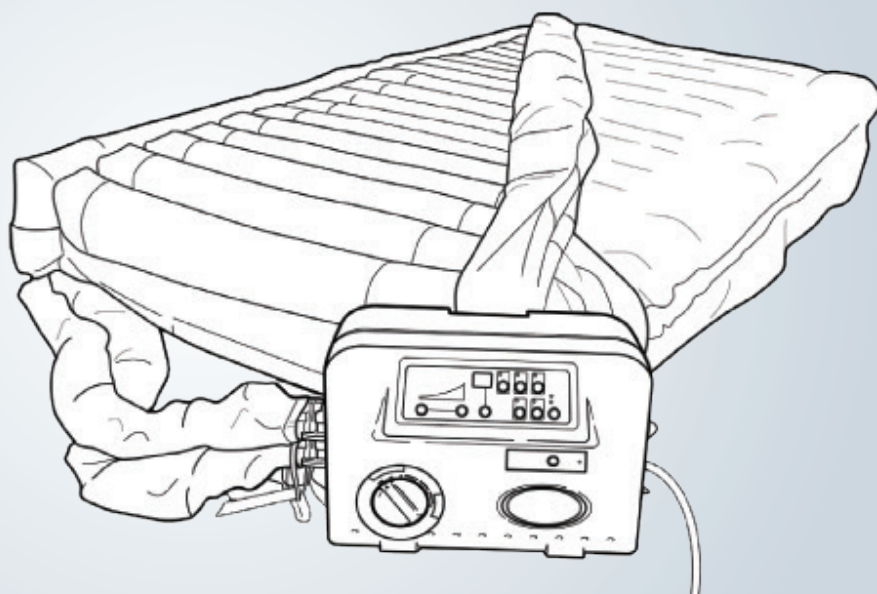


# MaxxAir ETS

## Maintenance Manual

**ARJOHUNTLEIGH**  
GETINGE GROUP





## CAUTION

This MaxxAir ETS™ Maintenance Manual is not a guarantee or warranty as to this product. It is intended only as a quick reference source and is not intended to be a comprehensive guide. For additional product information or for specific questions please contact ArjoHuntleigh Customer Service (1-800-343-0974).

In order for ArjoHuntleigh products to provide safe and proper performance, the following conditions must be adhered to. Failure to comply with these conditions will void any applicable warranties.

- It is strongly recommended that all assembly, operation, adjustment, modification, maintenance and / or repair be carried out by qualified personnel authorized by ArjoHuntleigh.
- The electrical installations used must comply with the appropriate electrical wiring standards.
- The product must be used in accordance with this manual and all applicable Product information and labeling.

ArjoHuntleigh will upon request repair the unit using appropriately qualified personnel or service center personnel to replace those parts designated as repairable. Charges for the repair and ancillary expenses must often be paid by those requesting repair.

Although this equipment conforms with requirements in relation to Electromagnetic Compatibility, all electrical equipment may produce interference. If interference is suspected, move equipment away from sensitive devices or contact the manufacturer.

## NOTICE

This product has been configured from the manufacturer to meet the specific voltage requirements. Refer to the Product Information Label to verify 115 VAC, 5 Amp configuration.



# TABLE OF CONTENTS

<b>PREPARATION FOR USE.....</b>	<b>7</b>
Indications.....	7
Contraindications .....	7
Precautions .....	8
Safety Tips .....	8
Technical Description .....	10
Cycle Times .....	12
<b>TROUBLESHOOTING .....</b>	<b>13</b>
Preliminary Checks .....	13
Symptom, Possible Cause and Remedy .....	14
<b>MAINTENANCE .....</b>	<b>17</b>
Operational Maintenance.....	17
Air Supply Unit .....	17
Mattress .....	17
Scheduled Maintenance .....	18
Initial Assessment Procedure .....	18
Mattress Unit .....	24
Service Protocol Following Laundering / Cleaning .....	24
Infection Control Procedure .....	24
Layout Mattress and Check .....	24
Inflate System and Check .....	24
<b>MAINTENANCE / REPLACEMENT .....</b>	<b>25</b>
Maintenance and Replacement Procedures .....	25
Air Supply Unit .....	26
Clean Air Filter .....	26
Open Case Assembly .....	26
Change the PC Board .....	26
Main PC Board .....	27
Alarm PC Board .....	28
Replace the Air Supply Unit .....	29
Replace Synchronous Timer and Turning Valve Module (Part D).....	30
Replace Expansion Valve (Part E) .....	32
Air Supply Calibration Procedure.....	33
Air Supply Unit .....	33
Setup Pressure Gauge .....	33
Open Case Assembly .....	34

Calibrate the Air Supply Unit .....	34
Mattress.....	36
Mattress Service Following Laundering / Cleaning .....	36
Replacing Mattress Cover .....	36
Replacing Main Mattress Cell .....	36
Replacing the Side Bolster .....	36
Replacing the Turning Bladder .....	36
Replacing the Air Manifold .....	36
Replacing Middle Cushion Retainer .....	36
<b>SPECIFICATIONS .....</b>	<b>37</b>
Mattress Specifications .....	37
Air Supply Unit Size .....	37
Symbols Used .....	38
Miscellaneous .....	38
EMC .....	38
Classification .....	39
Environmental Storage / Transit Conditions .....	39
Environmental Operating Conditions .....	39
<b>SCHEMATICS AND REPLACEMENT PARTS .....</b>	<b>41</b>
Pneumatic Schematics / Valve Cross Sections.....	44
Electrical Schematic.....	52
Replacement Parts .....	53
<b>QUESTIONS AND INFORMATION.....</b>	<b>55</b>

## PREPARATION FOR USE

The *MaxxAir ETS* (Expandable Turning Surface) Mattress Replacement System is a pressure relief mattress replacement system designed to provide turning and low-air-loss therapy, principally for the BariMaxx™ and BariMaxx™ II bed. The system capabilities are designed for patients weighing up to 1000 lb\*, with expandability features from 36 in to 42 in to 48 in in width when used on the *BariMaxx II* frame.

**NOTE:** *The following information relates to the MaxxAir ETS Mattress Replacement System only. The existing mattress must be removed.*

The mattress replacement is comprised of one 36 in wide middle section, two 6 in wide side air bolsters to provide expandability, and two inflatable bladders beneath the mattress to provide the turn assist function. The 36 in middle section consists of a 2 in foam pad and twenty individual 8 in height cells. Each side bolster consists of four individual 10 in cells with no foam.

The Air Supply Unit is a variable speed air supply that provides adjustable air pressure for patient comfort, and manual transition expansion valves to expand the mattress from 36 in to 42 in or 48 in, for accommodating different patient sizes. A variable cycle time turning valve is used to activate the turn assist function. The *MaxxAir ETS* also provides the added benefits of vacuum deflation for size transitions or in the event CPR procedures are required.

**Turn Assist** - The Turn Assist feature uses the Air Supply Unit to slowly inflate the appropriate turning bladders to gently tilt the patient to the left or right. The cycle time may be set to use the turn as a Nurse Assist (turn and hold) or as a programmable continuous turn.

## Indications

The *MaxxAir ETS* Mattress Replacement System is indicated to Prevent and Treatment of Pressure Ulcers. The *MaxxAir ETS* Mattress Replacement System can be used for:

- Patients whose body weight and size pose a significant risk or care management issue to the patient or staff during the performance of routine nursing care
- Large patients weighing up to 1000 lb\*
- Large patients who are difficult to turn
- Large patients using a static mattress that would benefit from a pressure relief surface

## Contraindications

Patient conditions for which the *MaxxAir ETS* Mattress Replacement System is contraindicated include:

- Unstable Vertebral Fracture or Unstable Vertebral Column
- Cervical Traction
- Patients with total weight in excess of 1000 lb\*

\*Refer to Safety Tips on maximum recommended patient weight.

## Precautions

The following precautions should always be observed:

- **Skin Condition** - Monitor skin condition and reposition patient regularly (at least once every two hours).
- **Side Rails and Restraints - WARNING:** Serious injury or death can result from the use (potential entrapment) or non-use (potential patient falls) of side rails or other restraints. See related Safety Tips (below).
- **Patient migration** - As with all specialty bed products that are designed to reduce sheer and pressure on the patient's skin, the risk of gradual movement and / or sinking into hazardous positions of entrapment and / or inadvertent bed exit may be increased.
- **Skeletal Traction** - With skeletal traction, use care to guard against risks of patient migration or inadvertent deflation of air surface.

## Safety Tips

**General Protocols** - Follow all applicable safety rules and institution protocols concerning patient and caregiver safety.

**Brakes** - Set all caster brakes before transferring patient.

**Skin Care** - Monitor skin conditions regularly and consider adjunct or alternative therapies for high acuity patients. Give extra attention to skin over any raised side bolster and to any other possible pressure points and locations where moisture or incontinence may occur or collect. Early intervention section of this guide for contact information.

**Bed Height** - To minimize risk of falls or injury, the bed should always be in the lowest practical position when the patient is unattended.

**Side Rails and Restraints** - Whether and how to use side rails or restraints is a decision that should be based on each patient's needs and should be made by the patient and the patient's family, physician and caregivers, with facility protocols in mind. Caregivers should assess risks and benefits of side rail restraint use (including entrapment and patient falls from bed) in conjunction with individual patient needs, and should discuss use or non-use with patient and / or family. Consider not only the clinical and other needs of the patient but also the risks of fatal or serious injury from falling out of bed and from patient entrapment in or around the side rails, restraints or other accessories. In the US, for a description of entrapment hazards, vulnerable patient profile and guidance to further reduce entrapment risks, refer to FDA's Hospital Bed System Dimensional and Assessment Guidance To Reduce Entrapment. Outside the US, consult the local Competent Authority or Government Agency for Medical Device Safety for specific local guidance. Consult a caregiver and carefully consider the use of bolsters, positioning aids or floor pads, especially with confused, restless or agitated patients. It is recommended that side rails (if used) be locked in the full upright position when the patient is unattended. Make sure a capable patient knows how to get out of bed safely (and, if necessary, how to release the side rails) in case of fire or other emergency. Monitor patients frequently to guard against patient entrapment.

When selecting a standard mattress, ensure the distance between top of side rails (if used) and top of mattress (without compression) is at least 8.66 in to help prevent inadvertent bed exit or falls. Consider individual patient size, position relative to the top of the side rail) and patient condition in assessing fall risk. It is recommended that electrically operated beds conform to IEC 60601-2-38. Medical Electrical Equipment Part 2: Particular requirements for the safety of electrically operated hospital bed.

**Ambulatory Patient Entrance / Exit** - To ensure patient comfort, it is recommended that the ambulatory patient enter and exit a deflated unit. Caregiver should always aid patient in exiting the bed. Lower the patient surface completely during patient entrance and exit.

**Fluids** - Avoid spilling fluids on unit controls. If spills do occur, unplug unit, clean fluid from unit, wearing rubber gloves to avoid any possibility of shock. Once fluid is removed, check operation of components in area of spill.

**NOTE:** *Fluids remaining on controls can cause corrosion, which may cause components to fail or operate erratically, possibly producing hazards for patient and staff.*

**Moving Parts** - Keep all equipment, tubes and lines, loose clothing, hair and parts of the body away from moving parts and pinch points.



**Power Cord** - Ensure power cord is kept free from all pinch points and moving parts and is not trapped under casters. Improper handling of the power cord can cause damage to the cord, which may possibly produce risk of fire or electric shock.

**Avoid Fire Hazards** - To minimize risk of fire, connect the unit's power cord directly into a wall-mounted outlet. Do not use extension cords or multiple outlet strips. In the US, review and follow FDA's Safety Tips for Preventing Hospital Bed Fires. Outside the US, consult the local Competent Authority or Government Agency for Medical Device Safety for specific local guidance.

**Tobacco Smoke and other contaminants** - Please follow laundering and cleaning procedures described in the **Care and Cleaning** section of this **User's Guide**. It is recommended that no smoking occur in, on or around bed environment, so as to avoid build-up. Severe air restrictions (whatever the cause), may cause the Air Supply Unit to overheat and automatically deactivate.

**Oxygen Use** - Ensure that the unit is not contained in an oxygen enriched environment. Possible fire hazard when bed is used with oxygen administering equipment other than the nasal prongs, mask or half bed length tent type. Oxygen tent should not extend below mattress support level.

**BariMaxx and BariMaxx II Bed Frame** - For safest use, ArjoHuntleigh recommends the *BariMaxx* or *BariMaxx II* bed frame is always used in conjunction with the *MaxxAir ETS* Mattress Replacement System, as well as any other safeguards that might be appropriate.

**Other bariatric beds** - Although other bariatric bed frames may be suitable, special care should be taken to ensure that appropriate adaptations and additional safeguards are implemented. Choose a properly-sized bed frame and (when desired) side rails and positioning aids, ensuring against any gaps that might entrap the patient's head or body.

**Bed Expansions** - With variable-width bed frames, Slides and Side Rails should always be locked in place whenever expanded or retracted.

**Headboard / Footboard Transport Bar** - The Headboard / Footboard Transport Bar on the *BariMaxx* beds (when used) is intended to assist in bed movement during transport. It is not recommended for use by patient in repositioning or transfer.

**I.V. and Drainage Tubes** - Prior to activating any positioning or rotation function assess the security of all invasive lines and tubes to accommodate the desired angle of articulation and minimize the risk of binding, disconnecting or dislodging. Tubes and lines should always have sufficient slack for articulation and patient movements.

**Maximum Recommended Patient Weight** - Total patient weight capacity should not exceed 1000 lb or the patient weight capacity of the underlying bed frame, whichever is less. The use of accessories on the bed may decrease the patient weight capacity of the bed. Contact ArjoHuntleigh Customer Service for questions concerning the use of accessories and see the Questions and Information section of this guide for contact information.

**Transfer Board** - If a mechanical lift device is not available, a transfer board should always be used when transferring a patient to and from the bed. Use INSTAFLATE™ Mode for added safety during transfer.

## Technical Description

The Air Supply Unit is a variable speed air supply that fills the mattress with air pressure via the 8-speed comfort control. Two valves connect in parallel, a 7 / 1-way Expansion Valve and a 4 / 1-way Turning Valve determine the expanding and turning functions. The Expansion Valve controls the airflow to the main (middle) mattress (36 in bed frame), or the main mattress and one or both the side bolsters (42 in and 48 in bed frame).

The schematic of the pneumatic system below (Fig. 1-1) shows how the system expands a static mattress to 42 in wide. Air passes through openings 36 in and 42 in in the Expansion Valve to inflate both the main mattress and the Left Side Bolster.

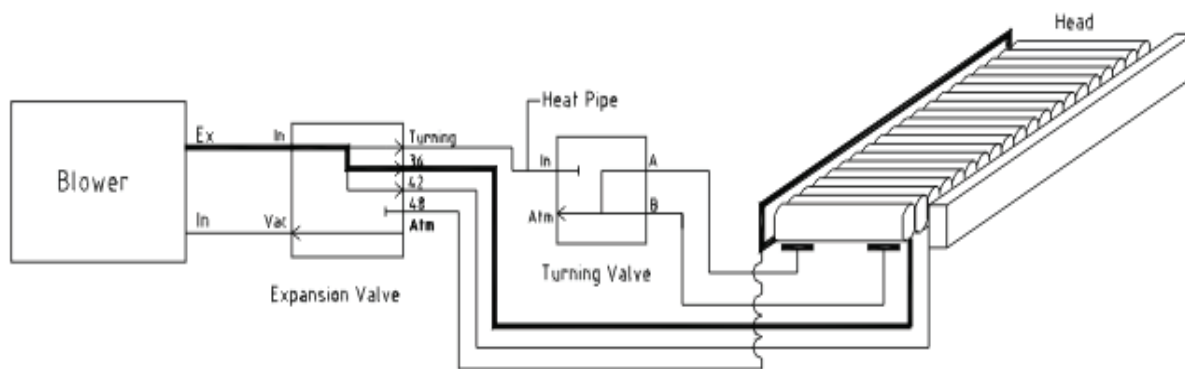


Fig. 1-1 Expand Width to 42 in in Static Mode

When the turning function is activated, air is inflated into the appropriate turning bladder thereby tilting the patient to the left or right with a cycle hold for each side on a variable time setting (3, 4, 5...20, 25 or 30 minutes) and returning to the horizontal middle (3, 4, 5...20, 25 or 30 minutes) before restarting the cycle. The bladders located beneath the cushions will slowly inflate and deflate turning the patient in a gentle side-by-side motion. For Cycle Time Testing please see Cycle Times Table on page 1-6.

By pressing the LEFT TURN button, the mattress is turned to the left. Press the CYCLE button to set the cycle time and mattress will periodically turn from the left and back to horizontal. Please see Figure 1-2 to see the Left Cycle Motion.

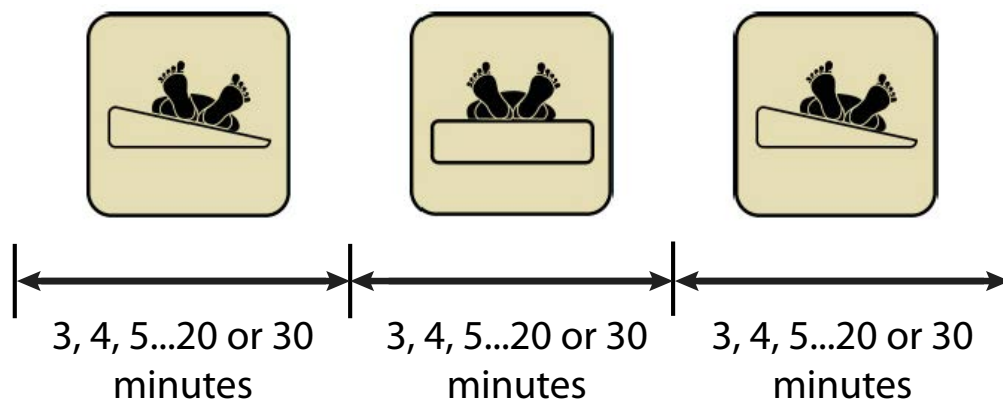


Fig. 1-2 Left Cycle Motion

By pressing the RIGHT TURN button the mattress is turned to the right. Press the CYCLE button to set the cycle time and mattress will periodically turn from the right and back to horizontal.

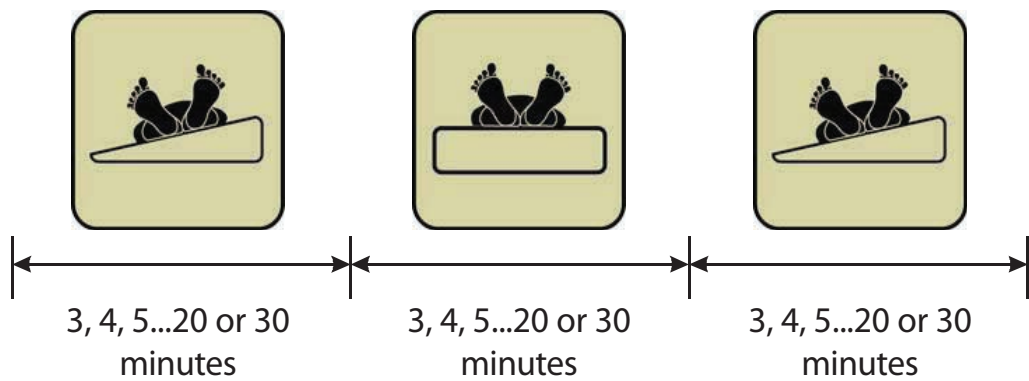


Fig. 1-3 Right Cycle Motion

By pressing the CONT TURN button the mattress will turn to the right, back to horizontal, to the left and back to horizontal.

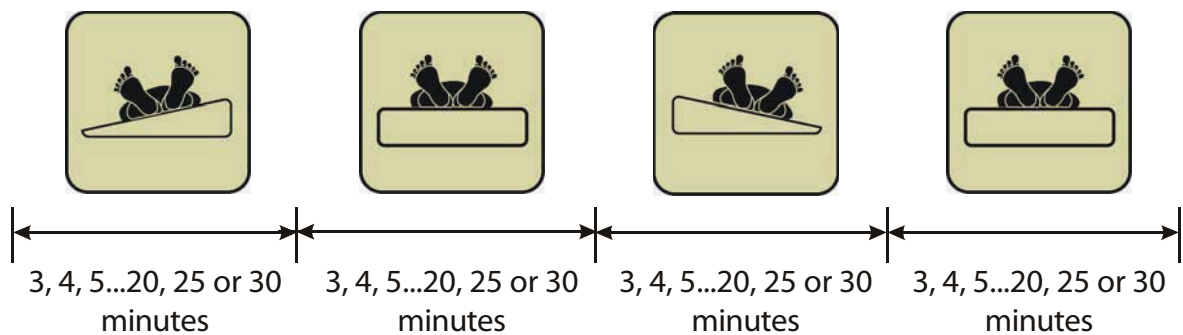


Fig. 1-4 Right Cycle Motion

See Figure 1-5 as it shows a Right Turn 36 in bed frame. Air passes through the Turning and 36 in openings, and from the Turning opening enters the Turning Valve and passes through opening B to inflate the Left Turning bladder.

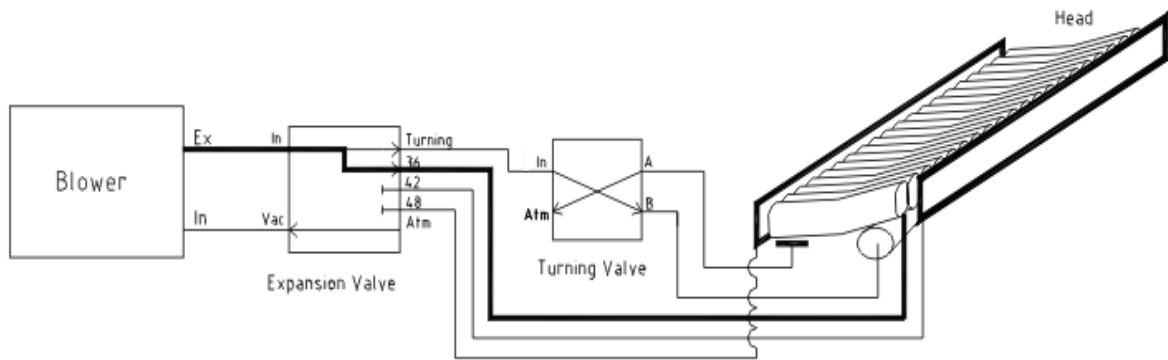


Fig. 1-5 Right Turn Mattress Without Expansion

## Cycle Times

Cycle Time on Air Supply Unit	Actual Time Recorded on Stop Watch (1) Tolerance $\pm$ 30 seconds	Actual Time Recorded on Stop Watch (2) Tolerance $\pm$ 30 seconds
0:03:00	0:02:43	0:03:42
0:04:00	0:03:38	0:04:37
0:05:00	0:04:33	0:05:32
0:06:00	0:05:27	0:06:26
0:07:00	0:06:22	0:07:21
0:08:00	0:07:17	0:08:16
0:09:00	0:08:12	0:09:11
0:10:00	0:09:06	0:10:05
0:11:00	0:10:01	0:11:00
0:12:00	0:10:56	0:11:55
0:13:00	0:11:50	0:12:49
0:14:00	0:12:45	0:13:44
0:15:00	0:13:40	0:14:39
0:16:00	0:14:34	0:15:33
0:17:00	0:15:29	0:16:28
0:18:00	0:16:24	0:17:23
0:19:00	0:17:19	0:18:18
0:20:00	0:18:13	0:19:12
0:25:00	0:22:47	0:23:46
0:30:00	0:27:20	0:28:19

1. Time starts when activating the turn and stops when the test-bags start to inflate.
2. Time starts when activating the turn and stops when the turning bladder is fully inflated.

Conditions: comfort setting set at 3, internal pressure of an inflated turning bladder is at 0.42 psi, no weight on mattress, no obstructions in hose set or turning bladder.

For (1) and (2), discard the time for the first three cycles because the time may vary depending on how the unit was shut down. The cycle times are applicable to the right, horizontal middle, and left turn.

When the CPR mode is selected, the mattress system is rapidly deflated. Please see Figure 1-6 (Air Evacuation in CPR Mode) below for the pneumatic system of the CPR mode from a static bed. Air in the mattress system evacuates through the Vac opening while the supplied air exits to the atmosphere.

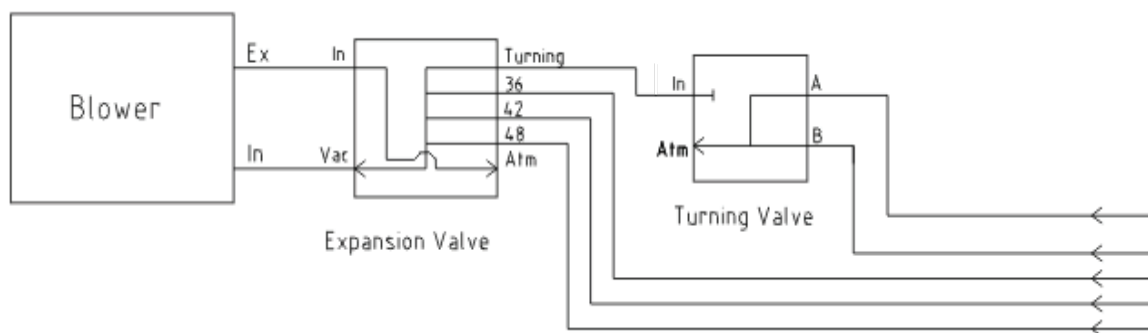


Fig. 1-6 Air Evacuating in CPR Mode

For detailed pneumatic, schematic and cross-sections of the valves, please refer to the Replacement Parts section of this manual.

# TROUBLESHOOTING

Basic troubleshooting procedures for the *MaxxAir ETS* Mattress Replacement System are provided in the following charts. Each chart deals with a specific symptom and provides a Symptom / Possible Cause / Remedy approach to use in identifying the solution. The Symptom will describe the condition that the unit is in. The Possible Cause will describe several likely reasons for the symptom and the steps to take in verifying the cause. The Remedy will describe the final solution to the symptom and cause.

**NOTE:** *Diagnosis of the problem can be performed by following the Symptoms and Possible Causes charts, whereby a Remedy may be provided. If a remedy is not available please contact a trained ArjoHuntleigh Service Center Representative or ArjoHuntleigh approved personnel.*

It is recommended that only qualified, trained ArjoHuntleigh service personnel or ArjoHuntleigh approved personnel perform the procedures outlined in this chapter. Follow all applicable warnings and use Universal Precautions.

## Preliminary Checks

Check the *MaxxAir ETS* Mattress Replacement System for the following before dismantling the pump unit:

- Check that the power cord is plugged in.
- Verify that all tubing connections are securely fastened and snap-locked into place.
- Check that the Expansion Knob is in the proper position.
- If the alarm light is still illuminated, visually inspect tubing and mattress cells for punctures or tears and verify that the cells connect to the manifold correctly.

**The following Cautions and Warnings should be observed during *all* troubleshooting procedures:**



**High voltage equipment to be serviced by trained, qualified personnel only. Dangerous voltages can present a significant shock or burn hazard to personnel.**



**Power must be switched off and Air Supply Unit unplugged prior to any maintenance procedure.**



**Carefully observe and mark locations and routing of all cables and tubing removed while performing the procedure in order to properly locate connections, cables and their Ty-Wraps during replacement. Wiring and tubing must be reinstalled exactly as before removal to ensure unit operation.**

## Symptom, Possible Cause and Remedy

<b>SYMPTOM</b>	<b>POSSIBLE CAUSE</b>	<b>REMEDY</b>
Cells do not inflate.	<p>Air Supply Unit is in CPR mode.</p> <p>Hose may not be properly connected to mattress or Air Supply Unit</p>	<p>Turn Expansion / CPR knob to proper position.</p> <p>Properly connect hoses.</p>
Cells do not inflate. Air Supply Unit power switch is on but LED does not illuminate	<p>Air Supply Unit may be controlled by wall switch.</p> <p>Power cord may be unplugged from wall outlet.</p> <p>Circuit breaker or fuse for wall outlet may be tripped or blown.</p> <p>Air Supply Unit may be damaged.</p>	<p>Plug Air Supply Unit into different wall outlet.</p> <p>Verify Power cord is plugged in.</p> <p>Reset circuit breaker or replace fuse.</p> <p>Repair circuit breaker or replace fuse.</p>
One or more cells do not inflate.	<p>Cell may not be properly connected to hose set.</p> <p>Cells may be damaged.</p> <p>Cell fabric may be twisted above connector, preventing air from entering cushion.</p>	<p>Properly connect hose to cell.</p> <p>Replace cell.</p> <p>Adjust cell and verify hose connection.</p>

Remedy procedures are in last column of tables.

<b>SYMPTOM</b>	<b>POSSIBLE CAUSE</b>	<b>REMEDY</b>
Air Supply Unit is turning on and off, or varying in speed.	Air Supply Unit may be controlled by a wall switch.	Plug Air Supply Unit into different wall outlet.
	Too many devices may be in operation or plugged into same circuit as Air Supply Unit.	Unplug or turn off one or more devices.
	Air filter may be clogged with dust and debris.	Clean or replace air filter.
Air Supply Unit air flow increases or decreases without adjustment and does not respond to Soft / Firm button.	PC Board in Air Supply Unit may be damaged.	Change the PC Board.
After using for a while, push buttons can operate normally but no air is coming out.	Air supply over heated. (If you switch off the Air Supply Unit for 30 minutes and turn the Unit back on, unit is able to operate normally again).	Check Heat Exhaust hose.  Clean or replace air filter.
	If Symptoms happen twice.	Change the Air Supply.
Air Supply still runs but cannot change between modes. (i.e. cannot change LED lights from <i>INSTAFLATE</i> to <i>STATIC</i> ).	CPU needs to be reset. (If you turn master switch off for 10 seconds, and back on, unit should revert back to normal).	If this happens on the same machine / unit twice, change the PC Board.
Air supply still runs and can change LED lights in different modes but physically the mattress does not change to the function accordingly.	The connectors on the PC board are loose.	Reconnect the connectors.
	The air hose set is not connected according to the colors.	Connect the air hose set properly according to the colors indicated.
The turning bladder does not inflate and deflate in continuous lateral rotational mode. (The time display window shows other time cycle than 0 min)	Synchronous timer and valves module may be defective.	Change the Synchronous Timer and Valve Modules.
	Air leakage from the turning bladder.	Change Turning Bladder.

<b>SYMPTOM</b>	<b>POSSIBLE CAUSE</b>	<b>REMEDY</b>
The Air Supply Unit is working and there is air output but the mattress is not inflating.	Is the power source correct? Improper voltage may cause the pump to function abnormally and damage the Air Supply Unit.	Use power regulator or plug Air Supply Unit into different wall outlet.
	Does the air hose allow smooth airflow? Is the air hose kinked?	Adjust the air hose to allow smooth airflow.
	Is there any air leakage from the air cells?	Replace with new air cells.
	Is there any air leakage from air hose between mattress and Air Supply Unit.	Replace with new air hoses.
	Is the air hose set connected properly?	Reconnect the air hose.
Alarm sounds.	Power to unit has been interrupted or turned off.	Push Alarm Reset button on front of unit, and / or re-apply power.



# **MAINTENANCE**

It is recommended that all sections of this manual be reviewed prior to product use. Carefully review the Indications, Contraindications, Precautions and Safety Tips sections in the Introduction prior to performing nursing care on the *MaxxAir ETS* (Expandable Turning Surface) Mattress Replacement System.

## **Operational Maintenance**

The following procedures should be established as routine and carried out each time the system is used.

### **Air Supply Unit**

1. Inspect the Air Supply Unit for external damage to case, controls and connections.
2. Test all controls.

### **Mattress**

Check integrity of mattress top cover and manifold connections.

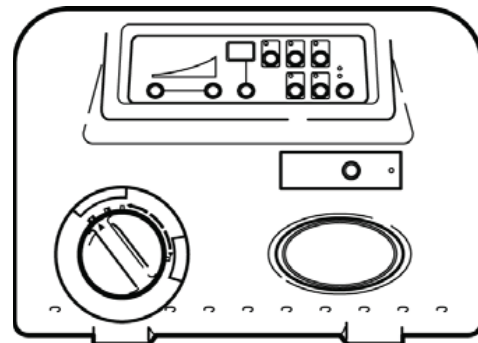
# Scheduled Maintenance

Prior to each placement:

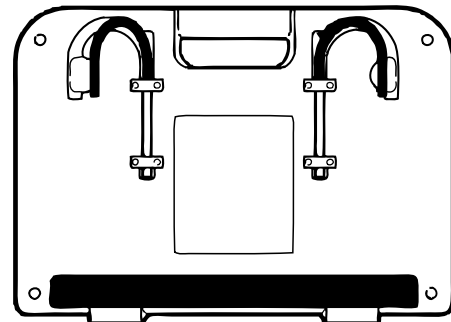
- Perform Quality Control Checklist document part number 48818.
- Reference work instructions document part number 48381, 48382 and 48390

## Initial Assessment Procedure

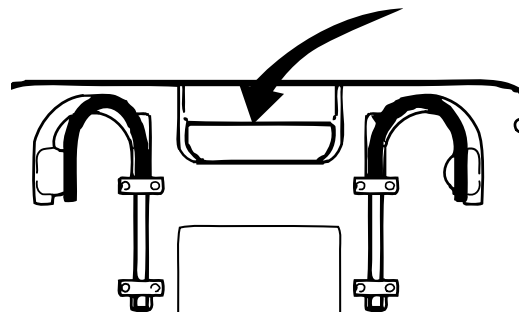
1. Check the Chassis / Housing appearance.
2. Check the Mount / Fasteners.



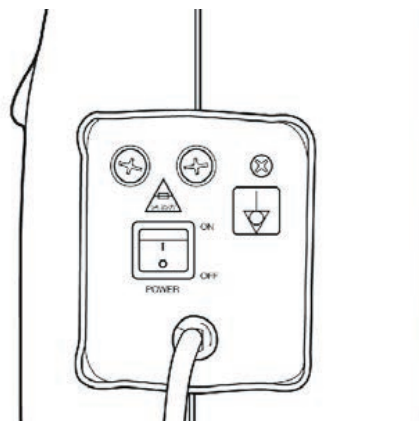
3. Check the bed hooks function properly.



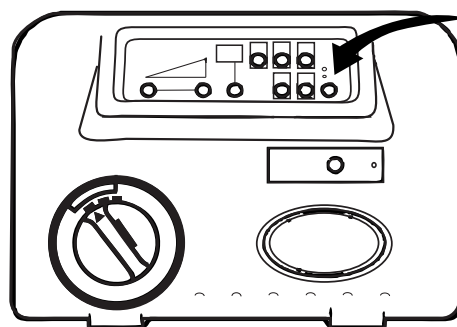
4. Check the filter.



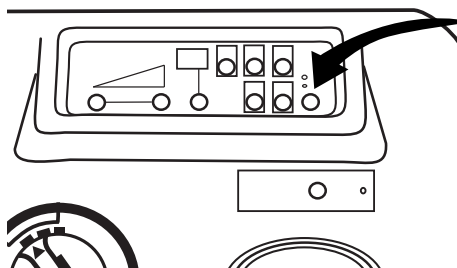
5. Check the AC Plug / Receptacles.
6. Check the power supply panel (including: Strain Relief, Circuit Breaker / Fuse, Controls / Rock Switch and Ground).



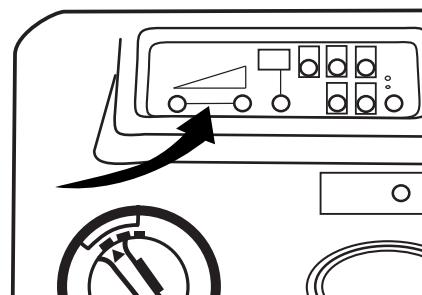
7. Turn on the Rock Switch; the Orange AIR OFF LED will illuminate.



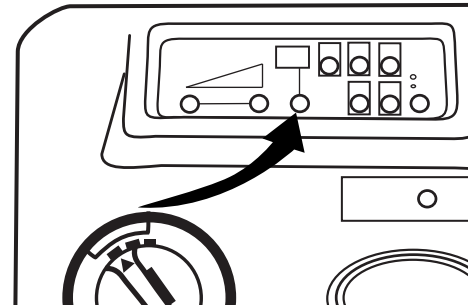
8. Press the AIR ON button, the air supply will start (the AIR OFF orange LED will go out and the AIR ON green LED will illuminate), the Static Mode will turn on and the Comfort Control will be in scale 5.



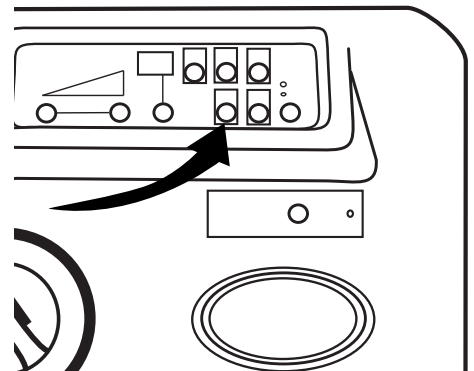
9. Check the COMFORT CONTROL SOFT and FIRM buttons. Begin with the pressure scale at 5, press FIRM to increase the pressure scale up to 8. Press the SOFT button to decrease the scale down to 1.



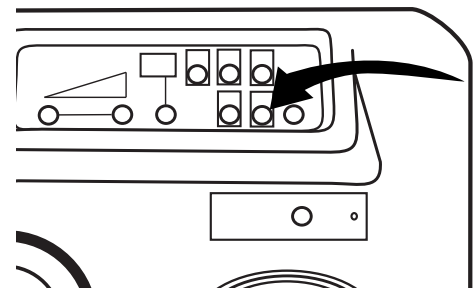
10. Check the CYCLE button after activating the RIGHT TURN, LEFT TURN and CONT TURN modes. The Cycle time cannot be adjusted in STATIC and *INSTAFLATE* modes. The cycle has the following time intervals: 3, 4, 5...20, 25, and 30 minutes.



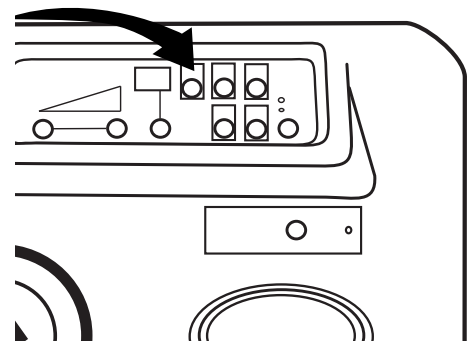
11. The Static mode should be activated when the Unit is turned on. If you were in any other mode press the STATIC button, the green LED will illuminate.



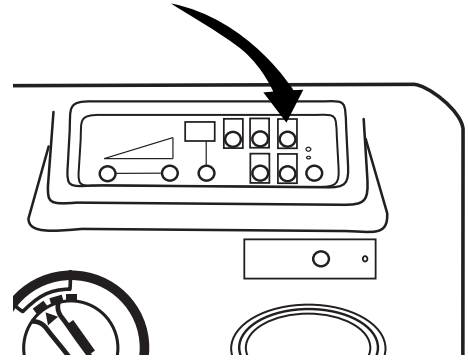
12. Press the *INSTAFLATE* button, the green LED will illuminate and the Comfort Control scale will turn to 8. At this mode, no other modes can be selected (Right Turn, Left Turn, Cont Turn and Static modes). Press *INSTAFLATE* again to deactivate. The *Instaflate* green LED will go off and the unit will return to the previous mode selected.



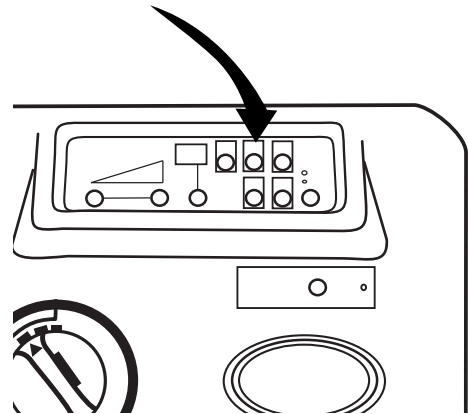
13. Press the LEFT TURN button. The green LED will illuminate and the cycle time window will display 00. Press the CYCLE button to increase the time setting (3, 4, 5...20, 25, and 30 minutes).



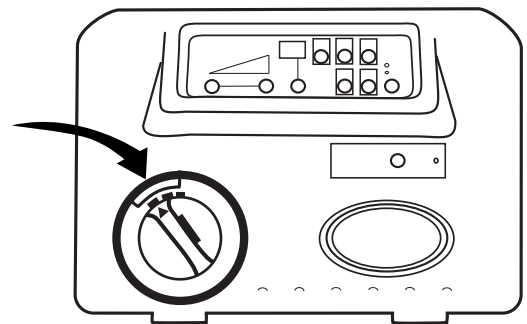
14. Press the RIGHT TURN button. The green LED will illuminate and the cycle time window will display 00. Press the CYCLE button to increase the time setting (3, 4, 5...20, 25, and 30 minutes).



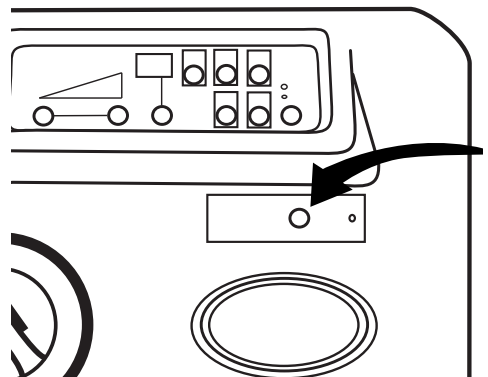
15. Press the CONT TURN. The green LED will illuminate and the cycle time window will display 03. Press the CYCLE button to increase the time setting (3, 4, 5...20, 25, and 30 minutes).



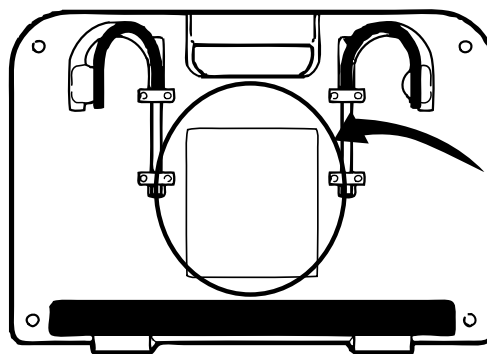
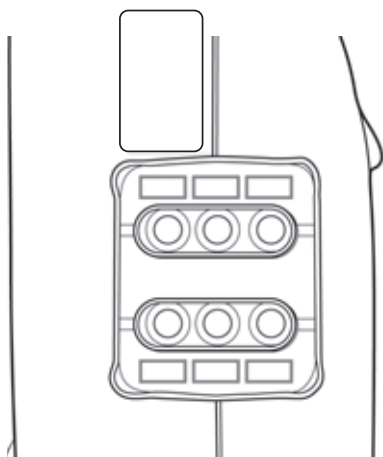
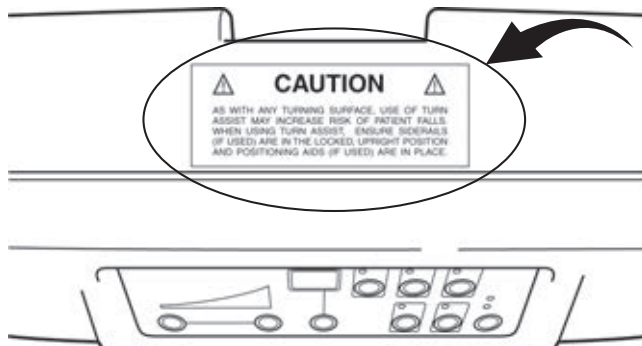
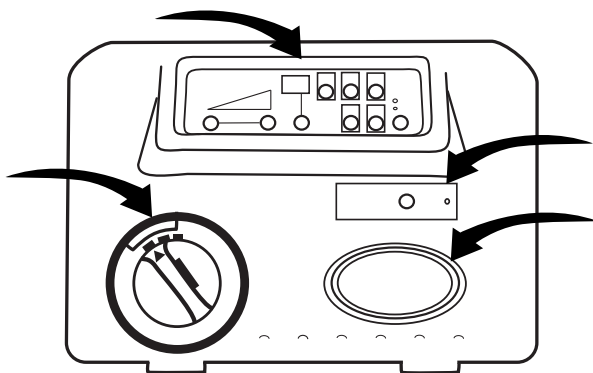
16. Turn the Expansion Knob to 42 in.  
17. Turn the Expansion Knob to 48 in (shown).  
18. Turn the Expansion Knob to CPR.



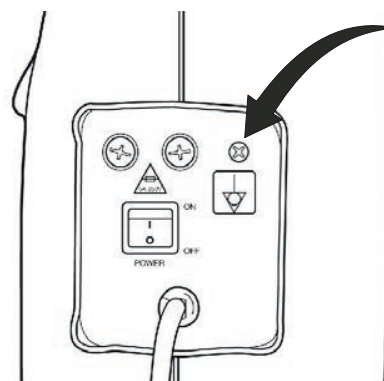
19. Switch off the main power. The POWER FAILURE will sound and the red LED will illuminate. Pressing ALARM RESET will turn off the sound and the LED.



20. Check all labels (including: the Main Control, Alarm Reset, *MaxxAir ETS* Logo, Expansion and CPR, Side Rail Caution , Colored Hose Set and the Specification Caution).

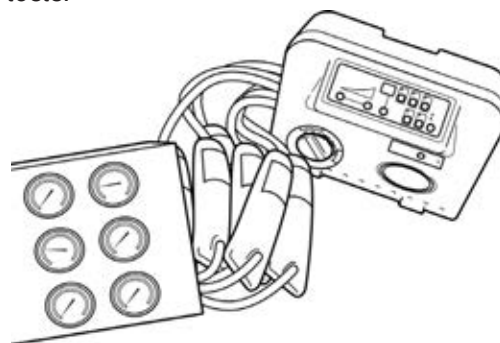


21. Use a voltmeter / ammeter to measure the ground resistance (less than 0.15 ohm) and the maximum leakage current (less than 100 uA).



**NOTE:** Prepare the testing-bags and pressure gauge for the quantitative tests.

22. Reset the air supply. Follow the list below and take measurements from the indicated hose set outlet when the appropriate testing-bag is filled with air. Measurements should accord with the conditions.



Pressure Mode	Expansion Mode	Hose Set Outlet	Condition	Note
<i>Instaflate</i>	---	White	(0 psi)	At any expansion mode
<i>Instaflate</i>	---	Yellow	(0 psi)	
<i>Instaflate</i>	---	Red	Above (1.06 psi)	
<i>Instaflate</i>	48 in	Black	Above (1.06 psi)	
<i>Instaflate</i>	48 in	Blue	Above (1.06 psi)	
<i>Instaflate</i>	48 in	Green	Above (1.06 psi)	
Scale 6	36 in	Black	Above (0.58 psi)	The readings at Blue and Green should be 0
Scale 6	42 in	Blue	Above (0.58 psi)	Black - above 30, Green should be 0
Scale 6	48 in	Green	Above (0.58 psi)	Black and Blue - above 30
Scale 6	Left Turn	Yellow	Above (0.58 psi)	White should read 0
Scale 6	Right Turn	White	Above (0.58 psi)	Yellow - 0

23. Press the CONT TURN button, select 3 minutes for the cycle time and measure the alternating time and make sure the pressure at the outlets are correct.

- Open Control Unit and Check



**The control unit must be disconnected from the power supply. Unplug the power cord from wall outlet before any maintenance or servicing work is carried out.**

- Wiring and Terminations are secure
- Tubing Security and Integrity
- Components Fastenings are secure
- General condition inside is clean

If any items appear defective, replace with appropriate spare part and record action. Re-assemble pump unit completely, run for a minimum of one (1) hour and check calibration. Open and adjust if required.

# Mattress Unit

## Service Protocol Following Laundering / Cleaning

### Infection Control Procedure

The mattress should be cleaned on the bed weekly using a damp, soft cloth and mild detergent. If top sheet (Top Cover) or base (Bottom Cover) becomes grossly soiled, put on clean gloves, plastic gown and eye protection before removing top sheet or base and dispose according to standard hospital procedures for contaminated waste. Replace with clean covers.

Refer to the appropriate Infection Control Procedures implemented within the local institution or within your ArjoHuntleigh Service Area for specific instructions. Covers can be washed and thermally disinfected in a washing machine.

**NOTE:** *Never use phenol based cleaning solutions.*

**NOTE:** *Tumble Drying or Tunnel Drying is not recommended.*

*Mattress Cell can be wiped over with a solution of sodium hypochlorite 1000 ppm or any other non-phenolic germicidal solution, following institutional protocol instructions or Infection Control Procedures.*

### Layout Mattress and Check

- General Condition of mattress.
- All components are secure and intact.
- Tube set is in good condition.

### Inflate System and Check

- Weld integrity (i.e. no leaks).
- All fittings, i.e. base sheets and connectors are secure, are of good quality and in good condition.
- Cover sheet is in good condition.
- Batch number is secure and legible.

If any items appear defective, then replace with appropriate spare part and record action. Re-assemble pump unit completely, run for a minimum of one (1) hour and check.



## MAINTENANCE / REPLACEMENT

It is recommended that all sections of this manual be reviewed prior to product use. **Carefully review the Indications, Contraindications, Precautions and Safety Tips sections in the Introduction prior to performing nursing care on the MaxxAir ETS (Expandable Turning Surface) Mattress Replacement System.**

### Maintenance and Replacement Procedures

The following procedures should be established as routine and carried out each time the system is used.



**The control unit must be disconnected from the power supply. Unplug the power cord from the wall outlet before any maintenance or servicing work is carried out.**

The following Cautions and Warnings should be observed during all maintenance and replacement procedures:



**High voltage equipment to be serviced by trained, qualified personnel only. Dangerous voltages can present a significant shock or burn hazard to personnel.**



**Power must be switched off and Transformer unplugged prior to any maintenance procedure.**



**Carefully observe and mark locations and routing of all cables and tubing removed while performing the procedure in order to properly locate connections, cables and their Ty-Wraps during replacement. Wiring and tubing must be reinstalled exactly as CAUTION before removal to insure unit operation.**

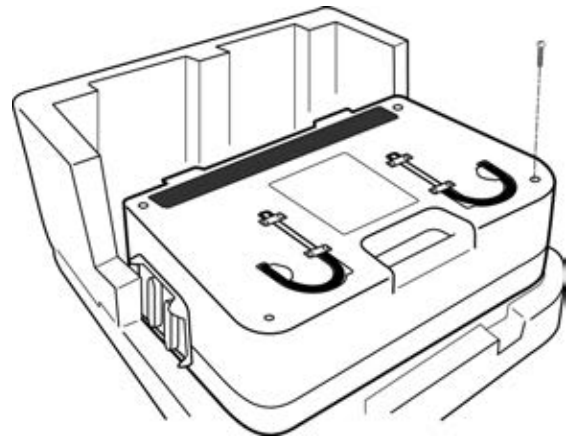
# Air Supply Unit

## Clean Air Filter

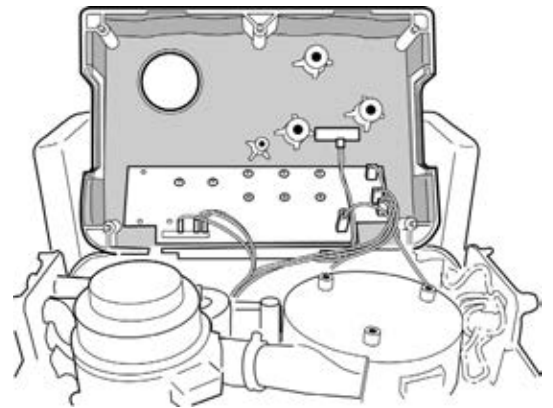
Remove and clean the filter from the handle cavity located on the back of the control unit. After removing filter from the unit, clean filter by washing with mild soap and water. Thoroughly rinse and dry before reinstalling filter.

## Open Case Assembly

1. After unplugging the Air Supply Unit, place it face down on a foam shell repair box. Unscrew the six (6) pan head screws.

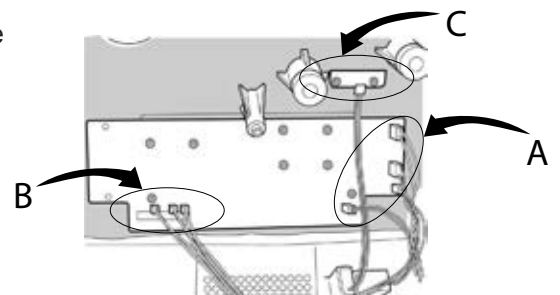


2. Keep the screws in a safe place. Carefully turn the case upright with the front case facing up. Lift and rest the front case on the foam shell. The unit is now ready for internal servicing.



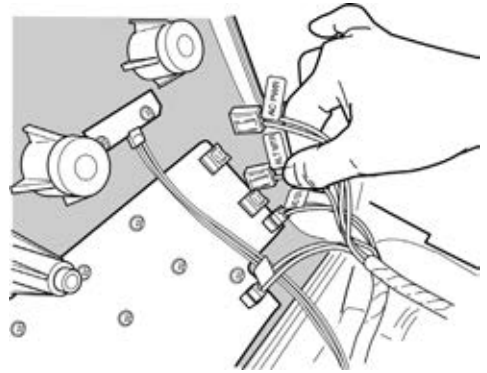
## Change the PC Board

There are seven (7) and ten (10) screws to remove in order to replace the Main PC Board, and three (3) wires and three (3) screws to remove the Alarm PC Board. Note corresponding areas for Part A, B and C.

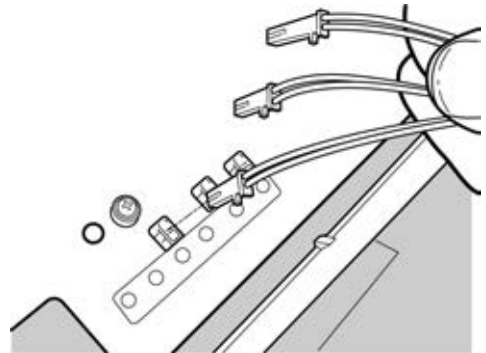


## Main PC Board

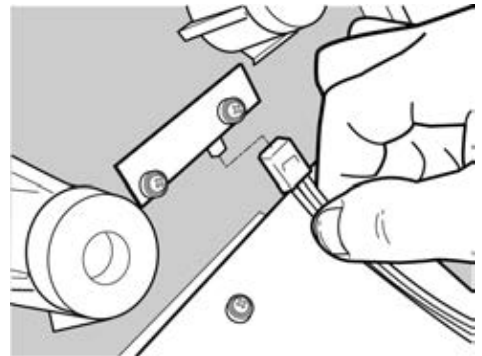
1. With the Control Unit unplugged or disconnected from all power supplies, carefully unplug the AC PWR, ALT MTR, AC 12V and BL CTL connectors. Note that the stickers at the end of each wire indicate the corresponding plugs. (Part A)



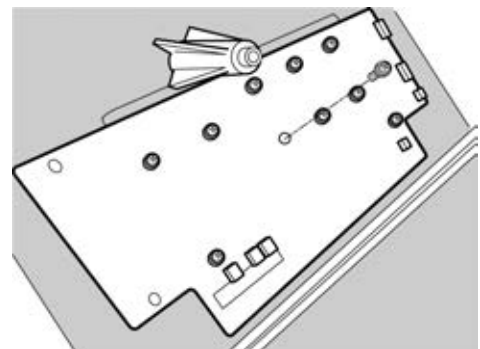
2. Loosen the Micro Switch Plugs. The colors of the wires indicate where they should be plugged into according to the colors labeled below the plugs. (Part B)



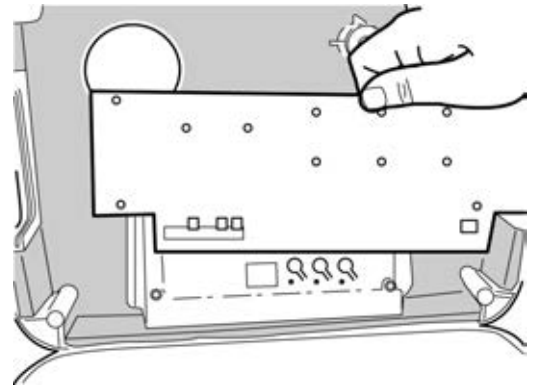
3. Unplug Alarm connector. (Part C)



4. Remove ten (10) screws from the PCB.

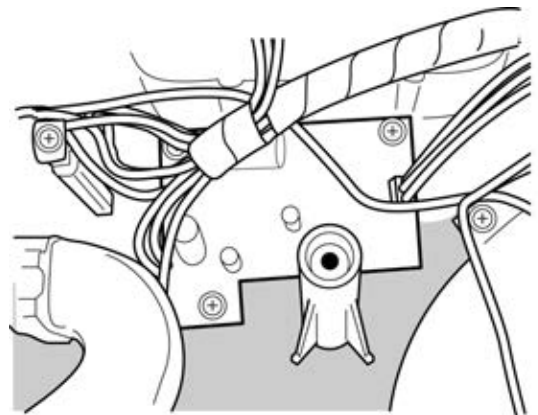


5. Remove the PCB.
6. Mount the new PCB.
7. Replace the components in the reverse order of removal.

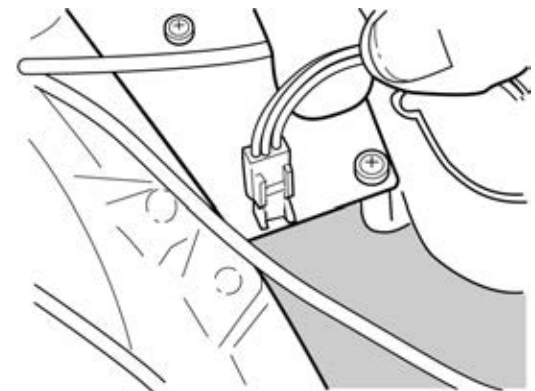


## Alarm PC Board

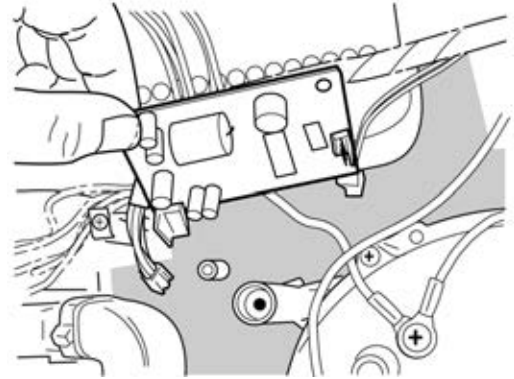
1. With the Control Unit disconnected from all power supplies, remove the AC 12V connectors and the alarm connector.



2. Remove three (3) screws.

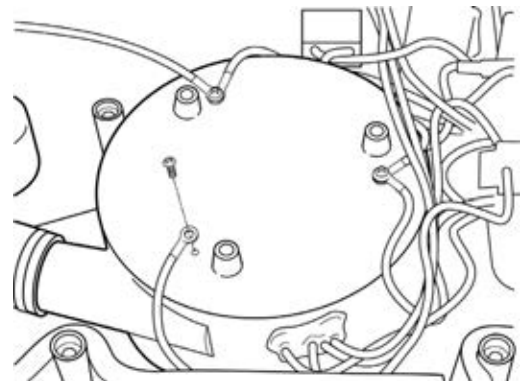


3. Replace the Alarm PC Board.
4. Replace the components in the reverse order of removal.

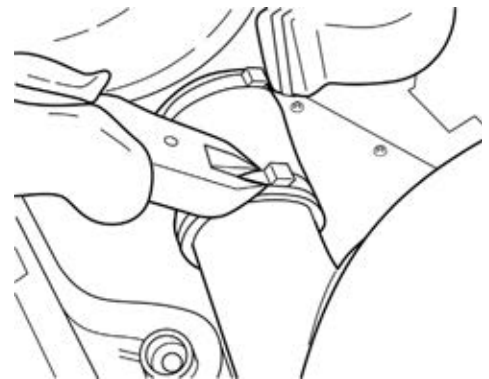


## Replace the Air Supply Unit

1. With power supplies disconnected, remove three (3) pan head screws.



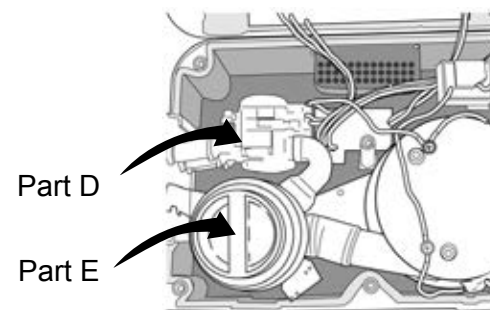
2. Clip the zip tie and disconnect the pneumatic air tube.



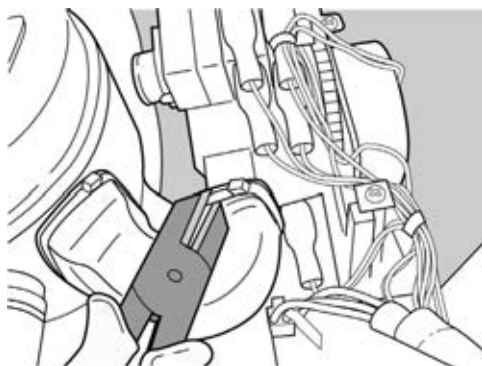
3. Disconnect the AC PWR and the BL CTL (Part A). Lift the air supply assembly clear of the case. Inspect the vibration absorber rubber feet that are secured to the air supply-mounting bracket. Replace rubber feet if damaged. Replace in the reverse order of removal.



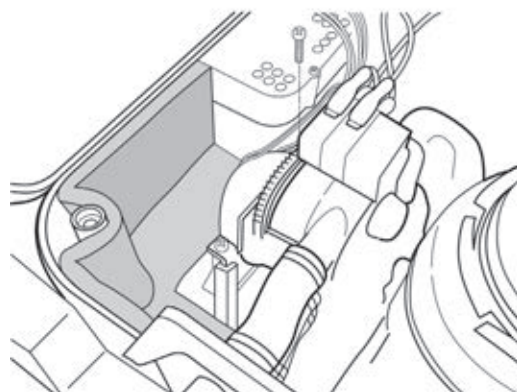
## Replace Synchronous Timer and Turning Valve Module (Part D)



1. With power supplies disconnected, cut and remove the zip ties.

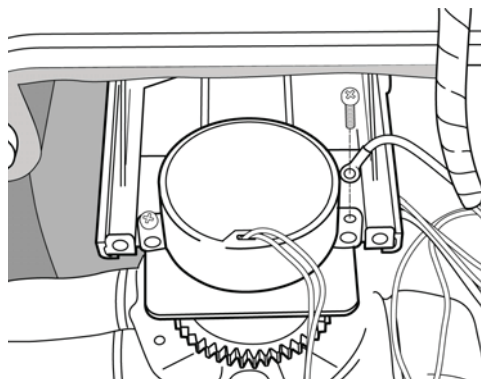


2. Remove two (2) screws from the Turning Valve.

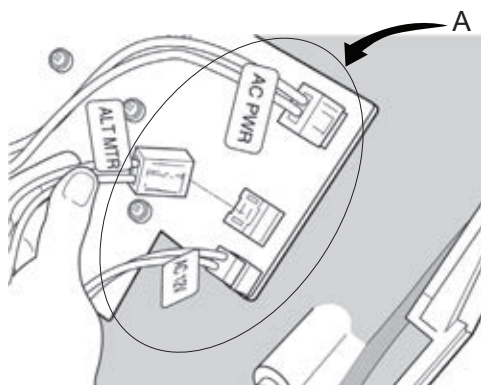




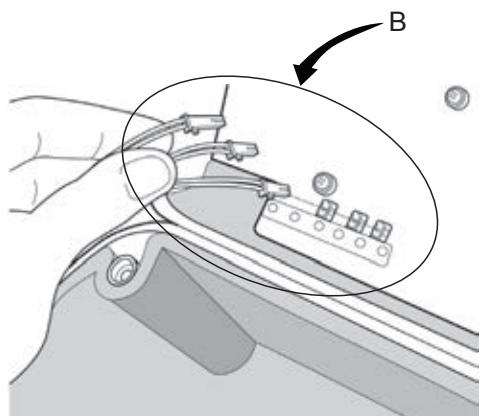
3. Unscrew the timer grounding wire.



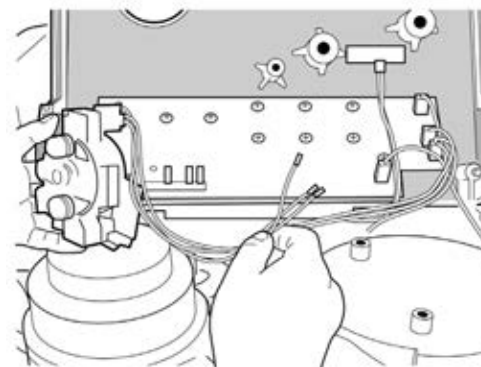
4. Remove the ALT MTR wire from the PCB. (Part A)



5. Disconnect the Micro Switch Plugs. (Part B)

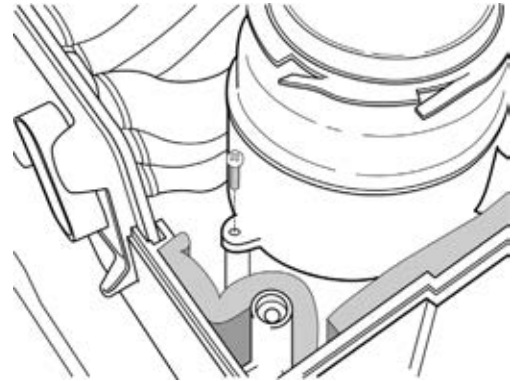


6. Replace the Synchronous Timer and Turning Valve Module. Replace in the reverse order of removal.

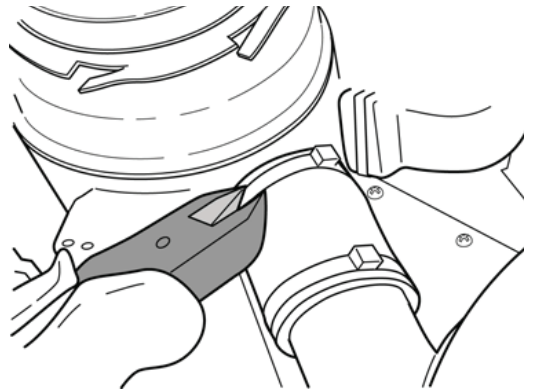


## Replace Expansion Valve (Part E)

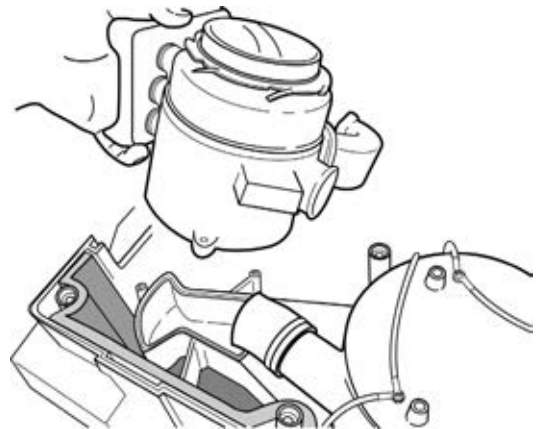
1. With power supplies disconnected, remove the three (3) screws holding the Expansion Valve to the rear case.



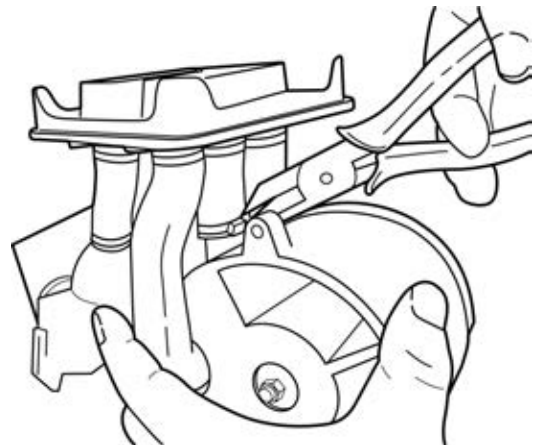
2. Clip the zip tie and remove the air tube connecting to the air supply unit.



3. Lift up the Expansion Valve together with the hose set.



4. Cut the zip ties and remove the air tubes connecting to the Turning Valve, Hose Set and the Vacuum outlet.



5. Replace components in reversed order.



# Air Supply Calibration Procedure



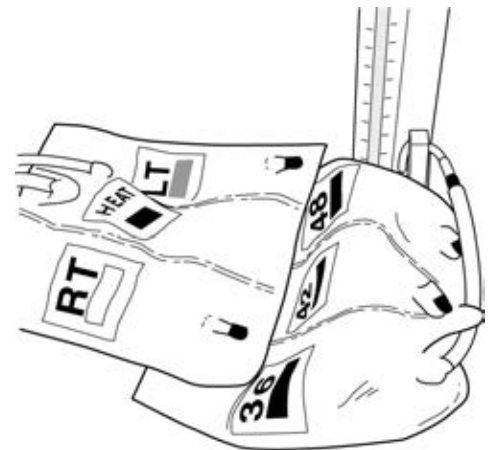
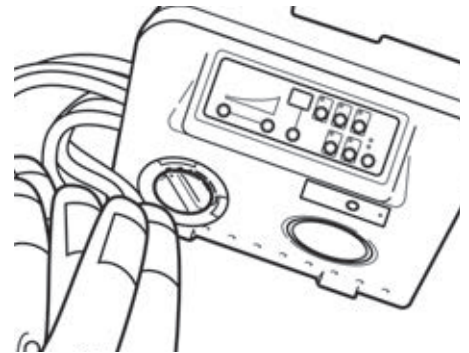
**The control unit must be disconnected from the power supply. Unplug the power cord from the wall outlet before any maintenance or servicing work is carried out.**

Before attempting to calibrate the air supply, follow Setup Pressure Gauge steps 1-3 and check if pressure readings align with the following standards. These readings are based on a setup with test.

## Air Supply Unit

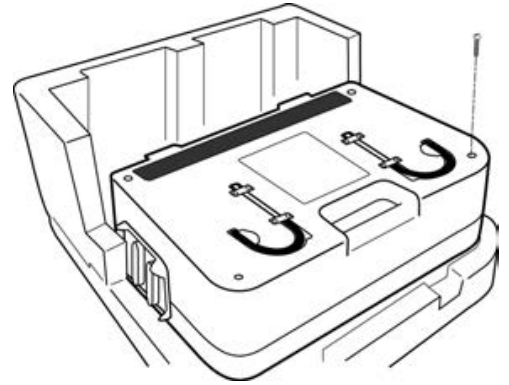
### Setup Pressure Gauge

1. Connect test bags (with laser holes) to the Air Supply Unit and setup the pressure gauge.
2. Connect the 36 outlet air tube from test bag to the pressure gauge. Let the heat exhaust air outlet run freely and block rest of the air outlets. Turn on the Air Supply Unit. Select *INSTAFLATE* from the control panel and turn the Expansion Knob to 48 in.
3. Check if the pressure gauge reads 1.35 - 1.45 psi within the first minute from turning on the unit. If not, turn off the Air Supply Unit to allow the air supply to cool down, and then proceed to next step.

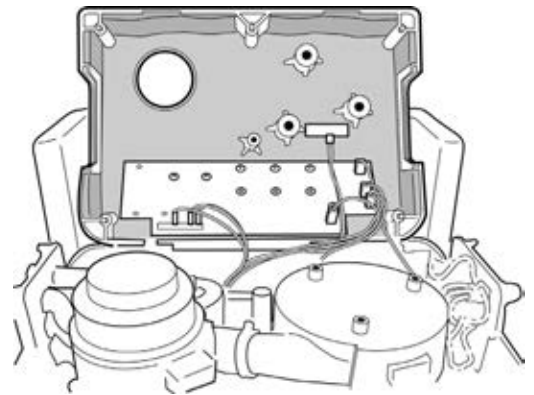


## Open Case Assembly

1. After unplugging the Air Supply Unit, place it face down on a foam shell repair box. Remove the black protective strip and unscrew the 6 pan head screws.

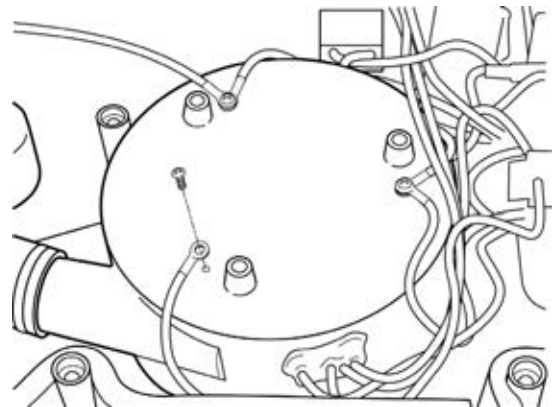


2. Keep the screws in a safe place. Carefully turn case upright with the front case facing down. Lift and rest the front case on the foam shell.

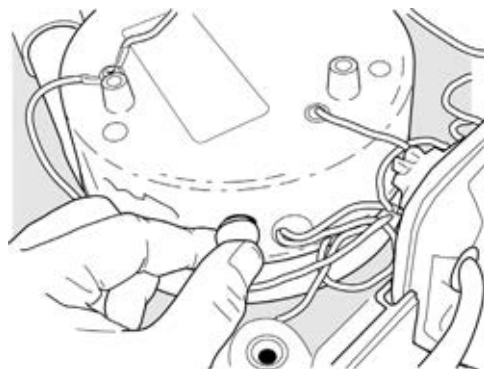


## Calibrate the Air Supply Unit

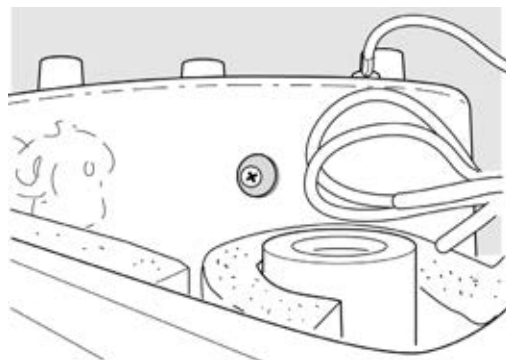
1. Locate the black rubber stopper on the air supply.



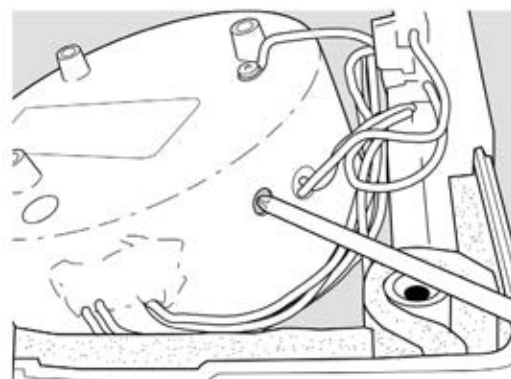
2. Pull to remove the rubber stopper and keep it in a safe place.



3. Locate the cross-head screw.



4. Guarding against electric shock, connect power to the Air Supply Unit and turn it on. Select *INSTAFLATE* and make sure the Expansion Knob is at 48 in. Adjust the unit's pressure setting with a cross-head screw driver. Screw clockwise to lower the pressure and counter-clockwise to raise (higher) the pressure setting. Pay attention to the pressure gauge and adjust the screw so that the pressure gauge reads within 1.35 - 1.45 psi. This process should not continue over one minute because, as the air supply heats up, the pressure reading lowers.



5. After calibration is complete, turn off the Air Supply Unit and disconnect the power supply. Re-assemble unit with the reversed order of the above procedure.

# **Mattress**

## **Mattress Service Following Laundering / Cleaning**

### **Replacing Mattress Cover**

To remove the mattress cover, unbuckle at both sides.

### **Replacing Main Mattress Cell**

If one of the mattress cells is leaking, replace the cell by disconnecting the press-stud fastener at each end of the cell, and remove the cell connector from the manifold. Pull the cell from the middle cushion retainer. Replacement of the cells is the reversal of the above procedure. Ensure that cell is fed through the entire middle cushion retainer. The seam end of each cell should be facing toward the bottom.

### **Replacing the Side Bolster**

Access side of the bolster pocket. Disconnect the press-stud fasteners along the same side of the bolster. Disconnect the CPC connector and carefully feed the air hose through hole at corner of the side pocket. Remove bolsters from side pockets. Replacement of bolsters is the reversal of the above procedure.

### **Replacing the Turning Bladder**

Unzip the bladder pocket located at the bottom. Disconnect the CPC connector and carefully feed the air hose through hole at corner of the bladder pocket when removing the bladder. Replacement of bladder is the reversal of the above procedure.

### **Replacing the Air Manifold**

To replace the manifold, disconnect all press-stud fasteners on the appropriate side of the mattress. Remove all cell connectors from the manifold. Disconnect the CPC connector and carefully feed air hose through corner of the base sheet. Replacement of manifold is a reversal of the above procedure.

### **Replacing Middle Cushion Retainer**

To replace the Retaining Loop, disconnect all press-stud fasteners on the appropriate ends of the mattress. Slide the loop from cell structure. Replacement is a reversal of the above procedure.

# SPECIFICATIONS\*

## Mattress Specifications

### Recommended Patient Weight Limit

Maximum ..... 1000 lb\*

### MaxxAir ETS Therapy System

Width ..... 36 in W

Width ..... 42 in W

Width ..... 48 in W

Length ..... 80 in L

Height ..... 10 in H

### Mattress Weight

Total Weight ..... Approximately 48 lb

### Materials

Cell Material ..... Polyurethane 0.35 (mm)

Cover Material ..... Nylon Fabric with Moisture Vapor Permeable Backing

Base Material ..... Nylon Laminated PVC

## Air Supply Unit Size

### Air Supply Unit

Width ..... 16.5 in W

Depth ..... 6.7 in D

Height ..... 10.5 in H

### Unit Weight

Total Weight ..... Approximately 12.5 lb

### Other

Cycle Time ..... 3- 30 minutes

Rated Voltage ..... 115 Volt

Max Current ..... 5 Amp

Rated Frequency ..... 60 Hz

Protection Type ..... Class II, Type BF

Mode of Operation ..... Continuous

Safety Standard ..... UL 60601-1

Maximum Electrical Leakage ..... 100 Micro amps

Power Cord Length ..... 16 ft

\*Specifications subject to change without notice.

## Symbols Used



Refer to accompanying documents



Equal Potential



Power off



Power on

## Miscellaneous

### EMC

The *MaxxAir ETS* (Expandable Turning Surface) Mattress Replacement System's Air Control Unit uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause interference in nearby electronic equipment. The *MaxxAir ETS* was tested to the following standards:

- IEC 60601-1-2: Second Edition
- EN 5501: 1998 Group 1, Class B
- EN 61000-3-2: Class A
- EN 61000-3-3

## Classification

Classification in accordance with UL 60601-1, CSA C22.2 No 601.1, and IEC 60601-1

- Class II
- Type BF
- IPX1
- No Sterilization
- Not for Use with Flammable Anesthetic Mixture with Air, Oxygen or Nitrous Oxide
- Continuous Operation
- Ordinary Equipment

## Environmental Storage / Transit Conditions

Temperature Range: -4 to 140° F

Relative Humidity Range: 30 to 95%

Atmospheric Pressure Range: 500 to 1060 hPa

## Environmental Operating Conditions

Temperature Range: 50 to 104° F

Relative Humidity Range: 30 to 75%

Atmospheric Pressure Range: 500 to 1060 hPa

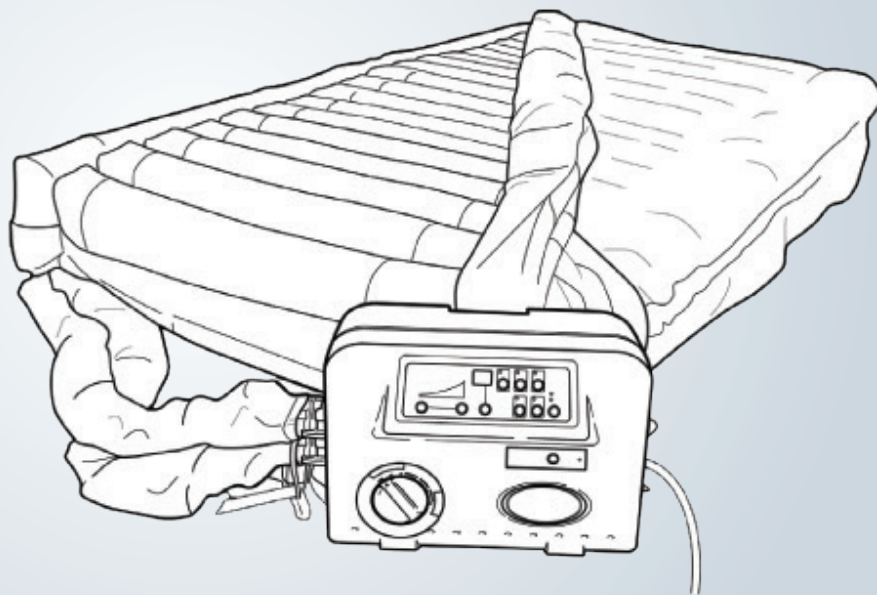




# MaxxAir ETS

## Schematics and Replacement Parts

**ARJOHUNTLEIGH**  
GETINGE GROUP



...with people in mind

## CAUTION

This MaxxAir ETS™ Maintenance Manual is not a guarantee or warranty as to this product. It is intended only as a quick reference source and is not intended to be a comprehensive guide. For additional product information or for specific questions please contact ArjoHuntleigh Customer Service (1-800-343-0974).

In order for ArjoHuntleigh products to provide safe and proper performance, the following conditions must be adhered to. Failure to comply with these conditions will void any applicable warranties.

- It is strongly recommended that all assembly, operation, adjustment, modification, maintenance and / or repair be carried out by qualified personnel authorized by ArjoHuntleigh.
- The electrical installations used must comply with the appropriate electrical wiring standards.
- The product must be used in accordance with this manual and all applicable Product information and labeling.

ArjoHuntleigh will upon request repair the unit using appropriately qualified personnel or service center personnel to replace those parts designated as repairable. Charges for the repair and ancillary expenses must often be paid by those requesting repair.

Although this equipment conforms with requirements in relation to Electromagnetic Compatibility, all electrical equipment may produce interference. If interference is suspected, move equipment away from sensitive devices or contact the manufacturer.

## NOTICE

This product has been configured from the manufacturer to meet the specific voltage requirements. Refer to the Product Information Label to verify 115 VAC, 5 Amp configuration.

# TABLE OF CONTENTS

<b>PNEUMATIC SCHEMATICS / VALVE CROSS SECTIONS .....</b>	<b>44</b>
36 in Wide Bed and Actual Valve Configuration for 36 in Wide Bed Frame at Static Mode.....	44
42 in Wide Bed and Actual Valve Configuration for 42 in Wide Bed Frame at Static Mode.....	45
48 in Wide Bed and Actual Valve Configuration for 48 in Wide Bed Frame at Static Mode.....	46
36 in Wide Bed and Actual Valve Configuration for 36 in Wide Bed Frame at Left Turn Mode .....	47
36 in Wide Bed and Actual Valve Configuration for 36 in Wide Bed Frame at Right Turn Mode .....	48
CPR and Actual Valve Configuration for CPR Mode at Static Mode.....	49
CPR and Actual Valve Configuration for CPR Mode at Left Turn Mode .....	50
CPR and Actual Valve Configuration for CPR Mode at Right Turn Mode .....	51
<b>ELECTRICAL SCHEMATIC.....</b>	<b>52</b>
Air Supply Unit Electrical Schematic.....	52
<b>REPLACEMENT PARTS .....</b>	<b>53</b>
Air Supply Unit .....	53
Mattress Assembly .....	54

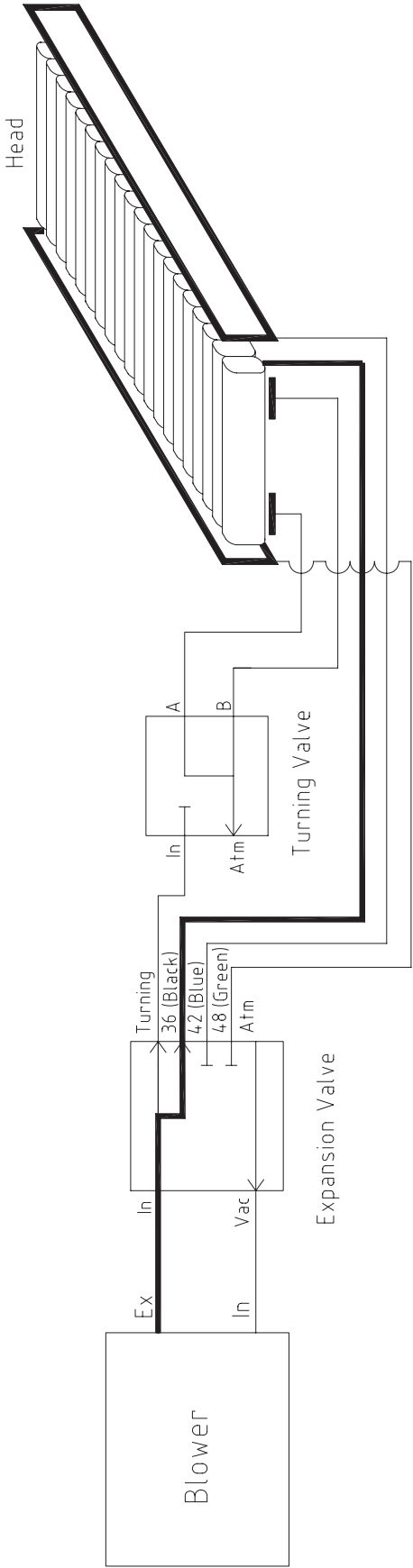


Fig A-1 36" Wide Bed Frame at Static Mode

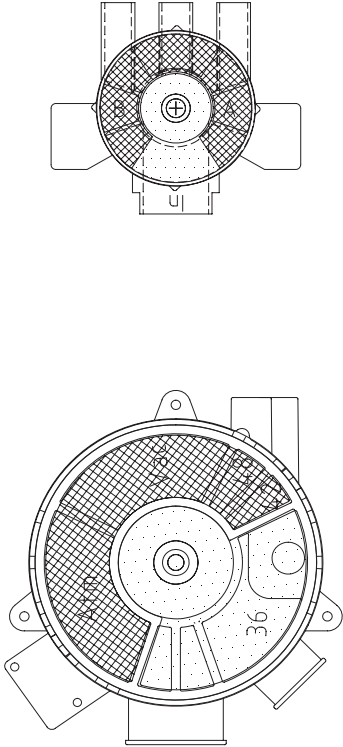


Fig A-2 Actual Valve Configuration for 36" Wide Bed Frame at Static Mode

FIG. 1-1. 36 in Wide Bed and Actual Valve Configuration for 36 in Wide Bed Frame at Static Mode

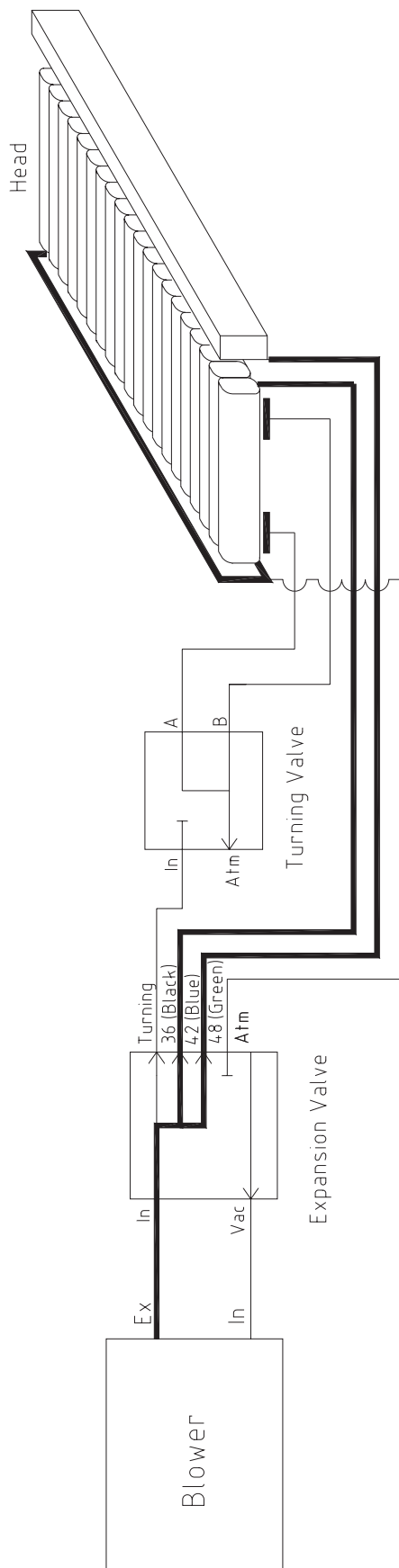


Fig A-3 42" Wide Bed Frame at Static Mode

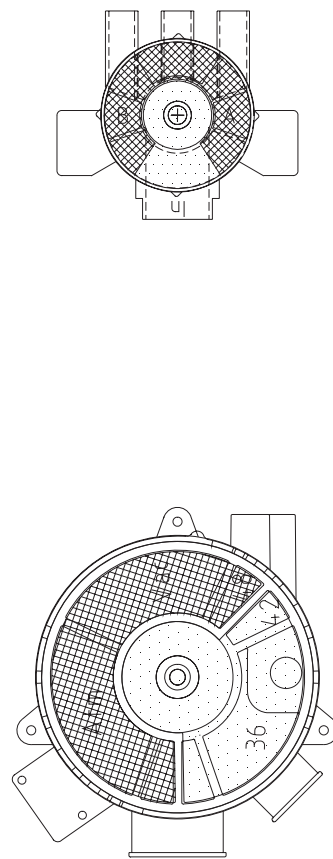


Fig A-4 Actual Valve Configuration for 42" Wide Bed Frame at Static Mode

FIG. 1-2. 42 in Wide Bed and Actual Valve Configuration for 42 in Wide Bed Frame at Static Mode

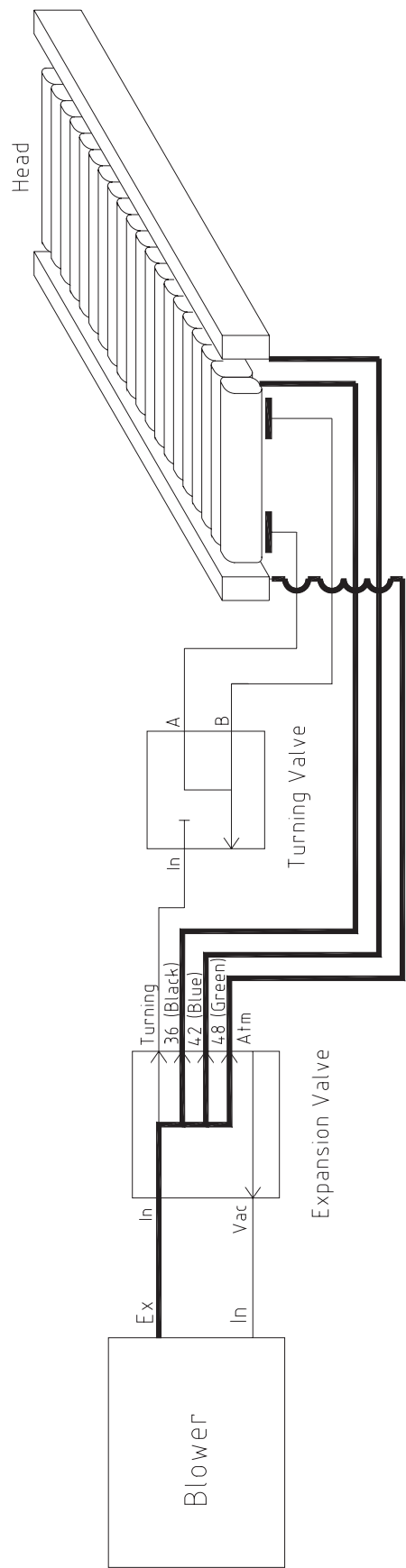


Fig A-5 48" Wide Bed Frame at Static Mode

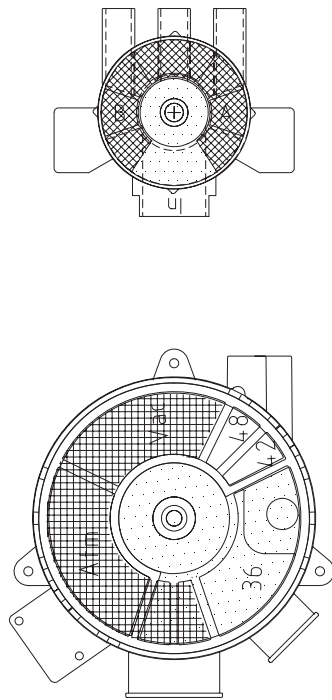


Fig A-6 Actual Valve Configuration for 48" Wide Bed Frame at Static Mode

FIG. 1-3. 48 in Wide Bed and Actual Valve Configuration for 48 in Wide Bed Frame at Static Mode

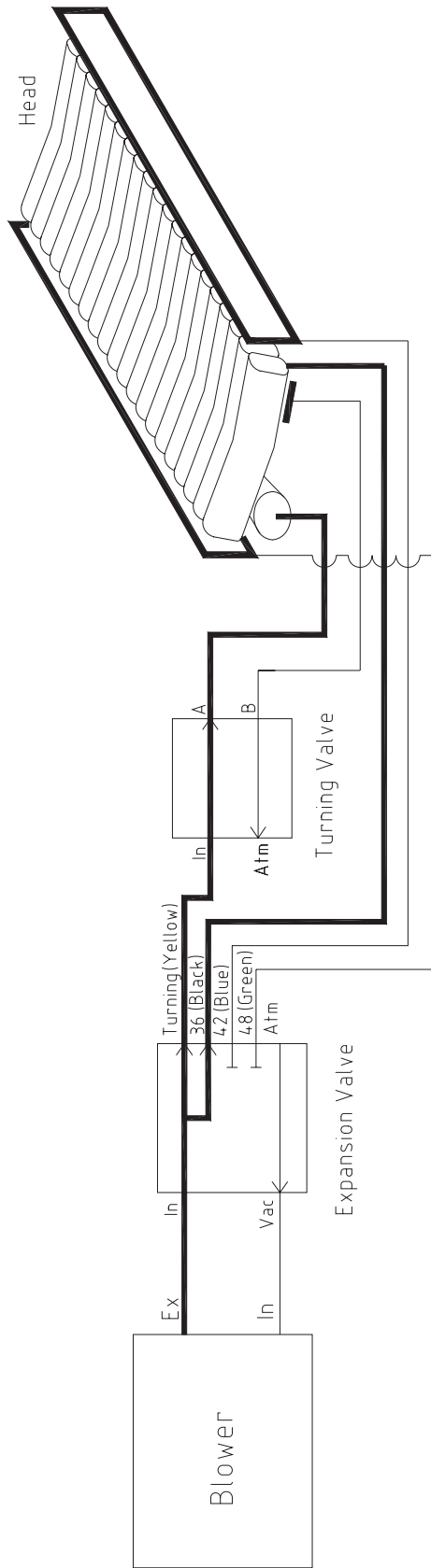


Fig A-7 36" Wide Bed Frame at Left Turn Mode

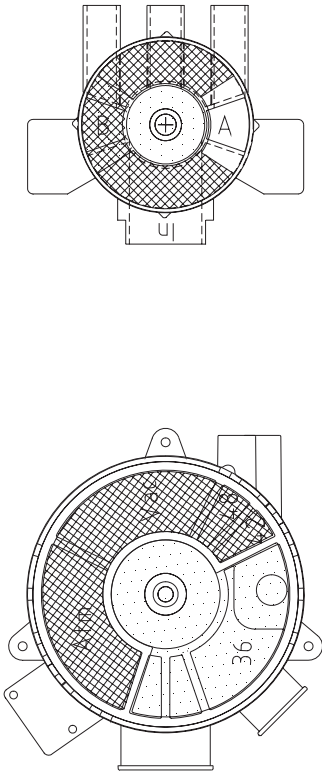


Fig A-8 Actual Valve Configuration for 36" Wide Bed Frame at Left Turn Mode

FIG. 1-4. 36 in Wide Bed and Actual Valve Configuration for 36 in Wide Bed at Left Turn Mode

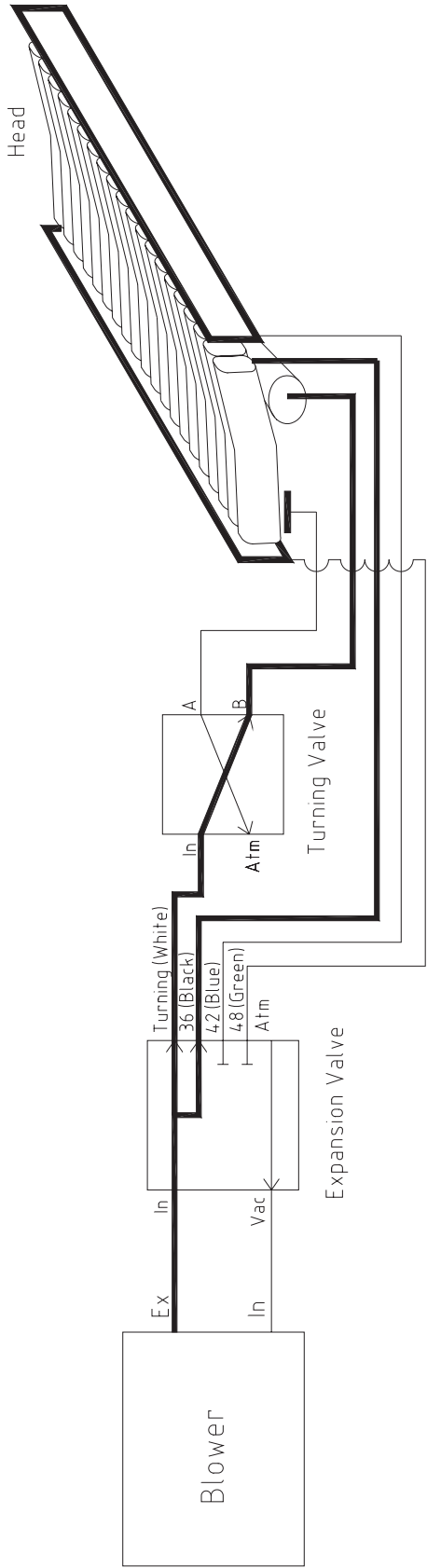


Fig A-9 36" Wide Bed Frame at Right Turn Mode

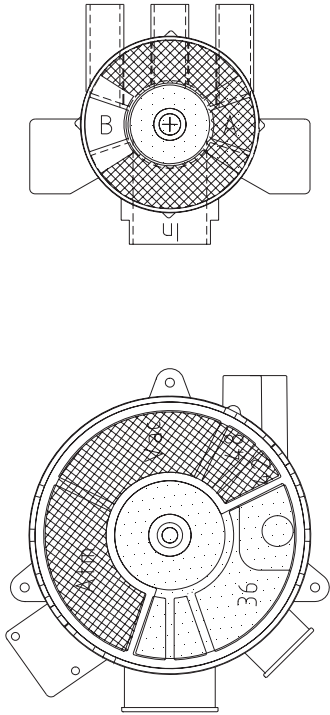


Fig A-10 Actual Valve Configuration for 36" Wide Bed Frame at Right Turn Mode

FIG. 1-5. 36 in Wide Bed and Actual Valve Configuration for 36 in Wide Bed at Right Turn Mode



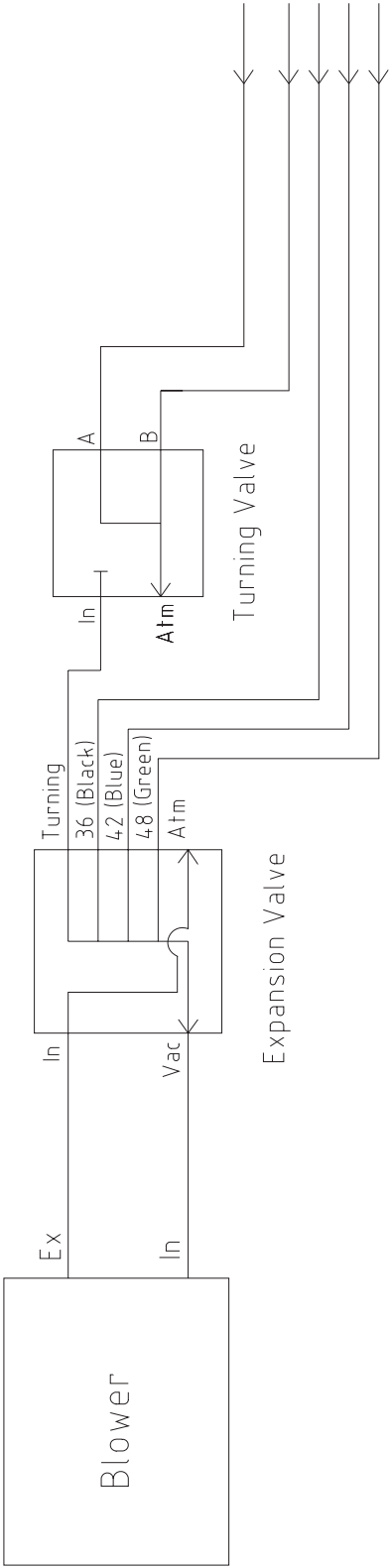


Fig A-11 CPR Mode at Static Mode

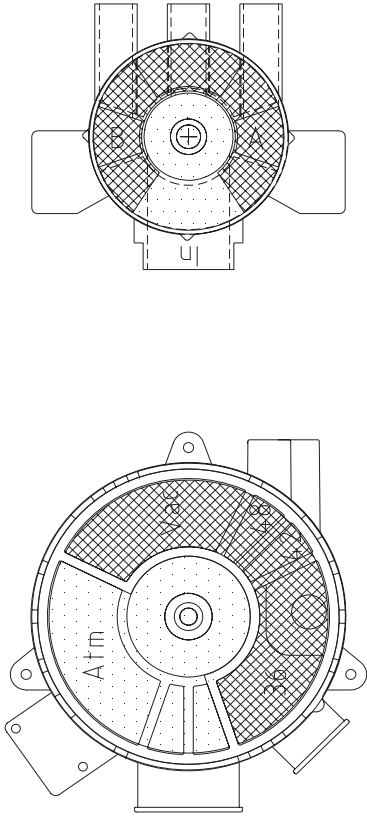


Fig A-12 Actual Valve Configuration for CPR Mode at Static Mode

FIG. 1-6. CPR and Actual Valve Configuration for CPR Mode at Static Mode

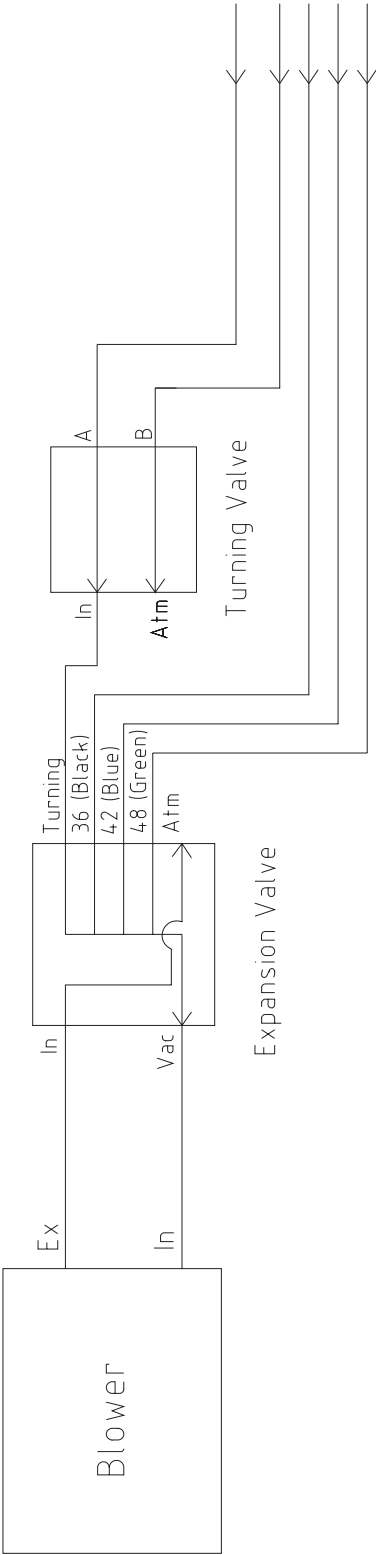


Fig A-13 CPR Mode at Left Turn Mode

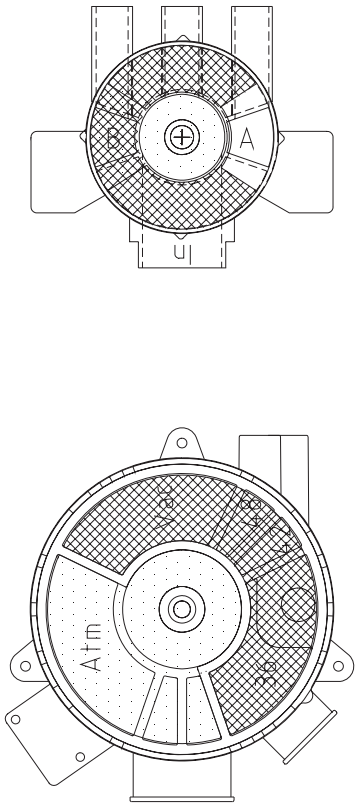


Fig A-14 Actual Valve Configuration for CPR Mode at Left Turn Mode

FIG. 1-7. CPR and Actual Valve Configuration for CPR Mode at Left Turn Mode

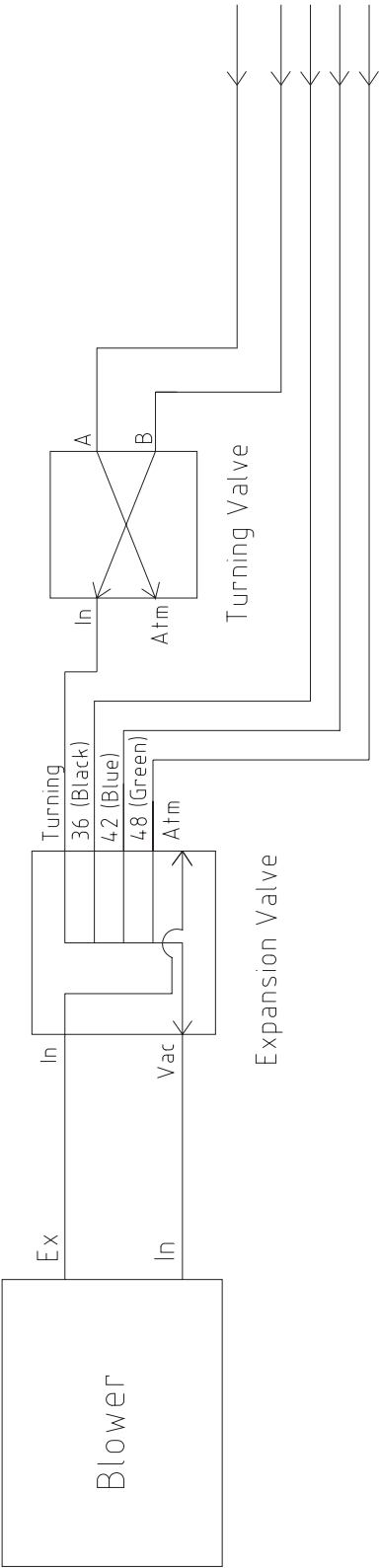


Fig A-15 CPR Mode at Right Turn Mode

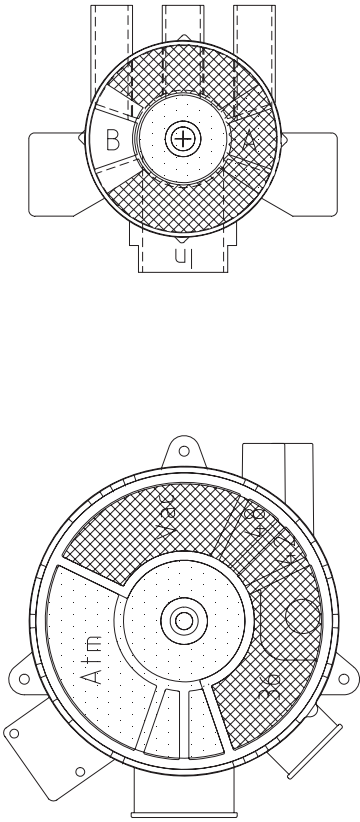


Fig A-16 Actual Valve Configuration for CPR Mode at Right Turn Mode

FIG. 1-8. CPR and Actual Valve Configuration for CPR Mode at Right Turn Mode

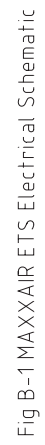


FIG. 1-9. Air Supply Unit Electrical Schematic

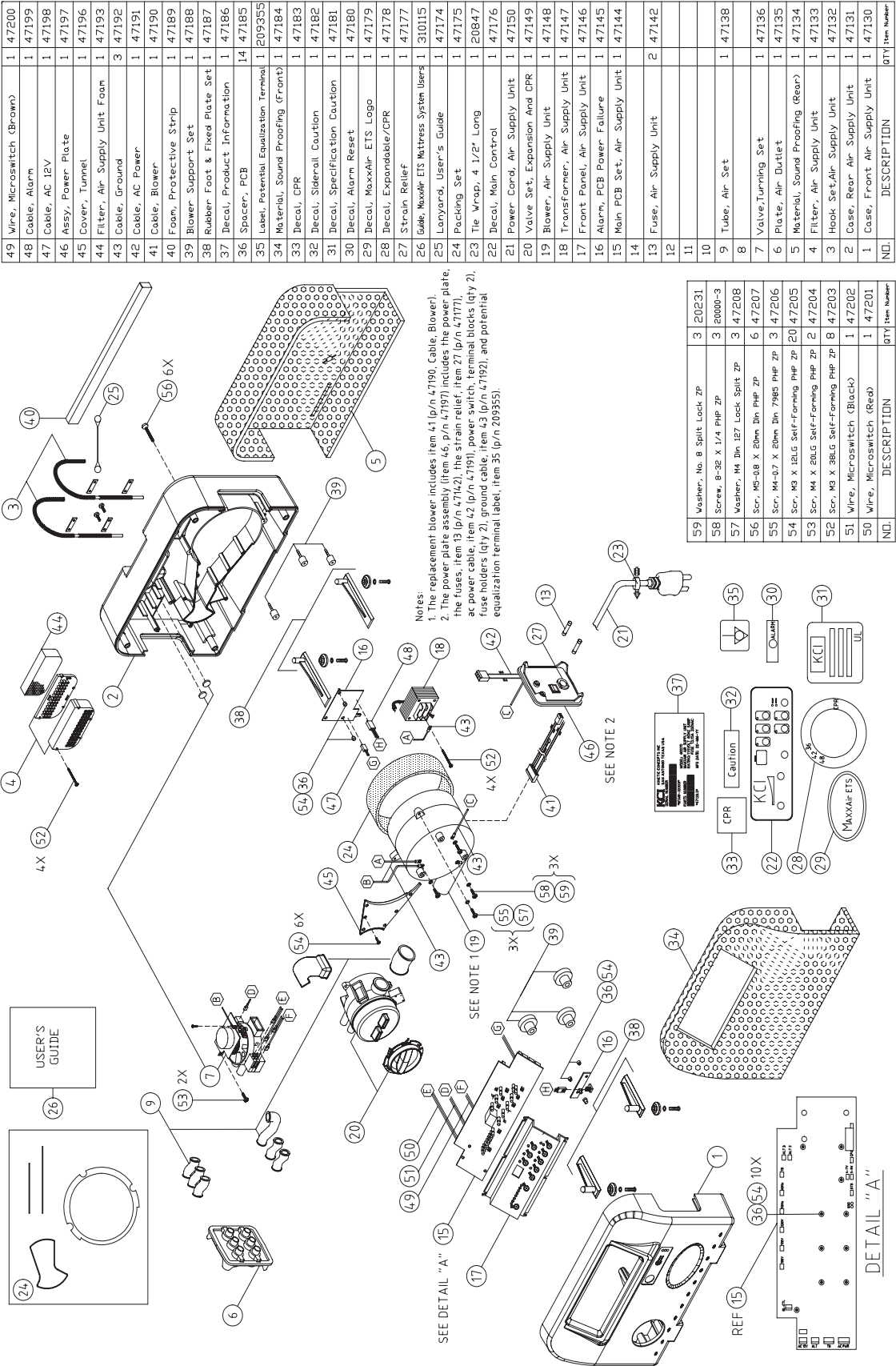


FIG. 1-10. Air Supply Unit

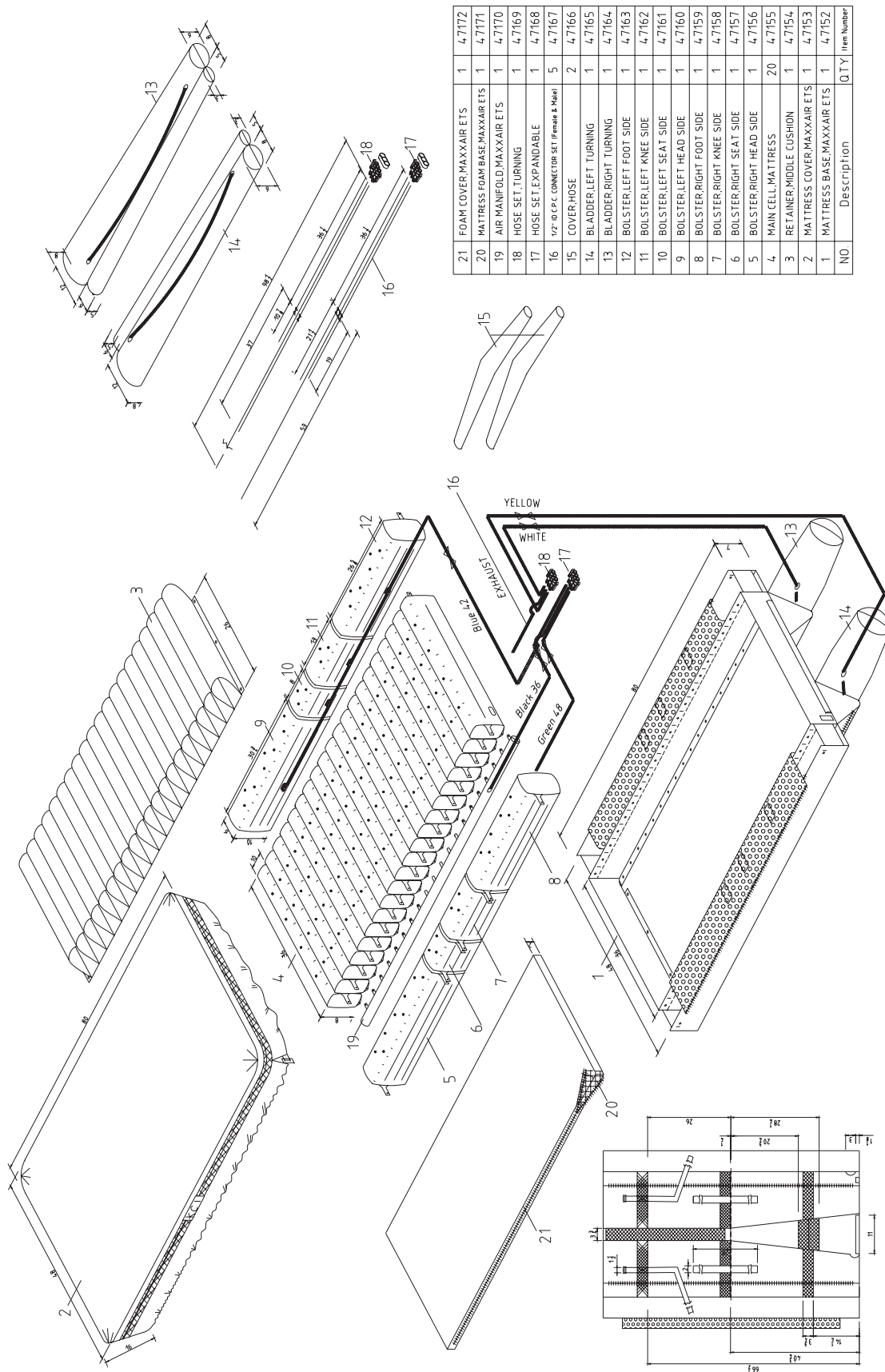


FIG. 1-11. Mattress Assembly

Replacement Parts

1-11

MaxxAir ETS Replacement Parts Manual

## QUESTIONS AND INFORMATION

For questions regarding this product, supplies, maintenance or additional information about ArjoHuntleigh products and services, please contact ArjoHuntleigh or an ArjoHuntleigh authorized representative or visit [www.ArjoHuntleigh.com](http://www.ArjoHuntleigh.com). In the US call 1-800-343-0974.

---

## GETINGE GROUP

**Getinge Group** is a leading global provider of products and systems that contribute to quality enhancement and cost efficiency within healthcare and life sciences. We operate under the three brands of **ArjoHuntleigh**, **Getinge** and **Maquet**. **Getinge** provides solutions for infection control within healthcare and contamination prevention within life sciences. **Maquet** specializes in solutions, therapies and products for surgical interventions, interventional cardiology and intensive care.

---

## ARJOHUNTLEIGH

GETINGE GROUP

ArjoHuntleigh focuses on patient handling and hygiene, disinfection, DVT prevention, medical beds, therapeutic surfaces and diagnostics.



ArjoHuntleigh AB  
Hans Michelsensgatan 10  
211 20 Malmö, Sweden  
**[www.arjohuntleigh.com](http://www.arjohuntleigh.com)**

---