

**TECHNICAL SERVICE MANUAL**

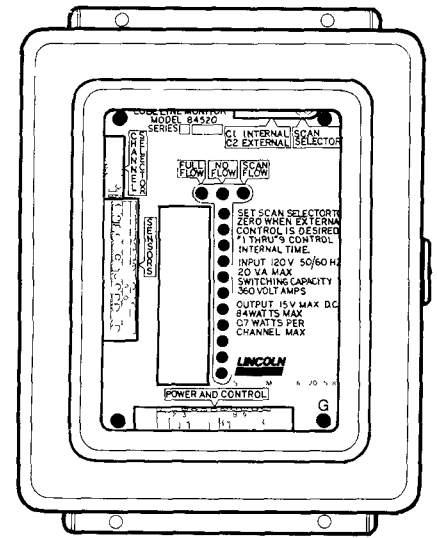
IT IS THE RESPONSIBILITY OF THE OWNER AND/OR OPERATOR TO PROPERLY USE AND MAINTAIN THIS EQUIPMENT. CAREFULLY READ AND UNDERSTAND THE INSTRUCTIONS AND WARNINGS IN THIS MANUAL BEFORE OPERATING THIS EQUIPMENT.

If the operator is not fluent in English, the instructions and warnings shall be read and discussed in the operator's native language, making sure the operator comprehends the contents.

This equipment complies with OSHA Standards where applicable.

**SPECIFICATIONS**

- Power Requirements: 115 Volts A.C., 12 Volt Amps (Optional 24 V.D.C., 10 Watts)
- Vibration and Shock Tolerance: 3G (Max.)
- Temperature: 32°F to 160°F (Lubricant Temperature)
- Environment: All Except Hazardous Areas
- Switching Capacity: 3 Amp at 120 V.A.C., 30 V.D.C.
- Internal Scan Control: 3.2 Hours Maximum, 90 Seconds Minimum
- External Scan Control: No Maximum Limit, 15 Seconds Minimum
- Sensors: Measures a minimum of .004 cu. in. intermittent lubricant delivery.



**84520**

**WARNING**

**Shock hazard. Turn power off before servicing.**

**CAUTION**

1. Follow local electrical codes concerning equipment grounding. Use slotted, Hex Head, green colored terminal for connecting grounding connector.
2. DO NOT subject sensor bodies to pressure greater than 6,000 PSIG.

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This manual contains **IMPORTANT WARNINGS** and **INSTRUCTIONS** READ AND RETAIN FOR REFERENCE

# PROCEDURE FOR SENSITIVITY ADJUSTMENT ON MODEL 84520 LUBE LINE MONITOR WITHOUT REMOVING IT FROM ITS INSTALLATION

Model 84520 monitors are factory set for most standard applications. To compensate for special applications (i.e., low/high flow, rapid cycle rates, extreme temperatures, noisy electrical environment) it may be necessary to adjust the sensitivity of sensors installed in the feedlines.

## To increase sensitivity of sensor:

If it is desired to make adjustment for maximum sensitivity, because of high temperatures, low flow, or rapid cycles, then follow as indicated below.

- A. Turn off electrical power to monitor and remove nameplate. Replace ground wire to grounding terminal (green screw). Remove any wiring presently connected to terminals 3, 4, 10 or 11 of power and control terminal strip.
- B. Connect jumper wire between terminals 4 and 10. Connect a switch (N.O.) between terminals 3 and 11.

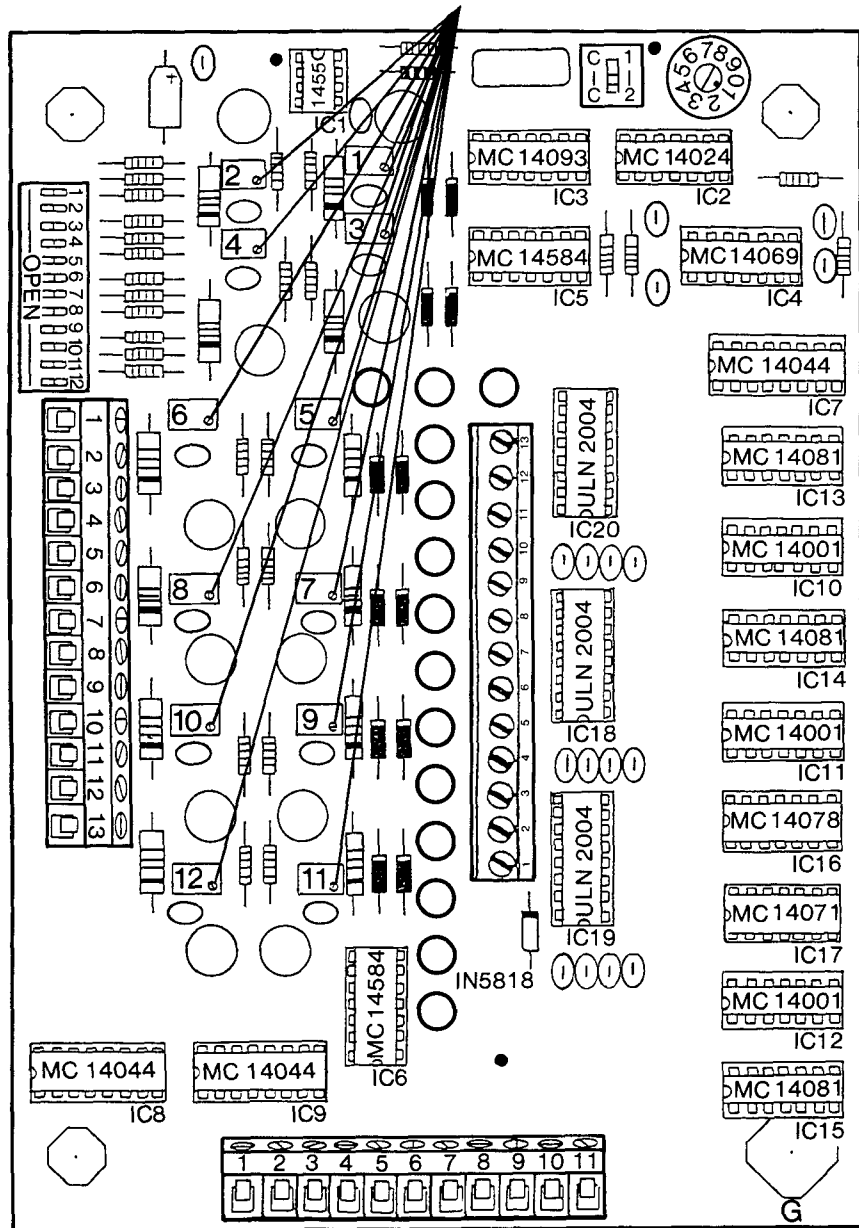
**CAUTION**

These circuits carry 120 volts AC when power is on to monitor.

- C. Open channel selector switches for all channels to which sensors are connected. Set control switch to C-2. Set scan timer switch (white dot) to zero (0). Turn power on. Green LED will light.
- D. Close switch which you connected between terminals 3 and 11. This switch will duplicate the scan function of the monitor. The yellow LED should turn on with the Green LED. Open external scan switch, close, then reopen switch.
- E. At the second opening of the external scan switch all Red LED's which correspond to the open channels will turn on. The Green and Yellow LED's will not be lit. Now reclose the external scan switch to relight the Yellow LED.
- F. Turn Number 1 sensitivity control slowly counterclockwise. Stop as soon as the Red LED goes out for Number 1 channel.
- G. Turn Number 1 sensitivity control 1/3 turn clockwise. Open, reclose, and reopen external scan switch.
  - a. If Red LED turns on, initiate lube cycle to turn Red LED off.
  - b. If Red LED does not light, turn sensitivity control and additional 1/16 turn clockwise. Repeat steps D, E and F.
- H. Repeat steps D, E, F and G for the 11 other channels.

**NOTE:** This is the most sensitive adjustment possible.

## SENSITIVITY ADJUSTMENTS



**IMPORTANT:** Surge suppressors will be required across all solenoids and shielded wire is recommended for sensor wiring when monitor is adjusted for maximum sensitivity.

## To desensitize sensor:

If it is desired to make a sensor less sensitive because normally large volumes are to be delivered and user wishes to guard against too small volume delivery. Then repeat steps A, B, C, D and E. Then follow as indicated below.

- i. Turn sensitivity control a full turn clockwise and initiate lube cycle then open, reclose and reopen scan switch.

- a. If Red LED remains on adjust control counterclockwise in increments of 1/16 turn. Initiate lube cycle until Red LED goes out.
- b. If Red LED does not remain on, adjust sensitivity control another full turn clockwise. Continue turning clockwise until Red LED comes on at opening of scan switch. When Red LED remains on adjust control counterclockwise in 1/8 turn.

**NOTE:** This is the least sensitive adjustment.

**IMPORTANT:** It is possible that channel selector switch will not be effective as a channel bypass means when channel is adjusted for least sensitivity.

## OPEN COLLECTOR SWITCHING INTERFACE WITH PROGRAMMABLE LOGIC CONTROLLER

The Red fault indicating LED's are controlled by open collector NPN Darlington Arrays connected to their cathodes. This cathode connection point is accessed by a terminal block located just to the right of the row of Red LEDs under the nameplate. This terminal block can be used to operate an input of a programmable logic control (PLC) provided the input module receives its power from the 24 volt DC source from terminals 8 and 9 of the power and control terminal block of the monitor.

The available power dissipation is restricted to .01 amp at 24 VDC by the limitations of the Darlington Arrays. To prevent an improper connection caused by confusion as to which terminal block is for what connection this PLC interface terminal board cannot be reached without first removing the nameplate. (Replace nameplate after making connections).

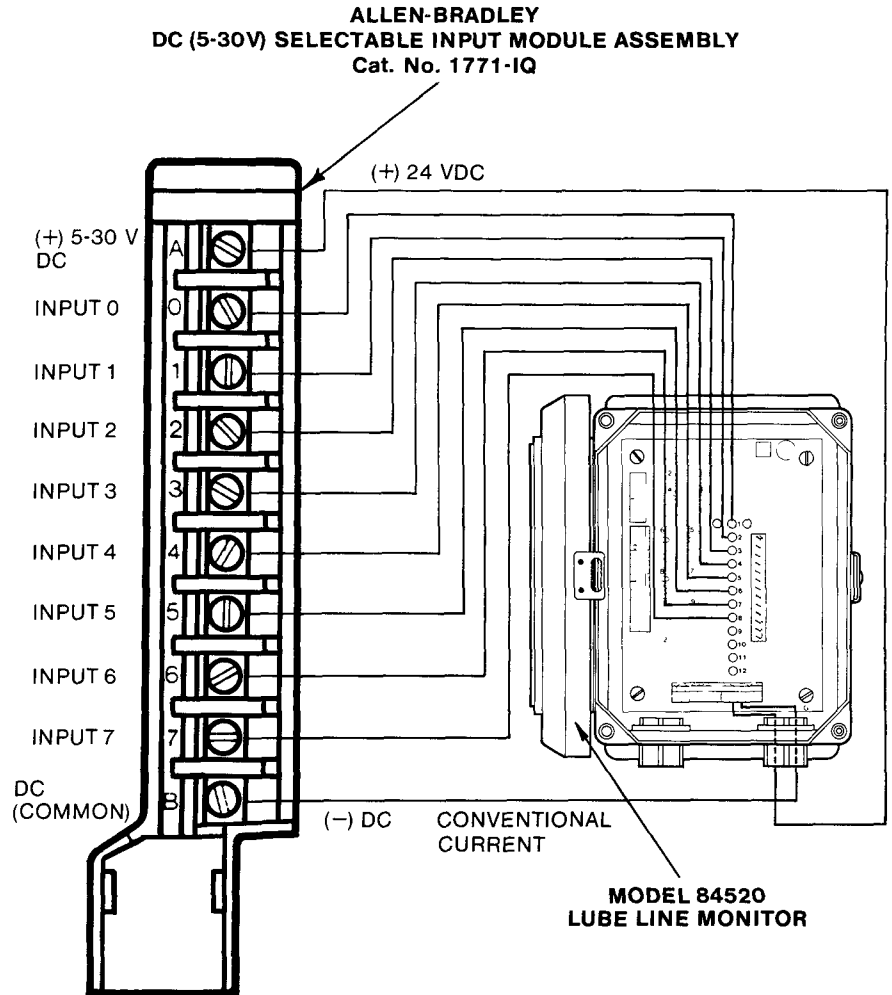
An additional conduit passage hole is to be cut into the side of the monitor enclosure to accommodate the wiring to the PLC.

An illustration of interconnection wiring between Lincoln 84520 monitor and Allen Bradley CAT No. 1771-1Q input module assembly is shown. (Printed by the permission of Allen Bradley Co., Milwaukee, Wisconsin).

Other manufacturers also make suitable equipment to accept the open collector, switching offered by the 84520.

## CONNECTION DIAGRAM

(See Applicable Codes and Laws)



## PROCEDURE FOR VERIFYING PROPER OPERATION OF MONITOR

It may become necessary to verify that fault signal (Red LED) is being caused by a lack of flow within the lubrication system. The procedure noted below will verify that the sensors are operating and are connected properly and the monitor is operating and connected properly.

Use a voltmeter capable of measuring at least 15 volts DC (an analog voltmeter is recommended).

Manually operate lube system while measuring DC voltage between sensor terminal indicating fault and base stud terminal (13) on 84520 lube line monitor.

- A. Voltage changes 0.5 (1/2) volt or more during lube cycle.
  1. Fault signal clears
    - a. Monitor is improperly programmed. Reprogram monitor to properly match the lube system operating sequences (Ref. Page 5 service sheet M36-2).
  2. Fault signal does not clear
    - a. Monitor is defective.
- B. Voltage does not change 0.5 (1/2) volt or more during lube cycle.
  1. Voltage reads  $15 \pm .5$  volt
    - a. Single conductor cable connecting monitor to sensor is broken.
    - b. Base stud is not connected to same conductive body of machine as is the sensor body.
  2. Voltage reads 0
    - a. Single conductor cable connecting monitor to sensor is shorted to base stud circuit.
    - b. Sensor element is shorted.
  3. Voltage reads between 1 and 3 volts.
    - a. No lube is reaching the sensor.
    - b. Lubricant temperature is too high.
  4. Voltage reads between 12 and 14 volts.
    - a. Lubricant is too cold to be effectively heated by sensor.
    - b. Defective sensor.
  5. Voltage reads between 3 and 12
    - a. Injector, divider valve or pump are not dispensing lube.
    - b. Feedline or supply lines are broken or blocked.

## OPERATING AT TEMPERATURES BELOW 32°F (0°)

When it is expected that lubricant temperature at sensors will be below 0°C (32°F), some form of heater must be applied so that the lube surrounding the sensing element will be heated to 0°C (32°F) or more. Only the lubricant in the immediate vicinity of the sensor need be heated; it is not necessary to heat the entire lube supply line length.

## OPERATING UNDER LOW VOLTAGE OR ELECTRICAL NOISY CONDITIONS

Electrical noise generated by the operation of solenoids and motors operating near the sensor can induce a high frequency pulse into the sensor lines or into the power lines which may be misinterpreted as a signal caused by lube flow when none has taken place. The solenoid, controlling the lube pump is most likely to be the culprit since its function occurs at approximately the same moment the monitor expects the signal to arrive from the sensor.

The most straight forward method to overcome this problem is to use a surge suppressor connected across the solenoid or motor. Good results have been obtained by connecting Allen Bradley Cat. No. 700-N5 Series C or R-K Electric Co. Cat. No. SS2A-6 surge compressors across the pump controlling solenoid.

Another procedure available, when lube flow is in excess of .01 cu. in., is to readjust the sensitivity to a less sensitive setting.

Low line voltage (110V or less) makes monitor more susceptible to this problem. Using shielded wire makes monitor less susceptible to this problem.

## TERMINAL 13 ON SENSOR TERMINAL BLOCK

The sensors are intended to be connected to the frame of the machine being lubricated when they are threaded into the bearing inlet. Using Teflon tape or other non-electrical conductive materials on these threads can prevent this connection.

It is also possible that moving members of the machine are not continuously connected electrically to the machine frame consequently an inconsistent performance will be present.

When there is the possibility of an inadequate return path through the machine frame, a conductor can be attached to the sensor fitting at one end and connected to terminal 13 of sensor terminal block at the other end.

Terminal 13 is isolated from the earth ground so such a connection will not effect other electronic devices which may be using the machine frame as part of their circuits.

We do not advocate using earth ground to connect to terminal 13. The preferred procedure is to mount the ground fitting (Part Nos. 350236 or 350323) on the machine frame and connect a wire from this fitting to terminal 13 of the sensor terminal block.

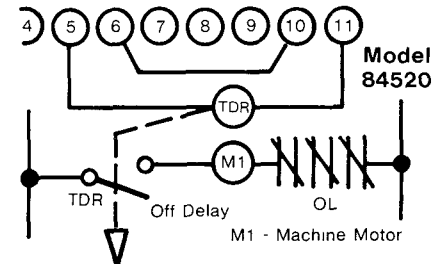
## 24 VOLT DC OPERATION LIMITS

The monitor can be used on mobile equipment where 24 volts DC power only is available by connecting the DC power (+) at terminal 8 and (-) at terminal 9 of the power and control terminal board.

When operating on 24 VDC only the on board timer is capable of controlling the scan time.

## INTERLOCK ALARM INTO MAIN CONTROL

The fault relay contacts can be used to stop the machine being lubricated if they are connected to operate a time delay relay (T.D.R.) with the delay contacts operating in the controller.



## TYPICAL WIRING DIAGRAMS FOR INSTALLING SUPPRESSOR

