

Isolibrium® Support Surface



















Maintenance Manual

REF 2972

Integrated with InTouch® FL27 (2131 / 2141 / 2151 / 2152) version 4.0 or higher



Symbols

	Refer to instruction manual/booklet
	Consult instructions for use
	General warning
	Caution
	Warning; electricity
	Alternating current
	Catalogue number
	Serial number
	Manufacturer
	Date of manufacture
	Safe working load
	Mass of equipment
	Protective earth terminal
IPX4	Protection from liquid splash
	Defibrillation proof type B applied part
	Medical Equipment recognized by UL LLC with respect to electric shock, fire, and mechanical hazards in accordance with ANSI/AAMI ES60601-1:2005/(R)2012, A1:2012, C1:2009/(R)2012, A2:2010/(R)2012, and CAN/CSA-C22.2 No. 60601-1 (2008)
	In accordance with European Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE) as amended, this symbol indicates that the product should be collected separately for recycling. Do not dispose of as unsorted municipal waste. Contact local distributor for disposal information. Ensure infected equipment is decontaminated prior to recycling.
	Wash by hand
	Do not tumble dry






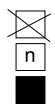










	Do not dry-clean
	Do not iron
	Allow to completely air dry
	Chlorinated bleach
US Patents	For US Patents see www.stryker.com/patents
	Keep dry
	Stacking limit by number
	This side up
	Fragile
	Do not use sharp objects to open the package
	Center of gravity/weight distribution
	Two person lift
	Pressure redistribution
	Moisture management, Low Air Loss
	Lateral rotation
	Shear
	Turn assist

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Warning/Caution/Note Definition

The words **WARNING**, **CAUTION**, and **NOTE** carry special meanings and should be carefully reviewed.

WARNING

Alerts the reader about a situation which, if not avoided, could result in death or serious injury. It may also describe potential serious adverse reactions and safety hazards.

CAUTION

Alerts the reader of a potentially hazardous situation which, if not avoided, may result in minor or moderate injury to the user or patient or damage to the product or other property. This includes special care necessary for the safe and effective use of the device and the care necessary to avoid damage to a device that may occur as a result of use or misuse.

Note - Provides special information to make maintenance easier or important instructions clearer.

Summary of safety precautions

Always read and strictly follow the warnings and cautions listed on this page. Service only by qualified personnel.

WARNING

- Do not service or perform maintenance while the product is in use.
 - This equipment/system is intended for use by healthcare professionals only. This equipment/system may cause radio interference or may disrupt the operation of nearby equipment. It may be necessary to take mitigation measures, such as reorienting or relocating **Isolibrium** or shielding the location.
-

CAUTION

- Always use ESD protective equipment before you open antistatic bags and service electronic parts.
 - Do not place unprotected circuit boards on the floor.
-

Introduction for service

This manual assists you with the service of your Stryker product. Read this manual to service this product. This manual does not address the operation of this product. See the Operations Manual for operating and use instructions. To view your Operations Manual online, see <https://techweb.stryker.com/>.

Product description

Stryker Model 2972 **Isolibrium**® is a powered support surface with features that provide Pressure Redistribution, Low Air Loss, and Lateral Rotation. **Isolibrium** is for use with the **InTouch**® (revisions 4.0 or higher software) bed frame. **Isolibrium** and **InTouch** are an integrated bed and surface system that caregivers use to assist in patient care.

Indications for use

The Stryker Model 2972 **Isolibrium** support surface is intended to assist in the prevention and treatment of all pressure injury or pressure ulcers (includes all stages, unstageable and deep tissue pressure injury). As a recommendation, healthcare professional should complete a clinical evaluation of risk factors and skin assessments. The intended users is both healthcare HCPs (nurses, nurse aids, and medical doctors), transporters, and human patients. This product is for use by human patients in a health delivery organization (HDO).

The **Isolibrium** patient-specific immersion is intended to assist in the management of microclimate of the patient's skin, patient repositioning, and the support in prevention of early mobility and pulmonary complications.

The **Isolibrium** powered support surface is not intended for use in or with:

- Oxygen rich environments
- Sterile environments
- Home care or long-term care facility settings
- Behavioral health populations

Contraindications

Isolibrium is contraindicated for use on patients with:


- Unstable fractures
- Unstable spinal cord injuries

Expected service life

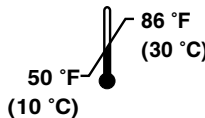
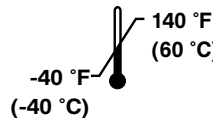
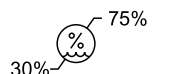
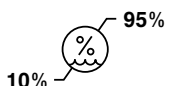
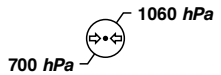
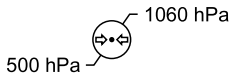
Isolibrium support surface has a five year expected service life under normal use, conditions, and with appropriate periodic maintenance.

Isolibrium covers (top and bottom) have a two year expected service life under normal use, and conditions.

Specifications

 Safe working load Note - Safe working load indicates the sum of the patient and accessory weight.	460 lb	208.6 kg
Therapeutic weight	50 lb to 350 lb	22.7 kg to 158.7 kg
Length	84 in.	213,4 cm
Width	35 in.	88,9 cm
Thickness	8 - 10.5 in.	20.3 - 26.7 cm
Weight	90 lb	40.8 kg
Electrical requirements	ANSI/AAMI ES60601-1:2005/(R)2012 and A1:2012, C1:2009/(R)2012 and A2:2010/(R)2012 CAN/CSA-C22.2 No. 60601-1 (2008)	120VAC 50/60Hz, 2.5A
Power cord	3 foot, 16 AWG cord with hospital grade plug for use with the InTouch foot end auxiliary power outlet	
Low Air Loss flow rate	100 LPM	
Leakage current	300 uA Maximum	
Noise level	50 dBA maximum	

Stryker reserves the right to change specifications without notice.

Environmental conditions	Operation	Storage and transportation
Ambient temperature		
Relative humidity (non-condensing)		
Atmospheric pressure		

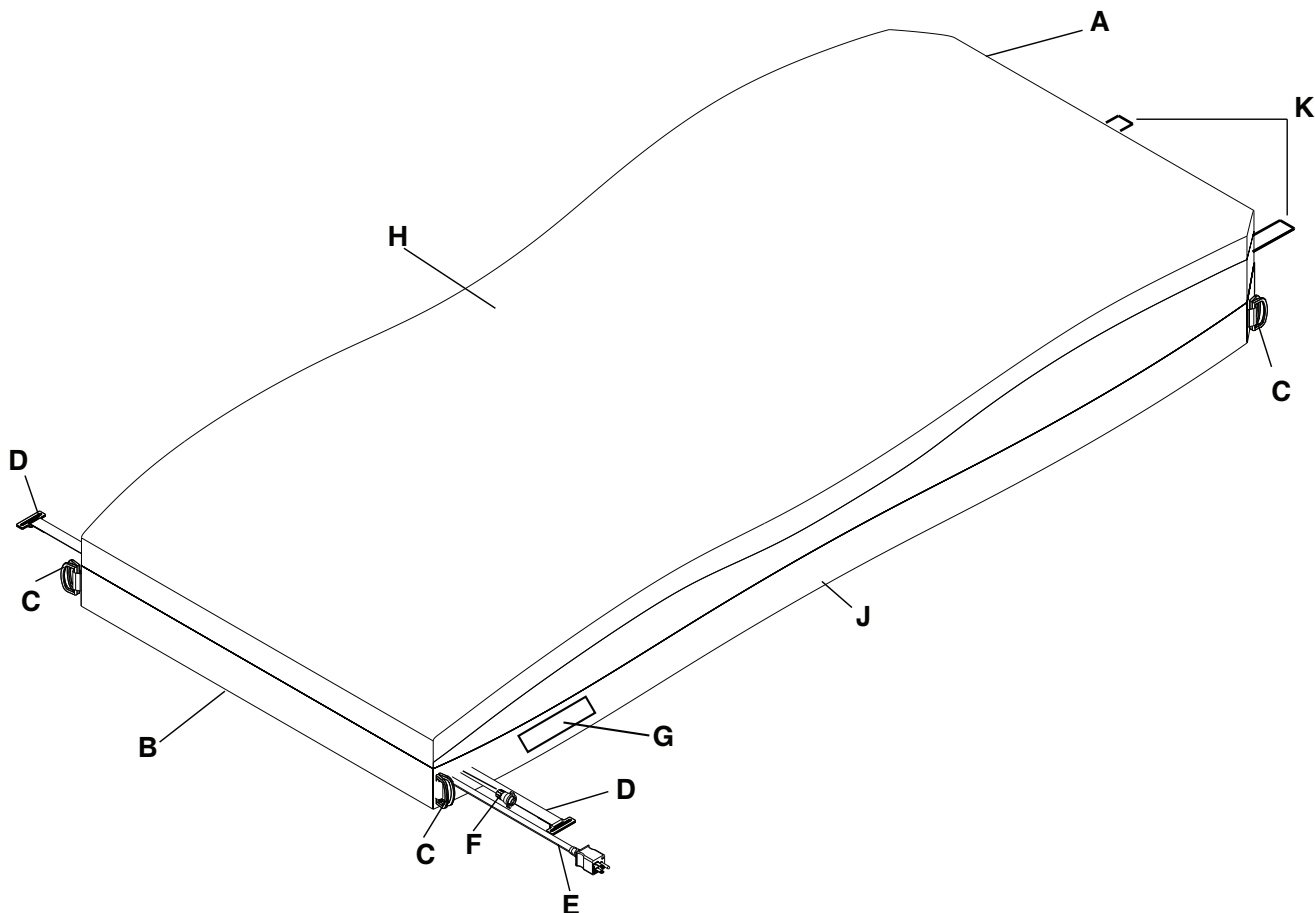
See the **InTouch** Operations Manual for bed specifications.

European REACH

In accordance with the European REACH regulation and other environmental regulatory requirements, the components that contain declarable substances are listed.

Description	Number	Substance of very high concern (SVHC) chemical name
Sensor assembly	2971-021-033	1,3,5-Tris(oxiran-2-ylmethyl)-1,3,5-triazinane-2,4,6-trione (TGIC)
		2-Ethoxyethyl acetate
		Cadmium
		Diboron-trioxide
		Lead-monoxide
Main board PCB assembly	2971-022-140	Cadmium
		Diboron-trioxide
		Lead-monoxide
Footbox bottom weldment	2971-022-009	Tris(2,3-epoxypropyl) isocyanurate
Footbox top	2971-022-200	Tris(2,3-epoxypropyl) isocyanurate
Pump assembly	297300220010	Lead-steel
		Lead-brass
		Lead-aluminum

Product illustration



A	Head end
B	Foot end
C	D-rings
D	CPR straps
E	Power cord

F	Integration cable
G	Handles
H	Top support surface cover
J	Bottom support surface cover
K	Retainer straps (D-rings not shown)

To view the power cord label, the operator must position the cord by rotating it until the label is legible from a distance of up to 1m.

Isolibrium features

Physical Concepts Pressure Redistribution

The ability of a support surface to distribute load over the contact areas of the human body.

Pressure Redistribution setpoint

Allows the operator to input patient weight range resulting in automatic change of zoned sensor technology allowing immersion and envelopment.

Lateral Rotation Therapy

A feature of a support surface that provides rotation about a longitudinal axis as characterized by degree of patient turn, duration, and frequency.

BackSmart® Turn Assist

A feature of a support surface that provides a single position turn about a longitudinal axis.

Max Inflate

Allows maximum firmness inflation for use when boosting a patient and on lateral transfer, Promotes patient ease with dangling, egress, and ingress.

Moisture management

The top surface cover draws excess moisture away from the patients skin and support surface interface.

Low Air Loss (LAL)

Provides air flow to assist in the management of (microclimate) the skin.

HeelGel®¹ Technology

A feature of the support surface to address pressure redistribution in the heel area.

Patient Specific Immersion™

Assists in managing microclimate of the patient skin, patient repositioning, early mobility, and prevention of pulmonary complications.

¹**Intelli-Gel®** hollow column configuration licensed by EdiZONE LLC of Alpine, UT

Contact information

Contact Stryker Customer Service or Technical Support at: 1-800-327-0770.

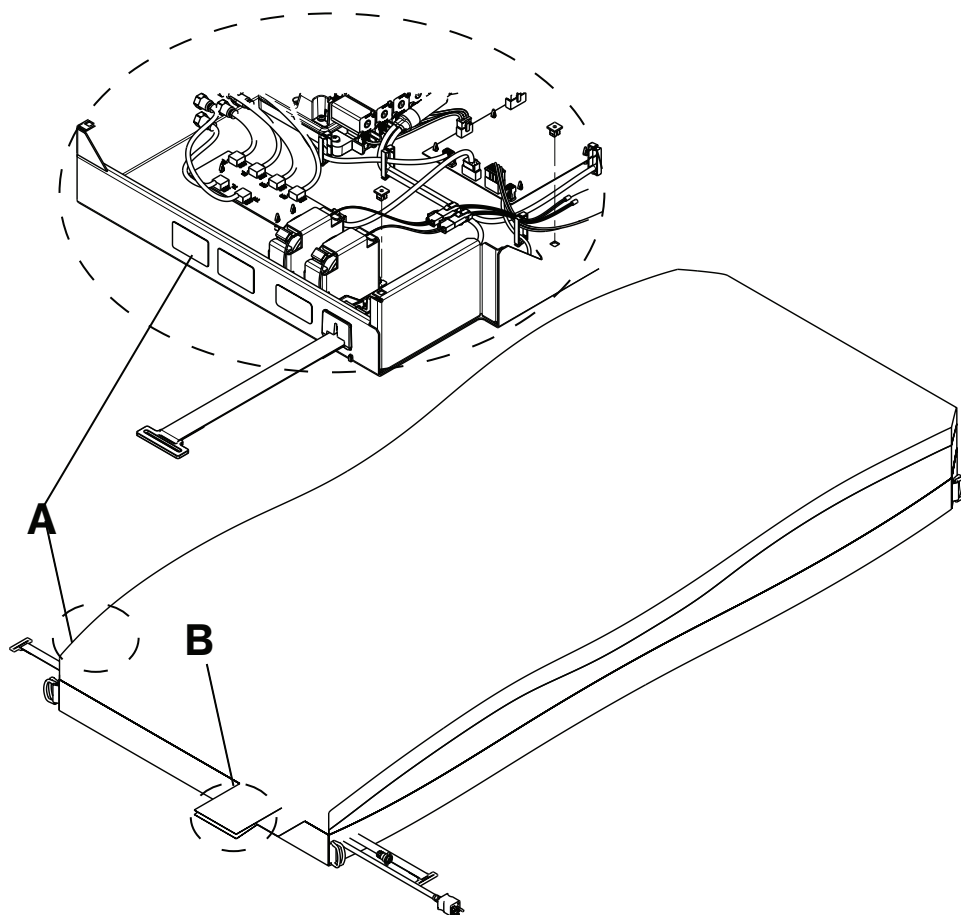
Stryker Medical
3800 E. Centre Avenue
Portage, MI 49002
USA

To view your operations or maintenance manual online, see <https://techweb.stryker.com/>.

Have the serial number (A) of your Stryker product available when calling Stryker Customer Service or Technical Support. Include the serial number in all written communication.

Serial number location

The serial number (A) for your support surface is located on the patient right side of the foot box on the specification label. Unzip the support surface top cover to access the specification label. The serial number (B) is for the support surface cover.



Preventive maintenance

WARNING - Do not service or perform maintenance while the product is in use.

At a minimum, check all items listed during annual preventive maintenance for all Stryker Medical products. You may need to perform preventive maintenance checks more frequently based on your level of product usage. Service only by qualified personnel.

Remove product from service before you perform preventive maintenance inspection.

Note - Clean and disinfect the exterior of the support surface before inspection, if applicable.

Inspect the following items:

_____ Zipper, snaps, and covers (top, bottom, and fire barrier) are free of tears, cuts, holes, or any other damage

Note - If excessive wear is observed on the cover or the fire barrier, it is strongly recommended to replace the cover.

_____ Support surface cover labels are legible, have proper adherence, and free of damage.

_____ Handles are free of rips or cracks

_____ Power cord, integration cable, and plug are free of damage

_____ **Perform a functional test of the Isolibrium functions

_____ **Perform system diagnostics and confirm there are no errors

_____ *Internal components for signs of staining from fluid ingress or contamination by fully unzipping the cover

_____ Pods are not leaking or cracking

_____ Hose connections to the manifold and sensor tubes (both ends) are seated fully

_____ Foam is free from large tears or large gouges

_____ Turn bladders are free of excessive wear and function properly

_____ Low Air Loss fans rotate freely and are free of debris and dust

_____ Left and Right CPR releases function properly

_____ Both foot box cooling fans rotate freely and are free of debris and dust

_____ Pump spring mount has visible clearance from the foot box bottom

_____ Listen for abnormal pump vibration and noise level

_____ Clean the foot box intake metal screen

_____ Clean the mesh on the bottom cover

_____ Clean the fan filter screen on the foot box

_____ Standoffs (feet of the foot box) are present

_____ Cable tie is present on the power cord

_____ Current leakage not more than 200 μ A

_____ Ground impedance not more than 100 m Ω (Figure 1)

Note - The ground lug can be accessed through the slit in the cover for the CPR, patient left.

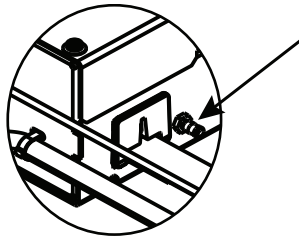


Figure 1 – Ground lug (patient left side)

Note

- *A zipper pull tool or equivalent is required to access the internal components of the support surface.
- **You cannot perform these preventive maintenance checks without the **InTouch** footboard. See the **InTouch** integrated Models 2131 and 2141, software version 4.0 or higher manual.
- The zipper overlaps at the end and may appear to be misaligned.

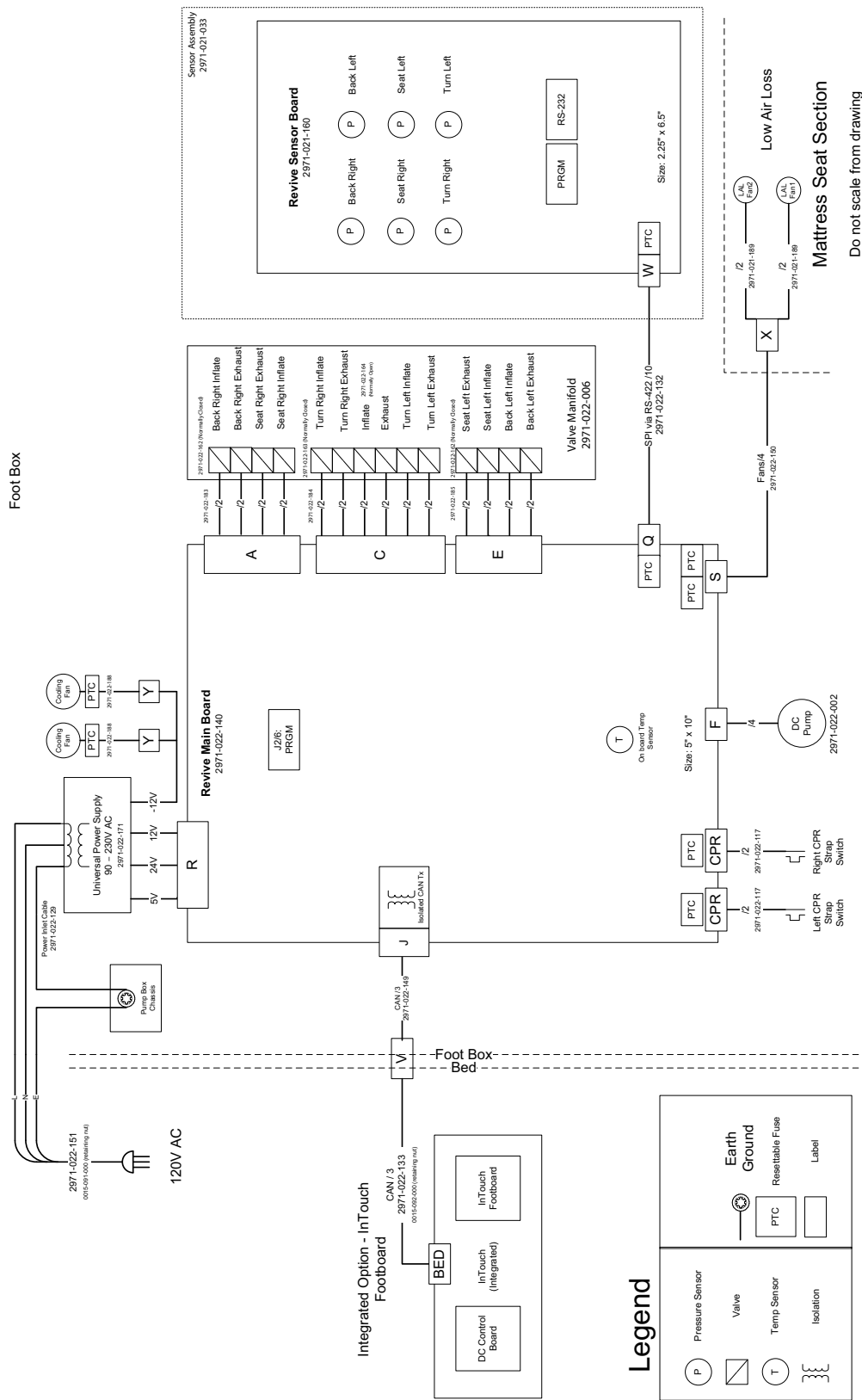
Replace the following items every two years:

- Cover assembly, top and bottom

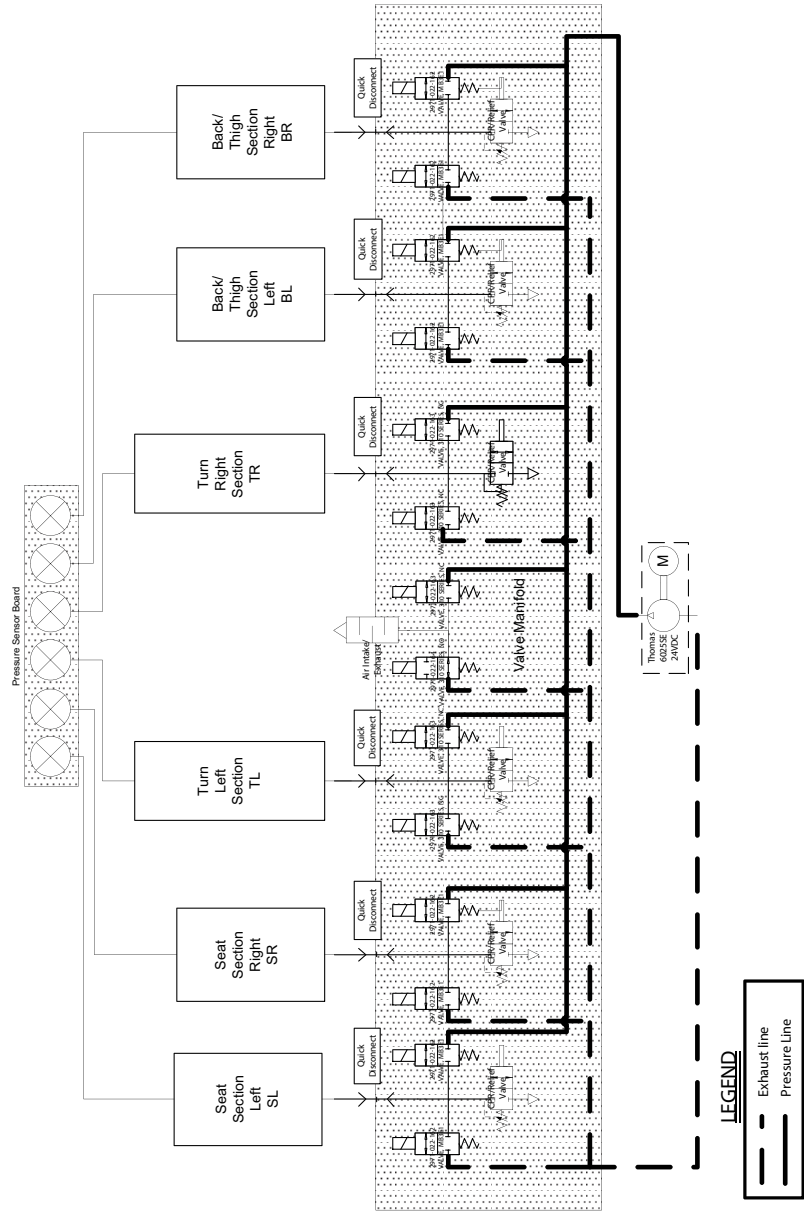
Product serial number:
Completed by:
Date:

Block diagram

Isolibrium wiring



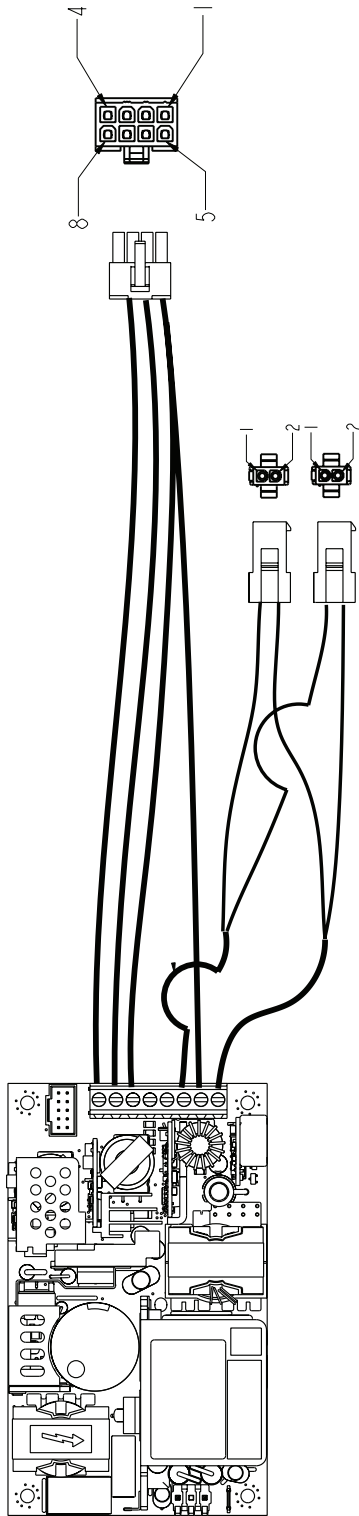
ISOLIBRIUM PNEUMATIC DIAGRAM

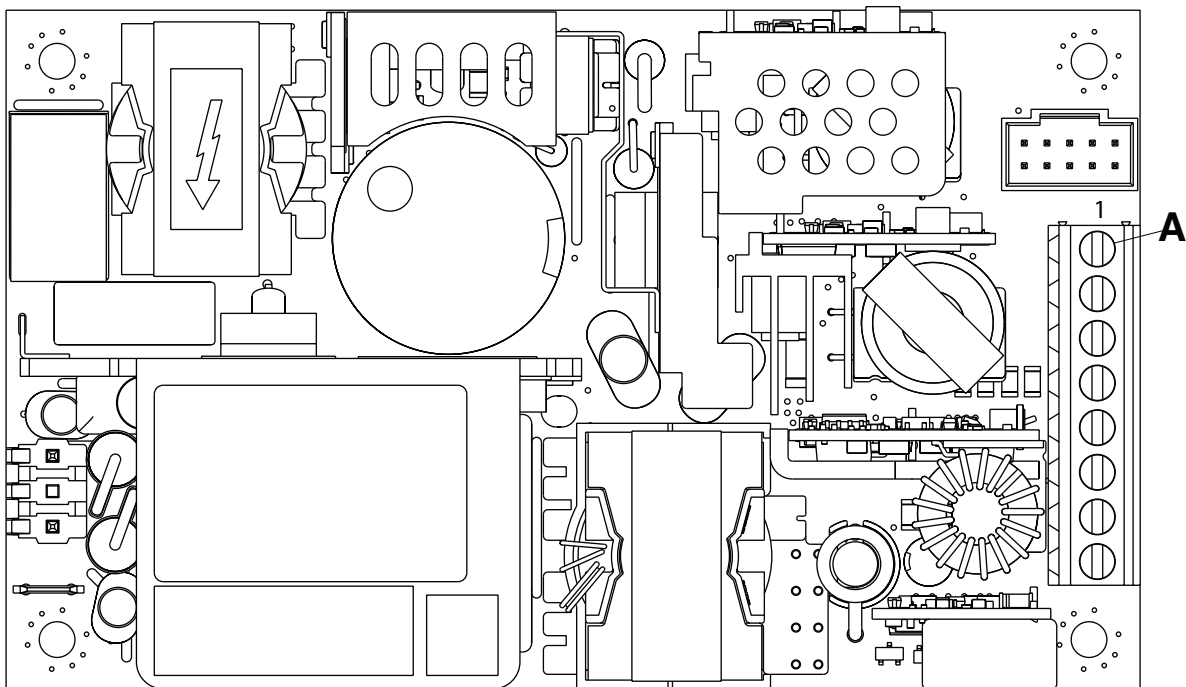


Circuit boards

Power supply assembly

2971-022-171 Rev J (Reference only)

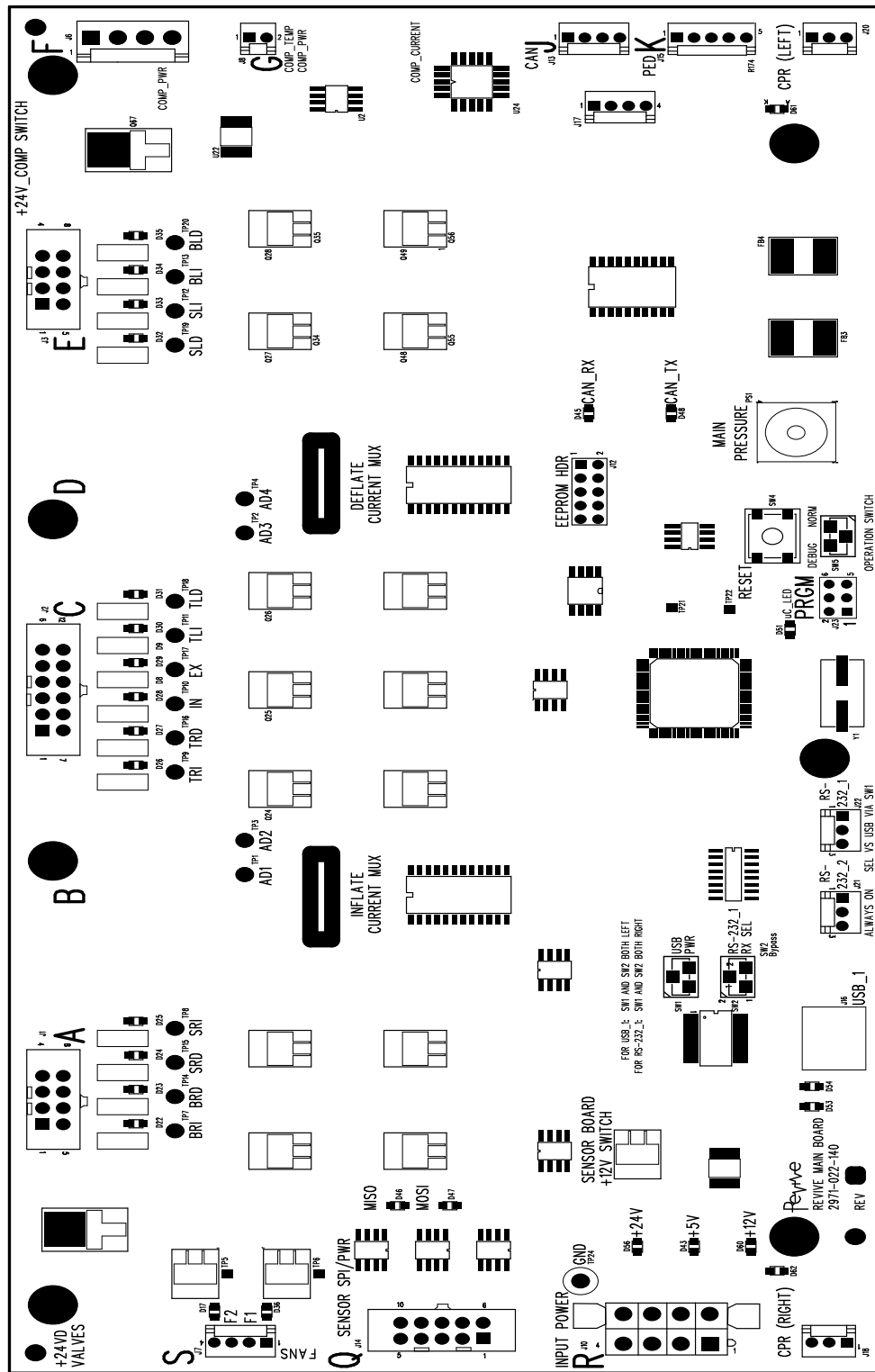




Cable location	Voltage	Positive lead	Negative lead	Description
SK1	120AC	Pin 1 brown	Pin 2 blue	120VAC power in to the power supply
SK2 (A)	+5VDC	Pin 1 red	Pin 3 green	+5VDC from the power supply for the main board
SK2	+12VDC	Pin 2 black	Pin 3 green	+12VDC from the power supply for the main board
SK2	+24VDC	Pin 7 blue	Pin 3 green	+24VDC from the power supply
SK2	-12VDC	Pin 8 blue	Pin 6 red	-12VDC from the power supply for the foot box fans

Main power board assembly

2971-022-140 Rev L (Reference only)



Cable and test point (LED) location	Voltage	Positive lead	Negative lead	Description
D43	+5VDC	N/A	N/A	+5VDC from power supply to main board
D60	+12VDC	N/A	N/A	+12VDC from power supply to main board

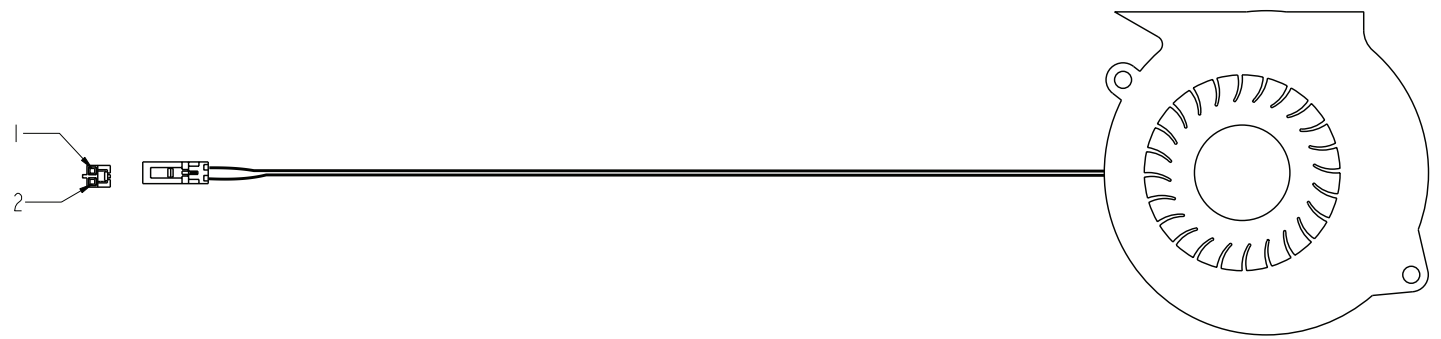
Cable and test point (LED) location	Voltage	Positive lead	Negative lead	Description
D56	+24VDC	N/A	N/A	+24VDC from power supply to main board
CPR (left)	+5VDC	Pin 2 red	Pin 3 black	+5VDC power out to CPR switch
CPR (right)	+5VDC	Pin 2 red	Pin 3 black	+5VDC power out to CPR switch
TLI (D30)	+24VDC	TP11	TP24 GND	+24VDC from main board to solenoid valve (Turn Left Inflate)
TLD (D31)	+24VDC	TP18	TP24 GND	+24VDC from main board to solenoid valve (Turn Left Deflate)
TRI (D26)	+24VDC	TP9	TP24 GND	+24VDC from main board to solenoid valve (Turn Right Inflate)
TRD (D27)	+24VDC	TP16	TP24 GND	+24VDC from main board to solenoid valve (Turn Right Deflate)
BLI (D34)	+24VDC	TP13	TP24 GND	+24VDC from main board to solenoid valve (Back Left Inflate)
BLD (D36)	+24VDC	TP20	TP24 GND	+24VDC from main board to solenoid valve (Back Left Deflate)
BRI (D22)	+24VDC	TP7	TP24 GND	+24VDC from main board to solenoid valve (Back Right Inflate)
BRD (D23)	+24VDC	TP14	TP24 GND	+24VDC from main board to solenoid valve (Back Right Deflate)
SLI (D33)	+24VDC	TP12	TP24 GND	+24VDC from main board to solenoid valve (Seat Left Inflate)
SLD (D32)	+24VDC	TP19	TP24 GND	+24VDC from main board to solenoid valve (Seat Left Deflate)

Cable and test point (LED) location	Voltage	Positive lead	Negative lead	Description
SRI (D25)	+24VDC	TP8	TP24 GND	+24VDC from main board to solenoid valve (Seat Right Inflate)
SRD (D24)	+24VDC	TP15	TP24 GND	+24VDC from main board to solenoid valve (Seat Right Deflate)
IN (D28)	+24VDC	TP10	TP24 GND	+24VDC from main board to solenoid valve (Air Intake)
EX (D29)	+24VDC	TP17	TP24 GND	+24VDC from main board to solenoid valve (Air Exhaust)
J14	+12VDC	Pin 1 red	Pin 6 black	+12VDC out to sensor board from main board
J6	+24VDC	Pin 1 yellow	Pin 2 black	+24VDC out to compressor from main board (variable voltage) - D65 = 24.4% - D66 = 48.8% - D67 = 73.2% - D68 = 97.6% - D71 = 110%

Cables

Fans and cable assembly

2971-021-188 Rev C (Reference only)



Item	Color
1	Red
2	Blue

SPI cables (main board to foot box) assembly

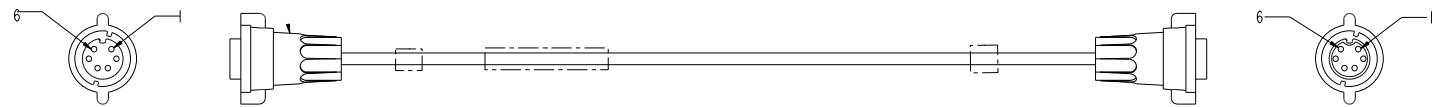
2971-022-132 Rev D (Reference only)



Item	Color
1	Red
6	Black
2	Black
3	Green
4	Black
5	White
7	Blue
8	Black
9	Brown
10	Black

Integration cable assembly 2971-022-133

Rev C



Item	Color
1	Black
2	Red
4	Green
6	open

Troubleshooting

Problem	Possible Cause	Solution
Support surface will not inflate	Support surface has no power	See <i>No power</i>
	CPR pull is active	Pull down the CPR to reset
	Support surface menu is available on the InTouch bed screen	Check the connection of the support surface integration cable (see <i>Installation</i>)
	Pod manifold connector is not set	Set the pod manifold connector and secure
	Pump does not run when you start Max Inflate	<p>Check for 24VDC (variable) is going to the pump on connector F on the main board pin 1 (yellow) and pin 2 (black) (see <i>Power supply assembly</i> (page 12))</p> <ol style="list-style-type: none"> 1. If voltage is present, replace pump assembly 2. If no voltage present, replace the control board
	Solenoids or pod assembly possible disconnected hose connections	Check the hose connections, solenoids, and pod assembly
No left turn inflate	Left turn bladder hose quick connection coupler loose or disconnected	Make sure that the left turn bladder hose quick connection coupler is together and locked
	Pod manifold connector loose or disconnected	Make sure that the pod manifold connector is set into the manifold and set
	Turn bladder possible leak	Listen for air flowing into the turn bladder
		Look for a leak in the turn bladder
		If you find a leak, replace the turn bladder assembly
	Turn bladder no air enters	Make sure that the LED (D30) is lit to show the TLI solenoid is energizing (see <i>Main power board assembly</i> (page 13))
		If energized, replace the TLI inflate solenoid
No left turn deflate	Left turn bladder hose quick connection coupler loose or disconnected	Make sure that the left turn bladder hose quick connection coupler is together and locked
	Turn bladder no air exits	Make sure that the LED (D31) is lit to show the TLD solenoid is energizing (see <i>Main power board assembly</i> (page 13))
		If energized, replace the TLD inflate solenoid

Problem	Possible Cause	Solution
No right turn inflate	Right turn bladder hose quick connection coupler loose or disconnected	Make sure that the right turn bladder hose quick connection coupler is together and locked
	Pod manifold connector loose or disconnected	Make sure that the pod manifold connector is set into the manifold and set
	Turn bladder possible leak	Listen for air flowing into the turn bladder
		Look for a leak in the turn bladder
		If you find a leak, replace the turn bladder assembly
	Turn bladder no air enters	Make sure that the LED (D26) is lit to show the TLI solenoid is energizing (see <i>Main power board assembly</i> (page 13))
		If energized, replace the TLI inflate solenoid
No right turn deflate	Right turn bladder hose quick connection coupler loose or disconnected	Make sure that the right turn bladder hose quick connection coupler is together and locked
	Turn bladder no air exits	Make sure that the LED (D27) is lit to show the TLD solenoid is energizing (see <i>Main power board assembly</i> (page 13))
		If energized, replace the TLD inflate solenoid
No back right inflate	Pod manifold connector loose or disconnected	Make sure that the pod manifold connector is set into the manifold and secured
	Turn bladder possible leak	Listen for air flowing into the turn bladder
		Look for a leak in the turn bladder
		If you find a leak, replace the turn bladder assembly
	Turn bladder no air enters	Make sure that the LED (D22) is lit to show the BRI solenoid is energizing (see <i>Main power board assembly</i> (page 13))
No back right inflate	Turn bladder no air enters	If energized, replace the BRI inflate solenoid
No back right deflate	Pod manifold connector loose or disconnected	Make sure that the pod manifold connector is set into the manifold and secured
	Turn bladder no air exits	Make sure that the LED (D23) is lit to show the BRD solenoid is energizing (see <i>Main power board assembly</i> (page 13))

Problem	Possible Cause	Solution
		If energized, replace the BRD inflate solenoid
No back left inflate	Pod manifold connector loose or disconnected	Make sure that the pod manifold connector is set into the manifold and secured
	Turn bladder possible leak	Listen for air flowing into the turn bladder
		Look for a leak in the turn bladder
		If you find a leak, replace the turn bladder assembly
	Turn bladder no air enters	Make sure that the LED (D34) is lit to show the BLI solenoid is energizing (see <i>Main power board assembly</i> (page 13))
		If energized, replace the BLI inflate solenoid
No back left deflate	Pod manifold connector loose or disconnected	Make sure that the pod manifold connector is set into the manifold and secured
	Turn bladder no air exits	Make sure that the LED (D36) is lit to show the BLD solenoid is energizing (see <i>Main power board assembly</i> (page 13))
		If energized, replace the BLD inflate solenoid
No seat right inflate	Pod manifold connector loose or disconnected	Make sure that the pod manifold connector is set into the manifold and secured
	Turn bladder possible leak	Listen for air flowing into the turn bladder
		Look for a leak in the turn bladder
		If you find a leak, replace the turn bladder assembly
	Turn bladder no air enters	Make sure that the LED (D25) is lit to show the SRI solenoid is energizing (see <i>Main power board assembly</i> (page 13))
		If energized, replace the SRI inflate solenoid
No seat right deflate	Pod manifold connector loose or disconnected	Make sure that the pod manifold connector is set into the manifold and secured
	Turn bladder no air exits	Make sure that the LED (D24) is lit to show the SRD solenoid is energizing (see <i>Main power board assembly</i> (page 13))
		If energized, replace the SRD inflate solenoid

Problem	Possible Cause	Solution
No power	Support surface power cord is not plugged into the InTouch bed auxiliary outlet	Plug the support surface power cord into the InTouch bed auxiliary outlet
	Pod manifold connector loose or disconnected	Make sure that the pod manifold connector is set into the manifold and secured
	Turn bladder possible leak	Listen for air flowing into the turn bladder
		Look for a leak in the turn bladder
		If you find a leak, replace the turn bladder assembly
	Turn bladder no air enters	Make sure that the LED (D33) is lit to show the SLI solenoid is energizing (see <i>Main power board assembly</i> (page 13))
		If energized, replace the SLI inflate solenoid
	Pod manifold connector loose or disconnected	Make sure that the pod manifold connector is set into the manifold and secured
	Turn bladder no air exits	Make sure that the LED (D32) is lit to show the SLD solenoid is energizing (see <i>Main power board assembly</i> (page 13))
		If energized, replace the SLD inflate solenoid
	LAL icon on the InTouch bed footboard is not orange	Tap the LAL icon to on
	LAL fan not secure in frame or obstructed	If you find no obstruction and the fan is set in the frame, replace the LAL fan assembly
	Power supply quick connector loose or disconnected	Check the power supply quick connector is together and locked
	Foot box fans do not run	Use a voltmeter to check for -12VDC on pin 8 (+/ blue) and pin 6 (-/red)
		If no 12VDC, replace the power supply
	Fan cage is not secure or obstructed	If you find no obstruction and the fan is set in the cage, replace the foot box fan assembly
	Support surface power cord is plugged into the InTouch bed auxiliary outlet	Check that the InTouch bed auxiliary outlet breaker is not tripped
	InTouch bed power cord is not plugged into a hospital grade outlet	Plug the InTouch power cord into a hospital grade outlet
		Using a voltmeter, check the auxiliary outlet on the InTouch bed for 120VAC

Problem	Possible Cause	Solution
No power	Support surface power supply is not supplying DC power	Voltage (120VAC) is not present on the AC connector on the support surface power supply (see <i>Power supply assembly</i> (page 12))
		<p>Check the VDC voltage on the support surface terminal block on the power supply:</p> <ol style="list-style-type: none"> 1. Pin 1 (red) and pin 3 (green) = 5VDC 2. Pin 2 (black) and pin 3 (green) = 12VDC 3. Pin 7 (blue) and pin 3 (green) = 24VDC <p>Note - If no low voltage is present, replace the power supply.</p>

Service

Protecting against electrostatic discharge (ESD)

CAUTION

- Always use ESD protective equipment before you open antistatic bags and service electronic parts.
 - Do not place unprotected circuit boards on the floor.
-

Note - Always ship the circuit boards back to Stryker. Use the antistatic bag that the new board was originally shipped in.

The electronic circuits in the product are completely protected from static electricity damage when factory assembled. Always use adequate static protection when you service the electronic systems of the product. All service personnel must use static protection whenever they touch wires.

Sample antistatic protection equipment includes:

- Antistatic wrist strap
- Grounding plug
- Test lead with a banana plug on one end and an alligator clip on the other end

Make sure that you follow the ESD manufacturer's instructions for appropriate protection against static discharge.

Cover replacement, top

Tools required:

- Zipper pull tool or equivalent

Procedure:

1. Apply the **InTouch** brakes.
2. Unplug the support surface power cord.
3. Remove the headboard and footboards and set aside.
4. Lower all the siderails.
5. Unsnap the two secure snaps (C) at the foot end corners (Figure 2).
6. Unsnap the four corner retainers (B) (Figure 2).
7. Insert a zipper pull tool or equivalent through the hole in the zipper slider to unlock.
8. Using the zipper pull tool or equivalent, unzip the support surface top cover from the bottom (A) (Figure 2).

Note - The zipper starts on the patient right side near the foot end.

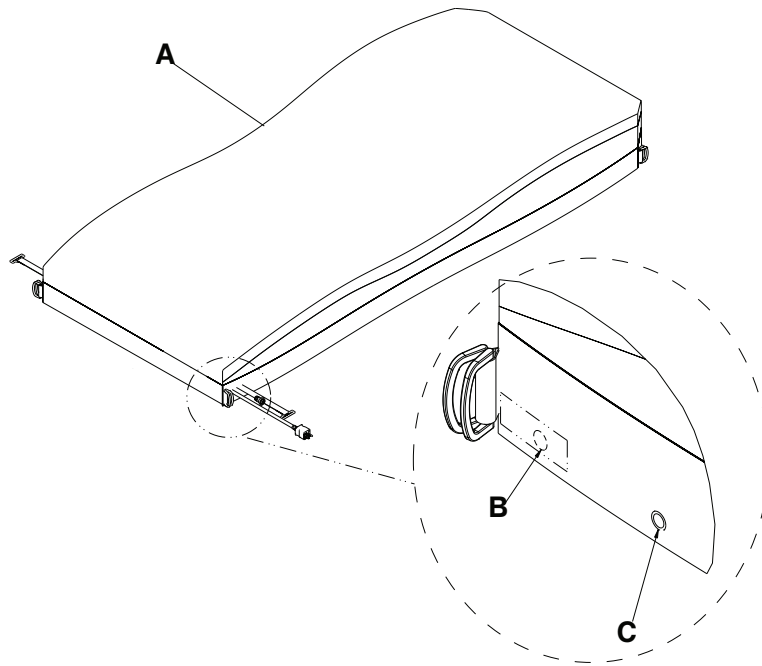


Figure 2 – Top cover

9. Remove and discard the top cover.

10. Reverse to install the new cover.

Note

- After installation, remove the zipper pull tool or equivalent from the zipper.
- Connect the corner retainers. Place the strap below each D-ring and snap to the cover. Repeat for the other three corners.
- Cover the zipper with the support surface cover watershed.

11. Verify proper operation before you return the product to service.

Cover replacement, bottom

Tools required:

- Zipper pull tool or equivalent

Prerequisite: A minimum of two operators are required to replace the bottom support surface cover.

Procedure:

1. Apply the **InTouch** brakes.
2. Unplug the support surface power cord (D) (Figure 3).
3. Disconnect the support surface integration cable (E) (Figure 3) from the bed.
4. Set the **InTouch** litter surface to a flat position.
5. If powered, unplug the **InTouch** from the wall outlet and turn the battery switch to off.
6. Remove the headboard and footboards and set aside.
7. Lower all the siderails.
8. Loosen and remove the retainer straps (A) holding the support surface to the Fowler.
9. Before you turn over the support surface, place a protective sheet on the surface that the support surface top cover will rest.

10. Using two operators, turn the support surface over (Figure 3).

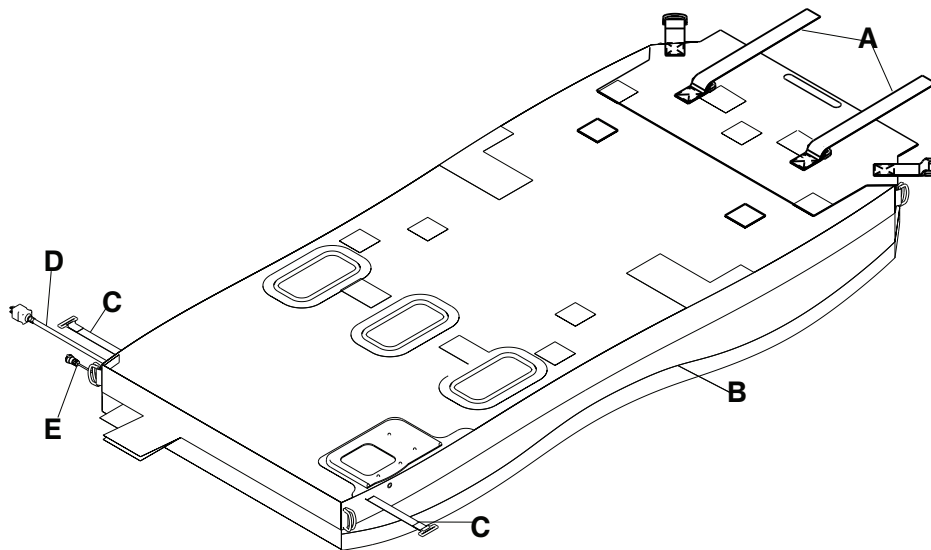


Figure 3 – Bottom support surface cover

11. Unsnap the four corner cover snaps.
12. Unsnap the two secure snaps at the right and left foot end corners.
13. Insert a zipper pull tool or equivalent through the hole in the zipper slider to unlock.
14. Grasp the zipper pull tool or equivalent and pull to unzip the bottom cover from the top cover (B) (Figure 3).
15. Feed the CPR release straps (C), power cord (D), and integration cable (E) through the bottom cover (Figure 3).
16. Unsnap the two snaps that secure the bottom support surface cover to the foot box.

Note - During reinstall, align the foot box with the lines on the bottom cover.

17. Starting at the head end of the support surface, separate the six **Velcro®** patches from the bottom cover (F) (Figure 4).
18. In a gentle motion, unsnap the twelve snaps and separate the **Velcro®** from the left and right sides of the turn bladder (G) (Figure 4).

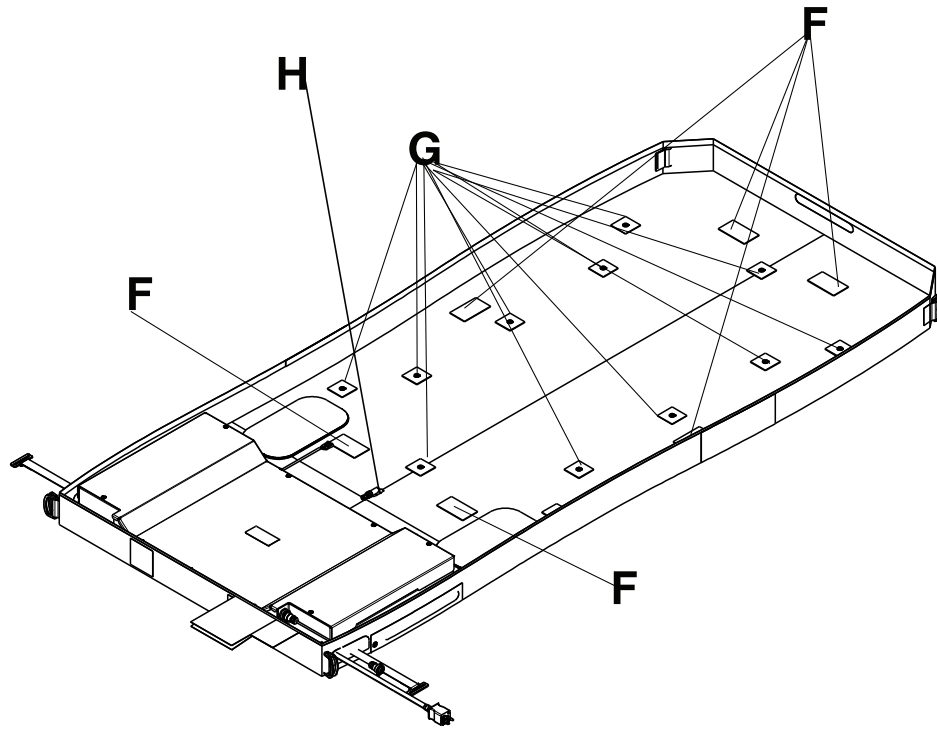


Figure 4 – Pod Velcro® and snap retainers

19. Detach the foot end foam crib from the bottom cover.
20. Disconnect the exhaust tube quick disconnect (H) from the bladder assembly (Figure 4).
21. Remove and discard the bottom cover.
22. Reverse to install the new bottom cover.

Note

- During reinstall, align the **Velcro®** patches, snaps and the foot box cover.
- Connect the corner retainers. Place the strap below each D-ring and snap to the cover. Repeat for the other three corners.
- After installation, remove the zipper pull tool or equivalent from the zipper.
- Cover the zipper with the support surface cover watershed.

23. Verify proper operation before you return the product to service.

Pod assembly replacement

Tools required:

- Zipper pull tool or equivalent

Procedure:

1. Remove the top cover. See *Cover replacement, top* (page 24) for removal.
2. Unsnap the pillow (H) from the left and right side of the pod assembly (Figure 5). Save the pillow.
3. Separate the six **Velcro®** connectors holding the foot section gel crib to the pod assembly.
4. Remove the foot section gel crib (F) by lifting upward (Figure 5). Save the gel crib.

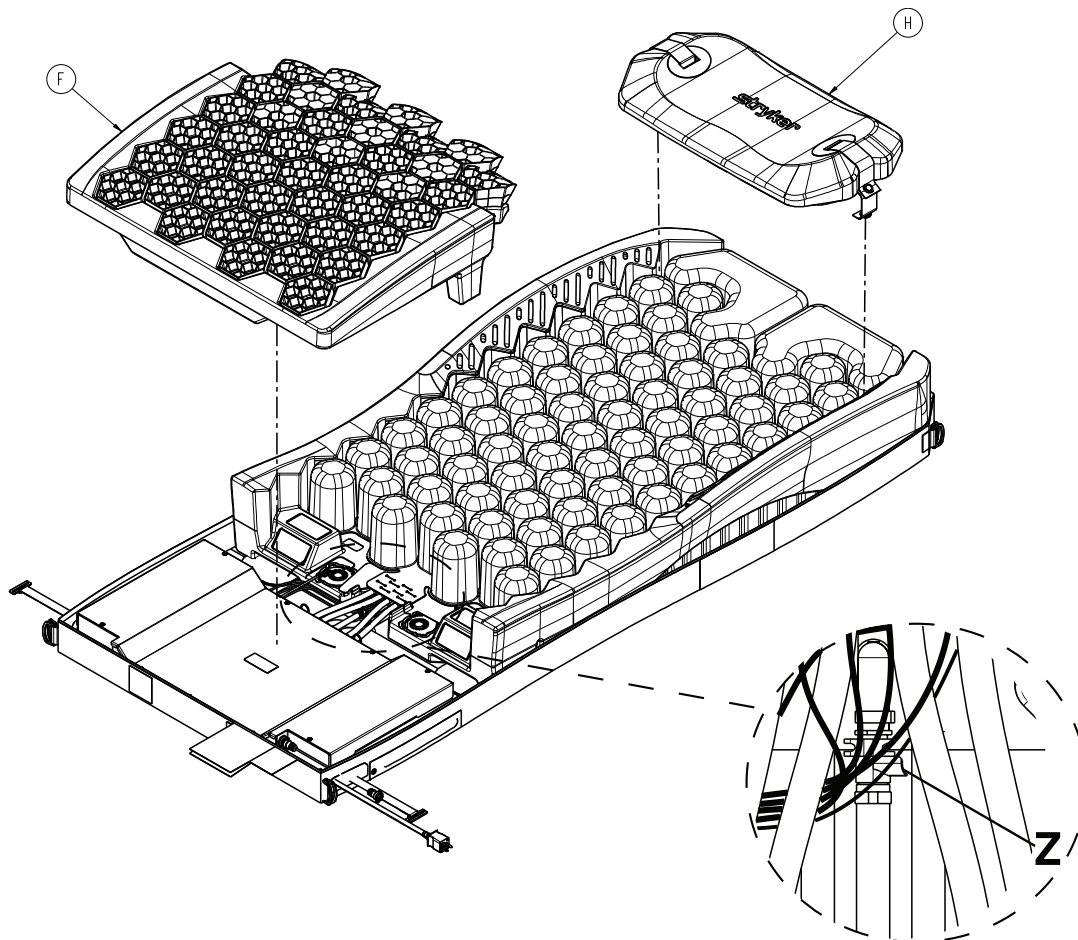


Figure 5 – Gel crib, pillow, and quick disconnect fitting

5. Disconnect the quick disconnect fitting (Z) (Figure 5).
6. Remove the two retaining pins (A) from the hose quick connection from the foot box assembly (Figure 6). Save the pins.

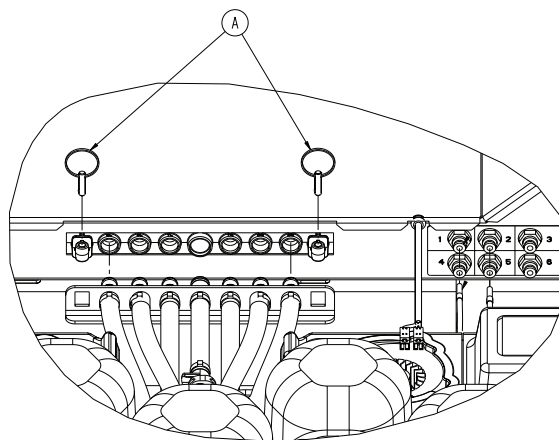


Figure 6 – Retaining pins

7. Grasp both sides of the hose quick connection from the pod assembly and carefully pull out toward the head end of the support surface to disconnect from the foot box manifold.
8. Disconnect the four pod sensor hoses (Y) (1 blue, 2 yellow, 4 green, and 5 orange) from the foot box. Push into the coupling and pull out on each of the hoses (Figure 7).

Note

- When handling the pod sensor hoses, do not bend or kink the hoses.
- Pay attention to the sensor hose position and insertion color and number labels.
- During reinstall, insert the hose and once you hit a stop, continue to push until you reach a hard stop.

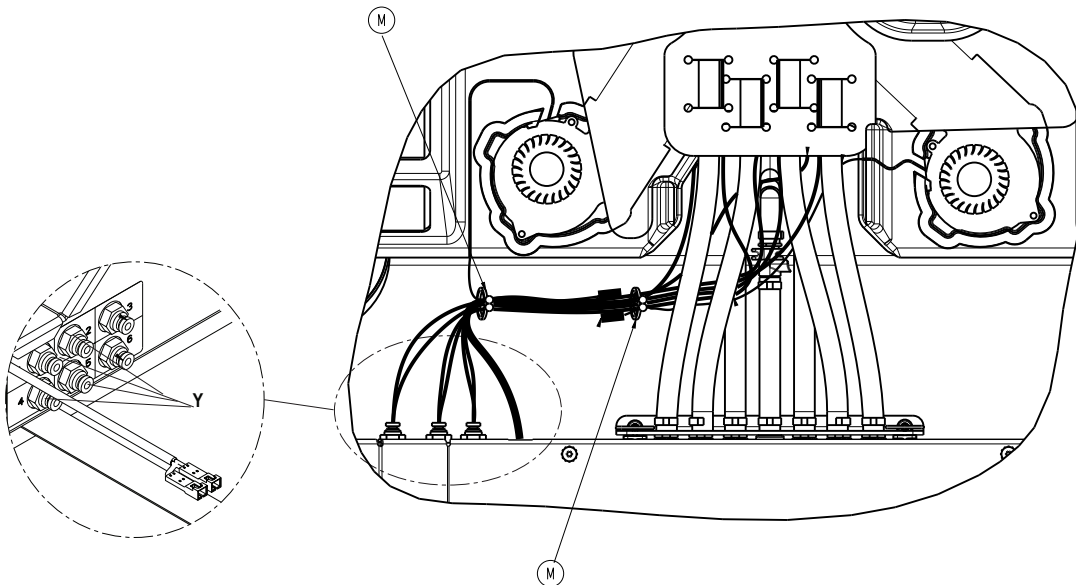


Figure 7 – Pod sensor hoses and purse lock wire tie

9. Remove sensor hoses from the purse lock wire ties (M) (Figure 7).
10. Reach under the pod assembly (C) from the patients right side near the middle to access the turn bladder and disconnect the turn bladder quick disconnect. Repeat on the patient left side (Figure 8).

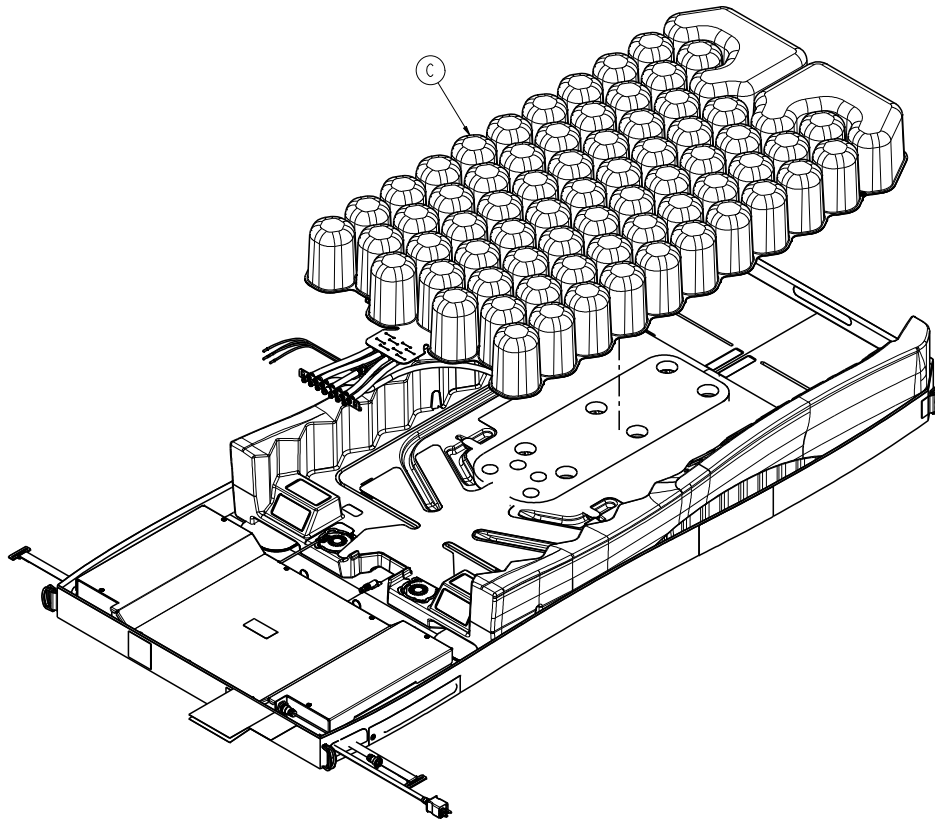


Figure 8 – Pod assembly

11. Separate the **Velcro®** from the head end of the pod assembly (C) and feed the turn bladder hose quick connection through the foam crib.
12. Remove and discard the pod assembly (C)(Figure 8).
13. Reverse to install the new pod assembly.

Note

- During reinstall, align the **Velcro®** patches.
- After installation, remove the zipper pull tool or equivalent from the zipper.
- Cover the zipper with the support surface cover watershed.

14. Run the leak diagnostic test. See *Accessing the Isolibrium Diagnostic Menu* in the **InTouch** Maintenance Manual.
15. Verify proper operation before you return the product to service.

Foot box cover access

Tools required:

- Zipper pull tool or equivalent
- T20 Torx driver
- T15 Torx driver

Procedure:

1. Apply the **InTouch** brakes.
2. Unplug the support surface power cord.
3. Remove the headboard and footboards and set aside.
4. Lower all the siderails.

5. Unsnap the two secure snaps (C) at the foot end corners (Figure 9).
6. Unsnap the two foot end corner retainers (B) (Figure 9).
7. Insert a zipper pull tool or equivalent through the hole in the zipper slider to unlock.
8. Using the zipper pull tool or equivalent, unzip the support surface top cover from the bottom cover (A) (Figure 9) and stop unzipping at the middle of the opposite side (D).

Note - The zipper starts on the patient right side near the foot end.

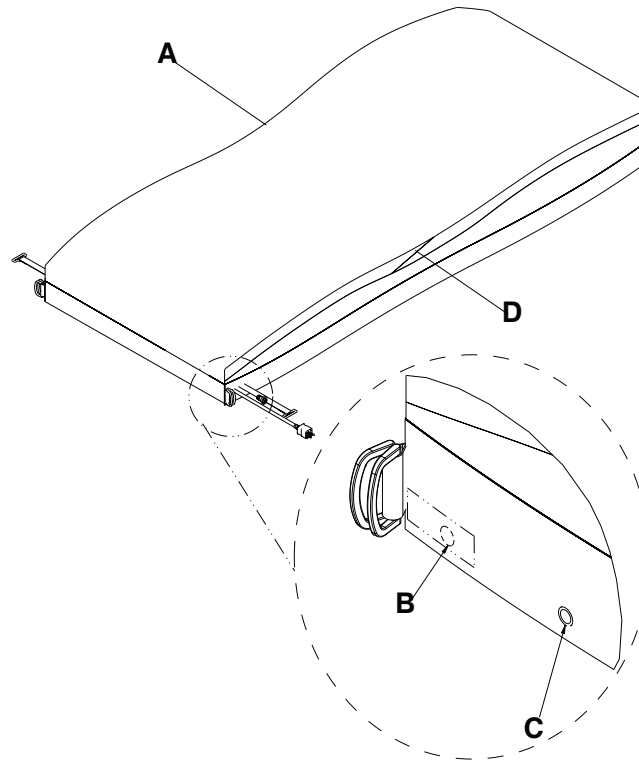


Figure 9 – Top cover

9. Fold the cover up toward the head end.
10. Separate the six **Velcro®** connectors holding the foot section gel crib to the pod assembly.
11. Remove the foot section gel crib (F) by lifting upward (Figure 10). Save gel crib.
12. Unsnap the two snaps that secure the bottom support surface cover to the foot box.

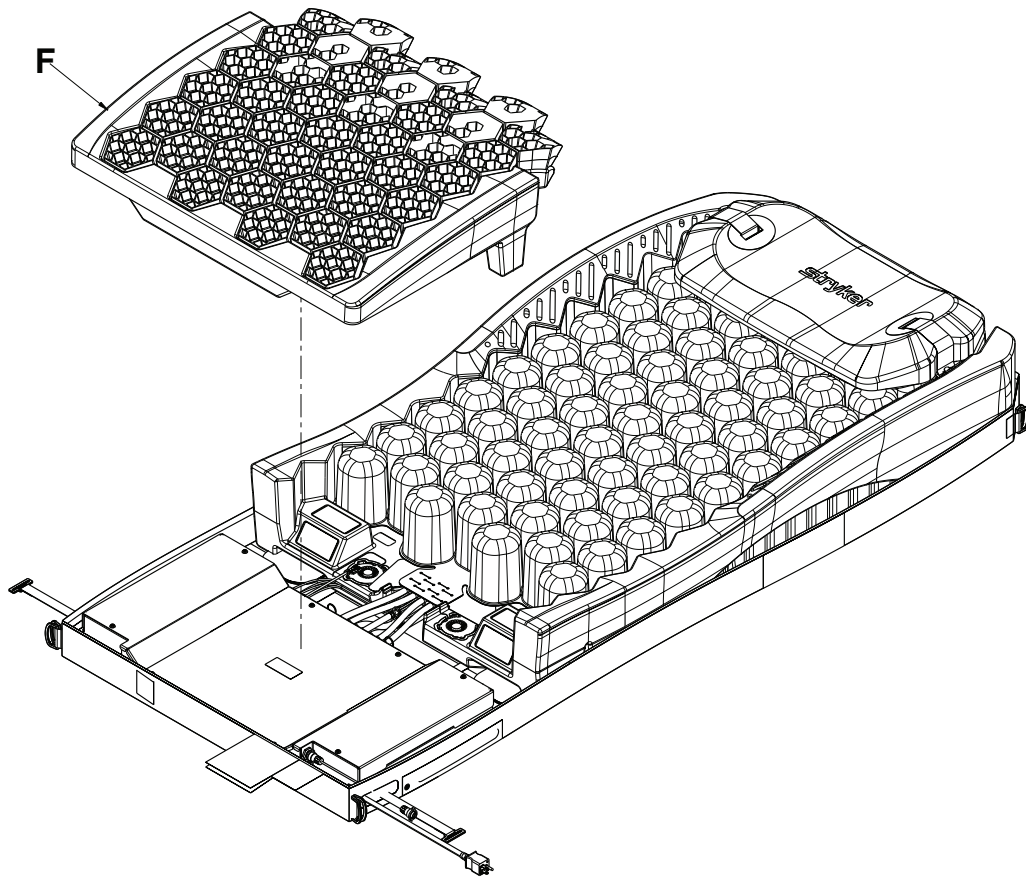


Figure 10 – Gel crib

13. Using a T15 Torx driver, remove the nine ground screws (B) and nine star washers (D) (Figure 9). Save the ground screws and star washers.

Note

- During reinstall, tighten the screws equally and do not over tighten. Torque (B) to 22 ± 4 in-lb.
- During reinstall, check the LAL fan cable (G) and grommet (H) are in place before replacing the foot box cover (Figure 11).

14. Remove the foot box cover (AF) (Figure 11). Save the foot box cover.

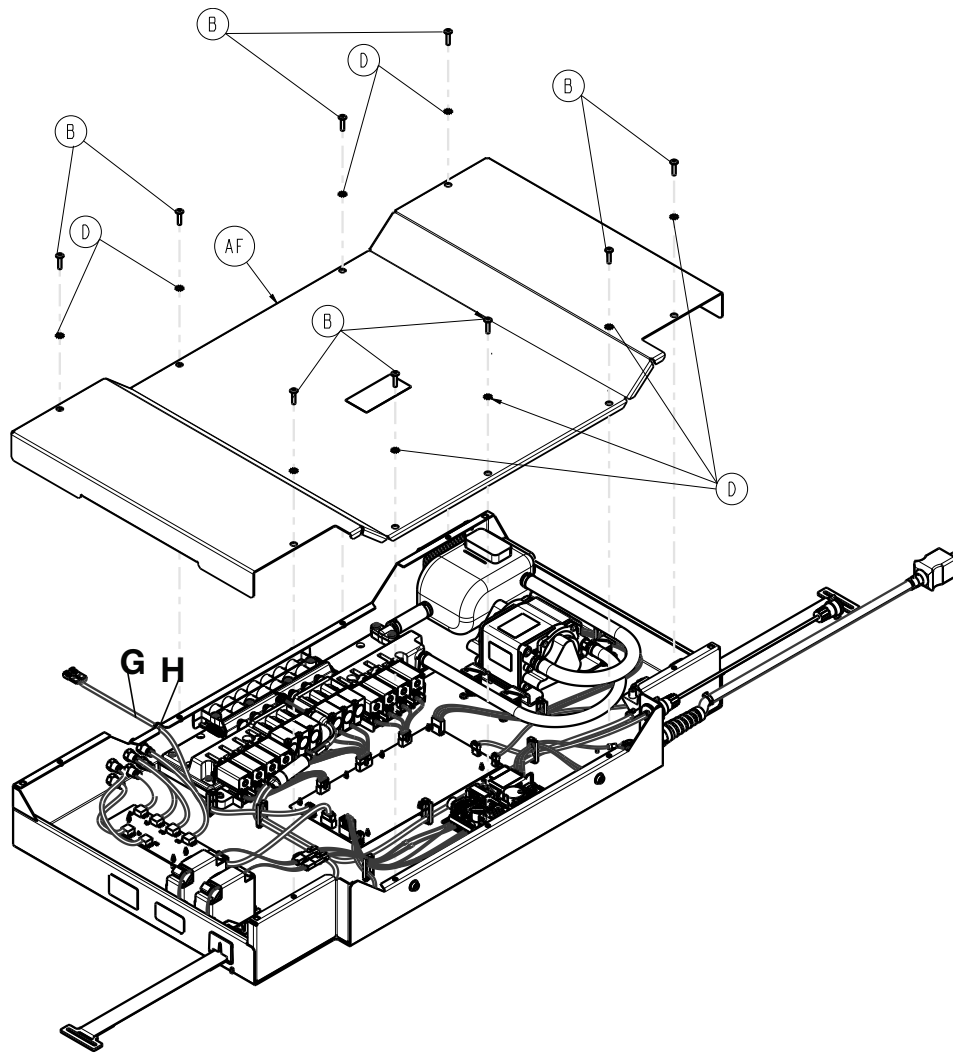


Figure 11 – Foot box cover

15. Reverse to reinstall.

Solenoid valve replacement

Tools required:

- Zipper pull tool or equivalent
- Torque driver
- ESD system

Procedure:

1. See *(Foot box cover access (page 30))*.
2. See *Protecting against electrostatic discharge (ESD) (page 24))*.
3. Using the supplied torque driver, remove the two screws that secure the solenoid valve (H, J, or K) to the manifold assembly (Figure 12). Save the screws.

Note - During installation tighten the screws equally. Use the supplied torque driver and torque the screws to 4.4 in-lb.

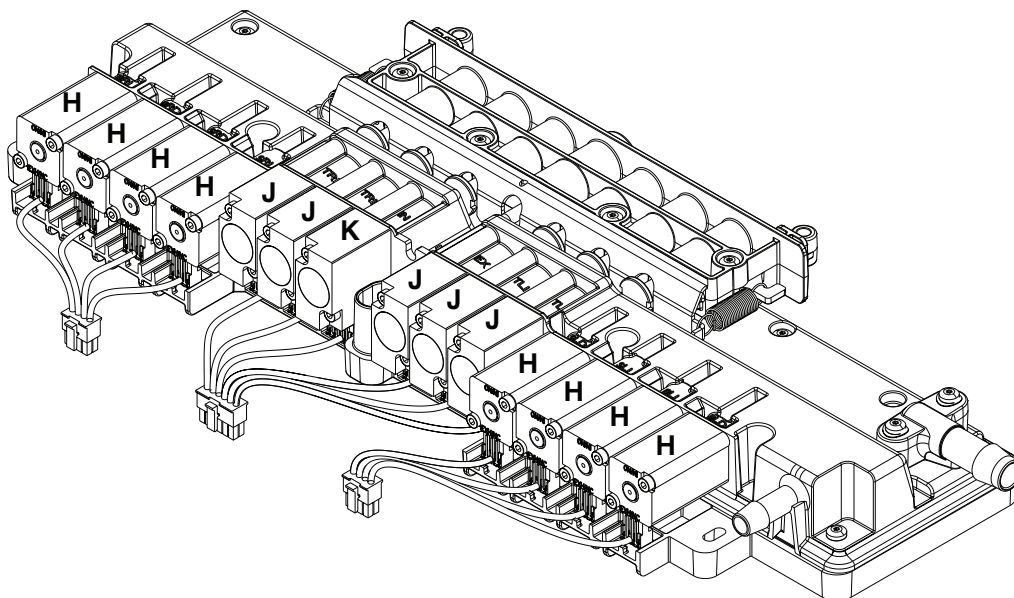


Figure 12 – Solenoid valve

4. Remove the solenoid valve.
5. Disconnect the connector for the solenoid valve.

Note - Inspect the replacement solenoid valve to make sure that the O-ring is in place. If the O-ring is not in place, transfer the O-ring from the removed solenoid valve to the supplied solenoid valve.

6. Discard the solenoid valve.
7. Reverse steps to reinstall.

Note

- During reinstall, align the **Velcro®** patches.
 - After installation, remove the zipper pull tool or equivalent from the zipper.
 - Cover the zipper with the support surface cover watershed.
8. Verify proper operation before you return the product to service.

Power supply replacement

Tools required:

- Zipper pull tool or equivalent
- T10 Torx driver
- ESD system

Procedure:

1. See *Foot box cover access* (page 30).
2. See *Protecting against electrostatic discharge (ESD)* (page 24)).
3. Remove the wires for the fans and DC power from the wire clip (A).
4. Disconnect the DC power connector from the main board (AR) (connector R) (Figure 13).

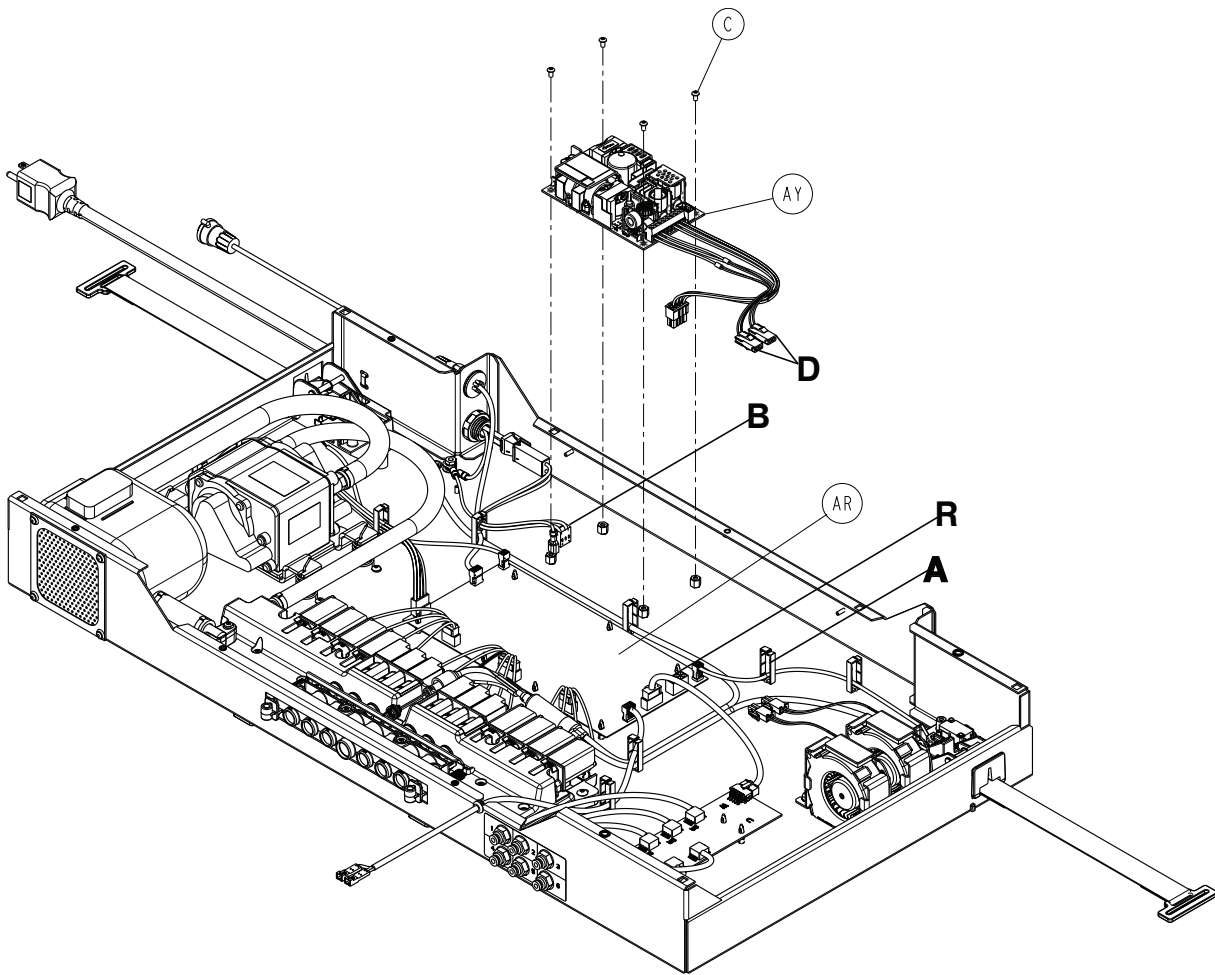


Figure 13 – Power supply

5. Disconnect the AC power connector (B) from the power supply (Figure 13).
6. Disconnect the two foot box fans (D).
7. Disconnect the ground wire connector from the power supply.
8. Using a T10 Torx driver, remove the four screws (C) that secure the power supply (AY) to the foot box (Figure 13). Save the screws.

Note - During reinstall, torque (C) to 8 ± 2 in-lb.

9. Remove and discard the power supply (AY) (Figure 13).
10. Reverse steps to reinstall.

Note

- During reinstall, align the **Velcro®** patches.
- After installation, remove the zipper pull tool or equivalent from the zipper.
- Cover the zipper with the support surface cover watershed.
- Do not dispose of as unsorted municipal waste. See your local distributor for return or collection systems available in your country.

11. Verify proper operation before you return the product to service.

Main board replacement

Tools required:

- Zipper pull tool or equivalent
- Needle nose pliers
- ESD system

Procedure:

1. See *Foot box cover access* (page 30).
2. See *Protecting against electrostatic discharge (ESD)* (page 24)).
3. Remove all wiring connections from the main board (AR) (Figure 14).

Note - Pay attention to all connection points before you disconnect.

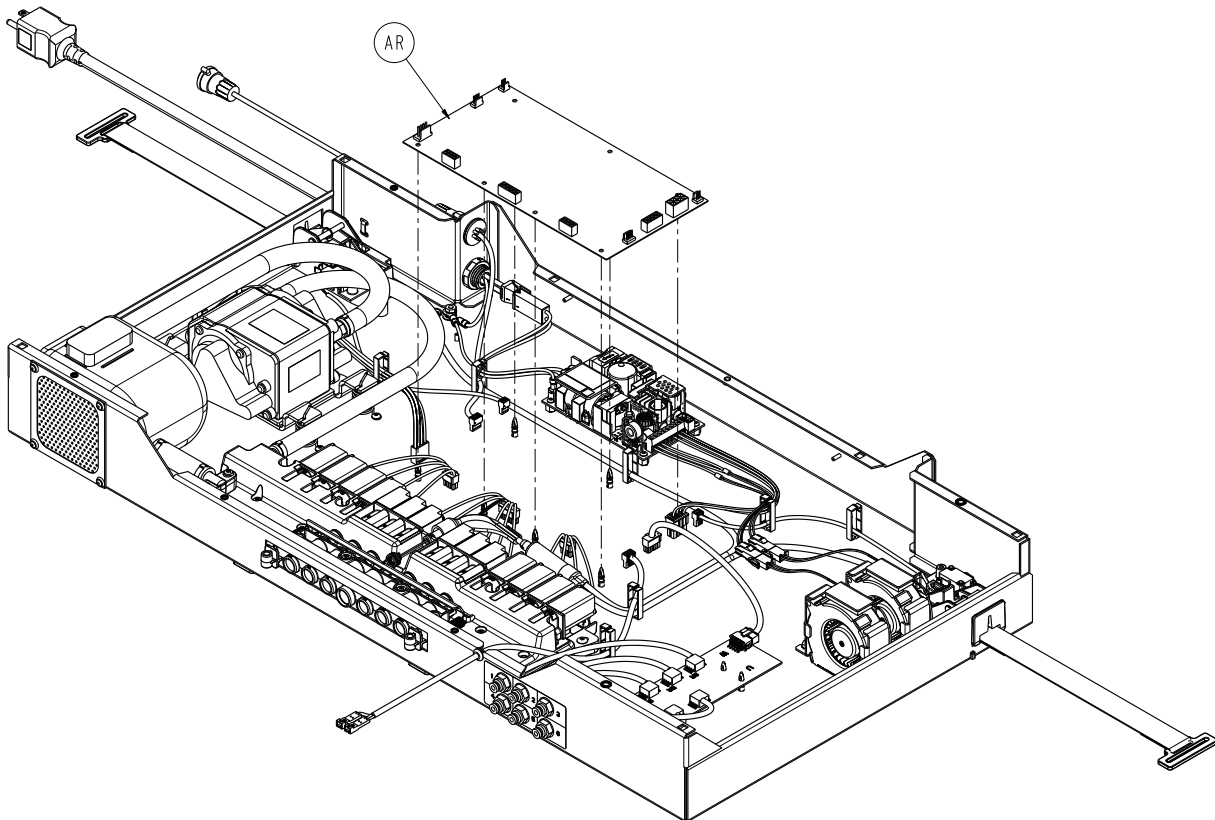


Figure 14 – Main board

4. Using needle nose pliers, apply a slight upward pressure on the main board to unclip the seven plastic standoffs.

Note - During reinstall, align the standoffs to the main board and press near the standoffs to seat the main board. Do not bend the board.

5. Remove and discard the main board.
6. Reverse steps to reinstall.

Note

- During reinstall, align the **Velcro®** patches.
- After installation, remove the zipper pull tool or equivalent from the zipper.
- Cover the zipper with the support surface watershed.
- Do not dispose of as unsorted municipal waste. See your local distributor for return or collection systems available in your country.

7. Verify proper operation before you return the product to service.

Power cord replacement

Tools required:

- Zipper pull tool or equivalent
- 5/16" Nut driver
- 1" Combination wrench
- Diagonal pliers

Procedure:

1. See *Foot box cover access* (page 30).
2. Using diagonal pliers, cut the cable tie (BG) (Figure 15) and discard.

Note

- Pay attention to the orientation of the cable tie for installation of the new power cord.
- From the inside of the foot box, install the supplied cable tie through the top hole with the cable tie lock to face up. Feed the cable tie around the new power cord and through the bottom hole in the foot box to secure the power cord to the foot box.
- During installation, before you cut the end off of the cable tie, use the diagonal pliers to pry the slack out of the cable tie (one to two clicks).

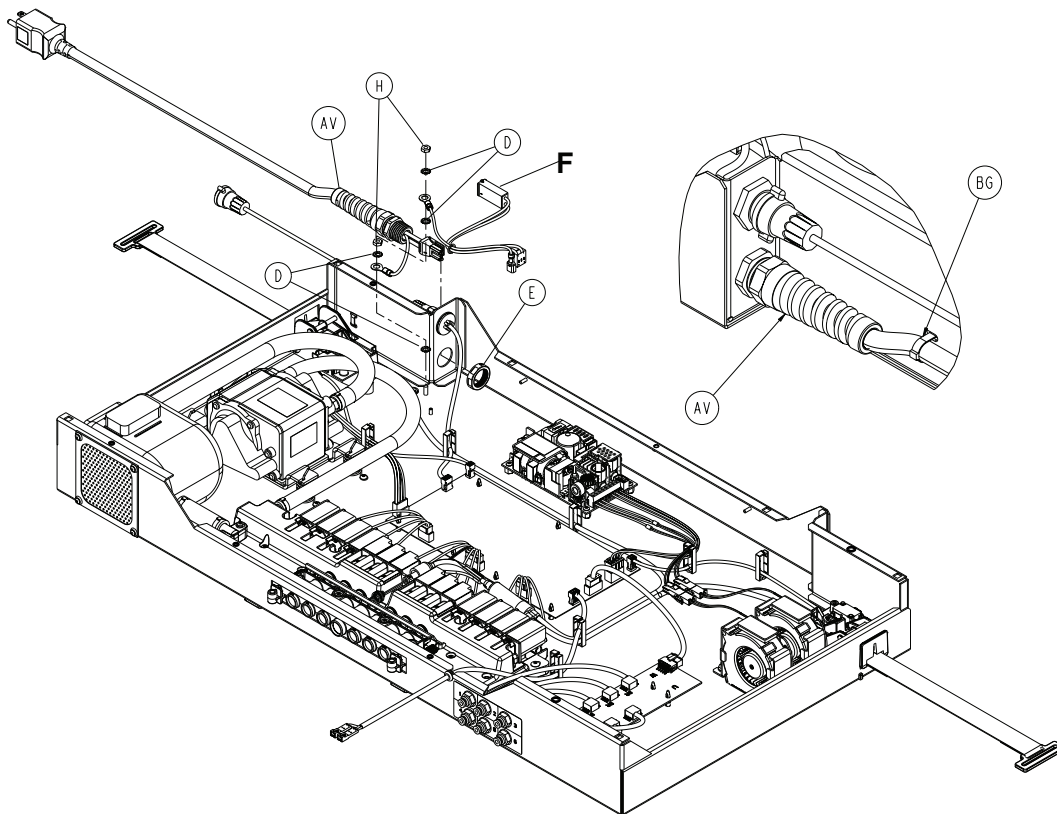


Figure 15 – Power cord

3. Using a 5/16" Nut driver, remove the two nuts (H) and four star washers (D) that secure the power cable ground connector (Figure 15). Save the nuts and star washers.

Note - During reinstall, torque (H) to 22 ± 4 in-lb

4. Using a 1" combination wrench, remove the nut (E) that secures the power cord strain relief to the foot box.

5. Feed the ground through the plastic retaining nut (E) (Figure 15).
6. Disconnect the power cord quick connect (F) from the power supply (Figure 15).
7. Feed the two pin connector through the nut (E) (Figure 15).
8. Remove and discard the power cord (AV) (Figure 15).
9. Reverse steps to reinstall.

Note

- During reinstall, first assemble the power cord ground star washers and nut, and then the power supply ground star washers and nut.
 - During reinstall, align the **Velcro®** patches.
 - After installation, remove the zipper pull tool or equivalent from the zipper.
 - Cover the zipper with the support surface watershed.
10. Verify proper operation before you return the product to service.

Bed integration cable connector replacement

Tools required:

- Zipper pull tool or equivalent
- 1" Combination wrench or socket

Procedure:

1. See *Foot box cover access* (page 30).
2. Using your fingers, disconnect the bed integration cable connector (AP) from the foot box and rotate the turn-lock counterclockwise (Figure 16).
3. Using a 1" combination wrench, remove the plastic retaining nut (F) on the bed integration cable connector that secures it to the foot box. Save the nut.
4. Disconnect the can inner cable (AT) from the main board (connector J) (Figure 16).

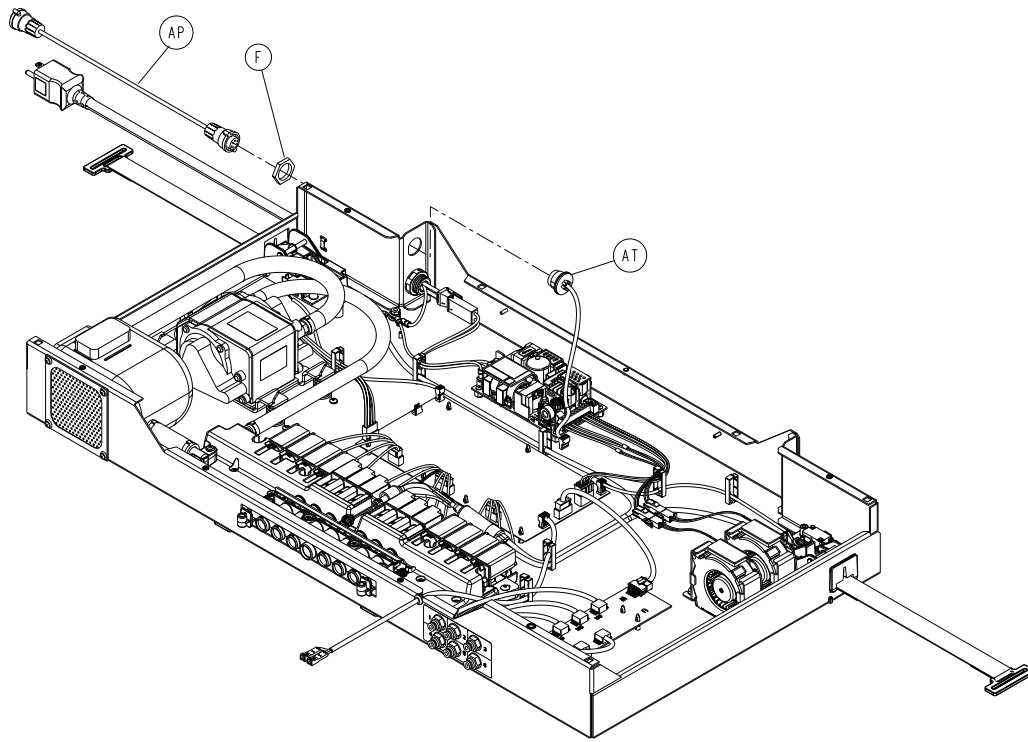


Figure 16 – Bed integration cable connector

5. Remove and discard the bed integration cable connector.
6. Reverse steps to reinstall.

Note

- During reinstall, align the **Velcro®** patches.
 - After installation, remove the zipper pull tool or equivalent from the zipper.
 - Cover the zipper with the support surface cover watershed.
7. Verify proper operation before you return the product to service.

Pump assembly replacement

Tools required:

- Zipper pull tool or equivalent
- Diagonal pliers
- T15 Torx driver

Procedure:

1. See *Foot box cover access* (page 30).
2. Disconnect the pump power connector from the main board (connector F).
3. Disconnect the cable from the three wire retainers.
4. Using diagonal pliers, carefully cut the cable ties where the inlet hose connects to the manifold (BG) and the exhaust hose connects to the resonator (Figure 17). Do not cut the manifold barb.

Note - During installation, before you cut the end off of the cable tie, use the diagonal pliers to pry the slack out of the cable tie (one to two clicks).

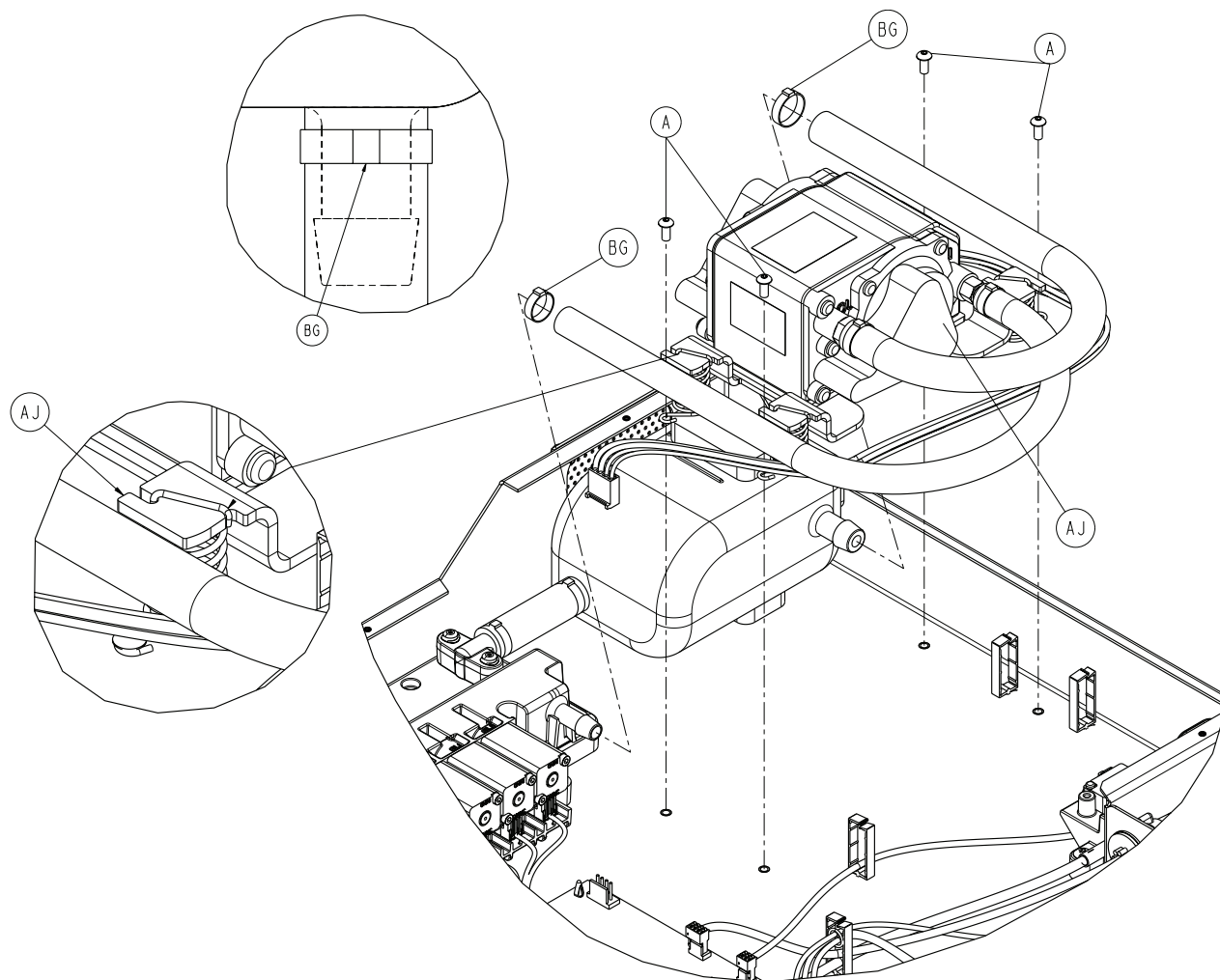


Figure 17 – Pump assembly

5. Using a T15 Torx driver, remove the four screws (A) that secure the pump assembly (AJ) to the foot box (Figure 17). Save the screws.

Note - During reinstall, torque (A) to 22 ± 4 in-lb.

6. Move the pump assembly to the side so the area in front of the manifold is clear to remove the hose from the manifold.
7. With a firm grasp on the manifold hose, pull straight out and twist.

Note - Try not to damage the manifold barb when you remove or install.

8. Grasp the resonator hose and hold the resonator while you pull the resonator hose out.
9. Remove and discard the pump assembly.
10. Reverse steps to reinstall.

Note

- During reinstall, hold the pump springs while you tighten so the pump springs do not turn.
- During reinstall, make sure that the pump hose is not kinked or bent.
- During reinstall, align the **Velcro®** patches.
- After installation, remove the zipper pull tool or equivalent from the zipper.
- Cover the zipper with the support surface cover watershed.
- Do not dispose of as unsorted municipal waste. See your local distributor for return or collection systems available in your country.

11. Verify proper operation before you return the product to service.

Low Air Loss (LAL) fan replacement

Tools required:

- Zipper pull tool or equivalent

Procedure:

1. Apply the **InTouch** brakes.
2. Unplug the support surface power cord.
3. Remove the headboard and footboards and set aside.
4. Lower all the siderails.
5. Unsnap the two secure snaps (C) at the foot end corners (Figure 18).
6. Unsnap the two foot end corner retainers (B) (Figure 18).
7. Insert a zipper pull tool or equivalent through the hole in the zipper slider to unlock.
8. Using the zipper pull tool or equivalent, unzip the support surface top cover from the bottom cover (A) (Figure 18) and stop unzipping at the middle of the opposite side (D).

Note - The zipper starts on the patient right side near the foot end.

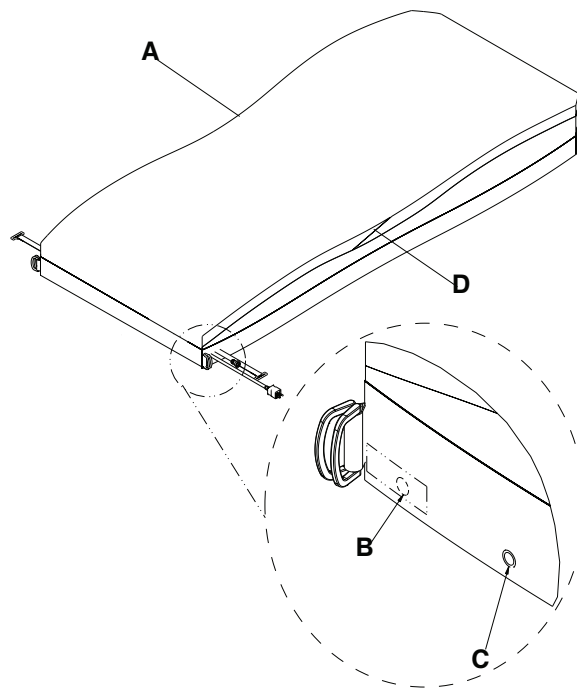


Figure 18 – Top cover

9. Fold the cover up toward the head end.
10. Separate the six **Velcro®** connectors that secure the foot section gel crib to the pod assembly.
11. Remove the foot section gel crib (F) and lift up (Figure 19). Save gel crib.

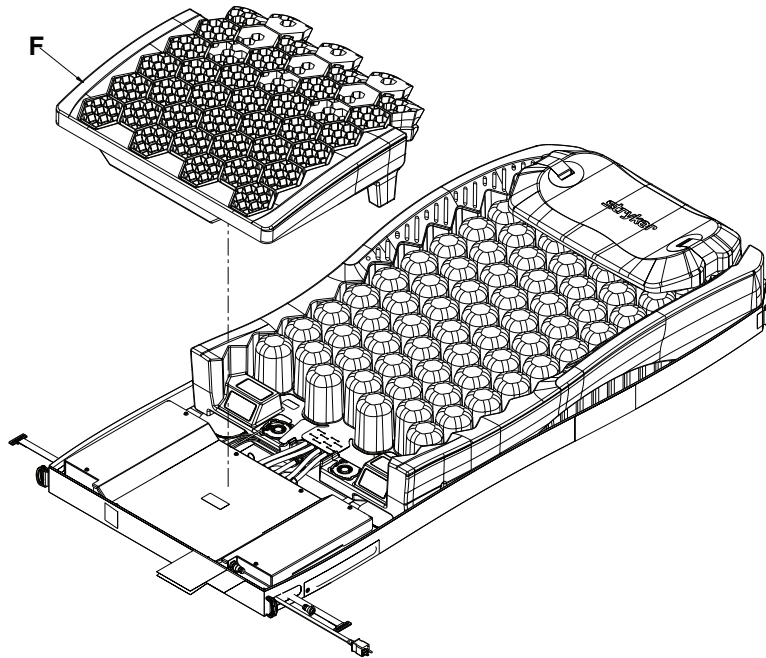


Figure 19 – Gel crib

12. Remove the two purse lock wire tie (M)(Figure 20). Save the purse lock wire ties.

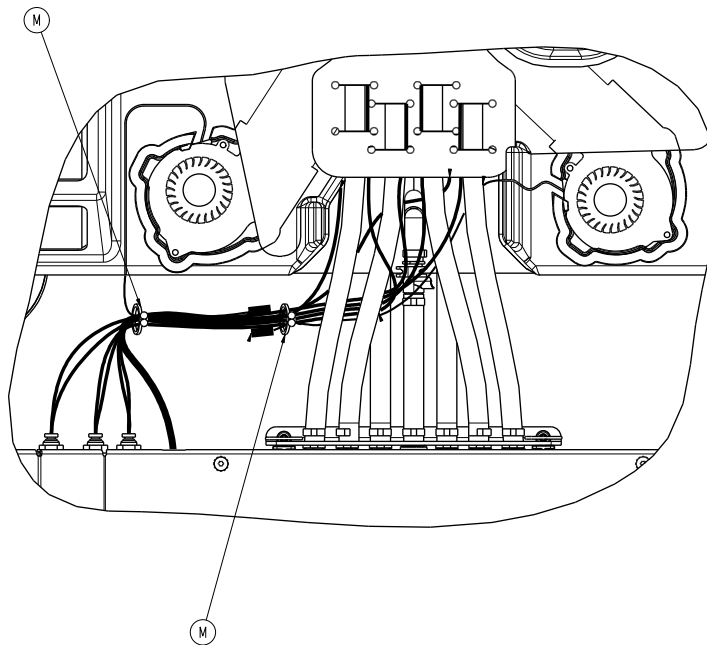


Figure 20 – Purse lock wire tie

13. Disconnect the LAL fan from the quick connection.

14. Remove the LAL fan from the LAL fan nest and discard the LAL fan (J) (Figure 21).

Note - During reinstall, route the cable back through the foam and make sure that the new fan is seated into the LAL fan nest.

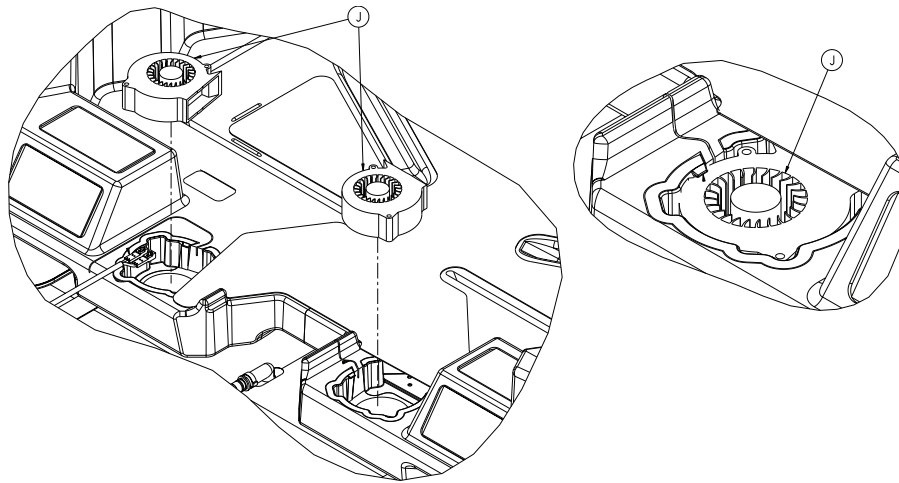


Figure 21 – LAL fan

15. Reverse steps to reinstall.

Note

- During reinstall, align the **Velcro®** patches.
- After installation, remove the zipper pull tool or equivalent from the zipper.
- Cover the zipper with the support surface cover watershed.

16. Verify proper operation before you return the product to service.

Foot box cooling fan replacement

Tools required:

- Zipper pull tool or equivalent
- 5/16" Nut driver

Procedure:

1. See *Foot box cover access* (page 30).
2. Disconnect the cooling fan from the quick connection.
3. Using a 5/16" nut driver, remove the nut (H) that secures the fan cage to the foot box. Save the nut (H) and the washer (D) (Figure 22).

Note - During reinstall, torque (H) to 22 ± 4 in-lb.

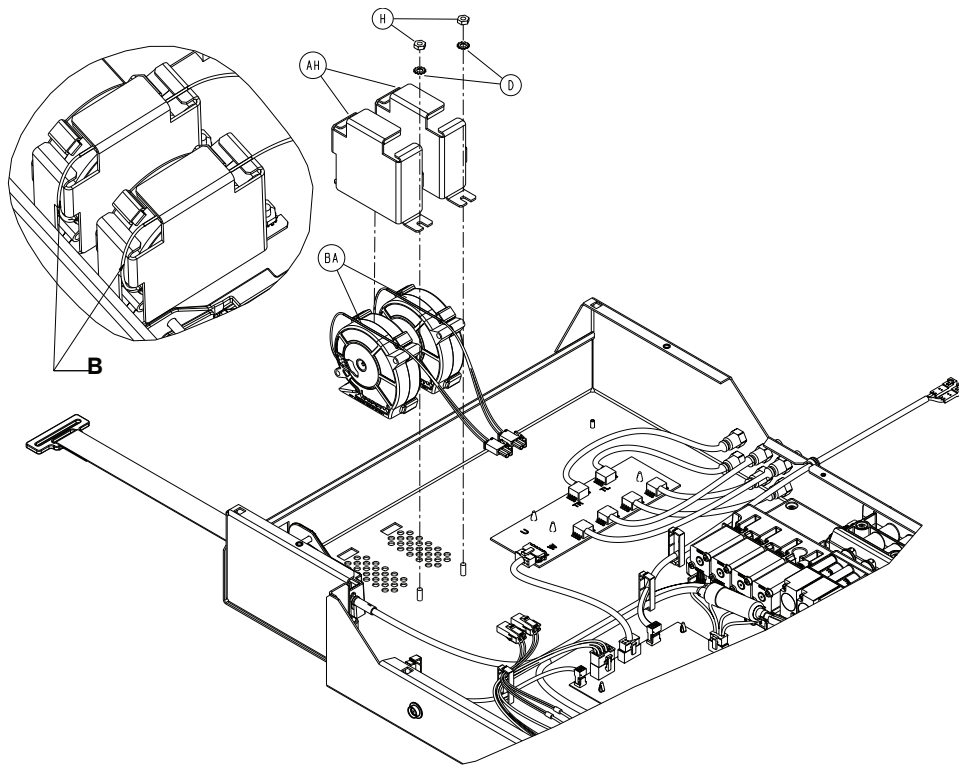


Figure 22 – Cooling fan and cage

4. Remove the cooling fan (BA) (Figure 22) from the fan cage (AH). Discard the cooling fan.

Note - During reinstall, route the fan power cables (BA) over the top of the supplied fan (B) and under the foam tape (Figure 22).

5. Reverse steps to reinstall.

Note

- During reinstall, align the **Velcro®** patches.
- After installation, remove the zipper pull tool or equivalent from the zipper.
- Cover the zipper with the support surface cover watershed.

6. Verify proper operation before you return the product to service.

Sensor board replacement

Tools required:

- Zipper pull tool or equivalent
- Needle nose pliers
- ESD system

Procedure:

1. See *Foot box cover access* (page 30).
2. See *Protecting against electrostatic discharge (ESD)* (page 24)).
3. Disconnect all six of the pod sensor hoses from the foot box. Push in on the coupling and pull each of the hoses out.

Note

- Do not bend or kink the pod sensor hoses.
- Pay attention to the sensor hose position, insertion color, and number labels.

- During reinstall, insert the sensor hose and once you hit a stop, continue to push until you reach a hard stop.
4. Disconnect the cable (AN) from the sensor board (AB) (Figure 23).
 5. Using needle nose pliers, lift up slightly, disconnect the sensor board (AB) from the three plastic standoffs (Figure 23).

Note - During reinstall, align the standoffs to the main board and press near the standoffs to seat the main board. Do not bend the board.

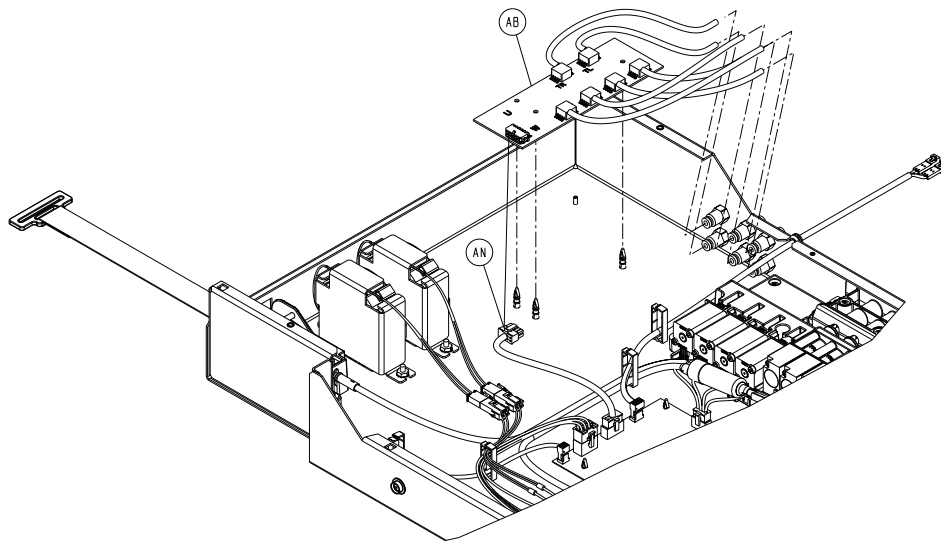


Figure 23 – Sensor board

6. Remove and discard the sensor board.
7. Reverse steps to reinstall.

Note

- During reinstall, align the **Velcro®** patches.
 - After installation, remove the zipper pull tool or equivalent from the zipper.
 - Cover the zipper with the support surface cover watershed.
 - Do not dispose of as unsorted municipal waste. See your local distributor for return or collection systems available in your country.
8. Run the leak diagnostic test. See *Accessing the Isolibrium Diagnostic Menu* in the **InTouch** Maintenance Manual.
 9. Verify proper operation before you return the product to service.

Resonator replacement

Tools required:

- Zipper pull tool or equivalent
- Diagonal pliers

Procedure:

1. See *Foot box cover access* (page 30).
2. Using diagonal pliers, cut the cable ties (BG) from the inlet and outlet hoses of the resonator (Figure 24). Discard the cable ties.

Note - During installation, before you cut the end off of the cable tie, use the diagonal pliers to pry the slack out of the cable tie (one to two clicks).

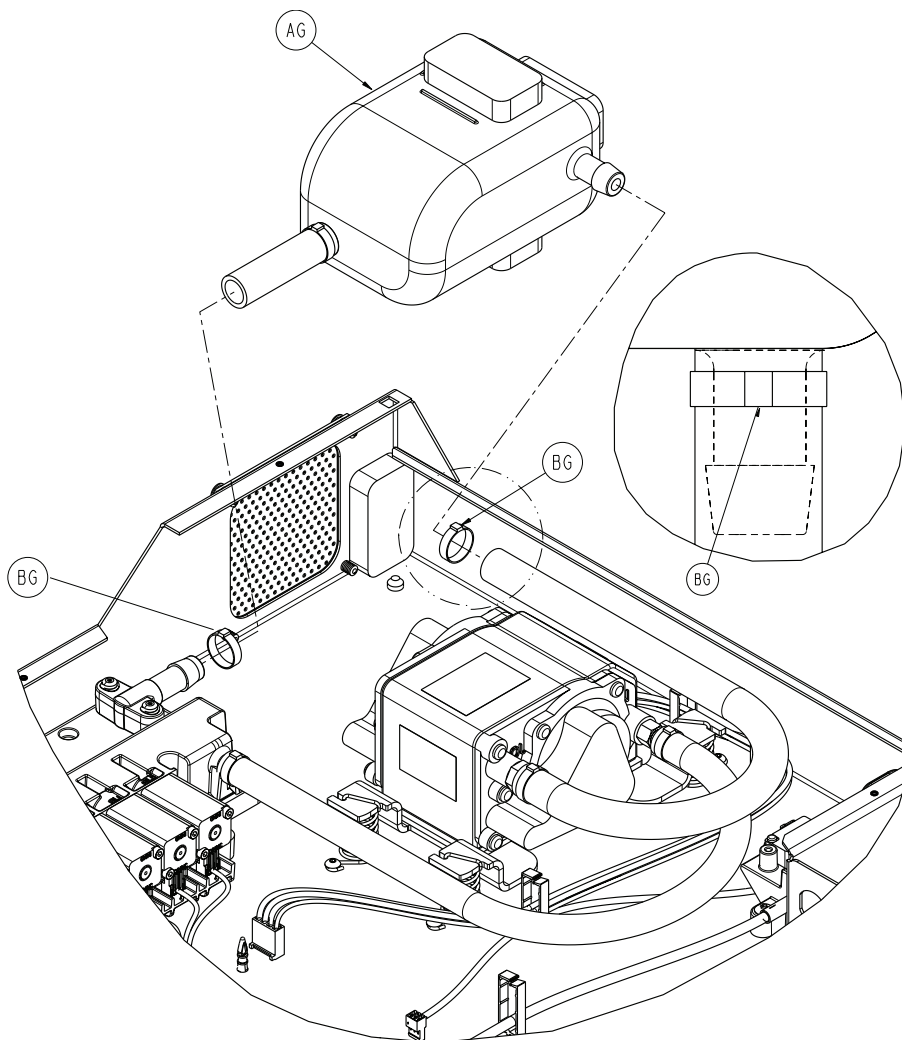


Figure 24 – Resonator

3. Pull to disconnect each of the hoses from the resonator (AG) and the manifold (Figure 24).
4. Remove and discard the resonator.

Note - During reinstall, make sure that the compressor supply hose is not kinked or bent.

5. Reverse steps to reinstall.

Note

- During reinstall, align the **Velcro®** patches.
- After installation, remove the zipper pull tool or equivalent from the zipper.
- Cover the zipper with the support surface cover watershed.

6. Verify proper operation before you return the product to service.

Turn bladder assembly replacement

Tools required:

- Zipper pull tool or equivalent
- Diagonal pliers

Procedure:

1. Remove the top cover. See *Cover replacement, top* (page 24) for removal.

2. Separate the six **Velcro®** connectors that hold the foot section gel crib to the pod assembly.
3. Remove the foot section gel crib (F) (Figure 25). Save the gel crib.

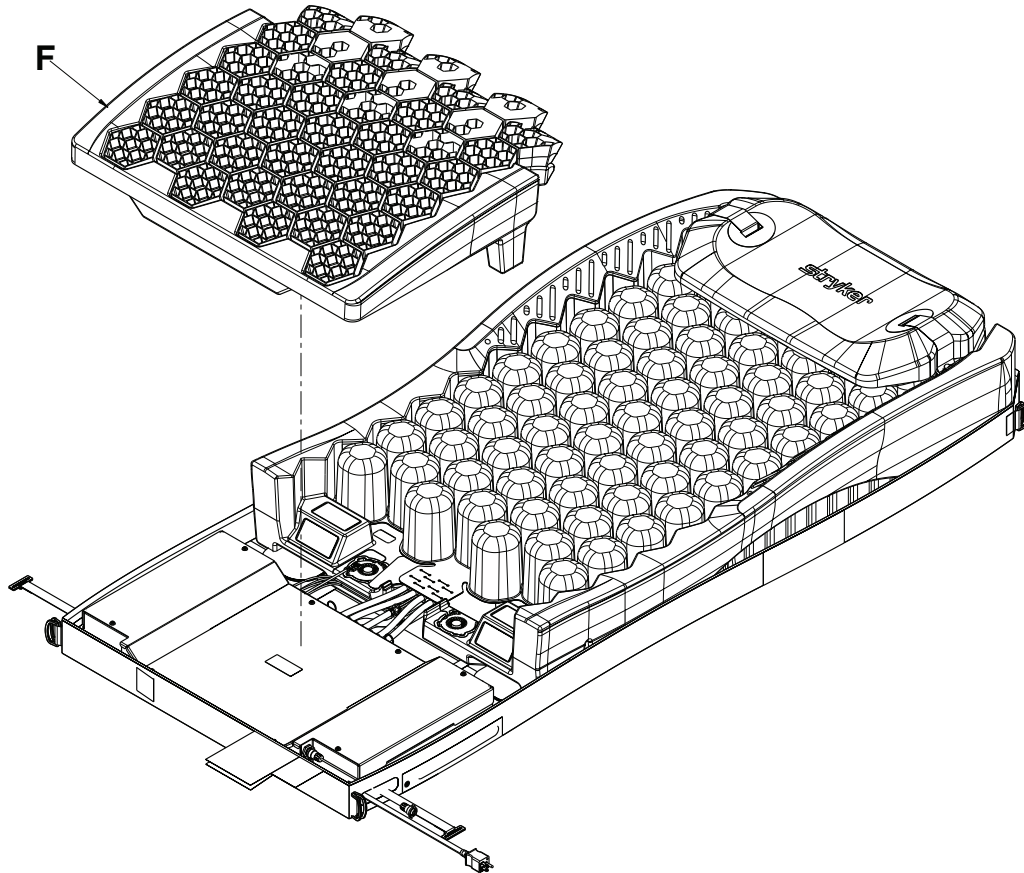


Figure 25 – Gel crib

4. Lift up on the bottom corner of the pods assembly and foam crib to detach the turn bladder quick disconnect. Repeat for the opposite side.
5. Remove the turn bladder red and black sensor hoses from the foot box. Push in on the sensor hose quick connector and then pull the hose out.
Note - Do not kink or bend the hoses.
6. Remove the hoses from the purse clips.
7. Lift up on the foam crib, reach between the foam crib and the bottom cover to unhook the six **Velcro®** retainers (A) and unsnap the 12 snap retainers (B) (Figure 26). Repeat for the opposite side.

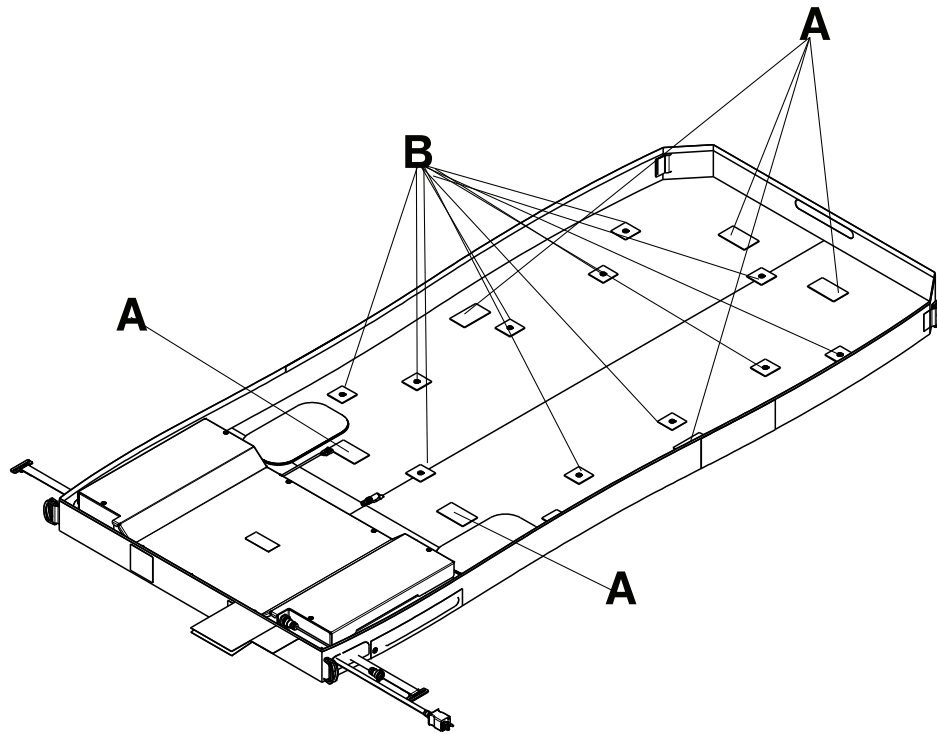


Figure 26 – Pod Velcro® and snap retainers

8. Remove and discard the turn bladder assembly.
9. Reverse steps to reinstall.

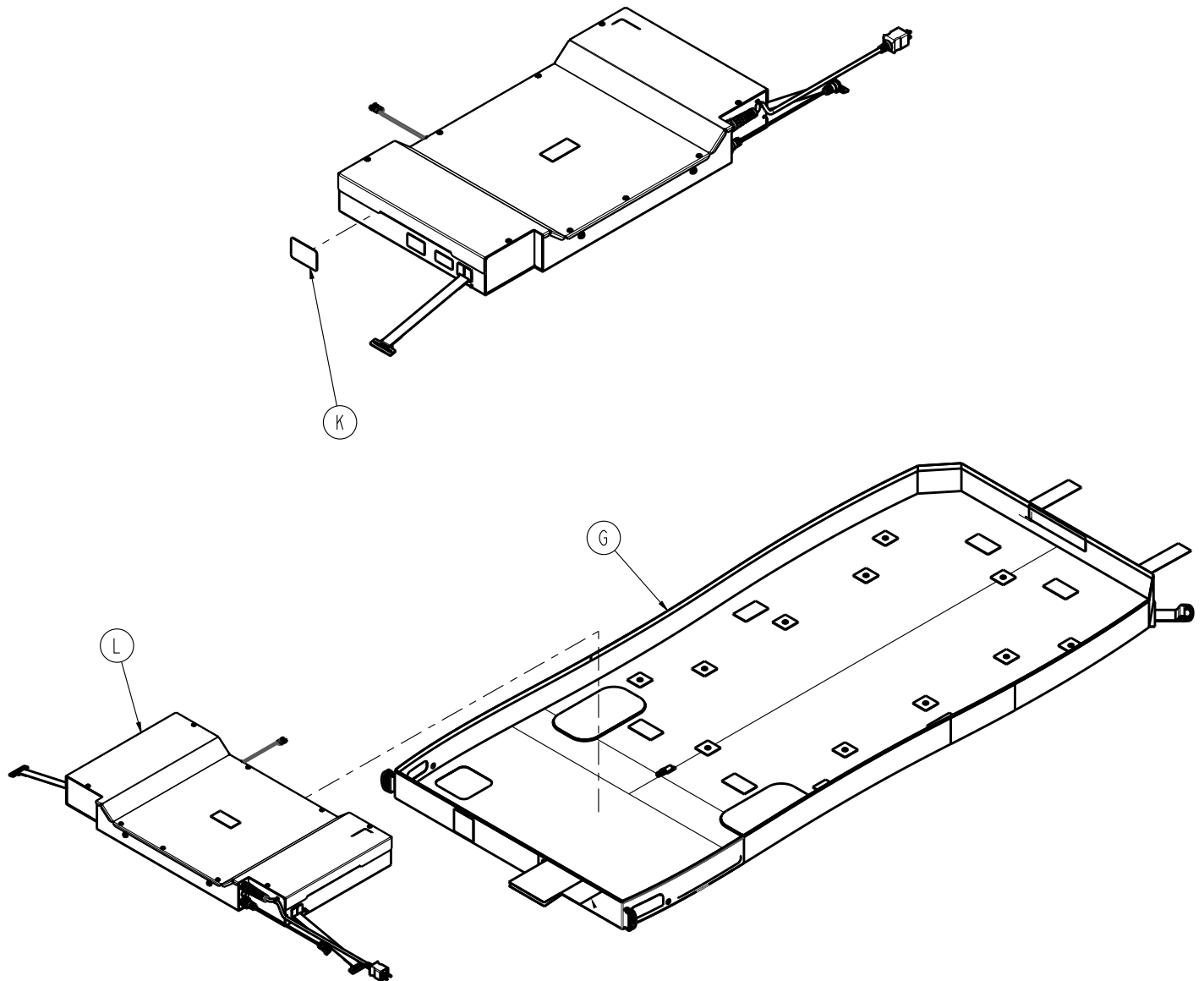
Note

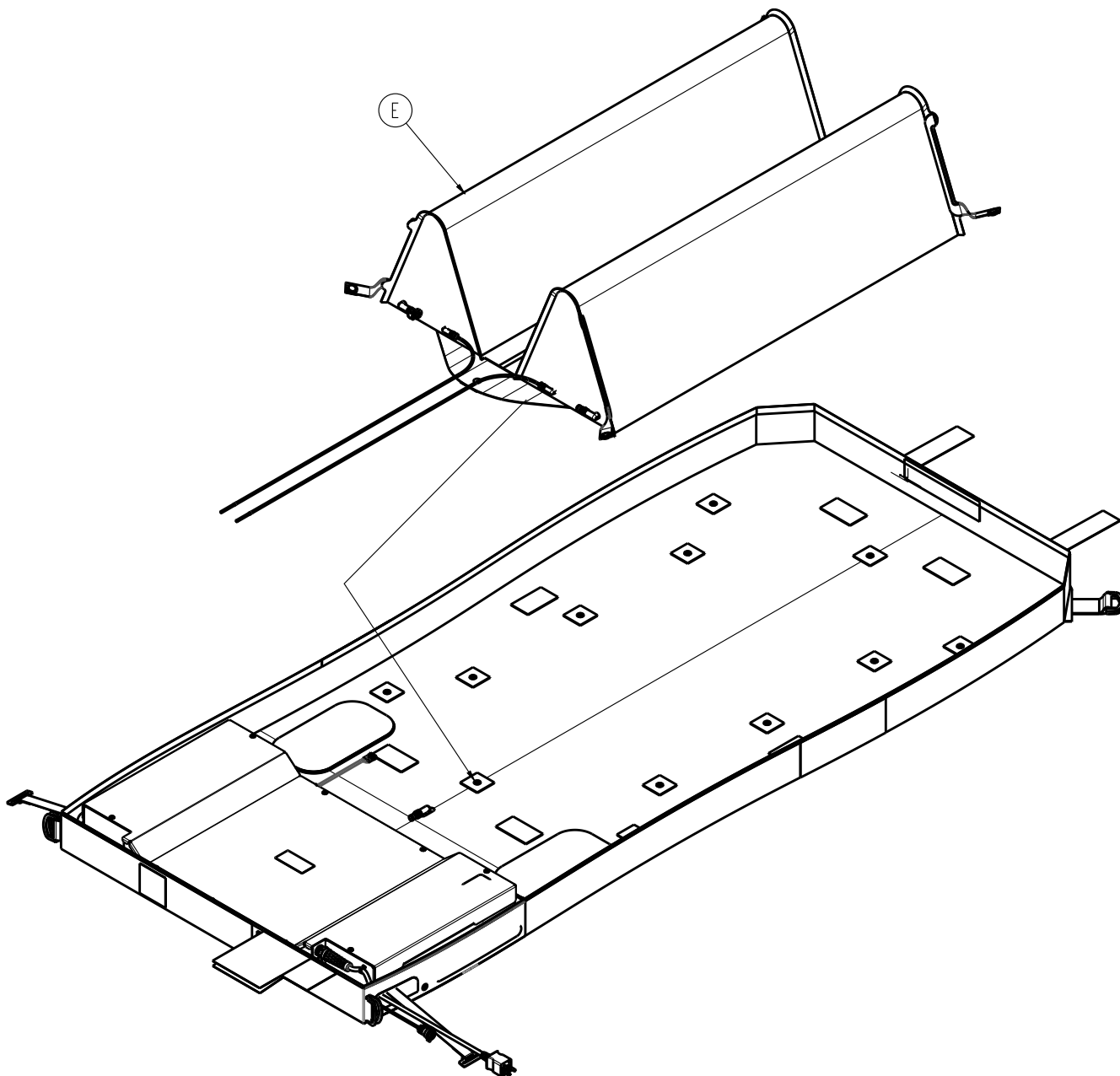
- When you reinstall, align the **Velcro®** patches.
- After installation, remove the zipper pull tool or equivalent from the zipper.
- Cover the zipper with the support surface cover watershed.

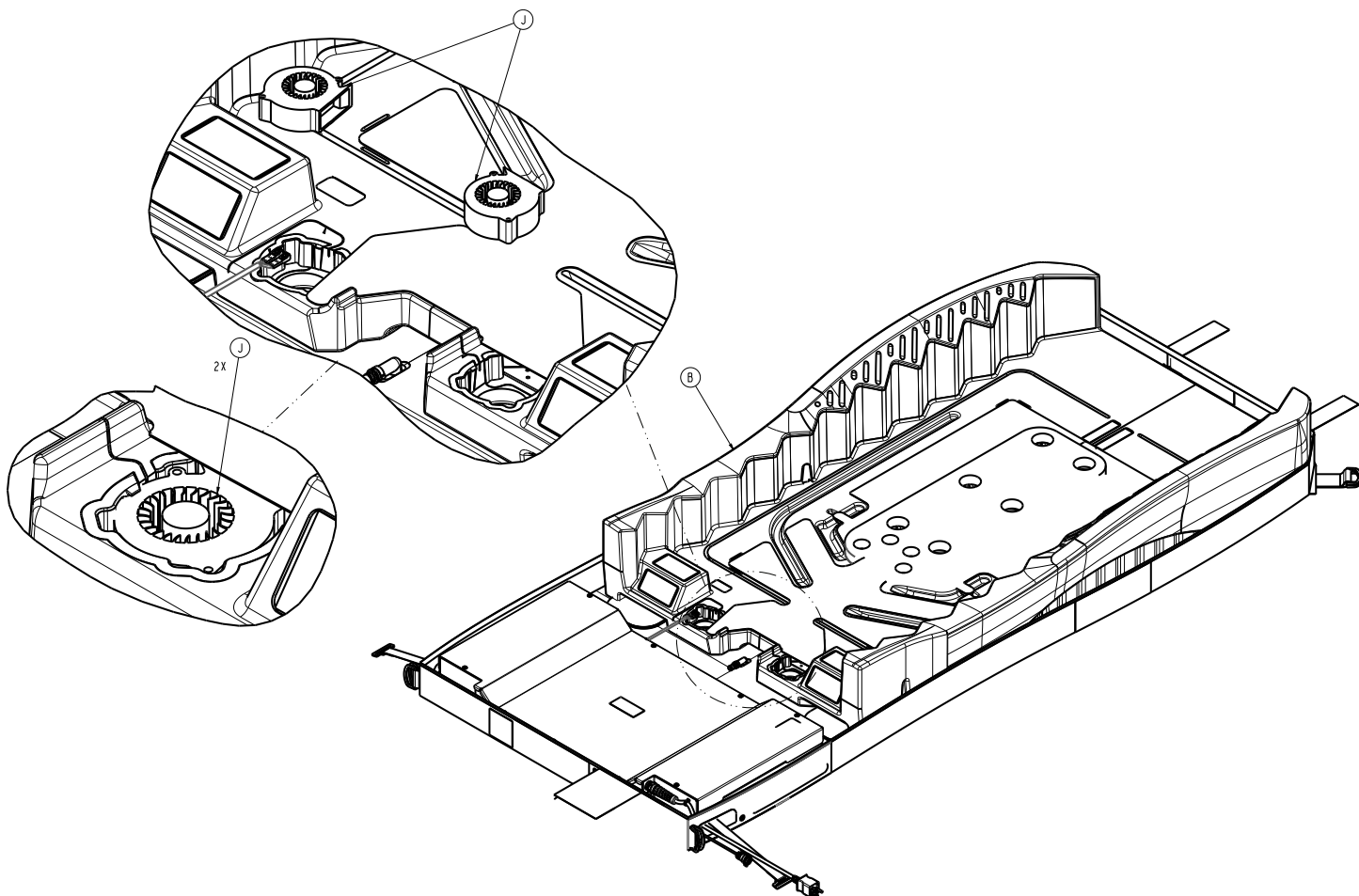
10. Run the leak diagnostic test. See *Accessing the Isolibrium Diagnostic Menu* in the **InTouch** Maintenance Manual.
11. Verify proper operation before you return the product to service.

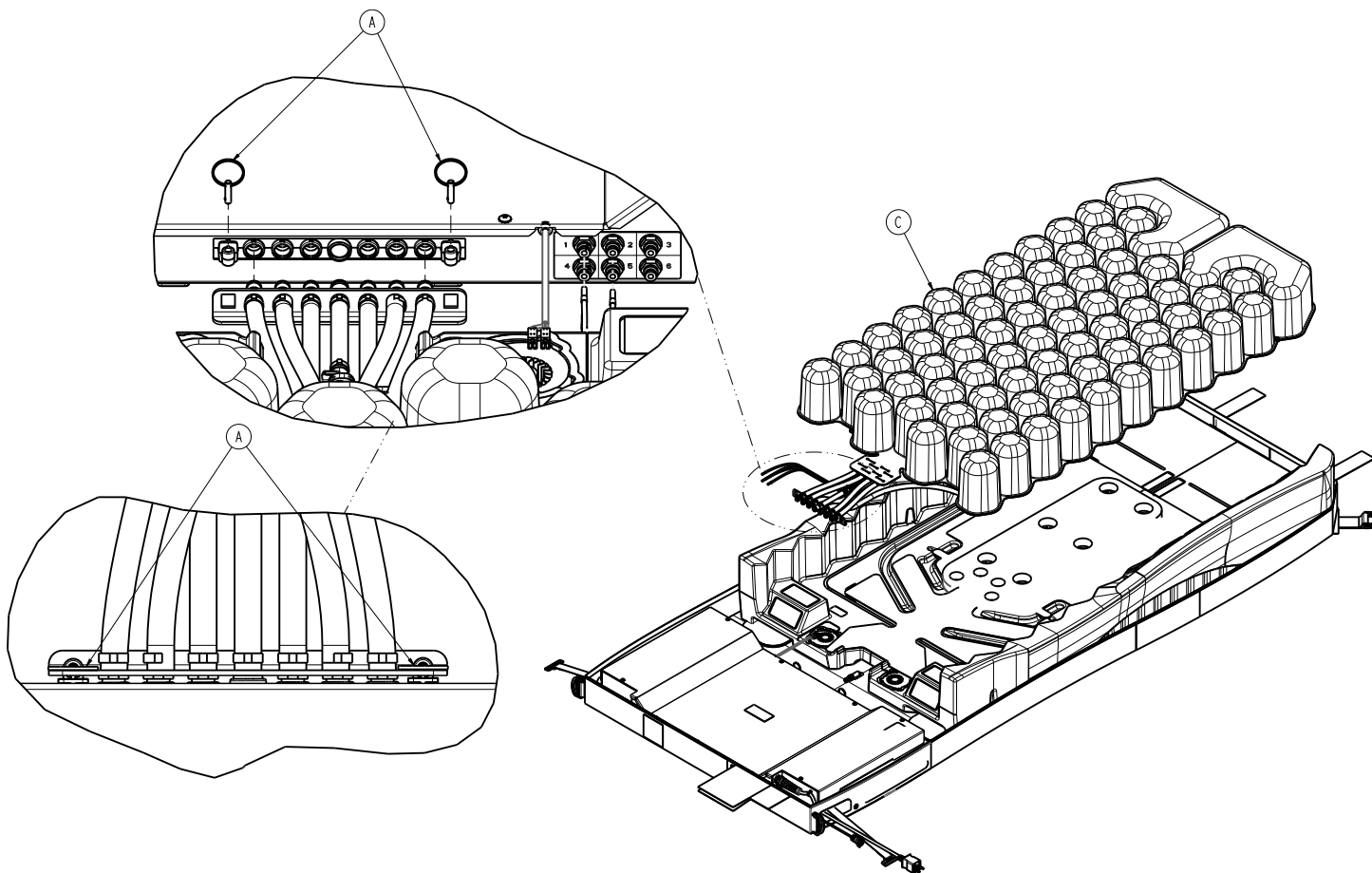
Isolibrium assembly

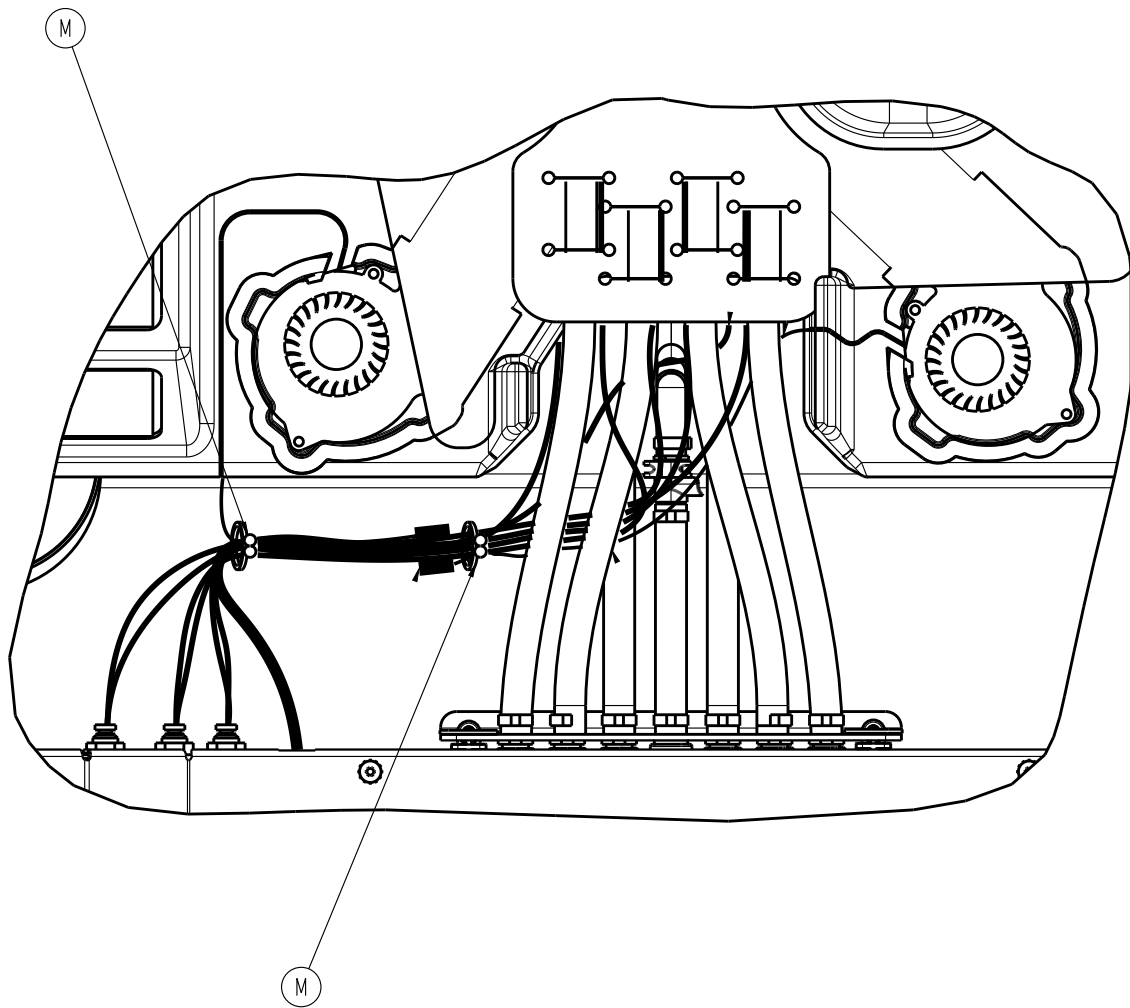
2972-021-001 Rev AB (Reference only)

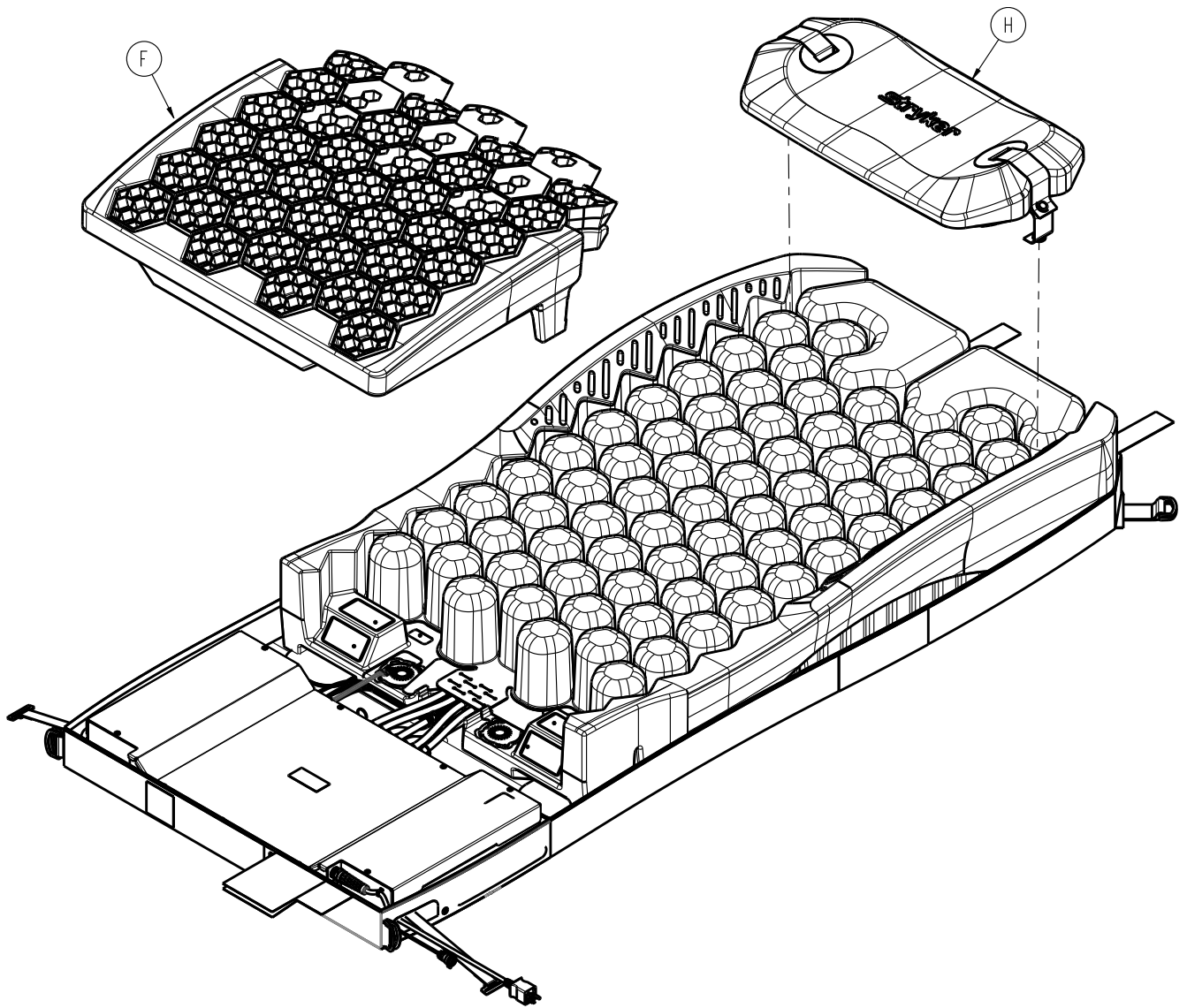


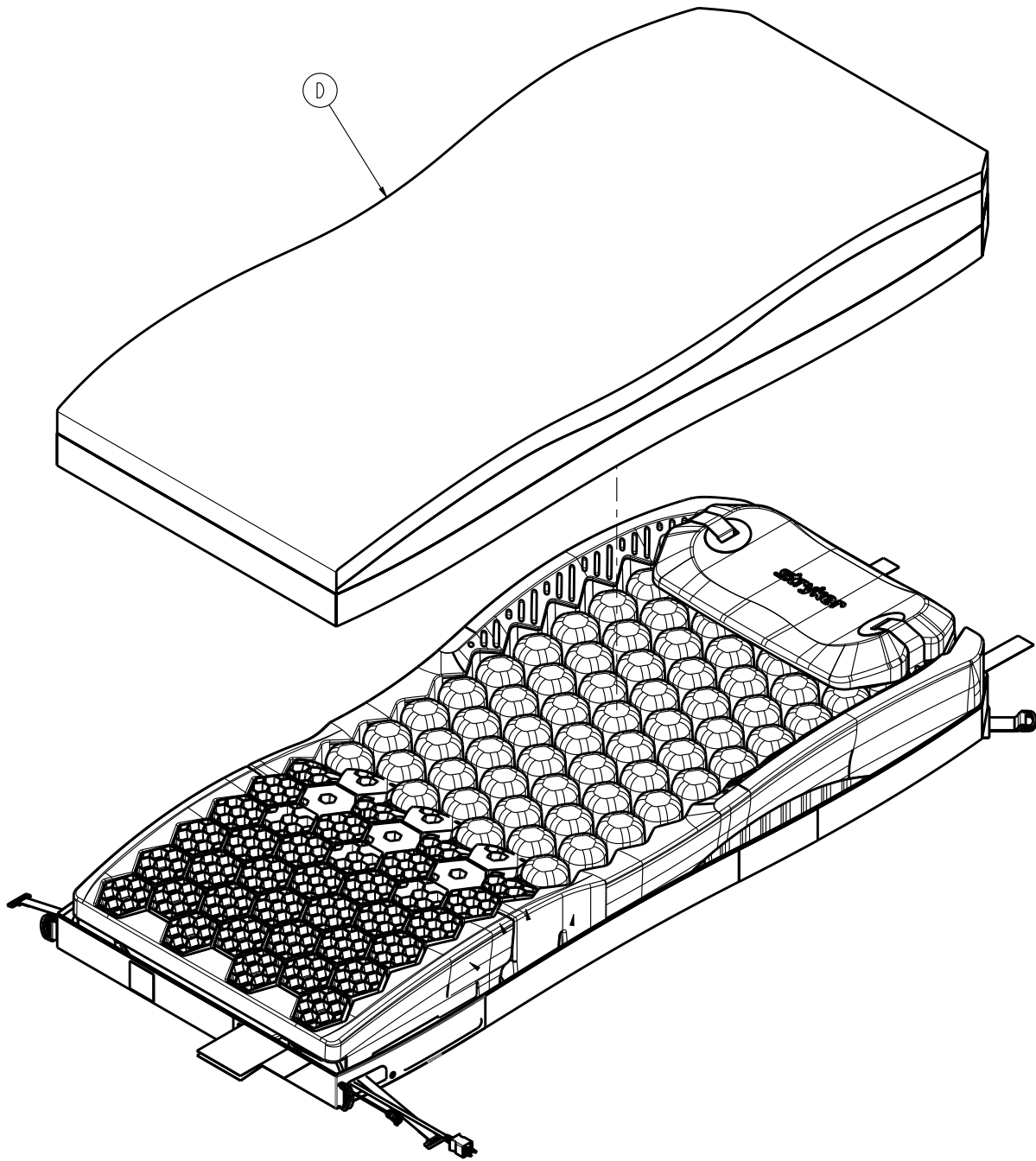










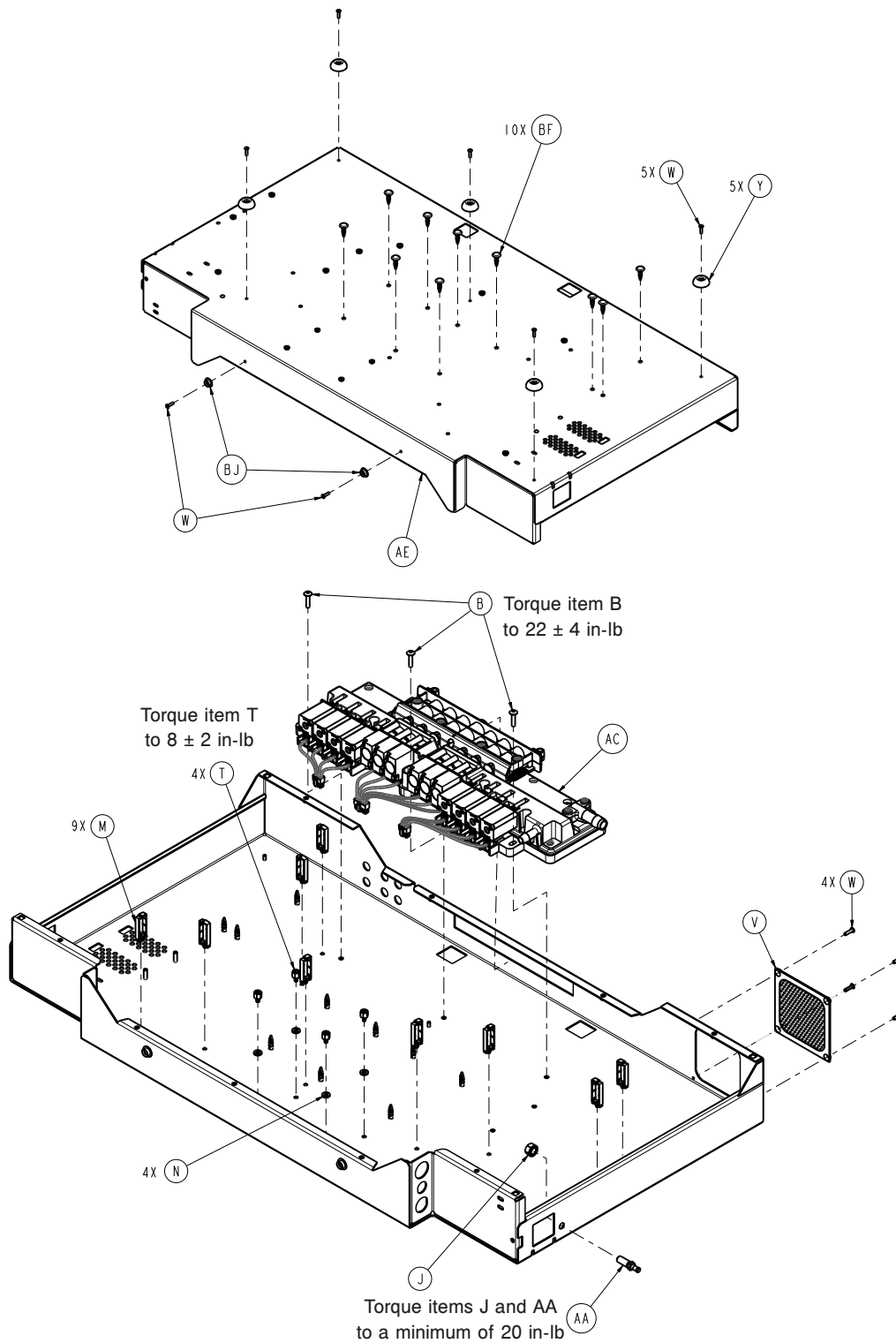


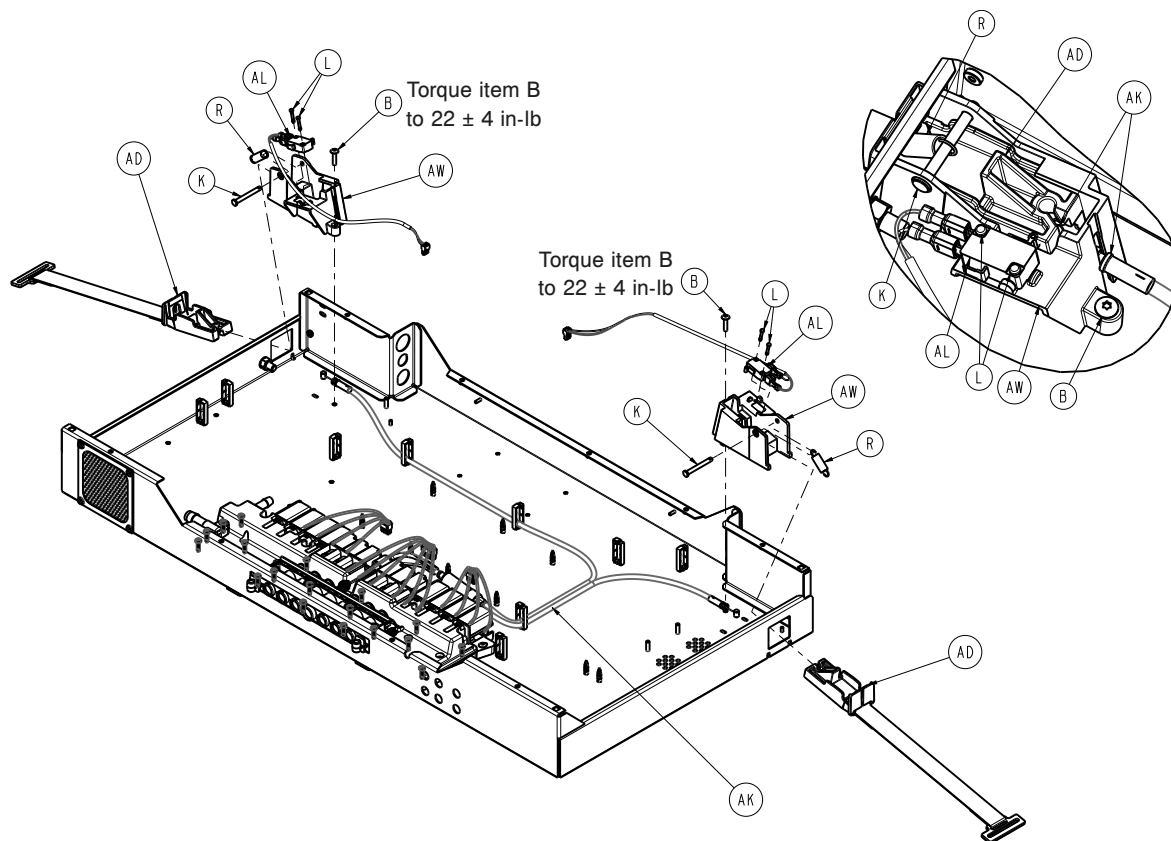
Item	Number	Name	Quantity
A	0026-672-000	Quick release pin	2
B	2971-021-005	Foam crib assembly	1
C	2971-021-003	Pods layer assembly	1
D	2972-021-004	Top cover assembly	1
E	297300210007	Turn bladder assembly	1
F	2971-021-011	Foot foam crib assembly	1
G	2972-021-017	Bottom cover assembly	1
H	2971-021-045	Pillow assembly	1

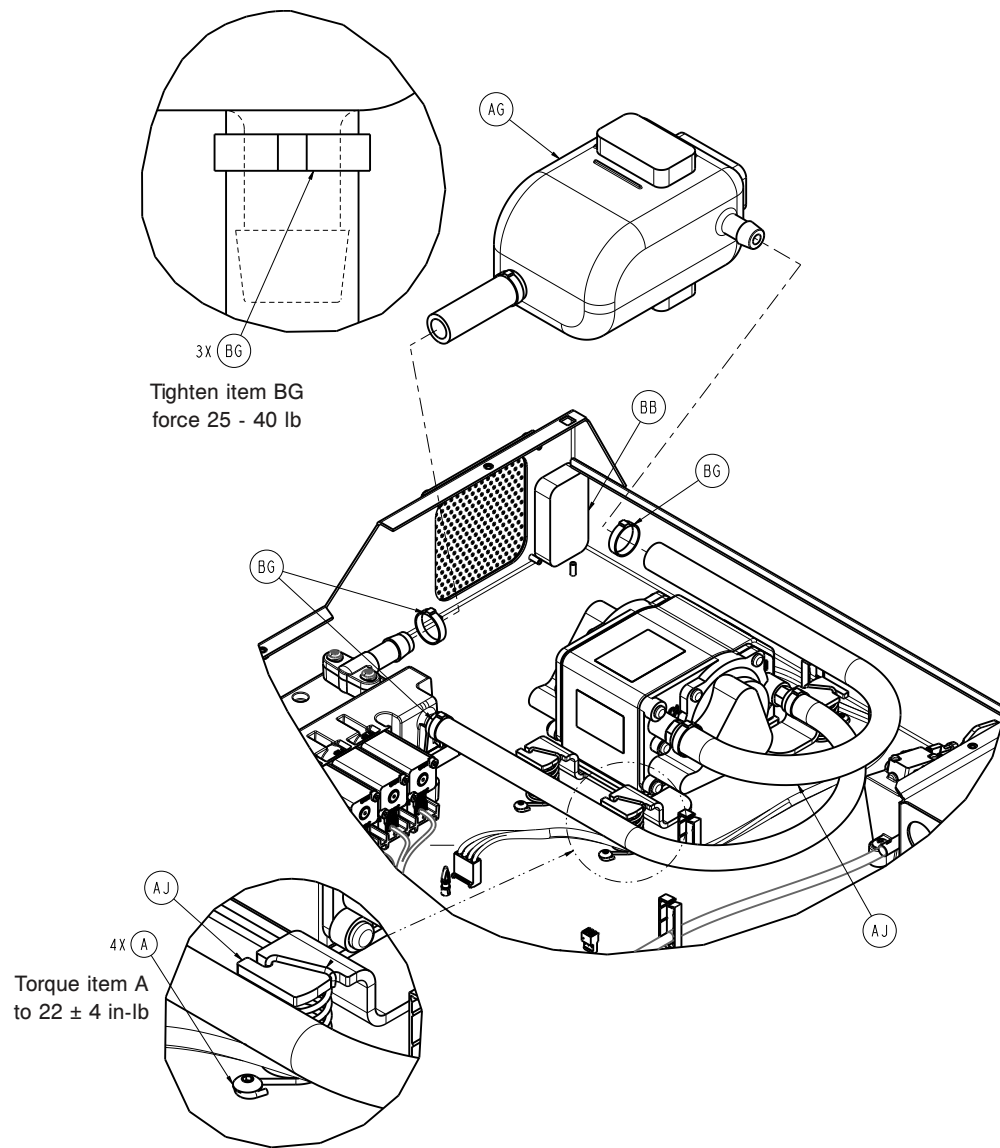
Item	Number	Name	Quantity
J	2971-021-189	Fan cable assembly	2
K	2971-021-901	Serial number label	1
L	2971-022-008	<i>Footbox assembly</i> (page 57)	1
M	0058-383-000	Purse lock wire tie	2

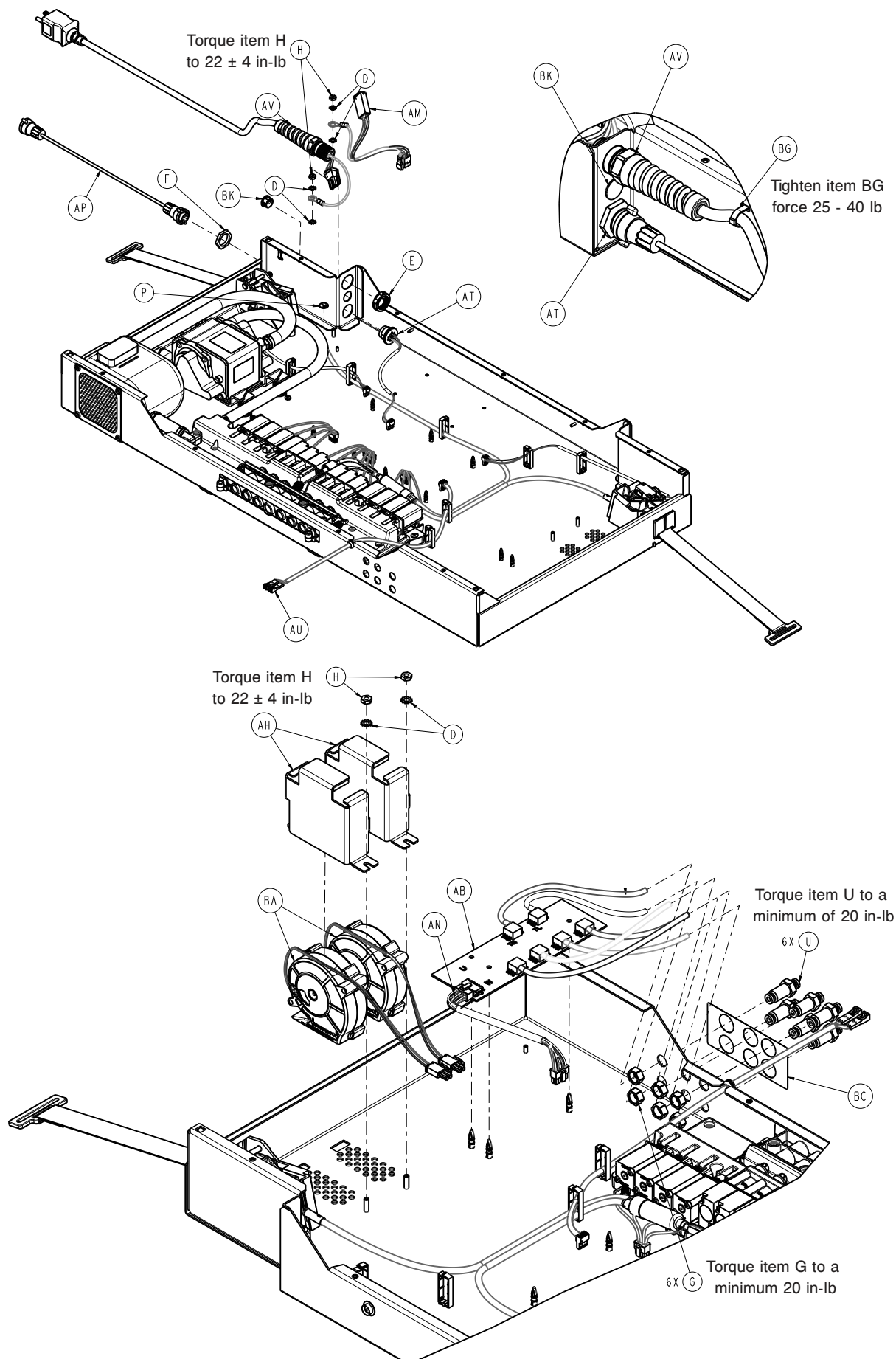
Footbox assembly

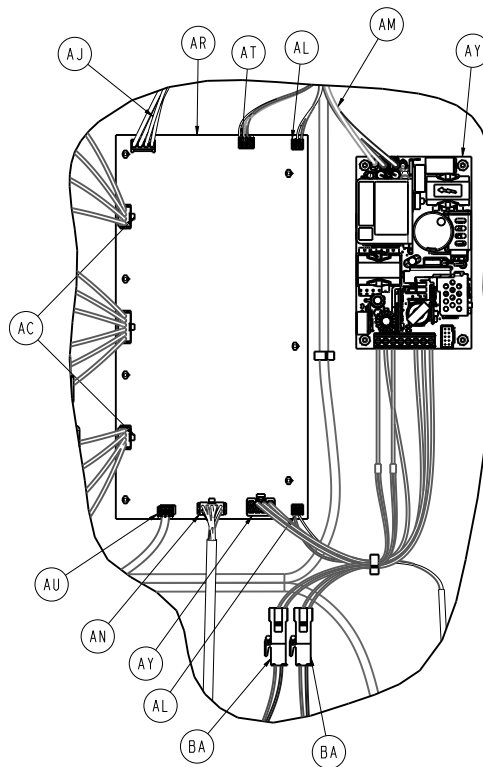
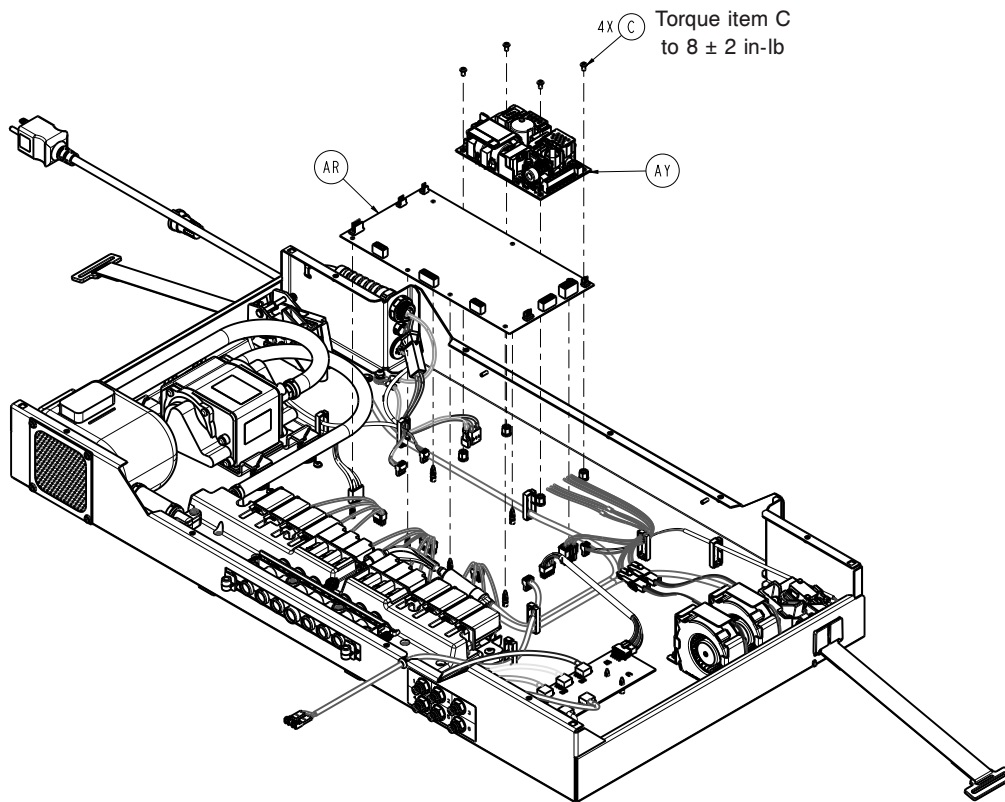
2971-022-008 Rev AB (Reference only)

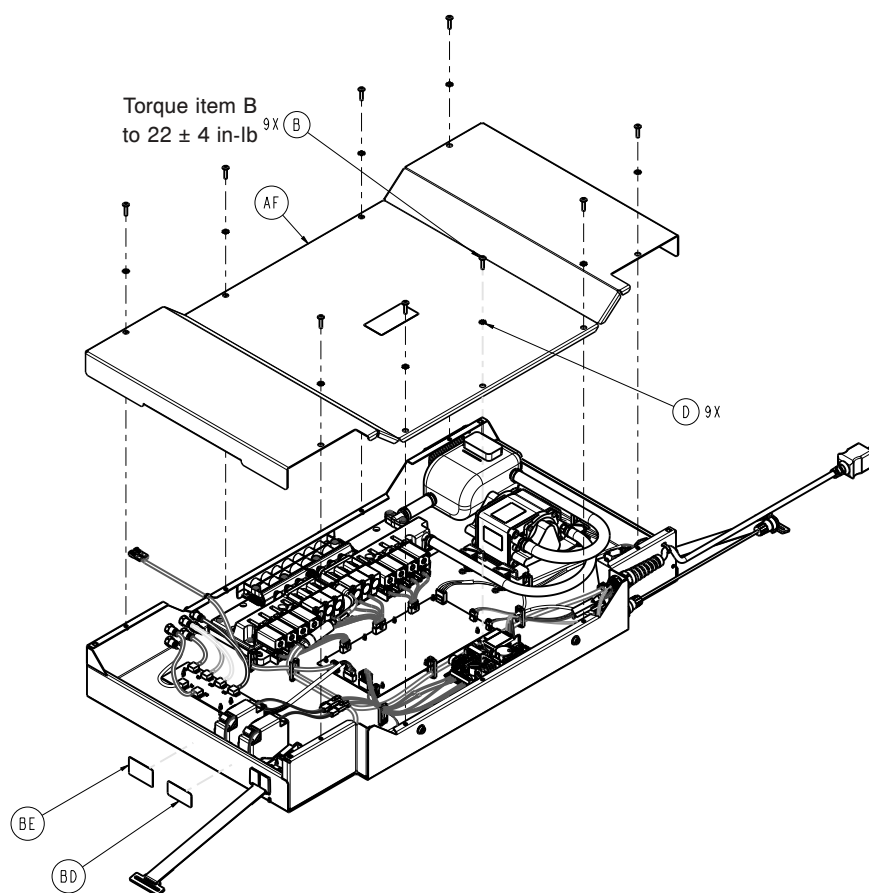
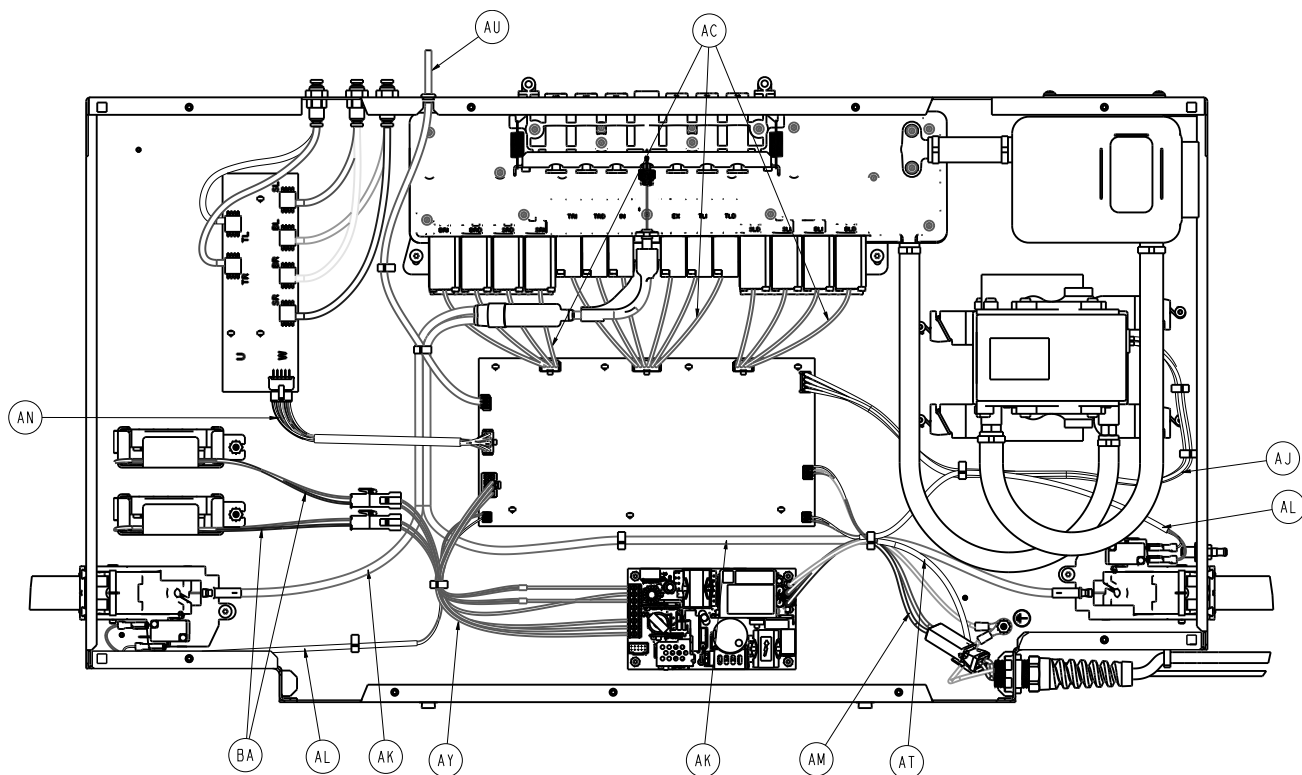










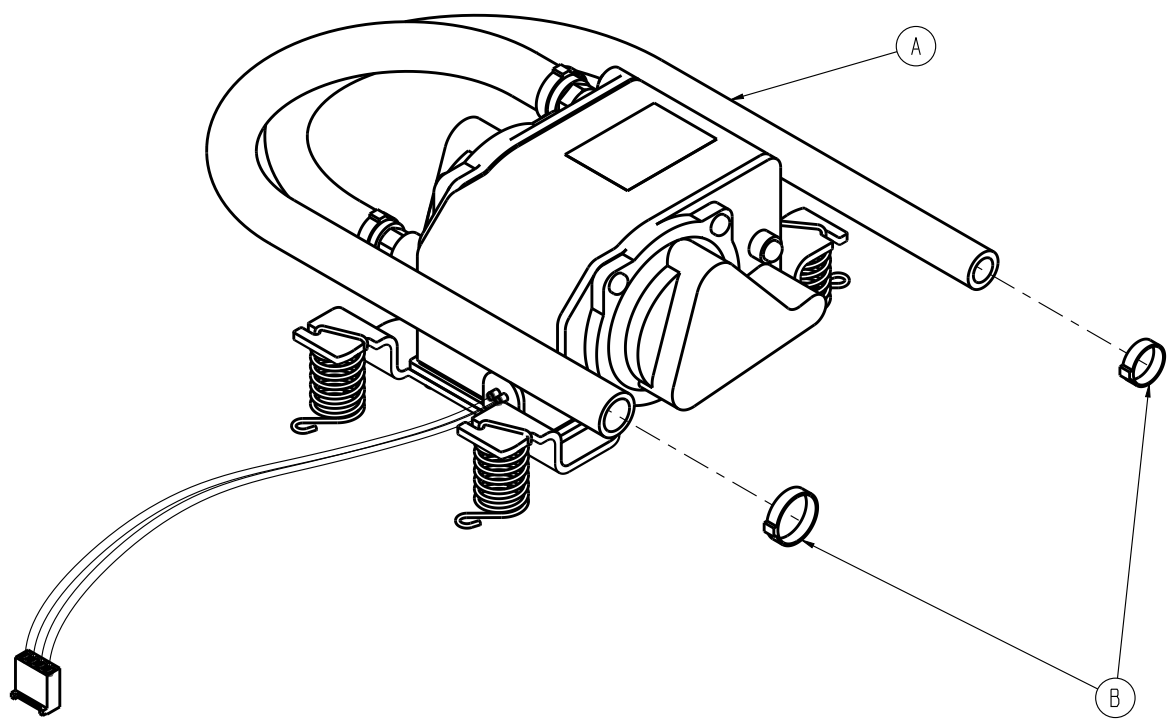


Item	Number	Name	Quantity
A	0004-880-000	Button head cap screw, Torx with star washer	4
B	0007-094-000	Truss head machine screw	14
C	0004-883-000	Button head cap screw	4
D	0013-018-000	Tooth lock washer	15
E	0015-091-000	Nylon locknut	1
F	0015-092-000	CAN outer nut	1
G	0015-093-000	Nut	6
H	0015-094-000	Hex nut, small	4
J	0016-033-000	Kep nut	1
K	0027-041-000	Cotter pin, spring detent	2
L	0029-028-000	Push pin	4
M	0029-029-000	Wire clip	9
N	0011-436-000	Washer	4
P	0036-046-000	Ground label	1
R	0038-330-000	Extension spring	2
T	0052-916-000	Hex standoff	4
U	0058-380-000	Push in coupler	6
V	0058-381-000	Fan filter screen	1
W	0025-650-000	Dome head blind rivet	11
Y	0946-001-155	Bumper	5
AA	2011-001-215	Lug grounding	1
AB	2971-021-033	Sensor assembly	1
AC	2971-022-006	Valve manifold assembly	1
AD	297300220007	CPR puller assembly	2
AE	2971-022-009	Foot box bottom weldment	1
AF	2971-022-016	Foot box top cover assembly	1
AG	2971-022-012	Resonator assembly	1
AH	2971-022-013	Fan bracket assembly	2
AJ	297300220014	Mounted pump assembly	1
AK	2971-022-113	CPR activation cable	1
AL	2971-022-117	CPR switch cable assembly	2
AM	2971-022-129	Foot box power supply cable assembly	1

Item	Number	Name	Quantity
AN	2971-022-132	Main board to foot box SPI cable	1
AP	2971-022-133	CAN outside cable assembly	1
AR	2971-022-140	Main board PCB assembly	1
AT	2971-022-149	CAN inner cable assembly	1
AU	2971-022-150	Fan box cable assembly	1
AV	2971-022-151	Power cable assembly	1
AW	297300220165	Base CPR	2
AY	2971-022-171	Power supply cable assembly	1
BA	2971-022-188	Fan foot box cable assembly	2
BB	2971-022-192	Resonator foam	1
BC	2971-022-903	Color foot box label	1
BD	2971-022-904	Serial number foot box label	1
BE	2971-022-905	Pass foot box label	1
BF	3000-300-115	Standoff	10
BG	8815-029-200	Cable tie	4
BJ	0029-003-000	Brass eyelet	2
BK	700001380899	Double d hole plug	1

Pump assembly kit - 297307000001

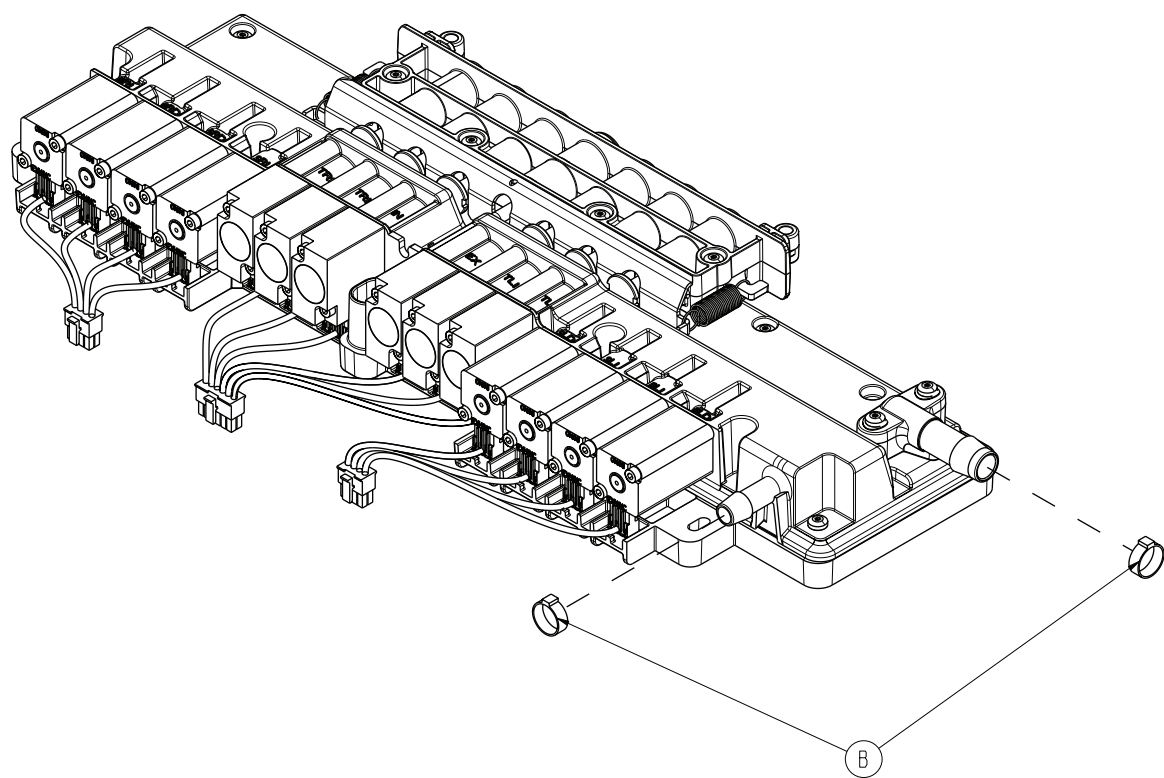
Rev AA (Reference only)



Item	Number	Name	Quantity
A	297300220014	Pump mounted assembly	1
B	8815-029-200	Cable tie	2

Valve manifold assembly kit - 2971-700-007

Rev A (Reference only)



Item	Number	Name	Quantity
A	2971-022-006	Valve manifold assembly	1
B	8815-029-200	Cable tie	2

EMC Information

Guidance and Manufacturer's declaration - Electromagnetic Immunity			
Isolibrium is suitable for use in the electromagnetic environment specified below. The customer or the user of Isolibrium should make sure that it is used in such an environment.			
Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment Guidance
Electrostatic Discharge (ESD) IEC 61000-4-2	±6 kV contact ±8 kV air	±6 kV contact ±8 kV air	Floors should be wood, concrete, or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrostatic fast transient/ burst IEC 61000-4-4 *	±2 kV for power supply lines ±1 kV for input/ output lines	±2 kV for power supply lines ±1 kV for input/ output lines	Main power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5 *	+1 kV lines to lines +2 kV lines to earth	+1 kV lines to lines +2 kV lines to earth	Main power quality should be that of a typical commercial or hospital environment.
Voltage dips, voltage variations and short interruptions on power supply input lines IEC 61000-4-11 *	<5% U_T (>95% dip in U_T) for 0.5 cycle 40% U_T (60% dip in U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles <5% U_T (>95% dip in U_T) for 5 sec	<5% U_T (>95% dip in U_T) for 0.5 cycle 40% U_T (60% dip in U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles <5% U_T (>95% dip in U_T) for 5 sec	Main power quality should be that of a typical commercial and/or hospital environment. If the user of Isolibrium requires continued operation during power main interruptions, it is recommended that the device be powered from an uninterrupted power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial and/or hospital environment.
Note - U_T is the a.c. mains voltage before applications of the test level.			

Recommended separation distances between portable and mobile RF communications equipment and Isolibrium.

Isolibrium is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of **Isolibrium** can help prevent electromagnetic interferences by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and **Isolibrium** as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter W	Separation distance according to frequency of transmitter m		
	150 kHz to 80 MHz $d=[3.5/V1]\sqrt{P}$	80 MHz to 800 MHz $d=[3.5/E1]\sqrt{P}$	800 MHz to 2.5 GHz $d=[7/E1]\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23


For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

Note - At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

Note - These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

Isolibrium is suited for use in the electromagnetic environment specified below. The customer or the user of **Isolibrium** should make sure that it is used in such an environment.

Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment - Guidance
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<p>Conducted RF IEC 61000-4-6 *</p> <p>Radiated RF IEC 61000-4-3</p>	<p>3 Vrms 150 kHz to 80 MHz</p> <p>3 V/m 80 MHz to 2.5 GHz</p>	<p>3 Vrms</p> <p>3 V/m</p>	<p>Portable and mobile RF communications equipment should be used no closer to any part of Isolibrium, including cables, than the recommended separation distance calculated from the equation appropriate for the frequency of the transmitter.</p> <p>Recommended Separation Distance</p> $d=1.2\sqrt{P}$ <p>80 MHz to 800 MHz</p> $d=2.3\sqrt{P}$ <p>800 MHz to 2.5 GHz</p> <p>where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m).</p> <p>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,^a should be less than the compliance level in each frequency range.^b</p> <p>Interference may occur in the vicinity of equipment marked with the following symbol:</p> 
<p>Note - At 80 MHz and 800 MHz, the higher frequency range applies.</p> <p>Note - These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.</p>			
<p>^aField strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast, and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which Isolibrium is used exceeds the applicable RF compliance level above, Isolibrium should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating Isolibrium.</p> <p>^bOver the frequency range 150 kHz to 80 MHz, field strengths are less than 3 V/m.</p>			

Guidance and Manufacturer's declaration - Electromagnetic Emissions

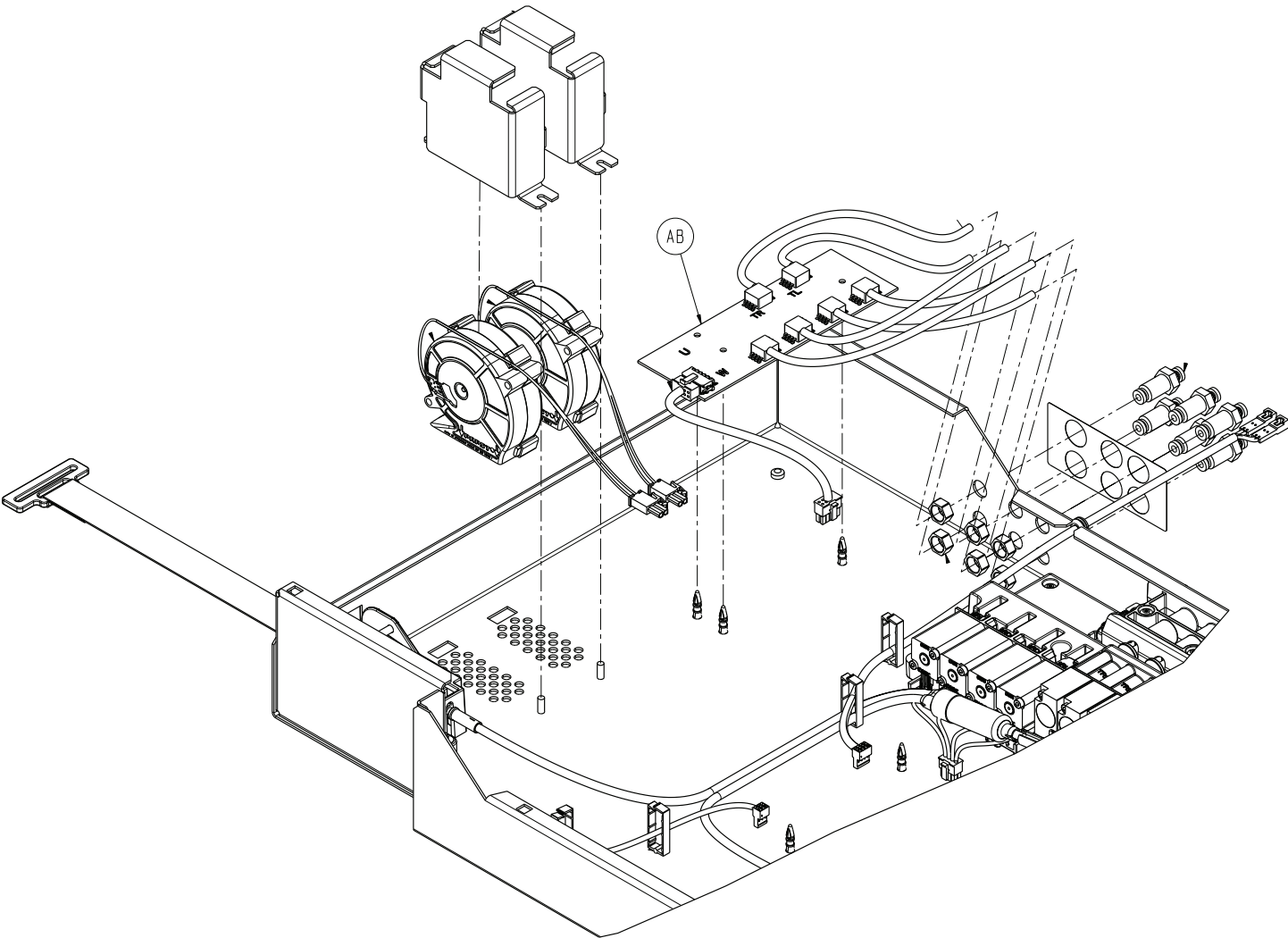
Isolibrium is intended for use in an electromagnetic environment specified below. The customer or the user of **Isolibrium** should make sure that it is used in such an environment.

Emissions Test	Compliance	Electromagnetic Environment
RF Emissions CISPR 11	Group 1	Isolibrium uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment. Isolibrium is suitable for use in all establishments other than domestic and those directly connected to the public low voltage power supply network that supplies buildings used for domestic purposes.
RF Emissions CISPR 11	Class A	
Harmonic Emissions IEC 61000-3-2	Class A	
Voltage Fluctuations Flicker Emissions IEC 61000-3-3	Complies	

WARNING - This equipment/system is intended for use by healthcare professionals only. This equipment/system may cause radio interference or may disrupt the operation of nearby equipment. It may be necessary to take mitigation measures, such as reorienting or relocating **Isolibrium** or shielding the location.

2971-022-008

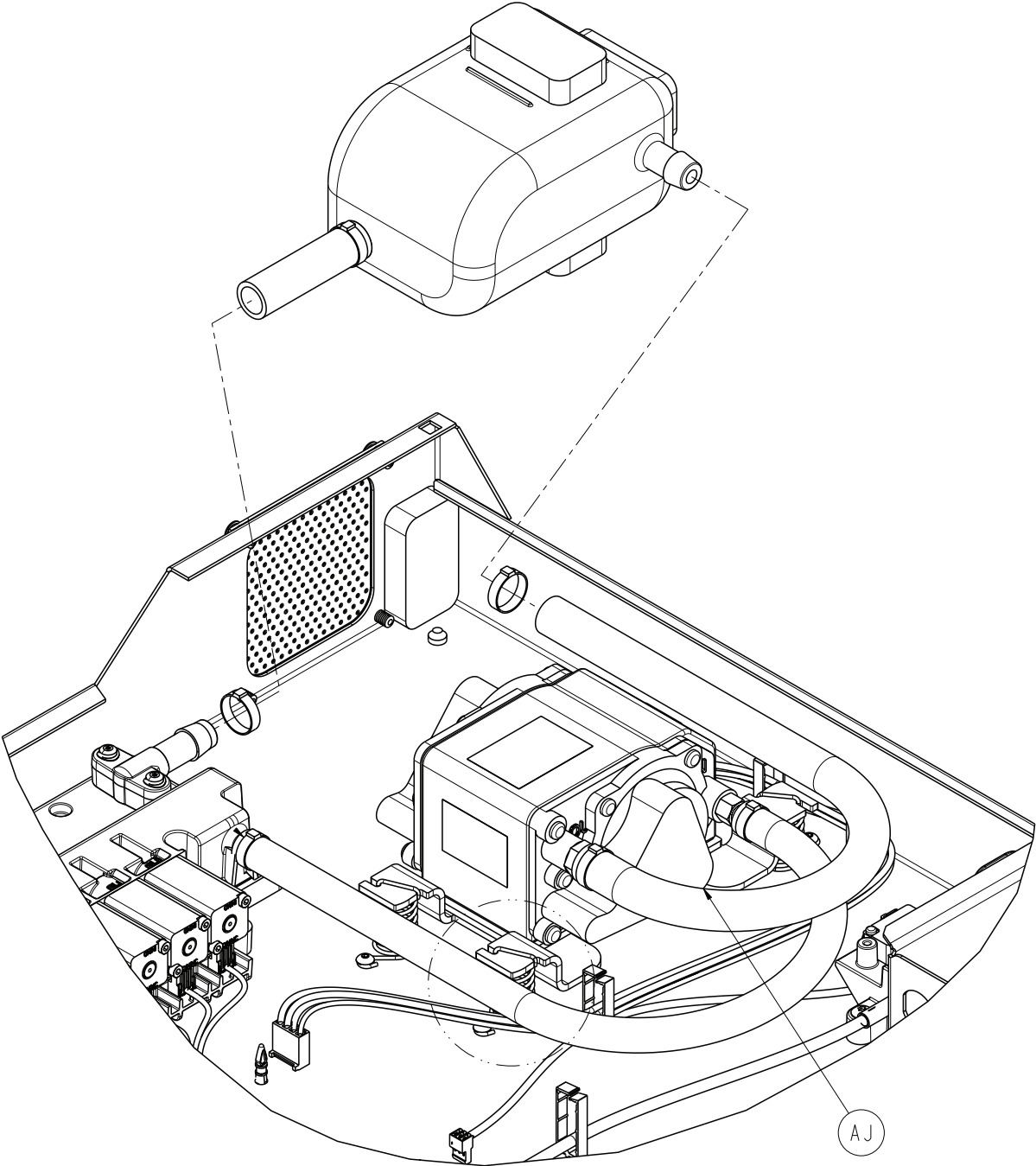
Rev AB (Reference only)



AB	2971-021-033	1
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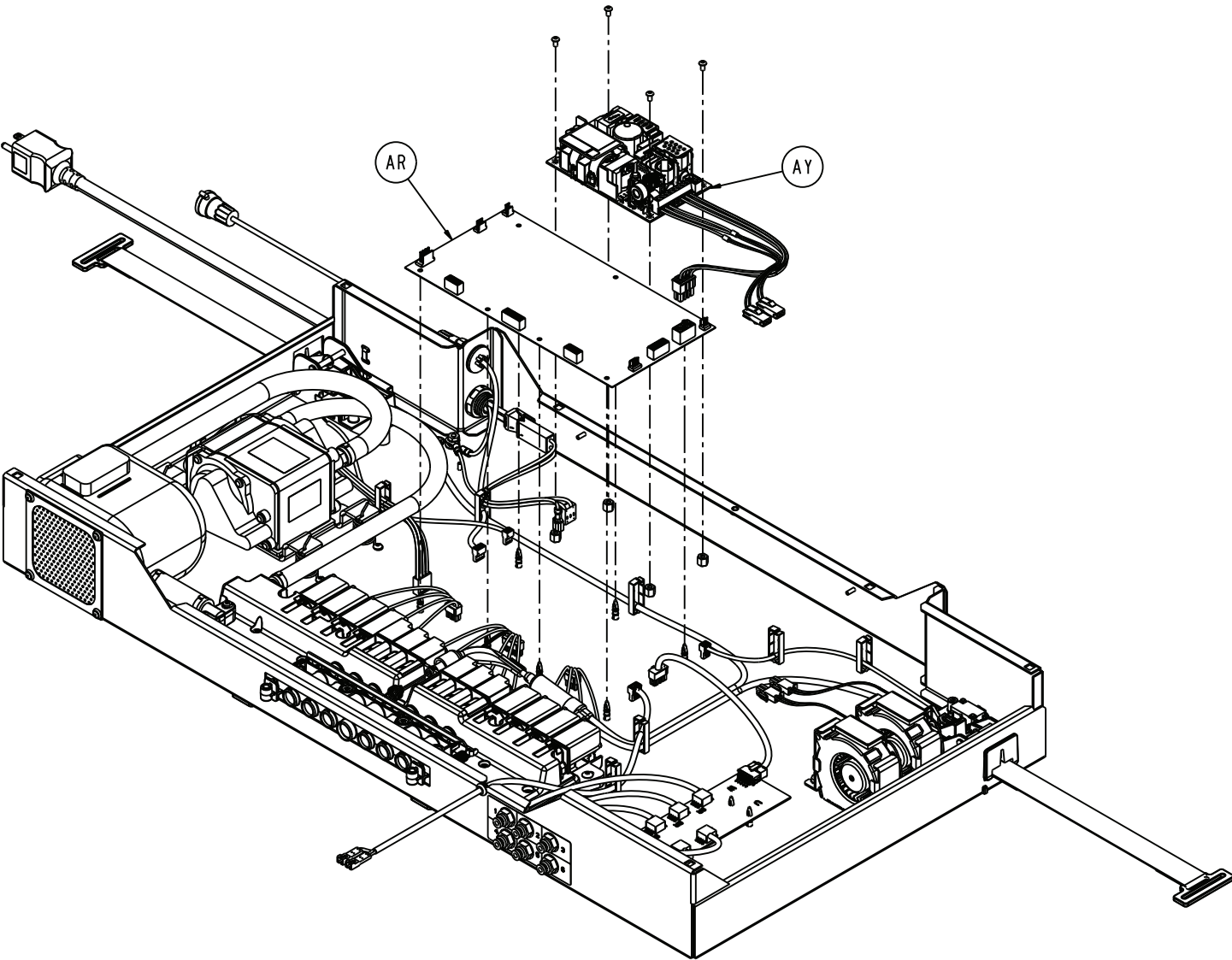
Rev AB (Reference only)



AJ	297300220014	1
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2971-022-008

Rev AB (Reference only)



AR	2971-022-140	1
AY	2971-022-171	1



Stryker Medical
3800 E. Centre Avenue
Portage, MI 49002
USA