Background
ISO 7637-2:2004
Road vehicles – Electrical disturbances from conduction and coupling
Part 2: Electrical transient conduction along supply lines only

Transient source in the Car:
- Inductive load
- Switching process
- Sudden interruption of current
- Energizing the starter-motor circuit of the internal combustion engines
- Load dump transient

Government, 72/245/EC, 2004/104/EC, 2006/96/EC
World trade Committee, ECE R10.03
Manufacturer Requirement, BMW, GS 95002

Equipment installed on passenger cars and light commercial vehicles
12V or 24V vehicles system
Bench Test Standard

Voltage Transient Emission Test
Device generate the conducted emission of transient for the switching process.
All wiring and Device 50mm above the ground plane.
Switch Close, Switch Open, Change of State
Slow pulse (ms range or slower) and Fast pulses (ns to ms range)
In 2004/104/EC and ECE R10.03, no switch or no inductive load device is exempted
Susceptibility of Transient Emission

Pulse 1
Pulse 2a and Pulse 2b
Pulse 3a and Pulse 3b
Pulse 4
Pulse 5a and Pulse 5b

Pulses 3a and 3b, 0.5m between terminal and Device and 50mm above the ground plane.
Evaluate the device during and after test.

Simulation of transients due to supply disconnection from inductive loads.

Table C.2 — Suggested limits for the classification of 12 V equipment

<table>
<thead>
<tr>
<th>Pulse amplitude (A)</th>
<th>Suggested limit for 12 V equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>80 A</td>
<td>&gt; 10 V</td>
</tr>
<tr>
<td>50 A</td>
<td>&gt; 5 V</td>
</tr>
<tr>
<td>30 A</td>
<td>&gt; 3 V</td>
</tr>
<tr>
<td>10 A</td>
<td>&gt; 1 V</td>
</tr>
</tbody>
</table>

Table C.3 — Suggested limits for the classification of 24 V equipment

<table>
<thead>
<tr>
<th>Pulse amplitude (A)</th>
<th>Suggested limit for 24 V equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>80 A</td>
<td>&gt; 15 V</td>
</tr>
<tr>
<td>50 A</td>
<td>&gt; 10 V</td>
</tr>
<tr>
<td>30 A</td>
<td>&gt; 5 V</td>
</tr>
<tr>
<td>10 A</td>
<td>&gt; 1 V</td>
</tr>
</tbody>
</table>

Figure 1 — Test pulse 1
Simulate transients due to sudden interruption of currents in a device connected in parallel with Device due to inductance of wiring harness.

Simulation of transients which occur as a result the switching process.

Simulate supply voltage reduction caused by energizing the starter circuit of internal combustion engines, excluding spikes associated with starting.

Simulation of the load dump transient.
Simulation of the load dump transient

\[ E.g \, U_{\text{ss}} = 80V, \, U_{\text{L}} = 32V \text{ for BMW} \]

**Conducted Transient Immunity for ESA**

Conducted Transient Immunity for ESA

**Example criteria from 2004/104/EC**

**Immunity Requirements**

**Q&A**
Thank You