

**PE03-044**  
**FORD**  
**5/13/2005**  
**APPENDIX I**  
**BOOK 23 OF 28**  
**PART 2 OF 4**

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**From:** Aber, Robert (R.B.)  
**Sent:** Monday, June 08, 2003 2:21 PM  
**To:** West, Gregory (G.S.)  
**Cc:** Aber, Robert (R.B.)  
**Subject:** Williams Controls Pedal

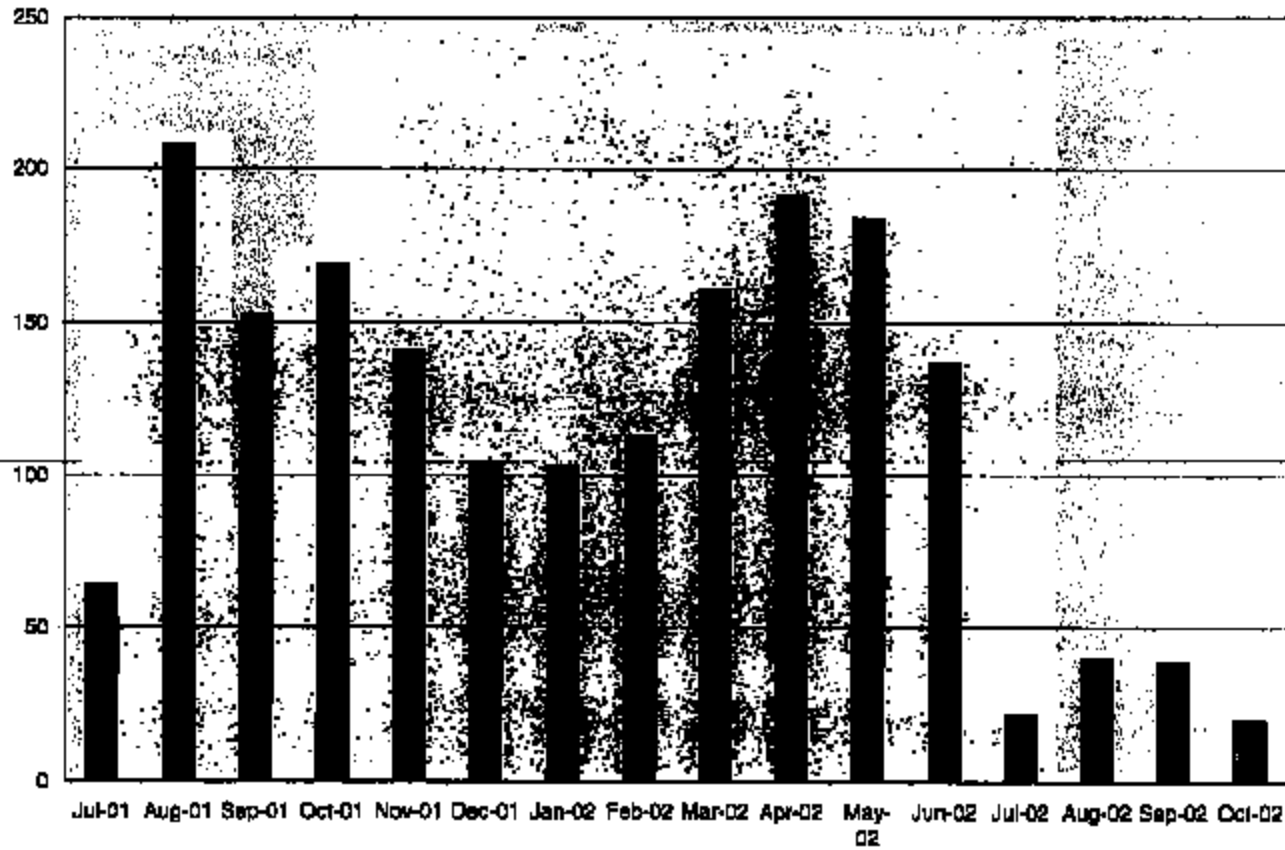


28 9F836 - Williams  
Controls ...

**Robert B. Abar**  
Manager, Powertrain

(313) 84-56247    FAX(313) 24-98073    rabar@ford.com  
Room: 10P20/Rokunda C284    Mail Drop: LM411D

1C3Z - BA



1C3Z - BA

PERC-044 0250

**From:** Sillanpaa, Don [dsillanpaa@waco.com]  
**Sent:** Thursday, March 08, 2001 10:02 AM  
**To:** Greg West (E-mail)  
**Subject:** Reliability chart draft



**Robustness  
Checklist Draft.xls**

Greg, here's what I have so far. Am I filling this out correctly? I wish this thing came with instructions or on-line training!

Regards,  
Don Sillanpaa  
Product Engineer, Williams Controls Technology Center  
phone: (941) 351-9118, extension 31  
fax: (941) 351-3829  
e-mail: dsillanpaa@waco.com  
<<Robustness Checklist1 Draft.xls>>



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**From:** Frankstein, Michael (M.)  
**Sent:** Thursday, March 01, 2001 9:33 AM  
**To:** West, Gregory (G.S.)  
**Subject:** RCL



Attachments  
Ched881.xls

Regards,

**Michael Frankstein**

Quality/Reliability Engineer

TVC, Super Duty F-Series

E-Mail: [mfrankst@ford.com](mailto:mfrankst@ford.com)

Phone: (313) 62-16285 Fax: (313) 62-16285 Pager: (313) 796-4339

Text Page: <http://vm4.dearborn.ford.com/cgi/textpage?PAGEID=mfrankst>

Snail Mail MD 185, PDC 2D-H59

**ROBUSTNESS and RELIABILITY CHECKLIST**  
**ENTER Program or Vehicle Line**  
**ENTER component or systems DESCRIPTION**

Update **Draft**

2007 This version of the Checklist is to be used with a draft design in a DMP Class 4p, 1999  
 Design Controls, CAD / CAE - Component to Subsystem - System - Vehicle Tests

1. **SYS. FUNCTION** Enter a specific description and outline (Developer's language preferred)

2. **DESIGN STATE** - specify DTD code "initial" or other appropriate level description

3. **DESIGN FACTOR SUMMARY**  
 See: Section  
 I. Check Technology  
 II. Apply Parameter Design  
 III. Upgrade Design Team  
 IV. Reduce / Remove Parts  
 V. Add Compensation Device  
 VI. Simulate / Test

4. **PROPERTY TABLE** (This section is to be completed by the Design Engineer)

Design Factor	Initial	Final	Weight	Priority	Status
Stress	...	...	...	...	...
...	...	...	...	...	...

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	
Design Factor																																				
Weight																																				
Priority																																				
Status																																				

**ANSWER 1**   X : Image / Information from Point in New State / Positive   M, B, P, Q : Ined Function   A : When Factor Incorporated in the (or (initial) Includes the New State)  
 O : Image / Information from Point in Old State / Positive   R, S, G, W : New State   N : When Factor Incorporated in the (or (initial) Excludes the New State)

PEES-044-8715

GENERAL DATA  
Constant Volume



**Request for Central Laboratory Service**  
 15000 Conroy Dr., Dearborn, MI 48120-1267 FAX (313) 32-2164

All shaded areas must be filled in to process your request.

Administrative Use Only  
 Laboratory Number: **31079** Date: **5/12/03**

Secretary Contact: **LARRY LIPOSKY** Telephone: **213 274-8172** CDS ID: **LLIPOSKY** FAX:

Number of Samples	Sample	Source	TURCASP
<input checked="" type="checkbox"/>	Before after test		
	Dispose after test		
			Supplier
<b>ELECTRONIC ACEL PEDAL</b>	<b>A82930, A82912</b>	<b>234-9473-04</b>	<b>TELEFLEX</b>
<b>NYOGE L 719</b>		<b>N/A</b>	<b>Provided NYE</b>
<b>NYE ENVIRONMENT CORP 710</b>		<b>N/A</b>	<b>" NYE</b>

Specific Testing Requirements/Additional Sample Information

Responsible Info Box (Responsible The)

Sharp testing upon failure?  No  Yes

- 1) FTIR testing to verify if NYE 706D has migrated from switch track (light brown) to pit track (dark brown)
- 2) Determine the quantity of NYE 706D that was applied during manufacturing process
- 3) Photos of sensors, matched with pedal serial #s.

Report (A shaded area copy final report will be mailed.)

How you prefer the report:  Thru the primary route  FAX final report  Send photographs only

Do you prefer hard copy:  Please primary route  No report copies (electronic)

Administrative Use Only

Chemistry (313) 32-2177  Metallurgy & Mechanical (313) 32-2161  Polymers, Coatings & Corrosion (313) 32-2169

For information about services or assistance in completing this form, refer to the Central Laboratory WEB page: ([www.detroitmi.gov/mec/central.html](http://www.detroitmi.gov/mec/central.html))  
 Laboratory number and date cannot be assigned without receipt of samples.  
 Samples will be disposed of 30 days after report completion, unless otherwise requested.

CL-Form #CLF07\_02



ETC#1.jpg



ETC#1\_10.jpg



ETC#1\_11.jpg



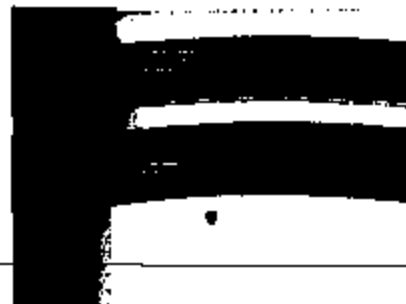
ETC#1\_2.jpg



ETC#1\_3.jpg



ETC#1\_4.jpg



ETC#1\_8.jpg



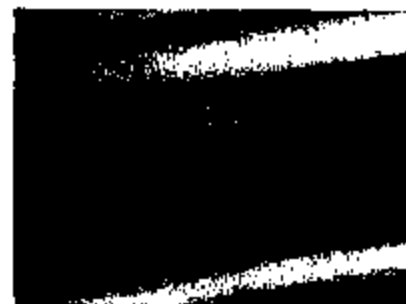
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ETC#1\_8.jpg



ETC#1\_9.jpg

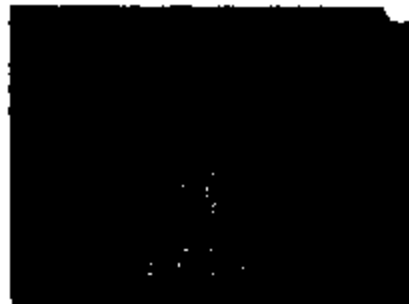


ETC#1\_falled track rider.jpg

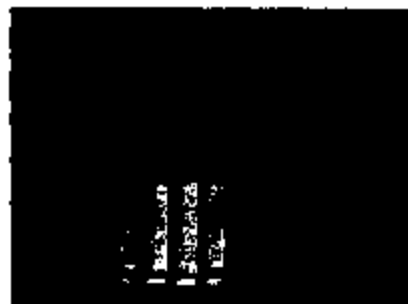
REC-044 12744



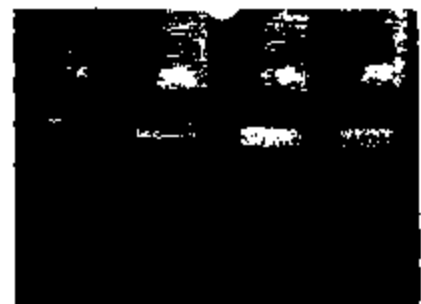
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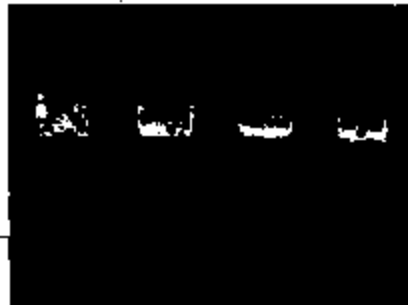
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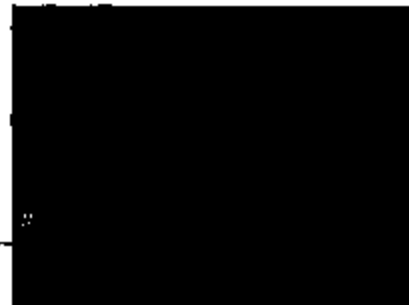
ETC#1\_failed track rider\_3.jpg



ETC#1\_failed track rider\_4.jpg



ETC#1\_failed track rider\_5.jpg



ETC#1\_failed track.jpg



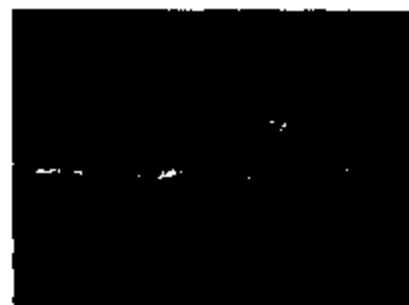
ETC#1\_failed track\_plow.jpg



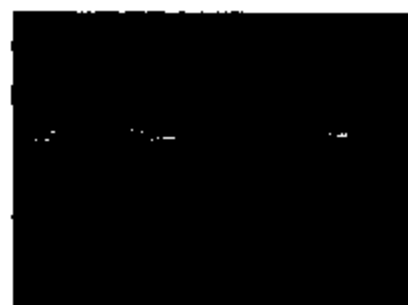
ETC#1\_pass track rider.jpg



ETC#1\_pass track rider\_1.jpg



ETC#1\_pass track rider\_2.jpg



ETC#1\_pass track rider\_3.jpg



ETC#1\_pass track\_plow.jpg

PERC-04 12743



ETCM4\_PV Test\_0.jpg



ETCM4\_PV Test\_1.jpg



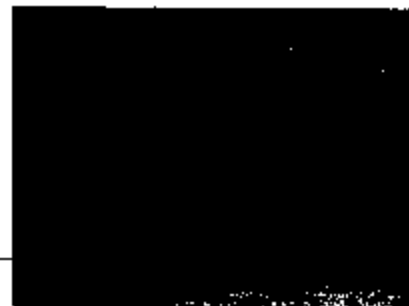
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ETCM4\_PV Test\_2.jpg



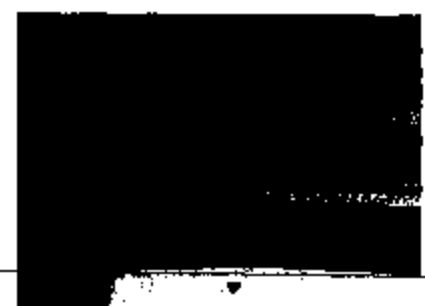
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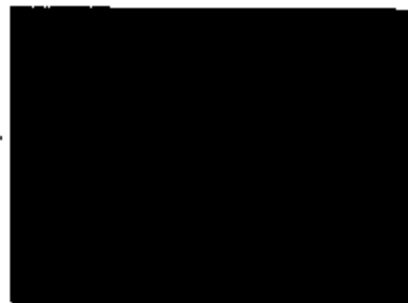
ETCM4\_PV Test\_4.jpg



ETCM4\_PV Test\_5.jpg



ETCM4\_PV Test\_6.jpg



ETCM4\_PV Test\_7.jpg



ETCM4\_PV Test\_8.jpg



ETCM4\_PV Test\_9.jpg

PERC-04 12748



ETC#2.jpg



ETC#2\_1.jpg



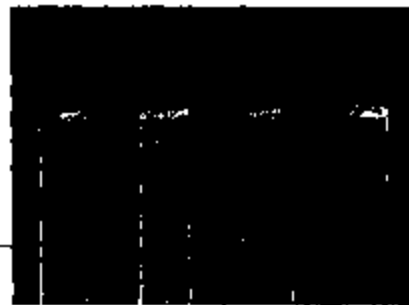
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ETC#2\_3.jpg



ETC#2\_4.jpg



ETC#2\_5.jpg



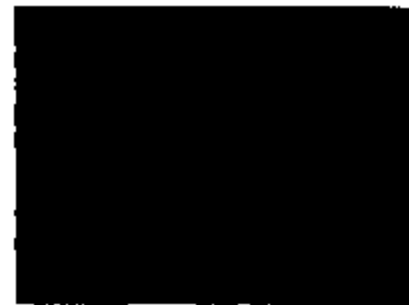
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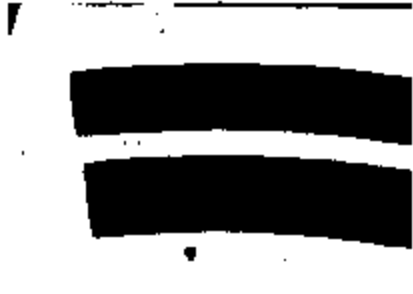


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ETC#2\_9.jpg

PER3-041 12/1/77



Post Clean 1.jpg



Post Clean 10.jpg



Post Clean 11.jpg



Post Clean 12.jpg



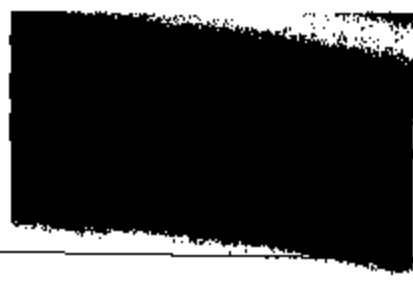
Post Clean 13.jpg



Post Clean 14.jpg



Post Clean 15.jpg



Post Clean 16.jpg



Post Clean 2.jpg



Post Clean 3.jpg



Post Clean 4.jpg



Post Clean 5.jpg

PERM-AM 12748



Post Clean 6.jpg



Post Clean 7.jpg



Post Clean 8.jpg



Post Clean 9.jpg

FBI-044 12749

FBI

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**From:** West, Gregory (G.S.)  
**Sent:** Monday, June 23, 2003 12:35 PM  
**To:** Whuk, John (J.G.)  
**Subject:** Wiring clarification letter



Wiring  
clarification.doc



---

**From:** Whuk, John (J.G.)  
**Sent:** Monday, June 23, 2003 2:26 PM  
**To:** 'kmcMahon@tfsauto.com'  
**Cc:** Sheffield, Drew (D.L.); Patel, Mona (M.S.); Figurski, Patrick (P.M.); Liposky, Lawrence (L.J.);  
West, Gregory (G.S.)  
**Subject:** MY02/03 P131/J137 Wiring Clarification Letter



P131\_TaichedField\_  
Action1.doc..

John Whuk  
Buyer - Cables, Pedals, & Parking Brakes  
Global Chassis Commodity Management  
Phone/ Fax: (313) 337-2505  
EMAIL: jwhuk@ford.com  
Office: VPO 3E010

*Ford Motor Company*

Ford Motor Company

John G. Wnuk  
Buyer  
Global Chassis Commodity Management  
5600 Auto Club Drive  
Dearborn, MI 48126

June 23, 2003

Mr. Kevin McMahon  
V.P. Sales, Marketing, and Engineering  
Teleflex Automotive Group  
850 Stephenson Highway  
Truy, MI 48083

Re: MY02/03 P131/U137 ETC Accelerator Pedal Field Action #03B03

Dear Kevin:

Teleflex raised a theory that an electrical issue related to wiring, not a pedal concern, was the cause for unacceptable failure rate on 2002 Model Year F-Series Super Duty and Excursions equipped with ETC pedals. We took your ideas seriously and conducted a very thorough warranty data review and product reviews to determine the contribution of the wiring concern to the extremely high warranty repair data. Our reviews and analyses included not only the Teleflex pedal assembly, but also the related wiring components. We would like to share our conclusions from our analysis with you.

Observations/conclusions:

- The wire chaffing issue at the left hand side shock tower effected vehicles from Job #1 2002 through 12/1/2002.
- All F-Series Super Duty/Excursion with 7.3L engines were affected including 4x4 and 4x2.
- The following ETC pedal circuits were could have been affected by the chaffing:
  - o Pin 8 circuit 640 (RD/YE) Voltage supplied in Start and Run (overload protected)
  - o Pin 7 circuit 1285 (RD/LG) Idle validation switch, signal
  - o Pin 8 circuit 355 (GY/WH) Accelerator pedal position sensor, signal
  - o Pin 9 circuit 357 (YE/WH) Accelerator pedal position sensor, ground
  - o Pin 10 circuit 351 (BN/RD) Reference voltage
- All circuits except 640 routes near the shock tower.
- We determined that there might be three P-codes associated with wiring shorts of ETC pedal circuits through conducting a fault analysis during the product reviews. They are:
  - o P0221, P0122, P0123
- We identified 83 total confirmed claims on the 2C3Z-9F836-\*\* Teleflex adjustable pedal assembly for failures related to shorts at the shock tower based on our reviews and analysis. This is from a population of 7925 warranty claims.

We look forward to discussing this further at our June 26 meeting.

Sincerely,

*John G. Wnuk*

Teleflex raised a theory that an electrical issue related to wiring, not a pedal concern, was the cause for unacceptable failure rate on 2002 Model Year F-Series Super Duty and Excursions equipped with ETC pedals. We took your ideas seriously and conducted a very thorough warranty data review and product reviews to determine the contribution of the wiring concern to the extremely high warranty repair data. Our reviews and analyses included not only the Teleflex pedal assembly, but also the related wiring components. We would like to share our conclusions from our analyses with you.

**Observations/conclusions:**

-The wire chaffing issue at the left hand side shock tower effected vehicles from Job #1 2002 through 12/1/2002.

-All F-Series Super Duty/Excursion with 7.3L engines were affected including 4x4 and 4x2.

-The following ETC pedal circuits were could have been affected by the chaffing:

- Pin 6 circuit 640 (RD/YE) Voltage supplied in Start and Run (overload protected)
- Pin 7 circuit 1285 (RD/LG) Idle validation switch, signal
- Pin 8 circuit 355 (GY/WH) Accelerator pedal position sensor, signal
- Pin 9 circuit 357 (YE/WH) Accelerator pedal position sensor, ground
- Pin 10 circuit 351 (BN/RD) Reference voltage

-All circuits except 640 routes near the shock tower

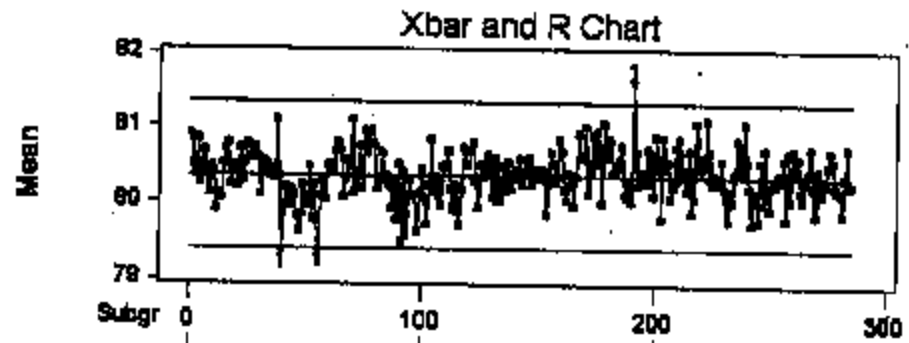
-In conducting a fault analysis during the product reviews, we determined that there might be three P-codes associated with wiring shorts of ETC pedal circuits:

-P0221, P0122, P0123

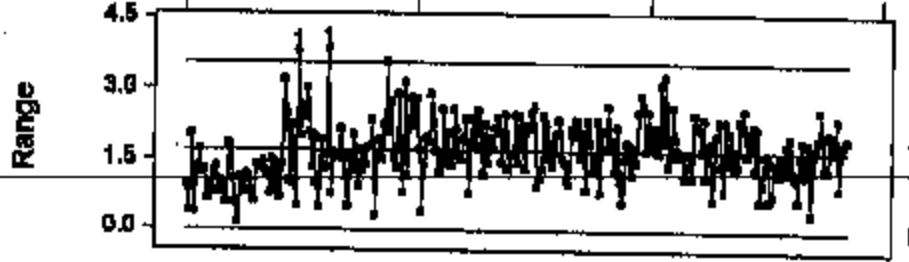
Based on our reviews and analyses, we identified 83 total confirmed claims on the 2C3Z-9F936-\*\*- Teleflex adjustable pedal assembly for failures related to shorts at the shock tower. This is from a population of 7925 warranty claims.

Last 5000 pps.

# TRACK 1 IDLE MIN. % VOLTAGE

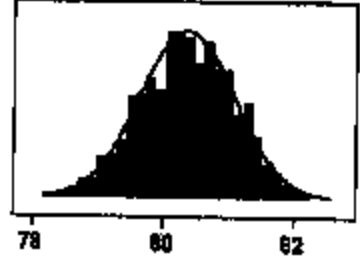


UCL=81.33  
Mean=60.36  
LCL=79.38

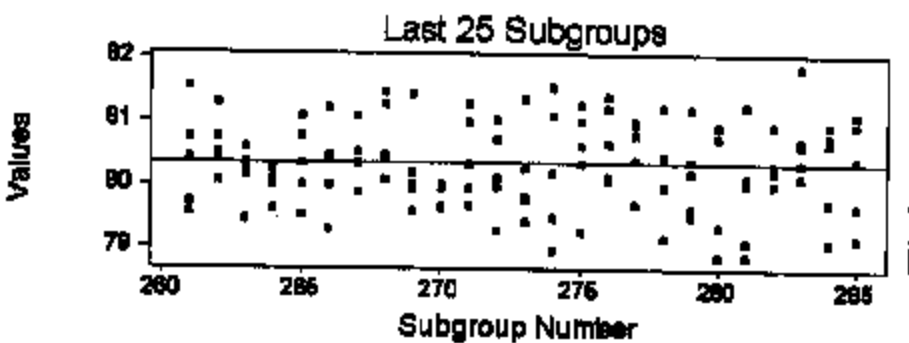
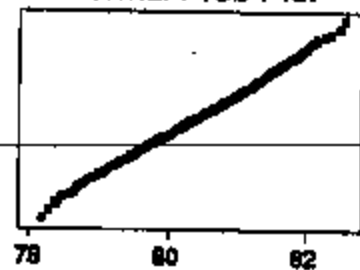


UCL=3.574  
R=1.690  
LCL=0

### Capability Histogram



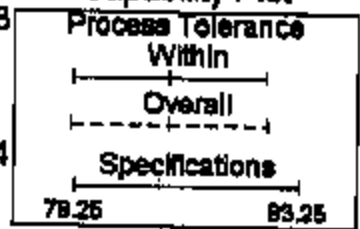
### Normal Prob Plot



Within  
StDev: 0.726623  
Cp: 1.15  
Cpk: 0.97

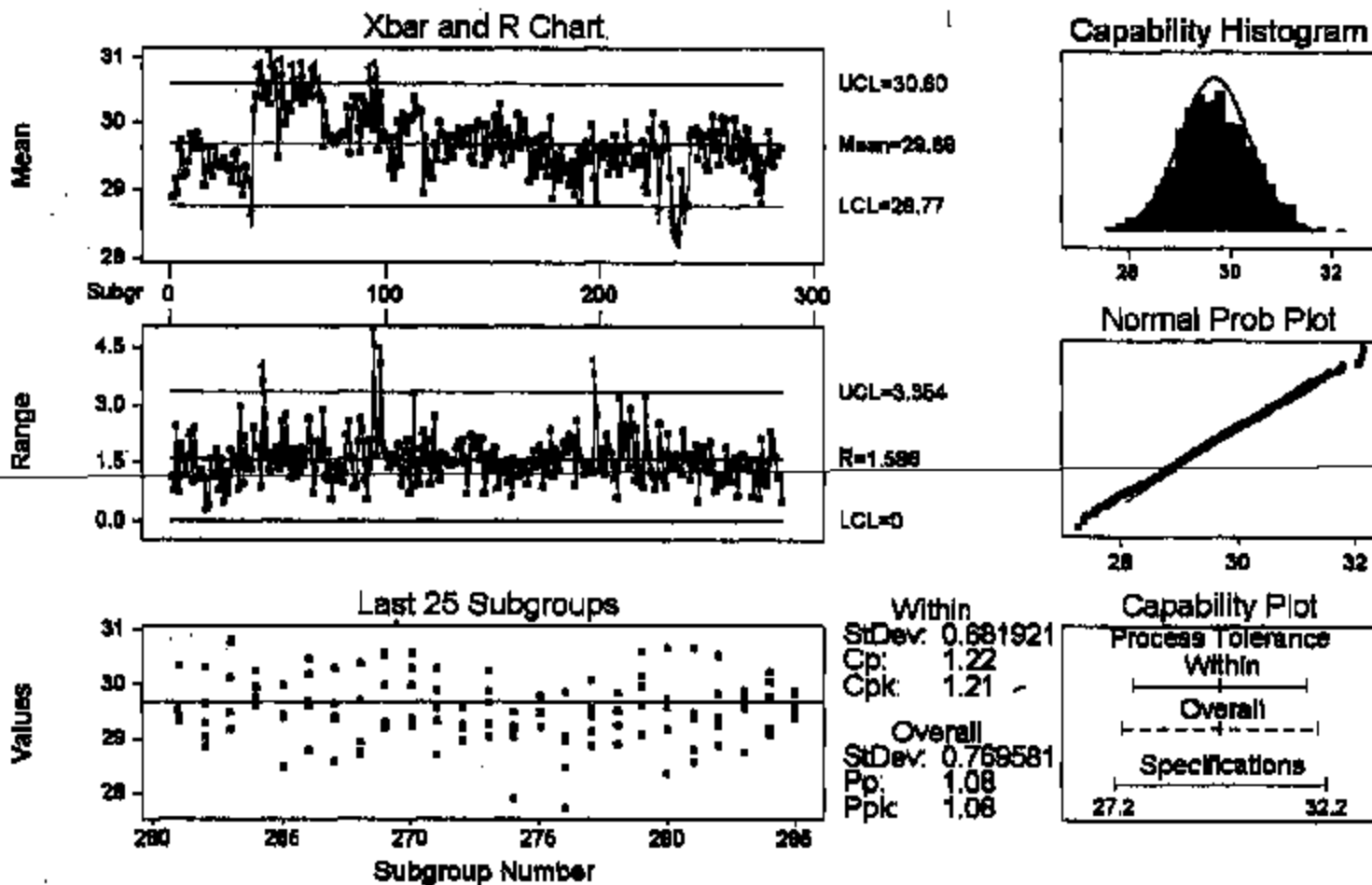
Overall  
StDev: 0.730204  
Pp: 1.14  
Ppk: 0.96

### Capability Plot

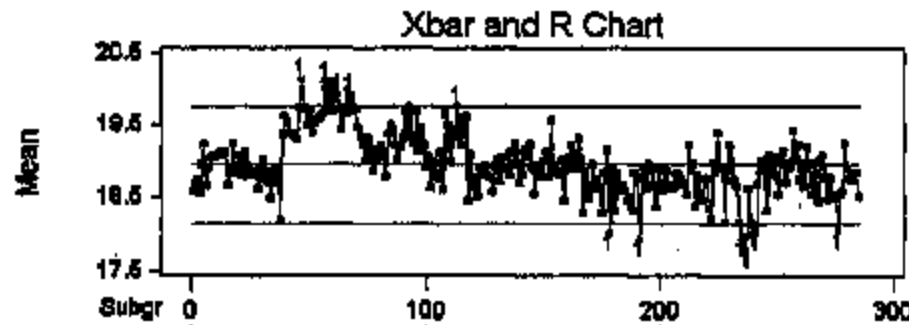


PSB-044 12810

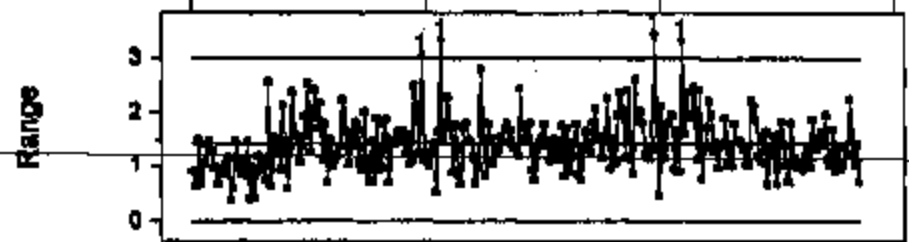
# TRACK 2 IDLE MIN. % VOLTAGE



# TRACK 3 IDLE MIN. % VOLTAGE

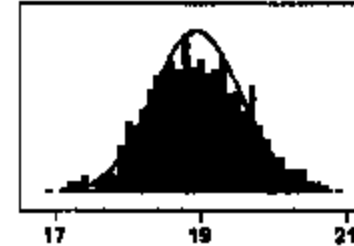


UCL=19.76  
 Mean=18.85  
 LCL=18.13

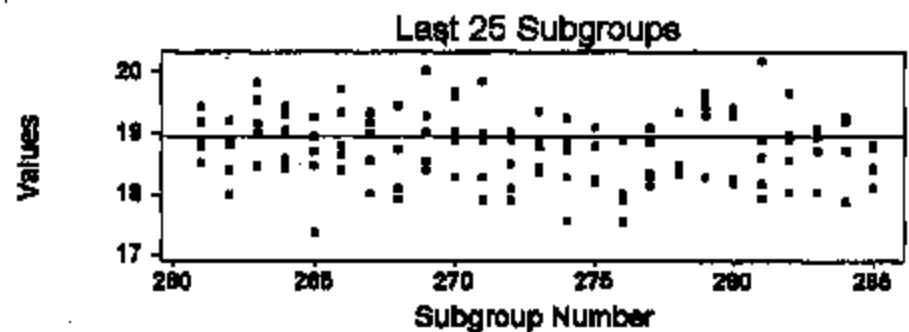
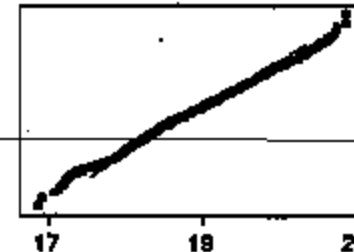


UCL=2.984  
 R=1.418  
 LCL=0

**Capability Histogram**



**Normal Prob Plot**



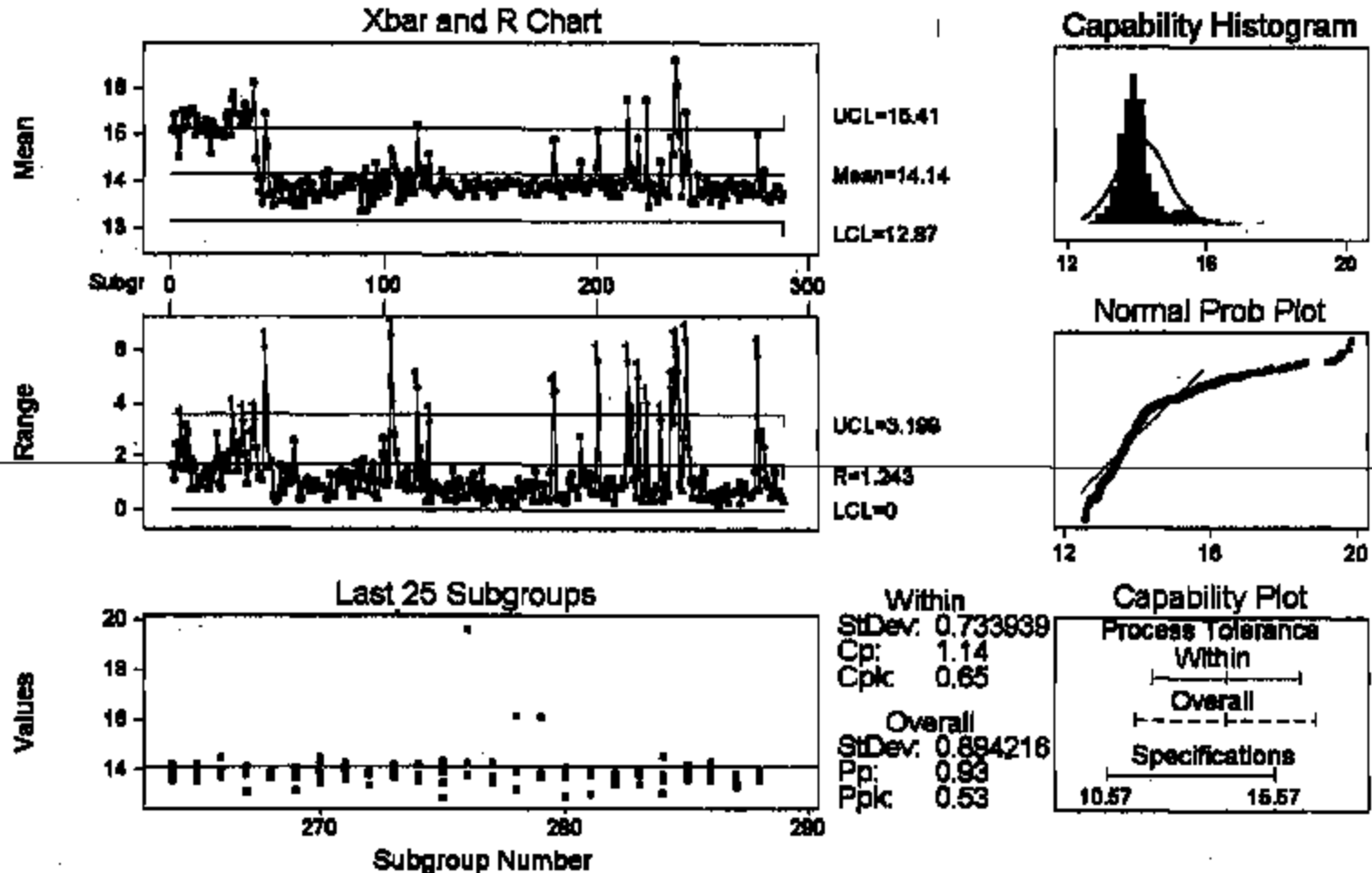
Within  
 StDev: 0.608785  
 Cp: 1.37  
 Cpk: 1.23 -

Overall  
 StDev: 0.688185  
 Pp: 1.21  
 Ppk: 1.09

**Capability Plot**

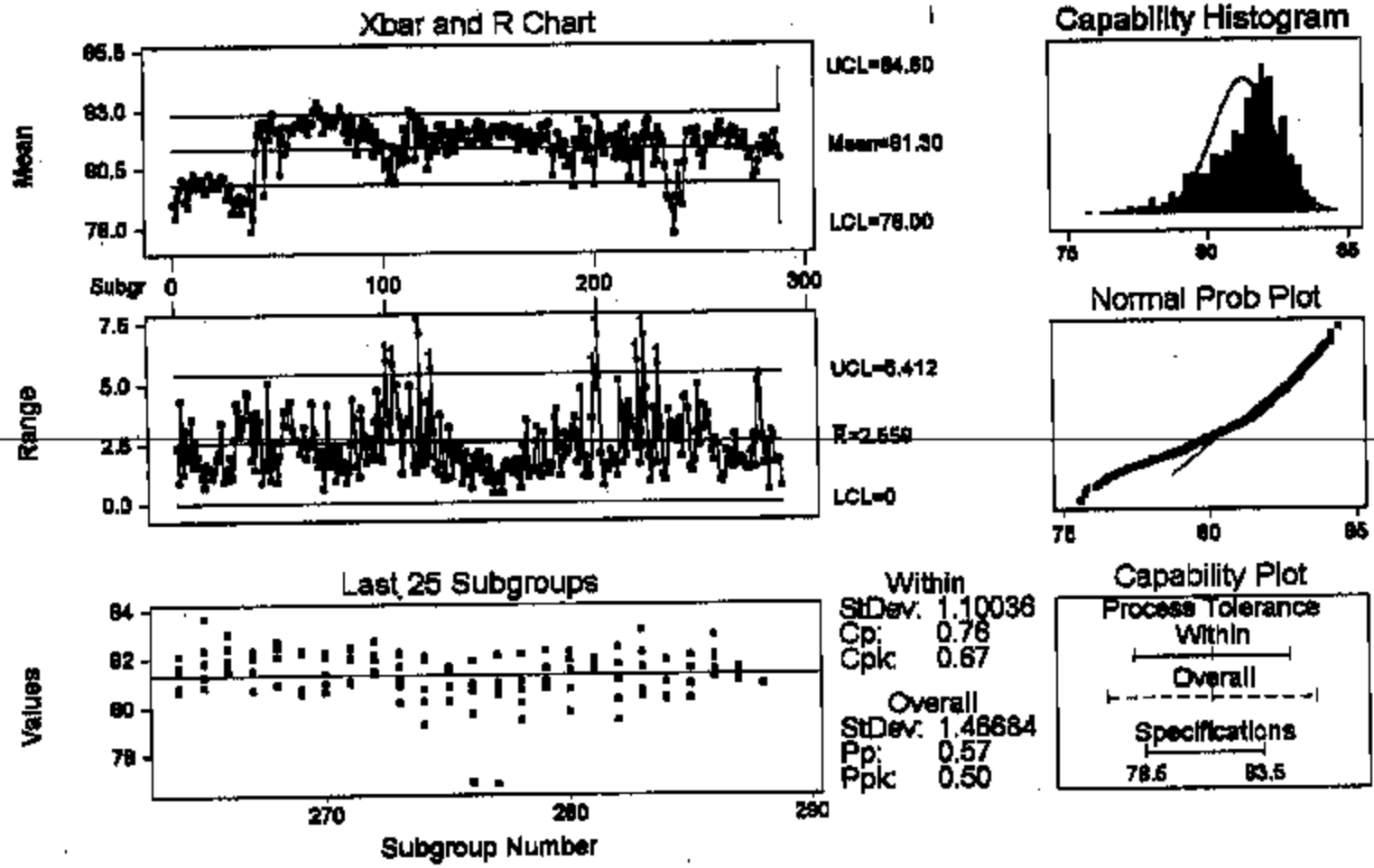


# TRACK 1 WOT % VOLTAGE



PERI-044 12813

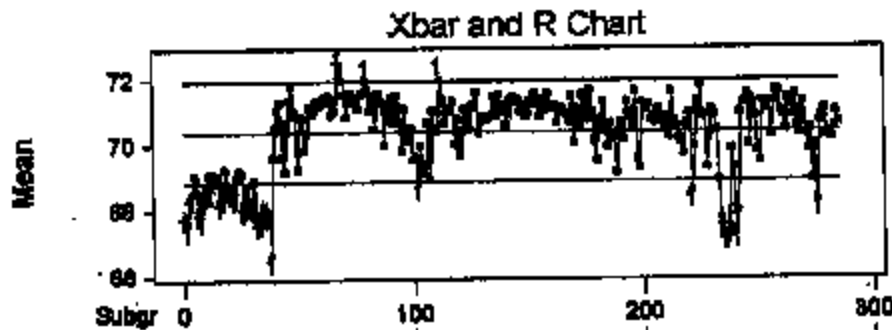
# TRACK 2 WOT % VOLTAGE



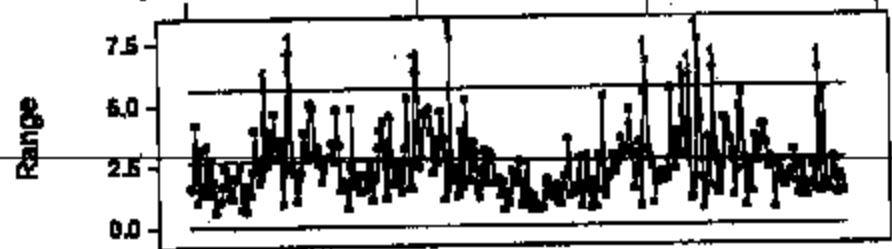
PC90-044 12814



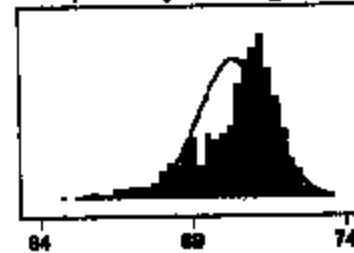
# TRACK 3 WOT % VOLTAGE



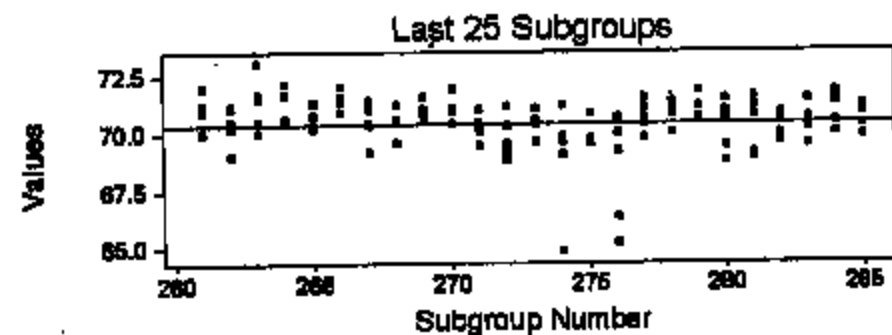
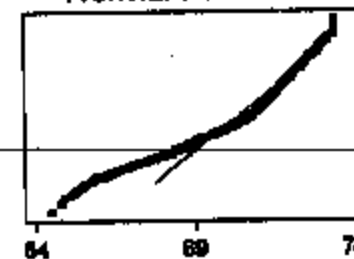
UCL=71.90  
 Mean=70.36  
 LCL=68.81



**Capability Histogram**



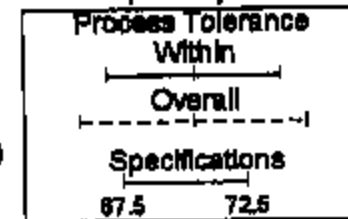
**Normal Prob Plot**



Within  
 StDev: 1.14833  
 Cp: 0.73  
 Cpk: 0.62

Overall  
 StDev: 1.51550  
 Pp: 0.55  
 Ppk: 0.47

**Capability Plot**



TRACK 1 ROLE INDEX

Tablet	Ford's		Ford's		Tablet	Distance (ft)	Ford's		KV Print		KV Print	
	Low Limit (FS VI)	High Limit (FS VI)	Low Limit (FS VI)	High Limit (FS VI)			Low Limit (FS VI)	High Limit (FS VI)	Low Limit (FS VI)	High Limit (FS VI)		
72.0						2.81						
72.1						2.07						
72.2						0.82						
72.3						0.09						
72.4						0.1						
72.5						0.28						
72.6						0.07						
72.7						0.1						
72.8						0.34						
72.9						0.34						
73.0						0.44						
73.1						0.28						
73.2						0.28						
73.3						0.11						
73.4						1.17						
73.5						0.57						
73.6						0.77						
73.7						0.88						
73.8						0.88						
73.9						0.13						
74.0						0.28						
74.1						0.37						
74.2						0.8						
74.3						0.67						
74.4						0.88						
74.5						0.28						
74.6						0.28						
74.7						0.8						
74.8						0.28						
74.9						0.28						
75.0						0.54						

FORD WILLE HIGHER  
 KENDALL WILLE VALUE HIGHER

PH02-044 12018



TRACK 3 IDLE INDEX

Telephone #	Ford's		Ford's Counts	Ford's		Difference	Ford's		Ford's	KV Print		KV Print	
	Low Limit (Counts)	High Limit (Counts)		Test Value (PS V)	Test Value (PS V)		Low Limit (PS V)	High Limit (PS V)		(PS V)	Low Limit (PS V)	High Limit (PS V)	
100			200			0.93	14.00			18.2		21.2	
101			200			0.93	14.00			18.2		21.2	
102			200			1.04	14.00			18.2		21.2	
103			200			1.07	14.00			18.2		21.2	
104			200			0.93	14.00			18.2		21.2	
105			200			1.07	14.00			18.2		21.2	
106			200			0.79	14.00			18.2		21.2	
107			200			1.00	14.00			18.2		21.2	
108			200			0.90	14.00			18.2		21.2	
109			200			0.82	14.00			18.2		21.2	
110			200			1.24	14.00			18.2		21.2	
111			200			1.03	14.00			18.2		21.2	
112			200			1.00	14.00			18.2		21.2	
113			200			1.19	14.00			18.2		21.2	
114			200			0.75	14.00			18.2		21.2	
115			200			1.35	14.00			18.2		21.2	
116			200			1.30	14.00			18.2		21.2	
117			200			1.41	14.00			18.2		21.2	
118			200			0.98	14.00			18.2		21.2	
119			200			2.13	14.00			18.2		21.2	
120			200			1.00	14.00			18.2		21.2	
121			200			1.07	14.00			18.2		21.2	
122			200			1.07	14.00			18.2		21.2	
123			200			1.24	14.00			18.2		21.2	
124			200			1.2	14.00			18.2		21.2	
125			200			2.23	14.00			18.2		21.2	
126			200			0.8	14.00			18.2		21.2	
127			200			0.88	14.00			18.2		21.2	
128			200			0.8	14.00			18.2		21.2	
129			200			1.0	14.00			18.2		21.2	
130			200			1.1	14.00			18.2		21.2	

FORD VALUE HIGHER  
 KENDALLVILLE VALUE HIGHER

PERC-044 12018

TRACK 1 WOT

Table No	Ford's		Ford's		Ford's		Toll Value (\$ V)	Toll Value (\$ V)	Difference (\$)	Low	Ford's		KV Print	
	Low	High	Low	High	Low	High					Low	High	Low	High
100	144	144	144	144	2.00				0.00					
101	144	144	144	144	2.00				0.00					
102	144	144	144	144	2.00				0.00					
103	144	144	144	144	2.00				0.00					
104	144	144	144	144	2.00				0.00					
105	144	144	144	144	2.00				0.00					
106	144	144	144	144	2.00				0.00					
107	144	144	144	144	2.00				0.00					
108	144	144	144	144	2.00				0.00					
109	144	144	144	144	2.00				0.00					
110	144	144	144	144	2.00				0.00					
111	144	144	144	144	2.00				0.00					
112	144	144	144	144	2.00				0.00					
113	144	144	144	144	2.00				0.00					
114	144	144	144	144	2.00				0.00					
115	144	144	144	144	2.00				0.00					
116	144	144	144	144	2.00				0.00					
117	144	144	144	144	2.00				0.00					
118	144	144	144	144	2.00				0.00					
119	144	144	144	144	2.00				0.00					
120	144	144	144	144	2.00				0.00					
121	144	144	144	144	2.00				0.00					

FORD VALUE HIGHER  
 KENDALLVILLE VALUE HIGHER

TRACK 2 WOT

Table#	Ford's Low Limit (Counts)	Ford's High Limit (Counts)	Ford's Counts	Ford Test Value (C/V)	Table#	Ford's Test Value (C/V)	Difference (C/V)	Ford's Low Limit (Counts)	Ford's High Limit (Counts)	KV Print Low Limit (C/V)	KV Print High Limit (C/V)
252	720	820	816	1.00			1.00			720	820
	720	820	820	1.11			1.11			720	820
	720	820	820	1.22			1.22			720	820
	720	820	820	1.33			1.33			720	820
	720	820	820	1.44			1.44			720	820
	720	820	820	1.55			1.55			720	820
	720	820	820	1.66			1.66			720	820
	720	820	820	1.77			1.77			720	820
	720	820	820	1.88			1.88			720	820
	720	820	820	1.99			1.99			720	820
	720	820	820	2.10			2.10			720	820
	720	820	820	2.21			2.21			720	820
	720	820	820	2.32			2.32			720	820
	720	820	820	2.43			2.43			720	820
	720	820	820	2.54			2.54			720	820
	720	820	820	2.65			2.65			720	820
	720	820	820	2.76			2.76			720	820
	720	820	820	2.87			2.87			720	820
	720	820	820	2.98			2.98			720	820
	720	820	820	3.09			3.09			720	820
	720	820	820	3.20			3.20			720	820
	720	820	820	3.31			3.31			720	820
	720	820	820	3.42			3.42			720	820
	720	820	820	3.53			3.53			720	820
	720	820	820	3.64			3.64			720	820
	720	820	820	3.75			3.75			720	820
	720	820	820	3.86			3.86			720	820
	720	820	820	3.97			3.97			720	820
	720	820	820	4.08			4.08			720	820
	720	820	820	4.19			4.19			720	820
	720	820	820	4.30			4.30			720	820
	720	820	820	4.41			4.41			720	820
	720	820	820	4.52			4.52			720	820
	720	820	820	4.63			4.63			720	820
	720	820	820	4.74			4.74			720	820
	720	820	820	4.85			4.85			720	820
	720	820	820	4.96			4.96			720	820
	720	820	820	5.07			5.07			720	820
	720	820	820	5.18			5.18			720	820
	720	820	820	5.29			5.29			720	820
	720	820	820	5.40			5.40			720	820
	720	820	820	5.51			5.51			720	820
	720	820	820	5.62			5.62			720	820
	720	820	820	5.73			5.73			720	820
	720	820	820	5.84			5.84			720	820
	720	820	820	5.95			5.95			720	820
	720	820	820	6.06			6.06			720	820
	720	820	820	6.17			6.17			720	820
	720	820	820	6.28			6.28			720	820
	720	820	820	6.39			6.39			720	820
	720	820	820	6.50			6.50			720	820
	720	820	820	6.61			6.61			720	820
	720	820	820	6.72			6.72			720	820
	720	820	820	6.83			6.83			720	820
	720	820	820	6.94			6.94			720	820
	720	820	820	7.05			7.05			720	820
	720	820	820	7.16			7.16			720	820
	720	820	820	7.27			7.27			720	820
	720	820	820	7.38			7.38			720	820
	720	820	820	7.49			7.49			720	820
	720	820	820	7.60			7.60			720	820
	720	820	820	7.71			7.71			720	820
	720	820	820	7.82			7.82			720	820
	720	820	820	7.93			7.93			720	820
	720	820	820	8.04			8.04			720	820
	720	820	820	8.15			8.15			720	820
	720	820	820	8.26			8.26			720	820
	720	820	820	8.37			8.37			720	820
	720	820	820	8.48			8.48			720	820
	720	820	820	8.59			8.59			720	820
	720	820	820	8.70			8.70			720	820
	720	820	820	8.81			8.81			720	820
	720	820	820	8.92			8.92			720	820
	720	820	820	9.03			9.03			720	820
	720	820	820	9.14			9.14			720	820
	720	820	820	9.25			9.25			720	820
	720	820	820	9.36			9.36			720	820
	720	820	820	9.47			9.47			720	820
	720	820	820	9.58			9.58			720	820
	720	820	820	9.69			9.69			720	820
	720	820	820	9.80			9.80			720	820
	720	820	820	9.91			9.91			720	820
	720	820	820	10.02			10.02			720	820



FORD VALUE HIGHER



KENDALLVILLE VALUE HIGHER

TRACK 3 WOT

Table#	Ford's		Ford's Density	Ford Test Value (kV)	Table#	Difference (kV)	Ford's		KV Point	
	Low Limit (kV)	High Limit (kV)					Low Limit (kV)	High Limit (kV)	Low Limit (kV)	High Limit (kV)
800										
801										
802										
803										
804										
805										
806										
807										
808										
809										
810										
811										
812										
813										
814										
815										
816										
817										
818										
819										
820										
821										
822										
823										
824										
825										
826										
827										
828										
829										
830										
831										
832										
833										
834										
835										
836										
837										
838										
839										
840										
841										
842										
843										
844										
845										
846										
847										
848										
849										
850										
851										
852										
853										
854										
855										
856										
857										
858										
859										
860										
861										
862										
863										
864										
865										
866										
867										
868										
869										
870										
871										


FORD VALUE HIGHER  
 KENDALLVILLE VALUE HIGHER

PERS-014 12821

Operator: Steve Simko  
Client: none  
Job: Throttle control sensor  
Res: Ultrafine  
Label: Demo ink

(27 Nov 02 15:21:11)

~20um

A high-magnification scanning electron micrograph (SEM) showing the surface morphology of a throttle control sensor. The surface is covered with a dense, irregular layer of small, dark, granular particles, likely the 'demo ink' mentioned in the text. The particles vary in size and shape, creating a complex, porous-looking texture. A scale bar in the top left corner indicates a length of approximately 20 micrometers. The background is a light, speckled gray, representing the underlying sensor material.

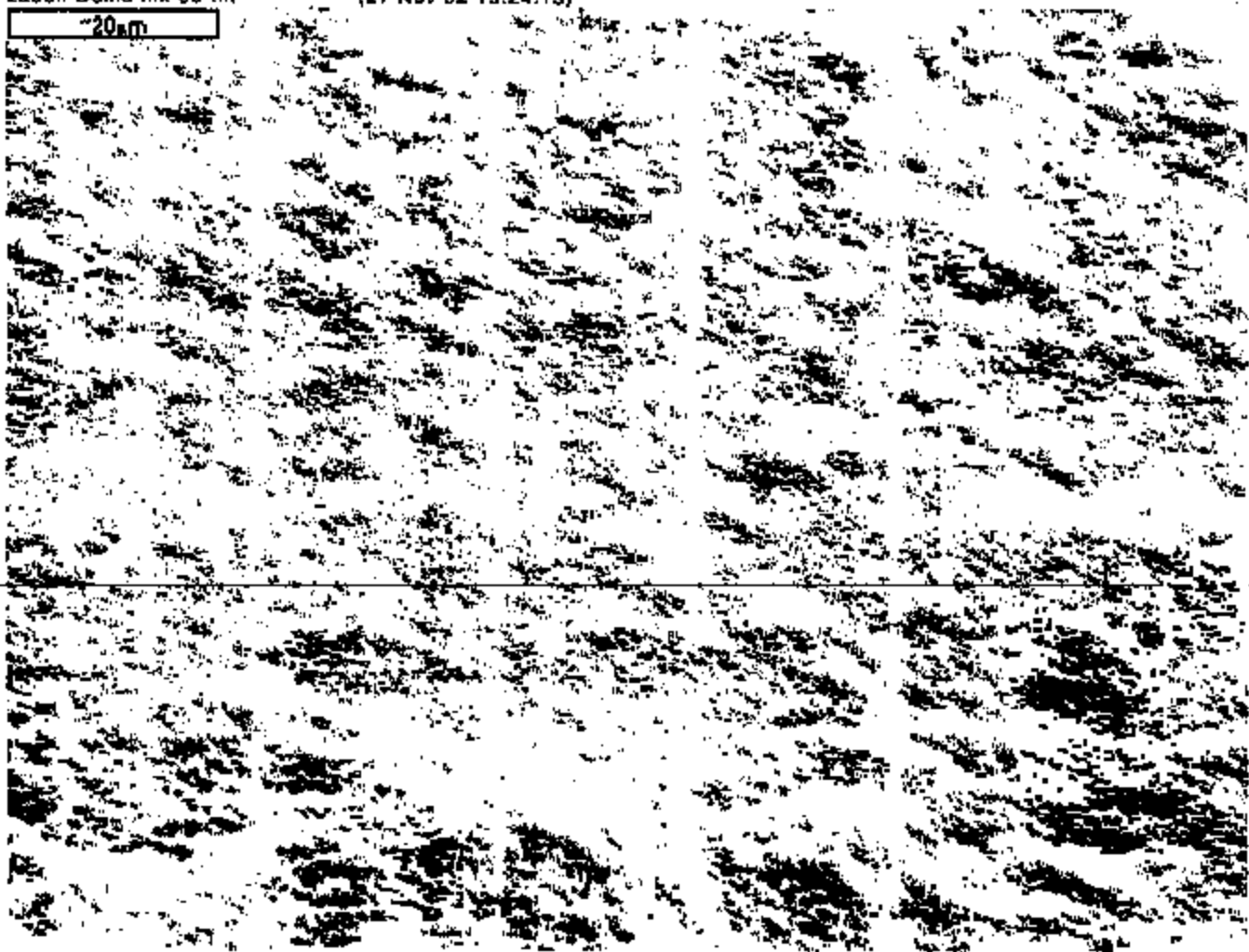
PER3-044 19912



Operator: Steve Simko  
Client: none  
Job: Throttle control sensor  
Res: Ultralite  
Label: Demo Ink 80 tIII

(27 Nov 02 15:24:13)

20µm



PERC-045 18913

Operator: Steve Simko

Client: none

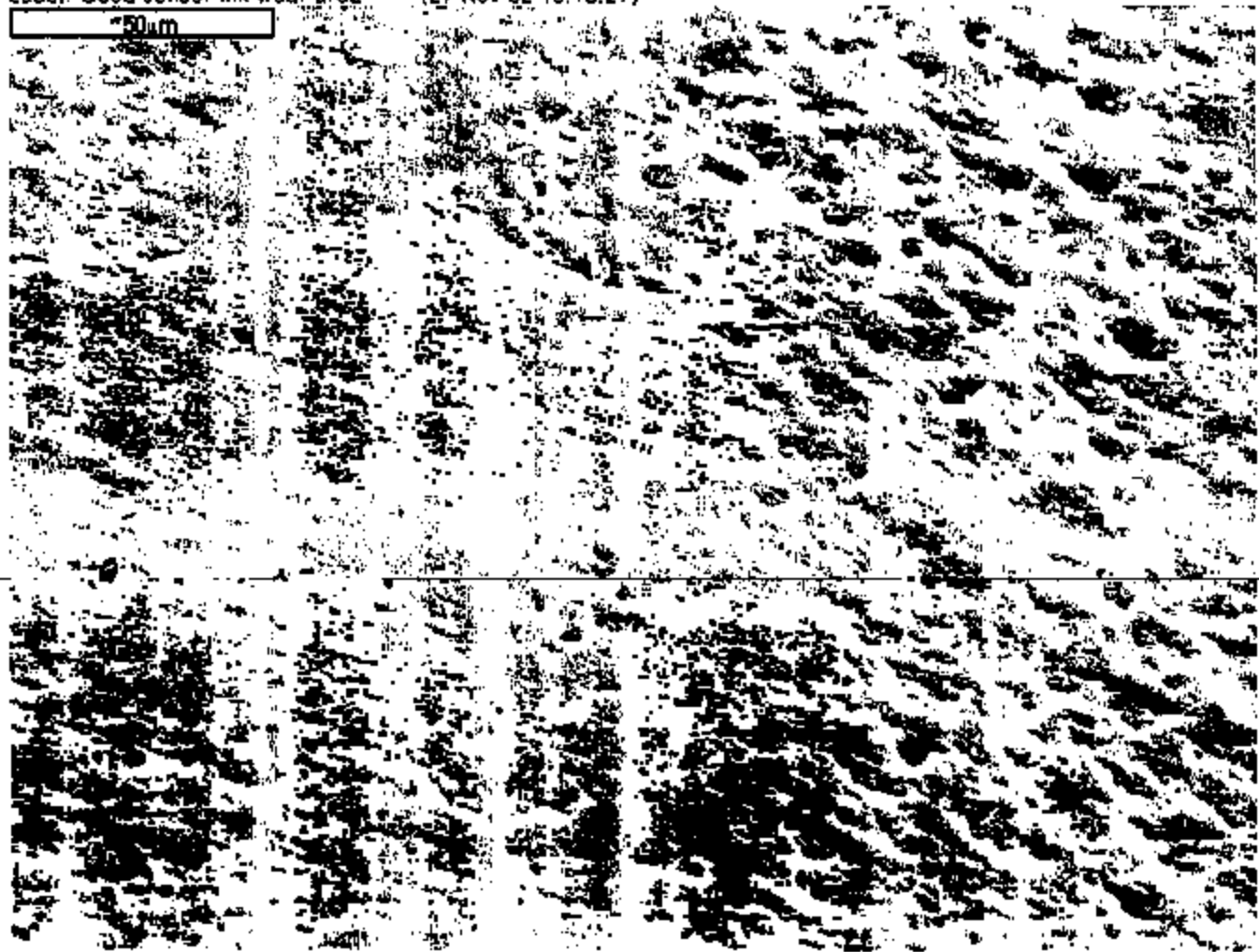
Job: Throttle control sensor

Res: Ultraline

Label: Good sensor ink wear area

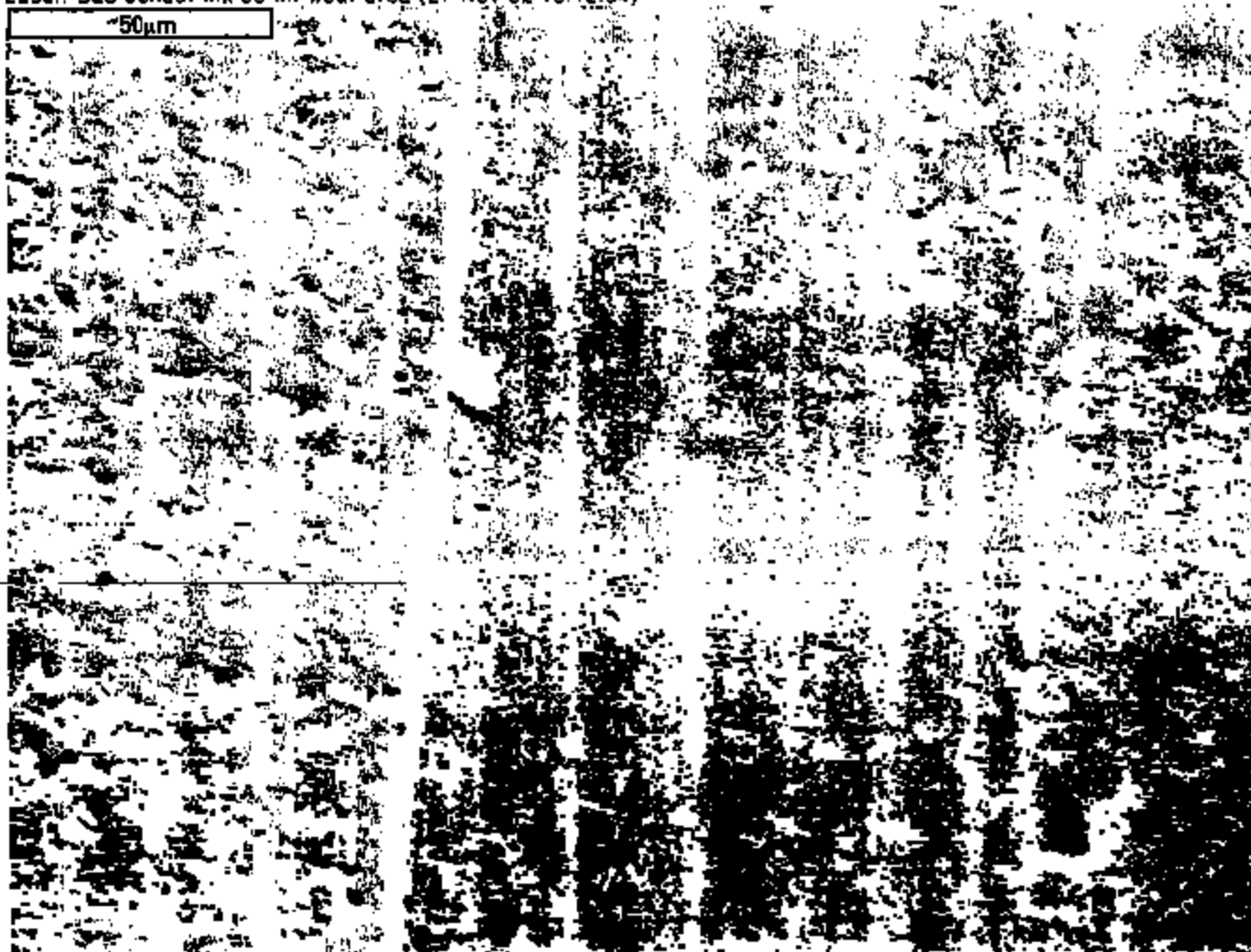
(27 Nov 02 16:18:27)

50µm



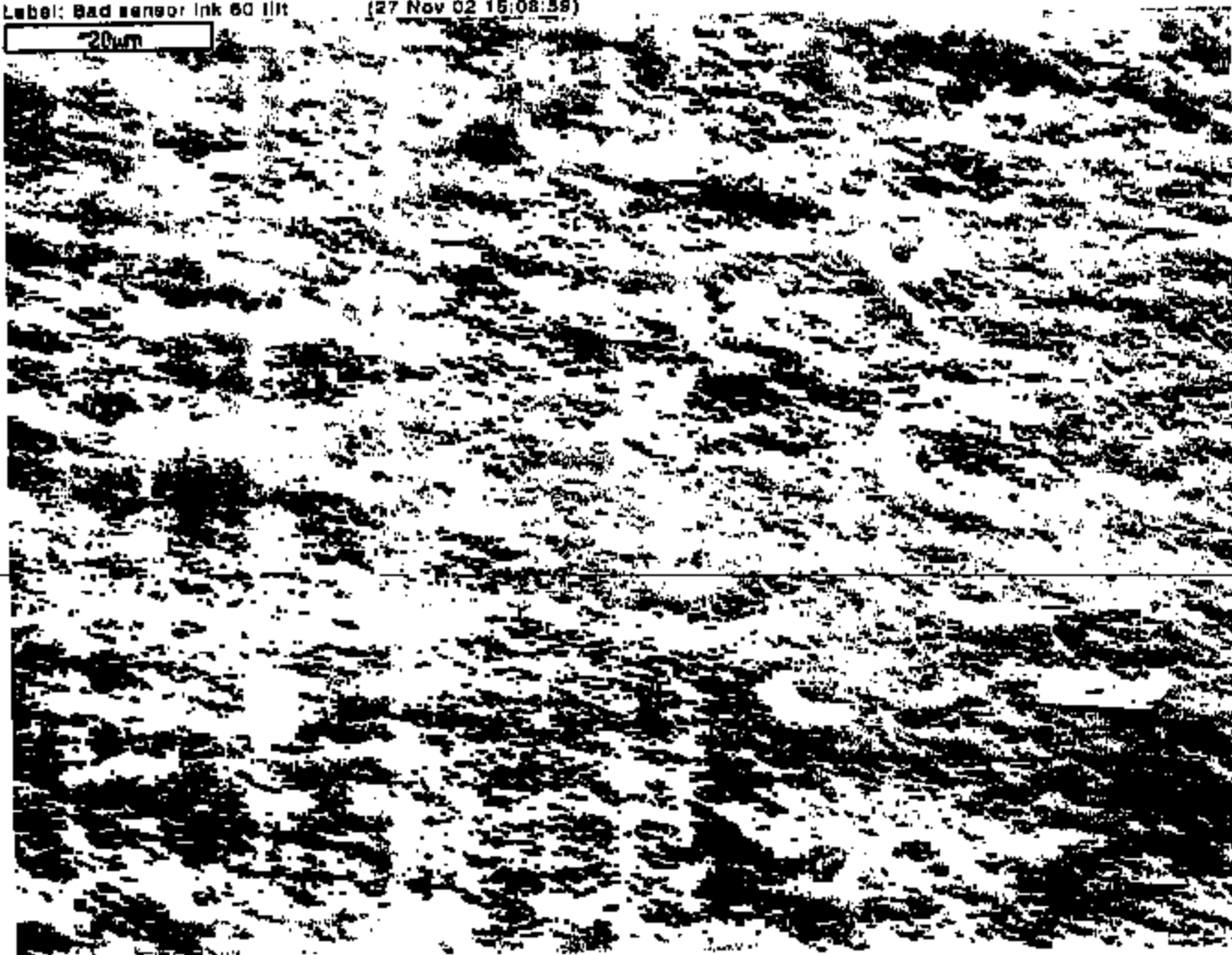
P03-044 19814

Operator: Steve Simko  
Client: none  
Job: Throttle control sensor  
Res: Ultralins  
Label: Bad sensor Ink 60 IIII wear area (27 Nov 02 15:12:54)



PERC-044 10810

Operator: Steve Simko  
Client: none  
Job: Throttle control sensor  
Res: Ultrafine  
Label: Bad sensor Ink 60 lit (27 Nov 02 15:08:59)



PERO-844 18018

Operator: Steve Simko  
Client: none  
Job: Throttle control sensor  
Res: Ultrafine  
Label: Good sensor ink 50 tll

(27 Nov 02 15:05:40)

20µm

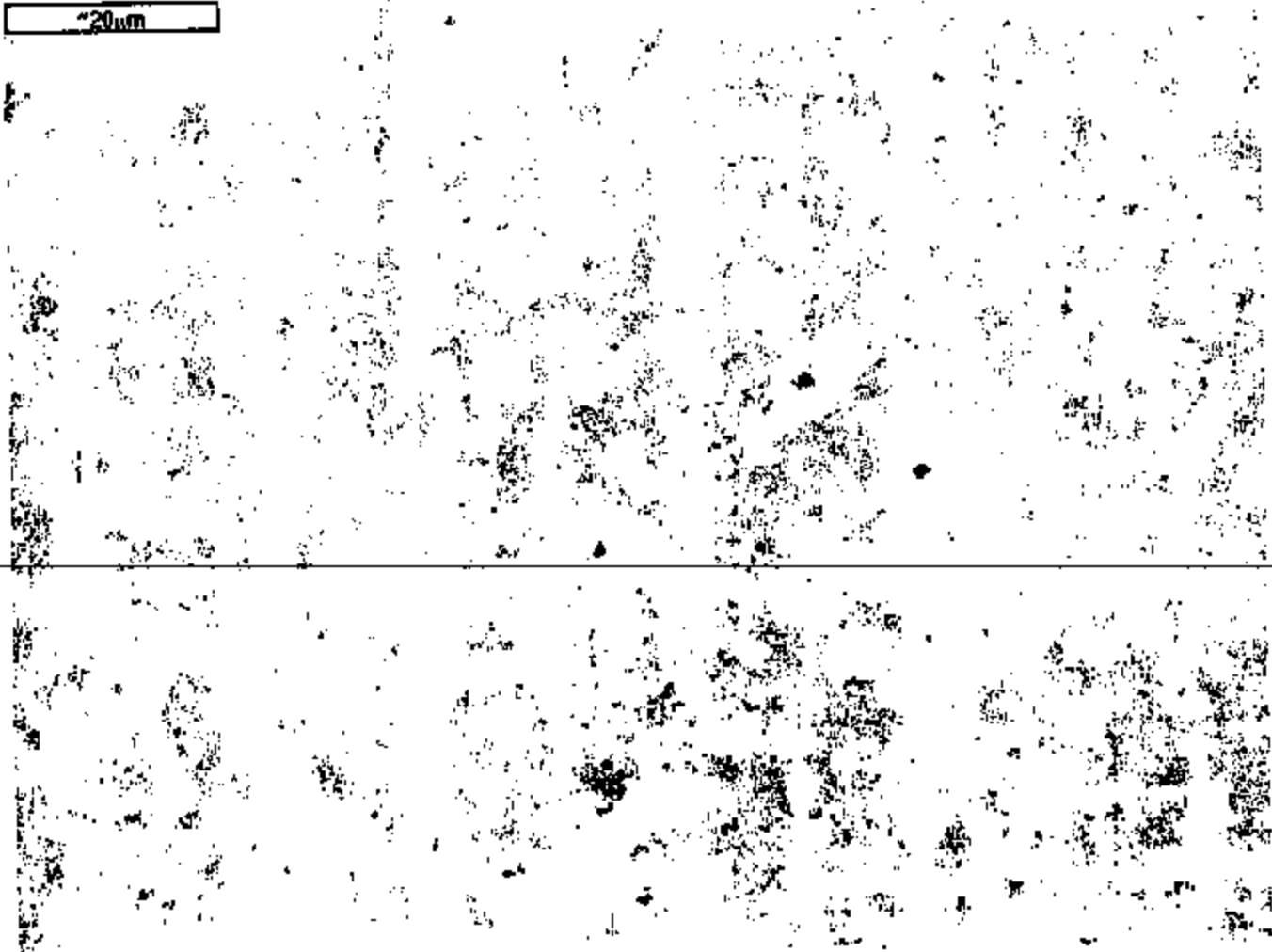


PC02-044 18917

Operator: Slava Simko  
Client: none  
Job: Throttle control sensor  
Res: Ultraline  
Label: Good sensor Ink

(27 Nov 02 15:02:20)

20µm




PERC-044 100218

Operator: Steve Simko  
Client: none  
Job: Throttle control sensor  
Res: Ultraline  
Label: Bad sensor ink

(27 Nov 02 14:58:19)

~20µm



PERG-044 18818

Operator: Steve Simko

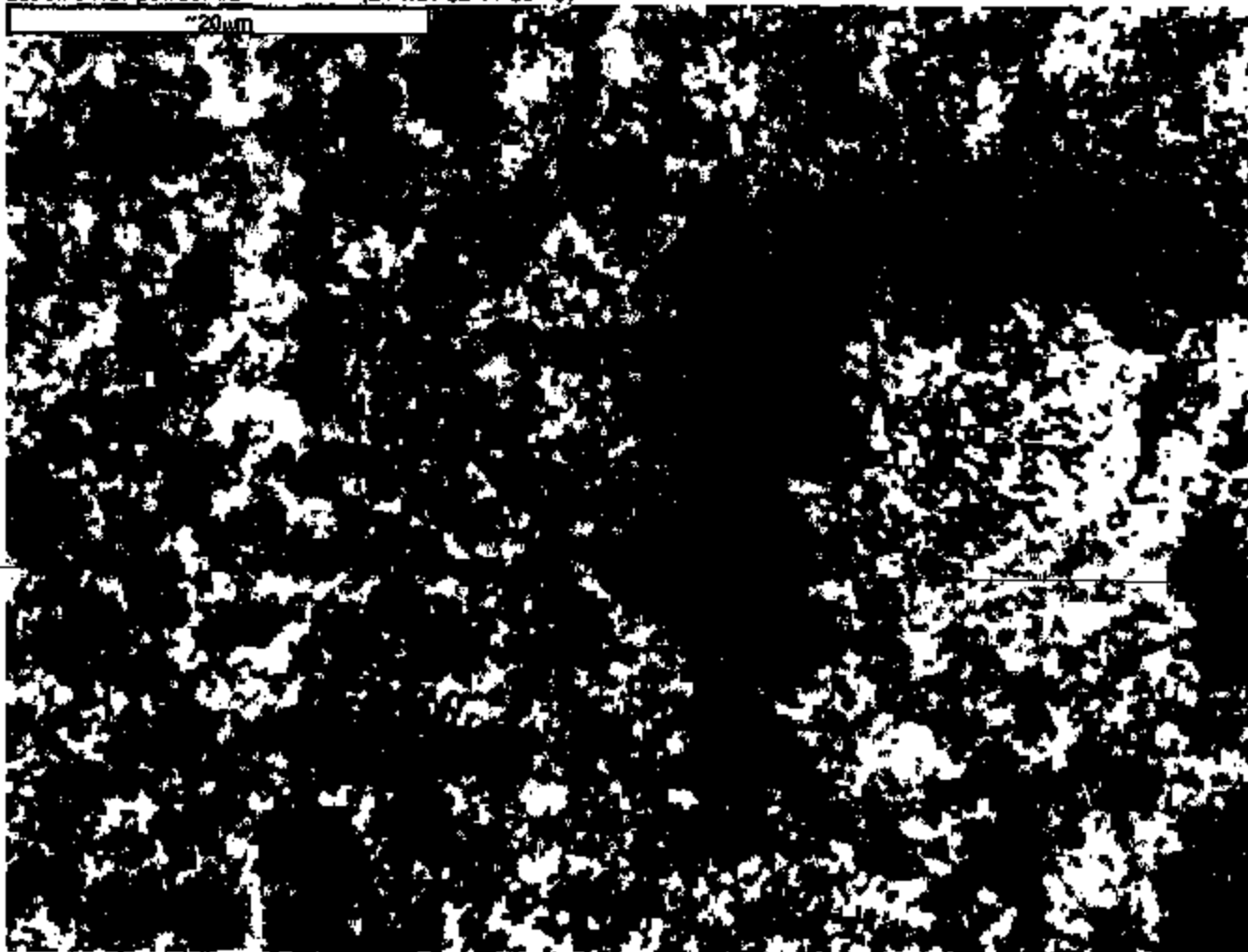
Client: [REDACTED]

Job: ETC sensors

Ree: Ultrafine

Label: silver powder #2

(21 Nov 02 11:29 '8)



PERC-044 19828



Operator: Steve Simka

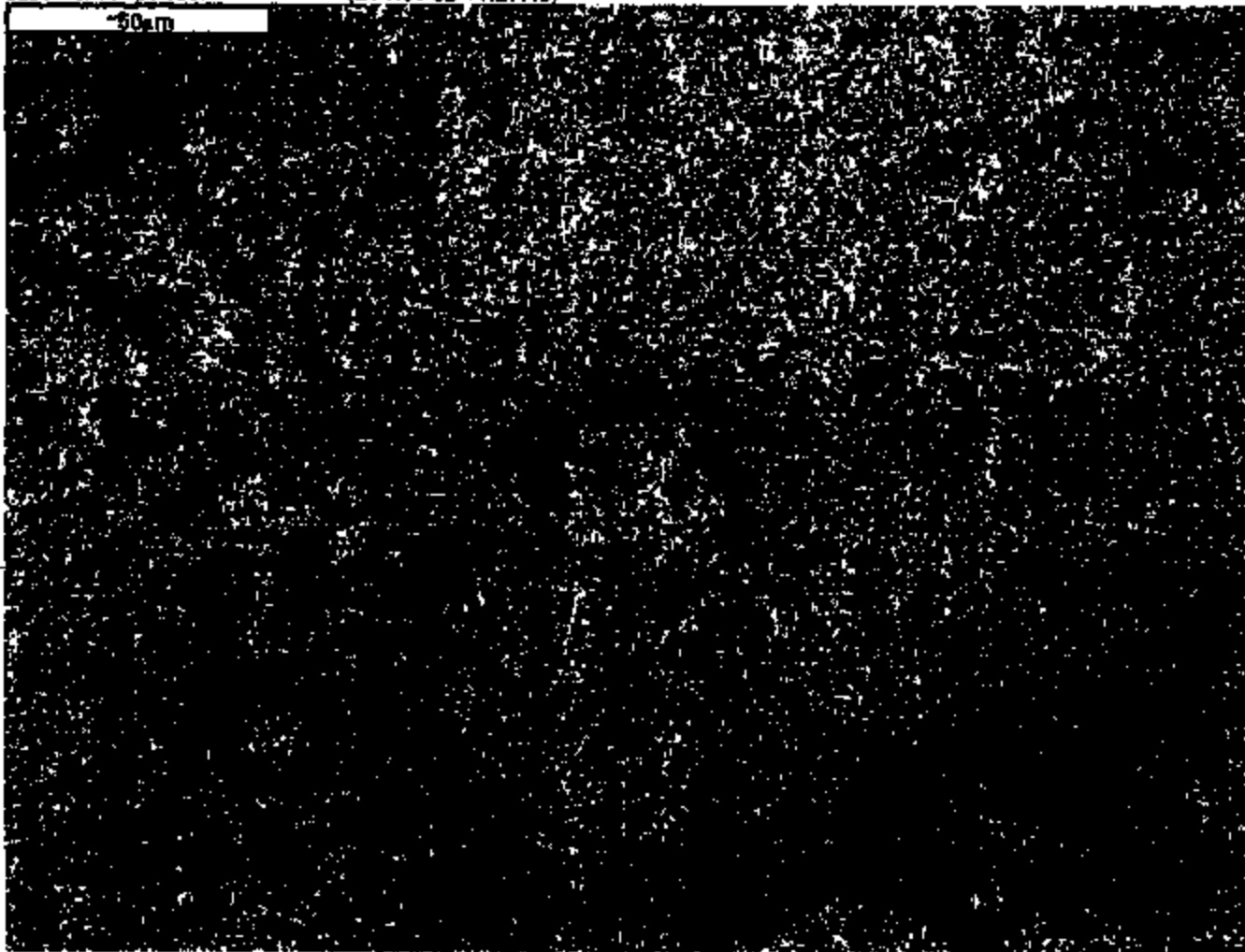
Client: [REDACTED]

Job: ETC sensors

Res: Ultrafine

Label: silver powder

(21 Nov 02 11:27:48)



FD03-044 18821

Operator: Steve Simko  
Client: [REDACTED]  
Job: ETC sensors  
Res: Ultrafine  
Label: silver flake for ETC

(21 Nov 02 11 13:05)

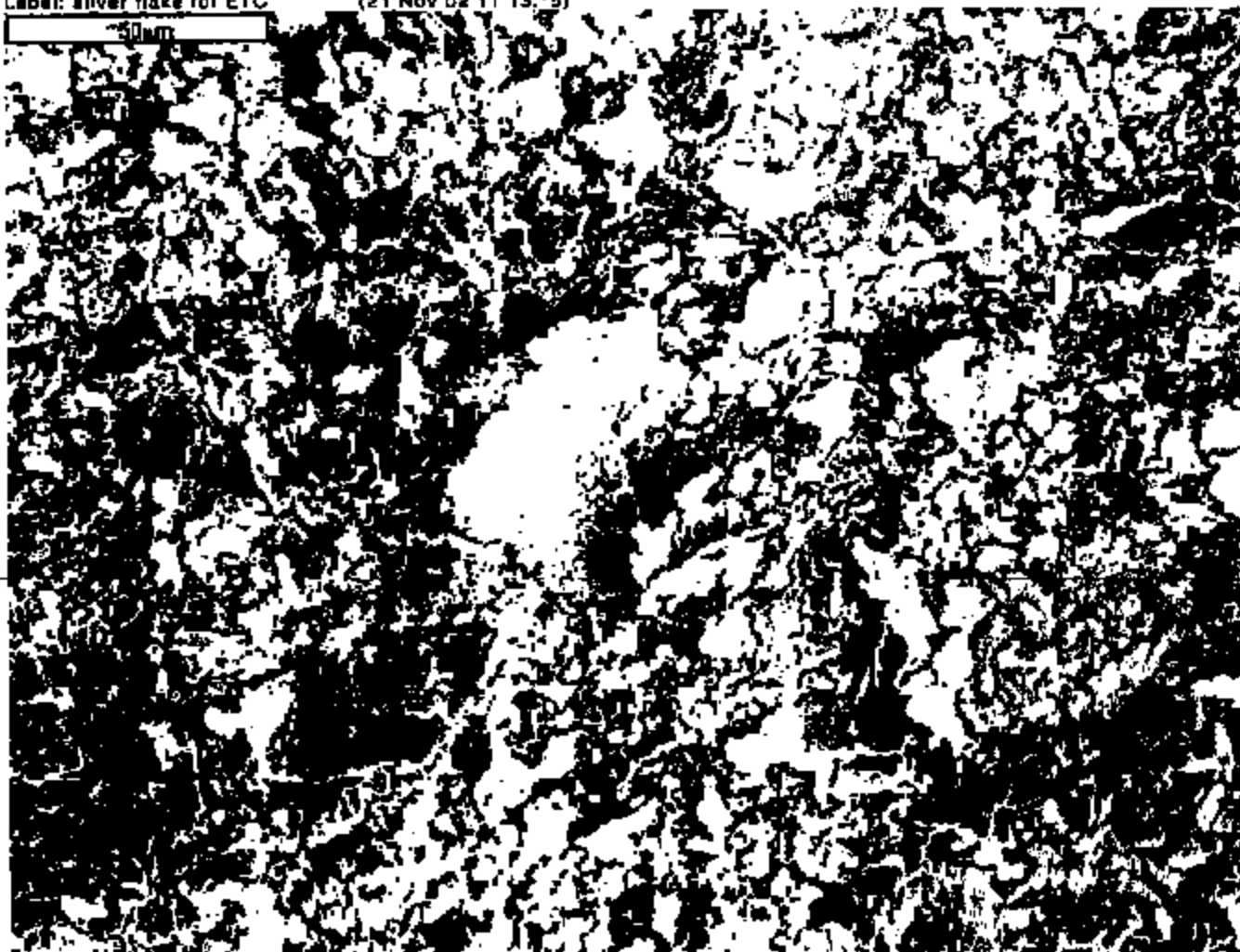
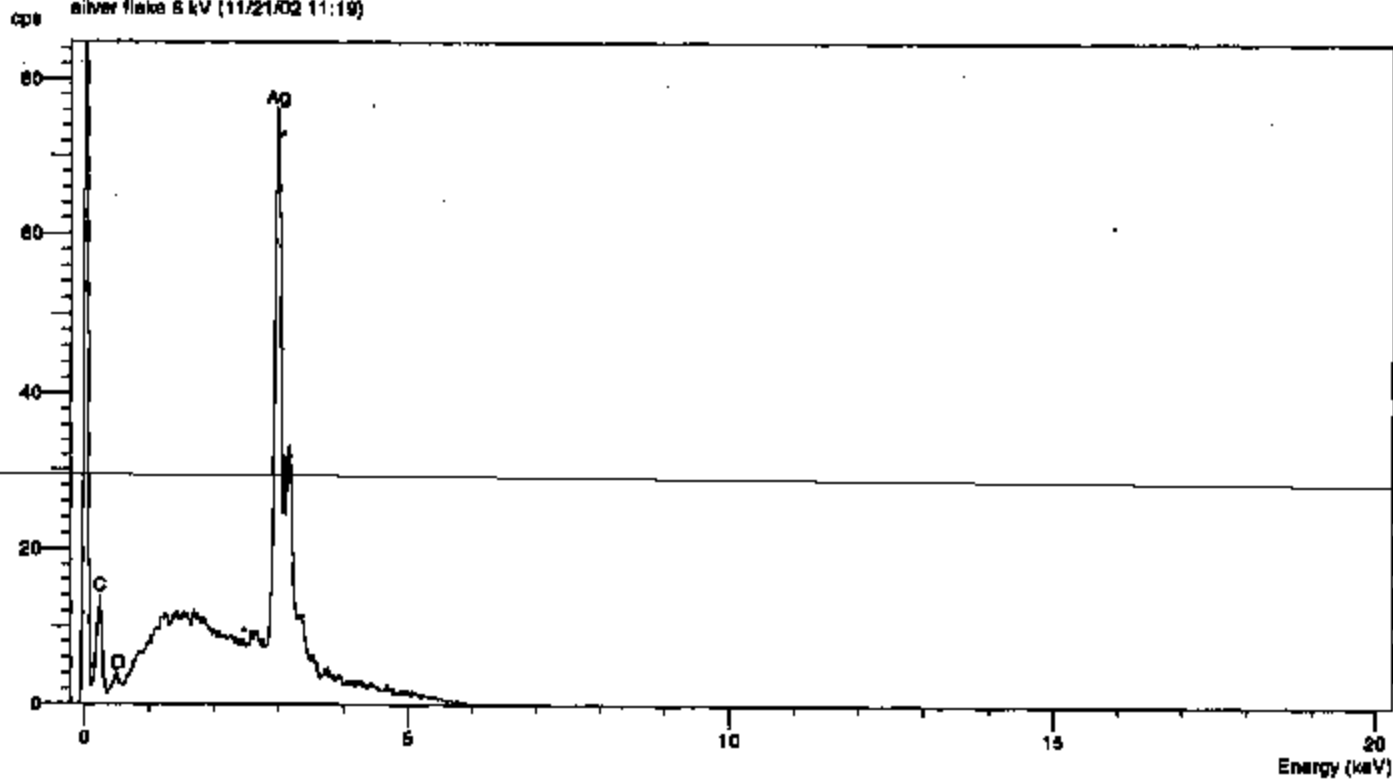


PHOTO-044 150222

Operator: Steve Simko  
Client: [REDACTED]  
Job: ETC sensors  
silver flake 5 kV (11/21/02 11:19)



PS&S-044 18023

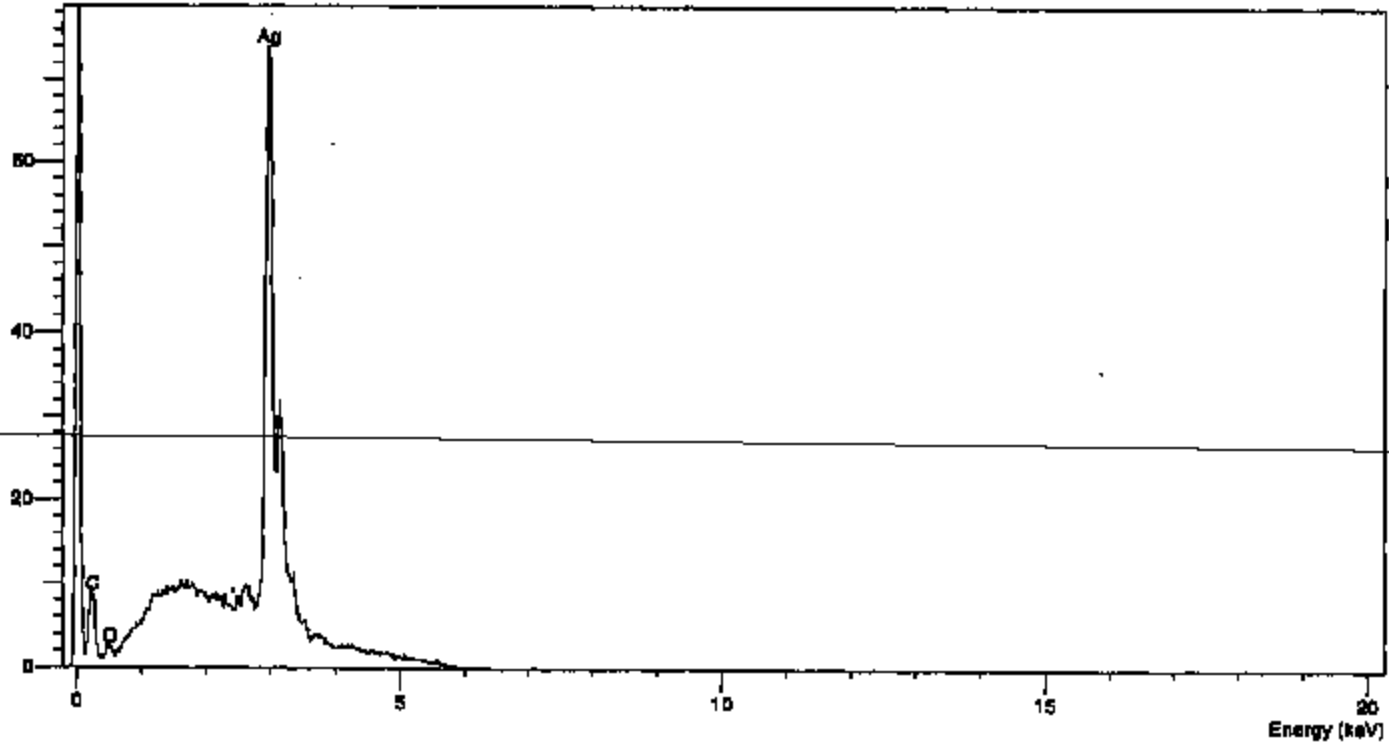
Operator : Steve Simko

Client : ██████████

Job : ETC sensors

silver powder 5 kV (11/21/02 11:02)

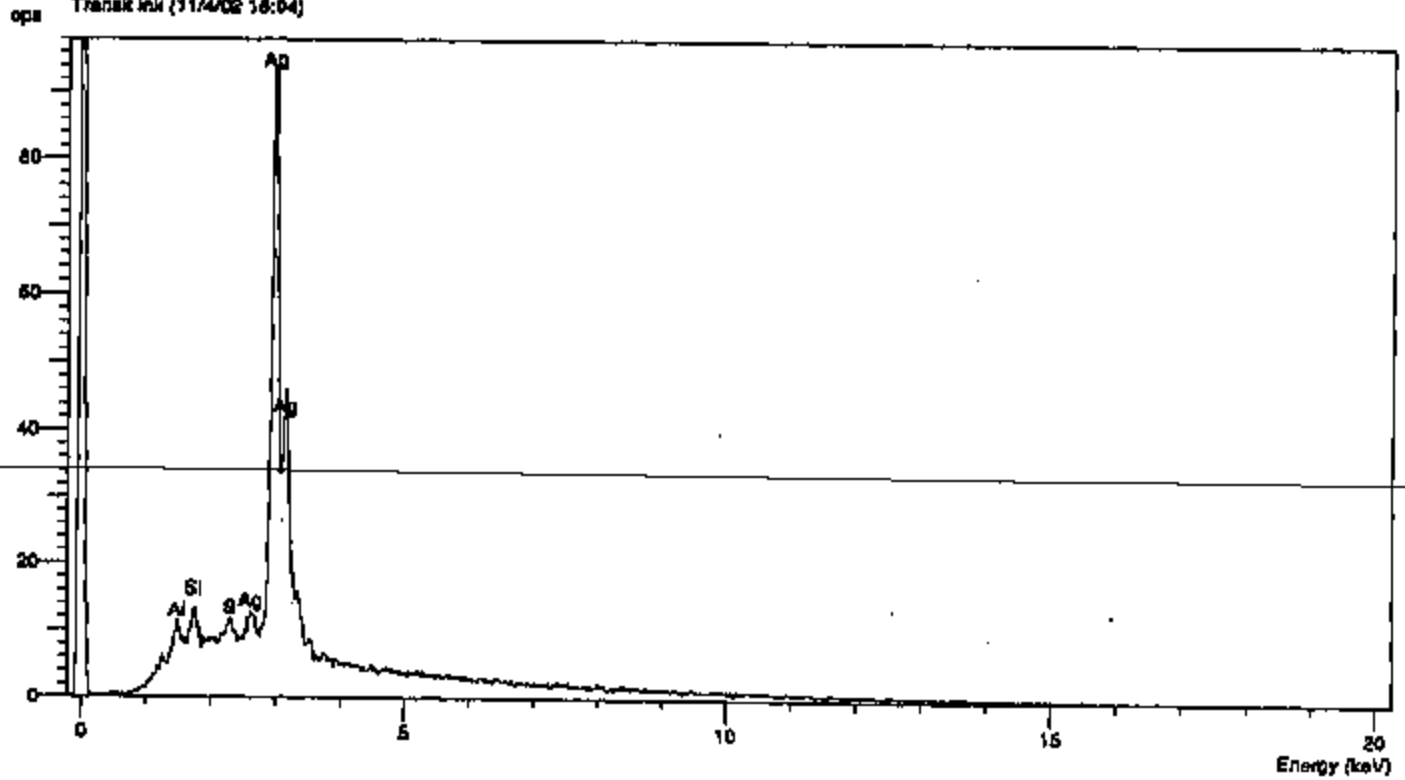
cps



PERC-004 10024

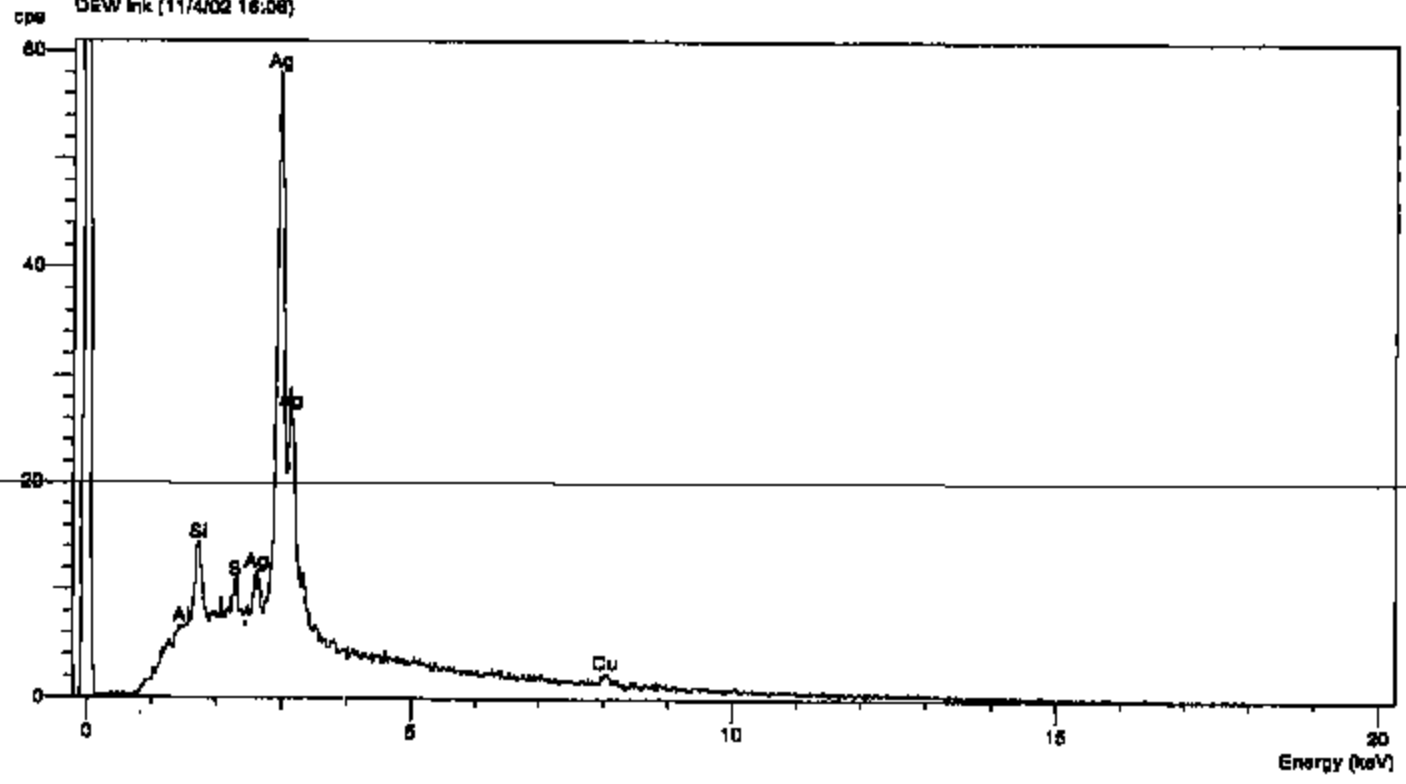
END

Operator: Eeva Simko  
Client: [REDACTED]  
Job: ETC analysis  
Transit ink (11/4/02 16:04)



7583-844 15825

Operator: Steve Simko  
Client: [REDACTED]  
Job: ETC sensors  
DEW Ink (11/4/02 16:08)



82261 440-0834

Operator: Steve Simko

Client: [REDACTED]

Job: ET [REDACTED]

Res: Ultrafine

Label: DEW trace #2 area 1

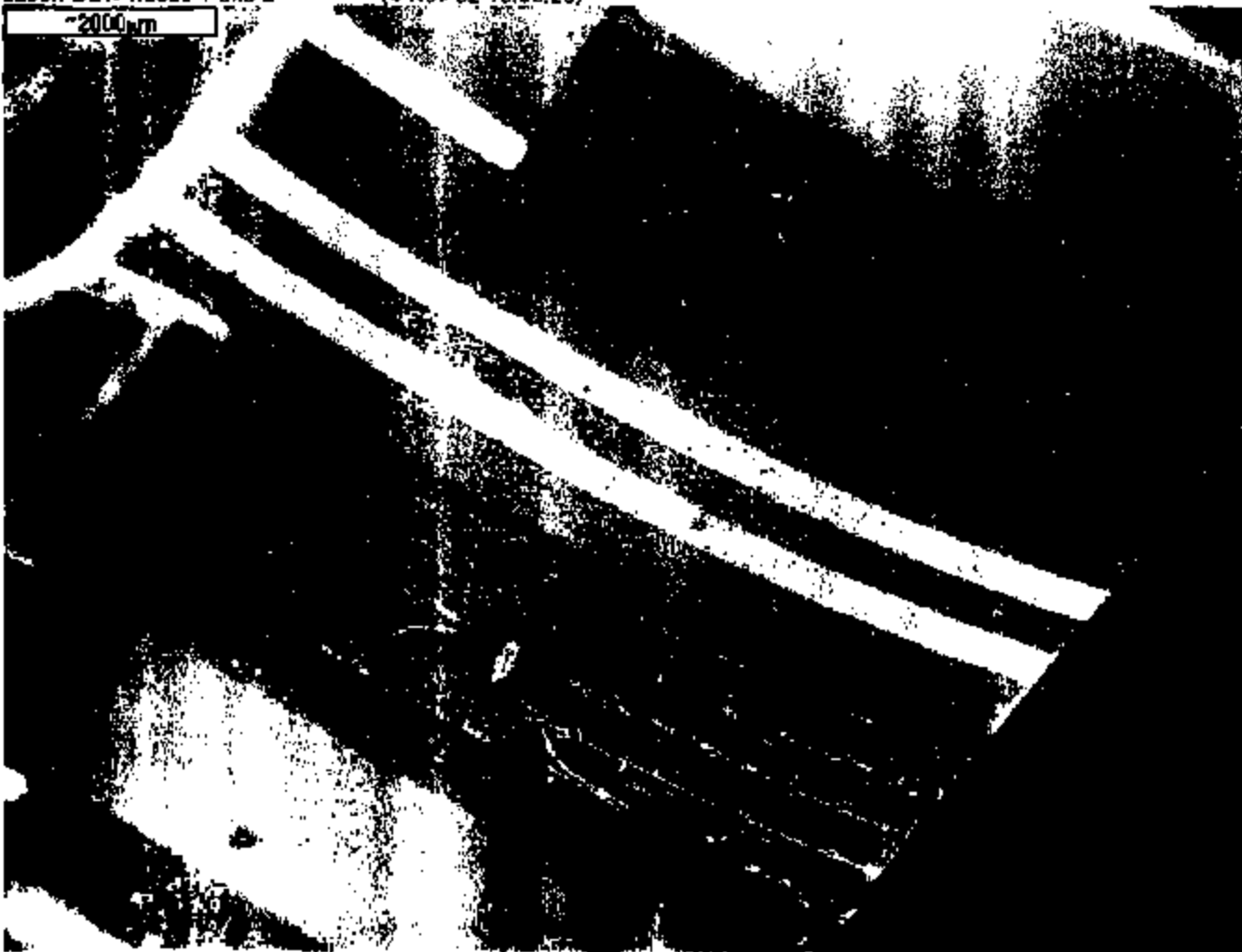
[4 Nov 02 16:14:32]



PHOTO-044 19827

Operator: Steve Simko  
Client: [REDACTED]  
Job: ETC Sensors  
Ree: Ultraline  
Label: DEW traces 1 and 2

(4 Nov 02 16:20:26)



PER3-04 19826



Operator: Steve Simko  
Client: ██████████  
Job: ETC sensors  
Ree: Ultrafine  
Label: DEW trace 2 ill area 1 (4 Nov 02 16:26:26)



PERC-944 150228

RM. 1H-666 ETC Pedal Sensor 10/29

Non Gauge/contact 221 systems Release Engineer  
Guam Bai/05 221 " " "

6 KLT failures / 7 pass 13 total  
6 failures in sideload test  
group 1; 4 failed / 2 passed; group 2; 2 failed / 4 still under test  
Some failures high  
" " low

KLT

up to 2M cycles Temp. changes humidity / cycling  
over 2M cycles cycling only

Supplier Teleflex

only 3 tracks 1 is pickup; one is resistance

same ink for all 6 contacts different ink supplier  
than previous

DEV; P221 same contacts + materials

different lever arms

5V or less arcing not likely  
max.

~ 1 mA max current

Track 1 is measurement track

Track 2 is back up

Track 3 is for comparison only

track 1 compared to 3

if failure; track 2 is compared to 3

Compare track 1 to 3

2 to 3

1 to 2

DEW durability part; failed

Made in Mexicali

3-track Wabash sensor

Nye is the supplier

Pedal Position Sensor

Greg

P 131

NYE tubes for grease

706 D ??

RTV used for sealing

Teleflex makes switch

Wabash makes ink + ceramic

Ink comp. proprietary?

1500<sub>so far</sub> 2002

Excursion

fail

P-131 250, 350, 450

125-150/failure

P-221 F-150

6-12 mis

0-5V

~1mA

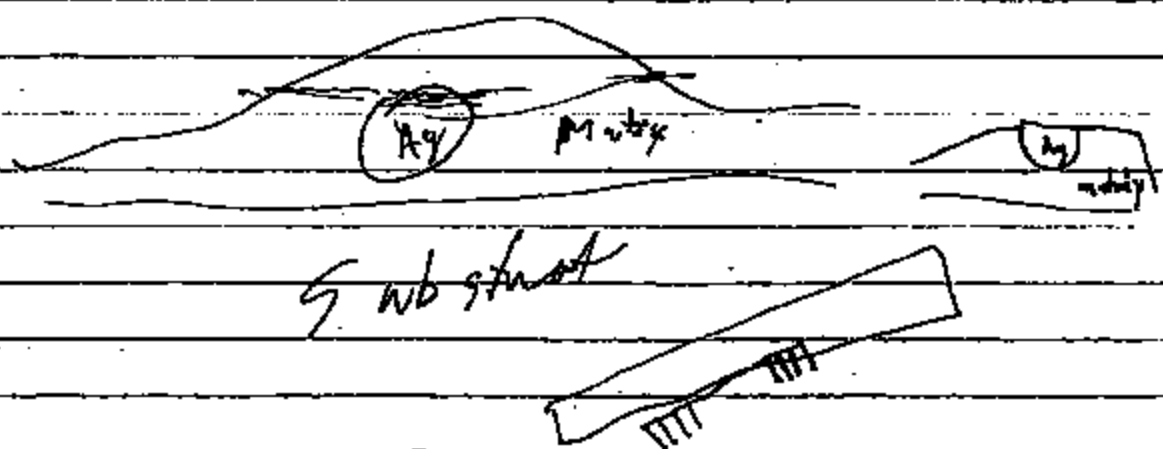
1. Is tube getting on

what is getting on ink?

2

Nano indenter see Leby

1. DEW fingers look fine. Wear is trace wear.
2. Drastically different wear on DEW ~~finger~~ <sup>traces</sup>
3. Wear appears mechanical. (No electrical wear)
4. ~~Wear is trace wear~~ Mild wear on all transit
5. Initial wear is damage to rough high ~~spots~~ <sup>spots</sup>
6. Chemistry some material transfer from fingers to flat



Operator: Steve Simko

Client: [REDACTED]

Job: ETO sensors

Res: Ultrafine

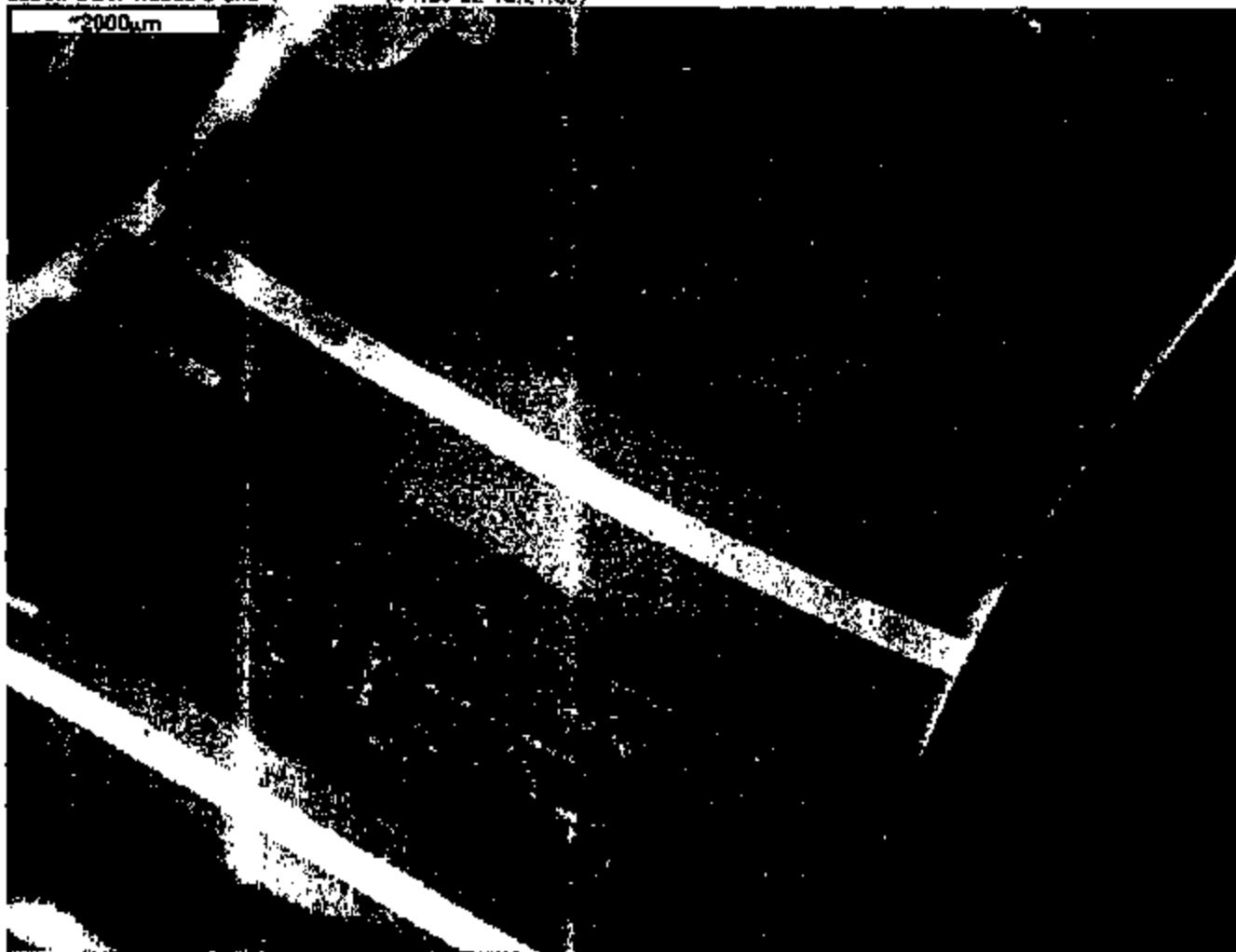
Label: DEW trace 2 tilt area 2 (4 Nov 02 15:27:51)



PERC-044 19934

Operator: Steve Simko  
Client: [REDACTED]  
Job: ETC sensors  
Rea: Ultraline  
Label: DEW traces 3 and 4

(4 Nov 02 16:21:35)



PH3-044 18824

Operator: Steve Simko  
Client: [REDACTED]  
Job: EVO sensors  
Res: Ultraline  
Label: DEW traces 5 and edge of 6 (4 Nov 02 16:22:36)

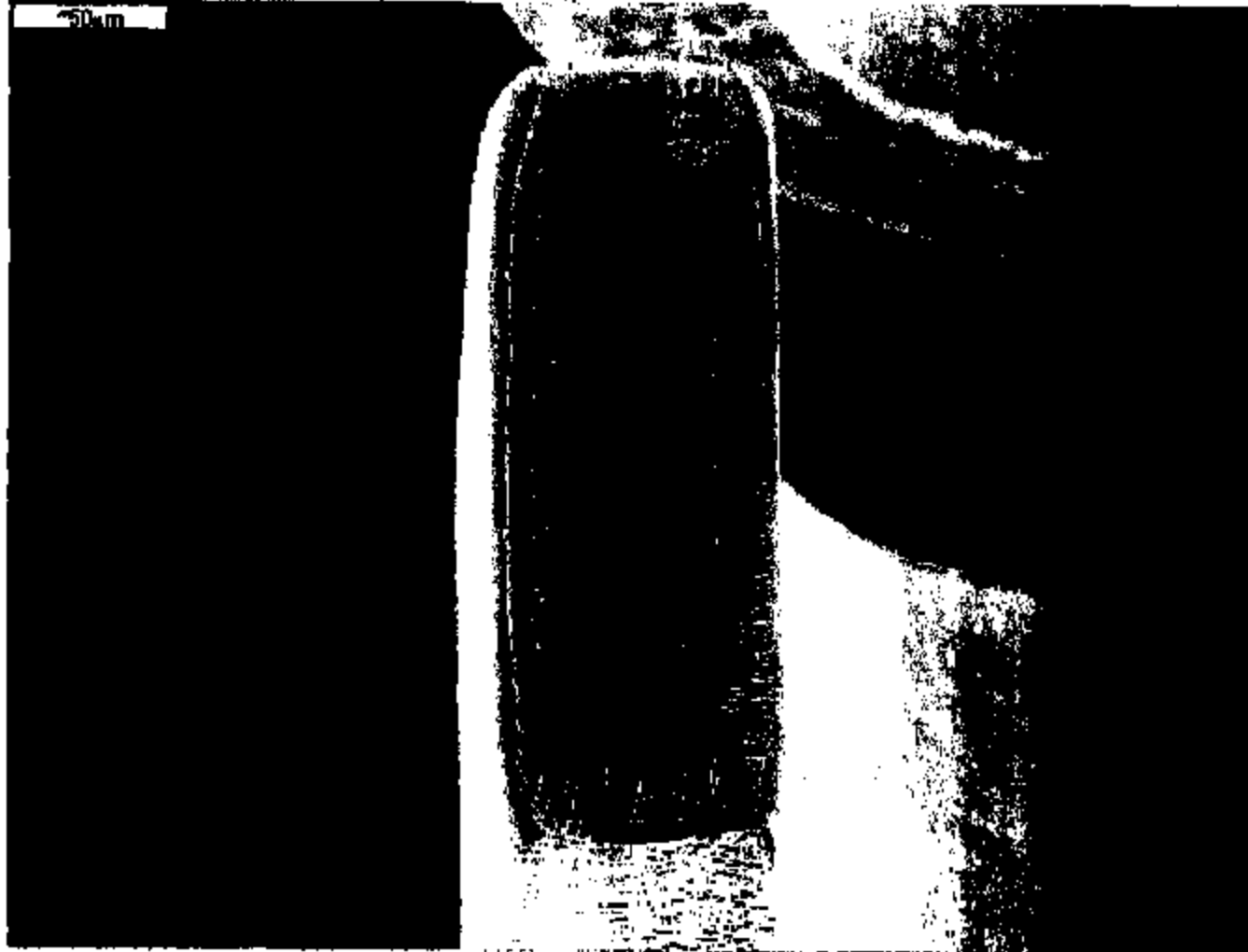


PERO-044 10008



Operator: Steve Cimko  
Client: [REDACTED]  
Job: E  
Res: Ultraline  
Label: DEW (finger trace 1)

(6 Nov 02 15:34:19)



FBI-044 10037

Operator: Steve Simko

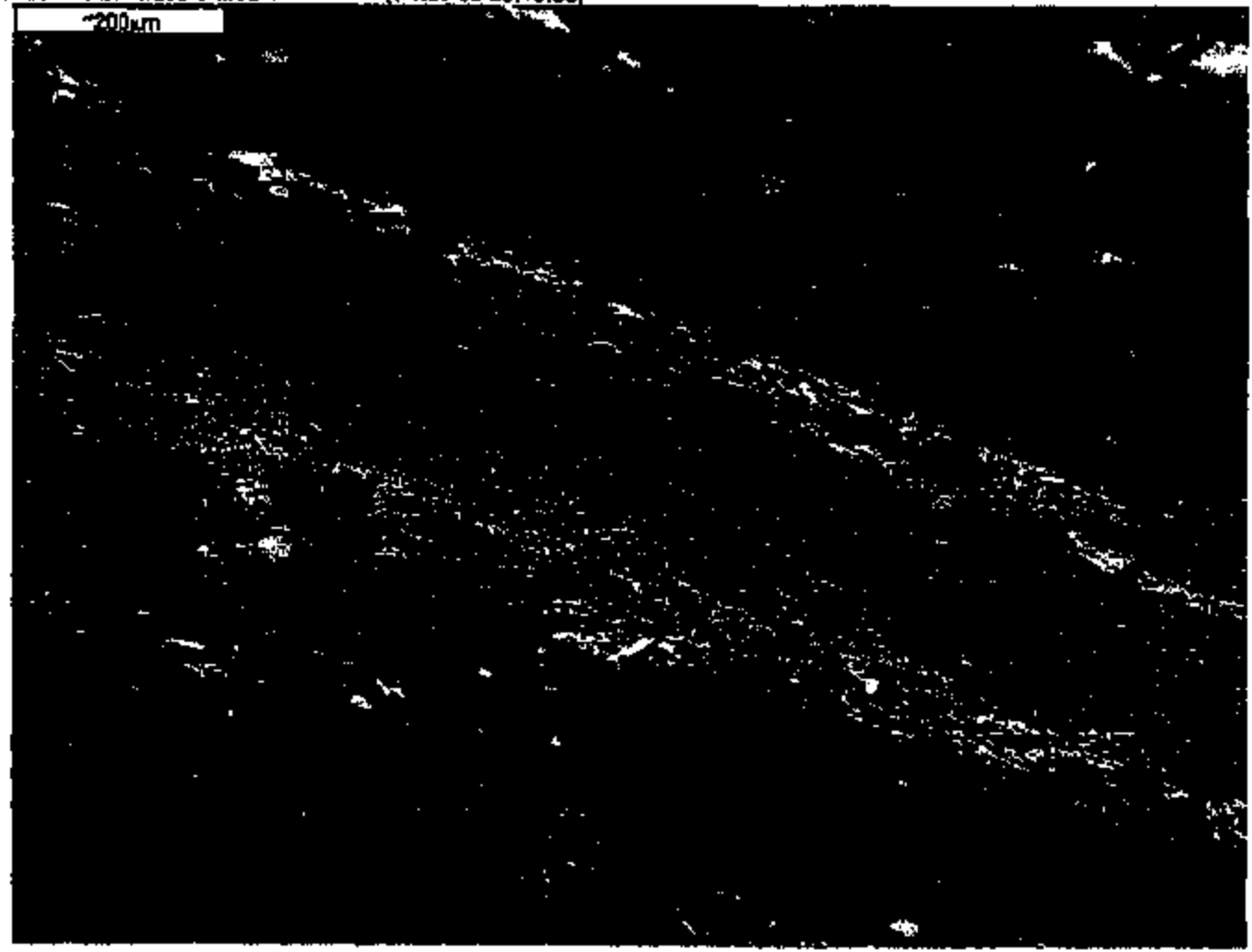
Client: [REDACTED]

Job: ETO sensors

Res: Ultrafine

Label: DEW trace 8 area 1

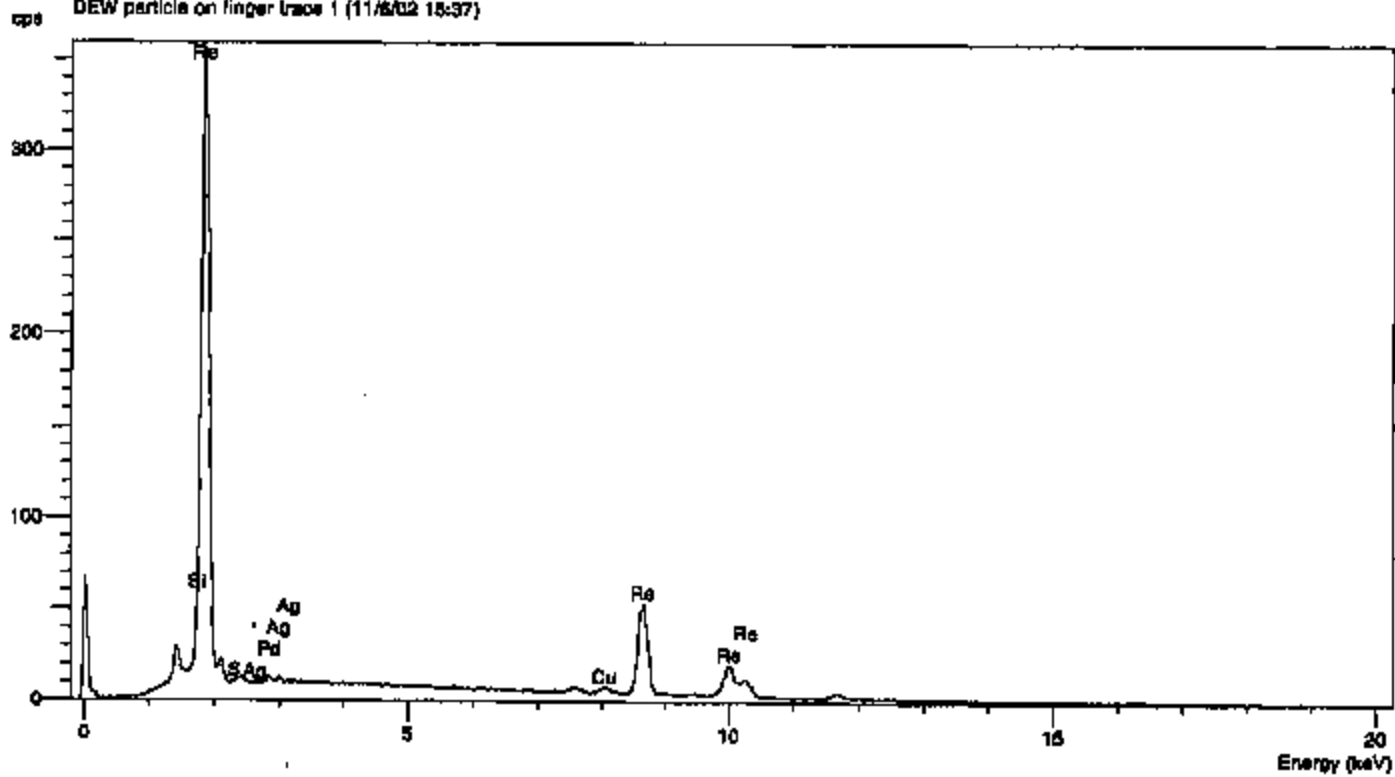
(7 Nov 02 08:13:56)



*Handwritten notes:*  
1  
1  
1  
1

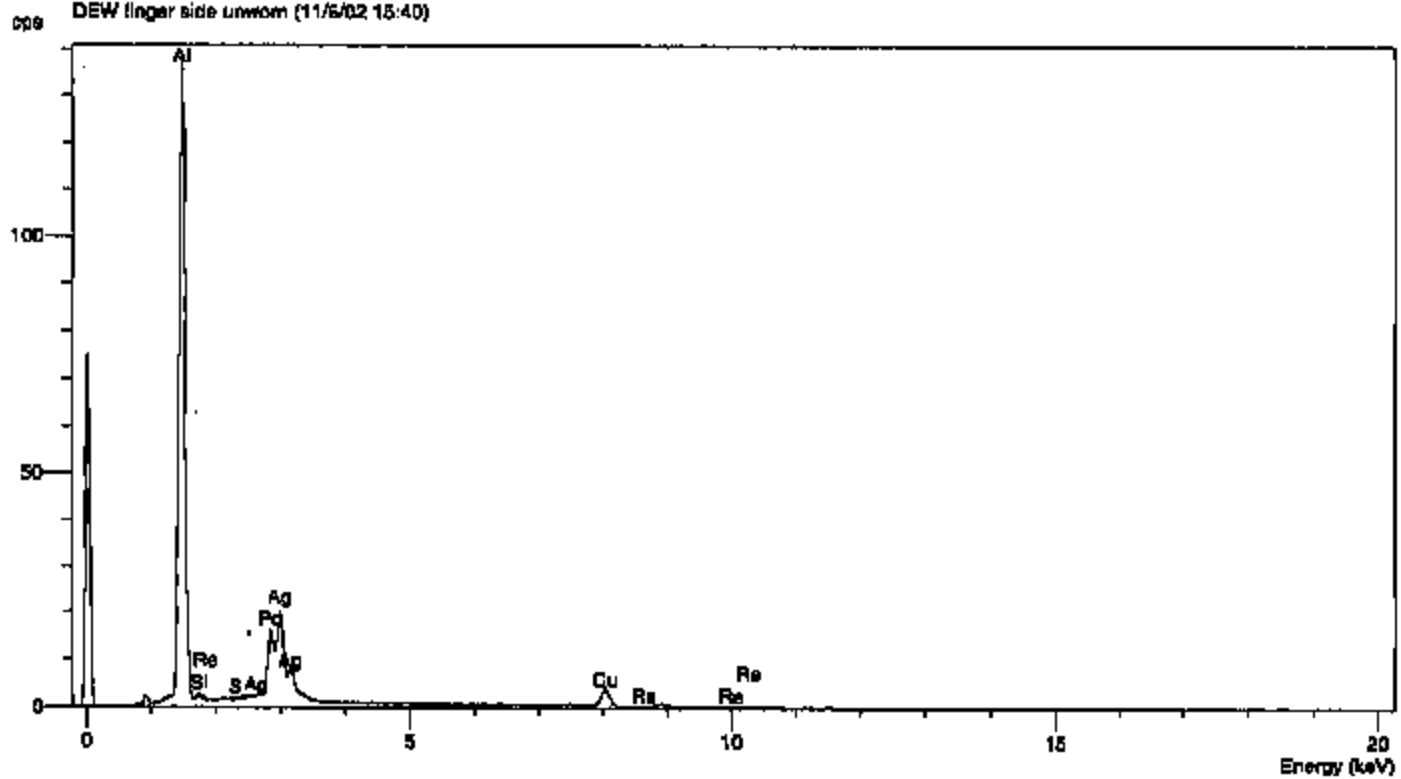
PHOTOGRAPH 19938

Operator: Slava Simko  
Client: [REDACTED]  
Job: ETC sensors  
DEW particle on finger trace 1 (11/6/02 15:37)



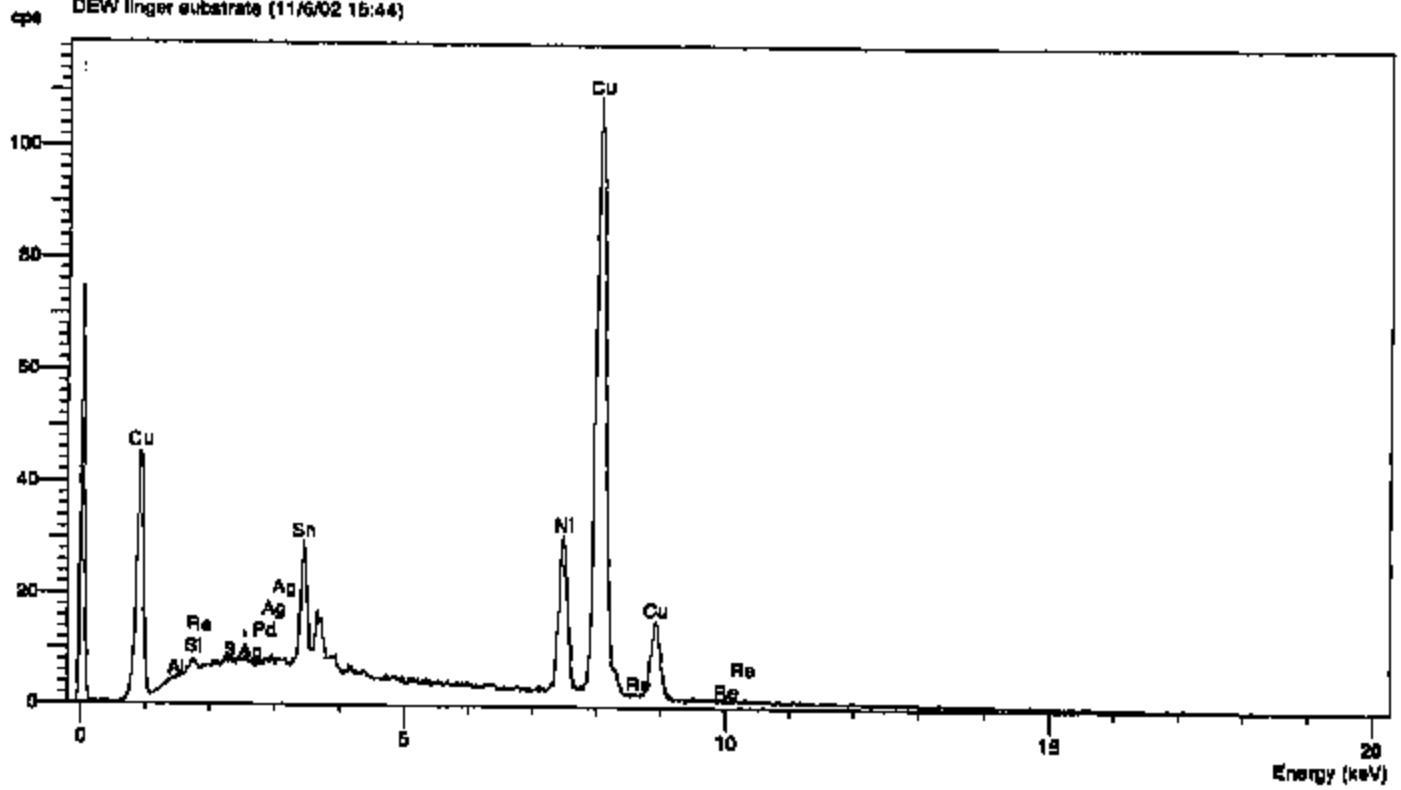
PER-044 19038

Operator: Steve Simko  
Client: [REDACTED]  
Job: ETC sensors  
DEW finger side unworn (11/5/02 15:40)



PL03-044 18048

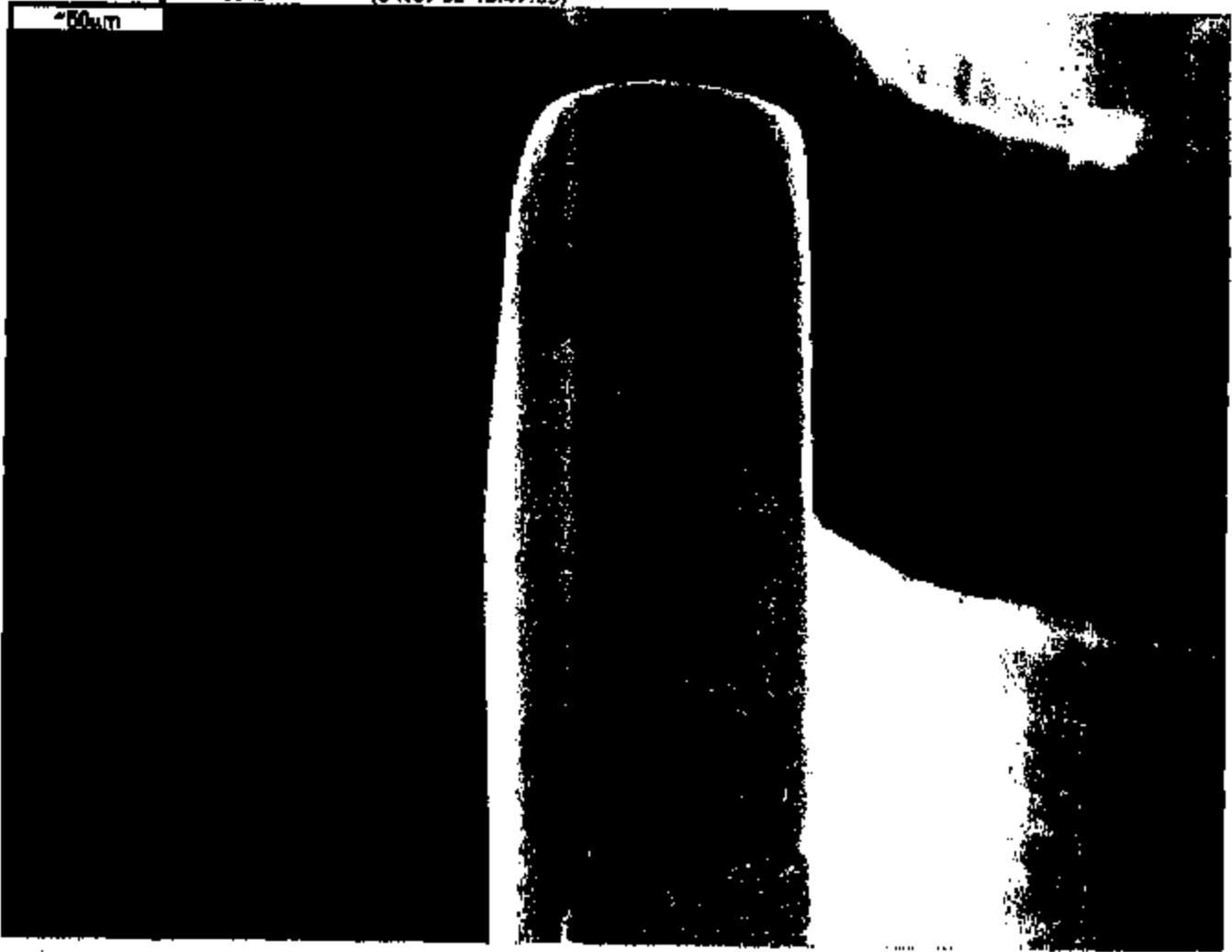
Operator : Steve Simko  
Client : ██████████  
Job : ETC-████████  
DEW finger substrate (11/6/02 15:44)



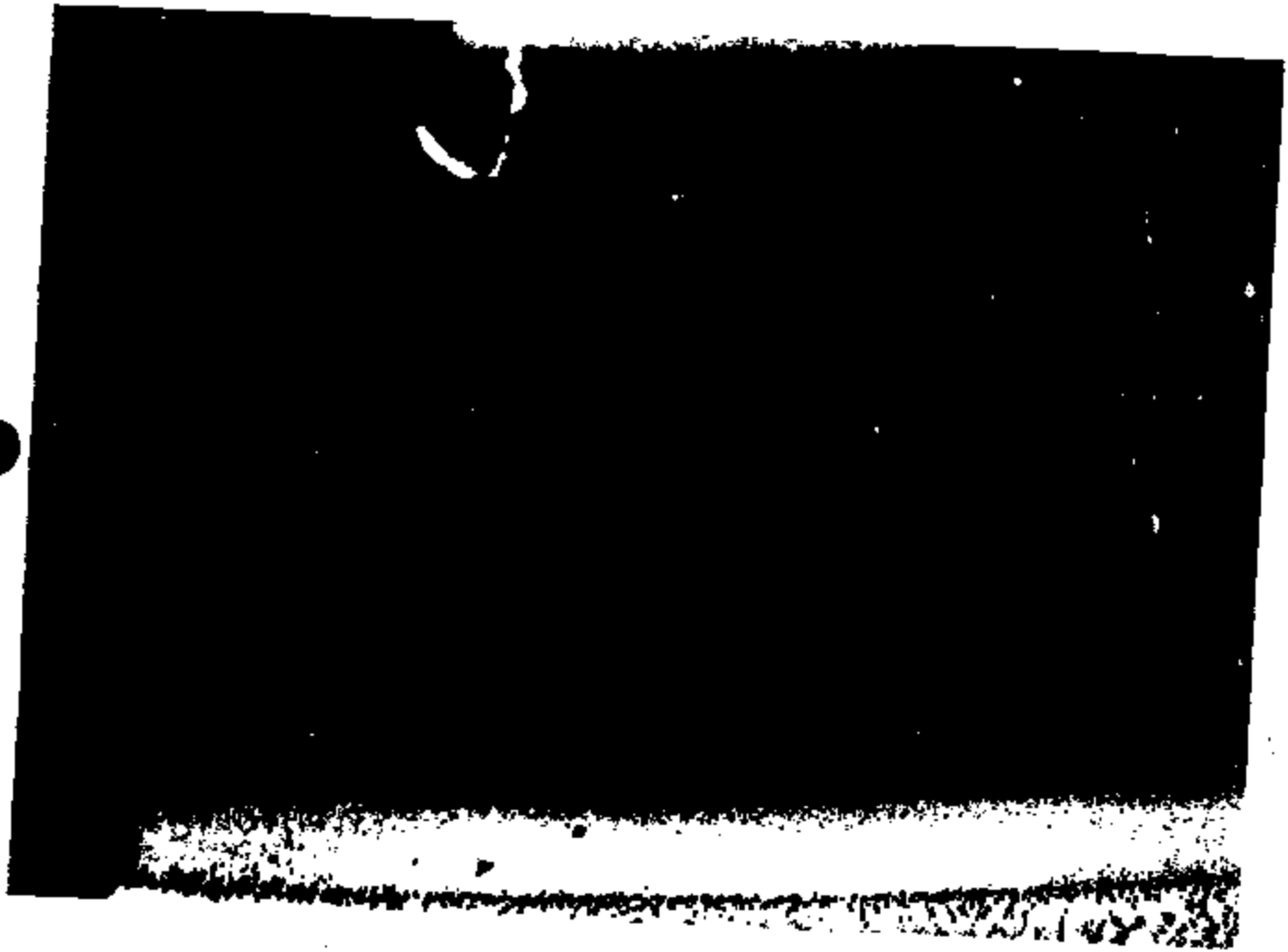
PC93-044 18061

Operator: Steve Simko  
Client: [REDACTED]  
Job: ETD sensors  
Res: Ultrafine  
Label: DEW finger trace 2

(8 Nov 02 15:47:39)



PS33-044 18912



DEW

trace 1



DEW

trace 2





DEW

trace 3



DEW  
trace 4



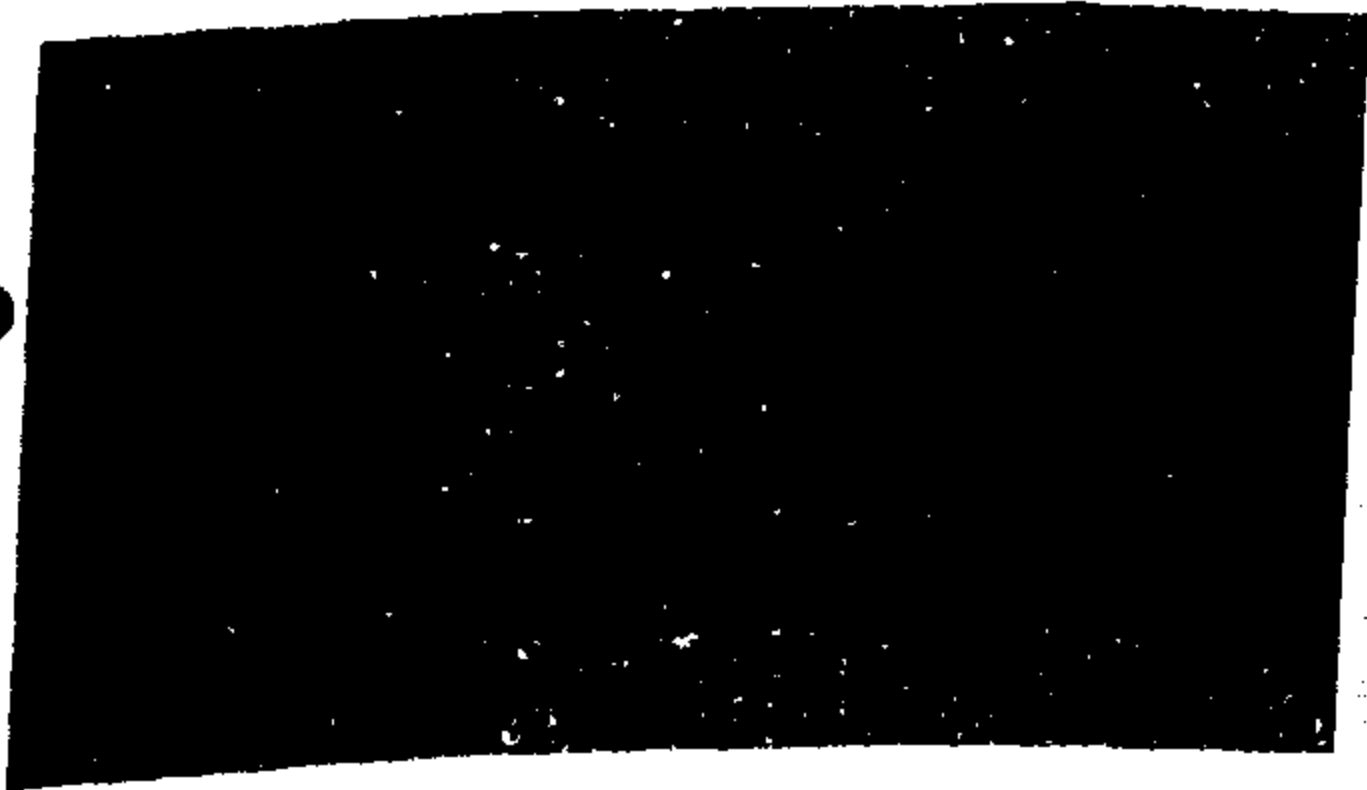
DEW

Trace 5



DEW

trace 6



Transit trace 1



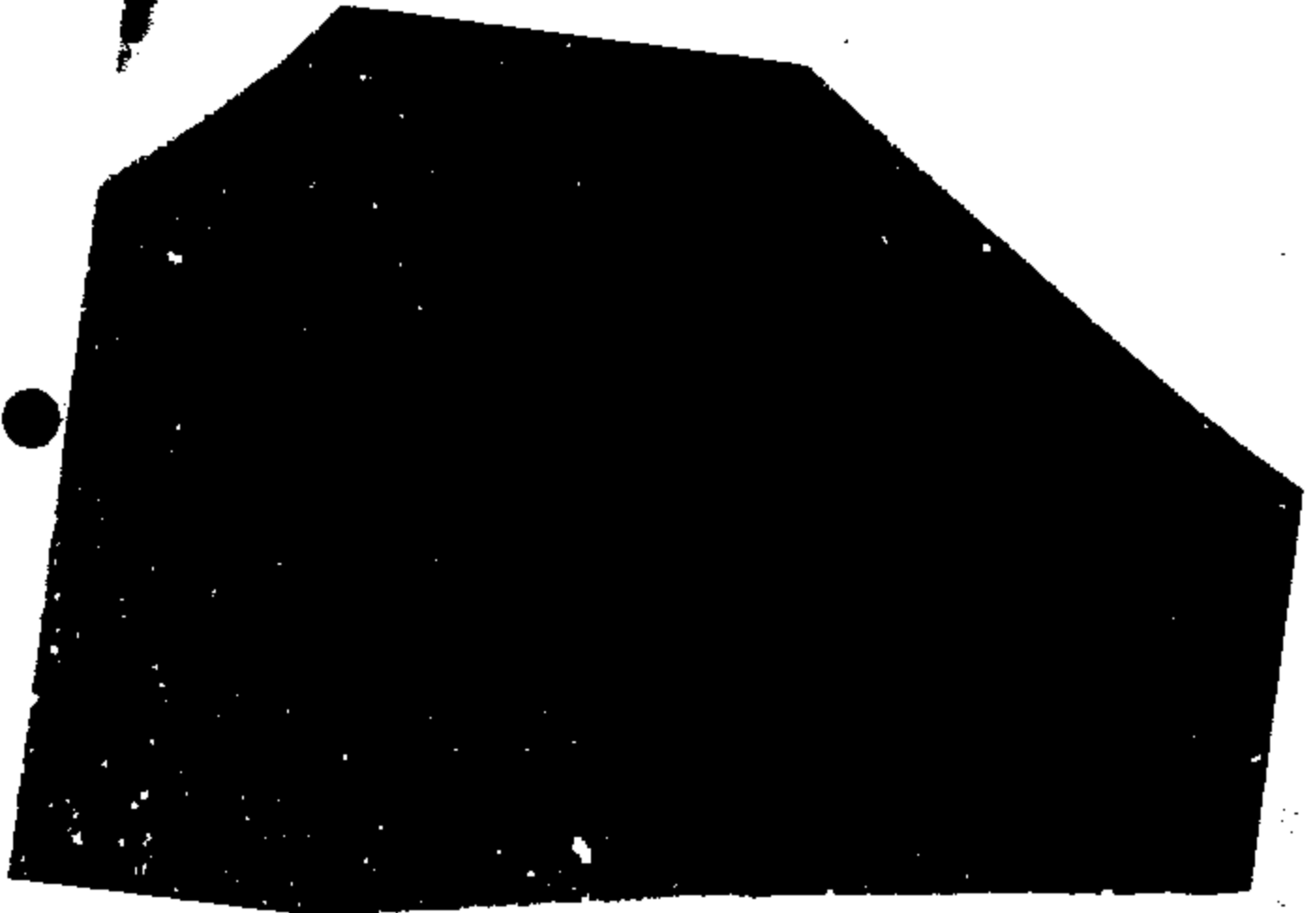


Transit

trace 2

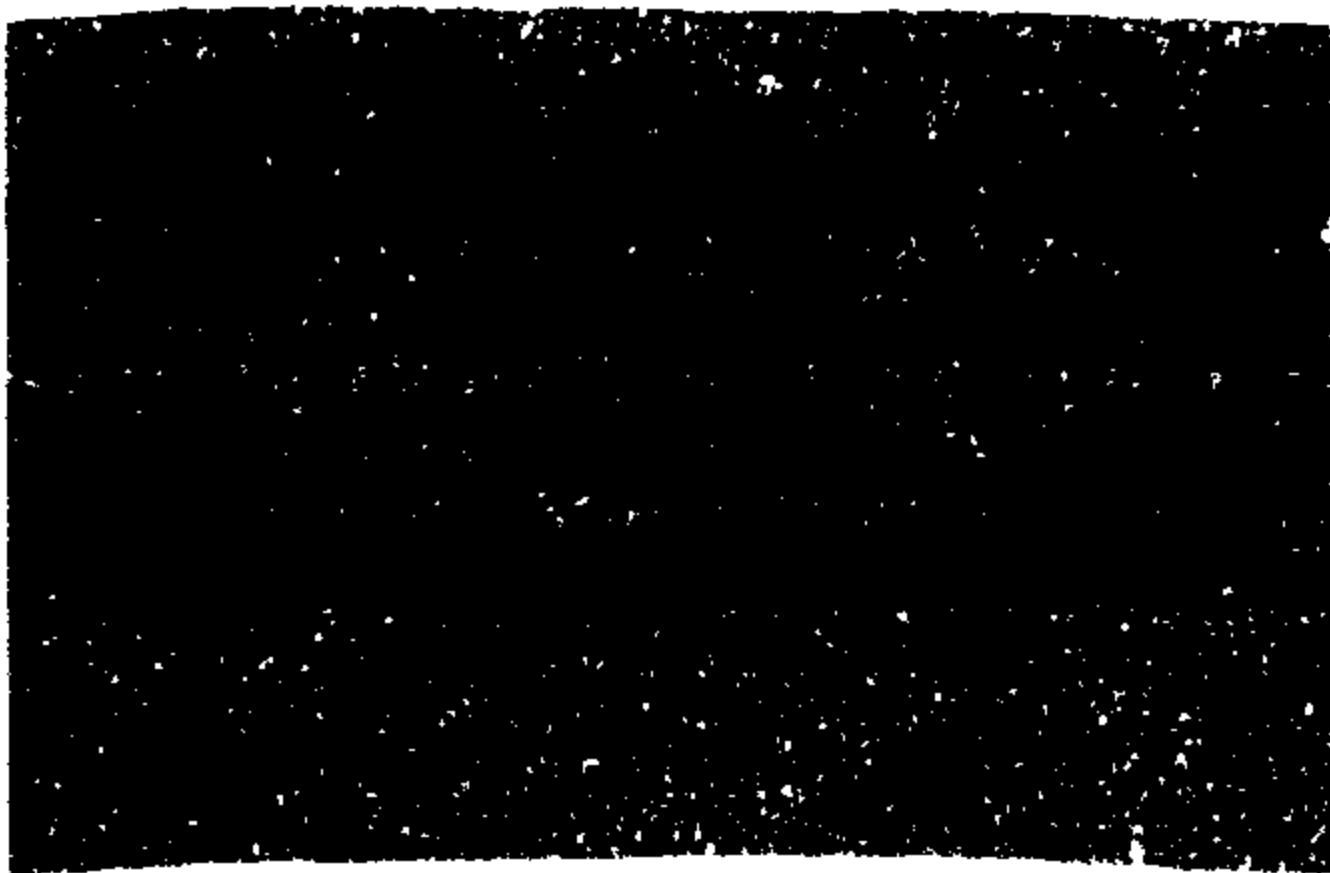


Transit  
trace 3.

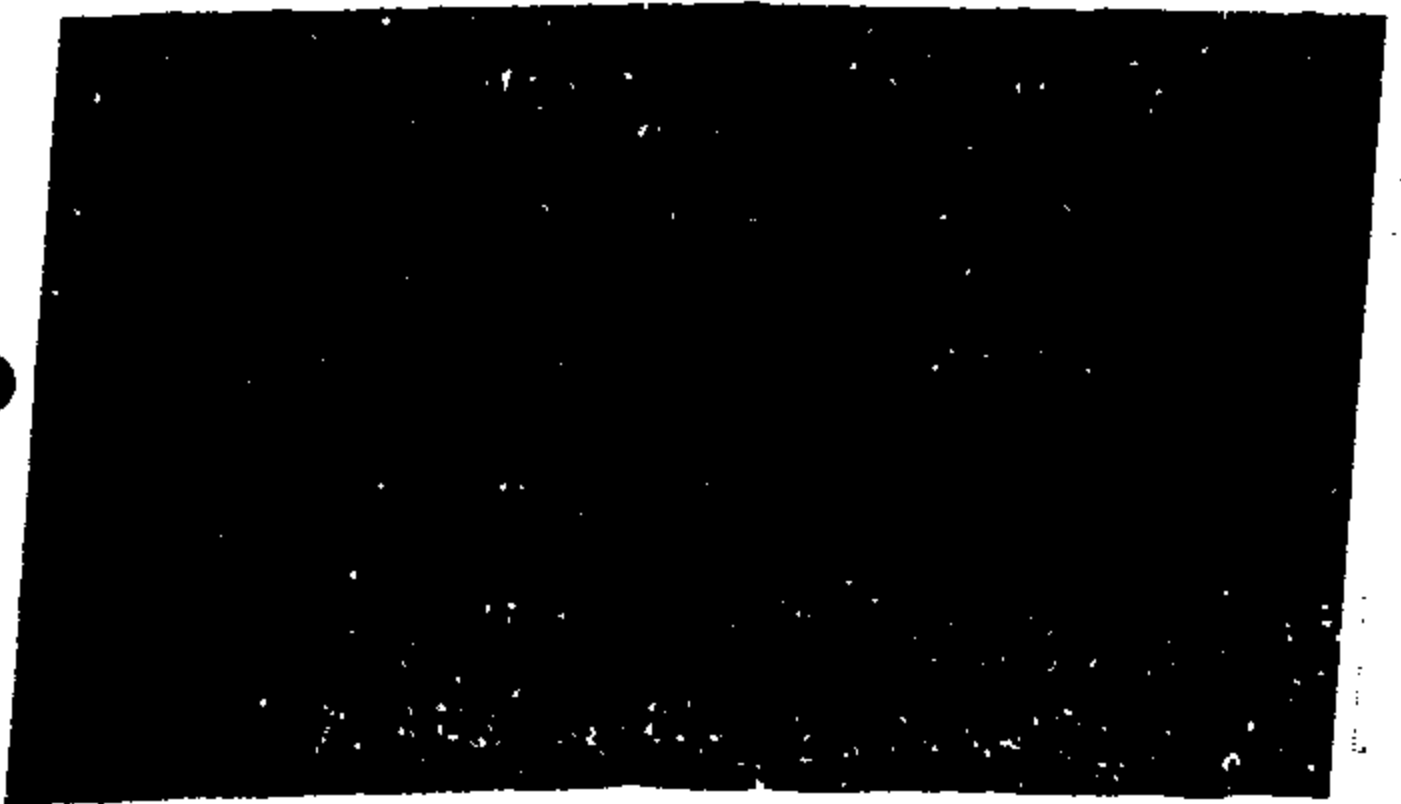


Transit  
trace 4

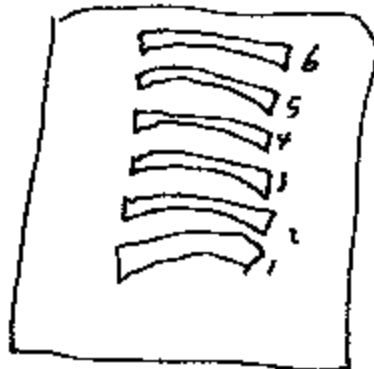


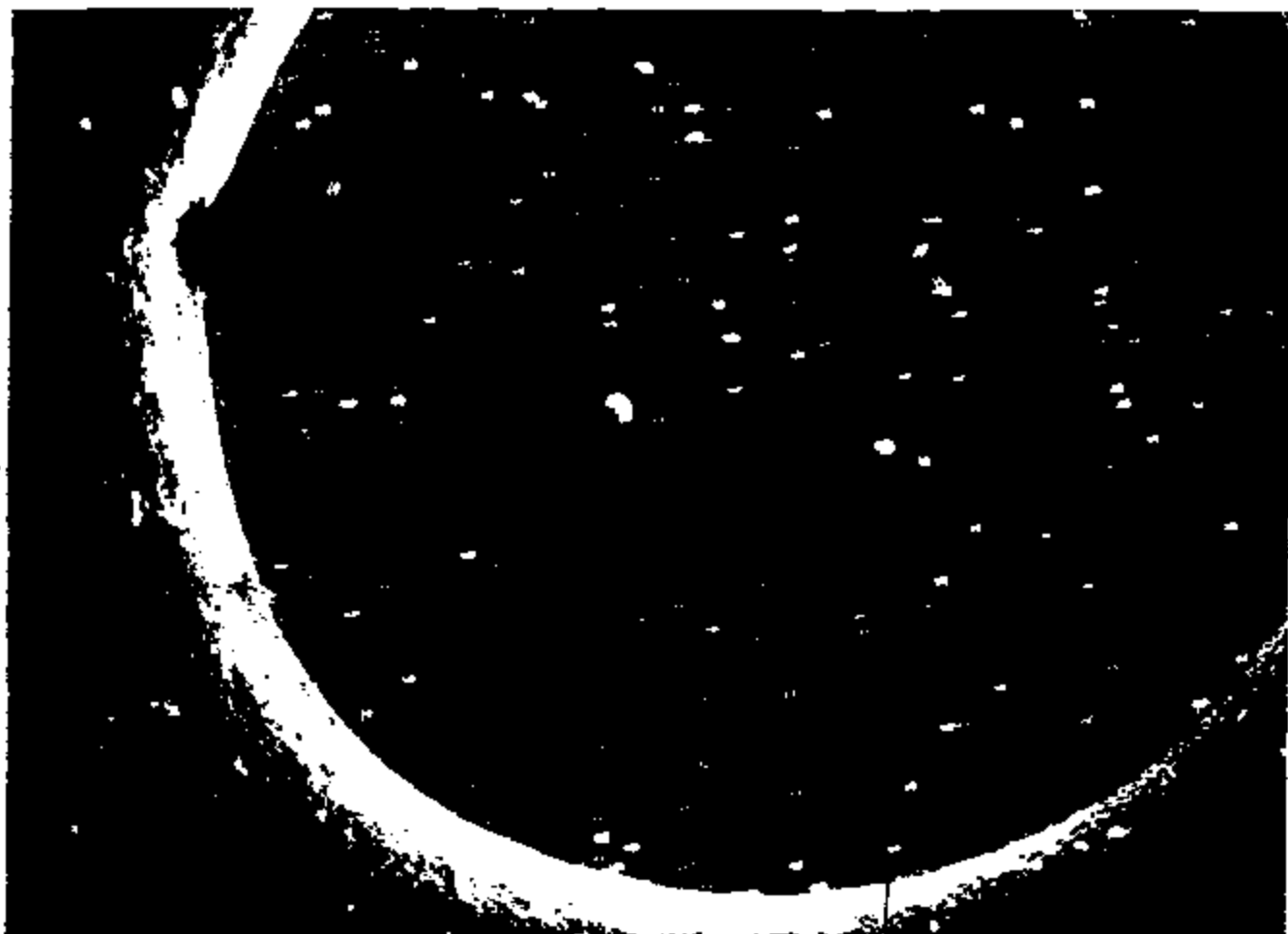


Transit  
trace 5



Transit  
trace 6

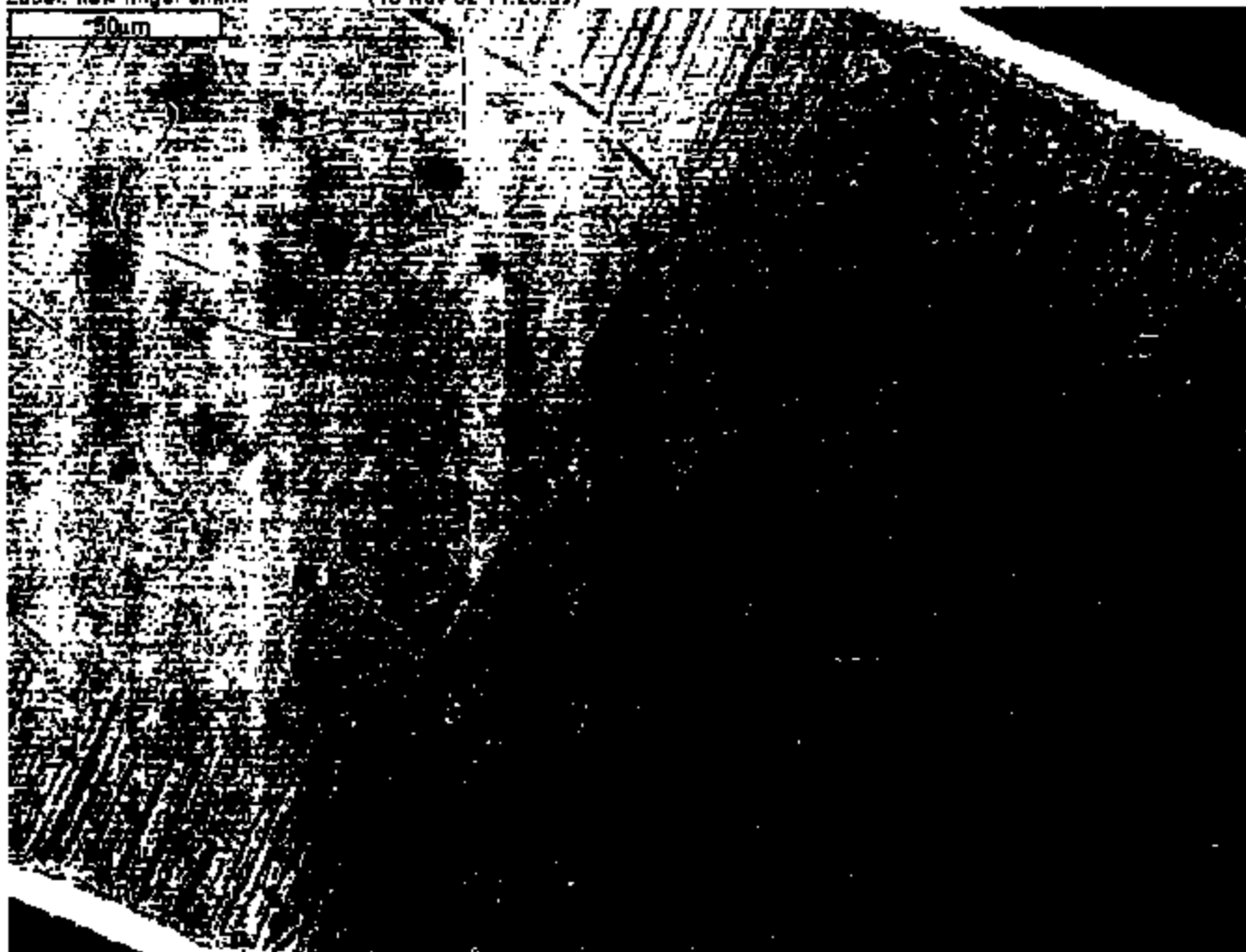




0.1mm

Operator: Steve Simko  
Client: Ron Gaw  
Job: ETC sensors  
Res: Ultrafine  
Label: new finger shank

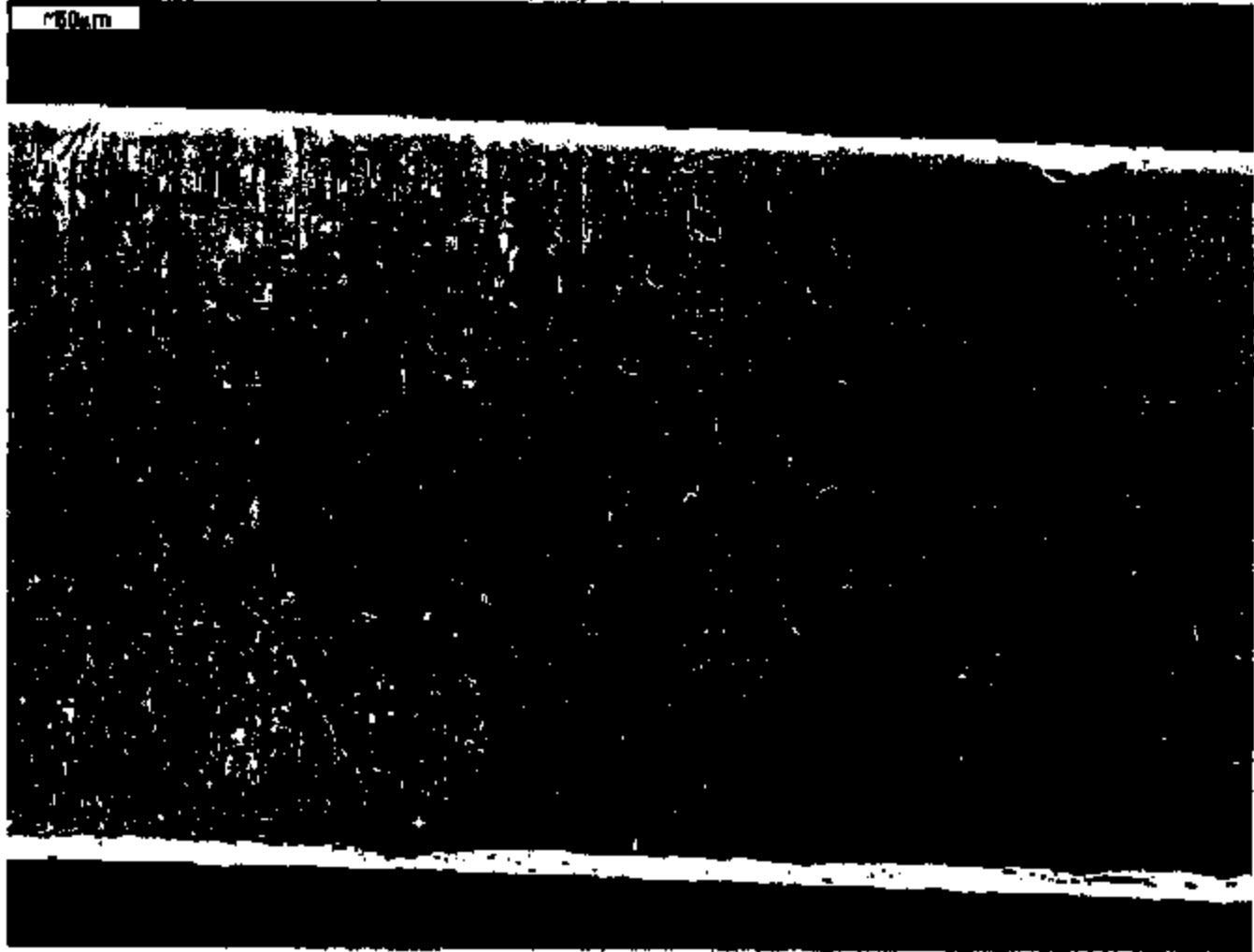
(13 Nov 02 11:23:09)



PERI-044 19826

Operator: Steve Simko  
Client: Ron Gaw  
Job: ETC sensors  
Res: Ultraline  
Label: new finger shank 2

(19 Nov 02 11:34:02)



PHO-044 1987

Operator: Steve Simko

Client: Ron Gaw

Job: ETC sensors

Res: Ultrafine

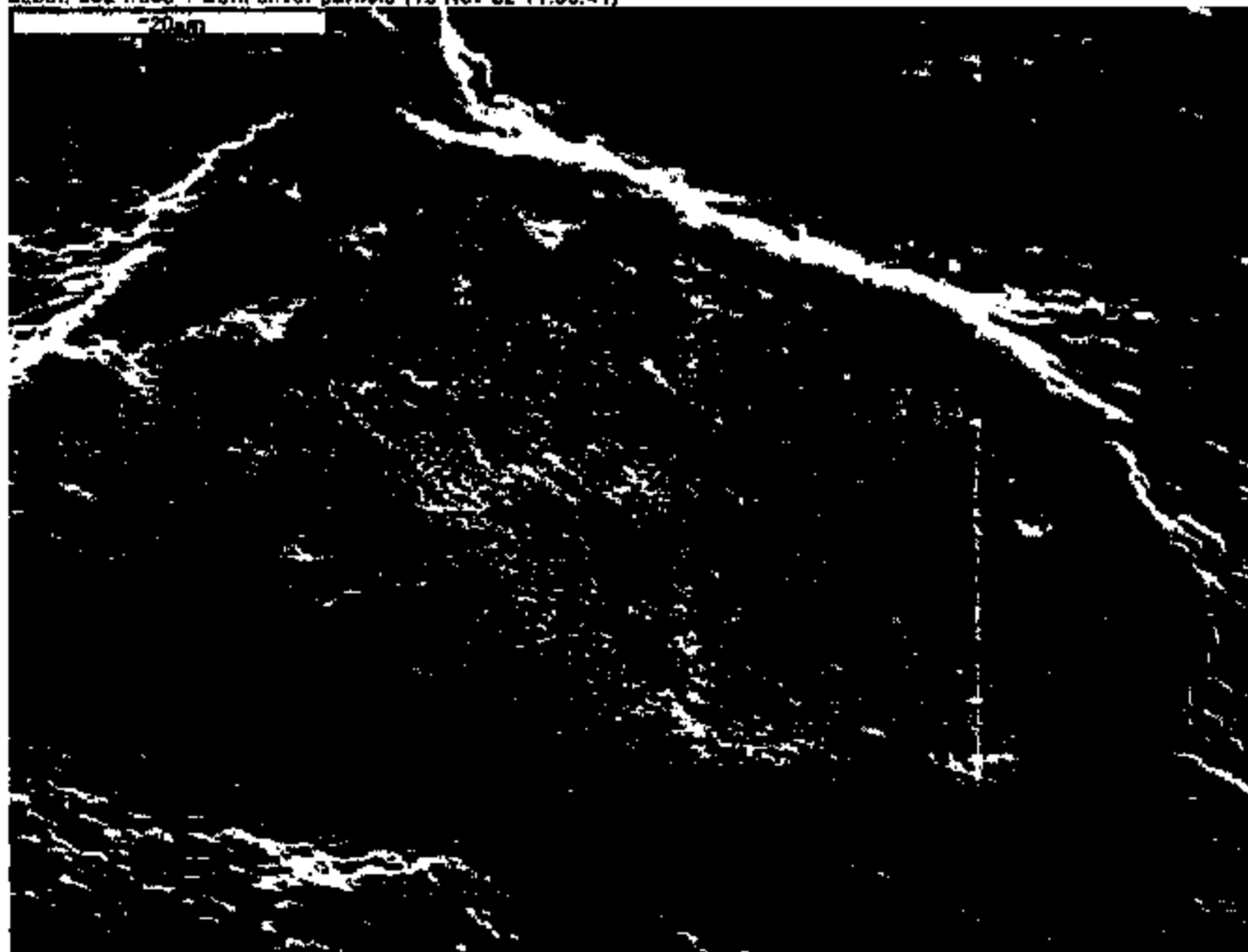
Label: D02 traos 1

(13 Nov 02 11:07:04)



PENS-04 18888

Operator: Steve Simko  
Client: Ron Gaw  
Job: ETC sensors  
Res: Ultrafine  
Label: 002 trace 1 worn silver particle (13 Nov 02 11:08:41)



PERC-044 18928

Operator: Steve Simko  
Client: Ron Gaw  
Job: ETC sensors  
Res: Ultraline  
Label: 002 trace 3

(18 Nov 02 11:16:21)

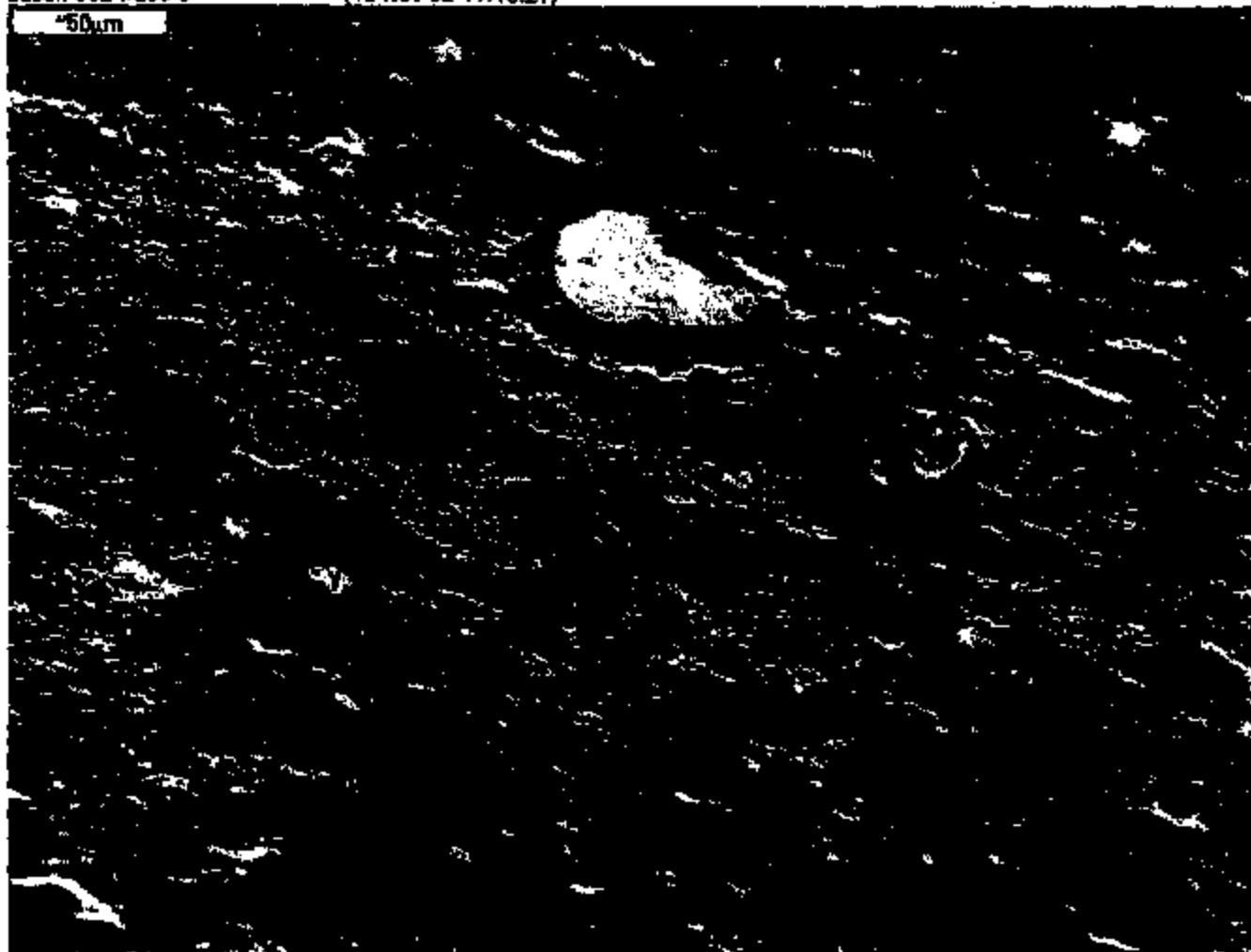


PHOTO-244 10000