

Some Facts About Sudden Acceleration in Mitsubishi Montero Sport Vehicles in the Philippines

by

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1. Sudden Unintended Acceleration (SUA) in the Philippines has been found only in Mitsubishi vehicles with diesel engines. It is not found in any of Mitsubishi's competitor's vehicles, like the Toyota Fortuner or the Chevrolet Trailblazer, which also use diesel engines. Mitsubishi vehicles make up only about 20% of all the vehicles on the road in the Philippines. Toyota has about 45% of the vehicles and Ford has about 8%. (Figure 1).

Philippine Market Share

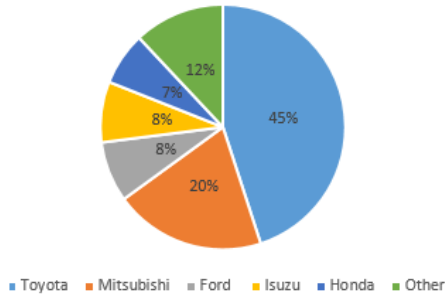


Figure 1. Approximate percentages of vehicles on the road in the Philippines

Mitsubishi Models

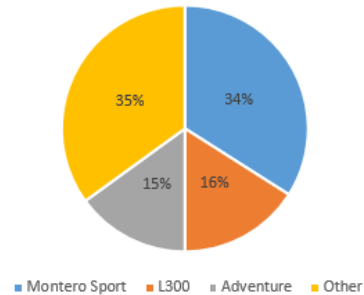


Figure 2. Approximate percentages of Mitsubishi vehicle models

2. SUA is found only in Mitsubishi's Montero Sport model. The Montero Sport was introduced in 2008, and sudden acceleration incidents started in 2008. SUA is not found in any other Mitsubishi models, including the Mitsubishi L300, Adventure, Strada, Pajero, ASX, or even the Montero. The Montero's chassis is different from the Montero Sport's chassis. It is more like a truck, while the Montero Sport's chassis is more like a passenger vehicle. Only about one third of Mitsubishi's vehicles on the road in the Philippines are Montero Sport vehicles (Figure 2).
3. SUA is found only in Mitsubishi Montero Sport models with the 2.5L 4D56 diesel engine. It is not found in Montero Sport models with different diesel engines, like the 3.2L diesel turbo that provides 263 hp and 343 Nm of torque. See Table 1 for more details.

Table 1. Versions of the 2.5L 4D56 Diesel Engine on Mitsubishi vehicles⁶

Fuel Distribution	Turbocharger	Intercooler	Code	Power	Torque	MY	SUA
Jet pump	None	No		55 kW (74 hp) @ 4200 rpm	142 N·m (105 lb-ft) at 2,500 rpm		No
Jet pump	TD Wastegate	No	TD	62 kW (84 hp) at 4,200 rpm	201 N·m (148 lb-ft) at 2,000 rpm		No
Jet pump	TD04 Wastegate	No	TD	67 kW (90 hp) at 4,200 rpm	197 N·m (145 lb-ft) at 2,000 rpm		No
Jet pump	TD04 Wastegate	Water Cooled	TD	78 kW (104 hp) at 4,300 rpm	240 N·m (177 lb-ft) at 2,000 rpm	L300, L200, Gen1 and Gen 2 Strada, Adventure and Gen 2 Pajero	No
1st Gen CRDi ¹	TD04 Wastegate	Water Cooled	TD	85 kW (114 hp) at 4,000 rpm	247 N·m (182 lb-ft) at 2,000 rpm		No
2nd Gen CRDi	TD04 Wastegate	Water Cooled	TD	103 kW (138 hp) at 4,000 rpm	320 N·m (236 lb-ft) at 2,000 rpm	2008+ Montero Sport	No
2nd Gen CRDi	VGT ³	Water Cooled	VGT TD	131 kW (178 hp) at 4,000 rpm	350 N·m (258 lb-ft) at 1,800 rpm	2008+ Montero Sport ⁴	Maybe
3rd Gen DI-D ²	VGT ³	Water Cooled	VGT DI-D	130 kW (175 hp) at 4,000 rpm	400 N·m (295 lb-ft) at 2,000 rpm	2008+ Montero Sport ⁴	Yes

1. CRDi = common rail direct injection. Later generations produce higher air pressure.
2. DI-D = direct injection diesel.
3. VGT = variable geometry turbocharger. VGT boost starts at lower RPM (1800 RPM) than TD04 turbo (2000 to 2500 RPM).
4. All 97 Montero Sports with SUA had either the VGT TD or VGT DI-D engine, and all but one had automatic transmissions.
5. Other Mitsubishi vehicles have the 2.5L 4D56 diesel engine, but without the VGT turbo. New Strada's are getting the VGT turbo.
6. <http://www.manualdownload.co/ccp0-prodshow/mitsubishi-4d56-4d5-workshop-engine-repair-manual.html> and <http://montir-online.blogspot.com/2011/08/4d56-engine-specs.html>

4. SUA is found mostly in Mitsubishi Montero Sport models having VGT turbos. (First pointed out by Luckycab Norkis at <http://www.topgear.com.ph/features/feature-articles/why-sudden-unintended-acceleration-baffles-us>^a. Also mentioned by Lance Carre at <http://lancecarreview.blogspot.com/2014/07/i-have-always-been-fascinated-with.html>)^b. The VGT turbo was introduced into the Montero Sport in 2011. A few SUA incidents have been connected with the 2008 Montero Sport turbo design, which uses a non-VGT turbo.
5. Conclusions:
 - a. Mitsubishi's claim that sudden acceleration is impossible in the Montero Sport and that the 97 SUA incidents were caused by the driver is completely unsupported by the facts. If this were true, then one would see SUA incidents in other manufacturer's vehicles, in other Mitsubishi models, and in other versions of the Montero Sport with non-4D56 engines or 4D56 engines without VGT turbos.
 - b. SUA has something to do with the VGT turbo and/or the new DI-D direct injection scheme on the 4D56 engine. Both of these would require a new ECU design.
6. As of Oct. 15, 2015, there have been over 88,000 Montero Sports sold in the Philippines since its introduction in 2008, and another 260,000 sold elsewhere worldwide. Of the 88,000 units sold in the Philippines, 60,000 were automatics. 97 SUA incidents out of 88,000 units implies an SUA incident rate of 0.11% of all Montero Sports. 97 SUA incidents out of 60,000 implies an SUA incident rate of 0.16% of all Montero Sports with automatic transmissions. This is approximately 10 times higher than the SUA incident rate in gasoline vehicles with electronic throttles in the USA, which is <12 per 100,000 vehicles, or 0.012%.
7. The Montero Sport accounts for over 30% of Mitsubishi's sales in the Philippines. The Montero Sport has had a market share of more than 40 percent of the midsize SUV segment in the Philippines for five consecutive years from 2009-2013.
8. Mitsubishi is providing the new 2016 Montero Sport with a different engine, the 4N15 MIVEC diesel engine.

^a The Montero Sport is the only SUV that has a Variable Geometry Turbo or VGT. VGT is more responsive than CRDI. My personal conclusion, most of those 97 accidents are a few years old. If the VGT engages in a certain RPM and the idling RPM of those units are similar with the VGT's, then the moment you pull the shift, it's lift off! Hindi ba even if you do not step on the gas, the moment you put the automatic gear to drive, it will accelerate on its own. Now imagine putting the Montero in drive while its VGT turbo is already engaged. My personal opinion. – Luckycab Norkis at <http://www.topgear.com.ph/features/feature-articles/why-sudden-unintended-acceleration-baffles-us>

^b These SUA reports usually occur on automatic VGT variants. Remember that the Montero is equipped with a turbo that engages in 1800 rpm coupled with the VGTs powerful turbo, it is a recipe for disaster for an inexperienced driver. The turbo zone is very low compared to the turbos of the 90's which engages at around 2000 to 2500 rpm. This means that if you place the car in gear, with the AC on, in a cold engine, the ETCS will compensate for the cold engine and AC by increasing the RPM or idle speed of the car to meet its operating temperature faster. In some instances, this may hit the turbo range and trigger the turbo causing the powerful car to lurch forward once the car is placed in gear. –Lance Carre at <http://lancecarreview.blogspot.com/2014/07/i-have-always-been-fascinated-with.html>.