SID II s DUMMY DURABILITY

SAE Government/Industry Meeting
May 2002

Heather Rhule
US Department of Transportation
National Highway Traffic Safety Administration
Vehicle Research and Test Center
SIDII's Dummy

- Shoulder Rib Guide
- Pot Housing
- Pot Shaft
- Thorax & Abdomen Rib Guides
Overview of Durability Issues

- Extensive testing revealed several durability issues
  - Pot shafts bent at rib-end
  - Pot shafts bent mid-shaft
  - Pot housing crushed
  - Pot housing inset
  - Ribs deformed
  - Damping material separated from rib

- Mechanism of damage identified

- Modification concepts by VRTC appear promising

- OSRP, FTSS and NHTSA working toward a solution
Pot Bottom-out

Mechanism
- ribs @ max deflection ⇒ pot bottom-out

Test condition

Damages
1. Pot housing crushed
2. Pot shaft bent

15 mph Rigid Abdomen Plate Offset
Thorax & Abdomen Rib Jump

Mechanism:
- Rib jump

Test conditions:
1. 15 mph Rigid & Padded Abdomen Plate Offset
2. 15 mph Rigid & Padded Thorax Plate Offset

Damages:
1. Gouges in damping material
2. Pot shaft bent
3. Ribs deformed

- Gouges in damping material
- Pot shaft bent
- Ribs deformed

F(t)
Shoulder Rib Jump

Mechanism
-rib jump

Test conditions

In-vehicle static airbag OOP
15 mph Padded Abdomen Plate Offset

Damages
1. Rib deformation
2. Pot housing inset
3. Pot shaft bent
4. Damping material separated

-rib jump

F(t)

-rib jump

V_o

-rib jump
Summary

- SID-Il dummy has durability problems

- Mechanisms causing damage are:
  - Potentiometer bottom-out
  - Thorax & abdomen rib jump
  - Shoulder rib jump

- VRTC has suggested possible minimally invasive modifications to remedy situation

- OSRP, FTSS and NHTSA working toward resolving durability problems
Thank You