IMPORTANT

Engineering Bulletin #116
M00352 Limit Board Installation & Adjustment on Existing Controllers

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O. Thompson M00352 Limit Board

The O. Thompson M00352 Limit board is designed to be an exact replacement of the older style M00118 Limit board. The M00352 Limit board uses a processor to monitor car speed and the status of the hoistway limit switches. If the car speed exceeds that which is safe for an approach to the top or bottom terminal floor, the Limit board will open the safety circuit, removing power from the brake and hoist motor.

The following is an explanation on installation and adjustment of the board. The board can be installed in one of two ways. If you have an existing installation, and do not wish to activate the speed clamping function, follow the procedure that is outlined for an existing installation. If you wish to activate the clamping, follow the procedure for a new installation. The board will automatically detect if the speed reference is present, and if not, will not clamp the reference, but rather open the fault circuitry.

Limit Board Hardware

The Limit board requires hardware version 2.0 or later. If you have an earlier version board do not use it, as the Limit board may not operate properly.

Limit Board Software

In order to operate properly, the Limit board requires software version named “LIMITOT.” The most recent version of this software is dated 4/30/01. If you have an earlier version of the software do not use it, as the Limit board may not function correctly.

Limit Board Mounting

The mounting holes on the new board are positioned such that the new board will use the existing mounting holes on most controllers.

Position the Limit board so that it is aligned with the existing mounting holes on the right side. Install the mounting screws and stand-offs, securing the new board to the controller.

Limit Board Wiring

Before the Limit board can be adjusted, it must be wired correctly. The board was designed so that the wiring from the existing board will connect

to the new board. You may, however, have to re-route or lengthen the wires that connect to some of the terminals. Due to the smaller size of the new board, some of the terminals have been relocated about 5 inches away. Refer to Figure 1 below for the correct terminals.

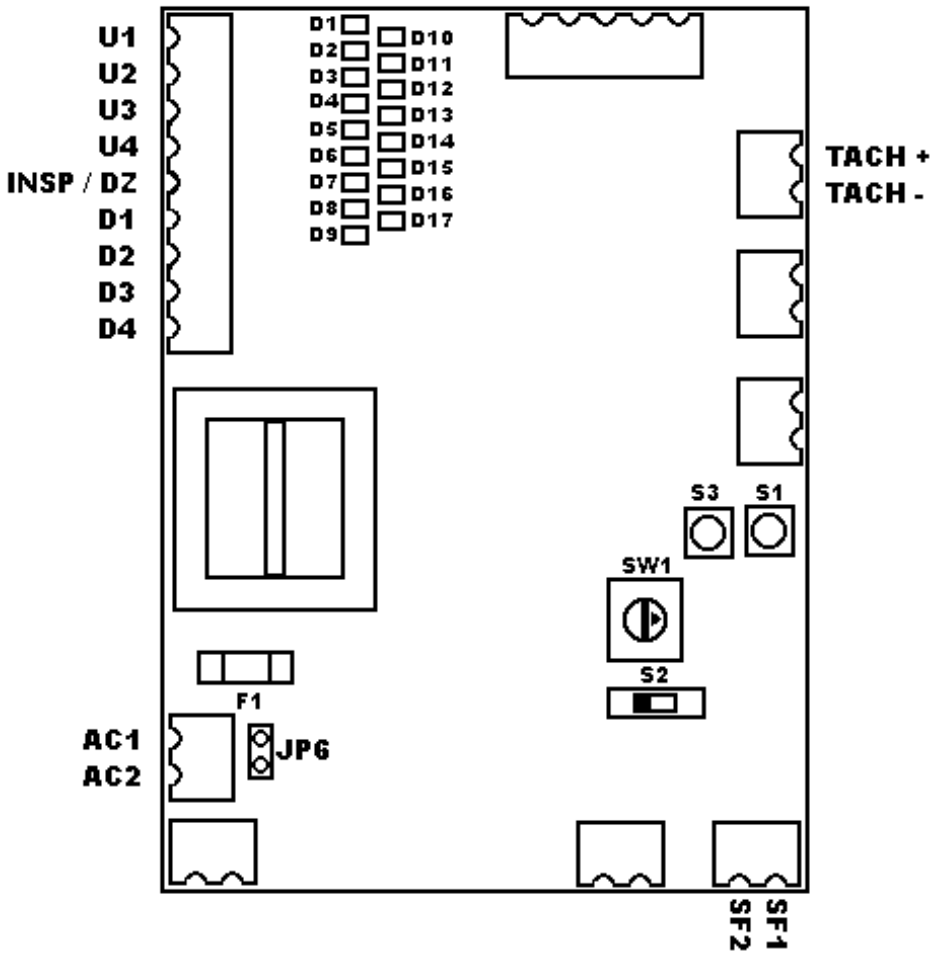

Figure 1

Please Note: Not all limit switch input terminals may be used on your application. If there were no wires on the existing board on U1, U2, U3, D1, D2, or D3, nothing should be connected to the new board. If AC2 is the power supply to the limit switches, then AC1 is common. Put jumper JP6 in place on the Limit board. If the jumper is not present, terminals J8-1 and J8-2 must be wired to the low side of the line supplying the switches.

Limit Board Set Up

Before the Limit board is adjusted, it is necessary to program the car speed. Locate the rotary switch "SW1" on the board. Using the chart

below, locate the contract speed of the car. SW1 will be set based on the car speed. If the contract speed of the car is not divisible by 100 (for example, 350 FPM), S2 will be used to add 50 FPM to the programmed car speed.

Car Speed	SW1	Car Speed	SW1	Car Speed	SW1
100	1	600	6	1100	B
200	2	700	7	1200	C
300	3	800	8	1300	D
400	4	900	9	1400	E
500	5	1000	A	1500	F

Set SW1 to the value specified above. If 50 FPM needs to be added, place S2 in the right most position. If not, S2 must remain in the left most position.

The Limit board requires a learn procedure for calibration. With the car on inspection, place it somewhere near the center of the hoistway, away from all terminal floor slowdown switches. Confirm that all of the switches are turned on by checking the LED on the board. Use the chart below to determine which LED corresponds to which limit.

Limit	LED	Limit	LED
U1	D1	D1	D5
U2	D2	D2	D6
U3	D3	D3	D7
U4	D4	D4	D8

LED D9 should be turned off. It will come on when the car is on Automatic operation with the doors closed.

Bring the car to the lowest landing door zone on inspection operation. Disable the doors, and place the car on Automatic operation. Press and hold S3. Press and release S1. Release S3. D25 will begin blinking rapidly, and D10 and D11 will be illuminated.

Do a high-speed run to the top floor. After the car stops, D10 will turn off.

Do a high-speed run to the bottom floor. After the car stops, D11 will turn off, and D25 will be on continuously, indicating that the high speed learn procedure was completed successfully, and the Limit board is in normal operation.

The Limit board set up is now complete.

Limit Board Testing

To confirm that the board will function correctly, remove the J1 connector. Run the car in the up direction on automatic. As soon as the car speed reaches about 100 – 150 FPM, the Limit board will trip, stopping the car. Re-connect the J1 connector, cycle power to the controller and the car can be returned to service.

Limit Board LED Indicators

The LED's on the Limit board are divided into two columns. The first column, D1 - D9 are limit input diagnostic LED's. They each correspond to a specific limit switch input.

- **D1** Up Limit 1
- **D2** Up Limit 2
- **D3** Up Limit 3
- **D4** Up Limit 4
- **D5** Down Limit 1
- **D6** Down Limit 2
- **D7** Down Limit 3
- **D8** Down Limit 4
- **D9** Inspection Operation / Door Open

The LED will be illuminated when the limit switch is closed. The limits will open as the car passes them traveling toward the terminal floor. D9, Inspection Operation / Door Open, turns off to indicate that car is on inspection, or the gate switch or door locks are open.

LED's D10 - D17 are diagnostic or fault indicators. On normal operation, all the LED's will be off, with the exception of D10 and D11. These LED's indicate the direction of the car's motion, up or down.

Normal Operation

On normal operation, if a fault has occurred, the board will save the last fault. It will indicate the direction the car was traveling and which limit switch opened to initiate the slowdown into the terminal floor. The LED's are:

- **D10** Limit 1 Trip
- **D11** Limit 2 Trip
- **D12** Limit 3 Trip
- **D13** Limit 4 Trip

D14 Up
D15 Down
D16 Speed Feedback Failure
D17 Not Used

LED D14 or D15 will indicate the car's direction of travel, and D10 - D13 will indicate which limit opened to initiate the trip. D16 indicates that the board has lost the speed feedback input, preventing the board from being able to monitor the speed of the car.

Set Up Mode

While the board is in set up mode, D10 - D17 indicate the status of various functions the board monitors.

D10 Learn Up
D11 Learn Down
D12 Not Used
D13 Not Used
D14 Limit Opening at High Speed During Set Up
D17 Car on Inspection

D10 and D11 indicate that the learn up or learn down operations have not been completed. They will turn off after these operations have been performed.

D14 indicates that the car had not gone into slow down when the first limit switch opened. The limit switches need to be moved closer to the floor for proper operation of the board.

D15 indicates that an encoder has been detected for the speed feedback.

D16 indicates that the Limit board has detected that the speed reference input is present, and pattern clamping will be enabled.

D17 indicates that the car is on inspection operation.