Reuse then Recycle

RESPONSIBLE REUSE OF HIGH VOLTAGE VEHICLE BATTERIES USING CERTIFICATION PROTOCOLS

- ARA is highly engaged and has made it one of our highest priorities to address any gaps in information, resources and training for our members and the auto recycling industry. We know that training and resource materials must be dynamic to address the rapid pace of change in the EV marketplace.

- The automotive recycling industry has become more complex as vehicles become more advanced. As a result, the demand for training that increases safety, efficiency, and profitability has become a vital need.

TECHNICIAN TRAINING

HVV Dismantler/Technician Certification - The Facility has provided the ARA Electric and Hybrid Vehicle Technology Guide to each High Voltage Vehicle Technician.

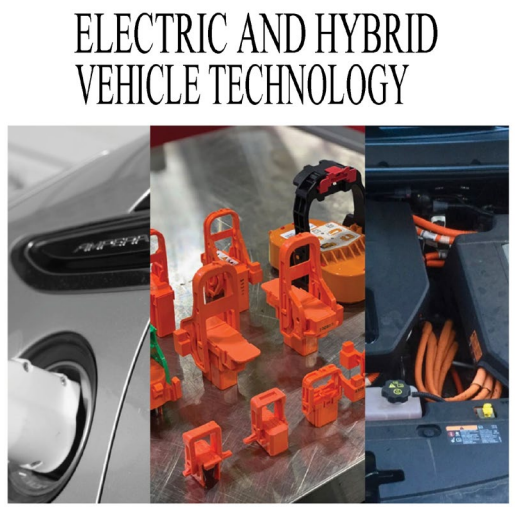
Download the ARA Guide and distribute to each technician working with HVVs, https://arauniversity.org/electric-hybrid-vehicle-technology-guide/

HVV Dismantler/Technician Certification - All HVV technicians have completed the eight (8) ARA University training modules. https://arauniversity.org/

HVV Dismantler Technician Certification - All HVV Dismantlers have read and signed the HVV Protocol.

The High Voltage Vehicle Dismantling protocol is the guide to the industry standard for safer management of hybrid and high voltage vehicles.

Download the HVVD protocol at https://aracertification.com/electric-vehicles.

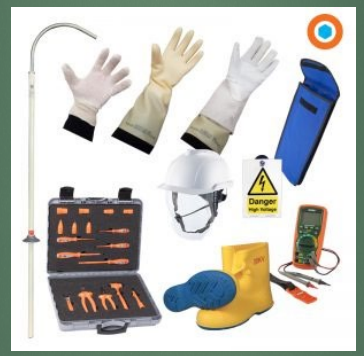


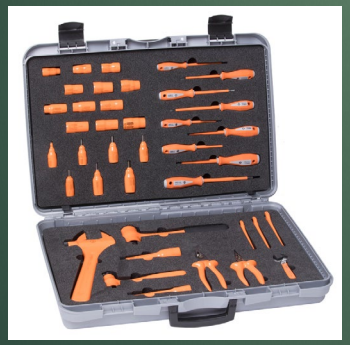
COMPLIANCE MATTERS
ARA CERTIFICATION IS THE TOOL

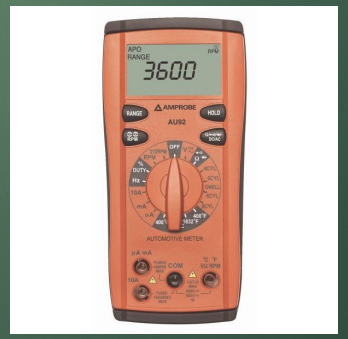
The professional automotive recycling industry places significant emphasis on the importance of certification. For over 20 years the ARA Certified Automotive Recycler (CAR) Program has provided professional automotive recyclers with a set of standards for general business practices, environmental and safety issues.

The program is one of the cornerstones of ARA and industry partners recognize CAR certified automotive recyclers as market leaders.

FACILITY READINESS







Certified Auto Recyclers should be prepared for end-of-life EVs by stocking ALL NECESSARY supplies and equipment to protect dismantlers/technicians and the facility.

ALL High Voltage Vehicle (HVV) batteries pose a risk to everyone if not properly prepared, trained and using all necessary standard operating procedures.

Stock the proper Personal Protection Equipment (PPE) to safely handle HVV's such as:

- Lineman hook
- Electrical Safety Gloves
- Insulated electric-protective glove liners
- Leather glove covers
- Face Shields
- Dielectric Over boots
- Insulating Rubber Apron

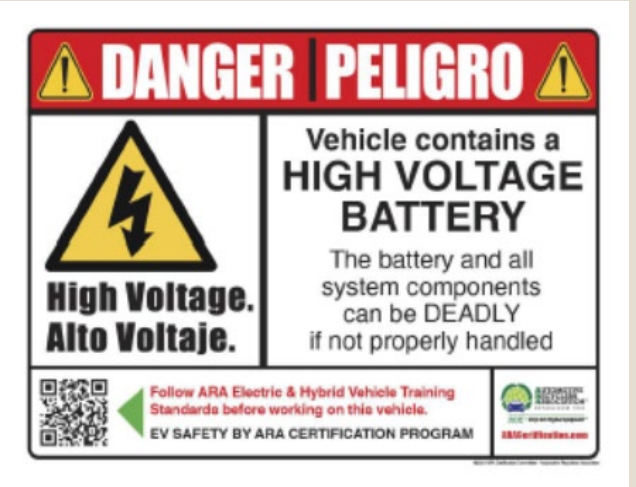
Stock the proper Specialized Tools for processing High Voltage Vehicles

- Insulated tools- must be rated to 1000V
- Digital Multi Meter

HVV Shipping Certification - Shipping personnel are trained and certified within the last three (3) years for packaging and shipping of HazMat and/or Dangerous goods including Lithium-Ion High Voltage Vehicle (HVV) batteries.

High Voltage Vehicle Dismantling Protocol

Collection & Check-In



- **The facility documents the vehicle record with the words HIGH VOLTAGE at the first opportunity after purchase.**
- **Upon acquisition, the Hybrid or Electric Vehicle (H/EV) should be noted in the vehicle record to be a High Voltage Vehicle (HVV).**
- **The facility has trained their transportation drivers and vehicle moving specialists on the potential dangers of High Voltage Vehicles (HVV).**
- **During vehicle collection - During the vehicle retrieval process, when an HEV/EV is identified, the vehicle must be clearly marked, so the vehicle is easily identifiable as "High Voltage" ARA High Voltage Warning signage must be applied to multiple sides of the vehicle.**
- **Vehicle on site and initial check in - Once the HEV/EV arrives at the recycler's location, if it has not been done already, the ARA High Voltage Signage must be added to multiple sides of the vehicle. Battery is intact signage to alert anyone near the vehicle that the high voltage battery is still intact, so the danger of electrocution exists. Download the BATTERY INTACT sign at https://aracertification.com/electric-vehicles.**

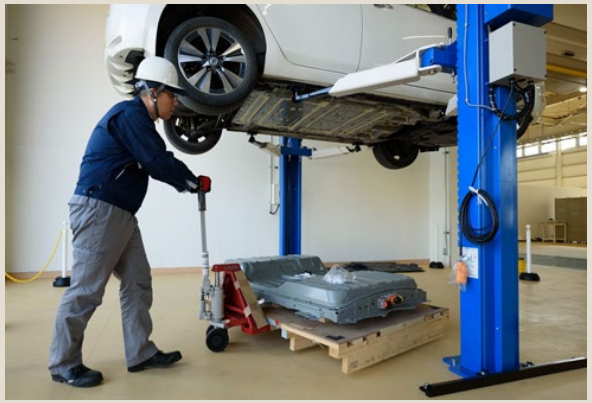
High Voltage Vehicle Dismantling Protocol

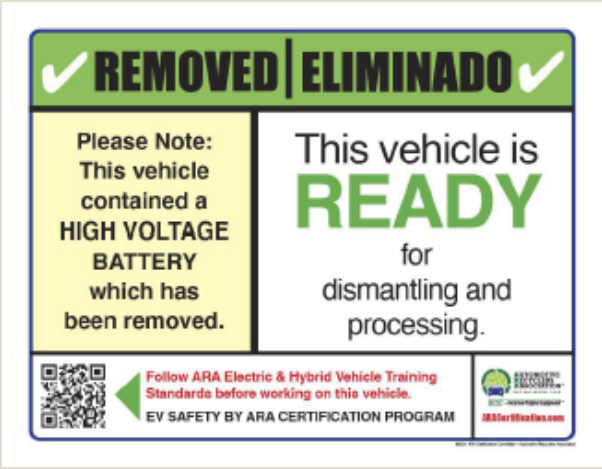
Battery Removal

- At the proper point in the inventory process, and as soon as possible to not disrupt the correct retrieval of information and processing of the vehicle, a trained team member utilizing the proper PPE removes the High Voltage Battery Disconnect Service Plug and ties it to the steering wheel.

- The technician should place the master disconnect on their tool cart away from the vehicle and let the vehicle discharge for a minimum of 15 mins before working on the vehicle. The dismantler/technician should place the master disconnect on their tool cart away from the vehicle and let the vehicle discharge for a minimum of 15 mins before working on the vehicle.

- After check in, inventory and any dismantling needs for the system to be complete, at the first possible point in the process, the High Voltage Battery is removed. Team members utilize the proper PPE and follow the manufacturers procedures for the proper removal of the battery.



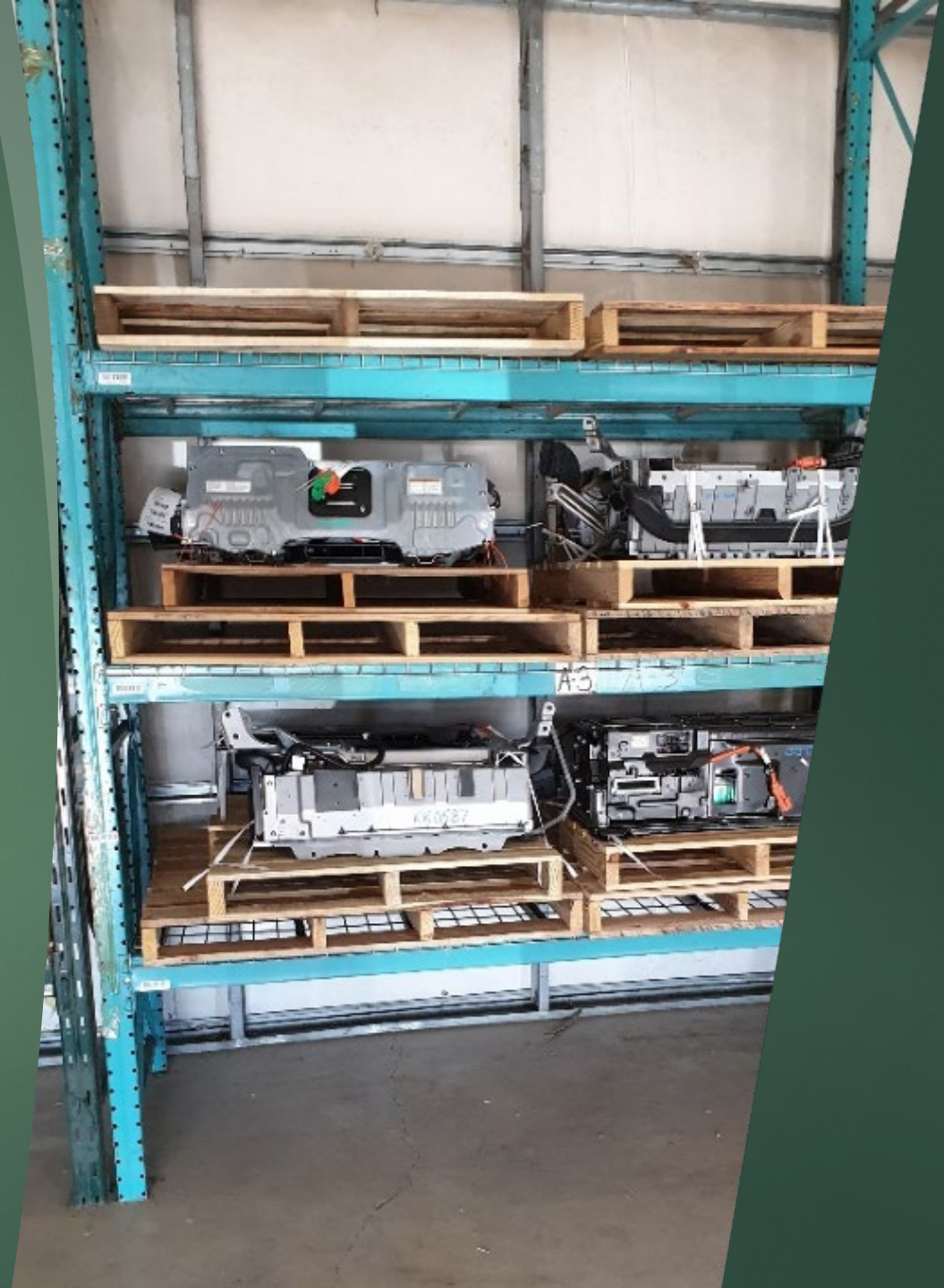


Battery Storage After Removal from Vehicle

The High Voltage Battery should be properly stored for future sale as a ROE component or for proper recycling. The storage must follow local fire code. It is recommended that quantities of batteries be stored in a separate area, if possible segregated in a separate building or protected outdoor structure, that is easily identifiable and accessible in the event of an emergency.

Store away from other combustible materials whenever possible and away from moisture, direct sunlight and in a clearly marked and controlled area. Nickle-metal hydride (NiMH) and Lithium-ion (Li-ion) batteries must be separated in the storage area.

Batteries can be stacked no more than two high and must be separated by a non-conductive layer such as wood or rubber sheeting. Follow the specific storage instructions for each type of battery (see ARA University and reference the Electric and Hybrid Vehicle Technology Guide)



STANDARD OPERATING PROCEDURES

Transportation of High Voltage Batteries

- **The facility has the trained and certified staff and understands that High Voltage Battery pack assemblies must be transported as “Dangerous Goods” when shipped on ground transportation or shipping carriers.**

- **Transportation – Once the connectors or leads are protected to prevent short circuit, the Lithium-Ion Battery or cell should be wrapped with adequate dunnage to prevent movement or damage and secured or strapped to a non-conductive shipping container such as a wooden pallet or crate or other strong outer packaging conforming to general packaging requirements. Batteries must be secured to prevent inadvertent movement, and the terminals may not support the weight of other superimposed elements.**

- **https://aracertification.com/electric-vehicles**

REUSE THEN RECYCLE™

AUTOMOTIVE RECYCLERS ASSOCIATION®
ESTABLISHED 1943
ROE – Recycled Original Equipment®

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