

# Toyota's sudden unintended acceleration

[Business](#), [Company](#)



University of Sharjah Electrical ; Computer Engineering Department PRO.

SOC. ISSUES IN ENG. Term Paper " TOYOTA's sudden unintended

acceleration" Submitted to: Dr. Abdul Kadir Mohammed Hamid Done by:

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about Toyota : Toyota's company is a product of many years of experience, production and high efficiency. Toyota has been one of the most successful companies all over the world. Toyota's company success in leading the Japan's economy to be NO. 1 in Asia, beside that Toyota is a major multinational car manufacturer headquartered in Japan.

It was built by Kiichiro Toyoda in 1937. Nowadays this factory is the first factory for cars in the world. And what make Toyota's so special that it manufactured vehicles with high quality and simplicity in use, beside the less costly compared with the other companies, which make the use of Toyota vehicles so extended. Toyota is the second largest producer of vehicles all over the world with a production of 6 million vehicles per year deployed in more than 160 countries, Also achieve an annual income of 108 billion dollars . Toyota produces a full range models of vehicles and employs 246, 700 staff. It is also one of the top ten companies in the list of Fortune Global 500 largest trading company, There is a survey that has been published in cnnMoney. com that Toyota is one of the most impressive and appreciated company.

Kiichiro Toyoda," founded the company in 1933, when he had just returned from a tour in the United States, he choose the spin factory which was owned by his father to set up a workshop for the vehicles industry. Then he

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produces the first models in 1935. Introduction about the mechanism : The throttle is a metal plate that connected to the end of the gas pedal this part controls the amount of the air that go to the vehicle's engine. And the throttle body consists of 4 main parts which is: ? the throttle plate or butterfly valve ? electronic throttle control Sensor ? Engine Control Unit (ECU) Talking about the throttle body we have to give you an explanation about it. The main part on the throttle body is the throttle plate, which is a butterfly valve that controls the Intel gases. The throttle plate is communicated by a site of wire. To move the throttle plate there is an electronic throttle control that connects the throttle linkages and the accelerator pedal to a sensor which take the signal to the Engine Control Unit (ECU), which calculate the angel and give the exact position of the plate depending on the inputs.

We can say that this part is controlled partially by the driver when he press on it the throttle the plate or the butterfly valves will be opened and the angle is depending on the force you apply it the more force the largest angle and vice versa. The problem : Unintended acceleration is the main problem in Toyota's case. Where you suddenly feel like your vehicle's speed is increasing up without any order from you to increase, and according to some cases what was happen that if you press on the pedals to drive by 80 km speed you notice that the vehicle is move according to 120 km speed and that is the basic problem here. Most of t he people thought that this problem is because of two reasons. The first one that when you drive the vehicle and while you applying your force on the gas pedals it stuck and it can't be return to its normal position so this lead to our big problem the unintended

acceleration . The second reason that the gas pedals didn't stuck, but it take more time to return to its normal position this also cause the unintended acceleration that happen to the vehicle. These two reasons cause a lot of accidents resulting with number of deaths and injuries Toyota documented this problem by recalling 4.

2 million vehicles to replace the floor mats that might impede the pedals and what they did about this point is reducing the length of the floor mat from the top of it so the pedal can return easily without any difficulty, beside 2. 4 million to install a shim behind the electrical pedals assembly to make it return to its normal position at the expected time. All the pedals that are used in Toyota's vehicles were manufactured by Canadian supplier CTS. Toyota's engineer thought that the problem is solved for these pedals that it take time to return " slow down " or maybe it's sticking in the floor mat . The problem Contd. : By doing the biggest recall ever Toyota's thought that this is the end of the problem, but unfortunately and according to the complaints of 24, 000 customers received by the NHTSA (National Highway Traffic Safety Administration) from Toyota's vehicles users about problems in their vehicles. The cases of deaths and injuries is still recording , so Toyota has to do something with the system as a whole not only with the parts, and the NHTSA has eventually concluded that there was no mechanical problem !! It was not easy for Toyota to diagnose the real problem and it took long time to identify the issue they got confused if the issue is not about the two recalling or its about the system as whole or there is a problem about the electrical throttle concept.

At the same time Mike Allen-senior automotive editor delves into modern car tech, explaining why widespread theories about electrical throttle problems and electromagnetic interference are misguided and he was making his own research about electromagnetic interference from devices. And he conclude that there is electrical devices in the cars contribute to the acceleration problem like : cell phones , navigators , TVs and cameras. The problem

Contd. : According to this simple figure we will explain how Mike Allen proved his results about the electromagnetic inference and how it's related to our case We will start with process backward. The electronic throttle represented by the Actuators and it's any part in the vehicles that take the action and the throttle is controlled by the ECU " Engine Control Unit " which can be compared to the CPU function in our PCs , All the process that happen in the vehicles must pass through the ECU . Let's start with the main point of the case when you press on the pedals. There is a sensor that converts your movement into an electrical signal.

And when these signals interface with the external signals which are brought by the electrical devices the vehicles become out of control. It speeds up and this is cause the sudden acceleration even the breaks can't react in this case. We can simply summarize this case as the heart attack. When you go to the hospital and you checked that everything is doing its work very well. You can't recognize that there is any problem in your body and you can't estimate when the heart attack will happen it happens suddenly. This is so related to Toyota's case where the vehicles parts are is our organs and the heart attack is the unintended acceleration. It can be also summarized by the " Hackers ".

When you received a virus from external resource like flash memories and websites you can't blame the PCs Company because it's not their fault. Also we can't blame Toyota because they can't control this wide problem. Also people notice that this problem become obvious in the snowy weather, because as we know that the vehicle slides if the street is wet, so imagine what would happen if the way is snowy beside that the vehicle is out of control and it's speeding up, That will lead for disaster for sure !! Why this happen with Toyota only ? 1- Some parts are manufactured by another company, so it differ from one to another like in our case the pedals was manucfaterd by Canadian supplier. 2- The sensitivity of the system " ECU " is differing from car to another. 3-This problem happen with more than automotive company, but the media focus on Toyota only because it is one of the successful companies in US and the middle east and the other companies like General motors and Ford motor took it as chance to shine !

What did TOYOTA do? Toyoda apologizes in tears Toyoda said that he wanted more than anyone else for Toyota to be safe. He said in English before they start answering questions through an interpreter: " My name is on every car. ", The Chairman of Toyota's Akio Toyoda apology to the American Congress and the users of company cars in the United States for a bug in the pedals speed in some categories of Toyota, which have caused traffic accidents, and he conclude this investigation by saying " we will double the quality ".

- Recalling process NHTSA (National Highway Traffic Safety Administration) has received complaints from the customers who complain about the unintended acceleration of their TOYOTA's vehicles, then Toyota asked

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NHTSA to help them in contacting with their customers. Toyota has recalled more than 8 million vehicles worldwide for problem related to sudden acceleration, which have been blamed for several accidents resulting in injuries and death . The automaker has repeatedly apologized for the lapses in quality control and TOYOTA technicians are working extended hours to repair the recalled vehicles, and the actual repair takes like 30 min. orks and TOYOTA will cover all costs associated with work. •Educating the public On the other hand Toyota focused on educating the users of Toyota vehicles about the problem itself , what to do if the customer face such a problem , what is the procedure that should be taken if the driver face this while he/she is driving , and a lot of information and details posted on their website. Also the concern about contacting with all the customers who has the vehicles that has this bug. What did TOYOTA do in U.

A. E.? The Ministry of Economy appointed an officer to follow up on repairs and maintenance carried out by the company « Al-Futtaim Motors» - Agents of Toyota company in UAE- to address the problem that might occur in these models of cars “ Avalon “ ; “ Sequoia” which are more than 3200 cars during the period ranging from one month (24 February to 24 March ) The Code of Ethics of Toyota : “ At Toyota, safety is a priority in everything we do - from the vehicles we put on the road to the people who drive them. That’s why we sponsor programs across the U. S . That encourage safety for drivers and passenger alike” Akio Toyoda According to this statement we drive the main ethical rule about our case, and Toyota’s case is the only case that was taken from the positive side •Obey the law. • To be honest in word and deed.

• Respect the values of society. • Being responsible. • Perform their duties in accordance with the law • To have rules of conduct use of good governance and to avoid actions that could lead to conflict between the company and personal interests of society. Conclusion At the end, we can say that this problem is out of Toyota's hand, although they do all what they can do in this case and they tried to limit this case as much as they can. It's uncontrolled!! What would Toyota do if the guy next to you at a traffic light answered his cell phone? Or some ghost in the machine or a hacker caused a software glitch that made your car run away and the brakes suddenly fail? Toyota deserves a better deal than the media and Congress are giving it.