

Batch Type Machines

This Section Contains:

- Ten Tips
- Burp wire
- Conversion of Convertible Machines
- Door Start Instructions
- Kool-Aid Test
- Low Level Alarms
- Low & High Voltage Wiring on motors
- Solids on ADS Machines
- Mercury Relay Replacement Kit

Section 7

Batch Type Machines

Commonly called, Low Temp, Low Energy,
Dump & Fill, Batch Type, or Chemical sanitizing
machines

TEN TIPS

For Low-Temp Dishmachines **Check before making the service call**

These precautions will avoid a needless service charge to your account

1. Clean pump filter screens.
2. Make sure the drains are clear and free running.
3. Check primary water heating source. Temperature at the dishmachine should be 120 - 140° F. If the temperature reads below 120° F the water heater must be increased.
4. Inspect all spray arms to see if endcaps are installed.
5. Check spray arm jets and clear any clogged openings.
6. Inspect drain ball and drain seat for straws, utensils, or foreign articles.
7. Avoid washing mop heads, napkins, or towels in the dishwasher.
8. Check chemical buckets and place pickup tubes in correct container.
9. Observe correct racking procedure. (see wall chart)
10. Do not use consumer grade dishsoap for the utensil pre soak. (it will cause foaming problems)

Batch-Type

Preventive Maintenance Schedule

THREE GENERAL AREAS TO INSPECT

SPRAY ARM ROTATION

1. Free moving
2. Check psi at lower arm with pressure tester (17 S series, 20 L series)
3. All spray tips show fan spray and not just a single tube of water
4. Rinse shows full spray arm pressure for at least 10 seconds
5. Rotation of lower arm approximately 60 rpm

DRAIN AND FILL

1. Check for free movement of solenoid, no buzzing sound when activated
2. Drain chain has 1" movement side to side
3. Fill requires min. 17 psi on inlet DURING fill. Refill should take 15 seconds, 20 maximum
4. Fill temperature is no lower than 120° F and no higher than 150° F
5. Fill plumbing is a min. of ½ NPT (never use a 3/8" line on a dishmachine)

DOOR OPERATION

1. Doors lift and close smoothly and evenly together
2. Door will close all the way down, and stay up without dropping (adjustment on spring eyebolt)
3. Table does not interfere with door closing, crimped door guide does not impede door, guides are well adjusted
4. Bolt tables to the machine to avoid leaks under table lip or door interference

NORMAL CHECKS

1. Check for bent or damaged parts
2. Filter screens are in good order
3. Drain lines are open and running clear
4. Feeder pumps are functional and adjusted w/no leaking chemical
5. All endcaps and thumbscrews are operational
6. Correct all leaks to avoid damage to motors
7. Spray patterns are consistent and typical
8. Chemical supply is readily available
9. Lime build-up is a problem for machine operation
10. Eliminate the use of consumer dishsoaps in presoak (foaming problem)
11. Eliminate the use of steel-wool pads (rust and bearing damage)

ELECTRICAL CHECKS (by qualified technician)

1. Amp draw on 1.5 HP should be about 12 -13 amps
2. Power should be 115 to 120v, low voltage causes coil and switch failure
3. Check polarity, black wire power, white wire neutral (important drain coil protection)
4. Grounded machine to electrical supply GREEN bar

American Dish Service

Preview for Batch/type, Single-rack Accounts

Electrical, 120v, 20 Amp, (40 amp for 5AG)

Look for a circuit breaker in the panel box that has a screw terminal on the side and a bar across the top. It should be labeled 20 on the cross bar. It must have a minimum of 14-gauge wire.

Plumbing

The item to look for in the hot water supply is what is called "Recovery" rate. This data will be found on the information plate attached to the primary water heater. It will be listed in Gallons Per Hour (GPH), and is the number of gallons heated to a certain temperature during one hour's continuous operation. For the AF3D dishmachine, the incoming water must be a minimum of 82 GPH (118 GPH for double 5AG machine) as a recovery rate, a new heater or a booster will be needed. Water should be brought to the machine by a minimum size of ½" pipe (do not use 3/8" or beverage supply water lines). If the incoming line is connected to the Pre-Rinse unit, install one way check valves on each line to the Pre-Rinse. This will prevent cross over cooling.

Drains

Drains must be lower than the machine's drain on the scrap accumulator (9" from floor). The dishmachine is gravity drained and must have drains that drop. All commercial dishmachines should be drained by 2" pipe size. Tight 90° and horseshoe bends will cause clogging. For ET undercounter models, the drain is gravity drain. If plumbing is slow (no drop), the ET series will leak at the drain elbow. ADS has no provision for pumping out or up from the ET machines, they are gravity drain only.

Tables

The table lip into the machine must cover the door opening. Code requires tables to be sealed to the wall at the backsplash (easily cleanable). The purpose of tables is to speed the process of the dishmachine. They support the machine and must be made according to the machine's specified table requirements (21" door opening, ¾" lip, 1.5" rolled edge, backsplash). A square 29" are needed to install in a corner, check distance between tables – not all machines are the same size.

Minimum Basic Requirements

Heated water at a minimum of 120° F for a running rate of no less than 82 gallons per hour (120 GPH for 5AG models). Electrical supply of 120v, 20 amps, 60Hz on a clean circuit (40 amps for 5AG models). Gravity drain of at least 2" pipe.

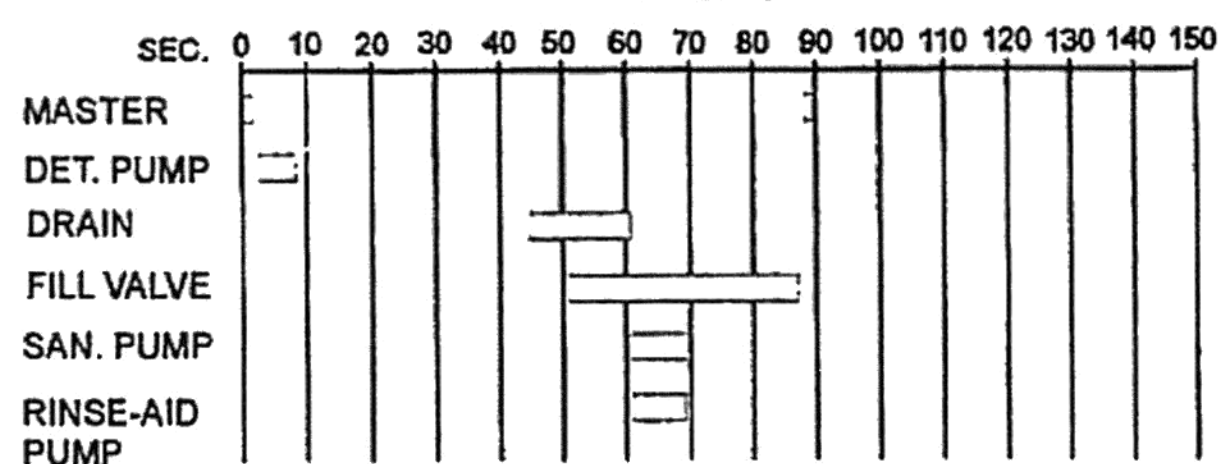
Adjustment of the left side of each cam will determine the length of time that the solenoid valve is open or the chemical pump operates and thus controls the amount of water or chemical introduced into the machine.

Cams are adjusted using the special wrench which fits into notches on the side of the cam.

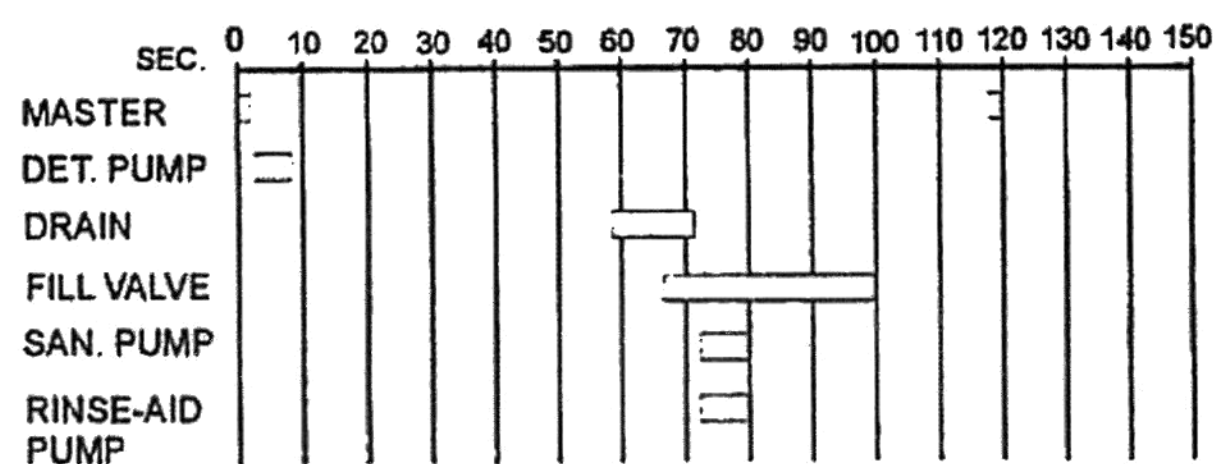
The chart below shows factory cam settings. The right side of the cam should always be at this factory setting but the left side may be changed to suit field conditions.

TIMER CYCLES

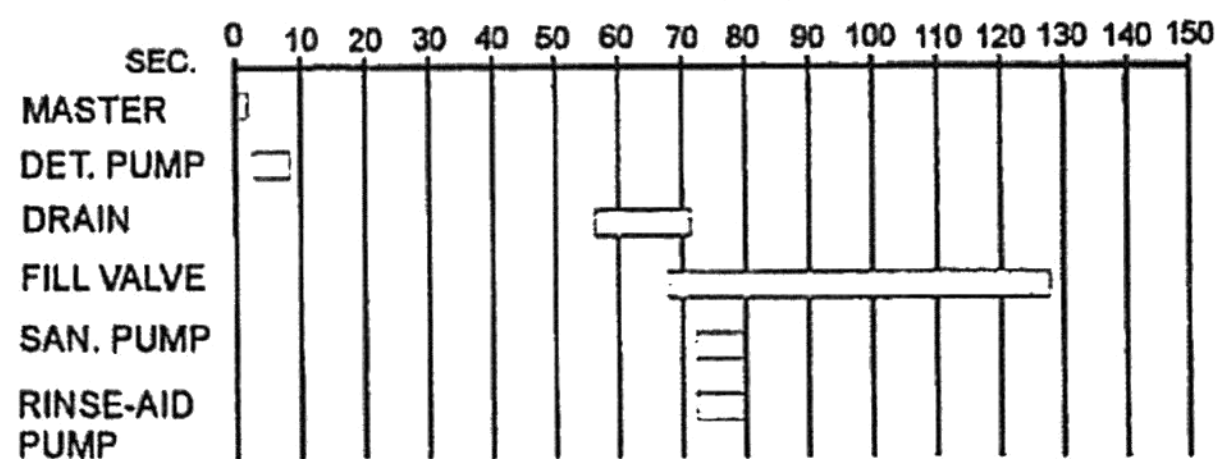
90 SEC.



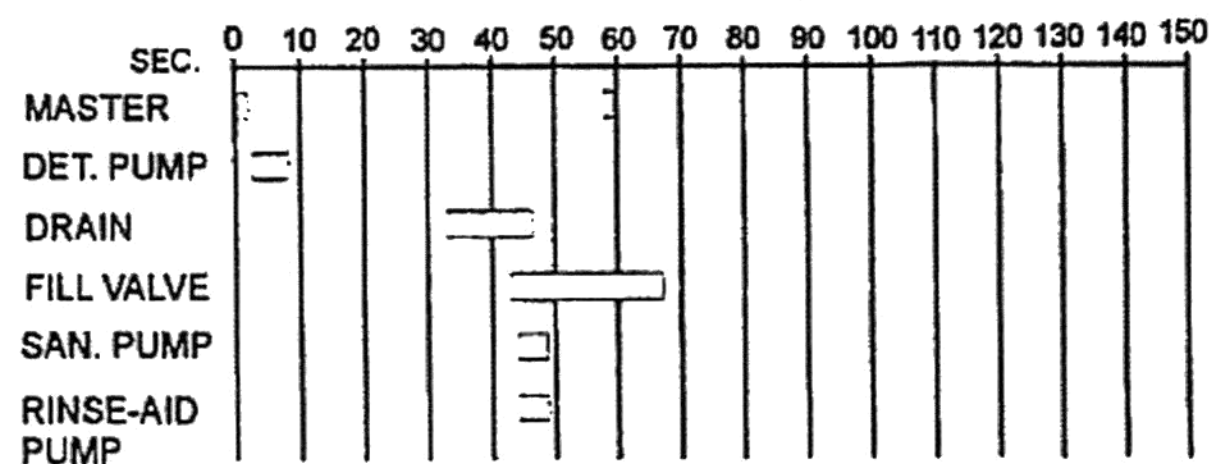
120 SEC.



150 SEC.



60 SEC.



BURP WIRE

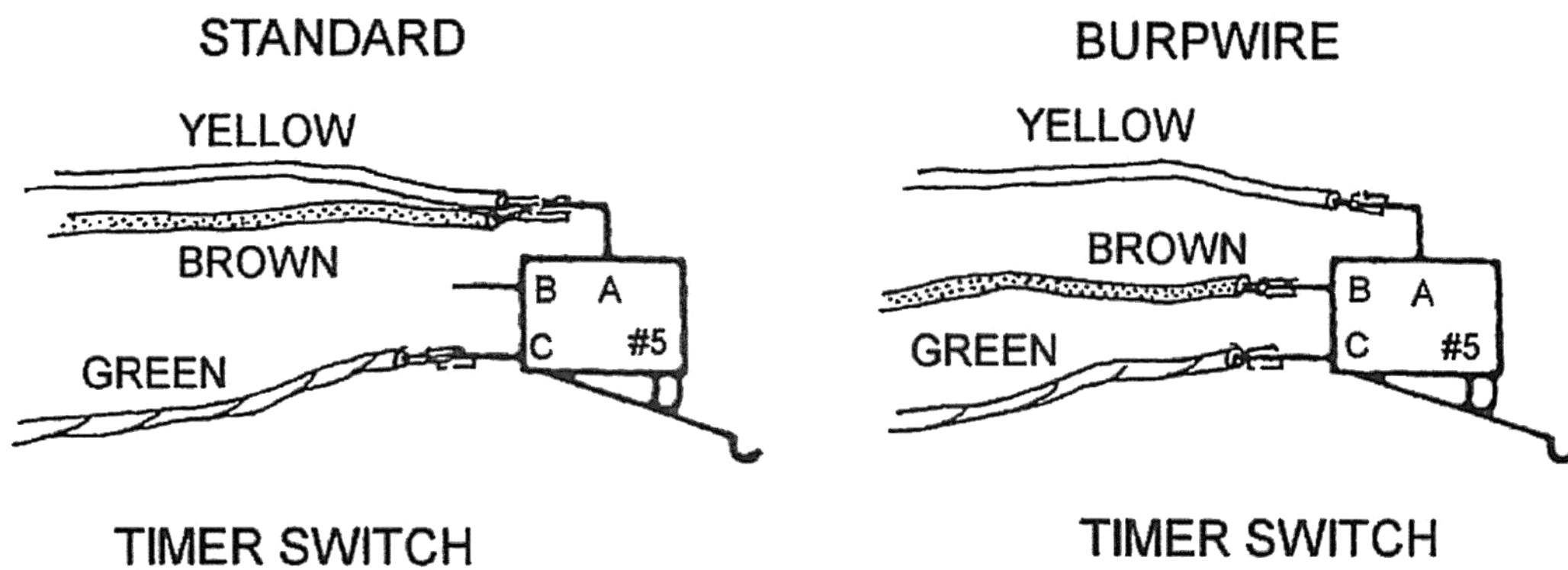
To wire an ADS, batch-type machine for a burp cycle, the following procedure has been prepared:

On the top terminal of the sanitizer micro-switch (5th cam from the left) there are two wires joined together by connector. These are the yellow and brown coded wires.

Remove these wires from the switch and separate the terminal connectors. Replace the yellow to the original top terminal on the switch and move the brown wire down to the middle terminal. Make sure that these wires and terminals do not touch one another.

Now, as you look at the wires on the sanitizer switch they should now be yellow on top, brown on the middle and green on the bottom terminal.

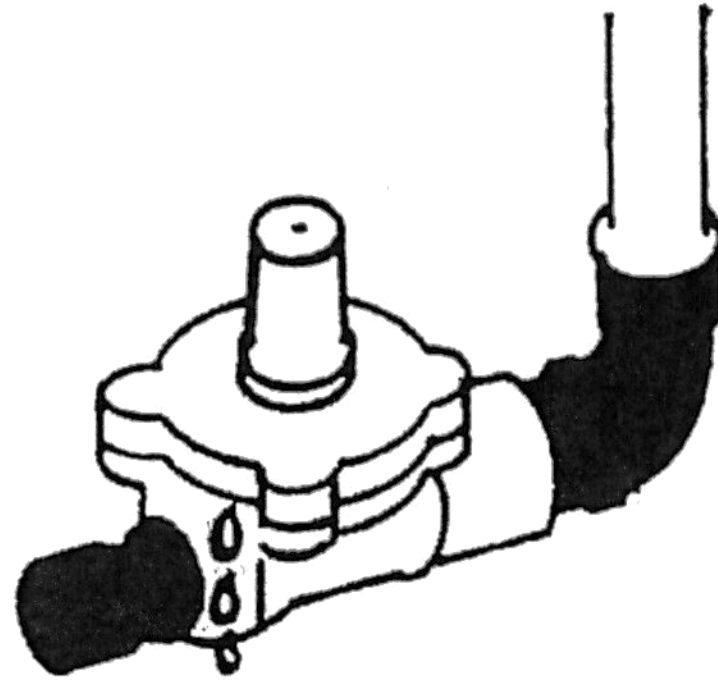
The motor will now stop during the sanitizer / rinse aid and fill sequence and start again to finish the rinse. This will allow air to escape the pump that has been trapped by excessive heat (above 150° F) or pressure dynamics of the water.



WARNING: Dishwasher pump will shut off for a few seconds during cycles. Inform operator to not open the door until entire cycle is finished.

6.18

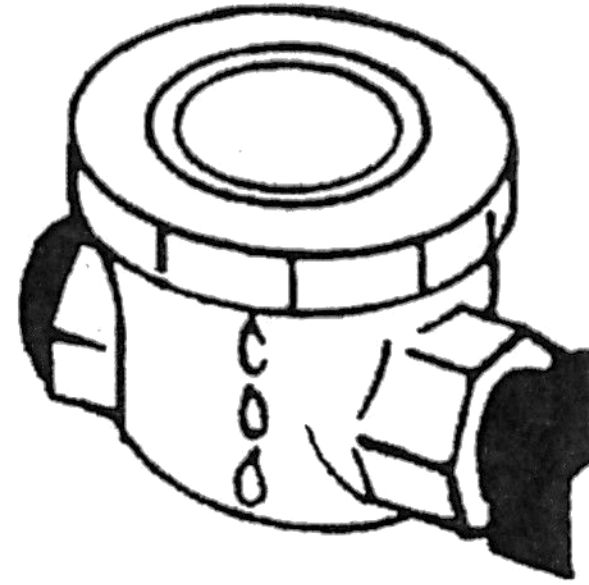
WATER LEAKS FROM
ANTI-FOAM VALVE



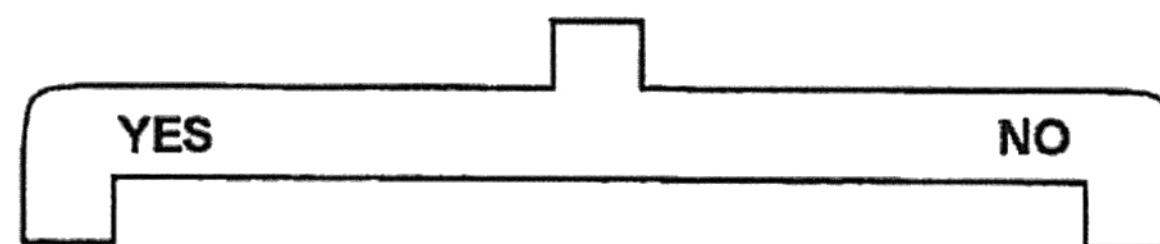
Repair and replace diaphragm
(7.5)

6.17

**WATER LEAKS FROM
VACUUM BREAKER**

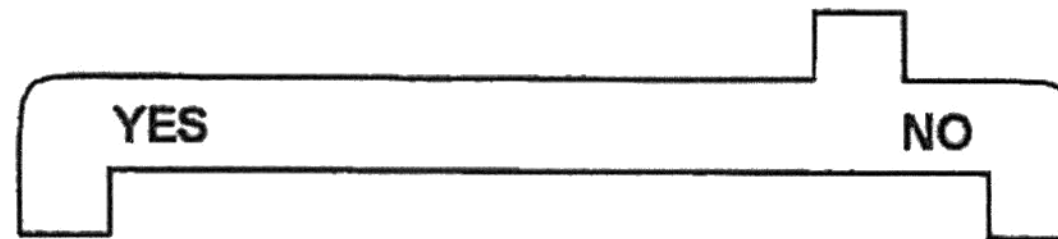


Does water leak from breaker
during the fill?



Replace vacuum breaker poppet
and inspect the seat for foreign
material or damage

Does the water leak stop when
the machine is turned off?

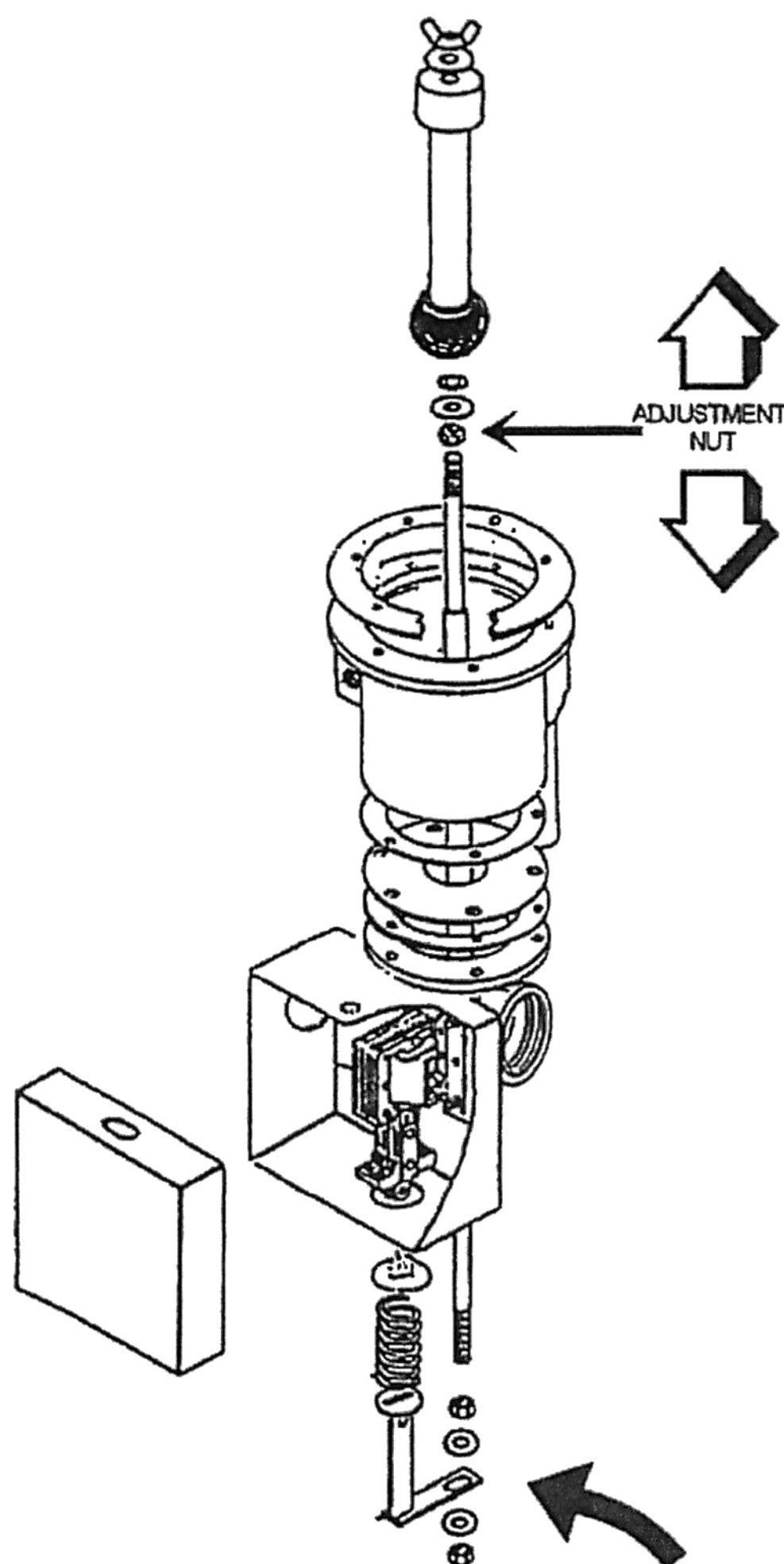


Replace check valve

Replace faulty valve
seat/diaphragm

9.0 SERVICE BULLETIN

Cautions on Inside Sump Drain Systems (ET-AF, AFW & AFWC)



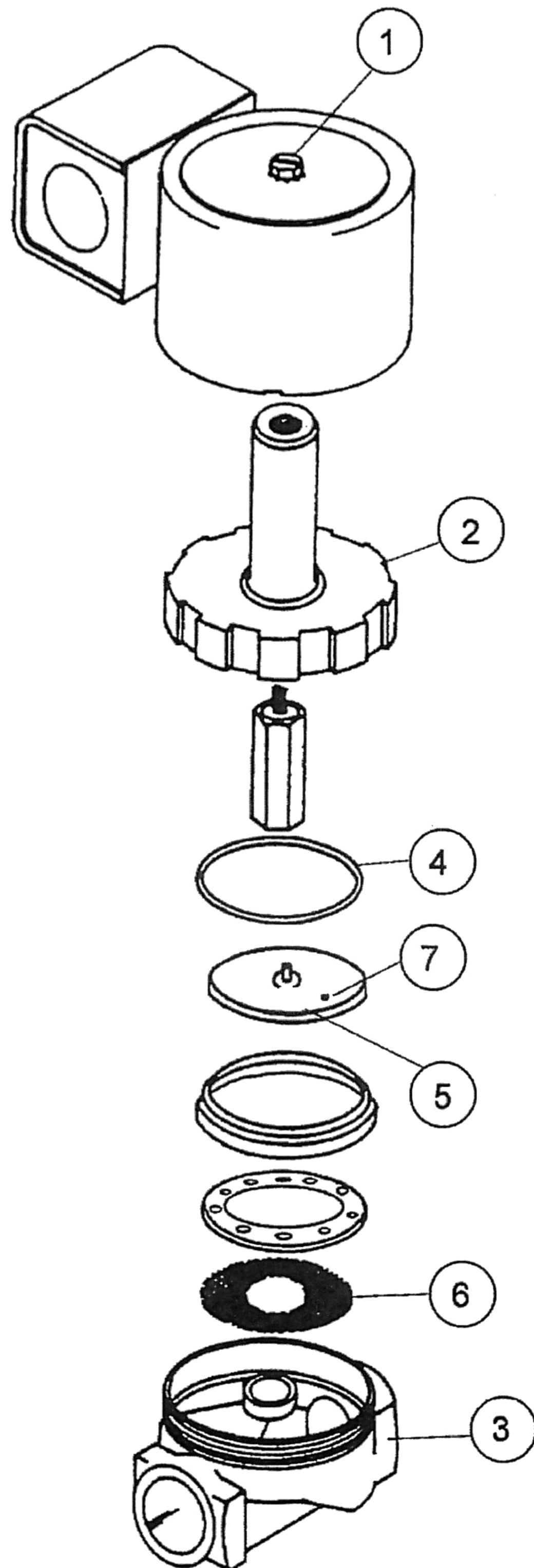
- A. Unscrew wing nut and remove drain tube assembly from drain rod.
- B. Using a 7/16" wrench, turn ¼-20 nut clockwise two complete turns and reassemble. This procedure regulates water flow to the drain, thus eliminating back pressure. If two complete turns does not eliminate the back pressure leak, repeat procedure to obtain desired results. **CAUTION:** Make sure when making adjustments that machine completely removes all water from tank in the drain cycle mode.

1. Drain should be plumbed with 1 ½" pipe or larger. Do not reduce pipe. If necessary to reduce pipe, do it as far away from machine as possible.
2. Drain should be plumbed straight out 8" before making any turns. If unable to plumb straight out, then try to adapt to a larger pipe before making any turns.
3. Do not connect to a slow running or a plugged drain.
4. If your installation dictates that you cannot follow the recommended procedures (1 – 3), then the above drain adjustment may be necessary.
5. Do not operate machine with the water level too high. (Not above the brass wing nut on the drain tube.)
6. DO NOT PLUMB DRAIN UPHILL.

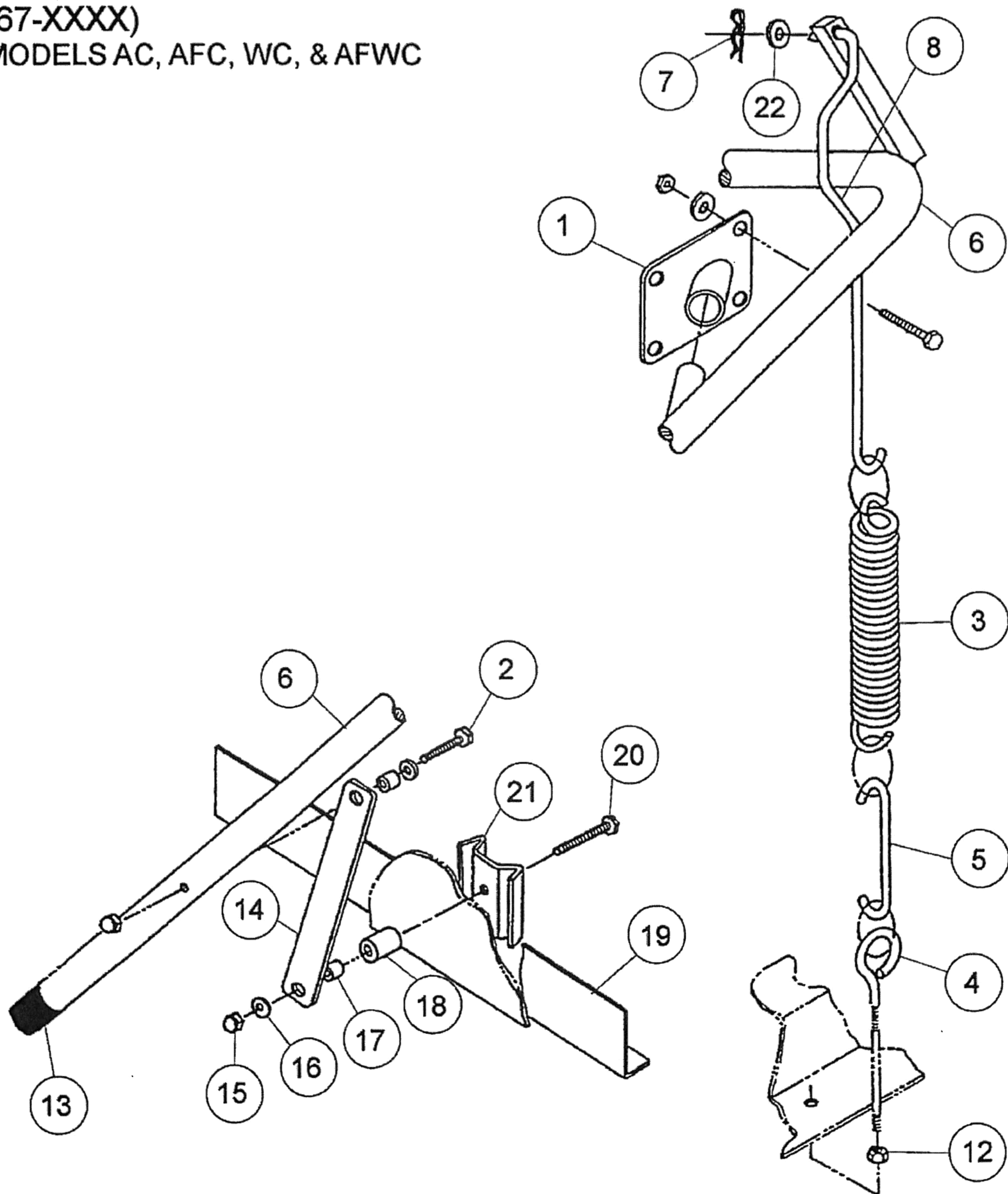
IMPORTANT:

CHECK FOR BENT OR BINDING ROD AND LINK.
ADJUST FOR SMOOTH TRAVEL UP & DOWN.

WATER SOLENOID
ALL MODELS

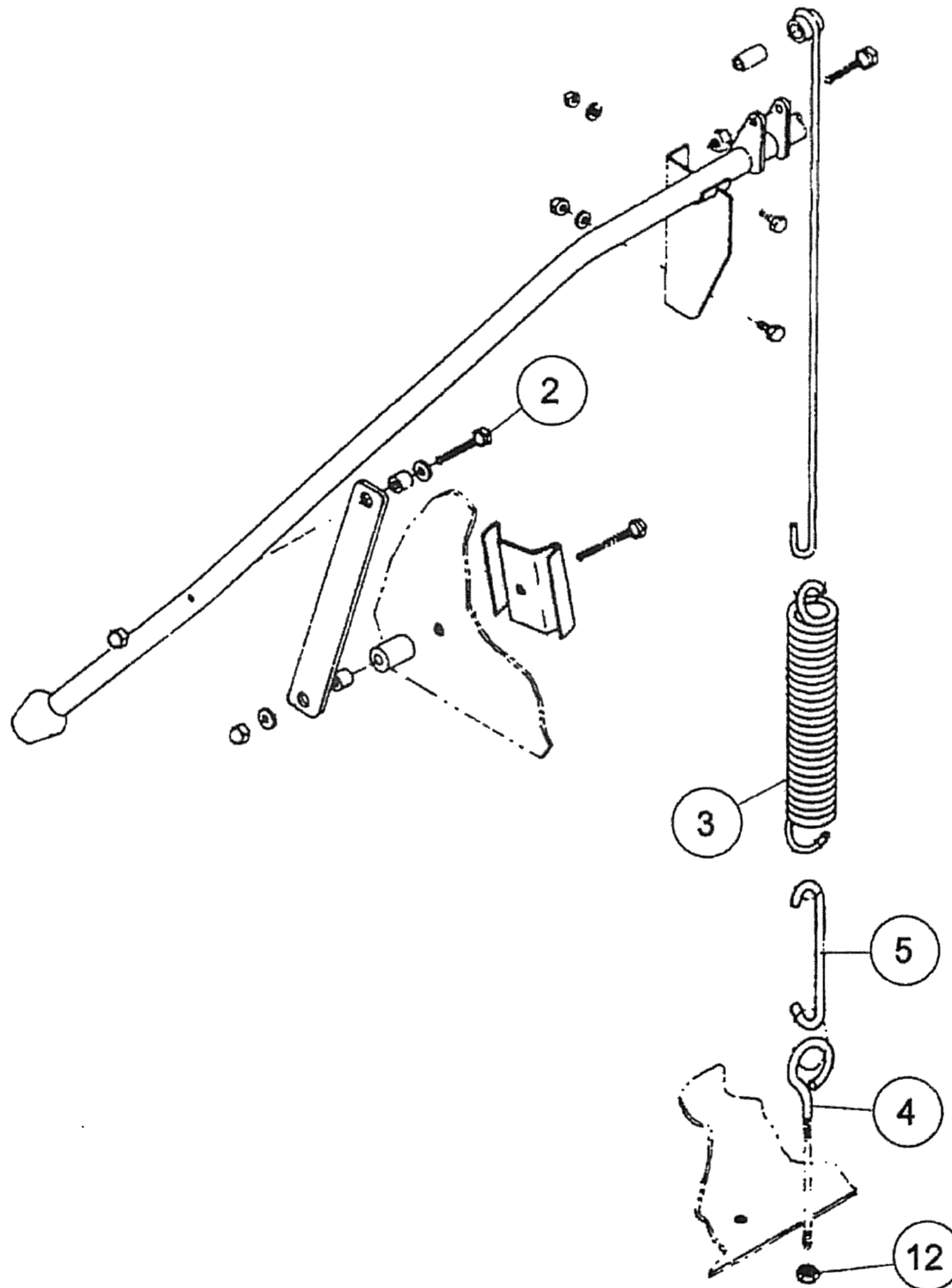


DOOR ACTUATOR
ASSEMBLY
(67-XXXX)
MODELS AC, AFC, WC, & AFWC

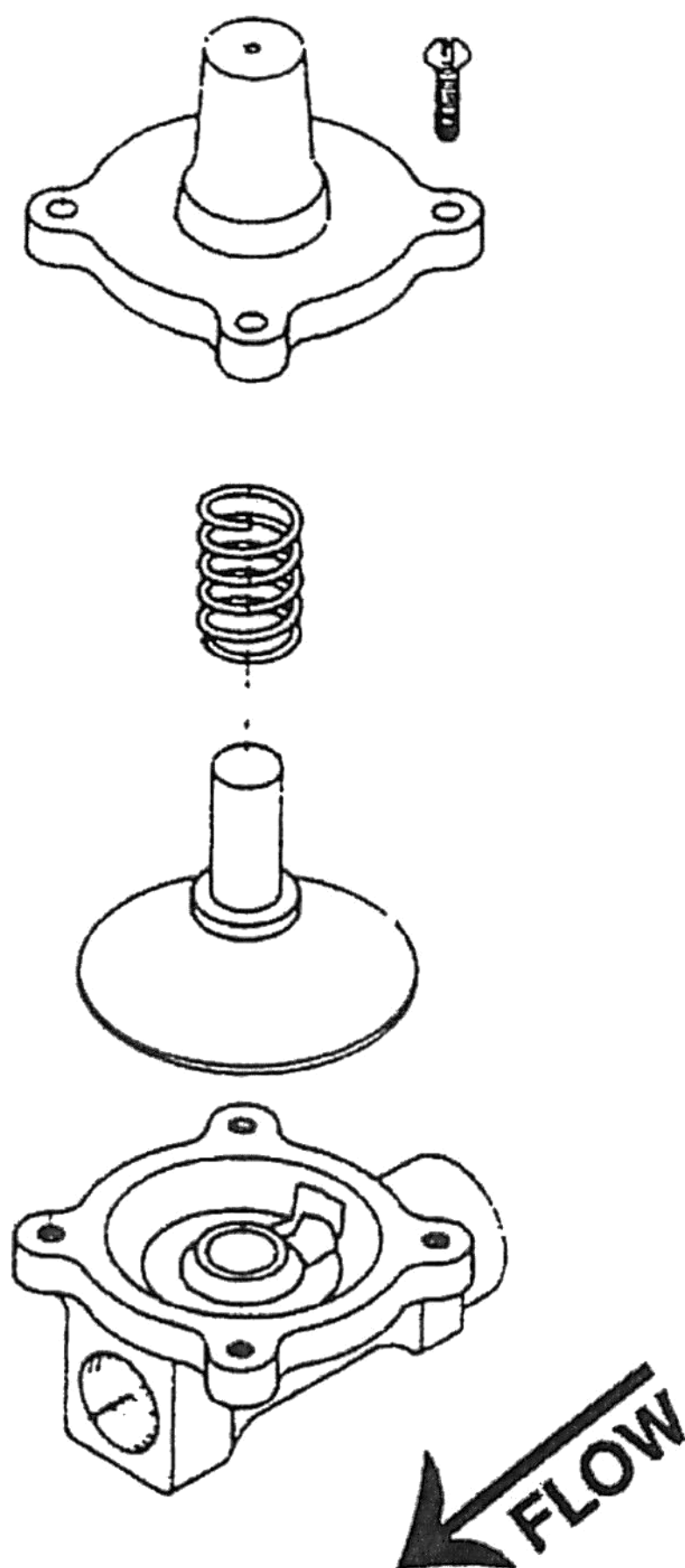


DOOR ACTUATOR
ASSEMBLY
(67-XXXX)

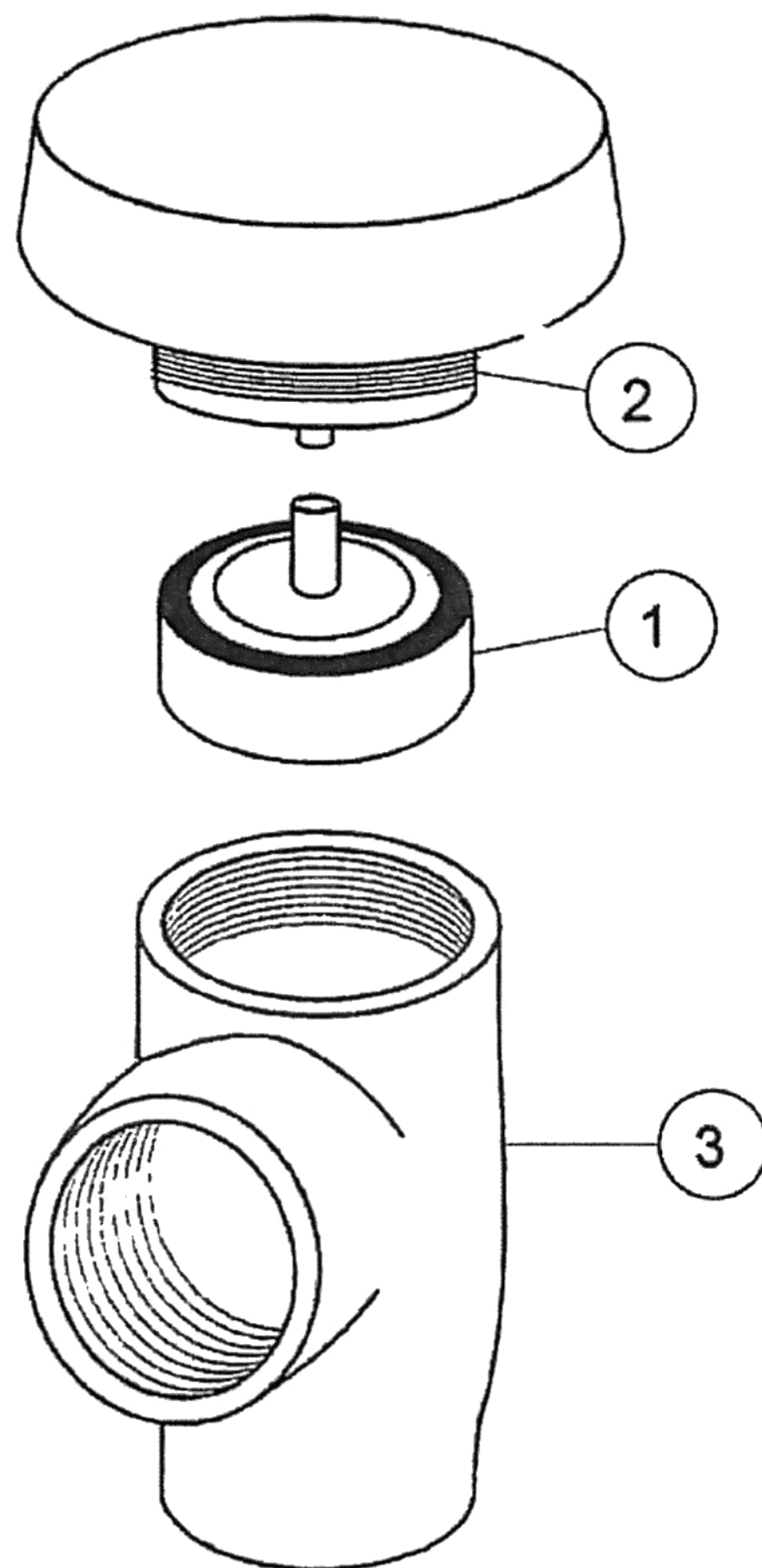
MODELS W, AFW, 5AG, 5A, AF, & A



ANTI-FOAM VALVE
(65-XXXX)
ALL MODELS



VACUUM BREAKER ALL MODELS



TECHNICAL SUPPORT MATERIAL

CONVERSION:

3-DOOR STRAIGHT TO 3-DOOR CORNER 3-DOOR CORNER TO 3-DOOR STRAIGHT

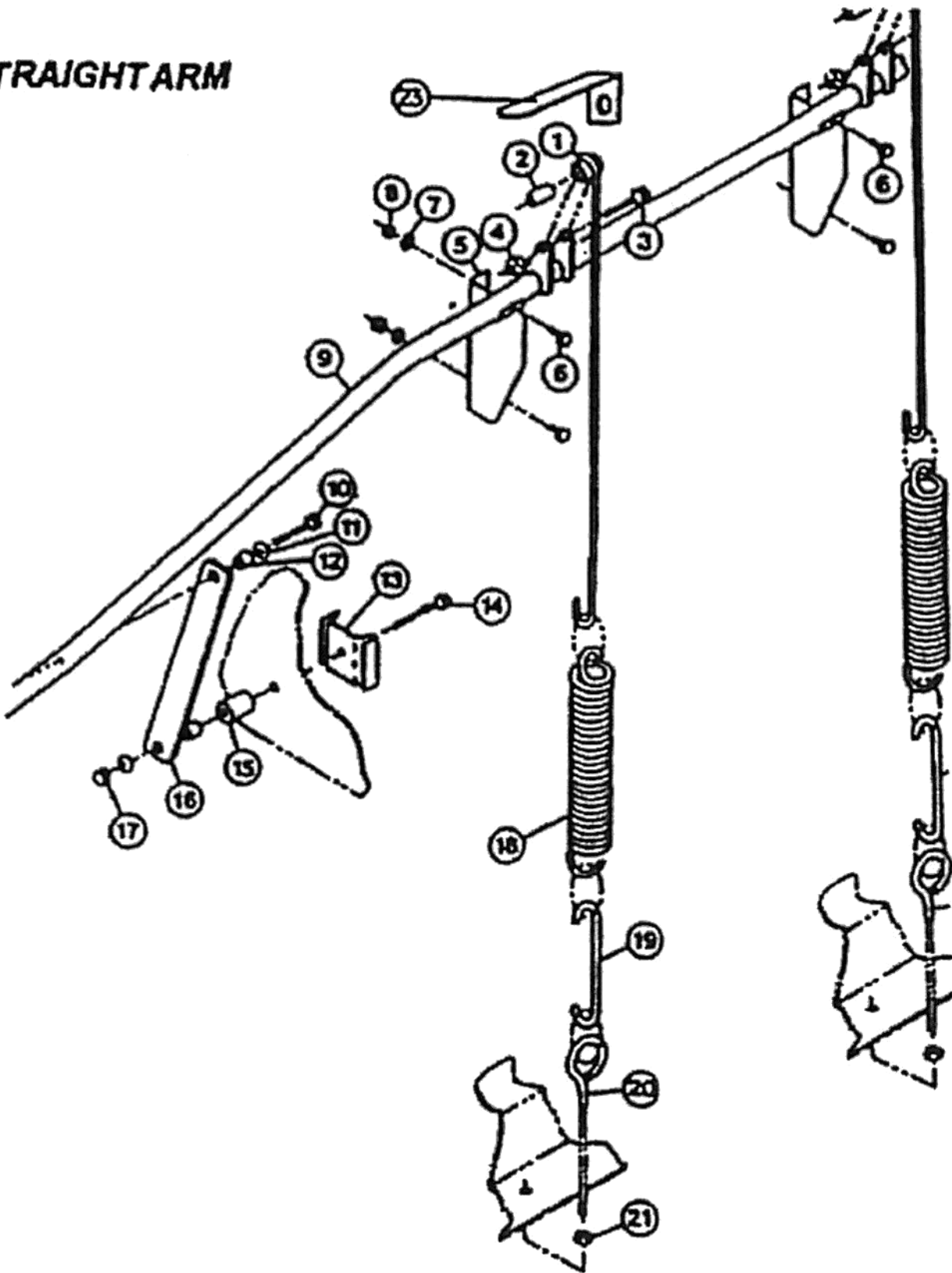
1. **Read all of the instructions first and verify you have all the parts needed before starting your conversion. If you have any questions please call 1-800-922-2178.**
2. Remove the existing lever arm and linkage hardware from the machine (including the two lever arm pivot attachments). Remove safety cut-off switch and bracket from the back of the machine. (Machines manufactured prior to 1994 may not have the safety cut-off switch installed) **CAUTION:** The lever arm springs are under tension – use caution during removal.
3. Remove the door that you wish to convert (either the machine's right-hand door or the front door as you are looking at the front of the control box) with the door guides.
4. Unbolt and remove the (dummy door) panel that serves as the "conversion" cabinet side.
5. Install the (dummy door) panel on the appropriate opening. If you were converting from **straight to corner**, you would place the panel over the machine's right-hand door opening – which is the door to your left as you stand facing the machine's front. If you are converting from **corner to straight**, you would place the panel over the door opening on the front of the machine – as you stand facing the front of the control box.
6. Lever arm pivots: For **Straight-through** machines, install the two door brackets on the back of the machine (fixed back panel with plumbing lines). There are holes provided for mounting, with nuts and bolts to seal the opening. Use these to mount the brackets. For **Corner** machines, install only one of the two pivot plates (long) in the 4-hole position located on the back wall. There are two 4-hole positions, which sit adjacent to each other and toward the back corner of the machine. Observe that these pivot plates are not the same; there is a long pivot and a short pivot. Bolt the long pivot to the back panel, its purpose is to clear the spring linkage. Later, when the lever arm is installed, the short pivot will be placed on the lever arm pivot stub and dropped-in as one unit. Then the short pivot plate can be bolted to the (dummy door) panel. This procedure will help you install the arm; otherwise, you will not be able to spread the arm enough to reach into the pivot holes.
7. Lever arm, Straight: Install the lever arm, including the assembled **spring extensions** (extensions are the bushing mounted rods with hooks of the end). With the lever arm in the 'doors-down' position, the bushing tabs, which are welded to the lever arm, should be pointing up and the extensions should be hanging over the outside of the lever arm (backside).
8. Lever arm, Corner: Put the Corner (square shaped, open on one end) lever over the top of the machine and slide into place on the one installed pivot plate (long) on the back wall of the machine. The extension mounting bar (SS block welded to lever) should be **pointing up**. The Corner spring extension (shaped like a 'dog-leg') should be installed through the extension-mounting bar with the copper washer and cotter pin. **The extension will hang between the lever arm and the back of the machine, with the hook hanging downward.** The remaining pivot plate (short) should be placed over the lever arm pivot stub. After the arm is slid into place, bolt the remaining pivot plate to the (dummy door) side panel.
9. Door Springs: Place the Springs (two springs for Straight, one large spring for Corner) on the extension hooks. Place the secondary extension ('C' hook) on the bottom of the spring and through the eyebolt. Then pull the eyebolt down through the hole in the frame located directly under each spring assembly. The ADS tool #88-1052 simplifies the pulling down and threading of the eyebolt. A 5/16" nut is used to secure the eyebolt.
10. Door guides: Install door guides on the open door. Leave bolts loose. Put the doors on, but do not attach to the lever arm linkage yet. The doors should be centered over the door opening and laying flat across the top of the machine. Now, slide the right door guide next to the door and tighten the four bolts securing the door guide. Move the left door guide toward the door with approximately 1/8" clearance. Tighten the bolts on the left door guide. **NOTE: both doors should now move up and down freely with no binding. The doors and guides must be parallel to each other.**

There should be a 1/16" to 1/8" play between door and the two guides.

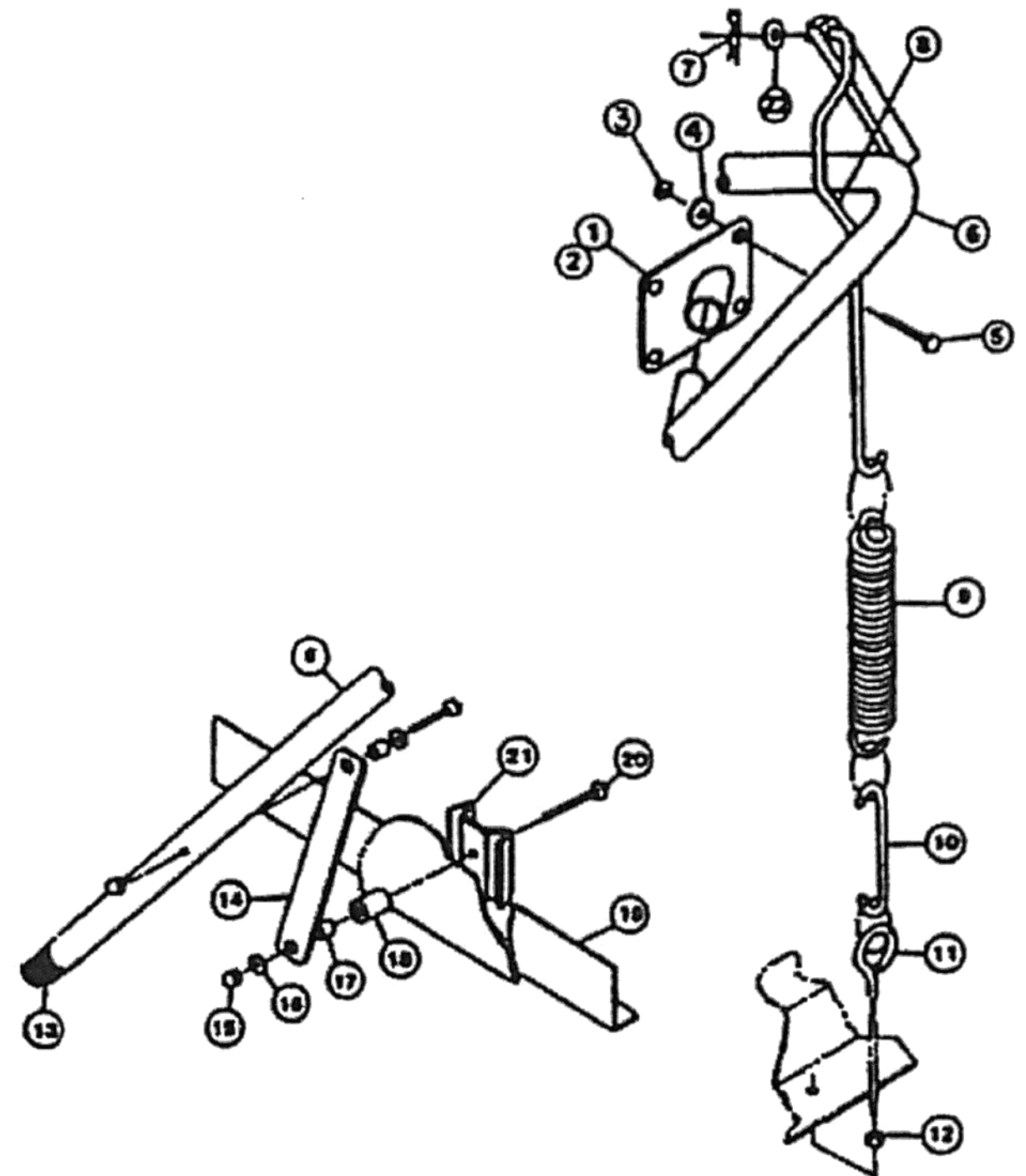
11. Door Links: Install door links, doorstops, door brace, and connect links to lever arm.
12. Adjust Doors: From 1.5" to 2" of threaded eyebolt should be extending below the adjusting nut. The cantilever arm should hold the door in the open position as well as in the closed position. If the doors droop down from full-up position, you need more of the eyebolt extending below the adjusting nut. If the doors won't stay down, you need less of the eyebolt below the nut. **Doors Uneven**: the lever arm is the cause of one door rising above the other. The lever arm must be bent further to even out the alignment. Hold one side down while lifting on the other until the doors are even.
13. Installing Door Cut-Off Switch: In the **Straight** configuration, the switch is mounted over the machine's left shoulder (your right as you face the machine). There are two holes on the back wall of the hood, over the lever arm bracket holes. Mount the switch bracket on these holes. An 'L' lever goes on the spring extension bushing bolt and acts as the stop for the cut-off switch's plunger. The orientation of the switch plunger wheel is at a right angle to the lever arm. In the **Corner** configuration, the switch is mounted above, and to the rear of the long pivot plate, which is mounted on the back wall of the hood. Mount the switch bracket in the two holes located there. The plunger rides on the arm; **the 'L' lever is not used**. The orientation of the switch plunger wheel is parallel to the lever arm (four screws holding the plunger head in can be removed and the head rotated 90°).

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STRAIGHT ARM



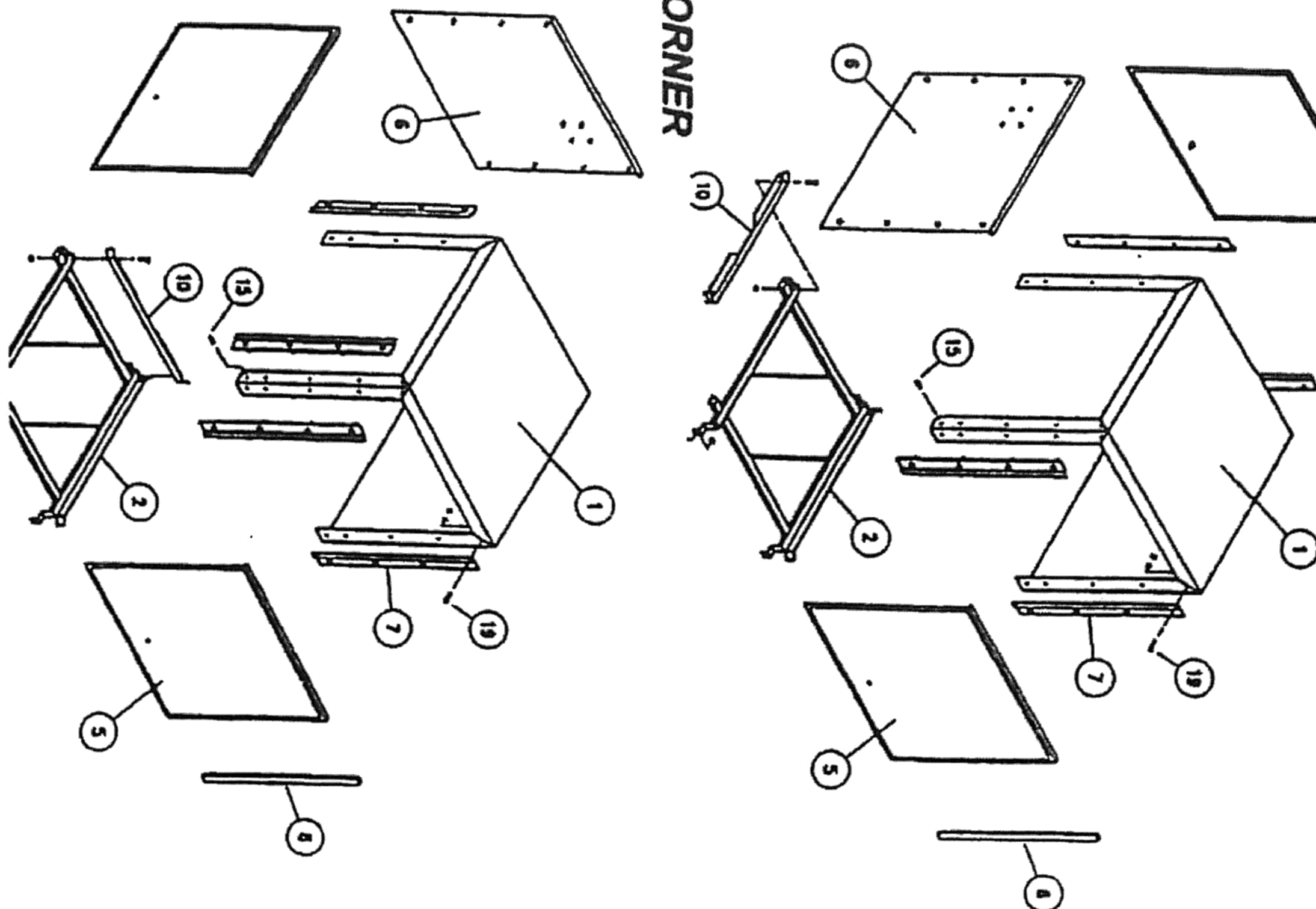
CORNER ARM



Cabinet Assembly

STRAIGHT

CORNER



American Dish Service

AMERICAN DISH SERVICE FIELD SERVICE

INSTALLATION INSTRUCTIONS FOR *DOOR START SWITCH* KIT #88-1027

Mounting Door Switch

(for machines manufactured before 1991 or currently do not have a "door cut-off" switch)

1. Mount 'L' bracket on spring extension pivot bolt.
2. With the door closed, position switch bracket assembly on cabinet and mark the layout for the two holes.
3. Drill two ¼" holes.
4. Mount switch/bracket assembly with two ¼" x 20 x ½" hex bolts, washers and locknuts. The switch should be fully depressed when the door is closed.
5. Install ½" conduit to the rear or bottom of the control box and connect to door switch. Run the two red wires, which are connected to the door-switch's "normally open" position, into the control box.

NOTE: For older model machines, made before 1991, attach one of the red wires coming from the newly installed door-switch with the red wire on top of the #3 micro switch on cam timer. Attach the other red wire coming from the door switch to the terminal on top of the Mercury Relay Switch (the terminal with heavy red wire). Then cut and remove the existing red wire going from the top of the mercury relay to the red wire "daisy-chain" across the top of the cam timer switches.

Mounting and Wiring Door Start Relay

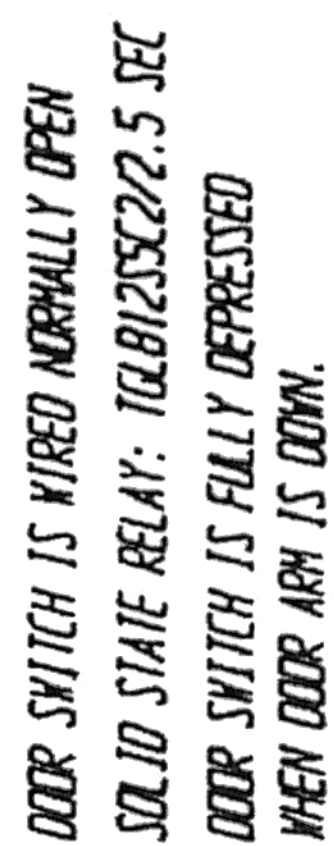
1. Drill ¼" hole in control box platform shelf close to cam timer. Bolt the Door Start Relay down onto the shelf.
2. Piggy-back the RED wire to the supply (red) wire going to the top of cam timer switch #2 (detergent), and attach the other end to terminal pin #2 on the Door Start Relay.
3. Piggy-back the YELLOW wire to the supply (yellow) wire going to the top of cam timer switch #1, and attach the other end to terminal pin #1 on the Door Start Relay.
4. Attach the WHITE wire (with ring terminal) to the (white) coil terminal of the Mercury Relay Switch, then connect that wire to terminal pin #3 on the Door Start Relay.
5. Remove the "instant start relay" (or ice-cube relay). Turn power on and close the door. The machine should start up and run through a complete cycle.

OPTION: In order to fill the machine while the doors are open (or avoid having the machine start without water already in the pan), you must do the following:

1. Remove the red wire off the fill switch and securely insulate the end.
2. Install a new red wire from the top of the mercury relay (same as heavy red wire) to the terminal on the fill switch which was vacated by step #1.

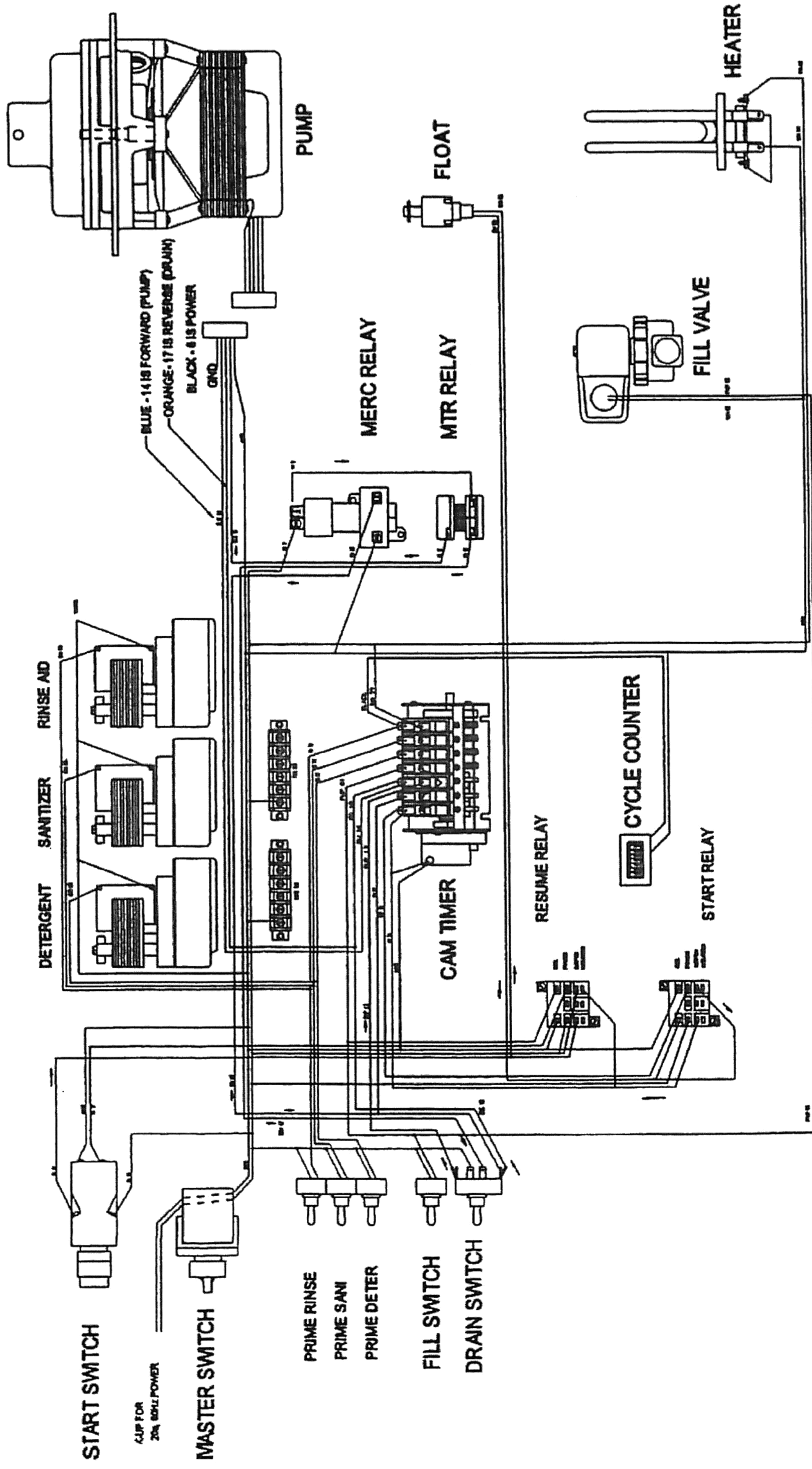
DOOR START (AUTO) SWITCH INSTRUCTIONS

SWITCH BRACKET
ODOR START SWITCH —
"L" BRACKET —



RECEIVED

ASQ control wire layout



TECHNICAL SUPPORT MATERIAL

The “Koolaid™ Test”

Even for the ware-washing industry, occasionally there comes a marketing strategy of some cleverness. The “Koolaid™ test” is one of these. The test is reportedly conducted by emptying the contents of a punch-mix packet into a batch-type (dump/fill) dishmachine. The demonstration shows dye ‘carry-over’ from the wash cycle’s soil to the rinse cycle’s clean water. When the dye color is seen in the clear rinse water, it is represented as proof the machine is incapable of reliable rinsing. Then, without a side by side demonstration for comparison, it is explained that the machine being offered as a replacement has a lower sump and by-pass/reprime tube that prevents this reported rinse problem. This amounts to a challenge without having to step onto the playing field.

Explanation: The cleverness is the use of dye, which has properties altogether different than that of food soil and chemicals. Concentrated water soluble dye has the unique characteristic of extension and permeation (covers and stains everything). Other factors will act as a mordant (reagent) or fixing agent such as temperature, acids, salts, potassium, or generally speaking, everything found in a dishmachine. Once introduced to the machine’s internals, it will take several washings before the dye is completely removed (an illustration is found washing blue denim trousers).

The “test” is playing on the inherent weakness of all batch-type equipment, including the machine being represented as a solution. That weakness is any pump that provides the recirculation for both wash and rinse liquids will mingle the two solutions to some extent. That is why all manufacturers have stressed balancing or tuning the machine. When drain, flush and fill are balanced a clear and effective rinse is obtained. Carry-over of chemicals and soil found in the rinse can best be measured by accepted industry methods. A Phenolphthalein test will demonstrate more accurately the presence of detergent chemical residue, rather than expanding dye crystals. Unlike the soils, which are emulsified and carried away by the flush, the dye will repeatedly color the chemicals, food, pipes, gaskets, and water alike. If the Phenol test shows clear, then a complete rinse has occurred.

More to the point, we believe the real reason for the ‘reprime’ tube facing back against the pump filter screen is actually a severe design failure of the flat filter screen. Although an expedient necessity in this fabricated sump, the flat filter is limited in effective surface area. It is hoped that the reprime tube would dislodge debris but in operation the screen only clogs beyond use. When the clog occurs, water cannot go around. Once observed, this unfortunate combination is easily recognizable in all machines of this design. The dye test is a diversion from the real issue. Contrast the ADS design that has a cylinder standoff filter, which gives accessible surface area for the entire filter. Basically, it can run all day. If you balance the dump and fill dishmachine, results will be clear – carry-over will not be the issue.

Dyeing: process of coloring materials, such as textile fibers, so that the color becomes part of the fiber. Dyes, or dyestuffs, are compounds that are absorbed by the fiber or chemically combined with it.

History

Dyeing was practiced in Egypt, Persia, China, and India thousands of years ago. In 1856 the first synthetic dye, mauve, was derived from coal tar. Since then a great number of synthetic dyes have been developed, and the use of natural dyes has almost ceased.

Dye Classification

Dyes are classified as either natural or synthetic. With few exceptions, all dyestuffs are synthetic organic chemicals. Dyers generally classify dyes based on the application method. Direct dyes produce colors in fibers placed directly in the dye solutions. Indirect dyes produce colors only if the fibers are chemically treated before or after dyeing.

Direct cotton dyes are used to color cellulose fibers. Other direct dyes include acid dyes – used for protein fibers such as silk and for synthetic fibers such as nylon – and basic dyes, used for fibers such as jute and acrylic. Developed direct dyes are similar to direct dyes but must be formed on the fibers.

The simplest method of indirect dyeing involves pretreating the fiber with mordants (fixing solutions) before applying the dye. Some indirect dyes must be chemically altered to be soluble in water. Other dyeing methods include dispersed dyes, reactive dyes, and pigments. Dispersed dyes are colloidal suspensions of dyes in mild alkaline solutions (see Colloid). Reactive dyes form stable chemical links with fibers. Pigments are finely ground particles bonded to fibers.

Dyeing Processes

Textile materials can be dyed at any stage in their manufacturing process. Fibers can be dyed and then woven into patterned fabrics or solid colored clothes. Colored designs can also be formed on woven cloth by several processes.

There are three methods of pattern dyeing and printing: direct, resist, and discharge printing. In direct printing, a design is etched into a roller, which is coated with dye and rolled onto the fabric, or dye is forced onto the fabric through a screen. In resist printing, a dye-repelling substance is selectively applied to the cloth, which is then placed in a dye bath. In discharge printing, the whole fabric is dyed. A pattern is then printed on the fabric with a chemical that alters the dye, creating a white pattern on a colored background.¹

Gelatin: protein substance obtained by boiling animal bones and connective tissue containing collagen in water or dilute acid. It is colorless, transparent, brittle, odorless, and tasteless in a purified form. Gelatin dissolves in hot water and forms a gel or jelly upon cooling. It is insoluble in organic solvents, such as ether, chloroform, and benzene. When placed in cold water, gelatin takes up five to ten times its own weight and swells to an elastic, transparent mass.

Gelatin in its purest form is used as a constituent of foods, being highly nutritious and easily digested and absorbed. It cannot, however, completely replace other proteins because it lacks some essential amino acids. Gelatin is used in making jams and jellies, ice cream and marshmallows and as a setting for other foods in aspics. It is employed in photography in the preparation of film, plates, and paper; in bacteriology as a culture medium; and in medicine as a coating for capsules, pills, and some surgical dressings. It is also used in dyeing and in photomechanical printing processes. Glue is an impure form of gelatin. A purified form of gelatin obtained from the air bladders of certain fish, including sturgeon, cod, catfish, and carp, is called isinglass.²

Uses

Potassium is used in photoelectric cells and its many compounds have a variety of uses. Potassium bromide is used in photography, engraving, and lithography. Potassium chromate and potassium dichromate are used in textile dyeing and in leather tanning. Potassium nitrate, which occurs naturally in saltpeter, is used in matches, explosives, and fireworks. Potassium hydrogen tartrate, commonly known as cream of tartar, is used in baking powder and in medicine. The term *potash* is used for a number of potassium compounds, including potassium carbonate, which is used in making glass and soft soap, and potassium hydroxide, which is used in the manufacture of soap.³

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TECHNICAL SUPPORT MATERIAL

Power Cord Attachment on Door-Type, Single Tank, Chemical Sanitizing Dishmachines

Reference: National Electrical Code, UL Standard #921, Commercial Electric Dishwashers

While the NEC (section 426-51) allows power cords with rated values of 20 or less amperes, it is clear from section 430-32 that motors greater than 1 HP be supplied on a *separate overload device*. A wall outlet would not insure a separate overload device such as a fuse or circuit breaker for the motor alone. The intent is protection of the motor power supply. A hard-wired supply with the correct wire size would offer better service for the machine and is the recommendation of the manufacturer.

The Underwriters Laboratories standard for dishwashers states (section 10.1, #921) that power cords can be used for portable dishwashers but the cord shall be no longer than 6 feet and be Type S, SE, SO, SOO, ST, STO or STOO Cord. However, it also states the machine must not exceed a rated 15 amperes. The ADS machines in question are UL rated 20 Amps, and are not compliant with UL Standard #921 if power cords were used.

We provide the language of UL #921, section 10.12 concerning permanently connected dishwashers.

10.12 A dishwasher intended to be fastened or secured in position or permanently connected to a water supply and drain line shall be provided with field-wiring terminals or leads for the connection of power-supply conductors, and means for connection of a permanent wiring system.

This code and standard language makes it clear that all ADS equipment is considered permanently connected and could not use a power cord.

payzant/ADS/8.31.00

TECHNICAL SUPPORT MATERIAL

Model AF series Batch-Type Dishmachine Operation (Water Temperature and Water Heaters)

Operating a batch-type dishwasher requires first turning on the master switch, filling the machine by pushing the "fill" button on the control box. Then opening the doors, placing a loaded dishrack inside, close the doors and push the "Start" button. The machine will typically run for 45 seconds, drain for 15 seconds, refill with hot water (NSF 120° F minimum rinse water, better results are obtained at 140° F and poor results begin at 160° F) and then rinse. The next batch will then use the hot water from the previous rinse cycle as it begins the new wash cycle.

The "machine's hot water" is supplied by the building's primary water heating facility. There are no tank heaters in a batch-type design. It depends entirely on supplied hot water and uses the water twice. After utilizing the water for the second time (wash cycle), the machine discards the batch then refills with new hot water for rinsing. The demand is approximately 82 gallons per hour for a 90-second cycle, single-rack model (118 gallons/hour for double rack). These are specifications for operation and temperature must be supplied by the building. The water heater has a "recovery rate" data plate attached to the tank, on that plate is a number related to the amount of water heated to a certain temperature rise in an hour's time. This number is the gallons per hour recovered, and it is the number you are looking for. If it is below the machine's total demand, you will run out of hot water.

Maximum and Minimum Tank Temperatures

NSF certifies a minimum operating temperature during the listing process. These minimum temperatures are placed on the machine's data plate. Only the final rinse on High Temp machines have a required Maximum statement, that of 195° F. Other maximums are according to manufacturer's operating specifications. Exceeding recommended temperatures create result problems and can affect performance. Excess of 165° F in tank temperatures is not recommended by ADS. Reference ANSI/NSF 3 – 1996, p 7

Advantages and Realities of Batch Design

The savings in water and energy come from the fact that there are no booster heaters required and there are no sustaining heaters that run constantly. However, if the dishmachine sits idle for long periods of time, temperature will be lost from the former rinse water. A thermometer is provided to monitor water temperature. There is a NSF data plate on each model that describes minimum temperature levels for each machine type. When the temperature drops below the minimum, the batch should be dumped and the dishmachine refilled with hot water. If water in the line has cooled over time, the machine should be filled until hot water is again available. This usually takes running the machine through several cycles, but the least expensive way is dumping the water out and refilling

If the water heating facility in the building is more than twenty feet from the machine, it may require an additional heater, pipe insulation, or moving the water heater. The greatest demand for water in a food service facility is the dishwasher; the water heater should be as close as possible to avoid loss of cleaning and heating efficiency. ADS machines are all listed with NSF International as Chemical Sanitizers (batch-type) or Hot Water Sanitizers, they are tested to ANSI/NSF3 standards and listed with UL standard #921 Commercial Dishwasher.

180° F Booster Heaters

ADS makes no machine with an internal booster heater. ADS makes no booster heater. When boosted temperatures are needed, a separately installed booster must be supplied with its own electrical circuit. These booster heaters are made by others and must be arranged before installation of the ADS dishmachine, when such temperatures are required.

LOW LEVEL ALARM BILL OF MATERIALS **031-0326 CHEMICAL ALARM**

QTY	PART NUMBER	DESCRIPTION
1	091-3080	Vacuum Switch
1	092-1137	Fitting, Tee, 1/4" Hose Barb (plastic)
1	087-6700	Squeeze Tube
1	091-5110	Wire, Green 18GA x 12"
1	091-5108	Wire, White 18GA x 12"
1	091-5109	Wire, Black 18GA x 12"
4	091-5202	Terminal, .187 Female Spade
1	091-5210	Terminal, Ring Connector
1	091-5204	Terminal, .187 Piggyback Spade
7	091-5220	Cable Tie, Small
2	098-1213	Screw, #3 x 3/4" Lg, SS
2	098-2002	Nut, #3, SS
1	037-2103	Buzzer
1	098-1102	Screw, 6-32 x 1/4" RH, SS
1	098-1104	Screw, 6-32 x 1/2" RH, SS

WIRES

GREEN WIRE 18 Gauge 12" Long

91-5204 .187 Piggy-back Terminal on One End

91-5202 .187 Female Spade Terminal on One End

WHITE WIRE 18 Gauge 12" Long

91-5202 .187 Female Spade Terminal on One End

91-5210 Ring Terminal on Other End

BLACK WIRE 18 Gauge 12" Long

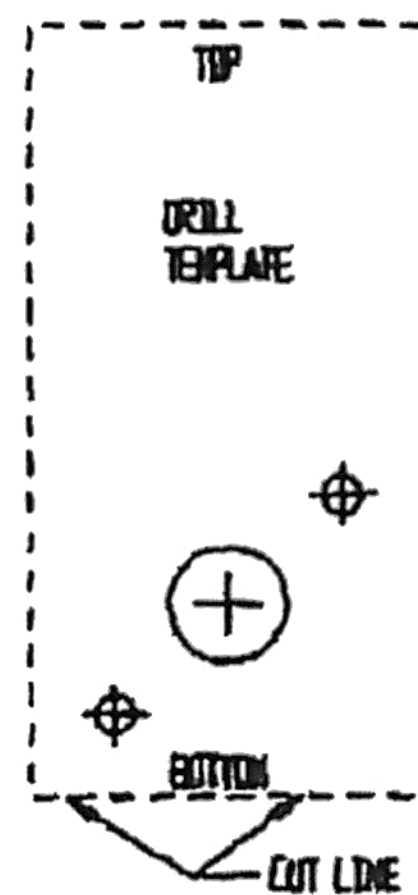
91-5202 .187 Female Spade Terminal on Both Ends

LOW LEVEL ALARM WIRING INSTRUCTIONS

1. Connect the green wire with the green wire on the bottom terminal of the sanitizer micro switch on the timer.
2. Connect the other end of the green wire to the common terminal of the vacuum switch.
3. Connect one end of the black wire to the normally open terminal on the vacuum switch.
4. Connect the other end of the black wire to one of the terminals on the buzzer.
5. Connect one end of the white wire to the other terminal on the buzzer.
6. Connect the other end of the white wire to the bottom terminal on the mercury relay, that has all the white wires on it. (NOTE: On 3-D models connect the white wire to the terminal on the delime switch with the two white wires.)

LOW LEVEL ALARM INSTALLATION INSTRUCTIONS

1. Using the provided template, mark the holes and drill. The center hole is 3/8" and the two other holes are 1/8". NOTE: Try to mount the vacuum switch above the chemical line to prevent back flow of chemicals into the switch.
2. Bolt the switch to the control box.
3. Drill a 3/16" hole and mount the buzzer.
4. Connect the long rubber hose to the vacuum switch and the middle leg of the plastic tee.
5. Connect the two short rubber hoses to the other two legs of the tee.
6. Locate the 1/4" chemical pick up line for the sanitizer pump and cut it so that the plastic tee can be put in line.
7. Use cable ties to secure all of the ends of the rubber hose.
8. Wire the low level alarm using the wiring instructions.



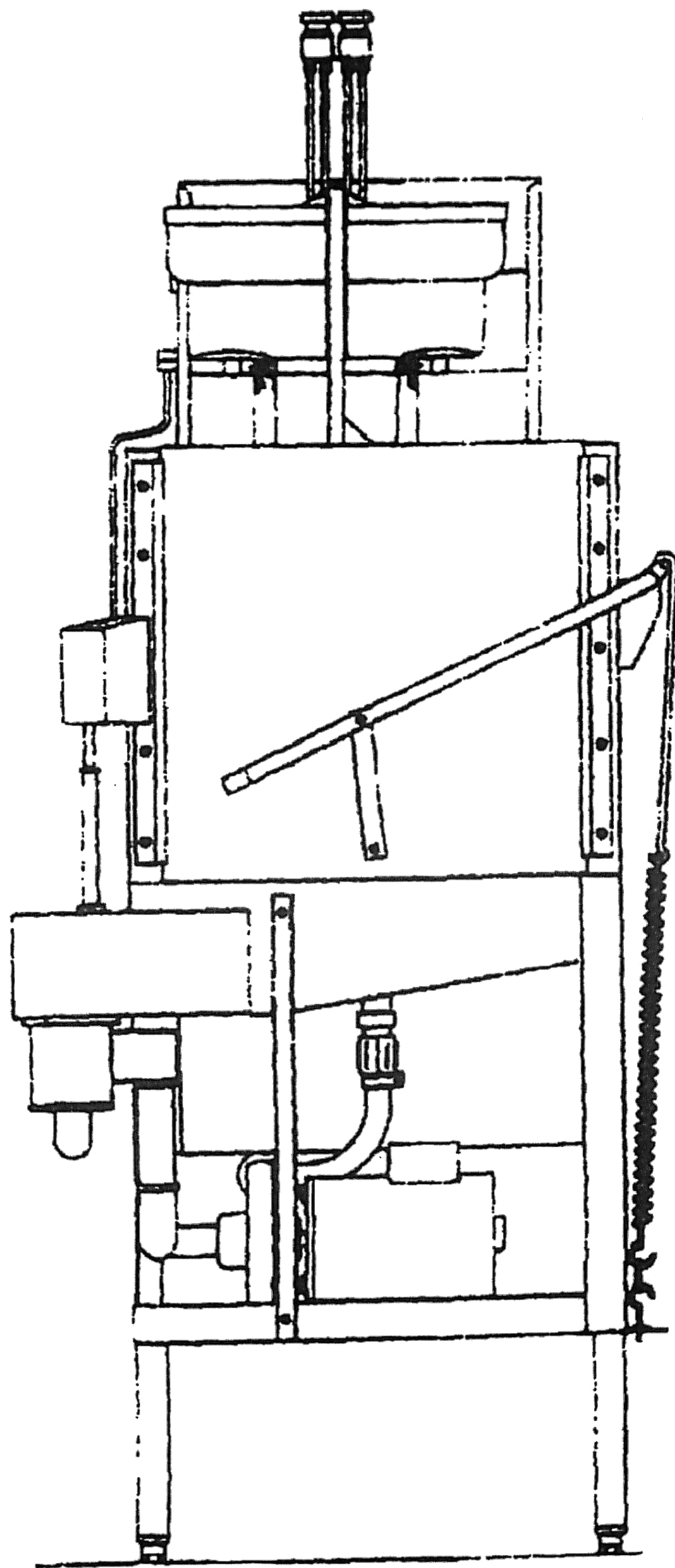
WAREWASHING WITH SOLIDS

With valued assistance from our distributors, ADS has redesigned our popular 3-D series machine to accommodate solid products. This machine gives you the dependability of the ADS line with the versatility that is only provided by American Dish Service.

- *Two Solid "Beta" or "Viking" dispensers – integrated into the Design of the Machines.
- *Quick change components (Water Solenoid and Peristaltic Pump). Complete versatility from "Liquid to Solids" or Vice Versa!
- *Visual Dispensing – Customers can see chemicals entering the machine! A stringent NSF requirement.
- *Fine Tuning Timer lets you dial in the exact amount of chemical products. Now you can actually get the advertised number of racks out of your solid container. ADS optional adjustable timer allows you to fine tune chemicals down to a tenth of a second.
- *Simple Installation! ADS offers a complete machine with connected water lines. Eliminate needless, costly trips for supplies.
- *Water line service valve – Allows you to adjust water supply to chemicals!
- *Convertible Machine can be Corner or Straight
- *Other Standard Features:
 - Auto Start
 - Large Capacity Internal Scrap Accumulator
 - 1 ½ HP Pump
 - Built-in Prime & Deliming Switches

PRICING

One Solid Dispenser	\$160.00
Two Solid Dispenser	\$280.00
Chemical Dispenser Adjustable Timer	\$ 40.00

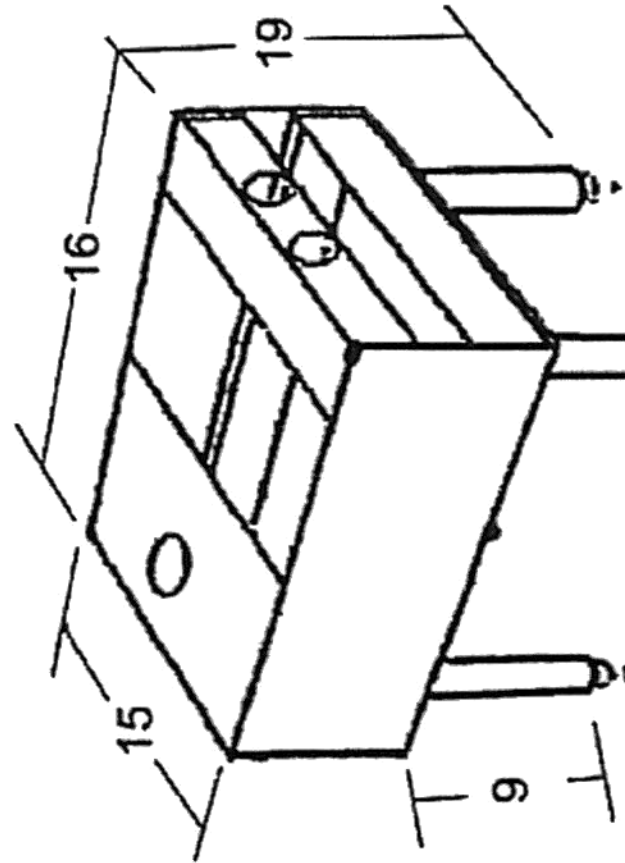


AMERICAN DISH SERVICE

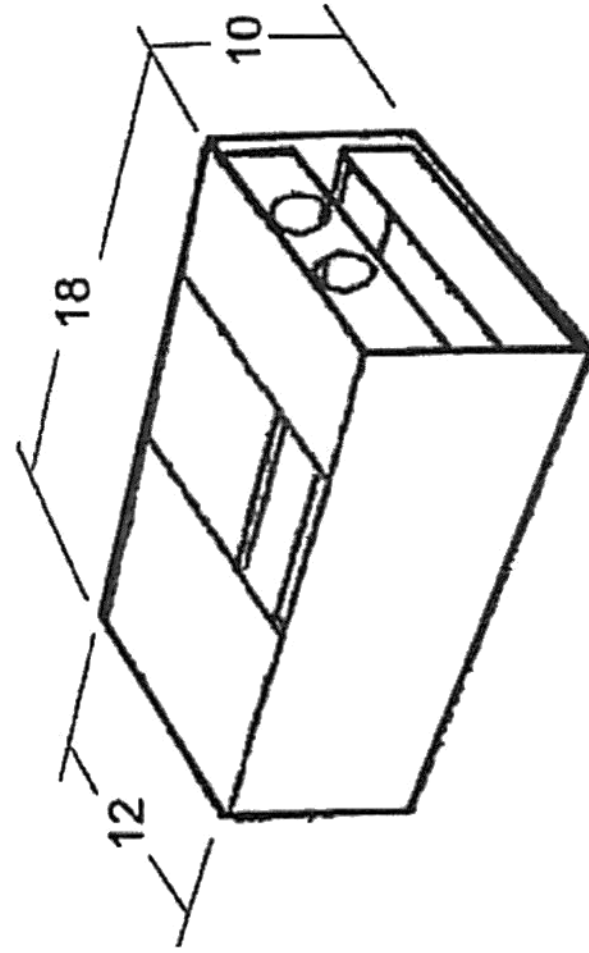
3D-S Tray
8 3/4" W x 21 1/4" D x 1 1/8" H
5AG-S Tray
9 3/4" W x 21 3/16" D x 1 3/8" H

*Rear or Bottom Exit 2" MPT

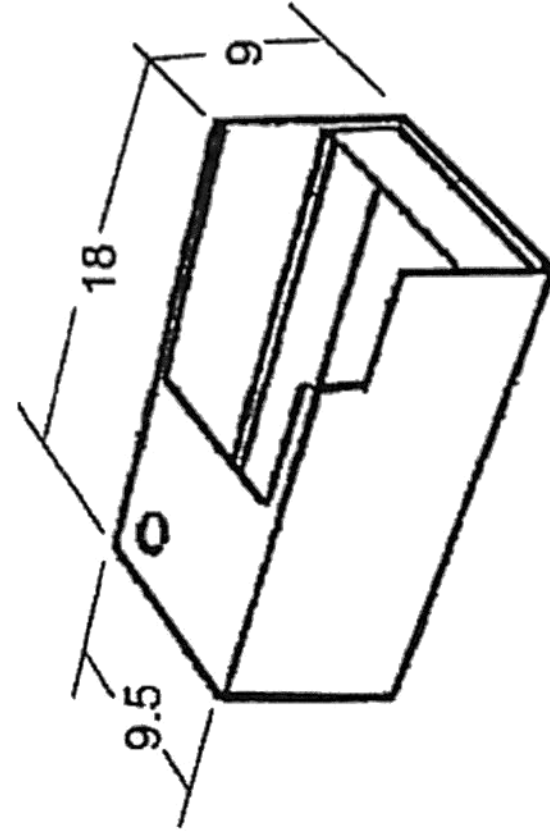
*Tray Measurements Do Not Include Handles



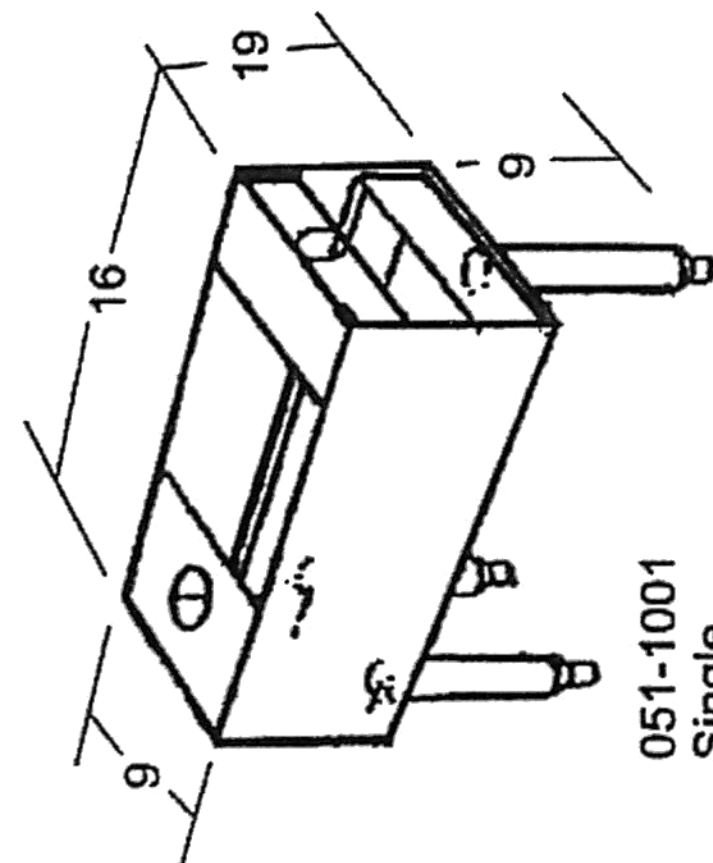
051-2001
Double
089-9129 Scrap Trap
Tray Double
14 1/2" W x 14 3/4" D x 1 3/4" H



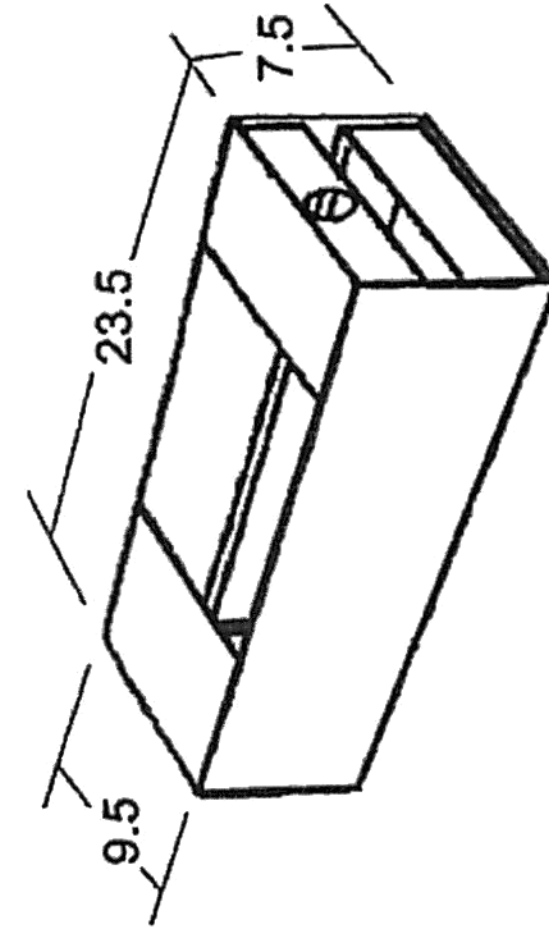
051-4001
Dual Purpose
089-9154 Scrap Trap
Tray Dual
11 3/8" W x 16 1/2" D x 1 1/4" H



051-5001
Low Water Inside
089-9195 Scrap Trap
Tray 'L' Series
9 1/4" W x 17 1/4" D x 2" H



051-1001
Single
089-9110 Scrap Trap
Tray Single
8 1/2" W x 14 3/4" D x 1 1/2" H



051-6001
3-D Inside Scrap
089-9199 Scrap Trap
Tray 3-D Series
9 3/8" W x 22 1/8" D x 7/8" H

ADS TECHNICAL SUPPORT ET Pump Drain Sustainer Heater Parts

86-6328 Heater box cover
86-6331 Float Cover
86-6329 Heater Cover
299-1004 Temp Gauge

86-6337 Outer Screen
Hold-down

4 (1") weld studs

91-9010 500W Heater

91-3081 Float Switch

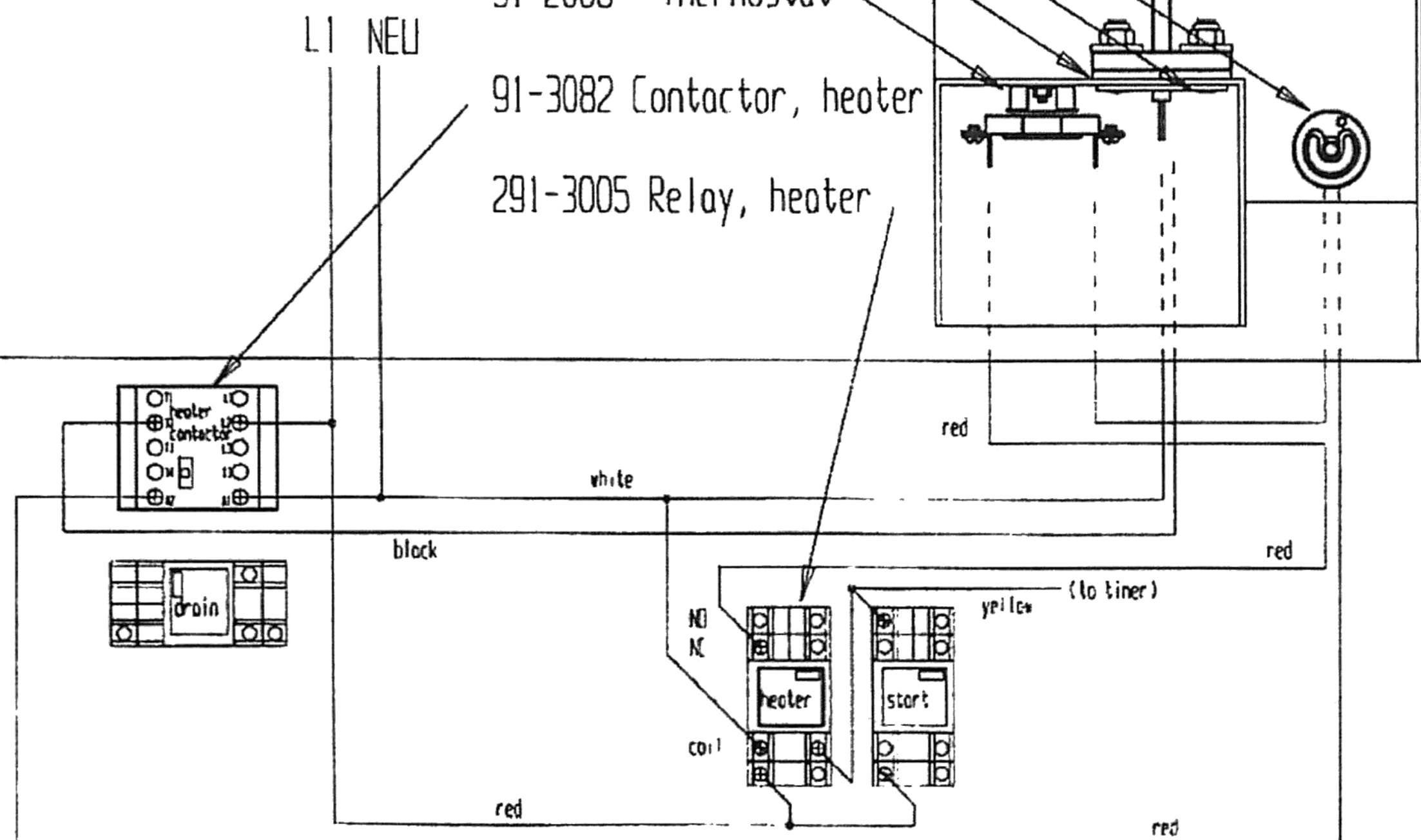
85-6220 Heater Plate

89-6612 Heater gasket

91-2008 Thermostat

91-3082 Contactor, heater

291-3005 Relay, heater



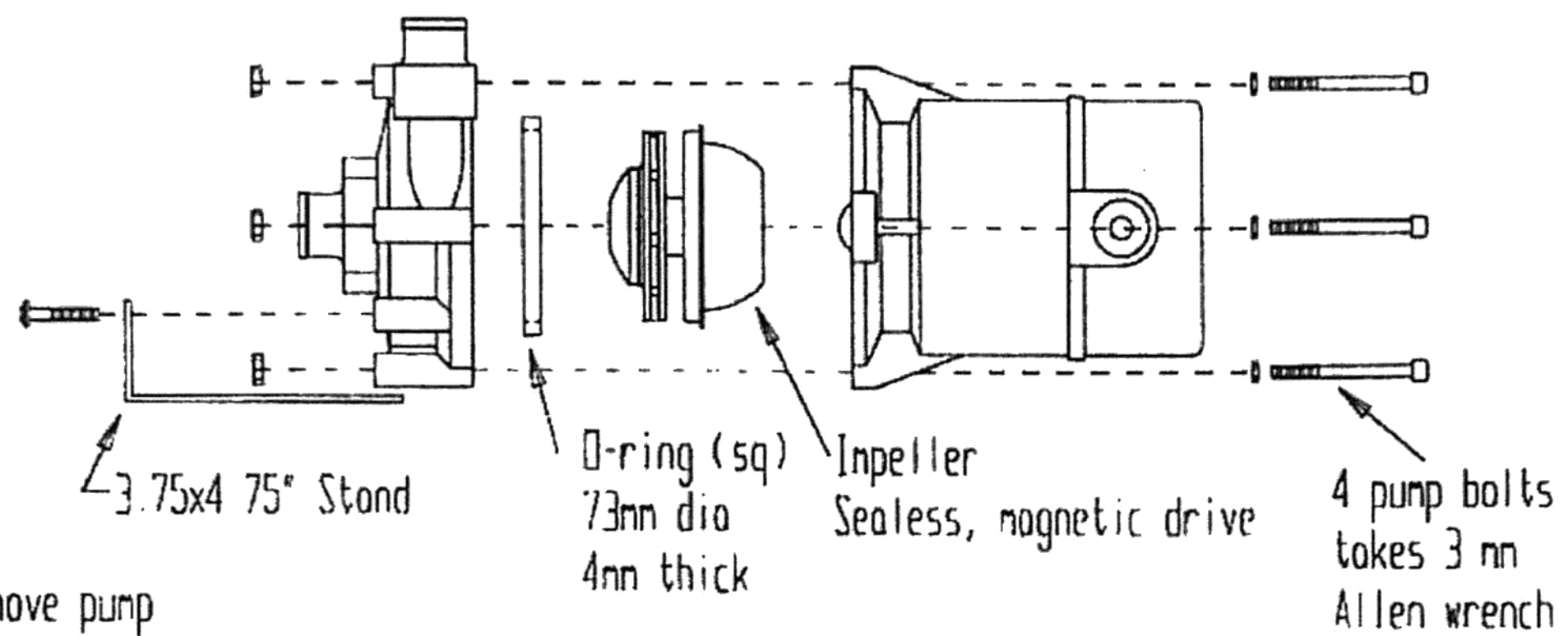
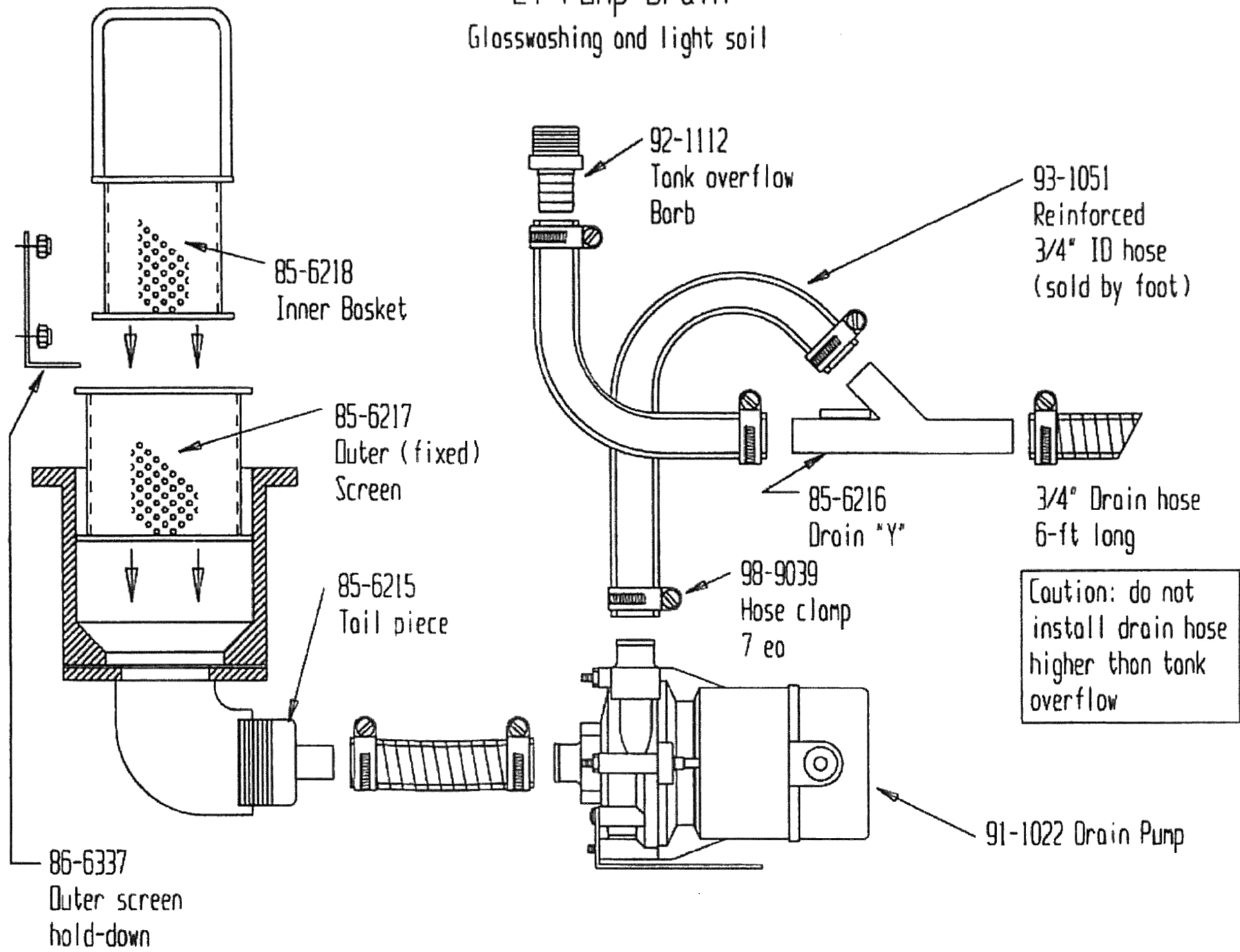
9/2007

Filter System
Pic & stick block

ADS TECHNICAL SUPPORT

ET Pump Drain

Glasswashing and light soil



Service note:
For easier access, remove pump from the stand and hose connections when clearing a clogged impeller.

8/2007