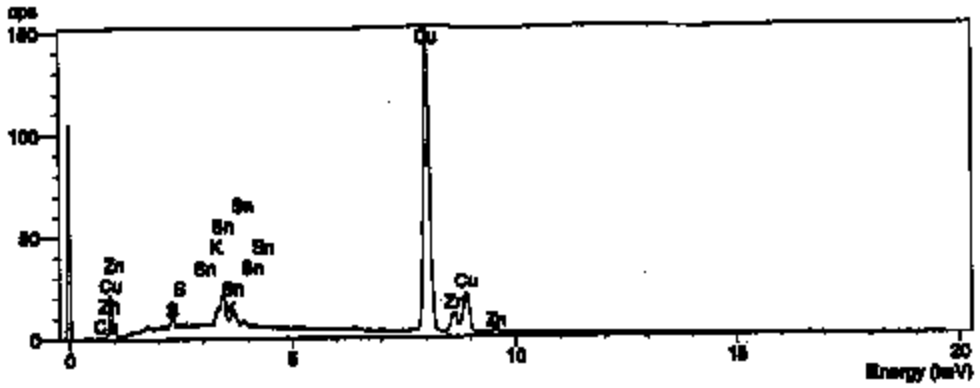
EA02-025

FORD 10/27/03

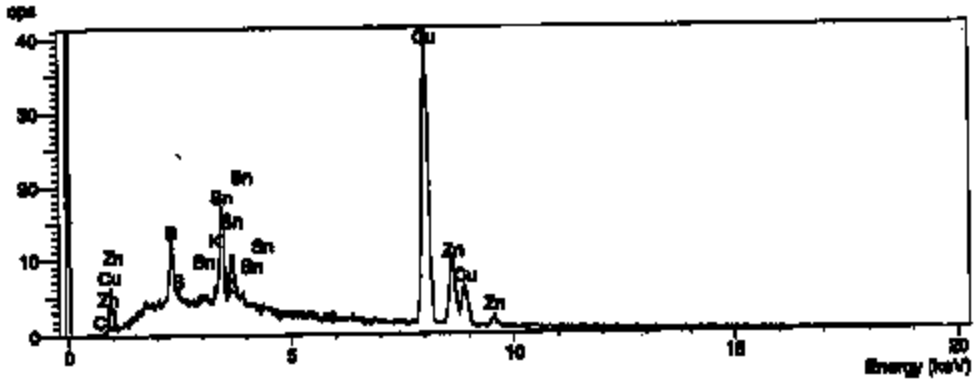
APPENDIX N

BOOK 18 OF 61

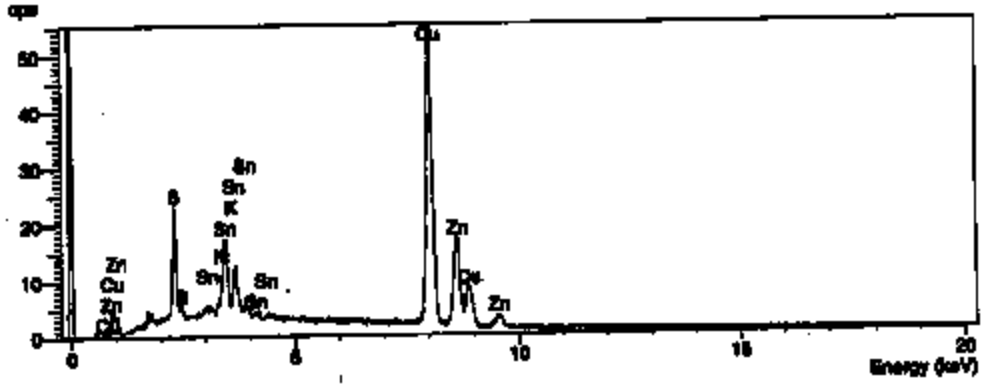
PART 3 OF 4



Operator : Patrick Nellos
Client : Greg Stevens
Job : 9804105
7a (1/14/99 15:37)



Operator : Patrick Nellos
Client : Greg Stevens
Job : 9804105
7b (1/14/99 15:39)



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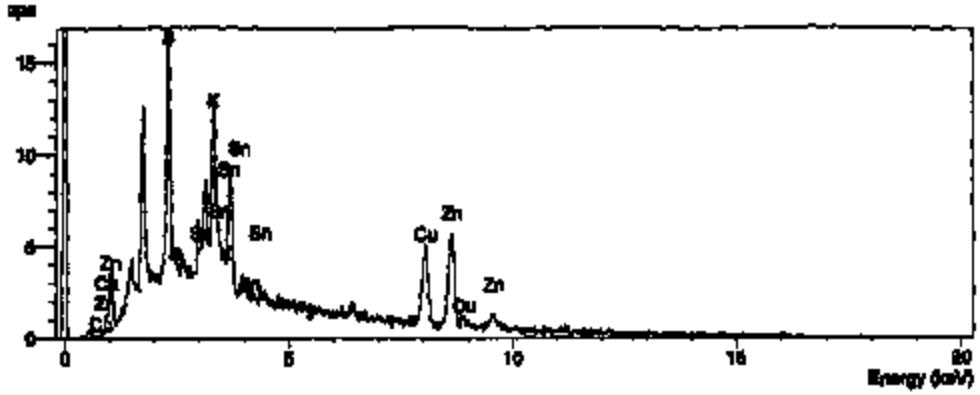
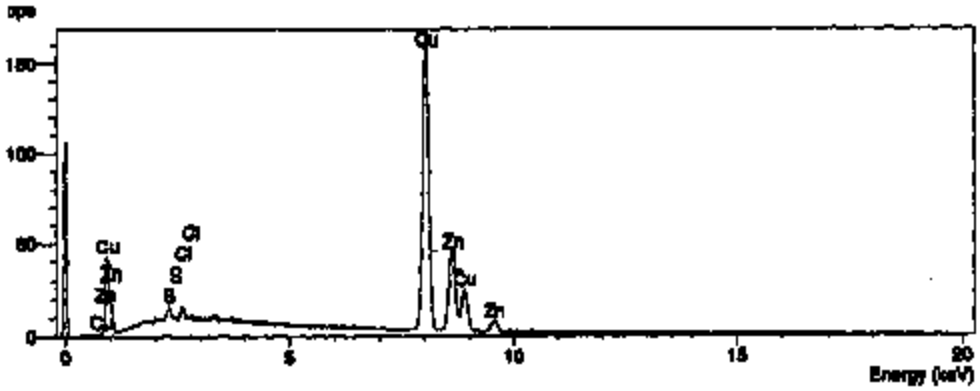
Client : Greg Stevens
Job : 9804105
7c (1/14/99 15:41)



Operator : Patrick Nellos
Client : Greg Stevens
Job : 9804105
6a (1/14/99 15:51)



Operator : Patrick Nellos
Client : Greg Stevens
Job : 9804105
1a (1/15/99 10:16)

TITLE Speed Control C.E.O.H. Switch

Project No. 9804145-S (8457)

Book No. 2758

From Page No. To: Greg Stevens / Steve Rieke

Subject: Speed Control C.E.O.H. Switch

Purpose: Failure Analysis

Specimen: 4 Pieces

Supplier: Texas Instruments

Results: Failure analysis was performed on 4 pieces of used switches (Contact, Cup, Housing & Wire Guide) received from Texas Instruments on Sept

Objective: Perform EDS analysis on these 5 samples.

Test Data:

EDS Spectra

Samples were taken from the contact region, cup region, housing (old) & white wire guide on a used switch, & a control new housing.

The samples were examined on a JEOL using EDS. 20kV, used 20 sec. The Chem. also was used to identify what elements were present (Consistent with the reliability Data Sheet supplied with EDS)

Contact	Cup	Cup	Housing (New)	Housing Old	Housing Old
Cu	Cu	Si	Si	Si	Fe
Zn	Zn	Ca	Ca	Ca	Ca
S	Cr	Al	Al	Al	Si
Ni	S	Ti		Ti	Ti
	K	Cu			
	Si	Fe			
	Fe				
	Al				

To Page No. 20

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	

From Page No. 19

EDS Analysis (cont)

White Residue	White Residue	White Residue
F	Si	F
Si	Al	Si
Ca	K	
Fe	P	
Al	Fe	
Mg	Ti	
	Mg	

Contains an + high Cu Brass (oxide + sulfide)
Mill fire use as blowpan charcoal, probably combined carbon. Carbon
from the outer, clear fibers by the heat.
New housing gaskets are white. All housing O-rings have a fiber clay
Thicker outer panel.
Blue white residue Powder is a compound with trace amounts
a high Tantal glass plate of Si-Al-K and metal oxides.
This is from fire extinguisher

To Page No. 24

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	11/6/99

Project No. BC4105-S

24 Book No. 2756 TITLE Some Cadmium Sulfide Solar Cells (cont)

From Page No. 24

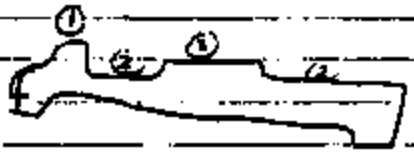
Some Examination of EDS Analysis

Two Beveled Wafers received 11/19 for SEM examination

(1) Document as shipped condition of shipping container

(2) Examine potting for 2-4 transmission or damage

(3) Examine Tef lon wafer Image Do EDS of the coating



Bulbous appearance changes in coating

Bright #2 does not look like any damage but appears more flatly, it appears damage more to right

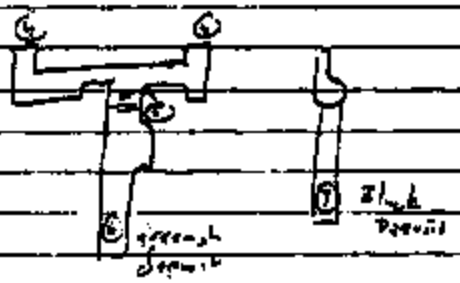
Pad looks to have cadmium for EDS also but S could Brass = Sulfide

(4) Determine fumbrae cable - Use optical type if necessary

(5) Determine conductivity

(6) EDS of Deposit

(7) EDS of Deposit



To Page No. 25

Witnessed & Understood by me.	Date	Invented by	Date
		Recorded by	

3713 2646

From Page No. 25

Sem & EDS (cont)

(4) Fracture surface element & topological relationship between fracture & Primarily Ti-Nb Intermetallic (B.G) EDS shows presence of some Si Cl on the brass

(5) Crack in B.G

(6,7) Deposits have different ratio of elemental concentration (Three readings)

6	7
Zn	Cu
Cu	Zn
S	Sn
Si	S
Cu	K
K	Si
Al	

To Page No.

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	1/16/98

804105

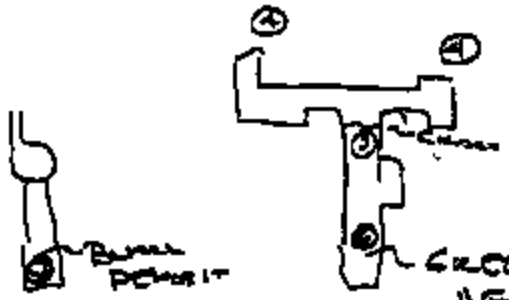
① DOCUMENT ARC DAMAGE CONDITION OF STATUS AND CONTAIN

② EXAMINE FITTING IS T ARC DAMAGE OR CORROSION

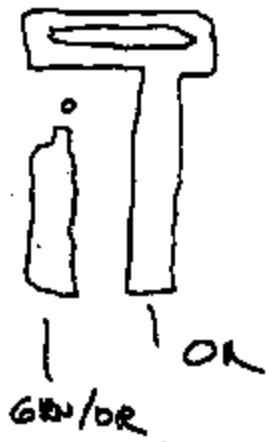
③ EXAMINE PAD FOR ARC DAMAGE AS-IS, EDS OF COATING

④ DETERMINE FRACTURE MODE. CLEAN IF NECESSARY (REV. TAPE)

⑤ MODE OF CRACK IF POSSIBLE.



⑥,⑦ EDS OF DEPOSITS (SCRAPE IF NECESSARY TO AVOID PEAKS FROM BASE METAL.



Central Laboratory
15000 Century Drive
Dearborn, MI 48120-1267
FAX (313) 322-1614

Report 9804105
Preliminary

January 6, 1999

To: G. Stevens/N. LaPointe (313) 32-36686 07224 FAX

From: S. LaRouche (313) 84-54578

Subject: Speed Control Cut-Off Switch
Part Number: F2VY-9F24-A
Source: Customer Vehicle

Received: One switch which had been involved in a thermal event, one unused switch, and unused switch components were received on December 17, 1998.

Object: Determine cause of thermal event.

Conclusion: Surface analysis indicates that oxide or corrosion product from the brass contacts may have transferred to the cup component of the switch. Deposits on the cup also appear to contain filler materials from the switch base.

The white deposit in the connector cavity below the wire seal appears to be from a dry chemical fire extinguisher.

Data and Analysis:

Surface Analysis
(Visual Examination, Scanning Electron Microscopy (SEM),
Energy Dispersive X-ray Spectroscopy (EDS))

The as-received condition of the switch is shown in Figure 1. The switch is shown after sampling for EDS in Figure 2 (arrow A in photograph points to area where sample was removed). Energy dispersive X-ray spectroscopy was performed on the following materials:

Oxide-like material on side surface of stationary contact body[1]

Greenish deposit visible on switch side of cup[2]

Material scraped from switch base

Material scraped from new switch base

White material in cavity of connector below wire seal

The spectra from these materials are attached.

The spectra from the material on the side of the stationary contact exhibits elements from the base metal (brass) as well as a trace amount of sulfur. This suggests that the material on the surface of the stationary contact is most likely an oxide of the base metal with possibly a sulfate.

[1] Small scraping from side of contact.

[2] Small scraping from deposit.

Surface Analysis - continued

The spectra from the greenish deposit on the cup exhibits mostly copper and zinc with trace amounts of sulfur, potassium, silicon, chromium, and iron. The presence of copper and zinc indicates that the deposit is primarily an oxide of the brass contact material which has transferred to the cup. The presence of sulfur suggests that some of the material may be a sulfate. The chromium and iron are most likely from the cup. The deposit also contains fibers which have spectra similar to those in the switch housing.

Spectra from the switch bases are similar. Aluminum, silicon, and calcium are most likely from the fillers (fibers, etc.) used in the housing material.

Spectra from the white deposit exhibit elements which would be found in dry chemical fire extinguishers, i.e., high phosphorus content material with plates of Si, Al, F – rich material (Muscovite).

Contributor: P. Nallos

Concur: _____
P. Klass, Supervisor
Metallurgy Section

By: _____
Steven LaRouche (SLAROUCH)

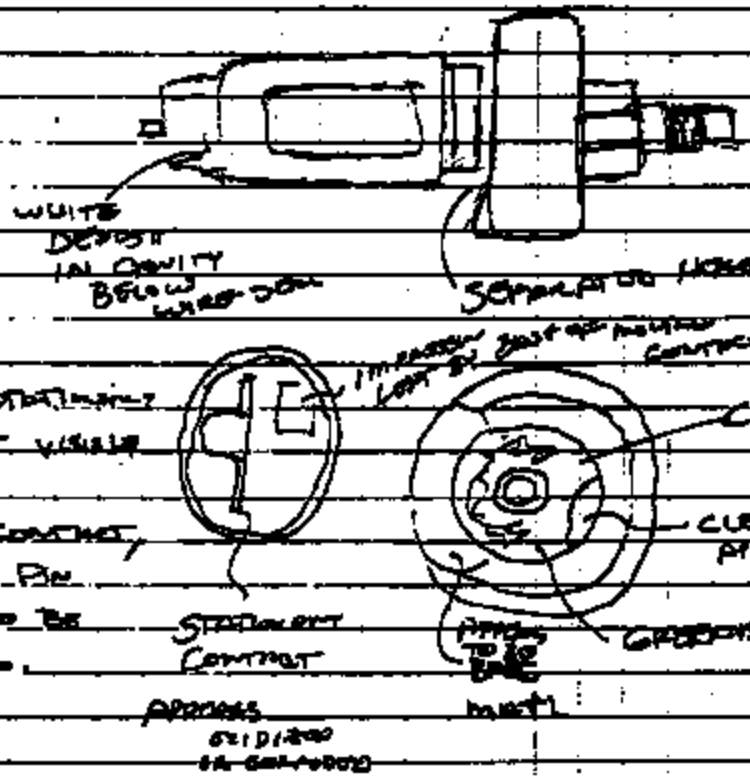
Enclosures: Eight EDS spectra
Data sheet on muscovite

SL/sl

om Page No. B437 S

Rec'd 12-17-98

RECEIVED ONE SPENT GOLD TEAL CONTACT SWITCH



L. Peterson
1-14-99

RECEIVED NEW SWITCH + USED SWITCH
CONFIRMED DURING INSPECTION WITH TEXAS INSTRUMENTS / [illegible]
F. Peterson on 12-22-98

A SURVEY PERFORMED FLUOROSCOPICALLY 12-21-98 IN TRANSFER HSE
N. L. Powers & S. [illegible]

To Page No.

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	

Central Laboratory
15000 Century Drive
Dearborn, MI 48120-1257
FAX (313) 322-1614

Report 9804106

January 6, 1999

To:	G. Stevens	(313) 32-36686	(313) 39-07224 FAX
From:	P. J. Nalloe	(313) 33-75358	

Subject: Speed Control Cut-Off Switch
Part Number: F2VY-9F924-A
Specification: Not Provided
Supplier: Texas Instruments

Received: Particle scrapings were taken from four areas of a used switch (contact, cup, base, and a white residue) as well as from a new base on January 5, 1999.

Object: Perform EDS analyses on each of the five areas.

Conclusion: The results are listed below in the Data and Analysis section.

Data and Analysis:

Surface Analysis
(Visual Examination, Scanning Electron Microscopy (SEM),
Energy Dispersive X-ray Spectroscopy (EDS)

Scrapings were taken from the side of the stationary contact body, the cup region, the base and a white residue from the connector cavity below the wire seal on a used speed control cut-off switch. A sliver of material was taken from a new base as well. Each sample was examined on a scanning electron microscope (SEM) using Energy Dispersive X-ray Spectroscopy (EDS). The following elements were detected, in decreasing order of elemental concentration (Figures 1 - 8).

Contact	Cup 1	Cup 2	New Base	Old Base
Copper	Copper	Silicon	Silicon	Silicon
Zinc	Zinc	Calcium	Calcium	Calcium
Sulfur	Chromium	Aluminum	Aluminum	Aluminum
Potassium	Sulfur	Titanium		Titanium
	Potassium	Copper		
	Silicon	Iron		
	Iron			
	Aluminum			

White Residue 1	White Residue 2	White Residue 3
Phosphorus	Silicon	Phosphorus
Silicon	Aluminum	Silicon
Calcium	Potassium	
Iron	Phosphorus	
Aluminum	Iron	
Magnesium	Titanium	
	Magnesium	

Project No. 7804165
Book No. 2765 TITLE SPEED CONTROL CUT OFF SWITCH

From Page No.

CENTI COORDINATOR: STEVE CAROUCHE

BY G. STEVENS

RECEIVED: 3 CUT OFF SWITCHES (1 ASSEMBLED, 1 ASSEMBLED NEW & 1 DISASSEMBLED FAILED) WERE RECEIVED ON 12/17/98

REQUESTED: DETERMINE THE EXTENT/CAUSE OF THE DAMAGED KAPTON STRIPS.

SEE THE REPORT FOR DETAILS

To Page No.

Witnessed & Understood by me.	Date	Invented by	Date
		Recorded by	

Central Laboratory
15000 Century Drive
Dearborn, MI 48120-1287
FAX (313) 322-1614

Report 9804105
Preliminary Report

January 15, 1999

To: G. Stevens/N. LaPointe (313) 32-36666 07224 FAX

From: V. Beltran (313) 69-47304

Subject: Speed Control Cut Off Switch
Part Number: F2VY-9F924-A
Specification: Not Provided
Supplier: Texas Instruments

Received: 3 switches (1 assembled, 1 assembled new, and one disassembled failed) were received on December 17, 1998.

Object: Determine the extent/cause of the damage Kapton Strips.

Conclusion: Damage appears to have been initiated at the Kapton strip closest to the washer prior to assembly of the switch by pinching and/or impact which tore the teflon and deformed the Kapton material. The damaged Kapton material appears to have been darkened and embrittled by an unknown mechanism.

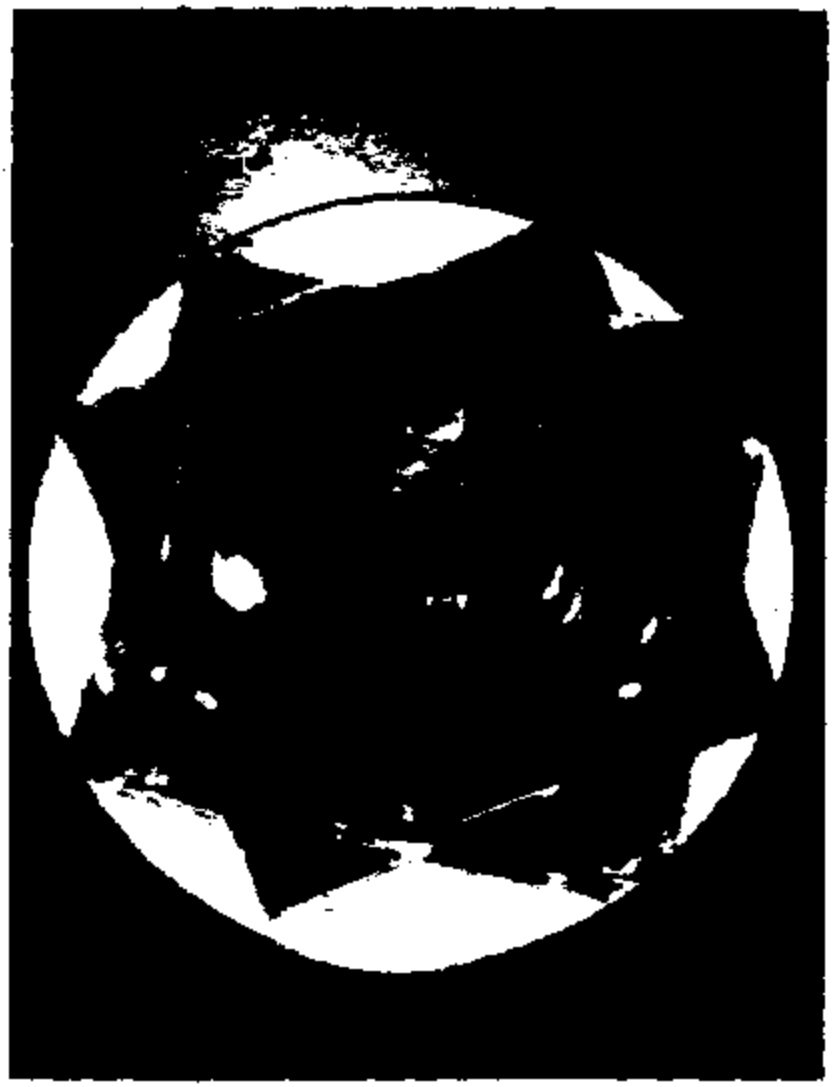
Data and Analysis:

See Attached Photographs.

By: Vladimir S. Beltran

Vladimir S. Beltran (VBELTRA1)
Laboratory Engineer

3713 2654



CONCAVE SIDE DOWN

3713 2656

#3 CONCAVE DOWN

COUCHE SIDE DOWN

3713 2859

Central Laboratory
15000 Century Drive
Dearborn, MI 48120-1257
FAX (313) 322-1614

Report 9804105
Preliminary Report

February 6, 1999

To:	G. Stevens/N. LaPointe	(313) 32-36686	39-07224 FAX
From:	V. Beltran	(313) 39-05018	

Subject: Speed Control Cut Off Switch
Part Number: F2VY-9F924-A
Specification: Not Provided
Supplier: Texas Instruments

Received: 3 switches (1 assembled, 1 assembled new, and one disassembled failed) were received on December 17, 1998.

Object: Determine the extent/cause of the damage Kapton Strips.

Conclusion: Damage appears to have been initiated at the Kapton strip closest to the washer prior to assembly of the switch. Pinching and/or impact tore the Teflon and deformed the Kapton material. The damaged Kapton material appears to have been darkened and embrittled by an unknown mechanism.

Data and Analysis:

Reflected Light Microscopy

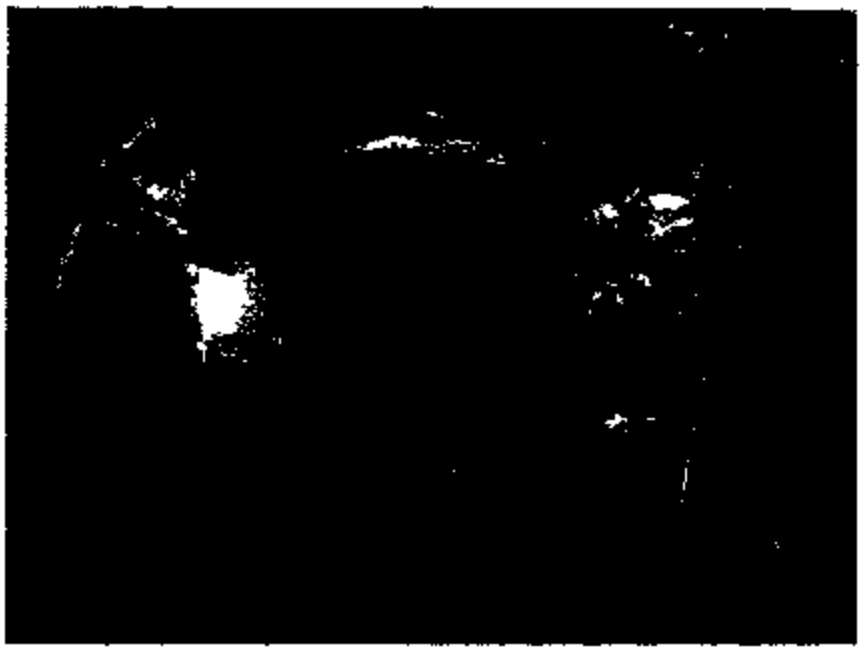


Figure 1.
Kapton Strip (Teflon Layers Removed) Closest to Washer with Concave Side Down.
7X Magnification

Scanning Electron Microscopy

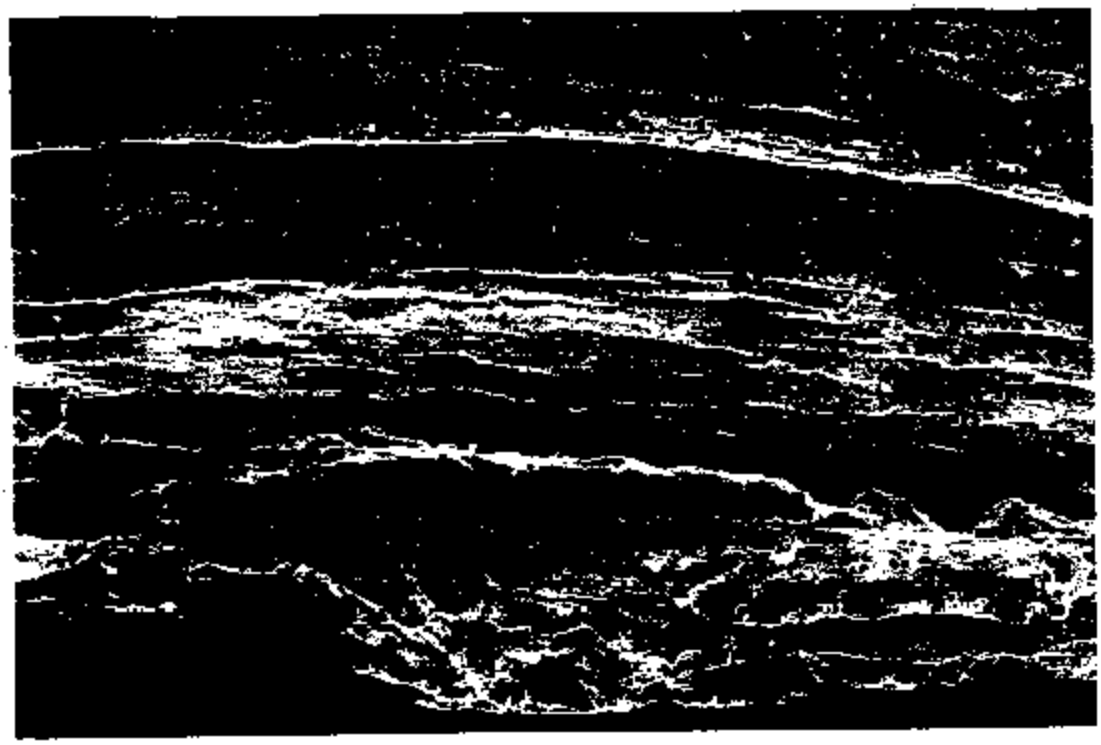


Figure 2.
SEM Photomicrograph of Brittle Fracture on Kapton Strip.
The fracture appears to propagate away from the washer.
The direction of propagation is perpendicular to the plane of the page.
152X Magnification

Scanning Electron Microscopy continued

Figure 3.
Scanning Electron Photomicrograph of Brittle Fracture on Kapton Strip.
The direction of fracture propagation is perpendicular to the plane of the page.
230X Magnification

By: _____
Vladimir S. Beltran (VBELTRA1)
Laboratory Engineer, Polymers Section

Central Laboratory
15000 Century Drive
Dearborn, MI 48120-1267
FAX (313) 322-1614

Report 9804105
Preliminary Report

February 10, 1999

To:	G. Stevens/N. LaPointe	(313) 32-36686	39-07224 FAX
From:	V. Beltran	(313) 39-06018	

Subject: Speed Control Cut Off Switch
Part Number: F2VY-9F924-A
Specification: Not Provided
Supplier: Texas Instruments

Received: 3 switches (1 assembled, 1 assembled new, and one disassembled failed) were received on December 17, 1998.

Object: Determine the extent/cause of the damage Kapton Strips.

Conclusion: Damage to the Kapton strips appears to be the result of pinching and/or buckling of the Kapton material. The damaged Kapton material appears to have been darkened and embrittled by an unknown mechanism and fractured in a brittle mode. Torn Teflon material on all three strips of the switch coinciding with the location of the fractured Kapton material provide a leak path.

Data and Analysis:

Reflected Light Microscopy

Figure 1.
Kapton Strip (Teflon Layers Removed) Closest to Washer with Concave Side Down.
7X Magnification

Scanning Electron Microscopy

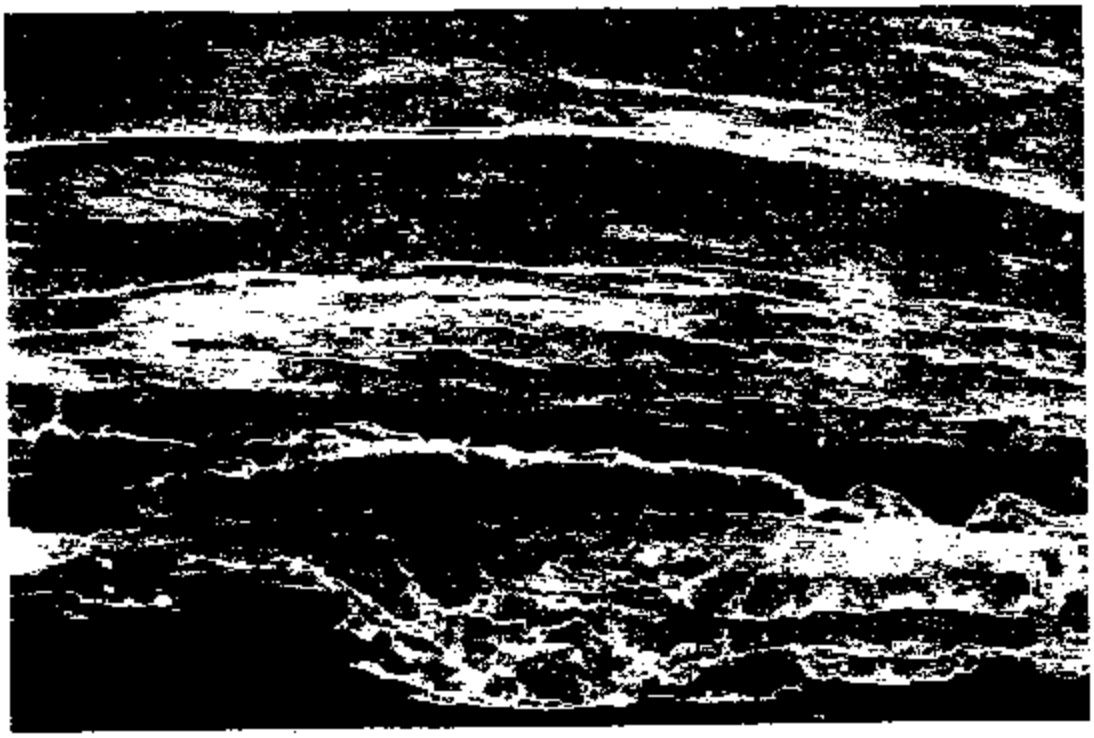


Figure 2.
SEM Photomicrograph of Brittle Fracture on Kapton Strip.
The fracture appears to propagate away from the washer.
The direction of propagation is perpendicular to the plane of the page.
203X Magnification

Scanning Electron Microscopy continued

Figure 3.
Scanning Electron Photomicrograph of Brittle Fracture on Kapton Strip.
The direction of fracture propagation is perpendicular to the plane of the page.
230X Magnification

By: _____
Vladimir S. Beltran (VBELTRA1)
Laboratory Engineer, Polymers Section

Central Laboratory
16000 Century Drive
Dearborn, MI 48120-1267
FAX (313) 322-1614

Report 9804105

January 19, 1999

To:	G. Stevens/N. LaPointe/S. LaRouche	(313) 32-36886	07224 FAX
From:	Gayle D. Gullen	(313) 32-27322	

Subject: Speed Control Cut-Off Switch
Part Number: F2VY-9F924-A
Source: Customer Vehicle

Received: One opened switch which had undergone a thermal event and one unused switch housing were received on January 4, 1999, from S. LaRouche. The switch was returned on January 11, 1999, after disassembly and preliminary examination by Texas Instruments.

Object: Determine if any fluid is present on the switch base in metallic-exposed area and compare the switch housing material to the unused material. Determine the nature of the black residue in the hexport and converter and determine the type of fluid in the diaphragm squares.

Conclusion/ Discussion: There was spectral evidence of a glycol ether [spectrally similar to Dow HD 50-4 brake fluid] and a metal soap on the metallic-exposed area of the switch cup. The customer base and unused base are spectrally similar and are composed of a polyester material. This is not the 'Noryl' material which was specified. [Noryl is a styrenated PPO (polyphenylene oxide).]

The exact nature and source of the noted metal soap could not be conclusively determined. Metal soaps can be utilized as polymeric compounding and/or mold release agents. Metal soaps are also utilized in greases [this glycol ether material does not match known carrier grease fluids] and may also be formed in the presence of acids and metal salts [both perhaps a reaction of the polymeric housing and metallic interference during the event].

The black residue in the hexport, converter, and washer are similar and are composed of a glycol based material [probably brake fluid] and a metal salt [probably an oxalate salt]. The black residue on the spacer is composed of a metal salt [probably oxalate salt], and a glycol based fluid [probably brake fluid]. The fluid removed from the #2 diaphragm was glycol based [probably brake fluid] and contained a metal salt [probably oxalate salt]. The hexport deposit appears to contain ~10% water, however, this value may be artificially elevated due to reactions with the salts and other compounds in the deposit.

Decomposition of the polyester base causes acid formation, with one of these acids likely being oxalic acid. Reaction with the metals in the system forms oxalate salts. Based on this, it is highly unlikely that the oxalate salts were introduced into the system in this fashion but were likely formed during the thermal decomposition of the housing.

Data and Analysis:

Molecular Characterization
(FTIR, Qualitative, Microscopic)

Arrow B in Figure 2 points to area where analysis was performed). Spectra of the fluid noted on the metallic surface [chloroform micro casts - several areas] are characteristic of a glycol ether [spectrally similar to Dow HD 50-4 brake fluid] with evidence of an ester and metal soap.

Spectra of the new, brown base are characteristic of a polyester on the base of terephthalic acid.

Spectra of the blackened, customer base are similar to the new base and are characteristic of a polyester on the base of terephthalic acid.

Molecular Characterization
(FTIR, Qualitative, Conventional and Microscopic)

Hexport Deposit

Spectra as received are characteristic of a glycol based material [probably brake fluid] and a metal salt [probably an oxalate].

Spectra of the methanol solubles are characteristic of a glycol based material [probably brake fluid] and ester.

Spectra of the insolubles are characteristic of essentially a metal salt [possibly an oxalate].

Converter Deposit

Spectra as received are characteristic of a glycol based material [probably brake fluid] and a metal salt [probably an oxalate].

Spectra of the methanol solubles are characteristic of a glycol based material [probably brake fluid, ester, and other material.

Spectra of the insolubles are characteristic of essentially a metal salt [probably an oxalate].

Spacer Deposit

Spectra of the deposit [as received] are characteristic of a metal salt [probably an oxalate] and a glycol based material [probably brake fluid].

Washer Deposit

Spectra of the deposit [as received] are characteristic of a glycol based material [probably brake fluid] and a metal salt [possibly an oxalate].

Diaphragm #2 Internal Fluid/Deposit

Spectra as removed are characteristic of a glycol based material [probably brake fluid] and a metal salt [possibly an oxalate].

Water Content, % by weight[1] ~10
(ASTM D 1744)

[1] Accuracy of this result is unknown based on the small sample size and possible interferences caused between compounds present in the deposit and the titrant.

INFORMATION[2]

Chemical Resistance	Polytetrafluoroethylene [Teflon ®][3]	Polyimide [Ultem ®]	Polyester [Valox ®]
Brake Fluid [100%conc./73°F/ 180 days]	no information listed	no information listed	no observed changes no tensile strength change
Sulfuric Acid	no observed changes -2% tensile change [30%conc/212°F/6hr]	no observed changes -3% tensile change [20% conc/73°F/100 days]	no observed changes -4% tensile change [36%conc/73°F/180 days]
Water Absorption, % [1/8 in thick sample, 24hr]	<0.01	0.24-0.34	0.06-0.08 [30% glass filled]
Environmental Stress Cracking			
Brake Fluid [100% conc/2500 psi stress/72°F]	no information listed	>336 hours - no failure	no information listed

[2] Information obtained from *Modern Plastics Encyclopedia*, October 1994, November 1998: Teflon ® manufactured by DuPont, Ultem ® and Valox ® are manufactured by General Electric. Ultem ® is a polyetherimide material similar to Kapton ® polyimide which is manufactured by DuPont. Ultem ® was substituted for informational purposes only since Kapton ® information was not readily available [water absorption information is for Kapton ®, Ultem ® value is 0.25.]

[3] "Not known to dissolve in any known solvent and not attacked by highly corrosive acids and caustic materials", *Today's Chemist At Work*, January 1996

Contributor: V. Cooper, M Hage

Concur: _____
Mary Hage
Organic Section

By: _____
Gayle D. Gullen (GGULLEN)
Product Materials Engineer

Central Laboratory
16000 Century Drive
Dearborn, MI 48120-1267
FAX (313) 322-1614

Report 9804108
Preliminary

January 5, 1999

To: G. Stevens/N. LaPointe/S. LaRouche (313) 32-36656 07224 FAX

From: Gayle D. Gullen (313) 32-27322

Subject: Speed Control Cut-Off Switch
Part Number: F2VY-9F924-A
Source: Customer Vehicle

Received: One opened switch which had undergone a thermal event and one unused switch housing were received on January 4, 1999, from S. LaRouche.

Object: Determine if any fluid is present on the switch base in metallic-exposed area and compare the switch housing material to the unused material.

Conclusion/ Discussion: There was spectral evidence of a glycol ether [spectrally similar to Dow HD 50-4 brake fluid] and a metal soap on the metallic-exposed area of the switch cup. The customer base and unused base are spectrally similar and are composed of a polyester material. This is not the 'Noryl' material which was specified. [Noryl is a styrenated PPO (polyphenylene oxide).]

The exact nature and source of the noted metal soap could not be conclusively determined. Metal soaps can be utilized as polymeric compounding and/or mold release agents. Metal soaps are also utilized in greases [this glycol ether material does not match known carrier grease fluids] and may also be formed in the presence of acids and metal salts [both perhaps a reaction of the polymeric housing and metallic interference during the event].

Data and Analysis:

Molecular Characterization
(FTIR, Qualitative, Microscopic)

Arrow B in Figure 2 points to area where analysis was performed). Spectra of the fluid noted on the metallic surface [chloroform micro casts - several areas] are characteristic of a glycol ether [spectrally similar to Dow HD 50-4 brake fluid] with evidence of an ester and metal soap.

Spectra of the new, brown base are characteristic of a polyester on the base of terephthalic acid.

Spectra of the blackened, customer base are similar to the new base and are characteristic of a polyester on the base of terephthalic acid.

Contributor: V. Cooper

Concur: _____
Mary Haga
Organic Section

By: Gayle D. Gullen
Gayle D. Gullen (GGULLEN)
Product Materials Engineer

Project No. [illegible]

TITLE [illegible] Book No. [illegible]

From Page No.

[illegible]

To Page No.

Witnessed & Understood by me | Date | Invented by | Date

3713 2670

Project No. [illegible]

Book No. [illegible] TITLE [illegible]

om Page No.

Molecular Characterization

(Fourier Transform Infrared Microspectroscopy)

Spectra of a whitish [illegible] residue at the metal surface inside the connector are characteristic of glycol ether (similar to brake fluid) and indicate [illegible] ester and metal soap.

Spectra of the brown plastic housing material are characteristic of polyester based on terephthalic acid.

Spectra of the blackened plastic housing material are characteristic of polyester based on terephthalic acid.

Nicki Cooper
1/6/1999

To Page No.

itnessed & Understood by me.	Date	Invented by	Date

7804/05

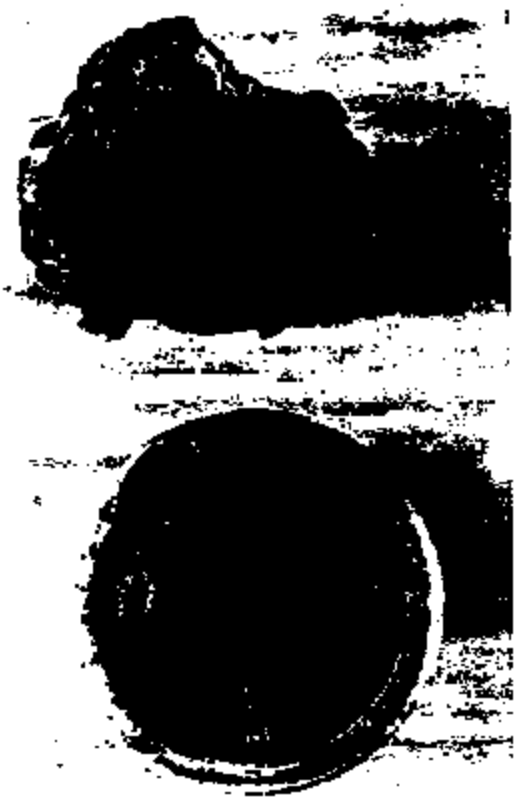


FIG 2 SAMPLE REMOVED

Request for Central Laboratory Service

Receipt - Copy

Lab Request Number: 009804106
Date of Request: 12/17/1998 10:50:33 AM
Print Date: 01/04/1999 01:36:52 PM

Request Description: SPEED CONTROL CUT-OFF SWITCH

Requestor Information:

Primary Contact: STEVENS, GREG - 10006	Phone: (313) 323-6686	PROFS ID: GSTEVEN1	Fax: (313) 390-7224
Secondary Contact: LA POINTE, NORM - 10075	Phone: (313) 594-2686	PROFS ID: NLAPOINT	Fax: (313) 337-6266

Send Report to: MD 6006/2G065, AVT MATERIALS, BLDG. #5
Bill to: Acctg.Location: 5100
Dept: T113
Work Task: XOG04

Sample Information:
Total Number of Containers: 1
Source: Not specified
Sample Handling: Return after test
Supplier Code: Not specified

Part/Material Name	Qty	Sample Identification	Part Number	Material Spec	CPSC Code	Supplier
SPEED CONTROL CUT-OFF SWITCH	1	BURNED CONNECTOR *	F2VY-9F924-A	NA	15.05.00	TEXAS INSTRUMENTS

Investigation Information:
Nature of Investigation/Requestor Info. Box: Mail typed report
Fax preliminary results
HIGH PRIORITY - POSSIBLE LEGAL

Additional Sample Information/Testing Requirments:
SAMPLE ID: BURNED CONNECTOR & PRESSURE ACTUATOR (REDDICK)

DETERMINE CAUSE
OF BURNED CONNECTOR - RADIOGRAPH, PHOTOGRAPH, PRESSURE TEST DIAPHRAGM.

EVALUATE/UNDERSTAND CIRCUITRY OF NEW SWITCHES.

ATTN: S. LA
ROUCHE - SAMPLE IN LAB

NOTE: ALL COMMUNICATIONS/REPORT, ETC. TO BE DUAL
(I.E. N. LA POINT).

Reporting Directions:
Date customer would like report: 01/13/1999
Date customer must have report: 01/14/1999

Report Format(s):

Log-In Information:
Initial Routing: Metallurgy
Accepted for Central Laboratory by: Morton, Jacqueline R. Phone: 59-47084

View your test status at: 'HTTP://bd4web.pd7.ford.com/kalis'

Program Name: KALISLab Engr Module
Program Version: Version: 2.0.6

Request for Central Laboratory Service

Receipt - Copy

Lab Request Number: 009804106
Date of Request: 12/17/1998 10:50:33 AM
Print Date: 01/04/1999 01:38:52 PM

Request Description: SPEED CONTROL CUT-OFF SWITCH

Requester Information:
Primary Contact: STEVENS, GREG - 10008 Phone: (313) 323-6688 PROFS ID: GSTEVEN1 Fax: (313) 390-7224
Secondary Contact: LA POINTE, NORM - 10075 Phone: (313) 594-2686 PROFS ID: NLAPOINT Fax: (313) 337-8258

Send Report to: MD 6006/2G065, AVT MATERIALS, BLDG. #8
Bill to: Acctg.Location: 5100
Dept: T113
Work Task: XQG04

Sample Information:
Total Number of Containers: 1 Sample Handling: Return after test
Source: Not specified Supplier Code: Not specified

Part/Material Name	Qty	Sample Identification	Part Number	Material Spec	CPSC Code	Supplier
SPEED CONTROL CUT-OFF SWITCH	1	BURNED CONNECTOR *	F2VY-9F924-A	NA	16.06.00	TEXAS INSTRUMENTS

Investigation Information:
Nature of Investigation: Requestor Info. Box: Mail typed report
Fax preliminary results
HIGH PRIORITY - POSSIBLE LEGAL

Additional Sample Information/Testing Requirments:
SAMPLE ID: BURNED CONNECTOR & PRESSURE ACTUATOR (REDDICK)

DETERMINE CAUSE
OF BURNED CONNECTOR - RADIOGRAPH, PHOTOGRAPH, PRESSURE TEST DIAPHRAGM.

EVALUATE/UNDERSTAND CIRCUITRY OF NEW SWITCHES.

ATTN: S. LA
ROUCHE - SAMPLE IN LAB

NOTE: ALL COMMUNICATIONS/REPORT, ETC. TO BE DUAL
(I.E. N. LA POINT).

Reporting Directions:
Date customer would like report: 01/13/1999
Date customer must have report: 01/14/1999

Report Format(s):

Log-in Information:
Initial Routing: Metallurgy
Accepted for Central Laboratory by: Morton, Jacqueline R. Phone: 59-47064

View your test status at: 'HTTP://b04web.pd7.ford.com/kals'

Program Name: KALISLab Engr Module
Program Version: Version: 2.0.8

3713 2674

3713 2675

Ford Central Lab
1-11-99

980410:

- Hexport
  + Sample black sludge id:
    water - dark/fail to detect by IR. or KF
    brake fluid
    unknown.

- Kapton (3-diaphram squares)
  + Sample fluids -
    - water -
    - brake fluid -
    - unknown
  + Access Kapton's sensitivity to water/brake flu

- Cup - steel cover side
  + Sample heavy black deposits.

- Electrical Arc
  - id black compound on one blade
  - id gray compound on 2nd blade

- Stationary Terminal
  - Remove 1/2 & Photo SEM → clean & determine fx mode.

Helpful

Converter
Same as Helpful

Thanks
Hayle

Request for Central Laboratory Service

Receipt - Copy

Lab Request Number: 009804105
Date of Request: 12/17/1998 10:30:33 AM
Print Date: 01/12/1999 09:30:44 AM

Request Description: SPEED CONTROL CUT-OFF SWITCH

Requester Information:

Primary Contact: STEVENS, GREG - 10008	Phone: (313) 323-8686	PROFS ID: GSTEVEN1	Fax: (313) 390-7224
Secondary Contact: LA POINTE, NORM - 10075	Phone: (313) 594-2586	PROFS ID: NLAPOINT	Fax: (313) 337-6256

Send Report to: MD 5006/2G065, AVT MATERIALS, BLDG. #6
Bill to:
Acctg.Location: 5100
Dept: T113
Work Task: XQG04

Sample Information:
Total Number of Containers: 1
Source: Not specified
Sample Handling: Return after test
Supplier Code: Not specified

Part/Material Name	Qty	Sample Identification	Part Number	Material Spec	CPSC Code	Supplier
SPEED CONTROL CUT-OFF SWITCH	1	BURNED CONNECTOR *	F2VY-9F924-A	NA	15.08.00	TEXAS INSTRUMENTS

Investigation Information:
Nature of Investigation: Requestor Info. Bcc: Mail typed report
Fax preliminary results
HIGH PRIORITY - POSSIBLE LEGAL

Additional Sample Information/Testing Requirements:
SAMPLE ID: BURNED CONNECTOR & PRESSURE ACTUATOR (REDDICK)

DETERMINE CAUSE
OF BURNED CONNECTOR - RADIOGRAPH, PHOTOGRAPH, PRESSURE TEST DIAPHRAGM.

EVALUATE/UNDERSTAND CIRCUITRY OF NEW SWITCHES.

ATTN: S. LA
ROUCHE - SAMPLE IN LAB

NOTE: ALL COMMUNICATIONS/REPORT, ETC. TO BE DUAL
(I.E. N. LA POINT).

Reporting Directions:
Date customer would like report: 01/13/1999
Date customer must have report: 01/14/1999

Report Format(s):

Log-in Information:
Initial Routing: Metallurgy
Accepted for Central Laboratory by: Morton, Jacqueline R. Phone: 59-47064

View your test status at: 'HTTP://td4web.pd7.ford.com/kalis'

Program Name: KALISLab Engr Module
Program Version: Version: 2.0.6

Gullen, Gayle (G.D.)

From: Gullen, Gayle (G.D.)
Sent: Thursday, January 14, 1999 11:44 AM
To: LaRoucha, Steve (S.)
Cc: Kowalczyk, Richard (R.A.)
Subject: black residue in switch

Steve,

I went back to some basic chemistry information I had available and I believe I know how the black residue is forming inside the switch. We have seen this black residue in the Yuma Police vehicles as I told you yesterday. We had tentatively identified it as an oxalate [a metal salt of an oxalic acid]. What bothered us is that the usage of this material is for cleaning metal parts and that didn't fit. However, based on past experience with polyester materials we knew that acids were formed during the decomposition process. Terephthalic acid [the base acid in the polyester] has a ring structure with side groups. If you take the side groups off and leave the ring structure you form oxalic acid which would make sense if the housing were smoldering. Glycols and glycol ethers [which is what brake fluids are made up of] are highly reactive with this acid. This in turn with contact with any metallic surface would form a metal salt of oxalic acid. This still doesn't tell us what caused the fire to start, however, it indicates that brake fluid had to be present within the area of the housing reaction during the smoldering of the part and that it was not introduced into the part in this reacted form. I'll forward this information to you when I write up my portion of the report, however, I don't have Mary's formal data in order to do that at this time.

Regards,

Gayle Gullen

Gayle Gullen (313) 32-27322 (313) 32-21614 FAX

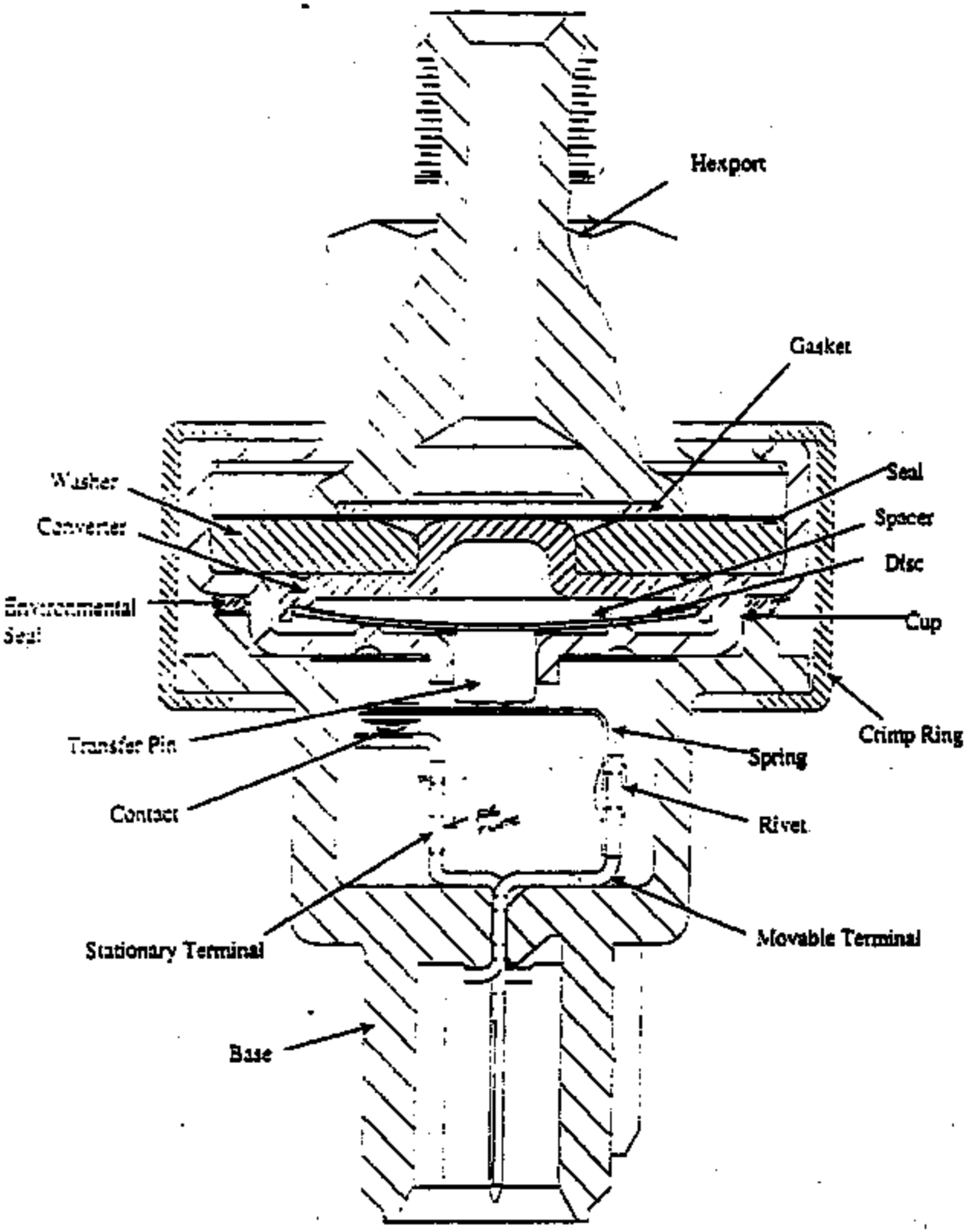
Gullen, Gayle (G.D.)

From: LaRouche, Steve (S.)
Sent: Wednesday, December 23, 1998 12:31 PM
To: Gullen, Gayle (G.D.); Schumacher, Dan (D.E.); LaRouche, Steve (S.)
Cc: Klaas, Pete (P.F.); Kowalczyk, Richard (R.A.); Manor, James (J.R.)
Subject: Brake/Cruise Control Switch Failure Analysis

Gayle and Dan: We are going to have a meeting in the large conference room on January 4 to discuss what types of analyses we could perform on a brake/cruise control switch that was involved in a fire. Specifically we may need to identify corrosion products, brake fluid, and other materials which could have entered the switch. Norm LaPointe from Design Analysis will most likely attend. Please attend if you can, or let me know if you can send a substitute. ASO needs to respond to NHTSA by 1/15/99. If asked to perform analyses, we will probably need to respond by 1/7/99. Thanks

Steve LaRouche (SLAROUCH)
Metallurgy Section
Central Laboratory, Room N410
(313) 845-4878
(313) 322-1614 FAX

Hydraulic Pressure Switch Cross Section



3713 2682

Project No. 9615

Book No. _____ TITLE [illegible]

From Page No. _____

FT

Drawer Deposit:

Metal Wetted: possibly metal salt (probably an oxide)

Spacer Deposit

metal salt (probably an oxide) + glycol
based material (probably brass filled)

Washer Deposit

glycol based material (probably brass filled)
metal salt (possibly an oxide)

Diaphragm

glycol based material (probably brass filled)
metal salt (possibly an oxide)

Wm. C. Hayes
11/9/99

To Page No. _____

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	

3713 2683

From Page No.

Received: Hexpick
Conductor
Spacer
Washer
Diaphragm
Water Deposit from Hexpick, 2 layer

ASTM D1744 Blank: 1.2125 mg
Tot: 5.6395 mg

Sample 0.0084
Aliquot, mL 1.464
Dil 13.6269

~ 10%

ETR

Hexpick deposit:
as received glycol based material (probably brake fluid) + metal salt (possibly an oxide)

Methanol solubles: glycol based material (probably brake fluid) + ester

methanol insolubles: essentially metal salt (possibly an oxide)

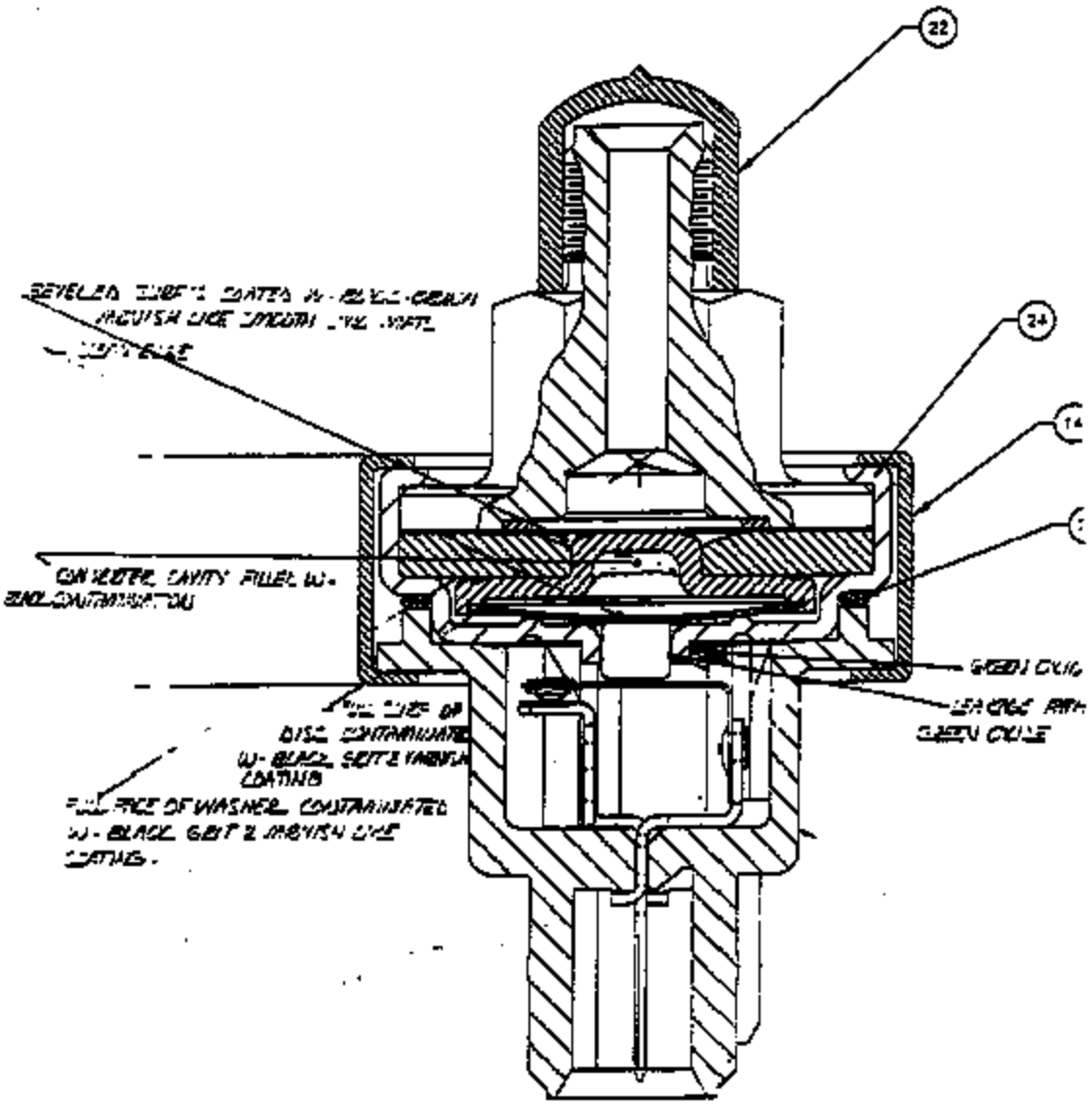
Conductor deposit
as received: glycol based material (probably brake fluid) + metal salt (possibly an oxide)

Methanol solubles: glycol based material (probably brake fluid), ester + other material

To Page No.

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	

3713 2684



3713 2885

Project No._____

Book No._____ TITLE _____

Page No.__

4/8/04/05 Log Stevens / L.L. to Brock

Spec / Cotton Cut-Sheets

Y4 10pm mtg with W at Rio

Lariat/ could not reach anyone

while waiting on TL received

fax Mag. Ex (AP)

Jim Kaplan

voicemail on Mgmt Block

Ok with Bill Rotter

returned call & confirmed request ½ to Stevens

To Page No.____

Read & Understood by me,	Date	Invented by	Date
[illegible]	1/6/99		

3713 2656

111

Project No.

TITLE

Book No.

From Page No.

98-1405 Test Structure / S of Curve
Speed Control Circuit Evaluation

Meeting at Motley 11 9:30-11:30 Design
Both spread assembly + pitch gauge

To Page No.

Witnessed & Understood by me, | Date | Invented by | Date

3713 2687

Project No. [illegible]

TITLE [illegible] Book No. [illegible]

From Page No.

Supplement / Logic Failure

Review: A new valve FSV61F0434S was added to a specified circuit to maintain a small pump bypass flow when pump is running. The valve is called "Minimum"

Observe: Using an inductive current clamp, ensure the valve is energized when pump is running and de-energized when pump is not running.

Perform: Check relays in MCC using manual and automatic testing.

Verify manual is updated to include new valve

Ask people who work in Chemistry

Yes

4/5/1999 Attempt to purge the air from the system by opening the vent. The water should not be completely purged. The water indicates that the system may not be purged of any air. Pump cannot be run.

High value in chemistry area - not 4105.1pa

4105.1pa

Pump is now running

Not in chemistry area as the unit is not running

Pump is 4105.1pa

Pump is running 4105.1pa

To Page No.

Witnessed & Understood by me,	Date	Invented by	Date

3713 2699

From Page No.

Molecular Characterization

(Fourier Transform Infrared Microspectroscopy)

Spectra of a chloroform microextract of the metal furniture oxide the connector are characteristic of glycol ether (similar to motor fluid) and indicate evidence of resin and metal soap.

Spectra of the brown plastic housing material are characteristic of polyester based on terephthalic acid

Spectra of the blackened plastic housing material are characteristic of polyester based on terephthalic acid.

Vicki Lopez
1/6/1999

To Page No.

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	

3713 2689

Received: Hexpack
Collector
spacer
Washer
Diaphragm

Water in Deposit from Hexpack, 2 by wt

ASTM D 1744 Blank = 1.255 mg
Titer = 5.6095 mg/ml

sample, g 0.0084
titrant, ml 1.464
Ω 13.6899

~ 10 Ω

IR

Hexpack deposit:
as received: glycol based material (probably brake fluid) + metal salt (possibly an oxalate)

Methanol Solubles glycol based material (probably brake fluid) + ester

methanol insolubles: essentially metal salt (possibly an oxalate).

Collector deposit
as received: glycol based material (probably brake fluid) + metal salt (possibly an oxalate)

Methanol solubles glycol based material (probably brake fluid), ester + other material

Project No. 9201015

30 Book No. _____ TITLE Speed Control Cruise Switch

From Page No. _____

ETC

Cruise Deposits

Methanol insolubles: essentially metal salt (probably an oxalate)

Spacer Deposit

Metal salt (probably an oxalate) + glycol based material (probably brake fluid)

Washer Deposit

glycol based material (probably brake fluid) + metal salt (possibly an oxalate)

Diaphragm

glycol based material (probably brake fluid) + metal salt (possibly an oxalate)

M. C Hayes

11/4/99

To Page No. _____

9804105 SPACER, DEPOSIT

Specification:

Supplier:

Preparation method: AS RECEIVED

IR Technique: MICROSCOPE

Wed Jan 13 09:51:20 1999 Engineer: MCH

Scans: 128 / 256 APOD: Norton-Beer (medium)

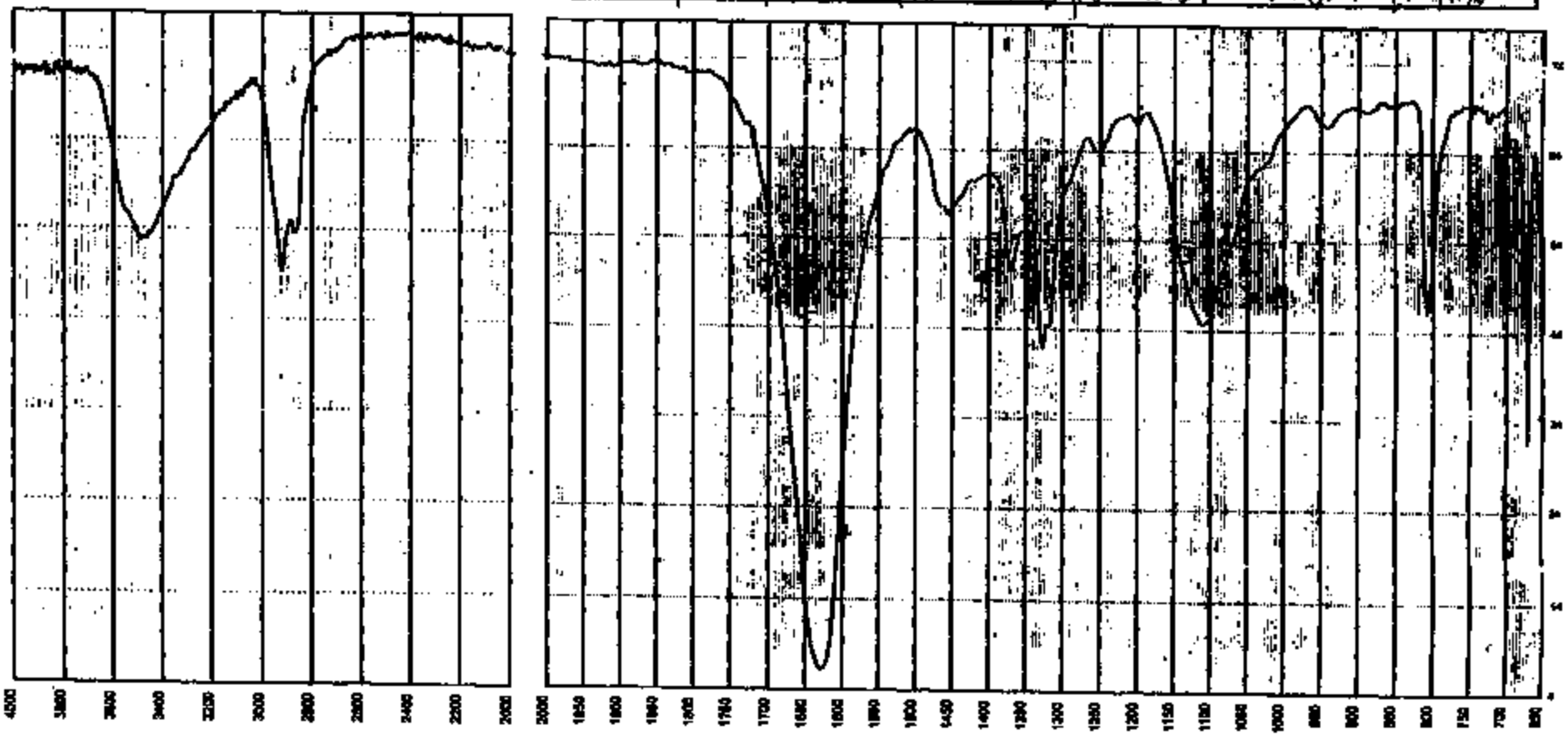
Resolution: 4.00 Detector: MCT[16]

Gain: 4R / 4R Y Axis: % Transmittance X Axis: Wavenumber

Engineer:

Concur:

Interpretation:



3713 2692

9804105 WASHER, DEPOSIT

Specification:

Supplier:

Preparation method: AS RECEIVED

IR Technique: BETWEEN NACL PLATES — MINERAL

Wed Jan 13 09:43:59 1999 Engineer: MCH

Scans: 128 / 256 APOD: Norton-Beer (medium)

Resolution: 4.00 Detector: MCT[15]

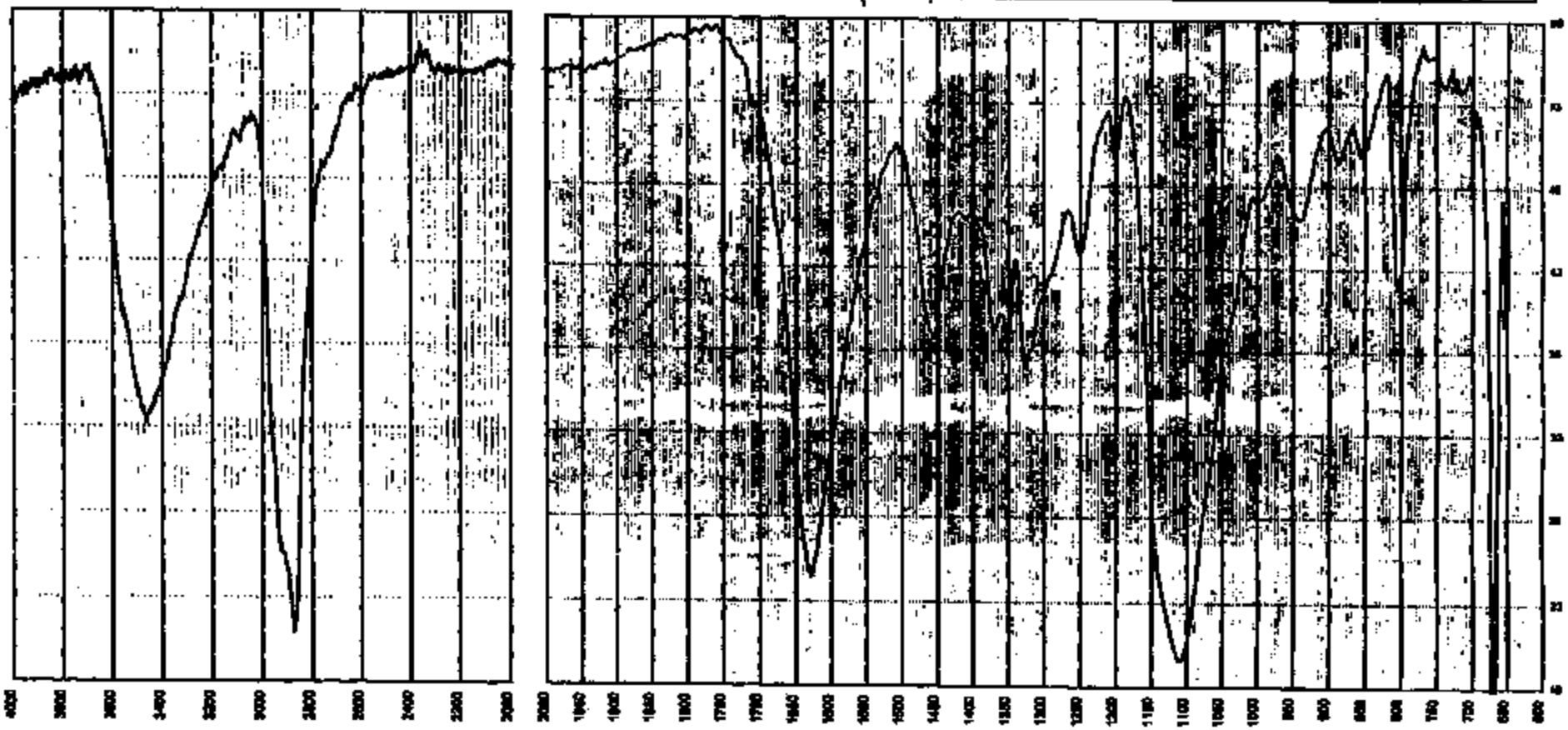
Gain: 4R / 4R Y Axis: % Transmittance X Axis: Wavenumber

Engineer: mch

Operator:

Interpretation:

(plastic polyester) Hair lotion + (Fatty alcohol polyether) Surfactant Fumed Silica



3713 2093

9804105 DIAPHRAGM, DEPOSIT

Specification:

Supplier:

Preparation method: AS RECEIVED

IR Technique: MICROSCOPE

Wed Jan 13 11:19:29 1999 Engineer: MCH

Scans: 128 / 256 APOD: Norton-Beer (medium)

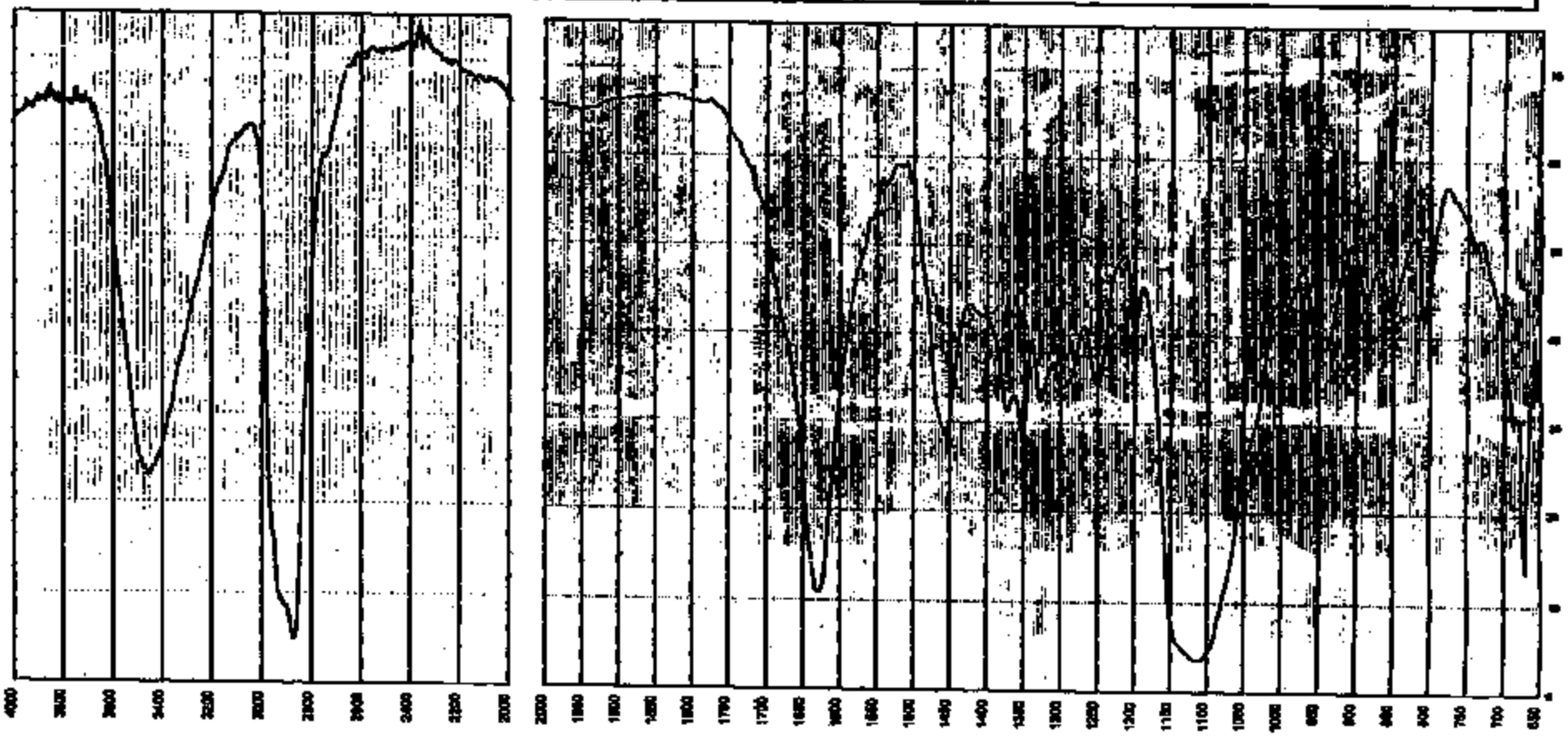
Resolution: 4.00 Detector: MCT[15]

Gain: 4R / 4R Y Axis: % Transmittance X Axis: Wavenumber

Engineer: MCH

Comm:

Interpretation: glycol based material (grease) from flexible weld valve (possibly an oxide)



3713 2694

9804105 CONVERTOR

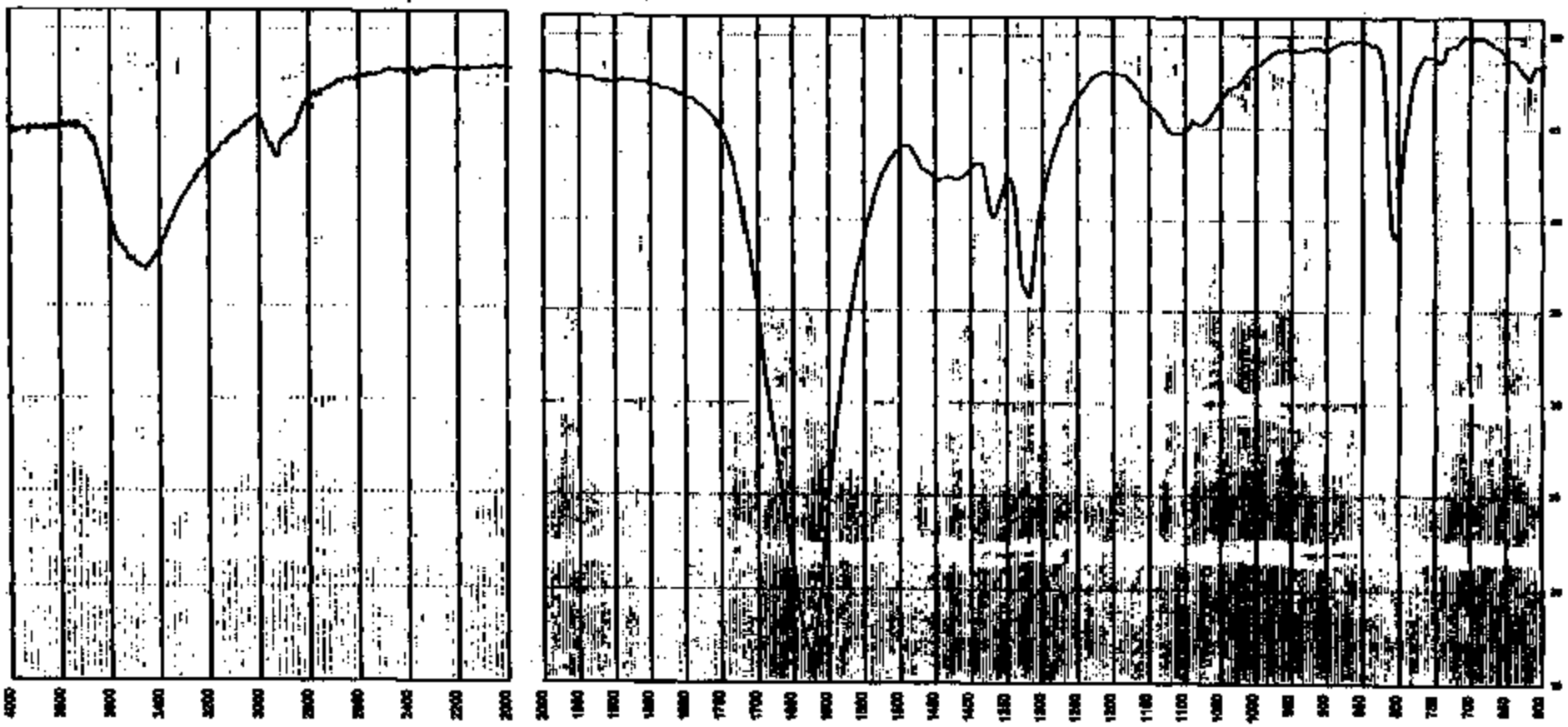
Specification:
Supplier:
Preparation method: INSOLUBLES
IR Technique: BETWEEN NACL PLATES

Thu Jan 14 10:07:52 1999
Scans: 32 / 64
Resolution: 4.00
Gain: 4 / 4

Engineer: MCN
APOD: Norton-Beer (medium)
Detector: TGS[0]
Y Axis: % Transmittance
X Axis: Wavenumber

Engineer: MK
Concur:

Interpretation:



3713 2896

9804105 CONVERTOR

Specification:

Supplier:

Preparation method: MEOH SOLUBLES

IR Technique: BETWEEN NACL PLATES

Thu Jan 14 09:19:01 1999 Engineer: MCH

Scans: 32 / 64 APOD: Norton-Beer (medium)

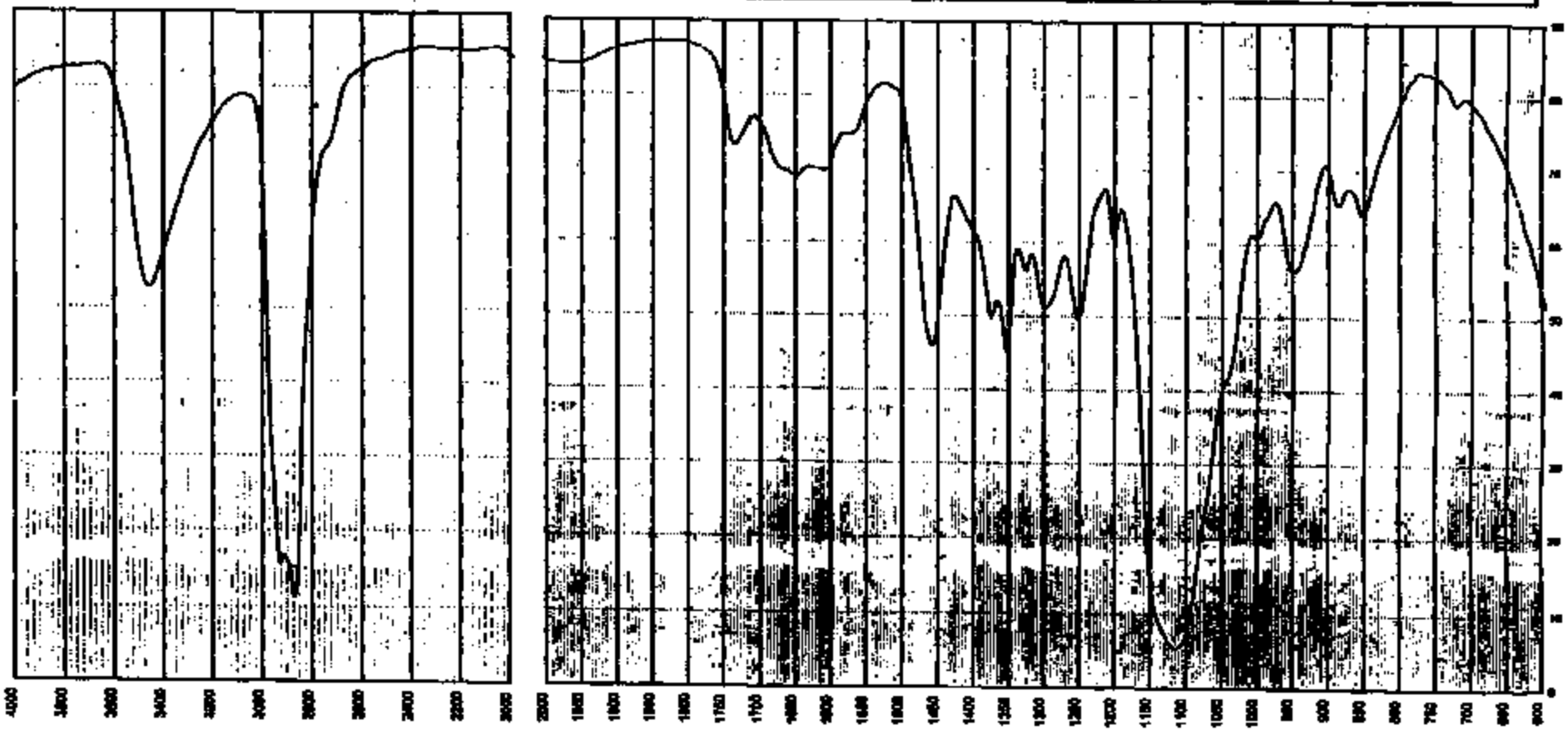
Resolution: 4.00 Detector: TGS[0]

Gain: 2 / 2 Y Axis: % Transmittance X Axis: Wavenumber

Engineer: mck

Comm:

Interpretation: glycol based with all proteins, but small, ester + ether material



3713 2696

9804105 CONVERTOR, DEPOSIT

Specification:

Supplier:

Preparation method: AS RECEIVED

IR Technique: BETWEEN NACL PLATES

Wed Jan 13 09:30:16 1999 Engineer: MCH

Scans: 32 / 64 APOD: Norton-Beer (medium)

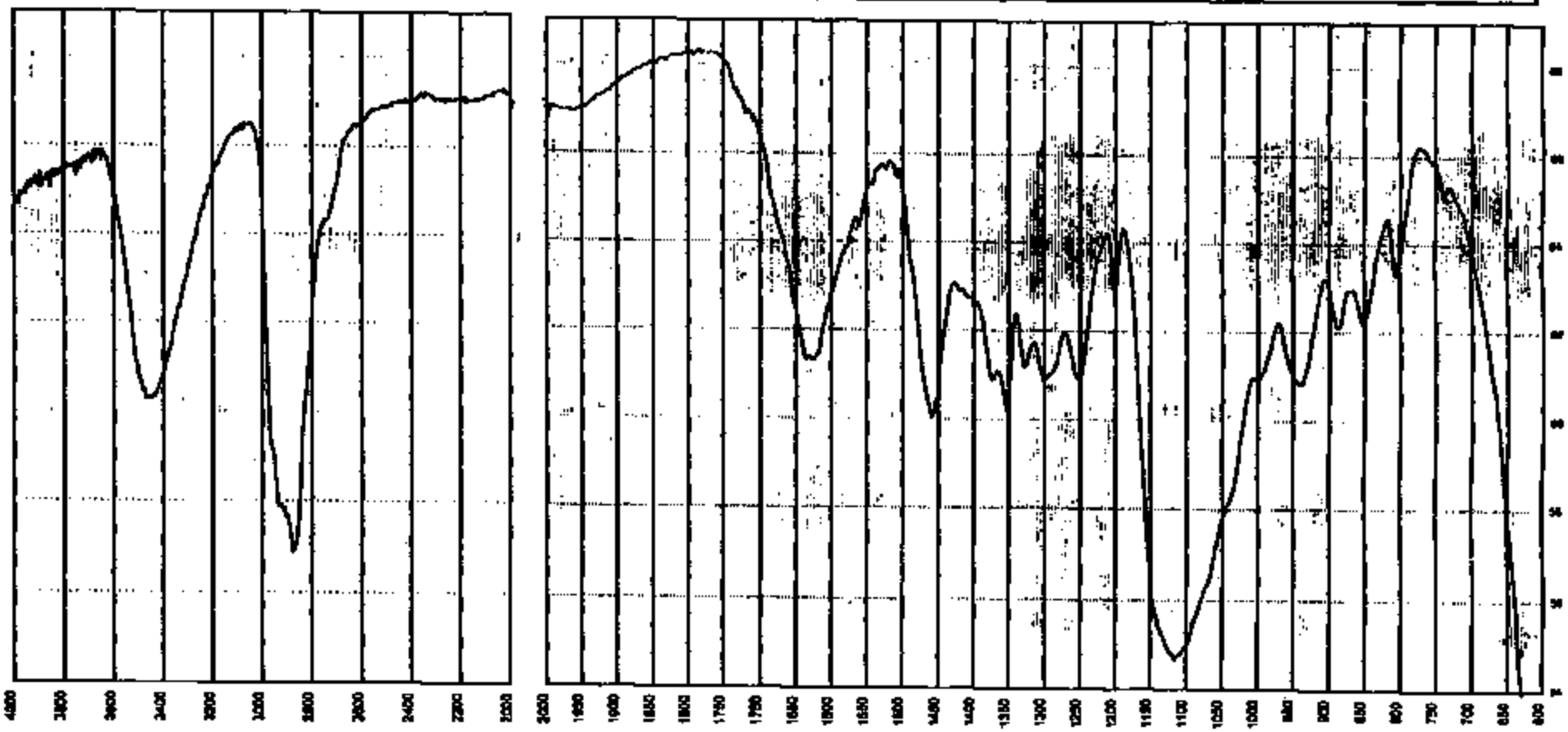
Resolution: 4.00 Detector: TGS[0]

Gain: 2 / 2 Y Axis: % Transmittance X Axis: Wavenumber

Engineer: MH

Comm.

Interpretation: glycol based water ? (probably hydroxide) + metal salt (possibly Na acetate)



3713 2897

9804105 HEXPORT

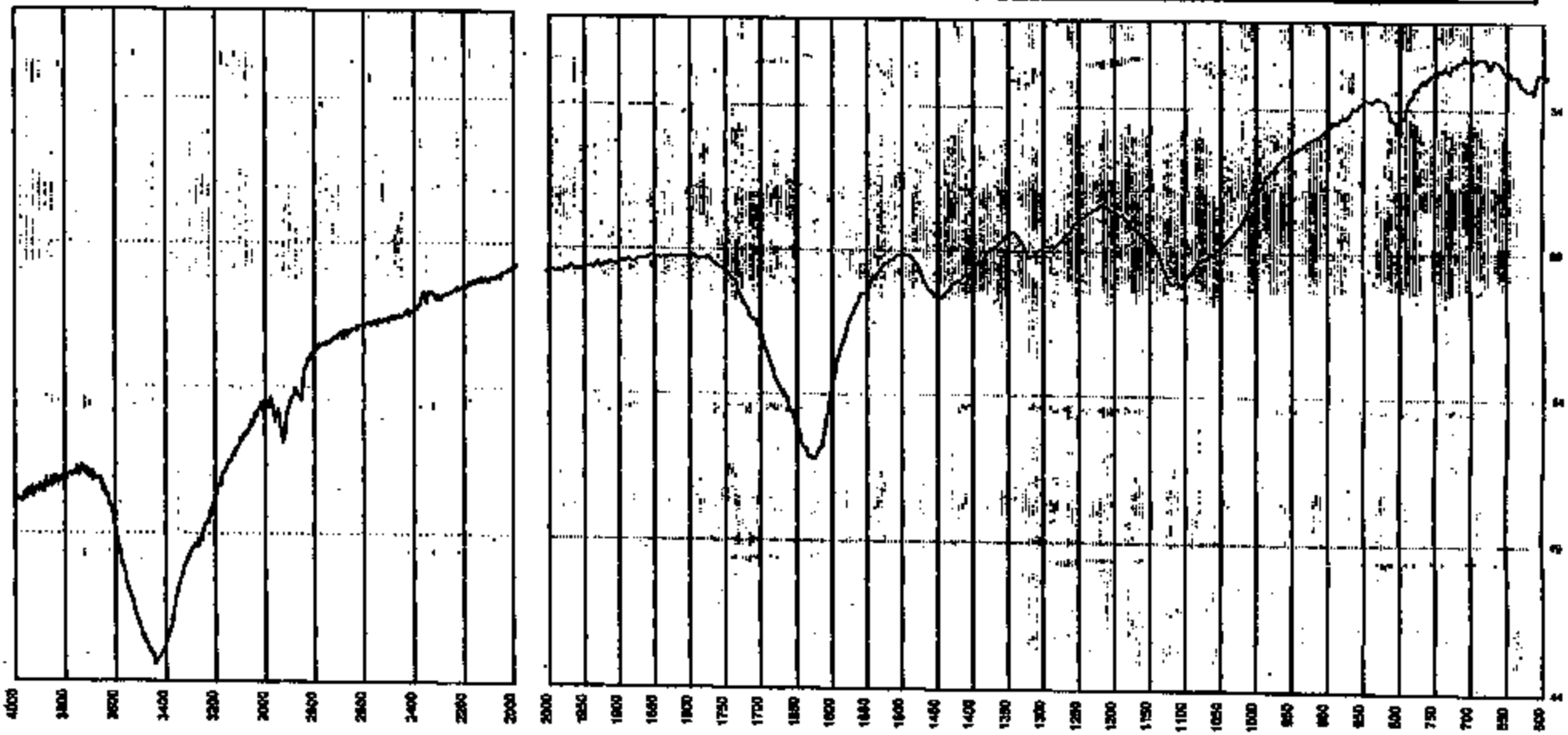
Specification:
Supplier:
Preparation method: INSOLUBLES
IR Technique: BETWEEN NACL PLATES

Thu Jan 14 09:58:28 1999
Scans: 32 / 64
Resolution: 4.00
Gain: 4 / 4

Engineer: MCH
APOD: Norton-Beer (medium)
Detector: TGS[0]
Y Axis: % Transmittance
X Axis: Wavenumber

Engineer:
Colour:

Interpretation: sodium hydrated salt (possibly an alkyl(ic))



3713 2698

9804105 HEXPORT

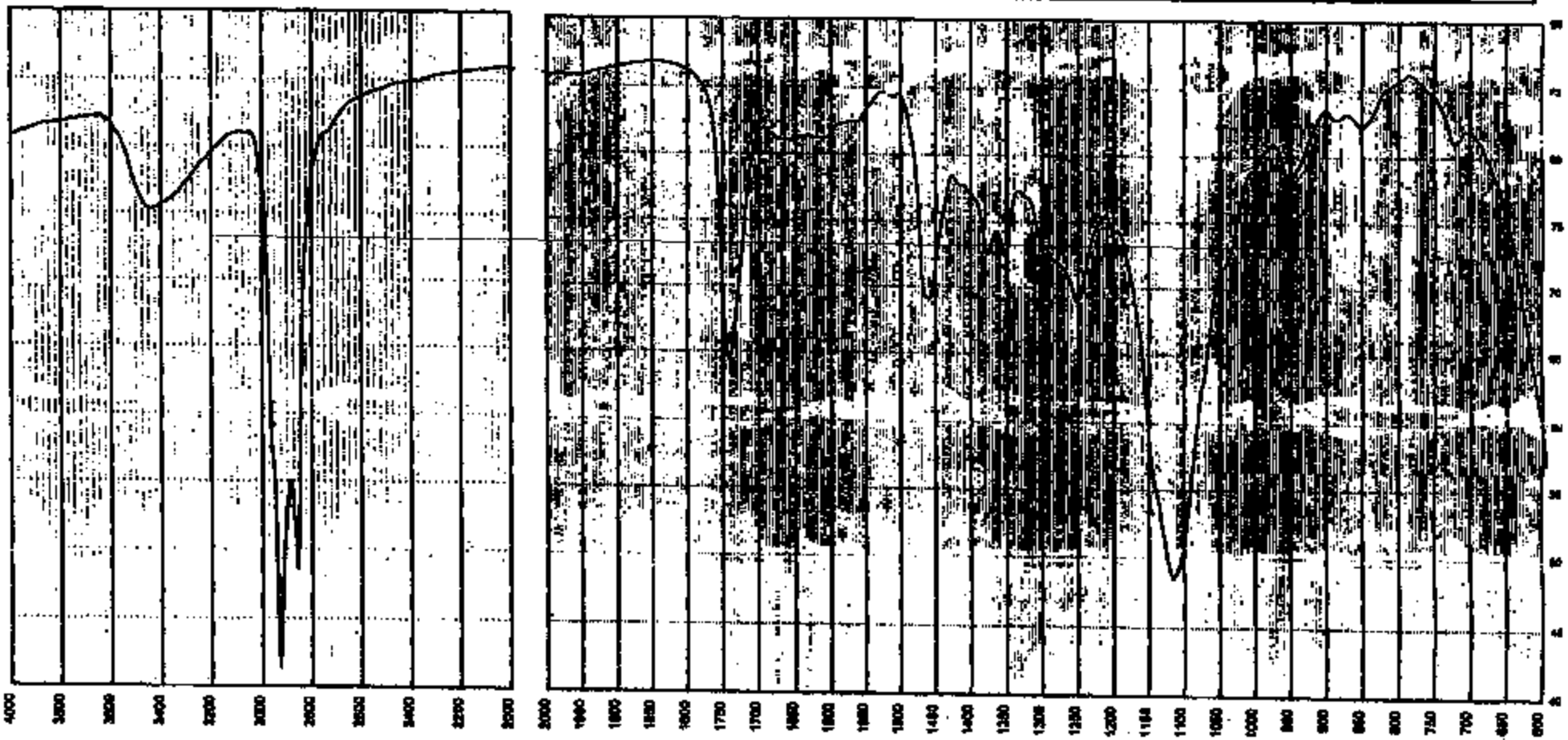
Specification:
Supplier:
Preparation method: MEOH SOLUBLES
IR Technique: BETWEEN NACL PLATES

Thu Jan 14 09:31:35 1999
Scans: 32 / 64
Resolution: 4.00
Gain: 2 / 2

Engineer: MCH
APOD: Norton-Beer (medium)
Detector: TGS[0]
Y Axis: % Transmittance
X Axis: Wavenumber

Engineer: mft
Comm:

Interpretation: glycol base molecule (probably brake fluid) + water



3713 2690

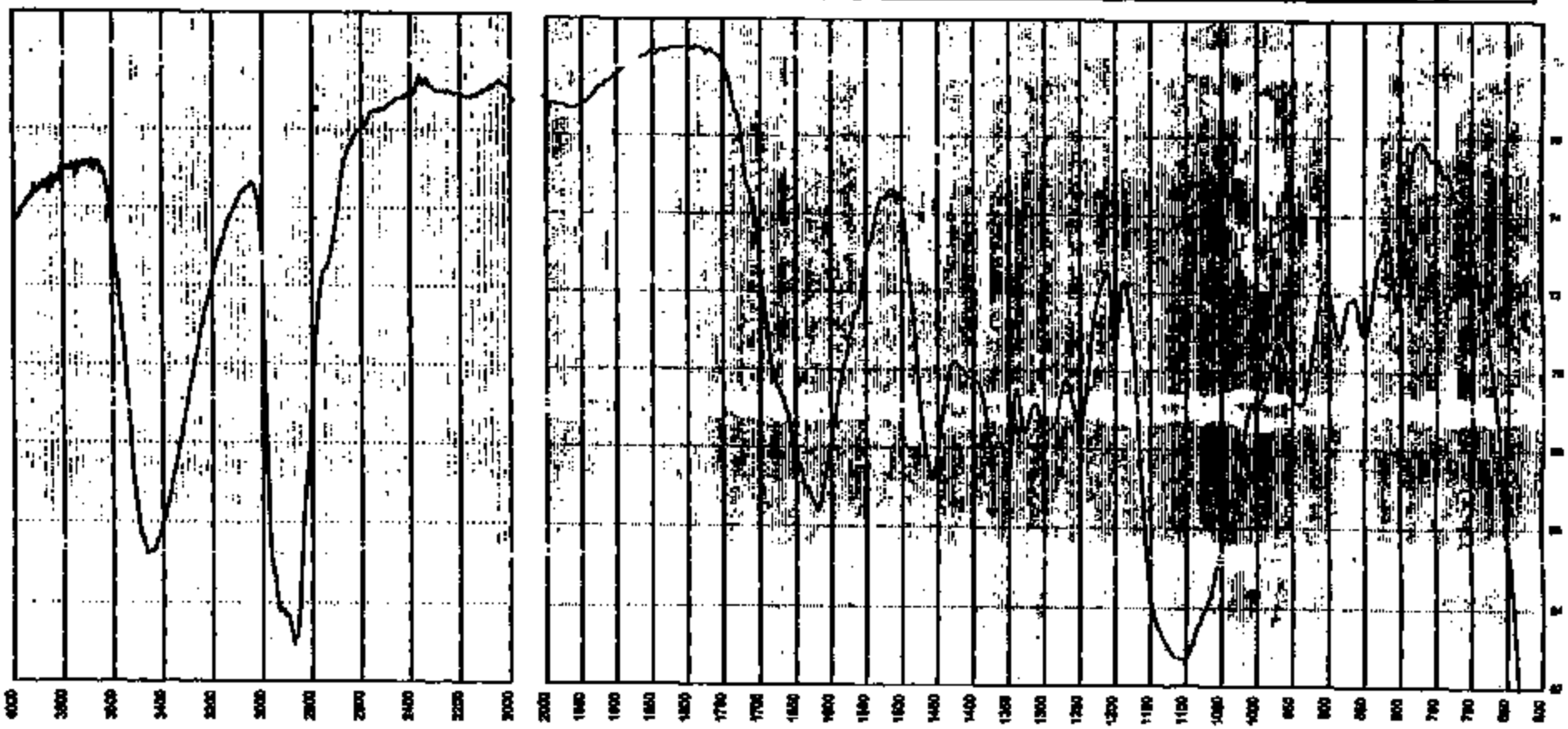
9804105 HEXPORT, DEPOSIT

Specification:
Supplier:
Preparation method: AS RECEIVED
IR Technique: BETWEEN NACL PLATES

Wed Jan 13 09:02:05 1999 Engineer: MCH
Scans: 32 / 64 APOD: Norton-Beer (medium)
Resolution: 4.00 Detector: TGS[0]
Gain: 2 / 2 Y Axis: % transmittance X Axis: Wavenumber

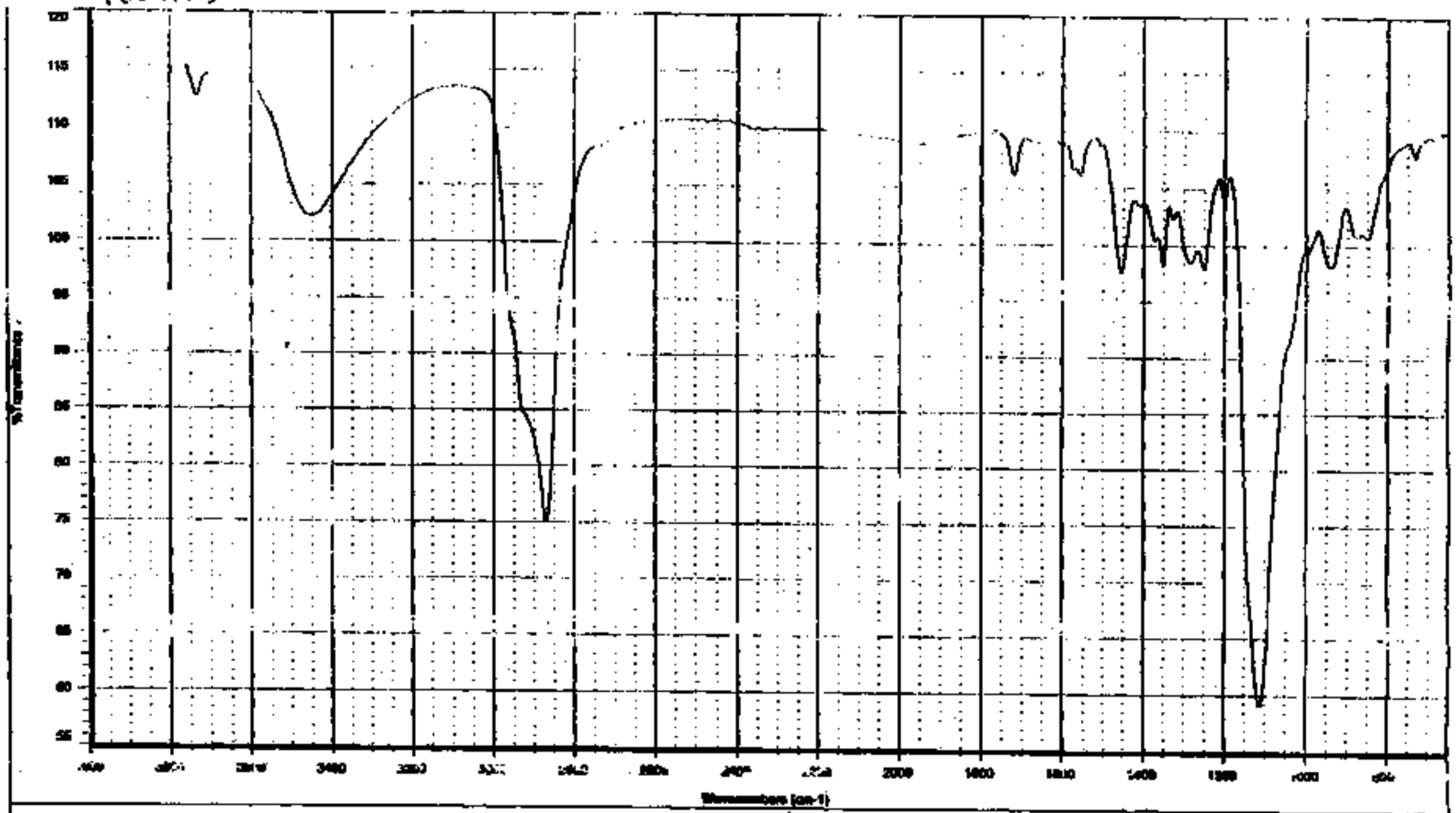
Engineer: MH
Group: JS

Interpretation: Phenol band mainly (probably hydrogen bonded) - Amide salt (possibly acetate)



9713 2700

9804105



Date: Tue Jan 05 13:08:29 1999

Scans: 128

Resolution: 8.000

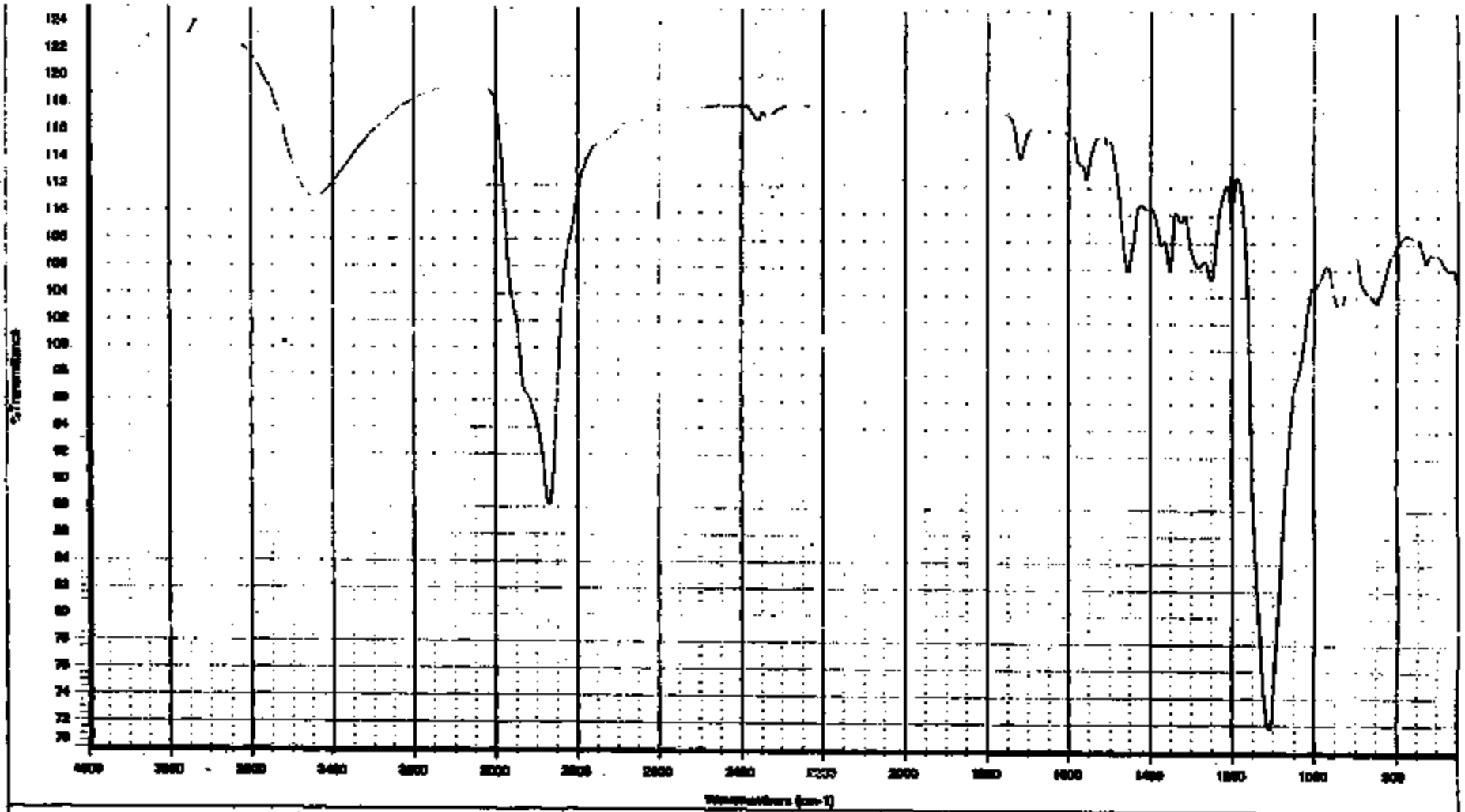
Tue Jan 05 12:55:10 1999 9804105- CONNECTOR SPEED CONTROL SWITCH

Chloroform Micro-Cast of Metal Surface Inside Connector

VC

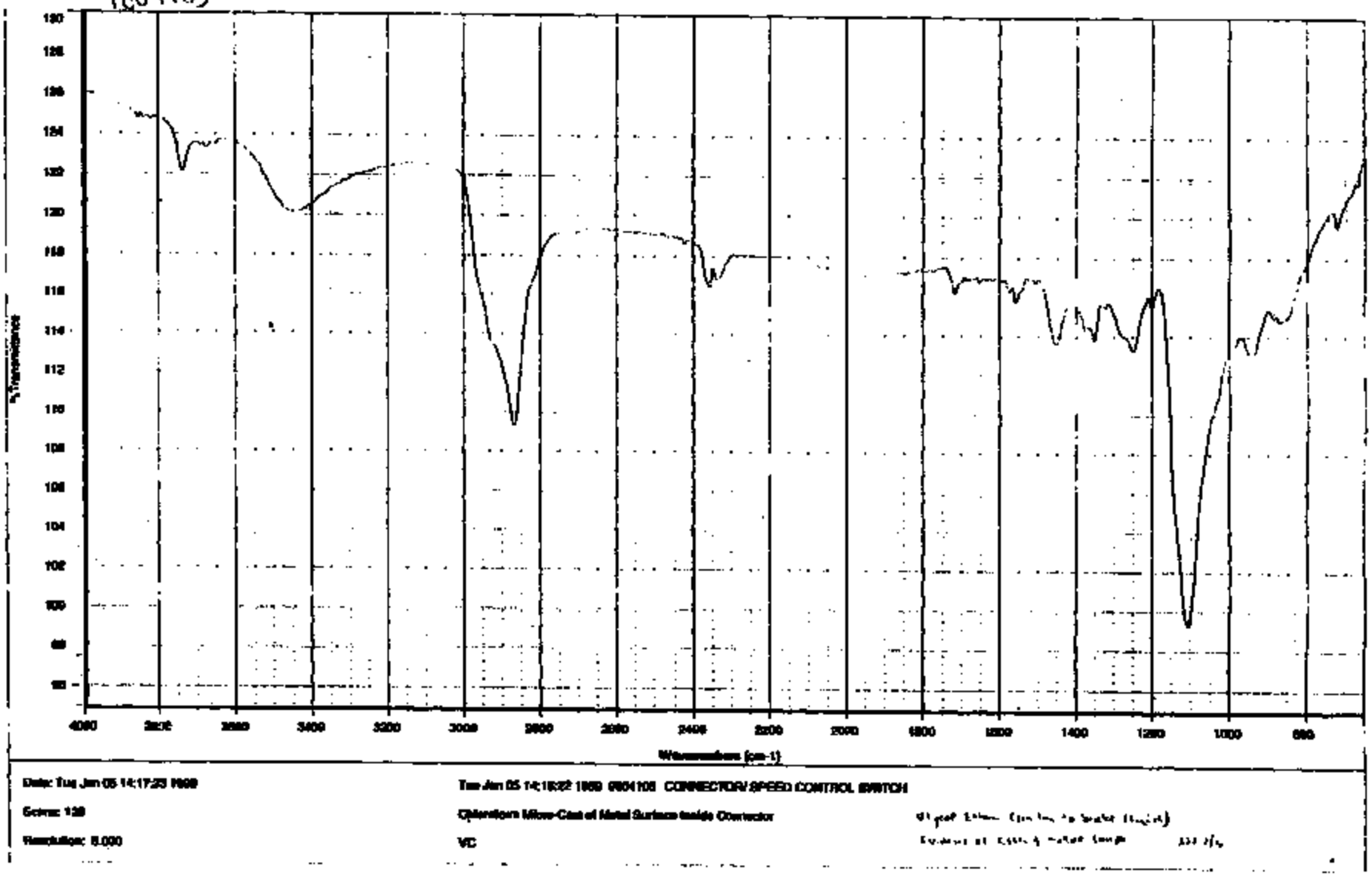
9713 2701

9804105



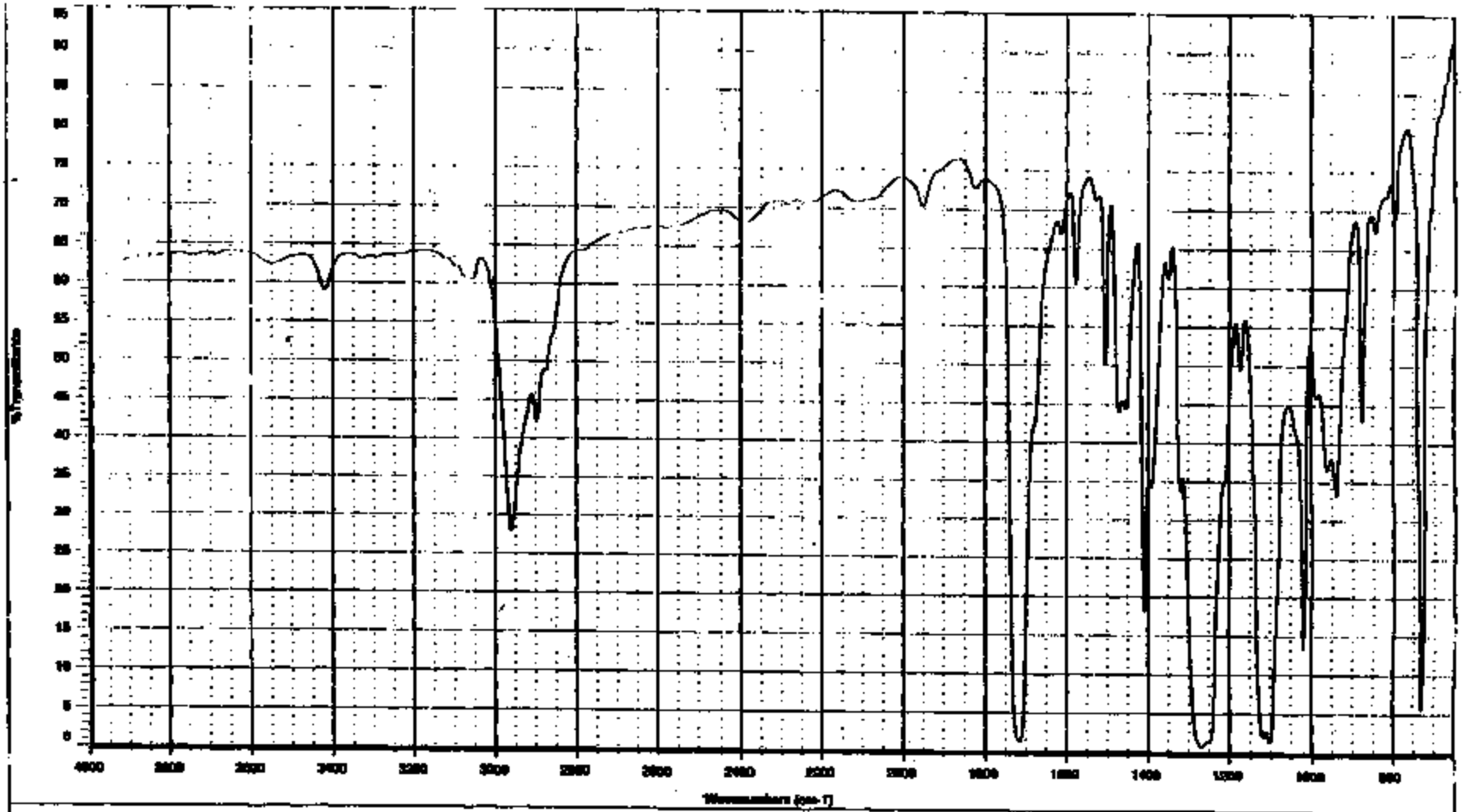
8719 2702

9804105



3719 2703

9804105



Date: Tue Jan 05 14:33:28 1999

Scans: 128

Resolution: 4.000

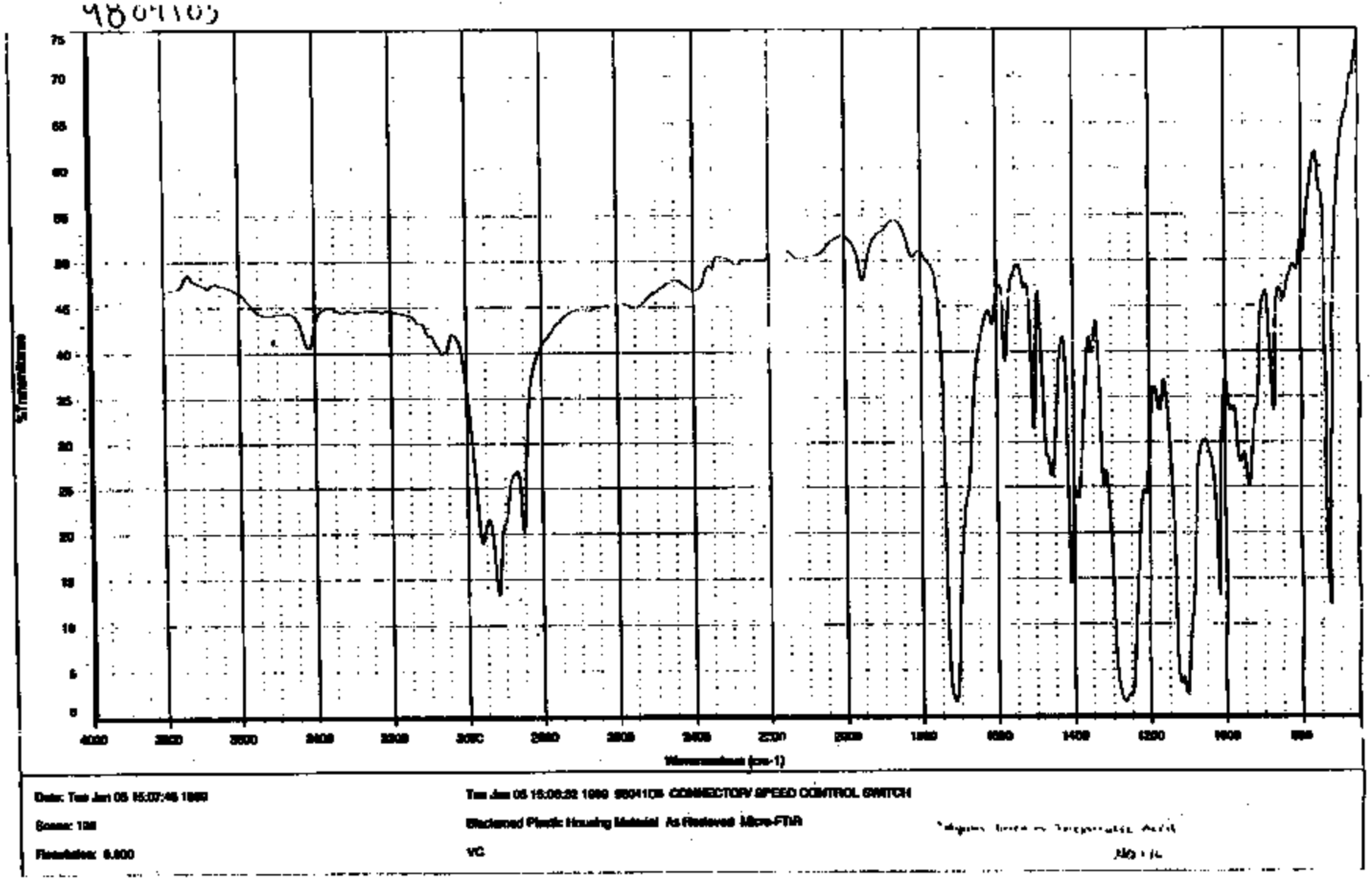
Tue Jan 05 14:32:28 1999 9804105 CONNECTOR SPEED CONTROL SWITCH

Brown Plastic Housing Material As Received Micro-FTIR

VC

Polyester based on terephthalic acid diol

3719/2704


%Transmittance
Wavenumber (cm-1)
Date: Tue Jan 05 15:07:46 1999
Scans: 128
Resolution: 8.000
Tue Jan 05 15:06:22 1999 9804105 -CONNECTORV SPEED CONTROL SWITCH
Blackened Plastic Housing Material As Received (Micro-FTIR
VC

3713 2706

Dague, Bryan

From:	Hopkins, AL
Sent:	Wednesday, January 20, 1999 11:21 AM
To:	Dague, Bryan; Baumann, Russell
Cc:	McGuirk, Andrew; Andres, Amy
Subject:	99-033: TSL # 150709: ANALYSIS OF MATERIAL REMOVED FROM 77P6 THERMAL EVENT

...ITION

OBJECTIVE:
Determine nature of deposit; in particular, determine if it is consistent with the results from Ford's analysis.

SUMMARY:
The results were very similar to those found by Ford. The main difference is that our EDX detector has a much better low energy cutoff than did the Ford detector. Their detector is unable to detect carbon and oxygen. Our analysis showed large amounts of carbon and oxygen on all three samples.

RESULTS AND DISCUSSION:
All of the samples were comprised of a mixture of different phases that had agglomerated together. A description of our findings is shown below:

BLACK FLAKE FROM TROUGH: We found the following elements which are listed in a very approximate decreasing order of preponderance: copper, oxygen, carbon, chrome, zinc, potassium, sulfur, and silver.

MATERIAL SCRAPPED FROM CUP ASSEMBLY: There were a very large number of glass fibers present which had the composition that is typically used in plastics for reinforcing purposes. In other words, this is almost certainly from thermal decomposition of the plastic base. The EDX detectable elements in these fibers are calcium, aluminum, silicon and oxygen. The rest of the material was very similar in composition to that reported for the above sample although we also detected some phosphorous in this sample.

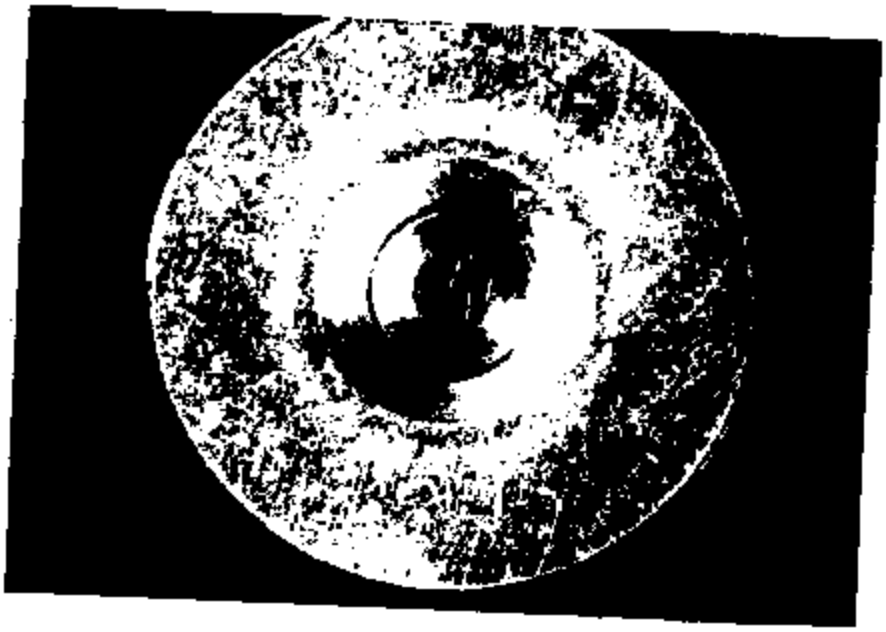
GREEN MATERIAL ON CUP: This material was similar to that found on the first sample although the amount of chrome was much less.

The data was collected under the guidelines of TSL-S-71, Rev A which can be accessed at http://www-mcd.mc.ti.com/tsl/. SEM-EDX (Scanning Electron Microscope with Energy Dispersive Analysis of X-rays) analysis was used in the above described analysis. The data will be sent through the internal mail.

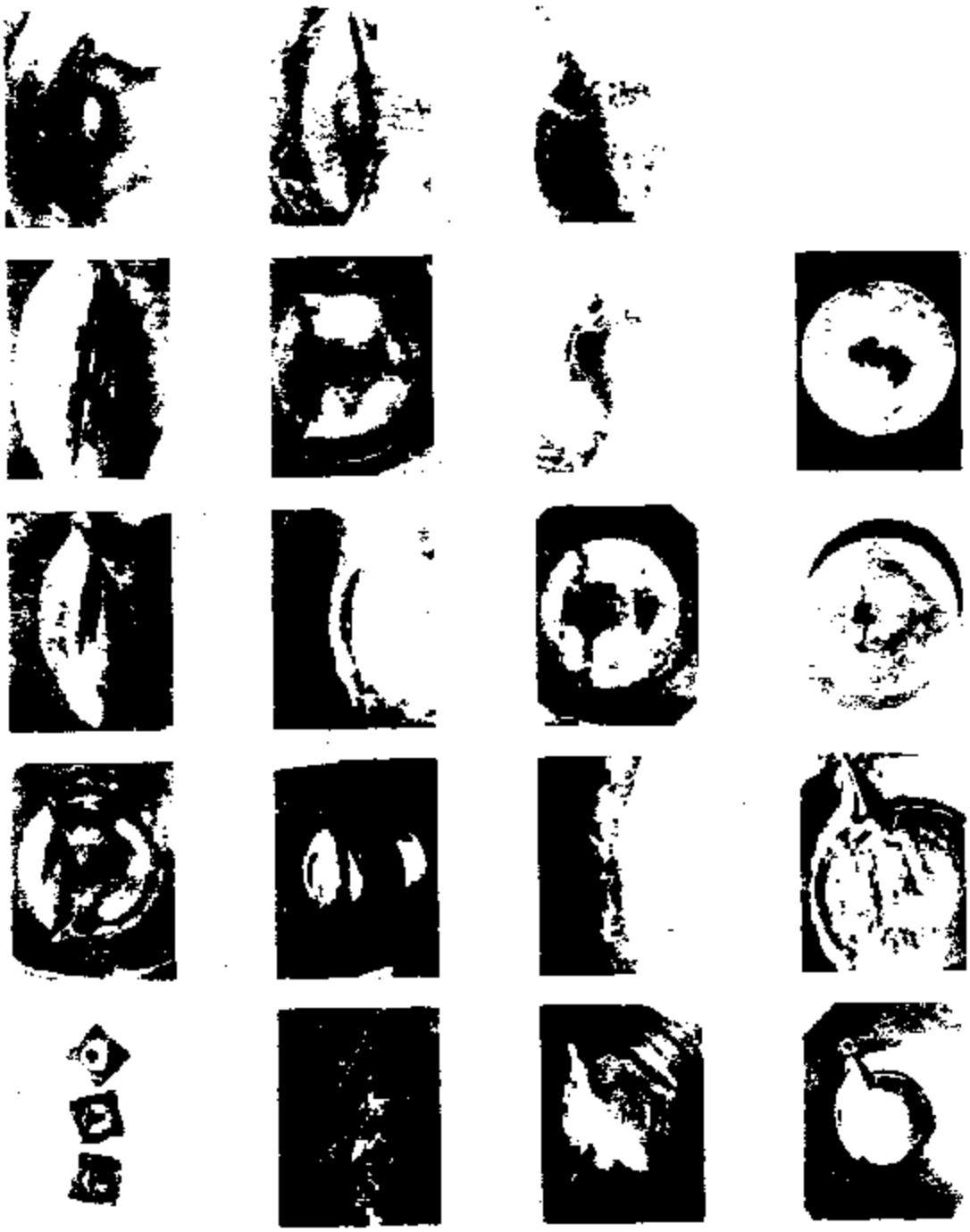
AL HOPKINS MSG ID: AHOP PHONE: 508/236-3040

ALTERNATE STACKING ORDER
(PIECES SEEM TO FIT EACH OTHER BETTER)

COUCHE SIDE DOWN




3



2

3

CONCAVE SIDE DOWN!

1 2 3

1

CONCAVE SIDE DOWN

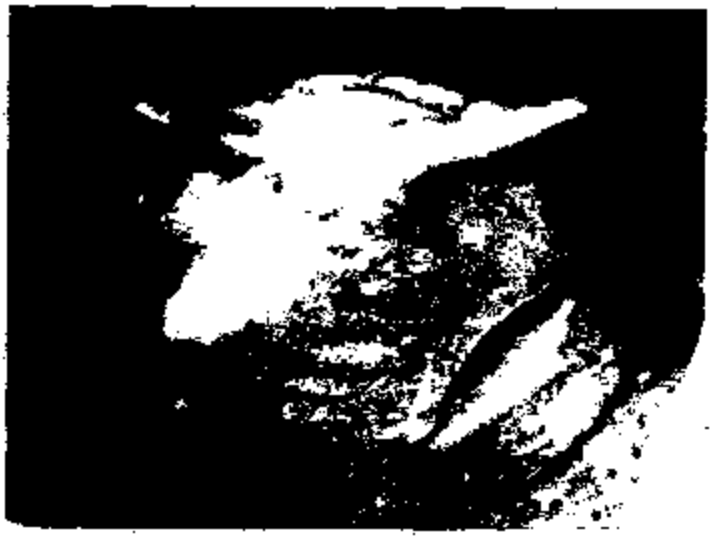
1 2 3

1

3713 2712

CONCAVE SIDE UP

1



2

3

M

CONCAVE SIDE DOWN

2

3

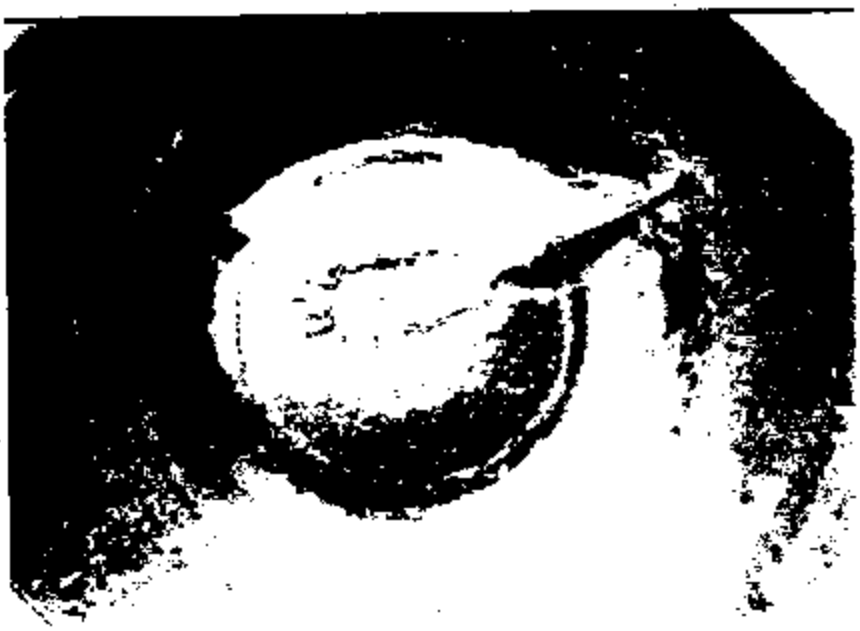
3713 2715

CONCAVE SIDE UP

3

3

CONCAVE SIDE UP



3

3

CONCAVE SIDE DOWN

2

3

3713 2718

CONCAVE SIDE UP

1

2

3

DIRECTION OF DEFORMATION/TEARING

INITIAL SIDE OF CONTACT/DEFORMATION

3713 2719

ALTERNATE STACKING ORDER
(PIECES SEEM TO FIT BETTER)

greatest amount of damage

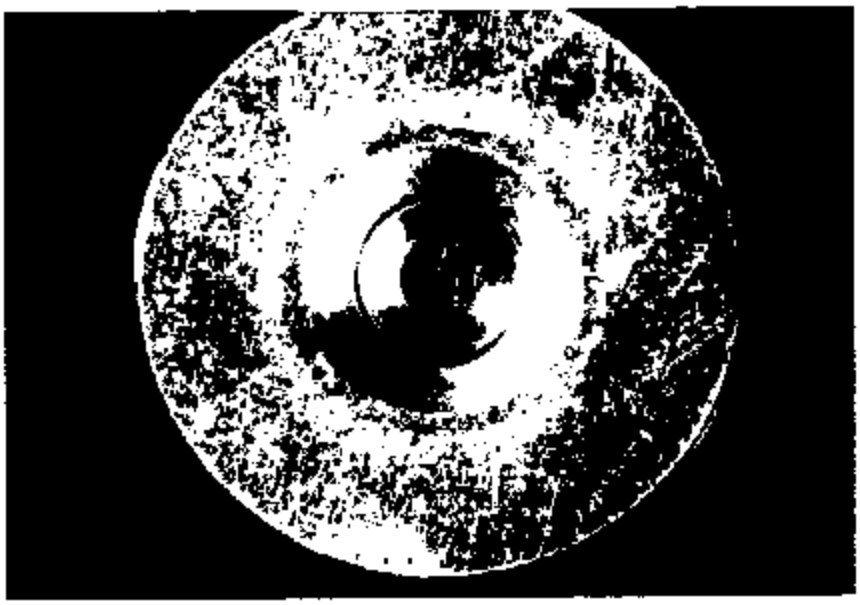
X

least amount of damage

2 1 3

Orientation of Layer

X

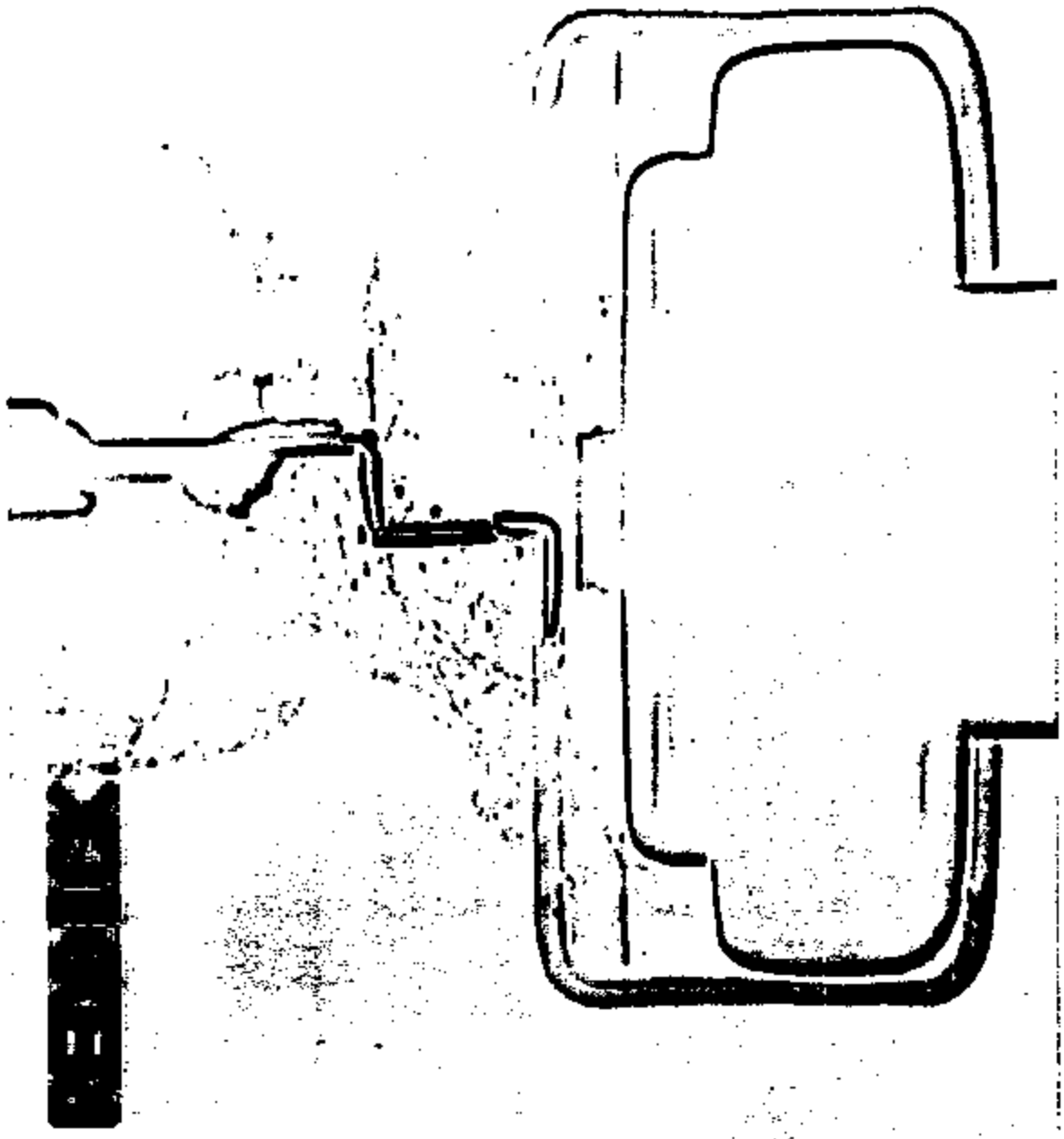


REDDICK

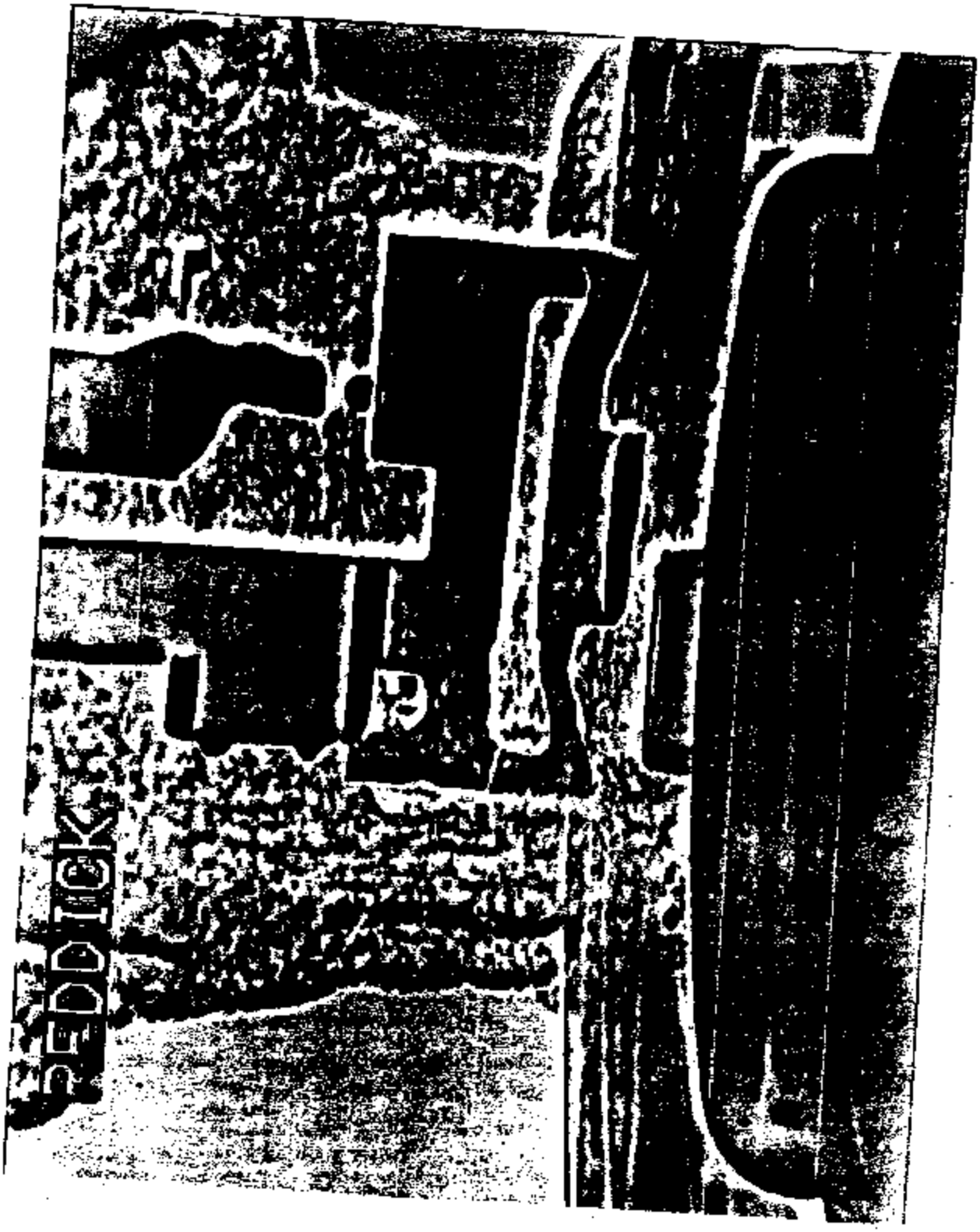
3713 2722

3713 2725

3713 2726



3713 2728



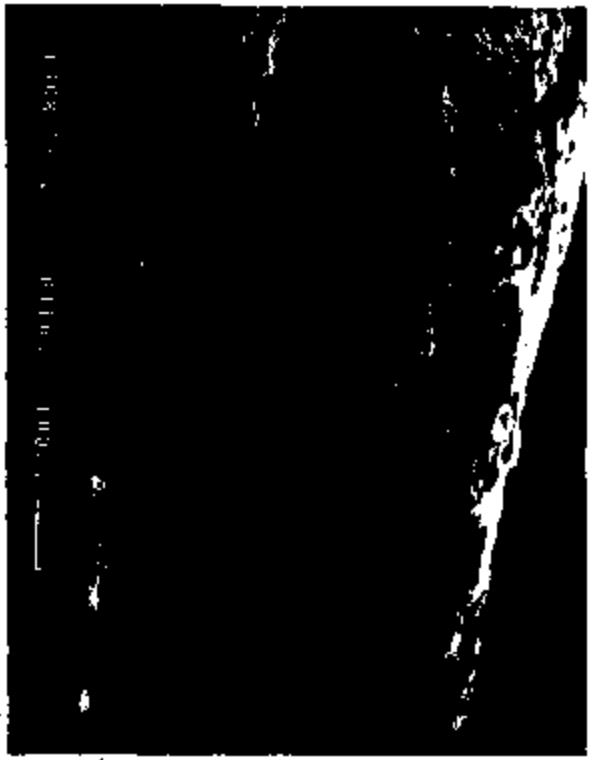
3713 2729

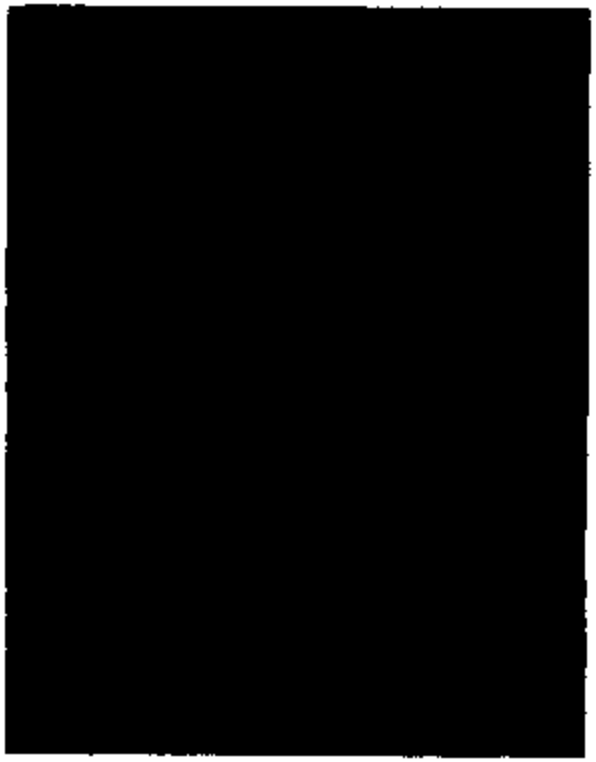
REDDICK

3719 2730

REDDICK

3713 2733



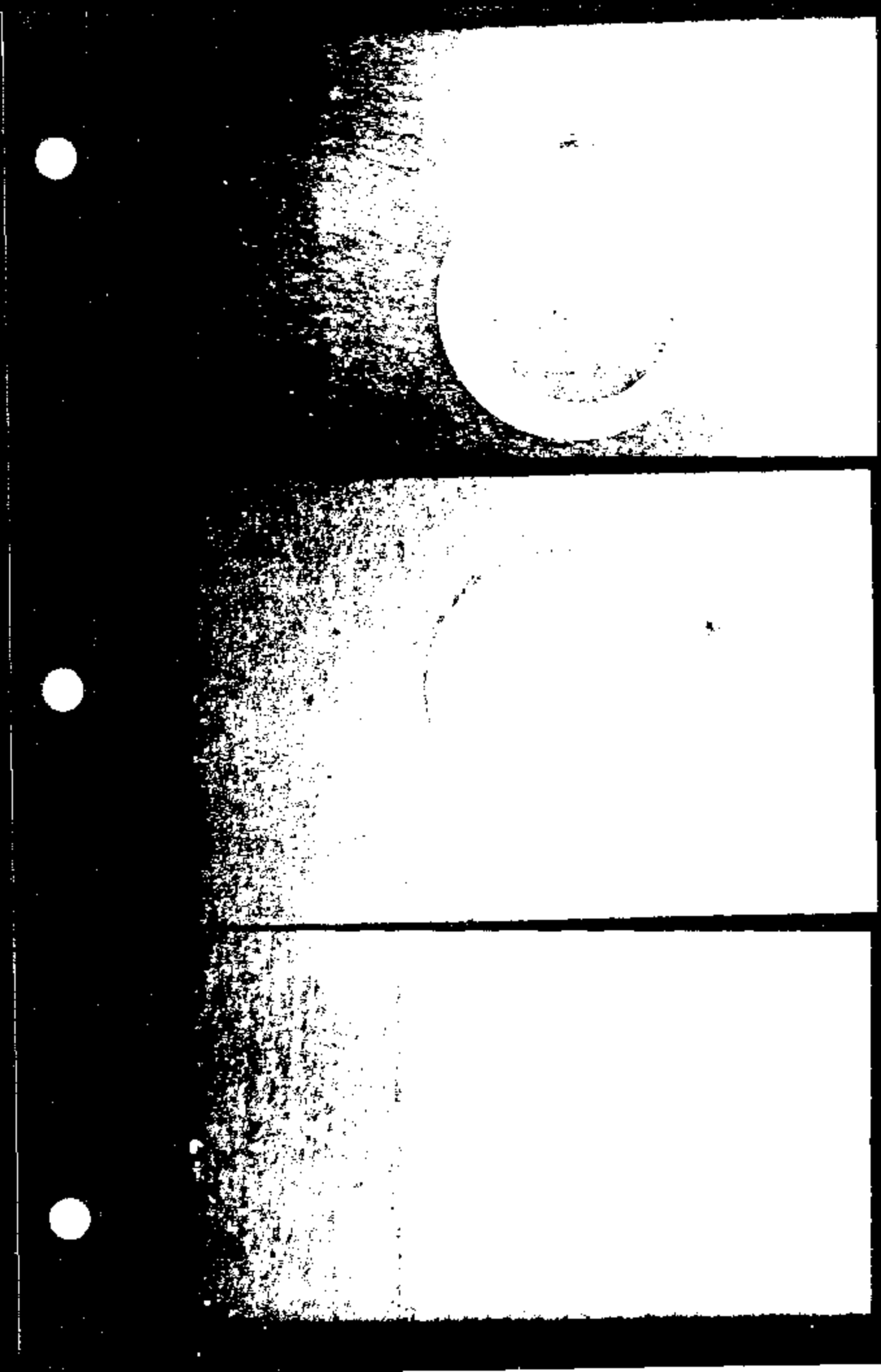


3713 2734

X

3

3713 2735



3713 2736

FIG 2 SAMPLE REMOVED

3713 2740

9900226

IN PROGRESS

FINAL REPORT NOT ISSUED

RAW DATA

PRELIM. REPORTS

Request for Central Laboratory Service

All shaded areas must be filled in to process your request

Administrative Use Only

Laboratory Number	Date
9900226	1-26-99 SC

15080 Century Dr., Dearborn MI 48120-1267 Phone [313] 32-21674 FAX [313] 32-21614

Your Name [Send report to]	Telephone	PROFS ID	FAX
G. STEVENS	36680	GSTEVEN1	36680
Secondary Contact	**Telephone**	**PROFS ID**	**FAX**
N LA POINTE	42686	N/A POINTE	

Send Report To | **Bill To**

Room No./Mail Drop/PO Box	Department/Activity	Building	Location Code	Dept. #	Work Task # [For 5180 Loc. Only]
MD 5006	MATERIALS ANT	BLDG #3	5100	T113	X0G164

Samples

Total # of Samples	Sample Handling	TOX/CAR	Source	Supplier Code
	X Return after test ___ Dispose after test ___ Dispose after 30 days			

Part/Material Name	Sample Identification [Continue below if needed]	Part Number [If any]	Material Specification [If any]	CPSC Code	Supplier
SPRING CONTACT CURRENT SWITCH	A, B, C, D, II(E), AND F	F2YY-SCP2H	N/A		TEXAS INSTRUMENTS

Instructions

Nature of Investigation/Specific Tests Required [Check all that apply]

- ___ Production/Field problem
- X Failure Analysis
- X Legal
- ___ Specification Compliance
- ___ Perform Tests as in Lab No. _____
- ___ Photograph [Describe below]
- ___ Use Specification _____ as a guide
- ___ Other [Describe below]

Requester Info. Box [For requester use].

Stop testing upon failure? ___ No ___ Yes

Does this support CAR testing? [If "Yes", what is the expected amount?] X No ___ Yes

Do you need to know your CL contact and testing? ___ Yes

Additional Sample Information/Testing Requirements

DISASSEMBLE SWITCHES AS REQUIRED FOR TESTING FROM TEXAS INSTRUMENTS.

REVIEW PHOTOS TO DETERMINE CAUSE OF FAILURE. SUBMIT FINAL REPORT.

Report

Date you would like report 2-11-99

Date you must have report 2-11-99

Format [Check all that apply]

- ___ FAX preliminary results
- ___ FAX typed report
- ___ FAX hand written
- ___ Mail hand written
- X Mail typed report
- ___ Electronically transfer report
- ___ Phone preliminary results

For information about services or assistance in completing this form please refer to the Central Laboratory WEB page. [www.qis.ford.com/central/home.htm]

Laboratory number and due means to assigned without receipt of samples.

Samples will be disposed of after 30 days unless otherwise indicated above.

3713 2743

From Page No. Sensors Rec'd. 1-24-99

Rec'd six switches A, B, C, D, 11(E), & F
(Fire, Fire, Fire, Laser Activated, No Lens, Lens No Fiber)

Switches under discussion for presence of Trade Secret Material

A Switch housed in fire Hotspot sensing body = Metal in proximity of infrared Cover, Dial, Optical Connector & Fiber Optic Metal Base, Contacts, Terminals, Insulator, Dial Axle Shaft & Steel Separator all Covered by Fire.

Face of Cut Sensor = Switch + Seal Protect Rotary Cover Plate = Silver Plated Cut Open Cut.

Face of Hotspot, Inside of Cut Body Metal Sensor = Stainless Steel Sensor Insulator Dial Contacts Screw, Contacts, Disc Contacts Set Screw = Stainless Steel Parts. (Outlines visible of wiring & Hotspot)

B Switch housed in Metal Hotspot Sensing Contacts = Fiber Protrusion Fiber Optic Cover Plate, Sensor & Terminal Mounts Base Separator Steel Switch Stationary Contact Possible, Contacts at End of Wiring in Black. Movable Contact Assembly = Metal Pin Insulator Terminals & Wiring Present Switch Base of Face of Cut Sensor = Axle & Shaft Assembly. Fiber Optic Connector Housing to be Metal Base Material. Connector Not Pertinent to Proprietary Switch.

To Page No

Witnessed & Understood by me.	Date	Invented by	Date
		Recorded by	

3713 2744

C. Sump, inward in side
Vacuum assisted pump - put around drain in bottom end
Check pump running continuously & pumping water
Sump, cover, thermostat, & transducer all intact.
Pipe on discharge - put & each drawn.
Remove check valve - pull stop mushroom
Cut open cap
Pipe on vacuum, inside of cap, unseen, connected,
& disc. Check operation & put.
Keypad seal in place - appears changed & charged.
Gasket - stand pattern

D. Switch operation to open - no flow
Extension of switch noted with what appears
to be brake fluid. Technician on site and noted with
what appears to be brake fluid. Technician advised client.
Black pressure vessel in bottom end of vacuum
Remove check valve
Environmental seal intact in place, & pressure
to portion surface - does not appear to have
been changed.
Switch cavity contains dark green liquid - appears
to have possible mineral content & pH. Sump is free
of contents. Gaskets used on, but not present at
base of contents.
Drain hose to sump is routed on floor of cab. Cannot trace
to discharge-termination. Put on floor is visible.
Operate cap.
Vacuum check valve. Check below. Gasket intact - see photo
Remove cable to solenoid for evaluation.
Inside of cap, unseen, connected, & disc. Exhibit black residue.
Tubing connected has cracked appearance.

To Page No.

Data	Invented by	Data

3713 2748

From Page No.

11(E) [illegible]

[illegible]

F [illegible]

To Page No

Witnessed & Understood by me,	Date	Invented by	Date
1-24-98		Recorded by	

Central Laboratory
16000 Century Drive
Dearborn, MI 48120-1267
FAX (313) 322-1614

Report 9900228

February 11, 1999

To: G. Stevens / S. LaRouche (313) 32-36886 (313) 39-07224 FAX

From: Gayle D. Gullen (313) 32-27322

Subject: Speed Control Cut Off Switch
Part Number: F2VY-9F924-A
Supplier: Texas Instruments

Received: Various components from 5 cut off switches were received on January 29, 1999.

Object: Determine presence of brake fluid in materials.

Conclusion/ Discussion: Switches A and C showed no evidence of brake fluid. Switches A and C appeared to mostly contain rust with traces of silicone. Sample C contained on both the material on switch side of cup and on the disc material something which appeared to be zinc carbonate. Switches D, F, and 11 showed glycol based material (most areas) as well as a metal salt, probably an oxalate (some areas). A metal salt (not an oxalate but perhaps an intermediate material) was noted in some areas. The oxalate salt may be formed in a reaction from degraded polyester and metal components.

Areas on D, F, and 11 where no brake fluid was noted include only: D - base material seal 2 and brown/black on seal 3. Areas which did not exhibit the oxalate metal salt include: D - seal 1 material, base material of seal 2, converter, interior and switch side of the cup, contact, and base connector cavity; F - seal 2, seal 3, material on spacer, interior and switch side of cup, and base connector cavity; - Sample 11: None on any of the 3 seals. Areas on D, F, and 11 where a metal salt (not an oxalate-type) was detected: D - material on the contact; - Sample F - material on the contact; No areas on Sample 11.

Data and Analysis:

Molecular Characterization
(FTIR, Qualitative, Microscopic)

Sample A

Spectra of the ***material in the fitting end of the hexport*** are characteristic of inorganic material, probably containing yellow iron oxide ($Fe_2O_3 \cdot H_2O$), and a trace of silicone.

Spectra of the ***black material in the cavity of the hexport*** are show a trace of silicone.

Spectra of the ***brown material in the cavity of the hexport*** are characteristic of inorganic material, probably containing yellow iron oxide ($Fe_2O_3 \cdot H_2O$), and a trace of silicone.

Spectra of the ***material in the interior of the cup*** are characteristic of inorganic material, probably containing yellow iron oxide ($Fe_2O_3 \cdot H_2O$), and a trace of silicone.

Spectra of the ***gray material on the switch side of the cup*** are characteristic of essentially inorganic material.

Spectra of the ***brown material on the switch side of the cup*** are characteristic of essentially inorganic material with a trace of silicone.

3713 2747

Spectra of the *material on the washer* are characteristic of essentially inorganic material with a trace of silicone.

Spectra of the *brown material on the converter* are characteristic of essentially inorganic material with a trace of silicone.

Spectra of the *black material on the converter* are characteristic of essentially inorganic material with a trace of silicone.

Spectra of the *black material on the disc* are characteristic of a trace of silicone.

Spectra of the *brown material on the disc* are characteristic of essentially inorganic material with a trace of silicone.

Sample C

Spectra of the *material in the fitting end of the hexport* are characteristic of inorganic material, probably containing yellow iron oxide ($Fe_2O_3 \cdot H_2O$), and a trace of silicone.

Spectra of the *black material in the cavity of the hexport* are show a trace of hydrocarbon (possibly mineral oil) and a trace of silicone.

Spectra of the *brown material in the cavity of the hexport* are characteristic of inorganic material, and a trace of hydrocarbon (possibly mineral oil).

Spectra of the *material in the interior of the cup* are characteristic of inorganic material, probably containing yellow iron oxide ($Fe_2O_3 \cdot H_2O$), and a trace of silicone.

Spectra of the *material on the switch side of the cup* are characteristic of an inorganic carbonate [probably zinc carbonate] and possibly a trace of a metal soap.

Spectra of the *material on the washer* are show evidence of inorganic material.

Spectra of the *material on the converter* are characteristic of inorganic material probably containing yellow iron oxide ($Fe_2O_3 \cdot H_2O$), and a trace of silicone.

Spectra of the *material on the disc* are characteristic of an inorganic carbonate [probably zinc carbonate] and other..

Sample D

Spectra of the *material in the fitting end of the hexport* are characteristic of glycol based material (probably brake fluid) and metal salt (probably an oxalate).

Spectra of the *material in the cavity of the hexport* are characteristic of glycol based material (probably brake fluid) and metal salt (probably an oxalate).

Spectra of the *material on Seal 1* are characteristic of a glycol based material, probably brake fluid.

Spectra of the *material on Seal 2* are characteristic of metal salt (possibly an oxalate) and glycol based material (probably brake fluid) and polytetrafluoroethylene (PTFE) and/or Fluorinated Ethylene Propylene (FEP).

Spectra of the *base material of Seal 2* are characteristic polytetrafluoroethylene (PTFE) and/or Fluorinated Ethylene Propylene (FEP).

Spectra of the *liquid material on Seal 3* are characteristic of metal salt (possibly an oxalate) and a glycol based material (probably brake fluid).

Spectra of the *brown/black material on Seal 3* are characteristic of metal salt (possibly an oxalate) and polytetrafluoroethylene (PTFE) and/or Fluorinated Ethylene Propylene (FEP).

Spectra of the *material on the washer* are characteristic of glycol based material (probably brake fluid) and metal salt (probably an oxalate).

Spectra of the *material on the converter* are characteristic of essentially glycol based material (probably brake fluid).

Spectra of the *material on the spacer* are characteristic of metal salt (probably an oxalate) and glycol based material (probably brake fluid).

Spectra of the *material on the disc* are characteristic of metal salt (possibly an oxalate) and a glycol based material (probably brake fluid).

Sample D

Spectra of the *material in the interior of the cup* are characteristic of glycol based material (probably brake fluid).

Spectra of the *material on the switch side of the cup* are characteristic of glycol based material (probably brake fluid) and other hydrocarbon.

Spectra of the *material on the contact* are characteristic of metal salt and glycol based material (probably brake fluid).

Spectra of the *material on the base, connector cavity* are characteristic of essentially glycol based material (probably brake fluid).

Sample F

Spectra of the *material in the fitting end of the hexport* are characteristic of metal salt (probably an oxalate) and glycol based material (probably brake fluid).

Spectra of the *material in the cavity of the hexport* are characteristic of glycol based material (probably brake fluid) and metal salt (probably an oxalate).

Spectra of the *material on Seal 1* are characteristic of metal salt (possibly an oxalate) and glycol based material (probably brake fluid).

Spectra of the *material on Seal 2* are characteristic essentially glycol based material (probably brake fluid).

Spectra of the *material on Seal 3* are characteristic of glycol based material and other material.

Spectra of the *material on the washer* are characteristic of glycol based material (probably brake fluid) and metal salt (probably an oxalate).

Spectra of the *material on the converter* are characteristic of glycol based material (probably brake fluid) and metal salt (probably an oxalate).

Spectra of the *material on the spacer* are essentially characteristic of glycol based material (probably brake fluid).

Spectra of the *material on the disc* are characteristic of metal salt (possibly an oxalate) and a glycol based material (probably brake fluid).

Spectra of the *material in the interior of the cup* are essentially characteristic of glycol based material (probably brake fluid).

Spectra of the *material on the switch side of the cup* are characteristic of glycol based material (probably brake fluid) and other material.

Spectra of the *material on the contact* are characteristic of glycol based material (possibly brake fluid) and other material, possibly a metal salt.

Spectra of the *material on the base, connector cavity* are characteristic of essentially glycol based material (probably brake fluid).

Sample 11

Spectra of the *material in the fitting end of the hexport* are characteristic of metal salt (probably an oxalate) and glycol based material (probably brake fluid).

Spectra of the *material in the cavity of the hexport* are characteristic of glycol based material (probably brake fluid) and metal salt (probably an oxalate).

Spectra of the *material on Seal 1* are characteristic essentially glycol based material (probably brake fluid).

Spectra of the *material on Seal 2* are characteristic glycol based material (probably brake fluid) and silicone.

Spectra of the *material on Seal 3* are characteristic of glycol based material and other material, possibly silicone.

Contributor: M. Haga

By: _____
Gayle D. Gullen (GGULLEN)
Product Materials Engineer

Central Laboratory
15000 Century Drive
Dearborn, MI 48120-1257
FAX (313) 322-1614

Report 9900226

February 10, 1999

To:	G. Stevens / S. LaRouche / G. Gulen	(313) 32-39696	(313) 39-07224 FAX
From:	M. C. Haga	(313) 33-78398	

Subject: Speed Control Cut Off Switch
Part Number: F2VY-9F924-A
Supplier: Texas Instruments

Received: Various components from 5 cut off switches were received on January 29, 1999.

Object: Determine presence of brake fluid in materials.

Discussion: Switches A and C showed no evidence of fluid. Switches D, F and 11 showed glycol based material as well as a metal salt, probably an oxalate. The salt may be formed in a reaction from degraded polyester and metal components.

Data and Analysis:

Molecular Characterization
(FTIR, Qualitative, Microscopic)

Sample A

Spectra of the *material in the fitting end of the hexport* are characteristic of inorganic material, probably containing yellow iron oxide ($Fe_2O_3 \cdot H_2O$), and a trace of silicone.

Spectra of the *black material in the cavity of the hexport* are show a trace of silicone.

Spectra of the *brown material in the cavity of the hexport* are characteristic of inorganic material, probably containing yellow iron oxide ($Fe_2O_3 \cdot H_2O$), and a trace of silicone.

Spectra of the *material in the interior of the cup* are characteristic of inorganic material, probably containing yellow iron oxide ($Fe_2O_3 \cdot H_2O$), and a trace of silicone.

Spectra of the *gray material on the switch side of the cup* are characteristic of essentially inorganic material.

Spectra of the *brown material on the switch side of the cup* are characteristic of essentially inorganic material with a trace of silicone.

Spectra of the *material on the washer* are characteristic of essentially inorganic material with a trace of silicone.

Spectra of the *brown material on the converter* are characteristic of essentially inorganic material with a trace of silicone.

Spectra of the *black material on the converter* are characteristic of essentially inorganic material with a trace of silicone.

Spectra of the *black material on the disc* are characteristic of a trace of silicone.

Spectra of the *brown material on the disc* are characteristic of essentially inorganic material with a trace of silicone.

Molecular Characterization
(FTIR, Qualitative, Microscopic)

Sample C

Spectra of the ***material in the fitting end of the hexport*** are characteristic of inorganic material, probably containing yellow iron oxide ($Fe_2O_3 \cdot H_2O$), and a trace of silicone.

Spectra of the ***black material in the cavity of the hexport*** are show a trace of hydrocarbon (possibly mineral oil) and a trace of silicone.

Spectra of the ***brown material in the cavity of the hexport*** are characteristic of inorganic material, and a trace of hydrocarbon (possibly mineral oil).

Spectra of the ***material in the interior of the cup*** are characteristic of inorganic material, probably containing yellow iron oxide ($Fe_2O_3 \cdot H_2O$), and a trace of silicone.

Spectra of the ***material on the switch side of the cup*** are characteristic of metal soap and other material.

Spectra of the ***material on the washer*** are show evidence of inorganic material.

Spectra of the ***material on the converter*** are characteristic of inorganic material, probably containing yellow iron oxide ($Fe_2O_3 \cdot H_2O$), and a trace of silicone.

Spectra of the ***material on the disc*** are characteristic of metal soap and inorganic material.

Sample D

Spectra of the ***material in the fitting end of the hexport*** are characteristic of glycol based material (probably brake fluid) and metal salt (probably an oxalate).

Spectra of the ***material in the cavity of the hexport*** are characteristic of glycol based material (probably brake fluid) and metal salt (probably an oxalate).

Spectra of the ***material on Seal 1*** are characteristic of a glycol based material, probably brake fluid.

Spectra of the ***material on Seal 2*** are characteristic of metal salt (possibly an oxalate) and glycol based material (probably brake fluid) and polytetrafluoroethylene (PTFE) and/or Fluorinated Ethylene Propylene (FEP).

Spectra of the ***base material of Seal 2*** are characteristic polytetrafluoroethylene (PTFE) and/or Fluorinated Ethylene Propylene (FEP).

Spectra of the ***liquid material on Seal 3*** are characteristic of metal salt (possibly an oxalate) and a glycol based material (probably brake fluid).

Spectra of the ***brown/black material on Seal 3*** are characteristic of metal salt (possibly an oxalate) and polytetrafluoroethylene (PTFE) and/or Fluorinated Ethylene Propylene (FEP).

Spectra of the ***material on the washer*** are characteristic of glycol based material (probably brake fluid) and metal salt (probably an oxalate).

Spectra of the ***material on the converter*** are characteristic of essentially glycol based material (probably brake fluid).

Spectra of the ***material on the spacer*** are characteristic of metal salt (probably an oxalate) and glycol based material (probably brake fluid).

Spectra of the ***material on the disc*** are characteristic of metal salt (possibly an oxalate) and a glycol based material (probably brake fluid).

Molecular Characterization
(FTIR, Qualitative, Microscopic)

Sample D

Spectra of the ***material in the interior of the cup*** are characteristic of glycol based material (probably brake fluid).

Spectra of the ***material on the switch side of the cup*** are characteristic of glycol based material (probably brake fluid) and other hydrocarbon.

Spectra of the ***material on the contact*** are characteristic of metal salt and glycol based material (probably brake fluid).

Spectra of the ***material on the base, connector cavity*** are characteristic of essentially glycol based material (probably brake fluid).

Sample F

Spectra of the ***material in the fitting end of the hexport*** are characteristic of metal salt (probably an oxalate) and glycol based material (probably brake fluid).

Spectra of the ***material in the cavity of the hexport*** are characteristic of glycol based material (probably brake fluid) and metal salt (probably an oxalate).

Spectra of the ***material on Seal 1*** are characteristic of metal salt (possibly an oxalate) and glycol based material (probably brake fluid).

Spectra of the ***material on Seal 2*** are characteristic essentially glycol based material (probably brake fluid).

Spectra of the ***material on Seal 3*** are characteristic of glycol based material and other material.

Spectra of the ***material on the washer*** are characteristic of glycol based material (probably brake fluid) and metal salt (probably an oxalate).

Spectra of the ***material on the converter*** are characteristic of glycol based material (probably brake fluid) and metal salt (probably an oxalate).

Spectra of the ***material on the spacer*** are essentially characteristic of glycol based material (probably brake fluid).

Spectra of the ***material on the disc*** are characteristic of metal salt (possibly an oxalate) and a glycol based material (probably brake fluid).

Spectra of the ***material in the interior of the cup*** are essentially characteristic of glycol based material (probably brake fluid).

Spectra of the ***material on the switch side of the cup*** are characteristic of glycol based material (probably brake fluid) and other material.

Spectra of the ***material on the contact*** are characteristic of glycol based material (possibly brake fluid) and other material, possibly a metal salt.

Spectra of the ***material on the base, connector cavity*** are characteristic of essentially glycol based material (probably brake fluid).

Molecular Characterization
(FTIR, Qualitative, Microscopic)

Sample 11

Spectra of the ***material in the fitting end of the hexport*** are characteristic of metal salt (probably an oxalate) and glycol based material (probably brake fluid).

Spectra of the ***material in the cavity of the hexport*** are characteristic of glycol based material (probably brake fluid) and metal salt (probably an oxalate).

Spectra of the ***material on Seal 1*** are characteristic essentially glycol based material (probably brake fluid).

Spectra of the ***material on Seal 2*** are characteristic glycol based material (probably brake fluid) and silicone.

Spectra of the ***material on Seal 3*** are characteristic of glycol based material and other material, possibly silicone.

Concur: _____
G. Gullen
Organic Section

By: _____
Mary C. Haga (MHAGA)
Laboratory Development Analyst

Project No. [illegible]

72 Book No. _____ TITLE Speed [illegible]

From Page No. _____

FIG 1

A

Aspect

Fitting End ring is possibly tubing yttria stabilized zirconia (Y_2O_3: ZrO_2) ceramic

Cavity - black fused silica

Cap

Interior - see fig

Outside diameter - essentially same

Washer - same as cap

Connecting rings or washers

black

Discontinuous silicon

brown see washers

C

Aspect

Fitting End - see "A"

Cavity - basically same as prior - possibly more tapered

To Page No. _____

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	

3713 2755

Project No. 37-0226

TITLE Seal Cartridge Book No.

From Page No.

FIG

2

Cup ~~Body Seal Cartridge~~
Interior Seal Insert Fitting End

Switchable Basic Seal Cartridge

Visible evidence of Inorganics

Connector Seal Insert Fitting End

Disc Metal Salt + Inorganics

1

D

Insert
Fitting End Silicon based material (probably Brake Fluid)
+ metal salt (probably an oxide)

cavity silicon based material (probably Brake Fluid) +
Metal salt (probably an oxide)

Seal 7 (from Table)

seal 2 metal (from BF) + PTFE & FEP

seal (Seal material) PTFE & FEP

seal 3 stainless steel (pad) + glass

base/black rubber material S.S (pad) + PTFE & FEP +

To Page No.

Witnessed & Understood by me.	Date	Invented by	Date
		Recorded by	

3713 2756

Project No. 90-2263

Book No. _____ TITLE Spec Cntr: Subc

From Page No. _____

FET

Source gbm(pBF) + m.s.(p.0)

Drain: essentially gbm(pBF)

Spacer: m.s.(p.0) + gbm

Gate: m.s(pG) + gbm

Emitter gbm(pBF)

Switch side gbm(pBF) + other hy Amount

Contact m.s + gbm(pBF)

Base: essentially gbm(pBF)

E

Hexpost

Filling End: m.s (p.0) + gbm (pBF)

Cavity: gbm(pBF) + m.s(p.0)

To Page No. _____

Witnessed & Understood by me.	Date	Invented by	Date
		Recorded by	

From Page No.

FT Ltr

Seal 1 : MS (p.c) + gbm (pBF)

Seal 2 : essentially gbm (pBF)

Seal 3 gbm + ftr

Washer : gbm (pBF 17 MS (p.c)

Connector see work

Spacer : essentially gbm (pBF)

Disc : MS (p.c) + gbm (pBF)

Cup Retainer : gbm (pBF)

Switch side : gbm + other

Contact gbm (possibly BP) + other possibly another SM

Base essential gbm (pBE)

To Page No.

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	

From Page No. _____

FTLK

11

Hesperiet

Filling Ent: m.s.(p.v) st gbm (pBF)

Cavity gbm (pBF) + m.s (p.v)

Seal 1 oss. gbm (pBF)

Seal 2 gbm + s.l. cem

Seal 3 gbm / possible s.l. cap

M.C. Hoyt

2/16/99

To Page No. _____

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	

Request for Central Laboratory Service

Receipt - Copy

Lab Request Number: 009900226
Date of Request: 01/26/1999 11:18:53 AM
Print Date: 01/26/1999 02:13:51 PM

Request Description: SPEED CONTROL CUTOFF SWITCH

Requester Information:
Primary Contact: STEVENS, GREG - 10006 Phone: (313) 323-6666 PROFS ID: GSTEVEN1 Fax: (313) 390-7224
Secondary Contact: LA POINTE, NORM - 10075 Phone: (313) 594-2666 PROFS ID: NLAPOINT Fax: (313) 337-8258

Send Report to: MD 8005/2G065, AVT MATERIALS, BLDG. #5
Bill to: Acctg.Location: 6100
Dept: T113
Work Task: XQG04

Sample Information:
Total Number of Containers: 6 Sample Handling: Dispose after 30 days
Source: Not specified Supplier Code: Not specified

Part/Material Name	Qty	Sample Identification	Part Number	Material Spec	CPSC Code	Supplier
SPEED CONTROL CUTOFF SWITCH	6	A,B,C,D,11(E), AND F	F2VY-9P924-A	NA	00.00.00	TEXAS INSTRUMENTS

Investigation Information:
Nature of Investigation:Requestor Info. Box: Mail typed report

Additional Sample Information/Testing Requirments:
DISASSEMBLE SWITCHES IN PRESENCE OF PERSONNEL FROM TEXAS INSTRUMENTS. PERFORM ANALYSES TO ASSIST IN DETERMINING CAUSE OF POSSIBLE SWITCH FIRE OR LEAKAGE.

Reporting Directions:
Date customer would like report: 02/11/1999
Date customer must have report: 02/11/1999

Report Format(s):

Log-In Information:
Initial Routing: Metallurgy
Accepted for Central Laboratory by: LaRouche, Steve Phone: 84-54876

View your test status at: 'HTTP://bd4web.pd7.ford.com/kalis'

Program Name: KALISLab Engr Module
Program Version: Version 2.0.6

PLEASE DETERMINE PRESENCE OF BRAKE FLUID IN LOCATIONS SPECIFIED ON ATTACHED SHEET. ALSO IDENTIFY ANY OTHER MATERIALS, ESPECIALLY IN DARKENED AREAS OF INTERIOR COMPONENTS. PLEASE RETURN PARTS AFTER YOU FINISH SAMPLING SO I CAN ROUTE THEM FOR OTHER ANALYSES

THANKS,

S. LaRouche

3713 2760

990226 Test Locations

Sample	Component	Location
A, C	Hexport	Fitting End
		Cavity
	Cup	Interior
		Switch Side
	Washer, Converter, Disc	Anywhere
D,F	Hexport	Fitting End
		Cavity
	Seal	Dark Areas
	Washer, Converter, Spacer and Disc	Dark Areas
	Cup	Interior
		Switch Side[1]
	Contact	Anywhere[1]
	Base	Connector Cavity
11	Hexport	Fitting End
		Cavity
	Seal	Dark Areas

[1] Sample already collected prior to further disassembly. Placed in Gelman dish or in vial.

990226 Test Locations

Sample	Component	Location
A, C	Hexport	Fitting End
		Cavity
	Cup	Interior
		Switch Side
	Washer, Converter, Disc	Anywhere
D,F	Hexport	Fitting End
		Cavity
	Seal	Dark Areas
	Washer/Converter/Spacer and Disc	Dark Areas
	Cup	Interior
		Switch Side[1]
	Contact	Anywhere[1]
	Base	Connector Cavity
11	Hexport	Fitting End ✓
		Cavity ✓
	Seal	Dark Areas

11 - is in device - no problem
fluid in interior (of hexport) probably
came from interior during handling -
indicated in ID - my blank report

It's - general method to determine presence
of blank fluid +/or debris - do not use for measuring
blank fluid only
Hexport cavity - just wash behind diaphragm and
fitting end - just wash the 1st couple of threads.
only

Thanks
Steph

[1] Sample already collected prior to further disassembly. Placed in Gelman dish or in vial

Request for Central Laboratory Service

Receipt - Copy

Lab Request Number: 009900229
Date of Request: 01/28/1999 11:15:53 AM
Print Date: 01/28/1999 02:13:51 PM

Request Description: SPEED CONTROL CUTOFF SWITCH

Requester Information:

Primary Contact: STEVENS, GREG - 10006	Phone: (313) 323-8686	PROFS ID: GSTEVEN1	Fax: (313) 390-7224
Secondary Contact: LA POINTE, NORM - 10075	Phone: (313) 594-2686	PROFS ID: NLAPOINT	Fax: (313) 337-6256

Send Report to: MD 5008/2G085, AVT MATERIALS, BLDG. #5
Bill to: Acctg.Location: 5100
Dept: T113
Work Task: XQG04

Sample Information:
Total Number of Containers: 8
Source: Not specified
Sample Handling: Dispose after 30 days
Supplier Code: Not specified

Part/Material Name	Qty	Sample Identification	Part Number	Material Spec	CPSC Code	Supplier
SPEED CONTROL CUTOFF SWITCH	8	A,B,C,D,1(E), AND F	F2VY-9F924-A	NA	00 00 00	TEXAS INSTRUMENTS

Investigation Information:
Nature of Investigation: Requestor Info. Box: Mail typed report

Additional Sample Information/Testing Requirments:
DISASSEMBLE SWITCHES IN PRESENCE OF PERSONNEL FROM TEXAS INSTRUMENTS. PERFORM ANALYSES TO ASSIST IN DETERMINING CAUSE OF POSSIBLE SWITCH FIRE OR LEAKAGE

Reporting Directions:
Date customer would like report: 02/11/1999
Date customer must have report: 02/11/1999

Report Format(s):

Log-In Information:
Initial Routing: Metallurgy
Accepted for Central Laboratory by: LaRouche, Steve
Phone: 84-54875

View your test status at: 'HTTP://bd4web.pd7.ford.com/kalis'

Program Name: KALISLab Engr Module
Program Version: Version 2.0.5

PLEASE DETERMINE PRESENCE OF BRAKE FLUID IN LOCATIONS SPECIFIED ON ATTACHED SHEET. ALSO IDENTIFY ANY OTHER MATERIALS, ESPECIALLY IN DARKENED AREAS OF INTERIOR COMPONENTS. PLEASE RETURN PARTS AFTER YOU FINISH SAMPLING SO I CAN ROUTE TO OTHER ANALYSTS

THANKS,

S. LaRouche

3713 2769

Project No._____

TITLE_____ Book No._____

From Page No.____

990226 Test Locations

Sample	Component	Location
A, C	Hexport	Fitting End
		Cavity
	Cup	Interior
		Switch Side
	Washer, Converter, Disc	Anywhere
D,F	Hexport	Fitting End
		Cavity
	Seal	Dark Areas
	Washer, Convertar, Spacer and Disc	Dark Areas
	Cup	Interior
		Switch Side[1]
	Contact	Anywhere[1]
	Base	Connector Cavity
11	Hexport	Fitting End
		Cavity
	Seal	Dark Areas

[1] Sample already collected prior to further disassembly. Placed in Gelman dish or in vial

To Page No.____

Witnessed & Understood by me, | Date 2/.1/09 | Invented by | Date

3713 2764

9900226 HEXPORT A, FITTING END, BROWN MATERIAL

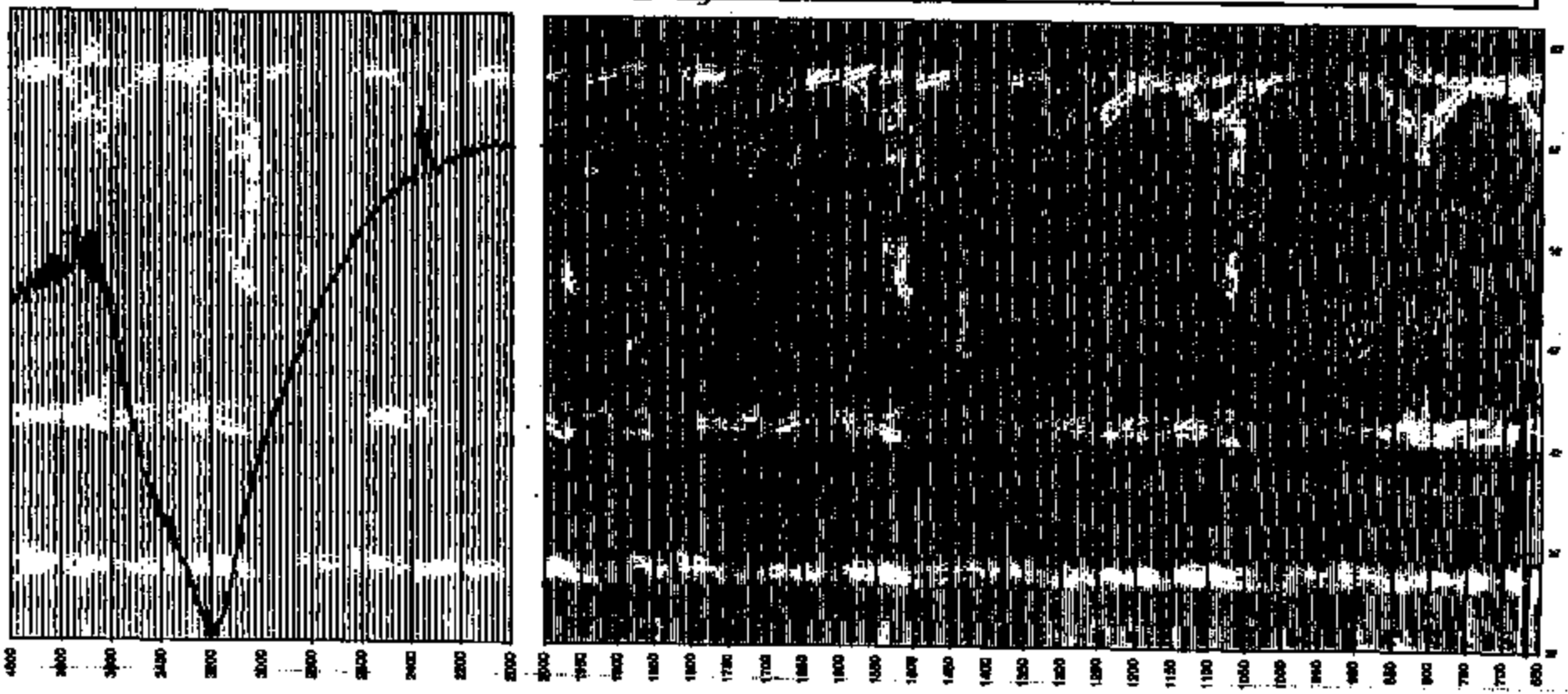
Specification:
Supplier:
Preparation method: AS RECEIVED
IR Technique: MICROSCOPE

Thu Feb 04 10:27:45 1999
Scans: 128 / 256
Resolution: 4.00
Gain: 4R / 4R

Engineer: MCH
APOD: Norton-Beer (medium)
Detector: MCT[15]
Y Axis: % Transmittance
X Axis: Wavenumber

Engineer: MH
Conc: 20 l.P

Interpretation:
Magnesia, probably containing ~~Metal oxide~~ yellowing agent / trace silicate



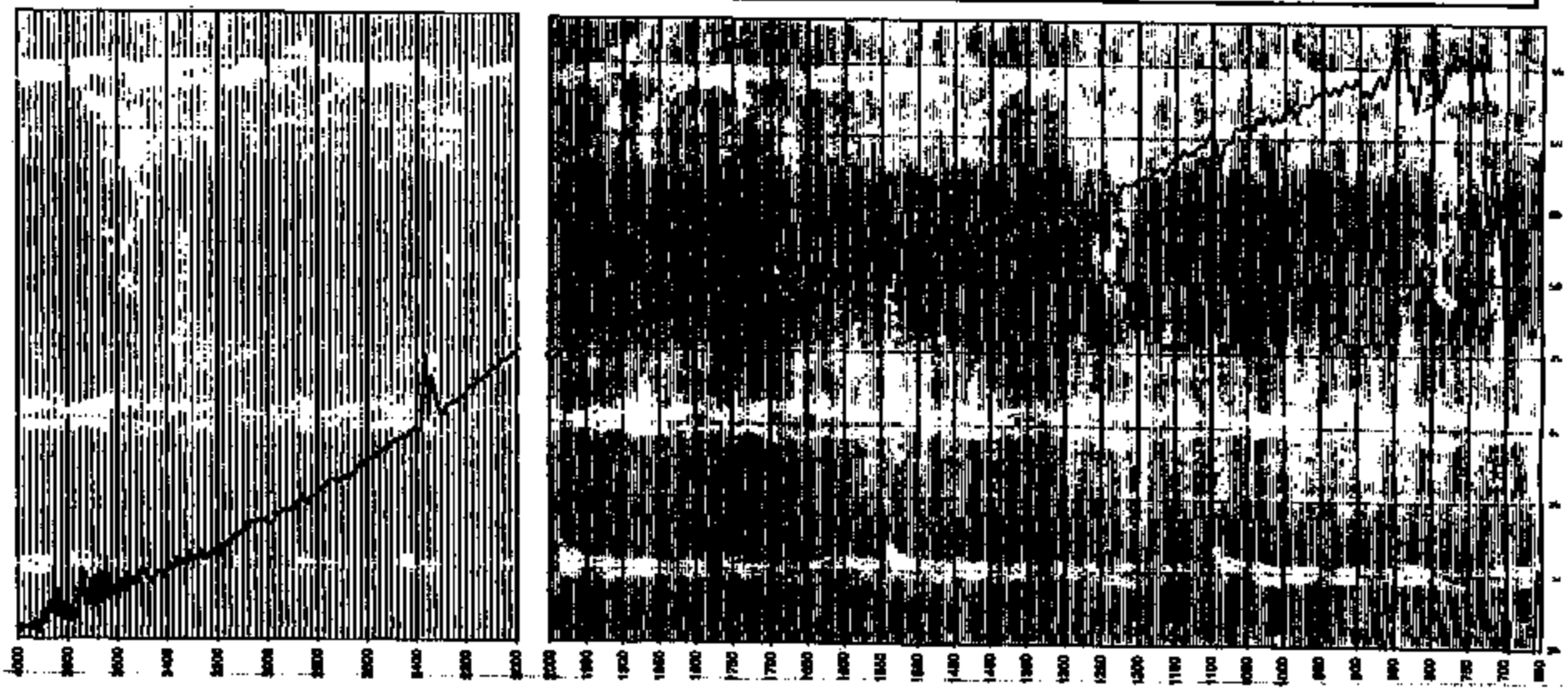
3713 2765

9900226 HEXPORT A, CAVITY, BLACK MATERIAL

Specification:
Supplier:
Preparation method: AS RECEIVED
IR Technique: MICROSCOPE
Interpretation: Kratos silicone

Thu Feb 04 10:14:00 1999
Scans: 128 / 256
Resolution: 4.00
Gain: 4R / 4R

Engineer: MCH
APOD: Norton-Beer (medium)
Detector: MCT[16]
Y Axis: % Transmittance
X Axis: Wavenumber



8713 2788

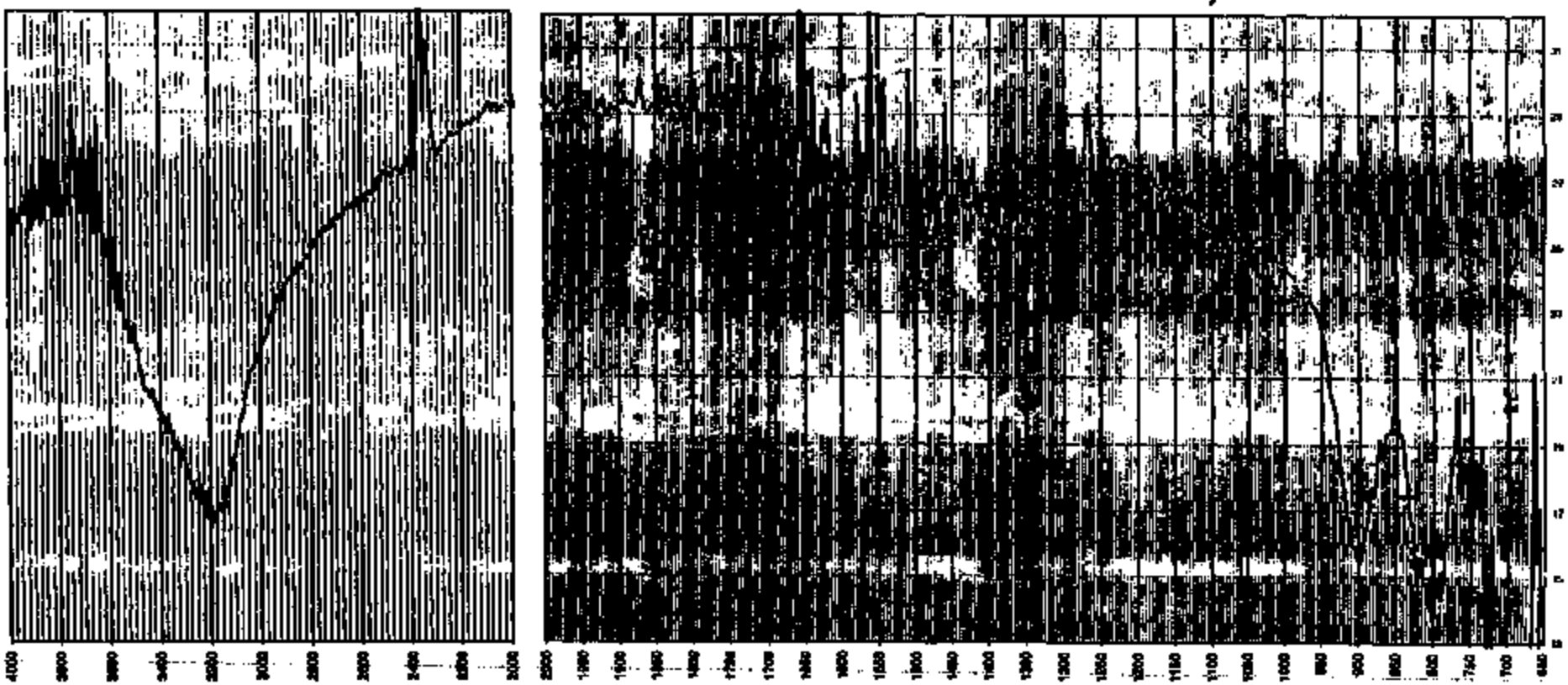
9900226 HEXPORT A, CAVITY, BROWN MATERIAL

Specification:
Supplier:
Preparation method: AS RECEIVED
IR Technique: MICROSCOPE

Thu Feb 04 10:08:48 1999 Engineer: MCH
Scans: 128 / 256 APOD: Norton-Beer (medium)
Resolution: 4.00 Detector: MCT[15]
Gain: 4R / 4R Y Axis: % Transmittance X Axis: Wavenumber

Engineer: MH
Checked:

Interpretation: manganese - probably including yellow iron oxide (Fe$_2$O$_3$.H$_2$O) plus silicate



3713 2767

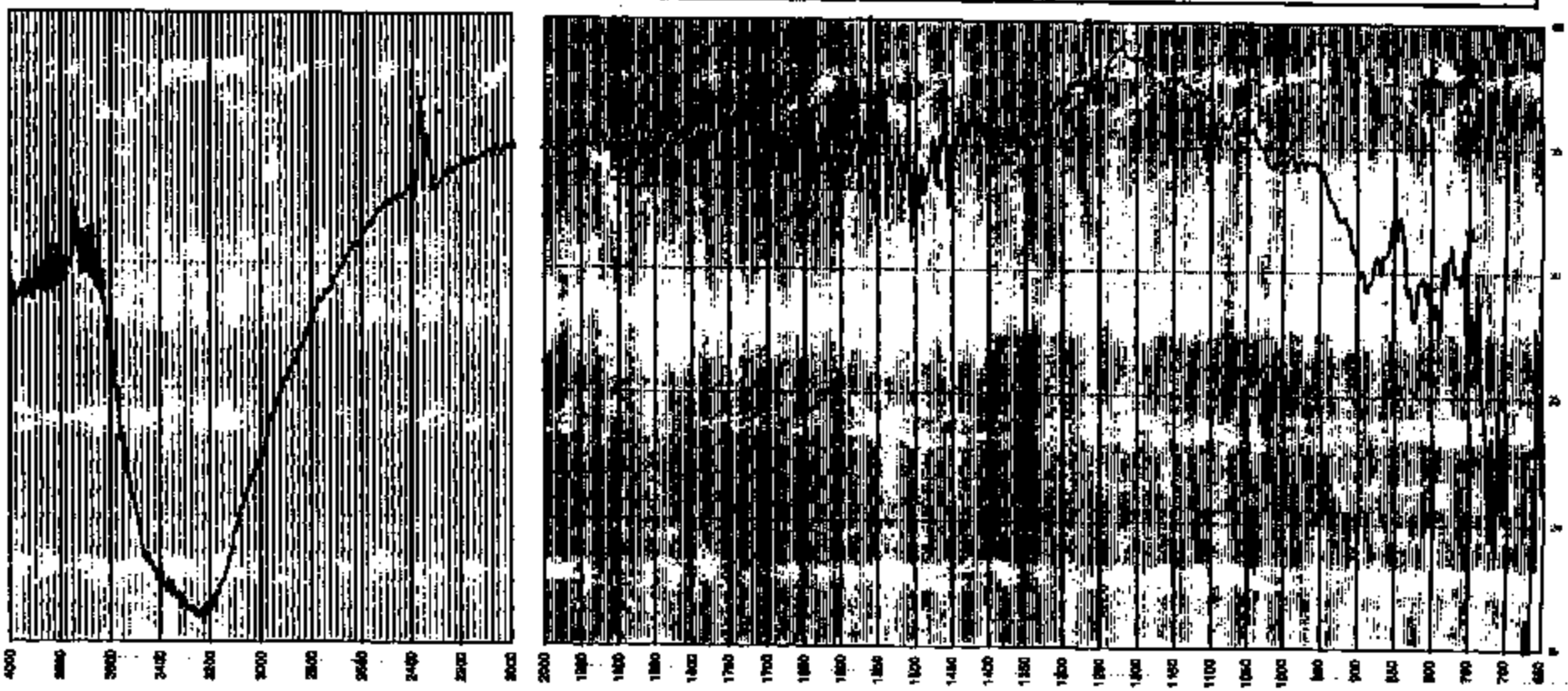
9900226 "A", CUP, INTERIOR

Specification:
Supplier:
Preparation method: AS RECIEVED
IR Technique: MICROSCOPE
Interpretation:

Thu Feb 04 11:00:10 1999
Scans: 128 / 256
Resolution: 4.00
Gain: 4R / 4R

Engineer: MCH
APOD: Norton-Beer (medium)
Detector: MCT[15]
Y Axis: % Transmittance
X Axis: Wavenumber

Engineer: mk
Doctor:



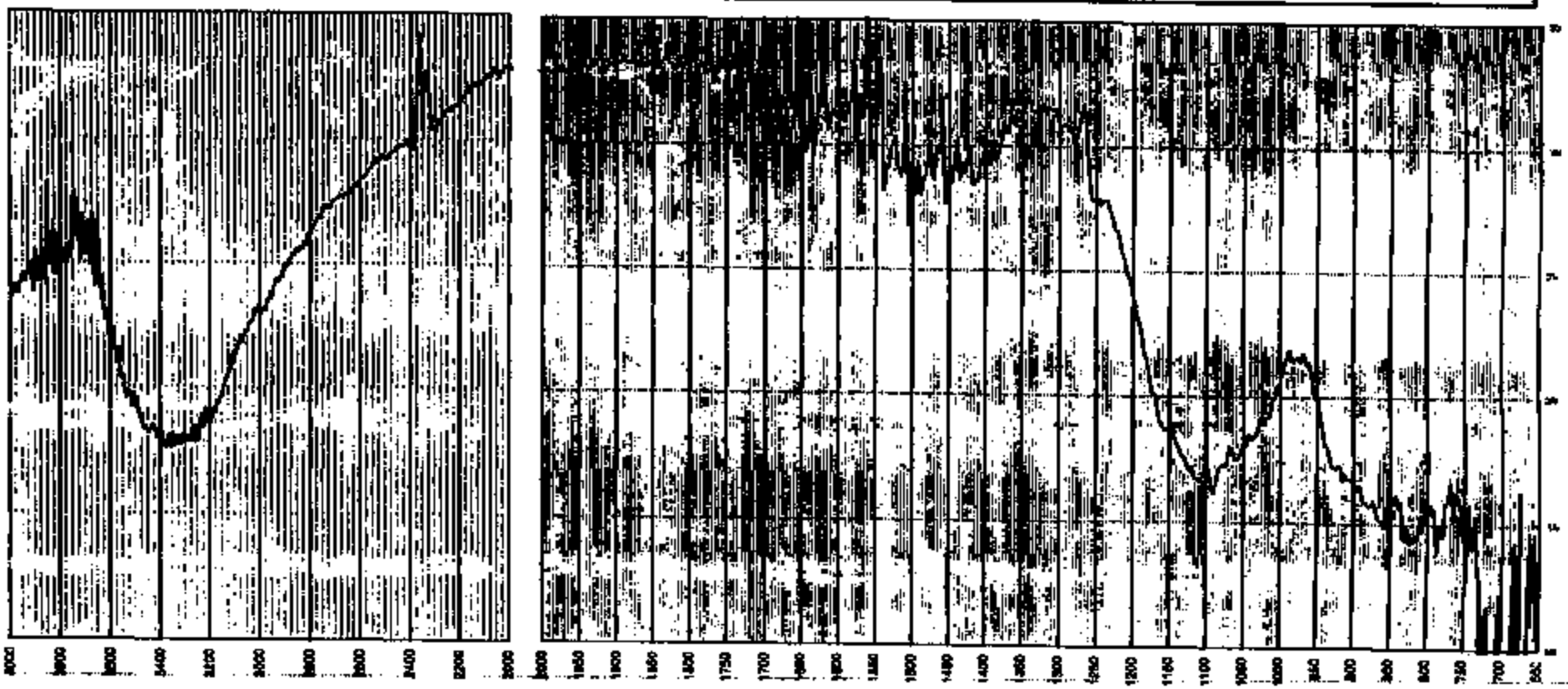
3713 2768

9900226 "A", CUP, SWITCH SIDE, GREY MATERIAL

Specification:
Supplier:
Preparation method: AS RECEIVED
IR Technique: MICROSCOPE
Interpretation:

Thu Feb 04 11:08:25 1999 Engineer: MCH
Scans: 128 / 256 APOD: Norton-Beer (medium)
Resolution: 4.00 Detector: MCT[15]
Gain: 4R / 4R Y Axis: % Transmittance X Axis: Wavenumber

Engineer:
Comm:



3713 2769

9900226 "A", CUP, SWITCH SIDE, BROWN MATERIAL

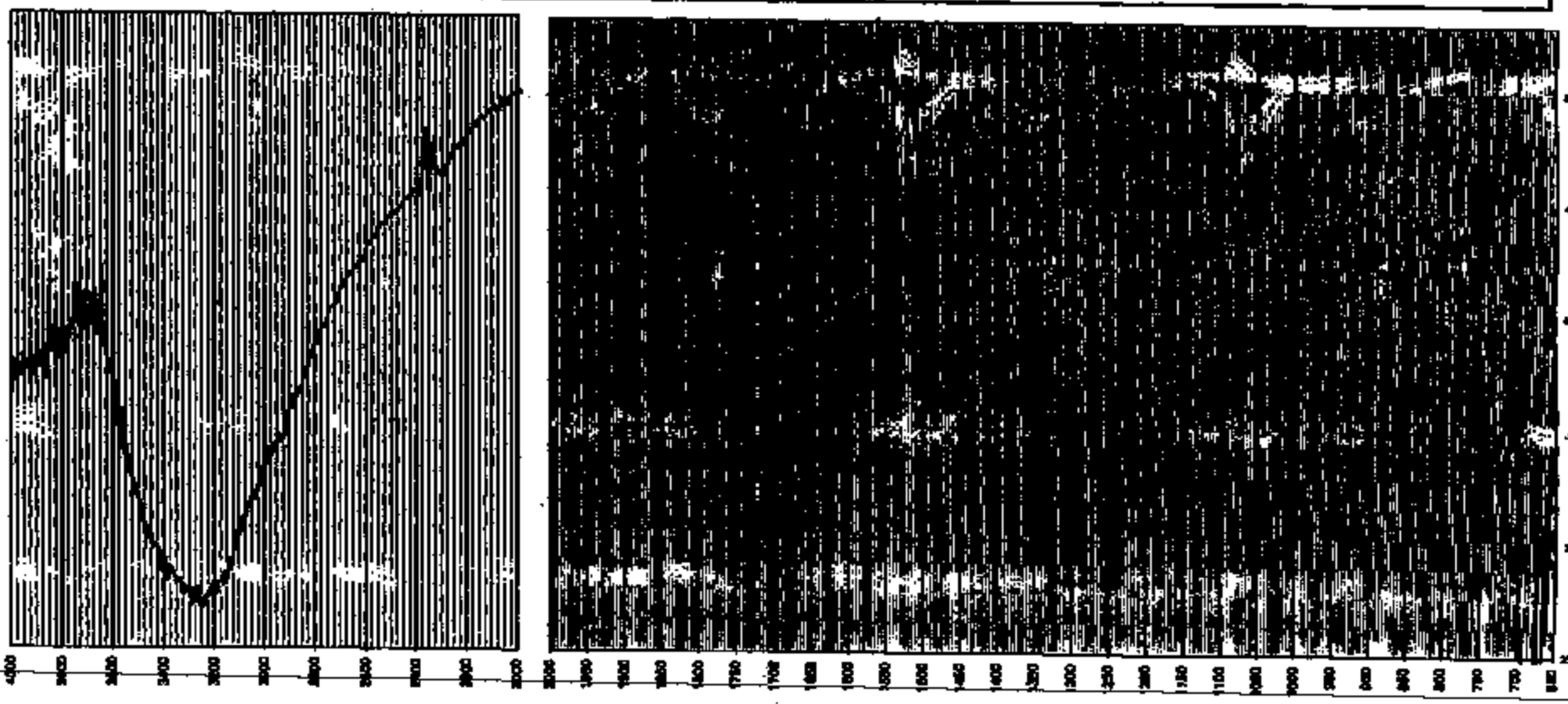
Specification:
Supplier:
Preparation method: AS RECEIVED
IR Technique: MICROSCOPE

Thu Feb 04 11:12:01 1999
Scans: 128 / 256
Resolution: 4.00
Gain: 4R / 4R

Engineer: MCH
APOD: Norton-Beer (medium)
Detector: MCT[15]
Y Axis: % Transmittance
X Axis: Wavenumber

Engineer:
Critique:

Interpretation:
Inorganic trace silicate



8713 2770

9900226 "A", WASHER

Specification:
Supplier:
Preparation method: AS RECIEVED
IR Technique: MICROSCOPE
Interpretation: magnesium trace silicone

Thu Feb 04 11:25:26 1999
Scans: 128 / 256
Resolution: 4.00
Gain: 4R / 4R

Engineer: MCH
APOD: Norton-Beer (medium)
Detector: MCT[15]
Y Axis: % Transmittance
X Axis: Wavenumber

Engineer: MP
Chemist:

8713 2771

9900226 "A" CONVERTER, BROWN MATERIAL

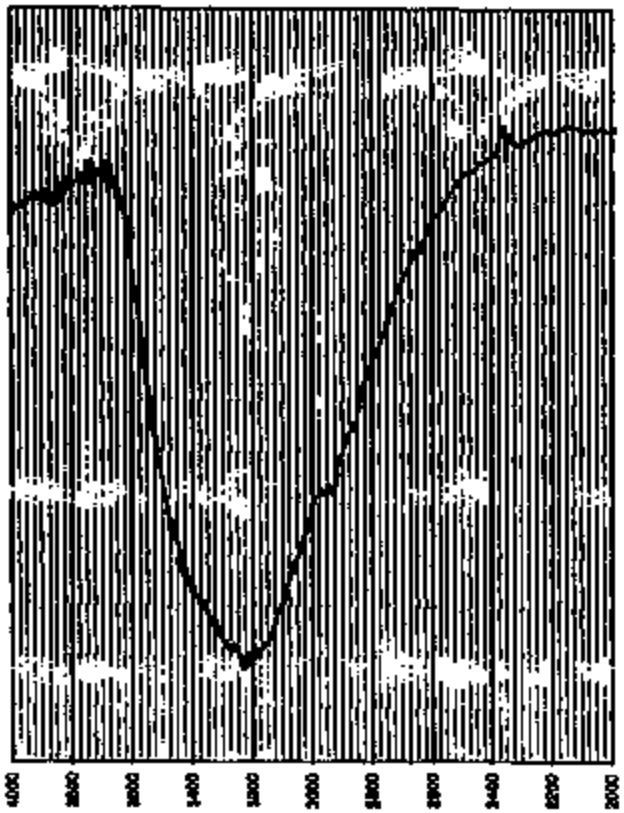
Specification:
Supplier:
Preparation method: AS RECEIVED
IR Technique: MICROSCOPE

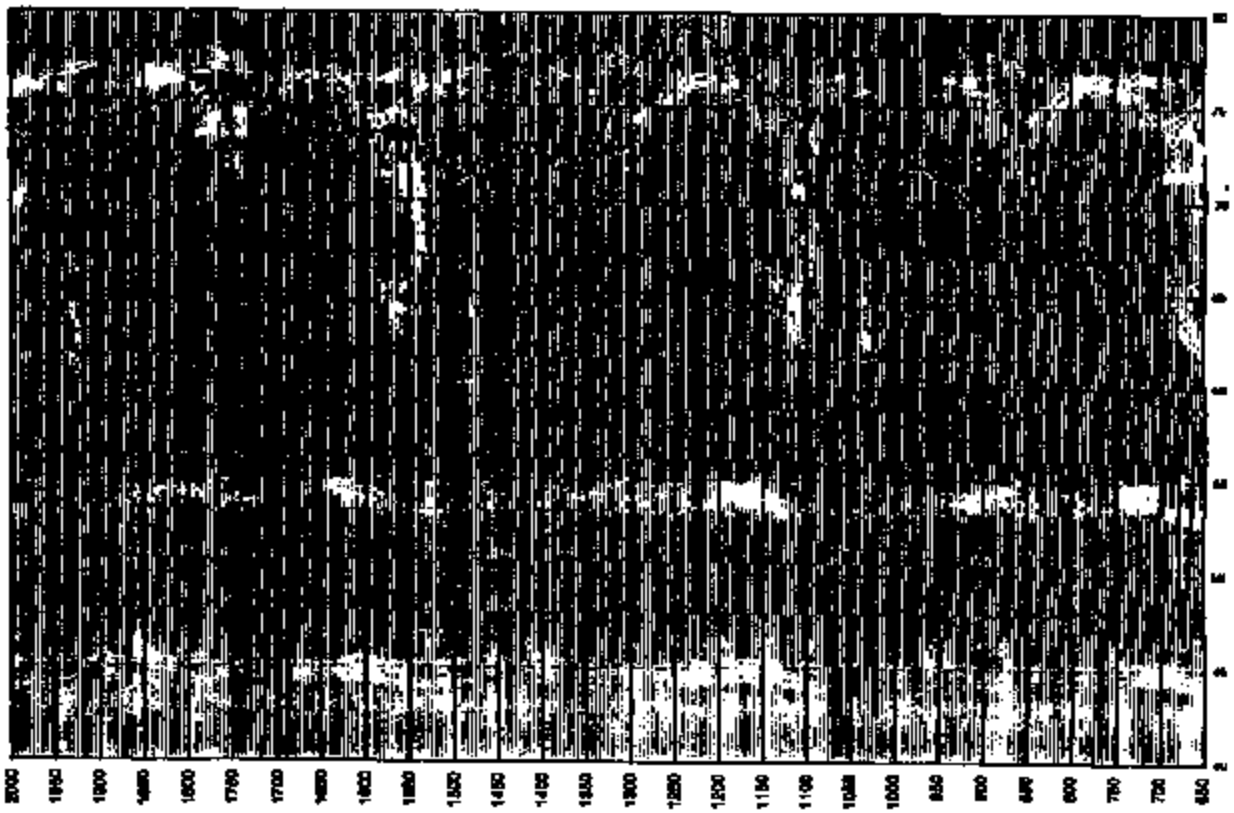
Fri Feb 05 13:26:12 1999
Scans: 128 / 256
Resolution: 4.00
Gain: 4 / 4

Engineer: MCH
APOD: Norton-Beer (medium)
Detector: MCT(15)
Y Axis: % Transmittance
X Axis: Wavenumber

Engineer:
Course:

Interpretation: organics present





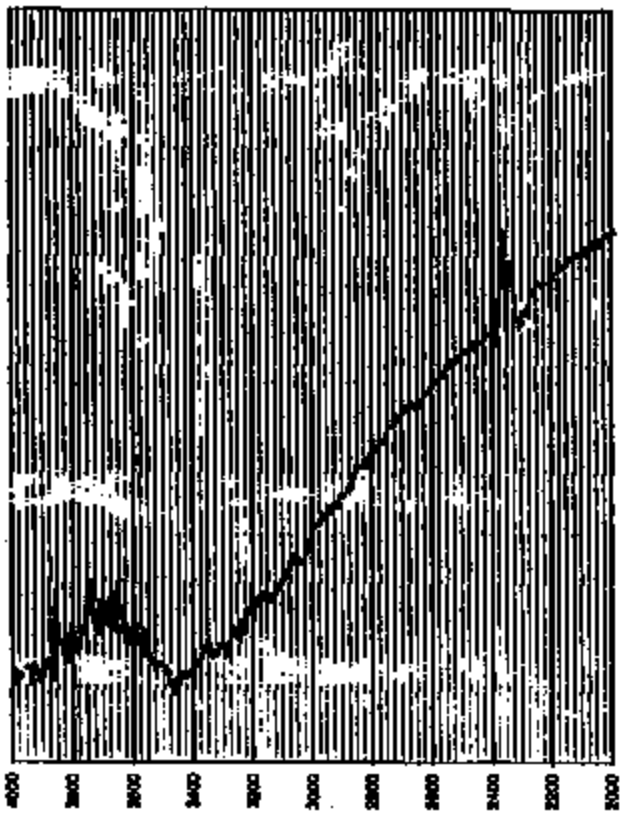
3713 2772

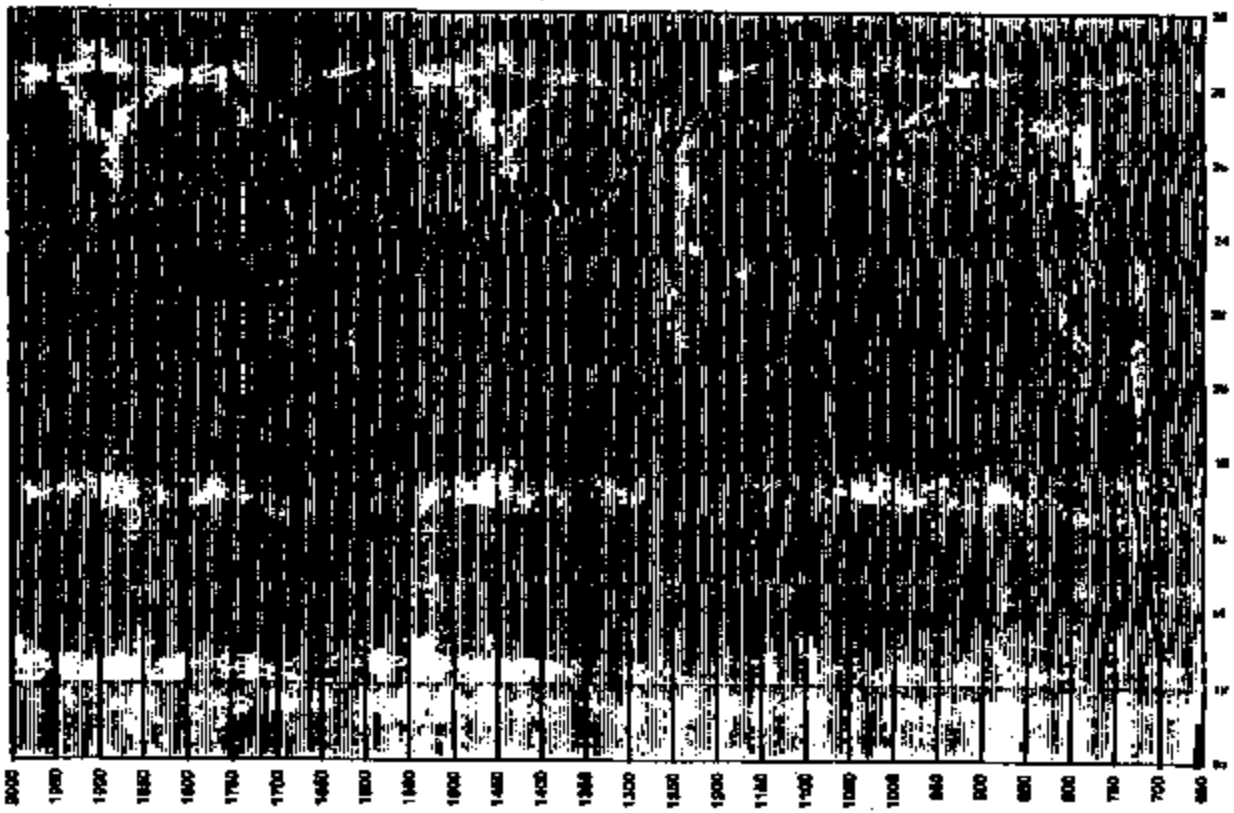
9900226 "A" CONVERTER, BLACK MATERIAL

Specification:
Supplier:
Preparation method: AS RECEIVED
IR Technique: MICROSCOPE
Interpretation: trace silicone

Fri Feb 05 13:30:50 1999
Scans: 128 / 256
Resolution: 4.00
Gain: 4 / 4

Engineer: MCH
APOD: Norton-Beer (medium)
Detector: MCT[15]
Y Axis: % Transmittance
X Axis: Wavenumber





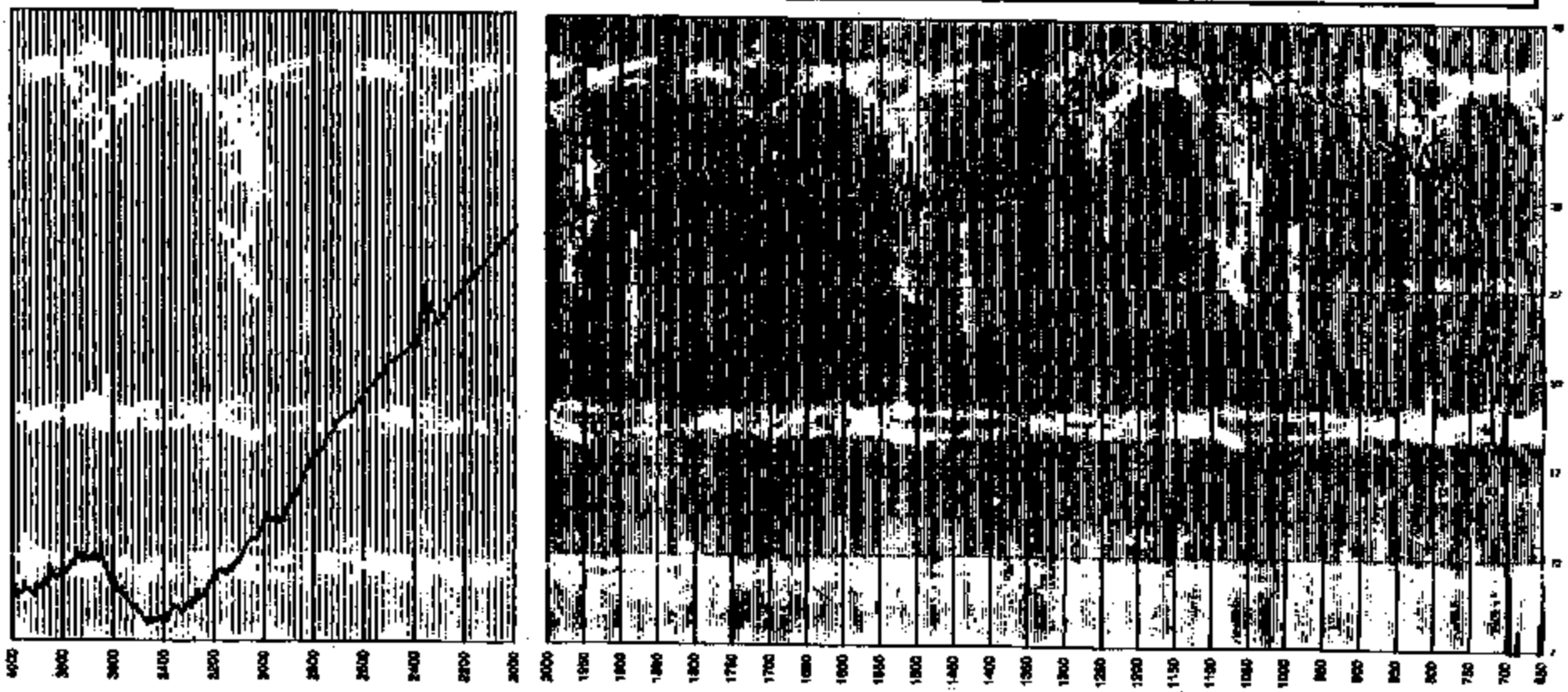
8719 2778

9900226 "A" CONVERTER,DISC, BLACK MATERIAL

Specification:
Supplier:
Preparation method: AS RECEIVED
IR Technique: MICROSCOPE
Interpretation: true of silicones

Fri Feb 05 13:37:54 1999
Scans: 128 / 256
Resolution: 4.00
Gain: 4 / 4

Engineer: MCH
APOD: Norton-Beer (medium)
Detector: MCT[15]
Y Axis: % Transmittance
X Axis: Wavenumber



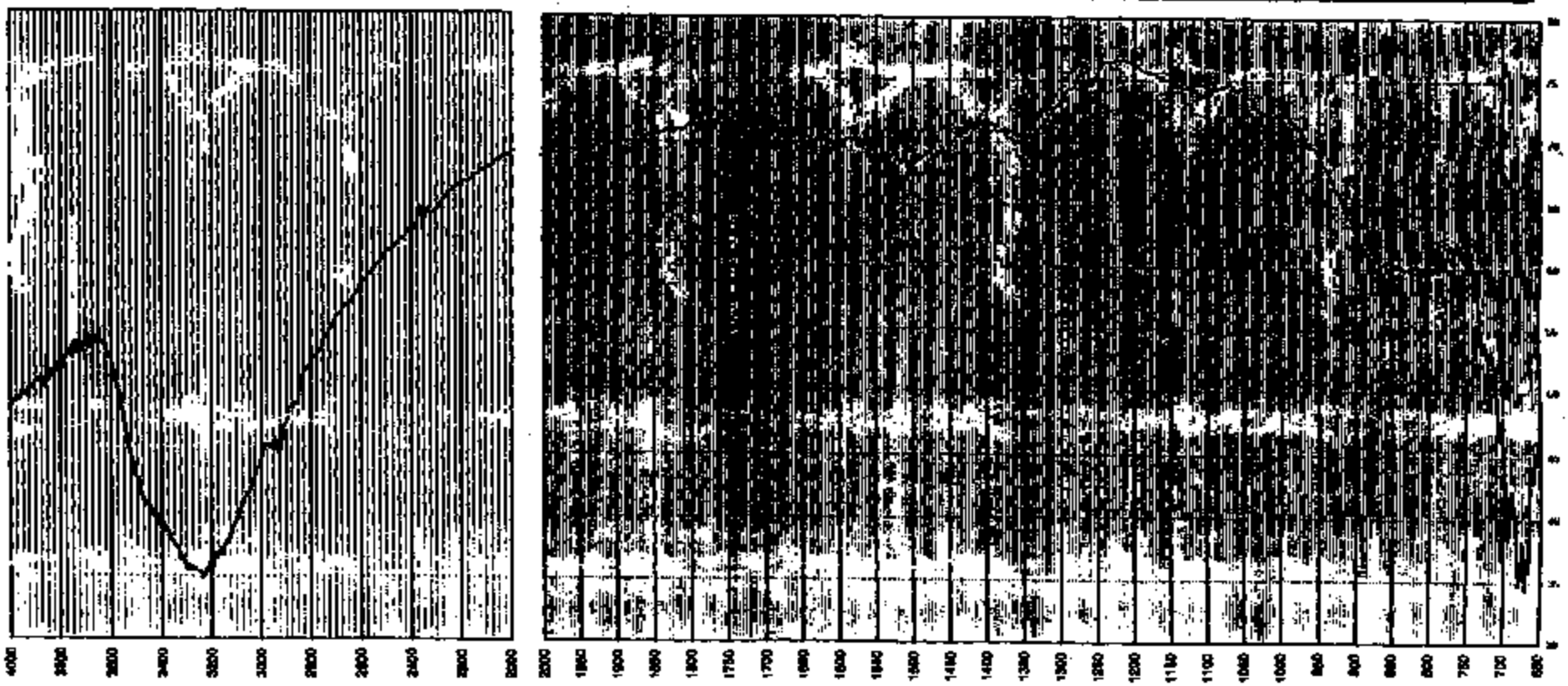
9713 2774

9900226 "A" CONVERTER,DISC, BROWN MATERIAL

Specification:
Supplier:
Preparation method: AS RECEIVED
IR Technique: MICROSCOPE
Interpretation: inorganic [illegible]

Fri Feb 05 13:34:33 1999
Scans: 128 / 256
Resolution: 4.00
Gain: 4 / 4

Engineer: MCH
APOD: Norton-Beer (medium)
Detector: MCT[15]
Y Axis: % Transmittance
X Axis: Wavenumber



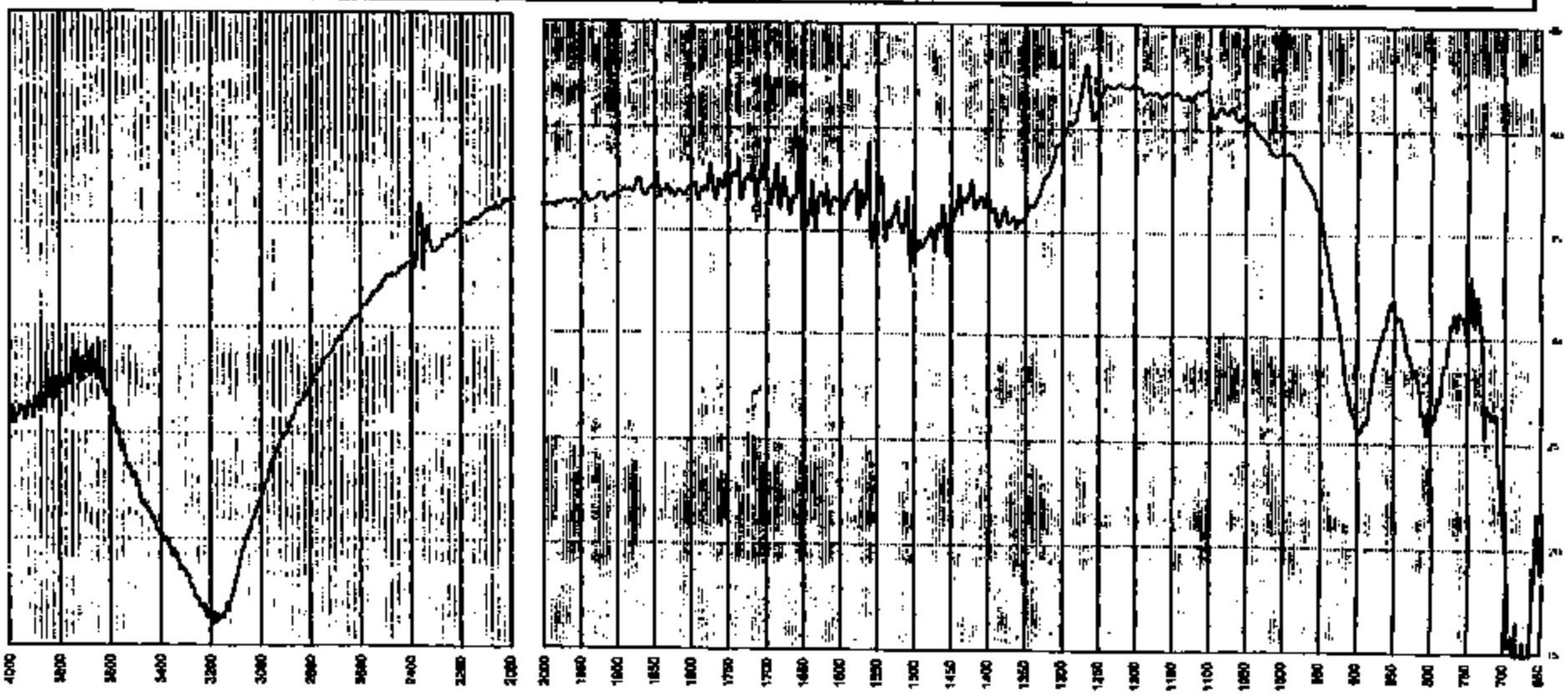
3713.2776

9900226 "C" HEXPORT, FITTING END

Specification:
Supplier:
Preparation method: AS RECEIVED
IR Technique: MICROSCOPE
Interpretation: magnesium phenate including yellow metal trace silicone

Mon Feb 08 14:31:03 1999 Engineer: MCH
Scans: 128 / 256 APOD: Norton-Beer (medium)
Resolution: 4.00 Detector: MCT[15]
Gain: 2R / 2R Y Axis: % Transmittance X Axis: Wavenumber

Engineer: MH
Comm:



3713 2779