

EA02-025

TEXAS INSTRUMENTS, INC.'S

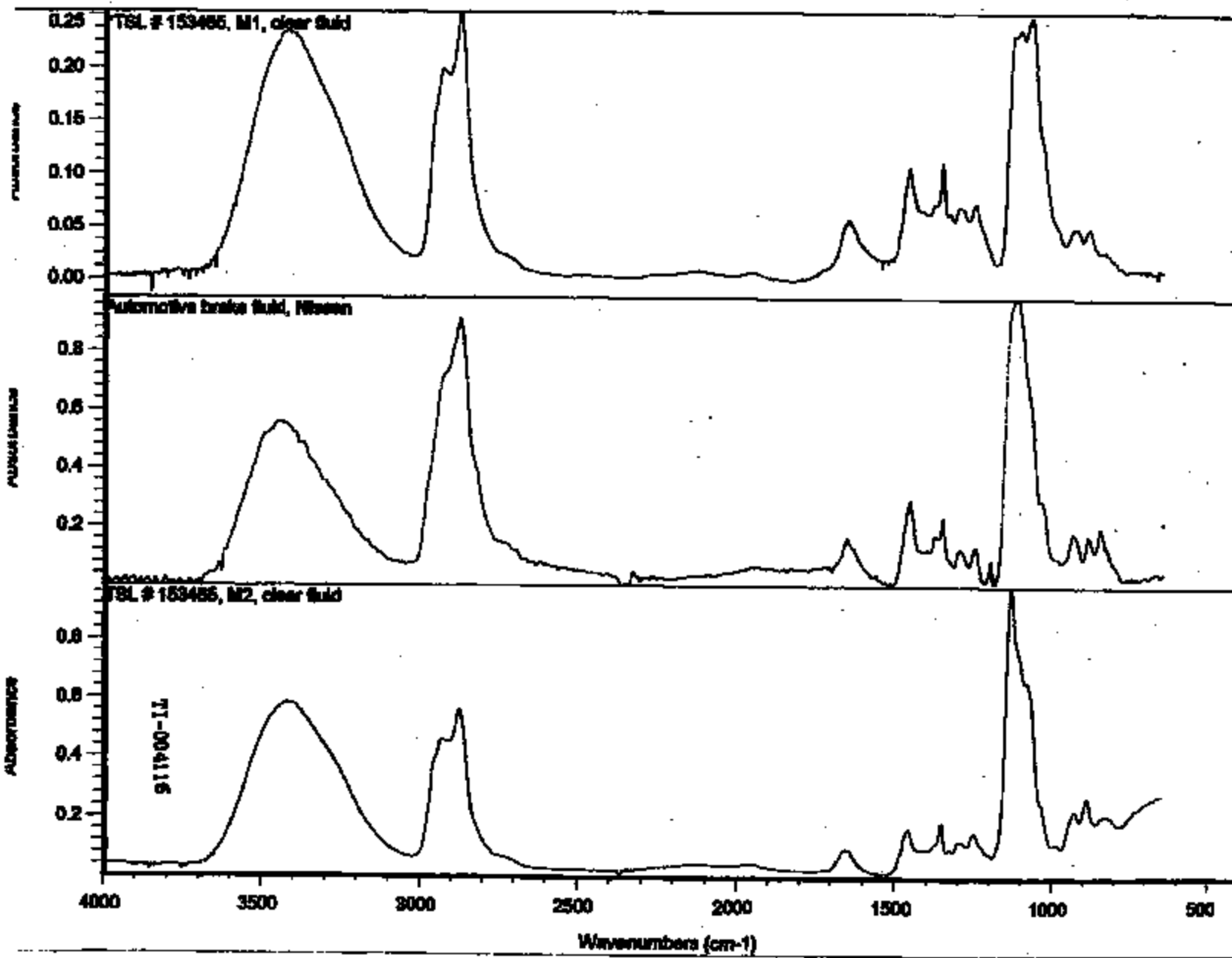
9/10/03

REQUEST NO. 7

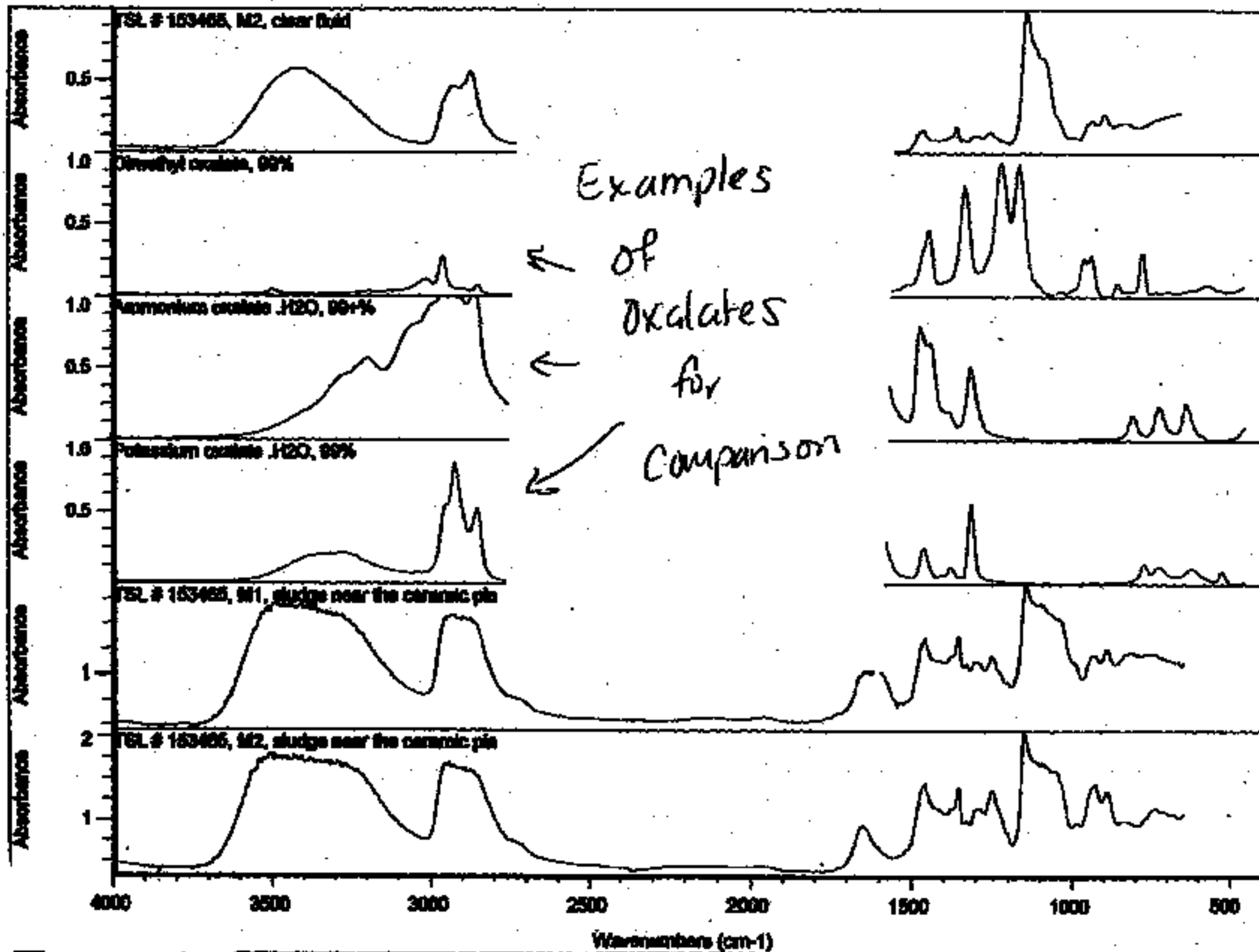
BOX 9

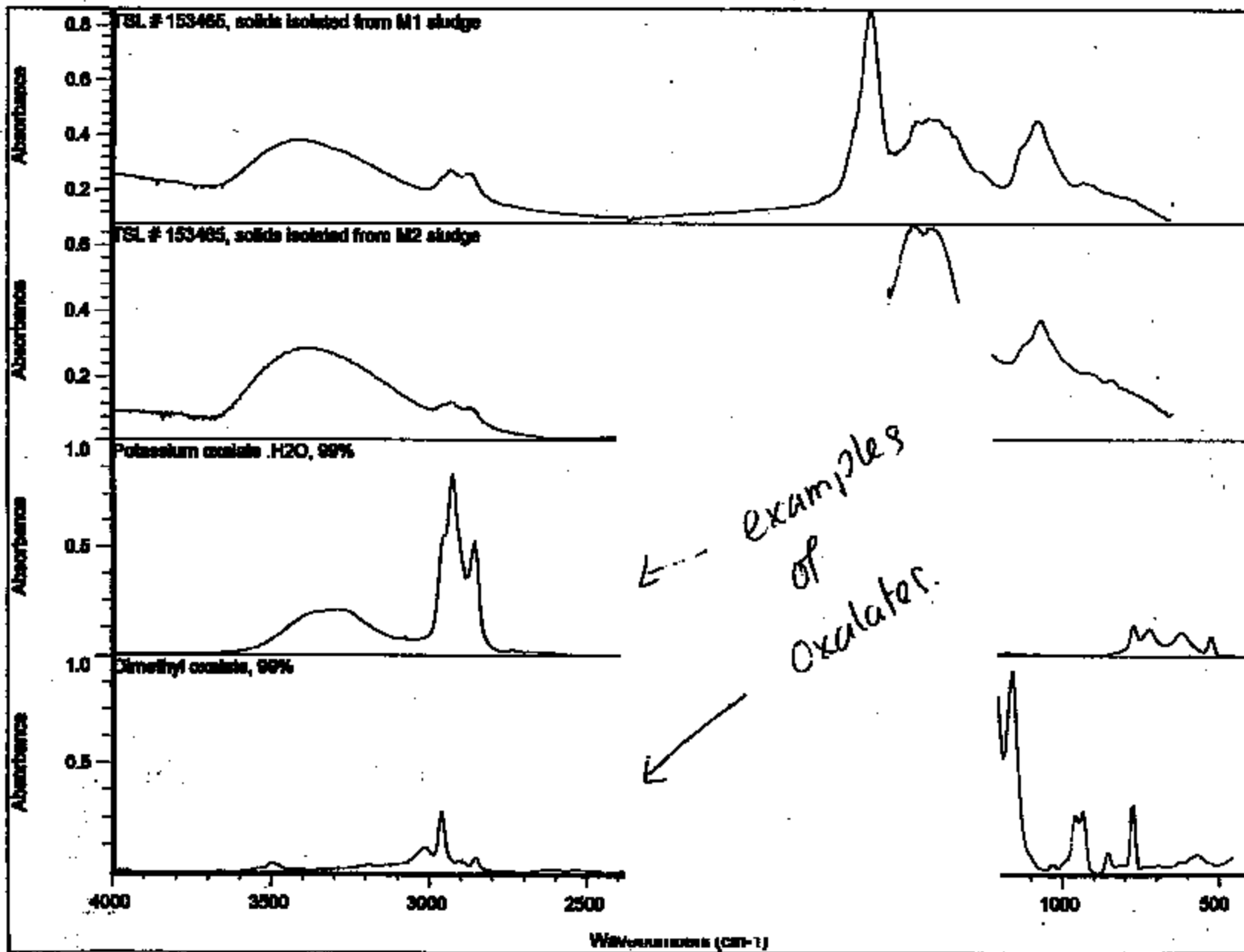
PART A – R

PART Q



TI-NHTSA 014843





TI-NHTSA 014845

OMNIC Search

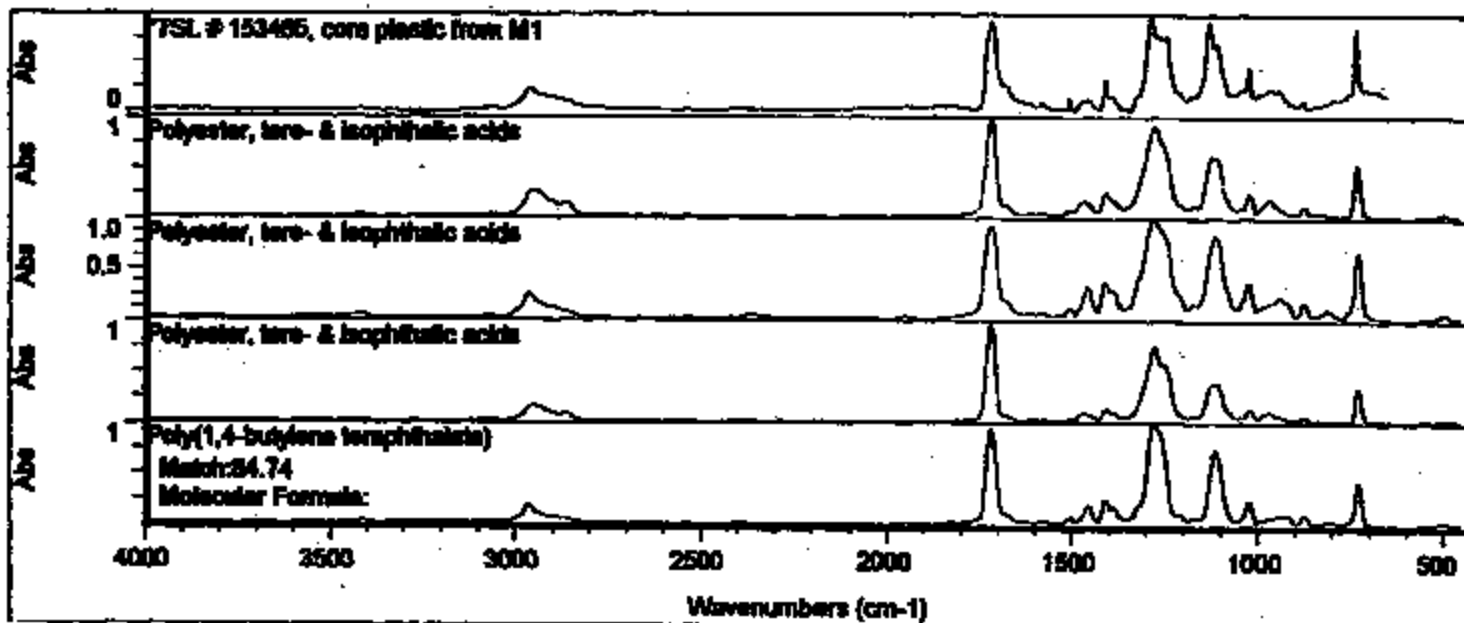
Spectrum: *TSL # 153465, core plastic from M1

Tue May 06 17:47:24 1999

Region: 3995.85 649.98

Search type: Correlation

Comment:



Index	Match	Compound name	Library
23	90.41	Polyester, tere- & isophthalic acids	Hazard Polymer and Additives
25	89.89	Polyester, tere- & isophthalic acids	Hazard Polymer and Additives
24	88.18	Polyester, tere- & isophthalic acids	Hazard Polymer and Additives
885	84.74	Poly(1,4-butylene terephthalate)	Hazard Polymer and Additives
29	82.69	Polyester, tere- & isophthalic acids	Hazard Polymer and Additives
81	82.35	Celanex 3300-2, Thermoplastic polyester	TSL
28	82.30	Poly(1,4-butylene terephthalate)	Hazard Polymer and Additives
32	81.88	Poly(1,4-butylene terephthalate)	Hazard Polymer and Additives
19407	80.87	Poly(1,4-butylene terephthalate)	Aldrich Condensed Phase
38	77.25	Polyester, terephthalic acid	Hazard Polymer and Additives

TLNHTSA 014946

OMNIC Search

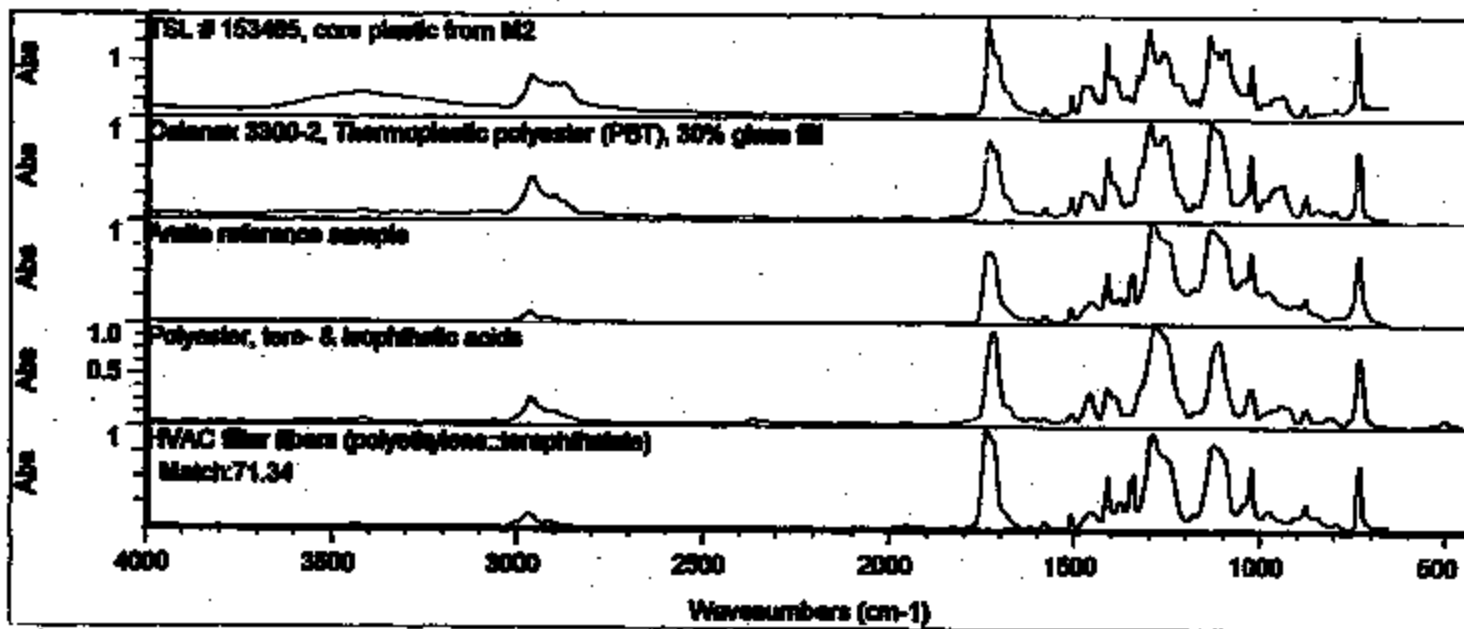
Spectrum: TSL # 153465, core plastic from M2

Thu May 06 17:58:54 1999

Region: 3995.85 649.98

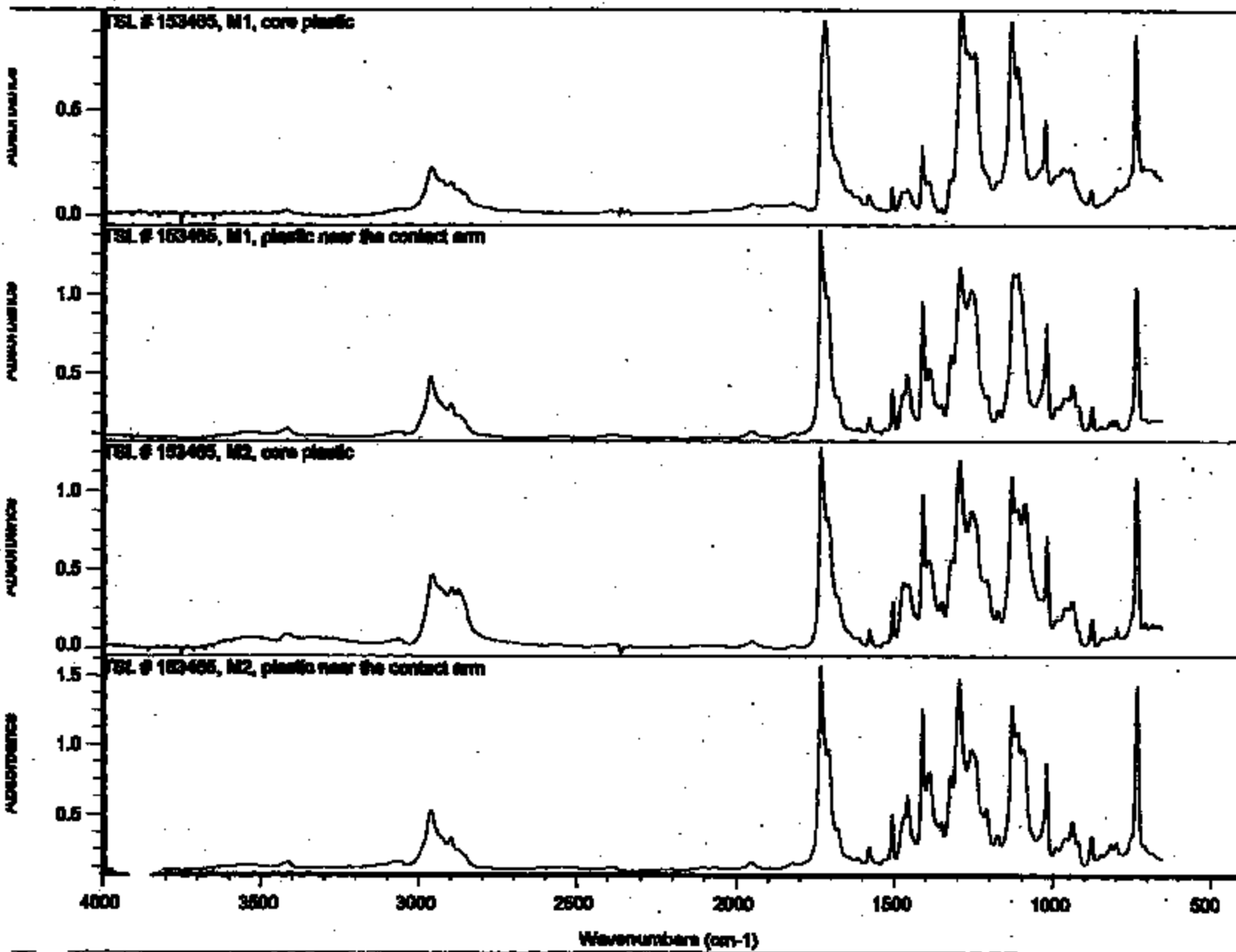
Search type: Correlation

Comment:



Index	Match	Compound name	Library
81	81.74	Celanex 3300-2, Thermoplastic polyester	TSL
47	75.87	Avila reference sample	TSL
25	71.40	Polyester, tere- & isophthalic acids	Hummel Polymer and Additives
28	71.34	HVAC filter fibers (polyethylene terephthalate)	TSL
63	69.89	Polyethylene terephthalate	Hummel Polymer and Additives
19	69.44	Thermal glass, white (polyethylene terephthalate)	TSL
23	67.89	Polyester, tere- & isophthalic acids	Hummel Polymer and Additives
32	65.74	Poly(1,4-bisphenol terephthalate)	Hummel Polymer and Additives
18	64.63	Thermal glass, blue	TSL
78	64.08	shaded glass	TSL

TXNH7SA 014847



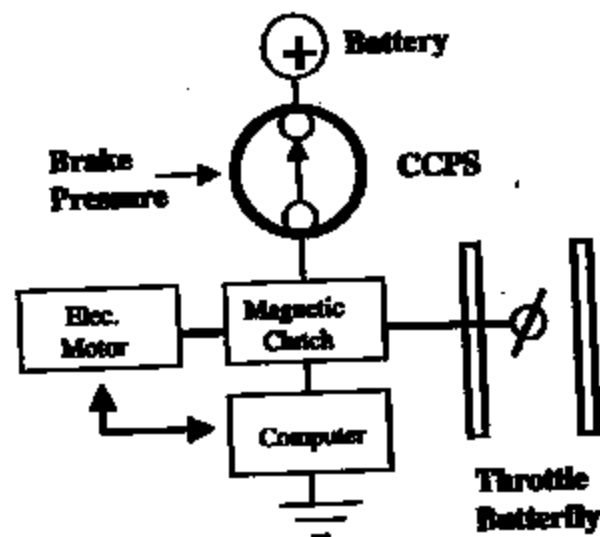
TI-NHTSA 014840

Overview

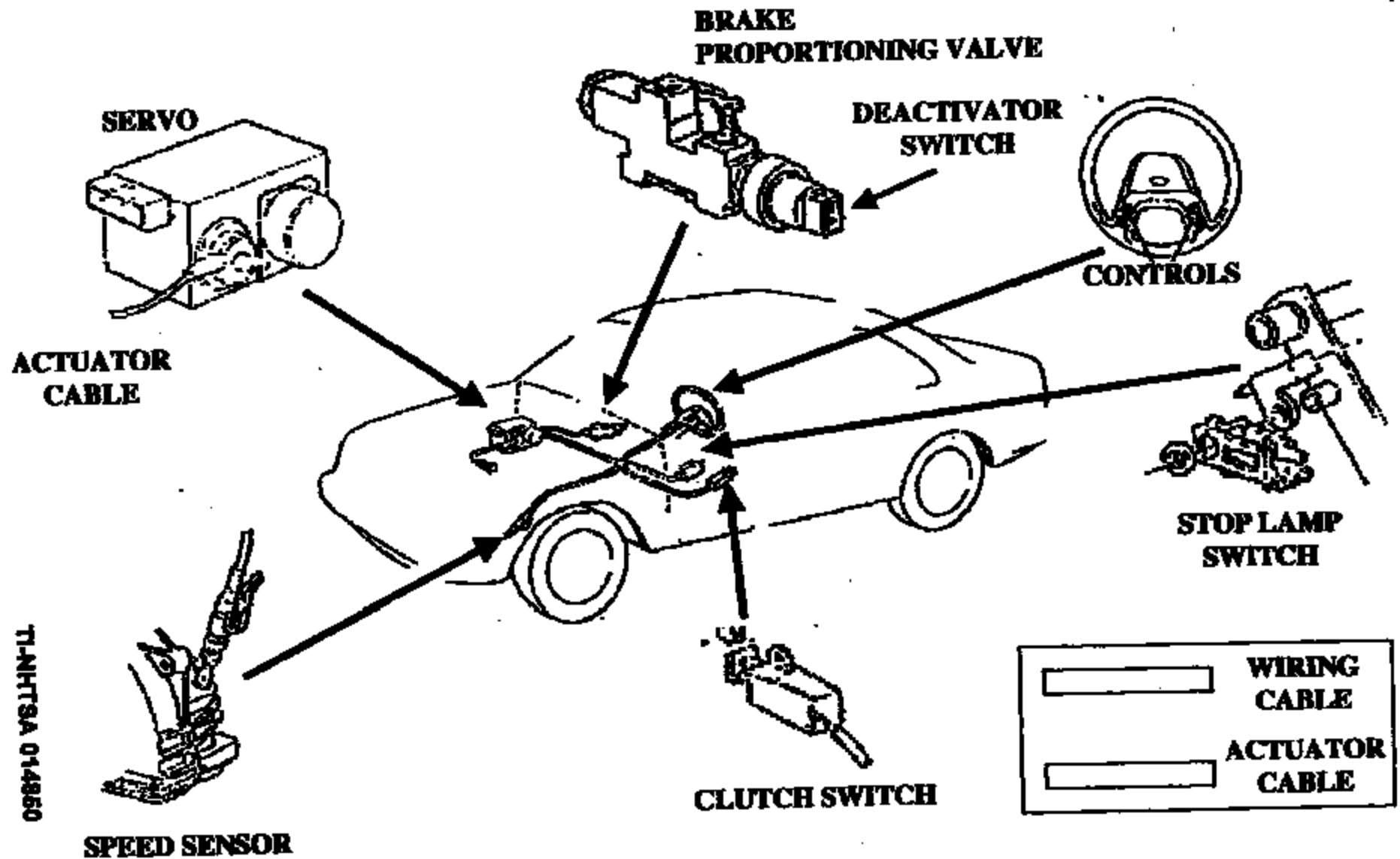
- The CCPS is a redundant safety device designed for use in a vacuum-less electronic cruise control system.
- Functionally, it replaces the present vacuum dump valve by de-energizing a clutch which connects the throttle to an electronic actuator.
- It is plumbed into the brake line. When the driver applies pressure to the brake pedal, the normally-closed switch opens, disconnecting the actuator from the throttle butterfly.

Specifications:

Actuation:	125 PSI +/- 35 250 PSI +/- 50
Release:	20 PSI min 40 PSI min
Burst:	7000 PSI
Proof:	3000 PSI 4000 PSI
Cycles:	500K, 0 - 1450 PSI, 2 Hz
Voltage:	Battery
Current:	0.75 AMP Inductive



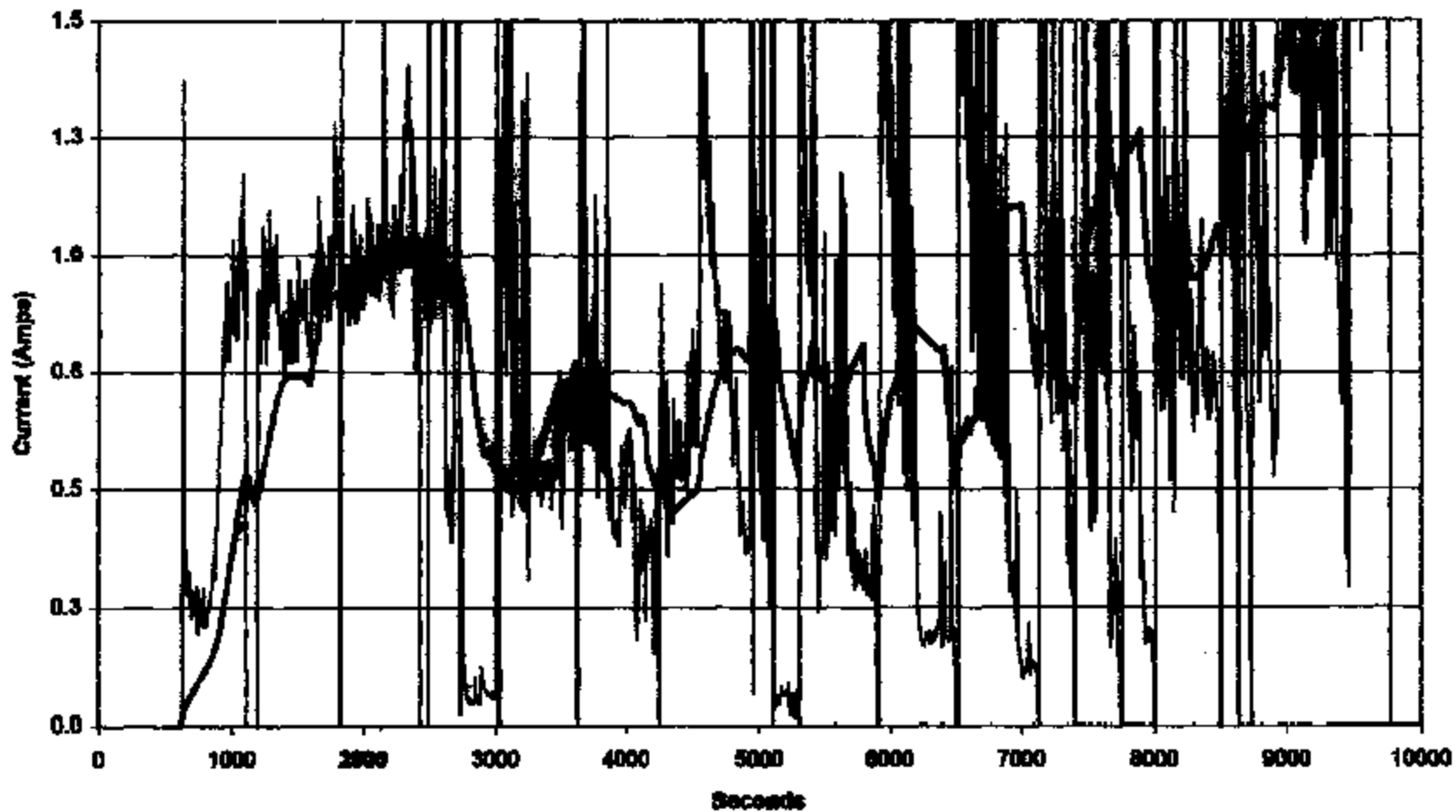
1991 Next Generation Speed Control System



TI-NHTSA 014860

Hotspot Current vs. Time
5% Salt Water Ingress Experiment

— Hotspot Current — 100 per. Mov. Avg. (Hotspot Current)

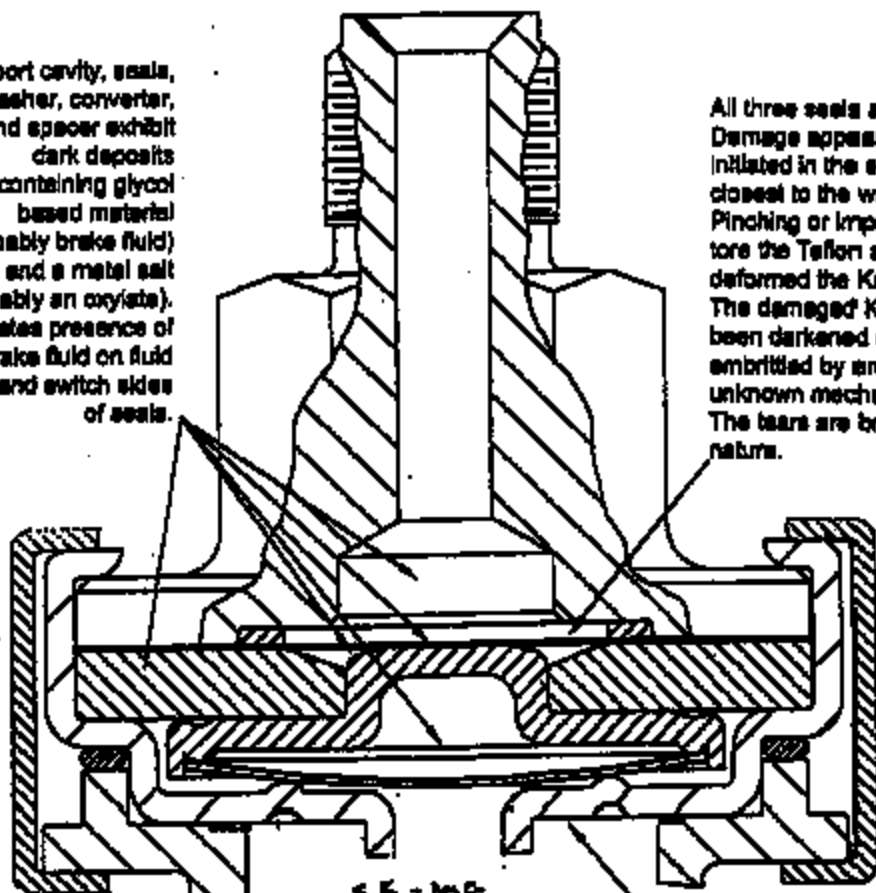


TI-NHTSA 014861

Memphis Switch

Harport cavity, seals, washer, converter, and spacer exhibit dark deposits containing glycol based material (probably brake fluid) and a metal salt (probably an oxyate). Indicates presence of brake fluid on fluid and switch sides of seals.

All three seals are torn. Damage appears to have inflated in the seal closest to the washer. Pinching or impact tore the Teflon and deformed the Kapton. The damaged Kapton has been darkened and embrittled by an unknown mechanism. The tears are brittle in nature.

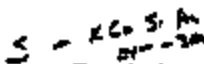


Stationary contact exhibits corrosion and dezincification, as well as intergranular cracking (stress corrosion cracking). Small amount of arc damage at upper corner away from contact pad.

Transfer pin and movable contact are missing.

Base has separated in this general area.

3, 2, 1, 5
Green deposit on face of cup contains copper, zinc, and traces of sulfur, indicating transfer of brass contact material to cup probably as an oxide or corrosion product. Glycol based material (probably brake fluid) also detected in this area.



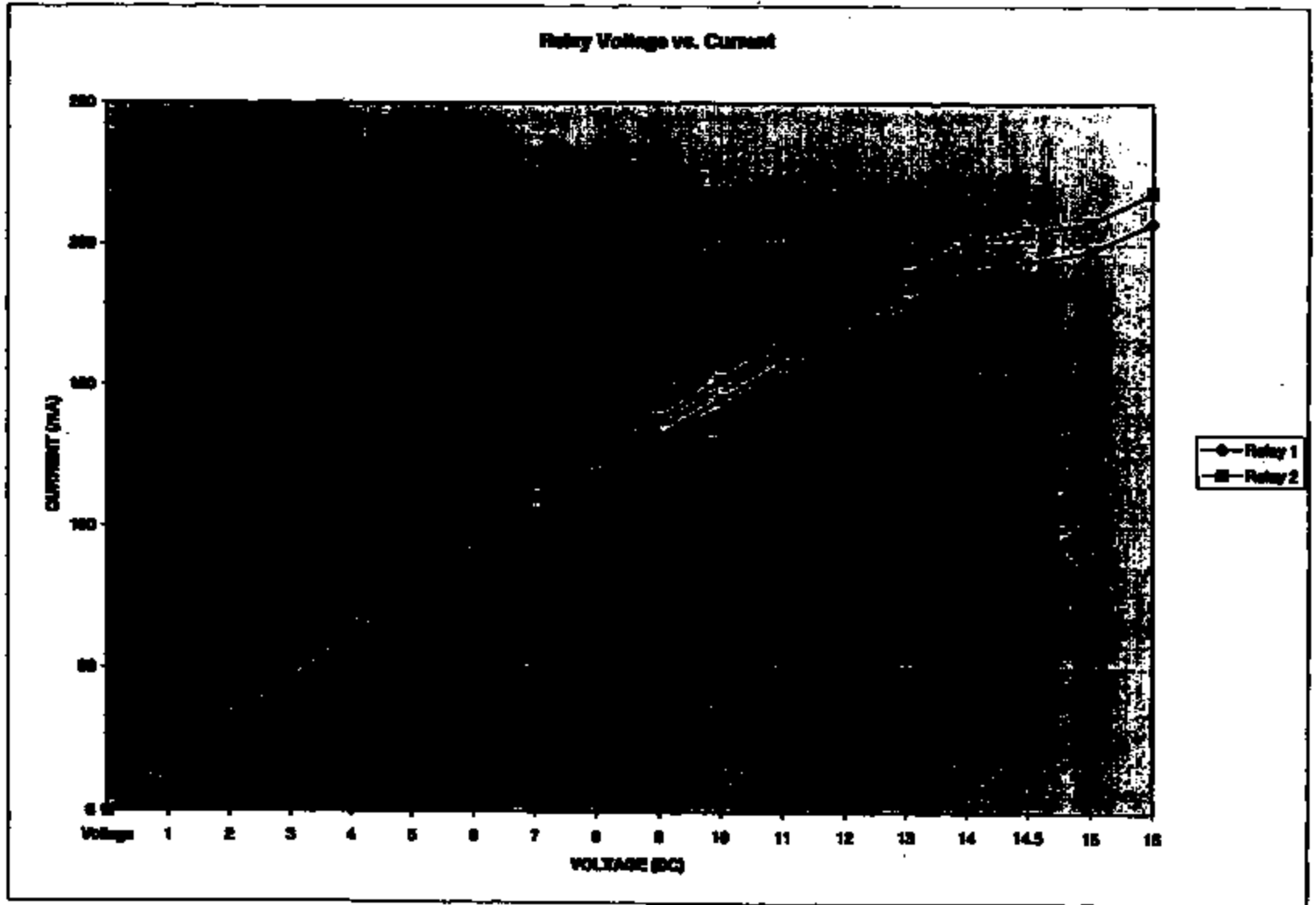
Terminals exhibit black deposits (GRN/OR wire) and olive green deposits (OR wire), which contain copper, zinc, and sulfur. These deposits are probably sulfides or sulfates of the brass terminal material.

*Green
Base metal + sulfur
+ sulfur
Base metal
element
+ sulfur*

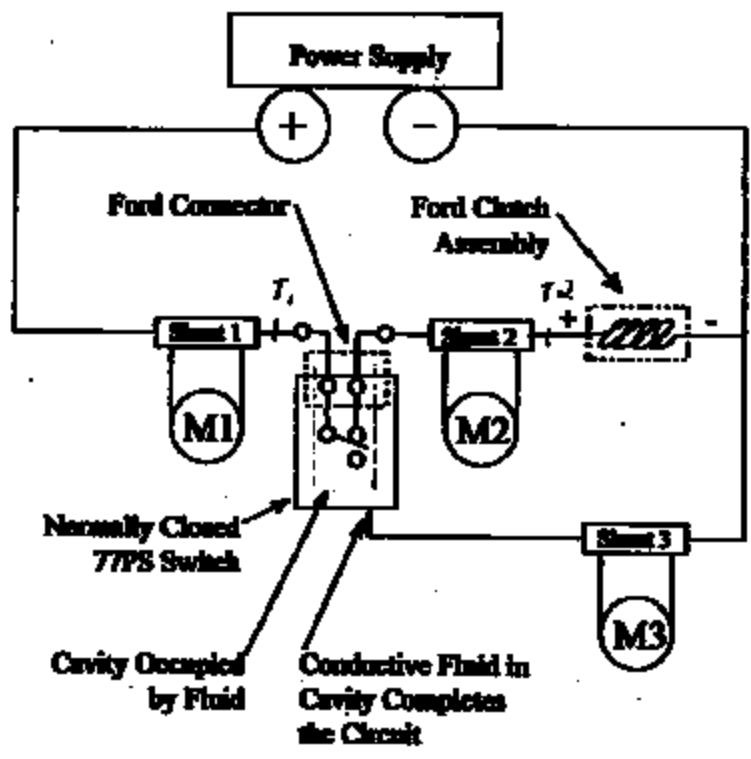
Base of movable contact appears to have been melted back into wall between switch and terminal cavities. Damage appears fresh, suggesting that it occurred in later stages of event.

Wire cavity in connector (not shown) exhibits white deposits below seal, which contain elements typical of those found in dry chemical fire extinguishers.

Sheet1 Chart 2

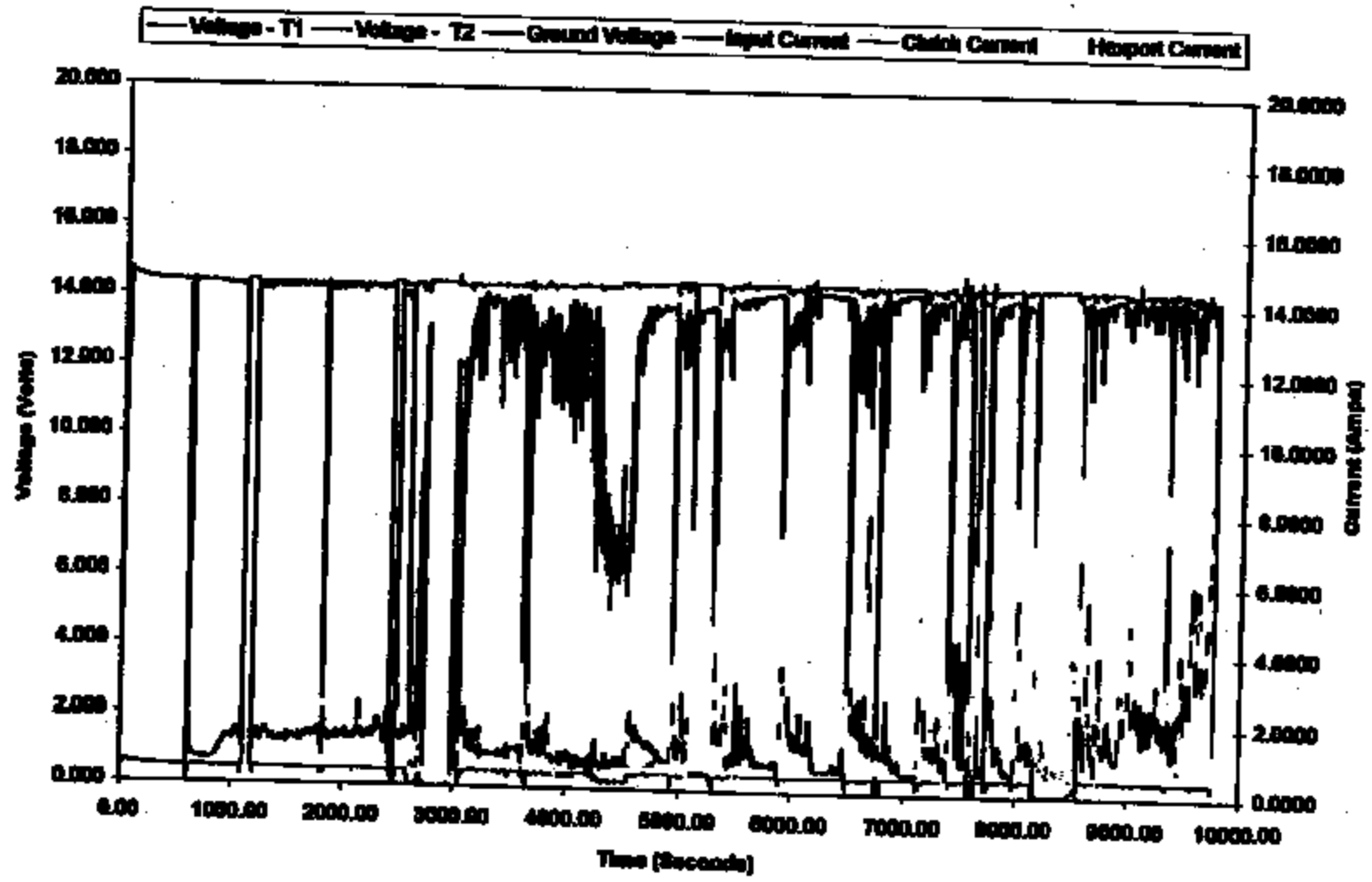


TI-NHTSA 014833



71-NHTSA 014864

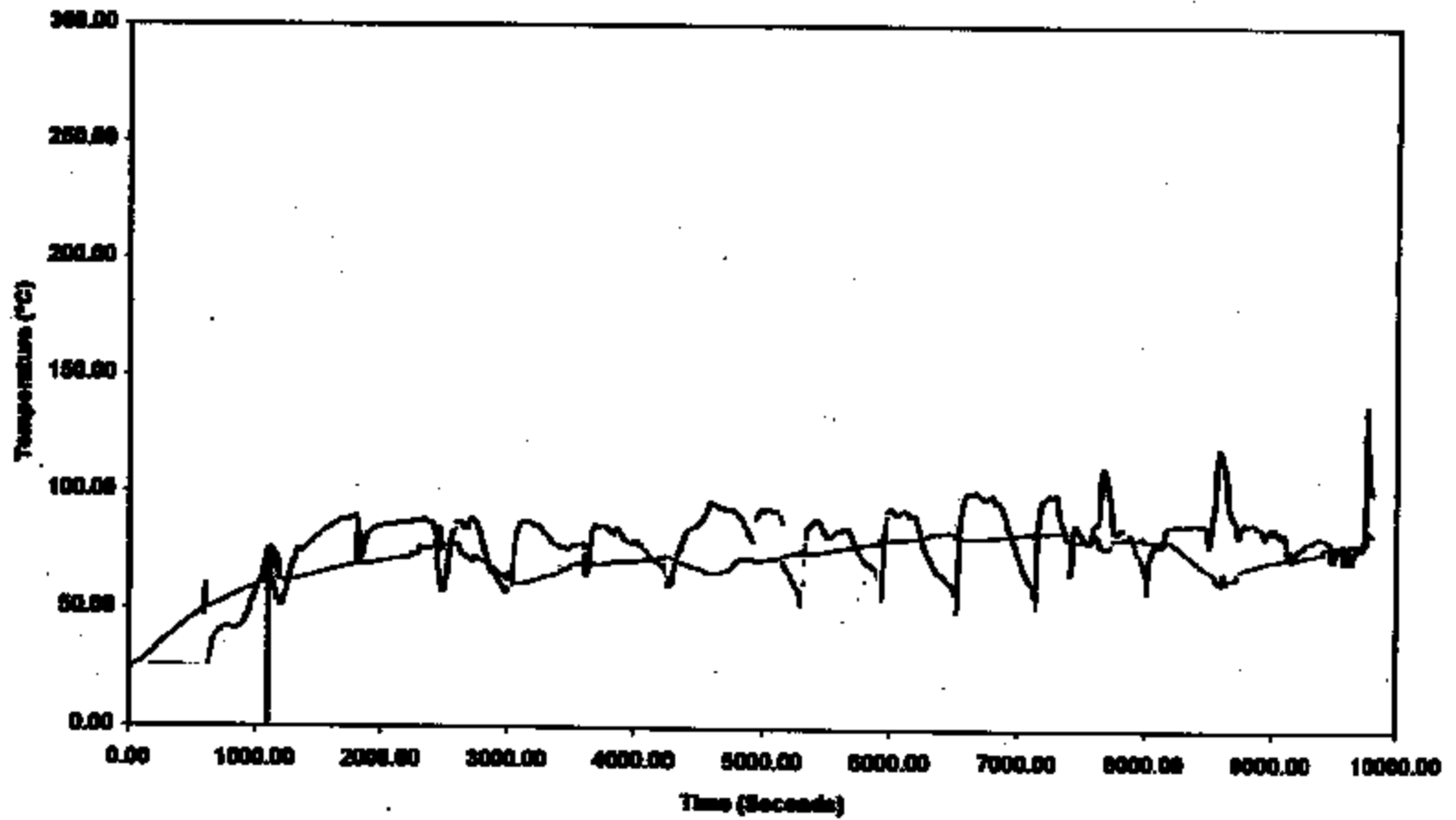
8% Salt Water Ingress Experiment



TI-NHTSA 014886

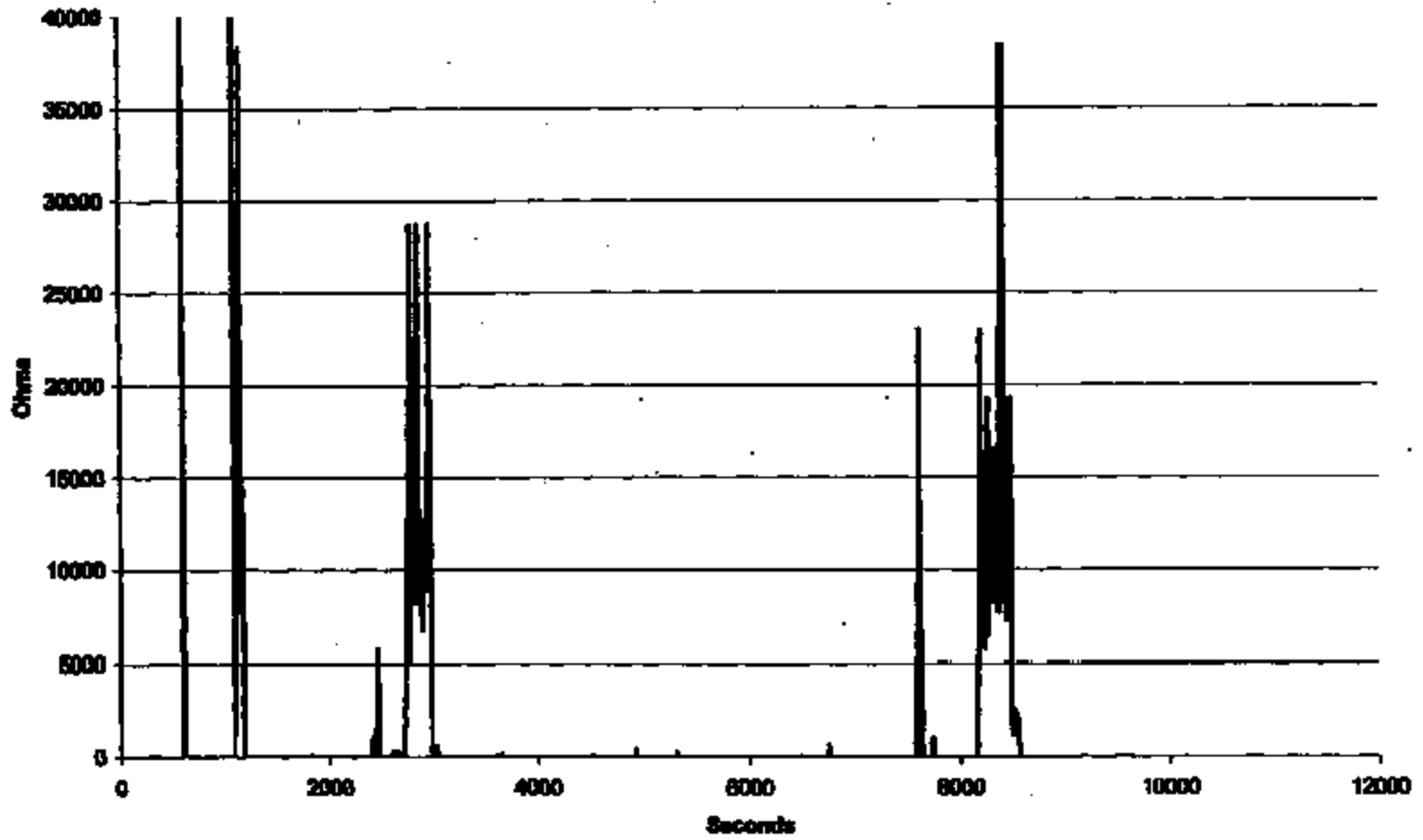
5% Salt Water Ingress Experiment
Temperature vs. Time

— Top Temp — Clutch Temp Bottom Temp



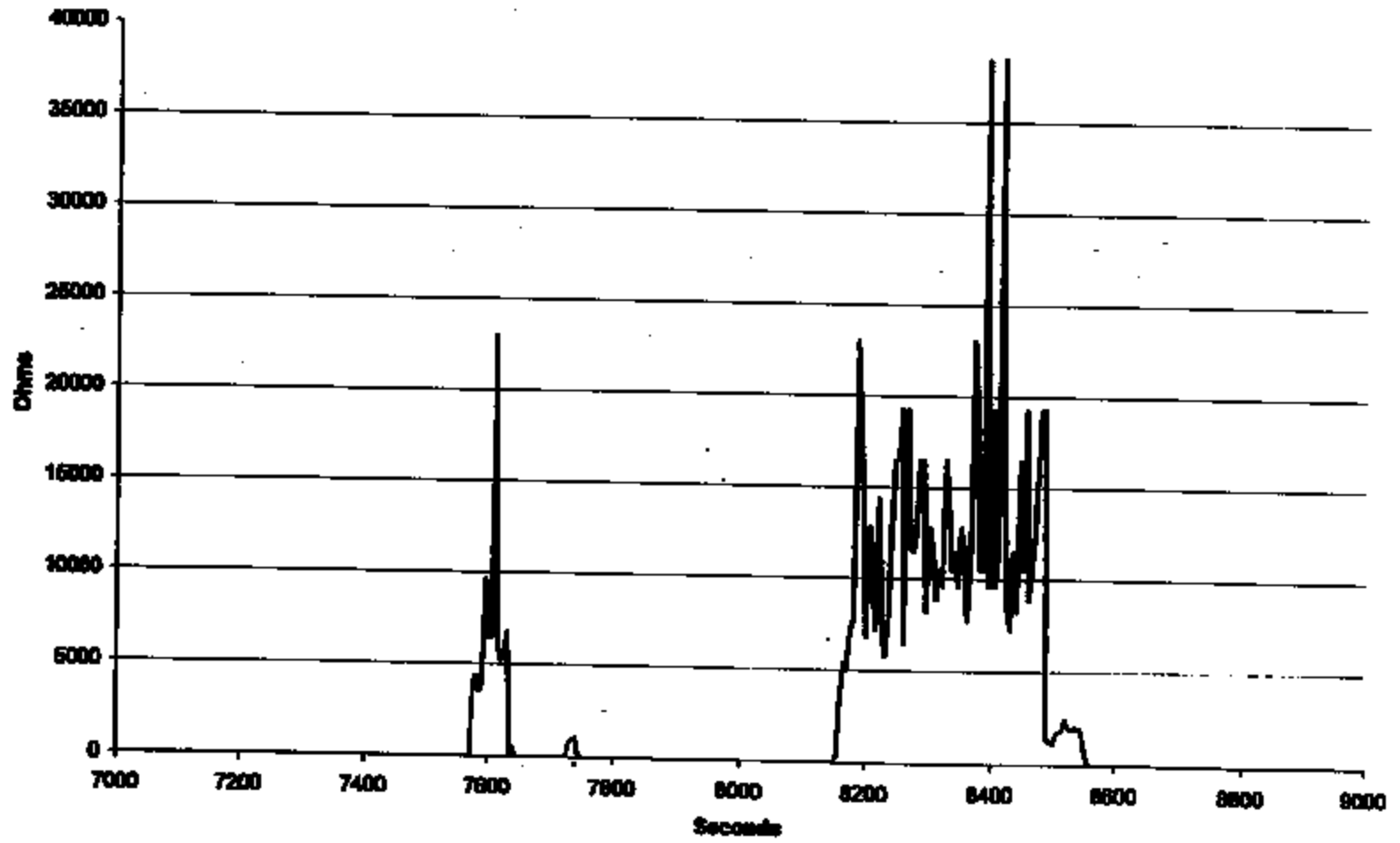
TI-NHTSA 014866

**Terminal Resistance vs. Time
5% Salt Water**



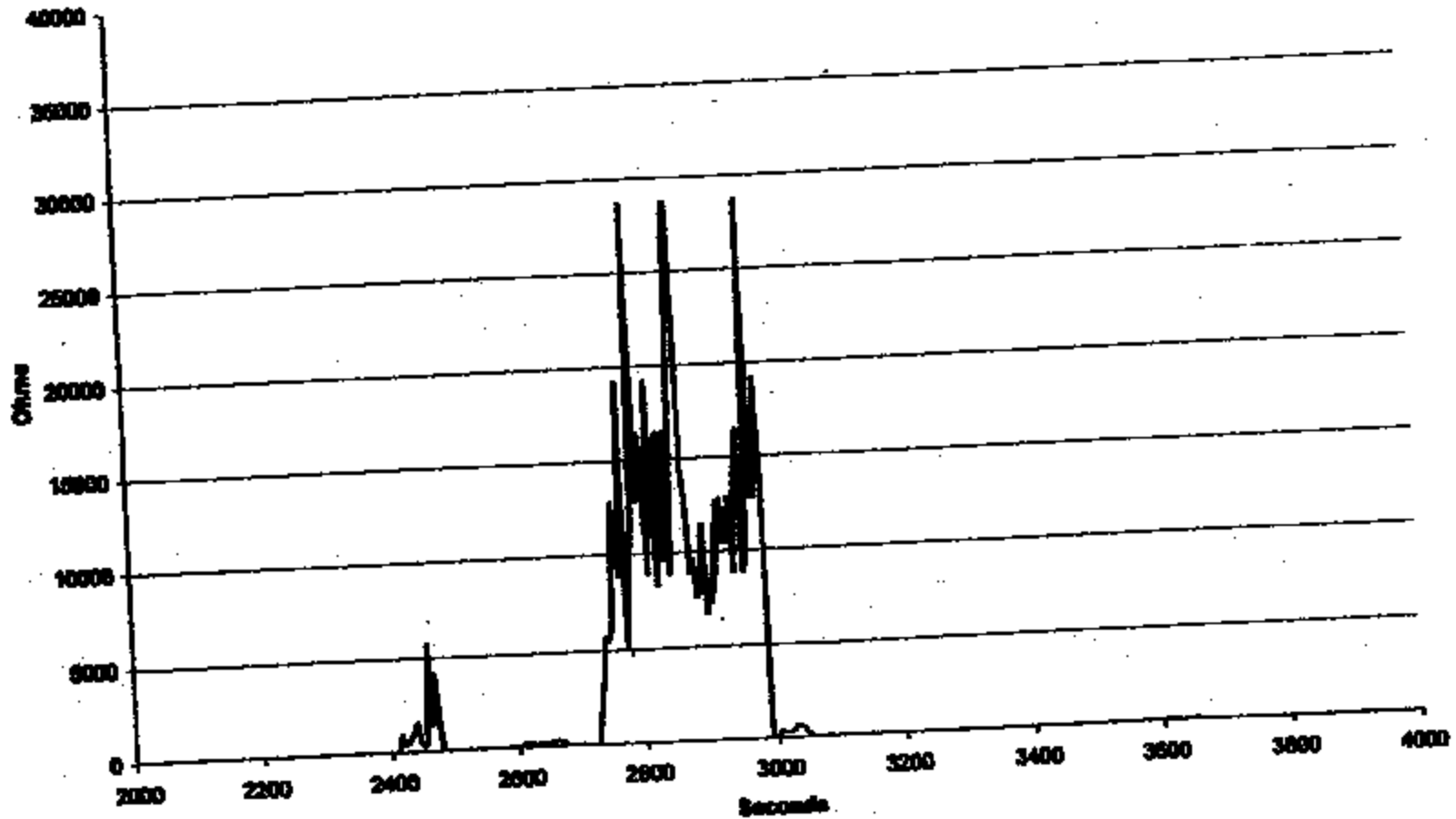
TI-NHTSA 014867

Terminal Resistance vs. Time
5% Salt Water



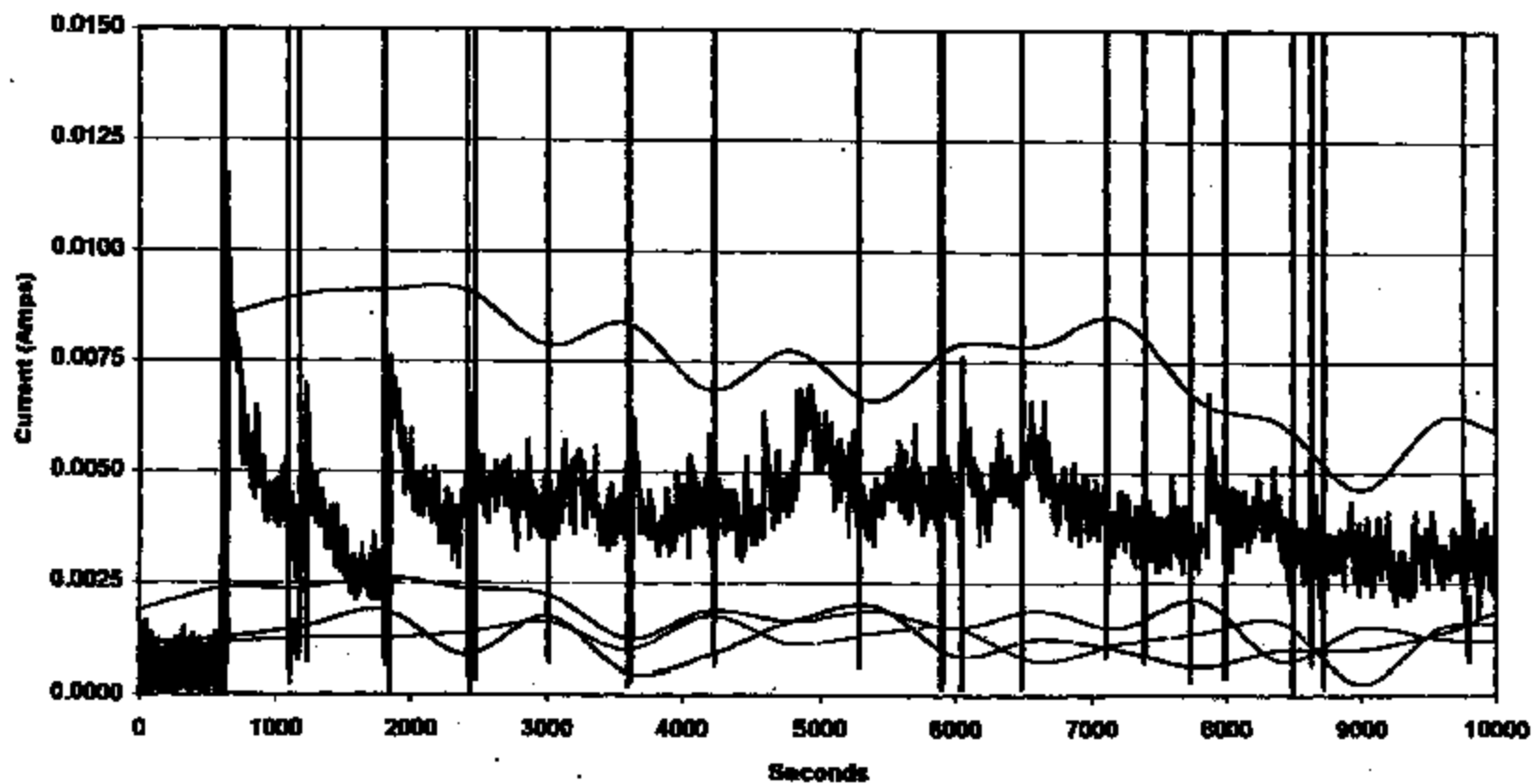
TI-NHTSA 014859

Terminal Resistance vs. Time
5% Salt Water



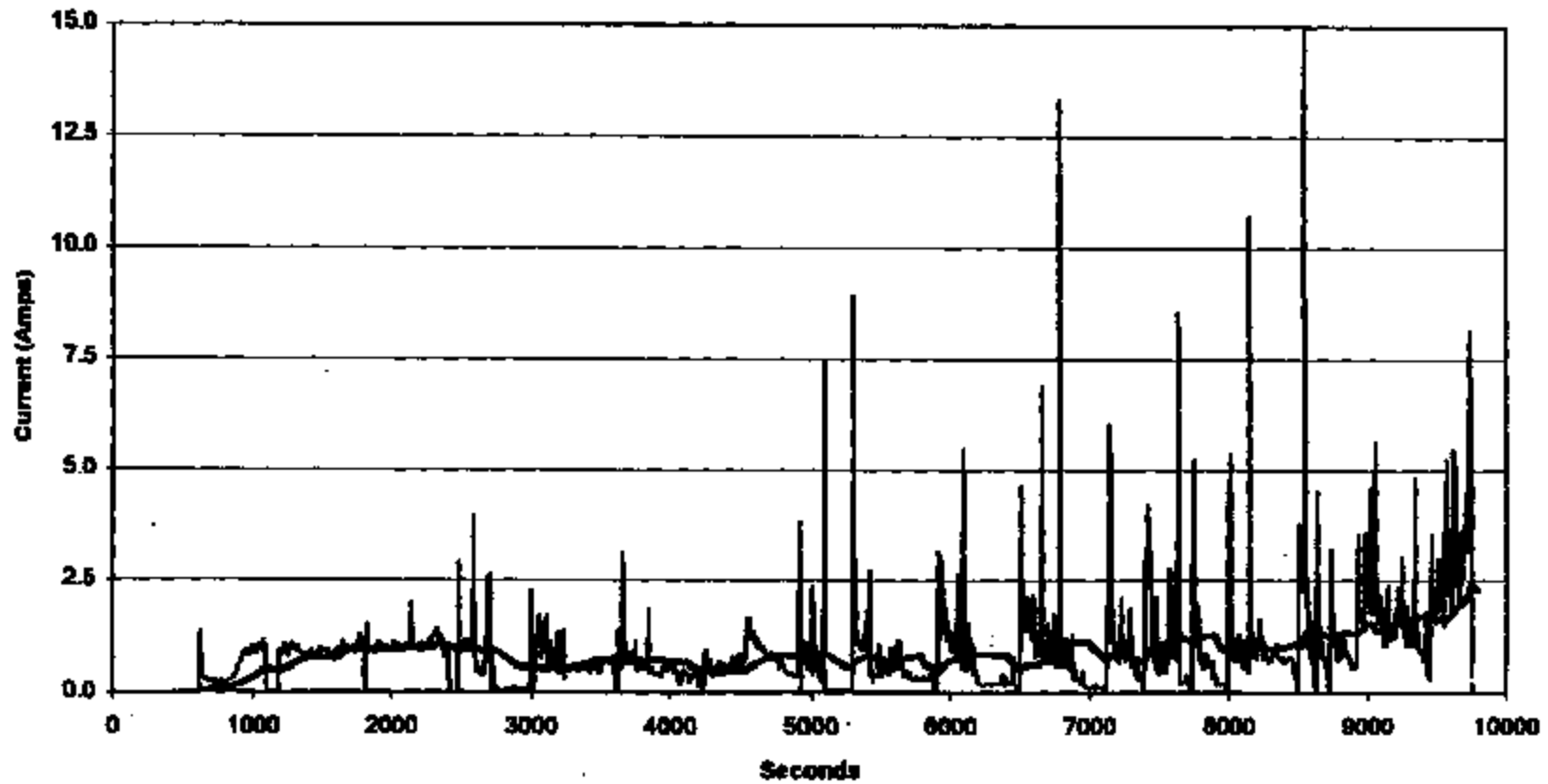
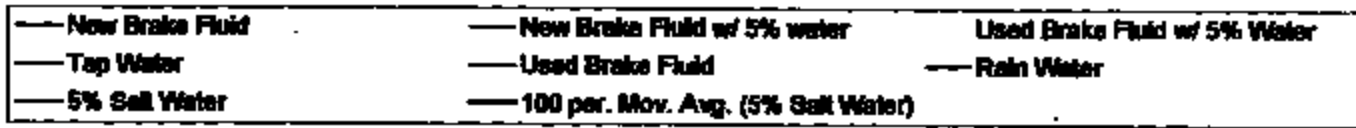
TL-NHTSA 014869

Hexport Current vs. Time Fluid Ingress Experiment



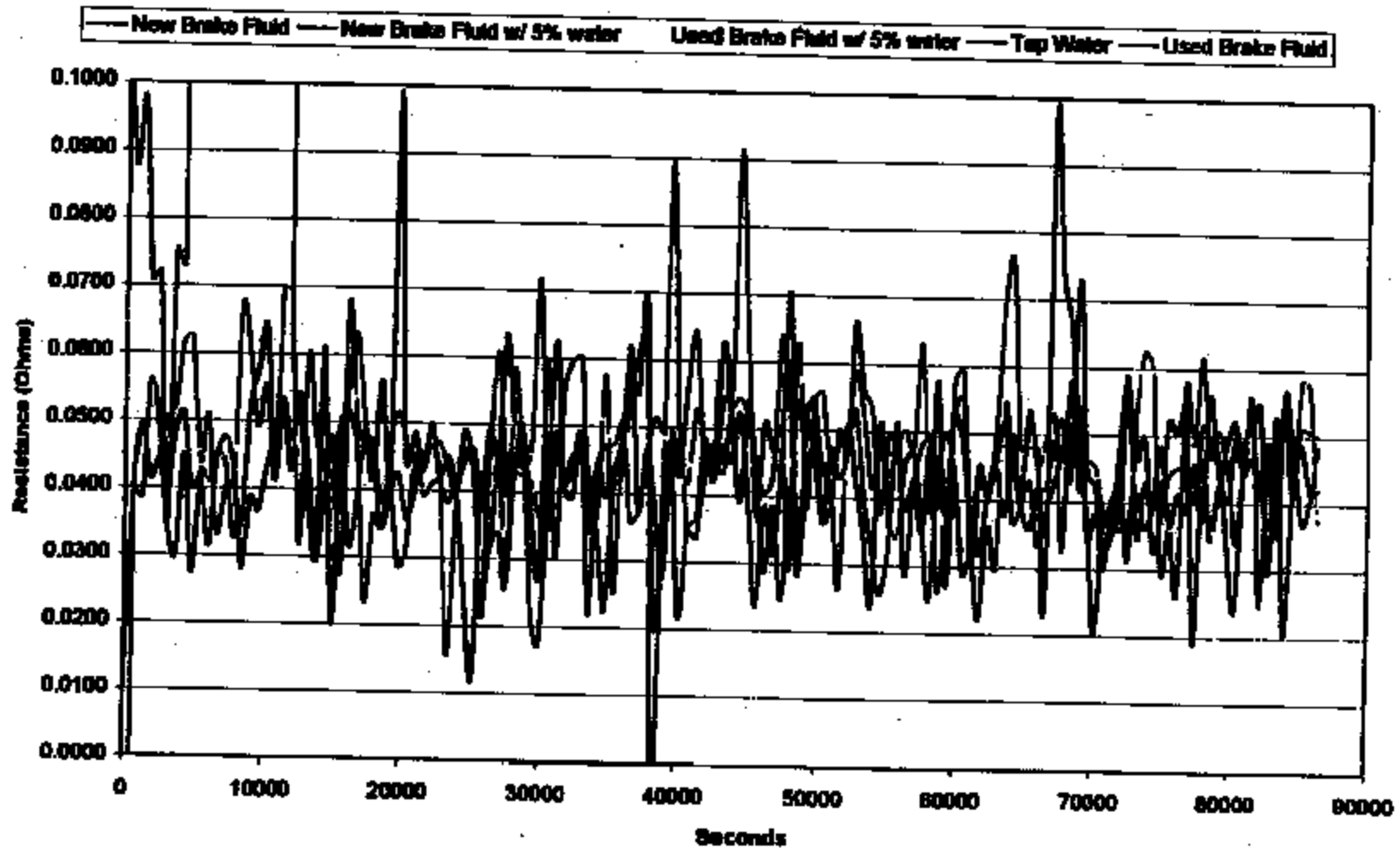
TL-NHTBA 014860

Hexport Current vs. Time Fluid Ingress Experiment



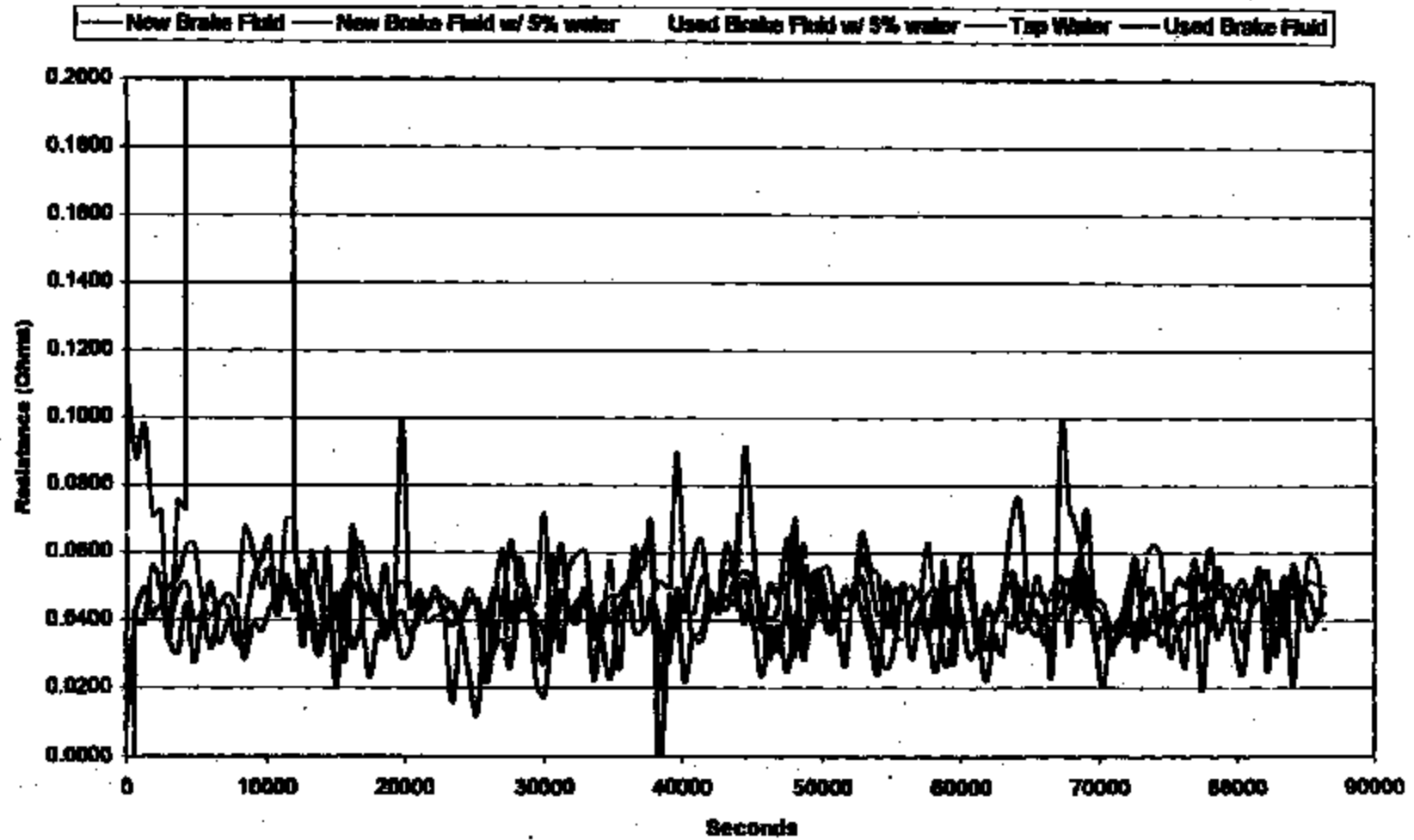
71-NHTSA 014861

Terminal Resistance Fluid Ingress Experiment



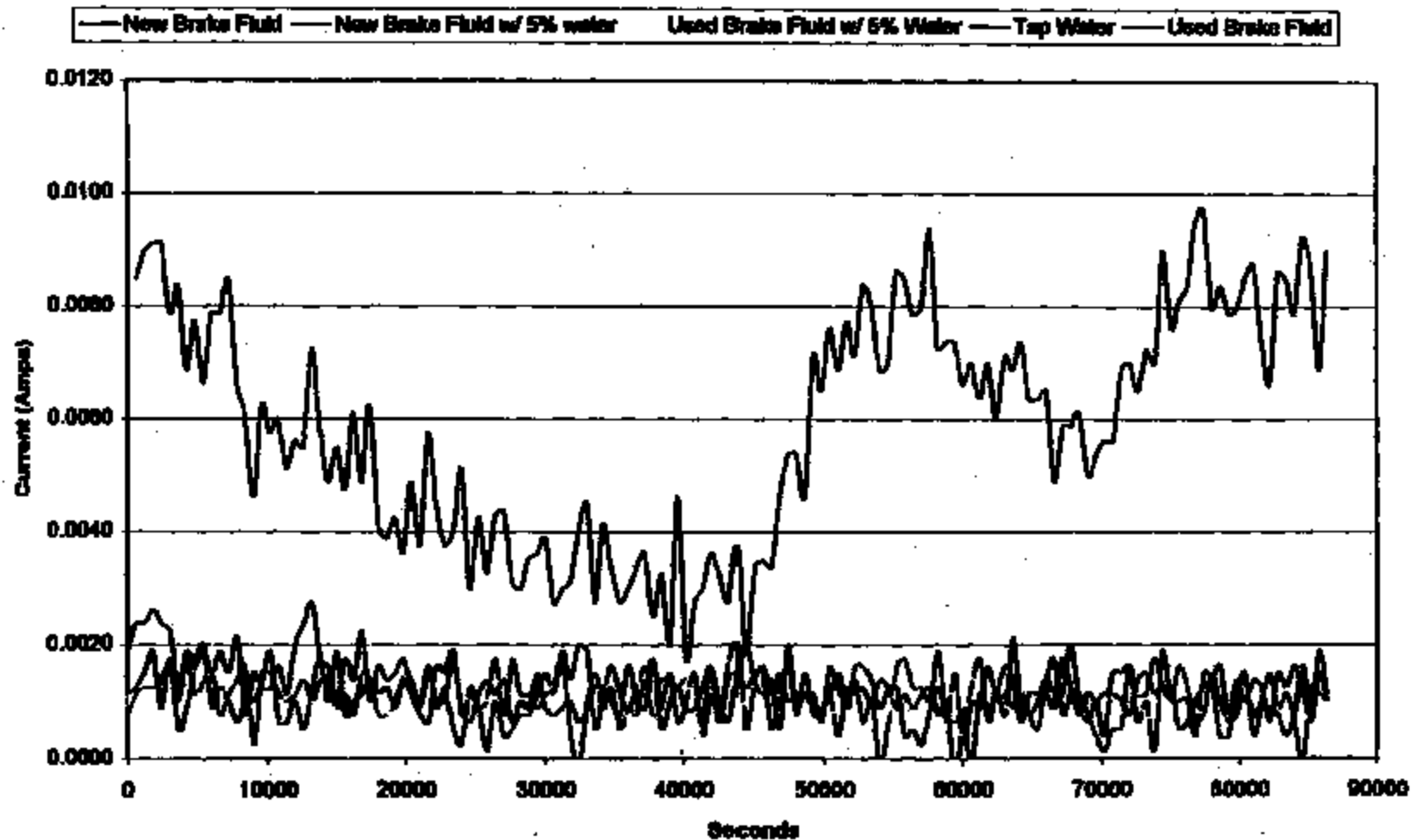
71-NHTSA 014862

Terminal Resistance Fluid Ingress Experiment



TI-NHTSA 014963

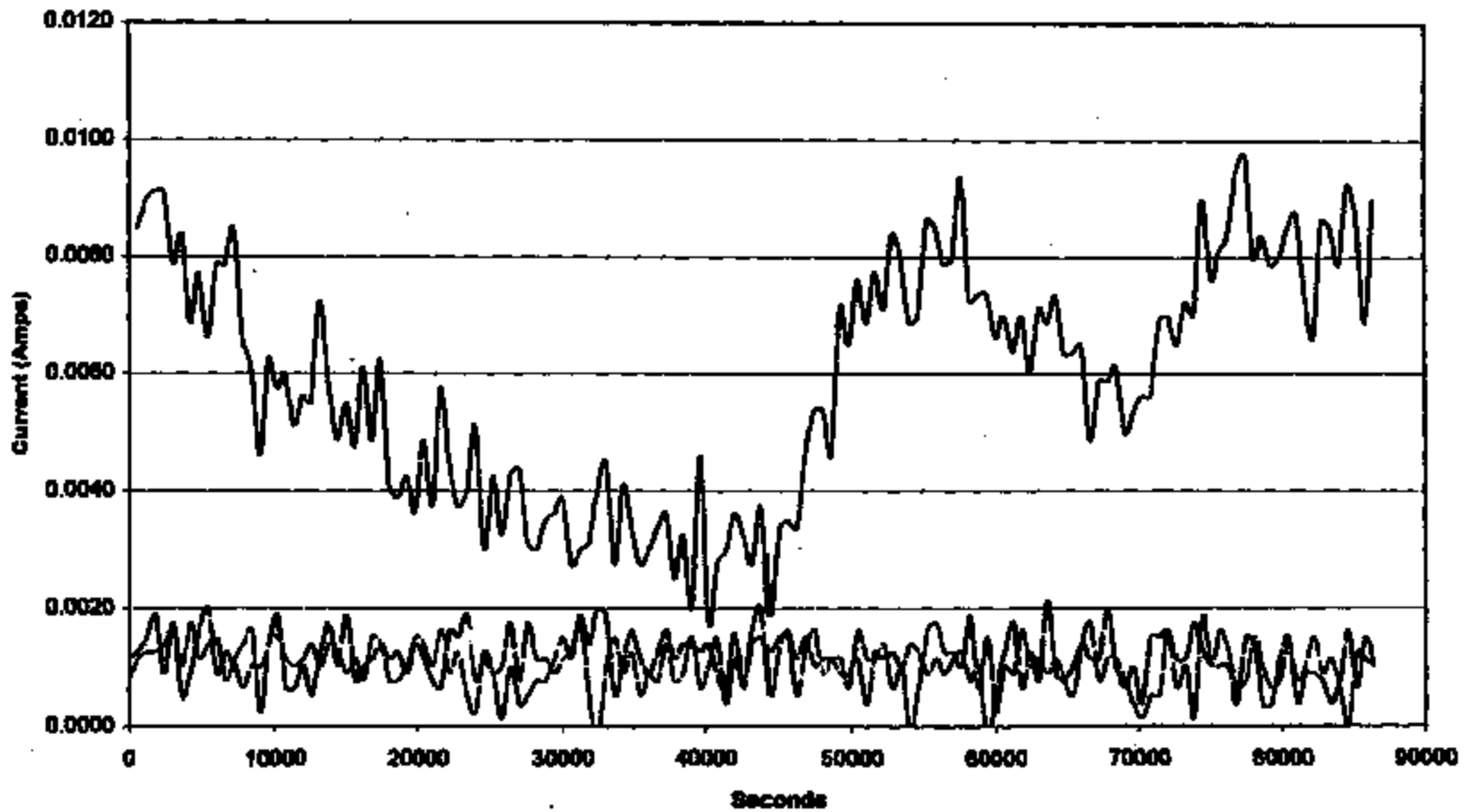
Hexport Current Fluid Ingress Experiment



TI-NHTSA 01A884

Hexport Current Fluid Ingress Experiment

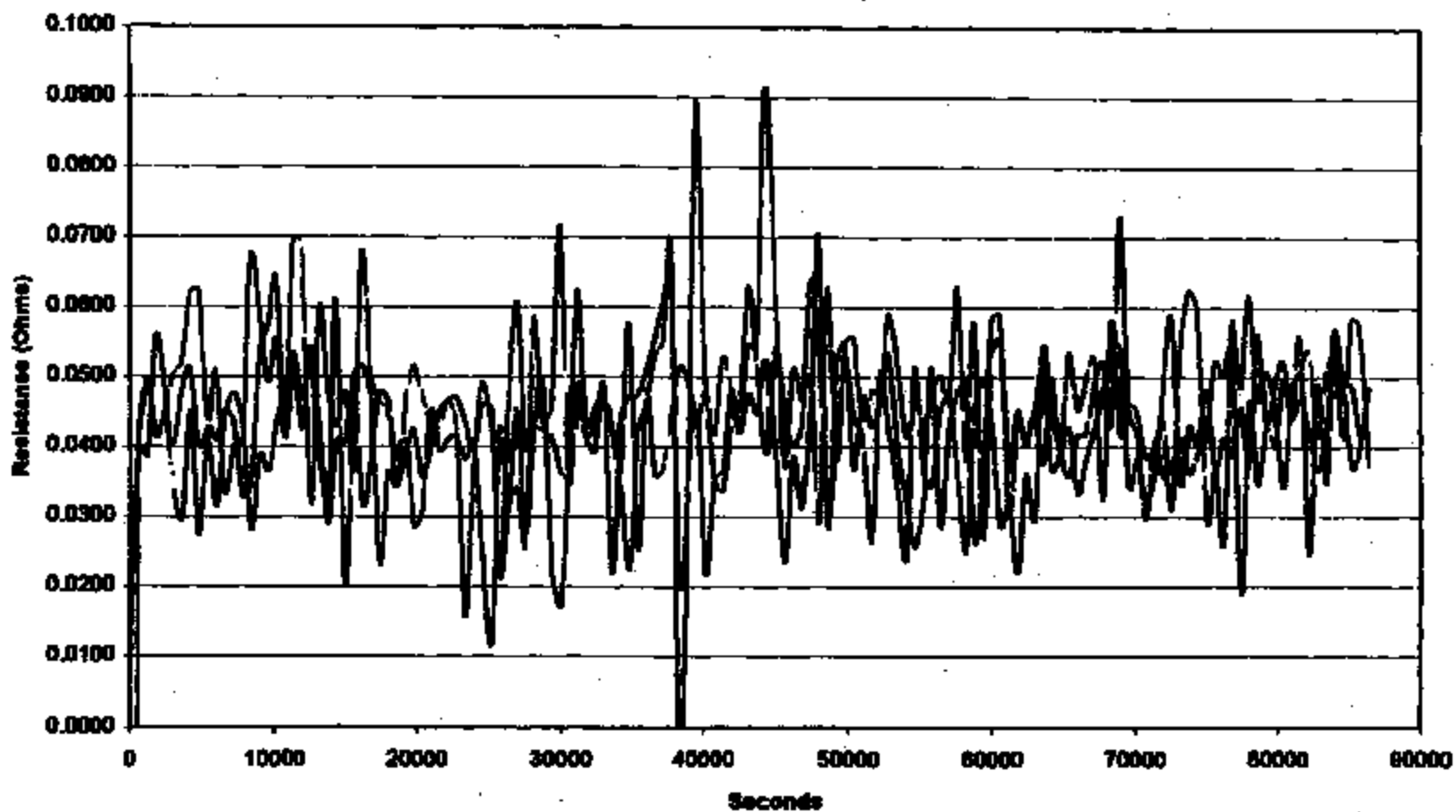
— New Brake Fluid - - - New Brake Fluid w/ 5% water Used Brake Fluid — Tap Water



TI-NHTSA 014885

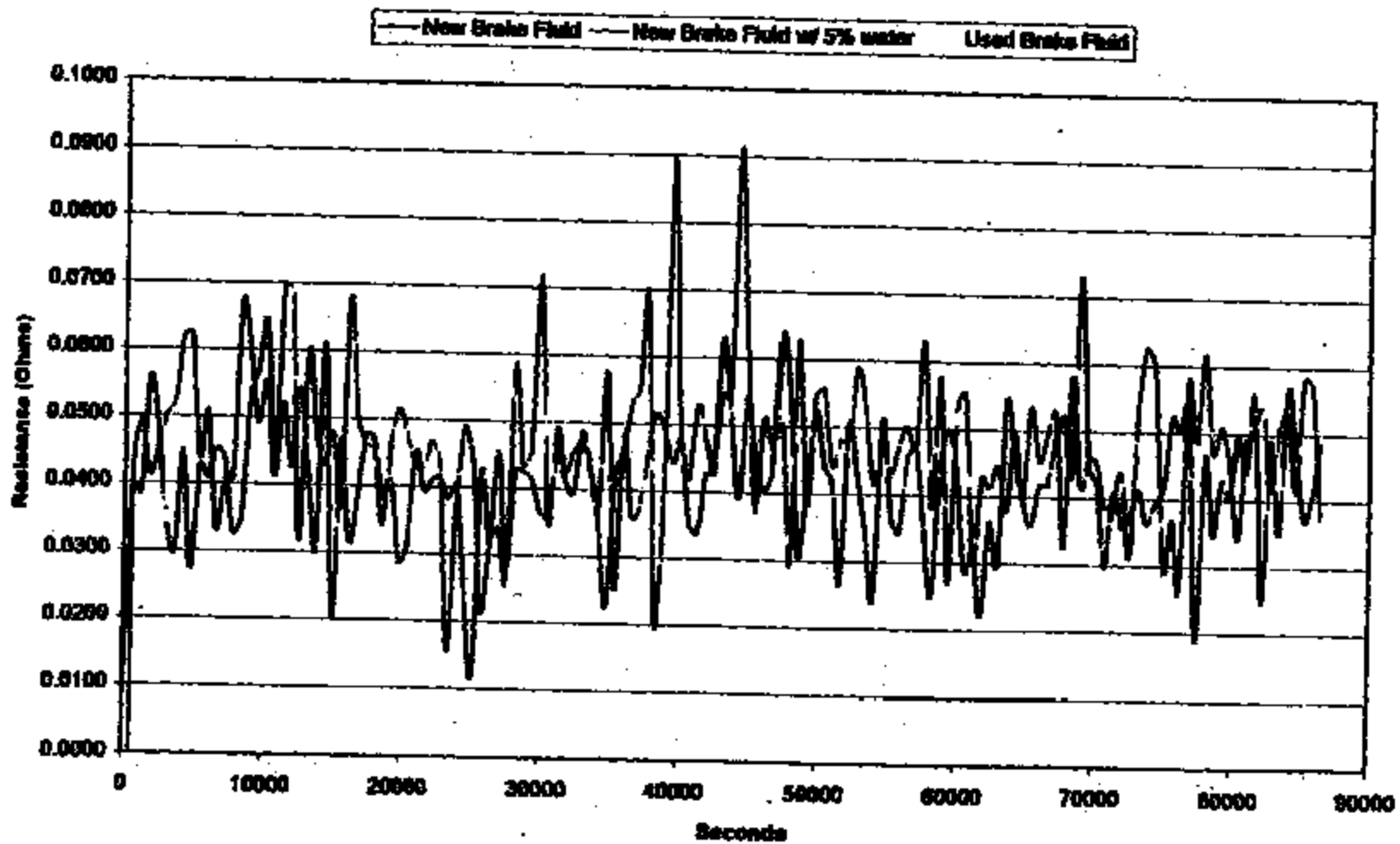
Terminal Resistance Fluid Ingress Experiment

— New Brake Fluid — New Brake Fluid w/ 5% water — Used Brake Fluid — Tap Water

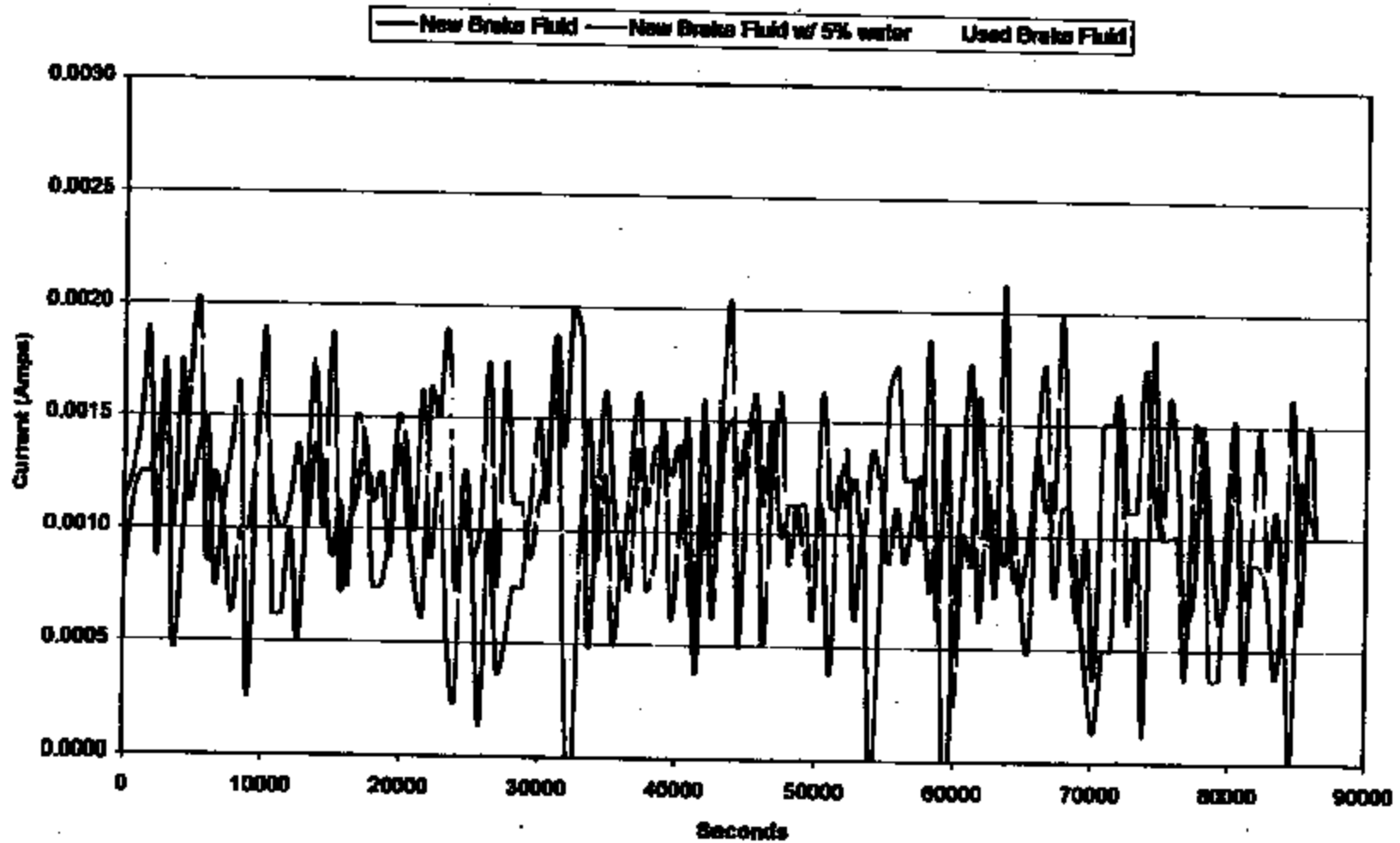


TM-NHTSA 014900

Terminal Resistance Fluid Ingress Experiment

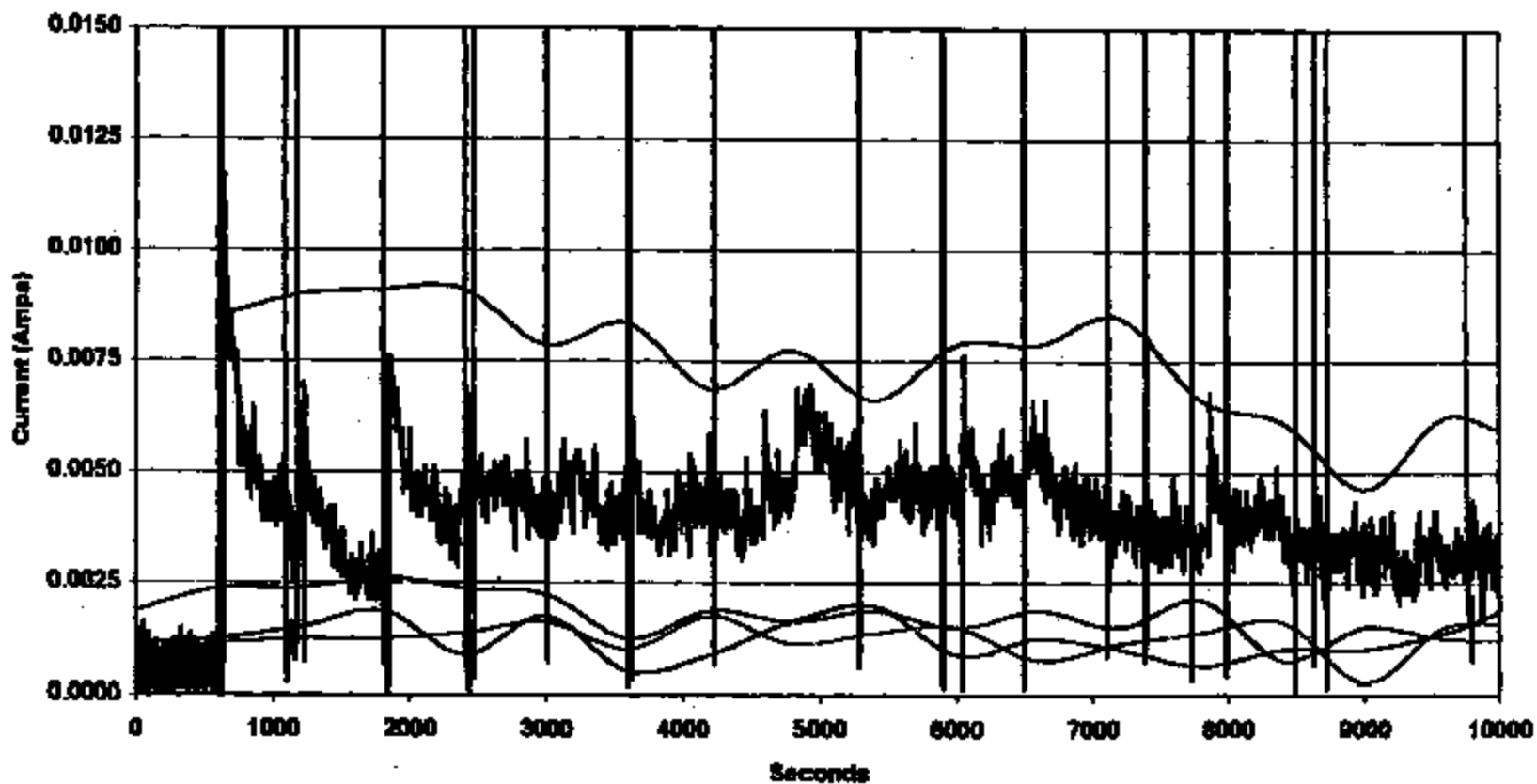
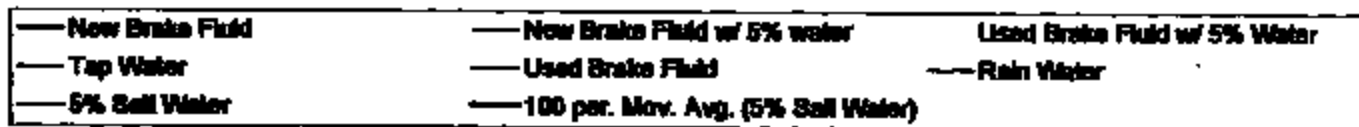


Hexport Current Fluid Ingress Experiment



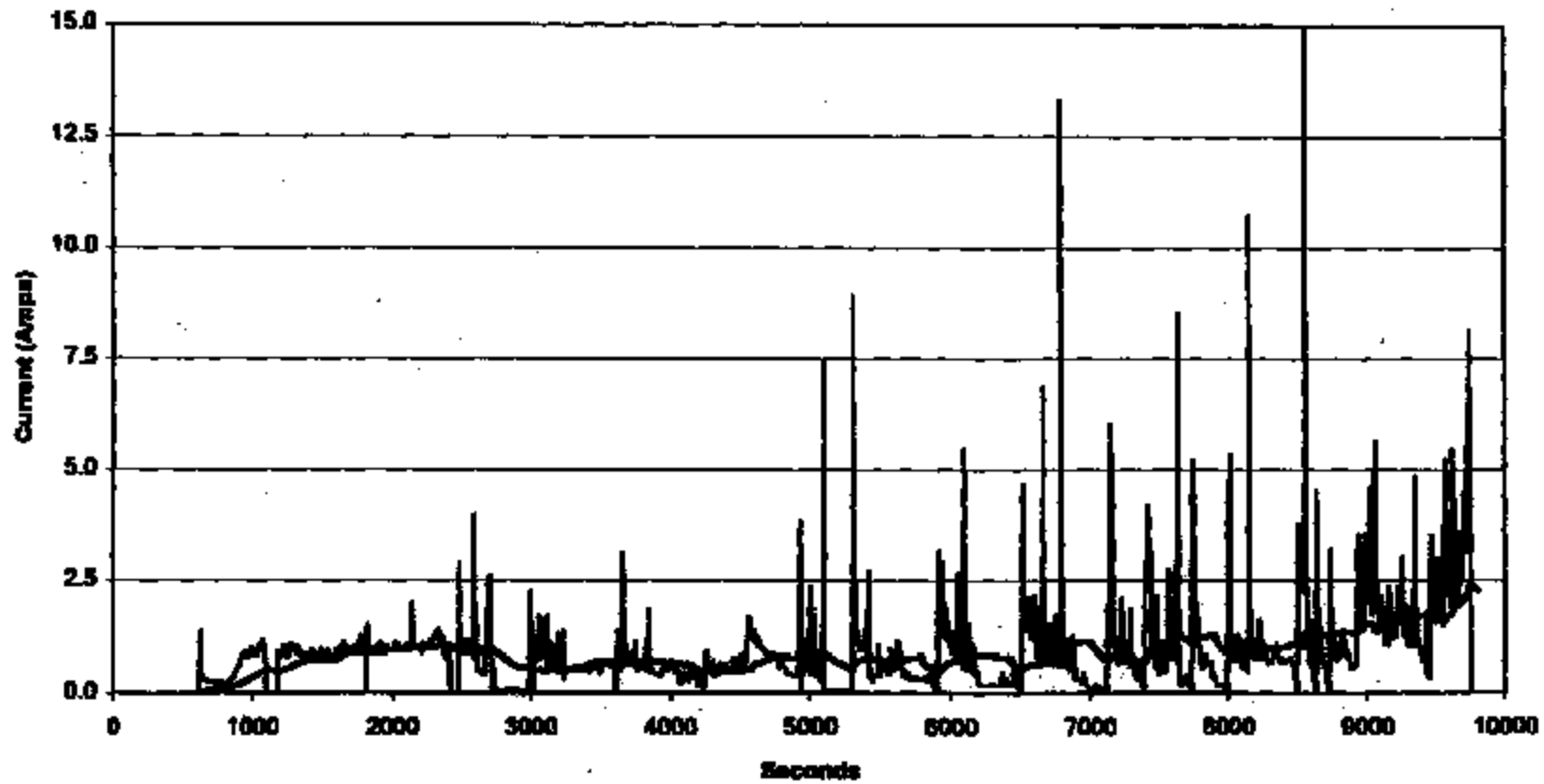
TJ-NHTSA 014868

Hexport Current vs. Time Fluid Ingress Experiment



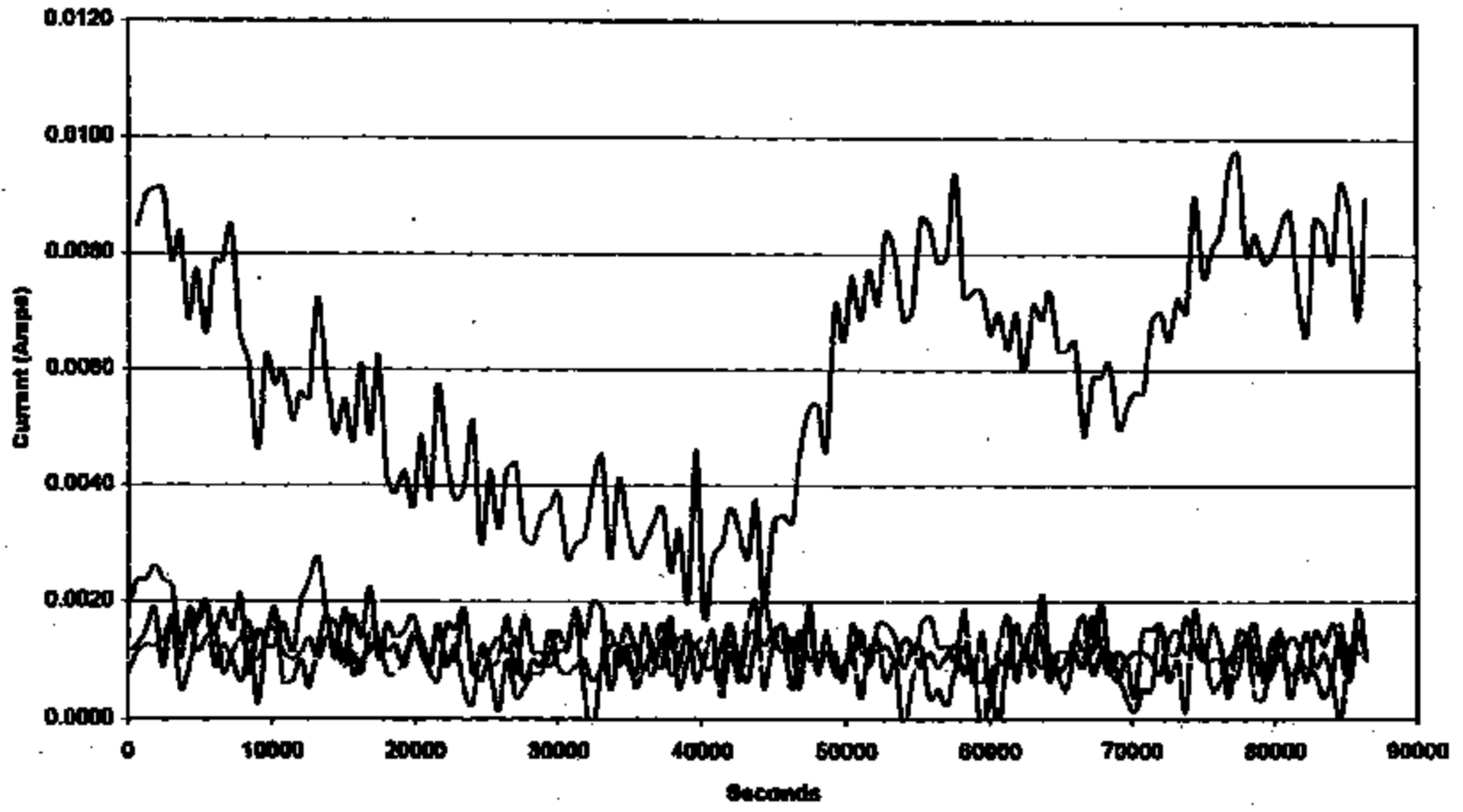
TJNH7SA 01A069

Hexport Current vs. Time Fluid Ingress Experiment



**Hexport Current vs. Time
Fluid Ingress Experiment**

— New Brake Fluid — New Brake Fluid w/ 5% water — Used Brake Fluid w/ 5% Water — Tap Water — Used Brake Fluid



TI-NHTSA 014871

X-bar
Chart

USL:
0.095
LSL:
0.07

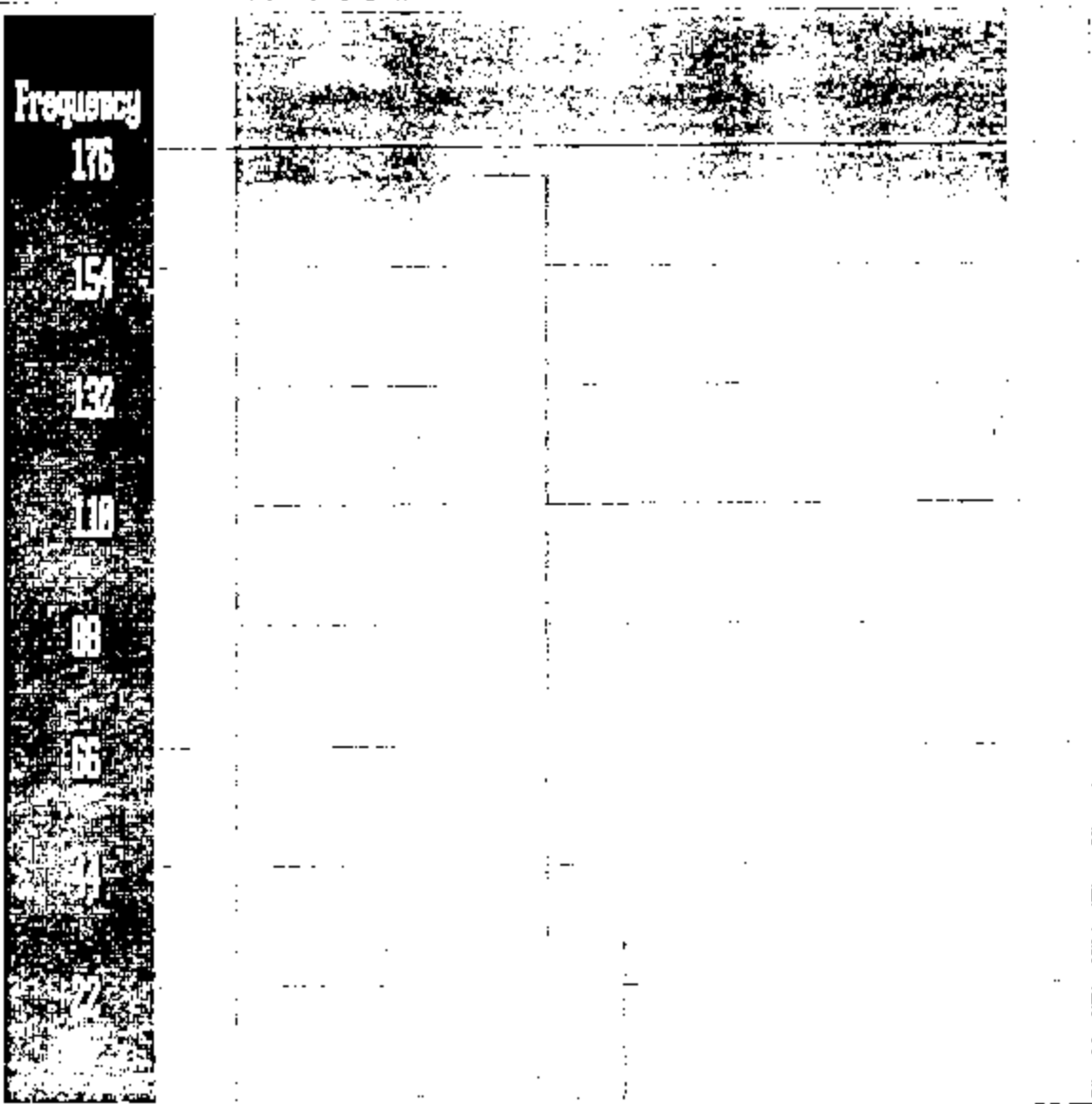
UCL:0.089
AVG:0.0828
LCL:0.073
fixed

Range
Chart

UCL:0.01
AVG:0.002
LCL:0.0



TI-NHTSA 014872



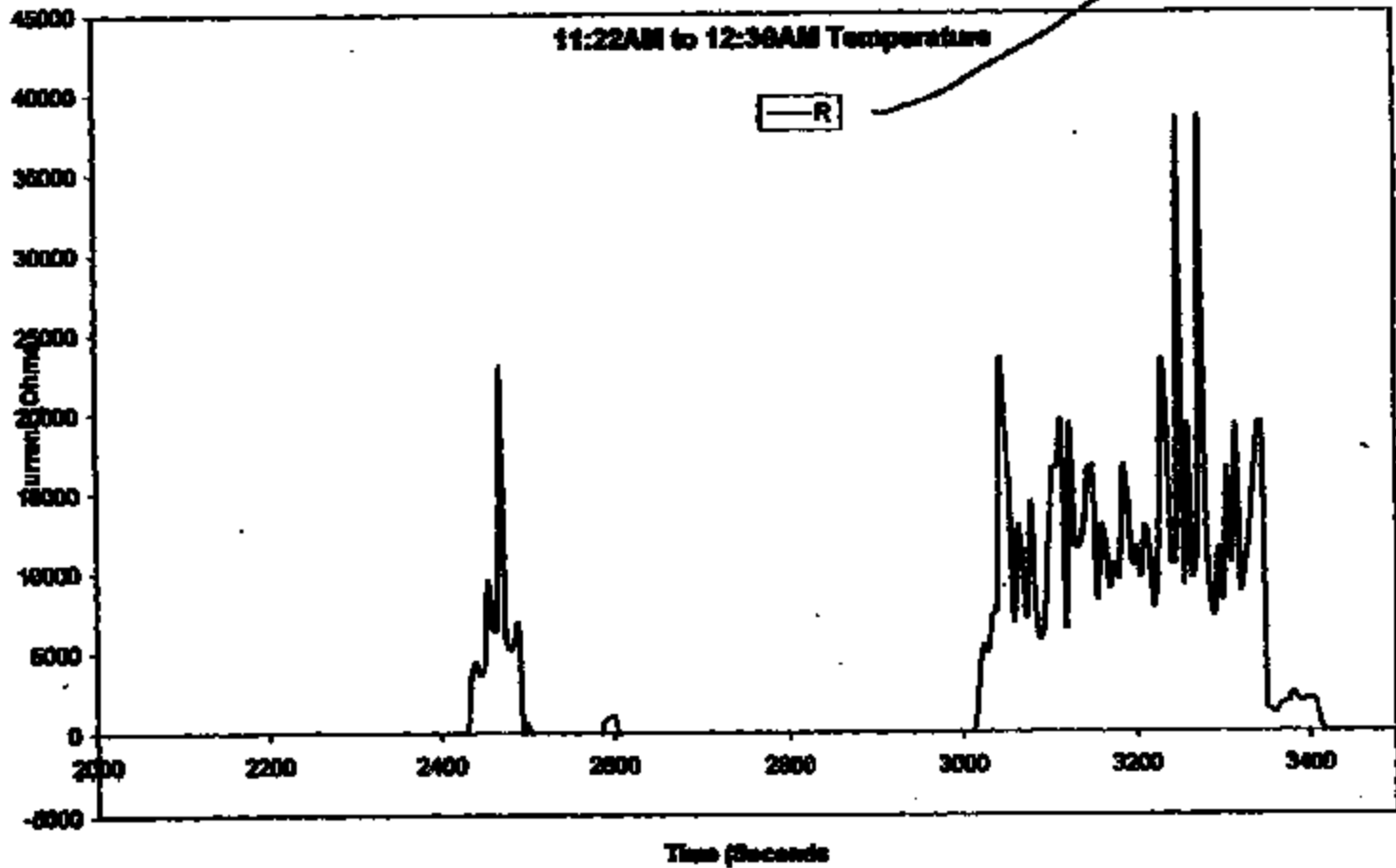
Frequency
 176
 154
 132
 110
 88
 66
 44
 22

HISTOGRAM 0.2768 0.2798 0.2836 0.2874 0.2912 0.2958

SENTENCE 27709-172 2927578 3137150 3346722 3556294

press any key to continue

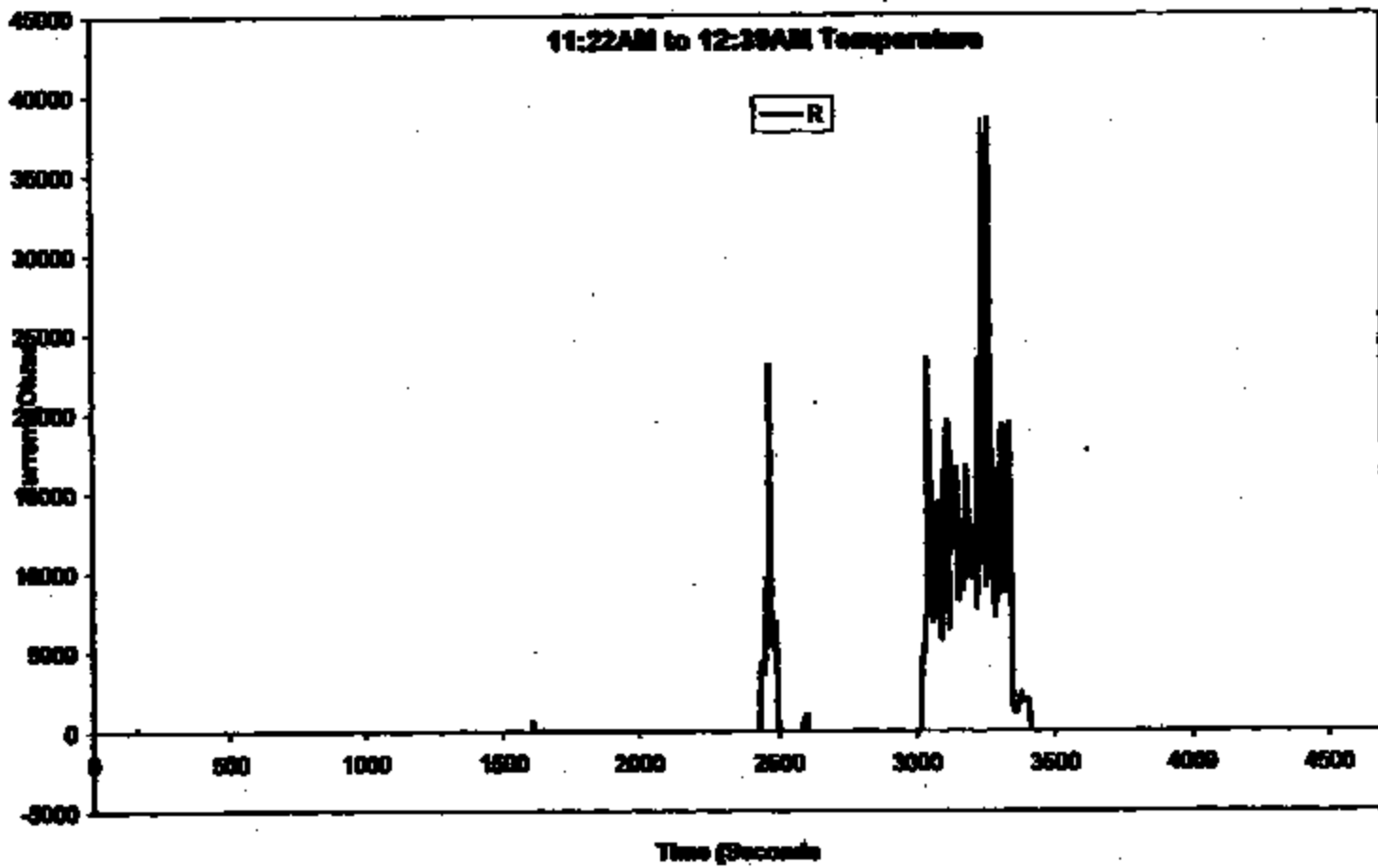
Bryant $R = \frac{11-10}{i \text{ clutch}}$



I did
in hurry
need to
check,

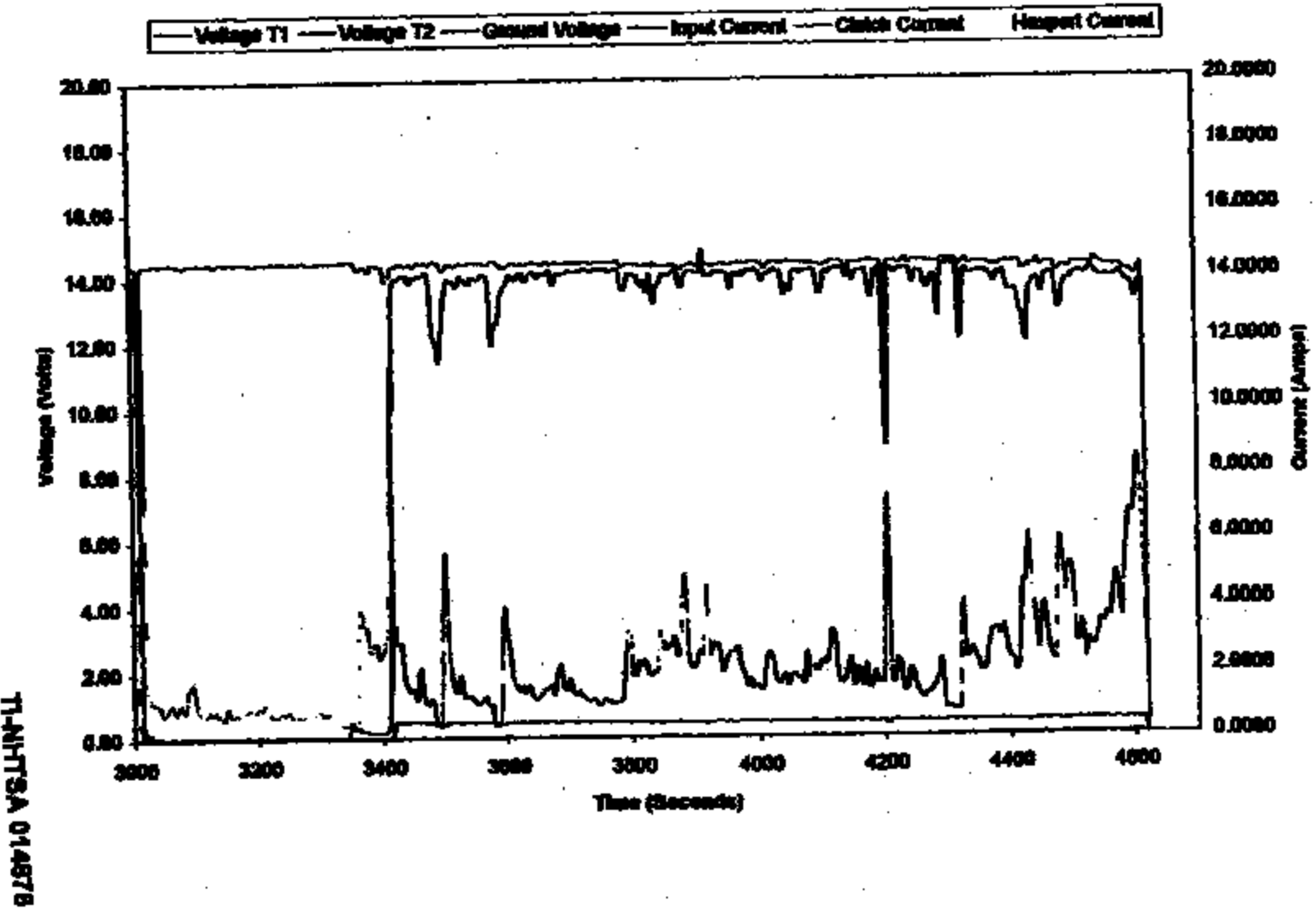
Sean

TI-NHTSA 014874



TI-NHTSA 014876

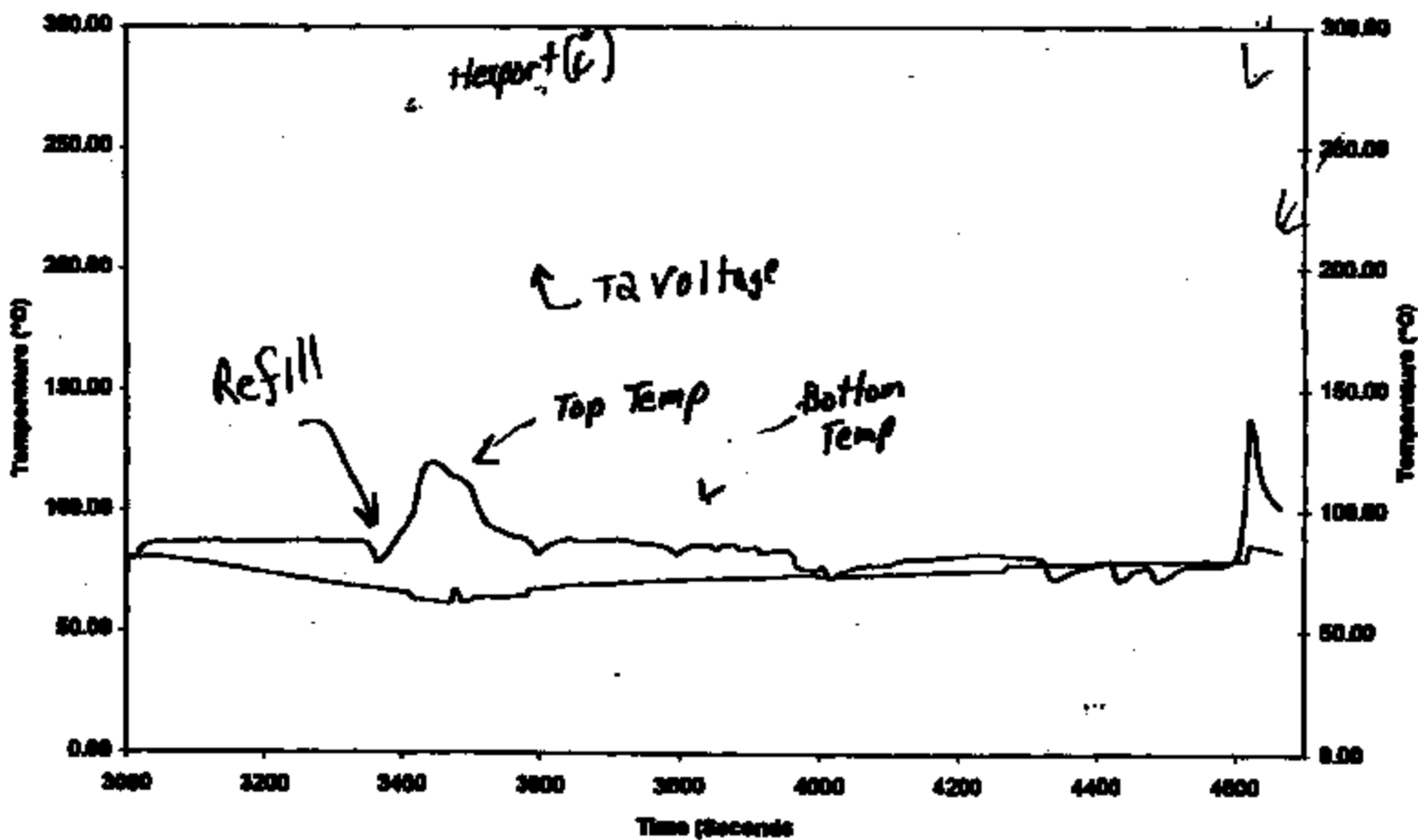
10:00 AM to 12:30 PM



Last 25 minutes of test

11:22AM to 12:30AM Temperature

— Top Temp — Clutch Temp — Bottom Temp

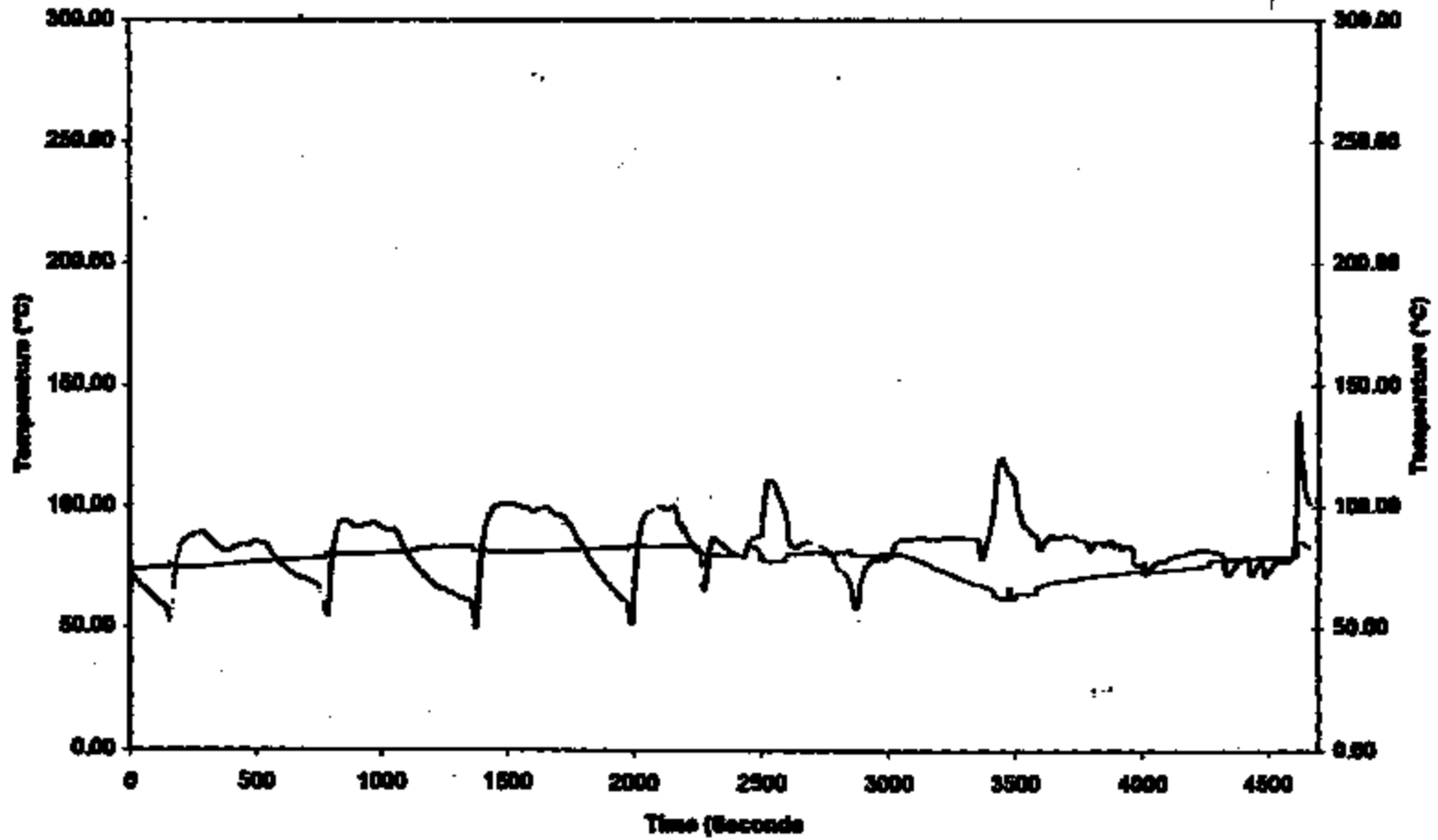


TI-NHTSA 014877

REVISION 02/15/2000

11:22AM to 12:30AM Temperature

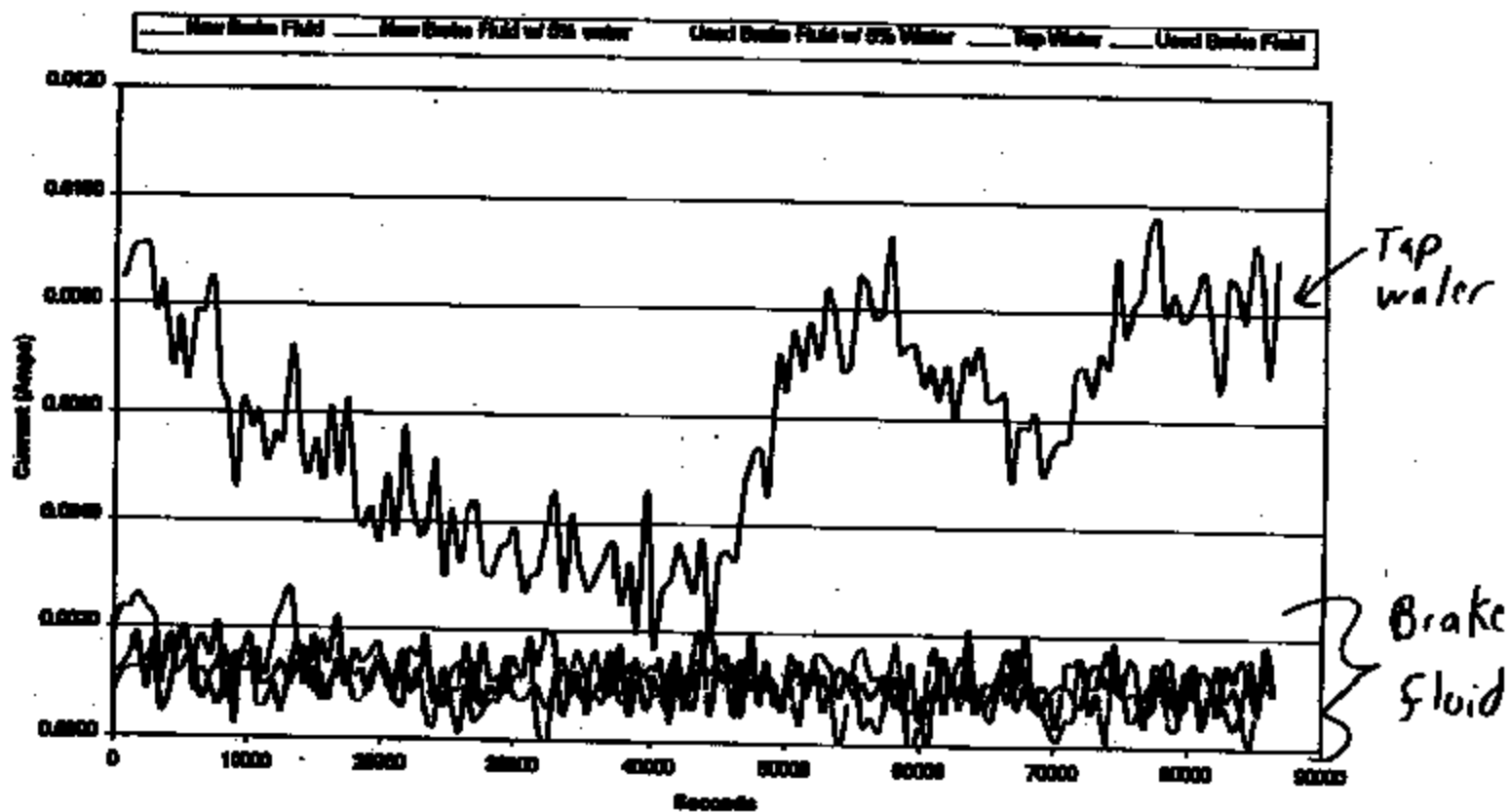
— Tap Temp — Churn Temp — Bottom Temp



TI-NHT8A 014978

(24) Hour Fluid Ingress Test

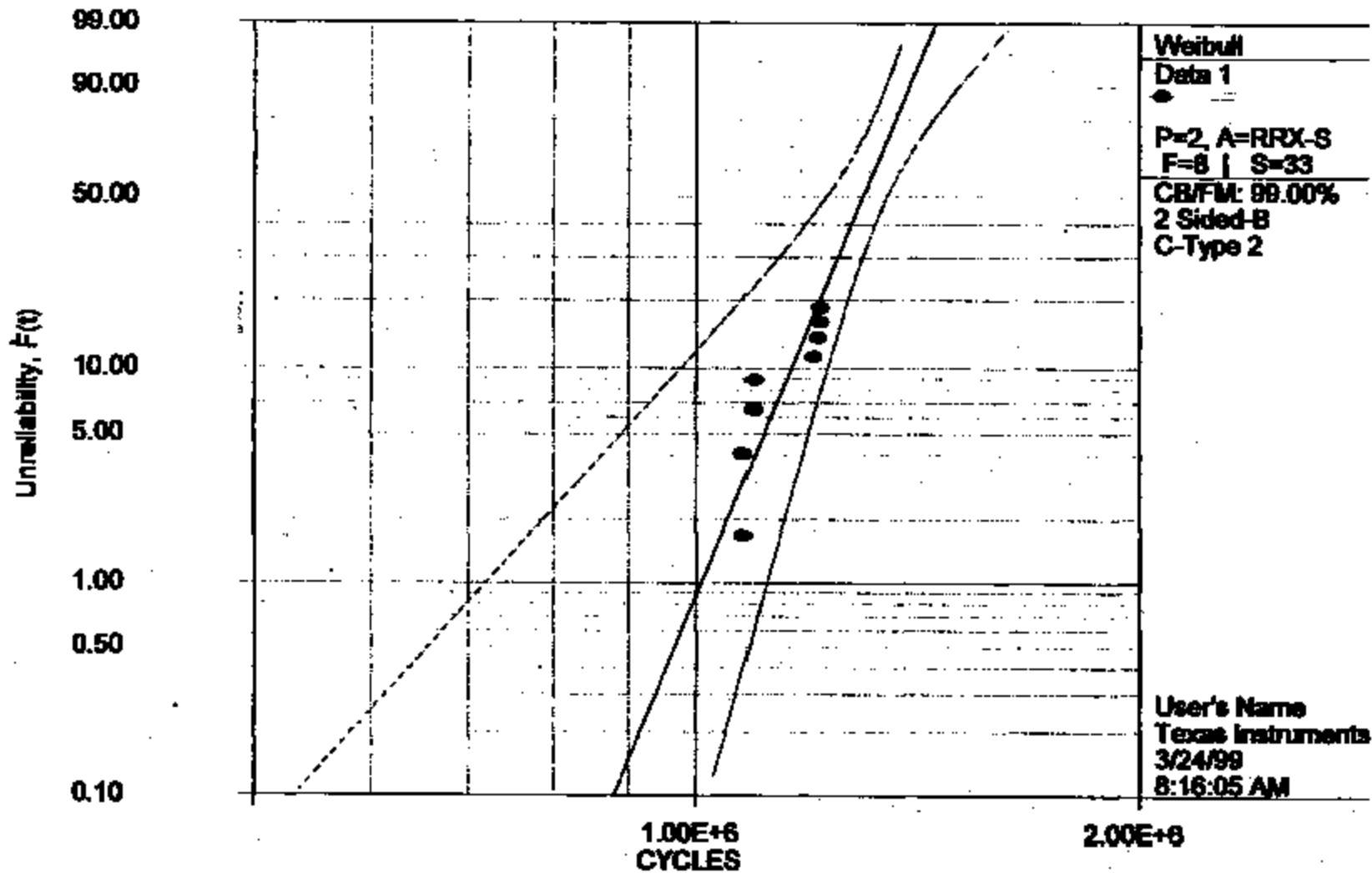
Hoop Current vs. Time
Fluid Ingress Experiment



TI-NHTSA 014879

Generated by: ReliaSoft's Weibull++ 5.0 - www.Weibull.com - 888-886-0410

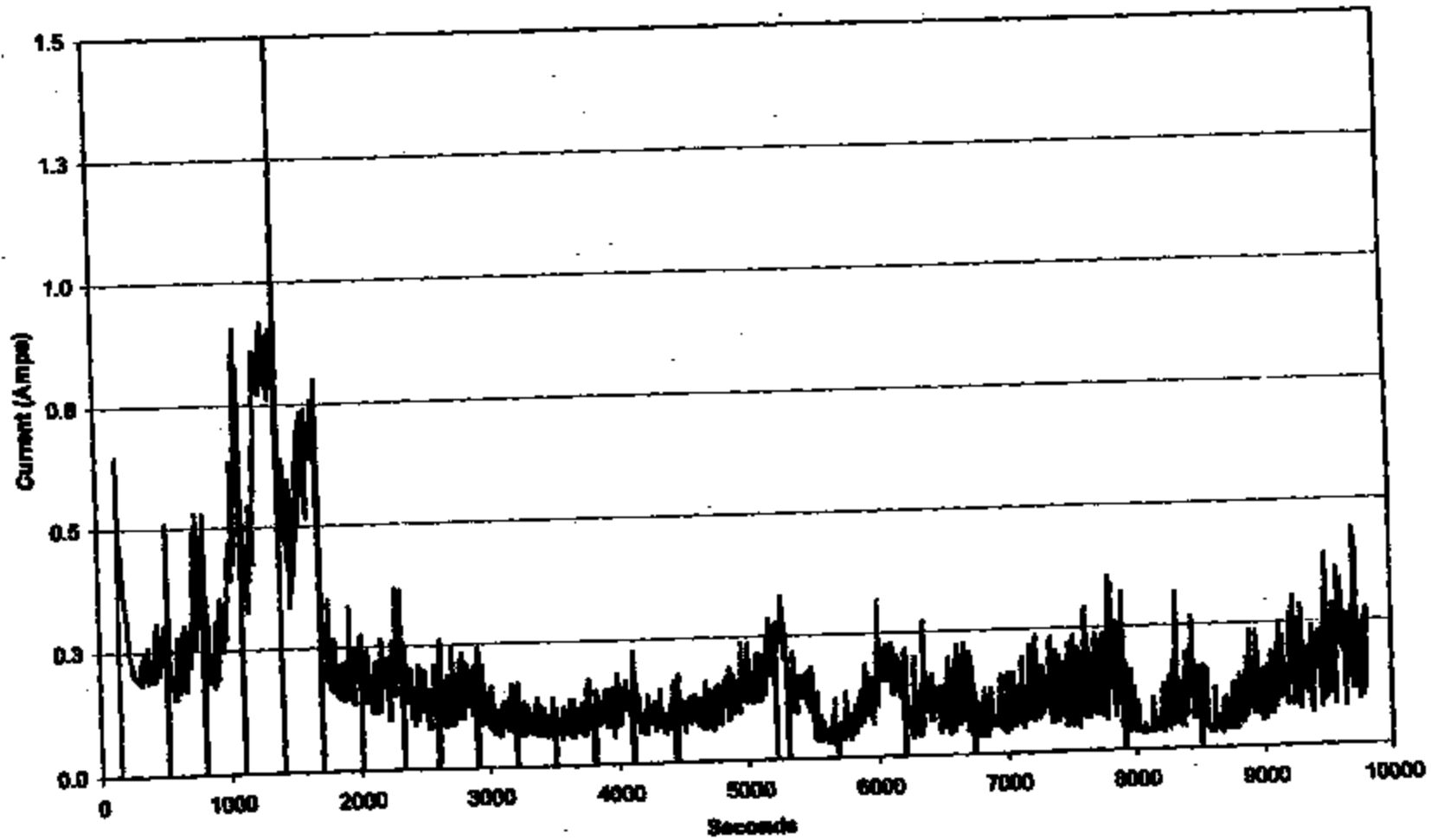
77PSL2-1 COMBINED TEST



$\beta=16.80, \eta=1.33E+6, \rho=0.86$

TI-NHTSA 014890

Hexport Current vs. Time
Noryl base_1 5% Salt Water Ingress Experiment



TI-NHTSA 014881



X-bar
Chart

USL:

0.479

LSL:

0.459

UCL: 0.475

AVG: 0.4579

LCL: 0.46

fixed

Range
Chart

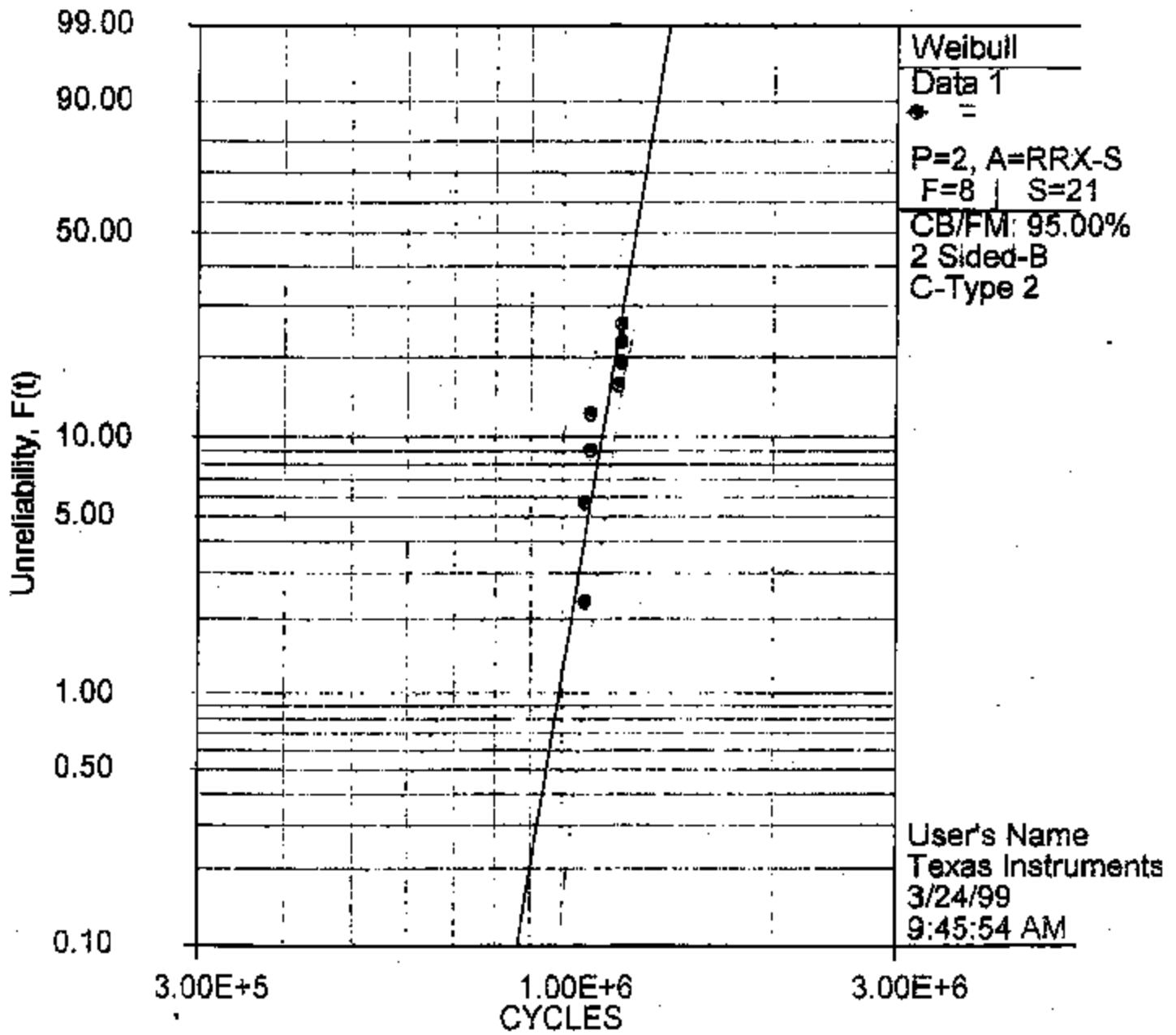
UCL: 0.007

AVG: 0.0014

LCL: 0.0

press any key to continue

77PSL2-1 LIFE CYCLE TEST



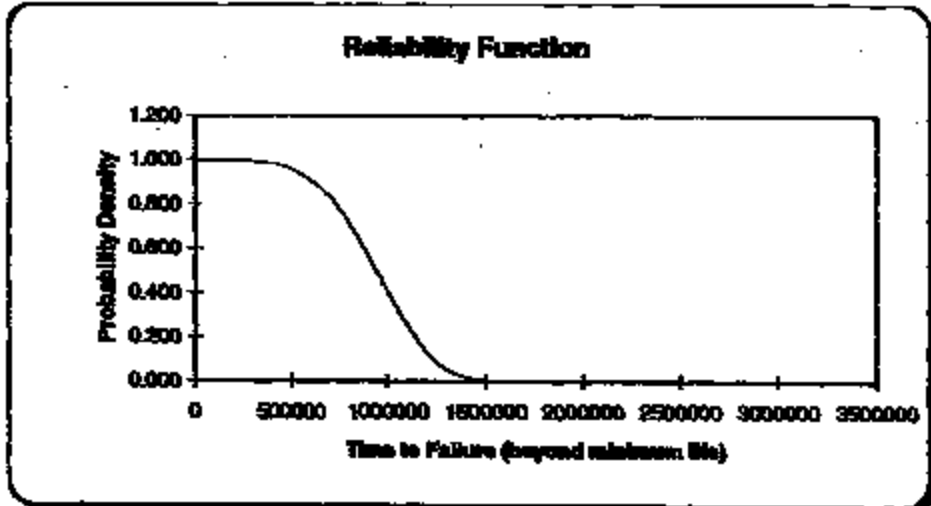
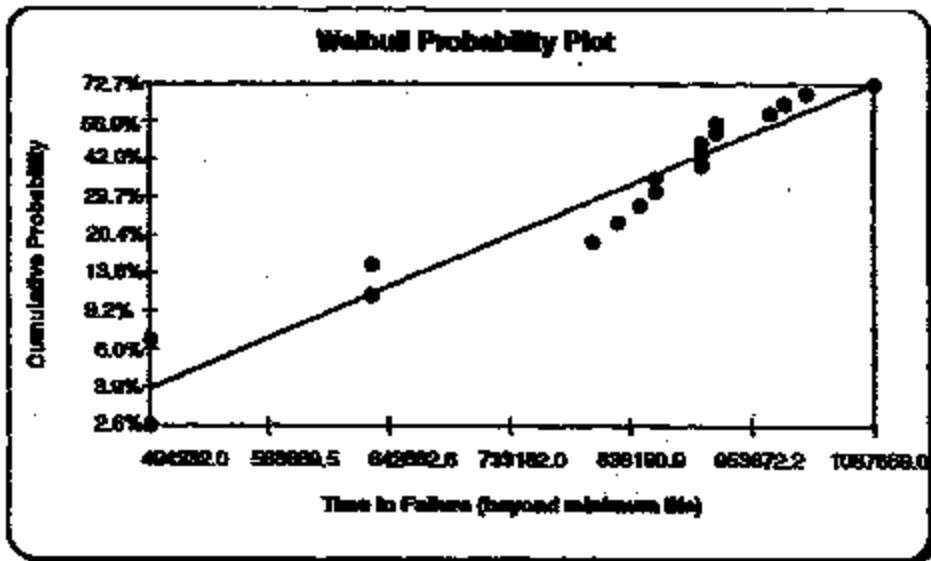
$\beta=17.05, \eta=1.30E+6, \rho=0.86$

2 and 3 parameter WEIBULL FAILURE ANALYSIS

CLICK here to recalculate if failure data or "Minimum life" input values is altered

664232		600000	
994282			
1181102			
1181102			
1302891			
1325190		600000	100%
1344673			
1358658			
1358658		90%	1115347.013
1403622			
1403622			
1403622			
1418250			
1418250			
1472621			
1486221			
1511726			
1597859			
1634821	B		
1634821	B		
1634821	B		
1634821	B		
1634821	B		
1634821	B		

Calculated Outputs



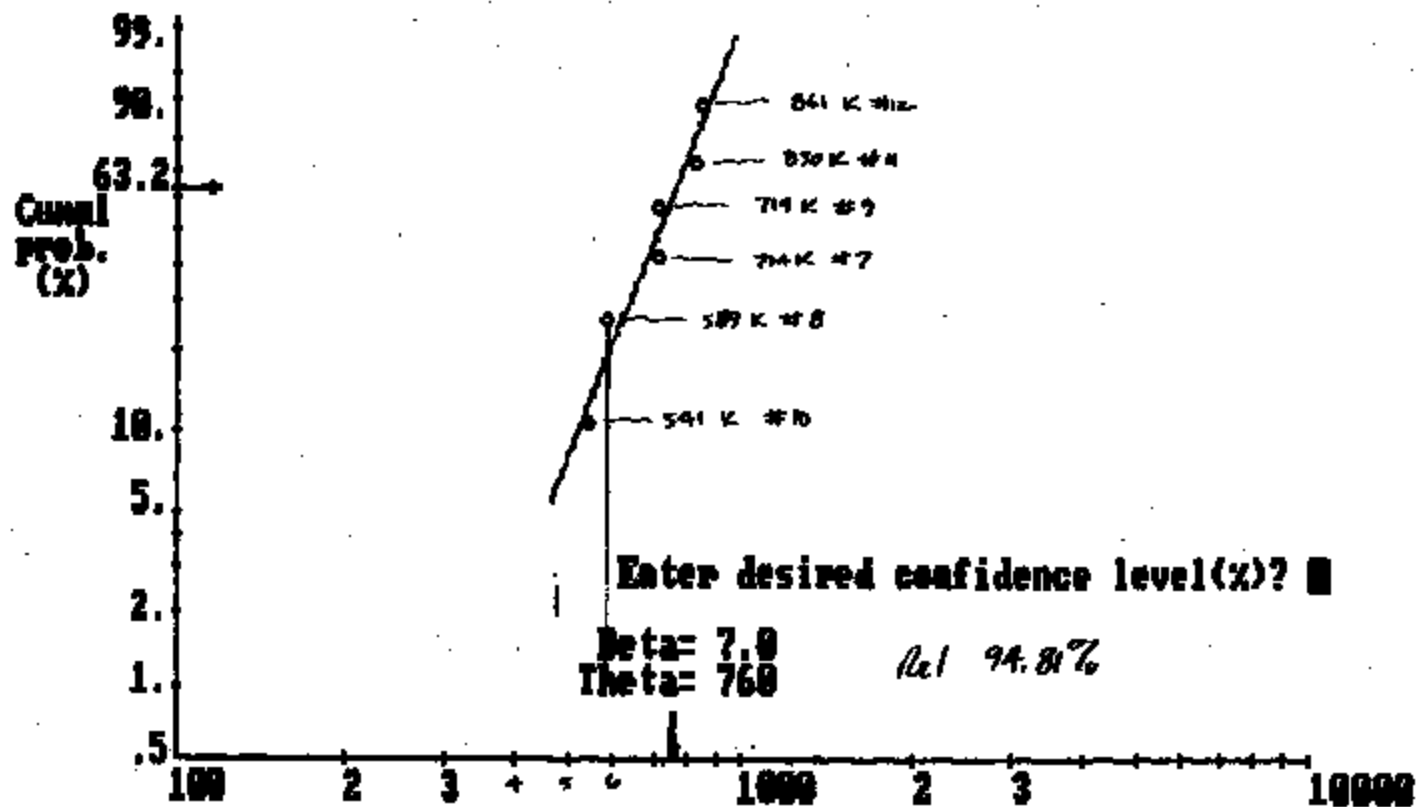
NOTES:

MODEL SHOP CVP

AMI CRIMP

6/6 FAIL

TEST 159

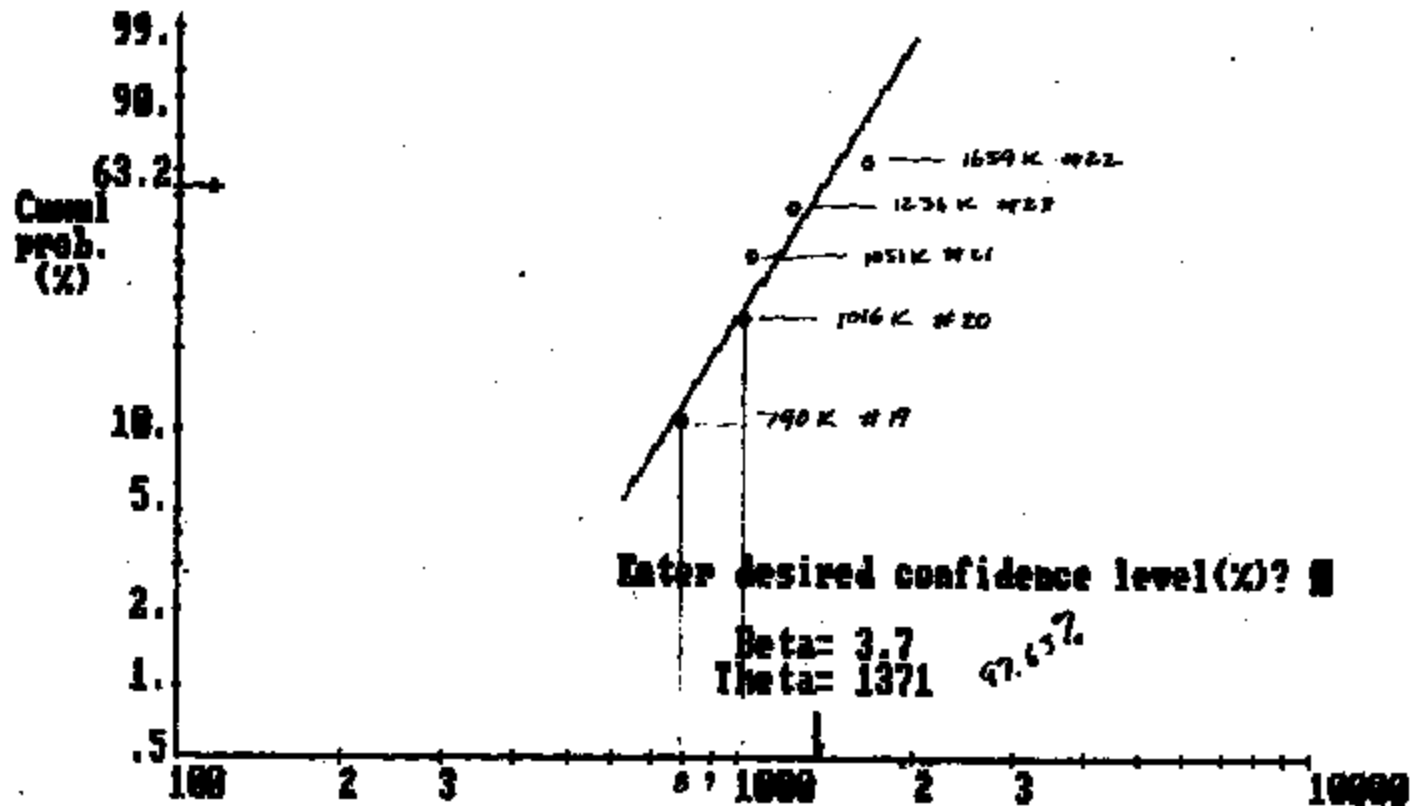


TI-NHTSA 014985

M/S RETURN UP
 HAND-LINE CRIMP (ORIGINAL STRESS VAL)

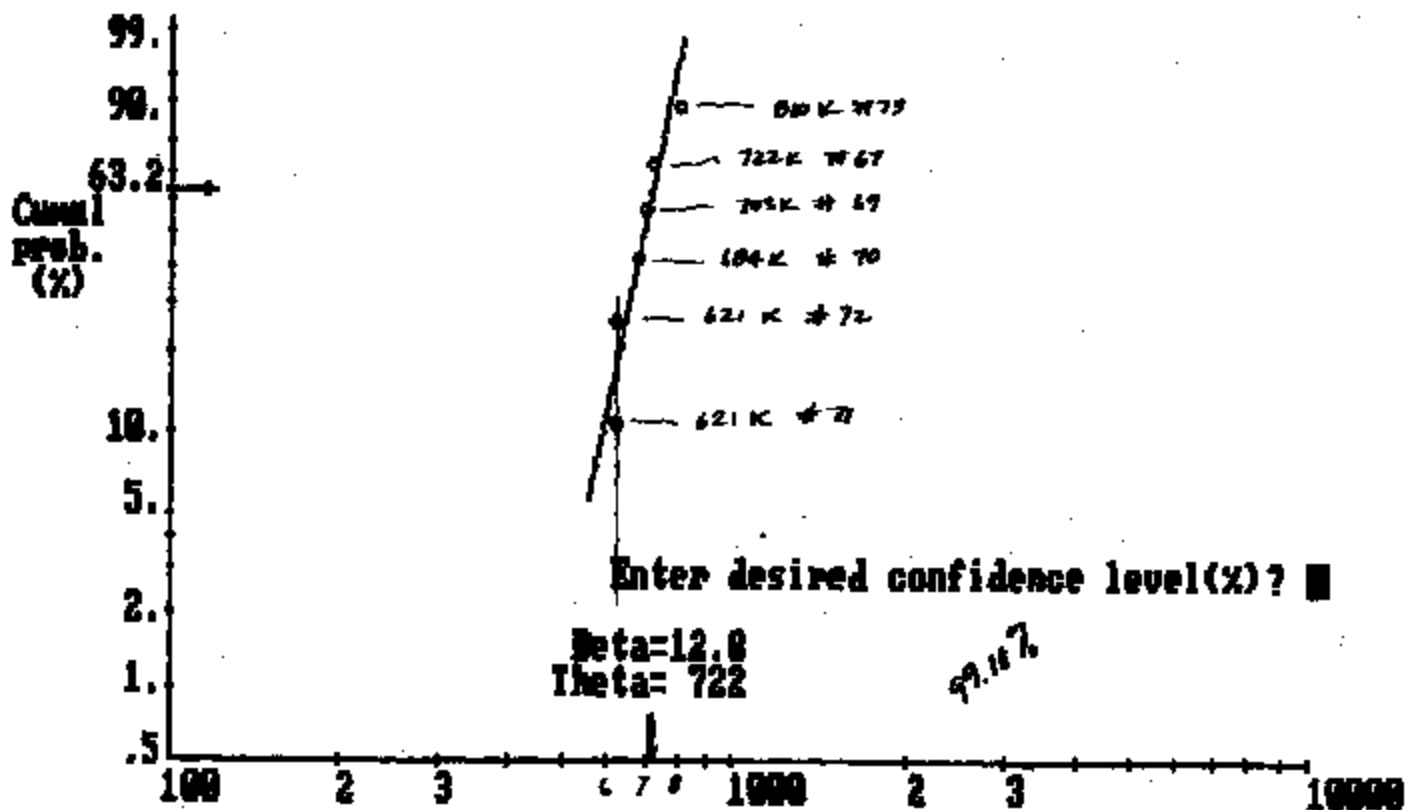
5/6 FAIL

1 SUSPENDED @ 1975 K TEST 159



LT VALIDATION PARTS

BUILT ON Am1 JULY '91 TEST 159



TI-NHTSA 014887

RELIABILITY LEVELS FOR SPECIFIED VALUES OF TIME

 * WEIBULL SLOPE : 12.60
 * CHARACTERISTIC LIFE : 722.00

NO. 1
 TIME 500
 RELIABILITY (%) 99.0672

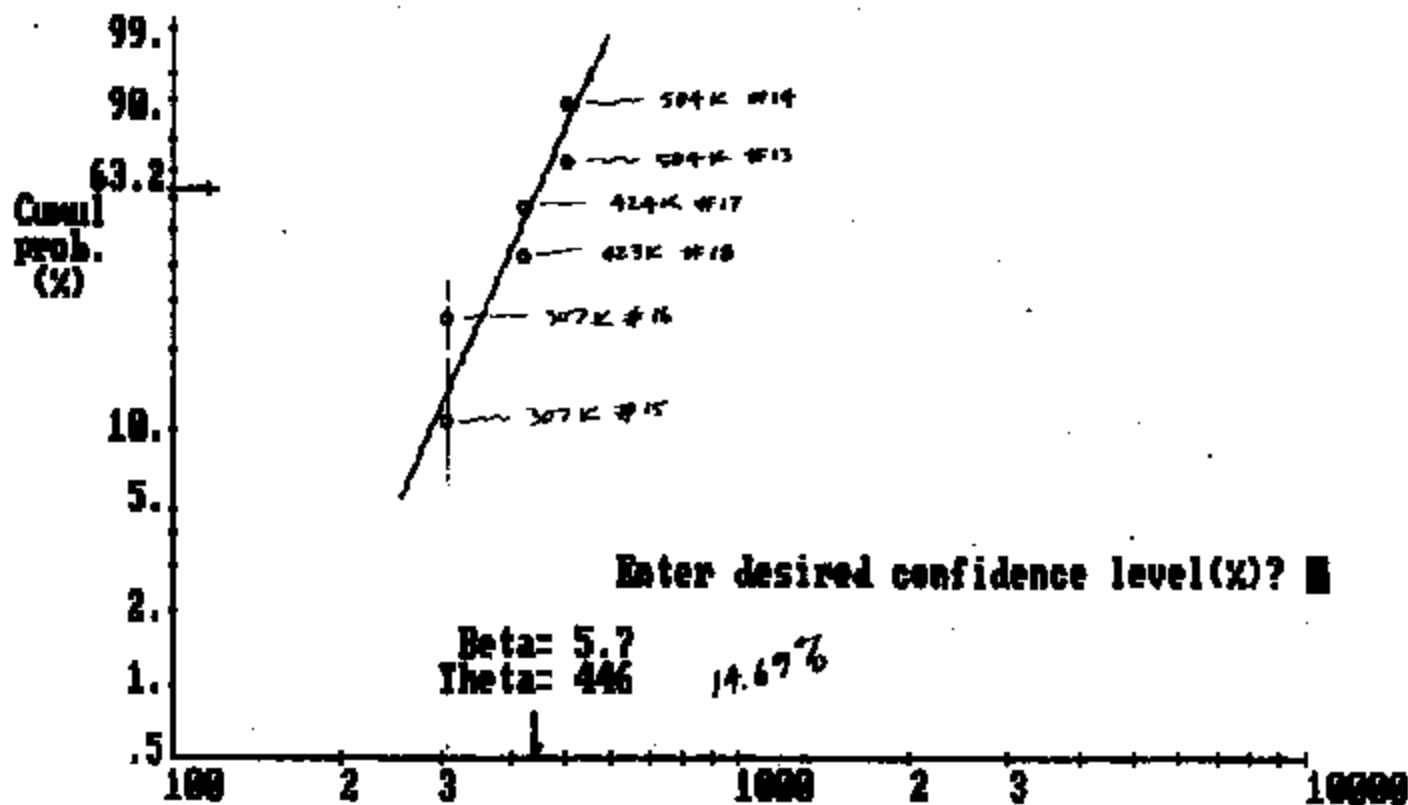
PRODUCTION CUP

AWM1 CRIMP

TEST 159

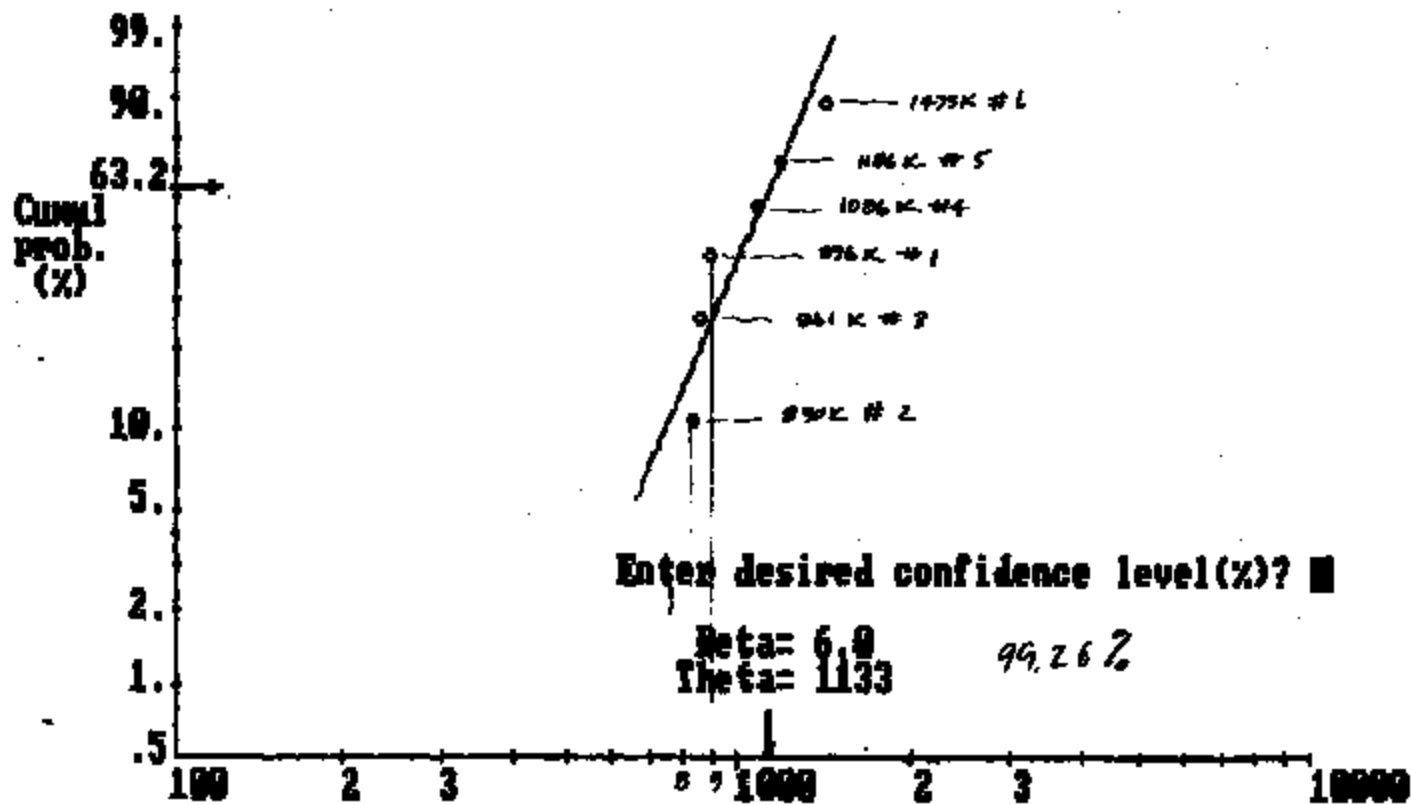
6/6 FAIL

BUILT FOR 7715 VAL (ORIGINAL)



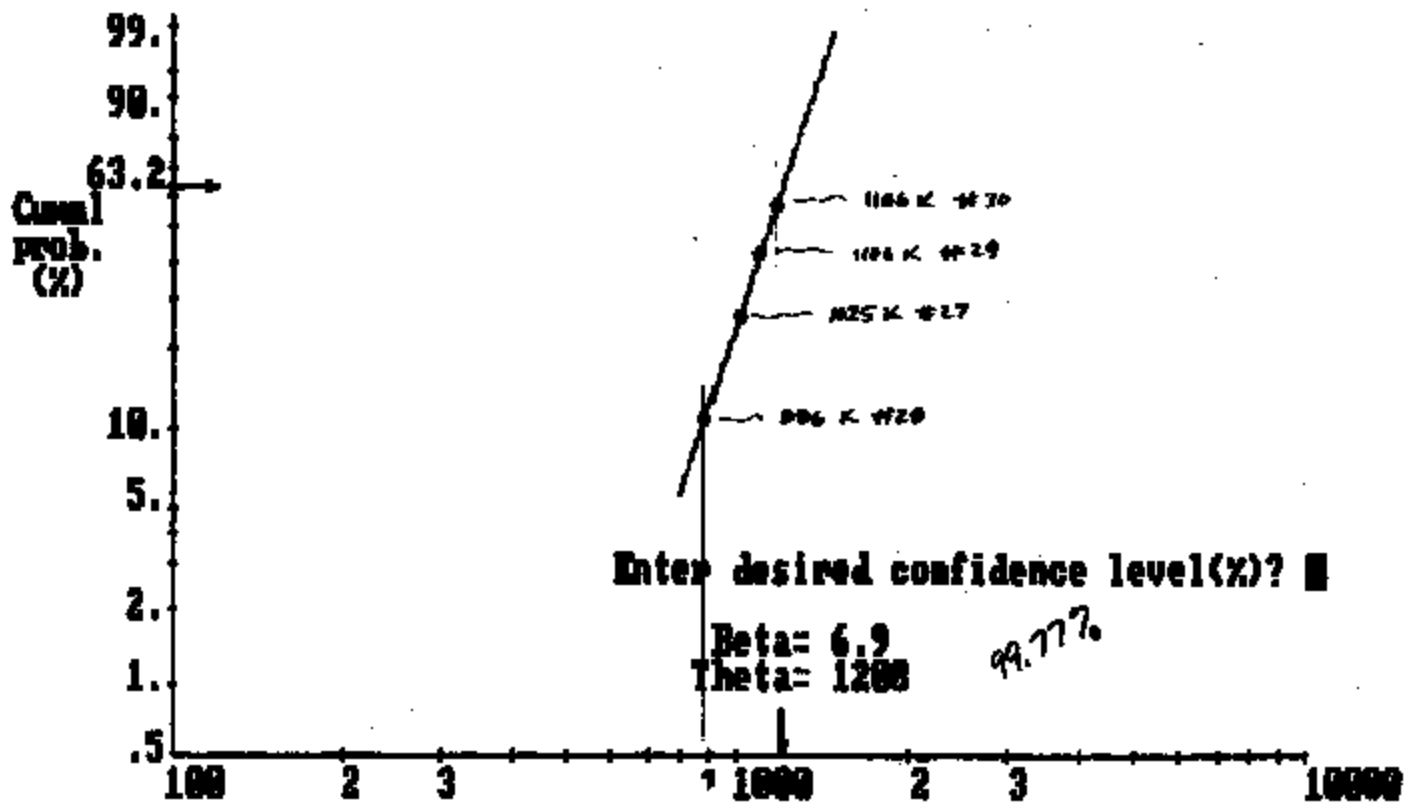
TI-NHTSA 014898

PRODUCTION CUP
 HAND-LINE CRIMP (FIRST BATCH)
 6/6 FAIL
 TEST 157



TI-NHTSA 014889

PROD LUP
 AMI BUILT 910025 W/ PRE-CRIMP
 4/6 FAIL TEST 159
 2 SUSPENDED @ 1590K



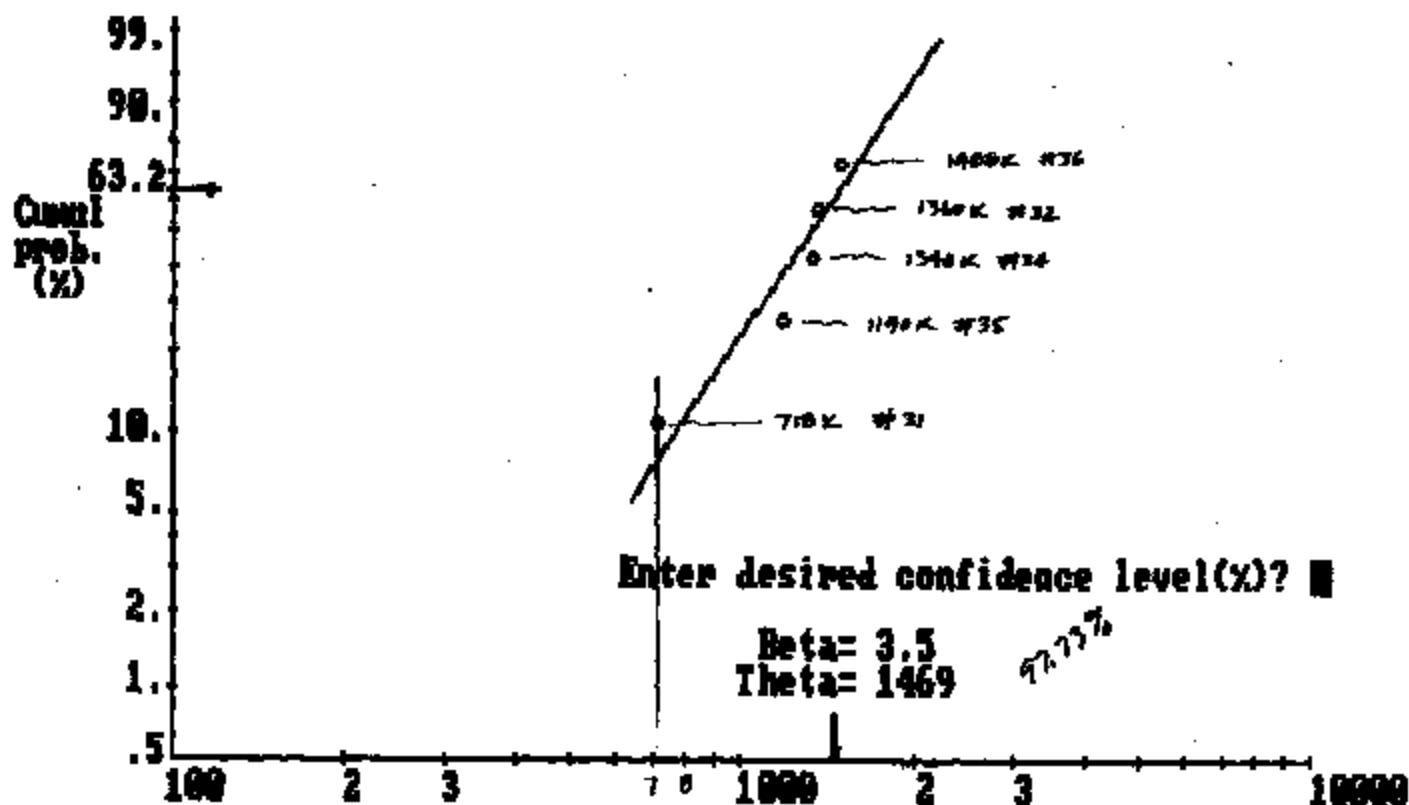
TI-NHTSA 014890

PROD CUP

AMI CRIMP W/O IRCRIMP

5 OF 6

#33 SUSP. @ 1590 K TEST 159



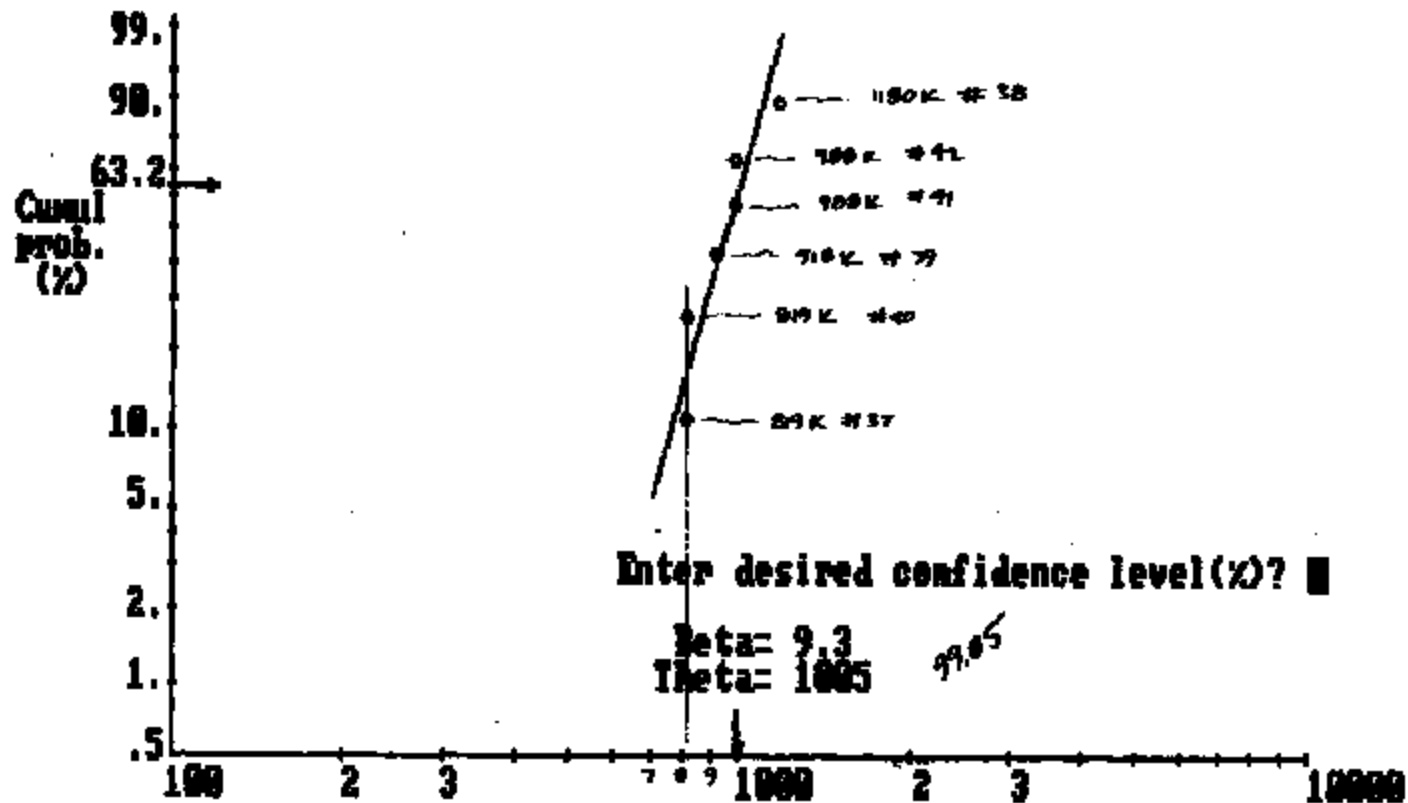
TI-NHTSA 014891

PROD CUPS

HAND-LINE CRIMP

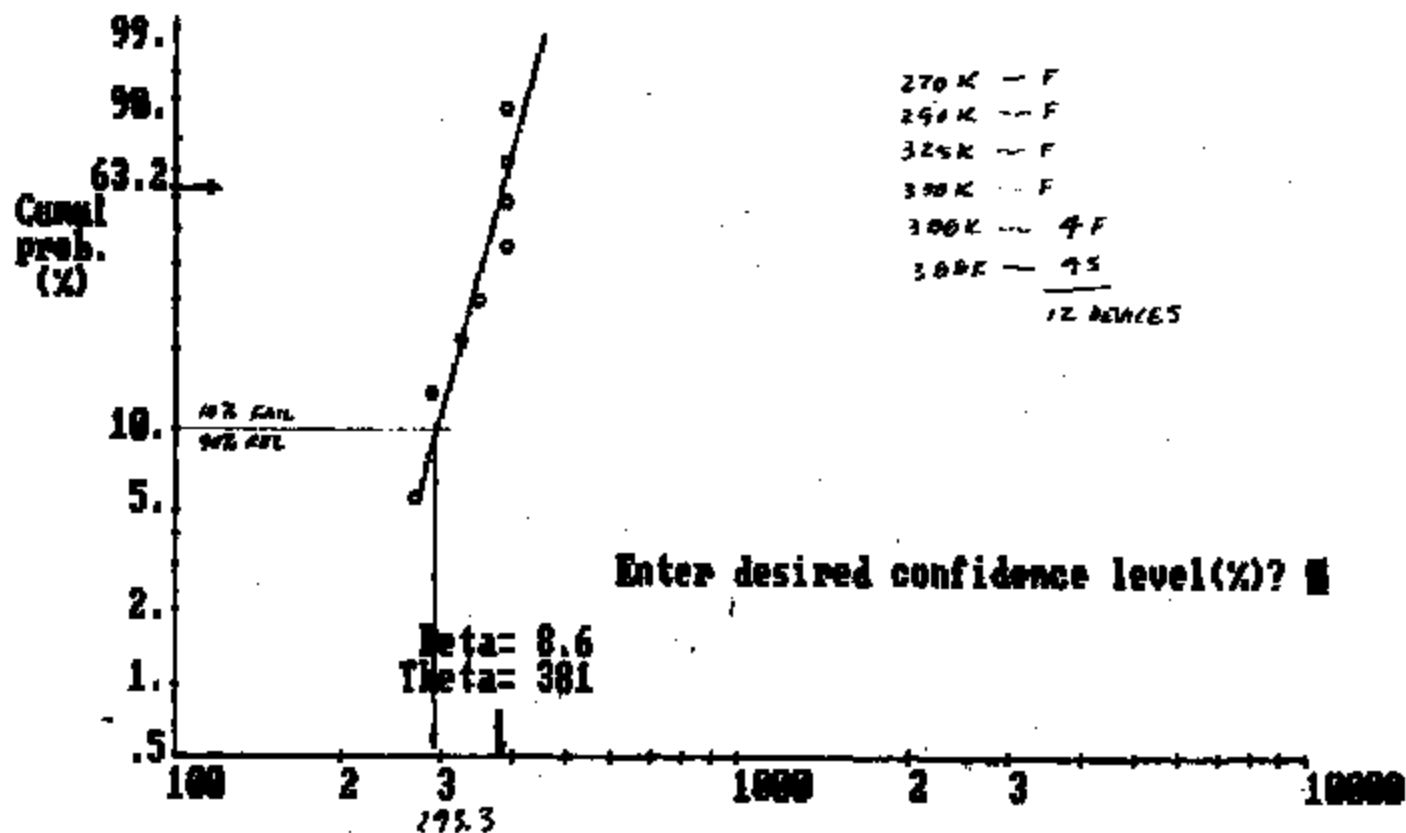
W/ AMI PRECRIMP

TEST 159



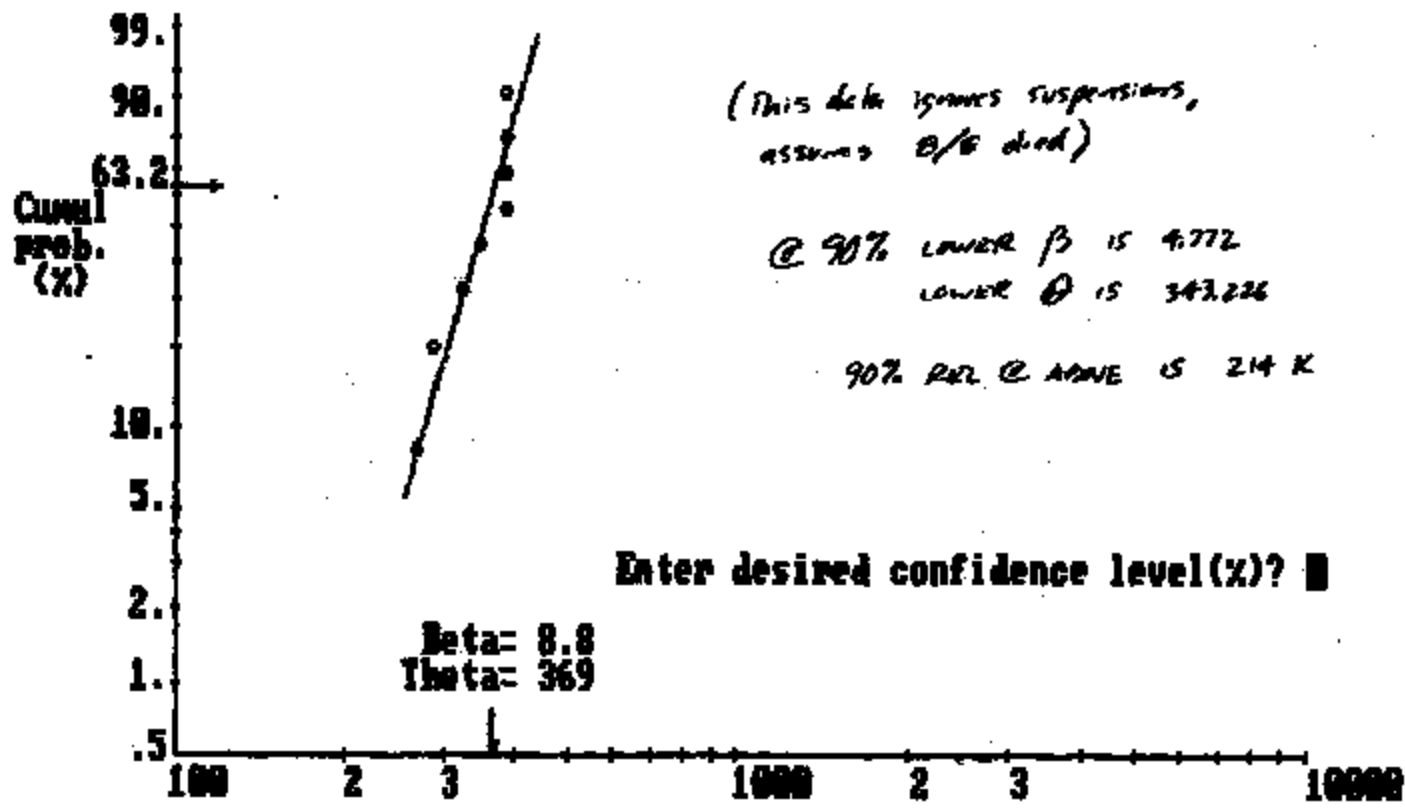
TI-NHTSA 014892

ACTUAL VALIDATION FAILURES PC 77PSLZ-1

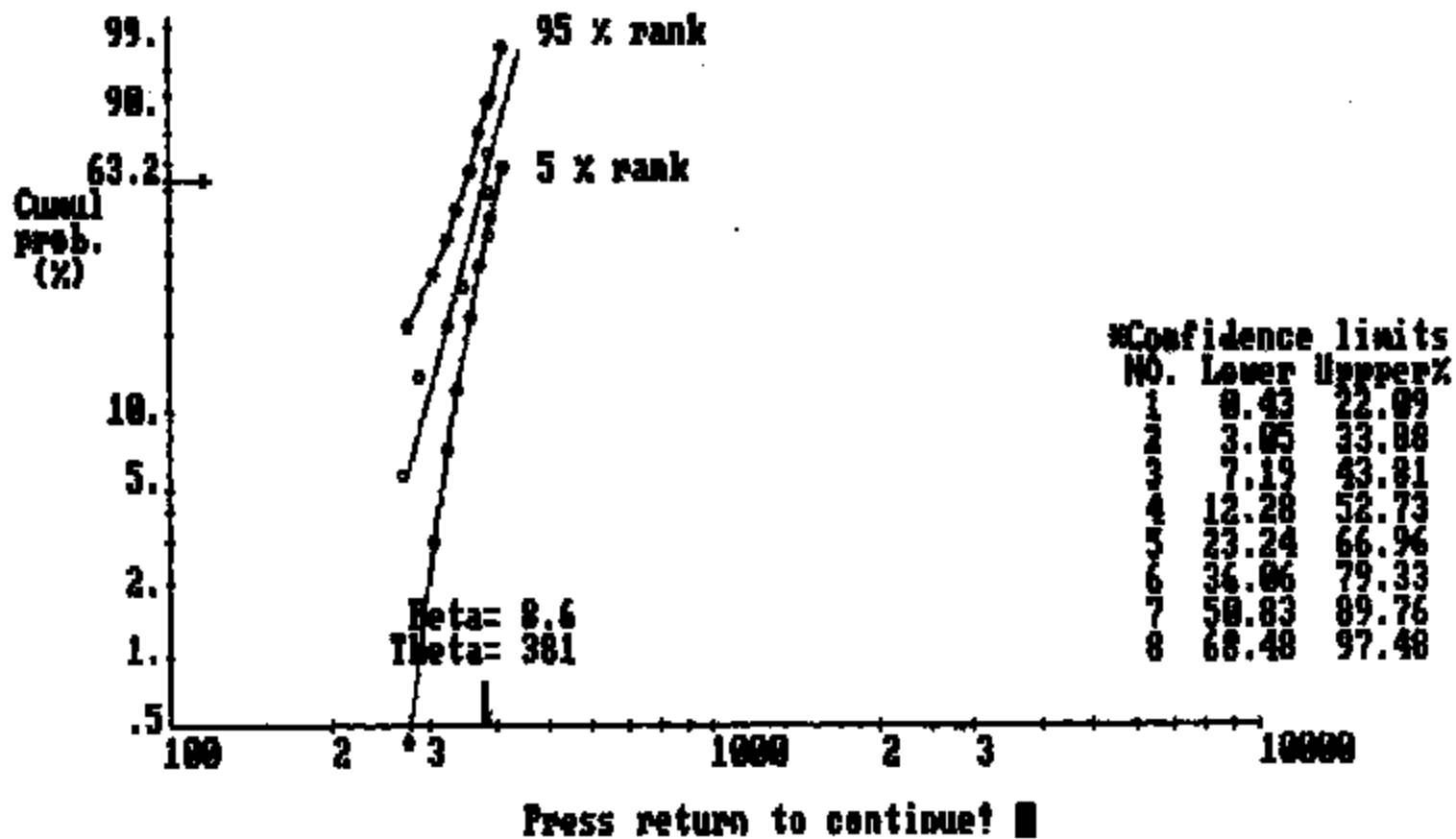


TI-NHTSA 014883

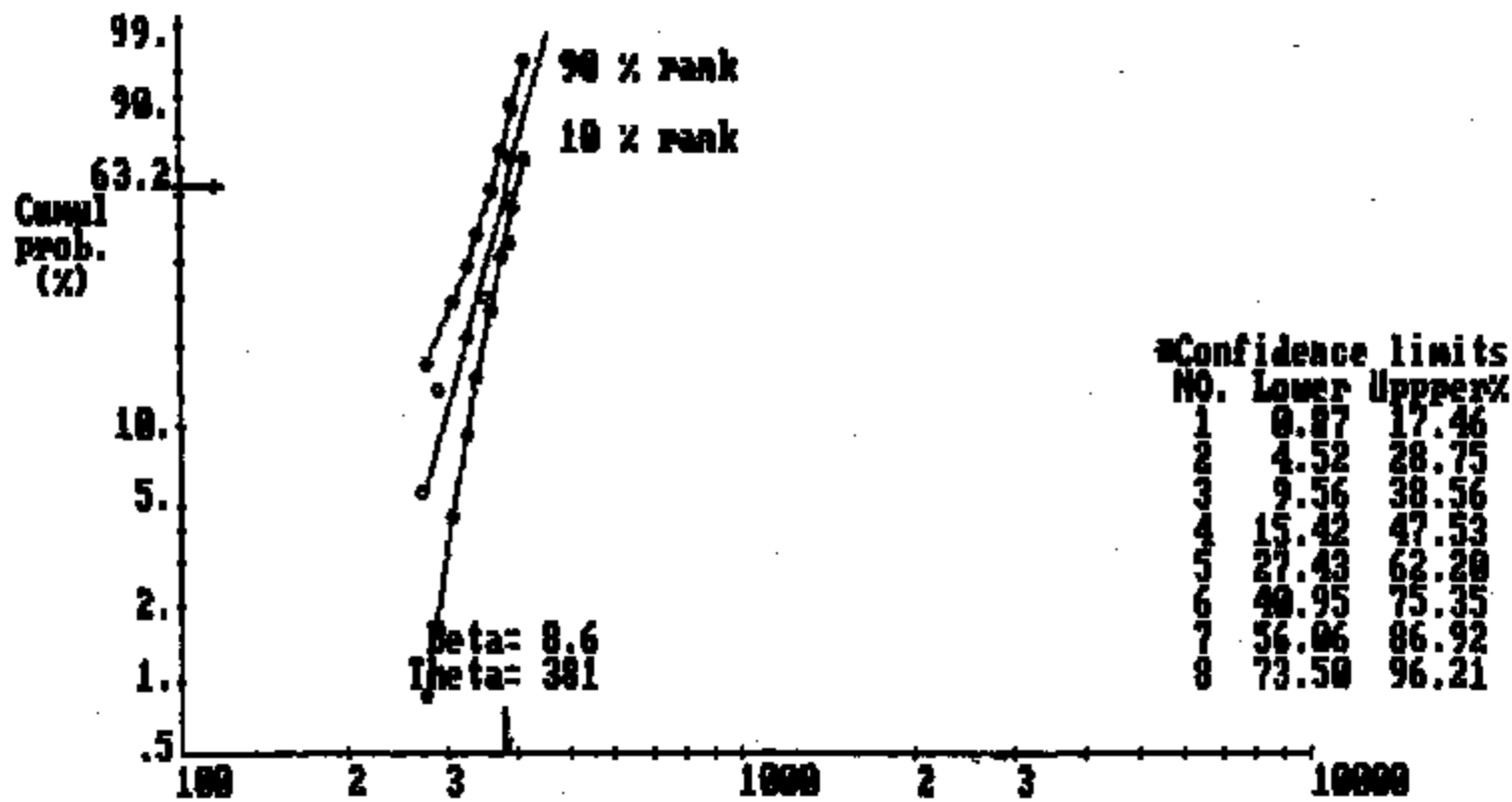
TI-NHTSA 014894



TL-NHTSA 014896



TI-NHTSA 014898



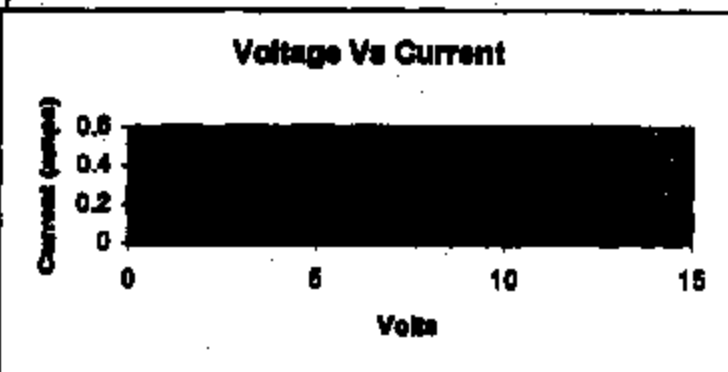
Press return to continue! ■

Voltage -vs- Current with monitored temperature

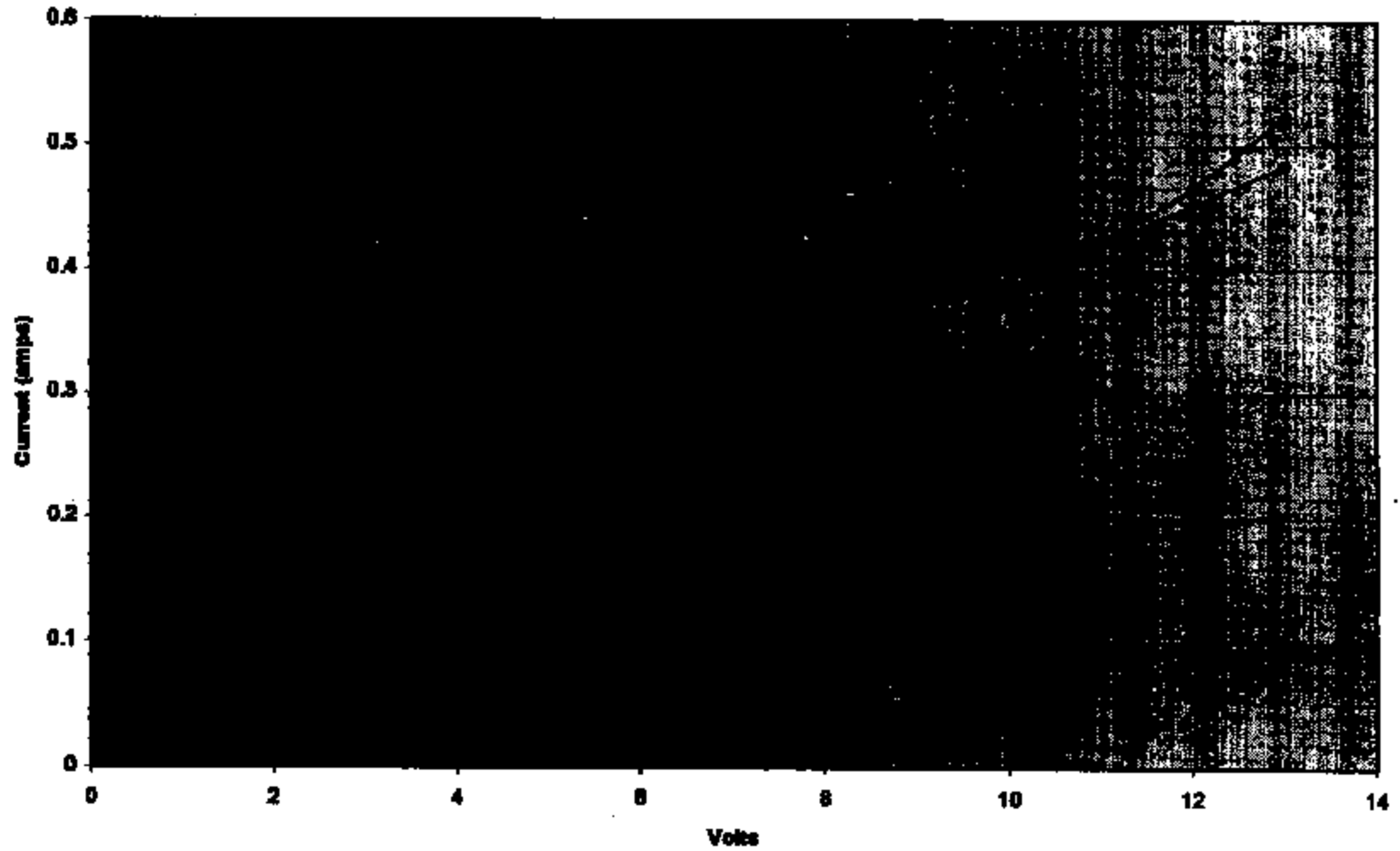
Vdc

Vdc	I (amps)	Temp deg F
13	0.524	79.2
12	0.469	80.3
11	0.422	81.3
10	0.381	81.9
9	0.342	82.8
8	0.305	83
7	0.268	83.2
6	0.231	82.8
5	0.194	82.7
4	0.157	82.9
3	0.119	83
2	0.081	83.1
1	0.042	82.8
1	0.044	82.6
2	0.063	82.1
3	0.124	82.8
4	0.184	82.4
5	0.209	82.7
6	0.243	83.4
7	0.279	83.5
8	0.316	83.2
9	0.351	83.3
10	0.387	87.2
11	0.419	88.5
12	0.452	90.7
13	0.484	89.5

misc. note: closes at 7.0 Vdc, and opens @0.2Vdc.



Voltage Vs Current

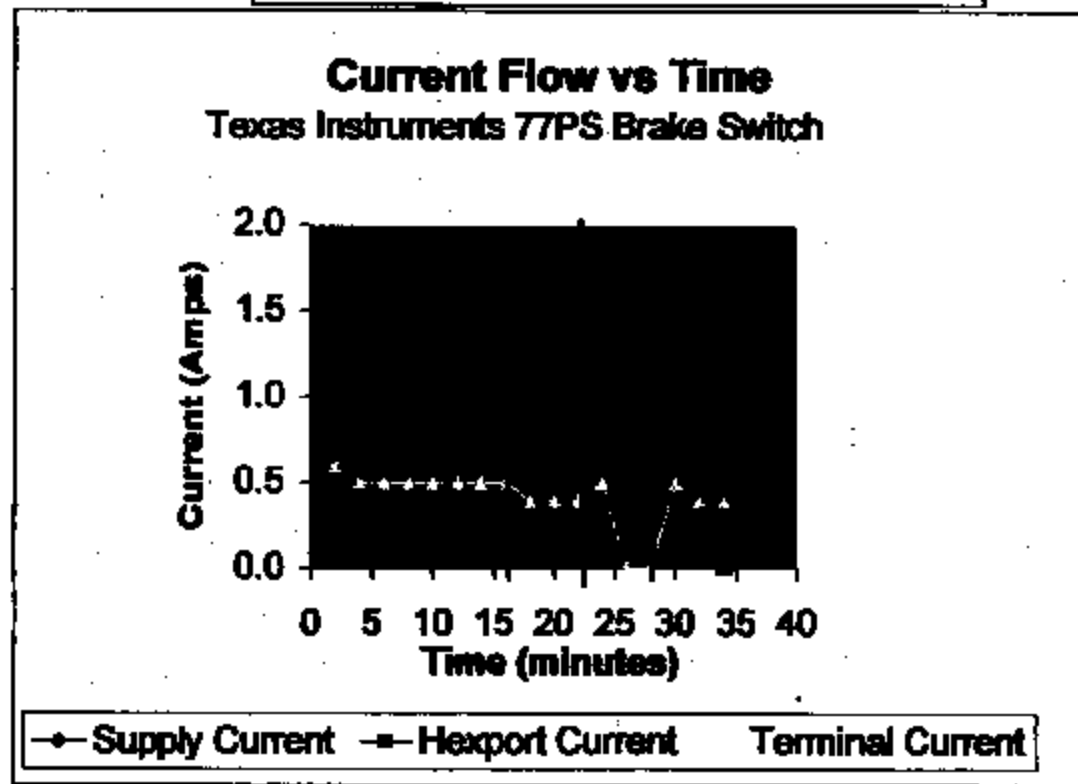
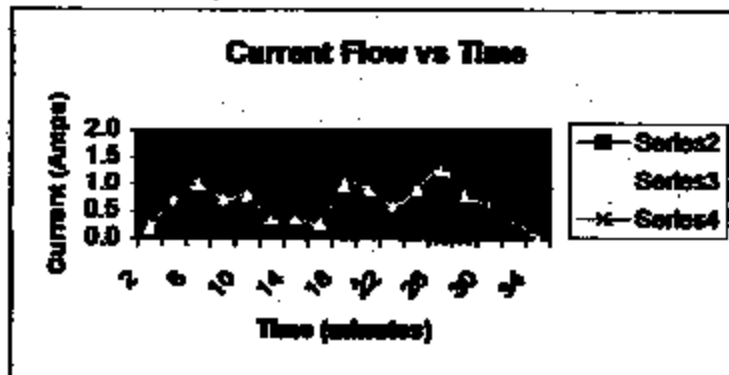


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Voltage -vs- Current at 130 deg. C

Vdc

Vdc	I (amps)
13	0.413
12	0.371
11	0.337
10	0.305
9	0.274
8	0.243
7	0.212
6	0.182
5	0.152
4	0.122
3	0.093
2	0.062
1	0.033
0.007	0.002
1	0.032
2	0.062
3	0.092
4	0.122
5	0.152
6	0.181
7	0.208
8	0.235
9	0.263
10	0.292
11	0.32
12	0.347
13	0.371



Time	Supply Cur	Hzport C _u	Terminal C	Check
2	0.8	0.2	0.6	0.0
4	1.2	0.7	0.5	0.0
6	1.4	1.0	0.5	-0.1
8	1.2	0.7	0.5	0.0
10	1.3	0.8	0.5	0.0
12	0.9	0.4	0.5	0.0
14	0.9	0.4	0.5	0.0
16	0.7	0.3	0.5	-0.1
18	1.8	1.0	0.4	0.2
20	1.4	0.9	0.4	0.1
22	1.0	0.8	0.4	0.0
24	1.3	0.9	0.5	-0.1
26	1.4	1.3	0.0	0.1
28	0.7	0.8	0.6	-0.1
30	1.1	0.8	0.5	0.0
32	0.9	0.4	0.4	0.1
34	0.4	0.0	0.4	0.0
36				
38				
40				

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**DRAWINGS AVAILABLE UPON
REQUEST**