Fan Motor

The fan motor speed is set by the controller if the watchdog is not tripped. The microprocessor supplies a PWM signal to an optocoupler for isolation. The output is connected to an integrator circuit that converts the PWM to an analog signal for the motor controller. The motor incorporates hall effect sensors for monitoring and control. One of the hall effect sensor outputs is fed to the microprocessor for measuring the motor speed. In the event the watchdog timer is tripped, the fan motor speed is maintained at 1500 rpm ± 450 rpm.

The controller provides an alarm to indicate a failure of the fan to rotate. The heater and humidifier are disabled when this occurs. An audible alarm with visual indication is activated.

Heater Power

The controller monitors the heater power. A current transformer is in series with the power to the heater and the humidifier. The output of the current transformer is connected to the A/D converter.

The system provides a means for controlling the incubator heater. The microprocessor controls a solid state relay that controls the power to the heater. The microprocessor and the watchdog circuit control the safety relay (K3). The release of the safety relay removes power from the heater regardless of the functionality of the heater triac.

Humidity Heater Power

The controller monitors the humidity heater power. A current transformer is in series with the power to the heater and humidifier. The output of the current transformer is connected to the A/D converter.

The system provides a means for controlling the humidity heater. The microprocessor controls a solid state relay that controls the power to the humidity heater. The microprocessor and the watchdog circuit control the safety relay (K3). The release of the safety relay removes power form the humidifier heater regardless of the functionality of the humidity heater triac.

Oxygen Control

The system provides a means for controlling the oxygen pneumatics. The microprocessor provides a PWM signal to the solenoid MOSFET.

The voltage to the oxygen solenoid is monitored and fed into the A/D converter. This circuit monitors the 12V power supply and thermal fuse.

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LEDs

Each LED is driven by the microprocessor. The hardware watchdog timer circuit also drives the alarm/system fail indicator. The power fail detection circuitry also drives the power fail indicator.

Audio Alarms

The audible alarm circuit incorporates an oscillator circuit to generate 600 Hz, 1500 Hz and 2500 Hz, the three alarm frequencies used. The microprocessor, the watchdog circuit, and the power failure detection circuitry drive the audible alarm circuit.

The audio volume is capable of three discrete sound levels. An analog switch is incorporated in the audible alarm amplifier circuit to select 57 dB, 62 dB, or 65 dB output as measured per IEC601-19-2:102.3. The microprocessor, the watchdog circuit, and the power failure detection circuit control the analog switch.

Power Fail

The controller provides an audio output for power fail conditions. The alarm oscillator is set for 600 Hz at 65 dB output as measured per IEC601-19-2:102.3. A timer circuit is used to generate the cadence tone during power failures.

When a **Power Failure** alarm is activated, the following occurs:

- The **Power Fail** indicator on the front panel illuminates.
- An alarm sounds.

The power failure detection circuitry is powered by a high energy storage capacitor capable of supplying power to the audible alarm and indicator for a minimum of 10 min. This capacitor is charged while the unit is operating. When power is lost to the controller and the power switch remains in the on position, the storage capacitor supplies power to the power failure circuitry. The power failure circuitry incorporates a timer circuit that periodically (cadence of 520 millisecond OFF and 98 millisecond ON) enables the audible alarm and **Power Fail** indicator. This continues until the power switch is turned off, power is restored, or the storage capacitor is depleted.

The **Power Failure** alarm silence is hardware controlled. Pressing the **Alarm Silence** key during power failure silences the audible alarm for the duration of the power failure. The **Power Fail** indicator continues to flash until the storage capacitor is depleted, the power switch is turned off, or power is restored. The system failure alarm is unaffected by the **Alarm Silence** key.

Interfacing

An interface port provides an RS-232 serial communication link. The serial port is fully isolated form the remaining controller circuitry. Power to the serial port interface circuitry is derived from an isolated winding on the power supply transformer. The RS-232 interface connector is a female DB-9 mounted on the rear of the controller. An RS-232 transceiver converts the RS-232 to logic voltage levels and vice versa. Optocouplers provide the isolation barrier and interface the RS-232 transceiver to the PC16550 UART. The UART interfaces the serial port to the microprocessor bus. All lines connected to the RS-232 connector are filtered to block EMI. The RS-232 transceiver incorporates electrostatic discharge (ESD) protection.

An interface is provided for communication between the controller module and the sensor module. The sensor module interface connector is a female DB-9 mounted on the rear of the controller. This is comprised of a bi-directional data line, a clock output line, and a reset output line. The data lines are fully isolated and optocoupled to the microprocessor. The controller provides isolated power to the sensor module.

Door Switches

The controller is connected to the two door switches that are wired in parallel. The controller provides no more than 5 ma of current and less than 6V of power to the switches and monitors the return current to determine if either door is open. The switches are open when the door is closed. The input is protected with transorb diodes and filtered to block EMI and prevent ESD damage to the controller.

Cooling Fan

The cooling fan provides a continuous flow of air through the controller to remove heat generated by the various components inside the controller enclosure. The cooling fan is operated whenever power is applied to the controller. The cooling fan is equipped with a tachometer output signal that is supplied to the microprocessor.

Ambient Temperature Sensors

The temperature sensors are NTC thermistors. The output signals of the redundant sensors are fed into the A/D converter. The sensors are located in the airflow of the cooling fan.

Watchdogs

The first watchdog timer is internal to the microprocessor. In the event the software does not update the watchdog timer within the required time frame, the internal watchdog resets the microprocessor and all peripherals connected to the external reset line.

The second watchdog timer circuit is attached to the microprocessor bus. The microprocessor must continuously write the following data to the watchdog timer:

- Data 55 hex (01010101 binary) to watchdog register #1.
- Data AA hex (10101010 binary) to watchdog register #2.

The watchdog timer trips in 1 s ± 0.4 s unless the above sequence is completed. Once the watchdog timer trips, the following occurs:

- The safety relay is turned off. This removes power from the heater and the humidifier.
- The fan control reverts to closed loop control, maintaining a constant fan speed regardless of the door positions.
- The oxygen solenoid control from the microprocessor is overridden, and the oxygen solenoid is turned off so no oxygen can enter the hood.
- A constant audible alarm is sounded for a minimum of 500 milliseconds.
- The system failure indicator is lit.

The microprocessor can reset the watchdog timer after a watchdog trip by sending the above data sequence.

Factory Defaults

Factory defaults are stored in program memory (flash EEPROM). System parameters that have been configured are stored in the Real Time Clock (RTC) module or serial EEPROM. The RTC memory and Random Access Memory (RAM) is protected against corruption during power failures and is battery-backed for a period of time.

3

The program is stored in reprogrammable memory and may be reprogrammed via a cable connected to the serial port of a personal/notebook computer. The program memory is stored in a flash EEPROM. The RS-232 serial port is designed to operate at speeds of 115,200 baud to expedite the speed of the program download.

Power Supply

The power supply is so designed that 1 s after disconnection of the plug, the voltage between the supply pins of the plug and between either supply pin and the enclosure does not exceed 60V. This is accomplished by using a bleeder resistor across the mains filter capacitor if necessary.

Air System

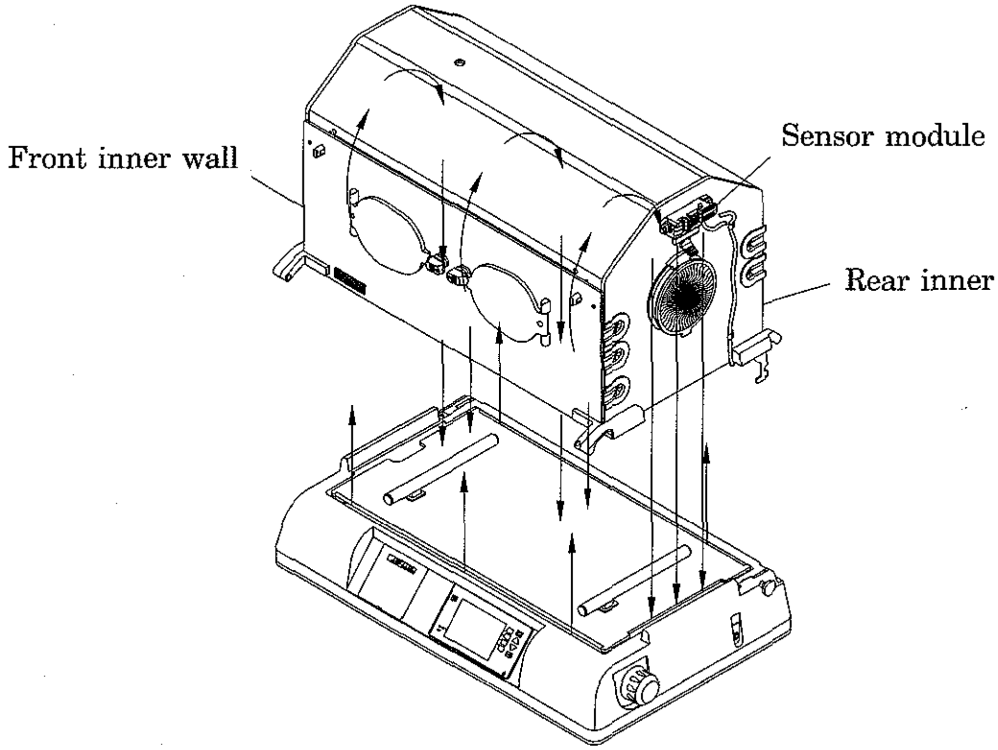
Overall Functional Description

The controller provides displays of air temperature and skin temperature on an electro-luminescent display. Optional displays of humidity and oxygen concentration levels within the hood environment and infant weight are available. In addition, trend displays of 2, 4, 8, 12 and 24 hours of all parameters (except weight, which is presented in days) are user selectable.

To indicate which parameter (air or skin) is controlling, the set temperature of the controlling parameter remains on adjacent to the actual displayed temperature. In addition, the rotating wheel in the **Air** or **Skin** softkey designator rotates.

The control of temperature, humidity, and oxygen concentration are controlled by means of the forced air circulation system (see figure 3-10 on page 3-23). A controlled amount of room air (approximately 7 lpm) is drawn through the air intake filter by means of the motor-driven impeller located in the shell.

Figure 3-10. Air/Oxygen Circulation System



3

In addition to drawing fresh, filtered air into the incubator, the impeller provides for the internal circulation at a much greater flow than that of the fresh gas inflow. The total flow of fresh and circulated air is directed past the airflow sensor and around the heater. The air enters the infant compartment up through the slots at the front and rear of the main deck. It then passes between the front and rear inner walls. The air circulates past the sensor module, which contains the temperature sensing probe that encapsulates the air temperature control thermistor and a high air temperature alarm thermistor. After circulating within the infant compartment, the air is then re-circulated down through a slot in the right end of the main deck, and back to the impeller. When the access panel of the hood is open, the air continues to flow upward past the opening, creating a warm air curtain, which minimizes the drop in air temperature in the incubator. Temperature is regulated using either incubator air or skin temperature as the controlling parameter; the desired mode is selected by the front panel keys.

In either mode of operation, the heater output is proportional to the amount of heat required to maintain the desired temperature. Each mode of operation (including the optional oxygen, weight, and humidity functions) is described below.

Air Mode

In Air Mode, the air temperature can be maintained from 68°F to 99°F (20°C to 37°C) (99°F to 102°F (37°C to 39°C) in Temperature Override Mode), as selected by the **Air Set Temperature** Up and Down arrow keys on the front panel. The incubator air temperature is monitored by a probe located in the sensor module and compared with the air set temperature setting. The information from this probe is supplied to the heater control circuitry, which regulates the heater output to maintain the air temperature setting. The actual air temperature is displayed on the **Air Temperature** display. A second sensor within the air temperature probe serves as a backup to limit the maximum incubator temperature. In the event that the high temperature limit is activated, the heater is shut off.

In Air Mode, the infant's temperature is a function of the air temperature and the infant's ability to establish and maintain its own temperature. A small infant, or one with underdeveloped homeostatic control, may not be able to maintain a stable temperature at the desired level.

Skin Mode

In Skin Mode, the infant's temperature can be selected from 93°F to 99°F (34°C to 37°C) (99°F to 100°F (37°C to 38°C) in Temperature Override Mode) by the **Skin Set Temperature** Up and Down arrow keys on the front panel. A temperature sensing probe is attached directly to the infant's skin; the information from the probe is supplied to the heater control circuitry which proportions the heater output to maintain the skin set temperature.

The air temperature is still displayed in Skin Mode, for information only. If Air Mode is selected while the skin probe remains connected, the **Skin Temperature** display continues to display actual skin temperature, but it will not control.

The sensor module is equipped to accept two skin probes. However, when the second skin probe is connected to the sensor module in skin mode, an alarm sounds, and the message **Remove Skin 2 Probe** appears. In order to connect the second skin probe, first select Air Mode. Then the controller displays the two temperatures.

If probe 1 is disconnected from its receptacle during the Skin Mode, the **Skin Temperature** display blanks and an alarm sounds and the heater turns off.

Oxygen Control

The oxygen concentration level within the incubator hood environment is controlled by adjusting the flow of oxygen into the hood by using an oxygen sensor assembly mounted inside the sensor module.

Flow into the incubator is regulated by a valve that periodically interrupts the flow of oxygen into the incubator.

The sensor module houses two independent oxygen fuel cells, which are used to monitor and control the oxygen concentration levels inside the incubator.

If the sensor module is outside of the hood environment during oxygen control mode, audible and visual alarms are enabled, and the flow of oxygen is interrupted.

In Oxygen Mode, the user may set the oxygen level control point from 21% to 65%. The high and low alarm limits are automatically set to ±3% from the control point. In the event that the oxygen concentration level rises above or falls below the selected setpoint limits, an audible and visual alarm occurs.

Humidity Control Valve

The built-in humidifier provides humidification of the incubator from 30% to 95% RH in 1% increments. The humidifier reservoir permits visual inspection of the water level.

If the water level in the chamber is depleted, an audible and visual **Low Humidity** alarm occurs, indicating a need to replenish the water supply.

Hardware

Weighing Mode

The actual weighing function is performed by two load cells contained in a platform under the mattress. These cells provide a voltage that is proportional to the load on it. The voltage is processed by the controller, which in turn displays it in either kilograms or pounds/ounces on the weight display.

The weighing routine may be initiated by placing the infant on the mattress, or in the event the infant is already on the mattress, the infant must be lifted off the mattress; when the system zeros, the infant can be returned to the mattress to obtain the weight.

The **Weigh** key allows for repeated re-weighing of the infant after the weighing routine has been initiated as described above.

Trend Displays

Four standard parameters are presented on Trend displays:

- Air temperature
- Skin temperature #1
- Skin temperature #2
- Heater power

Additional Trend displays are also available when the unit is equipped with any of the following options:

- Oxygen
- Weight
- Humidity

The Trend time is user-selectable in intervals of 2, 4, 8, 12, and 24 hours for all parameters, except for weight which provides a trend of 7 days.

Interface Connections

A serial interface port is provided. This port is configured as a data terminal device and provides an RS-232 output.

The following parameters are available:

- Air and skin setpoint temperatures
- Current air and skin temperatures
- Oxygen setpoint
- Oxygen level
- Humidity setpoint
- Humidity level
- Infant weight

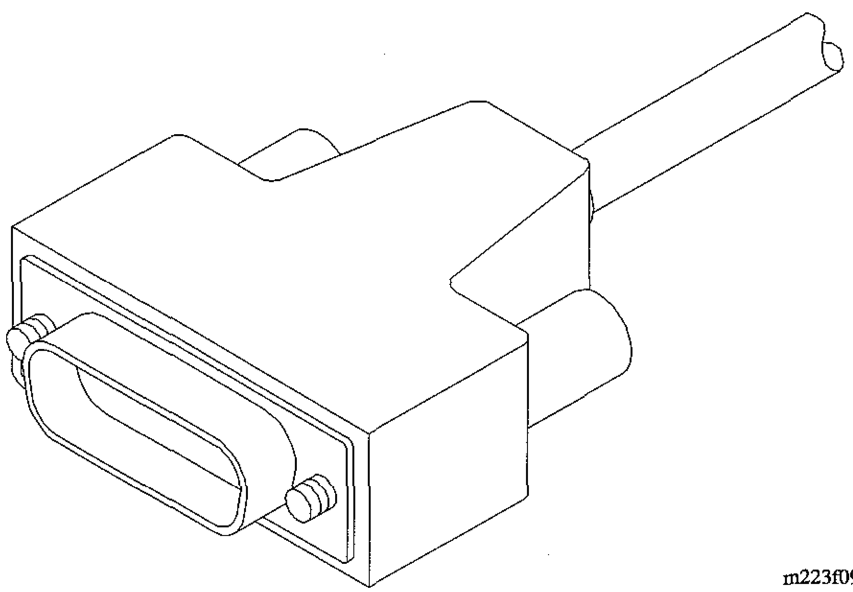
RS-232 Serial Port Protocol

The RS-232 serial port connector is located next to the AC power connector on the front of the incubator. The serial port is configured for 2400 baud, 8 data, 1 stop, no parity, and is output only (see figure 3-11 on page 3-27).

Figure 3-11. RS-232 Connector Pin Outs

C2000 RS-232 port connector
9-pin D-female

1 NC
2 RXD
3 TXD
4 NC
5 GND
6 NC
7 NC
8 NC
9 NC



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During normal system operation, a data packet is transmitted every 5 seconds. Each data packet is presented entirely in American Standard Code Information Interchange (ASCII) and is readable when displayed on any standard RS-232 terminal device. A data packet consists of one line of text. Each text line is exactly 82 characters and is composed of a prefix, a data portion, a suffix, a checksum, and a CR/LF pair.

The prefix serves to identify the data line. It consists of an opening bracket and an ID character that are unique to the data line. The format of the data portion is dependent on the specific data line. Any character positions within the data portion that are presently undefined are transmitted as spaces to enhance the readability of the output. The suffix property limits the data portion and consists of a closing bracket.

The checksum is two ASCII hexadecimal digits and represents an 8-bit acclamation of the ASCII characters from the prefix to the suffix, inclusive.

All monitored parameters, including temperature, oxygen, humidity, and weight, are transmitted at the 5 second interval. Asynchronous events, such as alarms or mode changes, are transmitted as they occur.

Example of the data string:

000000000111111111122222222223333333333444444444455555555556666

123456789012345678901234567890123456789012345678901234567890123

[ISOLETTE 000000000000 361A 385 387 360 220 050 76 75 21 21 1245]8D

Table 3-1. RS-232 Serial Port Protocol

Columns	Description
1 and 2	Prefix: 2 characters, '[' followed by the ID character (see table 3-2 on page 3-29)
4 through 11	Product ID: 8 characters
13 and 14	Mode bit flags: 2 hexadecimal digits (see table 3-3 on page 3-29)
15 through 24	Alarm bit flags: 10 hexadecimal digits (see table 3-4 on page 3-30)
26 through 28	Setpoint temperature: 3 digits, 1 decimal, Celsius
29	Air/skin mode: 1 character "A or B"
31 through 33	Skin temperature 1: 3 digits, 1 decimal, Celsius
35 through 37	Skin temperature 2: 3 digits, 1 decimal, Celsius
39 through 41	Air temperature: 3 digits, 1 decimal, Celsius
43 through 45	Ambient temperature: 3 digits, 1 decimal, Celsius
47 through 49	Heater power: 3 digits, range 0 to 250
51 and 52	Humidity: 2 digits, 0 decimal
54 and 55	Setpoint humidity: 2 digits
57 and 58	Oxygen: 2 digits, 0 decimal
60 and 61	Setpoint oxygen: 2 digits
63 through 66	Weight: 4 digits, 3 decimals, k grams
78	Suffix: 1 character, '['
79 and 80	Checksum: 2 hexadecimal digits
81 and 81	CR/LF: 2 control characters

Table 3-2. ID Character

Character	Description
<space>	Normal mode
1	Special/Test Mode is in effect (data may be invalid)

Table 3-3. Mode Bit Flags

Bit	Description
01	Humidity on
02	Oxygen on
04	Baby Mode configuration
08	0.5°C baby alarm limit
10	Reserved
20	Reserved
40	Reserved
80	Reserved

For example: If "Humidity on" and "Baby Mode configuration" are selected, the character would be '05.'

Table 3-4. Alarm Bit Flags

Bit	Description
0000000001	Low control temperature
0000000002	High control temperature
0000000004	Low oxygen
0000000008	High oxygen
0000000010	High temperature cut-out
0000000020	Skin 1—probe failure
0000000040	Skin probe—disconnect
0000000080	Oxygen calibration required
0000000100	Sensor out of position
0000000200	Water level low
0000000400	Procedural Silence
0000000800	Motor failed
0000001000	Low air flow
0000002000	Heater failed
0000004000	EEPROM failed
0000008000	Sensor module failure
0000010000	Controller failure 1
0000020000	Controller failure 2
0000040000	Controller failure 3
0000080000	Controller failure 4
0000100000	Air probe failed
0000200000	Oxygen cell different
0000400000	Scale disconnect
0000800000	Too much weight
0001000000	Scale failed

For example: If the air temperature and oxygen were low and Procedural Silence had been initiated (door open), the 10 chiropractor value would be equal to "000000405."

Certain fields, such as air temperature, are defined as having an implied decimal point. The decimal point does not physically appear in the data stream.

Chapter 4
Removal, Replacement, and Adjustment Procedures

Chapter Contents

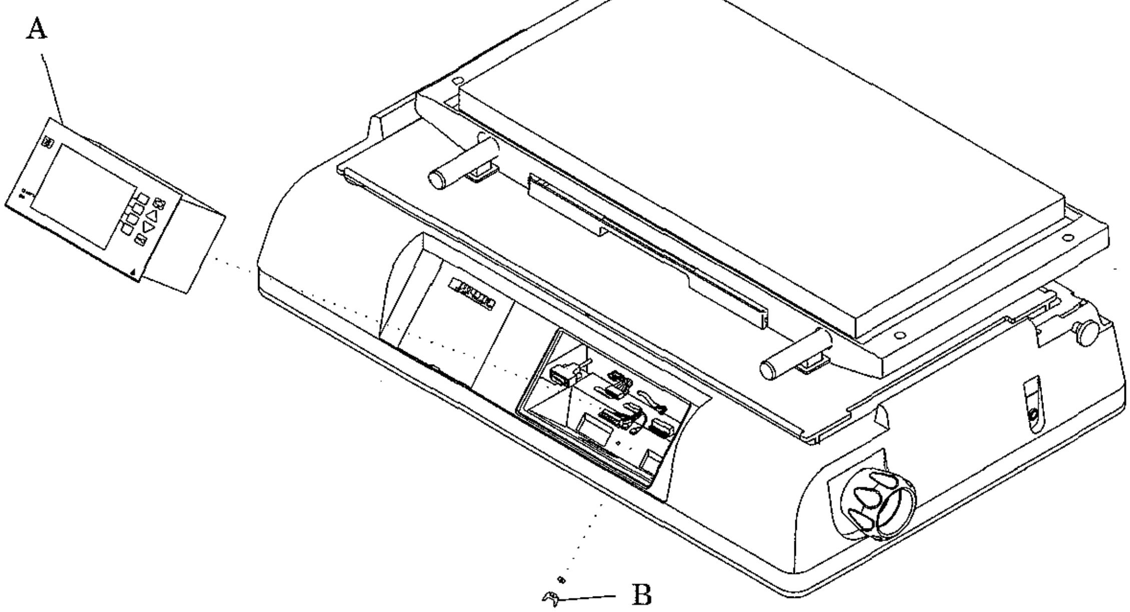
4.1 Controller

Tools required: None

Removal

1. Disconnect the AC power cord from the controller (A) and, if necessary, the cable attached to the RS-232 port (see figure 4-1 on page 4-3).

Figure 4-1. Controller



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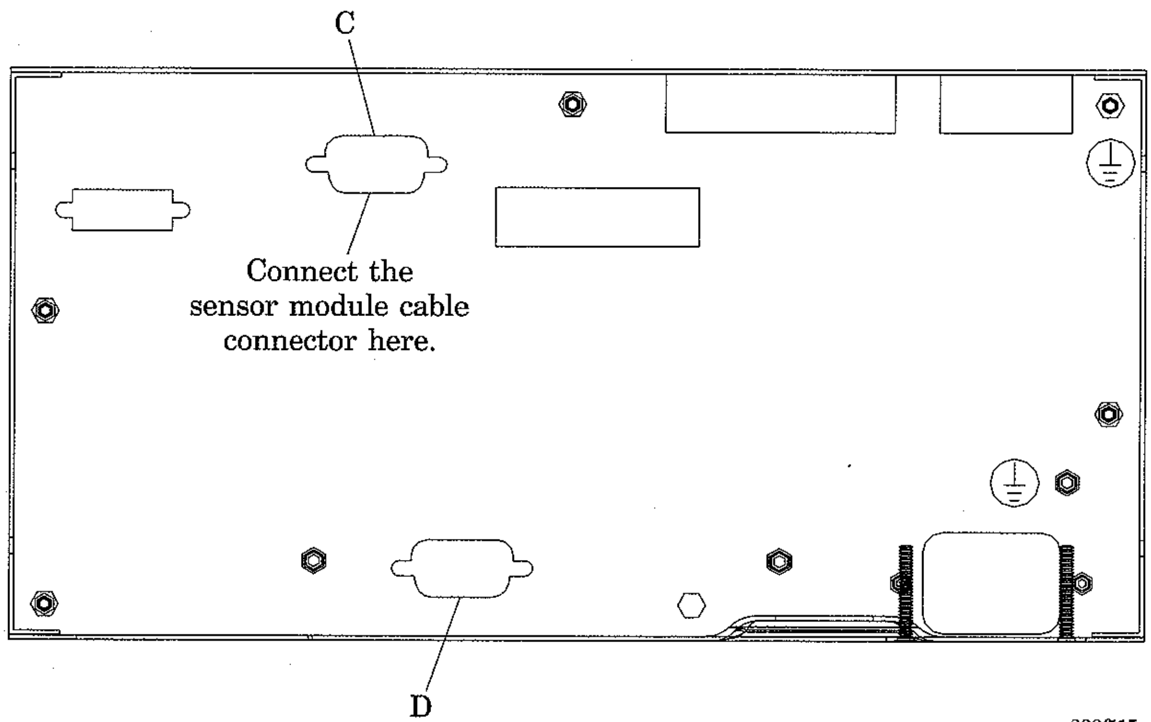
2. Remove the two wing nuts (B) located next to the AC power connector and the RS-232 port.
3. Slide the controller (A) out from the shell until the rear panel connectors are visible.
4. Disconnect the cables from the rear panel, and remove the controller (A).

Replacement

CAUTION:
When reconnecting the rear panel connectors, connect the sensor module cable connector to the sensor module connector, and not the RS-232 connector. Equipment damage could occur.

1. Perform the removal procedure in reverse order. Connect the sensor module cable connector to the sensor module connector (C), and not the RS-232 connector (D) (see figure 4-2 on page 4-4).

Figure 4-2. Controller Enclosure Rear Panel



2. To ensure proper operation of the Isolette® Infant Incubator, perform the "Function Checks" on page 2-4.

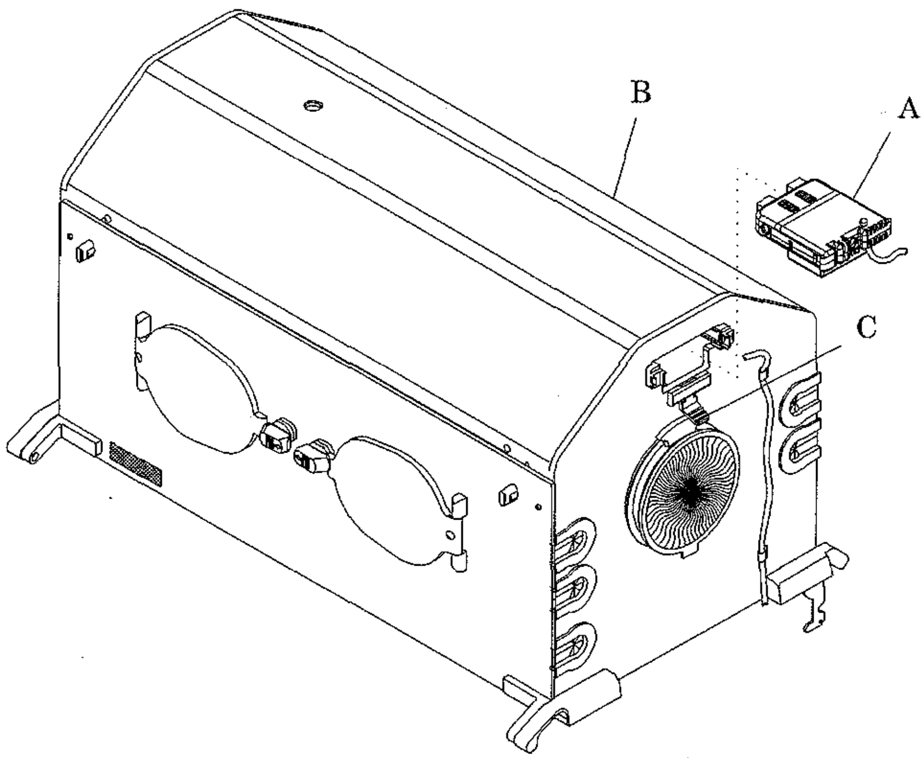
4.2 Sensor Module

Tools required: None

Removal

1. Withdraw the sensor module (A) from the hood (B) until it stops (see figure 4-3 on page 4-5).

Figure 4-3. Sensor Module



2. Pull out the clip (C) located on the left side of the sensor module (A), and remove the sensor module (A) from the hood (B).

Replacement

1. Perform the removal procedure in reverse order.

2. To ensure proper operation of the Isolette® Infant Incubator, perform the "Function Checks" on page 2-4.

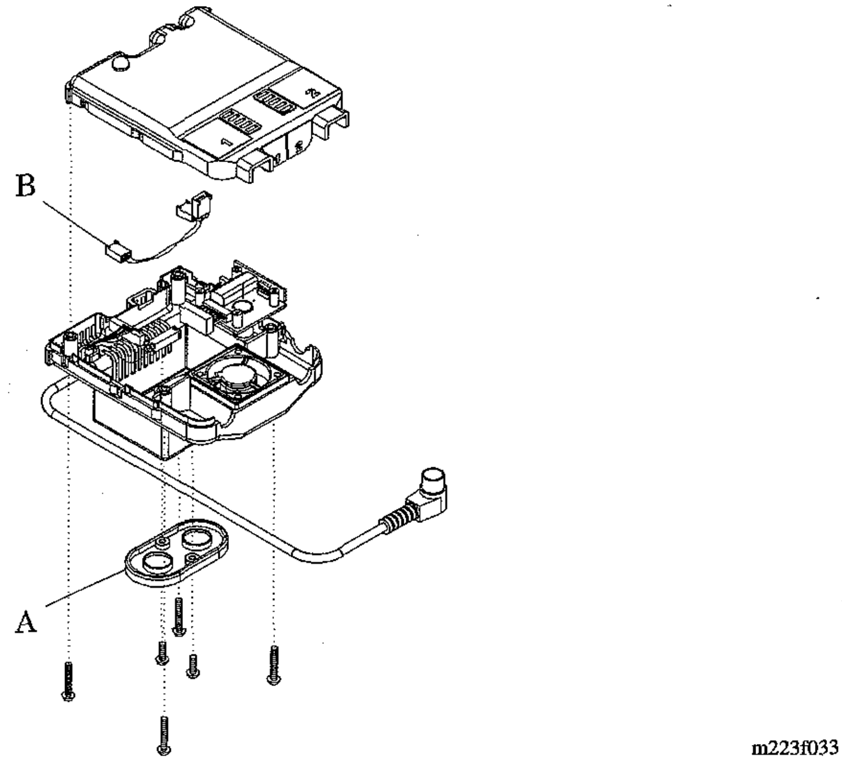
4.3 Oxygen Sensor Cell

Tools required: Phillips head screwdriver

Removal

1. Remove the sensor module from the hood (refer to procedure 4.2).
2. Using the phillips head screwdriver, remove the mounting plate (A) from the bottom of the sensor module (see figure 4-4 on page 4-6).

Figure 4-4. Oxygen Sensor Cell



3. Disconnect the leads (B) from the sensors.
4. Unscrew both sensors from the mounting plate (A).

Replacement

CAUTION:
Replace both oxygen sensor cells at the same time. Failure to do so could result in equipment damage.

1. Install both replacement sensors.
2. Connect the sensor cells to the sensor module.
3. Using the phillips head screwdriver, install the mounting plate (A) on the sensor module.
4. Place the sensor module in the hood (refer to procedure 4.2).
5. Perform the calibration procedure (refer to procedure 6.2).
6. To ensure proper operation of the Isolette® Infant Incubator, perform the "Function Checks" on page 2-4.

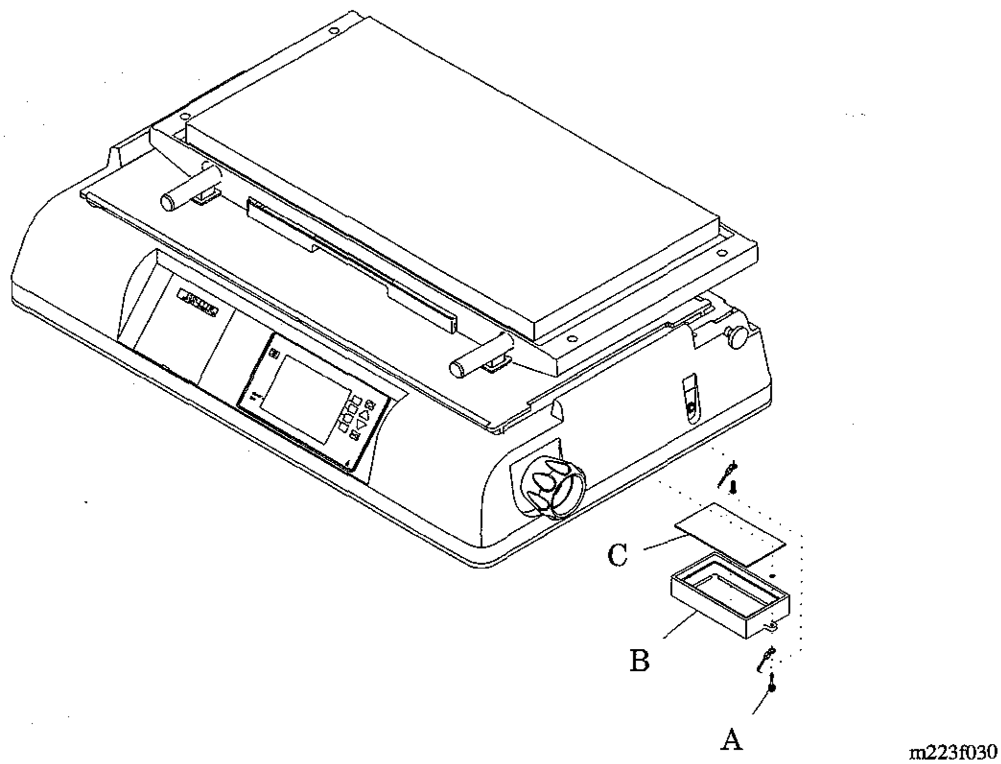
4.4 Air Intake Microfilter

Tools required: None

Removal

1. Loosen the two thumbscrews (A) that secure the air intake microfilter cover (B) to the unit (see figure 4-5 on page 4-8).

Figure 4-5. Air Intake Microfilter



2. Remove the air intake microfilter cover (B).
3. Remove the air intake microfilter (C).

Replacement

1. Perform the removal procedure in reverse order.
2. To ensure proper operation of the Isolette® Infant Incubator, perform the "Function Checks" on page 2-4.

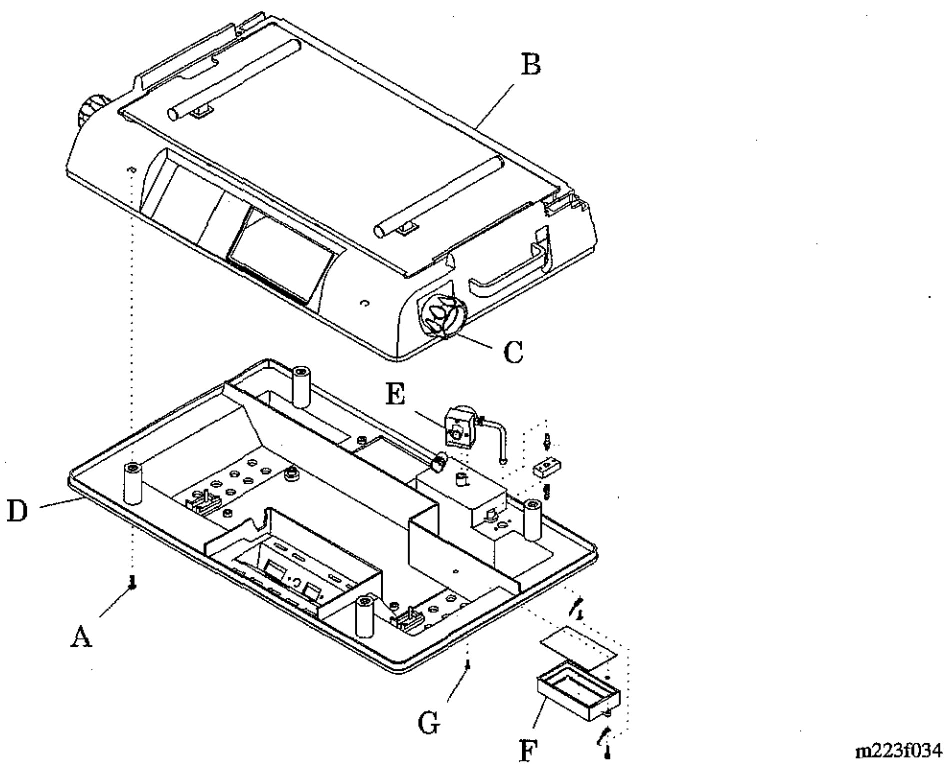
4.5 Check Valve Assembly

Tools required: Phillips head screwdriver
12" long wooden prop
Pliers

Removal

1. Disconnect the power cord from the controller.
2. Using the phillips head screwdriver, remove the four screws (A) and washers (see figure 4-6 on page 4-9). Retain the hardware.

Figure 4-6. Check Valve Assembly



3. At the controller end of the incubator, lift the upper shell (B) using the mattress tilt knob (C) and the rear hood hinge.
4. Insert the 12" long wooden prop between the upper shell (B) and lower shell (D).
5. Using the pliers, disconnect the three hoses from the existing check valve (E).

4

6. Remove the filter cover (F) (refer to procedure 4.4).
7. Remove the check valve (E) by using the phillips head screwdriver to remove the screw (G). Retain the screw (G).

Replacement

1. Install the check valve (E) provided using the screw (G) and the phillips head screwdriver.
2. Using the pliers, connect the three hoses.
3. Remove the 12" long wooden prop, and lower the upper shell (B) in place.
4. Ensure that no cables are pinched and that the shell gasket is fitted properly.
5. Using the phillips head screwdriver, install the four screws (A) and washers.
6. Replace the filter cover (F) (refer to procedure 4.4).
7. To ensure proper operation of the Isolette® Infant Incubator, perform the "Function Checks" on page 2-4.

4.6 Motor Assembly

Tools required: Phillips head screwdriver

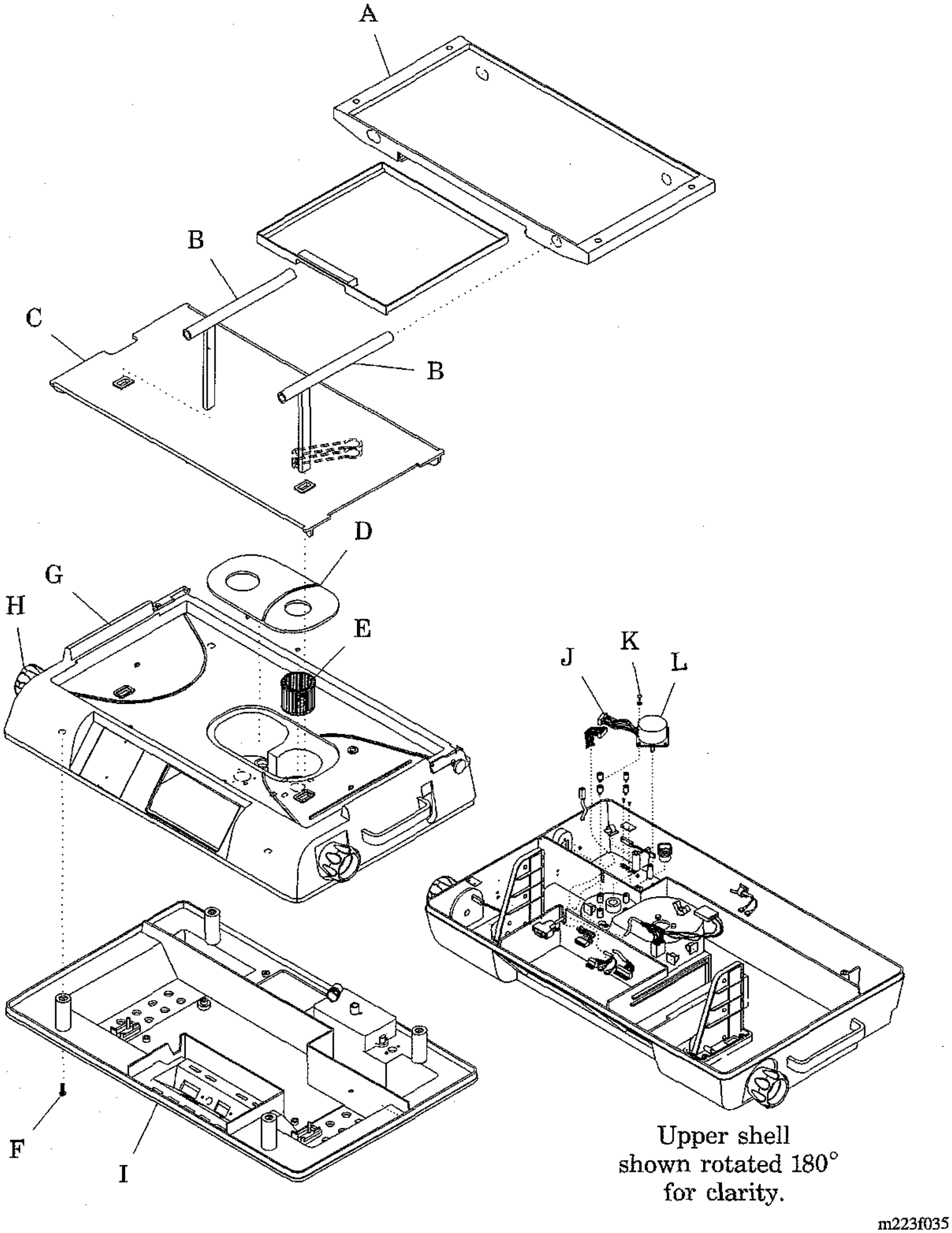
Removal

1. Disconnect the power cord from the controller.
2. Lift the hood.
3. Remove the mattress tray (A), tilt bars (B), main deck (C), and heater/impeller cover (D) (see figure 4-7 on page 4-12).
4. Remove the impeller (E) from the motor shaft.
5. Lower the hood.
6. Using the phillips head screwdriver, remove the four screws (F) and washers. Retain the four screws (F) and washers.
7. At the controller end of the incubator, lift the upper shell (G) using the mattress tilt knob (H) and the rear hood hinge.
8. Insert one of the tilt bars (B) between the upper shell (G) and lower shell (I).
9. Disconnect the motor ribbon cable (J).
10. Using the phillips head screwdriver, remove the four screws (K) holding the motor (L) to the upper shell (G). Retain the four screws (K).

Replacement

1. Install the motor (L) provided with the four screws (K), and connect the ribbon cable (J).
2. Remove the tilt bar (B), and lower the upper shell (G) in place. Ensure that the shell gasket is fitted properly.
3. Install the impeller (E) provided on the motor shaft.
4. Assemble the incubator.
5. To ensure proper operation of the Isolette® Infant Incubator, perform the "Function Checks" on page 2-4.

Figure 4-7. Motor Assembly



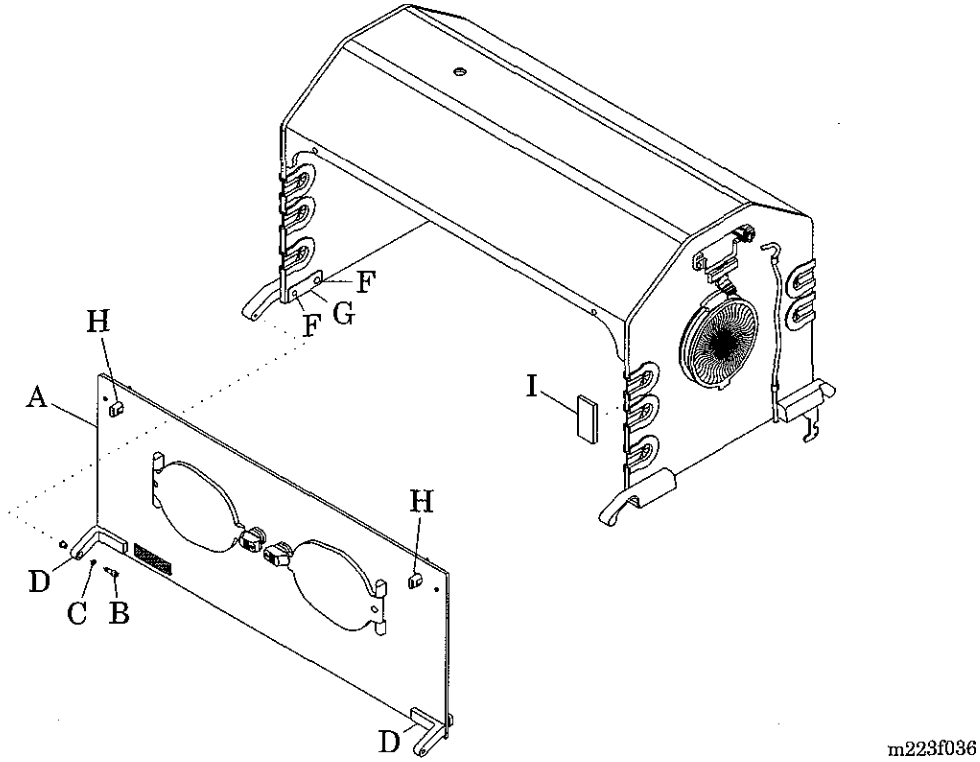
4.7 Access Panel

Tools required: Phillips head screwdriver
Access panel gauge (P/N 83 900 14)

Removal

1. Open the access panel (A) (see figure 4-8 on page 4-13).

Figure 4-8. Access Panel



2. Remove the mattress tray and tilt handles (refer to procedure 4.6).
3. Close and latch the access panel (A).
4. Using the phillips head screwdriver, remove the shoulder screws (B) and washers (C) from the access panel hinges (D).
5. Remove the access panel (A) from the unit, and transfer the hardware to the replacement access panel (A).

Replacement

1. Mount the replacement access panel (A) on the access panel hinges (D).

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2. Using the phillips head screwdriver, loosen, but do not remove, the four screws (F) holding the hinge plates (G).

3. Close the access panel (A) on the access panel gauge (I). Ensure that the access panel (A) is latched.

4. Push the left end of the access panel (A) firmly against the access panel gauge (I).

5. Using the phillips head screwdriver, tighten the rear screw (F) of the hinge plate (G).

6. Place the access panel gauge (I) on the right side.

7. Press the access panel (A) firmly against the access panel gauge (I).

8. Using the phillips head screwdriver, tighten the rear screw (F) of the hinge plate (G).

9. Hold the access panel gauge (I), and open the access panel (A).

10. While pressing down on the hinge plate (G) tab, use the phillips head screwdriver to tighten the front hinge plate (F) screws.

11. Open the access panel (A), and then close it.

12. Make sure the panel latches properly. If the access panel (A) does not latch properly, readjust the latch keepers (H).

13. To ensure proper operation of the Isolette® Infant Incubator, perform the "Function Checks" on page 2-4.

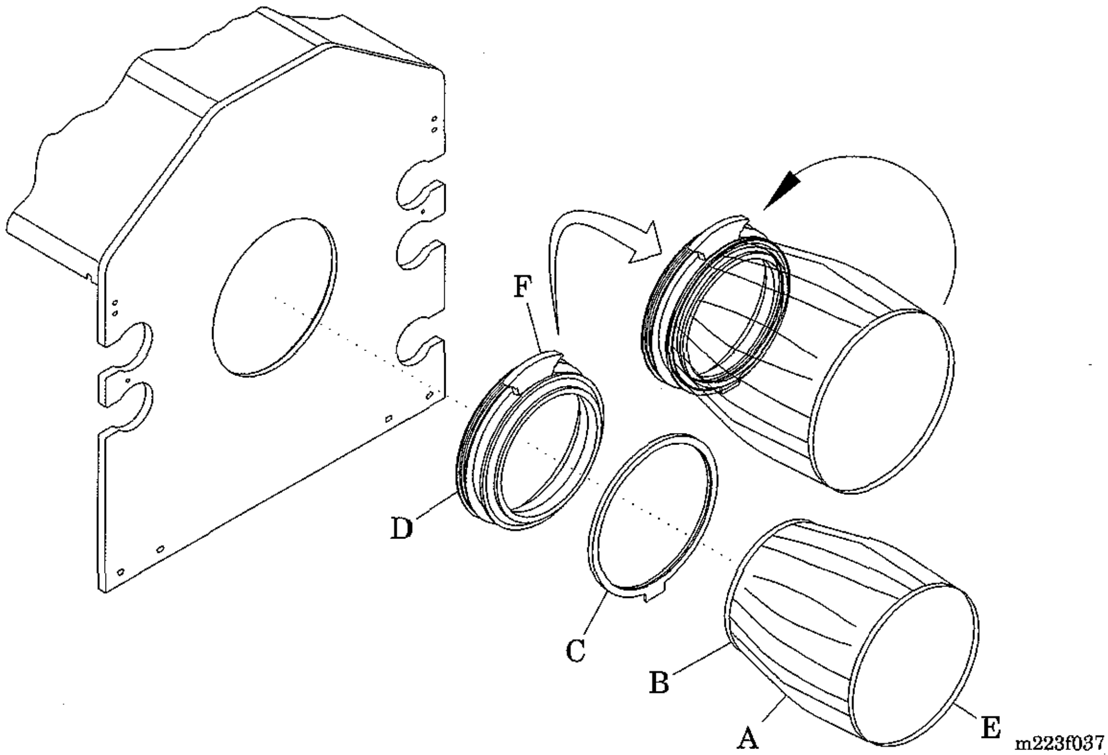
4.8 Iris Entry Port Sleeve

Tools required: None

Removal

Pull the iris entry port sleeve (A) off the port housing (D) (see figure 4-9 on page 4-15).

Figure 4-9. Iris Entry Port Sleeve



Replacement

1. Install the smaller diameter elastic band (B) of a new iris entry port sleeve (A) over the inner ring (C) of the port housing (D).
2. Fold the iris entry port sleeve (A) back upon itself, and slip the larger elastic band (E) over the outer ring (F) of the port housing (D).
3. Rotate the outer ring (F) to close. If properly installed, the iris entry port sleeve (A) will open again if you rotate it in the other direction.
4. To ensure proper operation of the Isolette® Infant Incubator, perform the "Function Checks" on page 2-4.

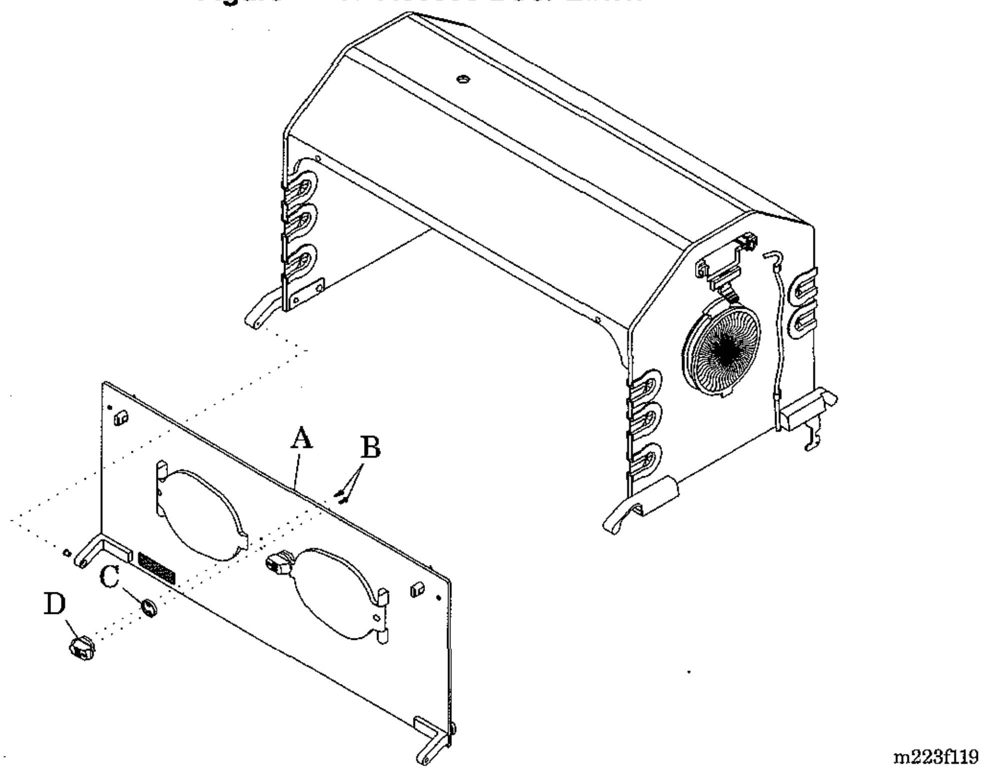
4.9 Access Door Latch

Tools required: Phillips head screwdriver

Removal

1. Open the access panel (A) (see figure 4-10 on page 4-16).

Figure 4-10. Access Door Latch



2. Using the phillips head screwdriver, remove the two screws (B) that secure the access door latch mount (C) and access door latch (D) to the access panel (A).
3. Remove the access door latch mount (C) and access door latch (D) from the access panel (A).

Replacement

1. Perform the removal procedure in reverse order.
2. To ensure proper operation of the Isolette® Infant Incubator, perform the "Function Checks" on page 2-4.

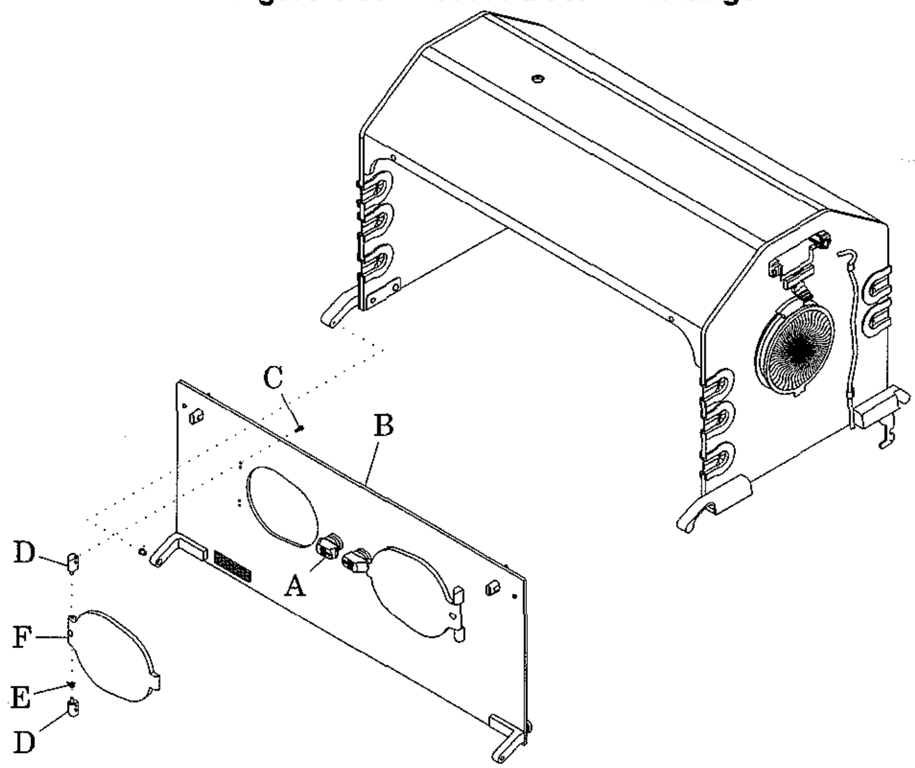
4.10 Access Door and Access Door Pivot Hinge

Tools required: Phillips head screwdriver

Removal

1. Release the access door latch (A) (see figure 4-11 on page 4-17).

Figure 4-11. Access Door Pivot Hinge



2. Open the access panel (B).
3. Using the phillips head screwdriver, remove the two screws (C) that secure each access door pivot hinge (D) to the access panel (B).
4. Remove the two access door pivot hinges (D), the torsion spring (E), and the access door (F) from the access panel (B).

Replacement

1. Perform the removal procedure in reverse order.
2. To ensure proper operation of the Isolette® Infant Incubator, perform the "Function Checks" on page 2-4.

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NOTES: