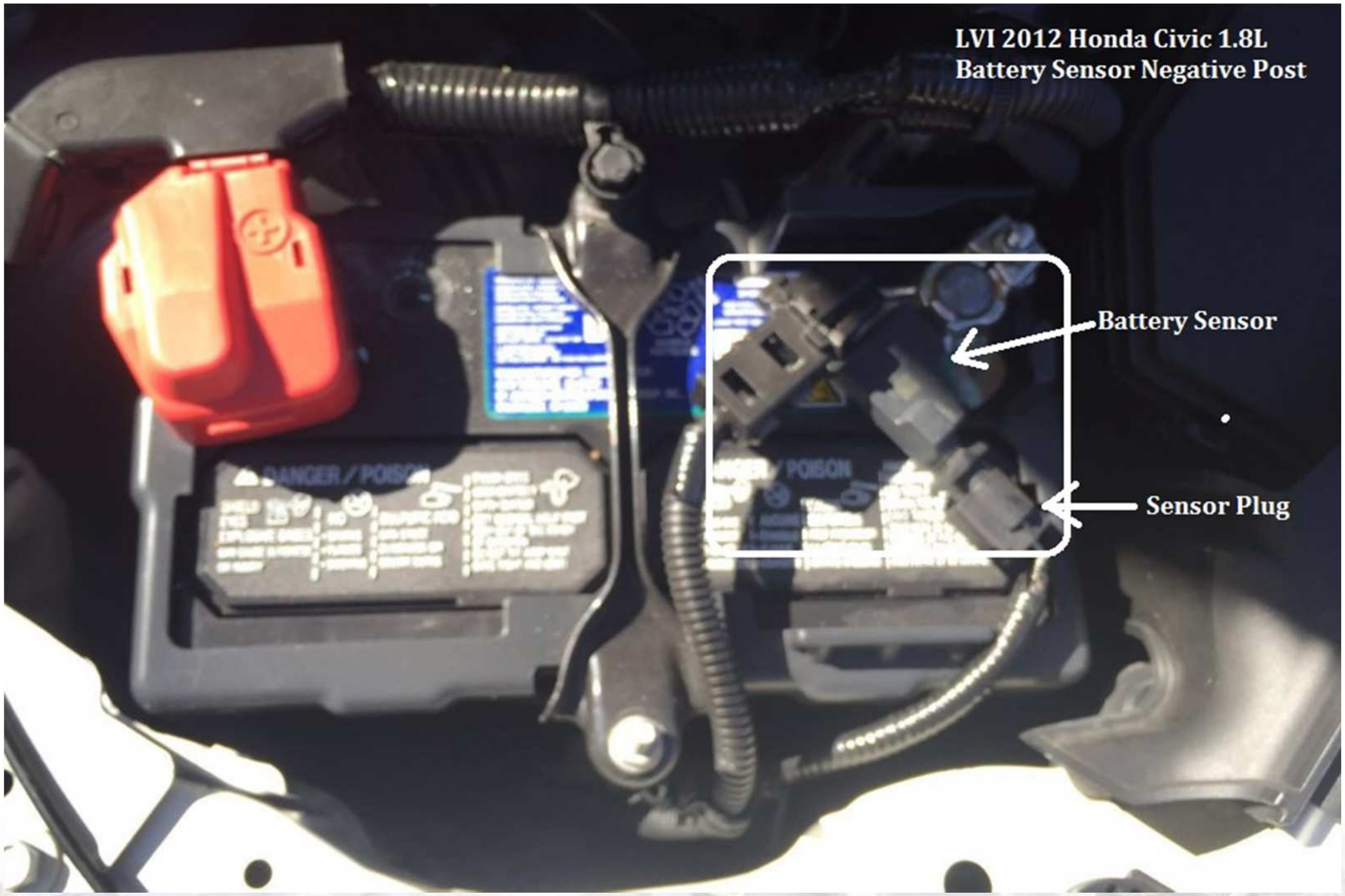
Honda Civic & Accord LIN



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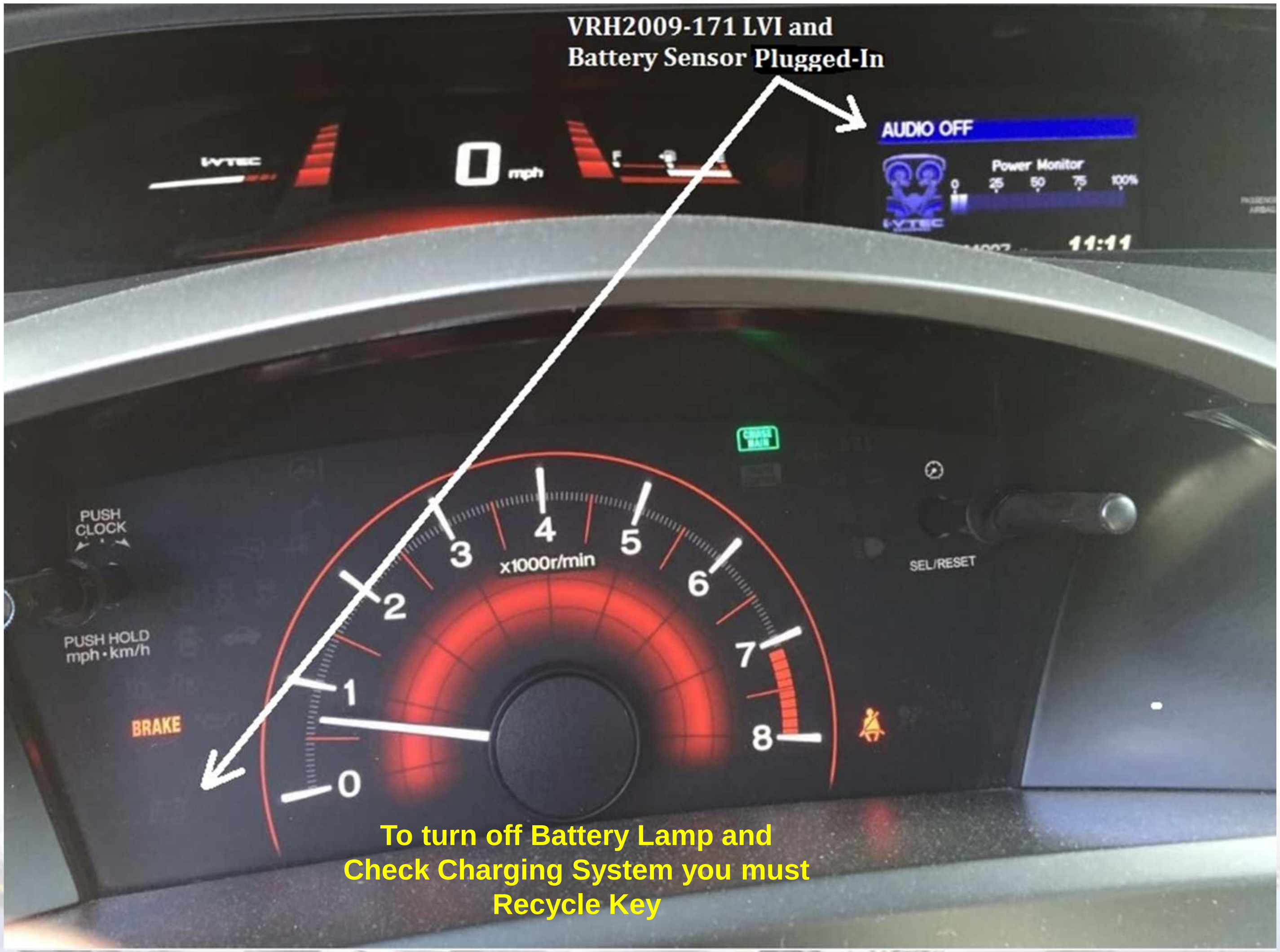
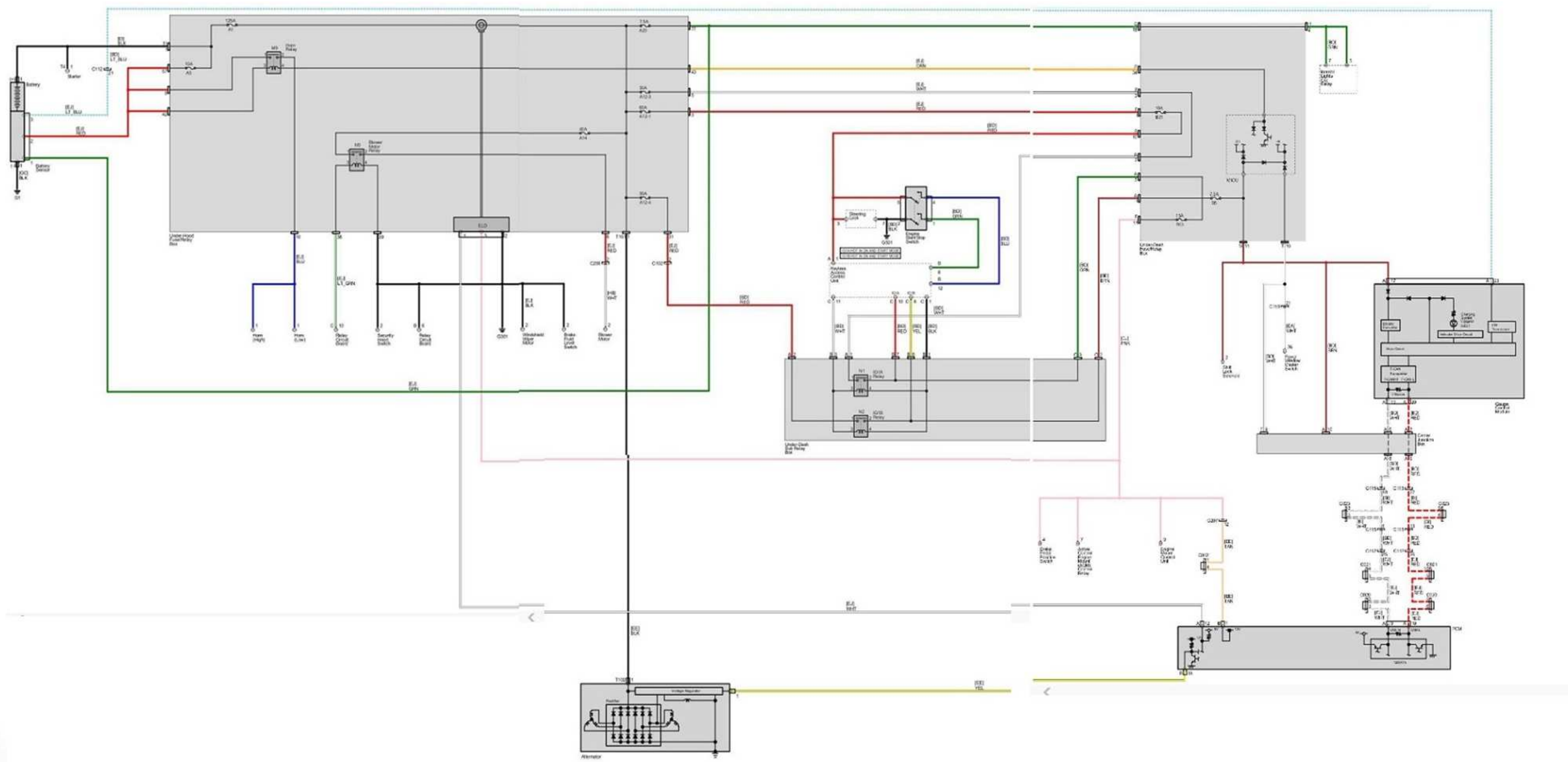
Honda Civic & Accord LIN

Honda Civic & Accord LIN



2013-2017 Honda Accord 2.4L



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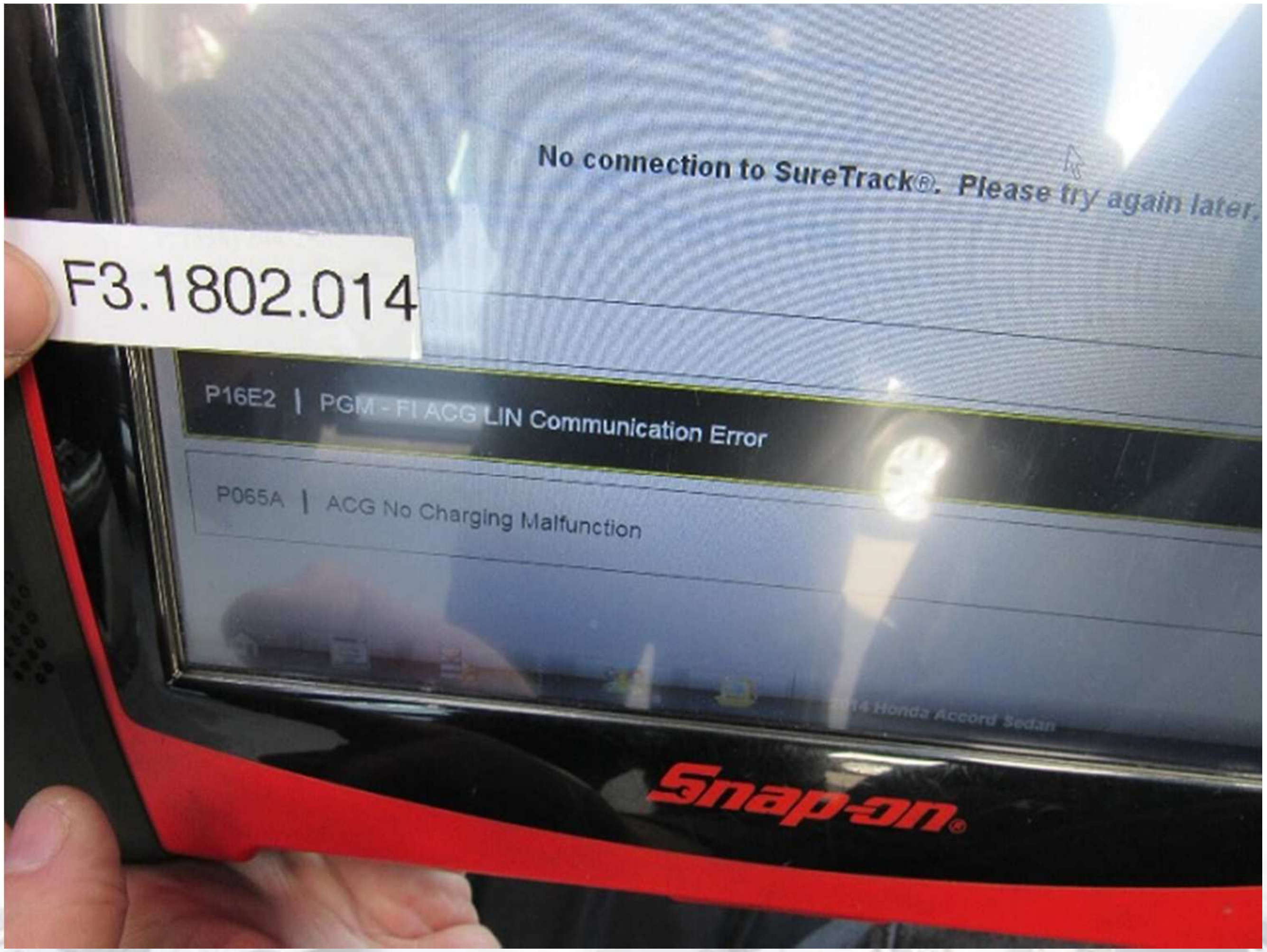
2013-2017 Honda Accord LIN UNPLUGGED



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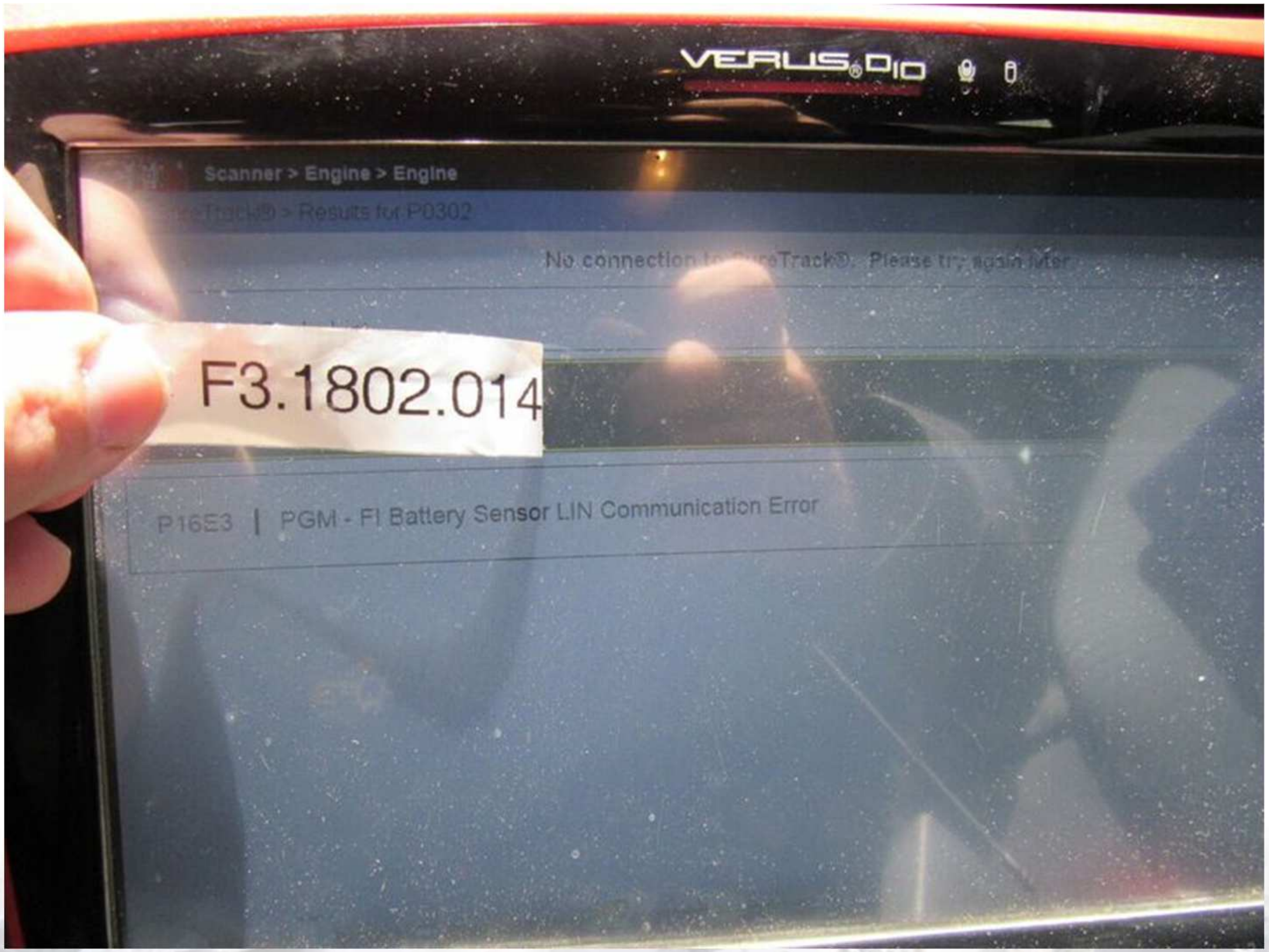
2013-2017 Honda Accord LIN UNPLUGGED

2013-2017 Honda Accord Battery Sensor UNPLUGGED



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File Tools and Options Help

To Configure the LIN Analyzer, go to: Tools and Options -> Configure LIN Analyzer

Log Monitor to a File

Time Stamp (sec)	Frame ID	Frame Data	Checksum	Checksum Type	Baud Rate (bits/sec)	Error Condition
1141.700285	E9	28 00 00 00	D7	Classic	19231	
1141.708056	E9	28 00 00 00	ED	Enhanced	19157	
1141.712964	11	28 4B	8C	Classic	19231	
1141.720735	E9	28 00 00 00	D7	Classic	19157	
1141.728915	92	19 04	E2	Classic	19157	
1141.808261	E9	28 00 00 00	D7	Classic	19231	
1141.816032	E9	28 00 00 00	ED	Enhanced	19231	
1141.820940	11	30 4A	85	Classic	19157	
1141.829120	E9	28 00 00 00	D7	Classic	19231	
1141.837300	92	19 04	E2	Classic	19231	
1141.940777	E9	28 00 00 00	D7	Classic	19157	
1141.948957	E9	28 00 00 00	ED	Enhanced	19231	
1141.953865	11	30 49	86	Classic	19157	
1141.962045	E9	28 00 00 00	D7	Classic	19157	
1141.969816	92	19 04	E2	Classic	19157	
1142.049162	E9	28 00 00 00	D7	Classic	19231	
1142.056933	E9	28 00 00 00	ED	Enhanced	19157	
1142.061841	11	28 4A	8D	Classic	19231	
1142.069612	E9	28 00 00 00	D7	Classic	19157	

LIN Frames to be Sent (Right-click to view more options)

29 27 00 00 00
11
12
Edit and enter the new frame

Send Once
Send Continuous
50
Checksum Type
Classic Enhanced Forced Debug

A product of:

To Configure the LIN Analyzer, go to: Tools and Options -> Configure LIN Analyzer

Log Monitor to a File

Time Stamp (sec)	Frame ID	Frame Data	Checksum	Checksum Type	Baud Rate (bits/sec)	Error Condition
155.949394	11	28 22	B5	Classic	19231	Next Frame Header Recei...
155.990294	92	19 00	E6	Classic	19231	
156.038147	E9	27 00 00 00	D8	Classic	19231	Next Frame Header Recei...
156.088045	11	30 22	AD	Classic	19231	Next Frame Header Recei...
156.137943	92	19 00	E6	Classic	19231	
156.188250	E9	27 00 00 00	D8	Classic	19231	Next Frame Header Recei...
156.237739	11	38 22	A5	Classic	19231	Next Frame Header Recei...
156.287637	92	19 00	E6	Classic	19231	
156.337944	E9	27 00 00 00	D8	Classic	19231	Next Frame Header Recei...
156.387842	11	40 0E	B1	Classic	19231	Next Frame Header Recei...
156.437740	92	19 00	E6	Classic	19231	
156.491728	E9	27 00 00 00	D8	Classic	19231	Next Frame Header Recei...
156.538354	11	30 0E	C1	Classic	19231	Next Frame Header Recei...
156.587434	92	19 00	E6	Classic	19231	
156.637332	E9	27 00 00 00	D8	Classic	19231	Next Frame Header Recei...
156.687230	11	30 3E	91	Classic	19231	Next Frame Header Recei...
156.737128	92	19 00	E6	Classic	19231	
156.799296	E9	27 00 00 00	D8	Classic	19231	Next Frame Header Recei...
156.838969	11	30 3E	91	Classic	19231	Next Frame Header Recei...

LIN Frames to be Sent (Right-click to view more options)

29 27 00 00 00
11
12

Send Once
Stop Sending Continuously
50
Checksum Type
Classic Enhanced Forced Debug

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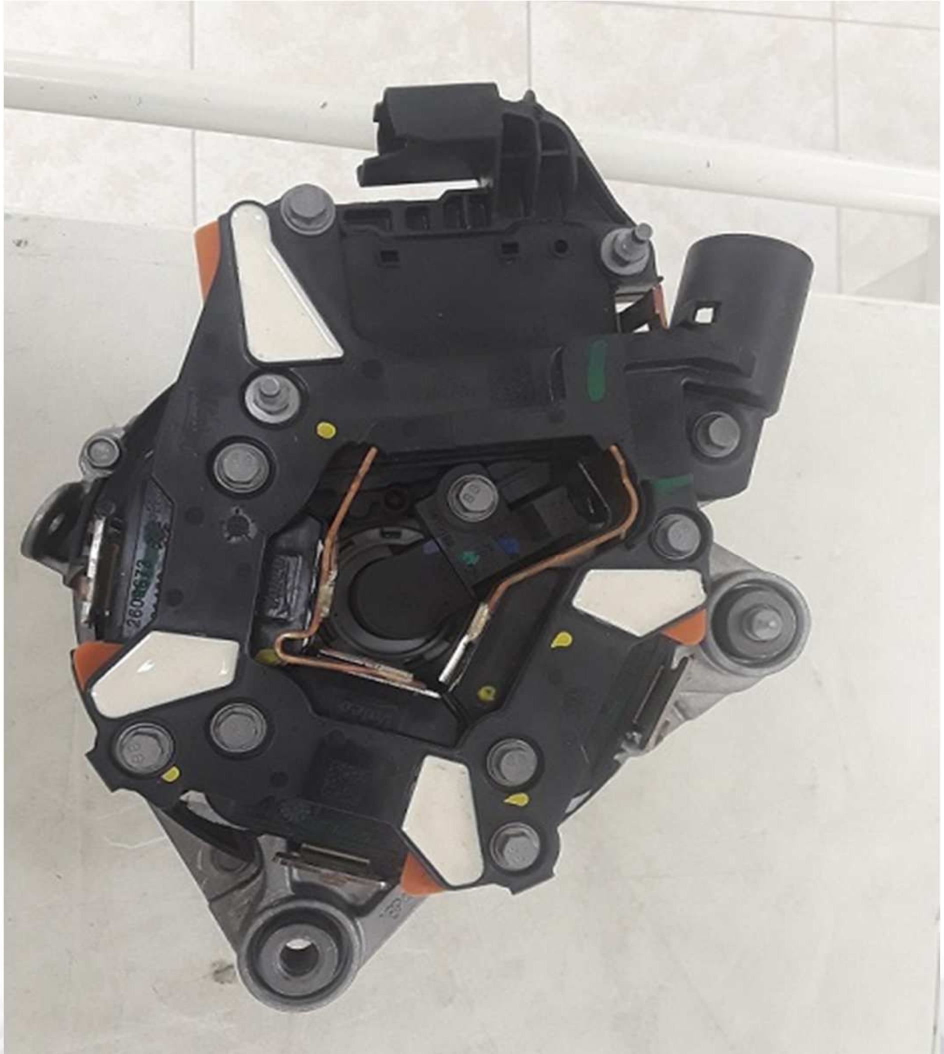
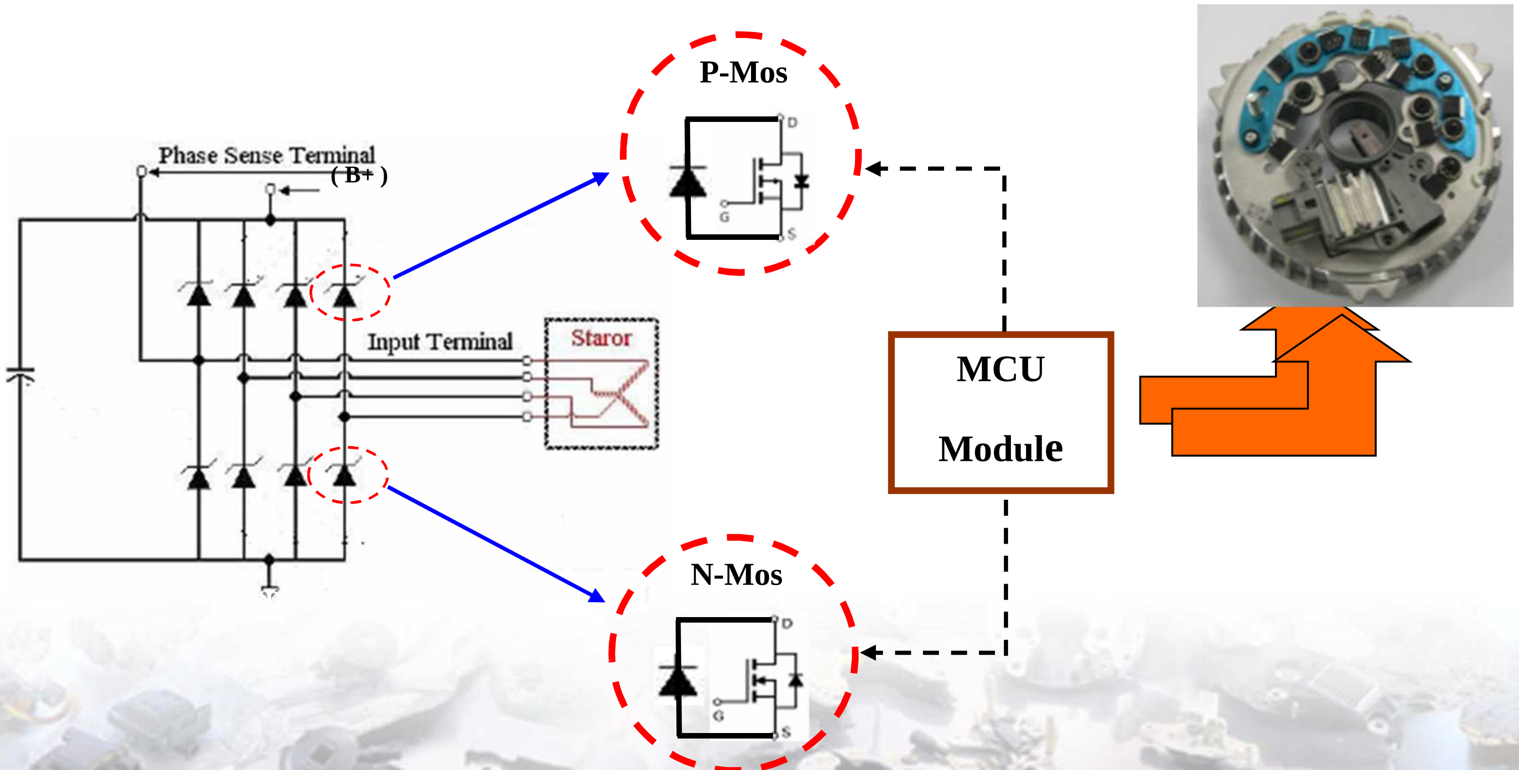
- **Make of Vehicle, model year, engine size, VIN Number if possible.**
- **Why did you remove this Alternator?**
- **Have you replaced the Battery?**
- **Did you replace your Battery with-in the Manufactures guideline for your vehicle?**
- **Are you getting Check Engine Codes or is the Dash Battery Lamp staying on?**
- **Any Wiring been changed on vehicle?**
- **Ask about driving habits**



MOSFET ALTERNATOR

Mosfet Rectifier

➢ Proposal of development:



Mazda i-ELOOP

Mitsubishi 9G variable-voltage generator

Fig.5 High Efficiency Alternator

DXE1200F
ϕ40x150mm

DLCAP^{TM} module
(10 cells of DXE1200F)

Nippon Chemi-Con DXE series 1200F /2.5V and DLCAPTM Module.

Two technologies are commonly used for reversible energy storage in vehicle systems--batteries and capacitors. Batteries have much higher energy density and thus offer the significant advantage of longer driving range when used in all-electric vehicles. Capacitors, on the other hand, have much higher power performance, higher efficiency, and operate for millions of full depth-of-discharge cycles.

Charging efficiency of a high-rate lithium ion battery with a that of a symmetric electrochemical capacitor. Here each storage device is charged at a constant-current value from minimum to maximum voltage and the charge time and efficiency are reported. Charging is used because this is the process that occurs during vehicle deceleration when waste energy is being captured and stored.

The i-ELOOPTM system captures, stores, and then uses energy that normally is wasted. In addition, it minimizes or eliminates engine idling while the vehicle is stopped. When the vehicle is stopped, energy stored in the i-ELOOPTM system is used to provide power for the air conditioner, headlights, radio, etc. The heart of the system is the DLCAPTM module, comprised of 10 series-connected DXE1200F electrochemical capacitor cells that were developed by Nippon Chemi-Con especially for this application.

The improved energy efficiency of these hybrid vehicles depends on vehicle design and the addition of energy storage to recapture kinetic energy during vehicle deceleration events. Later this stored energy is used for vehicle drive or to provide utility power (vehicle electrical load). Key features of the regenerative energy capture storage system are that it must be safe, have high cycle life and long calendar life, and operationally be highly efficient so as to allow recovery and use of a significant fraction of the energy that normally would be wasted.

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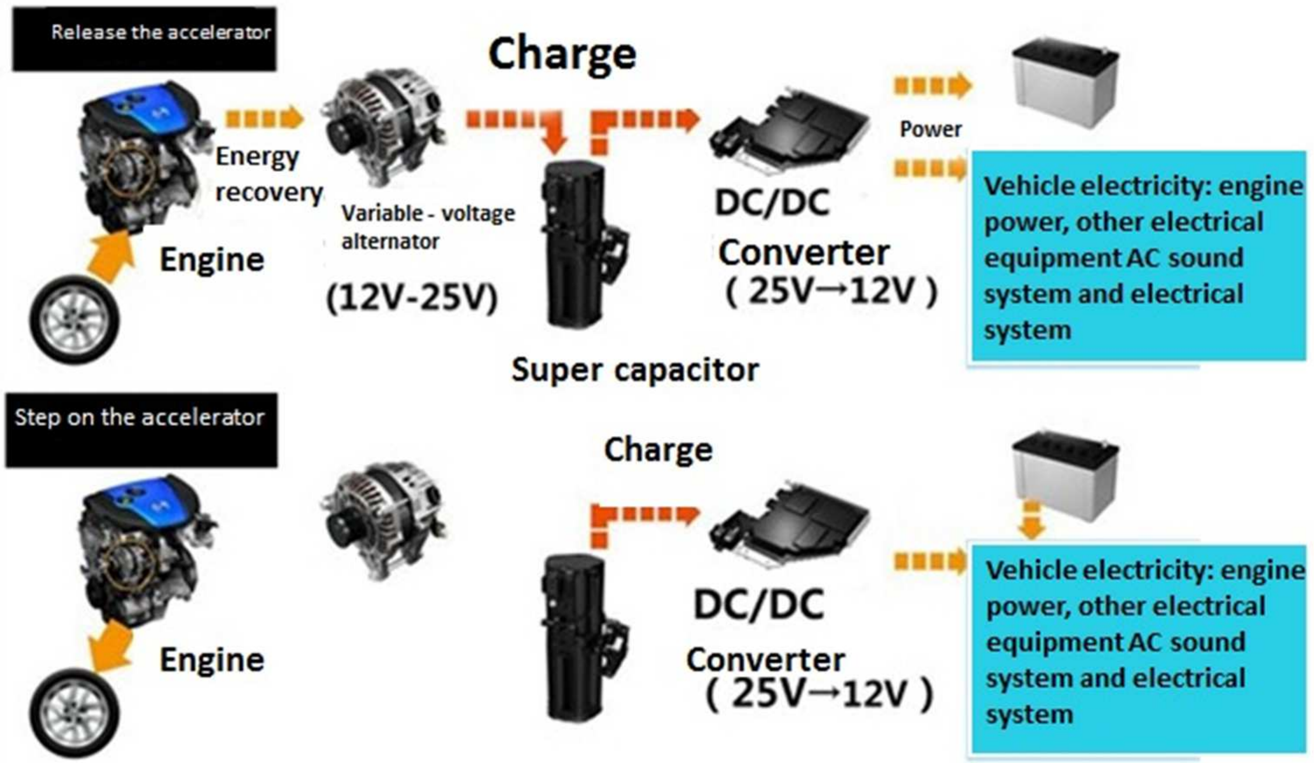
Mazda i-ELOOP



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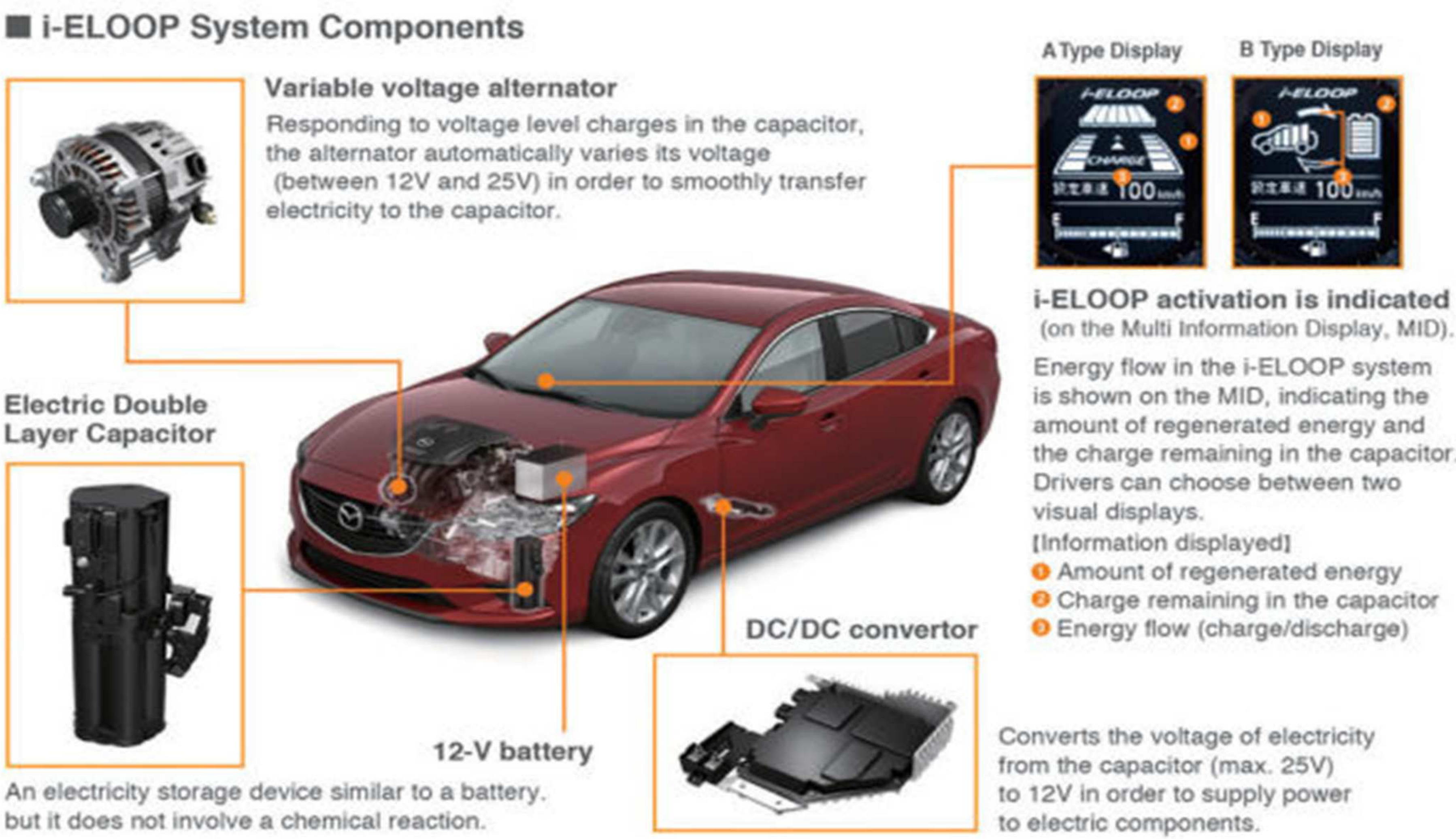
i-ELOOP part size and location



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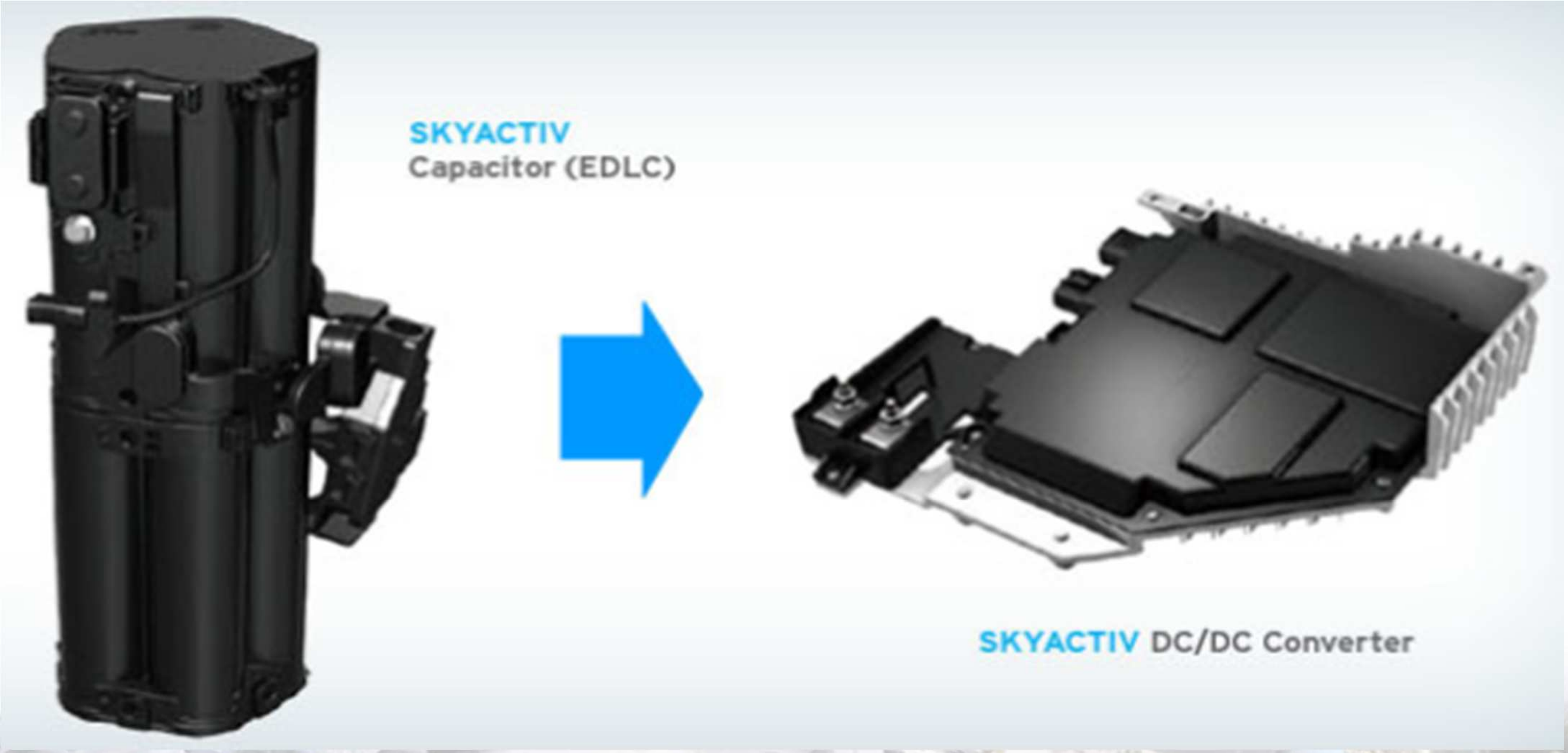
Capacitor DC/DC converter



8 modes

RUN PATTERN	VEHICLE CONDITION: NORMAL	HIGH ELECTRICAL LOAD	LOW CAPACITOR (i-ELOOP) VOLTAGE	LOW BATTERY VOLTAGE	i-ELOOP MALFUNCTION
IGNITION SWITCH: OFF	⑧ CAPACITOR (i-ELOOP) POWER GENERATION MODE	—	⑦ PRE-CHARGE MODE	⑧ CAPACITOR (i-ELOOP) POWER GENERATION MODE	④ BATTERY POWER SUPPLY MODE
IGNITION SWITCH: ACC	—	④ BATTERY POWER SUPPLY MODE		—	
IGNITION SWITCH: ON (ENGINE OFF)	③ CAPACITOR (i-ELOOP) POWER SUPPLY MODE*			③ CAPACITOR (i-ELOOP) POWER SUPPLY MODE*	
CRANKING	④ BATTERY POWER SUPPLY MODE				
ENGINE ON (IDLE)	③ CAPACITOR (i-ELOOP) POWER SUPPLY MODE	⑥ BY-PASS MODE	⑦ PRE-CHARGE MODE	② CONVENTIONAL POWER GENERATION MODE (NO REGENERATIVE BRAKING)	⑥ BY-PASS MODE
ENGINE ON (ACCELERATION/CRUISE)			④ BATTERY POWER SUPPLY MODE		
ENGINE ON (DECELERATION)	① REGENERATIVE BRAKING MODE		① REGENERATIVE BRAKING MODE		
i-stop (ENGINE OFF)	③ CAPACITOR (i-ELOOP) POWER SUPPLY / ④ BATTERY POWER SUPPLY MODE	— (INHIBIT i-stop)			
i-stop (ENGINE RESTART)	⑤ i-stop MODE				

rated voltage	25V
Capactance	120F
Typical ESR	9mΩ
Store Enegy	37.5KJ
Operating temperature	-30℃ to 70℃

Valuable output voltage	12V to 25V
Maximu current	200A
Maximu output power	5KW

Figure 9. 12V to 25V valuable output Generator - Alternator used with the i-ELOOP™ system, [4][5]

6. Field test data

The vehicle speed is ~120 km/h to 80 km/h with frequent deceleration. In this driving mode, the vehicle electric load will be provided from the regeneration energy most of the time. The capacitor voltage profile is showing the discharging current to the vehicle electric load. 30A to 40A of the electric load will be the most common number for practical driving.

TEST BOXES

TEST HARNESS

VOLT METER

TESTER BENCH

OSCILLOSCOPE

CORRECT LAMP

EARLY TRIO LAMP 900mA

CS LAMP 250mA

PCM LAMP 1.5mA

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THANK YOU!

Special Thanks

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Family Owned

Electrical Rebuilder's ERA Association
FOUNDED 2001

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