LD Spectra OCS Warranty Return Part Inspection Results

2015.10.07

Kia Quality Division
Quality Assurance Team 2

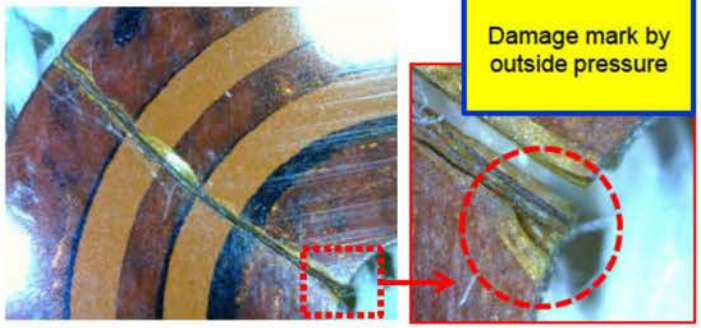
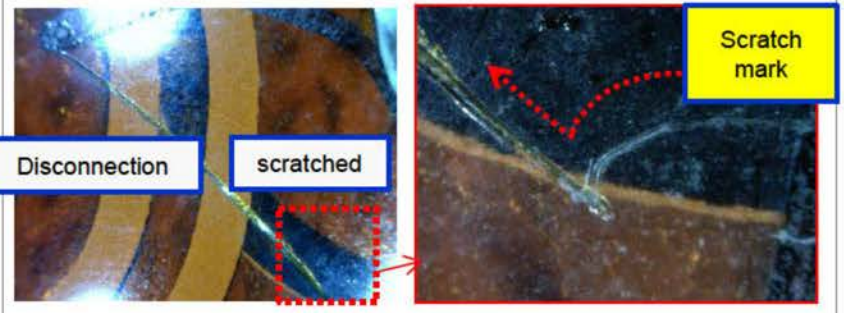
▣ OCS Warranty Return Part Inspection Summary & Results

1. Inspection Summary – To analyze the cause of Airbag Warning Light ON by inspecting OCS Warranty Return Parts

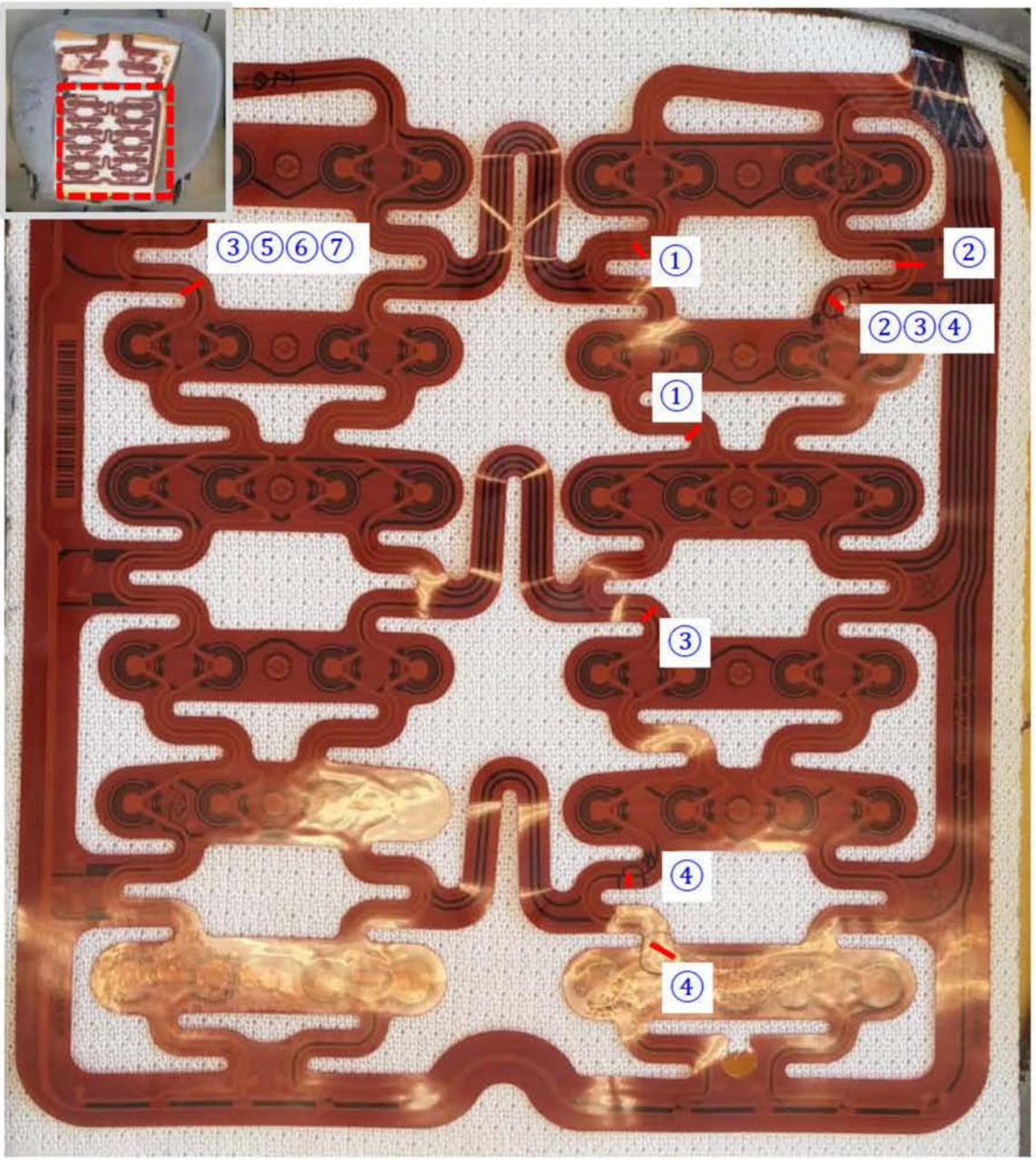
What was inspected	4 of KMA's recent (Sep. 2015) warranty return parts and 3 of VOQ parts – total 7 pieces
Date / Location	10/5 ~ 10/7/2015 / USA (KMA)
Inspectors	KMC Quality Assurance Team 2 (Manager, Min-Soo Kim), KMC Chassis Engineering Improvement Team (Sr. Engineer, Jae-Seung Song), KMC Electronics Improvement Team 2 (Asst. Manager, Wan-Hyun Baek)
Inspection Method	Visual Inspection on the damaged area of OCS Mat and Microscopic Inspection for detailed analysis on the damage patterns

2. Inspection Results

1. Shape/Form of damage: OCS circuit was damaged by repeated weight pressure on small affected areas or by sharp-edged objects
2. Damage Location: Each inspected part had different locations of damage

Damage by repeated weigh pressure on small area	Damage by sharp-edged objects	
		

▣ Circuit Disconnection Location by Inspected Parts

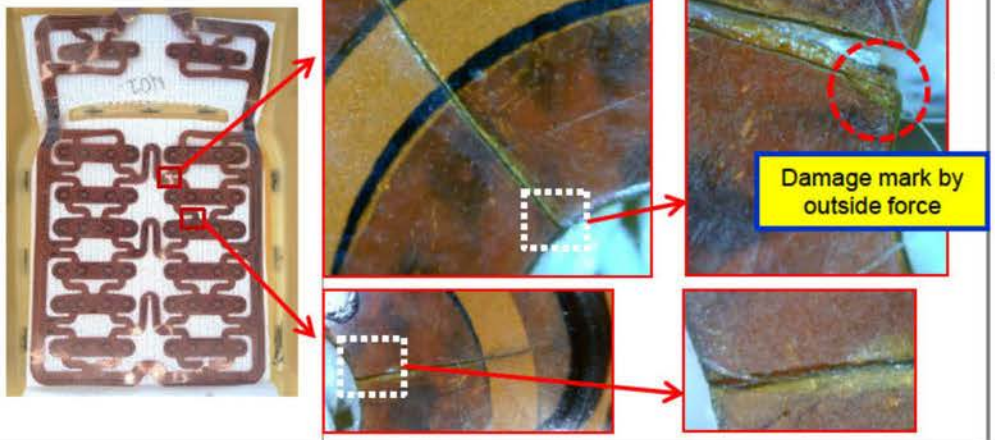
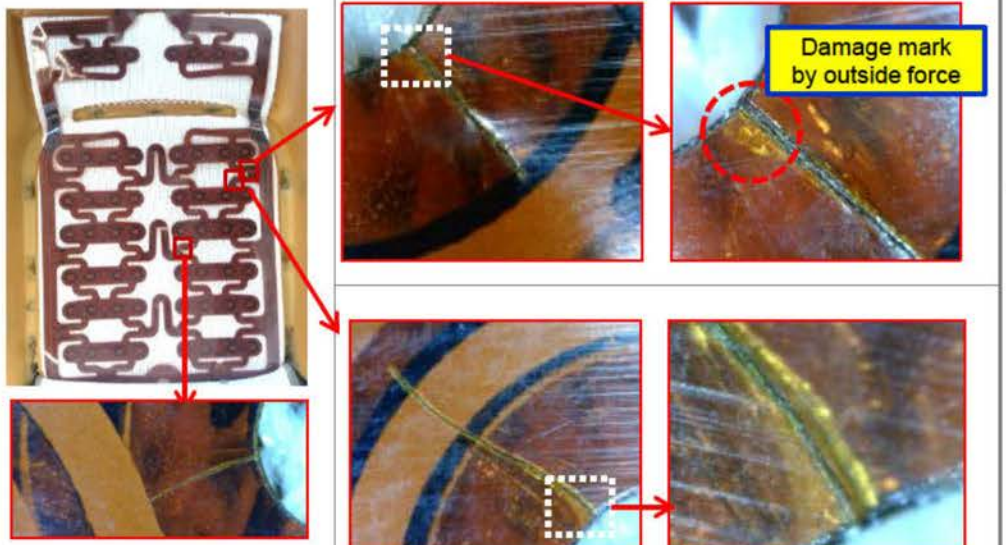


Return Part #	VIN	# of Circuit Breakages
①	KNAFE222X95[redacted] (47,373 mile)	2
②	KNAFE161085[redacted] (74,562 mile)	2
③	KNAFE221295[redacted] (96,452 mile)	3
④	KNAFE222695[redacted] (82,239 mile)	3
⑤	KNAFE241295[redacted] (54,300 mile)	1
⑥	KNAFE161485[redacted] (76,687 mile)	1
⑦	KNAFE241995[redacted] (50,000 mile)	1

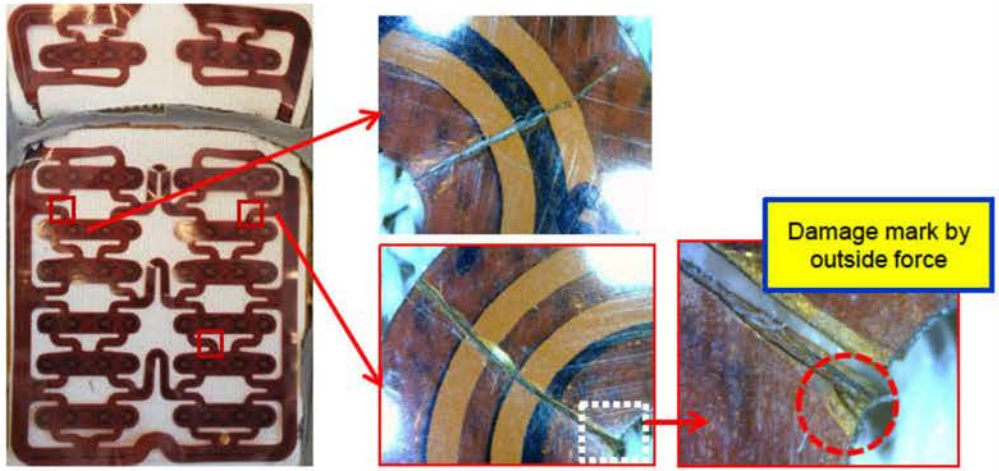
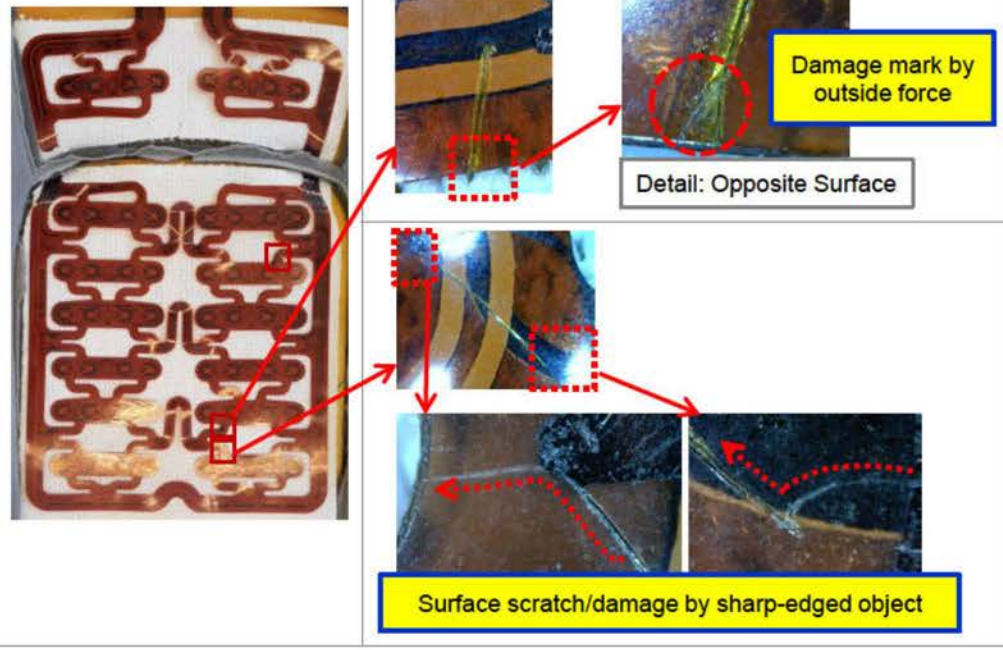
※ Return Part Inspection Result Summary

NO	VIN	MY	Retail Date	Repair Date	Months in Service	Mileage	NHTSA VOQ#	Inspection Results
1	KNAFE222X95[redacted]	2009	7/14/2009	7/30/2015	72.5	47,373	N/A	• Determined as repeated weight pressure focused on a certain area by small-size object(s) damaged the mat sensor circuit
2	KNAFE161085[redacted]	2008	9/2/2008	6/8/2015	81.2	74,562	N/A	
3	KNAFE221295[redacted]	2009	4/27/2009	9/2/2015	76.2	95,452	N/A	• Determined as repeated weight pressure focused on a certain area by angular object(s) damaged the mat sensor circuit
4	KNAFE222695[redacted]	2009	3/16/2009	5/28/2015	74.4	82,239	10712140	• Determined as repeated weight pressure focused on a certain area by small-size object(s) damaged the mat sensor circuit • Identified scratch mark by sharp & pointy object(s) which possibly damaged the mat sensor circuit
5	KNAFE241295[redacted]	2009	12/19/2008	7/21/2015	79.1	54,300	N/A	• Determined as direct weight pressure by small-size object(s) cracked the mat sensor circuit • Determined that damages started at crack are due to repeated weight pressure on the damaged area
6	KNAFE16148[redacted]	2008	3/24/2008	5/2/2015	85.3	76,687	10705387	• Determined as direct weight pressure focused on a certain area by small-size object(s) distorted and damaged the mat sensor circuit
7	KNAFE241995[redacted]	2009	4/22/2009	9/12/2015	76.7	50,000	10607838	• Determined as direct weight pressure focused on a certain area by angular object(s) damaged the mat sensor circuit

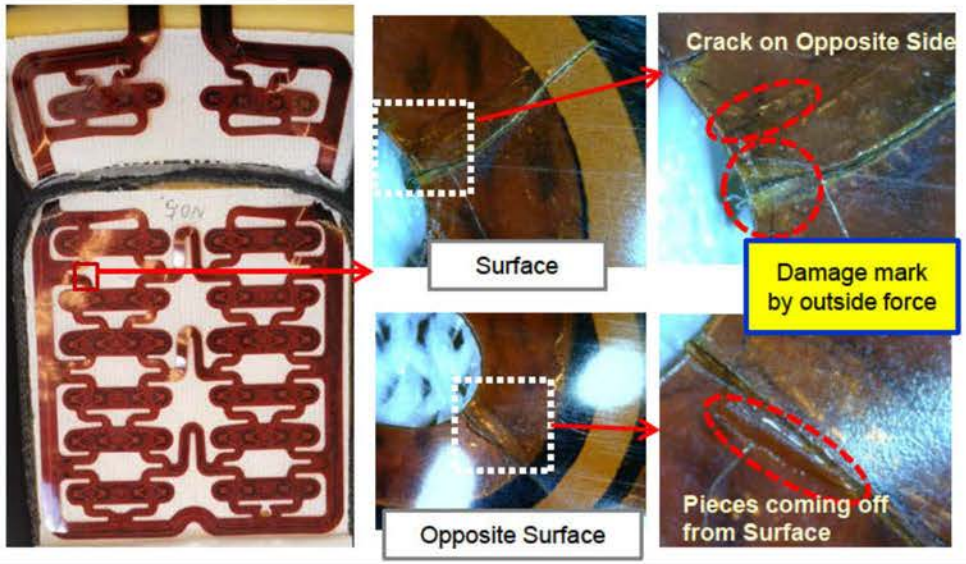
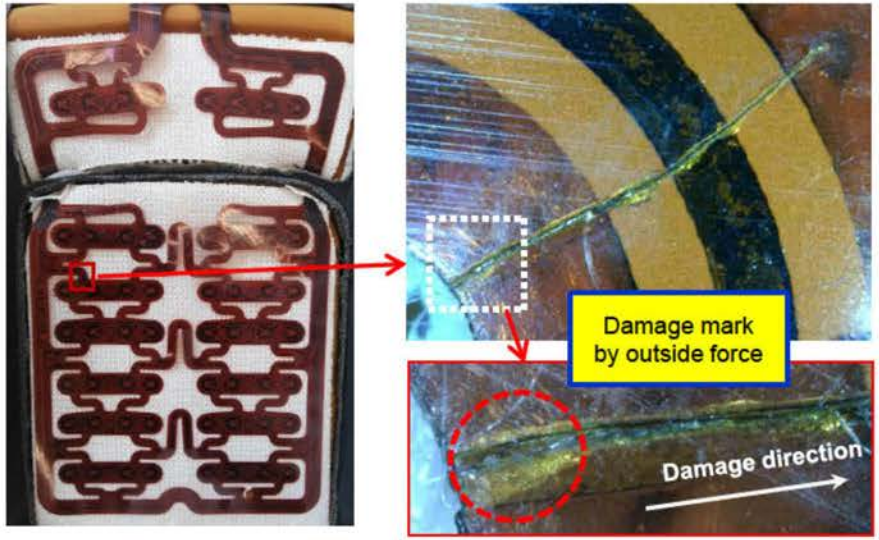
※ Detailed Results of each Part Inspected

No.	Vehicle Info	Damage Location	Inspection Results
1	KNAFE222X95[redacted] [redacted] (47,373 mile)		• Determined as repeated weight pressure focused on a certain area by small-size object(s) damaged the mat sensor circuit - Inner-side was damaged first → expanded to outer-side
2	KNAFE161085[redacted] [redacted] (74,562 mile)		• Determined as repeated weight pressure focused on a certain area by small-size object(s) damaged the mat sensor circuit - Inner-side was damaged first → expanded to outer-side

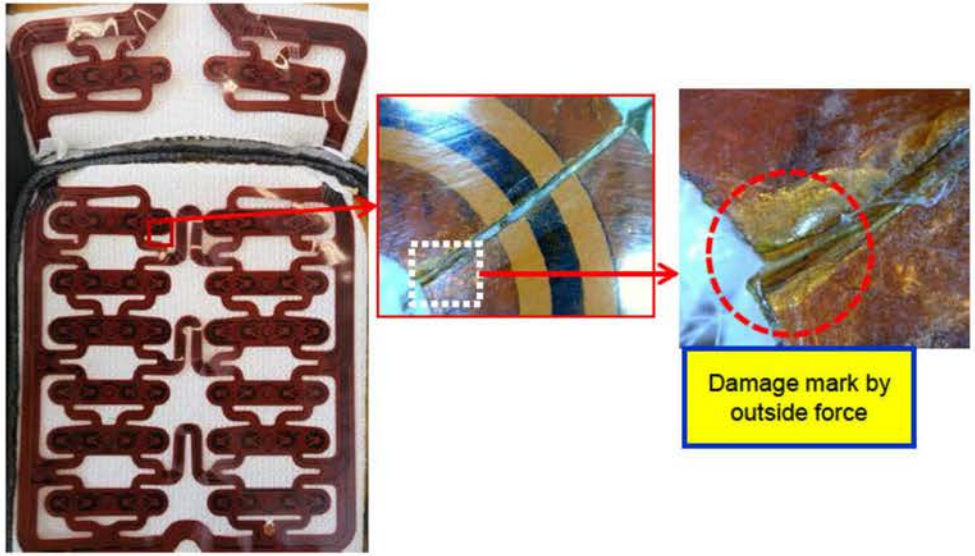
※ Detailed Results of each Part Inspected

No.	Vehicle Info	Damage Location	Inspection Results
3	KNAFE221295[redacted] [redacted] (96,452 mile)		• Determined as repeated weight pressure focused on a certain area by angular object(s) damaged the mat sensor circuit - Inner-side was damaged first → expanded to outer-side
4	KNAFE222695[redacted] [redacted] (82,239 mile)		• Determined as repeated weight pressure focused on a certain area by small-size object(s) damaged the mat sensor circuit - Inner-side was damaged first → expanded to outer-side • Identified scratch mark by sharp & pointy object(s) which possibly damaged the mat sensor circuit

※ Detailed Results of each Part Inspected

No.	Vehicle Info	Damage Location	Inspection Results
5	KNAFE24129[redacted] [redacted] (54,300 mile)		• Determined as direct weight pressure by small-size object(s) cracked the mat sensor circuit • Determined that damages started at crack are due to repeated weight pressure on the damaged area - Inner-side was damaged first → expanded to outer-side
6	KNAFE161485[redacted] [redacted] (76,687 mile)		• Determined as direct weight pressure focused on a certain area by small-size object(s) distorted and damaged the mat sensor circuit - V-shaped distortion observed around the damaged area

※ Detailed Results of each Part Inspected

No.	Vehicle Info	Damage Location	Inspection Results
7	KNAFE241995[redacted] [redacted] (50,000 mile)		• Determined as direct weight pressure focused on a certain area by angular object(s) damaged the mat sensor circuit - Straight-line shaped damage

KOREAN

DOCUMENT

LD Spectra OCS 고품분석 결과 보고

2015.10.07

기아 품질사업부
품질보증2팀

▣ OCS 고품 분석 개요 및 결과

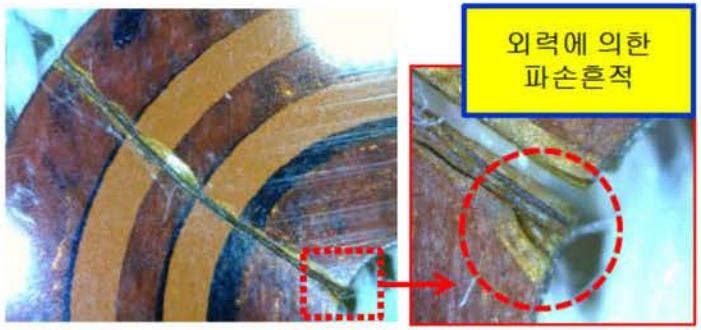
1. 출장 조사 개요 - LD Spectra OCS 고품 분석하여 경고등 점등 원인 조사

분석 대상	KMA에서 최근 수거한 고품 (4개) 및 VOQ part (3개), 총 7개
일정 / 장소	'15.10/5 ~ 7 / 미국(KMA)
참석부문	품질보증2팀(김민수 과장), 샤시설계개선팀(송재승 책임), 전자개선2팀(백완현 대리)
조사 방법	OCS MAT 파손부위 육안 검사 및 현미경 사용하여 세부 파손유형 분석

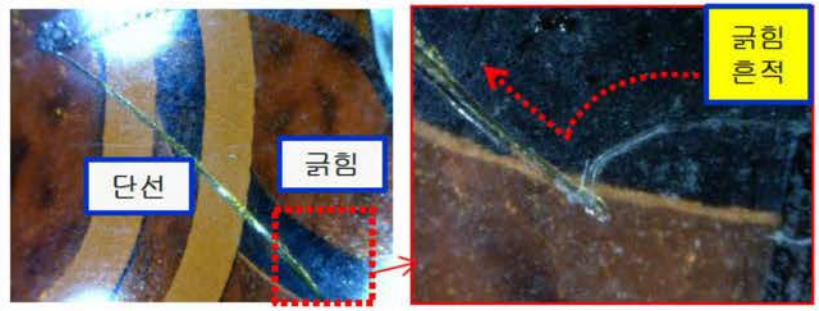
2. 고품 분석 결과

1. 파손 현상 : 국소 집중 하중 및 날카로운 물체에 의한 OCS 회로 파손
2. 발생위치 : 고품마다 파손 위치 상이

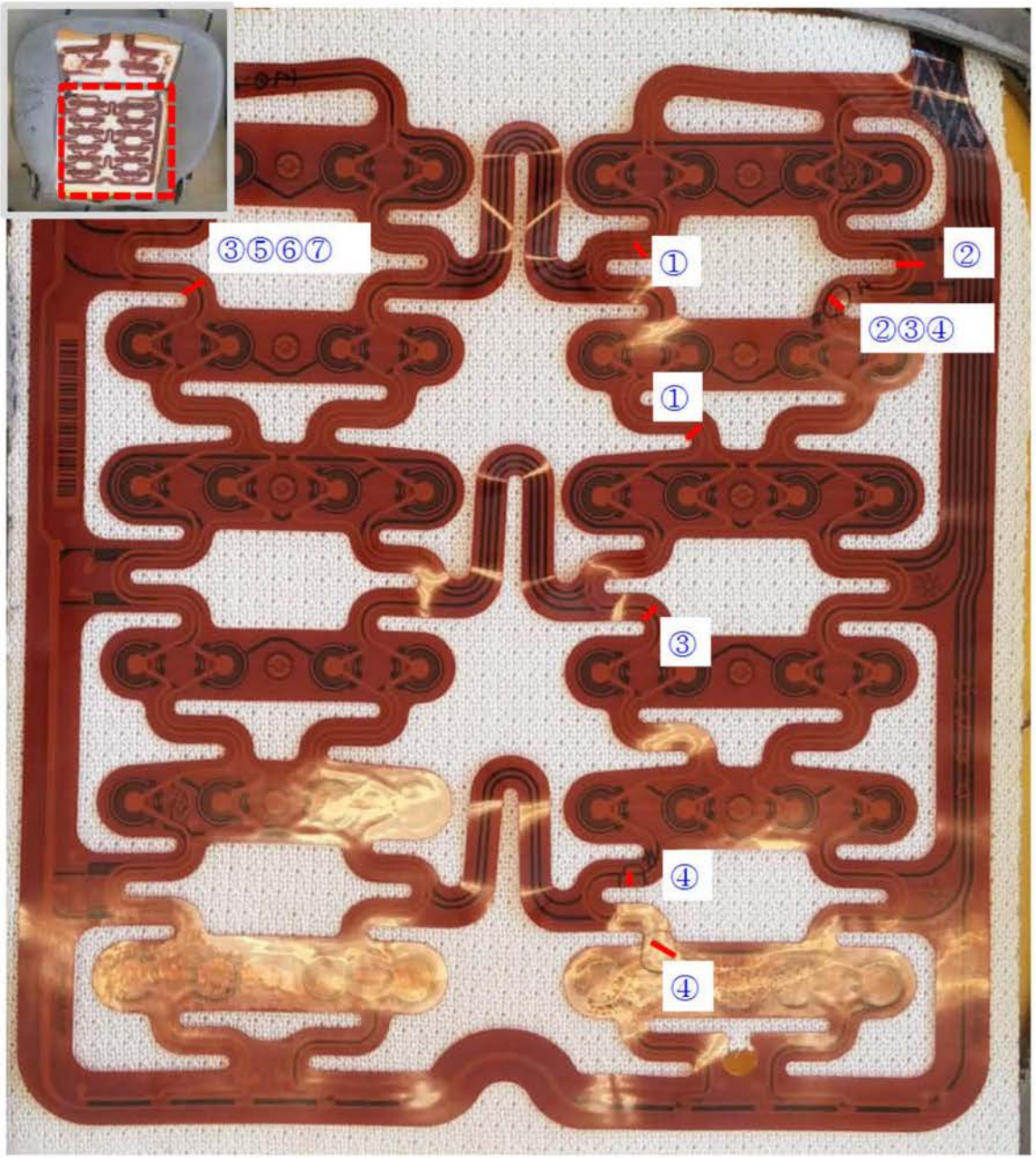
국소 집중하중에 의한 파손



날카로운 물체에 의한 파손



▣ 고품별 단선 발생부위

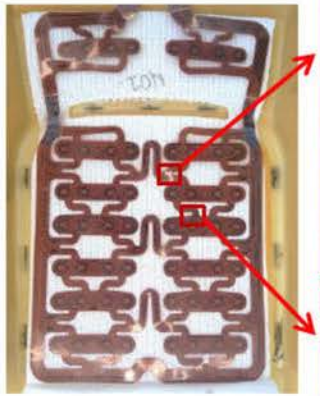
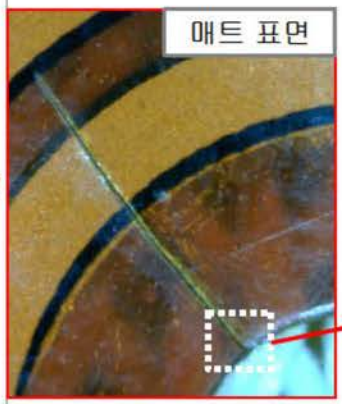
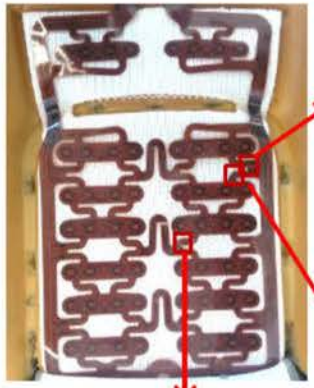
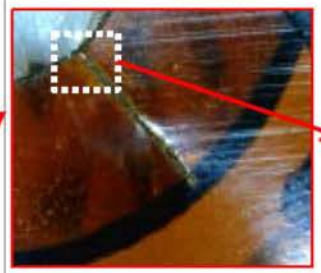
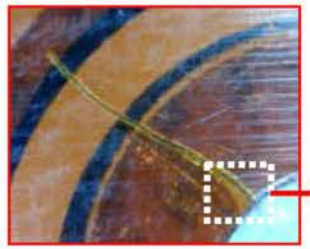
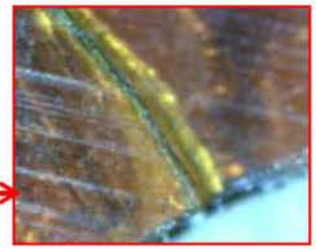


고품 NO	VIN	회로 단선 (발생 개수)
①	KNAFE222X95[redacted] (47,373 mile)	2
②	KNAFE161085[redacted] (74,562 mile)	2
③	KNAFE221295[redacted] (96,452 mile)	3
④	KNAFE22269[redacted] (82,239 mile)	3
⑤	KNAFE241295[redacted] (54,300 mile)	1
⑥	KNAFE161485[redacted] (76,687 mile)	1
⑦	KNAFE241995[redacted] (50,000 mile)	1

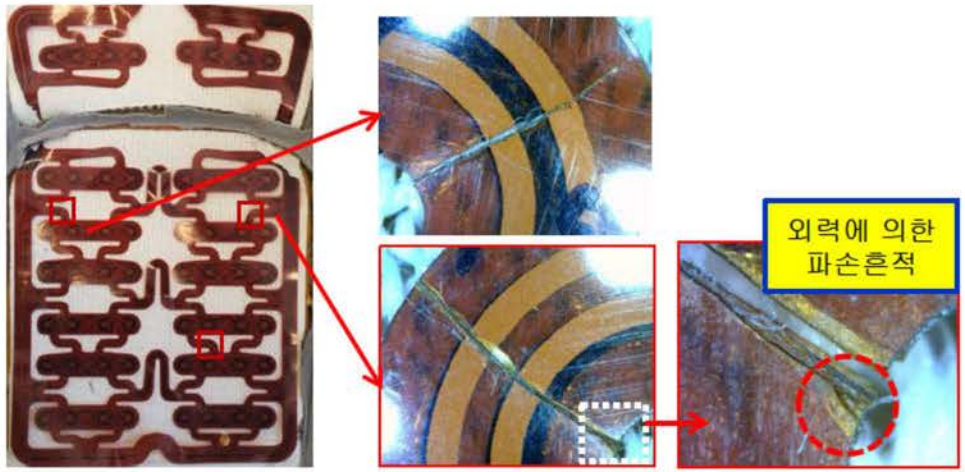
※ 고품 조사 결과 요약

NO	VIN	MY	판매일	수리일	주행기간 (개월)	주행거리 (mile)	NHTSA VOQ#	분석결과
1	KNAFE222X95 [redacted]	2009	'09.7/14	'15.7/30	72.5	47,373	없음	• 면적이 좁은 물체가 특정 부위에 하중을 집중 시켜 매트 인장에 의한 파손 판단됨
2	KNAFE161085 [redacted]	2008	'08.9/2	'15.6/8	81.2	74,562	없음	
3	KNAFE221295 [redacted]	2009	'09.4/27	'15.9/2	76.2	95,452	없음	• 각진 물체가 해당 부위에 하중을 집중 시켜 손상 및 인장에 의한 파손 판단됨
4	KNAFE222695 [redacted]	2009	'09.3/16	'15.5/28	74.4	82,239	10712140	• 면적이 좁은 물체가 특정 부위에 하중이 집중되어 매트 인장에 의한 파손 판단됨 • 날카로롭고 뾰족한 물체에 의한 긁힘 흔적있으며 그로인해 해당부 단선 발생 함
5	KNAFE241295 [redacted]	2009	'08.12/19	15'.7/21	79.1	54,300	없음	• 좁은 면적의 물체가 의해 직접적으로 하중을 받아 크랙발생 • 크랙부위를 기점으로 반복적인 하중이 적용되어 파단된 것으로 판단됨
6	KNAFE161485 [redacted]	2008	'08.3/24	'15.5/2	85.3	76,687	10705387	• 좁은 면적의 물체에 의해 직접적으로 하중을 받아 , 뒤틀림에 의한 파손 판단됨
7	KNAFE241995 [redacted]	2009	'09.4/22	'15.9/12	76.7	50,000	10607838	• 각진물체의 직접적인 하중 집중에 의해 손상 판단됨

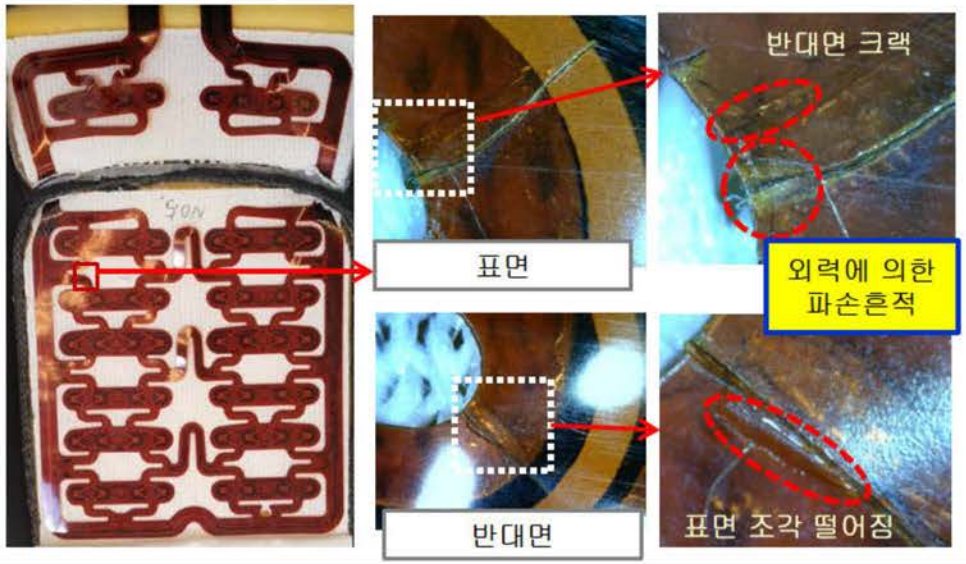
※ 고품별 세부 분석 결과

No.	차량정보	고품 - 발생부위	분석내용
1	KNAFE222X95 [redacted] (47,373 mile)	    	• 면적이 좁은 물체가 특정 부위에 하중을 집중 시켜 매트 인장에 의한 파손 판단됨 - 내측 최초 파손 → 외측으로 전이
2	KNAFE161085 [redacted] (74,562 mile)	    	• 면적이 좁은 물체가 특정 부위에 하중을 집중 시켜 매트 인장에 의한 파손 판단됨 - 내측 최초 파손 → 외측으로 전이

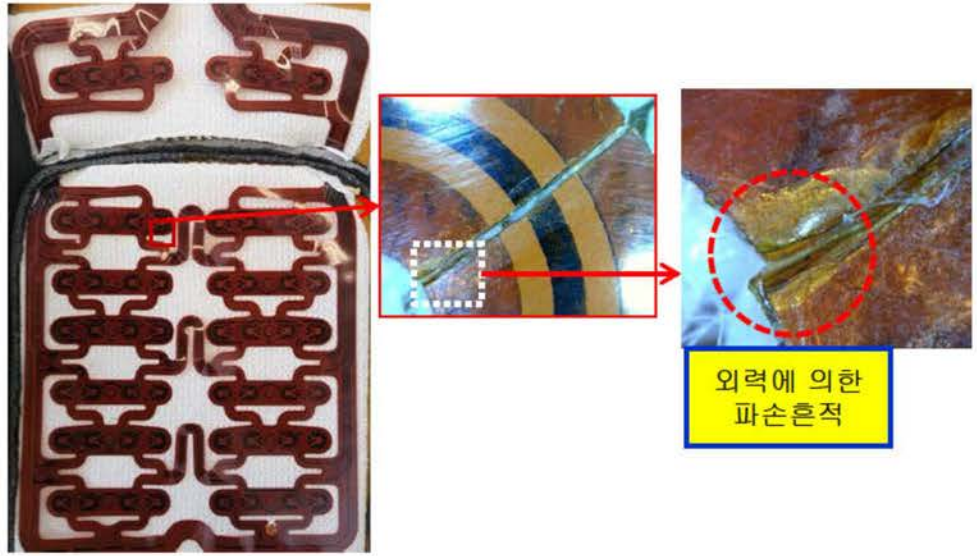
※ 고품별 세부 분석 결과

No.	차량정보	고품 - 발생부위	분석내용
3	KNAFE221295 [redacted] (96,452 mile)		• 각진 물체가 해당 부위에 하중을 집중 시켜 손상 및 인장에 의한 파손 판단됨 - 내측 최초 파손 → 외측으로 전이
4	KNAFE222695 [redacted] (82,239 mile)		• 면적이 좁은 물체가 특정 부위에 하중이 집중되어 매트 인장에 의한 파손 판단됨 - 내측 최초 파손 → 외측으로 전이 • 날카로롭고 뾰족한 물체에 의한 긁힘 흔적 있으며 그로인해 해당부 단선 발생 함

※ 고품별 세부 분석 결과

No.	차량정보	고품 - 발생부위	분석내용
5	KNAFE241295 [redacted] (54,300 mile)		• 좁은 면적의 물체가 의해 직접적으로 하중을 받아 크랙발생 • 크랙부위를 기점으로 반복적인 하중이 적용되어 파단된 것으로 판단됨 - 내측 최초 파손 → 외측으로 전이
6	KNAFE161485 [redacted] (76,687 mile)		• 좁은 면적의 물체에 의해 직접적으로 하중을 받아 , 뒤틀림에 의한 파손 판단됨 - 꺾임시 발생하는 v형태의 파단모양

※ 고품별 세부 분석 결과

No.	차량정보	고품 – 발생부위	분석내용
7	KNAFE241995 [redacted] (50,000 mile)		• 각진물체의 직접적인 하중 집중에 의해 손상 판단됨 - 파단 현상이 일자현상