

# Driving Cars Comfortably

## An ergonomics guide for passenger vehicle drivers

### Issues with Driving

Millions of people drive on a regular basis, some more than others. Many tens of thousands of people drive in a work-related role, whether they are in service, sales or other roles. However, the more time that people spend driving, the more they are at risk for physical issues, due to spending extended periods in the constrained space of the vehicle.

The less a vehicle seat can adjust, the more likely a driver will experience discomfort. Some studies have found that 65% of drivers experience back discomfort, 43% experience neck discomfort, and 40% report shoulder pain.

Many of the issues people are exposed to include awkward postures while driving, material handling loading and unloading materials from cars, force exertion gripping the steering wheel, and whole-body vibration from the movement of vehicles over roads in various states of repair. In addition, people may have significant job stress, which affects health and well-being, the shape of the seat will affect comfort, and the size of the vehicle will also affect how a driver feels.

### Selecting the Correct Vehicle

Just as with the clothes a person wears, the vehicle that is driven will affect comfort. If a larger-framed person is assigned a small vehicle, the individual may not be able to easily enter, exit, or achieve a level of interior adjustment that is comfortable. At the same time, a smaller person may not comfortably fit into a particularly large vehicle. Thus, in large vehicle fleets, there should not be a “one size fits all” approach to the vehicles assigned to employees, but rather a range of vehicle sizes (small, medium, and large) should be made available.

### Good Driving Habits

Drivers should wear appropriate footwear when operating vehicles. Shoes should be securely on the feet and should have low or no heels. Flip flop style sandals should not be worn while driving as they may get caught in the pedals. Shoes that are too heavy may result in inadvertent acceleration, and boots may prevent ankle flexion.

Safety belts should always be buckled by all passengers in the vehicle, and the driver should not proceed until all passengers' seat belts are buckled. Many people install child safety seats in their vehicles. Check with a local public safety department to ensure the seats are properly attached.

When entering a car, the driver should face away from the open door and sit down, with the feet on the ground and the buttocks on the driver's seat. Then the driver should swing the legs and feet into the car. Depending upon the size of the vehicle, the steering wheel may get in the way. If the steering wheel is adjustable, then raise it to provide more clearance for vehicle entry and exit.



### **Seat Adjustment for Safe Driving**

Drivers should remove wallets and any other items from their back pockets prior to settling into a car. (It is never a good practice to regularly carry a wallet in a back pocket, as it increases the risk for theft and can affect the ability to sit properly.)

The seat should be raised to maximize vision through the windows of the car, and the eyes should be several inches above the steering wheel. If this is not possible, the driver should sit on a cushion or a pad. All occupants of a vehicle should wear a safety belt, and if a belt is uncomfortable, a simple cushion can be placed over the shoulder strap.

Adjust the seat pan and backrest so the knees are slightly bent and it is possible to move the feet to access the pedals. The thighs should be about parallel to the floor and the back should be reclined about 100- to 110-degrees. Adjust the distance of the seat from the steering wheel so the elbows are near the sides of the body and are bent about 90- to 100-degrees. Allow a gap between the back of the knees and the front of the seat. If the seat is too deep, then use a pillow to provide additional support for the back.



### Mirror Adjustment

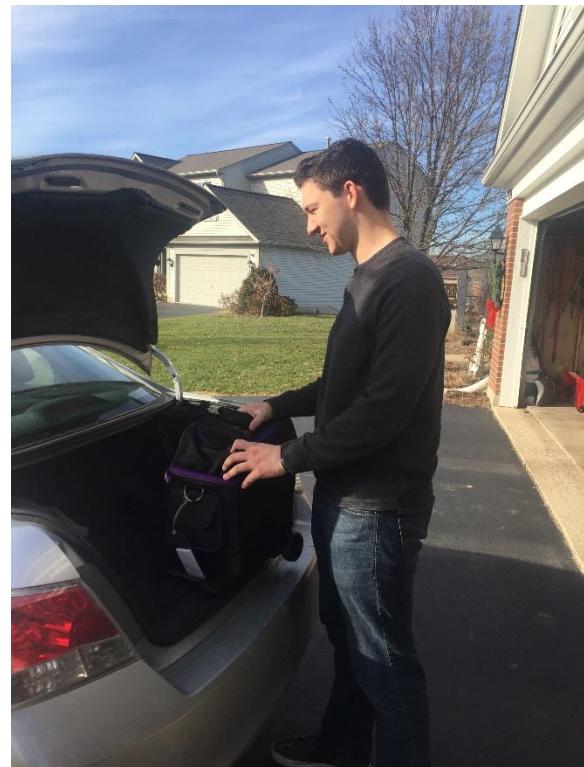
To correctly adjust the side mirrors, for cars with the steering wheel on the left, lean so you are next to the driver's side window and set the left-side mirror, so you can clearly see the adjacent left driving lane (keeping the mirror angled so you can see the side of the car may result in being unable to effectively see traffic in the adjacent left lane. Lean to the center of the vehicle to set the right-side mirror, so that traffic in the adjacent right lane can be clearly seen. Do the opposite for vehicles that have the steering wheel on the right.

### Gripping the Steering Wheel

The goal when driving is to keep the hands at the "4" and "8" positions on the steering wheel, with the wrists straight. The arms should be relaxed, and the hands should have a light grip on the wheel. A grip that is too strong can affect muscles, tendons and nerves, and may result in possible physical issues.



- Two hands on the object
- Move the feet versus twisting the spine
- Move slowly and deliberately
- Set item on an interim position such as the lip of the trunk



### Loading and Unloading the Cargo Area

The techniques for loading and unloading the trunk or cargo area are like those for other lifting tasks.

### Driving tips

- Rest up before traveling, and take frequent breaks to get out of the vehicle and walk around
- Perform simple stretches to improve circulation and range of motion
- Share the driving with another person if that is an option
- Do not use alcohol, drugs, or mobile telephones
- If driving a rented vehicle, become familiar with its operation and controls prior to proceeding
- Research local traffic laws before traveling to new areas
- Do not exceed the speed limit
- Bring healthy snacks
- Keep a fire extinguisher and first aid kit in the vehicle

- Prepare for cold weather driving with a cold weather kit including extra food and water, blankets and a small shovel
- Keep an accident reporting kit in the glove box.

### Vehicle Accommodations

Depending on a driver's needs, many options are now available on vehicles to accommodate a variety of needs. These options include: Automatic transmission. Push buttons for starting & emergency brake, Multi-directional power seats, Power mirrors and one-touch powered windows, Automatic climate control, Steering-wheel mounted controls including radio, automatic speed control, etc., Automatic windshield wipers and headlights.

### References:

- Canadian Centre for Occupational Health and Safety, *Driving and Ergonomics*, 2017.
- Research Institute for Consumer Affairs, *Techniques for Getting Into and Out of a Car*, November 2013.
- Reed, Matthew P. and University of Michigan, *Research: Driver and Passenger Ergonomics*, 2017.
- Consumer Reports, The Human Factors Blog, *Consumer Reports Story on Automobile Ergonomics*, 2009.
- Aquire, S., Safer Motoring, *Appropriate Footwear When Driving*, 2010.
- American Automobile Association, Senior Driving, *How to Use & Adjust Your Mirrors*.
- Smarter Travel, *Top 20 Safe Driving Tips*, 2017.
- Back and Neck Care Centre, CMCC, *Back Safety*, 2014.
- USDA, Ergonomics Training, *Driving Ergonomics*, 2016.

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