CH530 Diagnostics for CenTraVac Chillers

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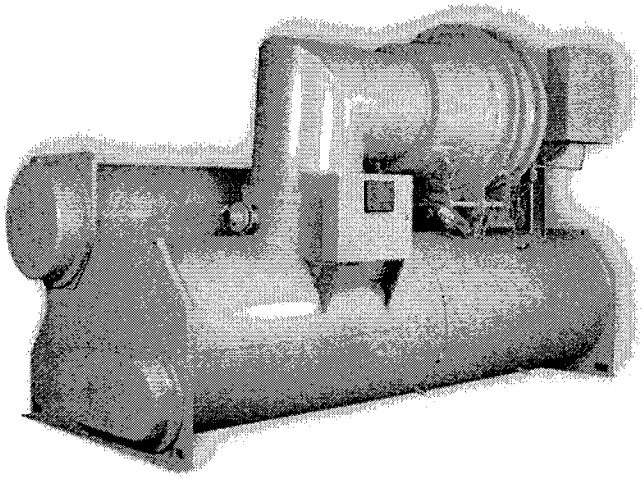

ST-0011
TCS Technical Service Training (1/03)

CTV CH530 Diagnostic

Introduction:

This information piece provides troubleshooting information for the CH530 Control Diagnostics of CVHE/F/G, CDHF/G, CVGF units.

Purpose:

This document lists all the CTV CH530 diagnostics by major category, i.e. Starter, MP. For each diagnostic, it lists the three-digit code if applicable, diagnostic name, target, severity, persistence, active (inactive) modes, criteria and reset level.

1.0 Table Header Notes

Three Digit Reference Code (3DC): 3-digit hexadecimal code used on all past products to uniquely identify diagnostics. As many of the diagnostics as have been aligned into the existing codes [UCP2 Comm 4]. Generalized new codes were established for the remainder.

The following codes were added to cover the unmapped diagnostics:

6B4	Unknown Purge Diagnostic
6B5	Unknown Starter Diagnostic
6B6	Unknown Chiller Diagnostic
6B7	Unknown Compressor Diagnostic

Diagnostic Name and Source: Name of Diagnostic and its source. (Note that this is the exact text used in the User Interface and/or Service Tool displays.)

Effects Target: Defines the "target" or what is effected by the diagnostic. Usually either the entire **Chiller**, or a particular **Circuit** is effected by the diagnostic, but in special cases functions are modified or disabled by the diagnostic. In some cases, the effected sub target, i.e. chilled water reset is listed in parenthesis().

Possible targets are: Chiller, Circuit (Duplex Only), Purge, Free Cooling, Hot Gas Bypass, Ice Building, Platform

Severity: Defines the severity by means of the resulting action.
Immediate Shutdown means immediate shutdown of the effected portion,
Normal Shutdown means normal or friendly shutdown of the effected portion and,
Warning means an Informational Note or Warning is generated.

Persistence: Defines the action taken: Manually reset **(Latching),** or Automatically reset **(Nonlatching).**

Active Modes [Inactive Modes]: States the modes or periods of operation that the diagnostic is active in and, as necessary, those modes or periods that it is specifically not active in as an exception to the active modes. The inactive modes are enclosed in brackets, [ ]. Note that the modes used in this column are internal and not generally enunciated to any of the formal mode displays.

Criteria: Quantitatively defines the criteria used in generating the diagnostic and, if nonlatching, the criteria for auto reset.

Reset Level: Defines the lowest level of manual diagnostic reset command which can clear the diagnostic. The manual diagnostic reset levels in order of priority are: **Local** and **Remote**.

2.0 Starter Diagnostics

These diagnostics are called out by the Starter module and communicated to the Main Processor.

Starter Diagnostics							
# and Reference Code (Hex)	**Diagnostic Name**	**Effects Target**	**Severity**	**Persistence**	**Active Modes [Inactive Modes]**	**Criteria**	**Reset Level**
1. F0	Starter Did Not Transition	Chiller	Immediate Shutdown	Latching	Starting Compressor: On the first check after initiate transition.	For all electromechanical starters: The Starter Module did not receive a transition complete signal in the designated time from its command to transition. The must hold time from the Starter Module transition command is 1 second. The Must trip time from the transition command is 6 seconds. Actual design is 2.5 seconds.	Local
2. 1F5	Starter Did Not Fully Accelerate	Chiller	Immediate Shutdown	Latching	Starting Compressor	For non-communicating SSS and non-communicating AFD: The Starter Module did not receive an Up to Speed(from SSS) or At Speed(from AFD) signal within the Maximum Acceleration Setting setpoint.	Local
3. E5	Phase Reversal	Chiller	Immediate Shutdown	Latching	Compressor energized to transition command [All Other Times]	Phase Reversal Protection enabled: A phase reversal was detected on the incoming current. On a compressor startup the phase reversal logic must detect and trip in a maximum of .7 second from compressor start.	Local
4. 188	Starter Dry Run Test	Chiller	Immediate Shutdown	Latching	Starter Dry Run Mode	While in the Starter Dry Run Mode either 50 % line voltage was sensed at the potential transformers or 10 % RLA current was sensed at the current transformers.	Local
5. E4	Phase Loss	Chiller	Immediate Shutdown	Latching	Compressor Start Sequence and Running and Stopping modes	a. Phase Reversal Protection enabled: Current is not sensed on one or two of the current transformer inputs. Logic will detect and trip in a maximum of 0.7 second from compressor start. b. Phase Reversal Protection disabled: No current was sensed on one or two of the current transformer inputs while running or starting. Must hold = 20% RLA. Must trip = 5% RLA. Actual design trip point is 10% RLA.	Local
6. D9	Power Loss	Chiller	Immediate Shutdown	Nonlatching	All compressor running modes [all compressor starting and non-running modes]	The compressor had previously established currents while running and then all three phases of current were lost. Design: Less than 10% RLA, trip in 2.64 seconds. This diagnostic is not active during the start mode before the transition complete input is proven. Thus a random power loss during a start would result in either a "Starter Fault Type 3",Phase Loss or a "Starter Did Not Transition" latching diagnostic.	Local

Starter Diagnostics							
# and Reference Code (Hex)	Diagnostic Name	Effects Target	Severity	Persistence	Active Modes [Inactive Modes]	Criteria	Reset Level
7. E2	Momentary Power Loss	Chiller	Immediate Shutdown	Nonlatching	All compressor running and stopping modes [all compressor starting and non-running modes]	Momentary Power Loss option enabled: A loss of power on three line cycles or more was detected at the PT and /or CT inputs of the starter module. Diagnostic is reset in 30 seconds.	Remote
8. 1B2	Severe Current Unbalance	Chiller	Normal Shutdown	Latching	All modes compressor is running	A motor Current Unbalance has been detected on one line relative to the average of all 3 lines that exceeds the Current Unbalance Trip Point setpoint for a continuous time longer than the Current Unbalance Grace Period setpoint. (90 seconds default)	Local
9. 1E9	Starter Fault Type I	Chiller	Immediate Shutdown	Latching	Starting Compressor. Y Delta Starters Only	This is a specific starter test where 1M(2K1) is closed first and a check is made to ensure that there are no currents detected by the CT's. If currents are detected when only 1M is closed first at start, then one of the other contactors is shorted or there exists a wiring error.	Local
10. 1ED	Starter Fault Type II	Chiller	Immediate Shutdown	Latching	Starting Compressor. All types of starters	This is a specific starter test where the Shorting Contactor S(2K3) is individually energized and a check is made to ensure that there are no currents detected by the CT's. If current is detected when only S is energized at Start, then 1M is shorted or there exists a wiring error.	Local
11. 1F1	Starter Fault Type III	Chiller	Immediate Shutdown	Latching	Starting Compressor [Adaptive Frequency Drive Starter Type]	As part of the normal start sequence to apply power to the compressor, the Shorting Contactor S(2K3) and then the Main Contactor 1M(2K1) were energized. 1.6 seconds later there were no currents detected by the CT's for the last 1.2 Seconds on all three phases. The test above applies to all forms of starters except Adaptive Frequency Drives.	Local
12. 3D5	Transition Complete Input Shorted	Chiller	Immediate Shutdown	Latching	Waiting to Start	The Transition Complete input was found to be shorted before the compressor was started. This is active for all electromechanical starters.	Local
13. 3D6	At Speed Input Shorted	Chiller	Immediate Shutdown	Latching	Waiting to Start	The At Speed(For SSS)/Up to Speed(For AFD) input was found to be shorted before the compressor was started. This is active for all non-communicating SSS and non-communicating AFDs.	Local
14. 3D7	Transition Complete Input Opened	Chiller	Immediate Shutdown	Latching	All cprsr running modes after successful transition	The Transition Complete input was found to be opened with the compressor motor running after a successful completion of transition. This is active for all electromechanical starters. To prevent this diagnostic from occurring as the result of a power loss to the contactors, the minimum time to trip must be greater than the trip time for the power loss diagnostic.	Local

Starter Diagnostics							
# and Reference Code (Hex)	**Diagnostic Name**	**Effects Target**	**Severity**	**Persistence**	**Active Modes [Inactive Modes]**	**Criteria**	**Reset Level**
15. 3D8	At Speed Input Opened	Chiller	Immediate Shutdown	Latching	All cprsr running modes after successful acceleration	The At Speed input was found to be opened with the compressor motor running after successfully obtaining at speed condition. Applies only to non-communicating Solid State Starters.	Local
16. EC	Motor Current Overload	Chiller	Immediate Shutdown	Latching	Cprsr running in Running and Preparing to Shut Down	Compressor current exceeded overload time vs. trip characteristic.	Local
17. EE	Compressor Did Not Accelerate: Shutdown	Chiller	Immediate Shutdown	Latching	Cprsr Accelerating	a. Acceleration Time Out Action set to Shutdown: Compressor motor current did not drop below 85% RLA within the Maximum Acceleration Setting setpoint. Compressor motor deenergized. b. Acceleration Time Out Action set to Transition: See diagnostic for Compressor Did Not Accelerate: Transitioned	Local
18. 1FA	Cprsr Did Not Accelerate: Transition	Chiller	Warning	Latching	Cprsr Accelerating	a. Acceleration Time Out Action set to Transition: Compressor motor current did not drop below 85% RLA within the Maximum Acceleration Setting setpoint. Compressor motor put across the line. b. Acceleration Time Out Action set to Shutdown: See diagnostic for Compressor Did Not Accelerate: Shutdown	Local
19. CA	Starter Contactor Interrupt Failure	Chiller	Immediate Shutdown	Latching	Starter Contactor not Energized [Starter Contactor Energized]	a. Welded starter contactor b. Detected compressor currents greater than 10% RLA on any or all phases when the compressor was commanded off. Detection time shall be 5 second minimum and 10 seconds maximum for all electromechanical and solid state starters. Detection time for Adaptive Frequency Drives shall be 12 seconds minimum and 20 seconds maximum . On detection and until the controller is manually reset: generate diagnostic, energize the appropriate alarm relay, continue to energize the Evap Water and oil Pump Outputs, continue to command the affected compressor off, fully unload the effected compressor and command a normal stop to all other compressors(Duplex). c.	Local
20. 6B5	Starter Module Memory Error Type 1	Chiller	Warning	Latching	All	Checksum on RAM copy of the Starter LLID configuration failed. Configuration recalled from EEPROM.	Local
21. 6B5	Starter Module Memory Error Type 2	Chiller	Immediate Shutdown	Latching	All	Checksum on EEPROM copy of the Starter LLID configuration failed. Factor default values used.	Local

Starter Diagnostics							
# and Reference Code (Hex)	**Diagnostic Name**	**Effects Target**	**Severity**	**Persistence**	**Active Modes [Inactive Modes]**	**Criteria**	**Reset Level**
22. 2D0	Starter Comm Loss: Main Processor	Chiller	Immediate Shutdown	Latching	All	The Starter module detected a continual loss of communication with the main processor for greater than the Communications Loss Time bound setpoint.	Local

3.0 Adaptive Frequency Drive Diagnostics

These diagnostics are called out by the Adaptive Frequency Drive and communicated to the Main Processor.

Adaptive Frequency Drive Diagnostics							
3DC (Hex)	**Diagnostic Name**	**Effects Target**	**Severity**	**Persistence**	**Active Modes [Inactive Modes]**	**Criteria**	**Reset Level**
23. 6B5	AFD Power Loss	Chiller	Immediate Shutdown	Nonlatching	All compressor starting and running modes	When power is lost for a longer period such that drive operation is impaired, the drive shall take action based on the Power Loss Mode and wait an adjustable Power Loss Time before setting a Power Loss Diagnostic that will keep the drive in the stop mode. When power is restored, the drive shall wait an adjustable Power Loss Reset Time and then automatically clear this diagnostic.	Local
24. 6B5	AFD Start Inhibited	Chiller	Normal Shutdown	Nonlatching	Waiting to Start	The drive may inhibit starts due to internal conditions such as temperature.	Local
25. EC	AFD Motor Current Overload	Chiller	Immediate Shutdown	Latching	Cprsr starting and running modes	Compressor motor current exceeded overload time vs. trip characteristic. It is assumed that the drive will not need a different overload function for starting vs. running because it will limit current during a start.	Local
26. 6B5	AFD Motor Short	Chiller	Immediate Shutdown	Latching	All	Motor or power stage is shorted.	Local
27. 6B5	AFD Instantaneous Current Overload	Chiller	Immediate Shutdown	Latching	All	The drive itself detected instantaneous overcurrent.	Local
28. 6B5	AFD High Temperature	Chiller	Immediate Shutdown	Latching	All	The drive transistor temperature was detected to be above a safe temperature.	Local
29. E4	AFD Output Phase Loss	Chiller	Immediate Shutdown	Latching	All	A greater than 15% current unbalance is detected for more than 5 seconds while running or starting	Local
30. 6B5	AFD Ground Fault	Chiller	Immediate Shutdown	Latching	All	The drive detected ground fault current.	Local
31. 6B5	HPC/High AFD Heat Sink Water Pressure	Chiller	Immediate Shutdown	Latching	All	The 'Gate Kill' input to the AFD opened. The devices that may open this circuit are the condensor high pressure cutout switch N.C. contact opening or the heat sink water pressure switch opening.	Local
32. 2D0	AFD Communication Loss: Main Processor	Chiller	Immediate Shutdown	Latching	All	The AFD detected a continual loss of communication with the main processor for greater than the Communications Loss Time bound setpoint.	Local
33. 6B5	AFD High Bus Voltage	Chiller	Immediate Shutdown	Latching	All	High DC bus voltage was detected on the drive	Local
34. 6B5	AFD Control Board Memory Error Type 2	Chiller	Immediate Shutdown	Latching	All	Checksum on the EEPROM on the Control board configuration failed. Factory default values used.	Local
35. 6B5	AFD General Failure	Chiller	Immediate Shutdown	Latching	All	A failure within the AFD exists. Clear the diagnostic. If persists,	Local
36. 6B5	AFD Fatal Software Error	Chiller	Immediate Shutdown	Latching	All	A fatal software fault has occurred. Cycle power. If persists, ...	Local

Adaptive Frequency Drive Diagnostics							
3DC (Hex)	**Diagnostic Name**	**Effects Target**	**Severity**	**Persistence**	**Active Modes [Inactive Modes]**	**Criteria**	**Reset Level**
37. 6B5	AFD I/O Board Failure	Chiller	Immediate Shutdown	Latching	All	A failure has occurred on the I/O board. Clear the diagnostic. If persists, ...	Local
38. 6B5	AFD Power Intfc Controller Board Failure	Chiller	Immediate Shutdown	Latching	All	A failure has occurred on the Power Interface Controller(PIC) board. Clear the diagnostic. If persists, ...	Local
39. 6B5	AFD Power Structure Board Failure	Chiller	Immediate Shutdown	Latching	All	A failure has occurred on the Power Structure board. Clear the diagnostic. If persists, ...	Local
40. 6B5	AFD DPI Communication Failure	Chiller	Immediate Shutdown	Latching	All	A failure has occurred with the internal DPI communications interface.	Local
41. 6B5	AFD RS485 Board Memory Error Type 2	Chiller	Immediate Shutdown	Latching	All	Checksum on the EEPROM on the RS485 board failed. Factory default values used.	Local

4.0 Main Processor Defective Sensor or LLID Diagnostics

These are diagnostics which the main processor calls out after determining the data it is receiving from the LLID is invalid or the LLID itself is indicating its data is invalid. This section includes the Purge sensor and LLID diagnostics..

Main Processor Defective Sensor or LLID Diagnostics							
3DC (Hex)	**Diagnostic Name**	**Effects Target**	**Severity**	**Persistence**	**Active Modes [Inactive Modes]**	**Criteria**	**Reset Level**
42. 87	External Chilled/Hot Water Setpoint	Chiller (Ext. Chilled Water Setpoint)	Warning	Nonlatching	All	This diagnostic will handle either functions of Ext. Chilled Water or Ext. Hot Water setpoint. a. Function Not "Enabled": no diagnostics. b. Function "Enabled ": Out-Of-Range Low or Hi or bad LLID, set diagnostic. External CWS(or HWS if selected) command will withdraw from decision to do CWS(or HWS if selected). This warning diagnostic will automatically reset if the input returns to the normal range.	Remote
43. 89	External Current Limit Setpoint	Chiller (Ext Current Limit setpoint)	Warning	Nonlatching	All	a. Not "Enabled": no diagnostics. b. "Enabled ": Out-Of-Range Low or Hi or bad LLID, set diagnostic. External current limit command will withdraw from decision to do current limit. This warning diagnostic will automatically reset if the input returns to the normal range.	Remote
44. 8E	Evaporator Entering Water Temp Sensor	Chiller (Chilled Water Reset, Feed forward control, Ice Building)	See Criteria	See Criteria	All	Defective Sensor or LLID. a. Chiller in mode other than Ice Building: Severity is warning, persistence is latching, reset is remote If chiller in Return or Constant Return Chilled Water Reset, set CWS' equal to the next higher priority chilled water setpoint. Feedforward control is disabled. b. Display invalid value for temperature c. Hot water operation: No effect on controls d. If Chiller in Ice Building mode: Severity is Normal, persistence is latching, reset is Remote. This diagnostic shall clear when the Ice Building command is withdrawn.	See Criteria
45. AB	Evaporator Leaving Water Temp Sensor	Chiller	Normal Shutdown	Latching	All	Defective Sensor or LLID a. Display invalid value for temperature	Remote
46. 9A	Condenser Entering Water Temp Sensor	Chiller	Warning	Latching	All	Defective Sensor or LLID a. Normal heating operation: feedforward control is disabled. b. Chilled water operation: No effect on controls c. Display invalid value for temperature	Remote

Main Processor Defective Sensor or LLID Diagnostics							
3DC (Hex)	**Diagnostic Name**	**Effects Target**	**Severity**	**Persistence**	**Active Modes [Inactive Modes]**	**Criteria**	**Reset Level**
47. 9B	Condenser Leaving Water Temp Sensor	Chiller	See Criteria	Latching	All	Defective Sensor or LLID a. Chilled water control: Severity is Warning, rest level is Warning b. Hot water control: Severity is Normal, reset level is remote c. Display invalid value for temperature	See Criteria
48. 2EB	Evaporator Differential Water Pressure Transducer	Chiller	Warning	Latching	All	Defective Sensor or LLID a. Display invalid value	Remote
49. 2EC	Condenser Differential Water Pressure Transducer	Chiller	Warning	Latching	All	Defective Sensor or LLID Display invalid value Flow calculation shall be disabled.	Remote
50. 2E9	Second Cond Entering Water Temp Sensor	Chiller	Warning	Latching	All	Defective Sensor or LLID Display invalid value	Remote
51. 2EA	Second Cond Leaving Water Temp Sensor	Chiller	Warning	Latching	All	Defective Sensor or LLID Display invalid value	Remote
52. AD	Evap Saturated Refrigerant Temp Sensor	Chiller	Normal Shutdown	Latching	All	Defective Sensor or LLID a. Display invalid value for temperature	Remote
53. 8F	Cond Saturated Refrigerant Temp Sensor	Chiller	Normal Shutdown	Latching	All	Defective Sensor or LLID Display invalid value for temperature	Remote
54. 2A4	Purge Liquid Temperature Sensor	Purge	Normal Shutdown	Latching	Retrofit Purge	Defective Sensor or LLID Display invalid value	Remote
55. AC	Condenser Refrigerant Pressure Xdcr	Chiller	Normal Shutdown	Latching	All	Defective Sensor or LLID a. Display invalid value	Remote
56. A9	Oil Tank Temperature Sensor	Chiller	Normal Shutdown	Latching	All	Defective Sensor or LLID a. Display invalid value	Remote
57. 2F1	Oil Pump Discharge Pressure Transducer	Chiller	Immediate Shutdown	Latching	All	Defective Sensor or LLID Display invalid value	Remote
58. 2F3	Oil Tank Pressure Transducer	Chiller	Immediate Shutdown	Latching	All	Defective Sensor or LLID Display invalid value	Remote
59. A4	Motor Winding Temperature 1 Sensor	Chiller	Normal Shutdown	Latching	All	Defective Sensor or LLID Display invalid value	Remote
60. A7	Motor Winding Temperature 2 Sensor	Chiller	Normal Shutdown	Latching	All	Defective Sensor or LLID Display invalid value	Remote
61. A8	Motor Winding Temperature 3 Sensor	Chiller	Normal Shutdown	Latching	All	Defective Sensor or LLID Display invalid value	Remote
62. AF	Inboard Bearing Temperature Sensor	Chiller	Normal Shutdown	Latching	All	Defective Sensor or LLID Display invalid value	Remote
63. B0	Outboard Bearing Temperature Sensor	Chiller	Normal Shutdown	Latching	All	Defective Sensor or LLID Display invalid value	Remote

Main Processor Defective Sensor or LLID Diagnostics							
3DC (Hex)	**Diagnostic Name**	**Effects Target**	**Severity**	**Persistence**	**Active Modes [Inactive Modes]**	**Criteria**	**Reset Level**
64. 284	Compressor Discharge Refrigerant Temperature Sensor	Chiller	See Criteria	Latching	All	Defective Sensor or LLID a. With HGBP installed Chiller shall revert to normal (non-HGBP) mode regardless of last state. Display invalid value. A normal shutdown diagnostic is set. b. HGBP not installed, Compressor Discharge Refrigerant Temperature is installed: Perform a normal shutdown. Display invalid value b. HGBP mode not installed, Compressor Discharge Refrigerant Temperature not installed: No diagnostic	Remote
65. A1	Outdoor Air Temperature Sensor	Chiller (Chilled Water Reset)	Warning	Nonlatching	All	Defective Sensor or LLID. a. Operation other than outdoor chilled water reset: No effect on controls b. Display invalid value for temperature c. This warning diagnostic will automatically reset if the temperature returns to the normal range.	Remote
66. 2A3	Purge Cprsr Suction Rfgt Temp Sensor	Purge	Normal Shutdown	Latching	All	Defective Sensor or LLID Display invalid value	Remote
67. 6B4	Purge Carbon Tank Temperature Sensor	Purge	Normal Shutdown	Latching	All	Defective Sensor or LLID Display invalid value	Remote
68. 4C4	External Base Loading Setpoint	Chiller (Base Loading)	Warning	Nonlatching	Base Loading	Defective Sensor or LLID Display invalid value a. External base load Not "Enabled": no diagnostic. b. Function "Enabled ": Out-Of-Range Low or Hi or bad LLID, set diagnostic, default base load setpoint to next level of priority (e.g. Front Panel Setpoint). This warning diagnostic will automatically reset if the input returns to the normal range.	Remote

5.0 Main Processor Purge Diagnostics

These are diagnostics which the main processor calls out pertaining to the Purge functions. Note that the diagnostics for the Purge Defective Sensor or LLIDs are listed in the Defective Sensor or LLID Diagnostics section.

Main Processor Purge Diagnostics							
3DC (Hex)	**Diagnostic Name**	**Effects Target**	**Severity**	**Persistence**	**Active Modes [Inactive Modes]**	**Criteria**	**Reset Level**
69. 2A5	Purge Liquid Level Too High Warning	Purge	Normal Shutdown	Nonlatching	All	The level switch was open for 30 seconds.	Remote
70. 2A5	Purge Liquid Level Too High Continuously	Purge	Normal Shutdown	Latching	All	If after 15 minutes of the initial liquid level diagnostic and the switch is still open or if the initial level diagnostic has occurred more than 4 times in two hours.	Remote
71. 6B4	Purge Carbon Regen Temperature Too Low	Purge	Normal Shutdown	Latching	All	The carbon tank temperature did not reach the required minimum temperature within 3 hours after energizing the carbon tank heater.	Remote
72. 6B4	Purge Carbon Regen Temp Limit Exceeded	Purge	Normal Shutdown	Latching	All	The carbon tank temperature exceeded the required temperature limit for the carbon tank temperature.	Remote
73. 6B4	Purge Regen Cooldown Temp Too High	Purge	Normal Shutdown	Latching	All	The carbon tank temperature did not get below the required cooldown temperature within 4 hours after deenergizing the tank heater.	Remote
74. 2AA	Purge Daily Pumpout Limit Exceeded	Purge	Normal Shutdown	Nonlatching	All	The 24 hour average pumpout exceeded the daily pumpout limit setpoint. Diagnostic will clear when pumpout limit is nolonger exceeded.	Remote
75. 6B4	Purge Carbon Regen Temp Not Satisfied	Purge	Normal Shutdown	Latching	All	The purge carbon tank temperature did not reach its required value within 4 hours of the start of the regeneration procedure	Remote

6.0 Main Processor Unit Level Diagnostics

These are diagnostics which the main processor calls out excluding those listed in the Defective Sensor or LLID, Purge, Communication, Main Processor and Boot Messages and Special Troubleshooting Messages diagnostic sections.

Main Processor Unit level Diagnostics							
3DC (Hex)	**Diagnostic Name**	**Effects Target**	**Severity**	**Persistence**	**Active Modes [Inactive Modes]**	**Criteria**	**Reset Level**
76. FB	Low Evaporator Refrigerant Temperature	Chiller	Immediate Shutdown	Latching	All	a. The Evaporator Saturated Refrigerant Temperature dropped below the Low Refrigerant Temperature Cutout Setpoint for 30°F-sec (8°F-sec max rate).	Local
77. F4	High Oil Temperature	Chiller	Immediate Shutdown	Latching	All	If Oil Temperature exceeds 180 °F (for CVHE, F G, CDHE, F) for more than 120 degree F seconds this diagnostic is issued. (There will be a different cutout for CVGF)	Remote
78. C5	Low Evap Leaving Water Temp: Unit Off (Unit in auto but not starting or running)	Chiller (Evap Pump)	Warning	NonLatching	Unit in Stop Mode, or in Auto Mode and No Ckt's Energized [Any Ckt Energized]	The evaporator leaving water temp. fell below the leaving evaporator water temp cutout setting for 30 degree F seconds while the Chiller is in the Stop mode, or in Auto mode with no compressors running. Energize Evap Water pump Relay until diagnostic auto resets, then return to normal evap pump control. Automatic reset occurs when the temp rises 2°F (1.1°C) above the cutout setting for 2 minutes.	Remote
79. C6	Low Evap Leaving Water Temp: Unit On (Unit Starting of Running)	Chiller	Immediate Shutdown	NonLatching	Any Ckt[s] Energized [No Ckt's Energized]	The evaporator leaving water temp. fell below the cutout setpoint for 30 degree F Seconds while the compressor was running. Automatic reset occurs when the temperature rises 2 °F (1.1°C) above the cutout setting for 2 minutes. This diagnostic shall not de-energize the Evaporator Water Pump Output.	Remote
80. 384	Evaporator Water Flow Overdue	Chiller	Normal Shutdown	NonLatching	Estab. Evap. Water Flow on going from STOP to AUTO.	Evaporator water flow was not proven within 4.25 minutes of the Evap. water pump relay being energized. The diagnostic will de-energize the Evaporator Water Pump output. It will be re-energized if the diagnostic clears with the return of flow and the chiller will be allowed to restart normally (to accommodate external control of pump)	Remote
81. ED	Evaporator Water Flow Lost	Chiller	Immediate Shutdown	NonLatching	[All Stop modes]	a. The evaporator water flow switch input was open for more than 6-10 contiguous seconds. b. This diagnostic does not de-energize the evap pump output. c. 6-10 seconds of contiguous flow shall clear this diagnostic. d. Even though the pump times out in the STOP modes, this diagnostic shall not be called out in the STOP modes.	Remote

Main Processor Unit level Diagnostics							
3DC (Hex)	**Diagnostic Name**	**Effects Target**	**Severity**	**Persistence**	**Active Modes [Inactive Modes]**	**Criteria**	**Reset Level**
82. F5	Condenser High Pressure Cutout	Chiller	Immediate Shutdown	Latching	All	a. Condenser pressure exceeded the trip point of the form C HPC switch causing it to open its N.C. contacts removing power from the compressor motor contactors and closing its N.O. contacts supplying a signal to the CH530 controls that it was the HPC switch that shut down the compressor. b. Other diagnostics that may occur as an expected consequence of the HPC trip will be suppressed from annunciation. These include Phase Loss, Power Loss, MPL and Transition Complete Input Open. c. For CVHE/E/G and CDHE/F, the available HPC trippoints are 15 and 25 PSIG. d. The Condenser Refrigerant temperature or pressure sensors are not used to initiate a high pressure shutdown.	Local
83. FD	Emergency Stop	Chiller	Immediate Shutdown	Latching	All	a. Emergency Stop input is open. An external interlock has tripped. Time to trip from input opening to unit stop shall be 0.1 to 1.0 seconds.	Local
84. 399	MP: Invalid Configuration	Platform	Immediate Shutdown	Latching	All	MP recalled a configuration from nonvolatile memory that is not compatible with installed application, i.e. new software downloaded does not match configuration in MP.	NA
85. 1AD	MP: Non-Volatile Memory Reformat	Platform	Warning	Latching	All	MP has determined there was an error in a sector of the Non-Volatile memory and it was reformatted. Most likely recalled default setpoints. Check settings.	Local
86. 2E6	Check Clock	Platform	Warning	Latching	All	The real time clock had an error. The real time clock had detected loss of its oscillator at some time in the past. This diagnostic can be effectively cleared only by writing a new value to the chiller's time clock using the TechView or DynaView's "set chiller time" functions.	Remote
87. 1D1	MP: Could not Store Starts and Hours	Platform	Warning	Latching	All	On power-up, MP has determined that it could not complete the previous power-down store. Starts and Hours may have been lost for the last 24 hours. Most likely due to a setpoint store inprogress at time of power down.	Remote
88. 1D2	MP: Non-Volatile Block Test Error	Platform	Warning	Latching	All	On powerup, MP has detected a CRC error with a block in the Non-Volatile memory. Check diagnostic history and settings. Could loose history block and some setpoints. Recall ROM defaults for lost setpoints. Up to three blocks may fail before the sector is reformatted(Diagnostic 1AD)	Local
89. D9	MP: Reset Has Occurred	Platfom	Warning	Latching	All	The main processor has successfully come out of a reset and built its application. A reset may have been due to a power up, installing new software or configuration.	Remote

Main Processor Unit level Diagnostics							
3DC (Hex)	**Diagnostic Name**	**Effects Target**	**Severity**	**Persistence**	**Active Modes [Inactive Modes]**	**Criteria**	**Reset Level**
90. DA	Extended Compressor Surge	Chiller	Normal Shutdown	See Criteria	Running and Stopping	a. Chiller not in Ice Building mode: An extended Surge condition was detected and the Surge protection feature was Enabled. An extended Surge condition is defined as being in a "continuous" surge condition for 7 ± 10% minutes. Severity is Normal, persistence is Latching. b. Chiller in Ice Building mode: An extended Surge condition was detected while in Ice Building Mode. Severity is Normal, persistence is Nonlatch. This diagnostic shall clear when the Ice Building command is withdrawn.	Remote
91. D7	Over Voltage	Chiller	Normal Shutdown	Nonlatching	Starting and Any Ckt[s] Energized	a. Over/Under voltage option not selected: No effect b. Over/Under voltage option selected Line voltage above + 10% of nominal. [Must hold = + 10 % of nominal. Must trip = + 15 % of nominal. Reset differential = min. of 2% and max. of 4%. Time to trip = minimum of 1 min. and maximum of 5 min.) Design: Nom. trip: 60 seconds at greater than 112.5%, + or - 2.5%, Auto Reset at 109% or less.	Remote
92. D8	Under Voltage	Chiller	Normal Shutdown	Nonlatching	Starting and Any Ckt[s] Energized	a. Over/Under voltage option not selected: No effect b. Over/Under voltage option selected Line voltage below - 10% of nominal or the Under/Overvoltage transformer is not connected. [Must hold = - 10 % of nominal. Must trip = - 15 % of nominal. Reset differential = min. of 2% and max. of 4%. Time to trip = min. of 1 min. and max. of 5 min.) Design: Nom. trip: 60 seconds at less than 87.5%, + or - 2.8% at 200V or + or - 1.8% at 575V, Auto Reset at 90% or greater.	Remote
93. 2F4	Low Evaporator Water Flow	Chiller	Warning	NonLatching	Chiller Auto and All Running Modes	a. The evap. water flow measurement option was installed and the flow dropped to or below the Evaporator Low Water Flow Warning Setpoint in TV. This IFW shall be Auto Reset and reset 0.1 gpm/ton above the adjustable trippoint or when the Evaporator water pump is turned off.	Remote
94. DC	Condenser Water Flow Overdue	Chiller	Normal Shutdown	NonLatching	Waiting to Start	Condenser water flow was not proven within 4.25 minutes of the Condenser water pump relay being energized. The diagnostic will de-energize the Condenser Water Pump output. It will be re-energized if the diagnostic clears with the return of flow and the chiller will be allowed to start normally (to accommodate external control of pump)	Remote

Main Processor Unit level Diagnostics							
3DC (Hex)	**Diagnostic Name**	**Effects Target**	**Severity**	**Persistence**	**Active Modes [Inactive Modes]**	**Criteria**	**Reset Level**
95. F7	Condenser Water Flow Lost	Chiller	Normal Shutdown	Nonlatching	Starting(after established flow) running and stopping [All Stop modes]	a. The Condenser water flow switch input was open for more than 6-10 contiguous seconds. b. This diagnostic does not de-energize the Cond. Water pump output. c. 6-10 seconds of contiguous flow shall clear this diagnostic. d. In hot water mode, even though the pump times out in the STOP modes, this diagnostic shall not be called out in the STOP modes.	Remote
96. F9	Free Cooling Actuators Not Open	Free Cooling	Normal Shutdown	Latching	Free Cooling	The FC valve closed limit switches did not open within 3 minutes after energizing the FC relays.	Remote
97. F9	Free Cooling Actuators Not Open During FC	Free Cooling	Normal Shutdown	Latching	Free Cooling	The FC valve limit switches closed while in the Free Cooling mode	Remote
98. F9	Free Cooling Actuators Not Closed	Free Cooling	Normal Shutdown	Latching	Free Cooling	The FC valve closed limit switches did not close within 3 minutes after deenergizing the FC relays.	Remote
99. F9	Free Cooling Actuators Unexpectedly Open	Chiller	Immediate Shutdown	Latching	[Free Cooling]	The FC valve limit switches are open while not in a free cooling mode.	Remote
100.6B5	Unexpected Starter Shutdown	Chiller	Normal Shutdown	Nonlatching	All Cprsr Running modes, Starting, Running and Preparing to Shutdown	The Starter module status reported back that it is stopped when it should be running and no Starter diagnostic exists. This diagnostic will be logged in the history buffer and then cleared.	Local
101.6B5	Starter Failed to Arm/Start	Chiller	Normal Shutdown	Latching	All	Starter failed to arm or start within the allotted time (15 seconds).	Remote
102.189	Solid State Starter Fault	Chiller	Immediate Shutdown	Latching	All	A fault condition was detected on the non-communicating Solid State Starter. The fault relay contacts on the SSS opened while the SSS had control power. Filtering of the fault signal must allow for an approximate 2 second delay time from when the SSS is powered to when the fault relay contacts are valid.	Local
103. F2	Low Differential Oil Pressure	Chiller	Immediate Shutdown	Latching	After established Diff. Oil Press in Starting. Also at all times in Running and Stopping	a. When the compressor is running, if the differential oil pressure falls below the Low Differential Oil Pressure Cutout setpoint for more than (cutout * 3) psid seconds then this diagnostic is issued. b. However for any listed mode, if the differential pressure ever falls below .75 of the Low Differential Oil Pressure Cutout this diagnostic is issued within 2 seconds.	Remote
104. 4C1	Check Oil Filter	Chiller	Warning	Latching	Oil Pump Running and Feature Enabled [Manual oil pump]	a. Check Oil Filter Diagnostic disabled: No diagnostic b. Check Oil Filter Diagnostic enabled: The calculated differential oil pressure fell below the Check Oil Filter Setpoint for the specified psid-seconds.	Remote

Main Processor Unit level Diagnostics							
3DC (Hex)	**Diagnostic Name**	**Effects Target**	**Severity**	**Persistence**	**Active Modes [Inactive Modes]**	**Criteria**	**Reset Level**
105. 2E7	Oil Pressure Sensor Calibration	Chiller	Normal Shutdown	Latching	All modes in which the oil pump is not running nor has been running in the previous five minutes	The calibration error between the Oil Tank and Oil Discharge Pressure sensors exceeded the Differential Pressure Calibration Limit(The limit is not a setpoint)	Remote
106.287	High Vacuum Lockout	Chiller	Immediate Shutdown	Latching	Waiting to Start	The oil tank pressure is at or below the High Vacuum Lockout Limit. A high vacuum lockout mode is entered and a timed recovery is attempted. If the recovery is unsuccessful, the High Vacuum Lockout diagnostic is called	Remote
107.482	Low Oil Temperature	Chiller	Immediate Shutdown	Latching	All Running modes	If the oil temperature is at or below the Low Oil Temperature Cutout(Not a setpoint), this diagnostic will be issued stopping the compressor. This diagnostic is ignored for the first 10 minutes of compressor run.	Local
108.EA	High Inboard Bearing Temperature	Chiller	Immediate Shutdown	Latching	All	The Inboard Bearing temperature sensor exceeded 180 + or - 5 F (82.2 C) for 0.5 - 2 seconds.	Local
109.EB	High Outboard Bearing Temperature	Chiller	Immediate Shutdown	Latching	All	The Outboard Bearing temperature sensor exceeded 180 + or - 5 F (82.2 C) for 0.5 - 2 seconds.	Local
110.1C2	High Cprsr Discharge Rfgt Temperature	Chiller	Immediate Shutdown	Nonlatching	All	The discharge temp. exceeded the High Discharge Temp Cutout setpoint. Time to trip from trip value exceeded shall be 0.5 to 2.0 seconds. The diag. shall reset automatically 50 F below the trippoint.	Remote
111.18B	High Motor Winding Temperature 1	Chiller	Immediate Shutdown	Latching	All	The motor winding temp. at sensor #2 exceeded 265 °F for 0.5 - 2 seconds.	Local
112.18C	High Motor Winding Temperature 2	Chiller	Immediate Shutdown	Latching	All	The motor winding temp. at sensor #2 exceeded 265 °F for 0.5 - 2 seconds.	Local
113.18D	High Motor Winding Temperature 3	Chiller	Immediate Shutdown	Latching	All	The motor winding temp. at sensor #2 exceeded 265 °F for 0.5 - 2 seconds.	Local
114.6B7	Restart Inhibit Switched to Time Based	Chiller	Warning	Latching	Looking for motor temp. heating after start	At least one of the motor winding temperatures did not rise high enough in temperature during a start.	Remote
115.2F2	Refrigerant Monitor Input	Chiller	Warning	NonLatching	All	Defective Sensor or LLID Display invalid value The generic refrigerant monitor input read a value that was out of range. < 2mA/1Vdc or >22mA/11Vdc.	Remote
116.E8	Unexpected Differential Oil Pressure	Chiller	Immediate Shutdown	Latching	Idle Oil Management Mode	The differential oil pressure did not fall far enough below the Differential Oil Pressure Cutout after waiting the required time after the oil pump was shut off. (Could be due to a defective pressure transducer or stuck oil pump relay).	Remote
117.1FF	Differential Oil Pressure Overdue	Chiller	Immediate Shutdown	Latching	Waiting to Start; Establishing Oil Pressure	Sufficient differential oil pressure was not established within the specified time of starting the oil pump.	Remote

Main Processor Unit level Diagnostics							
3DC (Hex)	**Diagnostic Name**	**Effects Target**	**Severity**	**Persistence**	**Active Modes [Inactive Modes]**	Criteria	**Reset Level**
118.390	BAS Failed to Begin Comm to Comm4 Board	Chiller	Warning	Nonlatching	At power up or rebuild	The BAS did not communicate with the Comm4 interface module within two minutes after Comm4 LLID came out of reset. This is also the same time MP comes out of reset. Set default setpoints to next level of priority (e.g. Front Panel Setpoint). Refer to Section on Setpoint Arbitration to determine how setpoints may be effected. Diagnostic is cleared when successful communication is received from the BAS.	Remote
119.398	BAS Comm Lost with Comm4 Board	Chiller	Warning	Nonlatching	All	The local BAS Comm4 interface module lost communications with the BAS for 15 continuos minutes after it had been established. This is a warning diagnostic. Use last valid BAS setpoints. Refer to Section on Setpoint Arbitration to determine how setpoints may be effected. Diagnostic is cleared when successful communication is received from the BAS.	Remote
120. 3B6	Hot Gas Bypass Valve Closure Overdue	HGBP	Warning	Latching	When exiting HGBP, on reset	The HGBP Valve was commanded to close and did not close in the three minutes allowed for closure	Remote
121.6B6	Hot Gas Bypass Valve Not closed	Chiller	Warning	Latching	[in HGBP mode]		Remote

7.0 Main Processor Communication Diagnostics

a. These are diagnostics which the main processor calls out when it does not hear from a particular functional ID for the specified duration.
b. The following communication loss diagnostics will not occur unless that input or output is required to be present by the particular configuration and installed options for the chiller.
c. Communication diagnostics (with the exception of "Excessive Loss of Comm" are named by the Functional Name of the input or output that is no longer being heard from by the Main Processor. Many LLIDs, such as the Quad Relay LLID, have more than one functional output associated with it. A communication loss with such a multiple function board, will generate multiple diagnostics. Refer to the Chiller's wiring diagrams to relate the occurrence of multiple communication diagnostics back to the physical LLID boards that they have been assigned to (bound).

Main Processor Communication Diagnostics							
3DC (Hex)	**Diagnostic Name**	**Effects Target**	**Severity**	**Persistence**	**Active Modes [Inactive Modes]**	**Criteria**	**Reset Level**
122.6B6	Excessive Loss of Communication	Platform	Immediate Shutdown	Latching	All	Loss of comm with four or 10% which ever is greater of the LLIDs configured for the system has been detected. The MP had to pass the token for these four LLIDs. This diagnostic will suppress the callout of all subsequent comm loss diagnostics. Note that this diagnostic is for the MP not hearing from four LLIDs which may contain multiple functional IDs.	Remote
123.6B6	Comm Loss: External Auto/Stop	Chiller	Normal Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period.	Remote
124.6B6	Comm Loss: Emergency Stop	Chiller	Normal Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period.	Remote
125.6B6	Comm Loss: External Ice Building Command	Ice Building Mode	Normal Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. Chiller shall revert to normal (non-ice building) mode regardless of last state.	Remote
126.6B6	Comm Loss: Outdoor Air Temperature	Chiller (Chilled Water Reset)	Warning	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. If Tracer not installed or has an invalid outdoor air temperature, default to chilled water reset of zero. If using a valid tracer outdoor temp, no affect. Display Invalid value for temperature.	Remote
127.6B6	Comm Loss: Evap Leaving Water Temp	Chiller	Normal Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. a. Display invalid value for temperature	Remote

Main Processor Communication Diagnostics							
3DC (Hex)	**Diagnostic Name**	**Effects Target**	**Severity**	**Persistence**	**Active Modes [Inactive Modes]**	**Criteria**	**Reset Level**
128.6B6	Comm Loss: Evap Entering Water Temp	Chiller (Chilled Water Reset, Feed forward control, Ice Building)	See Criteria	See Criteria	All	Defective Sensor or LLID. b. Chiller in mode other than Ice Building: Severity is warning, persistence is latching, reset is Remote If chiller in Return or Constant Return Chilled Water Reset, set CWS' equal to the next higher priority chilled water setpoint Feedforward control is disabled. b. Display invalid value for temperature c. Hot water operation: No effect on controls d. Chiller in Ice Building mode: Severity is Normal, persistence is Nonlatch, reset is Remote. This diagnostic shall clear when the Ice Building command is withdrawn.	See Criteria
129.6B6	Comm Loss: Condenser Leaving Water Temp	Chiller	See Criteria	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. a. Chilled water control: Severity is Warning, reset level is Remote b. Hot water control: Severity is Normal, reset level is remote Display invalid value for temperature	See Criteria
130.6B6	Comm Loss: Condenser Entering Water Temp	Chiller	Warning	Latch	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. Default to a chilled water reset of zero if in load based chilled water reset. a. Normal heating operation: feedforward control is disabled. b. Chilled water operation: No effect on controls c. Display invalid value for temperature	Remote
131.6B6	Comm Loss: Sec Cond Leaving Water Temp	Chiller	Warning	NonLatching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. Display invalid value	Remote
132.6B6	Comm Loss: Sec Cond Entering Water Temp	Chiller	Warning	NonLatching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. Display invalid value	Remote
133.6B7	Comm Loss: Oil Tank Temperature	Chiller	Normal Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. c. Display invalid value	Remote
134.6B6	Comm Loss: Ext Chilled/Hot Wtr Setpoint	Chiller (Ext. Chilled Water Setpoint)	Warning	NonLatching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. External CWS(or HWS if selected) command will withdraw from decision to do CWS(or HWS if selected). This warning diagnostic will automatically clear when successful communication is reestablished.	Remote

Main Processor Communication Diagnostics							
3DC (Hex)	**Diagnostic Name**	**Effects Target**	**Severity**	**Persistence**	**Active Modes [Inactive Modes]**	**Criteria**	**Reset Level**
135.6B6	Comm Loss: Ext Current Limit Setpoint	Chiller (Ext Current Limit Setpoint)	Warning	NonLatching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. External current limit command will withdraw from decision to do current limit. This warning diagnostic will automatically clear when successful communication is reestablished.	Remote
136.6B7	Comm Loss: Cond High Pressure Cutout	Chiller	Normal Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period.	Remote
137.6B6	Comm Loss: Evaporator Water Flow Switch	Chiller	Immediate Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period.	Remote
138.6B6	Comm Loss: Condenser Water Flow Switch	Chiller	Normal Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period.	Remote
139.6B6	Comm Loss: Evap Saturated Rfgt Temp	Chiller	Immediate Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. Display invalid value	Remote
140.6B6	Comm Loss: Cond Saturated Rfgt Temp	Chiller	Normal Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. Display invalid value	Remote
141.6B4	Comm Loss: Purge Liquid Temperature	Purge	Normal Shutdown	Latching	Retrofit Purge	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. Display invalid value	Remote
142.6B6	Comm Loss: Cond Refrigerant Pressure	Chiller	Normal Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. Display invalid value	Remote
143.6B7	Comm Loss: Oil Tank Pressure	Chiller	Immediate Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. Display invalid value	Remote
144.6B7	Comm Loss: Oil Pump Discharge Pressure	Chiller	Immediate Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. Display invalid value	Remote
145.6B6	Comm Loss: Evaporator Water Pump Relay	Chiller	Warning	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period.	Remote
146.6B6	Comm Loss: Condenser Water Pump Relay	Chiller	Warning	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period.	Remote
147.6B6	Comm Loss: Ice Building Relay	Ice Building	Normal Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. Chiller shall revert to normal (non-ice building) mode regardless of last state.	Remote
148.2AD	Comm Loss: Starter	Chiller	Immediate Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period.	Local
149.2AD	Comm Loss: Adaptive Frequency Drive	Chiller	Immediate Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period.	Local

Main Processor Communication Diagnostics							
3DC (Hex)	**Diagnostic Name**	**Effects Target**	**Severity**	**Persistence**	**Active Modes [Inactive Modes]**	**Criteria**	**Reset Level**
150.389	Comm Loss: Local BAS Comm4 Board	Chiller	Warning	NonLatching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. Use last valid BAS setpoints. Diagnostic is cleared when successful communication is established with the Comm4 LLID.	Remote
151.6B6	Comm Loss: Compressor Running Relay	Chiller	Warning	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period.	Remote
152.6B6	Comm Loss: Non-Wrn Latching Alarm Relay	Chiller	Warning	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period.	Remote
153.6B6	Comm Loss: Non-Wrn NonLatching Alm Relay	Chiller	Warning	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period.	Remote
154.6B6	Comm Loss: Unit Purge Alarm Relay	Chiller	Warning	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period.	Remote
155.6B6	Comm Loss: Limit Warning Relay	Chiller	Warning	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period.	Remote
156.6B6	Comm Loss: Maximum Capacity Relay	Chiller	Warning	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period.	Remote
157.6B6	Comm Loss: Head Relief Request Relay	Chiller	Warning	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period.	Remote
158.6B6	Comm Loss: Evap Diff Water Pressure	Chiller	Warning	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. Flow and tons calculation shall be disabled. Display invalid value.	Remote
159.6B6	Comm Loss: Cond Diff Water Pressure	Chiller	Warning	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. Flow calculation shall be disabled.	Remote
160.6B6	Comm Loss: Cond Rfgt Pressure Output	Chiller	Warning	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period.	Remote
161.6B6	Comm Loss: Compressor Motor % RLA Output	Chiller	Warning	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period.	Remote
162.6B6	Comm Loss: Refrigerant Monitor Input	Chiller	Warning	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. Display out of range value(dashes)	Remote
163.6B6	Comm Loss: External Free Cooling Command	Free Cooling	Normal Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. Chiller shall revert to normal (non-free cooling) mode regardless of last state.	Remote
164.6B6	Comm Loss: Free Cool Actrs Closed Input	Chiller	Immediate Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period.	Remote
165.6B6	Comm Loss: Free Cool Liq Line Actuator Relay	Free Cooling	Normal Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. Chiller shall revert to normal (non-free cooling) mode regardless of last state.	Remote

Main Processor Communication Diagnostics							
3DC (Hex)	**Diagnostic Name**	**Effects Target**	**Severity**	**Persistence**	**Active Modes [Inactive Modes]**	Criteria	**Reset Level**
166.6B6	Comm Loss: Free Cool Gas Line Actr Relay	Free Cooling	Normal Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. Chiller shall revert to normal (non-free cooling) mode regardless of last state.	Remote
167.6B6	Comm Loss: Free Cooling Auxiliary Relay	Free Cooling	Warning	NonLatching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period.	Remote
168.6B4	Comm Loss: Purge Cprsr Suction Rfgt Temp	Purge	Normal Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. Display invalid value	Remote
169.6B4	Comm Loss: Purge Carbon Tank Temperature	Purge	Normal Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. Display invalid value	Remote
170.6B4	Comm Loss: Purge Liquid Level Switch	Purge	Normal Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period.	Remote
171.6B4	Comm Loss: Purge Chiller Cprsr Run Input	Purge	Normal Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period.	Remote
172.6B4	Comm Loss: Purge Pumpout Relay	Purge	Normal Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period.	Remote
173.6B4	Comm Loss: Purge Carbon Tank Heater Rly	Purge	Normal Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period.	Remote
174.6B4	Comm Loss: Purge Regen Solenoid Relay	Purge	Normal Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period.	Remote
175.6B4	Comm Loss: Purge Alarm Relay	Purge	Normal Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period.	Remote
176.6B4	Comm Loss: Purge Pumpout Solenoid Output	Purge	Normal Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period.	Remote
177.6B4	Comm Loss: Purge Exhaust Solenoid Output	Purge	Normal Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period.	Remote
178.6B4	Comm Loss: Purge Condensing Unit Relay	Purge	Normal Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period.	Remote
179.6B5	Comm Loss: Solid State Starter Fault	Chiller	Immediate Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period.	Local
180.6B5	Comm Loss: PFCC Relay	Chiller	Warning	Nonlatching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. Diagnostic is cleared when communications is reestablished.	Remote
181.6B7	Comm Loss: Oil/Refrigerant Pump Relay	Chiller	Immediate Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period.	Remote
182.6B7	Comm Loss: Oil Tank Heater Relay	Chiller	Warning	Nonlatching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. Compressor allowed to start if oil temperature is okay. If oil temperature is not okay to enter a start, this diagnostic is called.	Remote

Main Processor Communication Diagnostics							
3DC (Hex)	**Diagnostic Name**	**Effects Target**	**Severity**	**Persistence**	**Active Modes [Inactive Modes]**	Criteria	**Reset Level**
183.6B7	Comm Loss: Motor Winding Temperature 1	Chiller	Normal Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. Display invalid value	Remote
184.6B7	Comm Loss: Motor Winding Temperature 2	Chiller	Normal Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. Display invalid value	Remote
185.6B7	Comm Loss: Motor Winding Temperature 3	Chiller	Normal Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. Display invalid value	Remote
186.6B7	Comm Loss: Inboard Bearing Temperature	Chiller	Normal Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. Display invalid value	Remote
187.6B7	Comm Loss: Outboard Bearing Temperature	Chiller	Normal Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. Display invalid value	Remote
188.6B7	Comm Loss: Cprsr Discharge Rfgt Temp	Chiller	See Criteria	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. a. With HGBP installed. Chiller will revert to normal (non-HGBP) mode regardless of last state. Display invalid value. A warning diagnostic is set. b. HGBP not installed, Compressor Discharge Refrigerant Temperature is installed: Perform a normal shutdown. Display invalid value c. HGBP mode not installed, Compressor Discharge Refrigerant Temperature not installed: No diagnostic	Remote
189.2B0	Comm Loss: IGV First Stage Actuator	Chiller	Normal Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period.	Remote
190.2B1	Comm Loss: IGV Second Stage Actuator	Chiller	Normal Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period.	Remote
191.6B6	Comm Loss: Ext Base Loading Setpoint	Chiller (Base Loading)	Warning	Nonlatching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. Chiller shall discontinue use of the External Base Loading Setpoint source and revert to the next higher priority for setpoint arbitration	Remote
192.6B6	Comm Loss: Ext Base Loading Command	Chiller (Base Loading)	Warning	Nonlatching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. Chiller shall discontinue use of the External Base Loading Setpoint source and revert to the next higher priority for setpoint arbitration	Remote
193.6B6	Comm Loss: External Hot Water Command	Chiller (Ext. Hot Water)	Warning	Nonlatching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. Chiller shall discontinue use of the External Hot Water Setpoint source and revert to the next higher priority for setpoint arbitration	Remote

Main Processor Communication Diagnostics							
3DC (Hex)	**Diagnostic Name**	**Effects Target**	**Severity**	**Persistence**	**Active Modes [Inactive Modes]**	Criteria	**Reset Level**
194. 3B8	Comm Loss Hot Gas Bypass Actuator Open Relay	HGBP	Normal Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. Chiller shall revert to normal (non-HGBP) mode regardless of last state.	Remote
195. 3B8	Comm Loss Hot Gas Bypass Actuator Close Relay	HGBP	Normal Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. Chiller shall revert to normal (non-HGBP) mode regardless of last state.	Remote
196. 3B8	Comm Loss Hot Gas Bypass Actuator Closed Input	HGBP	Normal Shutdown	Latching	All	Continual loss of communication between the MP and the Functional ID has occurred for a 30 second period. Chiller shall revert to normal (non-HGBP) mode regardless of last state.	Remote

8.0 Main Processor Boot Messages and Diagnostics

Main Processor Boot Messages and Diagnostics	
DynaView Display Message	**Description //Troubleshooting**
Boot Software Part Numbers: LS Flash --> 6200-0318-07 MS Flash --> 6200-0319-07	The "boot code" is the portion of the code that is resident in all MPs regardless of what application code (if any) is loaded. Its main function is to run power up tests and provide a means for downloading application code via the MP's serial connection. The Part numbers for the code are displayed in the lower left-hand corner of the DynaView during the early portion of the power up sequence and during special programming and converter modes. See below. // This is normal, but you should provide this information when contacting Technical Service about power up problems.
197.Err2: RAM Pattern 1 Failure	There were RAM errors detected in RAM Test Pattern #1. // Recycle power, if the error persists, contact Service, may need to replace MP.
198.Err2: RAM Pattern 2 Failure	There were RAM errors detected in RAM Test Pattern #2. //Recycle power, if the error persists, contact Service, may need to replace MP..
199.Err2: RAM Addr Test #1 Failure	There were RAM errors detected in RAM Address Test #1. // Recycle power, if error persists, contact Service, may need to replace MP.
200.Err2: RAM Addr Test #2 Failure	There were RAM errors detected in RAM Address Test #2. //Recycle power, if the error persists, contact Service, may need to replace MP.
201.No Application Present 202.Please Load Application...	No Main Processor Application is present – There are no RAM Test Errors. // Connect a TechView Service Tool to the MP's serial port, download the configuration if prompted by TechView. Then proceed to download the most recent MP application or specific version as recommended by Service.
203.App Present. Running Selftest.... 204.Selftest Passed	An application has been detected in the Main Processor's nonvolatile memory and the boot code is proceeding to run a check on its entirety. // Temporary display of this screen is part of the normal power up sequence.
205.App Present. Running Selftest... 206.Err3: CRC Failure	An application has been detected in Main Processor's nonvolatile memory and the boot code is proceeding to run a check on its entirety. A few seconds later, the boot code had completed but failed the (CRC) test. //Connect a TechView Service Tool to the MP's serial port, provide chiller model number (configuration information) and download the configuration if prompted by TechView. Then proceed to download the most recent MP application or specific version as recommended by Technical Service. If the problem persists, contact Service, may need to replace MP.
Err4: UnHandled Interrupt Restart Timer: [30 sec countdown timer]	An unhandled interrupt has occurred while running the application code. This event will normally cause a safe shutdown of the entire chiller. Once the countdown timer reaches 0, the processor will reset, clear diagnostics, and attempt to restart the application and allow a normal restart of chiller as appropriate. // This condition might occur due to a severe electro-magnetic transient such as can be caused by a near lightening strike. Such events should be rare or isolated and if no damage results to the CH.530 control system, the Chiller will experience a shutdown and restart. If this occurs more persistently it may be due to an MP hardware problem. Try replacing the MP. If replacement of the MP proves ineffective, the problem may be a result of extremely high radiated or conducted EMI. Contact Technical Service. If this screen occurs immediately after a software download, attempt to reload both the configuration and the application. Failing this, contact Technical Service.
Err5: Operating System Error Restart Timer: [30 sec countdown timer]	An Operating System error has occurred while running the application code. This event will normally cause a safe shutdown of the entire chiller. Once the countdown timer reaches 0, the processor will reset, clear diagnostics, and attempt to restart the application and allow a normal restart of chiller as appropriate. // See Err 4 above
Err6: Watch Dog Timer Error Restart Timer: [30 sec countdown timer]	A WatchDog Timer Error has occurred while running the application code. This event will normally cause a safe shutdown of the entire chiller. Once the countdown timer reaches 0, the processor will reset, clear diagnostics, and attempt to restart the application allowing a normal restart of chiller as appropriate.
Err7: Unknown Error Restart Timer: [30 sec countdown timer]	An Unknown Error has occurred while running the application code. This event will normally cause a safe shutdown of the entire chiller. Once the countdown timer reaches 0, the processor will reset, clear diagnostics, and attempt to restart the application allowing a normal restart of chiller as appropriate
Converter Mode	A command was received from the Service Tool (Tech View) to stop the running application and run in the "converter mode". In this mode the MP acts as a simple gateway and allows

Main Processor Boot Messages and Diagnostics	
DynaView Display Message	**Description //Troubleshooting**
	the TechView service computer to talk to all the modules on the IPC3 bus.
Programming Mode	A command was received by the MP from the Tech View Service Tool and the MP is in the process of first erasing and then writing the program code to its internal Flash (nonvolatile) Memory

9.0 Special Troubleshooting and Informational Messages

Special Troubleshooting and Informational Messages	
DynaView Display Message	**Description //Troubleshooting**
Error Resulted From Invalid Configuration – Record Condition and Call Trane Service Assertion: 'File Name' 'Line Number'	This error message is displayed when the MP code finds itself in an improper software location. These assertion points are placed in code locations to aid the software team in identifying why the MP locked up as a result of vectoring to an invalid location. When this message occurs, copy down the file name and line number and have this ready to give Trane service. This message remains on the screen for two minutes. After two minutes, the watchdog times out and a 'Watchdog Error' message is displayed. The watchdog then resets the MP. The MP heads into a boot and configuration mode the same as it does on a power up. These error messages are on the DynaView screen and do not appear in TechView nor in the diagnostic logs.
A Valid Configuration is Present	A valid configuration is present in the MP's nonvolatile memory. The configuration is a set of variables and settings that define the physical makeup of this particular chiller. These include: number/airflow,/and type of fans, number/and size of compressors, special features, characteristics, and control options. // Temporary display of this screen is part of the normal power up sequence.