



OPERATING MANUAL

Gilson Wet-Vac WV-1, WV-2 & WV-3



WV-1

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SAFETY INSTRUCTIONS

Whether you are the owner, employer, operator, or maintenance person, safety is your responsibility. You are responsible for operating and maintaining this equipment in compliance with these instructions and with the use of common sense. You should **ALWAYS** review and completely understand the operating and safety instructions before using this machine.

WARNING!

This machine operates on electric current. Improper use could result in electric shock, electrocution, injury by explosion, or even death.

1. The standard Gilson Wet-Vac comes equipped with a 115/230V 60-Hz, 1-phase, 7-amp, 1/3-HP, TEFC motor and a 115V, 60Hz, 7-amp Bypass Vacuum motor wired for 115-volt, single-phase operation. **ALWAYS** verify that the motor and electrical components are as ordered and appropriate for your intended use and environment.
2. **ALWAYS** disconnect and lock out electric power supply performing maintenance and repairs.
3. **ALWAYS** check electrical wiring for loose connections and for pinched or frayed wiring.

WARNING!

The Wet-Vac also uses water in its operation as a wet-sieving screen. ALWAYS check the machine for loose fittings and hoses before operating, as water is a conductor of electricity and can increase the likelihood of electric shock, electrocution, injury, or even death.

1. **NEVER** operate the Wet-Vac if water is visible where it is not supposed to be located.
2. If there is water visible in the area of your Wet-Vac, disconnect and lock out your power supply before performing maintenance on the Wet-Vac.
3. Disconnect and lock out power supply from Wet-Vac when loading or unloading the Wet Sieve Stack or wet filter paper. **ALWAYS** clean up and dispose of water to which the operator would be exposed before connecting and operating the Wet-Vac again.
4. Review operating and installation instructions from the manufacturer of Bypass Vacuum motor.

WARNING!

WARNING: Never operate the Wet-Vac without all doors, covers and guards in place.

WARNING: Keep all parts of your body, clothing, tools, and other objects away from the Wet-Vac and its moving parts when operating the machine.

WARNING: Unplug or disconnect machine from its power source when it is not in operation.

WARNING: ALWAYS lock swivel casters before operation to prevent machine from moving.

WARNING: Wear safety glasses or goggles when operating, maintaining, or repairing this machine.

Gilson Wet-Vac

The Wet-Vac is for Particle size measurement of fine granular materials that resist dry sieving.

I. UNPACKING & SETUP

A) Pre-installation Requirements

1) Space: The unit requires 40 x 40 in. (101.6 x 101.6 cm) of flat floor space, 6 feet (1.83M) of working height, and access to the front & right sides of the cabinet.

2) Electrical: A grounded 115V/60Hz, 20amp. circuit is required for models WV-1, WV-2 & WV-3.

Model numbers with "F" suffix require 230V/50Hz and have factory installed transformer.

3) Water: At least a 40 psi and 3/8 in. ID supply are required to run the unit effectively using the once-through cycle (see section II).

4) Drain: Drainage capacity should be sufficient to handle a full-flow discharge rate from the Holding Tank. Always properly dispose of water as it will normally contain particulate from the sample you are sieving.

B) Unpacking and Assembly

The Sieve Cover (#124) will be found packed in the top section of the shipping container and should be removed first. Lift the Wet-Vac unit free of packing material and release wheels by turning locking tabs. Other items such as Lift Ring (#106) assembly, two Vertical Guide Rod (#103) assemblies, Filter Holder, See-Through Nesting Cylinder, Rubber Gaskets, and Adapter Ring for 8-inch Sieves (#113) will be found inside the right cabinet door. Refer to Figure 5 for parts positioning. Remove lock nuts from bottom of rods, slide rods through holes in handles of Lift Ring, replace lock nuts, and thread rods into holes provided in platform (#105). Lock rods in place by tightening lock Nuts (#102) at bottom. If you have models WV-2 or WV-3, see section III E for mounting 8-inch sieve adapter.

C) Lift Ring Operation

The Lift Ring Handles (#109) provide a means of raising and lowering the sieve stack. The handles should be released by squeezing handle ends to lower the Lift Ring only. To raise Lift Ring, the operator should place palms of hands on the Vertical Guide Rods (#103) facing each other under the Lift Ring. Then lift directly upward using the top of the hands (at base of thumbs) as points of contact with the Lift Ring. Do Not squeeze handle ends when lifting. Handles will drop into notches on the rods to hold the sieve stack in the lifted position.

When raising or lowering, try to move both sides together at the same rate.

II. BASIC STEP-BY-STEP OPERATION

- 1) Send in your Gilson Owner Registration Card immediately.
- 2) Before plugging cord into wall, set "Master Power Switch" (#152), "Vibration" (#145) & "Vacuum" (#146) Switches to "off" position.
- 3) Set "Water" switch (#144) to center "off" position.
- 4) Make Sure the 4 Tank End Plate Knobs (#11) are tight.
- 5) Close the Drain Valve (#25).
- 6) Close the Water-Inlet Valve (#49).
- 7) Open the Internal Recycle Valve (#47).
- 8) Close the Water Outlet Valve (#43).
- 9) Open the left hand cabinet door so you can view the Holding Tank. Add water through the well in the Platform (#105) until the Holding Tank (#15) is half full.
- 10) Assemble the sieve stack with or without a filter section; (see section III-B for loading the filter section) make sure gaskets are in place between all nesting elements. The acrylic See-Through Nesting Cylinder should be placed above an expected source of water backup in the stack. (normally filter section or bottom sieve).
- 11) Place the sample on the top sieve and fit the Cover (#124) over the stack.
- 12) Plug in the unit. Note that steps 20-24 describe use without optional Digital Electronic Timer accessory. Also see III-D for use with timer.
- 13) Place the red and yellow Master Switch to the "on" position.
- 14) Turn on the "Vacuum" switch (#146). If the stack is properly sealed, and the vacuum is sufficient for a test, the Vacuum Indicator Bulb (#98) will light.
- 15) Next, turn on the "Vibration" Switch (#145). Adjust the vibration level by turning the Variable Transformer (#141) dial knob to the desired level of vibration for the test. Normally a moderate vibration sufficient to break water surface tension will be adequate.
- 16) Finally, turn on spray water in the cover by throwing the water pump switch to the "cover" position. Adjust the water flow rate through the stack by turning the Water Control Valve (#140) knob to balance input and output Volume. The Setting may need periodic adjustment during a test if sieves or the bottom filter begin to blind. Monitor water level via use of the See-Through Nesting Cylinder and the See-Through Sight Glass (#13) in the Holding Tank.
- 17) If excessive blinding causes a low rate of water drainage, and water begins to back up from the filter section or limiting sieve, shut the Wet-Vac off in Water-Vibration-Vacuum switch order. An alternative to shutting the entire unit off,

is to shut off only the water, and wait for the water to drain, but this procedure is not recommended for timed tests.

- 18) If the filter paper is limiting, raise the Lift Ring (#106) by its handles to change filter paper. A spare pre-assembled filter section is useful for reducing run down time. If a sieve is the limiting unit, a smaller starting sample may be necessary. An intermediate sieve may also be inserted to reduce critical sieve loading. Once the limiting factor is corrected, lower the Lift Ring, and turn on the vacuum, vibration and water switches in order.
- 19) At the end of the test turn off the Wet-Vac in Water-Vibration-Vacuum order.
- 20) Please read the remaining sections of your manual to fully understand your Wet-Vac instrument, and factors which can affect test results.

III. ADDITIONAL OPERATING METHODS

A) Assembly and Use of the filter Section

It is recommended that the filter section always be used to avoid plugging of water spray heads. Filter paper circles of 50 cm diameter are required, and choice of paper will depend on sample characteristics and particle sizes to be filtered. Gilson stocks a suitable ashless paper with good wet strength that retains 98% of 20-25 μm particles at a rapid flow rate.

The Filter base is a 12-inch diameter sieve with special support bars welded in place below the sieve cloth. The Filter Holder is a stainless steel "basket" that fits inside the Filter Base on top of the filter paper.

To assemble filter section place Filter Holder bottom-side-up on a flat surface, center a filter paper circle on the bottom, and fit Filter Base gently over the holder and paper. Invert, and place the assembly into the Platform (#105) well using a rubber gasket on the bottom flange of the Filter Base as a seal. Another rubber gasket should be used around top of the Filter Base to hold filter paper against the top of the Filter Holder after wetting the paper. Lower the Lift Ring (#106) to nest the sieve stack to the Filter Section.

When the Filter Section is used in the system, The See-Through Nesting Cylinder is normally nested directly into the top of the Lift Ring so that water level on the filter can be monitored visually during a test. When testing materials which tend to blind the filter paper, it is recommended that a second assembled filter section be on hand for replacement in the system when necessary. (See I-C and II-23) Sometimes a second see through cylinder is helpful if you need to watch another section of the sieve stack.

B) Dry Sieving

Dry Sieving can be used to separate samples partially prior to wet sieving or to remove a portion of fines in samples with high percentages of fines. To collect fines for removal, stack an extended-rim pan below the finest sieve. This procedure will reduce filter blinding during the wet sieving to follow.

Cover Hold Down Clamp Assemblies (#110-#112) should be used if vacuum is not employed. The cover is pulled

down tightly over the sieve stack, and cover clamps are pressed down and tightened as one motion, one side at a time. Set vibration level somewhat more severe than with wet sieving as necessary to make particles on top sieve move about freely.

C) Timed Runs

Wet-Vac units with serial numbers WV-325 and higher are equipped with a Digital Electric Timer. The following instructions for timed runs are based on use of this timer.

1) Operation of Wet-Vac with Timer

- a. Set Master Switch to "on" position.
- b. Set Timer Switch (#147) to "on" position.
- c. Timer is ready for timed runs when set as above. If timing is not desired, merely switch Timer Switch to "off", and Wet-Vac controls will respond manually.
- d. Turn Wet-Vac Panel switches for Vacuum, Vibration, and Water to "on" position. Vibration intensity should be preset to desired level or adjust immediately after timing begins.
- e. Set timer to desired test time. This time can either be total test time or time to spray on each sieve according to desired procedure.
- f. Press "start" button on timer, and all Wet-Vac functions begin simultaneously.
- g. If a pause in the test time is necessary to manually break sample clumps on a sieve or to change filter paper or filter sections, press "stop" button on timer. This stops all Wet-Vac functions and retains remaining test time in memory. To continue balance of run, press timer "start" button. If it should be necessary to start over using a full time interval from the "hold" position, press "the up and down" arrow buttons to reset time before restarting with the "start" button.
- h. Timer automatically resets at the end of a test to repeat the same test time.

D) Adapting for 8-inch Diameter Sieves

The Wet-Vac basic design is Model WV-1 for 12 inch round sieves. Models WV-2 (for 8-inch sieves) and WV-3 (for either size sieves) use an Adapter Ring (#113) with Gasket (#114) for 8-inch Sieves which fits into the Lift Ring (#106) as illustrated below.

Eight-inch sieves nest inside the Adapter Ring, and the filter section remains as 12-inch diameter for maximum filter capacity.

Model WV-3 is supplied with complete cover assemblies for both 8-inch and 12-inch sieves. These may be interchanged by quick disconnects on water and electric lines. Clip on Platform Upper Electrical Fitting (#119) is removed by turn-

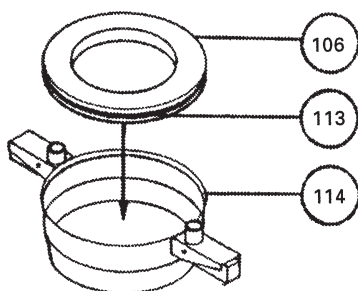
ing outer threaded ring, then pulling. Later serial numbered Models WV-1 and WV-2 also have quick disconnects, and can be converted to Model WV-3 in the field if desired.

IV. PROCEDURAL GUIDELINES

The variety of sample types requires some adaptation of basic Wet-Vac procedure to meet test requirements. However, the following suggestions should be helpful for many situations.

A) Basic Procedure

Assuming the starting sample is dry, the recommended test sequence would include an initial period of 5-10 minutes of dry sieving prior to introduction of water spray. To lighten the



load on the filter section, material passing the finest sieve can be collected in an extended-rim pan and retained for later combination with fines from wet sieving. Dry sieving may also be used subsequent to wet sieving after drying of the washed sieves to constant weight at 105-110°C. If an initial period of dry sieving is not used or if the test sample is difficult to wet, it will be advantageous to pre-wet the sample, use wetting agents, or introduce sample as a slurry. If sample is caked or agglomerated, a slaking period of up to an hour may be necessary before sieve testing.

Spread sample evenly over entire surface of the top sieve. If the sample is dry, check visually inside the top sieve to be sure that the sample separates and sets. This may require a second see through cylinder. Mix by hand with a spatula or use the hand spray if necessary. Once the sample is wet, a standard time period such as 1-3 minutes should be used to spray each sieve in the stack. After each sieve is sprayed, the unit is switched off, the sieve is removed, and the spray period is repeated on the next sieve -- until each sieve has been sprayed and removed.

The hand spray is useful for washing particles from the inside of the cover into the top sieve and from the bottom of each sieve into the top of the next one as sieves are removed. Turn water switch to "Hand" position. Use care to avoid excessive water pressure which could cause loss of sample from the sieve.

Normally, when wet sieving, vibration should be set at some moderate standardized setting on the Variable Transformer (#141). This action need not be severe for wet sieving since its main function is merely to break surface tension of the liquid. A more severe vibration will be helpful when dry sieving.

B) Sample Size -- Loading Limitations

It is difficult to generalize regarding quantity of sample that may be tested in the Wet-Vac because of variations in sample characteristics and specific equipment to be used in the test. The following factors will all affect the ability of the machine to handle test material:

SAMPLE CHARACTERISTICS

Particle Size Range

Particle size distribution within the range

Particle shape characteristics

Amount of near size material on each sieve

Specific gravity

Amount and type of material to be removed in the filter section

EQUIPMENT FACTORS

12-inch vs. 8-inch sieves

Number of sieves used

Type of filter paper used

Once through vs. Internal recycle mode

Filter vs. Non filter

All Wet-Vac Models have a 12-inch diameter filter section, but 12-inch sieves have about 2-1/4 times the wire cloth area of 8-inch sieves and capacity varies accordingly. If the amount of fines to be removed in the filter is the capacity-limiting factor for a test, the extra sieve area of the 12-inch sieves will not provide substantial added sample capacity unless the filter section will not provide substantial added sample capacity unless the filter section is replaced during a test. If sieve loading is a limiting factor, however, sample capacity of the 12-inch model should be up to 2-1/4 times the capacity of the 8-inch model.

It is recommended that sample sizes be set by experience based on performance with a given type of sample materials. Normally, if a system is not filter limiting, the sieve which retains the largest amount of sample will be limiting. Until experience indicates some lower value is appropriate, the following maximum loadings at conclusion of test are recommended:

MAXIMUM LOADING PER SIEVE

FOR 12-INCH SIEVES 180cm³

FOR 8-INCH SIEVES 80 cm³

The above limits correspond to about 2.5 mm average sample depth on the sieve surface at conclusion of sieving. As one method of checking to see if the above limitations are reasonable for a given situation it is suggested that no more than one percent of residue on a given sieve should pass in an additional 60-second wash period. Remember that coarse sieves can normally handle more sample than fine ones. If a single sieve severely limits sample capacity because of overloading, an intermediate-size sieve may be used to reduce loading even though that sieve size may not be of interest in the analysis being performed.

In many cases, the sample size will be dictated by other factors such as specifications and/or the quantity of individual size segments that must be recovered for subsequent

tests. Large samples should be tested in several batches and combined later if necessary. If an overload condition exists in a sieve or in the filter section, it must be eliminated to assure accurate test results.

V. MAINTENANCE & REPAIR PROCEDURES

Disconnect electrical plug from outlet before attempting adjustments or repairs of any kind.

A) Cleaning the Water System

Once the operating instructions of Sections II, III and IV become familiar, little maintenance will be required for the Wet-Vac if reasonable care is taken in use of the apparatus. After some period of normal use, or after use without a filter, it will become necessary to clean particles from various points in the systems as follows:

1) A Filter-Screen (#59), located inside the strainer (#60), may be removed by loosening the large hex nut at the end of the Strainer. Inspect and remove lodged particles from the inside of the Filter-Screen. Replace with a new screen if it is seated in the body and hex nut end cavities or damage will result when hex nut is tightened.

2) Spray nozzles (#130 & #131) in the Spray Bar (#129), Well (#169) and the Hand Spray (#71) normally are protected by the filter-screen in the strainer unless it becomes worn. All nozzles are threaded in place and may be removed for back flushing in a water tap and/or removal of particles with a fine wire. Replace nozzles if plugging is severe or if spray pattern is permanently impaired.

3) The Holding Tank (#15) must be cleaned periodically to remove accumulated sample material, especially if the system is used without a filter. Open the Drain Valve (#25) and completely drain all water. Properly dispose of waste water as required. Remove the four Tank End Plate Knobs (#11), the Tank End Plate (#12), See-Through Sight Glass (#13), AND Tank-to-End Plate "O" Ring (#14). The tank can be flushed & washed as needed to clean. Rinse with water until the effluent is clear. If a pressure washer is used, then jam the Water Level Check Ball (#18) up into the vacuum orifice to prevent water from entering the blower. When the tank is open it is also convenient to inspect the condition of the check ball. The sealing ability of the check ball can be confirmed by turning on the vacuum switch only and moving the ball up until the vacuum causes it to seat. If a good seal is not formed replace the ball with a standard racquetball from a sporting goods store.

B) Vacuum Blower Replacement

The Vacuum Blower (#6) should be replaced as a unit in case of failure. First, disconnect the power to the Wet-Vac. Then, remove the Vacuum Blower Shield (#10). Disconnect the power cord leads from the blower motor leads. Remove the 3 stud-mounted hex nuts which attach the blower motor to the Holding Tank (#15), and remove defective blower from housing. Reverse above procedure to install new blower. The vacuum blower and tank can be removed as a unit if desired as follows. Unplug the blower motor leads and disconnect all tubing including the Well to Tank Hose (#170), disconnect the Tank-to-Drain Pipe

Union (#23), and remove the two anchoring screws on the right side bottom flange of the tank. The tank and blower can then be removed from the cabinet.

C) Motor Replacement

To replace Motor (#30) which drives the water pump, disconnect the motor wire from the motor junction box electrical box and remove the four Motor Mounting Screws (#36). Remove Motor from cabinet, transfer the power cord to the new motor noting wire lead placements. Loosen setscrew from Motor-to-Pump Coupling (#31) half that is attached to old Motor and transfer it to new motor shaft. Check rubber Spider (#32) at center of coupling and replace if worn.

When reassembling, be sure coupling halves realign properly with the spider before replacing Motor Mounting Screws. Reconnect electrical leads exactly as old motor had been connected to assure proper polarity and direction of motor rotation. Motor must drive the Pump Shaft in clockwise direction (as viewing the pump shaft).

D) Pump Draining and Replacement

If the Wet-Vac will be exposed to freezing temperatures, the water system must be completely drained including all residual water in the Pump (#33). First, position Wet-Vac with Drain Hose Fitting (#29) over a Floor drain, if permissible, or connect fitting to drain with a hose, if permitted. Then, drain the Holding Tank (#15) by opening Drain Valve (#25). Disconnect Tubing-to-Pump Fitting (#38) on the Pump inlet. If compressed air is available, the Pump may be emptied by opening the Water Outlet Valve and running the Pump for about ten seconds while blowing air into the inlet port of the Pump. Do not run the Pump for longer than ten seconds without water or damage may result. If compressed air is not available, the Pump must be removed using the replacement procedure below. Internal water must then be poured out by hand. If, waste water must otherwise be disposed, create your procedure for retaining waste water and sludge.

When replacing the water Pump, disconnect the power supply to the Wet-Vac, and drain the Holding Tank as described above. Next, disconnect the Tubing-to-Pump Fitting (#38) on the Pump inlet and the Water Discharge Union (#55). Then remove the Pump Mounting Screws (#35) and Pump may be removed from the Wet-Vac. Transfer remaining parts from the discharge side to new Pump. Position Motor-to-Pump Coupling (#31) half on shaft of new Pump. Be sure coupling halves realign properly with the Spider (#32) at the center of the coupling before replacing Pump Mounting Screws. Replace Spider if worn. Reconnect all connections. Fill Holding Tank to above tank-to-pump line outlet, check for leaks and add more water to bring level to middle of the viewing port before running Pump. Do not run Pump dry.

E) Cover Motor Replacement

To replace Cover Motor (#123), disconnect power supply and place cover assembly on work area of Cabinet top. Remove Cover Motor Gear (#127) from motor shaft on inside of Cover by loosening the setscrew. Then remove

the four or six screws holding Cover Motor Guard (#125) to the Cover. The Cover Motor may now be removed from the Cover by loosening the two mounting screws and disconnecting electrical leads. It may be necessary to cut away old sealant material holding motor to cover. Note how leads are connected in order to install new motor with proper rotation direction. Connect new Motor, and reassemble the cover assembly. Prior to installing the replacement motor, clean off old sealant material and place a new coating of silicone rubber sealant around the motor shaft hub to seal it to the Cover surface. (Any of several local hardware store products will do.) Except for the addition of the sealant, reassembly is in reverse order of the above.

F) Water Pressure Gauge Replacement

With power supply disconnected, open Cabinet Doors (#2 and #3) and locate bottom of the Water Pressure Gauge (#142) with flashlight in area above Left Cabinet Door inside Instrument Case (#96). Gauge is held in Instrument Case with a U-shaped holding tab around gauge body. Remove the two nuts in the holding tab.

To remove Water pressure Gauge, remove the ferrule nuts and tubing from all three fittings (#162, #166 and #172) in sides and bottom of Cross (#163). The Water pressure Gauge may now be lifted free from the outside of the Instrument Case with the Water Pressure Bushing (#164) and Cross attached. Transfer these parts to new replacement gauge using pipe thread sealant, and reassemble in reverse order reconnecting all tubing and the U-shaped holding tab.

G) Variable Transformer Replacement

The Variable Transformer (#141) includes the indicator plate, knob and setscrew, and mounting nut with washer. Before attempting removal, disconnect power supply to the Wet-Vac unit. Open the cover to the Control Console (#153) and locate the back of the Variable Transformer. After noting position of connections, loosen set screw on knob and pull knob to remove from outside of console. Remove mounting nut and washer to free variable transformer for removal from console. Replace with new unit positioned and wired same as old unit.

H) Electromagnet Assembly Replacement

Always disconnect power supply before replacing Electromagnet Assemblies (#175). The Wet-Vac has three such assemblies, and location and parts are illustrated on Figure 5. Proper Vibratory action depends on all three assemblies working together. Inoperable assemblies may be replaced as complete units or Electromagnet Body (#176), Armature (#177) and Leaf Spring (#178) may be replaced separately, as necessary.

For replacement of Electromagnet Assembly, remove 16 Platform-to-Case Screws (#99) holding Platform (#97) to Instrument Case (#96). On inside of Cabinet loosen bottom Well-to-Tank Hose Clamp (#171). Carefully raise Platform Well from Instrument Case slightly. Then disconnect Vacuum switch Tubing (#165) and ferrule nuts on Well Inlet Fitting (#168) so that the Well can be lifted far enough to work on the Electromagnet Assemblies.

Disconnect electrical leads to Electromagnet Assembly located in Junction Box (#221), which is located inside the right hand cabinet door, and remove the four mounting screws. Replace or repair assembly and replace mounting screws being careful to align Electromagnet. Reassemble using the reverse procedure, being sure to reconnect all electrical leads, tubes, hoses, and replace all screws before using the Wet-Vac.

I) Vacuum Switch & Indicator Light Replacement

Disconnect the power to the Wet-Vac. Use a flashlight to locate the Vacuum Indicator Switch Cover (#154), remove screws (#159), and lift cover to expose Vacuum Switch Mounting Bracket. Remove (2) nuts to remove the mounting bracket. Vacuum Switch (#143) can be removed by disconnecting the vacuum tubing (#165) and removing mounting screws (#158). Replace defective switch and reassemble in reverse order.

J) Solenoid Valve Replacement

Disconnect power to Wet-Vac. The Hand Spray Solenoid Valve (#64) and Cover Spray Solenoid Valve (#75) are located in the upper right rear area of the cabinet where they are difficult to work on while in place. Best procedure is to remove Pump and Motor Mounting Base (#34), with Pump (#33), Motor (#30), and all interior piping attached as a unit. To do this, remove the four screws holding the Pump and Motor Mounting Base (#34) to the floor of the Cabinet Body. After noting or marking connecting parts, disconnect tubing from internal piping at fittings (#38, #44, #72, #76 and #79 of Fig. 3). Disconnect electrical connections for Motor and Solenoid Valves located in the Rear Electrical Box (#212) as shown on Fig. 7. The Motor Mounting Base can now be removed from the Wet-Vac with attached parts including the Solenoid Valves.

Either Solenoid Valve can now be replaced quite easily as a complete unit. After replacement is made, and piping parts are reassembled with pipe thread sealant, reinstall all tubing and electrical connections.

VI. TROUBLESHOOTING

A) Unit Will Not Operate

Be sure unit is plugged to power source and the master switch is turn to the "on" position. Check internal fuses (#207 to #209), power source fuses (#223), or circuit breaker. If circuit is thrown by the Wet-Vac, then disconnect the Motor (#30) and Vacuum Blower (#6) wires from the rear electrical box on the back of the cabinet. If a retest still results in failure, then disconnect the electromagnet Assembly leads, and progressively all electrical leads until the defective component is revealed. If all electrical equipment is disconnected and circuit failure still occurs, then leakage tests should be run on internal wiring and operation of the transformer (#220) located on the rear wall of the cabinet.

If external circuit is not thrown then confirm power delivery to the Rear Electrical Box (#212) and the Control Console (#153) by circuit testing the terminal bar power leads. Test failure would indicate poor connection within the circuit.

B) Panel Switches Will not Operate

The "Vacuum" and "Water" switches are wired so that the water Pump cannot be turned on unless the Vacuum Blower motor is operating.

C) Vacuum Indicator Will Not Light

Light Failure may occur because of insufficient vacuum, a malfunctioning switch, or a burned out indicator bulb. Make sure the Holding Tank (#15) is half full of water. Check the sieve stack for vacuum leaks such as caused by poorly fitted, missing or worn gaskets. Reduce the sieve stack to one sieve, and disconnect the Vacuum Switch Tubing (#165) from the Tubing Barb Fitting (#148). Make sure the path to the well has no obstructions. Connect a longer piece of tubing, and check the vacuum being pulled on the tube using a manometer or automotive-type vacuum gauge. The gauge should show about 3 inches of mercury vacuum. If vacuum is below normal, check the vacuum blower motor housing for improper sealing loose bolts, torn gasket material, etc.). If the vacuum is good, check the Vacuum Indicator Bulb (#98) and replace if defective. If the bulb is good, replace the vacuum switch as described in Section V-I.

VI. TROUBLESHOOTING - CONTINUED

| Symptom | Problem | Solution |
|---|--|---|
| Water buildup on Filter Section or bottom sieve is excessive. | Water rate is too high for type of sample. | Reduce water pressure. |
| | Sample size is too large. | Use smaller sample, Test in 2 batches, etc. (see IV-B). |
| | Filter paper is too full to allow water to pass. | Replace filter paper or change filter Sections (see III-B). |
| Abnormal metallic, humming, or clattering sound from Motor and Pump area. | No water in pump. | Check valve settings, other parts in water path. |
| | Loose mounting bolts for Pump or Motor. | Tighten. |
| | Worn Motor Bearings. | Replace Motor. |
| | Spider (#32) of Motor-to-Pump Coupling (#31) worn. | Replace Spider or entire coupling as indicated by damage (see V-D). |
| Clattering sound from the Instrument Case when vibration is on. | Electromagnet Assemblies (#175) parts are loose. | Check for loose parts and replace assembly or parts as necessary (see V-H). |
| Water pressure is low. | Valves in cabinet not set right. | Check and correct. |
| | Pump worn or not working. | Replace Pump (see V-D) |
| | Filter-Screen in the strainer is plugged. | Clean/replace Filter-Screen (see V-A). |
| Spray nozzles (#130, #169, #71) plugging with sample particles. | Filter-Screen in the Strainer is worn. | Replace (see V-A) |
| No water to Cover spray and Well. No water to Hand Spray. | Solenoid Valves (#64, #75) defective. | Inspect, repair, or replace (see V-J). |
| | Improper switch sequence. | See II. |
| Cover Spray Bar does not rotate. | Loose Platform Upper Electrical Fitting (#119). | Connect or tighten. |
| | Defective Cover Motor (#123.) | Replace (see V-E). |
| | Defective Gear (#127, #128). | Replace (see Fig. 4). |
| Water Leak in Cover, water not passing through spray nozzles. | Defective Spray Water Rotary Seal (#122). | Replace (see Fig. 4). |
| Timer circuit does not work. | Improper hookup. | Review III-D and timer instructions. |
| | Defective timer. | Check, replace. |
| | Defective Timer Control Relay (#203). | Replace. |

VII. PARTS LIST

| Key | Fig. No. | No. Req'd | Description |
|----------------------------------|----------|-----------|---|
| Cabinet Overall View (Fig. 1) | | | |
| 1 | 1 | 1 | Cabinet Body |
| 2 | 1 | 1 | Cabinet Door, Right |
| 3 | 1 | 1 | Cabinet Door, Left |
| 4 | 1 | 2 | Cabinet Handle Assembly |
| 5 | 1 | 4 | Locking Wheel Assembly w/bolts (4) and nuts (4) |
| 7 | 1 | 1 | Cabinet Cooling Fan and Guard w/screws (4) & nuts (4) |
| 8 | 1 | 1 | Cabinet Cord Grip |
| 66 | 1-3-4 | 1 | Hand Spray Tubing |
| 67 | 1-4 | 1 | Hand Spray Tubing Fitting |
| 68 | 1-4 | 1 | Hand Spray Tubing Pipe Nipple |
| 69 | 1-4 | 1 | Hand Spray Tubing Valve |
| 70 | 1-4 | 1 | Hand Spray Tubing Adapter (Nozzle Body) |
| 71 | 1-4 | 1 | Hand Spray Tubing Nozzle |
| 165 | 1-5-7 | 1 | Vacuum Switch Tubing |
| 174 | 1 | 1 | Sieve Cover Coupling Fitting |
| 220 | 1 | 1 | Transformer |
| 221 | 1 | 1 | Vibrator Cord Junction Box |
| Holding Tank Assy (Fig. 2) | | | |
| 6 | 2 | 1 | Vacuum Blower |
| 9 | 2 | 3 | Vacuum Blower Shield Nut w/lock washer |
| 10 | 2 | 1 | Vacuum Blower Shield |
| 11 | 2 | 4 | Tank End Plate Knob |
| 12 | 2 | 1 | Tank End Plate |
| 13 | 2 | 1 | See-Through Sight Glass |
| 14 | 2 | 1 | Tank-to-End Plate "O" Ring |
| 15 | 2 | 1 | Holding Tank w/mounting screws (2) & grommets |
| 16 | 2 | 1 | Tubing-to-Tank Fitting |
| 17 | 2-3 | 1 | Relief Valve-to-Tank Tubing |
| 18 | 2 | 1 | Water Level Check Ball |
| 19 | 2 | 1 | Vacuum Exhaust Hose |
| 21 | 2 | 6 | Vacuum Blower Mounting Nut |
| 22 | 2 | 1 | Vacuum Blower-to-Tank Hose |
| 23 | 2 | 1 | Tank-to-Drain Pipe Union |
| 24 | 2 | 1 | Drain Pipe |
| 25 | 2 | 1 | Drain Valve |
| 26 | 2 | 1 | Drain Nipple |
| 27 | 2 | 1 | Drain Tee |
| 28 | 2 | 1 | Outlet-to-Drain Tee Bushing |
| 29 | 2 | 1 | Drain Hose Fitting |
| 39 | 2-3 | 1 | Pump Inlet Tubing |
| 40 | 2 | 1 | Tubing-to-Tank Fitting |
| 45 | 2-3 | 1 | Water Outlet Tubing |
| 46 | 2 | 1 | Water Outlet Drain Tee Fitting |
| 170 | 2-5 | 1 | Well-to-Tank Hose |
| 171 | 2 | 2 | Well-to-Tank Hose Clamp |
| 188 | 2 | 1 | Vacuum Motor Adapter |
| Cabinet Interior Piping (Fig. 3) | | | |
| 17 | 2-3 | 1 | Relief Valve-to-Tank Tubing |
| 30 | 3 | 1 | Motor 115/230V, 60Hz, 1PH, 7 amps, 1/3 Hp, TEFC |
| 31 | 3 | 1 | Motor-to-Pump Coupling w/spider & set screws (2) |
| 32 | 3 | 1 | Spider only |
| 33 | 3 | 1 | Pump |
| 34 | 3 | 1 | Pump & Motor Mounting Base w/screws, nuts, flat washers and grommets (4ea.) |
| 35 | 3 | 2 | Pump Mounting Screw w/lock washer |
| 36 | 3 | 4 | Motor Mounting Screw, w/nut, lock washer & flat washer |
| 37 | 3 | 1 | Pump Discharge Bushing |
| 38 | 3 | 1 | Tubing-to-Pump Fitting |
| 39 | 2-3 | 1 | Pump Inlet Tubing |

VII. PARTS LIST - CONTINUED

| Key | Fig. No. | No. Req'd | Description |
|--|----------|-----------|--|
| Cabinet Interior Piping (Fig. 3) con't | | | |
| 41 | 3 | 1 | Pump Discharge Fitting |
| 42 | 3 | 1 | Water Discharge Tee |
| 43 | 3 | 1 | Water Outlet Valve |
| 44 | 3 | 1 | Water Outlet Fitting |
| 45 | 2-3 | 1 | Water Outlet Tubing |
| 47 | 3 | 1 | Internal Recycle Valve |
| 48 | 3 | 1 | Water Inlet Tee |
| 49 | 3 | 1 | Water Inlet Valve |
| 50 | 3 | 1 | Water Inlet Nipple |
| 51 | 3 | 1 | Water Inlet Adapter |
| 52 | 3 | 1 | Water Inlet Hose Nipple |
| 53 | 3 | 1 | Water Inlet Hose Fitting |
| 54 | 3 | 1 | Water Discharge Nipple |
| 55 | 3 | 1 | Water Discharge Union |
| 59 | - | 1 | Strainer Filter-Screen Only |
| 60 | 3 | 1 | Strainer with Filter-Screen |
| 61 | 3 | 2 | Strainer Bushing |
| 62 | 3 | 1 | Strainer Tee |
| 63 | 3 | 2 | Strainer Tee-to-Solenoid Fitting |
| 64 | 3 | 1 | Solenoid Valve, Hand Spray |
| 65 | 3 | 1 | Solenoid Valve Nipple |
| 66 | 1-3-4 | 1 | Hand Spray Tubing |
| 72 | 3 | 1 | Cover Spray Solenoid-to-Tubing Fitting |
| 73 | 3-4 | 1 | Solenoid-to-Control Valve Tubing |
| 75 | 3 | 1 | Solenoid Valve, Cover Spray |
| 76 | 3 | 1 | Relief Valve-to-Tubing Fitting |
| 77 | 3 | 1 | Pressure Relief Valve |
| 78 | 3 | 1 | Relief Valve Tee |
| 79 | 3 | 1 | Tee-to-Tubing Fitting |
| Upper Housing Plumbing (Fig. 4) | | | |
| 66 | 1-3-4 | 1 | Hand Spray Tubing |
| 67 | 1-4 | 1 | Hand Spray Tubing Fitting |
| 68 | 1-4 | 1 | Hand Spray Tubing Pipe Nipple |
| 69 | 1-4 | 1 | Hand Spray Tubing Valve |
| 70 | 1-4 | 1 | Hand Spray Tubing Adapter (Nozzle Body) |
| 71 | 1-4 | 1 | Hand Spray Tubing Nozzle |
| 73 | 3-4 | 1 | Solenoid-to-Control Valve Tubing |
| 74 | 4 | 1 | Water Control Valve Inlet Fitting |
| 96 | 4-5 | 1 | Instrument Case |
| 97 | 4-5 | 1 | Platform |
| 140 | 4 | 1 | Water Control Valve w/knob & mounting nut |
| 142 | 4 | 1 | Water Pressure Gauge |
| 160 | 4 | 1 | Water Control Valve Outlet Fitting |
| 161 | 4 | 1 | Control Valve-to-Cross Tubing |
| 162 | 4 | 1 | Cross Inlet Fitting |
| 163 | 4 | 1 | Cross |
| 164 | 4 | 1 | Water Pressure Bushing |
| 166 | 4 | 1 | Cross-to-Well Outlet Fitting |
| 167 | 4-5 | 1 | Cross-to-Well Tubing |
| 169 | 4-5 | 1 | Well Spray Nozzle |
| 172 | 4 | 1 | Cross-to-Cover Outlet Fitting |
| 173 | 4 | 1 | Cross-to-Case Tubing |
| Vibrating Housing Assy (Fig.5) | | | |
| 96 | 4-5 | 1 | Instrument Case |
| 97 | 4-5 | 1 | Platform |
| 99 | 5 | 15 | Platform-to-Case Screw |
| 101 | 5 | 3 | Vibration Ring-to-Stem Screw w/lock washer |
| 102 | 5 | 2 | Vertical Guide Rod Lock Nut |
| 103 | 5 | 2 | Vertical Guide Rod |

VII. PARTS LIST - CONTINUED

| Key | Fig. No. | No. Req'd | Description |
|--------------------------------------|----------|-----------|---|
| Vibrating Housing Assy (Fig.5) con't | | | |
| 104 | 5 | 2 | Vertical Guide Rod Acorn Nut |
| 105 | 5 | 1 | Vibration Ring |
| 106 | 5-8 | 1 | Lift Ring |
| 107 | 5 | 2 | Lift Ring Handle Pivot Pin w/cotter pin |
| 108 | 5 | 2 | Lift Ring Handle Spring |
| 109 | 5 | 2 | Lift Ring Handle |
| 110 | 5 | 2 | Cover Hold-Down Clamp Knob |
| 111 | 5 | 2 | Cover Hold-Down Clamp Housing |
| 112 | 5 | 2 | Cover Hold Down Clamp |
| 165 | 1-5-7 | 1 | Vacuum Switch Tubing |
| 167 | 4-5 | 1 | Cross-to-Well Tubing |
| 168 | 5 | 1 | Well Inlet Fitting |
| 169 | 4-5 | 1 | Well Spray Nozzle |
| 170 | 2-5 | 1 | Well-to-Tank Hose |
| 175 | 5 | 3 | Electromagnet Assembly, Complete |
| 176 | 5 | 3 | Electromagnet Body only |
| 177 | 5 | 3 | Electromagnet Armature only |
| 178 | 5 | 3 | Leaf Spring only |
| 179 | 5 | 9 | Leaf Spring Spacer only |
| 180 | 5 | 3 | Vibrator Stem |
| 181 | 5 | 6 | Vibrator Stem-to-Armature Screw w/lock washer |
| 182 | 5 | 6 | Vibrator Stem Grommet |
| 184 | 5 | 12 | Electromagnet Body Screw w/lock washer |
| 185 | 5 | 6 | Leaf Spring-to-Bracket Screw w/lock washer |
| 187 | 5 | 1 | Well Inlet Bushing |

Sieve Covers (Fig. 6)

| | | | |
|---------|---|---|---|
| 119 | 6 | 1 | Sieve Cover Electrical Cord |
| 120 | 6 | 1 | Case-to-Cover Tubing |
| 121 | 6 | 1 | Cover Inlet Fitting |
| 122 | 6 | 1 | Spray Water Rotary Seal |
| 122A | 6 | 1 | Spray Water Rotary Seal Screw |
| 123 | 6 | 1 | Cover Motor w/screws (2) and nuts (2) |
| 123A | 6 | 1 | Cover Motor Screws (2) and Nuts (2) |
| 124-12" | 6 | 1 | Cover, for WV-1 |
| 124-8" | 6 | 1 | Cover, for WV-2 |
| 125-12" | 6 | 1 | Cover Motor Guard, for WV-1 |
| 125-8" | 6 | 1 | Cover Motor Guard, for WV-2 |
| 126-12" | 6 | 6 | Cover Motor Guard Screw w/nut, for WV-1 |
| 126-8" | 6 | 4 | Cover Motor Guard Screw w/nut, for WV-2 |
| 127 | 6 | 1 | Cover Motor Gear w/set screw |
| 127A | 6 | 1 | Cover Motor Gear Set Screw |
| 128 | 6 | 1 | Rotary Seal Gear |
| 129-12" | 6 | 1 | Spray Bar, for WV-1 |
| 129-8" | 6 | 1 | Spray Bar, for WV-2 |
| 130-12" | 6 | 6 | Spray Bar Nozzle, for WV-1 |
| 130-8" | 6 | 3 | Spray Bar Nozzle, for WV-2 |
| 131 | 6 | 1 | Spray Bar Nozzle (End), for WV-2 only |

Electrical Boxes (Fig. 7)

| | | | |
|-----|---|---|--------------------------------------|
| 98 | 7 | 1 | Vacuum Indicator Switch |
| 118 | 7 | 1 | Sieve Cover Lower Electrical Fitting |
| 141 | 7 | 1 | Variable Transformer, complete |
| 143 | 7 | 1 | Vacuum Indicator Switch |
| 144 | 7 | 1 | Switch, "Hand Spray/Water", complete |
| 145 | 7 | 1 | Switch, "Vibrator", complete |
| 146 | 7 | 1 | Switch, "Vacuum", complete |
| 147 | 7 | 1 | Timer |
| 148 | 7 | 1 | Tubing Barb Fitting |
| 150 | 7 | 1 | Switch, "Timer", complete |
| 151 | 7 | 1 | Power Indicator Lamp |
| 152 | 7 | 1 | Master Power Switch, complete |

VII. PARTS LIST - CONTINUED

| Key | Fig. No. | No. Req'd | Description |
|---------------------------------|----------|-----------|--|
| Electrical Boxes (Fig. 7) con't | | | |
| 153 | 7 | 1 | Control Console |
| 154 | 7 | 1 | Vacuum Switch Cover |
| 155 | 7 | 1 | Vacuum Switch Cord Grip |
| 156 | 7 | 1 | Vacuum Switch Mounting Bracket w/nuts (2) and lock washers (2) |
| 157 | 7 | 2 | Standoff |
| 158 | 7 | 2 | Standoff Screw w/lock washer |
| 159 | 7 | 2 | Vacuum Switch Cover Screw w/flat washer |
| 165 | 1-5-7 | 1 | Vacuum Switch Tubing |
| 201 | 7 | 1 | Electrical Box Back Panel w/mounting screw (4) |
| 202 | 7 | 1 | Pump Motor Relay |
| 203 | 7 | 1 | Vacuum Motor Relay |
| 204 | 7 | 1 | Terminal Strip-Long |
| 205 | 7 | 1 | Terminal Strip-Short |
| 206 | 7 | 4 | Fuse Holder |
| 207 | - | 2 | Fuse — 8 AMP MDA |
| 208 | - | 1 | Fuse — 3 AMP AGC |
| 209 | - | 1 | Fuse — 1/4 AMP AGC |
| 210 | 7 | 1 | Water Solenoid Relay |
| 211 | 7 | - | Terminal Block |
| 212 | 7 | 1 | Rear Electrical Box |
| 213 | 7 | 1 | Rear Electrical Box Cover |
| 214 | 7 | 2 | Rear Electrical Box Hinge w/screws (4) |
| 215 | 7 | 1 | Rear Electrical Box Latch |
| 216 | 7 | 5 | Grip, Connector for Cord Set |
| 217 | 7 | 2 | Grip, Connector—Straight for Flex Conduit |
| 218 | 7 | - | Terminal block, Fused |
| 219 | 7 | - | Fuse Puller |
| 222 | 7 | 2 | Grip, Connector—Elbow for Flex Conduit |
| 223 | - | 2 | Fuse — 20 AMP FNQ |
| 224 | 7 | 1 | Conduit Tee-PVC |

Sieve Stack Parts & Accessories (Fig.8)

| | | | |
|-----|-----|---|--------------------------------|
| 106 | 5-8 | 1 | Lift Ring |
| 113 | 8 | 1 | Adapter Ring for 8-inch Sieves |
| 114 | 8 | 1 | Adapter Ring Rubber Gasket |
| 230 | 8 | 1 | Filter Base |
| 231 | 8 | 1 | Filter Support |
| 232 | 8 | - | 12" Sieve O-Ring |
| 233 | 8 | 1 | 12" See-thru-Cylinder |
| 234 | 8 | 1 | 8" See-thru-Cylinder |
| 235 | 8 | - | 8" Sieve O-Ring |

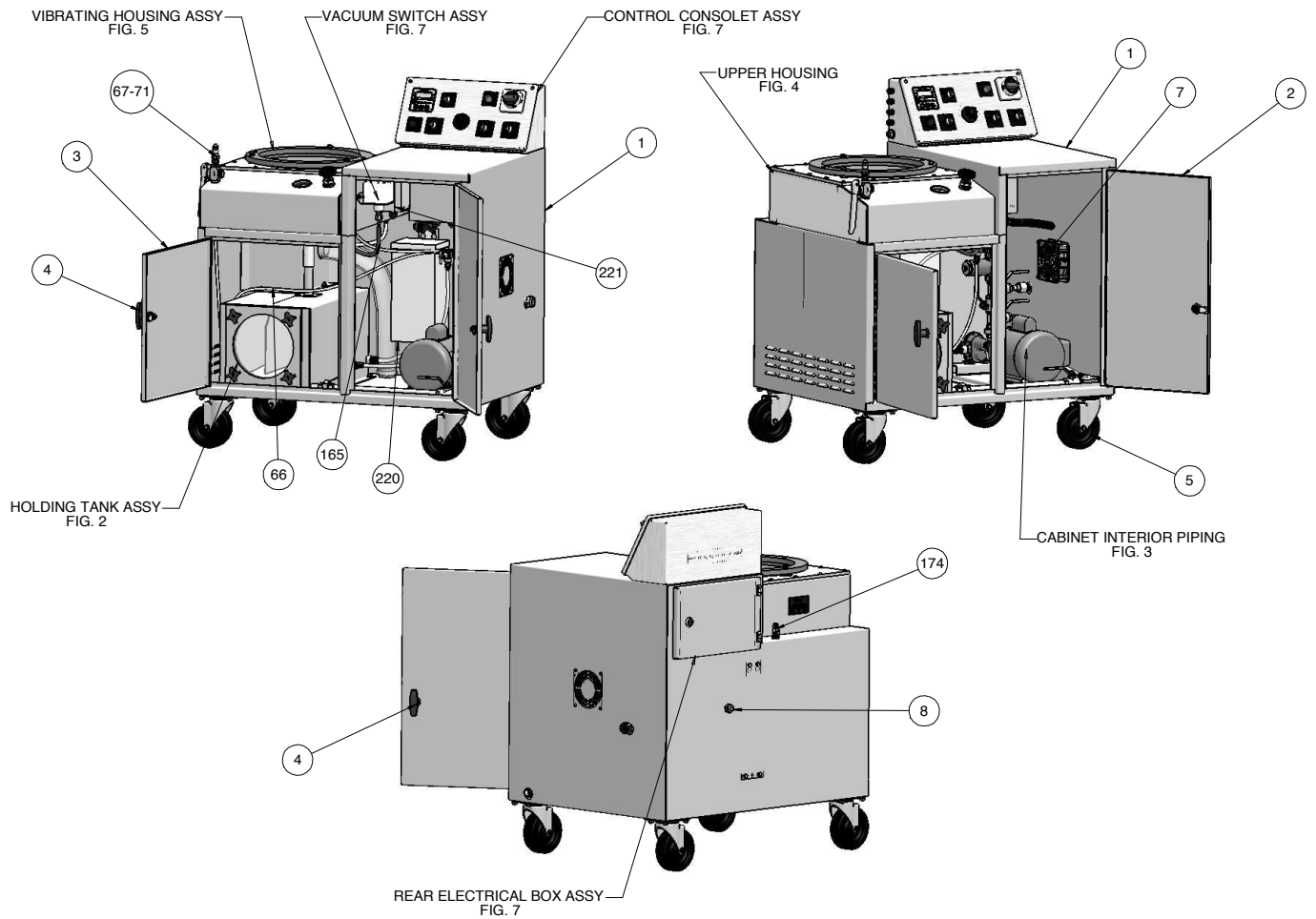


Figure 1
Cabinet Overall View

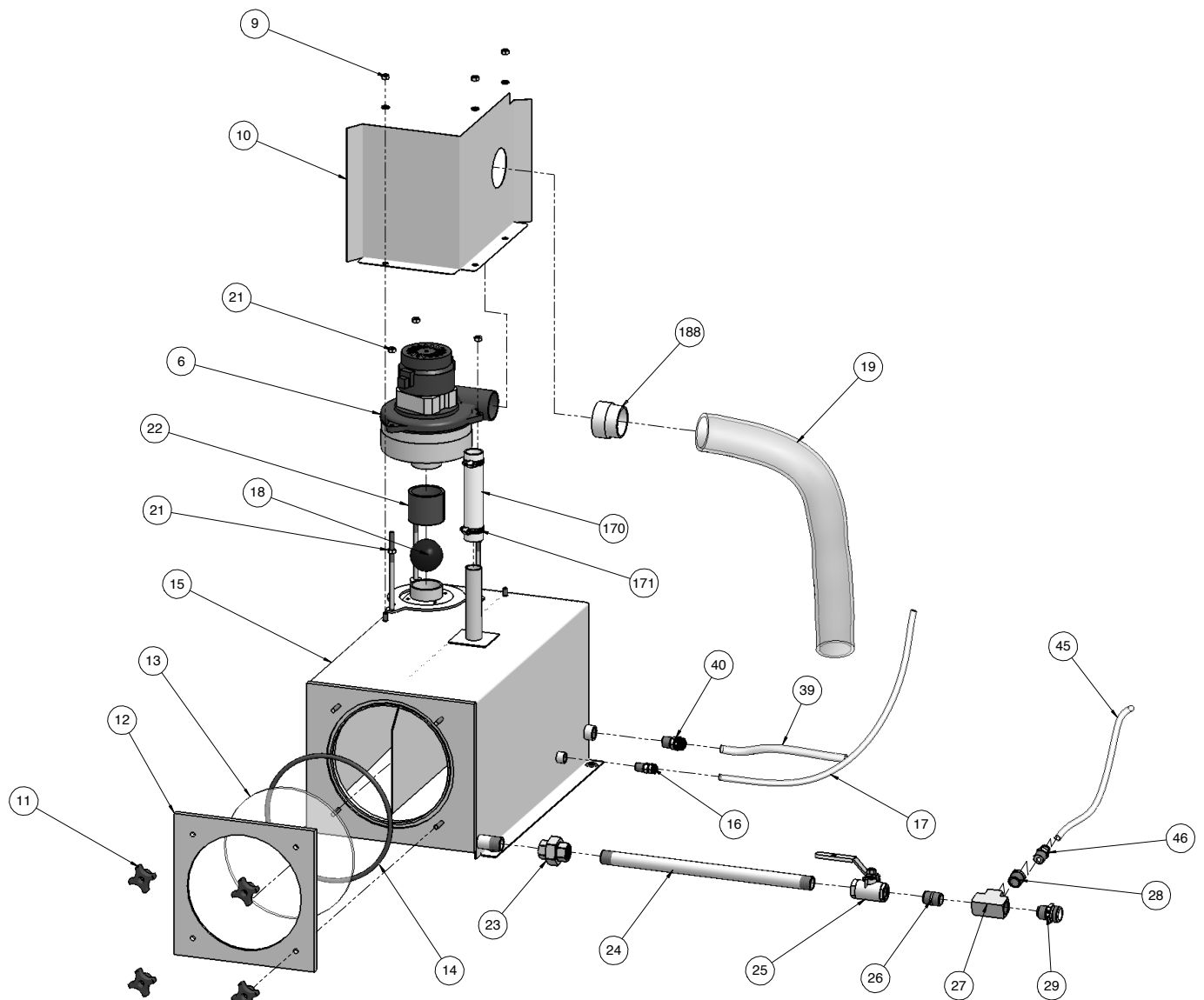


Figure 2
Holding Tank Assembly

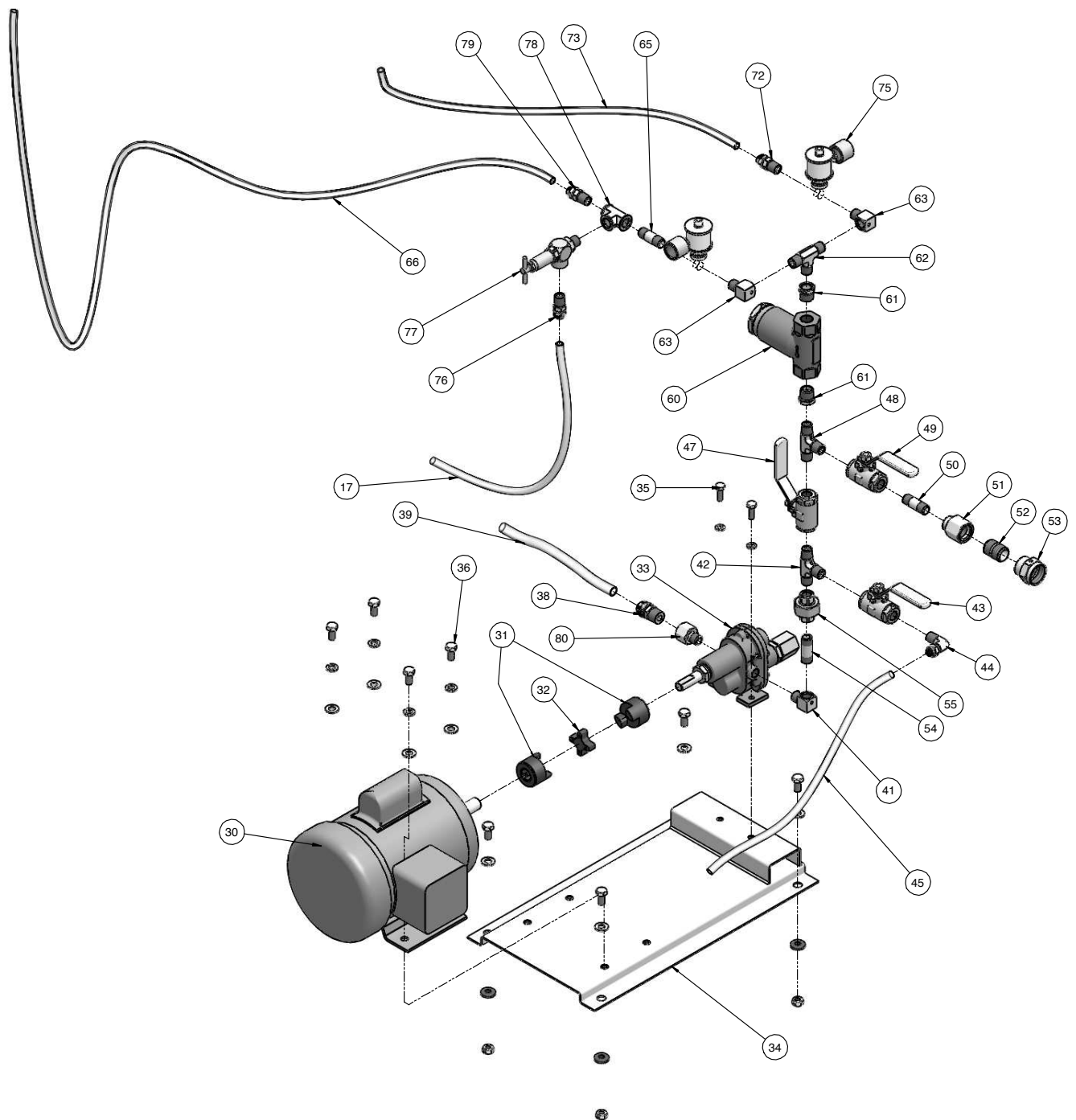


Figure 3
Cabinet Interior Piping

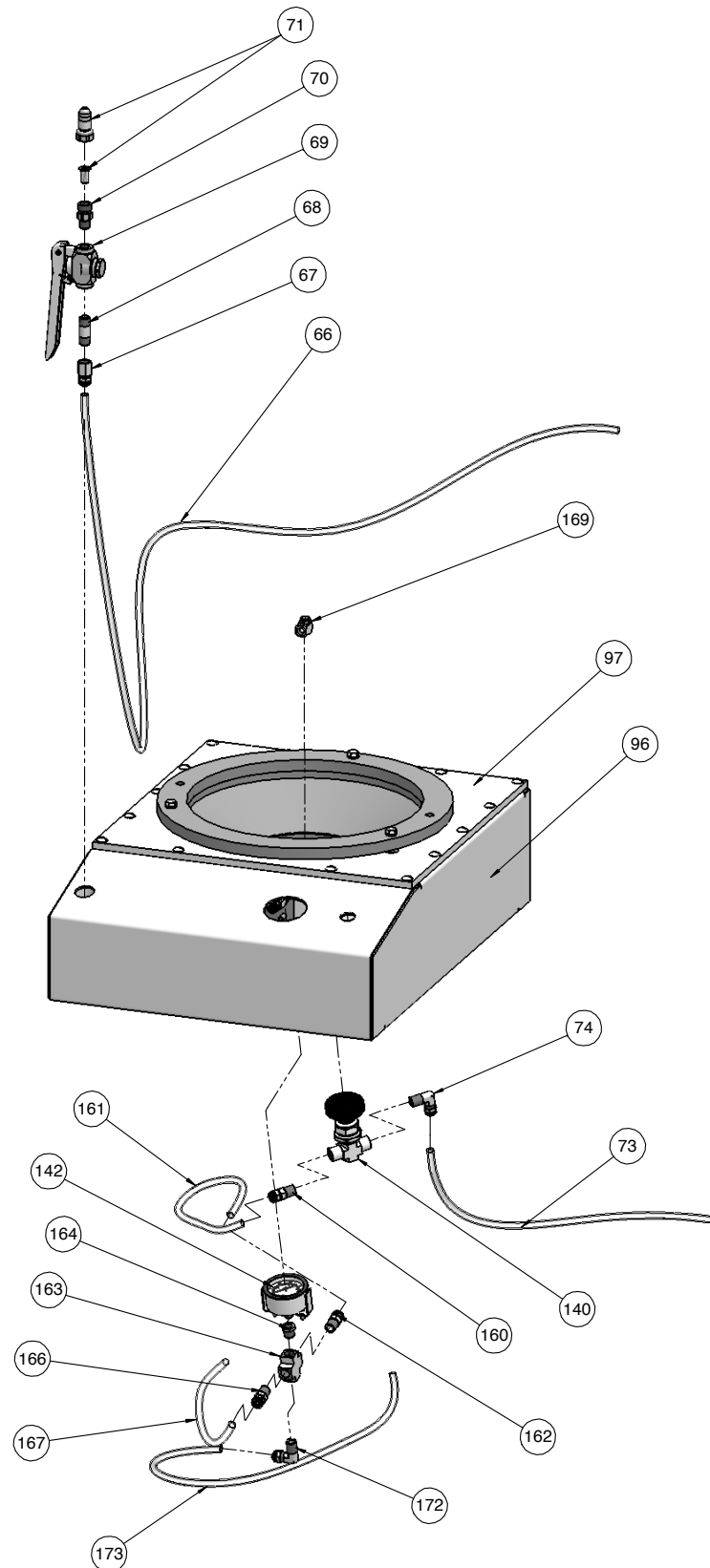


Figure 4
Upper Housing Plumbing

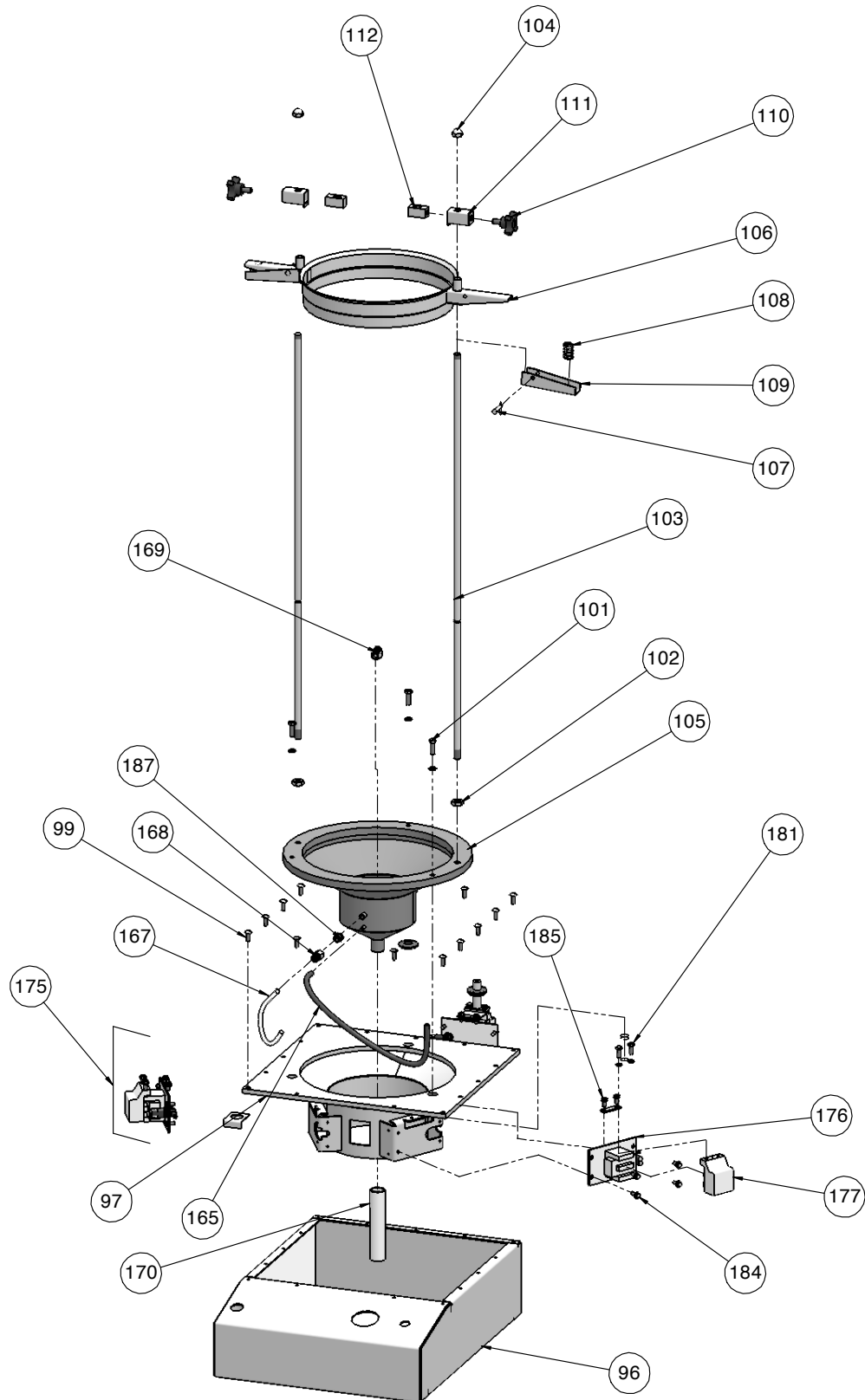


Figure 5
Vibrating Housing Assembly

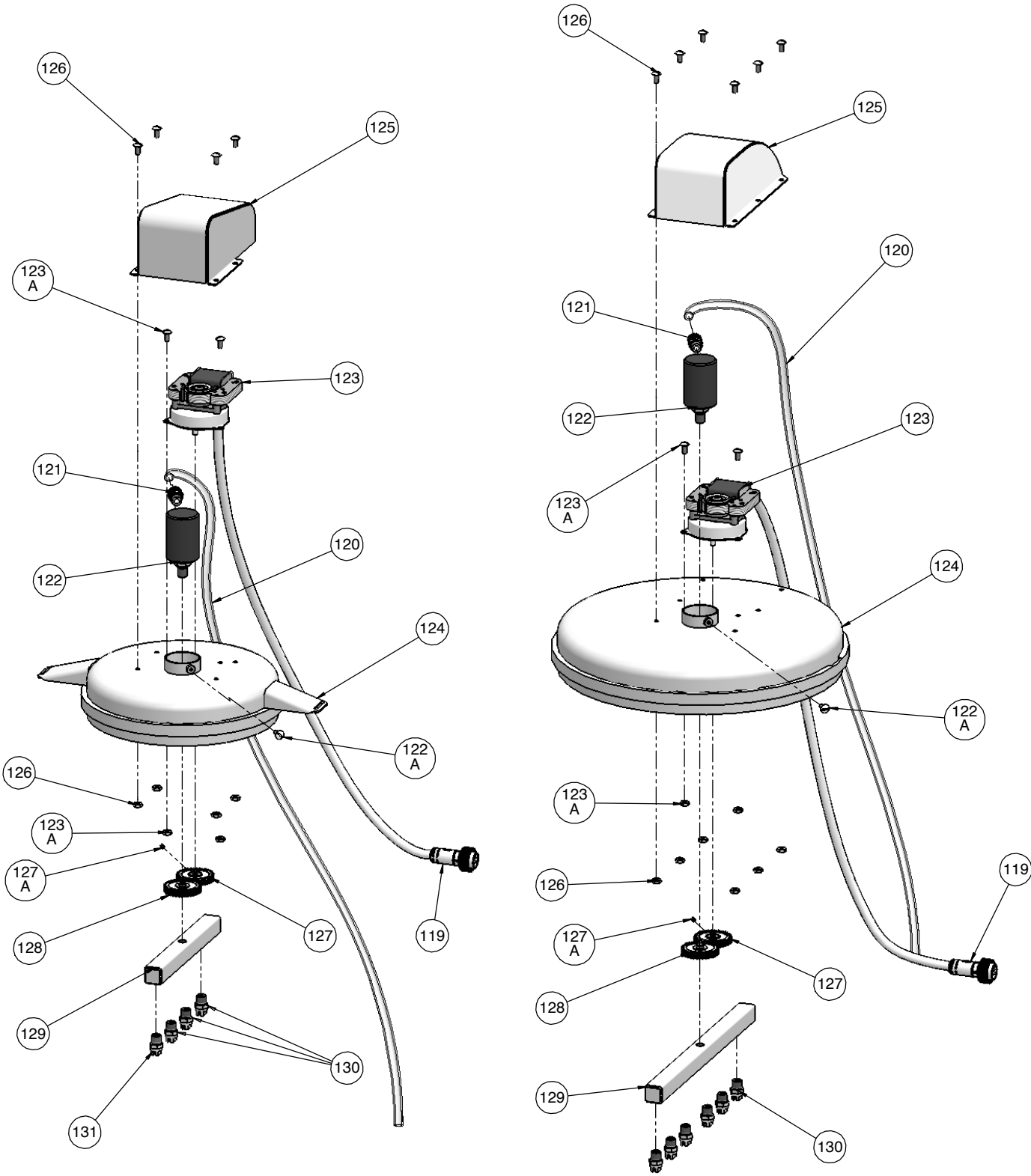


Figure 6
Sieve Covers

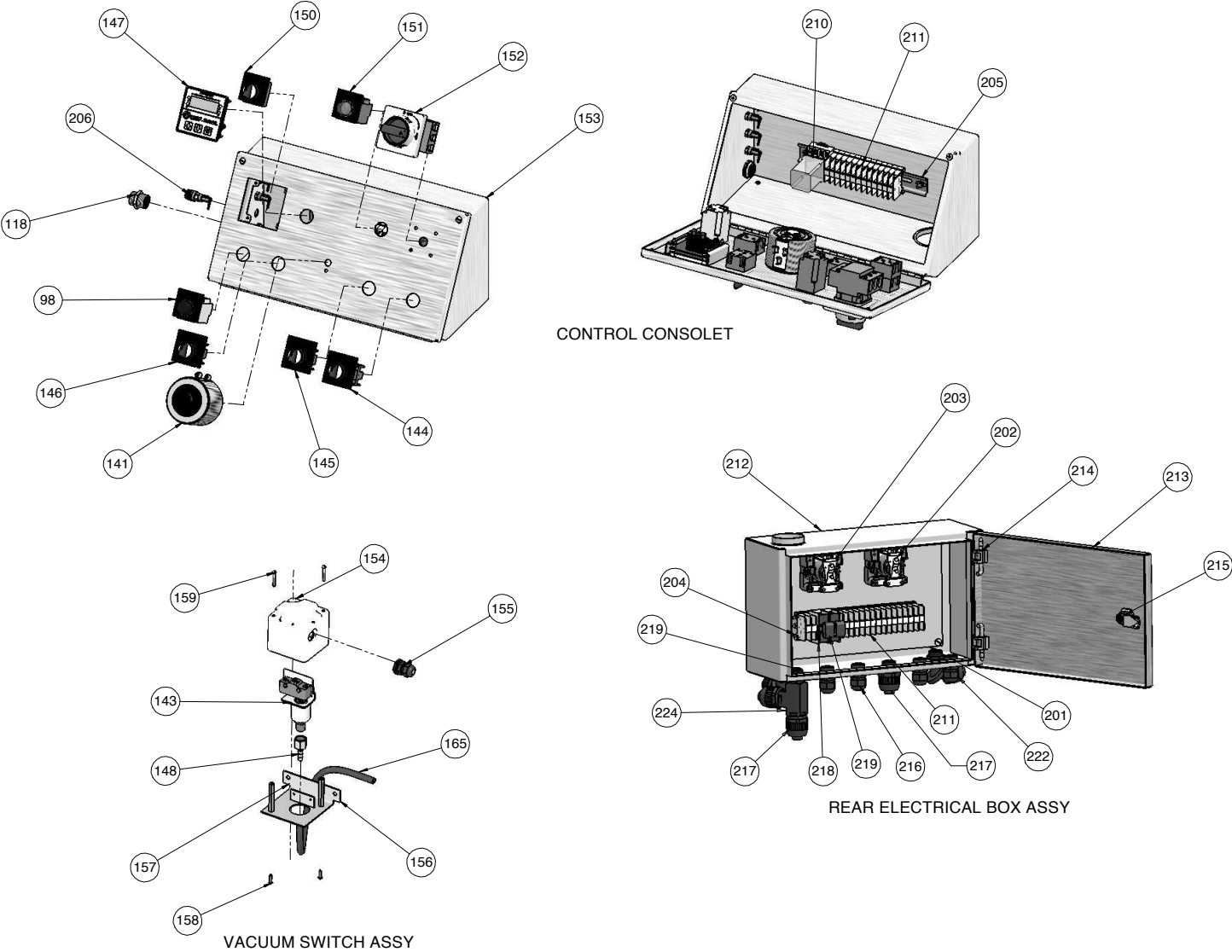


Figure 7
Electrical Boxes

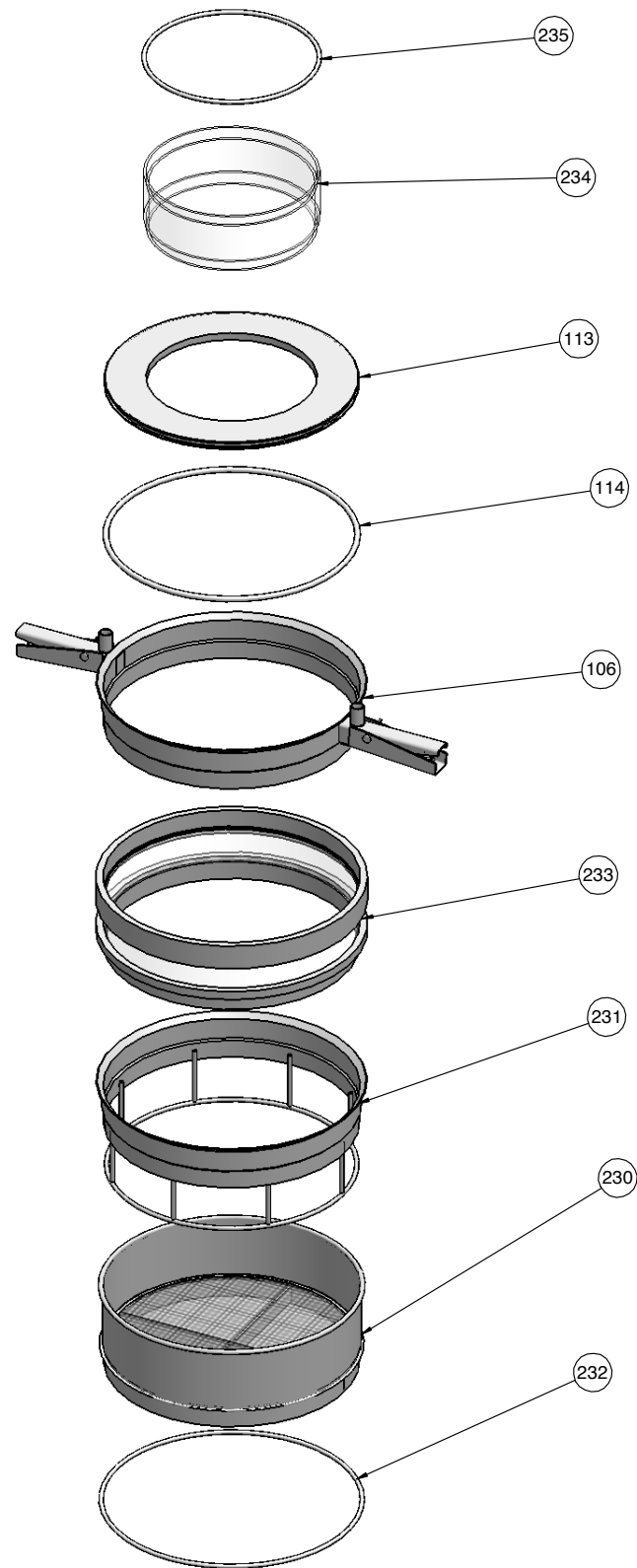
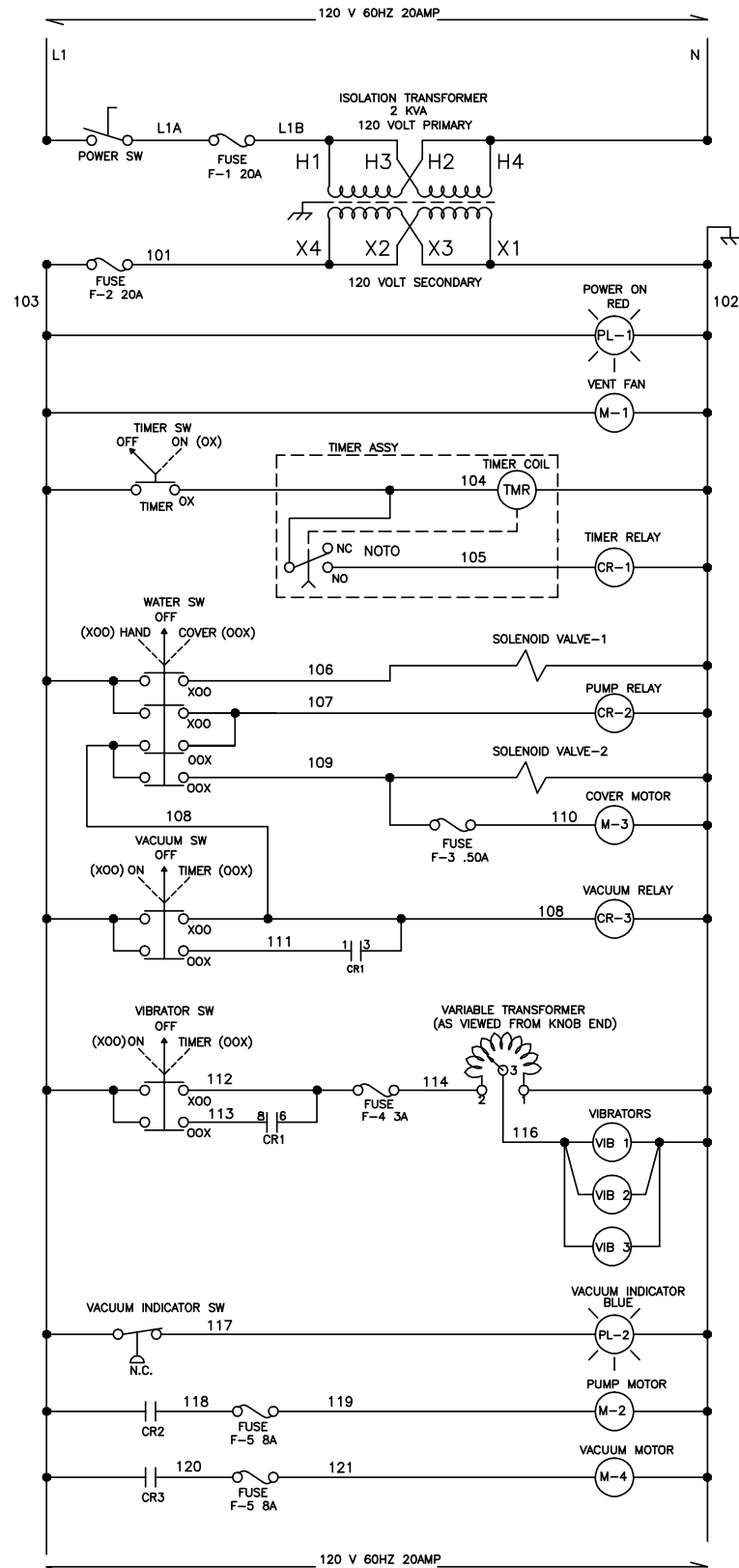


Figure 8
Sieve Stack - Misc. Assemblies



Electrical Schematic