

HSCAN & MSCAN

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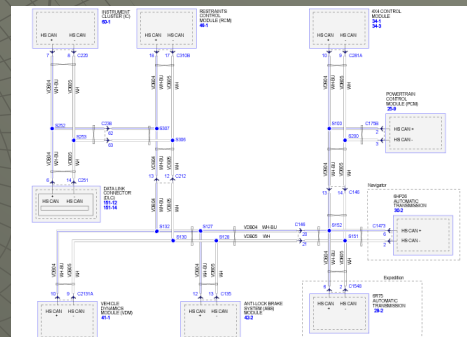
- ◆ HSCAN
 - High Speed Controller Area Network
- ◆ MSCAN
 - Medium Speed Controller Area Network
- ◆ Allow for network speeds required for vehicle operation.

Controller Area Network

- Vehicle communication utilizes both medium and high speed controller area network (CAN) communications. CAN is used for many modules to communicate with each other on a common network.
- CAN in-vehicle networking, is a method for transferring data among distributed electronic modules via a serial data bus. Without serial networking, inter-module communication requires dedicated, point to point wiring resulting in bulky, expensive, complex, and difficult to install wiring harnesses.
- Applying a serial data network reduces the number of wires combining the signals on a single network. Information is sent to the individual control modules that control each function.

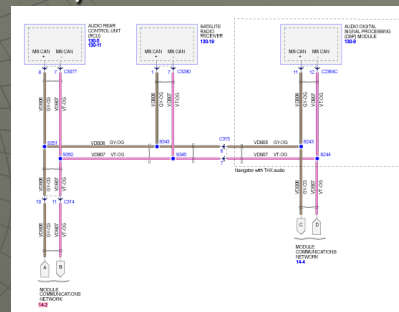
HSCAN

- 500kb/s
- Unshielded Twisted pair wiring (+,-)
- May contain multiple network protocols. (ie. Powertrain, body)
- Neutral/rest network voltage=2.5v
- As messages are sent the + circuit increases by 1.0 volt and - circuit reduces by 1.0 volt



MSCAN

- ◆ 125kb/s
- ◆ Unshielded Twisted pair wiring(+,-)
- ◆ Neutral/rest network voltage=2.5v
- ◆ As messages are sent the + circuit increases by 1.0 volt and - circuit reduces by 1.0 volt



HSCAN Modules

- ◆ ABS
 - Anti-lock Braking System
- ◆ APIM
 - Accessory Protocol Interface Module
- ◆ IC
 - Instrument Cluster
- ◆ OSCM
 - Occupant Seat Classification System Module
- ◆ PCM
 - Power-train Control Module
- ◆ PSCM
 - Power Steering Control Module
- ◆ RCM
 - Restraint Control Module
- ◆ 4x4
 - 4x4 Module

MSCAN Module

- ◆ APIM
 - Accessory Protocol Interface Module
- ◆ ACM
 - Audio Control Module
- ◆ DSM
 - Driver's Seat Module
- ◆ HVAC
 - Heating, Ventilation, and Air Conditioning Module
- ◆ IC
 - Instrument Cluster
- ◆ LTM
 - Liftgate/Trunk Module
- ◆ RETM
 - Rear Entertainment Module
- ◆ SDARS
 - Satellite Digital Audio Receiver System
- ◆ SJB
 - Smart Junction Box

Terms

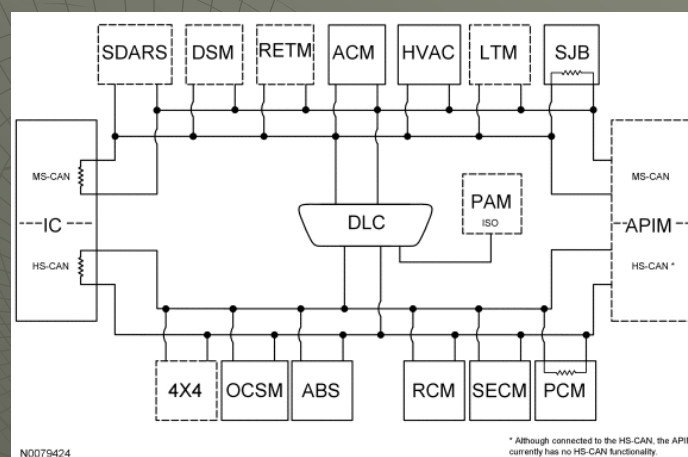
- ◆ Terminator
 - Can networks use a termination circuit to improve communication reliability . The termination takes place inside one of the modules by termination resistors. As messages are broadcast the voltage signals are stabilized by the termination resistors. Much like a pair of DVOM leads waving in the air.
- ◆ Gateway Module
 - Modules on two different networks are able to transmit information through the gateway module. Most often the IC is the module. It has built in HSCAN and MSCAN instructions and the ability to translate and transmit.

Terminator

- ◆ By design the CAN networks have one terminator on each of the two ends of the network.
- ◆ Each is 120Ω
- ◆ Both in parallel equal to 60Ω total circuit resistance.
- ◆ If the circuits are shorted a lower resistance will result.

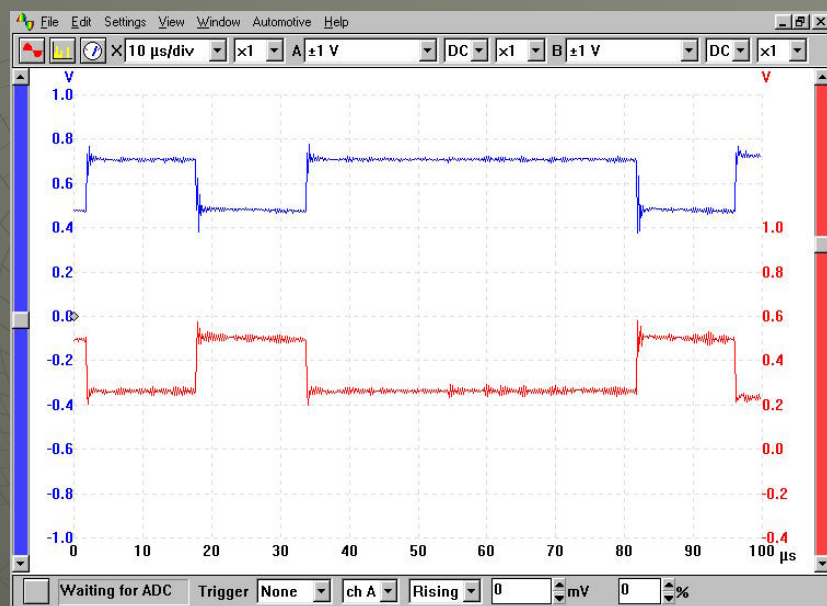
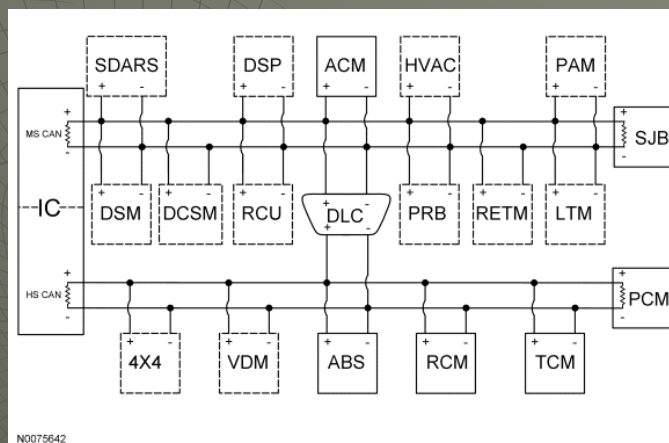
2008 Taurus

Topography



2008 Expedition

Topography



HSCAN Faults

HS-CAN Communication Fault Chart	
Failure Description	Symptom
HS-CAN (+) shorted to HS-CAN (-)	No communication
HS-CAN (+) short to voltage	No communication
HS-CAN (-) short to voltage	No communication
HS-CAN (+) short to ground	No communication
HS-CAN (-) short to ground	Unreliable communication possible in all network modules
HS-CAN (+) open	Unreliable communication possible in all network modules
HS-CAN (-) open	Unreliable communication possible in all network modules
Module loss of voltage or ground	No communication
Module internal failure	No communication

MSCAN Faults

MS-CAN Communication Fault Chart	
Failure Description	Symptom
MS-CAN (+) shorted to MS-CAN (-)	No communication
MS-CAN (+) short to voltage	No communication
MS-CAN (-) short to voltage	No communication
MS-CAN (+) short to ground	No communication
MS-CAN (-) short to ground	Unreliable communication possible in all network modules
MS-CAN (+) open	Unreliable communication possible in all network modules
MS-CAN (-) open	Unreliable communication possible in all network modules
Module loss of voltage or ground	No communication
Module internal failure	No communication