

UM-HSRI-78-23

**PENETRATION CHARACTERISTICS
OF HYPODERMIC NEEDLES IN
SKIN AND MUSCLE TISSUE**

Phase I

(Appendices B-E)

Lawrence W. Schneider

Leigh S. Peck

John W. Melvin

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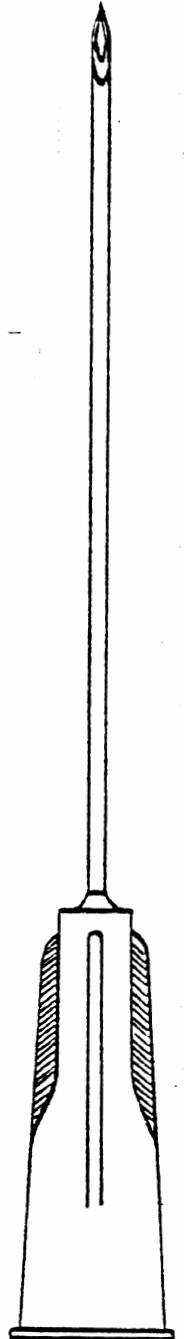


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APPENDIX B

DESCRIPTIVE STATISTICS BY TEST STRATA FOR CADAVER TESTS

The following pages give the sample size, minimum, maximum, mean, and standard deviation values for each measurement variable in each of the 48 test strata on cadaver tissue. The heading at the top of each page describes the test/tissue/needle conditions. Measurement units are as given in Figure 11.

DESCRIPTIVE MEASURES <1> VELOCITY:2.5*UJRRICNT:DRY*TYPE:SKIN*ANGLE:90.*SITE:(LTBUTT-RTHIGH) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	26	.85000	2.6700	1.7423	.61062
12.F3	26	.42000	1.6900	1.0158	.29952
13.F4	26	.65000	1.9900	1.2100	.32232
14.F32	26	.36000	.92000	.51077	.14613
15.F43	26	.69000	1.6300	1.2215	.23499
16.F42	26	.36000	1.1700	.75269	.23689
17.02	26	.70000	1.1890	.39927	.11867
18.03	26	.99300	1.6930	1.2549	.16290
19.04	26	2.5400	2.5510	2.5468	.26233 -2
20.024	26	.27000	.46000	.34846	.45404 -1
21.034	26	.38000	.66000	.48808	.64188 -1
22.T2	26	113.00	188.00	142.92	18.633
23.T3	26	157.00	268.00	199.04	25.719
24.T4	26	402.00	404.00	403.92	.39223
25.PWORK	26	3.3400	11.140	6.7138	2.2028
26.DWORK	26	8.8500	31.320	18.878	5.6023
27.TWORK	26	12.240	40.620	25.596	7.1281
28.DRAGW1	26	1.7300	9.3860	4.8877	2.1651
29.DRAGW2	26	6.3300	23.660	13.585	4.3932
30.PWORK*	26	17.000	34.000	25.654	5.1919
31.DWORK*	26	65.000	82.000	73.346	5.1919
32.DRHK12*	26	12.000	43.000	25.115	8.8513
35.NDHK	26	5.3898	18.294	11.431	3.1209
36.NDHK2	26	5.1528	17.776	10.808	2.9313

DESCRIPTIVE MEASURES <2> VELOCITY:5.0*LUHR ICNT:DRY*TYPE:SKIN*ANGLE:90.*SITE:(L*BUJT-R*HIGH) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	27	1.0300	2.8000	1.7963	.51236
12.F3	27	.47000	1.7000	1.0537	.32131
13.F4	27	.55000	1.6800	.99222	.31177
14.F32	27	.36000	.87000	.58852	.12120
15.F43	27	.67000	1.2600	.94704	.13222
16.F42	27	.36000	.89000	.55815	.13200
17.D2	27	.58000	1.1220	.80241	.14497
18.O3	27	.95700	1.4720	1.1880	.14497
19.O4	27	2.5400	2.5540	2.5481	.39293 -2
20.O24	27	.22000	.44000	.31074	.57508 -1
21.O34	27	.37000	.57000	.46111	.57802 -1
22.T2	27	40.000	89.000	63.963	11.584
23.T3	27	76.000	117.00	94.519	11.580
24.T4	27	202.00	203.00	202.89	.32026
25.PWORK	27	3.5200	10.150	6.5526	1.6378
26.DWORK	27	10.780	32.050	18.961	5.4513
27.TWORK	27	14.310	42.070	25.520	7.0030
28.DRAGW1	27	2.8100	8.9300	5.3130	1.6584
29.DRAGW2	27	6.6400	23.110	13.643	4.4250
30.PWORKK	27	18.000	35.000	25.333	3.5842
31.DWORKK	27	64.000	81.000	73.667	3.5842
32.DRHK12K	27	16.000	45.000	28.074	6.7989
35.NDWK	27	5.7895	17.736	10.919	3.1478
30.NDWK2	27	5.3468	16.600	10.023	3.0444

DESCRIPTIVE MEASURES <3> VELOCITY:10.0 LUBRICANT:DRY*TYPE:SKIN*ANGLE:90.*SIZE:(LIBJTT-RTHIGH) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	26	.97000	2.9900	1.9331	.57898
12.F3	26	.60000	1.6500	1.0350	.30143
13.F4	26	.64000	1.8400	1.1204	.36556
14.F32	26	.33000	.83000	.54962	.12851
15.F43	26	.59000	1.3400	1.0792	.16390
16.F42	26	.39000	.86000	.56846	.13235
17.02	26	.64400	1.2820	.89665	.14181
18.03	26	.95500	1.7300	1.3079	.20678
19.04	26	2.5400	2.6730	2.5520	.25485 -1
20.D24	26	.25000	.50000	.34692	.56126 -1
21.D34	26	.37000	.67000	.50808	.60698 -1
22.F2	26	27.000	53.000	36.923	5.9257
23.F3	26	39.000	71.000	53.538	8.4106
24.F4	26	101.00	104.00	102.96	.72004
25.PWORK	26	3.1800	11.150	7.2727	2.1609
26.DWORK	25	12.130	31.940	19.377	5.9686
27.TWORK	26	16.100	39.350	26.657	7.3306
28.DRAGW1	26	7.0500	12.530	6.0435	2.4097
29.DRAGW2	26	6.0300	25.100	13.328	4.7324
30.PWORK#	26	18.000	41.000	27.115	6.0685
31.DWORK#	26	58.000	61.000	71.885	6.0685
32.DRWK12#	26	15.000	51.000	31.000	9.9438
35.NDWK	26	6.6176	17.549	11.703	3.3497
36.NDWK2	26	5.5241	16.959	10.706	3.2251

DESCRIPTIVE MEASURES: <4> VELOCITY: 2.5*UMBRICNT: 1249.*TYPE: SKIN*ANGLE: 90.*SITE: (L)BUTT-R(HIGH) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	25	.64000	1.6500	1.0464	.26244
12.F3	25	.36000	.85000	.54120	.10826
13.F4	25	.42000	.82000	.58480	.11409
14.F32	25	.39000	.69000	.52680	.77229 -1
15.F43	25	.41000	1.3500	1.0804	.13640
16.F42	25	.43000	.75000	.56800	.85975 -1
17.D2	25	.51500	1.0900	.78428	.11003
18.D3	25	.86800	1.5300	1.1502	.14655
19.D4	25	2.5400	2.5510	2.5465	.33804 -2
20.D24	25	.20000	.42000	.30360	.42806 -1
21.D34	25	.34000	.60000	.44680	.57859 -1
22.I2	25	82.000	173.00	124.48	17.359
23.T3	25	137.00	242.00	182.20	23.182
24.T4	25	402.00	404.00	403.44	.91652
25.PWORK	25	1.5800	5.3500	3.6540	.84014
26.DWORK	25	7.6000	15.590	10.445	2.2970
27.FWORK	25	10.080	20.550	14.104	2.6240
28.DRAGW1	25	1.2400	5.9300	2.8356	1.0839
29.DRAGW2	25	5.3500	11.270	7.6040	1.6246
30.PWORK%	25	14.000	34.000	25.480	4.3313
31.DWORK%	25	65.000	85.000	73.520	4.3313
32.DRPHK12%	25	16.000	46.000	26.200	6.8252
35.NDHWK	25	4.2460	6.4649	5.9287	1.2194
36.NDHWK2	25	3.9494	7.7435	5.4720	1.1139

STATISTIC BY TEST GROUP

DESCRIPTIVE MEASURES <5> VELOCITY:5.0*LBKRICNT:1249.*TYPE:SKIN*ANGLE:90.*SITE:(LTBUTT-RTHIGH)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	25	.62000	2.8600	1.1668	.47306
12.F3	25	.37000	1.0700	.58800	.15468
13.F4	25	.28000	.90000	.51560	.15449
14.F32	25	.33000	.76000	.52640	.10649
15.F43	25	.69000	1.1700	.87040	.12805
15.F42	25	.29000	.60000	.45640	.96172 -1
17.02	25	.60400	1.2650	.81328	.17041
18.03	25	.88600	1.6990	1.1909	.20360
19.04	25	2.5400	2.5530	2.5481	.43043 -2
20.024	25	.23000	.49000	.31400	.68313 -1
21.034	25	.34000	.66000	.46320	.80037 -1
22.12	25	48.000	101.00	64.720	13.597
23.13	25	71.000	135.00	94.560	16.016
24.14	25	202.00	203.00	202.80	.40825
25.PWDPK	25	2.0300	7.9600	4.1168	1.3379
26.DWDRK	25	5.2400	21.030	10.870	3.3691
27.TWDRK	25	8.5900	28.990	14.990	4.2818
28.DRAGM1	25	1.4600	6.4400	3.2984	1.3977
29.DRAGM2	25	2.7200	14.590	7.5688	2.2949
30.PWDRK*	25	16.000	49.000	27.320	6.8964
31.DWDRK*	25	50.000	83.000	71.680	6.9964
32.DRAGM12*	25	16.000	48.000	29.640	7.7989
35.NDWK	25	3.7349	11.294	6.2357	1.7344
36.NDWK2	25	3.2084	9.5798	5.5681	1.5085

DESCRIPTIVE MEASURES <6> VELOCITY:10.0*LUERICANT:1249.*TYPE:SKIN*ANGLE:90.*SITE:(L)BUTT-R(HIGH) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	26	.75000	1.7100	1.1304	.26001
12.F3	26	.35000	.96000	.64615	.13588
13.F4	26	.36000	1.0100	.63385	.15420
14.F32	26	.35000	.79000	.58192	.10511
15.F43	26	.67000	1.2500	.97462	.11539
16.F42	26	.39000	.83000	.56615	.10538
17.D2	26	.69400	1.7250	.93354	.22851
18.D3	26	1.0050	2.0710	1.3397	.23963
19.D4	26	2.5410	2.5530	2.5464	.38606 -2
20.D24	26	.27000	.67000	.36154	.89608 -1
21.D34	26	.39000	.81000	.52115	.93950 -1
22.T2	26	29.000	71.000	38.769	9.3480
23.T3	26	42.000	84.000	55.115	9.5847
24.T4	26	103.00	104.00	103.62	.49614
25.PWORK	26	2.6000	12.370	4.7415	1.9488
26.DWORK	26	6.8000	17.510	11.272	2.7372
27.TWORK	26	10.430	22.650	16.016	3.0687
28.DRAGW1	26	1.7400	7.7200	3.6127	1.4819
29.DRAGW2	26	3.4200	11.070	7.6527	1.9140
30.PWORK*	26	20.000	64.000	28.923	9.5830
31.DWORK*	26	35.000	79.000	70.077	9.5830
32.DRAGW12*	26	16.000	50.000	31.385	9.5711
35.NDWORK	26	4.2684	10.260	7.0400	1.5170
36.NDAGW2	26	3.7904	9.8719	6.4236	1.4016

STATISTIC BY TEST GROUP

DESCRIPTIVE MEASURES <7> VELOCITY: 2.5 *LUBRICNT: 360. *TYPE: SKIN*ANGLE: 90. *SITE: (LTBOUIT-RTHIGH)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	25	.69000	2.0000	1.0844	.32196
12.F3	25	.21000	.54000	.35400	.99121 -1
13.F4	25	.25000	.61000	.36760	.99175 -1
14.F32	25	.21000	.51000	.33320	.74259 -1
15.F43	25	.72000	1.2500	1.0528	.15941
16.F42	25	.25000	.47000	.34360	.56560 -1
17.D2	25	.56700	.96200	.78280	.94305 -1
18.D3	25	.59000	1.6380	1.2084	.16544
19.D4	25	2.5400	2.5540	2.5482	.40133 -2
20.D24	25	.22000	.37000	.30160	.37045 -1
21.D34	25	.38000	.64000	.46960	.65414 -1
22.T2	25	91.000	153.00	124.12	14.774
23.T3	25	157.00	259.00	191.24	26.149
24.T4	25	402.00	404.00	403.60	.81650
25.PWOPK	25	2.6000	5.8500	3.6176	.77676
26.DWORK	25	4.0400	13.130	7.1532	2.1548
27.TWOPK	25	6.8700	18.580	10.776	2.8014
28.DRAGW1	25	1.1700	6.9700	2.8224	1.2284
29.DRAGW2	25	2.2300	7.2300	4.3252	1.2612
30.PWOPK*	25	27.000	41.000	33.880	4.4227
31.DWORK*	25	58.000	72.000	65.320	4.4227
32.DRAGW1*	25	22.000	61.000	38.480	9.4698
35.NDWK	25	2.3020	7.4139	4.0446	1.1772
36.NDWK2	25	1.7881	5.5505	3.2395	.95679

DESCRIPTIVE MEASURES <R> VELOCITY:5.0*UJRRICNT:360.*TYPE:SKIN*ANGLE:90.*SITE:(L*TRUIT-R*HIGH) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	25	.59000	2.2400	1.1188	.37037
12.F3	25	.22000	.54000	.36880	.77531 -1
13.F4	25	.14000	.36000	.24160	.54519 -1
14.F32	25	.19000	.60000	.34640	.89623 -1
15.F43	25	.45000	.84000	.66160	.11553
16.F42	25	.14000	.36000	.22720	.63016 -1
17.D2	25	.58000	1.2770	.84048	.19580
18.D3	25	1.0120	1.5570	1.2578	.17165
19.D4	25	2.5400	2.5530	2.5465	.49926 -2
20.D24	25	.22000	.50000	.32560	.77249 -1
21.D34	25	.39000	.61000	.48880	.66978 -1
22.T2	25	46.000	102.00	67.000	15.478
23.T3	25	81.000	124.00	100.00	13.555
24.T4	25	202.00	203.00	202.56	.50662
25.PWRK	25	1.8900	7.0800	4.1160	1.3039
26.DWRK	25	4.7100	11.390	7.0460	1.7836
27.TWRK	25	7.1300	18.470	11.168	2.4226
28.DRAG1	25	1.2100	5.8000	2.9764	1.1167
29.DRAG2	25	2.6400	5.8100	4.0644	1.0038
30.PWRK*	25	24.000	57.000	36.160	8.7639
31.DWRK*	25	42.000	75.000	62.840	8.7639
32.DRAG12*	25	23.000	56.000	41.080	8.6502
35.NDWK	25	2.8355	6.4041	4.1175	.83100
36.NDWK2	25	2.0529	4.1558	3.1401	.55955

STATISTIC BY TEST GROUP

<9> VELOCITY: 10.0*LUBRICNT:360.*TYPE:SKIN*ANGLE:90.*SITE:(L1BUTT-RTHIGH)

DESCRIPTIVE MEASURES	VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
	11.F2	26	.69000	1.8900	1.1688	.29557
	12.F3	26	.16000	.67000	.41538	.12978
	13.F4	26	.16000	.63000	.37538	.12183
	14.F32	26	.14000	.54000	.36154	.99587 -1
	15.F43	26	.62000	1.2700	.90962	.16773
	16.F42	26	.18000	.55000	.32615	.10052
	17.D2	26	.49700	.98300	.80392	.12930
	18.O3	26	.75200	1.6700	1.2356	.22146
	19.D4	26	2.5400	2.5530	2.5468	.42710 -2
	20.O24	26	.19000	.38000	.31192	.51148 -1
	21.O34	26	.29000	.65000	.48000	.87224 -1
	22.T2	26	21.000	41.000	33.462	5.2553
	23.T3	26	32.000	68.000	51.115	8.8423
	24.T4	26	103.00	106.00	103.85	.61269
	25.PWORK	26	1.9300	5.8200	3.9873	1.0999
	26.DWORK	26	5.1200	14.930	8.5646	2.4139
	27.TWORK	26	7.0500	18.750	12.556	2.9687
	28.DRAGW1	26	1.5000	5.3500	3.1992	1.0809
	29.DRAGW2	26	2.6100	10.050	5.3596	2.1292
	30.PWORK*	26	17.000	41.000	31.731	6.2133
	31.DWORK*	26	56.000	82.000	67.269	6.2133
	32.DR4K12*	26	17.000	56.000	37.962	11.410
	35.NDMK	26	2.7365	7.3765	4.9080	1.2588
	36.NDMK2	26	1.9713	6.5430	4.0518	1.2620

STATISTIC BY TEST GROUP

DESCRIPTIVE MEASURES <10> VELOCITY:2.5*LUBRICANT:DRY*TYPE:SMIS*ANGLE:90.*SITE:(LTBUTT-RTHIGH)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	19	1.8400	3.6800	2.5337	.59618
12.F3	19	1.0300	2.2500	1.5621	.40222
13.F4	19	1.1800	2.6000	1.7968	.44619
14.F32	19	.50000	.78000	.61105	.71328 -1
15.F43	19	.90000	1.4200	1.1553	.13741
16.F42	19	.55000	.93000	.70749	.92531 -1
17.D2	19	.47600	1.6730	1.2827	.28623
18.D3	19	1.1880	2.0120	1.6295	.33145
19.D4	19	2.5410	2.5530	2.5456	.38631 -2
20.D24	19	.34000	.65000	.49947	.11103
21.D34	19	.46000	.79000	.63474	.13104
22.T2	19	139.00	266.00	204.21	45.717
23.T3	19	188.00	319.00	258.53	52.894
24.T4	19	402.00	406.00	403.79	.91766
25.PWORK	19	8.0300	26.660	15.147	5.8504
26.DWORK	19	13.160	28.900	22.087	5.2788
27.TWORK	19	26.370	51.520	37.239	7.7365
28.DRAGW1	19	4.4100	14.330	7.0047	2.5431
29.DRAGW2	19	6.8500	24.210	15.079	5.4700
30.PWORK%	19	24.000	53.000	39.789	11.213
31.DWORK%	19	46.000	75.000	59.211	11.213
32.DRAG12%	19	16.000	55.000	32.684	12.338
35.NDWK	19	12.029	26.216	17.860	4.4267
36.NDWK2	19	10.757	23.805	16.783	4.1658

DESCRIPTIVE MEASURES <11> VELOCITY:5.0*LUBRICANT:DRY*TYPE:SNIS*ANGLE:90.*SITE:(LIBJT-RHIGH) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	24	1.5700	3.5100	2.3679	.61761
12.F3	24	.93000	2.2400	1.4733	.38169
13.F4	24	1.0000	2.4500	1.6733	.38481
14.F32	24	.50000	.77000	.62417	.87373 -1
15.F43	24	.82000	1.3600	1.1450	.14584
16.F42	24	.48000	1.0500	.71917	.13909
17.02	24	.80200	1.5660	1.1342	.19812
18.03	24	1.0560	1.9200	1.4590	.23283
19.04	24	2.5410	2.5540	2.5479	.37174 -2
20.024	24	.31000	.61000	.43917	.77903 -1
21.034	24	.41000	.75000	.56792	.91840 -1
22.T2	24	64.000	125.00	90.542	15.817
23.T3	24	84.000	153.00	116.21	18.657
24.T4	24	202.00	203.00	202.88	.33783
25.PWORK	24	6.5000	18.730	12.655	3.8935
26.OWORK	24	12.830	31.350	23.389	6.1451
27.TWORK	24	23.580	49.640	36.047	8.3535
28.OPAGW1	24	2.5700	12.650	6.2429	2.4221
29.DRAGM2	24	7.8300	24.060	17.140	5.1501
30.PWORK%	24	21.000	54.000	34.833	8.6410
31.DWORK%	24	45.000	78.000	64.167	8.6410
32.DRAG12%	24	14.000	53.000	26.708	8.6852
35.NDWK	24	10.482	23.461	16.515	3.9279
36.NDWK2	24	10.126	22.578	15.703	3.6591

DESCRIPTIVE MEASURES <12> VELOCITY:10.0*UARRICHT:DRY*TYPE:SHIS*ANGLE:90.*SITE:ILTBUTT-HHIGH) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	25	1.4200	3.3900	2.3136	.52295
12.F3	25	.75000	2.0100	1.4360	.34381
13.F4	25	1.0800	2.3300	1.7840	.41023
14.F32	25	.41000	.81000	.61920	.89811 -1
15.F43	25	.96000	1.7300	1.2520	.18619
16.F42	25	.53000	1.3000	.78200	.18342
17.02	25	.65600	1.4130	1.0127	.25267
18.03	25	.57100	1.6700	1.4205	.29819
19.04	25	2.5400	2.5530	2.5456	.38609 -2
20.024	25	.25000	.55000	.39240	.99343 -1
21.034	25	.38000	.73000	.55240	.11270
22.T2	25	27.000	58.000	41.920	10.352
23.T3	25	41.000	77.000	58.480	11.815
24.T4	25	103.00	104.00	103.60	.50000
25.PWORK	25	4.5600	18.020	10.757	3.7400
26.DWORK	25	13.550	33.780	25.592	6.4767
27.TWORK	25	24.330	47.870	36.353	7.2657
28.DRAGW1	25	3.3100	11.900	7.5856	2.5078
29.DRAGW2	25	8.3100	26.800	18.001	5.8859
30.PWORK*	25	14.000	47.000	29.480	9.8409
31.DWORK*	25	52.000	85.000	69.520	9.8409
32.DRWW12*	25	12.000	46.000	30.240	9.8034
35.NDWW	25	10.438	22.680	16.698	3.5202
36.NDWW2	25	10.147	21.700	15.959	3.5039

DESCRIPTIVE MEASURES <13> VELOCITY:2.5*LUBRICNT:1249.*TYPE:SHIS*ANGLE:90.*SITE:(LTBUTT-RTHIGH) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	20	.76000	1.5700	1.0120	.23677
12.F3	20	.42000	.89000	.60850	.11495
13.F4	20	.52000	1.1200	.84150	.15905
14.F32	20	.28000	.78000	.61400	.10860
15.F43	20	1.0800	1.8100	1.3870	.21119
16.F42	20	.34000	1.0800	.85500	.18277
17.02	20	.62900	1.1740	.89555	.12550
18.03	20	.88700	1.4410	1.1844	.14139
19.04	20	2.5400	2.5520	2.5459	.37262 -2
20.024	20	.24000	.46000	.34500	.49895 -1
21.034	20	.34000	.56000	.46000	.54964 -1
22.T2	20	99.000	186.00	141.10	20.037
23.T3	20	139.00	228.00	187.60	22.607
24.T4	20	402.00	404.00	403.30	.97872
25.PWORK	20	2.8100	8.5200	4.4095	1.2914
26.NWORK	20	9.3200	16.080	12.213	1.9108
27.TWORK	20	13.310	22.770	16.629	2.5412
28.DRAGW1	20	1.5300	3.3100	2.4070	.53134
29.DRAGW2	20	6.8300	13.150	9.7995	1.7393
30.PWORK*	20	18.000	40.000	26.000	5.5630
31.NWORK*	20	59.000	81.000	73.000	5.5630
32.DRAWK12*	20	13.000	26.000	19.250	4.0895
35.NDVK	20	5.4754	10.361	7.4097	1.2919
36.NDVK2	20	4.8065	9.8830	7.2368	1.3203

DESCRIPTIVE MEASURES <14> VELOCITY:5.0*LABRICNT:1249.*TYPE:SMIS*ANGLE:90.*SITE:(LTBUTT-RTHIGH) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	23	.62000	1.5000	1.0535	.22433
12.F3	23	.42000	.99000	.70552	.15546
13.F4	23	.46000	1.1800	.88391	.20126
14.F12	23	.50000	.91000	.67000	.87957 -1
15.F13	23	1.0400	1.6400	1.2500	.15949
16.F42	23	.63000	1.2000	.84478	.16492
17.02	23	.53700	.98200	.82978	.10683
18.03	23	.74500	1.2860	1.1725	.12877
19.04	23	2.5400	2.5540	2.5455	.39757 -2
20.024	23	.21000	.38000	.32000	.41341 -1
21.034	23	.29000	.50000	.45652	.49782 -1
22.T2	23	43.000	78.000	66.304	8.5410
23.T3	23	59.000	103.00	93.435	10.496
24.T4	23	202.00	203.00	202.70	.47047
25.PWORK	23	2.3200	6.2200	4.4361	1.1768
26.DWORK	23	8.7600	18.720	14.068	2.7178
27.TWORK	23	11.630	24.560	18.503	3.5341
28.DRAGW1	23	1.6200	5.0600	3.0574	.82081
29.DRAGW2	23	6.8700	15.840	11.007	2.4739
30.PWORK7	23	13.000	31.000	23.391	4.1092
31.DWORK7	23	6.8000	16.000	75.609	4.1092
32.DRWK12*	23	10.000	33.000	21.652	5.1927
35.NDVK	23	4.8939	11.030	8.2382	1.7130
36.NDVK2	23	4.6830	10.572	8.0345	1.7318

DESCRIPTIVE MEASURES <15> VELOCITY:10.0*LUBRICNT:1249.*TYPE:SMIS*ANGLE:90.*SITE:ILTRUTT-RTMICH) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	27	.72000	1.4500	1.1411	.19653
12.F3	27	.50000	1.0900	.74296	.17036
13.F4	27	.80000	1.6600	1.1437	.26202
14.F32	27	.51000	.86000	.64630	.80582 -1
15.F43	27	1.1500	2.3600	1.5496	.24976
16.F42	27	.78000	1.3000	1.0004	.15715
17.02	27	.52500	1.1250	.78563	.12218
18.03	27	.84500	1.4880	1.1171	.13508
19.04	27	2.5400	2.5540	2.5470	.41740 -2
20.024	27	.26000	.44000	.30333	.48754 -1
21.034	27	.33000	.58000	.43407	.52496 -1
22.12	27	22.000	49.000	33.037	5.5365
23.13	27	36.000	64.000	46.519	6.0724
24.14	27	103.00	107.00	104.07	.91676
25.PWORK	27	2.9400	6.2800	4.5163	.86923
26.OWORK	27	12.680	24.430	16.770	3.4583
27.TWORK	27	16.210	30.710	21.291	3.9971
28.DRAGW1	27	1.7600	5.3900	3.2556	.87123
29.DRAGW2	27	9.9500	20.350	13.509	2.8048
30.PWORK*	27	16.000	28.000	20.889	3.2026
31.OWORK*	27	71.000	83.000	74.111	3.2026
32.DRAGW12*	27	13.000	26.000	18.889	3.0676
35.NOWK	27	7.3138	14.559	9.5537	2.0025
36.NOWK2	27	7.1122	14.746	9.5134	2.0654

DESCRIPTIVE MEASURES <16> VELOCITY:2.5*LUBRICNT:300.*TYPE:SMIS*ANGLE:90.*SITE:(LTBUTT-RTHIGH) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	20	.78000	1.4500	1.0240	.16369
12.F3	20	.26000	.71000	.42000	.12990
13.F4	20	.38000	.96000	.64200	.16907
14.F32	20	.25000	.64000	.40850	.10111
15.F43	20	1.1700	2.2700	1.5225	.28434
16.F42	20	.36000	.97000	.63500	.18277
17.D2	20	.68300	1.2270	.92485	.18635
18.D3	20	.59800	1.7410	1.2824	.23808
19.D4	20	2.5420	2.5530	2.5467	.35851 -2
20.D24	20	.24000	.48000	.35900	.74403 -1
21.D34	20	.39000	.68000	.49950	.93667 -1
22.T2	20	108.00	195.00	146.65	29.676
23.T3	20	157.00	275.00	203.00	37.990
24.T4	20	402.00	404.00	403.30	.97672
25.PWORK	20	2.8400	7.1400	4.6195	1.2971
26.DWORK	20	5.3500	14.210	9.1745	2.5999
27.TWORK	20	10.770	19.350	13.800	2.5409
28.DRAGW1	20	1.5900	4.4800	2.4115	.75293
29.DRAGW2	20	3.2700	12.120	6.7585	2.5666
30.PWORKK	20	21.000	53.000	33.650	10.530
31.DWORKK	20	46.000	78.000	65.350	10.530
32.DRAGWK12K	20	13.000	48.000	27.550	9.9286
35.NDJK	20	3.5643	8.5706	5.6276	1.3982
36.NDJK2	20	3.0108	8.4519	5.2515	1.4872

DESCRIPTIVE MEASURES <17> VELOCITY:5.0+LUBRICANT:360.*TYPE:SMIS*ANGLE:90.*SITE:(L1BUTT-RHIGH) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	22	.74000	1.6700	.99409	.22114
12.F3	22	.25000	.72000	.62273	.12929
13.F4	22	.29000	1.1200	.65409	.26211
14.F32	22	.25000	.66000	.45773	.11182
15.F43	22	.93000	2.4200	1.4095	.34017
16.F42	22	.29000	1.4800	.66818	.28840
17.D2	22	.56800	1.1920	.85118	.16411
18.D3	22	.92600	1.7550	1.2188	.23962
19.D4	22	2.5400	2.5500	2.5450	.33607 -2
20.D24	22	.22000	.46000	.33000	.62944 -1
21.D34	22	.36000	.70000	.47500	.93133 -1
22.T2	22	45.000	95.000	67.909	13.144
23.T3	22	74.000	143.00	97.000	19.031
24.T4	22	202.00	203.00	202.64	.49237
25.PDRK	22	2.0800	6.3000	4.2164	1.1610
26.DMDRK	22	5.1500	15.480	10.132	3.2314
27.TWORK	22	10.070	21.780	14.351	3.2866
29.DRAGW1	22	1.3300	4.0900	2.5427	.73666
29.DRAGW2	22	2.2200	12.000	7.5841	3.1284
30.PDRK%	22	16.000	53.000	29.955	10.697
31.DMDRK%	22	46.000	83.000	69.045	10.697
32.DRWK12%	22	10.000	59.000	27.227	12.551
35.NDWK	22	3.6812	8.6106	5.9052	1.6074
36.NDWK2	22	2.9482	8.2840	5.5194	1.7537

DESCRIPTIVE MEASURES <18> VELOCITY:10.0*UHRICNT:360.*TYPE:SMIS*ANGLE:90.*SITE:(LT BUTT-RTHIGH) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	29	.60000	1.4200	1.0328	.21391
12.F3	29	.30000	.86000	.51862	.14599
13.F4	29	.48000	1.5900	.86724	.29903
14.F32	29	.38000	.82000	.43931	.97648 -1
15.F43	29	1.2000	2.3300	1.6614	.32811
16.F42	29	.55000	1.7000	.83655	.24473
17.02	29	.57700	1.0730	.77314	.14798
18.03	29	.91300	1.4480	1.1432	.15503
19.04	29	2.5400	2.5540	2.5463	.41083 -2
20.024	29	.22000	.42000	.29862	.59144 -1
21.034	29	.35000	.56000	.44379	.60911 -1
22.T2	29	24.000	47.000	32.621	6.7792
23.T3	29	38.000	62.000	47.655	7.0725
24.T4	29	103.00	107.00	104.28	1.2506
25.PWORK	29	2.2100	6.3000	3.9993	1.0307
26.DWORK	29	7.8700	19.600	12.293	3.2889
27.TWORK	29	10.080	23.410	16.297	3.7423
28.DRAGW1	29	1.7200	4.3200	2.8807	.68752
29.DRAGW2	29	5.9900	16.510	9.4072	2.8277
30.PWORK	29	12.000	36.000	24.414	5.3687
31.DWORK	29	63.000	87.000	74.586	5.3687
32.DRAGW12	29	15.000	30.000	23.483	3.8417
35.NDWK	29	4.3747	11.038	6.9781	1.9518
36.NDWK2	29	4.1396	10.897	6.7740	2.0966

DESCRIPTIVE MEASURES <29> VELOCITY:5.0*UMR*ICNT:DRY*TYPE:SKIN*ANGLE:45.*SITE:(LTBUTT-RHIGH) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	29	1.1700	2.8500	1.8772	.48704
12.F3	29	.71000	1.9700	1.2859	.35882
13.F4	29	.67000	2.4800	1.3810	.53000
14.F32	29	.43000	.89000	.68414	.10435
15.F43	29	.65000	1.5600	1.0517	.17994
16.F42	29	.40000	1.0500	.72759	.18179
17.02	29	.51700	1.4710	.99828	.28081
18.03	29	.82700	2.0030	1.4004	.30441
19.04	29	2.5410	2.5890	2.5490	.81874 -2
20.024	29	.26000	.57000	.38690	.11039
21.034	29	.32000	.78000	.54448	.12005
22.02	29	42.000	117.00	79.690	22.274
23.03	29	66.000	159.00	111.52	24.097
24.04	29	185.00	203.00	201.86	4.2739
25.PWORK	29	4.0300	13.480	8.2762	2.9979
26.DWORK	29	13.750	31.820	21.690	5.5708
27.TWORK	29	18.310	42.910	29.971	7.3833
28.0RAGW1	29	3.1500	12.340	6.5955	2.3902
29.0RAGW2	29	7.7100	22.090	15.089	4.6069
30.PWORKX	29	15.000	41.000	26.931	7.2108
31.DWORKX	29	58.000	84.000	72.069	7.2108
32.0RWORK12X	29	15.000	55.000	30.414	9.6751
35.MDVK	29	8.3366	21.720	14.333	4.1623
36.HDVK2	29	7.6539	20.728	13.553	4.1527

STATISTIC BY TEST GROUP

DESCRIPTIVE MEASURES <32> VELOCITY:5.0VLUBRICANT:1249.*TYPE:SKIN*ANGLE:45.*SITE:(LFBUTT-RTHIGH)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	27	.75000	1.9300	1.1713	.27850
12.F3	27	.42000	1.0600	.71852	.16858
13.F4	27	.41000	.93000	.68926	.15130
14.F32	27	.42000	.84000	.61889	.10602
15.F43	27	.79000	1.2100	.96185	.10314
16.F42	27	.43000	.76000	.59519	.10089
17.02	27	.55200	1.1190	.86481	.15730
18.03	27	.93000	1.6530	1.2913	.20012
19.04	27	2.5400	2.5520	2.5478	.29876 -2
20.024	27	.21000	.43000	.33370	.61840 -1
21.034	27	.36000	.66000	.50148	.78432 -1
22.T2	27	44.000	89.000	69.000	12.444
23.T3	27	74.000	135.00	102.89	15.941
24.T4	27	202.00	203.00	202.93	.26688
25.PWORK	27	2.0100	7.0500	4.5752	1.2117
26.DWORK	27	9.0500	18.680	12.967	2.4187
27.TWORK	27	12.360	24.730	17.547	3.2202
28.DRAGW1	27	2.1400	7.4100	4.1063	1.4887
29.DKAGW2	27	6.0800	12.510	8.6567	1.7390
30.PWORK%	27	16.000	34.600	25.444	4.5007
31.DWORK%	27	65.000	83.000	73.556	4.5007
32.DR4K12%	27	20.000	48.000	30.778	8.0781
35.DDWK	27	4.8578	11.122	7.7734	1.6034
36.DDWK2	27	4.4067	10.211	7.1480	1.4289

DESCRIPTIVE MEASURES <33> VELOCITY:5.0*UHR ICNT:360.*TYPE:SKIN*ANGLE:45.*SITE:(LTBUTT-RTHIGH) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	26	.71000	1.7200	1.1931	.28198
12.F3	26	.22000	.60000	.42731	.93576 -1
13.F4	26	.10000	.56000	.35462	.99969 -1
14.F32	26	.16000	.55000	.36962	.92886 -1
15.F43	26	.48000	1.1500	.82500	.16391
16.F42	26	.70000 -1	.50000	.30654	.94189 -1
17.D2	26	.62900	1.0770	.85573	.12037
18.D3	25	1.0270	1.6390	1.3016	.17713
19.D4	26	2.5400	2.5530	2.5477	.35189 -2
20.D24	26	.24000	.42000	.33154	.47724 -1
21.D34	26	.40000	.64000	.50654	.69854 -1
22.T2	26	51.000	86.000	68.346	9.6372
23.T3	26	82.000	131.00	103.65	14.184
24.T4	26	202.00	203.00	202.85	.36795
25.PWDRK	26	2.7500	6.3600	4.5619	.98317
26.DWDRK	26	5.5800	13.020	8.7135	1.8461
27.TWDRK	26	9.4400	18.740	13.278	2.4333
28.DHAGW1	26	1.3900	5.9700	3.5750	1.1537
29.DRAGW2	26	1.8000	8.8300	5.1331	1.6038
30.PWDRK*	26	24.000	44.000	33.923	5.4327
31.DWDRK*	26	55.000	75.000	65.077	5.4327
32.DHAGW12*	26	21.000	72.000	40.923	12.267
35.NDWRK	26	3.7299	6.9962	5.1414	.98056
36.NDWRK2	26	1.6549	6.1662	4.0715	.96020

DISCRIPTIVE MEASURES <38> VELOCITY:5.0*LUBRICANT:DRY*TYPE:SMIS*ANGLE:45.*SITE:ILTBJTT-RTHIGH) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	20	1.5900	2.8800	2.2690	.45023
12.F3	20	1.0900	2.1800	1.5985	.34635
13.F4	20	1.1200	2.2700	1.6360	.33230
14.F32	20	.57000	.94000	.70400	.96975 -1
15.F43	20	.85000	1.2800	1.0270	.11873
16.F42	20	.52000	1.0000	.72550	.11781
17.02	20	.72900	1.5620	1.0957	.22117
18.03	20	1.1080	1.8860	1.5005	.23822
19.04	20	2.5410	2.5540	2.5469	.38426 -2
20.024	20	.29000	.61000	.42550	.87688 -1
21.034	20	.43000	.74000	.58500	.94396 -1
22.12	20	58.000	125.00	87.600	17.804
23.13	20	88.000	151.00	119.50	19.174
24.14	20	202.00	203.00	202.95	.22361
25.PWORK	20	7.3200	18.760	12.331	3.5284
26.DWORK	20	15.870	32.140	24.659	4.9489
27.TWORK	20	27.900	48.140	36.994	6.5546
28.DRAGW1	20	4.5500	14.740	8.0030	2.9300
29.DRAGW2	20	10.090	23.190	15.651	3.9785
30.PWORK#	20	20.000	51.000	32.700	7.6441
31.DWORK#	20	48.000	79.000	66.300	7.6441
32.DRAGW12#	20	19.000	51.000	31.900	8.8787
35.NDWK	20	12.181	23.482	17.158	3.3757
36.NDWK2	20	11.430	21.637	16.187	3.2078

DESCRIPTIVE MEASURES <41> VELOCITY:5.0*LUBRICNT:1249.*TYPE:SMIS*ANGLE:45.*SITE:(LIBUTT-RTHIGH) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	19	.73000	1.3200	1.0547	.16758
12.F3	19	.51000	1.0500	.78737	.13828
13.F4	19	.59000	1.2500	.96211	.22105
14.F32	19	.66000	.92000	.74474	.63102 -1
15.F43	19	.87000	1.5800	1.2211	.22143
16.F42	19	.68000	1.2500	.90842	.16517
17.D2	19	.59200	.98300	.78700	.10408
18.D3	19	.80300	1.3610	1.1168	.13577
19.D4	19	2.5400	2.5520	2.5468	.39522 -2
20.D24	19	.23000	.38000	.30421	.39625 -1
21.D34	19	.31000	.53000	.43368	.52516 -1
22.T2	19	47.000	78.000	62.842	8.4279
23.T3	19	64.000	108.00	88.842	10.710
24.T4	19	202.00	203.00	202.89	.31530
25.PWORK	19	2.4100	6.9500	4.4179	1.2076
26.DWORK	19	11.340	20.210	15.724	2.5447
27.TWORK	19	13.750	24.580	20.145	3.2936
28.DRAGW1	19	1.9800	4.3100	3.1032	.72716
29.DRAGW2	19	8.3200	17.820	12.616	2.6048
30.PWORK*	19	15.000	29.000	21.263	3.9839
31.DWORK*	19	70.000	84.000	77.737	3.9839
32.DR PWK12*	19	11.000	34.000	19.737	5.7816
35.NDWK	19	5.9684	11.590	8.9738	1.5825
36.NDWK2	19	5.8621	11.617	8.8339	1.6800

DESCRIPTIVE MEASURES <44>. VELOCITY:5.0*LUBRICNT:360.*TYPE:SMIS*ANGLE:45.*SITE:(LTBUTT-RTHIGH) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	21	.75000	1.5200	1.0690	.23803
12.F3	21	.33000	.76000	.53048	.11617
13.F4	21	.36000	1.1500	.66810	.19015
14.F32	21	.36000	.68000	.50000	.78613 -1
15.F43	21	.96000	1.5100	1.2410	.13236
16.F42	21	.42000	.81000	.62381	.11741
17.02	21	.57800	1.1010	.77090	.12509
19.03	21	.91900	1.6060	1.2060	.15315
19.04	21	2.5400	2.5520	2.5459	.40485 -2
20.024	21	.22000	.43000	.29810	.49155 -1
21.034	21	.36000	.63000	.46905	.59909 -1
22.T2	21	46.000	88.000	61.333	10.131
23.T3	21	73.000	128.00	96.048	12.278
24.T4	21	202.00	203.00	202.71	.46291
25.PWORK	21	2.3000	6.6200	4.2210	1.3865
26.DWORK	21	8.1700	16.560	11.505	2.1509
27.TWORK	21	10.900	22.540	15.731	3.1557
28.DRACH1	21	1.6700	5.3400	3.4200	.94139
29.OPACH2	21	4.7400	12.810	8.0790	1.9007
30.PWORK%	21	17.000	42.000	26.143	5.4707
31.DWORK%	21	57.000	82.000	72.857	5.4707
32.DRCHK12%	21	15.000	44.000	29.429	7.3524
35.NOWK	21	4.2288	9.7815	6.5308	1.4049
36.NOWK2	21	3.9537	5.4330	6.0598	1.3841

DESCRIPTIVE MEASURES <55> VELOCITY:2.5*LURRICNT:DRY*TYPE:SKIN*ANGLE:90.*SITE:(LTCALF-RTCALF) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	12	1.0900	3.1400	1.8125	.57719
12.F3	12	.70000	1.5800	1.0192	.28609
13.F4	12	.88000	2.2300	1.2892	.42331
14.F32	12	.38000	.80000	.57917	.13554
15.F43	12	1.0200	1.5000	1.2583	.18235
16.F42	12	.40000	1.1500	.74167	.24620
17.02	12	.65300	1.2000	.88750	.17759
18.03	12	.96200	1.6360	1.2833	.25839
19.04	12	2.5410	2.5530	2.5449	.38720 -2
20.024	12	.25000	.47000	.34417	.69604 -1
21.034	12	.37000	.64000	.49917	.10264
22.T2	12	104.00	191.00	141.25	28.130
23.F3	12	153.00	259.00	203.58	40.764
24.T4	12	404.00	406.00	404.17	.57735
25.PWORK	12	3.8100	10.790	6.9850	2.2632
26.DWORK	12	13.590	32.880	19.947	6.8457
27.TWORK	12	19.110	41.050	26.937	7.5378
28.DRAGW1	12	3.0300	11.820	5.2475	2.3985
29.DRAGW2	12	7.6100	28.560	14.693	6.9060
30.PWORK%	12	17.000	43.060	26.250	8.5931
31.DWORK%	12	56.000	82.000	72.750	8.5931
32.DRWK12%	12	11.000	52.000	27.750	12.864
35.NDWK	12	8.6270	18.639	11.904	3.3758
36.NDWK?	12	7.6764	18.854	11.269	3.4530

DESCRIPTIVE MEASURES <56> VELOCITY:5.0*UURRICNT:DRY*TYPE:SKIN*ANGLE:90.*SITE:(LICALF-RICALF) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	12	1.0200	2.6300	1.6250	.47164
12.F3	12	.51000	1.4200	.85667	.28937
13.F4	12	.38000	1.5300	.92167	.36759
14.F32	12	.25000	.76000	.54750	.16896
15.F43	12	.68000	1.6000	1.0650	.27675
16.F42	12	.17000	.93000	.60667	.26120
17.02	12	.66200	1.0960	.83583	.15444
18.03	12	.87300	1.4920	1.1771	.21360
19.04	12	2.5480	2.5540	2.5504	.17814 -2
20.024	12	.25000	.42000	.32167	.59058 -1
21.034	12	.34000	.58000	.45583	.83716 -1
22.12	12	53.000	87.000	66.583	12.243
23.13	12	69.000	118.00	93.583	16.892
24.14	12	203.00	203.00	203.00	
25.PWORK	12	3.5400	9.4300	5.8867	1.6180
26.DWORK	12	8.9900	28.060	16.615	6.1114
27.TWORK	12	14.460	34.500	22.506	6.0993
28.DRAGW1	12	2.3200	6.5300	3.9658	1.3084
29.DRAGW2	12	4.9800	23.070	12.643	5.7019
30.PWORKX	12	18.000	46.000	27.083	5.8392
31.DWORKX	12	53.000	81.000	71.917	9.8392
32.DRWK12X	12	12.000	47.000	25.750	11.443
35.NDWK	12	5.7789	15.426	9.5684	3.0672
36.NDWK2	12	4.7025	15.000	8.9337	3.3074

DESCRIPTIVE MEASURES <57> VELOCITY:10.0+LUBRICNT:DRY+TYPE:SKIN+ANGLE:90.+SITE:(LICALF-RTCALF) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	12	.86000	1.7800	1.3358	.30464
12.F3	12	.45000	1.4600	.82083	.30497
13.F4	12	.41000	1.6300	.91083	.45979
14.F32	12	.37000	.89000	.61250	.16674
15.F43	12	.75000	1.4200	1.0575	.21278
16.F42	12	.28000	1.0000	.67667	.27734
17.D2	12	.54800	.87800	.70158	.11284
18.D3	12	.75400	1.5030	1.0685	.21133
19.D4	12	2.5420	2.5520	2.5476	.30588 -2
20.D24	12	.21000	.34000	.27083	.42950 -1
21.D34	12	.29000	.58000	.41333	.82609 -1
22.T2	12	22.000	37.000	29.000	4.9360
23.F3	12	31.000	63.000	44.000	9.1353
24.T4	12	103.00	105.00	103.50	.67420
25.PWORK	12	3.2400	6.6700	4.7117	1.0612
26.DWORK	12	8.6800	30.790	17.312	7.1405
27.TWORK	12	13.650	36.820	22.027	7.4507
28.DRAGW1	12	1.8500	7.0100	3.8508	1.3302
29.DRAGW2	12	5.9400	27.140	13.457	7.0754
30.PWORK*	12	14.000	37.000	22.667	7.7381
31.DWORK*	12	62.000	85.000	76.333	7.7391
22.DRHK12*	12	10.000	39.000	24.750	10.738
35.DWORK	12	5.0760	16.053	9.2975	3.5679
36.DWORK 2	12	4.2672	15.555	8.8713	3.8547

DESCRIPTIVE MEASURES <58> VELOCITY:2.5*LUBRICNT:1249.*TYPE:SKIN*ANGLE:90.*SITE:ILICALF-R(CALF) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	12	.54000	.94000	.73833	.14237
12.F3	12	.23000	.55000	.39500	.97561 -1
13.F4	12	.33000	.63000	.52583	.77748 -1
14.F32	12	.25000	.85000	.55583	.18520
15.F43	12	.90000	1.7400	1.3742	.26287
16.F42	12	.36000	.99000	.73500	.17037
17.D2	12	.50200	.99200	.72975	.18643
18.D3	12	.92200	1.5270	1.1388	.20687
19.D4	12	2.5430	2.5510	2.5461	.22343 -2
20.D24	12	.19000	.38000	.28250	.74116 -1
21.D34	12	.36000	.59000	.44250	.80918 -1
22.T2	12	79.000	157.00	115.63	29.640
23.T3	12	146.00	242.00	180.50	33.008
24.T4	12	402.00	404.00	403.83	.57735
25.PWORK	12	1.7400	3.4500	2.3833	.59556
26.DWORK	12	5.5700	10.390	8.2142	1.4367
27.TWORK	12	7.8200	12.570	10.602	1.5021
28.DPAGW1	12	1.1900	3.9700	2.3733	.81384
29.DRAGW2	12	3.1300	7.6000	5.8350	1.2510
30.PWORK*	12	15.000	31.000	22.250	5.5616
31.DWORK*	12	68.000	94.000	76.750	5.5616
32.DRAGW12*	12	15.000	47.000	28.667	9.1387
35.DMK	12	2.8404	5.6133	4.5533	.81306
36.DMK2	12	2.0325	5.3115	4.1965	.88449

DESCRIPTIVE MEASURES <59> VELOCITY:5.0*LUBRICANT:1249.*TYPE:SKIN*ANGLE:90.*SITE:(LTCALF-RTCALF) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	12	.59000	1.6300	.86500	.32338
12.F3	12	.20000	.59000	.34500	.11033
13.F4	12	.18000	.51000	.29417	.90600 -1
14.F32	12	.21000	.57000	.41250	.90365 -1
15.F43	12	.64000	1.1500	.87417	.18496
16.F42	12	.19000	.53000	.36000	.10471
17.02	12	.37100	1.0560	.74025	.24936
18.03	12	.49300	1.5320	1.1542	.28555
19.04	12	2.5470	2.5530	2.5510	.17057 -2
20.024	12	.14000	.42000	.28333	.94103 -1
21.034	12	.32000	.60000	.44750	.11331
22.12	12	29.000	87.000	58.917	20.011
23.T3	12	66.000	122.00	91.750	22.664
24.T4	12	203.00	203.00	203.00	
25.PWJRK	12	1.1500	6.3600	3.0983	1.7359
26.DWORK	12	5.6700	11.200	7.0400	1.4891
27.TWORK	12	6.9400	16.640	10.143	2.6989
28.DRAGW1	12	1.2300	5.5300	2.4850	1.2202
29.DRAGW2	12	3.0500	5.6600	4.5525	.74381
30.PWJRK*	12	16.000	49.000	28.417	10.621
31.DWJRK*	12	50.000	83.000	70.583	10.621
32.DRWK12*	12	19.000	49.000	33.833	10.452
35.NDWK	12	2.6480	6.8460	3.9858	1.1492
36.NDWK2	12	2.2657	5.5490	3.3698	.85318

DESCRIPTIVE MEASURES <60> VELOCITY:10.0+UBERTCNT:1249.*TYPE:SKIN*ANGLE:90.*SITE:ULTCALF-RTCALF) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	14	.57000	1.6000	.54500	.25681
12.F3	14	.30000	.57000	.43857	.85562 -1
13.F4	14	.21000	.57000	.41286	.93350 -1
14.F32	14	.31000	.85000	.48214	.12729
15.F43	14	.66000	1.0500	.93643	.13276
16.F42	14	.33000	.84000	.45286	.13653
17.D2	14	.49400	.99900	.67793	.16210
18.03	14	.78200	1.4570	1.0637	.21419
19.D4	14	2.5410	2.5510	2.5475	.30318 -2
20.D24	14	.19000	.39000	.26214	.64472 -1
21.034	14	.30000	.57000	.41286	.84072 -1
22.T2	14	20.000	43.000	28.214	7.1390
23.T3	14	32.000	60.000	44.000	9.4625
24.T4	14	103.00	106.00	103.86	1.0271
25.0W0RK	14	1.9200	6.3800	3.1107	1.1445
26.0W0RK	14	5.6900	11.330	9.1493	1.4712
27.1W0RK	14	7.8600	17.720	12.266	2.2733
28.DRAGW1	14	1.5100	4.3800	2.7300	1.0689
29.DRAGW2	14	4.0800	7.8600	6.4143	1.0315
30.PW0RK*	14	15.000	36.000	24.643	5.3293
31.0W0RK*	14	63.000	84.000	74.357	5.3293
32.0R0WK12*	14	17.000	43.000	28.786	8.5771
35.N0WK	14	2.8422	6.4669	4.9429	.95726
36.N0WK2	14	2.6848	5.4139	4.3891	.80695

DESCRIPTIVE MEASURES <61> VELOCITY:2.5*UPRTCNT:360.*TYPE:SKIN*ANGLE:90.*SITE:(L1CALF-R1CALF) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	11	.47000	1.0200	.68364	.17665
12.F3	11	.15000	.38000	.23727	.71006 -1
13.F4	11	.27000	.49000	.37000	.82219 -1
14.F32	11	.26000	.55000	.35091	.10222
15.F43	11	1.0400	2.0700	1.6064	.25496
16.F42	11	.38000	.85000	.55727	.13252
17.D2	11	.52900	.90500	.69764	.12375
18.D3	11	.89100	1.3280	1.0806	.15672
19.04	11	2.5440	2.5490	2.5475	.15726 -2
20.D24	11	.20000	.35000	.26909	.49488 -1
21.D34	11	.35000	.52000	.42091	.60076 -1
22.T2	11	84.000	144.00	110.82	19.600
23.T3	11	142.00	211.00	171.36	24.663
24.T4	11	404.00	404.00	404.00	
25.PWRK	11	1.4300	4.5500	2.3373	.81767
26.DWRK	11	3.6000	6.9700	5.4273	1.2610
27.TWRK	11	5.1200	11.520	7.7909	1.8978
28.DRAG1	11	.83000	2.3700	1.6636	.55421
29.DRAG2	11	2.7500	5.2700	3.7600	.88242
30.PWRK*	11	24.000	39.000	29.545	4.3901
31.DWRK*	11	60.000	75.000	69.455	4.3901
32.DRAG12*	11	19.000	39.000	29.909	6.2842
35.NDWK	11	1.6205	4.2474	2.9703	.82215
36.NDWK2	11	1.6636	3.6039	2.6158	.76444

DESCRIPTIVE MEASURES: <62> VELOCITY:5.04LUBRICNT:360.*TYPE:SK IN*ANGLE:90.*SITE:(LTCALF-RTCALF) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	13	.44000	2.1400	.95385	.55206
12.F3	13	.11000	.62000	.28385	.17798
13.F4	13	.30000 -1	.39000	.14846	.11575
14.F32	13	.14000	.54000	.31000	.13172
15.F43	13	.27000	.71000	.49308	.16142
16.F42	13	.40000 -1	.34000	.15462	.86276 -1
17.02	13	.47800	.99700	.64900	.13426
18.03	13	.84600	1.3110	1.0075	.11878
19.04	13	2.5410	2.5510	2.5483	.31459 -2
20.024	13	.18000	.39000	.25000	.54160 -1
21.034	13	.33000	.51000	.39000	.46726 -1
22.12	13	38.000	79.000	51.846	10.519
23.13	13	67.000	104.00	80.231	9.5320
24.14	13	202.00	203.00	202.92	.27735
25.PWORK	13	1.1900	8.0400	2.9792	1.9252
26.DWORK	13	2.4100	11.090	5.1869	2.6497
27.FWORK	13	3.9800	14.910	8.1738	3.9350
28.DPAGW1	13	.80000	3.5400	1.9300	.93941
29.DRAGW2	13	1.5800	7.5400	3.2515	1.8423
30.PWORK*	13	20.000	57.000	35.538	10.365
31.DWORK*	13	42.000	78.000	63.462	10.565
32.DRWK12*	13	22.000	54.000	37.308	8.7119
35.NDWK	13	1.2772	5.1653	2.7454	1.3834
36.NDWK2	13	1.0253	4.4589	2.1149	1.1510

DESCRIPTIVE MEASURES <63> VELOCITY:10.0*LUBRICNT:360.*TYPE:SKIN*ANGLE:90.*SITE:(LICALF-RTCALF) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	15	.59000	1.5600	.92600	.24357
12.F3	15	.15000	.43000	.31133	.77447 -1
13.F4	15	.80000 -1	.42000	.26267	.81369 -1
14.F32	15	.20000	.73000	.35000	.13049
15.F43	15	.53000	1.1700	.84600	.20371
16.F42	15	.10000	.48000	.29067	.91999 -1
17.07	15	.53300	.92200	.73600	.12208
18.03	15	.84900	1.4300	1.1501	.18799
19.04	15	2.5410	2.5530	2.5485	.34819 -2
20.024	15	.20000	.36000	.28467	.49694 -1
21.034	15	.33000	.56000	.44733	.74111 -1
22.T2	15	22.000	38.000	30.867	5.4099
23.T3	15	34.000	61.000	47.867	8.1317
24.T4	15	103.00	107.00	104.20	1.2071
25.PWORK	15	1.8000	4.2500	2.7727	.71234
26.DWORK	15	3.5000	11.760	6.5873	1.9318
27.TWORK	15	5.5400	16.020	9.3660	2.4084
28.DRAGW1	15	1.3400	5.4000	2.5620	1.1969
29.DRAGW2	15	1.9300	6.3600	4.0213	1.0401
30.PWORK*	15	20.000	41.000	29.600	5.8895
31.DWORK*	15	58.000	79.000	69.400	5.8895
32.DRHW12*	15	22.000	52.000	37.533	9.2649
35.DDWK	15	2.0302	5.9605	3.6262	.98766
36.DDWK2	15	1.4555	4.4789	2.8931	.74449

DESCRIPTIVE MEASURES <64> VELOCITY:2.5+LUBRICANT:DRY*TYPE:SMIS*ANGLE:90.*SITE:(LICALF-RICALF) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	14	1.5600	2.4100	1.9921	.24749
12.F3	14	1.1400	1.5900	1.3879	.16334
13.F4	14	1.5200	2.1300	1.8271	.18788
14.F32	14	.61000	.80000	.69500	.63941 -1
15.F43	14	1.1300	1.6000	1.3207	.13545
16.F42	14	.76000	1.0300	.91786	.81257 -1
17.D2	14	.56700	.85800	.69514	.95725 -1
18.D3	14	.79200	1.1000	.93479	.10146
19.D4	14	2.5420	2.5510	2.5464	.25539 -2
20.D24	14	.22000	.33000	.26786	.37453 -1
21.D34	14	.31000	.43000	.36286	.40082 -1
22.F2	14	91.000	137.00	110.64	15.415
23.F3	14	126.00	175.00	148.43	16.237
24.F4	14	404.00	404.00	404.00	
25.PWORK	14	4.9700	9.7100	6.9264	1.6803
26.DWORK	14	25.320	36.490	30.688	3.2205
27.TWORK	14	30.540	43.360	37.617	3.7790
28.DSAGW1	14	3.0400	5.4200	4.1021	.76670
29.OPAGW2	14	22.270	32.070	26.581	2.9020
30.PWORK*	14	12.000	23.000	17.929	3.7306
31.DWORK*	14	76.000	87.000	81.071	3.7306
32.DRWK12*	14	10.000	18.000	13.071	2.0926
35.NDVK	14	13.569	18.848	16.592	1.6498
36.NDVK2	14	13.448	18.552	16.515	1.6526

DESCRIPTIVE MEASURES: <65> VELOCITY:5.0*URRICNT:DRY*TYPE:SMIS*ANGLE:90.*SITE:(LTCALF-RTCALF) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	15	1.3600	2.5400	1.9220	.33018
12.F3	15	.86000	2.1400	1.4167	.32182
13.F4	15	1.4600	2.3400	1.9160	.27386
14.F32	15	.59000	.84000	.73067	.78145 -1
15.F43	15	1.0900	1.7200	1.3767	.19186
16.F42	15	.72000	1.1800	1.0033	.13091
17.02	15	.59100	1.0050	.72400	.11922
18.03	15	.79900	1.2590	.98067	.15557
19.04	15	2.5400	2.5490	2.5447	.28200 -2
20.024	15	.23000	.39000	.28000	.47660 -1
21.034	15	.31000	.49000	.38067	.61233 -1
22.12	15	47.000	81.000	58.000	9.7468
23.13	15	64.000	101.00	78.333	12.517
24.14	15	203.00	203.00	203.00	
25.PWORK	15	3.9800	12.770	7.2240	2.4719
26.DWORK	15	25.020	38.750	31.713	4.5205
27.TWORK	15	30.070	50.400	38.945	5.6519
28.DRAGW1	15	2.3500	8.7500	4.3667	1.5610
29.DRAGW2	15	21.490	35.200	27.342	4.3636
30.PWORK*	15	12.000	27.000	17.867	4.7640
31.DWORK*	15	72.000	87.000	81.133	4.7640
32.DRAGW12*	15	9.0000	22.000	13.333	4.4828
35.NDWHK	15	13.345	23.305	17.494	2.7978
36.NDWHK2	15	13.551	23.115	17.563	2.7883

DESCRIPTIVE MEASURES <66> VELOCITY:10.0*LUBRICNT:DRY*TYPE:SMIS*ANGLE:90.*SITE:ILTCALF-RICALF) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	12	1.6600	2.4600	1.9458	.31207
12.F3	12	1.0200	1.9400	1.3817	.25448
13.F4	12	1.7000	2.6700	2.2475	.30550
14.F32	12	.62000	.83000	.70750	.77004 -1
15.F43	12	1.2800	2.0500	1.5442	.24493
16.F42	12	.96000	1.6100	1.1658	.20273
17.D7	12	.49900	.88760	.64792	.10703
18.D3	12	.65600	1.1320	.94042	.13053
19.D4	12	2.5390	2.5530	2.5460	.49544 -2
20.D24	12	.19000	.34000	.25000	.41341 -1
21.D34	12	.27000	.44000	.36250	.51012 -1
22.T2	12	21.000	37.000	27.250	4.5151
23.T3	12	29.000	47.000	39.250	5.3957
24.T4	12	104.00	104.00	104.00	
25.PWORK	12	4.3300	11.600	6.6708	2.3685
26.DWORK	12	25.810	40.030	34.454	4.0298
27.TWORK	12	31.310	50.110	41.130	5.1647
28.DRAGW1	12	3.1300	6.6300	4.8917	1.0337
29.DRAGW2	12	21.110	34.730	29.557	4.3641
30.PWORK%	12	11.000	24.000	15.583	4.3996
31.DWORK%	12	75.000	88.000	83.417	4.3996
32.DRHK12*	12	8.0000	22.000	14.083	4.0555
35.NDWK	12	13.549	22.276	18.217	2.4812
36.NDWK2	12	13.553	22.149	18.416	2.4558

DESCRIPTIVE MEASURES <67> VELOCITY:2.5*LUBPICNT:1249.*TYPE:SMIS*ANGLE:90.*SITE:(LICALF-RTCALF) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	15	.58000	1.0200	.74733	.11805
12.F3	15	.37000	.58000	.46867	.62886 -1
13.F4	15	.65000	.99000	.83333	.99403 -1
14.F32	15	.49000	.81000	.62867	.93569 -1
15.F43	15	1.3400	2.2600	1.7967	.27846
16.F42	15	.79000	1.5100	1.1387	.23910
17.D2	15	.43100	.67100	.52173	.61964 -1
18.O2	15	.64400	1.0060	.79413	.84348 -1
19.O4	15	2.5430	2.5540	2.5502	.24260 -2
20.D24	15	.16000	.26000	.20000	.24202 -1
21.D34	15	.25000	.39000	.30600	.33975 -1
22.T2	15	68.000	106.00	82.600	9.8547
23.T3	15	102.00	159.00	125.67	13.399
24.T4	15	402.00	404.00	403.87	.51640
25.PWORK	15	1.6000	2.8700	2.0713	.34494
26.DWORK	15	10.830	17.290	13.716	1.8308
27.TWORK	15	12.600	19.450	15.793	1.9224
28.DRAGH1	15	1.0500	2.7000	1.6800	.52943
29.DRAGW2	15	9.1000	15.870	12.032	2.0058
30.PWORK*	15	10.000	18.000	12.867	2.1336
31.DWORK*	15	81.000	89.000	86.133	2.1336
32.DRWH12*	15	8.0000	21.000	12.067	4.5272
35.NDWH	15	5.2522	8.3769	6.7615	.87566
36.NDWHK2	15	5.2299	8.6297	6.8317	.95196

DESCRIPTIVE MEASURES <68> VELOCITY:5.0*LUBRICANT:1249.*TYPE:SMS*ANGLE:90.*SITE:ILTCALF-RTCALF1 STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	18	.70000	1.1700	.67333	.13204
12.F3	18	.37000	.73000	.54222	.89479 -1
13.F4	18	.72000	1.3100	.99944	.16616
14.F32	18	.40000	.79000	.62111	.84706 -1
15.F43	18	1.5500	2.8100	1.8528	.29389
16.F42	18	.84000	1.4800	1.1472	.16848
17.02	18	.37200	.71400	.55100	.85808 -1
18.D3	18	.69400	1.0370	.82783	.11778
19.04	18	2.5410	2.5500	2.5456	.20902 -2
20.024	18	.14000	.28000	.21222	.34735 -1
21.034	18	.27000	.40000	.32056	.46078 -1
22.T2	18	29.000	57.000	44.000	7.0126
23.T3	18	55.000	83.000	66.111	9.6094
24.T4	18	203.00	203.00	203.00	
25.PWORK	18	1.5200	3.8000	2.6628	.55760
26.DWORK	18	11.610	23.150	16.417	3.1871
27.TWORK	18	14.330	26.510	19.084	3.2003
28.DRAGW1	18	1.1700	3.0500	2.0078	.48116
29.DRAGW2	18	9.6800	20.640	14.402	3.1115
30.PWORK*	18	7.0000	21.000	13.833	3.5189
31.DWORK*	18	78.000	92.000	85.167	3.5189
32.DRAGW12*	18	8.0000	19.000	12.056	3.5558
35.NDWK	18	6.2052	11.448	8.2057	1.4132
36.NDWK2	18	6.3021	11.635	8.3413	1.4855

DESCRIPTIVE MEASURES <69> VELOCITY:10.0*LUBRICANT:1249.*TYPE:SMIS*ANGLE:90.*SIZE:(LICALF-RTCALF) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	12	.65000	1.1200	.87917	.13741
12.F3	12	.32000	1.0000	.55917	.16245
13.F4	12	.76000	1.4300	1.0367	.19317
14.F32	12	.39000	.89000	.63083	.11920
15.F43	12	1.4300	2.7200	1.9058	.39567
16.F42	12	.93000	1.4300	1.1750	.14222
17.02	12	.45600	1.2610	.62800	.22873
18.03	12	.68200	1.5490	.94800	.24760
19.04	12	2.5400	2.5530	2.5463	.47355 -2
20.024	12	.17000	.49000	.24167	.89933 -1
21.034	12	.26000	.61000	.36667	.98750 -1
22.12	12	19.000	53.600	26.500	9.7561
23.13	12	28.000	64.000	39.667	10.360
24.14	12	104.00	107.00	104.25	.86603
25.PWORK	12	1.8700	7.5300	3.1675	1.5137
26.DWORK	12	13.000	19.890	15.798	1.9759
27.TWORK	12	14.880	23.120	18.971	2.6668
28.DRAGH1	12	1.2800	4.4200	2.3642	1.0251
29.DRAGH2	12	10.910	18.420	13.428	2.0417
30.PWORK*	12	11.000	32.000	15.917	5.6642
31.DWORK*	12	67.000	88.000	83.083	5.6642
32.DRWK12*	12	7.0000	26.000	14.583	6.0522
35.DWORK	12	6.3230	12.109	8.3615	1.5425
36.DWORK2	12	6.3783	12.543	8.5539	1.6040

DESCRIPTIVE MEASURES <70> VELOCITY:2.5+1.UBRICNT:360.*TYPE:SMIS*ANGLE:90.*SITE:(LTCALF-RTCALF) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	17	.48000	.95000	.73941	.12725
12.F3	17	.21000	.39000	.29529	.48104 -1
13.F4	17	.36000	.90000	.57765	.13311
14.F32	17	.30000	.52000	.40412	.59588 -1
15.F43	17	1.3400	2.9600	1.9518	.42190
16.F42	17	.51000	1.2700	.80176	.23276
17.02	17	.46200	.65600	.56924	.61148 -1
18.D3	17	.70100	1.0890	.84412	.10427
19.D4	17	2.5410	2.5530	2.5492	.36782 -2
20.D24	17	.18000	.25000	.21765	.24117 -1
21.034	17	.27000	.42000	.32588	.41088 -1
22.T2	17	73.000	104.00	90.118	9.8608
23.T3	17	111.00	173.00	133.65	16.718
24.T4	17	402.00	404.00	403.65	.78591
25.PWORK	17	1.6100	3.4900	2.3594	.54329
26.DWORK	17	6.7700	12.390	9.5206	1.6557
27.TWORK	17	8.9000	15.280	11.886	1.7289
28.DRAGW1	17	.73000	2.4200	1.3547	.51397
29.DRAGW2	17	5.7800	11.070	8.1618	1.6251
30.PWORKK	17	13.000	29.000	19.647	4.6763
31.DWORKK	17	70.000	86.000	79.353	4.6763
32.DRHK12K	17	8.0000	26.000	13.941	5.5393
35.RDVK	17	3.4771	6.3118	4.8017	.78234
36.NDVK2	17	3.3527	6.4104	4.7768	.85486

DESCRIPTIVE MEASURES <71> VELOCITY:5.0*UHRICNT:360.*TYPE:SMIS*ANGLE:90.*SITE:ILTCALF-RTCALF) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	16	.50000	1.5200	.82875	.28289
12.F3	16	.21000	.61000	.33062	.10927
13.F4	16	.52000	1.0000	.71937	.12455
14.F32	16	.25000	.53000	.40750	.70380 -1
15.F43	16	1.1800	3.8300	2.3194	.75417
16.F42	16	.42000	1.4000	.93250	.26817
17.D2	16	.38300	.68500	.54063	.67292 -1
18.D3	16	.71600	1.0750	.81613	.10526
19.D4	16	2.5410	2.5490	2.5453	.27928 -2
20.D24	16	.15000	.26000	.20750	.25690 -1
21.D34	16	.28000	.42000	.31625	.42249 -1
22.T2	16	31.000	55.000	43.438	5.3537
23.T3	16	57.000	86.000	65.125	8.5313
24.T4	16	203.00	203.00	203.00	
25.DWORK	16	1.3800	5.3100	2.4281	1.1568
26.DWORK	16	9.0500	14.520	11.020	1.7193
27.TWORK	16	10.610	18.760	13.455	2.7078
28.DRAGW1	16	.79000	3.4000	1.5812	.79802
29.DRAGW2	16	7.7500	13.050	9.4362	1.3005
30.PWORK*	16	11.000	28.000	16.938	4.5529
31.DWORK*	16	71.000	88.000	82.063	4.5529
32.DRWF12*	16	8.0000	25.000	13.500	5.3417
35.NDWF	16	4.4777	7.4637	5.5160	.98601
36.NDWF2	16	4.5027	7.4106	5.4868	.89854

DESCRIPTIVE MEASURES <72> VELOCITY:10.0*LUBRICNT:360.*TYPE:SMIS*ANGLE:9J.*SITE:(LICALF-RTCALF) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	13	.56000	1.0600	.80000	.15943
12.F3	13	.27000	.59000	.37769	.90844 -1
13.F4	13	.57000	1.0100	.77385	.13451
14.F32	13	.30000	.96000	.48538	.15555
15.F43	13	1.2500	3.3900	2.1623	.74005
16.F42	13	.59000	1.4700	1.0123	.31718
17.02	13	.38200	.71700	.52500	.11564
18.03	13	.58100	1.0710	.81092	.13149
19.04	13	2.5420	2.5530	2.5469	.39468 -2
20.024	13	.15000	.28000	.20308	.46077 -1
21.034	13	.22000	.41000	.31308	.51378 -1
22.T2	13	16.000	31.000	22.385	5.5308
23.T3	13	24.000	47.000	34.231	6.0574
24.T4	13	104.00	107.00	104.54	1.0500
25.PWORK	13	1.0600	3.0900	2.0877	.58371
26.DWORK	13	9.4000	16.360	12.235	2.0112
27.TWORK	13	11.150	18.160	14.328	1.9348
28.DRAGW1	13	.87000	3.2100	1.7646	.68833
29.DRAGW2	13	7.3400	15.240	10.465	2.1487
30.PWORKX	13	7.0000	22.000	14.308	4.4979
31.DWORKX	13	77.000	92.000	84.692	4.4979
32.DRAGW12X	13	6.0000	25.000	14.308	5.8364
35.NDWK	13	5.0729	7.8315	6.0344	.80572
36.NDWK2	13	4.9528	8.1323	5.9940	.91809

DESCRIPTIVE MEASURES <R3> VELOCITY:5.0*LUBRICANT:DRY*TYPE:SKIN*ANGLE:45.*SITE:(LTCALF-RICALF) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	8	.97000	1.5000	1.2550	.18048
12.F3	8	.36000	.92000	.74250	.18172
13.F4	8	.37000	1.2400	1.0125	.29344
14.F32	8	.30000	.68000	.58875	.12194
15.F43	8	1.0200	1.5500	1.3413	.18962
16.F42	8	.30000	.99000	.80375	.22984
17.D2	8	.60800	1.0920	.85775	.14116
18.D3	8	.93400	1.4430	1.1892	.15969
19.D4	8	2.5460	2.5800	2.5522	.11311 -1
20.D24	8	.23000	.42000	.33000	.55549 -1
21.D34	8	.36000	.56000	.46125	.64462 -1
22.T2	8	48.000	87.000	68.250	11.361
23.T3	8	74.000	115.00	94.500	12.617
24.T4	8	191.00	203.00	201.50	4.2426
25.PWORK	8	3.3500	7.2900	4.8837	1.1756
26.DWORK	8	7.9800	15.490	15.410	3.6876
27.TWORK	8	11.340	24.180	20.301	4.3888
28.DPAGW1	8	2.1400	4.7200	3.3875	.88183
29.DRAGW2	8	5.4600	16.020	12.019	3.1508
30.PWORK2	8	19.000	31.000	24.000	4.1404
31.DWORK2	8	58.000	80.000	75.000	4.1404
32.DPWK12*	8	16.000	31.000	22.125	5.1944
35.NDWK	8	4.1113	10.811	9.1990	2.3255
36.NDWK2	8	3.3809	10.548	8.9856	2.4859

DESCRIPTIVE MEASURES <86> VELOCITY:5.0*LUBRICANT:1249.*TYPE:SKIN*ANGLE:45.*SITE:(LTCALF-RTCALF) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	8	.68000	.96000	.81000	.10664
12.F3	8	.30000	.64000	.44500	.11199
13.F4	8	.30000	.65000	.46500	.11477
14.F32	8	.44000	.76000	.54500	.11032
15.F43	8	.68000	1.1800	1.0200	.10941
16.F42	8	.43000	.89000	.57875	.14307
17.D2	8	.66300	.85600	.74375	.64690 -1
18.D3	8	.91500	1.2300	1.0894	.99996 -1
19.D4	8	2.5420	2.5530	2.5485	.32072 -2
20.D24	8	.26000	.33000	.28750	.25495 -1
21.D34	8	.35000	.48000	.42125	.40510 -1
22.T2	8	53.000	68.000	59.125	5.0832
23.T3	8	73.000	98.000	86.625	7.8182
24.T4	8	195.00	203.00	202.00	2.8284
25.PWDRK	8	2.3600	3.6900	2.9800	.43382
26.DWDRK	8	6.4200	13.790	9.3212	2.3424
27.TWDRK	8	8.7800	16.800	12.205	2.4891
28.DRAGW1	8	1.5000	3.6800	2.2075	.68041
29.DRAGW2	8	4.9100	10.100	7.1062	1.9340
30.PWDRK*	8	17.000	27.000	23.625	4.1382
31.DWDRK*	8	72.000	82.000	75.375	4.1382
32.DRWK12*	8	13.000	27.000	23.500	4.4401
35.DWPK	8	3.5294	7.5390	5.1513	1.1929
36.DWPK2	8	3.2260	6.9226	4.8570	1.1909

DESCRIPTIVE MEASURES <A9> VELOCITY:5.0*LUHRICNT:360.*TYPE:SKIN*ANGLE:45.*SITE:(LTCALF-RTCALF) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	8	.66000	1.1600	.95125	.17699
12.F3	8	.18000	.39000	.26250	.81372 -1
13.F4	8	.13000	.31000	.19250	.66279 -1
14.F32	8	.23000	.36000	.27500	.52099 -1
15.F43	8	.61000	.90000	.73000	.10365
16.F42	8	.14000	.26000	.20000	.45901 -1
17.02	8	.68100	.88300	.78100	.72870 -1
18.03	8	1.0410	1.3060	1.1518	.95973 -1
19.04	8	2.5460	2.5860	2.5536	.13201 -1
20.024	8	.26000	.34000	.30125	.29490 -1
21.034	8	.40000	.51000	.44625	.38149 -1
22.T2	8	54.000	71.000	62.250	5.9462
23.T3	8	83.000	104.00	91.500	7.6532
24.T4	8	158.00	203.00	202.38	1.7678
25.PWORK	8	2.5400	4.2500	3.4087	.61846
26.DWORK	8	3.9000	7.8400	5.3850	1.3673
27.TWORK	8	6.7800	12.030	8.7988	1.8277
28.DRAGW1	8	1.6000	3.0800	2.0387	.52149
29.DRAGW2	8	2.2500	4.7500	3.3400	.87683
30.PWORK%	8	32.000	43.000	38.500	4.2426
31.DWORK%	8	56.000	67.000	60.500	4.2426
32.DRWK12%	8	34.000	47.000	37.500	3.1158
35.NDWK	8	2.3242	4.4774	3.0448	.79364
36.NDWK2	8	1.8087	3.5741	2.3910	.65994

DESCRIPTIVE MEASURES <92> VELOCITY:5.0*LUBRICANT:DRY*TYPE:SHIS*ANGLE:45.*SITE:(LTCALF-RTCALF) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	10	1.0400	2.3300	1.6080	.48339
12.F3	10	.81000	1.7400	1.1950	.30307
13.F4	10	1.3400	2.0600	1.6450	.23801
14.F32	10	.63000	.87000	.74900	.64196 -1
15.F43	10	1.0100	1.7600	1.4130	.25032
16.F42	10	.64000	1.3700	1.0730	.23749
17.D2	10	.57400	.91100	.65860	.10383
19.D3	10	.79500	1.3870	.91970	.18006
19.D4	10	2.5400	2.5520	2.5461	.47947 -2
20.D24	10	.22000	.35000	.25500	.39511 -1
21.D34	10	.31000	.54000	.35700	.71500 -1
22.I2	10	46.000	73.000	52.600	8.3160
23.T3	10	64.000	111.00	73.600	14.347
24.T4	10	202.00	204.00	203.30	.67495
25.PWORK	10	3.5900	10.700	5.9440	2.4594
26.DWORK	10	22.690	31.840	27.690	3.7270
27.TWORK	10	26.330	42.540	33.641	5.7635
28.DKAGW1	10	2.1800	9.2000	3.9370	2.1930
29.DKAGW2	10	20.330	27.020	23.749	2.6483
30.PWORK*	10	13.000	25.080	16.600	4.2740
31.DWORK*	10	74.000	86.000	82.400	4.2740
32.DKWK12*	10	9.0000	28.000	13.200	6.0516
35.NDWK	10	11.668	19.438	14.762	2.5491
36.NDWK2	10	11.854	19.484	14.792	2.4401

DESCRIPTIVE MEASURES <95> VELOCITY:5-0*LUBRICNT:1249.*TYPE:SMIS*ANGLE:45.*SITE:(LTCALF-RTCALF) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	10	.55000	1.4700	.85400	.28029
12.F3	10	.30000	.63000	.44300	.10646
13.F4	10	.45000	1.2100	.87500	.26290
14.F32	10	.43000	.67000	.53200	.71616 -1
15.F43	10	1.4900	2.6500	1.9460	.36509
16.F42	10	.78000	1.5500	1.0410	.24021
17.D2	10	.34300	.50800	.43720	.56121 -1
18.D3	10	.66700	.84500	.75430	.58000 -1
19.D4	10	2.5400	2.5550	2.5460	.60737 -2
20.D24	10	.13000	.20000	.16800	.23476 -1
21.D34	10	.26000	.33000	.29300	.22632 -1
22.T2	10	27.000	41.000	34.900	4.5570
23.T3	10	53.000	67.000	60.300	4.7152
24.T4	10	202.00	204.00	203.20	.78881
25.PWJRK	10	1.2900	3.0500	1.9870	.67972
26.DWDRK	10	8.3900	18.250	13.930	3.3736
27.TWDRK	10	9.7900	21.310	15.924	3.8492
28.DRAGW1	10	1.0500	2.7900	2.1460	.60313
29.DRAGW2	10	7.2000	15.460	11.778	2.8549
30.PWDRK%	10	7.0000	16.000	12.100	2.8067
31.DWDRK%	10	83.000	92.000	86.900	2.8067
32.DPWRK12%	10	10.000	17.000	14.900	2.2828
35.NDWK	10	3.9933	8.6657	6.6073	1.6040
36.NDHWK2	10	3.9280	8.3576	6.5813	1.6008

DESCRIPTIVE MEASURES <98> VELOCITY:5.0*LUKRICNT:360.*TYPE:SNIS*ANGLE:45.*SITE:(LTCALF-RICALF) STATISTIC BY TEST GROUP

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	12	.71000	1.1700	.93667	.14631
12.F3	12	.22000	.47000	.35417	.74157 -1
13.F4	12	.42000	1.0000	.76667	.18247
14.F32	12	.30000	.45000	.37583	.49260 -1
15.F43	12	1.5200	3.7300	2.1950	.64401
16.F42	12	.48000	1.1800	.82667	.21487
17.02	12	.38500	.59400	.48317	.58435 -1
18.03	12	.66000	1.1560	.81600	.13764
19.04	12	2.5400	2.5450	2.5423	.17233 -2
20.024	12	.15000	.23000	.18583	.23143 -1
21.034	12	.25000	.45000	.31583	.54682 -1
22.T2	12	31.000	47.000	38.500	4.5427
23.T3	12	53.000	92.000	65.083	10.766
24.T4	12	202.00	203.00	202.67	.49237
25.PWORK	12	1.5700	3.4500	2.5750	.61297
26.DWORK	12	7.9800	13.560	11.217	1.6326
27.TWORK	12	10.220	16.610	13.798	1.8407
28.DRAGW1	12	.99000	2.9800	2.0692	.60332
29.DRAGW2	12	6.3800	11.210	9.1442	1.5246
30.PWORK%	12	11.000	25.000	18.333	3.8925
31.DWORK%	12	74.000	68.000	80.667	3.8925
32.DRAGW12%	12	9.0000	50.000	18.083	5.4181
35.NDWK	12	3.6794	6.5226	5.4419	.73321
36.NDWK2	12	3.6436	6.2164	5.2896	.71336

APPENDIX C

DESCRIPTIVE STATISTICS BY COMBINED VELOCITY

TEST STRATA FOR CADAVER TESTS AT 90 DEGREES

The following pages give the sample size, minimum, maximum, mean, and standard deviation values for each measurement variable in each of the 12 test strata for 90 degree tests formed by combining results at the three penetration velocities of 2.5, 5.0, and 10.0 inches/second. Measurement units are as given in Figure 11.

DESCRIPTIVE MEASURES <1> LUBRICNT:CRY*TYPE:SKIN*SITE:(LTAUT1-RTHIGH) STATISTIC BY GROUP (COMBINED VELOCITIES/90 DEG.)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	79	.85000	2.8900	1.8235	.56648
12.F3	79	.42000	1.7000	1.0351	.30419
13.F4	79	.55000	1.9900	1.1061	.34159
14.F32	79	.33000	.92000	.58304	.13365
15.F43	79	.67000	1.6300	1.0809	.21198
16.F42	79	.36000	1.1700	.63215	.19179
17.D2	79	.58000	1.2820	.86530	.14159
18.D3	79	.95500	1.7300	1.2495	.17796
19.D4	79	2.5400	2.6730	2.5490	.14848 -1
20.D24	79	.22000	.50000	.33506	.55536 -1
21.D34	79	.37000	.67000	.48544	.69996 -1
22.T2	79	27.000	188.00	81.051	46.835
23.T3	79	39.000	268.00	115.43	63.543
24.T4	79	101.00	404.00	236.16	125.22
25.PWORK	79	3.1800	11.150	6.8427	2.0674
26.DWORK	79	8.8500	32.050	19.071	5.6193
27.TWORK	79	12.240	42.070	25.919	7.0801
28.DRAGW1	79	1.7300	12.930	5.4134	2.1233
29.DRAGW2	79	6.0300	25.100	13.652	4.4680
30.PWORK*	79	17.000	41.000	26.025	5.0332
31.DWORK*	79	58.000	82.000	72.975	5.0332
32.DRWK12*	79	12.000	51.000	28.063	8.8308
35.NDWK	79	5.3898	18.294	11.345	3.1826
36.NDWK2	79	5.1928	17.776	10.506	3.0499

C2

DESCRIPTIVE MEASURES <2> LUBRICANT:1249.*TYPE:SKIN*SITE:(LTBUTT-RTHIGH) STATISTIC BY GROUP (COMBINED VELOCITIES/90 DEG.)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	76	.62000	2.8600	1.1147	.34610
12.F3	76	.36000	1.0700	.59250	.13944
13.F4	76	.28000	1.0100	.57882	.14874
14.F12	76	.33000	.79000	.54553	.99531 -1
15.F43	76	.67000	1.3500	.97513	.15162
16.F42	76	.29000	.83000	.53066	.10847
17.02	76	.51500	1.7250	.84488	.18669
18.03	76	.86800	2.0710	1.2284	.21467
19.04	76	2.5400	2.5530	2.5470	.38987 -2
20.024	76	.20000	.67000	.32684	.73543 -1
21.034	76	.34000	.81000	.47763	.84299 -1
22.12	76	29.000	173.00	75.500	38.611
23.13	76	42.000	242.00	109.89	56.089
24.14	76	103.00	404.00	234.87	125.65
25.PWORK	76	1.5800	12.370	4.1783	1.5058
26.DWORK	76	5.2400	21.010	10.867	2.8168
27.TWORK	76	8.5900	28.990	15.050	3.4959
28.DRAGW1	76	1.2400	7.7200	3.2537	1.3553
29.DRAGW2	76	2.7200	14.590	7.6091	1.9371
30.PWORKK	76	14.000	64.000	27.263	7.3382
31.DWORKK	76	35.000	85.000	71.737	7.3382
32.DRWK12K	76	16.000	50.000	29.105	8.3436
35.NDVK	76	3.7349	11.294	6.4099	1.5590
36.NDVK2	76	3.2084	9.8719	5.8292	1.4028

DESCRIPTIVE MEASURES <3> LUBRICANT:360.*TYPE:SKIN*SITE:(LUBUTT-RTHIGH) STATISTIC BY GROUP (COMBINED VELOCITIES/90 DEG.)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	76	.59000	2.2400	1.1246	.32775
17.F3	76	.16000	.67000	.37987	.10669
13.F4	76	.14000	.63000	.32882	.11329
14.F32	76	.14000	.60000	.34724	.88191 -1
15.F43	76	.45000	1.2500	.87513	.21889
16.F42	76	.14000	.55000	.29934	.91102 -1
17.D2	76	.49700	1.2770	.80900	.14579
18.D3	76	.75200	1.6700	1.2339	.18693
19.D4	76	2.5400	2.5540	2.5472	.44494 -2
20.O24	76	.19000	.50000	.31303	.57597 -1
21.O34	76	.29000	.65000	.47947	.73501 -1
22.T2	76	21.000	153.00	74.316	39.737
23.T3	76	32.000	259.00	113.29	61.058
24.T4	76	103.00	404.00	234.92	125.66
25.PWORK	76	1.8900	7.0600	3.9080	1.0886
26.DWORK	76	4.0400	14.930	7.6008	2.2220
27.TWORK	76	6.8700	18.580	11.514	2.8151
28.OPAGW1	76	1.1700	6.9700	3.0020	1.1383
29.DPAGW2	76	2.2300	10.050	4.5933	1.6320
30.PWORKX	76	17.000	57.000	33.829	6.8593
31.DWORKX	76	42.000	82.000	65.171	6.8593
32.DRHK12X	76	17.000	61.000	39.158	9.8955
35.NWORK	76	2.3020	7.4139	4.3640	1.1617
36.NWORK2	76	1.7881	6.5430	3.4847	1.0465

DESCRIPTIVE MEASURES <4> LUBRICANT:CRY+TYPE:SMIS+SITE:(LUBUTT-ATHIGH) STATISTIC BY GROUP (COMBINED VELOCITIES/90 DEG.)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	68	1.4200	3.6800	2.3943	.57725
12.F3	68	.75000	2.2500	1.4844	.37209
13.F4	68	1.0000	2.6000	1.7485	.41017
14.F32	68	.41000	.81000	.61868	.83091 -1
15.F43	68	.82000	1.7300	1.1872	.16519
16.F42	68	.48000	1.3000	.73912	.14865
17.D2	68	.65600	1.6730	1.1310	.26478
18.D3	68	.97100	2.0120	1.4925	.29245
19.D4	68	2.5400	2.5540	2.5464	.39144 -2
20.D24	68	.25000	.65000	.43882	.10382
21.D34	68	.38000	.79000	.58088	.11508
22.T2	58	27.000	266.00	104.43	70.967
23.T3	68	41.000	319.00	134.75	86.945
24.T4	68	103.00	406.00	222.51	121.38
25.PWORK	68	4.5600	26.660	12.653	4.7449
26.DWORK	68	12.830	33.780	23.835	6.1291
27.TWORK	68	23.580	51.520	36.493	7.6930
28.DRAGW1	68	2.5700	14.330	6.9494	2.5169
29.DRAGW2	68	6.8500	26.850	16.881	5.5648
30.PWORK%	68	14.000	54.000	34.250	10.555
31.DWORK%	68	45.000	85.000	64.750	10.555
32.DRAWK12%	68	12.000	55.000	29.676	10.347
35.NDWH	58	10.438	26.216	16.958	3.9174
36.NDWHK2	58	10.126	23.805	16.099	3.7213

DESCRIPTIVE MEASURES <5> LUBRICANT:1249.*TYPE:SMIS*SITE:(LITOUT-RTHIGH) STATISTIC BY GROUP (COMBINED VELOCITIES/90 DEG.)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	70	.62000	1.5700	1.0754	.22148
12.F3	70	.42000	1.0900	.69257	.15933
13.F4	70	.46000	1.6600	.97200	.25458
14.F32	70	.28000	.91000	.64486	.92997 -1
15.F43	70	1.0400	2.3600	1.4047	.24533
16.F42	70	.34000	1.3000	.90771	.18072
17.02	70	.52500	1.1740	.82983	.12409
18.D3	70	.74500	1.4890	1.1545	.13631
19.D4	70	2.5400	2.5540	2.5462	.39877 -2
20.D24	70	.20000	.46000	.32071	.49147 -1
21.D34	70	.25000	.59000	.44886	.52930 -1
22.T2	70	22.000	186.00	74.843	46.109
23.T3	70	36.000	229.00	102.24	59.519
24.T4	70	103.00	404.00	221.97	122.86
25.PWORK	70	2.3200	8.5200	4.4594	1.0898
26.DWORK	70	8.7600	24.430	14.580	3.3846
27.TWORK	70	11.630	30.710	19.044	3.9424
28.DRAGW1	70	1.5300	5.3900	2.9480	.83929
29.DRAGW2	70	6.8300	20.350	11.627	2.8690
30.PWORK*	70	13.000	40.000	23.171	4.7058
31.DWORK*	70	59.000	66.000	75.829	4.7058
32.DRWK12*	70	10.000	33.000	19.900	4.2772
35.MDWK	70	4.8939	14.555	8.5089	1.9256
36.NDMK2	70	4.6830	14.746	8.3770	1.9912

DESCRIPTIVE MEASURES <6> LUBRICNT:360.*TYPE:SMIS*SITE:(LTHUTT-RTHIGH) STATISTIC BY GROUP (COMBINED VELOCITIES/90 DEG.)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	71	.60000	1.6700	1.0183	.20131
12.F3	71	.25000	.86000	.47042	.14109
13.F4	71	.29000	1.5500	.73775	.27551
14.F32	71	.25000	.82000	.46085	.10835
15.F43	71	.93000	2.4200	1.5527	.33325
16.F42	71	.29000	1.7000	.72761	.25779
17.D2	71	.56800	1.2270	.84006	.17382
18.D3	71	.91300	1.7950	1.2058	.21349
19.D4	71	2.5400	2.5540	2.5460	.37645 -2
20.D24	71	.22000	.48000	.32535	.68678 -1
21.D34	71	.35000	.70000	.46915	.83713 -1
22.T2	71	24.000	195.00	75.676	50.353
23.T3	71	36.000	275.00	106.70	68.146
24.T4	71	103.00	404.00	218.99	123.46
25.PWORK	71	2.0800	7.1400	4.2413	1.1624
26.DWORK	71	5.1500	19.600	10.745	3.3331
27.TWORK	71	10.070	23.410	14.991	3.4402
28.DRAGW1	71	1.3300	4.4800	2.6438	.74002
29.DRAGW2	71	2.2200	16.510	8.0562	3.0378
30.PWORK*	71	12.000	53.000	28.732	9.5423
31.DWORK*	71	46.000	87.000	70.268	9.5423
32.DRAGW12*	71	10.000	59.000	25.789	9.1463
35.NDUNK	71	3.5643	11.018	6.2652	1.7880
36.NDUNK2	71	2.9482	10.697	5.9564	1.9391

DESCRIPTIVE MEASURES <IO> LURRICNT:DRY*TYPE:SKIN*SITE:(LTCALF-RTCALF) STATISTIC BY GROUP (COMBINED VELOCITIES/90 DEG.)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	36	.86000	3.1400	1.5911	.49328
12.F3	36	.45000	1.5800	.89889	.29821
13.F4	36	.38000	2.2300	1.0406	.44389
14.F32	36	.25000	.84000	.57972	.15559
15.F43	36	.68000	1.6000	1.1269	.24008
16.F42	36	.17000	1.1900	.67500	.26037
17.D2	36	.54800	1.2000	.80831	.16651
18.D3	36	.75400	1.6360	1.1763	.23932
19.D4	36	2.5410	2.5540	2.5476	.37198 -2
20.D24	36	.21000	.47000	.31222	.64547 -1
21.D34	36	.29000	.64000	.45611	.94454 -1
22.T2	36	22.000	191.00	78.944	50.419
23.T3	36	31.000	259.00	113.72	72.198
24.T4	35	103.00	406.00	236.89	126.84
25.PWDRK	36	3.2400	10.790	5.8611	1.9154
26.DWDRK	36	8.6800	32.880	17.958	6.6790
27.TWDRK	36	13.650	41.040	23.823	7.2125
28.DRAGW1	36	1.8500	11.820	4.3547	1.8205
29.DRAGW2	36	4.9800	28.960	13.598	6.4557
30.PWDRK*	36	14.000	46.000	25.333	8.7309
31.DWDRK*	36	53.000	85.000	73.667	8.7309
32.DRAG*12*	36	10.000	52.000	26.083	11.445
35.NDWK	36	5.0760	18.639	10.257	3.4565
36.NDWK2	36	4.2672	18.854	9.6912	3.6363

DESCRIPTIVE MEASURES <11> LUBRICNT:1249.*TYPE:SKIN*SITE:(LTCALF-RTCALF) STATISTIC BY GROUP (COMBINED VELOCITIES/90 DEG.)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	38	.54000	1.6300	.85447	.26038
12.F3	38	.20000	.59000	.39526	.10271
13.F4	38	.18000	.63000	.41105	.12651
14.F32	38	.21000	.85000	.48342	.14714
15.F43	38	.64000	1.7400	1.0550	.29302
15.F42	38	.19000	.99000	.51263	.20831
17.D2	38	.37100	1.0950	.71397	.19710
16.03	38	.78200	1.5320	1.1160	.23401
19.D4	38	2.5410	2.5530	2.5482	.31238 -2
20.D24	38	.14000	.42000	.27528	.77833 -1
21.D34	38	.30000	.60000	.43316	.92184 -1
22.T2	38	20.000	157.00	65.579	41.951
23.T3	38	32.000	242.00	102.18	61.754
24.T4	38	103.00	404.00	229.89	126.72
25.PWJRK	38	1.1600	6.3800	2.8771	1.2558
26.DW09K	38	5.5700	11.330	8.1879	1.6765
27.TW0RK	38	6.9400	17.720	11.070	2.3542
28.DRAGM1	38	1.1900	5.5300	2.5400	1.0318
29.DRAGW2	38	3.0600	7.8600	5.6434	1.2753
30.PW0RK2	38	15.000	49.000	25.079	7.6807
31.DW0RK2	38	50.000	84.000	73.921	7.6807
32.DRHK122	38	15.000	49.000	30.342	9.4305
35.NDWK	38	2.6480	6.8460	4.5176	1.0352
36.NDWK2	38	2.0325	5.5490	4.0064	.93614

DESCRIPTIVE MEASURES <12> LUBRICNT:360.*TYPE:SKIN*SITE:(LTCLF-R*CALF) STATISTIC BY GROUP (COMBINED VELOCITIES/90 DEG.)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	39	.42000	2.1400	.86692	.37417
12.F3	39	.11000	.62000	.28128	.12024
13.F4	39	.30000 -1	.49000	.29487	.12721
14.F32	39	.14000	.73000	.33692	.12196
15.F43	39	.27000	2.0700	.94282	.49089
16.F42	39	.40000 -1	.85000	.32051	.18996
17.D2	39	.47800	.99700	.69618	.12885
18.D3	39	.84600	1.4300	1.0830	.16633
19.D4	39	2.5410	2.5530	2.5481	.29035 -2
20.D24	39	.18000	.39000	.26872	.51971 -1
21.D34	39	.33000	.56000	.42077	.65308 -1
22.T2	39	22.000	144.00	60.410	35.383
23.T3	39	34.000	211.00	93.487	53.389
24.T4	39	103.00	404.00	221.67	123.25
25.PWDRK	39	1.1900	8.0400	2.7244	1.2631
26.DWDRK	39	2.4100	11.760	5.7933	2.1033
27.TWDRK	39	3.9800	16.020	8.5244	2.9072
28.DRACW1	39	.80000	5.6000	2.0979	1.0181
29.DRACH2	39	1.5900	7.5400	3.6910	1.3363
30.PWDRK*	39	20.000	57.000	31.564	7.7385
31.DWDRK*	39	42.000	79.000	67.436	7.7385
32.DPDRK12*	39	19.000	54.000	35.308	8.8173
35.NDWK	39	1.2772	5.9605	3.1476	1.1386
36.NDWK2	39	1.0293	4.4789	2.5555	.94274

DESCRIPTIVE MEASURES <13> LUBRICANT:DRY*TYPE:SMIS*SITE:(LTCALF-RICALF) STATISTIC BY GROUP (COMBINED VELOCITIES/90 DEG.)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	41	1.3600	2.5400	1.9529	.29284
12.F3	41	.86000	2.1400	1.3966	.25094
13.F4	41	1.4600	2.6700	1.9827	.30751
14.F32	41	.59000	.84000	.71171	.73038 -1
15.F43	41	1.0900	2.0900	1.4359	.23306
16.F42	41	.72000	1.6100	1.0217	.17199
17.D2	41	.49900	1.0050	.69188	.10988
18.D3	41	.69600	1.2590	.95322	.13020
19.D4	41	2.5390	2.5530	2.5457	.36029 -2
20.D24	41	.19000	.39000	.26707	.43258 -1
21.D34	41	.27000	.49000	.36927	.51254 -1
22.T2	41	21.000	137.00	66.976	35.877
23.T3	41	29.000	175.00	90.829	46.545
24.T4	41	104.00	404.00	242.66	124.37
25.PWORK	41	3.9800	12.770	6.9605	2.1565
26.DWORK	41	25.020	40.030	32.165	4.1715
27.TWORK	41	30.070	50.400	39.131	5.0171
28.DRAGW1	41	2.3500	8.7500	4.4300	1.2004
29.DRAGW2	41	21.110	35.200	27.730	4.0198
30.PWORK%	41	11.000	27.000	17.220	4.3504
31.DWORK%	41	72.000	88.000	81.780	4.3504
32.DRAGW12%	41	8.0000	22.000	13.463	3.6270
35.DWORK	41	13.345	23.305	17.398	2.3977
36.DWORK2	41	13.448	23.115	17.455	2.4203

DESCRIPTIVE MEASURES <14> LUBRICNT:1249.+TYPE:SMIS+SITE:(LTCLF-RICALF) STATISTIC BY GROUP (COMBINED VELOCITIES/90 DEG.)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	45	.56000	1.1700	.83289	.14014
12.F3	45	.32000	1.0000	.52222	.11219
13.F4	45	.65000	1.4300	.95400	.17627
14.F32	45	.39000	.89000	.62622	.95544 -1
15.F43	45	1.3400	2.8100	1.8482	.31464
16.F42	45	.79000	1.5100	1.1518	.18555
17.D2	45	.37200	1.2610	.56178	.13761
18.D3	45	.64400	1.5490	.84864	.16380
19.D4	45	2.5400	2.5540	2.5473	.36680 -2
20.D74	45	.14000	.49000	.21600	.54285 -1
21.D34	45	.25000	.61000	.32800	.64969 -1
22.T2	45	19.000	106.00	52.200	24.421
23.T3	45	28.000	159.00	78.911	36.769
24.T4	45	104.00	404.00	243.62	121.35
25.PWORK	45	1.5200	7.5300	2.6002	.95686
26.DWORK	45	10.830	23.100	15.352	2.7198
27.TWORK	45	12.600	26.510	17.957	3.0507
28.DRAGW1	45	1.0500	4.4200	1.9936	.71581
29.DRAGW2	45	9.1000	20.640	13.352	2.6654
30.PWORK*	45	7.0000	32.000	14.067	3.9623
31.DWORK*	45	67.000	92.000	84.933	3.9623
32.DRHW12*	45	7.0000	26.000	12.733	4.6729
35.NDWK	45	5.2522	12.189	7.7658	1.4595
36.NDWK2	45	5.2299	12.543	7.8948	1.5393

DESCRIPTIVE MEASURES <15> LUBRICANT:360.*TYPE:SMIS*SITE:(LTCALF-RTCALF) STATISTIC BY GROUP (COMBINED VELOCITIES/90 DEG.)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	46	.48000	1.5200	.78761	.20183
12.F3	46	.21000	.61000	.33087	.90082 -1
13.F4	46	.36000	1.0100	.68239	.15278
14.F32	46	.29000	.96000	.42826	.10255
15.F43	46	1.18000	3.8300	2.1391	.65107
16.F42	46	.42000	1.4700	.90674	.27871
17.02	46	.38200	.71700	.54678	.83649 -1
18.03	46	.59100	1.0890	.82500	.11132
19.04	46	2.5410	2.5530	2.5472	.37965 -2
20.024	46	.15000	.28000	.21000	.32111 -1
21.034	46	.22000	.42000	.31891	.43931 -1
22.T2	46	16.000	104.00	54.739	29.546
23.T3	46	24.000	173.00	81.717	43.606
24.T4	46	104.00	404.00	249.33	125.76
25.PWDRK	46	1.0600	5.3100	2.3065	.81364
26.DWDRK	46	6.7700	16.360	10.809	2.0663
27.TWDRK	46	8.9000	18.760	13.122	2.3541
29.0KACW1	46	.73000	3.4000	1.5493	.67868
29.DRAGW2	46	5.7800	15.240	9.2559	1.9026
30.PWDRK*	46	7.0000	29.000	17.196	4.9783
31.DWDRK*	46	70.000	92.000	81.804	4.9783
32.0RWK12*	46	6.0000	26.000	13.891	5.4415
35.NDWK	46	3.4771	7.8315	5.3988	.98548
36.NDWK2	46	3.3527	8.1323	5.3678	1.0020

APPENDIX D

DESCRIPTIVE STATISTICS BY COMBINED VELOCITY TEST STRATA AND CADAVER NO. FOR 90 DEGREE TESTS

The following pages give the summary statistics by cadaver (#'s 4, 5 and 6) for each measurement variable in each test strata formed by combining results for all penetration velocities. Measurement units are as given in Figure 11.

STATISTICS BY GROUP/CADAVER (COMBINED VELOCITIES)

<1> CADM:4*LUERICNT:DRY*TYPE:SKIN*SITE:(LTBUTT-RTHIGH)

DESCRIPTIVE MEASURES	VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2		18	1.1700	2.6700	1.9461	.47870
12.F3		18	.65000	1.4700	1.0605	.25625
13.F4		18	.60000	1.2800	.90944	.20235
14.F32		18	.36000	.83000	.55556	.12282
15.F43		18	.67000	1.2200	.86944	.14615
16.F42		18	.38000	.65000	.47111	.68504 -1
17.D2		18	.70100	1.2820	.95033	.14287
18.D3		18	1.0120	1.7300	1.3206	.21611
19.D4		18	2.5400	2.5540	2.5469	.49442 -2
20.D24		18	.27000	.50000	.36889	.56349 -1
21.D34		18	.39000	.67000	.51333	.84853 -1
22.T2		18	39.000	173.00	88.222	51.386
23.T3		18	50.000	244.00	123.22	73.427
24.T4		18	103.00	404.00	236.50	128.61
25.PWDOK		18	4.5200	11.140	7.8661	1.6551
26.DWORK		18	12.270	24.580	17.270	3.8367
27.TWORK		18	16.800	32.870	25.142	4.8892
28.DRAGW1		18	2.8100	9.3800	5.4789	1.8084
29.DRAGW2		18	6.0300	18.450	11.786	3.2373
30.PWDORK*		18	23.000	41.000	30.889	4.6512
31.DWORK*		18	58.000	76.000	68.111	4.6512
32.DR4K12*		18	18.000	51.000	31.500	9.8533
35.NDVK		18	6.8357	15.270	10.833	2.2230
36.NDVK2		18	6.3636	13.288	9.5902	1.9586

DESCRIPTIVE MEASURES <2> CAD#:5*LUBRICNT:DRY*TYPE:SKIN*SITE:(L*BU*TT-R*HIGH) STATISTICS BY GROUP/CADAVER (COMBINED VELOCITIES)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	37	.87000	2.8000	1.8116	.59097
12.F3	37	.47000	1.7000	.99054	.33871
13.F4	37	.55000	1.9900	1.1197	.40060
14.F32	37	.36000	.75000	.55189	.10105
15.F43	37	.77000	1.6300	1.1305	.16564
16.F42	37	.36000	1.0300	.62946	.15755
17.02	37	.59000	.92500	.77214	.92777 -1
18.03	37	.95500	1.4570	1.1713	.10742
19.04	37	2.5410	2.5530	2.5476	.30043 -2
20.024	37	.22000	.36000	.29865	.36679 -1
21.034	37	.37000	.57000	.45514	.42532 -1
22.T2	37	27.000	144.00	73.514	41.668
23.T3	37	39.000	213.00	109.62	57.420
24.T4	37	103.00	404.00	238.46	123.41
25.PWORK	37	3.1800	10.430	6.2332	2.1014
26.DWORK	37	10.780	32.050	19.722	6.4882
27.TWORK	37	14.310	42.070	25.961	8.3244
28.DPAGW1	37	1.7300	8.9300	5.4681	2.0433
29.DKAGW2	37	6.6400	23.660	14.248	5.0455
30.PWORK*	37	17.000	32.000	23.541	3.3714
31.DWORK*	37	67.000	82.000	75.459	3.3714
32.DRWWK12*	37	12.000	45.000	27.514	7.3697
35.ND4K	37	5.7895	18.294	11.159	3.7740
36.ND4K2	37	5.3468	17.776	10.365	3.6427

DESCRIPTIVE MEASURES <3> CAD#16*LUBRICANT:DRY*TYPE:SKIN*SITE:(LTHUTT-RTHIGH) STATISTICS BY GROUP/CADAVER (COMBINED VELOCITIES)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	19	.85000	2.4800	1.5805	.52396
12.F3	19	.42000	1.6500	1.0474	.27948
13.F4	19	.65000	1.8400	1.2053	.27196
14.F32	19	.42000	.92000	.68474	.14596
15.F43	19	.76000	1.5500	1.1753	.18668
16.F42	19	.47000	1.1700	.80684	.20602
17.D2	19	.72000	1.1880	.96295	.11958
18.D3	19	1.0040	1.7110	1.3467	.19879
19.D4	19	2.5400	2.5530	2.5468	.36556 -2
20.D24	19	.78000	.46000	.37368	.46573 -1
21.D34	19	.39000	.67000	.52474	.78200 -1
22.F2	19	29.000	188.00	93.842	52.049
23.T3	19	43.000	268.00	127.42	67.394
24.T4	19	103.00	404.00	245.63	130.74
25.PWORK	19	3.3900	9.3300	6.5132	1.7581
26.DWORK	19	8.8500	31.540	18.341	5.2867
27.TWORK	19	12.240	39.350	24.859	6.4422
28.DRAGW1	19	1.9400	12.930	5.1405	2.7967
29.DRAGW2	19	5.3300	25.100	13.196	3.9979
30.PWORKK	19	18.000	35.000	25.947	4.8474
31.DWORKK	19	64.000	81.000	73.053	4.8474
32.DRHK12K	19	13.000	51.000	26.895	10.780
35.NDWK	19	5.3898	17.549	11.531	2.8795
36.NDWK2	19	5.1928	16.959	11.019	2.6531

DESCRIPTIVE MEASURES <4> CAD#:4+LUBF ICNT:1249.*TYPE:SKIN*SITE:(LBTUTT-RTHIGH) STATISTICS BY GROUP/CADAVER (COMBINED VELOCITIES)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	18	.66000	1.3000	1.0067	.16949
12.F3	18	.37000	.73000	.56389	.11120
13.F4	18	.28000	.71000	.52722	.13163
14.F32	18	.39000	.76000	.56611	.10595
15.F43	18	.67000	1.3500	.93000	.17067
16.F42	18	.29000	.65000	.52111	.55171 -1
17.D2	18	.51500	1.7250	1.0417	.26999
18.D3	18	.86800	2.0710	1.3837	.29897
19.D4	18	2.5400	2.5530	2.5444	.47183 -2
20.D24	18	.20000	.67000	.40500	.10506
21.D34	18	.34000	.81000	.54000	.11652
22.T2	18	42.000	173.00	89.222	40.531
23.T3	18	51.000	224.00	119.78	53.453
24.T4	18	103.00	402.00	235.94	127.80
25.DWORK	16	1.5800	12.370	5.0767	2.2321
26.DWORK	18	5.2400	13.460	9.0811	1.9936
27.TWORK	18	8.5900	19.170	14.163	2.6919
28.DPAGW1	18	1.7200	4.5100	2.6717	.92602
29.DPAGW2	18	2.7200	9.3100	6.4044	1.9232
30.PWORK	18	14.000	64.000	34.667	10.954
31.DWORK	18	35.000	85.000	64.333	10.954
32.DPWK12*	18	19.000	50.000	29.833	11.320
35.DWORK	18	3.7349	8.3130	6.1318	1.2883
36.DWORK2	18	3.2084	7.2899	5.5816	1.2461

DESCRIPTIVE MEASURES <5> CAD#:5*LUBRICNT:1249.*TYPE:SKIN*SITE:(LBTUTT-RTHIGH) STATISTICS BY GROUP/CADAVER (COMBINED VELOCITIES)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	36	.70000	2.8000	1.3044	.38005
12.F3	36	.38000	1.0700	.63944	.14209
13.F4	36	.34000	.90000	.62750	.13009
14.F32	36	.33000	.67000	.50000	.83666 -1
15.F43	36	.69000	1.2300	.98611	.13521
16.F42	36	.31000	.67000	.49278	.93400 -1
17.02	36	.63600	1.1010	.78308	.98814 -1
18.03	36	1.0000	1.5800	1.1854	.14318
19.04	36	2.5400	2.5530	2.5480	.33079 -2
20.024	36	.24000	.43000	.30194	.39411 -1
21.034	36	.39000	.61000	.46000	.55240 -1
22.T2	36	29.000	133.00	71.167	35.742
23.T3	36	43.000	197.00	107.00	53.012
24.T4	36	103.00	404.00	236.81	126.77
25.PWORK	36	2.6100	7.9600	4.2961	1.0166
26.DWORK	36	7.6300	21.030	12.252	2.7520
27.TWORK	36	10.310	28.990	16.551	3.5038
28.DRAGW1	36	1.8200	7.7200	3.7967	1.3738
29.DRAGW2	36	5.8100	14.590	8.4514	1.7691
30.PWORK*	36	18.000	35.000	25.556	3.5250
31.DWORK*	36	64.000	81.000	73.444	3.5250
32.DRAGW12*	36	20.000	47.000	29.972	6.3268
35.NWORK	36	4.2460	11.294	6.9563	1.5500
36.NDWORK2	36	4.0235	9.5798	6.2494	1.3258

DESCRIPTIVE MEASURES <6> CAD#:6*LUBRICNT:1249.*TYPE:SKIN*SITE:ILTBUIT-RHIGH) STATISTICS BY GROUP/CADAVER (COMBINED VELOCITIES)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	18	.62000	1.2100	.84556	.15294
12.F3	18	.36000	.78000	.50778	.10350
13.F4	18	.29000	.83000	.48556	.11698
14.F32	18	.44000	.79000	.60111	.86832 -1
15.F43	18	.69000	1.3300	.95389	.14390
16.F42	18	.37000	.75000	.57333	.97920 -1
17.D2	18	.60400	.90500	.77517	.76450 -1
18.D3	18	.88600	1.4410	1.1305	.15436
19.D4	18	2.5450	2.5520	2.5482	.17574 -2
20.D24	18	.23000	.35000	.30000	.31249 -1
21.D34	18	.34000	.56000	.43889	.60962 -1
22.T2	18	31.000	144.00	72.667	41.440
23.T3	18	42.000	228.00	105.22	60.779
24.T4	18	104.00	404.00	237.00	128.43
25.PWDFK	18	2.0300	4.6700	3.0544	.71823
26.DWDRK	18	7.4700	14.140	9.3017	1.6436
27.TWDRK	18	9.7200	18.810	12.361	2.1741
28.DRAGW1	18	1.2400	4.1500	2.4422	.86828
29.DRAGW2	18	4.9200	9.9800	6.8333	1.3536
30.PWDRK*	18	16.000	32.000	24.222	3.4565
31.DWDRK*	18	67.000	83.000	74.778	3.4565
32.DRAGK12*	18	16.000	41.000	25.611	7.8000
35.NDWK	18	3.9289	8.2209	5.2670	1.0239
36.NDWK2	18	3.5408	7.6125	4.8623	.97255

DESCRIPTIVE MEASURES <7> CAD#:4*LUBRICAT:360.*TYPE:SKIN*SITE:(LTBUTT-RTHIGH) STATISTICS BY GROUP/CADAVER (COMBINED VELOCITIES)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	18	.74000	1.5500	1.0256	.22285
12.F3	18	.27000	.67000	.41222	.11091
13.F4	18	.16000	.63000	.32889	.13297
14.F32	18	.30000	.60000	.39889	.78582 -1
15.F43	18	.45000	1.1100	.80000	.23689
16.F42	18	.15000	.50000	.31833	.10382
17.D2	18	.49700	1.2770	.83706	.24063
18.D3	18	.75200	1.5570	1.1512	.23556
19.D4	18	2.5400	2.5540	2.5458	.52160 -2
20.D24	18	.19000	.50000	.32389	.95248 -1
21.D34	18	.29000	.61000	.44722	.93230 -1
22.I2	18	21.000	137.00	78.389	40.623
23.I3	18	32.000	177.00	107.89	55.287
24.I4	18	104.00	404.00	236.44	127.95
25.PWORK	18	2.4500	6.7500	3.3706	1.1197
26.DWORK	18	4.7100	14.930	7.7322	2.9615
27.TWORK	18	8.6700	18.750	11.707	2.9028
28.OPAGW1	18	1.3500	5.0200	2.2694	.85824
29.DRAGW2	18	2.8600	10.050	5.4561	2.4820
30.PWORKK	18	17.000	57.000	34.833	10.634
31.DWORKK	18	42.000	82.000	64.167	10.634
32.DRAGK12K	18	17.000	49.000	30.444	9.3256
35.NDVK	18	3.2937	7.3755	4.4515	1.2592
36.NDVK2	18	2.5851	6.5430	3.8031	1.2972

DESCRIPTIVE MEASURES <8> CAD#:5*LUBRICNT:350.*TYPE:SKIN*SITE:(LTBUTT-RTHIGH) STATISTICS BY GROUP/CADAVER (COMBINED VELOCITIES)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	36	.69000	2.2400	1.2811	.35256
12.F3	36	.21000	.57000	.40111	.10034
13.F4	36	.16000	.61000	.35444	.11279
14.F32	36	.19000	.52000	.32222	.82501 -1
15.F43	36	.49000	1.2500	.89056	.20994
16.F42	36	.14000	.55000	.28722	.10025
17.D2	36	.56700	.98300	.80008	.10506
18.D3	36	.99000	1.6700	1.2368	.15883
19.D4	36	2.5400	2.5530	2.5478	.45988 -2
20.D24	36	.22000	.38000	.30972	.41506 -1
21.D34	36	.38000	.65000	.48083	.62159 -1
22.I2	36	30.000	137.00	72.011	36.830
23.F3	36	48.000	228.00	112.44	58.549
24.F4	36	103.00	404.00	236.69	126.69
25.PWORK	36	2.7300	7.0800	4.2667	1.0482
26.DWJPK	36	4.0400	13.130	8.1489	2.0328
27.TWORK	36	6.8700	18.990	12.421	2.7890
28.DRAGW1	36	1.1700	6.9700	3.4442	1.2208
29.DRAGW2	36	2.3800	7.2300	4.0997	1.0830
30.PWORK*	36	26.000	46.000	34.111	5.3333
31.DWORK*	36	53.000	73.000	64.889	5.3333
32.DRHK12*	36	25.000	56.000	41.028	7.6288
35.NDHW	36	2.3020	7.4139	4.6716	1.1676
36.NDHW2	36	1.7881	6.3605	3.6357	.96257

DESCRIPTIVE MEASURES <9> CADW:6*LUBRICNT:360.*TYPE:SKIN*SITE:(LTBUTT-RTHIGH) STATISTICS BY GROUP/CADAVER (COMBINED VELOCITIES)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	18	.59000	1.0800	.85278	.12428
12.F3	18	.21000	.44000	.30389	.70389 -1
13.F4	18	.14000	.38000	.26667	.57189 -1
14.F52	18	.21000	.54000	.36111	.84358 -1
15.F43	18	.63000	1.2900	.88722	.20436
16.F42	18	.18000	.38000	.31056	.54823 -1
17.02	18	.64400	.96200	.79606	.10501
18.03	18	1.0120	1.6380	1.2976	.18337
19.04	18	2.5430	2.5510	2.5481	.22463 -2
20.024	18	.25000	.37000	.30778	.41381 -1
21.034	18	.39000	.64000	.50389	.72367 -1
22.T2	18	22.000	153.00	75.111	45.240
23.T3	18	49.000	259.00	122.39	72.376
24.T4	18	104.00	404.00	237.00	128.43
25.PWORK	18	1.8900	4.1200	3.0022	.64829
26.DWORK	18	4.9300	8.2000	6.2383	1.0506
27.TWORK	18	7.0500	12.330	9.2456	1.3402
28.DRAGW1	18	1.2100	4.1600	2.7389	.82530
29.DRAGW2	18	2.2300	5.4600	3.4939	.88811
30.PWORK%	18	24.000	41.000	31.944	5.3739
31.DWORK%	18	58.000	75.000	67.056	5.3739
32.DRWK12%	18	23.000	61.000	43.333	10.644
35.NDWH	18	2.7365	5.0462	3.5645	.56730
36.NDWH2	18	1.9713	4.0215	2.7945	.56614

DESCRIPTIVE MEASURES <10> CAD#:4*LUBRICNT:DRY*TYPE:SMIS*SITL:(LTBUTT-RHIGH) STATISTICS BY GROUP/CADVER (COMBINED VELOCITIES)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	27	1.4200	2.6200	2.0559	.31439
12.F3	27	75000	1.7100	1.3607	.20584
13.F4	27	1.3100	2.3300	1.7378	.26905
14.F32	27	.47000	.81000	.66148	.74612 -1
15.F43	27	1.0300	1.7300	1.2822	.17346
16.F42	27	.61000	1.3000	.85519	.15921
17.02	27	.65600	1.1220	.88089	.10933
18.03	27	.97100	1.5010	1.7094	.12305
19.04	27	2.5410	2.5540	2.5466	.50250 -2
20.024	27	.25000	.43000	.34111	.42547 -1
21.D34	27	.38000	.59000	.46963	.47756 -1
22.42	27	27.000	157.00	73.148	46.248
23.T3	27	41.000	202.00	97.407	57.490
24.T4	27	103.00	404.00	203.04	117.74
25.PWORK	27	4.5600	13.860	8.6344	2.0370
26.DWORK	27	19.770	32.500	25.962	3.3226
27.TWORK	27	24.330	42.240	34.600	4.1466
28.DRAGW1	27	3.3100	9.5400	5.6011	1.5510
29.DRAGW2	27	14.230	26.860	20.350	3.2449
30.PWORK*	27	14.000	36.000	24.370	4.4820
31.DWORK*	27	63.000	85.000	74.630	4.4620
32.DRWK12*	27	12.000	40.000	21.259	6.0294
35.NDVK	27	10.438	18.556	15.613	1.8859
36.NDVK2	27	10.332	17.929	15.211	1.8648

DESCRIPTIVE MEASURES <11> CAD#:5*LUBRICNT:DRY*TYPE:SMIS*SITE:(LTBUTT-RTHIGH) STATISTICS BY GROUP/CADAVER (COMBINED VELOCITIES)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	18	2.7600	3.6800	3.1617	.23961
12.F3	18	1.5700	2.2500	1.9072	.22998
13.F4	18	1.9000	2.6000	2.2311	.16224
14.F32	18	.50000	.69000	.59689	.59596 -1
15.F43	18	1.0500	1.3800	1.1722	.68221 -1
16.F42	18	.62000	.78000	.70167	.42461 -1
17.02	18	.91500	1.6730	1.2756	.19999
18.03	18	1.2710	2.0120	1.6771	.20987
19.04	18	2.5410	2.5520	2.5459	.33128 -2
20.024	18	.35000	.65000	.49556	.79426 -1
21.034	18	.49000	.79000	.65333	.82889 -1
22.T2	18	38.000	266.00	126.44	82.788
23.T3	18	53.000	319.00	162.11	99.973
24.T4	18	104.00	406.00	237.11	128.58
25.PWORK	18	11.950	26.660	18.102	3.8442
26.DWORK	18	21.670	33.730	27.731	3.5791
27.TWORK	18	41.380	51.520	45.837	2.7575
28.DRAGW1	18	6.0000	14.330	9.8150	1.9754
29.DRAGW2	18	11.060	24.900	17.910	4.0164
30.PWORK%	18	26.000	51.000	38.833	7.3103
31.DWORK%	18	48.000	73.000	60.167	7.3103
32.OPWK12%	18	22.000	53.000	35.500	8.4314
35.NDWK	18	19.152	26.216	22.008	2.0000
36.NDWK2	18	17.528	23.805	20.773	1.8773

DESCRIPTIVE MEASURES <12> CAD#16*LUBRICHT:DRY*TYPE:SMIS*SITE:(LTHUTT-RTHIGH) STATISTICS BY GROUP/CADAVER (COMBINED VELOCITIES)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	18	1.6100	2.8500	2.0522	.28171
12.F3	18	.85000	1.5900	1.1483	.19388
13.F4	18	1.0000	1.5900	1.2761	.16223
14.F32	18	.41000	.71000	.55444	.63173 -1
15.F43	18	.93000	1.3800	1.1206	.13063
16.F42	18	.48000	.77000	.62333	.77003 -1
17.02	18	1.1980	1.6000	1.3971	.10911
18.03	19	1.5120	1.9990	1.7669	.13955
19.04	18	2.5440	2.5510	2.5471	.19242 -2
20.024	18	.46000	.62000	.54278	.43495 -1
21.034	18	.59000	.78000	.68889	.55719 -1
22.T2	18	49.000	255.00	133.83	79.495
23.T3	18	67.000	317.00	168.06	99.538
24.T4	18	104.00	404.00	237.00	128.43
25.PWORK	18	9.5900	19.760	13.115	2.5078
26.DWORK	18	12.830	18.900	15.150	1.7358
27.FWORK	18	23.580	37.030	28.271	3.3937
28.DRAGW1	18	2.5700	8.6400	5.7672	1.6615
29.DRAGW2	18	6.8500	12.350	9.3794	1.4824
30.PWORK*	18	37.000	54.000	45.722	4.7627
31.DWORK*	18	45.000	62.000	53.278	4.7627
32.DRAGW12*	18	19.000	55.000	37.222	8.7820
35.NDWORK	18	10.482	18.245	13.278	1.9584
36.NDWORK2	18	10.126	15.389	12.152	1.5488

DESCRIPTIVE MEASURES <13> CADW:4*LUBRICNT:1249.*TYPE:SMIS*SITE:(LTBUTT-RHIGH) STATISTICS BY GROUP/CADDAVER (COMBINED VELOCITIES)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	27	.79000	1.4900	1.1152	.18339
12.F3	27	.42000	.95000	.68481	.12157
13.F4	27	.52000	1.5500	.97593	.25495
14.F32	27	.28000	.91000	.52222	.11719
15.F43	27	1.0500	2.3600	1.4233	.29317
16.F42	27	.34000	1.3000	.88667	.22300
17.02	27	.53700	.88700	.76252	.79997 -1
18.03	27	.74500	1.2800	1.0854	.10381
19.04	27	2.5400	2.5540	2.5453	.50612 -2
20.024	27	.21000	.34000	.29407	.30161 -1
21.034	27	.29000	.50000	.42296	.40460 -1
22.12	27	27.000	139.00	61.704	37.102
23.13	27	40.000	191.00	86.444	49.889
24.14	27	103.00	402.00	202.81	117.02
25.PWORK	27	2.3700	6.2300	4.3978	.97769
26.DWORK	27	9.3300	22.120	14.794	2.8206
27.TWORK	27	13.670	27.280	19.195	3.0559
28.DRAGW1	27	1.5300	5.0600	2.9689	.72485
29.DRAGW2	27	6.8300	17.760	11.820	2.5521
30.PWORKX	27	13.000	40.000	22.593	5.4155
31.DWORKX	27	59.000	86.000	76.407	5.4155
32.DRWK12X	27	10.000	33.000	19.852	4.6052
35.NDWMK	27	5.4754	11.583	6.2834	1.4526
36.NDWMK2	27	4.8065	12.016	8.0806	1.5735

DESCRIPTIVE MEASURES <14> CAD#:5*LUHRICNT:1243.*TYPE:SMIS*SITE:(LITBUTT-KTHIGH) STATISTICS BY GROUP/CADAVER (COMBINED VELOCITIES)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	21	.76000	1.5700	1.1990	.21277
12.F3	21	.53000	1.0900	.81238	.15713
13.F4	21	.77000	1.6600	1.1362	.21956
14.F32	21	.56000	.80000	.67429	.72358 -1
15.F43	21	1.0400	1.7100	1.4000	.16056
16.F42	21	.69000	1.1300	.94810	.12777
17.02	21	.78300	1.1740	.93571	.97516 -1
18.03	21	1.1460	1.4880	1.2634	.95737 -1
19.04	21	2.5430	2.5520	2.5475	.28040 -2
20.024	21	.30000	.46000	.36206	.39641 -1
21.034	21	.44000	.58000	.49048	.38533 -1
22.T2	21	33.000	186.00	88.810	49.935
23.T3	21	48.000	228.00	118.14	63.433
24.T4	21	104.00	404.00	237.29	127.58
25.PWORK	21	3.4400	8.5200	5.2338	1.0269
26.DWORK	21	10.630	24.430	16.298	3.4310
27.TWORK	21	14.070	30.710	21.536	3.8980
28.DRAGH1	21	2.0300	5.3900	3.3890	.88541
29.DRAGH2	21	8.5100	20.350	12.904	2.7758
30.PWORK	21	18.000	37.000	24.095	3.9863
31.DWORK	21	62.000	81.000	74.905	3.9863
32.DRHWK12*	21	15.000	26.000	20.239	3.2234
35.NDWWK	21	6.6855	14.559	10.090	1.8657
36.NDWWK2	21	6.7379	14.746	10.038	1.8974

DESCRIPTIVE MEASURES <15> CAD#:6*LUBRICNT:1249.*TYPE:SMIS*SITES(LTBUFT-KHIGH) STATISTICS BY GROUP/CADAYER (COMBINED VELOCITIES)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	19	.62000	1.1200	.89368	.13893
12.F3	19	.42000	.82000	.59158	.11471
13.F4	19	.46000	1.0600	.79474	.16208
14.F32	19	.55000	.86000	.65474	.69552 -1
15.F43	19	1.0800	1.9500	1.3732	.25318
16.F42	19	.64000	1.2600	.90105	.16779
17.02	19	.72000	1.0890	.83589	.10904
18.03	19	.96700	1.4410	1.1645	.12165
19.04	19	2.5410	2.5540	2.5459	.28959 -2
20.024	19	.28000	.42000	.32316	.43340 -1
21.034	19	.37000	.56000	.45211	.47326 -1
22.T2	19	30.000	173.00	80.105	51.790
23.T3	19	40.000	228.00	109.37	66.801
24.T4	19	104.00	404.00	230.00	128.49
25.PWORK	19	2.3200	5.6400	3.8121	.82388
26.DWORK	19	8.7600	16.240	12.203	2.2660
27.TWORK	19	11.630	20.550	16.020	2.6094
28.OPAGW1	19	1.6800	4.5000	2.4689	.65777
29.DRAGW2	19	6.8700	13.580	9.7268	2.0901
30.PWORK*	19	18.000	33.000	23.526	4.3252
31.DWORK*	19	66.000	81.000	75.474	4.3252
32.DRWK12*	19	13.000	33.000	20.053	4.9607
35.NIWK	19	4.8939	9.2273	7.1315	1.1987
36.NDWK2	19	4.6830	9.1103	7.0180	1.2168

DESCRIPTIVE MEASURES <16> CAD#:4*LUBRICNT:360.*TYPE:SMIS*SITE:(LBTUTT-RTHIGH) STATISTICS BY GROUP/CADAVER (COMBINED VELOCITIES)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	27	.75000	1.6700	1.0185	.21393
12.F3	27	.28000	.82000	.47259	.13002
13.F4	27	.51000	1.5500	.78259	.27612
14.F32	27	.31000	.82000	.46259	.10029
15.F43	27	1.1700	2.4200	1.6530	.33792
16.F42	27	.49000	1.7000	.77815	.28233
17.D2	27	.56800	.85900	.70248	.67834 -1
18.D3	27	.91300	1.1930	1.0458	.68576 -1
19.D4	27	2.5400	2.540	2.5440	.43100 -2
20.D24	27	.22000	.33000	.27111	.27642 -1
21.D34	27	.35000	.47000	.40667	.28148 -1
22.T2	27	24.000	122.00	56.000	34.157
23.T3	27	38.000	173.00	82.000	48.201
24.T4	27	103.00	402.00	199.07	118.61
25.PWORK	27	2.0800	6.3000	3.6667	.87307
26.DWORK	27	8.3900	19.600	11.406	2.9252
27.TWORK	27	11.240	23.410	15.077	3.3393
28.DFACW1	27	1.4300	3.9100	2.5511	.63840
29.DRACW2	27	6.2600	16.510	8.8485	2.5584
30.PWORK*	27	12.000	30.000	24.111	4.5938
31.DWORK*	27	69.000	87.000	74.889	4.5938
32.DRHK12*	27	11.000	30.000	22.222	4.3618
35.NDWRK	27	4.6251	10.230	6.1785	1.4952
36.NDWRK2	27	4.2202	10.423	5.8794	1.5462

DESCRIPTIVE MEASURES <17> CADR:5*LLBRICNT:360.*TYPE:SMIS*SITE:ILTBUTT-RTHIGH) STATISTICS BY GROUP/CADAVER (COMBINED VELOCITIES)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	21	.76000	1.4500	1.0776	.21774
12.F3	21	.33000	.86000	.56286	.13188
13.F4	21	.64000	1.3100	.93714	.17147
14.F32	21	.37000	.69000	.52476	.92283 -1
15.F43	21	1.2200	2.3300	1.6929	.28573
16.F42	21	.60000	1.1500	.88190	.15500
17.02	21	.60600	1.0720	.86143	.12476
18.03	21	1.0100	1.4480	1.2138	.14180
19.04	21	2.5440	2.5530	2.5484	.20015 -2
20.024	21	.23000	.42000	.33429	.49353 -1
21.034	21	.39000	.56000	.47190	.55373 -1
22.02	21	26.000	155.00	81.333	45.040
23.03	21	42.000	211.00	112.38	60.249
24.04	21	104.00	404.00	237.67	127.17
25.PWORK	21	2.4100	5.8300	4.3343	.97602
26.DWORK	21	8.1000	16.740	13.174	2.1965
27.TWORK	21	11.490	22.430	17.513	2.7386
28.DRACW1	21	1.3300	4.4800	2.8657	.90454
29.DRACW2	21	6.2400	13.710	10.303	1.8403
30.PWORK*	21	14.000	30.000	24.238	4.1822
31.DWORK*	21	69.000	85.000	74.762	4.1822
32.DRWH12*	21	10.000	33.000	21.333	5.8850
35.NDWH	21	4.8864	11.038	7.8496	1.4456
36.NDWH2	21	4.9406	10.897	7.7719	1.4720

DESCRIPTIVE MEASURES <18> CAD#:6*LUBRICNT:360.*TYPE:SMIS*SITE:(LFBUTT-RTHIGH) STATISTICS BY GROUP/CADAVER (COMBINED VELOCITIES)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	19	.60000	1.2000	.94684	.14757
12.F3	19	.25000	.53000	.36316	.89756 -1
13.F4	19	.29000	.65000	.47211	.11745
14.F32	19	.25000	.55000	.38737	.96139 -1
15.F43	19	.93000	1.7500	1.3068	.22974
16.F42	19	.25000	.85000	.50895	.15723
17.D2	19	.74400	1.2270	.99847	.16871
18.D3	19	1.0970	1.7550	1.3988	.22253
19.D4	19	2.5430	2.5500	2.5468	.19027 -2
20.D24	19	.29000	.48000	.38684	.66754 -1
21.D34	19	.43000	.70000	.54421	.87643 -1
22.T2	19	31.000	195.00	97.000	63.675
23.T3	19	46.000	251.00	133.58	83.715
24.T4	19	104.00	404.00	230.00	128.49
25.PWORK	19	2.2100	7.1400	4.8168	1.2955
26.DWORK	19	5.1500	9.9500	7.1889	1.5918
27.TWORK	19	10.070	15.040	12.009	1.5333
28.DRAGW1	19	1.7200	4.0900	2.4337	.55604
29.DRAGW2	19	2.2200	7.4300	4.7516	1.5702
30.PWORK*	19	21.000	53.000	39.579	10.335
31.DWORK*	19	46.000	78.000	59.421	10.335
32.DRWK12*	19	21.000	59.000	34.737	10.148
35.NDWK	19	3.5643	6.2422	4.6222	.78676
36.NDWK2	19	2.9482	5.3762	4.0599	.81050

DESCRIPTIVE MEASURES <28> CADM:4*LUBRICNT:DRY*TYPE:SKIN*SITES:(LICALF-RTICALF) STATISTICS BY GROUP/CADAVER (COMBINED VELOCITIES)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	15	1.0700	3.1400	1.7073	.55386
12.F3	15	.45000	1.2100	.73067	.20662
13.F4	15	.30000	1.2500	.70533	.27487
14.F32	15	.25000	.62000	.43867	.98913 -1
15.F43	15	.60000	1.2500	.93800	.17449
16.F42	15	.17000	.69000	.42200	.13790
17.02	15	.59500	1.2000	.93407	.16778
18.03	15	1.1390	1.6360	1.3709	.18681
19.04	15	2.5420	2.5540	2.5471	.37505 -2
20.024	15	.23000	.47000	.36067	.65516 -1
21.034	15	.44000	.64000	.53267	.74878 -1
22.T2	15	25.000	191.00	93.333	60.149
23.T3	15	47.000	259.00	135.47	86.671
24.T4	15	103.00	404.00	236.93	129.27
25.PWORK	15	3.9000	10.790	6.9233	2.0490
26.DWORK	15	8.6800	22.500	13.001	3.4709
27.TWORK	15	13.650	33.300	19.930	4.9944
28.DRAGW1	15	2.7300	11.820	4.9433	2.1449
29.OPAGW2	15	4.9800	10.900	8.0527	1.9032
30.PWORK%	15	23.000	46.000	34.267	5.6879
31.DWORK%	15	53.000	76.000	64.733	5.6879
32.DRAGW12%	15	26.000	52.000	37.000	7.0912
35.NDWK	15	5.0760	14.423	8.1804	2.4818
36.NDWK2	15	4.2672	11.723	7.0579	2.2046

DESCRIPTIVE MEASURES <30> CAD#:6*LUBRICNT:DRY*TYPE+SKIN*SITE:(LTCALF-KTCALF) STATISTICS BY GROUP/CADAVER (COMBINED VELOCITIES)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	18	.86000	2.6700	1.5383	.46966
12.F3	18	.66000	1.5800	1.0544	.30363
13.F4	18	.78000	2.2300	1.3300	.39211
14.F32	18	.50000	.84000	.69222	.91687 -1
15.F43	18	.93000	1.5000	1.2639	.16853
16.F42	18	.60000	1.1900	.87556	.15485
17.D2	18	.54800	.83900	.69700	.76363 -1
18.O3	18	.75400	1.2490	1.0028	.12635
19.O4	18	2.5410	2.5530	2.5475	.37455 -2
20.D24	18	.21000	.32000	.26944	.29600 -1
21.O34	18	.29000	.49000	.36833	.50439 -1
22.T2	18	22.000	126.00	66.667	39.249
23.T3	18	31.000	177.00	95.833	56.616
24.T4	18	103.00	406.00	236.78	128.95
25.PWDRK	18	3.2400	9.2200	5.1333	1.5444
26.DWDRK	18	12.960	32.880	22.492	6.0827
27.TWDRK	18	16.200	41.040	27.629	7.4436
28.DRAGW1	18	1.8500	6.8100	3.8961	1.3282
29.DRAGW2	18	9.8200	28.560	18.590	5.5240
30.PWDRK2	18	14.000	22.000	18.167	2.0934
31.DWDRK2	18	77.000	85.000	80.833	2.0934
32.DRAG12X	18	10.000	24.000	17.111	4.4575
35.ND4K	18	7.5745	18.639	12.173	3.3780
36.ND4K2	18	7.5480	18.654	12.027	3.3201

DESCRIPTIVE MEASURES <31> CAD#14*LUBRICNT:1249.*TYPE:SKIN*SITE:(LTCALF-KTCALF) STATISTICS BY GROUP/CADAVER (COMBINED VELOCITIES)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	16	.55000	1.6300	.98250	.33622
12.F3	16	.30000	.59000	.44125	.87245 -1
13.F4	16	.20000	.59000	.42125	.12355
14.F32	16	.21000	.76000	.48812	.16063
15.F43	16	.65000	1.3100	.94937	.22740
16.F42	16	.19000	.99000	.48062	.25011
17.02	16	.54600	1.0960	.85550	.17063
18.03	16	.90600	1.5320	1.2959	.19704
19.04	16	2.5410	2.5530	2.5486	.35000 -2
20.024	16	.21000	.42000	.33125	.66420 -1
21.034	16	.35000	.60000	.50437	.76765 -1
22.T2	16	23.000	157.00	81.813	51.640
23.T3	16	38.000	242.00	120.69	72.575
24.T4	16	104.00	404.00	228.81	129.04
25.PWORK	16	2.1600	6.3800	3.8725	1.2690
26.DWORK	16	5.6700	11.330	8.4719	1.8159
27.TWORK	16	7.8600	17.720	12.351	2.4378
28.DRAGW1	16	1.1900	5.5300	3.0900	1.1505
29.DRAGW2	16	3.0600	7.2600	5.3781	1.2296
30.PWORK*	16	22.000	49.000	30.813	7.5119
31.DWORK*	16	50.000	77.000	68.188	7.5119
32.DRAGW12*	16	15.000	49.000	35.688	9.5339
35.WORK	16	2.8422	6.8460	5.0085	.95989
36.WORK2	16	2.4848	5.5490	4.3152	.84702

DESCRIPTIVE MEASURES <33> CAD#16*LUBRICNT:1249.*TYPE:SKIN*SITE:(LTCALF-RTCALF) STATISTICS BY GROUP/CADAVER (COMBINED VELOCITIES)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	19	.54000	1.0000	.77842	.13309
12.F3	19	.20000	.50000	.34368	.84997 -1
13.F4	19	.18000	.63000	.39316	.13275
14.F32	19	.25000	.57000	.44105	.78450 -1
15.F43	19	.64000	1.7400	1.1532	.33390
16.F42	19	.25000	.84000	.50842	.16361
17.D2	19	.37100	.89000	.58858	.12527
18.D3	19	.78200	1.4570	.97116	.15790
19.D4	19	2.5420	2.5520	2.5483	.27455 -2
20.D24	19	.14000	.35000	.22526	.49930 -1
21.D34	19	.30000	.57000	.37579	.62656 -1
22.T2	19	20.000	106.00	52.263	29.939
23.T3	19	32.000	179.00	87.842	51.607
24.T4	19	103.00	404.00	229.68	128.81
25.PWORK	19	1.1600	3.5700	2.0911	.52393
26.DWORK	19	5.5700	10.550	7.9105	1.6173
27.TWORK	19	6.9400	12.670	10.007	1.8877
28.DRAGW1	19	1.2300	4.3800	2.1900	.76562
29.DRAGW2	19	3.1300	7.8600	5.7163	1.3155
30.PWORK*	19	15.000	29.000	20.579	4.1809
31.DWORK*	19	70.000	84.000	78.421	4.1809
32.DRAGW12*	19	17.000	43.000	27.316	7.5723
35.MDWK	19	2.6480	5.9451	4.0672	.94342
36.MDWK2	19	2.0325	5.2015	3.6617	.91785

DESCRIPTIVE MEASURES <34> CAD#:4*LUBRICNT:360.*TYPE:SKIN*SITE:ULTCALF-RTCALF) STATISTICS BY GROUP/CADAVER (COMBINED VELOCITIES)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	16	.55000	2.1400	1.0469	.49030
12.F3	16	.17000	.62000	.37063	.11936
13.F4	16	.90000 -1	.49000	.31688	.11516
14.F32	16	.14000	.73000	.39000	.14100
15.F43	16	.28000	2.0700	.94687	.51746
16.F42	16	.10000	.85000	.36000	.21179
17.D2	16	.47800	.99700	.70881	.15429
18.O3	16	.85400	1.4120	1.1310	.17763
19.O4	16	2.5450	2.5530	2.5485	.23095 -2
20.D24	16	.18000	.39000	.27375	.63021 -1
21.D34	16	.33000	.55000	.44000	.69666 -1
22.T2	16	22.000	144.00	63.563	43.233
23.T3	16	37.000	211.00	98.563	61.452
24.T4	16	104.00	404.00	216.44	120.15
25.PWORK	16	1.7600	8.0400	3.3444	1.6455
26.DWORK	16	5.1700	11.760	7.4106	1.9451
27.TWORK	16	7.1800	16.020	10.762	2.7776
28.DRAGW1	16	1.6900	5.4000	2.7900	1.0547
29.DRAGW2	16	2.7800	7.5400	4.6175	1.2195
30.PWORK%	16	20.000	57.000	29.750	9.2051
31.DWORK%	16	42.000	79.000	69.250	9.2051
32.DRWK12%	16	28.000	52.000	36.813	7.9601
35.NDWK	16	2.7710	5.9605	4.0296	.96395
36.NDWK2	16	1.8241	4.4789	3.2684	.77078

DESCRIPTIVE MEASURES <36> CAD#:6*LUBRICNT:360.*TYPE:SKIN*SITE:(LTGALF-RICALF) STATISTICS BY GROUP/CADAVER (COMBINED VELOCITIES)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	21	.44000	1.2100	.74571	.20383
12.F3	21	.11000	.31000	.20810	.65469 -1
13.F4	21	.30000 -1	.39000	.19714	.11380
14.F32	21	.14000	.50000	.28333	.74922 -1
15.F43	21	.27000	1.8000	.92429	.50350
16.F42	21	.40000 -1	.59000	.27095	.16343
17.0?	21	.51100	.92200	.68305	.11485
18.03	21	.84600	1.4300	1.0549	.15937
19.04	21	2.5410	2.5520	2.5479	.34336 -2
20.024	21	.20000	.36000	.26381	.45659 -1
21.034	21	.33000	.56000	.40952	.62488 -1
22.T2	21	23.000	103.00	56.810	27.921
23.T3	21	34.000	179.00	89.048	47.228
24.T4	21	103.00	404.00	222.48	125.23
25.PWORK	21	1.1900	3.8000	2.2667	.68622
26.DWORK	21	2.4100	6.6200	4.5024	1.2979
27.TWORK	21	3.9800	10.420	6.7752	1.7404
28.DRAGW1	21	.80000	2.9700	1.6424	.69082
29.DRAGW2	21	1.5800	4.1500	2.8543	.81413
30.PWORK*	21	23.000	49.000	33.238	6.6099
31.DWORK*	21	50.000	76.000	65.762	6.6099
32.DRAGW12*	21	22.000	54.000	35.571	8.7268
35.NDWK	21	1.2772	3.8399	2.4390	.77581
36.NDWK2	21	1.0293	2.9662	1.9452	.62830

DESCRIPTIVE MEASURES <38> CAD#:5*LUBRICNT:DRY*TYPE:SMIS*SITE:(LTCALF-RTCALF) STATISTICS BY GROUP/CADVER (COMBINED VELOCITIES)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	20	1.3600	2.3600	1.8770	.22177
12.F3	20	.86000	1.5600	1.3135	.17804
13.F4	20	1.4800	2.6700	2.0310	.31629
14.F32	20	.61000	.82000	.69700	.68063 -1
15.F43	20	1.1400	2.0900	1.5545	.24565
16.F42	20	.76000	1.6100	1.0875	.20092
17.D2	20	.54400	.70200	.61845	.42814 -1
18.D3	20	.75200	.98200	.86120	.51318 -1
19.04	20	2.5390	2.5510	2.5461	.34013 -2
20.D24	20	.21000	.27000	.23900	.16733 -1
21.034	20	.31000	.38000	.33300	.20026 -1
22.T2	20	23.000	111.00	60.850	30.081
23.T3	20	34.000	151.00	84.150	41.630
24.T4	20	104.00	404.00	248.60	123.59
25.PWORK	20	3.9800	7.3300	5.7075	.89242
26.DWORK	20	26.090	38.750	33.615	3.7073
27.TWORK	20	30.070	44.790	39.328	4.0983
28.DRAGW1	20	2.3500	5.6300	3.9180	.81096
29.DRAGW2	20	22.800	35.200	29.692	3.3910
30.PWORK*	20	11.000	18.000	14.050	2.0384
31.DWORK*	20	81.000	68.000	84.950	2.0384
32.DRWK12*	20	8.0000	15.000	11.250	2.0743
35.NDWK	20	13.345	20.000	17.444	1.9325
35.NDWK2	20	13.459	20.343	17.635	2.0325

DESCRIPTIVE MEASURES <39> CAD#:6*LUBRICIT:DRY*TYPE:SMIS*SITE:(LTCALF-RTLALF) STATISTICS BY GROUP/CADAVER (COMBINED VELOCITIES)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	18	1.5400	2.5400	2.0156	.34650
12.F3	18	1.0400	2.1400	1.4822	.30966
13.F4	18	1.4600	2.5000	1.9256	.32039
14.F32	18	.59000	.84000	.73056	.77571 -1
15.F43	18	1.0900	1.6300	1.3117	.15924
16.F42	18	.72000	1.1500	.95611	.10001
17.D2	18	.62700	1.0050	.77889	.97692 -1
18.D3	18	.89200	1.2590	1.0619	.99417 -1
19.D4	18	2.5400	2.5530	2.5451	.39029 -2
20.D24	18	.24000	.39000	.30167	.37924 -1
21.D34	18	.35000	.49000	.41222	.39341 -1
22.T2	18	26.000	137.00	74.000	40.565
23.T3	18	39.000	175.00	98.389	50.647
24.T4	18	104.00	404.00	237.00	128.43
25.PWDRK	18	5.2200	12.770	8.3450	2.3436
26.DWDRK	18	25.020	40.030	30.617	4.3957
27.TWDRK	18	30.540	50.400	39.966	6.2676
28.DRAGW1	18	3.0400	8.7500	4.9772	1.3724
29.DRAGW2	18	21.110	34.730	25.634	3.7360
30.PWDRK*	18	16.000	27.000	20.667	3.3955
31.DWDRK*	18	72.000	83.000	78.333	3.3955
32.DR*WK12*	18	11.000	22.000	15.833	3.4513
35.NWDRK	18	13.549	23.305	17.438	3.0171
36.NWDRK2	18	13.449	23.115	17.387	2.9694

DESCRIPTIVE MEASURES <41> CAD#:5*LURICNT:1249.*TYPE:SMIS*SITE:(LTCALF-R(CALF)) STATISTICS BY GROUP/CADAVER (COMBINED VELOCITIES)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	24	.53000	1.1700	.82333	.15236
12.F3	24	.32000	1.0000	.53083	.13969
13.F4	24	.84000	1.4300	1.0304	.17907
14.F32	24	.39000	.89000	.64333	.11772
15.F43	24	1.4300	2.8100	1.9883	.35166
16.F42	24	.90000	1.5100	1.2579	.14969
17.D2	24	.37200	1.2610	.56258	.17218
18.D3	24	.68200	1.5490	.80237	.17718
19.D4	24	2.5400	2.5540	2.5477	.38069 -2
20.D24	24	.14000	.49000	.21583	.67625 -1
21.D14	24	.26000	.61000	.31000	.71262 -1
22.T2	24	19.000	93.000	53.167	24.364
23.T3	24	28.000	131.00	76.375	33.966
24.T4	24	104.00	404.00	249.50	117.90
25.PWORK	24	1.5200	7.5300	2.5579	1.1429
26.DWORK	24	12.460	23.160	16.424	2.8393
27.TWORK	24	14.280	26.510	18.987	3.1894
28.DRAGW1	24	1.0500	3.1500	1.8550	.51642
29.DRAGW2	24	11.410	20.640	14.762	2.5736
30.PWORK	24	7.0000	32.000	13.000	4.4818
31.DWORK	24	67.000	92.000	86.000	4.4818
32.DRAGW12	24	7.0000	20.000	9.6250	2.6509
35.DWORK	24	6.1683	12.189	8.3290	1.5600
36.DWORK2	24	6.3565	12.543	8.5340	1.6112

DESCRIPTIVE MEASURES <42> CADW:6*LUBRICNT:1249.*TYPE:SMIS*SITE:(LTCALF-KTCALF) STATISTICS BY GROUP/CADDAVER (COMBINED VELOCITIES)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	18	.65000	1.1600	.85222	.13401
12.F3	18	.37000	.61000	.51167	.73983 -1
13.F4	18	.65000	1.0800	.85222	.12982
14.F32	18	.49000	.72000	.60000	.58812 -1
15.F43	18	1.3400	1.8800	1.6611	.14179
16.F42	18	.79000	1.2900	1.0022	.12652
17.02	18	.44600	.71400	.57767	.81794 -1
18.03	18	.74100	1.0930	.93372	.11151
19.04	18	2.5410	2.5530	2.5474	.35016 -2
20.024	18	.17000	.28000	.22333	.32176 -1
21.034	18	.29000	.42000	.36111	.43099 -1
22.T2	18	21.000	106.00	52.611	25.479
23.T3	18	31.000	159.00	84.778	41.306
24.T4	18	104.00	404.00	237.00	128.43
25.PWORK	18	1.7200	3.8400	2.7311	.72984
26.DWORK	18	10.830	17.320	13.965	2.1011
27.TWORK	18	12.600	21.170	16.700	2.6307
28.DRAGW1	18	1.5000	4.4200	2.4989	.69841
29.DRAGW2	18	9.1000	14.520	11.462	1.6468
30.PWORK*	18	12.000	21.000	15.778	2.7771
31.DWORK*	18	78.000	87.000	83.222	2.7771
32.DR HK12*	18	11.000	26.000	17.222	3.1911
35.NDWK	18	5.2522	8.9232	7.1028	1.1103
36.NDWK2	18	5.2299	9.0928	7.1403	1.1630

DESCRIPTIVE MEASURES <<<> CADW:5*LUBRICNT:360.*TYPE:SMIS*SITE:(LTCALF-RICALF) STATISTICS BY GROUP/CADAVER (COMBINED VELOCITIES)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	20	.50000	1.1600	.72150	.15621
12.F3	20	.21000	.43000	.29950	.50146 -1
13.F4	20	.55000	1.0100	.74800	.12854
14.F32	20	.29000	.53000	.42450	.65813 -1
15.F43	20	1.7100	3.8300	2.5105	.52775
16.F42	20	.66000	1.4700	1.0635	.24377
17.D2	20	.46200	.71700	.54545	.70139 -1
18.D3	20	.67700	.94600	.77480	.69300 -1
19.O4	20	2.5410	2.5530	2.5482	.39507 -2
20.D24	20	.18000	.28000	.20950	.27043 -1
21.O34	20	.26000	.37000	.29850	.27004 -1
22.T2	20	19.000	104.00	53.100	26.191
23.T3	20	24.000	137.00	75.250	36.670
24.T4	20	104.00	404.00	248.60	123.08
25.PWORK	20	1.5000	3.4500	2.0865	.47724
26.DWORK	20	8.2400	16.360	11.104	2.1618
27.TWORK	20	10.360	18.380	13.197	2.3573
28.DRAGW1	20	.77000	1.8700	1.1255	.27807
29.DRAGW2	20	7.4700	15.240	9.9745	1.9840
30.PWORKX	20	9.0000	23.000	15.450	3.1031
31.DWORKX	20	76.000	90.000	83.550	3.1031
32.DRAGW12X	20	6.0000	12.000	9.7500	1.6182
35.NDWK	20	4.1913	7.8315	5.5379	1.0099
36.NDWK2	20	4.2564	8.1323	5.6184	1.0405

DESCRIPTIVE MEASURES <4.5> CADR:6*LCURICNT:360.*TYPE:SHIS*SITE:(LTCALF-RTCALF) STATISTICS BY GROUP/CADVER (COMBINED VELOCITIES)

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD DEV
11.F2	23	.48000	1.5200	.84043	.23145
12.F3	23	.21000	.61000	.36435	.10706
13.F4	23	.36000	.84000	.59609	.11908
14.F32	23	.30000	.96000	.44174	.12798
15.F43	23	1.1800	2.5200	1.6804	.32773
16.F42	23	.42000	1.2100	.74217	.21224
17.D2	23	.38200	.68500	.54613	.93212 -1
18.D3	23	.58100	1.0830	.86678	.11573
19.D4	23	2.5410	2.5510	2.5462	.35156 -2
20.D24	23	.15000	.26000	.21000	.35420 -1
21.D34	23	.22000	.42000	.33609	.45998 -1
22.T2	23	16.000	104.00	56.913	33.659
23.T3	23	24.000	173.00	88.478	50.093
24.T4	23	104.00	404.00	251.52	131.09
25.PWORK	23	1.0600	5.3100	2.5017	1.0294
26.DWORK	23	6.7700	13.850	10.571	2.0860
27.TWORK	23	8.9000	18.760	13.078	2.5224
28.DRAGW1	23	.73000	3.4000	1.9343	.72552
29.DRAGW2	23	5.7800	12.300	8.6326	1.6771
30.PWORK*	23	7.0000	29.000	18.696	5.9729
31.DWORK*	23	70.000	92.000	80.304	5.9729
32.DR4K12*	23	8.0000	26.000	17.505	4.9527
35.ND4K	23	3.4771	7.4543	5.2831	1.0245
36.ND4K2	23	3.3527	7.1185	5.1479	.98754

<STOP>

APPENDIX E

COMPUTER PROGRAMS

The following pages list some of the major computer programs written for data collection and analysis for this study using a NOVA 1220 computer system.

"TPINIT"

A BASIC program written to initialize the directory of a data tape and assign the tape number.

```
0005 DIM D(127),T(150)
0010 OPEN FILE(1,1),"DIRECT.1"
0020 INPUT "TAPE NO. = ",D(1)
0030 PRINT "THE TAPE NO. IS "D(1)
0040 INPUT " TYPE OR IF OK",T(1)
0050 IF T(1)=" " THEN GOTO 0065
0060 GOTO 0020
0065 FOR I=1 TO 127
0070   LET D(I)=0
0075 NEXT I
0080 LET D(1)=1
0090 LET D(2)=399
0100 CALL 99,1,1,1
0110 FOR I=3 TO 127
0120   WRITE FILE(1),D(I)
0130 NEXT I
0140 CLOSE FILE(1)
0150 STOP
```

*

"RTINIT"

A BASIC program written to initialize and number a result tape
for storing output of program "WCAL"

```
0005 DIM D(127),T(150)
0010 OPEN FILE(1,1),"DIRECT,1"
0020 INPUT "TAPE NO. = ",D(0)
0030 PRINT "THE TAPE NO. IS "D(0)
0040 INPUT " TYPE CR IF OK",T(0)
0050 IF T(0)="" THEN GOTO 0065
0060 GOTO 0020
0065 FOR I=1 TO 127
0070   LET D(I)=0
0075 NEXT I
0080 LET D(0)=1
0090 LET D(3)=0
0100 CALL 90,1,1,1
0110 FOR I=0 TO 127
0120   WRITE FILE(1),D(I)
0130 NEXT I
0140 CLOSE FILE(1)
0150 STOP
```

*

CALL 40

A BASIC subroutine written in assembly language to:

- a) output D/A increments to control needle position
according to the values of IP, FP, PV, DT, and RV
- and, b) sample A/D channels 5 and 10 and store the results
in string array format in AS.

CALL 40

```

                LOC,466
234 ; CALL 47      SPECIAL NEEDLE POSITION CONTROL
235 ; CALL 47      INITIAL POSITION, FINAL POSITION, PENETRATION
236 ;              VELOCITY, DWELL TIME, RETRACTION VELOCITY,
237 ;              STORAGE ARRAY LOCATION
238 ; CALL 48,IP,FP,PV,IT,RV,AC      IP MUST BE GREATER THAN FP
239 ;
240 ; CALL 48,IP,FP,PV,IT,RV      JUST LIKE CALL 48 BUT
241 ;                              NO SAMPLING OF DATA ON LINE
242 ;
243 BI:          STA 2,RTN
244              AIC 2,2
245              LDA 2,TS      ;DWELL & SAMPLE TIME CONST
246              STA 2,T      ;STORE IN DELAY LOOP VAR.
247              JMP BI:
248              .PIX      17
249 CF4:         64
250 C448:        448
251 TS:          8148      ;17 USEC DWELL AND SAMPLE
252              .PIX      9
253 S:           8
254 CTR:         2
255 CTRS:        2
256 FLAG:        0
257 DIC:         2
258 KEEP:        0      ;SAVE ADDR OF 1ST WORD OF STRING
259 BI1:         INTDS      ;DISABLE INTERRUPTS
260              LDA 2,20
261              STA 2,STORE
262              LDA 2,21
263              STA 2,ST01
264              LDA 2,05
265              STA 2,SIMS
266              LDA 2,202
267              STA 2,20
268              STA 2,T      ;SAVE CALL PTR
269              JSD 2,BETH
270              JSD 2,PIX
271              LDA 2,E      ;REPLACE CALL PTR
272              STA 1,202
273              ISB SIMS
274              JMP 1,-6
275              CON# 3,3,SPD
276              JMP X
277              LDA 2,RTN
278              ISB RTN
279              LIA 2,2,2
280              LDA 2,2,2
281              HONED 2,2
282              WBS 2,2      ;SUB 1 FROM
283              CON 2,2      ;AUTO INCREMENTING REG
284              STA 2,KEEP      ;SAVE ADDR OF STRING
285              STA 2,21
286 Y:           LDA 1,FP
287              LDA 2,C500      ;1000 COUNTS TO START UP
288              SUB 2,1
289              STA 1,S      ;STORAGE LOCATION FOR # OF INCREMENTS
290              STA 1,20      ;# OF RETRACTION INC WITH SAMPLE
291              LDA 1,C070
292              STA 1,200      ;END OF INC'S TILL SWIV CONTACT

```

CALL 40 (continued)

```

093      SUBEL 1,1      ; SELECT CHAN 1
094      LOD 1, DACV    ; ON DTA CONVERTER
095      LIA 2, PV      ; ADD 448 TO PV
096      LIA 2, C448
097      ADD 2, 2
098      STA 2, P15     ; STORE IN ILY LOOP
099      SUBEL 2, 2     ; CTF = CTR5 = FLAG = 1
100      STA 2, CTR
101      STA 2, CTR5
102      STA 2, FLAG
103      LIA 2, C64
104      STA 2, DEC     ; INITIAL DECREMENT FOR SLOW START
                        ; SAVE CALL POINTER
                        ; SET SAMPLE FLAG TO OFF
                        ; STORE IN ILY LOOP
105
106      LEA 1, IP      ; LOAD INITIAL POS
107      JMP 2, +2
108      STA 2, DEC     ; SAVE NEW DEC FOR SLOW START
109      BACK:        ; OUTPUT TO MOTOR
110      ADEL 2, 2     ; DECREMENT POS BY 2
111      ADD 2, 1
112      JST ILY      ; JUMP TO DELAY LOOP
113      LDA 2, DEC    ; DECREMENT PMS BY DEC
114      LIA 2, PMS
115      SUB 2, 2
116      STA 2, PMS   ; STOP IN PMS
117      DSE CTR5
118      JMP BACK
119      LIA 2, CTR    ; CTR = SEGMENT NO
120      MOVEL 2, 2
121      STA 2, CTR   ; STORE IN CTR
122      STA 2, CTR5  ; STORE IN CTR5 ALSO
123      LDA 2, DEC   ; DEC = DEC / 2
124      MOVEL 2, 2, SER ; DEC = 2 ?
125      JMP BACK-1   ; JNC
126      LIA 2, KEIP   ; RESTORE POINTER TO STRING
127      STA 2, 81
128      JMP 2, 81
129      MONT:        ; PUT IN AUTO INC REG
130      SUB 2, 2
131      LOD 2, DACV
132      LDA 2, VI
133      LOA 2, DACV
134      SUBEL 2, 2
135      ; PENETRATION
136      LOD 2, DACV
137      LOA 1, DACV
138      ADEL 2, 2     ; ACC = -2
139      ADD 2, 1
140      STA 2, 3E
141      JST ILY      ; SAVE ACC
142      LDA 2, 3E    ; JUMP TO DELAY
143      ISE FDS     ; RETRIEVE ACC
144      FLOOP:     ; HIGH PENETRATING ???
145      JMP 2, 3E
146      ISE FLAG    ; JNC
147      JMP EVELL   ; IF FLAG = -1 START SAMPLING
148      LIA 2, 5    ; GO TO EVELL ROUTINE
149      STA 2, FDS  ; LOAD # OF STEPS TO REACH FP
150
151      ; IN PENETRATION LOOP
152      ; RESTORE CALL POINTER
153
154      JMP MONT
155      ILY:        ; RESTORE CALL POINTER
156      LEA 2, 5
157      CONJ 2, 2, SER ; SKIP IF SAMPLING DATA
158      JMP M1
159      LIA 2, C5
160      LOAS 2, AICH
161      SHDEN ADOV

```

CALL 40 (continued)

```

359      JMP  .-1
360      D100 2,ADCV
361      STA  2,221
362      LDA  2,C10
363      DOAS 2,ADCV
364      SHPDN ADCV
365      JMP  .-1
366      D100 2,ADCV
367      STA  2,221
368  M1:   LDA  2,PV5
369      STA  2,PV2
370      ESE  PV2
371      JMP  .-1
372      JMP  0,3
373  T:    0
374  PTD1: JMP  BDI
375  PTD2: JMP  DONE
376  TC:   0          ;# OF RETRACTION INC WITH SAMPLE
377  T1:   1
378  E:    2
379  SIMS: 0
380  STOR2: 2
381  ST01: 2
382  C5:   5
383  C10:  12
384      .PDX      12
385  C370: 370
386  C500: 500
387  V1:   200
388  V2:   400
389  V3:   600
390  T1:   2260.      ;10 MSEC DWELL
391  T2:   0
392  D2:   0
393  FPS:  0          ;CNTR FOR RETRACT LOOP
394  PV2:  0
395  PV5:  0
396  PV22: PV22
397  IP:   1000
398  FP:  -1200
399  PV:   100
400  D:    1000
401  RV:   360
402      .PDX      8
403  DWELL: STA  1,21      ;SAVE POSITION
404          SUB  1,1      ;OUTPUT 1 VOLT CHAN 0
405          DOB  1,IACV
406          LIA  1,V2
407          DOA  1,IACV
408          LIA  2,D
409          STA  2,D2
410  DV1:  ESE  D2
411          JMP  .+2
412          JMP  RETRCT
413          CON# 0,0,SEP
414          JMP  Y2
415          STA  0,7      ;SAVE CALL PTR
416          JSR  DLY      ;JMP TO DWELL DELAY
417          LDA  0,5      ;REPLACE PTR
418  Y2:   LIA  1,T
419          STA  1,T2
420          ESE  T2
421          JMP  .-1
422          JMP  DV1
423  RETRCT: SUBEL 1,1      ;IAC1 = 1
424          STA  1,T2      ;SET FLAG FOR WITH SAMPLE

```

CALL 40 (continued)

```

425      LIA 1,8V      ;LOAD RETRACTION VEL.
426      STA 1,8V8     ;STORE IN DELAY LOOP CONST.
427      SUB 1,1      ;AC1 = 2
428      DDB 1,8ACV
429      LIA 1,8V3
430      IOA 1,8ACV
431      SUBEL 1,1
432      DDB 1,8ACV
433      LIA 1,8V1     ;RESTORE POSITION
434 71:   IOA 1,8ACV
435      INC 1,1
436      INC 1,1      ;INCREMENT POSITION BY 2
437      STA 3,2      ;SAVE CALL PTF
438      JSP DLY      ;JUMP TO RETRACTION DELAY
439      LDA 3,2      ;REPLACE PTF
440      ISF 20      ;DONE WITH RETRACTION???
441      JNP 21
442      ISF 22      ;DONE SAMPLING WHILE RETRACTING
443      JMP DONE     ;NO - DONE RETRACTING PERIOD
444      LIA 2,0527   ;YES - RETRACT 1320 MORE STA'S
445      STA 2,20C    ;STORE IN RETRACTION LOOP
446      SUB 2,2      ;AC2 = 2
447      SUB 2,2 ;TURN OFF SAMPLING FLAG
448      IOB 2,8ACV   ;SELECT STA 3
449      IOA 2,8ACV   ;OUTPUT 0 VOLTS
450      SUBEL 2,2    ;AC2 = 1
451      IOB 2,8ACV   ;SELECT STA CHAN 1
452      JMP 21       ;CONTINUE RETRACTING
453 DONE:  LIA 2,STORE ;YES
454      STA 2,20
455      LIA 2,STO1
456      STA 2,21
457      SUB 1,1      ;PUT OUT 1 VOLT ON STA #2
458      IOB 1,8ACV  ;TO INDICATE END OF TEST
459      IOA 1,8ACV
460      INTEN
461      JMP 37TH
462 042:  STA 2,27TH
463      LIA 2,27V
464      STA 2,27     ;WAIT TIME NO SAMPLING
465      SUB 2,3      ;STORE IN DELAY LOOP
466      JMP 27R1

```

CALL 41

A BASIC subroutine written in assembly language to convert data points stored in string array to floating point format numbers for storage on LINC tape.

CALL 41

```

: 0000 XBS36
249
250           ; CALL 41,AS,1,FORCE(I),DISPLACEMENT(I)
251           ; CALL 41,AS,1,F(I),I(I)
252           ;
253 00245'050000-ARRAY: STA 2,RTN
254 00246'010200-      I SE RTN
255 00247'035200      LDA 3,0,2      ;AC3 = ADDR OF STRING INFO
256 00250'031400      LDA 2,0,3      ;AC2 = BYTE ADDR OF STRING
257 00251'151220      MOVER 2,2      ;AC2 = WORD ADDR
258 00252'050427      STA 2,WHY      ;WHY = WORD ADDR
259 00253'006001-      JSP 0.GETV
260 00254'006003S      JSP 0.FIX
261 00255'030424      LDA 2,WHY      ;AC2 = WORD ADDR
262 00256'125120      MOVL 1,1
263 00257'133000      ADD 1,2
264 00260'050421      STA 2,WHY      ;WHY = WORD ADDR +2*I
265 00261'025376      LDA 1,-2,2
266 00262'102400      SUB 0,0
267 00263'125113      MOVL# 1,1,SNC ;CHECK SIGN
268 00264'000402      JMP .+2      ;POS RESULT
269 00265'102000      ADC 0,0      ;NEG, SET AC0 TO -1
270 00266'006004S      JSP 0.FLOT
271 00267'006002-      JSP 0.PUTV
272 00270'030411      LDA 2,WHY      ;AC2 = WORD ADDR OF ITH VALE
273 00271'025377      LDA 1,-1,2
274 00272'102400      SUB 0,0      ;ZERO AC 0
275 00273'125113      MOVL# 1,1,SNC ;CHECK SIGN
276 00274'000402      JMP .+2      ;POS RESULT
277 00275'102000      ADC 0,0      ;NEG SET AC0 TO -1
278 00276'006004S      JSP 0.FLOT
279 00277'006002-      JSP 0.PUTV
280 00300'002000-      JMP 0RTN
281 00301'000000 WHY: 0
282

```

"PGO"

A BASIC program written to request and store basic test information, establish initial needle position, calibrate force and displacement signals, control the injection process through the "CALL 40" subroutine, and store digitized data on LINC tape using CALL 41 to convert data to floating point format.

"PGO"

```

LIST
0005 REM *****PROGRAM TO CONTROL NEEDLE AND PUT DATA ON TAPE*****
0010 REM *****VERSION 3 ---V9=1*****
0015 REM *****WRITES ONLY PENETRATION POINTS ON TAPE*****
0020 LET V9=3
0025 DIM A$(11),D$(127),P$(52)
0030 DIM E$(13),K$(16),T$(4),M$(12)
0035 DIM F$(2),L$(1)
0040 DIM S$(6),C$(2),R$(3)
0045 LET Q9=10000
0050 DIM D$(9)
0055 LET M=0
0060 LET P=0
0065 PRINT "      BD NEEDLE PROGRAM"
0070 CALL 20,0,0
0075 LET M1=2000
0080 CALL 20,1,1
0085 LET V=0
0090 LET L=0
0095 LET V1=0
0100 PRINT "TURN ON ALL EQUIPMENT"
0105 REM *****READ IN DIRECTORY OF DATA TAPE*****
0110 OPEN FILE$(1,3),"DIRECT,1"
0115 CALL 20,1,1,1
0120 FOR I=0 TO 127
0125   READ FILE$(1),D$(I)
0130 NEXT I
0135 LET R=D$(I)+1
0140 CLOSE FILE$(1)
0145 LET E$(13)=0
0150 PRINT "<12>"
0175 PRINT "TAPE NO. "D$(I)" CONTAINS "D$(I)" TESTS WITH "D$(I)" BLMS LEFT"
0180 PRINT
0185 PRINT "NEXT BLOCK IS ",D$(I)+1
0190 PRINT
0195 IF L=0 THEN GOTO 0205
0200 GOTO 0325
0205 IF D$(I)>099 THEN GOTO 0215
0210 GOTO 0240
0215 PRINT "TAPE FULL, LOAD NEW TAPE"
0220 INPUT "TYPE E WHEN DONE",A$
0225 IF A$="E" THEN GOTO 0110
0230 GOTO 0220
0235 REM *****GET GENERAL INFORMATION ***
0240 INPUT "DATE: MONTH= ",E$(11), " DAY= ",E$(2)
0245 INPUT "CADAVER SPECIMEN? ",A$
0250 IF A$="Y" THEN GOTO 0300
0255 FOR I=3 TO 7
0260   LET E$(I)=0
0265 NEXT I
0270 LET S$(6)= " "
0275 LET E$(3)=0
0280 LET R$(3)= " "
0285 LET C$(2)= " "
0290 INPUT "TYPE OF SYNTHETIC? ",C$(2)
0295 GOTO 0325
0300 INPUT "CADAVER NO.= ",E$(3)
0305 INPUT "AGE(YRS)= ",E$(4), " SEX= ",S$(6), " RACE= ",R$(3)
0310 INPUT "HOURS SINCE DEATH= ",E$(5)
0315 INPUT "CAUSE OF DEATH= ",C$(2)
0320 INPUT "CADAVER WT(LBS)= ",E$(6), " HEIGHT(IN)= ",E$(7)
0325 LET E$(1)=E$(1)+1

```

PGO (continued)

```

0337 IF V=1 THEN GOTO 0345
0338 IF EC03=0 THEN GOTO 0345
0347 LET EC131=EC131+1
0348 PRINT "NEXT TEST NO. ="DC03" -"EC13" -"EC03" -"EC13" -"EC13" -"EC02
J
0357 LET V=0
0358 IF V1=1 THEN GOTO 0365
0367 REM ***GIVE FORCE AND DISPLACEMENT CALIBRATION PULSES***
0368 INPUT "FOR CALIBRATION PULSE TYPE C",AC
0373 IF AC="C" THEN GOTO 0385
0375 GOTO 0365
0383 PRINT "DISCONNECT FWDUCER AND CONNECT FORCE CALIB. SIG."
0385 INPUT "TYPE P WHEN READY",AC
0390 IF AC="P" THEN GOTO 0405
0395 GOTO 0385
0407 FOR J=1 TO 2
0425   FOR I=1 TO 500
0417     CALL 30
0415   NEXT I
0420   CALL 20,0,-205
0425 NEXT J
0437 LET X1=0
0435 CALL 21,5,X1
0447 FOR J=1 TO 2
0445   FOR I=1 TO 500
0457     CALL 31
0455   NEXT I
0460   CALL 20,0,0
0465 NEXT J
0473 LET Y1=0
0475 CALL 21,5,Y1
0480 LET F=Y1-X1
0485 CALL 30
0490 INPUT "FORCE DONE, RECONNECT FORCE INPUT",AC
0495 INPUT "TYPE R WHEN READY FOR DISPLACEMENT PULSE",AC
0507 IF AC="R" THEN GOTO 0515
0525 GOTO 0495
0510 IF V1<0 THEN GOTO 0525
0515 IF V1>0 THEN GOTO 0535
0527 IF V1=0 THEN GOTO 0547
0525 LET E=-17
0537 GOTO 0540
0535 LET E=10
0547 LET A=11
0545 CALL 20,1,A
0557 IF V1<0 THEN GOTO 0560
0555 IF V1>0 THEN GOTO 0575
0560 IF A>0 THEN GOTO 0585
0565 GOTO 0575
0570 IF A<0 THEN GOTO 0585
0575 LET A=A-E
0580 GOTO 0545
0585 LET A=7
0590 FOR J=1 TO 2
0595   FOR I=1 TO 500
0600     CALL 20,1,A
0605   NEXT I
0610   CALL 20,0,-400
0615 NEXT J
0627 CALL 21,17,X1
0625 CALL 20,1,A
0637 IF A<-1447 THEN GOTO 0645
0635 LET A=A-10
0640 GOTO 0625
0645 FOR J=1 TO 2
0650   FOR I=1 TO 500

```

PGO (continued)

```

6655 CALL 23,1,0A
6661 NEXT I
6665 CALL 23,0,0A
6670 NEXT J
6675 CALL 21,10,01
6680 LET N=Y1-N1
6685 IF N1>-1440 THEN GOTO 6730
6690 IF N1<-1440 THEN GOTO 6730
6695 IF N1=-1440 THEN GOTO 6740
6700 CALL 23,1,0A
6705 IF A=>N1 THEN GOTO 6740
6710 LET A=A+10
6715 GOTO 6730
6720 CALL 23,1,0A
6725 IF A<N1 THEN GOTO 6740
6730 LET A=A-10
6735 GOTO 6720
6740 LET A=N1
6745 CALL 23,1,0A
6750 PRINT "CALIBRATION DONE"
6755 REM ***GET NEEDLE INFORMATION***
6760 IF V1=1 THEN GOTO 1015
6765 IF L=0 THEN GOTO 6785
6770 INPUT "NEEDLE OR SPECIMEN CONDITIONS?",AS
6775 IF AS="Y" THEN GOTO 6785
6780 GOTO 6075
6785 INPUT "TYPE OF TEST= ",T10
6790 LET Y2=99
6795 IF T10="SKIN" THEN LET Y2=1
6800 IF T10="SMIS" THEN LET Y2=2
6805 IF T10="SMN" THEN LET Y2=3
6810 IF Y2=99 THEN GOTO 6785
6815 INPUT "NEEDLE TYPE= ",N10
6820 INPUT "LUBRICANT= ",L10
6825 LET Y3=99
6830 IF L10="DRY" THEN LET Y3=1
6835 IF L10="1249" THEN LET Y3=2
6840 IF L10="362" THEN LET Y3=3
6845 IF Y3=99 THEN GOTO 6815
6850 INPUT "SPECIMEN NO.= ",F10
6855 INPUT "SPECIMEN SITE= ",K10
6860 INPUT "SPECIMEN SITE CODE NO.= ",Y4
6865 PRINT
6870 PRINT "SITE CODE IS "Y4
6875 INPUT " IF OK TYPE Y ",AS
6880 IF AS="Y" THEN GOTO 6880
6885 GOTO 6050
6890 IF L=0 THEN GOTO 6900
6905 INPUT "NEW TEST CONDITIONS?",AS
6910 IF AS="Y" THEN GOTO 6900
6915 GOTO 6905
6920 INPUT "DESIRED DISPLACEMENT(IN)= ",E001
6925 INPUT "PENETRATION VELOCITY(IN/SEC)= ",E01
6930 IF E01>14 THEN GOTO 6935
6935 INPUT "RETRACTION VELOCITY(IN/SEC)= ",E101
6940 IF E101>14 THEN GOTO 6945
6945 INPUT "WELL TIME IN SECONDS= ",E111
6950 IF E111>12 THEN GOTO 6925
6955 LET E111=E111*1000
6960 PRINT
6965 PRINT "DISP= "E01" PV= "E01" RT= "E101" DT= "E111" MSEC"
6970 PRINT
6975 INPUT "IF CORRECT TYPE CR",AS
6980 IF AS="" THEN GOTO 6970
6985 GOTO 6900
6990 INPUT "PENETRATION ANGLE= ",P10

```

PGO (continued)

```

0971 LET Y9=99
0975 IF P13="90" THEN LET Y9=1
0980 IF P13="45" THEN LET Y9=2
0982 IF Y9=99 THEN GOTO 0970
0985 LET D1=1438.0
0990 LET D2=INT(E101*D1)
0995 REM ***GET READY FOR TEST***
1000 PRINT "MOUNT SPECIMEN IN POSITION"
1005 LET A=W1
1010 REM ***ADJUST NEEDLE POSITION TO SKIN SURFACE***
1015 IF L=1 THEN GOTO 1025
1020 GOTO 1040
1025 INPUT "NEW SKIN POSITION? ",AS
1030 IF AS="Y" THEN GOTO 1040
1035 GOTO 1160
1040 PRINT "POSITION NEEDLE AT SKIN SURFACE"
1045 INPUT "ADJUSTMENT INTERVAL= ",W
1050 INPUT "F,B,OR S",AS
1055 IF AS="F" THEN GOTO 1065
1060 IF AS="B" THEN GOTO 1075
1065 IF AS="S" THEN GOTO 1155
1070 GOTO 1050
1075 LET E=INT(W/10+.5)
1080 GOTO 1090
1085 LET E=-INT(W/10+.5)
1090 INPUT AS
1095 IF AS="" THEN GOTO 1110
1100 IF AS="S" THEN GOTO 1040
1105 GOTO 1090
1110 LET S9=ABS(E)
1115 FOR I=1 TO " STEP S9
1120 LET A=A+E
1125 IF A>2000 THEN GOTO 1040
1130 IF A<-2000 THEN GOTO 1040
1135 CALL 23,1,A
1140 NEXT I
1145 PRINT A;
1150 GOTO 1090
1155 LET G=0
1160 CALL 21,10,G
1165 LET A=INT(A)
1170 LET H=A
1175 LET K=0
1180 PRINT "SKIN CONTACT AT D/A= ",H
1185 IF V1=1 THEN GOTO 1250
1190 LET R=INT(H-D2)
1195 IF R<-2000 THEN GOTO 1210
1200 IF R>2000 THEN GOTO 1210
1205 GOTO 1225
1210 PRINT "CANNOT DO TEST"
1215 GOTO 2165
1220 REM ***GET START POSITION***
1225 PRINT "D/A= ",A
1230 PRINT "INCHES BACK FOR START POSITION "
1235 INPUT "MUST BE >=.8 ",K1
1240 IF K1*D1>1100 THEN GOTO 1250
1245 GOTO 1230
1250 LET K=INT(H+K1*D1)
1255 IF K>A THEN GOTO 1265
1260 IF K<A THEN GOTO 1275
1265 LET E=10
1270 GOTO 1280
1275 LET E=-10
1280 IF K>2000 THEN GOTO 1290
1285 GOTO 1310
1290 PRINT "TOO FAR"

```

PGO (continued)

```

1295 INPUT "REPOSITION SPECIMEN? ",A$
1300 IF A$="Y" THEN GOTO 2210
1305 GOTO 1230
1310 CALL 23,1,A
1315 IF B>0 THEN GOTO 1330
1320 IF A<K THEN GOTO 1345
1325 GOTO 1335
1330 IF A>K THEN GOTO 1345
1335 LET A=A+B
1340 GOTO 1310
1345 LET A=INT(K)
1350 CALL 23,1,A
1355 REM ***SET UP PARAMETERS FOR PENETRATION RUN***
1360 LET Q=A
1365 LET R6=INT((Q-R)/2)
1370 LET S=INT(.5+309.20/EC91-20.264)
1375 LET T=INT(EC111/10)
1380 LET U=INT(.5+309.07/EC101-20.264)
1385 LET R7=2*R6+T-1200
1390 IF (R7*4)<Q9 THEN GOTO 1400
1395 GOTO 2380
1400 PRINT "READY FOR TEST?"
1405 PRINT "L/A= ",A
1410 INPUT "TYPE 3 TO BEGIN PUNCTURE",A$
1415 IF A$="3" THEN GOTO 1435
1420 IF A$="A" THEN GOTO 1950
1425 GOTO 1410
1430 REM ***DO TEST***
1435 CALL 40,Q,R6,S,T,U,B$
1440 CALL 23,0,0
1445 INPUT "KEEPER? ",A$
1450 IF A$="Y" THEN GOTO 1470
1455 IF A$="N" THEN GOTO 1950
1460 GOTO 1445
1465 REM ***UPDATE DIRECTORY***
1470 LET DC3)=DC3)+1
1475 IF T1501,2)= "SK" THEN GOTO 1500
1480 IF T1501,2)= "SK" THEN GOTO 1515
1485 LET DC6)=DC6)+1
1490 LET X1=300
1495 GOTO 1525
1500 LET DC4)=DC4)+1
1505 LET X1=100
1510 GOTO 1525
1515 LET DC5)=DC5)+1
1520 LET X1=200
1525 LET N9=0
1530 REM ***WRITE DATA ON TAPE***
1535 PRINT "THERE ARE ",R7," SAMPLE POINTS ON EACH CHANNEL"
1540 LET N9=4
1545 LET N9=1
1550 LET P1=(Q-R)/2-600
1555 LET P2=INT(P1/N9)
1560 LET R1=(P1/N9-P2)*N9
1565 LET S5=N9
1570 LET P5=P1
1575 LET R5=R1+N9
1580 LET C7=R5
1585 IF N9=1 THEN GOTO 1595
1590 GOTO 1605
1595 LET R5=0
1600 GOTO 1610
1605 IF R5<3 THEN LET R5=R5+N9
1610 LET E9=INT((P5-R5)/N9)+1
1615 PRINT E9" PENETRATION POINTS WILL BE STORED FOR EACH VARIABLE"
1620 LET EC=INT(1000*1000*N9*(1/(720*EC91)))

```

PGO (continued)

```

1625 LET E8=E8/1000
1630 PRINT "THIS GIVES ABOUT "E8" MSEC BETWEEN PENET. PTS"
1635 OPEN FILE(1,11),"TEST,1"
1655 CALL 90,1,DC3,1
1660 WRITE FILE(11),V9
1665 FOR I=1 TO 13
1670   WRITE FILE(11),E(1)
1675 NEXT I
1680 WRITE FILE(11),H,G,K,F,W,DC3
1685 WRITE FILE(11),Q,R,S,T,U,N9,R6,R7,P1,R1,E9,E8,R5,C7
1690 WRITE FILE(11),S1S,R1S,C1S,T1S,N1S,L1S,P1S,K1S,F1S
1695 WRITE FILE(11),Y9,Y2,Y3,Y4
1700 CLOSE FILE(11)
1705 REM *****FIND NEXT AVAILABLE BLOCK*****
1710 LET F9=0
1715 LET D9=0
1720 LET B=0
1725 OPEN FILE(1,11),"DATA,1"
1730 CALL 91,1,B,1
1735 CALL 90,1,B,1
1740 LET E9=0
1745 LET F8=0
1750 LET D8=0
1755 FOR I=R5 TO P5 STEP S5
1760   FOR J=-2 TO 2
1765     CALL 41,B8,I+J,F8,D8
1770     LET F9=F9+(3-ABS(J))*F8
1775     LET D9=D9+(3-ABS(J))*D8
1780   NEXT J
1785   LET F9=F9/9
1790   LET D9=D9/9
1795   WRITE FILE(11),F9,D9
1800   LET F9=0
1805   LET D9=0
1810 NEXT I
1815 CLOSE FILE(11)
1820 OPEN FILE(1,31),"TEST,1"
1825 CALL 91,1,B,1
1830 CLOSE FILE(11)
1835 LET V=B-DC3
1840 LET DC2=DC2-V
1845 REM ***FINISH DIRECTORY CODE WORD***
1850 IF P18="99" THEN GOTO 1865
1855 LET Y1=00
1860 GOTO 1870
1865 LET Y1=10
1870 LET B1=INT(E(9))
1875 IF B1=>10 THEN GOTO 1885
1880 GOTO 1890
1885 LET B1=0
1890 LET I=DC1+9
1895 LET DC11=1000*DC3+X1+Y1+B1
1900 LET DC3=B-1
1905 REM ***WRITE NEW DIRECTORY ON TAPE***
1907 GOTO 1960
1910 OPEN FILE(1,11),"DIRECT,1"
1915 CALL 90,1,1,1
1920 FOR I=0 TO 127
1925   WRITE FILE(11),DC11
1930 NEXT I
1935 CLOSE FILE(11)
1937 STOP
1940 GOTO 1960
1945 REM ***NEW TEST - IF V=1 TEST NOT DONE OR DELETED***
1950 LET V=1
1955 LET DC11=DC11-1

```


PGO (continued)

```

1960 INPUT "REPEAT TEST? ",AS
1965 IF AS="Y" THEN GOTO 1990
1970 LET V1=0
1975 GOTO 1985
1980 LET V1=1
1985 CALL 30
1990 CALL 23,1,A
1995 LET A=A+10
2000 IF A=>2000 THEN GOTO 2010
2005 GOTO 1990
2010 LET A=2000
2015 LET V1=2000
2020 CALL 23,1,A
2025 PRINT "D/A= ",A
2030 PRINT "MOVE SPECIMEN"
2035 INPUT "TYPE R WHEN READY FOR NEXT TEST ",AS
2040 IF AS="R" THEN GOTO 2050
2045 GOTO 2035
2050 PRINT "NEW TEST"
2055 LET L=1
2060 REM ***CHECK IF TAPE FULL***
2065 IF B>300 THEN GOTO 2260
2070 IF V1=1 THEN GOTO 2080
2075 GOTO 2150
2080 INPUT "NEW PENET. VELOCITY? ",AS
2085 IF AS="Y" THEN GOTO 2095
2090 GOTO 2100
2095 INPUT "NEW VELOCITY= ",E(9)
2100 IF E(9)>14 THEN GOTO 2095
2105 PRINT
2110 PRINT "PENETRATION VELOCITY= "E(9)" INCHES/SEC"
2115 INPUT "IF OK TYPE CR ",AS
2120 IF AS="" THEN GOTO 2130
2125 GOTO 2080
2130 INPUT "NEW LUBRICANT? ",AS
2135 IF AS="Y" THEN GOTO 2145
2140 GOTO 2150
2145 LET L10=""
2150 INPUT "LUBRICANT= ",L10
2151 LET Y0=99
2152 IF L10="DRY" THEN LET Y0=1
2153 IF L10="1249" THEN LET Y0=2
2154 IF L10="360" THEN LET Y0=3
2155 IF Y0=99 THEN GOTO 2150
2156 GOTO 2150
2160 REM ***CANNOT DO TEST - NEW DISP. OR POSITION***
2165 PRINT "NEW DISPLACEMENT OR REPOSITION SPECIMEN"
2170 INPUT "TYPE D OR R ",AS
2175 IF AS="D" THEN GOTO 2195
2180 IF AS="R" THEN GOTO 2215
2185 GOTO 2170
2190 REM ***NEW DISPLACEMENT***
2195 INPUT "DISPLACEMENT(IN)= ",E(8)
2200 LET D2=E(8)*E1
2205 GOTO 1190
2210 REM ***MOVE SPECIMEN***
2215 CALL 23,1,A
2220 IF A=>2000 THEN GOTO 2235
2225 LET A=A+10
2230 GOTO 2215
2235 LET A=2000
2240 CALL 23,1,A
2245 PRINT "REPOSITION SPECIMEN"
2250 INPUT "TYPE R WHEN READY",AS
2255 LET A=2000
2260 LET V1=2000

```

PGO (continued)

```

2265 IF AS="R" THEN GOTO 1040
2270 GOTO 2250
2275 REM ***LOAD NEW DATA TAPE***
2280 PRINT "LOAD NEW DATA TAPE ON UNIT 1"
2285 INPUT "TYPE D WHEN DONE",AS
2290 IF AS="D" THEN GOTO 2300
2295 GOTO 2265
2300 OPEN FILE(1,3),"DIRECT,1"
2305 CALL 90,1,1,1
2310 FOR I=2 TO 127
2315 READ FILE(I),D(I)
2320 NEXT I
2325 CLOSE FILE(1)
2330 IF D(1)>360 THEN GOTO 2280
2335 IF L=0 THEN GOTO 3150
2340 GOTO 2070
2345 CALL 20,1,A
2350 IF A<0 THEN GOTO 2365
2355 LET A=A-10
2360 GOTO 2345
2365 LET A=INT(0)
2370 CALL 20,1,A
2375 GOTO 1190
2380 REM *****TOO MANY POINTS *****
2385 PRINT "TOO MANY POINTS"
2390 PRINT
2395 INPUT "TYPE D,T, OR P FOR NEW DEPTH, DWELL, OR START POSITION",AS
2400 IF AS="D" THEN GOTO 2195
2405 IF AS="T" THEN GOTO 2420
2410 IF AS="P" THEN GOTO 1230
2415 GOTO 2395
2420 INPUT "NEW DWELL TIME IN SECONDS= ",E(11)
2425 IF E(11)>10 THEN GOTO 2420
2430 LET E(11)=E(11)*1000
2435 GOTO 1375

```

*

"PGET"

A BASIC program written to retrieve digitized force and displacement data and output on D/A channels 0 and 1 for chart recorder or oscilloscope display.

"PGET"

```

0005 PEM *****NEEDLE DATA*****
0010 PEM *****PROGRAM TO RETRIEVE NEEDLE PENETRATION DATA*****
0015 LET Q9=2000
0020 DIM F0(9),P(9)
0025 DIM A(1),D(127),E(1),S1(6),S1(6),C1(20),T1(4)
0030 DIM N1(10),L1(10),S2(2),S3(16),P1(2)
0035 PRINT "DATA SHOULD BE ON TAPE UNIT 1"
0040 PRINT
0045 PRINT "TYPE D FOR DIRECTORY LISTING"
0050 PRINT "TYPE R TO RETRIEVE DATA"
0055 LET K9=0
0060 INPUT " D OR R? ",AS
0065 IF AS="D" THEN GOTO 0085
0070 IF AS="R" THEN GOTO 0225
0075 GOTO 0060
0080 PEM *****LIST DIRECTORY*****
0085 LET K=0
0090 OPEN FILE(1,31,"DIRECT,1"
0095 CALL 90,1,1,1
0100 FOR I=0 TO 127
0105 READ FILE(1),D(I)
0110 NEXT I
0115 CLOSE FILE(1)
0120 IF K=1 THEN GOTO 0270
0125 PRINT "TAPE NO. "D(1)" CONTAINS "D(1)" TESTS WITH "D(2)" BLKS LEFT"
0130 PRINT "LAST BLOCK USED WAS "D(3)
0135 PRINT " BREAKDOWN OF TESTS"
0140 PRINT " NO. OF SKIN TESTS = "D(4)
0145 PRINT " NO. OF SKIN/MUSCLE TESTS= "D(5)
0150 PRINT " NO. OF SYNTHETIC TESTS = "D(6)
0155 PRINT "THE FOLLOWING LIST GIVES THE CODE WORD FOR INDIVIDUAL TESTS"
0160 PRINT "CODE IS 6 DIGIT NUMBER - BBBXYZ"
0165 PRINT " WHERE: BBB=BLK NO. FOR TEST INFO."
0170 PRINT " X=TYPE OF TEST(1=SKIN,2=S/M,3=SYN.)"
0175 PRINT " Y=ANGLE OF PENET.(1=90DEG,2=45DEG)"
0180 PRINT " Z=VELOCITY OF PENET.(INT(IN/SEC.))"
0185 LET C1=INT(D(1)/5+1)
0190 PRINT
0195 PRINT
0200 FOR I=1 TO C1
0205 LET J=I+9
0210 PRINT I-"D(J),I+C1"- "D(J+C1),I+2*C1"- "D(J+2*C1),I+3*C1"- "D(J+3*
11,I+4*C1"- "D(J+4*C1)
0215 NEXT I
0220 GOTO 0045
0225 PEM
0230 PEM *****RETRIEVE DATA*****
0235 INPUT "DISPLAY POINTS? ",AS
0240 IF AS="Y" THEN GOTO 0250
0245 GOTO 0255
0250 LET K9=1
0255 LET K=1
0260 LET Q6=0
0265 GOTO 0090
0270 INPUT "COMPLETE LIST? ",AS
0275 IF AS="Y" THEN GOTO 0530
0280 LET L=0
0285 INPUT "WHICH TEST NO.? ",T1
0290 IF T1=0 THEN GOTO 0620
0295 LET T1=INT(T1)
0300 LET E1=D(T1+9)
0305 IF E1=0 THEN GOTO 0660
0310 LET E1=INT(E1/1700)

```

"PGET" (continued)

```

0315 OPEN FILEC1,31,"TEST,1"
0320 CALL 90,1,E1,1
0325 READ FILEC11,K9
0330 FOR I=1 TO 13
0335 READ FILEC11,E011
0340 NEXT I
0345 READ FILEC11,H1,31,K1,F1,N1,N1
0350 READ FILEC11,01,R1,S1,T2,V1,N9,R6,P7,B6,P2,E9,E8,P5,C7
0355 READ FILEC11,S1S,R1S,C1S,T1S,N1S,L1S,P1S,S3S,S2S
0360 CLOSE FILEC11
0365 PRINT "TEST NO. "T1" AT BLK NO. "E1" ON TAPE "C001
0370 PRINT "CONTAINS DATA FROM:"
0375 LET P1=77
0380 LET G7=INT((B6-P5)/N9)+1
0385 IF E031=0 THEN GOTO 0435
0390 PRINT " CAUSAVER NO. "E031" TAKEN ON "E011"/"E021"/"P1
0395 PRINT " CAUSAVER DATA"
0400 PRINT " -----"
0405 PRINT " AGE= "E041" SEX= "S1S" RACE= "P1S
0410 PRINT " WT.= "E061" LBS HT= "E071" INCHES"
0415 PRINT " DATA TAKEN "E051" HOURS AFTER DEATH"
0420 PRINT " CAUSE OF DEATH - "C1S
0425 PRINT
0430 GOTO 0450
0435 PRINT "SYNTHETIC TEST USING "C1S
0440 PRINT
0445 PRINT
0450 PRINT " TEST INFORMATION"
0455 PRINT " -----"
0460 PRINT " TYPE OF TEST= ",T1S
0465 PRINT " NEEDLE TYPE - ",N1S
0470 PRINT " LUBRICANT = ",L1S
0475 PRINT " SPECIMEN NO.= ",S2S
0480 PRINT " SPECIMEN SIZE= ",S3S
0485 PRINT
0490 PRINT " PENETRATION VELOCITY= "E091" INCHES/SEC."
0495 PRINT " PENETRATION DISTANCE= "E061" INCHES"
0500 PRINT " RETRACTION VELOCITY = "E0101" INCHES/SEC."
0505 PRINT " EVELL TIME = "E0111" MSEC"
0510 PRINT " PENETRATION ANGLE = "P1S" DEGREES TO SURFACE"
0515 IF K9=1 THEN GOTO 0695
0520 IF L=0 THEN GOTO 0285
0525 GOTO 0570
0530 REM
0535 REM *****COMPLETE LISTING*****
0540 INPUT "CONTINUOUS? ",AS
0545 IF AS="Y" THEN LET Q6=2
0550 INPUT "STARTING AT TEST NO.= ",T1
0555 IF T1>D011 THEN GOTO 0540
0560 LET L=1
0565 GOTO 0295
0570 LET T1=T1+1
0575 IF T1>D011 THEN GOTO 0670
0580 IF Q6=2 THEN GOTO 0590
0585 GOTO 0610
0590 FOR I=1 TO 6
0595 PRINT
0600 NEXT I
0605 GOTO 0560
0610 INPUT AS
0615 GOTO 0560
0620 REM
0625 REM *****LOAD NEW DATA TAPE*****
0630 PRINT " LOAD NEW DATA TAPE IF DESIRED"
0635 PRINT " MAKE SURE TAPE IS TENSIONED"
0640 INPUT "TYPE R WHEN READY",AS

```

"PGET" (continued)

```
0645 IF AS="F" THEN GOTO 0655
0650 GOTO 0640
0655 GOTO 0040
0660 PRINT " NO SUCH TEST"
0665 GOTO 0285
0670 INPUT AS
0675 PRINT
0680 PRINT
0685 PRINT "      DONE"
0690 GOTO 0045
0695 REM *** GET DATA POINTS ***
0700 OPEN FILE(1,3),"DATA,1"
0705 LET B=0
0710 CALL 91,1,3,1
0715 CALL 90,1,3,1
0720 PRINT "THERE ARE "E9" PENETRATION POINTS IN THE ARRAY"
0722 PRINT "WITH "E2" MSEC BETWEEN POINTS"
0725 FOR I=1 TO E9
0730   READ FILE(1),FC(1),PC(1)
0735 NEXT I
0740 CLOSE FILE(1)
0745 REM
1110 INPUT "TYPE IN PAPER SPEED? ",S8
1115 LET E1=(100*E8)/S8
1120 PRINT "FOR A PAPER SPEED OF "S8" THERE WILL BE "E1
1125 PRINT "MSEC OF REAL TIME PER MM OF PAPER"
1130 LET E2=(E1/1000)/EC(9)
1135 PRINT "THIS CORRESPONDS TO "E2" INCHES OF PENETRATION PER MM OF PAP
E2"
1140 CALL 23,1,PC(1)
1145 CALL 23,0,FC(1)
1150 PRINT "TURN ON CHART RECORDER"
1155 INPUT "HIT CR WHEN READY",AS
1160 IF AS="" THEN GOTO 1177
1165 GOTO 1155
1170 FOR I=1 TO E9
1205   LET K=2*I
1210   CALL 23,1,PC(1)
1215   CALL 23,0,FC(1)
1220 NEXT I
1300 CALL 23,1,PC(1)
1305 CALL 23,0,FC(1)
1340 INPUT "AGAIN? ",AS
1345 IF AS="Y" THEN GOTO 1110
1350 GOTO 0520
```

*

"BDED"

A BASIC program written to retrieve force and displacement data points, compute force-displacement and work values, and printout results on the teletype.

"BDED" (continued)

```

LIST
0005 REM *****NEEDLE DATA*****
0010 REM *****PROGRAM TO RETRIEVE NEEDLE PENETRATION DATA*****
0015 REM *****THIS PROGRAM RETRIEVES PENETRATION POINT DATA"
0020 REM *****ONLY AND COMPUTES VALUES FOR FORCE BUILD UP(1)
0025 REM *****PEAK FORCE(2), END OF PEAK(3), AND 1" POINT(4)"
0030 REM *****IT ALSO COMPUTES VARIOUS VALUES OF WORK"
0035 LET Q9=1000
0037 DIM S9$(100)
0040 DIM F(99),P(99)
0045 DIM A$(11),D(127),E(10),S(6),R(6),C(20),T(4)
0050 DIM M(10),L(10),S(2),S(16),P(2)
0055 PRINT "DATA SHOULD BE ON TAPE UNIT 1"
0060 PRINT
0065 PRINT "TYPE D FOR DIRECTORY LISTING"
0070 PRINT "TYPE R TO RETRIEVE DATA"
0075 LET K9=0
0080 INPUT " D OR R? ",A$
0085 IF A$="D" THEN GOTO 0105
0090 IF A$="R" THEN GOTO 0245
0095 GOTO 0020
0100 REM *****LIST DIRECTORY*****
0105 LET K=0
0110 OPEN FILE(1,0),"DIRECT,1"
0115 CALL 90,1,1,1
0120 FOR I=0 TO 127
0125 READ FILE(1),D(I)
0130 NEXT I
0135 CLOSE FILE(1)
0140 IF K=1 THEN GOTO 0290
0145 PRINT "TAPE NO. "D(0)" CONTAINS "D(1)" TESTS WITH "D(2)" BLKS LEFT"
0150 PRINT "LAST BLOCK USED WAS "D(3)
0155 PRINT " BREAKDOWN OF TESTS"
0160 PRINT " NO. OF SKIN TESTS = "D(4)
0165 PRINT " NO. OF SKIN/MUSCLE TESTS= "D(5)
0170 PRINT " NO. OF SYNTHETIC TESTS = "D(6)
0175 PRINT "THE FOLLOWING LIST GIVES THE CODE WORD FOR INDIVIDUAL TESTS"
0180 PRINT "CODE IS 6 DIGIT NUMBER - BBBXYE"
0185 PRINT " WHERE: BBB=BLK NO. FOR TEST INFO."
0190 PRINT " X=TYPE OF TEST(1=SKIN,2=S/M,3=SYN.)"
0195 PRINT " Y=ANGLE OF PENET.(1=90 DEG,2=45 DEG)"
0200 PRINT " E=VELOCITY OF PENET.(IN/IN/SEC.)"
0205 LET C1=INT(D(1)/5+1)
0210 PRINT
0215 PRINT
0220 FOR I=1 TO C1
0225 LET J=1+9
0230 PRINT I;"-E(J),I+C1"-D(J+C1),I+2*C1"-D(J+2*C1),I+3*C1"-D(J+3*C1),I+4*C1"-D(J+4*C1)
0235 NEXT I
0240 GOTO 0265
0245 REM *****RETRIEVE DATA*****
0250 INPUT "CALCULATE POINTS? ",A$
0255 IF A$="Y" THEN GOTO 0270
0265 GOTO 0275
0270 LET K9=1
0275 LET K=1
0280 LET Q6=0
0285 GOTO 0110
0290 INPUT "COMPLETE LIST? ",A$
0295 IF A$="Y" THEN GOTO 0415

```


"BDED" (continued)

```

0390 LET L=7
0395 INPUT "WHICH TEST NO.? ",T1
0397 IF T1=0 THEN GOTO 0485
0398 LET T1=INT(T1)
0399 LET E1=D0T1+91
0400 IF E1=0 THEN GOTO 0525
0401 LET E1=INT(E1/1000)
0402 OPEN FILE(1,3),"TEST,1"
0403 CALL 90,1,E1,1
0404 READ FILE(1),V9
0405 FOR I=1 TO 13
0406   READ FILE(1),E011
0407 NEXT I
0408 READ FILE(1),H1,G1,X1,F9,M1,N1
0409 READ FILE(1),Q1,R1,S1,T2,V1,W9,R6,E7,B6,R2,E9,E8,R5,C7
0410 READ FILE(1),S1S,R1S,C1S,T1S,W1S,L1S,P1S,S3S,S2S
0411 READ FILE(1),Y9,Y2,Y3,Y4
0412 CLOSE FILE(1)
0413 IF Y9=99 THEN GOTO 0391
0414 IF Y2=99 THEN GOTO 0391
0415 IF Y3=99 THEN GOTO 0391
0416 IF Y4=99 THEN GOTO 0391
0417 GOTO 0394
0391 PRINT D0T1;"-T1" NOT A VALID TEST"
0393 GOTO 0405
0394 LET P1=77
0395 LET Q7=INT((B6-R5)/W9)+1
0400 IF W9=1 THEN GOTO 0560
0405 IF L=0 THEN GOTO 0395
0410 GOTO 0455
0415 REM
0420 REM *****COMPLETE LISTING*****
0425 INPUT "CONTINUOUS? ",AS
0430 IF AS="Y" THEN LET Q6=2
0435 INPUT "STARTING AT TEST NO.= ",T1
0440 IF T1>D011 THEN GOTO 0425
0445 LET L=1
0450 GOTO 0395
0455 LET T1=T1+1
0460 IF T1>D011 THEN GOTO 0535
0465 IF Q6=2 THEN GOTO 0445
0470 GOTO 0475
0475 INPUT AS
0480 GOTO 0445
0495 REM
0490 REM *****LOAD NEW DATA TAPE*****
0495 PRINT "  LOAD NEW DATA TAPE IF DESIRED"
0500 PRINT "  MAKE SURE TAPE IS TENSIONED"
0505 INPUT "TYPE R WHEN READY",AS
0510 IF AS="R" THEN GOTO 0520
0515 GOTO 0505
0520 GOTO 0560
0525 PRINT " NO SUCH TEST"
0530 GOTO 0395
0535 INPUT AS
0540 PRINT
0545 PRINT
0550 PRINT "      DONE"
0555 GOTO 0265
0560 REM *** GET DATA POINTS ***
0565 OPEN FILE(1,3),"DATA,1"
0570 LET B=3
0575 CALL 91,1,B,1
0580 CALL 90,1,D,1
0585 LET E9=37
0590 FOR I=1 TO E9

```

"BDED" (continued)

```

0595 READ FILE(1),F(1),P(1)
0600 NEXT I
0605 CLOSE FILE(1)
0610 REM
0615 LET M1=1272
0620 LET F9=112
0625 REM *** GET AVG. FORCE BEFORE PEN.***
0630 LET F1=0
0635 FOR I=2 TO 21
0640 LET F1=F1+F(I)
0645 NEXT I
0650 LET F1=F1/20
0655 REM ***SEARCH FOR MAXIMUM FORCE IN 1ST 300 PTS***
0660 LET K8=.0254
0665 LET K7=.23*9.8
0666 LET F3=0
0667 FOR I=2 TO INT(.8*E9)
0668 IF F(1)>F3 THEN LET F3=F(1)
0669 NEXT I
0670 LET F2=0
0675 LET P2=0
0680 FOR I=2 TO E9
0685 IF F(1)>F2 THEN GOTO 0705
0700 GOTO 0730
0705 FOR J=1 TO 30
0710 IF F(1)>ABS(F(1)+J) THEN GOTO 0720
0715 GOTO 0730
0720 NEXT J
0722 IF (F(1)-F1)<.5*(F3-F1) THEN GOTO 0730
0725 GOTO 0735
0730 NEXT I
0731 PRINT D(0) "- "T1" MAX. POINT NOT FOUND"
0732 GOTO 0405
0735 LET F2=F(1)
0740 LET P2=1
0745 LET D2=P(P2)
0750 LET S1=(F2-F1)*.05
0755 REM *** FIND P1 AND D1 -- FORCE BUILDUP POINTS***
0760 FOR J=P2 TO 1 STEP -1
0765 IF F(J)<S1 THEN GOTO 0785
0770 NEXT J
0775 PRINT D(0) "- "T1" FIRST POINT NOT FOUND"
0780 GOTO 0405
0785 LET P1=J
0790 LET D1=P(J)
0795 REM ***COMPUTE PEAK FORCE VALUE***
0800 LET F3=F2
0805 LET F2=((F2-F1)/F9)*K7
0810 REM ***COMPUTE PENETRATION DISTANCE AT PEAK FORCE***
0815 LET D2=((D1-D2)/M1)*K8
0820 REM ***COMPUTE PENETRATION TIME***
0825 LET T2=(P2-P1)*E8
0830 REM ***COMPUTE PENETRATION WORK***
0835 LET W1=0
0840 LET S2=D2/(P2-P1)
0845 FOR I=P1 TO P2
0850 LET W1=W1+F(I)-F1
0855 NEXT I
0860 LET W1=(W1*S2*K7)/F9
0865 REM ***FIND P4 AT ONE INCH PENETRATION***
0870 LET D4=D1-W1
0875 FOR I=P2 TO E9
0880 IF P(1)<D4 THEN GOTO 0900
0885 NEXT I
0890 PRINT D(0) "- "T1" ONE INCH PEN. NOT REACHED"
0895 GOTO 0405

```

"BDED" (continued)

```

0920 LET F4=((F011-F1)/F9)*K7
0925 LET P4=I
0930 LET D4=(D1-P011)*K8/M1
0935 LET T4=(P4-P1)*E8
0940 REM ***FIND MINIMUM FORCE BETWEEN P2 AND P4***
0945 LET S4=(F(P2+101-F0P2+2Z1))/10
0950 FOR I=P2+10 TO P4
0955 IF (F011-F01+101)=S4 THEN GOTO 0945
0960 NEXT I
0965 PRINT D001"-T1" POINT 3 NOT FOUND"
0970 GOTO 0405
0975 LET P3=I+5
0980 LET F3=(F01+51-F1)*K7/F9
0985 LET D3=(D1-P0P3)*K8/M1
0990 LET T3=(P3-P1)*E8
0995 REM***FIND AVG. DISTANCE BETWEEN PTS P2 AND P4***
1000 LET D5=(D4-D2)/(P4-P2)
1005 REM ***FIND DRAG WORK***
1010 LET W2=0
1015 FOR I=P2 TO P4
1020 LET W2=W2+F011-F1
1025 NEXT I
1030 LET W2=W2*D5*K7/F9
1035 REM ***FIND WORK BETWEEN P2 AND P3***
1040 LET W3=0
1045 FOR I=P2 TO P3
1050 LET W3=W3+F011-F1
1055 NEXT I
1060 LET W3=W3*D5*K7/F9
1065 REM ***TOTAL WORK***
1070 LET W9=W1+W2
1075 REM ***WORK FROM 3 TO 4***
1080 LET W5=W2-W3
1085 LET W6=W2-W3
1090 LET X2=INT((F2/F2)*100)/100
1095 LET X3=INT((F4/F3)*100)/100
1100 LET X4=INT((D2/D4)*100)/100
1105 LET X5=INT((D3/D4)*100)/100
1110 LET E8=INT((F4/F2)*100)/100
1115 LET F2=INT(F2*100)/100
1120 LET F3=INT(F3*100)/100
1125 LET F4=INT(F4*100)/100
1130 LET D9=100000
1135 LET D2=(INT(D2*D9))/1000
1140 LET D3=(INT(D3*D9))/1000
1145 LET D4=(INT(D4*D9))/1000
1150 LET T2=INT(T2)
1155 LET T3=INT(T3)
1160 LET J9=INT(W9*D9)/100
1165 LET T4=INT(T4)
1170 LET J1=INT(W1*D9)/100
1175 LET J2=INT(W2*D9)/100
1180 LET J3=INT(W3*D9)/100
1185 LET J5=INT(W5*D9)/100
1190 REM ***PRINT OUT RESULTS***
1195 LET S90="###:## ## ## ##.# ### ##.### ##.## ##.## ##.## ##.##"
1200 PRINT USING S90, D001, T1, Y2, Y3, E091, P2, F2, P3, F3, F4, D2, D3
1205 GOTO 0405
1210 FOR I=1 TO 09
1215 PRINT I, F011, P011
1220 NEXT I
1225 STOP

```

"WCAL"

A BASIC program written to compute values of force, displacement, force ratios, displacement ratios, and penetration work values from digitized force and displacement data.

"WCAL"

```

LIST
0005 REM *****NEEDLE DATA*****
0017 REM *****PROGRAM TO RETRIEVE NEEDLE PENETRATION DATA*****
0018 REM *****AND WRITE RESULTS ON CHANNEL C TAPE*****
0020 REM *****THIS PROGRAM RETRIEVES PENETRATION POINT DATA"
0025 REM *****ONLY AND COMPUTES VALUES FOR FORCE BUILD UP(1)
0030 REM *****PEAK FORCE(2), END OF PEAK(3), AND 1" POINT(4)"
0035 REM *****IT ALSO COMPUTES VARIOUS VALUES OF WORK"
0047 DIM F(500),P(500),S(500)
0048 DIM B(120),H(127)
0057 DIM AB(1),E(127),I(13),S(6),P(6),C(27),T(4)
0058 DIM N(10),L(10),S(2),S(16),P(2)
0060 PRINT "<10>"
0065 PRINT "REMOVE PROGRAM TAPE AND PUT RESULT TAPE ON CH.0"
0070 PRINT "DATA SHOULD BE ON TAPE UNIT 1"
0075 INPUT A$
0087 INPUT "IS PROGRAM TAPE REMOVED FROM CH.0",A$
0090 IF A$="Y" THEN GOTO 0095
0097 GOTO 0060
0095 PRINT "<10>"
0100 LET K=0
0105 INPUT "D OR P? ",A$
0110 IF A$="D" THEN GOTO 0130
0115 IF A$="P" THEN GOTO 0270
0120 GOTO 0105
0125 REM *****LIST DIRECTORY*****
0130 LET K=0
0135 OPEN FILE(1,3),"DIRECT,1"
0140 CALL 90,1,1
0145 FOR I=0 TO 127
0150 READ FILE(1),B(I)
0155 NEXT I
0160 CLOSE FILE(1)
0165 IF K=1 THEN GOTO 0290
0170 PRINT "TAPE NO. "D(3) " CONTAINS "D(2) " BLKS LEFT"
0175 PRINT "LAST BLOCK USED WAS "D(3)
0180 PRINT " BREAKDOWN OF TESTS"
0185 PRINT " NO. OF SKIN TESTS = "D(4)
0190 PRINT " NO. OF SKIN/MUSCLE TESTS= "D(5)
0195 PRINT " NO. OF SYNTHETIC TESTS = "D(6)
0200 PRINT "THE FOLLOWING LIST GIVES THE CODE WORD FOR INDIVIDUAL TESTS"
0205 PRINT "CODE IS 6 DIGIT NUMBER - EBNXVE"
0210 PRINT " WHERE: B=BK NO. FOR TEST INFO."
0215 PRINT " X=TYPE OF TEST(1=SKIN,2=S/M,3=SYN.)"
0220 PRINT " Y=ANGLE OF PENET.(1=90DEG,2=45DEG)"
0225 PRINT " E=VELOCITY OF PENET.(INT(IN/SEC.))"
0230 LET C1=INT(D(1)/5+1)
0235 PRINT
0240 PRINT
0245 FOR I=1 TO C1
0250 LET J=I+9
0255 PRINT I="[[J],I+C1"-"[[J+C1],I+2*C1"-"[[J+2*C1],I+3*C1"-"[[J+3*
C1],I+4*C1"-"[[J+4*C1]
0260 NEXT I
0265 GOTO 0105
0270 REM
0275 REM *****RETRIEVE DATA*****
0280 LET K=1
0285 GOTO 0135
0290 PRINT " DATA TAPE IS NO. ",D(3)
0295 OPEN FILE(3,3),"DIRECT,1"
0300 CALL 90,1,1
0305 FOR I=0 TO 99

```

WCAL (continued)

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8318 READ FILE(0),B(1)
8319 NEXT I
8320 CLOSE FILE(0)
8325 PRINT "THERE ARE "B(1)" TEST RESULTS ON TAPE "B(0)
8327 PRINT "LAST BLOCK USED WAS "B(2)
8335 IF B(3)=0 THEN GOTO 8375
8340 OPEN FILE(0,3),"DATA,Z"
8345 CALL 90,0,B(2),0
8350 FOR I=0 TO 127
8355 READ FILE(0),H(1)
8360 NEXT I
8365 LET B(2)=B(2)+1
8370 CLOSE FILE(0)
8375 INPUT "COMPLETE LIST? ",A0
8380 IF A0="Y" THEN GOTO 8510
8385 LET L=0
8390 INPUT "WHICH TEST NO.? ",T1
8395 IF T1=0 THEN GOTO 8420
8400 LET T1=INT(T1)
8405 LET E1=DOT1+91
8410 IF E1=0 THEN GOTO 8610
8415 LET E1=INT(E1/1000)
8420 OPEN FILE(1,3),"TEST,1"
8425 CALL 90,1,E1,1
8430 READ FILE(1),F2
8435 FOR I=1 TO 13
8440 READ FILE(1),B(1)
8445 NEXT I
8450 READ FILE(1),H1,S1,K1,F9,M1,N1
8455 READ FILE(1),Q1,R1,S1,T9,V1,N9,R6,F7,B6,R2,E9,E8,R5,C7
8460 READ FILE(1),S10,R10,C10,T10,N10,L10,P10,S35,S25
8465 READ FILE(1),Y1,Y2,Y3,Y4
8470 CLOSE FILE(1)
8475 IF Y2=99 THEN GOTO 1755
8480 IF Y3=99 THEN GOTO 1755
8485 IF Y4=99 THEN GOTO 1755
8490 IF Y1=99 THEN GOTO 1755
8495 LET P1=77
1500 LET B7=INT((B6-R5)/N9)+1
8505 GOTO 8710
8510 REM
8515 REM *****CONTINUOUS LISTING?*****
8520 INPUT "STARTING AT TEST NO. =",T1
8521 INPUT "ENDING WITH TEST NO. =",T6
8525 IF T1>D(1) THEN GOTO 8520
8530 LET L=1
8535 GOTO 8420
8540 LET T1=T1+1
8545 IF T1>D(1) THEN GOTO 8620
8546 IF T1>T6 THEN GOTO 8620
8550 GOTO 8420
8555 OPEN FILE(1,3),"NTAPE,1"
8560 CALL 90,1,1,1
8565 READ FILE(1),B0
8570 CLOSE FILE(1)
8575 REM *****LOAD NEW DATA TAPE*****
8576 FOR I=1 TO 10
8577 PRINT "<7>"
8578 NEXT I
8580 PRINT " LOAD NEW DATA TAPE IF DESIRED"
8585 PRINT " MAKE SURE TAPE IS TENSIONED"
8590 INPUT "TYPE 0 WHEN READY",A0
8595 IF A0="0" THEN GOTO 8635
8600 GOTO 8590
8605 GOTO 8100
8610 PRINT " NO SUCH TEST"

```

WCAL (continued)

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6615 GOTO 7397
6620 PRINT "DONE WITH TAPE "E031
6635 IF L=3 THEN GOTO 6645
6640 LET B(4)=B(4)+1
6645 LET S6=B(4)+4
6650 LET B(S6)=D(0)
6655 IF D(3)=0 THEN GOTO 6660
6660 LET S9=4
6665 GOTO 1695
6670 LET S8=0
6675 OPEN FILE(0,1),"DIRECT.0"
6680 CALL 97,3,1,7
6685 FOR I=0 TO 99
6690   WRITE FILE(0,1),B(I)
6695 NEXT I
6700 CLOSE FILE(0)
6705 GOTO 6555
6710 REM
6715 REM
6720 REM *** GET DATA POINTS ***
6725 OPEN FILE(1,3),"DATA.1"
6730 LET B1=0
6735 CALL 91,1,B1,1
6740 CALL 97,1,B1,1
6745 LET E9=37
6750 FOR I=1 TO E9
6755   READ FILE(1),F(1),P(1)
6760 NEXT I
6765 CLOSE FILE(1)
6770 FOR I=3 TO E9-3
6775   LET F2=0
6780   FOR J=-2 TO 2
6785     LET F2=F2+(3-ABS(J))*F(1-J)
6790   NEXT J
6795   LET B(1)=F2/9
6800 NEXT I
6805 FOR I=3 TO E9-3
6810   LET F(1)=B(1)
6815 NEXT I
6820 FOR I=3 TO E9-3
6825   LET F2=0
6830   FOR J=-2 TO 2
6835     LET F2=F2+(3-ABS(J))*P(1-J)
6840   NEXT J
6845   LET B(1)=F2/9
6850 NEXT I
6855 FOR I=3 TO E9-3
6860   LET P(1)=B(1)
6865 NEXT I
6870 LET M1=1272
6875 LET F9=110
6880 REM *** GET AVG. FORCE BEFORE PEN.***
6885 LET E9=E9-3
6890 LET F1=0
6895 FOR I=0 TO 22
6900   LET F1=F1+F(1)
6905 NEXT I
6910 LET F1=F1/23
6915 REM ***SEARCH FOR MAXIMUM FORCE IN 1ST 300 PTS***
6920 LET K6=.0254
6925 LET K7=.23*9.8
6930 LET F3=0
6935 FOR I=0 TO INT(.8*E9)
6940   IF F(1)>F3 THEN LET F3=F(1)
6945 NEXT I
6950 LET F3=0

```

WCAL (continued)

```

0945 LET P2=0
0950 FOR I=2 TO E9
0955 IF F(I)>F2 THEN GOTO 0965
0960 GOTO 0995
0965 FOR J=1 TO 30
0970 IF F(I)>ABS(F(I)+J) THEN GOTO 0980
0975 GOTO 0995
0980 NEXT J
0985 IF (F(I)-F1)<.5*(F3-F1) THEN GOTO 0995
0990 GOTO 1015
0995 NEXT I
1000 PRINT D(I) "-" T1" MAX. PT NOT FOUND"
1005 IF L=0 THEN GOTO 0390
1010 GOTO 0540
1015 LET F2=F(I)
1020 LET P2=I
1025 LET D2=P(P2)
1030 LET S1=.05*(F2-F1)
1035 REM *** FIND P1 AND D1 -- FORCE BUILDUP POINTS***
1040 FOR J=P2 TO 1 STEP -1
1045 IF F(J)=<S1 THEN GOTO 1070
1050 NEXT J
1055 PRINT D(J) "-" T1" FIRST POINT NOT FOUND"
1060 IF L=0 THEN GOTO 0390
1065 GOTO 0540
1070 LET P1=J
1075 LET D1=P(J)
1080 REM *** COMPUTE PEAK FORCE VALUE***
1085 LET F3=F2
1090 LET F2=((F2-F1)/F9)*K7
1095 REM *** COMPUTE PENETRATION DISTANCE AT PEAK FORCE***
1100 LET D2=((D1-D2)/M1)*K8
1105 REM *** COMPUTE PENETRATION TIME***
1110 LET T2=(P2-P1)*E8
1115 REM *** COMPUTE PENETRATION WORK***
1120 LET W1=0
1125 LET S2=D2/(P2-P1)
1130 FOR I=P1 TO P2
1135 LET W1=W1+F(I)-F1
1140 NEXT I
1145 LET W1=(W1*S2*K7)/F9
1150 REM *** FIND P4 AT ONE INCH PENETRATION***
1155 LET D4=D1-W1
1160 FOR I=P2 TO E9
1165 IF P(I)=<D4 THEN GOTO 1190
1170 NEXT I
1175 PRINT D(I) "-" T1" ONE INCH NOT REACHED"
1180 IF L=0 THEN GOTO 0390
1185 GOTO 0540
1190 LET F4=((F(I)-F1)/F9)*K7
1195 LET P4=I
1200 LET D4=(D1-P(I))*K8/M1
1205 LET T4=(P4-P1)*E8
1210 REM *** FIND MINIMUM FORCE BETWEEN P2 AND P4***
1215 LET S4=(F(P2+10)-F(P2+20))/10
1220 FOR I=P2+10 TO P4
1225 IF (F(I)-F(I+10))<S4 THEN GOTO 1250
1230 NEXT I
1235 PRINT D(I) "-" T1" POINT 3 NOT FOUND"
1240 IF L=0 THEN GOTO 0390
1245 GOTO 0540
1250 LET P3=I+5
1255 LET F3=((F(P3)-F1)*K7)/F9
1260 LET D3=(D1-P(P3))*K8/M1
1265 LET T3=(P3-P1)*E8
1270 REM *** FIND AVG. DISTANCE BETWEEN PTS P2 AND P4***

```


WCAL (continued)

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1275 LET D5=(D4-D2)/(P4-P2)
1280 REM ***FIND DRAG WORK***
1285 LET W2=0
1290 FOR I=P2 TO P4
1295 LET W2=W2+F(I)-F1
1300 NEXT I
1305 LET W2=W2*D5*K7/F9
1310 REM ***FIND WORK BETWEEN P2 AND P3***
1315 LET W3=0
1320 FOR I=P2 TO P3
1325 LET W3=W3+F(I)-F1
1330 NEXT I
1335 LET W3=W3*D5*K7/F9
1340 REM ***TOTAL WORK***
1345 LET W9=W1+W2
1350 REM ***WORK FROM 3 TO 4***
1355 LET W5=W2-W3
1360 LET X2=INT((F3/F2)*100)/100
1365 LET X3=INT((F4/F3)*100)/100
1370 LET X4=INT((D2/D4)*100)/100
1375 LET X5=INT((D3/D4)*100)/100
1380 LET B5=INT((F4/F2)*100)/100
1385 LET F2=INT(F2*100)/100
1390 LET F3=INT(F3*100)/100
1395 LET F4=INT(F4*100)/100
1400 LET D9=10000
1405 LET D2=(INT(D2*D9))/1000
1410 LET D3=(INT(D3*D9))/1000
1415 LET D4=(INT(D4*D9))/1000
1420 LET T2=INT(T2)
1425 LET T3=INT(T3)
1430 LET J9=INT(W9*D9)/100
1435 LET T4=INT(T4)
1440 LET J1=INT(W1*D9)/100
1445 LET J2=INT(W2*D9)/100
1450 LET J3=INT(W3*D9)/100
1455 LET J5=INT(W5*D9)/100
1460 REM
1465 LET E(9)=INT(E(9)/5)+1
1485 REM
1490 REM ***STORE DATA IN ARRAY***
1495 LET C8=B(9)*32
1500 LET H(C8+1)=D(9)
1505 LET H(C8+2)=T1
1510 LET H(C8+3)=E(9)
1515 LET H(C8+4)=0
1520 LET H(C8+5)=Y1
1525 LET H(C8+6)=Y2
1530 LET H(C8+7)=Y3
1535 LET H(C8+8)=Y4
1540 LET H(C8+9)=E(3)
1545 LET H(C8+10)=B(11)+1
1550 LET H(C8+11)=F2
1555 LET H(C8+12)=F3
1560 LET H(C8+13)=F4
1565 LET H(C8+14)=X2
1570 LET H(C8+15)=X3
1575 LET H(C8+16)=D2
1580 LET H(C8+17)=D3
1585 LET H(C8+18)=D4
1590 LET H(C8+19)=X4
1595 LET H(C8+20)=X5
1600 LET H(C8+21)=T2
1605 LET H(C8+22)=T3
1610 LET H(C8+23)=T4

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WCAL (continued)

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1622 LET H[24+CS1]=J1
1625 LET H[25+CS1]=J2
1633 LET H[26+CS1]=J9
1635 LET H[27+CS1]=J3
1640 LET H[28+CS1]=J5
1645 LET H[29+CS1]=INT((M1/M9)*100)
1652 LET H[30+CS1]=INT((M2/M9)*100)
1655 LET H[31+CS1]=INT((M3/M2)*100)
1662 LET D[11]=D[11]+1
1665 PRINT D[31]-"T1" "D[21]+1" "C0/32+1"
1670 LET S9=0
1675 IF D[31]=3 THEN GOTO 1695
1680 LET D[31]=D[31]+1
1685 IF L=0 THEN GOTO 0390
1690 GOTO 0540
1695 LET D[21]=D[21]+1
1700 OPEN FILE[12],10,"RESULT,C"
1705 CALL 90,0,D[21],0
1712 FOR I=0 TO 127
1715 WRITE FILE[0],H[11]
1720 NEXT I
1725 CLOSE FILE[0]
1730 PRINT "****"
1735 IF S9=4 THEN GOTO 0660
1740 LET D[31]=0
1745 IF L=0 THEN GOTO 0390
1750 GOTO 0540
1755 PRINT D[31] - "T1" IS NOT A GOOD TEST"
1760 IF L=0 THEN GOTO 0390
1765 GOTO 0540
2000 FOR I=3 TO E9
2010 PRINT I,F[11],P[11]
2020 NEXT I
2030 STOP

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