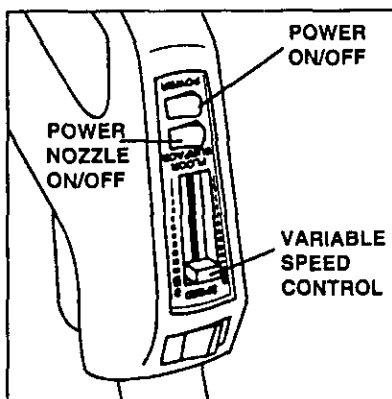


## PowerMAX Canisters

**PowerMAX** canister models were introduced in 1993 as replacements for Spectrums, which they resemble in appearance.

**ALL PowerMAX** canisters have power nozzles. Nozzle motors are turned on (rug) and off (bare) at the hose grip.

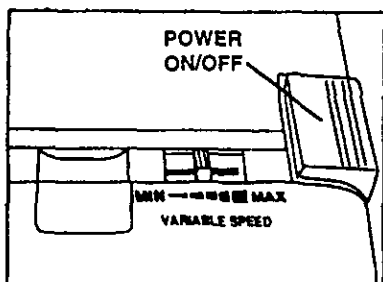
Power nozzles packed with **PowerMAX** models are all the style shown at the left with two brush brush roll, headlight and belt check window.



All nozzles used with the PowerMAX have a belt check window on the top.

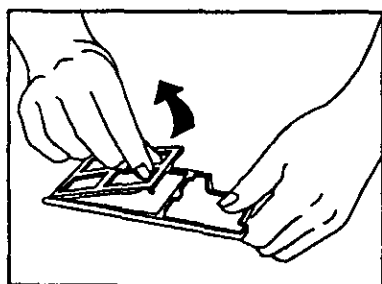
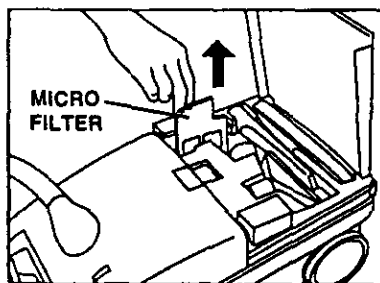
On all models (on/off on unit or hose) the hose must be plugged into the P.T.O. receptacle of the cleaner before the canister will operate.

Variable speed motors are in some PowerMAX models. Motor speed can be varied on the unit on some models and on the hose on others. See drawings.



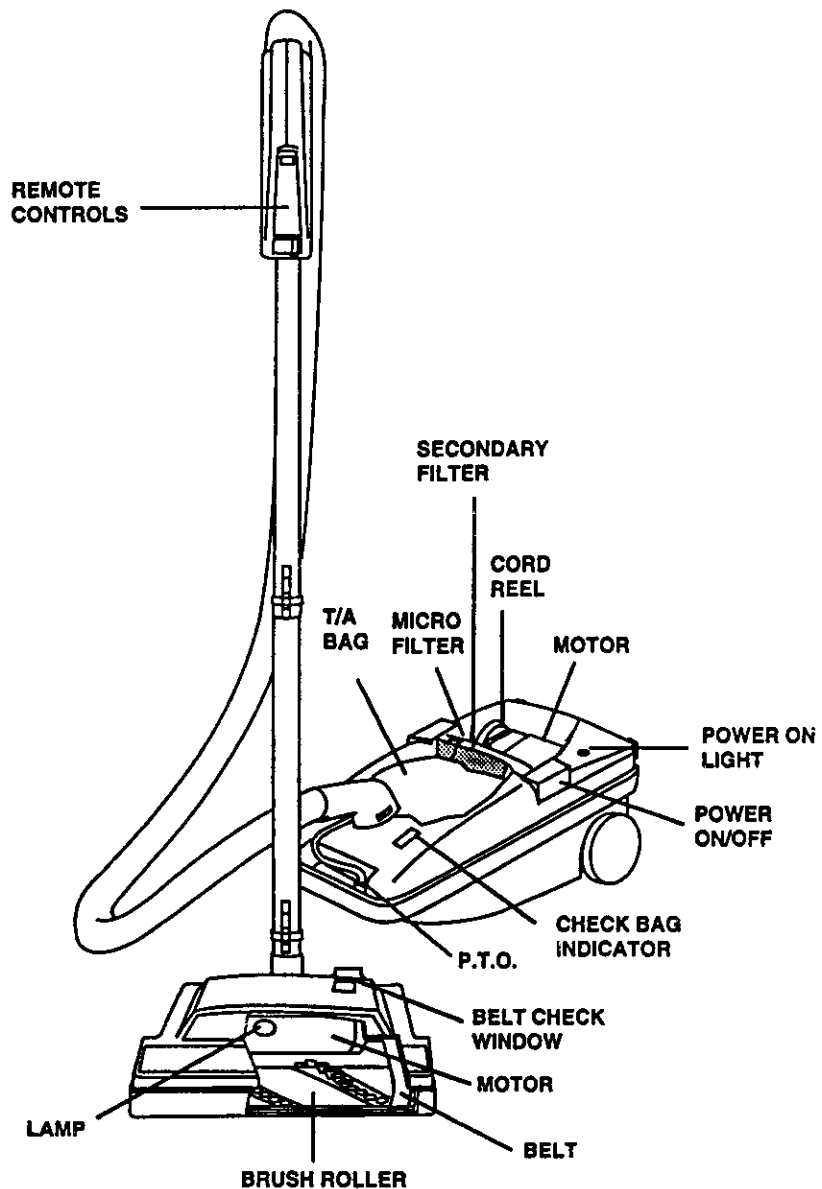
**ALL POWERMAX** models:

- Use Type "S", 7 quart, **micro filtration** T/A bags (std "S" bags will work)
- Have reusable secondary filters in the bag cavity to catch any fine dirt which may get past the T/A bag. These filters **can be washed** in warm water.
- Have washable **micro filters** to clean exhaust air even more before it is returned to the room. See drawing.
- Have 25' cords on a cord reel
- Have covered tool storage on the cleaner
- Include a 4 piece tool set
- Have "check bag" indicators
- Have bag lid hinges designed to break away if the lid is opened too far

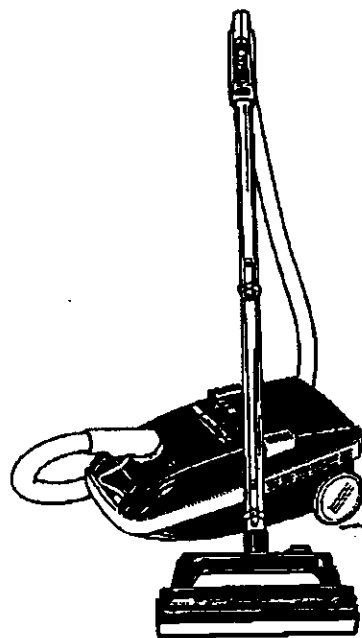
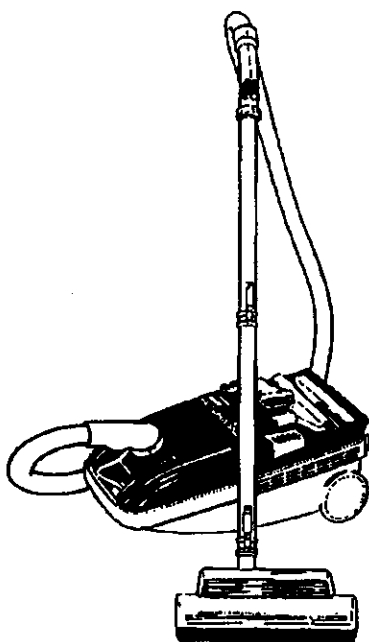
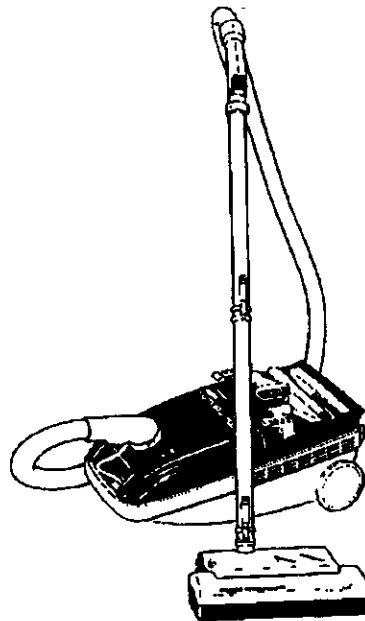
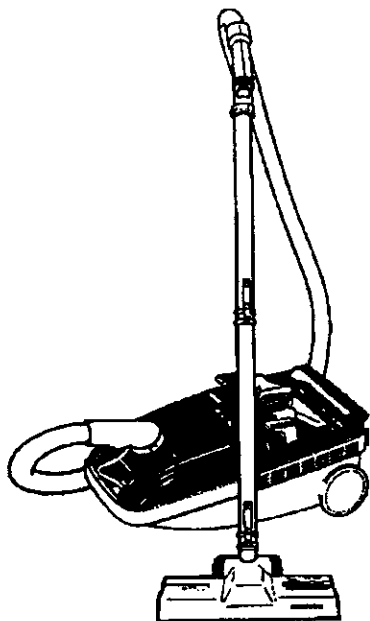


Prominent parts of one **PowerMAX** model are shown in the drawing below.

Refer to the Hoover Service Manual for repair procedures and to the **Microfiche Parts Catalog** -- (dark brown header) - for spare parts.



# SERVICE INSTRUCTIONS POWERMAX/SPECTRUM/FUTURA CLEANERS





## I. General

The Futura, Spectrum and PowerMAX cleaners are straight air suction type canisters designed to work efficiently at 120 Volts, 50 Hertz.

Features include:

- Full bag indicators
- Tool storage (hinged tool covers on Spectrum and PowerMAX models)
- 150° hose swivel at suction inlet
- Seven quart throw away bag - Type S
- Cord reels on deluxe models
- Power Surge on deluxe Spectrum models
- Powered nozzles on deluxe models

## II. Basic operation

### Futura

On Futura models, an on/off switch on the unit provides power to the unit and powered nozzle (where applicable). All models are single speed.

### Spectrum

On top of the line models, both the on/off switch on the unit and hose must be activated to power the unit. A rheostat located on either the unit or the hose controls the motor speed. Some models have a surge button on the hand grip to increase the speed of the powered nozzle motor.

### PowerMAX

On top of the line models, both the on/off switch on the unit and hose must be activated to power the unit. A rheostat located on either the unit or the hose controls the motor speed. Top of the line models incorporate an on/off switch on the grip that controls the powered nozzle.

Wiring diagrams are listed in the back of this instruction.

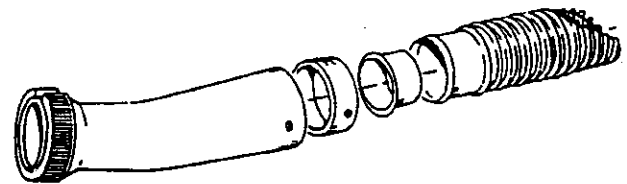
## III. Disassembly

### A. Hose Assembly

Futura current carrying: This hose cannot be disassembled and must be replaced as an assembly.

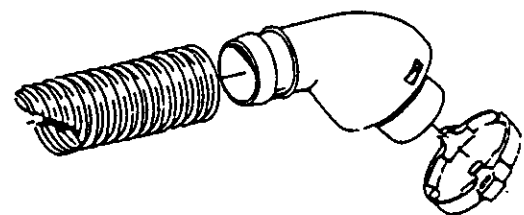
Futura straight air: To remove the hose grip, use a flat punch to push in on the plastic bosses on both sides of the grip while pulling outward on the hose.

HOSE GRIP



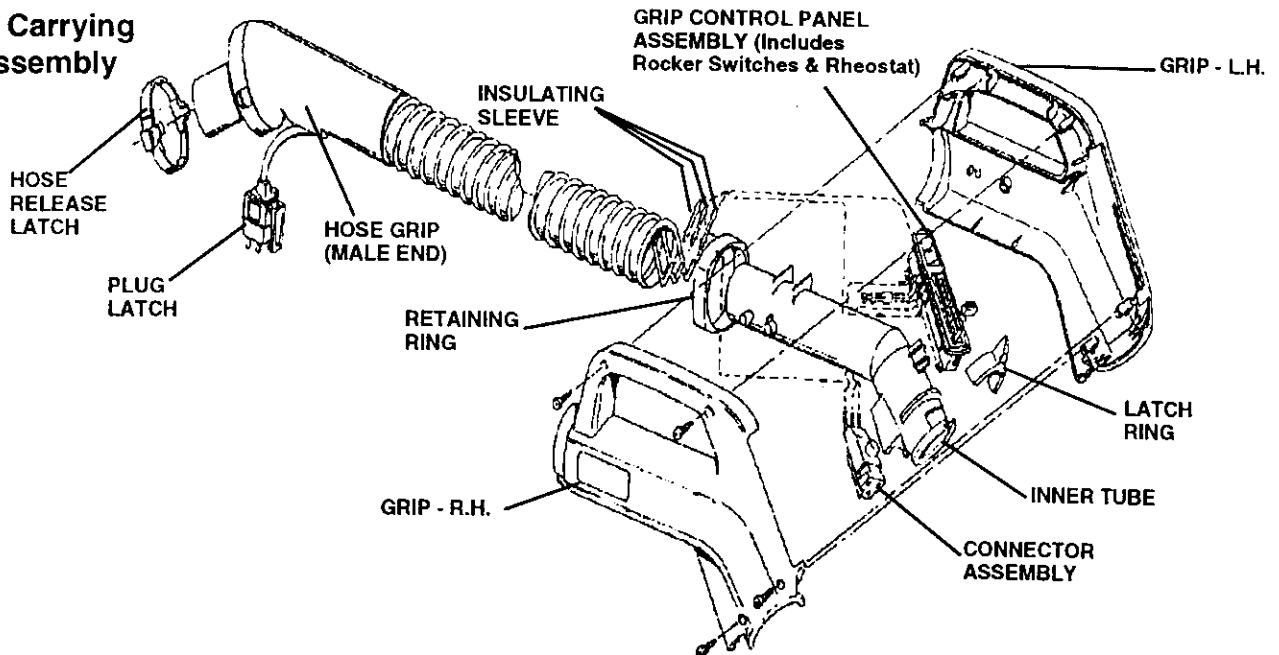
To remove the hose connector, grasp and pull outward while twisting.

HOSE CONNECTOR



Spectrum-PowerMAX hoses: The grip control panel assm. (Rheostat and rocker switch) latch, ring, inner tube and connector assm. can be replaced by disassembling the right and left hand grip halves.

## Current Carrying Hose Assembly



1. Remove retaining ring on end of hose grip.

a. Retaining ring is a bayonet type assembly - rotate ring counterclockwise and pry off end of grip.

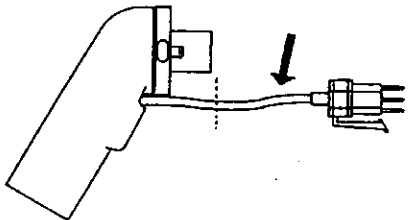
2. Remove four screws in handle grip.

Note the position of wiring for ease of reassembly.

### B. Hose/Hose grip (male end)

The hose grip cannot be disassembled. If the hose or grip are damaged the hose must be replaced as an assembly.

The pigtail cord in the grip can be repaired using a service repair kit.



### PART NO.    DESCRIPTION

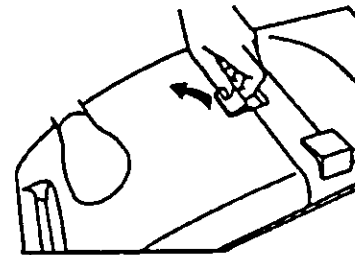
40300051	Service cord repair kit 2 wire
40300052	Service cord repair kit 3 wire

## Cleaner assembly

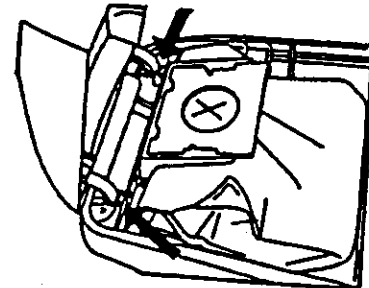
**Note:** Before making any repair or adjustment, bag lid and paper bag should be removed.

### A. Bag lid

1. Lift bag lid latch and open bag lid.



2. Push lid open past the first detent, lid will release.



**Note:** To reattach lid, align hinges with appropriate slots and push them into main body.

3. Remove hinges (snap fit - release tab - lift out).

**4. Remove bag lid latch.**

- a. Release latch spring on indentation in bag lid and slide latch out (snap fit).

**5. Remove full bag indicator.**

- a. Snap fit - release holding tab on support rib.

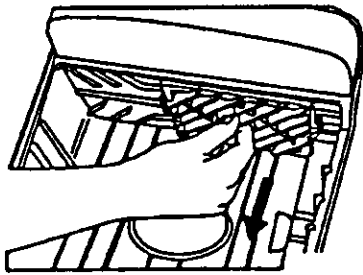
**6. Remove bag collar seal.**

**B. Bag collar support**

- 1. Snaps out - pivot support upward toward handle.

**C. Secondary filter/filter retainer**

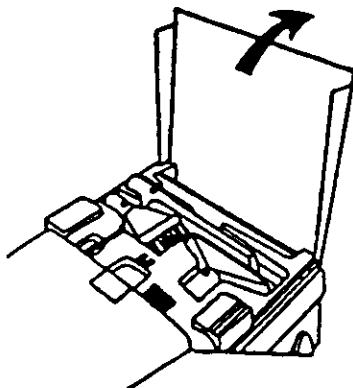
- 1. Pull off filter retainer, friction fit, lift out filter.



**D. Tool lid (where applicable)**

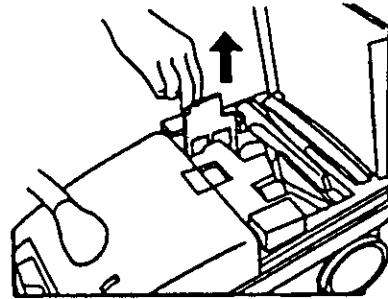
- 1. Friction fit - lift lid upward and tilt backwards until lid pops free.

- 2. Remove cleaning tools.

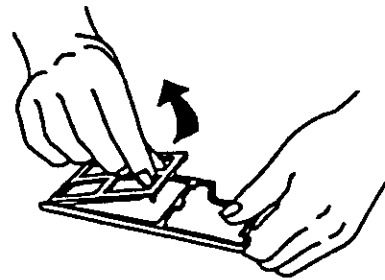


**E. Exhaust (micro) filter (Spectrum/PowerMAX units)**

- 1. Pull up - slide out.



- 2. Open grid on cassette and remove filter.



**F. Motor cover**

- 1. Remove the three mounting screws and lift off cover (Screws are located in tool cavities.)

- 2. After the motor cover is removed, note proper wire locations, then release sufficient wires to allow easy removal of the cover.

**G. Switch**

- 1. Remove motor cover (step 1, item F).

- 2. Disconnect switch leads (one from crimped insulator).

- 3. Remove switch pedal. **Note:** Remove pedal carefully to prevent losing the spring.

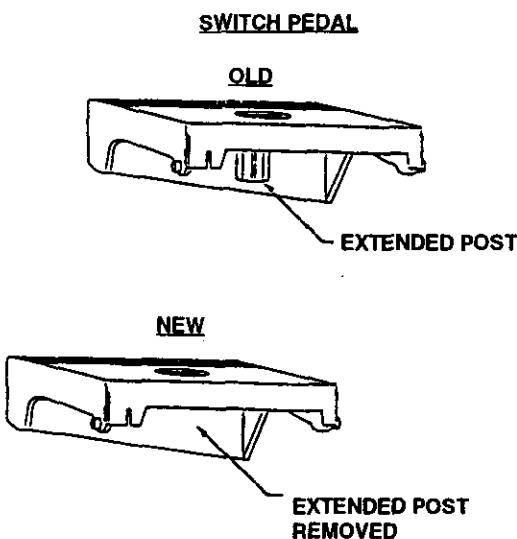
- a. Insert at blade screwdriver between pedal and housing, on either side near hinge.

b. Pry enough to release hinge while pulling up **carefully** on the pedal.

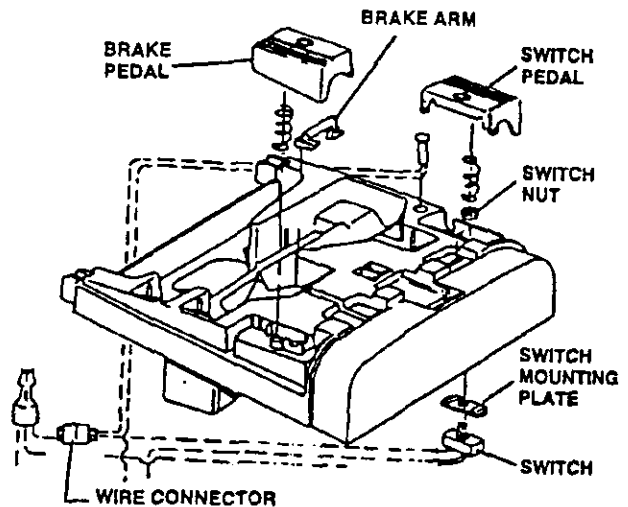
4. Remove switch mounting nut.\* Switch then drops down.

**Note:** When reinstalling switch be sure to include switch mounting plate.

\* The switch style was changed on PowerMAX and Futura models in mid-1994. The current switch is a snap-in design as shown below. To accommodate the latest switch, the switch pedal was modified by removing the extended post that contacts the switch button. Both switch pedals are available in service and identified on the microfiche parts list as switch pedal with post and switch pedal without post. When changing an old style switch you must also update the switch pedal or remove the post on the existing pedal.



## H. Cord reel pedal/brake arm



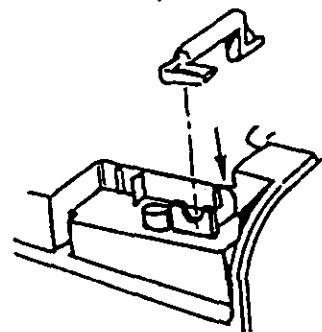
1. Insert at blade screwdriver between pedal and housing near the hinge pin **nearest the word cord.** (This hinge pin is shorter)

2. Pry enough to release hinge and lift off.

3. Remove brake arm.

a. Lift flap on brake arm upward - release brake arm body from slot in motor cover - snap fit.

b. Lift out from top or bottom of motor cover.



## I. Power light

1. Remove by pushing upward from beneath cover.

2. Disconnect leads replace light assembly.



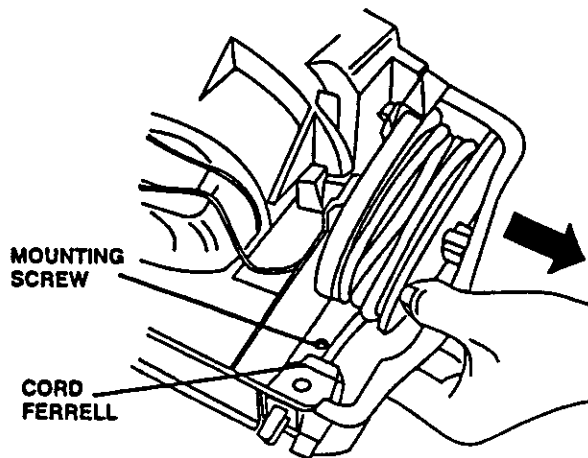
### J. Rheostat (Models with rheostat in motor cover)

1. Remove button on top of motor cover.
2. Release appropriate leads.
3. Release mounting tabs on each end of rheostat - lift out.

### K. Cord reel

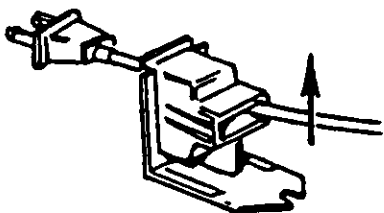
The cord reel is replaced as an assembly only.

1. Remove motor cover (step 1, item F).
2. Disconnect leads.



3. Push outward on side of main body and lift cord reel straight up and out.

4. Lay reel aside and remove cord ferrell.
  - a. Remove mounting screw. (Early models)
  - b. Grasp back edge of ferrell and pull up and out.

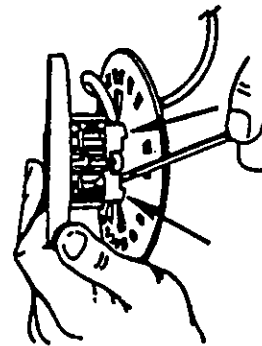


**Note:** The ferrell is carried as part of the cord reel. When reinstalling ferrell, insert top first into opening, then push down and into place.

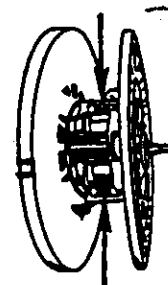
5. Install new cord reel assembly. When reinstalling cord reel, be sure lead wires are routed through retainer at bottom of reel. This is to prevent interference with exhaust filter frame.

### L. Cord (cord reel models)

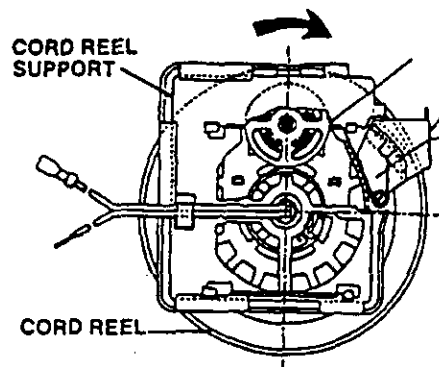
1. Repeat steps 1,2,3 and 4, section J.
2. Remove preturns on cord reel.
  - a. Depress brake pad and turn cord reel to remove preturns. Bracket will turn counter-clockwise.
3. Unwind the cord from the cord reel.
4. Remove the cord and terminal block.
  - a. Flex cord reel and slide locating tabs out of cord reel housing.



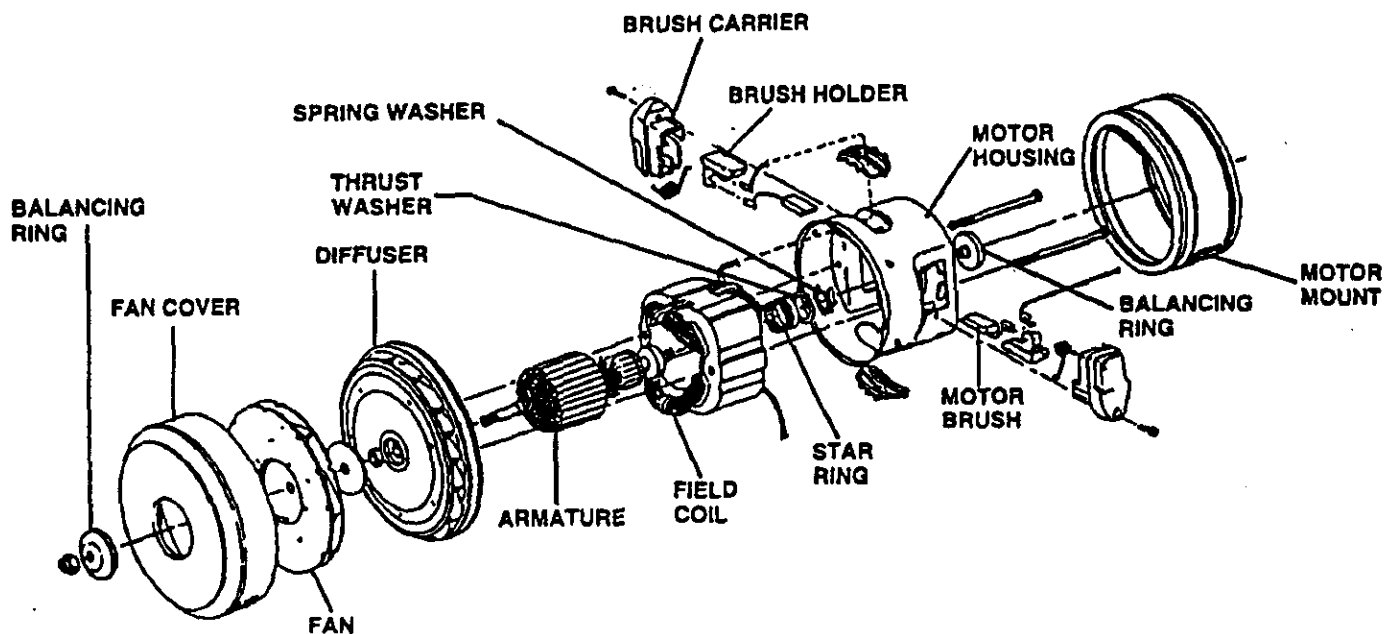
- b. Unlock the two end tabs and continue to slide the terminal block outward.



5. Remove cord and replace.
6. Set cord reel at proper preturns (3).
  - a. Hold cord reel with cord reel support facing up and turn **cord reel support** clockwise.



## MOTOR



### M. Motor

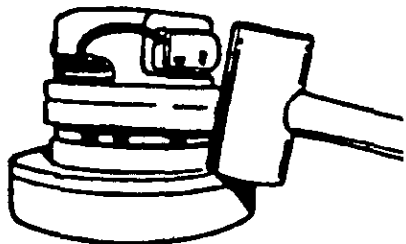
1. Remove motor cover (step 1, item F).
2. Remove motor retainer (4 screws).
3. Disconnect the appropriate leads and remove the motor.
4. Rotate the armature to check for noise or bearing failure.
5. Remove brush carriers from the motor and check carbon brushes. Be sure they slide freely in the holder.

If brushes are worn, replace. Also, check condition of commutator. If worn, replace armature .

6. Remove fan cover.

- a. Insert a screwdriver in indentations between fan cover and diffuser and tap with mallet.

**Note:** Upon reassembly of the fan cover it best to line up the fan cover and diffuser and set motor upright on bench and "tap" around the perimeter of the diffuser until the fan cover seats. This will eliminate tapping directly on the fan cover which could dent and cause the fan to rub.

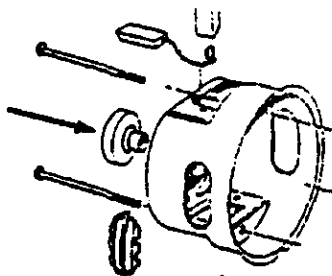


7. Remove the fan nut by turning **clockwise**. Armature shaft has a screwdriver slot.

8. Remove fan and check for wear at the hub.

9. Remove two screws which secure upper motor housing and remove field and armature.

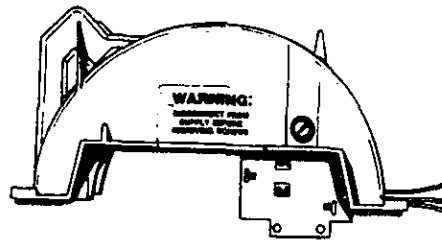
**Note:** On some models it will be necessary to remove the threaded balancing ring on the top of the motor. This ring was used to balance the motors in production. It is **not** necessary to replace this ring upon reassembly of the motor. Both service and production motors are now produced without this ring.



Upon reassembly be sure motor mount is positioned properly.

## N. Speed Control (where applicable)

**Note:** The speed control is an integral part of the motor cover assembly. This assembly includes the cover, speed control and required lead wires.



1. Remove motor cover (step 1, item F).

2. Disconnect the appropriate leads and remove the motor retainer assembly (4 crews).

3. Replace motor retainer assembly complete.

**Note:** When reattaching motor retainer be careful not to pinch furniture guard/seal.

## O. Thermal Protector (PowerMAX units)

The Thermal protector is held in position with a clip located on the rear wall near the motor exhaust.

Remove clip and disconnect leads at insulated terminals to remove.

## P. Receptacle assembly

1. Remove motor cover (step 1, item F).

2. Disconnect leads.

3. Remove cord channel cover.

a. Remove the one screw, grasp cover at receptacle end and pull free. Release tabs from main body, lift up and out.

#### 4. Replace receptacle assembly.

**a.** Insert flat blade screwdriver between receptacle and main body and pry upward to release tab on rear of receptacle from main body.

**b.** Once tab free, push receptacle downward until free.

**Note:** When reinstalling new receptacle assembly be sure lead wires are firmly inserted into slots molded in wiring channel on main body. This prevents pinching leads and eases installation of channel cover.

#### Q. Rear wheels

The rear wheels snap to the main body by tabs molded into the hub. To remove, tabs must be pushed inward while pulling out on the wheel.

#### R. Power nozzles - Spectrum

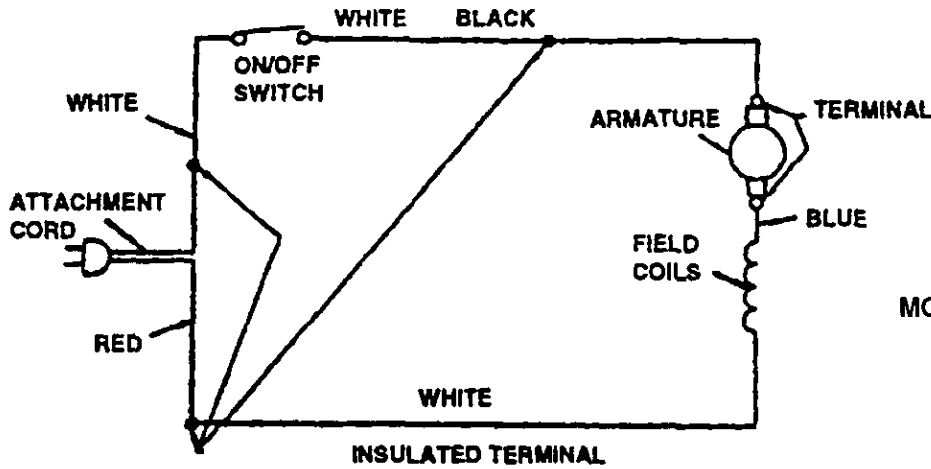
See Service Instructions Quadraflex Powermatic Nozzle

#### Futura /Spectrum

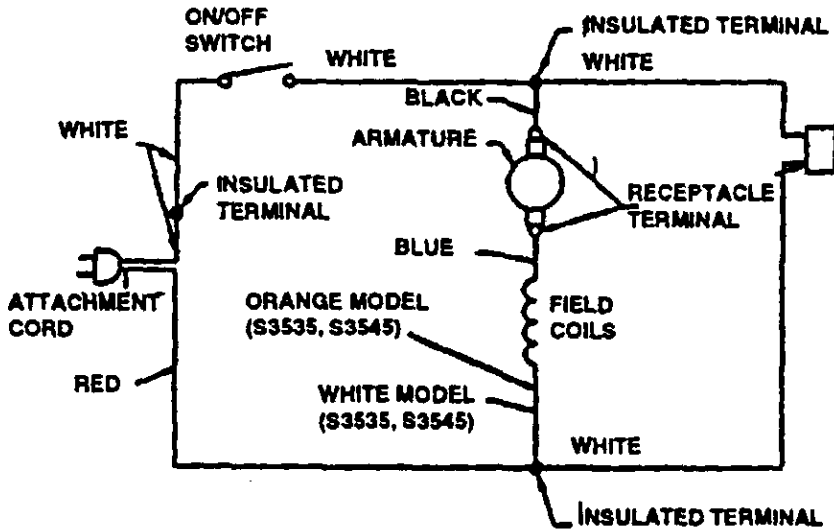
See Service Instructions Powermatic Nozzle Late Models.

# WIRING DIAGRAMS

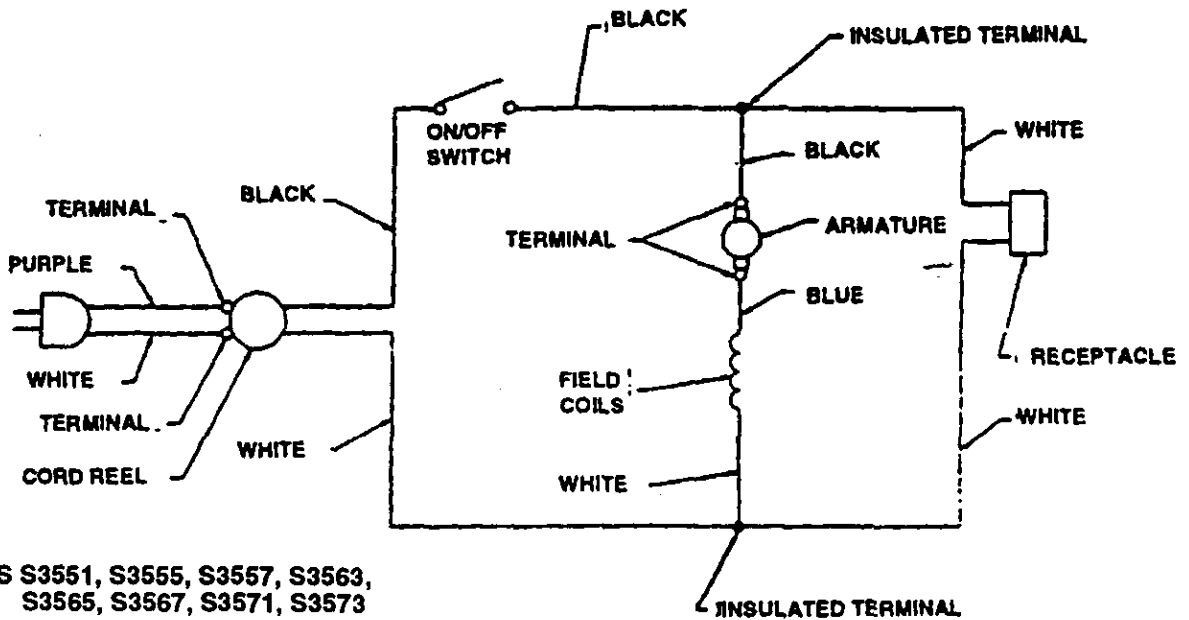
## Futura



MODELS S3509, S3511, S3513, S3515  
S3523, S3527, S3533, S3553



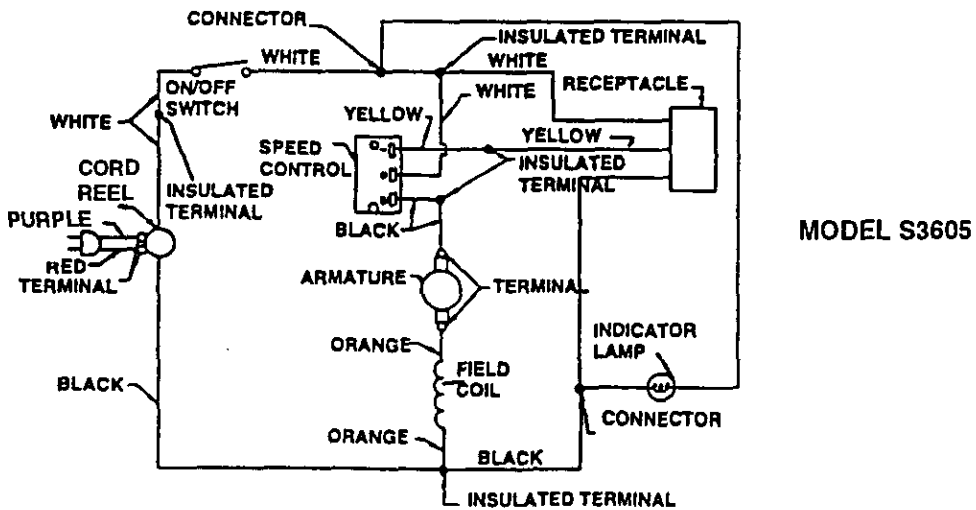
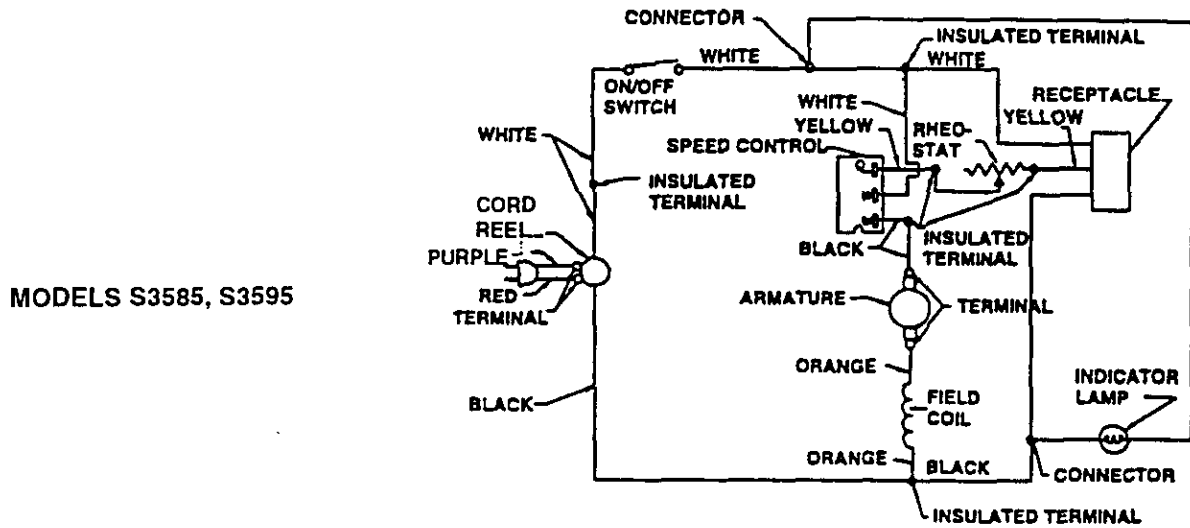
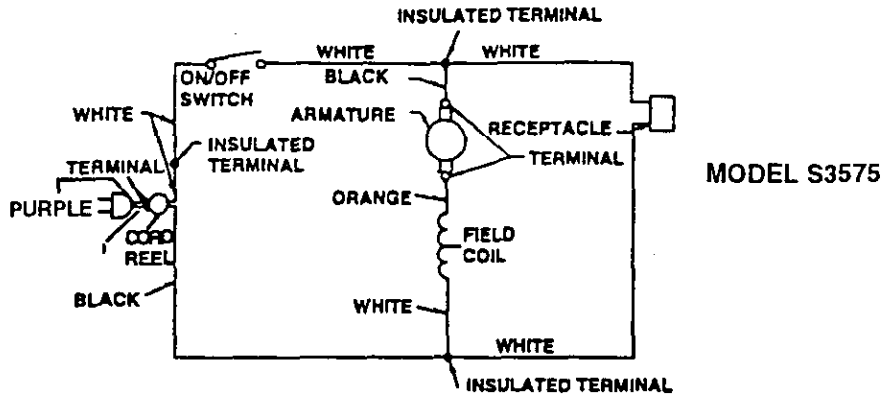
MODELS S3525, S3535,  
S3545, S3559



MODELS S3551, S3555, S3557, S3563,  
S3565, S3567, S3571, S3573

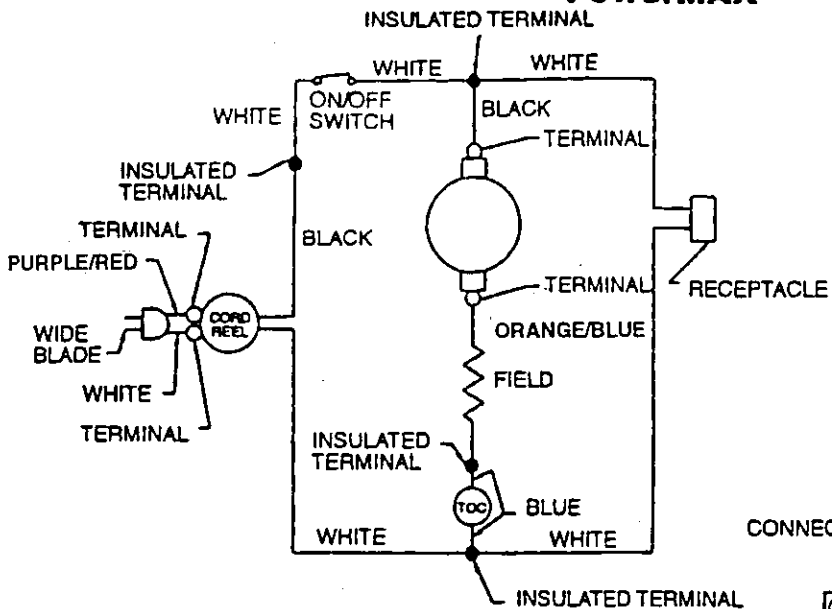
# WIRING DIAGRAMS

## Spectrum

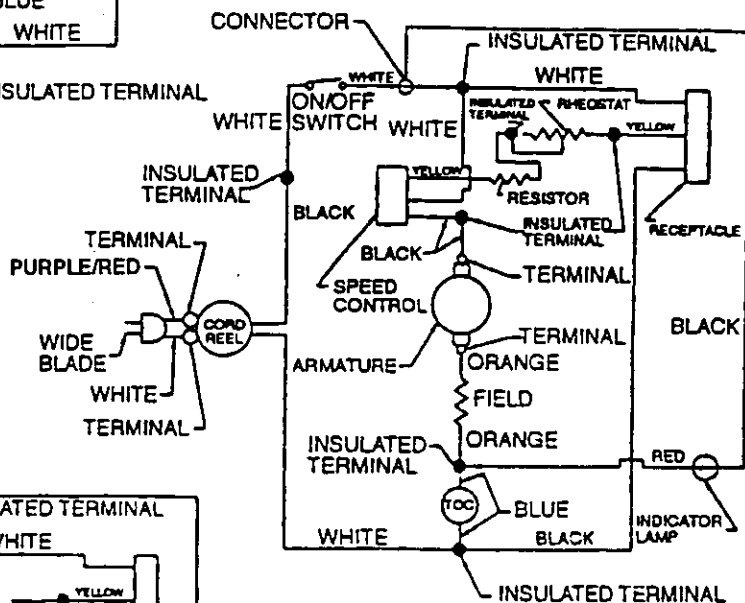


# WIRING DIAGRAMS

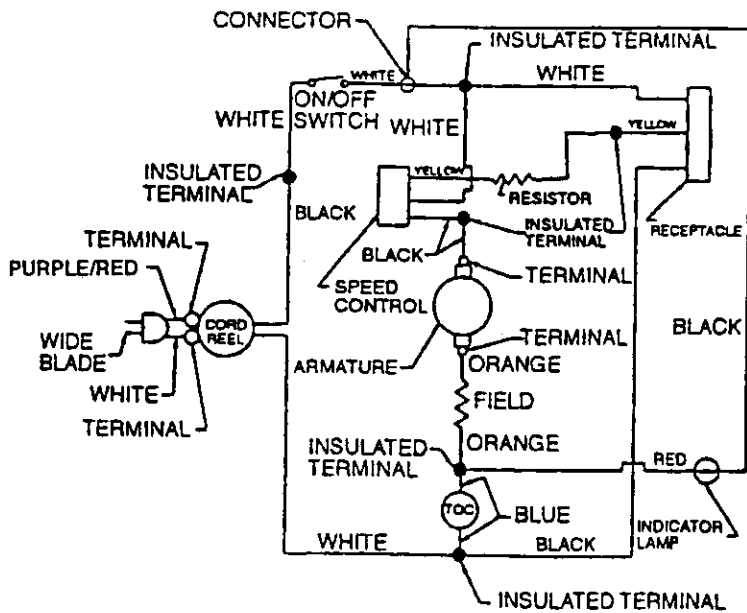
## PowerMAX



MODELS 3603, S3603-040

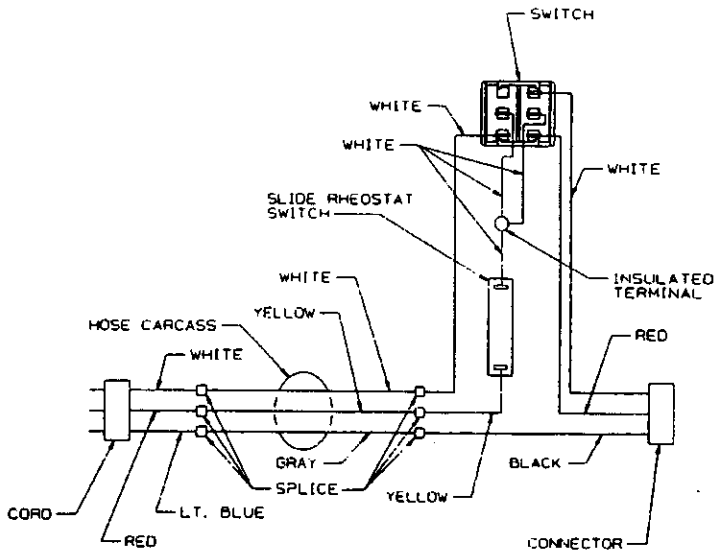


MODEL S3609

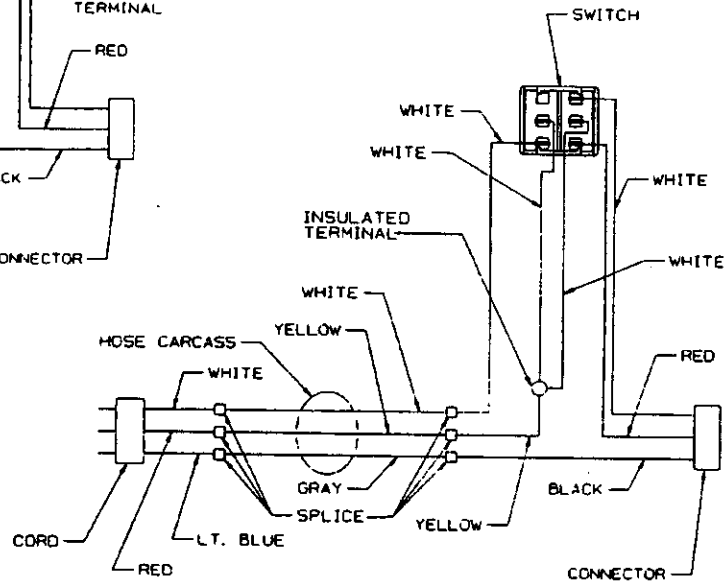


MODELS S3611, S3615

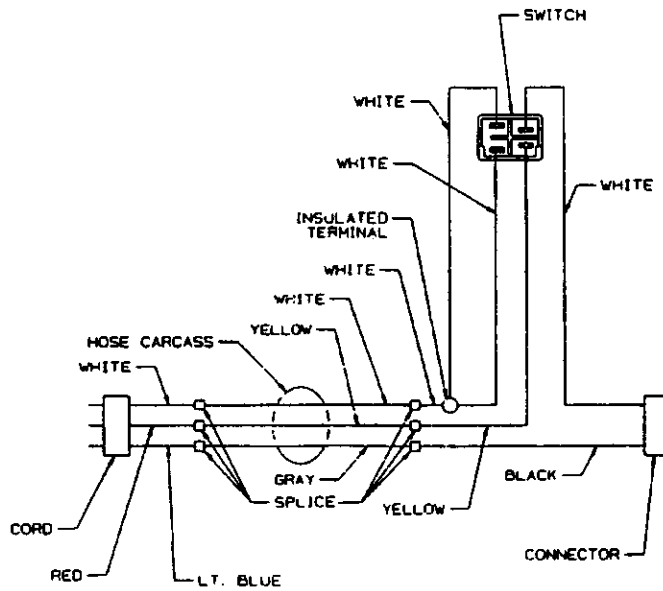
# HOSE WIRING DIAGRAM Spectrum



**S3605**



**S3595**

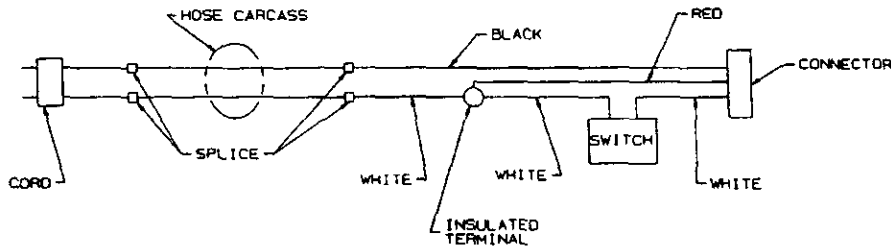


**S3585**

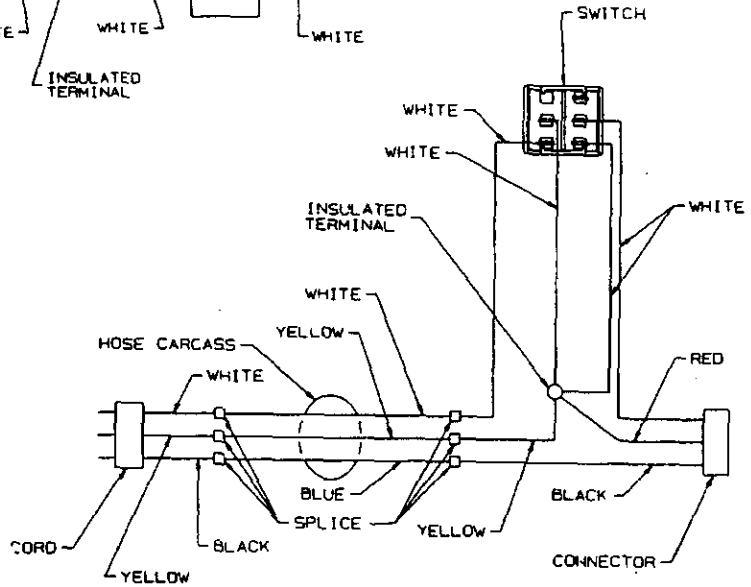


# HOSE WIRING DIAGRAM

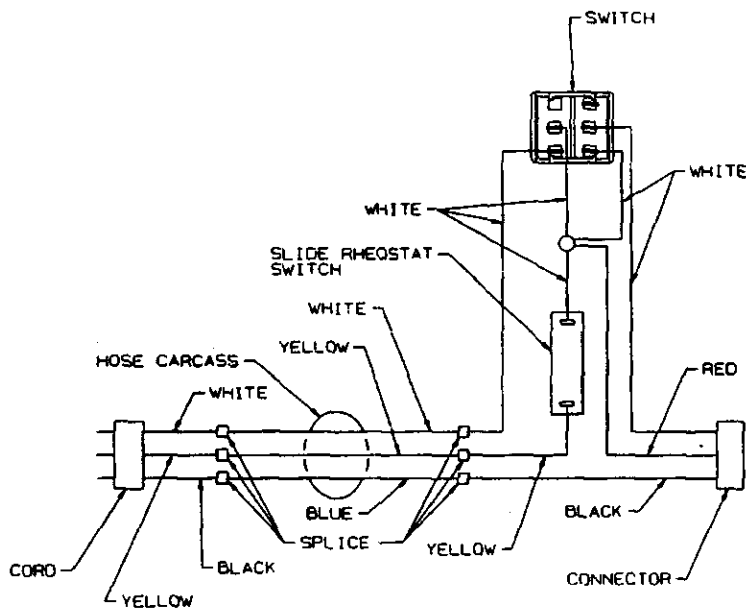
## PowerMAX



**S3603, S3603-040**



**S3609**



**S3611, S3615**

#### **IV. Troubleshooting check list - Futura**

This model is designed to operate at 120 Volts, 60 Hertz only. Operating characteristics and electrical checks may vary if input voltage differs appreciably from the 120 VAC specified.

The following is provided as a guide to aid in determining the origin of a problem for which this model could require service. If problems do occur, especially related to poor performance or intermittent operation of the motor, conventional causes should be examined prior to changing electronic and other related components.

<b>Problem</b>	<b>Possible Cause</b>	<b>Possible Solution</b>
<b>A. Motor won't run</b>	<ol style="list-style-type: none"><li>1. Not plugged in firmly.</li><li>2. No voltage in wall plug due to blown or tripped breaker.</li><li>3. Open in power cord.</li><li>4. Cord reel contacts worn (cord reel models).</li><li>5. On/off switch failed.</li><li>6. Open circuit in motor.</li><li>7. Open circuit or wire not connected.</li></ol>	<ol style="list-style-type: none"><li>1. Check to see that attachment cord prongs are in good shape and not bent.</li><li>2. Check fuse or reset breaker.</li><li>3. Replace cord.</li><li>4. Replace cord reel assembly.</li><li>5. Replace switch.</li><li>6. Check motor wiring, armature, field, and brush carrier assembly.</li><li>7. Replace wires or remake connections as necessary. Check for stuck motor brushes.</li></ol>
<b>B. Motor runs, cleaner won't pick-up</b>	<ol style="list-style-type: none"><li>1. Obstruction in hose.</li><li>2. Bag full.</li><li>3. Secondary filter clogged.</li><li>4. Poor seal between bag lid and main body.</li><li>5. Fan loose on motor shaft.</li></ol>	<ol style="list-style-type: none"><li>1. Remove obstruction.</li><li>2. Install new bag and advise customer.</li><li>3. Clean filter.</li><li>4. Check furniture guard warping, or obstructions which would prevent a good fit.</li><li>5. Replace fan, if necessary, and tighten fan nut securely.</li></ol>
<b>C. Bags bursting</b>	<ol style="list-style-type: none"><li>1. Bag pores clogged, fine dirt, powder, etc.</li></ol>	<ol style="list-style-type: none"><li>1. Change bag, advise customer to change bag frequently when picking up fine dirt.</li></ol>
<b>D. Cord won't rewind (cord reel models)</b>	<ol style="list-style-type: none"><li>1. Cord reel lost pretensions.</li><li>2. Cord reel brake arm out of position.</li></ol>	<ol style="list-style-type: none"><li>1. Readjust at three pretensions.</li><li>2. Check and reposition.</li></ol>

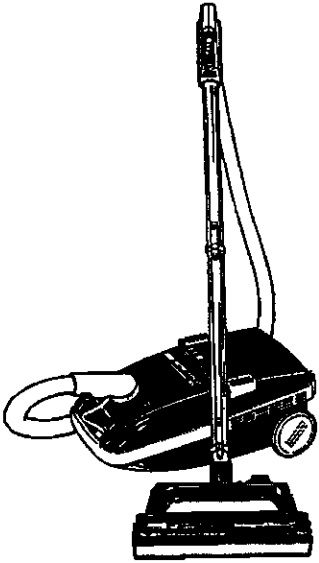
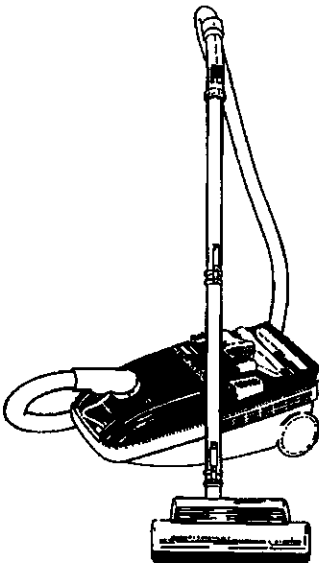
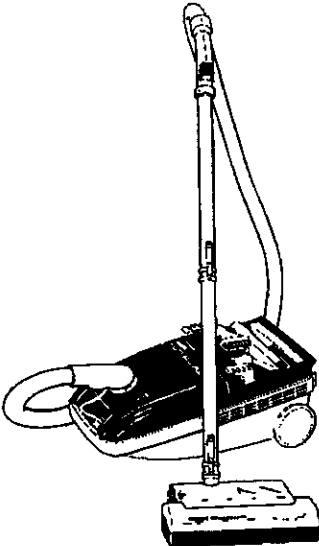
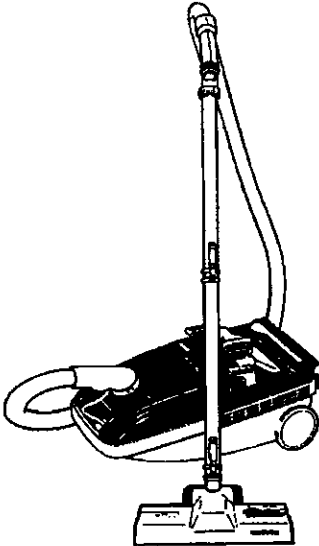
## V. Troubleshooting check list - Spectrum/PowerMAX

This section is intended as a guide to help further diagnose a possible problem related to the electrical system in Spectrum/PowerMAX models that have a power light, rheostat, and speed control.

Problem	Possible Cause	Possible Solution
A. Motor won't run	1. Hose not connected.	1. Connect hose and check operation.
	2. Speed control failed.	2. Replace motor retainer assembly. The speed control is incorporated in this assembly. The yellow lead on the replacement speed control incorporates a resistor. Remove the entire yellow lead back to the insulated terminal when removing the old motor retainer assembly.
	3. Power takeoff bad or leads not connected properly.	3. Remake connections and/or replace power takeoff.
	4. On/off switch on hose bad.	4. Replace switch.
	5. Thermal protector failed (PMAX)	5. Replace.
B. Motor runs in high speed - shuts off in low speed	1. Failed speed control resistor (yellow lead).	1. Replace motor retainer assembly. <b>Note:</b> Motor cover, speed control, and resistor replaced as an assembly.
	2. Bad rheostat.	2. Replace rheostat.
C. Power nozzle runs, cleaner motor doesn't (Model S3585 only)	1. On/off switch on hose bad.	1. Replace switch.
D. Units runs, power nozzle doesn't (models S3595, S3605 only)	1. Switch on hose bad.	1. Replace switch.
E. Power nozzle won't run. (PowerMAX)	1. Switch on hose bad.	1. Replace switch.

# Troubleshooting Guide

## Spectrum & Powermax Canister Cleaners



The following is a guide to aid in determining the origin of a problem for which these models could conceivably be brought in for service.

<b>Problem</b>	<b>Possible Cause</b>	<b>Possible Solution</b>
A. Unit won't run models without switch in hose	<ol style="list-style-type: none"> <li>1. Open in power cord.</li> <li>2. Cord reel contacts worn.</li> <li>3. Loose connection at insulated terminals</li> <li>4. On off switch failed.</li> <li>5. Motor brushes failed.</li> <li>6. Motor bearings failed - motor seized.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace cord.</li> <li>2. Replace cord reel assembly.</li> <li>3. Check connectors.</li> <li>4. Replace switch.</li> <li>5. Replace brushes.</li> <li>6. Replace armature assm. and / or diffuser.</li> </ol>
B. Unit won't run models with switch in hose Power light <u>not on</u>	<ol style="list-style-type: none"> <li>1. Open in power cord.</li> <li>2. Cord reel contacts worn.</li> <li>3. On off switch failed.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace cord.</li> <li>2. Replace cord reel assembly.</li> <li>3. Replace switch.</li> </ol>
C. Unit won't run models with switch in hose Power light on	<ol style="list-style-type: none"> <li>1. Hose not connected to unit.</li> <li>2. Speed control failed.</li> <li>3. PTO receptacle failed or mis- wired.</li> <li>4. Open in hose wiring.</li> <li>5. Switch in hose failed.</li> <li>6. Motor brushes failed or stuck in holder.</li> <li>7. TOC failed (Powermax units only).</li> </ol>	<ol style="list-style-type: none"> <li>1. Connect hose and check operation. Unit will not run without hose connected.</li> <li>2. Replace motor cover assembly. (includes speed control).</li> <li>3. Check wiring or replace.</li> <li>4. Check hose and replace if necessary.</li> <li>5. Replace hose.</li> <li>6. Replace brushes.</li> <li>7. Replace TOC.</li> </ol>
D. Motor runs in high speed - shuts off when rheostat is adjusted to low	<ol style="list-style-type: none"> <li>1. Failed speed control resistor or speed control</li> <li>2. Rheostat failed.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace motor retainer assembly.</li> <li>2. Replace rheostat.</li> </ol>
E. Power nozz. runs, cleaner doesn't (S3585)	<ol style="list-style-type: none"> <li>1. On off switch in hose failed.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace switch.</li> </ol>
F. Power nozz. won't run	<ol style="list-style-type: none"> <li>1. Power nozzle switch on hose failed. (PowerMax models only).</li> <li>2. Poor connection at nozzle cord to hose.</li> <li>3. Open in cord.</li> <li>4. Switch on powered nozzle in bare floor setting (where applicable)</li> <li>5. Switch on power nozzle failed (where app.)</li> <li>5. Power nozzle motor failed.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace switch.</li> <li>2. Check connection.</li> <li>3. Replace cord.</li> <li>4. Change setting to carpet and check operation.</li> <li>5. Replace switch.</li> <li>5. Replace motor assembly.</li> </ol>
G. Cord reel sluggish or won't retract	<ol style="list-style-type: none"> <li>1. Cord reel pedal pad worn or missing.</li> <li>2. Cord reel pedal spring broken.</li> <li>3. Cord reel brake arm broken or mis-positioned.</li> <li>4. Cord reel tension spring broken.</li> <li>5. Cord reel mounted out of position.</li> <li>6. Cord reel lost preturns.</li> <li>7. Obstruction in cord reel cavity.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace pedal. If both tabs are broken, pedal will not seat in housing.</li> <li>2. Replace spring.</li> <li>3. Replace.</li> <li>4. Replace cord reel assembly.</li> <li>5. Check mounting. Remount and check operation.</li> <li>6. Readjust to three preturns.</li> <li>7. Remove obstruction.</li> </ol>

<b>Problem</b>	<b>Possible Cause</b>	<b>Possible Solution</b>
H. Cord reel continually retracts	<ol style="list-style-type: none"> <li>1. Grease or dirt on cord reel pad or hub.</li> <li>2. Brake pad worn.</li> <li>3. Cord reel brake spring broken.</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean hub and brake pad.</li> <li>2. Replace cord reel assembly.</li> <li>3. Replace cord reel assembly.</li> </ol>
I. Dirt / Dust leakage inside bag cavity	<ol style="list-style-type: none"> <li>1. Bag broken.</li> <li>2. Bag collar torn or loose.</li> <li>3. Bag collar seal damaged or missing.</li> <li>4. Bag collar support not latest support.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace bag and thoroughly clean inside of bag cavity and secondary filter. Use Genuine Hoover bags for best results.</li> <li>2. Replace bag.</li> <li>3. Replace. Seal is friction fit to bag lid.</li> <li>4. Update with latest support. Models produced after 8/93 not affected.</li> </ol>
J. Motor runs unit won't pick up.	<ol style="list-style-type: none"> <li>1. Bag full.</li> <li>2. Bag pores clogged with fine materials.</li> <li>3. Obstruction in hose, wands, p.n. etc.</li> <li>4. Secondary filter clogged.</li> <li>5. Powered nozzle agitator brushes worn.</li> <li>6. Powered nozzle belt broken or stretched.</li> <li>7. Furniture guard torn or worn.</li> <li>8. Motor retainer seals damaged or missing.</li> <li>9. Motor retainer screws loose.</li> <li>10. Motor gasket damaged.</li> <li>11. Motor fan damaged.</li> </ol>	<ol style="list-style-type: none"> <li>1. Change bag.</li> <li>2. Change bag.</li> <li>3. Clear obstruction.</li> <li>4. Replace filter.</li> <li>5. Replace brushes.</li> <li>6. Replace belt.</li> <li>7. Replace furniture guard.</li> <li>8. Replace.</li> <li>9. Tighten and check.</li> <li>10. Replace.</li> <li>11. Replace.</li> </ol>
	<p>Note: Main Bodies were changed on PowerMax units in January of 1996. This change subsequently resulted in a change to the motor cover assembly. If you replace a main body on a unit produced prior to the change and do not update the motor cover assembly, it will result in significant suction loss. Ref: Service Bulletin 1-96.</p>	
K. Noise and / or vibration	<ol style="list-style-type: none"> <li>1. Motor bearings failed.</li> <li>2. Fan failed. Loose or damaged.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace armature / bearing assembly or diffuser.</li> <li>2. Replace or tighten.</li> </ol>
	<p>Note: When servicing these motors, the balancing rings should be removed upon reassembly. Failure to do so could result in some vibration. Balancing rings / washers were omitted from production units built after August 1991.</p>	