THE DAWN PROJECT

In Scientific Test, Tesla "Full Self-Driving" Technology Consistently Strikes Child-Sized Mannequins

July 13, 2022

EXECUTIVE SUMMARY

A scientific test of the capability of Tesla's Full Self-Driving technology to avoid a stationary mannequin of a small child has demonstrated conclusively that the software does not avoid the child or even slow down when the child is in plain view. A Tesla Model 3 equipped with full self-driving software repeatedly struck the child mannequin in a manner that would be fatal to an actual child. The software is a demonstrable danger to human life and must be removed from the market immediately.

Introduction

The Dawn Project conducted a professional test of Tesla's Full Service-Driving Technology on June 21, 2022, at Willow Springs International Raceway in Rosamond, California.[1]

The test methodology is detailed in this report so that other researchers can independently reproduce and verify the results.

The vehicle used for the test was a Tesla 2019 Model 3 with FSD Beta 10.12.2. This version, which was released June 1, 2022, was the most up-to-date software available from Tesla at the time of this test.

The 2019 Model 3 with FSD Beta 10.12.2 was in full self-driving mode during all portions of the June 21, 2022 test where the vehicle was driven straight down a row of cones (120 yards in length) at a child-size mannequin in its path with no interference by the driver.

Figure 1.

Aerial view of the test track with narrow lane demarcated by cones in standard testing pattern.
Video still taken June 21, 2022.

[1] Willow Springs International Raceway is an internationally recognized 2.5-mile vehicle testing and racing course. The fact that it has been running continuously since 1953 has caused the state of California to recognize Willow Springs International Raceway as an Official California Point of Historical Interest.

Figure 2.

View from the center of the test track with a mannequin in profile.
Video still taken June 21, 2022.

Oversight

This scientific test was conducted under the oversight of a professional test driver with extensive experience and professional certifications. The test driver, Art Haynie, has been a Factory Test Driver for Porsche AG Global, has trained test drivers for major automobile manufacturers including electric and self-driving vehicle manufacturers, has been a high-performance driving instructor for Porsche Club of America, was the Instructor of the Year for Porsche Club of America, Orange Coast Region in 2017, and is a high-performance driving instructor for military, law enforcement, and private security contractors.[2]

Methodology

The test was designed to simulate a realistic life-and-death situation in which everyday motorists frequently find themselves: a small child walking across the road in a crosswalk. To isolate the situation, all variables were removed from the situation except for the vehicle, the child, and the road itself. This made the testing environment more favorable to FSD, since a real-world scenario may include distracting elements such as other vehicles in motion, weather, signage, parked cars, shadows, etc.

Test Description:

1. Cones were placed on the course in a standard layout to mark a traffic lane 120 yards in length. Road cones in compliance with OSHA standards were used.[3]

[2] https://arthayniedriver.com/home
[3] https://www.osha.gov/sites/default/files/2018-12/fy10_sh-21004-10_wztc_refguide.pdf.

Figure 3.

View of the Tesla Model 3 driving into the lane of cones. *Video still taken June 21, 2022.*

2. A toddler-sized mannequin was set up in profile in the middle of the test track lane. The mannequin was located in the middle of the lane, at the end of the track, dressed in clothing.[4]

3. A professional test driver brought the vehicle up to a speed of forty (40) miles per hour and then put it in full self-driving mode once the car entered the lane defined by the cones.

4. The vehicle was driving for over approximately one hundred (100) yards within the lane of cones in full self-driving mode before striking the mannequin.

5. The test driver's hands were never on the wheel, and the driver did not press the accelerator or apply the brakes during the period of time the car was in Full Self-Driving mode until the vehicle was well past hitting the mannequin.

[4] The child-sized mannequin was 30.5" inches in height and was purchased from Store Supply Warehouse. It is available from Amazon and its Amazon Standard Identification Number (ASIN) is B006C3PYHI.

Figure 4.

View of the interior of the Tesla Model 3 under Full Self-Driving inside the lane of cones.
Video still taken June 21, 2022.

Results

Table 1

Trial	Speed at Impact	Result
#1	24 mph	Failure — Impact on Mannequin
#2	27 mph	Failure — Impact on Mannequin
#3	25 mph	Failure — Impact on Mannequin

The vehicle was driving for over one hundred (100) yards in full self-driving mode within the lane of cones before striking the mannequin.

Raw, unedited video footage from four different cameras of the Tesla striking the three (3) mannequins can be viewed here.

In three (3) repetitions of the test, the 2019 Model 3 with FSD Beta 10.12.2 made impact with the mannequin when it was initially set to forty (40) miles per hour in full self-driving (FSD) mode.

Figures 5, 6 and 7.

Figure 5. Image of Test #1.

Figure 6. Image of Test #2.

Figure 7. Image of Test #3.

All video stills taken June 21, 2022.

After being placed into FSD mode, the vehicle consistently slowed down to about 25 miles per hour. As reported by the test driver: " During the June 21, 2022 test drive, the 2019 Tesla Model 3 with FSD Beta 10.12.2 would generally start out at forty (40) miles per hour in full self-drive mode and start to stagger as if lost and confused, slow down a little, and then speed back up as it hit and ran over the mannequins, going over twenty-five (25) miles per hour when it hit the mannequins. Sometimes the speed at impact would be faster or slower than the twenty-five (25) miles per hour."

Signed and notarized affidavit from test driver Art Haynie can be read here[5].

Signed and notarized affidavit from Director of Photography and lead cameraman Nick Taylor who was in the vehicle with the test driver during the test sequences can be read here[6].

[5] Art Haynie signed affidavit testifying to what he experienced as the test driver in the FSD driving test
[6]Nick Taylor signed affidavit testifying to what he witnessed inside of the Tesla during the video shoot

Analysis

The results of this study contradict Tesla's long-standing claims that their Full Self-Driving technology is safe. In fact, Elon Musk has publicly stated via Twitter that Tesla's full self-driving technology is "amazing"[7] and it will "blow your mind"[8]. He also told the *Financial Times* last year, "I don't think there's a CEO on this planet that cares more about safety than me." To the contrary, the FSD software may be the most dangerous commercial software ever released onto public roads into the hands of over 100,000 untrained "beta" test drivers[9]. It must be removed from the market immediately to prevent further loss of life beyond what NHTSA is already investigating.

Given 100 yards of driving distance — which a car traveling an average of 28 mph traverses in about 7 seconds — an attentive human driver cannot fail to notice a stationary child in the middle of a clear roadway. Tesla's FSD software does fail this simple task, repeatedly and with deadly results.

Extrapolating from this study's findings results in grim arithmetic. FSD is unable to detect a child-sized object in its direct path. The software does not act to avoid the child. In 2019, the most recent year for which good data is available, 181 pedestrians under the age of 14 were struck by a moving vehicle. 96% of those children were killed by a single car crashing into them.[10]

These statistics are even more disturbing because Tesla is currently rolling out a massive expansion of its Full Self-Driving software. According to news reports, Tesla is abandoning its own driver readiness checks, resulting in a doubling of FSD installations in its vehicles[11]. Over 100,000 Tesla vehicles are currently equipped with FSD.

"American drivers — whether using these systems or sharing the road with them — are effectively guinea pigs in an experiment whose results have not yet been revealed," reports the *New York Times*[12].

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[7] https://twitter.com/elonmusk/status/1430266644971069446
[8] https://twitter.com/elonmusk/status/1435967157662150675
[9] While Tesla claims FSD is a "beta" product in a testing phase, over 100,000 purchasers of a Tesla automobile who elect to add the $12,000 option of "full self-driving" are currently able to use this software with no speciialised training in automotive software testing. *See* https://electrek.co/2022/04/20/tesla-number-people-full-self-driving-beta-program-an-accelerated-rate-improvement-coming/
[10] https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813122
[11] https://futurism.com/tesla-fsd-beta-no-safety-scores
[12] https://www.nytimes.com/2022/06/08/technology/tesla-autopilot-safety-data.html