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Script for 2011 ME227 HW 7 Problem 1

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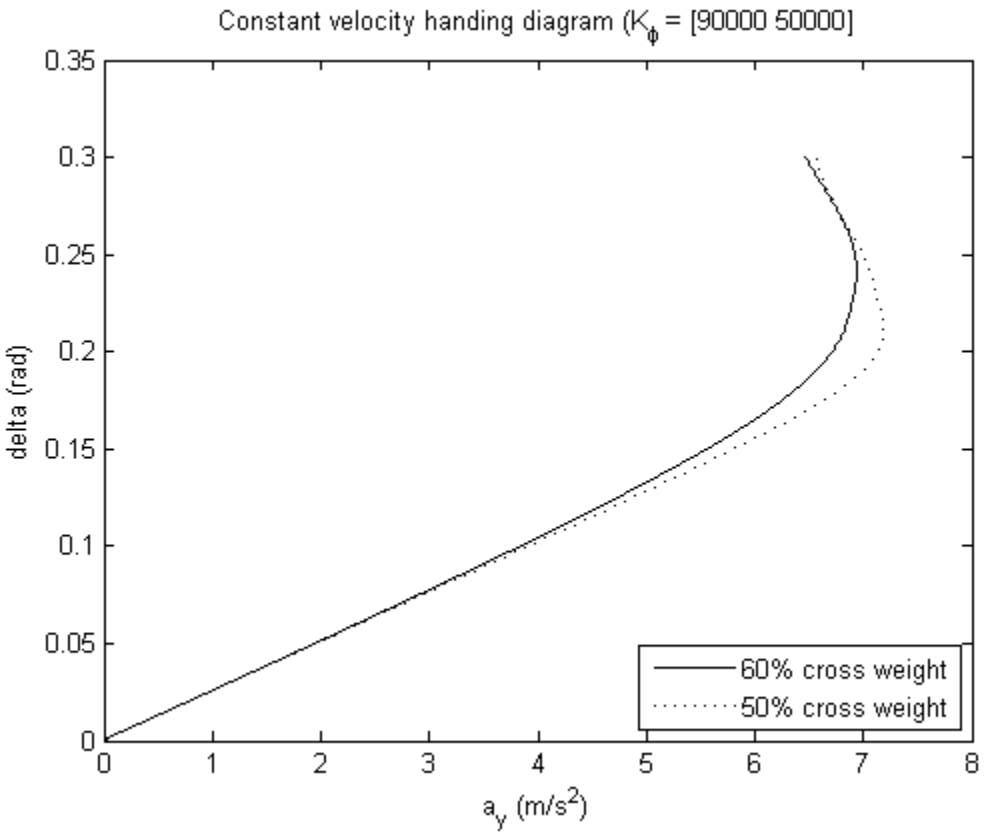
(7.2.1): 60% cross weight

```
Fz_50 =

  1.0e+003 *

    4.2271
    4.2271
    2.9680
    2.9680


Fz_60 =

  1.0e+003 *

    3.5076
    4.9467
    3.6875
    2.2485
```

(7.2.2): Handling diagram: 60% vs. 50% cross weight

Changing the cross weight to 60% makes the vehicle more understeering when doing a left-hand turn.

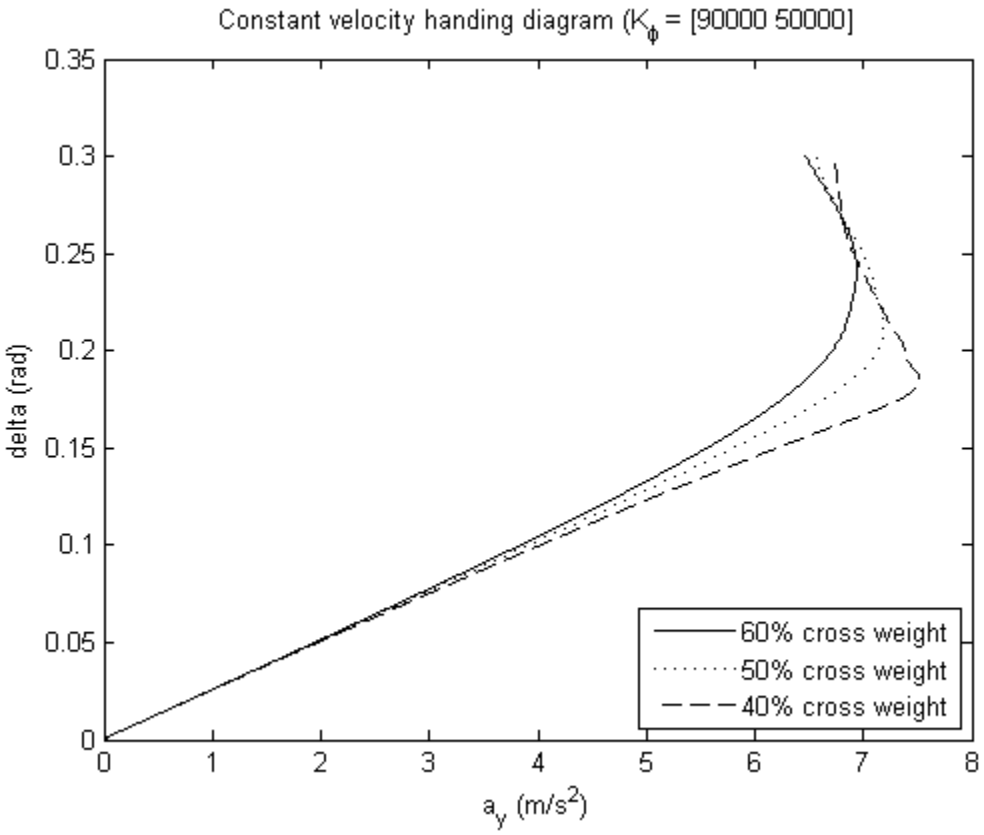


(7.2.3): 40% cross weight

See the peak lateral accelerations below. Decreasing the cross weight causes the peak lateral acceleration to increase, so the 40% cross weight produces the highest peak lateral acceleration. This makes sense because increasing the cross weight increases the load on the front outside tire and decreases the load on the rear outside tire, so we will saturate the front first, and therefore not reach as high of a lateral acceleration.

```
Fz_40 =

  1.0e+003 *

    4.9467
    3.5076
    2.2485
    3.6875


ay_max_40 =

    7.5197


ay_max_50 =

    7.1794


ay_max_60 =
```

6.9362



(7.2.4): 40% cross weight: right hand turn

It will behave similarly to the 60% cross weight left hand turn since these cases are symmetric.

(7.2.5): Limit oversteer compensation

To minimize the limit oversteer, we should increase the cross weight since this makes our vehicle more understeering.

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