

Treatment Chair

T688 Series

Service Manual



**FRESENIUS
MEDICAL CARE**

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Serial Number

The serial number and date of manufacture are located on a white label on the chair's base.

- The date of manufacture is in the following format: **YYYY-MM-DD**.
- The "0" in the serial number is a "zero".
- The letters "O" and "I" will not be used in the serial numbers.
- The label identifying the serial number is located on the base of the chair (see picture below).

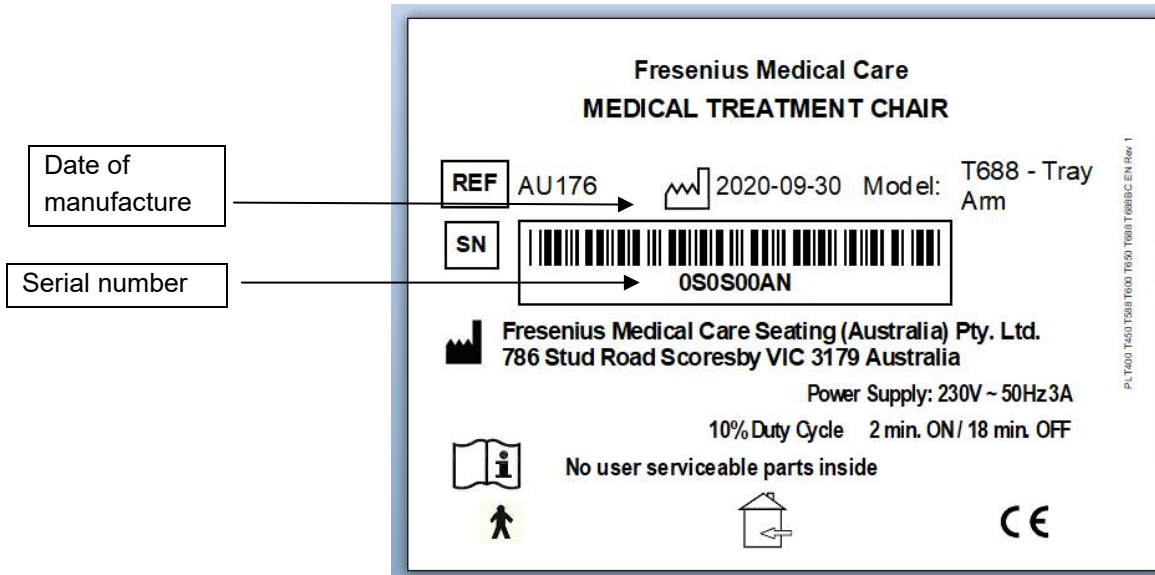


FIGURE 1. TYPE LABEL



FIGURE 2. TYPE LABEL (PRIOR TO JUNE 2020)

Preventative Maintenance

Remove product from service before performing the preventive maintenance inspection. Check all items listed during annual preventative maintenance, when required.

Inspection	Annually	Pass/ Fail	Initial
Visual Check Inspection	<input type="checkbox"/>		
Spills and overall condition of chair	<input type="checkbox"/>		
Upholstery and frame damage (not worn or torn)	<input type="checkbox"/>		
Power cord not frayed	<input type="checkbox"/>		
Cables for cuts and wear	<input type="checkbox"/>		
Rust or corrosion of parts	<input type="checkbox"/>		
Recline actions, steel constructions and fixings	<input type="checkbox"/>		
Broken welds	<input type="checkbox"/>		
All bolts are tight	<input type="checkbox"/>		
Actuators for damage including mountings	<input type="checkbox"/>		
Actuators fitted properly	<input type="checkbox"/>		
Plastic covers (control box cover, hand controls)	<input type="checkbox"/>		
All visible electrical connections are tight	<input type="checkbox"/>		
Operational Inspection	<input type="checkbox"/>		
Check for recline, lift, and smooth leg rest operation (weight loaded)	<input type="checkbox"/>		
Drive all actuators to the limit to ensure all motors operate smoothly through a cycle			
Tray arm operation and tray covers (if fitted)	<input type="checkbox"/>		
Check swivelling arms for free and easy movement (if applicable)	<input type="checkbox"/>		
Check all function of all buttons on hand controls (Nurse and Patient)	<input type="checkbox"/>		
Check all memory functions and settings on nurse hand control operate (Position 1, 2 and 3)	<input type="checkbox"/>		
Check castors for locking, easy movement and corrosion	<input type="checkbox"/>		
Central brake operates or individual castors brake	<input type="checkbox"/>		
Battery charges when the power supply cable is connected to the wall outlet	<input type="checkbox"/>		
Chair label exists on the base of the chair	<input type="checkbox"/>		

Product serial number:
Completed by: _____ Date: _____
Comments:

Installation




At all times, when positioning the chair, care should be taken to ensure that no part of the chair comes into contact with any equipment or structures, particularly during emergency procedures.

It is important to ensure that any staff members who are operating the chair have been trained by the manufacturer or its agent prior to use.

The installation procedure is as follows:

1. Position the chair. Do not position the chair so that it is difficult to disconnect the chair from the mains power.
2. Remove any temporary ties or packaging.
3. Connect the power cord to an approved power supply for the relevant country *as indicated by the label*.

 **WARNING:** To avoid risk of an electric shock, this chair must only be connected to supply mains with protective earth.

4. Test the chair by taking it through its complete range of movements.

The power cord should be connected to the power point and the power point should be switched on. The backup battery (if fitted) will recharge automatically and slow to trickle charge when full.

IMPORTANT

Charge backup battery for a **minimum of 24 hours** before use of the chair.

Troubleshooting

In the event the chair fails to operate correctly, take the following steps **prior to contacting Fresenius Medical Care or its authorised agent**:

1. Check that the mains power outlet is active.
2. Check that the power cord is not damaged or worn.
3. Check that the chair is connected into the mains power outlet and switched on correctly, as indicated by the green indicator light on the nurse's hand control.
4. Ensure battery was charged for a minimum of 24 hours. This should occur at least every 5 days.
5. Ensure there are no damage or cuts in the cables to the hand controls or actuators.
6. Determine which functions are not operating as follows:

Problem / Failure	Action / Solution
Leg rest motor (vertically mounted under the seat)	Depress the hand control button for the leg rest and the leg rest should raise or lower.
Backrest motor (mounted behind the backrest)	Depress the hand control button for the backrest and the back should raise or lower.
Lift column (mounted on top of the base)	Depress the hand control button for the chair height control and the chair should raise or lower.

Take note of the serial number of the chair. This information can be found on the Type Label (**Figure 1 or 2. Type Label – Serial number location section**) attached to the chair.

If unsure about any aspect of the above steps, please contact Fresenius Medical Care Seating at the contact details provided at the end of this service manual (see **Contact Information** section).







Hand Control – Programming

Programming can only be done using the nurse's hand control. A maximum of three positions may be programmed into the memory.

1. Position the chair to the desired position using the up & down arrows for the backrest, whole chair and leg rest.
2. When the chair is in the desired position, hold down the S (store) button for five seconds until the beep sounds.
3. Once the beep is sounding, select one of the numbers, 1, 2, or 3 and press it within two seconds to store the pre-programmed position. When completed the system will beep two times to confirm.

Troubleshooting

Power Source and Hand Control Indication

	LED "Amber" Off and LED "Green" On indicates Mains is on and Battery is fully charged.
	LED "Amber" On and LED "Green" Off indicates Battery is in normal use.
	LED "Amber" blinking and LED "Green" Off indicates Battery is in normal use and requires charging .
	LED "Amber" ON and LED "Green" ON indicates mains is on and battery is charging.
	LED "Amber" Off and LED "Green" Off indicates Mains is not on and battery requires charging. Chair will not operate.
	LED "Amber" blinking and LED "Green" blinking and indicates a system error.

When the chair is not connected to the mains, press any button on the nurse hand control to restart the application and check the indication lights. Application will return to sleep mode within 2 minutes with no button pressed.

Recalibration

If there is a loss of feedback from any of the actuators, a 'position lost' beep will be heard from the control box when any button is pressed.

T688 Treatment Chair

Recalibrate using the nurse's hand control as follows:

- **Stage 1 – Clear System Faults**

Press **both Up and Down arrow buttons** of the chair height function **simultaneously**. **If successful a constant beeping will be heard. Hold until the beeping stops** (approximately five seconds). Both buttons must be activated at **the same time**. If beeping does not start, repeat until successful.

- **Stage 2 – Initialise the System (Process 1)**

Press **both Up and Down arrow buttons** for the Backrest function simultaneously and **hold** until all the actuators have stopped moving. This will drive the Backrest actuator into the fully retracted (down), the Leg rest actuator into the fully retracted (down) position and the Height actuator into the fully retracted (down) position. When completed the system will beep two times to confirm.

If the system does not beep twice when all actuators have stopped, please contact Fresenius Medical Care or your local representative for further assistance.

If the chair does not respond to **Process 1**, please follow the instructions below (**Process 2**).

- **Stage 2 – Initialise the System (Process 2)**

Press and hold the “Backrest Down” button. Hold the button for one second after the actuator has stopped moving.

Press the “Height Down” button. Hold the button for one second after the actuator has stopped moving.

Press the “Leg rest Down” button. Hold the button for one second after the actuator has stopped moving.

The chair's positions can be reprogrammed via the nurse hand control. Refer to instructions in section: **Hand Control – Programming**.

T688B Treatment Chair

Recalibrate using the nurse's hand control as follows:

- **Stage 1 – Clear System Faults**

Press **both Up and Down arrow buttons** of the chair height function **simultaneously**. **If successful a constant beeping will be heard. Hold until the beeping stops** (approximately five seconds).

Both buttons must be activated at **the same time**. If beeping does not start, repeat until successful.

- **Stage 2 – Initialise the System**

Press **both Up and Down arrow buttons** for the Backrest function simultaneously and **hold** until all the actuators have stopped moving. This will drive the Backrest actuator into the fully retracted (down), the Leg rest actuator into the fully retracted (down) position and the Height actuators into the fully retracted (down) position. When completed the system will beep two times to confirm.

If the system does not beep twice when all the actuators have stopped, please contact Fresenius Medical Care or your local representative for further assistance.

Mechanical Parts Replacement

Arm Rest removal / replacement

Depending on the arm rest type, it can weigh up to 6.5 kg.

To remove the arm rest:

1. Apply the chair brakes.
2. To avoid unnecessary bending, press the memory button 3 on the hand control to raise the chair to a suitable working height.
3. Unlock the arm rest by grasping the black handle on the side of the chair (Locked Position).
4. Pull handle away from the chair until the handle is at a right angle to the chair (Unlocked Position).
5. Pull the arm rest post straight up and out of the arm rest holding bracket.

To replace the arm rest:

1. Insert the new armrest.
2. Position the black handle on the side of the chair at a right-angle to the chair (Unlocked Position).
3. Slide the arm rest post into the holding bracket until the desired height is achieved.
4. Relock the arm rest by pushing the black handle back to its original position (Locked Position).

Backrest cushion removal / replacement

To remove the backrest:

1. Apply the chair brakes.
2. To avoid unnecessary bending, press the memory button 3 on the hand control to raise the chair to a suitable working height.
3. Apply gentle force at the top rear of the backrest to unclip the plastic holders from the chair frame and lift the backrest up away from the chair.

To replace the backrest:

1. Insert the new backrest.
2. Apply the chair brakes.
3. Ensure the metal strip at the base of the back rest sits on the back frame of the chair.
4. Once in the correct position, push the top of the back rest into place ensuring the plastic clips properly lock onto the chair frame.

Seat cushion removal / replacement

To remove the seat cushion:

1. Apply the chair brakes.
2. To avoid unnecessary bending, press the memory button 3 on the hand control to raise the chair to a suitable working height.
3. Place hands at the front of the seat (near where the knees would be positioned) and apply a gentle pulling force upwards. The plastic clips located on the seat will come away from the frame.
4. Lift the seat cushion up and away from the frame.

To replace the seat cushion:

**Repeat the steps in reverse.*

1. Position the metal strip on the back of the seat so that it fits into the receiving ledge located on the chair frame.
2. Ensure the leg rest flap is attached to the round frame tube.
3. Position the plastic clips located at the front of the seat onto the round frame tube.
4. Ensure the frame and clips are properly aligned before applying a gentle downwards force.

All-Over Leg Rest removal / replacement

To remove the All-Over Leg Rest:

1. Apply the chair brakes.
2. To avoid unnecessary bending, press the memory button 3 on the hand control to raise the chair to a suitable working height.
3. Locate the elastic loops under the leg rest and unclip from the plastic anchors.
4. Repeat this step in the gap between the seat and the back rest. It may be easier if the backrest is removed.

To replace the All-Over Leg Rest

**Repeat the steps in reverse.*

1. Attach the elastic loops to the anchor points located between the seat and the back rest.
2. Attach the elastic loops to the anchor points located under the leg rest.

Electrical Parts Replacement

Control Box removal / replacement

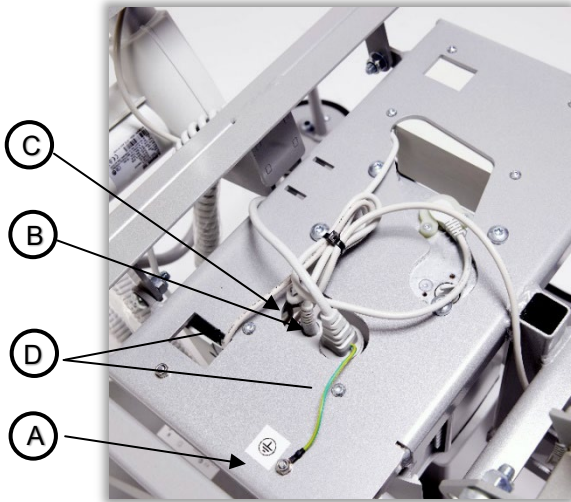


FIGURE 3. TOP FRAME

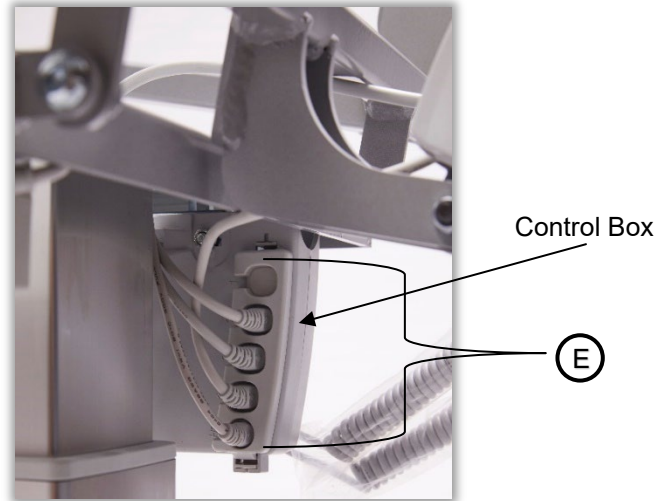


FIGURE 4. CABLES ON CONTROL BOX

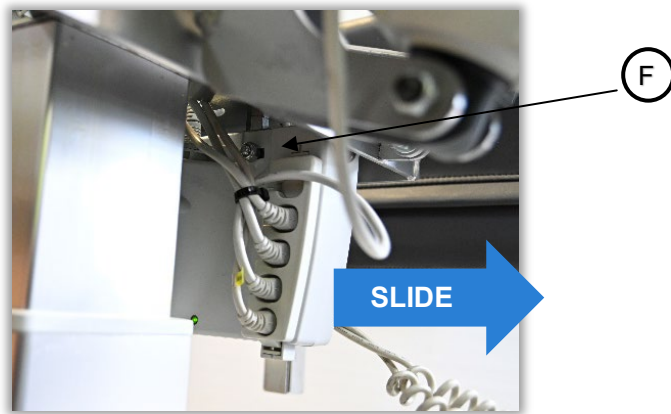


FIGURE 5. CONTROL BOX

To remove the Control Box:

1. Apply the chair brakes.
2. Raise the chair to its highest position, if applicable.
3. Disconnect the mains power supply cable from the wall outlet.
4. Remove the seat cushion from the chair, to access the top frame (refer to Seat Cushion removal / replacement section).
5. Undo the bolt (A) that holds the earth point cable (Figure 3).

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6. Press in the red retainer clip, to allow the power supply cable to be removed.
7. Disconnect the two cables from the top of the control box (**Figure 3**) (power supply cable (**B**) and battery (**C**)).
8. Once disconnected, undo the two bolts (**D**) head screws (**Figure 3**).
9. Disconnect all the cables (**E**) from the control box (**Figure 4**). It is recommended to number the cables while disconnecting them, to ensure they are connected into the corresponding ports of the new control box.
10. Once the control box disconnected, undo the bolt and nut (**F**) located on the side of the bracket and slide control box as directed in **Figure 5**.

To replace the Control Box:

1. Reinstall the mounting bracket onto the new control box. When reinstalling the mounting bracket, do not overtighten the bolt and nut. Tighten the bolt until it makes initial contact with the plastic housing of the control box.
2. Reconnect all the cables and mount the control box back onto the top frame.
3. Refit the seat cushion.

IMPORTANT

Recalibration and reprogramming are required after replacing the control box.

Lift Column removal / replacement (T688)



FIGURE 6. TOP FRAME

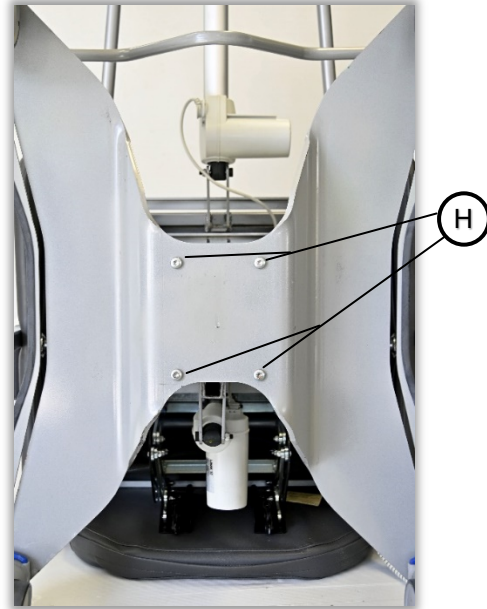


FIGURE 7. LIFT COLUMN BASE

To remove the Lift Column:

1. Apply the chair brakes.
2. Disconnect the mains power supply cable from the wall outlet.
3. Remove the seat cushion and the back rest (refer to Backrest and Seat Cushion removal / replacement section).
4. Remove the four mounting bolts (**G**) from the top of the column (**Figure 6**). Undo the four bolts using a T40 torx driver. Manual loosening may be required before using any power tools. And final tightening should be done manually too.
5. Lift the whole chair assembly off the column (Two people required).
6. Position the chair on its back (**see Figure 7**).
7. Remove the four mounting bolts (**H**) located at the bottom of the column (**Figure 7**).

To replace the lift column:

1. Place the new lift column to the base and install the four mounting bolts. The new lift column bolt holes are self-tapping, and the bolt forges a partial thread in the hole and the peak of the thread squashes down and creates the holding force. Start off with a hand wrench to get past the initial force and complete the procedure with a high force impact driver or similar tool.
2. Place the chair upright on its castors.
Reposition the chair assembly onto the column. Position the four mounting bolts of the column onto the top frame. Use the same procedure in step 1 above to secure the bolts.5. Refit the seat and backrest cushions.

Power Supply Cable removal / replacement

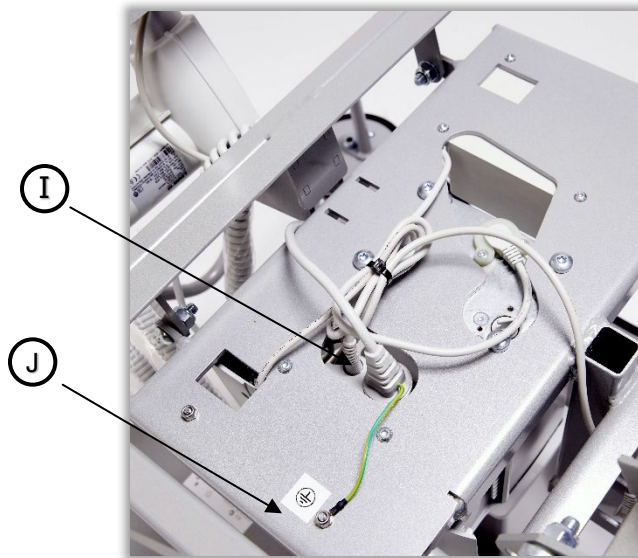


FIGURE 8. TOP FRAME

To remove the power supply cable:

1. Apply the chair brakes.
2. Raise the chair to its highest position, if applicable.
3. Disconnect the mains power supply cable from the wall outlet.
4. Remove the seat cushion (refer to Seat Cushion removal / replacement section).
5. Undo the bolt (J) that holds the earth point wire in place (**Figure 8**).
6. Simultaneously, press-in the red retainer clips on each side of the power cable (I), to enable the removal of the cable (**Figure 8**).

To replace the power supply cable:

1. Connect the new power cable through the top frame, onto the control box.
2. Reattach the earth point wire.
3. Refit the seat cushion.

Battery Backup removal / replacement

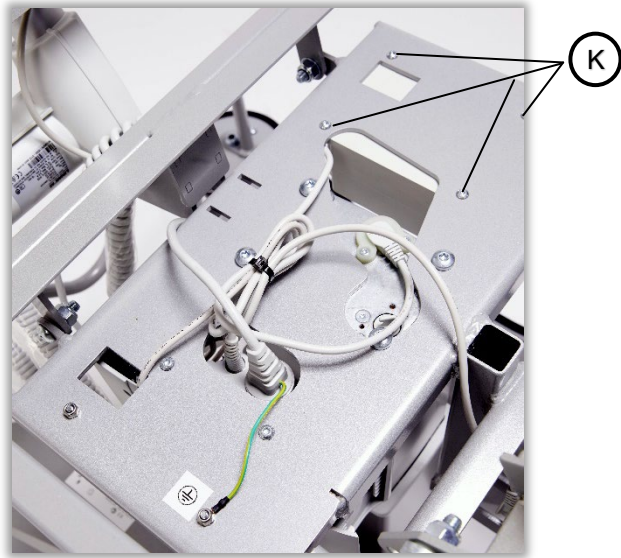


FIGURE 9. TOP FRAME

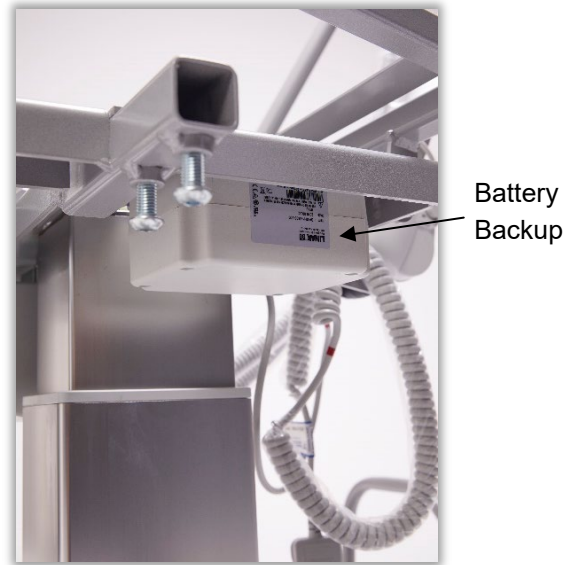


FIGURE 10. BATTERY BACKUP

To remove the Battery:

1. Apply the chair brakes.
2. Raise the chair to its highest position, if applicable.
3. Disconnect the mains power supply cable from the wall outlet.
4. Remove the seat cushion (refer to Backrest and Seat Cushion removal / replacement section).
5. Undo the four screws (**K**) located on the left side of the top frame, to allow the removal of the battery (**Figure 9**).
6. Disconnect the battery cable from the control box (**Figure 4, (E)**).

To replace the Battery:

1. Connect the cable of the new battery to the control box.
2. Reposition the battery underneath the top frame, to its initial position.
3. Insert the four screws into the top frame.
4. Refit the seat cushion and backrest.

MJB Junction Box removal / replacement

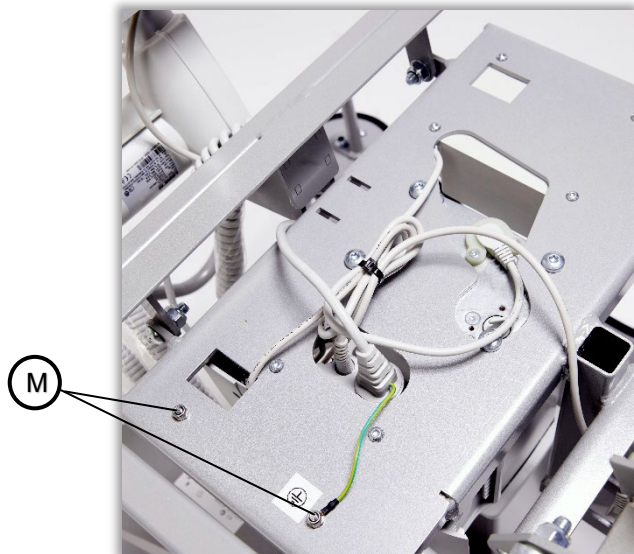


FIGURE 11. TOP FRAME

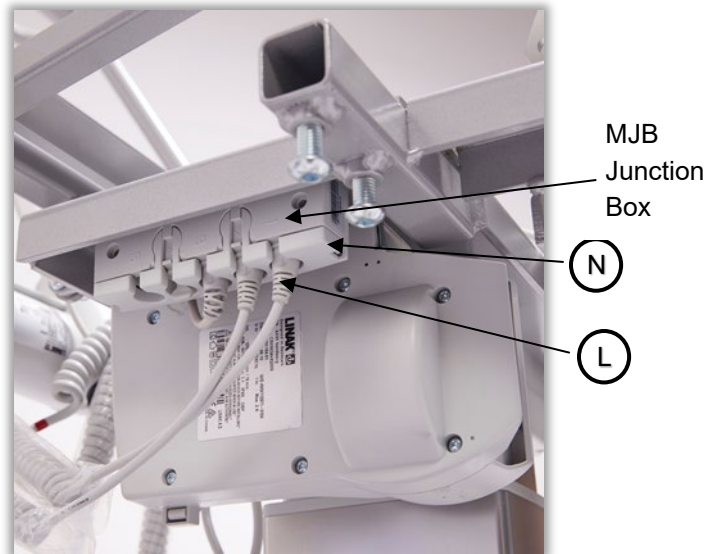


FIGURE 12. MJB JUNCTION BOX

To remove the MJB Junction Box:

1. Apply the chair brakes.
2. Raise the chair to its highest position, if applicable.
3. Disconnect the mains power supply cable from the wall outlet.
4. Remove the seat cushion (refer to Seat Cushion removal / replacement section).
5. Undo the retention clip (**N**) from the MJB junction box using a screwdriver, located underneath the chair (**Figure 12**).
6. Disconnect all the cables/ports (**L**) connected into the MJB junction box (**Figure 12**).
7. Undo the two bolts (**M**) located on the right side of the top frame, to allow the removal of the MJB junction box (**Figure 11**).

To replace the MJB Junction Box:

1. Reposition the new MJB junction box underneath the top frame.
2. Insert the two bolts that holds the MJB junction box into the top frame.
3. Reconnect all cables/ports that were previously connected into the MJB junction box.
4. Refit the seat cushion.

Hand Control (Nurse or Patient hand control) removal / replacement



FIGURE 13. HAND CONTROLS

To remove the Hand Control:

1. Apply the chair brakes.
2. Raise the chair to its highest position, if applicable.
3. Disconnect the mains power supply cable from the wall outlet.
4. Undo the retention clip (**N**) from the MJB junction box using a screwdriver, located underneath the chair (**Figure 12**).
5. Disconnect the cable of the Hand Control (**L**), from the MJB junction box (**Figure 12**).

To replace the Hand Control:

1. Connect the new hand control to the MJB junction box.
2. Place the retention clip back on the MJB junction box.
3. Reconnect the power supply cable to the wall outlet.

Backrest actuator removal / replacement

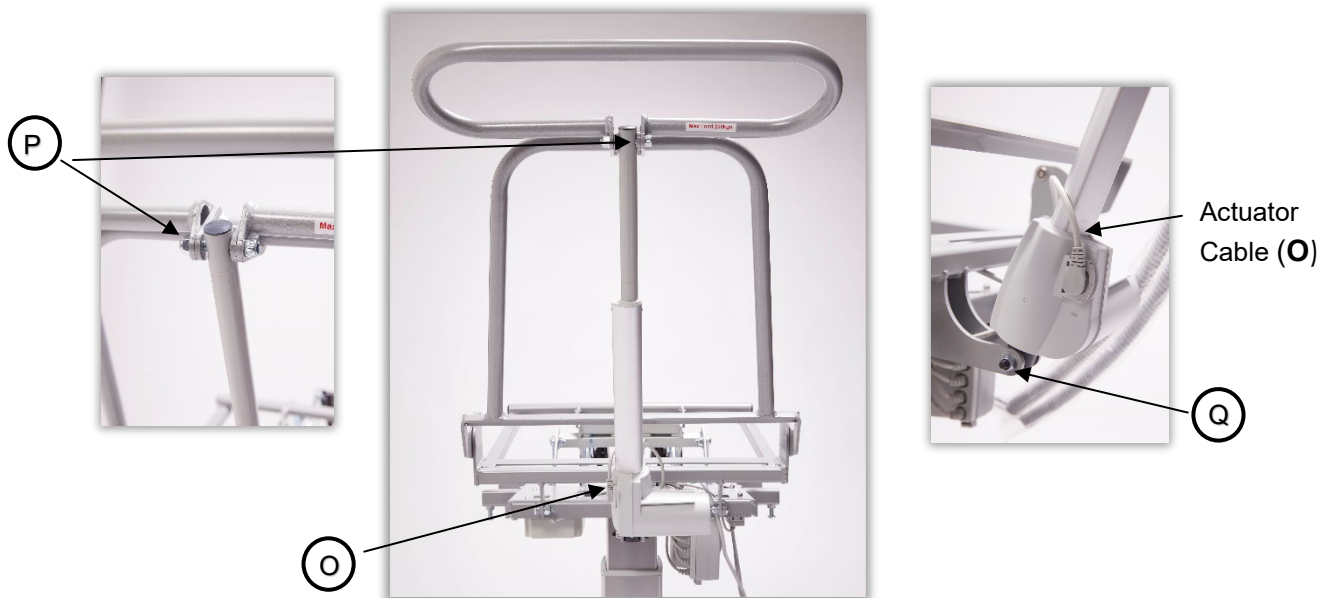


FIGURE 14. BACKREST ACTUATOR

To remove the Backrest actuator:

1. Apply the chair brakes.
2. Disconnect the mains power supply cable from the wall outlet.
3. Disconnect the actuator cable (O) (see **Figure 14 and Actuator cable**).
4. Undo and remove the two bolts (P) and (Q) located at each end of the actuator.
5. Remove the Backrest actuator.

To replace the Backrest Actuator:

1. Insert the Backrest actuator.
2. Replace the two bolts connecting the actuator to the frame.
3. Connect the actuator cable.

IMPORTANT

Recalibration is required after replacing the Backrest actuator.

Check of programming is recommended only.

Leg Rest actuator removal / replacement

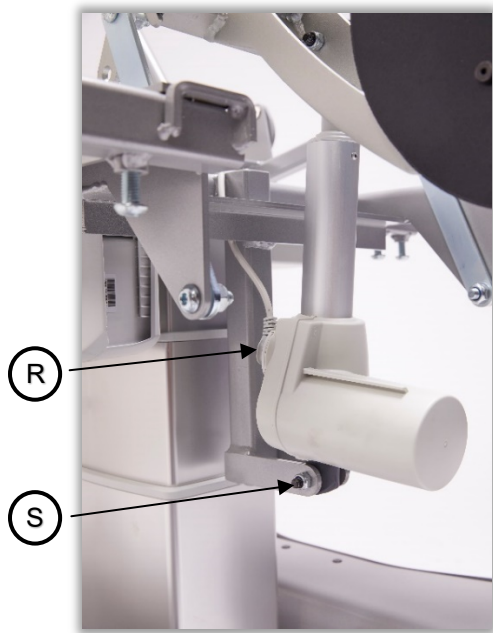


FIGURE 15. LEG REST ACTUATOR

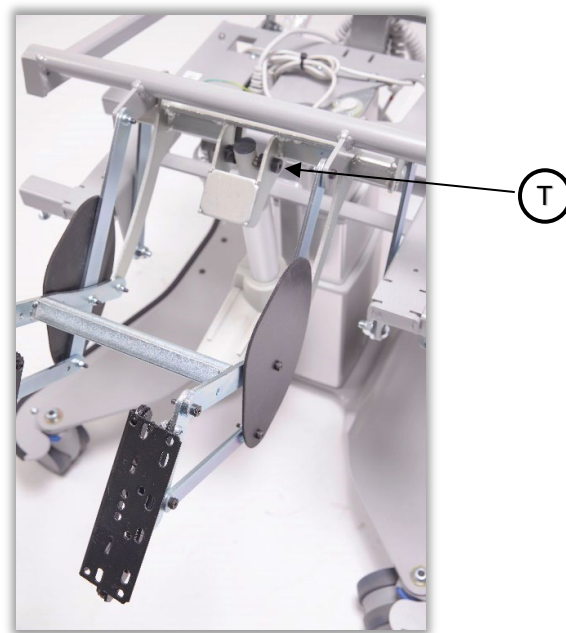


FIGURE 16. LEG REST ACTUATOR

To remove the Leg Rest actuator:

1. Apply the chair brakes.
2. Raise the chair to its highest position, if applicable.
3. Disconnect the mains power supply cable from the wall outlet.
4. Disconnect the actuator cable (R) (Figure 15).
5. Undo and remove the two bolts (S) and (T) located at each end of the actuator (Figure 15-16).
6. Remove the Leg Rest actuator.

To replace the Leg Rest actuator:

1. Insert the Leg Rest actuator.
2. Replace the two bolts connecting the actuator to the frame.
3. Connect the actuator cable.

IMPORTANT

Recalibration is required after replacing the Leg Rest actuator.

Check of programming is recommended only.

Service

Central Locking Castors removal / replacement

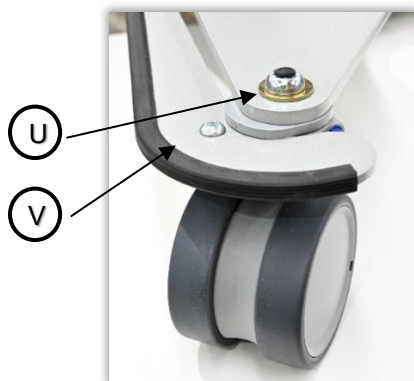


FIGURE 17. CENTRAL LOCKING CASTOR

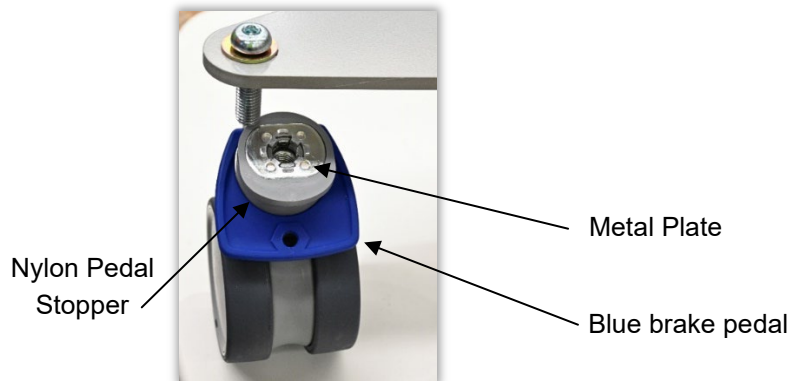


FIGURE 18. CASTOR



FIGURE 19. CASTOR

To remove the Central Locking Castor:

1. Apply the chair brakes.
2. Raise the chair on a block of approximately 15 cm height.
Locking the opposite individual castors will help in stabilizing the chair prior to tilting.
3. Remove the screw and nut (V) attached to each blue braking pedal, to remove the central locking bars (Figure 17).
4. Remove the black rubber plug and undo the bolt (U) (Figure 18).
Heat gun may be required to undo the bolt.
5. Remove the nylon pedal stopper and the metal plate located over the castor (Figure 18).

To replace the central locking castor:

1. Reposition the metal plate and the nylon pedal stopper over the new castor.
Ensure the wholes on the metal plate are facing up (Figure 18 and 19).
2. Re-assemble the castor to the bottom of the chair.
3. Ensure central locking bar is positioned between the vinyl stopper and blue breaking pedal.

CONTACT

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