

Learning Objectives

Learning objectives for this module include:

- **identifying the different types of construction for unibody and body-over-frame vehicles.**
- **identifying parts of a unitized structure.**
- **describing how vehicles are assembled.**
- **identifying the different types of materials used for vehicle construction.**
- **explaining how heat affects different strengths of metal.**
- **explaining the importance of restoring vehicle dimensions.**

Types Of Vehicle Construction



Unibody

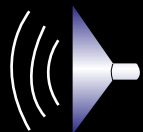


Space Frame



Body Over Frame

- Unibody
- Space frame
- Body over frame

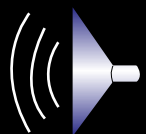


Unibody

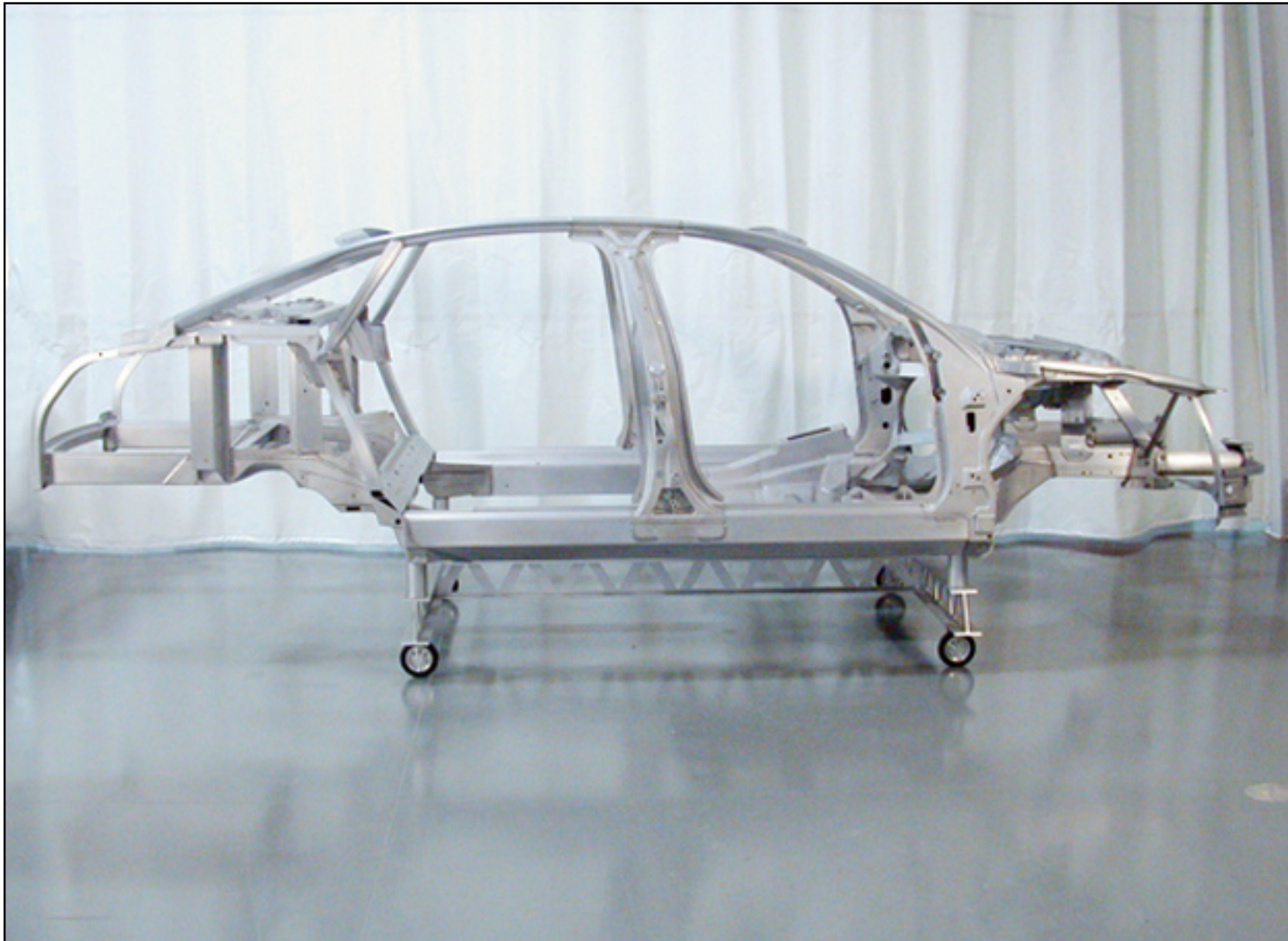


Cadillac DTS

- Single structure
- Drivetrain and suspension mounted to body structure
- Steering and suspension alignment dependent on dimensionally correct body
- Collision energy management

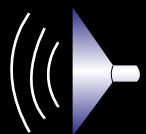


Space Frame



Audi A8

- Lightweight
- Similar to unibody
- Less dependent on body panels
- Panels attached with adhesives, fasteners, or welds
 - or combination

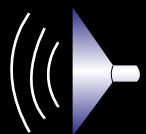


Body Over Frame



Ford F-150

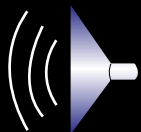
- Independent frame
- Separate unitized structure bolted to the frame
- Engine and drivetrain mounted to frame



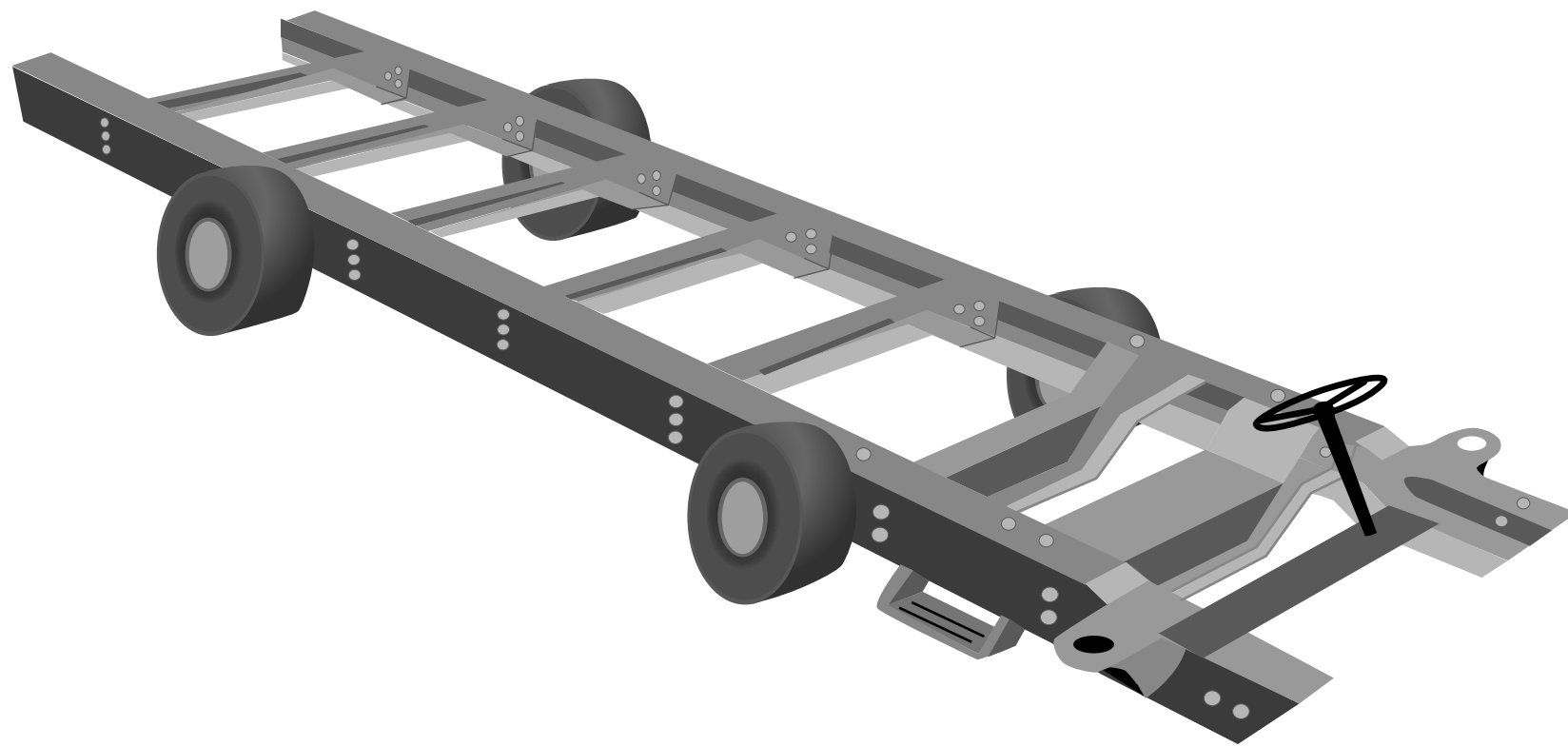
Perimeter Frames



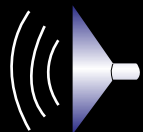
- Attached crossmembers
- Work with body to provide rigidity
- Torque boxes
- Box-type rail design



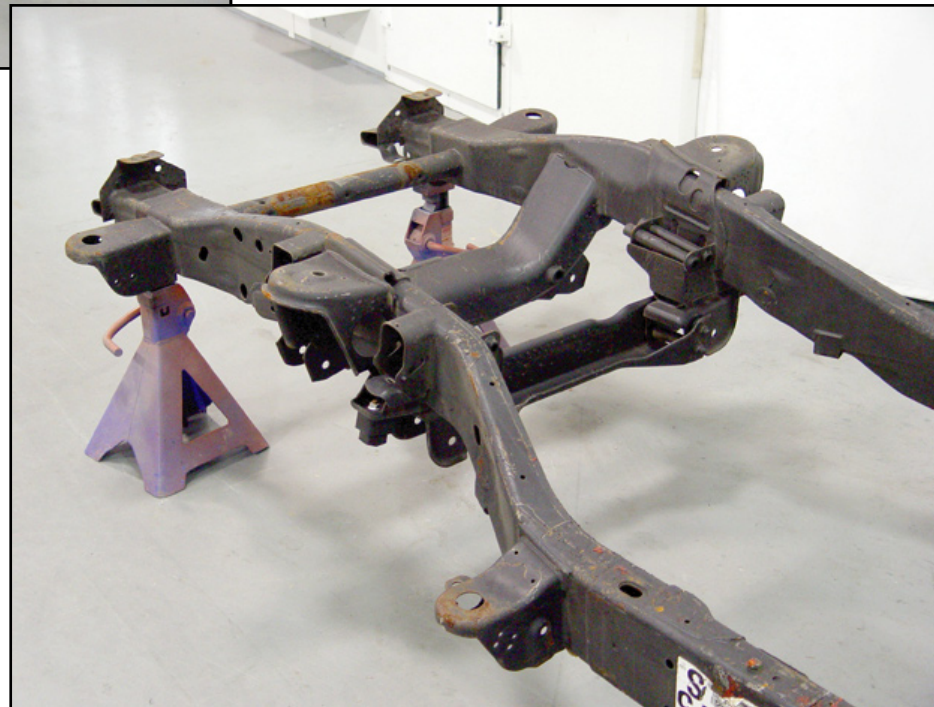
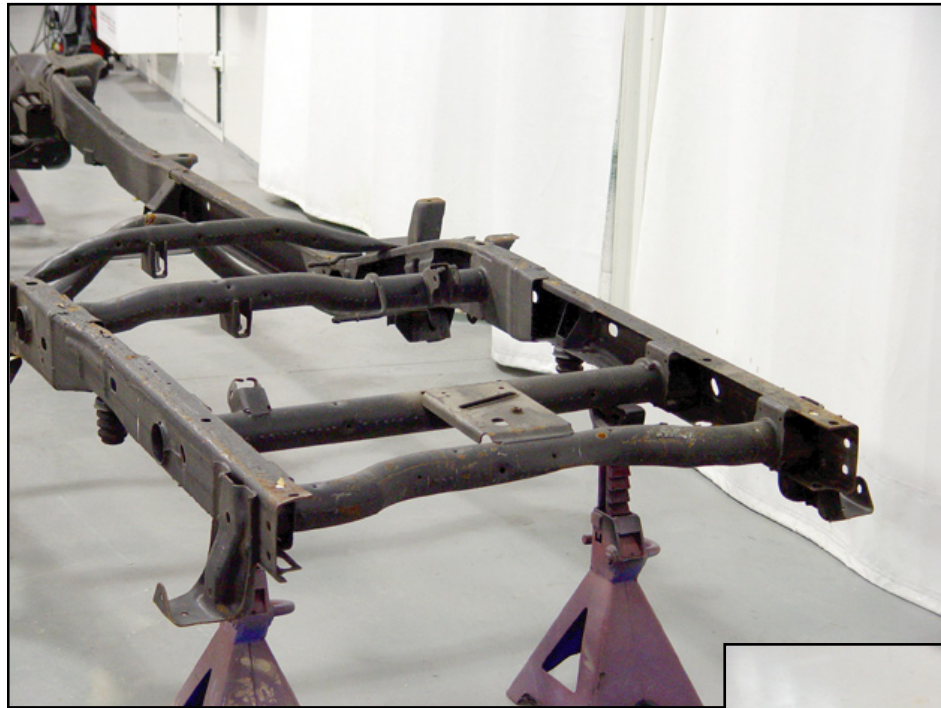
Ladder Frames



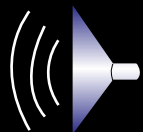
- Attached crossmembers
- Common on busses, RVs, and semi-trucks
- Straight
- Higher center of gravity
- C-channel rails



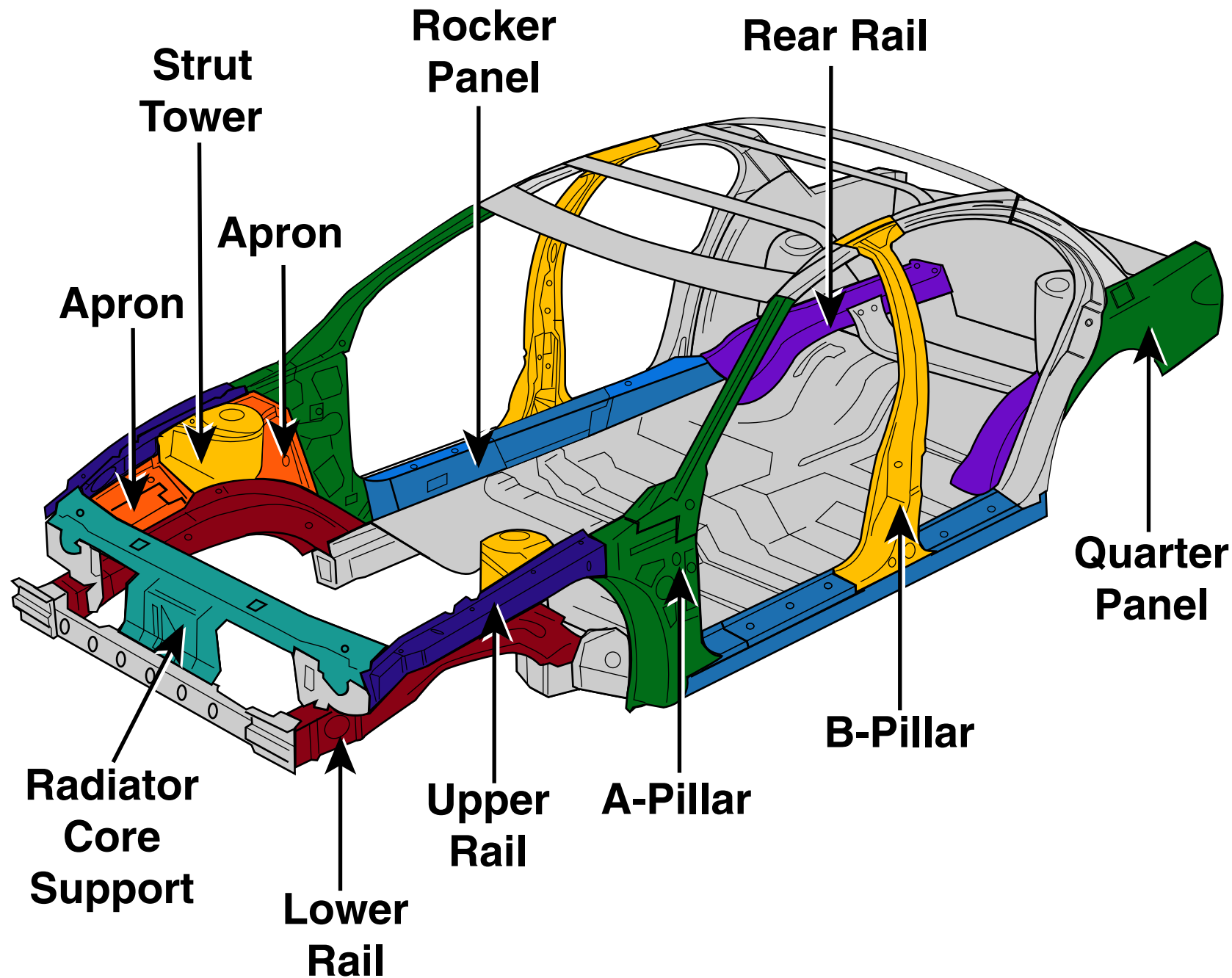
Frame Designs



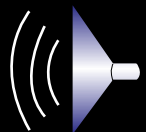
- Combination of characteristics
 - ladder
 - perimeter
- Torque boxes
- C-channel and box-type rails
- Hydroformed
- Collapse zones



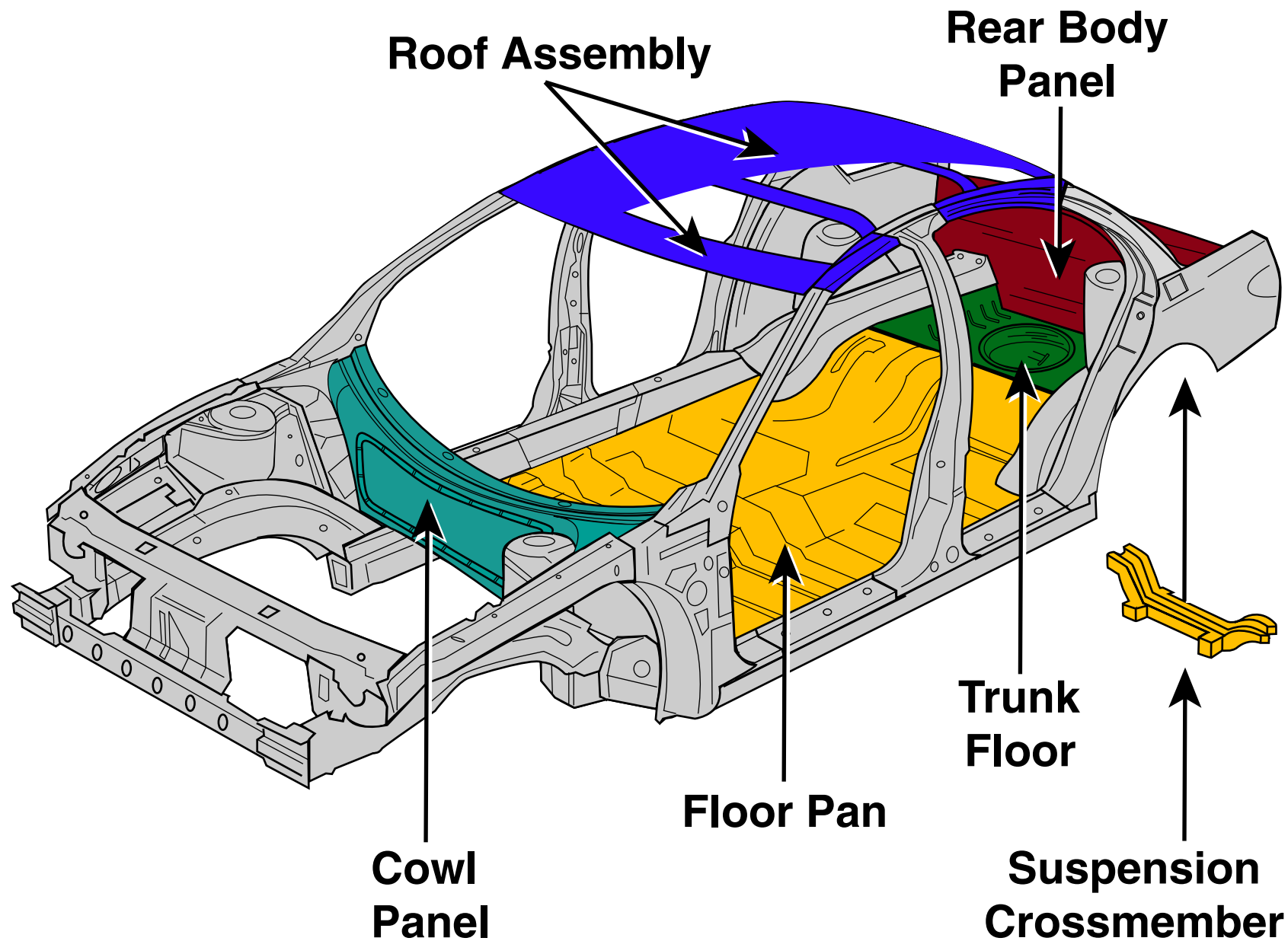
Unitized Structure Identification



- Rails
- Radiator core support
- Strut towers
- Aprons
- Pillars
- Rocker panels
- Quarter panels



Unitized Structure Identification (cont'd)



- Suspension crossmembers
- Cowl panel
- Roof assembly
- Floor pan
- Trunk floor
- Rear body panel

