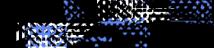
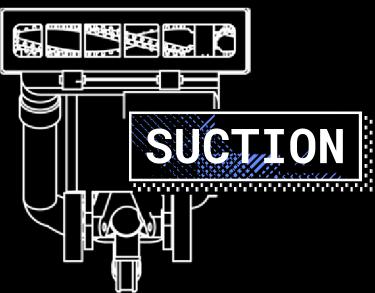


COMPONENT ROLE & FUNCTION

ME30356 Reverse Engineering
Callum Morrison
VAX UCPESHV1



MAIN PRODUCT FUNCTIONS



AIR PATH

- Route from entering to exiting the vacuum
- Longer path may **reduce suction**, or increase change of blockages



FILTERS



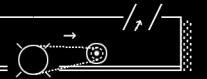
- Filters are a significant source of suction loss
- Blocked filters **reduce airflow**
- In cyclone design, filters are a last resort for catching dirt; they stay clean and block little

BUSH BAR & TURBO TOOL

- Increases efficiency of available suction by **brushing dirt into path of airflow**, making it easier to pick up



BOTTOM OF BUSH BAR
SWEEPS ALONG FLOOR
PICKING UP DIRT



BOTTOM BRUSH BAR POWERED BY 150W MOTOR. TURBO TOOL POWERED BY TURBINE IN AIRFLOW PATH

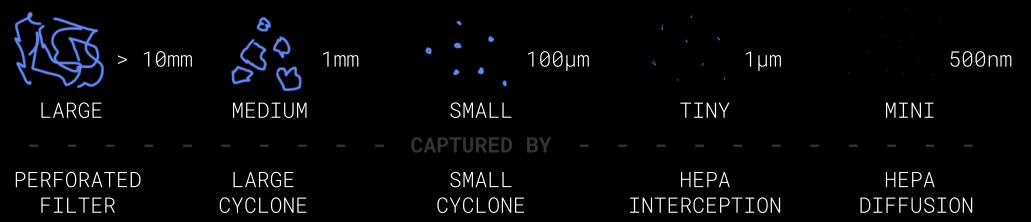
CYCLONIC SEPARATION

- The method in which captured dust or dirt is **separated from the airflow** is through a method called **cyclonic separation**
- Most new vacuum cleaners use this method DYSON | VAX | HOOVER | SAMSUNG | VONHAUS
- Further analysis performed in Deep Dive

FILTERS

- Final barrier against tiny dirt particles
- HEPA filter removes > 0.3µm particles
- Large filter for fluff / hair

PARTICLE SIZE

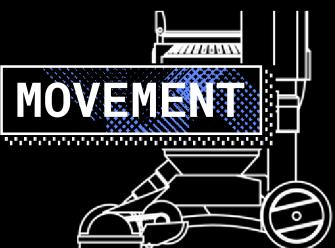


EMPTYING

- Paths from perforated filter and cyclones lead to bottom of dirt container
- HEPA filter must be cleaned manually, otherwise dirt will build up over time



MOVEMENT



- Main wheels on rear of base, **independent** to allow for turning
- Not powered, broke, or otherwise actuated, as this is not required here
- **Small rollers act as wheels** at the front to prevent scratches, can slide

SLIDING

- Attaching hard floor adaptor changes movement function through small rollers to **sliding on hard plastic / felt pads**. Only effective on hard floors.

HANDLES

- Control of the vacuum is primarily done through the main handle
- **Push, pull, and tilt** required

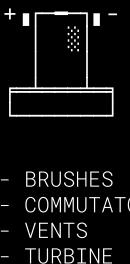
TWO GRIP LOCATIONS
ALLOWS REPOSITIONING
WHEN PUSHING / PULLING
OR TILTING

CABLE HOOK
ALLOWS ATTACHMENT
OF CABLE OUT OF WAY

USE OF COLOUR
TO INDICATE WHERE HANDLE
SHOULD BE GRIPPED

MOTOR & FAN ASSY

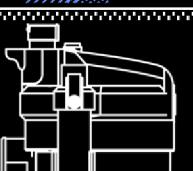
- Power behind suction function
- Requires **more power** than any other subsystem
- Power unavoidably lost through heat and noise
- Bought in unit; performance may vary with supplier
- Built in **safety shut off** to prevent overheating
- Capacitor to reduce noise



THE PRODUCT CAN BE SPLIT INTO SIX MAIN FUNCTIONS
EACH OF THESE SPLIT INTO MULTIPLE SUBFUNCTIONS



INTERFACE



BUTTONS

- Main method of control over the vacuum cleaner
- **Three primary functions**
- Generic, recognisable icons to help new users
- **Some icons new** (brush bar) and may not convey function
- **Tangible** push toggle; button retracts when active to convey function
- **Spring action** through button or dedicated spring



POWER



EJECT
DUST
CHAMBER



ENABLE
BRUSH
BAR

WRITING HINTS

- Multiple functions outlined in **English** on product itself
- Conveys information without use of manual or potentially **confusing symbols**

Clip hose here

CLEAR
INFORMATIVE

Wand release

INDICATOR LIGHTS

- Simple indication of brush bar
- Extra functionality could be added through extra lighting



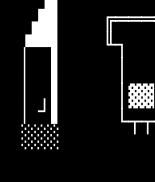
TOOL CLIP

- Used by the user to **join 3in1 tool** and the **main body**
- Pull off to release
- Push on to attach
- **Minimal complexity** to achieve function



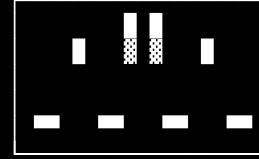
ACCESSORIES

- Upholstery brush
- Turbo tool
- 3in1 tool
- Used to affect vacuum / surface interference
- **Modular**



PLUG & CABLE

- Interface between product and **existing home utilities** / main power supply
- Cable provides link between fixed plug socket and movable vacuum cleaner
- Must allow flexibility and compatibility



DUST STORAGE



BUSH BAR DISASSEMBLY

- Manual outlines removal of brushbar assembly
- Brushbar side covers to **prevent dirt escaping**
- Belt is replaceable upon wear or damage
- **Brushbar may tangle** with hair impeding its functional requirement to spin; manual states to remove any before reinstallation



DUST CONTAINER DISASSEMBLY

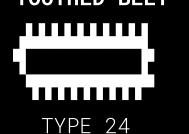


- Over time **dust will build** up on inside of dust container, this will block airflow holes and reduce suction power; reducing functionality
- **Cleaning to remove blockages** will improve airflow and restore suction

REPLACABLE PARTS

- Many parts are consumables, and many more are available from vax.co.uk for **replacement after wear or damage to originals**
- To simplify replacement process, all consumables are labeled with a Vax 'Type'

TOOTHED BELT



TYPE 24

FILTER KIT



TYPE 90

VACUUM HEADS



TYPE 2

TURBO TOOL



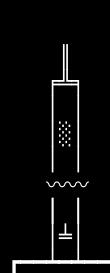
TYPE 6



STRUCTURE

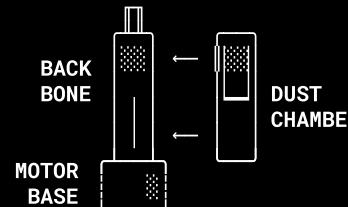
SPINE & HANDLE

- Unlike other styles of vacuum such as handheld or canister, upright vacuums require an **upright structure** to hold all required components
- This product requires **two main structural components**, due to the lift out mechanism, the 'spine' and 'backbone'



MOTOR BASE & BACKBONE

- Not only must design provide **structural rigidity** to the design in lift - out mode, but also all **electronics** to allow the vacuum to function must be contained within
- Motor base has cable connection, and backbone contains channels to **allow air flow**
- Dust chamber unites with base and backbone to form **lift out** design



DIRT CONTAINER

- The dirt container is not only a housing for all dirt and debris to be captured by the vacuum, but it contains all of the components required for **cyclonic separation**; required for the vacuum to function

