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Helping Today's Technicians Understand Today's Technology

Your Oregon Carport Connection

Your Connection for Understanding Vehicle Voltage Drop

Understanding Vehicle Voltage Drop, educator's version.

Written by Auto Instructor: Joe Glassford, author of: AVI Video LBT 101: "Voltage Drop Testing".

Joe shares his in depth understanding of shared current paths.

This "Educator's Version" designed for projection CD has:

"Understanding Voltage Drop in the Vehicle 14 Volt Current Path - 53 slides.

How Connections Affect Voltage Drop. 3 page word doc.

"Meters", Set Up and Probe Placement - 27 slides.

General Rules for Allowable Voltage Drop in Vehicle Circuits. 5 page word doc.

"How to Do Voltage Drop Testing" - 53 slides.

"Understanding Shared Current Paths" - 42 slides

"How to Test Vehicle Shared Current Paths for Voltage Drop" - 46 slides.

All slide programs are in "Power Point Show" format.

You must have Power Point to view them.

The programs on Understanding Voltage Drop and Shared Current paths answers these questions:

What makes up the "current path"?

What is a voltage drop?

What causes a voltage drop?

What vehicle symptoms are caused by voltage drops?

What is an "engineered" voltage drop?

Is significant resistance the "trouble" in troubleshooting?

Can oxidation, corrosion, and normal aging cause significant resistance?

Can loss of wire strands or loss of connector/connection tightness cause significant resistance?

What does significant resistance look like on a vehicle?

What factors determine when significant resistance will occur?

How much resistance is significant enough to cause a problem in a circuit?

Will one ohm of resistance stop a relay coil winding circuit and a starter motor armature circuit from working as designed?

Why is resistance such an elusive value?

What is the best way to find significant resistance?

What should be used as your only voltage source and ground source when troubleshooting?

What do you use when your testing point is beyond the length of your meter leads?

What should be done before you begin effective troubleshooting?

What are the 7 C's that make up any current path?

How are all single load current paths designed to work?

How are all parallel load current paths designed to work?

How does the location of resistance in a single load and parallel load circuit affect circuit operation?

What is a "shared current path"?

What parts of a vehicle make up shared current paths?

Which circuits use "shared current paths"?

Are there shared current parts in the voltage feed side and ground side of circuits?

How can voltage drops in shared current paths occur?

What vehicle symptoms are created by voltage drops in shared current paths?

Can a shared current path voltage drop cause a drive ability problem?

Why should I test shared current paths first before jumping into any individual current path?

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"How Connections Affect Voltage Drop" gives you in-depth understanding of how connections and connectors

affect circuit voltage drop.

The program on meters answers these questions:

How accurate is my test meter?

How can I test the accuracy of my meter?

How do I set the DVOM meter for voltage drop testing?

Where do I place the meter probes to do voltage drop testing?

How do I set the DVOM meter for reading:

source voltage, open circuit voltage, or charging voltage?

the amount of source voltage available to any load on the vehicle?

the voltage drop between the battery positive (+) terminal and the input pin to any load on the vehicle?

the voltage drop between the battery negative (-) terminal and the output pin or case ground from any

load on the vehicle?

How and where do I place the meter leads to find:

source, open circuit, or charging voltage?

**the amount of source voltage that has dropped
between the battery positive terminal and the input pin**

to any load?

**for finding how much of source voltage is being
dropped on the ground side?**

What is a voltmeter really reading?

**What can I use when testing beyond the length of my
meter leads?**

**SAE General Rules for acceptable voltage drops on
vehicle current paths are given.**

**The programs on "How to do Voltage Drop Testing" and
"How to Test Shared Current Paths":**

Shows you how to:

**do the "all inclusive" test of the starter motor
voltage feed side.**

test solenoid contacts if needed.

**test between the positive cable and the battery post if
needed.**

test connectors and connections if needed.

**test the starter for excessive amperage draw if
needed.**

Directs you once all necessary starter motor voltage feed side voltage drop tests are complete.

Explains the two different meter probe positions that can be used to find either "available voltage", or the

"amount of voltage that is being dropped".

Shows you how to: do the "all inclusive" voltage drop test of the starter ground.

test the between the starter motor housing and the block if needed.

test between the battery negative terminal and the frame or block where

the negative cable is attached if needed.

test between the negative cable and the battery post if needed.

test between the negative cable and its connector if needed.

Directs you once all necessary starter ground voltage drop tests are complete.

Shows you how to:

test for voltage drop in a battery positive cable pigtail wire.

do the "all-inclusive" voltage drop test between the battery + and the fuses.

test connectors and connections if needed.

Directs you when all positive pigtail voltage drop testing is complete.

Shows you how to:

test for voltage drop in a battery negative pigtail wire.

test connectors and connections if needed.

Directs you when all voltage drop testing of the battery negative (-) pigtail wire is complete.

Shows you how to:

test for voltage drop in ground straps that are not directly attached to the battery negative cable.

Directs you when all voltage drop tests of all ground straps are complete.

Shows you how to:

do the "all-inclusive" voltage drop test of the voltage feed side of the generator.

test connectors and connections if needed.

Directs you when the voltage feed side testing of the generator is complete.

Shows you how to:

do the "all-inclusive" voltage drop test of the generator ground.

test between the generator housing and the block if needed.

test between the block and the battery negative terminal if needed.

test between the negative cable and its connector if needed.

test between the negative cable clamp and the battery terminal if needed.

Directs you when all necessary generator ground voltage drop testing is complete.

Not only are your shown how to do the test, "speaker notes" explain why the tests are necessary.

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