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VT117L01 | Vehicle Technology Trends and Diagnostics Overview

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- Trends and technologies relevant to collision repair
- Module 1: Trends and some new tools and equipment
- Modules 2 - 4: Specific vehicle maker production for 2017
- Module 5: Some ideas for future model years
- Modules 6 - 9: Diagnostics overview and scan tools

OEMs Commit to Automatic Braking

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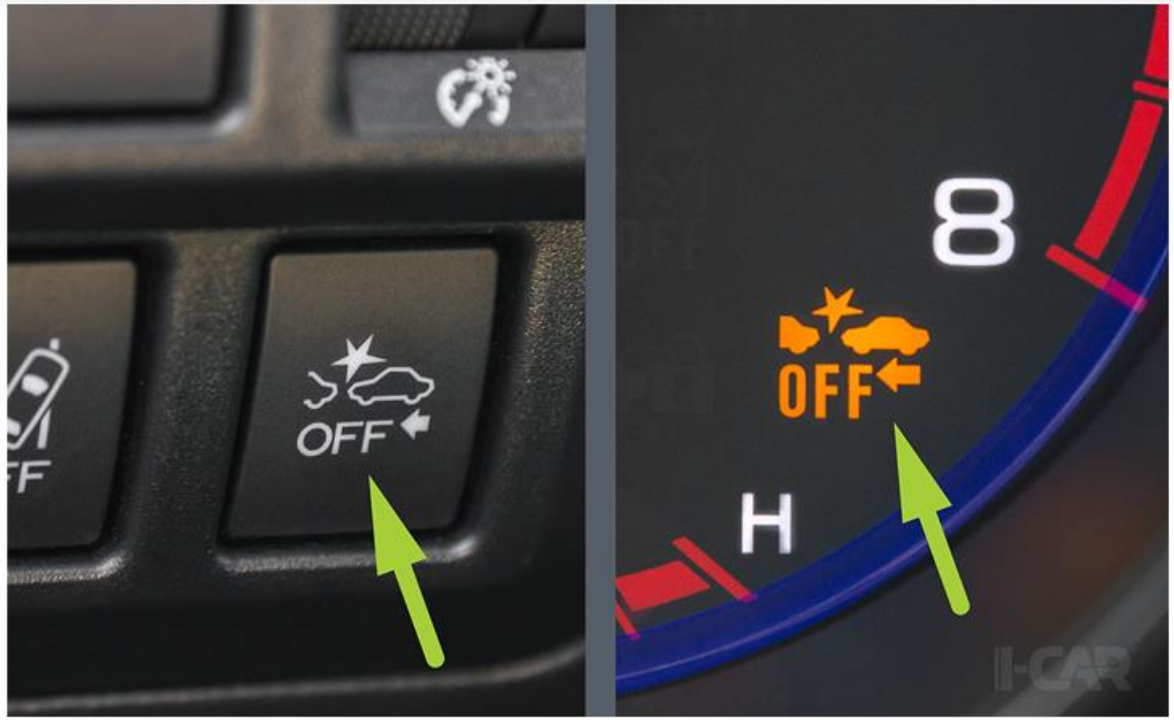
- 20 vehicle makers have committed to making automatic braking standard by 2022
- Toyota plans to have many models so-equipped by the end of 2017
- Honda plans to include as standard on many 2017 CR-Vs



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- Remote parking in a tight space using a key fob while standing outside the vehicle first available on the 2016 BMW 7 Series
- On 2017 Tesla Model S and X
- If popular with consumers, may trickle down

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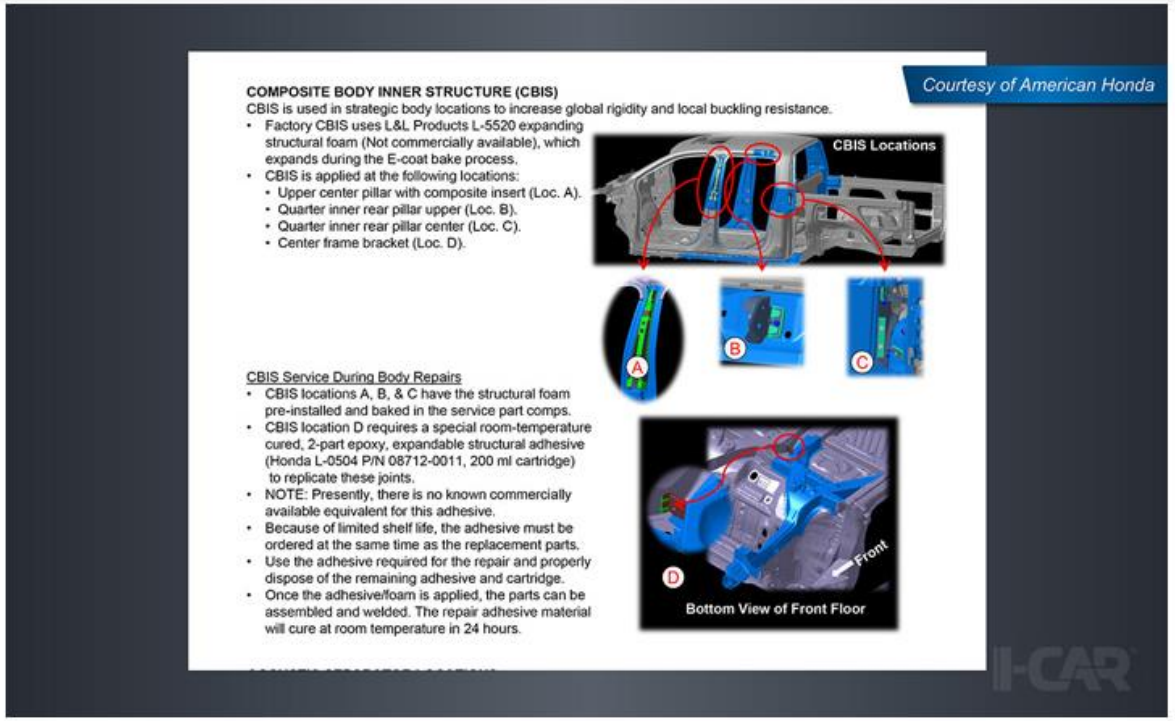
- 2017 Honda Ridgeline in the B-pillars and roof rails
- Fiat Chrysler for several years, including the 2017 Chrysler Pacifica
- BMW 7 Series carbon fiber reinforcements, or carbon fiber core
- Composite is light and can serve a similar purpose as steel



UHSS Front Door Ring

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- Started with Honda / Acura and the 2014 Acura MDX
- Many Honda / Acura models since, including 2017 Ridgeline
- 2017 Chrysler Pacifica has 1,300 MPa front door ring
- 2017 Kia Sportage, Volvo S90

Hybrids Overtaking Diesels

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- Diesels a longstanding trend in Europe and were thought to be the upcoming trend in the U.S.
- Diesel now falling behind hybrids, especially plug-in hybrids
- Diesel emission standards becoming tougher and the cost and performance of electric vehicles continue to improve

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- 2017 Ford F-Series Super Duty, Expedition, and Lincoln Navigator have an aluminum body and bed
- F-Series Super Duty frame is all new, made mostly of high-strength steel
    - front and rear frame module replacement procedures are still an option

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- Windshield and backglass on the Ford GT
- Lightweight hybrid glass technology
- Stronger, yet thinner and lighter than traditional laminated glass
- Testing has shown the glass will not shatter as easily in a collision
- Other vehicle makers have expressed an interest

Honda Revises Weld-Through Primer Recommendation

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- Honda no longer recommending the use of weld-through primer for GMA welding
- Weld-through primer only recommended for spot welding
- Further study from Honda has shown that weld-through primer can negatively affect weld or joint quality

Kia Hybrid Without a 12-Volt Battery

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- No 12-volt battery on the 2017 Kia Niro, Kia's first dedicated hybrid-electric vehicle
- Saves weight
- Power and energy control modules step down the high voltage battery to drive the 12-volt circuits
- Has exhaust gas recirculation system

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- Standard panoramic roof, though carbon fiber roof available
- Carbon fiber door shells, aluminum door skins
- Composite trunk floor
- Rest of the structure and body panels are steel

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- Jaguar Activity Key is a wristband that takes the place of a key fob
- Mixed material construction
- Collision repairs on Jaguar / Land Rover vehicles done by a repair network trained at the I-CAR Tech Center in Appleton, Wisconsin

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- Can tell a vehicle owner about a damaged panel
- Uses sensors bonded to panel backsides that can work with the existing electronics
- Information can include where a scratch is and how bad it is
- Wired into a telematics system like OnStar, information can include when the damage happened

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- Resistance spot riveting process for mixed material joining developed by Arconic, part of Alcoa Aluminum
- Could make its way to shops
- Combinations of steel, aluminum, magnesium, composites
- From floor pans to frame rails
- First application expected in 2018

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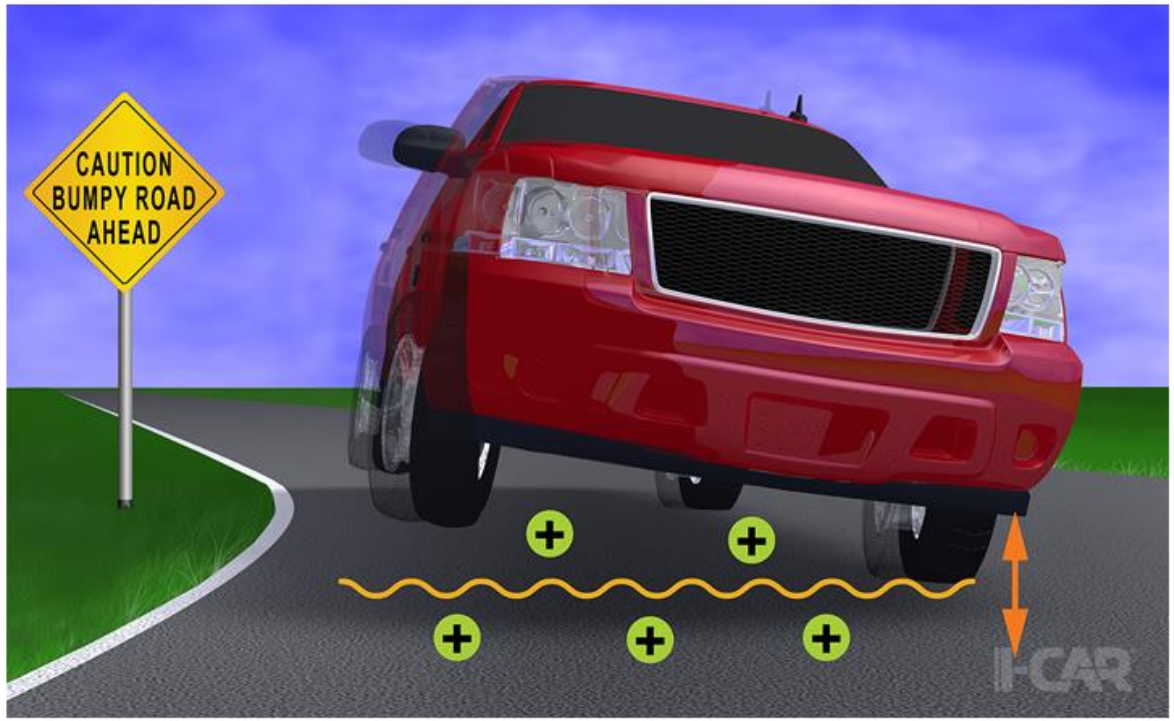
- Electromechanical rotary dampers
- Regenerates energy from bumps in the road
- Dampers replace the hydraulic dampers in the shock absorbers
- Up-and-down movements of the wheel are converted into a spinning motion, which is converted into electricity



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- Several safety systems on vehicles
- NHTSA mandates that many safety systems be standard equipment

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- You don't know what you don't know
- No way of knowing unless a complete scan is completed
- Relying on dash indicator lamps is not acceptable

Advantages of a Pre-Repair Scan

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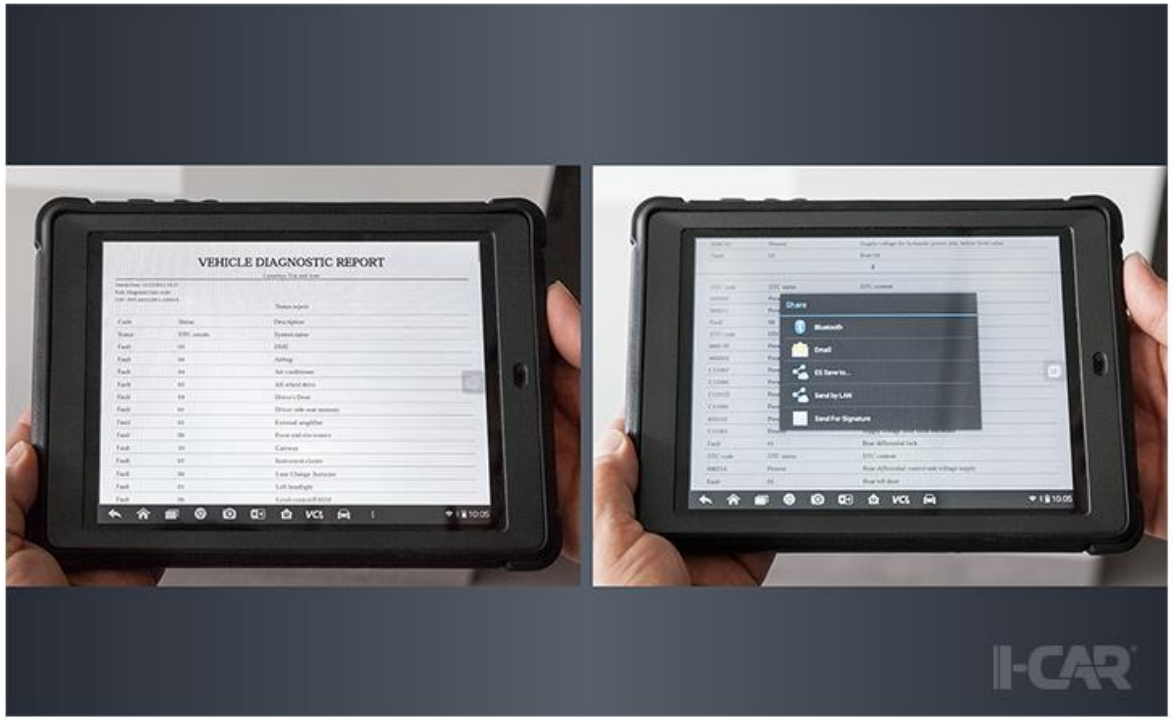
- Can identify and document any active diagnostic trouble codes or DTCs
- Can identify pre-existing codes
- Can be noted during a post-scan for set codes
- Identify calibration requirements up front
- Improve cycle time



Advantages of a Post-Repair Scan

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- Is a quality control check
- Ensures all items are corrected
- Removes the digital footprint

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- Can vary greatly in diagnostic capabilities
- Some can perform calibrations and OEM-specific tests
- Identify codes to include both OBD II and OEM
- Research and discuss with vendor

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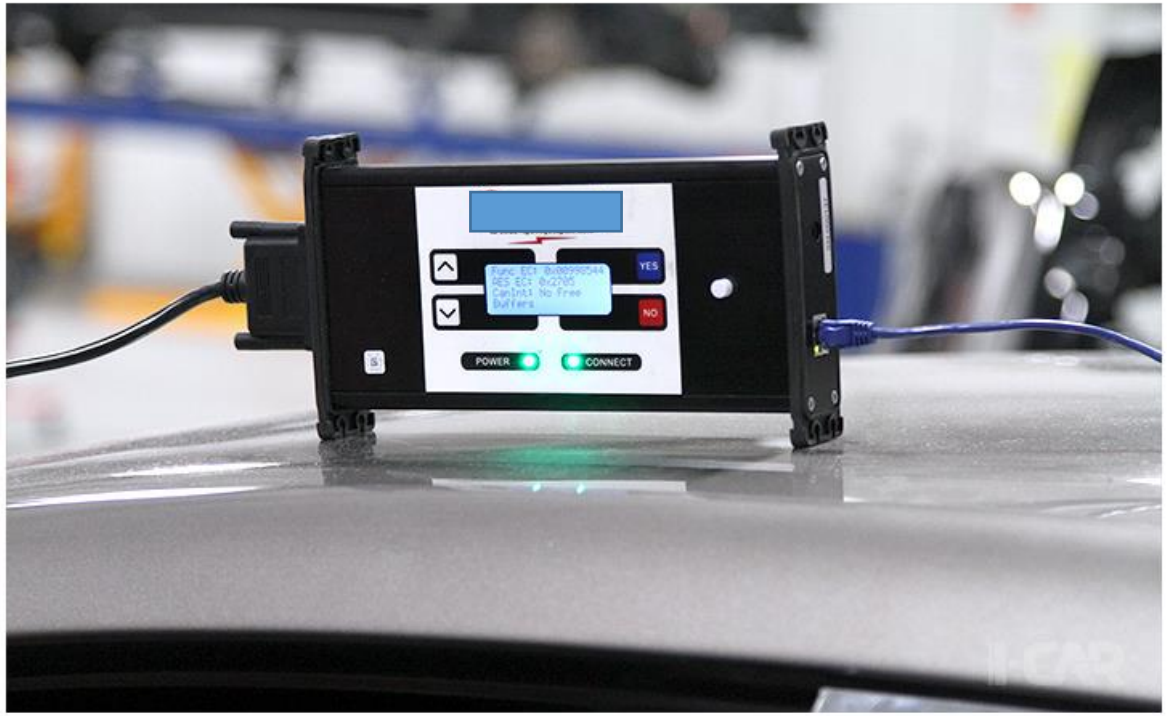
- Allows a facility to perform a pre- and post-repair scan without a scan tool
- Connects vehicle to remote computer equipped with OEM software
- Service technicians scan and provide guidance



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- MSOs may choose to have one or more diagnostic technicians that can travel between facilities
- Dedicated vehicles allow them to have tools, parts, and materials with them
- Makes for a faster repair

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- Sublet to a diagnostic technician specialist
- Can perform the more advanced procedures such as calibrations
- Can prevent vehicle from leaving repair facility
- May require vehicle to go to a facility equipped to handle OEM requirements