

Part 573 Safety Recall Report

21V-191

Manufacturer Name : Arcimoto Inc**Submission Date :** JUN 23, 2021**NHTSA Recall No. :** 21V-191**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 : 181

Estimated percentage with defect : 25 %

Vehicle Information :

Vehicle 1 : 2019-2020 Arcimoto FUV

Vehicle Type :

Body Style :

Power Train : NR

Descriptive Information : Affects all one-hundred eighty-one MY2019 & MY2020 vehicles (fifty-seven MY2019 T-FUV, one-hundred eighteen MY2020 T-FUV)

Production Dates : SEP 19, 2019 - MAR 16, 2021

VIN Range 1 : Begin : 7F7ATR312KER00000 End : 7F7ATR317KER00056 Not sequentialVIN Range 2 : Begin : 7F7ATR312LER00001 End : 7F7ATR312LER00094 Not sequentialVIN Range 3 : Begin : 7F7ATR316LER00096 End : 7F7ATR31XLER00117 Not sequentialVIN Range 4 : Begin : 7F7ATR313LER00119 End : 7F7ATR31XLER00120 Not sequential

Vehicle 2 : 2020-2020 Arcimoto Deliverator

Vehicle Type : MOTORCYCLES

Body Style : OTHER

Power Train : HYBRID ELECTRIC

Descriptive Information : Affects six (6) MY2020 D-Deliverator-1, 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**Description of Defect :**

Description of the Defect : The electronic drivers in some HV contactors may malfunction, causing these contactors to have a higher contact resistance than intended, potentially resulting in overheating.

FMVSS 1 : NR

FMVSS 2 : NR

Description of the Safety Risk : If HV contactors overheat, this can lead to either a blown fuse or opening of the contactors by the BMS, including the traction contactor opening, both of which will lead to unexpected battery shutdown and immediate loss of traction-power, which would make the vehicle more difficult to control and increase the likelihood of a crash.

Description of the Cause : The electronic drivers for the economizer coil in some HV contactors may malfunction, producing out-of-tolerance contact resistance, audible ringing noise, and/or misformed economizer coil current PWM, causing these contactors to have a higher contact resistance than intended, potentially resulting in overheating.

Identification of Any Warning that can Occur : None.

Involved Components :

Component Name 1 : 000895 Gigavac 300A GV241MAB contactor (as-receive

Component Description : Gigavac 300A GV241MAB contactor (as-received)

Component Part Number : 000895

Component Name 2 : 001052 BMS, Orion 2, Standard 36 Cell, Factory Def

Component Description : BMS, Orion 2, Standard 36 Cell, Factory Default Firmware & Profile

Component Part Number : 001052

Component Name 3 : 002176 Fuse, Semiconductor, 150VDC, 400A Rating

Component Description : Fuse, Semiconductor, 150VDC, 400A Rating

Component Part Number : 002176

Component Name 4 : 003024 Busbar, Mid-pack, Flexible

Component Description : Busbar, Mid-pack, Flexible

Component Part Number : 003024

Component Name 5 : 003105 Backbone, ASSY

Component Description : Backbone, ASSY

Component Part Number : 003105

Component Name 6 : 003196 Battery Bay, ASSY

Component Description : Battery Bay, ASSY

Component Part Number : 003196

Component Name 7 : 003198 Battery Electronics, ASSY

Component Description : Battery Electronics, ASSY

Component Part Number : 003198

Component Name 8 : 003357 Contactor, Traction, ASSY (Gigavac 300A GV2

Component Description : Contactor, Traction, ASSY (Gigavac 300A GV241MAB contactor - Arcimoto connectorized)

Component Part Number : 003357

Component Name 9 : 003358 Contactor, Isolation, ASSY (Gigavac 300A GV

Component Description : Contactor, Isolation, ASSY (Gigavac 300A GV241MAB contactor - Arcimoto connectorized)

Component Part Number : 003358

Component Name 10 : 003375 Firmware and Profile, Orion BMS2

Component Description : Firmware and Profile, Orion BMS2

Component Part Number : 003375

Component Name 11 : 004947 Battery Electronics V2, ASSY

Component Description : Battery Electronics V2, ASSY

Component Part Number : 004947

Component Name 12 : 004953 Battery Bay V2, ASSY

Component Description : Battery Bay V2, ASSY

Component Part Number : 004953

Component Name 13 : 004957 Busbar, Wide, Rear Contactor to Battery, FM

Component Description : Busbar, Wide, Rear Contactor to Battery, FM-PF

Component Part Number : 004957

Supplier Identification :

Component Manufacturer

Name : Sensata Technologies (formerly Gigavac)

Address : 529 Pleasant Street

Mail Station B-49 Attleboro Massachusetts 02703

Country : United States

Chronology :

On 5/19/20 a customer reported that while driving their FUV on the hwy, it suddenly coasted to a stop. Arcimoto immediately examined the vehicle, discovered a blown fuse & evidence of overheating involving the contactors. All fuses were immediately tested, but determined to be within acceptable limits & not the Root Cause. Analysis then focused on bus-bars, fasteners, & conductive graphite grease, which were all tested, but they were determined to be within acceptable limits & not the Root Cause. Resistance testing of the contactor closest to the blown fuse was measured to be 1.5 times the acceptable limit. On 7/1 a FUV with reduced speed/acceleration & evidence of overheating involving a contactor measured resistance 1.5 times the acceptable limit. On 7/2, a FUV with reduced speed/acceleration & evidence of overheating involving a contactor measured resistance 3.7 times the acceptable limit.

On 7/3 Arcimoto notified NHTSA of SB-20-003 (20MC8034, 10176916), which sampled vehicles already in the field for evidence of overheating; this method revealed 3 vehicles that each had 1 contactor that exhibited visual evidence of overheating. Upon these findings, vehicle sampling under SB-20-003 was discontinued. From 7/19 to 10/9, more complex electronic testing on contactors was developed & detected new contactors with excessive contact resistance, audible ringing noise, &/or misformed economizer coil current PWM, each of

which could result in overheating. This testing demonstrated the Root Cause of excessive contact resistance within the contactor led to overheating & validated safety concerns about the vehicle population. Following Arcimoto's process starting on 5/26 & continuing through 10/12, research data, analysis, & developments were discussed across more than eight meetings. On 11/12, the Engineering & Q&RA Depts presented findings to Arcimoto executives, who decided on 11/17 to validate these findings & notify NHTSA of a Safety Defect.

Description of Remedy :

Description of Remedy Program : Owners will be notified by mail and instructed to contact Arcimoto to schedule a service appointment(s) to have their contactors and related components replaced. 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 : Using Arcimoto's new advanced electronic testing, all HV contactors in customers' vehicles will be extensively inspected and tested, and any identified as out-of-tolerance will be replaced with contactors tested to be within acceptable limits. All HV electronics inside the compartment for the traction-power battery will be replaced with redesigned sub-assemblies, including (i) the bus-bars attached to the contactors have been enlarged for increased radiative capacity, (ii) a heat-sink has been added to a rear bus-bar, and (iii) a redundant second fuse for the traction-power battery has been eliminated. Additionally, due to an improperly implemented remedy in both Service and Production, the subject build dates and VIN range was increased to reflect these additional vehicles. Specifically, for vehicles built after this original defect report as well as those remedied under this recall prior to early February 2021, newly introduced parts (003739B B- Return Harness and 004955 Littelfuse) will be rescinded and replaced (with parts 003739C B- Return Harness and 002176 Mersen fuse).

Identify How/When Recall Condition was Corrected in Production :

Using Arcimoto's new advanced electronic testing, all HV contactors received from Component Manufacturer will be extensively inspected and tested, to ensure all product is within acceptable limits.

For vehicles in-process or already produced prior to November 18, 2020: All HV contactors already in vehicles will be re-tested, and any identified as out-of-tolerance will be replaced with contactors tested to be within acceptable limits.

All HV electronics inside the compartment for the traction-power battery will be reworked with redesigned sub-assemblies, including (i) the bus-bars attached to the contactors have been enlarged for increased radiative capacity, (ii) a heat-sink has been added to a rear bus-bar, (iii) a redundant second fuse has been eliminated, and (iv) only for vehicles already remedied under this recall prior to early February 2021, newly introduced harness and fuse will be rescinded and replaced with originally-designed harness and fuse.

For vehicles produced on or after November 18, 2020:

All HV electronics inside the compartment for the traction-power battery will have redesigned sub-assemblies, including (i) the bus-bars attached to the contactors have been enlarged for increased radiative capacity, (ii) a heat-sink has been added to a rear bus-bar, (iii) a redundant second fuse has been eliminated, (iv) only for vehicles built after this original defect report but prior to early February 2021, newly introduced harness and fuse will be rescinded and replaced with originally-designed harness and fuse, and (v) the rear access-hole of the compartment for the traction-power battery has been enlarged

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 : NR - NR

Planned Owner Notification Date : MAR 22, 2021 - APR 09, 2021

* NR - Not Reported