

**Forte, Forte Koup, Optima, Optima Hybrid, Sedona ACU Chronology
Basis of Safety Defect Determination 573.6(c)(6)**

March 2014	Kia Motors America, Inc., (“KMA”) receives lawsuit complaint alleging non-deployment of frontal airbag in 2012 Kia Forte. Incident reported to NHTSA through Early Warning Reporting.
July 2014	KMA receives and responds to inquiry DI14-024 from NHTSA regarding incident. Limited information; initial stages of litigation.
March-June 2015	KMA attempts download of airbag control unit (“ACU”); unable to communicate with module. KMA requests assistance from supplier, ZF TRW (“TRW”), and also obtains no data. Engineering consultant concludes front impact sensors (“FIS”) compromised before airbag signal could be transmitted.
Summer 2015	TRW advises Kia that NHTSA is investigating airbag non-deployment issues with wide range of models regarding TRW ACU.
October-November 2015	Under TREAD reporting, KMA provides NHTSA with ACU download and photographs taken by police and engineering consultants.
October 2015-January 2016	KMA ships subject ACU to Kia Motors Corporation (“KMC”) for analysis. KMC unable to determine ACU performance issues and refers to TRW, which concludes non-deployment occurred due to a complex series of possible events.
December 14-15, 2015	Joint inspection of subject vehicle conducted by TRW, KMC, KMA and MOBIS. KMC concludes 1) power terminal and front impact sensors (FIS) did not reveal any issues related to airbag non-deployment; 2) inspection of wiring confirmed no issues with interior ACU power terminal and ground terminal circuit; and 3) FISs disconnected during crash event.
February 5, 2016	Kia advised by TRW Legal that TRW has provided information regarding all manufacturers with this ACU and ASIC to NHTSA. TRW presentation includes unverified and incorrect information regarding Kia vehicles.
February 25, 2016	Kia meets with TRW in Korea to obtain information from TRW on what it has told NHTSA regarding NHTSA’s concerns with EOS issues. Discussion includes information reported unilaterally by TRW to NHTSA. TRW declines to provide detailed information regarding TRW’s experience with that ACU and ASIC issues with other manufacturers, in particular regarding what TRW calls electrical stress (“EOS”) issues. Kia requires TRW to provide Kia detailed questions TRW needs in order to determine whether a defect prevented a non-deployment of a frontal airbag in any Kia vehicle. KMA asks TRW whether an EOS related defect has caused any Kia airbag non-deployment and TRW advises that has not occurred.
April 21, 2016	KMC provides responses to TRW’s questions for use by TRW and for TRW’s reporting to NHTSA.

July 19, 2016	TRW meets with NHTSA. Based on communications with TRW, Kia understands NHTSA is satisfied and no action is to be taken by NHTSA.
July-August 2016	During several communications between Kia with TRW Legal, TRW advises KMA that the ACU issue has been fully reported to NHTSA, that NHTSA is satisfied and that Kia needs to take no further action. During last call, TRW Legal advises that FCA has decided to recall certain models, but that recall is due to the design of the wiring harnesses for the FIS in those vehicles and TRW disagrees with FCA's recall decision. TRW advises that the discussions with FCA and NHTSA do not require any recall by Kia.
May-June 2017	Kia Canada, Inc. ("KCI") advises KMA that Transport Canada (TC) has requested support of ACU download regarding possible non-deployment event involving a 2013 Kia Forte Koup. KMA advises TRW. KMA begins to pursue accident reconstruction but TC identifies Forte Koup has been destroyed. Only photos available. TC has ACU and it is provided by KCI to TRW.
August 24, 2017	TRW, Kia and MOBIS conduct joint inspection of 2013 Forte Koup ACU at TRW facility. Inspection identified internal damage to ACU ASIC; no EDR data recorded. TRW engineers advise Kia that damage to ACU ASIC occurred when TC attempted download. Based on limited photos, KMC concludes Canadian Forte crash structures not impacted and insufficient frontal crash energy to generate deployment signal.
September-October 2017	KMA receives and responds to DI17-077 request from NHTSA regarding 2013 Forte Koup Canadian incident.
January-February 2018	KMA participates in telephone conferences with NHTSA to discuss Forte non-deployment incidents. KMA provides historical background of its involvement with TRW during NHTSA's investigation into the EOS issue with TRW in 2016. KMA requests that NHTSA involve TRW in any discussions based on TRW's superior knowledge.
March 1, 2018	KMA participates in telephone conference with NHTSA. NHTSA seeks Kia's proposed action in light of Hyundai Sonata recall. KMA advises Hyundai Sonata incidents are very different than what Kia has seen in its Forte vehicles and expresses its belief that this issue had been resolved against any recall of Kia vehicles during NHTSA's investigation of the TRW ACU EOS issue in 2016. KMA requests in person meeting at NHTSA headquarters in Washington D.C. to present Kia's learning on the EOS issue and the investigative effort by Kia to evaluate this issue.
March 14, 2018	Kia meets with NHTSA and provides detailed presentation of its investigation and conclusions regarding Forte non-deployment incidents. Kia identifies no cause had been found despite extensive evaluation and investigation. In light of Kia's understanding that the FCA recall in 2016 was critically based on the design architecture of

	the wiring harnesses for those vehicles, Kia inquires whether NHTSA is basing its recall evaluation on the design architecture of the Forte or on the existence of specific internal damage to the TRW ACU ASIC in the Forte. NHTSA advises that it is still evaluating those issues.
March 15, 2018	At NHTSA's request, KMA participates in follow-up call with NHTSA. NHTSA identifies that it will open an investigation to evaluate the issue further.
March 16, 2018	ODI Resume issued to KMA and HMA to investigate non-deployment of frontal airbags in the 2012-2013 Kia Forte and 2011 Hyundai Sonata (PE18-003).
April 4-5, 2018	During telephone conference with NHTSA, KMA proposes that Kia conduct a design analysis to determine whether the 2010-2013 Kia Forte and Forte Koup are susceptible to EOS, leading to airbag non-deployment. NHTSA approves of proposed plan and timeline.
April 20-May 4, 2018	Weekly discussions between KMA and NHTSA to provide status updates of analysis. NHTSA locates two exemplar Forte vehicles in salvage yards for further evaluation and requests assistance from KMA to conduct ACU download.
May 15-16, 2018	NHTSA, KMA, NHTSA's Vehicle Research & Test Center (VRTC) and Kia's consultants participate in joint inspection of the 2011 Kia Forte Koup and 2012 Kia Forte. KMA able to communicate with 2011 Forte Koup ACU module. Crash did not meet deployment threshold. KMA unable to communicate with 2012 Forte ACU module. Both ACU modules removed for further analysis by TRW.
May 24, 2018	TRW, Kia, MOBIS, NHTSA and VRTC conduct joint inspection of 2011 Forte Koup and 2012 Forte ACUs at TRW facility. Downloaded data of 2011 Kia Forte Koup confirmed ACU operated as designed and crash pulse did not warrant deployment of front airbags. Downloaded data of 2012 Kia Forte showed one (1) event recorded in Event 1 buffer and no data recorded in Event 2 buffer. Ignition counter information showed Event 1 was a previous incident. Resistance measurements made on certain circuit board pins consistent with prior controller measurements taken by TRW that have exhibited an EOS event. Based on these results and available information from other manufacturers, NHTSA requests Kia conduct a recall of the 2010-2013MY Forte.
May 28, 2018	KMC agrees to recall 2010-2013 Kia Forte and Forte Koup based on NHTSA conclusion that ACUs that do not contain adequate circuit protection create a higher risk of EOS. Based on its engineering analysis of other Kia models equipped with the same TRW ACU as the Forte and Forte Koup, KMC determines that NHTSA logic also requires a recall of 2011-2013 Optima, 2011-2012 Optima Hybrid and 2011-2012 Sedona, regardless of the absence of prior incidents involving those vehicles.