# Automobile Headrests Extending Too Far Forward with Solutions

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Introduction

Thousands of people are complaining on the about car headrests being too far forward if they try to sit completely against the back of the seat, which results in neck and back pain. Almost every car made in 2011 have headrests that are too far forward. Try it for yourself. Sit in any 2011 car and sit completely against the back of the seat. The headrest will bend your neck so that you will be looking a the floor of the car. It seems that the solution of whiplash injury to the spine causes injury to the spine during normal driving.

# Crash Dummy Tests



As can be seen in Figure 1, which was taken from the 2006 crash test by the International Institute of Highway Safety, the crash dummy is NOT sitting completely against the back of the seat. They incorrectly assumed this is the normal seating position and recommended headrests be something like 7 inches forward of the seat so that it will be close to the head. However, it prevents one from sitting completely back against the seat and causes the neck and back to bend forward.



Figure 2 - IIHS Seat/Head Rest Test: 2006 Volvo XC90

In Figure 2 there is a significant angle of about 30 degrees between the head/neck line and the body line. Constantly bending the head in this manner will likely lead to spinal injury.

**Correct Sitting Position** 

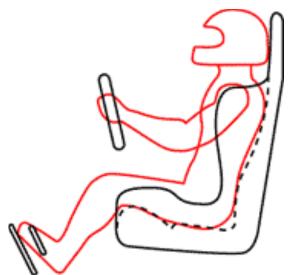


Figure 3 - Racing position recommend by Turnfast.com - The Road Racer's Reference Center

"**First**, sitting in the seat itself, the driver's back should be flat against the back of the seat with the buttocks squarely tucked into the corner created at the intersection of the seat back and bottom. The underside of the legs should be in contact with the seat bottom. The purpose of this position is to provide as much surface contact between the driver's body and the seat. This has safety benefits as well as providing the driver with the most tactile feedback as possible." - Turnfast - The Road Racer's Reference Center (www.turnfast.com).

#### **RECARO Pole Position**



Figure 4 - Racaro racing seat

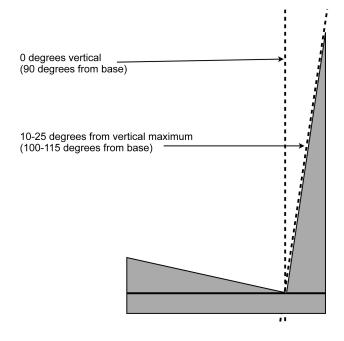
In Figure 4, one can see that the Recaro racing seat does not have a headrest that is too far forward.

### Our Own Research

1. Improper Seat Bottom Adjustment: It is very important to tilt the bottom of the seat upward towards the driver so that the driver's lower back will be pushed into the bottom of seat back preventing the driver from slouching, leading to back pain, which can occur without the driver being aware of it. After adjustment, the car seat bottom angle should look similar to the photo below:



2. Improper Seat Back Adjustment: It is very important to tilt the back of the seat at an angle no greater than 100-115 degrees (10-25 degrees from vertical). If the seat is tilted too far away from the driver's back, the driver will need to bend his/her neck and back to see straight, which may occur without the driver being aware of it. After adjustment, the car seat bottom angle should look similar to the photo below:



3. In most cars, the contour of the seat backs do not adequately match the contour of the driver's back and the headrests are too far forward.

4. The multi-contour seats offered by BMW and other manufacturers are the best seats because they can be adjusted to fit the contour of the driver's back. The back of the seat is split so that the upper part of the back of the seat can be adjusted independently from the lower part of the back of the seat. The downside is that they are only available in their more expensive cars. Furthermore, if you already own a different car, this information will be of little use to you.



5. We have tested almost every back support cushion on the market today in cars without eliminating back pain in those who are suffering from back pain as a result of their car seat.

# **Solution 1 - Multi-Contour Seats**



Figure 5 - BMW Multi-Contour Seats

Figure 5 is a photo of the multi-contour seats used in the BMW 5 or higher series cars.

The back of the seat is split so that the upper part of the seat back can be adjusted independently of the bottom part of the seat back. Audi makes a similar seat in their high end cars too. The drawback is that these cars are very expensive. We tested the BMW multi-contour seats and recommend them.



# **Solution 2 - Headrest and Seat Back Angular Measurement**

Figure 1 - IIHS Seat/Headrest Test January 8, 2006

### 2/24/16

After many hours of careful consideration and measurements, I hypothesize that consumer cars seats and headrests were designed to be used with the back placed at an angle of 24 degrees. Bringing the seat back more vertical could result in neck and back pain. Race car seats are different.

During the first 1,000 miles with my 2013 BMW 528xi with multi contour seats, I adjusted the seat back a number of times until it was completely comfortable without causing any neck or back pain. Then, I measured the angle of the seat back. That angle was 22 degrees.

Therefore, if you position your seat back at an angle of 22-24 degrees, your neck and back pain should be eliminated.

Please contact me at john@allocca.com or 631-757-3919 to let me know if this works.