ESG Service Information

File In/With: N/A	SI0052 New 01-03
Equipment Affected:	All Liquid Cooled Solid State Starters
Troubleshooting Output Current Imbalance	

General

The information contained in this letter will aid the technician in determining the source of an output current imbalance in a Liquid Cooled Solid Start Starter (LCSSS).
The possible sources of a current imbalance are the input line voltage, the LCSSS, or the motor.

Troubleshooting

The troubleshooting will be presented in flow chart form along with figures, tables, and a worksheet. Make a copy of the worksheet before starting.

Extreme care should be taken while make these measurements. Lethal Voltages Are Present in the Liquid Cooled Solid Start Starter.

Figure 1 above shows the location of voltage probes to measure phase to phase voltage. Repeat this measurement for the other 2 phases.
Place the value of the input voltage on line 1 of worksheet #1.

Figure 2 above shows the location of a current clamp-on. Ensure that the clamp-on is completely closed around the motor wire. Repeat this measurement for the other 2 phases.
Place the value of the motor phase current on line 7 of worksheet #1.

Figure 3 above shows the location of the voltage probes to measure the AC voltage from L1 – T1. Repeat this measurement for L2 – T2, and L3 – T3.

Figure 4 above hows the location of the voltage probes to measure the voltage from gate to cathode on connector J8. Repeat this measurement for J6 – J1

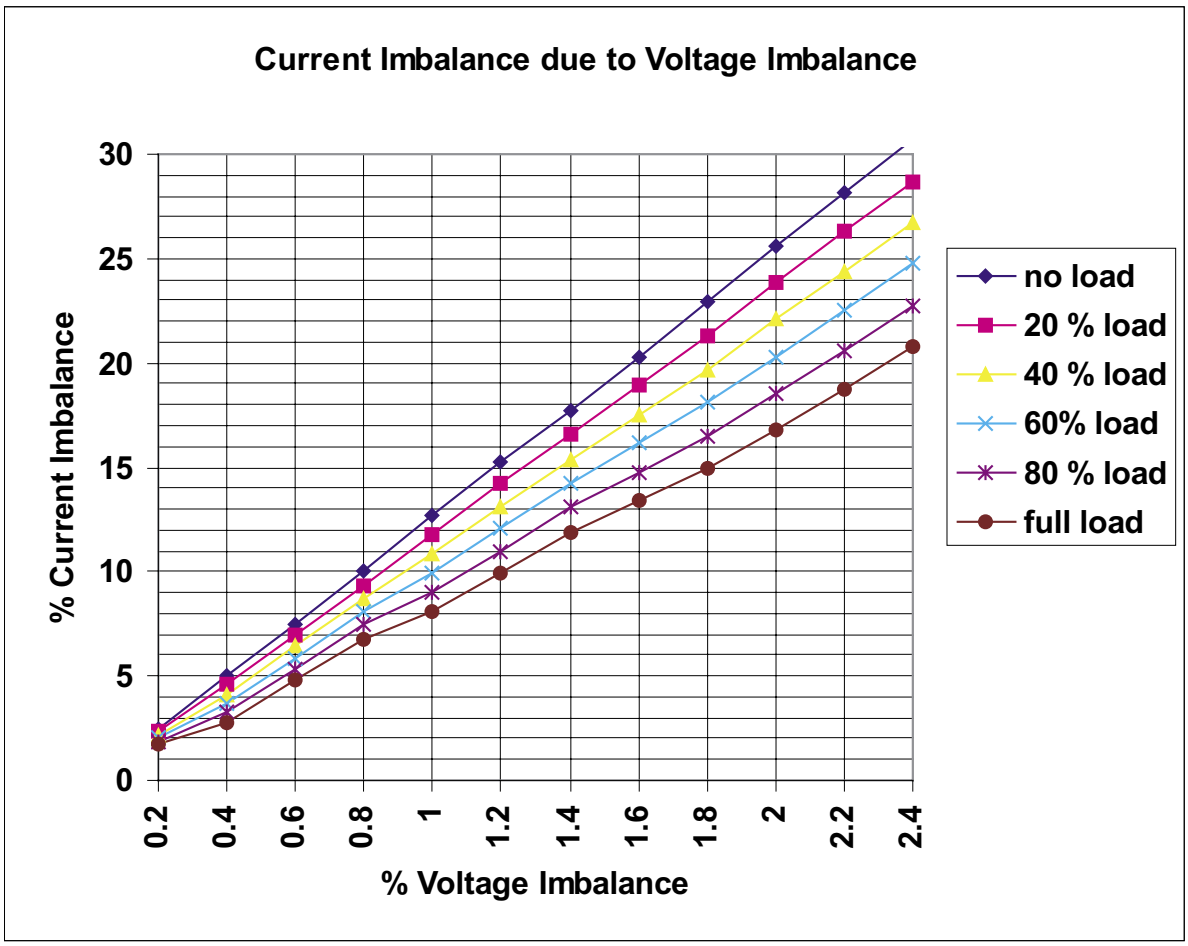


FIGURE 5

TABLE 1 - Rated Full Load Current For YS, YT, and YK 60 Hz chiller motors

Motor Code	Line Voltage		
	230 VAC	460 VAC	575 VAC
CF	352	176	141
CG	404	202	162
CH	464	228	185
CJ	540	269	216
CK	610	305	250
CL	685	342	274
CM	749	375	300
CN	804	380	318
CP	882	441	353
CR	N/A	472	377
CS	N/A	525	420
CT	N/A	565	452
CU	N/A	618	500
CV	N/A	675	540
CW	N/A	726	581
CX	N/A	778	622
CY	N/A	824	659
CZ	N/A	880	704
CA	N/A	931	744
CB	N/A	991	793
DA	N/A	N/A	901
DB	N/A	N/A	991

TABLE 2 - Rated Full Load Current For YS, YT, and YK 50 Hz chiller motors

Motor Code	LINE VOLTAGE		
	380 VAC	415 VAC	440 VAC
5CC	204	187	176
5CD	235	215	203
5CE	275	252	237
5CF	309	284	267
5CG	346	317	299
5CH	379	347	328
5CI	398	364	344
5CJ	438	401	378
5CK	481	441	416
5CL	532	487	459
5CM	572	526	497
5CN	630	577	544
5CO	690	632	596
5CP	743	680	440
5CQ	783	717	676
5CR	853	775	732
5CS	895	819	773
5CT	957	876	827
5CU	1008	923	871
5CV	N/A	985	929
5CW	N/A	1046	987
5CX	N/A	N/A	1045

NOTE: N/A in Table 1 and Table 2 indicates the LCSSS ratings are exceeded.

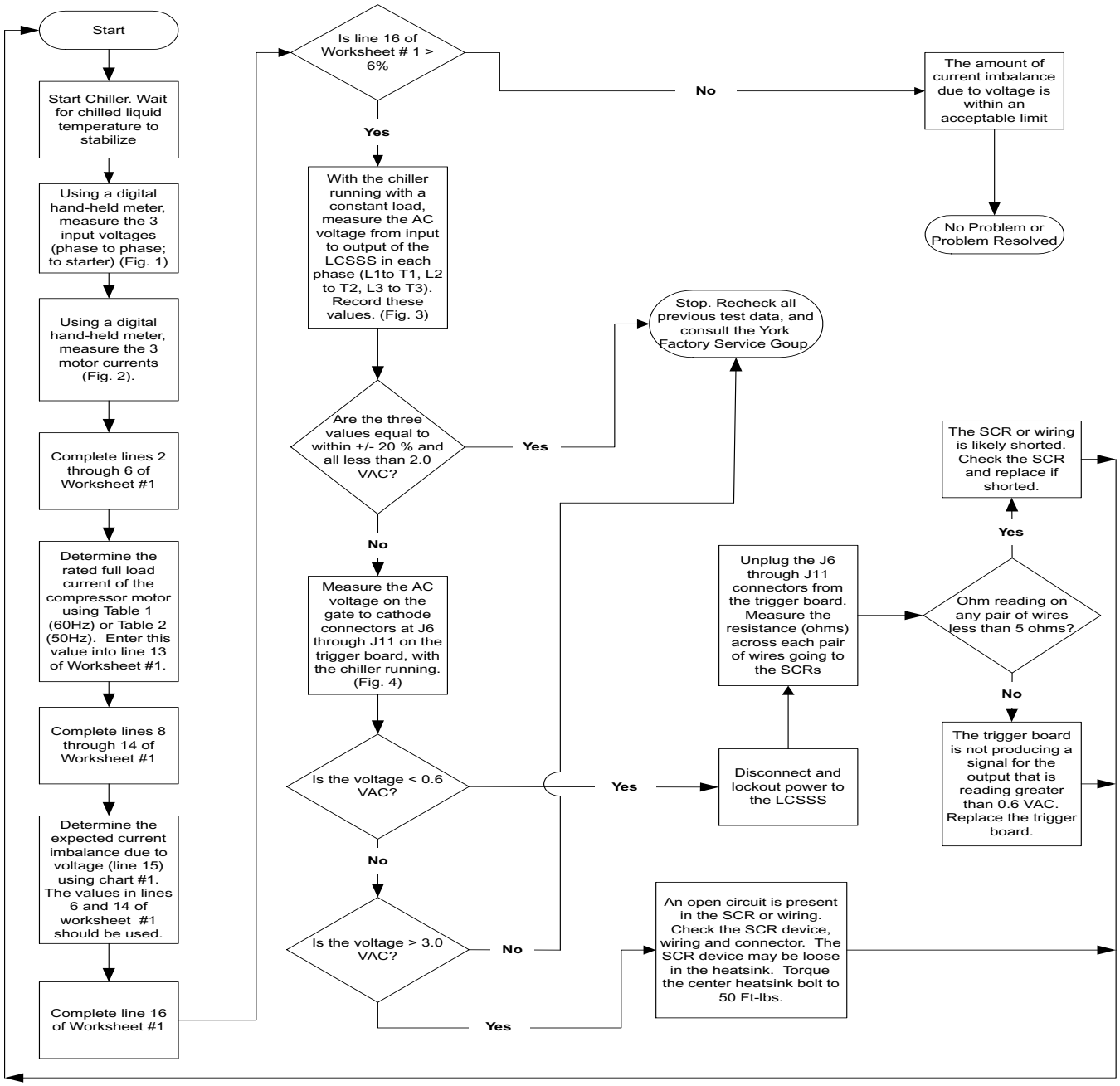
Worksheet #1

Determine Voltage Imbalance

1	Measured Input Voltage Phase to Phase	A-B	B-C	C-A
2	Highest Voltage Phase to Phase			
3	Lowest Voltage Phase to Phase			
4	Subtract line 3 from line 2			
5	Average Phase Voltage ([add the 3 values from line 1] ÷ 3)			
6	% Of Voltage Phase Imbalance ([line 4 ÷ line 5] X100)			

Determine Current Imbalance

7	Measured Motor Phase Current	A	B	C
8	Highest Motor Phase Current			
9	Lowest Motor Phase Current			
10	Subtract line 9 from line 8			
11	Average Motor Phase Current ([add the 3 values from line 7] ÷ 3)			
12	% Of Voltage Phase Imbalance ([line 10 ÷ line 11] X100)			
13	Rated Motor Full Load Current from Table #1 or #2			
14	% of Full Load Current ([line 8 ÷ line 1] X100)			
15	Expected Current Imbalance taken from Figure 5			
16	Subtract line 15 from line 12			



TROUBLESHOOTING FLOW DIAGRAM