POWER SYSTEMS
A MORRISON-KNUDSEN DIVISION

SUBJECT: Generic 300 start tests for Electro-Motive Division of General Motors (EMD) Model EMD-645E4 diesels.

OBJECTIVE: To demonstrate restarting reliability and load pickup capability, IEEE Standard 387-1972 and 387-1977.

TESTS: All tests were conducted on Tandem Diesel arrangements of the following combinations:

(a) Tandem 16-645E4 - 900 RPM. Exhibit 1
(b) Tandem 16-645E4 with a 12-645E4 - 900 RPM. Exhibit 2
* (c) Tandem 20-645E4 - 750 RPM. Exhibit 3

RESULTS: This is to certify that the data presented are copies of actual test results.

Very truly yours,

POWER SYSTEMS
A MORRISON-KNUDSEN DIVISION

Harry W. Falter, P.E.
Division Engineer

HWF:ll

NORTH CAROLINA PROFESSIONAL SEAL 7033 ENGINEER HARRY WILLIAM FALTER

5/10/84

*Please note that item (c) is test data pertaining to the Beloit generator unit and the auxillary systems for the 645E4 engine model. The auxillary systems are identical for all engines of that model irrespective of the number of cylinders (i.e. 16 or 20).

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(b) Tandem 16-645E4 with a 12-645E4 - 900 RPM. Exhibit 2
(c) Tandem 20-645E4 - 750 RPM. Exhibit 3

DISCUSSION: Proportional load division between diesels of the tandem arrangement is accomplished by means of the Woodward 2301 governing system and the Woodward governor actuator EGB 10 or 13P mounted on each engine.

The starting system components on the diesels for (a) and (c) above are EMD standard. The components on (b) except for the starting motors were to the ASME Section III Class 3 Code but the system function and arrangement was the same as for (a) and (c). The components used including the air start motors are the same size for all units.

Figure 1 shows a typical EMD16-645E4 tandem arrangement. Figure 2 shows a typical EMD 20-645E4 arrangement.

Figure 3 shows a typical EMD 645-E4 engine mounted starting system.

The starting logic and controls for tests (a), (b) and (c) were essentially the same with no significant differences.

The starting phase is actually in two parts:

(a) Start signal, start logic and cranking.
(b) The acceleration due to available engine torque when the engine fires.

Part (a) is essentially the same for all units tested and for which there are recorded 900 valid tests.

Part (b) is the acceleration to rated speed as a result of engine torque vs. system inertia. For all the tests, the acceleration was within the specified time limit of 10 seconds.

The generator inertia for the GEAPD HPCS differs from the inertia of the tests in this discussion. However, site tests conducted by GEAPD on the HPCS unit have verified the acceleration within the specified limits.

A minimum of 50% resistive load was applied to the diesel-generator for each of the tests (a), (b) and (c) to demonstrate the load acceptance capability of the units being tested.

The test conducted for (a) was done with 300 cold starts and no hot starts. This test was done prior to the 10% "hot start" requirement.

However, test (b) and (c) were conducted with 90% cold starts and 10% hot starts.

It is noted that there is no significant difference of the start and acceleration time between "hot" and cold starts.

() Cold starts are those made from standby conditions wherein the engine jacket and lube oil systems are kept warm by externally supplied means as is duplicated in operating plant conditions.

() Hot starts are those made from conditions where the engine jacket, lube oil system, and engine case with internal components are at normal operating temperatures the result of thermal gain from a previous run.

Remarks about Excerpts of Data

Strip Chart records of every 50th start show the following variables against time.

() Acceleration, RPM
() Power Loading, KW
() Current Loading, AMPS
() Frequency, HZ
() Potential, VOLTS

Fig. 4 shows how the charts may be read.

General Remarks about Exhibits

Each start consisted of:

a) Starting signal

b) Acceleration to rated speed within 10.0 seconds from issuance of starting signal.

c) The sudden application of at least 50% resistive load at the 10.0 second point.

d) The load level (50% minimum) was maintained until the jacket water, lube oil, and cylinder head temperatures stabilized. Stability for a variable is judged to be reached when the plot flattens beyond the knee in the conventional sense. This takes approximately 25 minutes from the start signal.

TANDEM DIESEL-GENERATOR QUALIFICATION TEST 300 CONSECUTIVE COLD STARTS

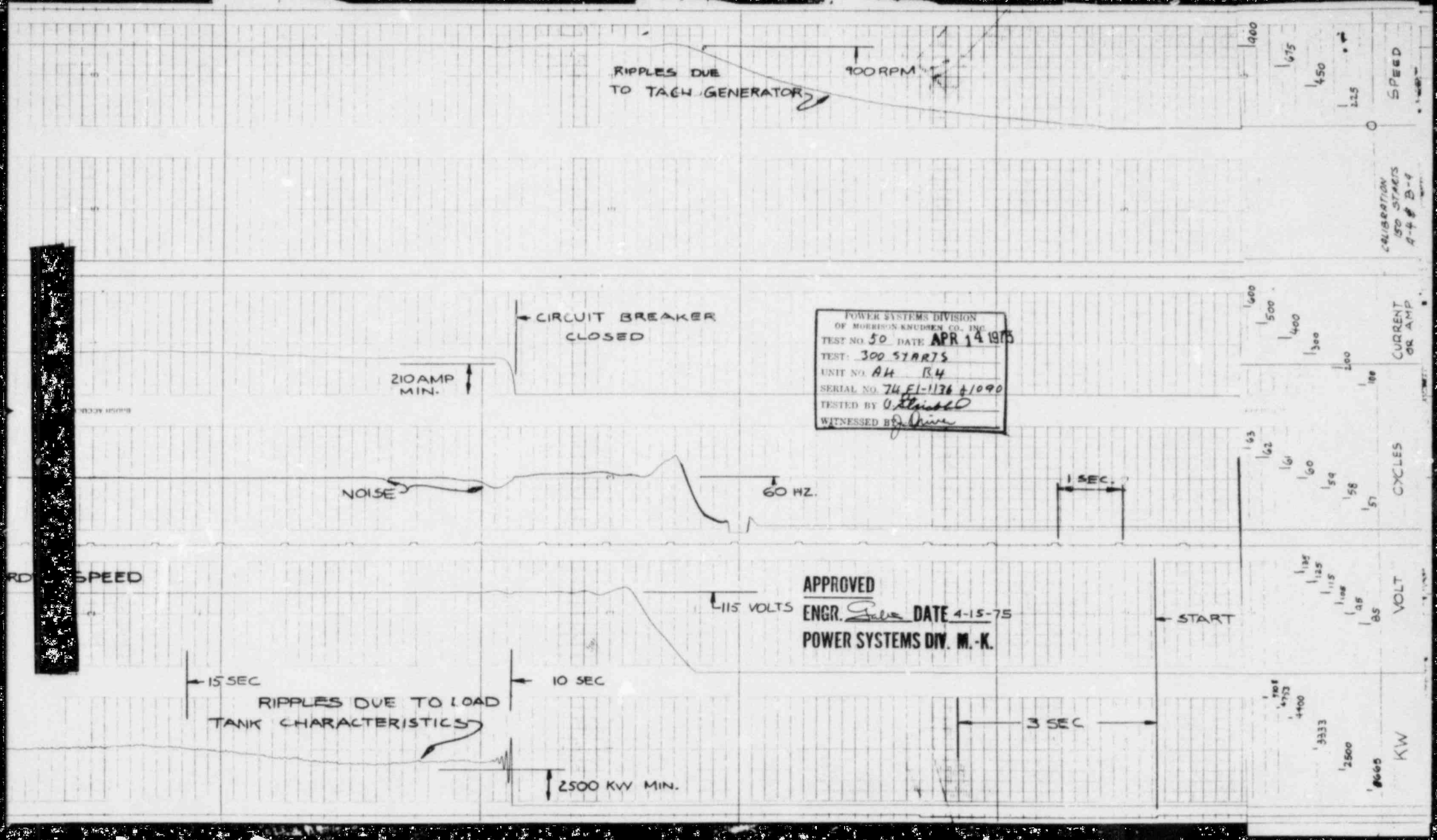
The tandem diesel-generator assembly includes:

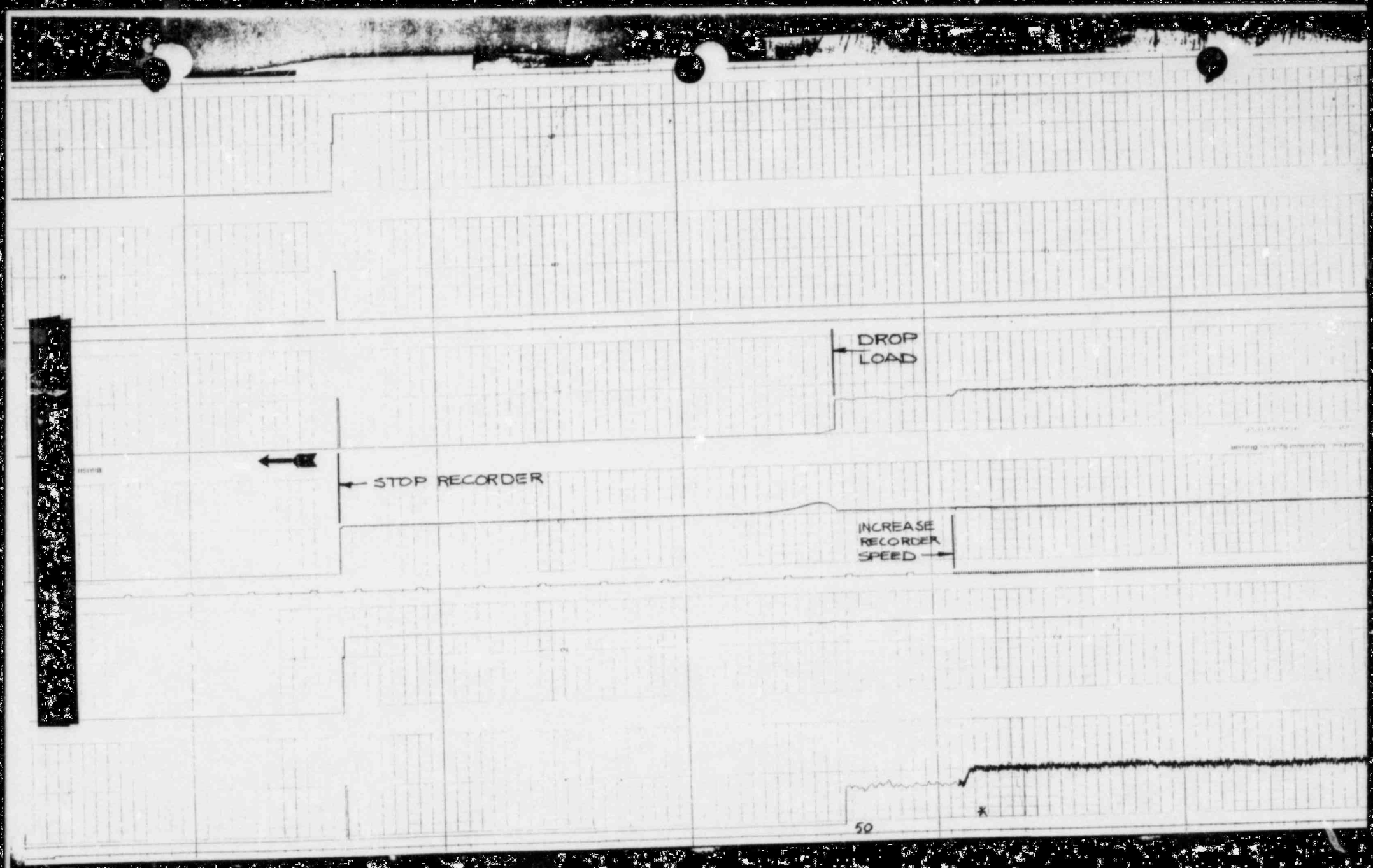
1) EMD 16-645E4 Diesel R.H.
2) EMD 16-645E4 Diesel L.H.
3) Electric Products Generator rated:

   Continuous - 4400KW .8PF
   2000 Hour - 4750KW .8PF
   ½ Hour - 5000KW .8PF
   6900 Volt, 3 Phase, 60 Cycle
   (900 RPM)

4) Electric Products Static Excitation
5) Governor System - Woodward 2310 Control
   EGB10/13P Actuator

Each tandem assembly will be subjected to a 72 hour load test at 4750KW, 0.8PF prior to conducting the 300 cold start qualification test.

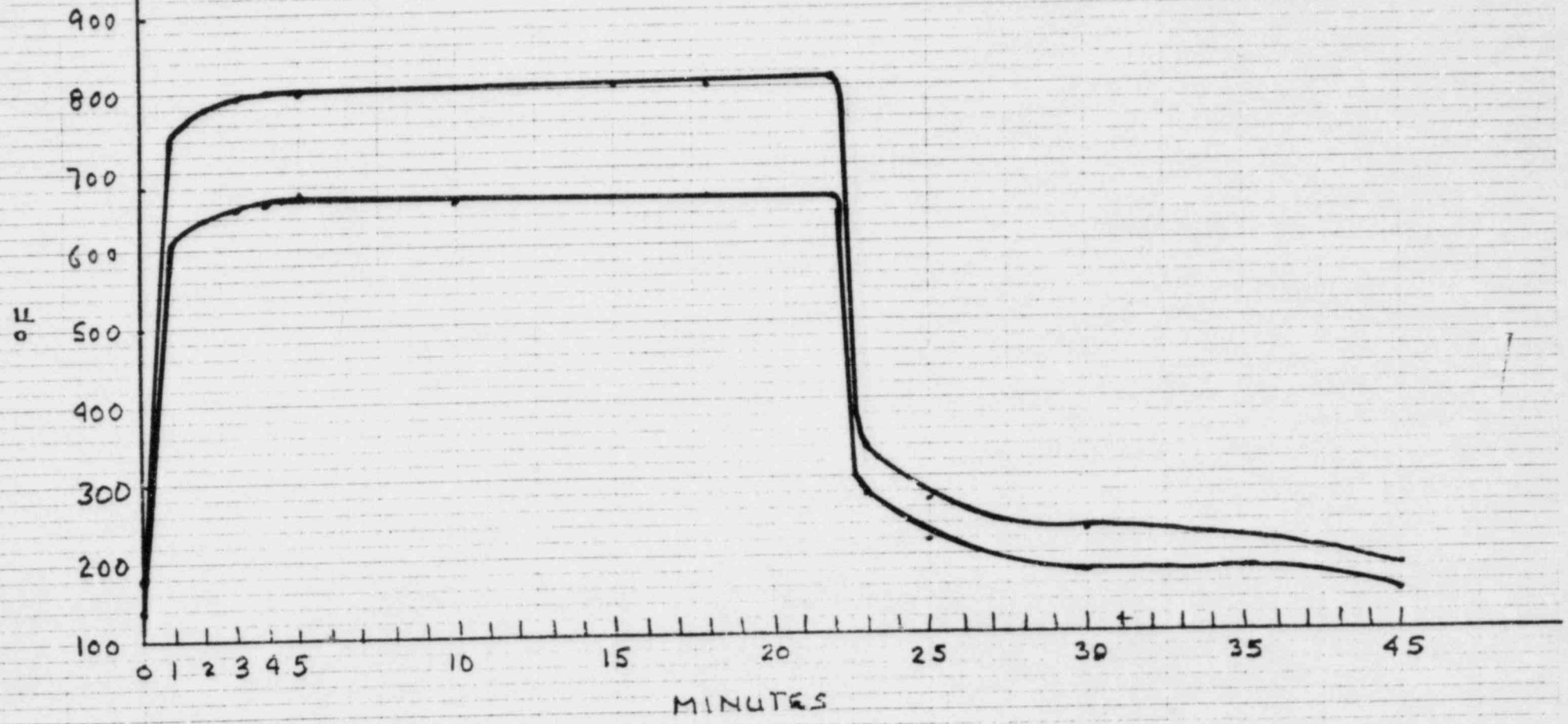

RIPPLES DUE
TO TACH GENERATOR
900 RPM
SPEED
CALIBRATION
50 STARTS
4-4 & B-4
CIRCUIT BREAKER
CLOSED
POWER SYSTEMS DIVISION
OF MORRISON-KNUDSEN CO., INC.
TEST NO. 50 DATE APR 14 1975
TEST: 300 STARTS
UNIT NO. A4 B4
SERIAL NO. 74 EI-1136 & 1090
TESTED BY O. Elquist
WITNESSED BY J. Chiva
210 AMP
MIN.
CURRENT
OR AMP
NOISE
60 HZ.
1 SEC.
CYCLES
SPEED
APPROVED
ENGR. [signature] DATE 4-15-75
POWER SYSTEMS DIV. M.-K.
115 VOLTS
START
VOLT
15 SEC
10 SEC
RIPPLES DUE TO LOAD
TANK CHARACTERISTICS
3 SEC
2500 KW MIN.
KW

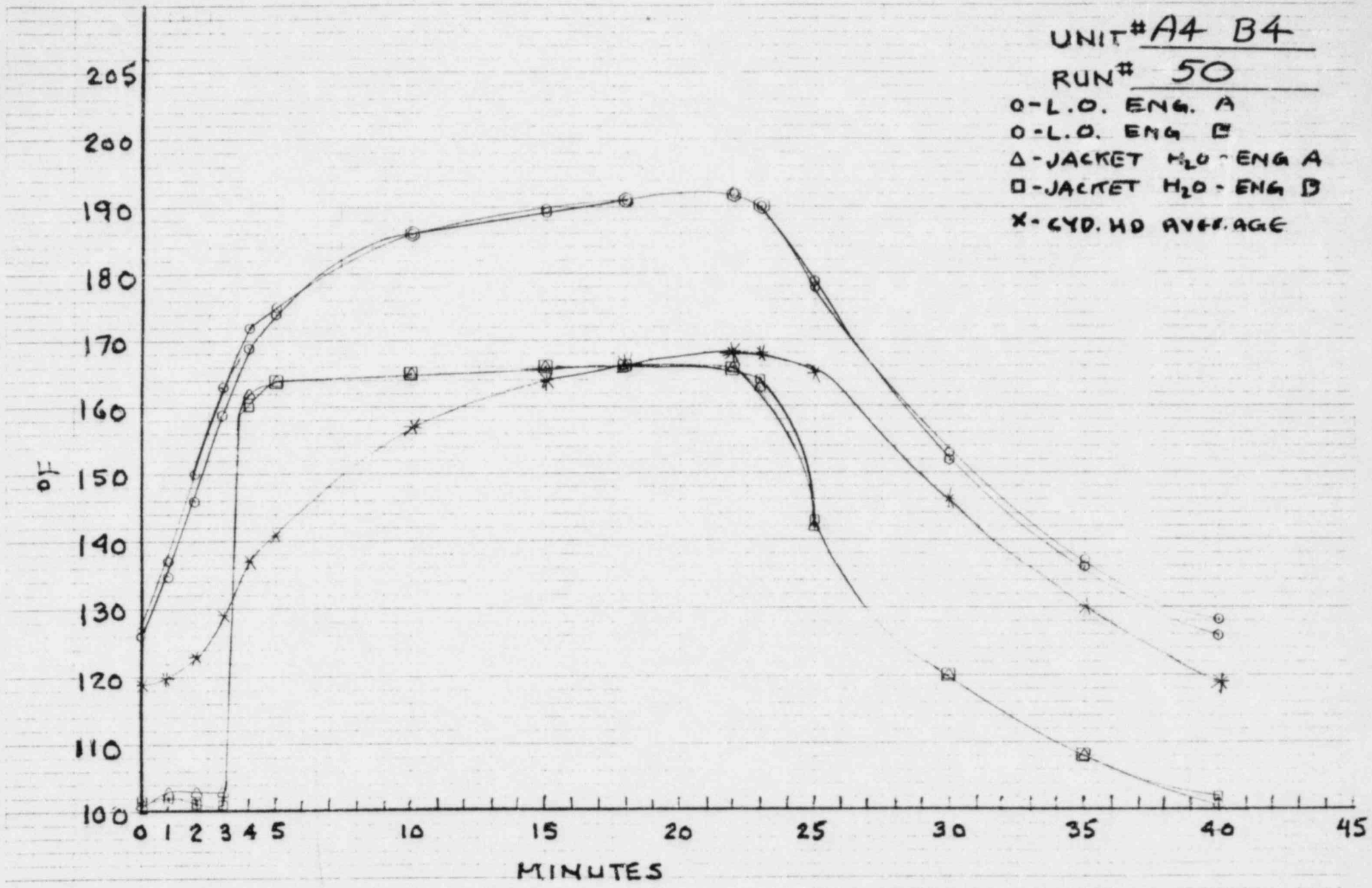

DROP
LOAD
STOP RECORDER
INCREASE
RECORDER
SPEED
50

EXHAUST GAS TEMPERATURE
HIGH AND LOW TEMPERATURE

UNIT # A4 B4

RUN # 50





JOB 850 TVA WATTS BAR

POWER SYSTEMS
DIVISION OF MORRISON-KNUDSEN COMPANY, INC.

P. O. BOX 1928 • ROCKY MOUNT, N. C. 27801 • TELEPHONE (919) 977-2720

PRESTART LOG SHEET

Unit # AH BA Test # 50 Date APR 14 1975

		A	QC	B	QC
Ambient Temperature	54				
Barometer Reading	30.31				
Humidity	55				
Hot Leg L.O. Temp.		127		126	
Hot Leg. J.W. Temp.		101		102	
DC Supply Voltage	123				
Auto-Start Position	CS				
Lube Oil Stand-by Press		12		14	
Pressure in Air Tanks	205				

Pressure in Air Tanks immediately after start 185

Remarks -

Test Technician Stickland

PSD QC J. Davis

Witness _____

POWER SYSTEMS
DIVISION OF MORRISON-KNUDSEN COMPANY, INC.

START LOG SHEET

UNIT# A4 B4 TEST# 50 DATE APR 14 1975

Interval	Time	A.C. Volt			A.C. Amp			Freq.	KW
	5:53	A	B	C	A	B	C		
1 min.	5:54	6900	6900	6900	280	290	280	60	3333
5 min.	5:58	6900	6900	6900	280	290	280	60	3333
10 min.	6:03	6900	6900	6900	280	290	280	60	3333
15 min.	6:08	6900	6900	6900	280	290	280	60	3333

Success	Void	Failure
✓		

TEST TECHNICIAN C. Stricklo

PSD QC J. Driver

WITNESS

REMARKS

POWER SYSTEMS
DIVISION OF MORRISON-KNUDSEN COMPANY, INC.

START LOG SHEET

Unit A4-1 -A/B Test # 50 -Date APR 14 1975

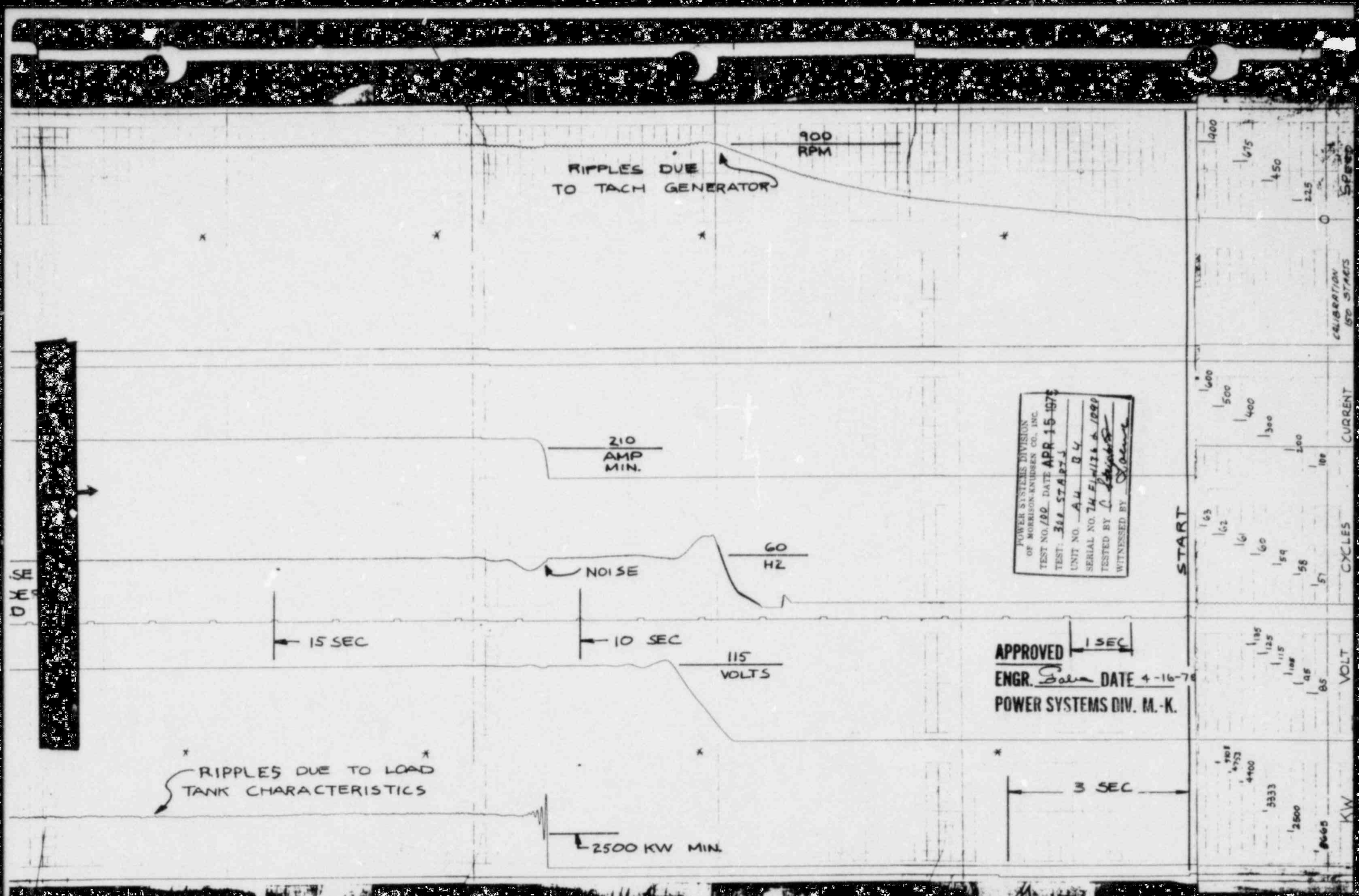
Interval	Time	Exhaust Back Press. Inches H2O		Intake Suction Inches H2O		L.O. Press.		F.O. Press.	
		A	B	A	B	A	B	A	B
	5:53								
2 min.	5:55	4.3	5.2	5.7	6.0	94	94	42	50
4 min.	5:57	4.3	5.3	5.6	5.8	86	89	42	50
8 min.	6:01	4.4	5.2	5.6	5.8	82	86	42	50
15 min.	6:08	4.4	5.3	5.5	5.7	79	84	42	50

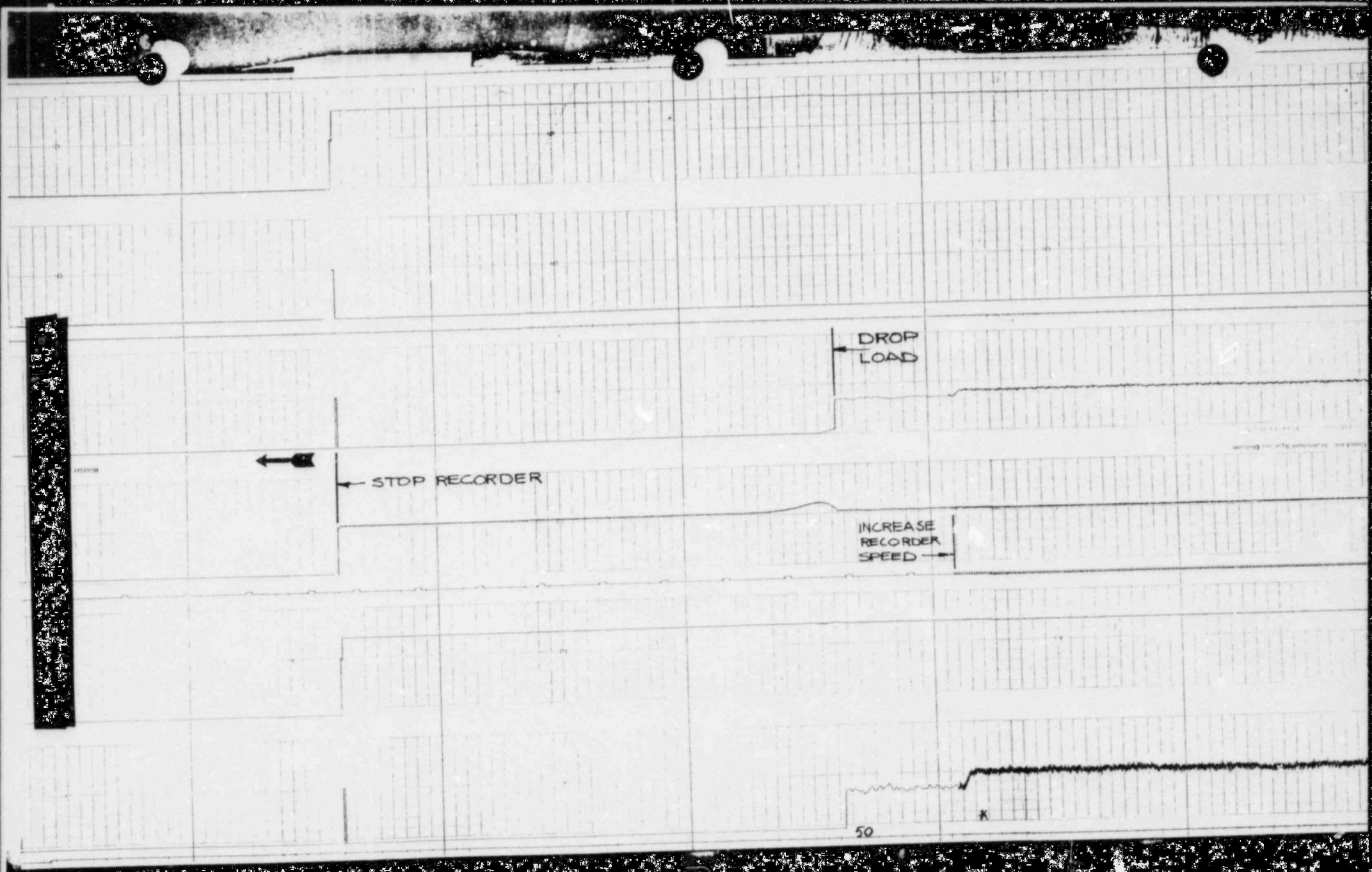
REMARKS

TEST TECHNICIAN C. Stuckey

PSD QC J. Diver

WITNESS


900
RPM
RIPPLES DUE
TO TACH GENERATOR
210
AMP
MIN.
60
HZ
NOISE
15 SEC
10 SEC
115
VOLTS
1 SEC
APPROVED
ENGR. Bolin DATE 4-16-7
POWER SYSTEMS DIV. M.-K.
RIPPLES DUE TO LOAD
TANK CHARACTERISTICS
2500 KW MIN.
3 SEC
START
SPEED
CALIBRATION
600 START
CURRENT
CYCLES
VOLT
KW
POWER SYSTEMS DIVISION
OF MORRISON-KNUDSEN CO., INC.
TEST NO. 180 DATE APR 15 1975
TEST 344 574 874
UNIT NO. AM 84
SERIAL NO. 74 EM 124 A 1289
TESTED BY
WITNESSED BY


DROP
LOAD
STOP RECORDER
INCREASE
RECORDER
SPEED
50

POWER SYSTEMS
DIVISION OF MORRISON-KNUDSEN COMPANY, INC.

START LOG SHEET

Unit A-4 & B-4 -A/B Test # 100 -Date APR 15 1975

Interval	Time	Exhaust Back Press. Inches H2O		Intake Suction Inches H2O		L.O. Press.		F.O. Press.	
		A	B	A	B	A	B	A	B
	21:31	—	—	—	—	—	—	—	—
2 min.	21:33	4.3	4.4	5.6	5.6	96	92	44	52
4 min.	21:35	4.3	4.4	5.6	5.6	96	92	44	52
8 min.	21:39	4.4	4.4	5.4	5.4	82	83	44	52
15 min.	21:46	4.4	4.6	5.4	5.6	80	82	44	52

REMARKS

TEST TECHNICIAN C. Sluiter

PSD QC Loewe

WITNESS Loewe

POWER SYSTEMS
DIVISION OF MORRISON-KNUDSEN COMPANY, INC.

START LOG SHEET

UNIT# AH BH TEST# 100 DATE APR 15 1975

Interval	Time	A.C. Volt			A.C. Amp			Freq.	KW
	21:31	A	B	C	A	B	C		
1 min.	21:32	6900	6900	6900	280	290	280	60	3333
5 min.	21:36	6900	6900	6900	280	290	280	60	3333
10 min.	21:41	6900	6900	6900	280	290	280	60	3333
15 min.	21:46	6900	6900	6900	280	290	280	60	3333

Success	Void	Failure
✓		

TEST TECHNICIAN C. Strickland

PSD QC Laeme

WITNESS Laeme

REMARKS

POWER SYSTEMS
DIVISION OF MORRISON-KNUDSEN COMPANY, INC.
P. O. BOX 1928 • ROCKY MOUNT, N. C. 27801 • TELEPHONE (919) 977-2720

PRESTART LOG SHEET

Unit # A4 B4 Test # 100 Date APR 15 1975

		A QC	B QC
Ambient Temperature	62		
Barometer Reading	29.95		
Humidity	59		
Hot Leg L.O. Temp.		126	129
Hot Leg. J.W. Temp.		103	107
DC Supply Voltage	123		
Auto-Start Position	CS		
Lube Oil Stand-by Press		12	14
Pressure in Air Tanks	210		

Pressure in Air Tanks immediately after start: 175

Remarks -

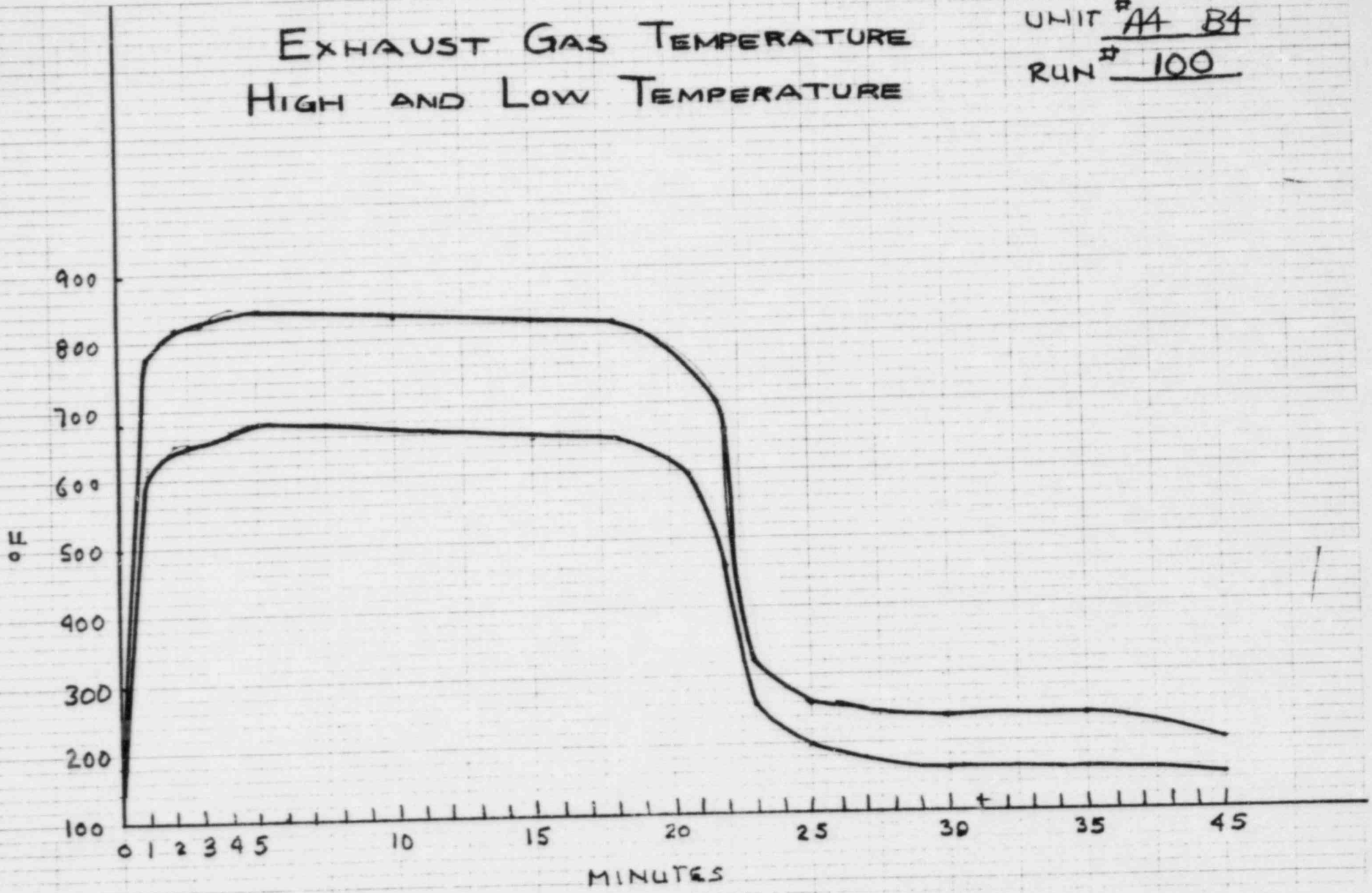
Test Technician C. Strickler

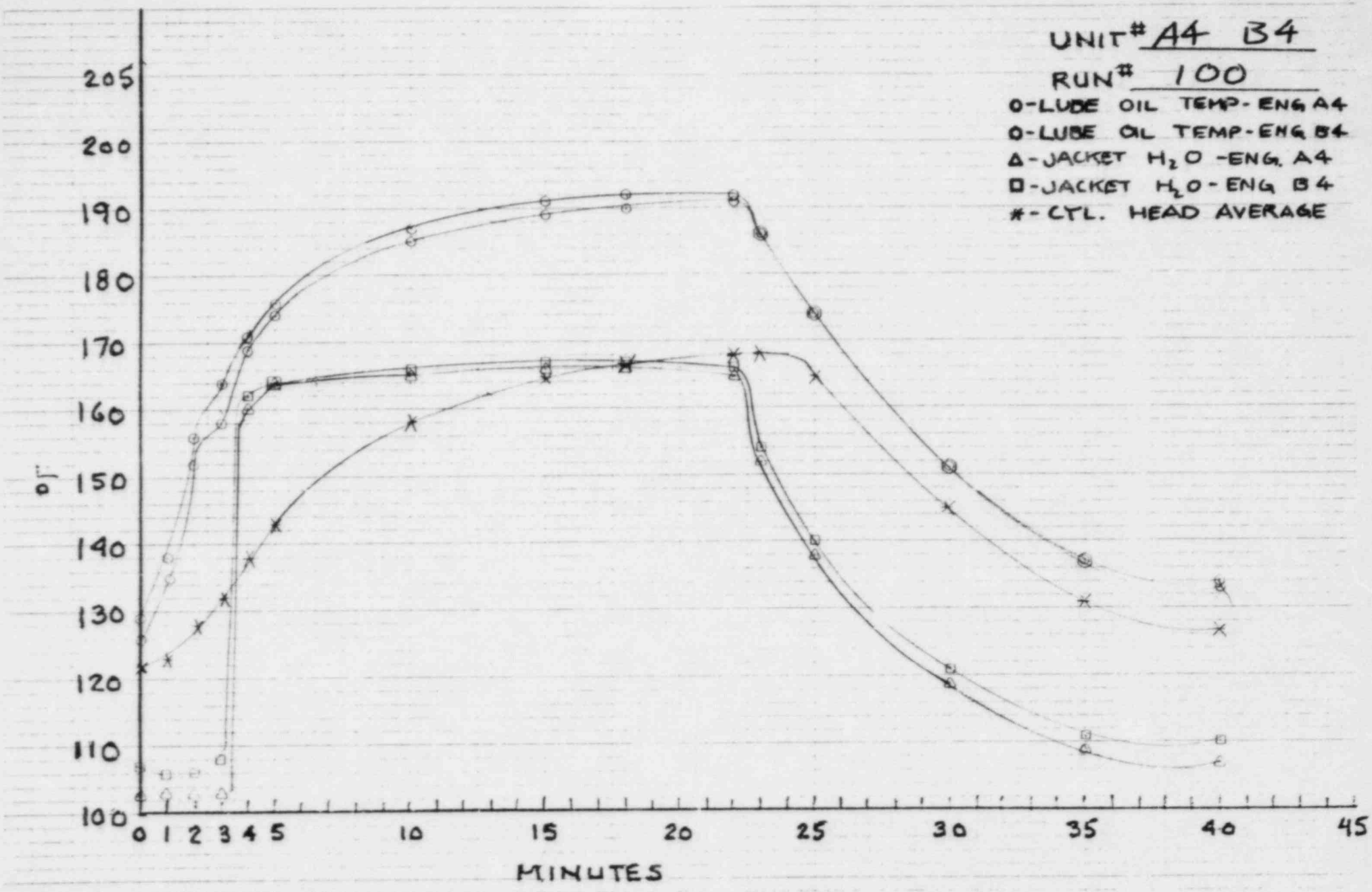
PSD QC Lacue

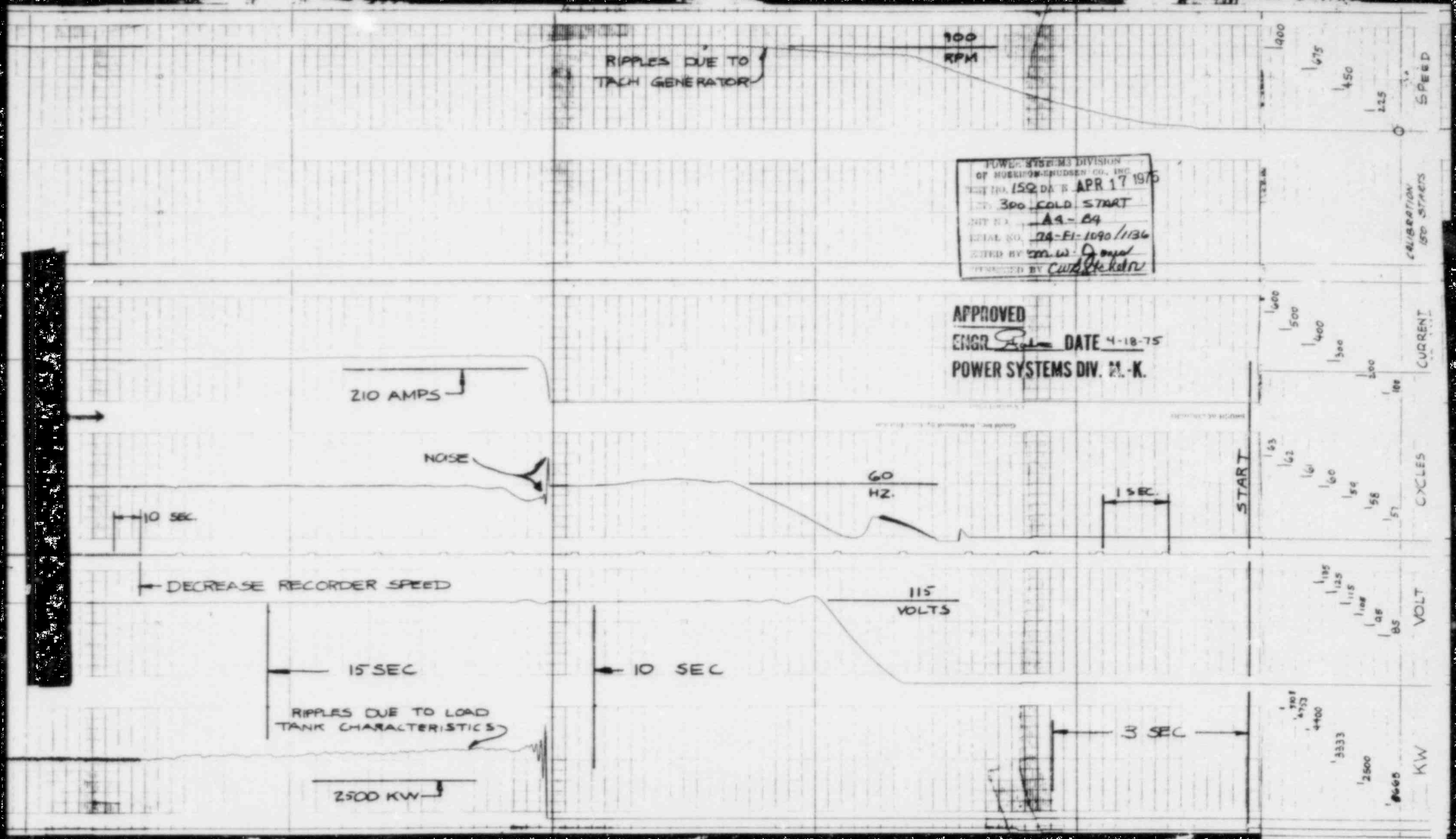
Witness Lacue

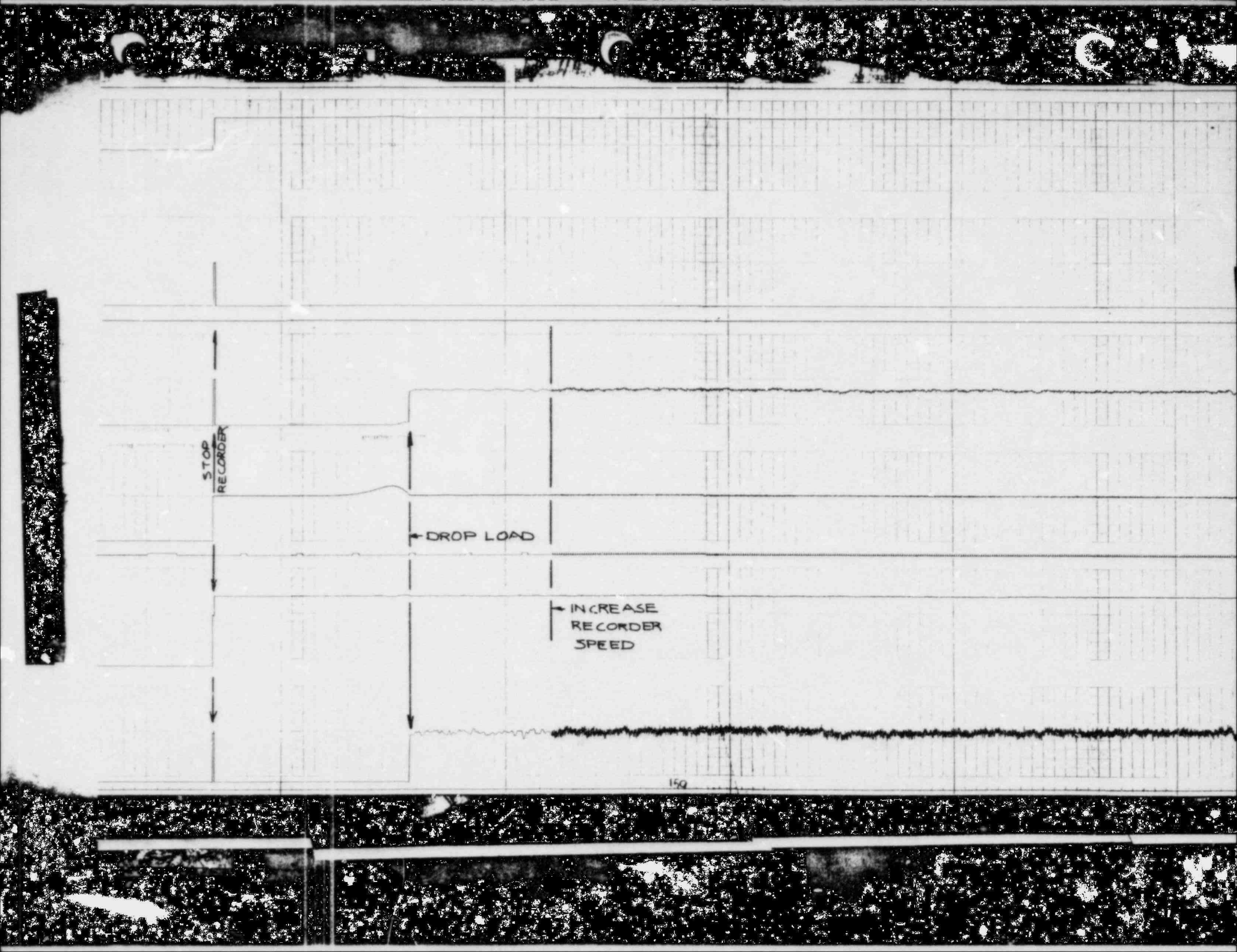
EXHAUST GAS TEMPERATURE
HIGH AND LOW TEMPERATURE

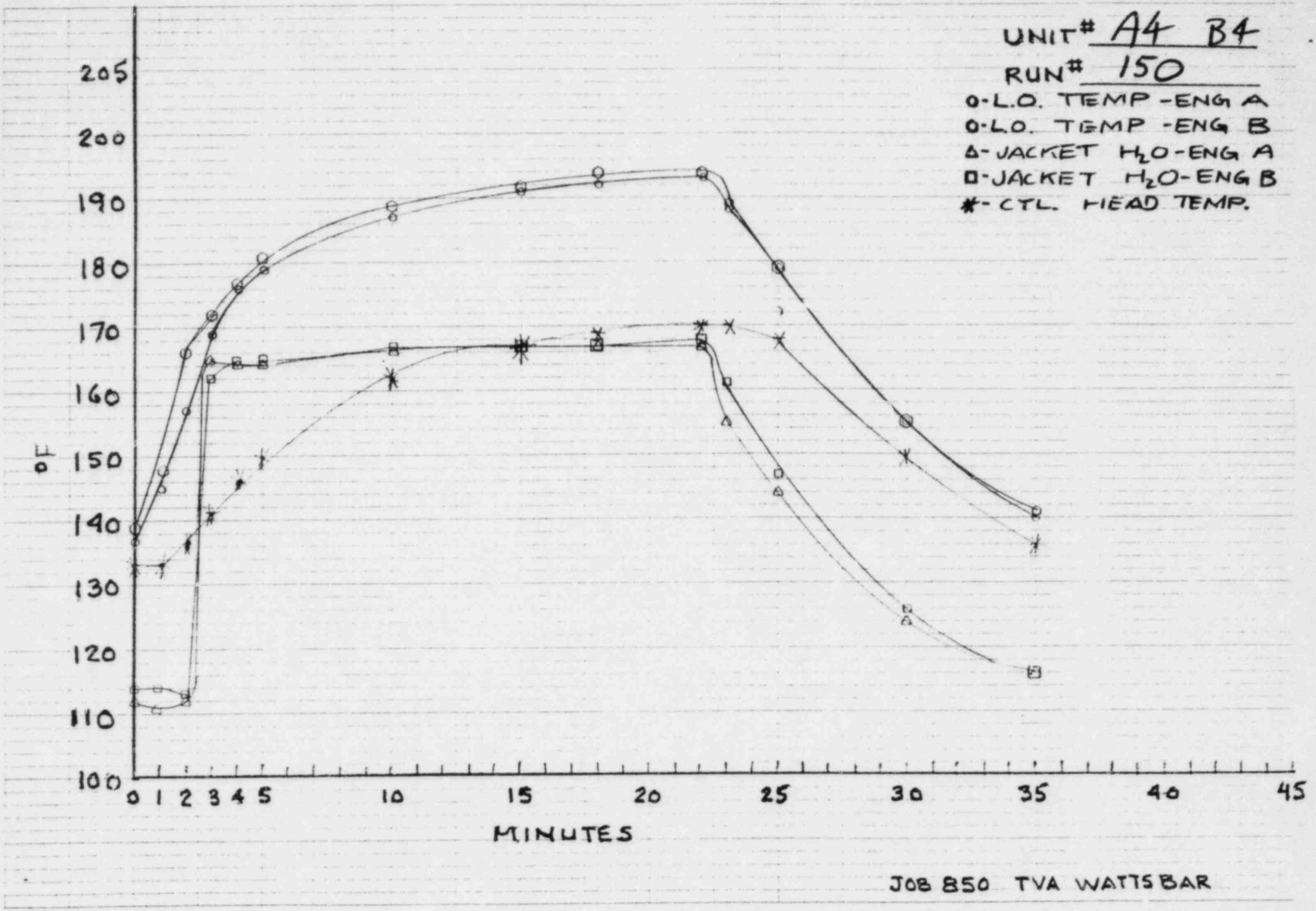
UNIT # AA BA
RUN # 100




UNIT# A4 B4
RUN# 100
O-LUBE OIL TEMP-ENG A4
O-LUBE OIL TEMP-ENG B4
Δ-JACKET H2O -ENG. A4
□-JACKET H2O-ENG B4
*-CTL. HEAD AVERAGE
205
200
190
180
170
160
150
140
130
120
110
100
°F
0 1 2 3 4 5 10 15 20 25 30 35 40 45
MINUTES
JOB 850 TVA WATTS BAR


RIPPLES DUE TO TACH GENERATOR
900 RPM
SPEED
CALIBRATION 50 STEPS
POWER SYSTEMS DIVISION OF HUGHES-SHUDSEN CO., INC.
TEST NO. 152 DATE APR 17 1975
300 COLD START
A4 - B4
74-E1-1090/1136
APPROVED
ENGR DATE 4-18-75
POWER SYSTEMS DIV. H.-K.
210 AMPS
CURRENT
NOISE
60 HZ.
1 SEC.
START
CYCLES
10 SEC.
DECREASE RECORDER SPEED
115 VOLTS
VOLT
15 SEC
10 SEC
RIPPLES DUE TO LOAD TANK CHARACTERISTICS
4 SEC
2500 KW
KW

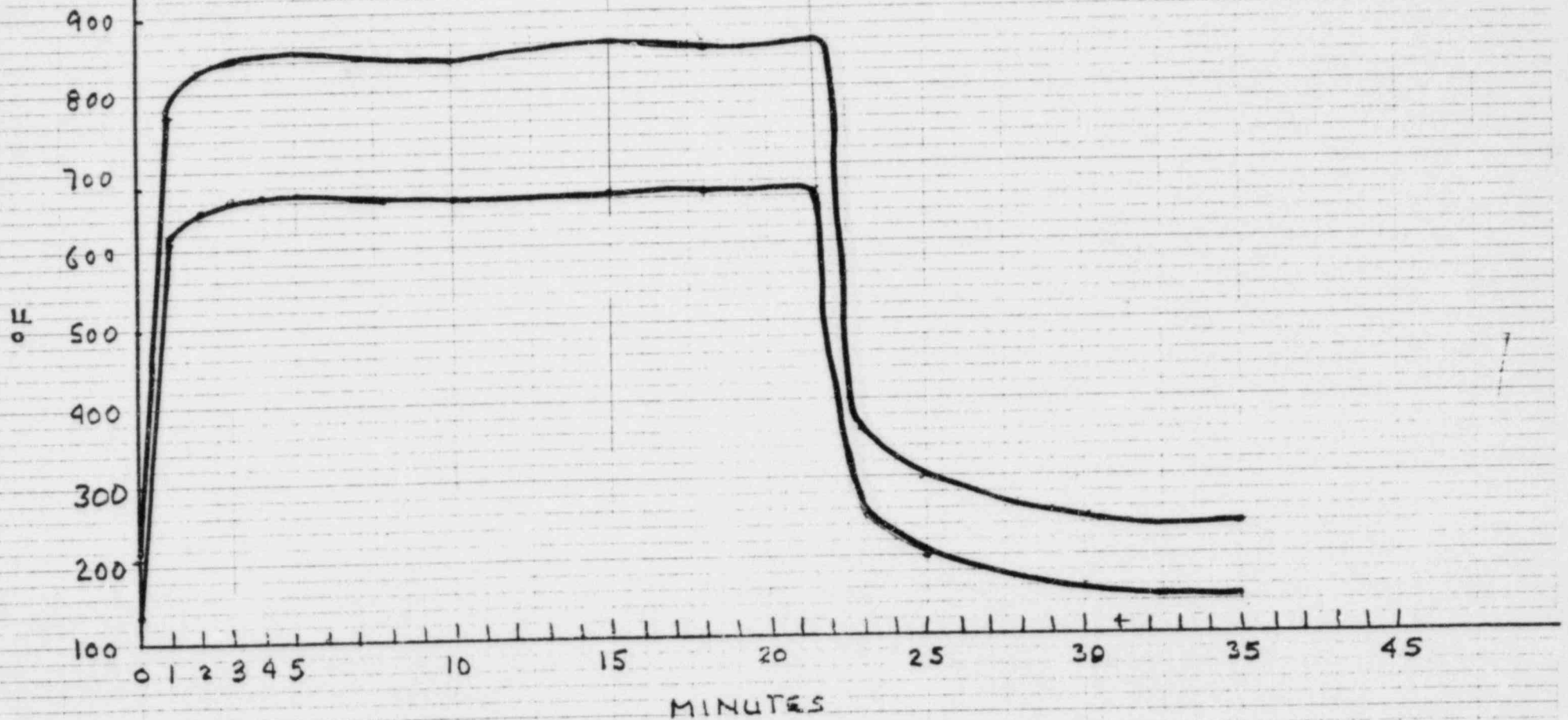

STOP RECORDER
DROP LOAD
INCREASE RECORDER SPEED


UNIT# A4 B4
RUN# 150
o-L.O. TEMP -ENG A
o-L.O. TEMP -ENG B
Δ-JACKET H2O-ENG A
□-JACKET H2O-ENG B
*-CTL. HEAD TEMP.
°F
205
200
190
180
170
160
150
140
130
120
110
100
0 1 2 3 4 5 10 15 20 25 30 35 40 45
MINUTES
JOB 850 TVA WATTS BAR

EXHAUST GAS TEMPERATURE
HIGH AND LOW TEMPERATURES

UNIT # A4 B4

RUN # 150



POWER SYSTEMS
DIVISION OF MORRISON-KNUDSEN COMPANY, INC.

P. O. BOX 1928 • ROCKY MOUNT, N. C. 27801 • TELEPHONE (919) 977-2720

PRESTART LOG SHEET

Unit # A4 B4 Test # 150 Date APR 17 1975

		A QC	B QC
Ambient Temperature	78		
Barometer Reading	30.0		
Humidity	30		
Hot Leg L.O. Temp.		137	139
Hot Leg. J.W. Temp.		112	114
DC Supply Voltage	124		
Auto-Start Position	M.S.		
Lube Oil Stand-by Press		12	15
Pressure in Air Tanks	220		

Pressure in Air Tanks immediately after start: 195

Remarks -

Test Technician M. W. Jones

PSD QC C.W. Batchelor

Witness _____

POWER SYSTEMS
DIVISION OF MORRISON-KNUDSEN COMPANY, INC.

START LOG SHEET

UNIT# A4 B4 TEST# 150 DATE APR 17 1975

Interval	Time	A.C. Volt			A.C. Amp			Freq.	KW
		A	B	C	A	B	C		
1 min.	5:01	6900	6900	6900	280	290	280	60	3333
5 min.	5:05	6900	6900	6900	280	290	280	60	3333
10 min.	5:10	6900	6900	6900	280	290	280	60	3333
15 min.	5:15	6900	6900	6900	280	290	280	60	3333

Success	Void	Failure
✓		

TEST TECHNICIAN M.W. Jones

PSD QC C.W. Batchelor

WITNESS _____

REMARKS

POWER SYSTEMS
DIVISION OF MORRISON-KNUDSEN COMPANY, INC.

START LOG SHEET

Unit A4 - B4 -A/B Test # 150 -Date APR 17 1975

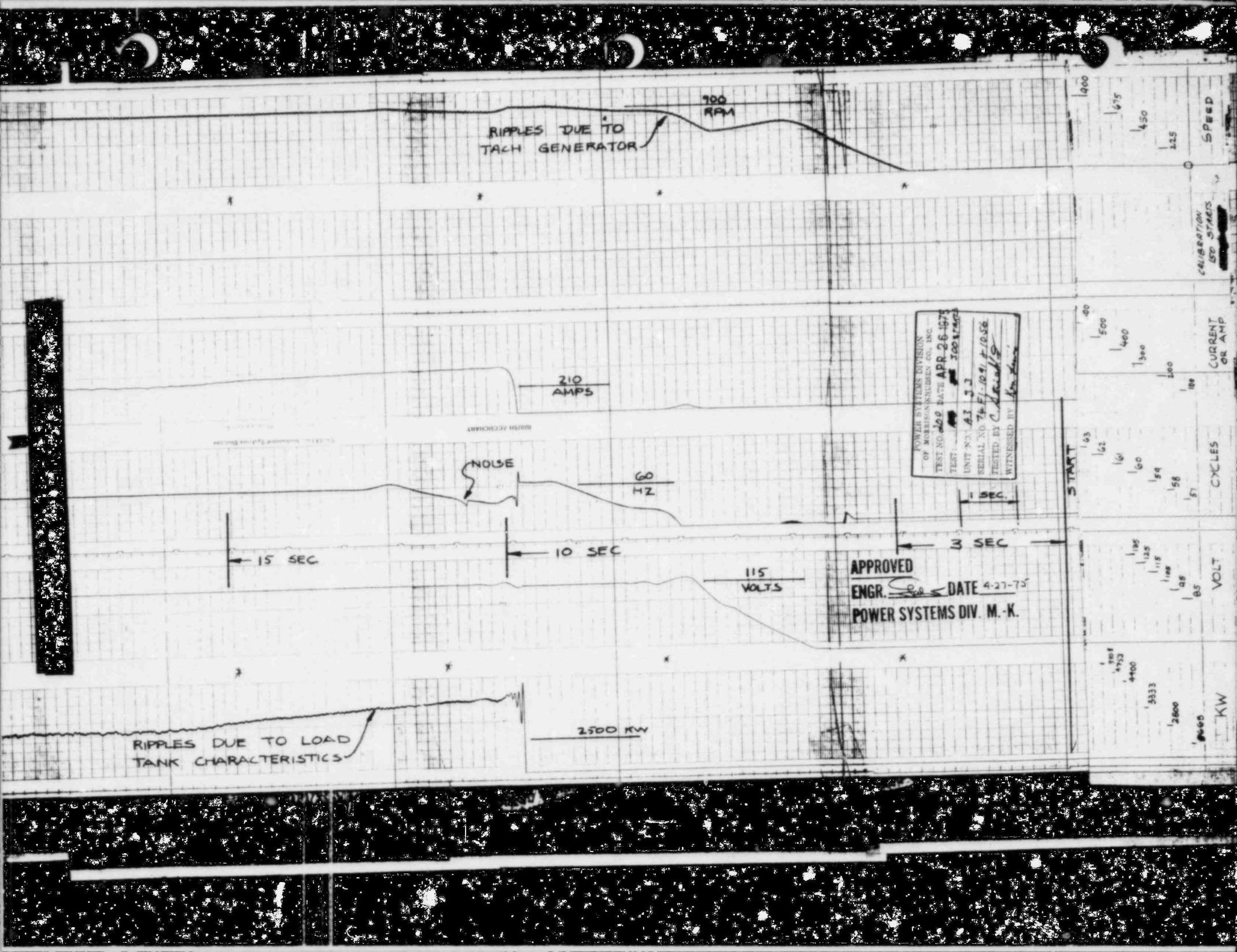
Interval	Time	Exhaust Back Press. Inches H2O		Intake Suction Inches H2O		L.O. Press.		F.O. Press.	
	5:00	A	B	A	B	A	B	A	B
2 min.	5:02	4,3	5,0	5,4	5,6	92	92	41	52
4 min.	5:04	4,4	5,2	5,4	5,7	86	87	41	53
8 min.	5:08	4,4	5,3	5,4	5,7	81	86	41	53
15 min.	5:15	4,5	5,5	5,4	5,7	78	82	41	52

REMARKS

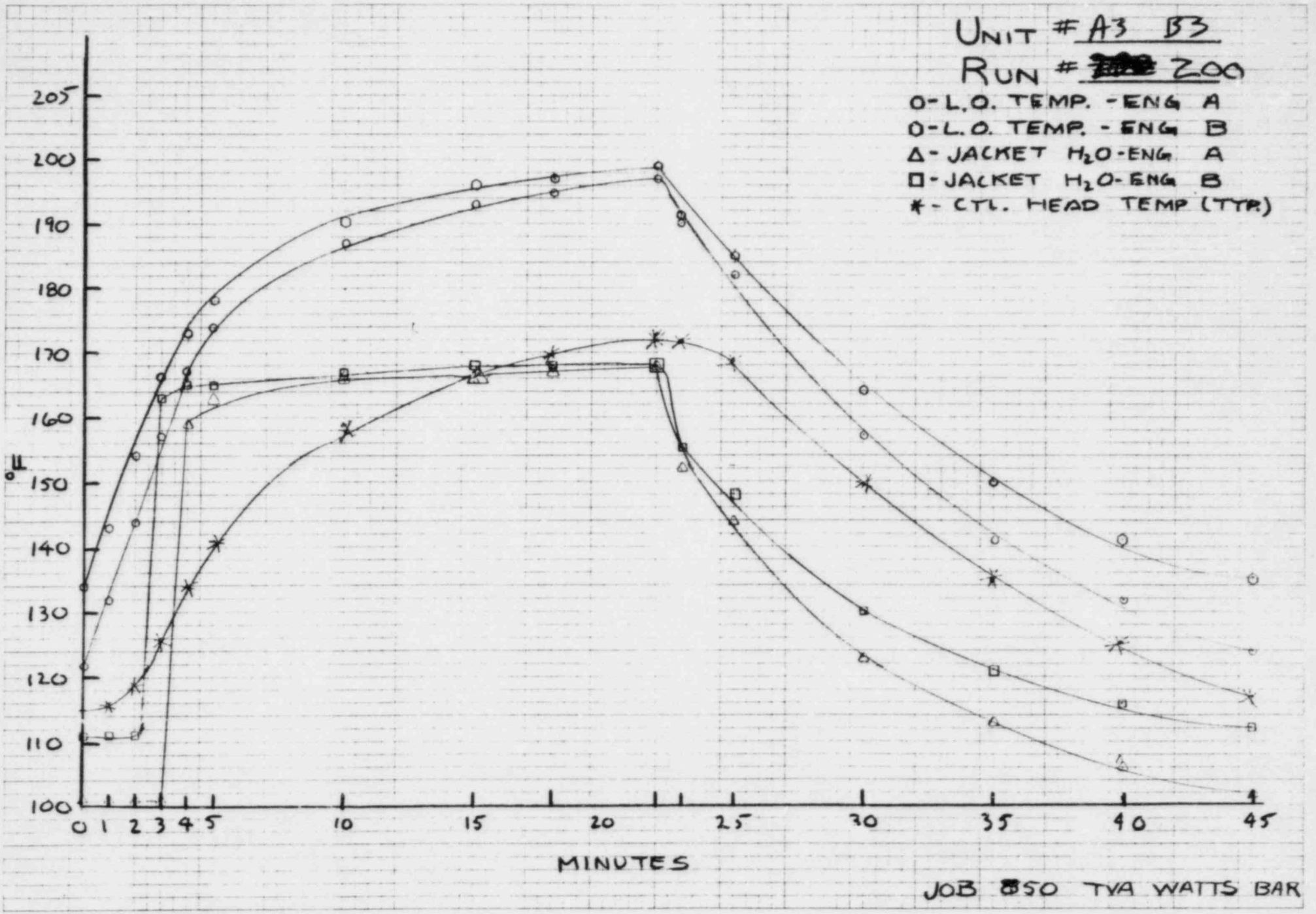
TEST TECHNICIAN M. W. Jones

PSD QC C W Batchelor

WITNESS

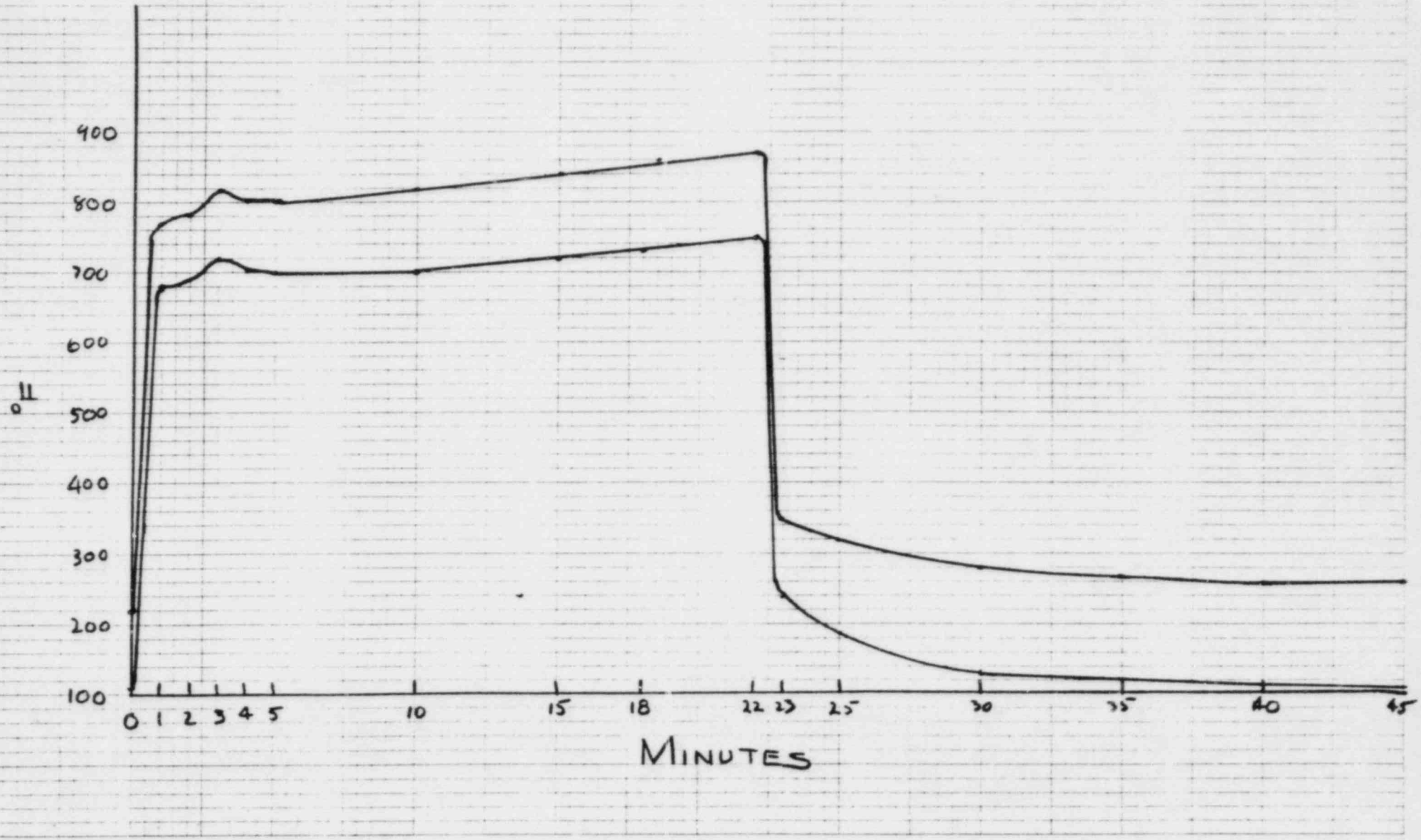

900 RPM
RIPPLES DUE TO TACH GENERATOR
210 AMPS
NOISE
60 HZ
15 SEC
10 SEC
115 VOLTS
1 SEC.
3 SEC
START
RIPPLES DUE TO LOAD TANK CHARACTERISTICS
2500 KW
SPEED
CALIBRATION STD STATES
CURRENT OR AMP
CYCLES
VOLT
KW
POWER SYSTEMS DIVISION OF MORRISON-KNUDSEN CO., INC.
TEST NO. 400 DATE APR 26 1973
TEST UNIT NO. A3 3.3
SERIAL NO. 74-E1-1091 & 1056
TESTED BY C. Arnold
WITNESSED BY
APPROVED
ENGR. DATE 4-27-75
POWER SYSTEMS DIV. M.-K.

INCREASE RE
SPEED
DROP
LOAD
STOP
RECORDER


UNIT # A3 B3
RUN # [redacted] 200
O - L.O. TEMP. - ENG A
O - L.O. TEMP. - ENG B
Δ - JACKET H2O - ENG A
□ - JACKET H2O - ENG B
* - CTL. HEAD TEMP (TTR)
°F
205
200
190
180
170
160
150
140
130
120
110
100
0 1 2 3 4 5 10 15 20 25 30 35 40 45
MINUTES
JOB 850 TVA WATTS BAR

Exhaust Gas Temperature
High and Low Temperature

Unit # A3 B3
Run # 200



POWER SYSTEMS
DIVISION OF MORRISON-KNUDSEN COMPANY, INC.

P. O. BOX 1928 • ROCKY MOUNT, N. C. 27801 • TELEPHONE (919) 977-2720

PRESTART LOG SHEET

Unit # A3 B3 Test # 200 Date APR 26 1975

		A QC		B QC
Ambient Temperature	78			
Barometer Reading	30.12			
Humidity	37			
Hot Leg L.O. Temp.		122		134
Hot Leg. J.W. Temp.		101		112
DC Supply Voltage	124			
Auto-Start Position	CS			22
Lube Oil Stand-by Press		20		
Pressure in Air Tanks	220			

Pressure in Air Tanks immediately after start 205

Remarks -

Test Technician C. Strickland

PSD QC Ken Lewis

Witness

POWER SYSTEMS
DIVISION OF MORRISON-KNUDSEN COMPANY, INC.

START LOG SHEET

UNIT# A3 B3 TEST# 200 DATE APR 26 1975

Interval	Time	A.C. Volt			A.C. Amp			Freq.	KW
	3:43	A	B	C	A	B	C		
1 min.	3:44	6900	6900	6900	270	280	270	60	3333
5 min.	3:48	6900	6900	6900	270	280	270	60	3333
10 min.	3:53	6900	6900	6900	270	280	270	60	3333
15 min.	3:58	6900	6900	6900	270	280	270	60	3333

Success	Void	Failure
✓		

TEST TECHNICIAN C Strickland

PSD QC Ken Tourné

WITNESS

REMARKS

POWER SYSTEMS
DIVISION OF MORRISON-KNUDSEN COMPANY, INC.

START LOG SHEET

Unit A3 B3 -A/B Test # 200 -Date APR 26 1975

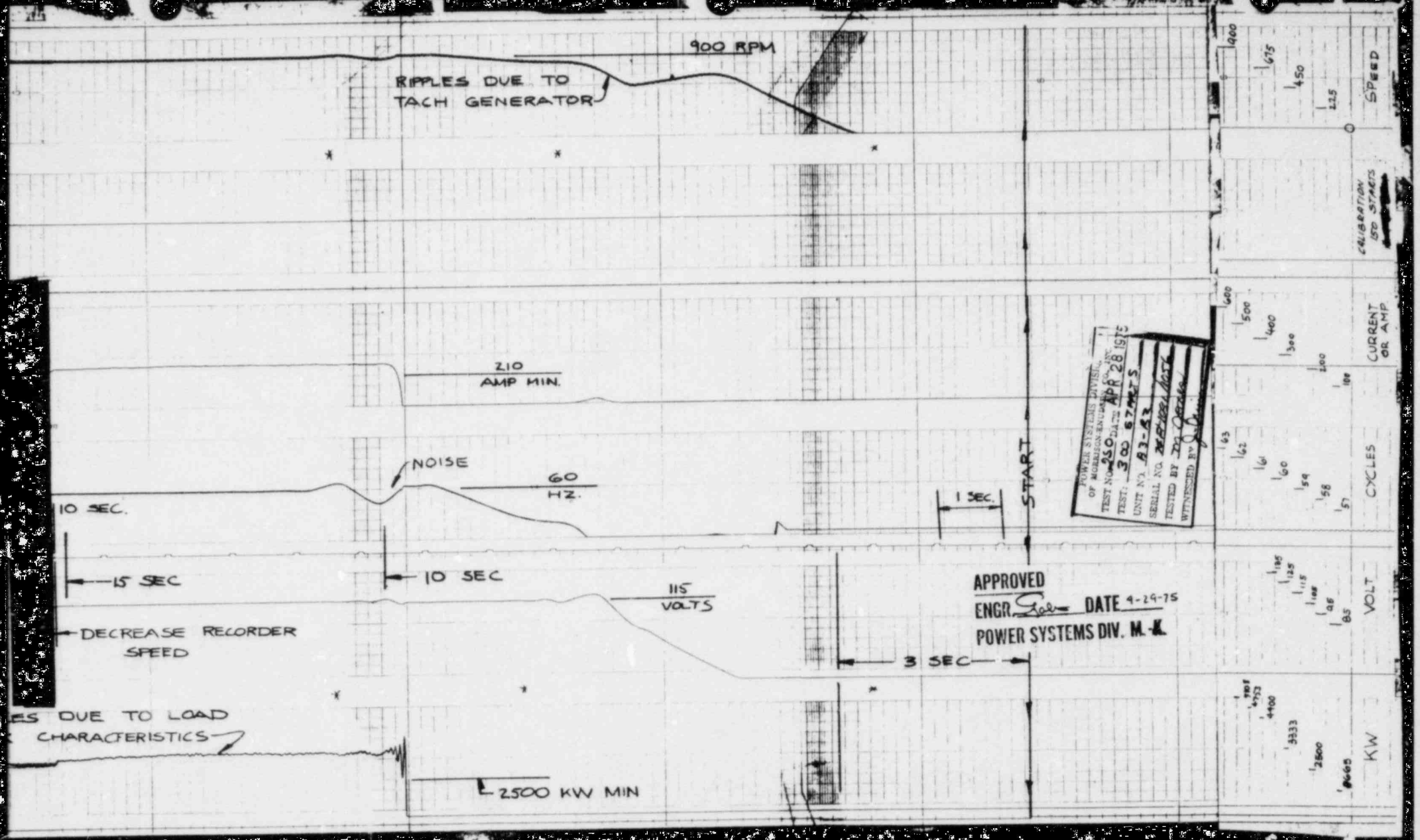
Interval	Time	Exhaust Back Press. Inches H2O		Intake Suction Inches H2O		L.O. Press.		F.O. Press.	
		A	B	A	B	A	B	A	B
	3:43								
2 min.	3:45	5	6	5.2	5.8	101	106	72	72
4 min.	3:47	5	6.1	5.2	5.8	94	100	72	72
8 min.	3:51	5	6.2	5.1	5.8	88	92	72	72
15 min.	3:57	5.2	6.2	5	5.8	84	88	72	74

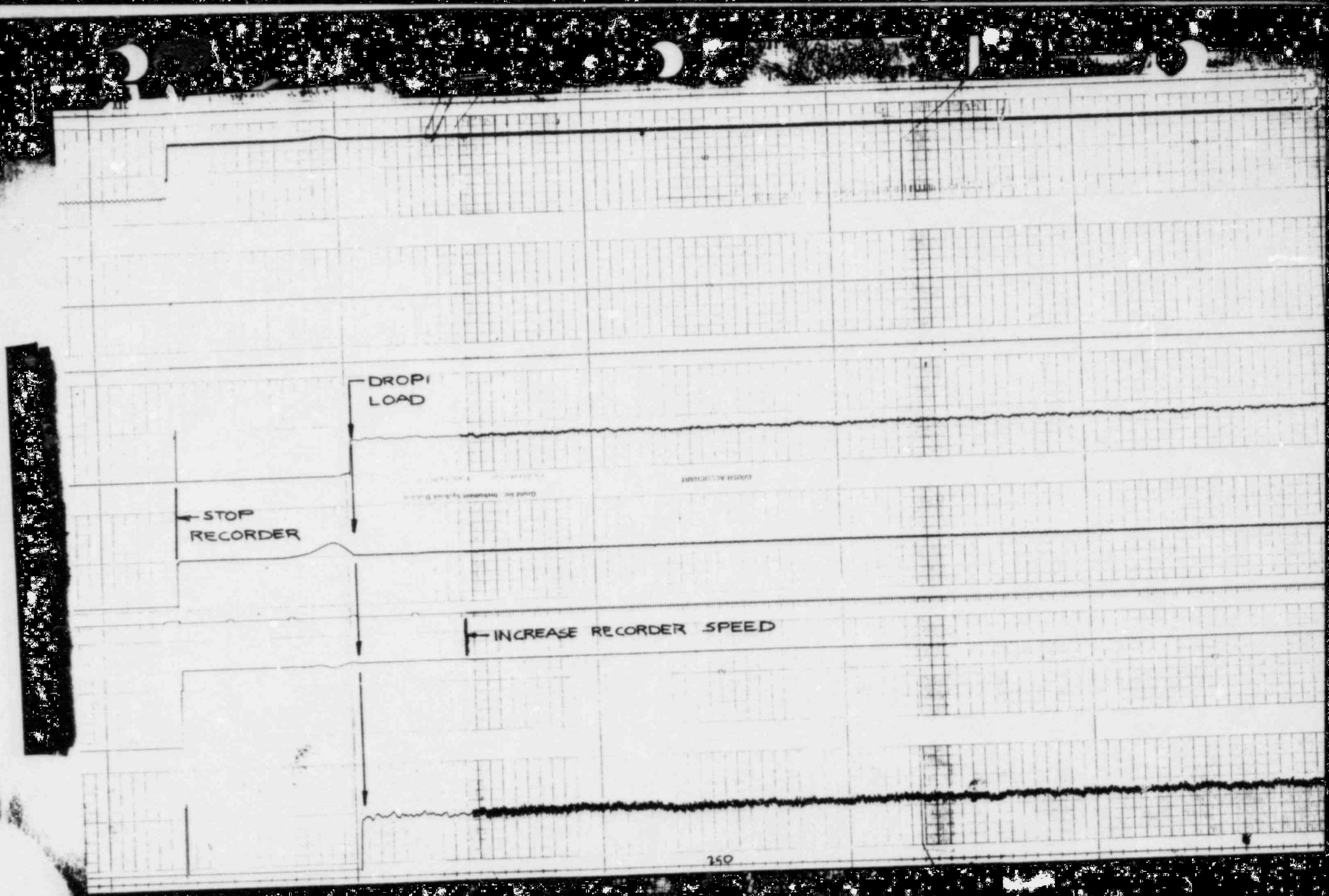
REMARKS

TEST TECHNICIAN C. Stricklin

PSD QC Ken Lewis

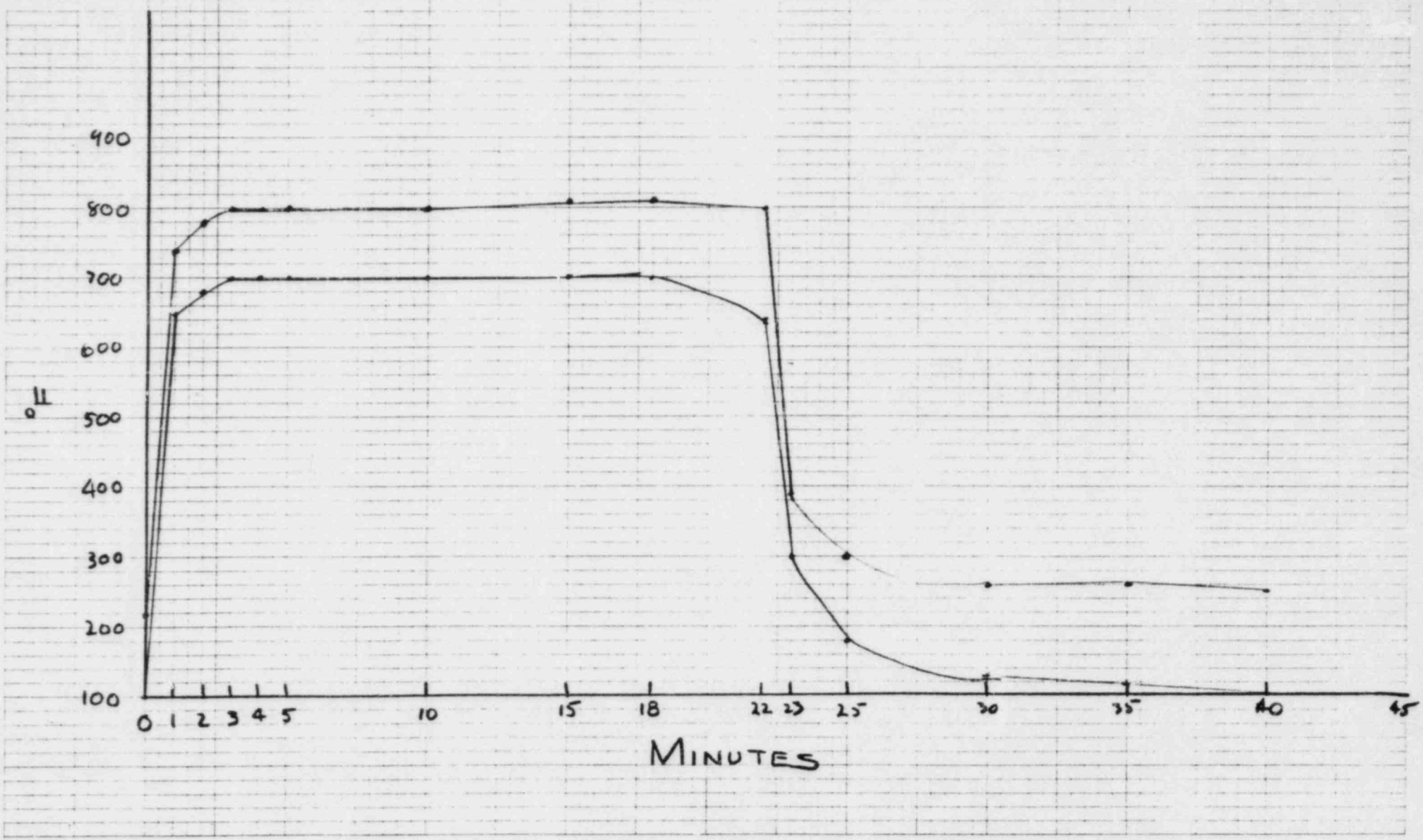
WITNESS

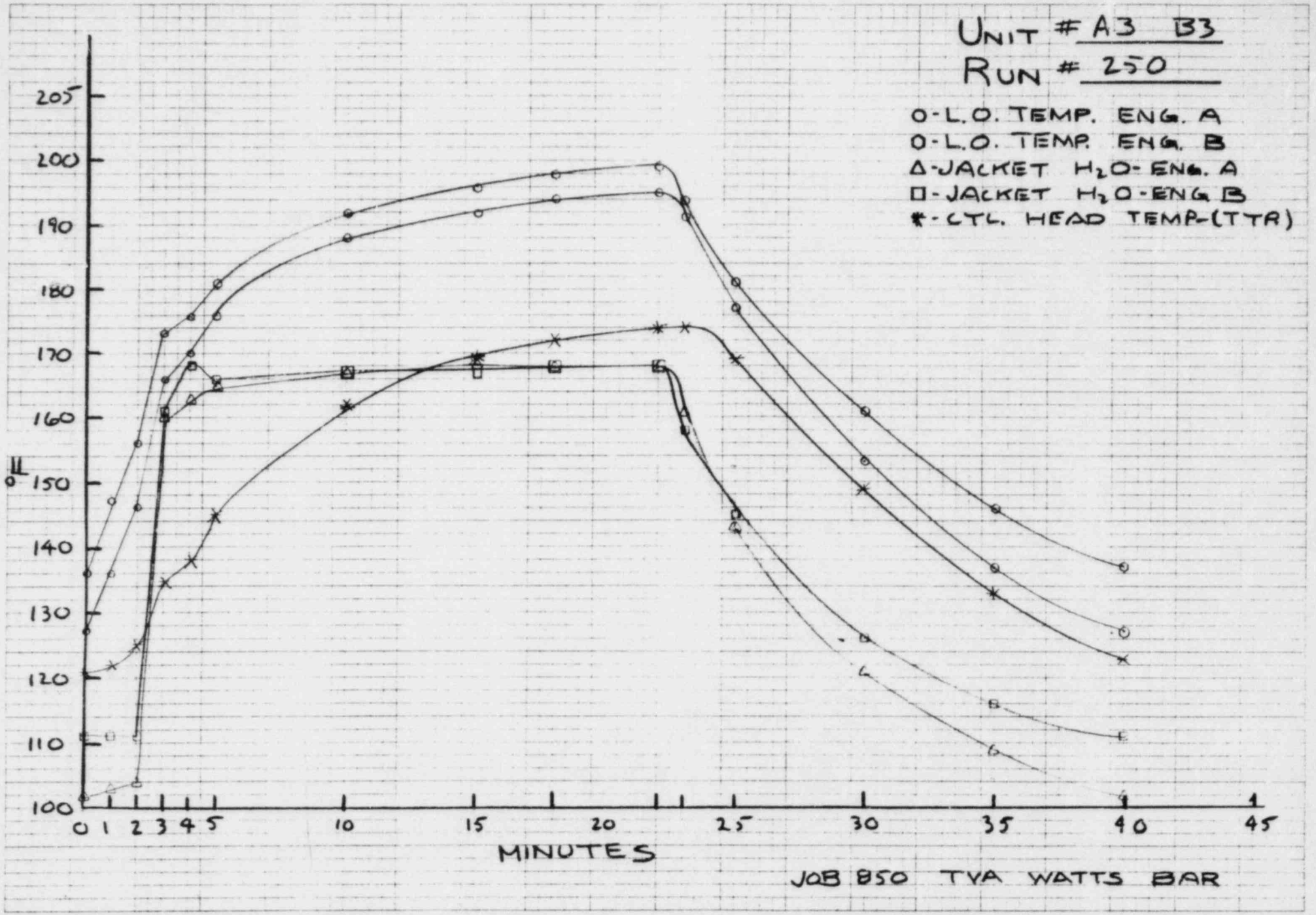

900 RPM
RIPPLES DUE TO TACH GENERATOR
210 AMP MIN.
NOISE
60 HZ.
10 SEC.
15 SEC
10 SEC
115 VOLTS
DECREASE RECORDER SPEED
ES DUE TO LOAD CHARACTERISTICS
2500 KW MIN
1 SEC.
START
3 SEC
APPROVED
ENGR. [illegible] DATE 4-29-75
POWER SYSTEMS DIV. M-E
POWER SYSTEMS DIVISION OF MORRISON-KNUDSEN CO., INC.
TEST NO. 250 DATE APR 28 1975
TEST: 300 67MTS
UNIT NO. A3-A3
SERIAL NO. [illegible]
TESTED BY [illegible]
WITNESSED BY [illegible]
SPEED
CALIBRATION 10 STEPS
CURRENT OR AMP
CYCLES
VOLT
KW


DROP
LOAD
STOP
RECORDER
INCREASE RECORDER SPEED

Exhaust Gas Temperature
High and Low Temperature

Unit # A3 B3
Run # 250





POWER SYSTEMS
DIVISION OF MORRISON-KNUDSEN COMPANY, INC.

P. O. BOX 1928 • ROCKY MOUNT, N. C. 27801 • TELEPHONE (919) 977-2720

PRESTART LOG SHEET

Unit # A3 B3 Test # 250 Date APR 28 1975.

		A	QC	B	QC
Ambient Temperature	63				
Barometer Reading	29.99				
Humidity	86				
Hot Leg L.O. Temp.		127		136	
Hot Leg. J.W. Temp.		102		111	
DC Supply Voltage	124				
Auto-Start Position	m.g.				
Lube Oil Stand-by Press		20		22	
Pressure in Air Tanks	230				

Pressure in Air Tanks immediately after start: 210

Remarks -

Test Technician M. Jones

PSD QC J. Cruse

Witness _____

POWER SYSTEMS
DIVISION OF MORRISON-KNUDSEN COMPANY, INC.

START LOG SHEET

UNIT# A3 B3 TEST# 250 DATE APR 28 1975

Interval	Time	A.C. Volt			A.C. Amp			Freq.	KW
		A	B	C	A	B	C		
1 min.	6:37	6900	6900	6900	270	280	270	60	3333
5 min.	6:41	6900	6900	6900	270	280	270	60	3333
10 min.	6:46	6900	6900	6900	270	280	270	60	3333
15 min.	6:51	6900	6900	6900	270	280	270	60	3333

Success	Void	Failure

TEST TECHNICIAN M. Jones

PSD QC J. Dines

WITNESS _____

REMARKS

POWER SYSTEMS
DIVISION OF MORRISON-KNUDSEN COMPANY, INC.

START LOG SHEET

Unit A3-B3 -A/B Test # 250 -Date APR 28 1975

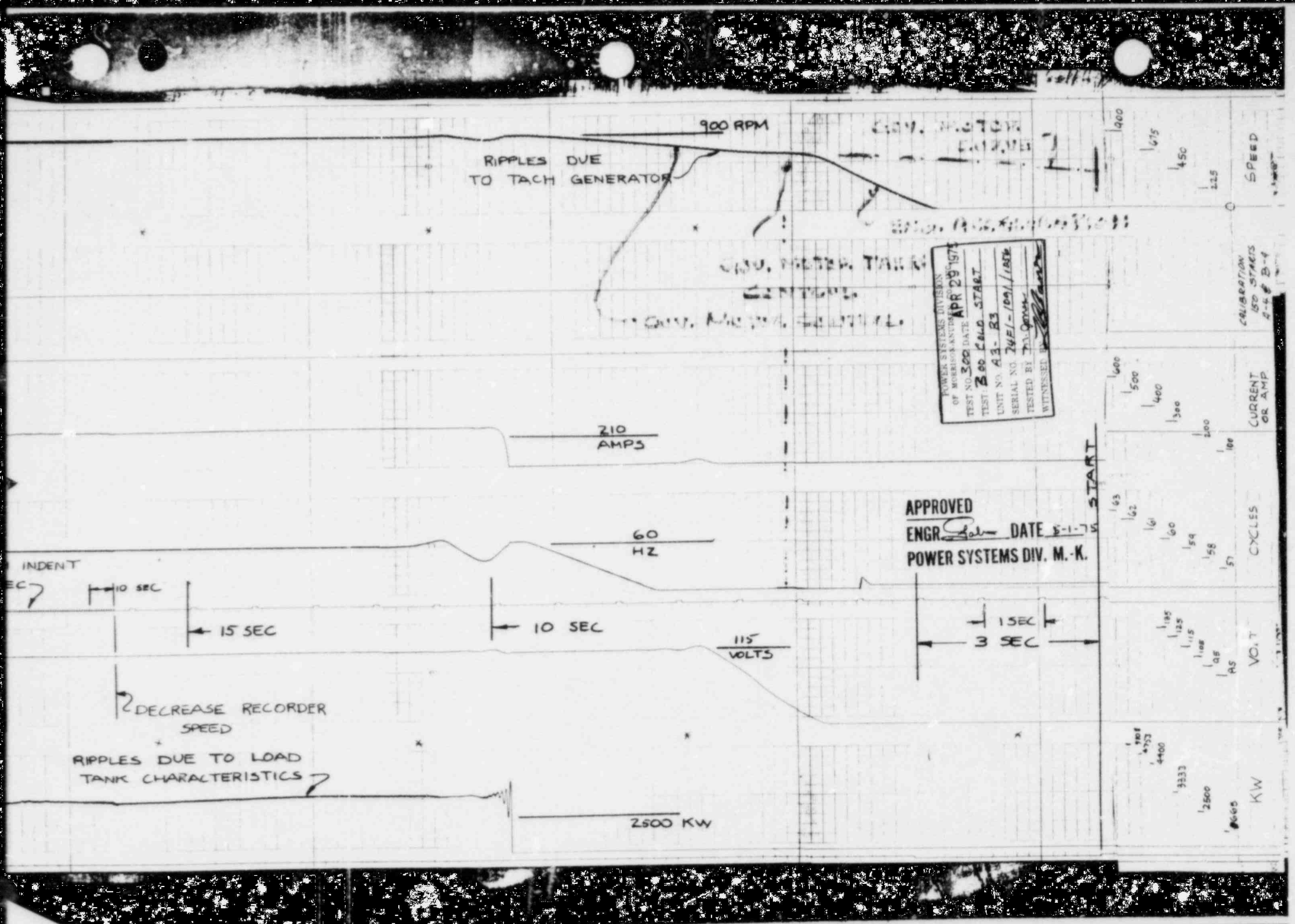
Interval	Time	Exhaust Back Press. Inches H2O		Intake Suction Inches H2O		L.O. Press.		F.O. Press.	
		A	B	A	B	A	B	A	B
—	6:36	—	—	—	—	—	—		
2 min.	6:38	5	6.2	5.1	5.6	96	100	70	70
4 min.	6:40	5	6.2	5.1	5.6	92	98	70	70
8 min.	6:44	5	6.2	5.1	5.6	88	92	70	70
15 min.	6:51	5	6.3	5.1	5.6	84	88	70	70

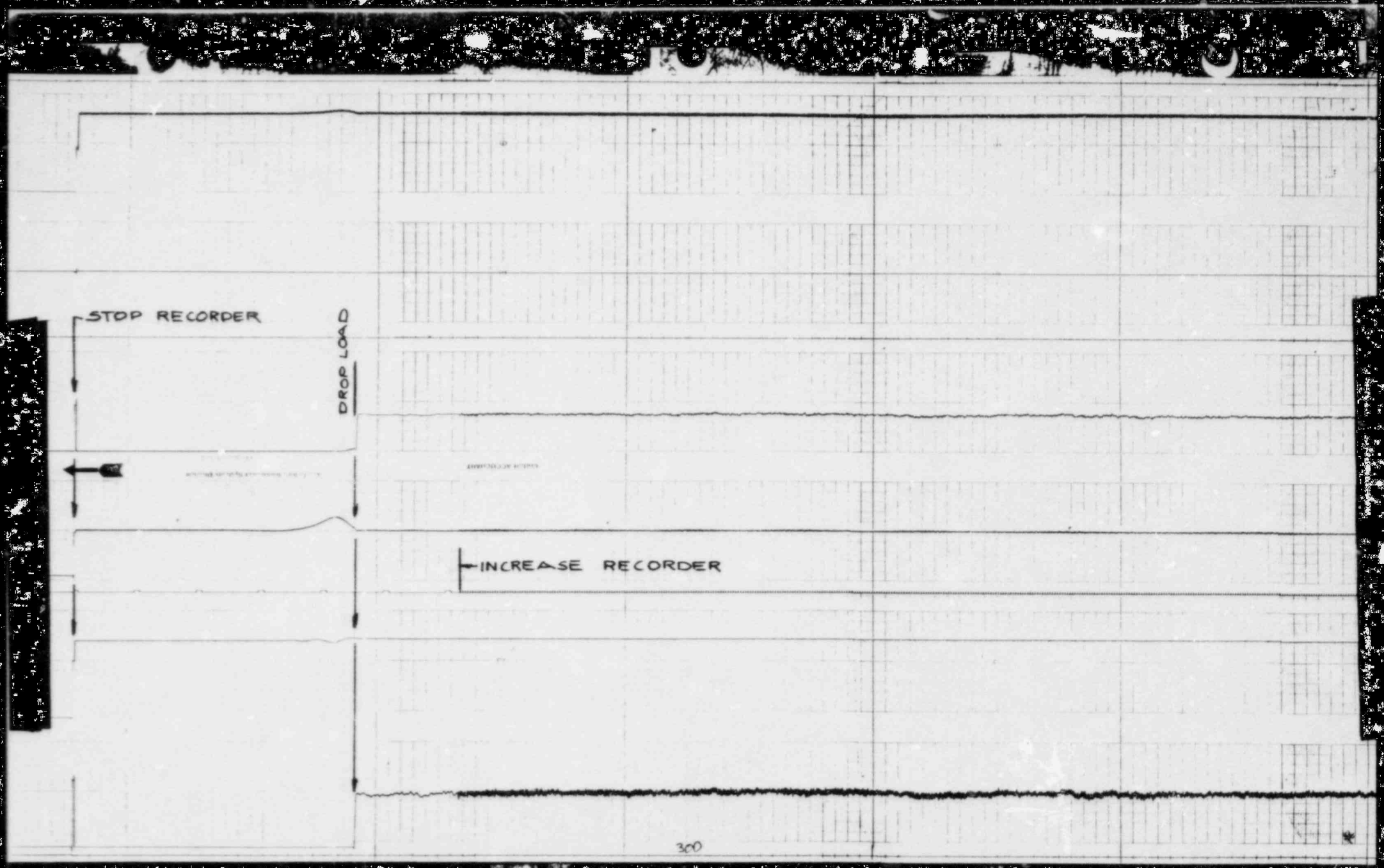
REMARKS

TEST TECHNICIAN M. Jones

PSD QC J-Drive

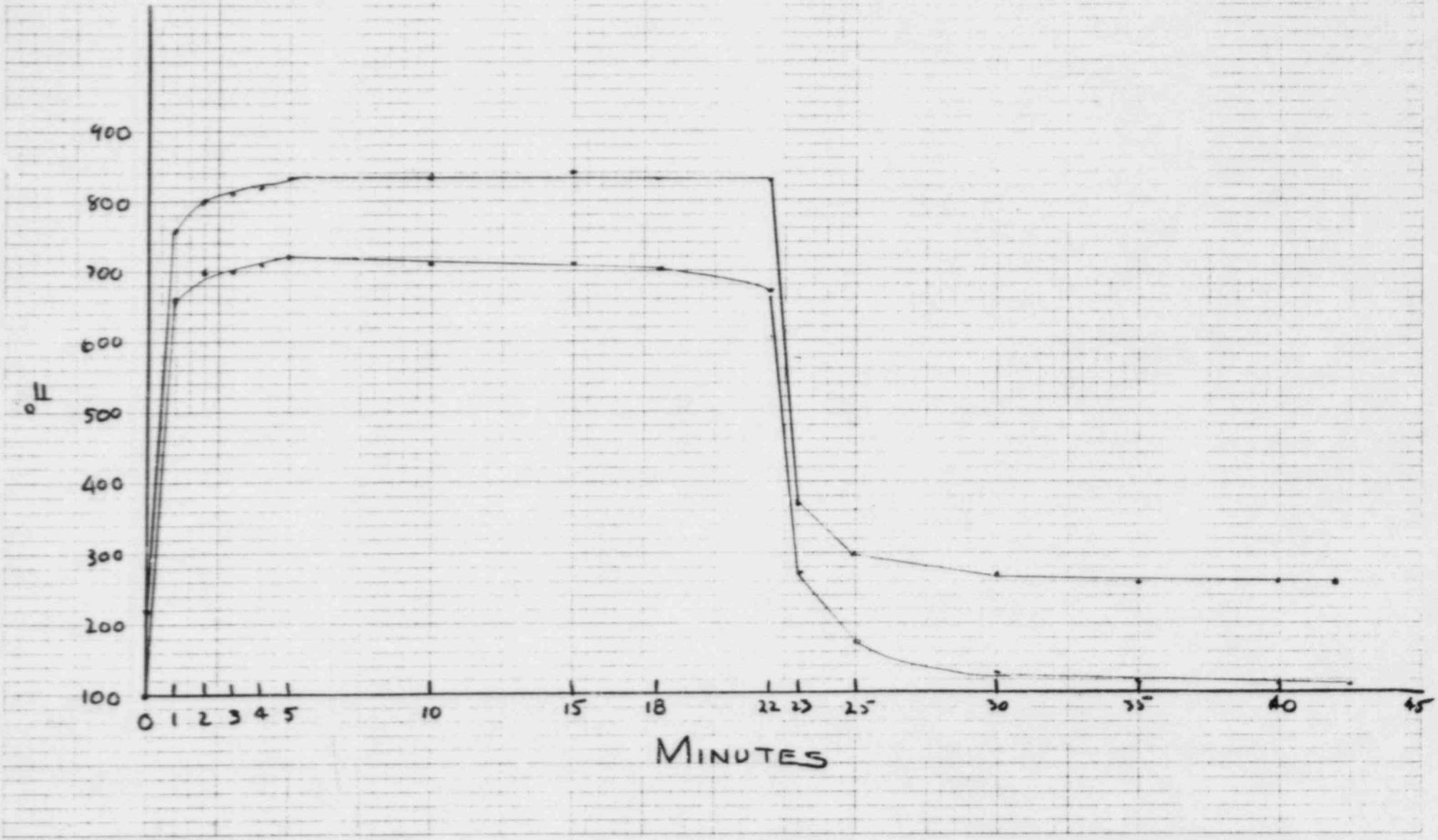
WITNESS

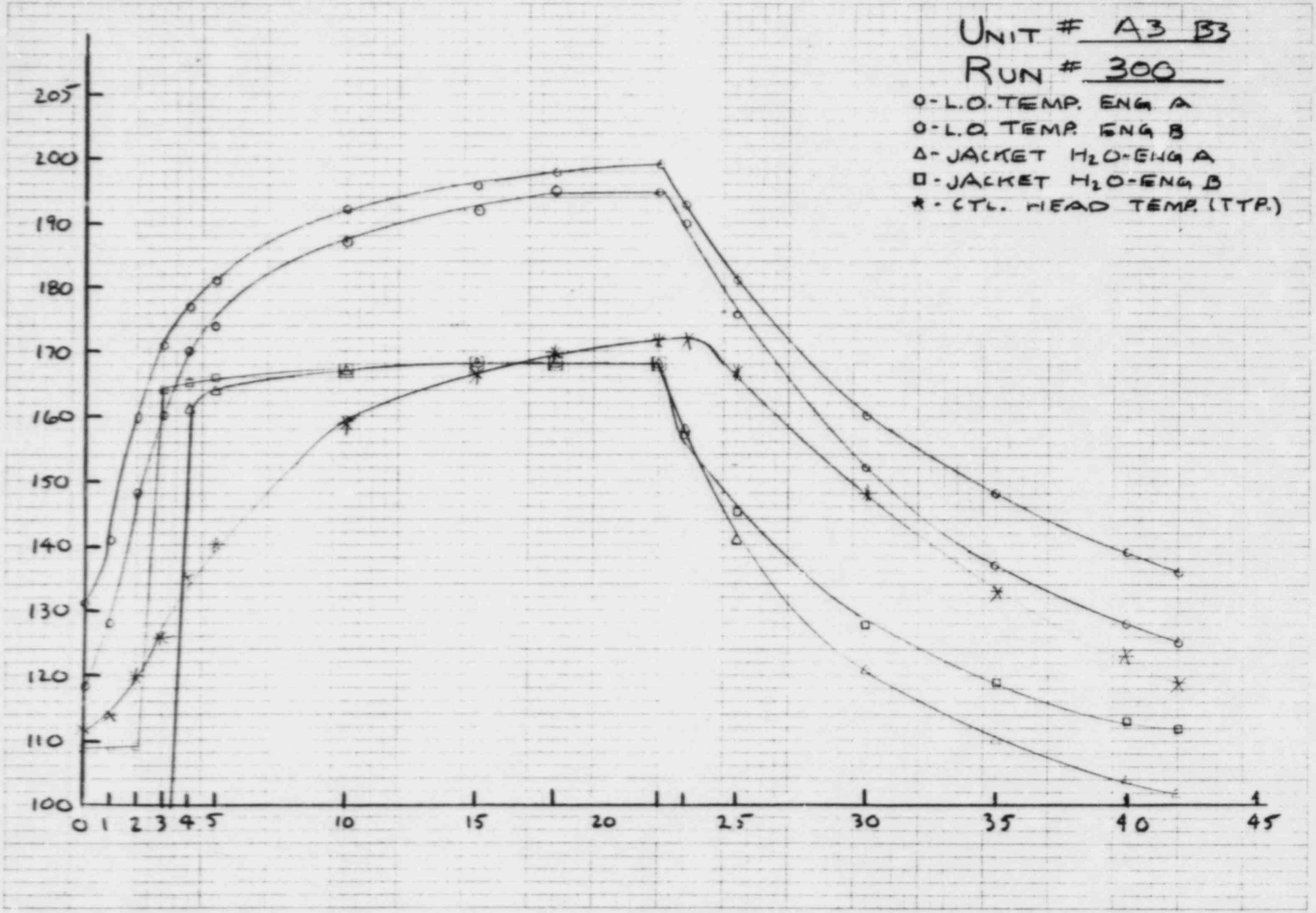

900 RPM
RIPPLES DUE
TO TACH GENERATOR
POWER SYSTEMS DIVISION
OF MORRISON-KNUDSEN
TEST NO 300 DATE APR 29 1974
TEST 300 Cold START
UNIT NO A3-83
SERIAL NO 74EL-109/1158
TESTED BY
WITNESSED BY
210
AMPS
60
HZ
115
VOLTS
APPROVED
ENGR
DATE 5-1-74
POWER SYSTEMS DIV. M.-K.
START
INDENT
10 SEC
15 SEC
10 SEC
1 SEC
3 SEC
DECREASE RECORDER
SPEED
RIPPLES DUE TO LOAD
TANK CHARACTERISTICS
2500 KW
SPEED
CURRENT
OR AMP
CYCLES
VOLT
KW


STOP RECORDER
DROP LOAD
INCREASE RECORDER
300

Exhaust Gas Temperature
High and Low Temperatures

Unit # A3 B3
Run # 300




UNIT # A3 B3
RUN # 300
O - L.O. TEMP. ENG A
O - L.O. TEMP. ENG B
Δ - JACKET H_2O - ENG A
□ - JACKET H_2O - ENG B
* - CTL. HEAD TEMP. (TTP.)
205
200
190
180
170
160
150
140
130
120
110
100
0 1 2 3 4 5 10 15 20 25 30 35 40 45

POWER SYSTEMS
DIVISION OF MORRISON-KNUDSEN COMPANY, INC.

P. O. BOX 1928 • ROCKY MOUNT, N. C. 27801 • TELEPHONE (919) 977-2720

PRESTART LOG SHEET

Unit # A3 B3 Test # 300 Date APR 29 1975

		A QC		B QC
Ambient Temperature	69			
Barometer Reading	30.01			
Humidity	22			
Hot Leg L.O. Temp.		118		131
Hot Leg. J.W. Temp.		98		109
DC Supply Voltage	124			
Auto-Start Position	mg			
Lube Oil Stand-by Press		20		22
Pressure in Air Tanks	220			

Pressure in Air Tanks immediately after start: 200 PSI

Remarks -

Test Technician M. Jones

PSD QC

Witness

POWER SYSTEMS
DIVISION OF MORRISON-KNUDSEN COMPANY, INC.

START LOG SHEET

UNIT# A3 B3 TEST# 300 DATE APR 29 1975

Interval	Time	A.C. Volt			A.C. Amps			Freq.	KW
		A	B	C	A	B	C		
1 min.	11:05 PM	6900	6900	6900	270	280	270	60	3333
5 min.	11:09	6900	6900	6900	270	280	270	60	3333
10 min.	11:14	6900	6900	6900	270	280	270	60	3333
15 min.	11:19	6900	6900	6900	270	280	270	60	3333

Success	Void	Failure
✓		

TEST TECHNICIAN M. Jones

PSD QC

WITNESS

REMARKS

POWER SYSTEMS
DIVISION OF MORRISON-KNUDSEN COMPANY, INC.

START LOG SHEET

Unit A2 B2 -A/B Test # 300 -Date APR 29 1975

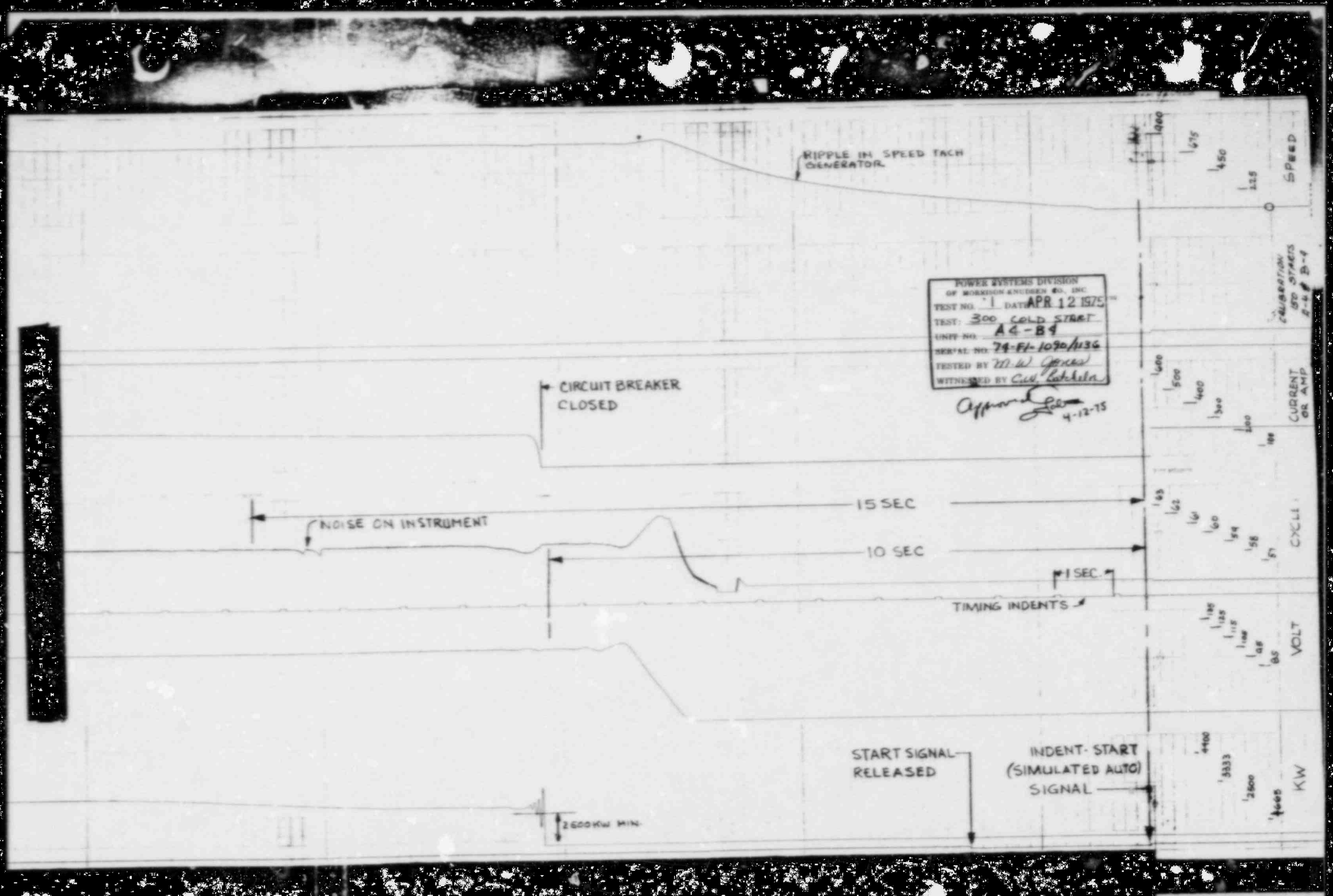
Interval	Time	Exhaust Back Press. Inches H2O		Intake Suction Inches H2O		L.O. Press.		F.O. Press.	
	11:04 AM	A	B	A	B	A	B	A	B
2 min.	11:06 PM	5.0	6.0	5.4	5.8	100	104	70	70
4 min.	11:08	5.0	6.2	5.2	5.8	92	98	70	70
8 min.	11:12	5.0	6.4	5.1	5.8	88	92	70	70
15 min.	11:19	5.4	6.4	5.2	5.8	86	90	70	70

REMARKS

TEST TECHNICIAN M. Jones

PSD QC L. Burns

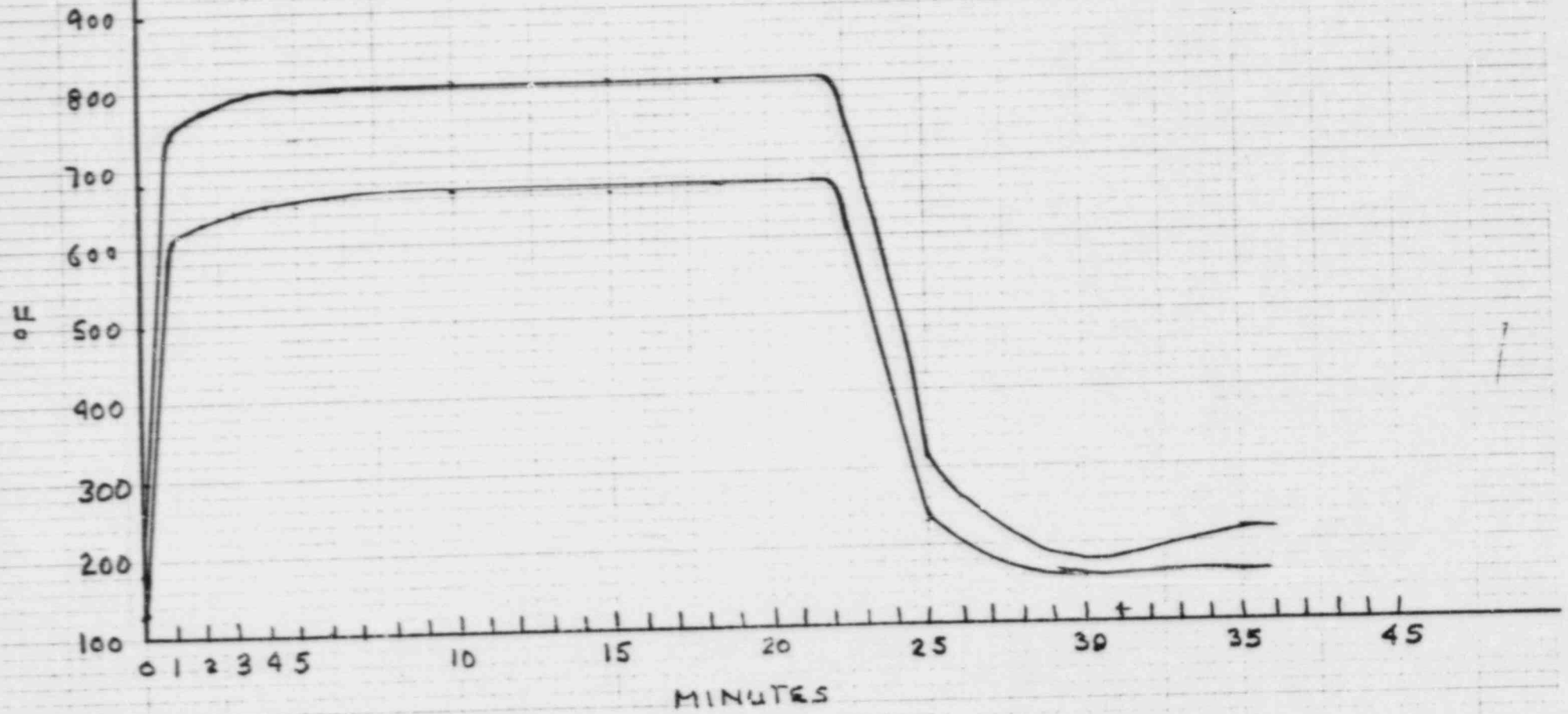
WITNESS _____

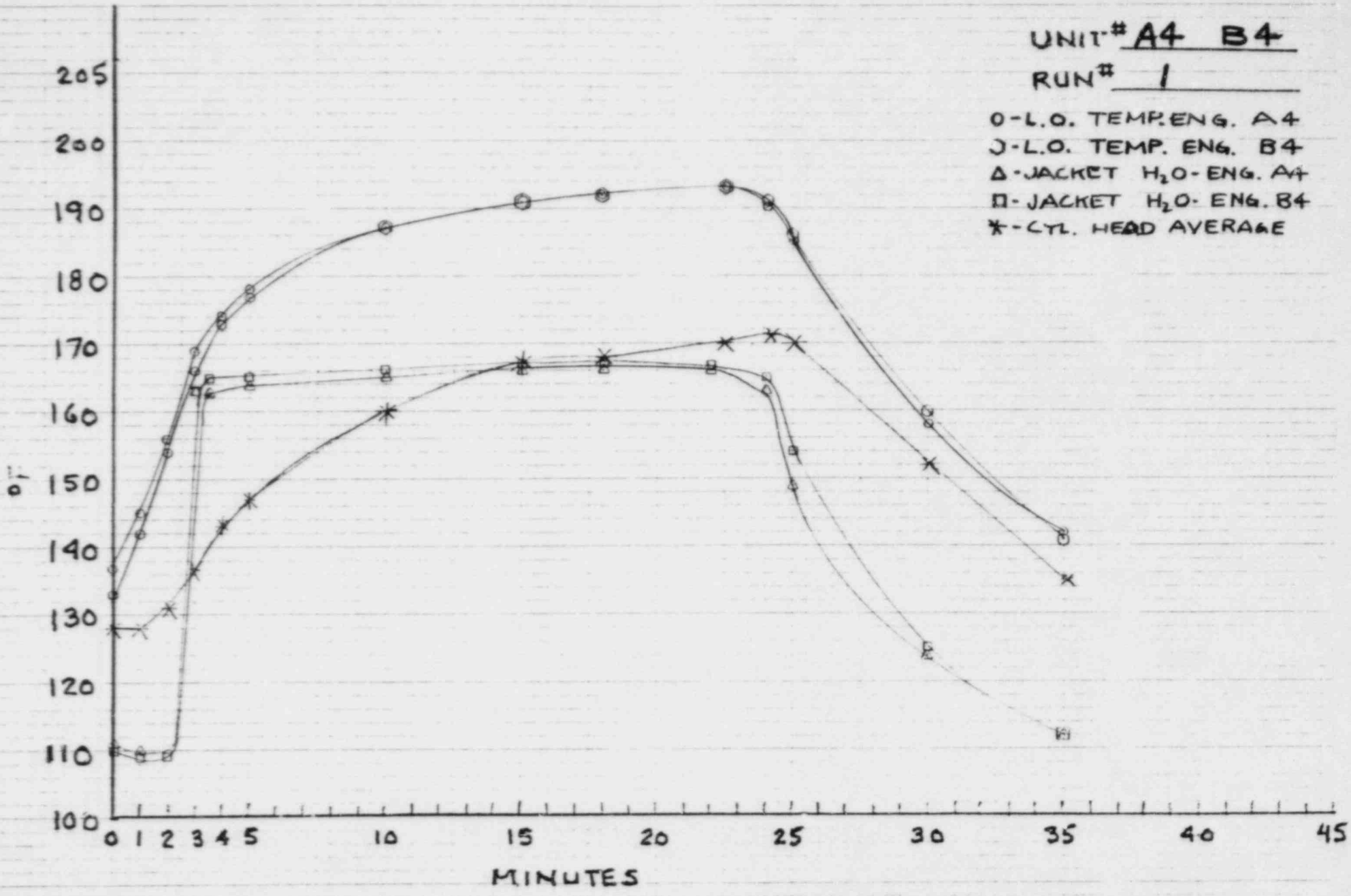

RIPPLE IN SPEED TACH GENERATOR
POWER SYSTEMS DIVISION
OF MORRISON-KNUDSEN CO., INC.
TEST NO. 1 DATE APR 12 1975
TEST: 300 COLD START
UNIT NO. A4-B4
SERIAL NO. 74-FI-1090/1136
TESTED BY W. W. Jones
WITNESSED BY Cliff Batchelor
4-12-75
CIRCUIT BREAKER CLOSED
15 SEC
NOISE ON INSTRUMENT
10 SEC
1 SEC
TIMING INDENTS
START SIGNAL RELEASED
INDENT-START (SIMULATED AUTO) SIGNAL
2600KW MIN.
SPEED
CURRENT OR AMP
VOLT
KW

UNIT # A4 B4

RUN # 1

EXHAUST GAS TEMPERATURE
HIGH AND LOW TEMPERATURES




UNIT # A4 B4
RUN # 1
O - L.O. TEMP. ENG. A4
J - L.O. TEMP. ENG. B4
Δ - JACKET H2O - ENG. A4
□ - JACKET H2O - ENG. B4
* - CYL. HEAD AVERAGE
°F
205
200
190
180
170
160
150
140
130
120
110
100
0 1 2 3 4 5 10 15 20 25 30 35 40 45
MINUTES
JOB 850 TVA WATTS BAR

POWER SYSTEMS
DIVISION OF MORRISON-KNUDSEN COMPANY, INC.
P. O. BOX 1928 • ROCKY MOUNT, N. C. 27801 • TELEPHONE (919) 977-2720

PRESTART LOG SHEET

Unit # 1 Test # 1 Date APR 12 1975

		A QC	B QC
Ambient Temperature	56		
Barometer Reading	30.00		
Humidity	56		
Hot Leg L.O. Temp.		137	133
Hot Leg. J.W. Temp.		111	110
DC Supply Voltage	123		
Auto-Start Position			
Lube Oil Stand-by Press		14	16
Pressure in Air Tanks	225		

Pressure in Air Tanks immediately after start 195

Remarks -

Test Technician M. W. Jones

PSD QC C W Batchelor

Witness

POWER SYSTEMS
DIVISION OF MORRISON-KNUDSEN COMPANY, INC.

START LOG SHEET

UNIT# 1 TEST# 1 DATE April 12, 1975

Interval	Time	A.C. Volt			A.C. Amp			Freq.	KW
		A	B	C	A	B	C		
1 min.	1:41	6900	6900	6900	280	290	280	60	3333
5 min.	1:45	6900	6900	6900	280	290	280	60	3333
10 min.	1:50	6900	6900	6900	280	290	280	60	3333
15 min.	1:55	6900	6900	6900	280	290	280	60	3333

Success	Void	Failure
✓		

TEST TECHNICIAN M. W. Jones

PSD QC C W Schulz

WITNESS _____

REMARKS

POWER SYSTEMS
DIVISION OF MORRISON-KNUDSEN COMPANY, INC.

START LOG SHEET

Unit 1 -A/B Test # 1 -Date APR 12 1975

Interval	Time	Exhaust Back Press. Inches H2O		Intake Suction Inches H2O		L.O. Press.		F.O. Press.	
		A	B	A	B	A	B	A	B
	1:40								
2 min.	1:42	4.3	5.0	5.5	5.7	90	92	43	52
4 min.	1:44	4.3	5.2	5.4	5.7	85	90	43	50
8 min.	1:48	4.4	5.3	5.4	5.7	80	88	43	52
15 min.	1:55	4.5	5.4	5.4	5.6	78	84	43	52

REMARKS

TEST TECHNICIAN M. W. Jones

PSD QC C. Batchelder

WITNESS

The power unit consists of two (2) EMD diesel engines, a 16-645E4, driving one (1) Electric Products generator coupled with EMD tandem couplings, forming a diesel-generator assembly.

1. Electric Products

   Generator Output Capability @ 0.8 Power Factor:

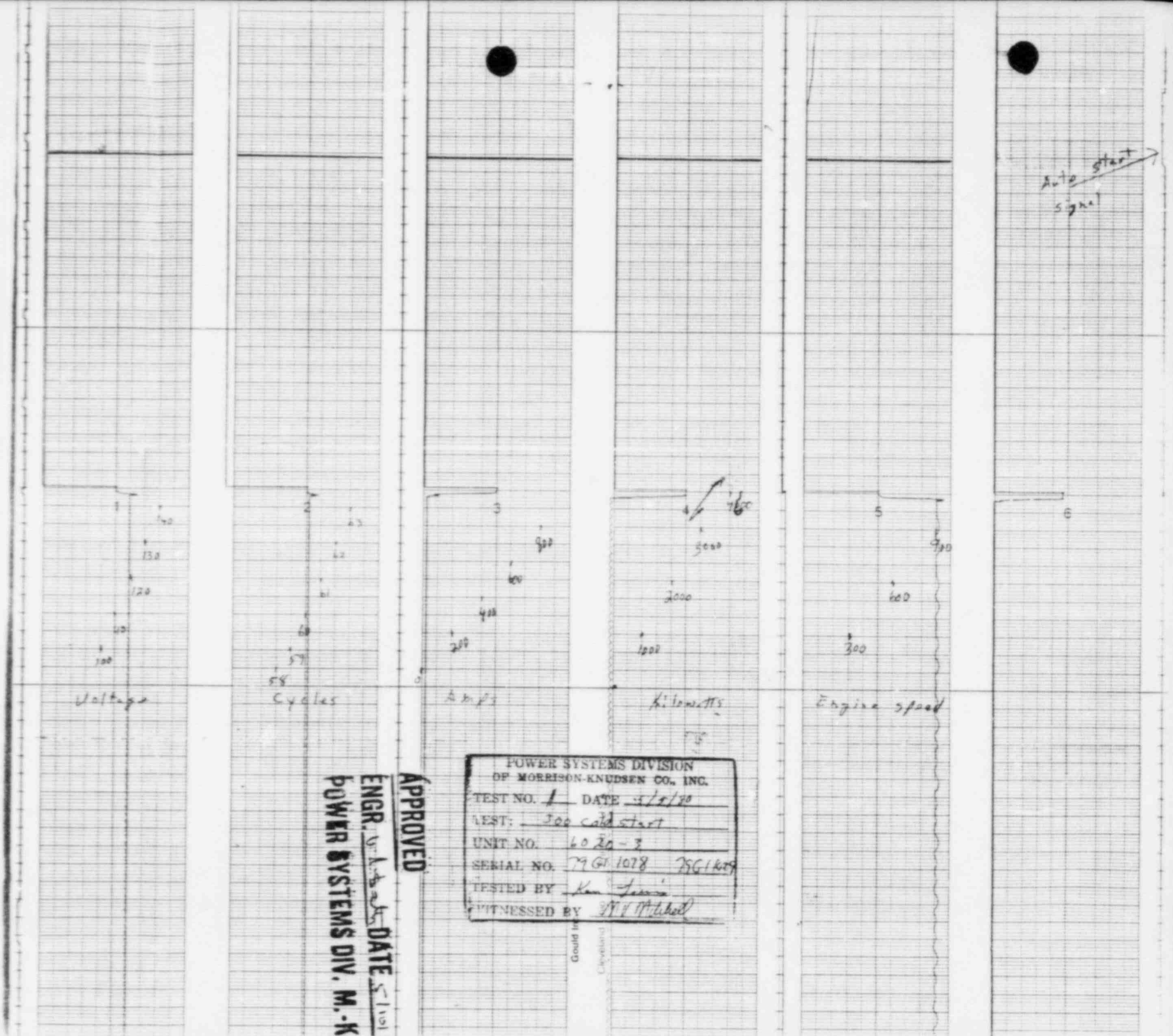
Continuous:	3676 KW
2000 Hours:	3970 KW
½ Hour:	4212 KW

   Generator Rating:

   Continuous: 3676 KW, 4595 KVA, 4160 Volts, 3 Phase, 60 Hertz, 900 RPM, 0.8 Power Factor

2. Electric Products Static Excitation

3. Governor System - Woodward 2310 Control EGB10/13P Actuators



POWER SYSTEMS DIVISION
OF MORRISON-KNUDSEN CO., INC.
TEST NO. 1 DATE 5/2/70
TEST: 300 cold start
UNIT NO. 60 Hz - 3
SERIAL NO. 79 G1 1078 75G1409
TESTED BY Ken Jones
WITNESSED BY W H Mitchell

APPROVED
ENGR. [illegible] DATE [illegible]
POWER SYSTEMS DIV. M.-K.

Rev. 5
4/23/80

START[illegible] SHEET
START 1

IWO #6020
UNIT #6020-3

ENGINE SERIAL # A. 79G1 1078 B. 79G1 1029 DATE: 5/5/80

RUNNING DATA LOG

INTER-VAL	TIME	EXH. BACK PRESS. INCH OF H_2O		INTAKE AIR SUCTION PRESS. INCH OF H_2O		FUEL OIL PRESS. PI-63A/B		LUBE OIL PRESS. PI-31A/B		LUBE OIL TEMP. TI-35A/B		JACKET WATER TEMP. TI-45A/B		EXHAUST TEMP. DIFF. WITHIN 200°F 220°F JW 5/4/80		REMARKS
		A	B	A	B	A	B	A	B	A	B	A	B	A	B	
	11:50	4.6	5	6.2	5.9	49	50	94	97	52°C	51°C	53°C	38°C	✓	✓	CHECK MARK INDICATES THAT DIFFER. TEMP. IS WITHIN REQU. LIMITS
	11:55	4.8	5	6.2	5.9	48	50	87	96	82°C	75°C	76°C	78°C	✓	✓	
	11:58	4.8	5	6.2	5.9	49	50	84	96	96°C	80°C	76°C	75°C	✓	✓	

NOTE: Take readings immediately after applying load and 5 minutes after. If the temperature did not reach minimum operating temperature specified on Page 83, continue operation of unit under load and take readings at 5 minutes intervals or after the minimum operating temperature requirement is met.

-85-

PRE-START DATA:

TEMPERATURES

1. Lube Oil Into Engine (TI-36A/B): (A) 51°C (B) 48°C
2. Lube Oil Out of Engine (TI-35A/B): (A) 60°C (B) 51°C
3. Jacket Water Into Engine (TI-44A/B): (A) 43°C (B) 31°C
4. Jacket Water Out of Engine (TI-45A/B): (A) 43°C (B) 32°C
5. Ambient Air 80°F

PRESSURES

6. Lube Oil (PI-34A/B): (A) 35 (B) 36
7. Starting Air Pressure: PI-70A 165, PI-71A 167, PI-70B 165, PI-71B 162

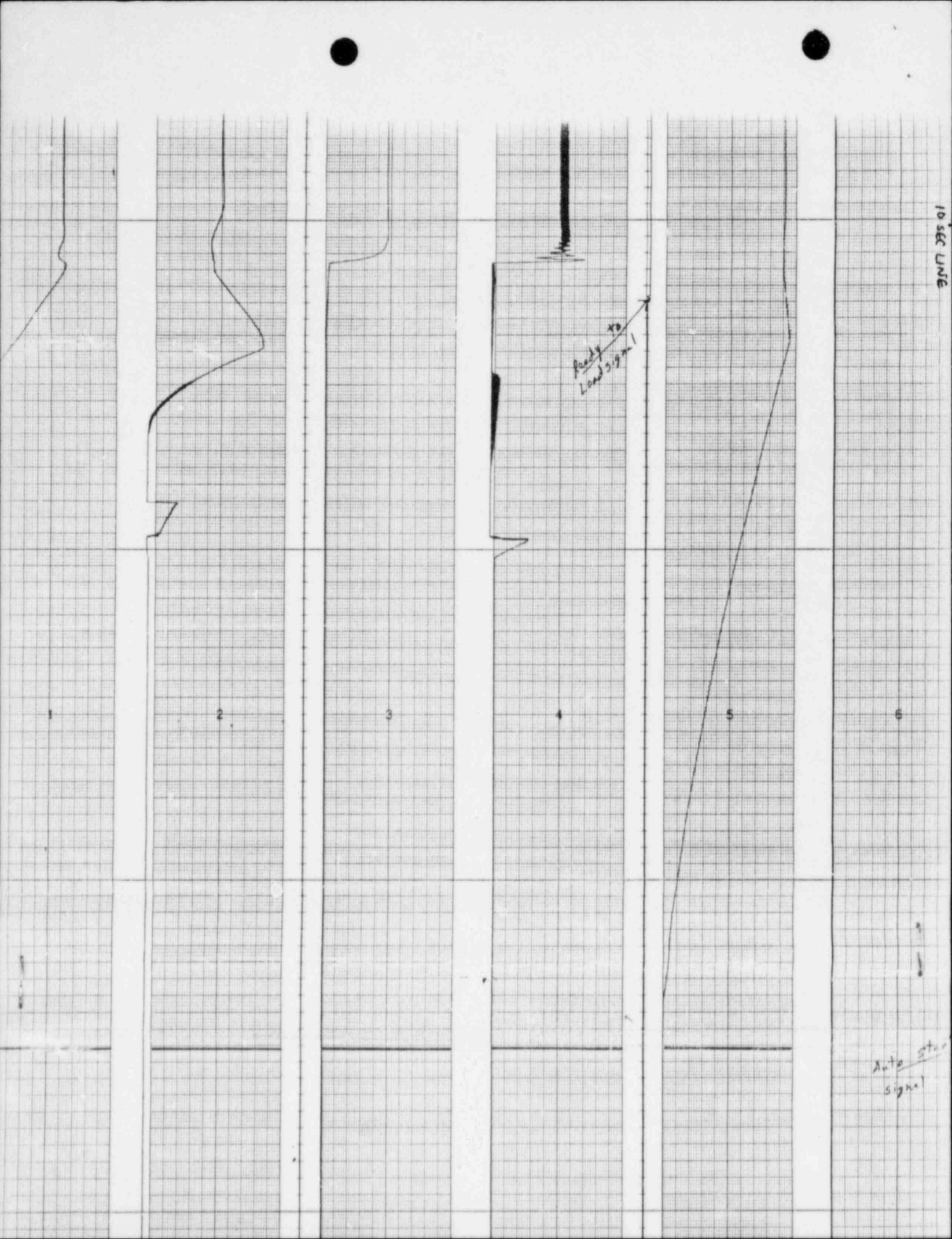
APPROVED
ENGR. [signature] **DATE** 5/10/80
POWER SYSTEMS DIV. M.-K.

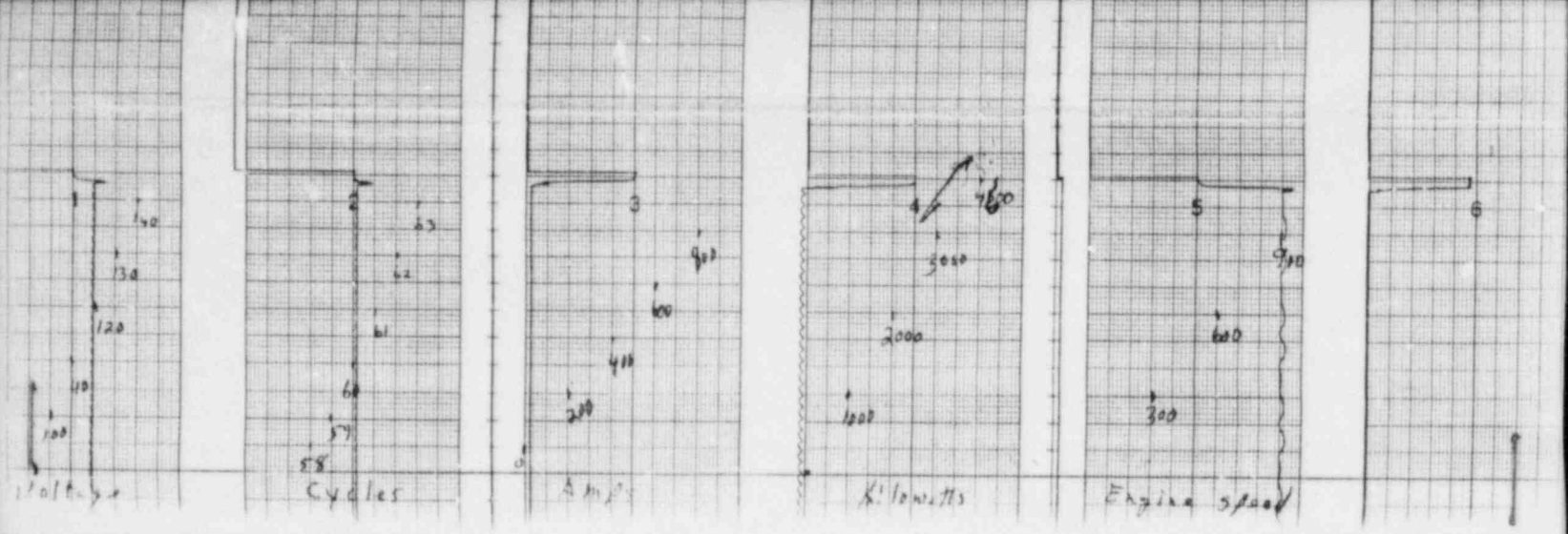
SUCCESS	VOID	FAILURE
✓		

TEST TECHNICIAN: [signature]

PSD QC: [signature]

WITNESS: [signature]


10 sec line
Ready to Load signal
1
2
3
4
5
6
Auto Start signal


1
140
130
120
110
100
Volts
2
63
62
61
60
59
58
Cycles
3
900
600
400
200
0
Amps
4
7500
5000
2000
1000
Kilowatts
5
900
600
300
Engine speed
6

Rev. 5

START LOG SHEET
START # 90

IWO #6020
UNIT #6020-3 ENGINE SERIAL # A. 79G1 1078 B. 79G1 1029 DATE: 5/6/80

RUNNING DATA LOG

INTERVAL MIN.*	TIME	EXH. BACK PRESS. INCH OF H_2O		INTAKE AIR SUCTION PRESS. INCH OF H_2O		FUEL OIL PRESS. PI-63A/B (PSIG)*		LUBE OIL (PSIG)* PRESS. PI-31A/B		($^{\circ}C$)* TEMP. TI-35A/B		JACKET WATER TEMP. ($^{\circ}C$)* TI-45A/B		EXHAUST TEMP. DIFF. WITHIN 220° Fah. *		REMARKS
		A	B	A	B	A	B	A	B	A	B	A	B	A*	B*	
	3:51	4.4	4.6	6.2	5.4	46	48	93	94	50	52	54	49	700 / 628	600 / 560	
5	3:56	4.8	4.9	6.1	5.6	46	49	90	105	78	74	72	74	750 / 700	740 / 700	
3	3:59	4.8	5	6.1	5.6	46	48	86	95	84	80	74	74	780 / 690	740 / 710	

NOTE: Take readings immediately after applying load and 5 minutes after. If the temperature did not reach minimum operating temperature specified on Page 83, continue operation of unit under load and take readings at 5 minutes intervals or after the minimum operating temperature requirement is met.

PRE-START DATA:

TEMPERATURES

1. Lube Oil Into Engine (TI-36A/B): (A) 42 (B) 47 ($^{\circ}C$) *
2. Lube Oil Out of Engine (TI-35A/B): (A) 33 (B) 43 ($^{\circ}C$) *
3. Jacket Water Into Engine (TI-44A/B): (A) 30 (B) 42 ($^{\circ}C$) *
4. Jacket Water Out of Engine (TI-45A/B): (A) 52 (B) 50 ($^{\circ}C$) *
5. Ambient Air 86 ($^{\circ}F$)*

APPROVED
ENGR. [signature] DATE 5/7/80
POWER SYSTEMS DIV. M.-K.

PRESSURES

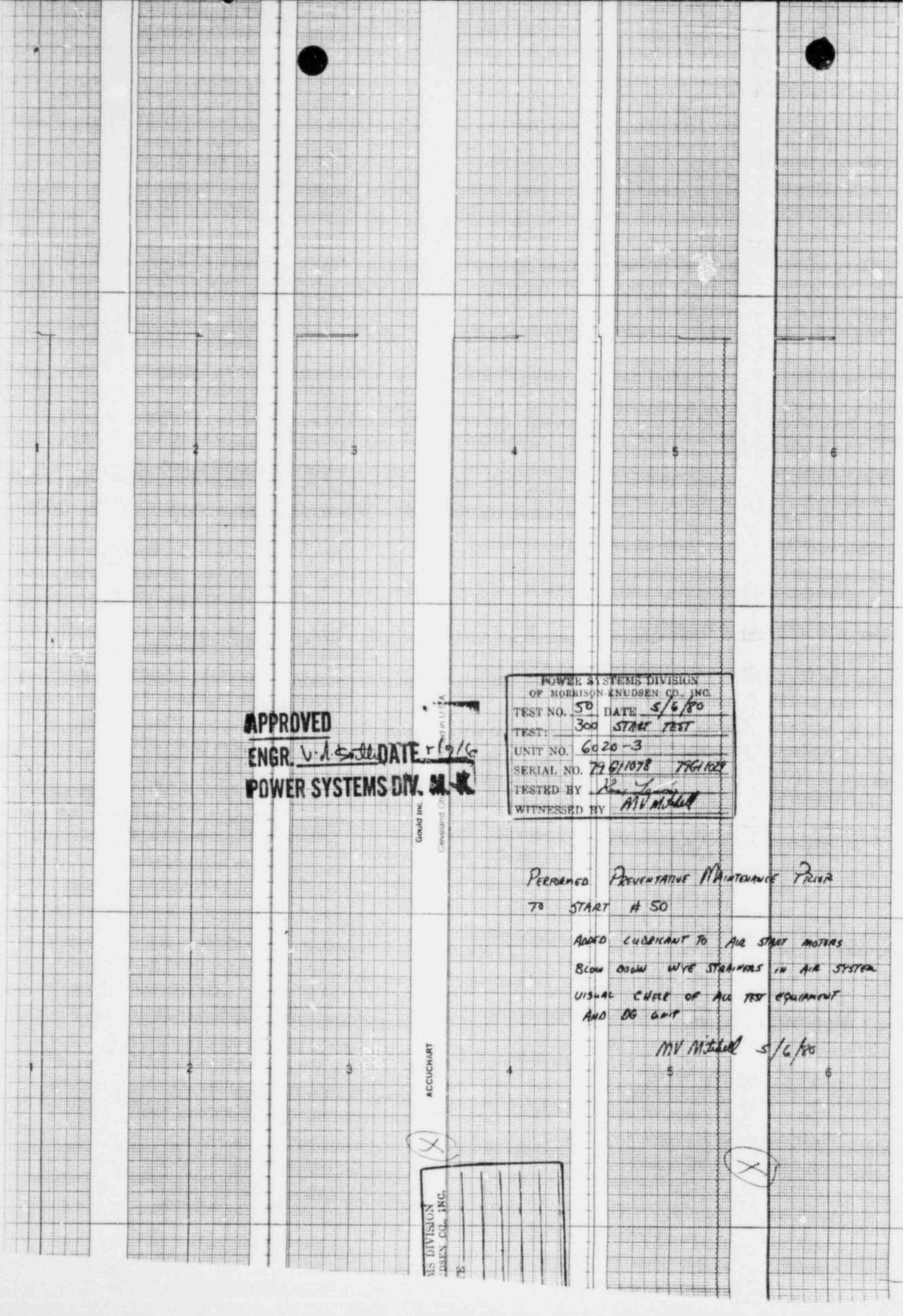
6. Lube Oil (PI-34A/B): PSI (A) 33 (B) 36
7. Starting Air Pressure: PSI PI-70A 187, PI-71A 188, PI-70B 187, PI-71B 187

SUCCESS	VOID	FAILURE
✓		

TEST TECHNICIAN: [signature] PSD QC: MV Mitchell 5/6/80 WITNESS: [signature]

INSPECTED BY [signature] 5

SECTION XIV



APPROVED
ENGR. [illegible] **DATE** [illegible]
POWER SYSTEMS DIV. M.K.

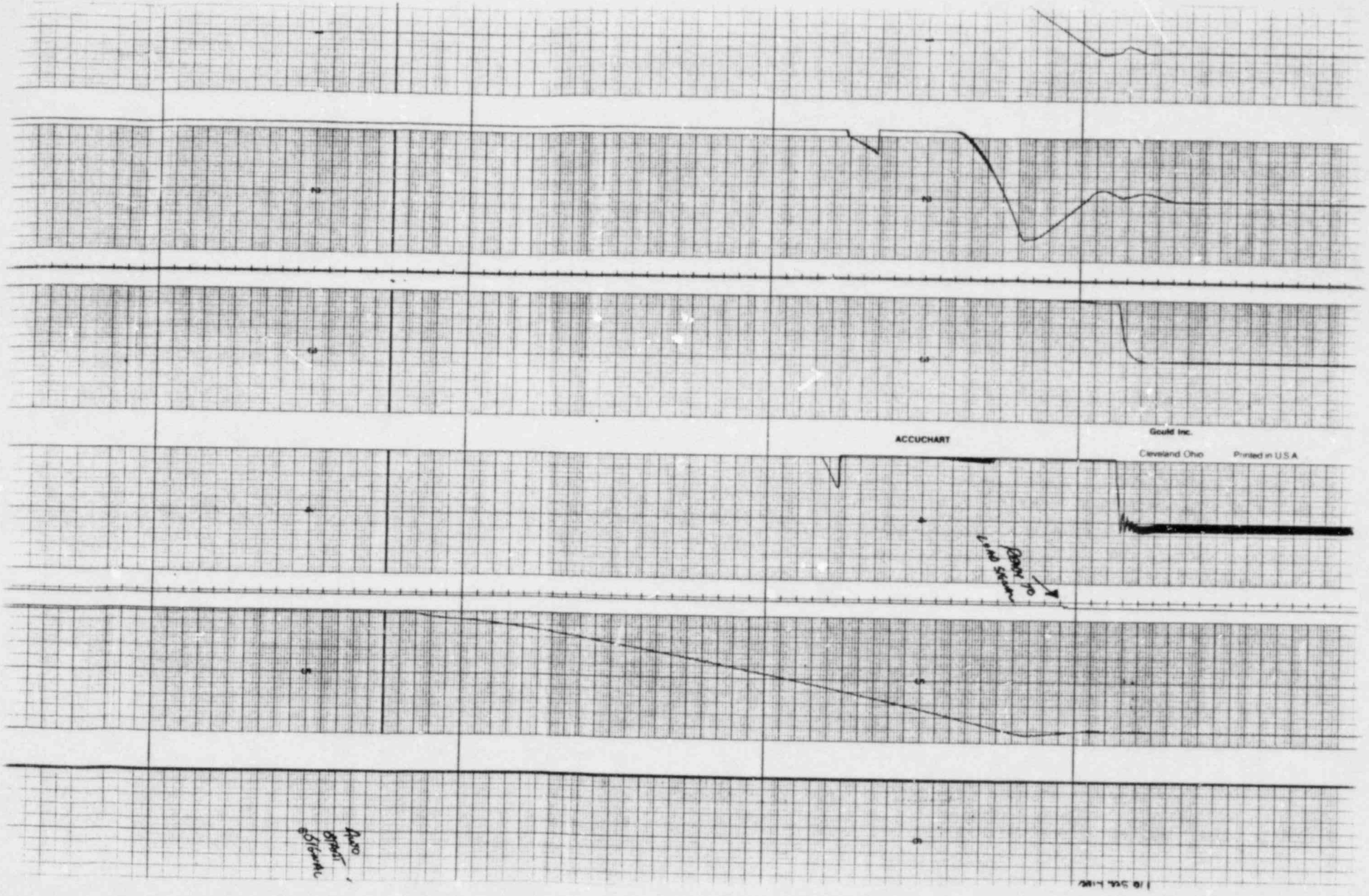
POWER SYSTEMS DIVISION
OF MORRISON-KNUDSEN CO., INC.

TEST NO. 50 DATE 5/6/80
TEST: 300 START TEST
UNIT NO. 6020-3
SERIAL NO. 79G11078 79G11029
TESTED BY [illegible]
WITNESSED BY MV Mitchell

PERFORMED PREVENTATIVE MAINTENANCE PRIOR TO START # 50

ADDED LUBRICANT TO AIR START MOTORS
BLOW DOWN WYE STRAINERS IN AIR SYSTEM
VISUAL CHECK OF ALL TEST EQUIPMENT AND DG UNIT

MV Mitchell 5/6/80


ACCUCHART
Gould Inc.
Cleveland Ohio
Printed in U.S.A.

Rev. 5
1/23/80
Rev. 6, May 5, 1980

START LOG SHEET
START # 101

IWO #6020
UNIT #6020-3 ENGINE SERIAL # A. 79G1 1078 B. 79G1 1029 DATE: 5/7/80

RUNNING DATA LOG

INTER-VAL MIN.*	TIME	EXH. BACK PRESS. INCH OF H_2O		INTAKE AIR SUCTION PRESS. INCH OF H_2O		FUEL OIL PRESS. PI-63A/B (PSIG)*		LUBE OIL (PSIG)* PRESS. PI-31A/B		($^{\circ}C$)* TEMP. TI-35A/B		JACKET WATER TEMP. ($^{\circ}C$)* TI-45A/B		EXHAUST TEMP. DIFF. WITHIN 220° Fah. *		REMARKS
		A	B	A	B	A	B	A	B	A	B	A	B	A*	B*	
	7:10	4.4	4.2	6.4	5.8	47	49	93	100	61	55	48	39	600/580	640/680	
5	7:15	4.4	4.6	6.4	5.7	47	49	89	101	80	74	74	75	760/660	700/740	
3	7:18	4.4	4.6	6.4	5.7	47	48	86	98	85	80	74	74	760/660	720/760	

NOTE: Take readings immediately after applying load and 5 minutes after. If the temperature did not reach minimum operating temperature specified on Page 83, continue operation of unit under load and take readings at 5 minutes intervals or after the minimum operating temperature requirement is met.

PRE-START DATA:

TEMPERATURES

1. Lube Oil Into Engine (TI-36A/B): (A) 52 (B) 52 ($^{\circ}C$) *
2. Lube Oil Out of Engine (TI-35A/B): (A) 60 (B) 55 ($^{\circ}C$) *
3. Jacket Water Into Engine (TI-44A/B): (A) 43 (B) 36 ($^{\circ}C$) *
4. Jacket Water Out of Engine (TI-45A/B): (A) 42 (B) 34 ($^{\circ}C$) *
5. Ambient Air 85 ($^{\circ}F$)*

PRESSURES

6. Lube Oil (PI-34A/B): PSI (A) 34 (B) 35
7. Starting Air Pressure: PSI PI-70A 154, PI-71A 154, PI-70B 154, PI-71B 154

APPROVED
ENGR. L. A. Batton DATE 5/10/80
POWER SYSTEMS DIV. M.-K.

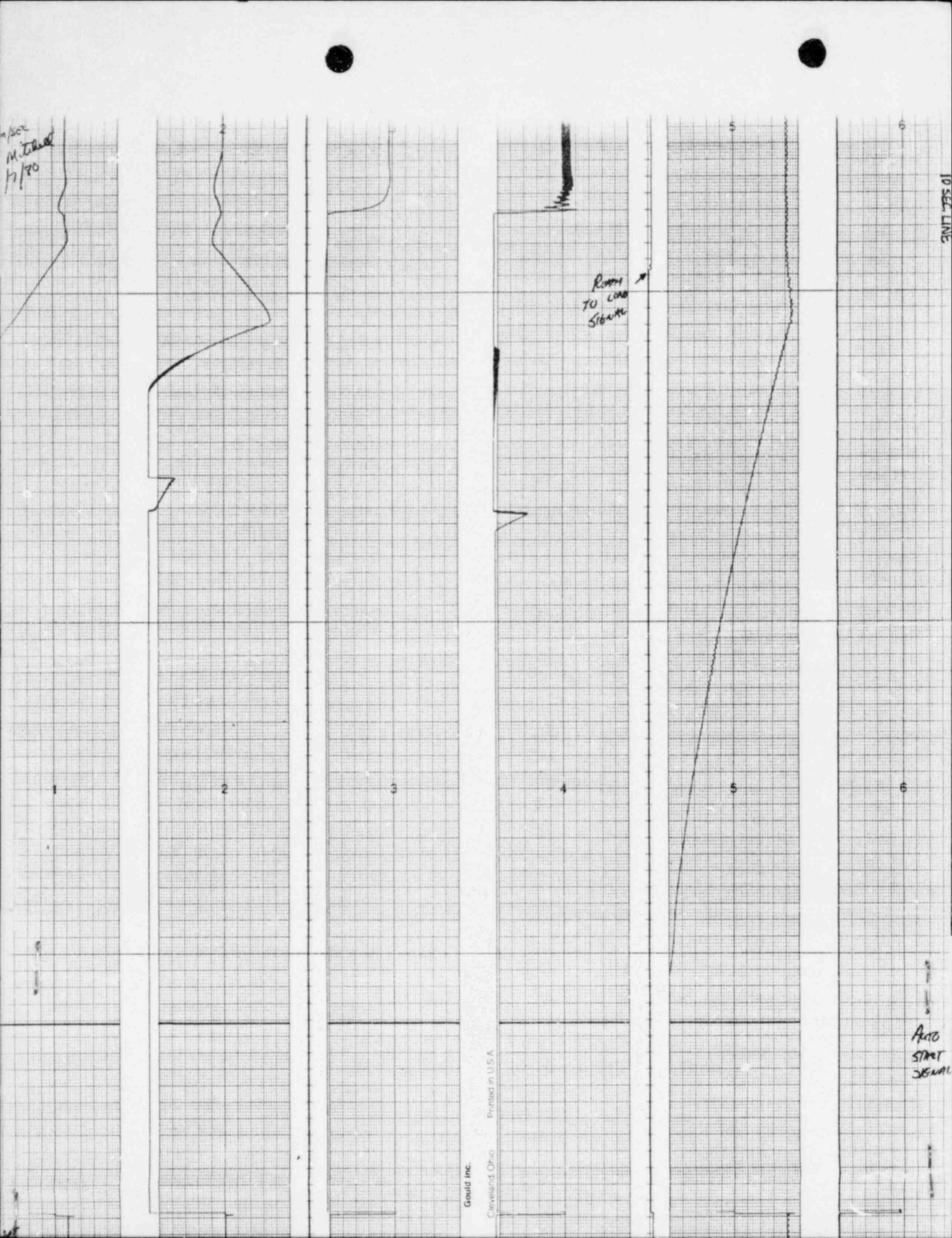
SUCCESS	VOID	FAILURE

TEST TECHNICIAN: William Stapsi PSD QC: Don W. Eilers 5/7/80 WITNESS: _____

INITIATED BY: DF

-85-

SECTION XIV


m/sec
M. Tibbett
7/80
1
2
3
4
5
6
10 SEC. LINE
RUNNY TO LOAD SIGNAL
AUTO START SIGNAL
Gould Inc.
Cleveland, Ohio
Printed in U.S.A.

APPROVED

ENGR. V. L Satterlee DATE 5/10/80

POWER SYSTEMS DIV. M.-K.

POWER SYSTEMS DIVISION
OF MORRISON-KNUDSEN CO., INC.

TEST NO. 100 DATE 5/7/80

TEST: 360 START

UNIT NO. 6020-3

SERIAL NO. 79G1078 79G1079

TESTED BY Ken Levin

WITNESSED BY MV Mitchell

ACCUCHART

Rev. 5
1/23/80

START LOG SHEET
START 150

IWO #6020
UNIT #6020-3 ENGINE SERIAL # A. 79G1 1078 B. 79G1 1029 DATE: 5/8/80

RUNNING DATA LOG

INTERVAL MIN.*	TIME	EXH. BACK PRESS. INCH OF H_2O		INTAKE AIR SUCTION PRESS. INCH OF H_2O		FUEL OIL PRESS. PI-63A/B (PSIG)*		LUBE OIL (PSIG)* PRESS. PI-31A/B		LUBE OIL (°C)* TEMP. TI-35A/B		JACKET WATER TEMP. (°C)* TI-45A/B		EXHAUST TEMP. DIFF WITHIN 120° Fah. *		REMARKS
		A	B	A	B	A	B	A	B	A	B	A	B	A*	B*	
	7:30	5	4.4	6.6	6.3	46	48	93	100	60	54	45	30	728/620	580/620	
5	7:35	4.8	4.9	6.5	6.1	47	48	90	102	79	71	74	72	928/920	680/720	
3	7:38	4.8	5	6.5	6.1	47	49	86	98	84	80	74	74	828/820	720/760	

NOTE: Take readings immediately after applying load and 5 minutes after. If the temperature did not reach minimum operating temperature specified on Page 83, continue operation of unit under load and take readings at 5 minutes intervals or after the minimum operating temperature requirement is met.

PRE-START DATA:

TEMPERATURES

1. Lube Oil Into Engine (TI-36A/B): (A) 50 (B) 52 (°C) *
2. Lube Oil Out of Engine (TI-35A/B): (A) 60 (B) 55 (°C) *
3. Jacket Water Into Engine (TI-44A/B): (A) 42 (B) 30 (°C) *
4. Jacket Water Out of Engine (TI-45A/B): (A) 40 (B) 30 (°C) *
5. Ambient Air 70 (°F)*

APPROVED
ENGR. [illegible] DATE 5/10/80
POWER SYSTEMS DIV. M.-K.

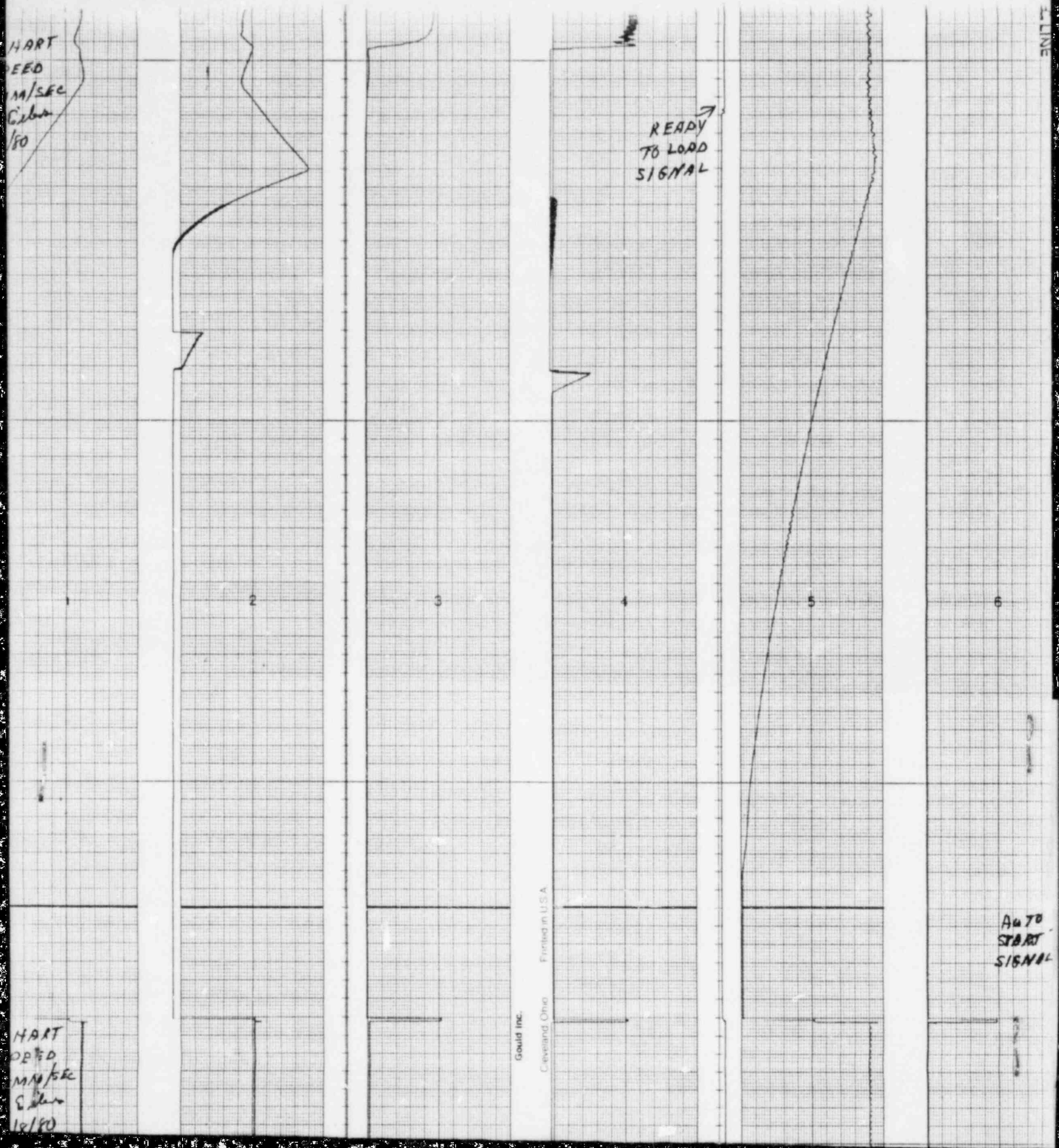
PRESSURES

6. Lube Oil (PI-34A/B): PSI (A) 34 (B) 35
7. Starting Air Pressure: PSI PI-70A 176, PI-71A 178, PI-70B 178, PI-71B 178

SUCCESS	VOID	FAILURE
✓		

TEST TECHNICIAN: [signature] PSD QC: Don D. Eilers 5/8/80 WITNESS: _____

APPROVED BY [illegible]


HART
EED
M/SEC
Cal
/80
READY
TO LOAD
SIGNAL
1
2
3
4
5
6
AUTO
START
SIGNAL
HART
SPEED
MM/SEC
Cal
18/80
Gould Inc.
Cleveland, Ohio
Printed in U.S.A.

APPROVED

ENGR. W. A. Scott DATE 5/12/80

POWER SYSTEMS DIV. M.-K.

POWER SYSTEMS DIVISION
OF MORRISON-KNUDSEN CO., INC.

TEST NO. 150 DATE 5/8/80

TEST 300 START

UNIT NO. 6020-3

DRAWING NO. 796/-1078 796/-1079

TESTED BY William Maggard

WITNESSED BY Alan H. Peters

ACCOUNTING

INSTRUMENTS

REV. 5 - 12/3/80

STAR[illegible] SHEET
START [illegible]00

IWO 06[illegible]0
UNIT #6020-3 ENGINE SERIAL # A._____ B._____ DATE: 5/12/80

RUNNING DATA LOG

INTERVAL	TIME	EXH. BACK PRESS. INCH OF H_2O		INTAKE AIR SUCTION PRESS. INCH OF H_2O		FUEL OIL PRESS. PI-63A/B		LUBE OIL PRESS. PI-31A/B		LUBE OIL TEMP. TI-35A/B		JACKET WATER TEMP. TI-45A/B		EXHAUST TEMP. DIFF. WITHIN 200°C		REMARKS
		A	B	A	B	A	B	A	B	A	B	A	B			
	1:20	4.8	5	6.4	6	44	46	82	94	87	84	75	74	720/620	600/660	
5	1:25	4.8	5.2	6.4	6	44	46	82	95	90	86	75	76	760/660	660/720	

NOTE: Take readings immediately after applying load and 5 minutes after. If the temperature did not reach minimum operating temperature specified on Page 83, continue operation of unit under load and take readings at 5 minutes intervals or after the minimum operating temperature requirement is met.

PRE-START DATA:

TEMPERATURES

1. Lube Oil Into Engine (TI-36A/B): (A) 74 (B) 80
2. Lube Oil Out of Engine (TI-35A/B): (A) 86 (B) 85
3. Jacket Water Into Engine (TI-44A/B): (A) 72 (B) 70
4. Jacket Water Out of Engine (TI-45A/B): (A) 72 (B) 74
5. Ambient Air 82

APPROVED
ENGR. [signature] DATE 5/12/80
POWER SYSTEMS DIV. M.-K.

PRESSURES

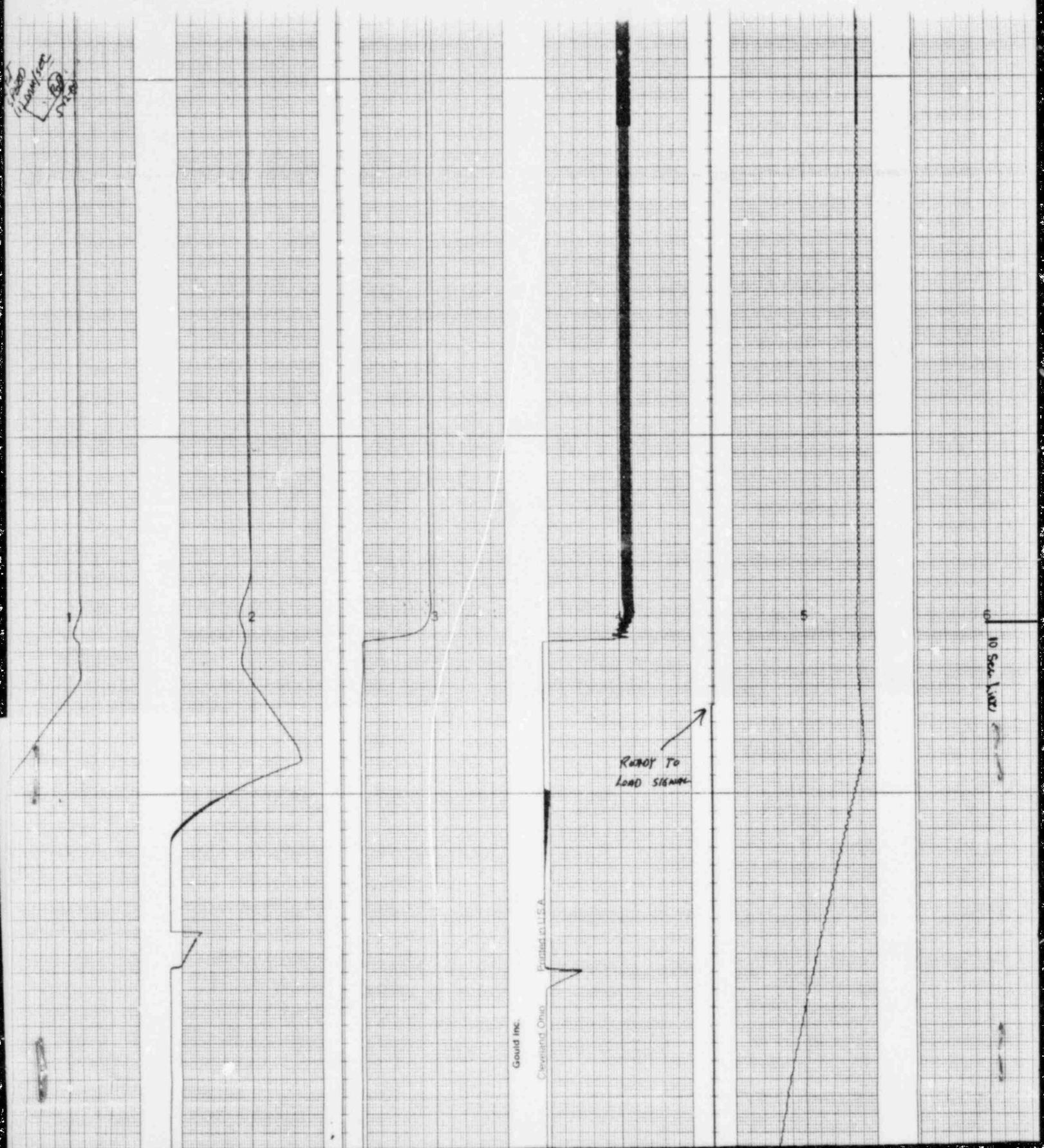
6. Lube Oil (PI-34A/B): (A) 26" (B) 28"
7. Starting Air Pressure: PI-70A 180, PI-71A 180, PI-70B 180, PI-71B 180

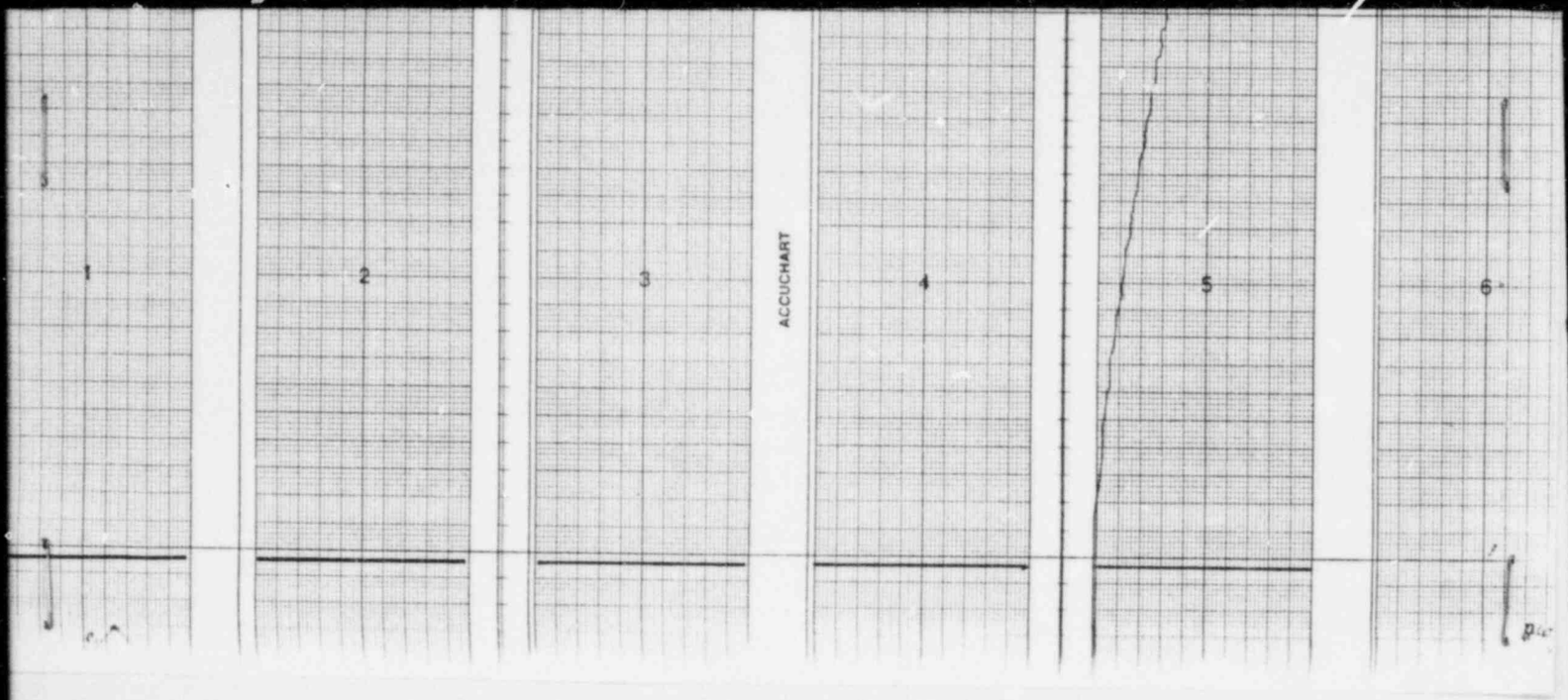
SUCCESS	VOID	FAILURE
✓		

TEST TECHNICIAN: [signature] PSD QC: [signature] 5/12/80 WITNESS:_____

5/12/80

SECTION XIV.


1
2
3
4
5
6
10 Sec Line
Robot To
Load Signal
Gould Inc.
Cleveland, Ohio
Printed in U.S.A.


ACCUCHART
1
2
3
4
5
6

Rev. 5
5/23/80

START LOG SHEET
START 200

IWO 6020
UNIT #6020-3 ENGINE SERIAL # A. 79G1 1078 B. 79G1 1029 DATE: 5/10/80

RUNNING DATA LOG

INTERVAL MIN.*	TIME	EXH. BACK PRESS. INCH OF H_2O		INTAKE AIR SUCTION PRESS. INCH OF H_2O		FUEL OIL PRESS. PI-63A/B (PSIG)*		LUBE OIL (PSIG)* PRESS. PI-31A/B		LUBE OIL (°C)* TEMP. TI-35A/B		JACKET WATER TEMP. (°C)* TI-45A/B		EXHAUST TEMP. DIFF. WITHIN 220° Fah. *		REMARKS
		A	B	A	B	A	B	A	B	A	B	A	B	A*	B*	
	1:50	5	4.8	7	6.6	47	48	92	100	60	55	45	32	640 / 560	520 / 560	
5	1:55	5	5	6.8	6.4	47	48	90	102	78	70	74	72	700 / 620	628 / 700	
3	1:58	5	5	6.8	6.4	47	48	87	98	83	79	74	74	709 / 620	709 / 720	
														/	/	

NOTE: Take readings immediately after applying load and 5 minutes after. If the temperature did not reach minimum operating temperature specified on Page 83, continue operation of unit under load and take readings at 5 minutes intervals or after the minimum operating temperature requirement is met.

PRE-START DATA:

TEMPERATURES

1. Lube Oil Into Engine (TI-36A/B): (A) 50 (B) 52 (°C) *
2. Lube Oil Out of Engine (TI-35A/B): (A) 60 (B) 55 (°C) *
3. Jacket Water Into Engine (TI-44A/B): (A) 40 (B) 28 (°C) *
4. Jacket Water Out of Engine (TI-45A/B): (A) 40 (B) 30 (°C) *
5. Ambient Air 63 (°F)*

APPROVED
ENGR. G. Batton DATE 5-11-80
POWER SYSTEMS DIV. M.-K.

PRESSURES

6. Lube Oil (PI-34A/B): PSI (A) 34 (B) 36
7. Starting Air Pressure: PSI PI-70A 198, PI-71A 198, PI-70B 198, PI-71B 198

SUCCESS	VOID	FAILURE
✓		

TEST TECHNICIAN: William Wagner PSD QC: Smith 5-10-80 WITNESS:

5/80

START LOG SHEET

START # 250

IWO 06[illegible]

UNIT #60[illegible]-3 ENGINE SERIAL # A. 79G1 1078 B. 79G1 1029 DATE: 5/11/80

RUNNING DATA LOG

INTERVAL MIN.*	TIME	EXH. BACK PRESS. INCH OF H_2O		INTAKE AIR SUCTION PRESS. INCH OF H_2O		FUEL OIL PRESS. PI-63A/B (PSIG)*		LUBE OIL (PSIG)* PRESS. PI-31A/B		LUBE OIL (°C)* TEMP. TI-35A/B		JACKET WATER TEMP. (°C)* TI-45A/B		EXHAUST TEMP. DIFF. WITHIN 220° max Fah. *		REMARKS
		A	B	A	B	A	B	A	B	A	B	A	B	A*	B*	
	5:10	5	4.8	6.8	6.5	45	45	92	98	58	54	50	32	700/600	580/600	
5	5:15	5	5.2	6.6	6	46	46	88	101	80	72	74	74	760/660	700/720	
3	5:18	5.2	5.2	6.6	6	46	46	86	98	84	79	74	74	760/660	700/720	
														/	/	

NOTE: Take readings immediately after applying load and 5 minutes after. If the temperature did not reach minimum operating temperature specified on Page 83, continue operation of unit under load and take readings at 5 minutes intervals or after the minimum operating temperature requirement is met.

PRE-START DATA:

TEMPERATURES

1. Lube Oil Into Engine (TI-36A/B): (A) 52 (B) 52 (°C) *
2. Lube Oil Out of Engine (TI-35A/B): (A) 60 (B) 54 (°C) *
3. Jacket Water Into Engine (TI-44A/B): (A) 42 (B) 34 (°C) *
4. Jacket Water Out of Engine (TI-45A/B): (A) 42 (B) 30 (°C) *
5. Ambient Air 72 (°F)*

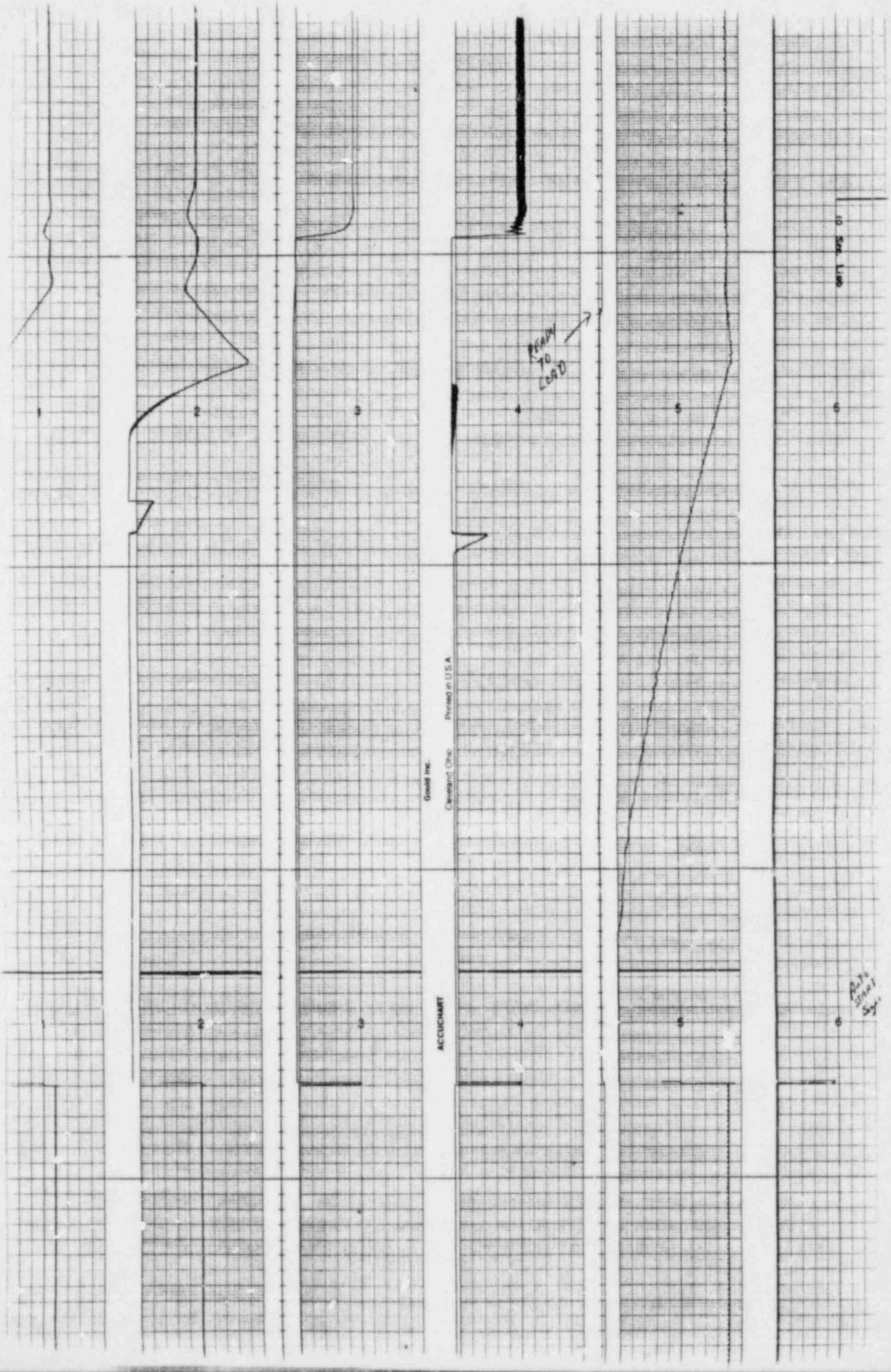
APPROVED
ENGR. V. I. Batta DATE 5/11/80
POWER SYSTEMS DIV. M.-K.

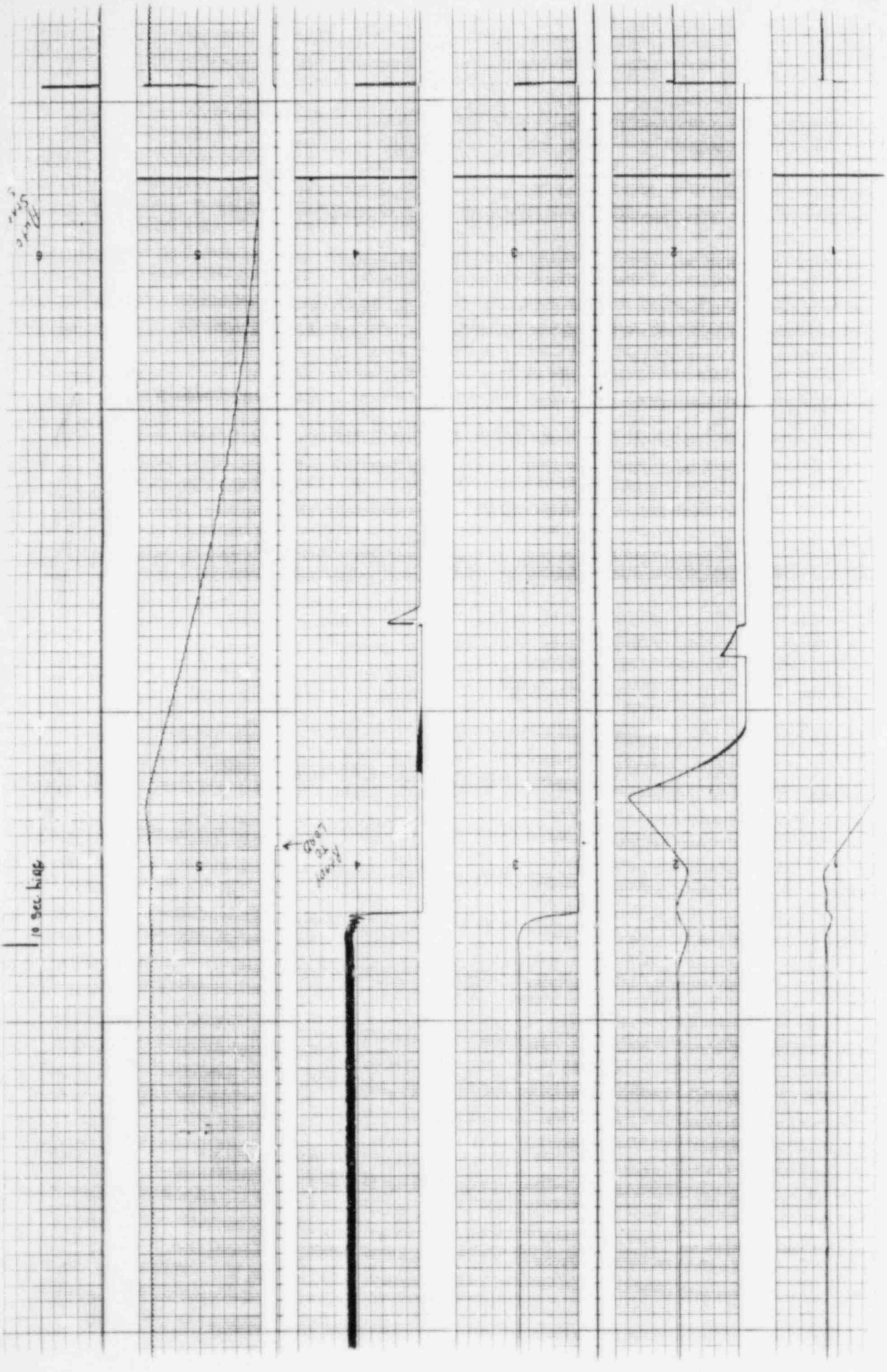
PRESSURES

6. Lube Oil (PI-34A/B): PSI (A) 34 (B) 35
7. Starting Air Pressure: PSI PI-70A 192, PI-71A 192, PI-70B 192, PI-71B 192

SUCCESS	VOID	FAILURE
✓		

TEST TECHNICIAN: William D Wagner PSD QC: [illegible] 5-11-80 WITNESS:


READY TO LOAD
10 SEC LAB
Gould Inc.
Cleveland, Ohio
Printed in U.S.A.
ACCUCHART


10 sec hash

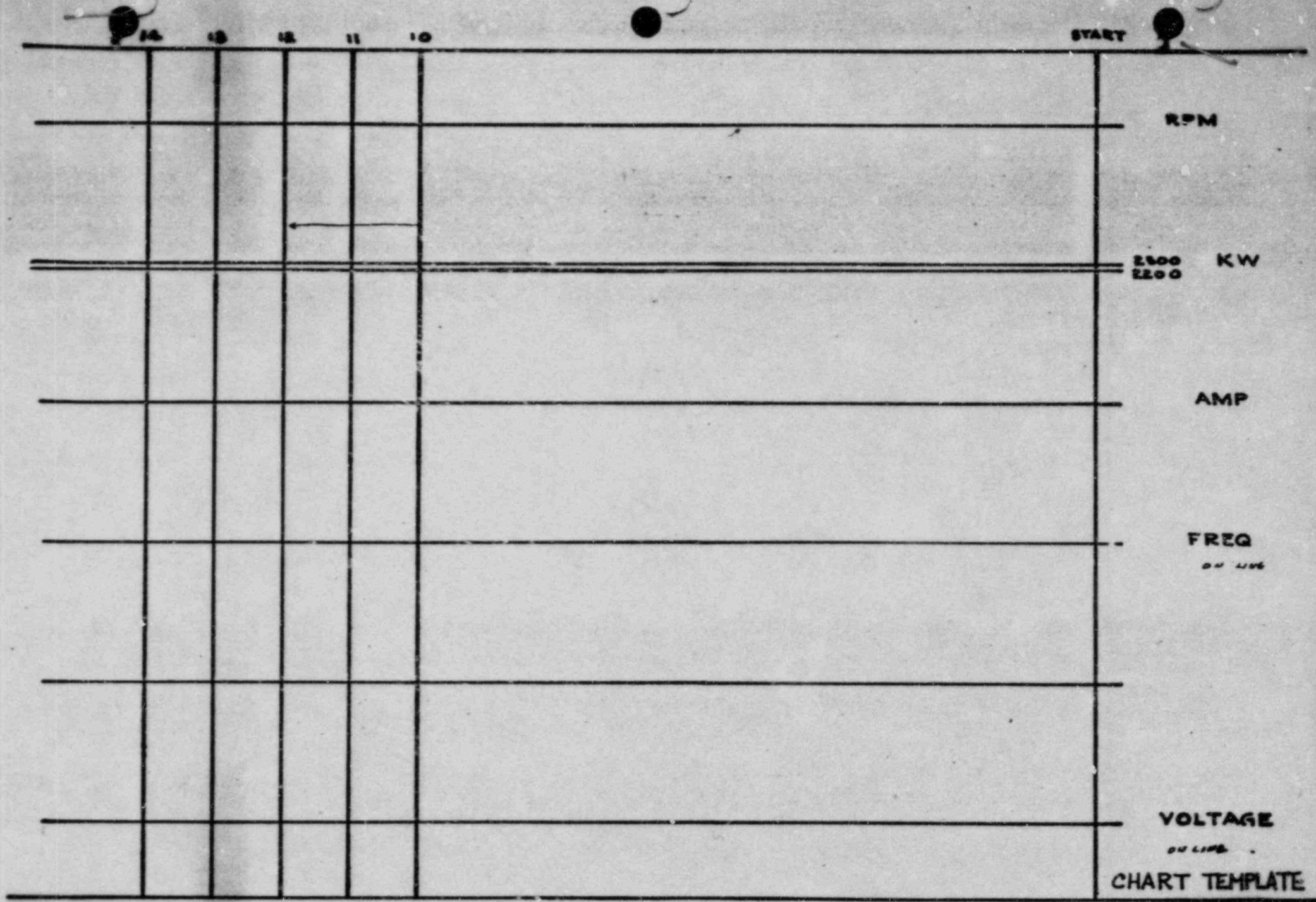
The power unit is a tandem package comprising of two (2) EMD 20-645E4 diesel engines driving one (1) Beloit generator. The power unit is shipped as three following sub-units:

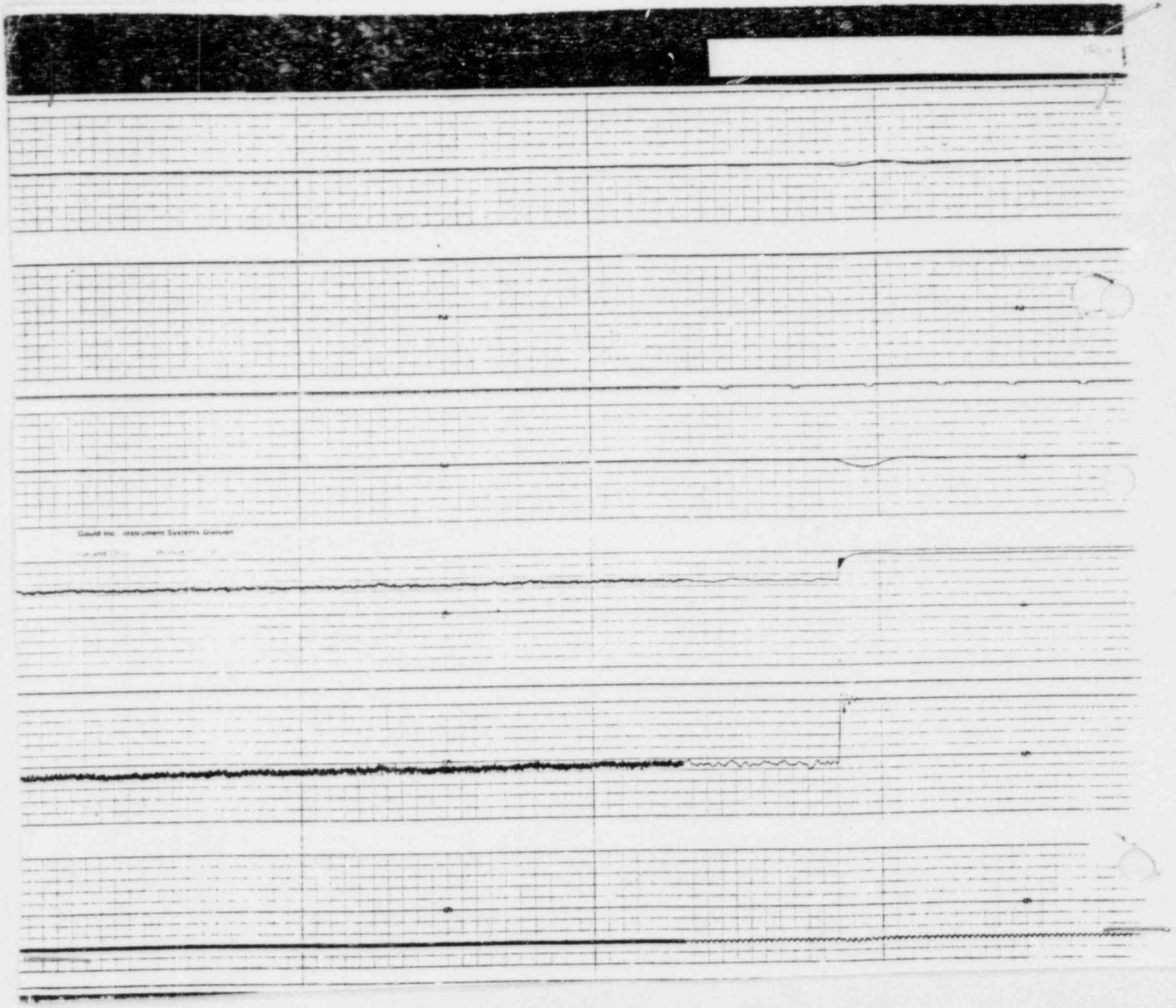
1) Engine 'A' with accessory rack and base
2) Engine 'B' with accessory rack and base
3) Generator with base

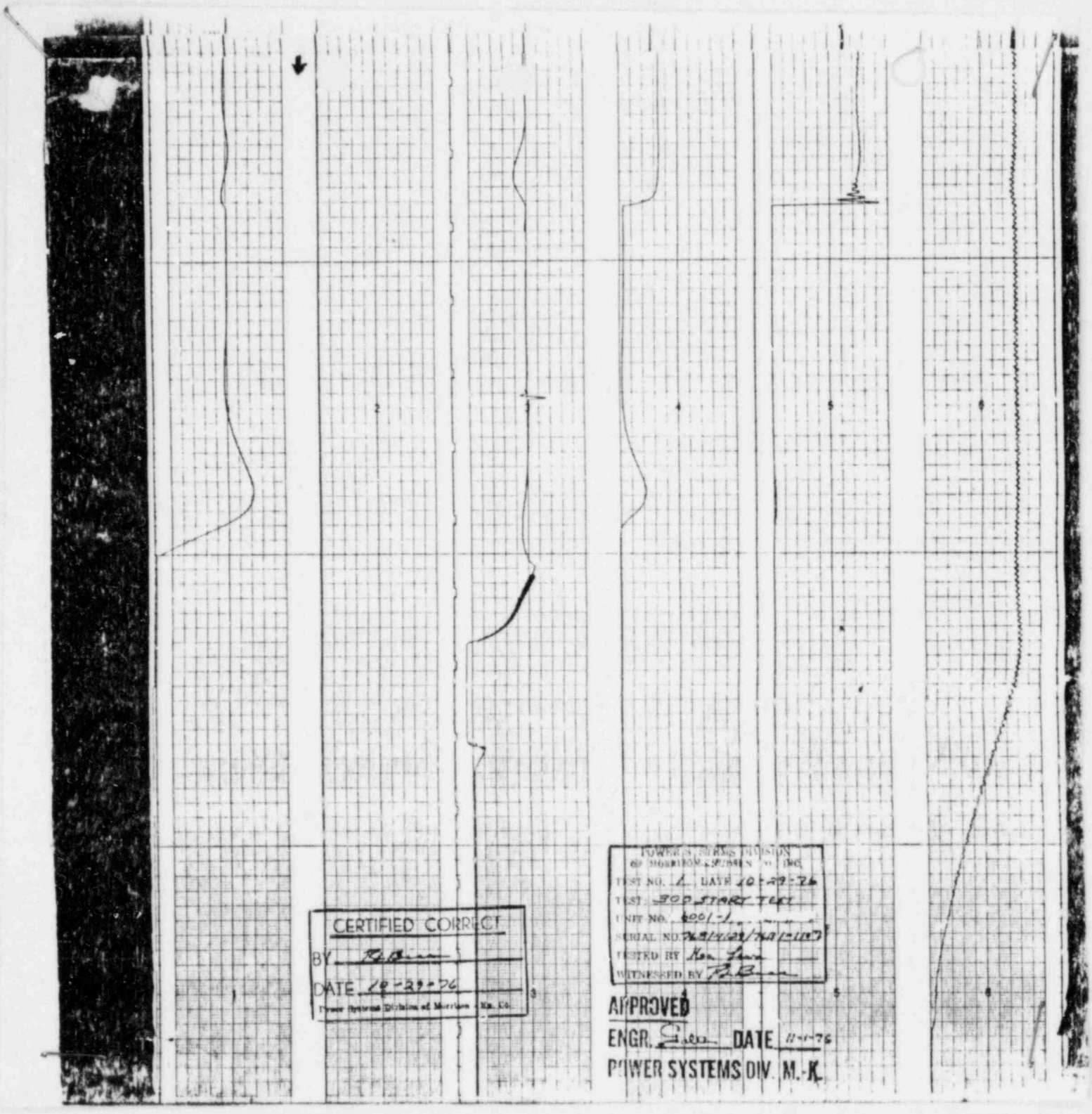
Continuous: 6100 BHP, 4400 KW
2000 HR/YR: 6600 BHP
½ HR/YR: 6750 BHP

0.8 P.F., 6600 Volts, 3 Phase, 50 Hertz, 750 RPM

4) Beloit Static Excitation System
5) Governor System - Woodward EGB 10/13P with a 1301 Control System.


14
13
12
11
10
START
RPM
2600
2200
KW
AMP
FREQ
ON LINE
VOLTAGE
ON LINE
CHART TEMPLATE


Gould Inc. Instrument Systems Division


CERTIFIED CORRECT
BY
DATE 10-29-76
Power Systems Division of Morrison
TEST NO. 1 DATE 10-29-76
TEST 300 START TEST
UNIT NO. 6001-1
SERIAL NO.
TESTED BY Ken Lam
WITNESSED BY
APPROVED
ENGR. DATE 11-1-76
POWER SYSTEMS DIV. M.-K.

PRESTART LOG SHEET

Unit # 6001-1 Test # 1 Date # 10-29-76

		A	QC	B	QC
Ambient Temperature	57°F				
Barometer Reading	30.32				
Humidity	54%				
Hot Leg L.O. Temp.		114		112	
Hot Leg. J. W. Temp.		73		74	
DC Supply Voltage	125				
Auto-Start Position	✓				
Lube Oil Stand-by Press		24		25	
Pressure in Air Tanks	220				

Pressure in Air Tanks immediately after start: 200

Remarks -

Test Technician Ken Lewis

PSD QC R. Bean INSPECTED BY

Witness Hal [illegible]

[illegible] 11-1-76

BY R. Bean

DATE 10-29-76

Power Systems Division of Morrison - Kn. Co.

In addition, the following readings will be taken per Start Log Sheet 850-2.

START LOG SHEET

Unit# 6001-1 Test# 1 Date 10-29-76

Interval	Time	A.C. Volt			A.C. Amp			Freq.	KW
	10:50	A	B	C	A	B	C		
1 min.	10:51	6600	6600	6600	265	265	265	50	3000
5 min.	10:55	6600	6600	6600	265	265	265	50	3000
10 min.	11:00	6600	6600	6600	265	265	265	50	3000
15 min.	11:05	6600	6600	6600	265	265	265	50	3000

Success	Void	Failure
✓		

TEST TECHNICIAN Ken Lewis

PSD QC R L Bass INSPECTED BY 3

Witness M. L. Overbeck 11/1/76 USF

REMARKS

Date 11-1-76

CERTIFIED CORRECT
BY R L Bass
DATE 10-29-76
Power Systems Division of Morrison - Kn. Co.

Also record readings per Start Log Sheet 850-3.

START LOG SHEET

Unit 6001-1 -A/B Test # 1 - Date 10-29-76

Interval	Time	Exhaust Back Press. Inches H_2O		Intake Suction Inches H_2O		I.O. Press.		F.O. Press.	
		A	B	A	B	A	B	A	B
	1050								
2 min.	1052	3.6	4.3	6.3	5.6	92	94	42	38
4 min.	1054	3.6	4.2	6.2	5.6	99	93	42	38
8 min.	1058	3.7	4.3	6.2	5.4	87	89	42	38
15 min.	1105	3.7	4.3	6.1	5.4	82	81	42	38

TEST TECHNICIAN Ken Lewis

PSD QC R. Bean [INSPECTED BY 2]

WITNESS [illegible] UST

[illegible] 11-1-76

REMARKS

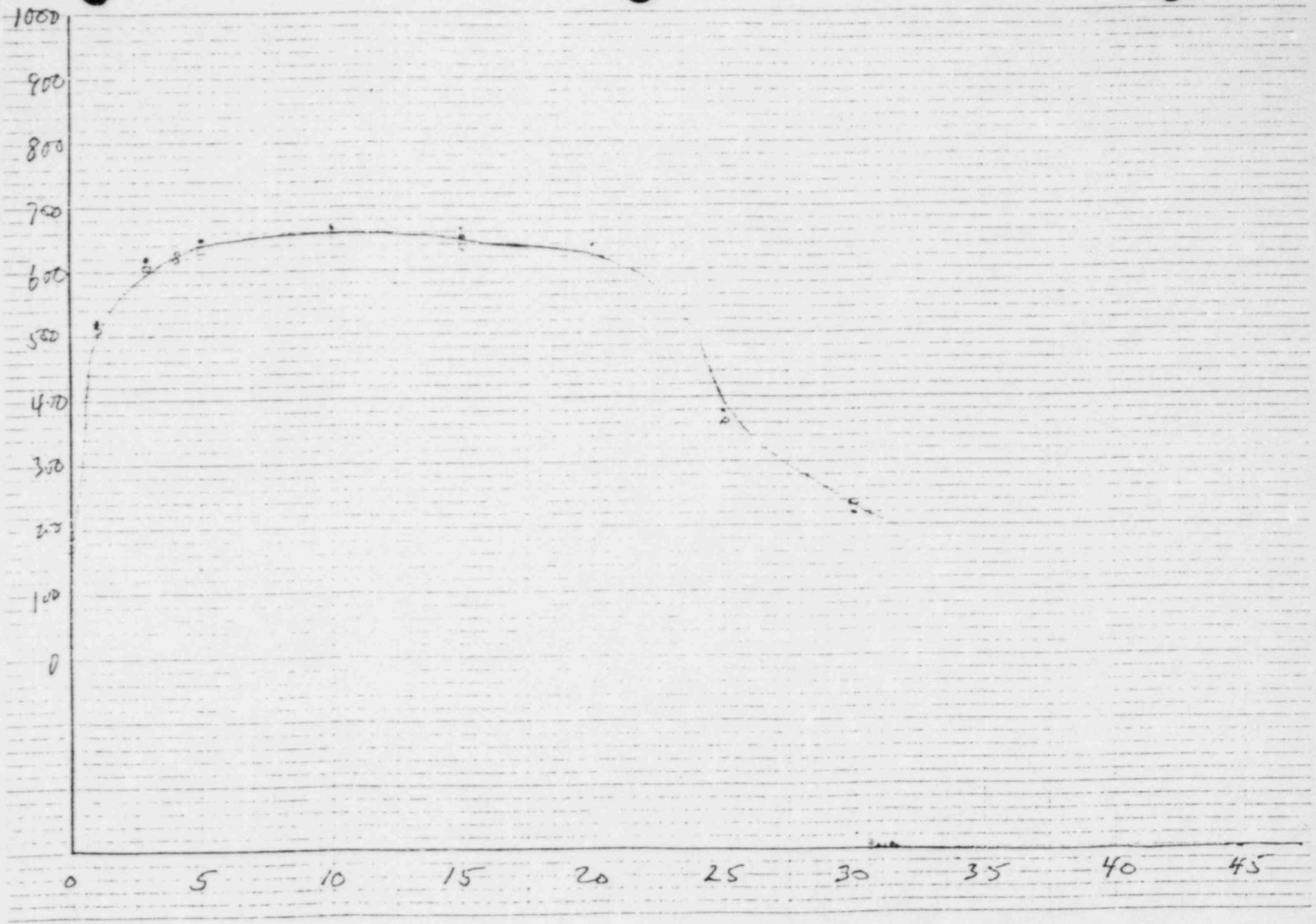
CERTIFIED CORRECT

BY R. Bean

DATE 10-29-76

Power Systems Division of Morrison - Kn. Co.

#1


1000
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800
700
600
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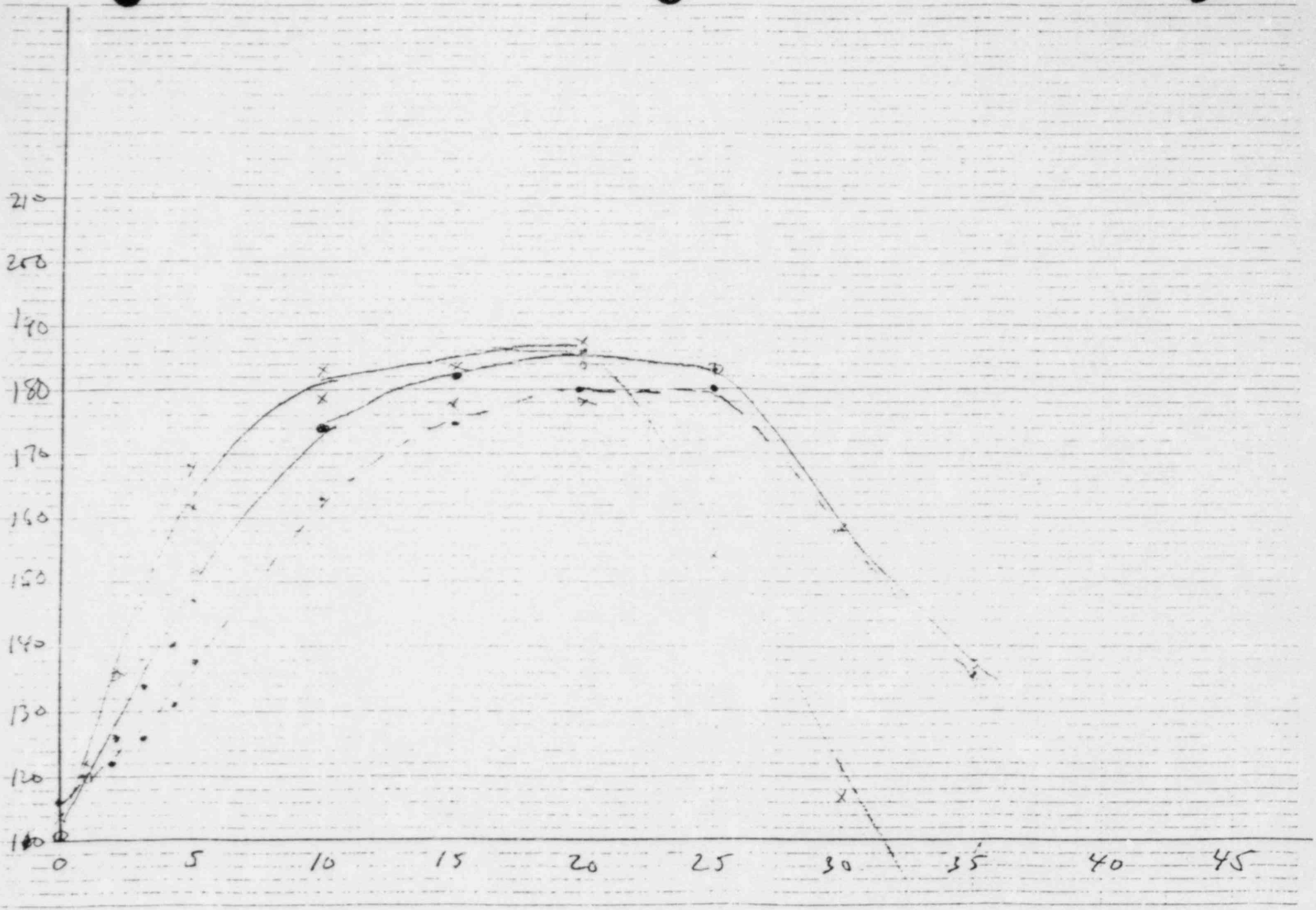
10
15
20
25
30
35
40
45

#3-#4 L O


210
200
190
180
170
160
150
140
130
120
110
0
5
10
15
20
25
30
35
40
45

POWER SYSTEMS DIVISION
OF MORRISON-KNUDSEN COMPANY, INC.

QUALITY CONTROL

ENGINE TEST "A" IWO 6001-1 ENGINE SER.# _____ CUSTOMER _____ CUST. INSP. Hub Arch Robinson

SHEET 1 OF _____ PSD INSPECTOR _____ DATE _____ UNIT (A)(B)(C)(D) 1-2-3-4

TIME	EXHAUST TEMPERATURE CYLINDERS 1-20																				EXHAUST TURBO IN		TESTER	INSP.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20				
0	190	183	110	112	74	75	110	113	117	116	112	118	116	118										
1	516	514	120	120	121	119	114	117	114	120	116	121	119	121										
2	596	591	136	126	136	133	118	119	115	122	119	123	122	124										
3	616	609	137	134	147	143	121	122	118	126	124	126	127	127										
4	634	626	142	141	159	153	128	129	121	131	132	131	133	132										
5	649	640	151	147	169	161	135	134	125	139	139	137	150	138										
10	669	663	174	174	183	179	165	163	142	163	167	162	171	165										
15	651	648	182	182	183	177	178	176	151	175	178	175	181	178										
20	647	646	186	186	184	177	183	183	157	180	182	181	186	184										
25	344	335	192	183	154	154	184	184	164	180	181	182	185	184										
30	225	219	158	159	116	115	160	163	150	154	155	163	161	165										
35	183	185	137	136	98	98	132	139	135	136	132	140	137	142										

CERTIFIED CORRECT

BY Bob Brown

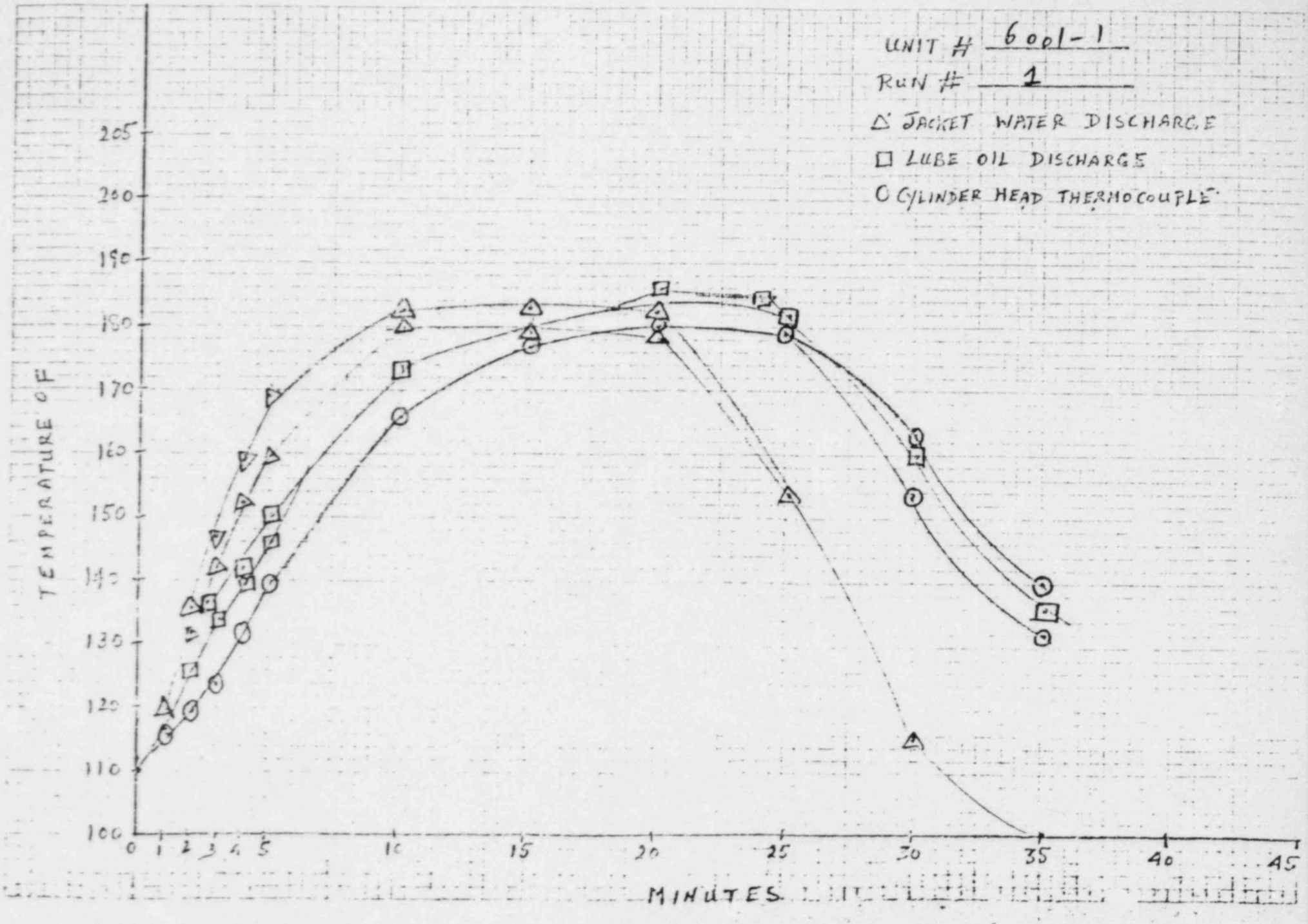
DATE 10-29-76

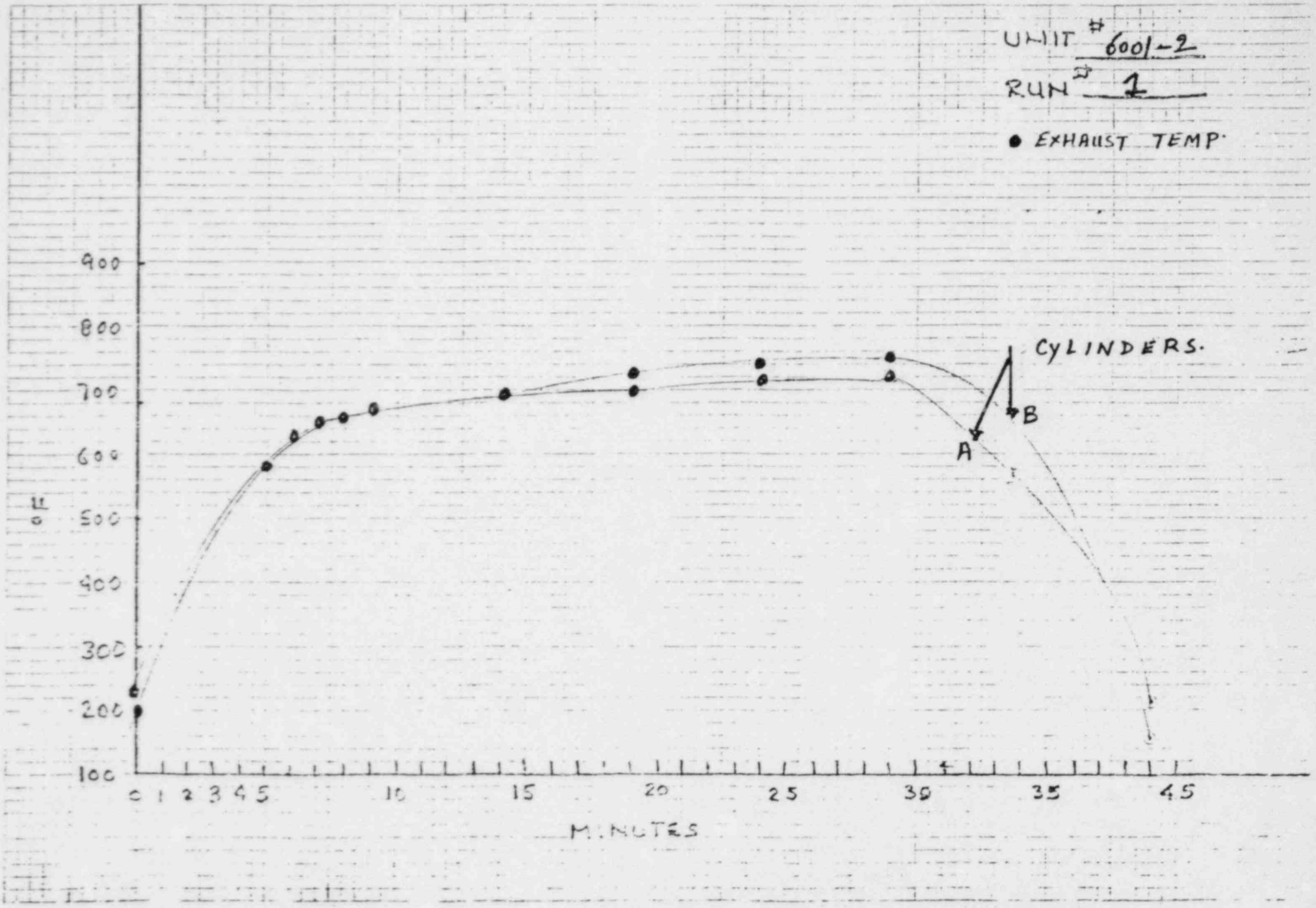
Power Systems Division of Morrison-Knudsen Co.

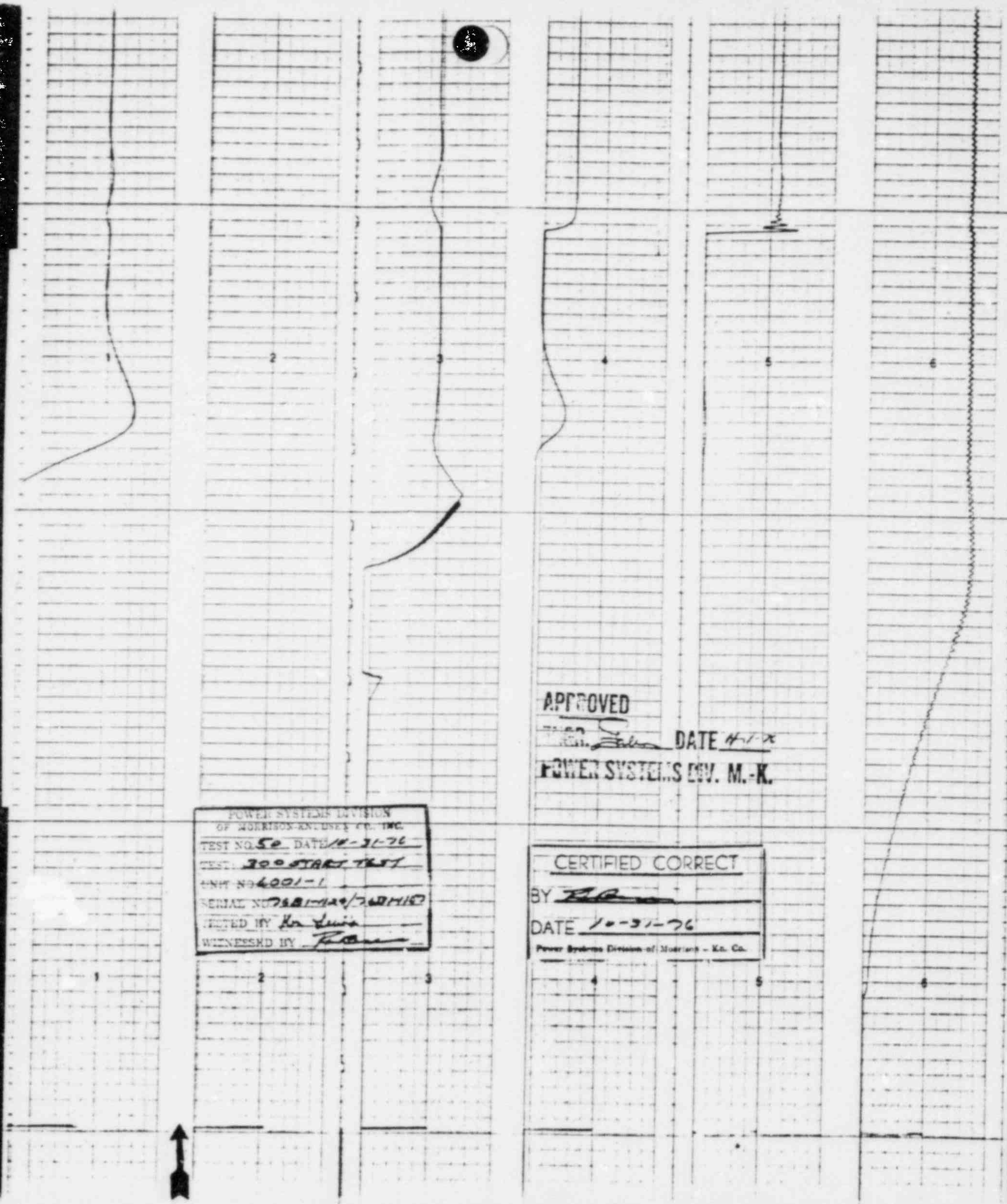
Tommy W. Taylor Tester

11-1-76

QC-TEST-300

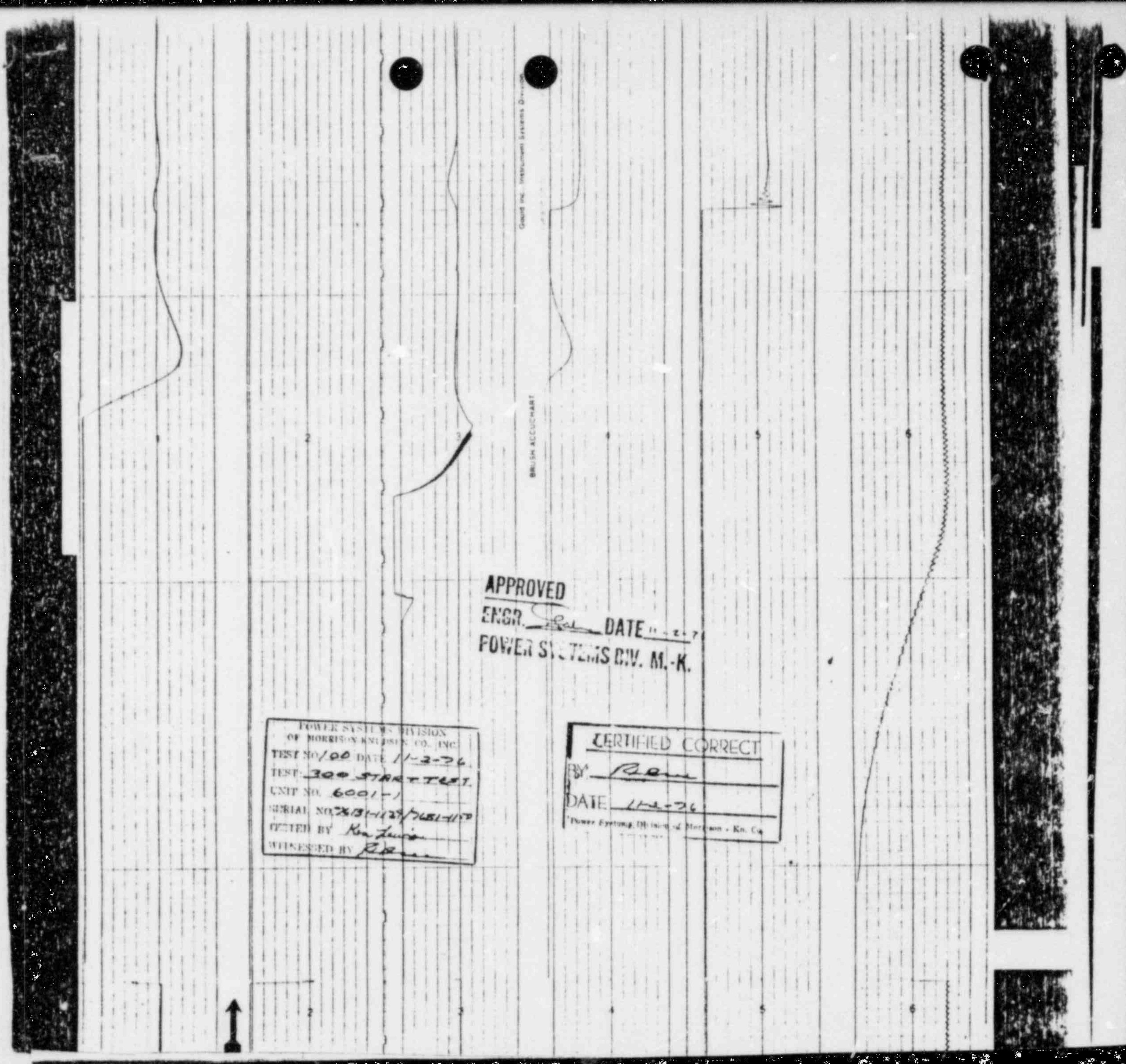



UNIT # 6001-2
RUN # 1
● EXHAUST TEMP.
CYLINDERS.
A
B
900
800
700
600
500
400
300
200
100
°F
0 1 2 3 4 5 10 15 20 25 30 35 45
MINUTES


1
2
3
4
5
6
POWER SYSTEMS DIVISION
OF MORRISON-KNUDSEN CO. INC.
TEST NO. 50 DATE 10-31-76
TEST: 300 START TEST
UNIT NO. 6001-1
SERIAL NO. 7681-1129/7681-1151
TESTED BY Ken Lewis
WITNESSED BY
APPROVED
ENGR. DATE 11-1-76
POWER SYSTEMS DIV. M.-K.
CERTIFIED CORRECT
BY
DATE 10-31-76
Power Systems Division of Morrison - Kn. Co.

Gould Inc. Instrument Systems Division

BRUSH ACCUCHART



APPROVED
ENGR. [signature] DATE 11-2-7[illegible]
POWER SYSTEMS DIV. M.-K.

POWER SYSTEMS DIVISION
OF MORRISON-KNUDSEN CO., INC.
TEST NO. 100 DATE 11-3-76
TEST: 300 START TEST
UNIT NO. 6001-1
SERIAL NO. 7681-1124/7681-1150
TESTED BY Ken Lewis
WITNESSED BY [signature]

CERTIFIED CORRECT
BY: [signature]
DATE 11-3-76
Power Systems Division of Morrison-Knudsen Co.

PRESTART LOG SHEET

Unit # 6001-1 Test # 100 Date # 11-2-76

	A	QC	B	QC
Ambient Temperature	66°F			
Barometer Reading	30.3			
Humidity	34%			
Hot Leg L.O. Temp.	131		130	
Hot Leg. J. W. Temp.	98		100	
DC Supply Voltage	130 V.D.C.			
Auto-Start Position				
Lube Oil Stand-by Press	30		30	
Pressure in Air Tanks	250			

Pressure in Air Tanks immediately after start 220

Remarks -

Test Technician Ken Lewis

PSD QC R Bass

Witness C. H. McDonald USAC

CERTIFIED CORRECT

BY R Bass

DATE 11-2-76

Power Systems Division of Morrison - Kn. Co.

In addition, the following readings will be taken per Start Log Sheet 850-2.

START LOG SHEET

Unit# 6001-1 Test# 100 Date 11-2-76

Interval	Time	A.C. Volt			A.C. Amp			Freq.	KW
	1520	A	B	C	A	B	C		
1 min.	1521	6600	6600	6600	270	270	270	50	3000
5 min.	1525	6600	6600	6600	270	270	275	50	3000
10 min.	1530	6600	6600	6600	270	270	275	50	3000
15 min.	1535	6600	6600	6600	270	270	275	50	3000

Success	Void	Failure
✓		

TEST TECHNICIAN Ken Lewis

PSD QC R Bass

Witness C.A. McDonald USAF

REMARKS

CERTIFIED CORRECT

BY R Bass

DATE 11-2-76

Power Systems Division of Morrison - Kn. Co.

Also record readings per Start Log Sheet 850-3.

START LOG SHEET

Unit 6001-1 -A/B Test # 100 - Date 11-2-76

Interval	Time	Exhaust Back Press. Inches H_2O		Intake Suction Inches H_2O		I.O. Press.		F.O. Press.	
		A	B	A	B	A	B	A	B
	1520								
2 min.	1522	3.4	4.1	5.9	5.2	94	94	40	36
4 min.	1524	3.4	4.1	5.9	5.2	90	90	40	36
8 min.	1528	3.4	4.2	5.8	5.2	85	84	42	37
15 min.	1535	3.4	4.2	5.9	5.1	79	80	42	38

TEST TECHNICIAN Ken Lewis

REMARKS

PSD QC R Bane

WITNESS C H McDonald USTC

CERTIFIED CORRECT
BY R Bane
DATE 11-2-76
Power Systems Division of Morrison - Kn. Co.

POWER SYSTEMS DIVISION
OF MORRISON-KNUDSEN COMPANY, INC.

QUALITY CONTROL

ENGINE TEST "A" IWO _____ ENGINE SER.# _____ CUSTOMER _____ CUST. INSP. C.H. McDonald OSTC

SHEET 100 OF ____ PSD INSPECTOR _____ DATE 1-2-76 UNIT (A)(B)(C)(D) 1-2-3-4

TIME	EXHAUST TEMPERATURE CYLINDERS 1-20																				EXHAUST TURBO IN		TESTER	INSP.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20				
0	187	179	131	130	98	100	123	128	133	126	124	130	128	131										
1	54	554	132	133	133	131	125	127	133	129	125	130	128	130										
2	621	620	139	140	149	145	128	129	134	131	129	132	131	132										
3	653	651	149	150	165	159	134	135	139	137	136	137	138	137										
4	670	667	156	158	176	168	141	139	143	142	143	141	144	142										
5	682	679	164	166	187	178	149	146	149	149	152	148	152	148										
10	694	694	183	186	187	183	174	170	167	171	174	169	176	171										
15	699	700	190	192	188	182	185	182	177	181	184	180	186	184										
20	702	703	194	195	189	181	189	187	181	185	188	185	191	189										
25	703	706	196	195	189	181	191	189	183	186	189	187	193	191										
30	259	256	172	174	130	129	176	176	171	172	171	175	176	179										
35	213	207	148	150	109	108	150	152	152	148	146	152	150	155										
40	198	191	136	138	98	99	136	139	141	136	133	140	138	141										

CERTIFIED CORRECT
BY _____
DATE _____
Power Systems Division of Morrison - Kn. Co.

Tommy W. Taylor

QC-TEST-300

POWER SYSTEMS DIVISION
OF MORRISON-KNUDSEN COMPANY, INC.

QUALITY CONTROL

ENGINE TEST "A" IWO 6001-1 ENGINE SER.# _____ CUSTOMER _____ CUST. INSP. C. A. Hill Donald USTC

SHEET 100 OF _____ PSD INSPECTOR _____ DATE _____ UNIT (A)(B)(C)(D) 1-2-3-4

TIME	EXHAUST TEMPERATURE CYLINDERS 1-20																				EXHAUST TURBO IN		TESTER	INSP.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20				
1535	680	700	710	720	700	700	700	680	670	640	700	720	730	730	720	700	720	700	680	660				
1540	680	700	720	730	700	700	700	680	660	640	700	720	730	730	720	700	720	700	680	660				

QC-TEST-300

POWER SYSTEMS DIVISION
OF MORRISON-KNUDSEN COMPANY, INC.

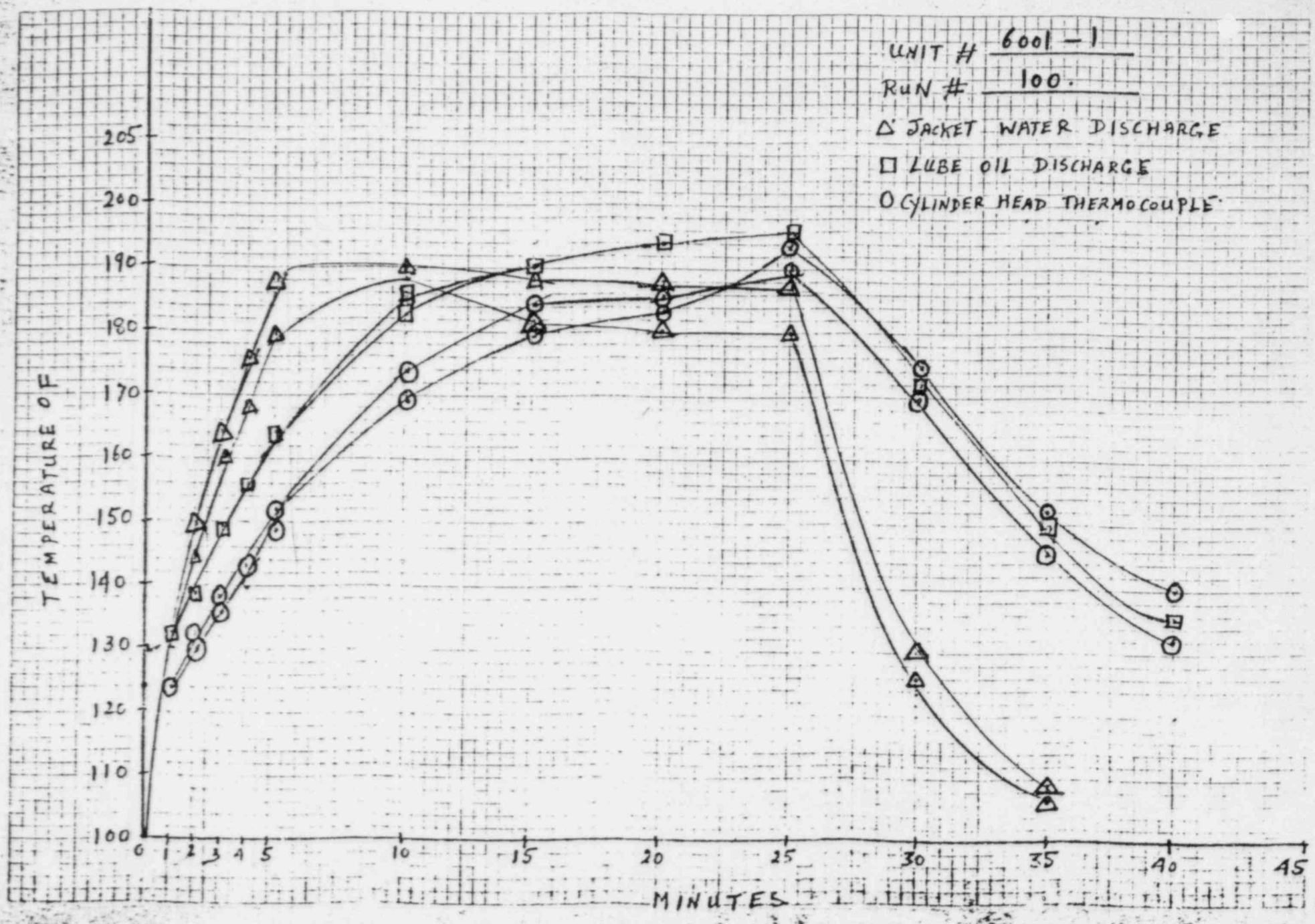
QUALITY CONTROL

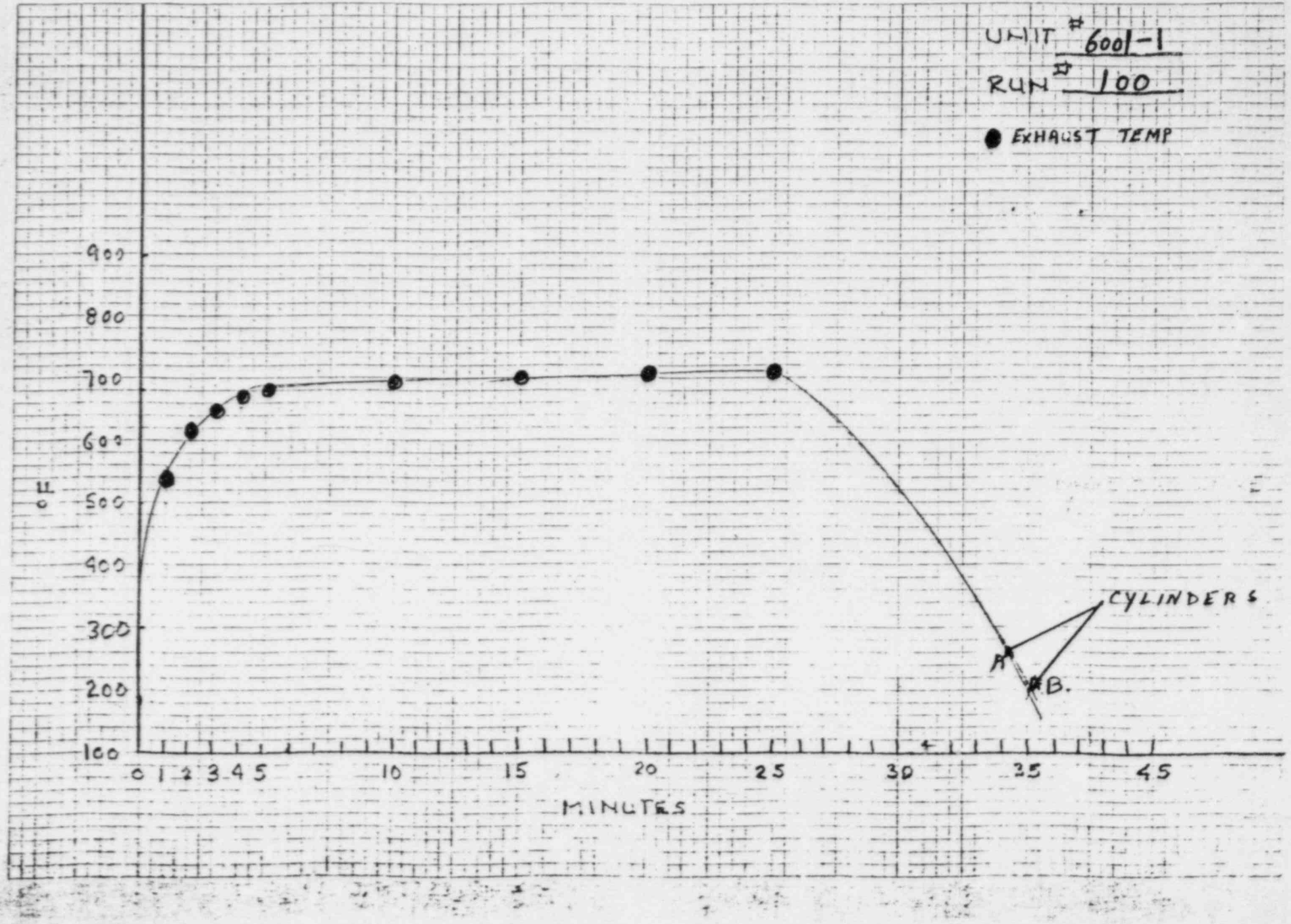
ENGINE TEST "A" IWO_____ ENGINE SER.#_____ CUSTOMER_____ CUST. INSP. CH McDonnell USTC

SHEET___OF___ PSD INSPECTOR_____ DATE_____ UNIT (A)(B)(C)(D) 1-2-3-4

TIME	EXHAUST TEMPERATURE CYLINDERS 1-20																				EXHAUST TURBO IN		TESTER	INSP.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20				
1535	720	740	740	780	760	740	710	750	710	700	710	760	710	760	740	710	720	700	690	680			K.L.	
1540	720	740	740	770	760	740	710	750	700	690	710	750	730	760	740	720	720	710	690	690			K.L.	

QC-TEST-300





[redacted]

APP'D
ENGR. DATE 1st Sept
POWER SYSTEMS DIV. M.-K.

CERTIFIED CORRECT
BY

[redacted]

PRESTART LOG SHEET

Unit # 6001-1 Test # 150 Date # 11-4-76

	A	QC	B	QC
Ambient Temperature	68°F			
Barometer Reading	29.92			
Humidity	51.7%			
Hot Leg L.O. Temp.	196	196		
Hot Leg. J. W. Temp.	186	183		
DC Supply Voltage	130 V DC.			
Auto-Start Position	✓			
Lube Oil Stand-by Press	30		30	
Pressure in Air Tanks	240			

Pressure in Air Tanks immediately after start 210

Remarks -

Test Technician Ken Lewis

PSD QC R. Bauer

Witness C. A. McDonald 11-4-76

CERTIFIED CORRECT
BY R. Bauer
DATE 11-4-76
Power Systems Division of Morrison - Kn. Co.

In addition, the following readings will be taken per Start Log Sheet 850-2.

START LOG SHEET

Unit# 6001-1 Test# 150 Date 11-4-74

Interval	Time	A.C. Volt			A.C. Amp			Freq.	KW
	1500	A	B	C	A	B	C		
1 min.	1501	6600	6600	6600	270	270	270	50	3000
5 min.	1505	6600	6600	6600	260	260	260	50	2875
10 min.	1510	6600	6600	6600	260	270	260	50	3000
15 min.	1515	6600	6600	6600	260	270	260	50	3000

Success	Void	Failure
✓		

TEST TECHNICIAN Ken Lewis

PSD QC R Bruce

Kind Witness CH Williamson USN

REMARKS

CERTIFIED CORRECT

BY R Bruce

DATE 11-4-74

Power Systems Division of Morrison - Kn. Co.

Also record readings per Start Log Sheet 850-3

START LOG SHEET

Unit 6001-1 -A/B Test # 150 - Date 11-4-76

Interval	Time	Exhaust Back Press. Inches H_2O		Intake Suction Inches H_2O		I.O. Press.		F.O. Press.	
		A	B	A	B	A	B	A	B
	1500								
2 min.	1502	3.4	4.0	5.9	5.1	79	78	40	38
4 min.	1504	3.4	4.1	5.9	5.1	78	76	41	38
8 min.	1508	3.4	4.2	5.9	5.1	77	75	40	38
15 min.	1515	3.4	4.2	5.9	5.1	76	75	40	38

REMARKS

TEST TECHNICIAN Ken Lewis

PSD QC R. Bass

Witness C. N. McTurnell (1) 71

CERTIFIED CORRECT

BY R. Bass

DATE 11-4-76

Power Systems Division of Morrison Kn. Co.

OWER SYSTEMS DIVISION
F MORRISON-KNUDSEN COMPANY, INC.

QUALITY CONTROL

ENGINE TEST "A" IWO 6001-1 ENGINE SER.# _____ CUSTOMER _____ CUST. INSP. C H Mitchell USTC

SHEET 150 OF _____ PSD INSPECTOR _____ DATE 11-3-76 UNIT (A)(B)(C)(D) 1-2-3-4

ME	EXHAUST TEMPERATURE CYLINDERS 1-20																				EXHAUST TURBO IN	TESTER	INSP.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20			
0	550	550	196	196	186	183	192	190	184	187	189	187	192	190									
1	658	669	197	195	184	180	194	191	185	188	191	188	193	191									
2	699	707	197	195	186	181	193	191	185	188	190	188	192	191									
3	705	711	199	197	188	183	194	192	187	189	191	190	194	194									
4	709	714	201	199	191	185	195	197	188	190	193	192	195	194									
5	709	713	201	199	191	186	196	194	188	191	192	191	195	194									
0	718	718	201	202	190	184	196	193	188	189	192	190	195	194									
5	711	715	202	200	188	182	195	192	189	189	192	191	195	193									
0	702	709	200	197	184	180	192	192	187	188	191	189	195	193									
5	700	700	201	201	190	183	197	196	192	192	194	195	198	196									
C	271	266	181	181	140	137	182	184	180	179	177	181	181	184									
5	222	215	155	154	115	114	154	157	158	153	150	156	154	158									
0	201	191	138	137	100	101	135	138	141	136	131	138	135	136									

CERTIFIED CORRECT

BY R Boone

DATE 11-4-76

Power Systems Division of Morrison Knudsen Co.

HOT START

Tommy W. Taylor

C-TEST-300

WER SYSTEMS DIVISION
F MORRISON-KNUDSEN COMPANY, INC.

QUALITY CONTROL

ENGINE TEST "A" IWO 6601-1 ENGINE SER.# _____ CUSTOMER _____ CUST. INSP. Cmdr C.A. McLeod USN

SHEET 150 OF _____ PSD INSPECTOR _____ DATE 11-4-76 UNIT (A)(B)(C)(D) 1-2-3-4

ME	EXHAUST TEMPERATURE CYLINDERS 1-20																				EXHAUST TURBO IN		TESTER	INSP.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20				
	740	760	740	780	760	780	720	760	700	700	720	770	760	770	740	720	740	720	700	700			K.L.	
	740	760	750	770	760	780	720	760	700	700	720	760	760	760	740	720	730	720	700	700			K.L.	

TEST-300

OWER SYSTEMS DIVISION
F MORRISON-KNUDSEN COMPANY, INC.

QUALITY CONTROL

ENGINE TEST "A" IWO 6001-1 ENGINE SER.# _____ CUSTOMER _____ CUST. INSP. Paul C. H. McTavish USN

SHEET 1/50 OF _____ PSD INSPECTOR _____ DATE _____ UNIT (A)(B)(C)(D) 1-2-3-4

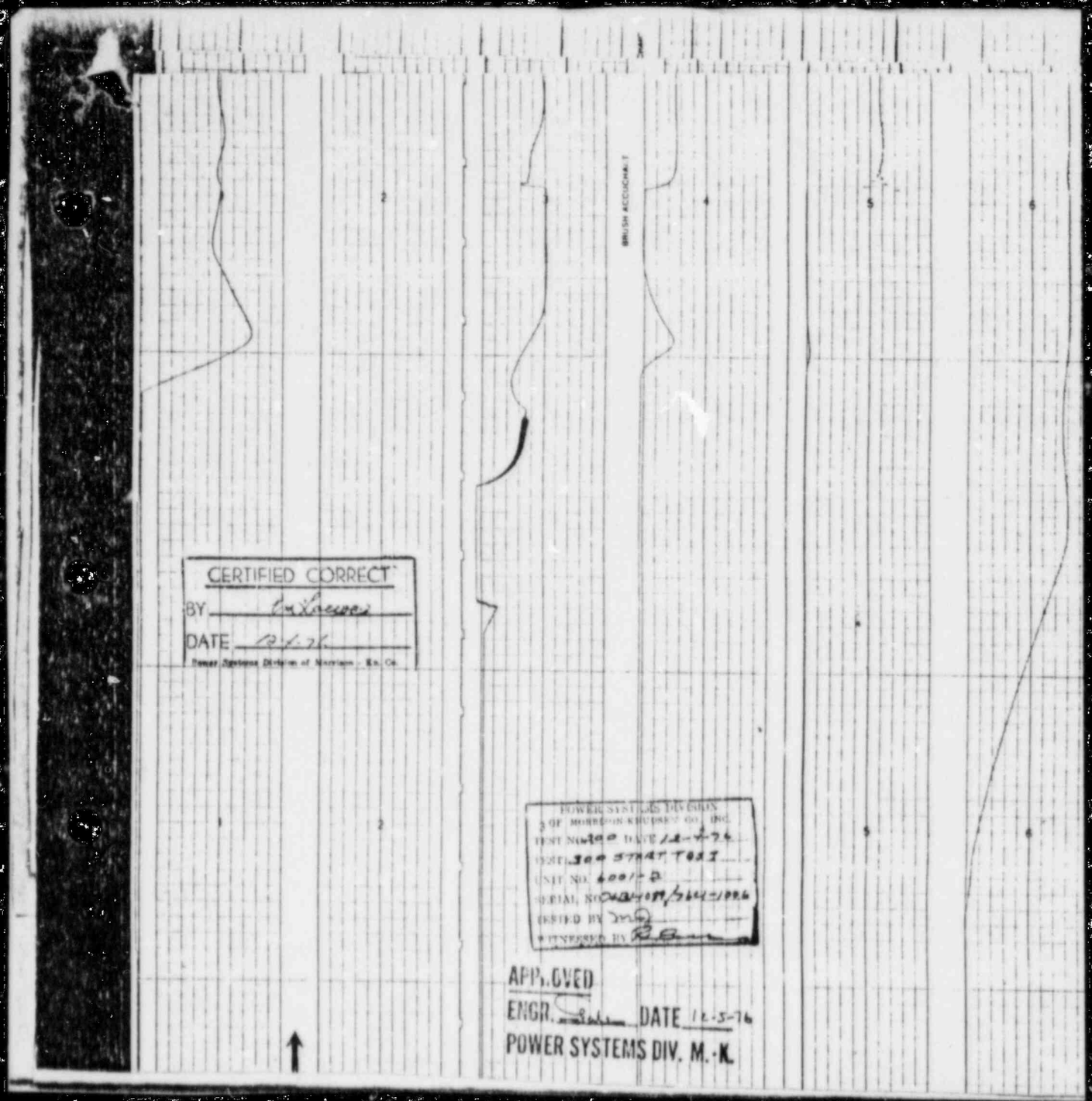
ME	EXHAUST TEMPERATURE CYLINDERS 1-20																				EXHAUST TURBO IN		TESTER	INSP.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20				
/5	690	700	720	720	700	700	700	690	660	640	700	720	730	730	710	710	720	690	670	640				
20	690	700	710	720	700	700	700	680	660	630	700	720	730	730	710	710	720	690	670	660				

APPROVED

ENGR. [signature] DATE 12-5-74

POWER SYSTEMS DIV. M.-K.

BRUSH ACCOCHART


BRUSH ACCUGRAF-1
CERTIFIED CORRECT
BY
DATE
POWER SYSTEMS DIVISION
OF MORRISON-KNUDSEN CO., INC.
TEST NO. 190 DATE 12-4-76
TEST 300 START TEST
UNIT NO. 6001-2
SERIAL NO.
TESTED BY
WITNESSED BY
APPROVED
ENGR. DATE 12-5-76
POWER SYSTEMS DIV. M.-K.

PRESTART LOG SHEET

Unit # 6001-2 Test # 200 Date # 12-4-76

	A	QC	B	QC
Ambient Temperature	45°F			
Barometer Reading	30.44			
Humidity	55%			
Hot Leg L.O. Temp.	127		123	
Hot Leg. J. W. Temp.	89		84	
DC Supply Voltage	130			
Auto-Start Position	✓			
Lube Oil Stand-by Press	40		40	
Pressure in Air Tanks	220			

Pressure in Air Tanks immediately after start: 185

Remarks -

Test Technician MG

PSD QC R Bruce

Witness _____

CERTIFIED CORRECT
BY R Bruce
DATE 12-4-76
Power Systems Division of Morrison - Kn. Co.

In addition, the following readings will be taken per Start Log Sheet 850-2.

START LOG SHEET

Unit# 6001-C Test# 200 Date 12-4-76

Interval	Time	A.C. Volt			A.C. Amp			Freq.	KW
	0738	A	B	C	A	B	C		
1 min.	0739	6600	6600	6600	265	265	265	50	3000
5 min.	0743	6600	6600	6600	265	265	265	50	3000
10 min.	0748	6600	6600	6600	265	265	265	50	3000
15 min.	0753	6600	6600	6600	265	265	265	50	3000

Success	Void	Failure
✓		

TEST TECHNICIAN mg

PSD QC R Bass

Witness

REMARKS

CERTIFIED CORRECT

BY R Bass

DATE 12-4-76

Power Systems Division of Harrison - Kn. Co.

Also record readings per Start Log Sheet 850-3.

START LOG SHEET

Unit 6001-2 -A/B Test # 700 - Date 12-4-76

Interval	Time	Exhaust Back Press. Inches H_2O		Intake Suction Inches H_2O		I.O. Press.		F.O. Press.	
		A	B	A	B	A	B	A	B
	738								
2 min.	740	3.5	4.3	4.9	4.9	100	90	40	41
4 min.	742	3.5	4.3	4.9	4.8	90	88	39	41
8 min.	746	3.5	4.2	4.8	4.8	87	83	39	40
15 min.	753	3.6	4.2	4.8	4.7	82	80	38	40

REMARKS

TEST TECHNICIAN mg

PSD QC RBrue

WITNESS

CERTIFIED CORRECT

BY RBrue

DATE 12-4-76

Power Systems Division of Morrison - Kn. Co.

POWER SYSTEMS DIVISION
OF MORRISON-KNUDSEN COMPANY, INC.

QUALITY CONTROL

ENGINE TEST "A" IWO 6001-2 ENGINE SER.# _____ CUSTOMER _____ CUST. INSP. _____

SHEET ___ OF ___ PSD INSPECTOR _____ DATE _____ UNIT (A)(B)(C)(D) 1-2-3-4

TIME	EXHAUST TEMPERATURE CYLINDERS 1-20																				EXHAUST TURBO IN		TESTER	INSP.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20				
753	740	710	750	740	740	740	720	720	720	680	760	740	750	740	730	710	730	720	730	710			RB	
758	740	710	740	740	740	740	720	720	720	680	760	740	760	74	730	730	740	720	740	710			RB	

CERTIFIED CORRECT
BY JGB
DATE 12-4-76
Power Systems Division of Morrison-Knudsen Co. Inc.

QC-TEST-300

POWER SYSTEMS DIVISION
OF MORRISON-KNUDSEN COMPANY, INC.

QUALITY CONTROL

ENGINE TEST "A" IWO 6001-2 ENGINE SER.# _____ CUSTOMER _____ CUST. INSP. _____

SHEET ___ OF ___ PSD INSPECTOR _____ DATE _____ UNIT (A) (B) (C) (D) 1-2-3-4

TIME	EXHAUST TEMPERATURE CYLINDERS 1-20																				EXHAUST TURBO IN		TESTER	INSP.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20				
0754	700	730	760	760	750	740	710	720	680	680	670	700	740	740	750	720	710	720	660	670			mg	
0759	710	740	760	760	750	750	720	720	680	680	670	700	740	720	750	720	710	720	660	670			mg	

CERTIFIED CORRECT
BY _____
DATE 12-4-75
Power Systems Division of Morrison - Kn. Co.

POWER SYSTEMS DIVISION

CERTIFIED CORRECT
BY R Bell
DATE 12-4-76
Power Systems Division of Morrison - Kn. Co.

START LOG SHEET

TEMPERATURE RECORDING SHEET 1 OF 5

UNIT # 6001-2 A/B TEST # 200 DATE: 12-4-76

TIME FROM START * MINUTES

013	CYLINDER HEAD #14 - "B" ENGINE.....		013 01111.7	F
012	CYLINDER HEAD #14 - "A" ENGINE.....		012 01140	F
011	CYLINDER HEAD #11 - "B" ENGINE.....		011 01111.4	F
010	CYLINDER HEAD #11 - "A" ENGINE.....		010 01139	F
009	CYLINDER HEAD #6 - "B" ENGINE.....		009 01111.7	F
008	CYLINDER HEAD #6 - "A" ENGINE.....		008 01173	F
007	CYLINDER HEAD #3 - "B" ENGINE.....		007 01110.9	F
006	CYLINDER HEAD #3 - "A" ENGINE.....		006 01142	F
005	JACKET WATER TEMP. - "B" ENGINE...		005 01111.9	F
004	JACKET WATER TEMP. - "A" ENGINE...		004 01154	F
003	LUBE OIL TEMP. - "B" ENGINE.....		003 01255	F
002	LUBE OIL TEMP. - "A" ENGINE.....		002 01282	F
001	TOTAL EXHAUST - "B" ENGINE.....		001 05536	F
000	TOTAL EXHAUST - "A" ENGINE.....	07 39 29	000 05565	F

013	CYLINDER HEAD #14 - "B" ENGINE.....		013 01132.1	F
012	CYLINDER HEAD #14 - "A" ENGINE.....		012 01139	F
011	CYLINDER HEAD #11 - "B" ENGINE.....		011 01111.7	F
010	CYLINDER HEAD #11 - "A" ENGINE.....		010 01136	F
009	CYLINDER HEAD #6 - "B" ENGINE.....		009 01111.1	F
008	CYLINDER HEAD #6 - "A" ENGINE.....		008 01172	F
007	CYLINDER HEAD #3 - "B" ENGINE.....		007 01110	F
006	CYLINDER HEAD #3 - "A" ENGINE.....		006 01141	F
005	JACKET WATER TEMP. - "B" ENGINE..		005 00862	F
004	JACKET WATER TEMP. - "A" ENGINE..		004 00896	F
003	LUBE OIL TEMP. - "B" ENGINE.....		003 01239	F
002	LUBE OIL TEMP. - "A" ENGINE.....		002 01271	F
001	TOTAL EXHAUST - "B" ENGINE.....		001 01519	F
000	TOTAL EXHAUST - "A" ENGINE.....	07 37 17	000 01843	F

*TIME FROM START

POWER SYSTEMS DIVISION

START LOG SHEET

TEMPERATURE RECORDING SHEET 2 OF 5

UNIT # 600-2 A/B TEST # 200 DATE: 12-4-76

TIME FROM START _____ MINUTES

013	CYLINDER HEAD #14 - "B" ENGINE.....		013	01167 F
012	CYLINDER HEAD #14 - "A" ENGINE.....		012	01196 F
011	CYLINDER HEAD #11 - "B" ENGINE.....		011	01159 F
010	CYLINDER HEAD #11 - "A" ENGINE.....		010	01190 F
009	CYLINDER HEAD #6 - "B" ENGINE.....		009	01159 F
008	CYLINDER HEAD #6 - "A" ENGINE.....		008	01211 F
007	CYLINDER HEAD #3 - "B" ENGINE.....		007	01155 F
006	CYLINDER HEAD #3 - "A" ENGINE.....		006	01187 F
005	JACKET WATER TEMP. - "B" ENGINE...		005	01410 F
004	JACKET WATER TEMP. - "A" ENGINE...		004	01451 F
003	LUBE OIL TEMP. - "B" ENGINE.....		003	01402 F
002	LUBE OIL TEMP. - "A" ENGINE.....		002	01436 F
001	TOTAL EXHAUST - "B" ENGINE.....		001	06021 F
000	TOTAL EXHAUST - "A" ENGINE.....	07 41 28	000	06162 F

013	CYLINDER HEAD #14 - "B" ENGINE.....		013	01130 F
012	CYLINDER HEAD #14 - "A" ENGINE.....		012	01152 F
011	CYLINDER HEAD #11 - "B" ENGINE.....		011	01125 F
010	CYLINDER HEAD #11 - "A" ENGINE.....		010	01150 F
009	CYLINDER HEAD #6 - "B" ENGINE.....		009	01130 F
008	CYLINDER HEAD #6 - "A" ENGINE.....		008	01161 F
007	CYLINDER HEAD #3 - "B" ENGINE.....		007	01120 F
006	CYLINDER HEAD #3 - "A" ENGINE.....		006	01154 F
005	JACKET WATER TEMP. - "B" ENGINE..		005	01203 F
004	JACKET WATER TEMP. - "A" ENGINE..		004	01321 F
003	LUBE OIL TEMP. - "B" ENGINE.....		003	01321 F
002	LUBE OIL TEMP. - "A" ENGINE.....		002	01351 F
001	TOTAL EXHAUST - "B" ENGINE.....		001	05882 F
000	TOTAL EXHAUST - "A" ENGINE.....	07 40 28	000	05959 F

POWER SYSTEMS DIVISION

START LOG SHEET

TEMPERATURE RECORDING SHEET 3 OF 5

UNIT #6001-2 A/B TEST #200 DATE: 12-4-76

TIME FROM START _____ MINUTES

013	CYLINDER HEAD #14 - "B" ENGINE.....		013	01230 F
012	CYLINDER HEAD #14 - "A" ENGINE.....		012	01233 F
011	CYLINDER HEAD #11 - "B" ENGINE.....		011	01206 F
010	CYLINDER HEAD #11 - "A" ENGINE.....		010	01228 F
009	CYLINDER HEAD #6 - "B" ENGINE.....		009	01264 F
008	CYLINDER HEAD #6 - "A" ENGINE.....		008	01314 F
007	CYLINDER HEAD #3 - "B" ENGINE.....		007	01266 F
006	CYLINDER HEAD #3 - "A" ENGINE.....		006	01287 F
005	JACKET WATER TEMP. - "B" ENGINE..		005	01603 F
004	JACKET WATER TEMP. - "A" ENGINE..		004	01640 F
003	LUBE OIL TEMP. - "B" ENGINE.....		003	01563 F
002	LUBE OIL TEMP. - "A" ENGINE.....		002	01602 F
001	TOTAL EXHAUST - "B" ENGINE.....		001	06271 F
000	TOTAL EXHAUST - "A" ENGINE.....	07 43 29	000	06357 F

013	CYLINDER HEAD #14 - "B" ENGINE.....		013	01230 F
012	CYLINDER HEAD #14 - "A" ENGINE.....		012	01235 F
011	CYLINDER HEAD #11 - "B" ENGINE.....		011	01206 F
010	CYLINDER HEAD #11 - "A" ENGINE.....		010	01228 F
009	CYLINDER HEAD #6 - "B" ENGINE.....		009	01207 F
008	CYLINDER HEAD #6 - "A" ENGINE.....		008	01257 F
007	CYLINDER HEAD #3 - "B" ENGINE.....		007	01206 F
006	CYLINDER HEAD #3 - "A" ENGINE.....		006	01237 F
005	JACKET WATER TEMP. - "B" ENGINE..		005	01514 F
004	JACKET WATER TEMP. - "A" ENGINE..		004	01557 F
003	LUBE OIL TEMP. - "B" ENGINE.....		003	01476 F
002	LUBE OIL TEMP. - "A" ENGINE.....		002	01533 F
001	TOTAL EXHAUST - "B" ENGINE.....		001	06263 F
000	TOTAL EXHAUST - "A" ENGINE.....	07 42 29	000	06286 F

POWER SYSTEMS DIVISION

START LOG SHEET

TEMPERATURE RECORDING SHEET 4 OF 5

UNIT #601-2 A/B TEST # 200 DATE: 12-4-76

TIME FROM START _____ MINUTES

013	CYLINDER HEAD #14 - "B" ENGINE.....		013	01645 F
012	CYLINDER HEAD #14 - "A" ENGINE.....		012	01615 F
011	CYLINDER HEAD #11 - "B" ENGINE.....		011	01609 F
010	CYLINDER HEAD #11 - "A" ENGINE.....		010	01612 F
009	CYLINDER HEAD #6 - "B" ENGINE.....		009	01603 F
008	CYLINDER HEAD #6 - "A" ENGINE.....		008	01646 F
007	CYLINDER HEAD #3 - "B" ENGINE.....		007	01619 F
006	CYLINDER HEAD #3 - "A" ENGINE.....		006	01629 F
005	JACKET WATER TEMP. - "B" ENGINE..		005	01661 F
004	JACKET WATER TEMP. - "A" ENGINE..		004	01654 F
003	LUBE OIL TEMP. - "B" ENGINE.....		003	01845 F
002	LUBE OIL TEMP. - "A" ENGINE.....		002	01859 F
001	TOTAL EXHAUST - "B" ENGINE.....		001	06538 F
000	TOTAL EXHAUST - "A" ENGINE.....	07 53 27	000	06573 F

013	CYLINDER HEAD #14 - "B" ENGINE....		013	01543 F
012	CYLINDER HEAD #14 - "A" ENGINE....		012	01517 F
011	CYLINDER HEAD #11 - "B" ENGINE....		011	01507 F
010	CYLINDER HEAD #11 - "A" ENGINE....		010	01507 F
009	CYLINDER HEAD #6 - "B" ENGINE....		009	01503 F
008	CYLINDER HEAD #6 - "A" ENGINE....		008	01547 F
007	CYLINDER HEAD #3 - "B" ENGINE....		007	01515 F
006	CYLINDER HEAD #3 - "A" ENGINE....		006	01527 F
005	JACKET WATER TEMP. - "B" ENGINE.		005	01659 F
004	JACKET WATER TEMP. - "A" ENGINE.		004	01640 F
003	LUBE OIL TEMP. - "B" ENGINE.....		003	01794 F
002	LUBE OIL TEMP. - ENGINE.....		002	01790 F
001	TOTAL EXHAUST - "B" ENGINE.....		001	06420 F
000	TOTAL EXHAUST - "A" ENGINE.....	07 48 29	000	06466 F

POWER SYSTEMS DIVISION

NO COOL DOWN - NEXT START-HOT START

START LOG SHEET

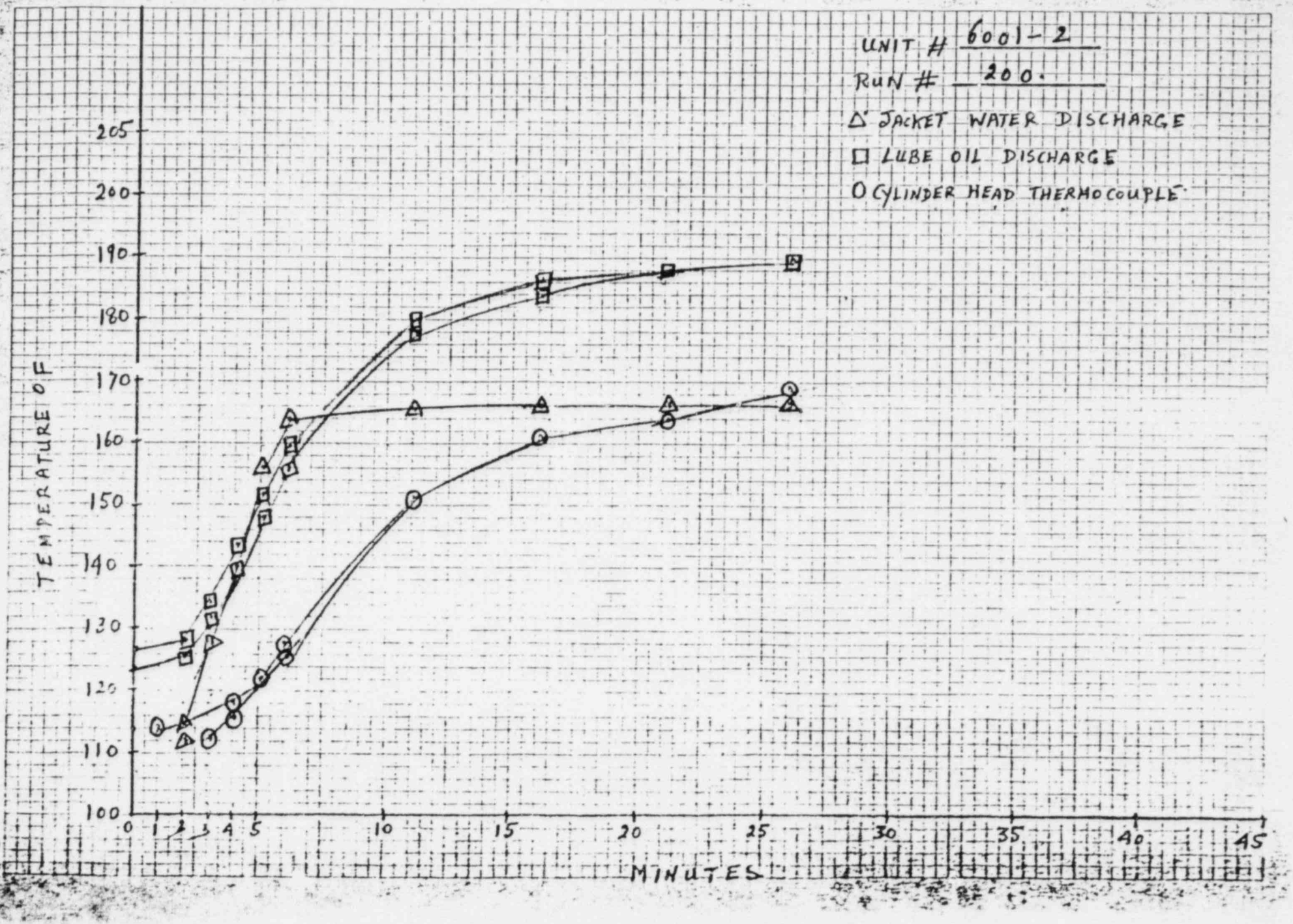
TEMPERATURE RECORDING SHEET 5 OF 5

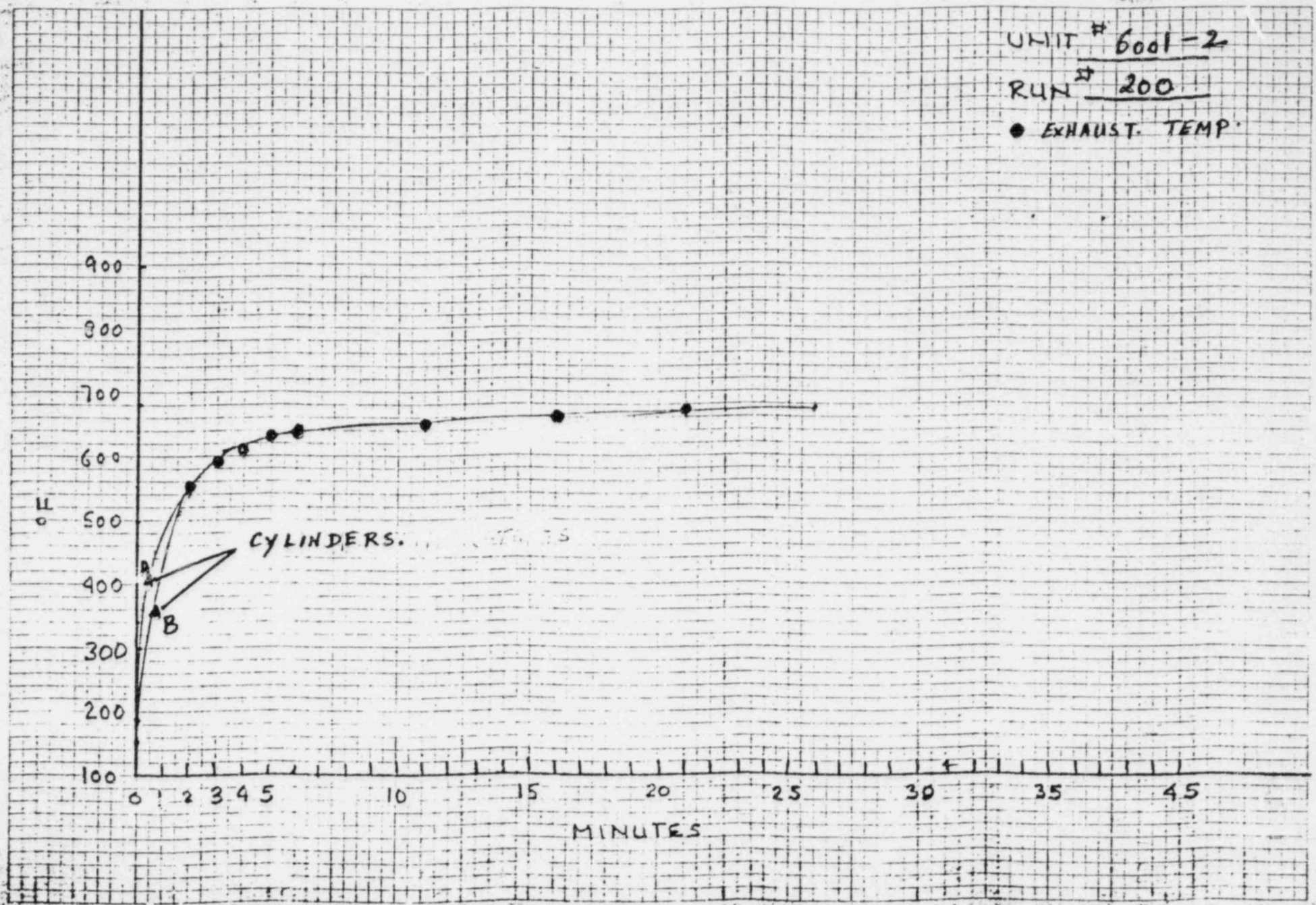
UNIT # 6001-2 A/B TEST # 200 DATE 12-4-76

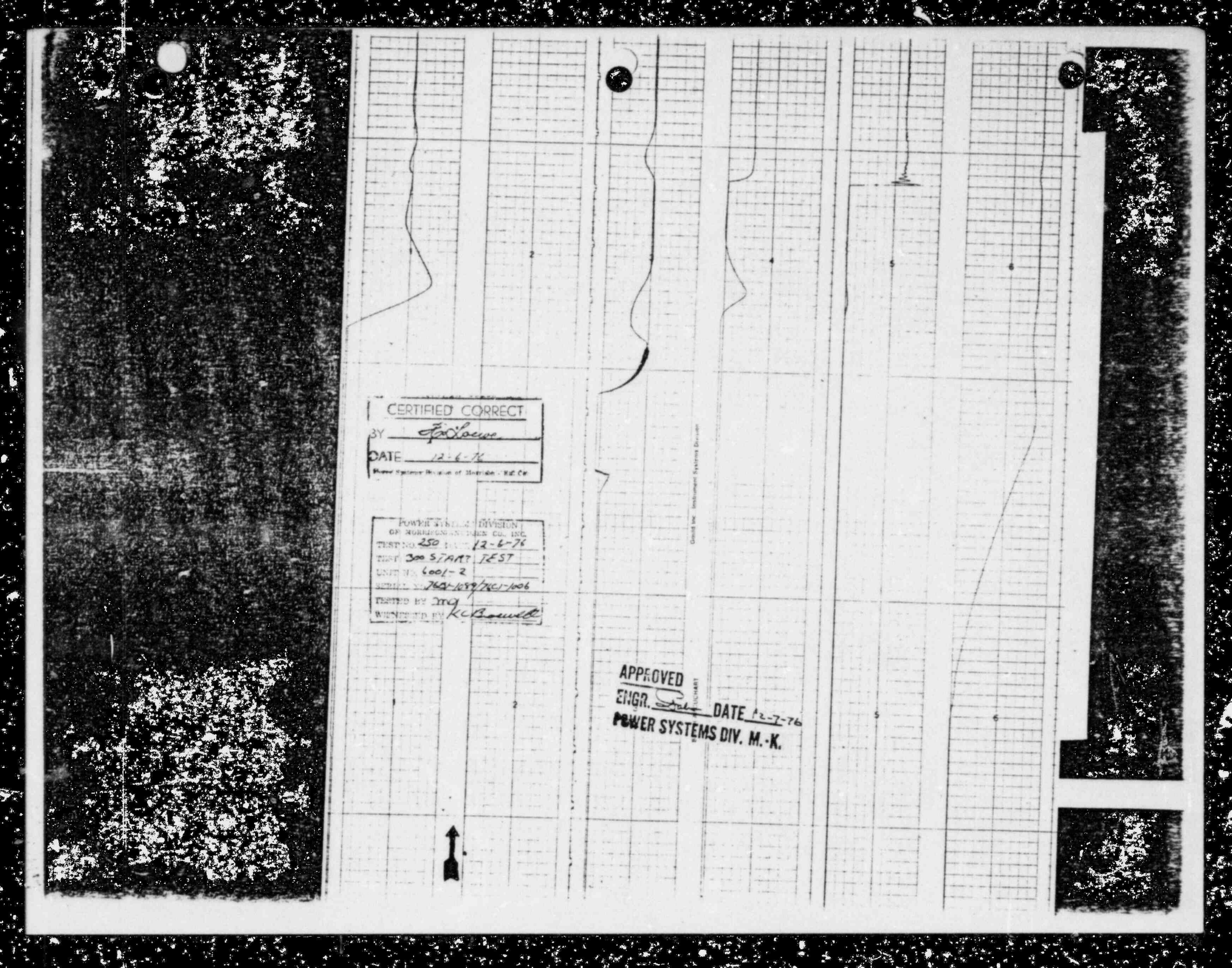
TIME FROM START _____ MINUTES

013	CYLINDER HEAD #14 - "B" ENGINE.....		013	0173.2 F
012	CYLINDER HEAD #14 - "A" ENGINE.....		012	0163.0 F
011	CYLINDER H D #11 - "B" ENGINE.....		011	0163.3 F
010	CYLINDER HEAD #11 - "A" ENGINE.....		010	0163.2 F
009	CYLINDER HEAD #6 - "B" ENGINE.....		009	0167.5 F
008	CYLINDER HEAD #6 - "A" ENGINE.....		008	0171.8 F
007	CYLINDER HEAD #3 - "B" ENGINE.....		007	0160.4 F
006	CYLINDER HEAD #3 - "A" ENGINE.....		006	0171.8 F
005	JACKET WATER TEMP. - "B" ENGINE..		005	0156.1 F
004	JACKET WATER TEMP. - "A" ENGINE..		004	0165.3 F
003	LUBE OIL TEMP. - "B" ENGINE.....		003	0183.2 F
002	LUBE OIL TEMP. - "A" ENGINE.....		002	0190.5 F
001	TOTAL EXHAUST - "B" ENGINE.....		001	0661.1 F
000	TOTAL EXHAUST - "A" ENGINE.....	09 03 28	000	0665.4 F

013	CYLINDER HEAD #14 - "B" ENGINE.....		013	0169.6 F
012	CYLINDER HEAD #14 - "A" ENGINE.....		012	0166.4 F
011	CYLINDER HEAD #11 - "B" ENGINE.....		011	0165.8 F
010	CYLINDER HEAD #11 - "A" ENGINE.....		010	0166.5 F
009	CYLINDER HEAD #6 - "B" ENGINE.....		009	0165.1 F
008	CYLINDER HEAD #6 - "A" ENGINE.....		008	0169.4 F
007	CYLINDER HEAD #3 - "B" ENGINE.....		007	0166.0 F
006	CYLINDER HEAD #3 - "A" ENGINE.....		006	0169.1 F
005	JACKET WATER TEMP. - "B" ENGINE.		005	0166.3 F
004	JACKET WATER TEMP. - "A" ENGINE.		004	0155.7 F
003	LUBE OIL TEMP. - "B" ENGINE.....		003	0187.8 F
002	LUBE OIL TEMP. - "A" ENGINE.....		002	0189.9 F
001	TOTAL EXHAUST - "B" ENGINE.....		001	0661.7 F
000	TOTAL EXHAUST - "A" ENGINE.....	07 58 28	000	0664.8 F






CERTIFIED CORRECT
BY
DATE 12-6-76
POWER SYSTEMS DIVISION
OF MORRISON-KNUDSEN CO., INC.
TEST NO. 250
DATE 12-6-76
TEST 300 START TEST
UNIT NO. 600/-2
SERIAL NO. 764-1689/765-1006
TESTED BY JMG
WITNESSED BY KC Boswell
APPROVED
ENGR.
DATE 12-7-76
POWER SYSTEMS DIV. M.-K.

PRESTART LOG SHEET

Unit # 6001-2 Test # 250 Date # 12-6-76

		A QC	B QC
Ambient Temperature	51°F		
Barometer Reading	30.94		
Humidity	60%		
Hot Leg L.O. Temp.		188	187
Hot Leg. J. W. Temp.		162	162
DC Supply Voltage	130		
Auto-Start Position	✓		
Lube Oil Stand-by Press		40	40
Pressure in Air Tanks	215		

Pressure in Air Tanks immediately after start: 190

Remarks -

Test Technician [illegible]

PSD QC K C Braswell

Witness _____

CERTIFIED CORRECT

BY K C Braswell

DATE 12-6-76

Power Systems Division of Morrison - Kn. Co.

In addition, the following readings will be taken per Start Log Sheet 850-2.

START LOG SHEET

Unit# 6001 C Test# Z50 Date 12-6-76

Interval	Time	A.C. Volt			A.C. Amp			Freq.	KW
	0255	A	B	C	A	B	C		
1 min.	0256	6600	6600	6600	265	265	265	50	3000
5 min.	0300	6600	6600	6600	265	265	265	50	3000
10 min.	0305	6600	6600	6600	266	265	265	50	3000
15 min.	0310	6600	6600	6600	265	265	265	50	3000

Success	Void	Failure
✓		

TEST TECHNICIAN mg

PSD QC K C Boswell

Witness

REMARKS

CERTIFIED CORRECT
BY K C Boswell
DATE 12-6-76
Power Systems Division of Morrison - Kn. Co.

Also record readings per Start Log Sheet 850-3.

START LOG SHEET

Unit 600-2 -A/B Test # 250 - Date 12-6-76

Interval	Time	Exhaust Back Press. Inches H_2O		Intake Suction Inches H_2O		I.O. Press.		F.O. Press.	
		A	B	A	B	A	B	A	B
	02:55								
2 min.	02:57	3.5	4.2	4.7	4.7	84	80	38	40
4 min.	02:59	3.5	4.2	4.7	4.7	81	80	38	40
8 min.	03:03	3.5	4.2	4.7	4.7	80	79	39	40
15 min.	03:10	3.5	4.2	4.7	4.7	80	78	38	40

REMARKS

TEST TECHNICIAN MJ

PSD QC KC Braswell

WITNESS

CERTIFIED CORRECT
BY KC Braswell
DATE 12-6-76
Power Systems Division of Morrison - Kn. Co.

POWER SYSTEMS DIVISION
OF MORRISON-KNUDSEN COMPANY, INC.

QUALITY CONTROL

ENGINE TEST "A" IWO 6004-2 ENGINE SER.# 7431-1089 CUSTOMER _____ CUST. INSP. _____

SHEET ___ OF ___ PSD INSPECTOR K C Brandell DATE 12-6-76 UNIT (A)(B)(C)(D) 1-2-3-4

TIME	EXHAUST TEMPERATURE CYLINDERS 1-20																				EXHAUST TURBO IN		TESTER	INSP.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20				
03:11	750	725	760	745	750	730	720	720	710	680	760	755	780	745	745	745	750	730	750	720		689	KCD	KCB
03:16	745	720	760	740	745	725	715	715	700	680	750	740	745	725	730	725	725	710	735	705		670	KCB	KCB

CERTIFIED CORRECT
BY K C Brandell
DATE 12-6-76
Power Systems Division of Morrison - Kn. Co.

POWER SYSTEMS DIVISION
OF MORRISON-KNUDSEN COMPANY, INC.

QUALITY CONTROL

ENGINE TEST "B" IWO 6001-2 ENGINE SER.# 764-1006 CUSTOMER _____ CUST. INSP. _____

SHEET ___ OF ___ PSD INSPECTOR KC Boswell DATE 12-6-76 UNIT (A) (B) (C) (D) 1-2-3-4

TIME	EXHAUST TEMPERATURE CYLINDERS 1-20																				EXHAUST TURBO IN		TESTER	INSP.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20				
0311	720	750	780	780	780	780	740	750	700	700	690	720	770	770	760	720	720	720	660	670		693	mg	KCB
0316	720	750	780	780	780	780	720	730	680	680	670	710	750	750	750	710	720	720	660	670		674	mg	KCB

CERTIFIED CORRECT
BY KC Boswell
DATE 12-6-76
Power Systems Division of Morrison - Kn. Co.

POWER SYSTEMS DIVISION

START LOG SHEET

TEMPERATURE RECORDING SHEET 1 OF 7

UNIT # 6001-2 A/B TEST # 250 DATE: 12-6-76

TIME FROM START * MINUTES

013	CYLINDER HEAD #14 - "B" ENGINE.....	013 01727	F
012	CYLINDER HEAD #14 - "A" ENGINE.....	012 0169.3	F
011	CYLINDER HEAD #11 - "B" ENGINE.....	011 0169.1	F
010	CYLINDER HEAD #11 - "A" ENGINE.....	010 0169.4	F
009	CYLINDER HEAD #6 - "B" ENGINE.....	009 0168.2	F
008	CYLINDER HEAD #6 - "A" ENGINE.....	008 0172.9	F
007	CYLINDER HEAD #3 - "B" ENGINE.....	007 0170.3	F
006	CYLINDER HEAD #3 - "A" ENGINE.....	006 0171.5	F
005	JACKET WATER TEMP. - "B" ENGINE....	005 0162.6	F
004	JACKET WATER TEMP. - "A" ENGINE....	004 0162.5	F
003	LUBE OIL TEMP. - "B" ENGINE.....	003 0187.6	F
002	LUBE OIL TEMP. - "A" ENGINE.....	002 0188.1	F
001	TOTAL EXHAUST - "B" ENGINE.....	001 0361.7	F
000	TOTAL EXHAUST - "A" ENGINE.....	000 0357.6	F

*TIME FROM START

CERTIFIED CORRECT

BY K C Boswell

DATE 12-6-76

Power Systems Division of Morrison - Kn. Co.

Hot Start

POWER SYSTEMS DIVISION

START LOG SHEET

TEMPERATURE RECORDING SHEET 2 OF 7

UNIT # 6001-2 A/B TEST # 250 DATE: 12-6-76

TIME FROM START _____ MINUTES

013	CYLINDER HEAD #14 - "B" ENGINE.....		013	0174.4 F
012	CYLINDER HEAD #14 - "A" ENGINE.....		012	0171.3 F
011	CYLINDER HEAD #11 - "B" ENGINE.....		011	0171.0 F
010	CYLINDER HEAD #11 - "A" ENGINE.....		010	0171.8 F
009	CYLINDER HEAD #6 - "B" ENGINE.....		009	0169.9 F
008	CYLINDER HEAD #6 - "A" ENGINE.....		008	0174.2 F
007	CYLINDER HEAD #3 - "B" ENGINE.....		007	0172.1 F
006	CYLINDER HEAD #3 - "A" ENGINE.....		006	0173.9 F
005	JACKET WATER TEMP. - "B" ENGINE....		005	0164.3 F
004	JACKET WATER TEMP. - "A" ENGINE....		004	0164.2 F
003	LUBE OIL TEMP. - "B" ENGINE.....		003	0184.9 F
002	LUBE OIL TEMP. - "A" ENGINE.....		002	0185.7 F
001	TOTAL EXHAUST - "B" ENGINE.....		001	0649.6 F
000	TOTAL EXHAUST - "A" ENGINE.....	02 57 40	000	0642.5 F

013	CYLINDER HEAD #14 - "B" ENGINE.....		013	0175.9 F
012	CYLINDER HEAD #14 - "A" ENGINE.....		012	0172.3 F
011	CYLINDER HEAD #11 - "B" ENGINE.....		011	0172.2 F
010	CYLINDER HEAD #11 - "A" ENGINE.....		010	0172.7 F
009	CYLINDER HEAD #6 - "B" ENGINE.....		009	0170.0 F
008	CYLINDER HEAD #6 - "A" ENGINE.....		008	0175.2 F
007	CYLINDER HEAD #3 - "B" ENGINE.....		007	0173.3 F
006	CYLINDER HEAD #3 - "A" ENGINE.....		006	0174.1 F
005	JACKET WATER TEMP. - "B" ENGINE...		005	0164.3 F
004	JACKET WATER TEMP. - "A" ENGINE...		004	0164.2 F
003	LUBE OIL TEMP. - "B" ENGINE.....		003	0184.1 F
002	LUBE OIL TEMP. - "A" ENGINE.....		002	0184.5 F
001	TOTAL EXHAUST - "B" ENGINE.....		001	0632.1 F
000	TOTAL EXHAUST - "A" ENGINE.....	02 57 40	000	0626.5 F

POWER SYSTEMS DIVISION

START LOG SHEET

TEMPERATURE RECORDING SHEET 3 OF 7

UNIT # 6001-2 A/B TEST # 250 DATE: 12-6-76

TIME FROM START ____ MINUTES

013	CYLINDER HEAD #14 - "B" ENGINE.....		013	0172.3 F
012	CYLINDER HEAD #14 - "A" ENGINE.....		012	0170.1 F
011	CYLINDER HEAD #11 - "B" ENGINE.....		011	0163.6 F
010	CYLINDER HEAD #11 - "A" ENGINE.....		010	0170.6 F
009	CYLINDER HEAD #6 - "B" ENGINE.....		009	0168.7 F
008	CYLINDER HEAD #6 - "A" ENGINE.....		008	0172.9 F
007	CYLINDER HEAD #3 - "B" ENGINE.....		007	0170.6 F
006	CYLINDER HEAD #3 - "A" ENGINE.....		006	0171.5 F
005	JACKET WATER TEMP. - "B" ENGINE....		005	0166.4 F
004	JACKET WATER TEMP. - "A" ENGINE....		004	0165.3 F
003	LUBE OIL TEMP. - "B" ENGINE.....		003	0187.0 F
002	LUBE OIL TEMP. - "A" ENGINE.....		002	0189.2 F
001	TOTAL EXHAUST - "B" ENGINE.....		001	0660.1 F
000	TOTAL EXHAUST - "A" ENGINE.....	02 59 40	000	0658.2 F

013	CYLINDER HEAD #14 - "B" ENGINE.....		013	0173.4 F
012	CYLINDER HEAD #14 - "A" ENGINE.....		012	0170.5 F
011	CYLINDER HEAD #11 - "B" ENGINE.....		011	0170.1 F
010	CYLINDER HEAD #11 - "A" ENGINE.....		010	0171.1 F
009	CYLINDER HEAD #6 - "B" ENGINE.....		009	0169.1 F
008	CYLINDER HEAD #6 - "A" ENGINE.....		008	0173.4 F
007	CYLINDER HEAD #3 - "B" ENGINE.....		007	0171.2 F
006	CYLINDER HEAD #3 - "A" ENGINE.....		006	0172.0 F
005	JACKET WATER TEMP. - "B" ENGINE...		005	0167.0 F
004	JACKET WATER TEMP. - "A" ENGINE...		004	0165.3 F
003	LUBE OIL TEMP. - "B" ENGINE.....		003	0136.6 F
002	LUBE OIL TEMP. - "A" ENGINE.....		002	0137.2 F
001	TOTAL EXHAUST - "B" ENGINE.....		001	0657.5 F
000	TOTAL EXHAUST - "A" ENGINE.....	03 58 41	000	0654.0 F

POWER SYSTEMS DIVISION

START LOG SHEET

TEMPERATURE RECORDING SHEET 4 OF 7

UNIT # 6001-2 A/B TEST # 250 DATE: 12-6-76

TIME FROM START _____ MINUTES

013	CYLINDER HEAD #14 - "B" ENGINE.....		013	01738	F
012	CYLINDER HEAD #14 - "A" ENGINE.....		012	01706	F
011	CYLINDER HEAD #11 - "B" ENGINE.....		011	01703	F
010	CYLINDER HEAD #11 - "A" ENGINE.....		010	01710	F
009	CYLINDER HEAD #6 - "B" ENGINE.....		009	01694	F
008	CYLINDER HEAD #6 - "A" ENGINE.....		008	01737	F
007	CYLINDER HEAD #3 - "B" ENGINE.....		007	01714	F
006	CYLINDER HEAD #3 - "A" ENGINE.....		006	01724	F
005	JACKET WATER TEMP. - "B" ENGINE....		005	01665	F
004	JACKET WATER TEMP. - "A" ENGINE....		004	01659	F
003	LUBE OIL TEMP. - "B" ENGINE.....		003	01903	F
002	LUBE OIL TEMP. - "A" ENGINE.....		002	01909	F
001	TOTAL EXHAUST - "B" ENGINE.....		001	06647	F
000	TOTAL EXHAUST - "A" ENGINE.....	07 05 41	000	06619	F

013	CYLINDER HEAD #14 - "B" ENGINE.....		013	01727	F
012	CYLINDER HEAD #14 - "A" ENGINE.....		012	01692	F
011	CYLINDER HEAD #11 - "B" ENGINE.....		011	01694	F
010	CYLINDER HEAD #11 - "A" ENGINE.....		010	01714	F
009	CYLINDER HEAD #6 - "B" ENGINE.....		009	01656	F
008	CYLINDER HEAD #6 - "A" ENGINE.....		008	01728	F
007	CYLINDER HEAD #3 - "B" ENGINE.....		007	01703	F
006	CYLINDER HEAD #3 - "A" ENGINE.....		006	01714	F
005	JACKET WATER TEMP. - "B" ENGINE...		005	01664	F
004	JACKET WATER TEMP. - "A" ENGINE...		004	01657	F
003	LUBE OIL TEMP. - "B" ENGINE.....		003	01896	F
002	LUBE OIL TEMP. - "A" ENGINE.....		002	01890	F
001	TOTAL EXHAUST - "B" ENGINE.....		001	06640	F
000	TOTAL EXHAUST - "A" ENGINE.....	07 10 41	000	06621	F

POWER SYSTEMS DIVISION

START LOG SHEET

TEMPERATURE RECORDING SHEET 5 OF 7

UNIT # 6001-2 A/B TEST # 250 DATE: 12-6-76

TIME FROM START _____ MINUTES

013	CYLINDER HEAD #14 - "B" ENGINE.....		013	0175.4	F
012	CYLINDER HEAD #14 - "A" ENGINE.....		012	0172.0	F
011	CYLINDER HEAD #11 - "B" ENGINE.....		011	0171.8	F
010	CYLINDER HEAD #11 - "A" ENGINE.....		010	0172.2	F
009	CYLINDER HEAD #6 - "B" ENGINE.....		009	0170.7	F
008	CYLINDER HEAD #6 - "A" ENGINE.....		008	0175.3	F
007	CYLINDER HEAD #3 - "B" ENGINE.....		007	0172.7	F
006	CYLINDER HEAD #3 - "A" ENGINE.....		006	0173.9	F
005	JACKET WATER TEMP. - "B" ENGINE....		005	0166.5	F
004	JACKET WATER TEMP. - "A" ENGINE....		004	0166.1	F
003	LUBE OIL TEMP. - "B" ENGINE.....		003	0191.4	F
002	LUBE OIL TEMP. - "A" ENGINE.....		002	0191.9	F
001	TOTAL EXHAUST - "B" ENGINE.....		001	0674.4	F
000	TOTAL EXHAUST - "A" ENGINE.....	03 15 40	000	0670.1	F

013	CYLINDER HEAD #14 - "B" ENGINE.....		013	0174.8	F
012	CYLINDER HEAD #14 - "A" ENGINE.....		012	0171.4	F
011	CYLINDER HEAD #11 - "B" ENGINE.....		011	0171.3	F
010	CYLINDER HEAD #11 - "A" ENGINE.....		010	0171.8	F
009	CYLINDER HEAD #6 - "B" ENGINE.....		009	0170.3	F
008	CYLINDER HEAD #6 - "A" ENGINE.....		008	0174.7	F
007	CYLINDER HEAD #3 - "B" ENGINE.....		007	0172.3	F
006	CYLINDER HEAD #3 - "A" ENGINE.....		006	0173.4	F
005	JACKET WATER TEMP. - "B" ENGINE...		005	0166.9	F
004	JACKET WATER TEMP. - "A" ENGINE...		004	0166.3	F
003	LUBE OIL TEMP. - "B" ENGINE.....		003	0191.0	F
002	LUBE OIL TEMP. - "A" ENGINE.....		002	0191.6	F
001	TOTAL EXHAUST - "B" ENGINE.....		001	0693.6	F
000	TOTAL EXHAUST - "A" ENGINE.....	03 10 40	000	0689.1	F

POWER SYSTEMS DIVISION

START LOG SHEET

TEMPERATURE RECORDING SHEET 6 OF 7

UNIT # 6001-2 A/B TEST # 250 DATE: 12-6-76

TIME FROM START _____ MINUTES

013	CYLINDER HEAD #14 - "B" ENGINE.....		013	0161.0 F
012	CYLINDER HEAD #14 - "A" ENGINE.....		012	0160.0 F
011	CYLINDER HEAD #11 - "B" ENGINE.....		011	0158.4 F
010	CYLINDER HEAD #11 - "A" ENGINE.....		010	0160.7 F
009	CYLINDER HEAD #6 - "B" ENGINE.....		009	0157.8 F
008	CYLINDER HEAD #6 - "A" ENGINE.....		008	0165.2 F
007	CYLINDER HEAD #3 - "B" ENGINE.....		007	0159.3 F
006	CYLINDER HEAD #3 - "A" ENGINE.....		006	0161.9 F
005	JACKET WATER TEMP. - "B" ENGINE....		005	0117.6 F
004	JACKET WATER TEMP. - "A" ENGINE....		004	0121.0 F
003	LUBE OIL TEMP. - "B" ENGINE.....		003	0168.4 F
002	LUBE OIL TEMP. - "A" ENGINE.....		002	0170.5 F
001	TOTAL EXHAUST - "B" ENGINE.....		001	0199.0 F
000	TOTAL EXHAUST - "A" ENGINE.....	03 25 40	000	0240.7 F

013	CYLINDER HEAD #14 - "B" ENGINE.....		013	0175.6 F
012	CYLINDER HEAD #14 - "A" ENGINE.....		012	0172.2 F
011	CYLINDER HEAD #11 - "B" ENGINE.....		011	0172.1 F
010	CYLINDER HEAD #11 - "A" ENGINE.....		010	0172.5 F
009	CYLINDER HEAD #6 - "B" ENGINE.....		009	0171.2 F
008	CYLINDER HEAD #6 - "A" ENGINE.....		008	0175.7 F
007	CYLINDER HEAD #3 - "B" ENGINE.....		007	0173.2 F
006	CYLINDER HEAD #3 - "A" ENGINE.....		006	0174.4 F
005	JACKET WATER TEMP. - "B" ENGINE...		005	0166.7 F
004	JACKET WATER TEMP. - "A" ENGINE...		004	0166.1 F
003	LUBE OIL TEMP. - "B" ENGINE.....		003	0191.5 F
002	LUBE OIL TEMP. - "A" ENGINE.....		002	0192.0 F
001	TOTAL EXHAUST - "B" ENGINE.....		001	0682.9 F
000	TOTAL EXHAUST - "A" ENGINE.....	03 20 40	000	0677.9 F

POWER SYSTEMS DIVISION

START LOG SHEET

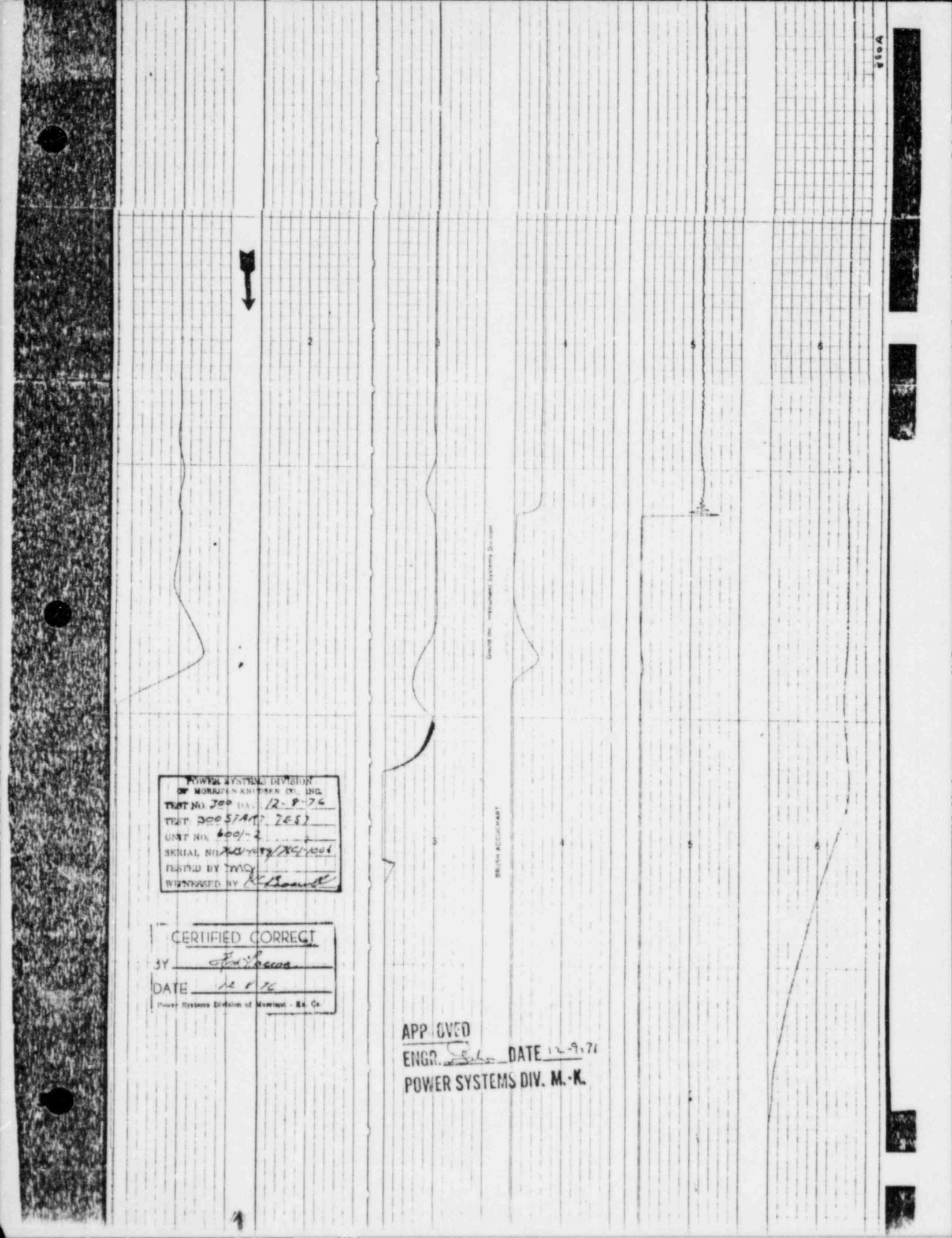
TEMPERATURE RECORDING SHEET 7 OF 7

UNIT # 600/2 A/B TEST # 250 DATE: 12-6-76

TIME FROM START _____ MINUTES

013	CYLINDER HEAD #14 - "B" ENGINE.....		013 01203	F
012	CYLINDER HEAD #14 - "A" ENGINE.....		012 01232	F
011	CYLINDER HEAD #11 - "B" ENGINE.....		011 01194	F
010	CYLINDER HEAD #11 - "A" ENGINE.....		010 01235	F
009	CYLINDER HEAD #6 - "B" ENGINE.....		009 01193	F
008	CYLINDER HEAD #6 - "A" ENGINE.....		008 01274	F
007	CYLINDER HEAD #3 - "B" ENGINE.....		007 01191	F
006	CYLINDER HEAD #3 - "A" ENGINE.....		006 01233	F
005	JACKET WATER TEMP. - "B" ENGINE....		005 00897	F
004	JACKET WATER TEMP. - "A" ENGINE....		004 00942	F
003	LUBE OIL TEMP. - "B" ENGINE.....		003 01281	F
002	LUBE OIL TEMP. - "A" ENGINE.....		002 01320	F
001	TOTAL EXHAUST - "B" ENGINE.....		001 01494	F
000	TOTAL EXHAUST - "A" ENGINE.....	03 35 41	000 01922	F

013	CYLINDER HEAD #14 - "B" ENGINE.....		013 01373	F
012	CYLINDER HEAD #14 - "A" ENGINE.....		012 01388	F
011	CYLINDER HEAD #11 - "B" ENGINE.....		011 01360	F
010	CYLINDER HEAD #11 - "A" ENGINE.....		010 01393	F
009	CYLINDER HEAD #6 - "B" ENGINE.....		009 01352	F
008	CYLINDER HEAD #6 - "A" ENGINE.....		008 01475	F
007	CYLINDER HEAD #3 - "B" ENGINE.....		007 01361	F
006	CYLINDER HEAD #3 - "A" ENGINE.....		006 01397	F
005	JACKET WATER TEMP. - "B" ENGINE...		005 01000	F
004	JACKET WATER TEMP. - "A" ENGINE...		004 01044	F
003	LUBE OIL TEMP. - "B" ENGINE.....		003 01439	F
002	LUBE OIL TEMP. - "A" ENGINE.....		002 01472	F
001	TOTAL EXHAUST - "B" ENGINE.....		001 01650	F
000	TOTAL EXHAUST - "A" ENGINE.....	03 70 40	000 02070	F


POWER SYSTEMS DIVISION
OF MORRISON-KNUDSEN CO., INC.
TEST NO. 300 DATE 12-8-76
TEST 300 START 2652
UNIT NO. 600/-2
SERIAL NO.
TESTED BY TMC
WITNESSED BY
CERTIFIED CORRECT
BY
DATE 12 8 76
Power Systems Division of Morrison - M. Co.
APPROVED
ENGR. DATE 12-9-76
POWER SYSTEMS DIV. M.-K.

PRESTART LOG SHEET

Unit # 6001-2 Test # 300 Date # 12-8-76

	A	QC	B	QC
Ambient Temperature	64° F			
Barometer Reading	29.73			
Humidity	78%			
Hot Leg L.O. Temp.	188		188	
Hot Leg. J. W. Temp.	163		163	
DC Supply Voltage	130			
Auto-Start Position	✓			
Lube Oil Stand-by Press	37		38	
Pressure in Air Tanks	210			

Pressure in Air Tanks immediately after start 197

Remarks -

Test Technician mg

PSD QC KC Braswell

Witness

CERTIFIED CORRECT
BY KC Braswell
DATE 12-8-76
Power Systems Division of Morrison - Kn. Co.

In addition, the following readings will be taken per Start Log Sheet 850-2.

START LOG SHEET

Unit# 6001-2 Test# 300 Date 12-8-76

Interval	Time	A.C. Volt			A.C. Amp			Freq.	KW
	2449	A	B	C	A	B	C		
1 min.	2450	6600	6600	6600	260	260	270	50	3000
5 min.	2457	6600	6600	6600	260	260	270	50	3000
10 min.	2459	6600	6600	6600	260	260	270	50	3000
15 min.	0104	6600	6600	6600	260	260	270	50	3000

Success	Void	Failure
✓		

TEST TECHNICIAN mg

PSD QC KC Brandell

Witness

REMARKS

CERTIFIED CORRECT
BY KC Brandell
DATE 12-8-76
Power Systems Division of Morrison - Kn. Co.

Also record readings per Start Log Sheet 850-3.

START LOG SHEET

Unit 6001-2 -A/B Test # 300 - Date 12- -76

Interval	Time	Exhaust Back Press. Inches H_2O		Intake Suction Inches H_2O		F.O. Press.		F.O. Press.	
		A	B	A	B	A	B	A	B
	00:49								
2 min.	00:51	3.3	4.0	4.5	4.4	81	79	37	39
4 min.	00:53	3.3	4.0	4.5	4.4	80	78	37	39
8 min.	00:57	3.3	4.1	4.5	4.4	79	78	37	38
15 min.	01:04	3.3	4.1	4.5	4.4	78	77	37	37

TEST TECHNICIAN mb

PSD QC KC Braswell

WITNESS

REMARKS

CERTIFIED CORRECT

BY KC Braswell

DATE 12-4-76

Power Systems Division of Morrison • Knudsen

POWER SYSTEMS DIVISION
OF MORRISON-KNUDSEN COMPANY, INC.

QUALITY CONTROL

ENGINE TEST "A" IWO 6001-2 ENGINE SER.# 7613-1089 CUSTOMER _____ CUST. INSP. _____

SHEET ___ OF ___ PSD INSPECTOR KC Braswell DATE 12-8-76 UNIT (A)(B)(C)(D) 1-2-3-4

TIME	EXHAUST TEMPERATURE CYLINDERS 1-20																				EXHAUST TURBO IN		TESTER	INSP.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20				
d:05	765	740	780	770	785	760	745	755	730	710	790	785	790	765	765	760	760	745	755	725		687	KCB	KCB
d:10	755	725	760	750	760	745	730	740	715	700	785	780	780	760	760	760	760	745	760	730		670	KCB	KCB

CERTIFIED CORRECT
BY KC Braswell
DATE 12-8-76
Power Systems Division of Morrison - Kn. Co.

QC-TEST-300

POWER SYSTEMS DIVISION
OF MORRISON-KNUDSEN COMPANY, INC.

QUALITY CONTROL

ENGINE TEST "A" IWO 6061-2 ENGINE SER.# 76C1-1006 CUSTOMER _____ CUST. INSP. _____

SHEET ___ OF ___ PSD INSPECTOR KC Braswell DATE 12-8-76 UNIT (A)(B)(C)(D) 1-2-3-4

TIME	EXHAUST TEMPERATURE CYLINDERS 1-20																				EXHAUST TURBO		TESTER	INSP.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	IN			
01:05	740	770	810	800	800	800	760	770	710	770	700	740	790	790	760	750	750	750	680	700		694	mg	KCB
01:10	740	760	810	800	790	800	750	770	710	770	700	740	790	790	760	750	760	750	690	700		674	mg	KCB

CERTIFIED CORRECT
BY KC Braswell
DATE 12-8-76
Power Systems Division of Morrison - Kn. Co.

QC-TEST-300

POWER SYSTEMS DIVISION

START LOG SHEET

TEMPERATURE RECORDING SHEET 1 OF 7

UNIT #600/-2 A/B TEST # 300 DATE 12-8-76

TIME FROM START * MINUTES

013	CYLINDER HEAD #14 - "B" ENGINE.....	013	0173.4	F
012	CYLINDER HEAD #14 - "A" ENGINE.....	012	0170.0	F
011	CYLINDER HEAD #11 - "B" ENGINE.....	011	0170.1	F
010	CYLINDER HEAD #11 - "A" ENGINE.....	010	0170.7	F
009	CYLINDER HEAD #6 - "B" ENGINE.....	009	0169.1	F
008	CYLINDER HEAD #6 - "A" ENGINE.....	008	0173.6	F
007	CYLINDER HEAD #3 - "B" ENGINE.....	007	0171.1	F
006	CYLINDER HEAD #3 - "A" ENGINE.....	006	0172.5	F
005	JACKET WATER TEMP. - "B" ENGINE...	005	0163.1	F
004	JACKET WATER TEMP. - "A" ENGINE...	004	0163.1	F
003	LUBE OIL TEMP. - "B" ENGINE.....	003	0188.5	F
002	LUBE OIL TEMP. - "A" ENGINE.....	002	0188.8	F
001	TOTAL EXHAUST - "B" ENGINE.....	001	0367.3	F
000	TOTAL EXHAUST - "A" ENGINE..... 00 45 42	000	0370.6	

*TIME FROM START

CERTIFIED CORRECT
BY KC Boswell
DATE 12-9-76
Power Systems Division of Morrison - Kn. Co.

Hot Start

START LOG SHEET

TEMPERATURE RECORDING SHEET 2 OF 7

UNIT # 6001-2A/B TEST # 300 DATE 2-8-76

TIME FROM START _____ MINUTES

013	CYLINDER HEAD #14 - "B" ENGINE.....	013	01744	F
012	CYLINDER HEAD #14 - "A" ENGINE.....	012	01712	F
011	CYLINDER HEAD #11 - "B" ENGINE.....	011	01713	F
010	CYLINDER HEAD #11 - "A" ENGINE.....	010	01721	F
009	CYLINDER HEAD #6 - "B" ENGINE.....	009	01767	F
008	CYLINDER HEAD #6 - "A" ENGINE.....	008	01750	F
007	CYLINDER HEAD #3 - "B" ENGINE.....	007	01739	F
006	CYLINDER HEAD #3 - "A" ENGINE.....	006	01742	F
005	JACKET WATER TEMP. - "B" ENGINE...	005	01655	F
004	JACKET WATER TEMP. - "A" ENGINE...	004	01654	F
003	LUBE OIL TEMP. - "B" ENGINE.....	003	01866	F
002	LUBE OIL TEMP. - "A" ENGINE.....	002	01871	F
001	TOTAL EXHAUST - "B" ENGINE.....	001	06799	F
000	TOTAL EXHAUST - "A" ENGINE..... 00 [illegible]	000	06738	F

013	CYLINDER HEAD #14 - "B" ENGINE.....	013	01746	F
012	CYLINDER HEAD #14 - "A" ENGINE.....	012	01719	F
011	CYLINDER HEAD #11 - "B" ENGINE.....	011	01723	F
010	CYLINDER HEAD #11 - "A" ENGINE.....	010	01726	F
009	CYLINDER HEAD #6 - "B" ENGINE.....	009	01716	F
008	CYLINDER HEAD #6 - "A" ENGINE.....	008	01759	F
007	CYLINDER HEAD #3 - "B" ENGINE.....	007	01740	F
006	CYLINDER HEAD #3 - "A" ENGINE.....	006	01754	F
005	JACKET WATER TEMP. - "B" ENGINE..	005	01656	F
004	JACKET WATER TEMP. - "A" ENGINE..	004	01643	F
003	LUBE OIL TEMP. - "B" ENGINE.....	003	01856	F
002	LUBE OIL TEMP. - "A" ENGINE.....	002	01858	F
001	TOTAL EXHAUST - "B" ENGINE.....	001	06594	F
000	TOTAL EXHAUST - "A" ENGINE..... 00 50 56	000	06489	F

START LOG SHEET

TEMPERATURE RECORDING SHEET 3 OF

UNIT # 6001-2A/B TEST # 300 DATE

TIME FROM START MINUTES

013	CYLINDER HEAD #11 - "B" ENGINE.....	013	01761 F
012	CYLINDER HEAD #11 - "A" ENGINE.....	012	01704 F
011	CYLINDER HEAD #11 - "B" ENGINE.....	011	01702 F
010	CYLINDER HEAD #11 - "A" ENGINE.....	010	01713 F
009	CYLINDER HEAD #6 - "B" ENGINE.....	009	01696 F
008	CYLINDER HEAD #6 - "A" ENGINE.....	008	01748 F
007	CYLINDER HEAD #3 - "B" ENGINE.....	007	01715 F
006	CYLINDER HEAD #3 - "A" ENGINE.....	006	01728 F
005	JACKET WATER TEMP. - "B" ENGINE...	005	01669 F
004	JACKET WATER TEMP. - "A" ENGINE...	004	01662 F
003	LUBE OIL TEMP. - "B" ENGINE.....	003	01982 F
002	LUBE OIL TEMP. - "A" ENGINE.....	002	01986 F
001	TOTAL EXHAUST - "B" ENGINE.....	001	06920 F
000	TOTAL EXHAUST - "A" ENGINE.....	000	06859 F

013	CYLINDER HEAD #11 - "B" ENGINE.....	013	01735 F
012	CYLINDER HEAD #11 - "A" ENGINE.....	012	01706 F
011	CYLINDER HEAD #11 - "B" ENGINE.....	011	01705 F
010	CYLINDER HEAD #11 - "A" ENGINE.....	010	01716 F
009	CYLINDER HEAD #6 - "B" ENGINE.....	009	01700 F
008	CYLINDER HEAD #6 - "A" ENGINE.....	008	01742 F
007	CYLINDER HEAD #3 - "B" ENGINE.....	007	01719 F
006	CYLINDER HEAD #3 - "A" ENGINE.....	006	01733 F
005	JACKET WATER TEMP. - "B" ENGINE...	005	01668 F
004	JACKET WATER TEMP. - "A" ENGINE...	004	01661 F
003	LUBE OIL TEMP. - "B" ENGINE.....	003	01981 F
002	LUBE OIL TEMP. - "A" ENGINE.....	002	01985 F
001	TOTAL EXHAUST - "B" ENGINE.....	001	06903 F
000	TOTAL EXHAUST - "A" ENGINE.....	000	06860 F

ENGINEERED SYSTEMS

START LOG SHEET

TEMPERATURE RECORDING SHEET 4 OF [illegible]

UNIT #GOL-2 A/B TEST # 300 DATE 12-8-76

TIME FROM START _____ MINUTES

013	CYLINDER HEAD #14 - "B" ENGINE.....	013	0174.4	F
012	CYLINDER HEAD #14 - "A" ENGINE.....	012	0171.5	F
011	CYLINDER HEAD #11 - "B" ENGINE.....	011	0171.2	F
010	CYLINDER HEAD #11 - "A" ENGINE.....	010	0173.2	F
009	CYLINDER HEAD #6 - "B" ENGINE.....	009	0170.2	F
008	CYLINDER HEAD #6 - "A" ENGINE.....	008	0174.4	F
007	CYLINDER HEAD #3 - "B" ENGINE.....	007	0173.2	F
006	CYLINDER HEAD #3 - "A" ENGINE.....	006	0173.5	F
005	JACKET WATER TEMP. - "B" ENGINE...	005	0167.0	F
004	JACKET WATER TEMP. - "A" ENGINE...	004	0166.6	F
003	LUBE OIL TEMP. - "B" ENGINE.....	003	0191.5	
002	LUBE OIL TEMP. - "A" ENGINE.....	002	0191.0	
001	TOTAL EXHAUST - "B" ENGINE.....	001	0693.0	
000	TOTAL EXHAUST - "A" ENGINE.....	00[illegible]	0[illegible]8[illegible]3	F

013	CYLINDER HEAD #14 - "B" ENGINE.....	013	0173.1	
012	CYLINDER HEAD #14 - "A" ENGINE.....	012	0170.3	
011	CYLINDER HEAD #11 - "B" ENGINE.....	011	0170.[illegible]	F
010	CYLINDER HEAD #11 - "A" ENGINE.....	010	0171.3	F
009	CYLINDER HEAD #6 - "B" ENGINE.....	009	0[illegible]3.4	F
008	CYLINDER HEAD #6 - "A" ENGINE.....	008	0173.7	F
007	CYLINDER HEAD #3 - "B" ENGINE.....	007	0171.4	F
006	CYLINDER HEAD #3 - "A" ENGINE.....	006	0172.6	F
005	JACKET WATER TEMP. - "B" ENGINE...	005	0166.9	F
004	JACKET WATER TEMP. - "A" ENGINE...	004	0165.4	F
003	LUBE OIL TEMP. - "B" ENGINE.....	003	0183.9	F
002	LUBE OIL TEMP. - "A" ENGINE.....	002	0[illegible]	F
001	TOTAL EXHAUST - "B" ENGINE.....	001	0693.1	F
000	TOTAL EXHAUST - "A" ENGINE.....	00[illegible]	0[illegible]6[illegible]1	F

FOSTER SYSTEMS

START LOG SHEET

TEMPERATURE RECORDING SHEET 5 OF 7

UNIT # 600-2 A/B TEST # 200 DATE 3-9-76

TIME FROM START _____ MINUTES

013	CYLINDER HEAD #14 - "B" ENGINE.....	013	01753 F
012	CYLINDER HEAD #14 - "A" ENGINE.....	012	01760 F
011	CYLINDER HEAD #11 - "B" ENGINE.....	011	01745 F
010	CYLINDER HEAD #11 - "A" ENGINE.....	010	01734 F
009	CYLINDER HEAD #6 - "B" ENGINE.....	009	01717 F
008	CYLINDER HEAD #6 - "A" ENGINE.....	008	01750 F
007	CYLINDER HEAD #3 - "B" ENGINE.....	007	01735 F
006	CYLINDER HEAD #3 - "A" ENGINE.....	006	01751 F
005	JACKET WATER TEMP. - "B" ENGINE...	005	01569 F
004	JACKET WATER TEMP. - "A" ENGINE...	004	01581 F
003	LUBE OIL TEMP. - "B" ENGINE.....	003	01923 F
002	LUBE OIL TEMP. - "A" ENGINE.....	002	01932
001	TOTAL EXHAUST - "B" ENGINE.....	001	01703
000	TOTAL EXHAUST - "A" ENGINE..... 01 05	000	01705 F

013	CYLINDER HEAD #14 - "B" ENGINE.....	013	01754 F
012	CYLINDER HEAD #14 - "A" ENGINE.....	012	01731
011	CYLINDER HEAD #11 - "B" ENGINE.....	011	01731 F
010	CYLINDER HEAD #11 - "A" ENGINE.....	010	01741 F
009	CYLINDER HEAD #6 - "B" ENGINE.....	009	01711 F
008	CYLINDER HEAD #6 - "A" ENGINE.....	008	01754 F
007	CYLINDER HEAD #3 - "B" ENGINE.....	007	01730 F
006	CYLINDER HEAD #3 - "A" ENGINE.....	006	01745 F
005	JACKET WATER TEMP. - "B" ENGINE..	005	01471 F
004	JACKET WATER TEMP. - "A" ENGINE..	004	01469 F
003	LUBE OIL TEMP. - "B" ENGINE.....	003	01923 F
002	LUBE OIL TEMP. - "A" ENGINE.....	002	01937 F
001	TOTAL EXHAUST - "B" ENGINE.....	001	01694 F
000	TOTAL EXHAUST - "A" ENGINE..... 01 05	000	01674 F

PROVEZER SYSTEMS
DIVISION

START LOG SHEET

TEMPERATURE RECORDING SHEET 6 OF 7

UNIT # 600-2 A/B TEST # 300 DATE 3-8-76

TIME FROM START _____ MINUTES

013	CYLINDER HEAD #14 - "B" ENGINE.....			
012	CYLINDER HEAD #14 - "A" ENGINE.....			
011	CYLINDER HEAD #11 - "B" ENGINE.....			
010	CYLINDER HEAD #11 - "A" ENGINE.....			
009	CYLINDER HEAD #6 - "B" ENGINE.....			
008	CYLINDER HEAD #6 - "A" ENGINE.....			
007	CYLINDER HEAD #3 - "B" ENGINE.....			
006	CYLINDER HEAD #3 - "A" ENGINE.....			
005	JACKET WATER TEMP. - "B" ENGINE....			
004	JACKET WATER TEMP. - "A" ENGINE....			
003	LUBE OIL TEMP. - "B" ENGINE.....			
002	LUBE OIL TEMP. - "A" ENGINE.....			
001	TOTAL EXHAUST - "B" ENGINE.....			
000	TOTAL EXHAUST - "A" ENGINE.....			

013	CYLINDER HEAD #14 - "B" ENGINE.....			
012	CYLINDER HEAD #14 - "A" ENGINE.....			
011	CYLINDER HEAD #11 - "B" ENGINE.....			
010	CYLINDER HEAD #11 - "A" ENGINE.....			
009	CYLINDER HEAD #6 - "B" ENGINE.....			
008	CYLINDER HEAD #6 - "A" ENGINE.....			
007	CYLINDER HEAD #3 - "B" ENGINE.....			
006	CYLINDER HEAD #3 - "A" ENGINE.....			
005	JACKET WATER TEMP. - "B" ENGINE...			
004	JACKET WATER TEMP. - "A" ENGINE...			
003	LUBE OIL TEMP. - "B" ENGINE.....			
002	LUBE OIL TEMP. - "A" ENGINE.....			
001	TOTAL EXHAUST - "B" ENGINE.....			
000	TOTAL EXHAUST - "A" ENGINE.....			

EDELVEISS SYSTEMS

START LOG SHEET

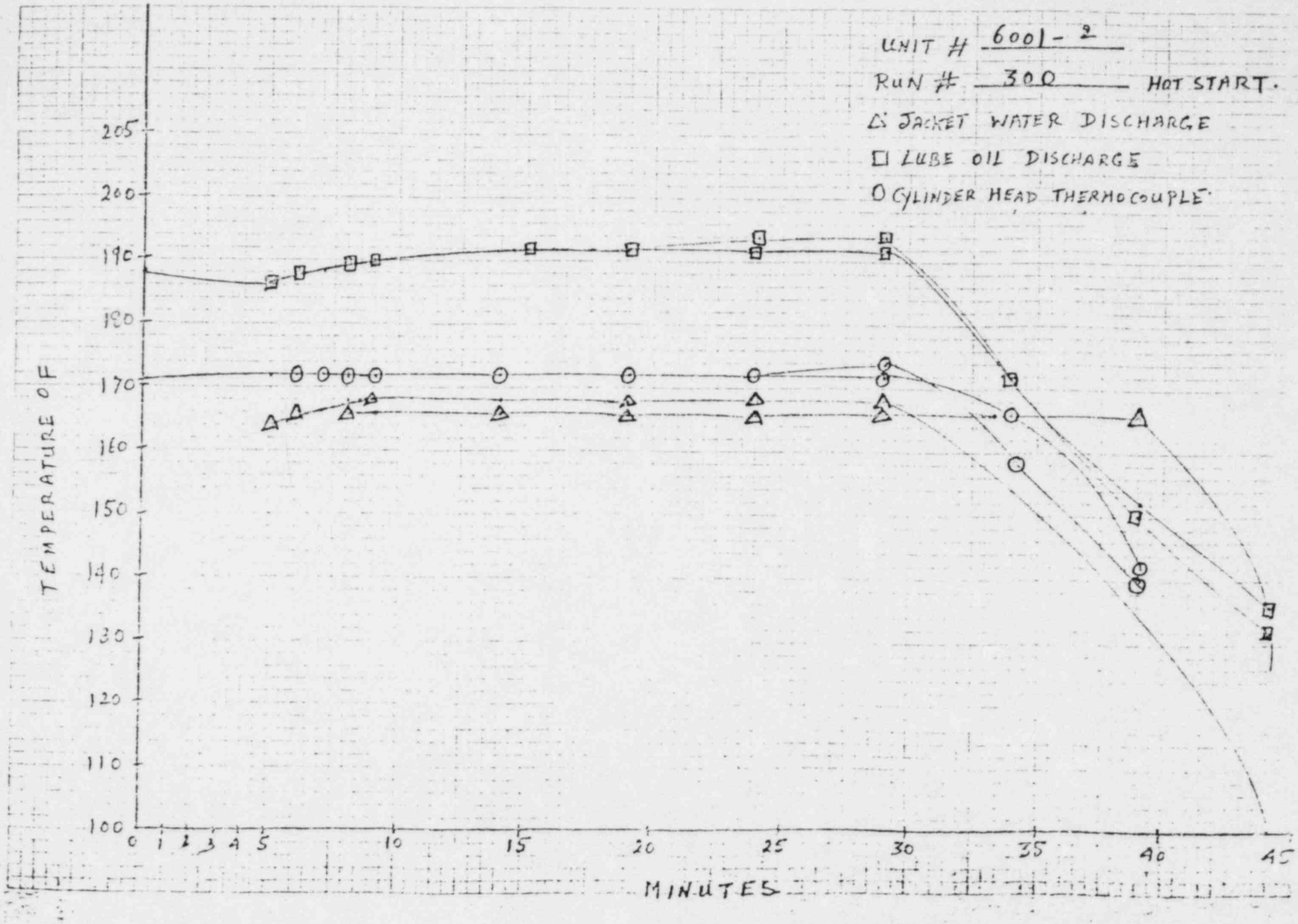
TEMPERATURE RECORDING SHEET 1 OF

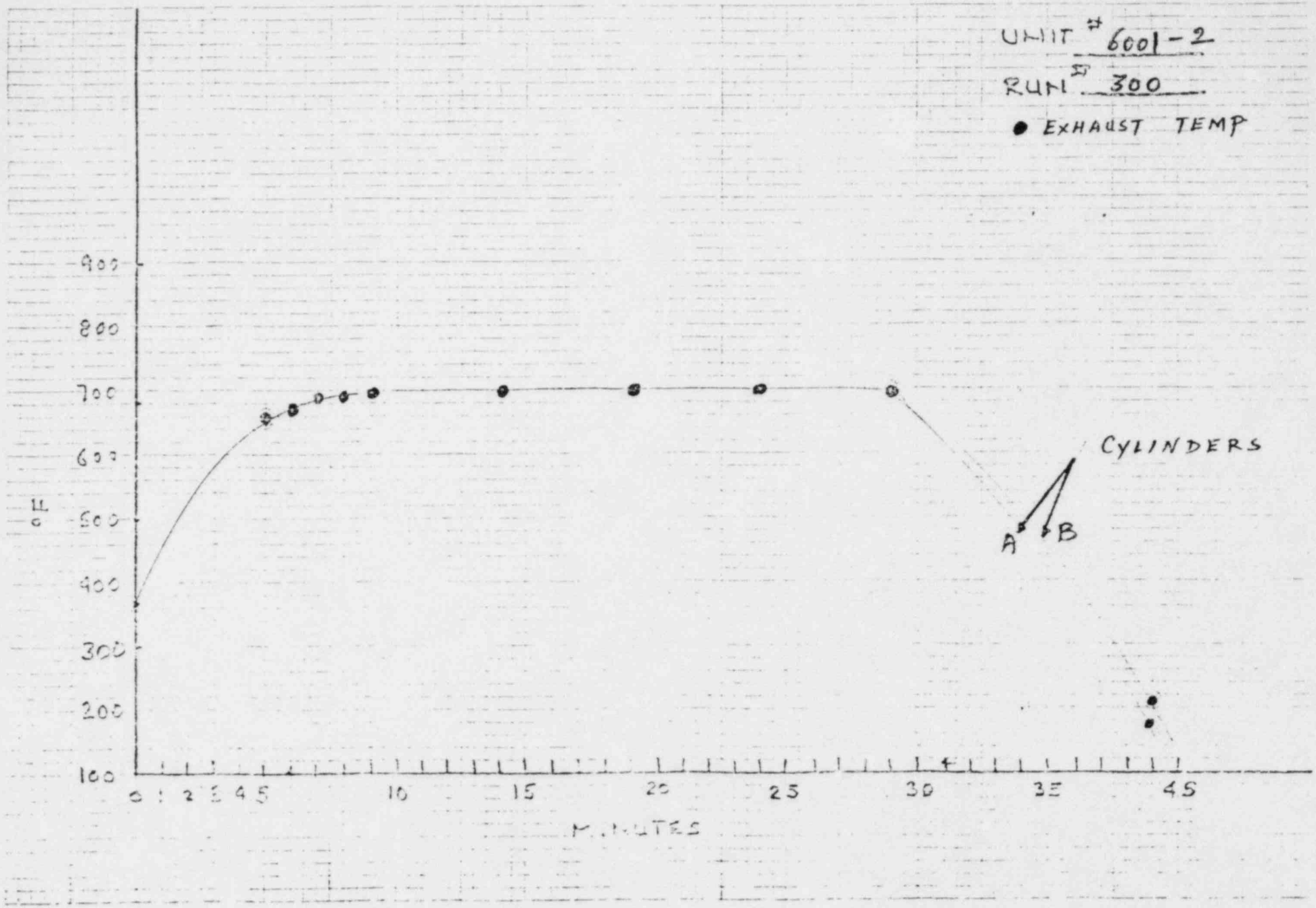
UNIT # 6001-2 A/B TEST # 300 DATE 8-76

TIME FROM START _____ MINUTES

013	CYLINDER HEAD #14 - "B" ENGINE.....		
012	CYLINDER HEAD #14 - "A" ENGINE.....		
011	CYLINDER HEAD #11 - "B" ENGINE.....		
010	CYLINDER HEAD #11 - "A" ENGINE.....		
009	CYLINDER HEAD #6 - "B" ENGINE.....		
008	CYLINDER HEAD #6 - "A" ENGINE.....		
007	CYLINDER HEAD #3 - "B" ENGINE.....		
006	CYLINDER HEAD #3 - "A" ENGINE.....		
005	JACKET WATER TEMP. - "B" ENGINE...		
004	JACKET WATER TEMP. - "A" ENGINE...		
003	LUBE OIL TEMP. - "B" ENGINE.....		
002	LUBE OIL TEMP. - "A" ENGINE.....		
001	TOTAL EXHAUST - "B" ENGINE.....		
000	TOTAL EXHAUST - "A" ENGINE.....		

013	CYLINDER HEAD #14 - "B" ENGINE.....		
012	CYLINDER HEAD #14 - "A" ENGINE.....		
011	CYLINDER HEAD #11 - "B" ENGINE.....		
010	CYLINDER HEAD #11 - "A" ENGINE.....		
009	CYLINDER HEAD #6 - "B" ENGINE.....		
008	CYLINDER HEAD #6 - "A" ENGINE.....		
007	CYLINDER HEAD #3 - "B" ENGINE.....		
006	CYLINDER HEAD #3 - "A" ENGINE.....		
005	JACKET WATER TEMP. - "B" ENGINE...		
004	JACKET WATER TEMP. - "A" ENGINE...		
003	LUBE OIL TEMP. - "B" ENGINE.....		
002	LUBE OIL TEMP. - "A" ENGINE.....		
001	TOTAL EXHAUST - "B" ENGINE.....		
000	TOTAL EXHAUST - "A" ENGINE.....		




UNIT # 6001-2
RUN # 300
● EXHAUST TEMP
CYLINDERS
A
B
900
800
700
600
500
400
300
200
100
°C
0 1 2 3 4 5 10 15 20 25 30 35 45
MINUTES

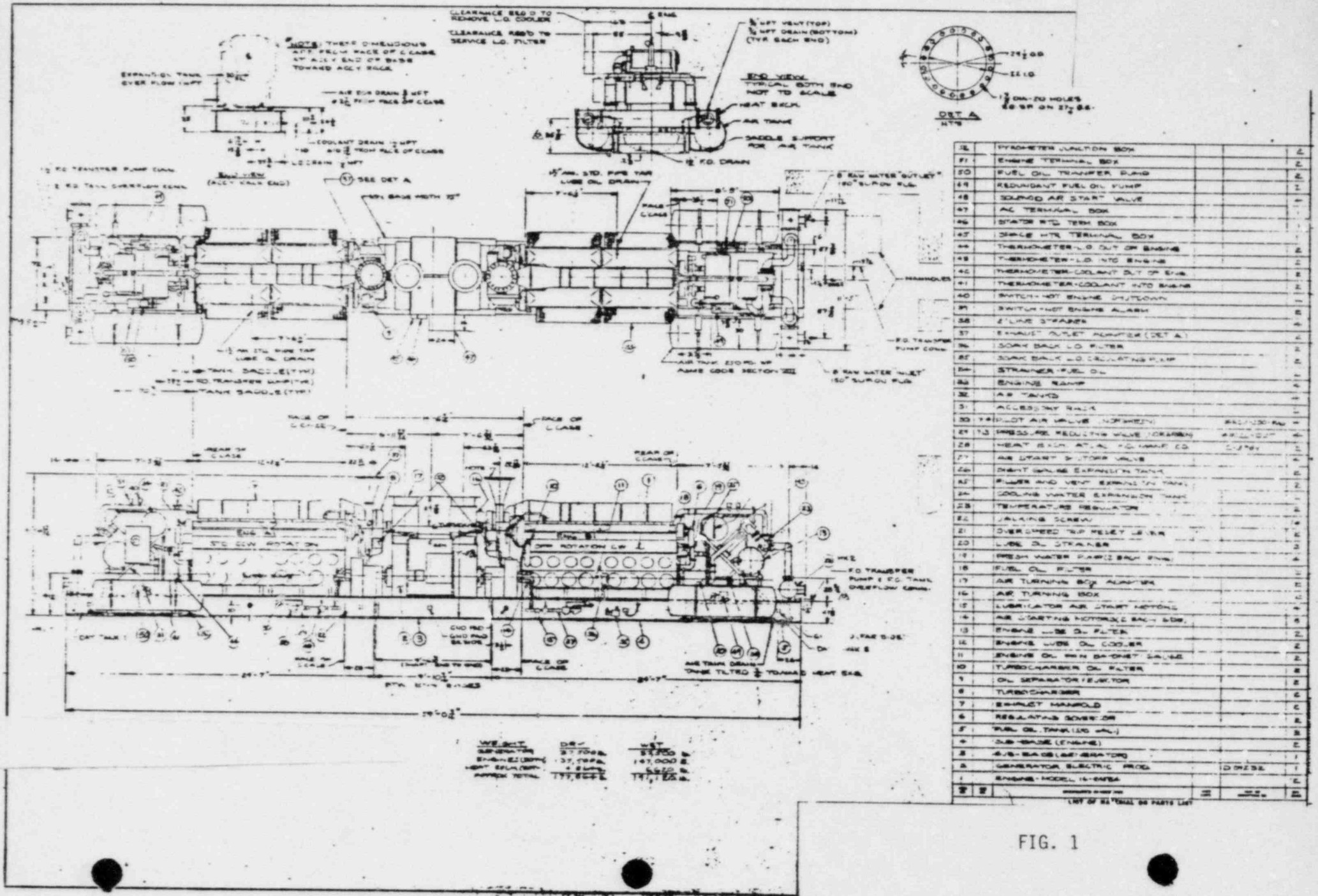
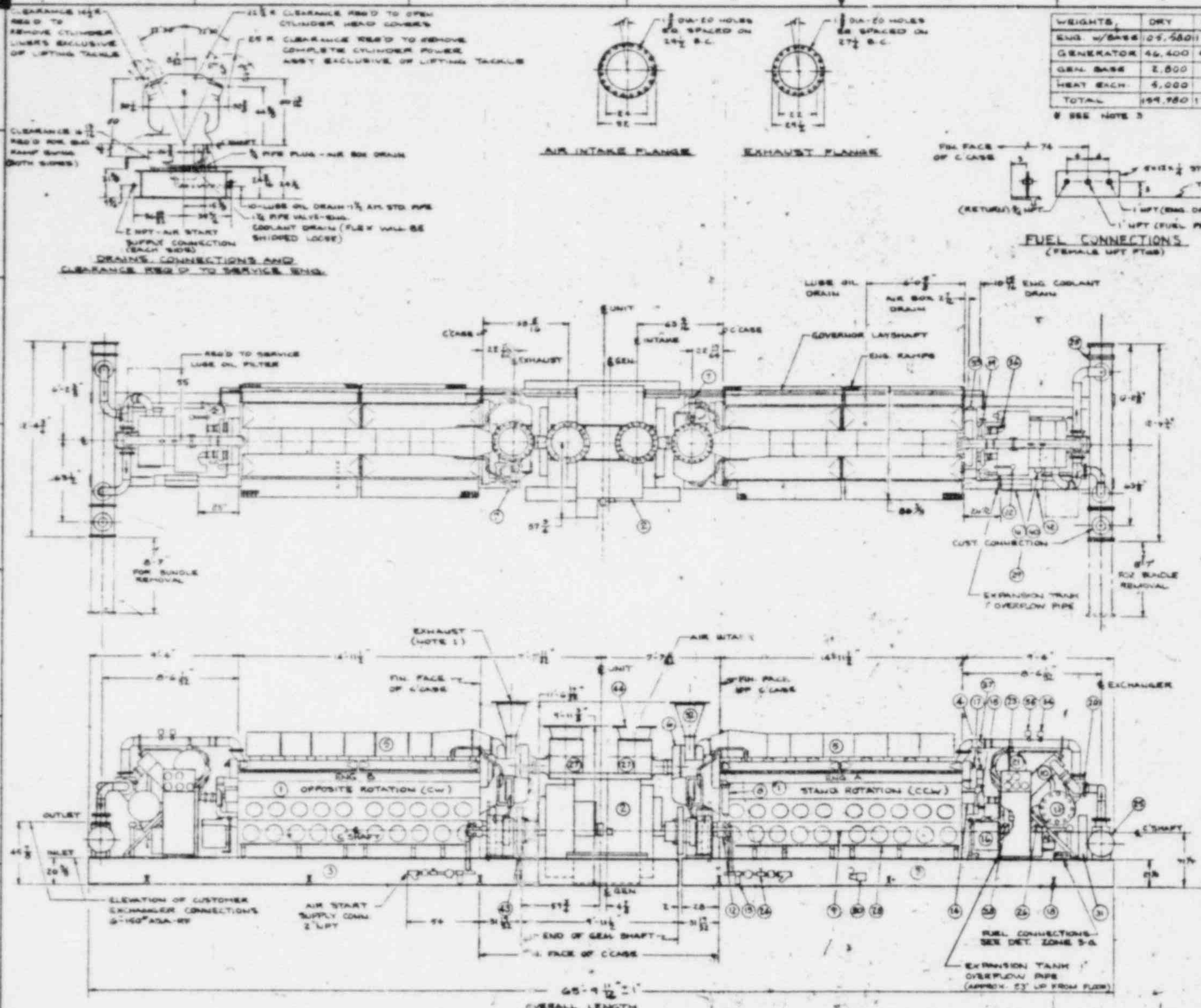


FIG. 1



WEIGHTS	DRY	WET
ENG. W/BASE	105,580	119,000
GENERATOR	46,400	46,400
GEN. BASE	2,800	2,800
HEAT EXCH.	5,000	7,000
TOTAL	159,780	179,200

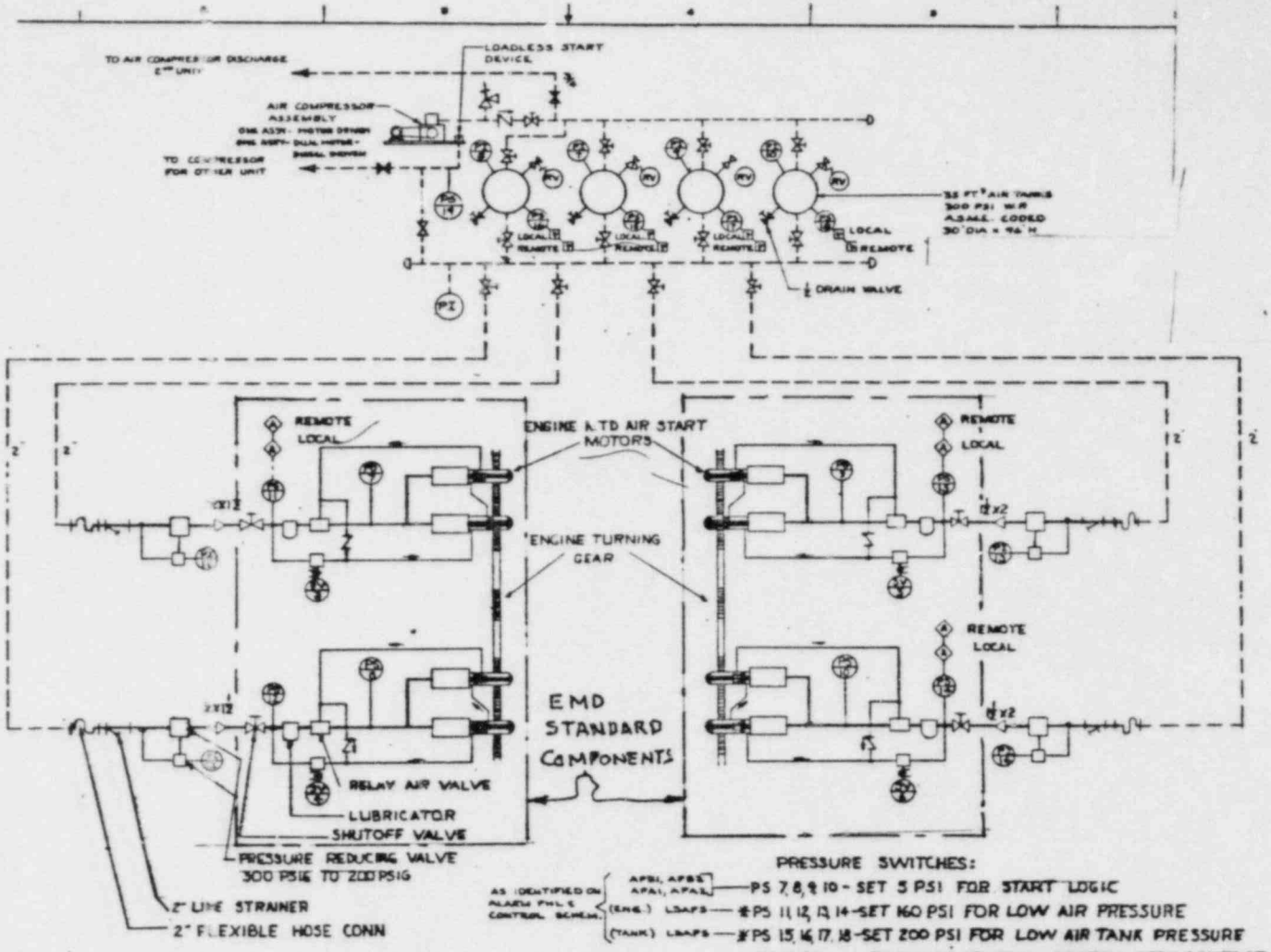
SEE NOTE 3

44	805	AIR INTAKE ADAPTER	008001	2
43	201	COUPLING (EMD)		2
42	203 A	IMMERSION HEATER CONTROLLER (C.H.)	*AXXCAXXXC	2
41	104	GAUGE PANEL	600102009	2
40	106	ENGINE TERM BOX (HOFFMAN)	A-481408LP	2
39	*	THERMOMETER - LUBE OIL OUT OF ENG. *	8138901	2
38		THERMOMETER - LUBE OIL INTO ENGINE	8138901	2
37		THERMOMETER - COOLANT OUT OF ENGINE	8138501	2
36		THERMOMETER - COOLANT INTO ENGINE	8138501	2
35		SWITCH - HOT ENGINE SHUTDOWN	8447099	2
34		SWITCH - HOT ENGINE ALARM	8449676	2
33		CRANKCASE PRESSURE DETECTOR	8961040	2
32		EXHAUST OUTLET ADAPTER	8565017	2
31		SOAK BACK LUBE OIL FILTER	8597651	2
30		SOAK BACK LUBE OIL CIRCULATING PUMP	8162483	2
29		STRAINER - FUEL OIL	8541985	2
28		ENGINE RAMP		8
27		AIR INTAKE TURNING BOX	8395811	2
26	201	ACCESSORY RACK (EMD)		2
25	401	HEAT EXCHANGER (AMER. STAND.)	*5120 CPK	2
24	*	AIR START SHUTOFF VALVE *	8576934	4
23		SIGHT GAUGE - EXPANSION TANK	8167447	2
22		FILLER & VENT - EXPANSION TANK	8291503	2
21		COOLING WATER EXPANSION TANK	8233904	2
20		TEMPERATURE REGULATOR	8594034	2
18		JACKING SCREWS		18
17		OVERSPEED TRIP RE-SET LEVER	8449516	2
16		LUBE OIL STRAINER	8161163	2
15		FRESH WATER PUMP	8147007 L.H. 8149001 R.H.	4
14		FUEL OIL FILTER	8479566	2
13		LUBRICATOR - AIR START MOTORS	8522844	4
12		AIR STARTING MOTOR	8367694	8
11		ENGINE LUBE OIL FILTER	8439643	2
10		ENGINE LUBE OIL COOLER	8966328	2
9		ENGINE OIL PAN BAYONET GAUGE	8378526	2
8		TURBOCHARGER OIL FILTER	8366743	2
7		OIL SEPARATOR & INJECTOR	8448163	2
6		TURBOCHARGER (EMD)	8564072	2
5		EXHAUST MANIFOLD (EMD)		2
4		REGULATING GOVERNOR (WOODWARD)	EGB-35C	1
3	201	SUB-BASE (EMD)		2
2	101	GENERATOR (BELOIT)	DWG. 00884-650	1
1	201	ENGINE - MODEL 20-645E4 (EMD)		2

LIST OF MATERIAL OR PARTS LIST

NOTES:
1. MAXIMUM PERMISSIBLE LOADING ON EXHAUST OUTLET FLANGE (LOADS NOT TO BE COMBINED)
LONGITUDINAL 275 LB
TRANSVERSE 2750 LB
VERTICAL 1000 LB
2. ALIGNMENT OF GENERATOR SET AT SITE IS RESPONSIBILITY OF CUSTOMER.
3. HEAVIEST ENGINE PIECE HANDLED IN NORMAL MAINTENANCE: 148 LBS CYLINDER HEAD

FIG. 2



PRESSURE SWITCHES:

AS IDENTIFIED ON ALARM PNL & CONTROL SCHEM.

- APS1, APS2, APA1, APA2 — PS 7, 8, 9, 10 - SET 5 PSI FOR START LOGIC
- (ENG.) LSAPS — PS 11, 12, 13, 14 - SET 160 PSI FOR LOW AIR PRESSURE
- (TANK) LSAPS — PS 15, 16, 17, 18 - SET 200 PSI FOR LOW AIR TANK PRESSURE

PS 19, 20 — PRESSURE CONTROL SWITCH - OPEN CONTACT ON RISING PRESSURE @ 250 PSI & CLOSE CONTACT ON FALLING PRESSURE @ 210 PSI

PRESSURE GAUGES:

PI 7, 8, 9, 10 - 0 - 350# AIR TANK

PI 11, 12, 13, 14 - 0 - 200# PRESS REDUCING VALVE

NOTE: ① PIPING FROM AIR TANK (& BETWEEN AIR TANKS) TO ENGINE FLEX CONN & AIR COMPRESSOR BY OTHERS

② ⋈ INDICATES VALVE NORMALLY CLOSED

③ ALL ALARM SIGNALS ARE PARALLED TO A SINGLE ALARM

④ PIPING SHOWN IN DASHED LINES NOT PROVIDED BY BRUCE G.M.D.

SOLENOID VALVE

SV3, 4, 5, 6 - AIR START 120 VDC

FIG. 3

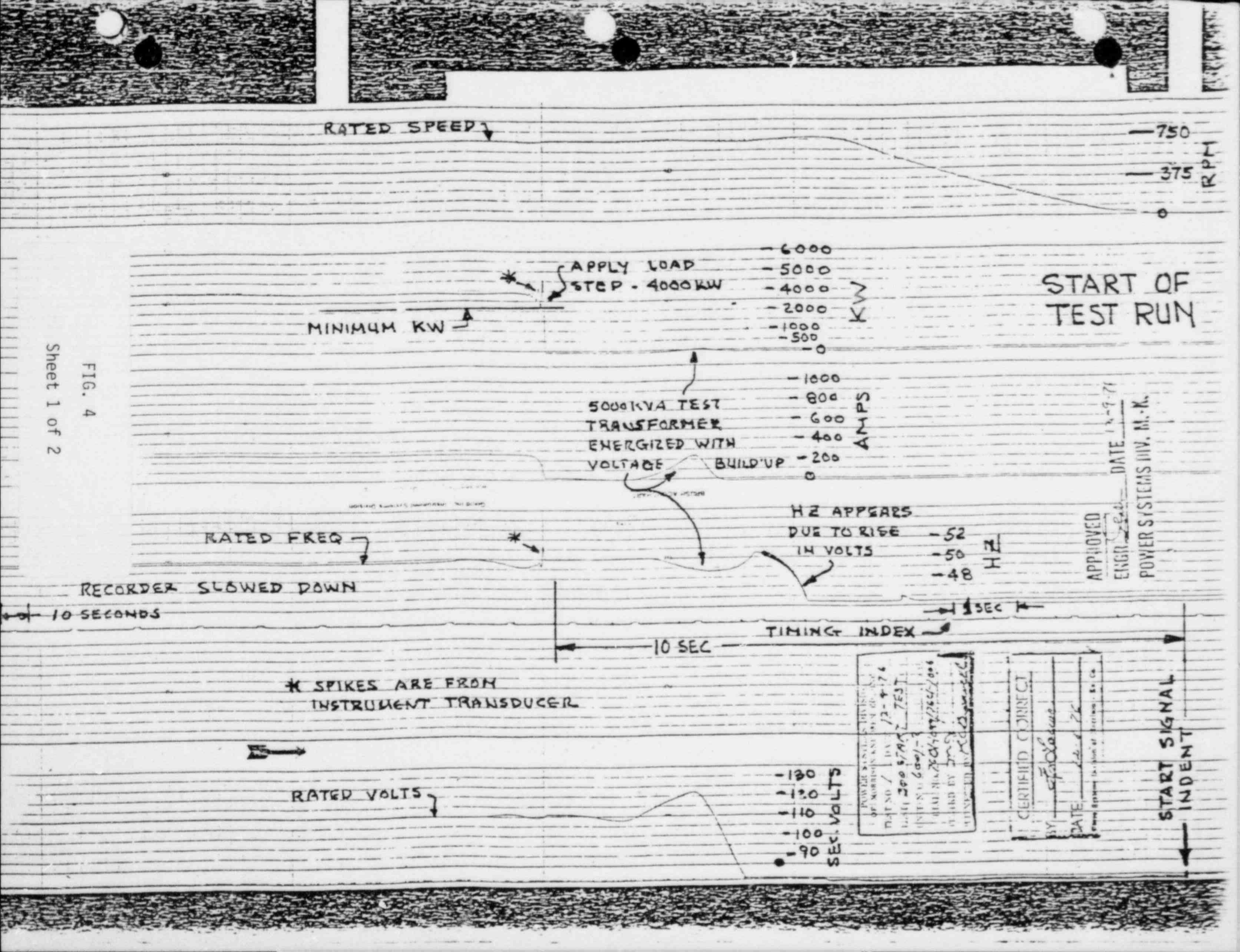


FIG. 4

Sheet 1 of 2

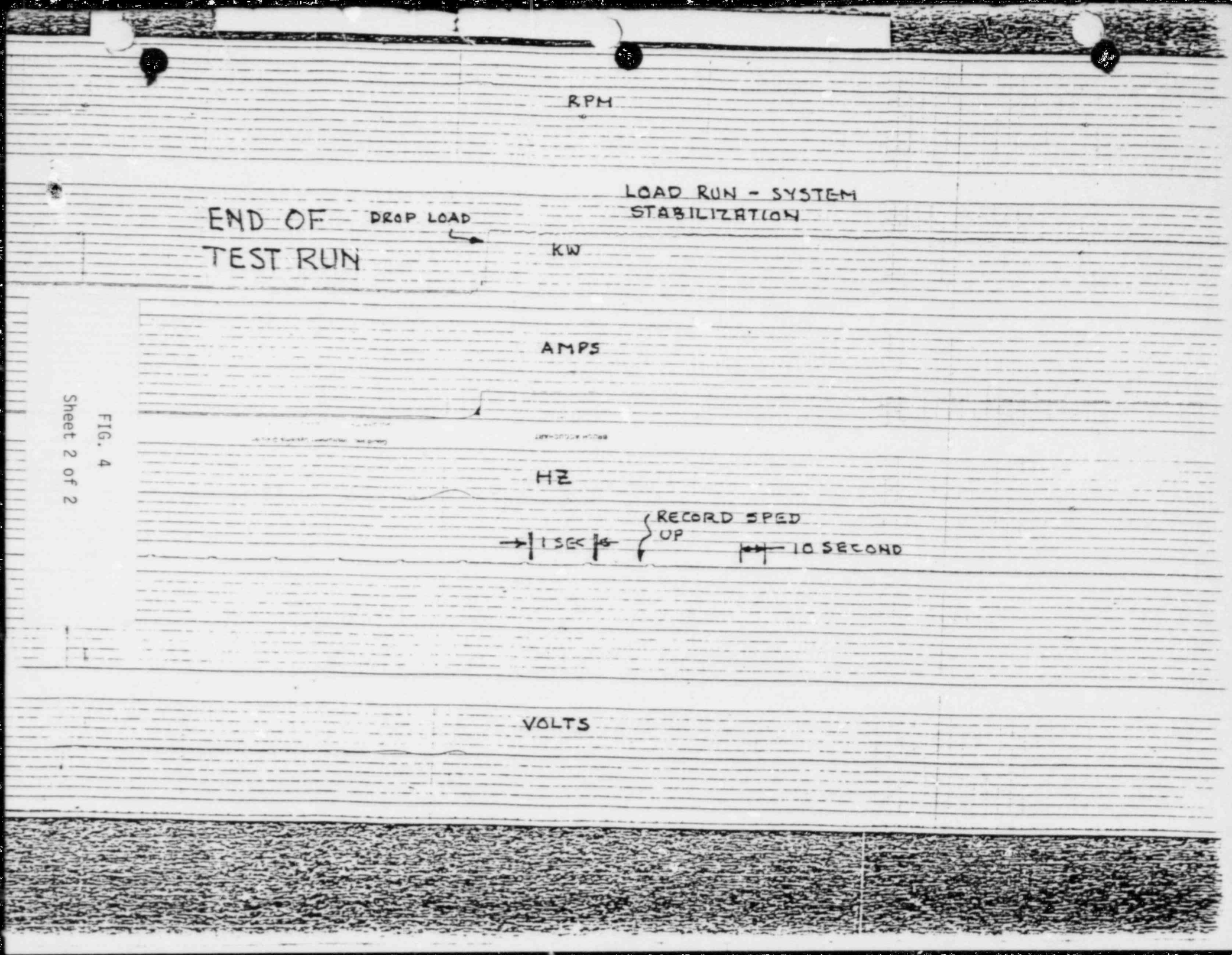


FIG. 4
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