THE RADCLIFFE *SHADOW* ***POWER*** BASE MK3

TECHNICAL MANUAL©

also incorporating for reference the User/Carer Handbook

G90

August 2006

I.M.12

CONTENTS

The Radcliffe Power Wheelbase is CE marked in line with our EC Declaration of Conformity, Council Directive 93/42/EEC of 14 June 1993 concerning medical devices.

If you have any queries or require further information please contact us.

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1 INTRODUCTION

WARNINGS

- ENSURE THAT ALL ELECTRICAL CABLES ARE TIED TO THE CHASSIS AND DO NOT INTERFERE WITH ANY MOVING PARTS.
- WE STRONGLY RECOMMEND THAT THE CHASSIS IS PUT THROUGH ALL TILT POSITIONS TO CHECK THAT THE CABLES ARE THE CORRECT LENGTH FOR THE SEATING REQUIREMENT AND ARE NOT FOULING ANY MOVING PARTS
- MATRIX DROPPED INTERFACE IS ONLY TO BE USED IF THE POWER MODULE/TAM UNIT HAS BEEN REPOSITIONED. IF IN DOUBT, PLEASE TELEPHONE RADCLIFFE.
- IT IS THE RESPONSIBILITY OF THE WHEELCHAIR SERVICE TO ENSURE THE SEAT IS FITTED ONTO THE CHASSIS CORRECTLY BEFORE ISSUE TO CLIENT.

1.1 Safety and Misuse Warnings

It is important to read, understand and heed all the warnings, instructions and advice given throughout this manual and handbook - if in any doubt, contact Radcliffe for clarification.

All the equipment identified in this manual, must not be used other than in the manner described.

If any changes are made to these products that can affect safety, the person making the changes may be held responsible. Radcliffe Rehabilitation Services cannot be held liable for any changes or modification made to their products once they have been despatched

1.2 Change of User

If the equipment is reassigned to a different user, it is important that the pre-programmed functions are checked as suitable for the new user. It is also important that the regular maintenance and inspection (User/Carer Handbook Sections 20.1 and 20.2) are carried out.

1.3 Storage of Wheelbase

If the wheelbase is being left for longer than 1 month, store in a semi tilted position and ensure wheelbase is fully charged, moved through the tilt positions and drive programs once a week. Failure to do this **may** result in the batteries deteriorating and system locking out

1 INTRODUCTION /continued...

1.4 **Push Handle Grips**

Please note that the push handle grips are an interference fit. If removed DO NOT use any form of lubricant or adhesive to refit, please contact . Radcliffe Rehabilitation Services Ltd.

1.5 **User/Carer Handbook**

In addition to this Technical Manual, please also read the information contained in the Power Wheelbase User/Carer Handbook, attached as an Appendix to this manual. This User/Carer handbook contains important information including the tilt and drive functions, batteries and charging, repairs, maintenance and inspections. All the information in the User/Carer Handbook should be read and understood.

The Section Titles within the User/Carer Handbook are as follows:

Section Number	**Section Title**
1	WHEELBASE CHASSIS NUMBER & SUPPLY INFORMATION
2	*TAKE CARE ! - IMPORTANT INFORMATION*
3	INTRODUCTION
4	WHEELBASE PARTS IDENTIFICATION
5	DRIVE AND TILT CONTROL SYSTEM TILT-IN-SPACE FUNCTION (5.5) POWER DRIVE FUNCTION (5.6)
6	BATTERIES AND CHARGING
7	SEATING SYSTEMS
8	FOLDING THE WHEELBASE
9	FOOTRESTS
10	ARMRESTS
11	FITTING THE TRAY
12	HEADRESTS
13	ANTI TIPPERS
14	BRAKES
15	MOVING IN AND OUT OF THE WHEELBASE & SEAT
16	USING YOUR POWER WHEELBASE OUTDOORS
17	SLOPES
18	PRAM TYPE PUSH HANDLES
19	REPAIRS
20	MAINTENANCE
21	TROUBLESHOOTING
22	WARRANTY
23	SAFETY & MISUSE WARNINGS
24	GENERAL ADVICE

A copy of the User/Carer Handbook is also supplied with each chassis

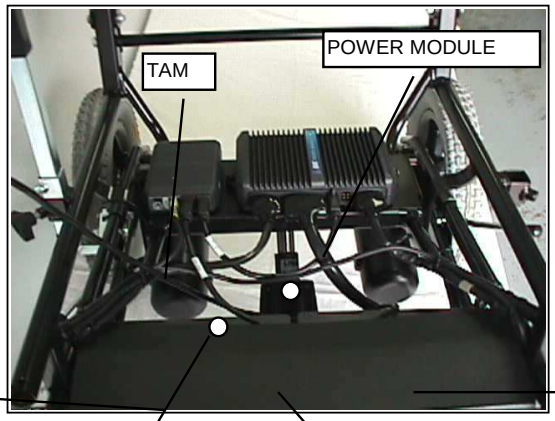
2 SPECIFICATION

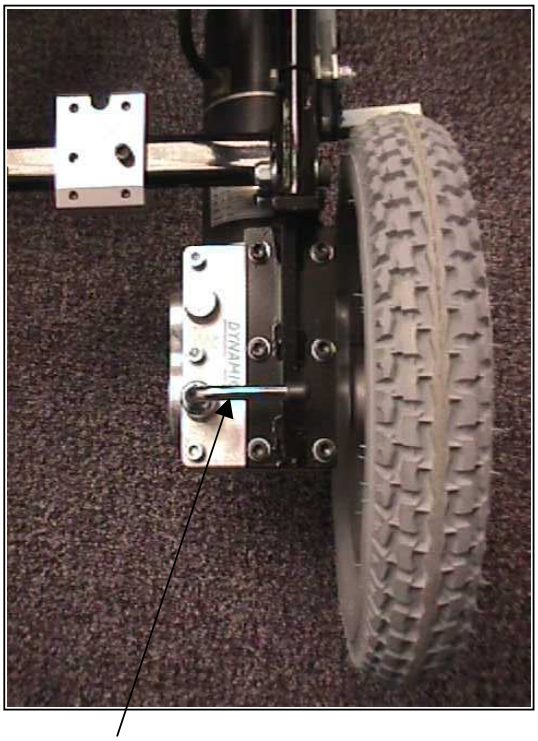
The following table provides technical data for the power models.

Dimensions	15" Radcliffe Power Wheelbase		18" Radcliffe Power Wheelbase	
Folded:	Overall length 800mm		Overall length 800mm	
	Overall height 535mm		Overall height 505mm	
	Overall width 525mm		Overall width 600mm	
Unfolded 100° recline:	**Upright**	**Tilted**	**Upright**	**Tilted**
Overall length	800mm	965mm	800mm	1030mm
Overall height	1080mm	795mm	1080mm	795mm
Unfolded 90° recline:	**Upright**	**Tilted**	**Upright**	**Tilted**
Overall length	800mm	895mm	800mm	940mm
Overall height	1120mm	865mm	1120mm	860mm
Unfolded 110° recline:	**Upright**	**Tilted**	**Upright**	**Tilted**
Overall length	815mm	1010mm	865mm	1060mm
Overall height	1050mm	765mm	1065mm	765mm
Weight:	65 kg		70 kg	
Weight Capacity:	A TOTAL WEIGHT OF 75KG		A TOTAL WEIGHT OF 108KG	
Turning Circle:	1725mm		1725mm	
Seat Rail Size:	381 mm wide x 432 mm deep		457 mm wide x 482 mm deep	
Seat Rail Height:	Above ground : 475mm		Above ground : 475mm	
Maximum Angle:	Chassis tilt-in-space 20 degrees		**Armrest Height**: 100 mm to 330 mm	
Paint Finish:	Silk Black Powder Coat		**Brakes :** Hand Operated plus Locking gear box	
Wheels:	Pneumatic: Rear: 315 mm (12.5") dia tyre width 58mm (2.1/4") Solid Front: 200mm (8") dia front castor, tyre width 50 mm (2")			
Speed:	Up to 4 mph / 6.4 km/h		**Range:** Approx. 10 miles	
Batteries:	15" : 24 amp/hr Part Number FGC224O3 18" : 31 amp/hr Part Number MK Powered type MU-1 SLD G			
Drive Units:	24 v DC Lever Locking Gear Box			
Actuator / Rating:	15"/18" : 24v dc 2500N		**Tilt Speed:** 15" /18" : 7mm / SEC	
Charging:	DX Type GC-O8O2 Daily - Overnight		**Control System:** DX G90 Joystick, Power Module, TAM	

All dimensions shown are approximate and based on telescopic push handles being fitted

3 PARTS IDENTIFICATION





4 SEATING SYSTEM

It is the responsibility of the Wheelchair Service to ensure the seat is fitted correctly to the chassis, before issue to the user.

4. 1 Cables

If Radcliffe have supplied the wheelbase, complete with a seating system, the cables are positioned and tied in line with our recommendations.

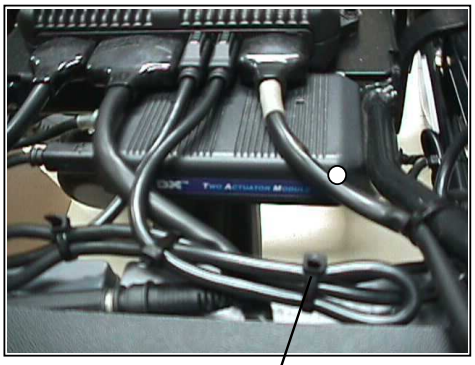
To remove or fit a seating system ensure the power supply is switched off before removing, or fitting the seating system.

The chassis has been supplied with sufficient cable from the joystick controller to the power module, to allow for positioning of the seating system onto the chassis, and positioning of the controller onto the armrest stem so that the user can operate the joystick and the programmed switches.

Once correct positioning has been achieved it is important that the cable is tied to the chassis and does not interfere with any moving parts.

Our recommended cable tie points are shown below. If it is necessary to carry out a side transfer, then if possible, use the side not fitted with the joystick controller. If however it is essential to transfer from the joystick controller side, please contact us for further advice.

Attach cable to controller support and armrest stem



Coil the excess controller cable and hold in position with cable ties.

We strongly recommend that the chassis is put through all tilt positions to check that the cables are the correct length for the seating requirement and are not fouling any moving parts, or could become entrapped by them.

4.2. Interface

- IT IS ***ESSENTIAL*** THAT THE SEATING SYSTEM IS ***INTERFACED CORRECTLY AND SECURELY*** - PLEASE ENSURE THE SEATING IS FITTED BY A SPECIALIST, USING AN APPROVED SEAT AND INTERFACE.

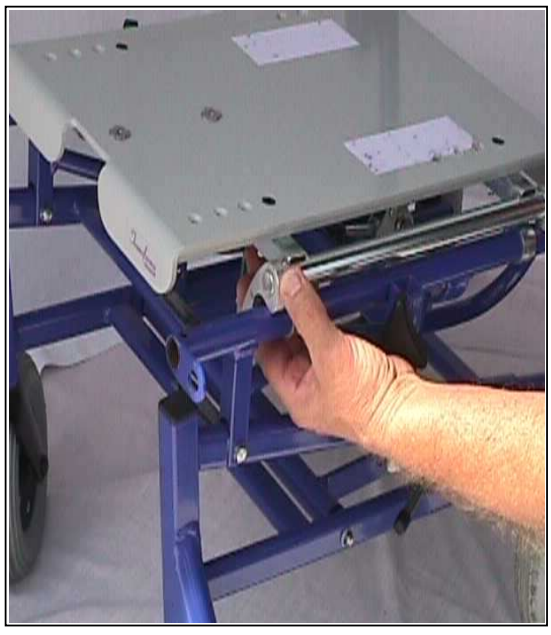
NOTE : IT IS THE RESPONSIBILITY OF THE WHEELCHAIR SERVICE AND THE SEATING SUPPLIER TO ENSURE THE INTERFACE AND SEAT ARE FITTED CORRECTLY.

- Please refer to your Seating Supplier's handbook for fitting instructions.
- **WE DO NOT RECOMMEND ANY SEATING SYSTEM IS RETAINED BY STRAPS OR BELTS.**
- If the interface is insecure or allows movement of the seat, the wheelbase could be damaged.

To fit the Radcliffe Interface :-

The interface is supplied with 4 sets of haden clamps and peg locators.

The cross bars on the interface have two sets of holes : 2 holes on each bar for the locator pegs and 2 M6 size holes on each bar for attaching the seat to the interface.



To position your seat :

Open the haden clamps and fit on the 7/8" seat rails at the desired position.

Fit the locator pegs into the first set of holes onthe underside of the interface and place the interface in position on the locator pegs.

When the correct position has been identified, lock the peg locator nuts tight. Remove the interface.

Now bolt the interface to the underside ofthe seating system using M6 bolts, nylock nuts and washers.

The seat is now ready to be attached to the wheelbase.

Position the interface onto the four peg locators and turn the cam locks down, this holds the interface to the seat rails and locks it into place.

4 SEATING SYSTEM /continued...

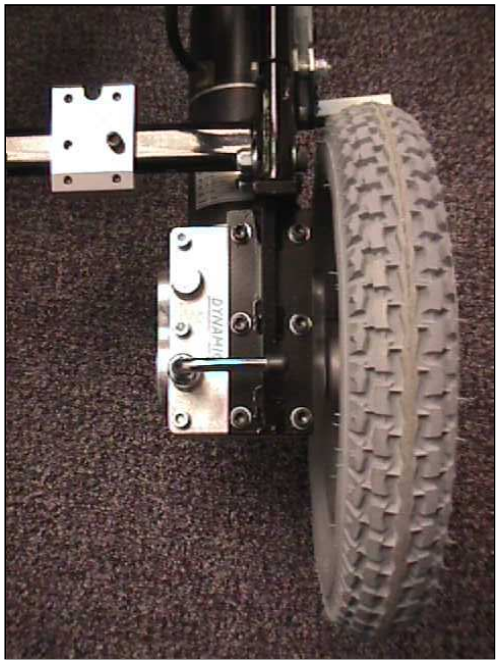
To Remove the Seat, fitted with a Radcliffe Interface, from the chassis :

Standing at the front of the wheelbase, release the interface cam locks.

Gently pull up the seat in line with seating supplier's instructions, this will reveal four locator pins.

To re-fit seat, reverse the above procedure ensuring interface is properly located onto the pins.

If a Radcliffe Interface has not been used, refer to your Seating Supplier for instructions.



5 **REAR WHEELS & CASTORS**

5.1 **Front Castors**
When fitting new castors please ensure that the threads are cleaned and that a thread locking compound is used (Locktite 222) and the bolt is tightened to a torque setting of 75NM.5.1

5.2 **Removal of Rear Wheel**
The rear wheel is held in place by an M8 set bolt and spring washer. To remove the rear wheel tip chassis onto front castor posts, undo the set bolt and the rear wheel can then be removed from the motor drive shaft. The wheel is located to the motor drive shaft by a steel key.

5.3 **Re-fitting the Rear Wheel**
Please follow the reverse of the above.

5.4 **Removal of Motor / Gearbox**
The motor / gearbox assembly is held in place by 6 x M6 Cap head bolts. To remove the assembly stand the wheelbase on the front castor posts. Disengage manual brake, and loosen off M6 Cap heads.

5.5 **Refitting of Motor / Gearbox**
Please follow the reverse of the above, ensuring the wheel is parallel to the frame. M6 Cap heads should be tightened to 10NM

- **REAR WHEELS & CASTORS cont…**

5.6 To Reposition and Adjust the Brakes

- With the wheelbase in its upright position, release the pressure on the **two** M6 nylock nuts that hold the brake assembly to the supporting frame.

- Note: it is only necessary to give two full turns of the M6 nylock nut in order to reposition and adjust the brakes to the correct wheel position.

- Apply the brake lever to the wheel and partially tighten the **two** M6 nylock nuts.

- Release the brake lever and fully tighten the M6 nylock nuts to torque setting 2NM.

Finally, test the brakes to ensure that the wheels are locked.

Note: see also User / Carer handbook section 14 Brakes

6 REPLACING / REMOVING BATTERIES

It may be easier to remove the batteries if the seating system is removed. See section 4 and/or refer to the Seating Manufacturer's instructions

1. Ensure main joystick power button is switched OFF and manual brakes are applied.

2. For 18" chassis, remove battery bracing bar using 13mm spanner.

   NOTE: For the 15" chassis, carry out procedure 3, before procedure 2.

3. Remove battery cover, which is secured using velcro.

4. Caution should be taken at this stage, not to arc between the battery terminals.

5. Loosen the negative (-) terminal nut/bolt which retains the thermal overload cut-out switch and move the cable away from the battery terminal.

6. Repeat procedure 5 above for the positive (+) end of the thermal overload cut - out switch.

7. Detach the remaining link cable from the other battery terminals, starting with the negative (-).

8. The batteries can now be removed from the chassis.

9. To replace, reverse the above procedure ensuring the battery bracing bar bolts are tightened to 7NM.

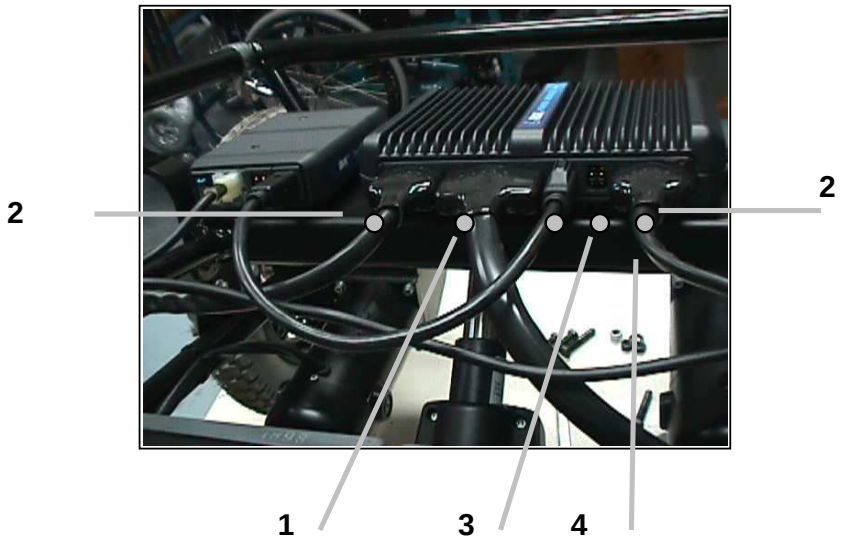
7 REPLACING / REMOVING THE DX SYSTEM MODULES

7.1 Remove the seating system in line with section 4 of this manual and/or the seating manufacturer's instructions.

7.2 Ensure the main joystick power button is switched OFF and the manual brakes are applied.

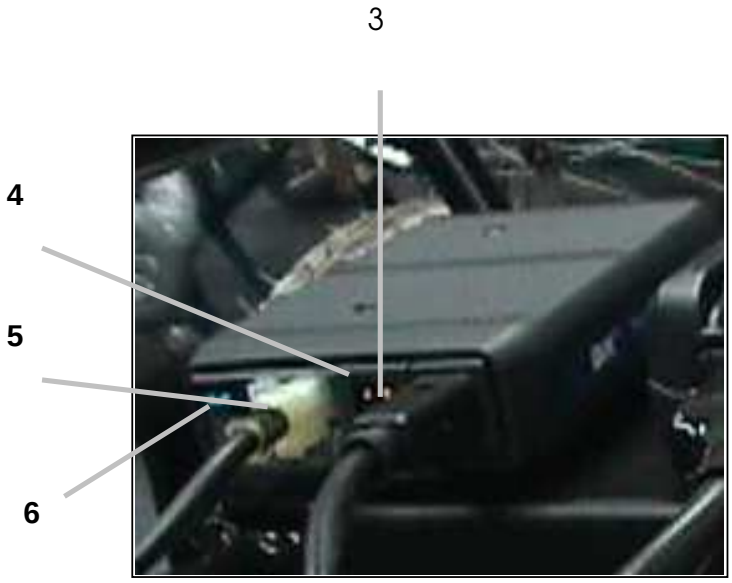
NOTE: It is not necessary to disconnect the batteries in order to replace one or all of the DX modules.

7.3 Power Module (PM) Removal



- Firstly detach the battery connector 1. by pressing down on the spring clip and pulling away from the module.
- Repeat the above for the motor connectors 2., bus cable 3., (which links to the TAM unit), and bus cable 4., (which connects to the joystick), if applicable.
- *NOTE: The joystick bus cable can be connected to either the PM or TAM unit.*
- Loosen the M5 bolts/screws and remove PM.
- To re-fit reverse the above procedure.

7.4 **Twin Actuator Modual (TAM) Removal**



- Firstly detach the bus cable 3 (which links to the PM), bus cable 4 (which connects to the joystick) if applicable, and actuator connector 5.
- The TAM unit can now be slid in the direction of the cable connections and removed.
- If the TAM is replaced with another unit, you must ensure the link clip 6, is transferred or present in the new unit, otherwise the actuator will be inhibited.
- To re-fit reverse the above procedure.

7.5 If new units are to be fitted, ensure the program parameters are transferred. This will usually be carried out by Radcliffe Rehabilitation Services and we will therefore require the old unit in order to do this.

7.6 When re-fitting units, ensure all cable are positioned in the original place and cables do not interfere with any moving parts.

8 DRIVING PROFILE / PARAMETERS

Driving parameters will usually be set before despatch on the chassis. This generally begins with profile 1 having a slow speed, rising to fast speed on profile 5.

These parameters can be changed by means of a hand held programmer (HHP). This will allow you to change the speed, acceleration and deceleration for :

Forward
Turning
*Reverse

This enables you to "fine tune" the system to the user's requirements.

*The reverse speed has been factory set at 40% of the maximum speed.

NOTE: The reverse speed should not be set above 65% to be compliant with EN12184: 1999 table 2 using test method ISO7176-6. Adjustment to this setting to a higher value would render the Power base non compliant to the standard

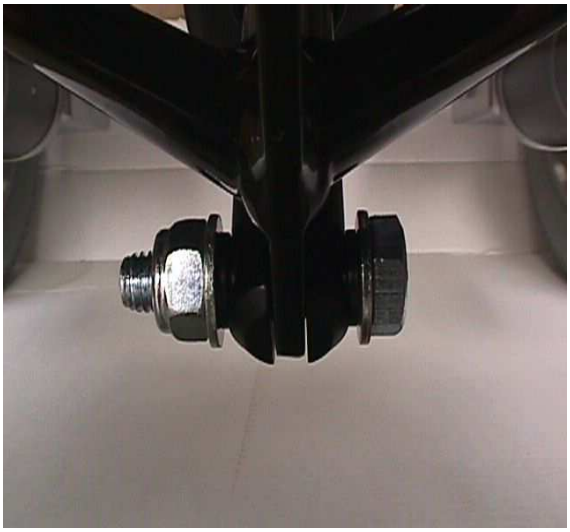
9 ACTUATOR REMOVAL / REPLACEMENT

- Remove the seating system in line with section 4 of this manual and/or the seating manufacturers instructions.
- Ensure the tilt is in an upright position and the power button is switched off on the joystick.
- Tip the chassis forward onto the front castor posts to give good access to the actuator mountings. Ensure any footrests are removed and some kind of protection is given to prevent scratching/damage to the castor posts.
- Disconnect the actuator cables from the TAM unit - section 7.4.
- Remove the cable ties which attach the actuator cable to the chassis, taking note of where they will need to be re-fitted. Care should be taken not to damage or brake any cables.

- Remove the upper M10 Nylock Nut
- Remove the lower M10 Nylock Nut
- Remove the Upper M10 Bolt and support washers
- Remove lower M10 bolt and support washers. The Actuator can now be taken out from the supports.
- Remove the actuator.
- To re-fit reverse the above procedure.

1

NOTE: When re-fitting the actuator, it is imperative that all cabling is cable tied into the original position and does not foul on any moving parts.



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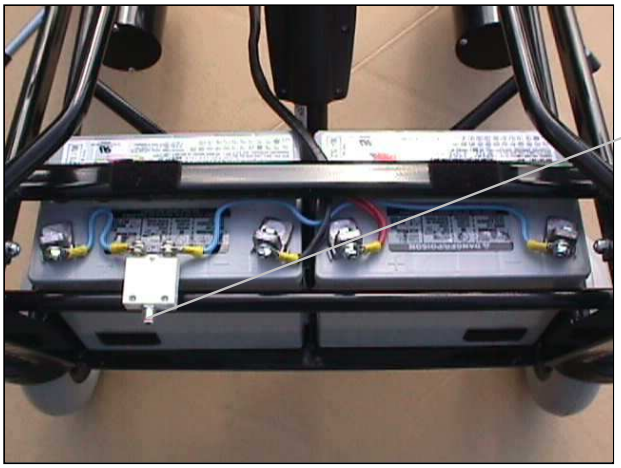
10 THERMAL OVERLOAD CUT-OUT SWITCH



- If the electrical system is short circuited accidentally, there is a thermal overload cut out switch fitted which is located on the top of the right hand battery (see above picture).

- To reset, press the button located on the front of the battery cover until it clicks.

- If the button will not stay in and the condition persists, we recommend you ascertain how the system is being used in order to determine the problem.

11 MOTOR MAINTENANCE

The DX Motors are sealed and damage to the seal will invalidate any warranty claim. However there are some maintenance checks that should be undertaken at least annually, more frequent if the Power Shadow is used extensively out of doors.

Mounting. Check security of motor mounting bolts.

Solenoid Brake. The solenoid brake should be checked to ensure it is operating effectively. The following tests should be undertaken with the drive lever engaged.

- With all four wheels on the ground, the controller switched OFF, check that the rear wheels do not turn when trying to push the wheelbase by hand.
- With all four wheels on the ground, the controller switched ON, check that the rear wheels do not turn when trying to push the wheelbase by hand.
- Lift the rear of the chair and mount on blocks, so that the rear wheels are clear of the ground. Run both motors, release joy stick and check that both drive wheels stop.
- With the controller switched on and the control joystick in the neutral position, check that both wheels are equally resistant to rotation by hand.

If the solenoid brake fails to function correctly in any of the above tests, the motor should be returned to Radcliffe Rehabilitation Services Ltd.

12 TROUBLESHOOTING

Flash Code

Any fault condition on the DX system will cause the RemG80's System Status LED to flash. Flashing occurs in bursts of flashes separated by a two second pause. The number of flashes in each burst is referred to as the Flash Code and indicates the nature of the fault. The title of the Flash Code fault is also displayed by the HHP (hand held programmer) if connected to the faulty wheelbase.

Faults that effect the safety of the wheelbase will cause it to stop while less critical ones will be indicated but allow the wheelbase to continue driving. Some faults will automatically clear when the fault condition is removed, in which case the System Status LED will become steady and the wheelbase may be driven normally. Other faults are latched and must be cleared by turning the DX System off, waiting for two seconds, then turning it back on again.

If the fault condition persists, take note of the flash code, when and where the fault began and have the chassis number available. Contact Radcliffe Rehabilitation Services.

APPENDIX : RADCLIFFE POWER USER/CARER HANDBOOK

A copy of the User/Carer Handbook is attached herewith. A copy of this handbook is also supplied with each wheelbase.

This Handbook contains important information and should be read in conjunction with this Technical Manual.

13 SPARE PARTS LIST

SP1000/15	POWER SHADOW BOTTOM CHASSIS 15”	ONE
SP1000/18	POWER SHADOW BOTTOM CHASSIS 18”	ONE
SP1170/15	POWER SHADOW TOP CHASSIS 15”	ONE
SP1170/18	POWER SHADOW TOP CHASSIS 18”	ONE
S10	WIDE PROFILE FRONT CASTOR	PAIR
SP1390	DX REAR WHEEL COMPLETE WITH TYRE AND TUBE	ONE
SP1381R	DX WHEELMOTOR R/HAND	ONE
SP1381L	DX WHEELMOTOR L/HAND	ONE
SP1080	DRIVE BATTERIES 15”	PAIR
SP1090	DRIVE BATTERIES 18”	PAIR
SP1140/15	BATTERY COVER 15”	ONE
SP1140/18	BATTERY COVER 18”	ONE
SP1220	BUS CABLE .3M	ONE
SP1120	BUS CABLE 1M	ONE
SP1250	BUS CABLE 1.5M	ONE