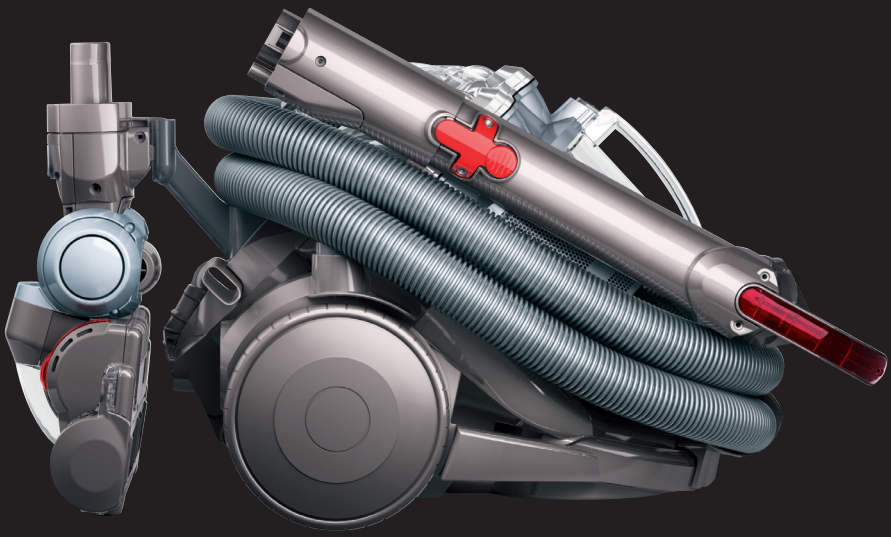
dyson

service manual DC21



Issued 04/07

dyson

service manual DC 21

motorhead

Root Cyclone™ technology
Patented Dyson technology.

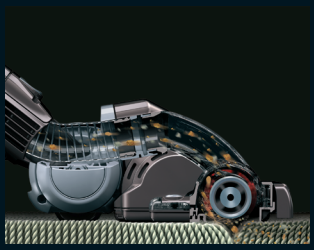
Shrinks to store away
Hose and wand compress and wrap for easy storage.

Flexible steering
Cleaner head steers easily around obstacles.

Clean exhaust air
Air expelled has up to 150 times less bacteria and mould than the air you breathe.

No running costs
Lifetime washable filter and no bags to buy.

5 year guarantee
Parts and labour guaranteed by Dyson for 5 years.



Motorised brushbar
Powerful bristles remove dirt and pet hair from carpets. Motorised brushbar has no belt to replace.

Flexible steering
Cleaner head steers easily around obstacles.

Shrinks to store away
Hose and wand compress and wrap for easy storage.

On-board tool storage
Tools store securely on the machine so they're always on hand.

Lifetime HEPA filtration
Approved for allergy sufferers by the British Allergy Foundation.

Durable tough construction
Made from ABS and polycarbonate.

Clear bin™
Made of tough polycarbonate, the clear bin™ lets you see when it's ready to empty.

Foot operated brush control
Operate brush control without bending down.

All models carry the British Allergy Foundation Seal of Approval.

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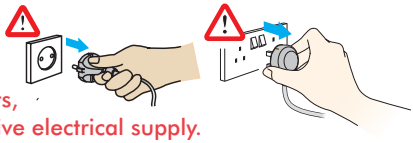
Introduction

This manual is written specifically for dyson trained engineers and covers the DC21 range.
The service instructions assume that the engineer has the approved tools and test equipment with them.

Electrical safety testing



Ensure that at all times during the repair and testing of products that customers, pets, children and you are not exposed to any Live electrical supply.

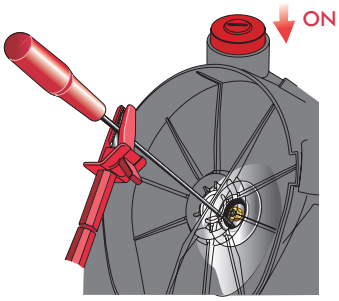
Insulation test

The following tests must be performed prior to and upon completion of all repairs to Dyson floorcare products and before any functional checks. **You must ensure that a full visual inspection of the product is completed prior to repair.** This is vital to avoid any possibilities of personal injury to the end user.

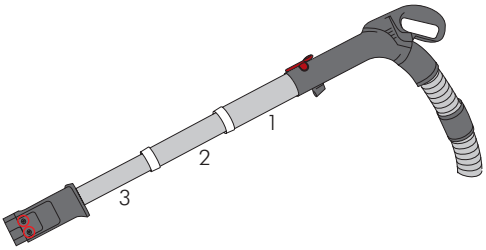
The Seaward Primetest 200 (or equivalent) should be used to test the electrical insulation of a Class II appliance; it indicates any electrical leakage.

Technical

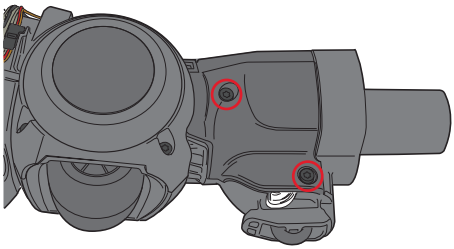
Insulation test points:



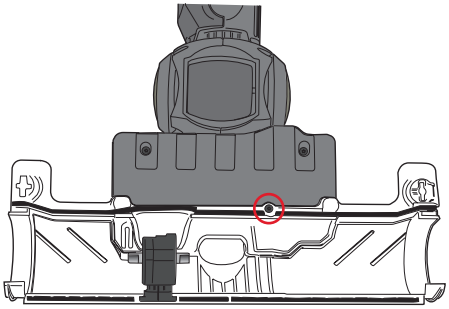
Test through the UMC grille onto the motor.



Test the 3 sections of the aluminium tube.
Test the 2 screws in the wand cuff cover.



Test the 2 screws in the stow neck cover.



Test the front screw in the brushbar motor cover lower.

A reading of > 2MΩ is accepted.
2MΩ is the minimal legal requirement. A reading of below 2MΩ is not considered safe and further investigation and rectification must be made before the product is used. The following components must be visually inspected:

- Cable rewind assembly, both internal and external
- Switches
- PCB assembly
- Motors
- Carbon build up in the motor housings

If you cannot repair a product with an insulation test reading of below 2MΩ you must inform the customer that it is unsafe to use. Please inform the customer of the required actions to repair the product (including the charge structure). If the product is left un-repaired please indicate on your paperwork/hand held device that the product is electrically unsafe!

Electrical overview

Plugging the powercord into a suitable electrical outlet and pressing the on/off actuator will always turn on the vacuum and brushbar motor simultaneously. Pressing the brushbar actuator will turn the brushbar motor off. Pressing the brushbar actuator whilst the brushbar motor is off will turn the brushbar motor on again. Note: for safety purposes, if the product is unplugged from the electrical outlet without turning the product off at the on/off actuator first, the brushbar will fail to turn upon plugging the product back into the electrical outlet. To activate the brushbar it will be necessary to switch the product off and then on again at the actuator.

The vacuum motor is fitted with a heat sensitive Thermal Cut-out (TCO). This will shut the motor down to up to 60 minutes if it reaches a temperature >96 degrees. Excessive temperatures within the motor are usually caused by machine/filter blockages.

The brushbar motor is protected by a current overload switch that turns off power to the brushbar motor if the brushbar is obstructed (usually caused by a blockage around the brushbar or within the brush housing). The obstruction must be cleared and the motor reset by pressing the brushbar actuator. If the cause of the obstruction is not cleared the overload switch will continually activate.

For added protection the underside of the power floor tool assembly neck contains a stow microswitch that is activated when the floor tool is stowed (stored) on the rear of the product. When activated the brushbar motor will not operate.

Electrical fault diagnostic

Note: check 'points' refer to the wiring schematic on page 4.

No power to either motor

1. Check for damage/electrical failure to the plug and powercord.
2. Carry out a resistance test across the fuse. A reading of $<1\Omega$ should be expected.
3. Check the mechanical actuation of the on/off switch.
4. Check for a loose connection at points 1-6.
5. Carry out a resistance test on the cable rewind assembly (Live pin on the plug to point 1, and neutral pin on the plug to point 2) and across the on/off switch (points 4-6). A reading of $<1\Omega$ should be expected.

If no faults are found replace the PCB assembly.

No power to the vacuum motor (brushbar motor operates)

1. Check for a loose connection at points 7-10.
2. Carry out a resistance test between points 7-9 and 8-10 (the wires from the PCB assembly to the vacuum motor). A reading of $<1\Omega$ should be expected.
3. Carry out a visual inspection of the vacuum motor (commutator, brushes, windings etc.).
4. Carry out a resistance test across the vacuum motor. A reading of approx. 4Ω should be expected.

If no faults are found replace the PCB assembly.

No power to the brushbar motor (vacuum motor operates)

1. Check for a loose connection between points 11-37.
2. Carry out a resistance test of the Live wire from the PCB assembly to the end of the power wand/hose assembly (11-27).
3. Carry out a resistance test of the Switch wire from the PCB assembly to the end of the power wand/hose assembly (12-28).
4. Carry out a resistance test of the Neutral wire from the PCB assembly to the end of the power wand/hose assembly (13-26).
5. Check the mechanical actuation of the stow microswitch and cam and the brushbar microswitch.
6. Carry out a resistance test across the brushbar microswitch (points 34-35). A reading of 470K Ω should be obtained.
7. Carry out a resistance test across the Neutral wire within the power floor tool (points 29-37). A reading of $<1\Omega$ should be expected.
8. Carry out a resistance test across the Live wire within the power floor tool (points 30-36). A reading of $<1\Omega$ should be expected.
9. Carry out a visual inspection of the brushbar motor (commutator, brushes, windings etc.).
10. Carry out a resistance test across the brushes on the brushbar motor. A reading of approx. 7Ω should be expected.

If no faults are found replace the PCB assembly.

Unable to turn the brushbar motor on or off using the brushbar switch

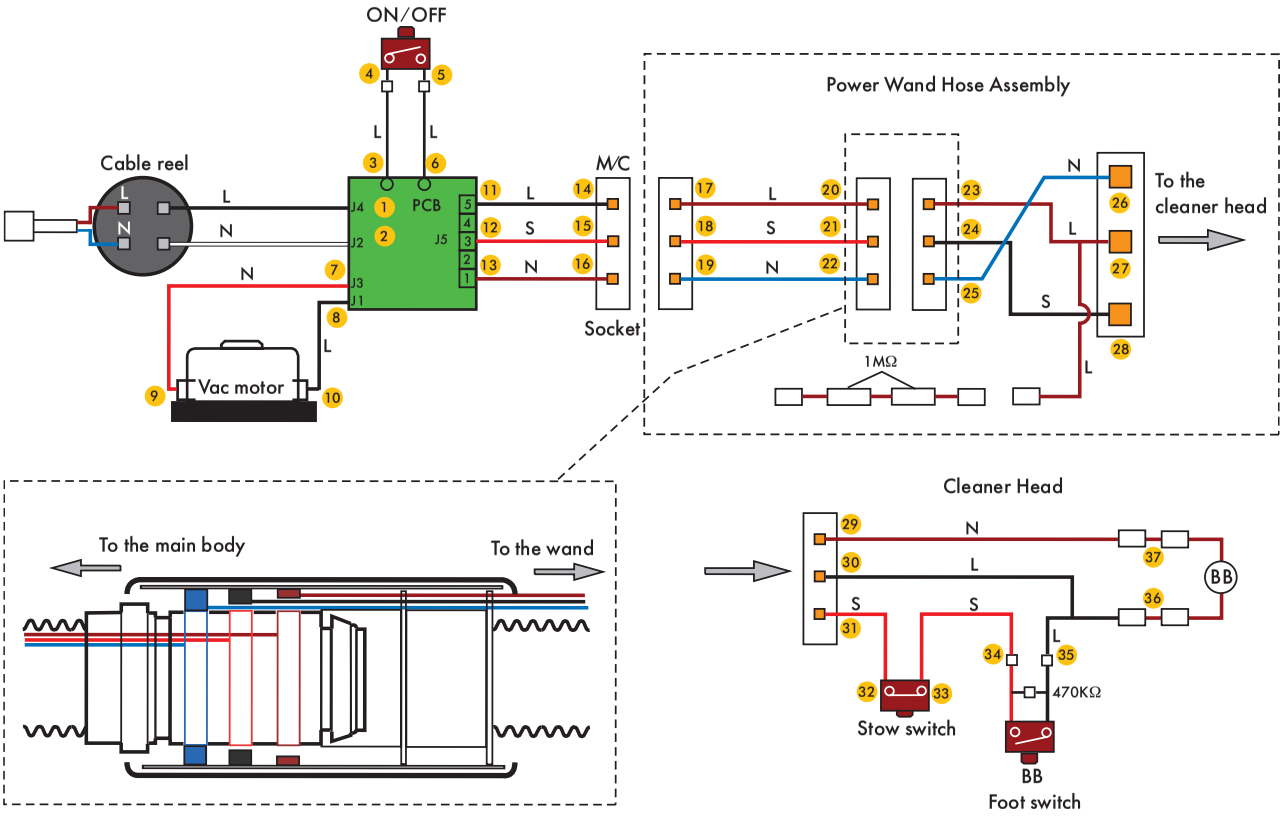
1. Check for a loose connection onto the brushbar microswitch (points 34 & 35).
2. Check the mechanical actuation of the brushbar actuator and the brushbar microswitch.

If no faults are found replace the PCB assembly.

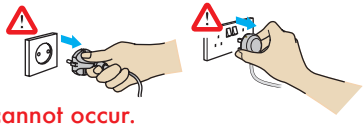
Brushbar motor operating whilst power floor tool is in stowed position

1. Check for a loose connection onto the stow microswitch (points 32 & 33).
2. Check the mechanical actuation of the stow microswitch cam and stow microswitch.
3. Carry out a resistance test from the PCB assembly to the end of the power wand/hose assembly (points 11-27, 12-28 & 13-26). A reading of $<1\Omega$ should be expected in all instances.

If no faults are found replace the PCB assembly.


ON/OFF
Cable reel
PCB
M/C
Socket
Vac motor
Power Wand Hose Assembly
To the cleaner head
1MΩ
To the main body
To the wand
Cleaner Head
470KΩ
Stow switch
BB
Foot switch

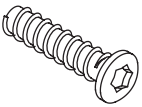
General notes



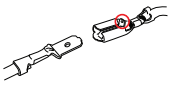
Before attempting any repairs it is vital to ensure the product is totally isolated from the mains supply and that accidental reconnection cannot occur.

Please ensure that safety goggles are worn at all times whilst servicing Dyson vacuums.

Where this symbol is shown, ensure ESD protection is used.



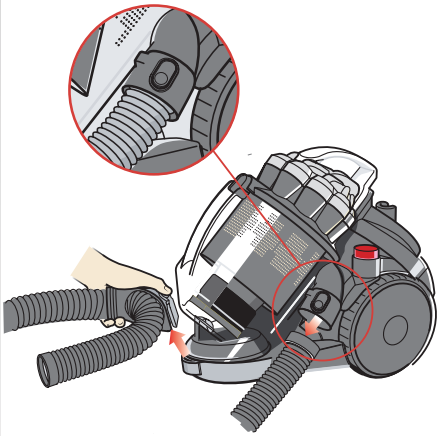
All screws used in DC21 are M3.5 x 16 Torx T-15 unless otherwise stated.



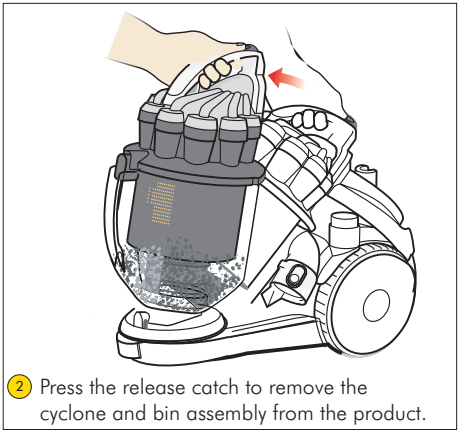
Some female terminal clips used in DC21contain a lock mechanism. The mechanism will need to be pressed before separation from the male terminal can occur.

Fitting notes

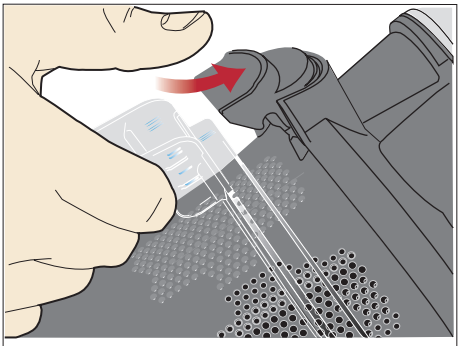
Main body - dismantle



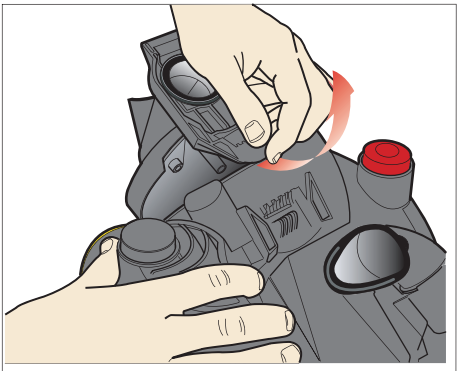
1 Unclip the wand assembly from the side of the cyclone assembly and unwrap the hose assembly from around the product. Press the release catch to remove the end of the hose from the inlet on the side of the product. Unclip the retaining bracket and remove from the front of the machine.

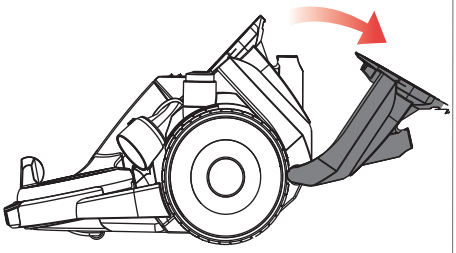


2 Press the release catch to remove the cyclone and bin assembly from the product.

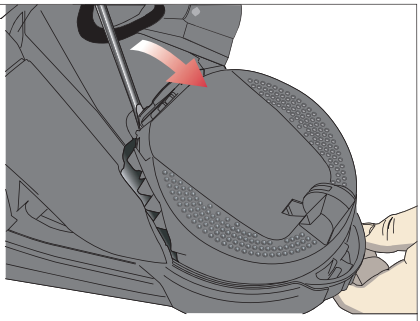


3 If necessary the bin can be removed from the cyclone assembly by pressing the bin release catch.

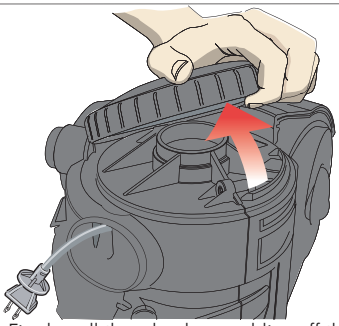




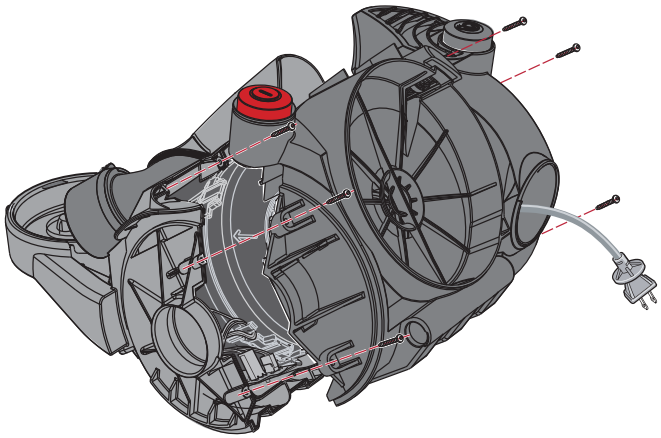
4 Unclip the pre-filter cover from the locating point on the upper motor cover (UMC). Pull the pre-filter cover away from the machine until it releases from the hinge points. Remove the pre-filter assembly.



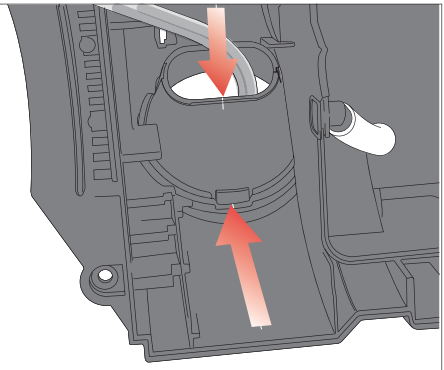
5 Unclip the post filter cover catch using a flat bladed screwdriver. Carefully remove the cover and filter.



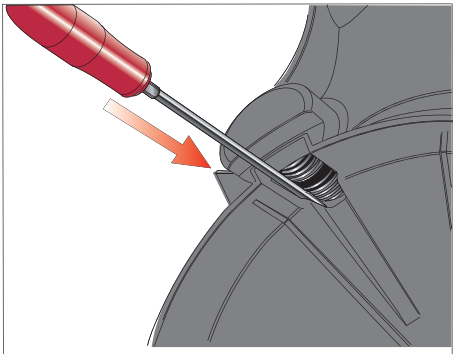
6 Firmly pull the wheel assemblies off the sides of the product.



7 Remove the six screws from the UMC. Pull the cable out slightly and lift the UMC off the Lower Motor Cover (LMC) assembly.

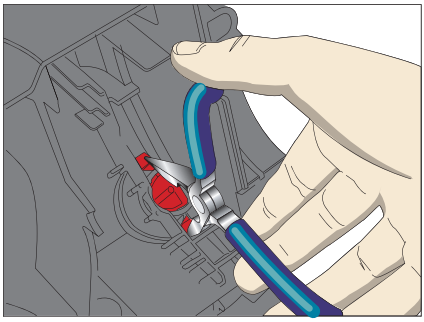


8 Press the lower retaining clip from inside the UMC to remove the cable collar.
Separate the collar from the powercord.

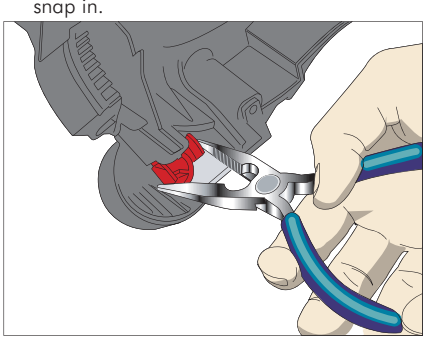


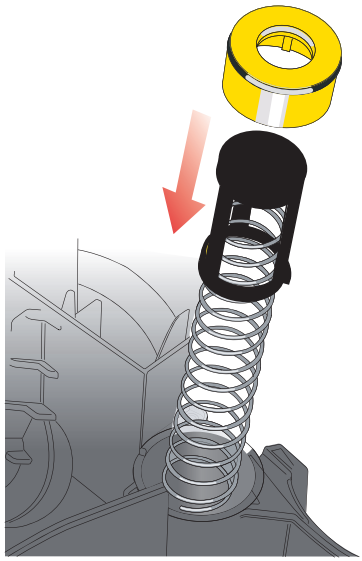
10 Should any parts of the bleed valve need replacing, carefully push out from the outside of the UMC using a thin, flat bladed screwdriver.

Fitting notes

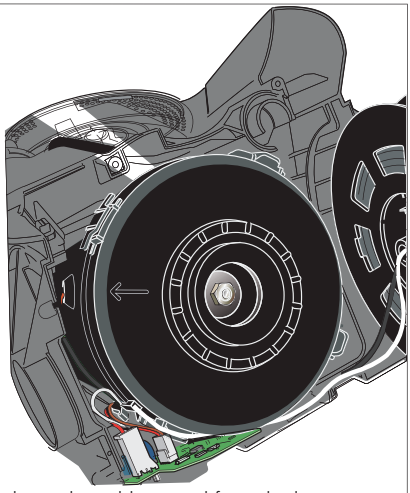


9 To remove either actuator or spring, unclip from the inside of the UMC with the aid of a pair of long nosed pliers.
To refit, locate the springs, then actuators from the outside of the UMC, and firmly snap in.

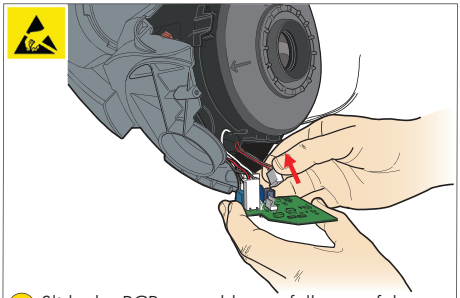




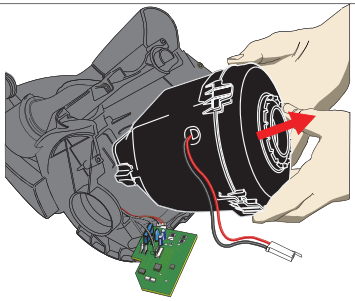
11 To replace the bleed valve, assemble in the above order.



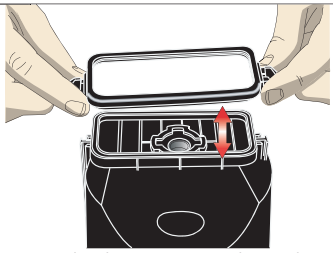
12 Release the cable rewind from the lower motor cover (LMC) assembly. Unclip the fly leads from around the side of the motor bucket.



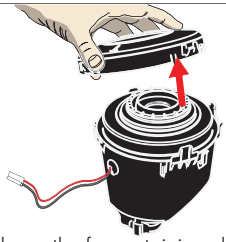
13 Slide the PCB assembly carefully out of the LMC assembly. Carefully unclip all connectors from the PCB assembly.



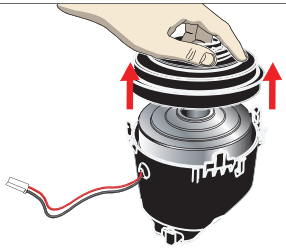
14 Release the motor bucket from the LMC assembly.



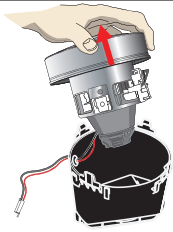
15 The motor bucket mount can be replaced if necessary as shown. When fitting ensure the mount is correctly located within the channel on the motor bucket.



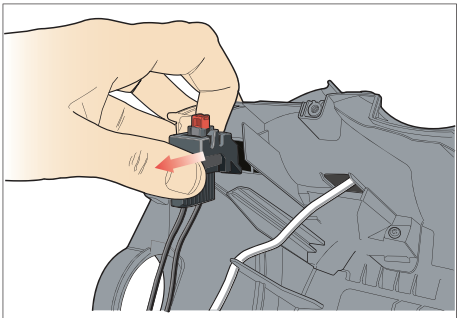
16 Firmly release the four retaining clips on the side of the motor bucket. Lift off the motor bucket top.



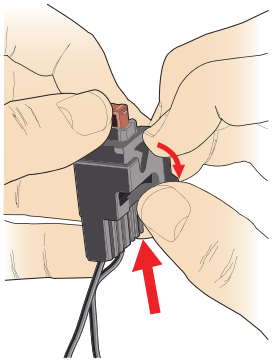
17 Peel the fan case seal off the base of the motor.



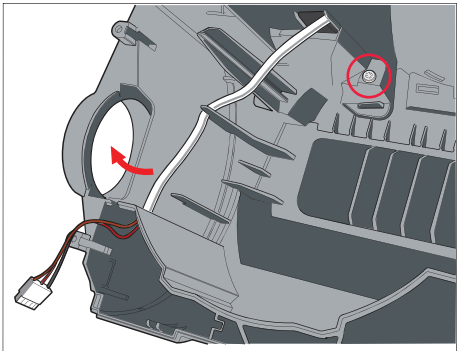
18 Lift the motor, motor plate and mount out of the motor bucket. Unclip the wiring harness from the motor. Release the wiring harness from the motor bucket if necessary.



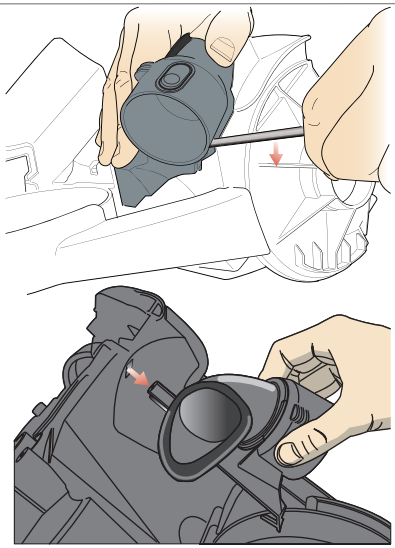
19 Release the switch holder from the LMC assembly.



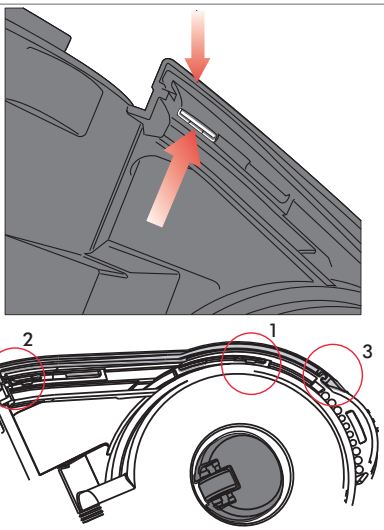
20 Release the switch from the switch holder. Unclip the wires to detach the switch from the PCB assembly.



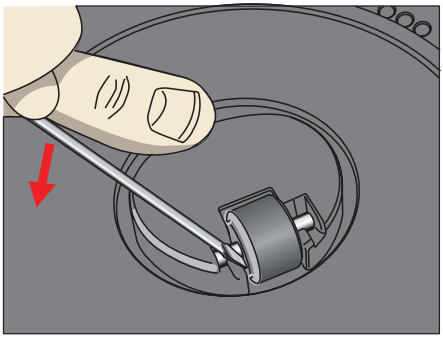
21 Should the cyclone inlet assembly need replacing, undo the screw and release the cyclone inlet loom from the retaining clips within the inside of the LMC assembly.



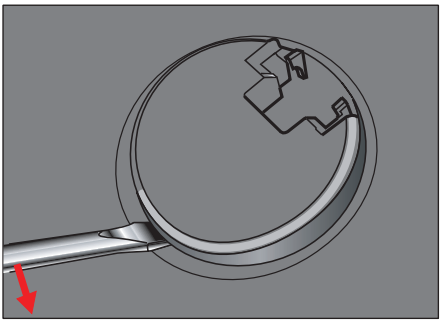
22 Then prise a thin, flat bladed screwdriver under the cyclone inlet and slide the inlet off the LMC assembly.
To refit, slide onto the LMC assembly, refit the screw and neatly dress the loom within the ribs.



23 To remove the bumper strip, unclip the retainers and forcefully push the bumper strip away from the LMC.
To replace, snap clips back in sequence shown.

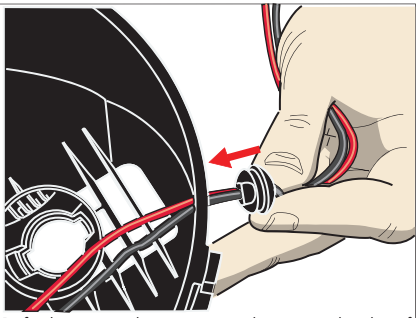


24 Prise the castor wheel and axle out of the castor body using a thin, flat bladed screwdriver. To refit, clip into the castor body.

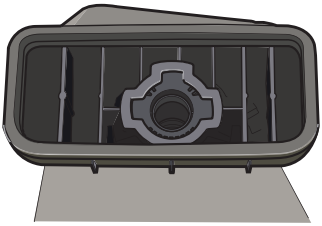


25 Prise the castor body away from LMC using a large flat bladed screwdriver. To refit, push firmly onto the castor spigot.

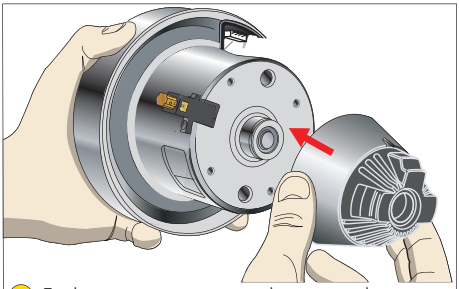
Main body assemble



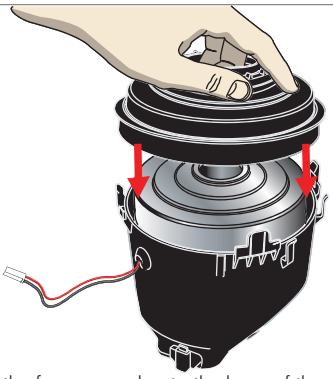
26 Refit the wiring harness into the motor bucket if previously removed. Ensure the grommet is adequately sealed.



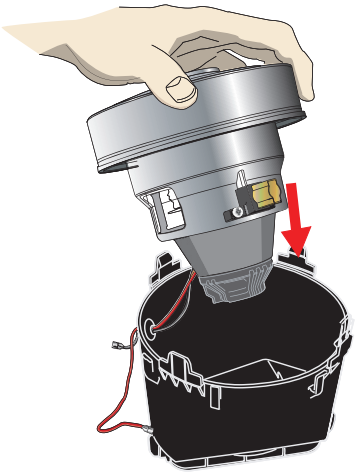
29 Ensure the detail on the motor mount locates into the end of the motor bucket.



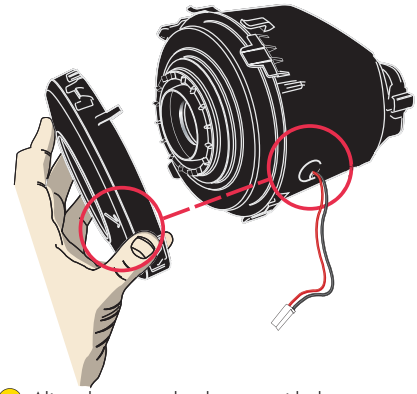
27 Fit the motor mount onto the motor plate. Locate the motor plate onto the motor.



30 Fit the fancase seal onto the base of the motor.

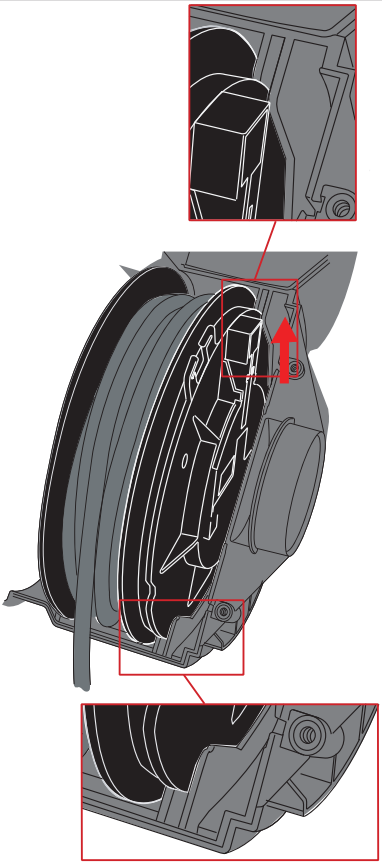


28 Attach the wiring harness to the motor. Lower the motor into the motor bucket.

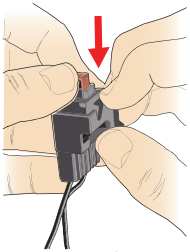


31 Align the motor bucket top with the motor bucket so the arrow points towards the wiring harness grommet. Firmly clip the motor bucket top onto the four catches around the side of the motor bucket. Ensure the detail on the fancase seal protrudes fully through the hole in the motor bucket top.

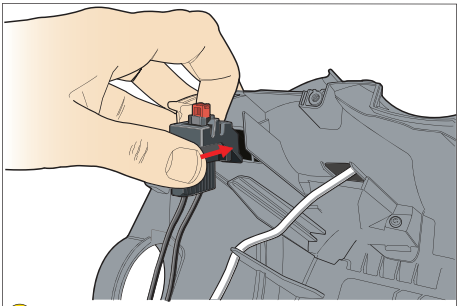
Fitting notes



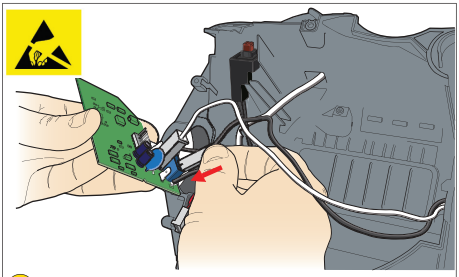
32 Locate the cable rewind assembly into the LMC assembly. Ensure it sits within the LMC as shown. When fitted correctly the brake actuator will point directly upwards.



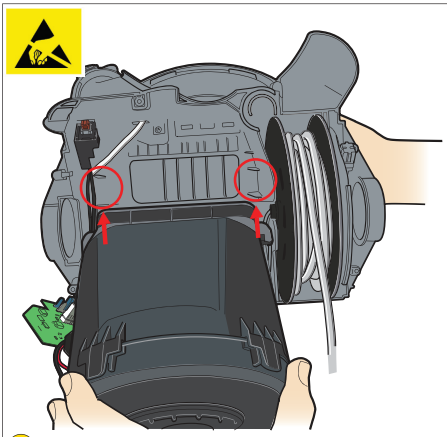
33 Locate the black wires from the PCB assembly through the switch holder and attach to the switch. Clip the switch into the holder.



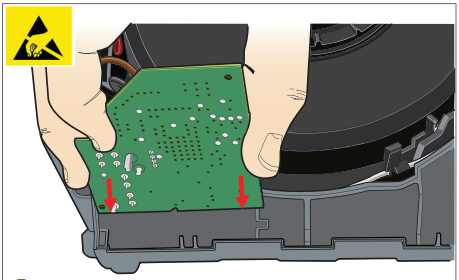
34 Position the switch holder into the LMC assembly. When positioned correctly the switch button will point directly upwards.



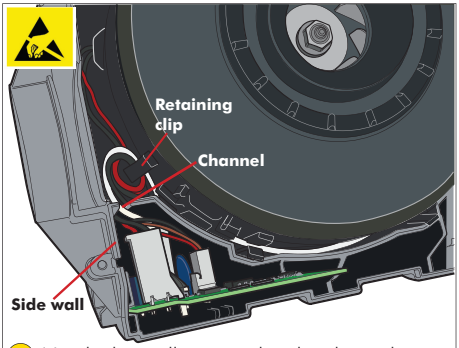
35 Carefully attach the wires from the cable rewind assembly and cyclone inlet assembly onto the PCB assembly.



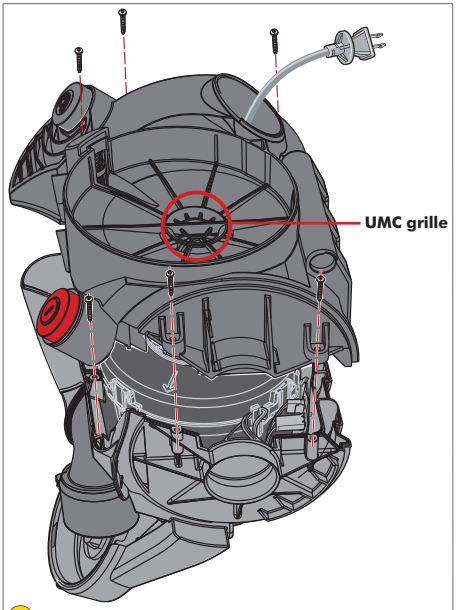
36 Lower the motor bucket into the LMC assembly. The lugs on the motor bucket mount locate into the ribs within the LMC assembly. Locate the cable rewind wires within the retaining clips around the side of the motor bucket.



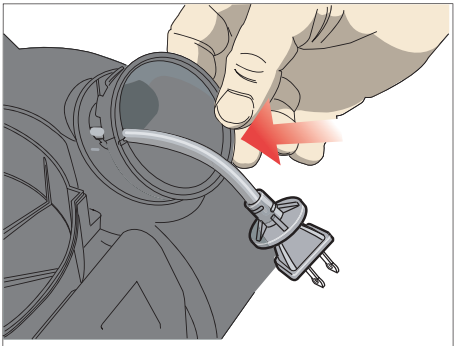
37 Carefully attach the wiring harness to the PCB assembly. Locate the PCB assembly into the channels in the LMC assembly.



38 Neatly dress all wires within the channel provided. Hook the wiring harness around the last retaining clip on the side of the motor bucket.
Note: locating the cable rewind wires in the channel last, retains the other wires within the channel.
Important: ensure all wires are clear of the side wall. Failure to ensure this could result in trapped wires when fitting the UMC.

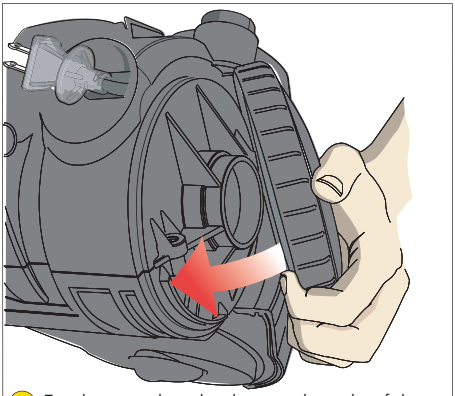


39 Locate the plug through the UMC. Position the LMC vertically. Locate the UMC onto it ensuring that the UMC grille is seated centrally around the fancase seal. Refit the 6 screws.

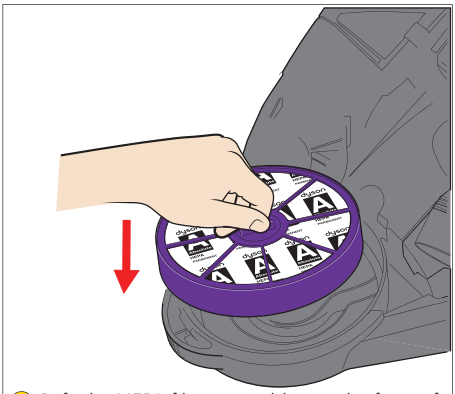


40 Open the cable collar and fit over the powercord. Locate the collar into the LMC. Firmly clipinto place.

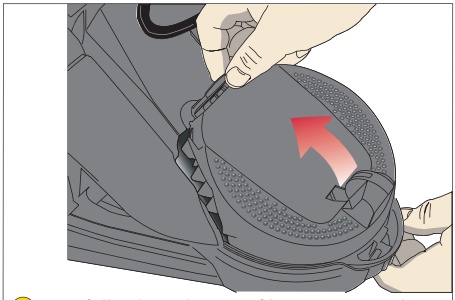
Fitting notes



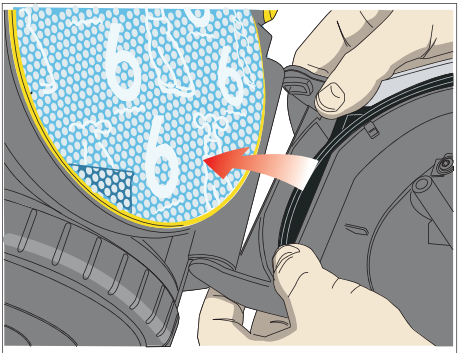
41 Firmly press the wheels onto the side of the product.



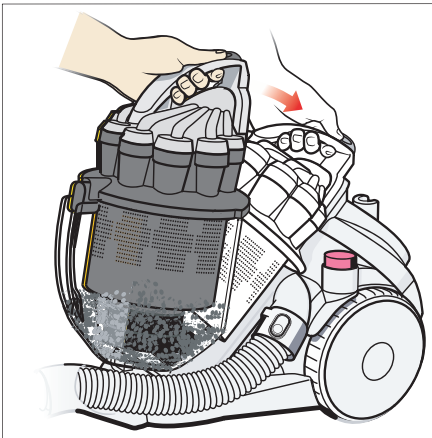
42 Refit the HEPA filter assembly into the front of the product.



43 Carefully place the post-filter cover into the 2 locating points at the front of the machine and then firmly clip the rear onto the LMC assembly.

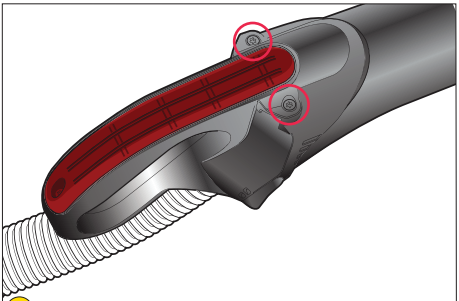


44 Refit the pre-filter assembly into the top of the UMC. Clip the pre-filter cover into the hinge points on the rear of the UMC. Clip the pre-filter cover catch over the retainer on the front of the UMC.

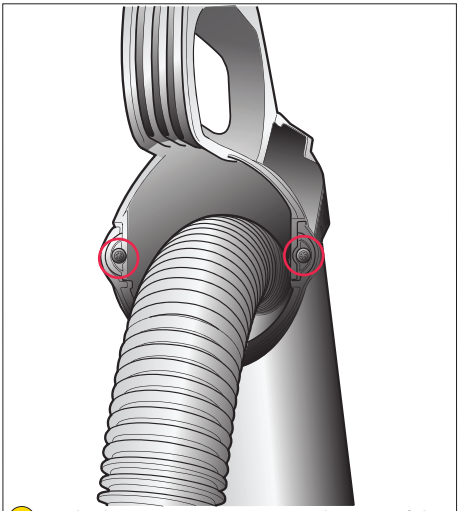


45 Clip the end of the hose assembly into the cyclone inlet. Clip the hose retainer onto the front of the product. Clip the cyclone and bin assembly onto the machine. Wrap the hose around the product and clip the wand into the side of the cyclone assembly.
Locate the power floor tool into the stow on the rear of the product.

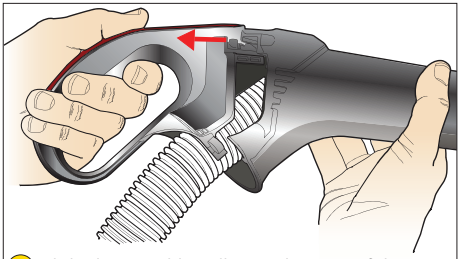
Sub-assemblies - power wand/hose assembly



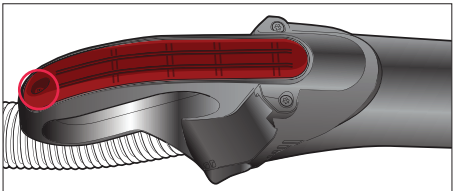
46 To remove the wand handle from the power wand hose assembly, undo the 2 screws on the top of the wand.



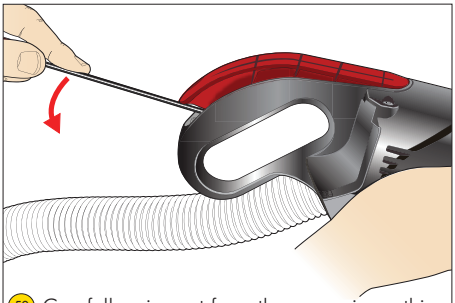
47 Undo the 2 Torx T-8 screws on the rear of the wand handle.



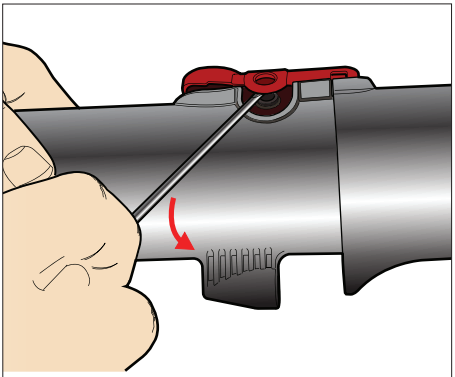
48 Slide the wand handle out the rear of the power wand hose assembly.
Fit in reverse.



49 The wand handle cover can be replaced by removing the Torx T-8 screw in the rear of the cover.

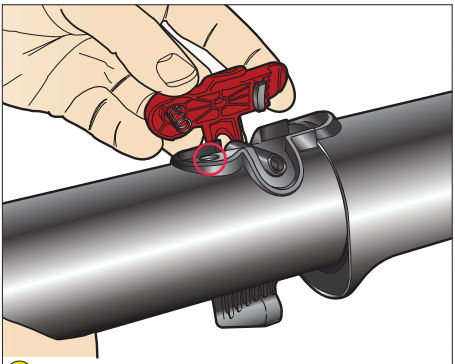


50 Carefully prise out from the rear using a thin, flat bladed screwdriver.
Fit in reverse.

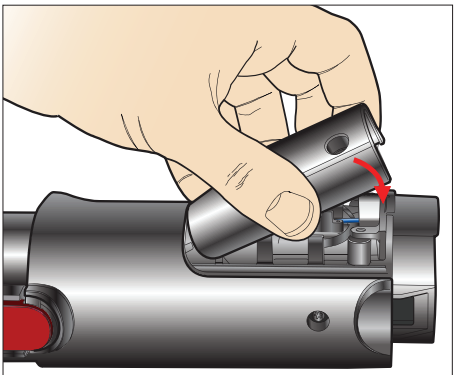


51 To replace the front wand catch or spring, prise the catch away from the retainers on the wand using a thin, flat bladed screwdriver.

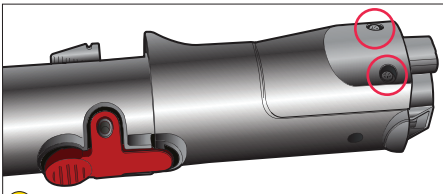
Fitting notes



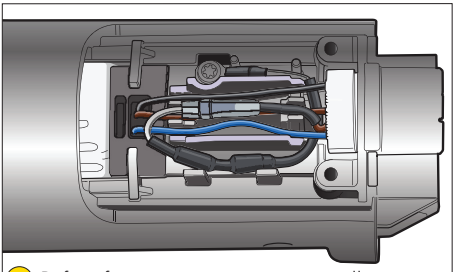
52 To refit, locate the spring onto the cruciform on the underside of the catch, then lower the catch onto the wand ensuring the spring locates into the circular detail on the wand. Firmly press the locating holes on the catch over the retainers on the wand.



55 To fit, locate the detail on the rear of the cover under the lip on the wand. Lower the cover onto the wand. Refit the 2 screws.



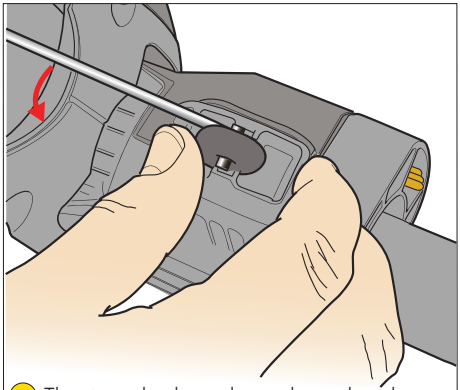
53 The wand cuff cover can be replaced if necessary by undoing the 2 screws shown and lifting off the cover.



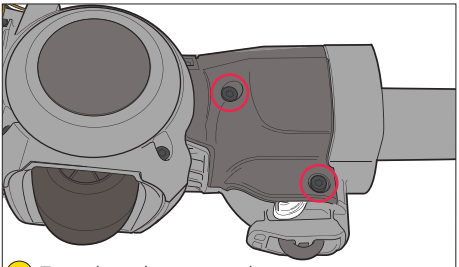
54 Before fitting a new cover, ensure all wires are located within the channels and retainers provided.

Sub-assemblies - Power floor tool assembly - dismantle

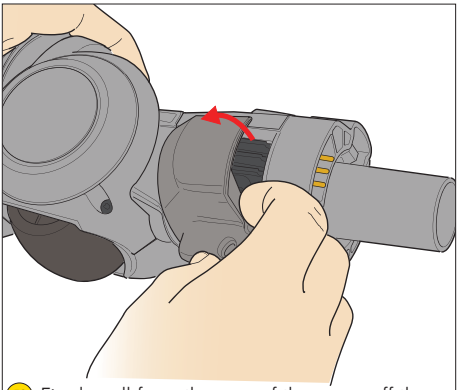
Fitting notes



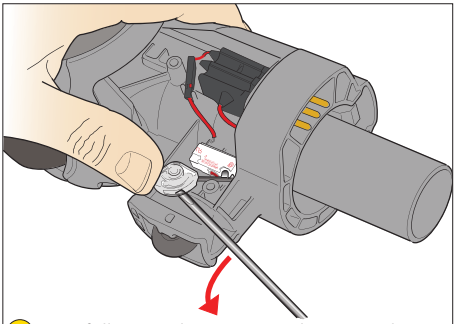
56 The stow wheel or axle can be replaced by prising out of the stow using a thin, flat bladed screwdriver.
To fit, push both parts firmly into the stow.



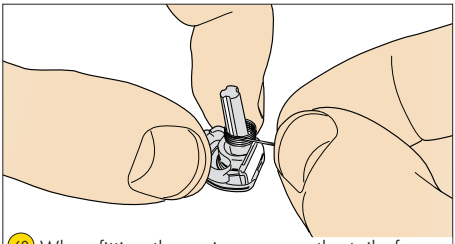
57 To replace the stow neck cover, stow microswitch cam or spring remove the 2 short screws in the cover.



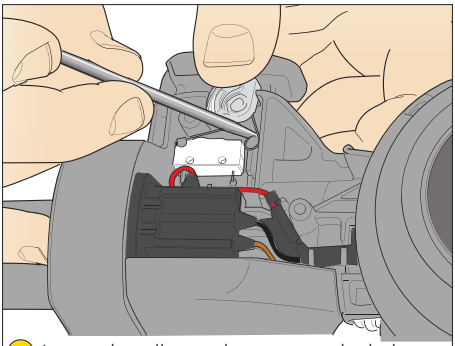
58 Firmly pull from the rear of the cover off the side of the neck.



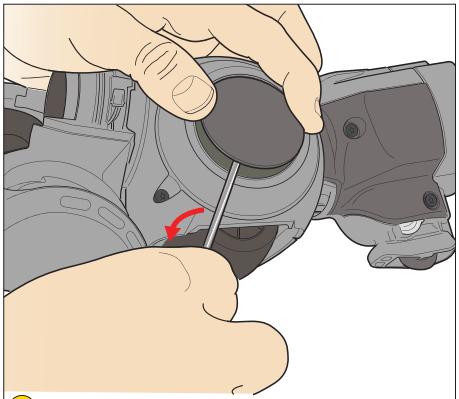
59 Carefully prise the microswitch cam and spring out of the neck.



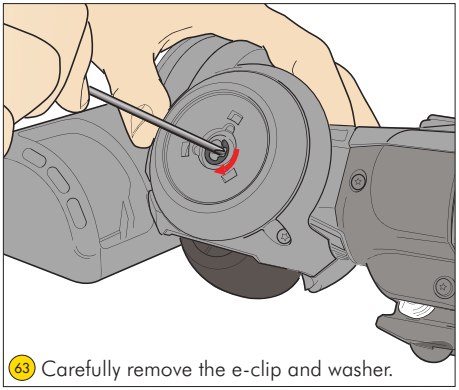
60 When fitting the spring, ensure the tail of the spring locates into the channel in the microswitch cam.



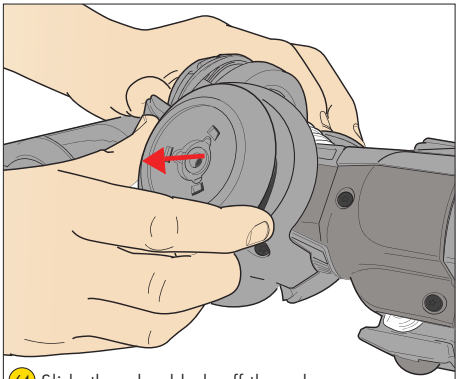
61 Locate the pillar on the cam into the hole in the side of the neck. Locate the ring on the end of the spring over the thin pillar in the neck ensuring the tail of the spring remains retained within the cam channel. Twist the cam into position.
Test the actuation of the cam against the microswitch.
Fit the stow neck cover and 2 short screws.



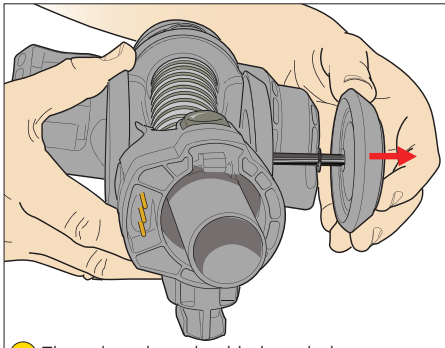
62 If either outer wheel hub, glamour cap or the axle need replacing, prise the relevant glamour cap off the wheel hub using a thin, flat bladed screwdriver.



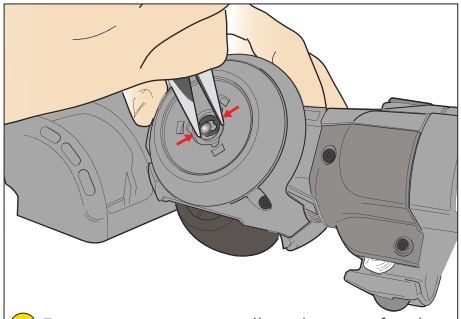
63 Carefully remove the e-clip and washer.



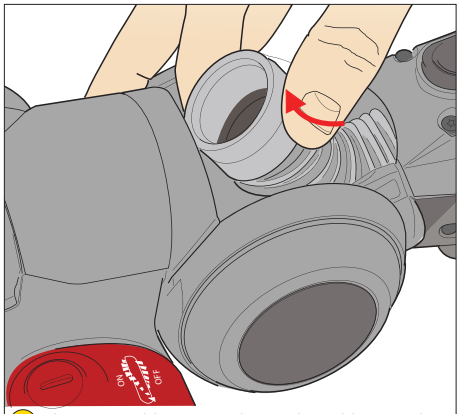
64 Slide the wheel hub off the axle.



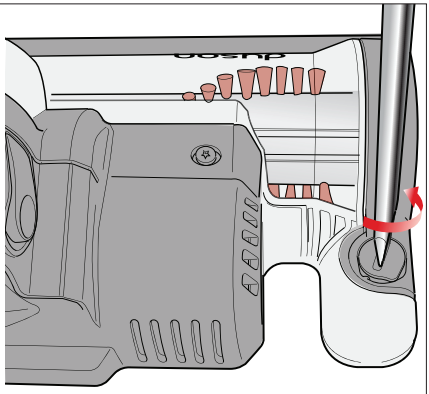
65 The axle, other wheel hub and glamour cap and remaining washers can then be removed from the side of the floor tool if necessary.



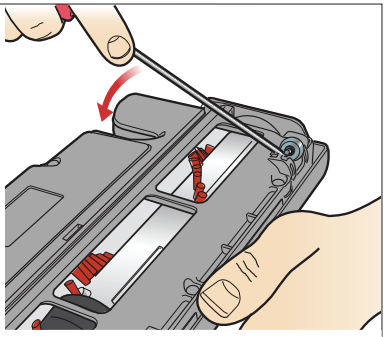
66 Fit in reverse ensuring all washers are fitted (2 on either side of each wheel).



67 The internal hose can be replaced by simply lifting out the top of the floor tool.
Fit in reverse.

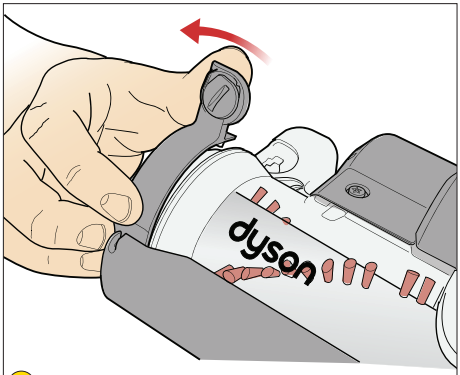


68 Turn the endcap fasteners counter-clockwise using a large, flat bladed screwdriver or coin.

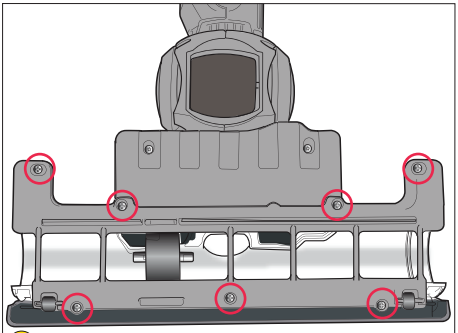


71 The soleplate wheels or axles can be prised out from the soleplate assembly if necessary using a thin, flat bladed screwdriver.
To fit, firmly press both parts into the soleplate assembly.

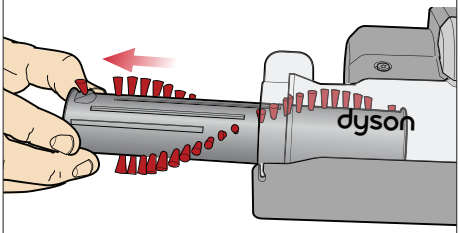
Fitting notes



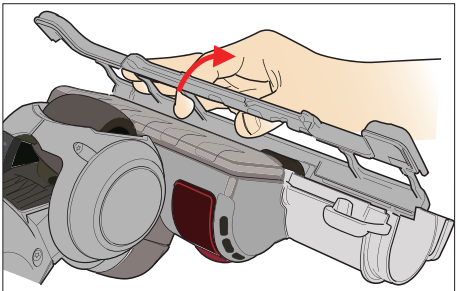
69 Twist the endcap assemblies off the sides of the brush housing.



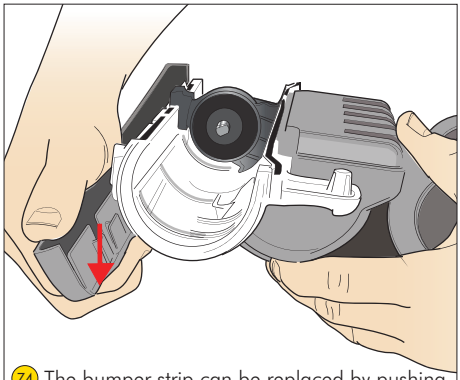
72 Undo the 7 Philips screws in the soleplate assembly.



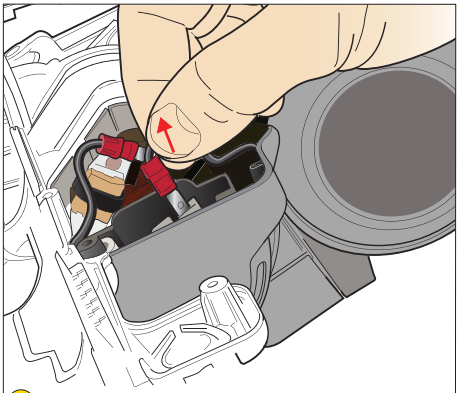
70 Slide each half of the brushbar assembly out of the brush housing.



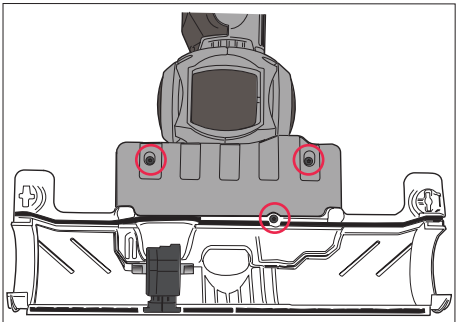
73 Remove the soleplate assembly from the brush housing.
If necessary any lengths of ropeseal in the brush housing can be replaced.



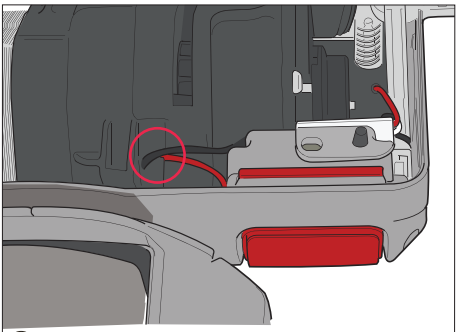
74 The bumper strip can be replaced by pushing very firmly away from the front of the brush housing.



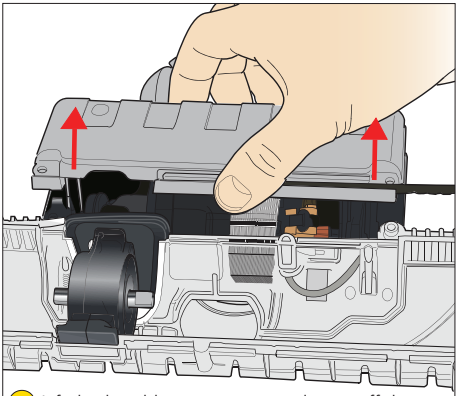
77 Disconnect the 2 brushbar motor wires from the connectors.



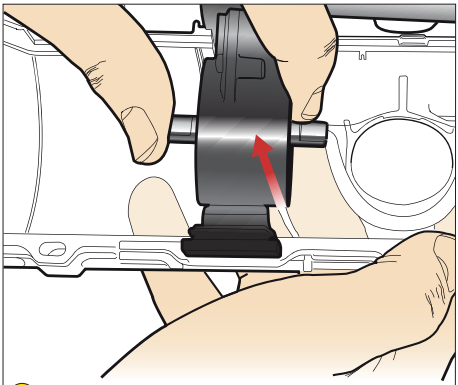
75 Undo the 3 screws in the brushbar motor cover lower.



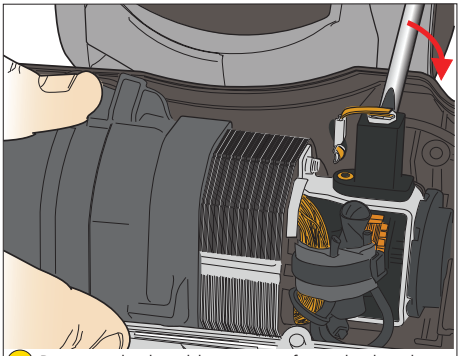
78 Carefully release the brushbar microswitch loom from the rubber retainer on the rear of the brushbar motor.



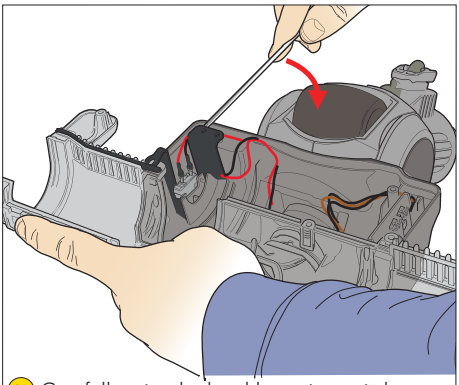
76 Lift the brushbar motor cover lower off the brushbar motor cover.



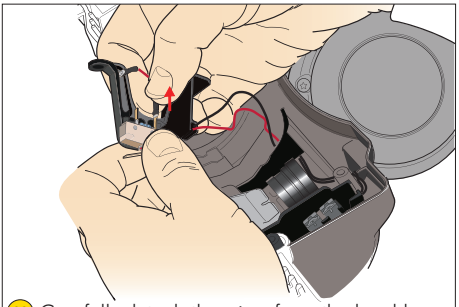
79 Release the brushbar motor from the brushbar motor front mount.



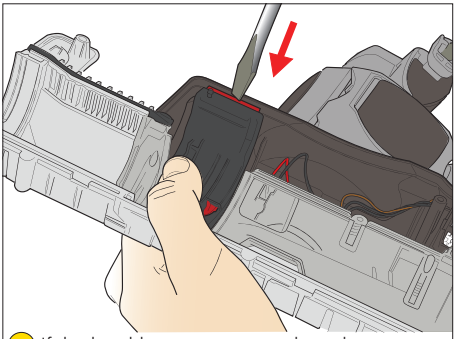
80 Remove the brushbar motor from the brush housing.
Note: it may be necessary to use a screwdriver to carefully ease the motor out.



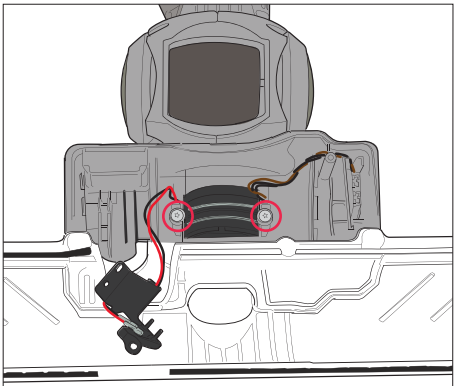
81 Carefully prise the brushbar microswitch holder off the retaining peg on the brushbar motor cover.



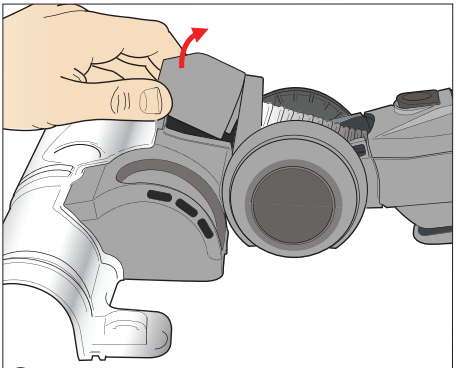
82 Carefully detach the wires from the brushbar microswitch. Remove the switch from the holder.



83 If the brushbar actuator needs replacing, release the lip of it firmly from the brushbar motor cover using a large, flat bladed screwdriver.

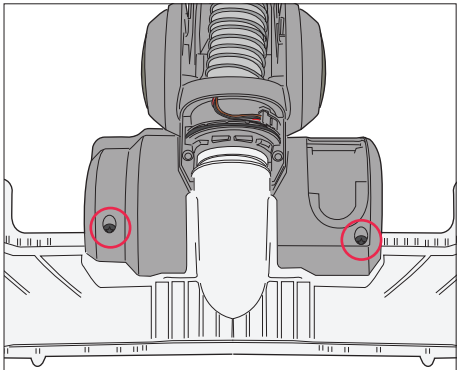


84 Undo the 2 long screws in the underside of the brushbar motor cover.

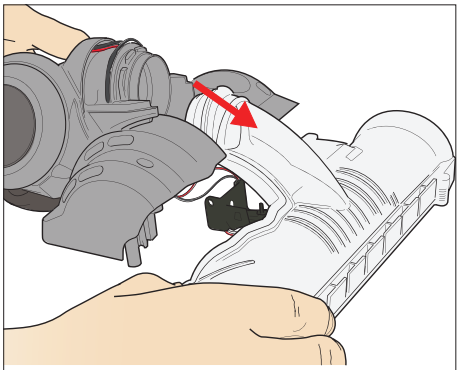


85 Lift the gimble cover off the top of the brushbar motor cover.

Fitting notes

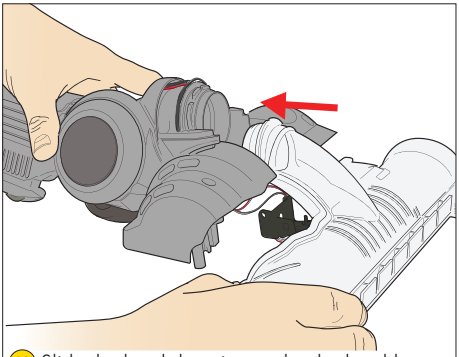


86 Undo the 2 screws in the top of the brushbar motor cover.

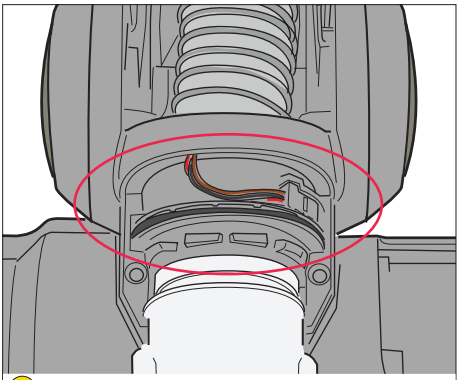


87 If the brush housing needs replacing, slide it away from the front of the brushbar motor cover.
Remove the brushbar motor front mount from the front of the brush housing.
Remove the ropeseal if not done previously.

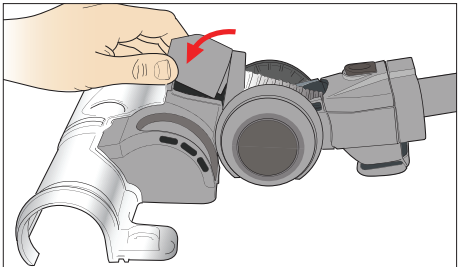
Sub-assemblies - Power floor tool assembly - assemble



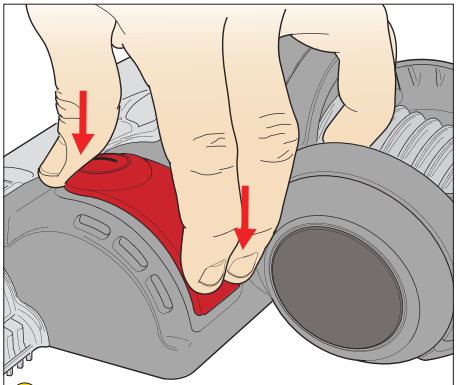
88 Slide the brush housing under the brushbar motor cover and into the neck.
Refit the 2 screws.



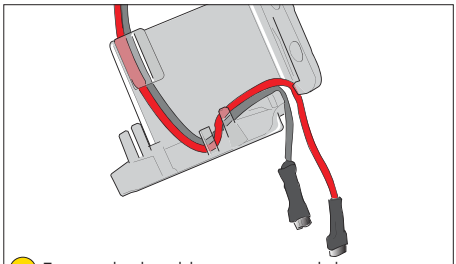
89 Ensure all wires are correctly located within the neck and can move freely.



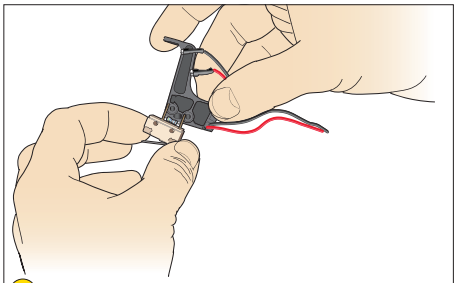
90 Locate the rear of the gimble cover into the neck. Clip the front of the cover onto the brush housing.
Refit the 2 long screws in the underside of the brush housing.



91 Locate the front of the brushbar actuator into the top of the brushbar motor cover. Then force the rear of the actuator into the cover. Turn the floor tool over and locate the lip of the actuator over the ledge in the underside of the brushbar motor cover.

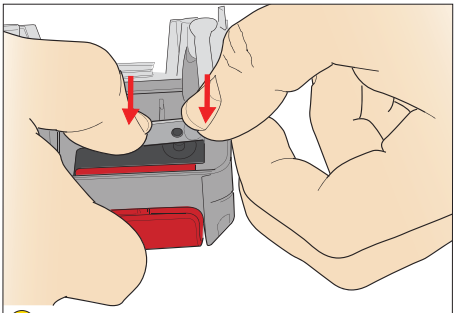


92 Ensure the brushbar microswitch loom is correctly located within all retainers on the rear of the switch holder.

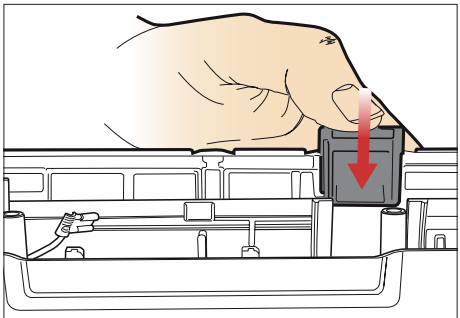


93 Locate the brushbar microswitch onto the 2 pegs on the holder. Attach the brushbar microswitch loom to the switch (red wire onto the front terminal).

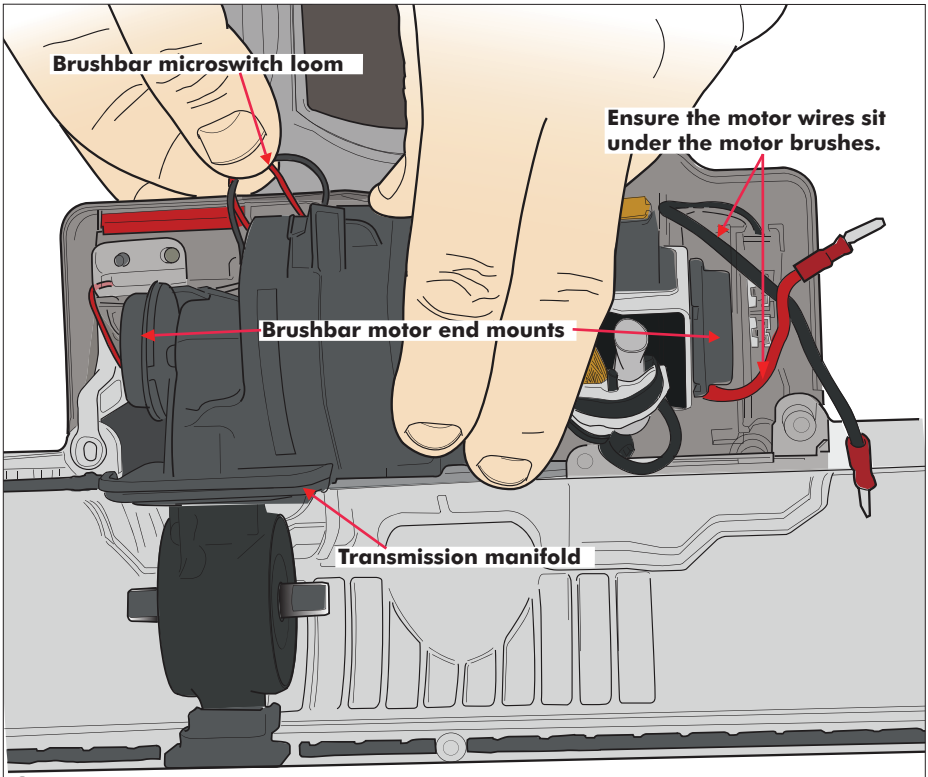
Fitting notes



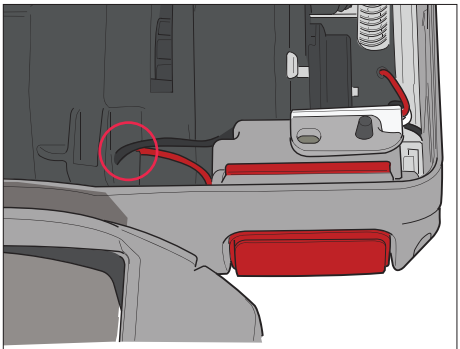
94 Firmly press the brushbar microswitch holder over the retaining peg on the brushbar motor cover.



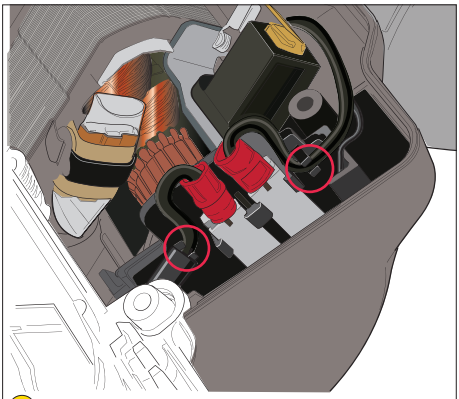
95 Locate the brushbar motor front mount into the front of the brush housing.



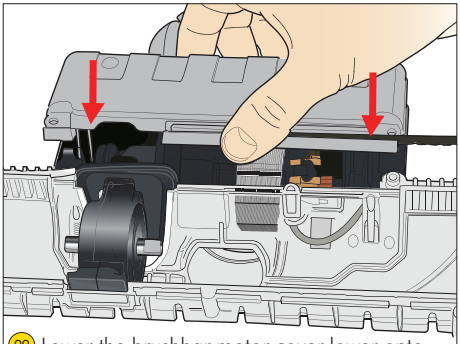
96 Ensure the brushbar motor wires are looped under the motor brushes. **Important:** hold the brushbar microswitch loom out of the way. Lower the brushbar motor into the brushbar motor cover. When correctly located the brushbar motor end mounts will sit onto the shelves. Ensure the brushbar motor wires are not trapped under the motor and can move freely. Ensure the transmission manifold is sealed behind the brush housing.



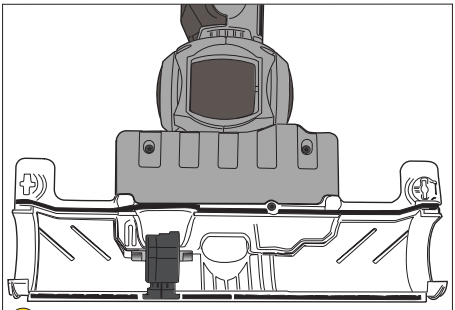
97 Carefully locate the brushbar microswitch loom behind the rubber retainer on the rear of the brushbar motor.



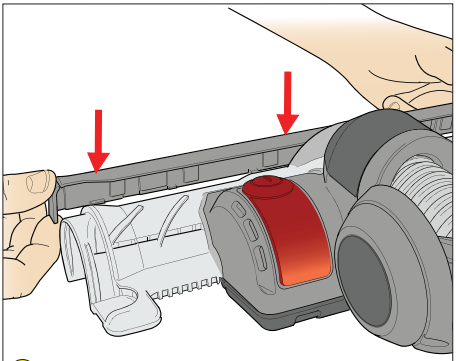
98 Attach the motor wires to the connectors. Ensure the wires are retained in the channels on the connector housing.



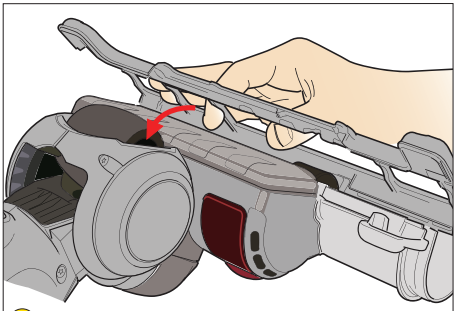
99 Lower the brushbar motor cover lower onto the brush housing. Refit the 3 screws.



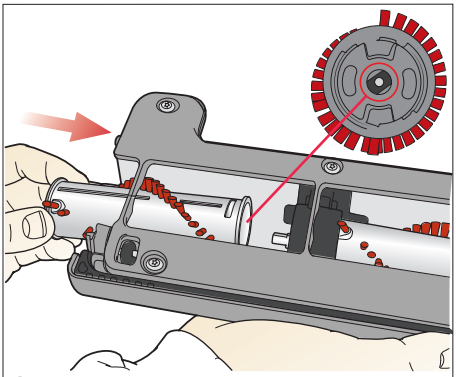
100 Ensure if previously removed that all lengths of ropeseal are fitted into the edges of the brush housing.



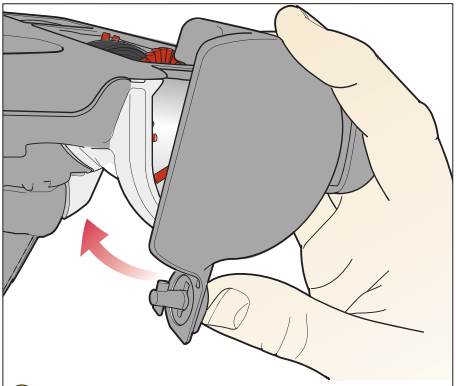
101 Press the bumper strip firmly onto the front of the brush housing if previously removed.



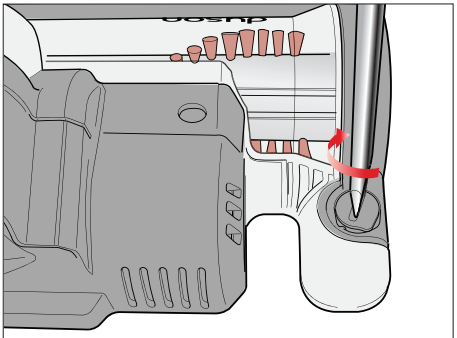
102 Lower the soleplate assembly onto the brush housing.
Fit the 7 Philips screws.



103 Locate the 2 halves of the brushbar assembly into the transmission of the brushbar motor.

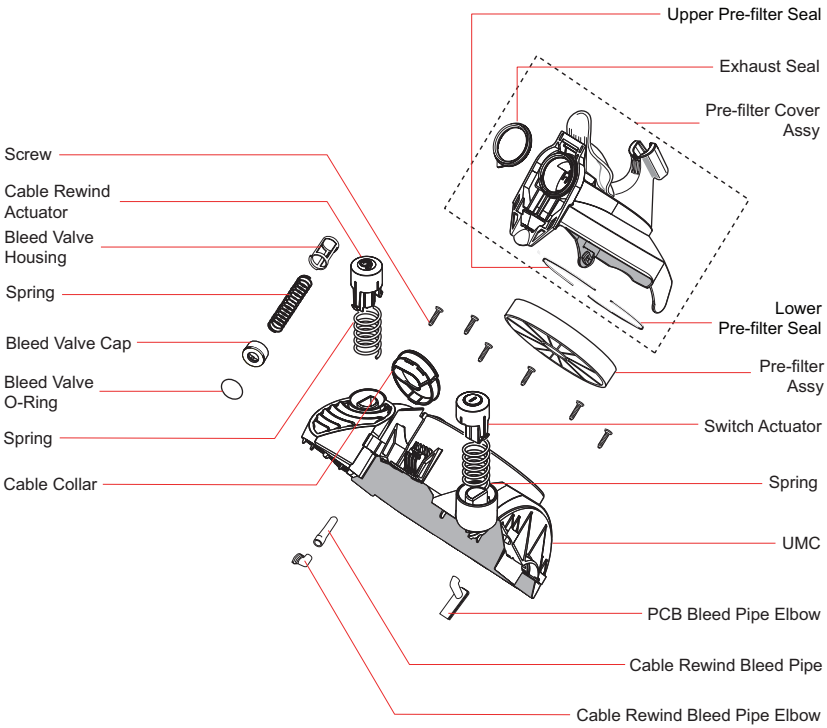


104 Locate the endcap assemblies onto the ends of the brushbar assembly. Twist into position on the brush housing.

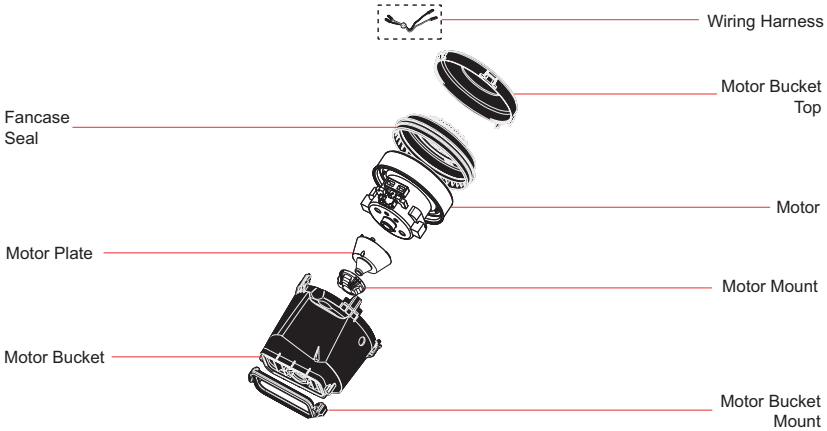


105 Twist the endcap fasteners clockwise to lock in position.

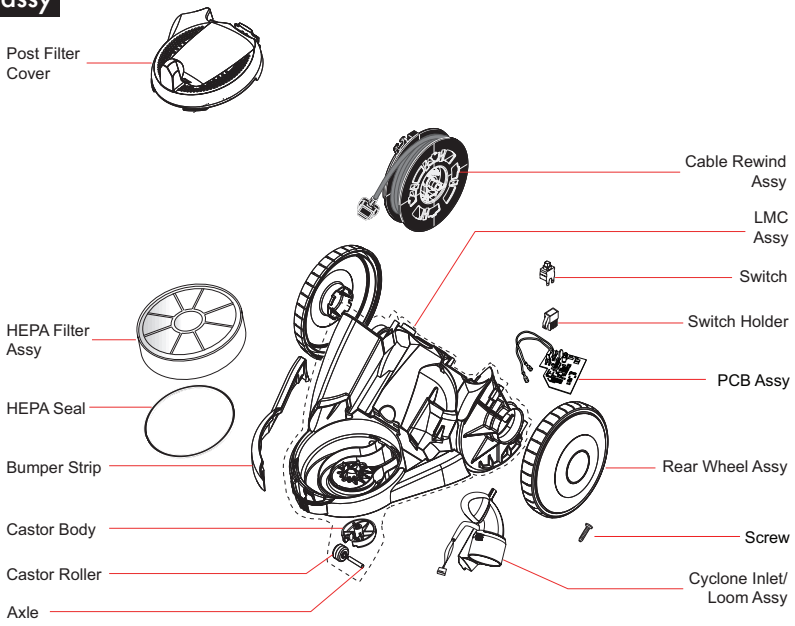
Pre-filter cover & UMC assy



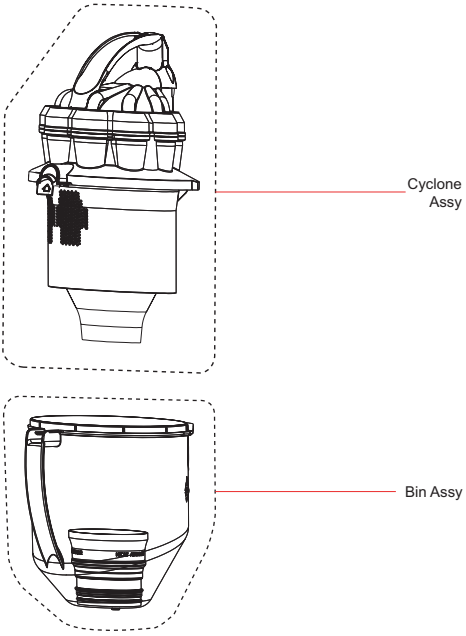
Motor assy



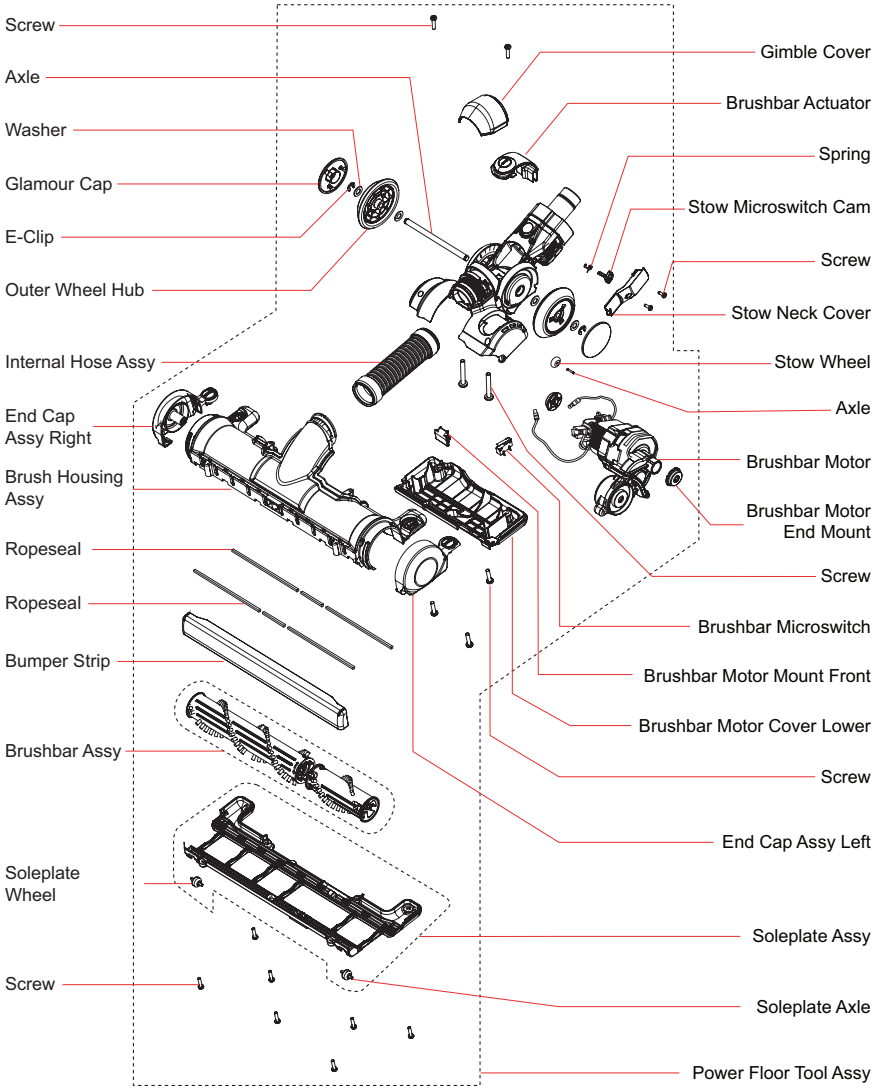
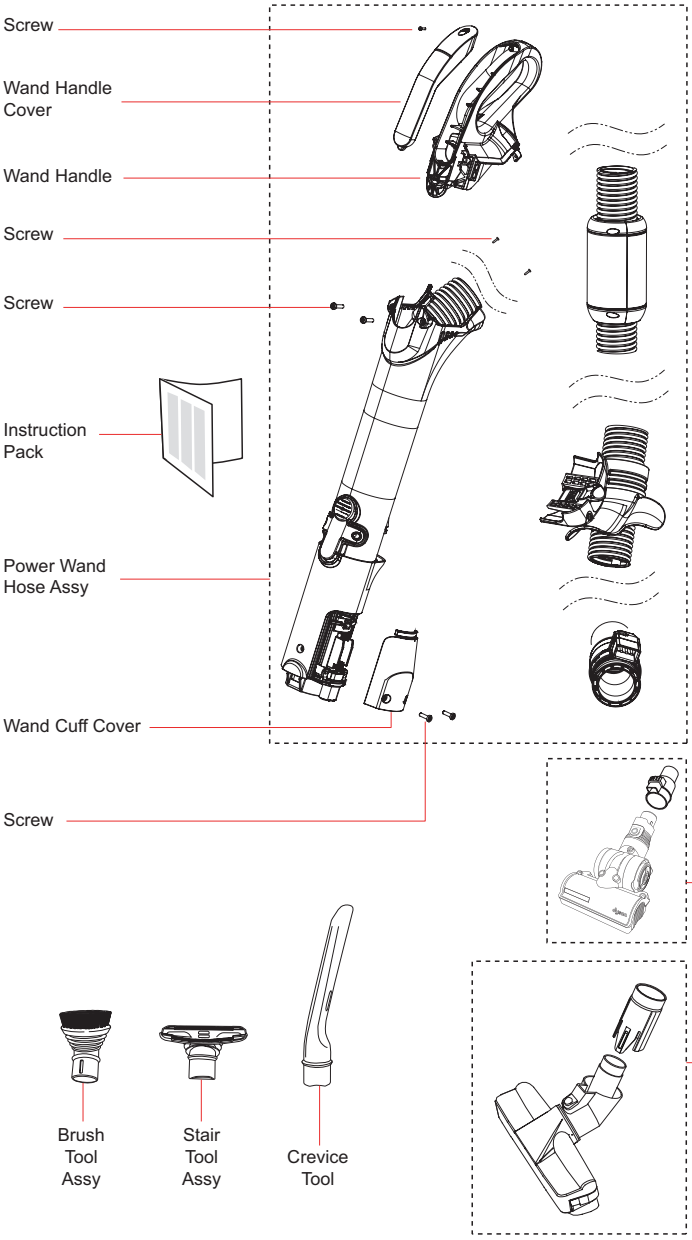
LMC assy



Cyclone & bin assy



Power floor tool assy



Power wand/hose assy