

To: MITSUBISHI MOTORS CORPORATION

Doc.No.AQ-F080082(1/16)

PS41,ST41 PW AS SW Failure Returned Part Analysis Result Report

June 30, 2008

Omron Corporation AEC Company
Quality Assurance Division

Issue	Check	Approve
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1 Failure Outline

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◆ Objective

P/W AS SW on PS41 and ST41 owned by the employee at MMNA Cypress developed a heating and smoking failure. The root cause of this failure needs to be identified.

◆ Failure Occurrence Status

Vehicle model	PS41	ST41
Vehicle No.	VIN:4A3AB36F24E097686	VIN:4A3AA46G62E090318
Vehicle manufactured date	Feb 4,2004	Dec 11,2001
Failure occurrence date	May 7,2008	Apr 23,2008
Failure occurrence location	GA(Georgia)	Long Beach Mitsubishi (Long Beach, CA)
Mileage	79000	131324
P/W SW production lot No.	Burnt, Unidentifiable	Burnt, Unidentifiable

* Judging from case shapes, both switches on PS41 and ST41 have been confirmed as parts before countermeasure against water intrusion.

2 Conclusion

◆ Conclusion

We have concluded that the recent SW failure led to heating and smoking by the same mechanism as 2C41 P/W AS SW failure reported back on September 17, 2004.

Based on the following consideration (*1, *2 respectively), the recent failure is thought to be an extremely rare case.

*1: The possibility of its occurrence in the market is very low.

*2: Recreation test result shows that the probability of recurrence is low.

[Mechanism of occurrence]

*1
Liquid with high content of electrolytes, such as sports drink, was spilled in a large quantity (250ml or more) at once in the vicinity of Sub SW knob area.

Liquid that entered the switch adhered to the broached area between IG-MU.

Adhered moisture dried out leaving deposit of electrolytes and carbide between traces.

Deposit of electrolytes and carbide absorbed moisture leading to a leakage between traces.

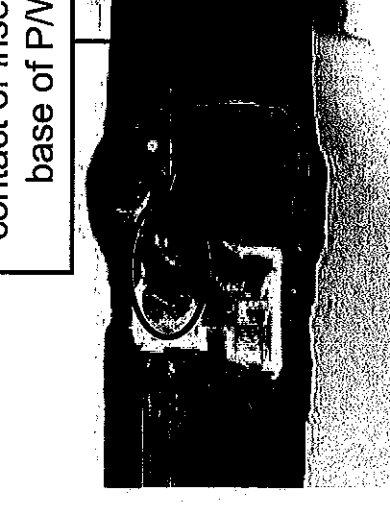
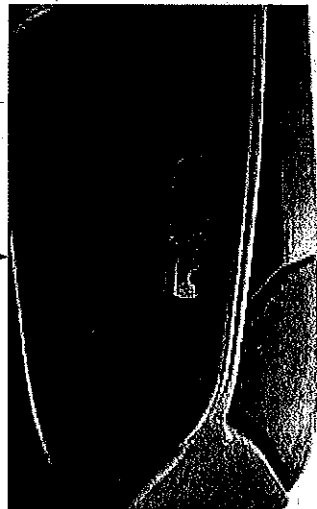
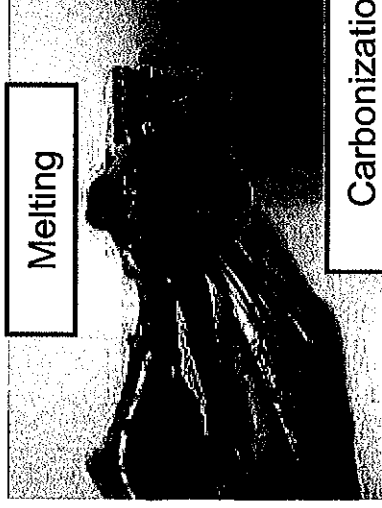
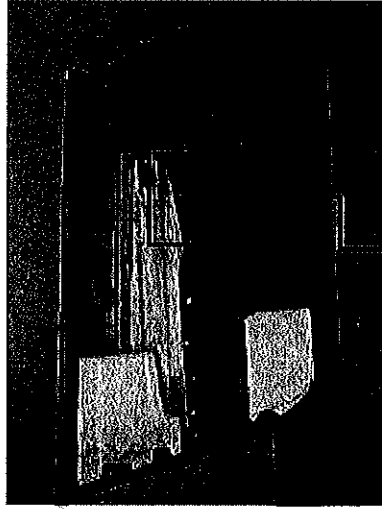
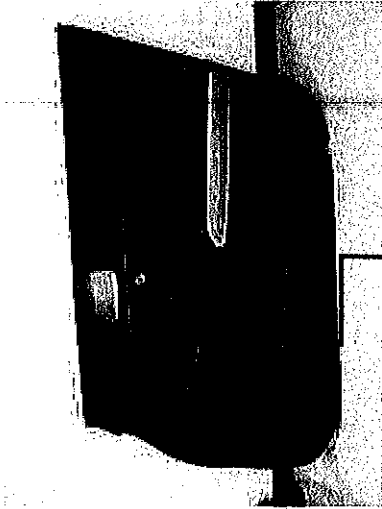
*2
Heat and smoke generated as certain resistance value was reached.

3-(1) Returned Part Investigation Result(PS41)

① Trim appearance examination

- Carbonization was confirmed in the vicinity of UP side NO contact on insert-molded base of P/W SW.
- Confirmed melting of P/W SW connector housing and the harness coating in the connector area (approx. 5cm).

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3-(1) Returned Part Investigation Result(PS41)

② SW appearance examination

- Contamination confirmed in the vicinity of P/W SW knob and D/L SW knob.
- Confirmed melting at the upper portion of UP side NO contact on case surface.

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Contamination

Contamination

Knob front wall
was cut open

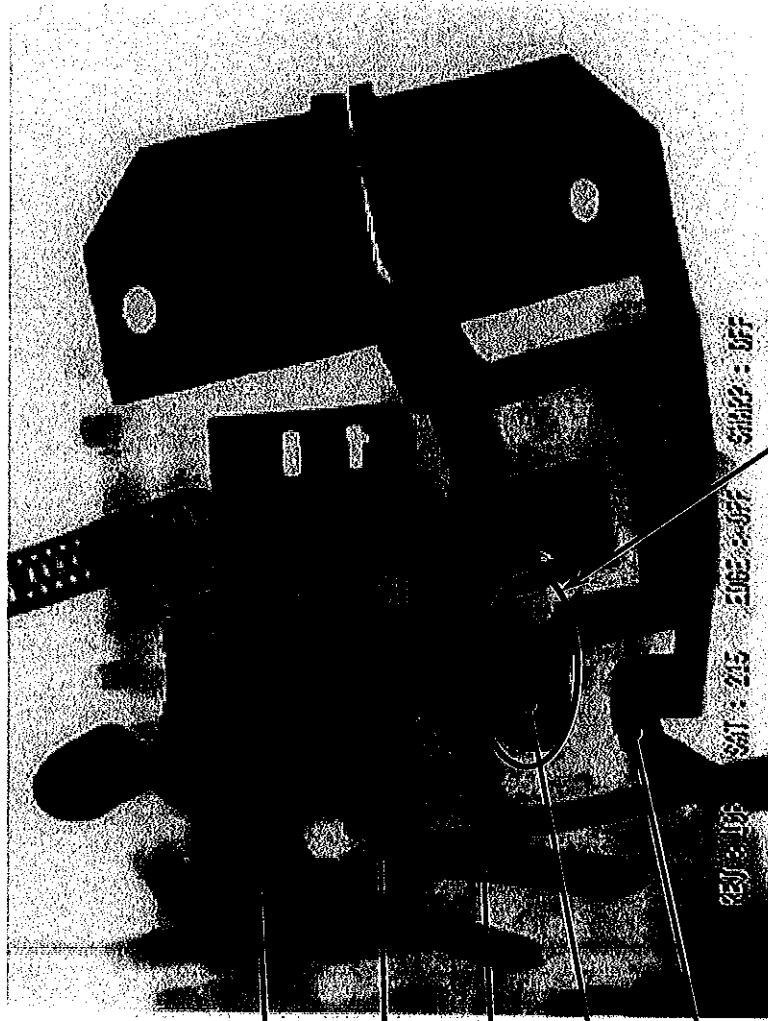
Melting at the upper portion of
UP side NO contact of the case.

3-(1) Returned Part Investigation Result(PS41)

③ X-ray examination

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-Confirmed broken IG trace in the vicinity of Up side NO contact area.



IG copper trace is broken in the vicinity of
UP side NO contact area.

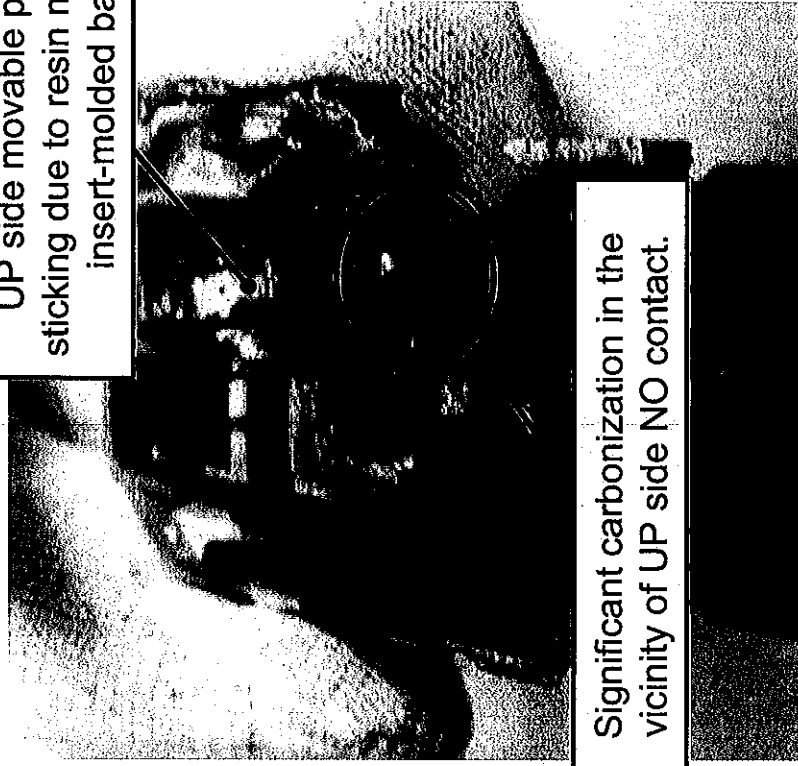
3-(1) Returned Part Investigation Result(PS41)

④ SW internal examination

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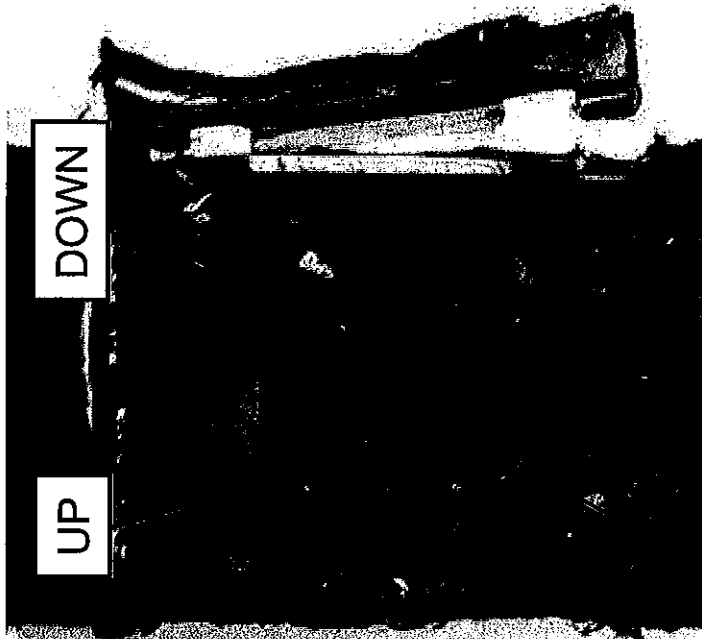
- Confirmed significant carbonization in the vicinity of UP side NO contact area.
- Confirmed that movable plate in UP side is sticking due to melting of insert-molded base resin.
- Confirmed carbonization in the upper portion of UP side NO contact (between IG-MU) on the back of the case.

UP side movable plate is sticking due to resin melting of insert-molded base.



Significant carbonization in the vicinity of UP side NO contact.

Insert-molded base, top side



Carbonization in the upper portion of UP side NO contact (between IG-MU)

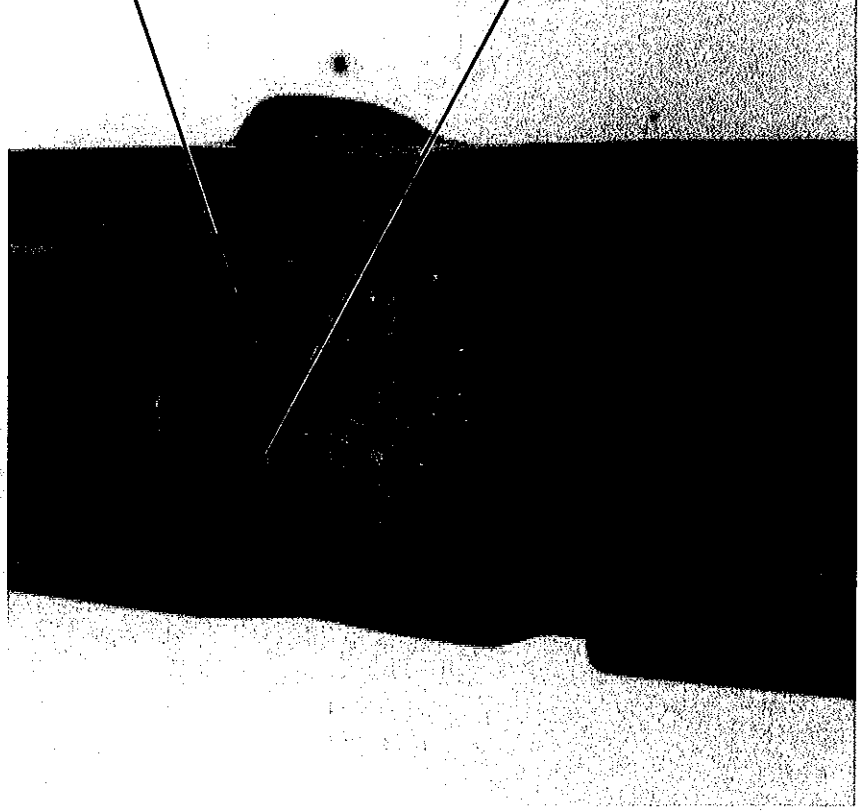
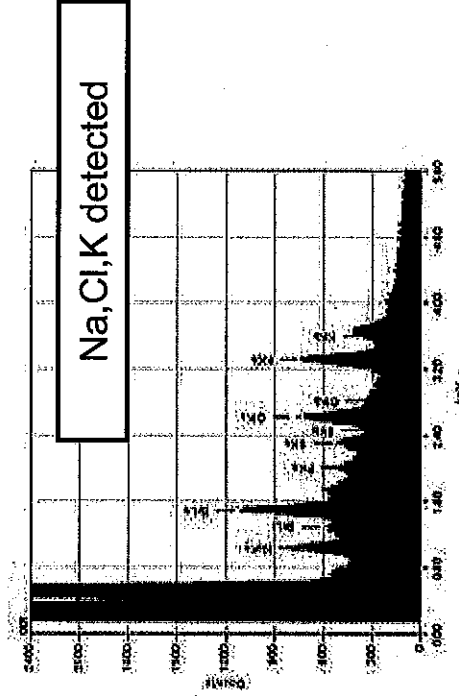
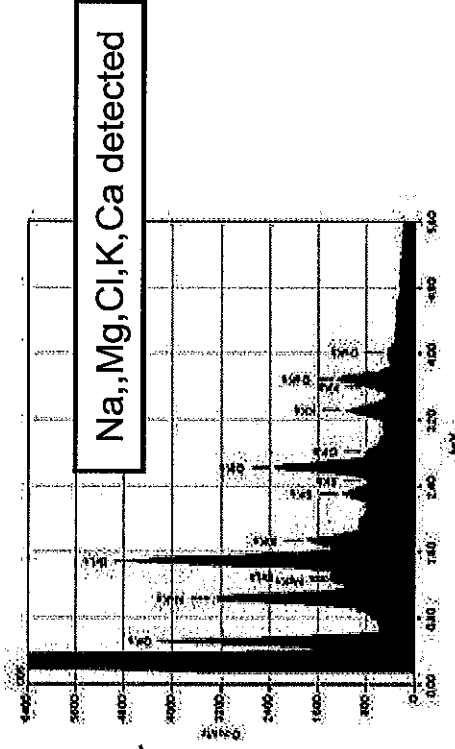
Case, back side

3-(1) Returned Part Investigation Result(PS41)

⑤ Element analysis

From the fact that ionic impurities (Na, Mg, Cl, K, Ca, etc.) are found under P/W SW knob, fluid intrusion inside SW is considered a high possibility.

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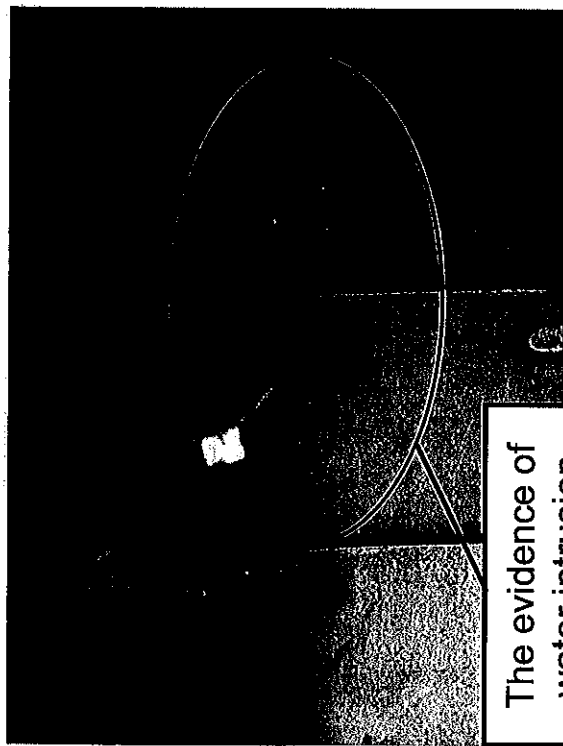
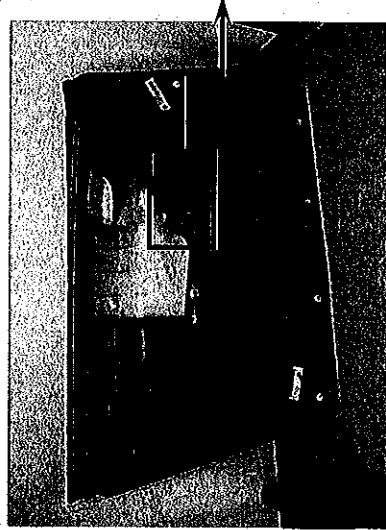
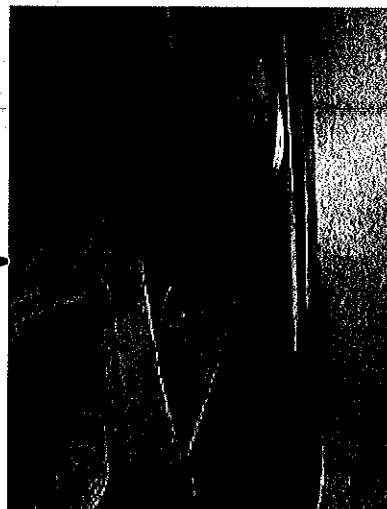
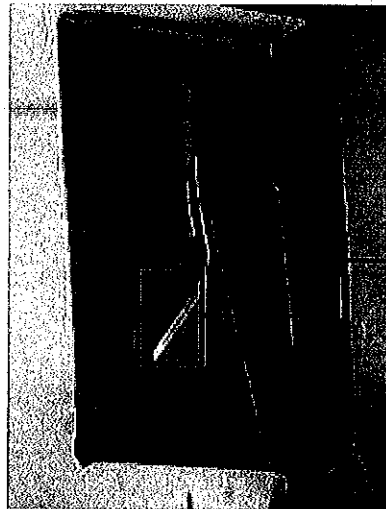


3-(2) Returned Part Investigation Result(ST41)

① Trim appearance examination-1

- The evidence of water intrusion is found in the back side of trim.

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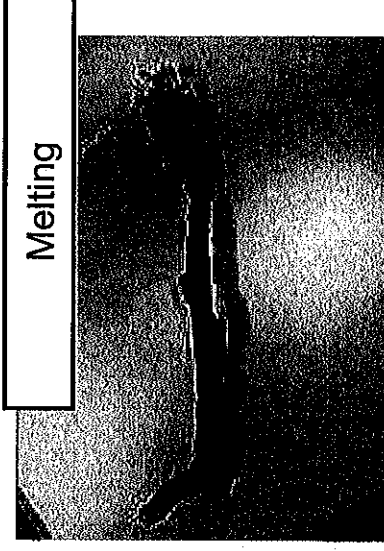
The evidence of water intrusion

3-(2) Returned Part Investigation Result(ST41)

① Trim appearance examination-2

資料No.AQ-F080082(11/16)

- ・Carbonization was confirmed in the vicinity of UP side NO contact on insert-molded base of P/W SW.
- ・ Confirmed melting of P/W SW connector housing and the harness coating in the connector area .



Carbonization in the vicinity of UP side NO contact of insert-molded base of P/W SW.



3-(2) Returned Part Investigation Result(ST41)

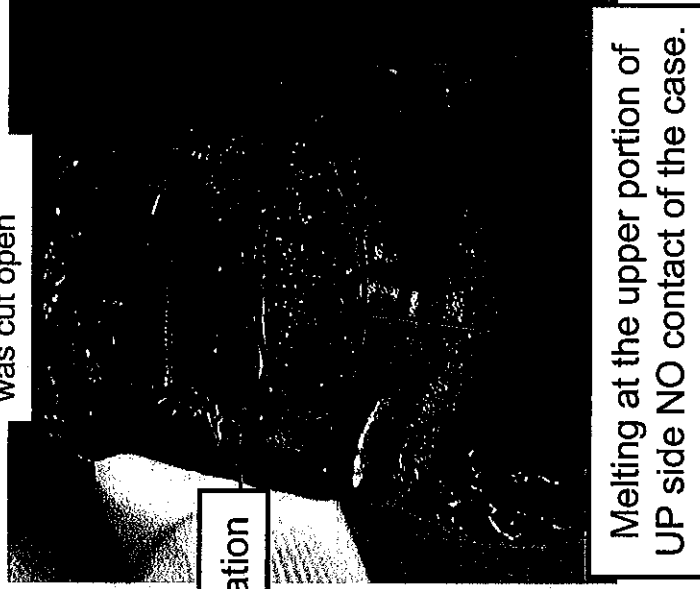
② SW appearance examination

- Contamination confirmed in the vicinity of P/W SW knob and D/L SW knob.
- Confirmed melting at the upper portion of UP side NO contact on case surface.

資料No.AQ-F080082(12/16)



Knob front wall
was cut open



Contamination

Contamination

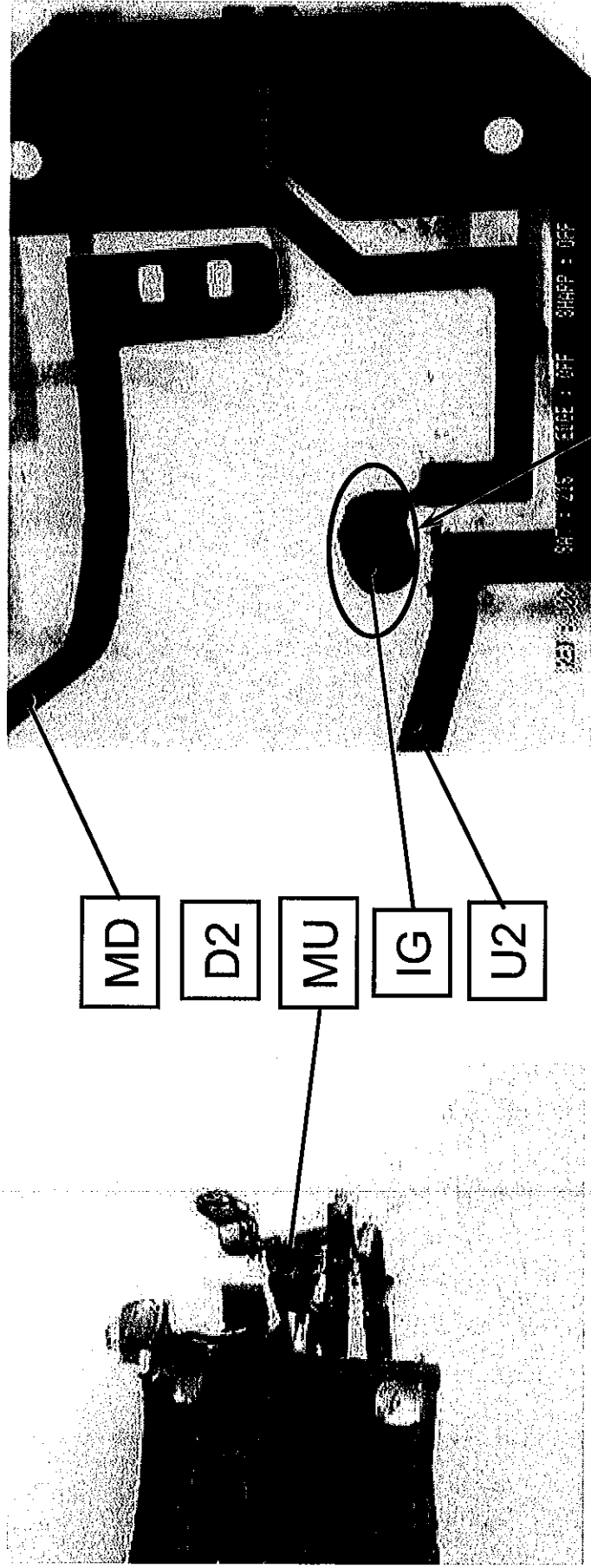
Melting at the upper portion of
UP side NO contact of the case.

3-(2) Returned Part Investigation Result(ST41)

③ X-ray examination

資料No.AQ-F080082(13/16)

• Confirmed broken IG trace in the vicinity of Up side NO contact area.

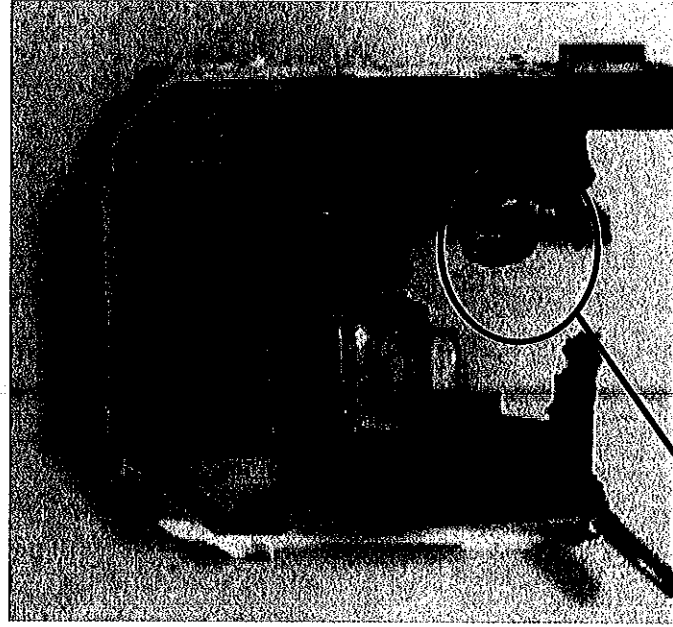


3-(2) Returned Part Investigation Result(ST41)

④ SW internal examination

資料No.AQ-F080082(14/16)

- Confirmed significant carbonization in the vicinity of UP side NO contact area.
- Confirmed that movable plate in DOWN side is sticking due to melting of plunger resin.
- Confirmed carbonization in the upper portion of UP side NO contact (between IG-MU) on the back of the case.



Significant carbonization in the vicinity of UP side NO contact.

Insert-molded base, top side



UP

DOWN

DOWN side movable plate is sticking due to resin melting of plunger.

Carbonization in the upper portion of UP side NO contact (between IG-MU)

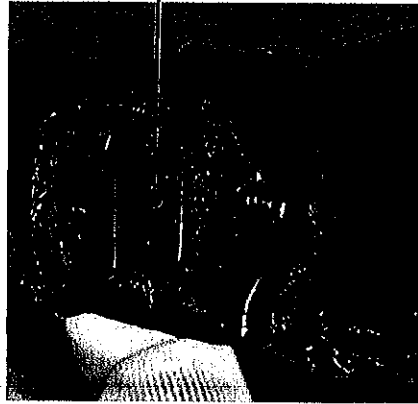
Case, back side

3-(2) Returned Part Investigation Result(ST41)

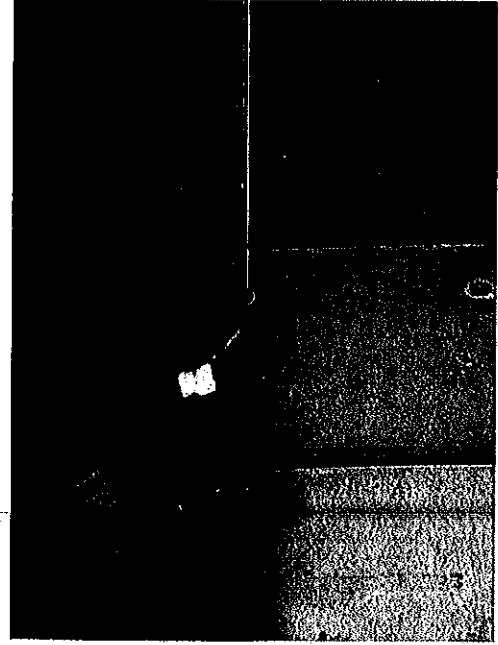
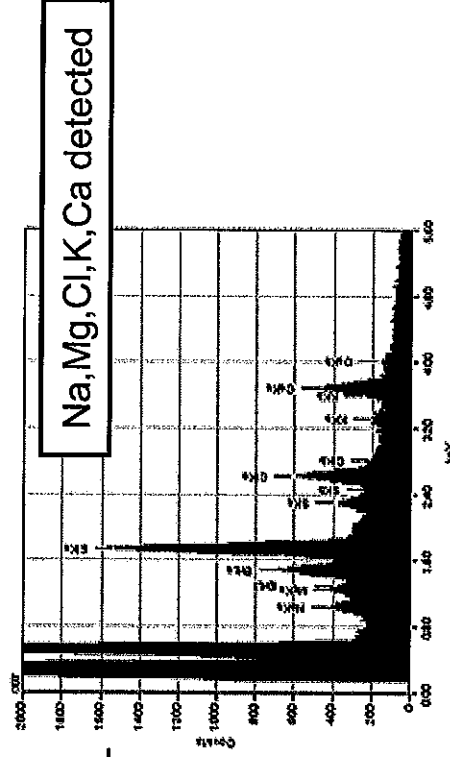
⑤ Element analysis

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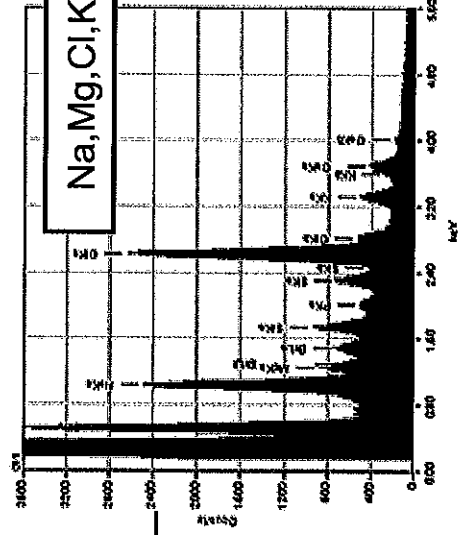
- From the fact that ionic impurities (Na, Mg, Cl, K, Ca, etc.) are found under P/W SW knob and back side of trim, fluid intrusion inside SW is considered a high possibility.



Case, top side



Trim, back side



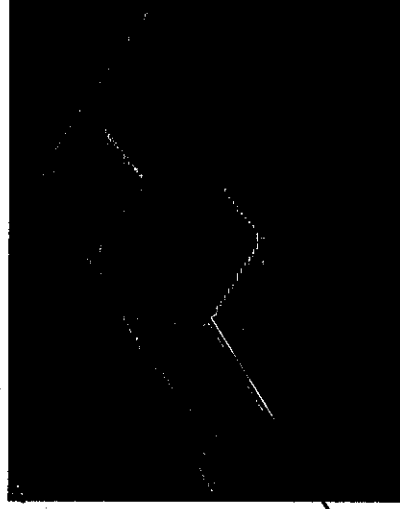
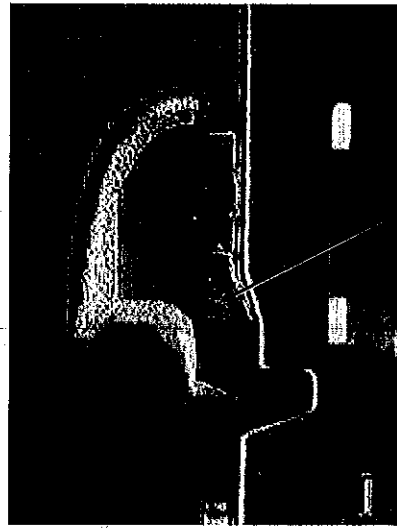
4 Countermeasure Implementation History

◆ Countermeasure implementation History

Doc.No.AQ-F080017(16/16)

* Case change

Jan-27,2005



Additional figure