2009 BMW CAN Bus Systems Manual

The CAN Bus is a two wire bus used to allow communication between powertrain related components and systems.
The CAN network uses a twisted pair configuration which also uses two terminal resistors of 120 ohms each for a total circuit resistance of 60 ohms.

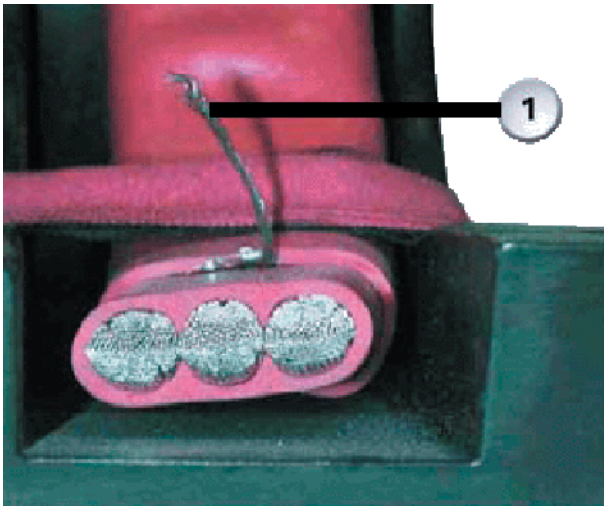
With all of the new CAN systems that are out there on BMW, it would take years to collect the information and knowledge. This Seminar will cover the entire spectrum of these systems.

Technicians need to be familiar with the CAN Bus principles and how they operate before diagnostics can be performed efficiently and productively.

Ultimately, if the Technician does not know the system that he is diagnosing, how long will the diagnostics take? Loss of productivity. Loss of shop hours. Loss of revenue for the entire shop.

Listed is some of the coverage in this Training Manual:

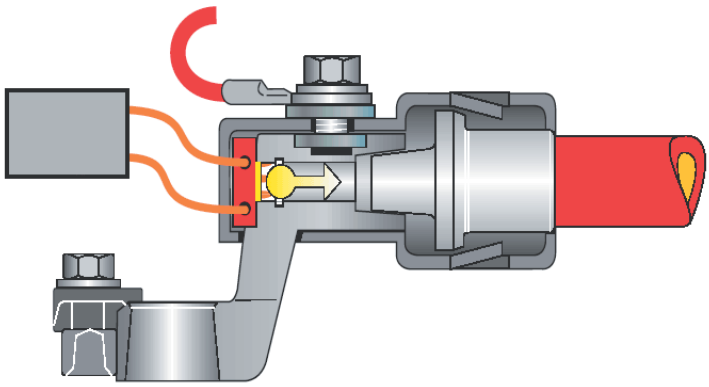
- ***Power Supply and Batteries***
- ***Power Management Systems***
- ***Battery Safety Terminal (BST)***
- ***Intelligent Battery System (IBS)***
- ***Electrical Energy Management***
- ***Bit Serial Data Interface (BSD)***
- ***Power Module (PM) E65***
- ***RADSOK (E65)***
- ***Power Distribution Center (JBE) E90***
- ***CAN Bus Principles for Coding***
- ***Understanding the operating principle of serial bus***
- ***CAN Bus (Controller Area Network)***
- ***D-Bus (Diagnostic Bus)***
- ***M-Bus (Motor Bus)***
- ***P-Bus (Peripheral Bus)***
- ***LIN-Bus (Local Interconnect Network Bus)***
- ***I/K-Bus (Intrument and Body Bus)***
- ***MOST-Bus (Fiber Optics System) Overview***
- ***PT-Can (Powertrain Can Bus)***

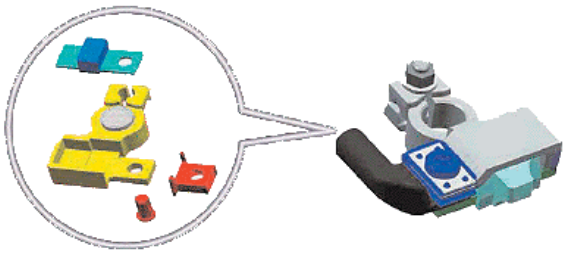


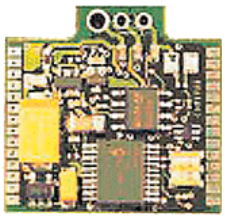
The Battery and Cable:

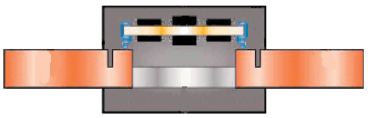
- The battery cable is installed on the underside of the vehicle.
- The battery cable is monitored by the ASE (1) system as in the E85.
- Sensor leads are routed from the battery cable to the left and right “B” Pillar satellites.
- Battery cable size is dependent on engine.
- The battery size is coded in the DME.
- Replacement batteries must be the same capacity rating as the original battery.

- What is this component connected to the BST cable?
- What is the function of the BST cable to the power management system?
- What and how is the protection features of the BST cable?
- What is the testing procedures for BST?

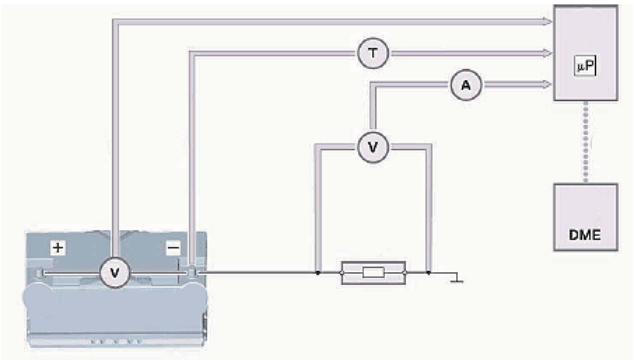








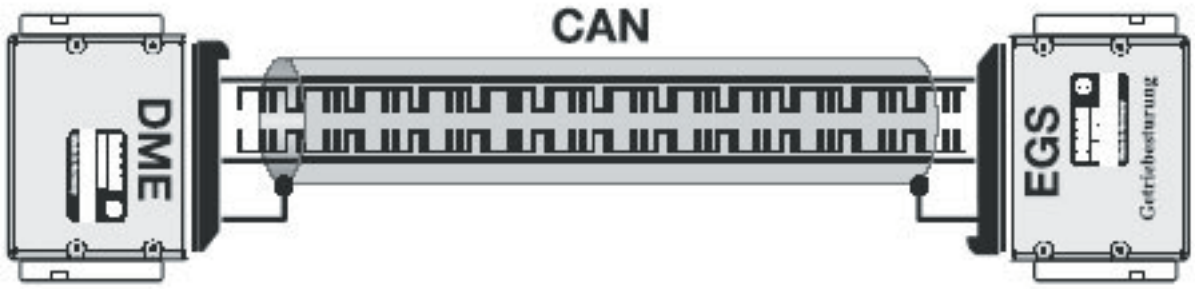
What are the above components related to?



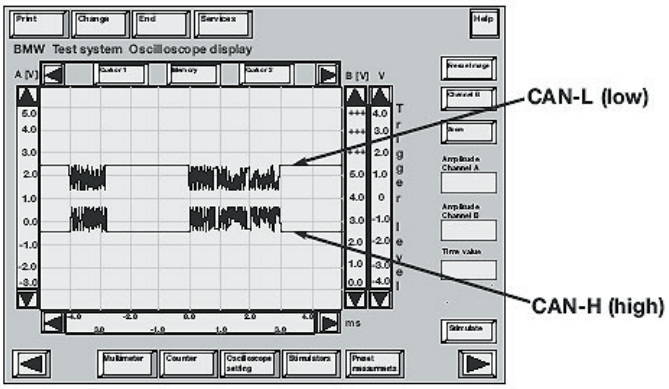
- The IBS is a mechatronic, Intelligent Battery Sensor with its own microcontroller.
- What does the IBS continuously takes measurements at the battery of?
- What battery terminal is the IBS connected to?
- How does the IBS operate in the battery system?

The software in the PC-board of the IBS calculates “State of Charge” and “State of Health” of the battery and sends the information to the DME via the ***Bit Serial Data*** link.

Controller Area Network



- A bus line is a group signal line that transmits serial data bidirectionally.
- It may consist of one or two wires.
- All controllers are connected in a parallel configuration in the bus system.
- Information is sent to all of the controllers and can be “heard” by all of the controllers.
- A BUS “subsciber” is any controller on the CAN Bus line (e.g. DME, EGS, GM, IKE).
- A ‘Gateway’ provides a link between the different bus lines to provide a means of sending information from the subscriber of one bus, to the subscriber of another bus.



- Check CAN Bus is like check any other wiring malfunction.
- Continuity testing from one controller to the other is performed.
- Perform this test with modules disconnected, and testing the CAN lines are not shorted or open to ground.
- If voltages and grounds are correct, then looking at the CAN signal is the next step to diagnose the controller operation.