

Part 573 Safety Recall Report

21V-307

Manufacturer Name : Arcimoto Inc

Submission Date : JUL 12, 2021

NHTSA Recall No. : 21V-307

Manufacturer Recall No. : NR



Manufacturer Information :

Manufacturer Name : Arcimoto Inc

Address : 2034 W. 2nd Ave
Eugene OR 97402

Company phone : 5416836293

Population :

Number of potentially involved : 261

Estimated percentage with defect : 15 %

Vehicle Information :

Vehicle 1 : 2019-2021 Arcimoto FUV

Vehicle Type : MOTORCYCLES

Body Style : OTHER

Power Train : HYBRID ELECTRIC

Descriptive Information : Affects all two-hundred forty-eight MY2019 - MY2021 T-FUV vehicles (fifty-seven MY2019 T-FUV, one-hundred twenty-six MY2020 T-FUV, and sixty-five MY2021 T-FUV) produced from 09/19/2019 through to 04/26/2021.

Production Dates : SEP 19, 2019 - APR 26, 2021

VIN Range 1 : Begin : 7F7ATR312KER00000	End : 7F7ATR317KER00056	<input type="checkbox"/> Not sequential
VIN Range 2 : Begin : 7F7ATR312LER00001	End : 7F7ATR310LER00126	<input type="checkbox"/> Not sequential
VIN Range 3 : Begin : 7F7ATR310MER00001	End : 7F7ATR315MER00009	<input type="checkbox"/> Not sequential
VIN Range 4 : Begin : 7F7ATR313MER00011	End : 7F7ATR314MER00048	<input type="checkbox"/> Not sequential
VIN Range 5 : Begin : 7F7ATR312MER00050	End : 7F7ATR313MER00056	<input type="checkbox"/> Not sequential
VIN Range 6 : Begin : 7F7ATR319MER00059	End : 7F7ATR317MER00061	<input type="checkbox"/> Not sequential
VIN Range 7 : Begin : 7F7ATR310MER00063	End : 7F7ATR31XMER00068	<input type="checkbox"/> Not sequential
VIN Range 8 : Begin : 7F7ATR318MER00070	End : 7F7ATR318MER00070	<input type="checkbox"/> Not sequential
VIN Range 9 : Begin : 7F7ATR318MER00084	End : 7F7ATR318MER00084	<input type="checkbox"/> Not sequential

Vehicle 2 : 2020-2020 Arcimoto Deliverator

Vehicle Type : MOTORCYCLES

Body Style : OTHER

Power Train : HYBRID ELECTRIC

Descriptive Information : Affects all six MY2020 D-Deliverator-1 vehicles produced from 01/30/2020 through to 10/19/2020.

Production Dates : JAN 30, 2020 - OCT 19, 2020

VIN Range 1 : Begin : 7F7ADR316LER00001 End : 7F7ADR315LER00006 ☐ Not sequential

Vehicle 3 : 2020-2021 Arcimoto Roadster

Vehicle Type : MOTORCYCLES

Body Style : OTHER

Power Train : HYBRID ELECTRIC

Descriptive Information : Affects all six MY2020 - MY2021 Roadster vehicles (four MY2020 R-Roadster, two MY2021 R-Roadster) produced from 11/30/2020 through to 02/18/2021.

Production Dates : NOV 30, 2020 - FEB 18, 2021

VIN Range 1 : Begin : 7F7ARR314LER00001 End : 7F7ARR31XLER00004

☐ Not sequential

VIN Range 2 : Begin : 7F7ARR312MER00001 End : 7F7ARR314MER00002

☐ Not sequential

Vehicle 4 : 2021-2021 Arcimoto Rapid Responder

Vehicle Type : MOTORCYCLES

Body Style : OTHER

Power Train : HYBRID ELECTRIC

Descriptive Information : Affects the one MY2021 E-Rapid Responder vehicle produced on 02/21/2021.

Production Dates : FEB 21, 2021 - FEB 21, 2021

VIN Range 1 : Begin : 7F7AER318MER00001 End : 7F7AER318MER00001

☐ Not sequential

Description of Defect :

Description of the Defect : There are two known failure modes (FM). The first FM is the Steering Angle Sensor (SAS) signal offset preventing the inverter from detecting a defective SAS. The second FM is the SAS offset resulting in an incorrect angle reading.

FMVSS 1 : NR

FMVSS 2 : NR

Description of the Safety Risk : Both FMs will result in the inverters applying substantial unequal torque when this is not intended, requiring substantial manual steering torque to correct. For example, if the throttle and KERS are used in quick succession, the unintended lateral motion in one direction may be initially counteracted by the driver, but then the rapid reversal of unintended lateral motion to the opposite direction may be more rapid than the driver's reaction speed, so the driver's countersteer to accomplish the prior direction becomes an augmenting force to the new direction. Because of the severity of the unintended lateral motion (measured up to 0.4g) and the driver having no advance warning of when this will occur, the vehicle could become extremely difficult to steer or control, resulting in an increased likelihood of a crash.

Description of the Cause : The issue is due to consistently building out of tolerance idler arms, and having no set tolerance for the set screw on the print, combined with manufacturing's lack of tools to correctly calibrate the Steering Angle Sensor (SAS) to "zero" and the risk of the SAS having a fault, not detecting a fault or incorrectly detecting a fault.

Identification of Any Warning NR
that can Occur :

Involved Components :

Component Name 1 : 000899 Idler Arm, STRG, LT, WLDMT

Component Description : Idler Arm, STRG, LT, WLDMT

Component Part Number : 000899

Component Name 2 : 001412 Sensor, Rotary Hall Effect, 90 Degree

Component Description : Sensor, Rotary Hall Effect, 90 Degree

Component Part Number : 001412

Component Name 3 : 003958 Control, Right Hand, Handlebar, Throttle, w

Component Description : Control, Right Hand, Handlebar, Throttle, with Connector

Component Part Number : 003958

Component Name 4 : 004085 Inverter, SME, AC-X1, CAN programming inter

Component Description : Inverter, SME, AC-X1, CAN programming interface

Component Part Number : 004085

Component Name 5 : 004332 Kinetic Energy Recovery System, ASSY

Component Description : Kinetic Energy Recovery System, ASSY

Component Part Number : 004332

Supplier Identification :

Component Manufacturer

Name : NR

Address : NR

NR
Country : NR

Chronology :

Since early January 2021, multiple reports of unintended lateral motion have been received by Product Support/ Service and Engineering.

A PCM meeting was held on January 29, 2021 to address these reports, and Arcimoto discovered various issues and failure modes ("FM") involving the Steering Angle Sensor (SAS), Idler Arm Left, and Inverter.

To determine the seriousness of these failure modes, Arcimoto performed preliminary testing at test-lab TRC from late February 2021 through mid April 2021. This preliminary testing qualitatively confirmed and partially quantified primary and secondary effects, focused around unintended lateral motion.

Based on an audit performed on April 22, 2021 of a small sample population, at least 8% were non-conforming with either loose set screw, wrong SAS orientation, incorrect steering profile, etc. There is no known advance warning to the operator for any of these issues or FM, and no advance warning of when unintended lateral motion will occur the next time an operator twists the throttle or uses KERS.

Since this situation can result in unintended lateral motion making the vehicle difficult to control, an Engineering and Regulatory meeting was held and recommended this issue to be escalated as a recall-candidate to Leadership on April 27, 2021. That same day Leadership accepted the recommendation with a majority vote and declared a voluntary safety recall.

Description of Remedy :

Description of Remedy Program : Owners will be notified by mail and instructed to contact Arcimoto to schedule a service appointment to have their idler arm replaced and to have their firmware upgraded. There will be no charge to vehicle owners for this service. To the best of our knowledge, no owners have incurred any costs resulting from this defect.

How Remedy Component Differs from Recalled Component : To remedy this recall, production began manufacturing the idler arms with additional tolerances and inspection dimensions to address the out-of-tolerance weldments as well as the set screw angle. In addition, new firmware will be programmed to properly and symmetrically define the steering profile to prevent improper calibration of the SAS.

Identify How/When Recall Condition was Corrected in Production : On April 28, 2021, Arcimoto began ECO-402 to poka-yoke the production of its idler arms, to provide additional tolerances, to add inspection dimensions, to address out-of-tolerance weldments and to release a single set of symmetric parameters for all vehicles, to uniformly define the steering profile. Additionally, Engineering has developed and validated explicit direction (EP0017 R1) to Service exactly how to remedy the recalled vehicles.

Recall Schedule :

Description of Recall Schedule : Arcimoto does not intend to send any dealer or distributor notifications, as it has neither dealers nor distributors at this time.

Planned Dealer Notification Date : MAY 20, 2021 - JUN 07, 2021

Planned Owner Notification Date : MAY 20, 2021 - JUN 07, 2021

* NR - Not Reported