

ACPE

# Pedal Error Accident Case for Unobstructed Accident Scenarios

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# Accelerate from a standstill or very low speed

## Case 1 (Sedan EV)

- ✓ Driver: Woman(58 years old)
- ✓ Overview: traffic signal waiting ⇒ move slowly ⇒ accelerates rapidly(Injured 2, Vehicle damaged 4)

Pre-crash data of EDR(Operate accelerator pedal), Accelerator Pedal was broken



# Accelerate from a standstill or very low speed

## Case 1 (EDR:Pre-crash data)

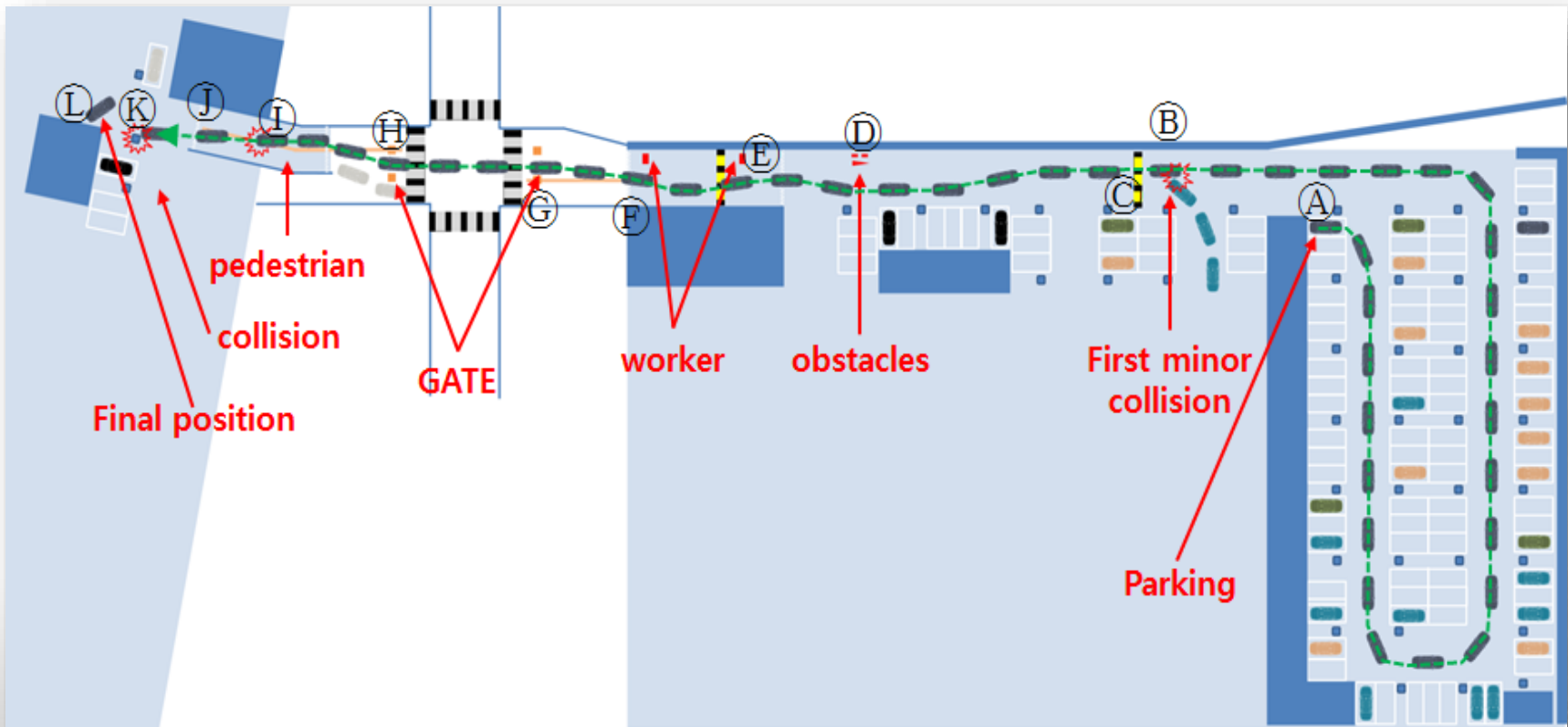
Time (sec)	Speed (kph)	Motor RPM	Engine Throttle (TPS %)	Accelerator Pedal (APS %)	Brake switch (on/off)	Anti lock Brake system(on/off)	electric stability control(ESC) (on/off/engaged)	Steering angle (degree)
-5	79	5,100	-	99	OFF	OFF	not engaged (ESC switch on)	-15
-4.5	82	5,300	-	99	OFF	OFF	not engaged (ESC switch on)	0
-4	83	5,300	-	99	OFF	OFF	not engaged (ESC switch on)	15
-3.5	84	5,400	-	99	OFF	OFF	not engaged (ESC switch on)	0
-3	86	5,600	-	99	OFF	OFF	not engaged (ESC switch on)	10
-2.5	89	5,700	-	99	OFF	OFF	not engaged (ESC switch on)	0
-2	92	5,900	-	99	OFF	OFF	not engaged (ESC switch on)	0
-1.5	94	6,100	-	99	OFF	OFF	not engaged (ESC switch on)	0
-1	98	6,300	-	99	OFF	OFF	not engaged (ESC switch on)	0
-0.5	100	6,400	-	99	OFF	OFF	not engaged (ESC switch on)	0
0	102	6,600	-	99	OFF	OFF	not engaged (ESC switch on)	-15



# Accelerate from a standstill or very low speed

## Case 2 (SUV)

- ✓ Driver: Woman(54 years old)
- ✓ Overview: Parking lot ⇒ move slowly ⇒ Minor collision(Left rear side) ⇒ accelerates rapidly(fatality 2, Injured 1), Pre-crash data of EDR(Operate gas pedal)



<The path of the accident vehicle>

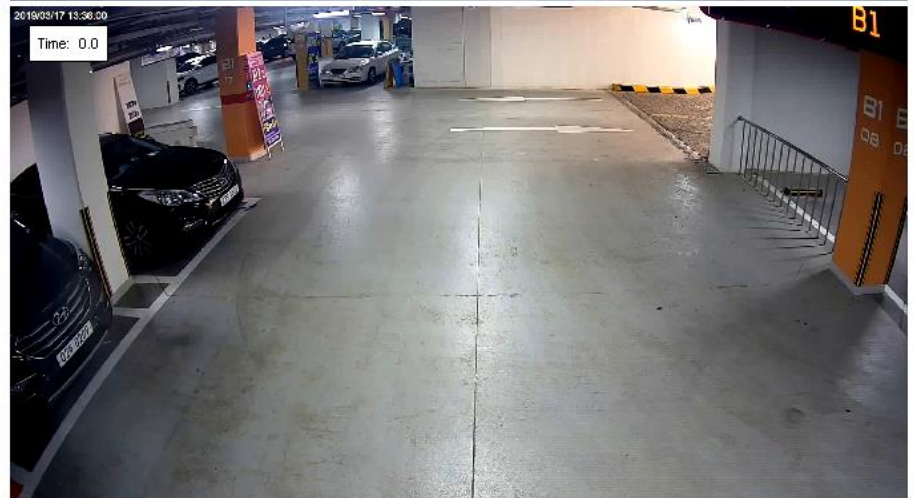
# Accelerate from a standstill or very low speed

## Case 2 (CCTV - Minor collision)



# Accelerate from a standstill or very low speed

## Case 2 (Synchronize with video clip)





# Accelerate from a standstill or very low speed

## Case 2 (EDR:Pre-crash data)

Time (sec)	Speed (kph)	Engine RPM	Engine Throttle (TPS %)	Accelerator Pedal (APS %)	Brake switch (on/off)	Anti lock Brake system(on/off)	electric stability control(ESC) (on/off/engaged)	Steering angle (degree)
-5	55	4,100	100	99	OFF	OFF	not engaged (ESC switch on)	35
-4.5	59	4,200	86	86	OFF	OFF	not engaged (ESC switch on)	-20
-4	58	3,900	100	99	OFF	OFF	not engaged (ESC switch on)	-10
-3.5	62	3,000	100	99	OFF	OFF	not engaged (ESC switch on)	0
-3	66	3,000	100	99	OFF	OFF	not engaged (ESC switch on)	10
-2.5	70	3,200	90	90	OFF	OFF	not engaged (ESC switch on)	-15
-2	75	3,400	100	99	OFF	OFF	not engaged (ESC switch on)	-5
-1.5	76	3,300	59	59	OFF	OFF	not engaged (ESC switch on)	0
-1	78	3,900	70	71	OFF	OFF	not engaged (ESC switch on)	-50
-0.5	81	3,000	63	63	OFF	OFF	not engaged (ESC switch on)	0
0	114	3,700	20	19	OFF	OFF	not engaged (ESC switch on)	-10

# Accelerate from driving

## Case 3 (CUV)

- ✓ Driver: Woman(52 years old)
- ✓ Overview: Driving(phone call) ⇒ intersection check ⇒ Driver panicking ⇒ left turn and crash the tree,  
Pre-crash data of EDR(Operate gas pedal)





# Accelerate from driving

## Event data ( Pre-Crash)

Time (sec)	Speed (kph)	Engine RPM	Engine Throttle (TPS %)	Accelerator Pedal (APS %)	Brake switch (on/off)	Anti lock Brake system(on/off)	electric stability control(ESC) (on/off/engaged)	Steering angle (degree)
-5	79	6,500	15	99	OFF	OFF	not engaged (ESC switch on)	0
-4.5	79	6,500	16	99	OFF	OFF	not engaged (ESC switch on)	25
-4	78	6,500	16	99	OFF	OFF	not engaged (ESC switch on)	15
-3.5	78	6,500	16	99	OFF	OFF	not engaged (ESC switch on)	50
-3	78	6,500	16	99	OFF	OFF	not engaged (ESC switch on)	105
-2.5	76	6,500	15	99	OFF	OFF	not engaged (ESC switch on)	55
-2	75	6,500	15	99	OFF	OFF	not engaged (ESC switch on)	120
-1.5	72	6,500	16	99	OFF	OFF	not engaged (ESC switch on)	200
-1	67	6,300	20	99	OFF	OFF	engaged (ESC switch on)	215
-0.5	64	6,400	19	99	OFF	OFF	engaged (ESC switch on)	190
0	49	6,100	8	99	OFF	OFF	engaged (ESC switch on)	135

# Conclusion

## Case study of unobstructed accident scenario

- ✓ Korea agrees with the obstacle scenario at a standstill or low speed.
- ✓ However, what if the driver misuses the pedal with no obstacle? It may result in more serious damage due to the increasing speed.
- ✓ These accidents have continuously happened in Korea.
- ✓ Crash mitigation would be helpful in the high-speed driving situation.
  - such as reducing the engine power, and smooth deceleration (Heavy braking at high speed may occur a secondary accident with rear following vehicles)
- ✓ If the ACPE group **considers the unobstructed accident scenario at high speed**, very appreciated.

## Criteria of how to determine pedal error(unintended pedal operation)

- ✓ Korea is testing to check the time for fully pushing the pedals. When the test is over, we will share the results next meeting.



# THANK YOU

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