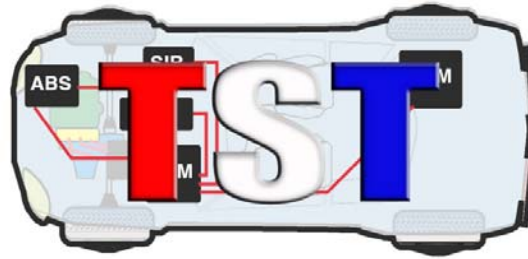


February 2013



Technicians Service Training

INSIDE THIS ISSUE:

Vehicle Networks and No Communication P. 1 - 18

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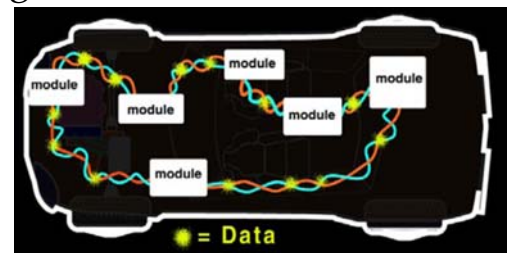
Editor

" G" Jerry Truglia

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Vehicle Networks and No Communication

Fully-functional vehicle networks allow modules and scan tools to interact whenever the vehicle is in the KOEO (Key On Engine Off) or KOER (Key On Engine Running) position, allowing them to share information, and send commands to actuators.



This type of network controls many vehicle functions and checks the vehicle for faults. Data is broadcast over the network. Special software regulates message traffic to prevent data collisions. (It's a little like watching a TV program when everyone is speaking at once, if they don't take turns speaking, we just don't understand the words coming out of their mouths). A bus is the highway that transmits data messages, and network message regulation is referred to as BUS arbitration.

Ford's Standard Corporate Protocol (SCP) network is just such a high speed data highway. It uses a communication protocol running at 41.6 kbps, and operates whenever the vehicle is running, allowing constant crosstalk among various vehicle sensors, actuators, and modules.

(Con't on page 3)

*Technicians Service Training***11 Lupi Plaza****Mahopac, NY 10541****Phone:** (845) 628-6928**Fax:** (845) 628-9109**Email:****Info@tstseminars.org**

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Information contained in this newsletter is intended for use by professional auto repair technicians familiar with approved vehicle repair procedures. The authors are not responsible for physical injury or property damage resulting from the incorrect application of information or procedures outlined in this volume.

Currently there are **TST chapters in Connecticut, Massachusetts, New Jersey, New York** and membership continues to grow. For more information you can call

TST headquarters at:

(845) 628-6928



Technicians Service Training



What is TST?

TST is a group of dedicated technicians and instructors committed to the continuing education of our fellow technicians. We provide once a month training seminars to technicians at a reasonable price. TST brings our members nationally known instructors and state of the art training.

Our Goal & Mission Statement

- *Keep our fellow technicians up to date with the latest technology.*
- *Provide training seminars for a reasonable price.*
- *Deliver information that the technician can use now.*
- *Keep technicians informed of information affecting our industry.*
- *Increase consumer awareness of what a good technician is.*

Why join TST?

TST membership includes special pricing on weekday night seminars and the occasional full Saturday seminar. With a \$75.00 yearly membership, the monthly seminars are only \$65.00. TST classes are NOT sales or product seminars. The instructors that TST brings in are all “hands-on” industry experts with up to date, cutting edge knowledge that you can use in your shop the next day. That’s 65 dollars for a seminar in which you are able to learn something useful, for fixing those tough jobs that we all see on a regular basis. Our instructors are masters at making the complex understandable. Membership also includes a Monthly Newsletter full of real world technical articles, diagnostic case studies, and solutions to the kinds of problems you see in your bays each week.

The following are some of TST’s regular instructors:

Bernie Thompson of ATS

John Thornton of Autotrain Inc.

Wayne Colonna of ATSG

Jorge Menchu the “Labscope Guru,” AES Wave

John Anello of Auto Tech On Wheels

Mark Warren of Motor Magazine

Bob Pattengale of Bosch

Peter Meier of Motor Age Magazine

Ken Zanders of Illinois Air Team

Jerry “G” Truglia of A.T.T.S. Inc.

Vehicle Networks and No Communication (con't from p. 1)

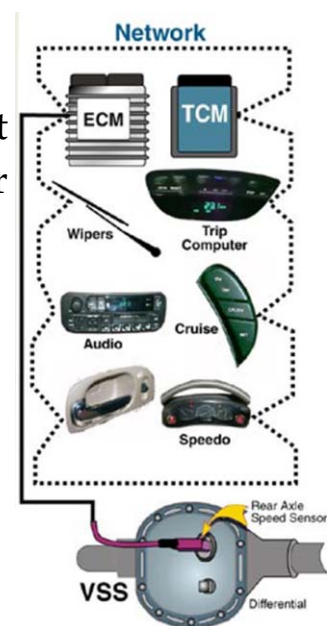
The SCP network data bus is made of two wires twisted together, known as a twisted pair. Others, like the new Chrysler PCI network, transmit data over a single wire bus. Twisted pairs protect the bus from stray signals that might be induced into the BUS wiring by high voltage electrical interference. This is particularly important when BUS wires run close to a high voltage wiring harnesses or to secondary ignition cables.

Computer modules need accurate information from many sensors to operate reliably. Without precise, dependable sensor inputs, control modules make errors and send bad commands to actuators. To borrow a saying from the computer industry, "Garbage in equals garbage out."

Since multiple modules commonly share inputs from multiple sensors, there needs to be a way to provide sensor information to any module that needs it. The hard way to accomplish this is to connect a separate wire from each sensor to each module. This is impractical and consumes a lot of wire that makes the vehicle heavier and more expensive to build. And, as we all know from experience, the more complicated things are, the more likely they are to break!

Let's look at an example. Here's a list of modules that might need the (VSS) Vehicle Speed Sensor input for their calculations:

- Engine Control Module (ECM)
- Transmission Controller (TCM)
- Cruise Control
- Speedometer/Odometer
- Speed Sensitive Wipers
- Audio System Volume Control
- Speed Sensitive Automatic Door Locks
- Trip Computer



(Con't on p. 7)

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Jim Bradanini
Program Administrator

QUOTE

Hey: To all my tool carrying friends,

I just switched Brian's tool insurance from Farmers to Pro-TEC and I am now only spending \$350 a year for \$70,000 of insurance on hand tools, welder, air compressor, tool boxes, etc....we were spending \$747 every six months.

Anyway, I figured whoever needs insurance on your tools against theft, flood, fire, etc.... blanket coverage. The people are really nice and you can do it over the phone. You don't have to have a tool inventory list, though you will need one if you have a claim so do one up front anyway.

They offer \$50,000 for \$250 but we upped it to \$70,000 for \$350. <http://www.mechanicsinsurance.com>. The guys name is Jim Bradanini and his email address is: JimB@cpminsurance.com. Their phone is 203-439-2810. I had left a message and he got back to me within the hour.

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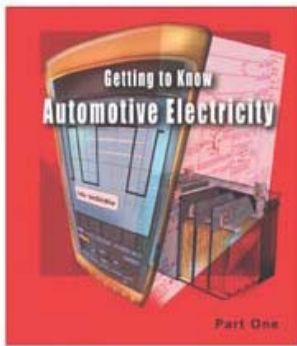
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OTC, announces a new standard of diagnostic innovation with the launch of the professional OEM-grade Genisys Touch, the first-ever PC-based tablet diagnostic tool with an included J2534 Reflash/Reprogramming device.

The new Genisys Touch is a leading-edge Windows 7 diagnostic platform with a large resistive 10.1-inch touch screen. It includes advanced and exclusive features such as VIN-based AutoID to detect CAN vehicles in one touch, Wi-Fi and web browser access, including directly to technicians' favorite OEM subscription sites, and Bluetooth pairing to an included J2534 vehicle communication device, as well as OTC's optional wireless TPMS reset tool and PC-Based 2-Channel Oscilloscope.

AutoDetect is an exclusive feature of Genisys Touch. It is an experience-based information solution aimed at providing the technician with instant repair information solutions on the spot. The system will automatically detect and alert the technician if there are any on-tool or internet repair solutions available for the specific year, make, and model based on trouble code or symptom.



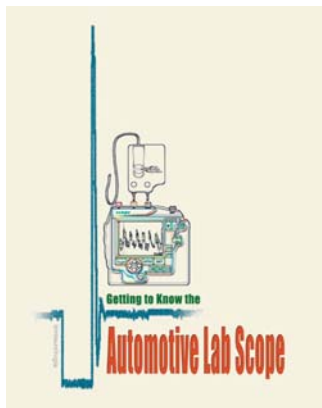
Batteries
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Vehicle Networks and No Communication (con't from p. 3)

Our Vehicle Speed Sensor (VSS) is connected to each module by a separate wire. While this gets the job done, it just isn't practical, especially when you consider that there are dozens of shared sensor inputs in modern vehicles.

The VSS is only one of many sensors in each vehicle. In certain highly accessorized vehicles, it could take miles of additional wire to connect all shared sensors this way. Repeating this process for every sensor in the vehicle would require miles of wire, adding many pounds to total vehicle weight.

The Society of Automotive Engineers (SAE) defines three types of data networks, categorized by transmission speed. For reference, data speed is measured in bps (bits per second) or kbps (kilobits, or 1000 bits per second).

- Class A - Slowest of the group, Class A crawls along at speeds below 10 kbps. Now outdated, an example of this protocol is pre-OBD II GM UART, transmitting at 8192 bps.
- Class B - Faster, Class B data speeds fall into a range between 10 and 125 kbps. Class B includes all four current OBD II data protocols. But at 10.4 kbps each, ISO 9141, Keyword 2000, and the VPW version of the J1850 protocol aren't apt to be pulled over for speeding. The PWM J1850 version used by Ford is four times faster at 41.6 kbps.
- Class C - This high speed class blasts data at rates between 125 and 1000 kbps. Now we're getting somewhere! While higher data transmission speed costs more to build into the system initially, it has a lot going for it.

(Con't on page 9)

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Vehicle Networks and No Communication (con't from page 7)

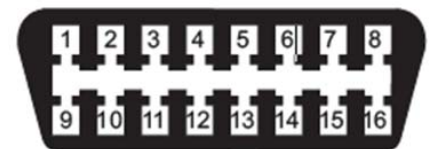
For instance, fast data improves powertrain control and diagnostics, more important as electrically operated throttles, steering, and brakes go from the drawing board to production vehicles.

Bottom line? None of the current OBD II protocols approaches what we call "real time" data transmission speeds. In other words, there is a noticeable delay between the time the data is sent and the time it is actually displayed on a scan tool. This is a real limitation when you are trying to see a circuit problem as it is happening (in real time).

Pin #	Pin Assignment	Pin #	Pin Assignment
1		9	
2	SAE J1850 (SCP Bus +)	10	SAE J1850 (SCP Bus -)
3	ISO 15765-4 CAN MS (Bus +)	11	ISO 15765-4 CAN MS (Bus -)
4	Chassis Ground	12	
5	Signal Return (Gnd)	13	
6	ISO 15765-4 CAN HI (Bus +)	14	ISO 15765-4 CAN Low (Bus -)
7	K Line of ISO 9141	15	L Line of ISO 9141
8		16	Fused Battery Power

Now that we covered the system background information you can imagine that No Communication aka "No Com" problems are something that can you can encounter while connecting a scan tool or the inspection machine. There are many of thing that can go wrong preventing the vehicles computers from communicating with the inspection machine or scan tool. The most common that the industry has experience is no power to Pin 16 on the OBD II connector. Some of the other problems that can cause a generic no communication problem are:

- Blown fuse
- Pin 16 Power battery - system voltage
- Pin 4 and 5 grounds
- Remote Starters
- Other aftermarket devices (radio, SD/DVD layers, alarm, auxiliary chargers, radar detectors, etc.
- Damaged OBD II connector
- Loose or missing pins in the OBD II connector
- Corrosion damaged pins in the OBD II connector
- PCM needs update reflash/programming
- Network problem, other computers on the BUS that have problems such as the security module.



(Con't on page 12)

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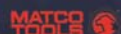


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Questions:

1. Do you want seminars to continue in your area?

2. Do you find the seminars useful?

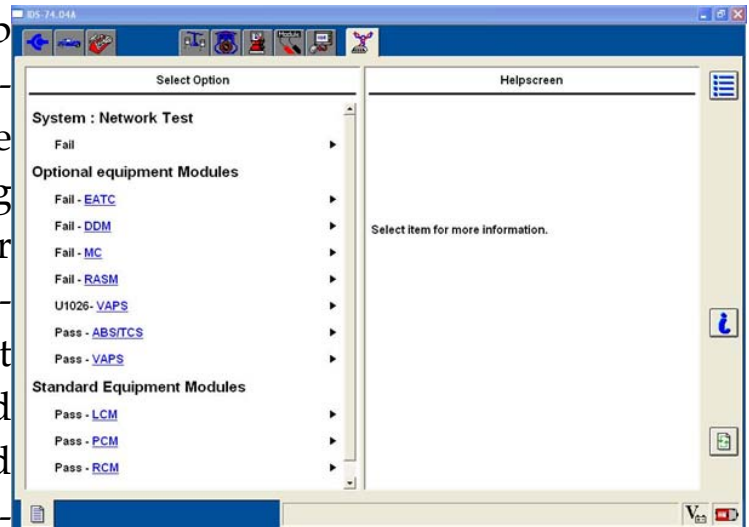
Please ask a fellow technician to come and check-out our seminars so we can continue to bring you the best available information each month.

We need your support:

Thank you,
G Truglia

Vehicle Networks and No Communication (con't from page 9)

Case in point is our case study on a **2004 Ford Escape** that failed for No Communication along with failing a re-tested. This vehicle was then taken from shop to shop, where it was tested and failed for a third time. When the shop contacted us for advice, we suggested that the shop check for power and ground at pins 16 power, 4 and 5 grounds. What the shop found was that pin 16 only had 9 volts not the needed battery or running engine voltage. A closer look revealed that an aftermarket remote start system had been installed in the vehicle and attached to pin 16. The installer had used a scotch-lock-style connector to tap into the wire, nearly cutting it in two and causing a large voltage drop when the circuit was loaded. Once the remote starter was disconnected and the wire was repaired, voltage at pin 16 was back to normal at 14.0 volts.



Not all aftermarket devices that are installed on vehicles will cause a Non Com but it should clue you to take a careful look and check that NOTHING is attached to the OBD II connector and its wires.

Audi/VW 1996 –2002 that have an aftermarket radios installed. Note that scanners and inspection machines may be damaged when connected to a vehicle with an aftermarket radio installed.

(Con't on page 16)

DYING TO FIND A/C LEAKS?

The new **UV Phazer NEO™** UV light finds leaks others miss.



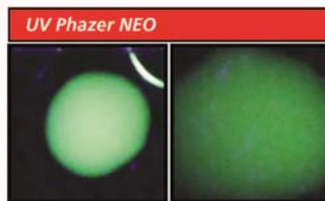
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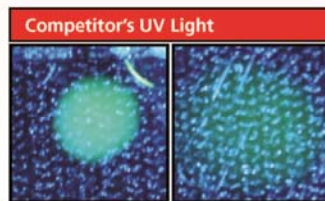
We found many shops use poor quality dyes with ineffective blue lights. That's when we challenged our Engineers to create the ultimate leak detection solution – the **UV Phazer NEO**.



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Vehicle Networks and No Communication (con't from page 12)

Dodge Caravan's that don't communicate with a scan tool or inspection machine may need to have the PCM reflashed, and or replaced. First check with another scan tool to see if you can communicate with the vehicle. If the scan tool cannot display data it maybe due to a communication problem, try the following that works on most Chrysler, Dodge and Jeep vehicles. While observing the odometer window on the dash, turning the key, on off three times with the final turn reminding in the on position. Check to see if there is a P06XX DTC displayed. If the system is good only dashes — — — — will be displayed or DONE in the window. All on-board DTCs will be in the window along with any messages. As you can see by the above picture it can even display a gas cap problem.



TIME OUT—Network Reminder Note:

The speed of the data connection has a direct effect on scan tool performance, especially when viewing vehicle parameters in datastream.

Some scan tools are faster than others, but no scan tool can display changes in vehicle data faster than it receives them! If the data BUS is slow, then the scan tool updates will be slow as well — guaranteed.

(Con't on page 18)

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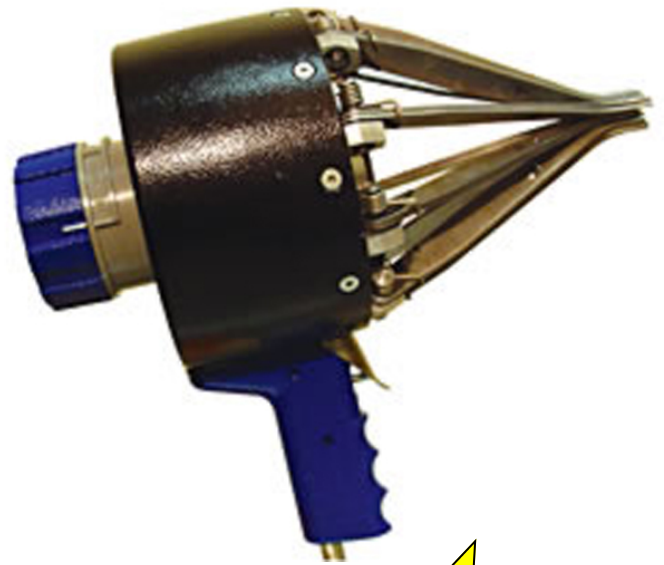
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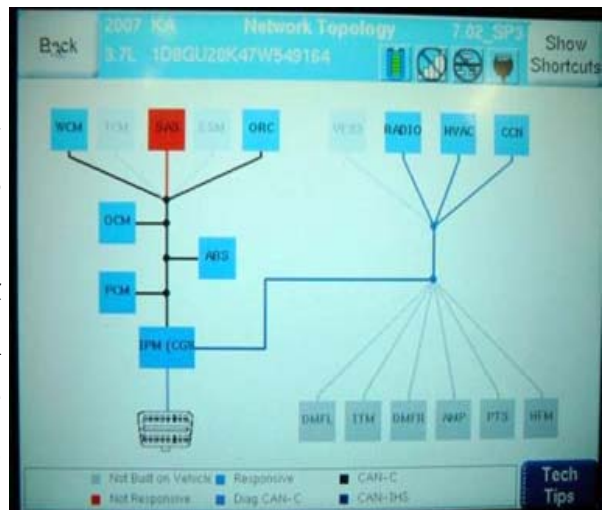
Vehicle Networks and No Communication (con't from page 16)

BMW, 1996 to 2004, M3, M5 among other series vehicles may have a problem communicating that will need to have their PCM software updated.

2000 Mazda MPV No Com due to a PCM that needs to be reflashed in order for the vehicle to communicate with some inspections machines and Generic/Global scan tools. Check the Mazda website and TSBs.

Case Study: 1998 Jeep Grand Cherokee

that failed its emissions test for a communication problem. The vehicle was tested several times at different inspection stations with the same results, No Communication. The technician at the third shop was smart enough to check not only the power at pin 16, which was good, but he checked the grounds at pins 4 and 5. The problem was found at pin 5 after being confirmed by a DVOM OHM meter check found no continuity between pins 4 and 5.



Another way to test for a good ground is by performing a volt drop test. This is done by connecting a volt meter's black lead to the battery negative terminal and the red lead of the meter to pin 4, (OBD II system ground), while cranking the engine over as to load the circuit. The voltage drop should be 100 mV or less. Your next step would be to test pin 5 sensor ground the same way we tested pin 4. On some vehicle pin 4 and 5 may be switched, but they will still be grounds and must have a good connection with less than a 100 mV drop.



Article by G Truglia,

ASE CMAT, CMTT, CMST, L1, CNG & TST Founder, President

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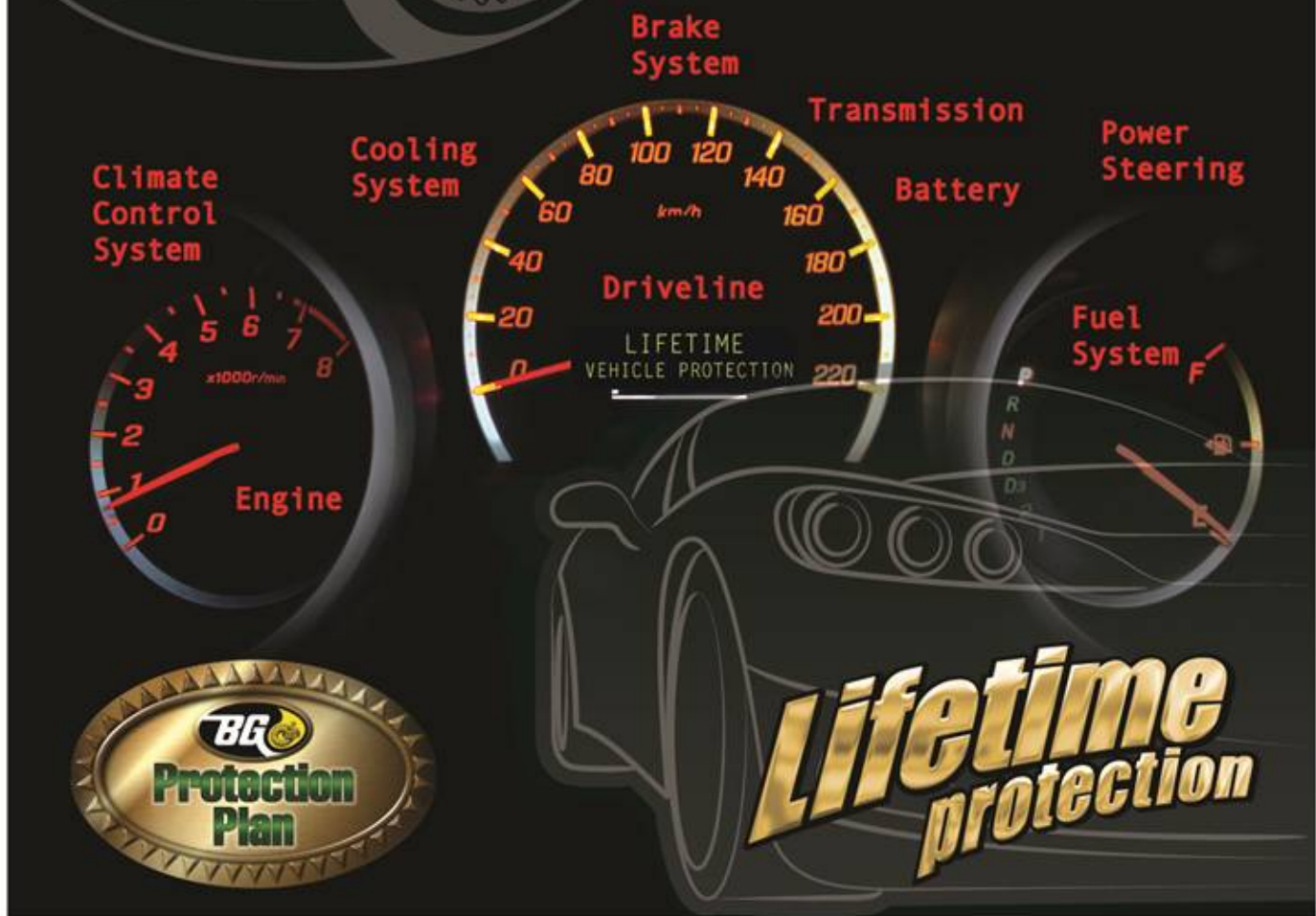


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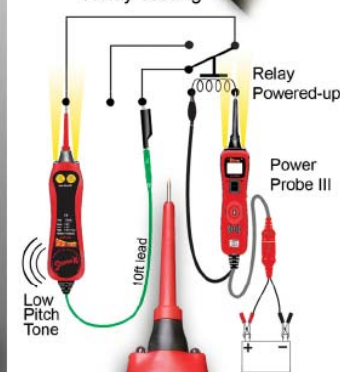
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