stryker

LIFEPAK® 35 monitor/defibrillator

SERVICE MANUAL

Section Navigator

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1. Introduction

This service manual describes how to maintain, test, troubleshoot, and repair the LIFEPAK 35 monitor/defibrillator.

Another publication, the ***LIFEPAK® 35 monitor/defibrillator Operating Instructions***, is for use by physicians, clinicians, and emergency care providers. The operating instructions provide step-by-step instructions for use, as well as user-level testing and maintenance. The ***LIFEPAK® 35 monitor/defibrillator Technical Manual*** contains specifications and technical information about the LIFEPAK 35 monitor/defibrillator. Some specifications and technical information not present in this service manual may be found in the technical manual.

Trademarks

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Responsibility for Information

This service manual describes the methods to be used to maintain, test, and repair the LIFEPAK 35 monitor/defibrillator. This manual does not address the operation of the device. Qualified service personnel must consult this manual and the *LIFEPAK 35 monitor/defibrillator Operating Instructions* to obtain a complete understanding of the use and maintenance of the device.

It is the responsibility of customers to ensure that the appropriate person(s) within their organization has access to the information in this service manual, including any warnings and cautions used throughout the manual.

Service Personnel Qualifications

Service technicians must be properly qualified and thoroughly familiar with the operation of the LIFEPAK 35 monitor/defibrillator. They should meet at least one of the following requirements (or the equivalent):

- Associate of Applied Science, with an emphasis in biomedical electronics

- Certificate of technical training, with an emphasis in biomedical electronics
- Equivalent biomedical electronics experience
- Completed repair and maintenance training on this product from Stryker

Service Information

Before attempting to clean, maintain or repair the device, the service technician should be familiar with the pertinent information provided in this manual.

A qualified service technician should inspect any device that has been dropped, damaged, or abused to verify that the device is operating within performance standards listed in the performance inspection procedure (PIP).

Replacement procedures for the device are limited to those parts and subassemblies accessible at the final assembly level. Replacements and adjustments must be made by qualified service personnel.

To obtain service and maintenance for your device, contact your local Stryker service or sales representative. In the USA, call Stryker's technical support at 1 800 STRYKER. Outside the USA, contact your local Stryker representative.

When contacting Stryker to request service, provide the following information:

- Model and part number
- Serial number
- Description of the problem

To view service documents online, visit techweb.stryker.com.

Configuration Information

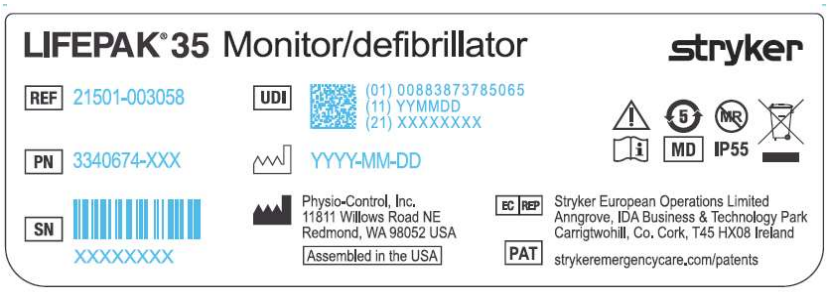
Unless otherwise noted, functions and features of the LIFEPAK 35 device are consistent as specified throughout this manual. Differences are noted as appropriate. Each hardware configuration will have a unique item number and catalog number per the scheme in the following table.

ITEM NUMBER[1]	CATALOG NUMBER[1]	DESCRIPTION
V35-X-XXXXXX	99335-XXXXXX	LIFEPAK 35 monitor/defibrillator

1 '-#' in the item and catalog numbers represents a variable. Each configuration will have a unique dash number.

Serial Number Label Information

The image below shows an example of a LIFEPAK 35 serial label.



The information present on the serial label includes the following:

- Catalog number (REF)
- Part number (PN)
- Serial number (SN) in barcode, and human readable formats
- Unique device identifier (UDI) information, including data matrix barcode
- Date of manufacture
- Other information, as shown

Device Tracking

The U.S. Food and Drug Administration requires medical device manufacturers and distributors to track the location of their defibrillators. If the device is located somewhere other than the shipping address, or the device has been sold, donated, lost, stolen, exported, destroyed, permanently retired from use, or if the device was not obtained directly from Stryker, please do one of the following to update this vital tracking information:

- Register the device at stryker.com/ec-device-registration.
- Call the device registration phone line at 1.800.426.4448.
- Use one of the postage-paid address change cards located in the back of the *LIFEPAK 35 monitor/defibrillator Operating Instructions*.

Recycling Information

The LIFEPAK 35 device should be recycled at the end of its useful life. See below for details.

- Recycling assistance: The device and its accessories should be recycled according to national and local regulations. For instructions on disposing of this product or its accessories, contact your local Stryker representative, or see stryker.com/ec-recycling.
- Preparation: The device should be clean and contaminant-free prior to being recycled.
- Recycling of disposable electrodes: After using disposable electrodes, follow your local clinical procedures for recycling.
- Recycling of batteries: The device uses rechargeable lithium-ion batteries. They should be recycled in accordance with local regulations and should not be placed in the trash.
- Recycling of calibration gases: Dispose of used and empty gas containers in accordance with local regulations.

- Packaging: Packaging should be recycled in accordance with national and local regulations.

Warranty Information

Using defibrillation electrodes, adapter devices, or other parts and supplies from sources other than Stryker is not recommended. Stryker has no information regarding the performance or effectiveness of its LIFEPAK defibrillators if they are used in conjunction with defibrillation electrodes or other parts and supplies from other sources. If device failure is attributable to defibrillation electrodes or other parts or supplies not provided by Stryker, this may void the product warranty.

For more information, or to obtain a detailed warranty statement, contact your local Stryker representative or go to stryker.com

Acronyms

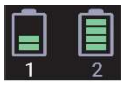
The following is a list of acronyms and abbreviations which may be found in this manual.

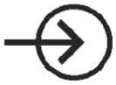
TERM	DESCRIPTION
AED	Automated external defibrillator
CO_2	Carbon dioxide
DMM	Digital multimeter
ECG	Electrocardiogram
ESD	Electrostatic discharge
$ETCO_2$	End-tidal carbon dioxide
FSR	Field service representative
IP	Invasive pressure
LED	Light-emitting diode
Li-Ion	Lithium-ion
mmHg	Millimeters of mercury (unit of pressure)
NIBP	Noninvasive blood pressure
OEM	Original equipment manufacturer
PCBA	Printed circuit board assembly
PIP	Performance inspection procedure
SpCO	Measurement of carboxyhemoglobin concentration
SpO_2	Measurement of oxygen saturation
SpMet	Measurement of methemoglobin concentration

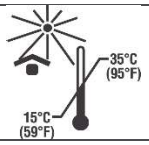
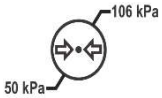
TERM	DESCRIPTION
SSD	Static-sensitive device
PSST	ProCare Services Support Tool
TCP	Test and calibration procedure
USB	Universal serial bus
WCT	Wi-Fi configuration tool

Symbols

The following table contains symbols, and their definitions, which are pertinent to device servicing and may be found in this manual, or on the monitor/defibrillator, its accessories, or packaging. Some symbols may not be relevant to your device or used in every country. Additional symbols may be found in the *LIFEPAK 35 monitor/defibrillator Operating Instructions*. Visit ifu.stryker.com for additional information about symbols that are defined in standards developed by standards development organizations (SDOs).

SYMBOL	DESCRIPTION
	Consult instructions for use
	Follow instructions for use
	• Peripheral devices ports on front of device: See Shock Hazard warning in Section 2. • ECG port: Connect only ECG cables and electrodes that are specified for use with this device. • Printer/Access port on back of device: See Shock Hazard warning in Section 2. • Therapy cable: Potential electric shock. Connect only therapy cables and electrodes that are specified for use with this device. • ECG cable: Use only with device that is specified for use with this cable. Protection of the device against defibrillator discharge is dependent on the use of ECG cables that are specified by Stryker. • Invasive pressure adapter cable: Use only with IP transducers that are approved for use with this device. See How IP Monitoring Works in the *LIFEPAK 35 monitor/defibrillator Operating Instructions*. • Power connector on back of device: See warnings in the *LIFEPAK 35 Power Adapter Instructions for Use*.
	Caution
	Dangerous voltage
	Battery status indicators
	Auxiliary power indicator

SYMBOL	DESCRIPTION
	Battery charging indicator
	Service indicator
	Main menu button
	CO2 exhaust
	Printer/access port
	Cellular modem port
	Peripheral devices port
	The device is MR Unsafe.
IP55	Protected against dust and jets of water
	Wi-Fi active
	Bluetooth wireless technology
	Power input
	Power output
	Rechargeable battery
	Direct current
	Static-sensitive device. Static discharge may cause damage.

SYMBOL	DESCRIPTION
	Fire or Burn Hazard – Do not open or dismantle
	Explosion Hazard – Do not dispose of in fire
	Fire or Burn Hazard – Do not deform or damage
	Remove label from battery
	Charge battery
	Insert battery in device
	Not made with natural rubber latex
	Use By date shown: YYYY-MM-DD
	Keep electrodes away from direct sunlight and heat sources. Recommended storage temperatures of 15° to 35°C (59° to 95°F). See Specifications in the LIFEPAK 35 monitor/defibrillator Technical Manual for detailed shelf life/temperature information.
	Recommended storage atmospheric pressure range 50 to 106 kPa
	Do not reuse
	Do not dispose of this product in the unsorted municipal waste stream. Dispose of this product according to local regulations. See stryker.com/ec-recycling for instructions on disposing of this product.
	Date of manufacture shown: YYYY-MM-DD
	Mark of conformity to applicable European regulations and/or directives
	Authorized representative in the European Community

SYMBOL	DESCRIPTION
	Medical device
	Manufacturer
	Part number
	Serial number
	Catalog number
	By prescription only
	For USA audiences only
	Lot number
	Unique device identifier
	Quantity
	Visit stryker.com/patents for patent information
	This end up
	Fragile
	Keep dry
 or	Recycle this item

2. Safety Information

Terms

The following terms are used in this service manual or on the various configurations of the LIFEPAK 35 monitor/defibrillator (device). The service provider should be familiar with these terms and their meanings.

Danger: Immediate hazards that will result in serious personal injury or death.

Warning: Hazards or unsafe practices that may result in serious personal injury or death.

Caution: Hazards or unsafe practices that may result in minor personal injury, product damage, or property damage.

General Dangers and Warnings

The following are the general danger and warning statements. Keep them in mind when working with the LIFEPAK 35 monitor/defibrillator. Additional specific warnings and cautions appear throughout this service manual and in the *LIFEPAK 35 monitor/defibrillator Operating Instructions*.

Note that all discovered failures that directly or indirectly have, or may have, affected patient or user safety shall, with no delay, be reported directly to the Quality Department at Stryker.

DANGER

- Explosion hazard. Do not use this device in the presence of flammable gases or anesthetics.

WARNINGS

- Shock hazard. The monitor/defibrillator delivers up to 360 joules of electrical energy. Unless properly used as described in the operating instructions and this service manual, this electrical energy may cause serious injury to the operator. Do not attempt to operate this device unless thoroughly familiar with these instructions and the function of all controls, indicators, connectors, and accessories.
- Shock hazard. Do not disassemble the LIFEPAK 35 monitor/defibrillator. It contains no operator serviceable components and dangerous high voltages may be present. Contact authorized service personnel for repair.
- Shock hazard. Do not simultaneously touch patient and any non-medical electronic equipment while the patient is connected to the monitor/defibrillator.
- Possible device failure. Do not modify the device or its accessories.
- Shock or fire hazard. Do not immerse any portion of the monitor/defibrillator in water or other fluids. Avoid spilling any fluids on monitor/defibrillator or accessories. Spilled liquids may cause the monitor/defibrillator and accessories to perform inaccurately or fail. Do not clean with ketones or other flammable agents. Do not autoclave or sterilize this monitor/defibrillator or accessories unless otherwise specified.
- Possible fire. Use care when operating this device close to oxygen sources (such as bag-valve-mask devices or ventilator tubing). Turn off gas source or move source away from patient during defibrillation.

WARNINGS

- Possible electrical interference with device performance. Equipment operating in close proximity to the LIFEPAK 35 monitor/defibrillator could emit strong electromagnetic disturbances, which could affect the performance of the monitor/defibrillator. If use of equipment in close proximity to the monitor/defibrillator is necessary, observe the device to verify normal operation in the configuration in which the device will be used. Electromagnetic disturbances could cause distorted ECG, incorrect ECG Lead status, failure to detect a shockable rhythm, cessation of pacing, or incorrect vital sign measurements. Avoid operating the device near cauterizers, diathermy equipment, metal detectors, or electronic articles surveillance gates. Do not rapidly key EMS radios on and off. If possible, maintain a minimum distance of 30 cm (12 in) between portable and mobile RF communications equipment (transmitters) and the LIFEPAK 35 monitor/defibrillator, including cables. Refer to the *LIFEPAK 35 monitor/defibrillator Operation Instructions* for examples of electromagnetic disturbances and troubleshooting information. Refer to “Electromagnetic Compatibility Guidance” section of the *LIFEPAK 35 monitor/defibrillator Technical Manual* for additional information about recommended separation distances.
- Possible electrical interference. The monitor/defibrillator should not be used adjacent to or stacked with other equipment. If adjacent or stacked use is necessary, the monitor/defibrillator should be observed to verify normal operation in the configuration in which it will be used.
- Possible electrical interference. Using cables, electrodes, or accessories not specified for use with the monitor/defibrillator may result in increased emissions or decreased immunity to electromagnetic disturbances which could affect the performance of the monitor/defibrillator or of equipment in close proximity. Use only parts and accessories specified in the *LIFEPAK 35 monitor/defibrillator Operating Instructions* and this service manual.
- Possible electrical interference. The monitor/defibrillator could cause electromagnetic disturbances especially during charge and energy transfers. Electromagnetic disturbances may affect the performance of equipment operating in close proximity. Verify the effects of monitor/defibrillator discharge on other equipment prior to using the monitor/defibrillator in an emergency situation, if possible.
- Possible equipment damage. Use only ECG, SpO_2, CO_2, Temp, IP, and NIBP cables that are specified for use with this device. Protection of the device against defibrillator discharge is dependent on the use of cables that are specified by Stryker. Refer to the *LIFEPAK 35 monitor/defibrillator Operating Instructions*.
- Possible improper device performance. Using other manufacturers’ cables, electrodes, power adapters, or batteries may cause the device to perform improperly and may invalidate the safety agency certifications. Use only the accessories that are specified in the *LIFEPAK 35 monitor/defibrillator Operating Instructions*.
- Possible improper device performance. Changing factory default settings will change the behavior of the device. Changes to the default settings must only be made by authorized personnel.
- Possible device shutdown. Always have immediate access to a spare, fully charged, properly maintained battery. Replace the battery when the device displays a low battery warning.
- Safety risk and possible equipment damage. The device and all accessories are MR unsafe. Keep them outside the magnetic resonance imaging (MRI) scanner room.
- Possible patient burns. A defect in the neutral electrode connection on HF surgical equipment could cause burns at the lead or sensor site and damage to the monitor/defibrillator. Do not apply patient leads, sensors, or catheters when using high frequency (HF) electrosurgical equipment.
- Improper device use environment. The LIFEPAK 35 monitor/defibrillator should not be used in commercial aircraft.

CAUTION

- Possible skin injury. The LIFEPAK 35 monitor/defibrillator may become warm when used for an extended period of time. Prolonged contact between exposed skin and a warm device may cause skin irritation or burns. If a warm device is placed against a patient, the operator should ensure that the patient's skin is adequately protected.

Latex Information

This device is not made with natural rubber latex.

3. Device Description

LIFEPAK 35 monitor/defibrillator General Description

The LIFEPAK 35 monitor/defibrillator (LP35) is a complete acute cardiac care response system designed for basic life support (BLS) and advanced life support (ALS) patient management protocols.

This section provides a high-level description of the LIFEPAK 35 device and basic specifications. For more operation and technical information, refer to the *LIFEPAK 35 monitor/defibrillator Operating Instructions* or the *LIFEPAK 35 monitor/defibrillator Technical Manual*. Note that all images—screenshots, diagrams, pictures—in this document are for reference only, and may not accurately represent the latest hardware or software versions.

Figure 1 LIFEPAK 35 device

Device Primary Functions

Features of the LIFEPAK 35 device include multi-parameter monitoring, manual and semi-automated defibrillation, synchronized cardioversion, non-invasive pacing, computerized 12- and 15-lead ECG analysis and reports, and data transmission. The LIFEPAK 35 monitor/defibrillator operates on auxiliary power when connected to the LIFEPAK 35 AC power adapter, or on LIFEPAK FLEX™ Lithium-ion batteries when unplugged. For more information, refer to the *LIFEPAK 35 monitor/defibrillator Operating Instructions* or the *LIFEPAK 35 monitor/defibrillator Technical Manual.*

Device Specifications

Device specifications may be found in the table below. Note that specifications are subject to change. For additional information about specifications, refer to the *LIFEPAK 35 monitor/defibrillator Technical Manual*.

General	
Classification	**Monitor/Defibrillator**: Battery powered. The external ACPA is Class II per IEC 60601-1. Applied parts per IEC 60601-1: ECG, Invasive Pressure, Temperature, and Internal Defibrillation: Type CF patient connections. CO2, SpO2, NIBP, and External Defibrillation: Type BF patient connections

Power	
Auxiliary power supply	Catalog number 11141-000170 14.82 to 16.0 VDC, 8.6 A DC from 0 to 40ºC At least 6.5 A DC from >40ºC to 45ºC Auxiliary Power indicator illuminated when device is connected to AC power.
Batteries	Rechargeable Lithium-ion battery. Dual or single battery capability with automatic switching. Low battery indication and message: Low battery fuel gauge indication and low battery screen message for each battery. Battery output voltage range is between +12.0 and +16.8 VDC.

Physical	
Weight	Monitor/defibrillator with two batteries installed: 7.14 kg (15.75 lb)
Dimensions	Height 35 cm (14.0 in) x width 35 cm (13.8 in) x depth12.4 cm (4.9 in)

Communications	The device is capable of transferring data records by wired or wireless connection. This device complies with Part 15 of the FCC rules, and its operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
Wi-Fi	Conforms to IEEE standard 802.11 a/b/g/n Security protocols supported: WPA2-PSK, WPA2-Enterprise, EAP-TLS, EAP-TTLS, PEAP-v0/EAP-MSCHAPv2 EAP types supported for Enterprise security protocols: EAP-TLS, EAP-TTLS, EAP-PEAPv0/MSCHAPv2 (PEAPv0).
Cellular connectivity (with an external cell modem)	Supports 4G LTE technology and Cat 4 data speed, up to 150 Mbps downlink and 50 Mbps uplink.
Bluetooth® technology	Bluetooth 5.1 technology provides short-range wireless communication with other Bluetooth-enabled devices. The Bluetooth transceiver complies with Bluetooth Class 1 frequency, power, and bandwidth requirements.

Monitoring	
Monitoring capabilities	Electrocardiograph (ECG) Oximetry Non-invasive blood pressure (NIBP) Capnography Invasive pressure (in some device configurations) Temperature (in some device configurations) Vital sign trends Alarms

Printer	Optional printer prints continuous displayed patient waveforms, and event annotations.
Paper size	100mm (3.9 in)

Defibrillator	Defibrillation energy up to 360 J. Manual defibrillation. Automated external defibrillation. Noninvasive pacing.

Environmental	The device meets functional requirements during exposure to the following environments unless otherwise stated. For additional information about environmental specifications, refer to the *LIFEPAK 35 monitor/defibrillator Technical Manual*. See the *LIFEPAK 35 monitor/defibrillator Operating Instructions* for a list of compatible accessories.
Temperature, operating	0° to 45°C (32° to 113°F)
Temperature, storage	-20° to 70°C (-4° to 158°F) Time from storage at -20°C to be ready for use at 20°C: 63 minutes Time from storage at 70°C to be ready for use at 20°C: 15 minutes
Relative humidity, operating	5 to 95%, non-condensing
Relative humidity, storage	5 to 95% non-condensing
Operating Conditions, Transient	After stabilization at 20°C, operates as specified for: 20 mins at -20°C, <15% relative humidity 20 mins at 50°C, <15% relative humidity
Atmospheric pressure, operating	1060 to 572 hPa (-382 to 4,572 m)
Atmospheric pressure, non-operating	1060 to 500 hPa (-382 to 5,486 m)

Solid and liquid ingress protection	IP55: protected against dust and jets of water per IEC 60529 and IEC 60601-2-4 (without accessories except for Therapy Cable, ECG Cable, and Batteries)
EMC	Meets 60601-1-2, General requirements for basic safety and essential performance — Collateral Standard: Electromagnetic disturbances — Requirements and tests
Cleaning	Withstands cleaning 480 times with the following: • Stryker SideKick disinfecting wipes • Sodium hypochlorite (5.25%-6.15% bleach diluted 1:10) For additional information on cleaning, refer to the *LIFEPAK 35 monitor/defibrillator Operating Instructions*.
Chemical resistance	Withstands 480 applications of the following: • Ethyl or isopropyl alcohol (70-90%) • Stryker SideKick disinfecting wipes • Sodium hypochlorite (5.25-6.15% bleach diluted 1:10) • Hydrogen peroxide (3%) • Iodophor germicidial detergent diluted per manufacturer's instructions • Quaternary ammonium germicidal detergent diluted per maufacturer's instructions For additional information on chemical resistance, refer to the *LIFEPAK 35 monitor/defibrillator Technical Manual*.

Battery	
Model name	LIFEPAK FLEX
Battery type	Lithium-ion (Li-ion)
Voltage	14.4 V
Weight	545 g (1.2 lb)
Charge time (with fully depleted battery)	5 hours (typical)
Battery indicators	Each battery has a fuel gauge that indicates its approximate charge. If the battery fuel gauge illuminates three or fewer LEDs after the battery completes a charge cycle, the battery should be replaced.
Charge by date	Fully charge the battery by the Charge By date printed on the battery package label or within 12 months of receipt, whichever comes first.
Storage life	2 years after first charge
Install by date	4 years from date of manufacture
Service life	2 years
Charging temperature range	0° to 60°C (32° to 140°F)
Operating temperature range	0° to 70°C (32° to 158°F)
Short-term storage temperature range	-20° to 60°C (-4° to 140°F)
Long-term storage temperature range	20° to 25°C (68° to 77°F)

Battery	
Operating relative humidity	5 to 95% relative humidity, non-condensing
Storage relative humidity	5 to 95% relative humidity, non-condensing
Operating atmospheric pressure	-382 to 4,572 m (-1253 to 15,000 ft) (1060 to 572 hPa) (106 to 57 kPa)
Non-operating atmospheric pressure	-382 to 5,486 m (-1253 to 18,000 ft) (1060 to 500 hPa) (106 to 50 kPa)
Transient operating conditions	After stabilization at 20°C, operates as specified for at least 20 minutes at an operating temperature of -20°C and <15% relative humidity, or at least 20 minutes at an operating temperature of 50°C and 41% relative humidity.
Solid and liquid ingress protection	IP55: protected against dust and jets of water
Designation (per IEC 61960-3)	4INR 19/66-2
Origin	Assembled in Mexico

Physical Description and Features

Front View

Figure 2 Front view

Figure 3 Keypad

CONTROL	DESCRIPTION	FOR MORE INFORMATION
	POWER button. Turns device ON or OFF. LED illuminated when ON. Push and hold to turn device OFF.	
CHARGE	**CHARGE** button. Charges the defibrillator in Manual mode. When pushed while in AED mode, switches to Manual mode (if allowed) and initiates charging.	See manual defibrillation in device operating instructions.
	SHOCK button. Initiates discharge of defibrillator energy to patient. LED flashes when charging is complete and defibrillator is ready to shock.	See manual defibrillation in device operating instructions.
ANALYZE	**ANALYZE** button. Initiates AED mode immediately when pushed.	See automated external defibrillation in device operating instructions.
	Auxiliary power indicator. Green LED illuminated when defibrillator is connected to auxiliary AC power source, whether defibrillator is turned on or off.	

CONTROL	DESCRIPTION	FOR MORE INFORMATION
	Battery charging indicator. • Green LED illuminated when installed batteries are fully charged. • LED flashes when either battery is charging. • LED not illuminated when no batteries are installed or a battery is unable to be charged.	
	Service indicator. Red LED flashes when a condition exists that prevents or could prevent normal defibrillator operation.	See troubleshooting section.
	Light sensor. Detects ambient light level for adaptive brightness function.	
	Speed dial. Scrolls through and selects screen or menu items as an alternative to touchscreen. Also safely discharges defibrillator if pushed when defibrillator is charged for shock.	See speed dial in device operating instructions.
	Peripheral connectors. Two ports provided to allow Stryker employees to connect Stryker-approved peripheral accessories for clinical use.	
	Warning: Use only accessories approved by Stryker.	See safety information in section 2.

Monitoring Connectors Overview

The following figure shows the locations of connectors for SpO_2, CO_2, NIBP, IP, and Temp monitoring. The individual connectors are described in the following sections.

Figure 4 Monitoring connectors

CONNECTOR	DESCRIPTION	FOR MORE INFORMATION
SpO_2	SpO_2 sensor cable port. **Connect:** Align cable connector with SpO_2 port and push in until connector clicks into place. **Disconnect:** Grip cable connector and pull connector out.	See monitoring SpO_2, CO, and met in device operating instructions.

CONNECTOR	DESCRIPTION	FOR MORE INFORMATION
Temp	Temperature cable port. **Connect:** Align adapter cable connector with port and push in firmly. **Disconnect:** Grip cable connector and pull connector out.	See monitoring continuous temperature in device operating instructions.
IP	Invasive pressure cable port. **Connect:** Align adapter cable connector with port and push in firmly. **Disconnect:** Grip cable connector and pull connector out.	See monitoring invasive pressure in device operating instructions.
CO_2	CO_2 tubing port. **Connect:** Open CO_2 port door, insert FilterLine connector, and turn clockwise until connector is firmly seated. **Disconnect:** Rotate FilterLine connector counterclockwise and pull connector out.	See monitoring $EtCO_2$ in device operating instructions.
NIBP	NIBP tubing port. **Connect:** Insert NIBP tubing connector into NIBP port. **Disconnect:** Press latch on left side of port and pull tubing connector out.	See monitoring noninvasive blood pressure in device operating instructions.
	Peripheral connectors. Two ports provided to allow Stryker employees to connect approved peripheral devices for clinical use.	
	Warning: Use only accessories approved by Stryker.	See safety information in section 2.

WARNING

Shock hazard. If you are monitoring a patient and using any of the peripheral connector ports, all equipment connected to the ports must be battery powered or electrically isolated from AC power according to IEC 60601-1. Use only accessories that are approved by Stryker with these ports. For more information, contact Technical Support.

Indicator lights

Figure 5 Indicator lights

ITEM	DESCRIPTION	FOR MORE INFORMATION
1	Patient beacon: • Flashing yellow when a medium priority physiological alarm is triggered • Flashing red when a high priority physiological alarm is triggered	See alarms in device operating instructions.
2	Readiness alert indicator: • Off when device is ready or has no power available • Inactive when device is turned on • Flashing yellow if device is turned off with power available and an issue has been detected. Note: The following setup options are available for the readiness alert indicator: • Alert when device is turned off and not connected to auxiliary power See setup options in the *LIFEPAK 35 monitor/defibrillator Technical Manual* for information about setup options.	See general troubleshooting tips in section 6.

Right View

Figure 6 Right view

ITEM	DESCRIPTION	FOR MORE INFORMATION
1	ECG/EKG port. Align green ECG connector with ECG port. Insert cable connector into port until connector is firmly seated. If possible, keep the ECG cable connected to the device at all times to prevent connector damage.	See electrocardiography in the device operating instructions.
2	Battery wells 1 and 2. Each well holds one Lithium-ion battery. Insert each battery until it clicks. To remove a battery, squeeze the latch and remove battery from well.	See battery operation in the device operating instructions.
3	Symbol for “Defibrillation-proof type CF applied part.”	
4	Symbol for “Warning: Use only accessories approved by Stryker.”	See safety information in section 2.

Top View

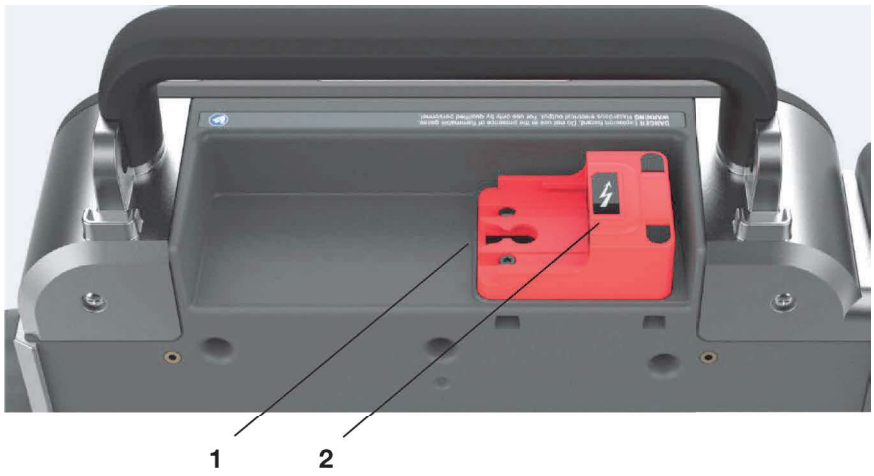


Figure 7 Top view

ITEM	DESCRIPTION	FOR MORE INFORMATION
1	Therapy cable receptacle, for use with therapy cable (catalog number 11113-000008) and QUIK-COMBO® pacing/defibrillation/ECG electrodes.	See therapy accessory options in device operating instructions.
2	Symbol for “Dangerous voltage.”	

To connect a therapy cable to the monitor/defibrillator:

1. Align the red therapy cable connector with the red receptacle. The gray release button should be facing up.
2. Slide the therapy cable until you feel the connector lock in place. You will also hear a “click.”

To disconnect the therapy cable from the monitor/defibrillator:

1. Press the release button on the therapy cable connector.
2. Slide the therapy cable out.

Note: Therapy cables for use with LIFEPAK 15 and 20e devices are not compatible with the LIFEPAK 35 monitor/defibrillator. Use only the therapy cable specified above.

WARNING: Keep therapy cable connected to the defibrillator at all times, to help protect the therapy cable connector from damage or contamination. Inspect the therapy cable daily as directed in the shift check on the device.

Back View

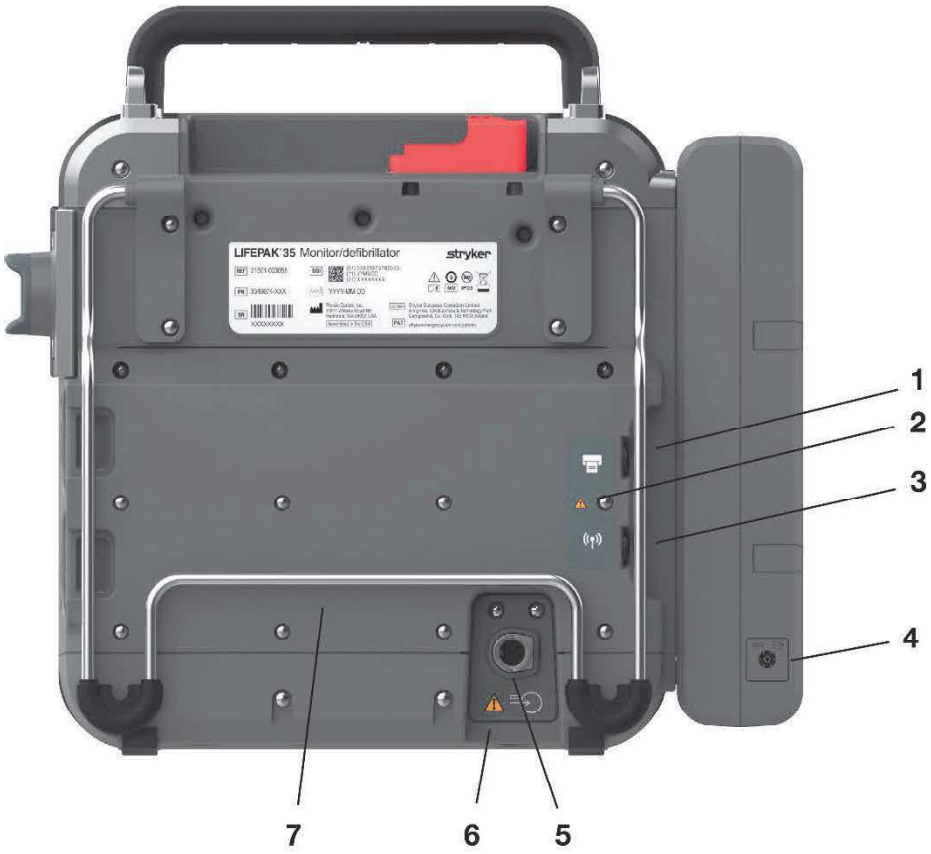


Figure 8 Back view

ITEM	DESCRIPTION	FOR MORE INFORMATION
1	Access port. Connects to optional printer. Also connects to a PC running Stryker applications that support transfer of device and patient data, updates to setup options, and update software.	See data management in the device operating instructions.
2	Warning: Equipment connected to these ports must be battery powered or electrically isolated from AC power according to IEC 60601-1.	
3	Cellular modem port. Connects to cellular modem for data transmission.	See data transmission in the device operating instructions.
4	CO2 exhaust port. Connects to a scavenger system when monitoring EtCO2 during use of anesthetics. Follow directions provided with your scavenging system to connect.	See monitoring ETCO2 in the device operating instructions.
5	Auxiliary power connector.	See auxiliary power operation in the device operating instructions.
6	Warning: Use only accessories approved by Stryker.	See safety information in section 2.
7	Kickstand. Pull out to adjust viewing angle.	

Power Management

The LIFEPAK 35 monitor/defibrillator operates on auxiliary power when connected to the LIFEPAK 35 AC power adapter, or on LIFEPAK FLEX Lithium-ion batteries when unplugged. You can switch between battery and auxiliary power while the device is on by connecting or disconnecting auxiliary power.

IMPORTANT! The power connector is the safety disconnect mechanism. Maintain clear access to all connections at all times.

Auxiliary Power Operation

When the LIFEPAK 35 monitor/defibrillator is connected to auxiliary power using the LIFPAK 35 AC power adapter, the Auxiliary Power indicator illuminates and installed batteries are automatically charged. When the device is not in use, battery charge is best maintained if the device is connected to auxiliary power and turned off.

The LIFEPAK 35 monitor/defibrillator has the following auxiliary power connector on the back.

Figure 9 AC power adapter connector

The LIFEPAK 35 AC power adapter plugs directly into the back of the device. To connect, push the plug firmly into the connector until it clicks. To disconnect, rotate the ring on the plug counterclockwise and pull.

Notes:

- Although the monitor/defibrillator can operate using auxiliary power with no batteries installed, both batteries should be installed at all times. If the monitor/defibrillator loses power for more than two minutes, the device reverts to the default settings and begins a new patient record.
- Always plug the power cord for the LIFEPAK 35 AC power adapter directly from an AC power outlet into the LIFEPAK 35 AC power adapter. Do not use an extension cord.

Battery Operation

The LIFEPAK FLEX Lithium-ion batteries are rechargeable and are intended for use in the LIFEPAK 35 monitor/defibrillator when auxiliary power is unavailable or when the device is being used in a portable manner. The defibrillator automatically switches to battery power when the power cord is disconnected.

IMPORTANT!

- Keep batteries charged by connecting to auxiliary power whenever possible.
- Keep spare, fully charged batteries available at all times.
- LIFEPAK FLEX batteries are not compatible with other LIFEPAK devices.

- Both batteries should be installed when operating on battery power. If only one battery is installed, the **INSERT BATTERY** message appears.

Two new, fully charged batteries at 20°C (68°F) provide an average of 603 discharges at 360 joules, 515 minutes of pacing, or 575 minutes of continuous monitoring before the defibrillator turns off.

If the **REPLACE BATTERY** message appears on the screen, immediately connect to auxiliary power to begin recharging the battery, or insert a fully charged battery.

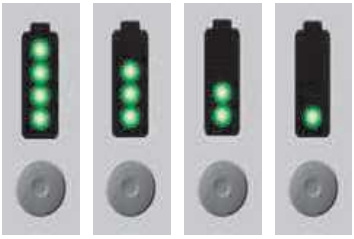
The defibrillator charges one battery at a time, starting with the battery that has the highest charge level. The LIFEPAK FLEX battery charger charges two batteries simultaneously. A fully depleted battery takes approximately 5 hours to charge in either the defibrillator or the battery charger.

Notes:

- Low battery messages do not appear if the device is connected to auxiliary power, but battery status is still indicated in the header area of the touchscreen.
- When battery charge levels are low, the device charges for defibrillation at a reduced rate to prevent unintended shutdown due to the large current draw.
- Under certain battery conditions, NIBP measurements may stop while the device is charging or charged for defibrillation. Printing may also stop during charging.

Battery Indicators

Each battery has a fuel gauge that indicates the approximate charge level in the battery. After the battery has been charged for the first time, you can press the gray button below the battery symbol to check the battery's charge level. The four battery indicators shown here represent approximate charge—greater than 75%, greater than 50%, greater than 25%, and greater than 15%, respectively.



Battery warning indicators are shown below. A single flashing green LED indicates that the battery is low and needs to be charged. Two red flashing LEDs indicate that the battery is not usable and should be returned to your authorized service personnel.

A battery that is new and has never been charged, or is fully depleted, does not illuminate any LEDs when the fuel gauge button is pressed.

New batteries are shipped with a low charge level and should be fully charged before use. Batteries may be charged in the battery charger, or in the defibrillator while it is connected to auxiliary power.

Notes:

- The fuel gauge on a new battery does not function until the battery has been charged for the first time.
- Older or heavily used batteries lose charge capacity. If the battery fuel gauge illuminates three or fewer LEDs after the battery completes a charge cycle, the battery should be replaced.

To install a battery:

1. Inspect battery pins for signs of damage or foreign material.
2. Align battery with the battery well.
3. Insert the battery into the battery well until it clicks into place.

To remove a battery:

1. Squeeze the battery latch.

2. Remove the battery from the well.

For additional information about battery maintenance, refer to the preventive maintenance section of this manual, or the Battery Maintenance section of the *LIFEPAK 35 monitor/defibrillator Operating Instructions*.

Touchscreen

The touchscreen responds to common touch inputs such as press, press-and-hold, and drag. The "pinch to zoom" gesture is not supported.

Touchscreen Orientation

The touchscreen is divided into three regions, described below.

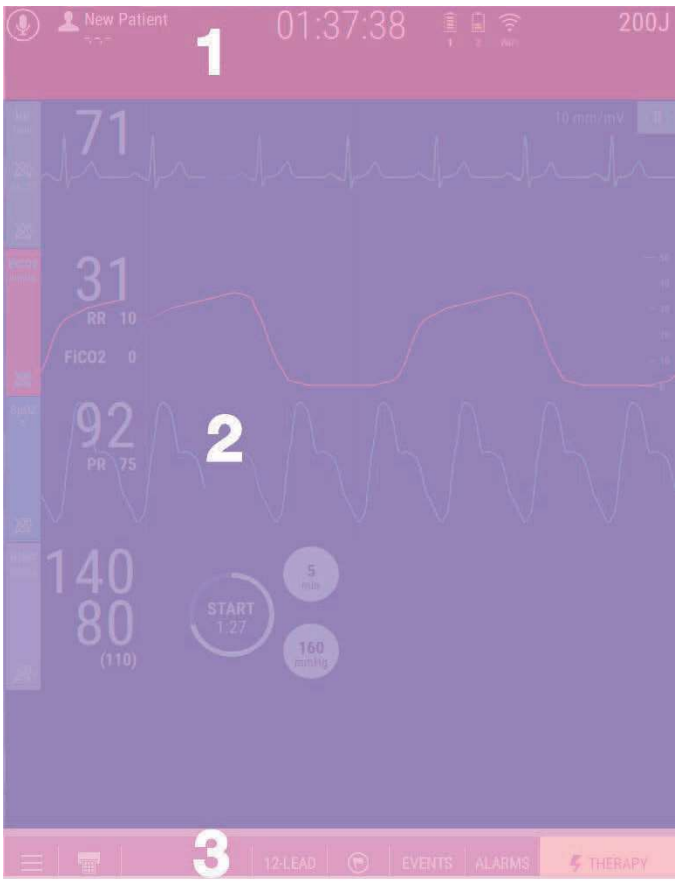


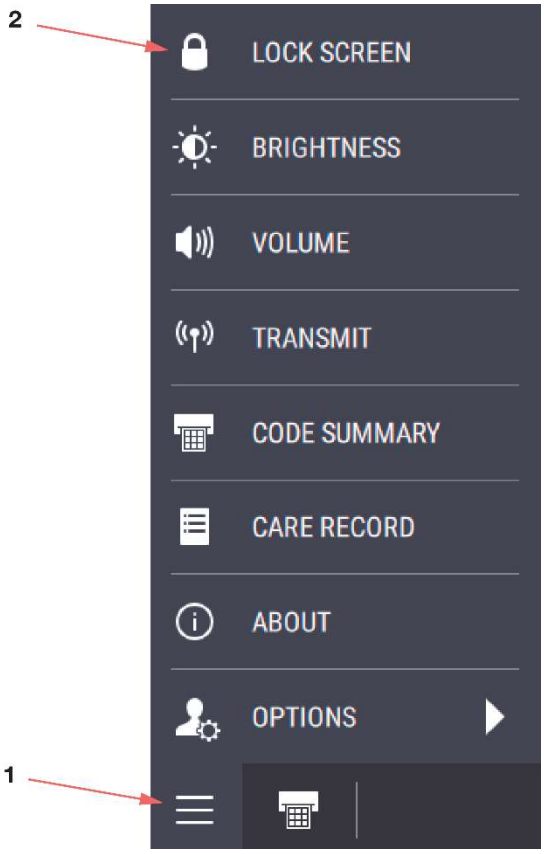
Figure 10 Touchscreen

REGION	DESCRIPTION
1	Header. The header region contains system status and messaging.
2	Body. The body region contains information and controls for the current operating mode, such as monitoring or therapy.
3	Footer. The footer region provides access to other operating modes and functions.

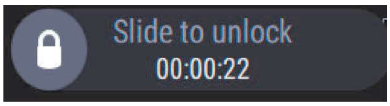
The touchscreen configuration changes depending on the current operating mode. For more information, refer to the *LIFEPAK 35 monitor/defibrillator Operating Instructions*.

Touchscreen Lock and Unlock

The touchscreen can be locked to prevent accidental inputs. To lock the touchscreen, 1) press the main menu button at the bottom of the touchscreen and 2) press **LOCK SCREEN**.



To unlock the touchscreen, touch anywhere on the screen, and then slide the **SLIDE TO UNLOCK** control that appears at the top of the screen. The unlocked icon will stay on the screen for several seconds and then disappear.



Using the speed dial to lock and unlock the touchscreen.

If motion or electrical interference makes it difficult to use the touchscreen, you may wish to use the speed dial to lock the screen.

To lock the touchscreen, push and hold the speed dial until the lock icon appears to indicate that the screen is locked.

To unlock the touchscreen, push and hold the speed dial until the lock icon changes to an unlocked icon.

Battery Status Indicators

Battery status indicators are shown at the top of the touchscreen. The indicators provide the following information about the batteries installed in the defibrillator:

- Presence or absence of battery in battery well
- Battery charge level
- Battery charging status
- Battery authentication status

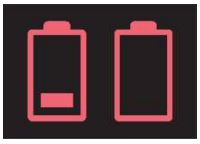
- ”Battery in Use” indication

IMPORTANT! Always check the battery charge level and ensure batteries are adequately charged before using the device on battery power.

When the defibrillator is not connected to auxiliary power, the following rules apply:

- If two batteries are installed, the defibrillator uses the battery with the lowest level of charge first.
- When a battery reaches the replace battery state, the defibrillator automatically switches to the other battery.
- When all battery capacity is exhausted, the defibrillator turns off. If you insert a charged battery or connect to auxiliary power and turn the defibrillator on in less than two minutes, the defibrillator retains certain important settings.

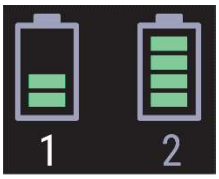
The following table provides a description of the various battery status indicators.

INDICATOR	MEANING	DESCRIPTION
	Battery > 75% charged	Battery status indicators display up to four green bars. Each green bar represents approximately 25% remaining charge. A battery with four bars is >75% charged.
	Battery > 50% and < 75% charged	
	Battery > 25% and < 50% charged	
	Battery > 15% and < 25% charged	
	Battery > 5% and < 15% charged	Battery is low and should be charged.
	Replace battery (Indicator alternates between one red bar and no bars.)	Battery has remaining charge of 5% or less. The defibrillator automatically switches to the other battery (if applicable) only if adequate charge is available. If all installed batteries have remaining charge of 5% or less, the **REPLACE BATTERY** voice prompt and high priority alarm occur.
	Battery charging	Battery is charging. A number beneath the icon indicates percent charged. In this example, the battery is 20% charged.

INDICATOR	MEANING	DESCRIPTION
	Unrecognized battery or battery fault	Battery communication failed, an unauthorized battery is installed, or a battery fault has been detected. The battery may power the defibrillator but the level of charge is unknown and low battery messages and prompts will not occur. Press battery icon to view details in the SYSTEM menu.
	No battery installed	No battery is installed in the battery well.
	Battery at end of service life	Battery is at end of service life. Replace battery immediately and recycle old battery. Note: A battery at the end of its service life has lost too much charge capacity or exhibits high internal resistance and should not be used.

Display Example

In this example, battery 1 is in use, as indicated by the highlighted well number beneath the battery icon. Battery 1 is between 25% and 50% charged, and battery 2 is fully charged.



Notes:

- When the defibrillator is operating on auxiliary power, the battery indicators show the battery charge level, but the well numbers are not highlighted. The **LOW BATTERY** and **REPLACE BATTERY** messages do not occur when operating on auxiliary power.
- Older or heavily used batteries lose charge capacity. If a fully charged battery is installed in the defibrillator and the battery status indicator shows less than four bars, the battery has reduced capacity and should be replaced.
- When the defibrillator is operating on battery power and all installed batteries are at end of service life, charging for defibrillation shock occurs at a slower rate and printing is disabled while charging. Other functions may be inhibited.

Speed Dial

The speed dial can be used to select options on the device instead of using the touchscreen. The speed dial can also be used to safely disarm the defibrillator during therapy. If the device is charging or has charged for a shock, you can push the Speed Dial to remove the charge without delivering a shock.

To use the speed dial:

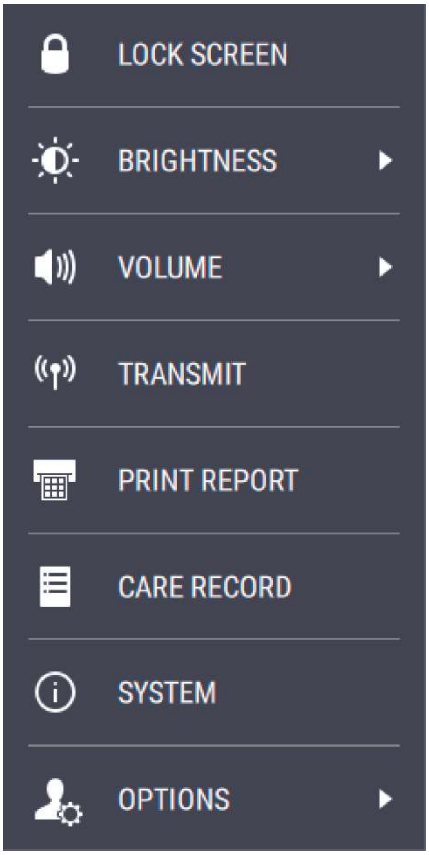
1. Rotate the speed dial clockwise or counter-clockwise until the desired option on the screen is highlighted.
2. Push the speed dial to select the option.
3. If the option has a sub-menu, continue using the speed dial to select the desired option in the sub-menu.
4. To exit speed dial navigation, either stop using the speed dial for 10 seconds or press anywhere on the touchscreen.

For example, to use the speed dial to navigate from the home screen to manual therapy and adjust the defibrillation energy, do the following:

1. Rotate the speed dial until the **THERAPY** button at the bottom-right corner of the screen is highlighted.
2. Push the speed dial to open the therapy screen.
3. If necessary, rotate the speed dial until the energy selection dial is highlighted.
4. Push the speed dial to select the energy selection dial.
5. Rotate the speed dial to increase or decrease the energy.
6. Push the speed dial to confirm the energy selection.

Main Menu

Press the main menu button at the bottom of the touchscreen to open the main menu. Menu items that are available from the main menu button on the home screen are shown here. The main menu that opens from therapy screens does not include **OPTIONS**.



LOCK SCREEN	Lock the touchscreen. See Touchscreen in the device operating instructions.
BRIGHTNESS	Manually adjust brightness, turn adaptive brightness ON or OFF, or switch to SunVue (high contrast) mode.
VOLUME	Adjust system volume or activate heart beat tone using ECG or SpO_2.
TRANSMIT	Transmit patient data. See Data Transmission in the device operating instructions.
PRINT REPORT	Print code summary or 12/15-lead ECG report. For more information, refer to the device operating instructions.
CARE RECORD	Enter patient information or view patient events. See Entering Patient Data and Viewing Patient Events in the device operating instructions.
SYSTEM	View system information, initiate Bluetooth connection, or change printer settings, 12/15-lead caliper units, or internal pacemaker markers.
OPTIONS	Access shift check (test mode), archive mode, setup mode, or service mode.

Figure 11 Main Menu

Device Options, Supplies, and Accessories

The following table lists the available basic hardware configurations and their associated features.

CONFIG	ECG	SPO_2	CO_2	NIBP	IP	TEMP
1	Yes	Masimo®	Medtronic	SunTech	No	No
2	Yes	Masimo	Medtronic	SunTech	Yes	Yes

Power, therapy, monitoring, and other accessories are available for the LIFEPAK 35. For more detail, refer to the *LIFEPAK 35 monitor/defibrillator Operating Instructions.* For ordering information, contact Stryker.

System Block Diagram

The mechanical assembly block diagram below shows, at a high level, the major hardware modules and subassemblies which make up the LIFEPAK 35 monitor/defibrillator.

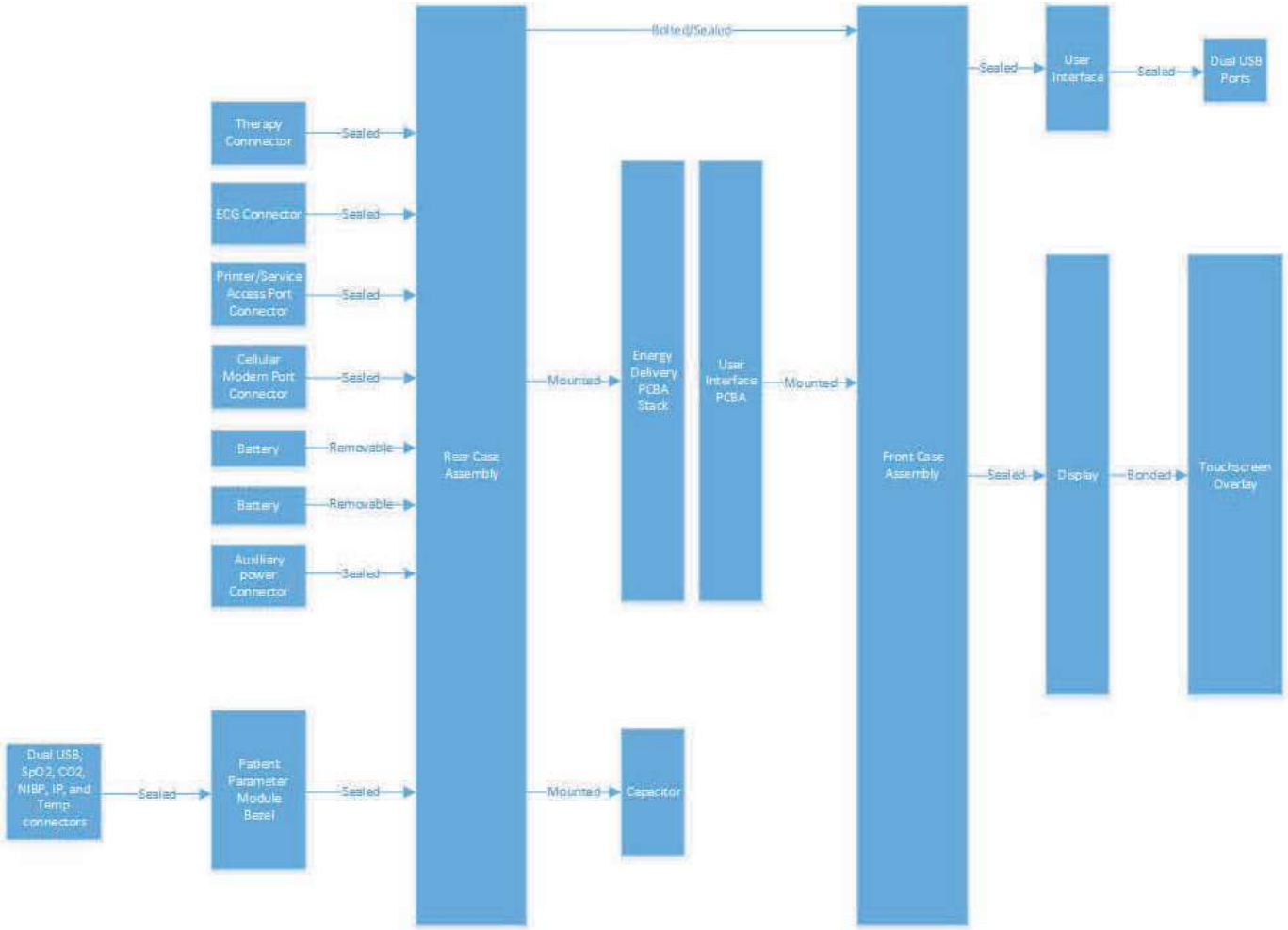


Figure 12 System Block Diagram

Functional Descriptions

The functional descriptions that follow provide a basic understanding of the LIFEPAK 35 device design and its major components. It is intended to assist the qualified service technician in troubleshooting to the subassembly level. Troubleshooting below the subassembly level, outside the factory is not recommended, nor is it within the scope of this service manual to provide the detail necessary to support such repairs. For context, the items in the subsection below may be found in the mechanical block diagram above, or in the diagrams in section 9.

System PCBA

The system PCBA is a central communications and control hub that mediates between the energy delivery PCBA, the interface PCBA, and the patient parameter PCBA. The LIFEPAK 35 architecture is centered around an i.MX6 processor located on a system on module (SOM) board which plugs onto the system PCBA. This module is responsible for controlling the user interface, therapy, and external communications. The SOM also contains the Wi-Fi and Bluetooth radio. Cellular communications are via USB to an external cellular module located outside of the device.

The system PCBA also includes the paddles control, paddles preamp and the vital signs monitor (VSM) subsystems. The VSM is responsible for ECG, invasive blood pressure, and invasive temperature.

The system PCBA is assembled together with the energy delivery PCBA to create a board stack subassembly during device assembly.

Energy Delivery PCBA

The energy delivery PCBA has two major functional blocks—power and therapy. The power section of the energy delivery PCBA provides battery charging, power switching, battery sharing and power source insertion/removal detection. The Therapy section provides high voltage capacitor charging, biphasic waveform delivery and pacing.

The energy delivery PCBA is assembled together with the system PCBA to create a board stack subassembly during device assembly.

Interface PCBA

The interface PCBA provides the electrical interconnects behind the user interface functions. It has the following main functions:

- Provides connectors and pathways for the various defibrillator interfaces to communicate with the other PCBAs internal to the defibrillator (system board, energy delivery board, beacon flex), the LCD, the touchscreen, the keypad, the rotary knob, and ultimately the user.
- Controls brightness of the display and patient beacon by communicating with the ambient light sensor on the keypad.
- Controls on/off functionality of some LEDs on the keypad.
- Provides CODEC and amplifier for speaker output to interface with SOM on the system board.
- Provides the touch controller for communication between the touchscreen and the SOM on the system board.
- Provides a method for grounding the LCD display case.
- Provides power switch to limit the amount of current available to USB ports.
- Provides fan control and fan interface.

Patient Parameter PCBA

The PCBA is housed in the patient parameter module. It provides connection from all patient parameter monitoring interfaces present in the device.

CO_2 Module

This OEM capnometry module is supplied by Medtronic and is housed in the patient parameter module. This module continuously monitors end-tidal carbon dioxide (CO_2) and respiratory rate. Signals pass through the patient parameter PCBA to/from the CO_2 module in route to/from the SOM on the system PCBA for processing.

SpO_2/SpCO/SpMet Module

This OEM oximetry module is supplied by Masimo and is housed in the patient parameter module. This module performs all functions related to oxygen, carboxyhemoglobin, and methemoglobin saturation. Signals pass through the patient parameter PCBA to/from the SpO_2 module in route to/from the SOM on the system PCBA.

NIBP Module

This OEM module is supplied by SunTech and is housed in the patient parameter module. This module performs non-invasive blood pressure monitoring, determining systolic, diastolic and mean pressures, and pulse rate. Signals pass through the patient parameter PCBA to/from the NIBP module in route to/from the SOM on the system PCBA.

Temperature and Invasive Pressure (IP) Monitoring

The connectors for temperature and IP monitoring are housed in the patient parameter module. Signals pass through the patient parameter module (bypassing the patient parameter PCBA) and go to the VSM on the system PCBA.

Energy Storage Capacitor

This metallized film capacitor is used for energy storage and is connected to the energy delivery PCBA. The capacitance is calculated when performing the TCP – defibrillator calibration procedure.

4. Modes of Operation

The LIFEPAK 35 monitor/defibrillator has a number of operating and non-operating modes.

The figure below maps the various operating and non-operating modes and shows transition paths between modes.

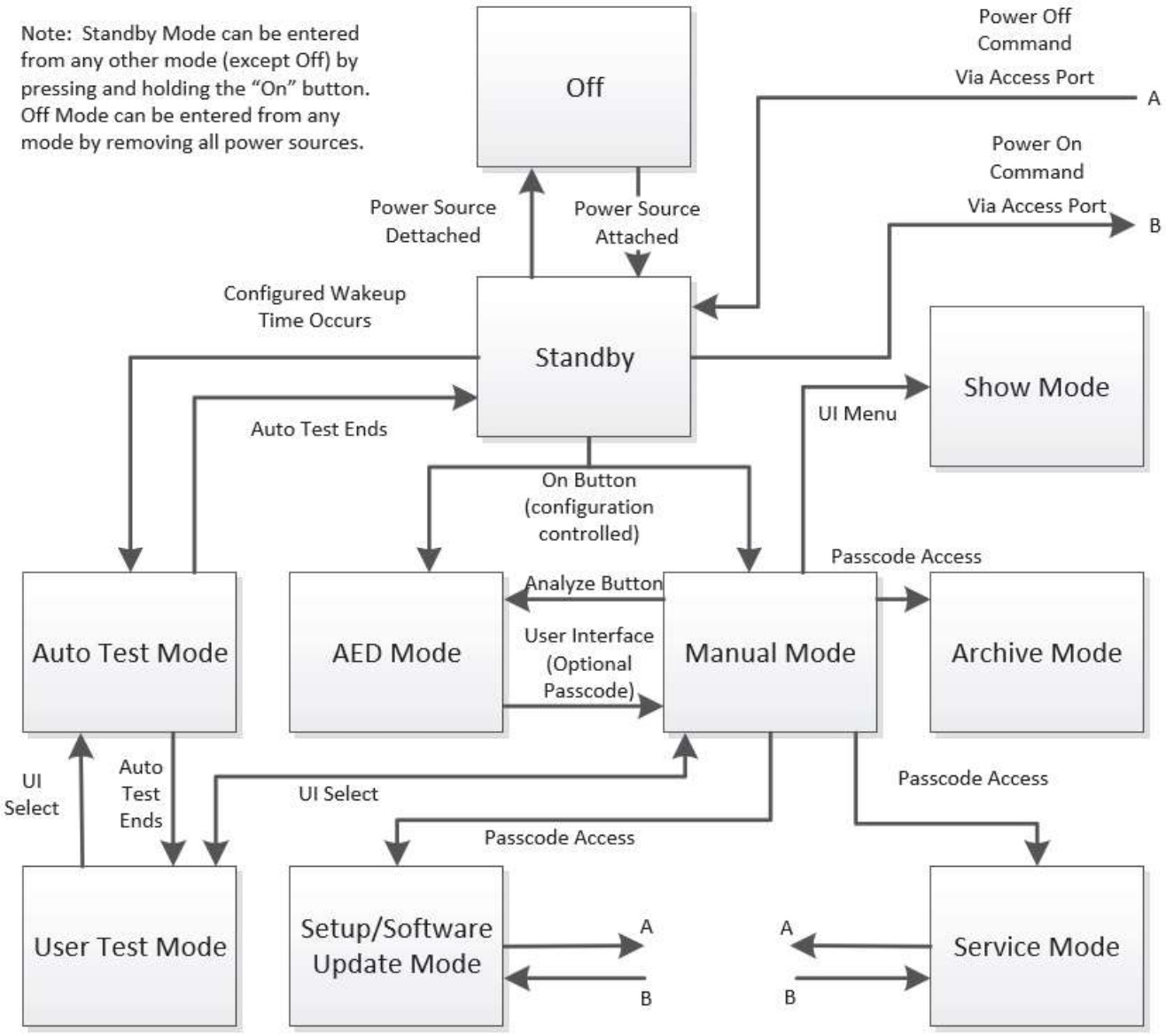


Figure 13 Operating and non-operating modes

Off Mode

In off mode, no power is applied to the device, and device functionality including the ability to perform auto test is not available.

Standby Mode

In standby mode, the device is turned off, but still has power supplied and is able to transmit records and perform auto-tests.

AED Mode

AED mode is for automated ECG analysis and a prompted treatment protocol for patients in cardiac arrest. Patient monitoring is also available. The device can be set up to power up in this mode as well as restrict access to manual therapy functionality.

Manual Mode

Manual mode is for performing manual defibrillation, synchronized cardioversion, and noninvasive pacing. Patient monitoring is also available.

Setup Mode

Setup mode is for viewing current setup options on the device, checking for updates, and adjusting the current date and time. Entry into this mode is password protected and not available to the general user. The device can receive setup options updates directly from LIFENET® or via LIFENET Device Agent, and can receive system software updates via LIFENET Device Agent.

Service Mode

Service mode is for authorized personnel to view device status registers and perform diagnostic tests and calibrations from off-device service software via access port connection to the device.

Auto Test Mode

Auto test mode provides a means for the device to perform a series of auto tests and provide pass/fail results to the user. The device will perform an auto test daily at the configurable time setting. In addition, the auto test can be initiated from within the user test mode (see below). Device functionality and indicators are limited in this mode.

User Test Mode

User test mode provides a means for the device to perform a series of user tests and provide pass/fail results to the user. Device functionality and indicators are limited in this mode.

Show Mode

Show mode provides the ability to display videos on the device to demonstrate key functionality to customers without the need for external accessory cables and simulators.

Archive Mode

Archive mode provides the ability to transmit stored patient records.

5. Device Connectivity and Communication

Device Connectivity and Communication Context Diagrams

The LIFEPAK 35 is a connected device, capable of multiple different means of communication, including Wi-Fi, cellular, Bluetooth, and via hard wire connection to the access port. Software loading and updating, and configuration and settings are managed via LIFENET. The subsections and diagrams below describe generally how the device connects and communicates in different scenarios. For detailed instructions on how to perform specific tasks, the service provider should refer to other sections in this manual, the device operating instructions, or the PIP/TCP.

You can transmit current and archived data from the LIFEPAK 35 monitor/defibrillator to the LIFENET system using a Wi-Fi or cellular connection to the internet.

You can also transmit archived data to a PC computer with DT EXPRESS™ data transfer software using Bluetooth wireless connection or a special USB access cable.

The following figure represents an overview of the data transmission process. For more information, refer to the *LIFEPAK 35 monitor/defibrillator Operating Instructions*.

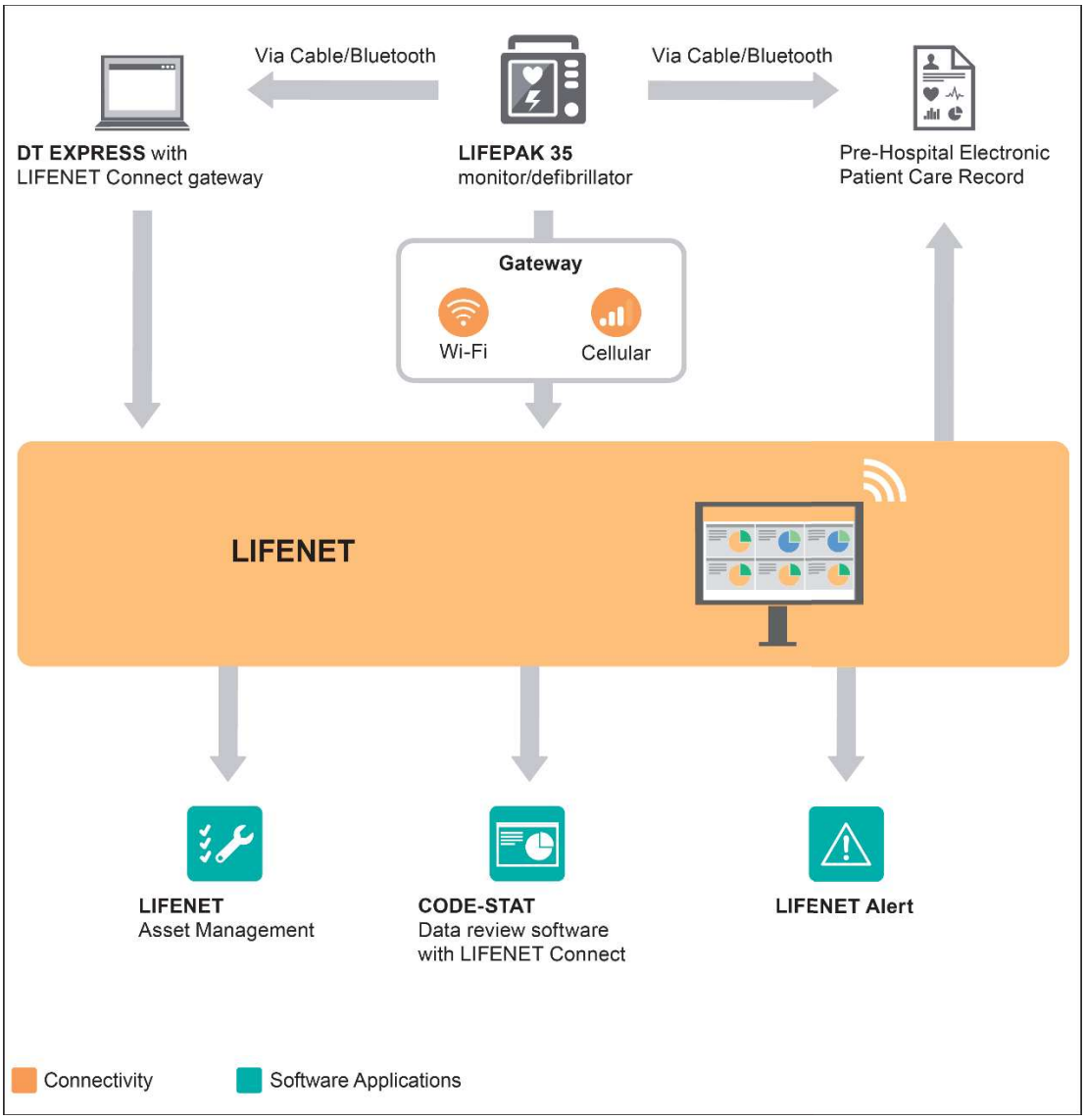


Figure 14 Data transmission process

Important! Customer should follow Wi-Fi Security Best Practices (specifications chapter). Unsecured data could lead to unidentified risks to patients, operators, or third parties. For more information, refer to the *LIFEPAK 35 monitor/defibrillator Technical Manual* or the *LIFEPAK 35 monitor/defibrillator Product Security Information.*

Device Configuration and Software Install context diagram

Software installation, update, and editing of device configuration and user settings can be done via the LIFENET Device Agent PC application using an access cable. User settings may also be updated wirelessly via the LIFENET streaming server. See the context diagram below. See also section 8 for more detail.

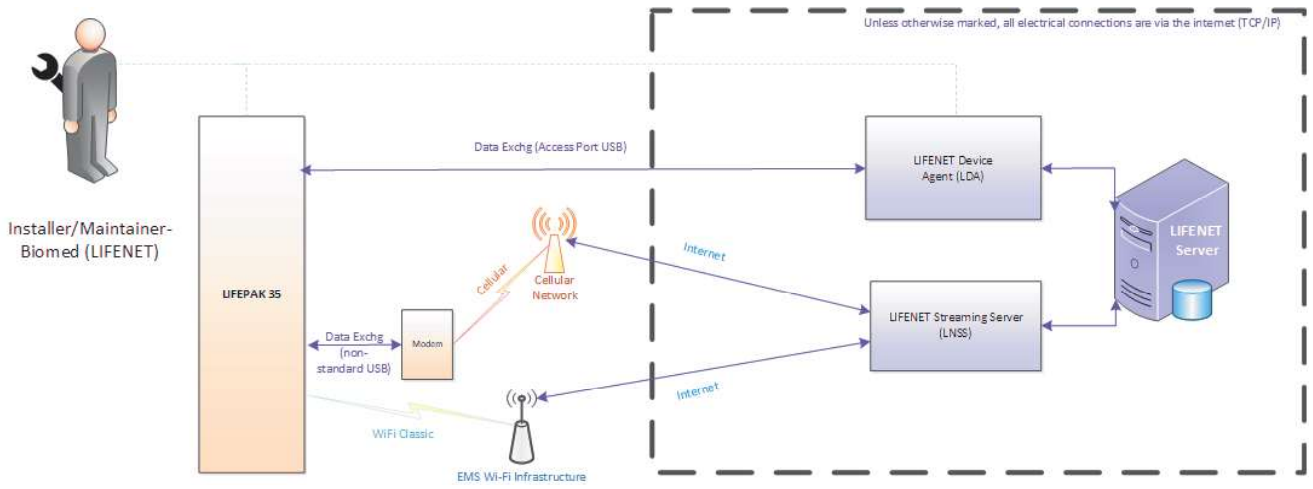


Figure 15 Device configuration and software install context diagram

Periodic Maintenance and Calibration context diagram

The following diagram gives context around performance of periodic maintenance and calibration by a Biomed or service provider.

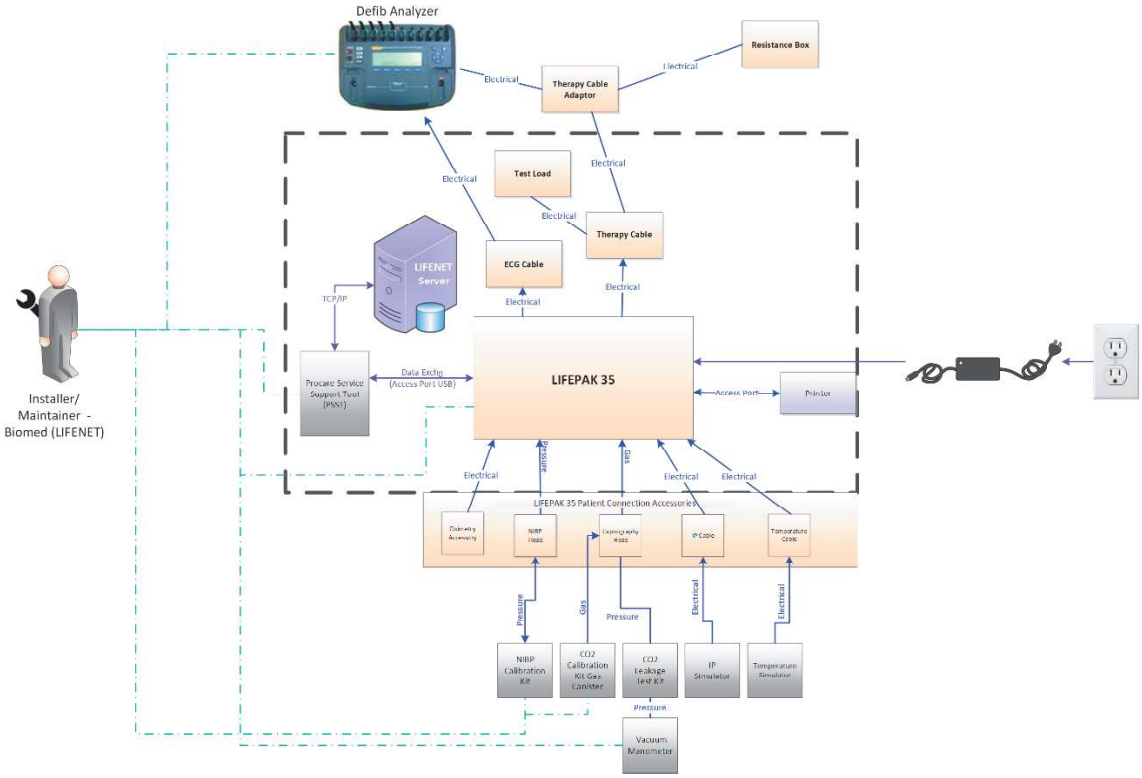


Figure 16 Periodic maintenance and calibration context diagram

Wi-Fi Connection

Wi-Fi configuration must be setup via the Wi-Fi configuration tool (WCT), which may be downloaded from LIFENET. Wi-Fi communication may be used to transmit to and from the device, including test results and readiness status, device configuration and user settings, and patient records. Transmissions to LIFENET are executed when the device is turned off, and when the user runs Check for Updates in setup mode or manually initiates transmission of records.

For detailed information on Wi-Fi connection and data transmission, refer to the *LIFEPAK 35 monitor/defibrillator Operating Instructions*.

Cellular Connection

Cellular communication via optional separate cellular modem connected to the port on the back of the device, may be used for device communication, similar to Wi-Fi. WCT is used to set up and configure cellular communication.

Bluetooth Connection

Bluetooth communication may be used to communicate with the device via a PC. For more information, refer to the *LIFEPAK 35 monitor/defibrillator Operating Instruction*.

Access Port Connection

The device may be connected to a PC using an access cable connected to the access port. Refer to section 3 for additional information. Note that the optional printer also connects to this port.

LIFENET Device Agent

LIFENET Device Agent may be used by the service provider, via connection to the device access port, to communicate with the device and load software. More information may be found in section 8.

LIFENET Device Agent is an application which may be downloaded from a user's LIFENET account.

6. Troubleshooting

This section contains information pertaining to troubleshooting methods for LIFEPAK 35, including error code usage, interpretation, and corrective action. General troubleshooting tips may be found in the *LIFEPAK 35 monitor/defibrillator Operating Instructions*.

General Troubleshooting

The table below describes general troubleshooting tips, including possible causes of problems, and associated corrective actions. Refer also to the *LIFEPAK 35 monitor/defibrillator Operating Instruction*.

OBSERVATION	POSSIBLE CAUSE	CORRECTIVE ACTION
No power when monitor/defibrillator is turned on.	Low battery voltage	• Replace with fully charged, properly maintained battery. • Connect to AC power.
	Battery connector pin loose, covered with foreign substance, or damaged	• Remove battery and inspect pins. Clean if foreign substance present. Contact a qualified service technician to replace if bent, cracked, or loose. • Connect to AC power.
	Defective battery	• Remove battery from service and replace with working battery. • Connect to AC power.
	Defective power cord	• Replace power cord. • Install fully charged battery.
	Power adapter not properly connected	• Check that power adapter is connected.
	Defective power adapter	• Replace with working power adapter.
POWER LED illuminated, but screen is blank and device does not operate	Device boot up has failed	• Push and hold **POWER** button until LED turns off (~5 seconds). Then push **POWER** button to turn device back on. • If device does not turn off, remove both batteries and disconnect power cord, if applicable. Then reinsert batteries, reconnect power cord, and push **POWER** button to turn device back on.
AUXILIARY POWER LED not illuminated	Device not properly connected to AC power source	• Check that device is properly connected to AC power.
	Defective power cord	• Replace power cord.
	Defective power adapter	• Replace with working power adapter.
BATTERY CHARGING LED not illuminated	Device not properly connected to AC power source	• Check that power adapter is connected properly.
	Battery not properly inserted in battery well	• Check that battery is properly inserted in battery well.
	No batteries installed	• Install batteries.
	Defective battery	• Remove battery from service and replace with working battery.
	Unrecognized battery	• Use only LIFEPAK FLEX battery.

OBSERVATION	POSSIBLE CAUSE	CORRECTIVE ACTION
	Defective power adapter or cables	• Replace with working power adapter and cables.
	Device unable to recognize installed battery	• Contact qualified service personnel.
CANNOT CHARGE BATTERY message appears	Defective battery	• Remove battery from service and replace with working battery.
	Defective power cord	• Replace power cord.
	Device unable to charge battery or batteries	• Contact qualified service personnel.
BATTERY X: REMOVE BATTERY FROM SERVICE message appears	Battery is at end of useful life	• Replace and recycle indicated battery immediately. Connect to AC power.
BATTERY X: INVALID BATTERY message appears	Device unable to recognize installed battery	• Replace indicated battery. • Contact qualified service personnel.
Fuel gauge on battery does not illuminate	Extremely depleted battery	• Charge battery in device connected to AC power, or in battery charger. •
	New battery that has not been charged	• Charge battery to enable fuel gauge.
	Faulty battery	• Replace battery.
Device turns off unexpectedly	High power draw	• Push **POWER** button immediately to turn device back on.
	Low battery power	• Connect to AC power or replace battery. • Push **POWER** button to turn device back on.
	Faulty battery	• Replace battery.
	RF equipment too close to defibrillator	• Separate RF equipment from defibrillator. See Electromagnetic Compatibility Guidance in the device technical manual. • Push **POWER** button to turn device back on.
Device won't turn off	**POWER** button not pushed long enough to turn off device	• Push and hold **POWER** button for at least two seconds.
	POWER button defective	• Contact qualified service personnel.
TOUCH SCREEN DISABLED – USE SPEED DIAL message appears	Touchscreen is not functioning	• Use speed dial to navigate and operate controls on the screen. • Turn device off and back on. If condition persists, contact qualified service personnel.
Device operates, but screen is blank	Operating temperature is too low or too high	• Operate device within specified ambient temperature range.
	Screen not operating properly	• Print ECG strip to assess rhythm and other active vital signs. • Push **ANALYZE** and use AED mode, if necessary.

OBSERVATION	POSSIBLE CAUSE	CORRECTIVE ACTION
		• Contact qualified service personnel.
Device operates, but screen not readable	Screen in direct sunlight	• Change screen to high contrast (SunVue) mode. • Reposition or shield device. • Print ECG strip to assess rhythm and other active vital signs. • Push **ANALYZE** and use AED mode with voice prompts, if necessary.
OVERHEATING – ALLOW DEVICE TO COOL DOWN message appears	Device has become too hot	• If possible, allow device to cool down before further use: move out of direct sunlight, remove blankets or other coverings, move to cooler ambient temperature. • If message persists after device has cooled down, contact qualified service personnel.
PRINTER OUT OF PAPER message appears	Printer is out of paper	• Install new paper roll.
PRINTER DOOR OPEN message appears	Printer door is not latched	• Close printer door.
PRINTER ERROR DETECTED message apears	Printer paper jams, slips, or misfeeds	• Check for printer jam or misfeed. • Contact qualified service personnel.
Service LED illuminates	Device self-test circuitry detects service condition	• Continue to use defibrillator or pacemaker, if needed. • Turn device off and then on again. Note that this creates a new record. If Service LED does not clear, remove device from active use. • Report occurrence of Service LED to qualified service personnel. • Obtain another device, if necessary.
ECG monitoring problems		• See Troubleshooting Tips for ECG Monitoring in the operating instructions.
Problems with AED operation		• See Troubleshooting Tips for AED Mode in the operating instructions.
Problems with defibrillation/synchronized cardioversion		• See Troubleshooting Tips for Defibrillation and Sync Cardioversion in the operating instructions.
Problems with pacing		• See Troubleshooting Tips for Pacing in the operating instructions.
Displayed time is incorrect	Time is incorrectly set	• Connect to LIFENET System to automatically update time setting. • Change the time setting on the device. See “Changing the Date and Time” in the LIFEPAK 35 technical manual.
Date printed on report is incorrect	Date is incorrectly set	• Connect to LIFENET System to automatically update date setting. • Change the date setting on the device. See “Changing the Date and Time” in the LIFEPAK 35 technical manual.

OBSERVATION	POSSIBLE CAUSE	CORRECTIVE ACTION
Displayed messages are faint or flicker	Low battery power	• Replace the battery immediately. • Connect to AC power.
	Out of temperature range	• Operate device within specified ambient temperature range.
Low speaker volume	Volume set too low	• Adjust system volume. See Main Menu in the operating instructions.
	Moisture in speaker grill holes	• Wipe moisture from speaker grill and allow device to dry.
MAINTENANCE DUE message appears	Maintenance prompt can be set to display every 3, 6, or 12 months	• Continue to use device, if needed. • Contact service personnel to perform routine maintenance. • Contact technical support for instructions on how to reset or turn off this prompt.

ProCare® Services Support Tool

ProCare Services Support Tool (PSST) is an external PC-based application, available to anyone with a LIFENET account, which may be used to perform certain service functions which cannot be performed directly on the device alone. PSST is required for completion of the manual performance inspection procedure (PIP), and the test calibration procedure (TCP). PSST may also be used for the following functions:

- Viewing active service codes
- Clearing active service codes
- Viewing asset usage data such as pacing and shock counts
- Resetting the maintenance prompt
- Erasing device data and settings, including patient data, setup options, LIFENET registration, WiFi settings, active codes and device logs

PSST may be downloaded from the software downloads section of your LIFENET account. Your LIFENET username and password are required for account login, and to run the PSST application.

To run PSST, start the application, and follow the on-screen instructions.

Device Logs

Logs containing LIFEPAK 35 device information are structured differently from past LIFEPAK devices. The prognostic log contains a variety of different types of information, including the following:

- Device data: Static, non-changing asset data for an individual device, such as serial numbers, manufacture date, and hardware and software part numbers.
- Usage data: Dynamic asset data for an individual device, such as power cycle count, shock count, operating time, operating temperature, battery data, and so on.
- Service codes and service code history: Service codes reported during tests and device operation, indicating improper operation or a device malfunction.
- Informational codes: Low-level codes which do not indicate a problem that requires service, but may be used for diagnostic purposes in failure analysis.
- Communications log: A record of the interactions between the device and PC tools to help troubleshoot connectivity issues.

A table of current active service codes can be retrieved from the device, using a PC-based Stryker service application. Service codes and service code history may also be found in the LIFENET device fault log for devices that are enrolled in LIFENET. This information is vital to troubleshooting issues and will be viewed by service providers during device maintenance and repair.

Other logs (separate from the prognostic log) include:

- Patient log: Contains patient data for clinical users. (Not accessible via PSST.)
- Test logs: Contains records of auto tests, shift checks, and monthly checks. (Viewable on the device.)

Service Codes and Processing Service Codes

The device operating software is designed to detect and report any improper operation or device malfunction by using a system of service codes. When an internal program or process fails to execute properly, a specific four-digit hexadecimal service code is written to the service code history in the prognostic log. These codes may be retrieved as active codes until they are cleared, at which point they will be removed from active codes but will remain in the prognostic log as part of service code history. When there are active codes, the Service LED indicator and/or readiness indicator may illuminate, depending on the type of problem. The illuminated Service LED indicator is your signal to examine the active codes and process any reported issues.

When service codes occur, they should be investigated thoroughly by a qualified service technician before the device is placed back into active use. Always complete the PIP after encountering and clearing any service codes.

The presence of active codes may not necessarily indicate a permanent failure. Service codes may indicate transient electromagnetic interference (EMI) or electrostatic discharge (ESD) issues. If you suspect transient EMI or ESD as the source of an error, clear the service code(s) as described below, and then shut down and restart and test the device. If the service code does not recur, it may have been a transient error.

To process service codes:

1. Review the service code(s) by displaying the current active service codes (per instructions below).
2. Clear the current service codes (per instructions below), and then turn the device OFF.
3. Complete the Performance Inspection Procedure (PIP).
    a. If the PIP completes successfully, the device may be returned to regular use; the service code(s) may have been transient errors related to EMI or ESD.
    b. If the Service LED illuminates at any time during the PIP, stop the PIP and investigate the PIP failure using the troubleshooting information in this section; continue with step 4.
4. Locate the specific corrective action for a service code as follows:
    a. View current active service code(s).
    b. Review the service codes and associated corrective actions in the tables below.
    c. Service the device based on these inputs, then repeat the PIP.
5. For persistent service codes, contact your local Stryker service or sales representative.

Displaying current active service codes

To display current active service codes in the service log, execute show active codes in PSST.

Clearing current active service codes

To clear active codes, execute clear active codes in PSST.

Service Code Format and Categories

The basic format for service codes is: **EXXX**

XXX is in hexadecimal format, with the first digit (X) indicating which PCBA or major component may have a problem, the second digit (X) indicating the subsystem which may have a problem, and the third digit (X) indicating a specific error. For the purpose of troubleshooting down to the serviceable (replaceable) component, service personnel should pay particular attention to the first digit following the E. The following table lists service code ranges, categories, and associated sub systems.

CODE INITIAL DIGITS	CODE RANGE	CATEGORY OR SUBSYSTEM	ASSOCIATED PCBAS AND ASSEMBLIES
E0XX	E000-E03F	Main processor	System PCBA
	E040-E07F	Paddles processor	System PCBA
	E080-E0FF	Internal VSM module	System PCBA
E1XX	E100-E11F	Internal communication devices	WiFi
	E120-E12F	System PCBA, IMX6 device	Access port, touch screen, audio functions
	E130-E13F	IMX6 device	Access port, usage counters, SOM
	E180-E1FF	IMX6 peripherals	SD card, data logging
E2XX	E200-E3FF	Power and therapy delivery	Energy delivery PCBA
E4XX	E400-E5FF	Interface PCBA	Interface PCBA
E6XX	E600-E7FF	Internal OEM modules	Patient parameter module PCBA CO_2 module SpO_2 module NIBP module
E8XX	E800-E9FF	External OEM devices	Patient parameter module
EAXX	EA00-EADF	User tests	Multiple

Service Codes, Severities, and Corrective Actions

Service code is a generic reference to the aggregate of all service errors, service warnings, non-ready conditions, and informational codes and test codes. The table below shows the service codes and information on possible causes and corrective actions. Service code severity categories are as follows:

SE = service error

Critical error that may affect the device's ability to deliver (energy)(defibrillation) therapy; requires service. A service error will illuminate the service indicator; should cause the readiness indicator to flash when the device is in standby mode.

Service errors may originate from a real time error during device use, or from a failure during a test such as power-on self-test, auto-test, user test, or performance inspection procedure (PIP).

When a service error occurs, a service code will be generated and written to the log. A message may also appear on the display screen (especially in the case of an error during normal use). See sections below for troubleshooting guidance.

Note that when a device is turned on, all front panel LEDs, including the service indicator, illuminate momentarily. This does not indicate an error; if an error exists, the indicator will remain illuminated.

Service warning (SW)

This is an issue that requires attention but is not critical to delivery of therapy. A service warning will not illuminate the service indicator but may cause the readiness indicator to flash when the device is in standby mode. A service code will be generated and written to the log. A message may also appear on the display screen (especially in the case of an error during normal use).

Though service warnings may not require that a device be immediately removed from service, they do indicate a condition which should be addressed by a service provider. Depending on how critical the affected function is to the clinical user, the device may require prompt servicing, or the issue may be addressed during the next scheduled preventive maintenance. Service codes may be processed per the instructions above. Reference the sections below for troubleshooting guidance.

Not ready (NR)

This is a condition where one or more key features is known to be unavailable, or user maintenance is required, for example, charge batteries, or replace electrodes. A not-ready condition will cause the readiness indicator to flash when the device is in standby mode. A message may also appear on the screen when the device is turned on. Not-ready codes by themselves can generally be corrected by the user, and do not require service.

Note that a service error or a service warning may also cause the readiness indicator to flash when the device is in standby mode

Readiness issues may be listed in the system tab of the main menu when the device is turned on. Readiness status may also be found in your LIFENET system account for enrolled devices.

See also the Device Description section of this manual for more details on what can cause a not-ready condition.

Informational

Informational codes represent non-critical minor issues which, by themselves, do not cause any problems with readiness for use. These codes do not appear in the list of active codes but may be seen in the service code history via the Prognostic Log. Informational codes are not intended for regular problem troubleshooting, and are not included in the list below, but may provide useful hints to secondary issues being investigated by engineering or failure analysis personnel when troubleshooting unusual and/or persistent problems.

CODE	SERVICE CODE DESCRIPTION	SEVERITY CATEGORY	CORRECTIVE ACTIONS (SEE TABLE BELOW)
E010	IMX6 PATIENT APP INTEGRITY CHECK	SE	1
E014	IMX6 RUNTEST APP INTEGRITY CHECK	SE	1
E021	IMX6 THERAPY RELATED SW FAILURE	SE	1, 5
E022	IMX6 NON-THERAPY SOFTWARE FAILURE	SW	1, 5
E023	IMX6 NAND FLASH INTEGRITY CHECK	SW	1
E024	SYSTEM SOFTWARE VERIFICATION ERROR	SE	1, 5
E025	IMX6 APPLICATION SOFTWARE INTEGRITY CHECK	SE	1, 5
E026	IMX6 WATCHDOG RESET OCCURRED	SW	1, 5

CODE	SERVICE CODE DESCRIPTION	SEVERITY CATEGORY	CORRECTIVE ACTIONS (SEE TABLE BELOW)
E028	IMX6 3.3V USB OTG RAIL VOLTAGE	SW	5
E029	IMX6 5.0V RAIL VOLTAGE	SW	2, 5
E02A	IMX6 3.3V TO PMOD VOLTAGE	SW	2, 5, 14
E02B	IMX6 3.3V CABLE VOLTAGE	SE	2, 5
E02C	IMX6 3.3V RAIL VOLTAGE	SE	2, 5
E02D	IMX6 3.9V RAIL VOLTAGE	SE	2, 5
E030	SETUP OPTIONS INTEGRITY CHECK	SE	1, 5
E031	MFG CONFIGURATION INTEGRITY CHECK	SE	1, 5
E032	TOUCHSCREEN FAILURE	SW	3, 11, 5
E034	ACTIVE CODE TABLE ACCESS FAILURE	SE	1, 5
E036	IMX6 PAD-CONNECTOR ATTACHED	SE	5
E037	PRINTER POWER OVERCURRENT	SW	5, 18
E038	INTERFACE USB BOTTOM PORT OVERCURRENT	SW	5, 11
E039	INTERFACE USB TOP PORT OVERCURRENT	SW	5, 11
E03A	PPB MODULE OVERVOLTAGE TO USB BOTTOM PORT	SW	14
E03B	PPB MODULE OVERVOLTAGE TO USB TOP PORT	SW	14
E03C	USB PORT 5.0 VOLTAGE POWER GOOD	SW	14
E03D	NIBP 6.0 VOLTAGE	SW	16, 14
E03E	CAPNOGRAPHY 5.0 VOLTAGE	SW	15, 14
E050	PADDLES SELF TEST	SE	1, 5
E055	PADDLES uC SOFTWARE INTEGRITY CHECK	SE	1, 5
E057	PADDLES EYE-CLOSE TEST	SW	5
E058	PADDLES COMMUNICATIONS TIMEOUT	SE	5
E059	PADDLES UC STATE MISMATCH	SE	5
E060	PADDLES WATCHDOG TEST	SE	5
E061	PADDLES STACK TEST	SE	1, 5
E062	PADDLES RAM TEST	SE	5
E063	PADDLES FLASH CRC TEST	SE	1, 5
E064	PADDLES POWER MONITOR	SE	5
E065	PADDLES MESSAGE CRC	SE	1, 5
E066	PADDLES MESSAGE ID	SE	1, 5
E067	PADDLES MESSAGE SEQUENCING	SE	5
E068	PADDLES IMPEDANCE NOT CALIBRATED	SE	2, 5

CODE	SERVICE CODE DESCRIPTION	SEVERITY CATEGORY	CORRECTIVE ACTIONS (SEE TABLE BELOW)
E069	PADDLES IMPEDANCE CALIBRATION CRC ERROR	SE	6
E06A	PADDLES ADC TIMEOUT	SE	5, 6
E06C	PADDLES OVER VOLTAGE RESET	SE	5
E06D	PADDLES ECG SELF TEST	SE	5
E06E	PADDLES Z1 SELF TEST	SE	4, 5
E06F	PADDLES Z2 SELF TEST	SE	4, 5
E070	PADDLES M1 SELF TEST	SE	4, 5
E071	PADDLES M2 SELF TEST	SE	4, 5
E0A1	VSM uC COMMUNICATION FAILURE	SW	5
E0A2	VSM uC COMMUNICATION CRC ERROR	SW	5
E0A5	VSM SOFTWARE INTEGRITY CHECK	SE	1, 5
E0A7	VSM Uc COMMUNICATION APERIODIC	SW	5
E0A8	VSM 3.3V RAIL	SW	2, 5
E0A9	VSM ANALOG 3.3V RAIL	SW	2, 5
E0AA	VSM 1.2V RAIL	SW	2, 5
E0AB	VSM 5.5V RAIL	SW	2, 5
E0AC	VSM -5.5V RAIL	SW	2, 5
E0AD	VSM 10V RAIL	SW	2, 5
E0AE	VSM -10V RAIL	SW	2, 5
E0AF	VSM LEADS	SW	5
E0B0	VSM LEADS	SW	5
E0B1	VSM LEADS III	SW	5
E0B2	VSM CHOPPER	SW	5
E0B3	VSM WILSON CENTRAL TERMINAL	SW	5
E0B4	VSM VOLTAGE	SW	2, 5
E0B5	VSM IBP CALIBRATION	SW	5
E0B6	VSM IBP MONITOR	SW	22, 5
E0B7	VSM PATIENT TEMPERATURE CALIBRATION	SW	7, 5
E0BA	VSM FPGA	SW	5
E0BB	VSM CABLE AUTHENTICATION	SW	23, 5
E0BD	VSM SPI READY HIGH	SW	5
E0BE	VSM SPI READY LOW	SW	5
E0BF	VSM QRS GPIO TOGGLE	SE	5
E101	WIFI POWER-ON SELF TEST	SW	5

CODE	SERVICE CODE DESCRIPTION	SEVERITY CATEGORY	CORRECTIVE ACTIONS (SEE TABLE BELOW)
E120	IMX6 I2C2 BUS ERROR	SW	5
E122	TOUCH SCREEN DEVICE FAILURE	SW	3
E123	TOUCH SCREEN FUNCTION ERROR	SW	3
E124	AUDIO AMP DEVICE FAILURE	SW	3
E126	AUDIO CODEC DEVICE FAILURE	SW	3
E127	AUDIO CODEC FUNCTION CHECK	SW	3
E128	SYS-PCBA EEPROM DEVICE FAILURE	SW	5
E129	SYS-PCBA EEPROM FUNCTION ERROR	SW	5
E12A	ACCESS 15 VOLT ADC DEVICE FAILURE	SW	5
E12C	TOUCH CONTROLLER PIN FAULT TEST FAILURE	SW	3
E12E	TOUCH CONTROLLER AVDD TEST FAILURE	SW	3
E130	IMX6 I2C3 ERROR	SW	5
E132	SOM USER EEPROM DEVICE FAILURE	SW	5
E133	SOM USER EEPROM FUNCTION ERROR	SW	5
E134	SOM MFG EEPROM DEVICE FAILURE	SW	5
E135	SOM MFG EEPROM FUNCTION ERROR	SW	5
E136	SOM TEMPERATURE SENSOR 0 DEVICE FAILURE	SW	5
E138	SOM TEMPERATURE SENSOR 1 DEVICE FAILURE	SW	5
E13C	HARD PADDLES ADC DEVICE FAILURE	SW	5
E13D	HARD PADDLES ADC FUNCTION ERROR	SW	5
E141	BLUETOOTH POWER-ON SELF TEST	SW	5
E225	POWER uC SOFTWARE INTEGRITY CHECK	SE	1, 2
E226	POWER uC WATCHDOG RESET	SW	2
E227	POWER uC COMMUNICATIONS ERROR	SE	2, 5
E228	POWER uc COMMUNICATIONS ERROR WITH SOM	SE	2, 5
E229	POWER uC COMMUNICATIONS APERIODIC MESSAGE CHECK	SE	2, 5
E22A	POWER uC EEPROM SERVICE READ ERROR	SE	2
E22C	POWER SOURCE FAILURE CHECK	SE	2
E230	POWER uC 15V BUS RAIL	SE	2
E231	POWER uC AO 3.3V RAIL	SE	2
E233	SERVICE LED FAILURE	SW	8, 2, 5, 11
E238	POWER BUTTON STUCK	SE	8, 2, 5, 11

CODE	SERVICE CODE DESCRIPTION	SEVERITY CATEGORY	CORRECTIVE ACTIONS (SEE TABLE BELOW)
E239	RTC CHECK – POSSIBLE POWER LOSS	SW	24, 1, 4
E23B	COIN CELL CHECK	SW	24, 1
E2A3	THERAPY UC STATE MISMATCH	SE	4
E2A5	THERAPY uC SOFTWARE INTEGRITY CHECK	SE	1, 4
E2A6	THERAPY PACING ERROR	SE	4
E2A7	THERAPY PACING RATE ERROR	SE	4
E2A8	THERAPY PREPULSE GPIO ERROR	SE	4
E2A9	THERAPY QRS GPIO ERROR	SE	4
E2AA	CHARGE REMAINING ON CAPACITOR AFTER SHOCK	SE	9, 4
E2AB	CHARGE ENERGY INCORRECT	SE	9, 4
E2AC	CHARGE ENERGY INCORRECT INTERNAL PADDLES	SE	9, 4
E2AD	CHARGE ENERGY TOO HIGH DISABLED	SE	9, 4
E2AF	THERAPY COMMUNICATION TIMEOUT	SE	4
E2C0	THERAPY uC WATCHDOG CHECK	SE	4
E2C1	THERAPY uC STACK CHECK	SE	4
E2C2	THERAPY uC RAM TEST	SE	4
E2C3	THERAPY FLASH CRC TEST	SE	4
E2C4	THERAPY 3.3V MONITOR CHECK	SE	4
E2C5	THERAPY 24V MONITOR CHECK	SE	4
E2C6	THERAPY ADC CONVERSION TIMEOUT	SE	4
E2C7	THERAPY OSCILLATOR CLOCK ERROR	SE	4
E2C8	THERAPY TRANSFER OPEN ERROR	SE	4
E2C9	THERAPY TRANSFER CLOSE ERROR	SE	4
E2CA	THERAPY uC COMMUNICATION CRC ERROR	SE	4
E2CB	THERAPY uC COMMUNICATION INTERNAL ISSUE	SE	4
E2CC	THERAPY uC COMMUNICATION DROPPED MESSAGE	SE	4
E2CD	THERAPY CHARGE COMMAND ERROR	SE	4
E2CE	THERAPY ARM COMMAND ERROR	SE	4
E2CF	THERAPY CAP OVER VOLTAGE	SE	9
E2D0	THERAPY CHARGING TIMEOUT	SE	9
E2D1	THERAPY DUMP TIMEOUT	SE	9
E2D2	SC_TH_ED_ERROR_PACE_ON_CMD	SE	4, 5
E2D3	THERAPY PULSE WIDTH ERROR	SE	4

CODE	SERVICE CODE DESCRIPTION	SEVERITY CATEGORY	CORRECTIVE ACTIONS (SEE TABLE BELOW)
E2D4	THERAPY PACE CHARGE TIMEOUT	SE	4
E2D5	SC_TH_ED_ERROR_PULSE_START_CD_TO	SE	4, 5
E2D6	SC_TH_ED_ERROR_PULSE_STOP_CD_TO	SE	4, 5
E2D7	SC_TH_ED_ERROR_PULSE_START	SE	4, 5
E2D8	SC_TH_ED_ERROR_UNEXPECTED_WATCHDOG	SE	4
E2D9	THERAPY H-BRIDGE ERROR	SE	4
E2DA	THERAPY DEFIB CALIBRATION ERROR	SE	9, 10
E2DB	THERAPY ADC COMPARE ERROR	SE	4
E2DC	THERAPY VOLTAGE ON CAP	SE	4, 9
E2DD	THERAPY REDUNDANT VARIABLE	SE	4
E2DE	THERAPY RELAY ERROR	SE	4
E2DF	THERAPY OVER VOLTAGE ERROR	SE	4, 9
E421	INTERFACE uC COMMUNICATION FAILURE	SE	8, 11
E425	INTERFACE uC SOFTWARE INTEGRITY CHECK	SE	1, 11
E427	INTERFACE uC COMMUNICATION ERROR	SE	8, 11
E430	INTERFACE uC POWER LED	SW	8, 11, 5
E431	INTERFACE uC SHOCK LED	SW	8, 11, 5
E432	INTERFACE uC RED BEACON	SW	11, 5
E433	INTERFACE uC YELLOW BEACON	SW	11, 5
E434	INTERFACE uC 15V RAIL	SE	2, 11, 5
E435	INTERFACE uC AVDD 3.3V RAIL	SW	2, 11
E437	INTERFACE uC 1.8V RAIL	SW	2, 11
E438	INTERFACE uC 3.3V RAIL	SE	8, 2, 11
E439	INTERFACE uC 5V RAIL	SW	2, 11
E43A	INTERFACE uC 12V RAIL	SE	2, 11
E43B	INTERNAL FAN	SE	12, 11, 5
E43C	INTERNAL SPEAKER	SW	13, 11, 5
E43D	INTERFACE PCBA EEPROM	SW	11
E43E	AMBIENT LIGHT SENSOR	SW	8, 11
E4E1	AUDIO DAMAGED FILES	SW	1, 5
E660	CAPNOGRAPHY SELF-TEST FAILURE	SW	15, 14, 5
E661	CAPNOGRAPHY DEVICE FAILURE	SW	15, 14, 5
E662	CAPNOGRAPHY COMMUNICATION FAILURE	SW	15, 14, 5
E670	CAPNOGRAPHY CALIBRATION FAILURE	SE	15, 14, 5

CODE	SERVICE CODE DESCRIPTION	SEVERITY CATEGORY	CORRECTIVE ACTIONS (SEE TABLE BELOW)
E6A0	NIBP SELF-TEST FAILURE	SW	16, 14, 5
E6A1	NIBP DEVICE FAILURE	SW	16, 14, 5
E6A2	NIBP COMMUNICATION FAILURE	SW	16, 14, 5
E6E0	OXIMETRY SELF-TEST FAILURE	SW	17, 14, 5
E6E1	OXIMETRY DEVICE FAILURE	SW	17, 14, 5
E6E2	OXIMETRY COMMUNICATION FAILURE	SW	17, 14, 5
E800	THERAPY CABLE VALIDITY CHECK	SW	25, 5
EA02	SHIFTCHECK CHARGE BUTTON	SW	8
EA03	SHIFTCHECK SHOCK BUTTON	SW	8
EA04	SHIFTCHECK ANALYZE BUTTON	SW	8
EA05	SHIFTCHECK SPEED DIAL PUSH	SW	20
EA06	SHIFTCHECK SPEED DIAL CLOCKWISE	SW	20
EA07	SHIFTCHECK SPEED DIAL COUNTER-CLOCKWISE	SW	20
EA08	SHIFTCHECK POWER BUTTON LED	SW	8
EA09	SHIFTCHECK SHOCK BUTTON LED	SW	8
EA0A	SHIFTCHECK AUXILIARY POWER LED	SW	8
EA0B	SHIFTCHECK BATTERY POWER LED	SW	8
EA0C	SHIFTCHECK SERVICE LED	SW	8
EA0D	SHIFTCHECK BEACON PATIENT RED	SW	21
EA0E	SHIFTCHECK BEACON PATIENT YELLOW	SW	21
EA0F	SHIFTCHECK READINESS LED YELLOW	SW	21
EA10	SHIFTCHECK TOUCH SCREEN PRESS	SW	3
EA11	SHIFTCHECK PIXEL DISPLAY	SW	3
EA12	SHIFTCHECK MICROPHONE SPEAKER	SW	13, 11, 5
EA13	SHIFTCHECK DEVICE DAMAGE	SW	19
EA14	SHIFTCHECK DEVICE SUBSTANCE	SW	19
EA15	SHIFTCHECK POWER CORD DAMAGE	SW	19
EA16	SHIFTCHECK PRINTER PAPER	NR	19
EA17	SHIFTCHECK PRINTER OPERATION	SW	19
EA18	SHIFTCHECK SPARE PADS	NR	19
EA19	SHIFTCHECK PADS DATE	NR	19
EA1A	SHIFTCHECK PADDLES CLEAN	NR	19
EA1B	SHIFTCHECK ELECTRODE PACKAGE	NR	19
EA1C	SHIFTCHECK THERAPY CABLE	SW	19

CODE	SERVICE CODE DESCRIPTION	SEVERITY CATEGORY	CORRECTIVE ACTIONS (SEE TABLE BELOW)
EA1D	SHIFTCHECK ECG CABLE	SW	19
EA1E	SHIFTCHECK SPO2 CABLE	SW	19
EA1F	SHIFTCHECK NIBP ACCESS	SW	19
EA20	SHIFTCHECK AC POWER	SW	19
EA21	SHIFTCHECK BATTERY POWER	SW	19
EA22	SHIFTCHECK CHARGED BATTERIES	SW	19
EA23	SHIFTCHECK TEMPERATURE CABLE	SW	19
EA24	SHIFTCHECK IBP CABLE	SW	19
EA43	ENERGY DIAL CLOCKWISE	SW	19, 25, 5
EA44	ENERGY DIAL COUNTERCLOCKWISE	SW	19, 25, 5
EA45	PADDLES CHARGE BUTTON	SW	19
EA46	PADDLE STERNUM BUTTON	SW	19
EA47	PADDLES APEX BUTTON	SW	19
EA48	PADDLES CHARGE BUTTON	SW	19
EA49	PADDLES PRINT BUTTON	SW	19
EA4A	PADDLES SURFACE INSPECTION	SW	19
EA4B	PADDLES CABLE INSPECTION	SW	19
EA4C	PADDLES CONNECTOR INSPECTION	SW	19
EA4D	PADDLES CONNECTION CHECK	SW	19
EA4E	PADDLES IN WELLS CHECK	SW	19
EA4F	PADDLES CHARGE CHECK	SW	19
EA50	PADDLES ENERGY DELIVERY CHECK	SW	19
EA51	PADDLES TEST LOAD DETECTED	SW	19
EA52	ENERGY TEST LOAD DETECTED	SW	19
EA53	ENERGY TEST LOAD CHARGE CHECK	SW	19, 4
EA54	ENERGY TEST LOAD DELIVERY CHECK	SW	19, 4
EA55	ENERGY TEST LOAD LEADS OFF DETECTED	SW	19
EA56	ENERGY TEST LOAD CABLE CHECK	SW	19
EAE0	AUTO-TEST SERVICE ERROR CHECK	SW	19
EB00	BATTERY 1 MISSING	NR	19
EB01	BATTERY 1 FAULT	NR	19
EB02	BATTERY 1 NOT AUTHORIZED	NR	19
EB03	BATTERY 1 LOW	NR	19
EB04	BATTERY 2 MISSING	NR	19
EB05	BATTERY 2 FAULT	NR	19

CODE	SERVICE CODE DESCRIPTION	SEVERITY CATEGORY	CORRECTIVE ACTIONS (SEE TABLE BELOW)
EB06	BATTERY 2 NOT AUTHORIZED	NR	19
EB07	BATTERY 2 LOW	NR	19
EB08	AUXILIARY POWER NOT CONNECTED	NR	19
EB09	BATTERY 1 END-OF-LIFE	NR	19
EB0A	BATTERY 2 END-OF-LIFE	NR	19
EB13	ELECTRODES TEST LOAD DETECTED	NR	19
EB14	ELECTRODES SIMULATOR DETECTED	NR	19
EB20	THERAPY CABLE MISSING	NR	19

Corrective Action Codes

The corrective actions in the table below are intended to be used as a guideline to aid the service technician when troubleshooting an issue. Corrective actions for each corrective action code are listed in the recommended sequential order. For actions which require replacement of a failed part or subassembly, refer to section 8 of this service manual.

CORRECTIVE ACTION CODE	DESCRIPTION
1	Software integrity issue: 1) Reinstall system software.
2	Power issue: 1) Check power-related cables, connections. 2) Possible energy delivery PCBA failure.
3	Touch screen controller issue: 1) Check system flex. 2) Possible touch screen/display failure.
4	Therapy function issue related to energy delivery PCBA: 1) Check therapy-related cables and connections. 2) Possible energy delivery PCBA failure.
5	Issue with functions related to system PCBA: 1) Check cables and connections to/from system PCBA. 2) Possible system PCBA failure.
6	Paddles impedance calibration issue: 1) Possible system PCBA failure.
7	Patient temperature calibration issue: 1) Possible system PCBA failure.
8	Issue with function related to keypad: 1) Check system flex. 2) Check keypad cable connection.

CORRECTIVE ACTION CODE	DESCRIPTION
	3) Possible keypad failure.
9	Energy storage capacitor issue: 1) Check energy storage capacitor connection. 2) Possible energy storage capacitor failure.
10	Defib energy calibration issue: 1) Recalibrate defib energy. **Note**: The user may clear calibration error (by using the Clear Active Service Codes command), and reenter device into service if defib energy passes PIP test.
11	Issue with functions related to interface PCBA: 1) Possible Interface PCBA failure.
12	Over-heating or fan issue: 1) Check system flex. 2) Check fan cable connection. 3) Possible fan failure. **Note**: In case of fan failure, the system PCBA should also be replaced.
13	Audio issue: 1) Check system flex. 2) Check speaker cable connection. 3) Possible speaker failure.
14	Issue with function related to patient parameter monitoring: 1) Check cables and connections to parameter module. 2) Possible patient parameter PCBA failure.
15	Issue with capnography function: 1) Calibrate CO_2. 2) Check cables and connections to CO_2 module and connector. 3) Check CO_2 hoses. 4) Possible CO_2 module failure.
16	Issue with NIBP function: 1) Check NIBP calibration. 2) Check NIBP hoses. 3) Check cables and connections to NIBP module and connector. 4) Possible NIBP pump failure. 5) Possible NIBP module failure.
17	Issue with oximetry function: 1) Check cables and connections to SpO_2 module and connector. 2) Check SpO_2 connector. 3) Possible SpO_2 module failure.

CORRECTIVE ACTION CODE	DESCRIPTION
18	System PCBA or accessory issue: 1) Possible printer or accessory failure. 2) Possible system PCBA failure.
19	Issues related to shift check failures and accessory problems: 1) Presence of, or issues with accessories such as electrodes, paddles, printer, batteries. 2) Corrective actions based on General Troubleshooting table. 3) Corrective actions based on on-screen messages. 4) Repair or replace external device parts or accessory items as required.
20	Speed dial issue: 1) Check connections to rotary switch. 2) Possible rotary switch failure. 3) Possible interface PCBA failure.
21	Beacon issue: 1) Possible beacon failure. 2) Possible interface PCBA failure.
22	Invasive pressure monitoring issue: 1) Possible temp-IP connector or temp-IP cable failure.
23	VSM cable authentication logic issue: 1) Possible issue with ECG cable or ECG cable connection.
24	Possible coin cell battery power loss: 1) Replace coin cell battery.
25	Possible issue with therapy connector or cabling: 1) Possible faulty therapy connector or cabling.

7. Preventive Maintenance

Periodic maintenance, inspection, and testing of the device helps prevent and detect possible electrical and mechanical problems. The following procedures describe actions which are used to test and maintain the device.

Device Self Tests

The LIFEPAK 35 monitor/defibrillator automatically performs self-tests to ensure that internal electrical components and circuitry work properly, including the following tests:

- Power-on self-test: Brief test that runs each time the device is turned on.
- Auto test: Test that runs daily, if powered and in standby mode (time of day is configurable; 3:00am by default).

A record of self-tests is posted to the test log within the prognostic log. If problems are detected during self-tests, service codes are generated, and the service indicator and/or the readiness indicator may illuminate. Refer to the Troubleshooting section above for guidance on interpreting and correcting issues. Test results, and the resulting readiness status, are transmitted to LIFENET when a Wi-Fi or cellular connection exists. Test logs may also be printed if a printer is connected. See the *LIFEPAK 35 monitor/defibrillator Operating Instructions* for more detail.

Device User Tests

User-initiated tests should be run to ensure that internal electrical components and circuitry work properly and that the device is ready for operation. User tests include the following:

- The **shift check** provides a means for testing, with user interaction, and providing pass/fail results. Functions tested include keypad buttons and controls, display and touch screen, printer (if equipped), power supply, and readiness of electrodes and accessories. Should be performed once per shift.
- The **monthly check** is similar to a shift check with additional functionality tested, including delivery of therapy. Should be performed monthly.
- Auto test may also be initiated by the user.

User tests may be run in test mode and may be accessed via the Options menu on the device screen. Refer to the *LIFEPAK 35 monitor/defibrillator Operating Instructions* for more detail.

A record of user tests will be posted to the test log within the prognostic log. If problems are detected during user tests, service codes are generated, and the service indicator and/or the readiness indicator may illuminate. Refer to the troubleshooting section above for guidance on interpreting and correcting issues. Test results, and the resulting readiness status, are transmitted to LIFENET when a Wi-Fi connection exists. Test logs may also be printed if a printer is connected. Refer to the *LIFEPAK 35 monitor/defibrillator Operating Instructions* for more detail.

Preventive Maintenance and Testing Schedule

Preventive maintenance activities should be performed according to the schedule in the table below. For more information on user maintenance, refer also to the *LIFEPAK 35 monitor/defibrillator Operating Instructions*.

ACTIVITY	DAILY	AFTER USE	AS NEEDED	MONTHLY	6 MONTHS	12 MONTHS
Shift check	●					
External physical inspection	●	●				●
Monthly test				●		
External cleaning			●			●
Performance inspection procedure (PIP)			●			●
Test and calibration procedures (TCP)			●			●[1]

1 – CO_2 calibration should be performed annually, followed by testing via PIP. This may be incorporated into annual preventive maintenance.

Scheduled Replacement Items

The following items have a finite life span and should be replaced as necessary. For service life, refer to the table below. Some items have an expiration date, and should be used before their expiration date, indicated by the symbol . For more information, refer to the device operating instructions or the accessory instructions for use. For information on ordering replacement parts, refer to chapter 9, or contact Stryker.

ITEM	SERVICE LIFE
ECG cable	2 years
Therapy cable	3 years
Battery	2 years
Printer (if equipped)	4 years
Coin cell battery	5 years

Setting/Resetting the Maintenance Prompt Interval

The MAINTENANCE DUE message can be set up to appear at selected intervals—3, 6, or 12 months—using setup options in LIFENET. When this time interval is reached, the message appears continuously for 10 minutes each time the device is turned on.

After completing a scheduled maintenance, reset the maintenance prompt interval timer, via PSST, to clear the MAINTENANCE DUE message and begin the count for the next scheduled maintenance.

Device Service Life

The LIFEPAK 35 monitor/defibrillator has an 8-year expected service life under normal use conditions and with appropriate periodic maintenance.

Support Policy

Stryker provides full technical support and replacement parts for a period of eight years from the date of shipment from the manufacturing facility. After this eight-year period, Stryker provides technical support and replacement parts on an as-available basis.

Cleaning

CAUTIONS

- Do not clean any part of the device or its accessories with phenolic compounds. Do not use abrasive cleaning agents. Do not use flammable cleaning agents while the device is powered on.
- Do not attempt to sterilize the device or any accessories unless otherwise specified in the instructions for the accessory.
- Avoid cleaning inside cable connectors unless necessary.
- Do not immerse or soak the device or accessories unless otherwise specified in the instructions for the accessory.

Device cleaning and disinfection processes were validated with Stryker SideKick wipes or sodium hypochlorite (5.25-6.15% bleach diluted 1:10). For more information, refer to the environmental specifications in the Device Description section of this manual, or the *LIFEPAK 35 monitor/defibrillator Operating Instructions*.

Software Updates

Software updates are managed through LIFENET system. A new setup options profile must be created. The software version to be applied to a device must be assigned to the new setup options profile in LIFENET, and that profile assigned to the device. The device can then be updated through an access cable, using LIFENET Device Agent. Note that user settings are also part of the setup options profile. In order to preserve device user settings, the desired user settings should be imported (i.e. from an existing device setup options profile) when creating the setup options profile in LIFENET; otherwise, factory default settings will be applied. For information on security, refer to the *LIFEPAK 35 monitor/defibrillator Product Security Information.*

Performance Inspection Procedure – PIP

The PIP is performed as part of regular preventive maintenance, and after certain device repairs, to ensure that the device meets all required performance criteria before being placed back into service. Note that the PIP will include a physical inspection, and certain aspects of the self tests and user tests defined above to provide complete test coverage. The PIP is defined in a separate document.

Test and Calibration Procedure – TCP

The TCP may be used to calibrate certain functions of the LIFEPAK 35 when a device has failed a test, or requires calibration after replacing certain parts or modules within the device. The TCP is defined in a separate document.

Printer Maintenance

The optional roll printer is powered by the device when the printer is plugged into the access port on the back of the device.

Controls, status messages, and status indicators for the printer are provided on the LIFEPAK 35 device screen. The printer also includes LED status indicators that illuminate according to the following rules:

- Solid green: printer connected to device and ready to print

- Flashing yellow: door open, out of paper, over/under temperature, or printer fault
- Off: printer off

The printer stops automatically if the paper runs out or the printer door is open. Refer to the *LIFEPAK 35 monitor/defibrillator Operating Instructions* for detailed instructions on loading printer paper.

The printer has a 4-year service life.

The printer, if present with a specific device being serviced, may be tested as part of the PIP. The printer is not serviceable, and if any failures are detected, it must be replaced. For troubleshooting tips, see General Troubleshooting in Section 6 above. For printer replacement instructions, see section 8 below.

Battery Maintenance

This section provides information about the LIFEPAK Flex Lithium-ion batteries that are specifically designed for use in the LIFEPAK 35 device. Lithium-ion batteries are low-maintenance and require no scheduled cycling to prolong battery life. For additional information, refer to the battery instructions for use.

IMPORTANT! The LIFEPAK Flex Lithium-ion batteries are NOT interchangeable with batteries that are used in other defibrillators.

WARNINGS

- Possible fire, explosion, and burns. Do not disassemble, puncture, crush, heat above 100°C (212°F), or incinerate the battery.
- Possible loss of power and delay of therapy during patient care. Using an improperly maintained battery to power the defibrillator may cause power failure without warning. Charge batteries by connecting the LIFEPAK 35 device to AC power with batteries installed, or charge batteries in the LIFEPAK Flex battery charger.
- Possible loss of power during patient care. Using other manufacturers' batteries, battery chargers, or power adapters may cause the device to perform improperly and invalidate the safety agency certifications. Stryker has no information regarding the performance or effectiveness of its LIFEPAK monitor/defibrillators if other manufacturers' batteries, battery chargers, or power adapters are used.

CAUTION

- Possible equipment damage. When storing the LIFEPAK 35 monitor/defibrillator for an extended period of time, the battery should be removed from the device.
- Possible electrical damage. Electrical connection between the battery contacts can cause a fire or damage the battery. Do not carry the battery where metal objects could create a connection between the battery contacts.

Charging Batteries

- Fully charge batteries before using the device on battery power. Batteries are charged automatically when installed in a device that is connected to AC power.
- Batteries can be charged in the LIFEPAK Flex battery charger. Carefully read the *Instructions for Use* provided with the battery charger for complete instructions, warnings, cautions, and specifications.
- Batteries must be between 0°C (32°F) and 60°C (140°F) to charge.
- Inspect batteries for damage or leakage before charging. If battery is damaged or leaking, recycle the battery and obtain a new battery.

- Remove the orange pictorial Charge Before Use label from new batteries before charging.
- The battery fuel gauge does not function until the battery is charged for the first time. For more information about the fuel gauge, see section 3 of this manual.

Replacing Batteries

The service life for the battery is approximately two years. Properly maintained batteries may last longer. A battery has reached the end of its useful life if *one or more* of the following circumstances occur:

- Physical damage to the battery case, for example, cracks or a broken clip.
- Battery leaking.
- Battery fuel gauge indicates three or fewer LEDs (bars) after the battery completes a charge cycle.
- **FAULT** indication during charging or use (Fault/Unrecognized Battery symbol on LIFEPAK 35 device screen or flashing red LED on LIFEPAK FLEX battery charger)

- **BATTERY AT END OF SERVICE LIFE** indication on LIFEPAK 35 device screen.

Recycle or properly dispose of used batteries promptly. Keep batteries away from children.

Recycling Batteries

To promote awareness of battery recycling, Stryker batteries are marked with this symbol:

When a battery has reached the end of its useful life, recycle the battery according to national and local regulations. Go to stryker.com/ec-recycling or contact your local Stryker representative for assistance.

Storing Batteries

Lithium-ion batteries self-discharge during storage.

If you store batteries:

- Do not remove the orange pictorial Charge Before Use label from new batteries. This label indicates that the battery has not yet been charged.
- Store batteries at temperatures between 20° to 25°C (68° to 77°F). Lower Temperatures within the recommended range reduce the battery self-discharge rate and increase battery life.
- Fully charge the battery by the Charge By date printed on the battery box label or within 12 months of receipt, whichever comes first.
- Fully charge the battery and place into service no later than 2 years after the initial charge.

Receiving New Batteries

New batteries do not arrive fully charged. Fully charge each new battery before using the device on battery power. Batteries are charged automatically when installed in a device that is connected to AC power. Batteries can also be charged in the LIFEPAK FLEX battery charger. The fuel gauge on a new battery does not function until the battery has been charged for the first time.

Coin Cell Battery

The coin cell battery, located on the energy delivery PCBA, should be replaced per the schedule shown in the scheduled replacement items section above. For instructions on how to access and replace the coin cell battery, refer to section 8 below.

8. Parts Replacement Procedures

Overview of Replacement Procedures

This section describes parts replacement procedures for device repair. Procedures are organized into sections as shown below. The service provider may use the links (ctrl-click) listed below to go directly to any particular procedure. Note that some parts replacement procedures contain links that refer the user to other procedures when warranted.

Note that alphanumeric reference identifiers are used in place of part numbers (for service parts and kits) throughout this service manual, including in the parts replacement procedures section and in the diagrams and parts lists section. These identifiers may be mapped to part numbers and catalog numbers in the service bill of materials (BOM).

Note that the appearance of some images—screenshots, diagrams, pictures—in this section may not exactly represent the latest hardware. However, images in each procedure adequately serve the purpose of conveying instructions for parts replacement.

Note that some accessory items, if present, will need to be removed prior to performing the repairs described in this section. For removal and installation instructions, refer to the instructions for use for the specific accessories.

Exterior parts

The procedures in this section describe how to remove and install parts accessible from the outside of the device without opening the case.

- Front Bezel Replacement
- USB Cover Replacement
- ECG Guard Replacement
- Parameter Module Front Housing Replacement
- CO_2 Door Replacement
- USB Cover (Parameter Module) Replacement
- Kickstand Replacement
- Removing the Parameter Module
- Installing the Parameter Module
- Replacing the Parameter Module Right Housing
- Skid Plate Replacement
- Battery Back Plate Replacement
- Handle Replacement
- Power Plug Replacement
- Printer Replacement

Parameter Module Parts

The procedures in this section describe how to remove and install parts within the parameter module. Unless other repairs are required, these procedures may be completed without opening the main device case.

- NIBP Pump Replacement
- Removing the Patient Parameter PCBA
- Installing the Patient Parameter PCBA
- SpO_2 Module Replacement (Masimo)
- CO_2 Module Replacement (Medtronic)
- CO_2 Exhaust Port Replacement
- NIBP Coupler Replacement
- USB Connector Replacement (Parameter Module)

- SpO_2 Connector Replacement (Masimo)
- NIBP Module Replacement
- Patient Parameter PCBA Replacement
- Temp/IP Connector Replacement
- Parameter Module Housing Replacement

Internal Parts

The procedures in this section describe how to disassemble the case to gain access to internal parts and how to reassemble the case. Parts replacement procedures for internal parts are covered below, separated into subsections pertaining to major subassemblies as defined by the device design.

- Disassembling the Case
- Assembling the Case

Front Housing Parts

- Fan Replacement
- USB Connector Replacement
- Video Display Flex Replacement
- Speaker Replacement
- Rotary Switch Replacement
- Interface PCBA Replacement
- Display Power Cable Replacement
- Keypad Replacement
- Readiness Indicator Beacon Replacement
- Display and Front Housing Replacement

Rear Housing Parts

- System Flex Replacement
- Wi-Fi Antenna Replacement
- Inductive Resistor Replacement
- Energy Storage Capacitor Replacement
- Temp/IP Cable Replacement
- Removing the PCBA Stack
- Installing the PCBA Stack
- System PCBA Replacement
- Energy Delivery PCBA Replacement
- Coin Cell Battery Replacement
- ECG Connector Replacement
- Therapy Receptacle Replacement
- Battery Connector Replacement
- DC Power Cable Replacement
- Access Port Flex Replacement
- Defib-Parameter Module Flex Replacement
- Rear Housing Replacement

Warnings and Cautions

The following warnings and cautions apply to all actions when performing the maintenance or repair of the LIFEPAK 35 monitor/defibrillator.

DANGER

- Shock hazard. Lethal voltages may be present even without operator action. To avoid electric shock, always ensure that the device is powered off and not connected to power prior to any repair procedures. Always discharge the energy storage capacitor prior to servicing. See the **Capacitor Discharging Procedure** for detailed instructions.

WARNING

- Possible shock and device damage. It is possible to pinch and damage wires during reassembly. To avoid pinching wires, carefully follow assembly instructions.

CAUTION

- Possible component damage. The PCBAs contain static-sensitive devices (SSDs). To avoid damage, observe the special handling practices in **Static-Sensitive Device Handling**. PCBAs contain high-impedance circuitry; always handle PCBAs by holding on to the edges. To avoid damage, always ensure that the device is powered off and not connected to power prior to any repair procedures.

Static-Sensitive Device Handling

About SSD Handling

Many electronic semiconductor devices (such as MOS ICs, FETs, optical isolators, and film resistors) can be damaged by the discharge of static electricity. Static charge buildup is very common. Static discharges commonly occur when the operator wears synthetic clothes and transfers charge to any object touched. These discharges can damage or destroy static-sensitive devices (SSDs). In most cases, the discharge is not even perceptible to the person who causes it. To prevent static discharge damage to SSDs, observe the following precautions during any open-case test, maintenance, or repair procedures:

Look for SSD Symbol

SSDs are identified with the following warning symbol: 

Use Static-Dissipative Mat

Always perform repair or maintenance on a static-dissipative mat that is connected to earth ground.

Wear a Wrist Strap

Always wear a conductive wrist strap connected to the mat and to ground except when working on energized equipment or when discharging high-voltage circuits. The strap must be snug enough to make good contact against bare skin.

Transport and Store PCBs Properly

Transport and store PCBs in anti-static racks or inside conductive bags. Packages containing PCBs should be labeled as static-sensitive.

Keep Work Area Static-Free

Keep static-generating products, such as non-conductive plastics, plastic cups or trays, away from the work area. Connect all electrical equipment, such as soldering irons and test equipment, to ground with a three-prong plug.

Test Work Area Routinely

Test all the anti-static parts of the work area (mat, straps, and cables) routinely.

Tools List

The suggested list of tools for the LIFEPAK 35 monitor/defibrillator replacement procedures is as follows:

- Static-dissipative mat and wrist strap.
- Anti-static rack and/or conductive bags.
- Capacitor discharge tool. Reference section below.
- Calibrated torque driver(s) capable of the following torque settings.

Torque Value in-lb	Torque Value in-oz	Torque Value N-cm	Tolerance
6.8	109	77	+/- 10%
10.0	160	113	+/- 10%
15.0	240	169	+/- 10%

- Phillips P-1 drive bit
- Phillips P-2 drive bit
- Torx T-8 drive bit
- Torx T-15 drive bit
- Hex socket – 7/16” deep
- Access port socket tool (for flex connector panel nuts), 3332101
- Small flat-blade tool for label removal
- Plastic blade/point tool for working with ZIF connectors
- Needle nose pliers
- Wi-Fi antenna connector removal tool, 3322014 or equivalent
- Aux power adapter, AC to DC, 3322421 (also requires power cord, 3337097 or equivalent)
- LIFEPAK FLEX Lithium-ion batteries
- LIFEPAK Access port cable, 3321422
- Blade connector adapter, 3345957
- CO_2 module hose retention tool, 3347027

Additional tools used for test and calibration in the PIP and TCP processes are listed separately in those procedure documents.

Fasteners

Any screws that are removed during device repairs are to be discarded, and replaced with new ones, unless noted otherwise in parts replacement procedures. Service parts kits will generally include all screws required to reassemble the device.

Labels

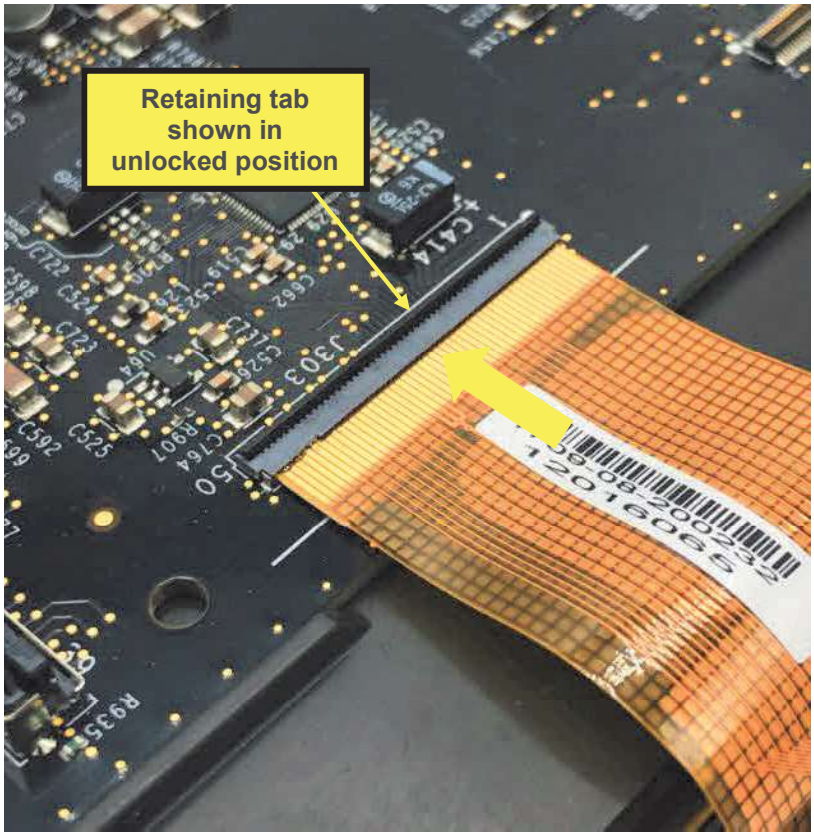
Adhesive labels which are removed during device repairs should be discarded, and replaced with new ones, unless noted otherwise in parts replacement procedures. Service parts kits will generally include all labels required to reassemble the device.

Electrical Connections

Ensuring that electrical connections are made properly during device servicing is important. This section describes different types of connectors used throughout the LIFEPAK 35 device, and how to connect and disconnect them completely and securely and without damage to ensure that they function as intended.

There are three basic types of connectors: zero insertion force (ZIF) connectors, non-locking connectors, and locking connectors. Examples are shown in the tables below, along with notes describing proper connection and disconnection techniques. Care is to be exercised when connecting and disconnecting electrical connectors to avoid damage. To the extent possible, force should be applied to the connector, and not the wires or flexes; force should be applied in the direction of the connection.

ZIF Connectors

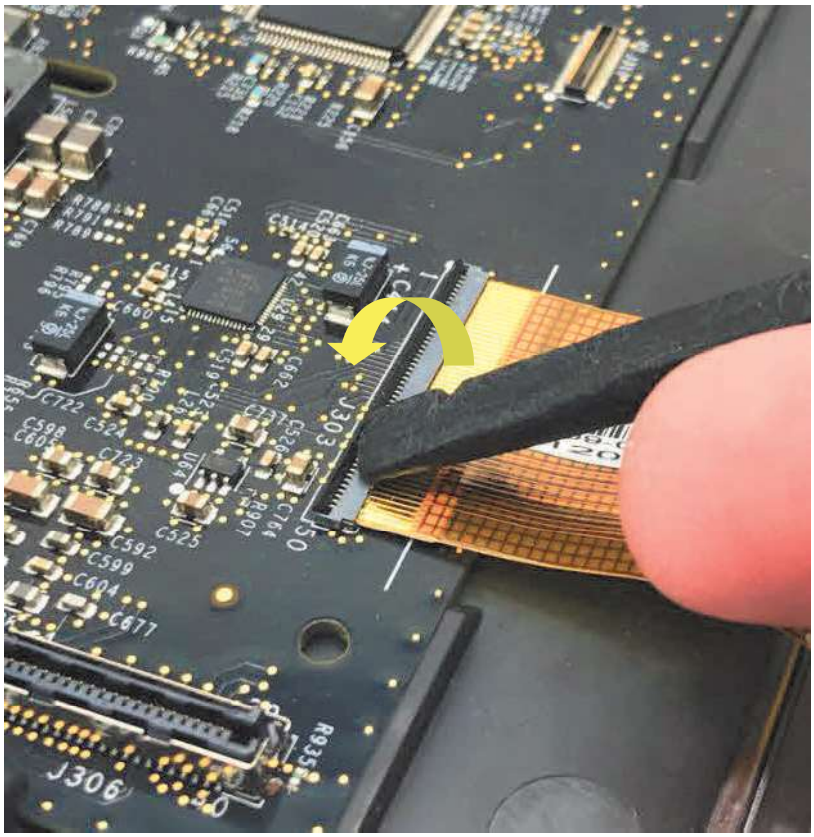


To connect:

- Ensure retaining tab is in the unlocked position—flipped up, vertically.
- Align flex and insert fully into connector. (There may be a reference line printed on the PCB to indicate full insertion when aligned with a line on the flex.)
- Using a finger, or a blunt, soft tool (such as the plastic tool shown below), push the retaining tab down to the locked (horizontal) position, across the entire width of the connector.

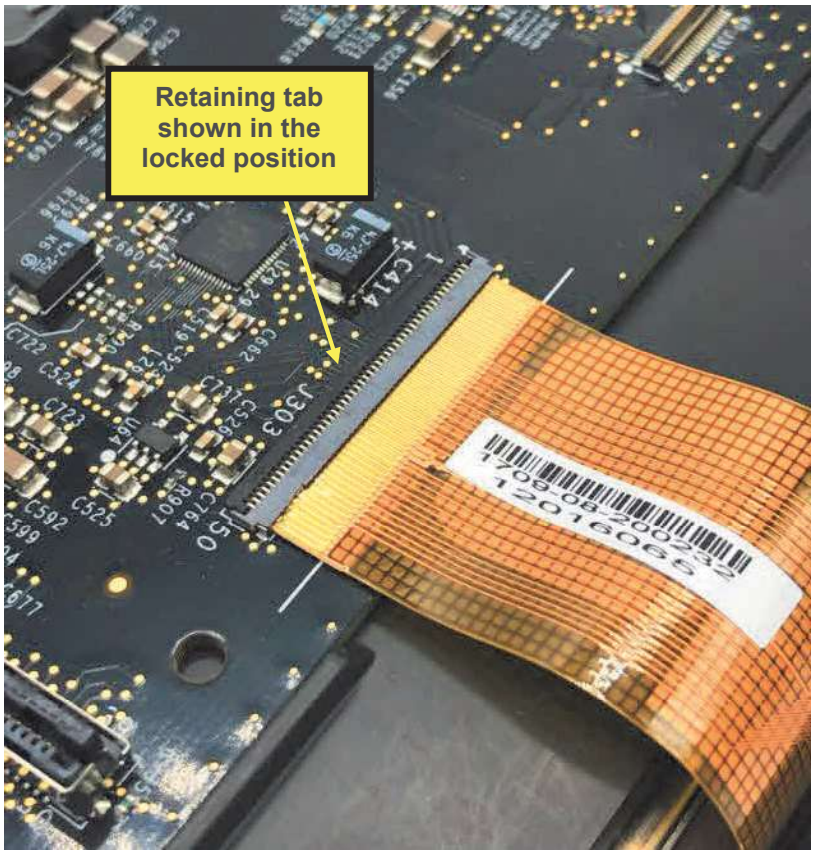
To disconnect:

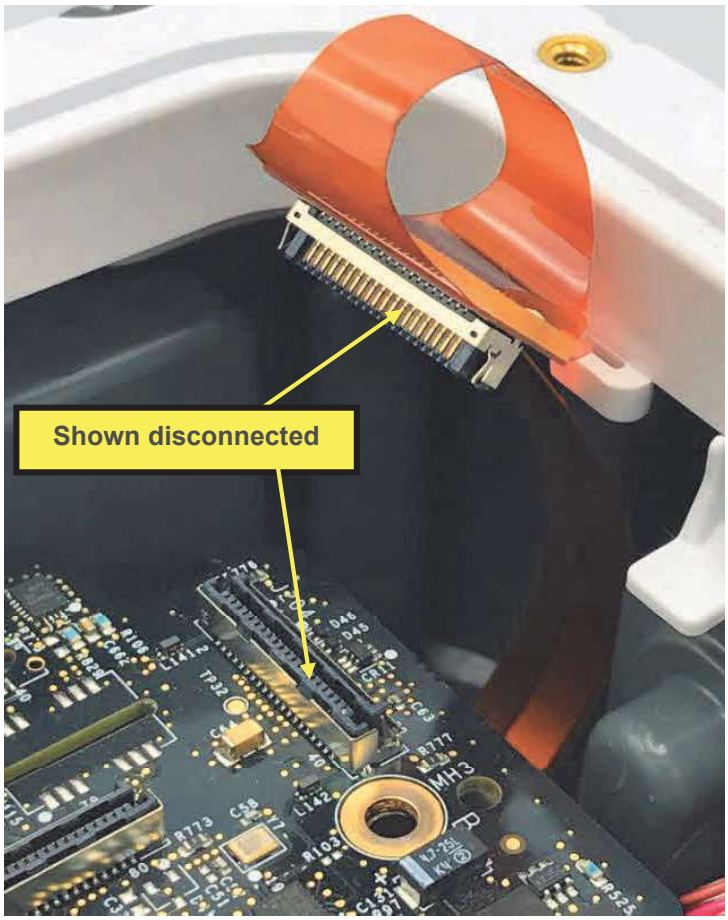
- Using a fingernail, or a thin, soft tool, carefully flip up the retaining tab to the unlocked (vertical) position.
- Pull the flex straight out of the connector.

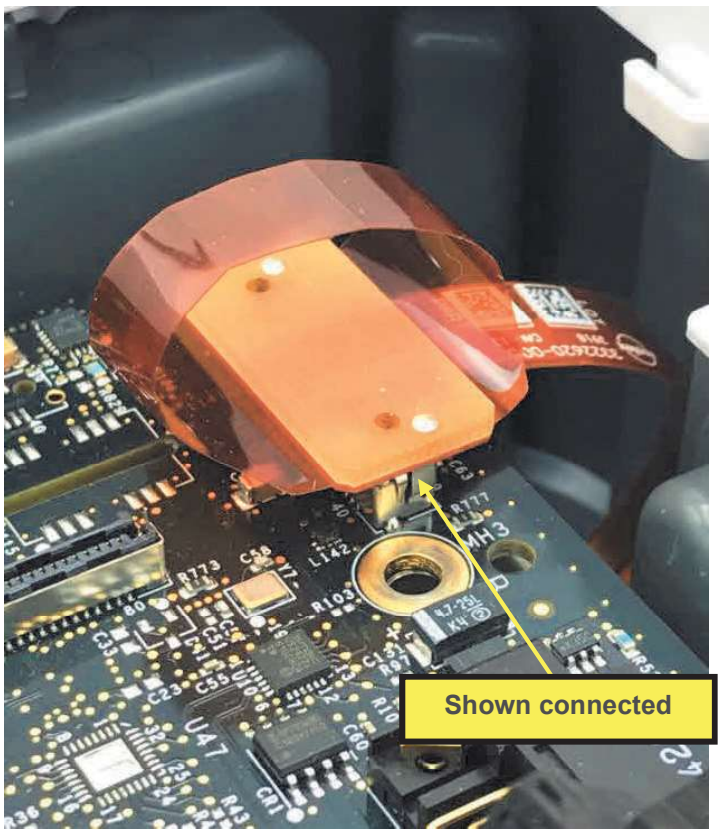


This type of connector is used in locations including the following:

- Display flex (shown at left)
- Beacon flex







The LSEM-type connector is typically used throughout the device to connect flex circuits, including the access port flex (shown at left). It will generally have a pull loop to aid in disconnection.

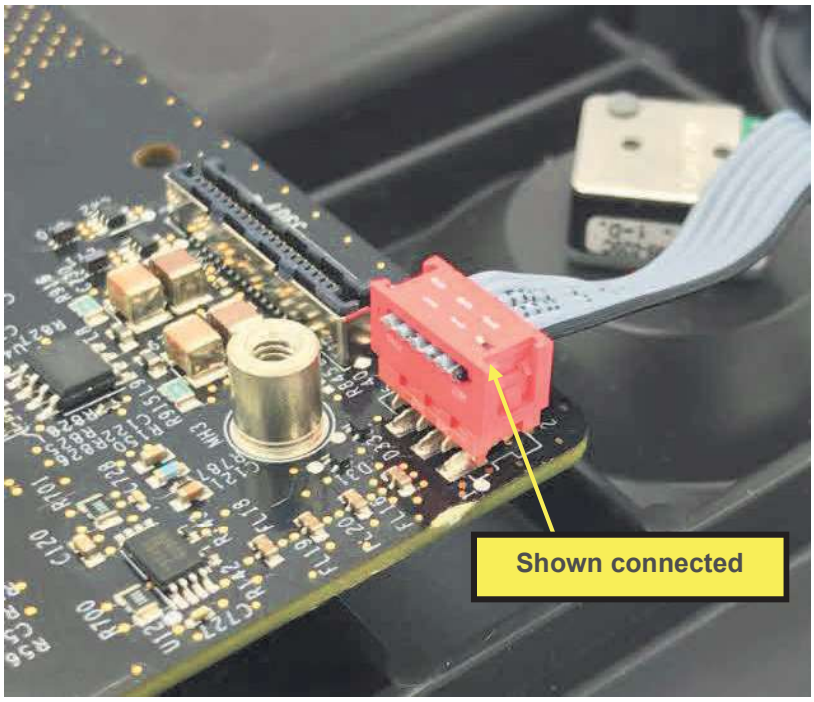
To connect:

- Align connector and press firmly together until fully seated.

To disconnect:

- Using the finger pull loop, pull straight up until connector is disengaged.

Note: To avoid damage of LSEM connectors (shown at left and below), force should be applied evenly and in the direction of connection. They should not be connected one end at a time or one side at a time.



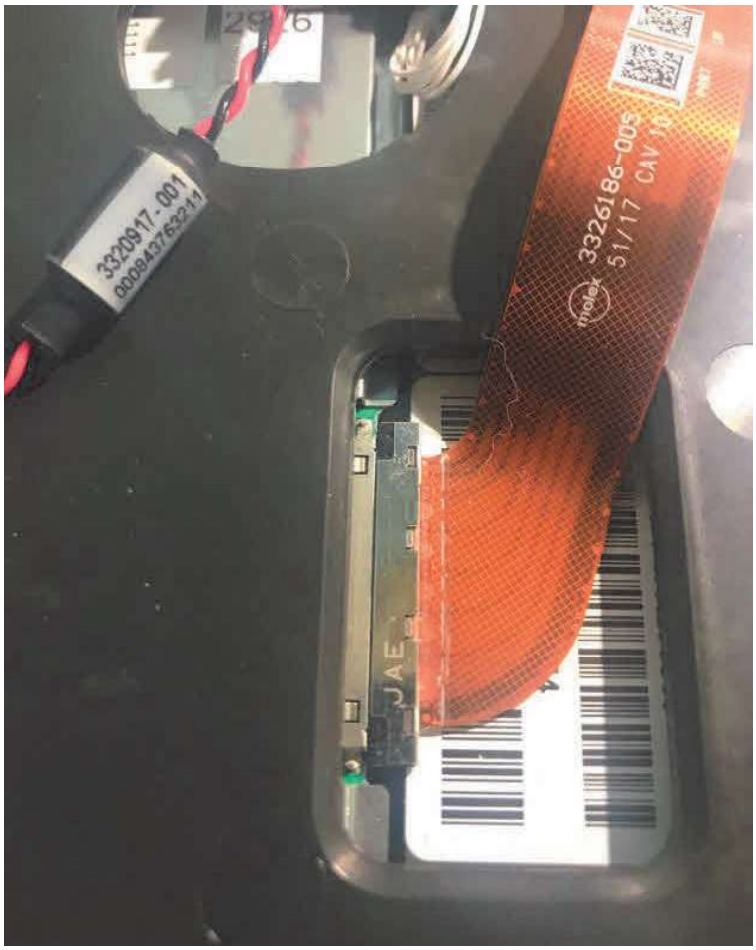
The non-locking connector for the rotary switch is shown at left.

To connect:

- Align connector and press firmly together until fully seated.

To disconnect:

- Pull straight up until connector is disengaged.



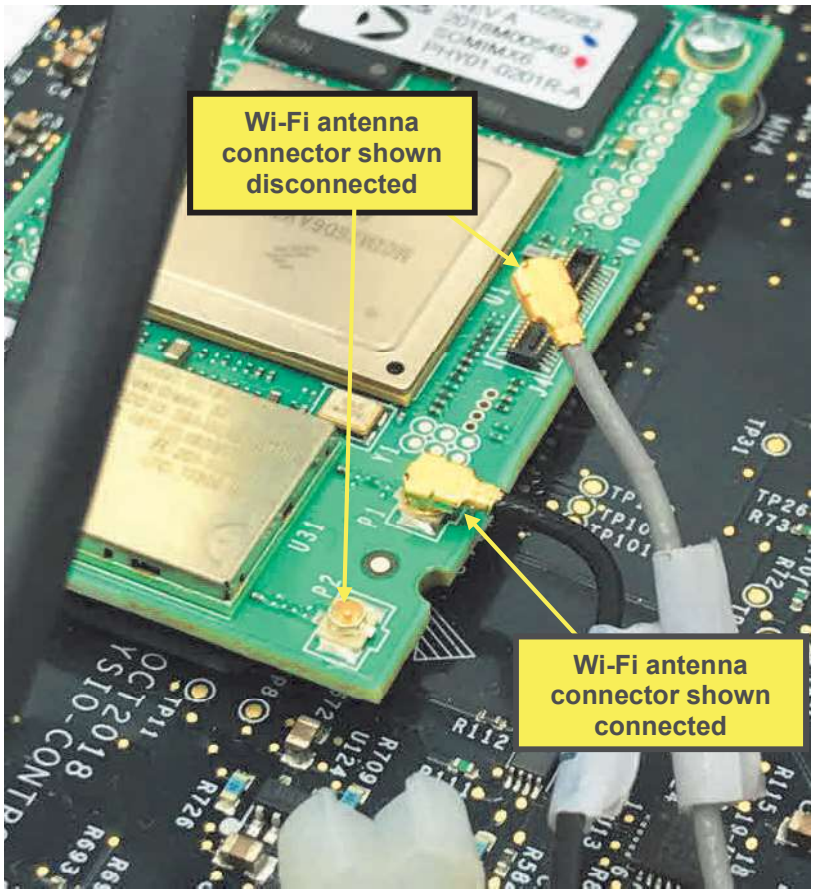
The non-locking connector for the display video flex (display end) is shown at left.

To connect:

- Align connector and press firmly together until fully seated.
- This connector uses a label, laid over the connector and pressed onto both ends of the connection to help retain the connection. (Reference the corresponding parts replacement sections for instructions.)

To disconnect:

- Pull connector straight out until it is disengaged.



The Wi-Fi antenna connections to the SOM on the system PCBA are shown at left.

To connect:

- Carefully align connector (circular, coaxial type) and press firmly together until fully seated. Connector will click and retain itself when properly seated. Do not force connector on if it is not aligned properly.

To disconnect:

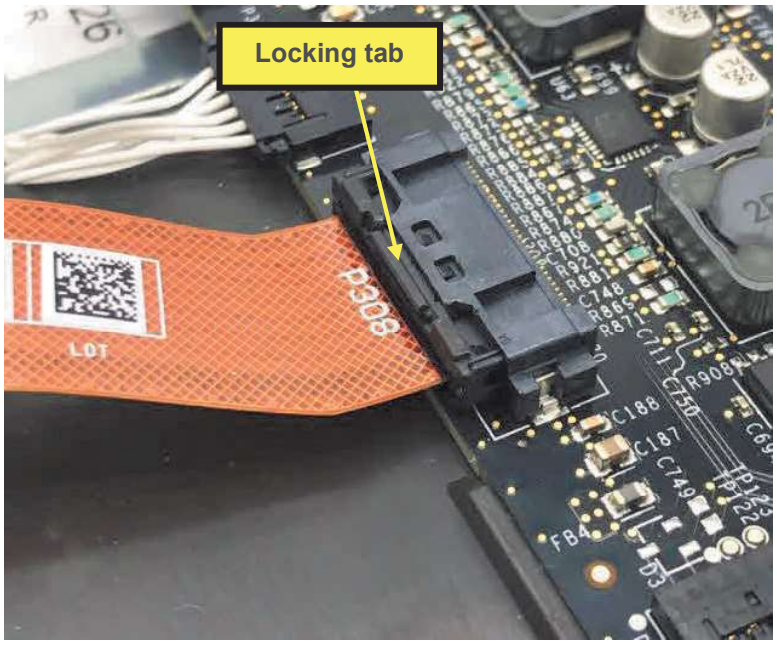
- Pull connector straight out until disconnected. A connector removal tool may be used to lift the connector away from the mating connector on the PCBA. The connector should be pulled straight out; the wire should not be used to pull the connection apart.

Other non-locking connectors not pictured include:

- SpO_2 connection to SpO_2 module.
- Board-to-board connections via header pins.

For these connections, simply carefully align connectors and press together until firmly seated. To disconnect, pull straight apart.

Locking Connectors



To connect:

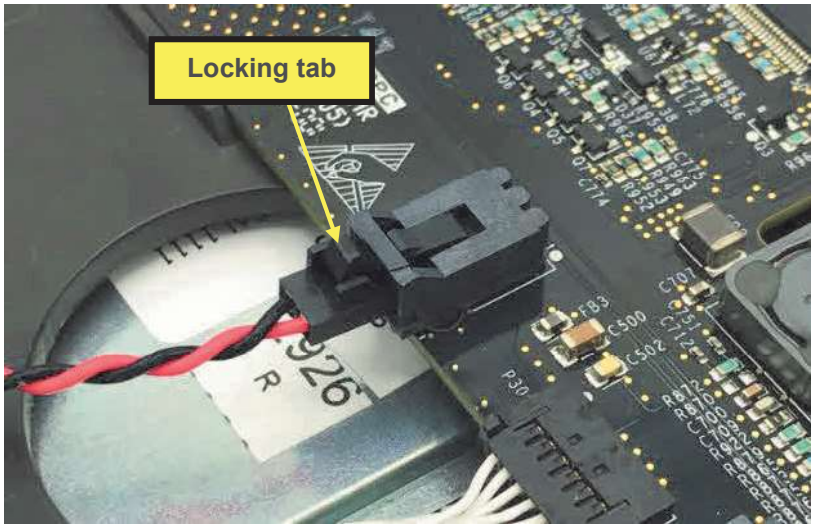
- Align connector, and push in completely. A click may be detectable when fully seated.

To disconnect:

- Using a finger, or a thin, soft tool, press the locking tab down while pulling the connector straight out.

The type of locking connector shown at left is used in locations including the following:

- Display video flex (shown at left)
- Keypad flex



To connect:

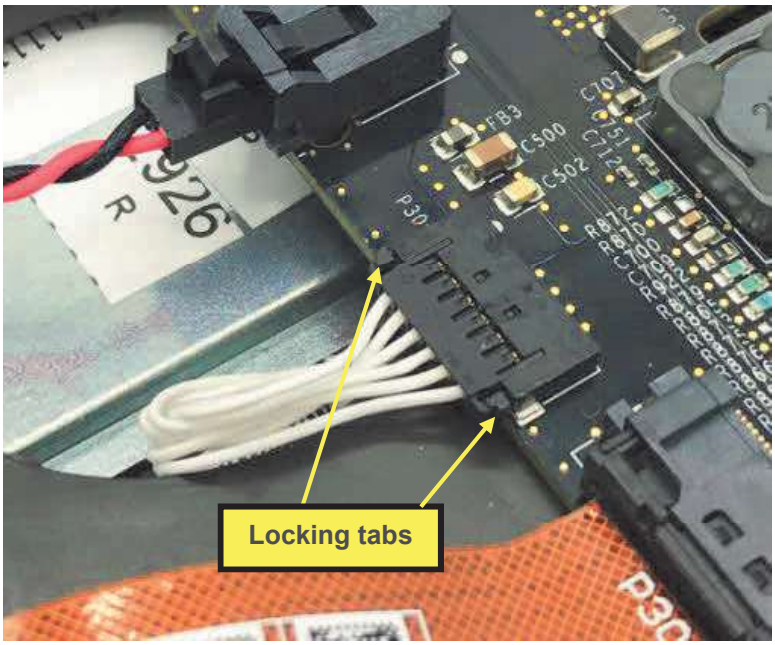
- Align connector and push in completely. A click may be detectable when fully seated.

To disconnect:

- Using a finger, or a thin, soft tool, press the locking tab down while pulling the connector straight out.

The type of locking connector shown at left is used in locations including the following:

- Speaker (shown at left)



To connect:

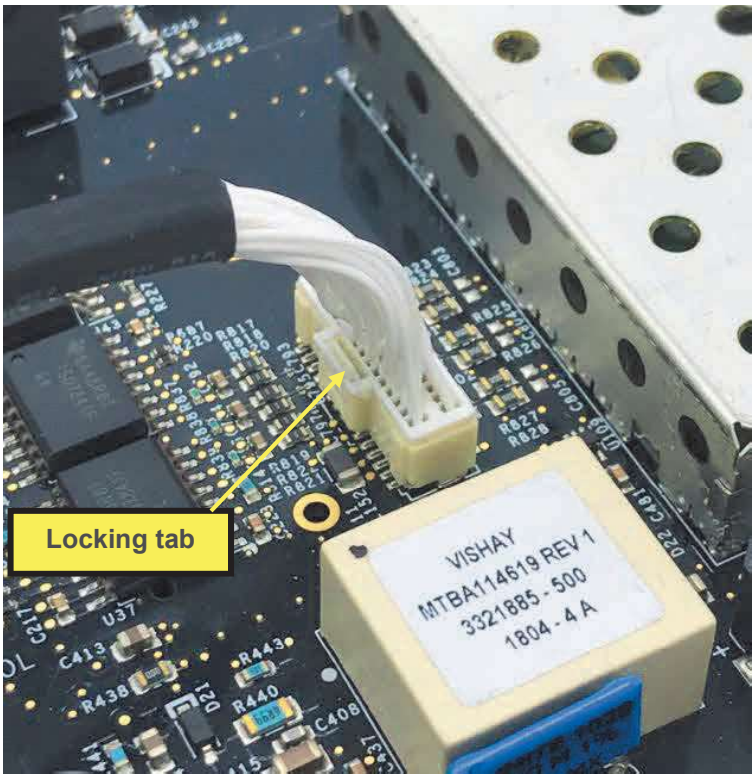
- Align connector and push in completely. A click may be detectable when fully seated.

To disconnect:

- Using two fingers or two soft pointed tools, pinch to press both locking tabs simultaneously while pulling the connector straight out.

The type of locking connector shown at left is used in locations including the following:

- Display power cable (interface PCBA end, shown at left)
- Fan



To connect:

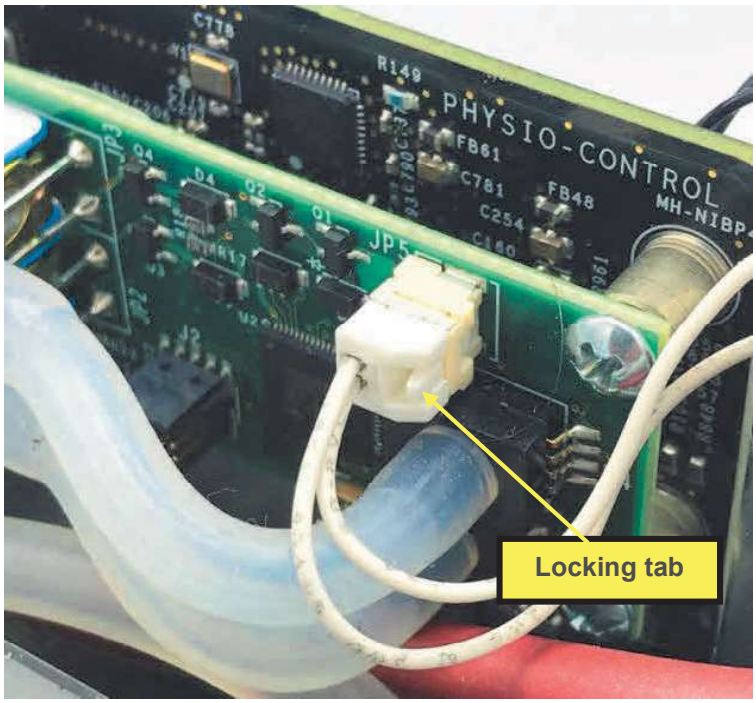
- Align connector and push in completely. A click may be detectable when fully seated.

To disconnect:

- Using a finger, or a thin, soft tool, press the locking tab in (toward the connector) while pulling the connector straight out.

The type of locking connector shown at left is used in locations including the following:

- Temp/IP cable (system PCBA end shown at left)
- CO_2 module connection to parameter module PCBA



To connect:

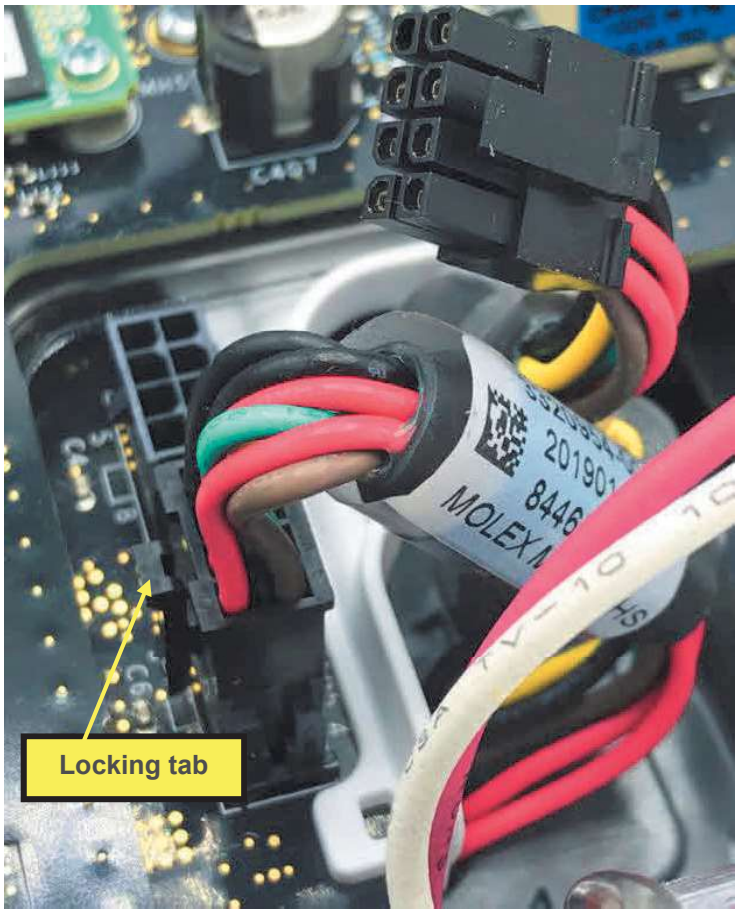
- Align connector and push in completely. A click may be detectable when fully seated.

To disconnect:

- Using a finger, or a thin, soft tool, press the locking tab in (toward the connector) while pulling the connector straight out.

The type of locking connector shown at left is used in locations including the following:

- NIBP pump connection to NIBP module (shown at left)
- NIBP coupler connection to parameter module PCBA



To connect:

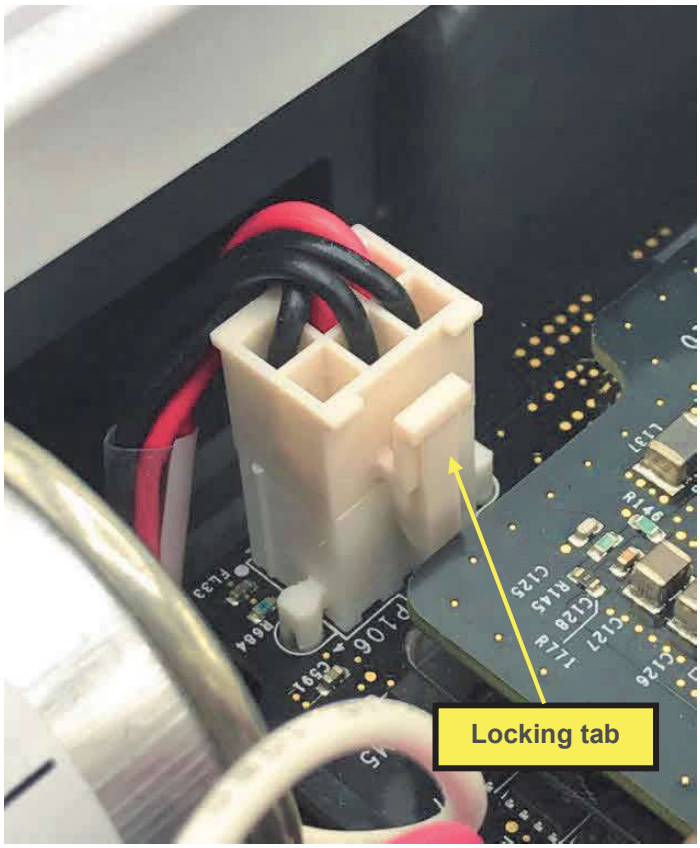
- Align connector and push in completely. A click may be detectable when fully seated.

To disconnect:

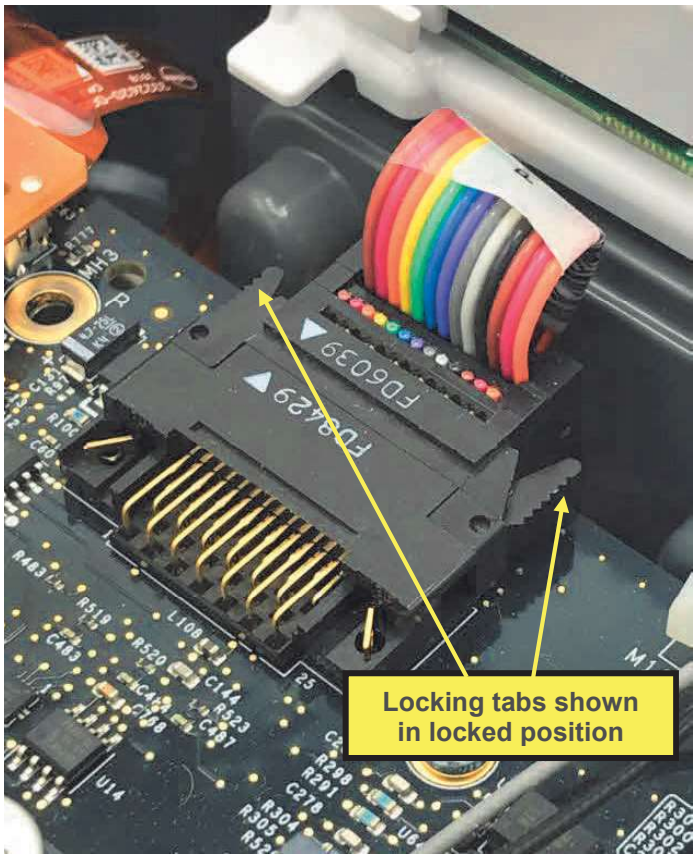
- Using finger and thumb, press the locking tab in to pivot lock hook away from catch, while pulling the connector straight out.

The type of locking connector shown at left is used in locations including the following:

- Battery connectors (shown at left)
- Internal DC power cable (shown at left, below)
- Power connector
- Energy storage capacitor



- Inductive resistor
- Therapy receptacle connection to energy delivery PCBA



To connect:

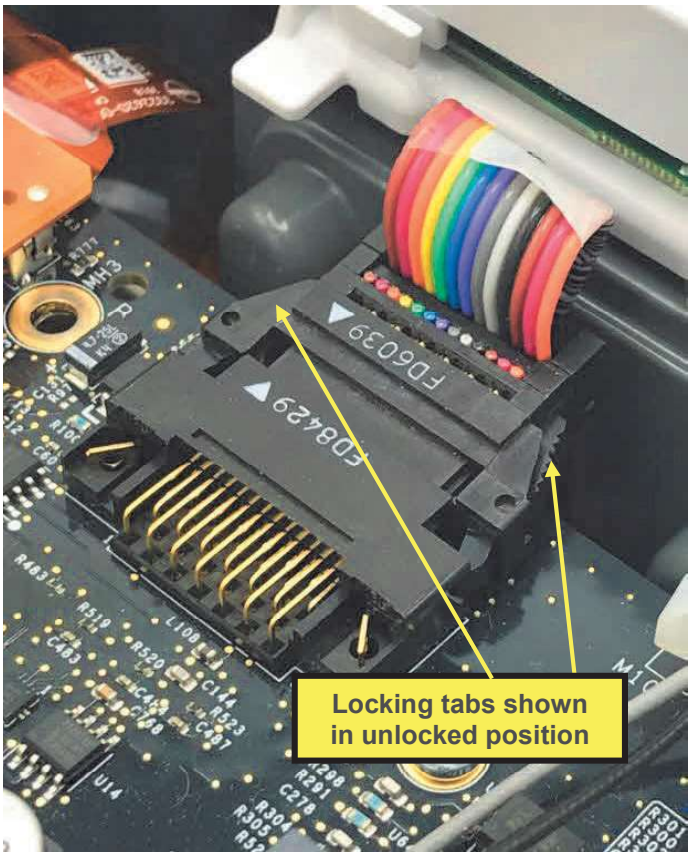
- Align connector and push in completely. A click may be detectable when fully seated, and locking tabs will pivot outward.

To disconnect:

- Using finger and thumb, pinch to press the locking tabs inward. Connector will disconnect partially.
- Pull connector straight out the remaining distance to completely disconnect.

The type of locking connector shown at left is used in locations including the following:

- Therapy receptacle connection to system PCBA (shown at left)



Capacitor Discharge Tool

A capacitor discharge tool is used to discharge the energy storage capacitor (see capacitor discharging procedure).

The illustration shows how the biphasic capacitor discharge tool is constructed. The materials used in this example are:

- 10 k, 2 W resistor (ten 1 K 2 W), high-voltage
- 5 MΩ, 5 W resistor, high-voltage
- Neon lamp, NE76, NE2, or NE2H
- 8 AWG copper wire
- Clear plastic tubing, capable of insulating 10 kV
- 10 kV insulation
- RTV silicone rubber sealant

DANGER

- Shock hazard. Capacitor discharge tools that are not designed and labeled for biphasic use are inadequate for use on biphasic defibrillators and will take several minutes to discharge the energy capacitor.

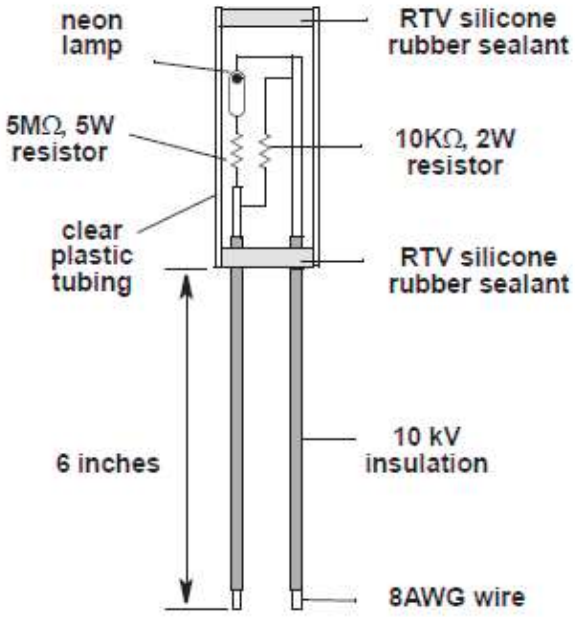


Figure 17 Capacitor discharge tool

Capacitor Discharging Procedure

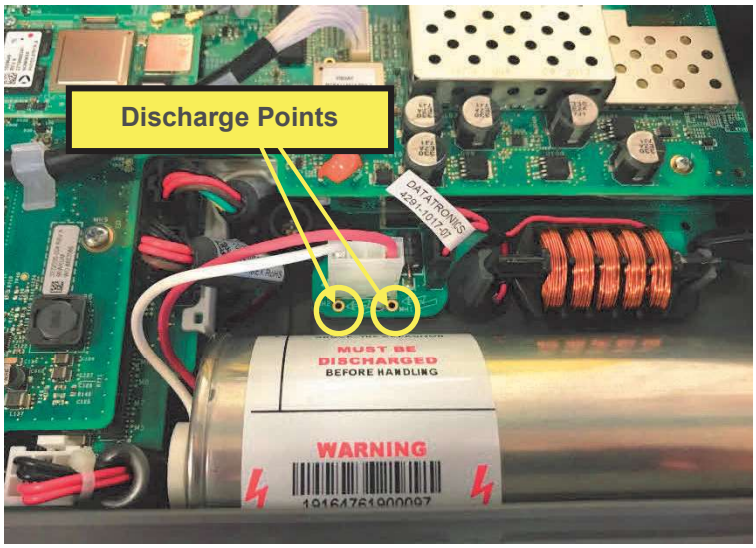
After disassembling the case, immediately discharge the energy storage capacitor using the capacitor discharge tool.

The discharge points are shown in the picture below.

DANGER

- Lethal voltages may be present, even without operator action. Do not assume the capacitor is discharged if the neon lamp does not light! There may still be a charge on the capacitor. Do not touch capacitor terminals until completing the discharging procedure.

Using the Capacitor Discharge Tool



1. Place one probe on a discharge point and hold it steady.
2. Place the other probe on the remaining discharge point and hold both probes steady.
3. Observe the neon lamp inside the capacitor discharge tool. If a charge of approximately 90 volts is present, the neon lamp will light.
4. Continue holding the probes on the points indicated for at least 30 seconds after the neon lamp is no longer lit.

Restoring Setup Configuration following a Device Repair

Setup options are managed via the LIFENET system. User settings are set in a setup options profile, and the setup options profile is assigned to device(s) in the LIFENET account. Then, the profile may be downloaded to devices, using LIFENET Device Agent. The download may also be done over Wi-Fi if the device has been set up via Wi-Fi configuration tool, using Check for Updates in setup mode.

If a device has had a repair which includes a PCBA replacement, setup options and software will need to be restored via LIFENET Device Agent service repair mode. Note that only Stryker authorized personnel may perform this type of repair.

Post-Repair Performance Inspection

Following certain repairs, a TCP and/or a PIP will need to be executed to ensure that the device meets all required performance criteria before it is returned to service. Refer to the individual parts replacement procedures for test and calibration requirements.

Physical inspection of the device should be performed following any repair and is included as a step in the PIP.

Refer also to the preventive maintenance section of this service manual for more information or refer to the separate PIP and TCP procedures.

Exterior Parts

Refer to procedures in this section for instructions pertaining to removing and installing parts accessible from the outside of the device, without opening the case.

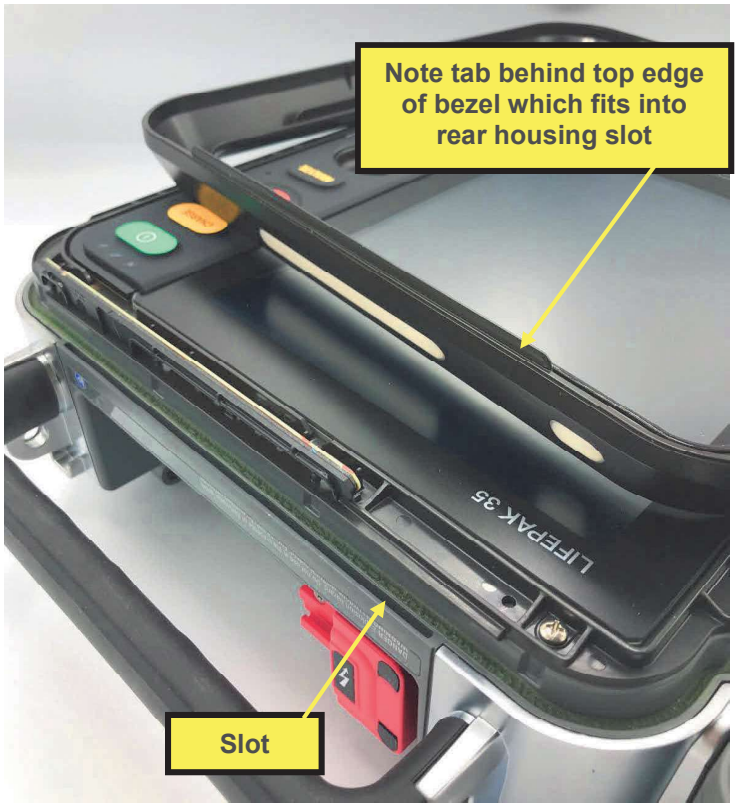
Front Bezel Replacement

The parts listed in the following table will be required to complete this repair. Reference Configuration Assembly.

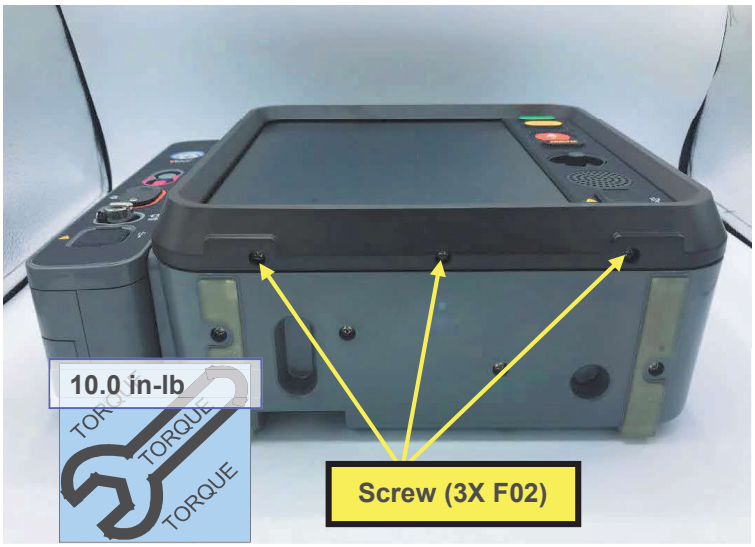
SERVICE BOM REF	QTY	DESCRIPTION	NOTES
M01	1	HOUSING, BEZEL, FRONT, LP35	
F02	3	SCREW, MACH, PANHEAD, PHDRV, SS, NYLOK, 6-32 X .312	

Removing the Front Bezel

	1. Remove 3 screws, using a driver with a P-2 bit.
	2. Lift bottom edge of bezel, then remove bezel.



1. Install tab at top edge of bezel into slot in rear housing (shown at left and below), then lower bottom edge into place.

	2. Install 3 screws, using a torque driver with a P-2 bit.

USB Cover Replacement

The parts listed in the following table will be required to complete this repair. Reference Configuration Assembly.

SERVICE BOM REF	QTY	DESCRIPTION	NOTES
M03	1	COVER, DUST, USB, LP35	
F02	3	SCREW, MACH, PANHEAD, PHDRV, SS, NYLOK, 6-32 X .312	

Removing the USB Cover

1. Remove front bezel as described in Removing the Front Bezel.
2. Remove USB cover.

Installing the USB Cover

1. Install USB cover.
2. Install front bezel as described in Installing the Front Bezel.

ECG Guard Replacement

The parts listed in the following table will be required to complete this repair. Reference Configuration Assembly.

SERVICE BOM REF	QTY	DESCRIPTION	NOTES
M04	1	GUARD, ECG, LP35	
F01	1	SCREW-CAP, SCH, REC T15 TORX 6-32, 0.375L, SS, NYLOK	
L01	1	LABEL, ECG COVER, LP35	

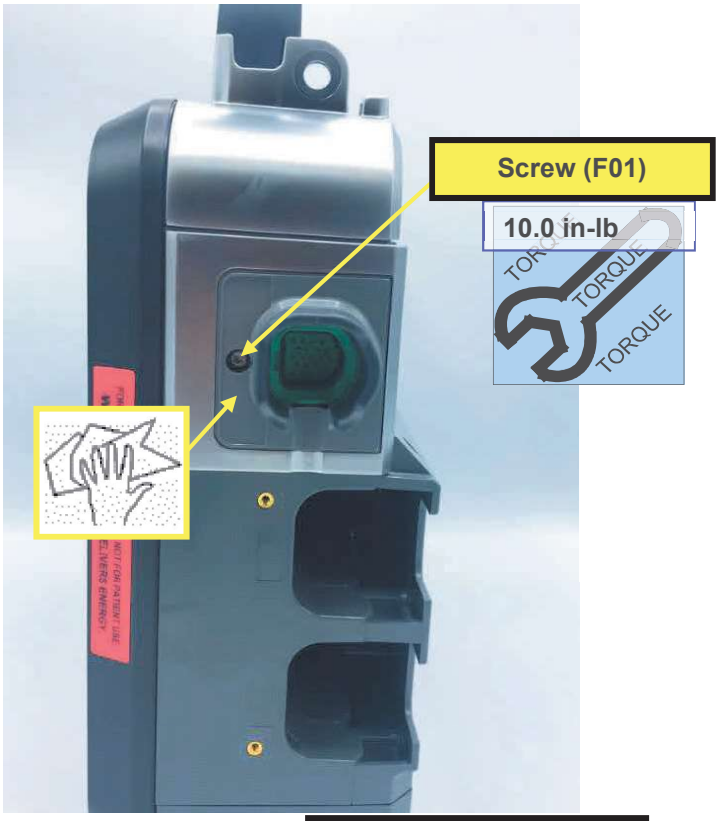
Removing the ECG Guard

1. Remove label by carefully prying away from ECG guard and peeling off. Discard.
2. Remove screw, using a driver with a T-15 bit.

	3. Pivot left side of ECG guard out, then remove ECG guard.

Installing the ECG Guard

	1. Insert right side of ECG guard, then pivot into place.



2. Install screw, using a torque driver with a T-15 bit.
3. Clean label area using isopropyl alcohol or equivalent cleaner with a clean cloth.
4. Remove adhesive liner from back side of label.
5. Align and install label and press firmly into place.

Parameter Module Front Housing Replacement

Note: For other repairs which require removal of the parameter module front housing, the housing (M09) may be cleaned of residual adhesive, and reused, or replaced, at the discretion of the service technician.

The parts listed in the following table will be required to complete this repair. Reference Configuration Assembly.

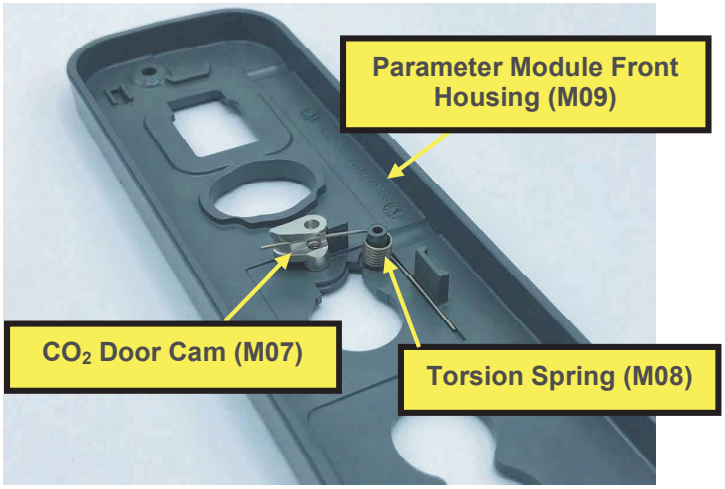
SERVICE BOM REF	QTY	DESCRIPTION	NOTES
M09	1	HOUSING, PARAMETER MODULE, FRONT, LP35	
F04	2	SCREW-M, PH, NYLOK, CS, 4-40, .250L	
L06	1	LABEL, PMOD,…, LP35	Various configs.
M10	1	COVER, CO2 DOOR, LPQ5	
F03	1	SCREW, BUTTONHEAD, TORX, #4-40 X LG 0.25 IN	

Removing the Parameter Module Front Housing

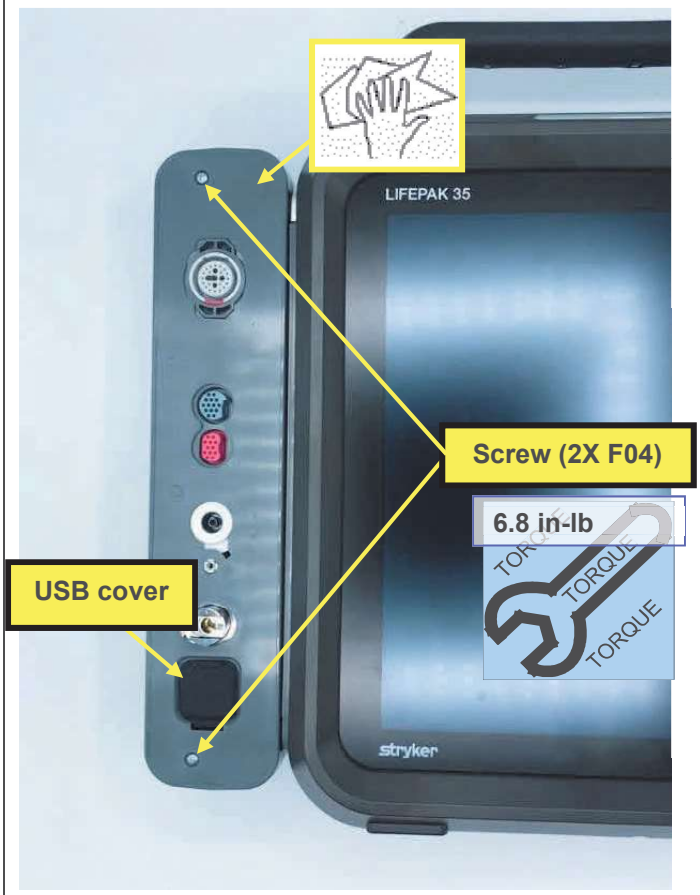
1. Remove CO_2 door as described in Removing the CO_2 Door. Discard.
2. Remove parameter module label. Carefully use a pry tool to start peeling label at one edge, then remove and discard.

3. Remove 2 screws, using a driver with a P-1 bit.
4. Lift off front housing, together with CO_2 door cam and torsion spring (far side, not shown), and USB cover. Cam, spring, and USB cover may be reused if not damaged.

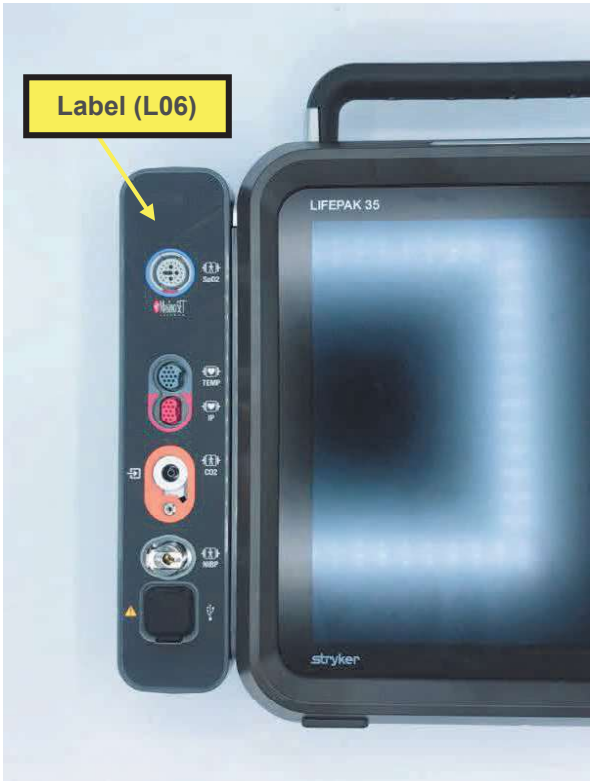
Installing the Parameter Module Front Housing



1. Install cam and torsion spring, if not present.
2. Place USB cover into opening in front housing.



3. Place parameter module front housing, together with USB cover, and cam and spring (far side, not shown), onto parameter module.
4. Install 2 screws, using a torque driver with a P-1 bit.
5. Clean front surface of housing.
6. Remove adhesive liner from back side of label.
7. Position label, and install, pressing firmly into place.
8. Install CO_2 door as described in Installing the CO_2 Door.

CO_2 Door Replacement

The parts listed in the following table will be required to complete this repair. Reference Configuration Assembly.

SERVICE BOM REF	QTY	DESCRIPTION	NOTES
M10	1	COVER, CO2 DOOR, LPQ5	
F03	1	SCREW, BUTTONHEAD, TORX, #4-40 X LG 0.25 IN	

Removing the CO_2 Door

1. Remove screw, using a driver with a T-8 bit.
2. Remove door.
3. If the spring-loaded return is not functioning properly, remove the parameter module front housing, replace the CO_2 door cam and torsion spring as described in Installing the Parameter Module Front Housing (step 1), then reinstall the parameter module front housing as described in Installing the Parameter Module Front Housing.

Installing the CO_2 Door

1. Position CO_2 door on the square shaft.

2. Install screw, using a torque driver with a T-8 bit.

USB Cover (Parameter Module) Replacement

The parts listed in the following table will be required to complete this repair. Reference Configuration Assembly.

SERVICE BOM REF	QTY	DESCRIPTION	NOTES
M03	1	COVER, DUST, USB, LP35	
F04	2	SCREW-M, PH, NYLOK, CS, 4-40, .250L	
L06	1	LABEL, PMOD,…, LP35	Various configs.
M10	1	COVER, CO2 DOOR, LPQ5	
F03	1	SCREW, BUTTONHEAD, TORX, #4-40 X LG 0.25 IN	

1. Remove the parameter module front housing as described in Removing the Parameter Module Front Housing.

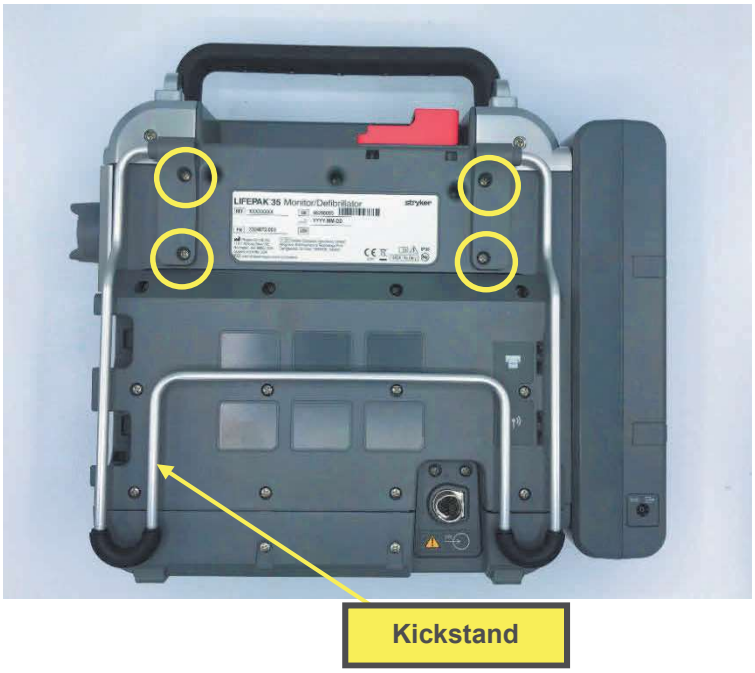
2. Install the parameter module front housing as described in Installing the Parameter Module Front Housing, replacing the USB cover (M03).

Kickstand Replacement

The parts listed in the following table will be required to complete this repair. Reference Configuration Assembly.

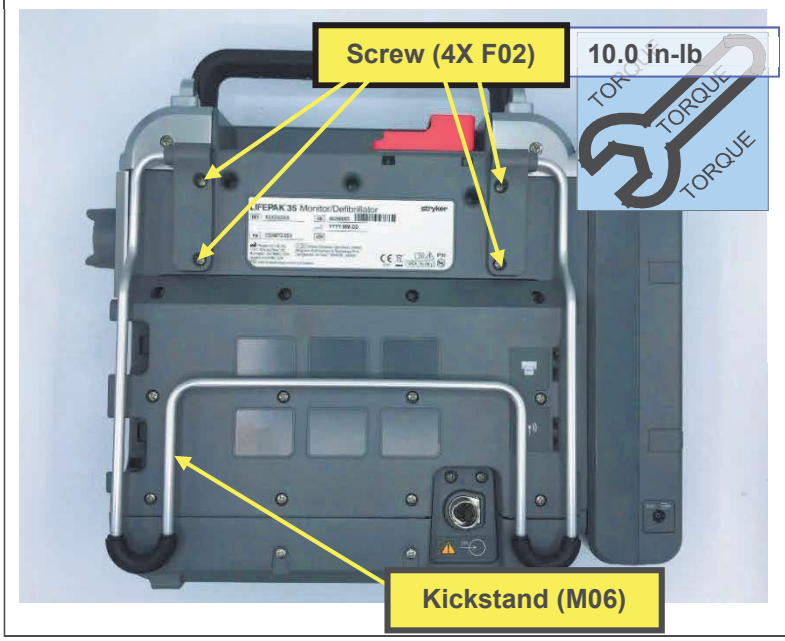
SERVICE BOM REF	QTY	DESCRIPTION	NOTES
M06	1	ASSY, KICKSTAND, LP35	
F02	4	SCREW, MACH, PANHEAD, PHDRV, SS, NYLOK, 6-32 X .312	

Removing the Kickstand



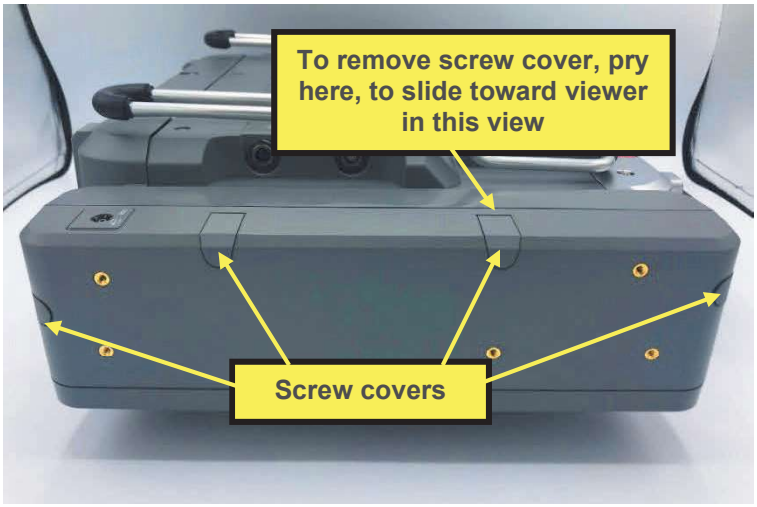
1. Remove 4 screws in the locations shown, using a driver with a P-2 bit.
2. Remove the kickstand.

Installing the Kickstand



1. Place the kickstand, aligning the screw holes.
2. Install 4 screws, using a torque driver with a P-2 bit.

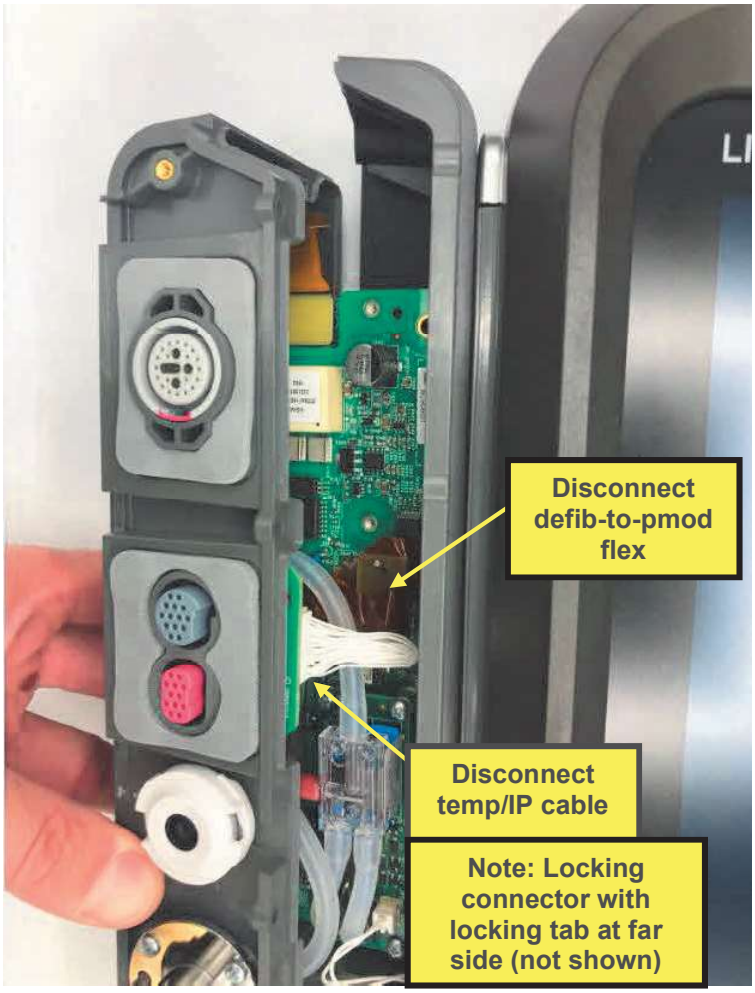
Removing the Parameter Module



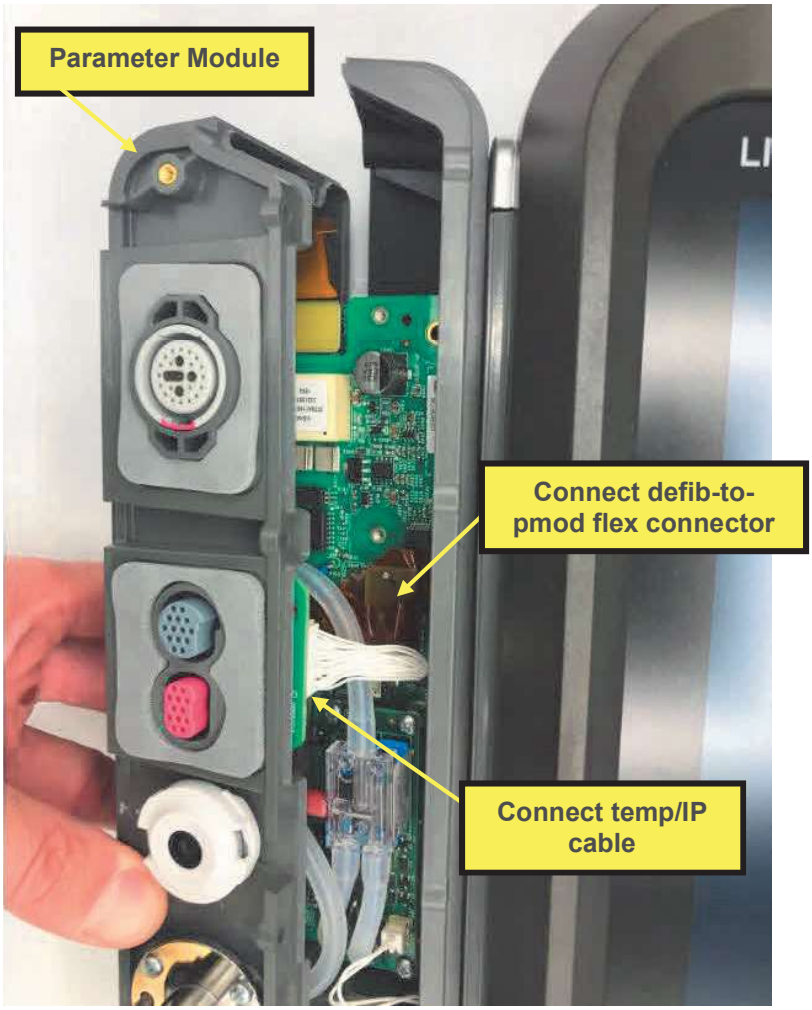
1. For convenience, the ECG guard may be removed as described in Removing the ECG Guard, in order to stand the device on its right side.
2. Remove the parameter module front housing as described in Removing the Parameter Module Front Housing.
3. Remove 4 screw covers, by carefully prying out of position, and sliding out toward left hand side of device. Discard.

Note: It may be helpful to pry up, with a small flat bladed tool, at the location shown before sliding the cover out.

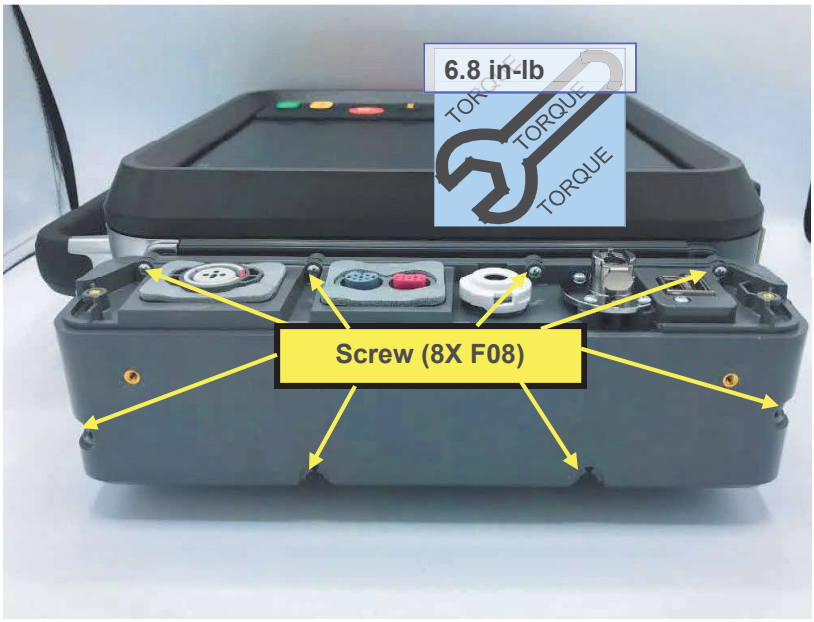
4. Remove 8 screws in the locations shown, using a driver with a P-1 bit.
5. Disconnect the temp/IP cable connector, if present (shown below).
6. Disconnect the defib-to-pmod flex connector (shown below).
7. Remove the parameter module.


Disconnect defib-to-pmod flex
Disconnect temp/IP cable
Note: Locking connector with locking tab at far side (not shown)

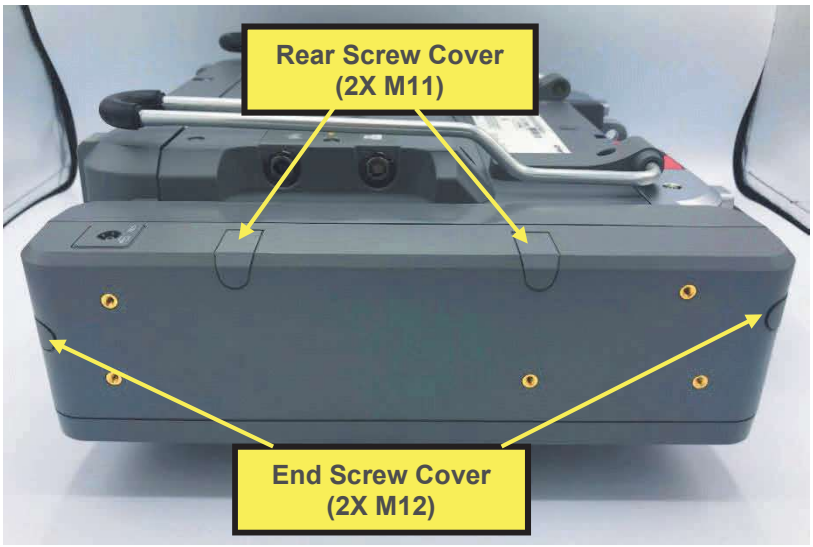
Installing the Parameter Module



1. Connect the defib-to-pmod flex connector, aligning, and pressing until fully connected.
2. Connect the temp/IP cable connector, if present.



3. Install 8 screws in the locations shown, using a torque driver with a P-1 bit.
4. Install parameter module front housing as described in Installing the Parameter Module Front Housing.
5. Install ECG guard as described in Installing the ECG Guard, if not present.



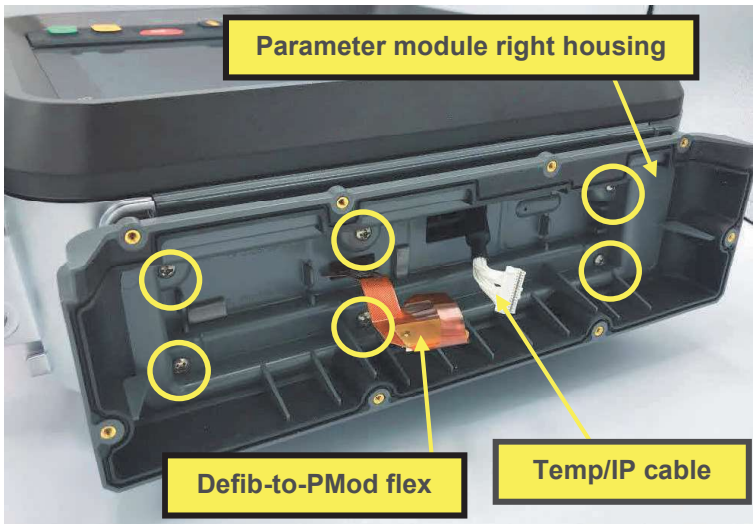
6. Install 2 rear screw covers in the locations shown. Press in fully.
7. Install 2 end screw covers in the locations shown. Press in fully.

Parameter Module Right Housing Replacement

The parts listed in the following table will be required to complete this repair. Reference Vanilla Assembly.

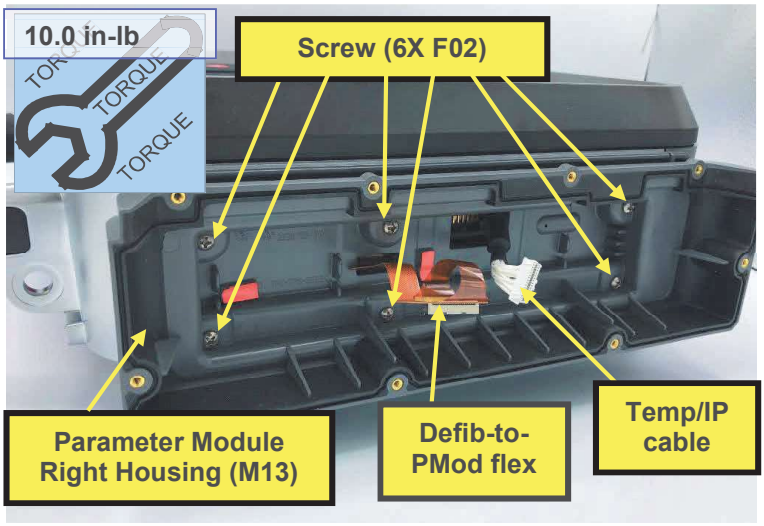
SERVICE BOM REF	QTY	DESCRIPTION	NOTES
M13	1	ASSY, HOUSING RIGHT, PMOD, LP35	
F02	6	SCREW, MACH, PANHEAD, PHDRV, SS, NYLOK, 6-32 X .312	
F08	8	SCREW-M,CS,Z,PH, NYLOCK,4-40 X .312L	
M11	2	COVER, SCREW, REAR, PARAMETER MODULE, LP35	
M12	2	COVER, SCREW, ENDS, PARAMETER MODULE, LP35	
L06	1	LABEL, PMOD,…, LP35	Various configs.
F04	2	SCREW-M, PH, NYLOK, CS, 4-40, .250L	
M10	1	COVER, CO2 DOOR, LPQ5	
F03	1	SCREW, BUTTONHEAD, TORX, #4-40 X LG 0.25 IN	

Removing the Parameter Module Right Housing

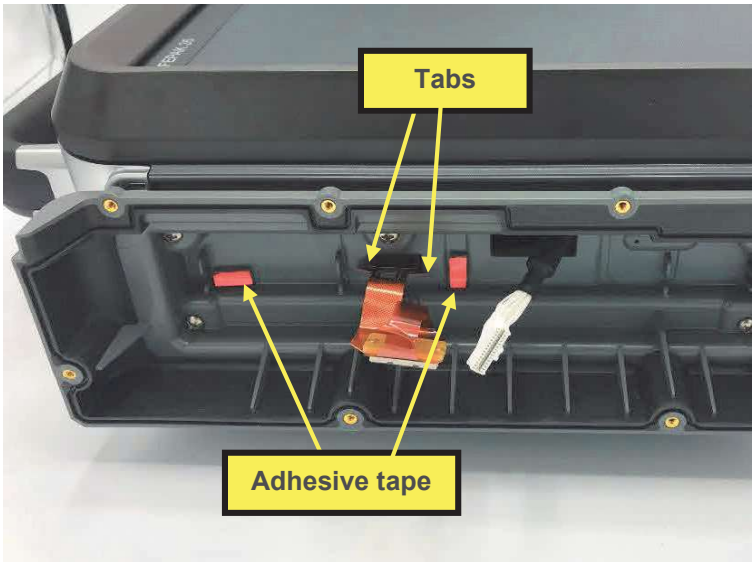


1. Remove parameter module as described in Removing the Parameter Module.
2. Remove 6 screws in the locations shown, using a driver with a P-2 bit.
3. Remove the parameter module right housing, feeding the defib-to-pmod flex connector, and the temp/IP cable (if present), through the respective holes.

Installing the Parameter Module Right Housing



1. Place the parameter module right housing in position, threading the temp/IP cable (if present), and the defib-to-pmod flex through the respective holes, and extending the flex cable tabs as shown below.
2. Install 6 screws, using a torque driver with a P-2 bit.
3. Peel the release liners from 2 pieces of adhesive tape on the parameter module right housing.
4. Install the parameter module as described in Installing the Parameter Module.
5. Execute the LIFEPAK 35 PIP.



Skid Plate Replacement

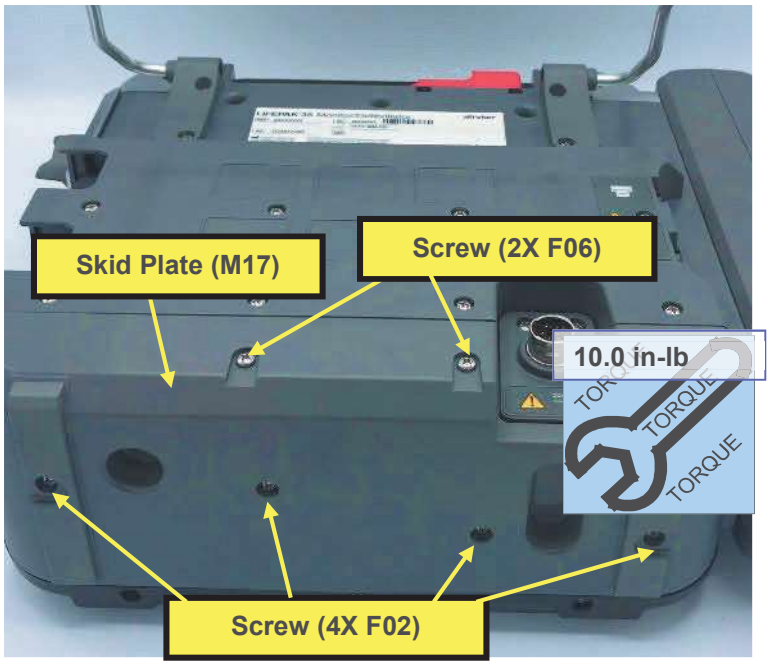
The parts listed in the following table will be required to complete this repair. Reference Defib Assembly.

SERVICE BOM REF	QTY	DESCRIPTION	NOTES
M17	1	HOUSING, PLATE, SKID, LP35	
F02	4	SCREW, MACH, PANHEAD, PHDRV, SS, NYLOK, 6-32 X .312	
F06	2	SCREW, MACHINE, PANHEAD, NYLOK, 6-32 X 1.125	

Removing the Skid Plate

1. Remove 6 screws, using a driver with a P-2 bit.
2. Remove skid plate.

Installing the Skid Plate



1. Position skid plate in place.
2. Install 4 screws at bottom of device, using a torque driver with a P-2 bit.
3. Install 2 screws at rear of device, using a torque driver with a P-2 bit.

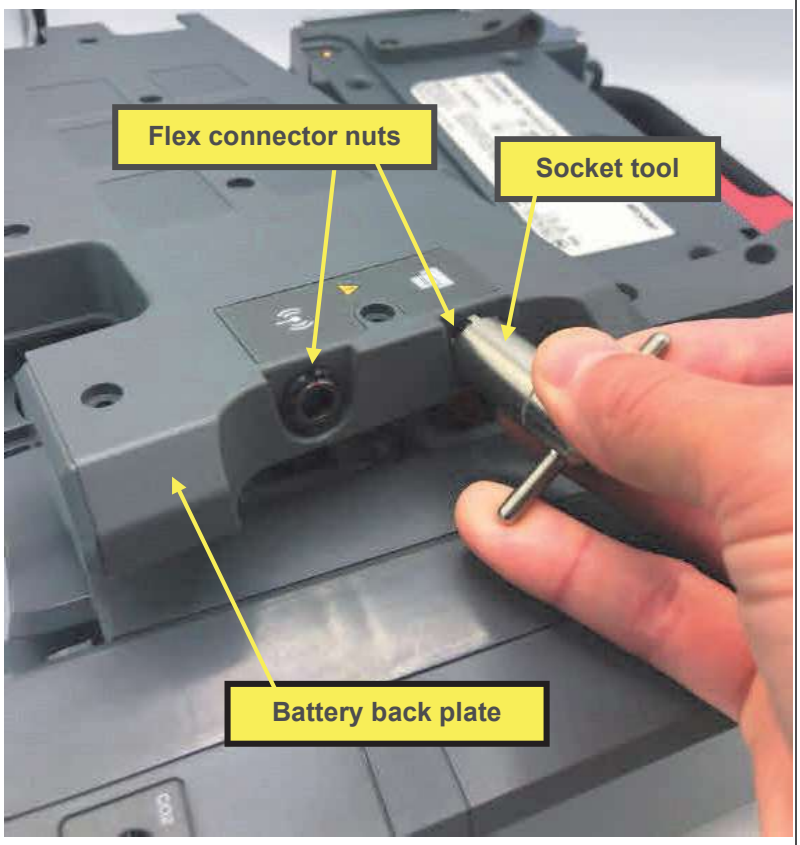
Battery Back Plate Replacement

The parts listed in the following table will be required to complete this repair. Reference Rear Housing Assembly.

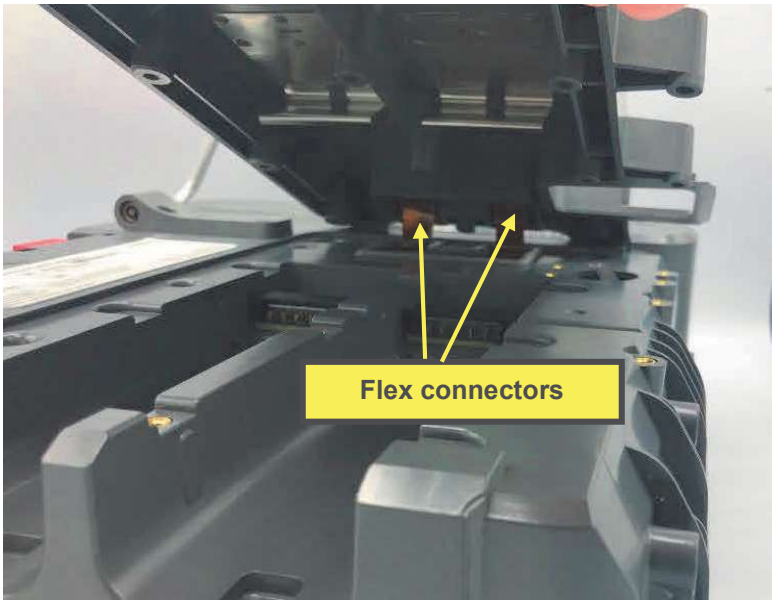
SERVICE BOM REF	QTY	DESCRIPTION	NOTES
K12	1	KIT, REPAIR, BATTERY BACK PLATE, LP35	

Removing the Battery Back Plate

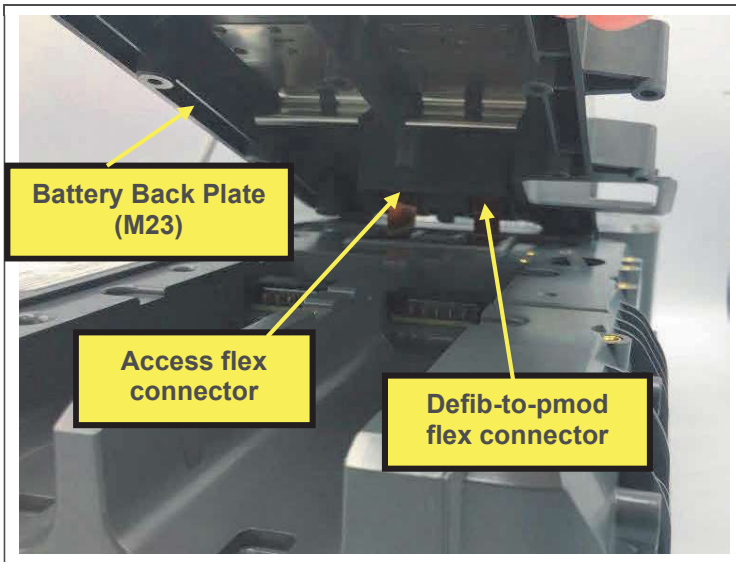
1. Remove the skid plate as described in Removing the Skid Plate.
2. Remove the power plug as described in Removing the Power Plug.
3. Remove 12 screws in the locations shown, using a driver with a P-2 bit.



4. Remove 2 flex connector nuts, using the socket tool as shown. Retain for reuse.
5. Remove flex connectors (shown below) from the battery back plate by pulling through holes from the inside. Leave flexes with the device.
6. Remove the battery back plate.



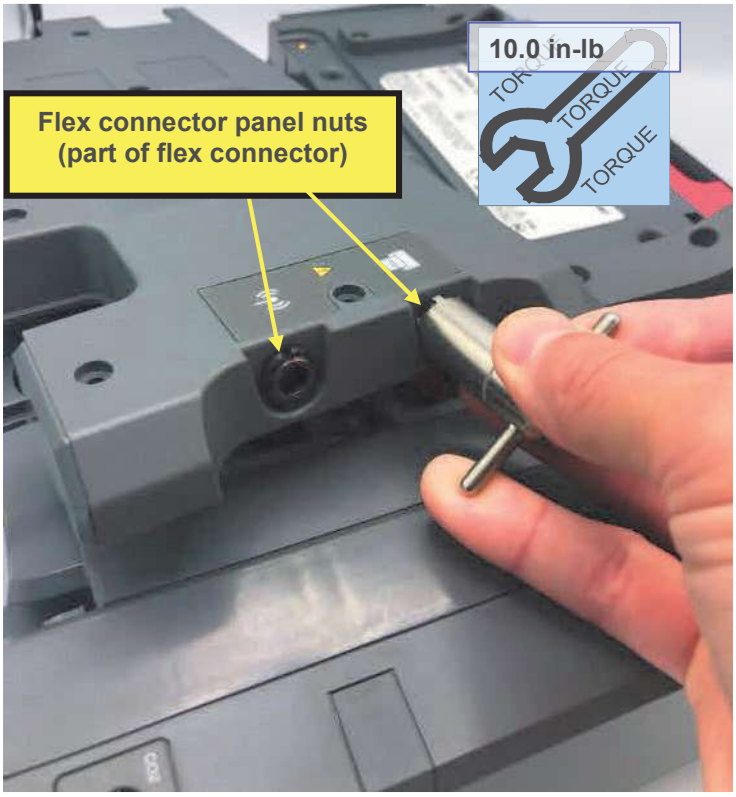
Installing the Battery Back Plate

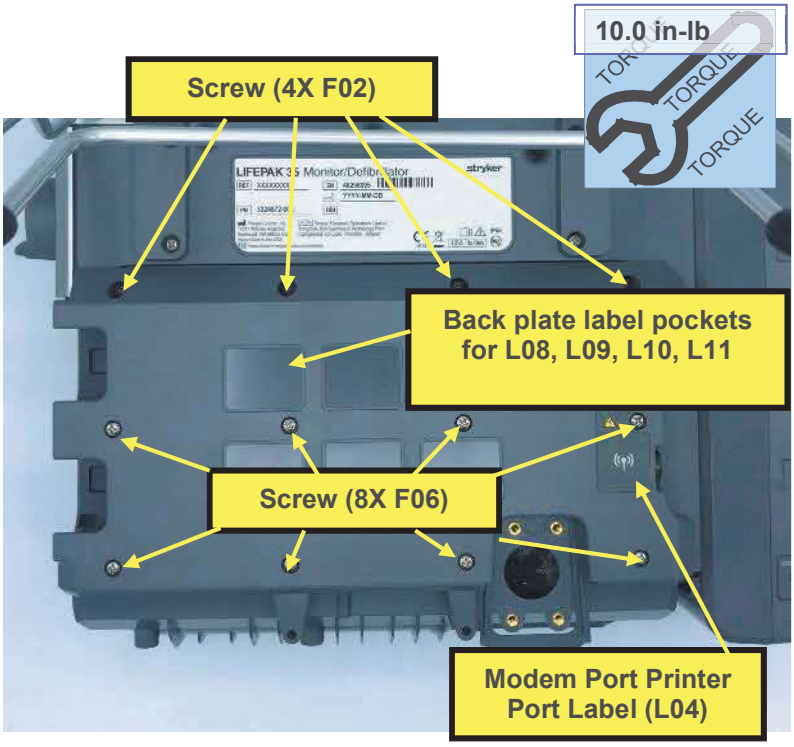


1. Insert access flex connector (nearest to top of device) and defib-to-pmod flex connector (nearest to bottom of device) through holes in battery back plate. Orient connectors so that flats align with flats in holes.

2. Install and tighten 2 flex connector panel nuts (part of flex connector, shown below), using a torque driver with a socket tool.

Note: The access port socket should be used with a torque driver. A tee handle socket is shown in the picture at left.





3. Position battery back plate in place.
4. Install 12 screws, using a torque driver with a P-2 bit.
5. Remove adhesive liner from back of modem port printer port label, and install label in pocket in battery back plate, pressing firmly into place.
6. Remove adhesive liners from 3 back plate labels, and affix to 3 of the 6 back plate pockets.

Note: Which labels are used depends on device configuration. See diagrams and parts lists in section 9 for more information.

7. Install power plug as described in Installing the Power Plug.
8. Install skid plate as described in Installing the Skid Plate.
9. Execute the LIFEPAK 35 PIP.

Handle Replacement

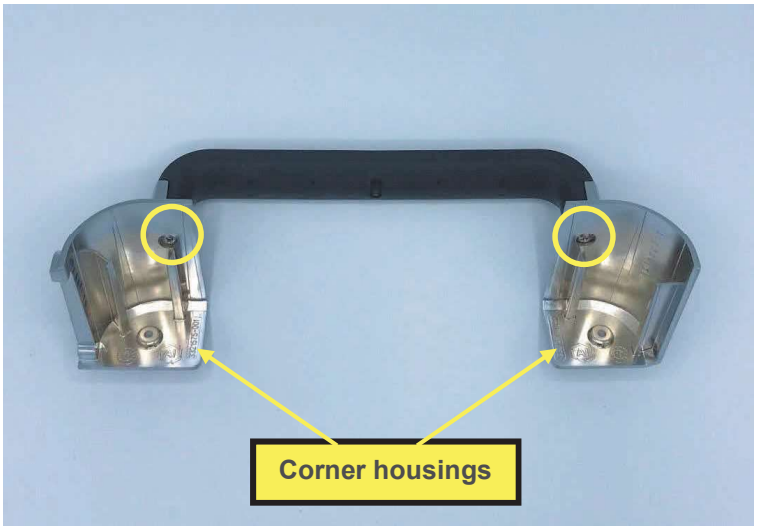
The parts listed in the following table will be required to complete this repair. Reference Rear Housing Assembly.

SERVICE BOM REF	QTY	DESCRIPTION	NOTES
K05	1	KIT, REPAIR, HANDLE, LP35	
L06	1	LABEL, PMOD,…, LP35	Various configs.

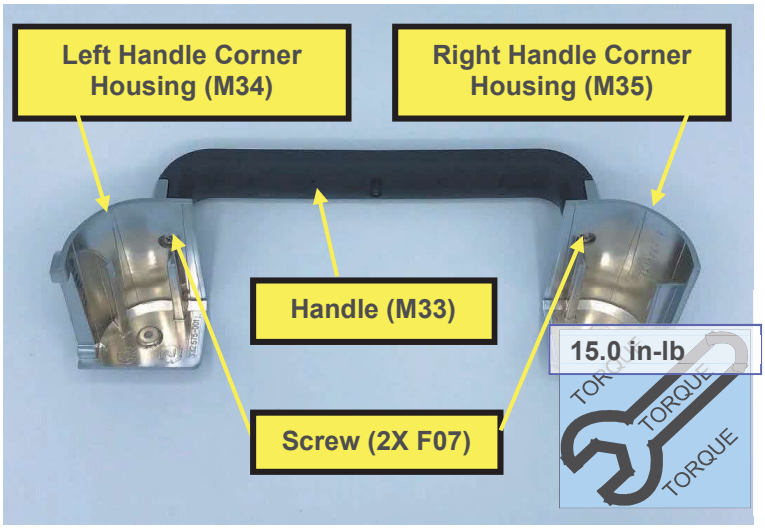
Removing the Handle

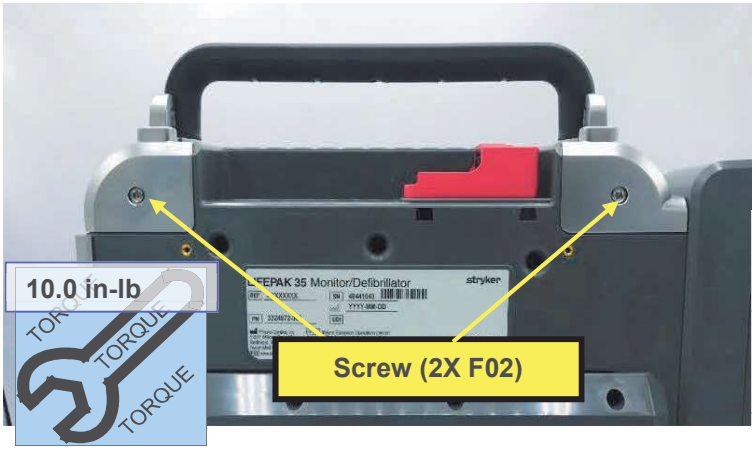
1. Remove kickstand as described in Removing the Kickstand.
2. Remove parameter module as described in Removing the Parameter Module.
3. Remove parameter module right housing as described in Removing the Parameter Module Right Housing.
4. Remove 2 screws, using a driver with a P-2 bit.

5. Slide handle assembly toward rear of device and remove.

	6. Remove 2 screws, using a driver with a P-2 bit. Corner housings may be reused if not damaged.

Installing the Handle

	1. Attach left handle corner housing to handle, using a screw, and a torque driver with a P-2 bit. 2. Attach right handle corner housing to handle, using a screw, and a torque driver with a P-2 bit.
	3. Slide handle assembly into place from rear of device.



4. Install 2 screws, using a torque driver with a P-2 bit.
5. Install parameter module right housing as described in Installing the Parameter Module Right Housing.
6. Install parameter module as described in Installing the Parameter Module.
7. Install kickstand as described in Installing the Kickstand.
8. Execute the LIFEPAK 35 PIP.

Power Plug Replacement

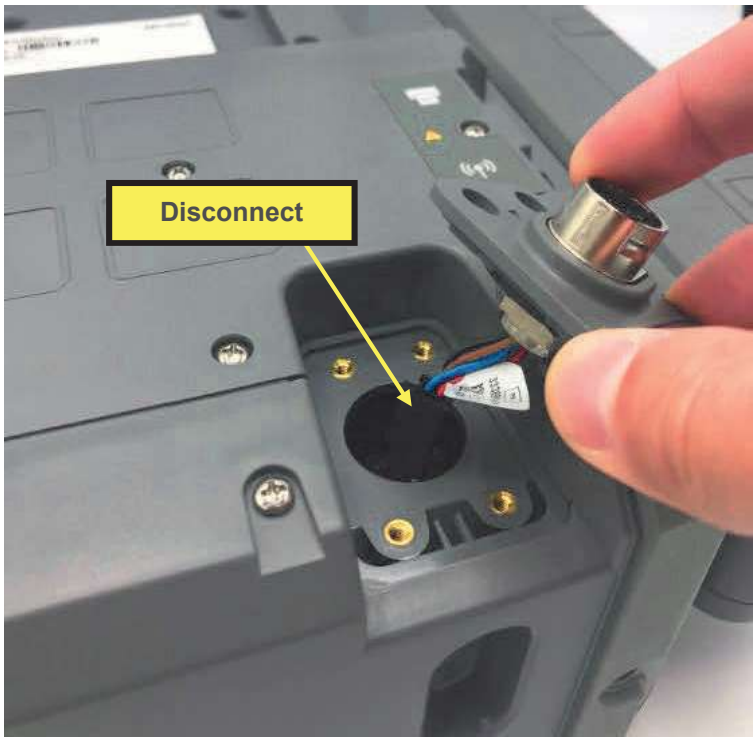
Note: The standard power plug is shown in the following procedures. For the blade style connector, follow the same process, except as noted in the procedure. Refer to the assembly diagrams in section 9 for more detail.

The parts listed in the following table will be required to complete this repair. Reference Configuration Assembly.

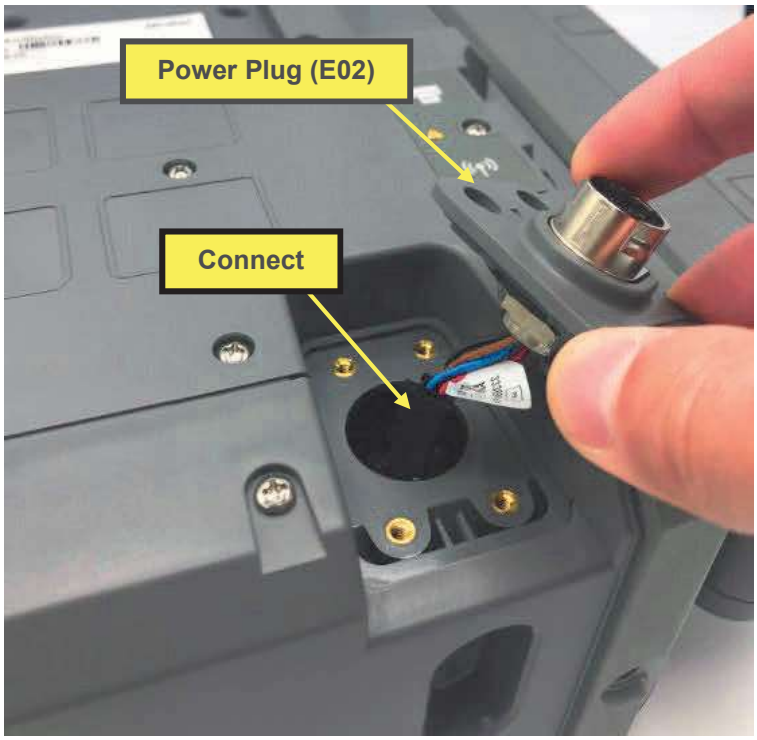
SERVICE BOM REF	QTY	DESCRIPTION	NOTES
E02	1	ASSY, POWER PLUG, LP35	
F02	4	SCREW, MACH, PANHEAD, PHDRV, SS, NYLOK, 6-32 X .312	
L05	1	LABEL, DC INPUT, LP35	
M36	1	SEAL, BLADE CONNECTOR, LP35	Qty 1, only for config with blade connector.

Removing the Power Plug

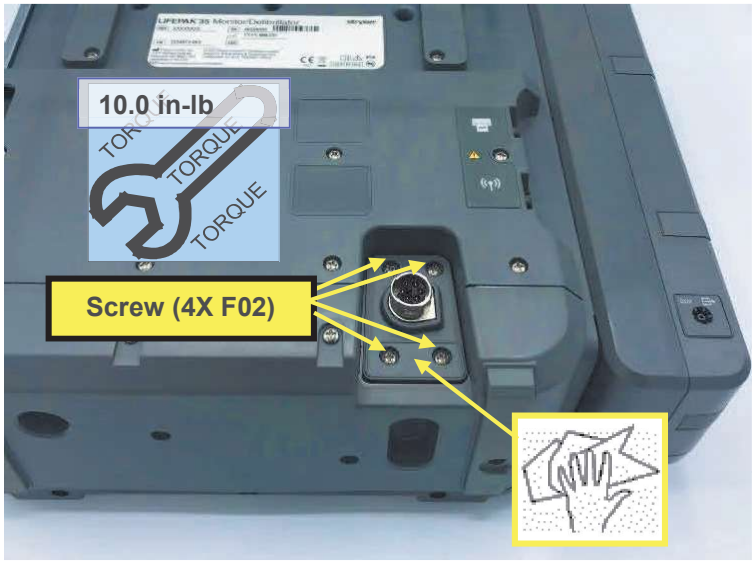
	1. Remove label, and discard.
	2. Remove 4 screws, using a driver with a P-2 bit. 3. Pull power plug assembly slightly away from the rear housing. 4. Disconnect power plug connector and remove power plug.



Installing the Power Plug



1. Connect power plug.



2. Tuck the wires and connector into the rear housing and position the power plug in place.
3. Install 4 screws, using a torque driver with a P-2 bit.
4. Clean area where label will be applied.
5. Remove adhesive liner from back side of label.
6. Apply label, pressing firmly in place.
7. Execute the LIFEPAK 35 PIP.

Printer Replacement

The printer is an optional, non-repairable accessory. If it is damaged or inoperable, it may be replaced. Refer to the printer instructions for use.

Parameter Module Parts

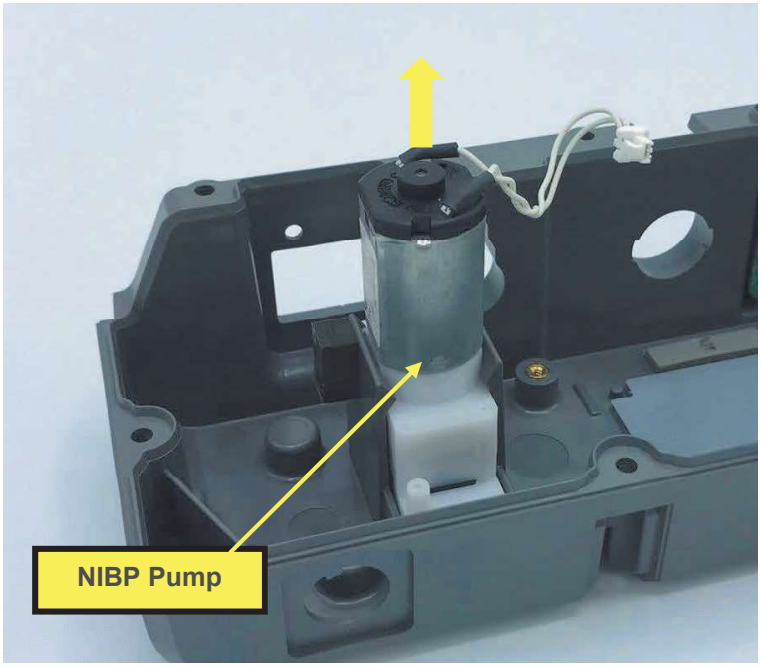
Refer to procedures in this section for instructions on removing and installing parts within the parameter module.

NIBP Pump Replacement

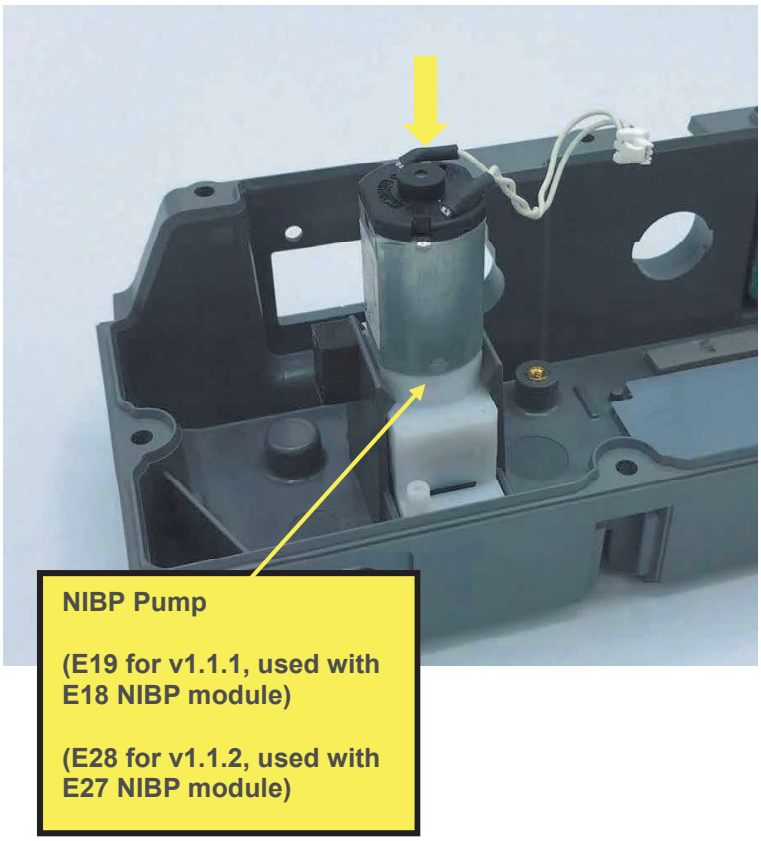
The parts listed in the following table will be required to complete this repair. Reference Parameter Module Assembly (-002, without temp/IP).

SERVICE BOM REF	QTY	DESCRIPTION	NOTES
K19	1	KIT, REPAIR, NIBP PUMP, LP35	For v1.1.1 only.
K24	1	KIT, REPAIR, NIBP PUMP, LP35	For v1.1.2 only.
L06	1	LABEL, PMOD,…LP35	Various configs.

Removing the NIBP Pump



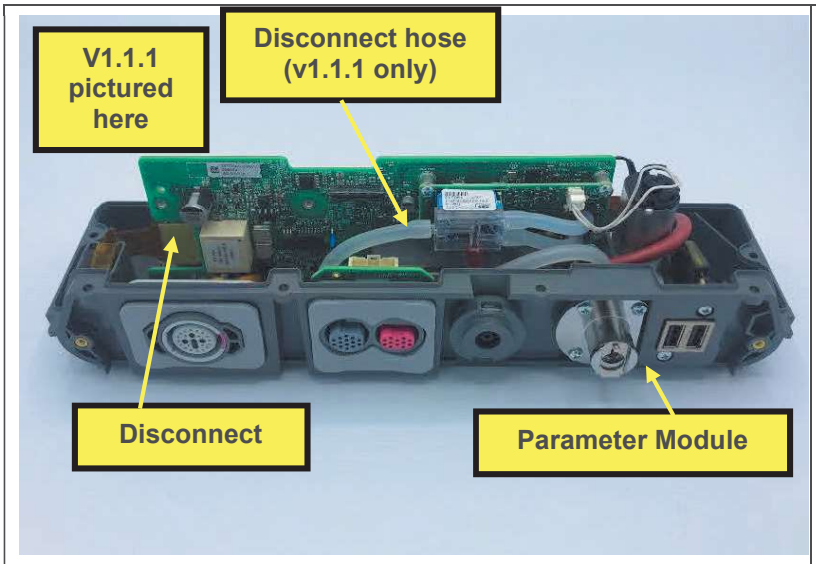
1. Remove the parameter module as described in Removing the Parameter Module.
2. Remove components from parameter module housing as described in Parameter Module Housing Replacement, steps 2-7, and 9.
3. Remove the pump by lifting the pump straight out of the housing. Lift firmly, and rock back and forth as necessary to break the adhesive bond between the housing and the bottom of the pump. Discard parameter module housing.



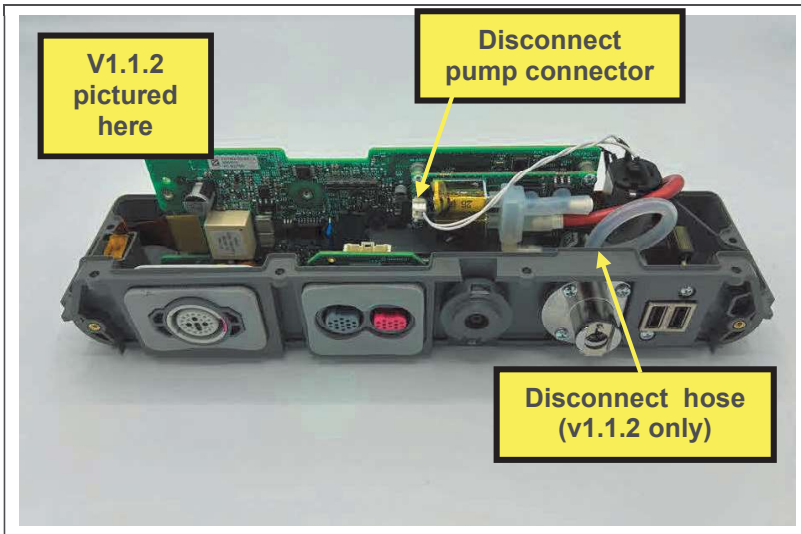
1. Prepare new parameter module housing and install components as described in Parameter Module Housing Replacement, steps 10-14.
2. Install the pump in the orientation shown, with the label facing away from the PCBA and the hose connector toward the rear of the parameter module. Press pump into pocket in housing until fully bottomed and adhered to the adhesive tape in the bottom of the housing.
3. Install remaining parameter module components and make connections as described in Parameter Module Housing Replacement, steps 15-25, and 27-30, omitting steps already completed.
4. Install the parameter module as described in Installing the Parameter Module.
5. Execute the LIFEPAK 35 PIP.

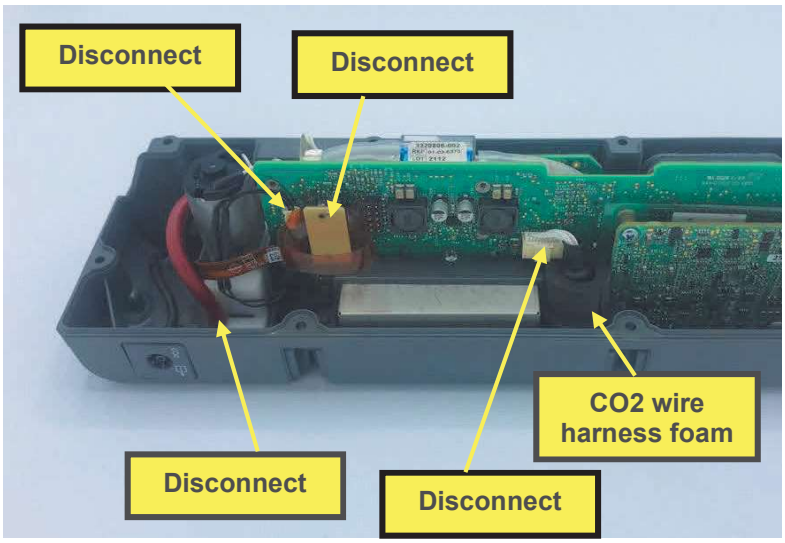
Removing the Patient Parameter PCBA

To perform many of the parameter module repair procedures, the patient parameter PCBA must first be removed. This section describes how to remove the patient parameter PCBA, and the subsequent section describes how to install the patient parameter PCBA.

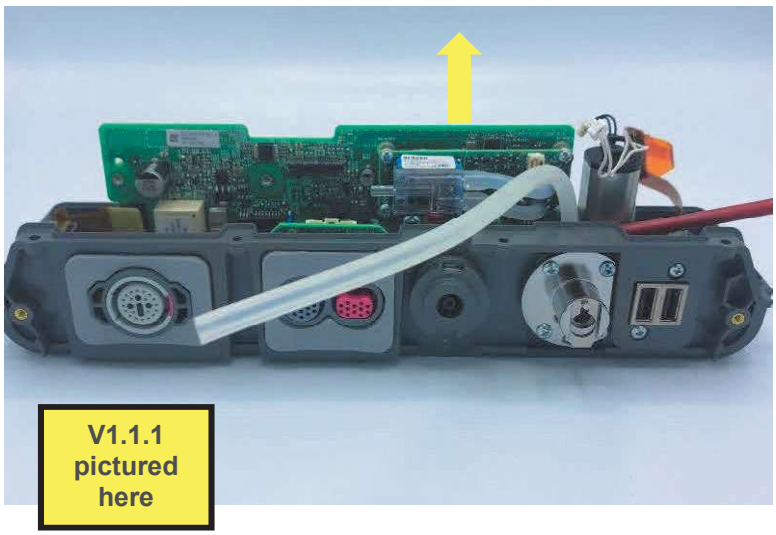


1. Remove the parameter module as described in Removing the Parameter Module.
2. Disconnect NIBP pump connector from NIBP module.
3. Disconnect the SpO_2 flex connector from the SpO_2 module.
4. Disconnect the NIBP coupler hose from the NIBP module for v1.1.1 only; from the NIBP coupler for v1.1.2 only.

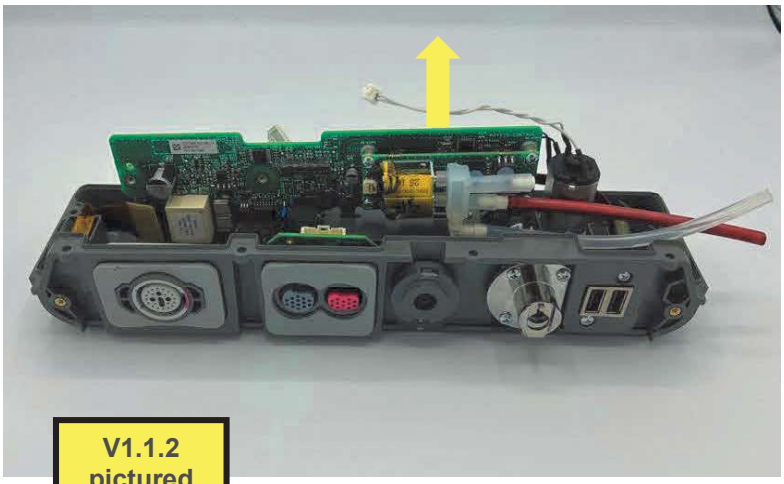




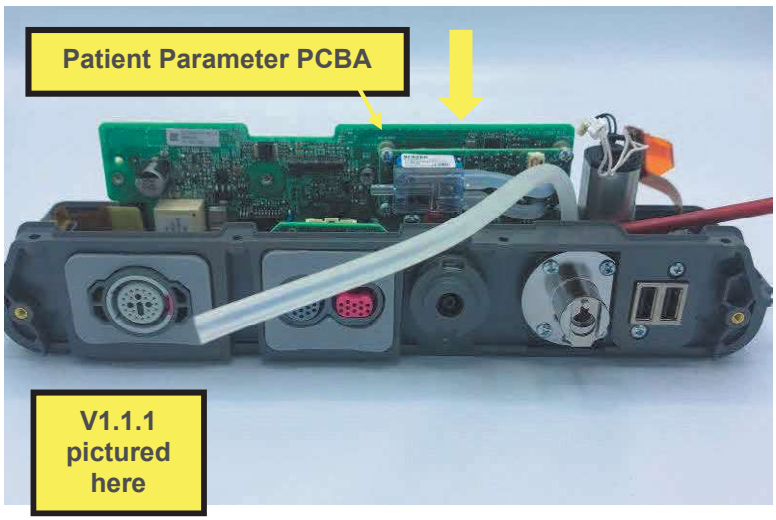
5. Disconnect hose from NIBP pump.
6. Disconnect USB flex connector.
7. Disconnect CO_2 cable.
8. Remove CO_2 wire harness foam. Retain for reuse.
9. Disconnect NIBP coupler connection.

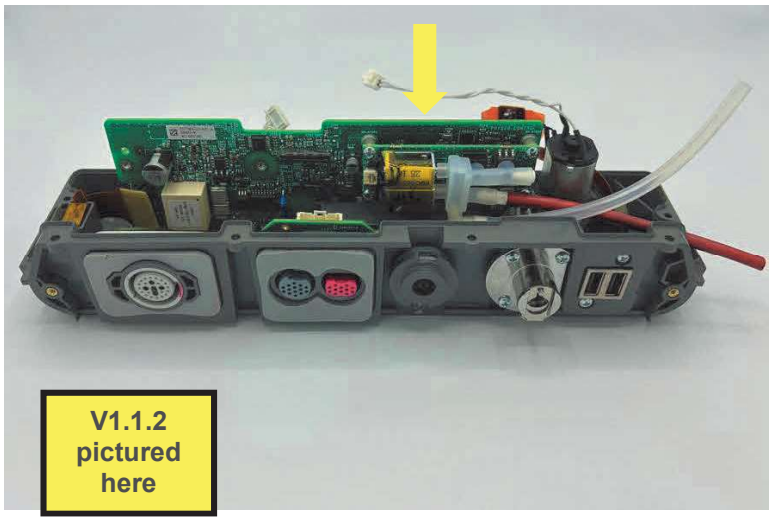


10. Lift patient parameter PCBA out of housing.

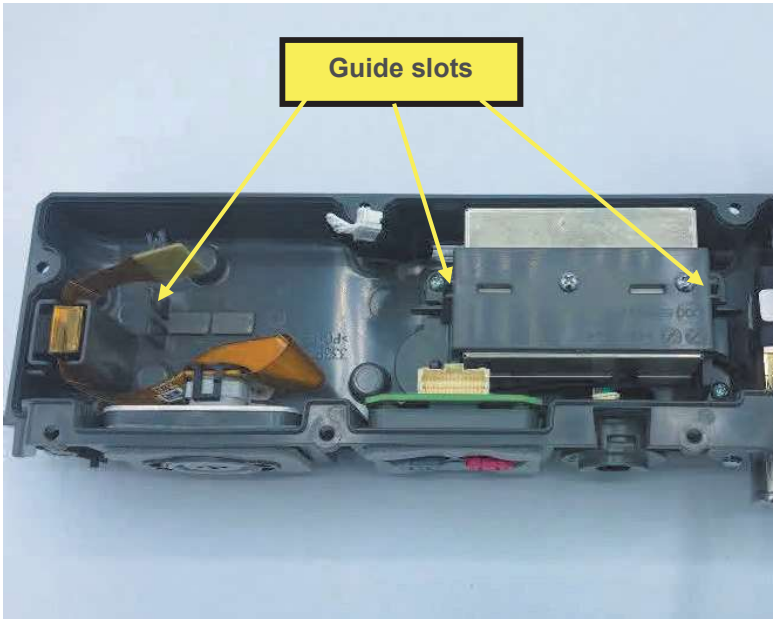


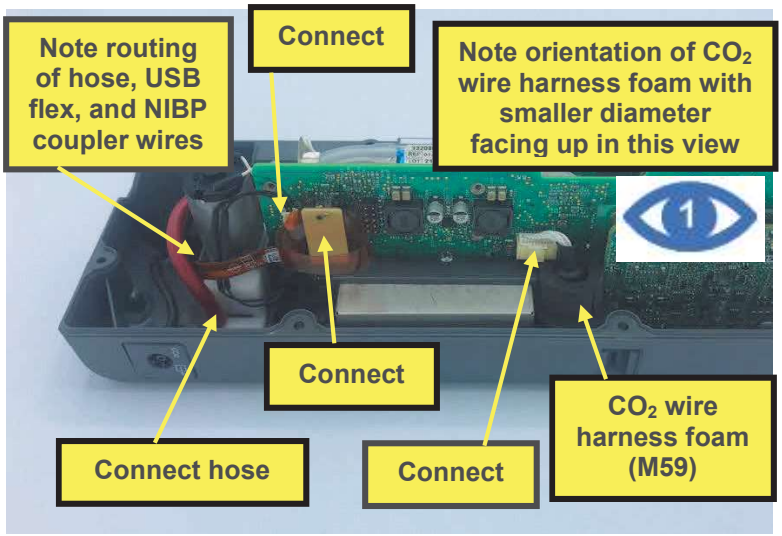
Installing the Patient Parameter PCBA



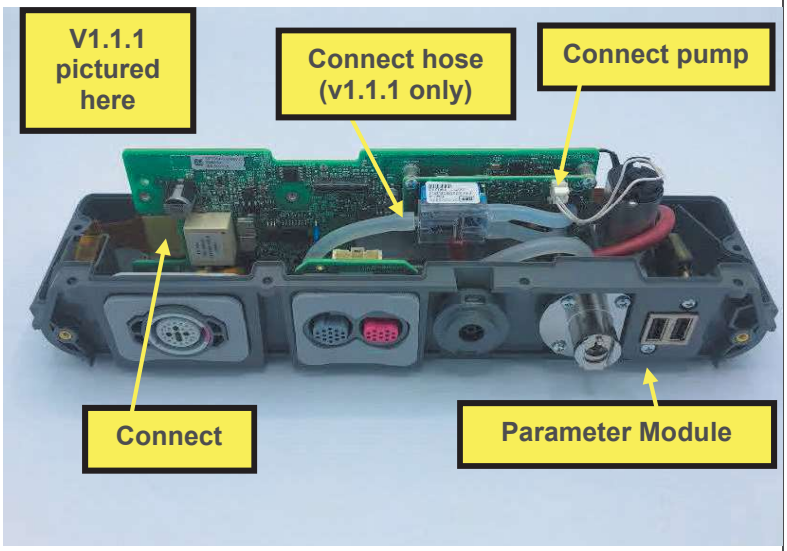


1. Place the patient parameter PCBA into the housing, between the guide slots (referenced in picture below), and press down until it fully clicks into place.

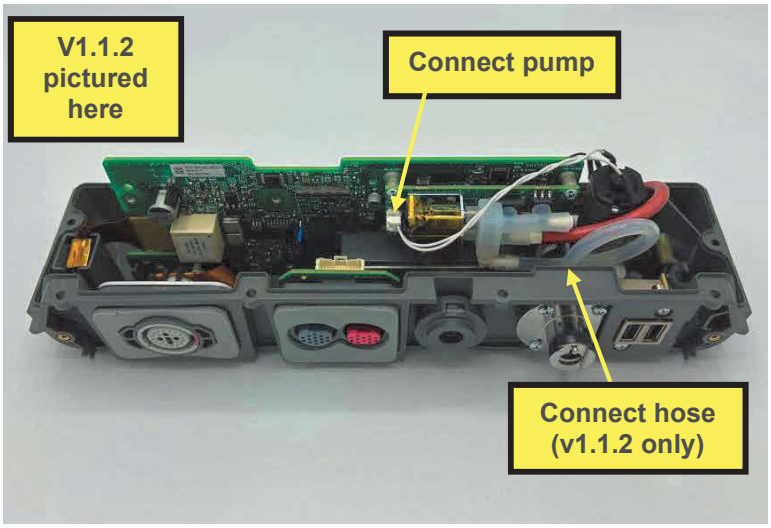




2. Connect NIBP coupler wire to patient parameter PCBA J404.
3. Install CO_2 wire harness foam if not already present.
4. Connect CO_2 module connector to patient parameter PCBA P402.
5. Route USB flex outside NIBP coupler wires as shown and connect USB flex cable connector to parameter module PCBA J407.
6. Connect hose to NIBP pump, routing hose outside USB flex as shown.



7. Connect the SpO_2 flex connector to SpO_2 module J1.
8. Connect the NIBP coupler hose to the NIBP module for v1.1.1 only. For v1.1.2, connect NIBP hose to NIBP coupler as shown below.
9. Connect the NIBP pump connector to the NIBP module.
10. Install the parameter module as described in Installing the Parameter Module.

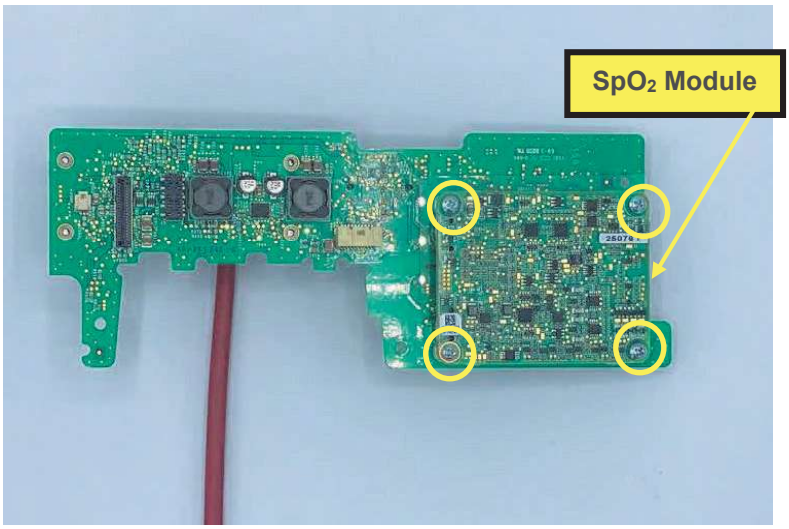


SpO_2 Module Replacement (Masimo)

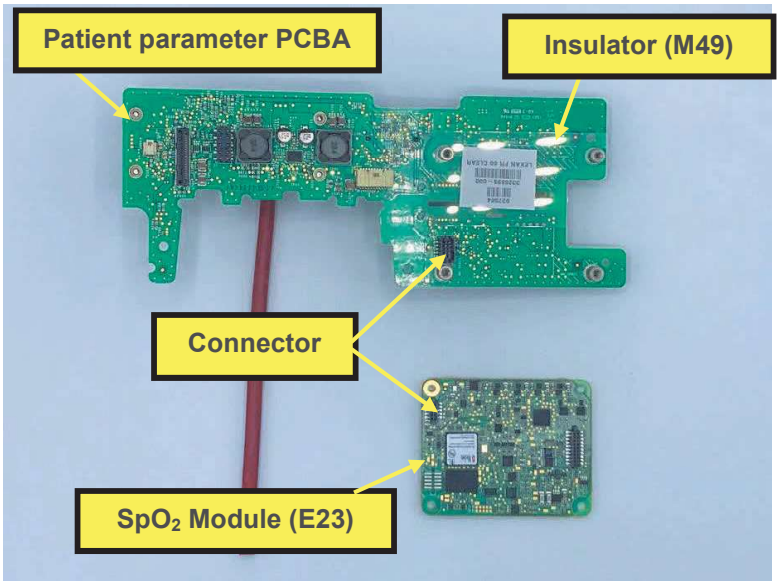
The parts listed in the following table will be required to complete this repair. Reference Parameter Module Assembly (-002, without temp/IP).

SERVICE BOM REF	QTY	DESCRIPTION	NOTES
K17	1	KIT, REPAIR, SPO2 MODULE, MASIMO, LP35	
L06	1	LABEL, PMOD,…LP35	Various configs.

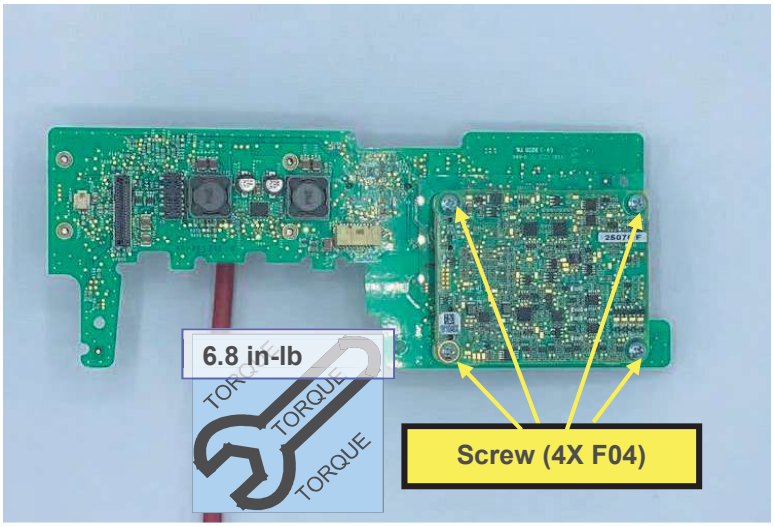
Removing the SpO_2 Module



1. Remove the patient parameter PCBA as described in Removing the Patient Parameter PCBA.
2. Remove 4 screws, using a driver with a P-1 bit.
3. Remove the SpO_2 module by pulling it away from the from patient parameter PCBA, perpendicular to the PCBA. The insulator (under the SpO_2 module, not shown) may be retained for reuse.



1. Ensure clear plastic insulator is laid over patient parameter PCBA.
2. Install SpO_2 module onto the patient parameter PCBA, aligning and seating the connector.



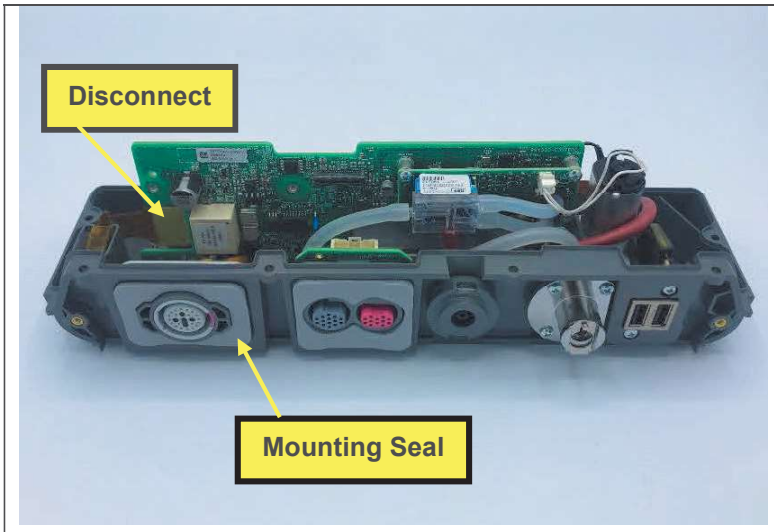
3. Install 4 screws, using a torque driver with a P-1 bit.
4. Install the patient parameter PCBA as described in Installing the Patient Parameter PCBA.
5. Execute the LIFEPAK 35 PIP.

SpO_2 Connector Replacement (Masimo)

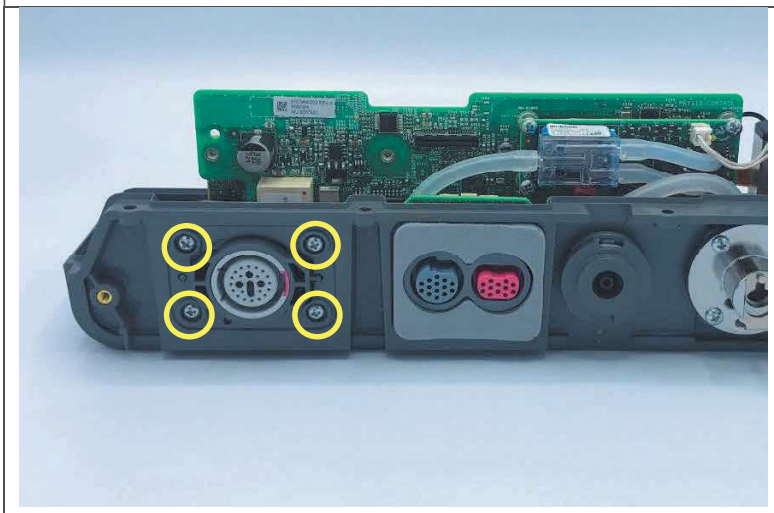
The parts listed in the following table will be required to complete this repair. Reference Parameter Module Assembly (-002, without temp/IP).

SERVICE BOM REF	QTY	DESCRIPTION	NOTES
K21	1	KIT, REPAIR, SPO2 CONNECTOR, MASIMO, LP35	
L06	1	LABEL, PMOD,…LP35	Various configs.

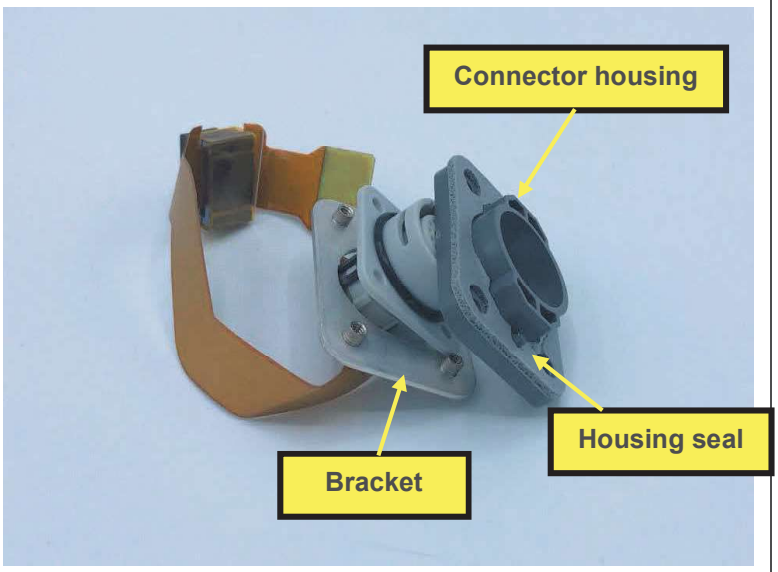
Removing the SpO_2 Connector

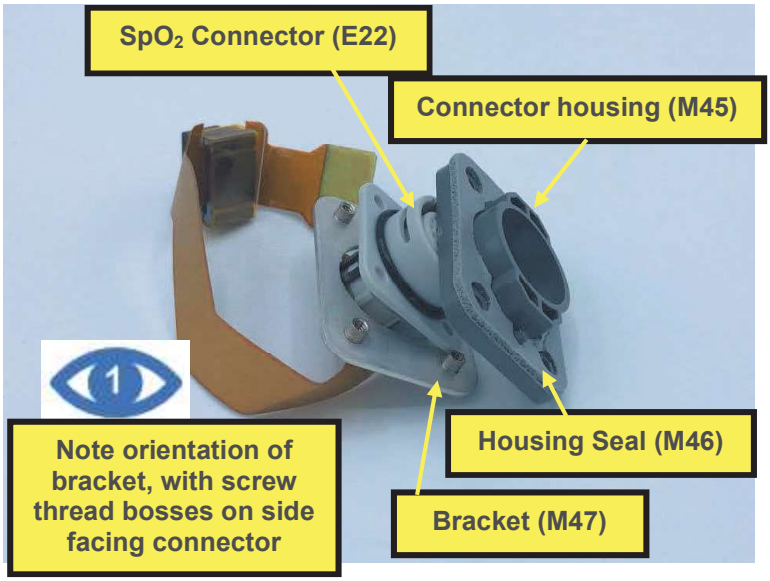


1. Remove the parameter module as described in Removing the Parameter Module.
2. Disconnect the SpO_2 flex connector from the SpO_2 module.
3. Remove the mounting seal, and discard.

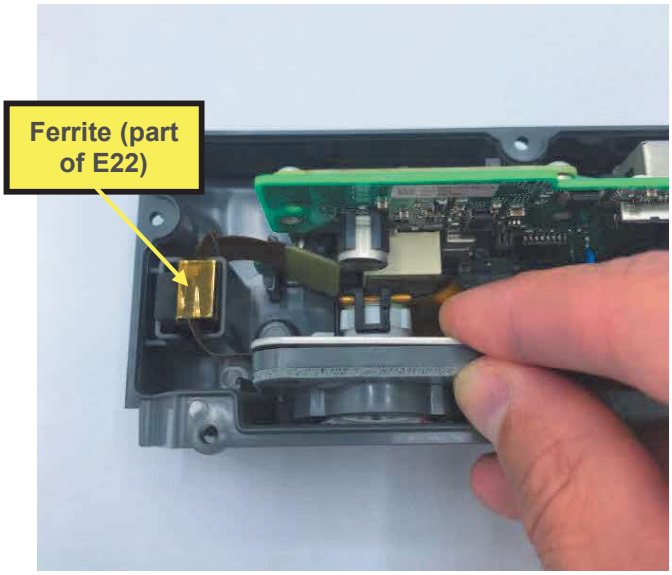


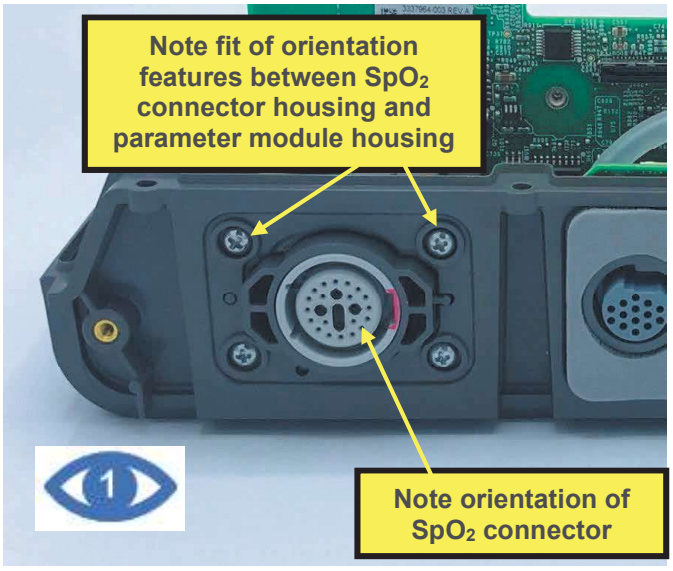
4. Remove 4 screws, using a driver with a P-1 bit.
5. Remove the SpO_2 connector from the inside of the parameter module housing. The bracket, connector housing, and seal (referenced in picture below) may be retained for reuse.



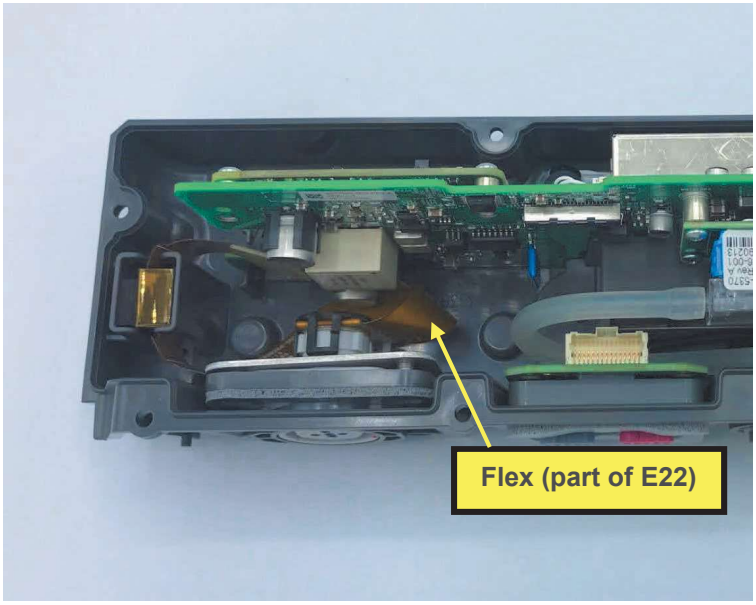


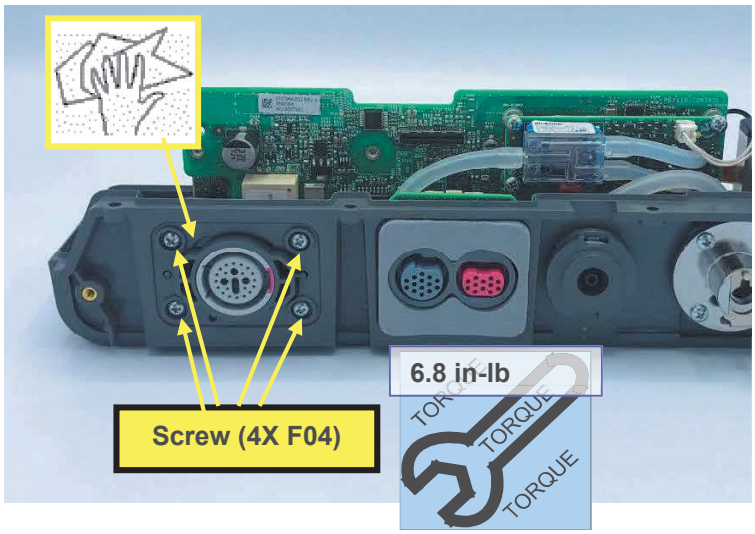
1. Ensure the housing seal is intact and not damaged.
2. Thread SpO_2 connector flex through bracket, in orientation shown.



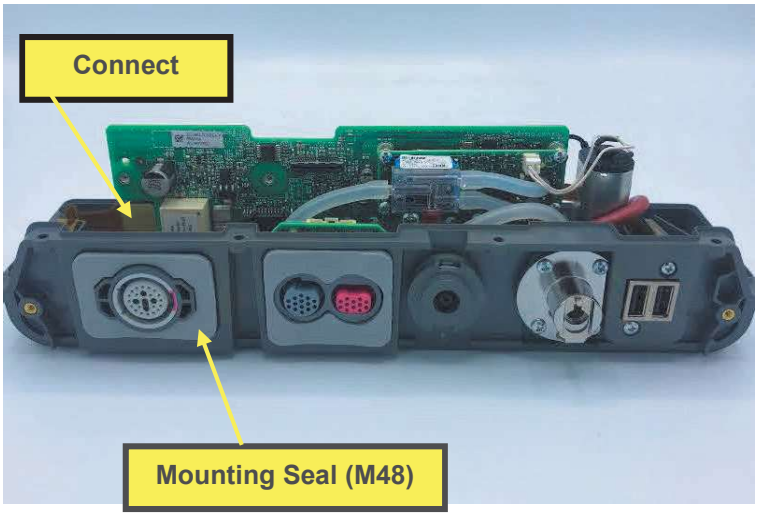


3. Stack bracket, connector, and connector housing, with connector housing oriented as shown in picture below, and install into parameter module housing while placing ferrite into pocket.





4. Note routing of SpO_2 flex to ensure flex does not get pinched.
5. Install 4 screws, using a torque driver with a P-1 bit.
6. Clean the parameter module housing in the area around the SpO_2 connector.



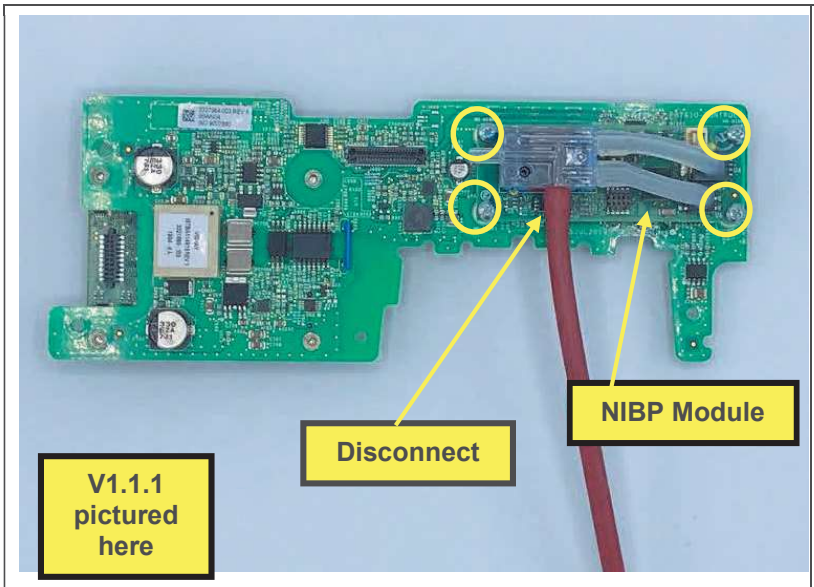
7. Connect the SpO_2 flex to SpO_2 module J1.
8. Remove the adhesive liner from the back of the mounting seal and install the mounting seal onto the parameter module housing. Press firmly to adhere.
9. Install the parameter module as described in Installing the Parameter Module.
10. Execute the LIFEPAK 35 PIP.

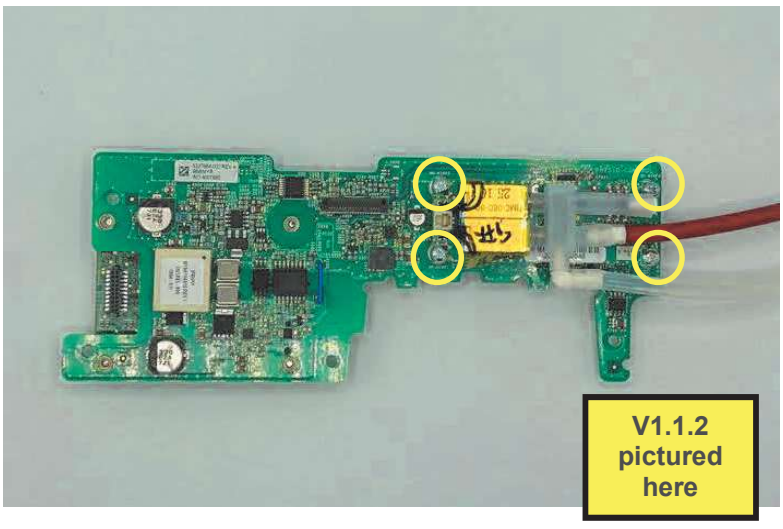
NIBP Module Replacement

The parts listed in the following table will be required to complete this repair. Reference Parameter Module Assembly (-002, without temp/IP).

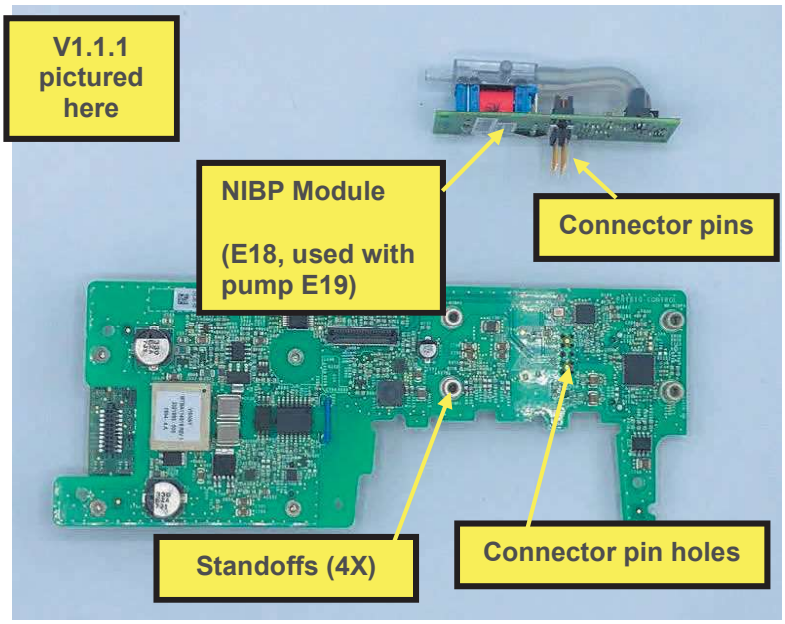
SERVICE BOM REF	QTY	DESCRIPTION	NOTES
K18	1	KIT, REPAIR, NIBP MODULE, LP35	For v1.1.1 only.
K23	1	KIT, REPAIR, NIBP MODULE, LP35	For v1.1.2 only.
L06	1	LABEL, PMOD,…LP35	Various configs.

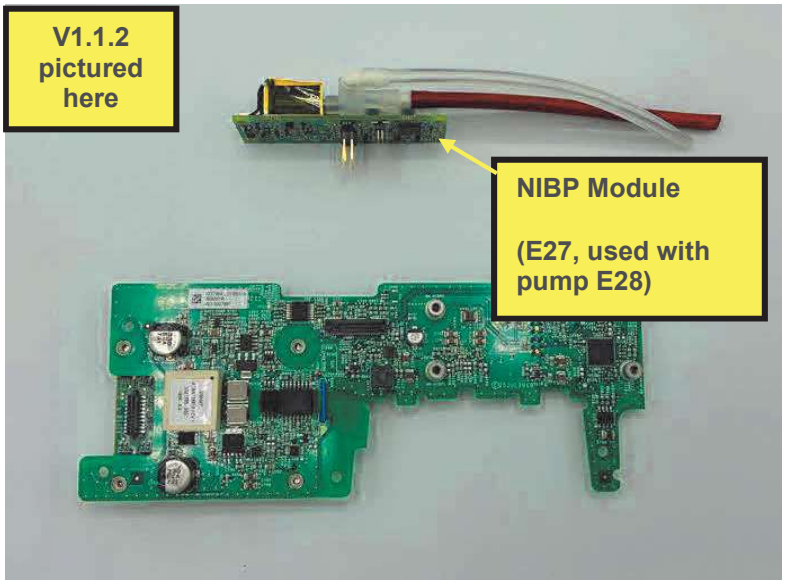
Removing the NIBP Module



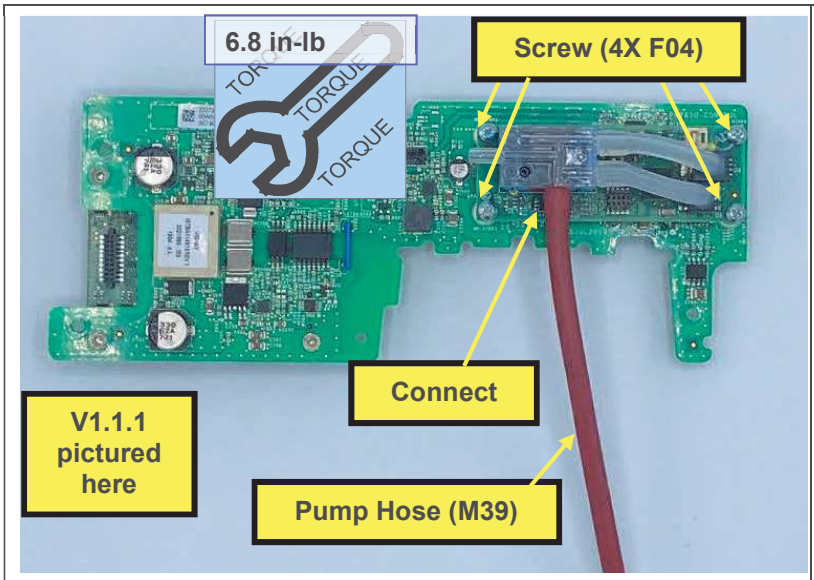


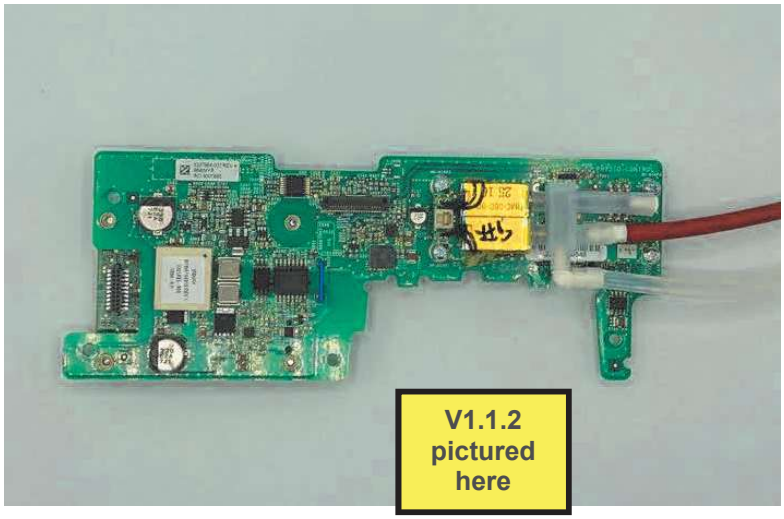
1. Remove the patient parameter PCBA as described in Removing the Patient Parameter PCBA.
2. Remove 4 screws, using a driver with a P-1 bit.
3. Remove the NIBP module by pulling it away perpendicular to the PCBA, disconnecting it from the patient parameter PCBA.
4. For v1.1.1 only, disconnect the pump hose by pulling away from the NIBP module fitting. The hose may be retained for reuse.





1. Install NIBP module onto patient parameter PCBA, aligning and engaging the connector pins. Seat completely onto standoffs.





2. Install 4 screws, using a torque driver with a P-1 bit.
3. For v1.1.1 only, connect the pump hose to the NIBP module by pushing fully onto the fitting.
4. Install the patient parameter PCBA as described in Installing the Patient Parameter PCBA.
5. Execute the LIFEPAK 35 PIP.

Patient Parameter PCBA Replacement

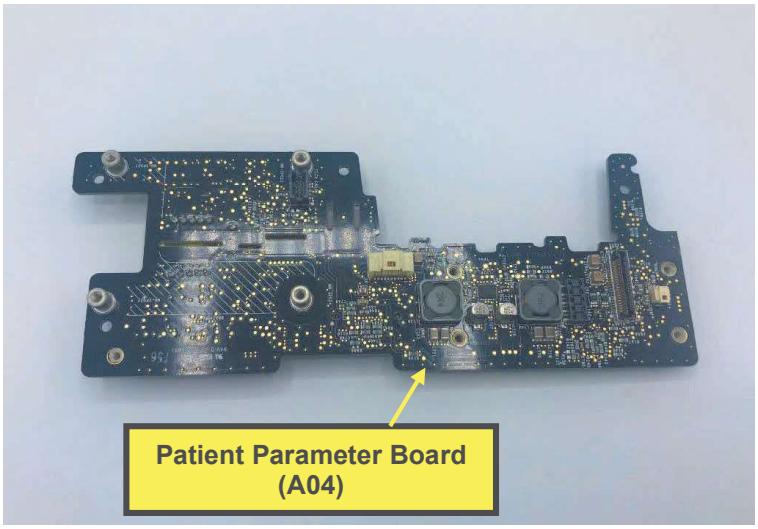
The parts listed in the following table will be required to complete this repair. Reference Parameter Module Assembly (-002, without temp/IP).

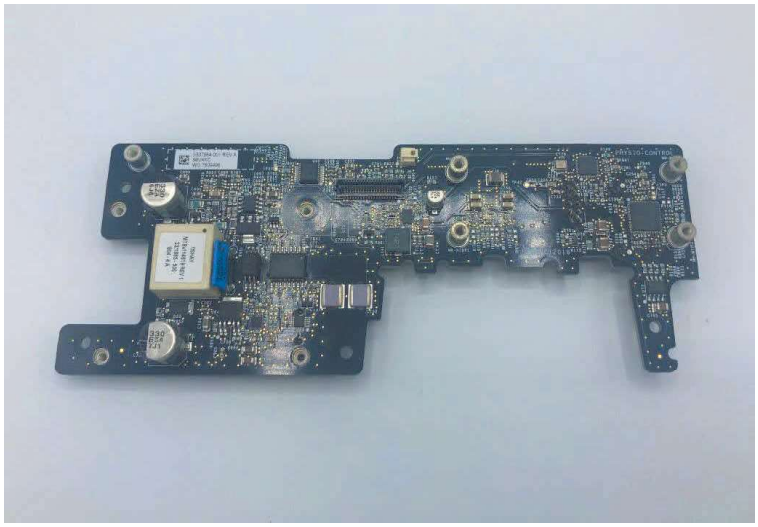
SERVICE BOM REF	QTY	DESCRIPTION	NOTES
K13	1	KIT, SERVICE, PATIENT PARAMETER PCBA, LP35	
L06	1	LABEL, PMOD,…LP35	Various configs.

Removing the Patient Parameter Board

1. Remove the patient parameter PCBA as described in Removing the Patient Parameter PCBA.
2. Remove SpO_2 module as described in Removing the SpO_2 Module, omitting steps already completed. Retain for reuse.
3. Remove NIBP module as described in Removing the NIBP Module, omitting steps already completed. Retain for reuse.

Installing the Patient Parameter Board





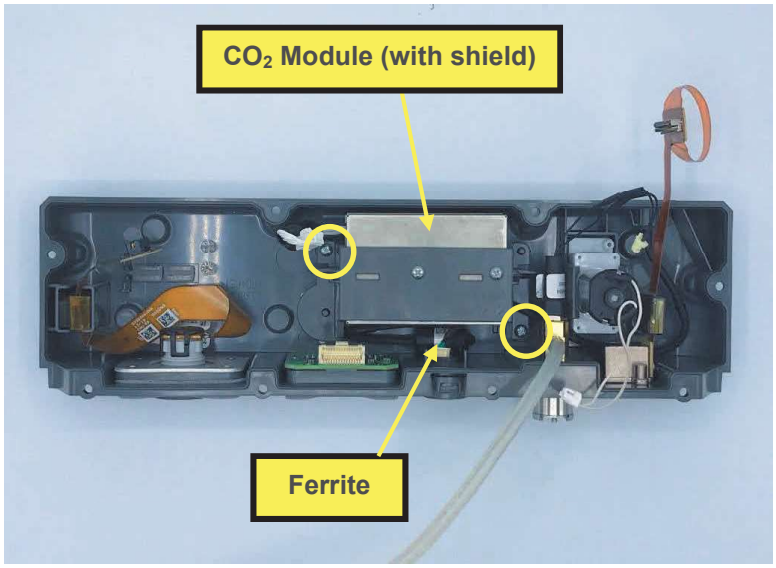
1. Install NIBP module as described in Installing the NIBP Module, steps 1-3.
2. Install SpO_2 module as described in Installing the SpO_2 Module, steps 1-3.
3. Install patient parameter PCBA as described in Installing the Patient Parameter PCBA.
4. Install the parameter module as described in Installing the Parameter Module, if not already completed.
5. Execute the LIFEPAK 35 PIP.

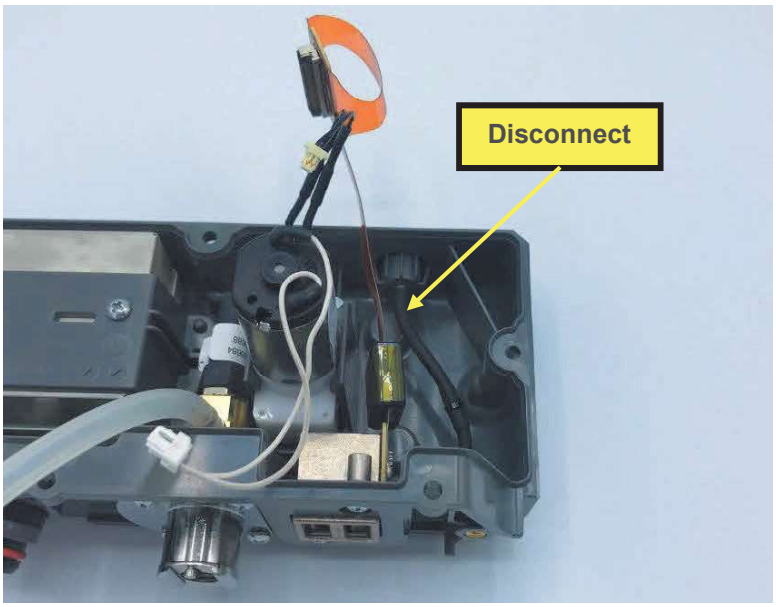
CO_2 Module Replacement (Medtronic)

The parts listed in the following table will be required to complete this repair. Reference Parameter Module Assembly (-002, without temp/IP).

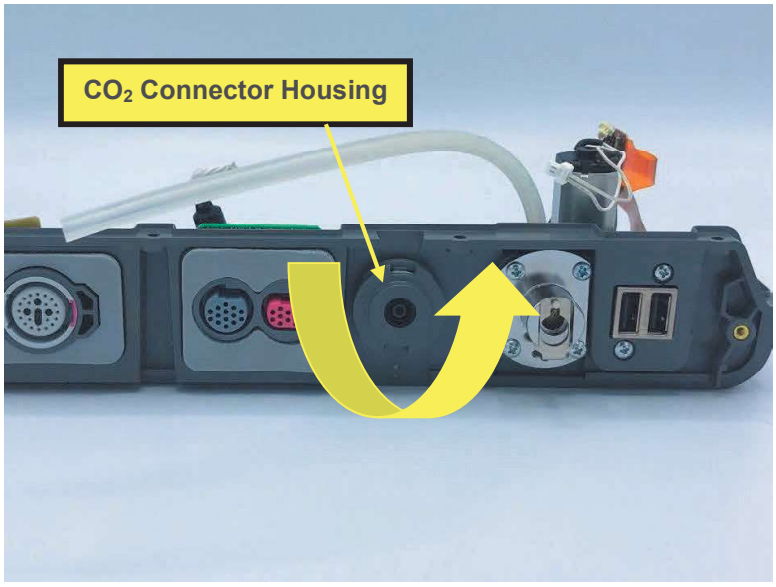
SERVICE BOM REF	QTY	DESCRIPTION	NOTES
K14	1	KIT, REPAIR, CO2 MODULE, MEDTRONIC, LP35	
L06	1	LABEL, PMOD,…LP35	Various configs.

Removing the CO_2 Module

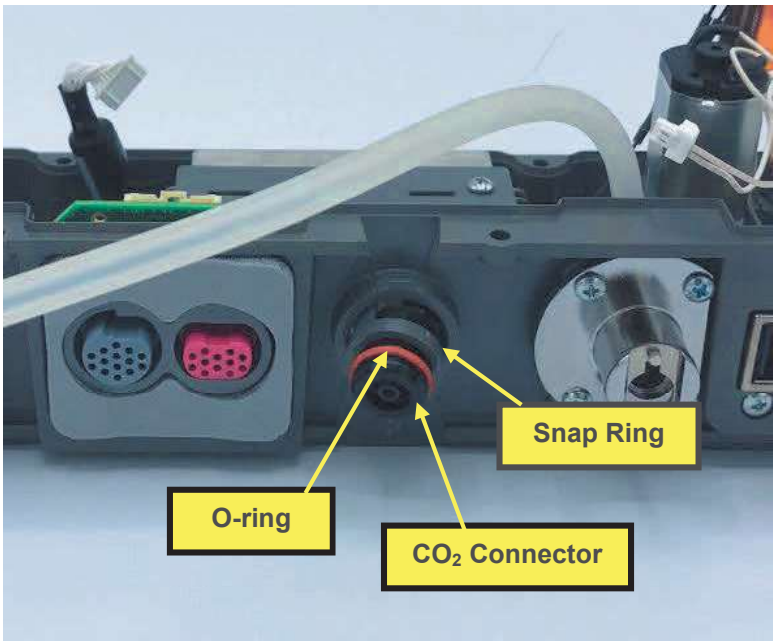




1. Remove the patient parameter PCBA as described in Removing the Patient Parameter PCBA.
2. Remove 2 screws in the locations shown, using a driver with a P-1 bit.
3. Disconnect CO_2 exhaust hose from exhaust port by pulling the hose away from the exhaust port fitting.

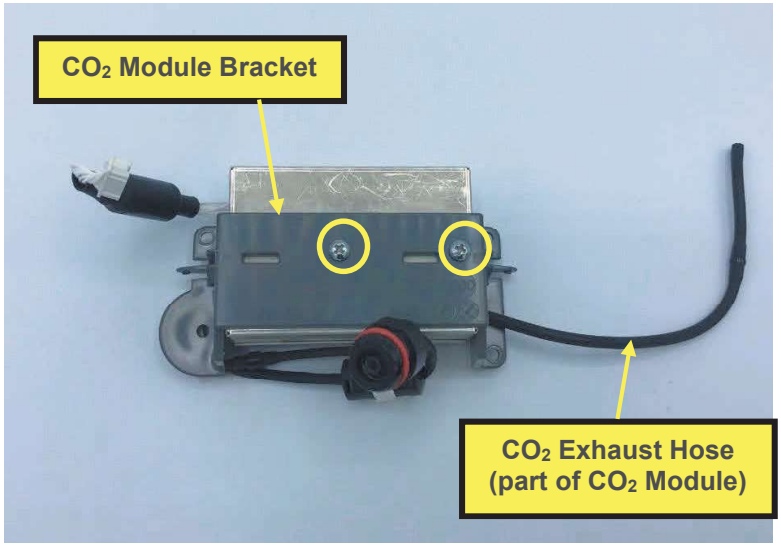


4. Rotate connector housing approximately 1/8-turn counterclockwise to disengage it from parameter module housing and remove the connector housing. Discard.

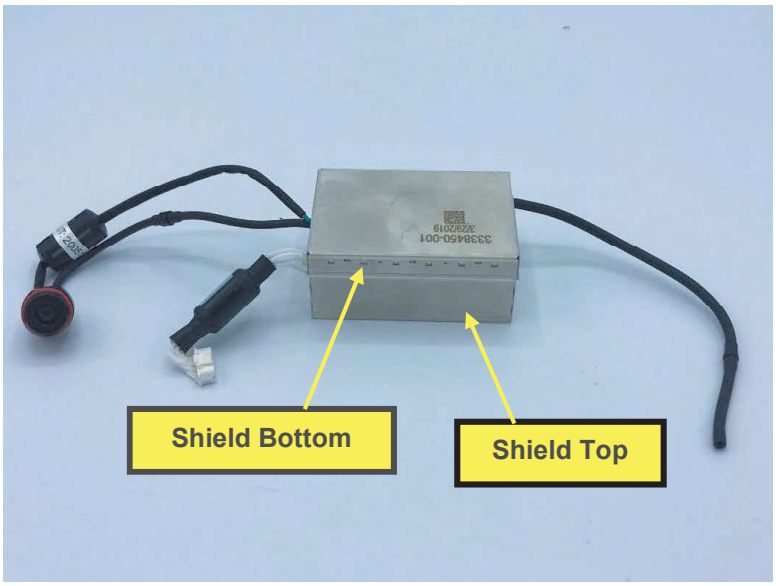


5. Remove o-ring and snap ring from CO_2 connector. These parts are to be discarded.

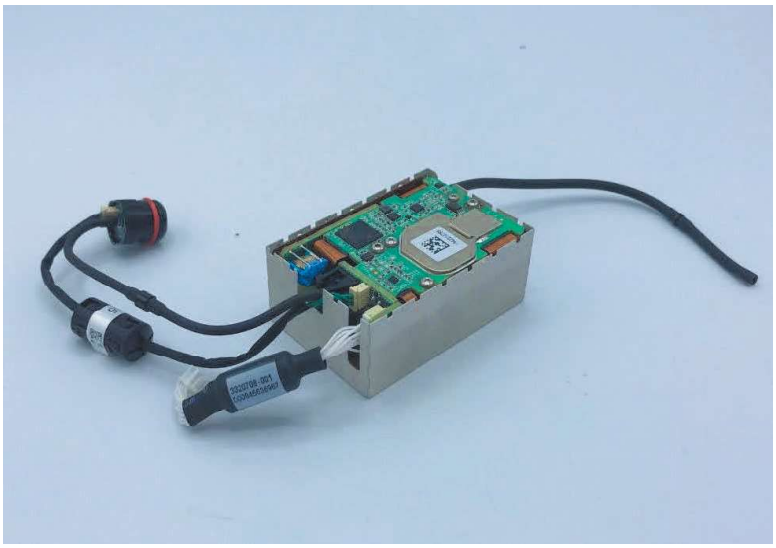
6. Remove the CO_2 module from the parameter module housing, together with the bracket (pictured in step below), and the CO_2 connector which is fed through the hole to the inside of the parameter module housing. The ferrite (pictured in step above) may need to be pulled away from the housing to break the adhesive bond.



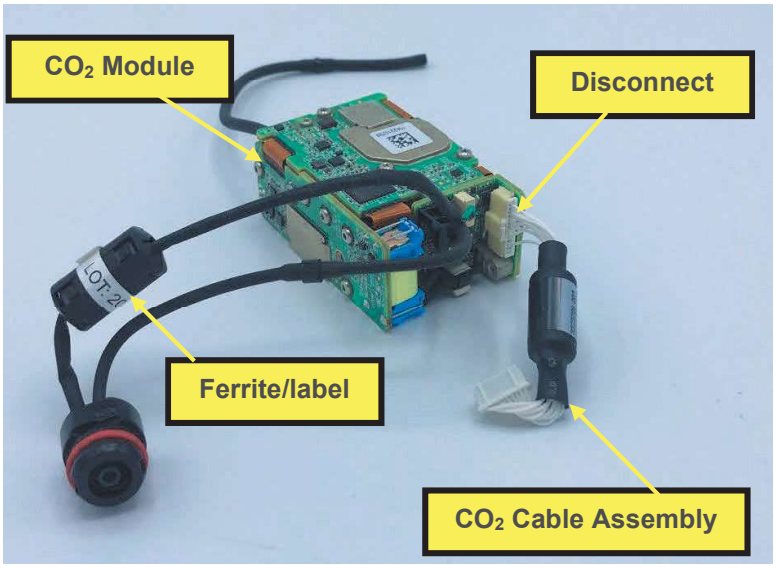
7. Remove 2 screws, using a driver with a P-1 bit.
8. Remove CO_2 module bracket, feeding exhaust hose out through hole. Retain bracket for reuse.



CO_2 module shown at left, upside down, with shield, for reference.

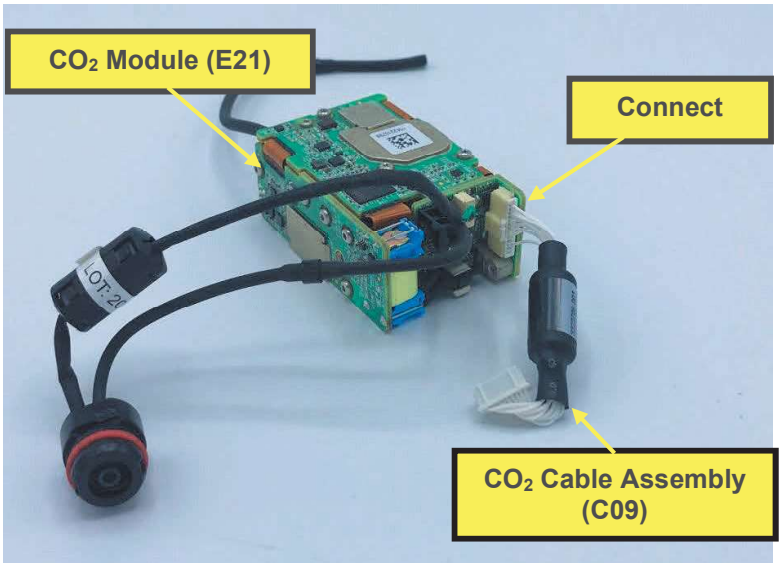


9. Turn module upside down and remove shield bottom. Retain for reuse.

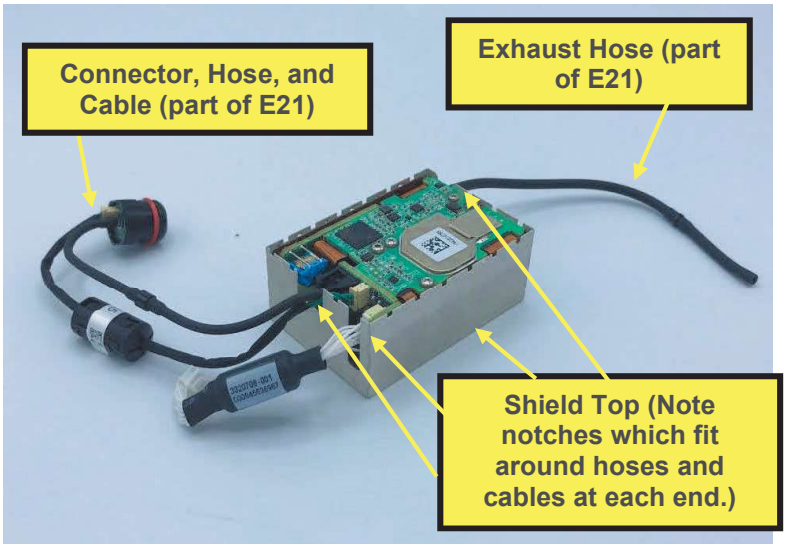


10. Remove CO_2 module from shield. Retain shield for reuse.
11. Disconnect CO_2 cable assembly and retain for reuse.
12. Remove label wrapped around ferrite, and discard. Remove ferrite by releasing two retaining clips. Retain ferrite for reuse.
13. Remove remaining components from parameter module housing as described in Parameter Module Housing Replacement, steps 4-9. Discard housing.

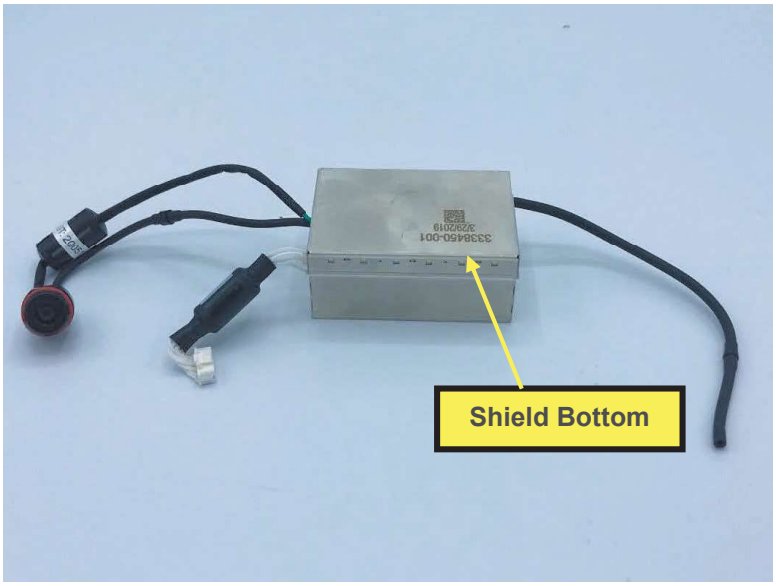
Installing the CO_2 Module



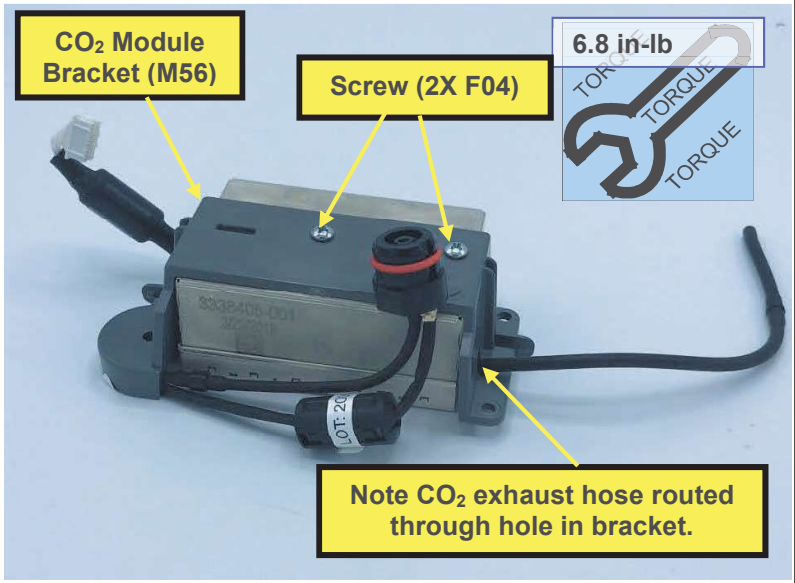
1. Prepare new parameter module housing and install components as described in Parameter Module Housing Replacement, steps 10-17.
2. Connect CO_2 cable assembly to new CO_2 module. (Note that the two connectors on the cable assembly are different and will only install in the correct end-to-end orientation.)
3. Install ferrite onto connector cable as shown, and clip retainers closed.
4. Remove adhesive liner from label.
5. Wrap label around ferrite as shown.



6. Install CO_2 module into shield top, noting orientation, and aligning notches in shield to hoses and cables.

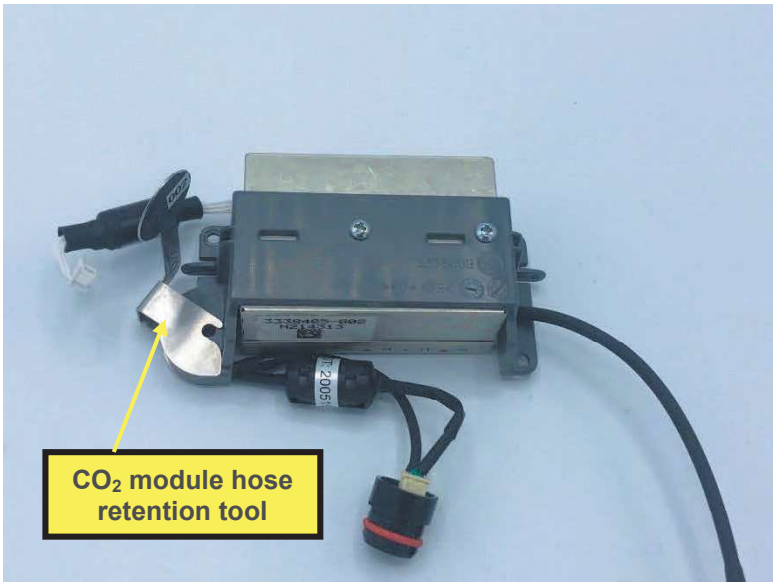


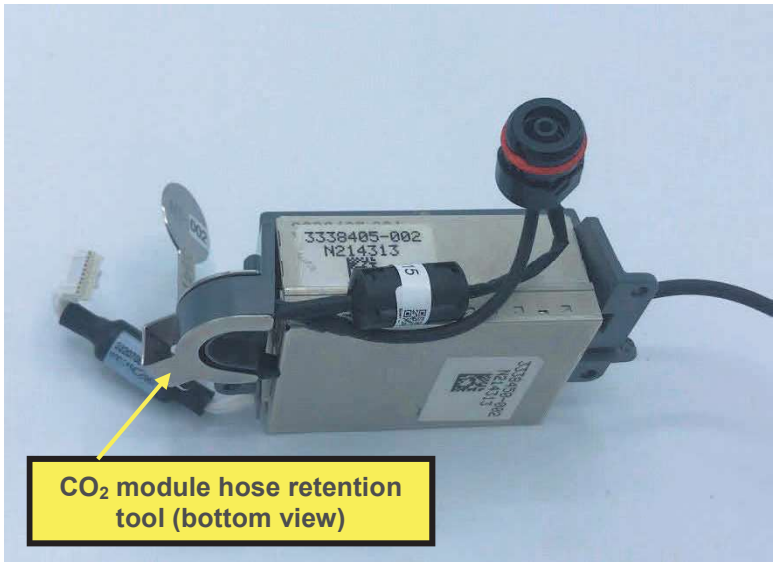
7. Install shield bottom, orienting end-to-end to align notches with hoses and cables.



8. Install CO_2 module bracket, routing exhaust hose through hole.

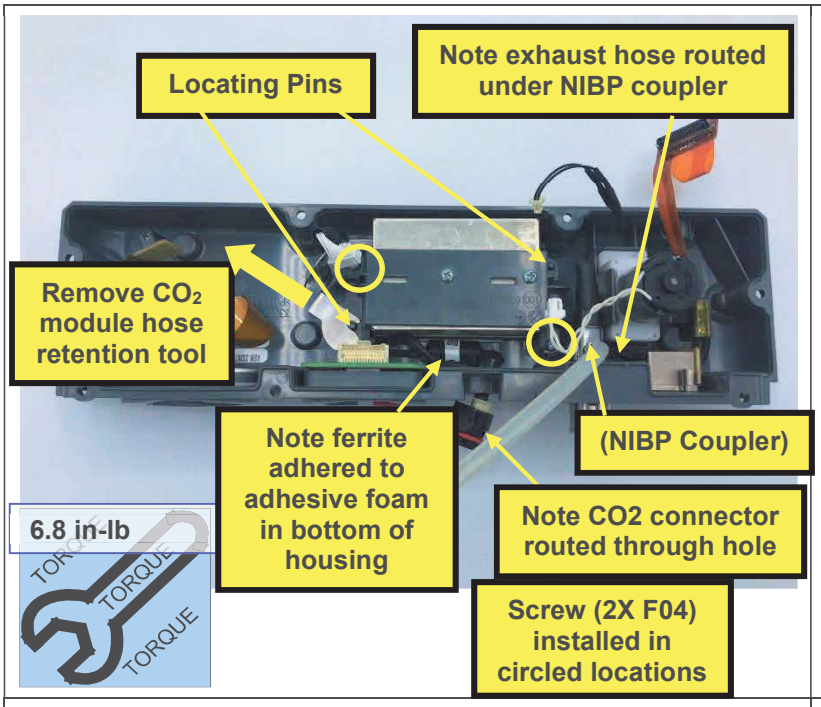
9. Install 2 screws to secure the CO_2 module bracket, using a torque driver with a P-1 bit.



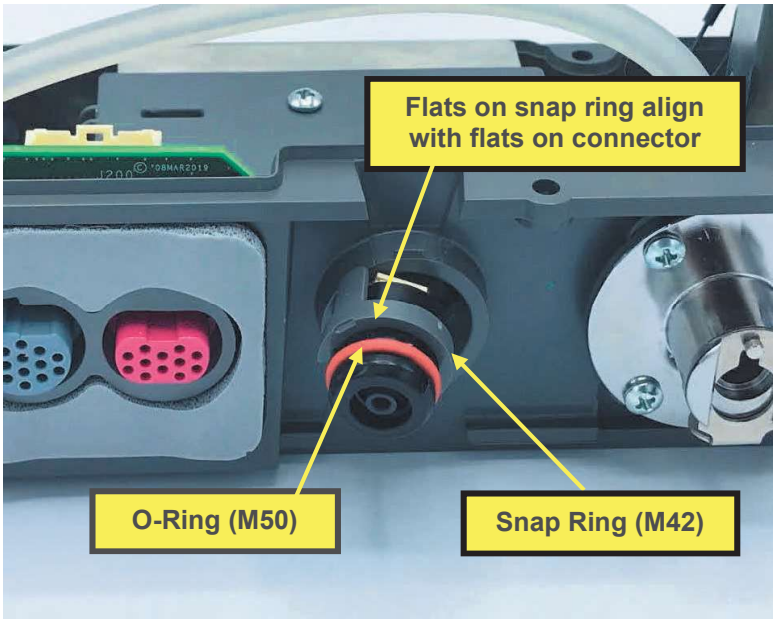


10. Route connector hose and cable by laying hose into crescent shaped routing track, then the cable as shown.

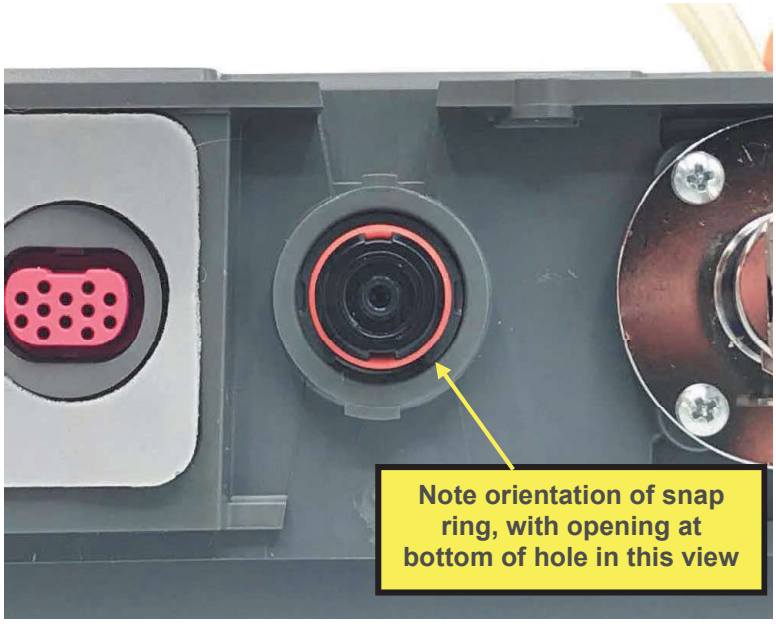
11. Install CO_2 module hose retention tool to retain hose and cable in routing track as shown below.

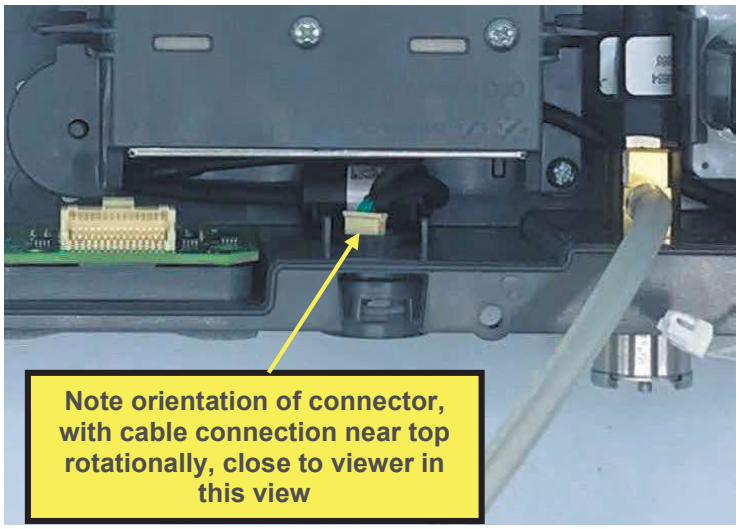


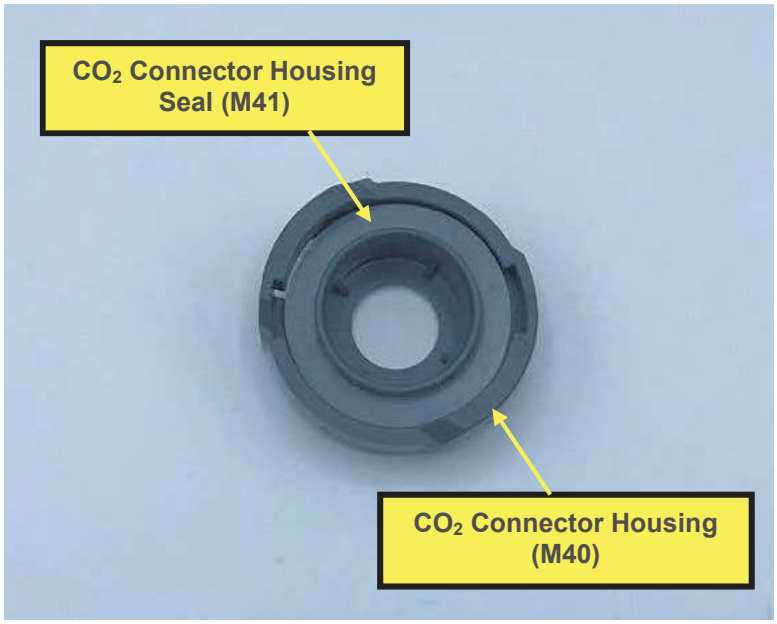
12. Install CO_2 module, feeding CO_2 connector through hole from inside the parameter module housing, fitting bracket holes over locating pins in parameter module housing, and routing exhaust hose under NIBP coupler as shown.
13. Align ferrite so that its entire length is within the length of adhesive foam in the bottom of the housing. Press ferrite firmly down against adhesive.
14. Install 2 screws in locations shown, using a torque driver with a P-1 bit.
15. Slide CO_2 module hose retention tool out from under CO_2 module and remove it.



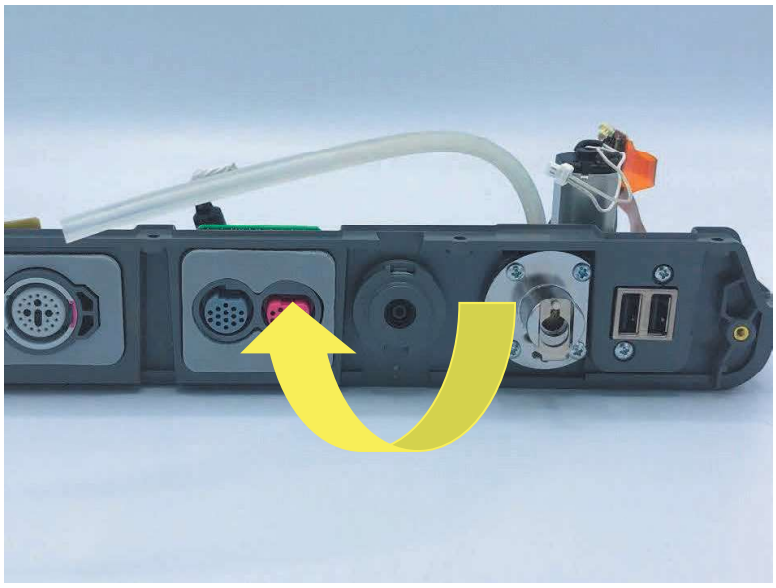
16. Install snap ring onto connector, aligning flats.
17. Install o-ring into groove in connector.
18. Align connector rotationally so that snap ring legs slide into grooves in parameter module housing. Reference pictures at left and below for orientation. Push connector into parameter module housing.







19. Remove adhesive liner from connector housing seal, and install seal into connector housing, pressing into place as shown.



20. Align connector housing notches with tabs on parameter module housing, press in, and turn approximately 1/8-turn clockwise until it stops.

Note: There is one wide tab, and one narrow tab. The connector housing will only fit on in one orientation.

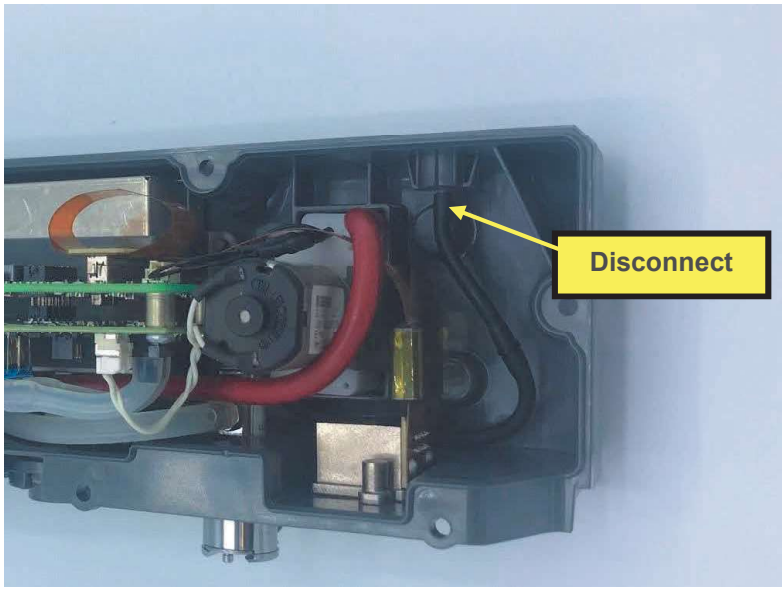
21. Install remaining parameter module components and make connections as described in Parameter Module Housing Replacement, steps 19-29, omitting steps already completed.
22. Install the parameter module as described in Installing the Parameter Module, if not already completed.
23. Execute the LIFEPAK 35 TCP – CO_2 calibration.
24. Execute the LIFEPAK 35 PIP.

CO_2 Exhaust Port Replacement

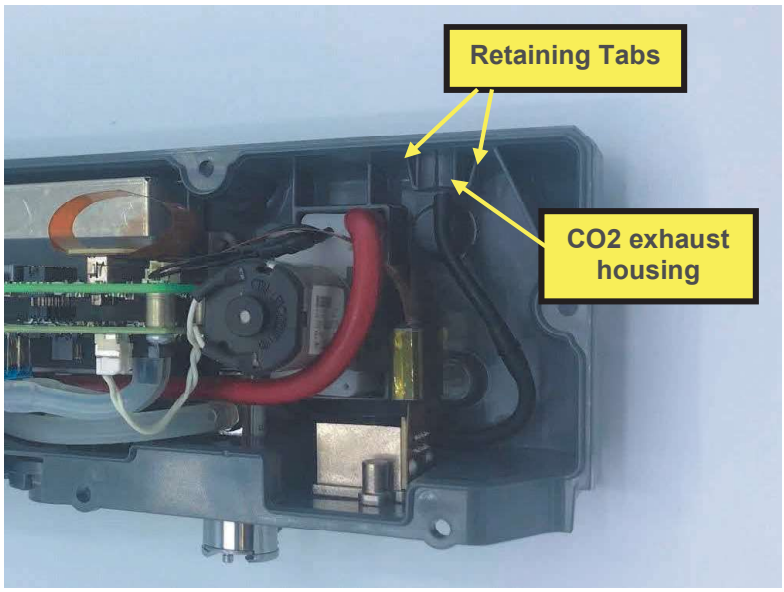
The parts listed in the following table will be required to complete this repair. Reference Parameter Module Assembly (-002, without temp/IP).

SERVICE BOM REF	QTY	DESCRIPTION	NOTES
M43	1	SEAL, CO2 EXHAUST, LP35	
M44	1	HOUSING, CO2 EXHAUST, LP35	
M10	1	COVER, CO2 DOOR, LPQ5	
F03	1	SCREW, BUTTONHEAD, TORX, #4-40 X LG 0.25 IN	
F04	2	SCREW-M,PH,NYLOK,CS,4-40,.250L	
F08	8	SCREW-M,CS,Z,PH, NYLOCK,4-40 X .312L	
M11	2	COVER, SCREW, REAR, PARAMETER MODULE, LP35	
M12	2	COVER, SCREW, ENDS, PARAMETER MODULE, LP35	
L06	1	LABEL, PMOD,…LP35	Various configs.

Removing the CO_2 Exhaust Port

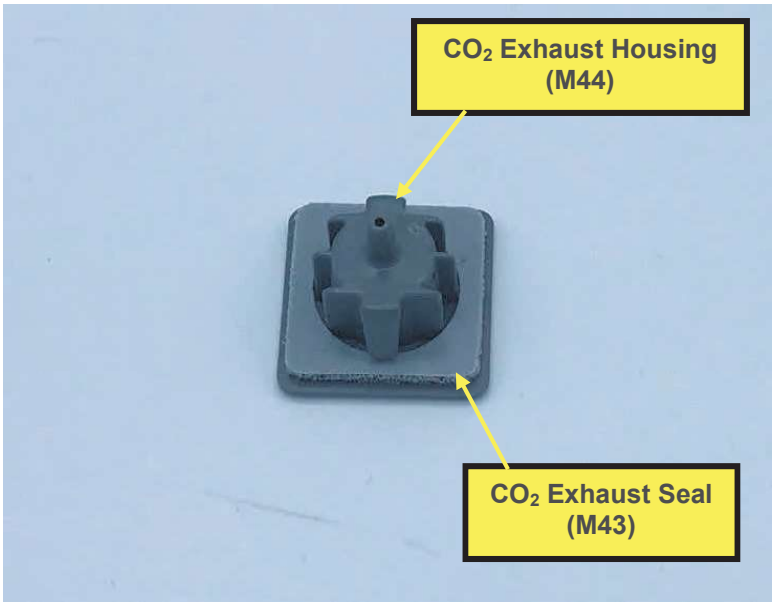


1. Remove parameter module as described in Removing the Parameter Module.
2. Disconnect CO_2 exhaust hose by pulling off of exhaust port fitting.

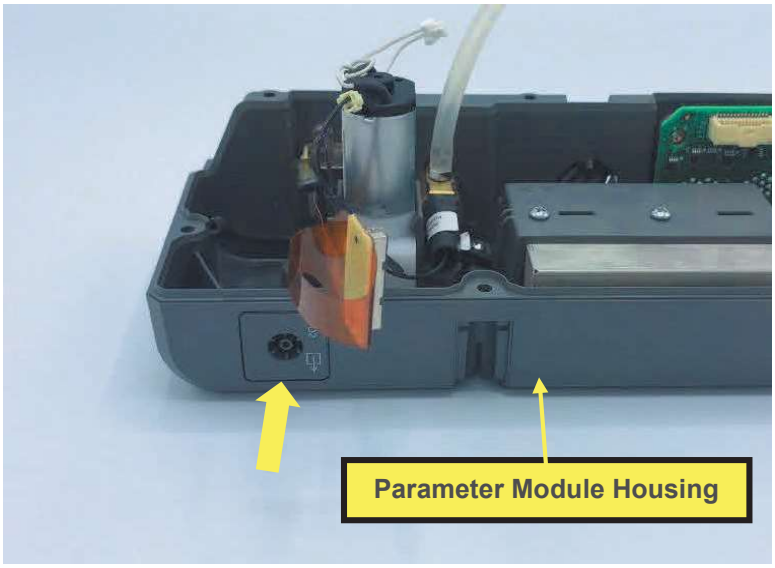


3. Pinch retaining tabs inward, using a blunt tool if necessary, and push exhaust housing out through hole in parameter module housing. Discard exhaust housing, and seal (not pictured).

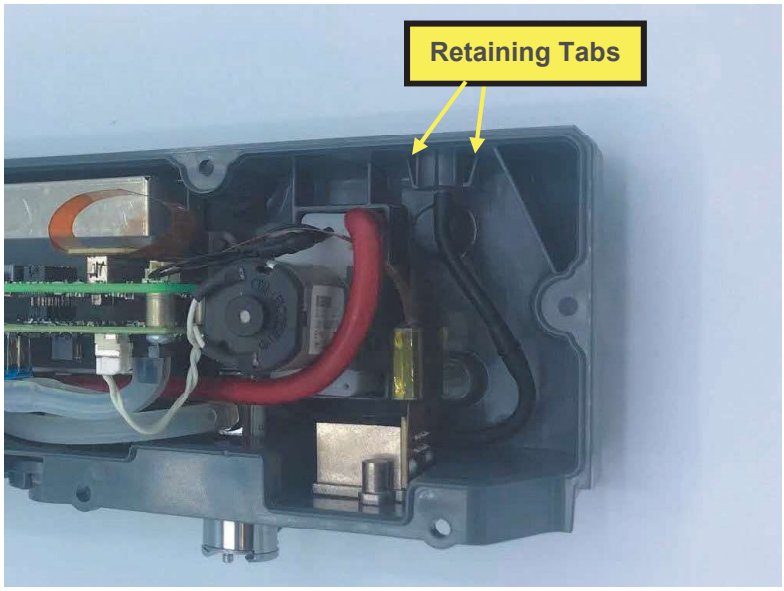
Installing the CO_2 Exhaust Port

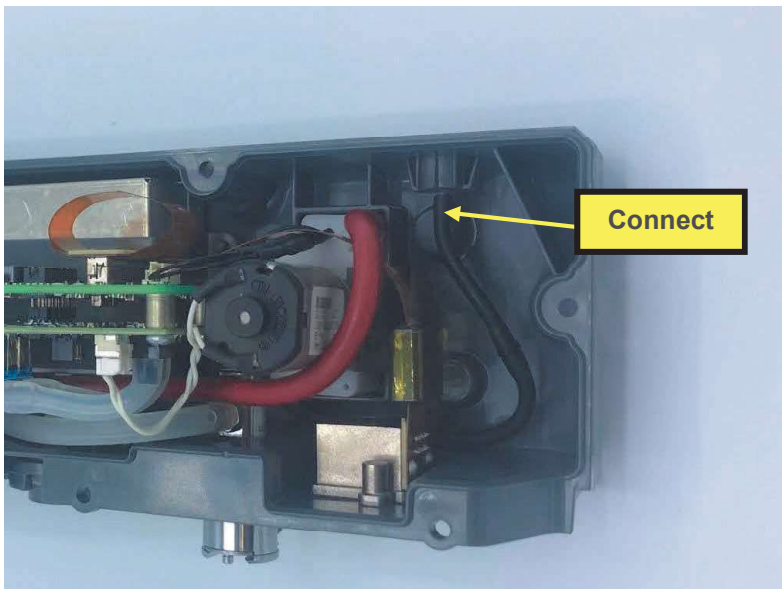


1. Install seal onto CO_2 exhaust housing.



2. Insert CO_2 exhaust housing into the hole, from outside the parameter module housing, pressing in until retaining tabs (pictured in step below) lock in.





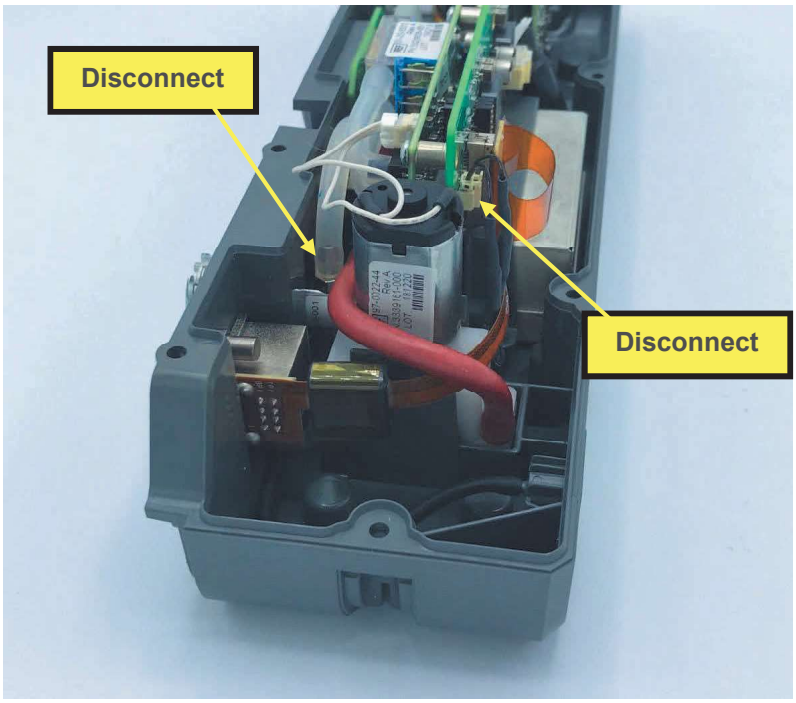
3. Connect CO_2 exhaust hose to CO_2 exhaust housing, pressing fully onto fitting (shown below).
4. Install parameter module as described in Installing the Parameter Module.
5. Execute the LIFEPAK 35 PIP.

NIBP Coupler Replacement

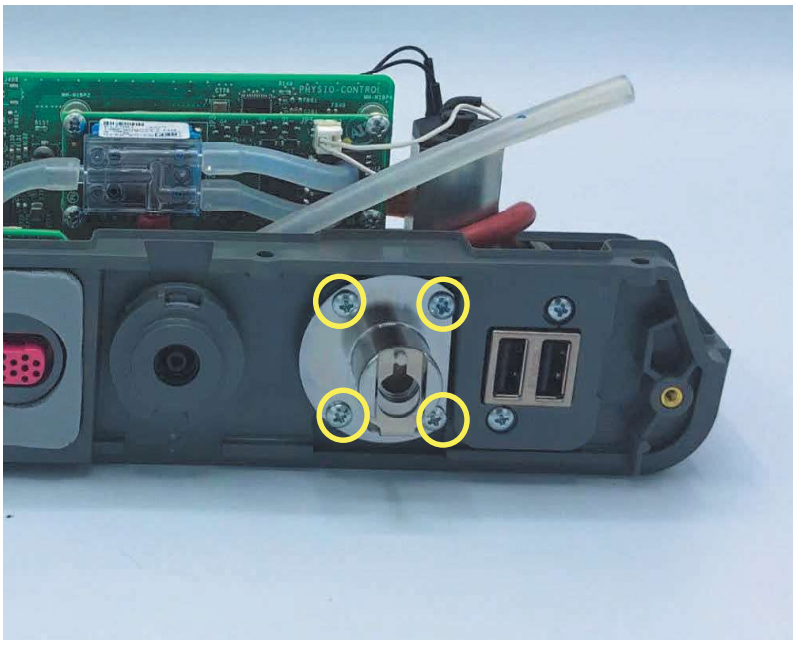
The parts listed in the following table will be required to complete this repair. Reference Parameter Module Assembly (-002, without temp/IP).

SERVICE BOM REF	QTY	DESCRIPTION	NOTES
K20	1	KIT, REPAIR, NIBP COUPLER, LP35	
L06	1	LABEL, PMOD,…LP35	Various configs.

Removing the NIBP Coupler

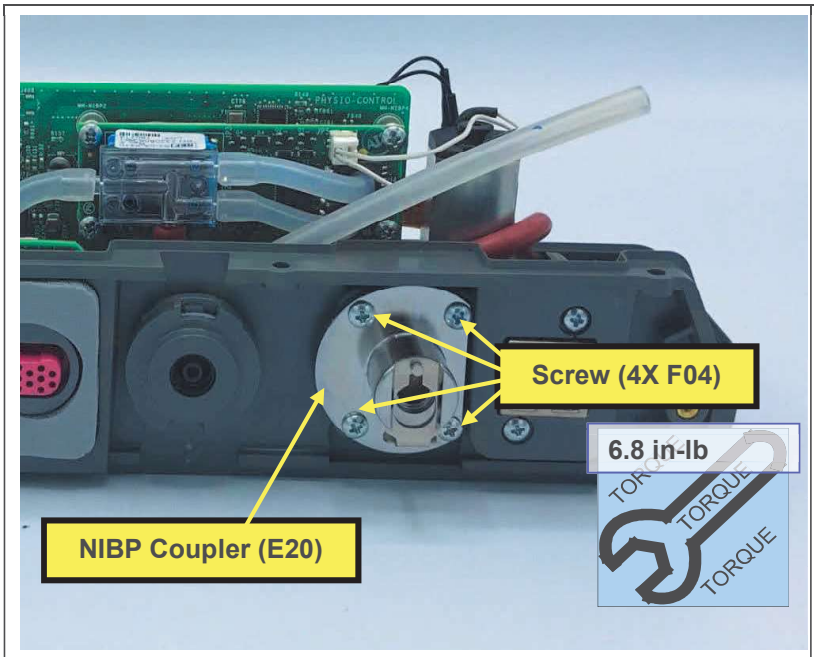


1. Remove the parameter module as described in Removing the Parameter Module.
2. Disconnect NIBP coupler connector from patient parameter PCBA.
3. Disconnect hose from NIBP coupler barb fitting.

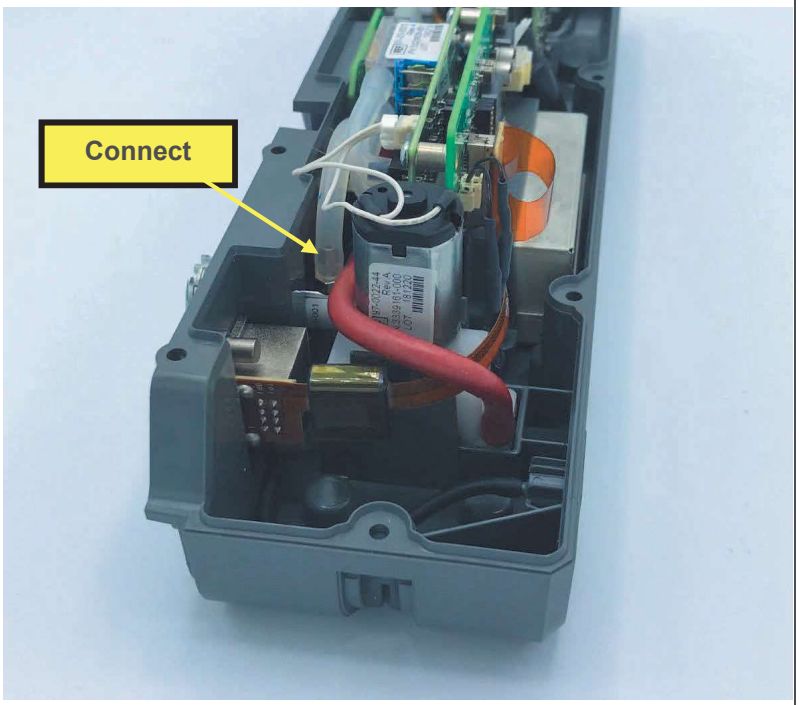


4. Remove 4 screws, using a driver with a P-1 bit.
5. Remove the NIBP coupler from the front of the parameter module housing, feeding cable and connector through hole in housing.

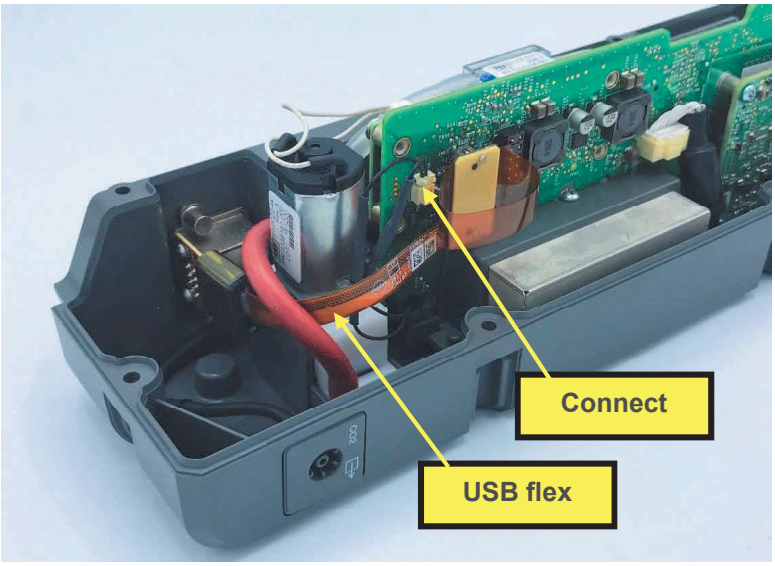
Installing the NIBP Coupler



1. Install coupler into parameter module housing, feeding cable and connector through hole in housing.
2. Install 4 screws, using a torque driver with a P-1 bit.



3. Route NIBP coupler wires inside USB flex as shown below.
4. Connect NIBP coupler connector to patient parameter PCBA J404 (shown below).
5. Connect hose from NIBP module by pressing fully onto NIBP coupler barb fitting.
6. Install parameter module as described in Installing the Parameter Module.
7. Execute the LIFEPAK 35 PIP.

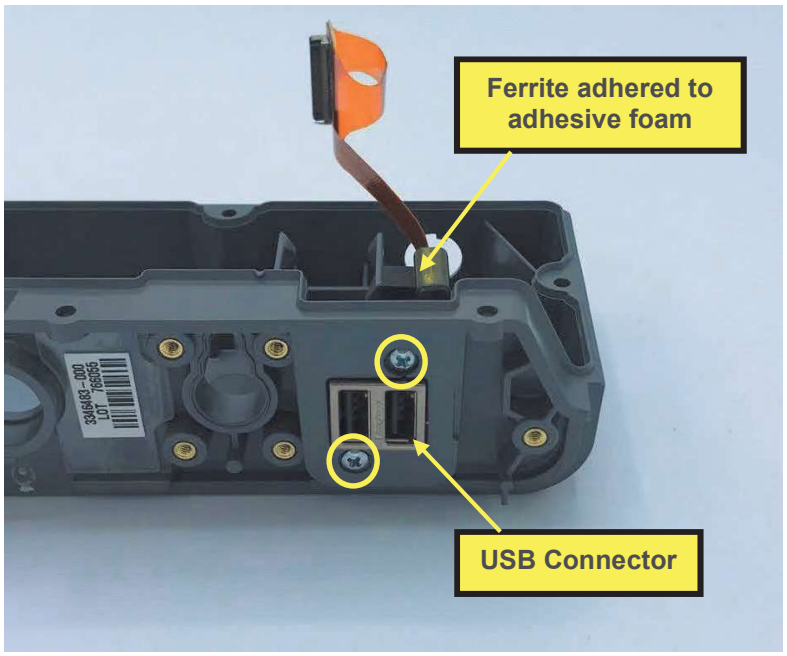


USB Connector Replacement (Parameter Module)

The parts listed in the following table will be required to complete this repair. Reference Parameter Module Assembly (-002, without temp/IP).

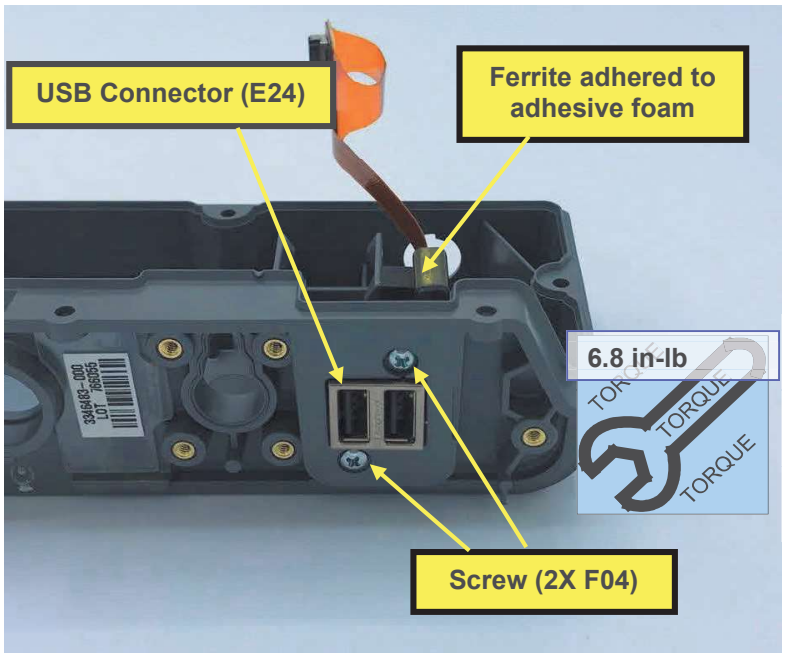
SERVICE BOM REF	QTY	DESCRIPTION	NOTES
E24	1	FLEX, USB, PMOD, LP35	
F04	18	SCREW-M, PH, NYLOK, CS, 4-40, .250L	
F08	8	SCREW-M,CS,Z,PH, NYLOCK,4-40 X .312L	
M58	1	ASSY, HOUSING LEFT, PMOD, LP35	
M48	1	SEAL, MASIMO MOUNTING, LP35	
M55	1	SEAL, TEMP-IP MOUNTING, LP35	
M11	2	COVER, SCREW, REAR, PARAMETER MODULE, LP35	
M12	2	COVER, SCREW, ENDS, PARAMETER MODULE, LP35	
M10	1	COVER, CO2 DOOR, LPQ5	
F03	1	SCREW, BUTTONHEAD, TORX, #4-40 X LG 0.25 IN	
L13	1	ASSEMBLY AID, CO2 DOOR, LP35	
L06	1	LABEL, PMOD,…LP35	Various configs.

Removing the USB Connector

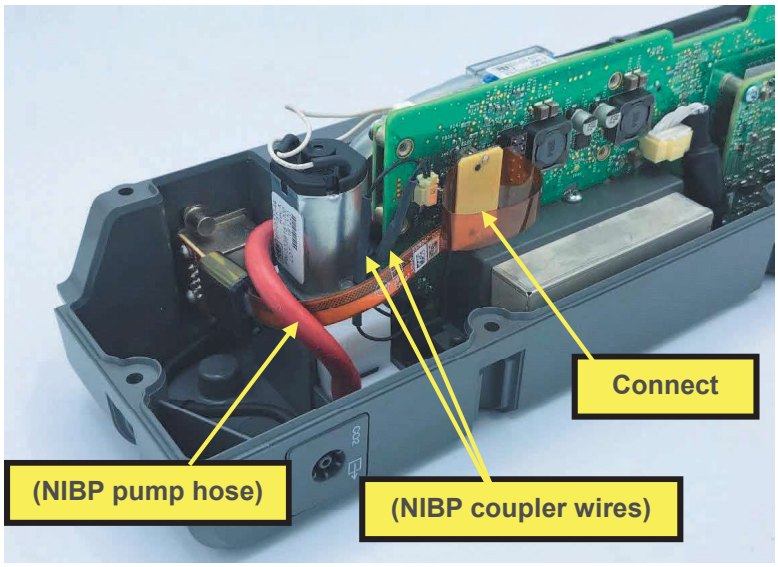


1. Remove parameter module as described in Removing the Parameter Module.
2. Remove components from parameter module housing as described in Parameter Module Housing Replacement, steps 2-8. Discard housing.
3. Remove 2 screws, using a driver with a P-1 bit.
4. Remove USB connector from the inside of the parameter module housing, pulling the USB flex ferrite away from the adhesive foam. Discard housing.

Installing the USB Connector



1. Prepare new parameter module housing and install components as described in Parameter Module Housing Replacement, steps 10-14.
2. Install USB connector from inside parameter module housing.
3. Install 2 screws, using a torque driver with a P-1 bit.
4. Press to adhere USB flex ferrite to foam adhesive.



5. Install remaining parameter module components and make connections as described in Parameter Module Housing Replacement, steps 16-27, omitting steps already completed.

6. Route USB flex inside NIBP pump hose, and outside NIBP coupler wires as shown, and connect USB flex cable connector to parameter module PCBA J407.

7. Connect NIBP hoses as described in Parameter Module Housing Replacement, steps 29-30.

8. Install parameter module as described in Installing the Parameter Module.

9. Execute the LIFEPAK 35 PIP.

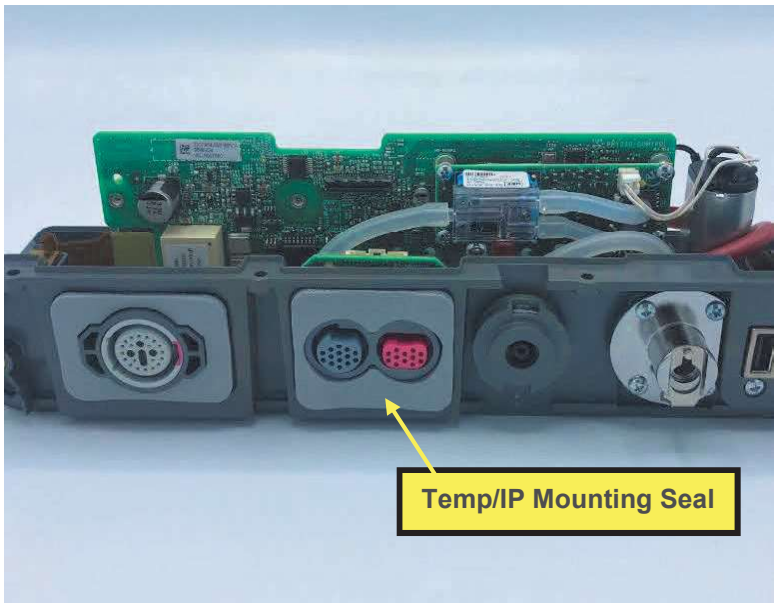
Temp/IP Connector Replacement

Note that not all configurations are equipped with temp/IP.

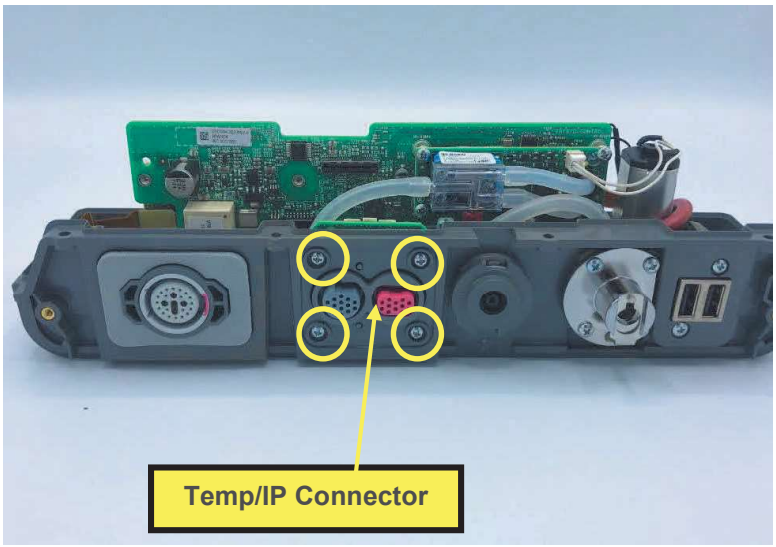
The parts listed in the following table will be required to complete this repair. Reference Parameter Module Assembly (-003, with temp/IP).

SERVICE BOM REF	QTY	DESCRIPTION	NOTES
E25	1	ASSY, PCB, TEMP AND IP CONNECTOR, LIFEPAK 35	
M55	1	SEAL, TEMP-IP MOUNTING, LP35	
F04	6	SCREW-M, PH, NYLOK, CS, 4-40, .250L	
F08	8	SCREW-M,CS,Z,PH, NYLOCK,4-40 X .312L	
M11	2	COVER, SCREW, REAR, PARAMETER MODULE, LP35	
M12	2	COVER, SCREW, ENDS, PARAMETER MODULE, LP35	
M10	1	COVER, CO2 DOOR, LPQ5	
F03	1	SCREW, BUTTONHEAD, TORX, #4-40 X LG 0.25 IN	
L06	1	LABEL, PMOD,…LP35	Various configs.

Removing the Temp/IP Connector

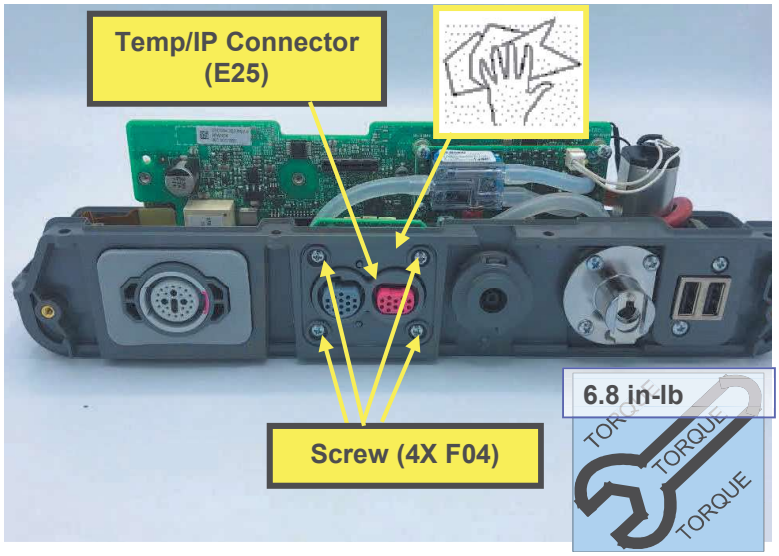


1. Remove the parameter module as described in Removing the Parameter Module.
2. Remove the temp/IP mounting seal, and discard.

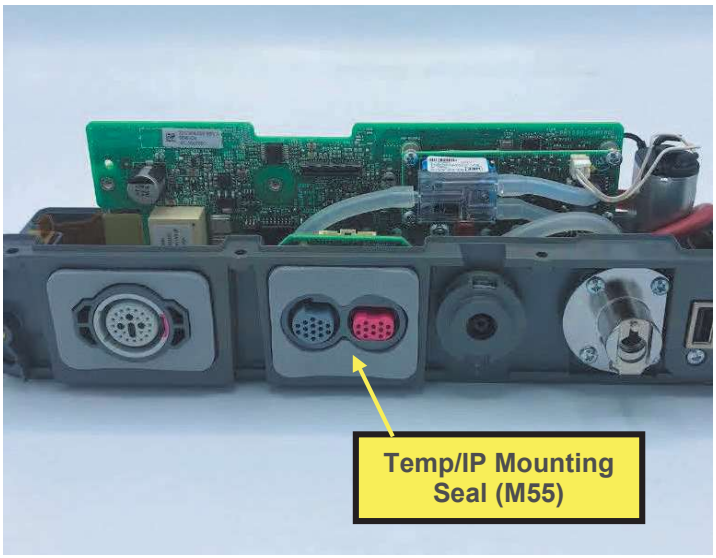


3. Remove 4 screws, using a driver with a P-1 bit.
4. Remove the temp/IP connector from inside the parameter module housing.

Installing the Temp/IP Connector



1. Install temp/IP connector from inside the parameter module housing.
2. Install 4 screws, using a torque driver with a P-1 bit.
3. Clean parameter module housing in the area around the temp/IP connector.



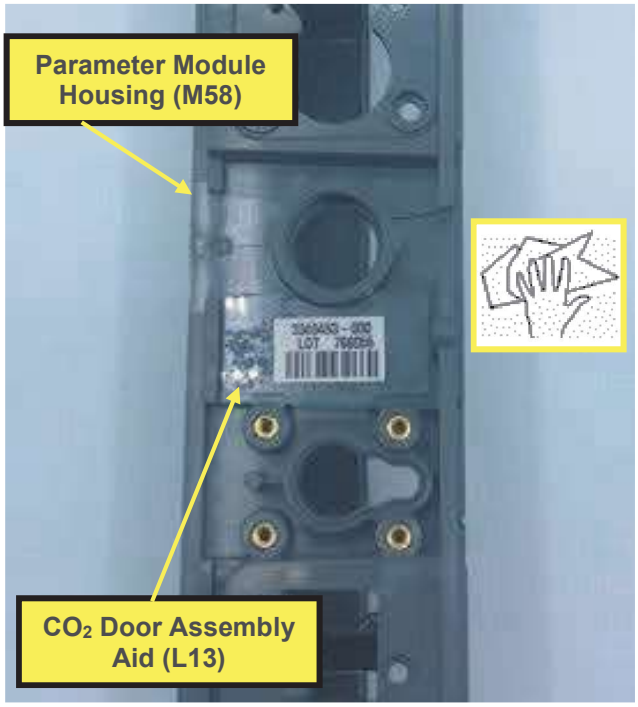
4. Remove the adhesive liner from the temp/IP mounting seal, and affix the seal to the housing as shown, pressing firmly against the housing all around seal.
5. Install parameter module as described in Installing the Parameter Module.
6. Execute the LIFEPAK 35 PIP.

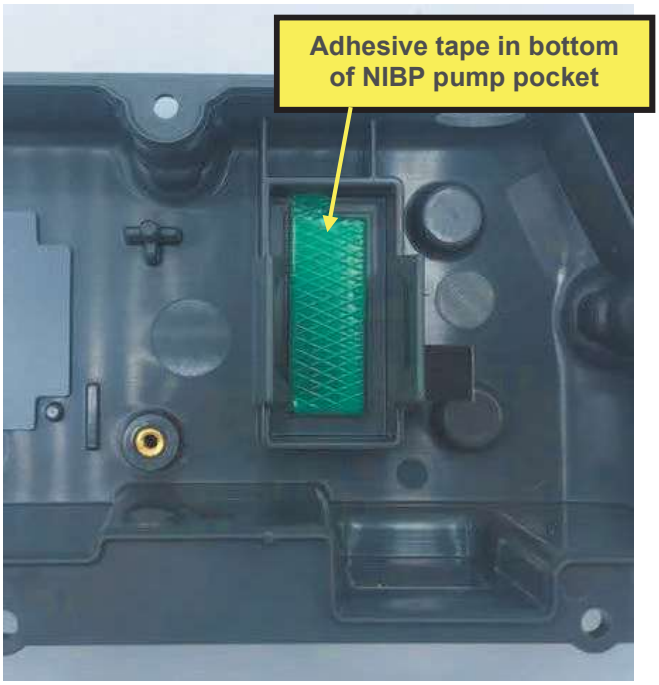
Parameter Module Housing Replacement

The parts listed in the following table will be required to complete this repair. Reference Parameter Module Assembly (-002, without temp/IP).

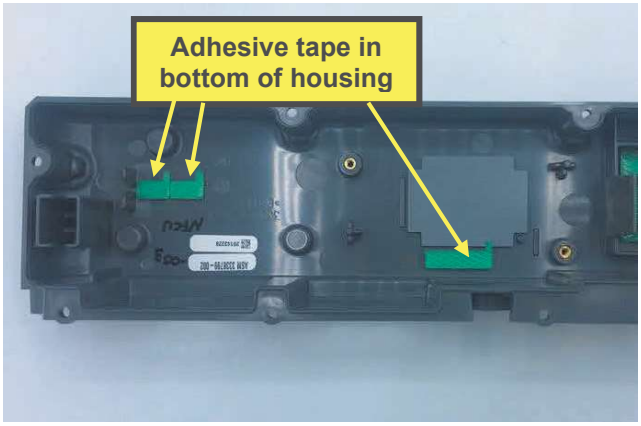
SERVICE BOM REF	QTY	DESCRIPTION	NOTES
K15	1	KIT, REPAIR, PMOD HOUSING, LP35	
L06	1	LABEL, PMOD,…LP35	Various configs.

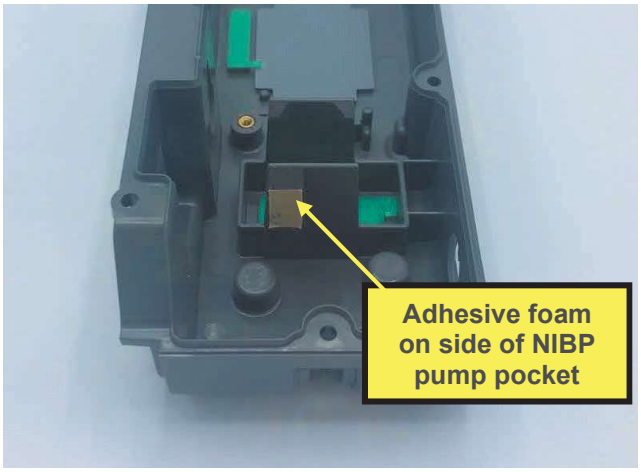
1. Remove parameter module as described in Removing the Parameter Module.
2. Remove patient parameter PCBA as described in Removing the Patient Parameter PCBA, omitting steps already completed. Retain for reuse.
3. Remove CO_2 module as described in Removing the CO_2 Module, steps 2-6. Retain for reuse.
4. Remove CO_2 exhaust port as described in Removing the CO_2 Exhaust Port, omitting steps already completed. Retain exhaust port and seal for reuse.
5. Remove NIBP coupler as described in Removing the NIBP Coupler, omitting steps already completed. Retain for reuse.
6. Remove SpO_2 connector as described in Removing the SpO_2 Connector, omitting steps already completed. Retain for reuse.
7. Remove temp/IP connector, if equipped, as described in Removing the Temp/IP Connector, omitting steps already completed. Retain for reuse. If not temp-IP equipped, remove 4 screws, and remove temp/IP plug (M53). Retain for reuse.
8. Remove NIBP pump as described in Removing the NIBP Pump, step 3. Retain for reuse.
9. Remove USB connector as described in Removing the USB Connector, omitting steps already completed. Retain for reuse.

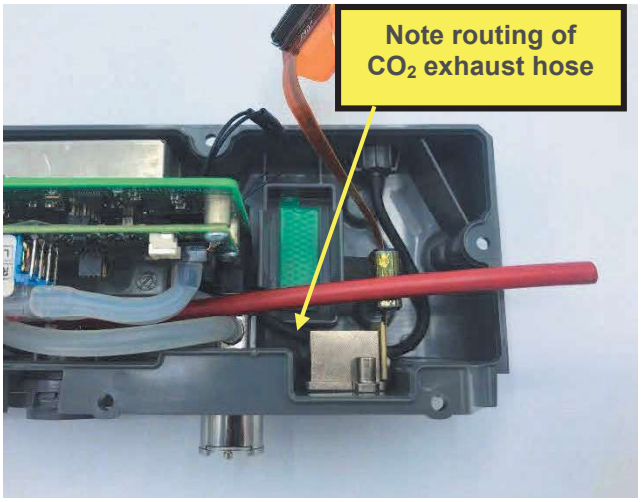




10. Clean parameter module housing (M58) in area where CO_2 door assembly aid will be applied.
11. Remove adhesive liner from back of CO_2 door assembly aid, then apply to parameter module housing as shown, pressing firmly in place.
12. Peel the release liner from adhesive tape (shown below) in the bottom of the NIBP pump pocket in the new parameter module housing.
13. Peel the release liners from 3 pieces of adhesive tape (shown below) in the bottom of the new parameter module housing.
14. Peel the release liner from adhesive foam on the side of the NIBP pump pocket.
15. Remove residual adhesive foam from USB flex ferrite as required, and install USB connector into new housing as described in Installing the USB Connector, steps 2-4.
16. Install NIBP coupler as described in Installing the NIBP Coupler, steps 1-2.
17. Install temp/IP connector, if equipped, as described in Installing the Temp/IP Connector, steps 1-4. If not temp/IP equipped, install temp/IP plug (M53) using the same procedure.
18. Install CO_2 exhaust port as described in Installing the CO_2 Exhaust Port, steps 1-2.
19. Install CO_2 module as described in Installing the CO_2 Module, steps 10-20, omitting steps already completed.
20. Install patient parameter PCBA as described in Installing the Patient Parameter PCBA, step 1.
21. Install SpO_2 connector as described in Installing the SpO_2 Connector, steps 1-8.
22. Connect CO_2 exhaust hose to exhaust housing as described in Installing the CO_2 Exhaust Port, step 3.







23. Install CO_2 wire harness foam as described in Installing the Patient Parameter PCBA, step 3.
24. Connect CO_2 module cable to parameter module PCBA as described in Installing the Patient Parameter PCBA, step 4.
25. Connect NIBP coupler to parameter module PCBA as described in Installing the Patient Parameter PCBA, step 2.
26. Install NIBP pump as described in Installing the NIBP Pump, step 2. Ensure that CO_2 exhaust hose is not routed over pump pocket as shown in picture below.
27. Connect the NIBP pump connector to the NIBP module as described in Installing the Patient Parameter PCBA, step 9.
28. Connect USB flex to parameter module PCBA as described in Installing the Patient Parameter PCBA, step 5.
29. Connect NIBP hose to NIBP coupler as described in Installing the NIBP Coupler, step 5. For v1.1.1, connect NIBP hose to NIBP module as described in Installing the Patient Parameter PCBA, step 8.
30. Connect NIBP pump hose to NIBP pump as described in Installing the Patient Parameter PCBA, step 6.
31. Install parameter module as described in Installing the Parameter Module.
32. Execute the LIFEPAK 35 PIP.

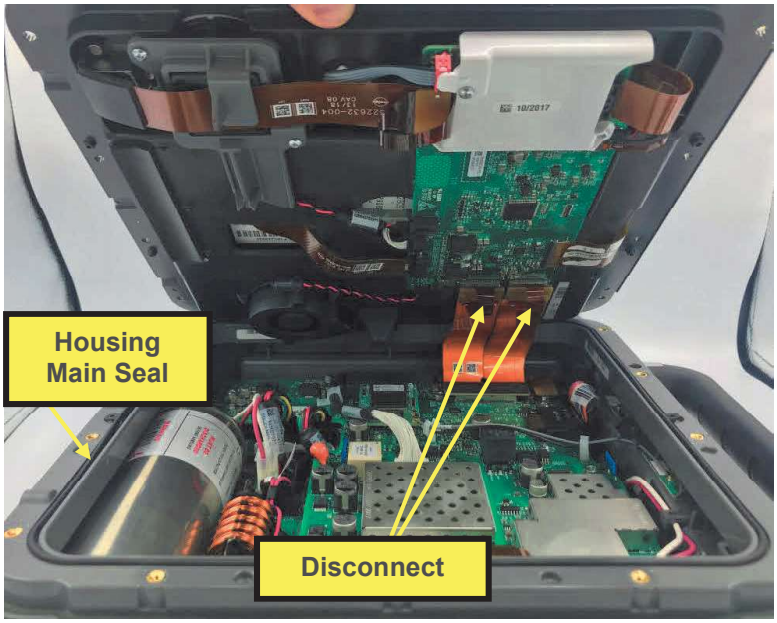
Internal Parts

Refer to procedures in this section for instructions on removing and installing parts internal to the main device case. Procedures pertaining to parts related to the front housing and rear housing subassemblies are separated into sections.

Disassembling the Case

For access to internal parts, use this procedure to open the main device case.

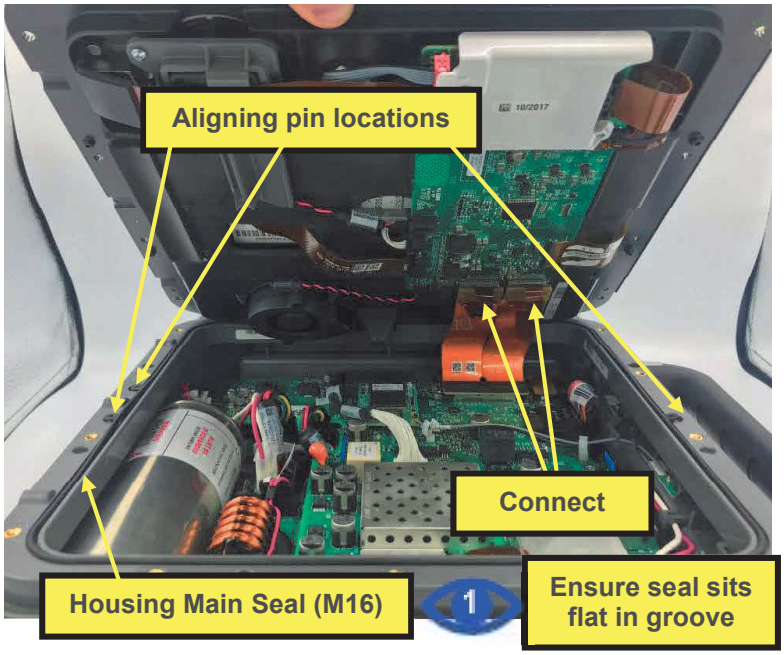
1. Remove front bezel as described in Removing the Front Bezel.
2. Remove USB cover as described in Removing the USB Cover, omitting steps already completed.
3. Remove 14 screws, using a driver with a P-2 bit.



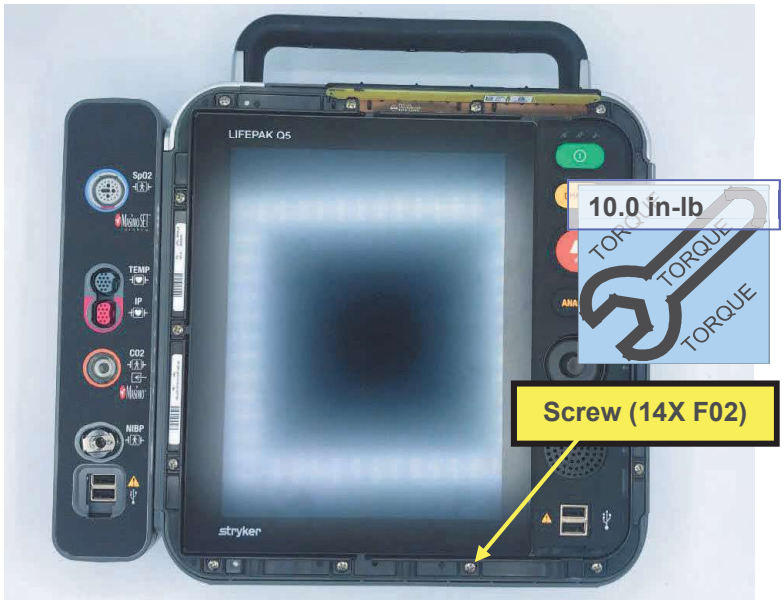
4. Lift front housing assembly, pivoting up from right hand side of device.
5. Discharge energy storage capacitor, using capacitor discharge tool as described in Capacitor Discharging Procedure.
6. Disconnect 2 system flex connectors from the interface PCBA and remove front housing assembly.
7. Remove and discard housing main seal.

Assembling the Case

Follow this procedure to reassemble the main device case following replacement of internal parts.



1. Install housing main seal in groove, and over aligning pins as shown. Ensure that the seal is not twisted and sits flat in housing groove.
2. Connect system flex connector P306 to interface PCBA J306, and P313 to J313.
3. Lay front housing assembly onto rear housing.



4. Install 14 screws around the perimeter of the front housing, using a torque driver with a P-2 bit.
5. Install USB cover as described in Installing the USB Cover.
6. Install bezel as described in Installing the Front Bezel.

Note that the LIFEPAK 35 PIP must be executed after any procedure which includes disassembling the case.

Front Housing Parts

The following procedures describe replacement of parts within the front housing subassembly.

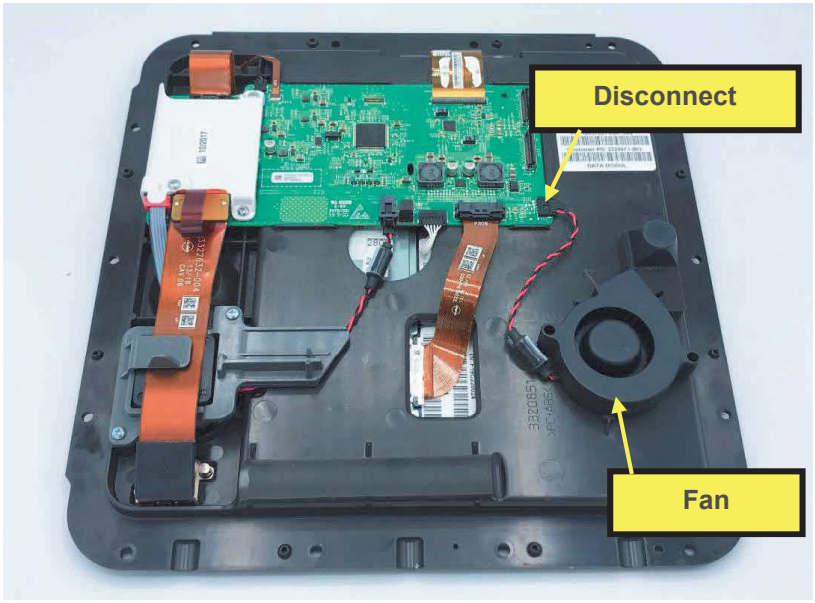
Fan Replacement

The parts listed in the following table will be required to complete this repair. Reference Front Housing Assembly.

SERVICE BOM REF	QTY	DESCRIPTION	NOTES
K10	1	KIT, REPAIR, FAN, LP35	

Note: If a fan failure has occurred, the system PCBA should also be replaced.

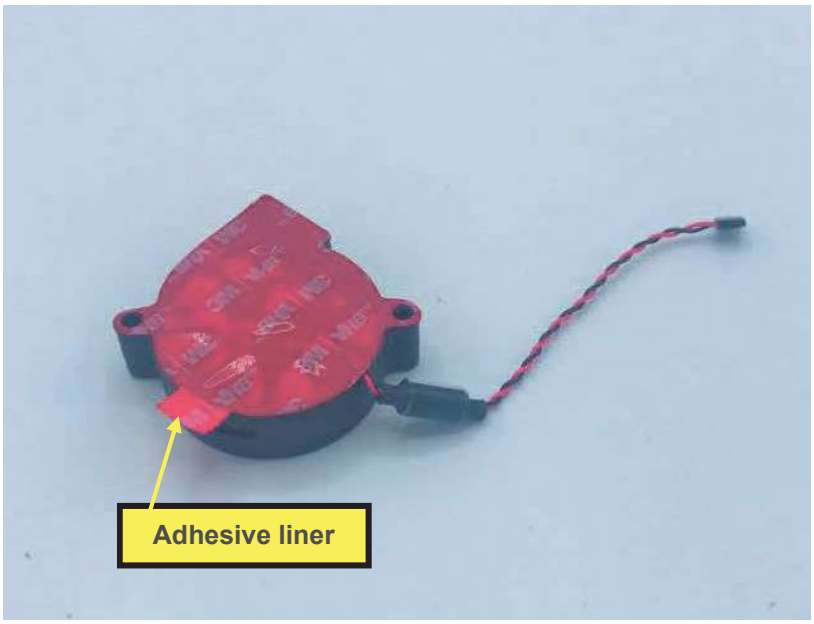
Removing the Fan

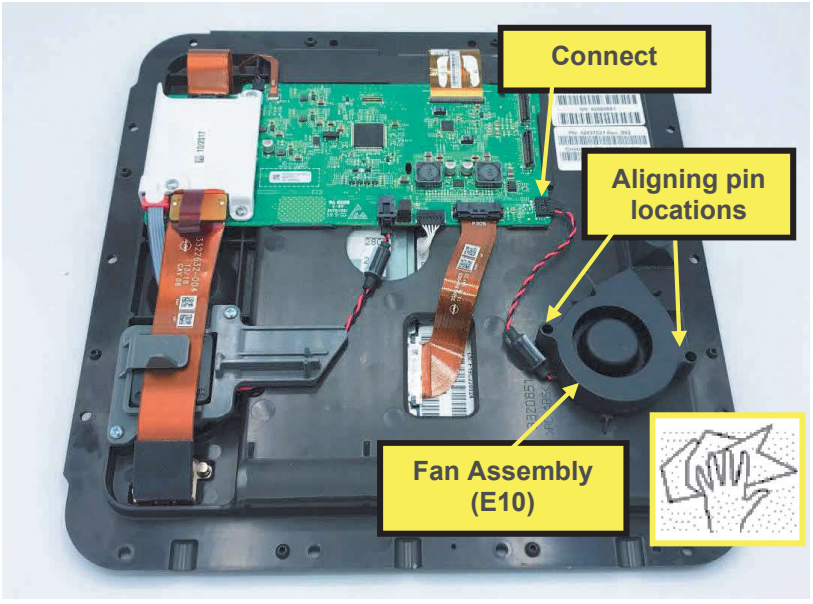


1. Disassemble the case as described in Disassembling the Case.
2. Lay the front housing assembly face down on a flat surface.
3. Disconnect fan connector.
4. Carefully pry fan away from housing to loosen from adhesive and remove fan.

5. Peel adhesive, if present, away from housing, and discard.

Installing the Fan





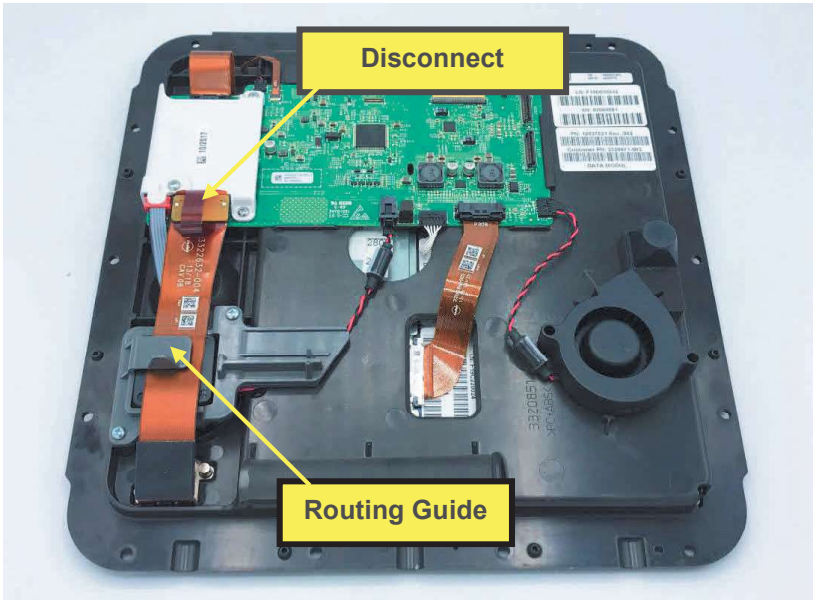
1. Clean housing where fan will be placed, removing any residual adhesive, and dirt and debris.
2. Remove liner from fan adhesive.
3. Apply fan to housing, lining up and fitting holes over 2 aligning pins. Press firmly to adhere to housing, routing wire as shown.
4. Connect fan connector to interface PCBA P312.
5. Assemble the case as described in Assembling the Case.
6. Execute the LIFEPAK 35 PIP.

USB Connector Replacement

The parts listed in the following table will be required to complete this repair. Reference Front Housing Assembly.

SERVICE BOM REF	QTY	DESCRIPTION	NOTES
E14	1	FLEX, USB, LSEM, LP35	
E01	1	KEYPAD, LP35,…	Various configs.
E13	1	FLEX, BEACON, READINESS INDICATOR, LP35	
F03	2	SCREW, BUTTONHEAD, TORX, #4-40 X LG 0.25 IN	
M16	1	SEAL, HOUSING, MAIN, LPQ5, LPT5	
F02	17	SCREW, MACH, PANHEAD, PHDRV, SS, NYLOK, 6-32 X .312	

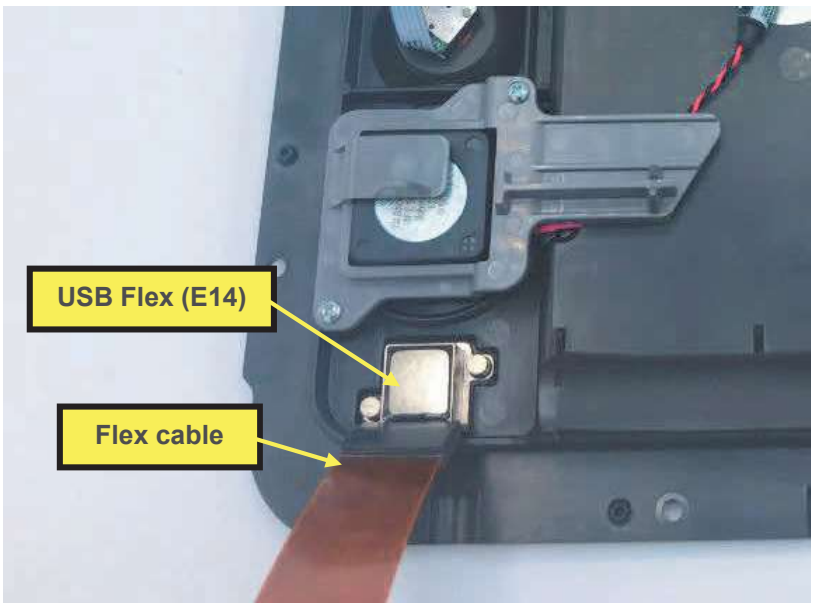
Removing the USB Connector



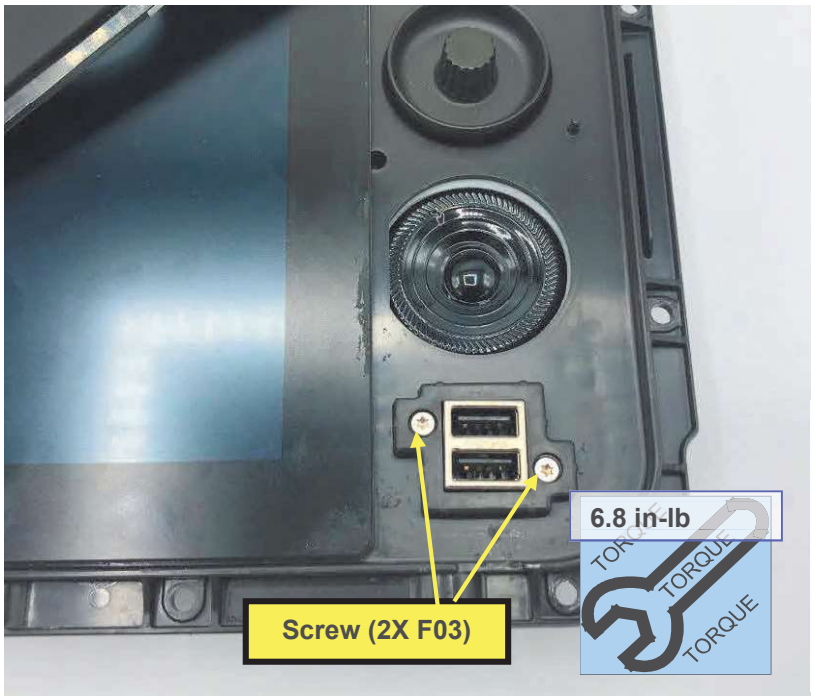
1. Disassemble the case as described in Disassembling the Case.
2. Remove the keypad as described in Removing the Keypad, omitting steps already completed.
3. Remove the readiness indicator beacon as described in Removing the Readiness Indicator Beacon, omitting steps already completed.
4. Lay the front housing assembly face down on a flat surface.
5. Disconnect USB flex connector from the interface PCBA and remove flex from under routing guide.

6. Lay front housing assembly on its back, on a flat surface.
7. Remove 2 screws, using a driver with a T-8 bit.
8. Remove USB connector assembly from the back of the housing.

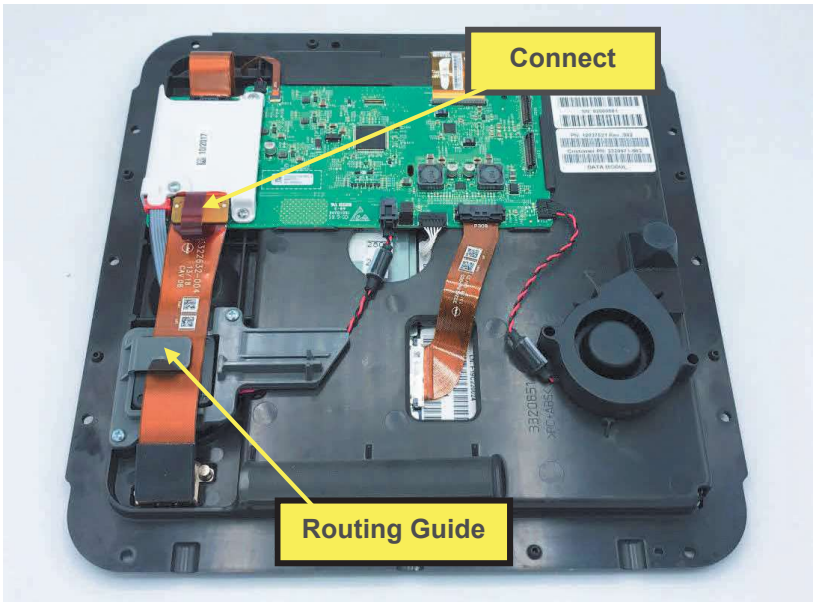
Installing the USB Connector



1. Install USB flex from back side of front housing, with flex cable at bottom as shown.



2. Install 2 screws from the front of the housing, using a torque driver with a T-8 bit.



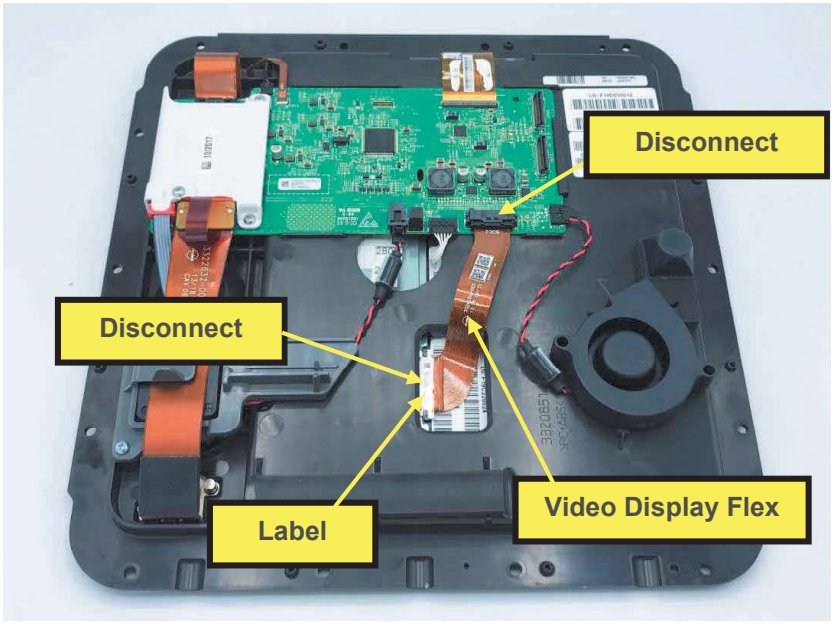
3. Route flex cable under routing guide, and connect USB connector to interface PCBA J307.
4. Install readiness indicator beacon as described in Installing the Readiness Indicator Beacon, steps 1-4.
5. Install keypad as described in Installing the Keypad, steps 2-6.
6. Assemble the case as described in Assembling the Case.
7. Execute the LIFEPAK 35 PIP.

Video Display Flex Replacement

The parts listed in the following table will be required to complete this repair. Reference Front Housing Assembly.

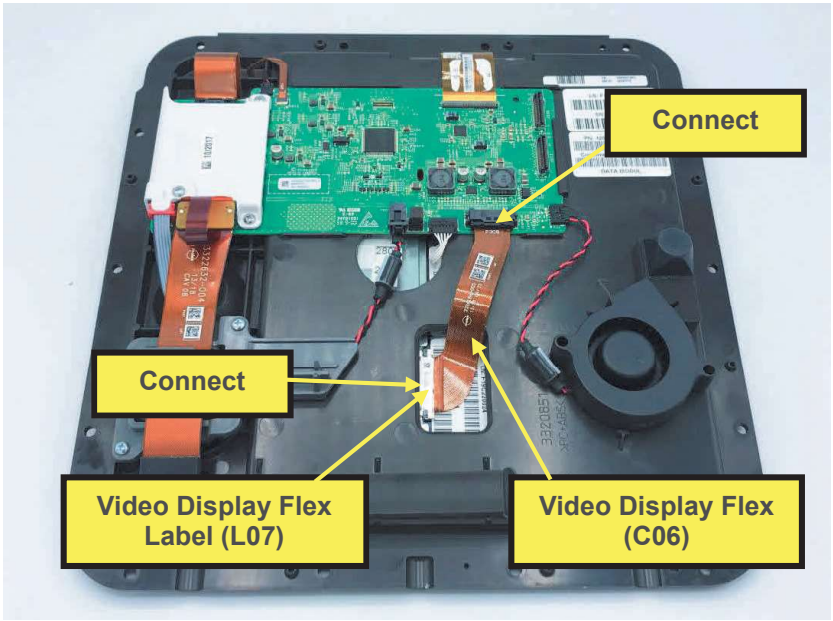
SERVICE BOM REF	QTY	DESCRIPTION	NOTES
C06	1	FLEX, DISPLAY VIDEO, LP35	
L07	1	LABEL, ASSY AID, 0.9IN, LP35	
M16	1	SEAL, HOUSING, MAIN, LPQ5, LPT5	
F02	17	SCREW, MACH, PANHEAD, PHDRV, SS, NYLOK, 6-32 X .312	

Removing the Video Display Flex



1. Disassemble the case as described in Disassembling the Case.
2. Lay the front housing assembly face down on a flat surface.
3. Disconnect video display flex from interface PCBA.
4. Remove label.
5. Disconnect video display flex from display, and remove video display flex.

Installing the Video Display Flex



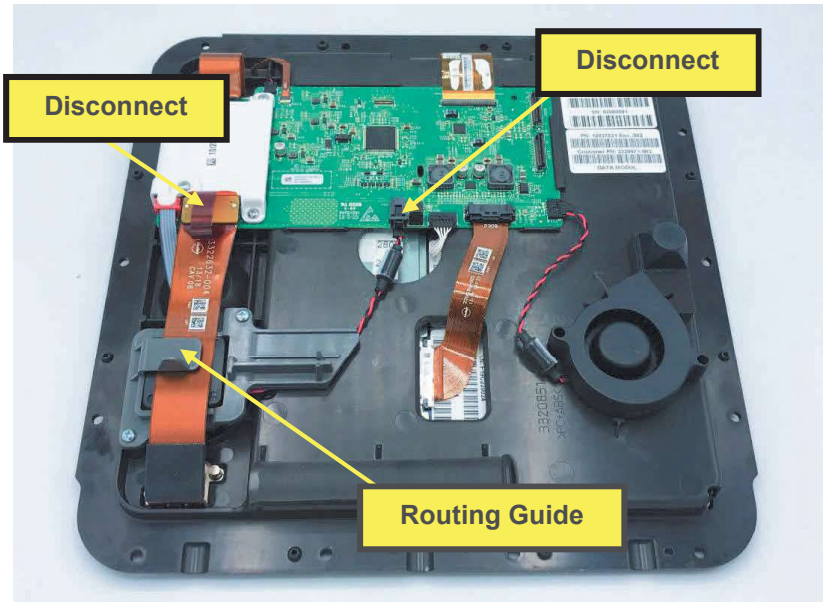
1. Connect video display flex to display.
2. Install label over connection at display.
3. Connect video display flex to interface PCBA J308.
4. Assemble the case as described in Assembling the Case.
5. Execute the LIFEPAK 35 PIP.

Speaker Replacement

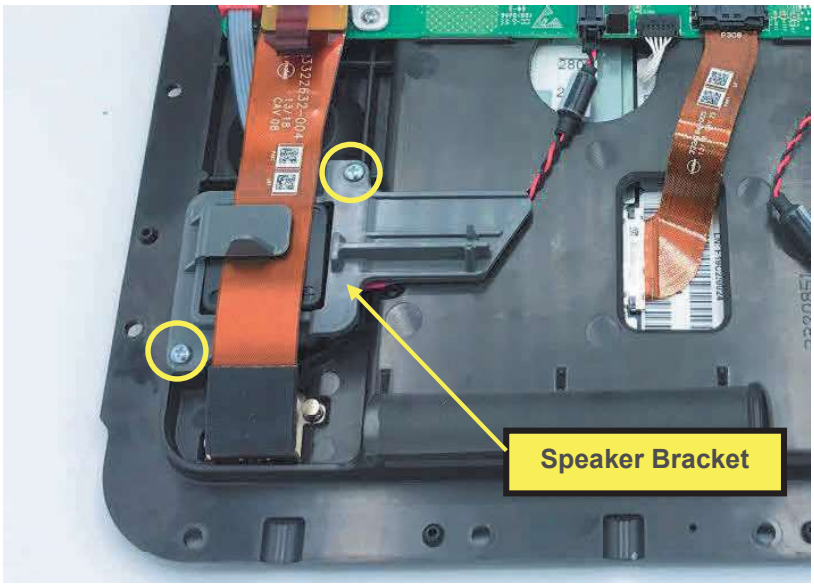
The parts listed in the following table will be required to complete this repair. Reference Front Housing Assembly.

SERVICE BOM REF	QTY	DESCRIPTION	NOTES
E15	1	ASSY, CABLE, SPEAKER, LP35	
F04	2	SCREW-M, PH, NYLOK, CS, 4-40, .250L	
M16	1	SEAL, HOUSING, MAIN, LPQ5, LPT5	
F02	17	SCREW, MACH, PANHEAD, PHDRV, SS, NYLOK, 6-32 X .312	

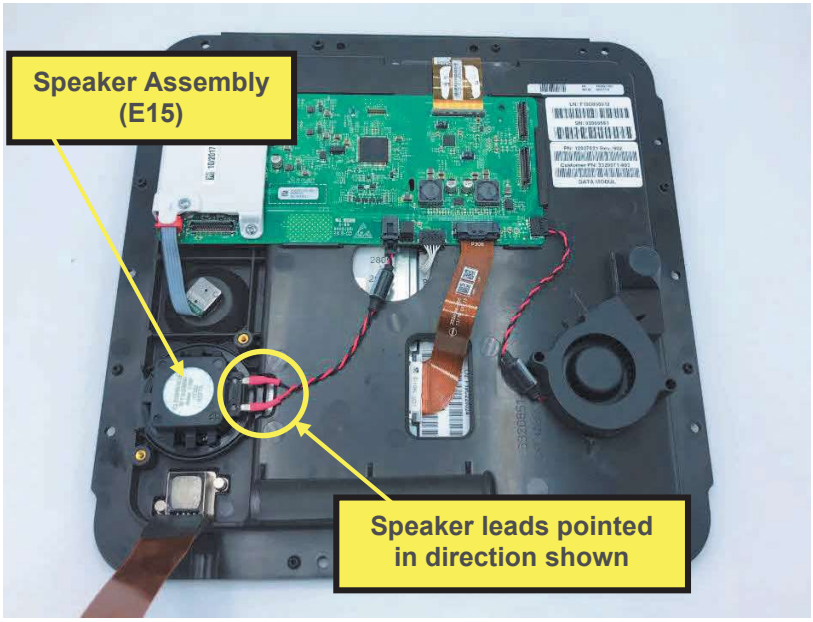
Removing the Speaker



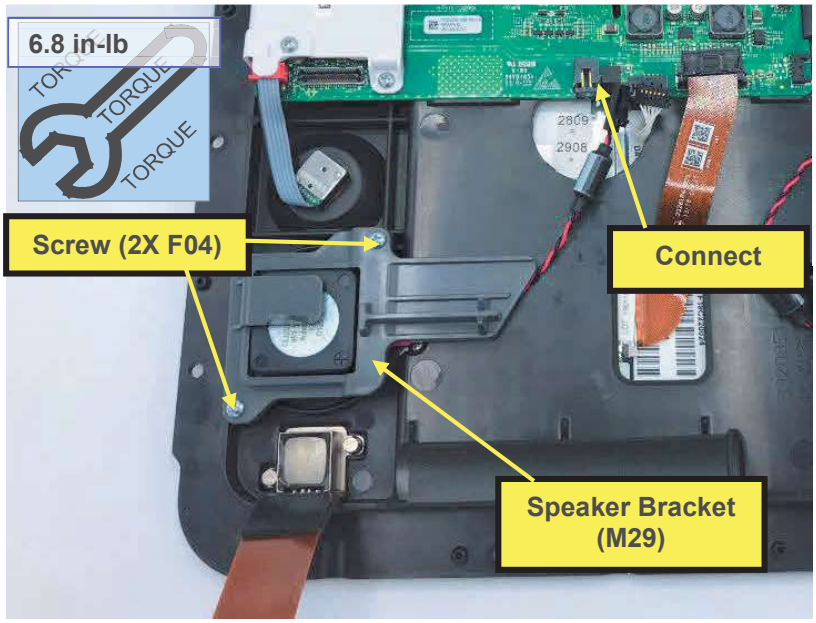
1. Disassemble the case as described in Disassembling the Case.
2. Lay the front housing assembly face down on a flat surface.
3. Disconnect USB flex connector and remove USB flex from under routing guide.
4. Disconnect speaker connector.



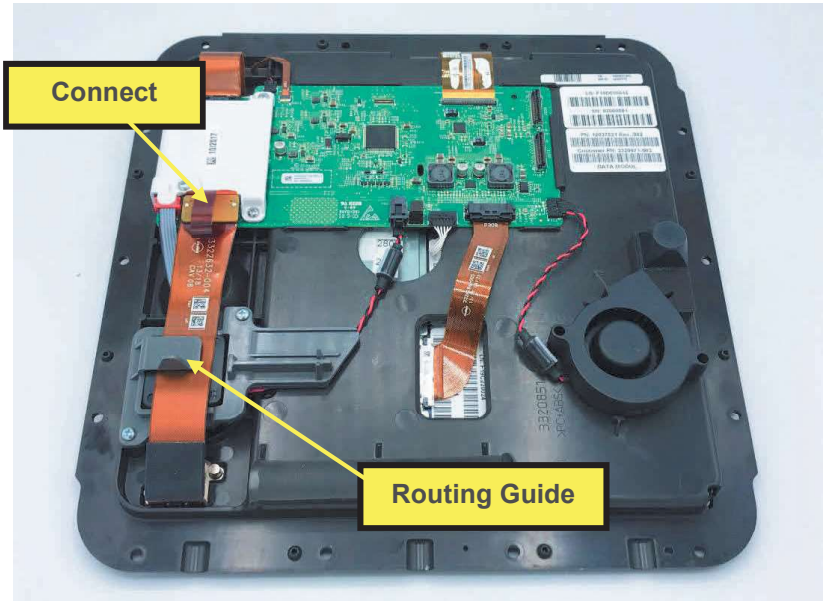
5. Remove 2 screws, using a driver with a P-1 bit.
6. Remove speaker bracket. Retain for reuse.
7. Remove speaker.



1. Place speaker into pocket in back side of front housing, with leads oriented as shown.



2. Place speaker bracket over speaker and speaker wires.
3. Install 2 screws, using a torque driver with a P-1 bit.
4. Connect speaker wire to interface PCBA P305.



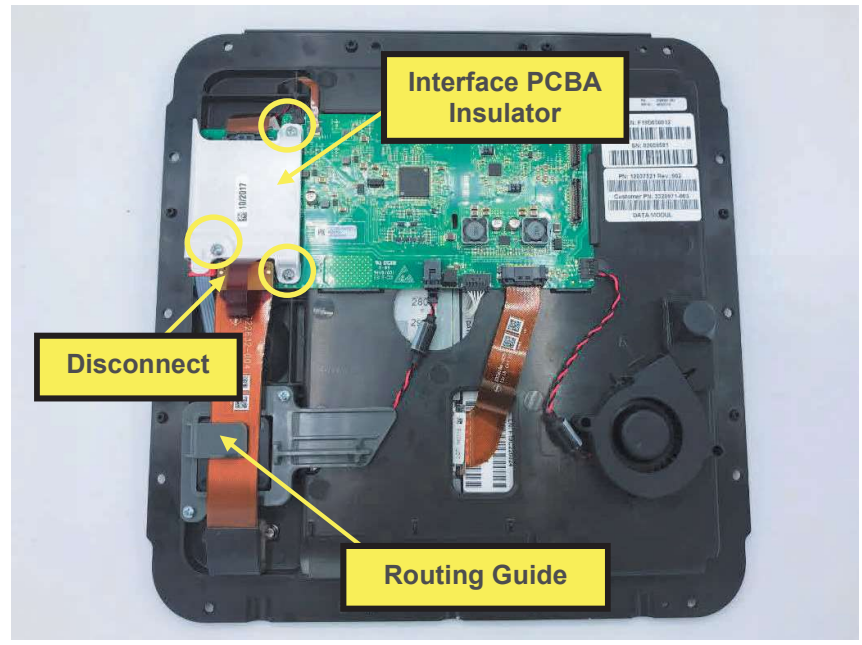
5. Route USB flex under routing guide and connect USB connector to interface PCBA J307.
6. Assemble the case as described in Assembling the Case.
7. Execute the LIFEPAK 35 PIP.

Rotary Switch Replacement

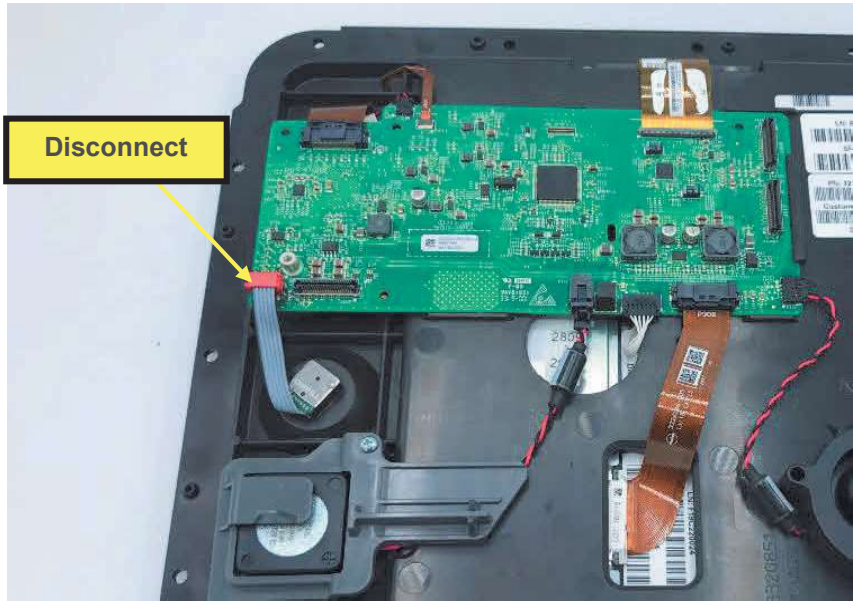
The parts listed in the following table will be required to complete this repair. Reference Front Housing Assembly.

SERVICE BOM REF	QTY	DESCRIPTION	NOTES
K11	1	KIT, REPAIR, ROTARY SWITCH, LP35	

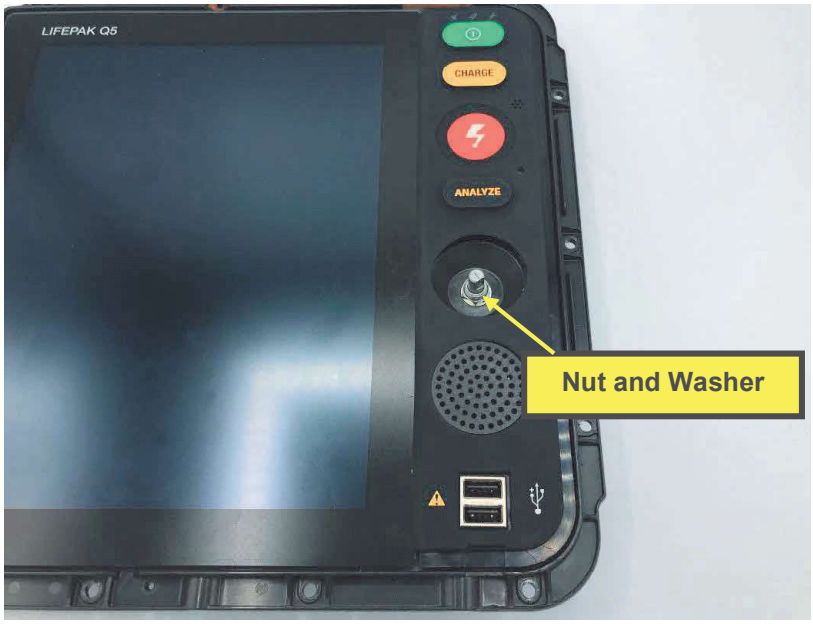
Removing the Rotary Switch



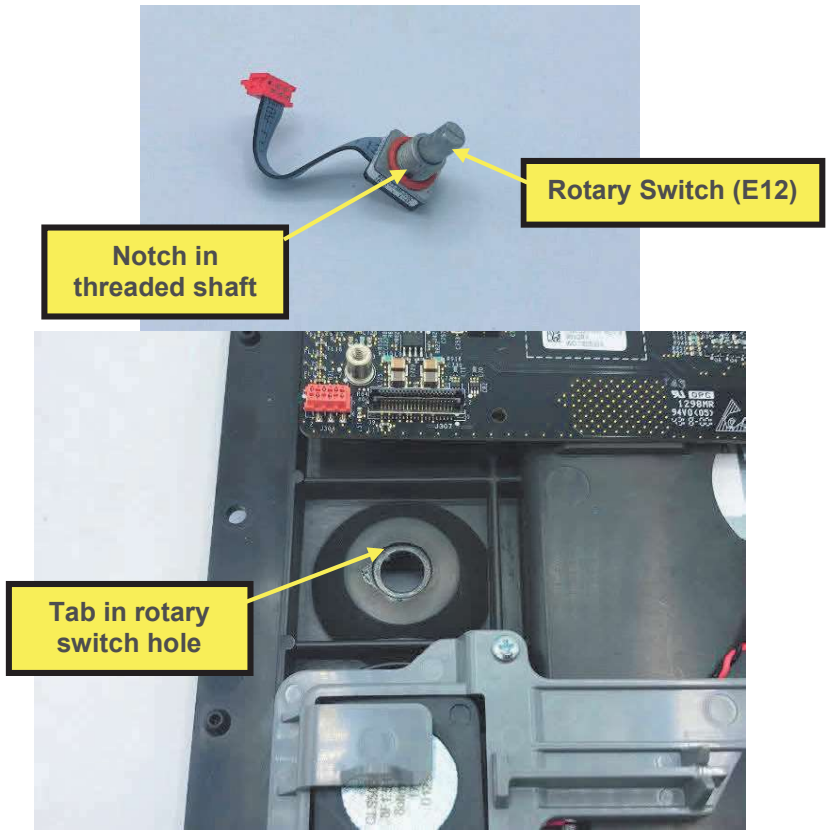
1. Disassemble the case as described in Disassembling the Case.
2. Lay the front housing assembly face down on a flat surface.
3. Disconnect USB flex connector and remove USB flex from under routing guide.
4. Remove 3 screws, using a driver with a P-1 bit.
5. Remove interface PCBA insulator. Retain for reuse.



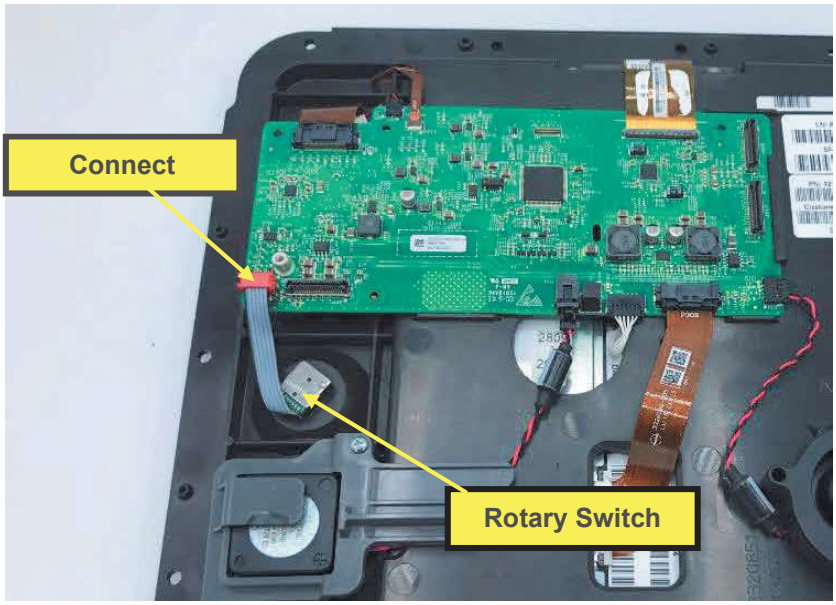
6. Disconnect rotary switch connector from interface PCBA.



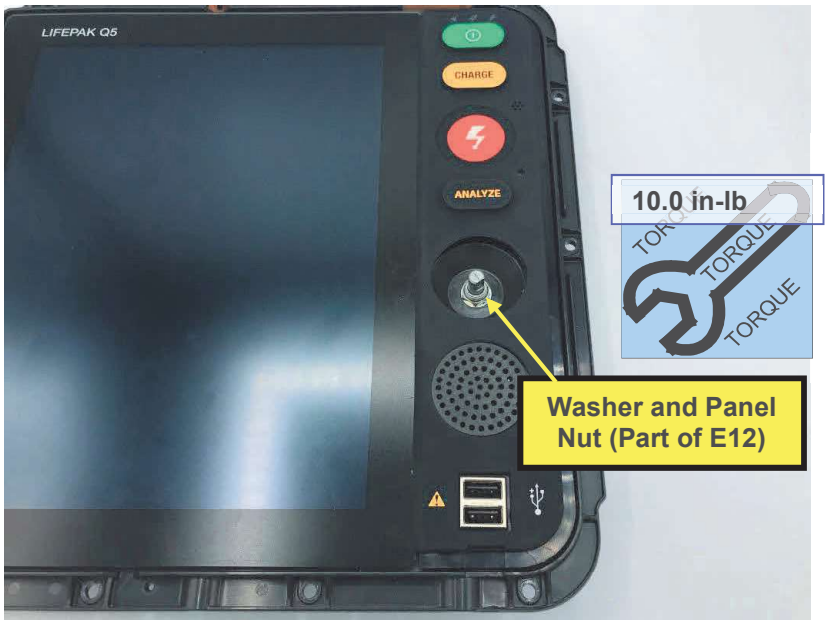
7. Remove the rotary knob, using a pliers or gripping tool as required. Discard.
8. Remove panel nut, using a driver with a 7/16” deep socket. Discard.
9. Remove washer. Discard.
10. Remove rotary switch from back of housing. The o-ring seal on the switch shaft should be discarded.



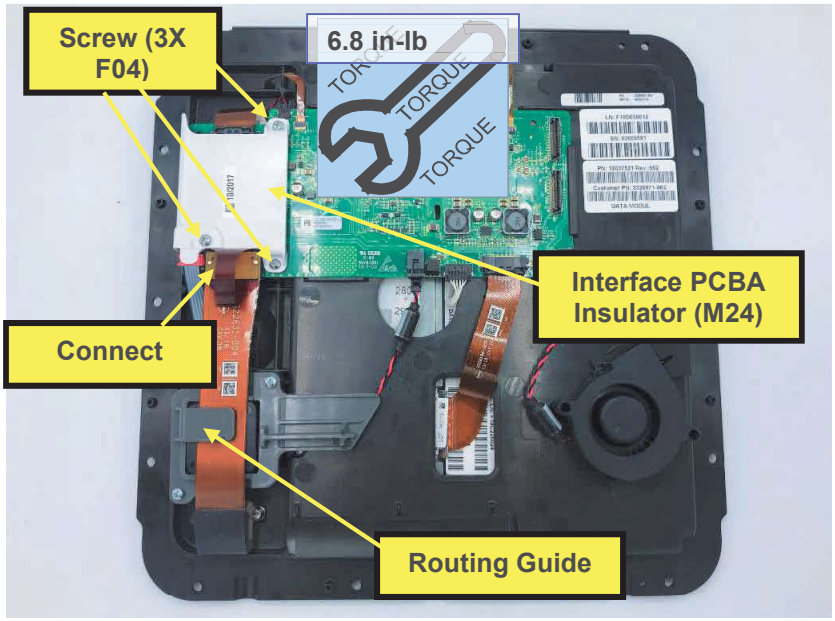
1. If required, remove panel nut and washer from rotary switch threaded shaft.
2. Install rotary switch from the back of the housing, aligning notch in threaded shaft with tab in housing hole.
3. Install washer (supplied with rotary switch) from front of panel.
4. Install panel nut (supplied with rotary switch) from front of panel.



5. Connect rotary switch connector to interface PCBA J304.



6. Tighten panel nut, using a torque driver with a 7/16” deep socket.



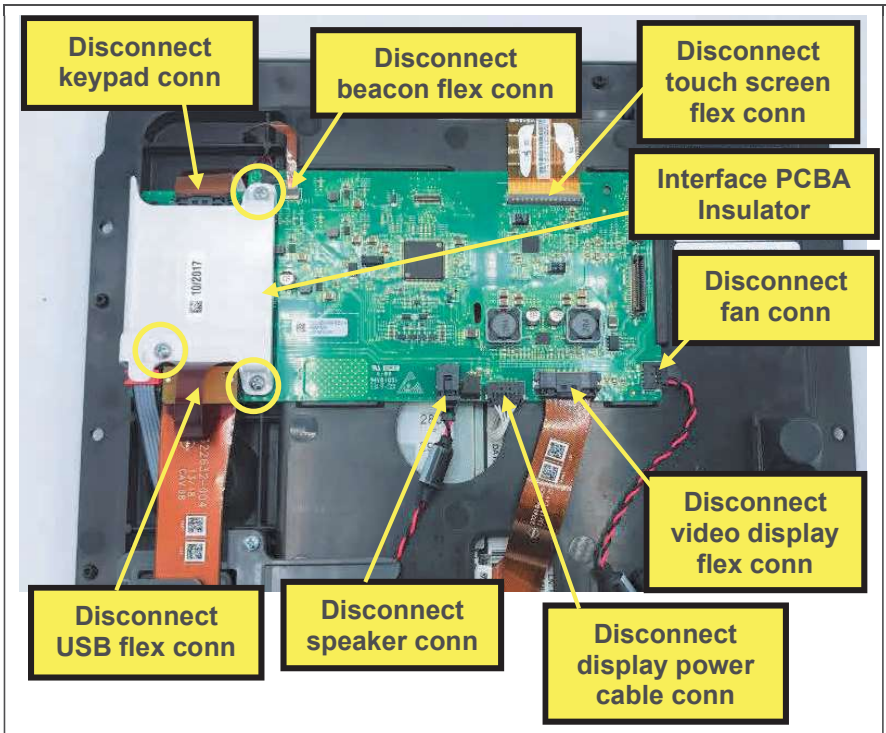
7. Install interface PCBA insulator.
8. Install 3 screws, using a torque driver with a P-1 bit.
9. Route USB flex under routing guide and connect USB connector to interface PCBA J307.
10. Install rotary knob, aligning flat part of D-shaped hole with flat on rotary switch shaft, and pressing in until it bottoms out, as pictured below.
11. Assemble the case as described in Assembling the Case.
12. Execute the LIFEPAK 35 PIP.

Interface PCBA Replacement

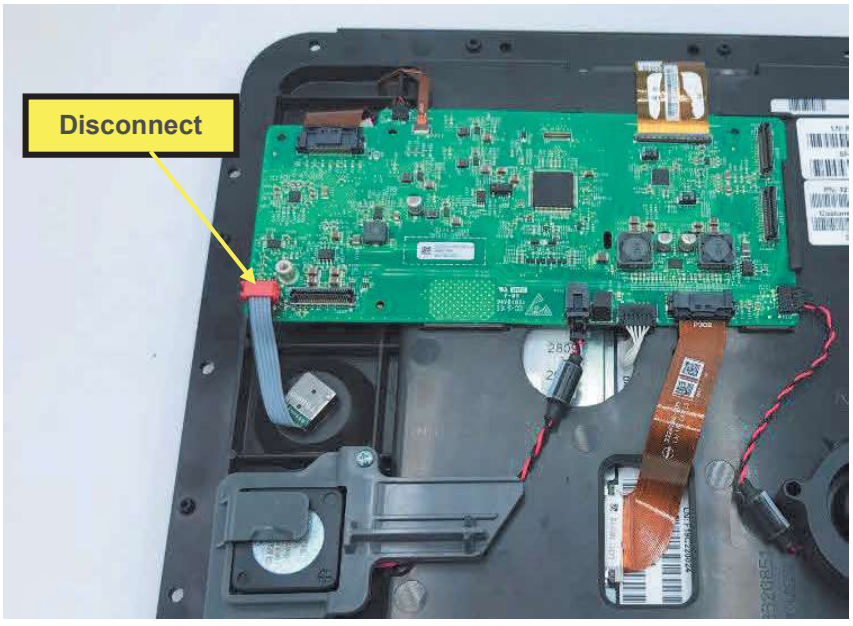
Note: This repair may be performed only by Stryker service technicians.

The parts listed in the following table will be required to complete this repair. Reference Front Housing Assembly.

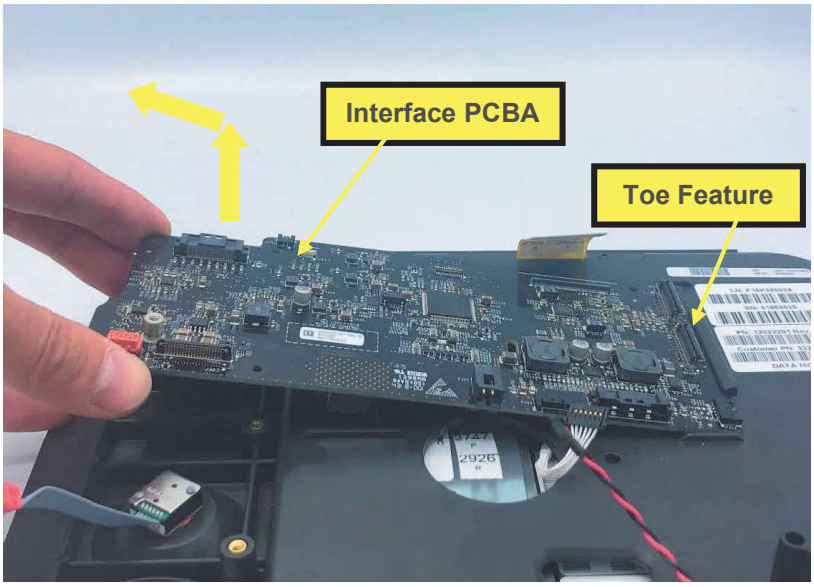
service bom ref	qty	description	notes
K03	1	KIT, REPAIR, INTERFACE PCBA, LP35	



1. Disassemble the case as described in Disassembling the Case.
2. Lay the front housing assembly face down on a flat surface.
3. Disconnect keypad connector.
4. Disconnect beacon flex connector.
5. Disconnect speaker connector.
6. Disconnect video display flex connector.
7. Disconnect the fan connector.
8. Disconnect display power cable connector.
9. Disconnect touch screen flex connector.
10. Disconnect USB flex connector.
11. Remove 3 screws in the locations shown, using a driver with a P-1 bit.
12. Remove interface PCBA insulator. Retain for reuse.

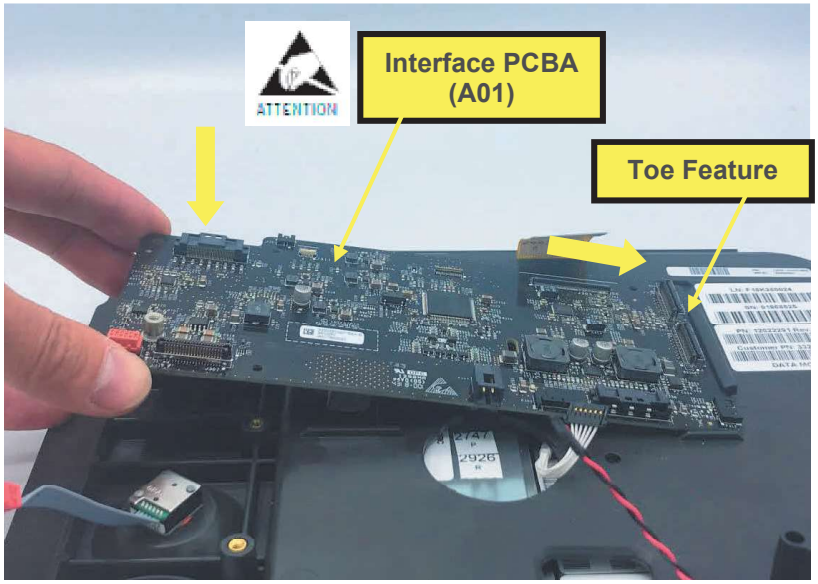


13. Disconnect rotary switch connector.

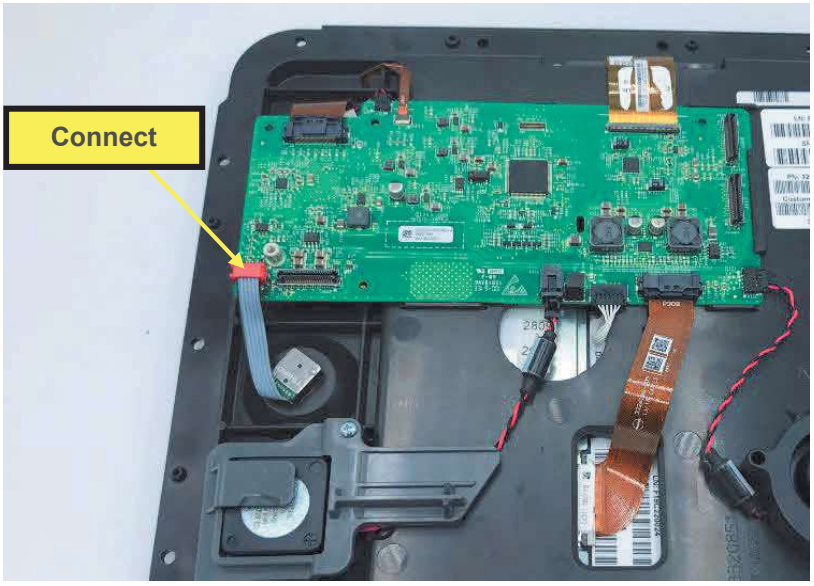


14. Lift end of interface PCBA, and remove, sliding out from under housing toe feature.

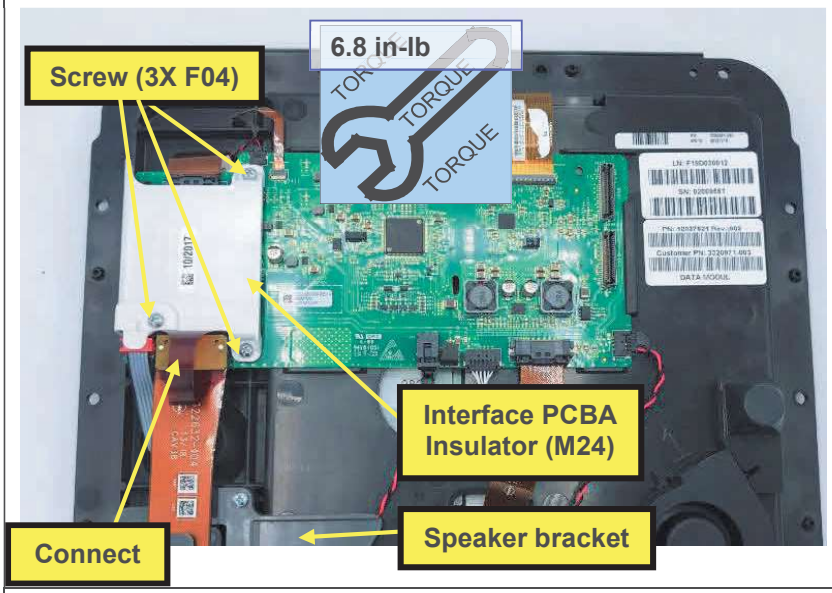
Installing the Interface PCBA



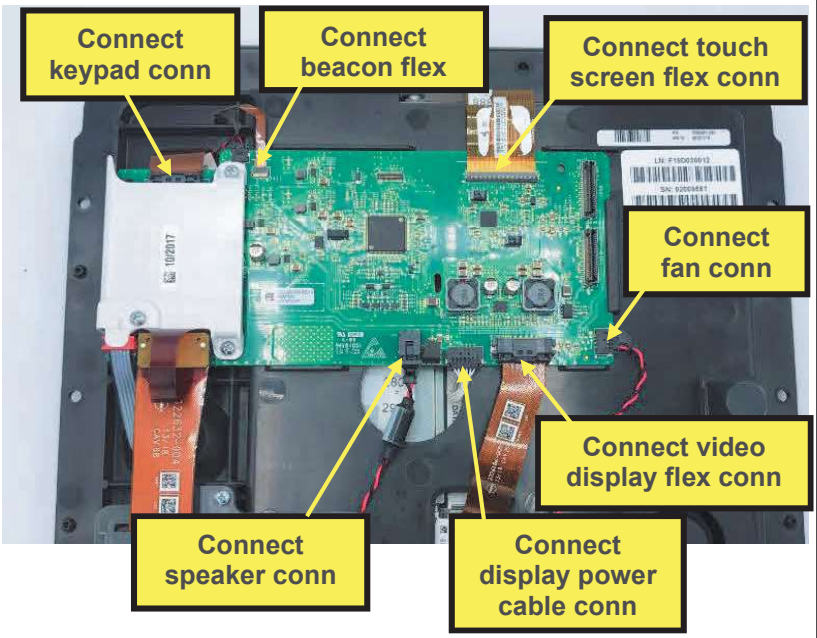
1. Lay front housing assembly face-down on a flat surface.
2. Ensure all cables and connectors are retracted, and will not get trapped under the interface PCBA.
3. Insert end of interface PCBA under housing toe feature, then lower opposite end onto housing.



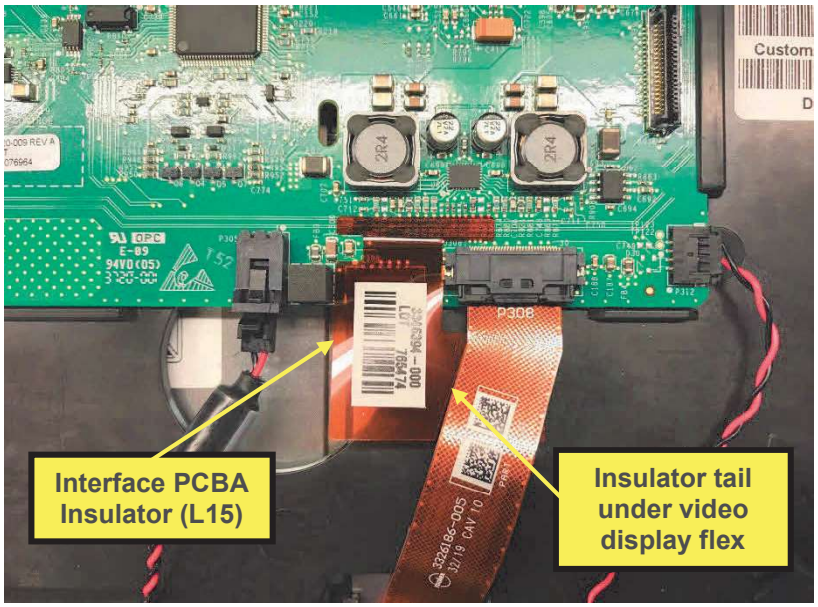
4. Connect rotary switch connector to interface PCBA J304.



5. Install interface PCBA insulator.
6. Install 3 screws, using a torque driver with a P-1 bit.
7. Connect USB flex connector to interface PCBA J307, routing flex under routing guide on speaker bracket.



8. Connect keypad connector to interface PCBA J300.
9. Connect touch screen flex connector to interface PCBA J303.
10. Connect display power cable connector to interface PCBA P309.
11. Connect video display flex connector to interface PCBA J308.
12. Connect speaker connector to interface PCBA P305.
13. Connect fan connector to interface PCBA P312.



14. Connect beacon flex connector to interface PCBA J311.

Steps 15-16 only required for devices configured with temp/IP.

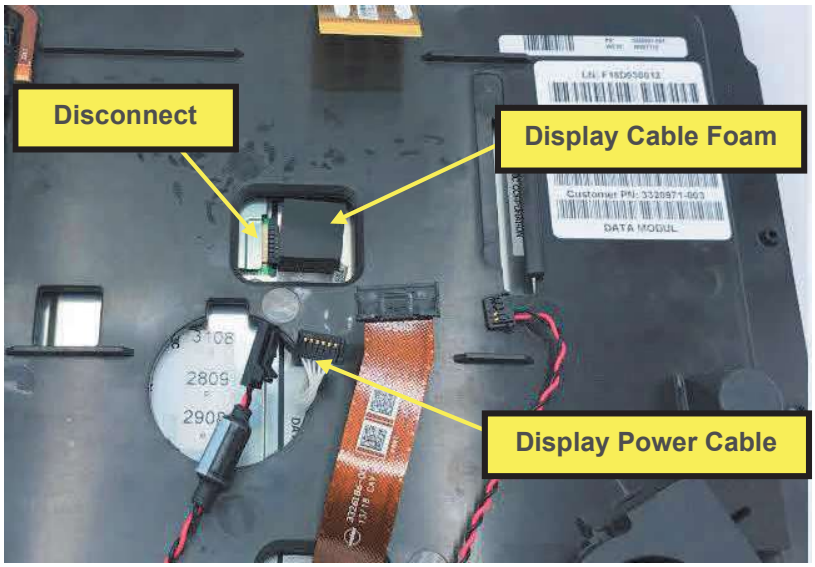
15. Remove adhesive liner from interface PCBA insulator, and apply insulator to PCBA as shown, pressing firmly in place.
16. Tuck insulator tail under video display flex.
17. Assemble the case as described in Assembling the Case.
18. Restore device software and settings using LIFENET Device Agent in Service Repair Mode.
19. Execute the LIFEPAK 35 PIP.

Display Power Cable Replacement

The parts listed in the following table will be required to complete this repair. Reference Front Housing Assembly.

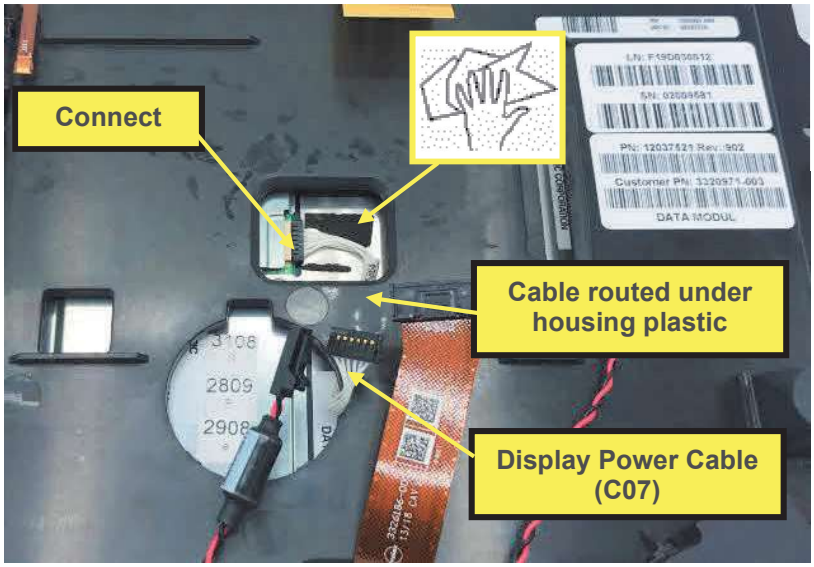
SERVICE BOM REF	QTY	DESCRIPTION	NOTES
C07	1	ASSY, CABLE, DISPLAY POWER, LPQ5, LPT5	
M38	1	FOAM, DISPLAY CABLE, LP35	
M16	1	SEAL, HOUSING, MAIN, LPQ5, LPT5	
F02	17	SCREW, MACH, PANHEAD, PHDRV, SS, NYLOK, 6-32 X .312	
F04	3	SCREW-M, PH, NYLOK, CS, 4-40, .250L	

Removing the Display Power Cable

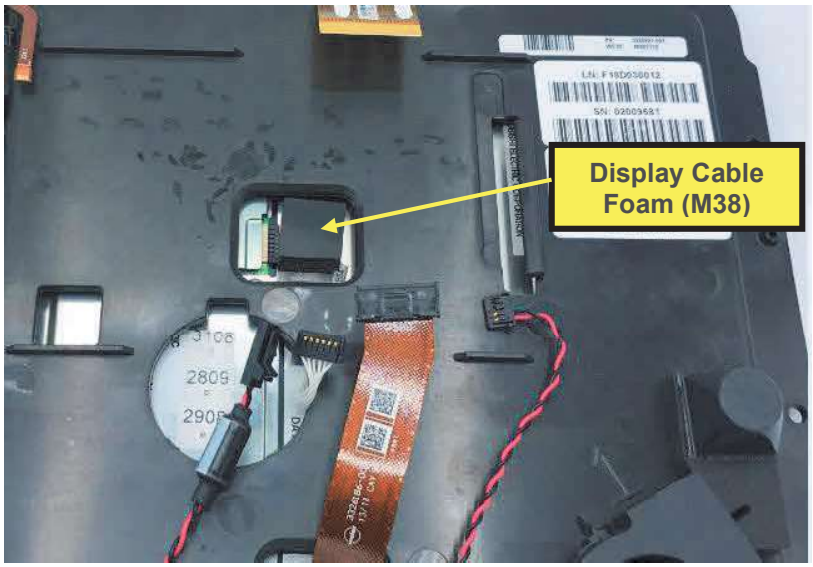


1. Remove the interface PCBA as described in Removing the Interface PCBA.
2. Remove the display cable foam, and discard.
3. Disconnect the display power cable from the display, and remove display power cable, threading connector under front housing plastic.

Installing the Display Power Cable



1. Clean area under cable location, removing all residual adhesive, and dirt and debris.
2. Route display power cable through hole, and under housing as shown.
3. Connect display power cable to display. Note that the cable must be oriented end-to-end, and top-bottom; the connectors will only fit in the proper orientation.



4. Remove adhesive liner from display cable foam.
5. Apply display cable foam over display cable as shown and press to adhere to cable and back of display.
6. Install interface PCBA as described in Installing the Interface PCBA, steps 1-14.
7. Assemble the case as described in Assembling the Case.
8. Execute the LIFEPAK 35 PIP.

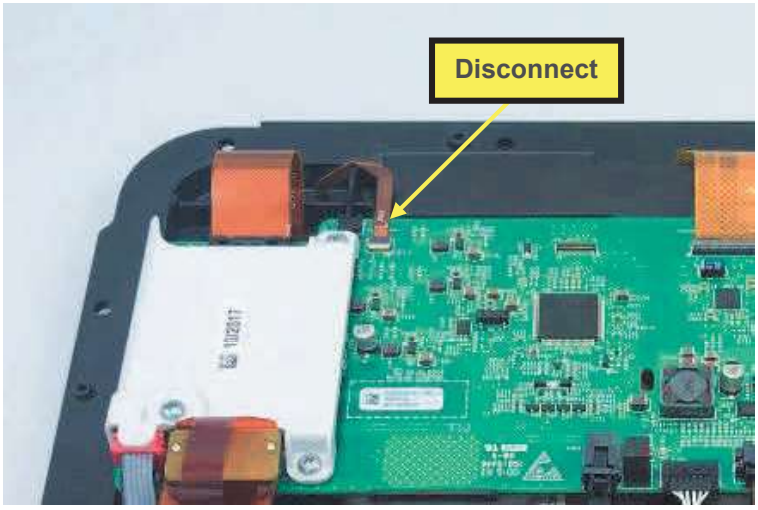
Keypad Replacement

Note that replacement of the keypad requires replacement of the readiness indicator beacon.

The parts listed in the following table will be required to complete this repair. Reference Configuration Assembly.

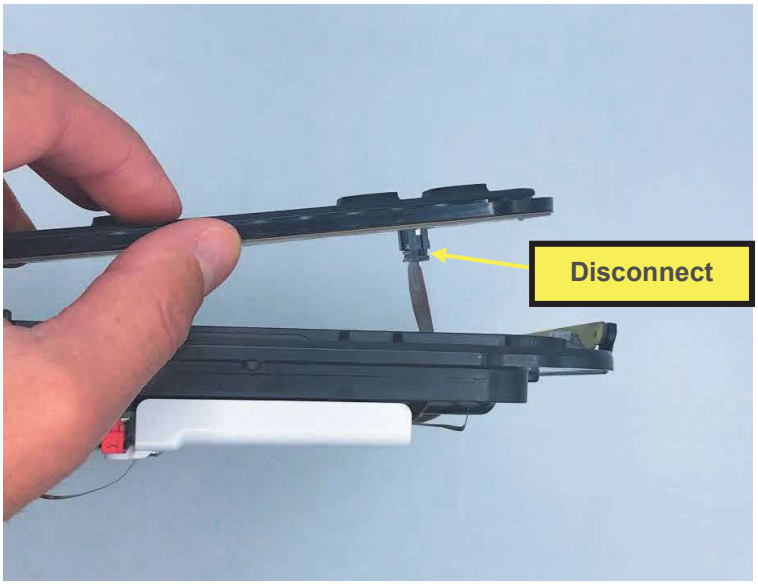
SERVICE BOM REF	QTY	DESCRIPTION	NOTES
E01	1	KEYPAD, LP35,…	Various configs. Refer to Configuration Assembly diagram in section 9.
E13	1	FLEX, BEACON, READINESS INDICATOR, LP35	
F02	17	SCREW, MACH, PANHEAD, PHDRV, SS, NYLOK, 6-32 X .312	
M16	1	SEAL, HOUSING, MAIN, LPQ5, LPT5	

Removing the Keypad



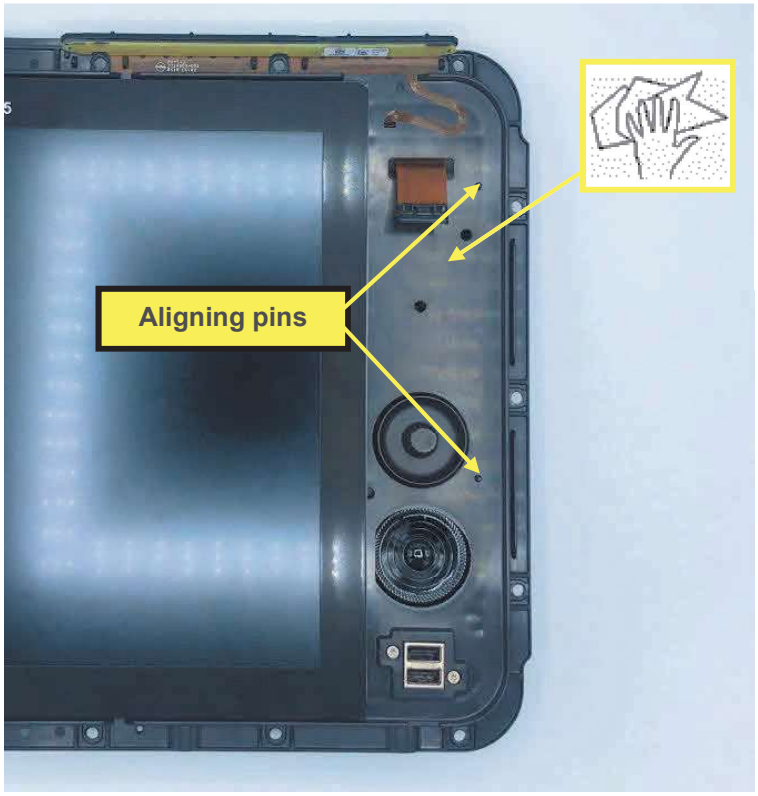
1. Disassemble the case as described in Disassembling the Case.
2. Disconnect the beacon flex from the interface PCBA.

3. Lay the front housing assembly face-up on a flat surface.
4. Using a flat, narrow pry tool such as a small putty knife, carefully lift the keypad away from the housing, peeling the adhesive, working from the bottom of the keypad to the top.

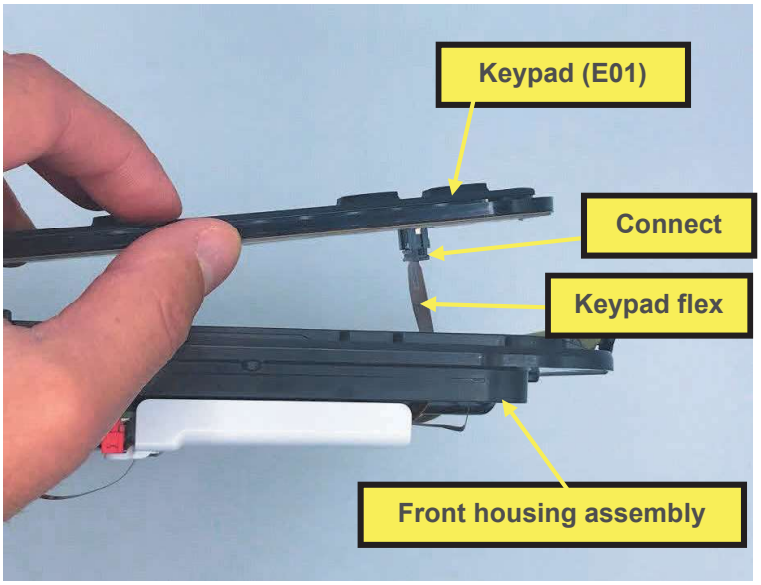


5. Disconnect keypad flex from keypad connector.
6. Remove the keypad. Keypad may not be reused.
7. Remove readiness indicator beacon as described in Removing the Readiness Indicator Beacon, omitting steps already completed. Readiness indicator beacon may not be reused.

Installing the Keypad



1. Install the readiness indicator beacon as described in Installing the Readiness Indicator Beacon, steps 1-4, if not already completed.
2. Clean area on front housing where keypad will be installed, removing any residual adhesive, dirt and debris.



3. Remove adhesive liner from back side of keypad.
4. Connect keypad flex to keypad connector.
5. Place keypad on front housing, pushing flex back into hole in housing, and engaging housing aligning pins (shown above) into hole and slot in back of keypad.
6. Press keypad firmly into place, starting from the bottom, and working toward the top.
7. Assemble the case as described in Assembling the Case.
8. Execute the LIFEPAK 35 PIP.

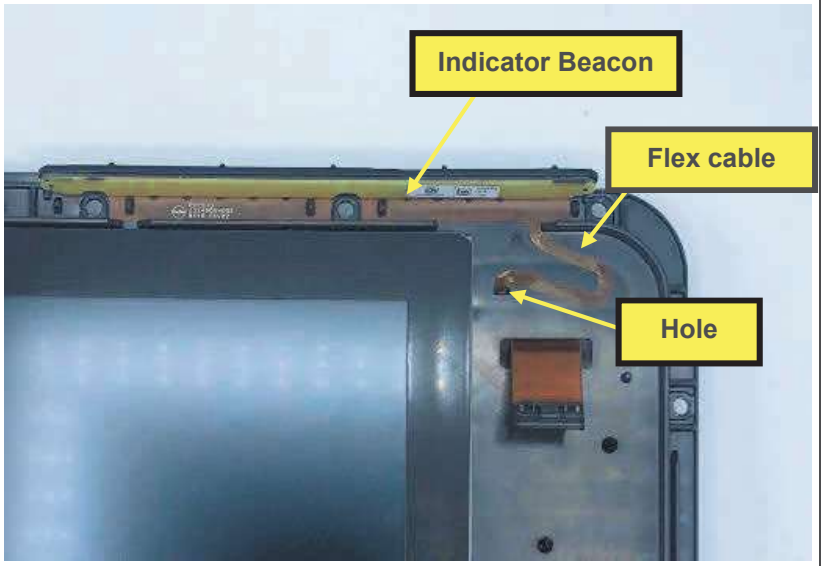
Readiness Indicator Beacon Replacement

Note that replacement of the readiness indicator beacon requires replacement of the keypad.

The parts listed in the following table will be required to complete this repair. Reference Front Housing Assembly.

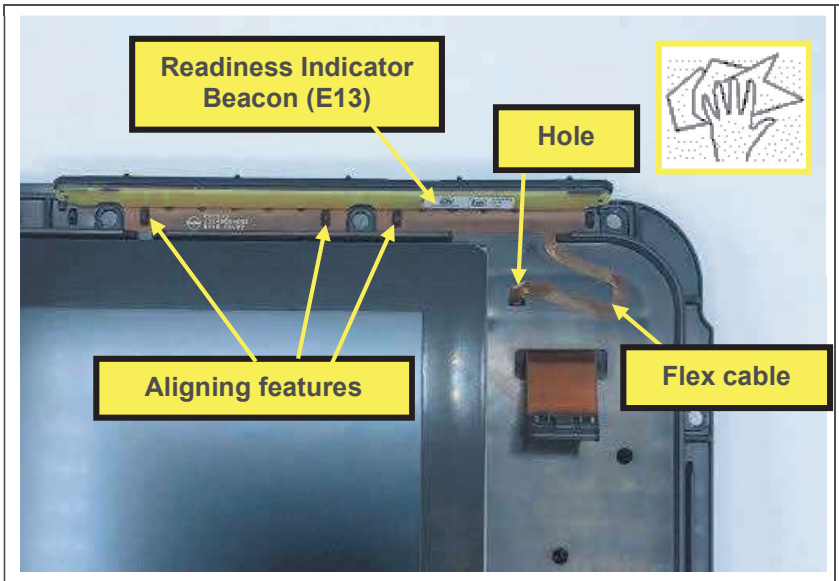
SERVICE BOM REF	QTY	DESCRIPTION	NOTES
E13	1	FLEX, BEACON, READINESS INDICATOR, LP35	
E01	1	KEYPAD, LP35,…	Various configs. Refer to Configuration Assembly diagram in Section 9.
F02	17	SCREW, MACH, PANHEAD, PHDRV, SS, NYLOK, 6-32 X .312	
M16	1	SEAL, HOUSING, MAIN, LPQ5, LPT5	

Removing the Readiness Indicator Beacon



1. Remove the keypad as described in Removing the Keypad, steps 1-6.
2. Remove beacon from housing, pulling adhesive bonded parts away from the front housing, and pulling the flex cable and connector through the hole in the housing.

Installing the Readiness Indicator Beacon

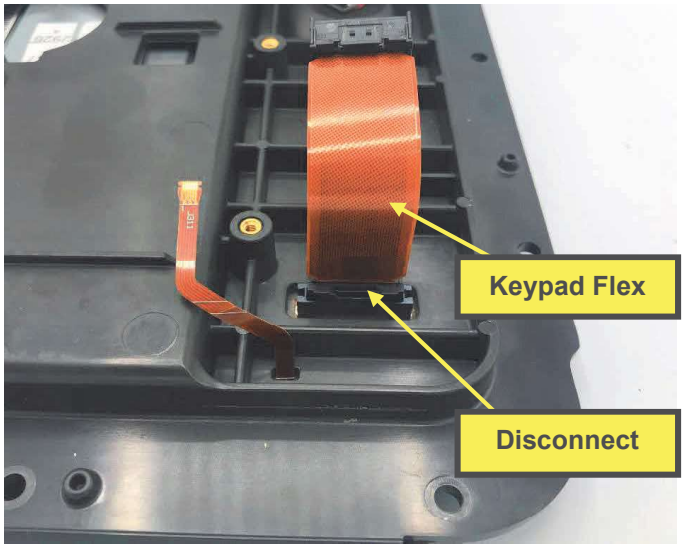


1. Clean any residual adhesive and debris from area where new beacon will attach to front housing.
2. Peel and remove adhesive liners from back side of beacon and flex cable.
3. Feed beacon flex and connector through hole in front housing, and place beacon over aligning features on front housing. Press all adhesive parts firmly onto front housing.
4. Connect the beacon flex connector to the interface PCBA (far side, not shown) as described in Installing the Interface PCBA, step 14.
5. Install keypad as described in Installing the Keypad, steps 2-6.
6. Assemble the case as described in Assembling the Case.
7. Execute the LIFEPAK 35 PIP.

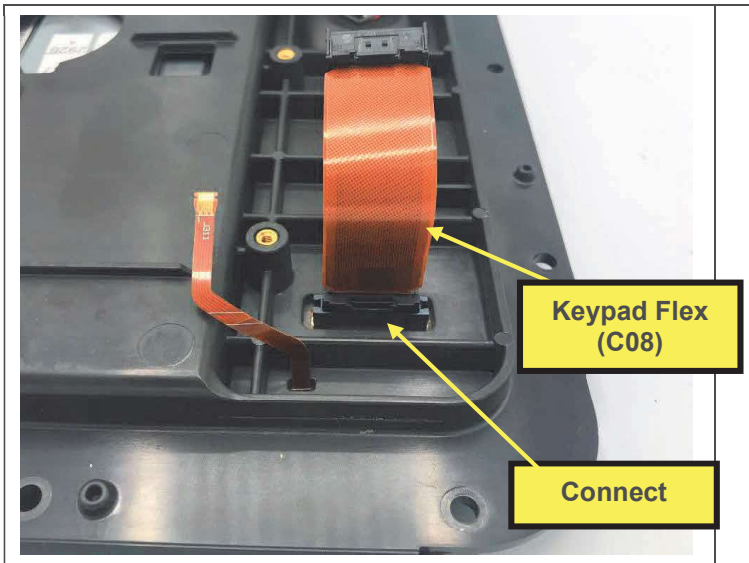
Display and Front Housing Replacement

The parts listed in the following table will be required to complete this repair. Note that some parts will be reused and transferred from the replaced front housing to the new front housing. Reference Defib Assembly.

SERVICE BOM REF	QTY	DESCRIPTION	NOTES
K04	1	KIT, REPAIR, FRONT HOUSING DISPLAY, LP35	Include fan in parts kit Cap foam and bumper pre-installed at kitting
E01	1	KEYPAD, LP35,…	Various configs. Refer to configuration assembly diagram in section 9.



1. Disassemble the case as described in Disassembling the Case.
2. Remove the interface PCBA as described in Removing the Interface PCBA, omitting steps already completed. Retain for reuse.
3. Disconnect the keypad flex from the keypad and remove the keypad flex. Retain for reuse.
4. Remove the keypad as described in Removing the Keypad, step 4. Discard.
5. Remove the USB connector as described in Removing the USB Connector, steps 7-8. Retain for reuse.
6. Remove the speaker as described in Removing the Speaker, omitting steps already completed. Retain speaker and speaker bracket for reuse.
7. Remove the rotary switch as described in Removing the Rotary Switch, omitting steps already. Retain the rotary switch for reuse. Discard the o-ring seal.
8. Remove the video display flex as described in Removing the Video Display Flex, omitting steps already completed. Retain for reuse.
9. Remove the display power cable as described in Removing the Display Power Cable, omitting steps already completed. Retain for reuse.



10. Lay the new display and front housing on a flat surface.
11. Install readiness indicator beacon as described in Installing the Readiness Indicator Beacon, steps 1-3.
12. Install USB connector as described in Installing the USB Connector, steps 1-2.
13. Install keypad as described in Installing the Keypad, steps 2-6.
14. Connect keypad flex to keypad connector, if not already completed.
15. Install rotary switch as described in Installing the Rotary Switch, steps 1-3, 5.
16. Install speaker as described in Installing the Speaker, steps 1-3.
17. Install display power cable as described in Installing the Display Power Cable, steps 1-5.
18. Install video display flex as described in Installing the Video Display Flex, steps 1-2.
19. Install fan as described in Installing the Fan, steps 1-5.
20. Install interface PCBA as described in Installing the Interface PCBA, steps 1-14.
21. Assemble the case as described in Assembling the Case.
22. Execute the LIFEPAK 35 PIP.

Rear Housing Parts

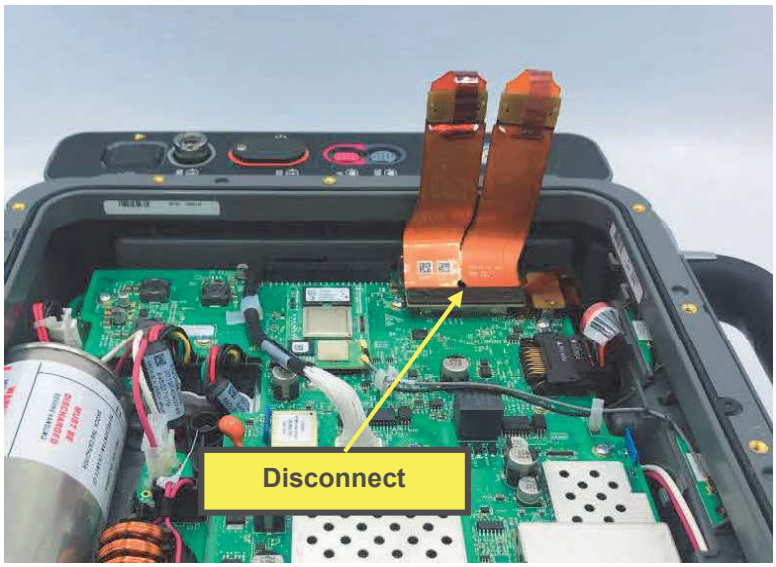
The following procedures describe replacement of parts within the rear housing subassembly.

System Flex Replacement

The parts listed in the following table will be required to complete this repair. Reference Defib Assembly.

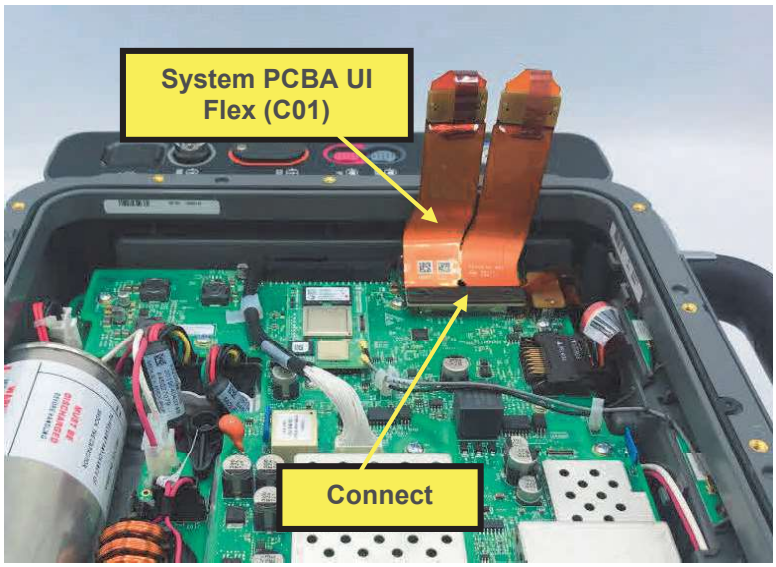
SERVICE BOM REF	QTY	DESCRIPTION	NOTES
C01	1	FLEX, UI, SYSTEM PCBA, LSEM, LP35	
F02	17	SCREW, MACH, PANHEAD, PHDRV, SS, NYLOK, 6-32 X .312	
M16	1	SEAL, HOUSING, MAIN, LPQ5, LPT5	

Removing the System Flex



1. Disassemble the case as described in Disassembling the Case.
2. Disconnect system flex from system PCBA and remove system flex.

Installing the System Flex



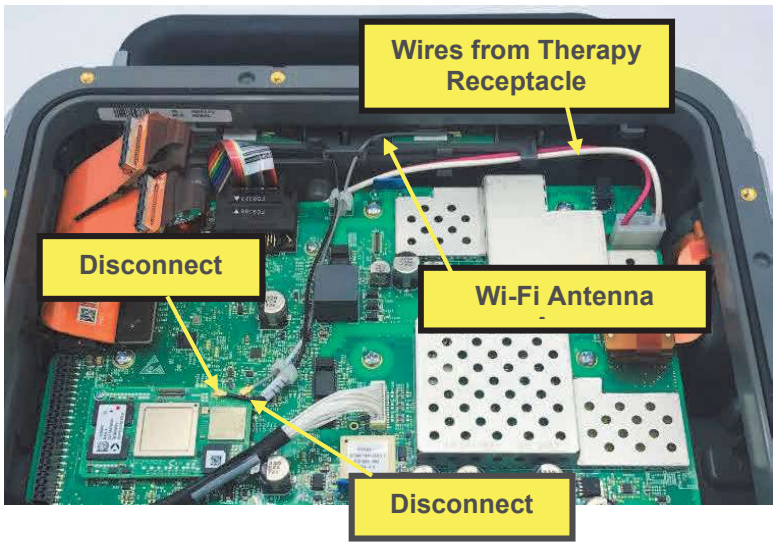
1. Connect system flex connector to system PCBA J206.
2. Assemble the case as described in Assembling the Case.
3. Execute the LIFEPAK 35 PIP.

Wi-Fi Antenna Replacement

The parts listed in the following table will be required to complete this repair. Reference Defib Assembly.

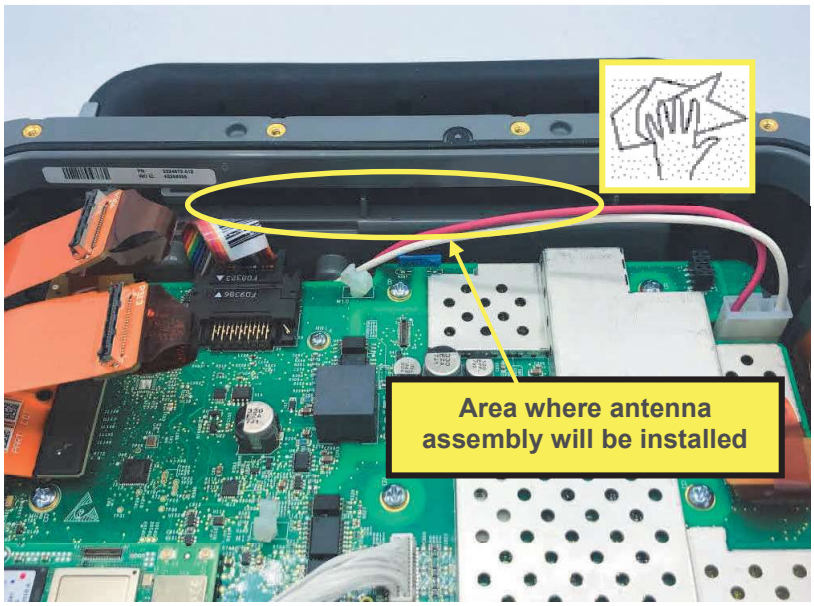
SERVICE BOM REF	QTY	DESCRIPTION	NOTES
E05	1	ASSY, ANTENNA, WLAN, LP35	
F02	17	SCREW, MACH, PANHEAD, PHDRV, SS, NYLOK, 6-32 X .312	
M16	1	SEAL, HOUSING, MAIN, LPQ5, LPT5	

Removing the Wi-Fi Antenna

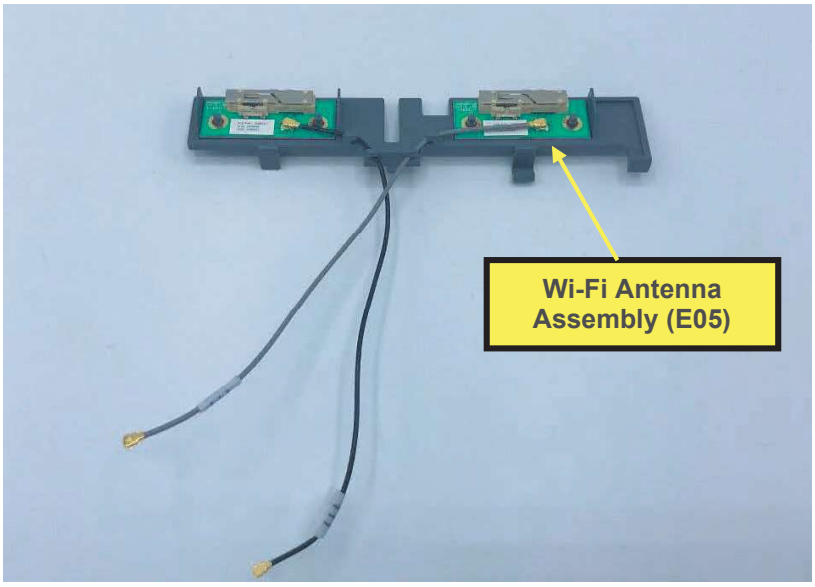


1. Disassemble the case as described in Disassembling the Case.
2. Disconnect 2 antenna wires from system PCBA. Optional antenna connector removal tool may be used.
3. Remove therapy receptacle wires from routing features in Wi-Fi antenna bracket.
4. Remove Wi-Fi antenna assembly from rear housing, pulling up and out, using a prying tool as required to break adhesive bond.

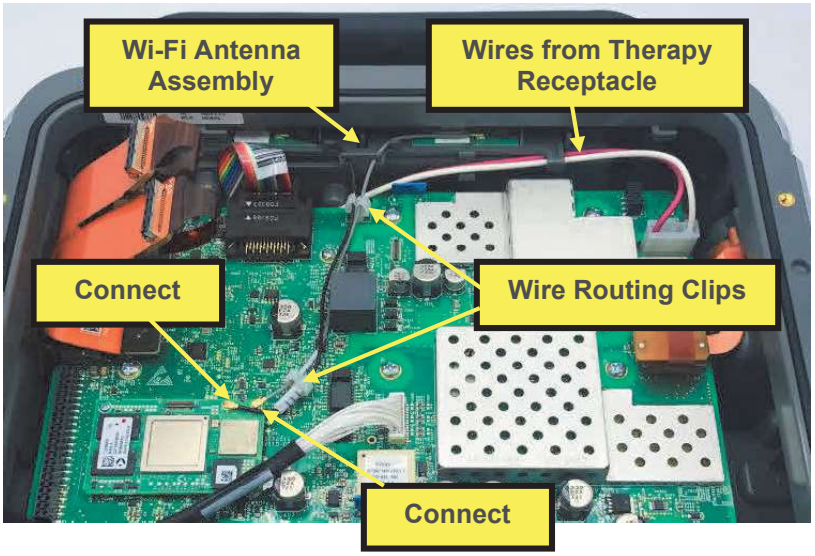
Installing the Wi-Fi Antenna



1. Clean any residual adhesive, and dirt or debris from the rear housing in the area where the Wi-Fi antenna assembly will be installed.



2. Remove 2 adhesive liners from adhesives (not shown) on the back side of the Wi-Fi antenna assembly.



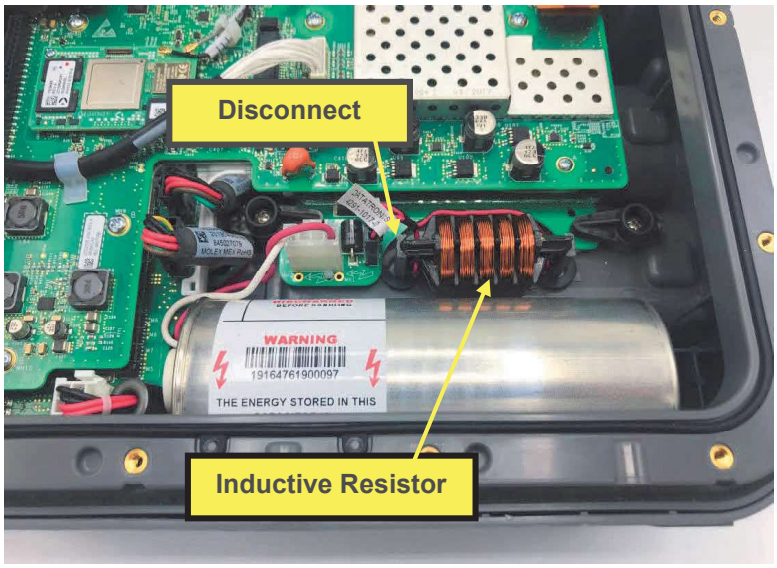
3. Install Wi-Fi antenna assembly onto the rear housing, pressing adhesives firmly against surface of rear housing.
4. Route antenna wires through clips on system PCBA and connect to the system PCBA SOM connectors—dark colored wire (left-hand antenna in picture) to P1, and light colored wire (right-hand antenna in picture) to P2.
5. Route wires from therapy receptacle through the Wi-Fi antenna bracket as shown.
6. Assemble the case as described in Assembling the Case.
7. Execute the LIFEPAK 35 PIP.

Inductive Resistor Replacement

The parts listed in the following table will be required to complete this repair. Reference Defib Assembly.

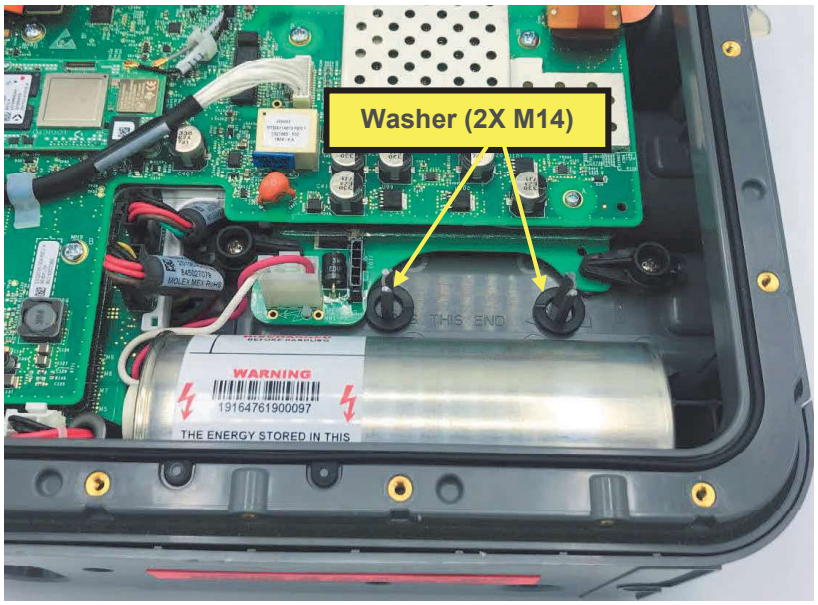
SERVICE BOM REF	QTY	DESCRIPTION	NOTES
E04	1	INDUCTIVE RESISTOR-5 OHM, LP35	
F02	17	SCREW, MACH, PANHEAD, PHDRV, SS, NYLOK, 6-32 X .312	
M16	1	SEAL, HOUSING, MAIN, LPQ5, LPT5	

Removing the Inductive Resistor

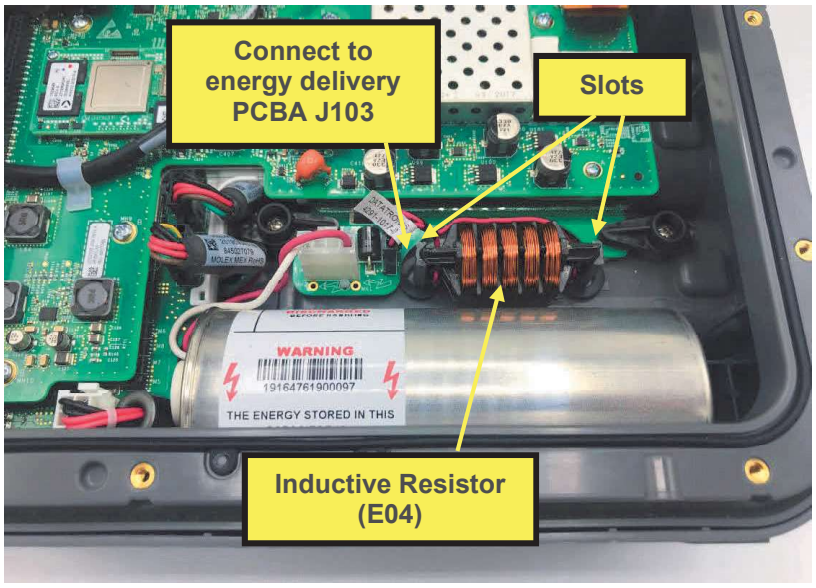


1. Disassemble the case as described in Disassembling the Case.
2. Lift inductive resistor out of position, disconnect the connector, and remove the inductive resistor.

Installing the Inductive Resistor



1. Ensure 2 washers are in place where shown.



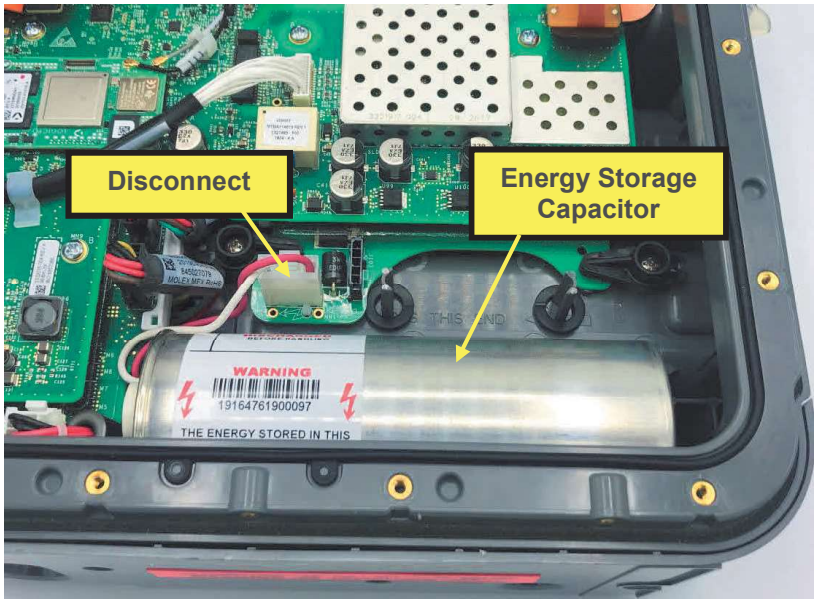
2. Connect and install inductive resistor, sliding into slots in rear housing, and oriented with solder connections facing down.
3. Assemble the case as described in Assembling the Case.
4. Execute the LIFEPAK 35 PIP.

Energy Storage Capacitor Replacement

The parts listed in the following table will be required to complete this repair. Reference Defib Assembly.

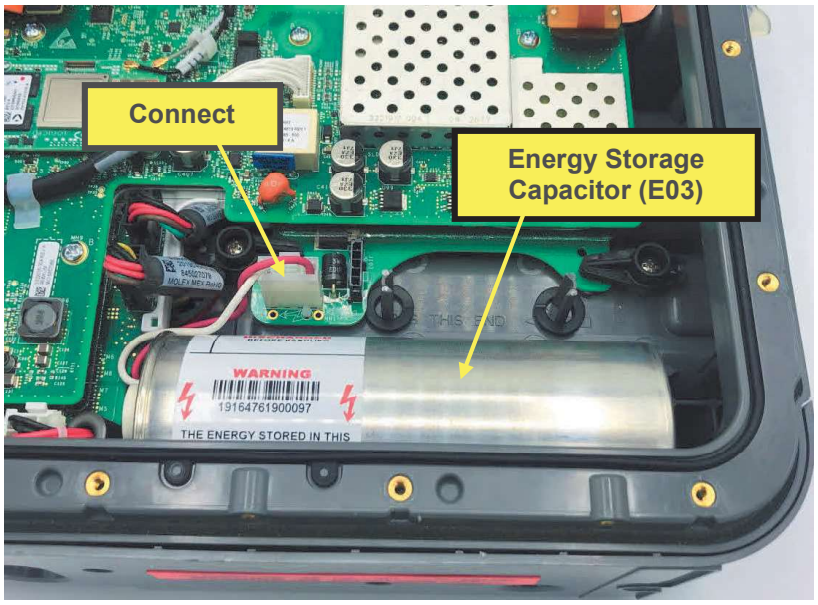
SERVICE BOM REF	QTY	DESCRIPTION	NOTES
E03	1	CAPACITOR, ENERGY STORAGE, LP35	
F02	17	SCREW, MACH, PANHEAD, PHDRV, SS, NYLOK, 6-32 X .312	
M16	1	SEAL, HOUSING, MAIN, LPQ5, LPT5	

Removing the Energy Storage Capacitor



1. Disassemble the case as described in Disassembling the Case.
2. Remove inductive resistor as described in Removing the Inductive Resistor, omitting steps already completed.
3. Disconnect capacitor connector.
4. Remove the capacitor by lifting it up, out of the rear housing.

Installing the Energy Storage Capacitor



1. If present, remove jumper from capacitor connector. The jumper may be discarded.
2. Place the energy storage capacitor into the rear housing with leads at left.
3. Connect capacitor connector to energy delivery PCBA P103.
4. Install inductive resistor as described in Installing the Inductive Resistor.
5. Assemble the case as described in Assembling the Case.
6. Execute the LIFEPAK 35 TCP – defibrillator energy tests.
7. Execute the LIFEPAK 35 PIP.

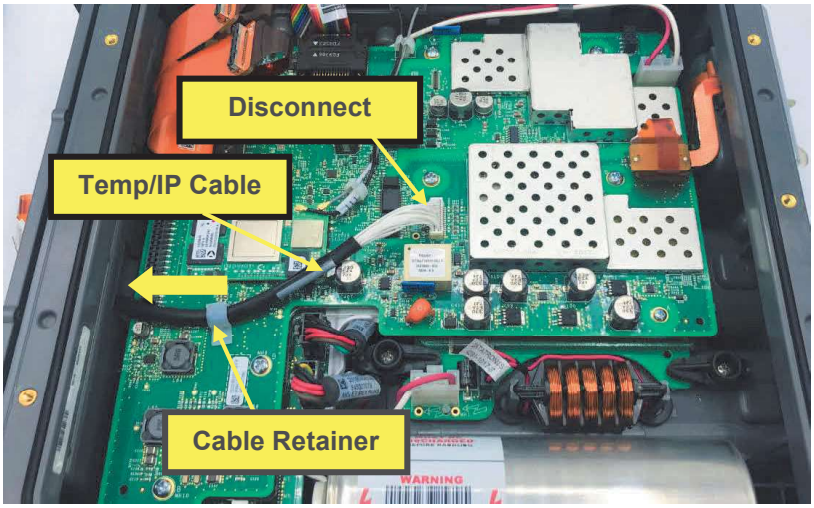
Temperature/Invasive Pressure (Temp/IP) Cable Replacement

Note that configurations not equipped with temp/IP monitoring do not have a temp/IP cable.

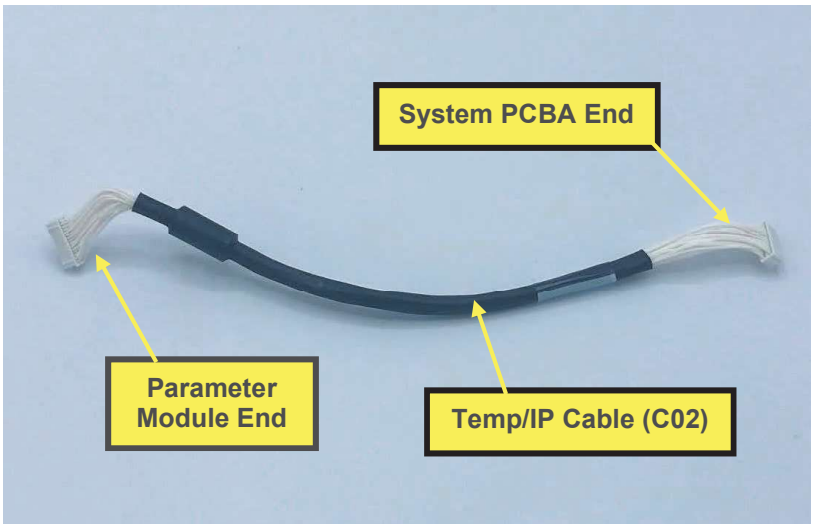
The parts listed in the following table will be required to complete this repair. Reference Defib Assembly.

SERVICE BOM REF	QTY	DESCRIPTION	NOTES
C02	1	CABLE ASSY, TEMP-IP, LP35	
F02	17	SCREW, MACH, PANHEAD, PHDRV, SS, NYLOK, 6-32 X .312	
F04	2	SCREW-M, PH, NYLOK, CS, 4-40, .250L	
F08	8	SCREW-M,CS,Z,PH, NYLOCK,4-40 X .312L	
M10	1	COVER, CO2 DOOR, LPQ5	
F03	1	SCREW, BUTTONHEAD, TORX, #4-40 X LG 0.25 IN	
M16	1	SEAL, HOUSING, MAIN, LPQ5, LPT5	
M11	2	COVER, SCREW, REAR, PARAMETER MODULE, LP35	
M12	2	COVER, SCREW, ENDS, PARAMETER MODULE, LP35	
L06	1	LABEL, PMOD,…LP35	Various configs.

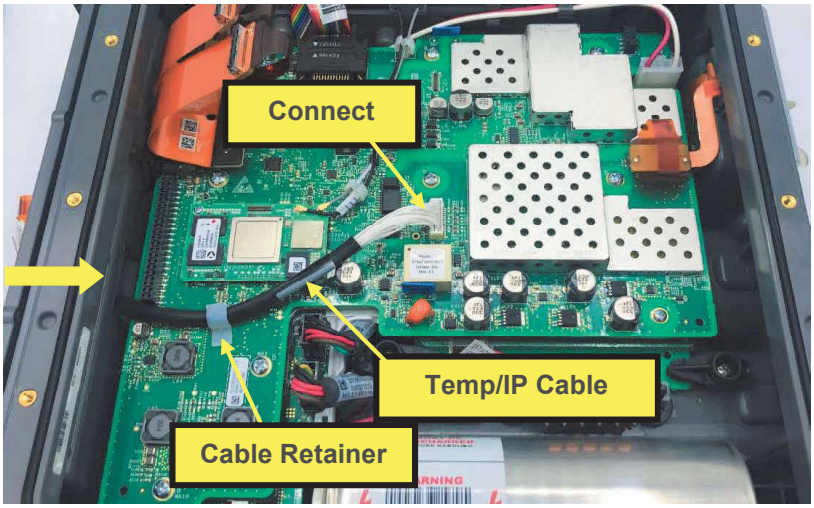
Removing the Temp/IP Cable



1. Remove the parameter module as described in Removing the Parameter Module.
2. Disassemble the case as described in Disassembling the Case.
3. Disconnect temp/IP cable from system PCBA.
4. Pull back the cable retainer, and remove the cable from under the retainer.
5. Slide the temp/IP cable, from the inside of the device, out through the hole in the side of the rear housing.

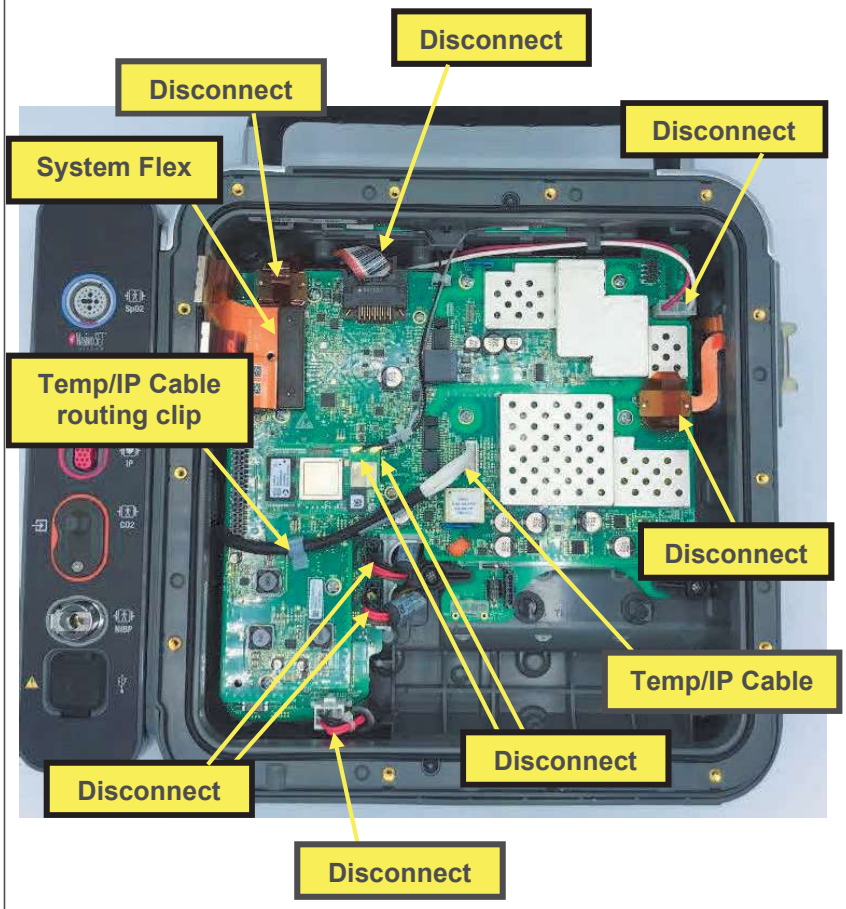


Note the end-to-end orientation of the temp/IP cable, shown at left.

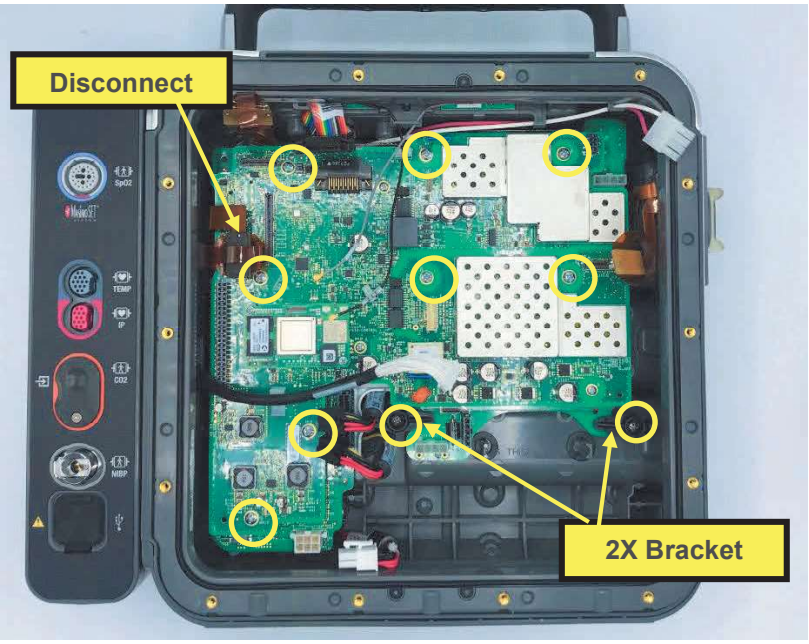


1. Install the temp/IP cable, inserting the system PCBA end into the device through the hole in the side of the rear housing.
2. Connect the temp/IP cable to system PCBA J211.
3. Pull the cable retainer back, and place the cable under the retainer.
4. Assemble the case as described in Assembling the Case.
5. Install the parameter module as described in Installing the Parameter Module.
6. Execute the LIFEPAK 35 PIP.

Removing the PCBA Stack

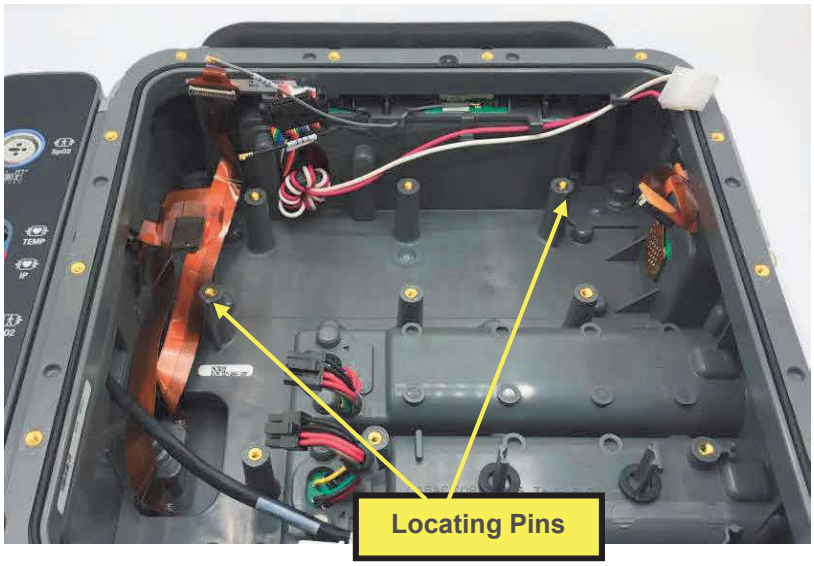


1. Disassemble the case as described in Disassembling the Case.
2. Remove inductive resistor as described in Removing the Inductive Resistor, omitting steps already completed.
3. Remove the energy storage capacitor as described in Removing the Energy Storage Capacitor, omitting steps already completed.
4. Disconnect and remove the system flex as described in Removing the System Flex, omitting steps already completed.
5. Disconnect the access port flex from the system PCBA.
6. Disconnect the therapy ribbon cable from the system PCBA.
7. Disconnect the therapy connector from the energy delivery PCBA.
8. Disconnect the ECG flex from the system PCBA.
9. Disconnect the 2 Wi-Fi antenna cables from the system PCBA.
10. Disconnect the AC power connector from the energy delivery PCBA.
11. Disconnect the 2 battery connectors from the energy delivery PCBA.
12. If present, disconnect temp/IP cable connector, and remove cable from under routing clip.



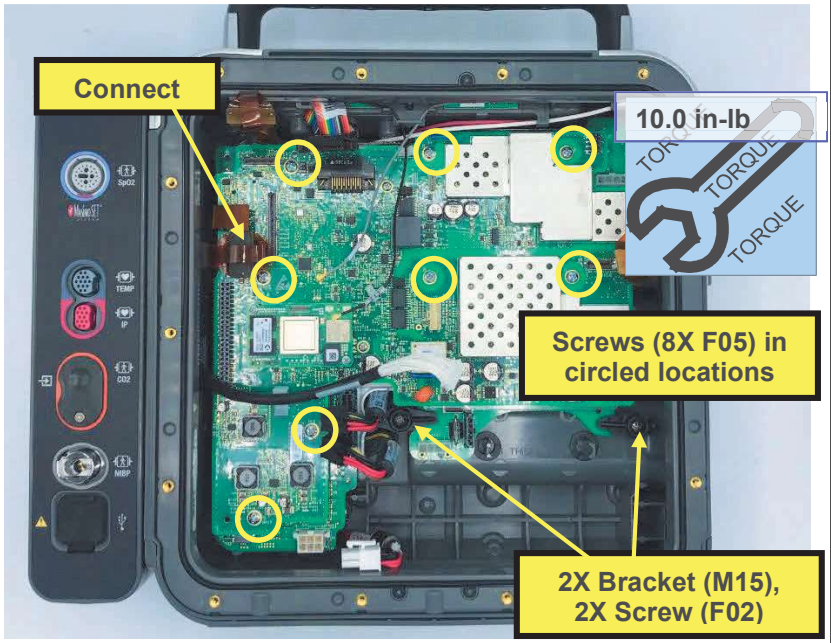
13. Disconnect the cell modem flex from the system PCBA (hidden from view in previous steps).
14. Remove 2 screws securing energy delivery PCBA brackets, using a driver with a P-2 bit.
15. Remove 2 energy delivery PCBA brackets. Retain for reuse.
16. Remove 8 screws in locations shown, using a driver with a P-2 bit.
17. Retract and stow cables and connectors to allow space for removal of board stack.
18. Carefully lift PCBA stack out of housing.

Installing the PCBA Stack

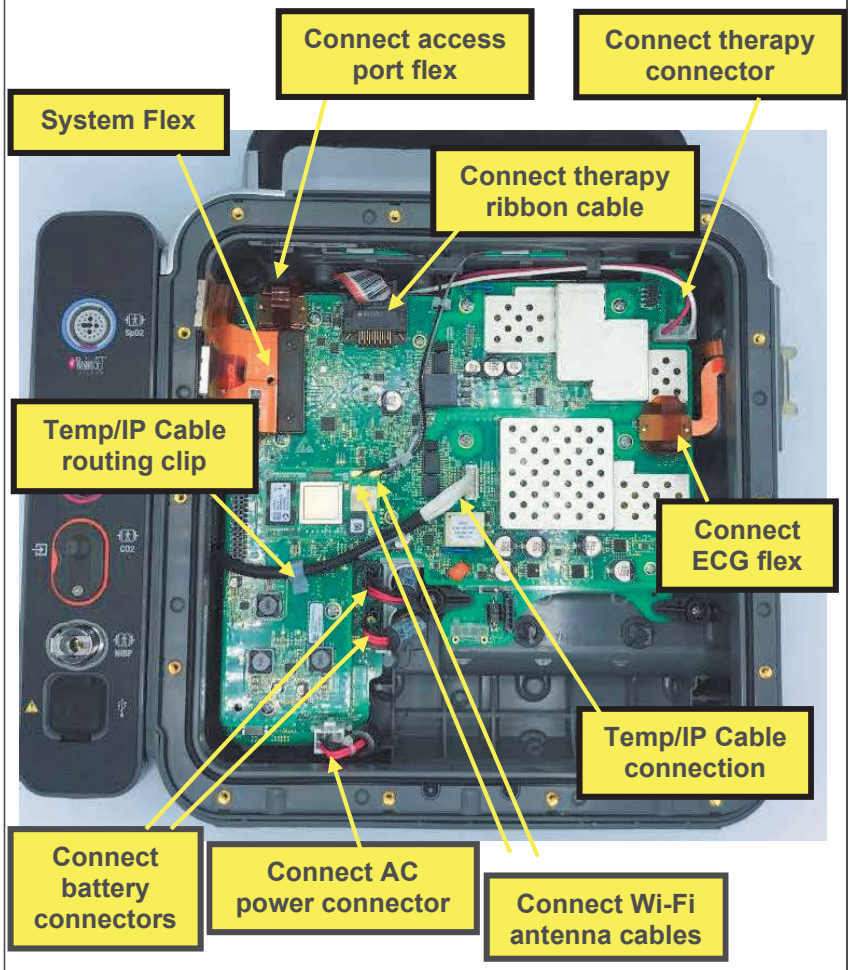


1. Retract and stow all cables and flexes to allow space for PCBA stack installation.

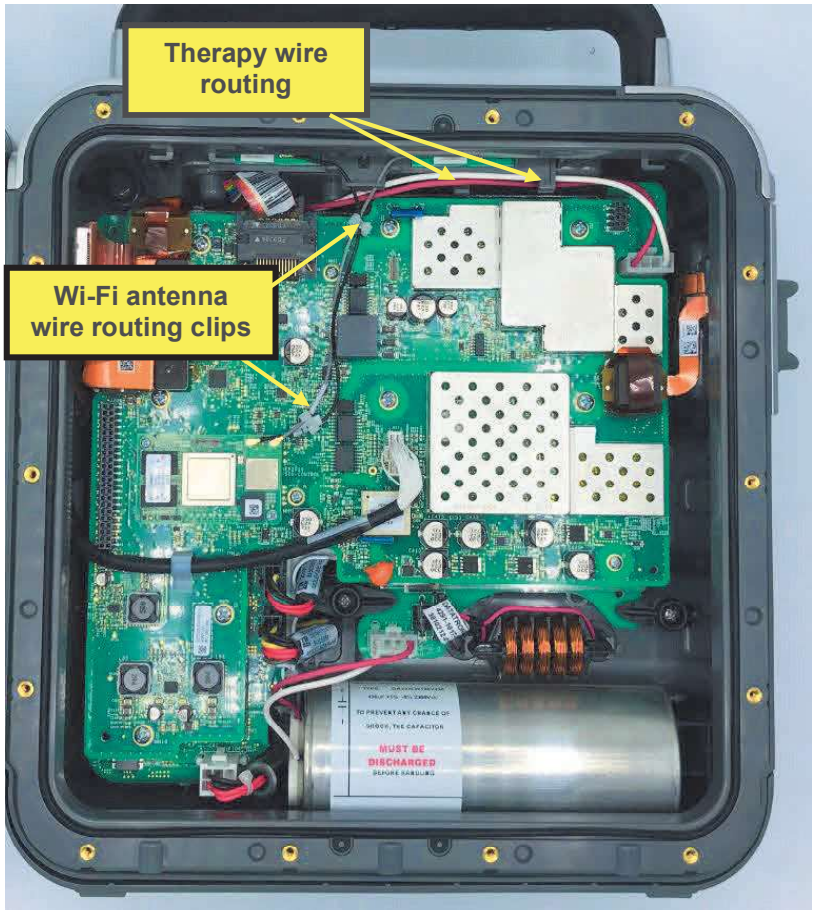
Note locating pin locations next to two screw bosses.



2. Carefully place the PCBA stack into the rear housing, aligning the screw holes, and engaging the locating pins (shown above) with the holes in the energy delivery PCBA. The PCBA stack should lay flat on the housing screw bosses.
3. Install 8 screws in locations shown, using a torque driver with a P-2 bit.
4. Install 2 energy delivery PCBA brackets using 1 screw for each, and a torque driver with a P-1 bit.
5. Connect defib-to-pmod flex to system PCBA J207.



6. Connect the access port flex to system PCBA J204.
7. Connect the therapy ribbon cable to system PCBA J201.
8. Connect the therapy connector to energy delivery PCBA P101.
9. Connect the ECG flex to system PCBA J203.
10. Connect the 2 Wi-Fi antenna cables to the system PCBA SOM connectors—dark colored wire (left-hand antenna in picture) to P1, and light-colored wire (right-hand antenna in picture) to P2.
11. Connect the AC power connector to energy delivery PCBA P106.
12. Connect the 2 battery connectors to energy delivery PCBA P104 and P105.
13. Connect temp/IP cable connector, if equipped, to system PCBA J211, and place cable under routing clip.
14. Install system flex as described in Installing the System Flex, step 1.



15. Ensure Wi-Fi antenna wires are routed through clips as shown.
16. Ensure therapy wires are routed within wi-fi antenna bracket routing features as shown.

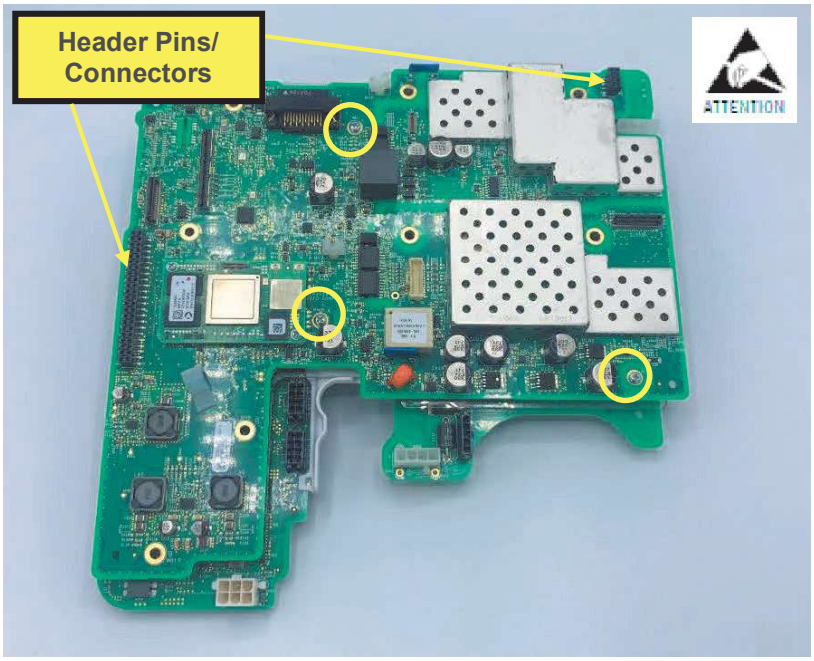
System PCBA Replacement

Note: This repair may be performed only by Stryker service technicians.

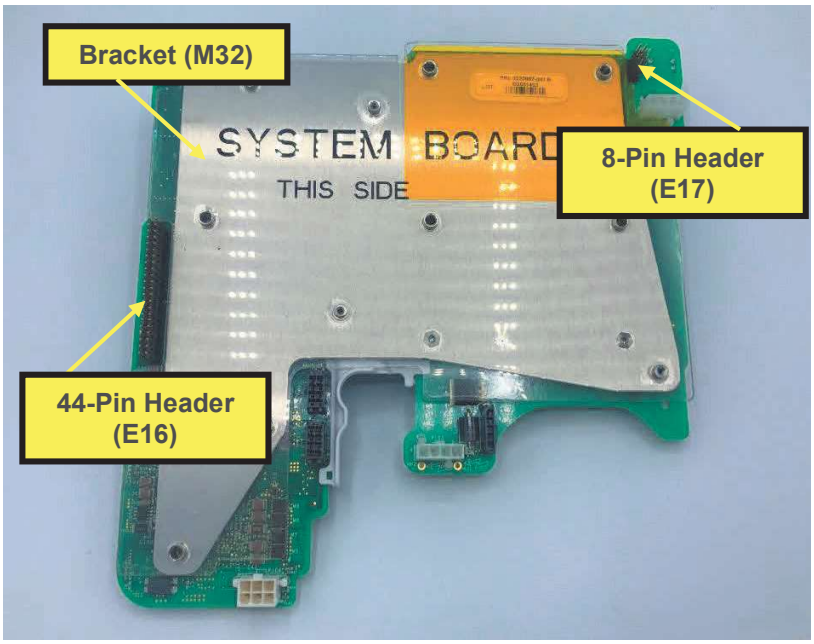
The parts listed in the following table will be required to complete this repair. Reference Defib Assembly.

SERVICE BOM REF	QTY	DESCRIPTION	NOTES
K01	1	KIT, REPAIR, SYSTEM PCBA, LP35	

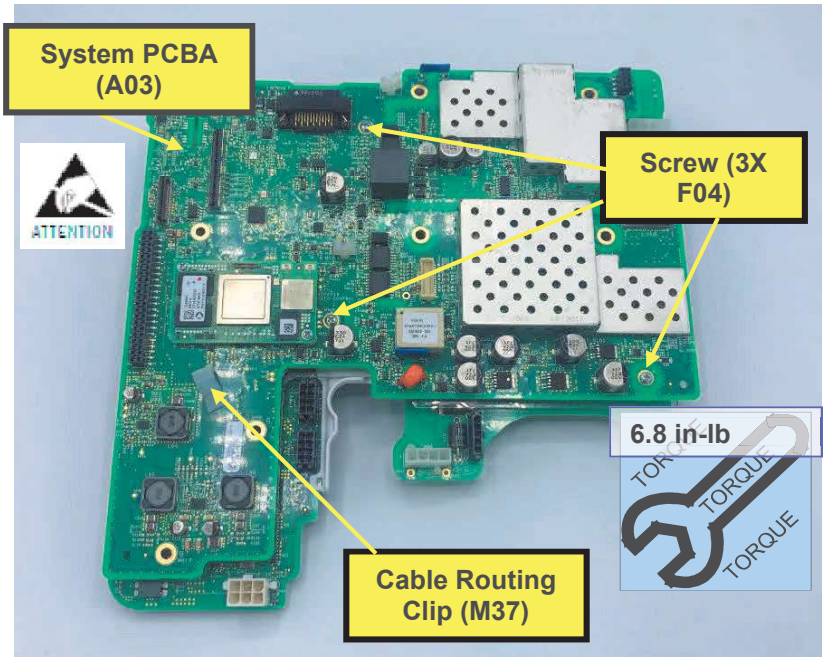
Removing the System PCBA



1. Disassemble the case as described in Disassembling the Case.
2. Remove inductive resistor as described in Removing the Inductive Resistor, omitting steps already completed.
3. Remove energy storage capacitor as described in Removing the Energy Storage Capacitor, omitting steps already completed.
4. Remove the PCBA stack as described in Removing the PCBA Stack, omitting steps already completed.
5. Place the PCBA stack on a flat surface, with the system PCBA face-up.
6. Remove 3 screws, using a driver with a P-1 bit.
7. Separate the system PCBA from the rest of the PCBA stack, disengaging the header pins and connectors, by gently pulling apart near header pin/connector locations shown.
8. Remove 2 header pins, and discard.



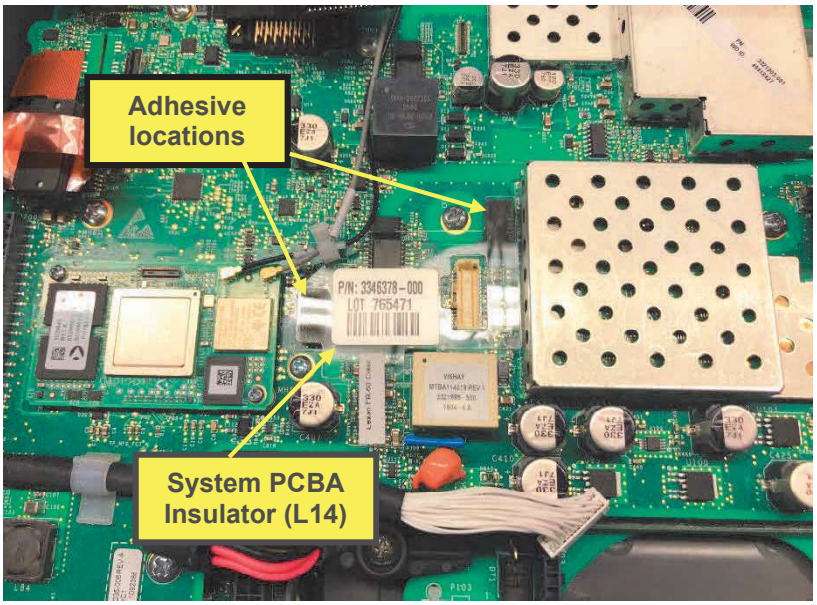
1. Place energy delivery PCBA and bracket on a flat surface.
2. Install 8-pin header into connector on energy delivery PCBA, pressing in to fully engage the pins.
3. Install 44-pin header into connector on energy delivery PCBA, pressing in to fully engage the pins.



4. Place system PCBA on PCBA stack, aligning header pins with holes.
5. Assemble PCBAs together, gently pressing near headers until pins are fully engaged and board is bottomed on screw bosses.
6. Install 3 screws, using a torque driver with a P-1 bit.
7. Install the PCBA stack as described in Installing the PCBA Stack, steps 1-12, 14-16.

Steps 8-10 are only required for devices configured with temp/IP.

8. Install temp/IP cable routing clip by pressing fully into hole in PCB until it snaps in.
9. Remove 2 adhesive liners from insulator, and apply insulator to system PCBA as shown below, pressing firmly in place.
10. Connect temp/IP cable connector, if equipped, to system PCBA J211, and place cable under routing clip.



11. Install energy storage capacitor as described in Installing the Energy Storage Capacitor, steps 1-3.
12. Install inductive resistor as described in Installing the Inductive Resistor.
13. Assemble the case as described in Assembling the Case.
14. Restore device software and settings using LIFENET Device Agent in Service Repair Mode.
15. Execute the LIFEPAK 35 TCP – defibrillator energy tests.
16. Execute the LIFEPAK 35 PIP.

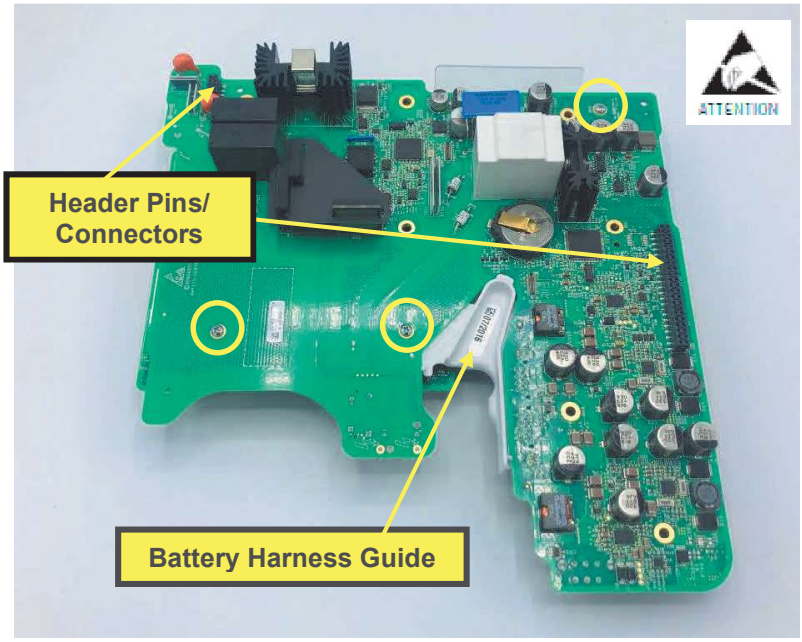
Energy Delivery PCBA Replacement

Note: This repair may be performed only by Stryker service technicians.

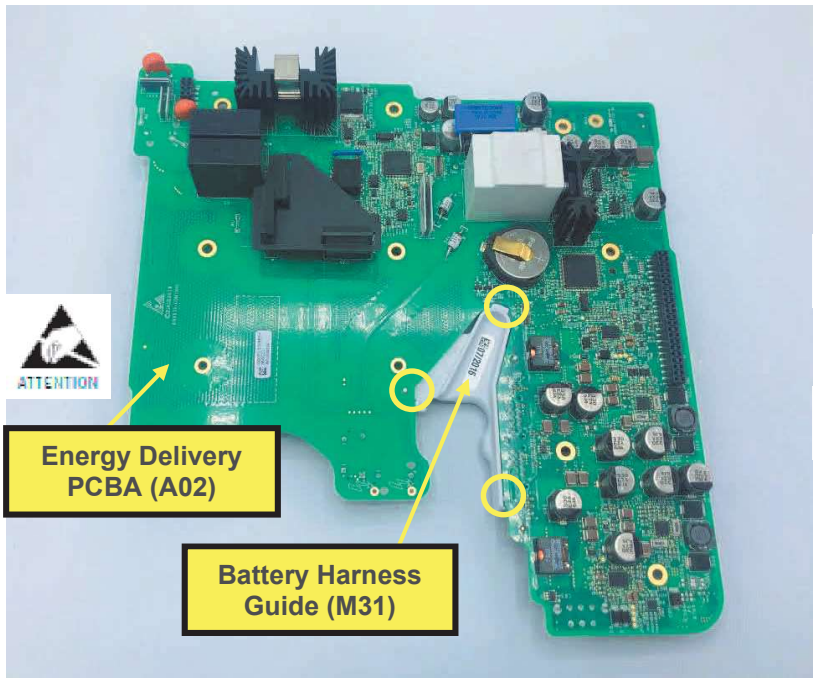
The parts listed in the following table will be required to complete this repair. Reference Defib Assembly.

SERVICE BOM REF	QTY	DESCRIPTION	NOTES
K02	1	KIT, REPAIR, ENERGY DELIVERY PCBA, LP35	

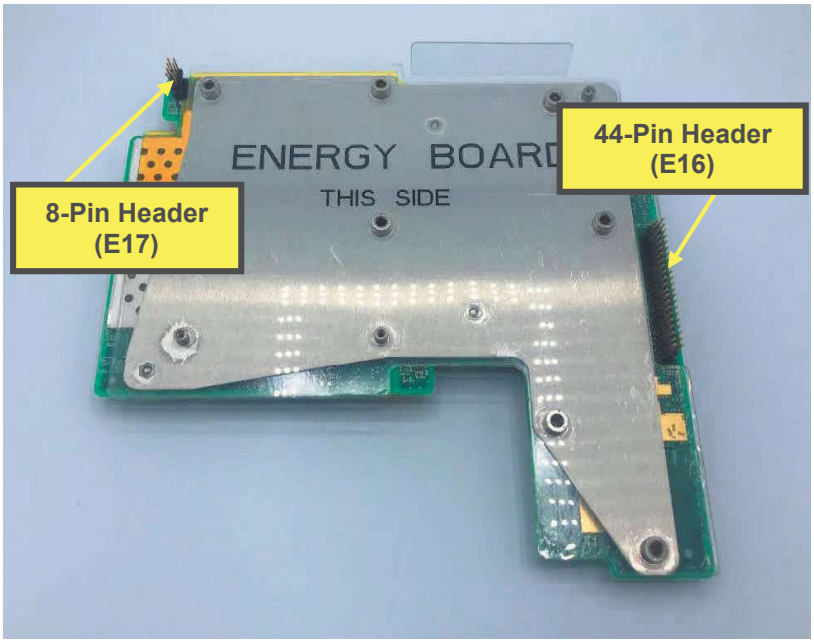
Removing the Energy Delivery (ED) PCBA



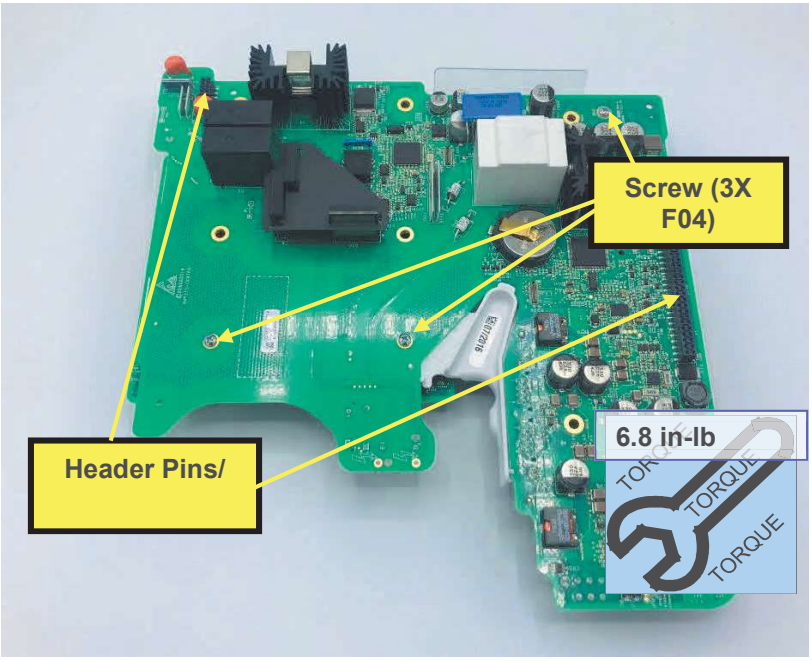
1. Disassemble the case as described in Disassembling the Case.
2. Remove inductive resistor as described in Removing the Inductive Resistor, omitting steps already completed.
3. Remove energy storage capacitor as described in Removing the Energy Storage Capacitor, omitting steps already completed.
4. Remove the PCBA stack as described in Removing the PCBA Stack, omitting steps already completed.
5. Place the PCBA stack on a flat surface, with the ED PCBA face-up.
6. Remove 3 screws, using a driver with a P-1 bit.
7. Separate the ED PCBA from the rest of the PCBA stack, disengaging the header pins and connectors, by gently pulling apart near header pin/connector locations shown.
8. Remove 2 header pins, and discard.
9. Remove the battery harness guide from the ED PCBA. Retain for reuse.



1. Install the battery harness guide onto the ED PCBA as shown. Ensure that pins and tabs are engaged with the PCB at 3 locations shown.



2. Place system PCBA and bracket on a flat surface.
3. Install 8-pin header into connector on system PCBA, pressing in to fully engage the pins.
4. Install 44-pin header into connector on system PCBA, pressing in to fully engage the pins.

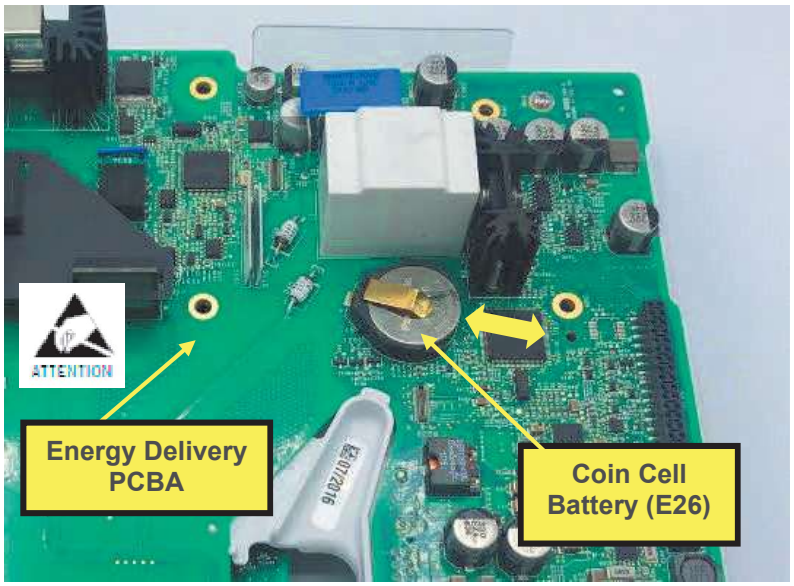


5. Place ED PCBA on PCBA stack, aligning header pins with holes.
6. Assemble PCBAs together, gently pressing near headers until pins are fully engaged.
7. Install 3 screws, using a torque driver with a P-1 bit.
8. Install the PCBA stack as described in Installing the PCBA Stack.
9. Install energy storage capacitor as described in Installing the Energy Storage Capacitor, steps 1-3.
10. Install inductive resistor as described in Installing the Inductive Resistor.
11. Assemble the case as described in Assembling the Case.
12. Restore device software and settings using LIFENET device agent in Service Repair Mode.
13. Execute the LIFEPAK 35 TCP – defibrillator energy tests.
14. Execute the LIFEPAK 35 PIP.

Coin Cell Battery Replacement

The parts listed in the following table will be required to complete this repair.

SERVICE BOM REF	QTY	DESCRIPTION	NOTES
E26	1	BATTERY-PRIMARY,LITH,3V,COIN, 255MAH,23MM,ROHS	
F02	19	SCREW, MACH, PANHEAD, PHDRV, SS, NYLOK, 6-32 X .312	
F04	3	SCREW-M, PH, NYLOK, CS, 4-40, .250L	
F05	8	SCREW, MACH, PANHD, PHDRV, NYLOK, 6-32 X .750, CS, ZN	
M16	1	SEAL, HOUSING, MAIN, LPQ5, LPT5	



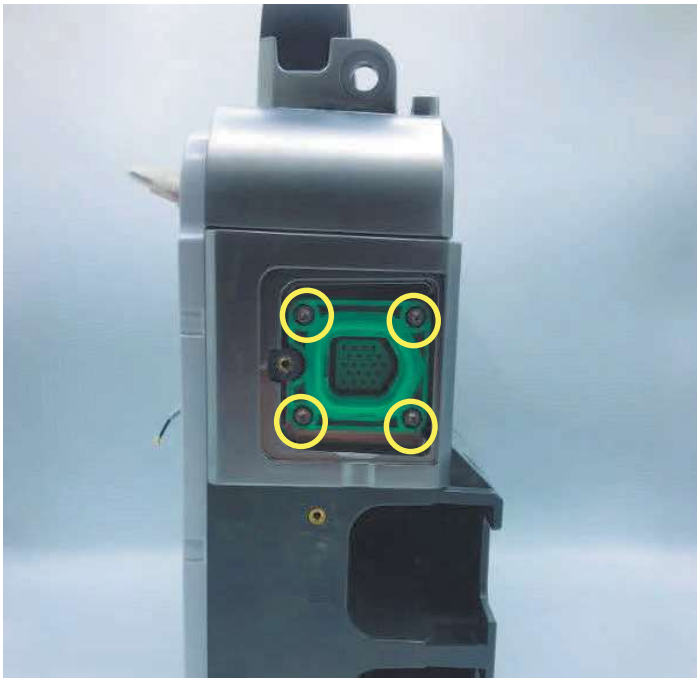
1. Remove the PCBA stack as described in Removing the PCBA Stack.
2. Set the board stack, ED PCBA face-up, on a flat surface.
3. Carefully remove the coin cell battery from the socket on the energy delivery PCBA, by lifting slightly at the open side of the socket, and sliding out. A soft pry tool may be used to lift the battery.
4. Install new coin cell battery under the + side contact, from the open side of the socket, with the + side facing out, until it is contained in the socket.
5. Install PCBA stack as described in Installing the PCBA Stack.
6. Install energy storage capacitor as described in Installing the Energy Storage Capacitor steps 1-3.
7. Install inductive resistor as described in Installing the Inductive Resistor, steps 1-2.
8. Assemble the case as described in Assembling the Case.
9. Execute the LIFEPAK 35 PIP.

ECG Connector Replacement

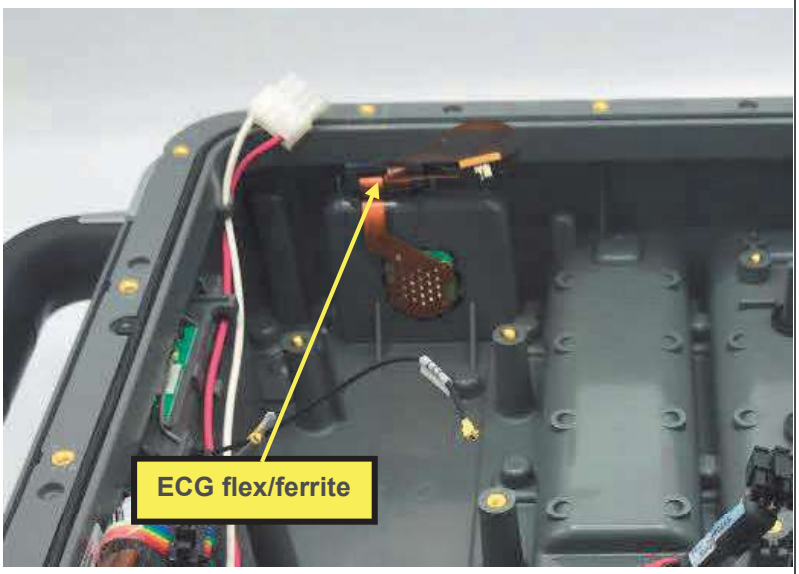
The parts listed in the following table will be required to complete this repair. Reference Rear Housing Assembly.

SERVICE BOM REF	QTY	DESCRIPTION	NOTES
K09	1	KIT, REPAIR, ECG CONNECTOR, LP35	

Removing the ECG Connector



1. Disassemble the case as described in Disassembling the Case.
2. Remove inductive resistor as described in Removing the Inductive Resistor, omitting steps already completed.
3. Remove energy storage capacitor as described in Removing the Energy Storage Capacitor, omitting steps already completed.
4. Remove the PCBA stack as described in Removing the PCBA Stack, omitting steps already completed.
5. Remove the ECG guard as described in Removing the ECG Guard.
6. Remove 4 screws, using a driver with a T-15 bit.

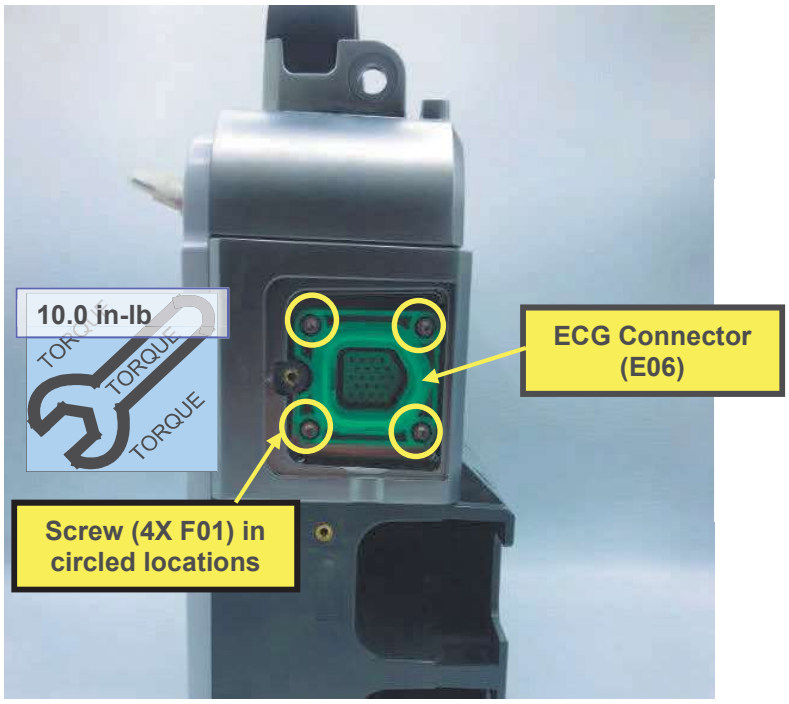


7. From inside the rear housing, pull the flex/ferrite out from under the housing flange.

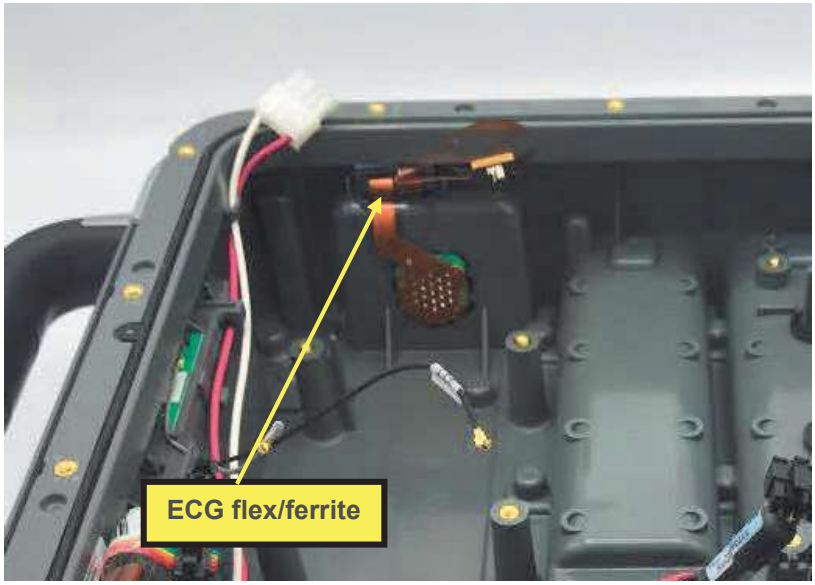
8. Remove the ECG connector, pulling the flex, ferrite and connector through the hole in the housing.
9. Remove the ECG housing plate. Retain for reuse.

Installing the ECG Connector

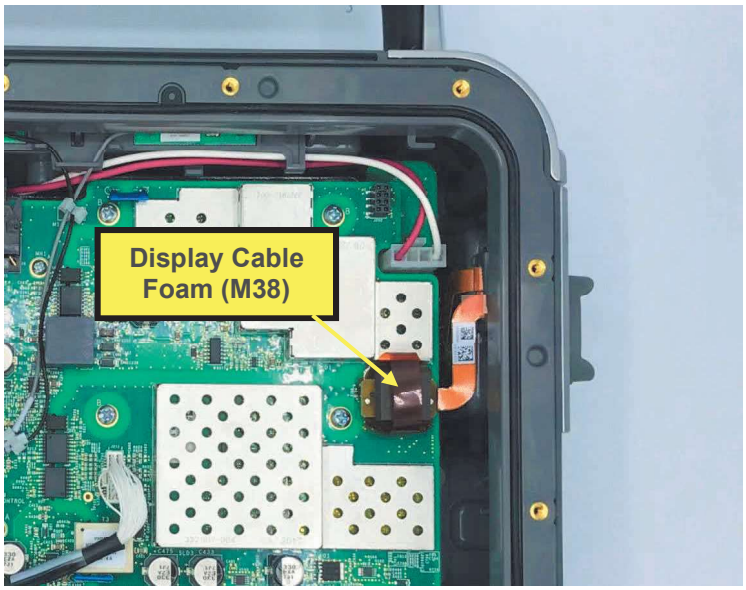
1. Install the ECG housing plate.



2. Install the ECG connector, routing the connector, flex, and ferrite through the hole in the housing.
3. Install 4 screws, using a torque driver with a T-15 bit.



4. Push the flex/ferrite into the cavity under the housing flange, compressing the foam attached to the ferrite.
5. Install the ECG guard as described in Installing the ECG Guard.
6. Install the PCBA stack as described in Installing the PCBA Stack.
7. Remove adhesive liner, and apply display cable foam to connector, under the pull loop, pressing firmly into place, as shown below.
8. Install energy storage capacitor as described in Installing the Energy Storage Capacitor steps 1-3.
9. Install inductive resistor as described in Installing the Inductive Resistor.
10. Assemble the case as described in Assembling the Case.
11. Execute the LIFEPAK 35 PIP.

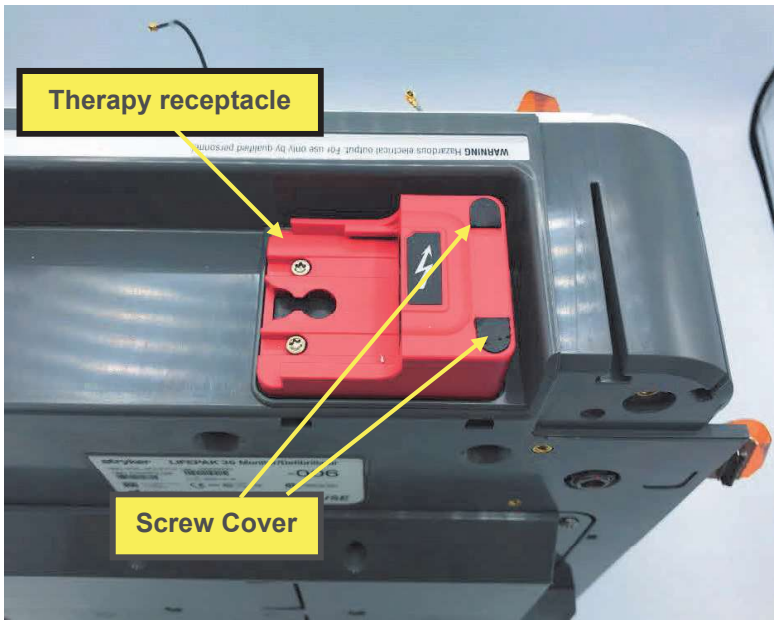


Therapy Receptacle Replacement

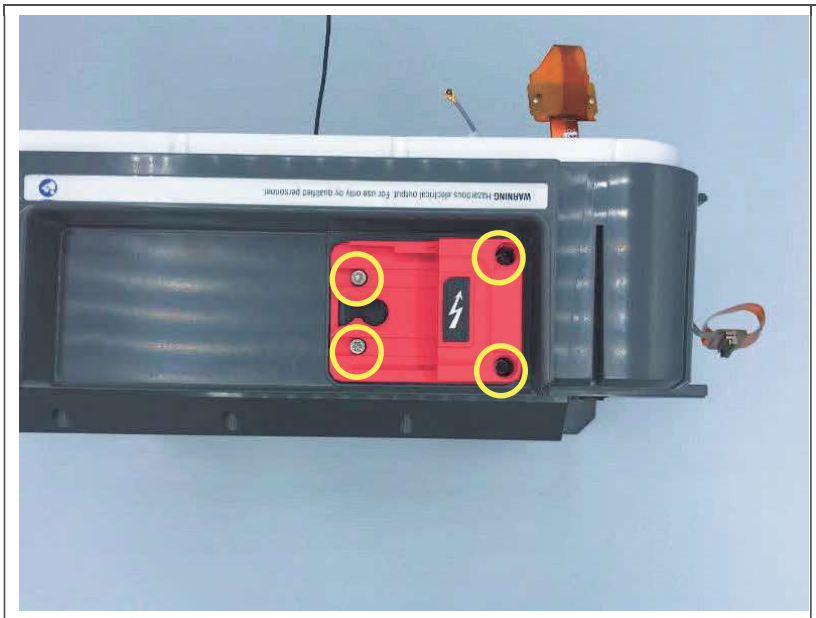
The parts listed in the following table will be required to complete this repair. Reference Rear Housing Assembly.

SERVICE BOM REF	QTY	DESCRIPTION	NOTES
K07	1	KIT, REPAIR, THERAPY RECEPTACLE, LP35	

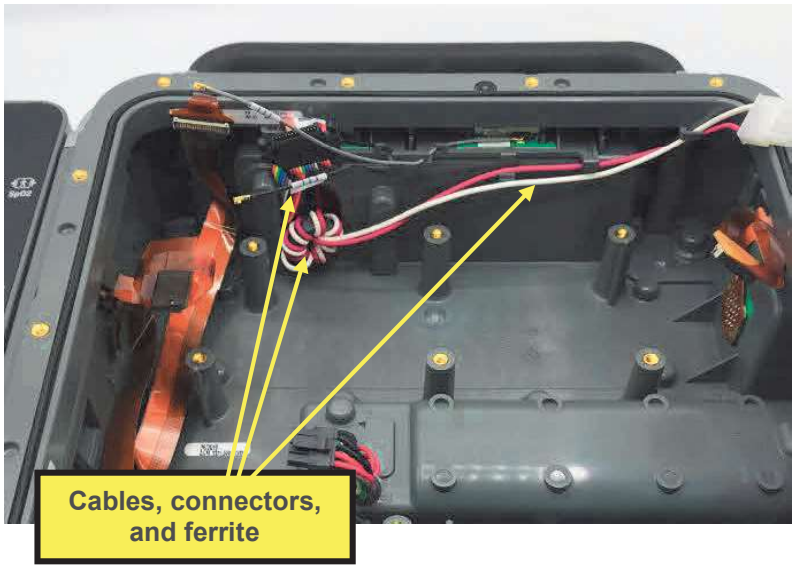
Removing the Therapy Receptacle



1. Disassemble the case as described in Disassembling the Case.
2. Remove inductive resistor as described in Removing the Inductive Resistor, omitting steps already completed.
3. Remove energy storage capacitor as described in Removing the Energy Storage Capacitor, omitting steps already completed.
4. Remove the PCBA stack as described in Removing the PCBA Stack.
5. Remove the handle assembly as described in Removing the Handle, steps 1-5
6. Remove 2 screw covers by carefully prying out with a pointed tool. Discard screw covers.



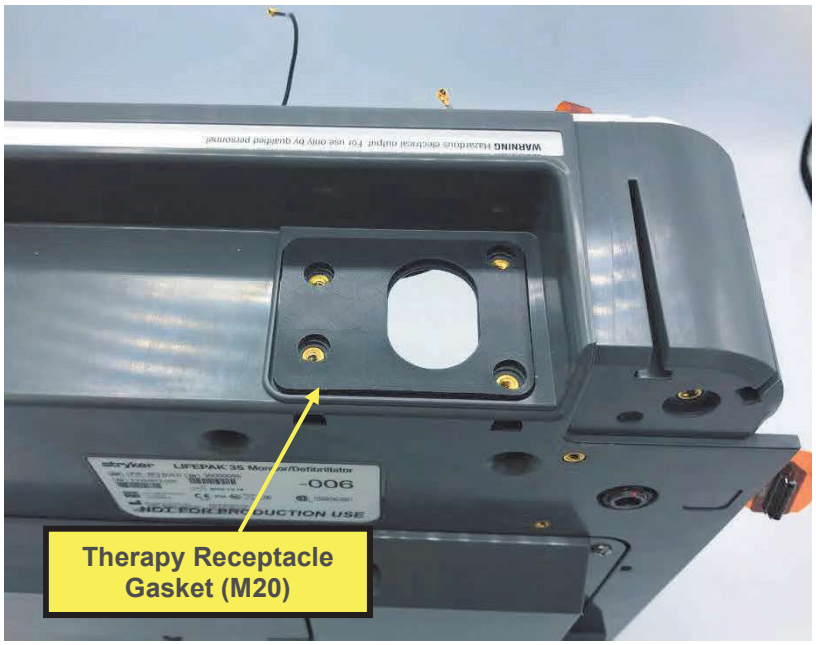
7. Remove 4 screws, using a driver with a T-15 bit.



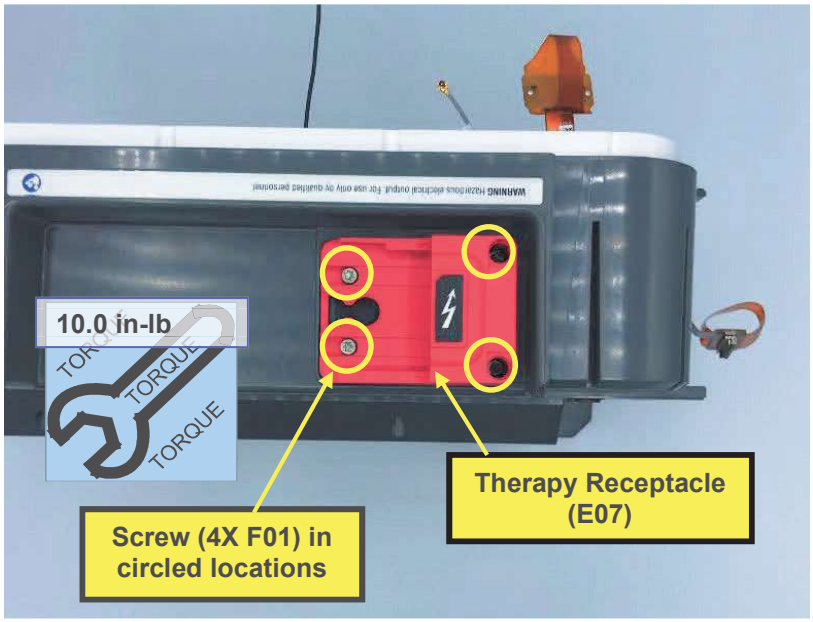
8. Remove the therapy receptacle, feeding the attached cables, connectors, and ferrite out through the hole in the housing.

9. Remove the therapy receptacle gasket (not shown) which is between the therapy receptacle and the top of the rear housing, and discard.

Installing the Therapy Receptacle



1. Set the gasket in place on the rear housing.



2. Thread the cables, connectors, and ferrite through the hole in the top of the rear housing, and set the therapy receptacle in place, so that it sits flat on the gasket.

3. Install 4 screws, using a torque driver with a T-15 bit.

4. Install two screw covers, pressing to flush, with a blunt tool.
5. Install the handle assembly as described in Installing the Handle, steps 3-6
6. Install the PCBA stack as described in Installing the PCBA Stack.
7. Install energy storage capacitor as described in Installing the Energy Storage Capacitor, steps 1-3.
8. Install inductive resistor as described in Installing the Inductive Resistor.
9. Assemble the case as described in Assembling the Case.
10. Execute the LIFEPAK 35 TCP – defibrillator energy tests.
11. Execute the LIFEPAK 35 PIP.

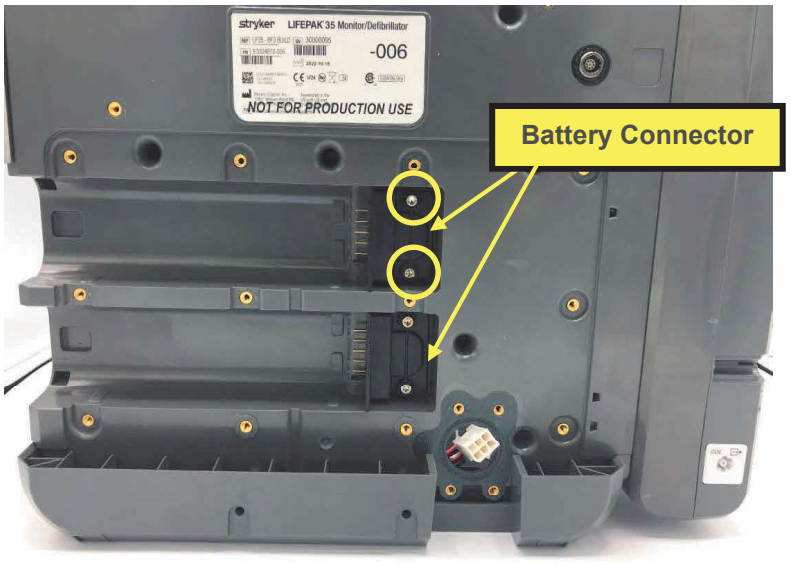
Battery Connector Replacement

Note that there are 2 battery connectors. Each may be replaced independently. This procedure covers replacement of the connector nearest the top of the device; the procedure is identical for the lower connector.

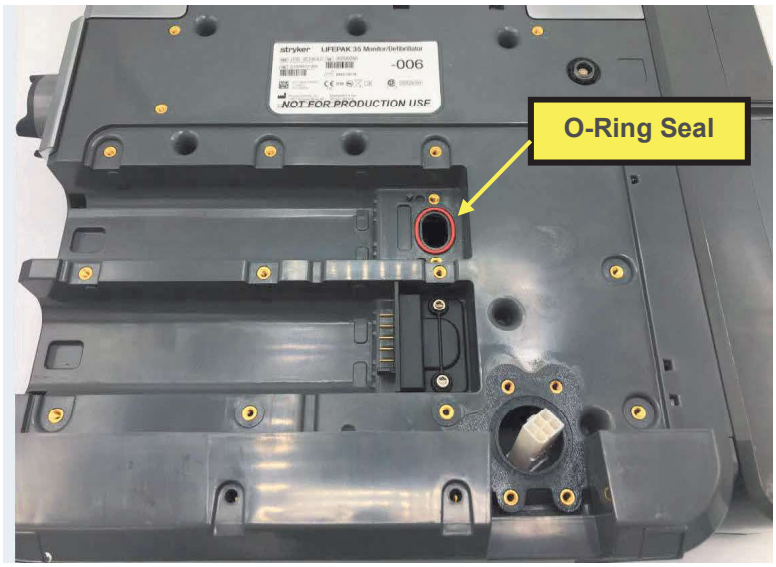
The parts listed in the following table will be required to complete this repair. Reference Rear Housing Assembly.

SERVICE BOM REF	QTY	DESCRIPTION	NOTES
K08	1	KIT, REPAIR, BATTERY CONNECTOR, LP35	

Removing the Battery Connector

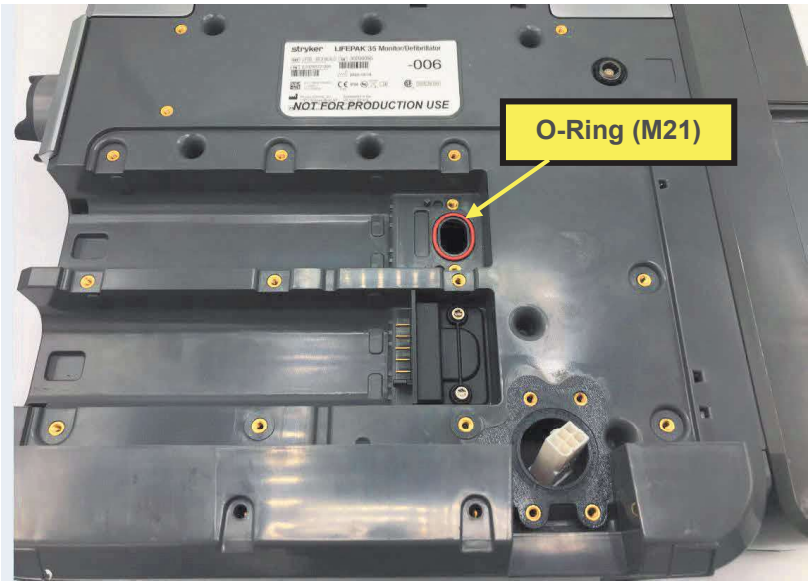


1. Disassemble the case as described in Disassembling the Case.
2. Remove inductive resistor as described in Removing the Inductive Resistor, omitting steps already completed.
3. Remove energy storage capacitor as described in Removing the Energy Storage Capacitor, omitting steps already completed.
4. Remove the PCBA stack as described in Removing the PCBA Stack.
5. Remove battery back plate as described in Removing the Battery Back Plate.
6. Remove 2 screws, using a driver with a T-15 bit.

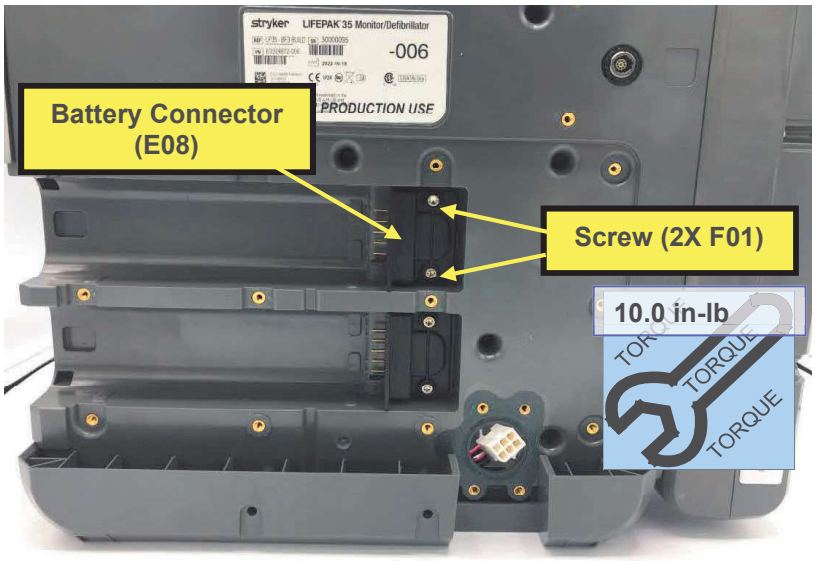


7. Remove the battery connector, feeding the cable and connector out through the hole in the housing.
8. Remove the o-ring, and discard.

Installing the Battery Connector



1. Place o-ring in groove.



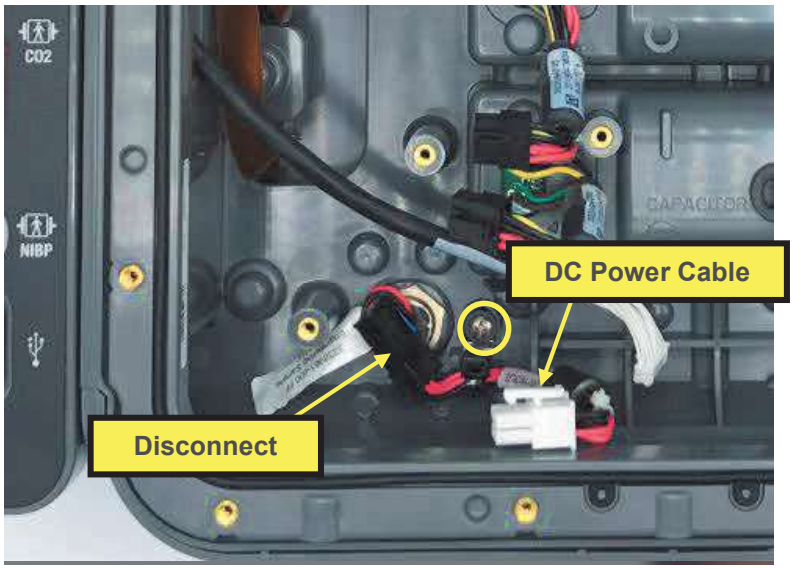
2. Install the battery connector, feeding the connector and cable through the hole in the housing.
3. Install 2 screws, using a torque driver with a T-15 bit.
4. Install battery back plate as described in Installing the Battery Back Plate.
5. Install the PCBA stack as described in Installing the PCBA Stack.
6. Install energy storage capacitor as described in Installing the Energy Storage Capacitor, steps 1-3.
7. Install inductive resistor as described in Installing the Inductive Resistor.
8. Assemble the case as described in Assembling the Case.
9. Execute the LIFEPAK 35 PIP.

DC Power Cable Replacement

The parts listed in the following table will be required to complete this repair. Reference Rear Housing Assembly.

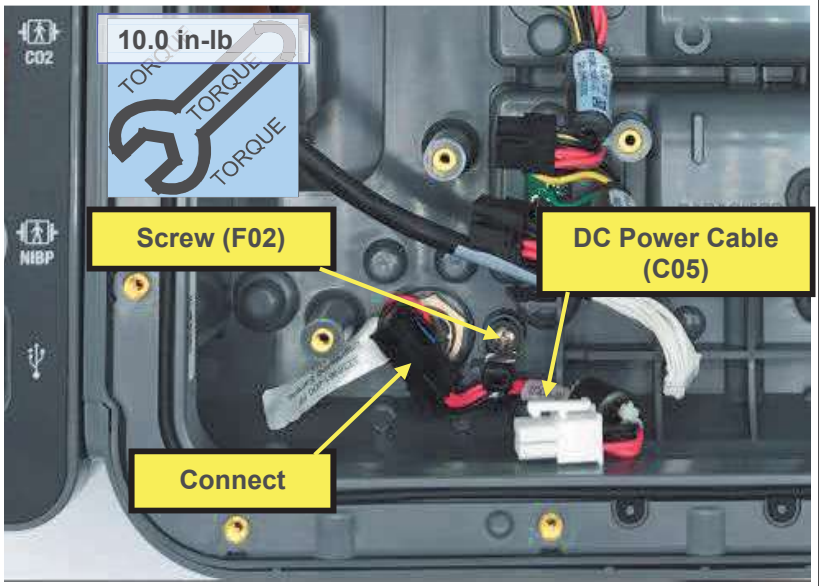
SERVICE BOM REF	QTY	DESCRIPTION	NOTES
C05	1	ASSY, CABLE, INTERNAL DC POWER, LP35	
F02	20	SCREW, MACH, PANHEAD, PHDRV, SS, NYLOK, 6-32 X .312	
F05	8	SCREW, MACH, PANHD, PHDRV, NYLOK, 6-32 X .750, CS, ZN	
M16	1	SEAL, HOUSING, MAIN, LPQ5, LPT5	

Removing the DC Power Cable



1. Disassemble the case as described in Disassembling the Case.
2. Remove inductive resistor as described in Removing the Inductive Resistor, omitting steps already completed.
3. Remove energy storage capacitor as described in Removing the Energy Storage Capacitor, omitting steps already completed.
4. Remove the PCBA stack as described in Removing the PCBA Stack.
5. Remove screw, using a driver with a P-2 bit.
6. Disconnect power cable from power plug assembly.
7. Remove DC power cable.

Installing the DC Power Cable



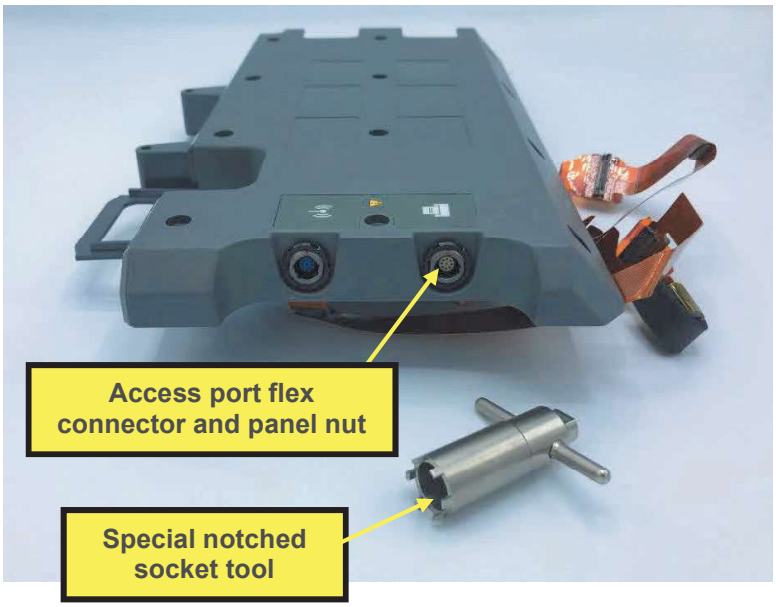
1. Connect DC power cable to power plug assembly.
2. Position DC power cable in place as shown, and secure cable clamp with a screw, using a torque driver with a P-2 bit.
3. Install the PCBA stack as described in Installing the PCBA Stack.
4. Install energy storage capacitor as described in Installing the Energy Storage Capacitor, steps 1-3.
5. Install inductive resistor as described in Installing the Inductive Resistor.
6. Assemble the case as described in Assembling the Case.
7. Execute the LIFEPAK 35 PIP.

Access Port Flex Replacement

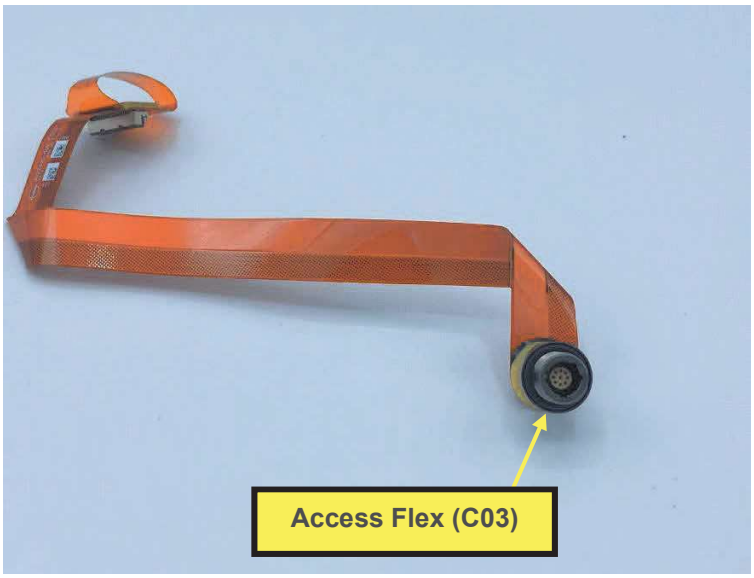
The parts listed in the following table will be required to complete this repair. Reference Rear Housing Assembly.

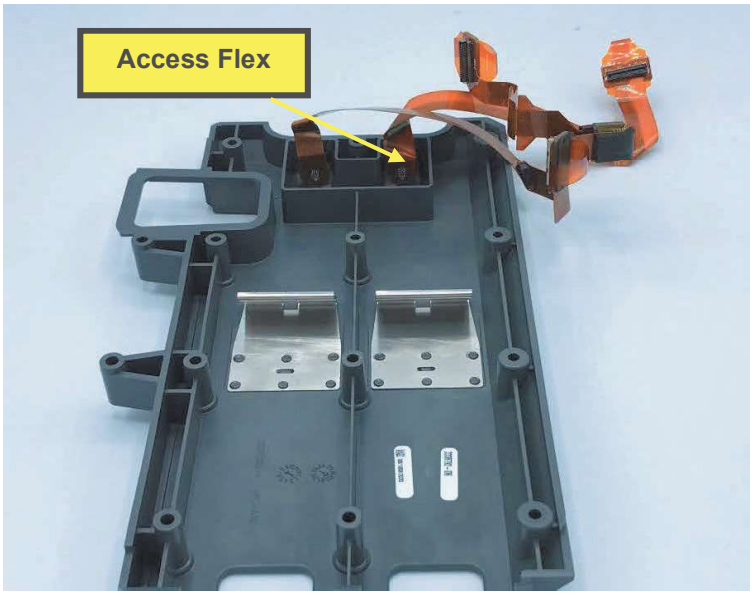
SERVICE BOM REF	QTY	DESCRIPTION	NOTES
C03	1	FLEX, ACCESS, LP35	
F02	31	SCREW, MACH, PANHEAD, PHDRV, SS, NYLOK, 6-32 X .312	
F05	8	SCREW, MACH, PANHD, PHDRV, NYLOK, 6-32 X .750, CS, ZN	
F06	10	SCREW, MACHINE, PANHEAD, NYLOK, 6-32 X 1.125	
L05	1	LABEL, DC INPUT, LP35	
M16	1	SEAL, HOUSING, MAIN, LPQ5, LPT5	
L06	1	LABEL, PMOD,…LP35	Various configs.
M10	1	COVER, CO2 DOOR, LPQ5	
F03	1	SCREW, BUTTONHEAD, TORX, #4-40 X LG 0.25 IN	

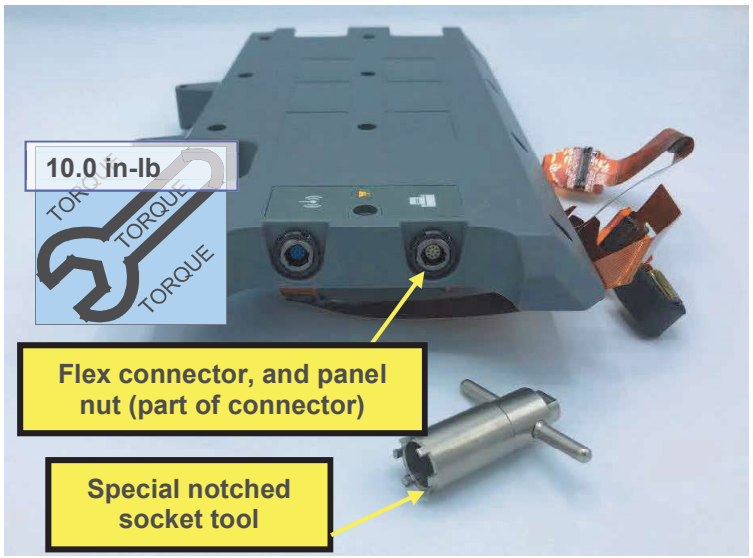
Removing the Access Port Flex



1. Remove the parameter module as described in Removing the Parameter Module.
2. Disassemble the case as described in Disassembling the Case.
3. Remove inductive resistor as described in Removing the Inductive Resistor, omitting steps already completed.
4. Remove energy storage capacitor as described in Removing the Energy Storage Capacitor, omitting steps already completed.
5. Remove the PCBA stack as described in Removing the PCBA Stack.
6. Remove the battery back plate as described in Removing the Battery Back Plate, steps 1-3.
7. Separate back plate from rear housing, feeding flex cables and connectors through hole in rear housing.
8. Remove access flex connector panel nut, using the special socket tool.
9. Remove the flex and connector from the inside of the battery back plate.

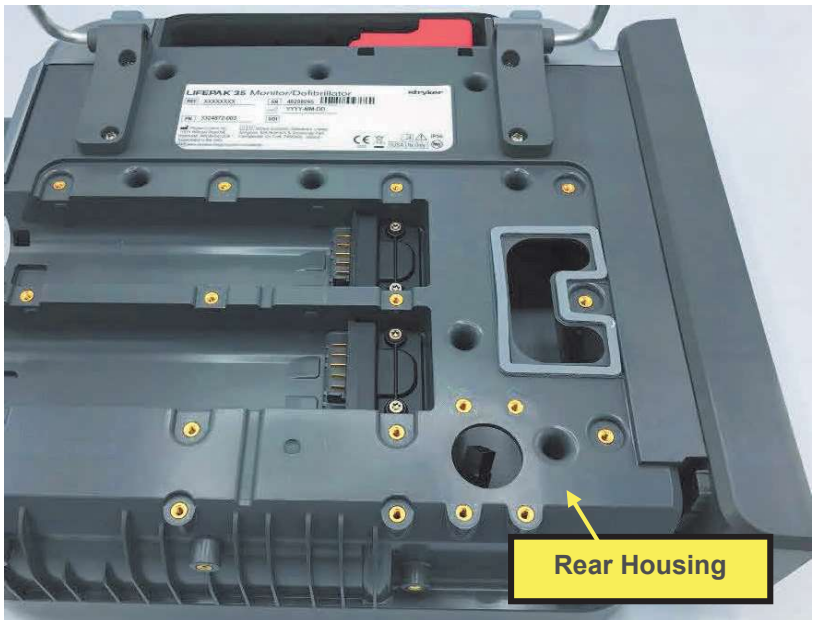


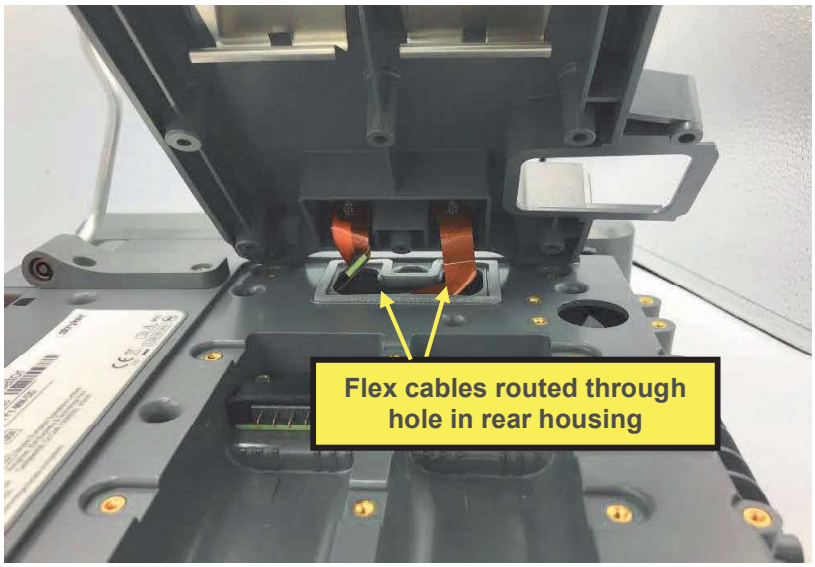




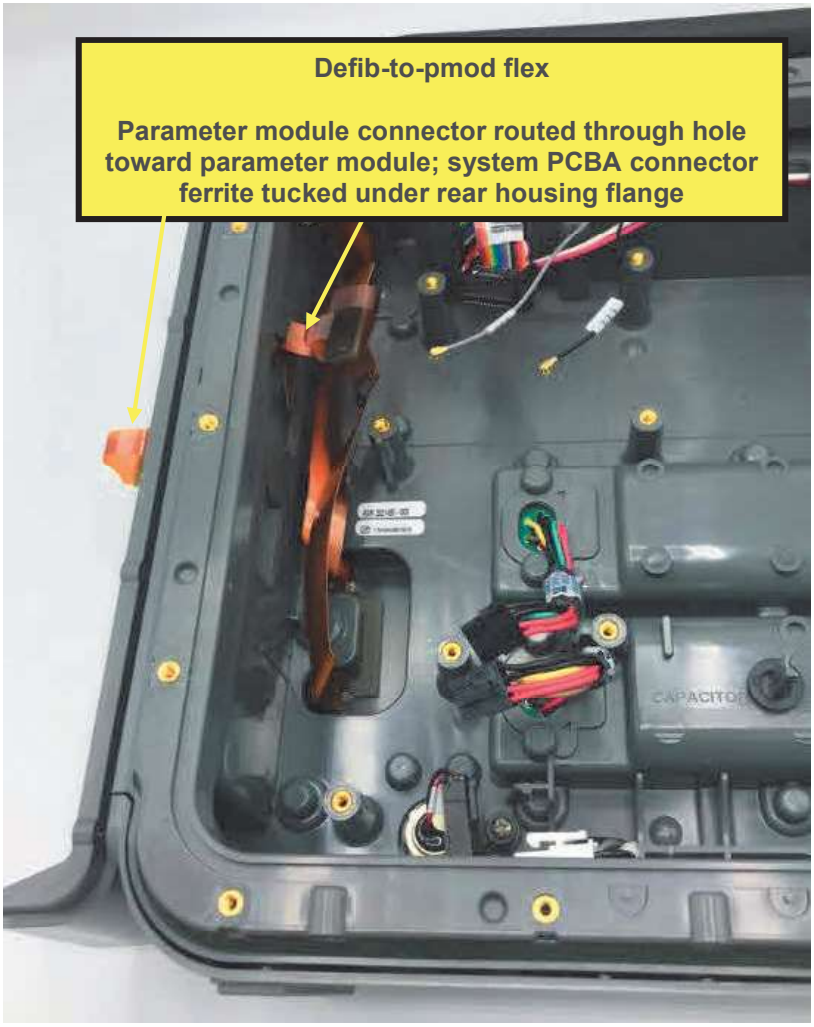
1. Install the access port flex connector into the hole in the battery back plate, aligning the flats with the flats in the hole.
2. Install the panel nut (part of access flex connector), using a torque driver with the special panel nut notched socket.

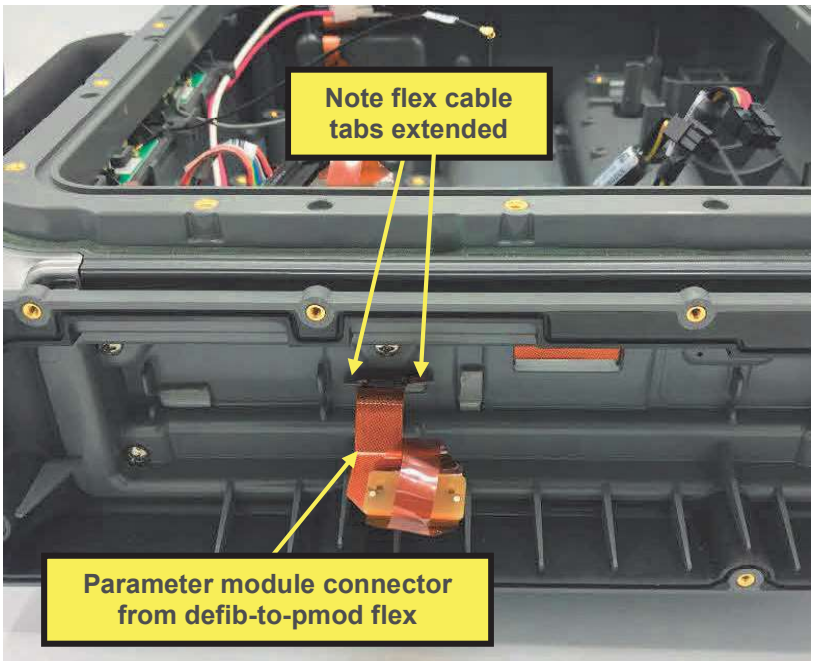
Note: The access port socket should be used with a torque driver. A tee handle socket is shown in the picture below.





3. Feed the flex connectors and cables through the hole in the rear housing, and install the battery back plate as described in Installing the Battery Back Plate, steps 3-4.
4. Install power plug as described in Installing the Power Plug.
5. Install skid plate as described in Installing the Skid Plate.
6. Route flex cables as shown below, with defib-to-pmod system PCBA connector flex ferrite tucked under rear housing flange, and parameter module connector routed through hole in housing, and flex cable tabs extended.
7. Install the PCBA stack as described in Installing the PCBA Stack.
8. Install energy storage capacitor as described in Installing the Energy Storage Capacitor, steps 1-3.
9. Install inductive resistor as described in Installing the Inductive Resistor.
10. Assemble the case as described in Assembling the Case.
11. Install the parameter module as described in Installing the Parameter Module.
12. Execute the LIFEPAK 35 PIP.


Defib-to-pmod flex
Parameter module connector routed through hole toward parameter module; system PCBA connector ferrite tucked under rear housing flange

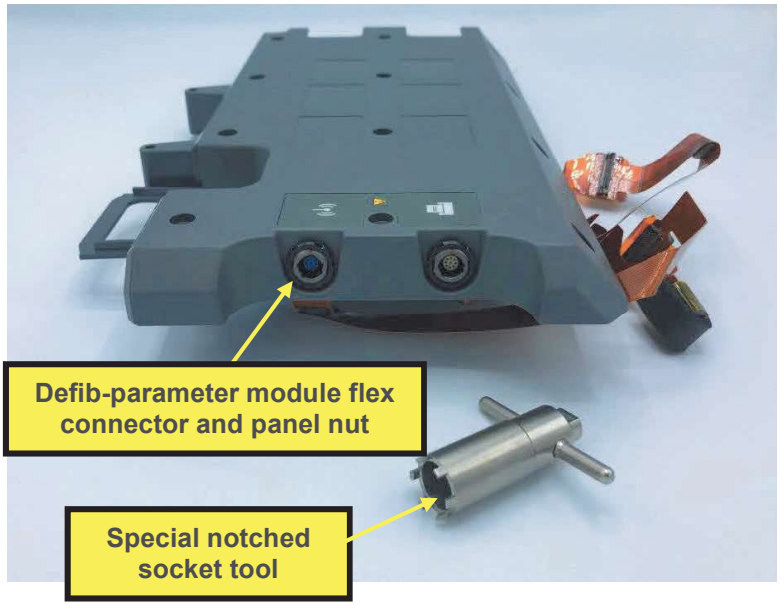

Note flex cable tabs extended
Parameter module connector from defib-to-pmod flex

Defib-Parameter Module Flex Replacement

The parts listed in the following table will be required to complete this repair. Reference Rear Housing Assembly.

SERVICE BOM REF	QTY	DESCRIPTION	NOTES
C04	1	FLEX, DEFIB-PMOD, LP35	
F02	31	SCREW, MACH, PANHEAD, PHDRV, SS, NYLOK, 6-32 X .312	
F05	8	SCREW, MACH, PANHD, PHDRV, NYLOK, 6-32 X .750, CS, ZN	
F06	10	SCREW, MACHINE, PANHEAD, NYLOK, 6-32 X 1.125	
L05	1	LABEL, DC INPUT, LP35	
M16	1	SEAL, HOUSING, MAIN, LPQ5, LPT5	
L06	1	LABEL, PMOD,…LP35	Various configs.
M10	1	COVER, CO2 DOOR, LPQ5	
F03	1	SCREW, BUTTONHEAD, TORX, #4-40 X LG 0.25 IN	

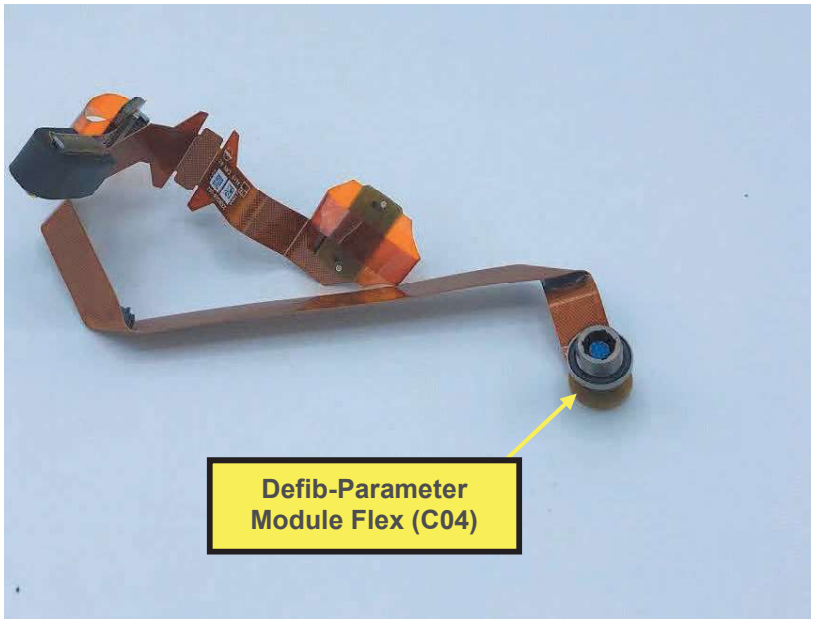
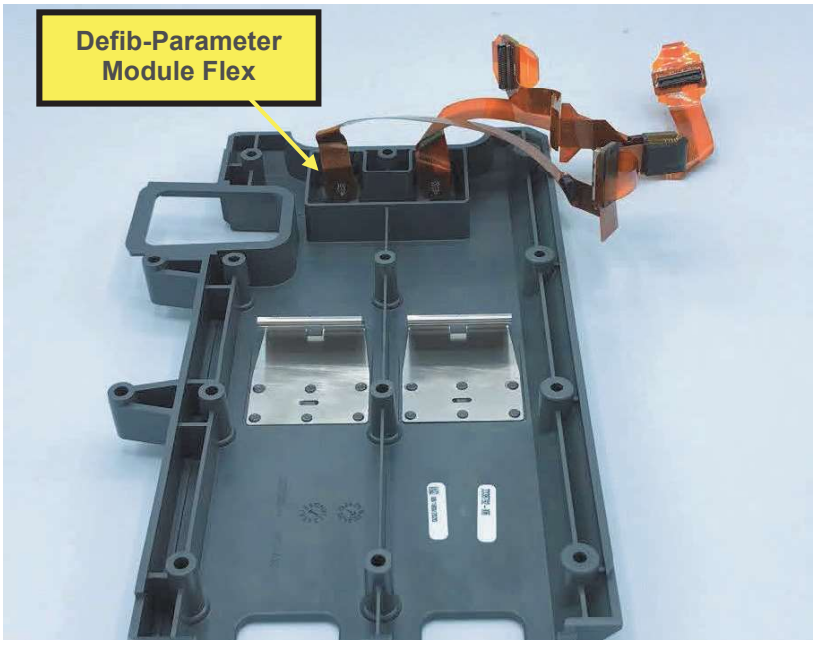
Removing the Defib-Parameter Module Flex

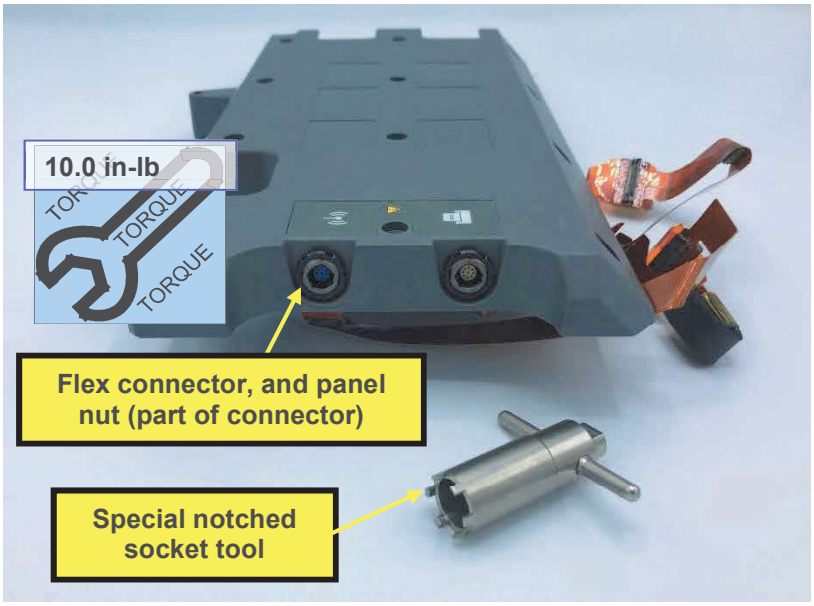


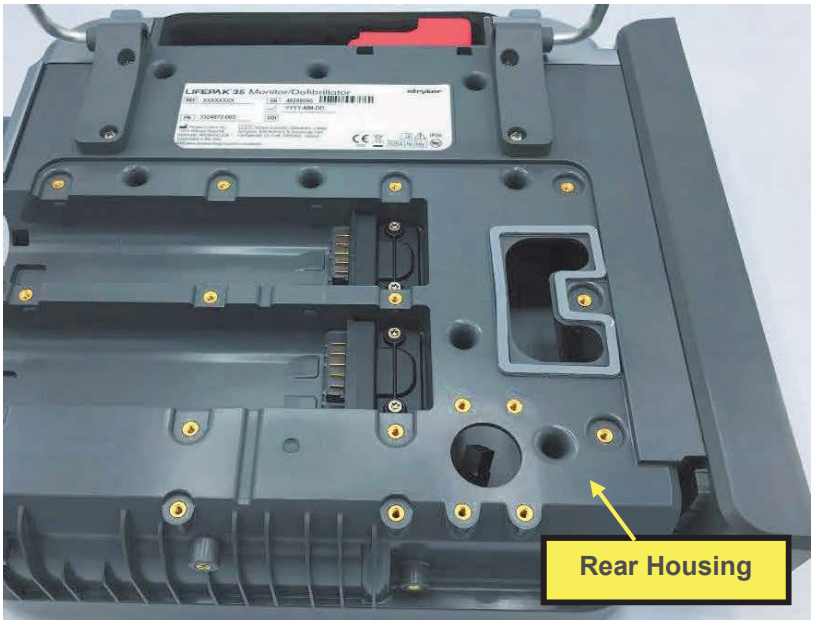
1. Remove the parameter module as described in Removing the Parameter Module.
2. Disassemble the case as described in Disassembling the Case.
3. Remove inductive resistor as described in Removing the Inductive Resistor, omitting steps already completed.
4. Remove energy storage capacitor as described in Removing the Energy Storage Capacitor, omitting steps already completed.
5. Remove the PCBA stack as described in Removing the PCBA Stack.
6. Remove the battery back plate as described in Removing the Battery Back Plate, steps 1-3.
7. Separate back plate from rear housing, threading flex cables and connectors through hole in rear housing.

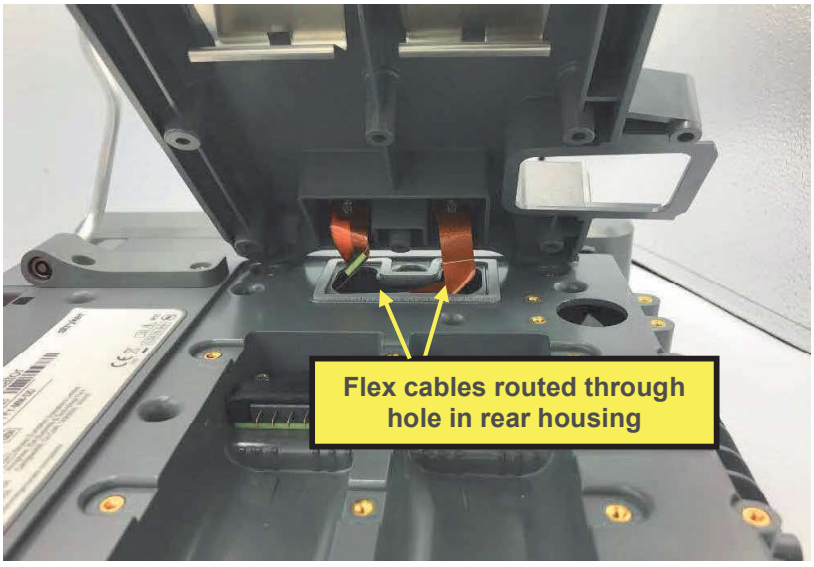
	8. Remove defib-parameter module flex connector panel nut, using the special socket tool. 9. Remove the flex and connector from the inside of the battery back plate.

Installing the Defib-Parameter Module Flex

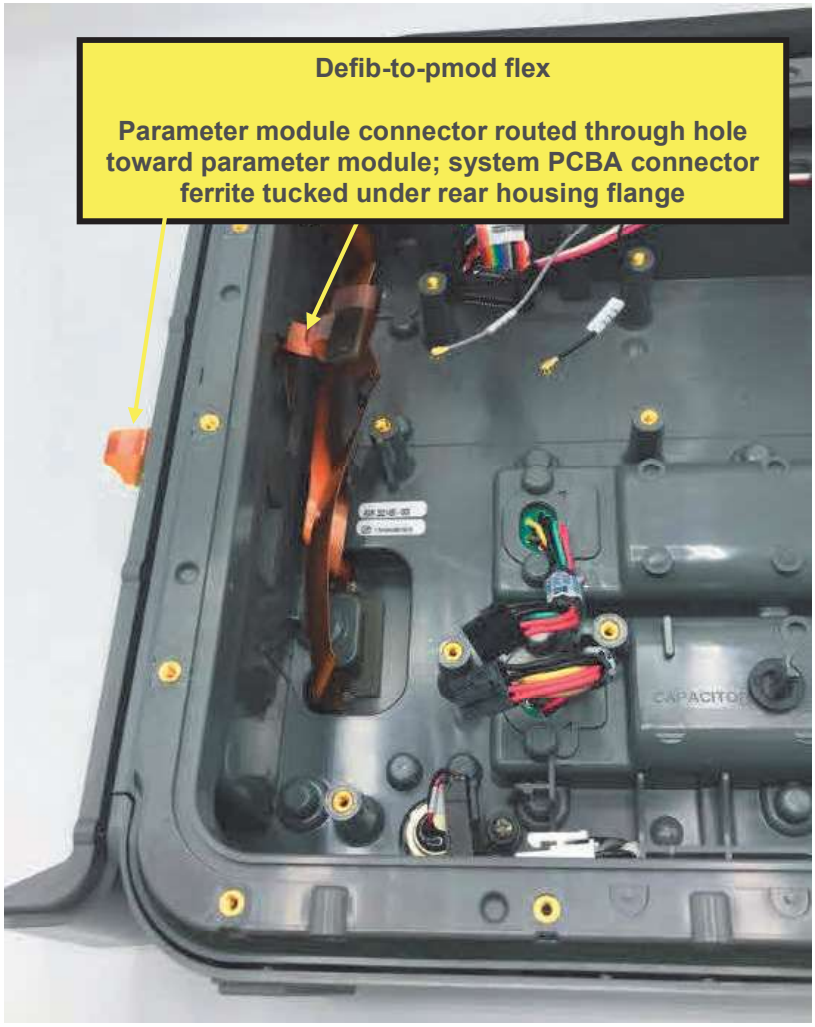
 	1. Install the defib-parameter module flex connector into the hole in the battery back plate, aligning the flats with the flats in the hole. 2. Install the panel nut (part of defib-parameter module flex connector), using a torque driver with the special panel nut notched socket. Note: The access port socket should be used with a torque driver. A tee handle socket is shown in the picture below.

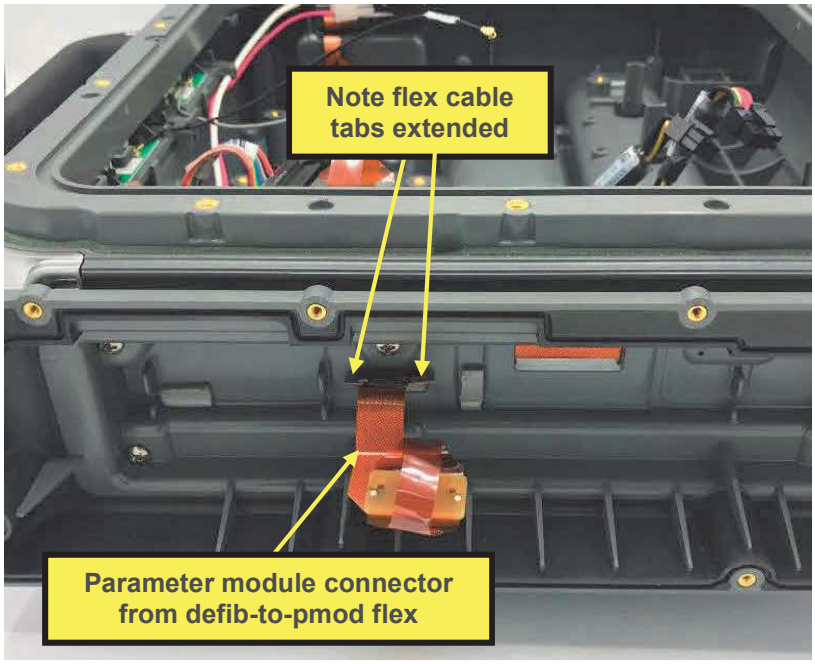






3. Feed the flex connectors and cables through the hole in the rear housing, and install the battery back plate as described in Installing the Battery Back Plate, steps 3-4.
4. Install power plug as described in Installing the Power Plug.
5. Install skid plate as described in Installing the Skid Plate.
6. Route flex cables as shown below, with defib-to-pmod system PCBA connector flex ferrite tucked under rear housing flange, and parameter module connector routed through hole in housing, and flex cable tabs extended.
7. Install the PCBA stack as described in Installing the PCBA Stack.
8. Install energy storage capacitor as described in Installing the Energy Storage Capacitor, steps 1-3.
9. Install inductive resistor as described in Installing the Inductive Resistor.
10. Assemble the case as described in Assembling the Case.





11. Install the parameter module as described in Installing the Parameter Module.

12. Execute the LIFEPAK 35 PIP.

Rear Housing Replacement

The parts listed in the following table will be required to complete this repair. Reference Defib Assembly.

SERVICE BOM REF	QTY	DESCRIPTION	NOTES
K06	1	KIT, REPAIR, REAR HOUSING, LP35	
L02	1	LABEL, INSTRUCTION,…, LPT5	Select correct variant for device configuration. See diagrams and parts lists in section 9.
L06	1	LABEL, PMOD,…, LP35	Various configs.
L03	1	LABEL,SERIAL NUMBER,LP35,…	Printed by factory, specific for device

Note: Some parts will be reused and transferred from the replaced rear housing to the new rear housing. Retain and reuse parts removed during this procedure, except as noted or if damaged. Parts which are expected to be replaced will be included in the parts kit.

1. Remove kickstand as described in Removing the Kickstand.
2. Remove parameter module front housing as described in Removing the Parameter Module Front Housing.
3. Remove parameter module as described in Removing the Parameter Module, omitting steps already completed.
4. Remove parameter module right housing as described in Removing the Parameter Module Right Housing, omitting steps already completed.
5. Remove handle assembly as described in Removing the Handle, steps 1-5, omitting steps already completed.
6. Disassemble the case as described in Disassembling the Case.
7. Remove system flex as described in Removing the System Flex, omitting steps already completed.
8. Remove inductive resistor as described in Removing the Inductive Resistor, omitting steps already completed.
9. Remove energy storage capacitor as described in Removing the Energy Storage Capacitor, omitting steps already completed.
10. Remove PCBA stack as described in Removing the PCBA Stack, omitting steps already completed.
11. Remove ECG guard as described in Removing the ECG Guard, of not already completed.
12. Remove ECG connector as described in Removing the ECG Connector, omitting steps already completed.

13. Remove therapy receptacle as described in Removing the Therapy Receptacle, omitting steps already completed.

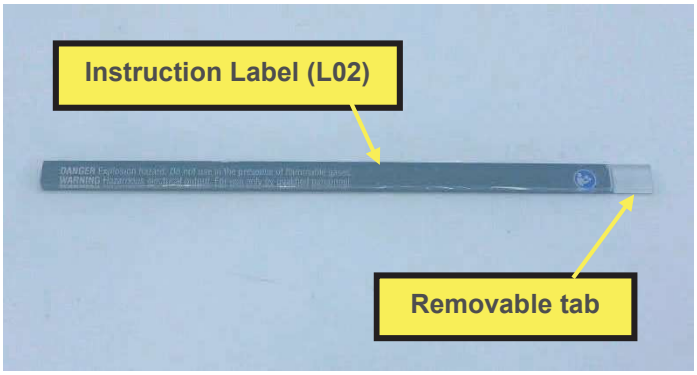
14. Remove the power plug as described in Removing the Power Plug.

15. Remove skid plate as described in Removing the Skid Plate.

16. Remove battery back plate as described in Removing the Access Port Flex, steps 1-7, omitting steps already completed.

17. Remove 2 battery connectors as described in Removing the Battery Connector, omitting steps already completed.

18. Remove DC power cable as described in Removing the DC Power Cable, omitting steps already completed.



19. Lay new rear housing (M18) on a flat surface.

20. Remove adhesive liner from back side of instruction label, using the removable tab if present. Discard the tab and liner.

21. Install instruction label in pocket in top of rear housing, oriented as shown, and press firmly into place.

22. Install DC power cable as described in Installing the DC Power Cable, step 2.

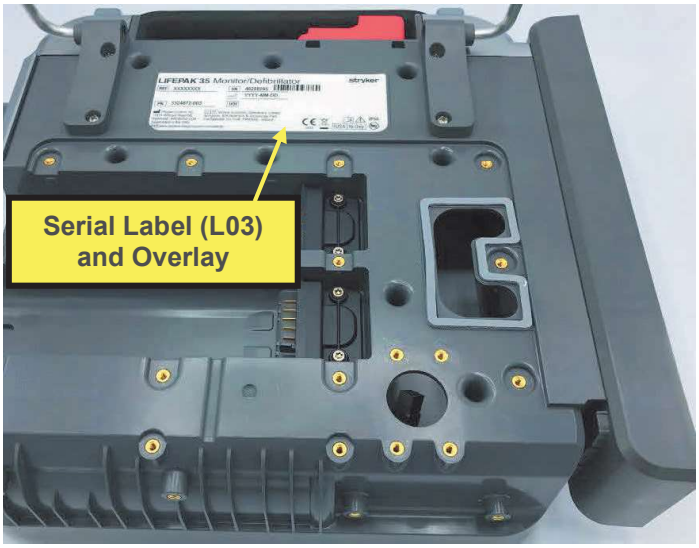
23. Install 2 battery connectors as described in Installing the Battery Connector, steps 1-3.

24. Install therapy receptacle as described in Installing the Therapy Receptacle, steps 1-4.

25. Install handle assembly as described in Installing the Handle, steps 3-4.

26. Install parameter module right housing as described in Installing the Parameter Module Right Housing, steps 1-3.

27. Install battery back plate as described in Installing the Access Port Flex step 4, and Installing the Battery Back Plate steps 3-6.



28. Install power plug as described in Installing the Power Plug, if not already completed.
29. Install skid plate as described in Installing the Skid Plate, if not already completed.
30. Install ECG connector as described in Installing the ECG Connector, steps 1-4.
31. Install ECG guard as described in Installing the ECG Guard.
32. Install kickstand as described in Installing the Kickstand.
33. Install PCBA stack as described in Installing the PCBA Stack.
34. Install energy storage capacitor as described in Installing the Energy Storage Capacitor, steps 1-3.
35. Install inductive resistor as described in Installing the Inductive Resistor, steps 1-2.
36. Install the Wi-Fi antenna assembly as described in Installing the Wi-Fi Antenna, steps 1-5, if not already completed.
37. Install system flex as described in Installing the System Flex, if not already completed.
38. Assemble the case as described in Assembling the Case.
39. Install parameter module as described in Installing the Parameter Module.
40. Install parameter module front housing as described in Installing the Parameter Module Front Housing.
41. Remove adhesive liner from device serial label and install serial label in pocket in back of rear housing, pressing firmly into place as shown.
42. Remove adhesive liner from serial label overlay, and apply overlay over serial label, pressing firmly into place.

Note that the serial label will need to be ordered from the factory.

43. Execute the LIFEPAK 35 PIP.

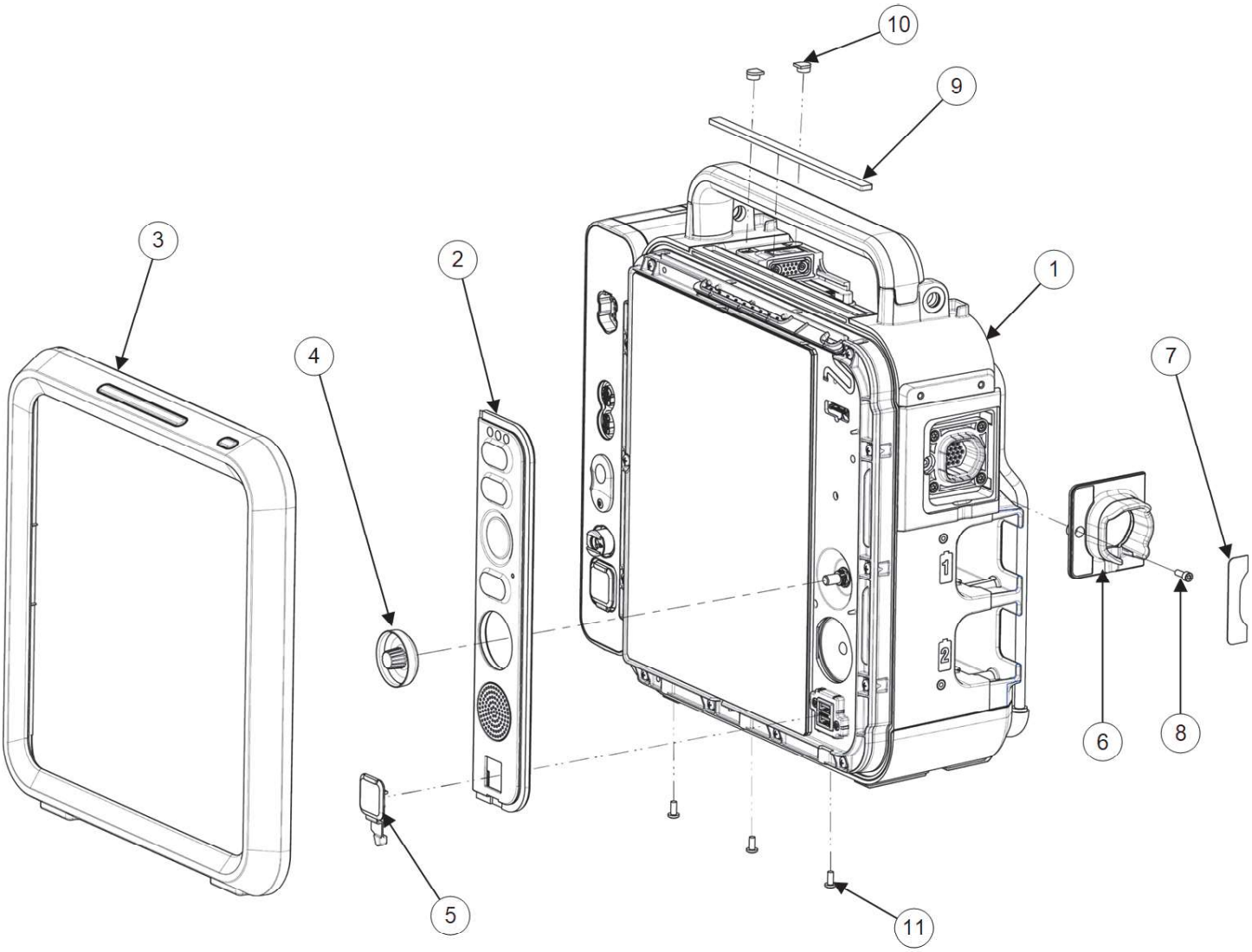
9. Assembly Diagrams and Parts Lists

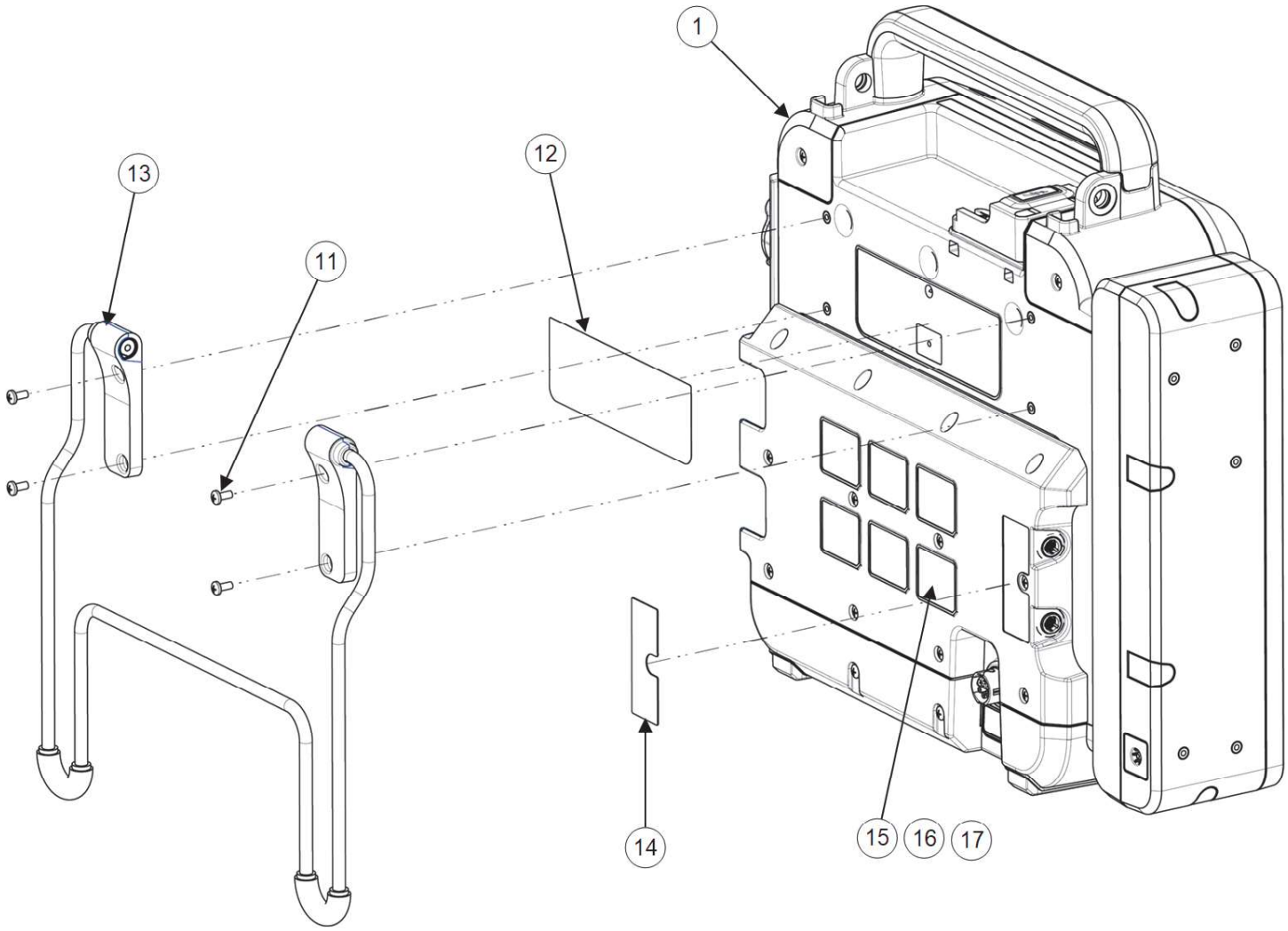
Assembly Diagrams

The exploded-view diagrams below show the parts that make up the LIFEPAK 35 device, and are presented in the various subassemblies, with the hierarchy of subassemblies generally following the product structure. Reference numbers in the tables below map to parts in service bill of materials (BOM), and/or parts within service repair kits. Refer to the service BOM, 3342155, in the PLM system for part numbers, catalog numbers, descriptions, and other details related to the parts presented in the tables. Kits are defined in the PLM system under 3342156. Parts are categorized as follows:

- A prefix – PCBAs
- F prefix – Fasteners
- M prefix – Plastic parts and mechanical components
- C prefix – Cables and wires
- E prefix – Electrical components
- L prefix – Labels and adhesives
- K prefix – Kit—parts assembled into a kit for a specific repair

Configuration Assembly

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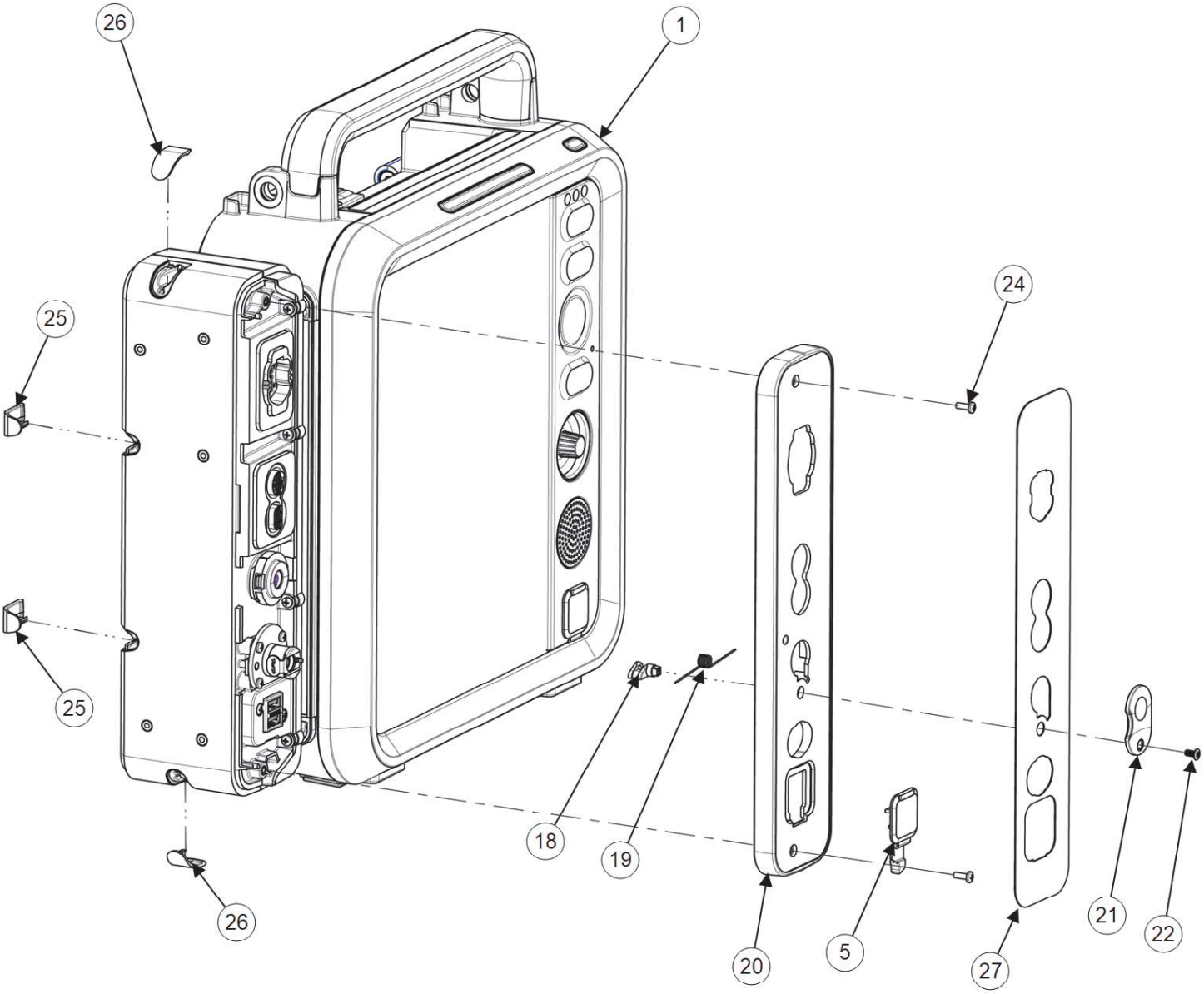
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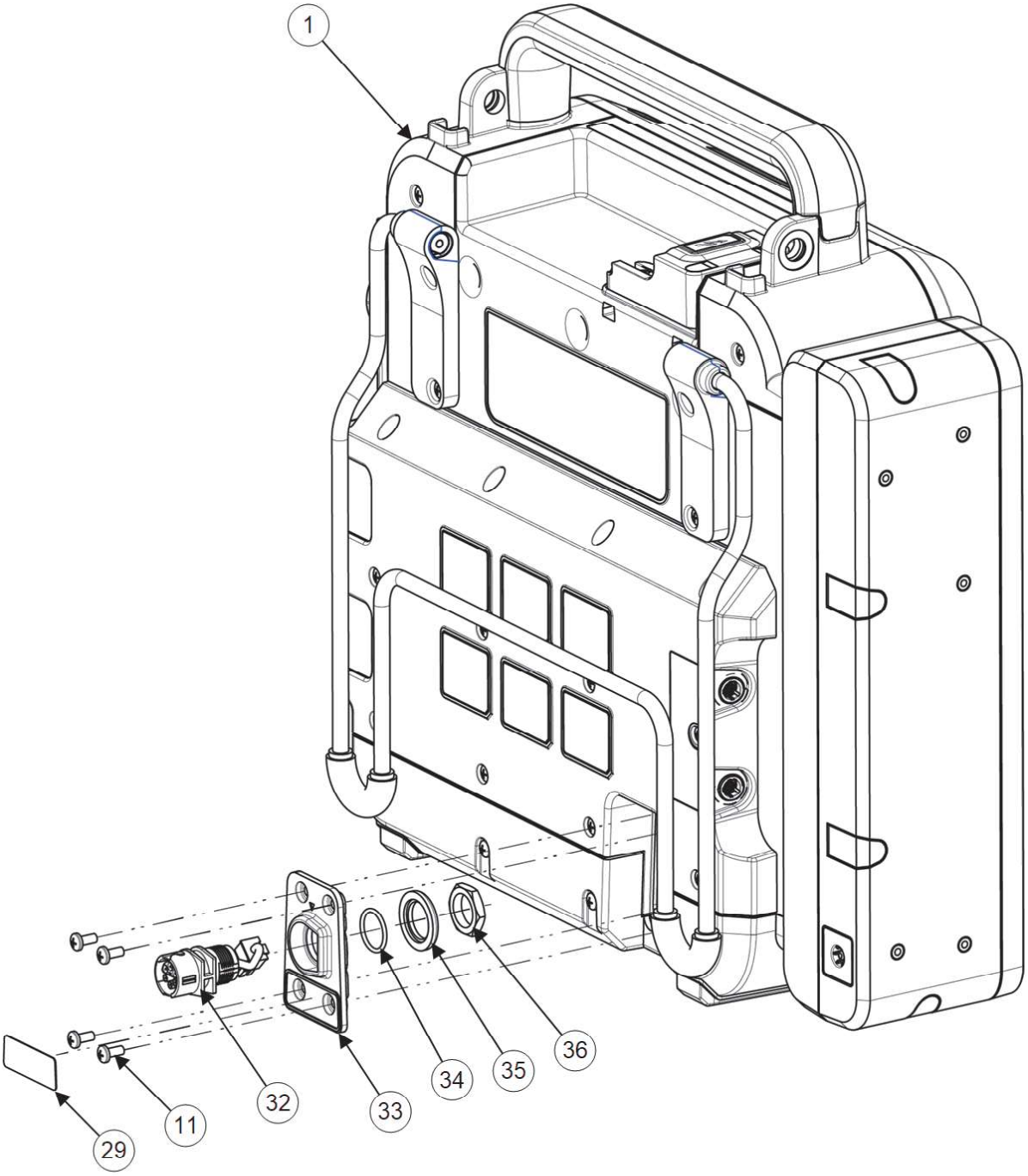


REF	SERVICE BOM REF	QTY	DESCRIPTION	NOTES
-	-	-	GENERIC, CONFIG, LIFEPAK 35	Various configs
1	-	1	VANILLA,…, LP35	Various configs Reference Vanilla Assembly.
2	E01	1	KEYPAD, LP35,…	Various configs[1]
3	M01	1	HOUSING, BEZEL, FRONT, LP35	

REF	SERVICE BOM REF	QTY	DESCRIPTION	NOTES
4	M02	1	KNOB, ROTARY, LP35	
5	M03	2	COVER, DUST, USB, LP35	
6	M04	1	GUARD, ECG, LP35	
7	L01	1	LABEL, ECG COVER, LP35	
8	F01	1	SCREW-CAP, SCH, REC T15 TORX 6-32, 0.375L, SS, NYLOK	
9	L02	1	LABEL, INSTRUCTION,…, LP35	Various configs[2]
10	M05	2	COVER, SCREW, THERAPY RECEPTACLE, LP35	
11	F02	11	SCREW, MACH, PANHEAD, PHDRV, SS, NYLOK, 6-32 X .312	
12	L03	1	LABEL, SERIAL NUMBER, LP35,…	Various configs[4]
13	M06	1	ASSY, KICKSTAND, LP35	
14	L04	1	LABEL, PRINTER PORT, MODEM PORT, LP35	
15	L08		LABEL, BACKPLATE, RX ONLY, LP35	Placed in one of six locations on backplate. Only one of two items 15 applies, depending on device configuration.
15	L09		LABEL, BACKPLATE, CE MARK, LP35	Placed in one of six locations on backplate. Only one of two items 15 applies, depending on device configuration.
16	L10	1	LABEL, BACKPLATE, SAFETY, CSA, LP35	Placed in one of six locations on backplate
17	L11	1	LABEL, BACKPLATE, MASIMO, LP35	Placed in one of six locations on backplate
18	M07	1	CAM, CO2 DOOR, LPQ5	
19	M08	1	SPRING, TRSN, WIRE DIA0.028IN, SS	
20	M09	1	HOUSING, PARAMETER MODULE, FRONT, LP35	
21	M10	1	COVER, CO2 DOOR, LPQ5	
22	F03	1	SCREW, BUTTONHEAD, TORX, #4-40 X LG 0.25 IN	
24	F04	2	SCREW-M,CS,Z,PH, NYLOCK,4-40 X .312L	
25	M11	2	COVER, SCREW, REAR, PARAMETER MODULE, LP35	

REF	SERVICE BOM REF	QTY	DESCRIPTION	NOTES
26	M12	2	COVER, SCREW, ENDS, PARAMETER MODULE, LP35	
27	L06	1	LABEL,PMOD,…,LP35	Various configs[3]
29	L05	1	LABEL, DC INPUT, LP35	
-	E02	1	ASSY, POWER PLUG, LP35	Comes as an assembly—items 32, 33, 34, 35, 36.
32	-		ASSY, CABLE, AUX POWER CABLE CONNECTOR, LP35	Available only as part of E02.
33	-		ASSY, POWER PLUG HOUSING, LP35	Available only as part of E02.
34	-		SEAL-O-RING,RUBBER, .551ID	Available only as part of E02.
35	-		PLATE-SEAL,CONNECTOR,REAR	Available only as part of E02.
36	-		NUT-AUX,SYSTEM,CONN,STAINLESS STEEL	Available only as part of E02.

1 – Keypad—item 2, E01. Multiple configurations are available, based on language, and listed in the table below. The service provider will need to order the correct part for the device being serviced. Each dash number pertains to a different configured device.

DASH NUMBER	DESCRIPTION
-263	KEYPAD, LPQ5, LPT5, POLISH
-243	KEYPAD, LPQ5, LPT5, NORWEGIAN
-223	KEYPAD, LPQ5, LPT5, FINNISH
-203	KEYPAD, LPQ5, LPT5, DANISH
-183	KEYPAD, LPQ5, LPT5, SWEDISH
-143	KEYPAD, LPQ5, LPT5, PORTUGUESE-PORTUGAL
-123	KEYPAD, LPQ5, LPT5, SPANISH-SPAIN
-103	KEYPAD, LPQ5, LPT5, DUTCH
-083	KEYPAD, LPQ5, LPT5, FRENCH-FRANCE
-063	KEYPAD, LPQ5, LPT5, ITALIAN
-043	KEYPAD, LPQ5, LPT5, GERMAN-GERMANY
-010	KEYPAD, LPQ5, LPT5, ENGLISH-UNITED STATES

2 – Instruction Label—item 9, L02. Multiple configurations are available and listed in the table below. The service provider will need to order the correct part for the device being serviced. Each dash number pertains to a different configured device.

DASH NUMBER	DESCRIPTION
-440	LABEL, INSTRUCTION, GREEK, LP35

-560	LABEL, INSTRUCTION, TURKISH, LP35
-700	LABEL, INSTRUCTION, ROMANIAN, LP35
-400	LABEL, INSTRUCTION, JAPANESE, LP35
-660	LABEL, INSTRUCTION, CROATIAN, LP35
-360	LABEL, INSTRUCTION, T-CHINESE, LP35
-261	LABEL, INSTRUCTION, POLISH, LP35
-320	LABEL, INSTRUCTION, RUSSIAN, LP35
-300	LABEL, INSTRUCTION, CZECH, LP35
-280	LABEL, INSTRUCTION, HUNGARIAN, LP35
-380	LABEL, INSTRUCTION, KOREAN, LP35
-340	LABEL, INSTRUCTION, S-CHINESE, LP35
-241	LABEL, INSTRUCTION, NORWEGIAN, LP35
-181	LABEL, INSTRUCTION, SWEDISH, LP35
-162	LABEL, INSTRUCTION, BRAZILIAN, LP35
-121	LABEL, INSTRUCTION, SPANISH, LP35
-221	LABEL, INSTRUCTION, FINNISH, LP35
-101	LABEL, INSTRUCTION, DUTCH, LP35
-580	LABEL, INSTRUCTION, SLOVAK, LP35
-201	LABEL, INSTRUCTION, DANISH, LP35
-141	LABEL, INSTRUCTION, PORTUGUESE, LP35
-061	LABEL, INSTRUCTION, ITALIAN, LP35
-041	LABEL, INSTRUCTION, GERMAN, LP35
-003	LABEL, INSTRUCTION, ENGLISH, LP35
-081	LABEL, INSTRUCTION, FRENCH, LP35

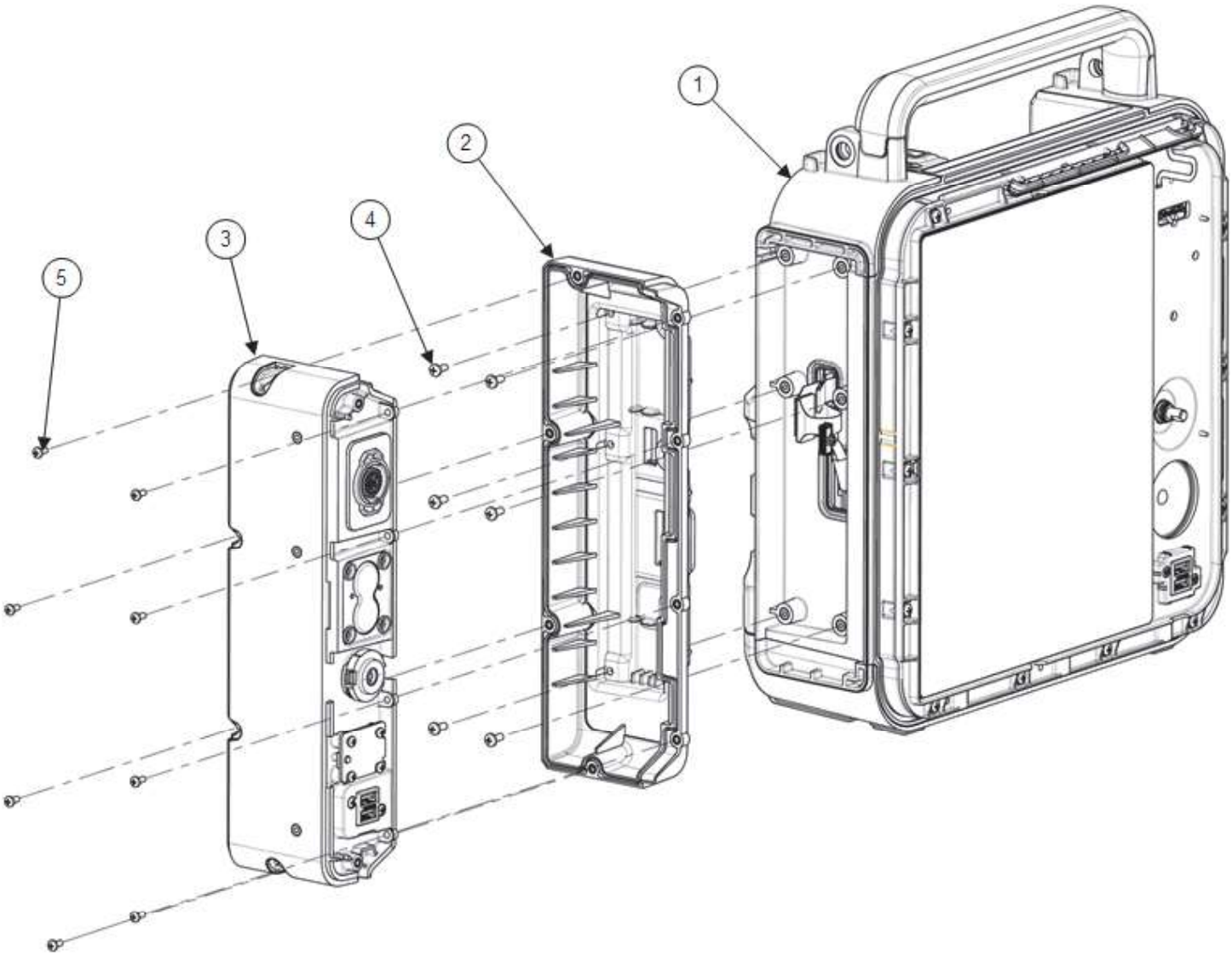
3 – Parameter Module Label—item 27, L06. Multiple configurations are available and listed in the table below. The service provider will need to order the correct part for the device being serviced. Each dash number pertains to a different configured device.

DASH NUMBER	DESCRIPTION
-346	LABEL,PMOD,MAS SPO2,MDT CO2,NIBP,TEMPIP,CHS,LP35
-340	LABEL,PMOD,MAS SPO2,MDT CO2,NIBP,CHS,LP35
-928	LABEL,PMOD,MAS SPO2,MDT CO2,NIBP,G2,LP35
-917	LABEL,PMOD,MAS SPO2,MDT CO2,NIBP,TEMPIP,G1,LP35
-934	LABEL,PMOD,MAS SPO2,MDT CO2,NIBP,G3,LP35
-938	LABEL,PMOD,MAS SPO2,MDT CO2,NIBP,TEMPIP,G2,LP35
-916	LABEL,PMOD,MAS SPO2,MDT CO2,NIBP,G1,LP35
-062	LABEL,PMOD,MAS SPO2,MDT CO2,NIBP,TEMPIP,IT,LP35
-222	LABEL,PMOD,MAS SPO2,MDT CO2,NIBP,TEMPIP,FI,LP35

4 – Serial Number Label—item 12, L03. Multiple configurations are available, based on language, and listed in the table below. The service provider will need to order the correct part for the device being serviced.

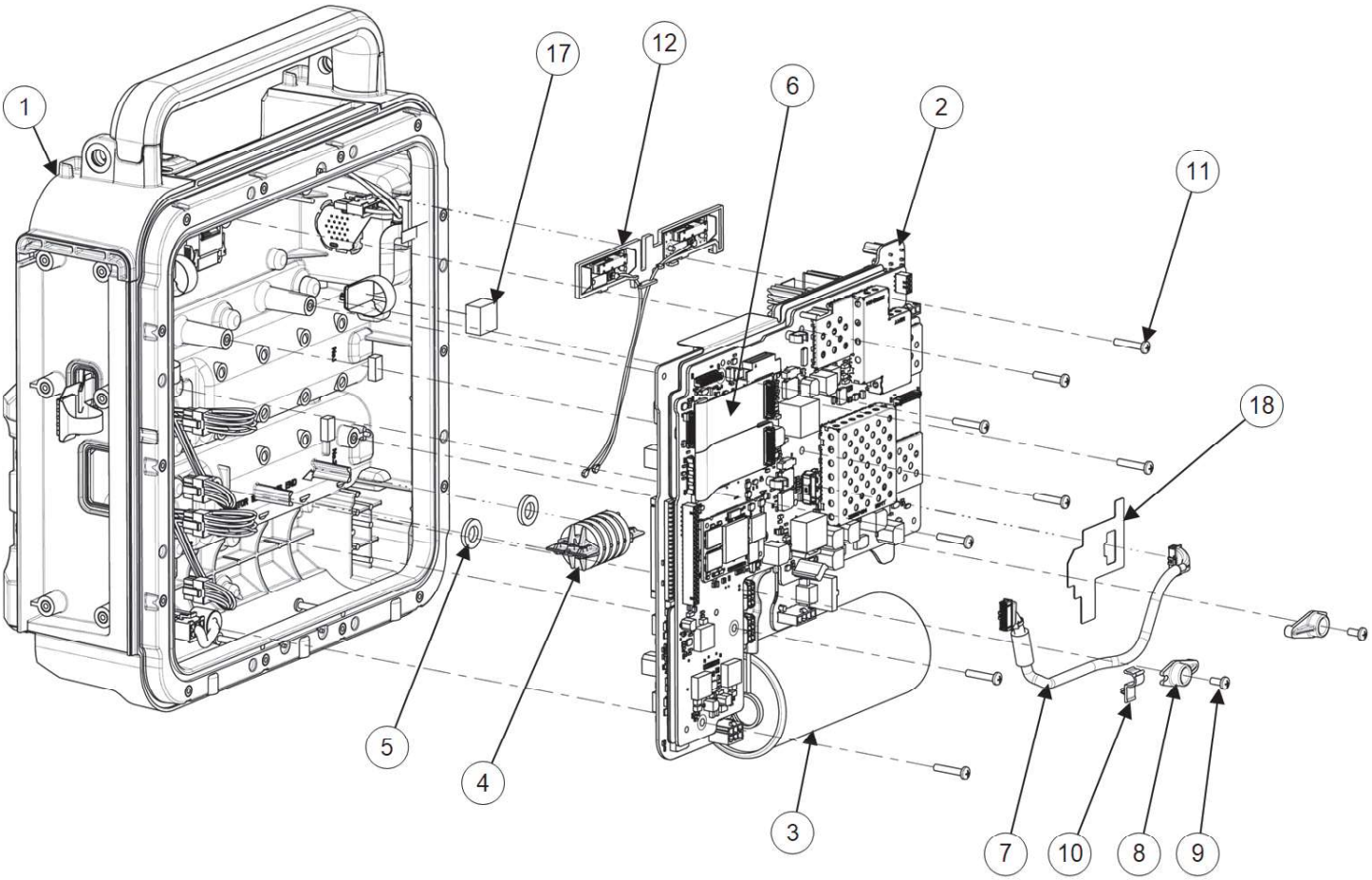
DASH NUMBER	DESCRIPTION
-001	LABEL, SERIAL NUMBER, LP35, ENGLISH
-021	LABEL,SERIAL NUMBER,LP35,INTL ENGLISH
-041	LABEL,SERIAL NUMBER,LP35,GERMAN
-061	LABEL,SERIAL NUMBER,LP35,ITALIAN
-081	LABEL,SERIAL NUMBER,LP35,FRENCH
-101	LABEL,SERIAL NUMBER,LP35,DUTCH
-121	LABEL,SERIAL NUMBER,LP35,SPANISH
-141	LABEL,SERIAL NUMBER,LP35,PORTUGUESE,IBERIAN
-181	LABEL,SERIAL NUMBER,LP35,SWEDISH
-201	LABEL,SERIAL NUMBER,LP35,DANISH
-221	LABEL,SERIAL NUMBER,LP35,FINNISH
-241	LABEL,SERIAL NUMBER,LP35,NORWEGIAN
-261	LABEL,SERIAL NUMBER,LP35,POLISH

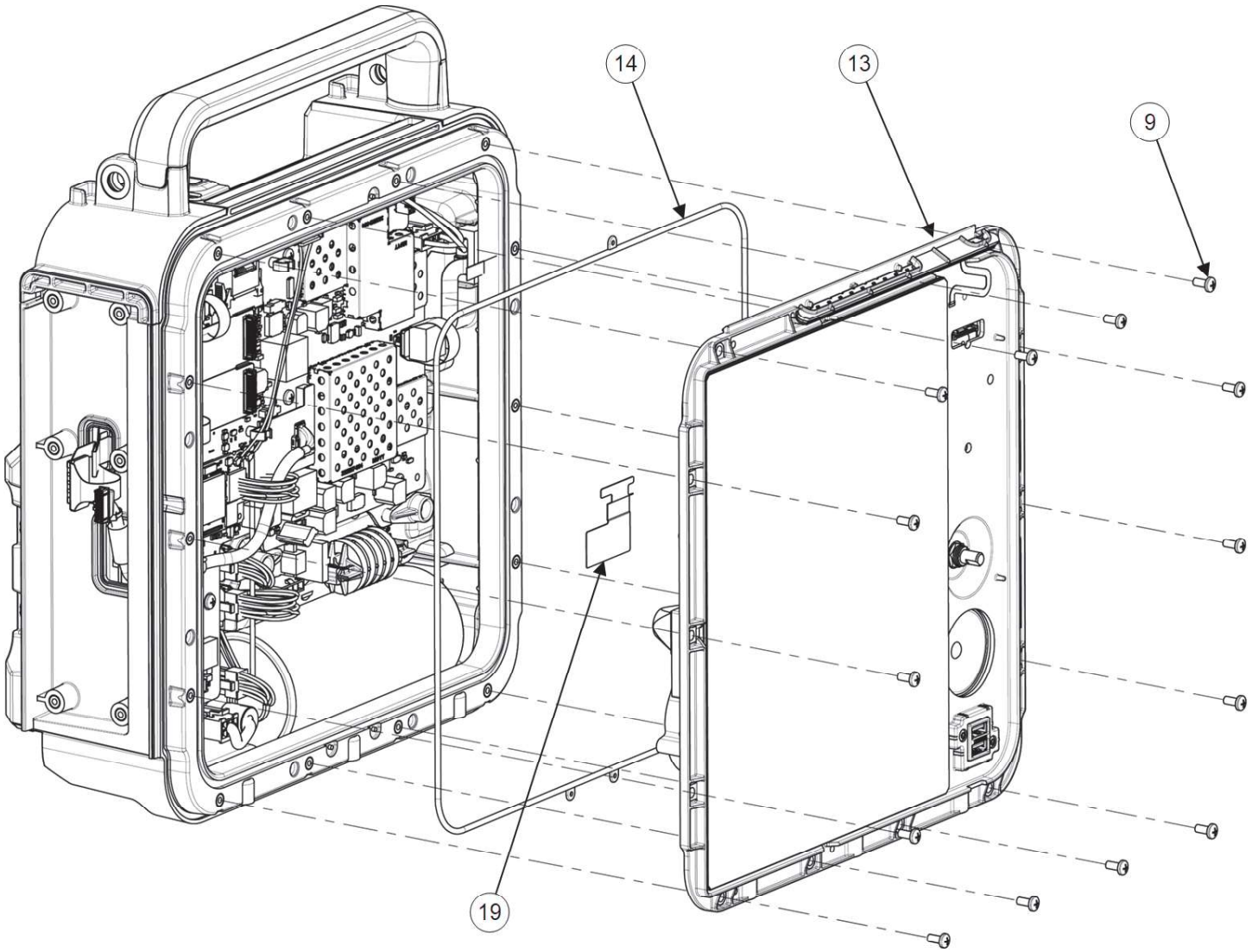
Vanilla Assembly



REF	SERVICE BOM REF	QTY	DESCRIPTION	NOTES
-	-	-	VANILLA,…, LP35	Various configs
1	-	1	ASSEMBLY, DEFIB,…, LP35	Various configs Reference Defib Assembly.
2	M13	1	ASSY, HOUSING RIGHT, PMOD, LP35	
3	-	1	ASSY, PMOD,…, LP35	Various configs Reference Parameter Module Assembly (-002, without temp/IP) or Parameter Module Assembly (-003, with temp/IP).
4	F02	6	SCREW, MACH, PANHEAD, PHDRV, SS, NYLOK, 6-32 X .312	
5	F08	8	SCREW-M,CS,Z,PH, NYLOCK,4-40 X .312L	

Defib Assembly

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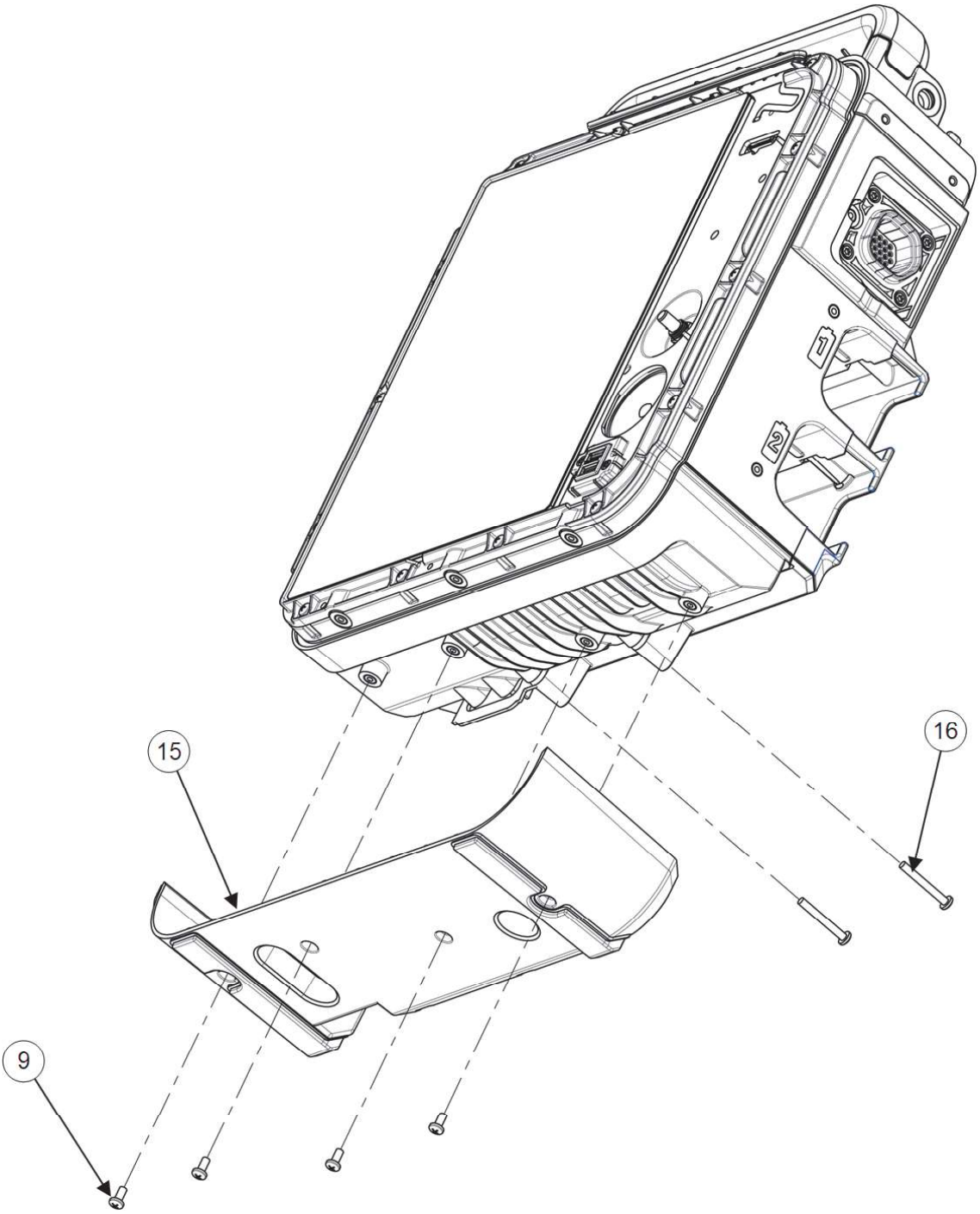
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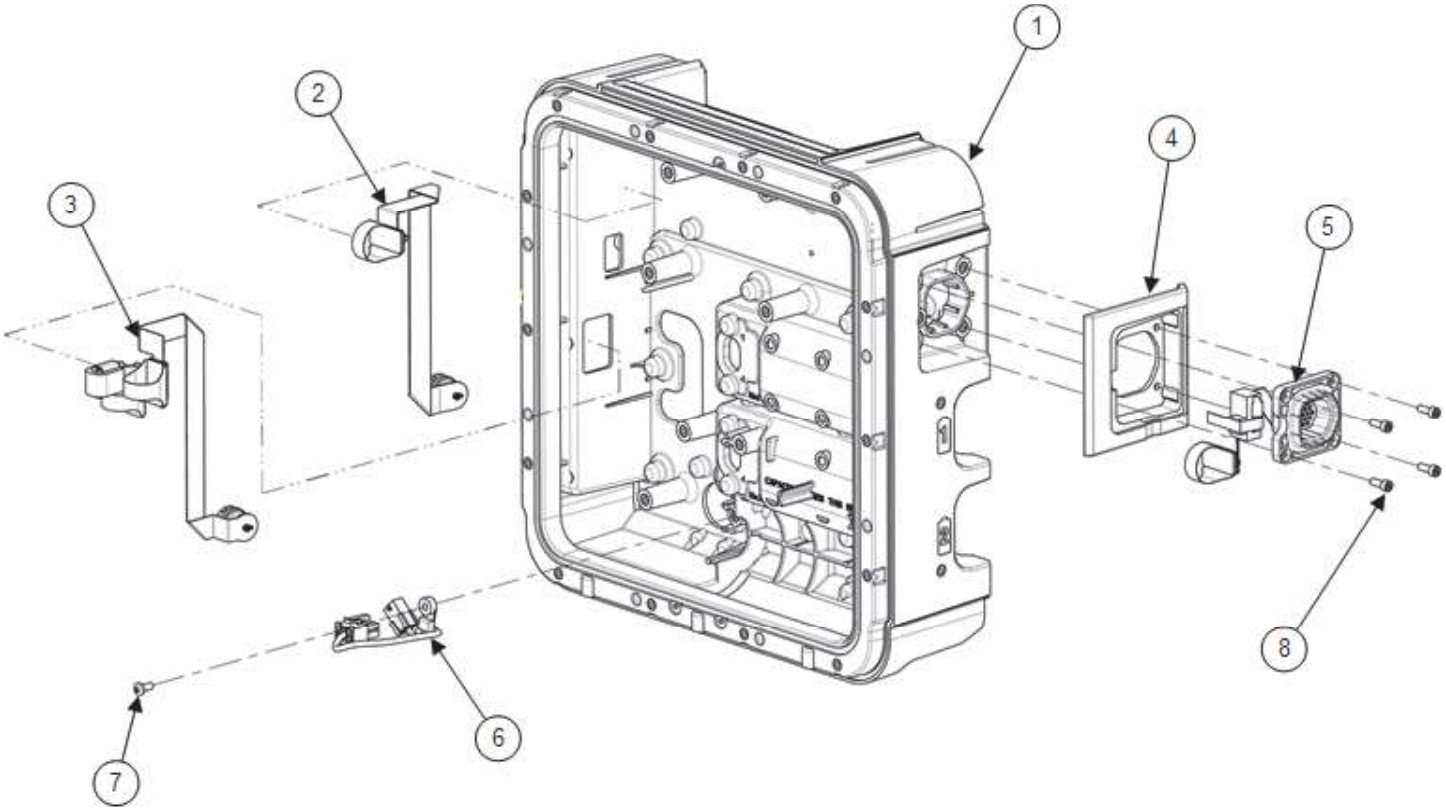
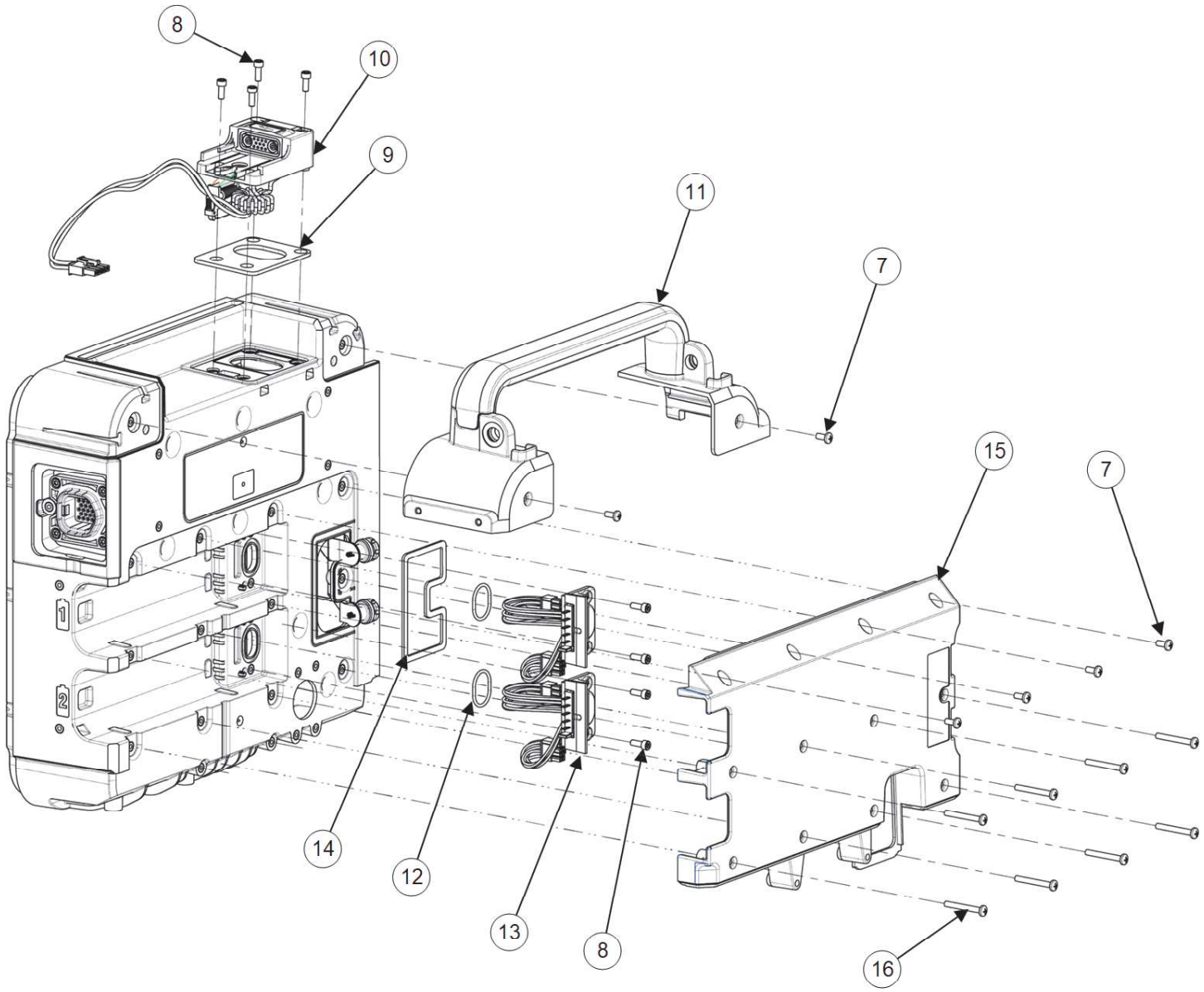
REF	SERVICE BOM REF	QTY	DESCRIPTION	NOTES
-	-	-	ASSEMBLY, DEFIB, LP35	
1	-	1	ASSY, REAR, LP35	Reference Rear Housing Assembly.
2	-	1	ASSY, PCBA STACK, LP35	Reference PCBA Stack Assembly.
3	E03	1	CAPACITOR, ENERGY STORAGE, LP35	
4	E04	1	INDUCTIVE RESISTOR-5 OHM, LP35	
5	M14	2	WASHER, FLAT, NPRN, .350IN ID, .625IN OD, .093IN THK	
6	C01	1	FLEX, UI, SYSTEM PCBA, LSEM, LP35	
7	C02	1	CABLE ASSY, TEMP-IP, LP35	Only required for temp-IP configurations.
8	M15	2	BRACKET, PCBA, ENERGY DELIVERY, LP35	
9	F02	20	SCREW, MACH, PANHEAD, PHDRV, SS, NYLOK, 6-32 X .312	
10	M37	1	CLIP,ROUTING,DIA.25IN HOLDING C,SNAP LOCK	Only required for temp-IP configurations.
11	F05	8	SCREW, MACH, PANHD, PHDRV, NYLOK, 6-32 X .750, CS, ZN	
12	E05	1	ASSY, ANTENNA, WLAN, LP35	
13	-	1	ASSY, HOUSING, FRONT, LP35	Reference Front Housing Assembly.
14	M16	1	SEAL, HOUSING, MAIN, LPQ5, LPT5	
15	M17	1	HOUSING, PLATE, SKID, LP35	
16	F06	2	SCREW, MACHINE, PANHEAD, NYLOK, 6-32 X 1.125	
17	M38	1	FOAM, DISPLAY CABLE, LP35	
18	L14	1	ASSY, INSULATOR, PCBA, SYSTEM, FRONT, LP35	Only required for temp-IP configurations.
19	L15	1	INSULATOR, PCBA, INTERFACE, DISPLAY POWER, LP35	Only required for temp-IP configurations.

Rear Housing Assembly

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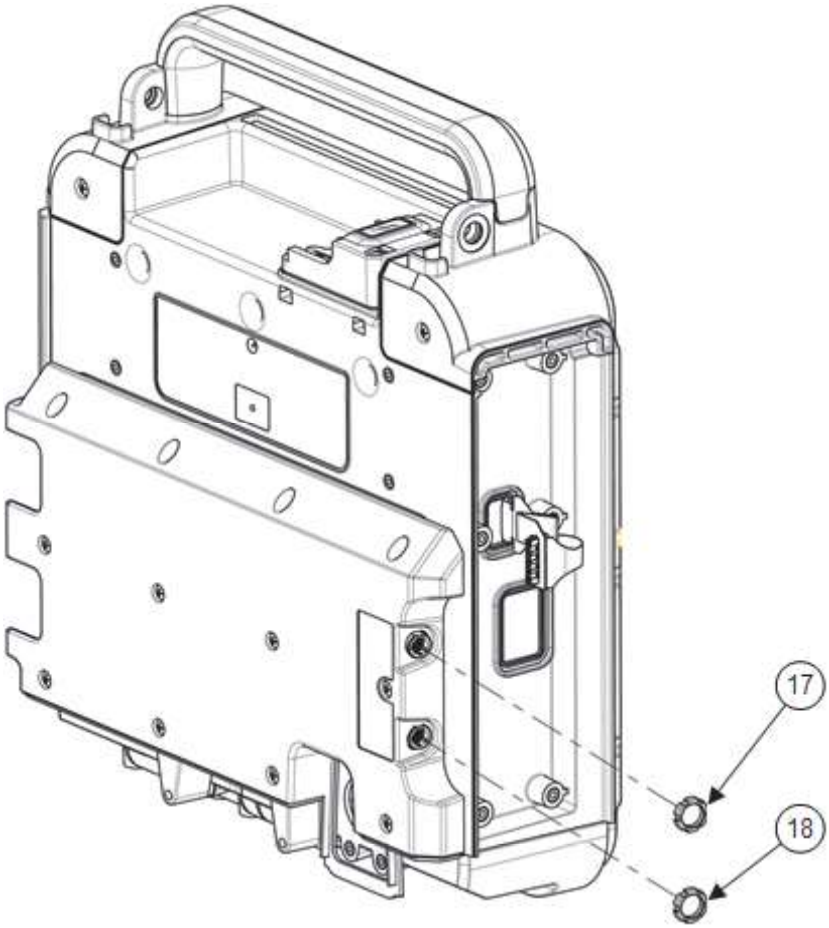
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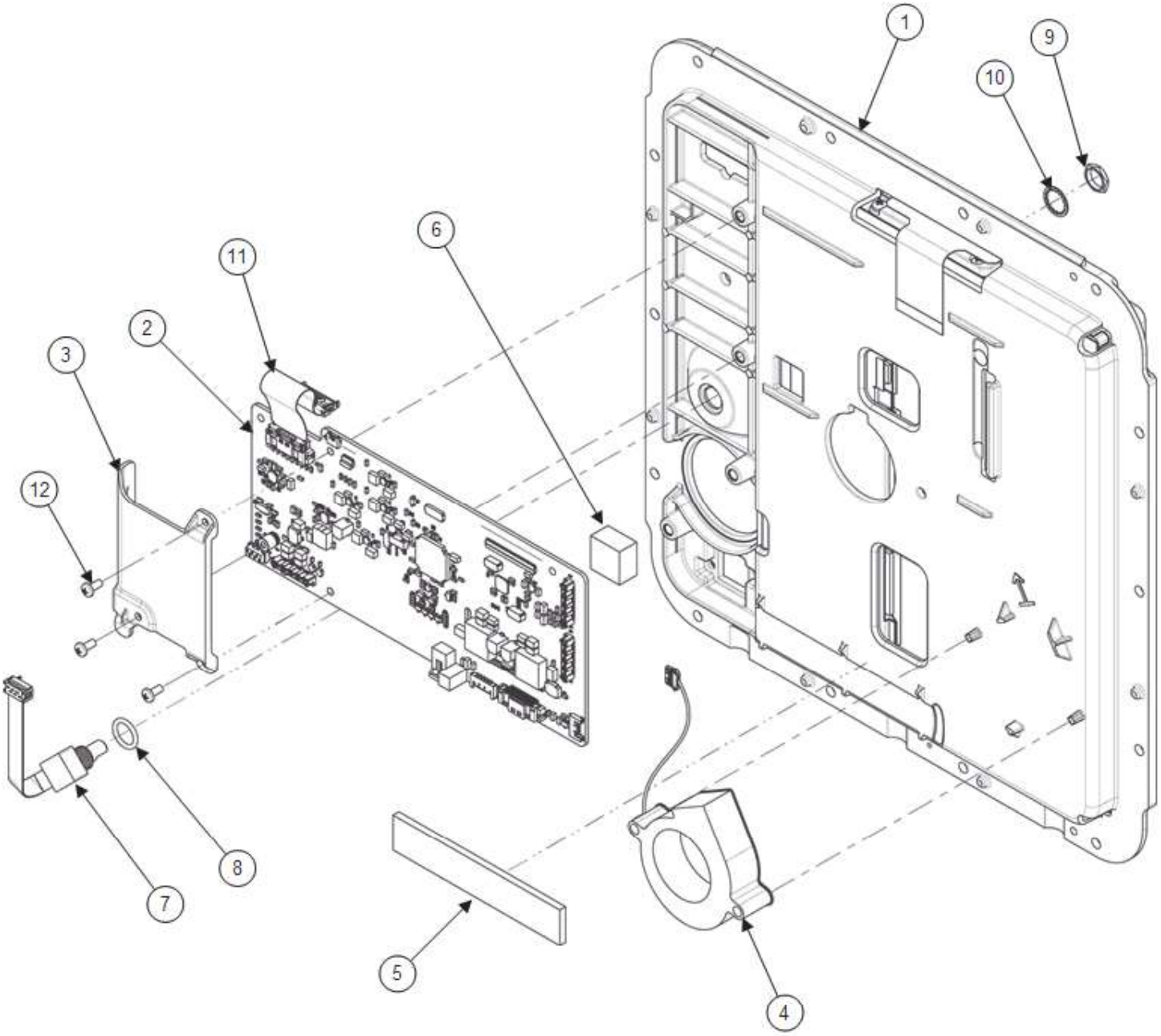
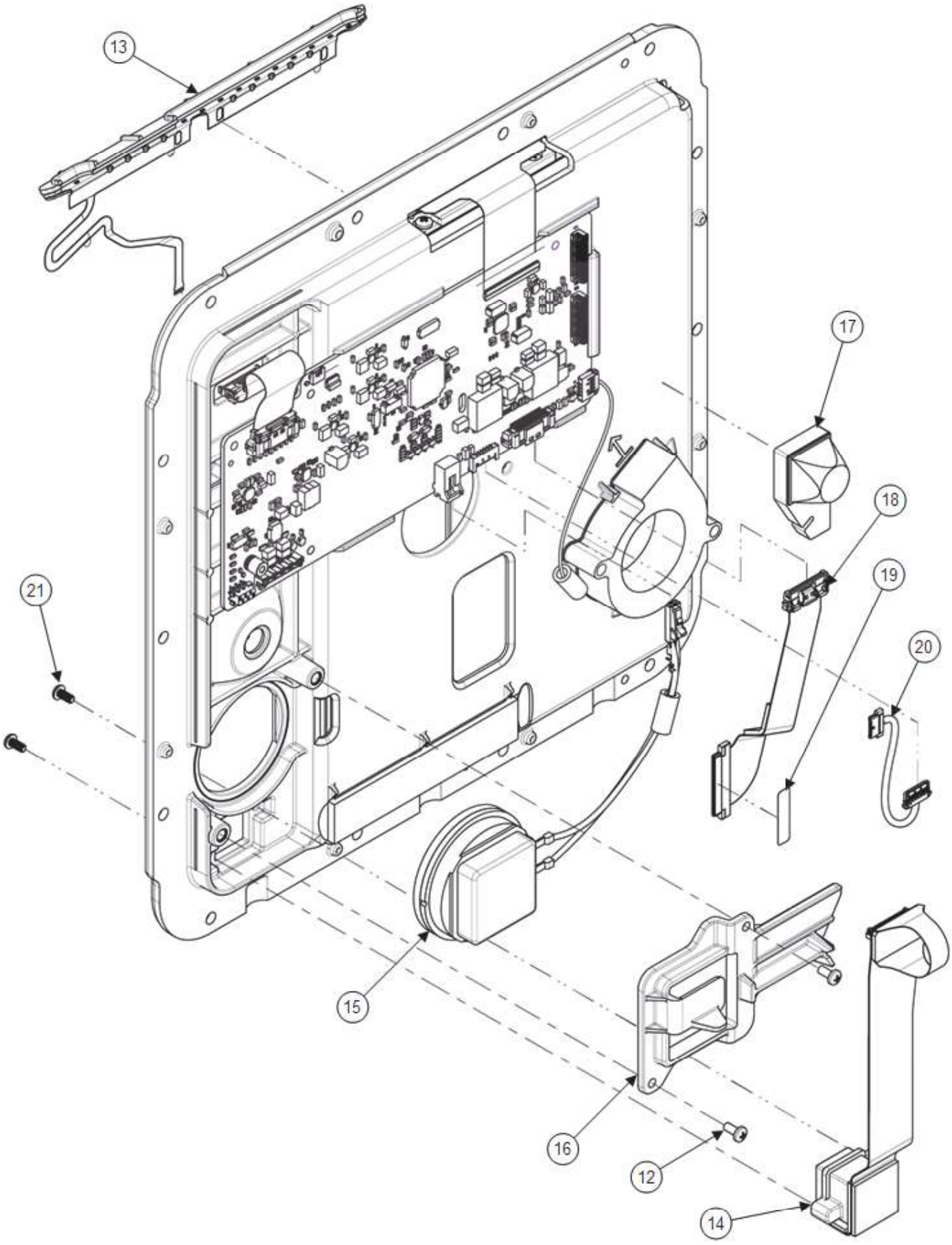
REF	SERVICE BOM REF	QTY	DESCRIPTION	NOTES
-	-	-	ASSY, REAR, LP35	
1	M18	1	ASSY, REAR HOUSING, LP35	Available only as part of repair kit(s).
2	C03	1	FLEX, ACCESS, LP35	
3	C04	1	FLEX, DEFIB-PMOD, LP35	
4	M19	1	HOUSING, ECG, PLATE, LPT5	
5	E06	1	ASSY, ECG FLEX, LP35	
6	C05	1	ASSY, CABLE, INTERNAL DC POWER, LP35	
7	F02	7	SCREW, MACH, PANHEAD, PHDRV, SS, NYLOK, 6-32 X .312	
8	F01	12	SCREW-CAP, SCH, REC T15 TORX 6-32, 0.375L, SS, NYLOK	
9	M20	1	GASKET, THERAPY RECEPTACLE, LPQ5, LPT5	Available only as part of repair kit(s).
10	E07	1	ASSEMBLY, RECEPTACLE, THERAPY, LP35	Available only as part of repair kit(s).
11	-	1	ASSY, HANDLE, LP35	Reference Handle Assembly
12	M21	2	O-RING, SILICONE, GSKT, ID 0.739 IN, W 0.070 IN	Available only as part of repair kit(s).
13	E08	2	HARNESS, WIRE, BATTERY CONNECTOR, LP35	Available only as part of repair kit(s).
14	M22	1	SEAL, REAR HSG PRINTER MODEM ACCESS, LP35	Available only as part of repair kit(s).
15	M23	1	ASSY, BATTERY BACKPLATE, LP35	
16	F06	8	SCREW, MACHINE, PANHEAD, NYLOK, 6-32 X 1.125	
17	-	1	PANEL NUT	Part of item 2
18	-	1	PANEL NUT	Part of item 3

Front Housing Assembly

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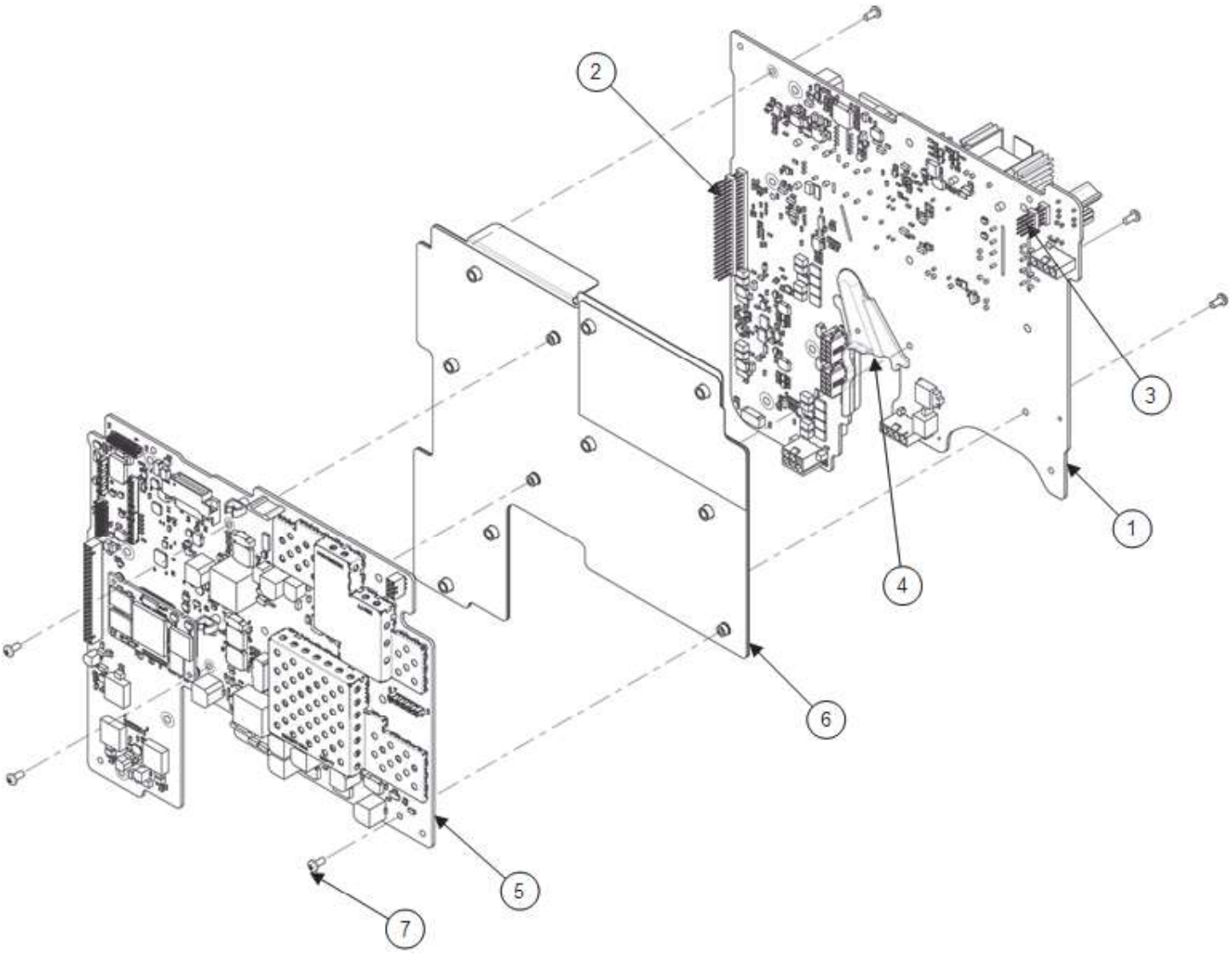
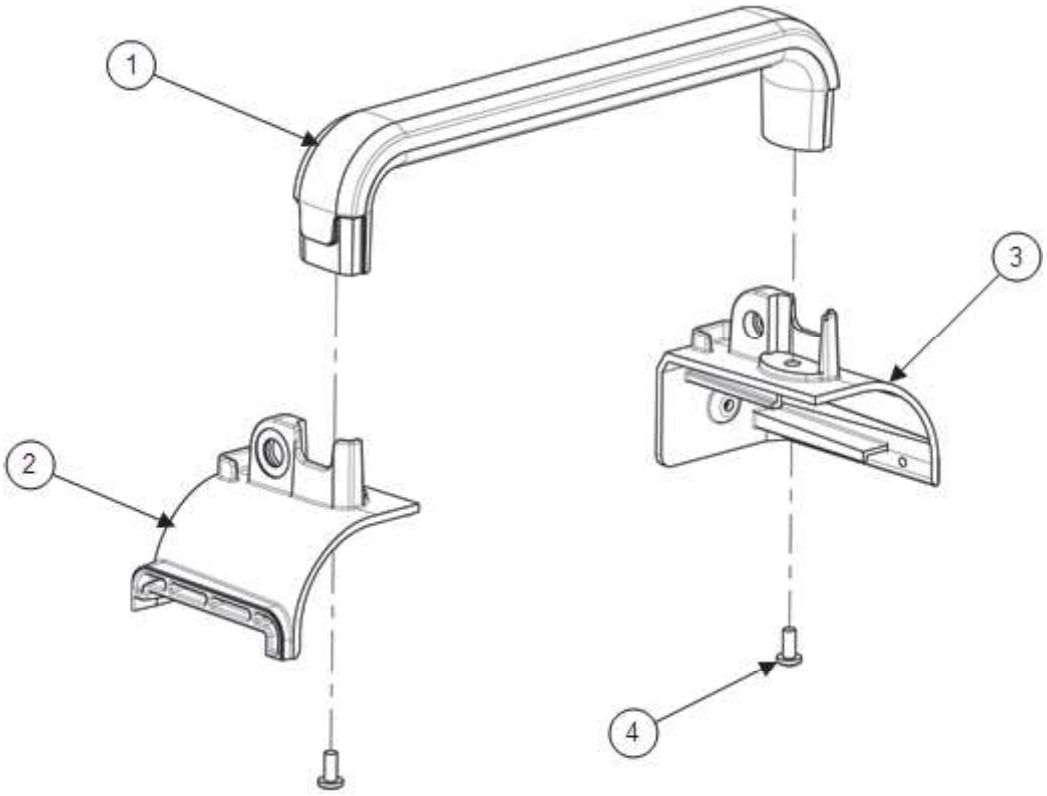
REF	SERVICE BOM REF	QTY	DESCRIPTION	NOTES
-	-	-	ASSY, HOUSING, FRONT, LP35	
1	E09	1	ASSY, FRONT HSG, DISPLAY, LOCA, LP35	Available only as part of repair kit(s).
2	A01	1	ASSY, PCB, INTERFACE, LIFEPAK 35	Available only as part of repair kit(s).
3	M24	1	INSULATOR, INTERFACE PCBA, LPQ5, LPT5	
4	E10	1	ASSY, FAN WITH VHB, LP35	Adhesive is pre-applied to fan.
5	M26	1	FOAM, CAPACITOR SUPPORT, LPQ5, LPT5	Available only as part of repair kit(s). Pre-installed onto item E09.
6	M38	1	FOAM, DISPLAY CABLE, LP35	
7	E12	1	ASSY, ROTARY SWITCH WITH O-RING, LP35	O-ring is pre-applied to rotary switch.
8	M28	1	O-RING, SILICONE, GSKT, ID0.364IN, W0.070IN, 50DURO-M	Available only as part of repair kit(s). Pre-assembled as part of item E12.
9	-	1	PANEL NUT	Part of item E12
10	-	1	LOCK WASHER	Part of item E12
11	C08	1	FLEX, DEFIB KEY PANEL-LIGHT SENSOR, LP35	
12	F04	5	SCREW-M, PH, NYLOK, CS, 4-40, .250L	
13	E13	1	FLEX, BEACON, READINESS INDICATOR, LP35	
14	E14	1	FLEX, USB, LSEM, LP35	
15	E15	1	ASSY, CABLE, SPEAKER, LP35	
16	M29	1	BRACKET, SPEAKER, LP35	
17	M30	1	ASSY, SHOCK BUMPER FOAM, LP35	Available only as part of repair kit(s). Pre-installed onto item E09.
18	C06	1	FLEX, DISPLAY VIDEO, LP35	
19	L07	1	LABEL, ASSY AID, 0.9IN, LP35	
20	C07	1	ASSY, CABLE, DISPLAY POWER, LPQ5, LPT5	
21	F03	2	SCREW, BUTTONHEAD, TORX, #4-40 X LG 0.25 IN	

PCBA Stack Assembly



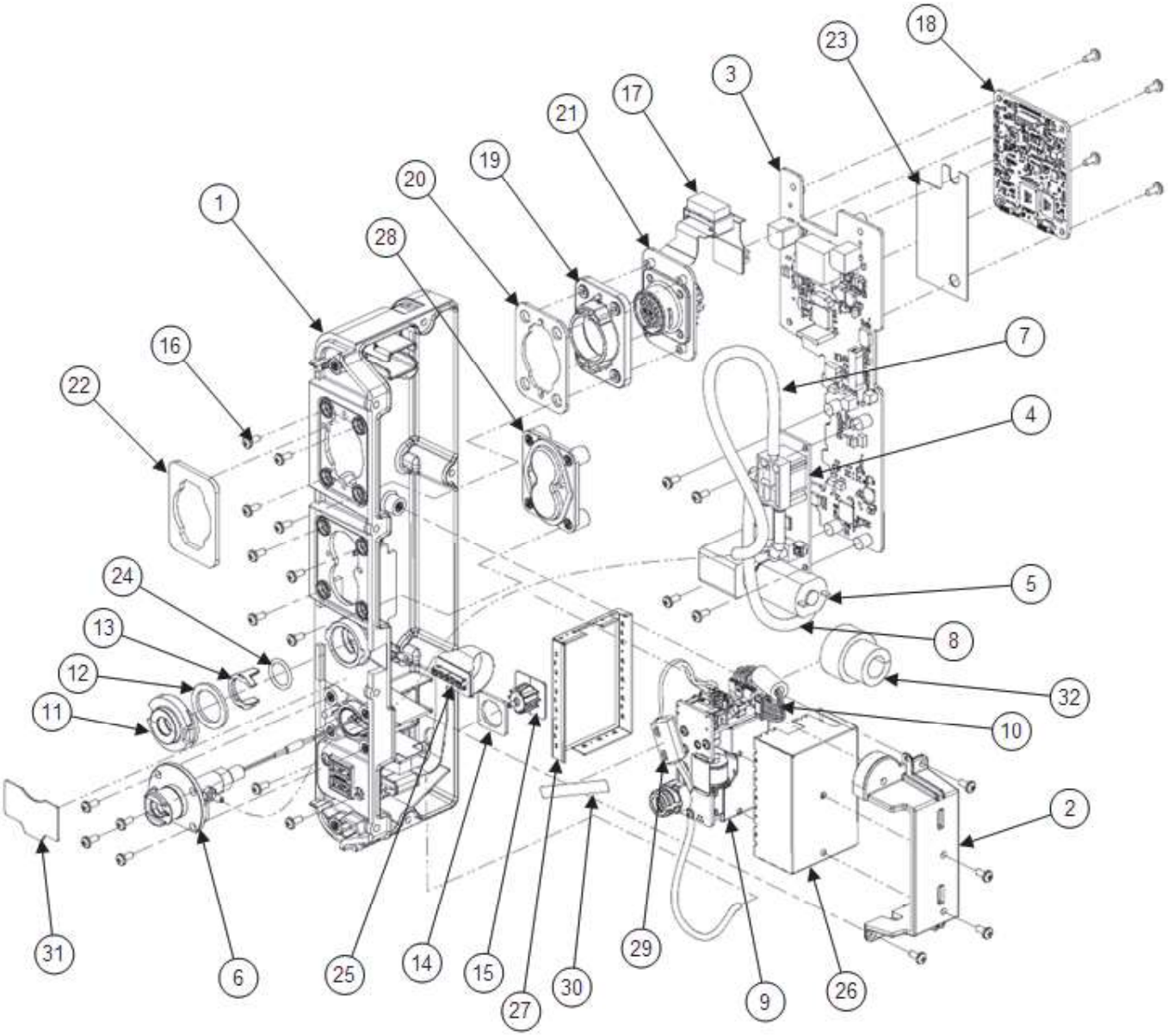
REF	SERVICE BOM REF	QTY	DESCRIPTION	NOTES
-	-	-	ASSY, PCBA STACK, LP35	
1	A02	1	ASSY, PCB, ENERGY DELIVERY, LIFEPAK 35	Available only as part of repair kit(s).
2	E16	1	HEADER, BOARD STACKER, .100 IN, 44 PIN	
3	E17	1	HEADER, BOARD STACKER, .100 IN, 8 PIN	
4	M31	1	GUIDE, BATTERY HARNESS, LPQ5, LPT5	
5	A03	1	ASSY, PCB, SYSTEM, LIFEPAK 35	Available only as part of repair kit(s).
6	M32	1	BRACKET ASSEMBLY, PCBA STACK, LPQ5, LPT5	
7	F04	6	SCREW-M, PH, NYLOK, CS, 4-40, .250L	

Handle Assembly

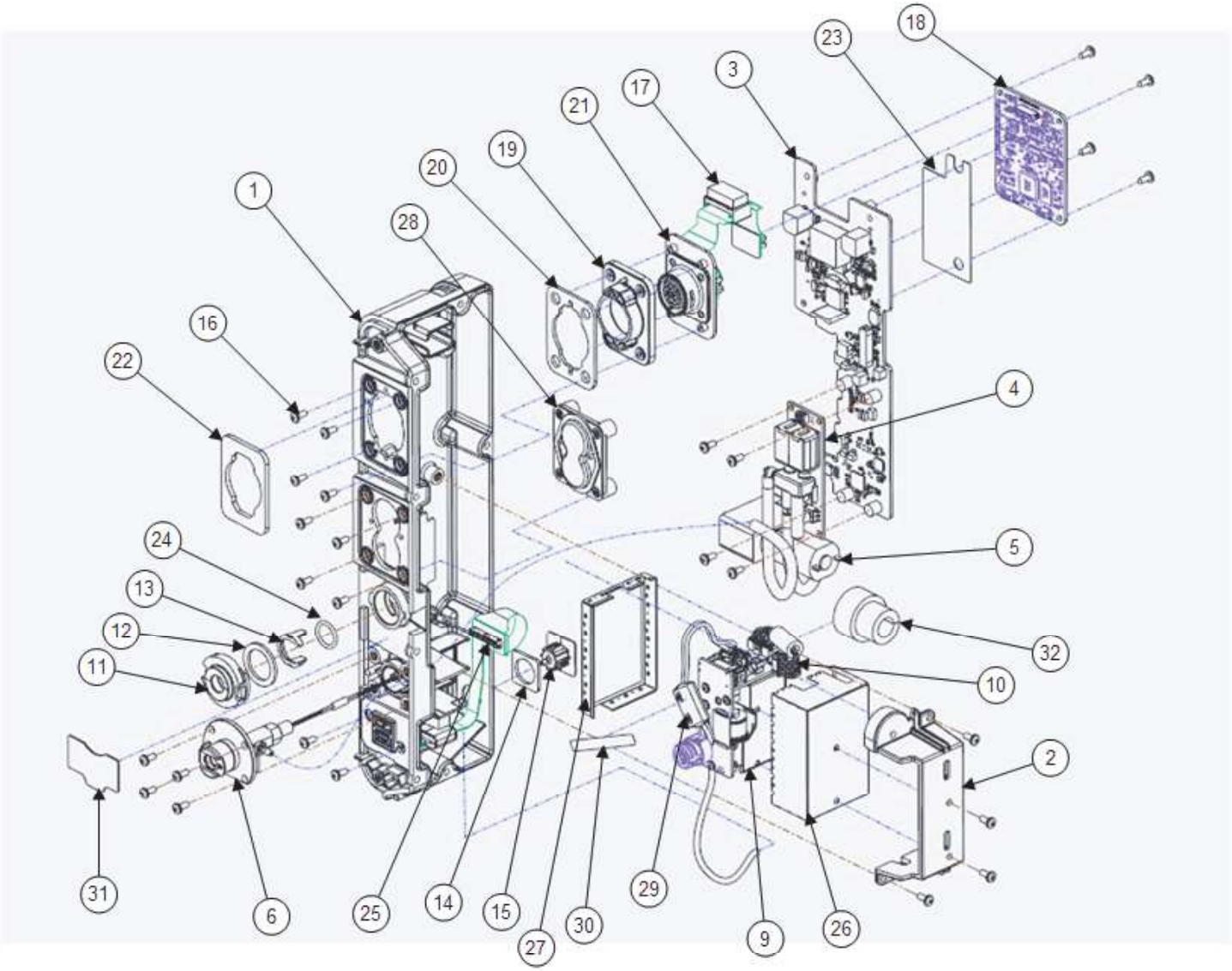


REF	SERVICE BOM REF	QTY	DESCRIPTION	NOTES
-	-	-	ASSY, HANDLE, LP35	
1	M33	1	HANDLE, LP35	
2	M34	1	HOUSING, CORNER, HANDLE, LEFT, LPT35	
3	M35	1	ASSY, CORNER, HANDLE, RIGHT, LP35	
4	F07	2	SCREW, #8-32X3/8 PH, CR, SS, PTCH	

Parameter Module Assembly(-002, without temp/IP), v1.1.1



Parameter Module Assembly (without temp/IP), v1.1.2

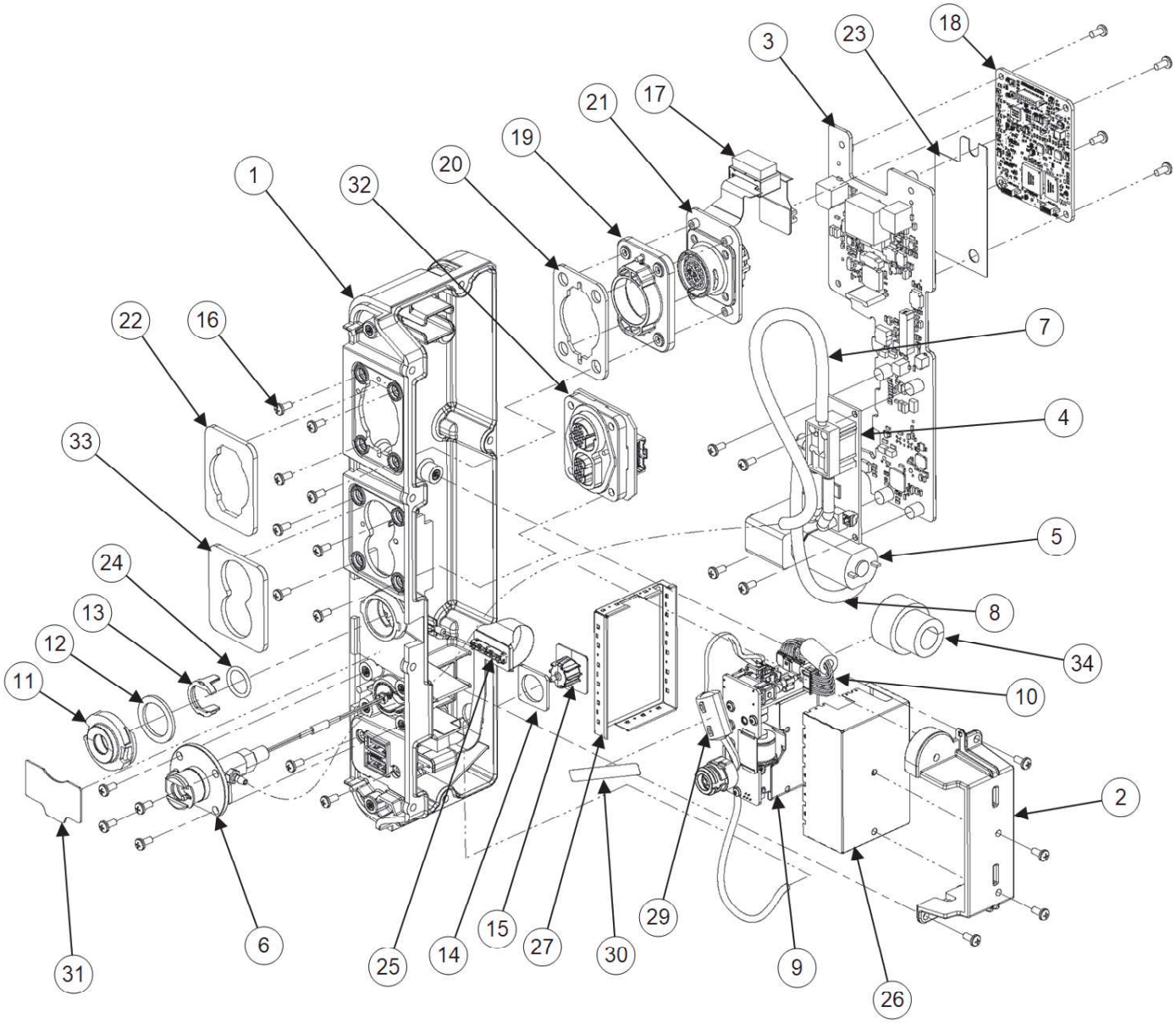


REF	SERVICE BOM REF	QTY	DESCRIPTION	NOTES
-	-	-	ASSY, PMOD, MAS SPO2, MDT CO2, NIBP, LP35	
1	M58	1	ASSY, HOUSING LEFT, PMOD, LP35	
2	M56	1	BRACKET, PMOD, INTERNAL, LP35	
3	A04	1	ASSY, PCB, PATIENT PARAMETER BOARD, LIFEPAK 35	Available only as part of repair kit(s).
4	E18	1	MODULE, NIBP, ADVANTAGE MX MINI, 6V, SUNTECH	Used on v1.1.1 device; paired with E19 pump.
4	E27	1	ASSY, MODULE, NIBP, ADVANTAGE MX MINI, 6V	Used on v1.1.2 device; paired with E28 pump.

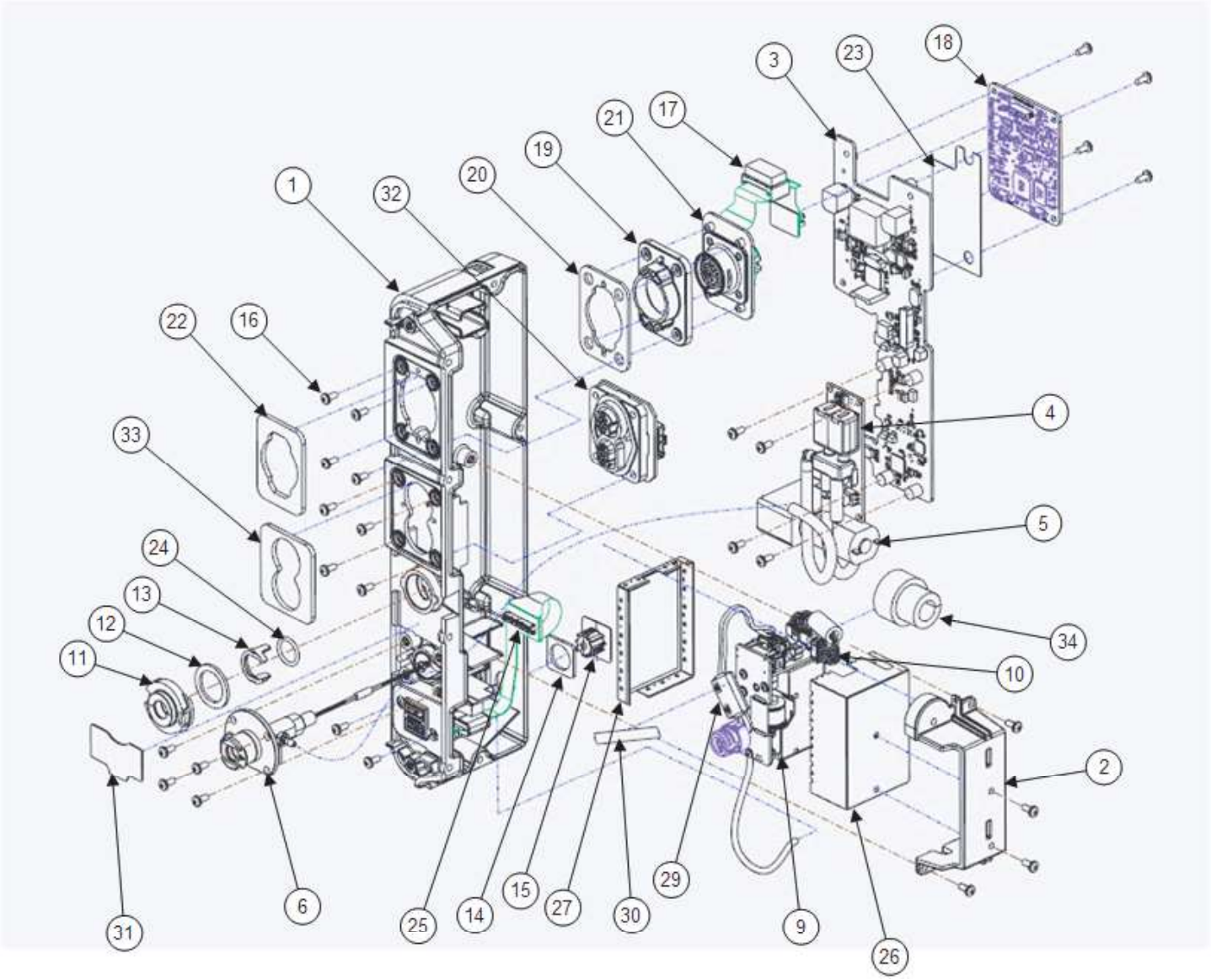
REF	SERVICE BOM REF	QTY	DESCRIPTION	NOTES
5	E19	1	PUMP, MINI-MAXIQ, 6V, SUNTECH, RA WIRES	Used on v1.1.1 device; paired with E18 module.
5	E28	1	PUMP,MINI-MAXIQ,6V,SUNTECH,4INC H RA WIRES,ROHS	Used on v1.1.2 device; paired with E27 module.
6	E20	1	COUPLER, NIBP, LP35	
7	M57	1	HOSE, COUPLER TO MODULE, NIBP, LPQ5	Does not apply to v1.1.2; hose is part of NIBP module.
8	M39	1	HOSE, PUMP TO MODULE, NIBP, LPQ5	Does not apply to v1.1.2; hose is part of NIBP module.
9	E21	1	MODULE, CO2, NANOMEDICO2 V2, ORIDION	Available only as part of repair kit(s).
10	C09	1	CABLE ASSY, CO2, LP35	
11	M40	1	HOUSING, FRS MOUNTING, LP35	
12	M41	1	SEAL, FRS HOUSING, LP35	
13	M42	1	SNAP RING, FRS MOUNTING, LP35	Available only as part of repair kit(s).
14	M43	1	SEAL, CO2 EXHAUST, LP35	
15	M44	1	HOUSING, CO2 EXHAUST, LP35	
16	F04	26	SCREW-M, PH, NYLOK, CS, 4-40, .250L	
17	E22	1	FLEX, MASIMO PATIENT, LP35	
18	E23	1	MODULE, SPO2, MX-5 BOARD V7, MASIMO	
19	M45	1	HOUSING, MASIMO CONNECTOR, LP35	
20	M46	1	SEAL, MASIMO HOUSING, LP35	Available only as part of repair kit(s).
21	M47	1	BRACKET, MASIMO PATIENT CONNECTOR, LPQ5	
22	M48	1	SEAL, MASIMO MOUNTING, LPQ5	
23	M49	1	INSULATOR, PCBA, REAR, PMOD, LPQ5	
24	M50	1	O-RING, SILICONE, GSKT, ID 0.426 IN, W 0.070 IN	Available only as part of repair kit(s).
25	E24	1	FLEX, USB, PMOD, LP35	

REF	SERVICE BOM REF	QTY	DESCRIPTION	NOTES
26	M51	1	SHIELD, CO2 MODULE, TOP, LP35	
27	M52	1	SHIELD, CO2 MODULE, BOTTOM, LP35	
28	M53	1	ASSY, PLUG, TEMP-IP, LP35	For non-temp/IP configurations.
29	M54	1	FERRITE, CLAMP ON,OD.465IN,ID.169IN,LG. 913IN	
30	L12	1	LABEL, ASSY AID, 2.0IN, LP35	
31	L13	1	ASSEMBLY AID, CO2 DOOR, LP35	
32	M59	1	FOAM, CO2 WIRE HARNESS, LP35	

Parameter Module Assembly (-003, with temp/IP), v1.1.1



Parameter Module Assembly (with temp/IP), v1.1.2



REF	SERVICE BOM REF	QTY	DESCRIPTION	NOTES
-	-	-	ASSY, PMOD, MAS SPO2, MDT CO2, NIBP, LP35	
1	M58	1	ASSY, HOUSING LEFT, PMOD, LP35	
2	M56	1	BRACKET, PMOD, INTERNAL, LP35	
3	A04	1	ASSY, PCB, PATIENT PARAMETER BOARD, LIFEPAK 35	Available only as part of repair kit(s).
4	E18	1	MODULE, NIBP, ADVANTAGE MX MINI, 6V, SUNTECH	Used on v1.1.1 device; paired with E19 pump.

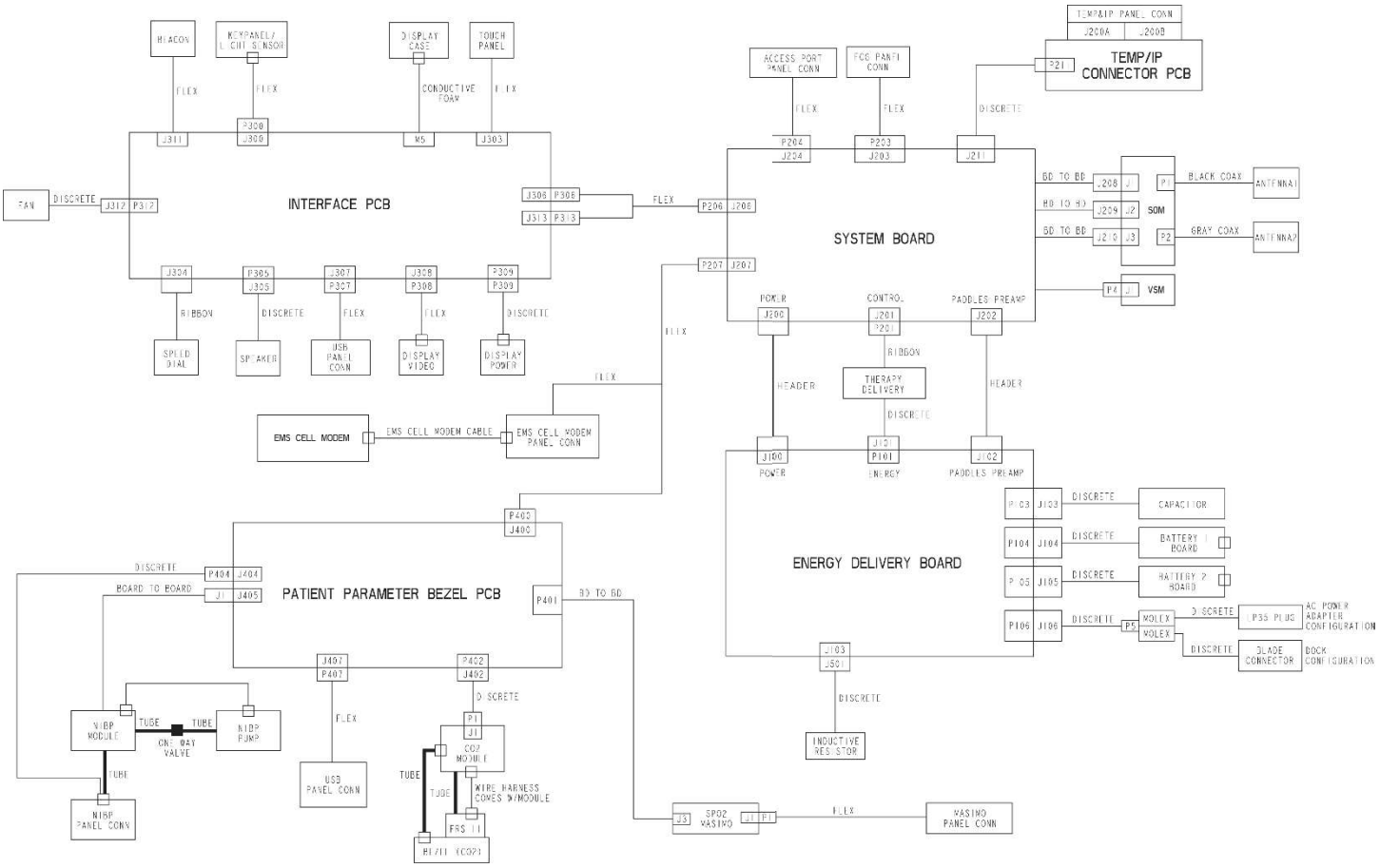
REF	SERVICE BOM REF	QTY	DESCRIPTION	NOTES
4	E27	1	ASSY, MODULE, NIBP, ADVANTAGE MX MINI, 6V	Used on v1.1.2 device; paired with E28 pump.
5	E19	1	PUMP, MINI-MAXIQ, 6V, SUNTECH, RA WIRES	Used on v1.1.1 device; paired with E18 module.
5	E28	1	PUMP,MINI-MAXIQ,6V,SUNTECH,4INCH RA WIRES,ROHS	Used on v1.1.2 device; paired with E27 module.
6	E20	1	COUPLER, NIBP, LP35	Used on v1.1.1 device; paired with E19 pump.
7	M57	1	HOSE, COUPLER TO MODULE, NIBP, LPQ5	Does not apply to v1.1.2; hose is part of NIBP module.
8	M39	1	HOSE, PUMP TO MODULE, NIBP, LPQ5	Does not apply to v1.1.2; hose is part of NIBP module.
9	E21	1	MODULE, CO2, NANOMEDICO2 V2, ORIDION	Available only as part of repair kit(s).
10	C09	1	CABLE ASSY, CO2, LP35	
11	M40	1	HOUSING, FRS MOUNTING, LP35	
12	M41	1	SEAL, FRS HOUSING, LPQ5	
13	M42	1	SNAP RING, FRS MOUNTING, LP35	Available only as part of repair kit(s).
14	M43	1	SEAL, CO2 EXHAUST, LP35	
15	M44	1	HOUSING, CO2 EXHAUST, LP35	
16	F04	26	SCREW-M, PH, NYLOK, CS, 4-40, .250L	
17	E22	1	FLEX, MASIMO PATIENT, LP35	
18	E23	1	MODULE, SPO2, MX-5 BOARD V7, MASIMO	
19	M45	1	HOUSING, MASIMO CONNECTOR, LP35	
20	M46	1	SEAL, MASIMO HOUSING, LPQ5	Available only as part of repair kit(s).
21	M47	1	BRACKET, MASIMO PATIENT CONNECTOR, LPQ5	
22	M48	1	SEAL, MASIMO MOUNTING, LPQ5	
23	M49	1	INSULATOR, PCBA, REAR, PMOD, LPQ5	

REF	SERVICE BOM REF	QTY	DESCRIPTION	NOTES
24	M50	1	O-RING, SILICONE, GSKT, ID 0.426 IN, W 0.070 IN	Available only as part of repair kit(s).
25	E24	1	FLEX, USB, PMOD, LP35	
26	M51	1	SHIELD, CO2 MODULE, TOP, LP35	
27	M52	1	SHIELD, CO2 MODULE, BOTTOM, LP35	
29	M54	1	FERRITE, CLAMP ON,OD.465IN,ID.169IN,LG. 913IN	
30	L12	1	LABEL, ASSY AID, 2.0IN, LP35	
31	L13	1	ASSEMBLY AID, CO2 DOOR, LP35	
32	E25	1	ASSY, PCB, TEMP AND IP CONNECTOR, LIFEPAK 35	For temp/IP configurations.
33	M55	1	SEAL, TEMP-IP MOUNTING, LP35	
34	M59	1	FOAM, CO2 WIRE HARNESS, LP35	

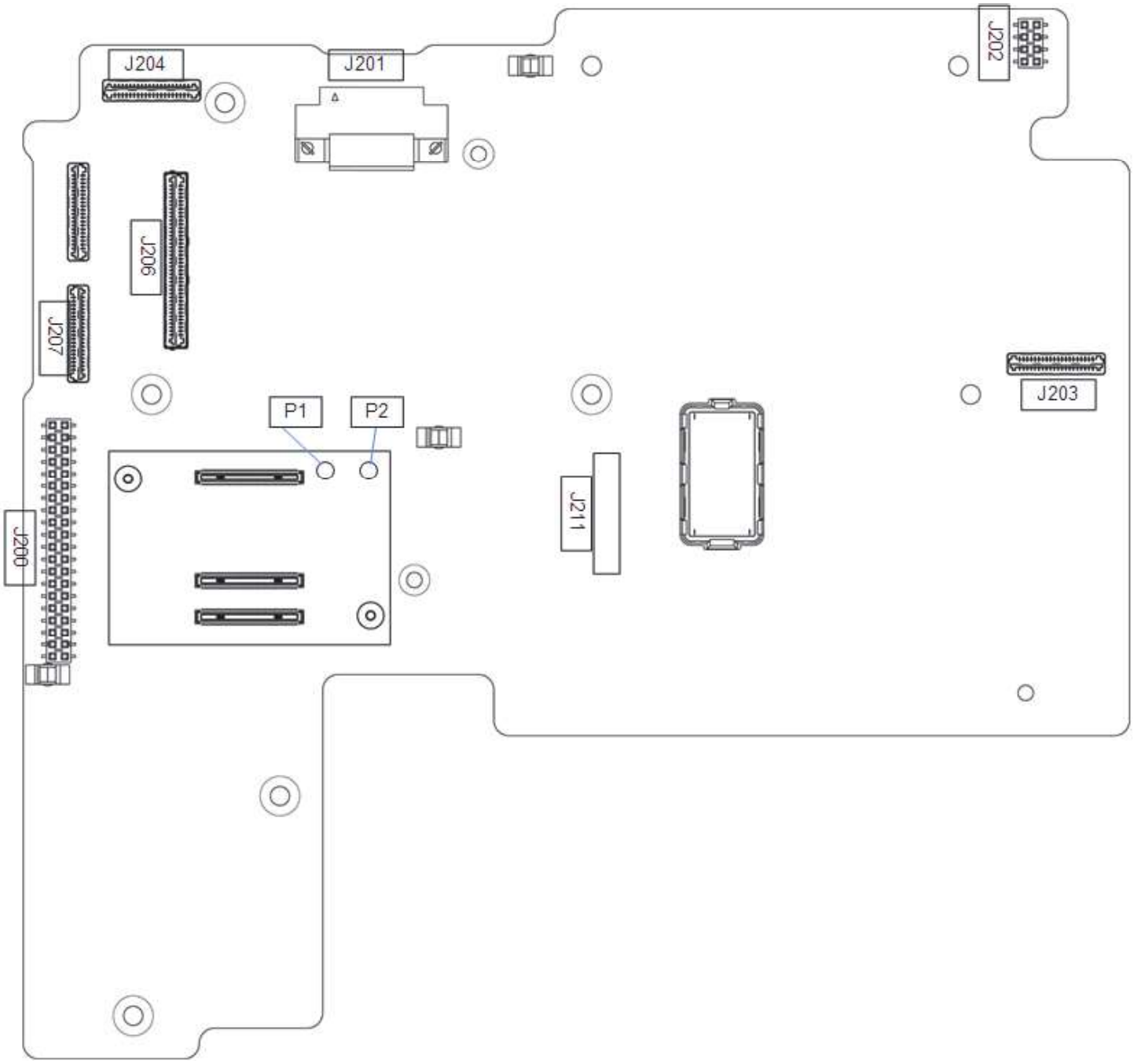
Connection Diagrams

The diagrams below show electrical connection points within the device, and their alphanumeric designators.

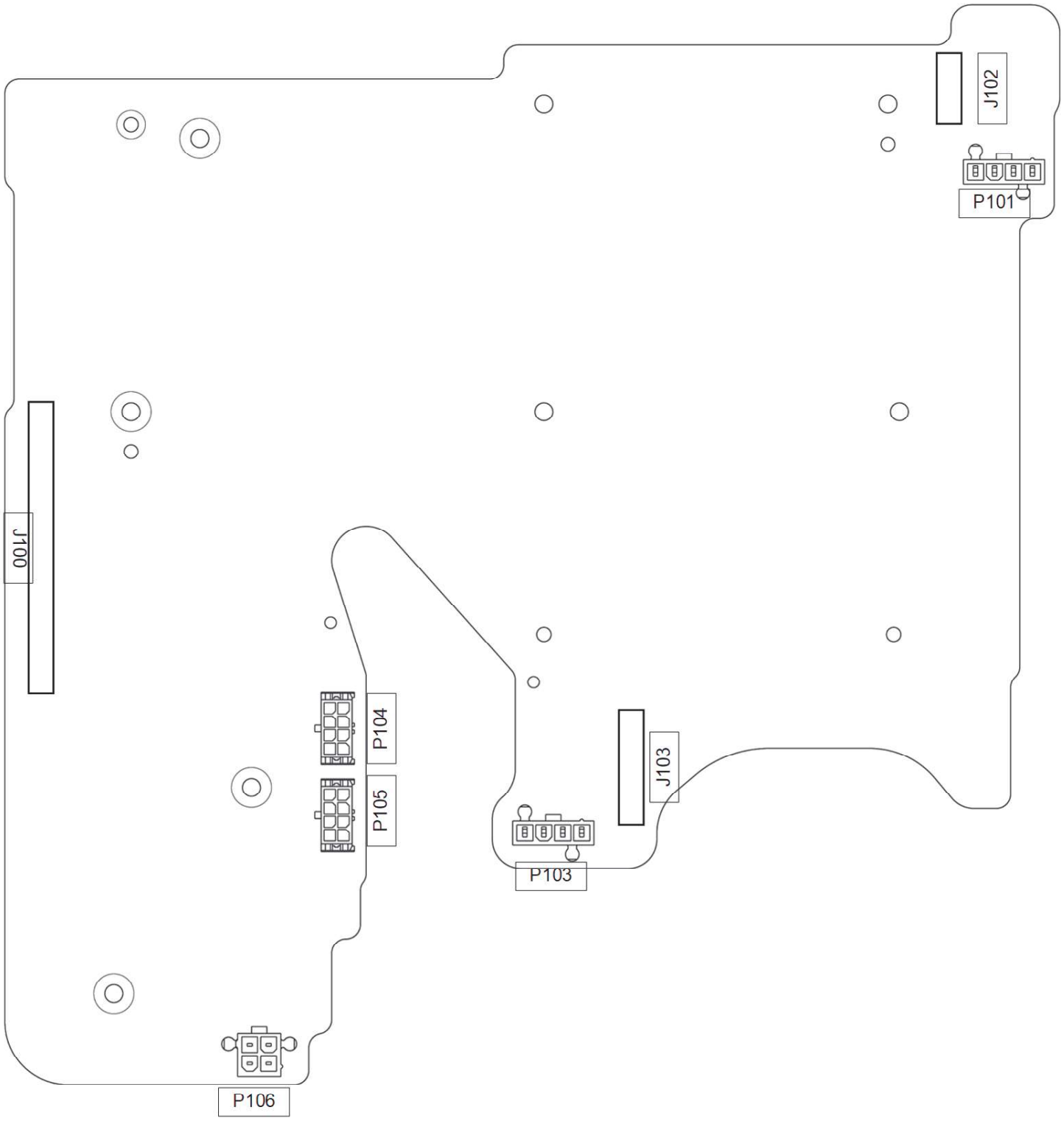
Interconnect Diagram



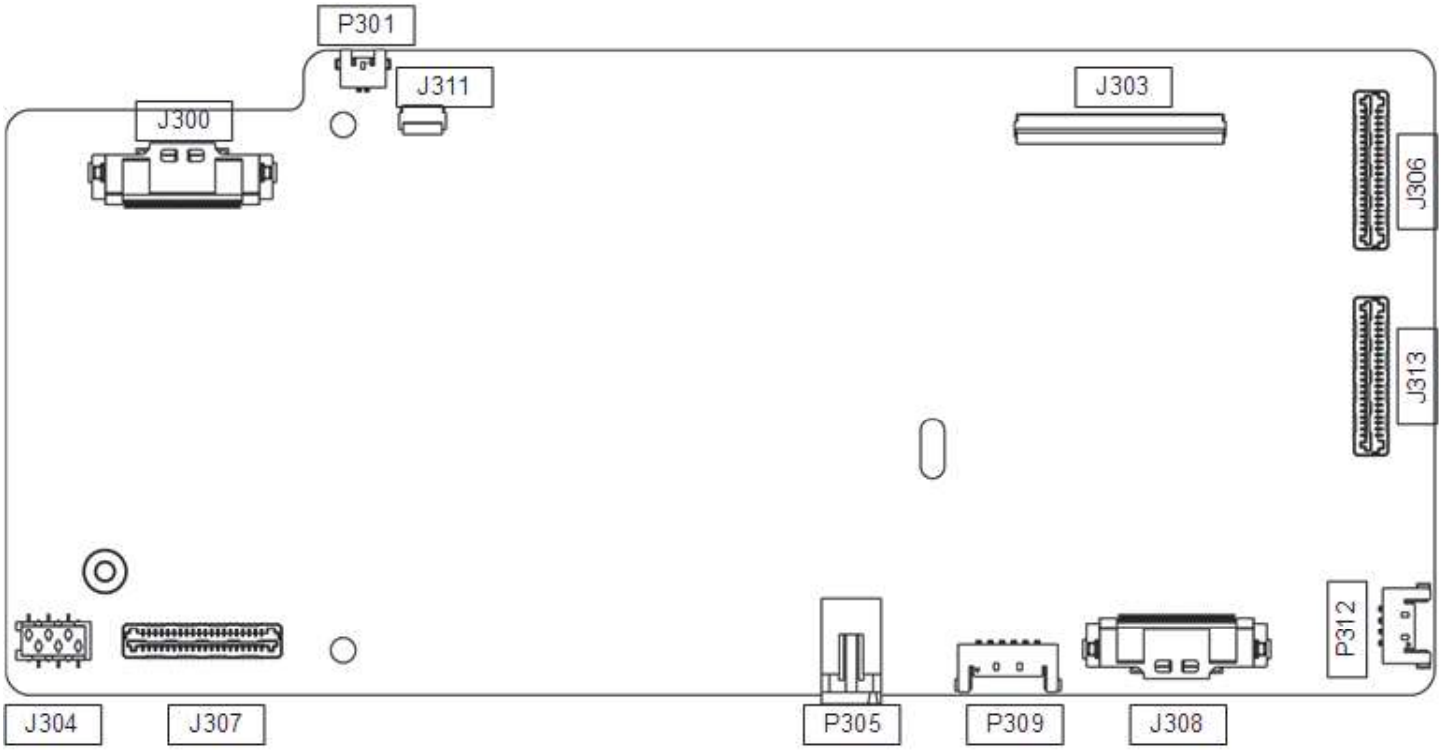
System PCBA (A03) Connections



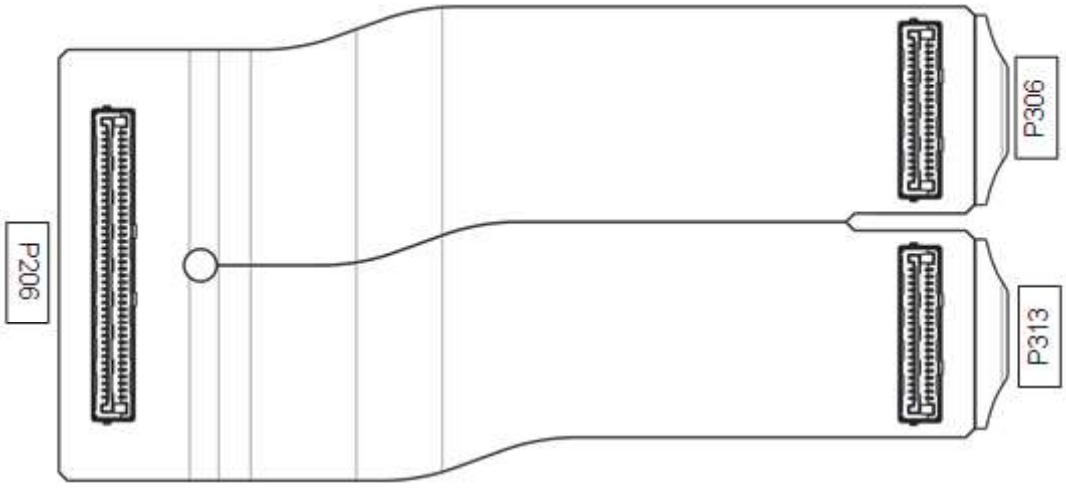
Energy Delivery PCBA (A02) Connections



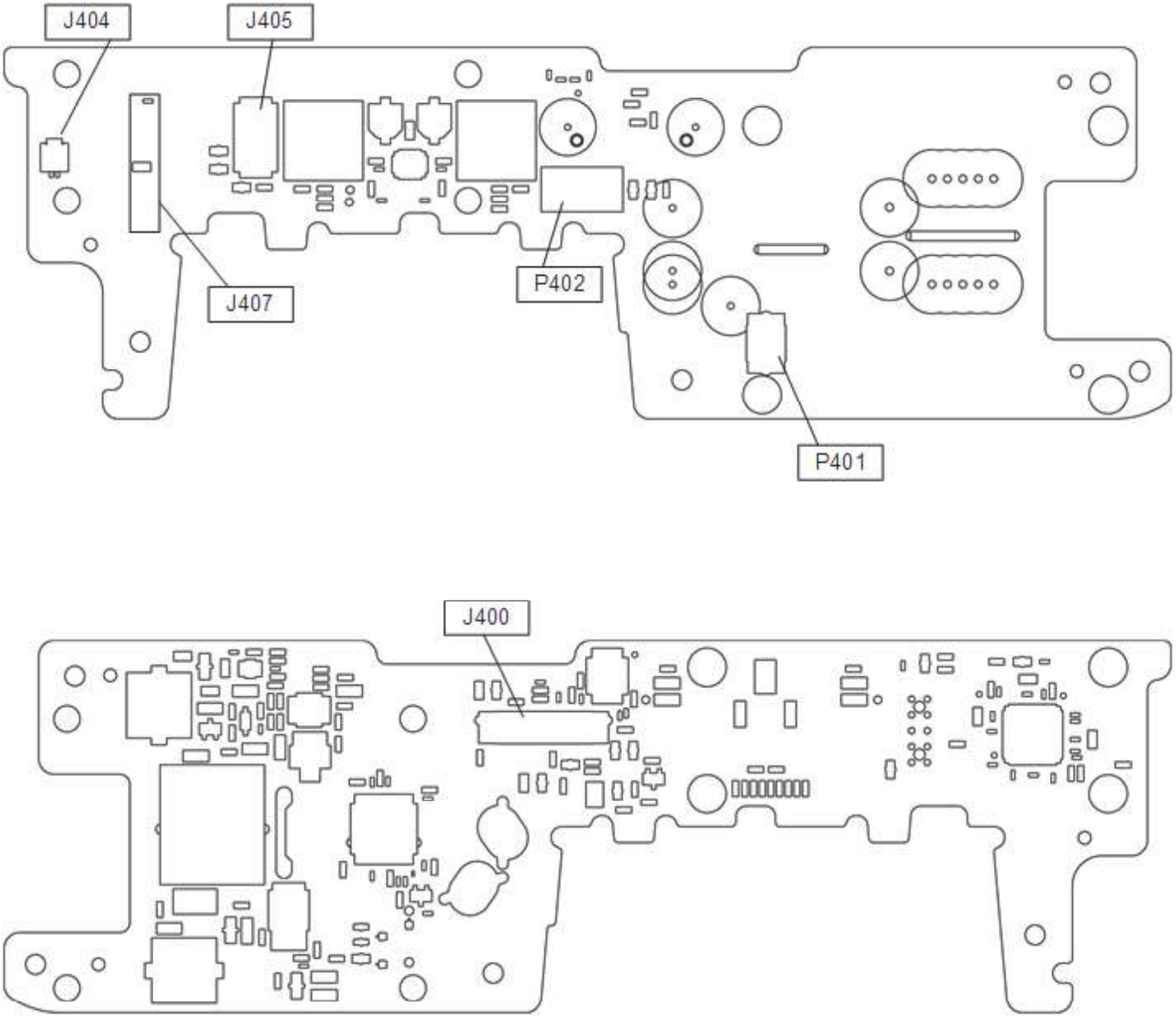
Interface PCBA (A01) Connections



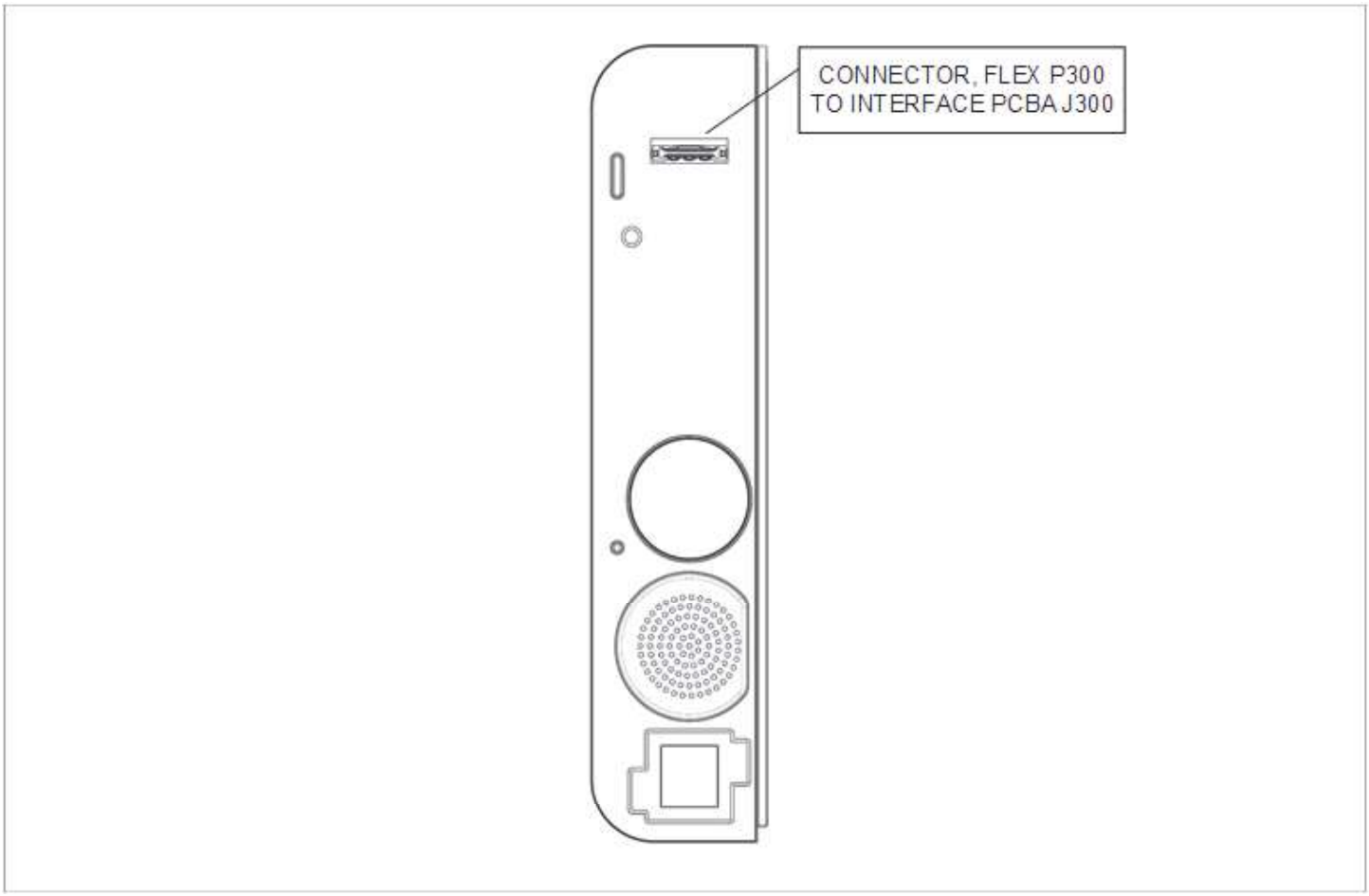
System Flex (C01) Connections



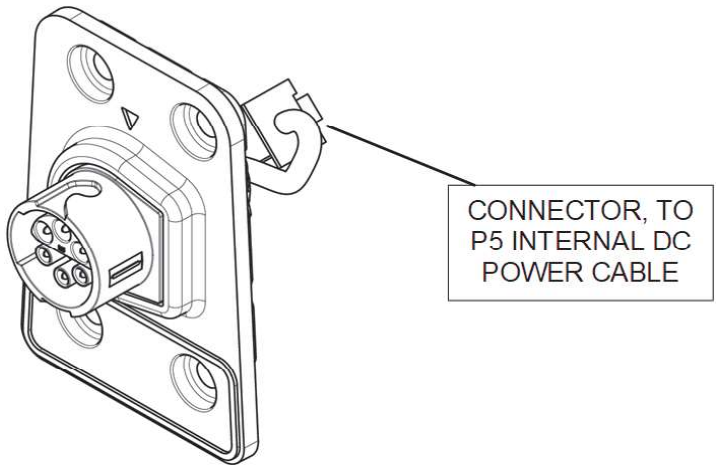
Patient Parameter PCBA Connections



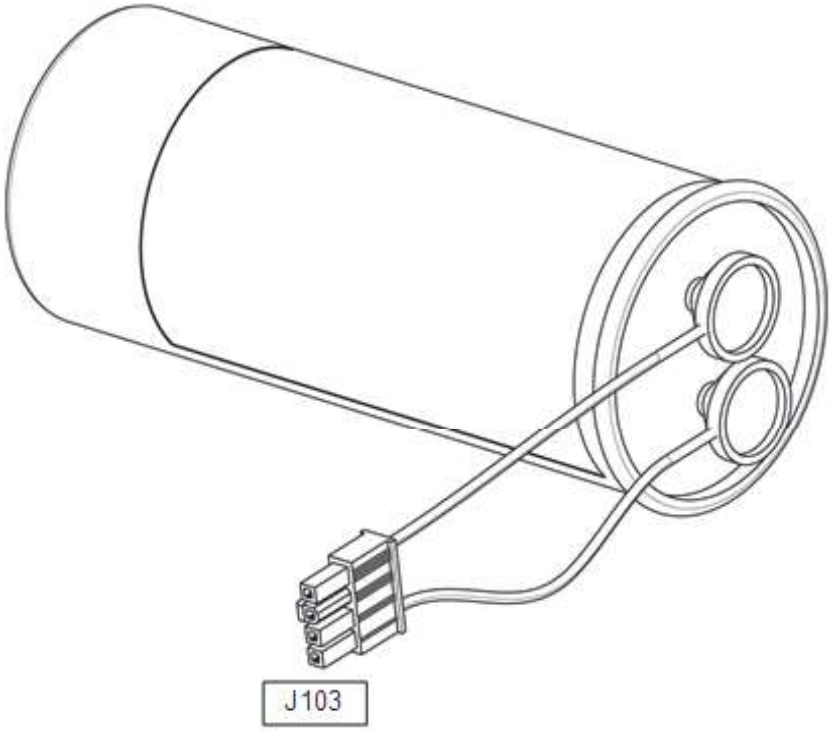
Keypad Connections



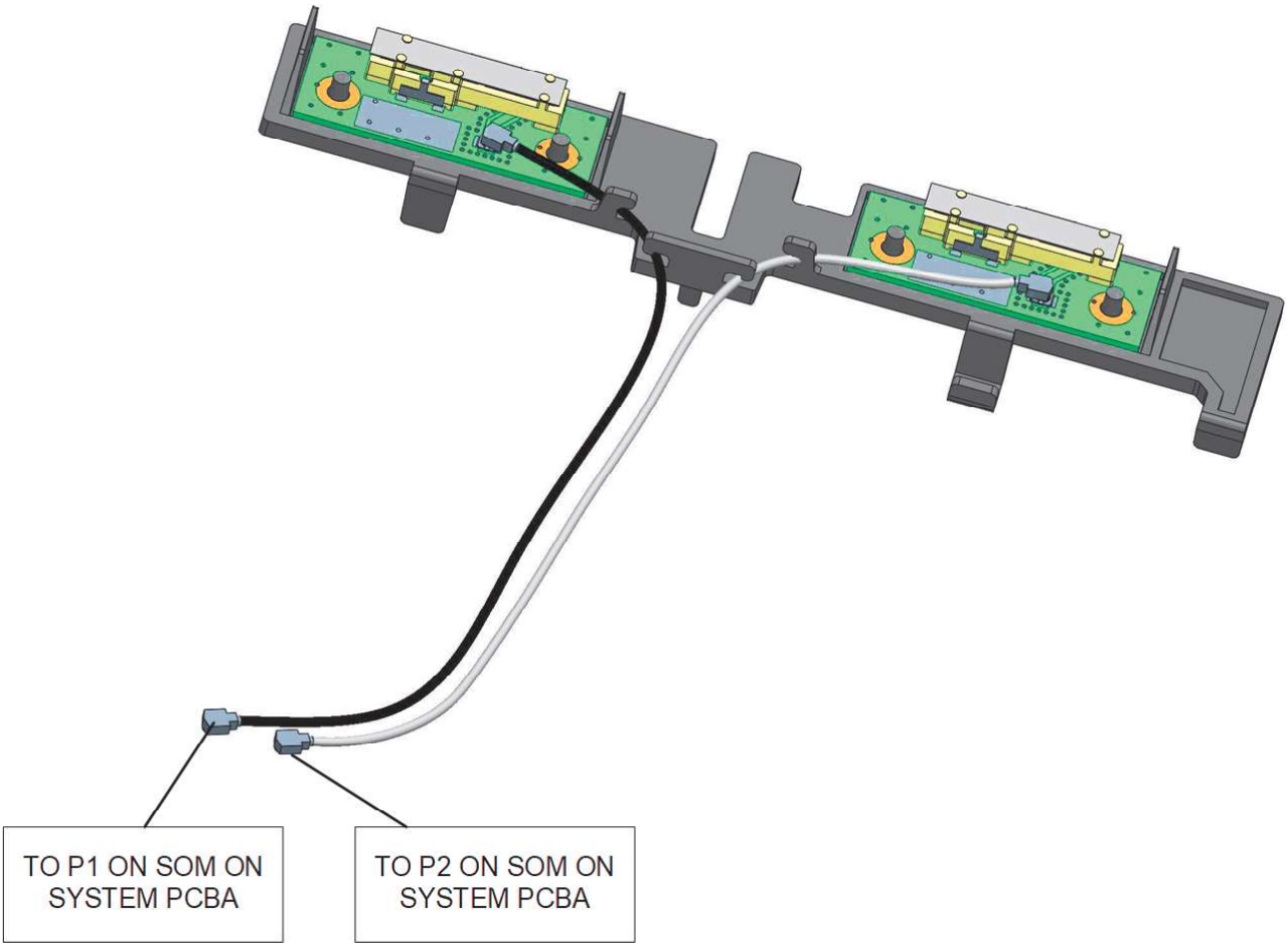
Power Connector Connections



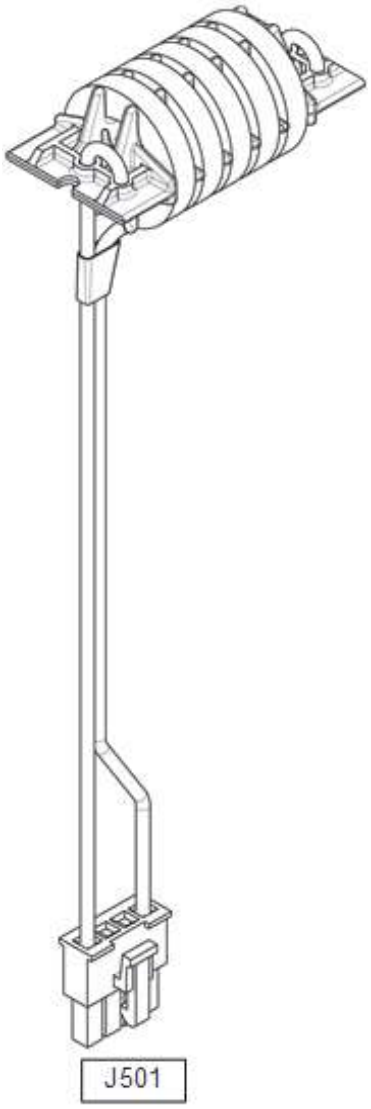
Energy Storage Capacitor Connections



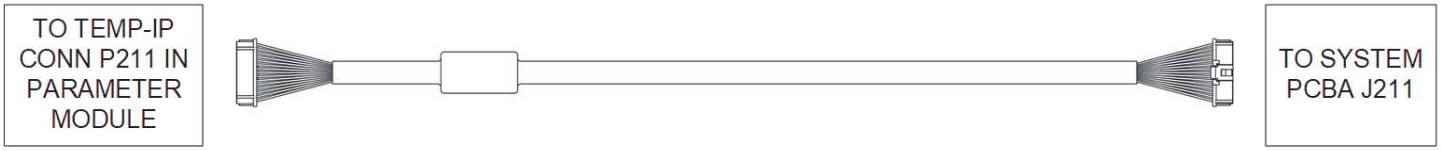
Wi-Fi Antenna Connections



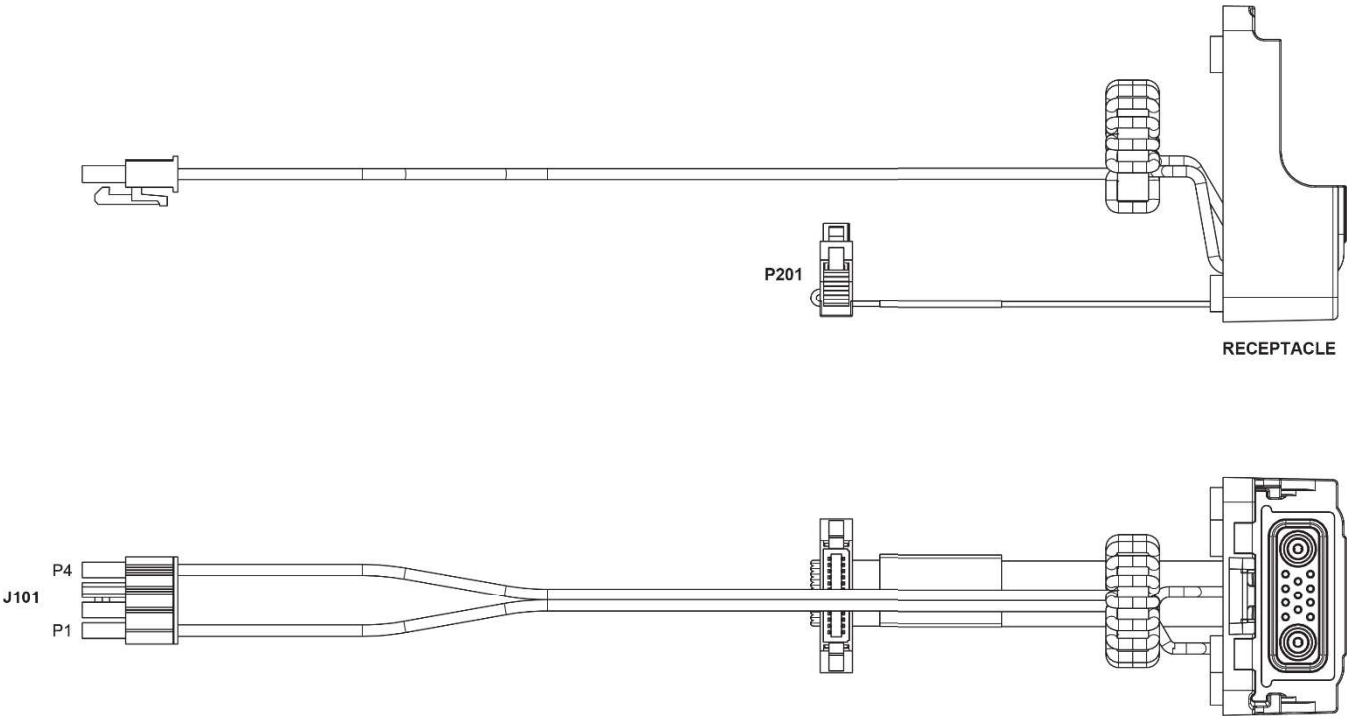
Inductive Resistor Connections



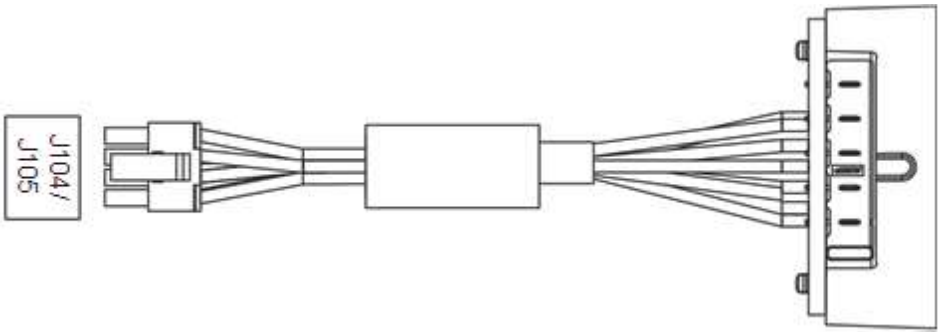
Temp/IP Cable Connections



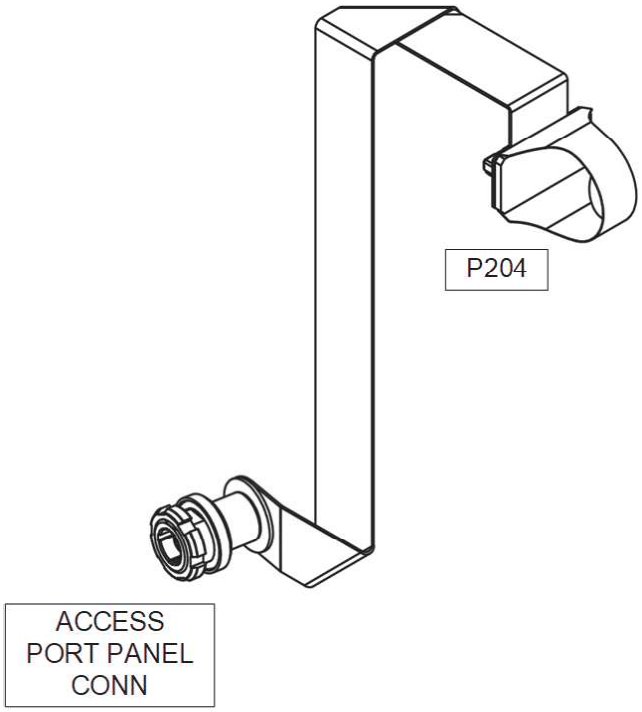
Therapy Connector Connections



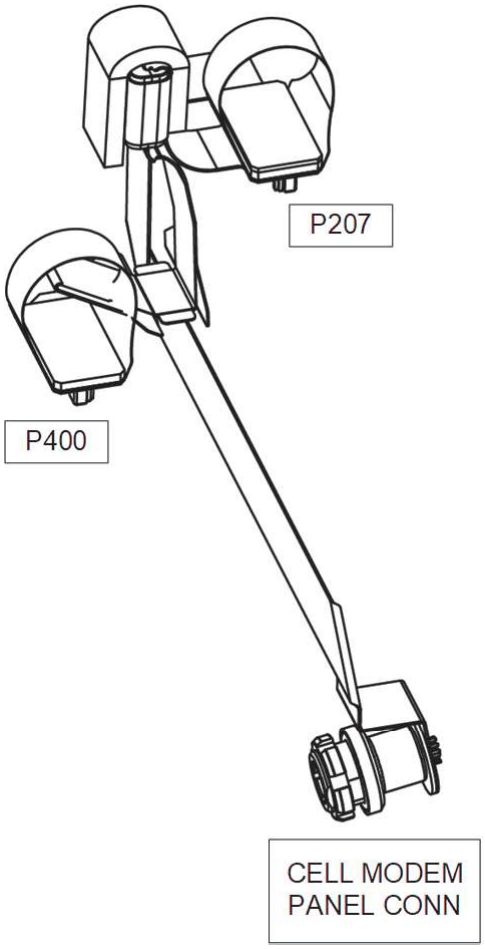
Battery Connector Connections



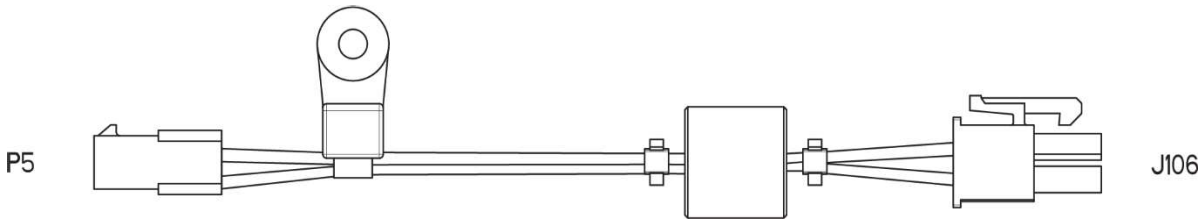
Access Port Flex Connections



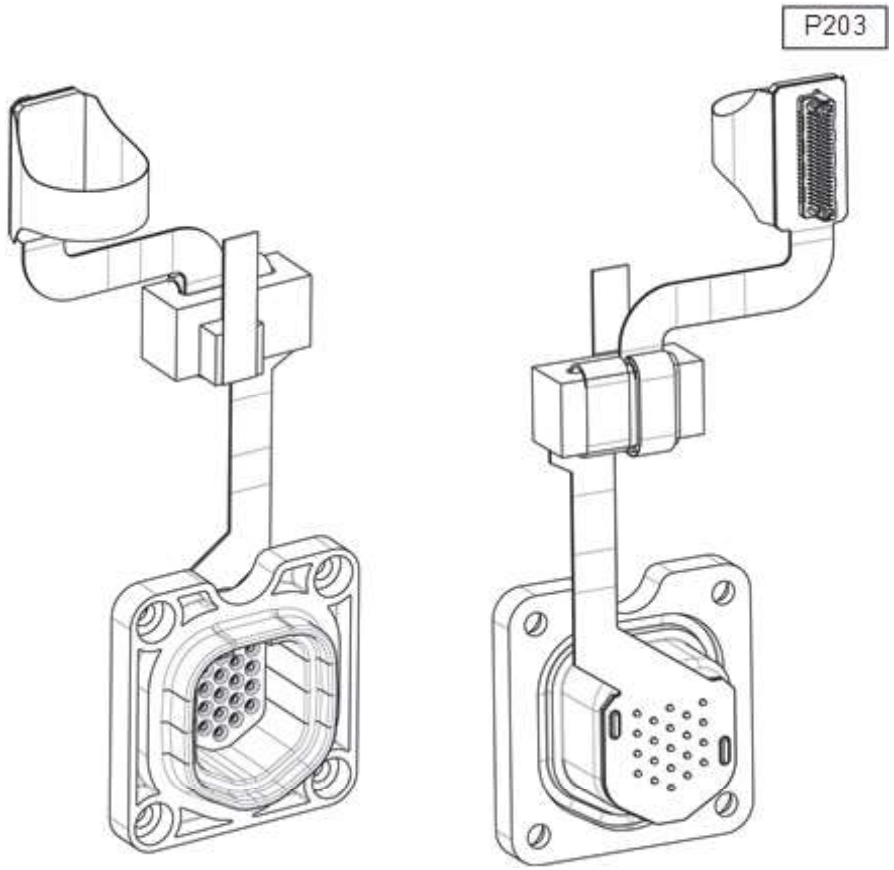
Defib-to-Parameter Module Flex Connections



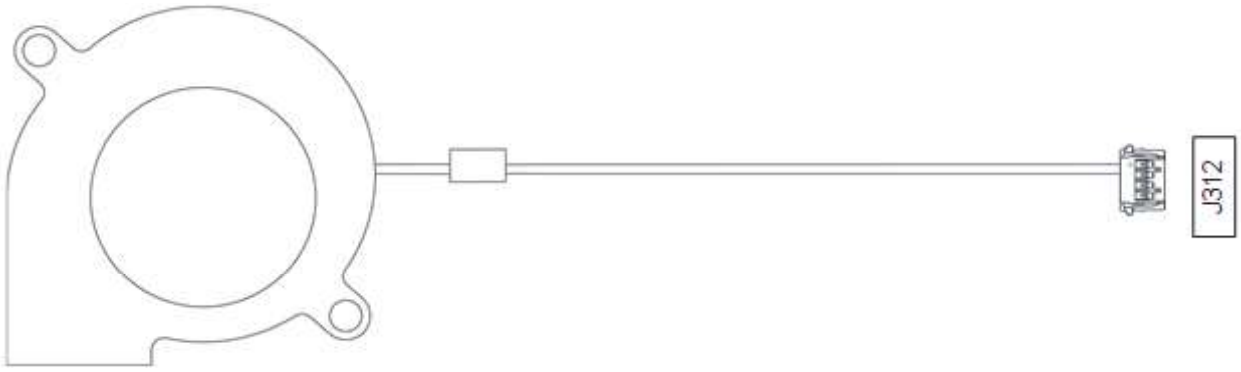
Internal DC Power Cable Connections



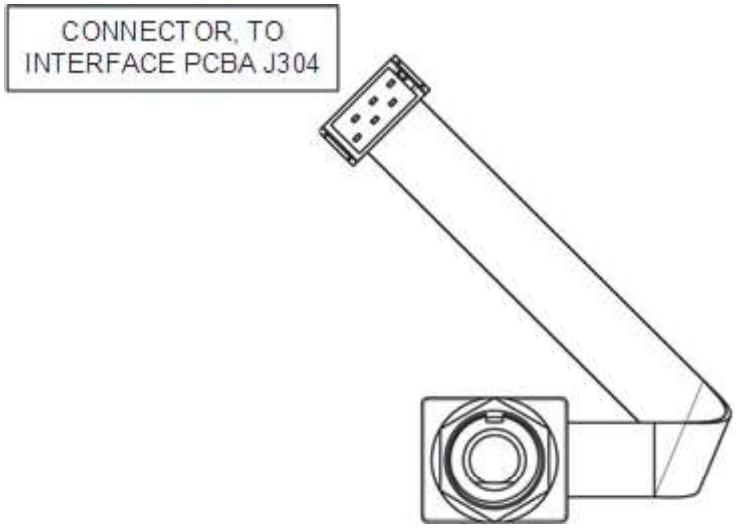
ECG Connector Connections



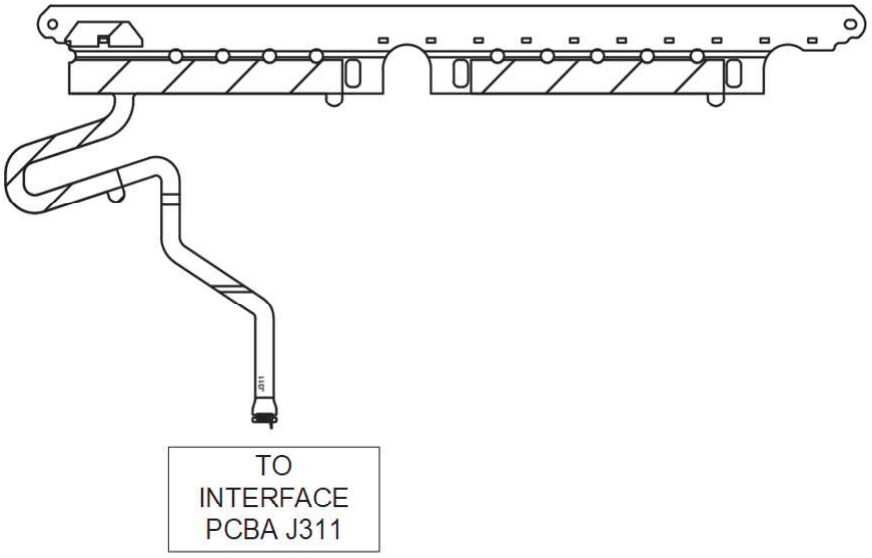
Fan Connections



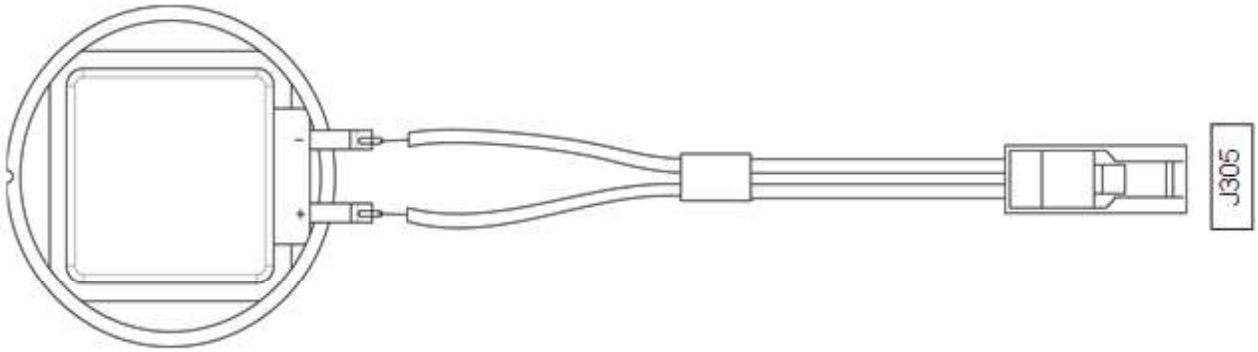
Rotary Switch Connections



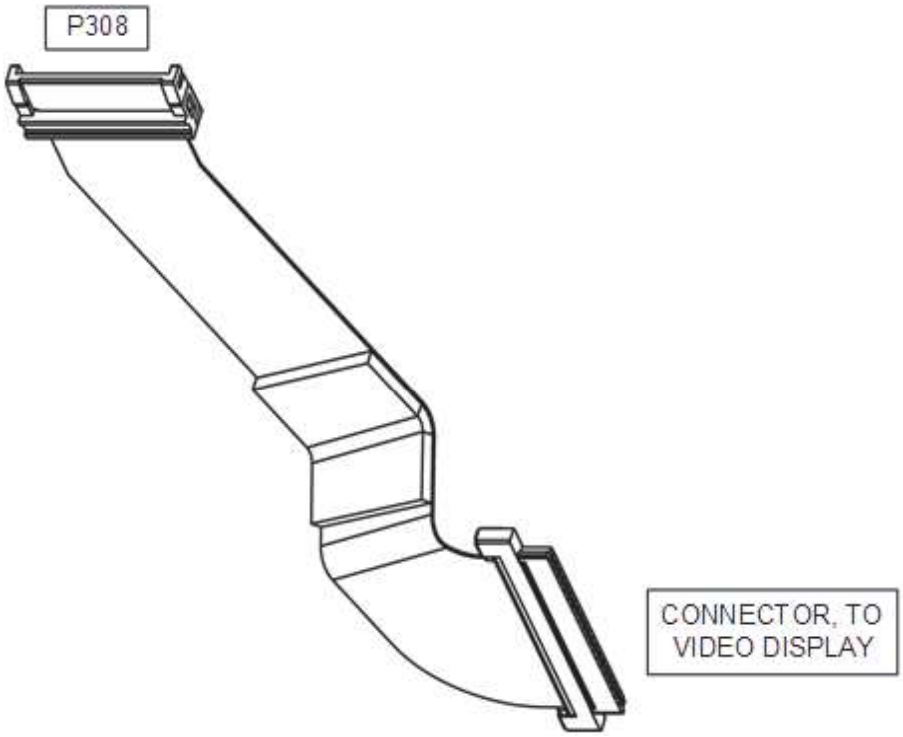
Beacon/Readiness Indicator Connections



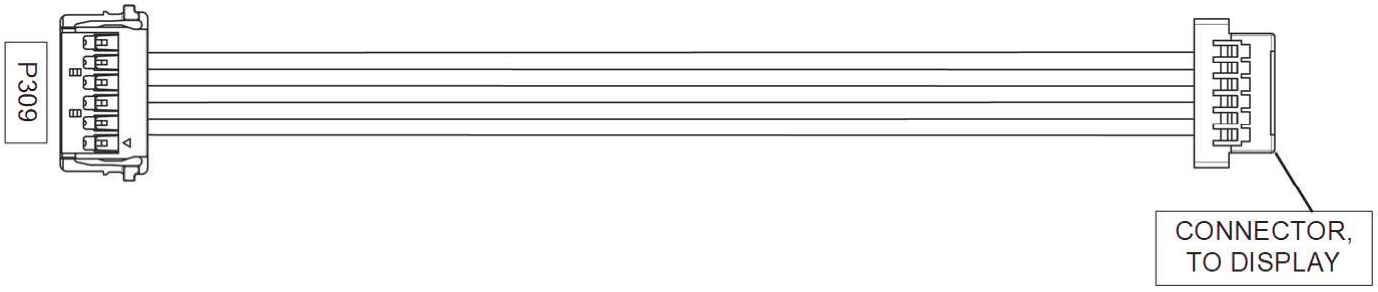
Speaker Connections



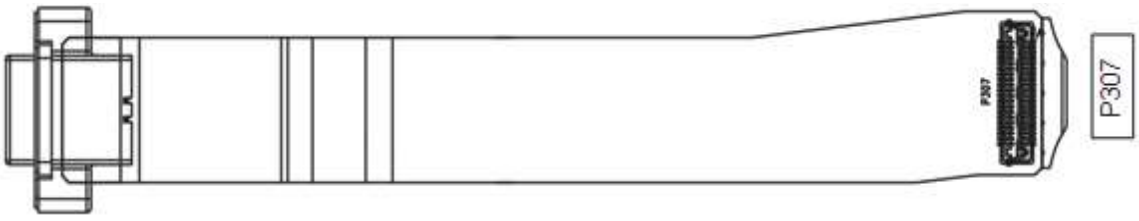
Video Display Flex Connections



Display Power Cable Connections



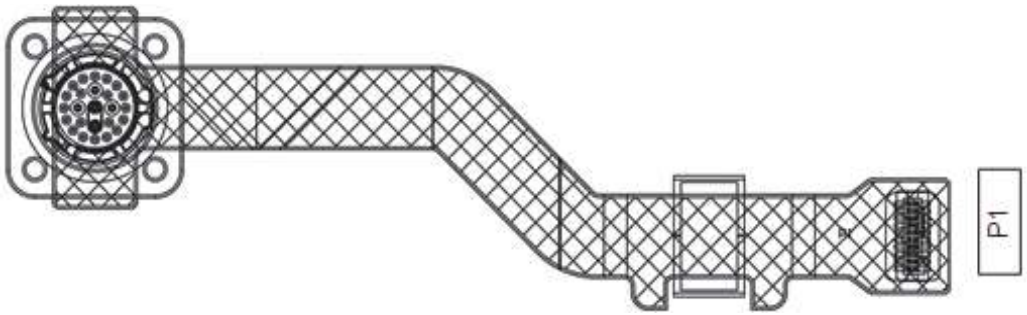
USB Connector Connections



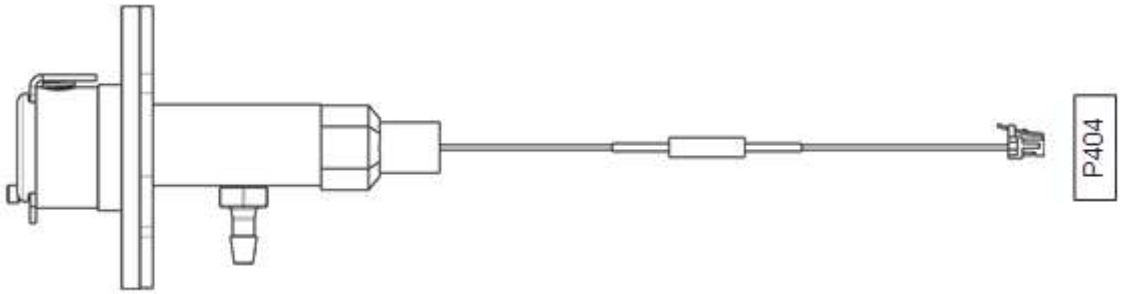
Keypad Flex Connections

SpO_2 Flex Connections

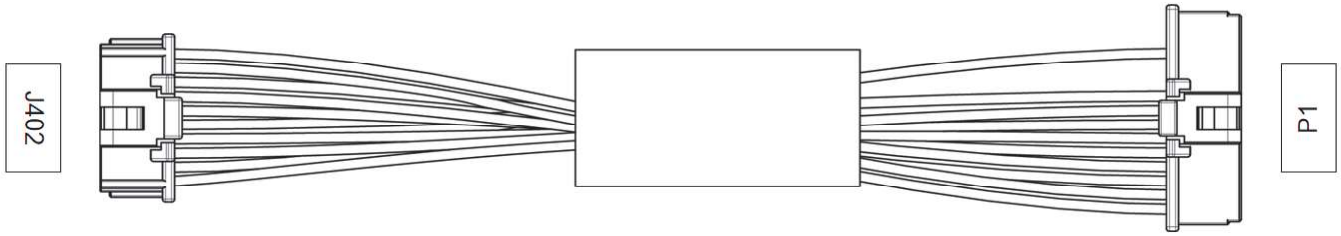
Masimo Connector Flex



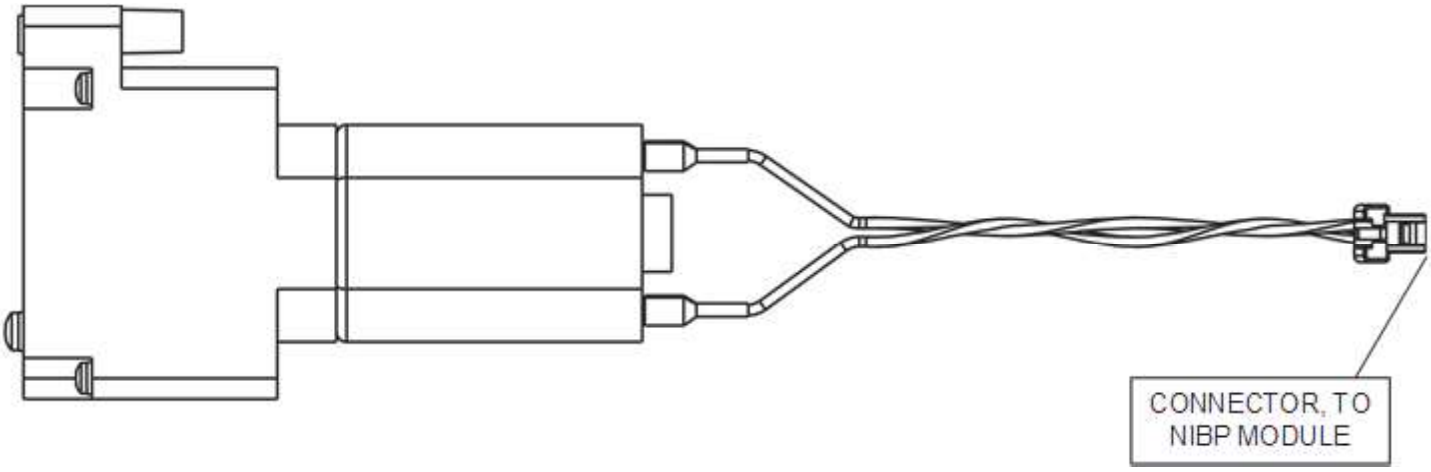
NIBP Coupler Connections



CO_2 Cable Connections

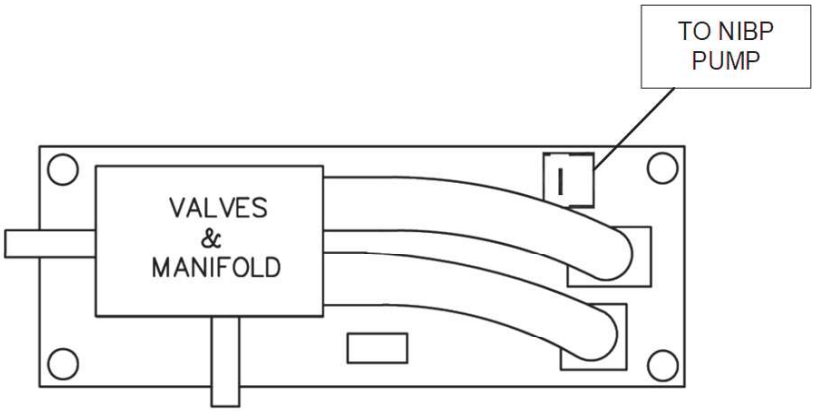


NIBP Pump Connections

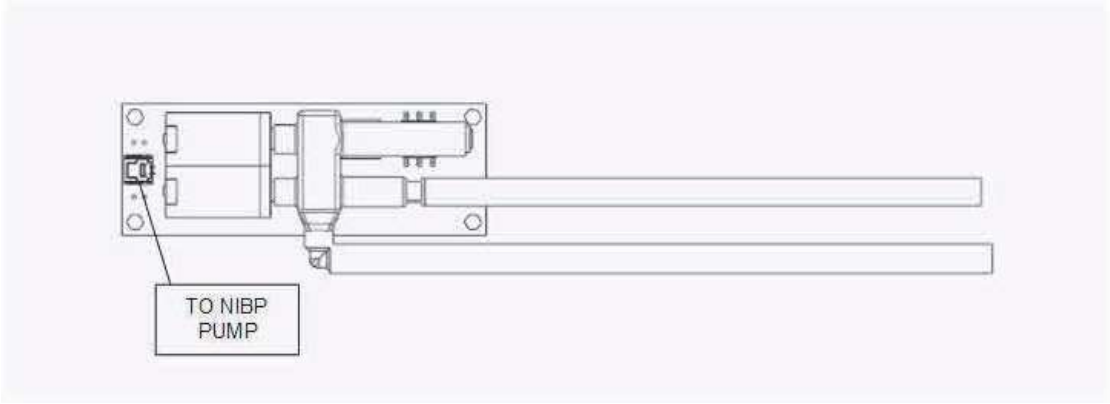


NIBP Module Connections

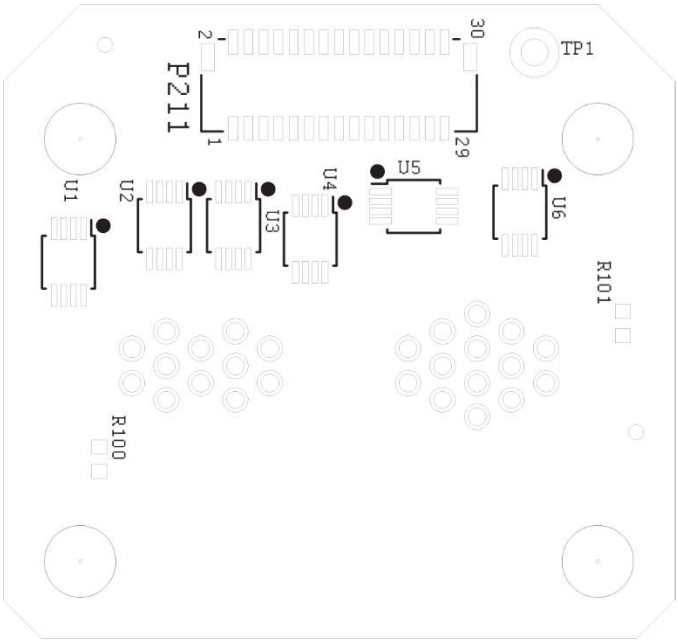
V1.1.1 version



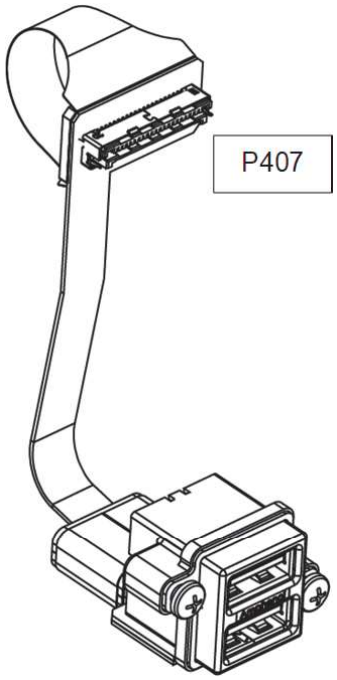
V1.1.2 version



Temp/IP Connector Connections



USB Connector (Parameter Module) Connections



Service Repair Kits

Service repair kits facilitate particular repairs and are listed in the table below. For kit part numbers and catalog numbers, and for kit contents, refer to the service BOM, 3342155.

SERVICE BOM REF	DESCRIPTION	NOTES
K01	KIT, REPAIR, SYSTEM PCBA, LP35	
K02	KIT, REPAIR, ENERGY DELIVERY PCBA, LP35	
K03	KIT, REPAIR, INTERFACE PCBA, LP35	
K04	KIT, REPAIR, FRONT HOUSING DISPLAY, LP35	
K05	KIT, REPAIR, HANDLE, LP35	
K06	KIT, REPAIR, REAR HOUSING, LP35	
K07	KIT, REPAIR, THERAPY RECEPTACLE, LP35	
K08	KIT, REPAIR, BATTERY CONNECTOR, LP35	
K09	KIT, REPAIR, ECG CONNECTOR, LP35	
K10	KIT, REPAIR, FAN, LP35	
K11	KIT, REPAIR, ROTARY SWITCH, LP35	
K12	KIT, REPAIR, BATTERY BACK PLATE, LP35	
K13	KIT, REPAIR, PATIENT PARAMETER PCBA, LP35	
K14	KIT, REPAIR, CO2 MODULE, MEDTRONIC, LP35	
K15	KIT, REPAIR, PMOD HOUSING, LP35	
K16	KIT, REPAIR, INTERNAL FASTENERS, LP35	
K17	KIT, REPAIR, SPO2 MODULE, MASIMO, LP35	
K18	KIT, REPAIR, NIBP MODULE, LP35	For v1.1.1 only.
K19	KIT, REPAIR, NIBP PUMP, LP35	For v1.1.1 only.
K20	KIT, REPAIR, NIBP COUPLER, LP35	
K21	KIT, REPAIR, SPO2 CONNECTOR, MASIMO, LP35	
K22	KIT, REPAIR, EXTERNAL FASTENERS, LP35	
K23	KIT, REPAIR, NIBP MODULE, LP35	For v1.1.2 only.
K24	KIT, REPAIR, NIBP PUMP, LP35	For v1.1.2 only.

Ordering Parts

Parts may be ordered by contacting the local Stryker representative. The device part number and serial number should be available when ordering parts. The manufacture date, which is printed on the serial label, may also be needed. This information may be found on the serial label on the back of the device, or if the device is powered on, may be found on the touch screen via the menu under System, or via LIFENET Device Agent.

Note that if the device rear housing is being replaced, a new serial label will need to be requested from Stryker service.

Parts are ordered using catalog numbers, which may be found in the service BOM, 3342155, which references part numbers and catalog numbers to reference designators used in sections 8 and 9 of this manual.

LIFEPAK® 35 monitor/defibrillator

SERVICE MANUAL

For further information, call Stryker at 1 800 STRYKER or visit stryker.com

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2023/03 **PN** 3342158-001