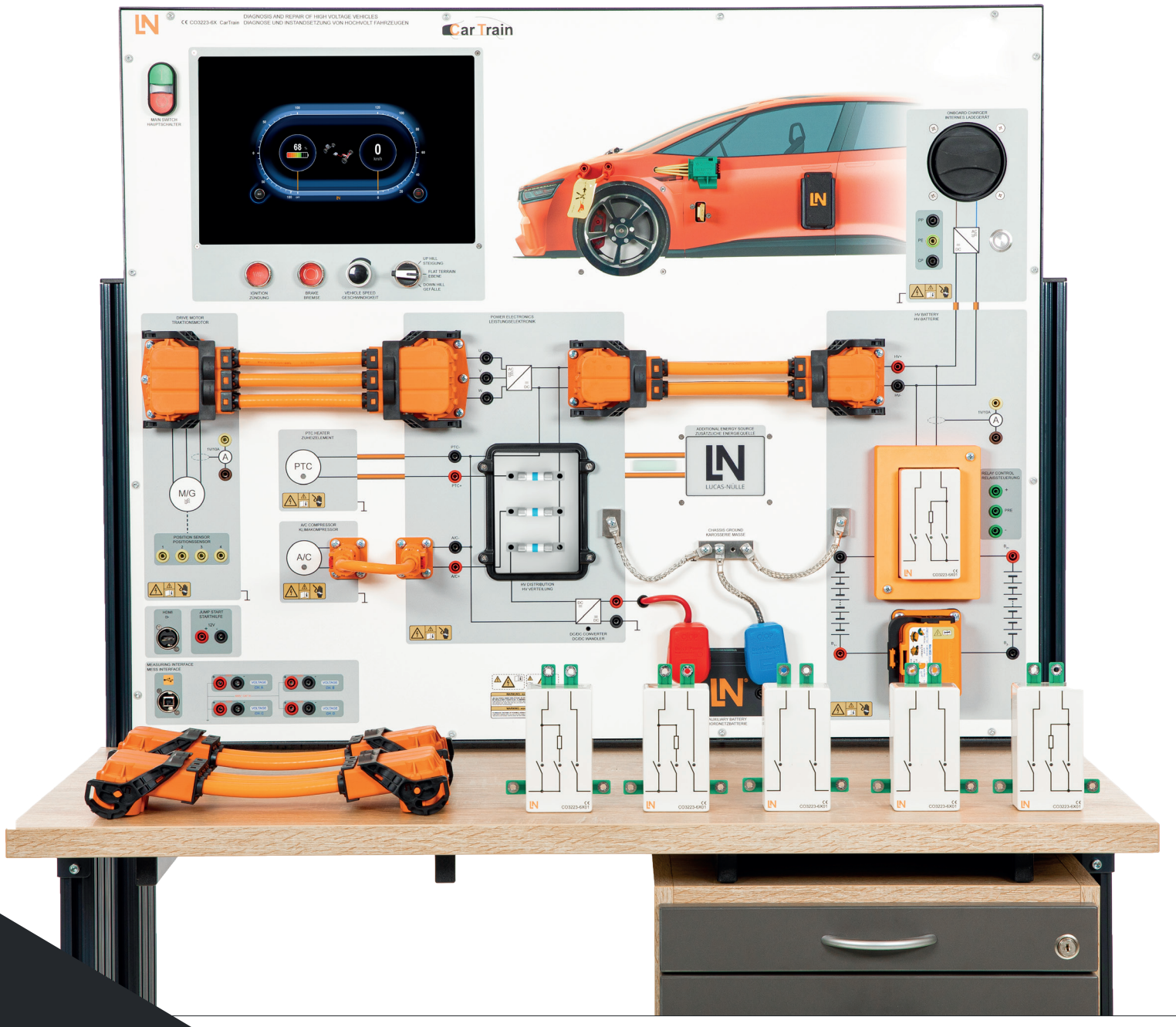


AVAILABLE FALL 2025

CO3223-6X7

Diagnosis and Repair of High Voltage Vehicles

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Technology Education Concepts

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REAL EXPERIENCE LEARNING
with practical applications such as:

- **Diagnostic flow charts: Based on real workshop practices**
- **Insulation testing: For HV cables, AC compressor and drive motor faults**
- **Testing of motor windings**
- **Comprehensive testing of system main relays/contactors:**
    - Three relay types: HV+ pre-charging, HV- pre-charging and pre-charging via DC/DC converter via 12V battery
    - Testing for welded relays
    - Replacement of faulty relays (on simulated live HV battery)
- **Voltage handling:** 400V with high impedance for the trainee safety
- **Defective high voltage fuses: identification and replacement**
- **Vehicle isolation methods:**
    - Manual Service Disconnect on HV battery with live-dead-live test
    - Low voltage disconnect
    - First responder cutting loop and fuse
    - Scan tool guided isolation
- **Acoustic feedback: Alerts for incorrect actions, e.g. opening the interlock when the ignition is on**
- **Energy flow analysis: For various hybrid and electric vehicles, including fuel cells**
- **Real HV signal measurements:**
    - Motor voltage and current during driving and regeneration
    - Charging communication
    - Motor position sensors (resolver and Hall effect)
    - DC/DC converter for 12V system
        - DC/DC converter fault
        - 12V battery fault requiring a jump start
- **Measurements of motor and insulation faults:** Using measuring adapters
- **Testing the potential equalisation:** On real metal components including faulty components for diagnosis and repair
- **Abnormal noise simulation:** For motor, gearbox or shielding
- **High voltage vehicle operation testing:** Via virtual cockpit on the touchscreen with HDMI output
- **Country specific charging plug:** Type 2 or type 1
- **Integrated scan tool with fault diagnosis and live data streaming**
- **Interactive course material:** Curriculum and experiments, projects and workshop assignments

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Real Experience Learning

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