

MATRIX BACK INTERFACE KIT

(for Matrix MAC, E2 and Elite Backs)

for Installation on a

PERMOBIL WHEELCHAIR SEATING SYSTEM

INSTALLATION INSTRUCTIONS

DEALER: The procedures contained in this manual should only be performed by a Qualified Service Technician.



This manual may not be reproduced or reprinted either partly or completely without previous written consent from Motion Concepts or its statutory representatives.

This manual is compiled from the latest product information available at the time of publication. We reserve the right to make any necessary as they become necessary. Any changes made to our products may cause slight variations between the illustrations and explanations in this manual and the product you have purchased. If you have any questions or concerns regarding the information provided in this manual, please contact our Customer Service Department for assistance.

Safety Symbols:

Completing the installation of your Matrix Back Interface depends upon your diligence in following the warnings, cautions and information provided in this Installation Manual.

The symbols below are used throughout all Motion Concepts' manuals to identify warnings, cautions and important notes. It is very important for you to read and understand them completely.



DANGER!

Danger indicates a potentially hazardous situation which, if not avoided, could result in significant non-reversible injury or death.



WARNING!

Warning indicates a potentially hazardous situation which, if not avoided, could result in serious personal injury, compromised safety or device damage



CAUTION!

Caution indicates a potentially hazardous situation which, if not avoided, may result in a minor injury and/or minor device damage.



IMPORTANT!

Indicates important information regarding the operation of your power positioning system, or a hazardous situation that could result in damage to property if not avoided, or both.

Contact Information:

If you have any questions or require support concerning your Motion Concepts product/device, please contact your authorized Motion Concepts Dealer, who has the necessary training and equipment to meet your needs, or you may contact Motion Concepts directly for assistance. The more we are able to understand your needs, the better we will be able to meet them.

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1.0 Safety Information/Warnings

1.1 General Safety Warnings



IMPORTANT! Motion Concepts disclaims all responsibility and liability for any personal injury or damage to property that occurs as a result of improper installation or unsafe use of the Matrix Back Interface Kit, and/or any unauthorized dealer or third party repairs or modifications made to the Interface Kit.



IMPORTANT! Please be certain to also read and understand the detailed safety warnings included in the OEM Power Wheelchair Base Owners Manual *(provided separately)*



DANGER! Risk of Death, Significant injury or damage if the wheelchair seating system and/or Matrix back support is used in any other way than the purpose described

- *Only ever operate the wheelchair/seating system in accordance with the instructions provided in this Manual and your Permobil Wheelchair Owners/Operators Manual (provided separately)*



WARNING! Risk of Serious Injury or Device Damage.

Missing or loosely secured hardware could result in serious injury or device damage.

- *Ensure all mounting hardware is present and tightened securely*
- *Following ANY adjustments, repair or service and before use, make sure that all mounting hardware is tightened securely.*

1.2 Stability Warnings

Only the dealer and/or health care professional can ensure that your wheelchair system meets your individual requirements. It is your dealer or healthcare professional's responsibility to ensure that the wheelchair and seating system are set up properly and safely for your specific needs.



DANGER! Risk of Death, Significant Injury or Device Damage.

By altering your seat position in the wheelchair (via power positioning functions such as tilting/reclining/elevating), you are changing the stability characteristics of the wheelchair. It is essential that the seating system is set up so that it remains stable in all seating positions.

- *NEVER extend your arms backward beyond the back when the seating system is in a tilted or reclined or elevated position. This could shift your center of gravity and cause the wheelchair to become unstable.*
- *Ensure all medical conditions are considered when setting up your wheelchair. Involuntary muscle movement such as spasms may affect the stability of the wheelchair, especially when the seating system is in a tilted, reclined, or elevated position.*



WARNING! Risk of Serious Injury or Device Damage.

The following factors should be considered when evaluating stability:

- *Consider all personal gear and accessories (backpacks, extra batteries, etc..) that will be carried on the wheelchair. For example, a loaded backpack, attached to the back of the seating system can significantly reduce the rearward stability of your wheelchair.*
- *Determine and establish your personal safety limits by practicing bending, reaching and transferring activities in the presence of a qualified healthcare professional before attempting active use of the wheelchair.*

1.3 Motor Vehicle Transportation Warnings



DANGER! Risk of Death, Significant Injury or Device Damage.

Your Matrx Back Support in combination with the wheelchair base has NOT been crash tested and may NOT be used as a vehicle seat!

- *Your Motion Concepts Matrx Back (in combination with the OEM wheelchair power base) has not been tested to the requirements of ISO 7176-19:2001 or ANSI/RESNA WC-19 and may not under any circumstances be used as a vehicle seat or to transport the user in a vehicle.*
- *Using a wheelchair that does not fulfill these criteria as a vehicle seat can lead to the most severe injuries and even death in the event of a motor vehicle accident.*



DANGER! Risk of Death, Significant Injury or Device Damage.

When travelling in a motor vehicle you must be properly secured in a motor vehicle seat with safety belts securely fastened.

- *Although your chair may be equipped with a positioning belt, this belt is not designed to provide proper restraint during motor vehicle transport. DO NOT sit in your wheelchair while it is in a moving vehicle.*

1.4 Hardware

Unless otherwise indicated, all the hardware required to complete the installation will be provided by Motion Concepts.



WARNING! Risk of Serious Injury or Device Damage.

Use of non-approved hardware may result in serious injury or damage.

- *DO NOT substitute hardware. The hardware used in the assembly and installation of our Matrx Back Interface is high strength. Unless otherwise specified, use only the hardware supplied.*

1.5 Weight Capacity

NOTE: Several different Matrx backs are available to interface onto Permobil wheelchair seating systems, including models of our Matrx E2, Matrx MAC and Matrx Elite Backs. Back widths are limited to a range from 16"W (41cm) up to 20"W (51cm), with a maximum load/weight capacity of 300lb (136kg) for each Matrx back model available.



WARNING! Risk of Serious Injury or Device Damage

Exceeding the weight capacity of the wheelchair/seating system could cause instability resulting in serious injury or device damage.

- *DO NOT exceed the maximum weight capacity of the wheelchair seating system or the wheelchair base.*
- *DO NOT use the wheelchair to transport more than one person. The wheelchair is only designed for use by a single occupant whose maximum weight does not exceed the maximum permissible load of the device.*
- *DO NOT carry heavy objects on your lap while operating the wheelchair.*



IMPORTANT! If you have any concerns or questions regarding weight capacities, or if the total occupant weight is determined to be greater than the maximum permissible load, please contact our Technical Service Department immediately.

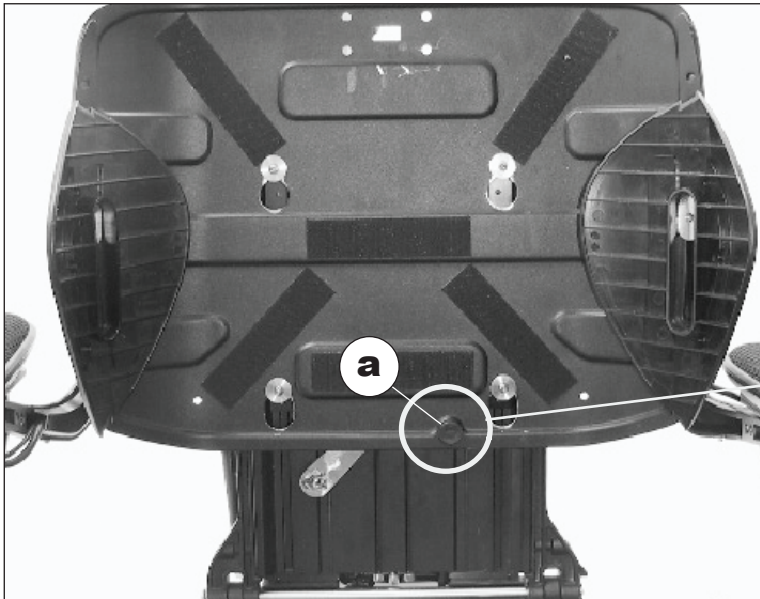
2.0 Preparing the Permobil Seating System



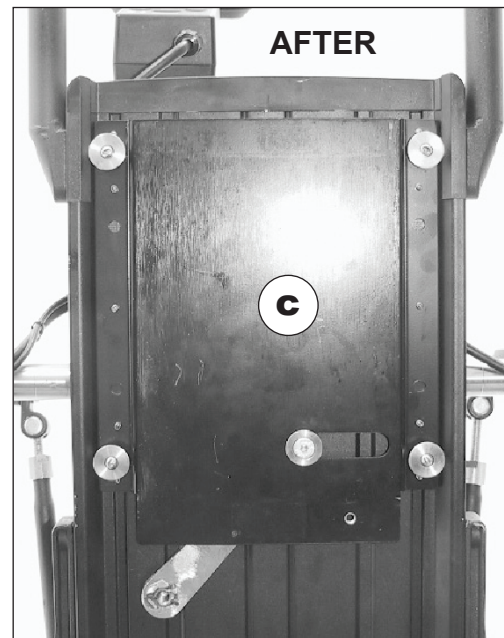
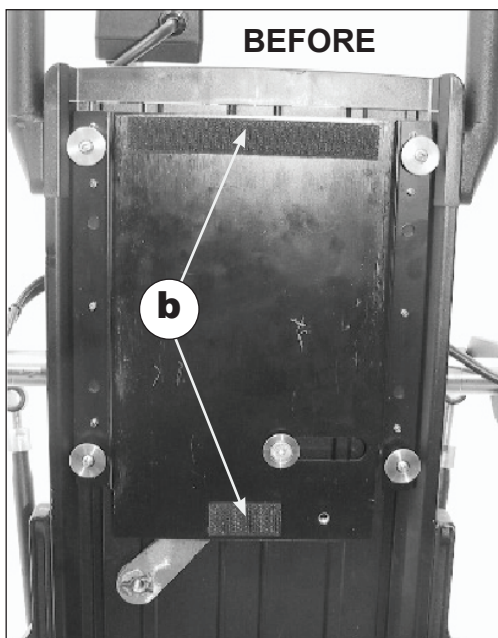
Some of the original Permobil mounting hardware is required to complete the Matrix Back installation. Please read through the entire installation instruction prior to removing the original back shell.

2.1 REMOVE THE EXISTING PERMOBIL BACK SUPPORT

1. Remove the existing Permobil back support from the wheelchair. If necessary, refer to the Permobil Wheelchair Owners Manual (*provided separately*) for further instructions on removing the existing back shell.
- i IMPORTANT!** Be sure to retain the OEM Thumb Screw (**a**) following removal of the original Permobil back (see image below). The thumb screw **MUST** be reinstalled following installation of the Matrix Back Interface.
2. Remove the adhesive hook and loop strips (**b**) from the Back Support Plate (**c**), and clean the plate surface to remove any residual adhesive.



**REMOVE AND RETAIN
THE THUMB SCREW**



3.0 Matrx Back/Permobil Interface Kits

NOTE: Your Matrx Back/Permobil Interface Kit will differ slightly depending on the model of Matrx Back being installed. Separate installation instructions are provided for our Matrx E2/MAC Backs (Section 3.2) and our Matrx Elite Backs (Section 3.3). Make certain to refer to the instructions applicable to the Matrx Back being installed.

Tools Required:

The following tools are recommended when performing a system installation:

- Metric Wrench Set and/or Metric Socket Wrench Set
- Metric Hex Key Set
- Tape Measure

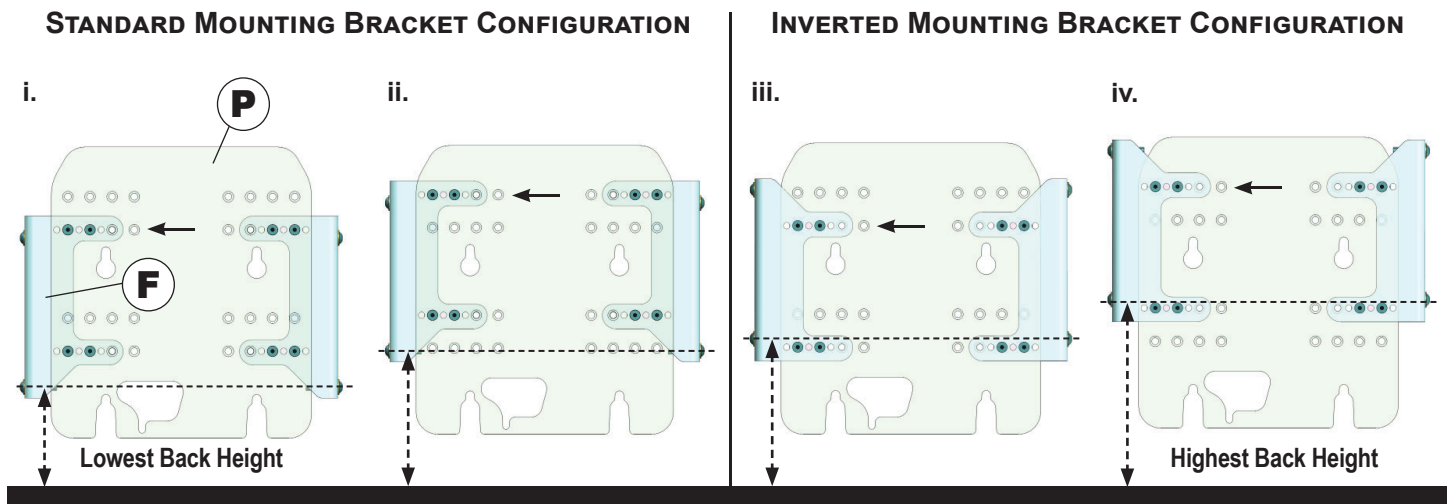
WARNING! Risk of Serious Injury or Device Damage.
Use of non-approved hardware may result in serious injury or damage.
• DO NOT substitute hardware. The hardware used in the assembly and installation of the Matrx Back Interface Kit is high strength. Unless otherwise specified, use only the hardware supplied.

3.1 BEFORE YOU BEGIN

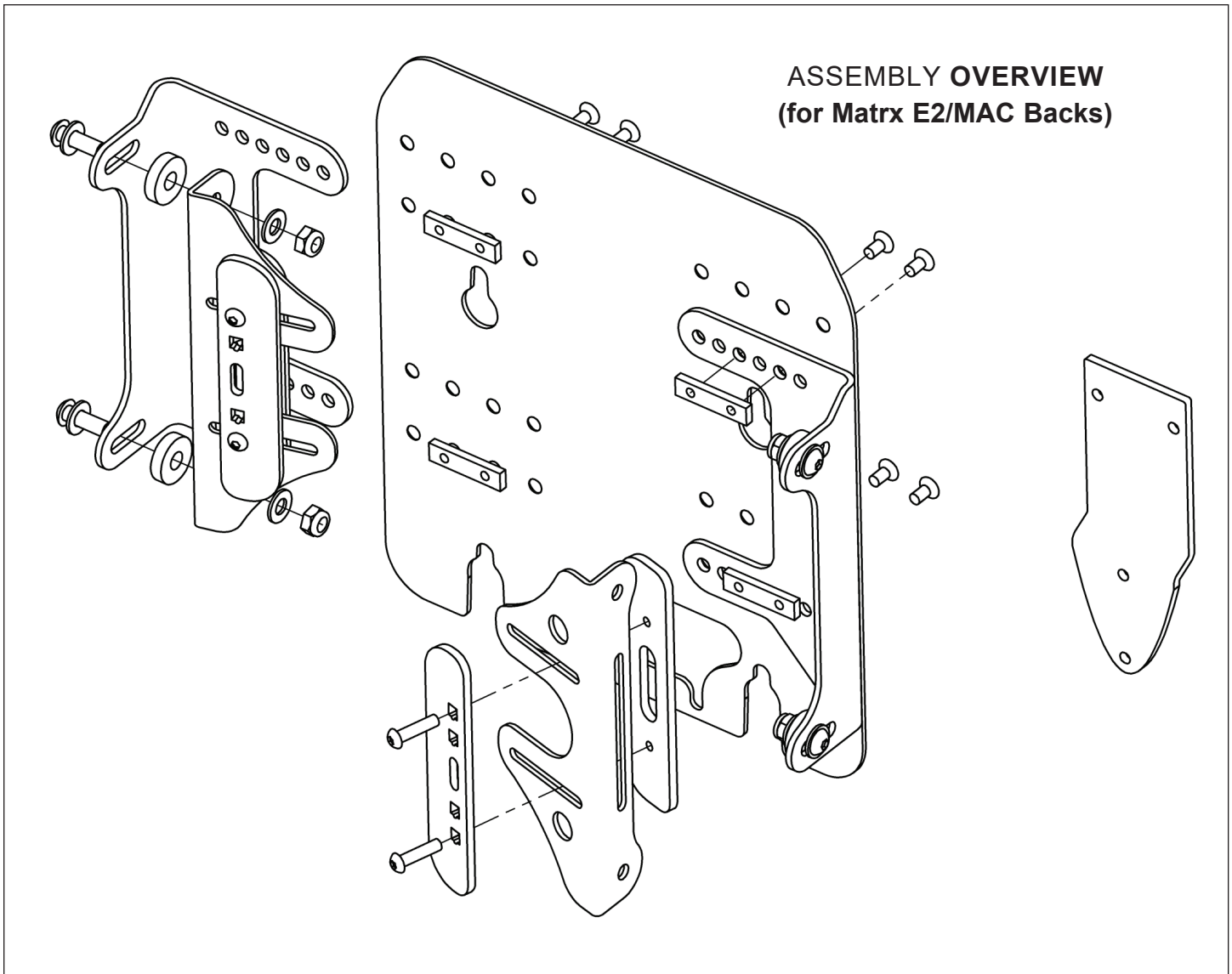
Before beginning the Matrx Back installation, please note that the orientation and mounting location of the Universal Mounting Brackets (**F**) on the Rear Mounting Plate (**P**) will affect the final height of the Matrx Back (relative to the Seat Cushion). For most standard installations, the back height is typically configured to one of the lower mounting positions (option i. or ii.). Prior to installing the Universal Mounting Brackets, determine the most appropriate configuration based on the options illustrated below).

Note: the Matrx E2 and MAC Backs allow for further/additional fine-tune height adjustment via the vertical slots in their back shells- refer to **section 3.2.4**.

3.1.1 OPTIONAL HEIGHT ADJUSTMENTS:



3.2 MATRX E2/MAC BACK INTERFACE KIT INSTALLATION

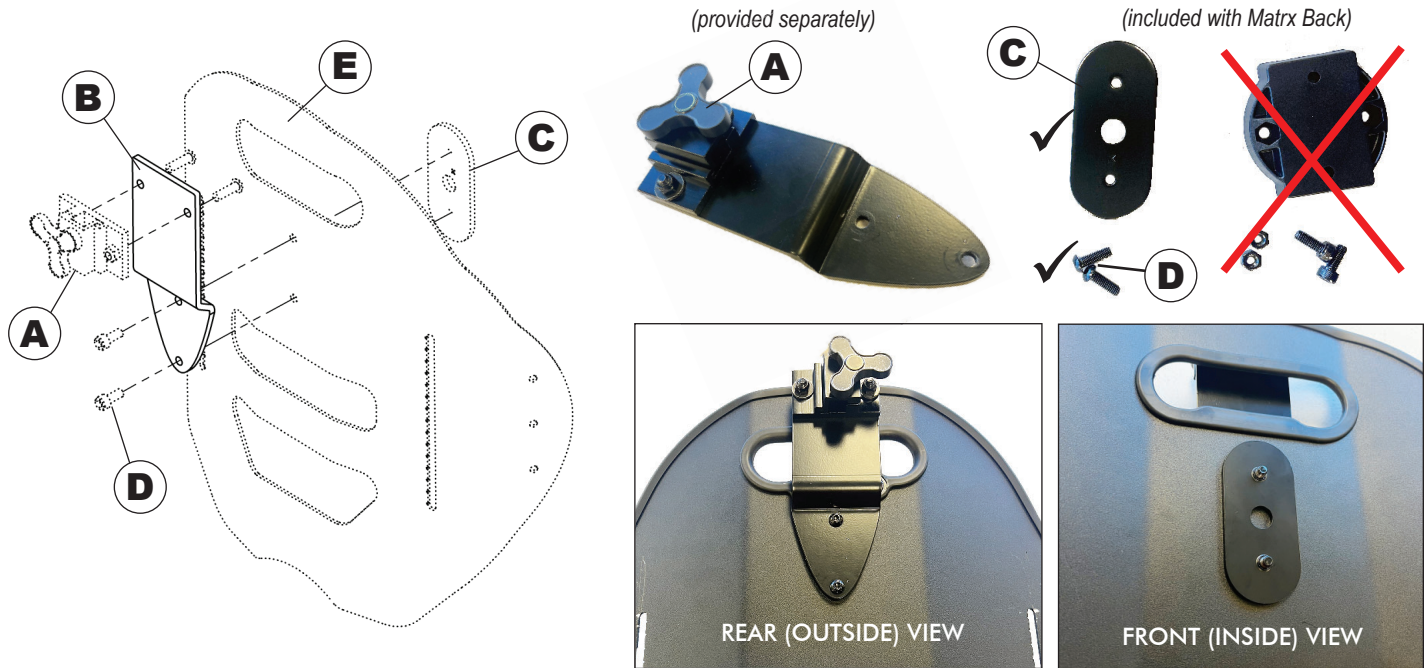


3.2.1 INSTALLING THE HEADREST EXTENSION PLATE (refer to images below)

i NOTE: The Headrest Extension Plate must be installed onto the Matrx E2/MAC back shell PRIOR to assembly/ installation of the Matrx Back/Permobil Interface

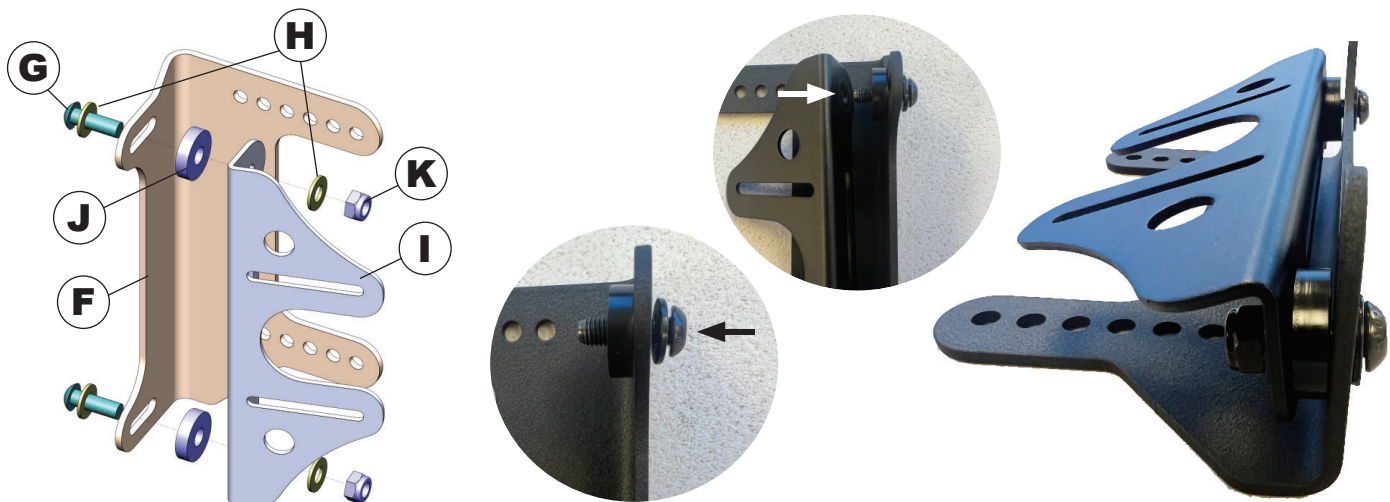
1. Install the Headrest Clamp kit **(A)** (*provided separately*) onto to the **Headrest Extension Plate (B)**. (Using the hardware provided with the headrest clamp kit)
2. Remove the outer cover from the Matrx back rest to expose Back Shell **(E)**
3. Using the Nut Plate **(C)** and M6 x 18mm Button Head Screws **(D)** provided with the Matrx Headrest Interface Kit, attach the Headrest Extension Plate **(B)** onto the rear face of the back shell **(E)**. Ensure all hardware is fully tightened.

3.2.1 INSTALLING THE HEADREST EXTENSION PLATE (...cont'd)



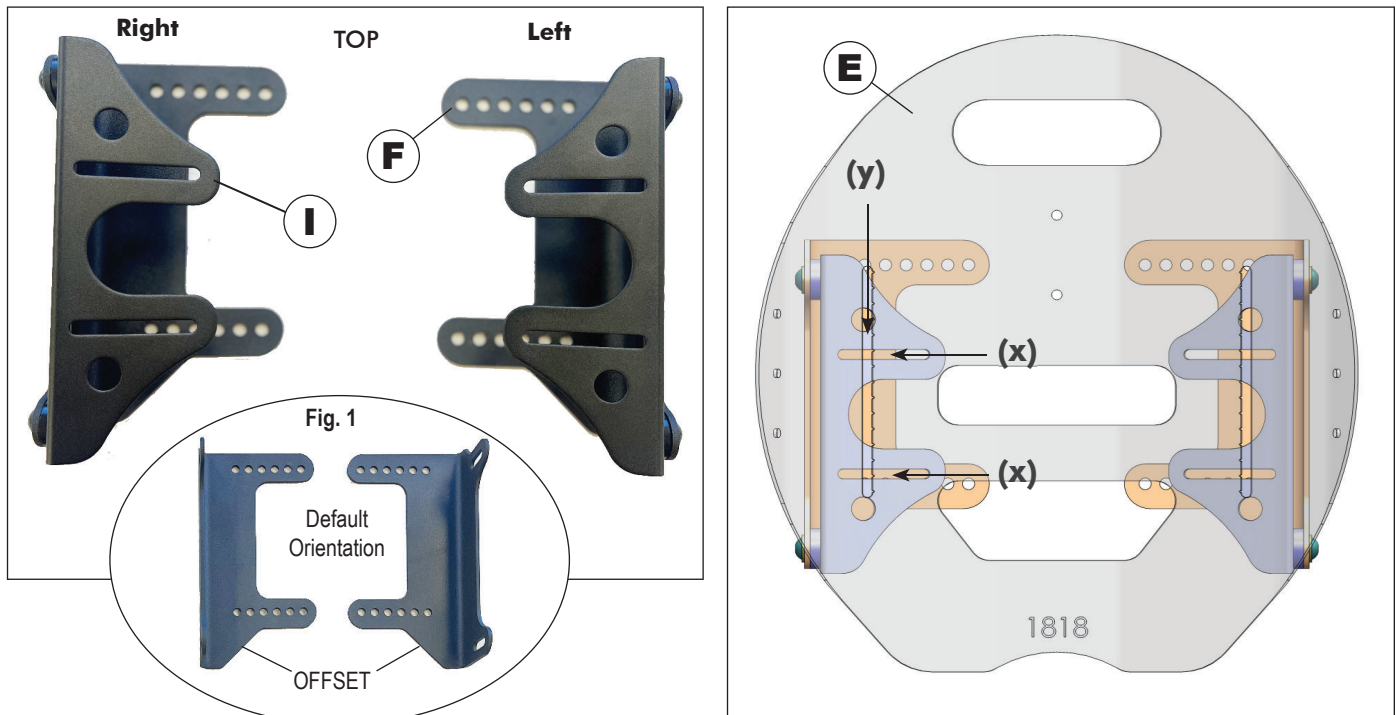
3.2.2 ASSEMBLING THE INTERFACE MOUNTING BRACKETS

- Working on one interface bracket assembly at a time (left or right), install the **Universal Mounting Bracket (F)** onto the corresponding **Matrix Interface Bracket (I)**, using the M8 x 25mm button head screws (**G**), M8 washers (**H**), 0.25" thick spacers* (**J**) and the M8 nyloc nuts (**K**). (**Note:** DO NOT fully tighten hardware at this time).

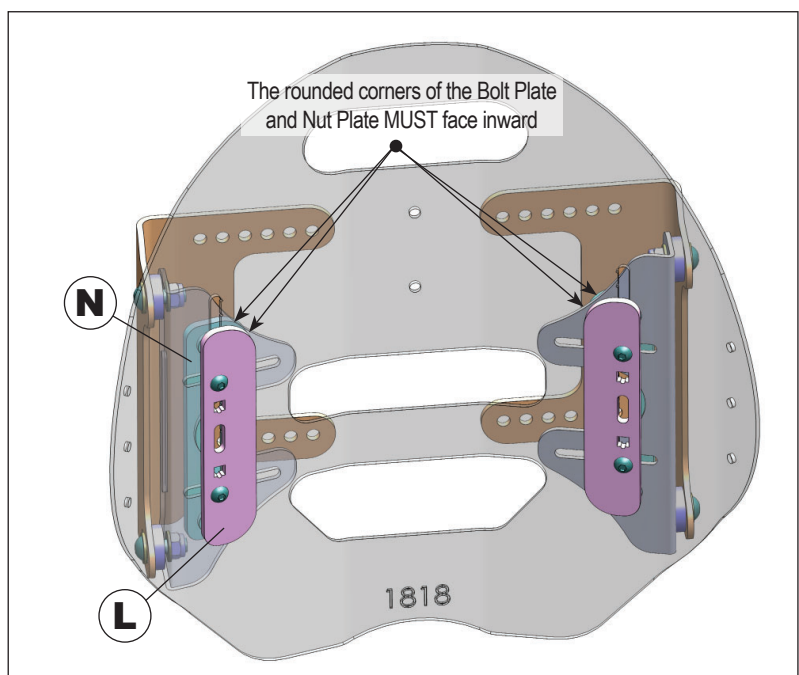
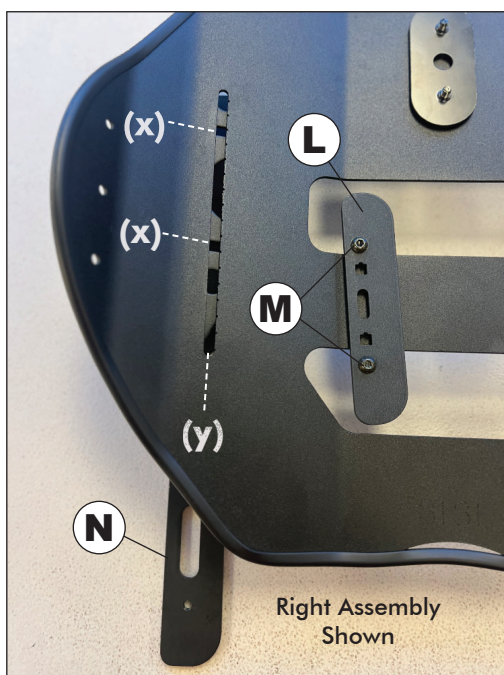


- Repeat assembly Step 1. for the opposite/remaining **Universal Mounting Bracket (F)** and **Matrix Interface Bracket (I)**.
- Place the assembled interface bracket assemblies on a flat surface with the Universal Mounting Brackets facing down (as shown below). (**Note:** In order to mount your Matrix back as low as possible, the offset portion of the Universal Mounting Brackets (F) should be oriented downward (see **Fig. 1** below). Further back height adjustments can be made via the adjustment slots in the back shell and/or the mounting position of the Rear plate (see **Section 3.2.4**)
- Place/align the Matrix back shell (**E**) face-up on top of the Matrix interface brackets (**I**) as illustrated.

3.2.2 ASSEMBLING/INSTALLING THE INTERFACE MOUNTING BRACKETS (...cont'd)

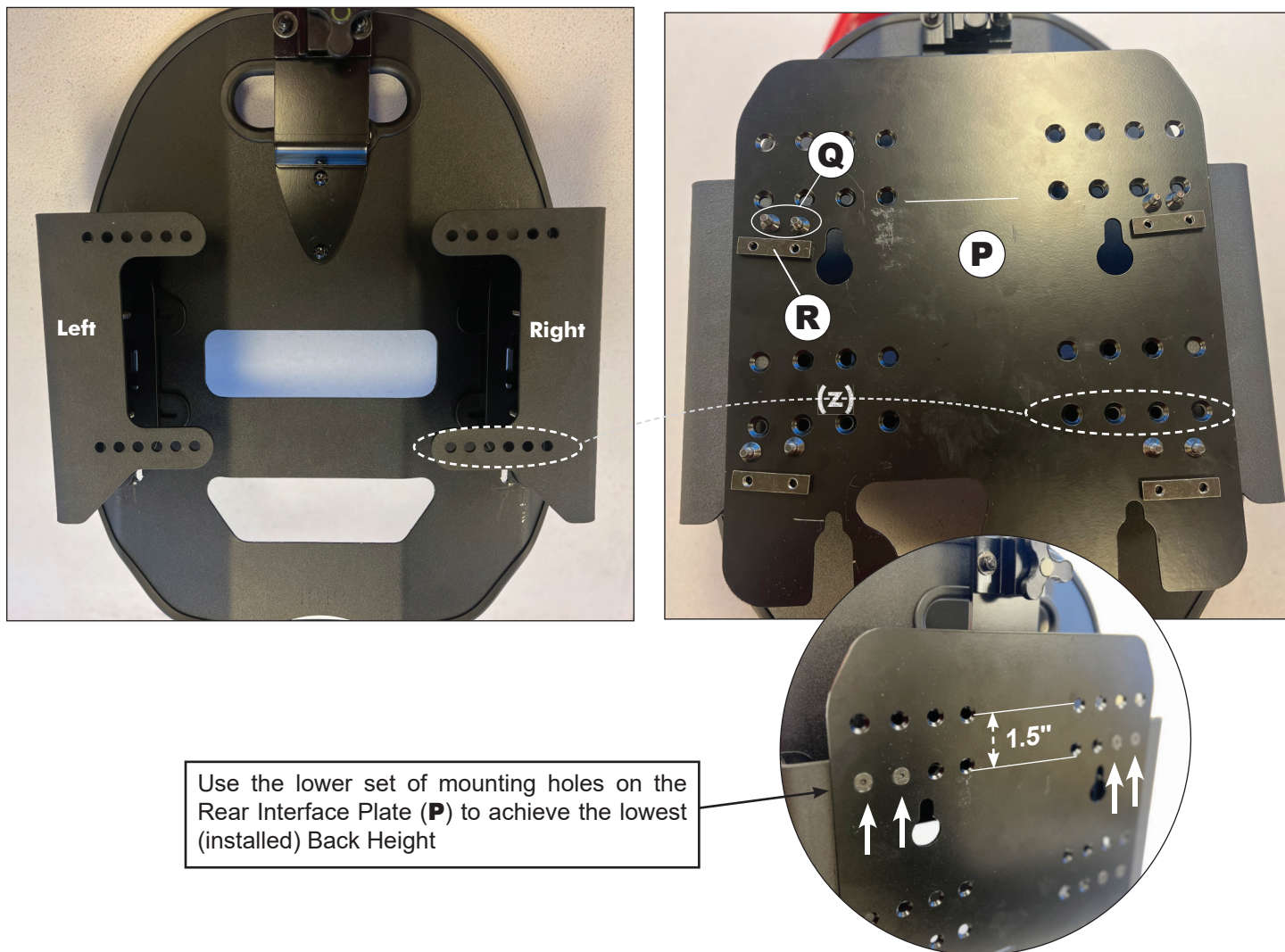


5. Working on side at a time, align the vertical slots **(y)** in the back shell **(E)** with the horizontal slots **(x)** in the Matrix Interface Bracket **(I)**.
 6. Secure the back shell to the bracket assembly using the M6 x 25mm button head screws **(M)**, the Bolt Plate **(L)** and the Nut Plate **(N)**. (**Note:** Do Not fully tighten the screws at this time)
- i Important!** The **rounded corners** of the Bolt Plate **(L)** and Nut Plate **(N)** **must** always face inward when installed- see images below. (*The orientation applies to left and right assemblies*)
7. Repeat steps 5-6 to install the interface bracket assembly onto the opposite side of the back shell.
 8. Once both bracket assemblies have been (loosely) installed, flip the back shell over so that it is facing downward.



3.2.2 ASSEMBLING/INSTALLING THE INTERFACE MOUNTING BRACKETS (...cont'd)

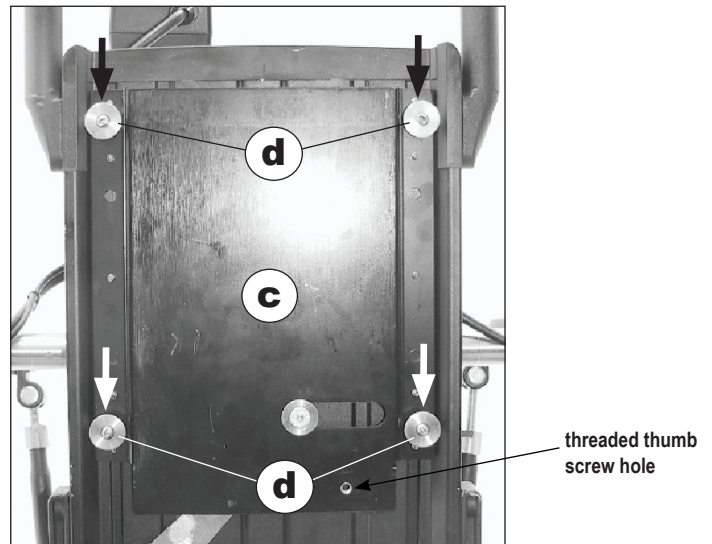
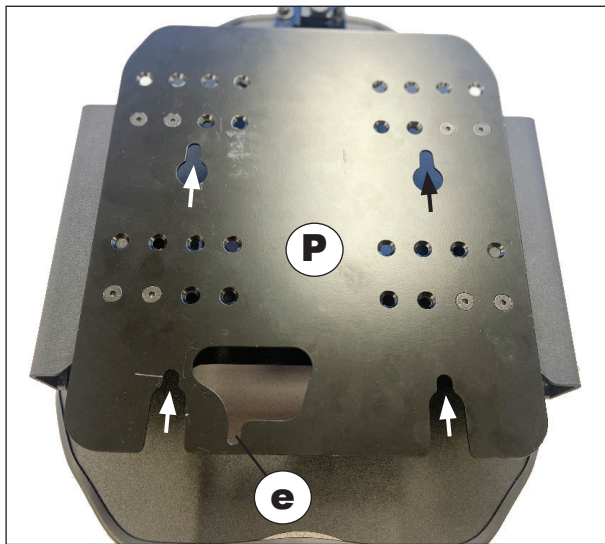
9. Place the Rear Mounting Plate (**P**) over top of the universal mounting brackets. Ensure the 'notched' cutouts on the mounting plate are toward the bottom of the back shell (as illustrated below).
10. Determine the final mounted height of the Matrix Back, prior to installation of the Rear Interface Plate (**P**). Selecting the lower set of mounting holes in the rear interface plate will position the Matrix back at the lowest possible back height (relative to the seat cushion). The upper set of mounting holes will increase the overall back height by 1.5". (See also **Section 3.1.1**).



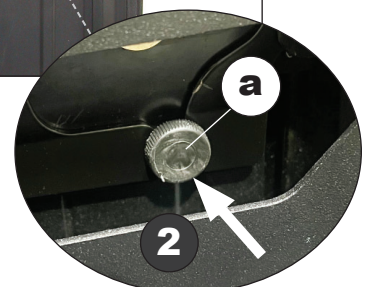
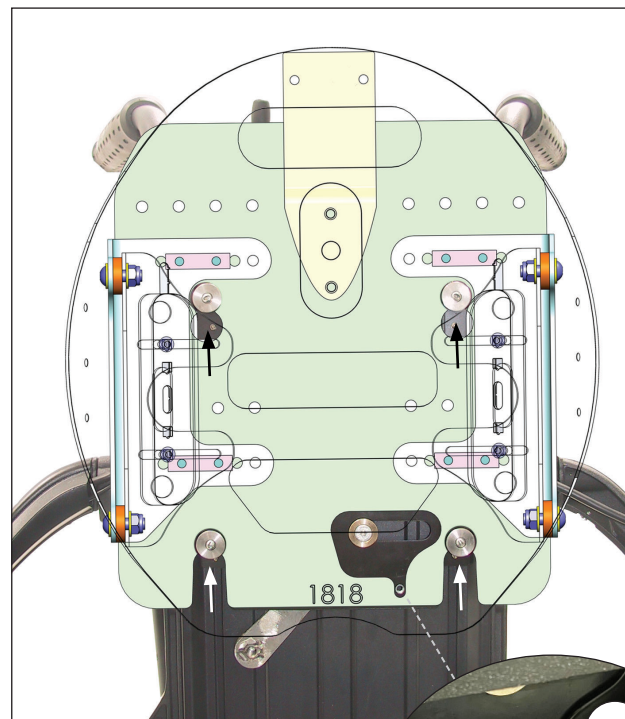
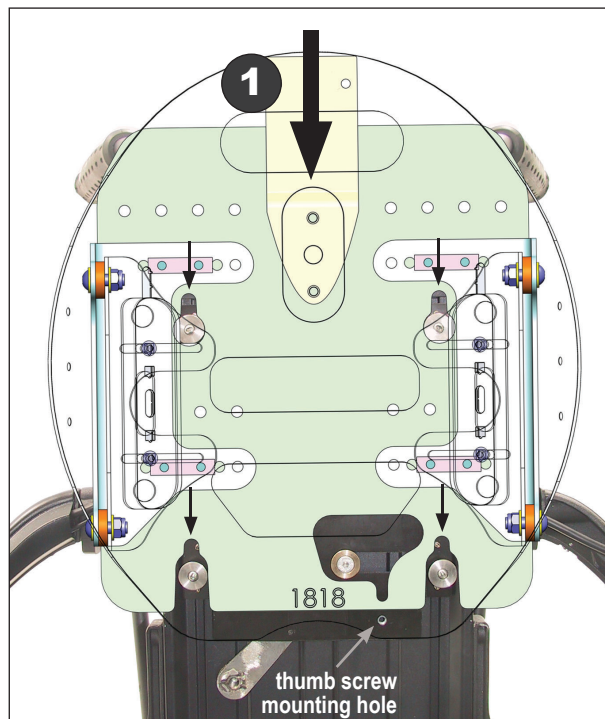
11. Align the mounting holes on the Rear Interface Plate (**P**) with the mounting holes on the left and right mounting bracket assemblies (**Z**). (**Note:** Whenever possible, align with the **OUTERMOST** holes on the rear mounting plate- as illustrated above).
12. Using the M6 x12mm flat head screws (**Q**) and the clamping bars (**R**), secure the Rear Mounting Plate onto the Interface Brackets (4 locations). Fully tightened all screws.

3.2.3 INSTALLING THE MATRX BACK INTERFACE

1. Align the four slots in the Rear Interface Plate (**P**) with the corresponding mounting pins/posts (**d**) on the Permobil back support plate (**c**).



2. When Installing, ensure that the Rear Interface Plate (**P**) is flush up against the back support plate (**c**) then press down (**1**) firmly on the Matrix Back assembly down so that it locks into place on the mounting posts (**d**). Verify that the back plate properly is fully seated onto each of the four mounting posts.
3. When installed correctly the threaded hole for the Permobil thumb screw should be visible through the notched cutout (**e**) in the rear mounting plate.
4. Re-install the OEM Thumb Screw (**a**) to secure the Matrix Back Assembly onto the Permobil back support plate (**2**).



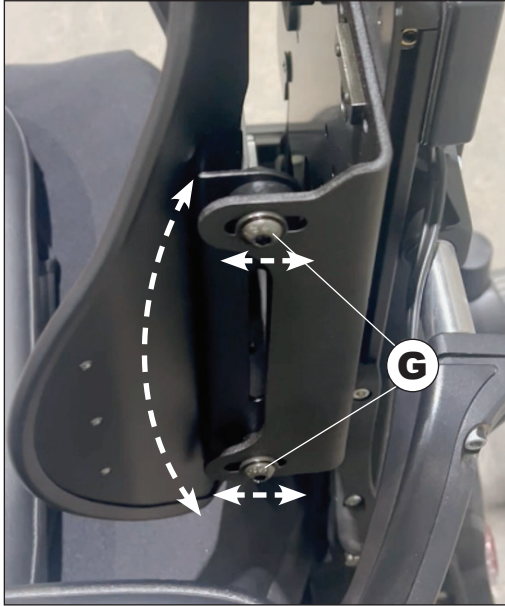
DANGER! Risk of serious injury or device damage

The **original Permobil thumb screw must** be re-installed to lock the back in place on the wheelchair. Failure to do so could cause the back to disengage from the mounting posts resulting in serious personal injury.

3.2.4 FINAL BACK ADJUSTMENTS (DEPTH, HEIGHT, BACK ANGLE)

i NOTE: For a standard back installation, adjustments to the Back Depth, Angle and Height should be made equally/symmetrically on the left and right side of the back support.

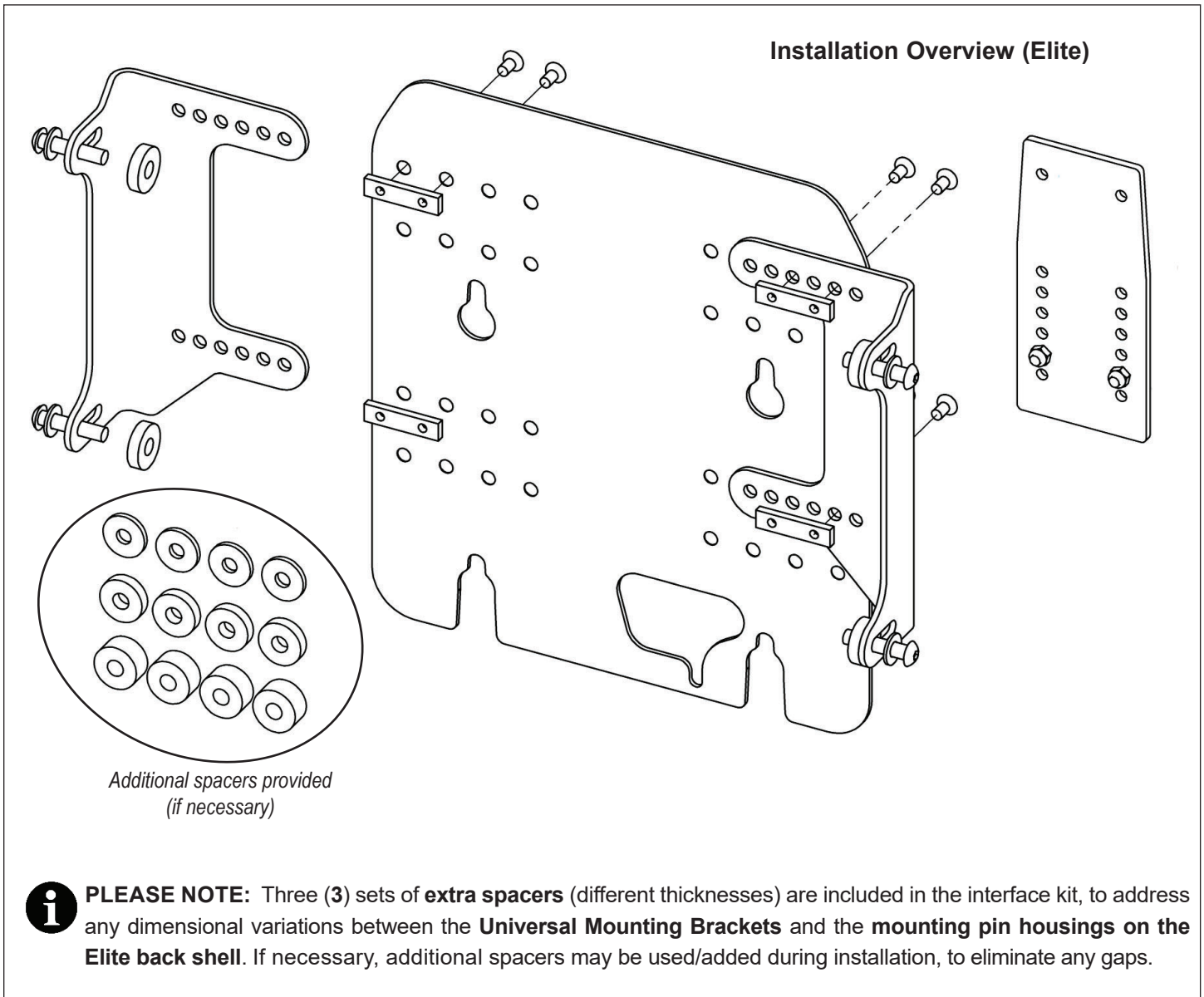
1. **Depth/ Back Angle Adjustment:** Use the M8 screws (**G**) to adjust the back depth and back angle via the slotted channels in the left and right Interface Bracket Assembly (Universal Mounting Brackets).
2. **Back Height Adjustments:** Use the M6 Button Screws (**M**) on the inside (front) of the back shell (Bolt Plates) to make final back height adjustments via the vertical slots in the Matrix back shell.



3. Once all the final back adjustments have been completed. Verify that all mounting hardware has been fully secured, and ensure the outer cover of the back support is properly installed onto the back shell.



3.3 MATRX ELITE BACK INTERFACE KIT INSTALLATION

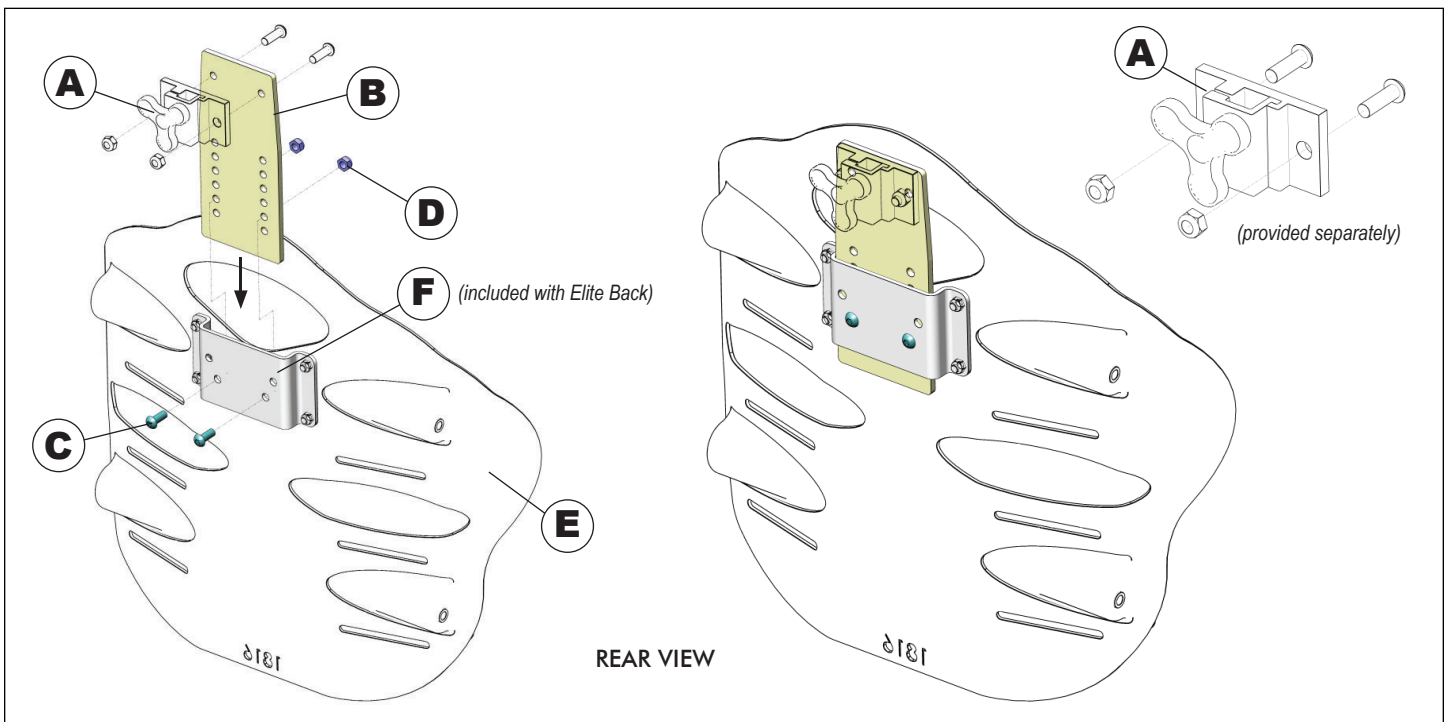


3.3.1 INSTALLING THE ELITE HEADREST EXTENSION PLATE (refer to images below)

i NOTE: The Headrest Extension Plate must be installed onto the Matrx Elite back shell PRIOR to assembly/installation of the Matrx Back/Permobil Interface

1. Install the Headrest Clamp Kit (**A**) (*provided separately*) onto to the **Headrest Extension Plate (B)**. (Using the hardware provided with the headrest clamp kit)
2. Remove the outer cover from the Matrx Elite back rest to expose the Back Shell (**E**)
3. Using the M6 x 16mm Button Head Screws (**C**) and M6 Nyloc Hex Nuts (**D**) provided with the Elite Headrest Adapter Plate (EHRA Plate), attach the Headrest Extension Plate (**B**) onto the Adapter Plate (**F**). (**Note:** *Install the headrest extension plate on the 'inside' of the headrest adapter plate, as shown*). Ensure all hardware is fully tightened.

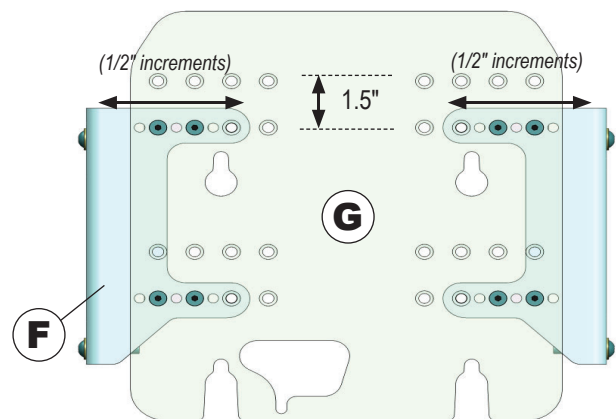
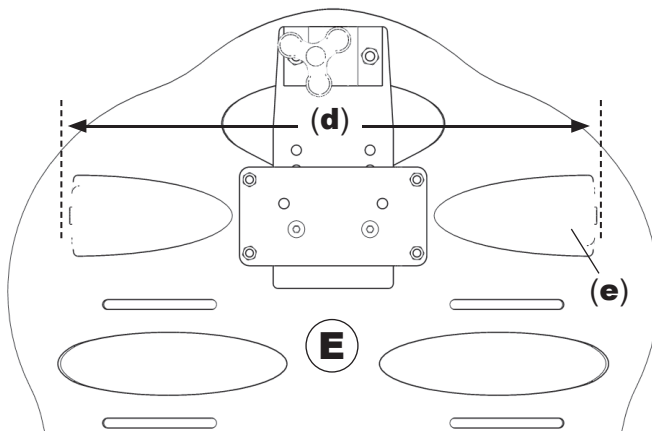
3.3.1 INSTALLING THE HEADREST EXTENSION PLATE (...cont'd)



3.3.2 ASSEMBLING/INSTALLING THE MOUNTING BRACKET INTERFACE

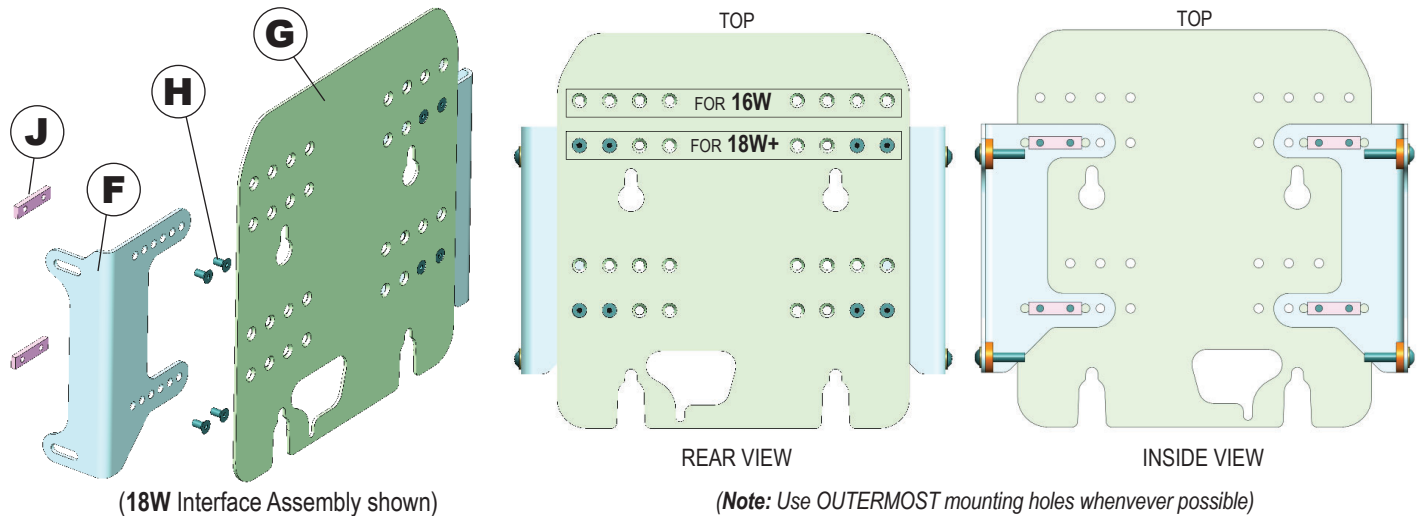
i IMPORTANT! The final back height is determined by the mounting position of the **Universal Mounting Brackets** on the **Rear Interface Plate**. Please refer to **Section 3.1 PRIOR** to beginning the installation. For most end users, the lowest mounting bracket interface configuration is recommended.

1. Once the orientation of the Universal Mounting Brackets (**F**) has been determined, the mounting position (height and width) of the mounting brackets on the Rear Interface Plate (**G**), must then be determined.
2. The correct mounting position of the left and right mounting brackets can be determined by measuring the distance (**d**) between the mounting pin housings (**e**) on the back of the Matrix Elite back shell (**E**).
3. **Width Adjustment:** The Universal Mounting Brackets (**F**) are adjustable in 1/2" increments to align with standard Elite Back widths (16W - 20W)*. (**Always adjust Mounting Brackets symmetrically on the Rear Interface Plate; For every 1" increase in back width, adjust each mounting bracket outward by 1/2"**)
NOTE: when adjusting the bracket width, ensure there is a minimum 1/2" gap between the mounting brackets and the pin housings to allow room for installation of the 1/4" spacers - refer to step 7. below
4. **Height Adjustment:** The Rear Interface Plate (**G**) provides two rows of mounting holes. Selecting the lower set of mounting holes will position the Elite Back at the lowest possible back height. Using the upper set of mounting holes will increase the final back height by 1.5". (**NOTE:** for **16W** Elite Backs the upper holes **MUST** be used)



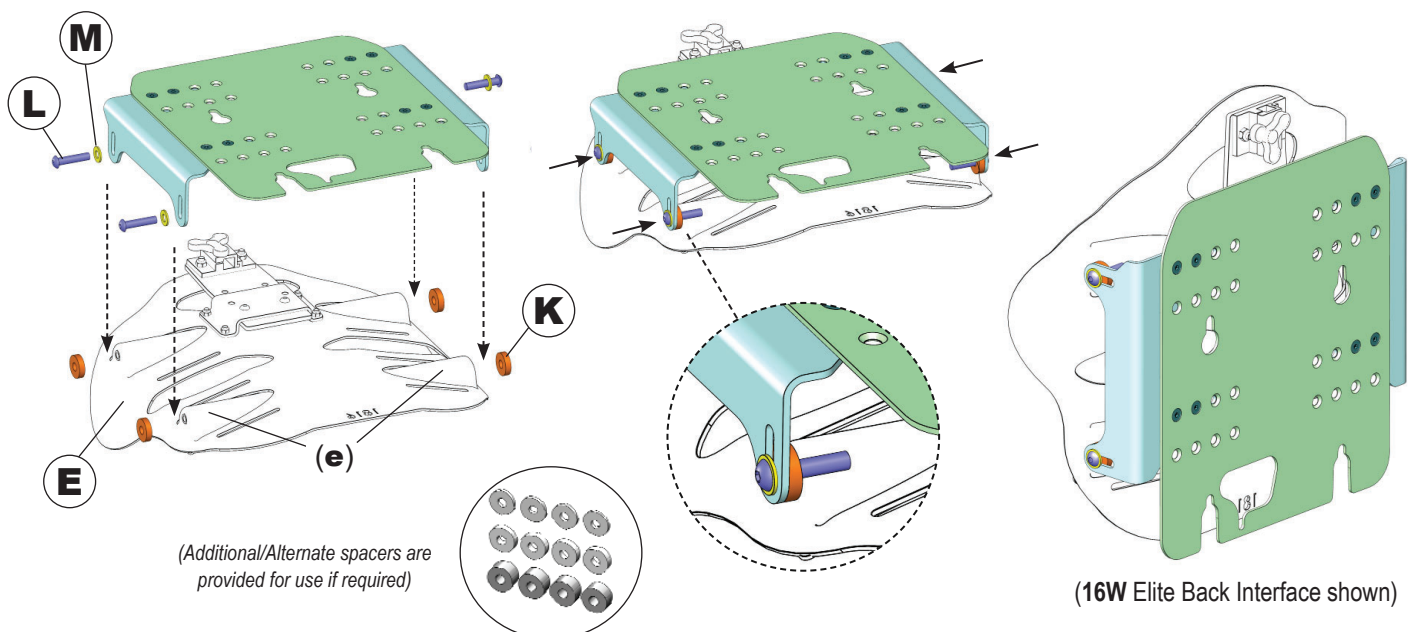
3.3.2 ASSEMBLING/INSTALLING THE MOUNTING BRACKET INTERFACE (...cont'd)

4. The mounting brackets are installed onto the inside of the rear interface plate using M6 x12mm flat head screws (**H**) and clamping bars (**J**), as illustrated below (4 screws per mounting bracket). (**Note: Whenever possible, align the mounting brackets with the **OUTERMOST** holes on the rear interface plate - as shown).**



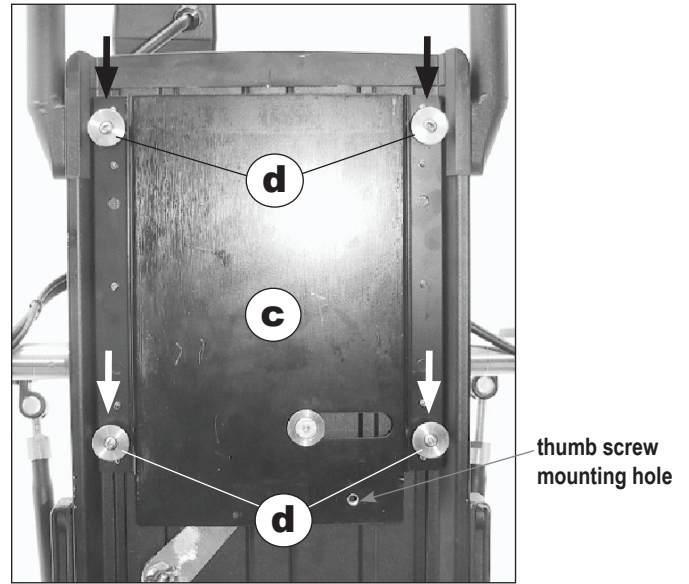
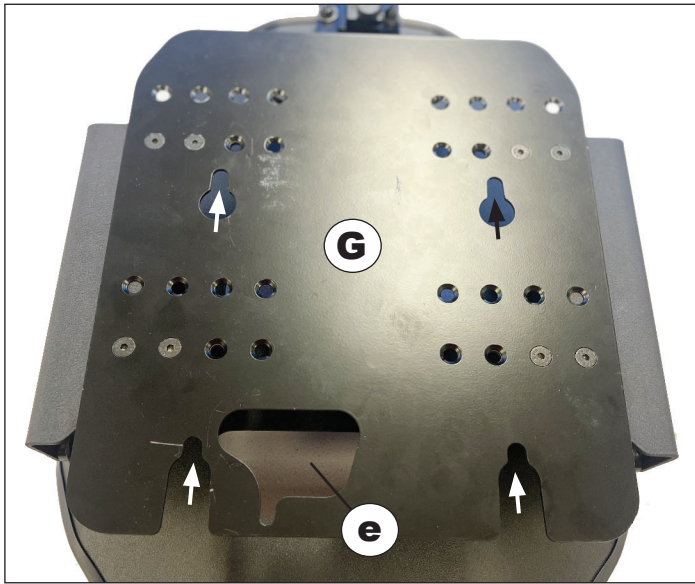
5. Place the Matrix Elite back shell (**E**) face-down on a flat surface.
6. Ensure the Mounting Bracket Interface (Rear Plate) (**G**) is in the proper orientation (with notched cutouts at the bottom), then align the 4 mounting holes/slots on the universal mounting brackets, with the threaded holes on the Elite Back mounting pin housings (**e**)- as illustrated below.
7. Using the 5/16 x 1.5" Button Head Screws (**L**), 5/16 Washers (**M**) and 0.25" Spacers* (**K**) provided, secure the Mounting brackets onto the Matrix Elite Back Shell (4 locations). Fully tightened all screws.

***Note: The Spacers (**K**) *MUST* be installed in between the mounting brackets and the mounting pin housing, as illustrated below. (Additional spacers are provided and may be added to compensate for any dimensional variations (gaps) between the universal mounting brackets and the mounting pin housings).**

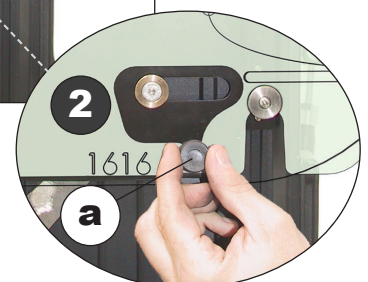
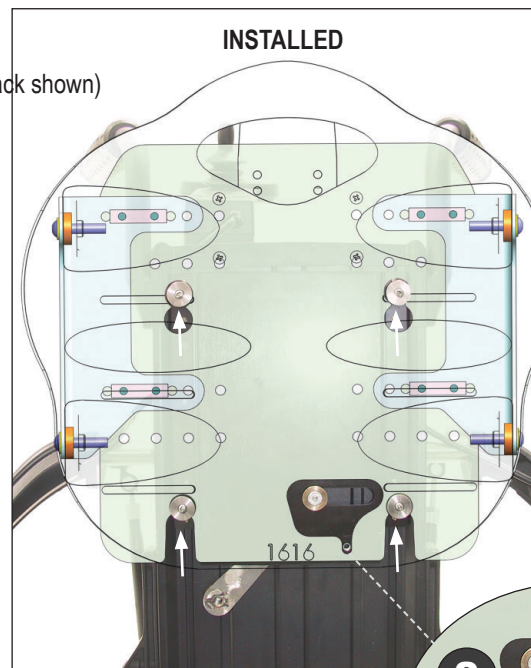
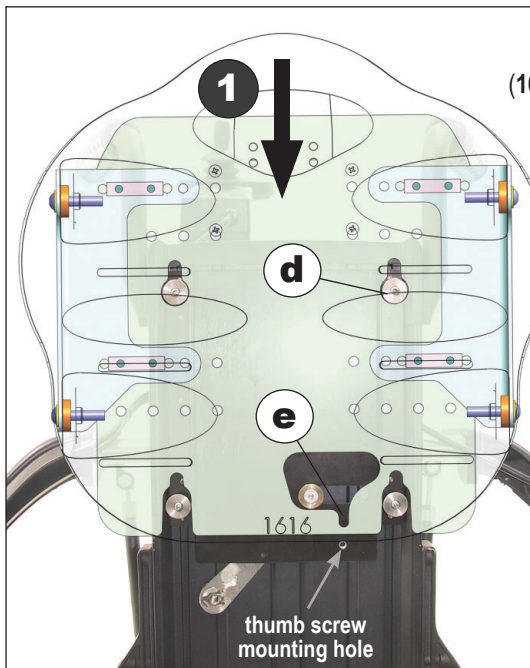


3.3.3 INSTALLING THE MATRIX BACK INTERFACE

1. Align the four slots in the Rear Interface Plate (**G**) with the corresponding mounting pins/posts (**d**) on the Permobil back support plate (**c**).



2. When Installing, ensure that the rear interface plate is flush up against the back support plate then press down (**1**) firmly on the Matrix Back assembly down so that it locks into place on the mounting posts (**d**). Verify that the back plate is fully seated onto each of the four mounting posts.
3. When installed correctly the threaded hole for the Permobil thumb screw hole should be visible through the notched cutout (**e**) in the rear interface plate.
4. Re-install the OEM Thumb Screw (**a**) to secure the Matrix Elite Back Assembly onto the Permobil back support plate (**2**).



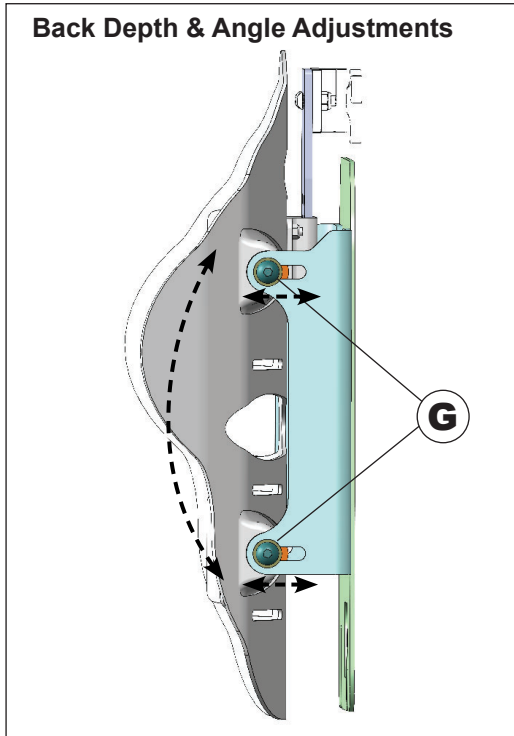
DANGER! Risk of serious injury or device damage

The **original Permobil thumb screw must** be re-installed to lock the back in place on the wheelchair. Failure to do so could cause the back to disengage from the mounting posts resulting in serious personal injury.

3.3.4 FINAL BACK ADJUSTMENTS (DEPTH AND BACK ANGLE)

i NOTE: For a standard back installation, adjustments to the Back Depth and Back Angle should be made equally/symmetrically on the left and right side of the back support.

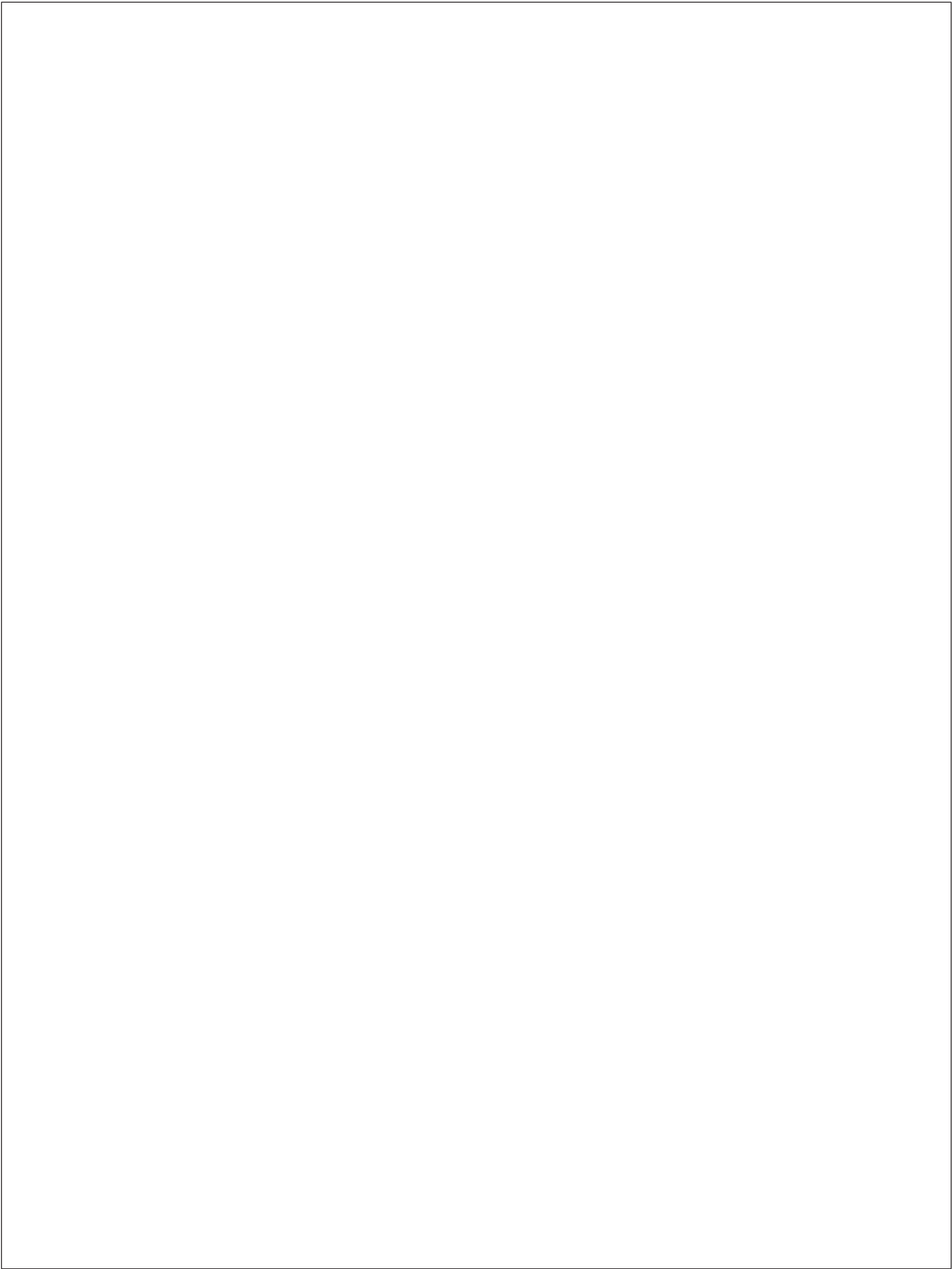
1. **Back Depth/Angle Adjustments:** Use the M8 screws (**G**) to adjust the back depth and back angle via the slotted channels in the left and right Universal Mounting Brackets.
2. Once all the final back adjustments have been completed. Verify that all mounting hardware has been fully secured, and ensure the outer cover of the back support is properly installed onto the back shell.



If you have any concerns or questions regarding the Matrix Back Interface Installation, please contact our Technical Service Department for assistance.

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