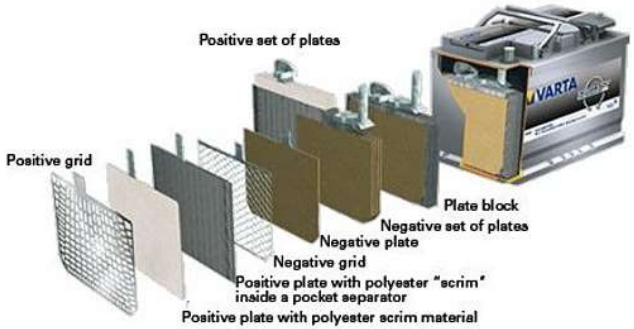


NEW BATTERY TECHNOLOGY

NEW POWER SYSTEM TECHNOLOGIES IN VEHICLES, HOW THEY ARE CHARGED AND TESTED, AND CHALLENGES FOR SERVICE PROVIDERS

etri™

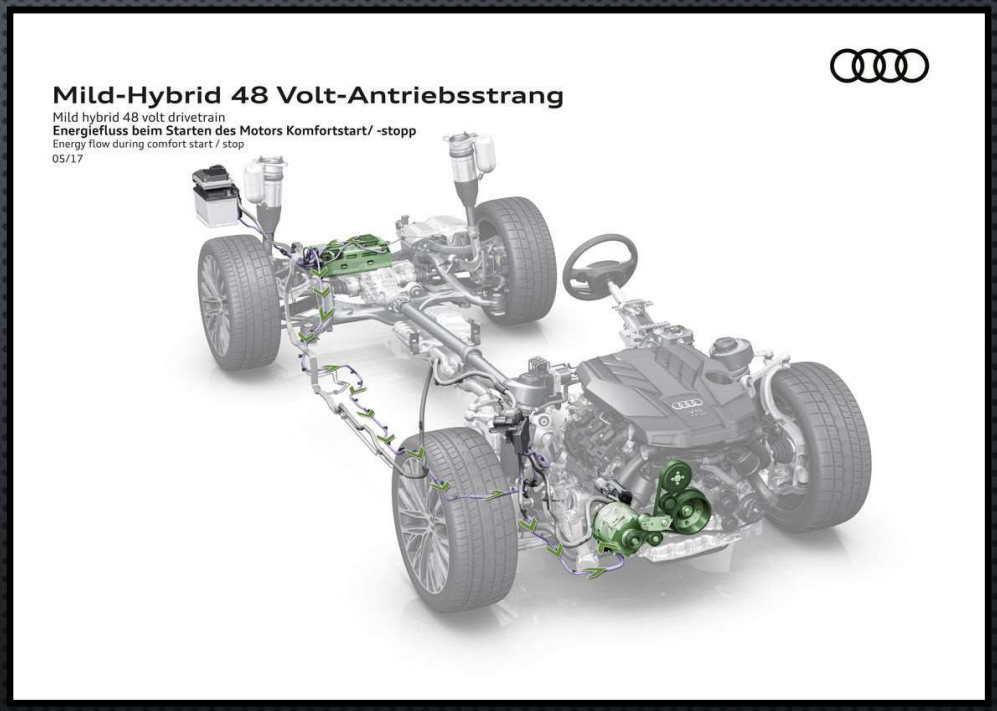
NEW BATTERY TECHNOLOGY

- **VEHICLE POWER SYSTEMS**
  - JEREMY CORDRAY, NORTHSTAR BATTERY
- **TESTING & CHARGING**
  - GARY MACKEY, ASSOCIATED EQUIPMENT
- **IMPACTS TO SERVICE PROVIDERS**
  - GEORGE HOFFMAN, SEARS

THE AUTOMOTIVE INDUSTRY IS UNDERGOING THE MOST SIGNIFICANT CHANGE SINCE HENRY FORD INDUSTRIALIZED AUTOMOTIVE MANUFACTURING. WHILE THE PAST 100 YEARS WERE LARGELY FOCUSED ON INCREMENTALLY ENHANCING MANUFACTURING TO BECOME MORE EFFICIENT FOR MASS SCALE, THE FUTURE IS ABOUT REDEFINING THE ROLE OF THE VEHICLE FOR PASSENGERS.

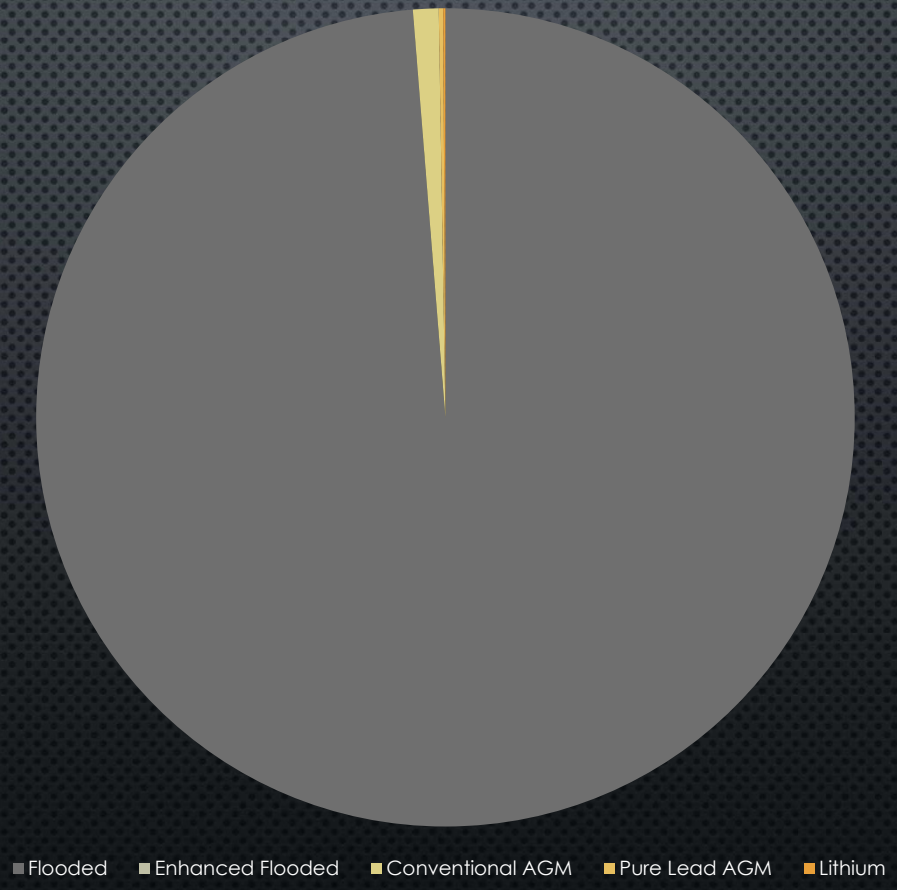
POWER SYSTEMS IN VEHICLES

- 12V
  - Flooded
  - Enhance Flooded
  - Calcium Absorbed Glass Mat (AGM)
  - Thin Plate Pure Lead (TPPL) AGM
  - Li-Ion
- 24V
  - Heavy Duty/Commercial
  - Group 31 & 8D
- 48V and Higher
  - Hybrid/Electric (Mild, Full, Stop-Start)
  - Lithium (LiFePO, Li-Ion,)
  - Lead Acid AGM



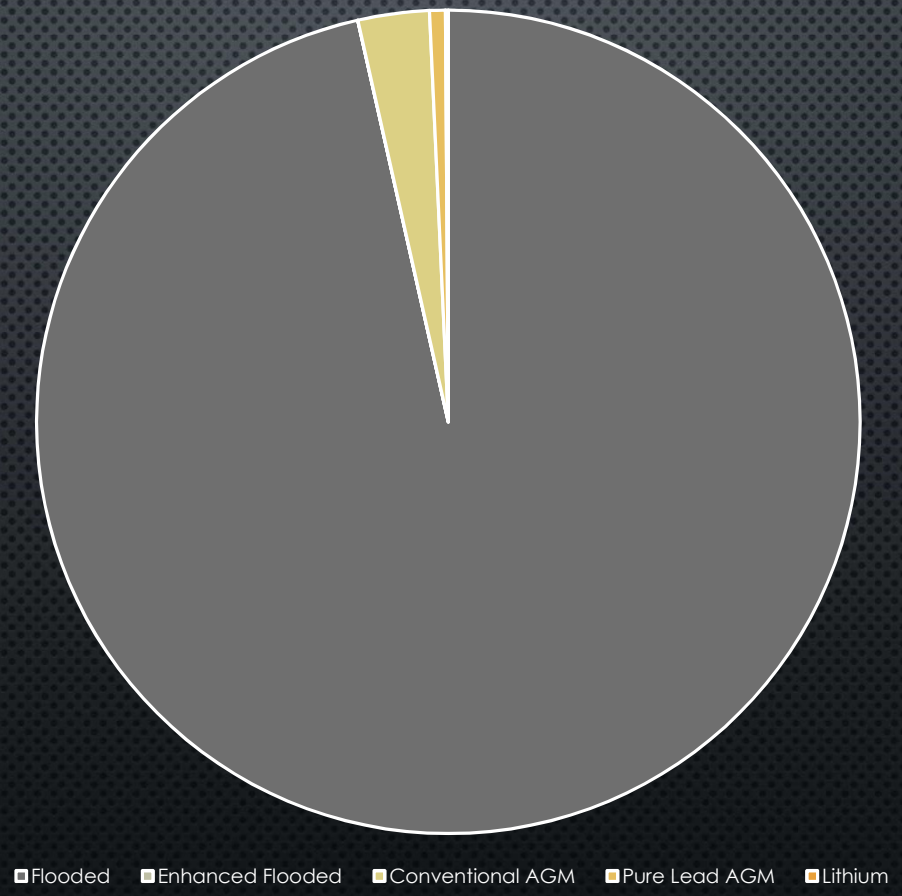
WHERE IS THE MARKET GOING?

- VEHICLE BATTERY MARKET (NORTH AMERICA) 2006*



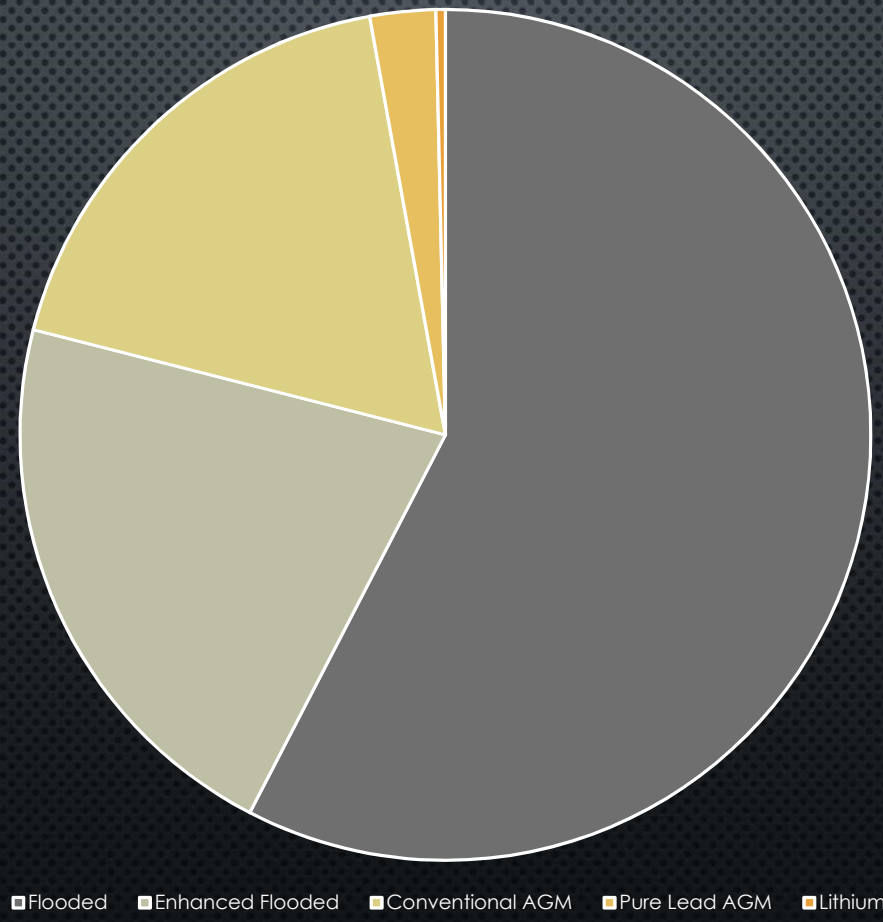
WHERE IS THE MARKET GOING?

- VEHICLE BATTERY MARKET (NORTH AMERICA) 2016

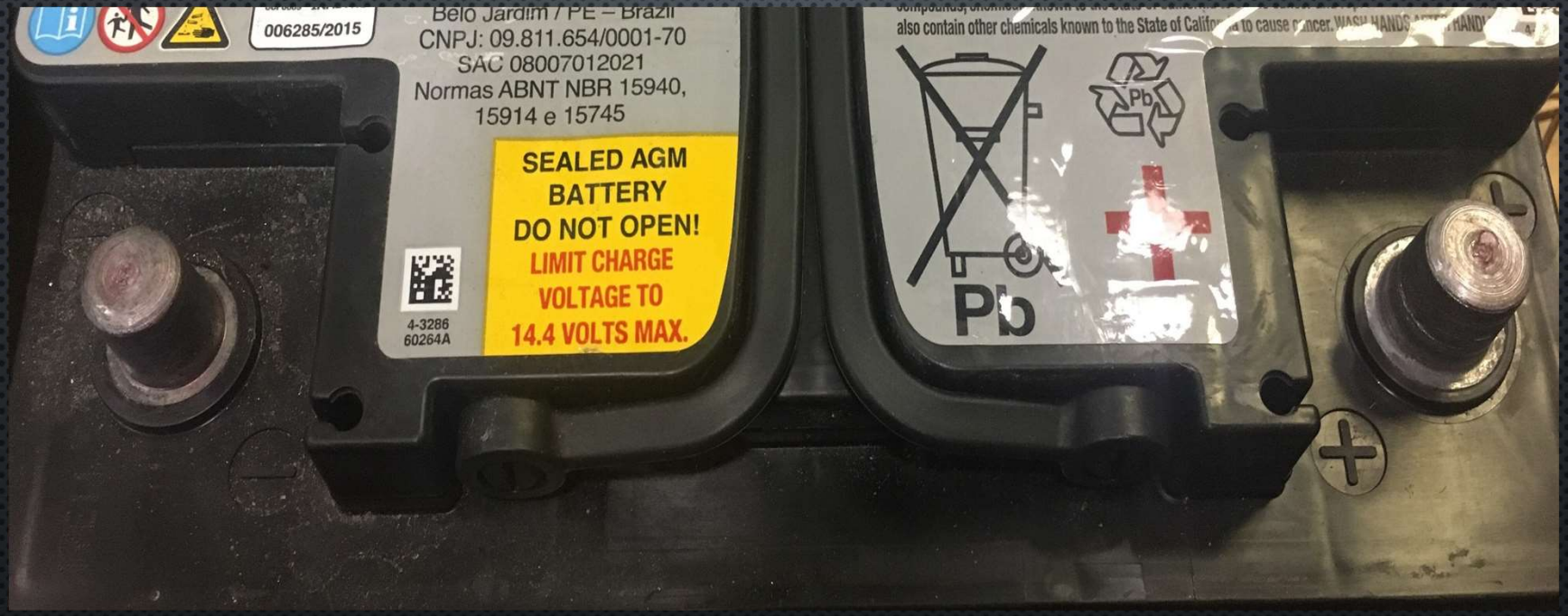


WHERE IS THE MARKET GOING?

- Expected Vehicle Battery Market (North America) 2026

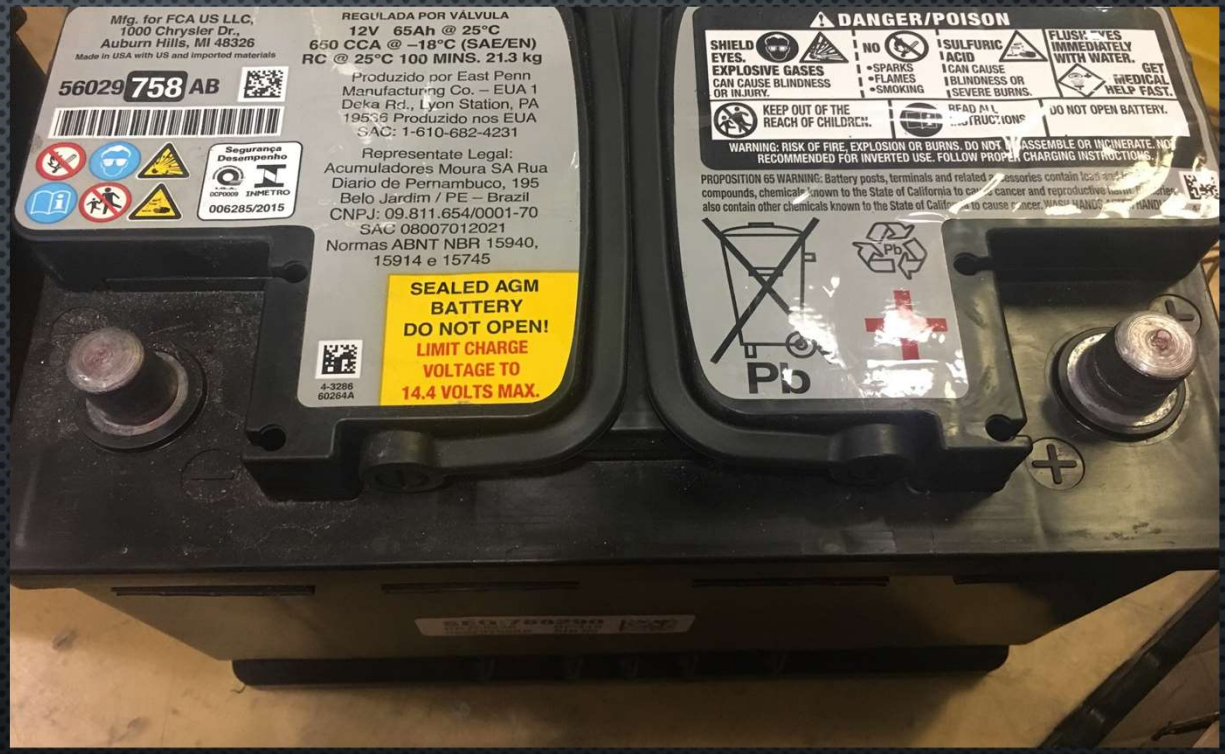


OEM BATTERY AND VEHICLE MANUFACTURE CHARGING REQUIREMENT



CHARGING REQUIREMENTS FROM BATTERY AND OEM VEHICLE MANUFACTURES

- Sealed Led Acid range 14.8V to 15.8V
- AGM range 14.4V to 14.9V
- Lithium Ion range 13.6V to 14.4V
- EFB range 14.4V to 14.8V
- Gel-Cell range 13.7V to 13.9V
- 48V Lithium Ion batteries are here. Dedicated Charging Port will Be required
- Hybrid Batteries Typically 380V to 460V Requiring 220V to 440V AC dedicated charging station



THE RESULTS OF AN AGM BATTERY CHARGED AT TOO HIGH OF VOLTAGE

WHY AGM OR OTHER NEW TECHNOLOGY BATTERIES

- Longer life up to twice that of a SLA battery
- Environmentally friendly, little to no free flowing electrolyte, no gassing or odor
- Retains charge much longer, when vehicle is not drive for a period of time
- Very resistant to vibration
- Can be mounted virtually anywhere even on it's side
- Lithium Ion batteries are typically smaller and lighter

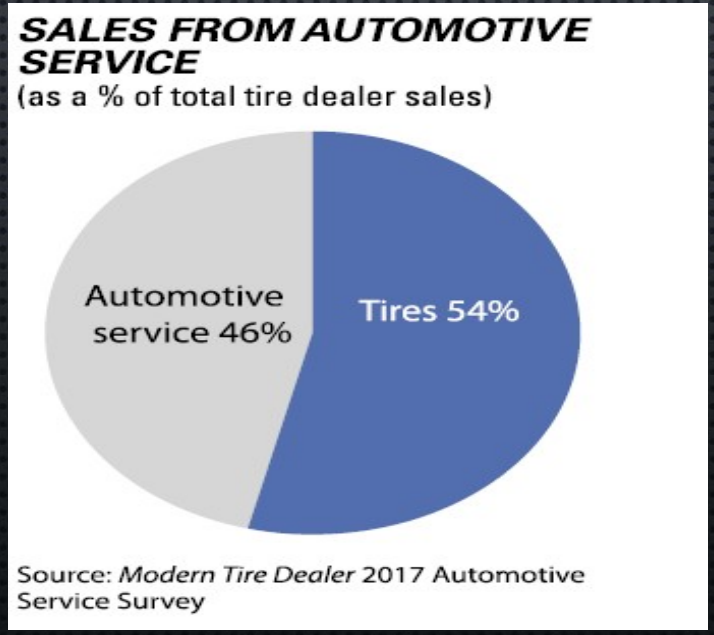
PREPARING FOR FUTURE TECHNOLOGY CHANGES

- Hybrids
- Autonomous and Electric Cars
- 12v / 24v / 48v Electrical Systems?
- Electrification / Energy Storage
- Fuel Cell Technology?
- The connected vehicle
- Telematics
- User Interface Technologies
- Customer Experience / Customer Interface

Service Challenges

Technicians, emerging technology, speed of change, Training and retention are just a few of the challenges service providers must address today and the future.

EMERGING TECHNOLOGIES SUCH AS AUTONOMOUS AND ELECTRIC VEHICLES, CONNECTIVITY, TELEMATICS SAFETY ENHANCEMENTS "ARE CHANGING" CUSTOMERS PERCEPTIONS ON WHERE TO HAVE THEIR VEHICLE SERVICED.



TESTING NEW TECHNOLOGY BATTERIES

- Challenges today, many batteries are remotely mounted either under the seats or in the trunk compartment, tech's often take the short cut by testing at charging posts. Several feet of cable effects the accuracy of test
- Sealed Led Acid, AGM, EHB, Gel-Cell Batteries can be tested by a number of technologies currently available in the market today including Conductance / Resistance, Load Testing, or Reserve Capacity Testers
- Conductance or Resistance testers requires the tester to be hooked to the battery posts for best accuracy of test
- Load Testing either carbon pile or electronic variable load testing can be done at charging post but battery must have 12.4V or more for accuracy of test
- Reserve capacity testing, requires testing at battery terminals for best accuracy of test

CHALLENGES FOR SERVICE PROVIDERS

- New Battery types to deal with including AGM flat plate and spiral, Lithium Ion, EFB (Enhanced Flooded Batteries), Gel-Cells, and Standard SLA (Sealed Acid Batteries)
- Most batteries are not marked well and often in battery cases or remotely mounted where their not easily visible to identify
- Identifying battery type for prober charging or testing
- Knowing Proper charging voltages with in each battery type or even brand
- Remote battery testing pulling seats or trunk liner out to access batteries When using Conductance, Resistance, or Reserve Capacity Testers
- Hybrid or electric vehicle batteries very high voltage and requires extensive training to safely service these battery systems, All Hybrid and Electrical Vehicles still have a 12V battery to be serviced

Challenges for service providers – cont.

- Start / Stop systems
- Security and convenience
- Navigation
- Availability of repair information
- Shop management
- Consumer Education!
- Shop marketing / integrating the future
  - Warranty
  - Preventative maintenance
  - Vehicle repairs

THE OVERLOADED LEAD ACID / AGM BATTERY AND VEHICLE CHARGING SYSTEM.

- Infotainment systems and options
- Navigation systems / Communication
- Electric PS Pumps, Compressors, fans, pumps, etc. etc..
- Operating vehicle under electric loads w/o engine on can result in excessive battery load and wear, customer discomfort and possibly fuel economy loss
- Shop management
- Consumer Education!
- Shop marketing / integrating the future
  - Warranty
  - Preventative maintenance
  - Vehicle repairs

THANK YOU

QUESTIONS ?