STERLING

ELITE XS 3 & 4 WHEEL, ONYX

Scooters

Workshop Manual

SUNRISE MEDICAL

ENGLISH

ELITE XS, ONYX
WORKSHOP MANUAL

The ELITE XS range is a rear wheel drive, three or four - wheeled electric powered scooter with pneumatic tyres, rake adjustable tiller, upholstered seat with folding back and flip up-width adjustable armrests, shopping basket, horn, battery gauges and security key on/off switch.

Sunrise Medical is ISO 9001 certified, which ensures quality at all stages of the development and production of this Scooter.

This product is manufactured to comply with the requirements of EEC directives 89/336/EEC

CE

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IMPORTANT

It is potentially hazardous to fit or use any parts other than genuine Sunrise Medical parts.
The company disclaims all liability for the consequences of such use, which in addition voids the machine warranty.

This scooter is for the carriage of
ONE PERSON
And must not be used for any other purpose.

ELITE/ONYX
SAFETY

Whilst working on powered mobility products, it is essential to observe good working practice.
Below are a series of safety guidelines and recommendations.
Please note that these precautions are intended to serve only as a guide and are not intended to supersede or replace any safety statute, NHS or other safety regulations.

General

- Always wear suitable protective clothing when handling batteries.
- Always wear suitable eye protection when drilling or inspecting.
- When safe to do so, wear protective gloves when handling the running gear or batteries, as these parts are exposed to paths, parks etc.
- If the drive wheels have to be raised of the floor, always use a pair of axle stands to secure the vehicle correctly.

Batteries

All work carried out on batteries or battery boxes should demand a degree of extra caution.

- Always make sure that the batteries are disconnected from the vehicle before commencing work.
- Always check that the battery charger is disconnected from the vehicle / batteries before commencing work.
- Do not smoke.
- Keep batteries away from all sources of ignition.
- Do not place objects on the battery tops.
- Always try to keep someone within earshot of your work area so that they may come to your assistance if needed.
- Always wear personnel protection when handling batteries including, eye / face protection and gloves.
- Make sure there is easy access to soap and water in case of acid spills.
- Avoid touching eyes or unprotected parts of the body while working on batteries.
- Remember that none sealed batteries can contaminate any packaging, housing, or boxes they may have been transported in, so handle all packaging with care especially when disposing of.
- If battery acid should come into contact with bare skin or clothing, be sure to wash immediately using plenty of soap and water. If battery acid enters the eyes, flush with running cold water for as long as possible while medical help is sought.

ELITE/ONYX
SAFETY

Batteries

- When the tops of batteries are exposed, take extra care when working on or around the terminals.
- Do not allow metal tools to drop on to or touch the exposed terminals of the batteries or other exposed connections as this could cause a short circuit, which may result in an explosion.
- Remove personnel items of jewellery such as rings, watches, chains etc. before commencing work on batteries. If such items were to cause short circuit whist being worn, very serious burns would result.
- Batteries are constructed using very heavy materials, because of this it is essential that correct lifting techniques be employed when moving batteries around. It is also recommended that safety footwear be worn.
- When disposing of old batteries, please ensure that correct disposal procedures are followed. Contact your local authority for their recommendations.

Battery Chargers

- Remember battery chargers are Mains Driven Units.
- Always observe all guidelines and laws relating to mains-connected installations and equipment.
- Never operate the battery charger in wet or damp conditions.
- If you suspect that the charger has been exposed to water or excessive damp, do not use it. Return the unit back to the dealer/supplier for inspection.
- If the battery charger is suspected of being defective or is visibly damaged, return the unit back to the dealer for inspection.

RECOMMENDED TOOLS

1. Metric socket set.
2. Imperial socket set.
3. Hexagon wrenches, (imperial & metric).
4. 3.5 - 8mm flat screwdriver.
5. No. 0 cross-head screwdriver.
6. No. 1 cross-head screwdriver.
7. No. 2 cross-head screwdriver.
8. Metric combination spanner set 5 - 25mm
9. Imperial combination spanner set 1/8 - 1”
10. Mole grips.
11. Long nose pliers.
12. Adjustable Spanner.
13. Combination pliers.
14. Ciclip pliers.
15. Hammer, (small & large).
16. Soft hammer,(rubber, hide or nylon).
17. Feeler gauges, (metric & imperial).
18. Stanley knife.
19. Pin punches.
20. Electric drill, (mains/battery).
21. Drill bits, (metric & imperial).
22. Hacksaw, (standard & junior).
23. Toque wrench.
24. Steel engineering rule.
25. Tape measure.
26. Tyre pump.
27. Tyre pressure gauge.
28. Personal safety gear.
29. Wire strippers/cutters.
30. Tag crimper.
31. Multi-meter.
32. Battery tester.
33. Hand held electronic programmers.
34. Parts manuals & wokshop manuals.
35. Tyre levers.

Service & Inspection

ANNUAL

Controller

- On/off Switch
- PCB Plug Connections
- Operation
- Dynamic Braking
- Programmable Settings, (where applicable).
- Test Run

Batteries

- Physical Inspection .
- Connections
- Discharge Test
- Up/Down Slope

Wheels & Tyres

- Wear
- Pressure, (Pneumatic Only).
- Bearings, (Where appropriate).
- Wheel Nuts
- Castors, (Where appropriate).
- Stub Axles

Motors

- Wiring
- Noise
- Connections
- Brake
- Brushes.

Chassis

- Condition, (Welded Joints etc.).
- Steering, (Twists etc.).

Upholstery / Seat

- Seat
- Back
- Arm pads
- Seat Slide Mechanism, (where fitted).
- Set Post Assy.

Electrical

- Loom
- Connections
- Lights/Indicators

Drive

- Forwards
- Reverse
- Emergency Stop
- Left Turn
- Right Turn
- Over Obstacles
- Parking Brake

TECHNICAL SPECIFICATIONS

Elite XS 3-Wheel

maximum range*	***57 km***
forward speed maximum	***12 km/h***
reverse speed maximum	***5 km/h***
turning circle	***115 cm***
incline 1:4 (25%), max. user weight	***115 kg***
incline 1:5 (20%), max. user weight	***150 kg***
total weight (excl. batteries)	***82 kg***
total length	***138 cm***
total width	***67 cm***
weight heaviest part	***64 kg***
batteries	***74 AH***
weight batteries each (74 AH)	***26.5 kg***
adjustable seat height	***48 - 55 cm***
backrest height	***52 cm***
seat depth	***43 cm***
seat width	***51 cm***

* Range is calculated under test conditions. Weight, terrain and weather conditions can affect range and speed.

TECHNICAL SPECIFICATIONS

Elite XS 4-Wheel

maximum range*	**57 km**
forward speed maximum	**12 km/h**
reverse speed maximum	**5 km/h**
turning circle	**162 cm**
incline 1:4 (25%), max. user weight	**115 kg**
incline 1:5 (20%), max. user weight	**150 kg**
total weight (excl. batteries)	**87 kg**
total length	**138 cm**
total width	**67 cm**
weight heaviest part	**69 kg**
batteries	**74 AH**
weight batteries each (74 AH)	**26.5 kg**
adjustable seatheight	**48 - 55 cm**
backrest height	**52 cm**
seat depth	**43 cm**
seat width	**51 cm**

* Range is calculated under test conditions. Weight, terrain and weather conditions can affect range and speed.

TECHNICAL SPECIFICATIONS

ONYX

Overall Length	**54" / 138 cm**
Overall Width	**26" / 67 cm**
Max.user weight	**330 lbs / 150 kg / 23.5 st**
Max.Gradient (1)	**14 degrees - 115 kg user weight**
Max.Gradient (2)	**11 degrees - 150 kg user weight**
Front wheel diameter	**12" / 31 cm**
Rear wheel diameter	**12" / 31 cm**
Range*	**24 m / 37 km**
Speed	**8 mph / 12 kph**
Turning Radius	**63" / 162 cm**
Weight (excluding batteries)	**190 lbs / 87 kg**
Battery Capacity	**50 AH**
Adjustable seat height	**19" - 23" / 48 cm - 58 cm**

***Range given represents test conditions. Please note that temperature, user weight, terrain and battery capacity may affect overall performance.**

PROGRAMME FOR ELITE, ONYX

Accessible with SP1				
Function	Fast	Slow	8kph	6kph
Forward acceleration	25	25		
Forward deceleration	15	15		
Reverse acceleration	20	20		
Reverse deceleration	20	20		
Forward speed with 2K5 resistor	100	100	66	50
Reverse speed	35	35		
Invert throttle polarity	yes			
Power down timer	0m			
Accessible only with SP1b	**v2.2**			
Current limit	110A	110A		
Motor compensation	60m&!	60m&!		
Hold factor/hold comp	180%	180%		
Mid current	0s			
mid time	0%			
Brake time	15			
ISO tests	on	**		
Bridge hold time	20			
Throttle gain	100			
Pulse reverse alarm	yes			
Wig-wag throttle	yes			
Low battery flash inhibit	yes			
Soft stop	yes			
Throttle deadband	10%			
Output voltage	25V			
Trucharge cable resistance	40m&!			
Trucharge cal	100			
Max charge amps	30			
Min charge amps	*			
Accessible only with SP1e	Top	Bottom		
Profile	1	80		

FRONT BUMPER ELITE XS (3W)

1. The front bumper is secured at each end by two hex stud bolts.

2. The nuts are between the outer chassis member and the edge of the foot board.

3. Use a 10.00mm open spanner and a 5.00mm hex key, to undo the bolts.

4. Remove all four bolts.

5. Finally, remove the bumper.

6. Note that the bumper has a smooth curved profile on the top surface and an angled profile underneath.

FRONT WHEEL/BRAKE ELITE XS (3W)

1. With the bumper removed it is easier to access the front brake.

2. Use a 4.00mm hex driver to release the brake anchor stud.

3. The Brake Anchor Stud & Washers.

4. Turn the brake adjuster and locking wheel to align their slots with the slot in the bracket.

5. Pull the brake cable cap out of the adjuster.

6. Drop the cable through the slots.

FRONT WHEEL/BRAKE ELITE XS (3W)

7. Free the cable & it's spring from the bracket.

8. Aline the cable with the slot in the actuator lever.

9. Pull the brake cable & nipple out of the actuator lever.

10. Use a 10.00mm cranked hex key to loosen the front axle.

11. Use a 19.00mm. socket to secure the other end of the front axle.

12. Once the axle is loosened, jack the front wheel up until it clears the floor.

FRONT WHEEL/BRAKE ELITE XS (3W)

13. Undo the dome nut and washer using finger pressure.

14. Turn the other side ant-clockwise and pull the axle slowly out.

15. Be careful not to lose the two shim washers as the axle retreats through the wheel.

16. Remove the large spacer as the axle withdraws from the wheel and fork.

17. With the axle removed, lift the front wheel clear of the forks.

18. Lift the brake assembly out from the centre of the wheel.

REAR WHEELS ELITE XS

1. Use a small flat-blade screw driver to get under the hub cap tag.

2. Carefully prize the hub cap off.

3. Use a 19.00mm socket to loosen the hub nut.

4. Use a jack or blocks to lift the rear wheel. Note that the jack should only be placed under the chassis box sections, not the flat panels.

5. Use the socket with hand pressure, to undo the hub nut fully.

6. Remove the hub nut.

REAR WHEELS ELITE XS

7. Remove the large washer.

8. Because the rear wheel is keyed to the drive shaft, a small ammount of force may be carefully applied to loosen the wheel.

9. Remove the wheel.

10. Remove the drive key.

11. Remove the spacer. Note that there is a rebate cut into the end of the inside face of the spacer.

12. The locating circlip that the spacer rebate encloses. This circlip correctly positions the rear wheel on the drive shaft.

FRONT WHEELS ONYX

1. View of the front wheel.

2. With the wheel on the ground, use a 19.00mm socket to loosen the centre self-locking nut

3. Once the centre nut is loosened, raise the wheel using a jack or axle stands/blocks.

4. Remove the centre nut using finger pressure only.

5. Remove the washer.

6. Carefully remove the wheel.

REAR WHEELS ONYX

1. Using a 19.00mm socket, loosen the rear wheel while it is still on the ground.

2. Use a jack or axle stands/blocks, to elevate the wheel.

3. Use finger pressure to remove the centre nut.

4. Remove the nut and washer.

5. Note that there is a key way cut in the centre of the rear wheel.

6. Remove the corresponding key from the drive shaft.

TYRES & TUBES ONYX

1. Remove the dust cap from the tyre valve.

2. Depress the valve pin. To release as much of the air as possible, squeeze the tyre.

3. Using a soft face hammer, carefully tap around the circumference of the back of the tyre.

4. Then tap around the front. This action helps to break the seal on the rims to aid removal.

5. The front face of the wheel has 4-dome nuts securing the hub.

6. The rear face of the wheel has 4 corresponding captured studs.

TYRES & TUBES ONYX

7. With the air out, loosen the four hub nuts using the opposites sequence, but don't take them off.

8. Once the hub nuts are loosened, use the socket shaft and finger pressure to fully remove them.

9. Remove the hub nuts.

10. Remove the washers.

11. Turn the wheel over.

12. Lift the hub away from the rims.

TYRES & TUBES ONYX

13. Lift the inner rim away from the tyre. A non-corrosive release agent will help.

14. Turn the wheel over and repeat for the outer rim. **Note**; Be careful if using metal tyre levers as excessive force on the rim edge may cause fracture.

15. With the rims removed, reach into the tyre and gently pull the tube out.

16. The Hub, Hub Nuts, Washers and Centre Wheel nut.

17. The Outer & Inner Rims.

18. The Tyre & Tube.

TYRES & TUBES ELITE XS

The Elite XS has different types of wheel rims to the Onyx. The outer rim has an integrated hub, but the basic process is the same.

1. The five rim studs are accessed from the back of the wheel.

2. Remove the valve dust cap and deflate the tyre as previously described.

3. Squeeze as much of the air out of the tyre as is possible. At this stage, use a non-corrosive releasing agent between the tyre & rim.

4. Remove the five recessed rim studs using a 4.00 mm hex key/driver.

5. Remove the inner rim from the tyre.

6. Lift the outer rim from the tyre & proceed as before to remove the tube. Note that the outer rim has an integrated hub.

FRONT BRAKE ELITE XS(4) & ONYX

1. With the wheel removed the front brake can be accessed.

2. Locate the brake actuator lever.

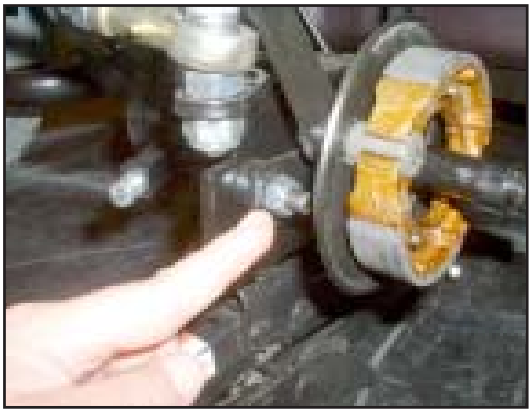
3. Push the brake actuator lever, so that it releases the tension on the cable.

4. Push the Nipple on the end of the brake cable, out of the actuator lever.

5. Carefully turn the brake adjuster until the slots line up with the slot in the bracket.

6. Release the end of the brake cable.

FRONT BRAKE ELITE XS(4) & ONYX



7. The brake assembly is secured by two bolts either side. The nuts are visible from the front.

8. The bolt heads are accessed from behind the brake assembly.

9. Use a 13.00mm open spanner on the nuts.

10. Use a 13.00mm ring spanner on the bolt heads.

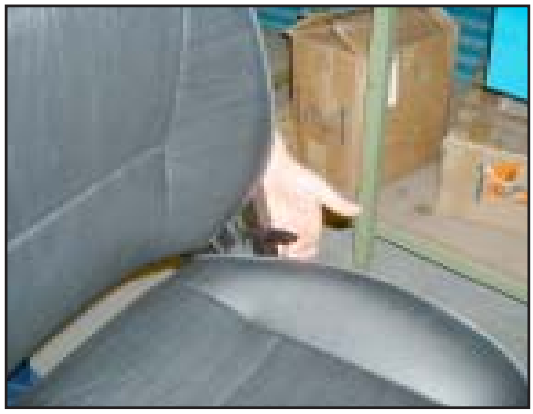
11. Access is easier if the fingers are used when the nuts are loose enough to remove. Repeat for the other side.

12. Finally, remove the brake assembly from the stub axle.

SEAT ASSEMBLY REMOVAL ELITE XS & ONYX

The seat removal process is the same for the Onyx and the Elite XS seats.

1. Lift the armrests up.



2. Pull the backrest lever up.

3. Fold the backrest forward.

4. Stand behind the seat, lift the seat swivel lever up and lift the seat off the seat post.

5. The complete seat assembly removed.

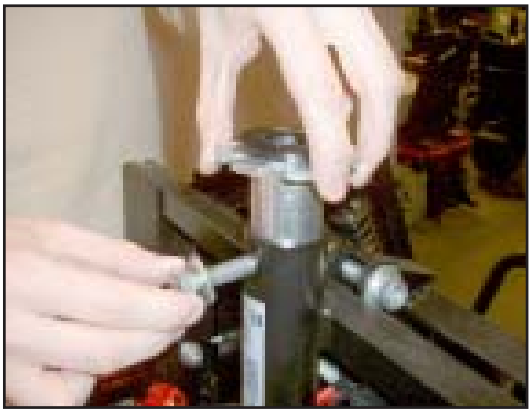
SEAT POST REMOVAL ELITE XS & ONYX

1. The seat post in situ.

2. Remove the seat and rear panel to access the seat post bolt, (see previous and next page).

3. Use two 17.00 mm spanners to loosen the seat post bolt.

4. Take the nut and washer off using finger pressure.



5. Hold the top of the seat stem to prevent it from falling when the bolt is withdrawn.

6. Lift the seat stem out. Note the height positioning holes in the seat stem.

SEAT ASSEMBLY ELITE XS & ONYX

1. Turn the seat over to access the two armrest width adjuster knobs.

2. Loosen both knobs.

3. Withdraw the armrests.

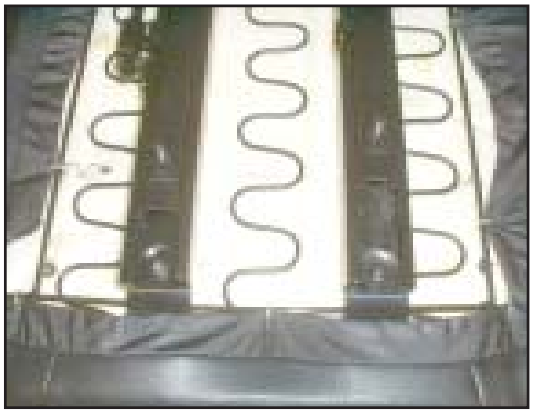
4. There are four nuts securing the seat plate assembly.

5. Use a 13.00 mm socket to undo the four seat plate securing nuts.

6. Lift the seat plate assembly off the four seat rail studs.

SEAT ASSEMBLY ELITE XS & ONYX

7. The seat plate assembly removed.



8. There are four hex bolts securing the two seat rails top and bottom.

9. Slide the seat rails forward to expose the bottom bolts and use a 5.00 mm hex key to undo them.

10. Depress the seat slide and slide the rail back to expose the top two bolts. Note that the other rail slides freely.

11. Undo the top two bolts.

12. Lift the seat rails off the seat assembly.

SEAT ASSEMBLY ELITE XS & ONYX

CAUTION!
The seat swivel lever assembly uses a strong locating spring. When working on this assembly, always wear suitable eye protection.

13. The seat swivel lever showing the position of the spring.

14. For safety, use a strong tie wrap to secure the spring as shown above.

15. Use a second tie wrap, adjusted slightly looser to catch the spring if it flies up.

16. Use a 5.00 mm hex key and a 13.00 mm socket, to undo the fulcrum nut.

17. Carefully remove the fulcrum bolt.

18. With the fulcrum bolt removed, cut the first tie wrap.

SEAT ASSEMBLY ELITE XS & ONYX

19. Lift up the lever to relieve the spring pressure and then cut the second tie wrap.

20. Remove the spring by pulling the two coiled sections off the lever fulcrum.

21. The lever & spring assembly.

22. The lever can be fitted to either side of the seat plate, providing left or right-hand operation.

23. The lever & spring showing the correct orientation of the spring ready for refitting.

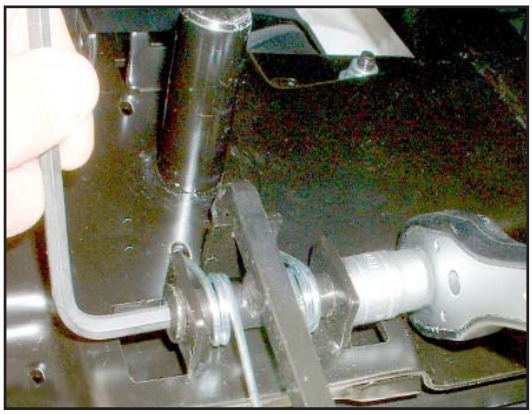
24. Squeeze the two ends of the spring into the two holes whilst holding the lever vertically. The angled end of the lever should face away from the seat post.

SEAT ASSEMBLY ELITE XS & ONYX

25. Ease the lever down so that the fulcrum lines up with the pressing on the seat plate. Use a screwdriver to line up the holes.

26. Hold the lever steady and insert the fulcrum bolt.

27. Drive the bolt through the fulcrum using a hex driver.



28. Tighten the nut & bolt, but do not over-tighten.

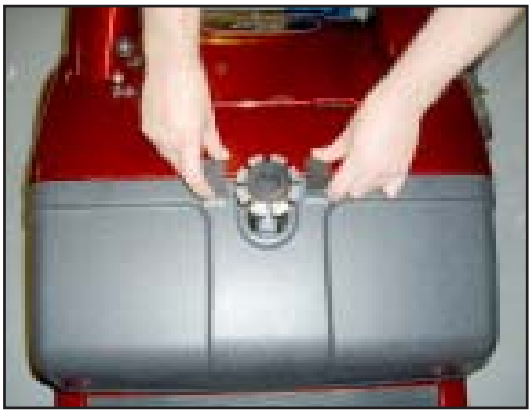
29. The angle on the lever head should be facing downwards, towards the seat plate.

30. Operate the lever several times to ensure it does not stick. If it is stiff, loosen the fulcrum nut and bolt slightly until a smooth action is obtained.

BATTERIES & CHARGER ELITE XS & ONYX

1. Unlock the boot using the ignition key.

2. Lift out the battery charger and cords.



3. Lift up the two plastic battery cover clips.

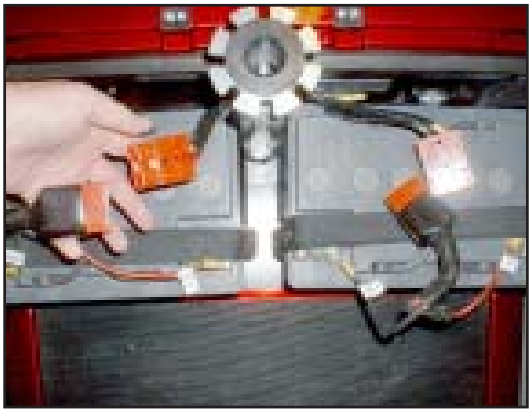
4. Carefully lift the rear panel tags out of the two location slots in the floor panel.

5. Pull the panel forwards.

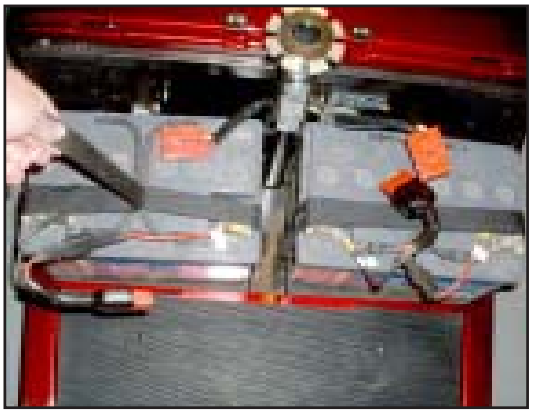
6. Finally, lift the panel away from the scooter.

BATTERIES & CHARGER ELITE XS & ONYX

7. The two batteries. Note that the battery size is 50A/h on the Onyx & 74A/h on the Elite.



8. Disconnect the two Anderson battery connectors.



9. Undo each of the velcro retaining straps.

10. Use the correct lifting technique to remove the batteries.

11. Remove the batteries one at a time.

12. The battery compartment.

REAR PANEL REMOVAL ELITE XS & ONYX

1. Unscrew the Parking Brake knob.

2. The rear panel is held in place by two screws.

3. Remove the two screws.

4. Lift the front of the panel up to access the rear lighting loom plugs.

5. Unplug the rear lighting loom.

6. Lift the panel clear of the scooter.

REAR LIGHTS & INDICATORS ELITE XS & ONYX

1. Remove the rear panel as described earlier.

2. Flip the pane up to expose the underside and loom.

3. Cut the small tie wrap located on the bottom of the storage compartment.

4. Cut the next tie wrap situated just below the first.

5. Cut the tie wrap next to the right hand light cluster.

6. Cut the tie wrap next to the left hand cluster.

REAR LIGHTS & INDICATORS ELITE XS & ONYX

7. The two rubber bulb holders at the back of the light cluster.

8. Twist and turn the holder to remove it from the back of the light cluster.

9. Carefully pull the bulb out of the holder. All rear bulbs are 24V - 5W Capless type.

10. Both bulb holders removed.

11. The rear lighting loom removed.

12. View of the flexi-clip on the lighting cluster body..

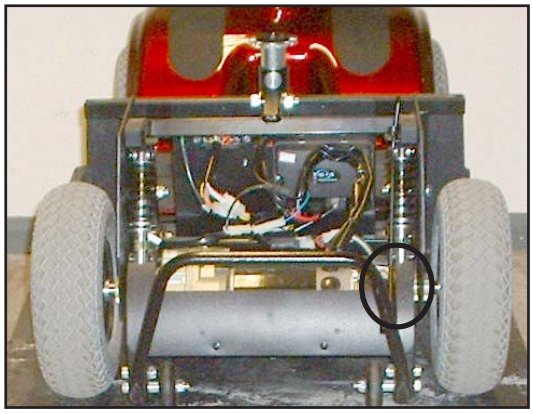
REAR LIGHTS & INDICATORS ELITE XS & ONYX

13. Use a flat blade screwdriver to gently prise the flexi-clip through the panel.

14. Lift the light cluster part way out.

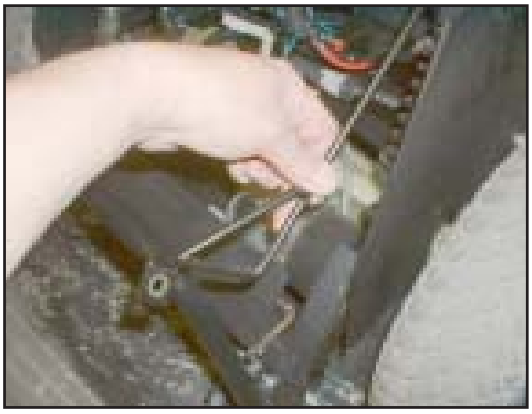
15. Withdraw the light cluster taking care not to break the straight locating tab.

REAR CHASSIS - BRAKE LEVER/LOOM



1. The brake lever is secured to the motor brake handle.

2. Use an 8.00mm socket & X-head screw driver to undo the nut and bolt.



3. Lift the brake lever out of the bottom mount.

4. Slide the top of the brake lever out the “P” clip.

5. Unplug the small white molex plug.

6. Unplug the main motor loom plug from main control box.

REAR CHASSIS - PANELS & CHASSIS BOLTS

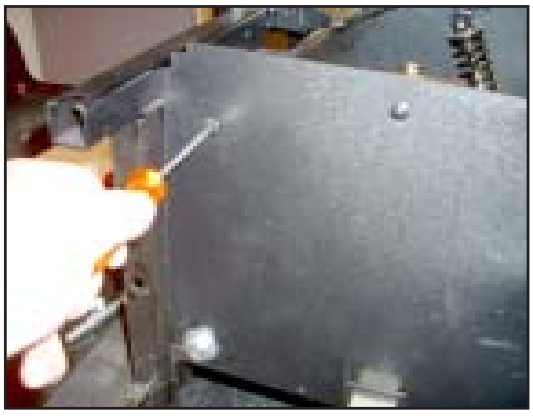
1. Undo the two screws on the rear splash panel.

2. Remove the splash panel.

3. Repeat for the other side. Note that the upper screws are larger than the lower screws.

4. Remove the rear wheel as previously described.

5. This exposes the rear wheel back panel.



6. Undo the screws.

REAR CHASSIS - PANELS & CHASSIS BOLTS

7. Loosen the nut and bolt but do not remove it yet.

8. It is a good idea to place the screws back into the frame for safe keeping.

9. There are two bolts found at each side of the rear frame.

10. Use a 17.00mm socket & spanner to remove the nuts.

11. Note that the bolt will not normally come out of the frame using the socket.

12. Use a soft faced hammer to carefully tap the bolts through the frame.

REAR CHASSIS - PANELS & CHASSIS BOLTS

13. Be aware that there is a washer between the left & right, rear chassis struts.

14. The top chassis bolt.

15. Use a 10.00mm hex key & 19.00mm spanner, to undo and remove the top bolt.

16. Carefully pull the drive assembly away from the main chassis.

17. Retrieve the washers & don't forget to fit them back when reassembling the scooter.

18. Place the drive assembly on a work bench for easier access.

REAR CHASSIS - PANELS & CHASSIS BOLTS

19. Lift the splash panels out of the bottom bolts taking care not to break the slots.

20. Remove the two self-tapping screws from the rear valance.

21. Remove the rear valance by carefully feeding the brake release lever through the slot in the valence.

22. It's a good idea to put the screws back in the frame for safe keeping.

23. There are four, transaxle mounting bolts. Two on the left hand side.

24. Two on the right hand side.

REAR CHASSIS - TRANSAXLE

1. View of the four nylok transaxle securing nuts, located on top of the assembly.

2. View of the four transaxle securing studs, located under the assembly.

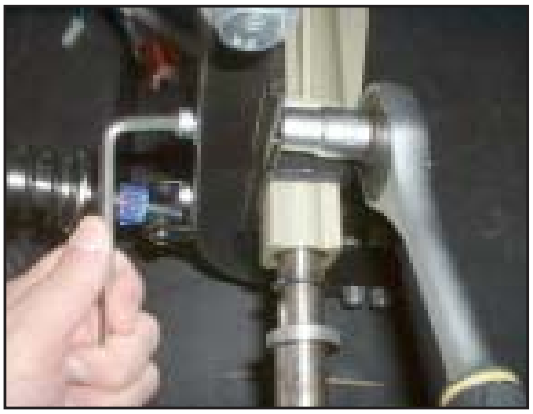
3. For easy access to the nuts & studs, turn the drive assembly so that it rests on the stabiliser wheels.

4. Use a 13.00mm socket & 6.00mm hex key to loosen the studs, but do not remove them yet.

5. Repeat for the lower stud.

6. Turn the drive assembly around to access the other set of studs.

REAR CHASSIS - TRANSAXLE



7. Repeat for the upper stud.

8. And finally, the lower stud.

9. Remove the nuts using finger pressure.

10. Don't forget to remove the washers also.

Caution! The transaxle may suddenly move when the studs are removed. Ensure that the drive assembly is in a stable work area and that your fingers are clear of the frame & work top.

11. Some studs may drop out of the frame quite easily.

12. Some studs may require tapping out with a soft face hammer.

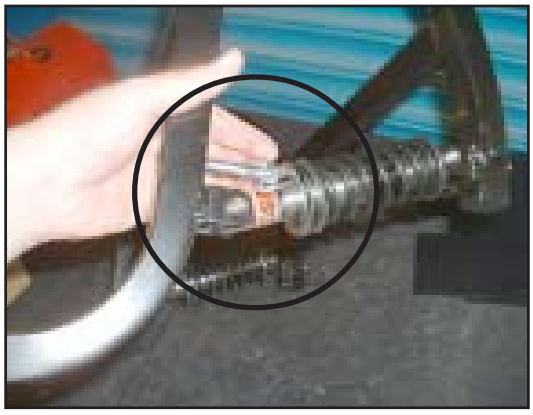
REAR CHASSIS - TRANSAXLE

Caution! The transaxle is heavy. Use proper lifting techniques. When resting the transaxle on the bench, be sure that fingers & thumbs are clear of the assembly.

13. Lift the “U” brackets off the transaxle.

14. Carefully lift the transaxle out of the drive assembly frame.

15. Remove the spacers.



16. Note that two of the transaxle mounting studs cannot be removed at this stage, due to a clash with the suspension struts.

17. The transaxle removed from the drive assembly frame.

18. It is a good idea to put the studs/ brackets back onto the frame for safe keeping.

REAR CHASSIS - SUSPENSION STRUTS

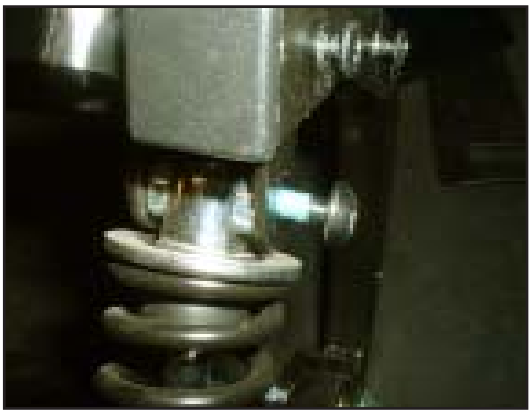
This process can be carried out with the transxle still in place, if required.

1. The two rear suspension struts.

2. The struts are adjustable by turning the large adjustment wheel with mole grips. Both struts must be evenly tensioned.

3. The struts are secured by two concentric studs. Use two 5.00mm hex keys/drivers, to undo them.

4. Repeat the process for the top studs.



5. Note the use of thread-lock on the inner concentric studs.

6. Withdraw the outer concentric stud.

REAR CHASSIS - STRUTS & STABILISERS

7. Drop the strut out of the top mounting.

8. Remove the lower concentric stud.

9. Lift the suspension strut out of the frame, (the transaxle stud described previously, can now be removed).

10. The stabiliser wheels are secured by a nylok nut.

11. Use 8.00mm hex key.....

12. and a 17.00mm socket to undo the axle studs.

REAR CHASSIS - STABILISERS & BUMPER

13. Remove the nut.

14. Slide the stabiliser wheel off the axle stud.

15. Slide the spacer off the axle stud.

16. Withdraw the axle stud from the frame. Repeat the process for the other stabiliser.

17. The rear bumper is secured by the stabiliser axle studs, (that have just been removed), and a further two studs.

18. Use the 8.00mm hex key and 17.00mm socket to undo these studs.

REAR CHASSIS - BUMPER & FRAME

19. Remove the studs on both sides.

20. Lift the bumper off.

21. Use a 17.00mm socket and a 13.00mm spanner, to undo the rear frame pivot bolts.

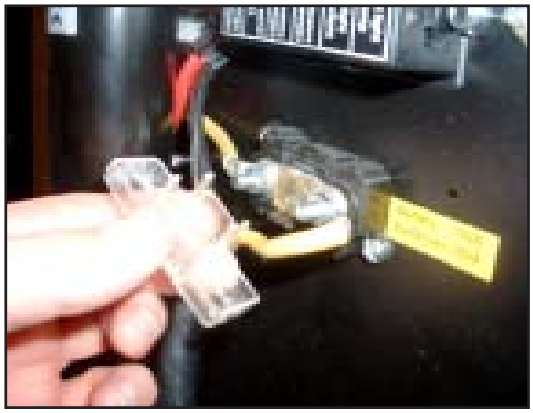
22. Take extra care when loosening/ removing the pivot bolts as the frame can drop down suddenly.

23. Lift the two halves of the frame apart.

24. The two halves of the rear frame.

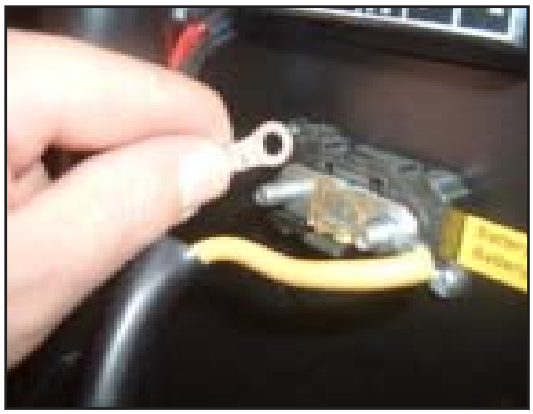
MAIN FUSE

1. Disconnect & remove the batteries to expose the main 150A fuse holder.

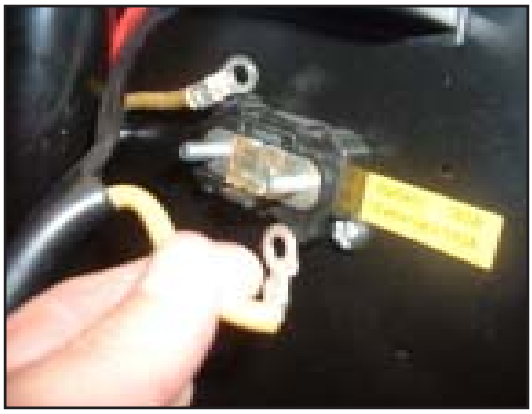


2. Be careful when removing the plastic fuse cover as it is easy to break the four locating lugs.

3. Use an 8.00mm socket/spanner to undo the fuse ring-tag connectors.



4. Remove the ring tags.



5. The main fuse is held on the two studs.

6. Use fingers to remove the main fuse.

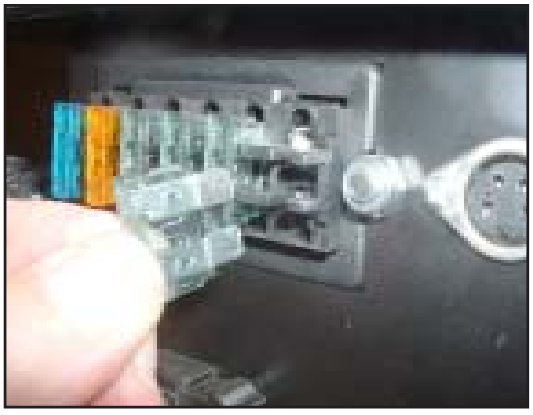
MAIN FUSE, FUSE PANEL & PROGRAM SKT.

7. The main 150A fuse and cover.

8. Fuses for the lights, indicators, front remote control and battery charger, are located under the black plastic cover.

9. Carefully unclip the cover and remove it to access the fuses.

10. There are six blade fuses in total, each have the rating in amps marked on the body.



11. To remove the fuse, carefully pull the body using finger force only, (not pliers). always replace fuses with the correct value and type.

12. The programming socket is located next to the fuse panel on the Elite only. The Onyx is programmed directly into the Egis main control box.

MAIN CONTROL BOX

1. The main control box is located behind the fuse panel.

2. Disconnect the main loom plug.

3. Remember to squeeze the locking tab to release the plug. Be careful not to pull the wires.

4. Release the square molex programming plug next.

5. Use the locking tag to release the programming plug.

6. Finally, squeeze the end tabs to release the power & motor looms.

MAIN CONTROL BOX

7. The main control box is secured by two screws located in a recess at each side.

8. Use a cross-head screwdriver to undo the screws.

9. Be careful when withdrawing the screws as white compound may cover the ends of the thread.

10. Carefully pull the main control box away from the rear of the fuse panel plate.

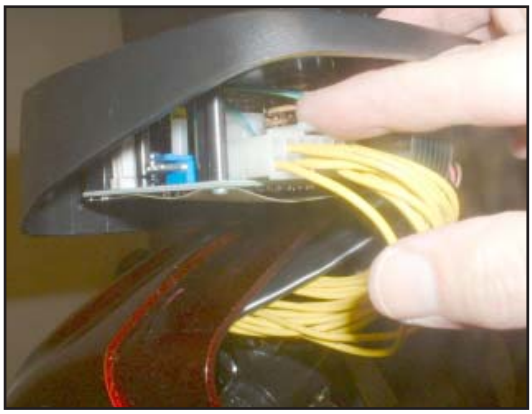
11. The rear of the main control box is coated with sticky white heatsink compound. Avoid contact with the skin and clothing.

It is important that more heatsink compound is applied when fitting a new main control box. The heatsink compound is available from electronics stockists, (RS Components, Maplin).

TILLER FASCIA PANEL

1. Carefully lift the base of the Tiller Fascia Panel using a flat blade screwdriver. It is a push fit.

2. Lift the fascia up to expose the plugs on the underside.



3. Locate the large white molex plug.

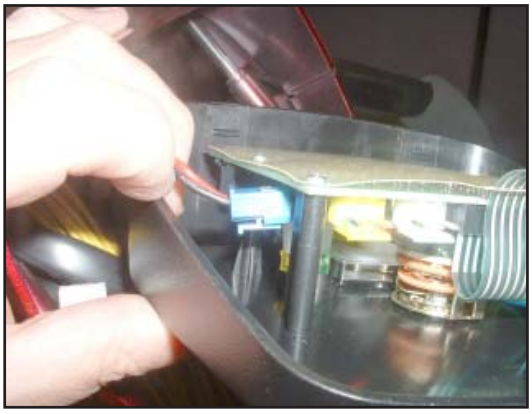
4. Press the plastic catch on the plug to remove it from the PCB.

5. Next, locate the smaller white and orange plugs.

6. Press the catch down on these two plugs to remove them from the PCB.

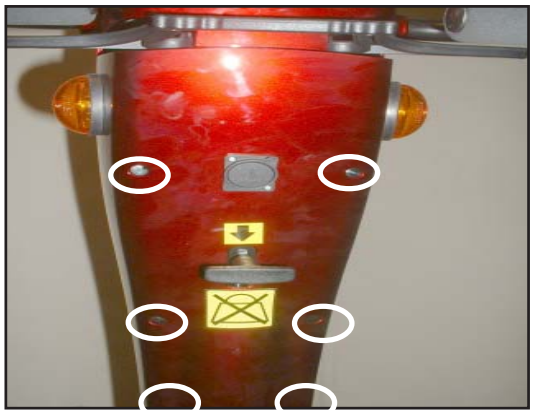
TILLER FASCIA PANEL & TILLER BACK PANEL

7. Remove the two plugs.

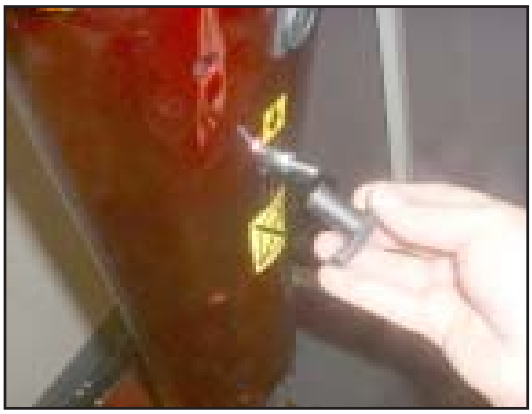


8. Use the same procedure to remove the blue plug.

9. When the plugs are disconnected, remove the fascia and store it in a safe place for reuse, or fit new one.



10. Location of tiller back panel screws.



11. Unscrew the Tiller Adjust Handle & remove it.

12. Undo the six screws in the tiller back panel.

TILLER BACK PANEL

13. Lift away the tiller back panel to expose the looms behind it.

14. Unclip and disconnect the orange plug.

15. Do the same with the green plug.

16. Finally, unclip and disconnect the white plug.

17. Remove the tiller back panel.

HAND BRAKE & TILLER FRONT PANEL

1. Loosen the hand brake, but do not remove it yet.

2. Squeeze the hand brake, grab the brake cable, let the brake handle go and at the same time pull firmly on the cable.

3. The brake cable should pop out of the location groove.

4. It may be easier to rotate the hand brake to gain access to the cable retaining rebate.

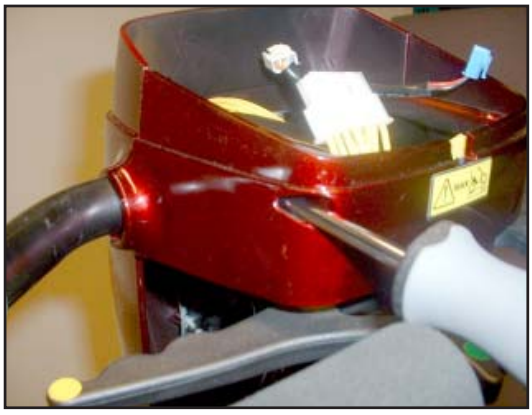
5. Release the brake nipple from the handle.

6. Feed the brake cable back through the hole in the tiller front panel. Remove the Handbrake if required.

TILLER FRONT & TOP PANEL

1. Undo the two Basket Bracket screws.

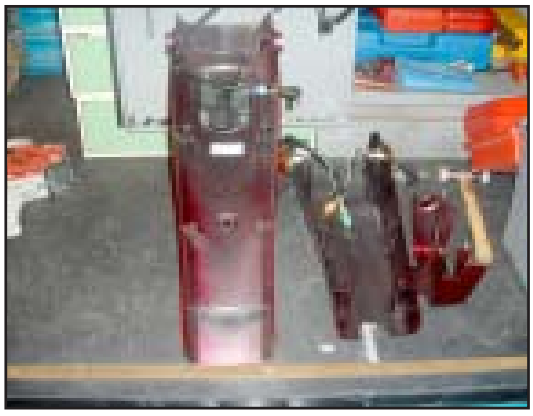
2. Remove the Basket Bracket.



3. Undo the two Tiller Top Panel screws.

4. Withdraw the Tiller Top Panel.

5. Make sure all of the remaining plugs are disconnected & remove the Tiller Front Panel.



6. The three tiller panels removed.

TILLER - HORN & REFLECTOR

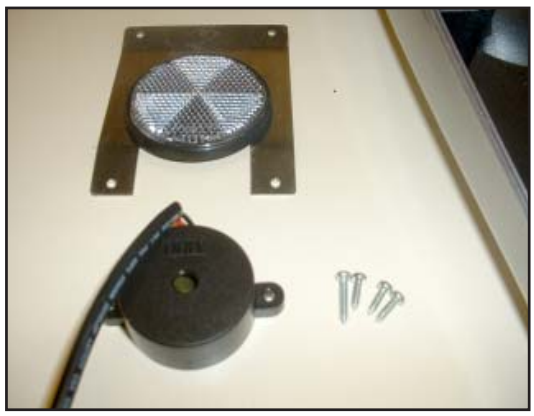
1. The Horn or Audible Warning Device, (AWD), is located on the Tiller Front Panel.

2. The horn, (AWD), is secured by one of the Reflector fixing screws.

3. Undo the screw to remove the Horn, (AWD).

4. Undo the remaining three screws.

5. Lift the Reflector off the mounting posts.



6. The AWD & Reflector.
Note that the longer screw secures the horn.

TILLER - INDICATORS - BULBS

1. The front Indicators are retained by plastic clips on the Tiller Front Panel.

2. There are two retaining clips per indicator, acting as a bayonet fixing.

3. To release the Indicator unit, twist the indicator body untill the clips align with the square cut out section.

4. Feed the whole assembly through the cut out in the panel.

5. The bulb holder is a push-fit, simply pull it out from the lense.

6. The bulb is also a push-fit, to release it, carefully pull on the glass bulb. 24V 5W Capless.

TILLER - CHARGING SOCKET

1. The Charging Socket is located on the front of the Tiller Front Panel.

2. Slide the socket cover over to the side to expose the two mounting screws for removal.

3. The sprung cover screw is located at the back of the socket, unscrew this with care as it could pop out suddenly.

4. Carefully remove the Charging Socket from the front of the panel.

5. Be careful not to lose the tiny spring.

6. The Charging Socket and screw.

TILLER LOOM.

1. Unclip the metal cable tag located half way up the Tiller stem.

2. Undo the Rubber Gaiter securing screw.

3. Carefully roll the rubber gaiter back to expose the tiller bracket.

4. Note that the lower cable tag holds the loom clear of the mobile joint.

5. Release the cable tag.

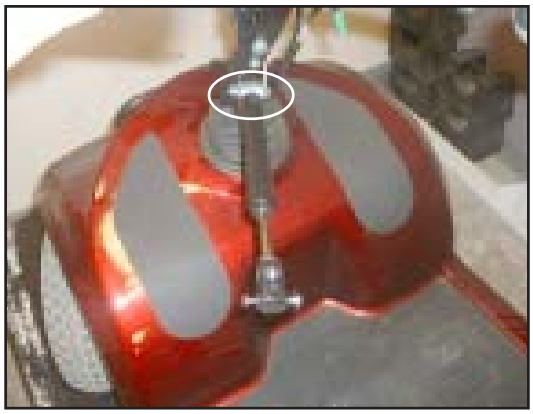
6. Check the cables for chaffing or splits.

TILLER ADJUSTMENT & WELD ASSY.

1. Use 6.0mm Hex key to partially undo the top cylinder mounting studs.

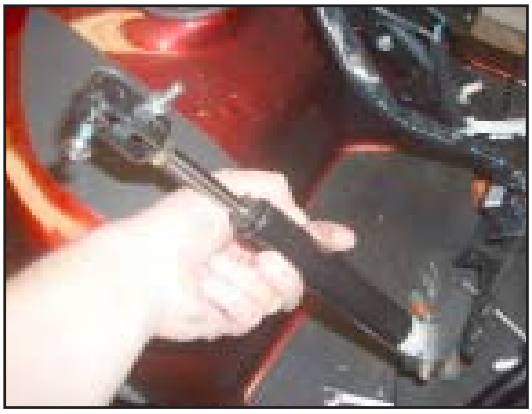
2. With the studs still together but screwed almost out, gently tap the standard stud to push through the sleeved stud.

3. Remove the standard stud and carefully lower the cylinder. Remove the sleeved stud.



4. The lower cylinder bracket.

5. The lower cylinder bracket requires a 12.0mm and a 10.0mm spanner / socket to undo it.



6. Lift the Cylinder Tiller Adjuster away.

TILLER ADJUSTMENT & WELD ASSY.

7. Unclip any remaining loom ties.

8. Unplug any remaining connectors.

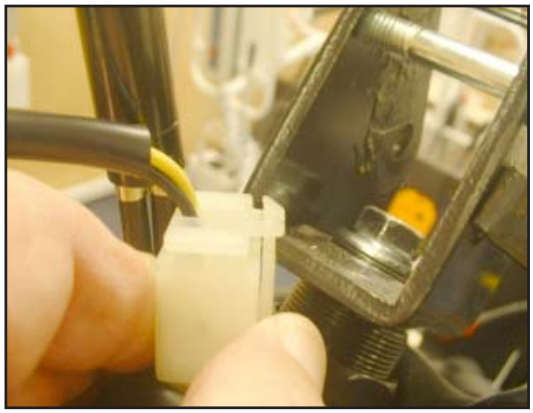
9. Move the cables clear of the Tiller Bracket.

10. Use a 12.0mm socket & 10.0mm spanner to undo the Tiller Bracket bolts.

11. Carefully lift the Tiller Weld Assembly out of the Tiller Bracket.

12. Remove the Tiller Weld Assy.

TILLER BRACKET



1. Unplug any remaining connectors that may be under the rubber gaiter.

2. Remove any disconnected looms.

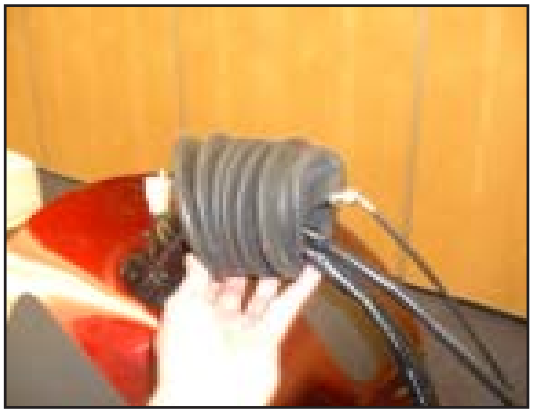
3. Clear the remaining looms out of the way to expose the Tiller Bracket Fixing Stud.

4. Use a 13.0mm socket to undo the stud, but be aware that the steering may turn onto the steering stop.

5. Lift the Tiller Bracket out from the Steering Head.

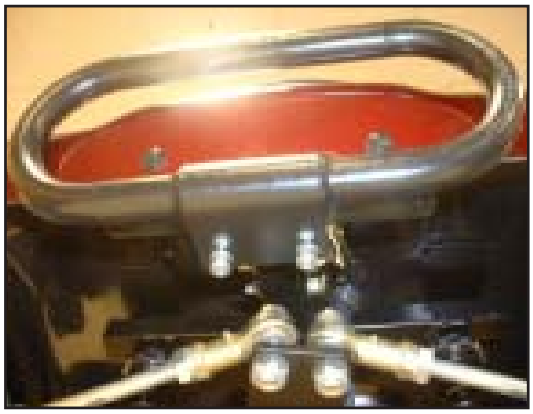
6. Note the serrations at the bottom of the bracket assy. When refitting the bracket, ensure the steering is aligned parallel and straight ahead.

GAITER & FRONT BUMPER (4-Wheel)



1. Carefully feed the rubber gaiter over the remaining looms and brake cables to remove it.

2. Cut the last remaining plastic tie wrap.



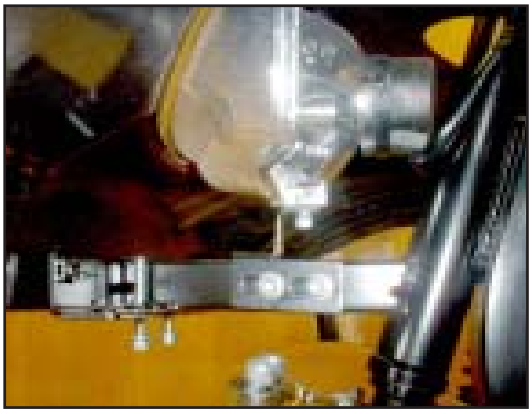
3. The two Front Bumper fixing studs are located directly beneath the bumper mounting bracket.

4. Use a 5.0mm hex key to undo the two studs.

5. Remove the Front Bumper.

HEADLAMP & BULB - (4-Wheel)

1. Access to the headlamp is improved if the left-hand, front wheel, is removed.



2. The headlamp is secured by two hex studs.

3. Use a 5.0mm hex key or driver, to undo the two studs.

4. Carefully remove the Headlamp unit taking care not to damage the rubber beading attached to the panel.

5. When refitting, slide the headlamp unit tight up against the rubber beading. Note the mounting bracket has elongations to facilitate this.

6. The headlamp bulb is accessed through the back plastic cover at the rear of the headlamp unit.

HEADLAMP & BULB - (4-Wheel)

7. Press the clip down on the re-useable tie wrap to release it and pull the black rubber cover back to expose the lamp holder.

8. There may be two redundant wires inside the rubber cover, these are not used, but check that they are insulated.

9. The bulb holder is a bayonet type. Twist and pull to release it.

10. Withdraw the bulb. 24V - 15W.

11. The Headlamp unit components.

HEADLAMP - (3-Wheel)

1. Undo the two screws located just above the headlamp.

2. The Headlamp can then be withdrawn from the cowling as a complete unit. Don't forget to disconnect the headlight loom from the main loom.

3. Unclip the reusable tie wrap.

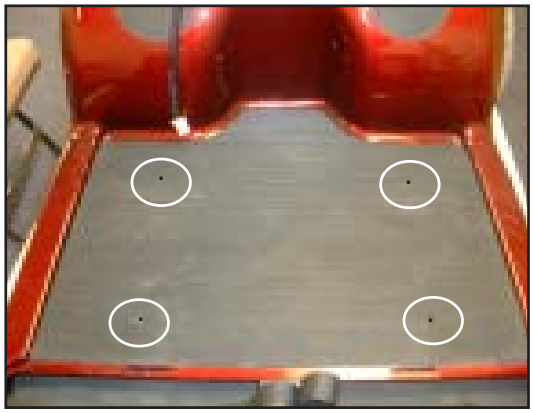
4. Pull the rubber cover back.

5. Twist and turn the bayonet-fit terminal cover.

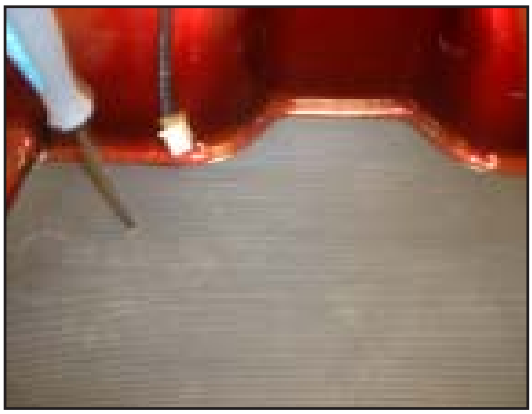
6. Remove the 24V - 15W bulb.

FRONT BODY PANEL (4-Wheel)

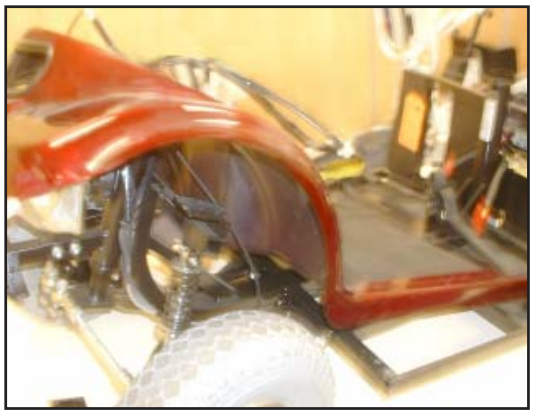
1. Undo the two self-tapping screws at the front of the body panel.



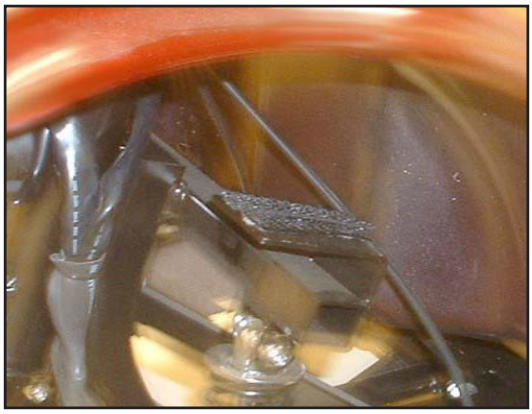
2. There are four further screws located in the foot mat.



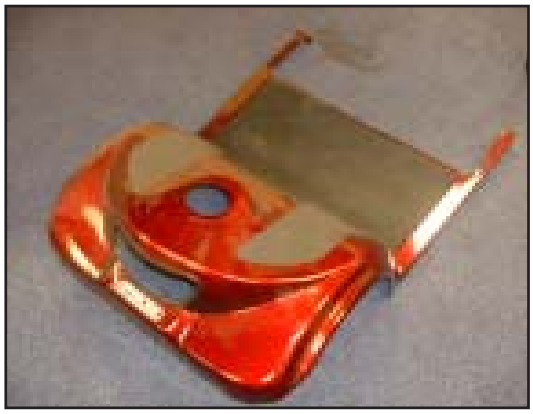
3. Unscrew all four self tapping screws.



4. Lift the body panel up from the front.



5. Note that there is a velcro pad under each wheel arch and corresponding chassis member.



6. The 4-wheel Front Body Panel.

FRONT BODY PANEL (3-Wheel)

Remove the Tiller using the same procedure as the 4-wheel scooter.
Remove the bumper as previously described.

Please note that the photographs below do not show the foot mat.
The screws can be accessed without removing the foot mat, exactly the same as the 4-wheel version.

1. Unscrew the left-hand front self tapping screw

2. and the right-hand screw.

3. Undo the two self tapping screws at the rear of the foot board.

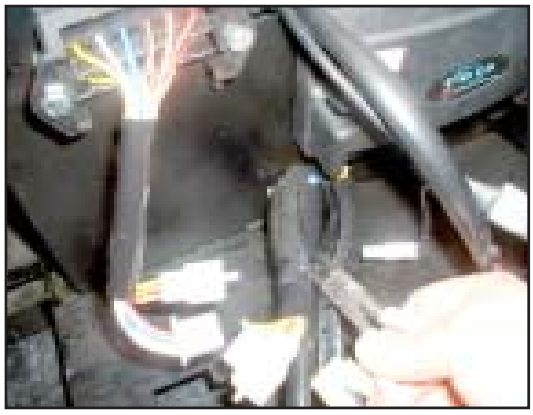
4. Lift the Footboard clear of the frame.

MAIN LOOM

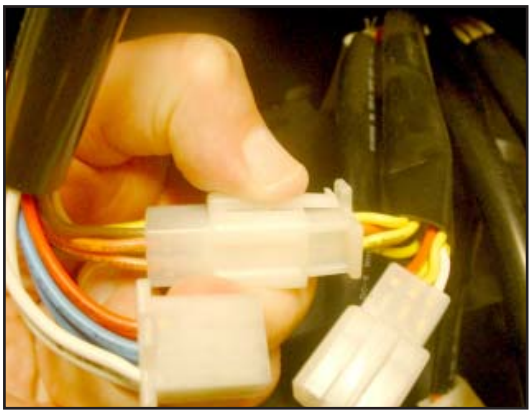
1. Start at the back of the scooter.

2. Unclip the two square molex plugs.

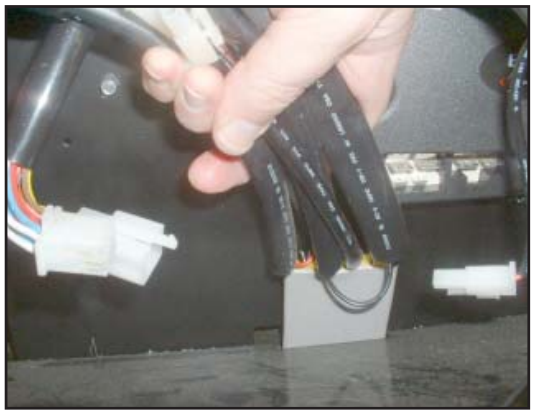
3. Unclip the small molex plug.



4. Cut the plastic tie wrap.



5. Unclip any remaining plugs.



6. Make sure the loom is free of cable ties and connections.

MAIN LOOM

7. Prop up the back of the scooter frame.

8. The lower splash guard has to be removed.

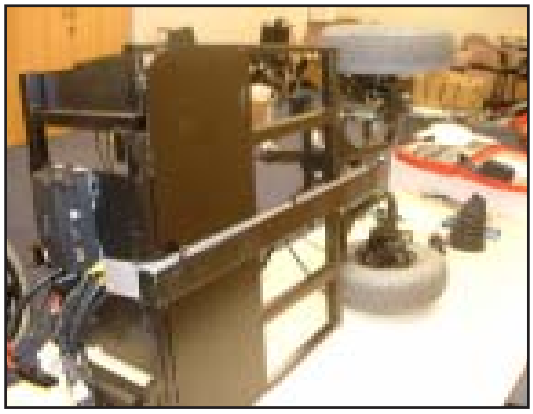
9. Undo the two screws located directly below the splash guard.

10. Remove the splash guard.

11. It is a good idea to screw the screws back into the frame for safe keeping.

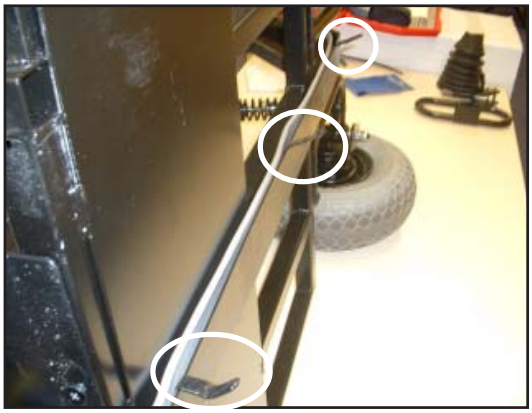
12. Release the cable clip at the base of the flat form loom.

MAIN LOOM



13. Turn the chassis on it's side for easier access.

14. Start by undoing the wire clip at the rear end of the loom.



15. The loom runs inside a metal channel. There are a further three clips to undo along this channel.

16. The final clip is located at the front of the channel.

17. Gently feed the loom out of the channel.

18. The Main Loom.

STUB AXLE (4-Wheel)

1. The Stub Axle assembly can be removed with or without dismantling the Steering rods first. This example shows removal with the steering still in place.

2. Use a 6.0mm hex key on the securing stud.

3. Use a 13.0mm socket on the nut below the securing stud.

4. With the nut removed, unscrew the securing stud, as it is threaded inside the bracket.

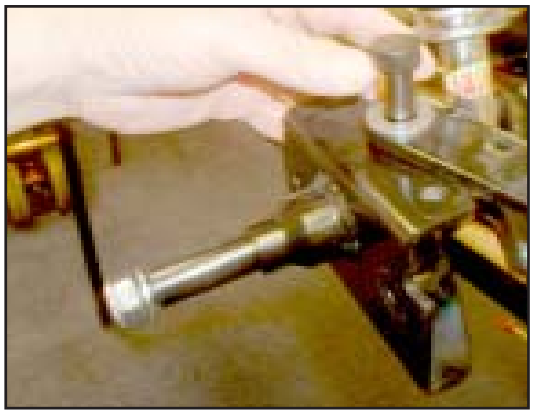
5. Use a 19.0mm spanner on the top stub axle bolt.

6. Use a 19.0mm socket on the lower stub axle nut.

STUB AXLE

7. After removing the locking nut, use a 19.0mm spanner to release the second securing nut.

8. The plain nut is refitted first, followed by the self-locking nut.



9. Use care when lifting the pivot bolt out, as there are bushes and spacers which can fall out of the assembly.

10. Remove the Stub Axle, again taking care not to lose the spacers and bushes.

11. The top and bottom brass spacer bushes.

12. The top sleeved bush.

STUB AXLE

13. Remove the bottom sleeved bush.

14. Finally, remove the internal spacer.

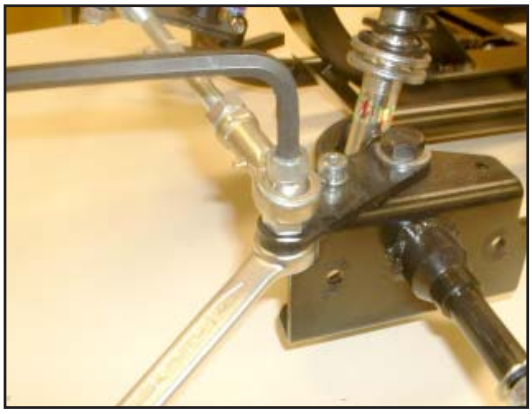
15. The Stub Axle assembly.

16. View of the bushing order; Brass Bush, Sleeved Bush, Spacer, Sleeved Bush and Brass Bush.

17. The stub axle component parts.

18. The remaining stub axle is a “mirror image” of the previous one and is removed using the same process.

STEERING RODS



1. Use an 8.0mm hex key and a 17mm spanner, to release the steering rod outer stud.

2. It is only possible to remove the lock nut not the stud.

3. Lift the steering rod up, until the stud is clear of the stub axle.

4. The second nut is permanently attached to the stud and acts as a spacer.

5. The other end of the steering rod is connected to the Steering Head.

6. Use an 8.0mm hex key and a 17mm spanner, to release the steering rod inner stud in exactly the same way.

STEERING RODS

7. The steering rod removed.

8. Use exactly the same process for the other steering rod.

9. If the stub axle has been removed before the steering rod, the stub axle pivot bracket will have to be removed from the steering rod.

10. Note that the two Steering Rods are identical.

11. Each end of the steering rods have grease nipples to aid the application of lubricant.

FRONT SUSPENSION STRUTS

1. The lower strut studs require two 5.0mm hex keys for removal. Because of interference with the swinging arm, a ball-end 5.0mm key is required on the outside stud.

2. View of a ball-end hex key.

3. The studs are concentric and thread into each other. The blue colour is thread-lock.

4. The upper studs are removed in the same way as the lower studs.

5. Remove the front suspension strut and repeat the process for the other strut if required.

6. One of the Front Suspension Struts showing the concentric studs. Note that the strut can be adjusted using the tension ring at the bottom.

SWINGING ARM

1. The swinging arm is secured to the main chassis by a pivot bolt.

2. Use a 13.0mm socket and a 13.0mm open spanner, to release the pivot bolt.

3. Withdraw the long pivot bolt.

4. There is a inner sleeve within the swinging arm. Use long nose pliers to pull this out.

5. There is a bush in each end of the swinging arm pivot.

6. The Swinging Arm assembly.

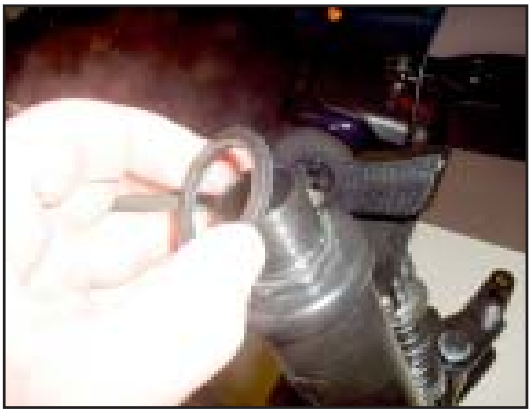
STEERING HEAD (4-Wheel)

1. Use an adjustable spanner to loosen the steering head securing nut.

2. It is a good idea to wedge the bottom of the steering head to stop it turning, here a screw driver is used.

3. The steering head securing nut should loosen quite easily.

4. As the steering head has a fine thread it is quicker to remove the securing nut, using the fingers.



5. Next, remove the spacer ring.

6. Again, use an adjustable spanner to release the Steering bearing retaining nut.

STEERING HEAD (4-Wheel)

7. Again, use finger pressure to undo the nut.

8. Removing the nut, exposes the top steering bearing race.

9. Use thin nose pliers to lift the top bearings out.

10. With the top bearings removed, lower the steering head to expose the bottom bearing race.

11. Feed the lower bearing race, up and over the top of the steering head.

12. The 4-Wheel Steering Head Assy.

STEERING HEAD & FORKS (3-Wheel)

1. Use an adjustable spanner to loosen the steering head nut.

2. As this nut has a fine thread, it is better to use fingers to undo it all the way.

3. Remove the nut and the washer.

4. The steering bearing nut.

5. Use the adjustable spanner to loosen the steering bearing nut also.

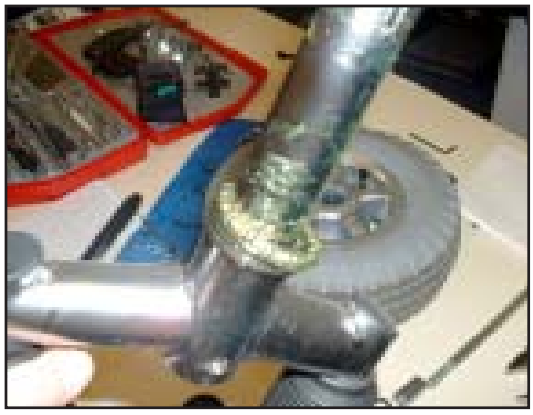
6. Undo the nut the rest of the way using finger pressure.

STEERING HEAD & FORKS (3-Wheel)

7. The top steering bearings usually come away with the nut.

8. Steering top bearing and retaining nut.

9. Withdraw the front fork assembly from the steering head.



10. The lower steering bearing will come away with the fork assembly.

11. View of the Steering bearings, retaining nut and Front Fork assembly.

NOTES