SECTION 6	**SERVICING INFORMATION**
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6.2	**Chassis Frames**
6.3	**Parking Brakes**
6.4	**Kerb-Climbers**
6.5	**Castors**
6.6	**Drive Wheels & Clutch Assembly**
6.7	**Drive Motors & Mounting Assembly**
6.8	**Electrical Drive & Control Systems**

6. SERVICING INFORMATION

6.1 Introduction

Servicing on the Vixen Family of wheelchairs is restricted to the adjustment, lubrication and replacement of faulty parts.

Where appropriate parts are numbered in illustrations, traceable to a parts list.

The spares available are listed in section 9 of this manual.

Where any additional information is required, or to place orders, please contact Newton Products Ltd.

6.2 Chassis Frame Assemblies

There are 5 types of Chassis Frame: -

The Standard Wheelbase, which is fitted to the Vixen Cub & Vixen EPIC.
The Long Wheelbase, which is fitted to the Vixen EPIOC.
The Heavy Duty, which is fitted to the Vixen Heavy Duty.
Extended (5” longer) Heavy Duty Wheelbase is available on request.
The XL chassis. This is fitted to the XL only.

(Note: the Tilt In Space seat unit can be fitted to any chassis except the XL.)

Full specification details are available in the appendices.

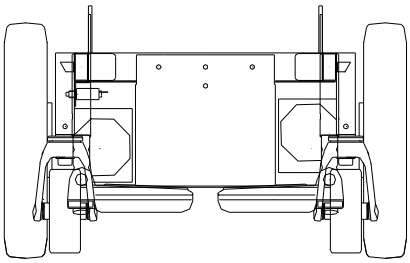
VIXEN STANDARD WHEELBASE USED ON CUB & EPIC

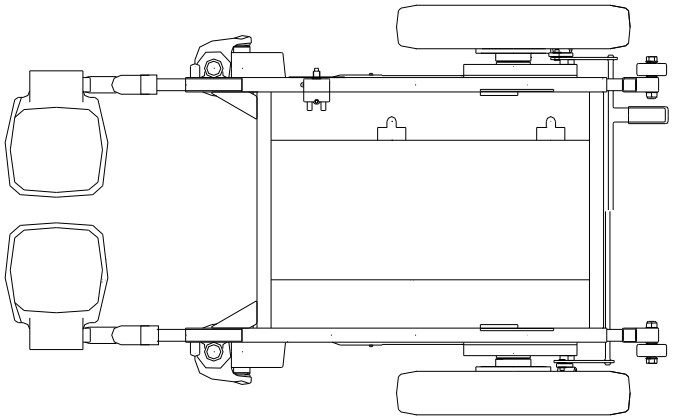
FITTED WITH 68 RPM MOTORS

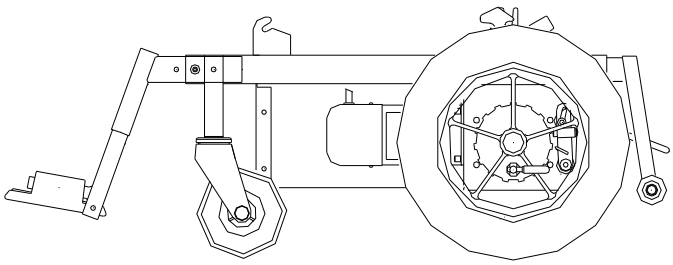
REMOVABLE FOOTRESTS

125MM CASTORS

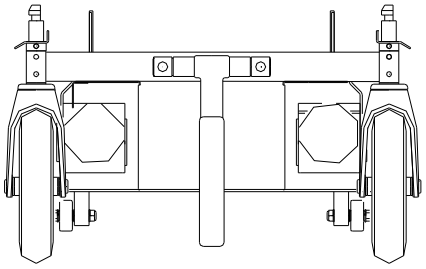
TYRES CAN BE INFLATABLE OR INFILL PUNCTURE PROOF IF SPECIFIED







VIXEN LONG WHEELBASE
USED ON EPIOC



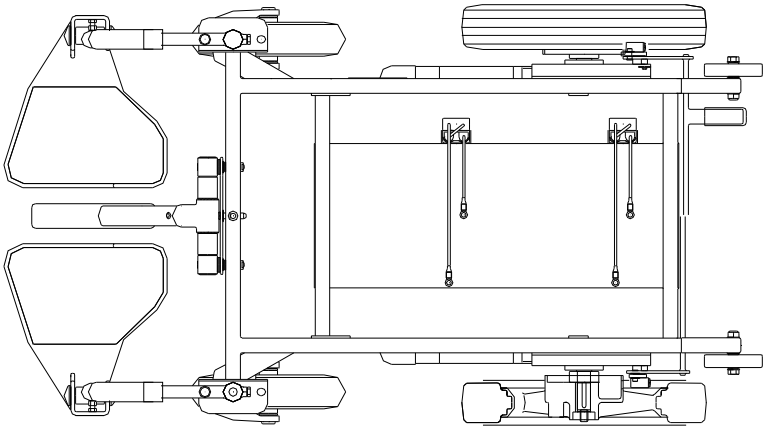
EPIOC FITTED WITH 110 RPM MOTORS

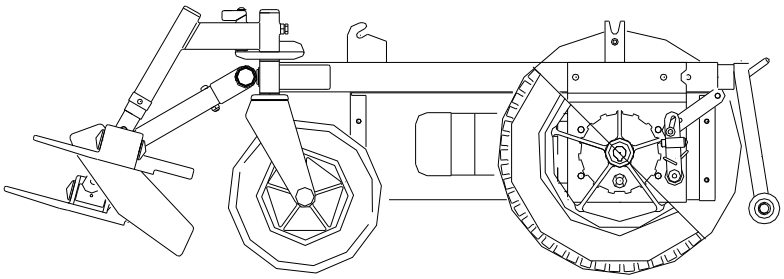
SWINGAWAY AND REMOVABLE FOOTRESTS

200 MM CASTORS

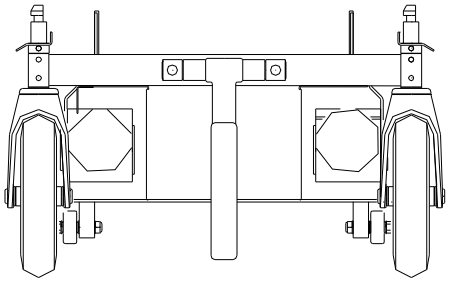
INFILL PUNCTURE PROOF TYRES

KERB CLIMBER





VIXEN HEAVY DUTY



MADE WITH HEAVY GUAGE STEEL

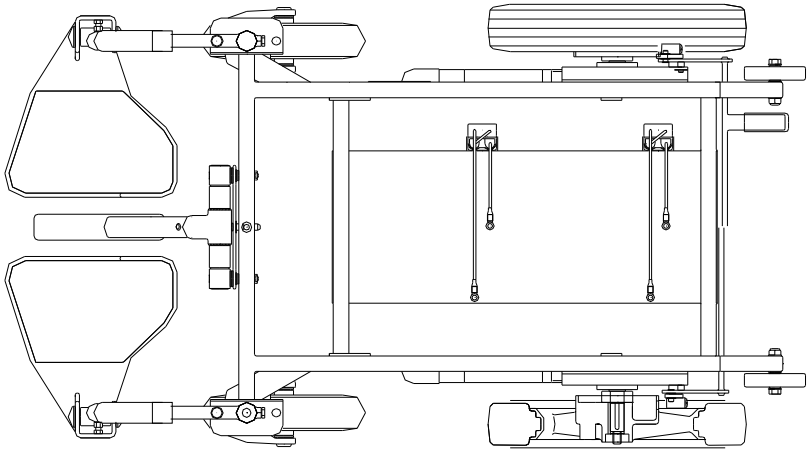
HEAVY DUTY FITTED WITH 117 RPM MOTORS

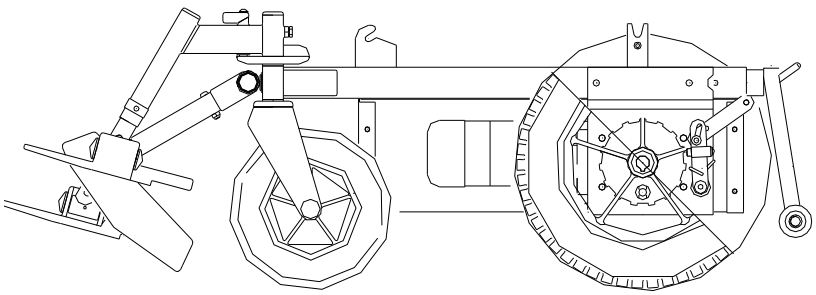
SWINGAWAY AND REMOVABLE FOOTRESTS

200 MM CASTORS

INFILL PUNCTURE PROOF TYRES

KERB CLIMBER





EXTENDED HEAVY DUTY WHEELBASE

EXTENDED CHASSIS FITTED WITH 117 RPM MOTORS

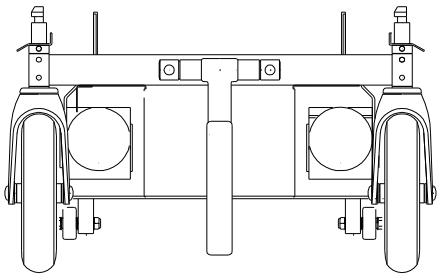
MADE FROM HEAVY GUAGE STEEL

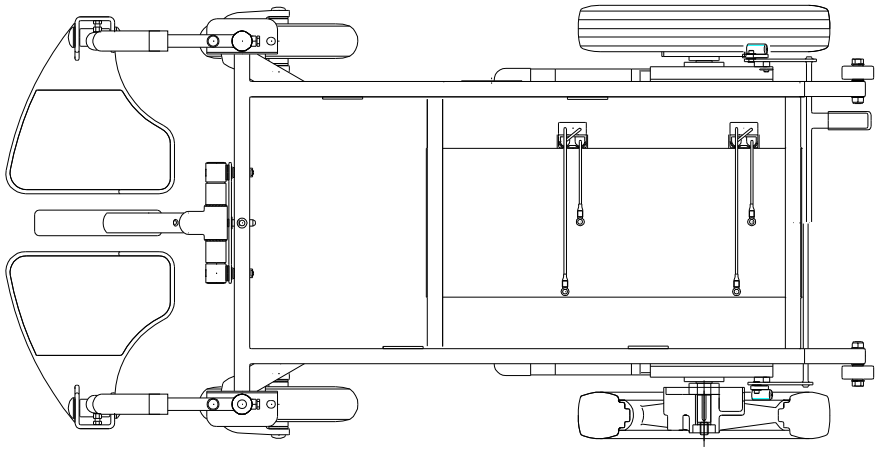
SWINGAWAY AND REMOVABLE FOOTRESTS

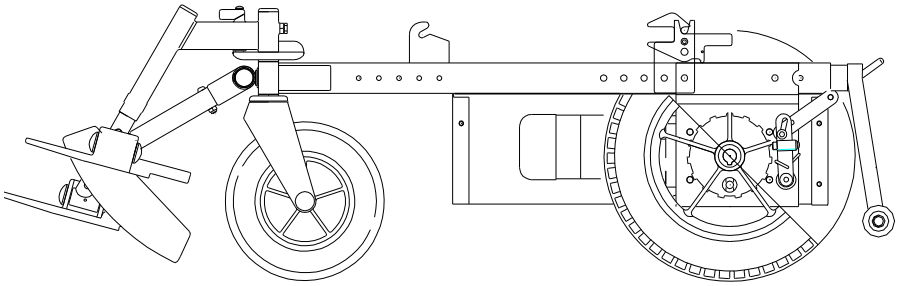
200 MM CASTORS

INFILL PUNCTURE PROOF TYRES

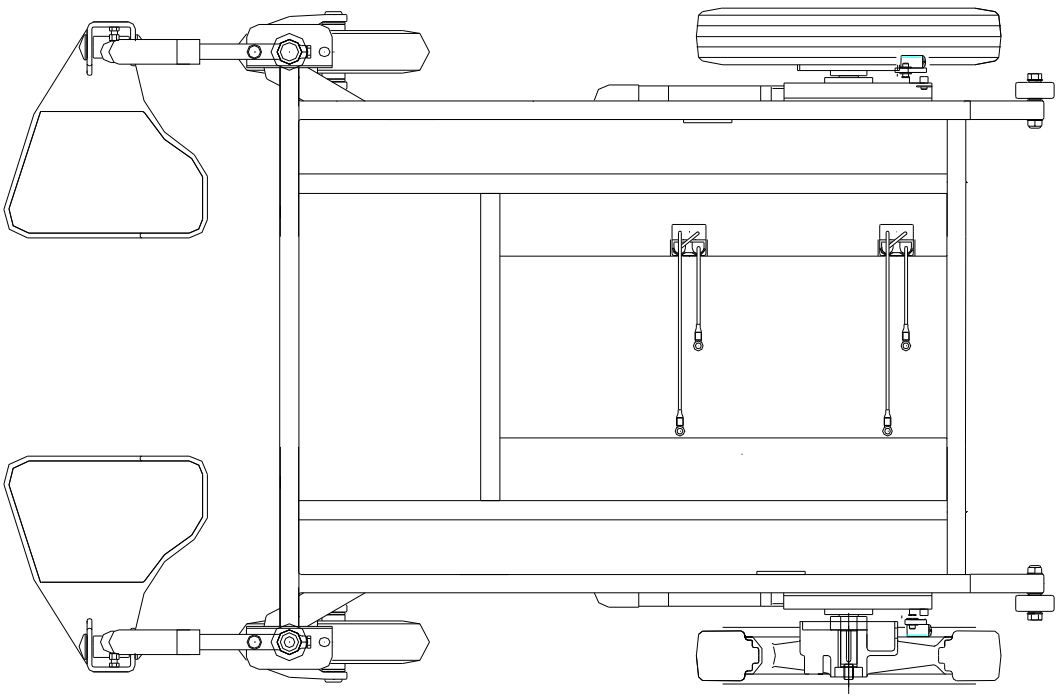
KERB CLIMBER CAN BE FITTED ON REQUEST







VIXEN XL CHASSIS



FITTED WITH HEAVY DUTY 120 RPM MOTORS

50 A BATTERIES

SWINGAWAY AND REMOVABLE FOOTRESTS

INFILL PUNCTURE PROOF TYRES

200 MM HEAVY DUTY CASTORS

DOUBLE RAIL HEAVY GAUGE STEEL CHASSIS FRAME

6.3 Parking Brakes.

There is a standard attendant operated parking brake used on Vixen Cub, Epic, Epioc, Heavy Duty, Heavy Duty Extended and Tilt in Space. This works by locking into the castellated hub on the drive wheels.

Drawings and parts lists are in the Appendices for each model.

6.4 Kerb-Climbers

There is one standard type of kerb-climber.

Kerb-climbing equipment can be fitted to the following models of Newton Vixen wheelchairs:

The Vixen EPIOC
The Vixen Heavy Duty

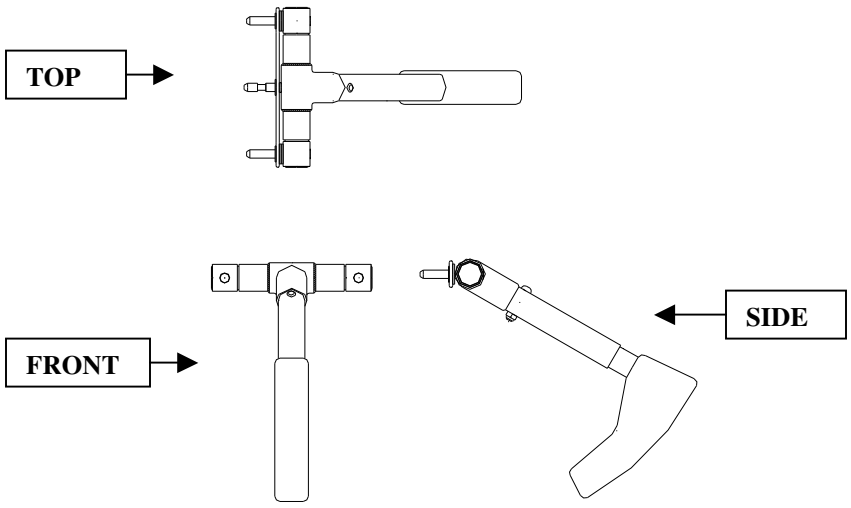
Kerb-climbing equipment is not for use with any other models.

To attach the kerb-climber slide the locating pins into the locating holes on the chassis and push in to lock the central pin into the chassis.

Ensure the latch lever has engaged correctly with locking pin.

The latch lever should be parallel to the front of the chassis.

To remove, turn the latch lever on the chassis 90º and remove the kerb-climber.



VIXEN KERB CLIMBER

6.5 Castors

There are 3 sizes of castor assembly: -

125mm wheels	Fitted to the Vixen Cub and Vixen EPIC
200mm wheels	Fitted to the Vixen EPIOC and Vixen Heavy Duty
200mm wheels	Fitted to the Vixen XL (Extra heavy duty.)

6.5.1 Removal of Castor Assembly

Castors are currently supplied as sealed bearing units complete with forks and mounting stud.

For all Vixen chairs, first remove the seat unit, batteries and footrests, and turn the chassis upside down on a bench before attempting to remove the castor assembly.

125mm Castor Assembly
Remove the 6mm bolt from the castor mounting tube.
Withdraw the castor assembly.

200mm Castor Assembly
Drive out the roll pins and remove the footrest location plate.
Withdraw the castor assembly.

200mm Heavy Duty (XL) Castor Assembly
Remove the 8mm button head set screw from the castor mounting tube.
Withdraw the castor assembly.

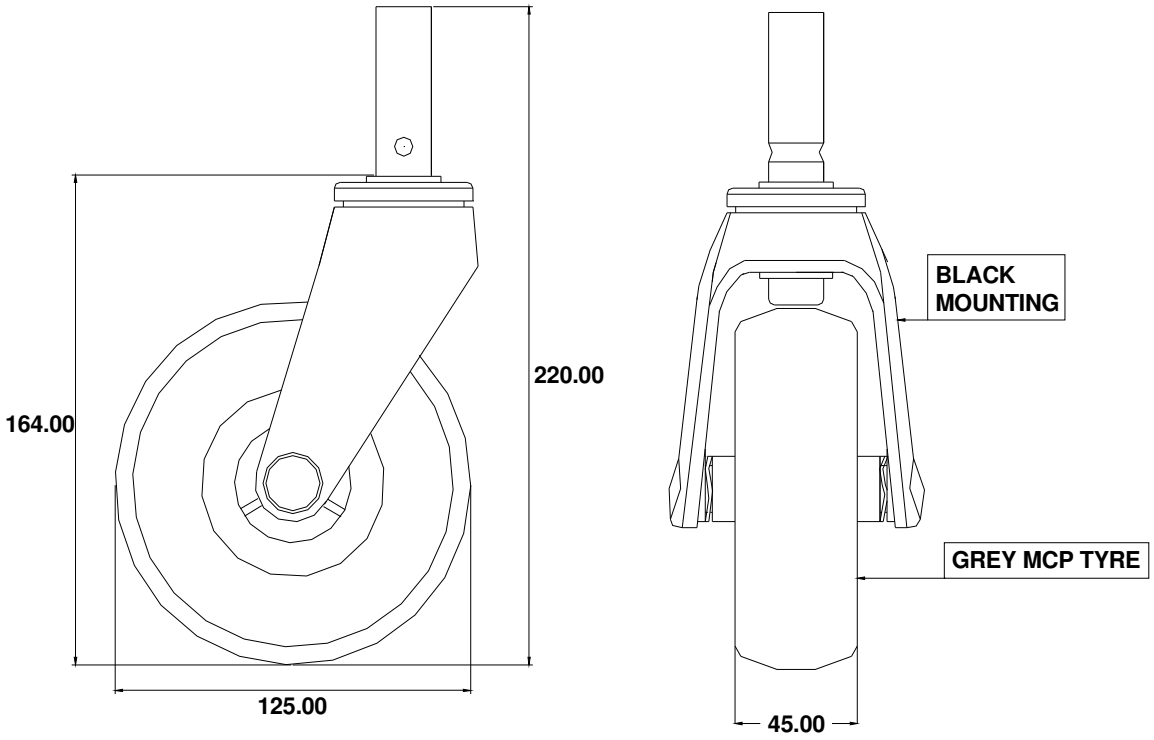
To refit the castor assembly after servicing or to replace the unit reverse the appropriate procedure above.

Note:
Under normal conditions the only maintenance required is the removal of debris and the application of light oil to the wheel bearings.

6.5.2 Castor Wheel

The castor wheel and fork are supplied in sealed units and are maintenance free.

125mm Castor



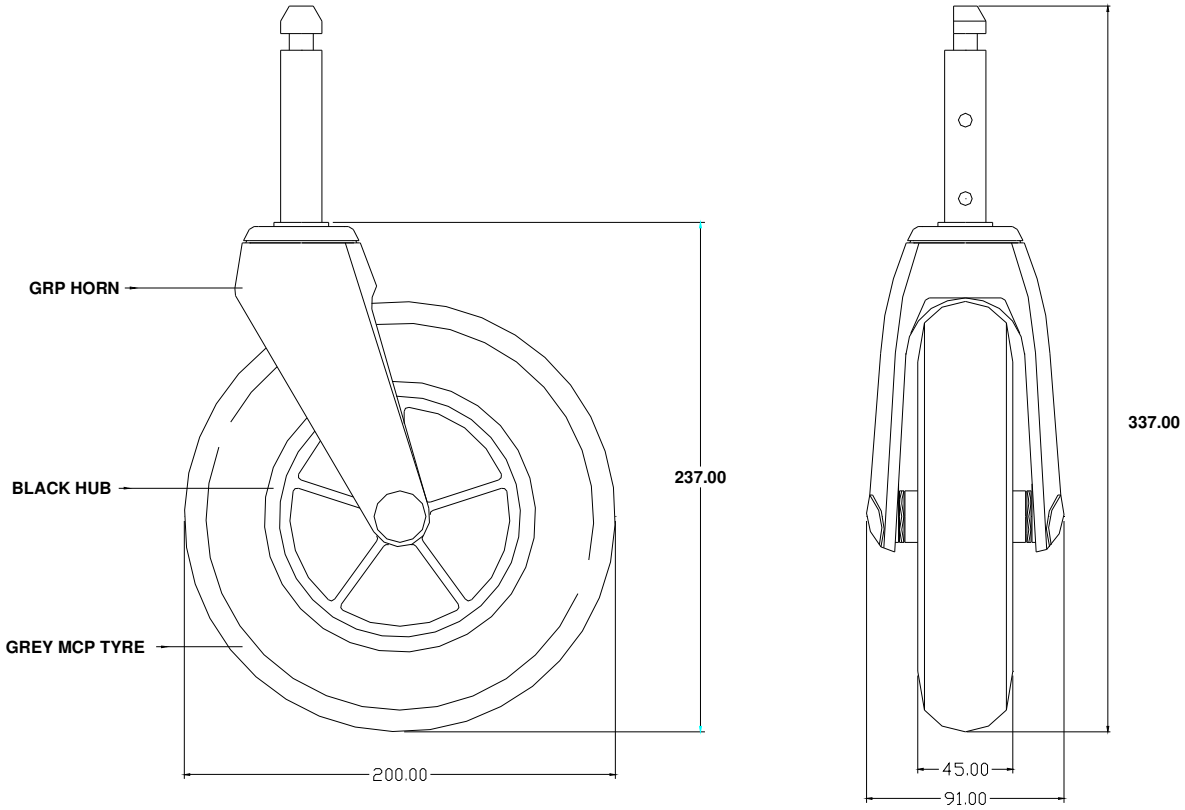
The 125mm castor is used on the Standard Wheelbase.

Vixen Cub

Vixen Epic

Part no. **3771**

200mm Castor (long stem)



The 200mm (long stem) castor can be used on the Long Wheelbase, Heavy Duty and Extended Heavy Duty.

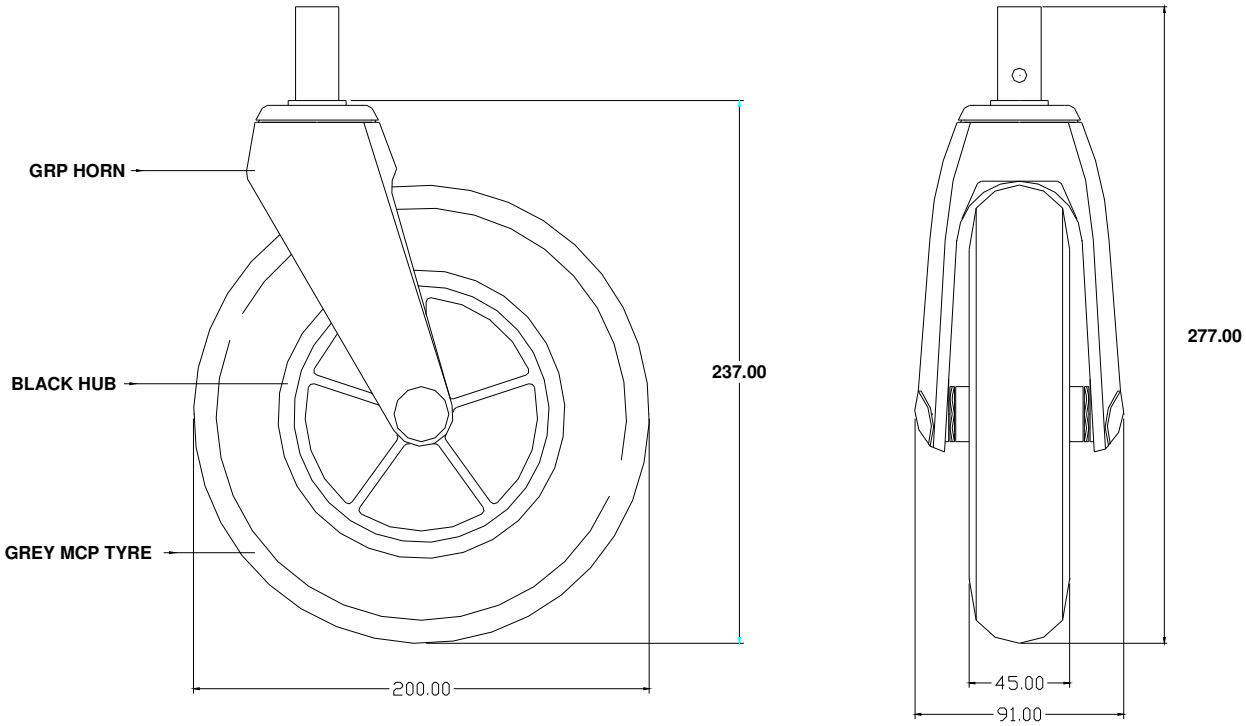
Vixen Epioc.

Vixen Heavy Duty.

The long stem castor is used when footrest hangers are mounted on the chassis frame.

Part no. **9966**

200mm Castor (short stem)



The 200mm (short stem) castor can be used on Long Wheelbase, Heavy Duty and Extended Heavy Duty.

Vixen Epioc.

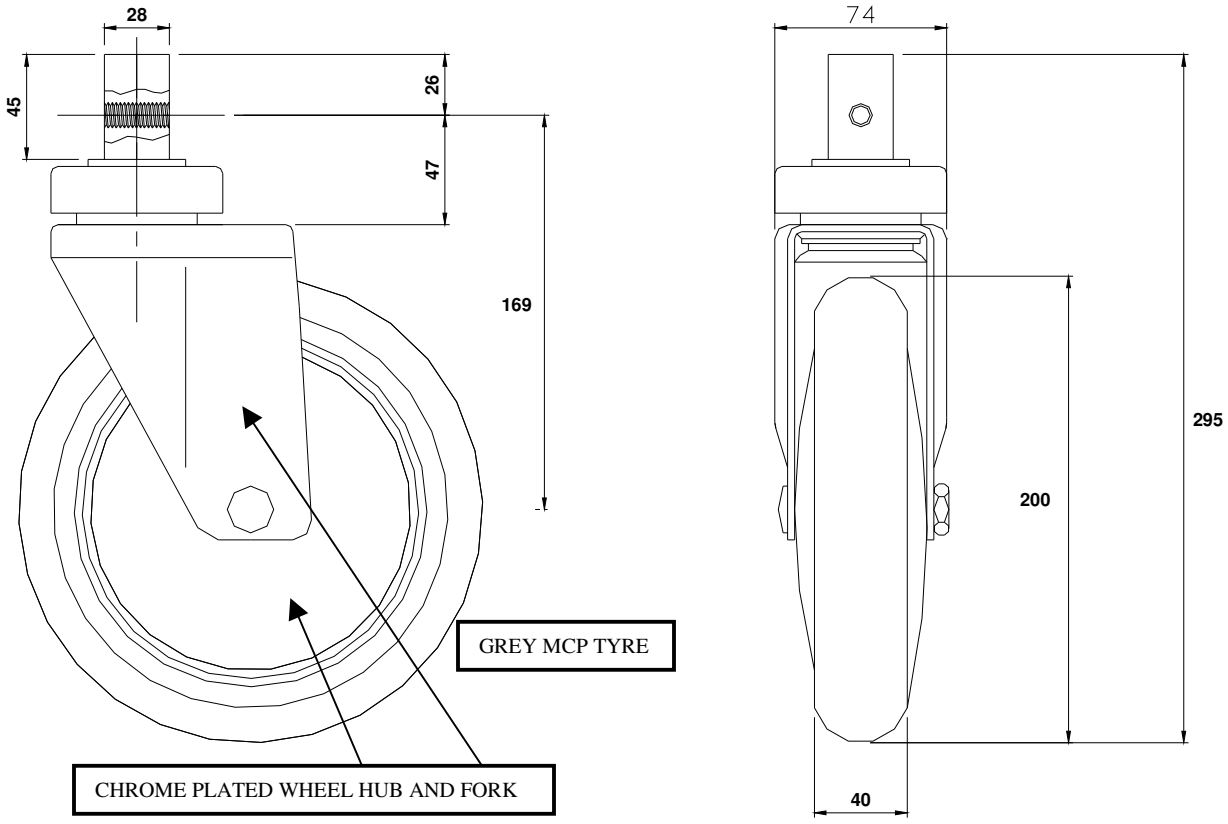
Vixen Heavy Duty.

Vixen Tilt in Space.

The short stem castor is used when footrests are seat mounted, or not required.

Part no. **9969**

200mm Castor Extra Heavy Duty



The 200mm Extra Heavy Duty castor is used on the Vixen XL only.

Part no. **10160**

6.6 Drive Wheel & Clutch Assembly

The drive wheel clutch assembly has an integral mount for the disengage pin assembly. The following instructions apply to the Cub, EPIC and EPIOC, using 68rpm motors and 110rpm motors.

There is a different clutch mechanism on the 117rpm and 120rpm motors used on the Heavy Duty and XL chairs. It is an integral part of the motor gearbox assembly. It is a non-serviceable item. The instructions for the removal of the drive wheel are below.

Removal of the Drive Wheel

First remove the seat unit, batteries and footrest.
Raise the chassis/drive wheels on 4" blocks positioned under the motor mounting plate.
Remove the plastic hubcap with a small screwdriver.

- For the Cub, EPIC and EPIOC (68 & 110rpm motors) remove the circlip using pliers and remove the thrust washer. Then withdraw the wheel from the axle.

- For the Heavy Duty (117rpm motors), remove the 10mm retaining nut and the washer. Then withdraw the wheel from the axle.

- For the XL (120rpm motors), remove the 19mm retaining nut, then the washer. Withdraw the wheel and hub from the axle.

If the wheel assembly is defective the complete unit must be replaced.

Removal of the Clutch Disc

Remove the two 6mm grub screws with a 3mm allen key.
Knock out the drive pin with a 3/16" (4.76mm) pin punch.
Withdraw the clutch disc with a hub puller.

Removal of the Disengage Pin and Spring

Tap out the roll pin with a 3/16" diameter pin punch
Remove the disengage pin and spring from the wheel body.

Refitting the Disengage Pin & Spring

Clean all component parts.
Replace any worn parts.
Lightly grease the disengage pin and spring.
Refit the disengage pin and spring.
Tap a new roll pin into place.
Check for correct operation.

Refitting the Clutch Disc

Clean all component parts.
Replace any worn parts
Place the clutch disc on the motor axle, with the boss facing the motor.
Ensure the clutch disc is positioned correctly.
Align the pinholes through both clutch disc and axle with a 3/16" diameter punch or rod.
Tap drive pins into place.
Screw in the two 6mm grub screws.

Refitting the Drive Wheel

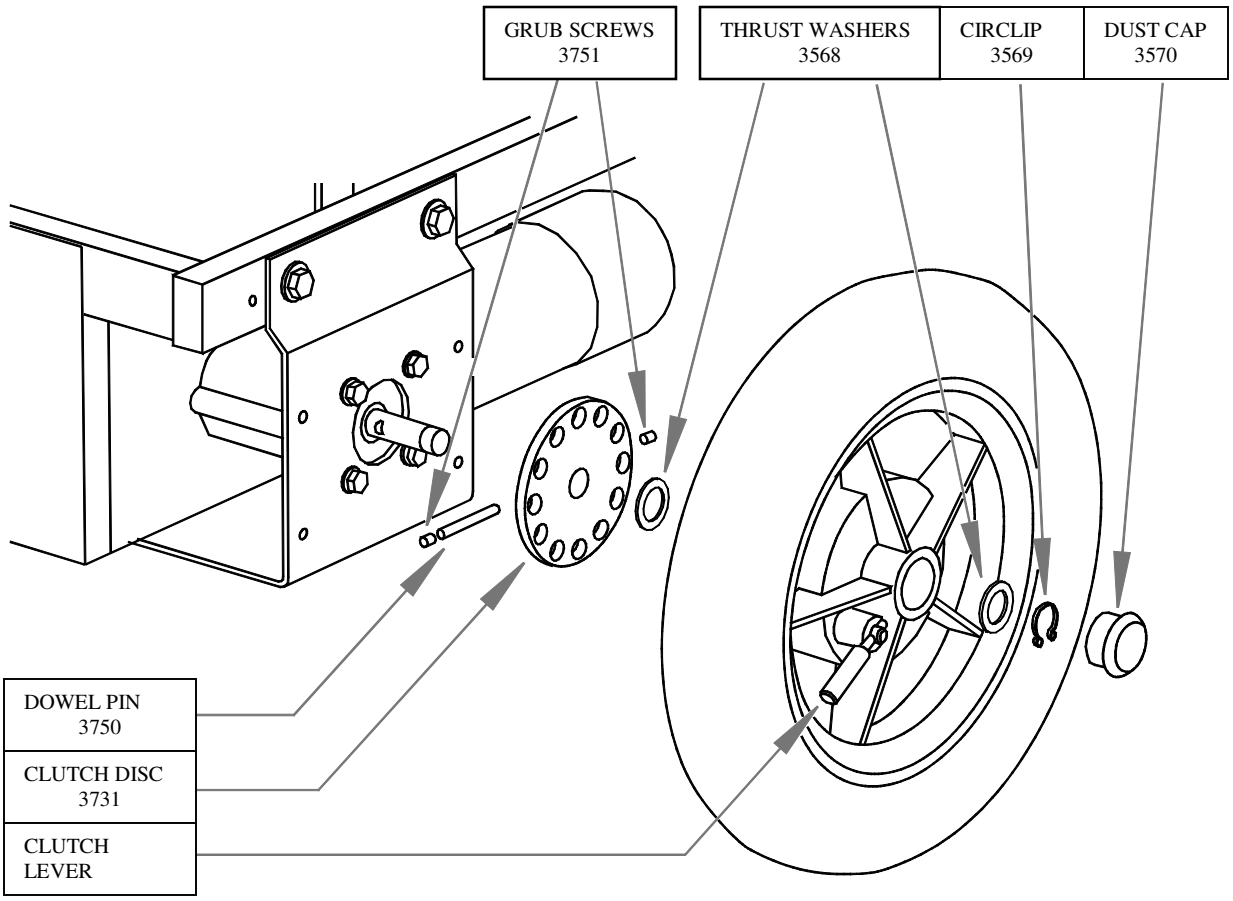
Clean all the component parts.
Replace any worn parts.
Lightly grease the axle.

- For the Cub, EPIC and EPIOC (68 & 110rpm motors), refit the thrust washer onto the axle against the clutch disc. Position the clutch lever in the free wheel position. Slide the wheel onto the axle. Refit the outer washer, and then replace the circlip. **Always fit a new circlip when replacing the drive wheel.** Do not over stretch the circlip. Check that the circlip is located correctly in the axle groove and that the wheel rotates freely. Refit the hubcap.

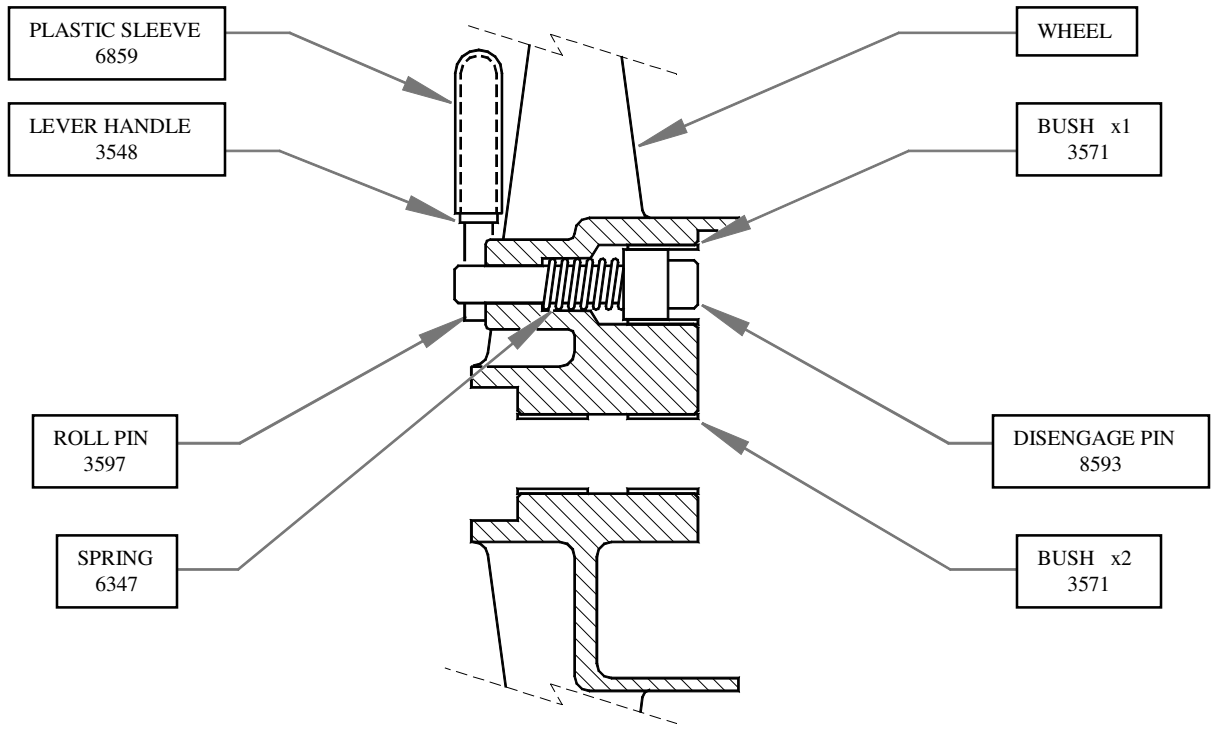
- For the Heavy Duty (117rpm motors), line up the keyway on the drive wheel with the woodruff key on axle, slide the wheel onto the axle up to the spacer bush, refit the outer washer and secure to axle with 10mm retaining nut. Refit the hubcap.

- For the XL (120rpm motors), line up the keyway on the drive wheel with the woodruff key on axle, slide the wheel onto the axle, refit the outer washer and secure to axle with 19mm retaining nut.

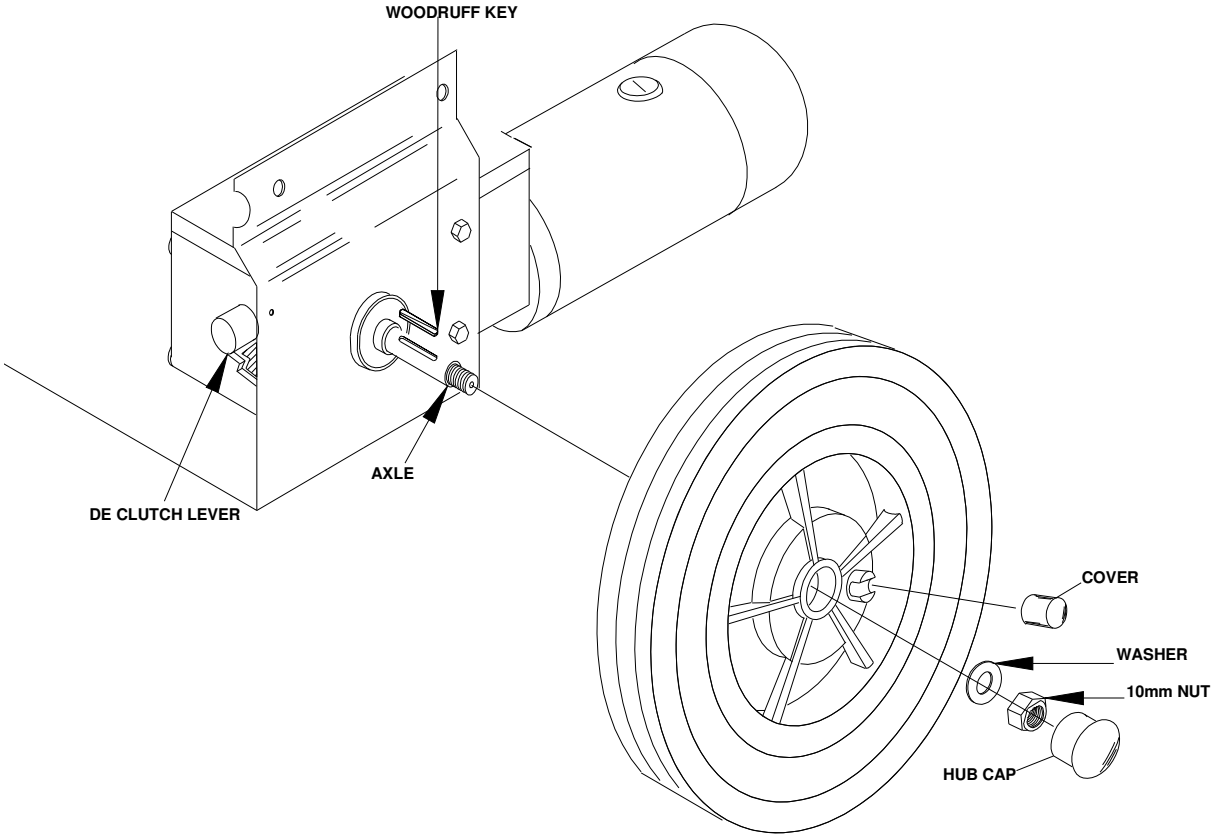
Drive wheel and clutch. 68rpm and 110rpm motors as used on Vixen Cub, EPIC and EPIOC.



Drive wheel de-clutch mechanism used on 68rpm and 110 rpm motors. Vixen Cub, EPIC and EPIOC.



Drive wheel and de-clutch mechanism used on 117rpm motors. Vixen Heavy Duty and Extended Heavy Duty.



6.7 Drive Motor & Mounting Plate Assembly

There are 2 types of motor mounting plate: -

Standard	Fitted to the Vixen Cub, Vixen EPIC, EPIOC, Heavy Duty and Tilt in Space.
XL	Fitted to the Vixen XL

There are 4 types of motor/gearbox: -

68rpm	2mph	Fitted to the Vixen Cub & Vixen EPIC
110rpm	4mph	Fitted to the Vixen EPIOC
117rpm	4mph	Fitted to the Vixen H/Duty and Tilt in Space
120rpm	4mph	Fitted to the Vixen XL

6.7.1 Removal/Refitting Mounting Plate and Motors (All chassis units)

First remove the seat unit and batteries and block up the rear of the chassis with a 4” block under the motor mounting plate.

Remove the drive wheels. See section 6.6.

Disconnect the motor supply cables at the in line plug/socket connectors.
Remove the 5 nuts and bolts securing the mounting plate to the chassis.
The chassis can now be removed, leaving the mounting plate assembly with motors on the block.

If the motors are fitted with clutch discs, they will need to be removed. See 6.6.

Remove the 4 bolts securing each motor to the mounting plate. Withdraw the motors from the mounting plate.

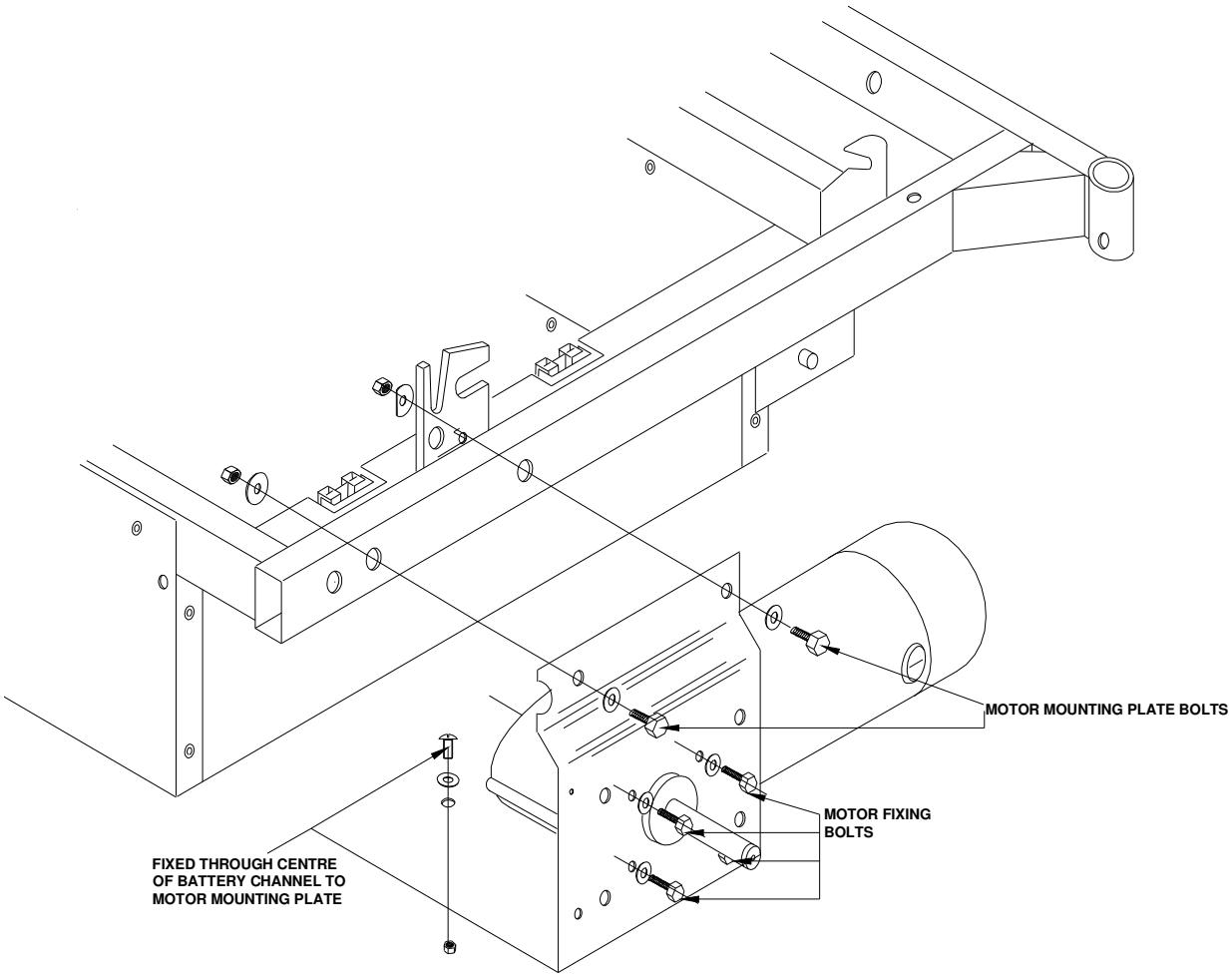
Note:
The motor and gearbox is a factory set integral unit and under no circumstances should any attempt be made to separate the gearbox from its motor. This would invalidate any warranty. If either motor is defective it must be replaced.

Clean all the component parts
Replace any worn parts.

Refit the motors to the mounting plate, tightening the bolts progressively with a torque wrench set 6 Nm (68 & 110rpm motors), and 10 Nm for Heavy duty (117 & 120rpm motors).

Refit the mounting plate and motors to the chassis, tightening the bolts progressively with a torque wrench set to 4 Nm.

Removal and refitting of Motor mounting plate assembly



6.7.2 Brush Replacement

Important: - New motors have warranty seals on cowl. If these seals are broken the warranty on the motor becomes invalid. Before performing any work, which involves disassembling the motor, check that the seals are not present. If the seals are present refer to Newton Products Ltd for more information.

Removal of Brushes

To replace the motor brushes, it may be necessary to remove the motor mounting plate form the chassis frame. See 6.7.1.

68rpm Internal brushes x2.
110rpm External brushes x2.
117rpm External brushes x2.
120rpm External brushes x4.

Internal Brushes

Loosen, but do not remove, the cowl screws.
Remove the cowl, feeding the lead inwards through the grommet at the same time.
Hook the brush springs back onto the brass pillars with a small screwdriver.
Pull the brushes/tags out.

Refitting Internal Brushes
Clean all carbon dust from the motor.
Check the commutator is not damaged. A dark black surface is not detrimental.
Check that the replacement brushes are the correct grade (M50).

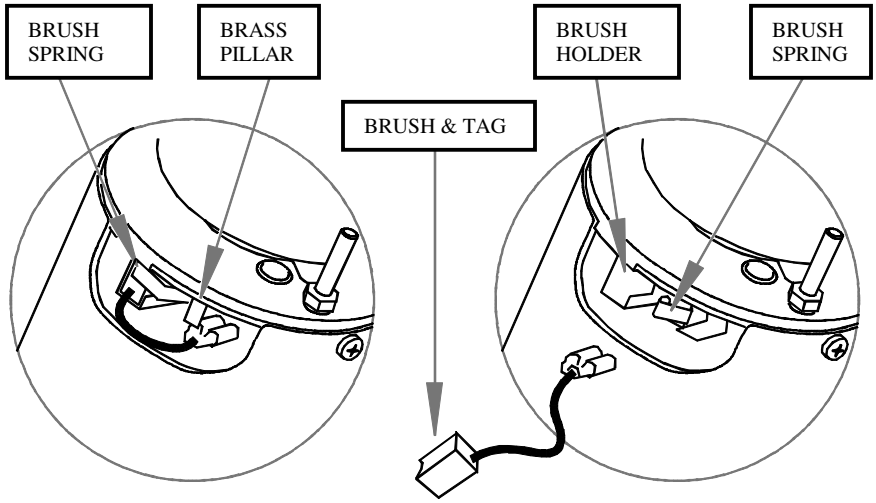
Push the tags into place. Ensure the tags are fitted correctly and pushed fully home.
Slide the brushes into the holders with the leads towards the body of the motor.
Unhook the springs from the brass pillars and position them on the brushes clear of leads.
Ensure the brush leads are inside the diameter of the motor body.
Refit the cowl, feeding the lead out through the grommet and tighten the cowl screws.
Refit the mounting plate and motors as described in section 6.6

External Brushes

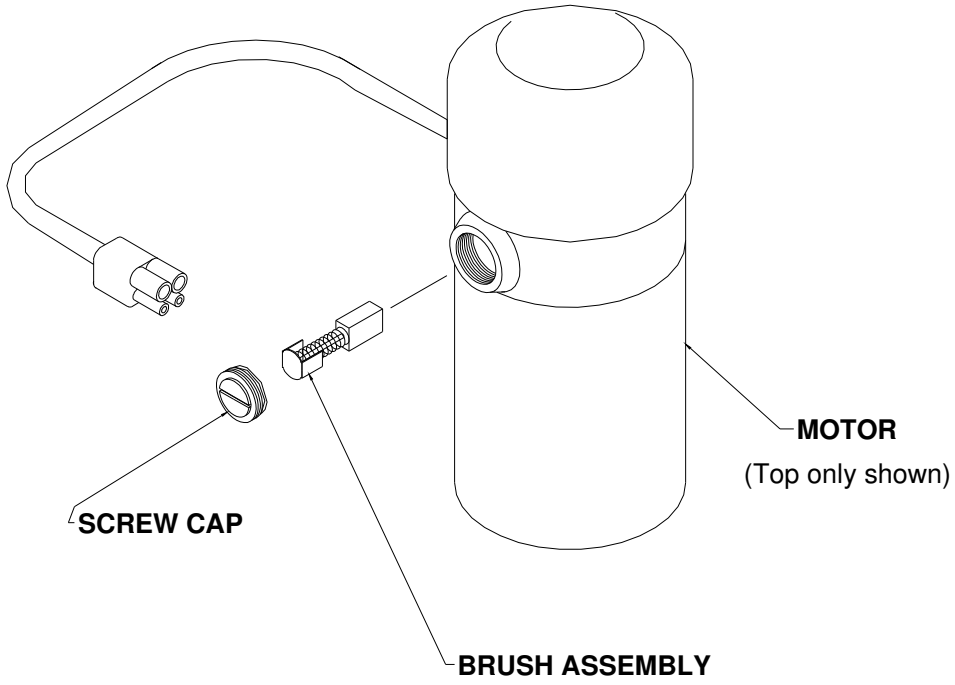
Unscrew cap on motor housing. Remove brush with spring

Refitting External Brushes
Clean all carbon dust from the motor.
Check the commutator is not damaged. A dark black surface is not detrimental.
Check that the replacement brushes are the correct grade (M50).
Refit brush and screw on cap.

Fitting Internal motor brushes



Fitting External motor brushes



6.7.3 Electromagnetic Brake Replacement

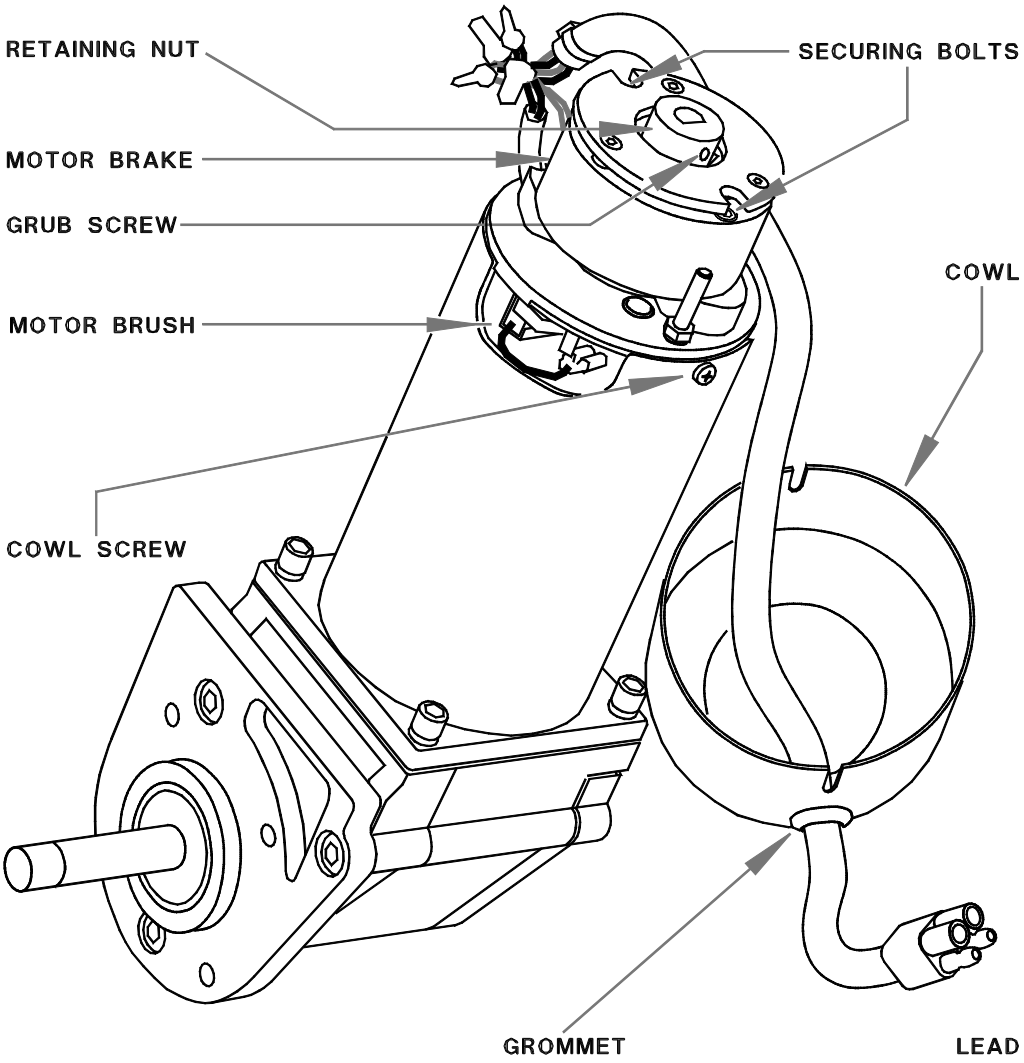
Should this be necessary, first remove the motors as described in section 6.6.

Removal of Electromagnetic Brake
Loosen, but do not remove, the cowl screws.
Remove the cowl, feeding the lead inwards through the grommet at the same time.
Loosen but do not remove the grub screw using a 2mm Allen Key.
Remove the 2 bolts securing the motor brake using a 3mm Allen key.
Disconnect the 2 yellow leads by removing appropriate plastic connectors.
Remove the central plastic retaining nut.
Remove the motor brake.

Refitting the Electromagnetic Brake

Place the new motor brake over the motor spindle.
Refit the plastic retaining nut, but do not tighten the grub screw.
Align the motor brake and motor unit and refit the securing bolts using a 3mm Allen key.
Tighten the grub screws.
Connect the 2 yellow leads from brake to the motor using new plastic connectors.
Refit the cowl feeding the lead out through the grommet.

Electromagnetic brake replacement



Electrical Drive & Control Systems

The drive circuits used in Vixen chairs are conventional and will be easily understood by the experienced Service Engineer.
The major parts of the system are described below.

Battery Supply

Two 12 volt batteries connected in series provide a 24 volt supply.
Each battery has a connecting lead assembly incorporating a thermal circuit breaker. The purpose of this is to provide 'back-up' to the external circuit breaker located under the right hand chassis rail and to protect the battery and connecting leads.

Main Harness

The battery connecting leads join the main harness via the two connecting sockets located in the battery compartment.

The main harness connects the controller to the motors, electromagnetic brakes and battery supply.
The main harness is protected by the external circuit breaker.

Circuit Diagram

The circuit diagram in the next page shows in schematic form the battery supply, motor drive and full circuit protection – including the rating of the fuses and circuit breakers.