

3. Fully load slide valve.

In "SERVICE" operating mode, press the slide valve **LOAD** key to cause the slide valve to fully load. Monitor the slide valve potentiometer shaft. The slide valve is fully loaded when the shaft no longer rotates.

4. While monitoring the slide valve position with the % **MOTOR AMPS**/% **SLIDE VALVE** keypad key, adjust micro board pot R58 (SVH, 100%) until displayed slide valve position just equals "100%".

If the displayed slide valve position already equals "100%", back off pot R58 to "99%" and then adjust to "100%".

5. Repeat "Calibration Check" per above. Because of the interaction of micro board pots R58 and R59, it might be necessary to perform "Fine Adjustment" several times until desired results are achieved. At that time seal pots R58 and R59 adjusting screws with "GLYPTAL" or equivalent sealer.

The following procedure allows the serviceman to manually operate the slide valve from fully open to fully closed while the chiller is shut down.

1. Remove 115VAC Control Power from MicroComputer Control Center.
2. Remove Wire #23 from left-hand side to TB6-23 in MicroComputer Control Center. Wrap electrical tape

around the terminal of the removed wire and secure temporarily to prevent contact with cabinet or electrical terminals. This allows the slide valve equalizer solenoid valve (2SOL) to remain de-energized (closed) during the procedure.

3. Apply 115VAC Control Power to the MicroComputer Control Center.
4. Place MicroComputer Control Center in **SERVICE** Mode and place slide valve in **HOLD**.
5. Refer to following figure:

TO LOAD SLIDE VALVE:

- a.) Connect a hose from Schrader Valve 1 to 3.
- b.) Using a hand oil pump, pump oil in Schrader Valve 2.

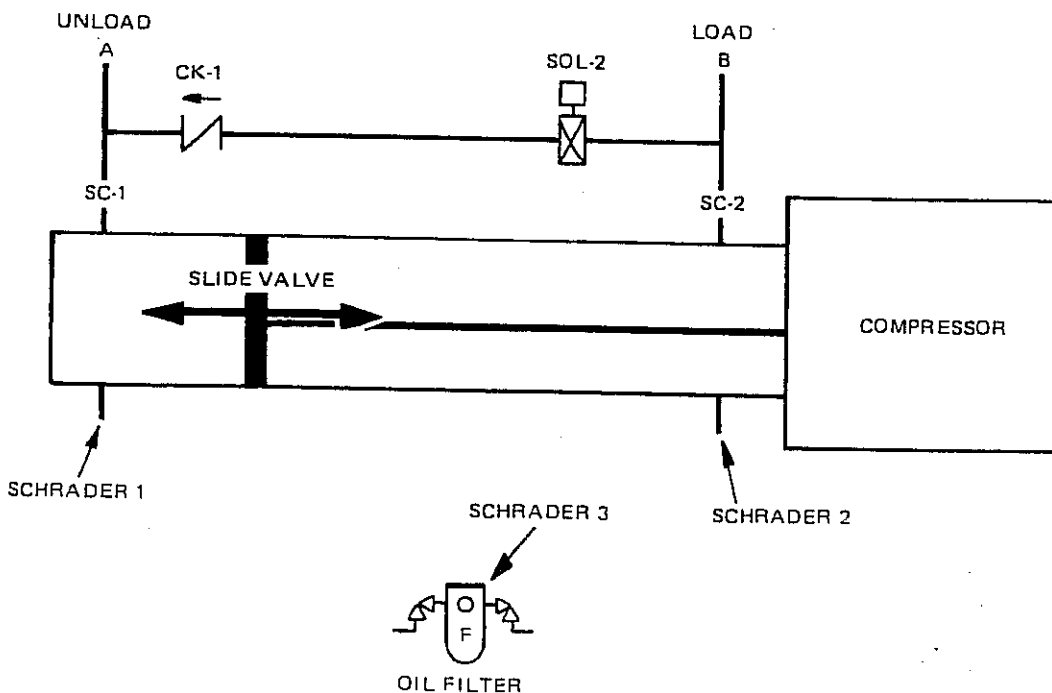
TO UNLOAD SLIDE VALVE:

- a.) Connect a hose from Schrader Valve 2 to 3.
- b.) Using a hand oil pump, pump oil in Schrader Valve 1.

6. Remove 115VAC power from MicroComputer Control Center.

7. Connect wire #23 (Removed in Step 2) to TB6-23.

8. Apply 115VAC Control Power to MicroComputer Control Center.



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In "SERVICE" operating mode, press the slide valve **LOAD** key to cause the slide valve to fully load. Monitor the slide valve potentiometer shaft. The slide valve is fully loaded when the shaft no longer rotates.

4. While monitoring the slide valve position with the % **MOTOR AMPS**/% **SLIDE VALVE** keypad key, adjust micro board pot R58 (SVH, 100%) until displayed slide valve position just equals "100%".

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1. Remove 115VAC Control Power from MicroComputer Control Center.
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around the terminal of the removed wire and secure temporarily to prevent contact with cabinet or electrical terminals. This allows the slide valve equalizer solenoid valve (2SOL) to remain de-energized (closed) during the procedure.

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4. Place MicroComputer Control Center in **SERVICE** Mode and place slide valve in **HOLD**.
5. Refer to following figure:

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- a.) Connect a hose from Schrader Valve 1 to 3.
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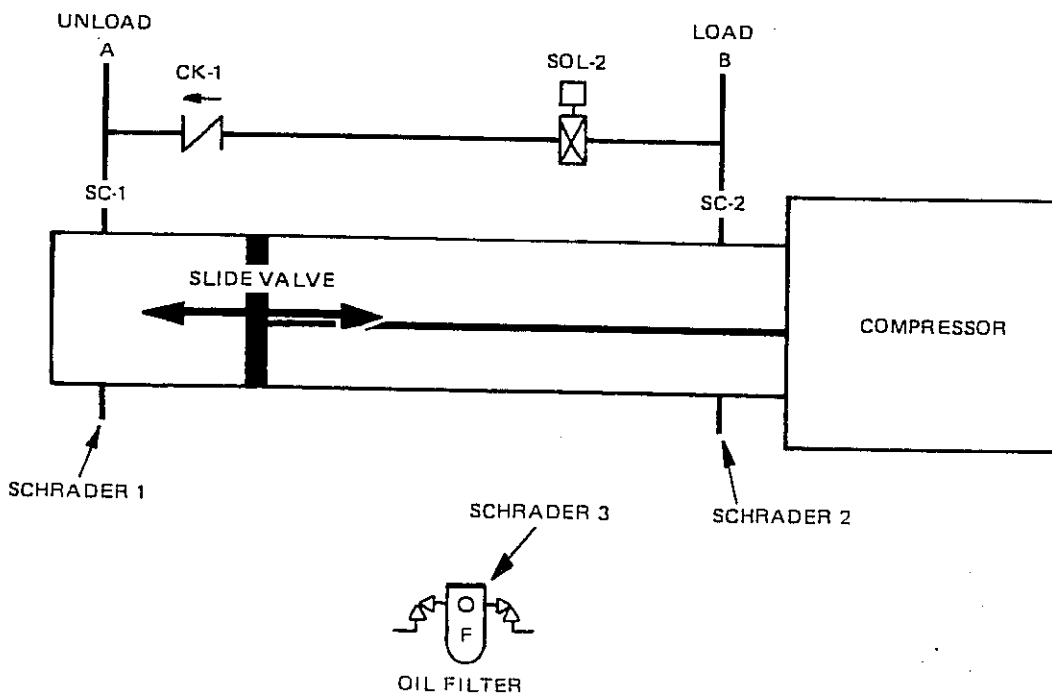
TO UNLOAD SLIDE VALVE:

- a.) Connect a hose from Schrader Valve 2 to 3.
- b.) Using a hand oil pump, pump oil in Schrader Valve 1.

6. Remove 115VAC power from MicroComputer Control Center.

7. Connect wire #23 (Removed in Step 2) to TB6-23.

8. Apply 115VAC Control Power to MicroComputer Control Center.



NOTE: Under certain operating conditions, the software could impose a high or low pressure slide valve load limit when the condenser pressure reaches 251.3 PSIG or evaporator pressure reaches 56.2 PSIG. If either of these conditions develop, modify local operating conditions to allow the slide valve to fully load.

7. When the slide valve reaches the fully loaded position, the keypad display should indicate a position of 100%.
8. Press slide valve **UNLOAD** key on keypad.
9. The slide valve should fully unload.

NOTE: Early production units equipped with version 4.A EPROM prevent the slide valve from fully unloading under certain operating conditions (Refer to 160.47-O1.1). If this occurs, it will be necessary to place the slide valve in **AUTO** mode and shutdown the chiller to cause slide valve to fully unload.

10. As the slide valve unloads, monitor the slide valve potentiometer shaft and the slide valve position on the keypad display.
11. The slide valve will be fully unloaded when the slide valve potentiometer shaft no longer turns.
12. The display should indicate 0% slide valve position when the slide valve is fully unloaded.

If the operation does not conform to above, calibration is necessary.

To calibrate, proceed as follows: (Ref. Fig. 34)

NOTE: If the slide valve pot is field replaced, perform the entire calibration procedure (coarse and fine). However, if only the Micro Board is field replaced, it is not necessary to perform the coarse adjustment, proceed with the fine adjustment. The instructions include procedures to load and unload the slide valve while the chiller is running. An alternate method of loading and unloading the slide valve is provided at the end of the adjustment procedure. This alternate method allows the slide valve to be loaded and unloaded while the chiller is shut down.

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COARSE ADJUSTMENT (WITH CHILLER RUNNING)

1. Fully unload the slide valve.

In "SERVICE" operating mode, press the slide valve **UNLOAD** key. Monitor the slide valve potentiometer shaft. The slide valve is fully unloaded when the shaft no longer rotates.

2. Shut down chiller.

3. Disconnect J20 plug (slide valve pot interface cable) from the Micro Board.

- *4. Using digital ohmmeter, measure resistance of slide valve pot by connecting ohmmeter in PINS 3 and 4 of plug removed in Step 2. With the slide valve fully unloaded the resistance should be 965 OHMS (± 10 OHMS).

If not, loosen retainer clips that secure the slide valve pot. Rotate the pot clockwise or counterclockwise to achieve correct resistance value. Tighten each slide valve retainer clip screw a little at a time in a sequential fashion so that pot is tight against frame with equal pressure.

5. Reconnect plug removed in Step 2 to Micro Board J20.

FINE ADJUSTMENT (WITH CHILLER RUNNING)

1. Fully unload the slide valve.

In "SERVICE" operating mode, press the slide valve **UNLOAD** key. Monitor the slide valve potentiometer shaft. The slide valve is fully unloaded when the shaft no longer rotates.

2. While monitoring the slide valve position with the % **MOTOR AMPS**/% **SLIDE VALVE** keypad key, adjust micro board pot R59 (SVL 0%) until displayed slide valve position just equals "0%".

If the displayed slide valve position already equals "0%", back off pot R59 to "1%" and then adjust to "0%".

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OVERLOAD -

1. Ascertain correct FLA value is programmed @ keypad.
2. Run chiller.
3. Monitor highest phase (ϕA , ϕB , or ϕC) of compressor motor current with clamp-on ammeter.
4. Monitor highest phase of compressor motor current using keypad **SSS MOTOR CURRENT/VOLTS** key in conjunction with **DISPLAY HOLD** key.
5. Display should read the same as clamp-on ammeter $\pm 5\%$. If it doesn't, refer to Solid State Starter troubleshooting Form 160.46-OM3.1.
6. Monitor highest phase of compressor motor current on keypad display using **SOLID STATE STARTER MOTOR CURRENT/VOLTS** key with **DISPLAY HOLD** key.
7. Manually operate slide valve to run compressor motor to 105% FLA as indicated by the highest phase on the display.
8. Solid State Starter Logic Board 105% LED should just illuminate.
9. If system doesn't operate per above, calibration is necessary.

To calibrate, proceed as follows:

START CURRENT -

1. Monitor Motor Current using a.) a clamp-on ammeter, or b.) **SOLID STATE STARTER MOTOR CURRENT/VOLTS** keypad key with **DISPLAY HOLD** key.
2. Start chiller.
3. When motor first begins to turn, adjust LCSSS Logic Board **START CURRENT POT** (R38) to achieve proper starting current **Clockwise** increases current, **Counter-clockwise** decreases current. Proper start current is $45\% \times \text{Delta LRA}$. (NOTE: If monitoring the motor current on the display, there is a 2 second delay on display update.) Tighten R38 locking nut.
4. Restart chiller and check starting current.

OVERLOAD -

1. Ascertain correct FLA value is programmed at keypad.
2. Run chiller.

3. Monitor highest phase of compressor motor current on keypad display using **SSS MOTOR CURRENT/VOLTS** key with **DISPLAY HOLD** key.
4. Monitor highest phase of compressor motor current with clamp-on ammeter.
5. Display should read the same as clamp-on ammeter $\pm 5\%$. If it doesn't, refer to Solid State Starter troubleshooting Form 160.46-OM3.1.
6. Monitor highest phase of compressor motor current on keypad display using **SSS MOTOR CURRENT/VOLTS** key with **DISPLAY HOLD** key.
7. Manually operate slide valve to run compressor motor to 105% FLA as indicated by the highest phase on the display.
8. Adjust LCSSS Logic Board **OVERLOAD POT** (R44) until LCSSS Logic Board 105% LED just illuminates.

Tighten R44 locking nut.

9. Re-check calibration.

ALL APPLICATIONS:

The **SLIDE VALVE POSITION CIRCUIT** (Ref. Fig. 34) is fully calibrated as delivered from the factory. However, it must be checked at start-up. If the slide valve pot or micro board is replaced, field calibration is necessary. The slide valve position circuit consists of the slide valve pot and two calibration pots (R58 & R59) located on the micro board.

Check calibration as follows: (Ref. Fig. 34)

1. Remove slide valve potentiometer cover plate.
2. Run chiller.
3. Monitor slide valve position on keypad display using $\% \text{ MOTOR AMPS}/\% \text{ SLIDE VALVE}$ display key and **DISPLAY HOLD** key.
4. In "Service" operating mode, press slide valve **LOAD** key on keypad.
5. While slide valve is loading, monitor slide valve position on keypad display and shaft of slide valve potentiometer.
6. Allow slide valve to fully load. The slide valve will be fully loaded when the slide valve potentiometer shaft no longer turns.

load amps value must be checked at the control center keypad at system start-up. If the proper supply voltage range is not programmed, the control center will shut-down on "Low Line Voltage" or "High Line Voltage". If the proper full load amps are not programmed, current limit control will not occur at the proper current levels. For security reasons, a special access code is required to program these setpoints. To prevent unauthorized personnel from changing these setpoints, this access code does not appear in any other published document. Refer to the programming procedure below.

The LCSSS Logic Board start current and overload POTS are calibrated as delivered from the factory. However, they must be checked at system start-up. If the LCSSS Logic Board is field replaced, field calibration is necessary. Refer to procedure below.

Programming the Undervoltage and Chiller Full Load Amps (FLA) Setpoints (Solid State Starter Applications Only):

1. Press **ACCESS CODE** key.
2. **ENTER VALID ACCESS CODE** is displayed.
3. Using entry keys enter 1 3 8 0.
4. As each digit is entered, the characters **Y O R K** are displayed. NOTE: If digits other than 1 3 8 0 are entered, **Y O R K** is still displayed.
5. Press **ENTER** key.
NOTE: If digits other than 1 3 8 0 were entered in Step No. 4, **INVALID ACCESS CODE** is displayed when the **ENTER** key is pressed. If this occurs, enter the correct access code (1380) and proceed.
6. **ACCESS TO PROGRAM KEY AUTHORIZED** is displayed. NOTE: Unless terminated by pressing the **ACCESS CODE** key again, the operator will have access to the **PROGRAM** key for 10 minutes. When 10 minutes have elapsed, access to program key will be automatically disabled and the operator must return to Step No. 1 to gain access.
7. Press **PROGRAM** key.
8. **PROGRAM MODE, SELECT SETPOINT** is displayed.
9. When the voltage range and chiller full load amps have been entered, per instructions below, press the **ACCESS CODE** key to exit program mode and terminate access to program mode. **ACCESS TO PROGRAM MODE DISABLED** is displayed. The control center will automatically return to **LOCAL**, **REMOTE** or **SERVICE** mode . . . whichever was last selected.

To enter **UNDERVOLTAGE** setpoints = (SOLID STATE STARTER APPLICATIONS ONLY)

1. Press and release **SSS MOTOR CURRENT/VOLTS**

key. The previously selected voltage range is displayed as follows:

SUPPLY VOLTAGE RANGE 200-208

or

SUPPLY VOLTAGE RANGE 220-240

or

SUPPLY VOLTAGE RANGE 380

or

SUPPLY VOLTAGE RANGE 400

or

SUPPLY VOLTAGE RANGE 415

or

SUPPLY VOLTAGE RANGE 440-480

or

SUPPLY VOLTAGE RANGE 550-600

or

SUPPLY VOLTAGE RANGE DISABLED

2. Press and release the **ADVANCE DAY/SCROLL** key to scroll to the desired voltage range. Each time the **ADVANCE DAY/SCROLL** key is pressed, a different voltage range is displayed. NOTE: The undervoltage cutout function can be disabled by scrolling to **SUPPLY VOLTAGE RANGE DISABLED**. This safety should not be arbitrarily disabled.
3. Press **ENTER** key.

To Enter Chiller Full Load Amps - (Solid State Starter Applications Only):

1. Press and release **% CURRENT LIMIT** setpoint key. The following program prompt message is displayed:
CURRENT LIMIT = XXX% FLA: MTR: CUR
= _ _ _ _ FLA
2. Use entry keys to enter the desired current limit value and a proper chiller (job) full load amps. The chiller (job) full load amp value is found on the motor data plate or sales order.
3. Press and release **ENTER** key. **PROGRAM MODE, SELECT SETPOINT** is displayed.

Check calibration as follows:

START CURRENT - Proper starting current is $45\% \times \text{Delta LRA}$. For example, if the motor nameplate Delta LRA (Locked Rotor Amps) is 2500A, the proper starting current is $.45 \times 2500 = 1125\text{A}$. To check, start chiller and monitor motor current with clamp-on ammeter or monitor current with **SSS MOTOR CURRENT/VOLTS** keypad key (use in conjunction with display hold key).

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3. Press and release **ENTER** key.
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