

Driven to Distraction

Human Factors Implications in Vehicle Design

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Design Flaws

- Vehicle designers may not always employ user-centered design
 - They may allow prior technology to dictate today's design
 - They may consider cost of production a priority over usability
 - They may not consider the user's requirements and preferences
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Poor Posture = Poor Function

- ❑ **Problem 1:** Contour of seat causes driver to slump uncomfortably, puts line of vision down towards dashboard, makes turning head difficult.

- ❑ **Principle violated:**
Anthropometry



Seat Yourself

- ❑ Reclining the seat back allows line of vision to be out windshield, but does not correct uncomfortable slumping posture.
- ❑ A bolster does the job. Driver looks straight ahead out windshield and no more backaches!
- ❑ **Solution:** Build multiple inflatable air bladders into seat back. Driver can then inflate/deflate individual bladders to improve posture, comfort, visibility and access to controls.



Cruising or Parked?

- ❑ **Problem 2:** Cruise Control must be “turned on” to use, which activates indicator light (green light below temperature gauge). This light remains on whether vehicle is operating on cruise control or parked (as in photo – parking brake lit too!).
- ❑ **Principles violated:** Feedback, Expectancies
- ❑ **Solution:** Design cruise indicator light to come on only when the vehicle is operating on cruise control.



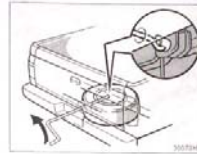
Blinded by the Light

- ❑ **Problem 3:** Gap between visor and mirror puts sun in eyes which can impair driver's vision
- ❑ **Principles Violated:** Visibility, Safety
- ❑ **Solution:** Add slide-out or fold out extension to visor. Better yet, increase extension to visor. Better yet, increase mirror size to better block the sun, increase rear view, and improve safety.



Mission Impossible

- **Problem 4:** Removing spare tire requires jack handle to be fed through tiny hole and hooked into screw above tire. Even in daylight with a flashlight the screw is not visible through the access hole because of the darkness underneath the vehicle.



To remove the spare tire:

1. Insert the end of the jack handle into the lowering screw and turn it counter-clockwise.
2. After the tire is lowered completely to the ground, remove the holding bracket.



It Takes Two!

- One person must feed the jack handle through the access hole while another person crawls under the vehicle, reaches above the spare tire, feels for screw, & guides the jack handle into the screw.
- **Principles Violated:** Environment, Accessibility, Visibility, Line of Sight
- **Solution:** Build a track between the access hole and screw to guide the jack handle to the unseen screw.



Stop!

- **Problem 5:** Brake pedal is higher off floorboard than gas pedal. Driver must first raise foot off gas to height of brake pedal and then lower the foot to depress the brake. Moving the foot in two different directions requires extra time to brake. That extra time might mean the difference between life and death!
- **Principles Violated:** Anthropometry, Best Location for Placement, Ergonomics
- **Solution:** Raise gas pedal higher from floorboard than brake pedal. Braking would then require movement in only one direction towards floorboard and would be quicker in emergencies.



Who's Driving?



- This vehicle requires a human operator!
Why not consider the implications of human factors in its design?