



Presents

Diagnosing Electrical Problems on Today's Motor Vehicles **PART 5**

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Your Instructor For This Class



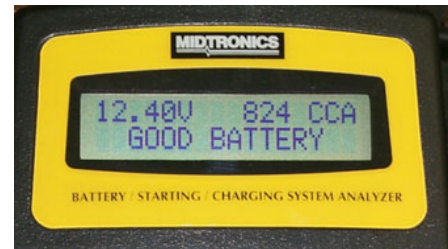
"G" Jerry Truglia

- National Trainer, ASE World Class, Master: Auto, Truck, School Bus, L1, L3, CNG and...
- **ATTP Master Instructor, New York State, CT and New Jersey**
- STS (Service Technician Society) 2003 President
- **TST (Technicians Service Training) Founder and President**
- Author / Co Author/ Technical adviser on 25 plus books including OBD II and Mode 6, and Understanding and Diagnosing Hybrid Vehicles
- **Published articles for multiple newsletters, and magazines**
- Picked as one of the Top Instructors in the country by EPA & SAE
- **Numerous Radio, TV, Internet, and SAE Video appearances**
- PTEN, MotorAge and TST Webcast Instructor
- **Motor Magazine Top 20 award winner**
- Provider of OBD II Training for 13 states, Ontario Canada and the US EPA
- **Guest speaker at SAE Congress, IM Solutions and Clean Air Conference**

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Battery Testers



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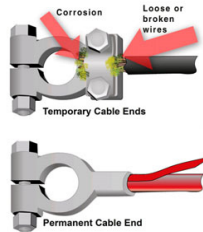
Battery Testers



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Corrosion



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Battery Charging



What does CCA stand for?

Cold Cranking Amps is the number of amps a battery can deliver at 0°F for 30 seconds, while maintaining a voltage of at least 7.2 volts.



What does RC stand for?

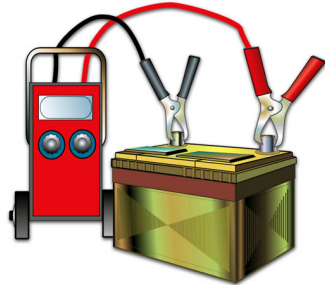
Reserve Capacity is the rating of the battery's ability in minutes to supply power to the vehicle if there is a problem with the charging system. A RC test conducted at 80°F should be able to discharge at least 25 amps while holding the voltage at 10.5 volts.



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Battery Charging



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Battery Maintainers For Reprogramming & Scan Tool Connecting



Battery maintainers for reprogramming must be able to put out at least 13 volts or more depending on the vehicle and have less than 1 volt AC ripple. Jumper packs should not be used. Example: BMW requires a charger that can output up to 14.2V @ 55A. New BMW 80 amps

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Toyota Glass Battery Charging

MAINTENANCE FOR HV AND AUXILIARY BATTERIES - PG007-03 Revised

October 9, 2003

Maintenance
Operation:
Condition B
(Continued)

2. Charge the 12-volt auxiliary battery.

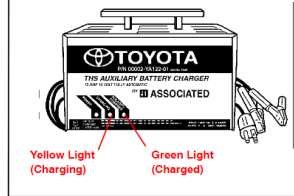
CAUTION:

- Do not charge with the battery mounted in the vehicle.
- Charge in a well-ventilated area.
- Do not allow sparks or fire near the battery.

A. Obtain the Prius Automatic
Automatic Charger
(SST P/N 00002-YA122-01*).

* Supersedes P/N 00002-YA121-01.
P/N 00002-YA121-01 may still be
used (with switch in 10 AMP position).

Prius Automatic Charger
(P/N 00002-YA122-01*)



NOTE IF USING P/N 00002-YA121-01:

Ensure that the charge current switch is set on the 10 AMP position.
When operated in the 10 AMP position, the Prius Automatic Charger
(SST P/N 00002-YA121-01) is designed to automatically regulate charging current
and voltage. Using this mode, the charger will minimize charge time, while preventing
overheating and possible battery damage. Charging in the 2 AMP position is not
recommended for the Prius 12-volt battery, due to prolonged charge time.

CAUTION:

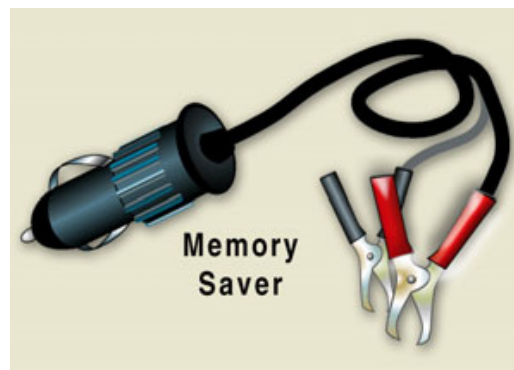
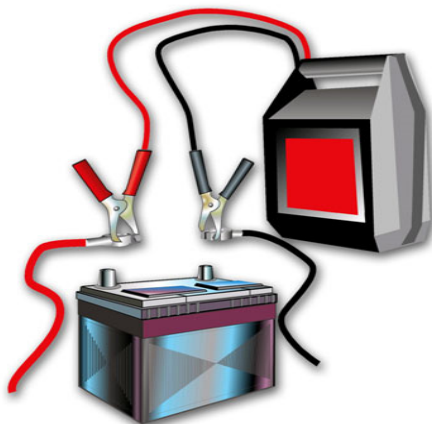
Use of standard battery chargers is NOT recommended on the Prius 12-volt auxiliary
battery, in order to prevent battery damage.

Courtesy of Toyota Motor Company

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Battery Packs and Memory Savers



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Battery Registration

REGISTER BATTERY REPLACEMENT

Last battery replacement

27732 mi

Second last battery replacement

0 mi

Third last battery replacement

0 mi

Fourth last battery replacement

0 mi

View in :

KM

MILES

Currently registered battery capacity: 90 Ah AGM (AGM batteries are identified by the black housing.)

Note: If another battery capacity or another battery was retrofitted recently, the new battery capacity is only displayed correctly in the diagnosis after a terminal change.

Note: The history of the last battery change is deleted during programming by the engine electronics (DME or DDE).

SCREEN
CAPTURE

OK

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Battery Registration

REGISTER BATTERY REPLACEMENT

Last battery replacement

94952 mi

Second last battery replacement

27732 mi

Third last battery replacement

0 mi

Fourth last battery replacement

0 mi

View in :

KM

MILES

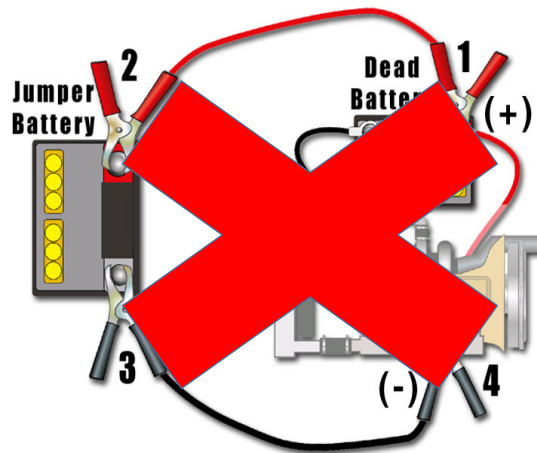
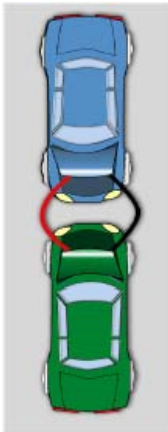
SCREEN
CAPTURE

OK

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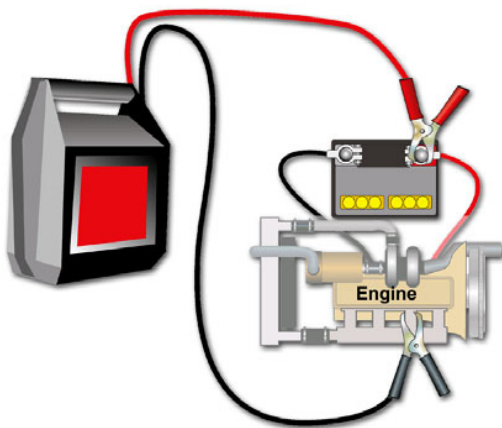
Battery Jump Starting



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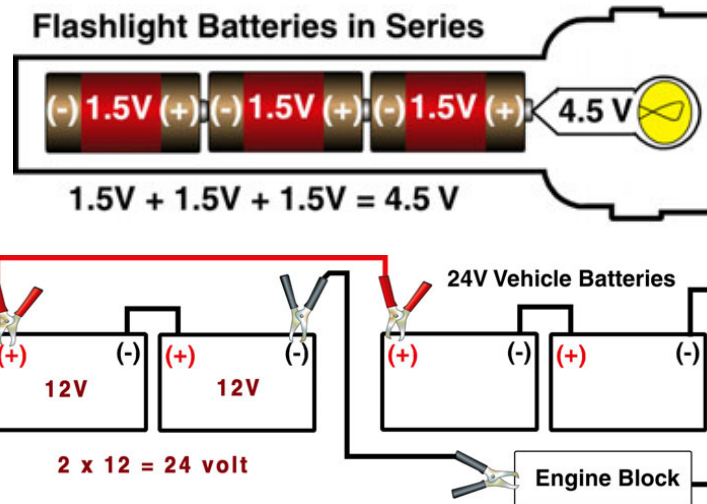
Battery Jump Starting



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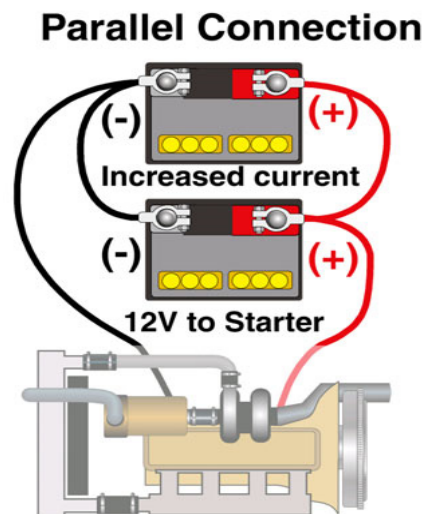
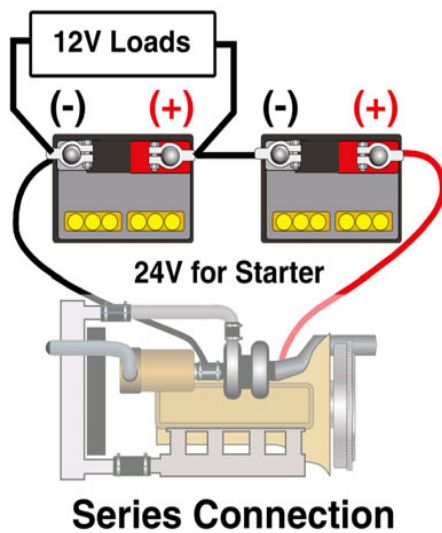
Battery In Series



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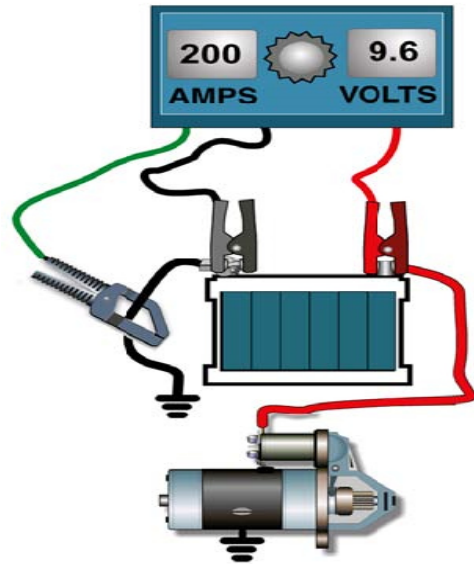
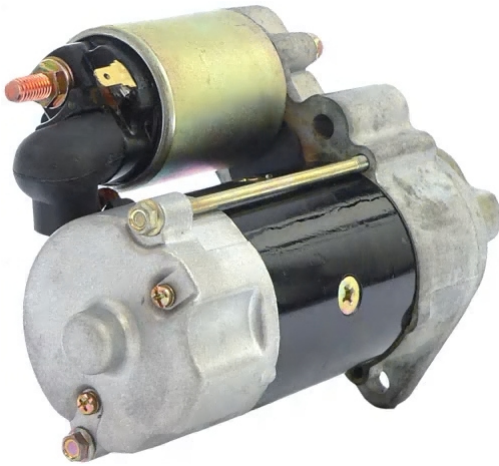
Battery Series And Parallel



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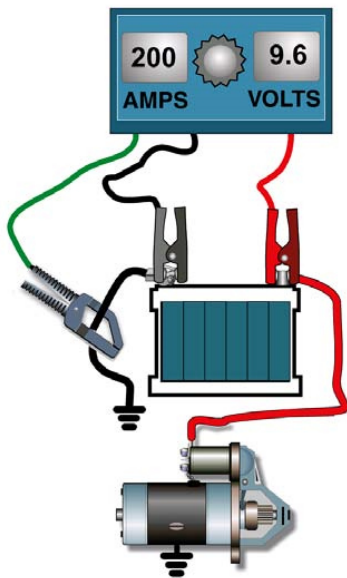
100

STARTERS

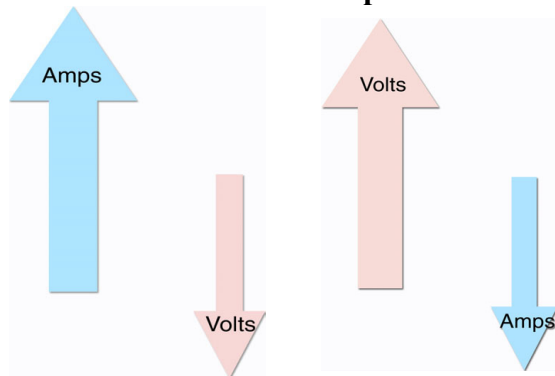


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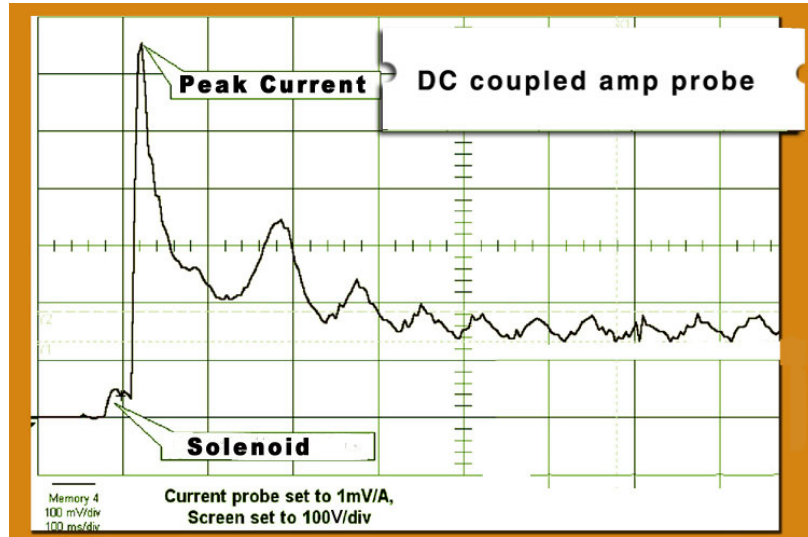
Most Common Starter Draw
 4 & 6 cyl's
 75 to 175 amps
 8 cyl
 150 to 200 amps



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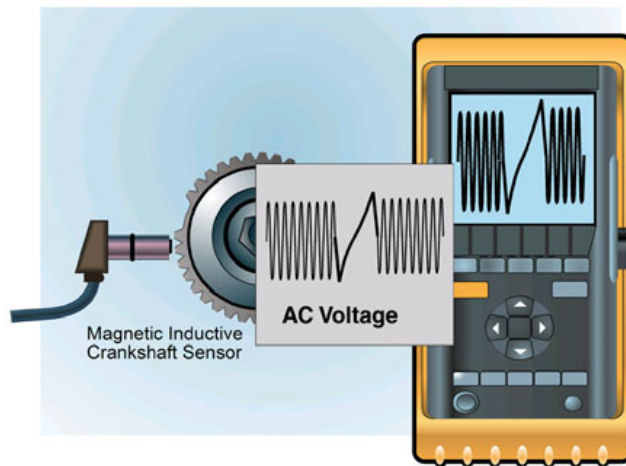
Cranking Amps Taken From A Labscope



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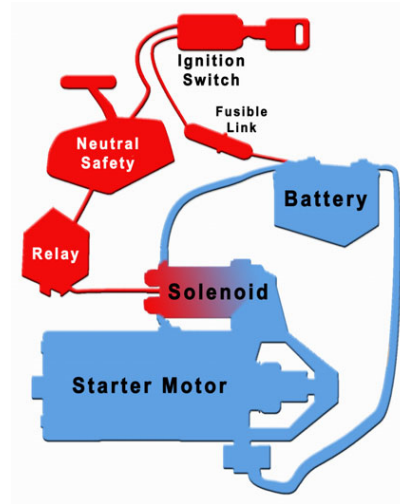
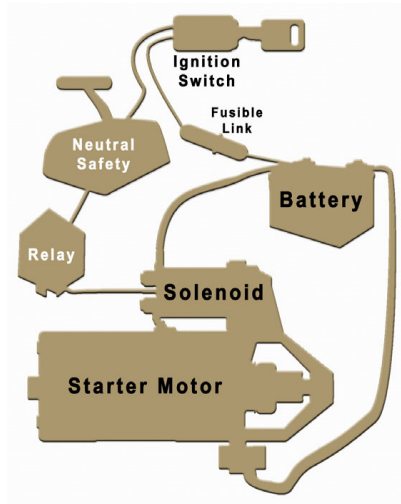
What This Crank Sensor Signal Have To Do With The Starting System?



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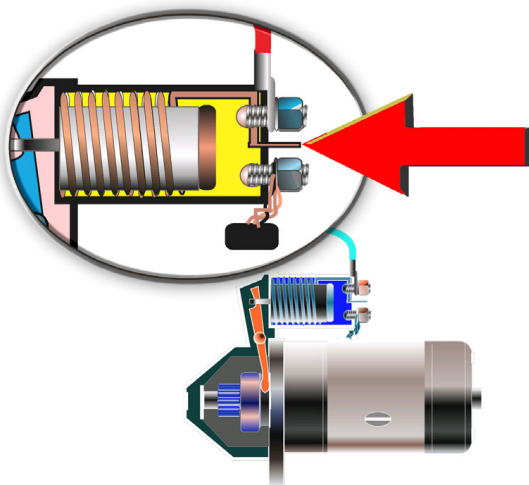
Checking Starter Circuit



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Checking Starter Circuit

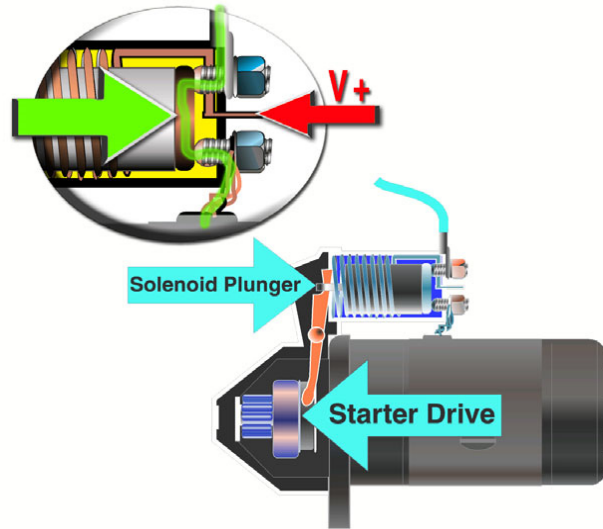


From Ignition Switch

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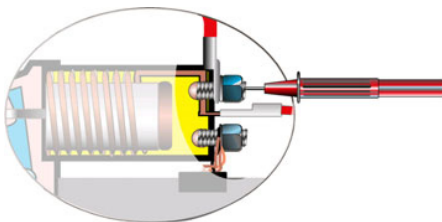
Checking Starter Circuit



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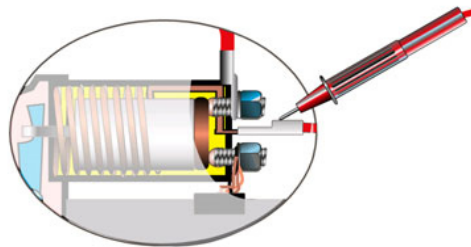
107

Checking Starter Circuit



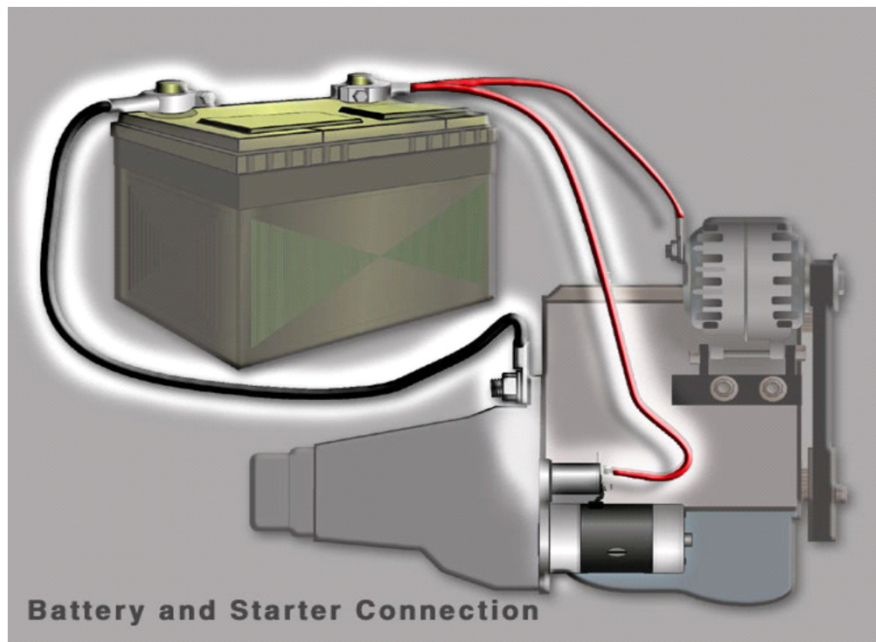
What Test is being Performed?

How is the Meter Hooked up?



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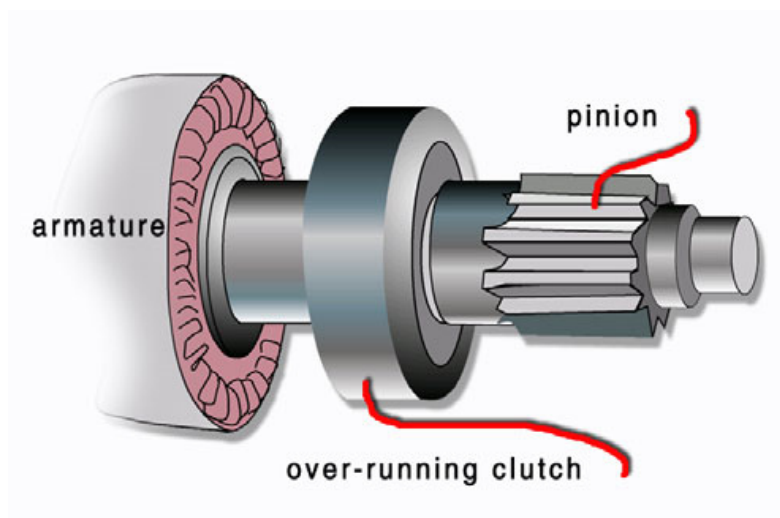
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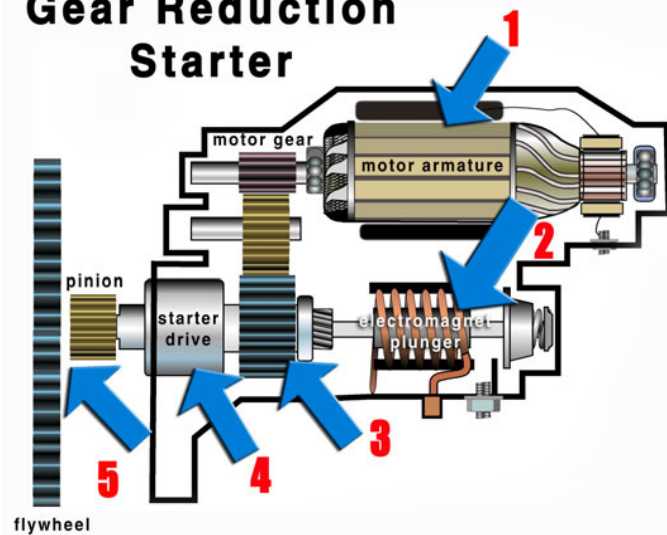
Over-running Clutch



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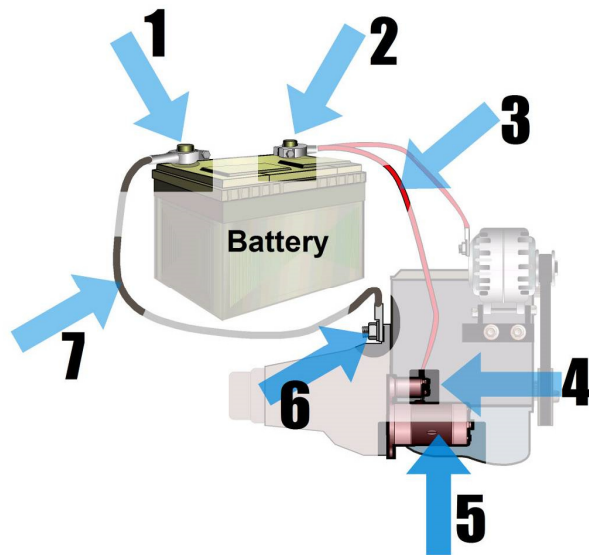
Gear Reduction Starter



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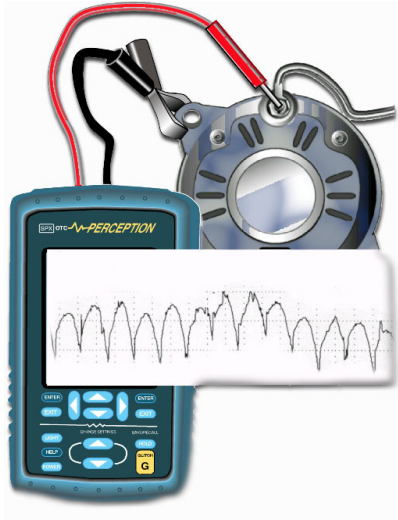
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Common Problem Areas



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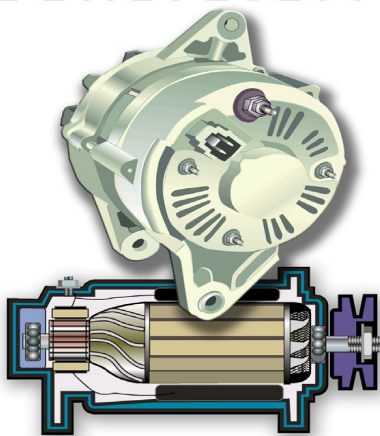
Alternators



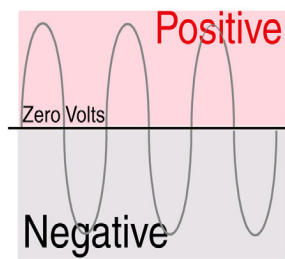
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Generator?



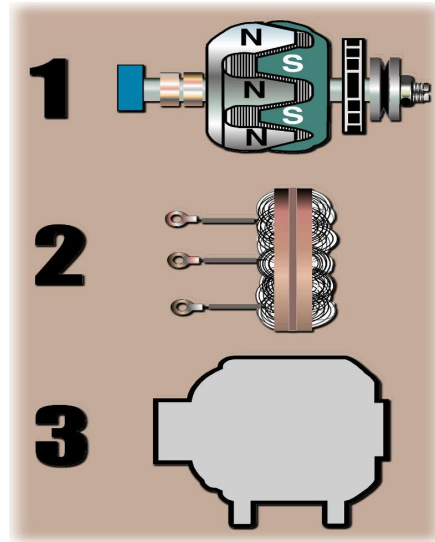
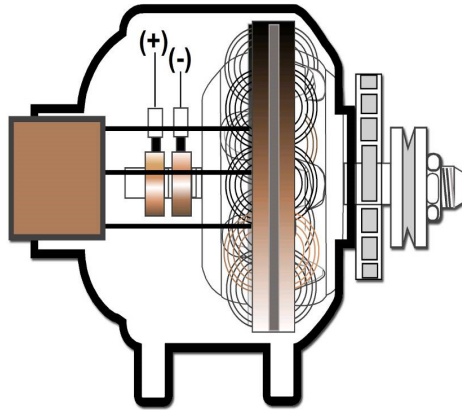
**Alternating
Current**



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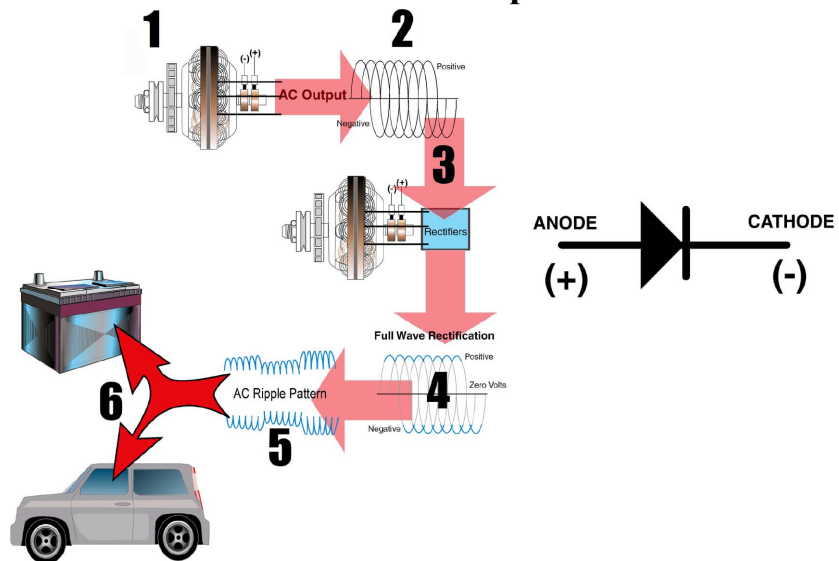
Alternator



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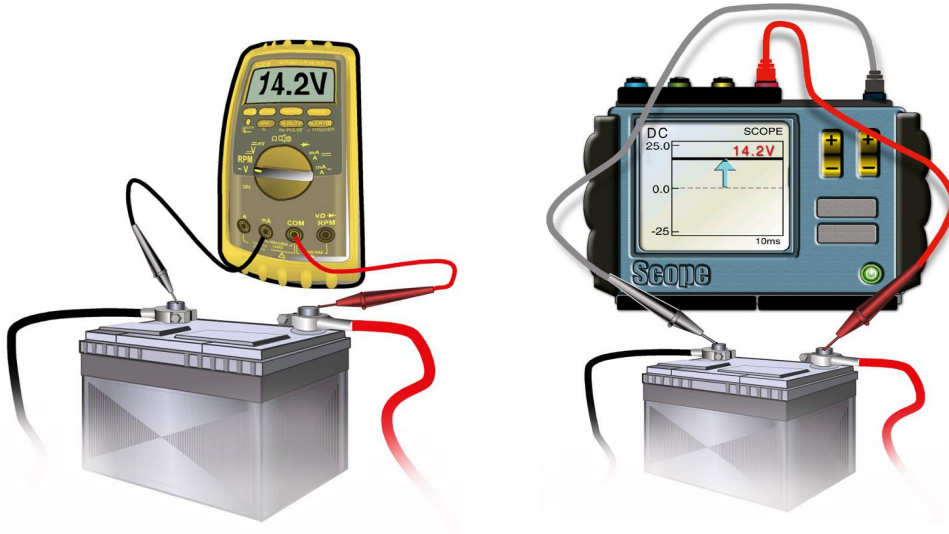
Alternator Output



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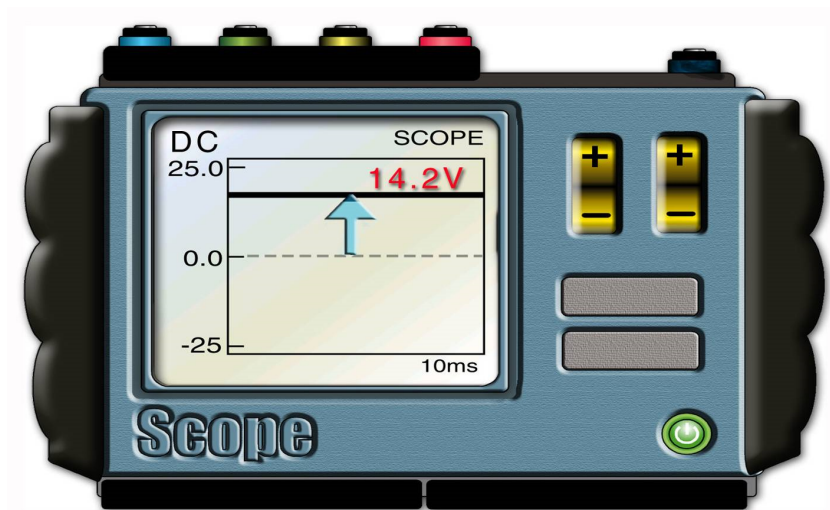
Check Alternator Output With A Meter Or Scope



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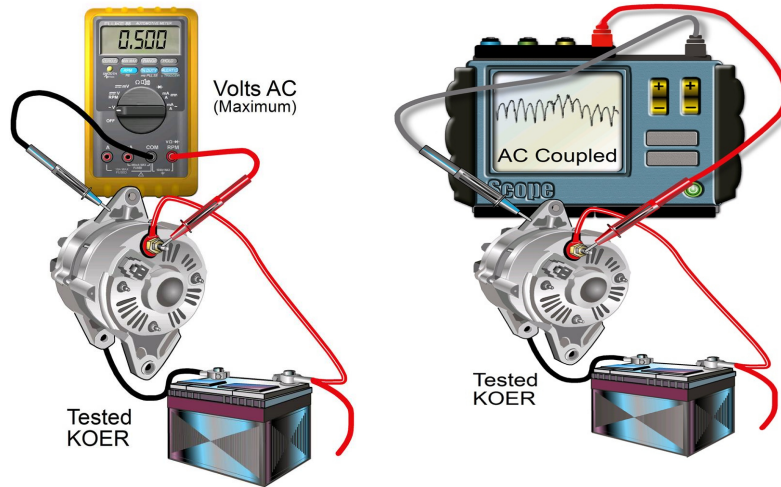
Check Alternator Output On A Scope



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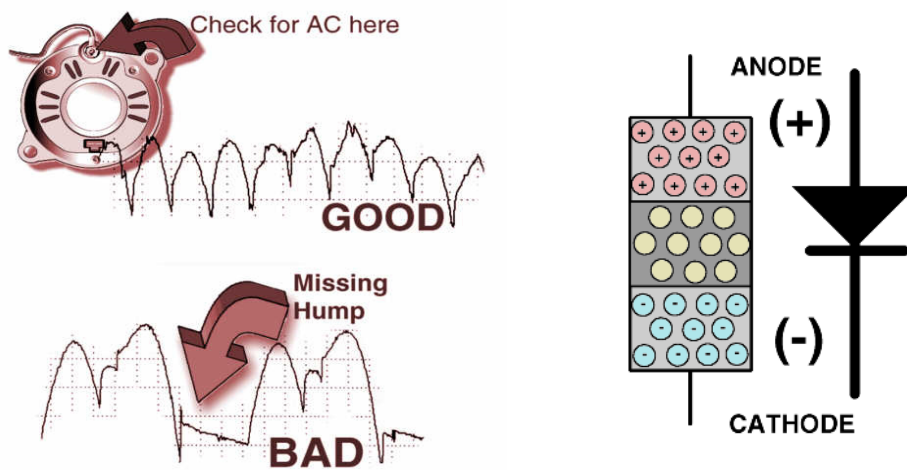
Check Alternator AC with DMM or Scope



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Check Alternator AC with DMM or Scope

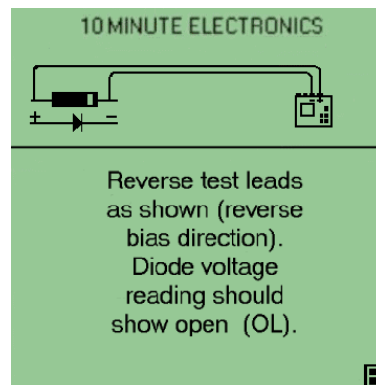
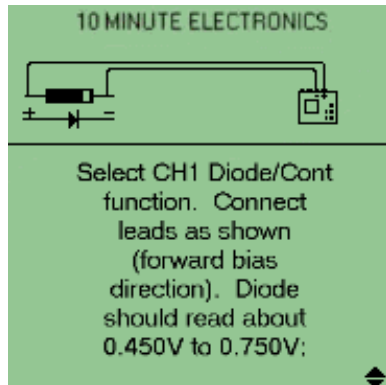


What should be the max AC voltage reading?

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Checking Diodes

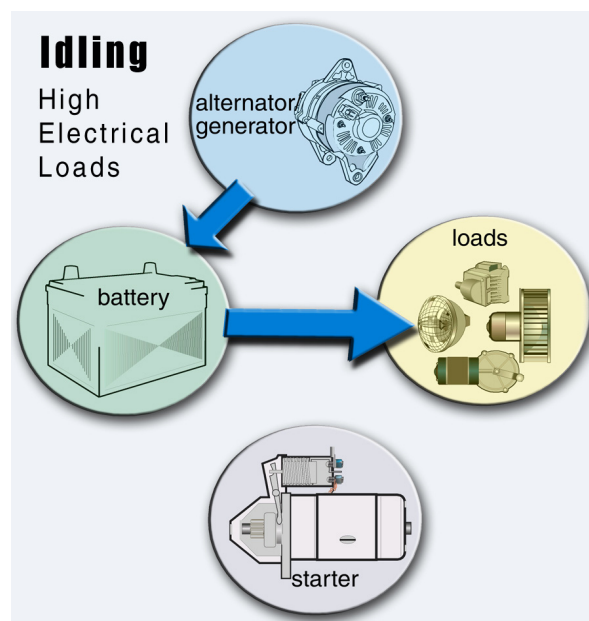


What's wrong if the meter reads OL in both directions?

What wrong if the meter reads resistance in both directions?

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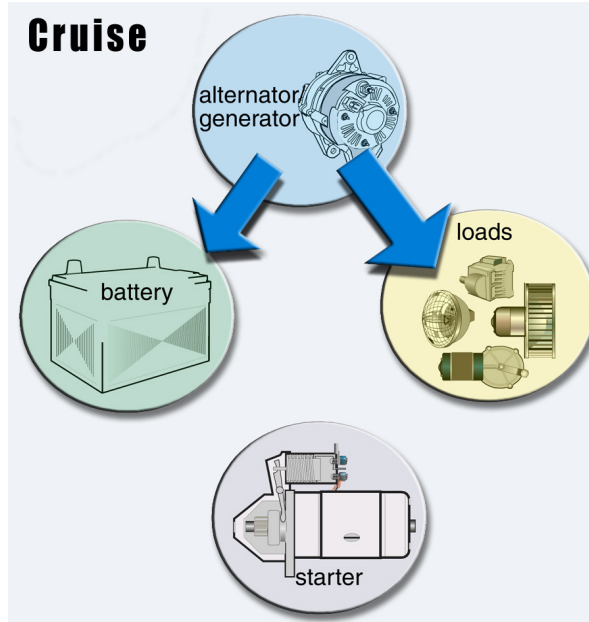
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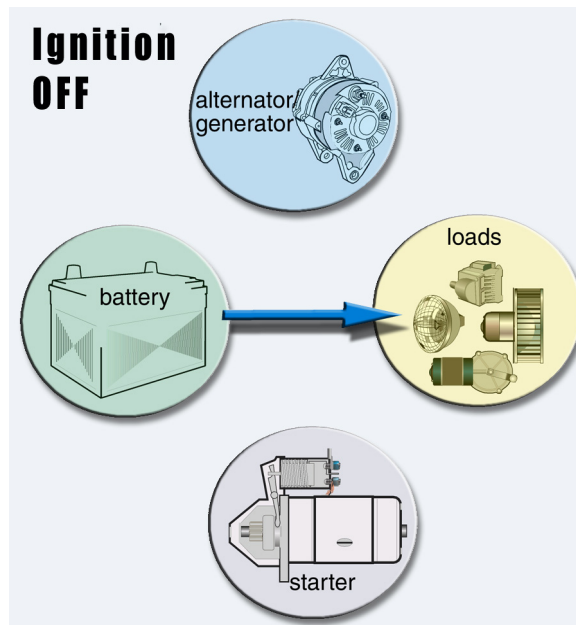
Cruise



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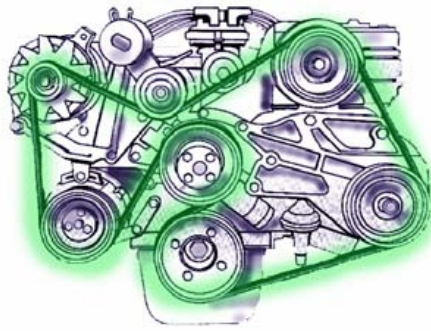
123

Ignition OFF

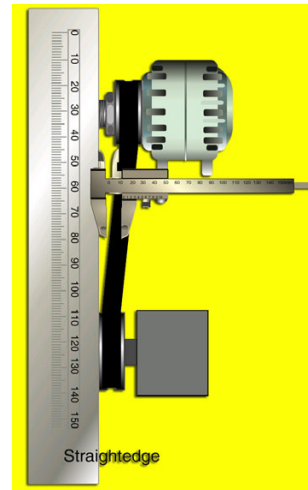


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Visual Inspections



Remember, the best tools you have are your brain, ears, eyes, nose, and hands.

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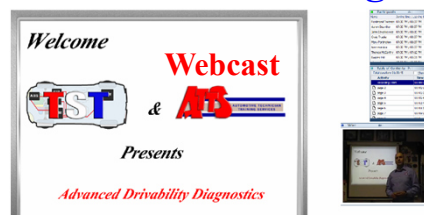
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