

AH54.00-P-0001-01A	Information on preventing damage to electronic components due to electrostatic discharge		
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Model all (4xWD, BUS, CAR, Heavy transporter, Light transporter, TRUCK, UNIMOG, smart)

Electrostatic charge

Every contact and every physical separation of materials or every movement of solids, liquids or charged particle-containing gases can generate electrostatic charge. Plastics generally produce the highest electrostatic charge.

We come across electrostatic charge or discharge in lots of everyday situations, e.g. with:

- Combs
- Walking on carpets or plastic floors
- Putting on and taking off textiles with synthetic fiber content

The following electronic components listed as an example can be damaged by ESD:

- Airbag components
- Control units, in particular their bus connections
Controller Area Network (data bus/CAN bus) (CAN),
Local Interconnect Network (LIN) etc.
- Sensors
- Mechatronic component parts (actuators etc.)
- Antenna amplifier
- Receivers and displays (Radio, TV, GPS, telephone etc.)

Modes of behavior and safety precautions

- Electrostatic discharge of the technician (e.g. by briefly touching the vehicle body).
- Suitable clothing, e.g. made of cotton.
- Wear ESD safety shoes with conductive soles.
- Keep workplace clean and clear away unnecessary objects such as conventional plastics.
- Special antistatic seat cushion protectors should be used when performing repair work inside a vehicle.

Training

It is strongly recommended that every company has an ESD officer trained in accordance with DIN EN 61340-5-1.

The ESD officer can carry out staff training courses.

The aim of the training measures is to communicate the main problems and effects of ESD to staff:

- Discharge generation
- Reasoning for safety precautions

- Disembarking from the vehicle
- Contact between various electrostatically chargeable packaging materials in shelves or in the transport container

The resulting electrostatic discharge (Electrostatic Discharge (ESD)) can be so strong that a small electric shock is detected. Even the smallest discharges which people cannot detect can cause lasting damage to electronic components and control units.

Effects and consequences of ESD

Electronic components and control units are very sensitive to ESD. The damage is often not immediately obvious, but becomes apparent some time later. In order to avoid failures and damage due to ESD in vehicle electronics, various procedures and safety precautions must be taken into account and followed.

Risk of damage arises during the transportation, handling, testing, removal and installation of electronic components during production and repair work.

- Leave replacement parts in the original packing for as long as possible, do not tear open seals but cut them open carefully.
- The ESD workplace must conform to the ESD guidelines.
- The operation-specific documentation in the WIS must be observed and the specified special tools and/or workshop equipment must be used in each case.
- Before unpacking, discharge ESD protective packaging at the ESD workplace.
- Avoid any contact with electrostatic chargeable materials such as, e.g. polyethylene, PVC, styrofoam.
- Use only original packaging or specially labeled and defined packaging and transport materials.
- Electronic components which have been removed must be put down on an ESD workplace.
- Electrical connectors on electronic component parts and in the wiring harness should be touched by their housing only. Do not touch pins or contacts!
- Electronic components must be installed before they are connected so that potential equalization with the body can take place.
- Shelves and worktables must stand directly on the floor, there must not be any insulating materials between the base of the shelves/feet and the floor. If the above mentioned insulators cannot be removed, the shelves and work tables must be grounded (e.g. low-resistance electrical connection/line from metal shelf to a coolant pipe).
- Do not put down conductive containers/crates when insulated, (e.g. on a wooden pallet), as otherwise potential equalization will not take place.
- Do not place control units and electronic components removed from the vehicle on electrostatically chargeable materials, such as PE, PVC, styrofoam. The electrostatic charge is transferred to the control unit or electronic component. An ESD service kit or a connected ESD table mat must be used.

- Effects and consequences of ESD
- ESD rules of conduct and safety precautions

Return of electronic components in warranty and goodwill cases

When returning electronic components it is absolutely essential to observe the procedure and safety precautions listed. The original fault may be falsified or hidden by electrostatic charge/discharge.

This can lead to distorted fault symptoms in the case of the fault analysis of the component concerned.