



Date: November 17, 2014  
Order No.: SM-B-54.10/11  
Group: 54

**SUBJECT: MY-All, Models 451.391/.491  
Handling High-Voltage Batteries After an Accident with Airbag and/or  
Pyrofuse Triggering**

### Initial Analysis

When the vehicle is received, the accident vehicle must be examined by qualified skilled personnel (who have received product training) for any possible damage to the high-voltage battery (HV battery) which can include:

- Visible mechanical damage to the HV battery (if body deformation is visible at or around the HV battery, the HV battery must be removed if necessary using protective equipment)
- Electrolyte leakage (visible or smellable)
- Heat development (heat tinting)
- Coolant leakage / refrigerant leakage from battery housing

If one of the criteria is applicable, suitable measures must be implemented immediately by the skilled personnel.

See AH54.10-P-0007-01EZV, AH54.10-P-0007-01MEV

If a repair order has been issued for the vehicle, the HV battery must be replaced following an accident where the pyrofuse has been triggered (irreversible shutoff of the HV system). If the HV battery cannot be removed using the conventional repair instructions, the responsible MPC must be contacted.

With Xentry Diagnostics / DAS, the fault memory of the battery management system (BMS) or VECU (169EV) can if necessary be used to establish whether the pyrofuse has been triggered.

### Possible Fault Codes

- Fault code B273500: "The squib for pyrofuse 'On-board electrical

This bulletin has been created and maintained in accordance with MBUSA-SLP S423QH001, Document and Data Control, and MBUSA-SLP S424HH001, Control of Records.

- Fault code P1CB400: "The power supply for circuit 30c has a malfunction"
- Fault code 0003: "Circuit 30c below 4.5 V"
- Fault code 00A2: "The crash signal has been detected"

**The Vehicle Must be Parked as Follows:**

1. Park vehicle in an open area at a sufficient distance (> 5 m) from other vehicles and buildings
2. Remove ignition key; with KEYLESS-GO, remove transmitter from vehicle
3. Disconnect 12 V battery
4. Actuate high-voltage disconnect device (PPE must be worn when actuating the high-voltage disconnect device or when disconnecting high-voltage lines; the skilled personnel must be qualified to do this (product training))
5. The open area must be cordoned off to prevent it from being entered by unauthorized persons, and indicated by means of locally applicable warning signs which indicate the danger of the accident vehicle (high voltage)

**NOTE:** If no qualified skilled personnel are available outside of business hours, with the exception of the initial analysis and point (4), points (1 - 3) and (5) must nevertheless be performed (precautionary measures with regard to fire protection and vehicle protection).

For the HV battery to remain in the vehicle following an accident in which the pyrofuse did not trigger, at minimum the checklist below must be performed and a visual inspection for damage to HV components and the 12-volt on-board electrical system (bare lines, risk of short circuit) must be done first. If no HV components and lines have external damage, the high-voltage disconnect device can be reconnected. PPE must be worn when connecting a high-voltage disconnect device and when connecting HV cables (model series 451.391/491).

**Function Test**

- Conduct the control unit quick test to detect safety-relevant faults and states in the battery management system (insulation resistance, proper operation of insulation monitor, proper operation of interlock, proper operation of contactors, max / min cell voltage, fuse triggering in the HV battery)
- Perform the charging process over 10 min ("Engine ON" with hybrid vehicles or using the charging cable with plug-in hybrid and electric vehicles).
- Check operation via the instrument cluster (hybrid vehicles) or via the charging indicator box or the vehicle-mounted charging socket (electric vehicle & plug-in hybrid)
- Perform a test drive

If safety-relevant fault codes (see above) or malfunctions occur during these checks, the HV battery must not remain in the vehicle and must be replaced.

**HV Battery Shipping Specifications**

1. Ideally, transportability should be checked before the HV battery is removed. The instructions from the vehicle manufacturer must be observed for each specific model series. See: OF54.10-P-3000-01B, OF54.10-P-3000-01C, OF54.10-P-3000-01Z
2. HV batteries in vehicles that have been involved in an accident with triggering of the pyrofuse are not suitable for transport and must be stored in the settling container intended for the HV

battery. Furthermore, the communicated processes for nontransportable HV batteries must be observed. See: AH54.10- P-0006-01MEV

3. Following triggering of the pyrofuse, HV batteries must be sprayed with insoluble and clearly visible paint (e.g. red), especially the inside and outside of at least one connector on the HV battery.
4. Only transportable HV batteries without triggered pyrofuse can be forwarded to the reman process.

Replacement of a HV battery due to an accident must be settled with the insurance company. Contact the responsible MPC in the case of technical queries concerning the high-voltage system.

**NOTE:** PPE (personal protective equipment) is intended to provide protection against potential hazards when working on vehicles on which the condition of the HV on-board electrical system cannot be clearly determined (e.g. accident vehicles). Potential hazards in connection with accident vehicles are: electric shock due to partially missing shock-hazard protection, arcing due to contactor adhesive and chemical hazard due to electrolyte leakage on a mechanically damaged HV battery.

#### **The PPE to be Worn**

- Face mask (to EN 166, code: 8) to protect against arcs
- Electrician's protective gloves (to IEC 60903, class 0, category R; certified to IEC 61482-1-2, class 2 and EN 61482-1-2, class 2) to protect against arcs and for a maximum operating voltage of 1000 V AC / 1500 V DC. Additional protection against acid, oil and ozone.
- Arc-resistant jacket (to EN 61482 1-2, class 2) to protect against arcs

The country-specific legislation must also be observed. If you have queries concerning the ordering process, please contact your responsible MPC.

#### **WIS References**

Note on high-voltage battery AH54.10-P-0006-01MEV

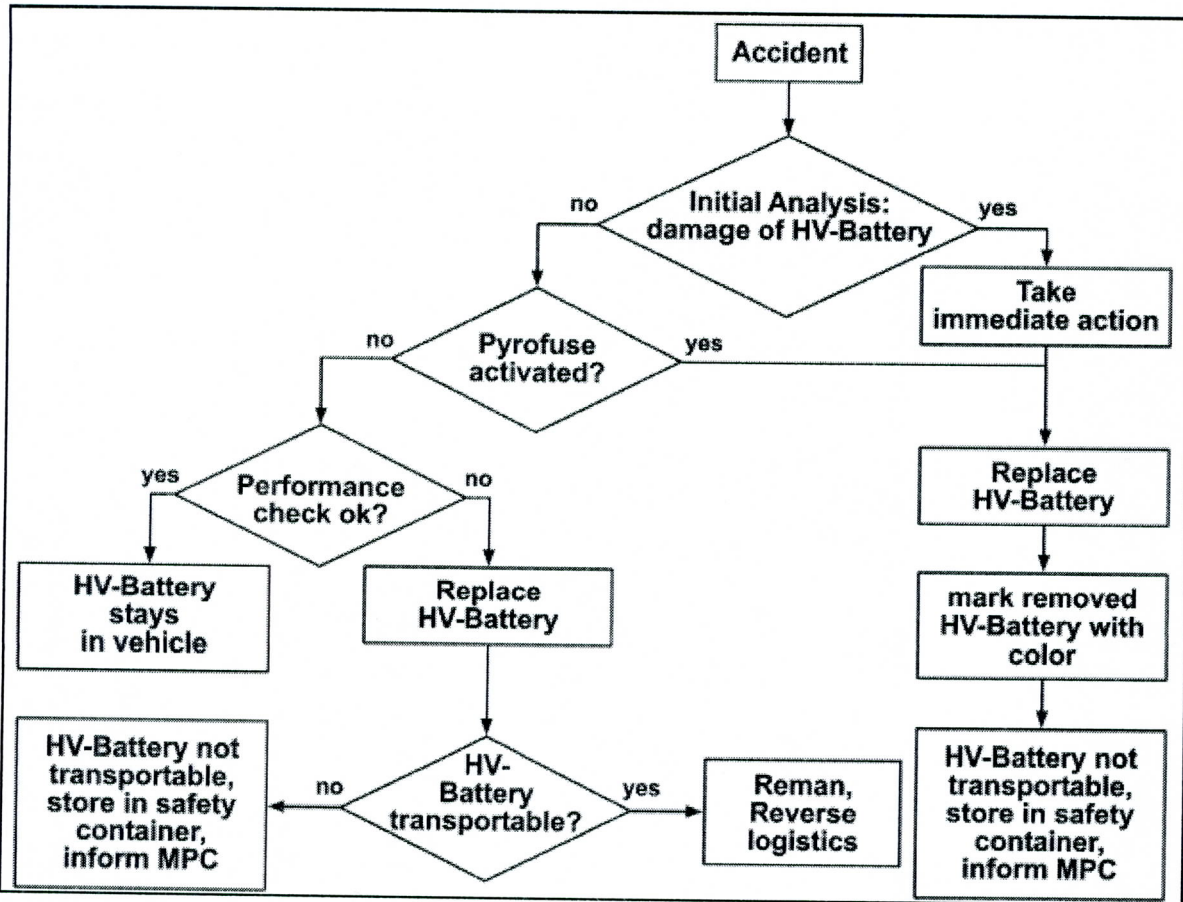
Note on acute hazards caused by high-voltage batteries AH54.10-P-0007-01EZV

Note on acute hazards caused by high-voltage batteries AH54.10-P-0007-01MEV

Analysis sheet for transportability of high-voltage batteries, form OF54.10-P-3000-01B

Analysis sheet for transportability of high-voltage batteries, form OF54.10-P-3000-01C

Analysis sheet for transportability of high-voltage batteries, form OF54.10-P-3000-01Z



HV Battery Handling After Accident with Airbag Deployment

P54.10-3903-06



Date: November 20, 2014  
Order No.: SM-B-54.10/11a  
Supersedes: SM-B-54.10/11, November 17, 2014  
Group: 54

*Revision a: Added models.*

**SUBJECT: MY-All, Models 451.390/.391/.490/.491  
Handling High-Voltage Batteries After an Accident with Airbag and/or  
Pyrofuse Triggering**

### **Initial Analysis**

When the vehicle is received, the accident vehicle must be examined by qualified skilled personnel (who have received product training) for any possible damage to the high-voltage battery (HV battery) which can include:

- Visible mechanical damage to the HV battery (if body deformation is visible at or around the HV battery, the HV battery must be removed if necessary using protective equipment)
- Electrolyte leakage (visible or smellable)
- Heat development (heat tinting)
- Coolant leakage / refrigerant leakage from battery housing

If one of the criteria is applicable, suitable measures must be implemented immediately by the skilled personnel.

See AH54.10-P-0007-01EZV, AH54.10-P-0007-01MEV

If a repair order has been issued for the vehicle, the HV battery must be replaced following an accident where the pyrofuse has been triggered (irreversible shutoff of the HV system). If the HV battery cannot be removed using the conventional repair instructions, the responsible MPC must be contacted.

With Xentry Diagnostics / DAS, the fault memory of the battery management system (BMS) or VECU (169EV) can if necessary be used to establish whether the pyrofuse has been triggered.

This bulletin has been created and maintained in accordance with MBUSA-SLP S423QH001, Document and Data Control, and MBUSA-SLP S424HH001, Control of Records.

## Possible Fault Codes

- Fault code B273500: "The squib for pyrofuse 'On-board electrical
- Fault code P1CB400: "The power supply for circuit 30c has a malfunction"
- Fault code 0003: "Circuit 30c below 4.5 V"
- Fault code 00A2: "The crash signal has been detected"

## The Vehicle Must be Parked as Follows:

1. Park vehicle in an open area at a sufficient distance (> 5 m) from other vehicles and buildings
2. Remove ignition key; with KEYLESS-GO, remove transmitter from vehicle
3. Disconnect 12 V battery
4. Actuate high-voltage disconnect device (PPE must be worn when actuating the high-voltage disconnect device or when disconnecting high-voltage lines; the skilled personnel must be qualified to do this (product training))
5. The open area must be cordoned off to prevent it from being entered by unauthorized persons, and indicated by means of locally applicable warning signs which indicate the danger of the accident vehicle (high voltage)

**NOTE:** If no qualified skilled personnel are available outside of business hours, with the exception of the initial analysis and point (4), points (1 - 3) and (5) must nevertheless be performed (precautionary measures with regard to fire protection and vehicle protection).

For the HV battery to remain in the vehicle following an accident in which the pyrofuse did not trigger, at minimum the checklist below must be performed and a visual inspection for damage to HV components and the 12-volt on-board electrical system (bare lines, risk of short circuit) must be done first. If no HV components and lines have external damage, the high-voltage disconnect device can be reconnected. PPE must be worn when connecting a high-voltage disconnect device and when connecting HV cables (model series 451.391/491).

## Function Test

- Conduct the control unit quick test to detect safety-relevant faults and states in the battery management system (insulation resistance, proper operation of insulation monitor, proper operation of interlock, proper operation of contactors, max / min cell voltage, fuse triggering in the HV battery)
- Perform the charging process over 10 min ("Engine ON" with hybrid vehicles or using the charging cable with plug-in hybrid and electric vehicles).
- Check operation via the instrument cluster (hybrid vehicles) or via the charging indicator box or the vehicle-mounted charging socket (electric vehicle & plug-in hybrid)
- Perform a test drive

If safety-relevant fault codes (see above) or malfunctions occur during these checks, the HV battery must not remain in the vehicle and must be replaced.

## HV Battery Shipping Specifications

1. Ideally, transportability should be checked before the HV battery is removed. The instructions from the vehicle manufacturer must be observed for each specific model series. See: OF54.10-P-3000-01B, OF54.10-P-3000-01C, OF54.10-P-3000-01Z
2. HV batteries in vehicles that have been involved in an accident with triggering of the pyrofuse are not suitable for transport and must be stored in the settling container intended for the HV battery. Furthermore, the communicated processes for nontransportable HV batteries must be observed. See: AH54.10-P-0006-01MEV
3. Following triggering of the pyrofuse, HV batteries must be sprayed with insoluble and clearly visible paint (e.g. red), especially the inside and outside of at least one connector on the HV battery.
4. Only transportable HV batteries without triggered pyrofuse can be forwarded to the reman process.

Replacement of a HV battery due to an accident must be settled with the insurance company. Contact the responsible MPC in the case of technical queries concerning the high-voltage system.

**NOTE:** PPE (personal protective equipment) is intended to provide protection against potential hazards when working on vehicles on which the condition of the HV on-board electrical system cannot be clearly determined (e.g. accident vehicles). Potential hazards in connection with accident vehicles are: electric shock due to partially missing shock-hazard protection, arcing due to contactor adhesive and chemical hazard due to electrolyte leakage on a mechanically damaged HV battery.

#### **The PPE to be Worn**

- Face mask (to EN 166, code: 8) to protect against arcs
- Electrician's protective gloves (to IEC 60903, class 0, category R; certified to IEC 61482-1-2, class 2 and EN 61482-1-2, class 2) to protect against arcs and for a maximum operating voltage of 1000 V AC / 1500 V DC. Additional protection against acid, oil and ozone.
- Arc-resistant jacket (to EN 61482 1-2, class 2) to protect against arcs

The country-specific legislation must also be observed. If you have queries concerning the ordering process, please contact your responsible MPC.

#### **WIS References**

Note on high-voltage battery AH54.10-P-0006-01MEV

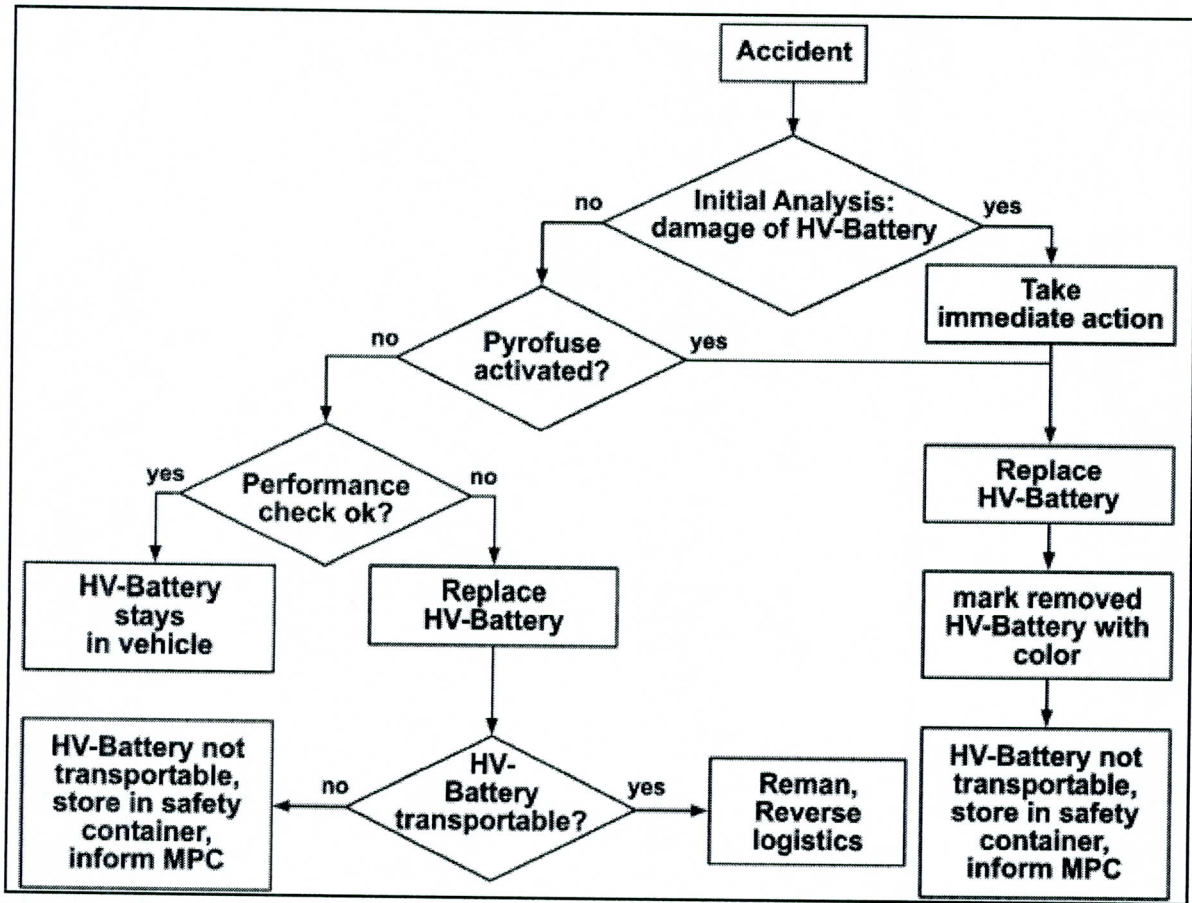
Note on acute hazards caused by high-voltage batteries AH54.10-P-0007-01EZV

Note on acute hazards caused by high-voltage batteries AH54.10-P-0007-01MEV

Analysis sheet for transportability of high-voltage batteries, form OF54.10-P-3000-01B

Analysis sheet for transportability of high-voltage batteries, form OF54.10-P-3000-01C

Analysis sheet for transportability of high-voltage batteries, form OF54.10-P-3000-01Z



HV Battery Handling After Accident with Airbag Deployment

P54.10-3903-06