



# Controller Area Networks

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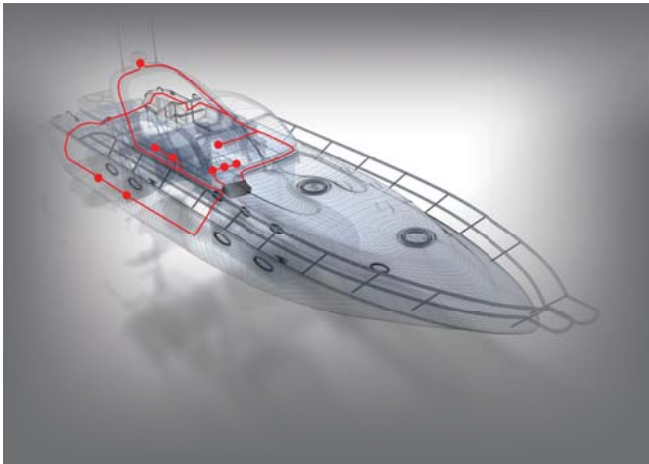


## CAN Overview

Controller Area Networks, or CAN are multiplex data systems. Multiplexing allows multiple data signals to travel on the same wires, integrating separate electronic systems and applications to a single point control and monitoring system. Using signals sent over a serial network, CAN systems provide instantaneous monitoring of diagnostic and control systems allowing early detection of potential problems. Early detection of problems leads to lower repair costs and reduced downtime. CAN systems allow an operator to use a single command station to control diagnostic systems and receive such varied information as brake and transmission temperature, tire pressure, fuel efficiency, and emissions levels. Anything that can be measured and controlled electronically can be monitored and directed by a CAN system.

Whether you're building a Controller Area Network for anything from on/off-highway, construction, material handling, agriculture machines, or your OEM fleet of fire engines, Deutsch has a solution for your CAN needs. Deutsch offers several configurations: 2-wire, 3-wire, and 4-wire, with in-line and flange mount, along with splitters, heavy duty breakaway connectors, and an off-board 9-pin diagnostic connector.

SAE J1939 is a specific type of CAN that defines the communications pathways for vehicle networks. Improved electrical systems as defined under SAE J1939 allow electrical devices to communicate with each other. Communication occurs using a Controlled Area Network between intelligent sensors over a serial network. Through a series of microprocessors a CAN interconnects every device establishing a common link between each.



There are four main electrical interconnect subsets of J1939 including /11, /12, /13, and /15:

- J1939/11 is a 3-wire system that uses the Deutsch DT Series connectors primarily for truck and bus. The DT Series accepts size 16 contacts and 14-20 AWG. Connector options include in-line, bulkhead, "Y" splitter, and terminating resistors.
- J1939/12 is a system that requires the Deutsch DT Series, HD30 Series, and ISO Box (HDBox). This group of electrical interfaces terminates a CAN between the tractor and its implement. Its main feature is a breakaway function that prevents damage to the tractor or implement in case of an accidental drive-away disconnect.
- J1939/13 is a system that uses the Deutsch HD10 Series connectors for on-board diagnostics. The HD10 Series accepts size 16 contacts and 14-20 AWG.
- J1939/15 is a 2-wire system that uses the Deutsch DTM Series connectors. The DTM Series accepts size 20 contacts and 16-22 AWG. Connector options include in-line, "Y" splitter, and terminating resistors.

The continued sophistication in design of equipment is demanding increased response of electrical systems. The application of J1939 has allowed designers to improve both the quantity and the quality of the options offered along with the increased electrical system reliability.

## ISO/CD 11783-2 & J1939/12 ISO Box and Associated Connectors

Description	Part Number
ISO Box Assembly	HDBOX-24-91PN
ISO Box Assembly, Reduced Wire Seal	HDBOX-24-91PE
Plug, Cable Clamp Assembly	HD36-24-91SN-059
Plug, Cable Clamp Assembly, Reduced Wire Seal	HD36-24-91SE-059
Plug, Breakaway Coupling, Cable Clamp Assembly	HDB36-24-91SN-059
Plug, Breakaway Coupling, Cable Clamp Assembly, Reduced Wire Seal	HDB36-24-91SE-059
Plug, Black, End Cap	DT06-4S-EP06*
Plug, Black, End Cap	DT06-2S-EP06*
Wedgelock, Green	W4S-P012
Wedgelock, Green	W2S-P012
Pin, Solid, Size 8	0460-204-08141
Pin, Solid, Size 12	0460-204-12141
Pin, Solid, Size 16, Gold	0460-202-1631
Socket, Solid, Size 8	0462-203-08141
Socket, Solid, Size 12	0462-203-12141
Socket, Solid, Size 16, Gold	0462-201-1631

\* DT Series receptacles are molded in the HDBox

Originally designed for agricultural applications, the Deutsch J1939/12 ISO Box creates a communication pathway between an on-board CAN system and the electronic components on an attached implement. The HDBox, which holds two DT13 connectors and an HD30 Series receptacle, mounts on the vehicle and mates with an HD30 plug connector that features a breakaway coupling ring. Deutsch breakaway couplings are designed to prevent damage to the vehicle or the attached implement by fragmenting and separating from the vehicle in the event of a drive-away disconnect.



## J1939/13 Universal 9-pin Diagnostic

Description	Part Number
Receptacle	HD10-9-1939P
Receptacle, Panel Nut Mount	HD10-9-1939P-B022
Receptacle, Panel Nut Mount, E Seal	HD10-9-1939PE-B022
Receptacle, Reduced Wire Seal	HD10-9-1939PE
Plug, Coupling Ring	HD16-9-1939S
Plug, Coupling Ring, Reduced Wire Seal	HD16-9-1939SE
Plug, No Coupling Ring (Slip-on)	HD17-9-1939S
Plug, No Coupling Ring (Slip-on), Reduced Wire Seal	HD17-9-1939SE
Pin, Solid, Size 16, Gold	0460-202-1631
Pin, Solid, Size 16, Gold, Extended	0460-247-1631
Socket, Solid, Size 16, Gold	0462-201-1631
Socket, Solid, Size 16, Gold, Extended	0462-221-1631

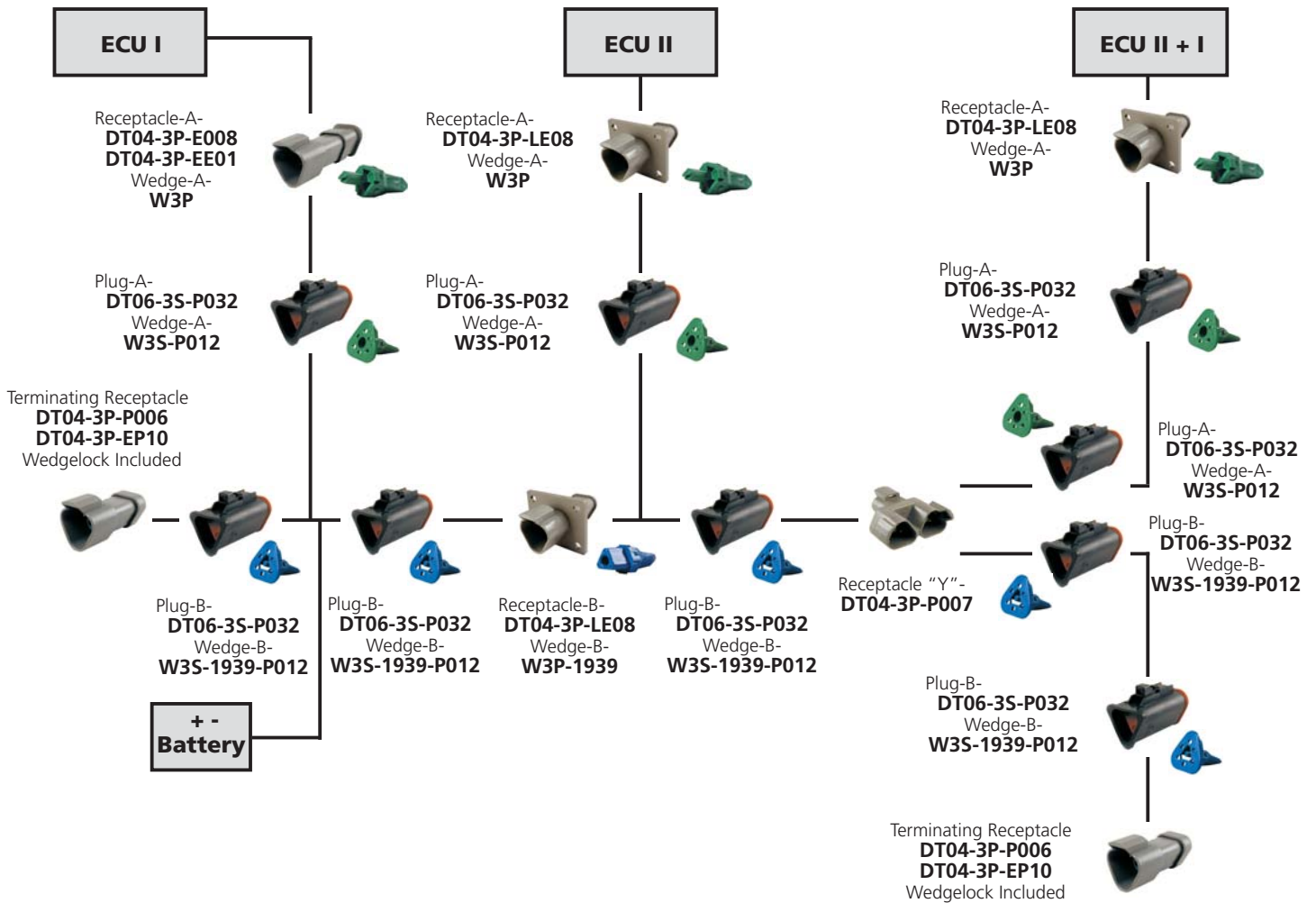
Deutsch's J1939/13, HD10 9 pin connector is a standard diagnostic tool for on- and off-highway OEMs. The HD10-9-1939P is a data port connector designed to allow an on-board CAN system to mate with a diagnostic computer. The Deutsch HD10 J1939/13 connectors offer several mounting options for the receptacle, and a mating plug that is available with or without a coupling ring.





## SAE J1939/11 Deutsch Connector Options

Deutsch J1939/11 connectors are rugged field proven DT 3 pin connectors designed to meet the SAE requirements for 3-wire CAN applications linking ECUs for serial data communications. The DT 3 way connectors accommodate the CAN\_HI, CAN\_LO and shield wires with a variety of options including “Y” receptacles, connectors with mounting flanges, keyed wedgelocks to prevent mis-mating, and network terminating connectors with molded-in 120Ω resistors.

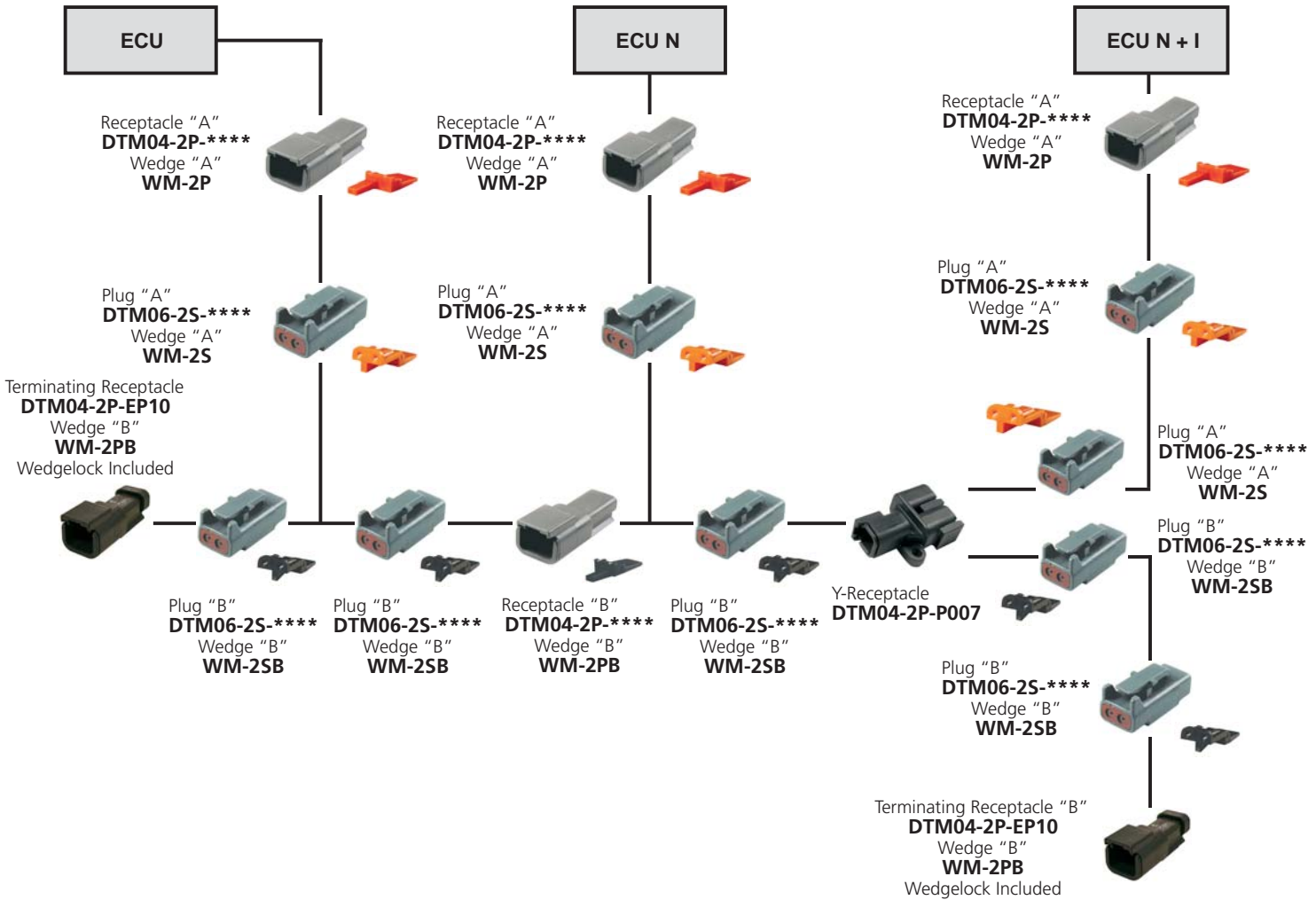


### J1939/11 3 Wire System

Part Number	Description	Part Number	Description
DT04-3P-P007	Receptacle, “Y” Connector	W3P-1939	Wedgelock, Blue
DT04-3P-E008	Receptacle, Gray, Shrink Boot Adapter	W3S	Wedgelock, Orange
DT04-3P-P006	Receptacle, Gray, 120 Ohm Resistor	W3S-P012	Wedgelock, Green
DT04-3P-EE01	Receptacle, Black, Shrink Boot Adapter	W3S-1939	Wedgelock, Blue
DT04-3P-EP10	Receptacle, Black, 120 Ohm Resistor	W3S-1939-P012	Wedgelock, Blue
DT06-3S-P006	Plug, Gray, 120 Ohm Resistor	0460-202-1631	Pin, Solid, Size 16, Gold
DT06-3S-EP11	Plug, Black, Shrink Boot Adapter	1060-16-0144	Pin, Stamped & Formed, Size 16, Gold
DT06-3S-PP01	Plug, Black, 120 Ohm Resistor	0460-247-1631	Pin, Solid, Size 16, Gold, Extended
DT06-3S-PE01	Plug, Black, 120 Ohm Resistor, Latch Guard	0462-201-1631	Socket, Solid, Size 16, Gold
DT06-3S-P032	Plug, Black, Single Piece Shrink Boot Adapter	1062-16-0144	Socket, Stamped & Formed, Size 16, Gold
		0462-221-1631	Socket, Solid, Size 16, Gold, Extended

## SAE J1939/15 Deutsch Connector Options

SAE J1939/15 defines the requirements for reduced physical layer 2-wire CAN systems consisting of an unshielded twisted pair of wires. Deutsch DTM 2 way connectors are offered in several modifications to meet the requirements of this standard. DTM connectors for serial data communications include “Y” receptacles, connectors with end caps and shrink boot adapters, DTM connectors for serial data communications include “Y” receptacles, connectors with end caps and shrink boot adapters, and receptacles with molded-in 120Ω resistors for network terminations.



### J1939/15 2 Wire System

Part Number	Description	Part Number	Description
DTM04-2P-P007	Receptacle, "Y" Connector	WM-2PA	Wedglock, Gray
DTM04-2P-E007	Receptacle, Gray, Shrink Boot Adapter	WM-2PB	Wedglock, Black
DTM04-2P-P006	Receptacle, Gray, 120 Ohm Resistor	WM-2S	Wedglock, Orange
DTM04-2P-EE03	Receptacle, Black, Shrink Boot Adapter	WM-2SA	Wedglock, Gray
DTM06-2S-P007	Plug, Gray, Shrink Boot Adapter	WM-2SB	Wedglock, Black
DTM06-2S-P006	Plug, Gray, 120 Ohm Resistor	0460-202-2031	Pin, Solid, Size 20, Gold
DTM06-2S-EE03	Plug, Black, Shrink Boot Adapter	1060-20-0144	Pin, Stamped & Formed, Size 20, Gold
DTM06-2S-EP10	Plug, Black, 120 Ohm Resistor	0462-201-2031	Socket, Solid, Size 20, Gold
WM-2P	Wedglock, Orange	1062-20-0144	Socket, Stamped & Formed, Size 20, Gold