

Automated Driver Assist Systems Service Related Challenges

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ADAS – How It Works for Drivers

CADILLAC SUPER CRUISE™



Engineers



Wes Rupert
Electrical Engineer EMC Group Delphi
Kokomo, Indiana USA

Gap



- Engineers Don't Know Technician Needs
- Engineering Time Limitations and Budgets

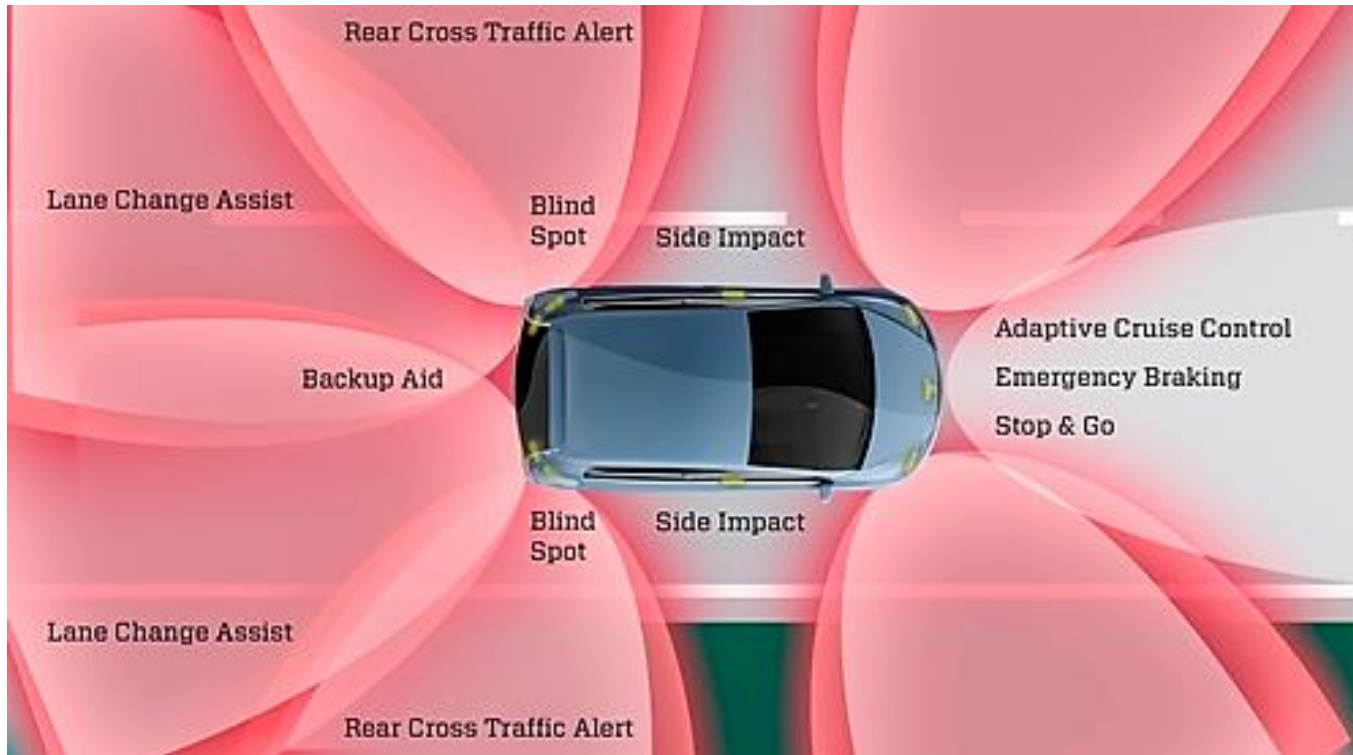
Technicians



Taurai Sewera
Auto Repair Shop Owner
Harare, Zimbabwe

Radar Service

- Multiple Radars – Potential for Multiple Problems!



**25GHz Ultra
Wide Band
Radars**

**24GHz Narrow
Band Radars**

**77GHz Multi
Mode Radars**

Radar Diagnostics

- Little or No PIDs or Field Tests Beyond CAN Bus Based DTCs
- Lower Frequency Radar Sensors Can be Checked with Radar Detector
- All Radar Sensors Have a Heat Signature . . . IF Activated
- Some Radar Sensors are Coded to Location via Harness Pin Ground



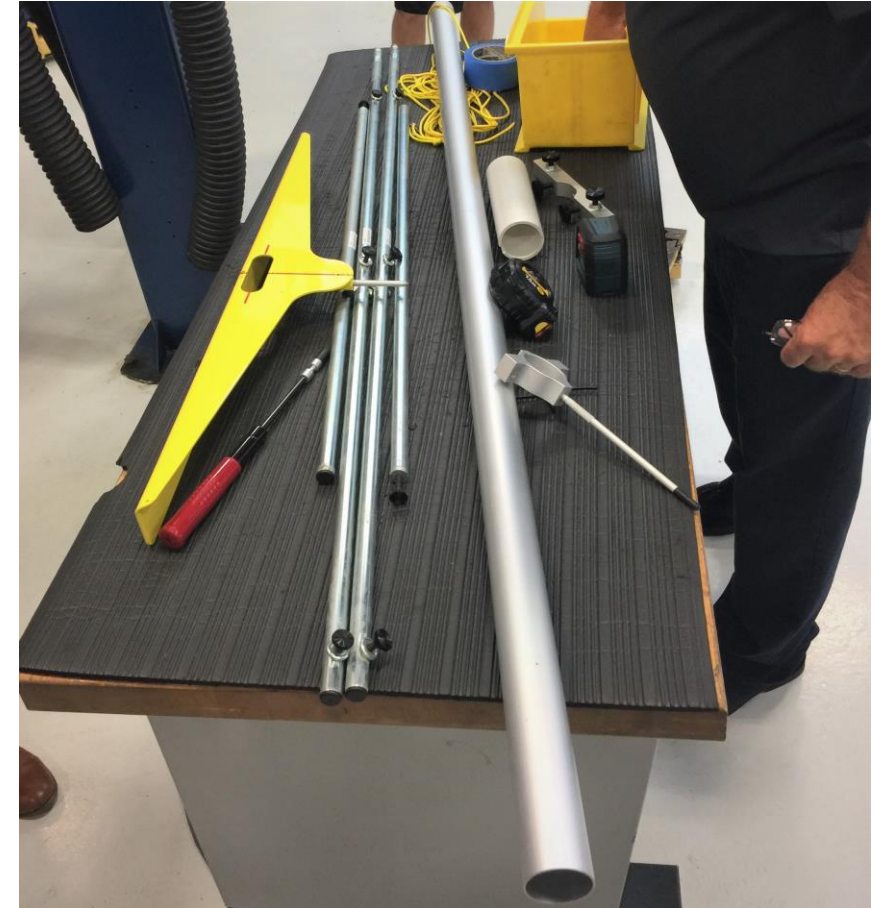
Radar Calibration

- **Reasons for Calibrations;**

- ✓ Radar Sensor Replacement
- ✓ Radar Sensor Mounting Hardware Bent / Damaged
- ✓ Body Damage
- ✓ Chassis Alignment

- **Types of Calibrations**

- ✓ Static Calibration
- ✓ Dynamic Calibration



Aiming Precision



Courtesy American Honda

Target- 30 cm

Aiming Precision



Courtesy American Honda

0° offset, 205 m

Aiming Precision



Courtesy American Honda

1° offset, 205 m

Smart Camera Service



Cameras in Grill

Cameras behind Windshield

Cameras in Side Mirrors

Cameras on Trunk

Cameras everywhere!

Smart Camera Challenges – “What If’s”



Smart Camera Challenges – “What If’s”



Smart Camera Challenges – Ford's Development



Courtesy Ford Motor Company

Smart Camera Challenges – Ford's Development



Courtesy Ford Motor Company

Smart Camera Challenges – Ford's Development



Courtesy Ford Motor Company

Smart Camera Calibrations

- **Reasons for Calibrations;**

- ✓ Camera Replacement
- ✓ Camera Mounting Hardware Bent / Damaged
- ✓ Windshield Replacement

- **Types of Calibrations**

- ✓ Static Calibration
- ✓ Dynamic Calibration



Calibration Challenges – OEM vs. Aftermarket

CONSULT-III plus Ver.85.11 Ver.CSP41.10 VIN:1N4BL4EV3KC161929 Vehicle : ALTIMA L34 2019 Country : United States

Back Home Print Screen Screen Capture Measurement Mode Recorded Data Help ERT 12.3V VI MI

Diagnosis (All Systems) Select Vehicle Confirm Vehicle Diagnosis (All Systems) LASER/RADAR

Work support : MILLIWAVE RADAR ADJUST

This display direction is looking from driver seat side.

Retry

Current status Completed

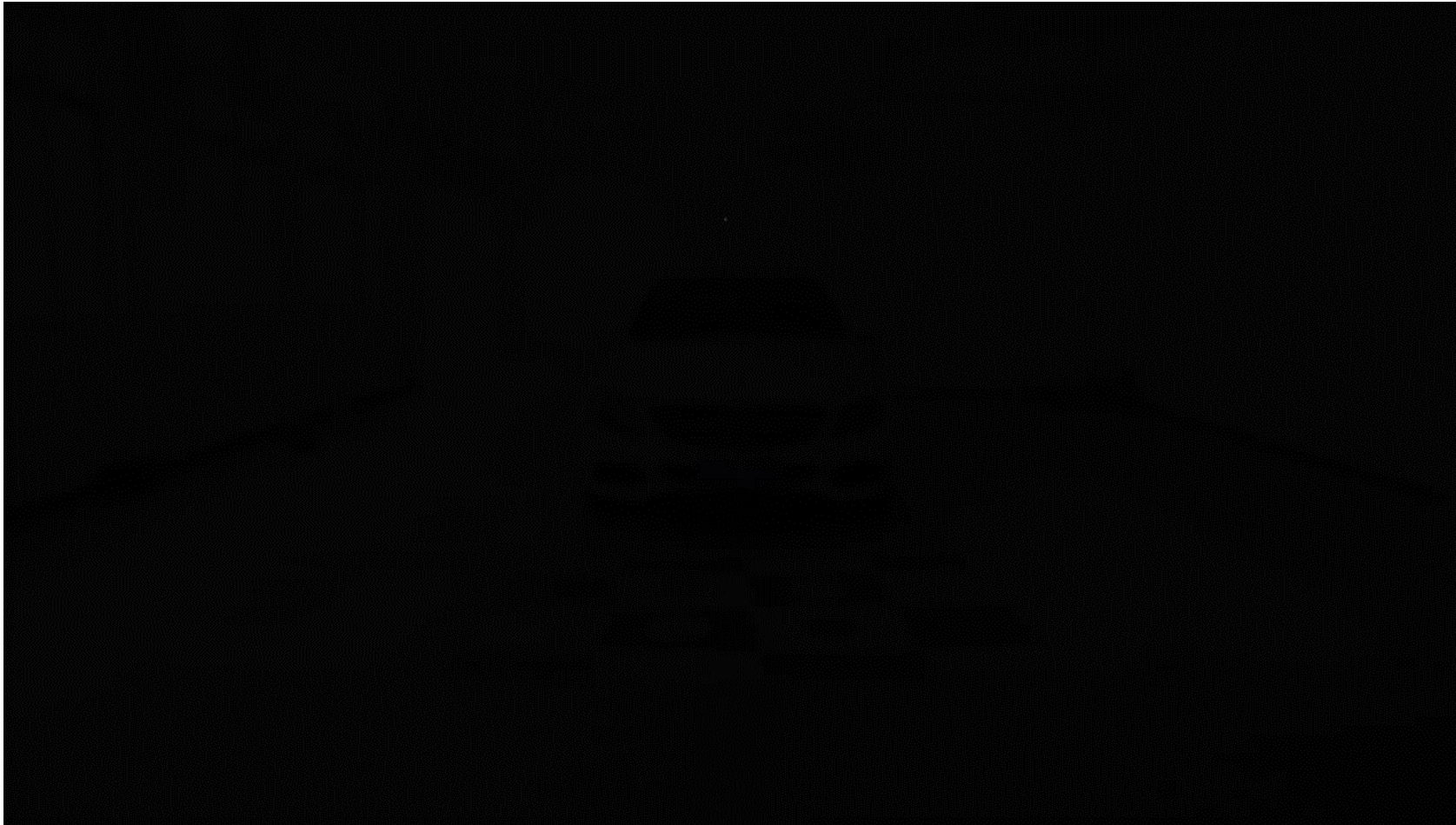
MONITOR

Vertical Angle	Radar angle	UpW	
Vertical Angle	Radar measurement result	-2.17	deg
Horizontal Angle	Radar angle	LeftW	
Horizontal Angle	Radar measurement result	2.34	deg
Alignment status	Alignment complete		

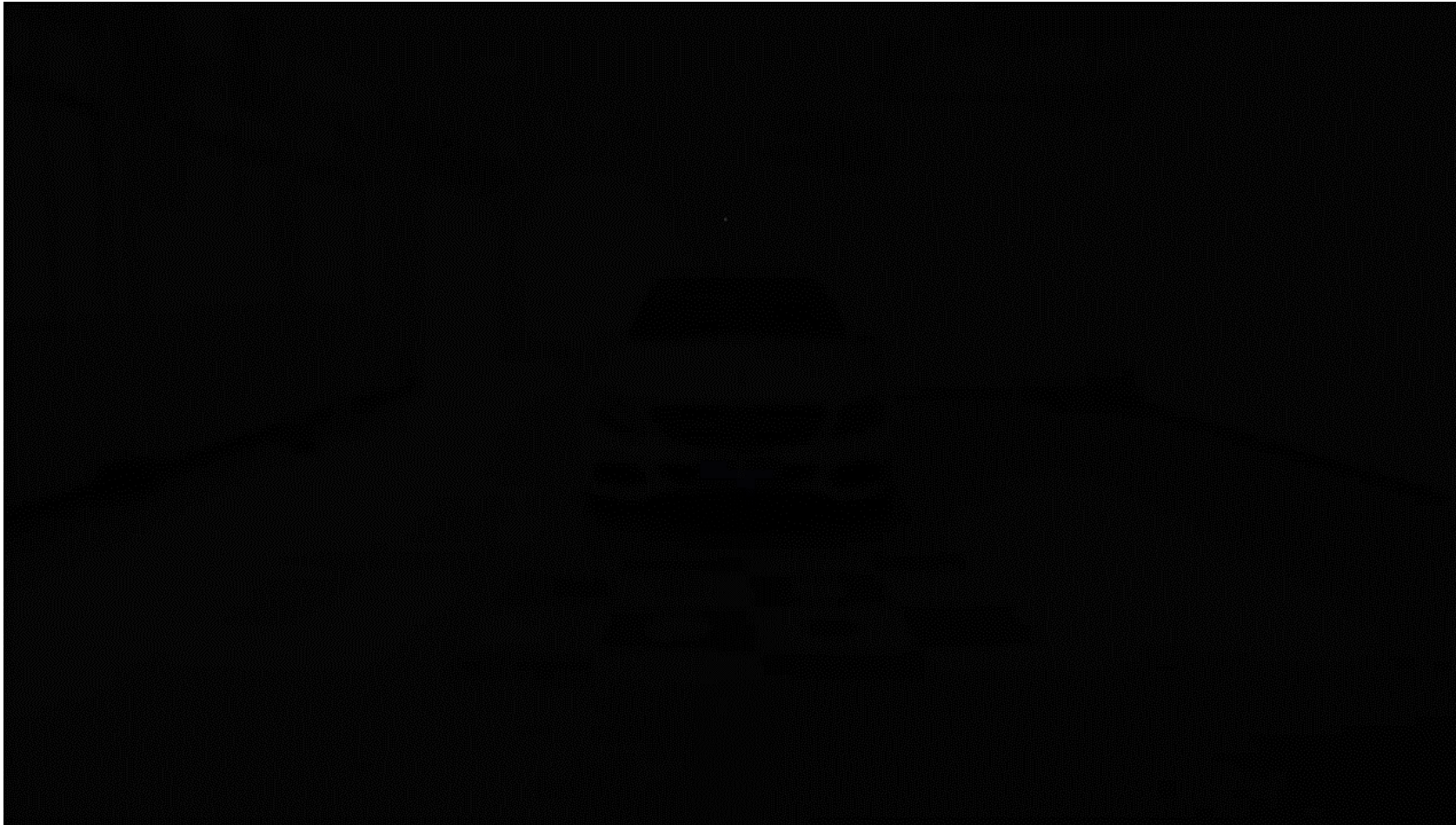
End



Calibration Challenges . . . Space



Calibration Challenges . . . Space



Steering Complaints?

A Steering Pull Complaint Would Prompt You to Check _____?

- a) Steering Angle Sensor
- b) Alignment
- c) Tire Condition
- d) Tie Rods / Control Arms



Customer Education – It's NOT Autonomous (Yet)



Customer Education – It's NOT Autonomous (Yet)



Thank You!

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