

Appendix A US-APWR Typical Load Profiles

Typical load profiles of Loss of Coolant Accident (LOCA) and LOOP are shown in Tables A.1.0-1 to A.1.0-10 and Figures A.1.0-1 to A.1.0-8.

Table A.1.0-1 Class 1E GTG - LOCA Load List

Load Group	Load Name	Rated Output (kW)	Load Factor (%)	Efficiency (%)	Power Factor (%)	Ratio of Starting Current to Normal Current (%)	Power Factor at Starting (%)	Load Starting Capacity (kW)	Load Necessary Input (kW)
1	Motor Control Center	861.0	----	----	----	----	30.0	258.3	77.0
		371.0	----	----	----	----	----	----	371.0
2	MOV Operated by SI Signal MOV Operated by SP Signal	109.1	----	90.0	85.0	6.5	30.0	278.1	----
3	Safety Injection Pump	900.0	95.0	90.0	85.0	6.5	25.0	1911.8	950.0
4	Componet Cooling Water Pump	610.0	95.0	90.0	85.0	6.5	25.0	1295.8	643.9
5	Service Water Pump	720.0	95.0	90.0	85.0	6.5	25.0	1529.4	760.0
6	Containment Spray/Residual Heat Removal Pump	400.0	95.0	90.0	85.0	6.5	25.0	849.7	422.2
7	Emergency Feed Water Pump	590.0	72.5	90.0	85.0	6.5	25.0	1253.3	475.0
8	Class 1E Electrical Room Air Handling Supply Fan	80.0	95.0	85.0	80.0	6.5	25.0	191.2	89.4
9	Safety Chiller Unit	290.0	95.0	85.0	80.0	6.5	25.0	693.0	324.1
10	Safety Chilled Water Pump	53.0	95.0	94.0	91.0	6.5	25.0	100.7	53.6

Table A.1.0-2 Class 1E GTG -LOOP Load List

Load Group	Load Name	Rated Output (kW)	Load Factor (%)	Efficiency (%)	Power Factor (%)	Ratio of Starting Current to Normal Current (%)	Power Factor at Starting (%)	Load Starting Capacity (kW)	Load Necessary Input (kW)
1	Motor Control Center	687.0	----	----	----	----	30.0	206.1	55.0
		326.0	----	----	----	----	----	----	326.0
2	Componet Cooling Water Pump	610.0	95.0	90.0	85.0	6.5	25.0	1295.8	643.9
3	Service Water Pump	720.0	95.0	90.0	85.0	6.5	25.0	1529.4	760.0
4	Containment Spray/Residual Heat Removal Pump	400.0	95.0	90.0	85.0	6.5	25.0	849.7	422.2
5	Charging Pump	820.0	95.0	90.0	85.0	6.5	25.0	1741.8	865.6
6	Emergency Feed Water Pump	450.0	95.0	90.0	85.0	6.5	25.0	955.9	475.0
7	Class 1E Electrical Room Air Handling Supply Fan	80.0	95.0	85.0	80.0	6.5	25.0	191.2	89.4
8	Safety Chiller Unit	290.0	95.0	85.0	80.0	6.5	25.0	693.0	324.1
9	Plessurizer Heater	562.0	100.0	100.0	100.0	----	----	562.0	562.0
10	Safety Chilled Water Pump	53.0	95.0	94.0	91.0	6.5	25.0	100.7	53.6

Table A.1.0-3 Class 1E GTG Starting Sequence Train A - LOCA

LOCA Signal Initiated Time [Sec]	LOCA Sequence Time [Sec]	Invest Load	Refer Load Group	Base Load1 [KW]	Start Load [KW]	Max Load [KW]	Base Load2 [KW]
100	0	MOV Operated by SI Signal MOV Operated by SP Signal Moter Control Center	2 1	0	907	907	448
105	5	A Safety Injection Pump	3	448	1912	2360	1398
110	10	A Component Cooling Water Pump A Safety Chilled Water Pump	4 10	1398	1296	2694	2042
115	15	A Service Water Pump	5	2042	1529	3571	2802
130	30	A Containment Spray/Residual Heat Removal Pump	6	2802	850	3652	3224
140	40	A Class 1E Electrical Room Supply Air Handling Unit	8	3224	191	3415	3313
150	50	A Safety Chiller Unit	9	3313	693	4006	3637
	Manual Start	Moter Control Center		3637	102	3739	3739

Table A.1.0-4 Class 1E GTG Starting Sequence Train A - LOOP

LOOP Signal Initiated Time [Sec]	LOOP Sequence Time [Sec]	Invest Load	Refer Load Group	Base Load1 [KW]	Start Load [KW]	Max Load [KW]	Base Load2 [KW]
100	0	Moter Control Center	1	0	532	532	381
105	5	A Charging Pump	5	381	1742	2123	1247
110	10	A Component Cooling Water Pump	2	1247	1296	2543	1891
115	15	A Service Water Pump A Safety Chilled Water Pump	3 10	1891	1630	3521	2705
130	30	A Class 1E Electrical Room Supply Air Handling Unit	7	2705	191	2896	2794
140	40	A Safety Chiller Unit	8	2794	693	3487	3118
	Manual Start	Moter Control Center A Plessurizer Heater	1 9	3118	627	3745	3745

Table A.1.0-5 Class 1E GTG Starting Sequence Train B - LOCA

LOCA Signal Initiated Time [Sec]	LOCA Sequence Time [Sec]	Invest Load	Refer Load Group	Base Load1 [KW]	Start Load [KW]	Max Load [KW]	Base Load2 [KW]
100	0	MOV Operated by SI Signal	2	0	907	907	448
		MOV Operated by SP Signal	1				
		Moter Control Center	1				
105	5	B Safety Injection Pump	3	448	1912	2360	1398
110	10	B Component Cooling Water Pump	4	1398	1296	2694	2042
		B Safety Chilled Water Pump	10				
115	15	B Service Water Pump	5	2042	1529	3571	2802
120	20	B Emergency Feed Water Pump	7	2802	1253	4055	3277
130	30	B Containment Spray/Residual Heat Removal Pump	6	3277	850	4127	3699
140	40	B Class 1E Electrical Room Supply Air Handling Unit	8	3699	191	3890	3788
150	50	B Safety Chiller Unit	9	3788	693	4481	4112
	Manual Start	Moter Control Center		4112	102	4214	4214

Table A.1.0-6 Class 1E GTG Starting Sequence Train B - LOOP

LOOP Signal Initiated Time [Sec]	LOOP Sequence Time [Sec]	Invest Load	Refer Load Group	Base Load1 [KW]	Start Load [KW]	Max Load [KW]	Base Load2 [KW]
100	0	Moter Control Center	1	0	532	532	381
110	10	B Component Cooling Water Pump	2	381	1296	1677	1025
115	15	B Service Water Pump	3	1025	1630	2655	1839
		B Safety Chilled Water Pump	10				
120	20	B Emergency Feed Water Pump	6	1839	956	2795	2314
130	30	B Class 1E Electrical Room Supply Air Handling Unit	7	2314	191	2505	2403
140	40	B Safety Chiller Unit	8	2403	693	3096	2727
	Manual Start	Moter Control Center	1	2727	627	3354	3354
		B Plessurizer Heater	9				

Table A.1.0-7 Class 1E GTG Starting Sequence Train C - LOCA

LOCA Signal Initiated Time [Sec]	LOCA Sequence Time [Sec]	Invest Load	Refer Load Group	Base Load1 [KW]	Start Load [KW]	Max Load [KW]	Base Load2 [KW]
100	0	MOV Operated by SI Signal	2	0	907	907	448
		MOV Operated by SP Signal					
		Moter Control Center	1				
105	5	C Safety Injection Pump	3	448	1912	2360	1398
110	10	C Component Cooling Water Pump	4	1398	1296	2694	2042
		C Safety Chilled Water Pump	10				
115	15	C Service Water Pump	5	2042	1529	3571	2802
120	20	C Emergency Feed Water Pump	7	2802	1253	4055	3277
130	30	C Containment Spray/Residual Heat Removal Pump	6	3277	850	4127	3699
140	40	C Class 1E Electrical Room Supply Air Handling Unit	8	3699	191	3890	3788
150	50	C Safety Chiller Unit	9	3788	693	4481	4112
	Manual Start	Moter Control Center		4112	102	4214	4214

Table A.1.0-8 Class 1E GTG Starting Sequence Train C - LOOP

LOOP Signal Initiated Time [Sec]	LOOP Sequence Time [Sec]	Invest Load	Refer Load Group	Base Load1 [KW]	Start Load [KW]	Max Load [KW]	Base Load2 [KW]
100	0	Moter Control Center	1	0	532	532	381
110	10	C Component Cooling Water Pump	2	381	1296	1677	1025
115	15	C Service Water Pump	3	1025	1630	2655	1839
		C Safety Chilled Water Pump	10				
120	20	C Emergency Feed Water Pump	6	1839	956	2795	2314
130	30	C Class 1E Electrical Room Supply Air Handling Unit	7	2314	191	2505	2403
140	40	C Safety Chiller Unit	8	2403	693	3096	2727
	Manual Start	Moter Control Center	1	2727	627	3354	3354
		C Plessurizer Heater	9				

Table A.1.0-9 Class 1E GTG Starting Sequence Train D - LOCA

LOCA Signal Initiated Time [Sec]	LOCA Sequence Time [Sec]	Invest Load	Refer Load Group	Base Load1 [KW]	Start Load [KW]	Max Load [KW]	Base Load2 [KW]
100	0	MOV Operated by SI Signal	2	0	907	907	448
		MOV Operated by SP Signal					
		Moter Control Center	1				
105	5	D Safety Injection Pump	3	448	1912	2360	1398
110	10	D Component Cooling Water Pump	4	1398	1296	2694	2042
		D Safety Chilled Water Pump	10				
115	15	D Service Water Pump	5	2042	1529	3571	2802
130	30	D Containment Spray/Residual Heat Removal Pump	6	2802	850	3652	3224
140	40	D Class 1E Electrical Room Supply Air Handling Unit	8	3224	191	3415	3313
150	50	D Safety Chiller Unit	9	3313	693	4006	3637
	Manual Start	Moter Control Center		3637	102	3739	3739

Table A.1.0-10 Class 1E GTG Starting Sequence Train D - LOOP

LOOP Signal Initiated Time [Sec]	LOOP Sequence Time [Sec]	Invest Load	Refer Load Group	Base Load1 [KW]	Start Load [KW]	Max Load [KW]	Base Load2 [KW]
100	0	Moter Control Center	1	0	532	532	381
105	5	D Charging Pump	5	381	1742	2123	1247
110	10	D Component Cooling Water Pump	2	1247	1296	2543	1891
115	15	D Service Water Pump	3	1891	1630	3521	2705
		D Safety Chilled Water Pump	10				
130	30	D Class 1E Electrical Room Supply Air Handling Unit	7	2705	191	2896	2794
140	40	D Safety Chiller Unit	8	2794	693	3487	3118
	Manual Start	Moter Control Center	1	3118	627	3745	3745
		D Plessurizer Heater	9				

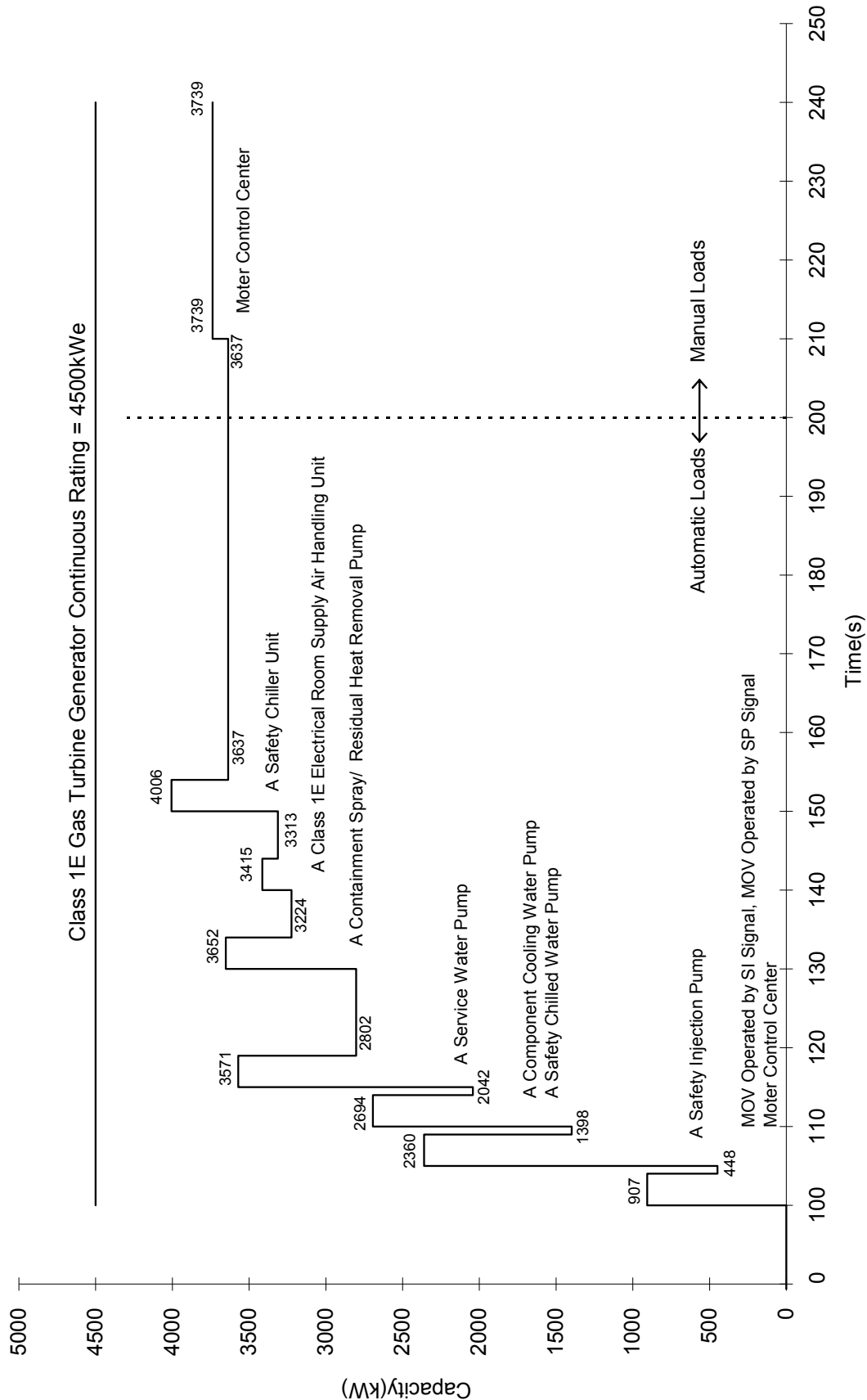


Figure A.1.0-1 LOCA Condition Class 1E GTG Load Profile (Train A)

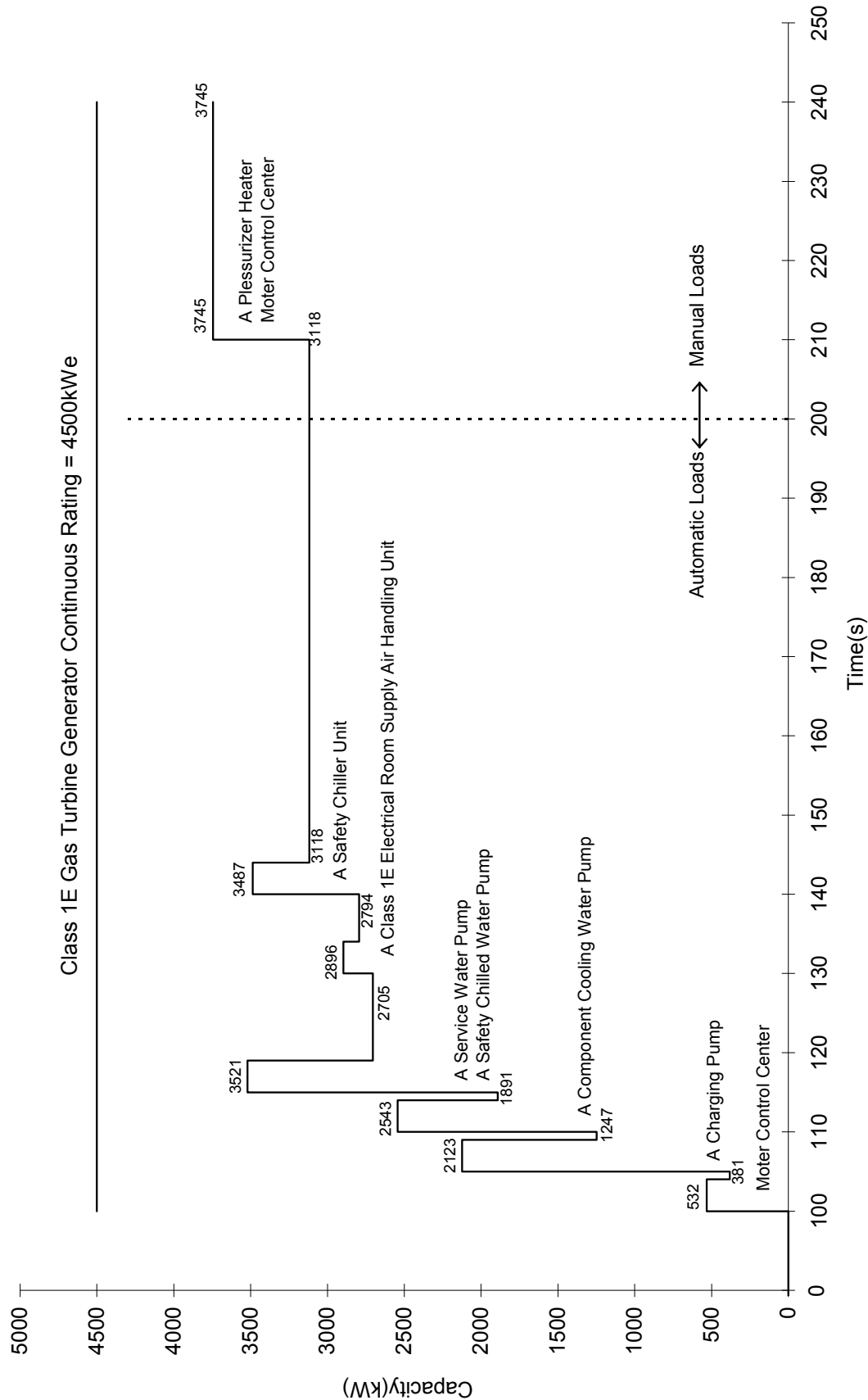


Figure A.1.0-2 LOOP Condition Class 1E GTG Load Profile (Train A)

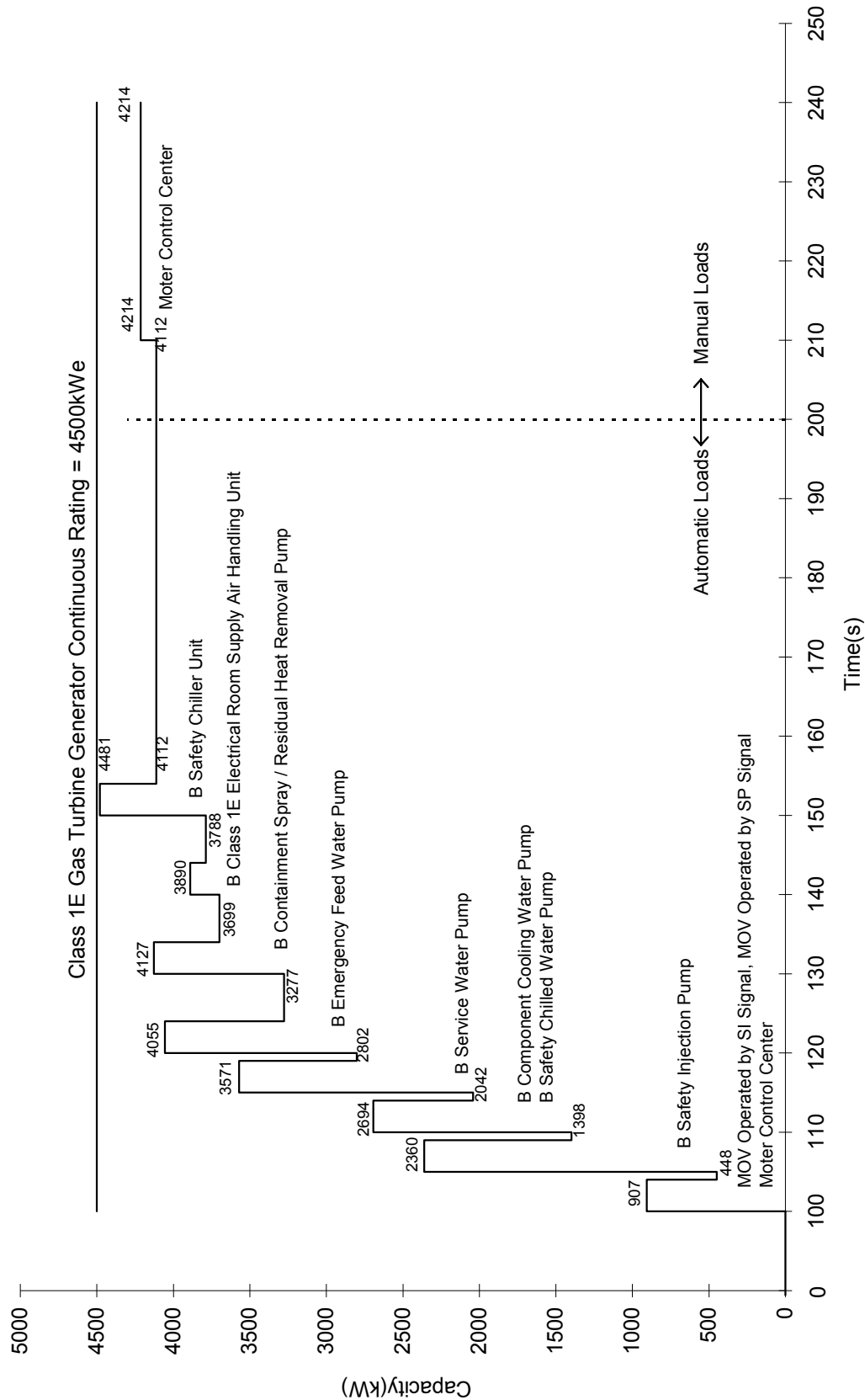


Figure A.1.0-3 LOCA Condition Class 1E GTG Load Profile (Train B)

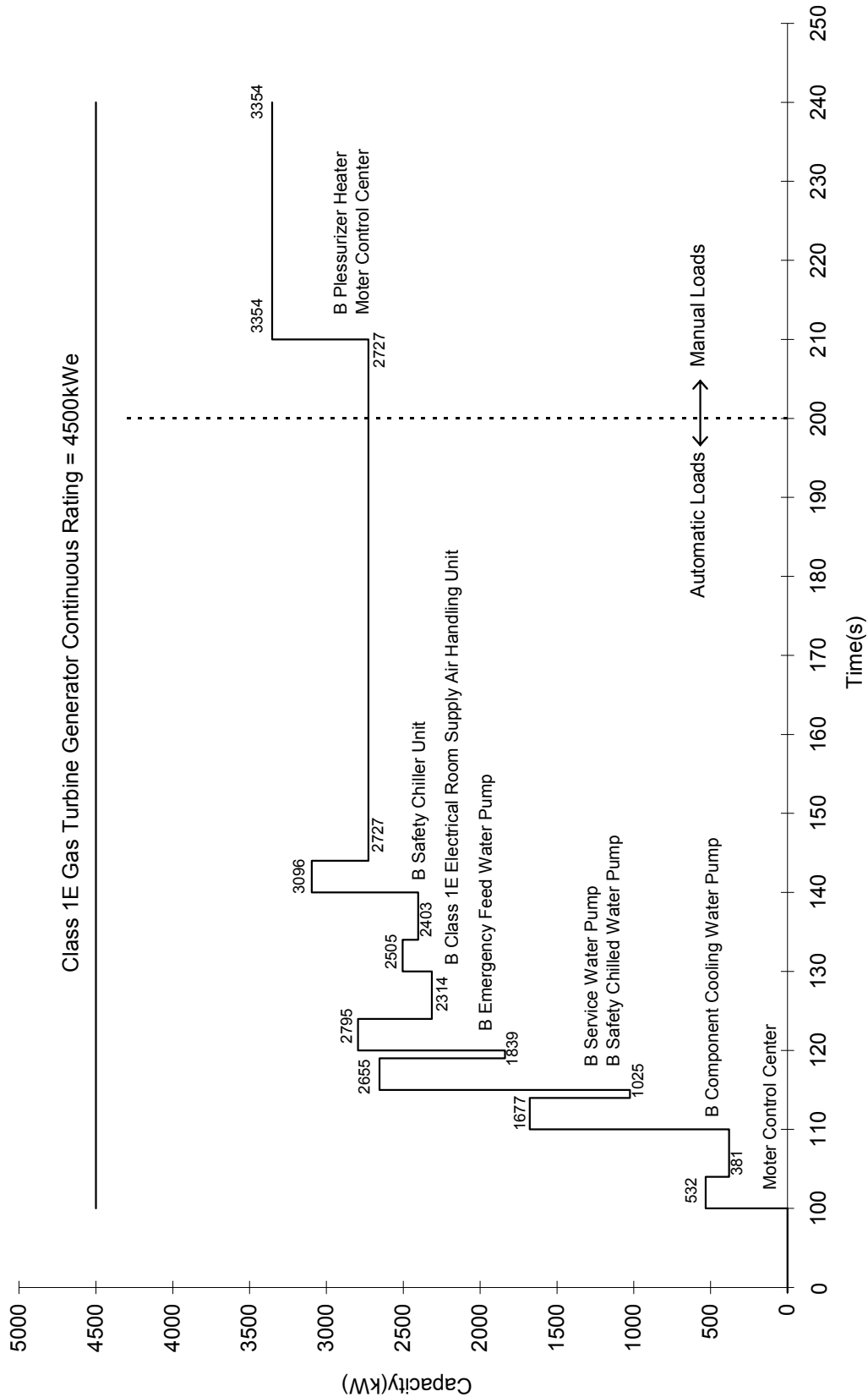


Figure A.1.0-4 LOOP Condition Class 1E GTG Load Profile (Train B)

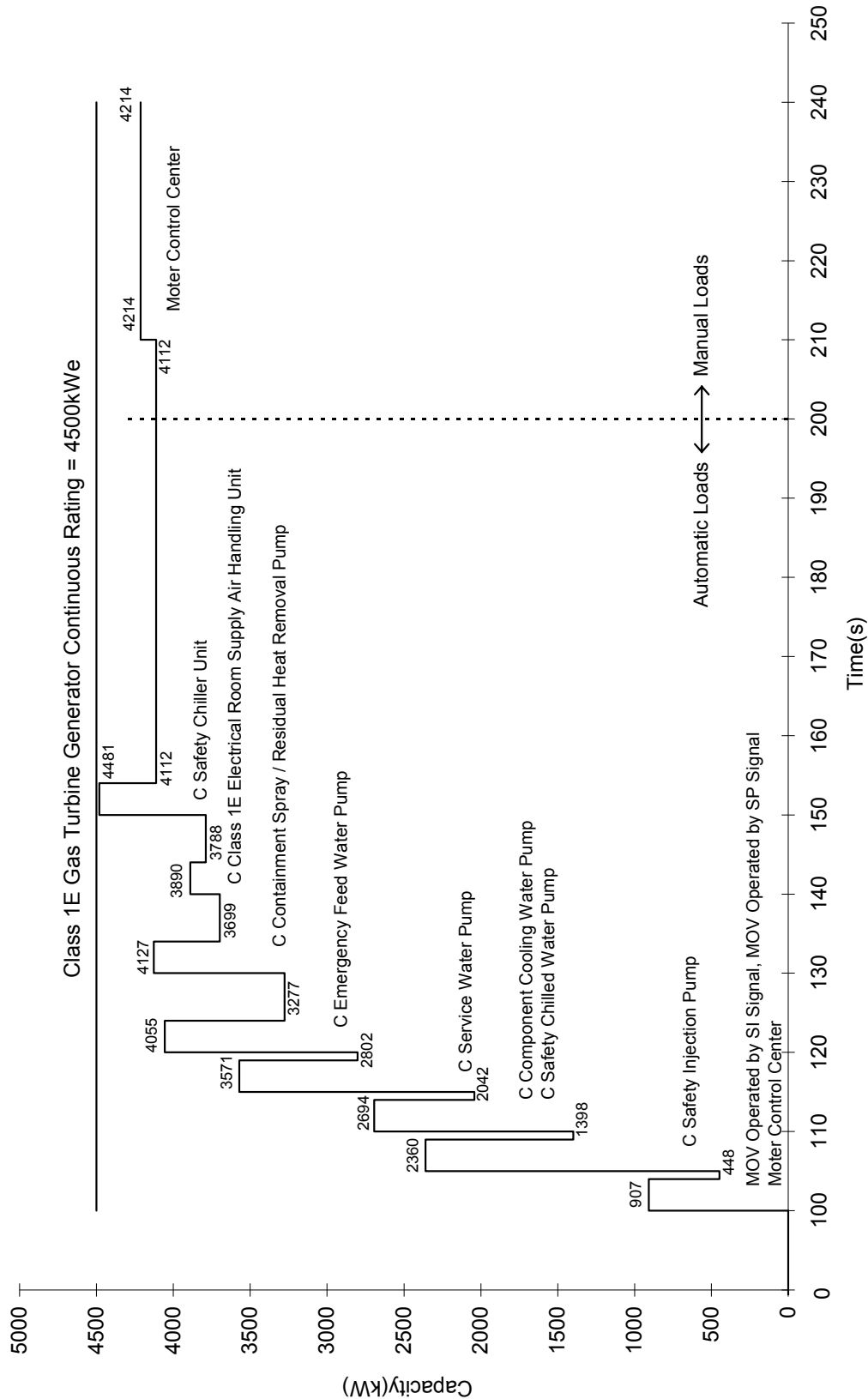


Figure A.1.0-5 LOCA Condition Class 1E GTG Load Profile (Train C)

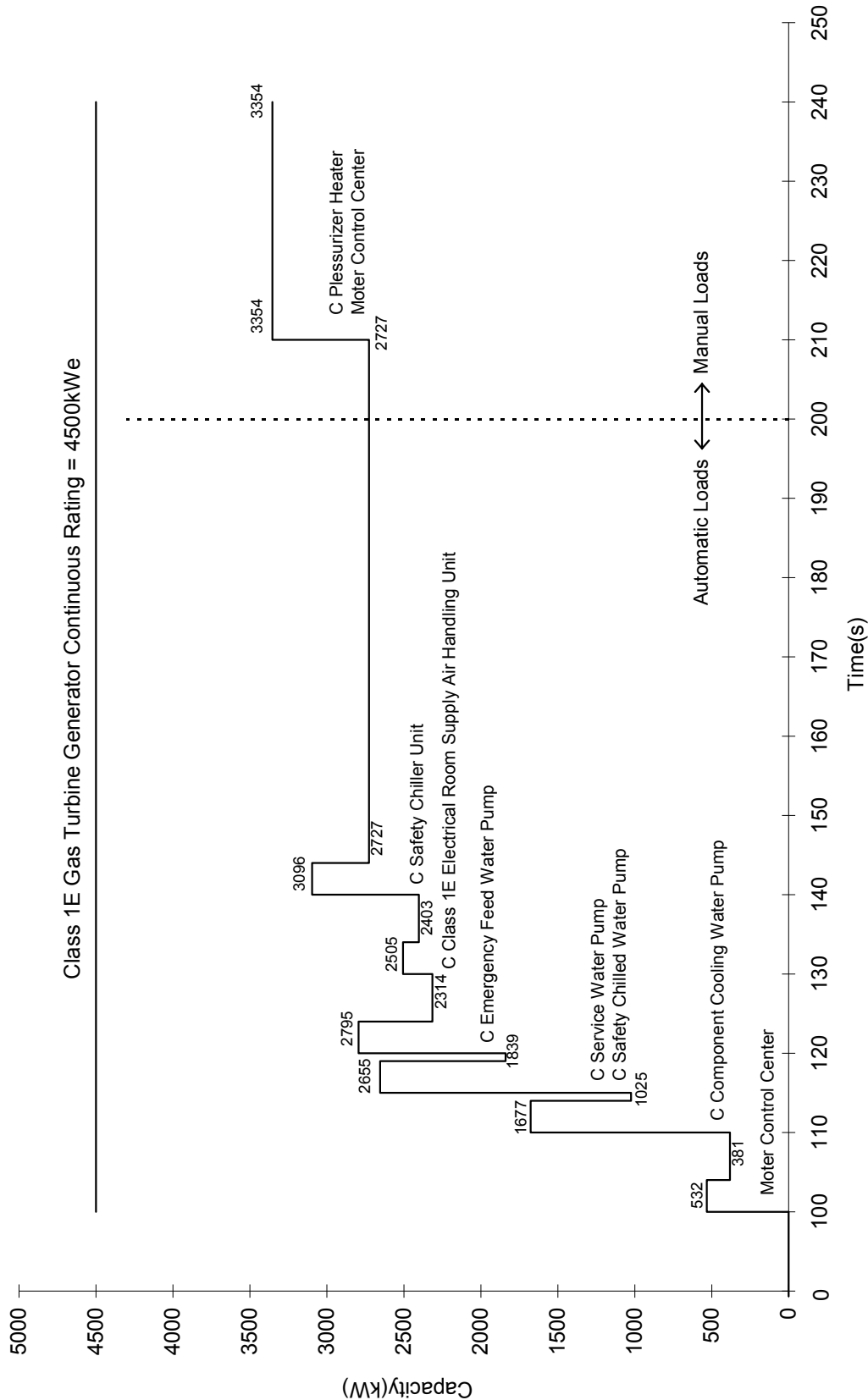


Figure A.1.0-6 LOOP Condition Class 1E GTG Load Profile (Train C)

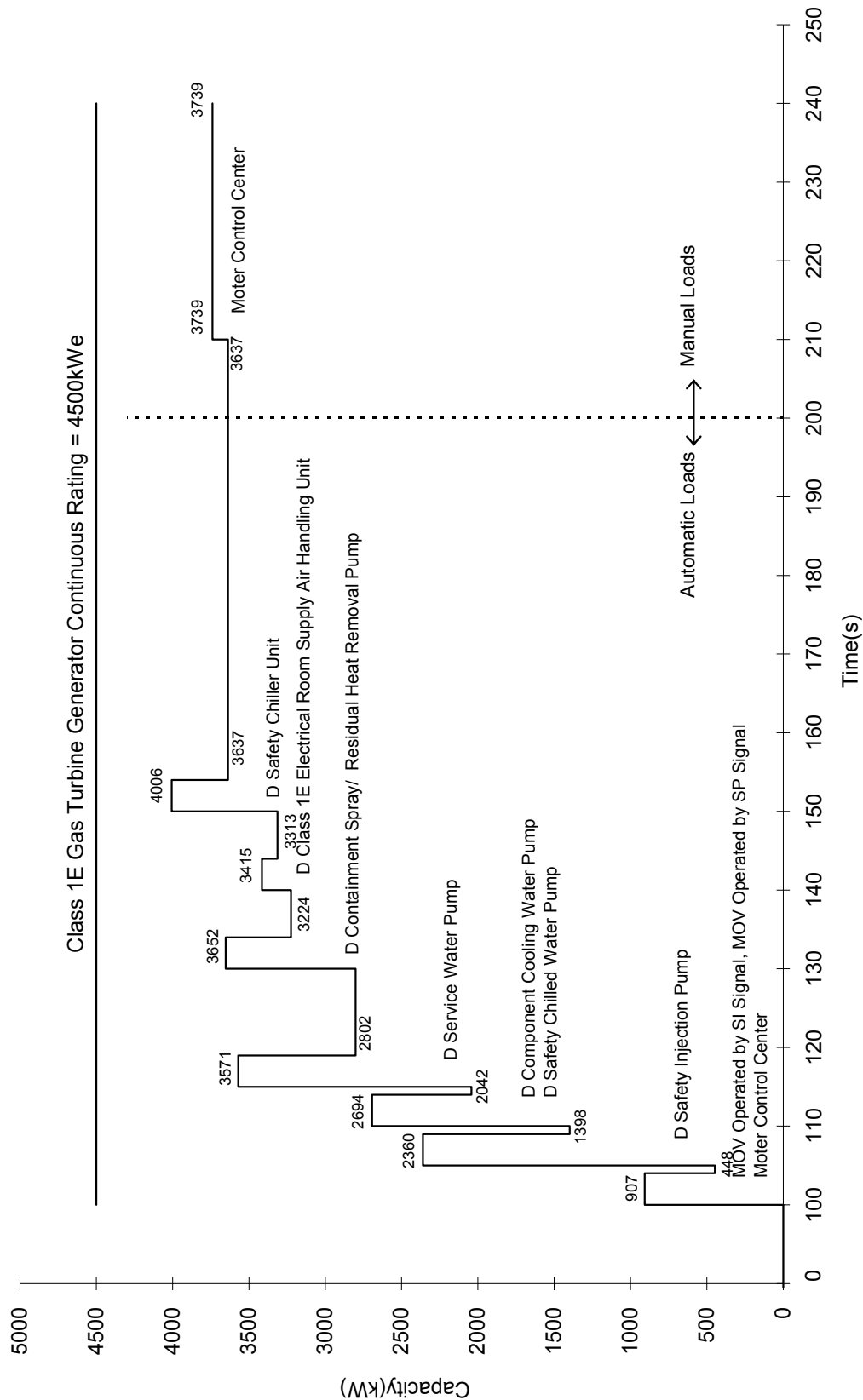


Figure A.1.0-7 LOCA Condition Class 1E GTG Load Profile (Train D)

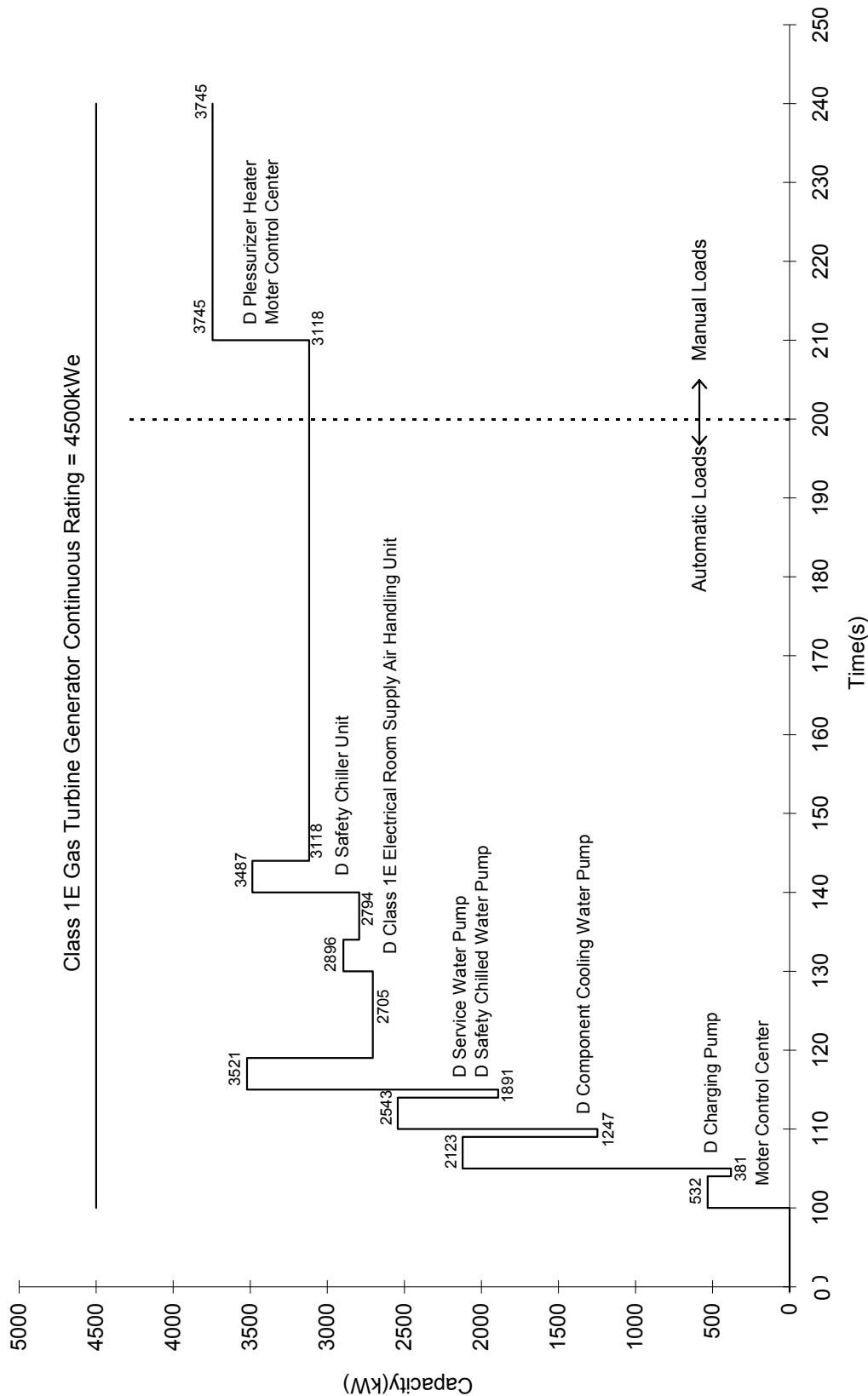


Figure A.1.0-8 LOOP Condition Class 1E GTG Load Profile (Train D)

Appendix B GTG Technical Specification

Table B.1.0-1 Main Parts of Fuel, Oil, and Air System

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Table B.1.0-2 Main Parts of Electric System

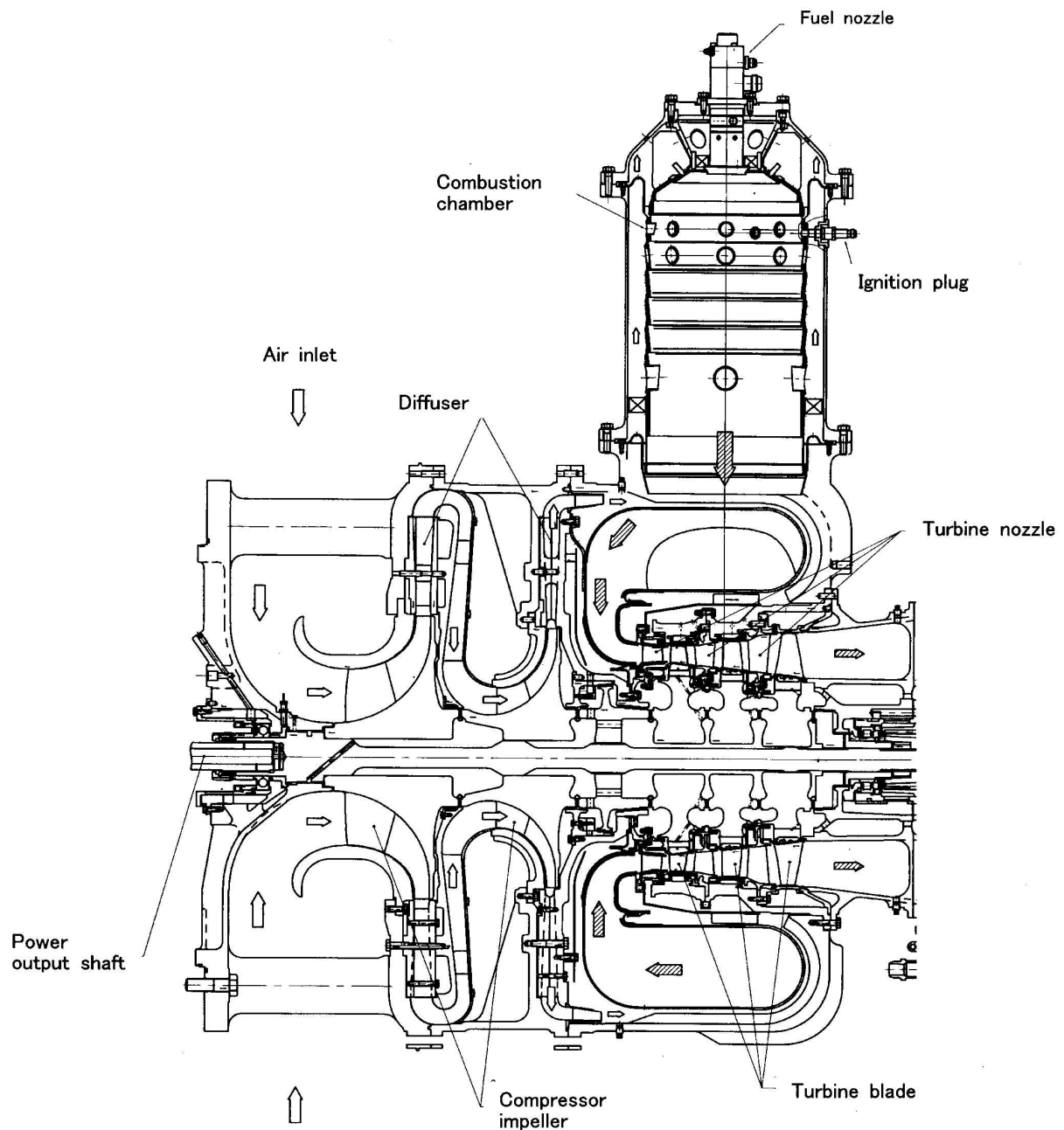
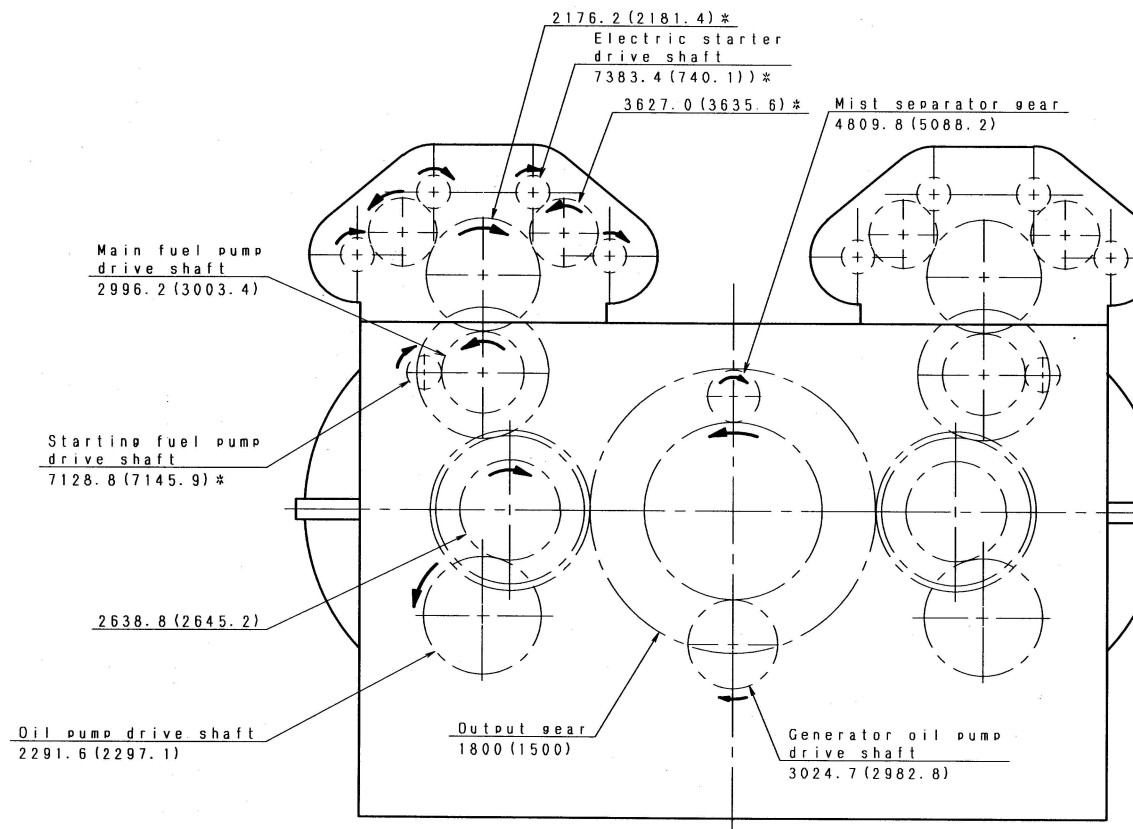


Figure B.1.0-1 Cross Sectional View of Power Section



Note : 1 Figures show the revolution speed (rpm).

The values are for 60Hz version machine and the values shown in parentheses are for 50Hz version machine.

: 2 The parts shown in asterisk * are intercepted by 55% revolution in case of electric starting system and by 50% revolution in case of pneumatic starting system.

That is, revolution speed at starter cut-off is 0.55 times of the above-mentioned value in case of electric starting system and 0.50 times of the above-mentioned value in case of pneumatic starting system.

: 3 The rotating direction is specified when it was viewed from the output shaft side.

Figure B.1.0-2 Gear Train of Reduction Gear Box

Figure B.1.0-3 Installation Drawing of Gas Turbine Assembly (Sheet 1 of 6)

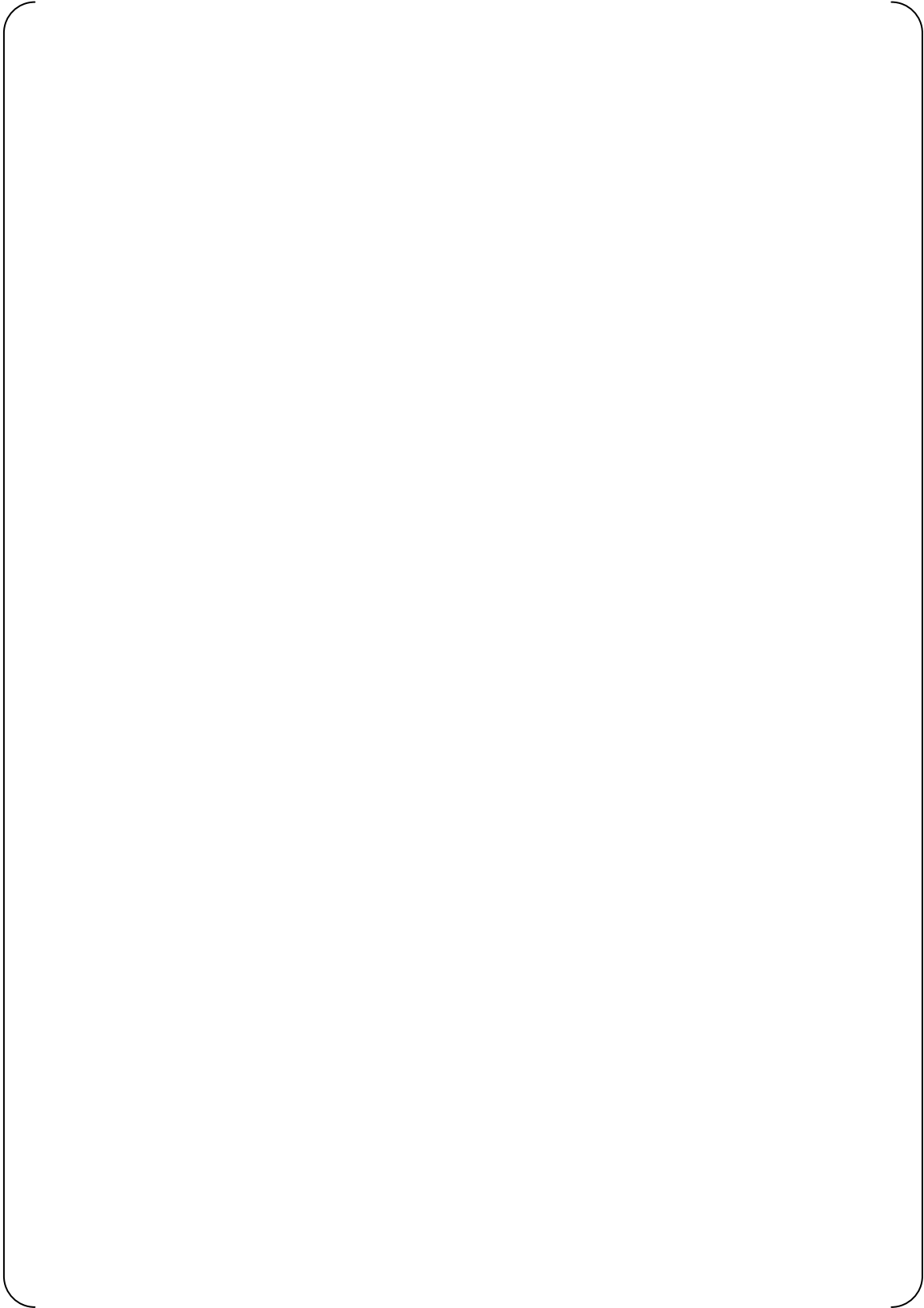


Figure B.1.0-3 Installation Drawing of Gas Turbine Assembly (Sheet 2 of 6)

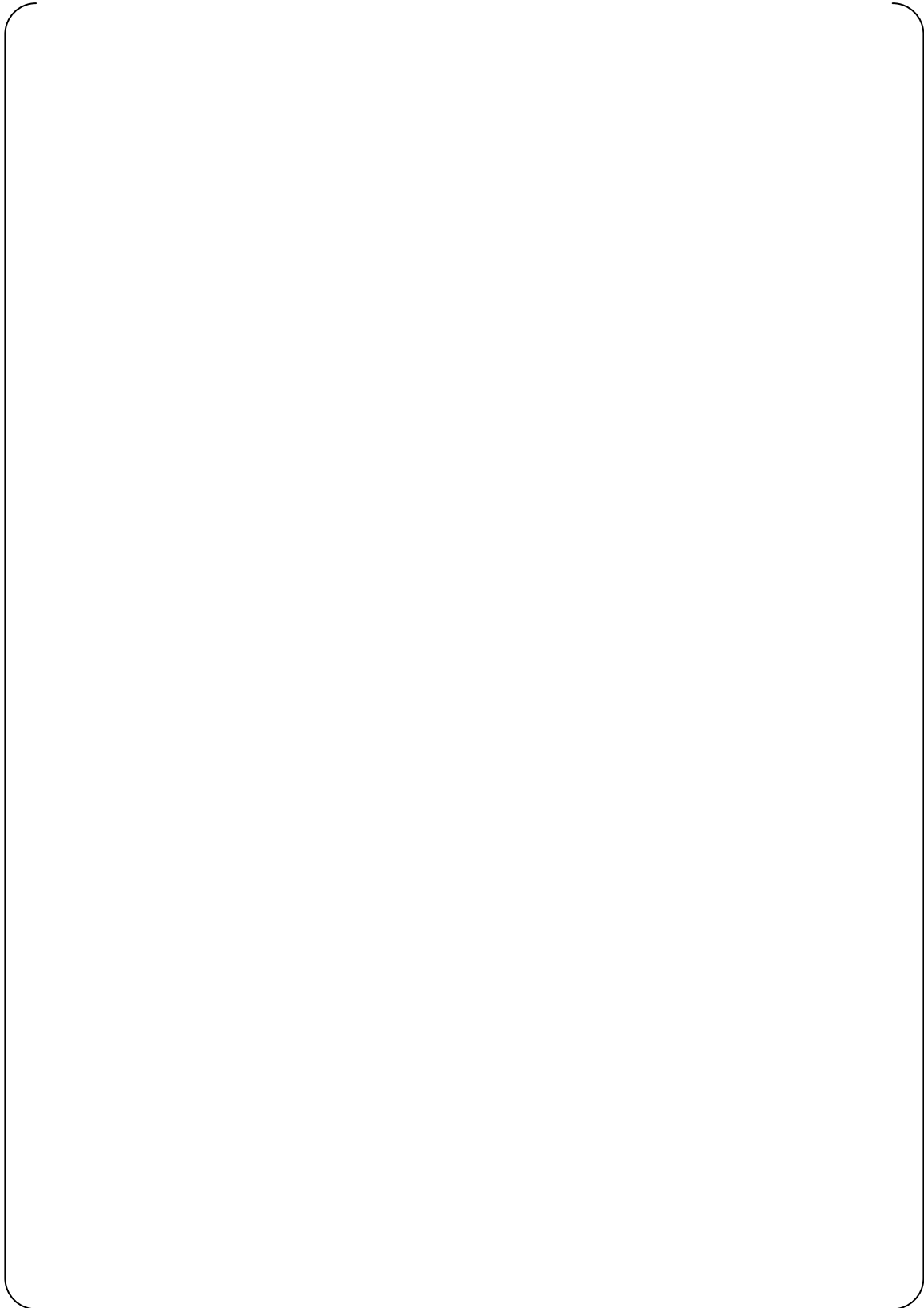


Figure B.1.0-3 Installation Drawing of Gas Turbine Assembly (Sheet 3 of 6)

Figure B.1.0-3 Installation Drawing of Gas Turbine Assembly (Sheet 4 of 6)

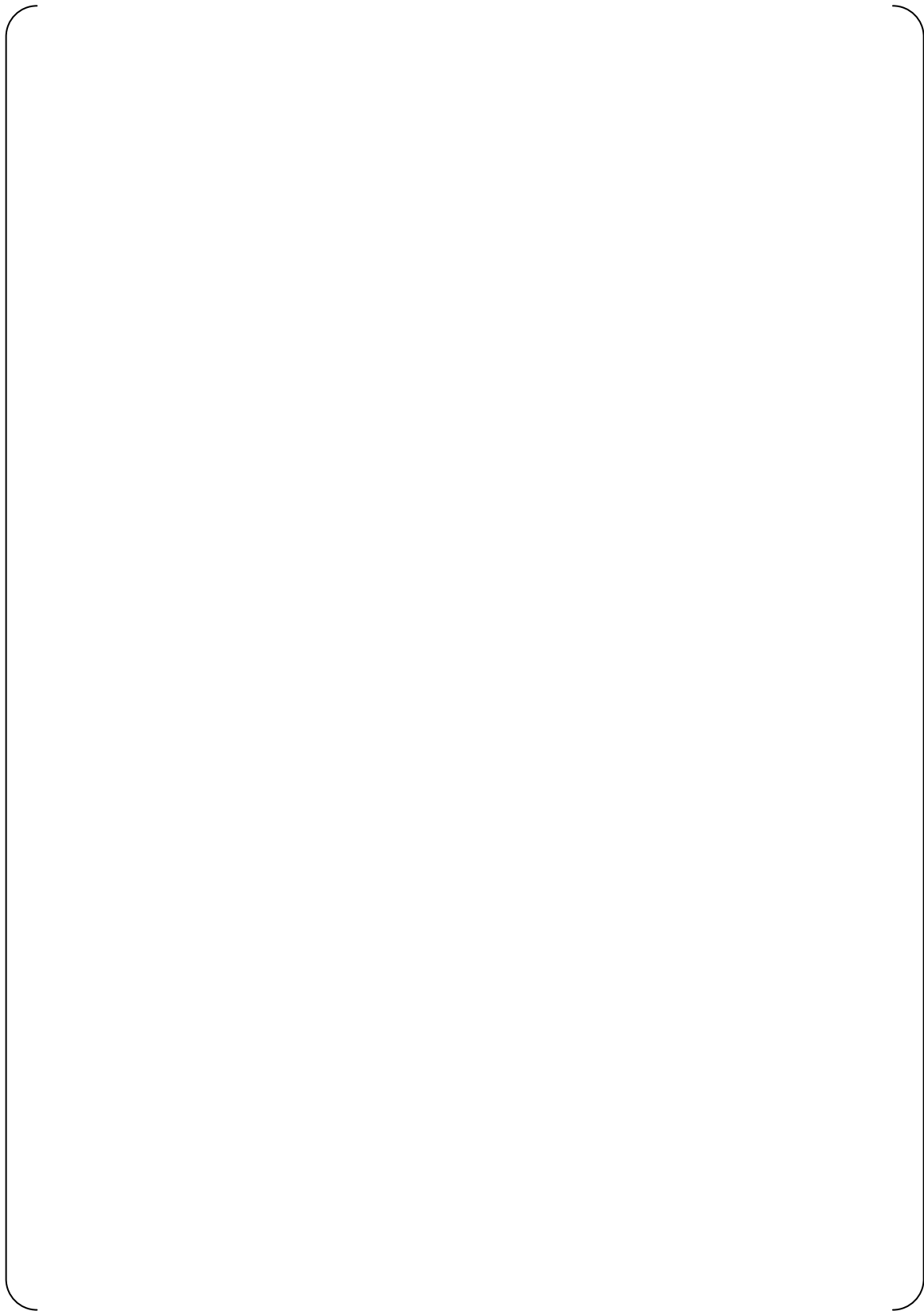


Figure B.1.0-3 Installation Drawing of Gas Turbine Assembly (Sheet 5 of 6)

Figure B.1.0-3 Installation Drawing of Gas Turbine Assembly (Sheet 6 of 6)

Figure B.1.0-4 Drawing of Generator and Oil Supply Unit (Sheet 1 of 4)

Figure B.1.0-4 Drawing of Generator and Oil Supply Unit (Sheet 2 of 4)

Figure B.1.0-4 Drawing of Generator and Oil Supply Unit (Sheet 3 of 4)

Figure B.1.0-4 Drawing of Generator and Oil Supply Unit (Sheet 4 of 4)

Figure B.1.0-5 Drawing of Fuel Day Tank (Sheet 1 of 2)

Figure B.1.0-5 Drawing of Fuel Day Tank (Sheet 2 of 2)

Figure B.1.0-6 Drawing of Air Start Receiver (Sheet 1 of 4)

Figure B.1.0-6 Drawing of Air Start Receiver (Sheet 2 of 4)

Figure B.1.0-6 Drawing of Air Start Receiver (Sheet 3 of 4)

Figure B.1.0-6 Drawing of Air Start Receiver (Sheet 4 of 4)

Figure B.1.0-7 Drawing of Acoustic Enclosure and Engine Skid (Sheet 1 of 3)

Figure B.1.0-7 Drawing of Acoustic Enclosure and Engine Skid (Sheet 2 of 3)

Figure B.1.0-7 Drawing of Acoustic Enclosure and Engine Skid (Sheet 3 of 3)

Figure B.1.0-8 Configuration of Lubricant Oil System (Sheet 1 of 2)

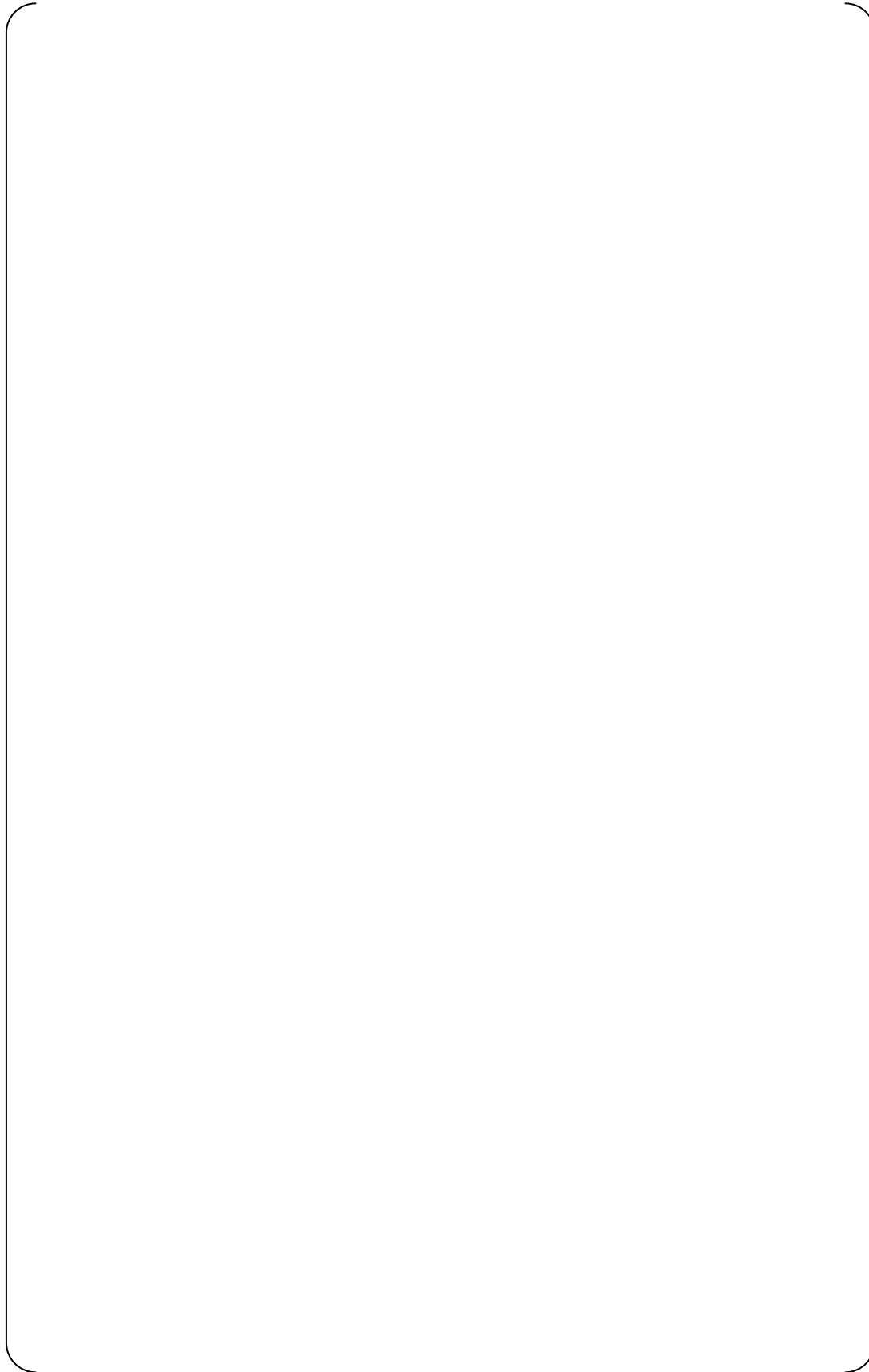


Figure B.1.0-8 Configuration of Lubricant Oil System (Sheet 2 of 2)

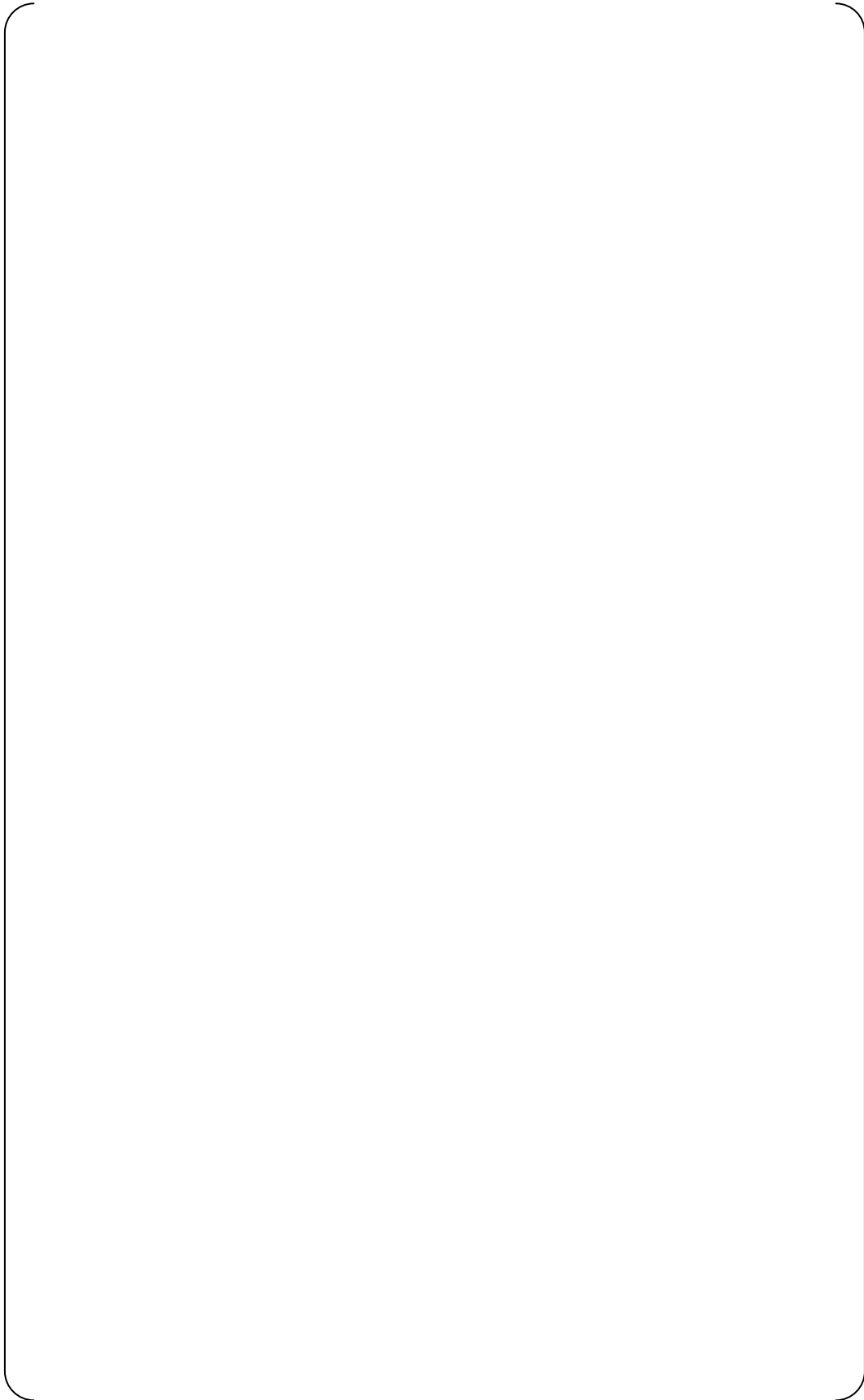


Figure B.1.0-9 Configuration of Fuel Oil System

Figure B.1.0-10 Drawing of Starting Air System (Sheet 1 of 4)

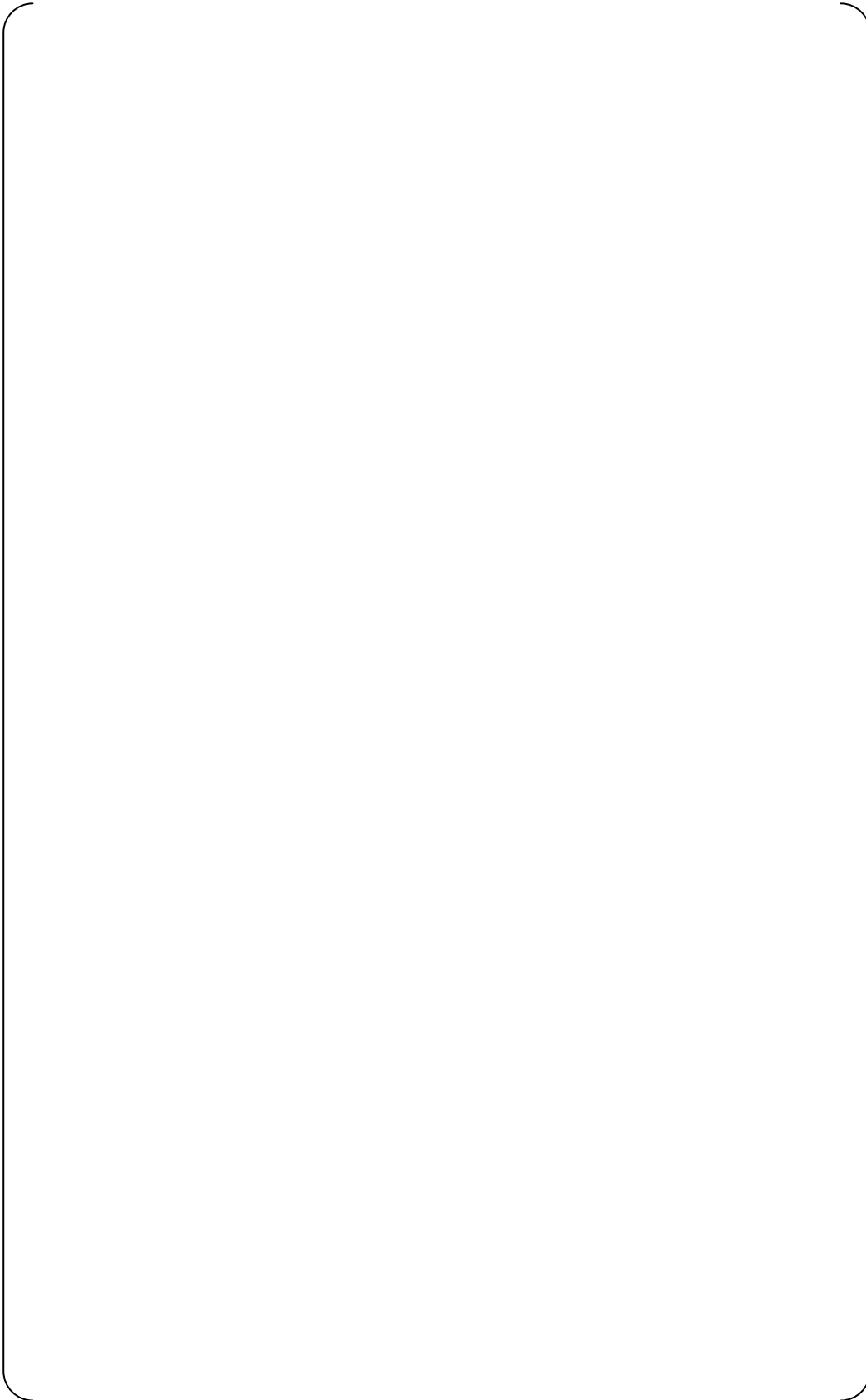


Figure B.1.0-10 Drawing of Starting Air System (Sheet 2 of 4)

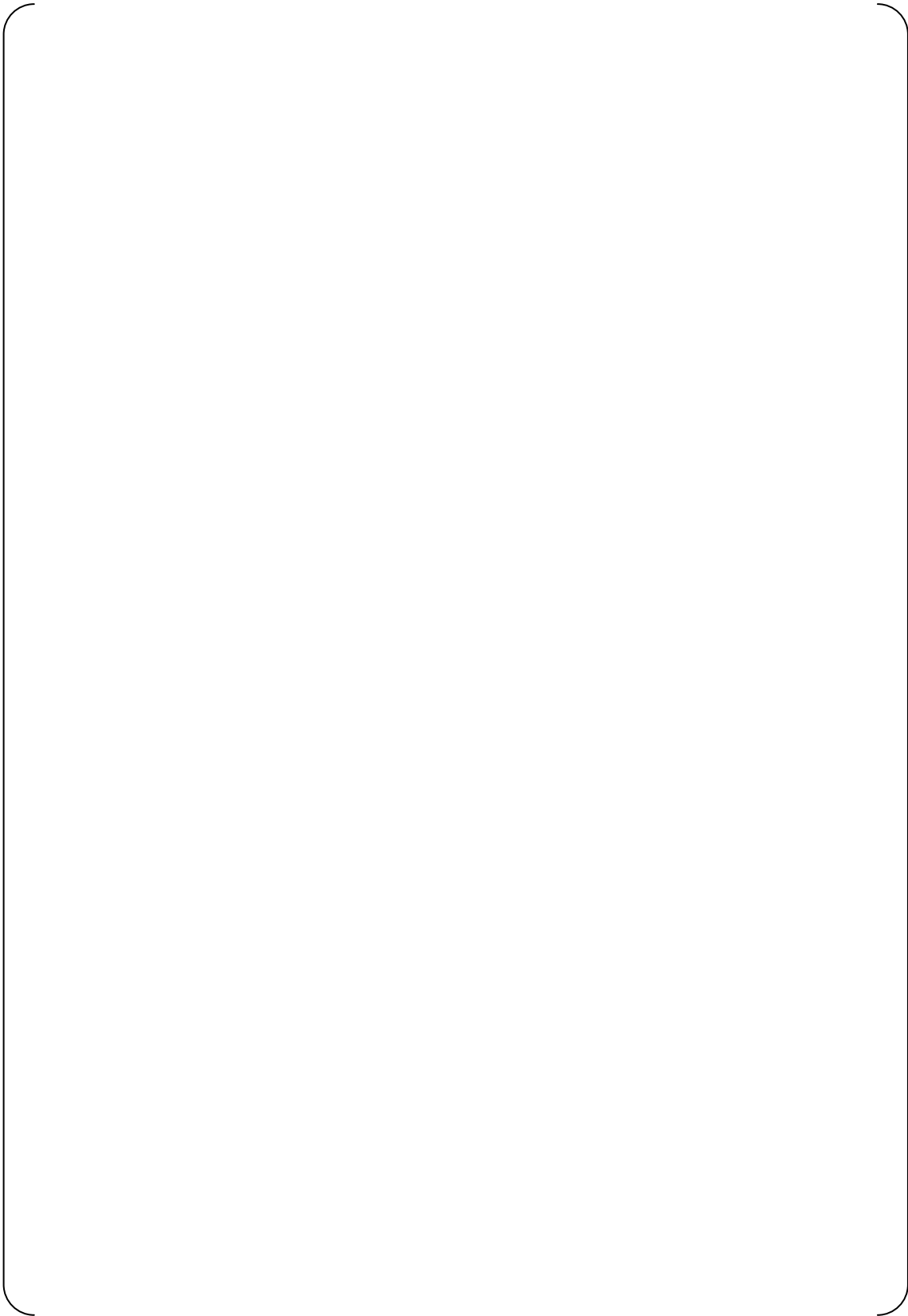


Figure B.1.0-10 Drawing of Starting Air System (Sheet 3 of 4)

Figure B.1.0-10 Drawing of Starting Air System (Sheet 4 of 4)

Figure B.1.0-11 Drawing of Intake / Exhaust Air System

Figure B.1.0-12 Drawing of Alarm Panel (Sheet 1 of 4)

Figure B.1.0-12 Drawing of Alarm Panel (Sheet 2 of 4)

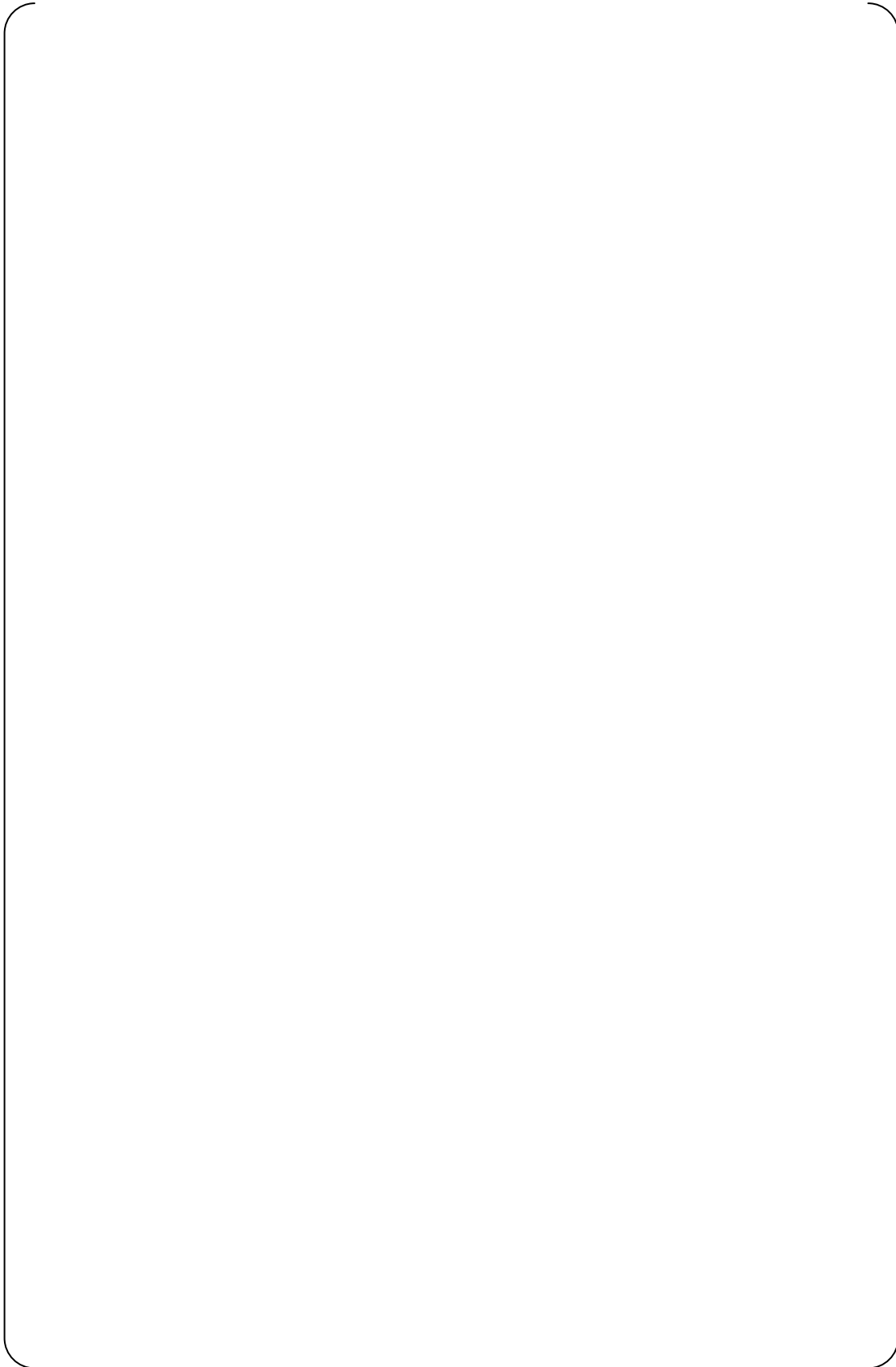


Figure B.1.0-12 Drawing of Alarm Panel (Sheet 3 of 4)

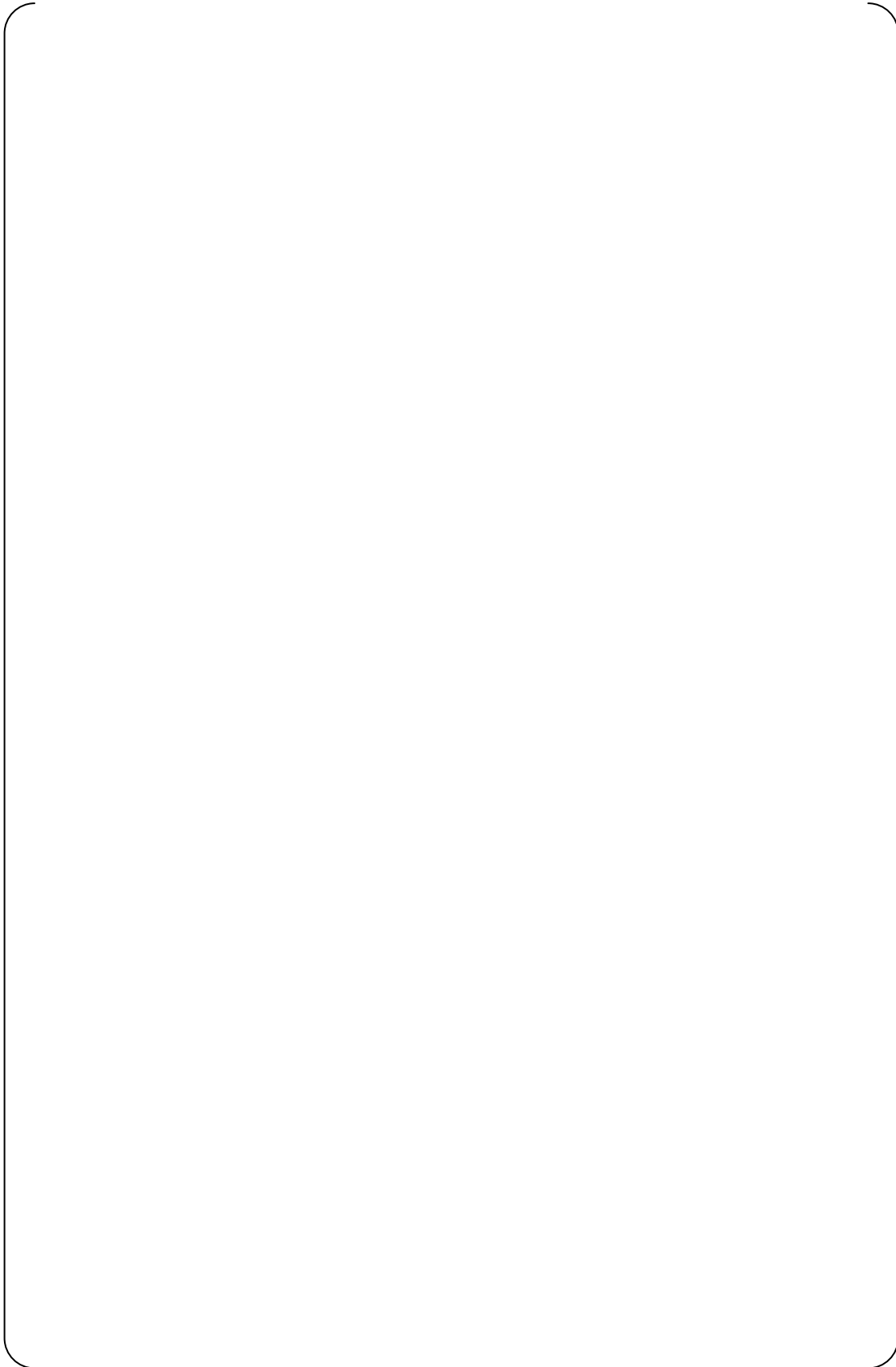


Figure B.1.0-12 Drawing of Alarm Panel (Sheet 4 of 4)

Appendix C Parameter Chart

The parameter chart shown on next page indicates following record.

1. Start Signal
2. Voltage
3. Frequency
4. Ready to load
5. Load (kW)
6. The speed of rotation

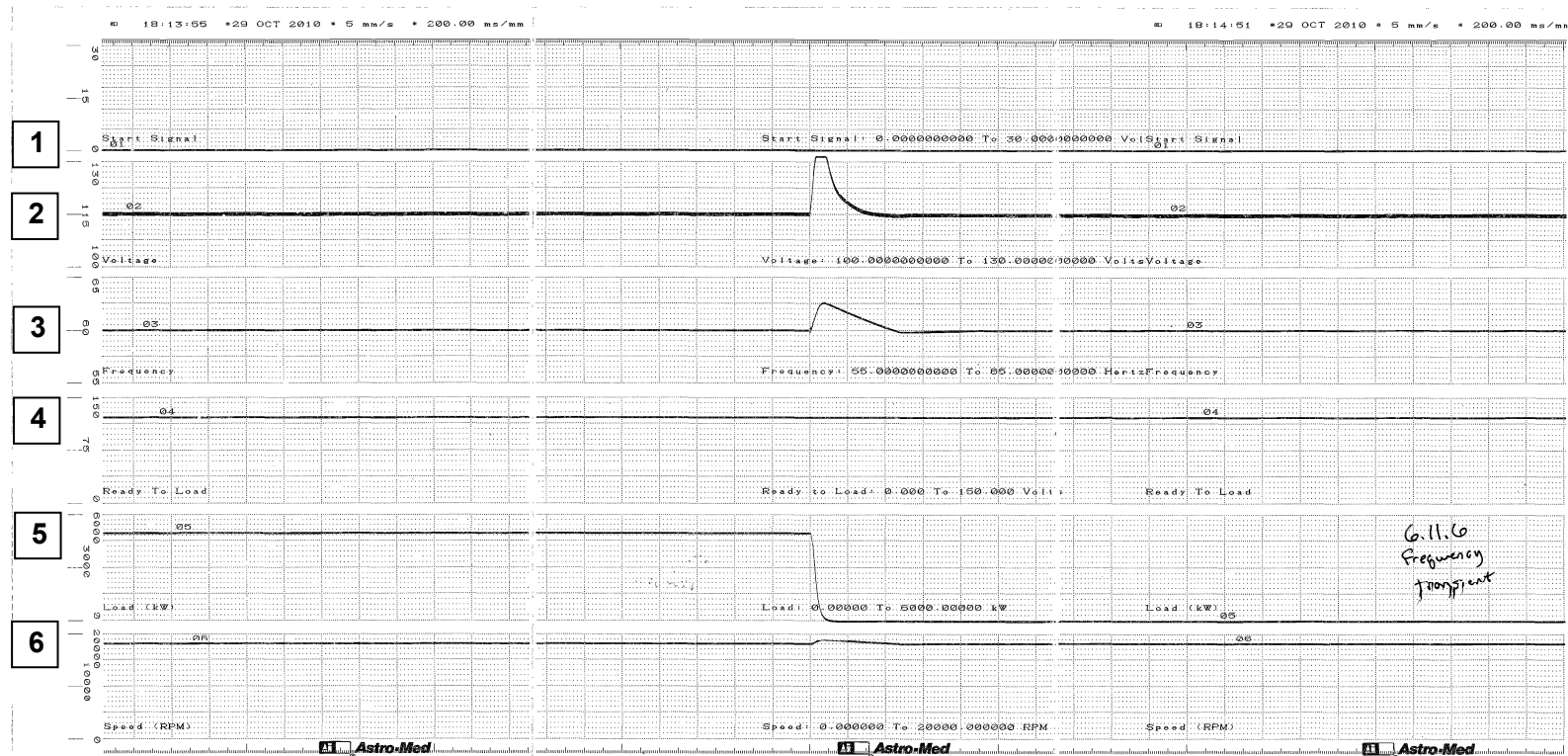


Figure C.1.0-1 Parameter Chart of Load Capability Test

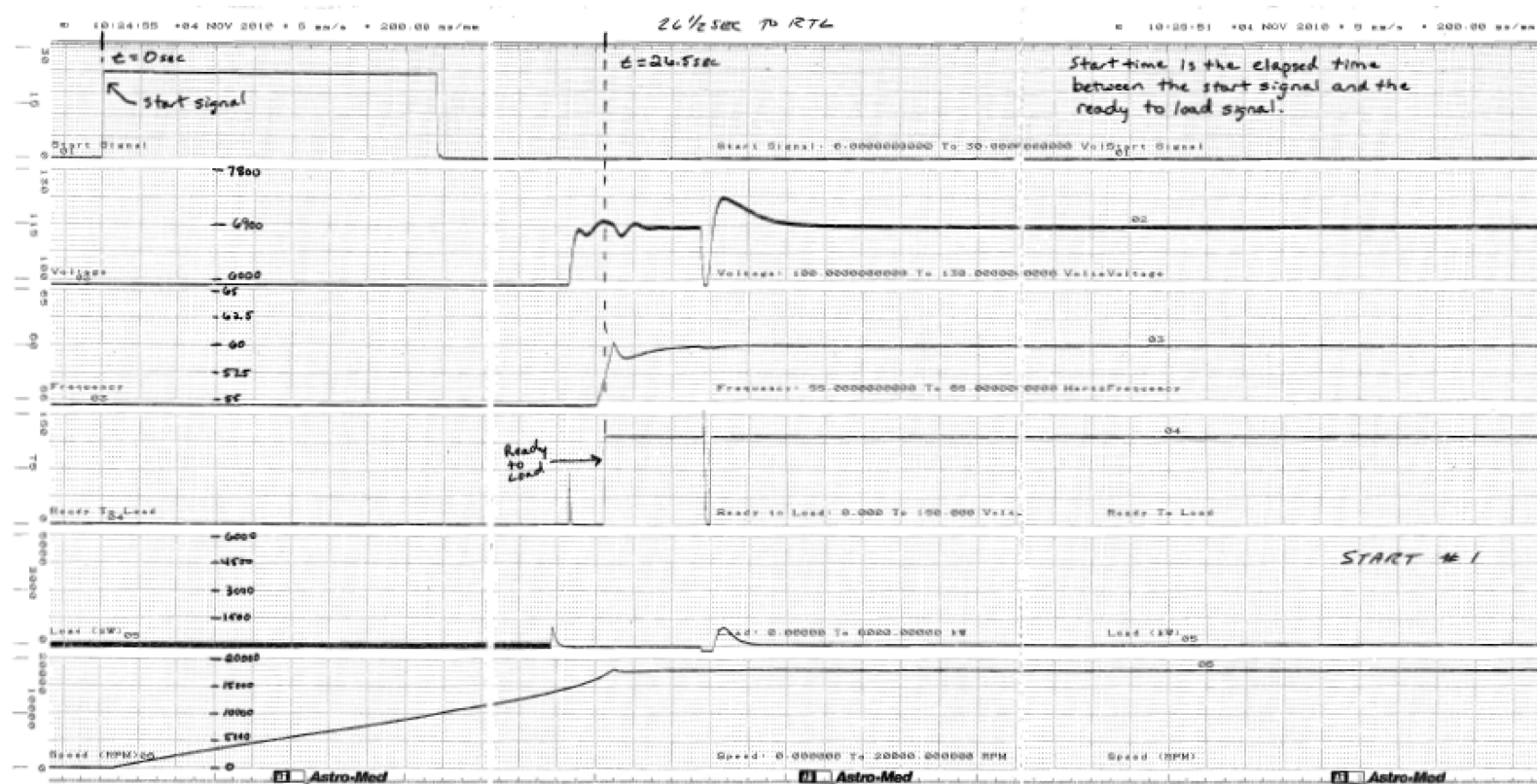


Figure C.1.0-2 Parameter Chart of Start and Load Acceptance Test, No.1, Cold

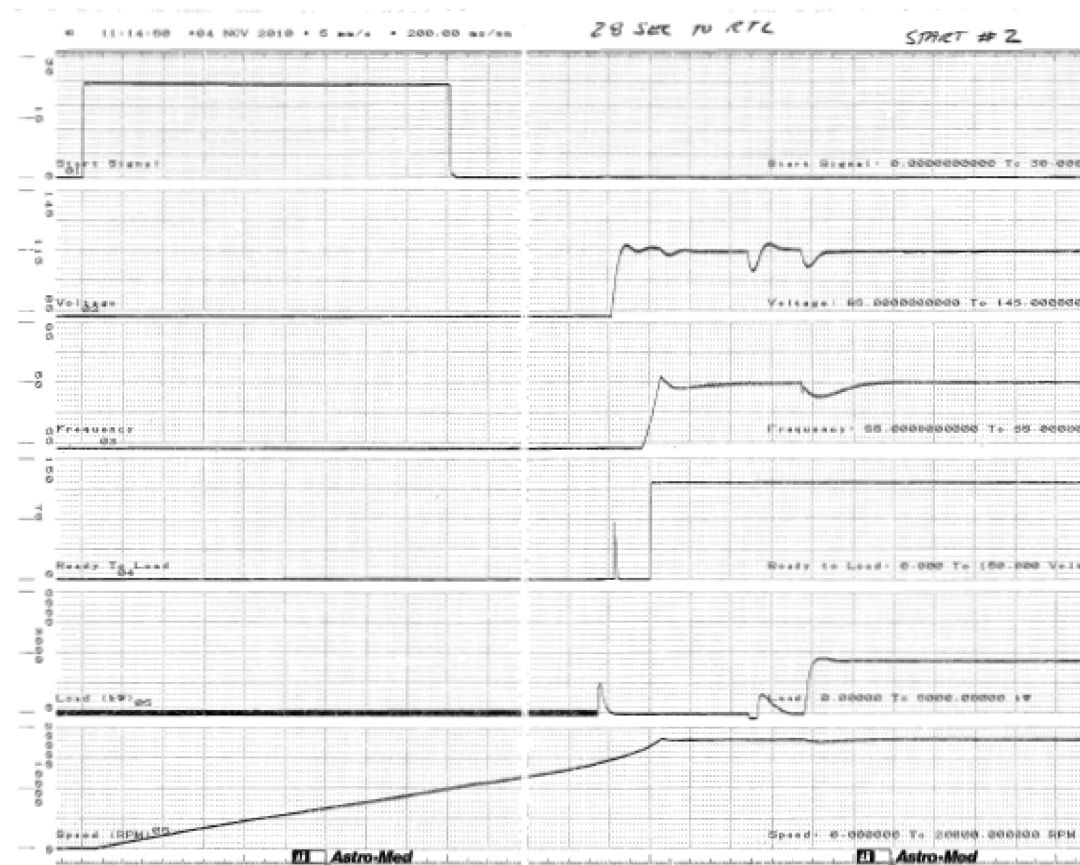


Figure C.1.0-3 Parameter Chart of Start and Load Acceptance Test, No.2, Hot

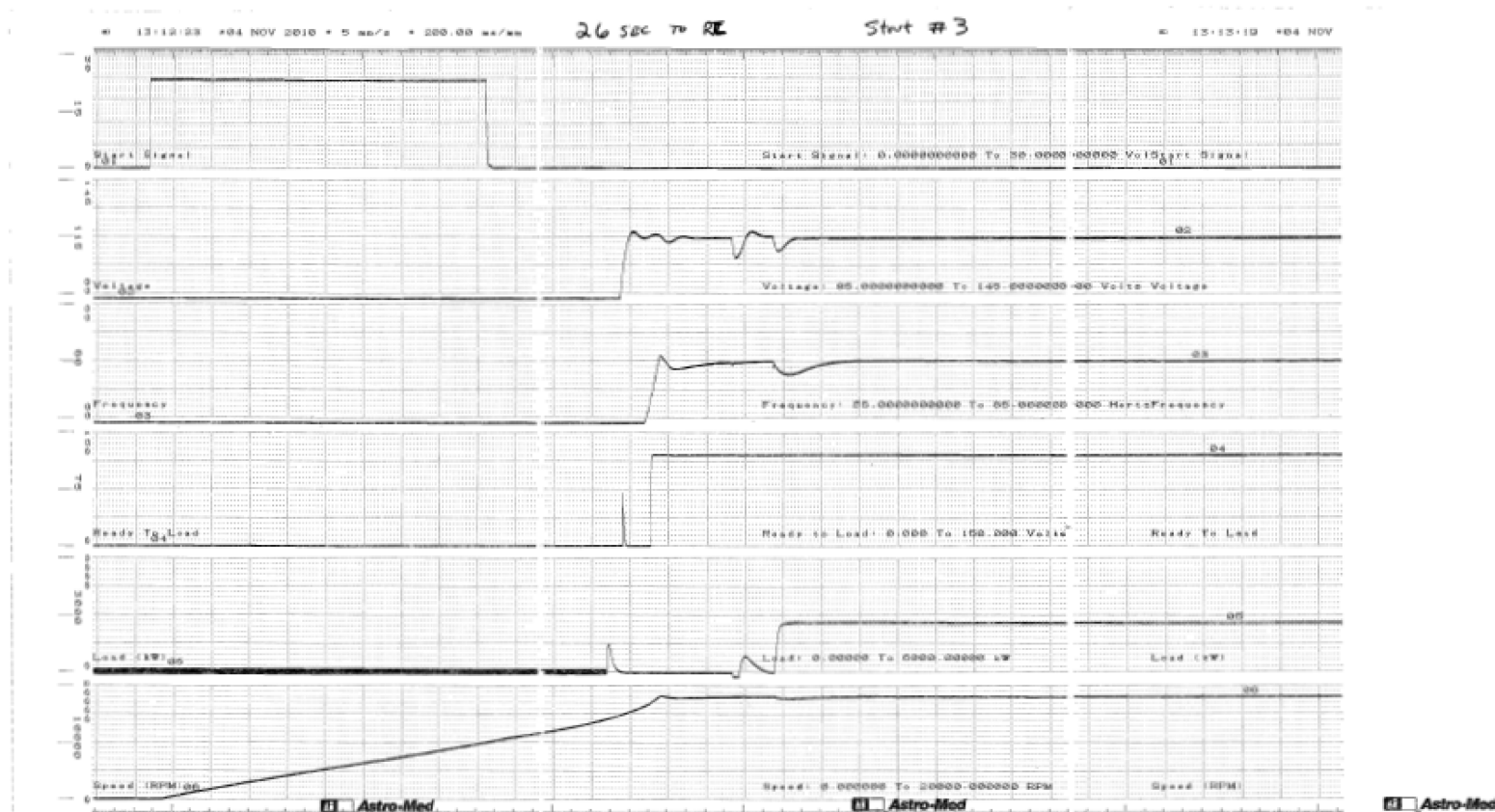


Figure C.1.0-4 Parameter Chart of Start and Load Acceptance Test, No.3, Hot

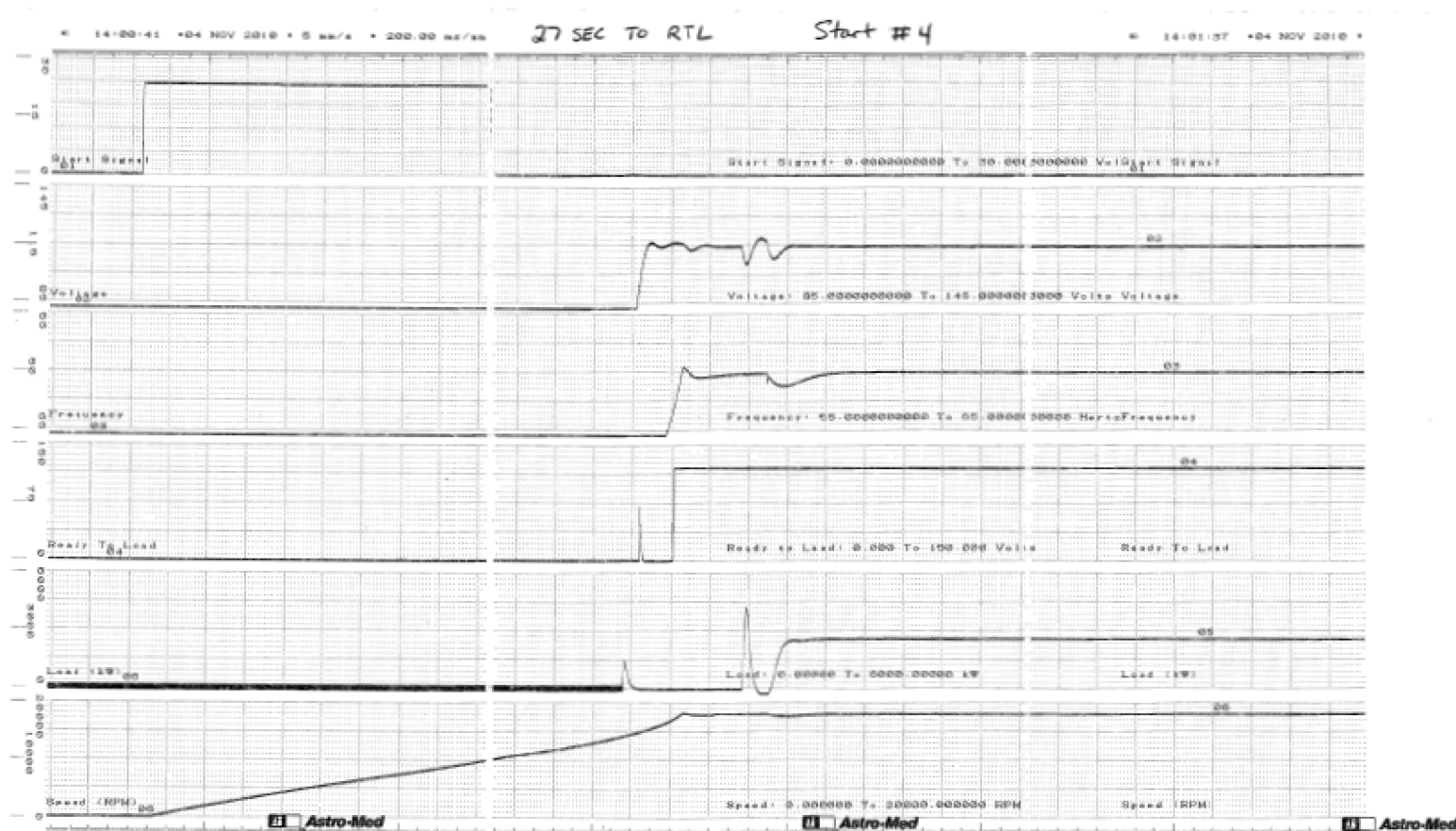


Figure C.1.0-5 Parameter Chart of Start and Load Acceptance Test, No.4, Hot

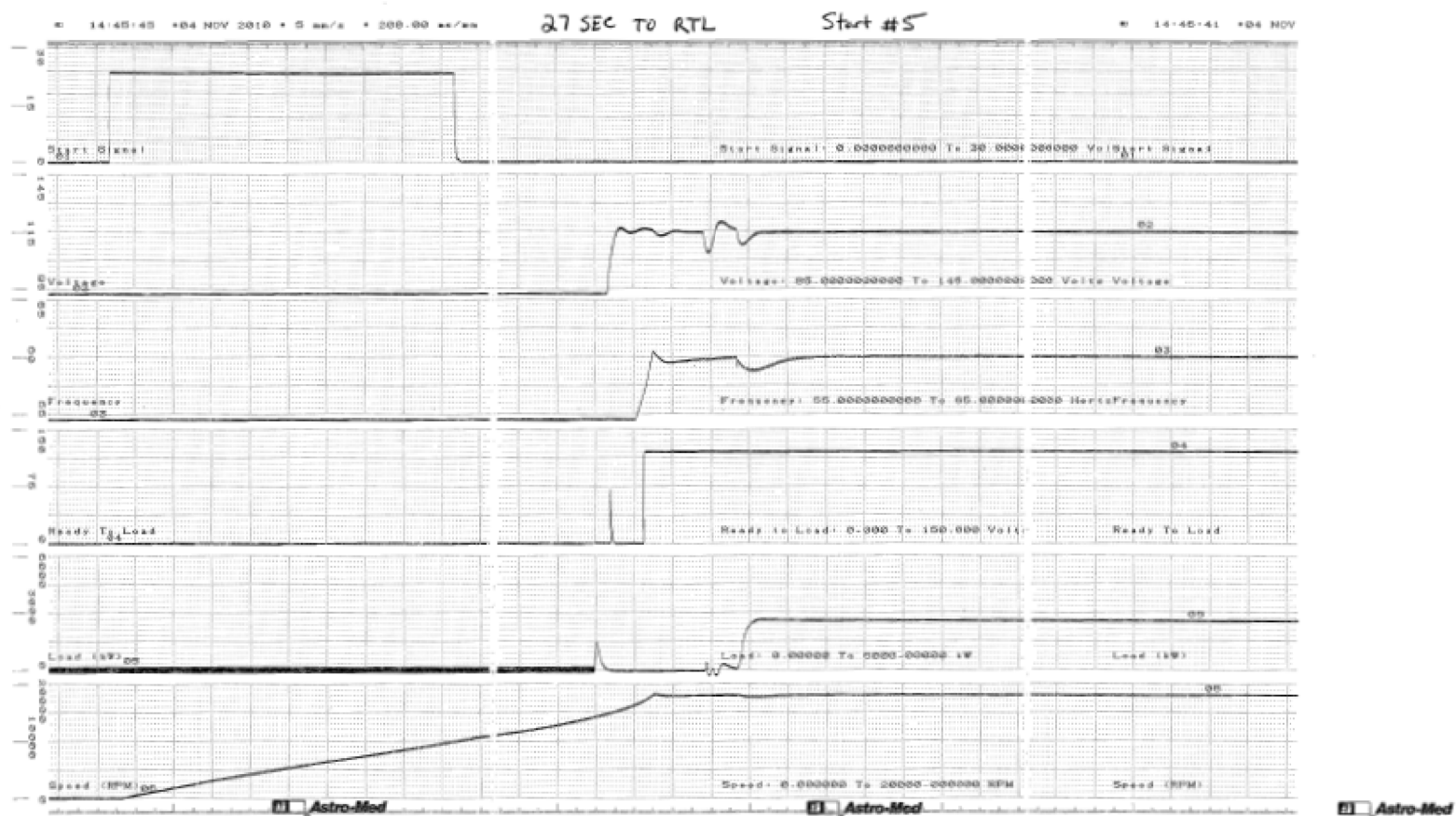


Figure C.1.0-6 Parameter Chart of Start and Load Acceptance Test, No.5, Hot

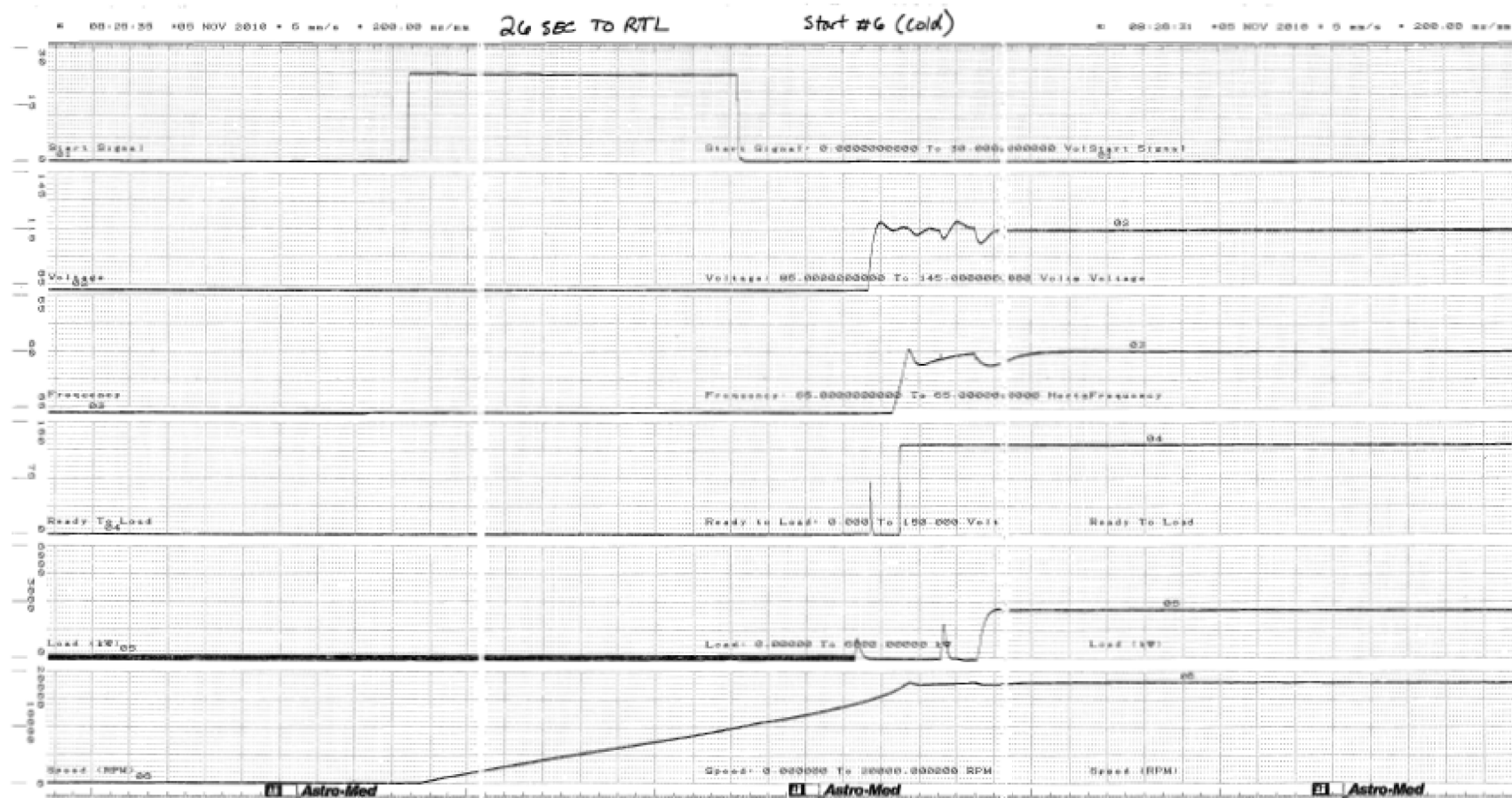


Figure C.1.0-7 Parameter Chart of Start and Load Acceptance Test, No.6, Cold

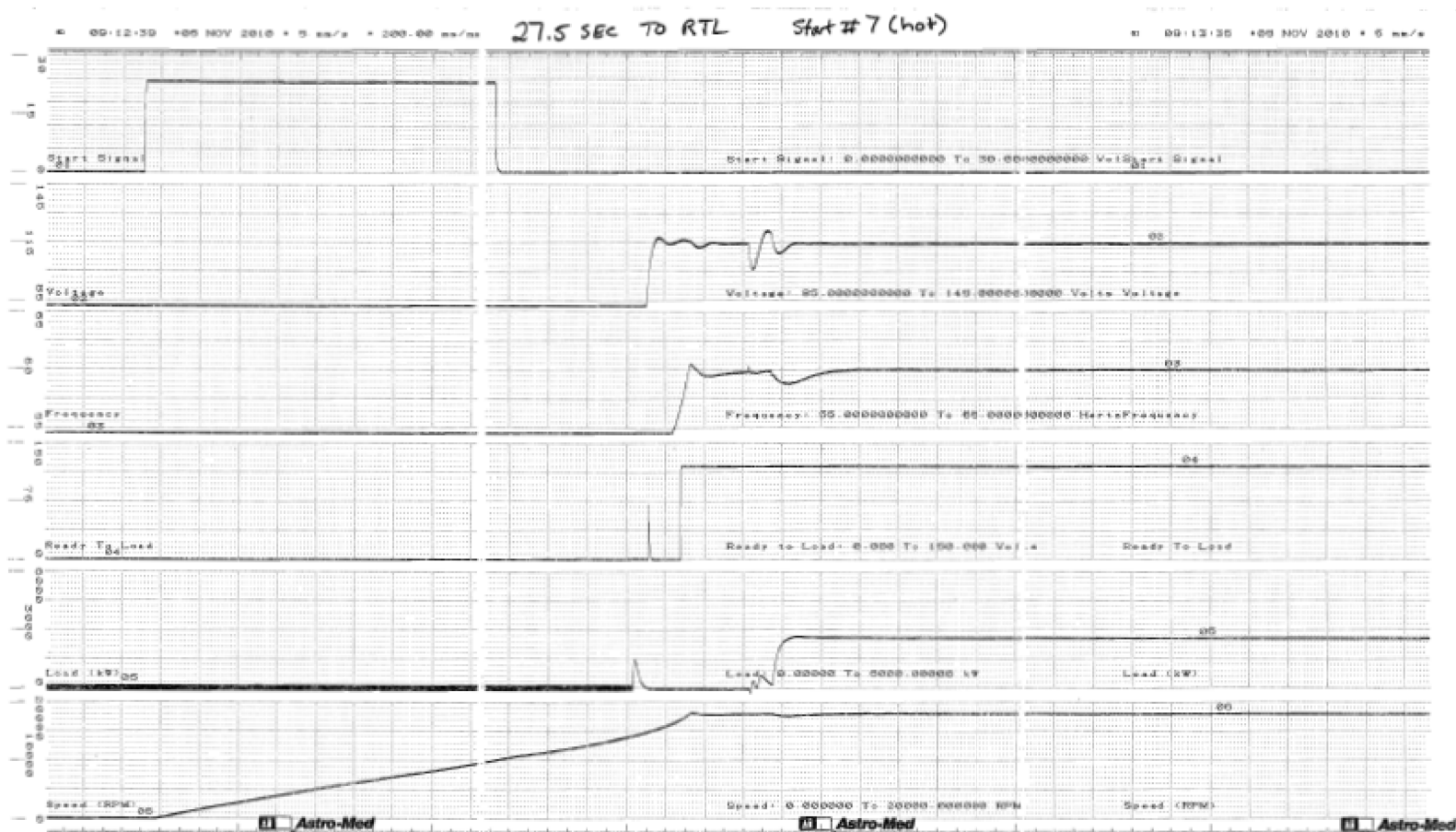


Figure C.1.0-8 Parameter Chart of Start and Load Acceptance Test, No.7, Hot

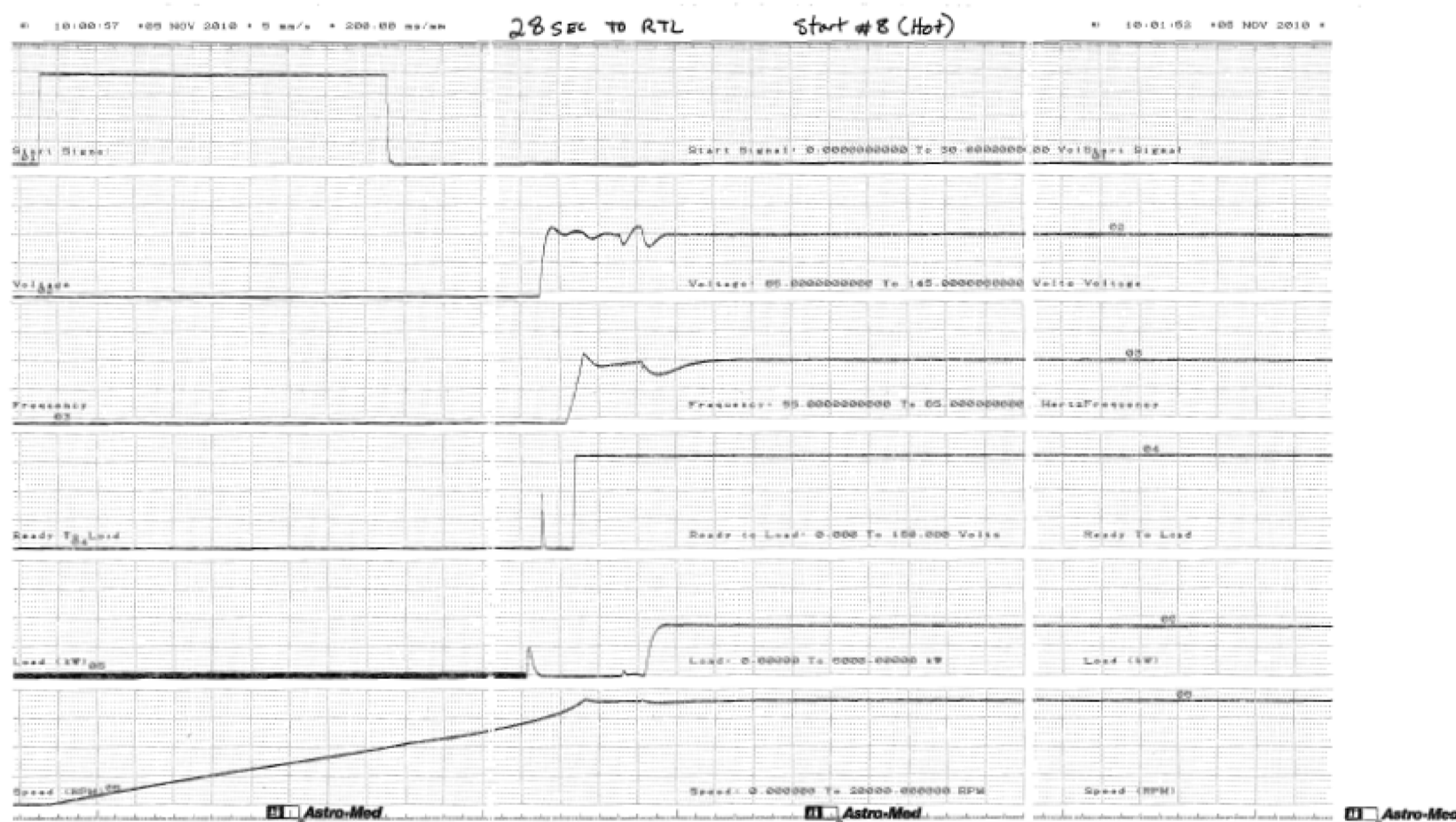


Figure C.1.0-9 Parameter Chart of Start and Load Acceptance Test, No.8, Hot

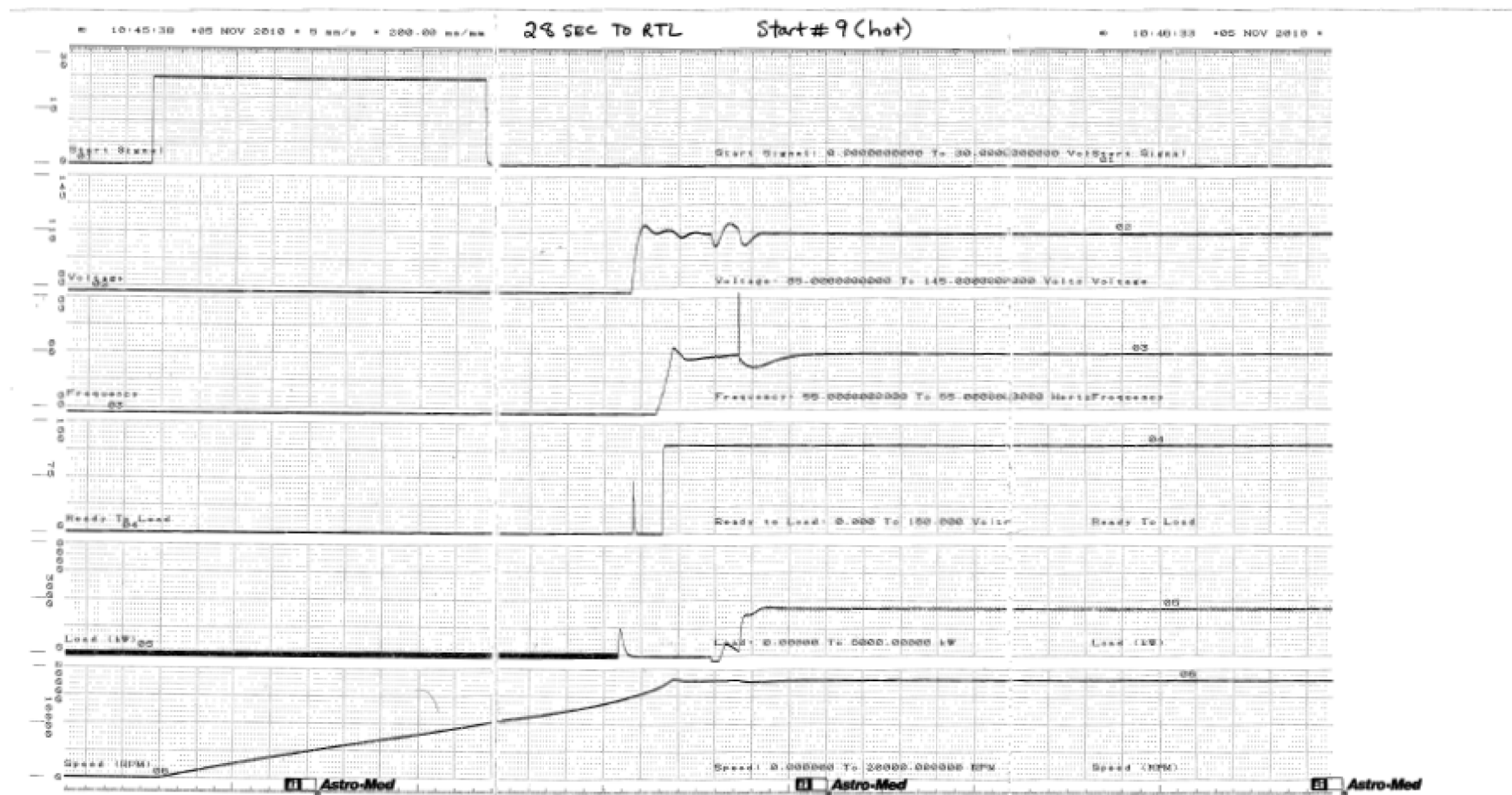


Figure C.1.0-10 Parameter Chart of Start and Load Acceptance Test, No.9, Hot

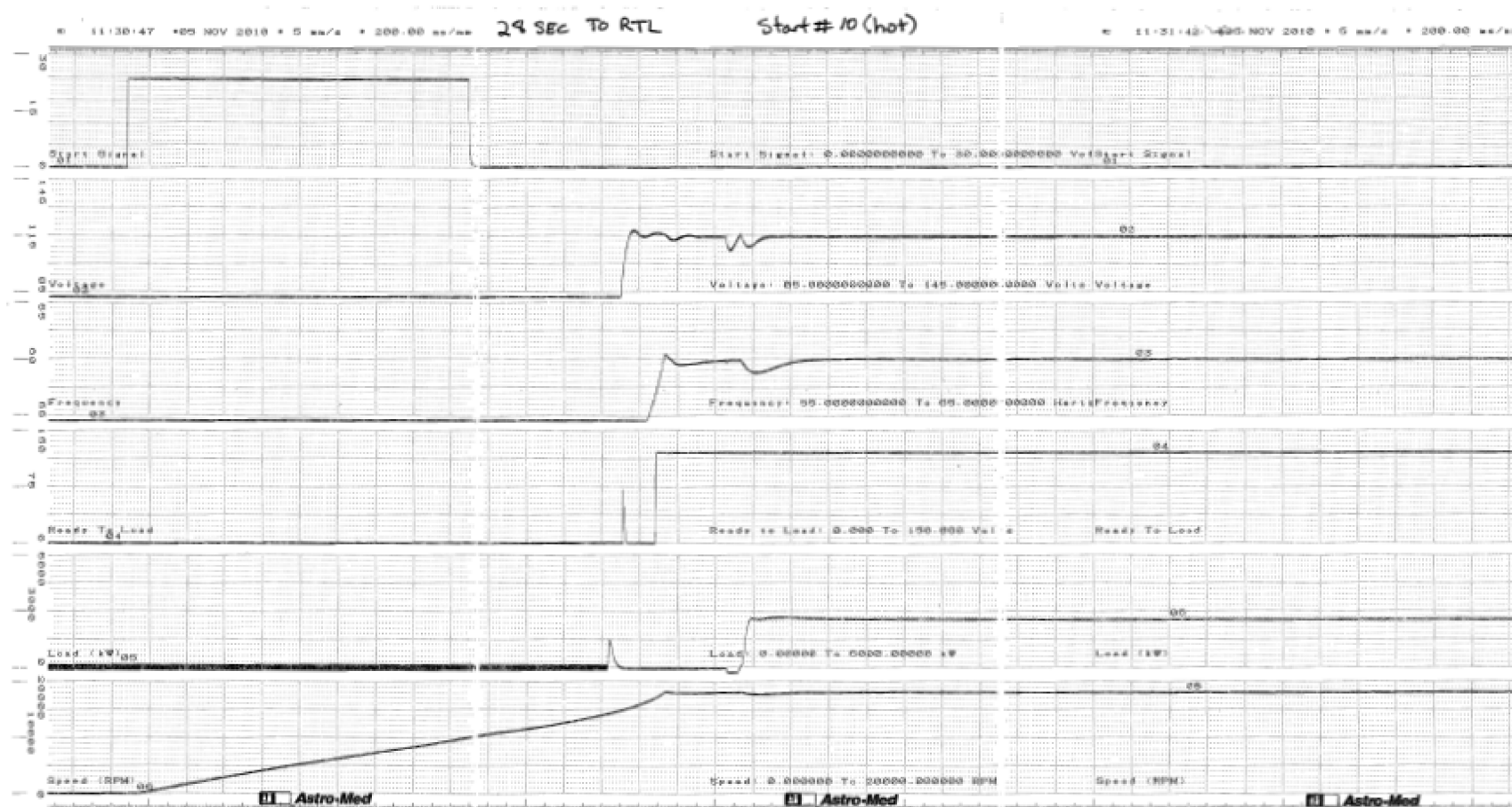


Figure C.1.0-11 Parameter Chart of Start and Load Acceptance Test, No.10, Hot

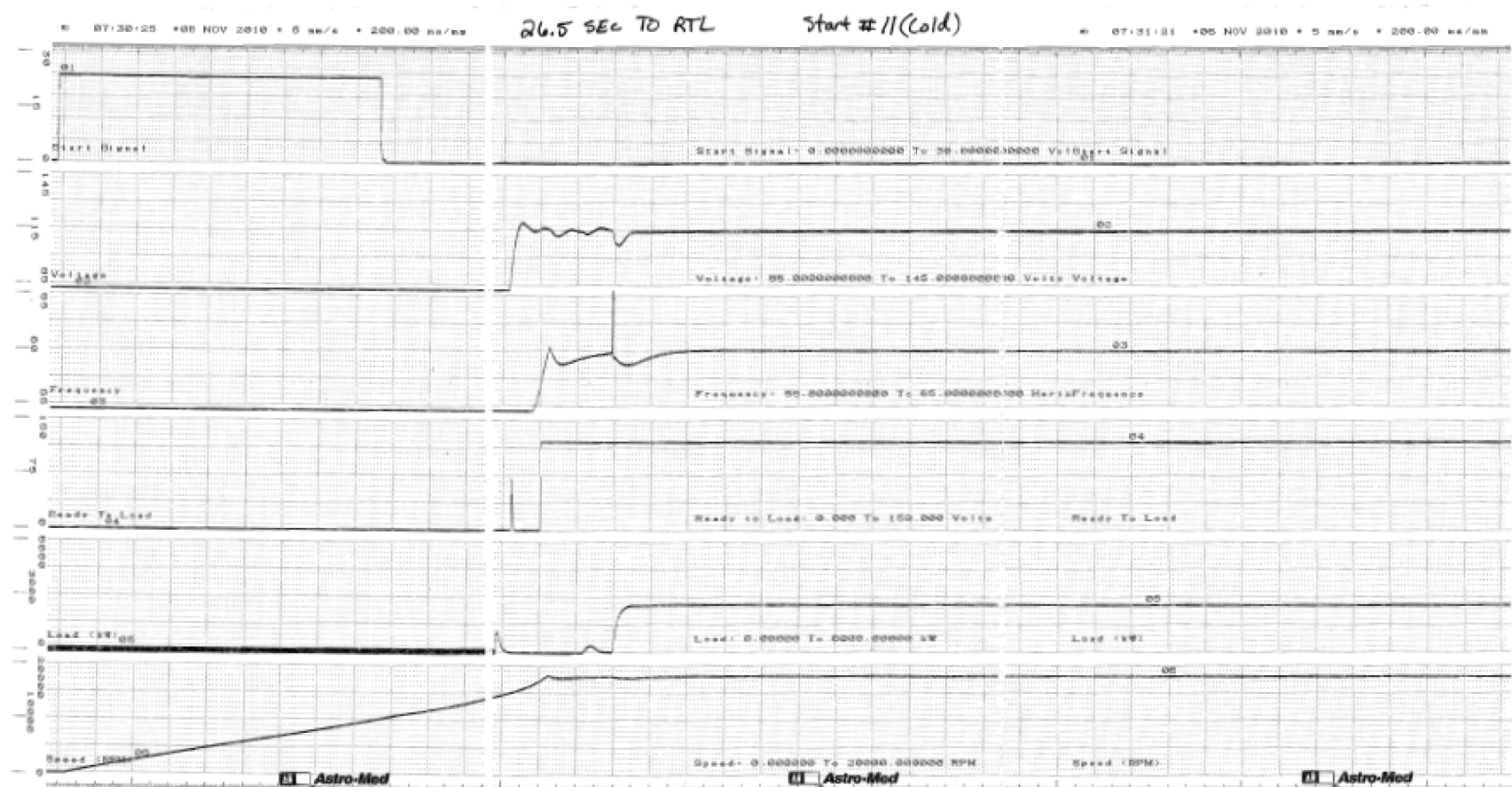


Figure C.1.0-12 Parameter Chart of Start and Load Acceptance Test, No.11, Cold

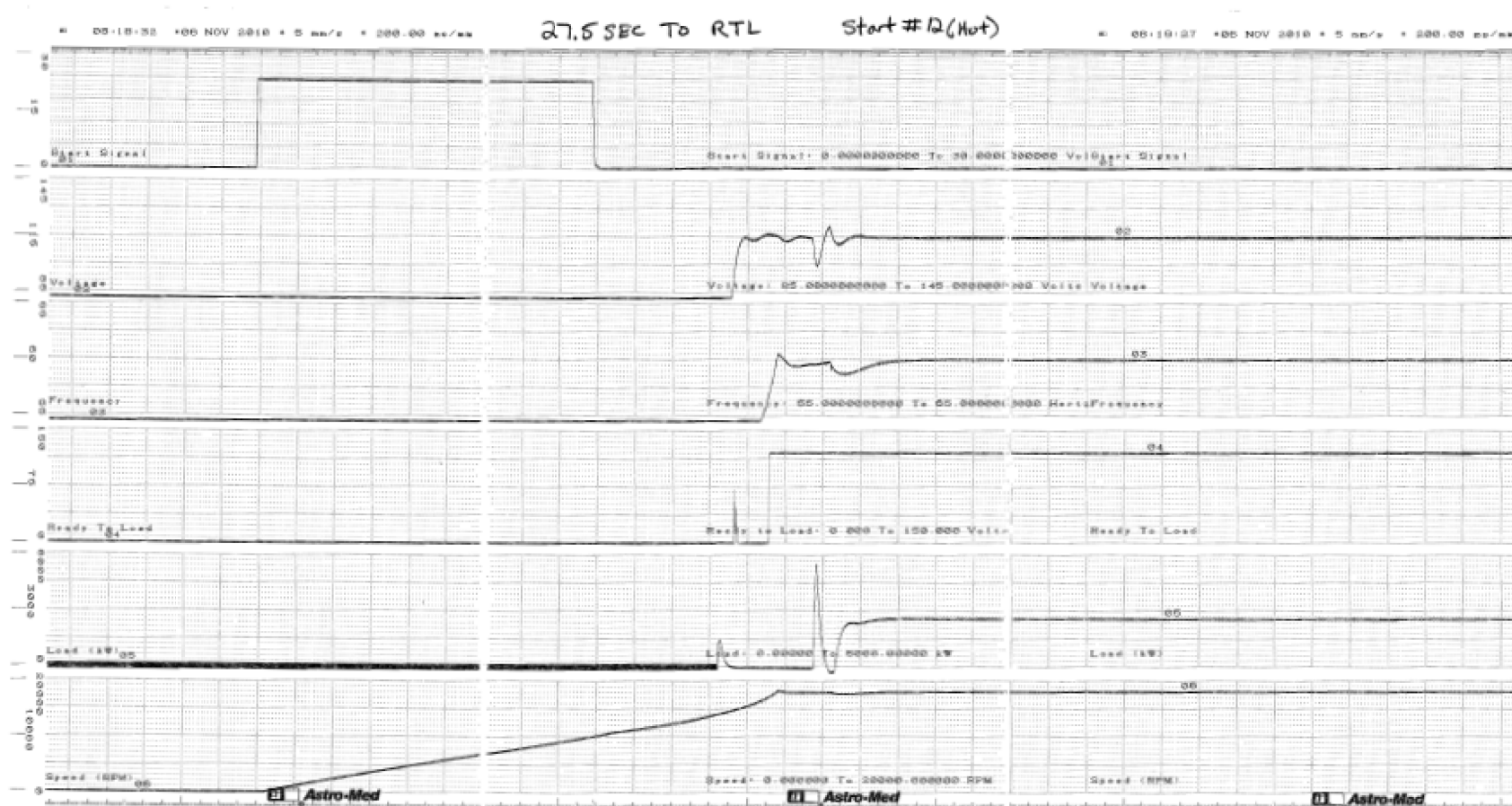


Figure C.1.0-13 Parameter Chart of Start and Load Acceptance Test, No.12, Hot

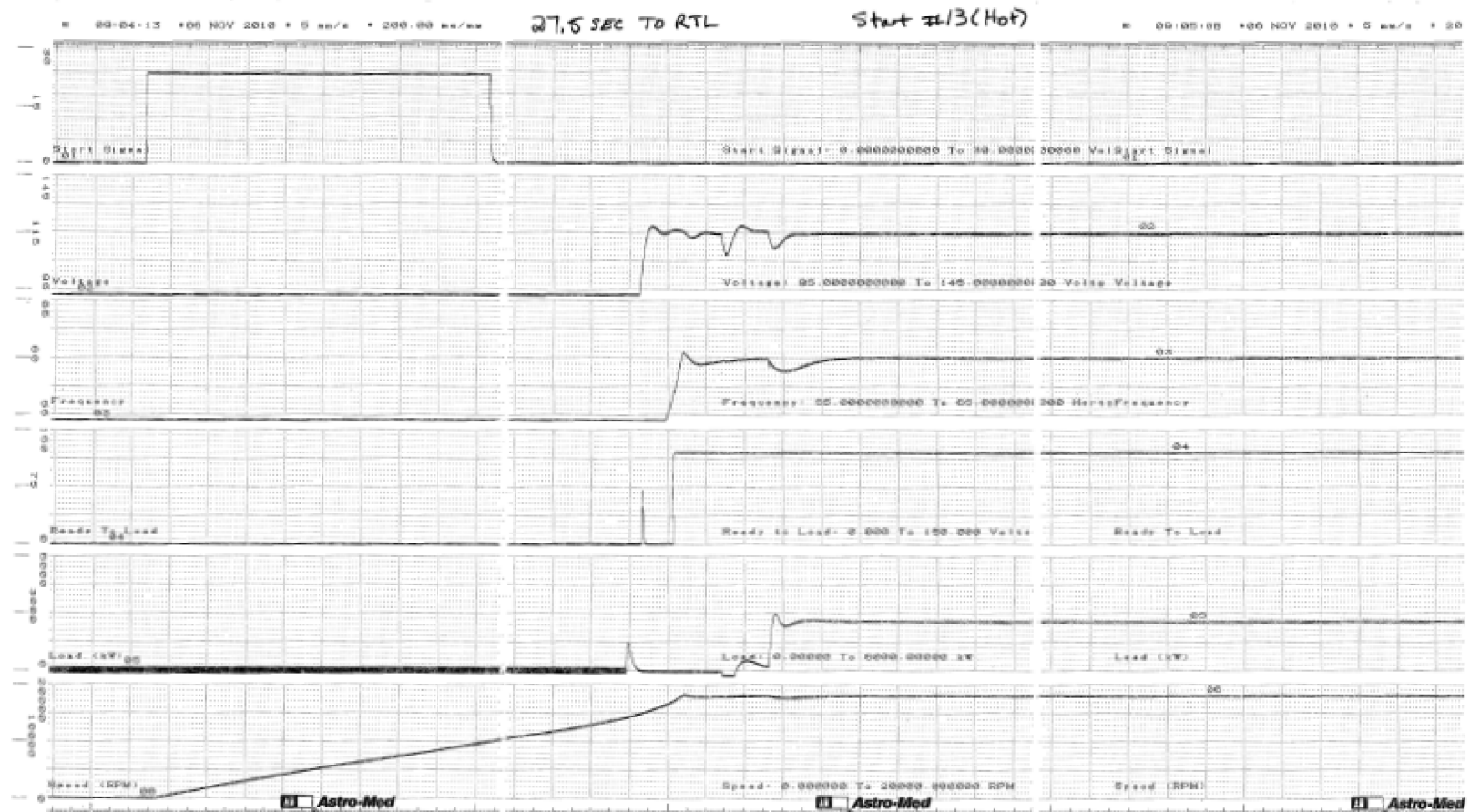


Figure C.1.0-14 Parameter Chart of Start and Load Acceptance Test, No.13, Hot

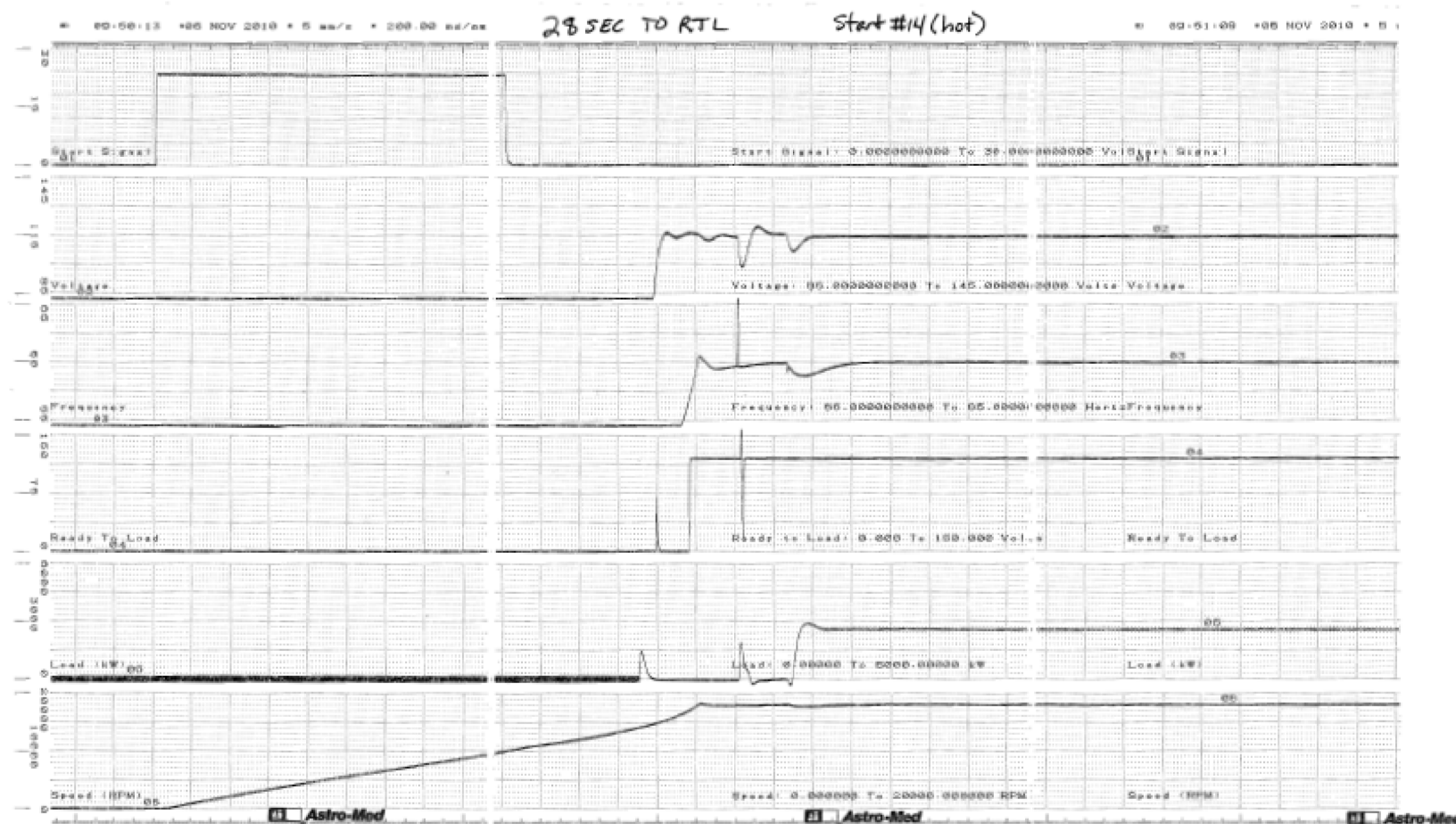


Figure C.1.0-15 Parameter Chart of Start and Load Acceptance Test, No.14, Hot

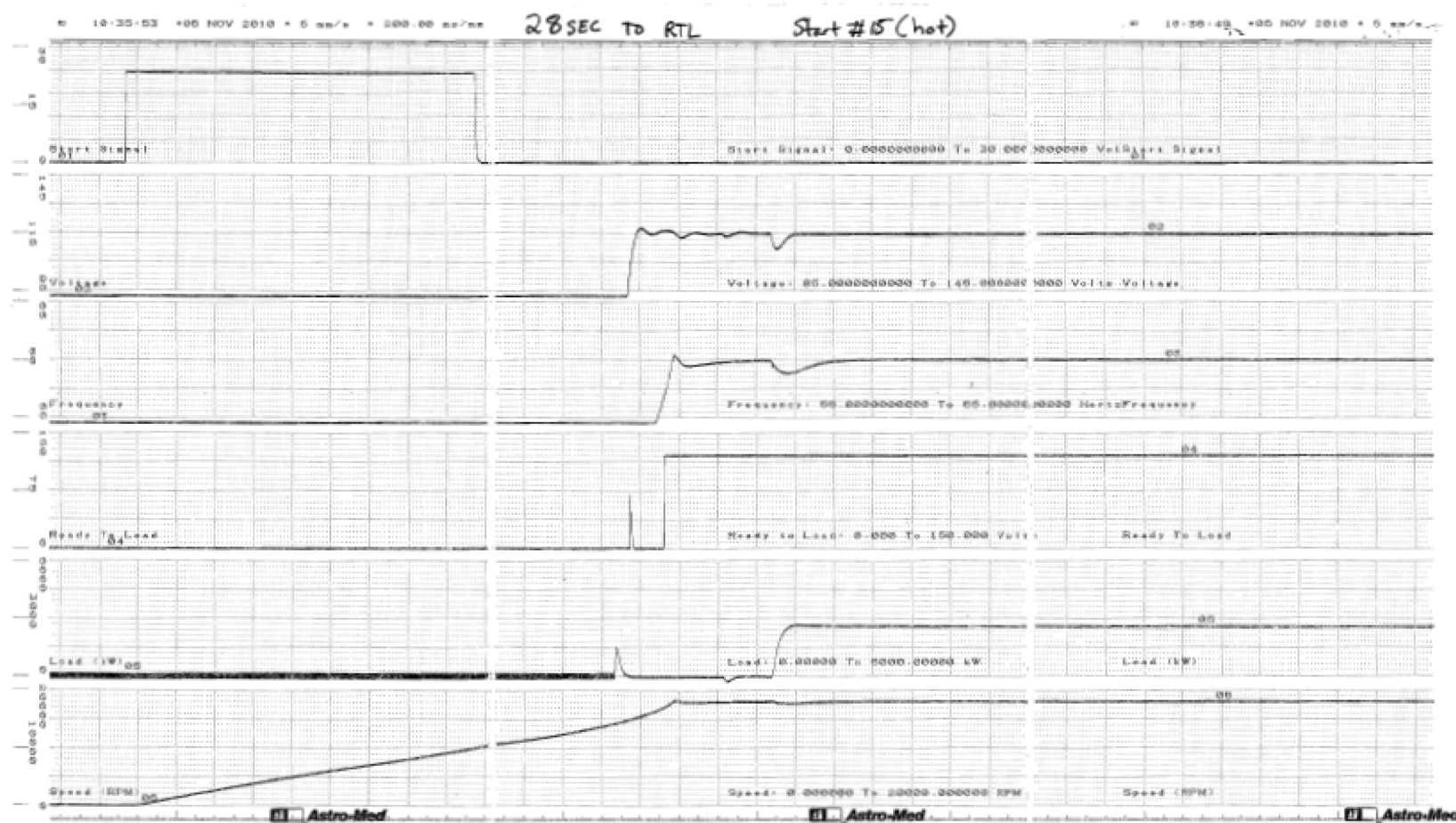


Figure C.1.0-16 Parameter Chart of Start and Load Acceptance Test, No.15, Hot

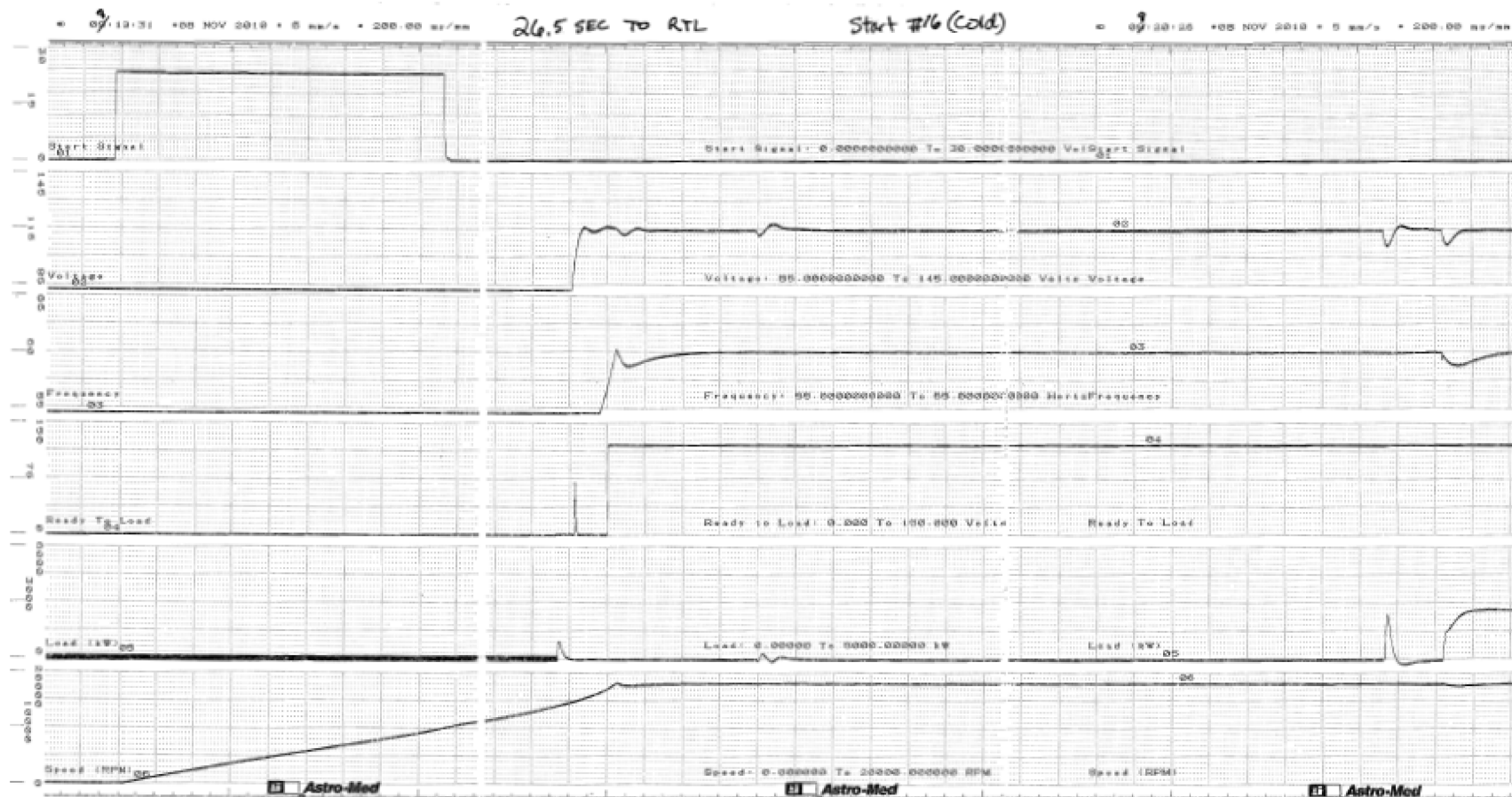


Figure C.1.0-17 Parameter Chart of Start and Load Acceptance Test, No.16, Cold

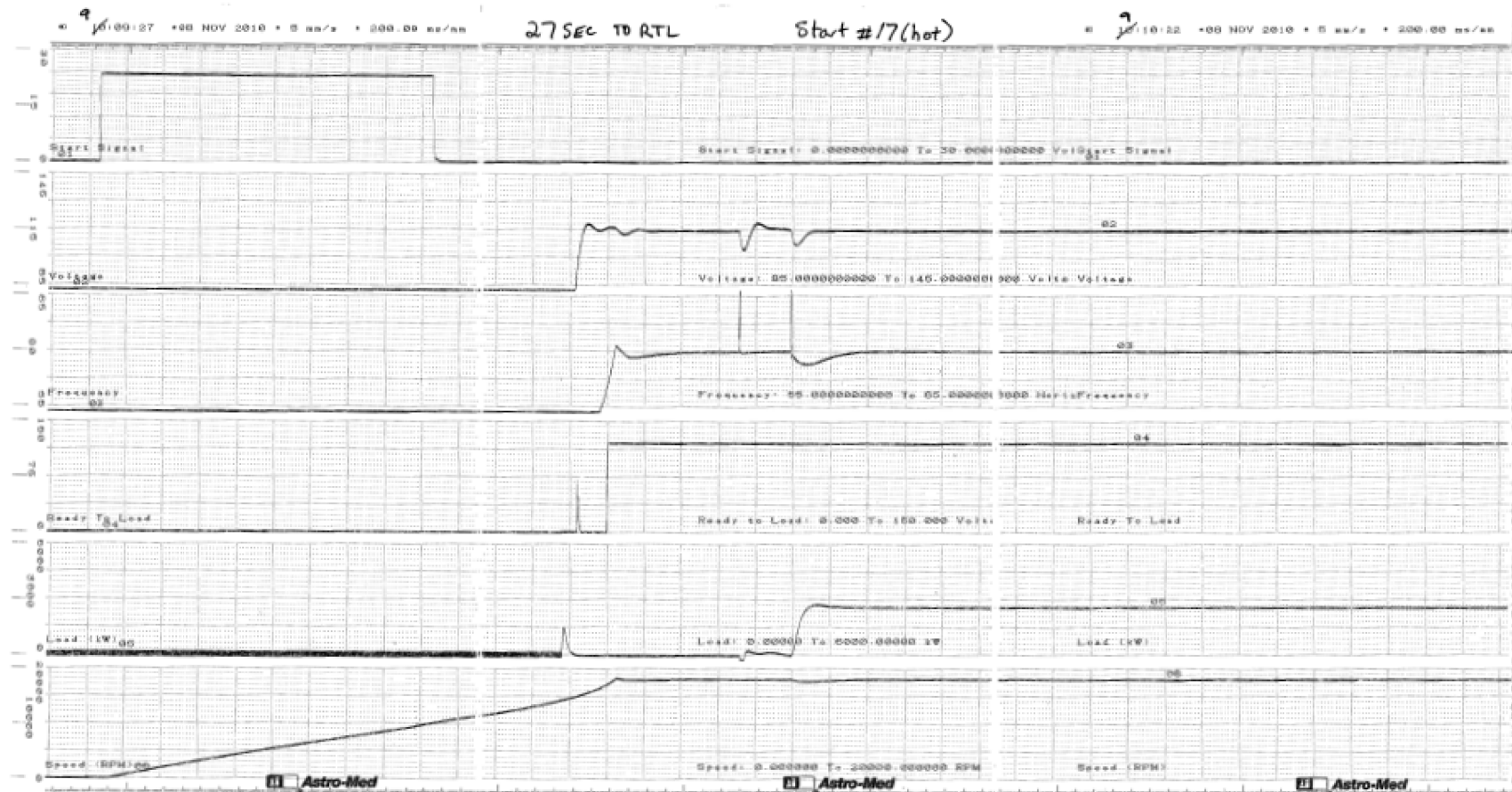


Figure C.1.0-18 Parameter Chart of Start and Load Acceptance Test, No.17, Hot

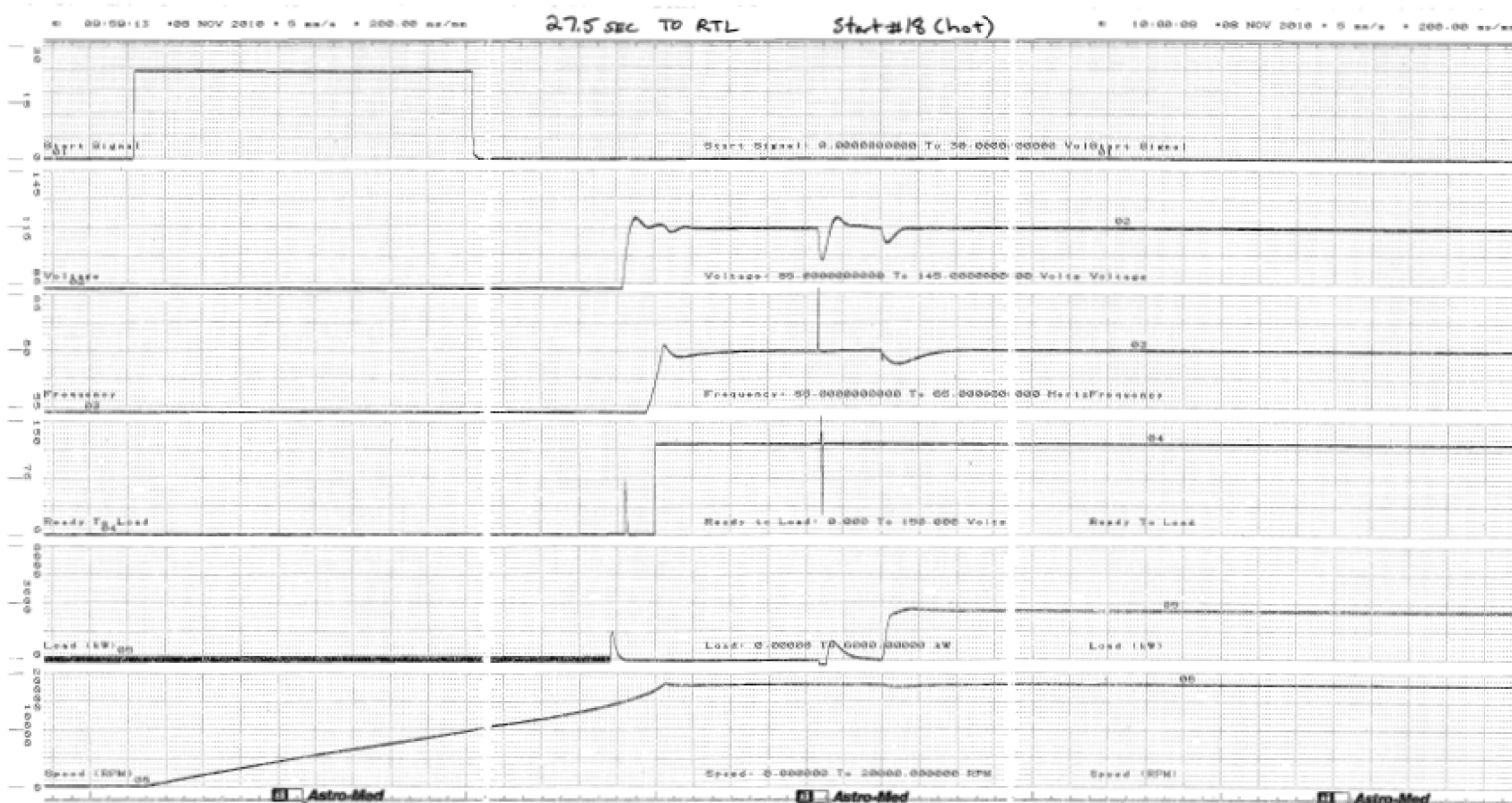


Figure C.1.0-19 Parameter Chart of Start and Load Acceptance Test, No.18, Hot

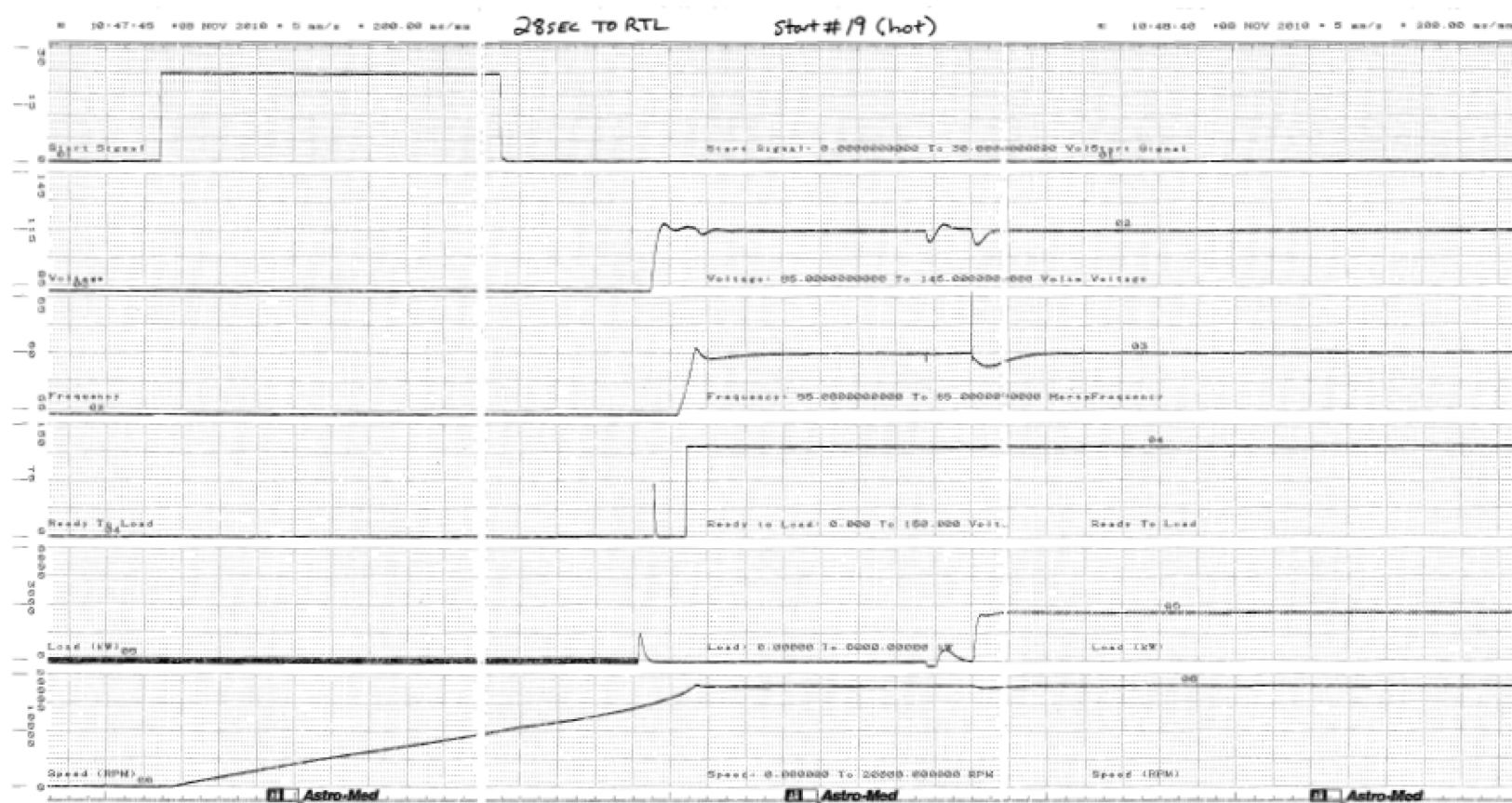


Figure C.1.0-20 Parameter Chart of Start and Load Acceptance Test, No.19, Hot

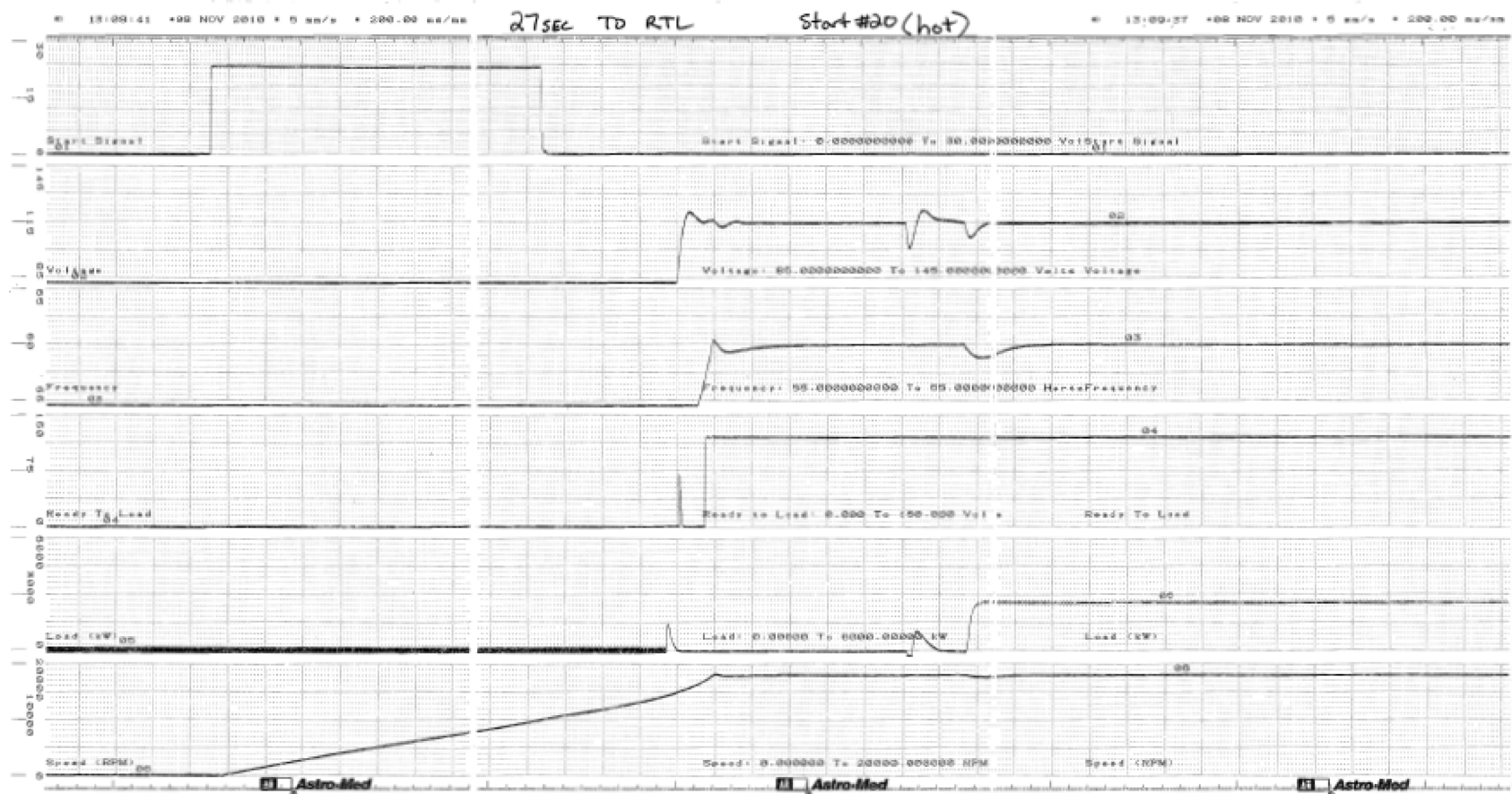


Figure C.1.0-21 Parameter Chart of Start and Load Acceptance Test, No.20, Hot

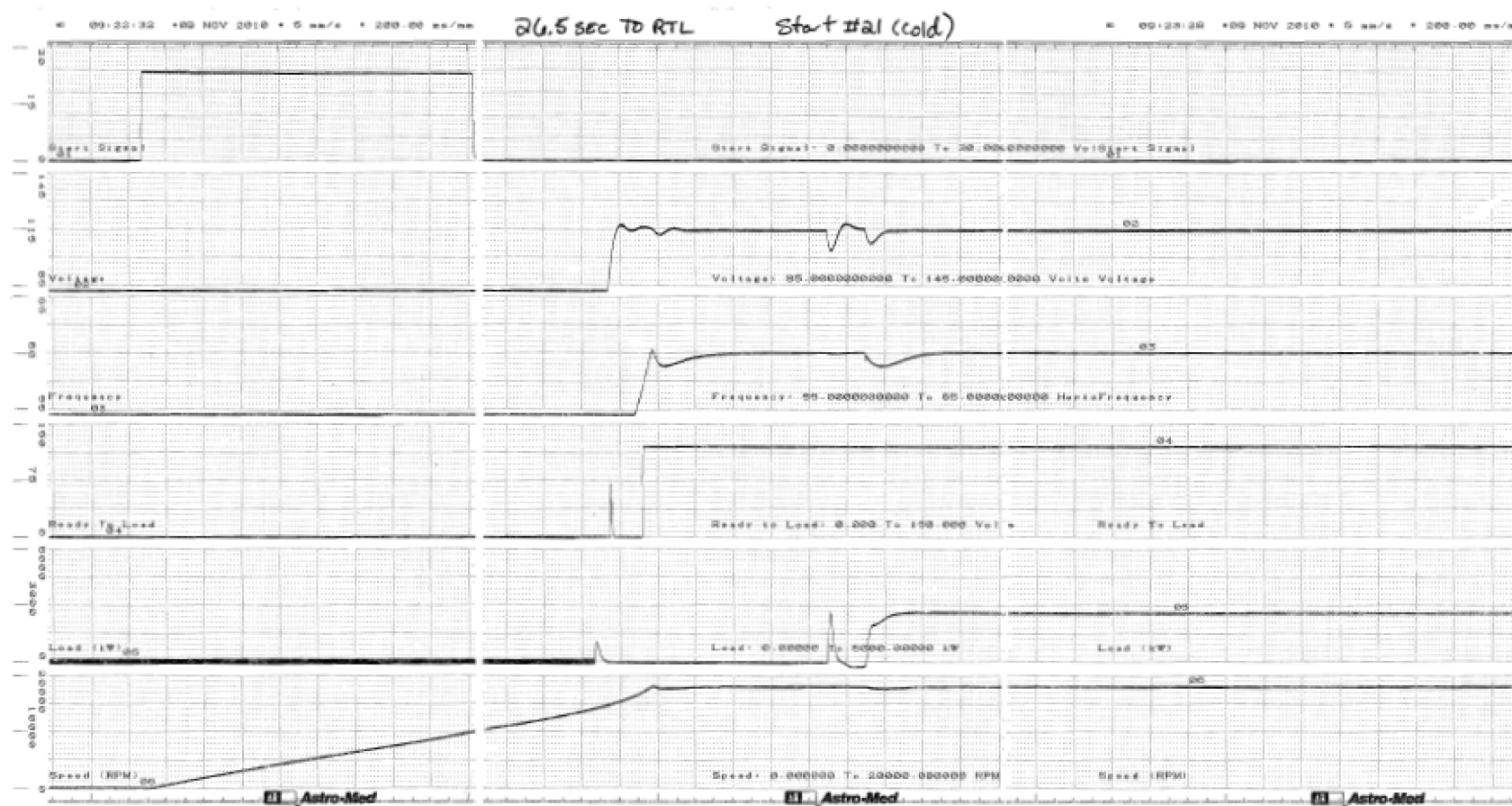


Figure C.1.0-22 Parameter Chart of Start and Load Acceptance Test, No.21, Cold

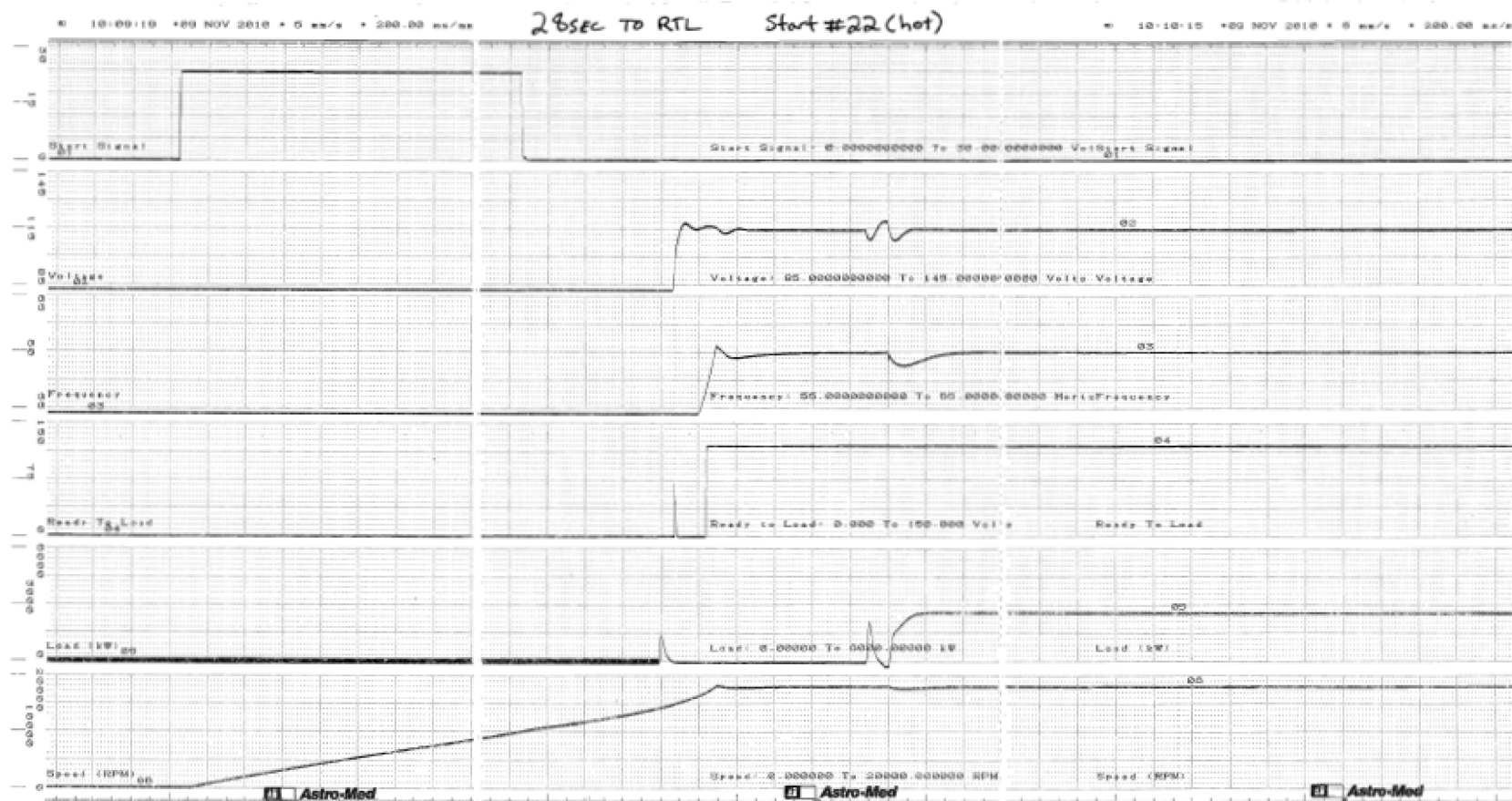


Figure C.1.0-23 Parameter Chart of Start and Load Acceptance Test, No.22, Hot

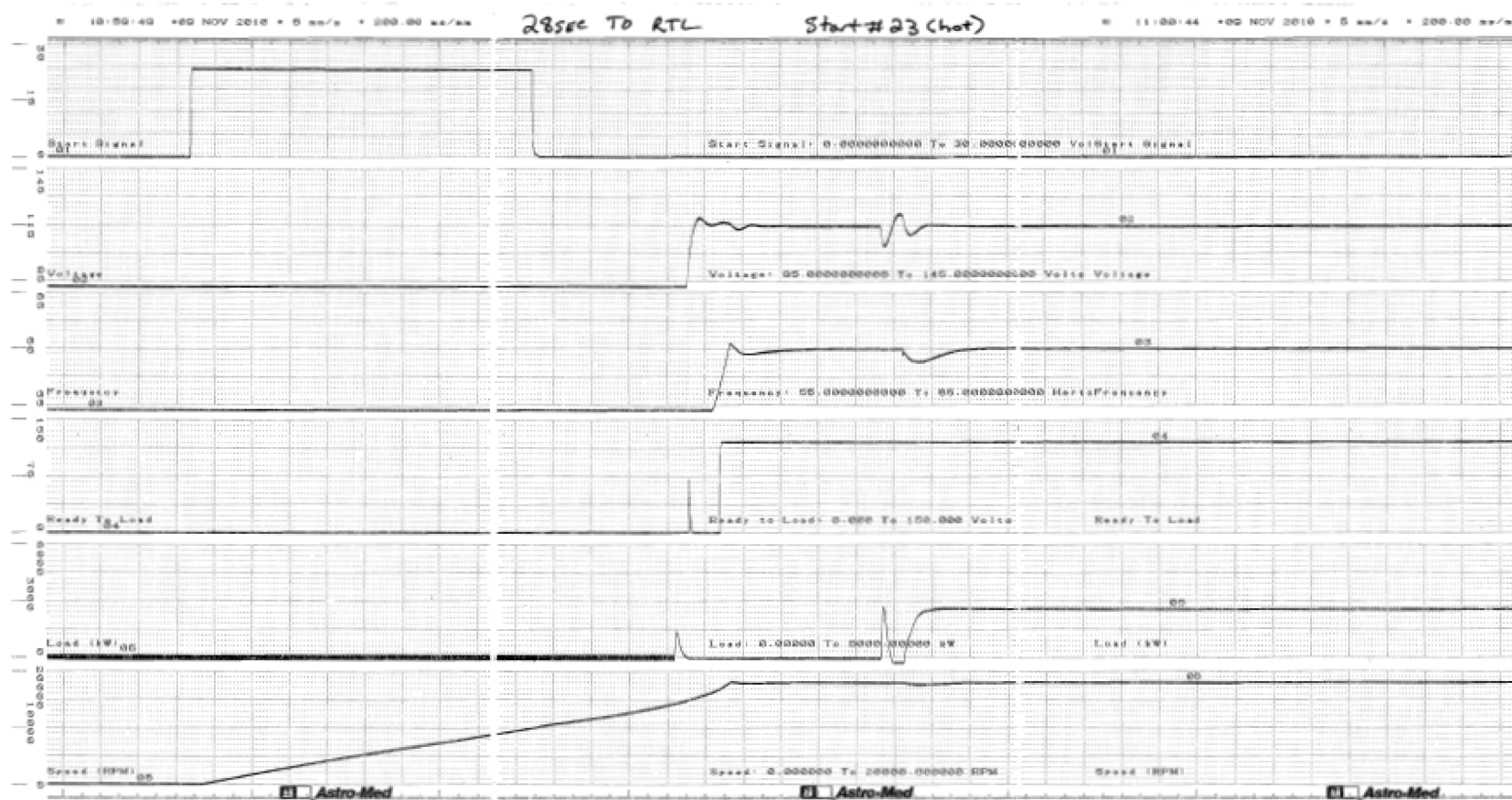


Figure C.1.0-24 Parameter Chart of Start and Load Acceptance Test, No.23, Hot