

# Introduction to Automotive CAN Bus

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# Outline

Introduction

What is CAN Bus?

Why Use CAN Bus?

CAN Bus Topology

CAN Bus Frame Structure

CAN Bus Data Transfer

CAN Bus Error Handling

CAN Bus Applications

Conclusion

# Introduction

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- CAN stands for Controller Area Network
- Used for communication between electronic control units (ECUs) in modern vehicles
- Introduced in the mid-1980s by Robert Bosch GmbH

# What is CAN Bus?

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# What is CAN Bus?

- Two-wire bus system (CAN-H and CAN-L)
- Allows multiple ECUs to communicate with each other
- Enables real-time data transfer between ECUs

## Why Use CAN Bus?

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# Why Use CAN Bus?

- Reduced wiring complexity and weight
- Improved reliability and fault-tolerance
- Enables modular design and flexibility in vehicle architecture



# CAN Bus Topology

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# CAN Bus Topology

- Nodes connected in a linear bus topology
- Each node has a unique identifier (CAN ID)
- Data is broadcasted to all nodes on the bus

# CAN Bus Frame Structure

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# CAN Bus Frame Structure

- Standard frame: 11-bit CAN ID
- Extended frame: 29-bit CAN ID
- Data frame: contains data transmitted by the sender
- Remote frame: used to request data from other nodes on the bus

# CAN Bus Data Transfer

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# CAN Bus Data Transfer

- Each node on the bus can be a sender or a receiver
- Messages are transmitted in a cyclical manner
- Priority-based arbitration is used to resolve bus access conflicts

# CAN Bus Error Handling

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# CAN Bus Error Handling

- Two types of errors: bit errors and frame errors
- Bit errors occur when a node receives a corrupted bit
- Frame errors occur when a node detects an error in a received frame
- Error handling is performed by each node on the bus



# CAN Bus Applications

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# CAN Bus Applications

- Engine control unit (ECU)
- Transmission control unit (TCU)
- Anti-lock braking system (ABS)
- Airbag control unit
- Climate control unit
- Audio system control unit
- Navigation system control unit
- And many more...

## Conclusion

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## Conclusion

- CAN Bus is a two-wire bus system used for communication between electronic control units (ECUs) in modern vehicles.
- It allows multiple ECUs to communicate with each other and enables real-time data transfer between ECUs.
- CAN Bus offers reduced wiring complexity and weight, improved reliability and fault-tolerance, and enables modular design and flexibility in vehicle architecture.
- CAN Bus error handling is performed by each node on the bus.

Thank you for your attention!