** TROUBLESHOOTING MANUAL**

**** topics ****** **page#**

TROUBLESHOOTING

IF YOU ARE EXPERIENCING ONE OF THE PROBLEMS LISTED BELOW, MAKE THE INDICATED CHECKS IN THE ORDER STATED. THE CHECK PROCEDURES CAN BE FOUND IN TEST PROCEDURES

SERIES 500 MONITORS

ONE OR MORE LIGHTS ARE NOT ILLUMINATING:
PERFORM CHECKS: a,b,h, f, j, l, & c

ALL OF THE LIGHTS ARE NOT ILLUMINATING:
PERFORM CHECKS: g, h, j, l, & c

ONE OR MORE LIGHTS STAY ON WHEN TANK IS EMPTY:
PERFORM CHECKS: a, b, e, j, l, & c

A LIGHT IS INTERMITENT:
PERFORM CHECKS: a, b, e, h, j, l,& c

FLASHING REFILL LIGHT ON THE 5 LIGHT DISPLAY DOESN'T FLASH:
PERFORM CHECKS: a, b

ALL OF THE LIGHTS ARE CONSTANTLY ON:
PERFORM CHECKS:d, e, j, l,& c

LED SENTINEL IS NOT ILLUMINATING:
PERFORM CHECKS: d

FREQUENT BULB FAILURE DUE TO EXCESSIVE VIBRATION/ ROUGH USAGE:
REFER TO CHECK: a

TROUBLESHOOTING

(SERIES 2000 MONITORS)

ONE OR MORE LIGHTS ARE NOT ILLUMINATING:
PERFORM CHECKS: a,b,h, o, p, & f

ALL OF THE LIGHTS ARE NOT ILLUMINATING:
PERFORM CHECKS: g, h, o, & p

ONE OR MORE LIGHTS STAY ON WHEN TANK IS EMPTY:
PERFORM CHECKS: a, b, e, o, & p

A LIGHT IS INTERMITENT:
PERFORM CHECKS: a, b, e, h, o, & p

FLASHING REFILL LIGHT ON THE 5 LIGHT DISPLAY DOESN'T FLASH:
PERFORM CHECKS: a, b, o, & p

ALL OF THE LIGHTS ARE CONSTANTLY ON:
PERFORM CHECKS:d, e, o, & p

LED SENTINEL IS NOT ILLUMINATING:
PERFORM CHECKS: d, & o

FREQUENT BULB FAILURE DUE TO EXCESSIVE VIBRATION/ ROUGH USEAGE:
REFER TO CHECKS: a

MONITOR DOES NOT APPEAR TO BE INDICATING PROPER LEVELS
PERFORM CHECKS: o, p & k

TROUBLESHOOTING

(SERIES 500 OR 6000 PRISM)

LEDS ARE NOT ILLUMINATING:
PERFORM CHECKS: o, n

MAIN PRISM DISPLAY LEDS REMAIN ON CONSTANTLY:
PERFORM CHECKS: g, h

(SERIES 6000 PRISM)

SERIES 6000 PRISM DISPLAY WILL NOT READ FULL:
PERFORM CHECKS: o, p

(SERIES 500 PRISM)

RECEIVING AN ERROR SIGNAL WITH LEDS CYCLING BLUE, GREEN, AMBER, RED:
PERFORM CHECKS: m, c, l

** TROUBLESHOOTING**SERIES 7000

BEFORE MAKING ANY OF THE FOLLOWING CHECKS, CHECK THE STANDARD DISPLAY ON THE PUMP PANEL TO CONFIRM THAT IT IS OPERATING PROPERLY. IF IT IS NOT OPERATING CORRECTLY, REFER TO THE TROUBLESHOOTING MANUAL FOR THAT UNIT. IF THE DISPLAY ON THE PUMP PANEL IS WORKING PROPERLY, THEN IF:

ALL LAMPS DO NOT ILLUMINATE:
PERFORM CHECKS: q

ONE LAMP DOES NOT ILLUMINATE:
PERFORM CHECKS: r

TROUBLESHOOTING SERIES 6000

DIAL IS NOT READING CORRECTLY:

PERFORM CHECKS: o, & p

* TROUBLESHOOTING** SERIES 5000

NO LIGHTS BELOW 28° TO 32° FAHRENHEIT:
PERFORM CHECKS: s

CONSTANT LIGHTS ABOVE 28° TO 32° FAHRENHEIT:
PERFORM CHECKS: t

TROUBLESHOOTING HEATER TAPES:
PERFORM CHECKS: u

“SERVICE REQUIRED” LED IS ILLUMINATED (LOAD EXCEEDED 20 AMPS)
PERFORM CHECKS: v

IMPORTANT SERIES 5000 NOTE!!

*USE ONLY A **MAXIMUM** OF 12 TAPES PER MODULE. 6 PER OUTPUT.*

TROUBLESHOOTING SERIES 4000

LIGHTS ARE CONSTANTLY FLASHING WHEN PUMP OR PTO HOUSING IS BELOW 120° F*:*
PERFORM CHECKS: w

LIGHTS DO NOT FLASH WHEN PUMP OR PTO HOUSING IS AT OR ABOVE 120° F:
PERFORM CHECKS: x

** TEST PROCEDURES**

a--------- CHECK BULBS …REPLACE NON-FUNCTIONING BULBS WITH KNOWN GOOD BULB TO DETERMINE PROBLEM. REPLACE DEFECTIVE BULB WITH P/N M2303 (INCANDESCENT) OR LED LAMP. P/N M0432-5 LED. LAMPS ARE COLOR SPECIFIC. REFER TO PAGE 13 FOR LED REPLACEMENTS.

FLASHING BULB REPLACE WITH P/N M2301
REPLACE 24V BULB WITH P/N M2304.
FLASHING 24V BULBS ARE NOT AVAILABLE

b-------- IF ALL BULBS ARE GOOD, CHECK FOR A LOOSE SOCKET BY WIGGLING THE BULB. IF SOCKET IS LOOSE, CALL MC TECH SUPPORT.

c---------

CLEANING THE SENSOR:

- REMOVE THE SENSOR FROM THE TANK
- LOOSEN COMPRESSION FITTING AND REMOVE STAINLESS STEEL TUBE.
- CLEAN EXPOSED ENDS OF PROBES WITH FINE STEEL WOOL.
- CLEAN INSIDE AND OUTSIDE OF THE STAINLESS STEEL TUBE.
- WIPE PROBES AND TUBE WITH A CLEAN CLOTH.
- REASSEMBLE AND INSTALL SENSOR BACK IN TANK.

d-------- ON NEW SERIES 500 WITH SENTINEL FEATURE, ORANGE WIRE MUST BE CONNECTED TO POWER SOURCE AHEAD OF THE MASTER SAFETY SWITCH. RED WIRE IS CONNECTED TO POWER SOURCE AFTER THE MASTER SAFETY SWITCH.

TO DISABLE SENTINEL FEATURE, CONNECT RED AND ORANGE WIRES TOGETHER AND CONNECT TO POWER SOURCE AFTER THE MASTER SAFETY SWITCH.

** TEST PROCEURES CONT.**

e--------- CHECK CABLE FOR DAMAGE THAT MIGHT ALLOW CABLE TO CAUSE A SHORT CIRCUIT. REPLACE CABLE IF NECESSARY.

f--------- TURN OFF POWER AND CLEAN SOCKETS WITH A CLEAN DAMP CLOTH.

g--------- MAKE SURE THE ALL CONNECTION FROM THE DISPLAY MODULE TO THE SENSOR ARE SECURE

h--------- ENSURE THAT THE UNIT IS WIRED CORRECTLY; THAT THE MASTER SWITCH IS ON; AND THE WATER TANK IS FULL.

j-------

CONTINUITY CHECK OF THE DISPLAY MODULE:
WHEN YOU TAKE PIN 1 (YELLOW) TO GROUND, THE FULL LIGHT SHOULD COME ON.
REPEAT FOR ALL REMAINING PINS.

PIN 1 (YELLOW WIRE) ----------"FULL" LIGHT SHOULD TURN ON
PIN 2 (BLUE WIRE) ----------3/4 LIGHT SHOULD TURN ON
PIN 3 (BLACK WIRE) ----------1/2 LIGHT SHOULD TURN ON
PIN 4 (WHITE WIRE) ---------- ¼ LIGHT SHOULD TURN ON

IF THIS TEST FAILS, CONTACT MC TECHNICAL SUPPORT.

k---------- REFER TO CALIBRATION INSTRUCTIONS IN SERIES 2000 MONITOR INSTRUCTION MANUAL

** TEST PROCEDURES CONT.**

l----------

CONTINUITY CHECK OF SENSOR

(IN-TANK) SENSOR CHECKS

(MAKE SURE TANK IS FULL FOR THIS TEST!)

DISCONNECT THE SENSOR FROM THE DISPLAY. WITH AN OHMMETER, CONNECT THE RED LEAD TO PIN 5 (GRAY WIRE) IN THE SENSOR CONNECTOR. CONNECT THE BLACK LEAD OF THE METER, ALTERNATELY TO:

PIN 1 (YELLOW WIRE) FULL LEVEL
PIN 2 (BLUE WIRE) ¾ LEVEL
PIN 3 (BLACK WIRE) ½ LEVEL
PIN 4 (WHITE WIRE) ¼ LEVEL

EACH OF THESE 4 OHMMETER READINGS SHOULD BE LESS THAN 15K OHMS. IF NOT, CLEAN SENSOR AS PER INSTRUCTIONS ON PG. 7, **"CLEANING THE SENSOR"**

(OUT-OF-TANK SENSOR CHECK)

EXPOSE THE PROBES BY UNDOING THE COMPRESSION FITTING AND REMOVING THE STAINLESS STEEL TUBE.

USING AN OHMMETER, CONNECT THE METER'S LEADS BETWEEN THE FOLLOWING POINTS. THE OHMMETER SHOULD INDICATE CONTINUITY BETWEEN THESE POINTS. (LESS THAN 10 OHMS).

CONNECT RED LEAD TO: ***SENSOR CONNECTOR PIN***	**WIRE COLOR**	**CONNECT BLACK LEAD TO:** ***PROBE***
P1N 1	YELLOW	**"FULL"** (SHORTEST)
PIN 2	BLUE	**¾ LEVEL** (NEXT PROBE DOWN)
PIN 3	BLACK	**½ LEVEL** (NEXT PROBE DOWN)
PIN 4	WHITE	**¼ LEVEL** (LONGEST)

****IF THESE TESTS DO NOT YIELD PROPER RESULTS, CONTACT MC PRODUCTS TECH SUPPORT..**

m-------- DISCONNECT THE DISPLAY MODULE FROM THE SENSOR. IF THE ERROR NO LONGER CYCLES AND THE TANK NOW READS EMPTY, THERE MAY BE A PROBLEM IN THE SENSOR OR THE WIRING. IF THE UNIT STILL SHOWS THE ERROR SIGNAL WITH THE SENSOR DISCONNECTED, CALL MC PRODUCTS TECH SUPPORT WITH THIS INFORMATION.

n------ REMOVE THE PRISM DISPLAY COMPLETELY FROM THE TRUCK AND POWER UP THE UNIT ONCE AGAIN WITH NOTHING TOUCHING THE CHASSIS OF THE PRISM. IF THE UNIT NOW WORKS PROPERLY, CONTACT MC PRODUCTS TECH SUPPORT WITH THIS INFORMATION.

o------- ENSURE THE TANK IS FULL. USING A VOLTAGE METER, VERIFY THAT THE VOLTAGE GOING TO THE DISPLAY IS APPROX. 12 VOLTS FOR 12V SYSTEMS OR 24 VOLTS FOR 24V SYSTEMS. TOUCH THE POSITIVE (RED) LEAD OF THE VOLT METER TO THE POWER WIRE COMING OFF OF THE DISPLAY MODULE. TOUCH THE BLACK GROUND LEAD FROM THE VOLT METER TO THE GROUND WIRE COMING OFF OF THE DISPLAY MODULE. IF THE READING OF THE VOLTAGE METER IS 12 VOLTS OR 24 VOLTS FOR 24V SYSTEMS, PROCEED WITH THE NEXT TEST PROCEDURE. IF THE VOLTAGE IS NOT 12 VOLTS FOR 12V SYSTEMS OR 24 VOLTS FOR 24V SYSTEMS, YOU MUST FIRST CORRECT THIS PROBLEM. BEFORE PROCEEDING WITH FUTURE TEST PROCEDURES. **REFER TO YOUR SPECIFIC MONITOR MANUAL FOR CONNECTOR PIN DESCRIPTIONS**.

p------- TANK MUST BE FULL FOR THIS TEST. DISCONNECT THE CONNECTOR ON THE DISPLAY MODULE FROM THE CONNECTOR ON THE CONTROL CABLE. USING THE CONTROL CABLE CONNECTOR, TOUCH A VERIFIED 12-VOLT POWER LEAD TO PIN #1. GROUND THAT POWER SOURCE TO PIN #2. USING A VOLTMETER, TOUCH THE POSITIVE **(RED)** LEAD TO PIN #3 AND THE NEGATIVE **(BLACK)** LEAD TO PIN #2. THE READING ON THE VOLT METER SHOULD BE APPROXIMATELY 4 - 6 VOLTS. IF THE VOLTAGE READING IS NOT BETWEEN 4 – 6 VOLTS, CALL MC PRODUCTS TECH SUPPORT.

WITH ALL TECHNICAL SUPPORT ASSISTANCE, THE MC TECHNICIAN REQUIRES THE VOLTAGE READING, STYLE OF DISPLAY, DATE OF PURCHASE OR ITEM SERIAL NUMBER (ITEM SERIAL NUMBER IS LOCATED ON THE CALIBRATION LABEL ON THE SIDE OF THE DISPLAY.

q---------

- CHECK THE EXTERIOR LAMP POWER SOURCE AND FUSES.
- MAKE SURE THE UNIT IS WIRED CORRECTLY
- MAKE SURE THE MASTER SAFETY SWITCH IS ON AND THE TANK IS FULL.
- MAKE SURE THE CONTROL CABLE IS CONNECTED TO THE UNITS 1 ft CABLE PROPERLY.

r---------

- CHECK TO MAKE SURE THE BULB IS GOOD
- CHECK THE BULB SOCKET. CLEAN IF NECESSARY
- CHECK ALL WIRING

s---------

- *CHECK PROPER POWER AND GROUND CONNECTIONS*
- *RESET CIRCUIT BREAKER ON DISPLAY MODULE*
- *CHECK BULB. BULB SHOULD BE REPLACED WITH MC PRODUCTS P/N M2301*
- *THE COLD SENSOR SHOULD BE TESTED WITH CO2 OR FREEZE-IT SPRAY ONLY. AN ICE CUBE IS NOT AN APPROPRIATE TEST, AS IT MAY NOT GET THE SENSOR COLD ENOUGH TO ACTIVATE THE COLD SENSOR.*

t----------

- *CHECK THE BULB. IT SHOULD BE A #256 FLASHER TYPE BULB.*

u---------

- ***CHECK FOR CUTS IN THE HEATER TAPES.*** *THEN APPLY 12 VDC ACROSS ANY ONE OF THE CONNECTORS AND GROUND ON THE OTHER. AFTER ABOUT A MINUTE, THE WARMTH CAN BE FELT WITH YOUR HAND.* ***BE CAREFUL*** *– THE TAPES DO GET HOT!*

v---------

- *RESET CIRCUIT BREAKER LOCATED ON THE BACK OF THE UNIT. IF IT TRIPS AGAIN, DISCONNECT THE HEATER TAPES FROM THE MODULE AND RESET BREAKER AGAIN. IF THE CIRCUIT BREAKER TRIPS WITH NO HEATER TAPES CONNECTED, THE PANEL GAUGE HEATER MODULE IS IN NEEDS SERVICED. CALL MC PRODUCTS TECH SUPPORT. IF THE BREAKER DOES NOT TRIP, ONE OR MORE OF THE HEATER TAPES NEEDS SERVICE OR REPLACEMENT. A* ***20 AMP RE-SETTABLE CIRCUIT BREAKER*** *IS LOCATED ON THE REAR OF THE DISPLAY MODULE AND CAN BE RESET BY PUSHING IN THE RESET PIN.*

w---------

- *DISCONNECT THE SENSOR FROM THE DISPLAY. IF LIGHTS REMAIN ON, THERE IS A PROBLEM WITHIN THE DISPLAY. IF THE LIGHTS GO OUT, THE PROBLEM IS IN THE SENSOR. (UNIT USES 2 - #256 FLASHING BULBS).*

x----------

- CHECK FOR PROPER POWER AND GROUND CONNECTIONS.
- PRESS THE TEST SWITCH. IF THE LIGHTS DO NOT COME ON, THE PROBLEM IS IN THE DISPLAY. IF THE LIGHTS DO COME ON, THE PROBLEM IS WITHIN THE SENSOR.

THE SWITCH ON THE OVERHEAT DISPLAY IS A TEST SWITCH USED TO INDICATE IF THE LIGHTS AND ALARM, IF USED, ARE FUNCTIONING PROPERLY. WHEN PRESSED, THE PUMP OVERHEAT UNIT BYPASSES THE SENSOR AND APPLIES 12VDC TO THE LIGHTS. (NOTE: THE LIGHTS WILL FLASH AS LONG AS THE SWITCH IS DEPRESSED.) THE TEST LETS THE OPERATOR KNOWS THAT THE UNIT HAS 12 VDC AND GROUND APPLIED AND THAT THE LIGHTS AND ALARM, IF USED, ARE WORKING PROPERLY.

LED

Incandescent, bayonet type bulb replacement

Direct replacement LED for bayonet type incandescent bulbs.

2 styles available:

- Negative center contact
- Positive center contact

To determine which style is required, conduct the following test outlined below.
Tools Required: Voltage Meter

Test procedure for installed units

- Ensure tank is full and unit is connected to power
- Remove a known working bulb from the display
- Connect the black lead of the voltage meter to ground
- Place the red lead on the center contact of the bulb socket
- If the voltage meter reads 12 Volts, a **Positive Center Contact LED** is required
- If the voltage meter reads 0 Volts, continue testing by connecting the red lead of voltage meter to power and the black lead to the center contact of the bulb socket
- The meter should now read 12 Volts indicating that a **Negative Center Contact LED** is required

Test procedure to bench test units

- With the unit connected to power, short pin # 1 to pin # 5. The full light should illuminate
- Remove the full bulb and conduct the above test to determine the style required

- **To assure highest visibility, color must match lens color**

Negative Center Contact LED

Part Number	Color	Price
M0428	Red	$7.50
M0429	Green	$11.25
M0430	Amber	$5.00
M0431	Blue	$7.50

Positive Center Contact LED

Part Number	Color	Price
M0432	Red	$7.50
M0433	Green	$11.25
M0434	Amber	$5.00
M0435	Blue	$7.50

All units with the Sentinel feature require a Positive Center Contact LED
All LED s are 12 Volt DC

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