TRUCK CAB CRASHWORTHINESS IN REAL WORD ACCIDENTS

CEESAR
Presented by RENAULT TRUCKS
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Traffic Accident involving Heavy Trucks (CEESAR/Renault VI database 2001)

### French Statistic 2000

**Truck Occupant Injured**

- Truck occupant injured 2%

### CEESAR/Renault VI database 2001

- **Off road**
  - 21%
- **Rollover**
  - 36%
- **Front to front**
  - 14%
- **Front to side**
  - 3%
- **Front to back**
  - 10%
- **Truck to car**
  - 15%
- **Truck to other**
  - 2%

22% of occupants (Truck and others) involved 212 crashes
233 truck occupant injured
FRONTAL IMPACT

- ACCIDENT N° 02 785.
- Frontal impact against agricultural trailer.
- One cab occupant.
THE OPPOSITE VEHICLE

- The back face of an agricultural trailer.
- Very rigid structure without deformation.
- Main impact height: 1 m 20.
CAB DEFORMATIONS

- Overlap 2/3 right front.
- Intrusion on right seat: 590 mm.
- Intrusion on left seat: 80 mm.
- Intrusion on center: 680 mm.
The truck driver is a 42 year old man.

Very slightly injured MAIS 1.

Contusion on right knee.
FRONTAL IMPACT FIRST
EXAMPLE

- Front to rear collision.
- Between a truck and an agricultural trailer.
- Overlap of 1700 mm on the truck right front.
- With a high level of intrusion on the right front part.
- But small deformation on the left seat.
- The driver is slightly injured.
FRONTAL IMPACT SECOND EXAMPLE

- ACCIDENT N° 02 782.
- Fatal accident between two trucks.
- On a highway at 04:42 am during the night.
- The truck is a SCANIA 143 HA.
THE OPPOSITE VEHICLE

- Another truck with its trailer.
- Main impact on the rear face.
- Nobody in the cab when the collision happened.
CAB DEFORMATIONS

- Front to rear collision between two trucks.
- 100% overlap of front face.
- Intrusion on left seat: 1090 mm.
- Intrusion on center: 1100 mm.
- Intrusion on right seat: 1070 mm.
MEDICAL RESULT

- Two occupants inside this cab.
- Two fatalities M.AIS 6.
- Death by intrusion.
FRONTAL IMPACT SECOND EXAMPLE

- Front to rear collision.
- Between two trucks with trailers.
- 100% front overlap of 2300 mm.
- With a high level of intrusion into the cab.
- With an important deformation of the cab.
- Two occupants fatally injured.
TIPOVER

- ACCIDENT N° 02 792.
- Loss of control in a right hand curve.
- The truck is a Renault Premium 400.
- One occupant in the cab.
**TIPOVER**

- Tipover on a fixed obstacle: a bank.
- Main impact on the roof.
- Impact speed: 36 km/h
CAB DEFORMATIONS

- First deformation type:
  - Roof intrusion 1200 mm on right seat
  - Roof intrusion 80 mm on left seat

- Second deformation type:
  - Frontal intrusion 300 mm on left seat without intrusion on right seat
MEDICAL RESULT

- One occupant in the cab.
- The truck driver is a 52 year old man.
- Very slightly injured M.ASI 1.
- Right ear contusion.
Tipover on a fixed obstacle.

Two types of cab deformation.

Important roof intrusion on right seat.

Small frontal intrusion on left seat.

But no cab structure deformation on driver seat.

One occupant, the driver slightly injured.
ACCIDENT N° 02 783.
Loss of control in a left hand curve.
The truck is a Renault G 340.
One occupant in the cab.
TURNOVER

- Turnover without fixed obstacle.
- Main impact on the cab roof.
- The driver was not trapped inside the cab.
CAB DEFORMATIONS

- Important roof intrusion on right seat: 810 mm.
- Roof intrusion on center: 510 mm.
- Small roof intrusion on left seat: 380 mm.
MEDICAL RESULT

- One occupant in the cab.
- The truck driver is a 28 year old man.
- Slightly injured M.AIS 2.
- Head contusion with unconsciousness.
TURNOVER

- Turnover without fixed obstacle.

- Important roof intrusion on right seat.

- Small roof intrusion on left seat.

- Asymmetrical cab structure deformation.

- One occupant, the driver slightly injured.
Accident n° 02 779.
Loss of control in a left curve hand due to inappropriate speed.
The truck is a VOLVO FH 12.
One occupant in the cab.
Tipover on two fixed obstacles: safety barrier and a bank.

Main impact on the roof.

Impact speed: 25 km/h.
CAB DEFORMATION

- Roof intrusion on right seat: 960 mm.
- Roof intrusion on center: 750 mm.
- Roof intrusion on left seat: 620 mm.
MEDICAL RESULT

- One occupant in the cab.
- The truck driver is a 29 year old man.
- Uninjured M.AIS 0.
TIPOVER

- Tipover on a fixed obstacle.
- One type of cab structure deformation.
- Roof intrusion on all seats.
- One occupant, the driver uninjured.
Accident n° 02 787.

Tuesday 29 May 2001.

Loss of control in a right hand curve.

Tipover on left side.

The truck is a Renault Premium 400.

One occupant in the cab.
Tipover on a fixed obstacle: a tree.

First impact is tipover.

Second impact is a frontal impact against a tree.
CAB DEFORMATION

- First type of deformation: roof intrusion 740 mm on left seat.
- Second type of deformation: frontal intrusion 1130 mm on left seat.
One occupant in the cab.

The truck driver is a 29 year old man.

The driver was trapped inside the cab for 4 hours.

Very seriously injured M.AIS 3.

Crush syndrome for left leg.
TIPOVER

- Tipover on a tree.
- First impact tipover.
- Just after second impact is a frontal impact against a tree.
- Major cab structure deformation.
- Roof and frontal intrusion on the driver.
- Driver trapped a very long time inside the cab.
- Driver seriously injured.
Accident n° 02 774.


Many impacts during the crash.

The truck is a Renault Premium 400.

Two occupants in the cab.
Tipover on fixed obstacles: safety barrier, concrete pole, low wall.
- Main impact on the roof.
- Major cab structure deformation.
CAB DEFORMATIONS

- Roof intrusion 1310 mm on left seat.
- Roof intrusion 1100 mm on center.
- Roof intrusion 1550 mm on right seat.
MEDICAL RESULT

- Two occupants in the cab.
- Two fatalities.
TIPOVER

- Tipover on fixed obstacles.
- Many impacts.
- Very important cab structure deformation.
- Two occupants and two fatalities.