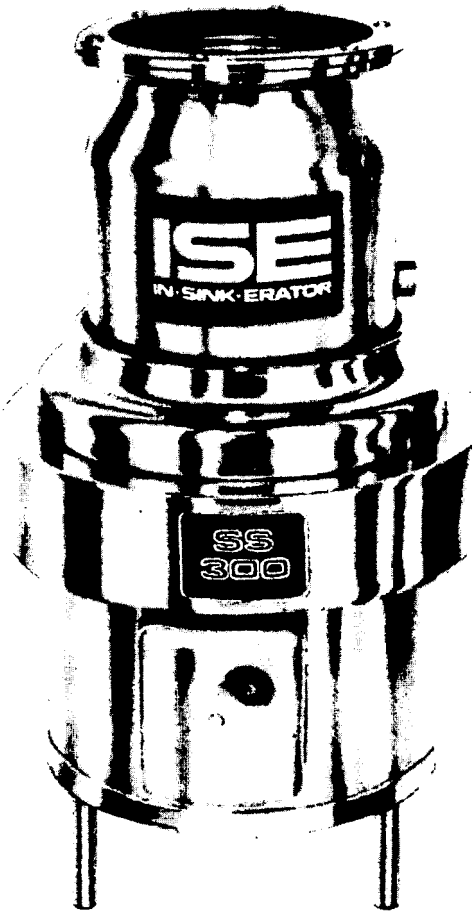
FOOD WASTE DISPOSERS

SERVICE MANUAL

COMMERCIAL DISPOSERS
(INCLUDES WIRING DIAGRAMS)



SEE PREFACE FOR MODEL REFERENCE

N-SINK-ERATOR DIVISION
EMERSON ELECTRIC CO.
4700 21st STREET, RACINE, WI 53406

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PREFACE SECTION 1

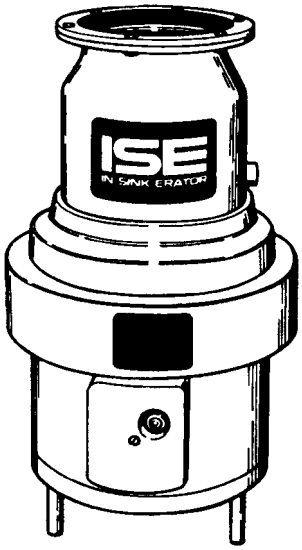
IN-SINK-ERATOR manufactures commercial food waste disposers from 1/2 horsepower through 10 horsepower.

The basic assembling or disassembling of all SS Series models is identical. However, electrical connections do vary depending on the disposer specifications, power supply and electrical controls. You will find disposers with single-voltage, dual-voltage and tri-voltage motors and for either a single or three phase power supply. Electrical connections for various electrical controls that may be used with the disposer are shown in this manual. Standard electrical connections are also included.

The method of mounting the disposer is uniform throughout models as is the mounting bolt circle diameter.

Basic models covered in this manual:

Above serial number 70,000:
SS-50
SS-75
SS-100
SS-125
SS-150
SS-200
Above serial number 130,000:
SS-300
SS-500
SS-750
SS-1000



This manual may be used for general referral for disassembly on SS series models prior to models shown above.

Models shown here are **Basic Model Numbers,** (i.e. SS-150) which includes several motor variances. The specification decal on the motor trim cover will reveal the **Complete Model Number,** (i.e. SS-150-24 denoting the motor is 115/208/230 Volt, Single Phase).

Whenever new replacement parts are used/ordered, you must know the **Complete Model Number,** serial number, motor voltage and phase found on the specifications decal. You **Must** use correct parts sheet for specific model you are servicing.

SECTION 2

PRIOR TO REPAIRS

Prior to diagnosing a problem, one must give consideration to the following items so that proper service adjustments are accomplished intelligently and without delay or "call-backs".

- Obtaining complete information on the phone will help the service technician before he arrives at the job site.
- Apparent electrical problems may actually be caused by a mechanical problem (I.E. worn bearings can cause a unit to hum and not run).
- Commercial disposers may be controlled by various types of starting controls and electrical accessories.
- Has someone else been on the job "attempting" repairs?
- A "cheater" test cord can be used to by-pass all electrical starting and/or electrical controls to run the disposer "direct".
- Do the electrical specifications of the disposer match the electrical power supply? Are the motor lead connections proper for the power supply as well as the starting controls?
- What is the age of the disposer? Any previous problems? Is it sized properly?
- Always make certain you have and use the correct wiring diagram(s) for the job and use the correct parts sheets.
- The only place (repeat-only place) to obtain the correct model number is from the disposer specifications plate.
- You may have to adjust the water supply to the correct recommended G.P.M.
- If the problem is electrical, are there electrical problems with other kitchen equipment?
- If you contact the factory for help, all of the above must have been considered.

SECTION 4

LIMITED WARRANTY

IN-SINK-ERATOR's Assurance of Quality Warrants its New Commercial Disposers as Follows:

What Equipment Is Covered by This Warranty?

All IN-SINK-ERATOR Commercial Disposers and Accessories produced and furnished by IN-SINK-ERATOR.

What are the IN-SINK-ERATOR Disposer and Accessories Warranted Against?

Against defects in workmanship or material only. Parts wear Is not considered a defect.

How Long Are the Disposer and Accessories Warranted?

The disposer and accessories are warranted for one year from date of installation.

Are Service Labor Charges Included in This Warranty?

Yes. During the first year following installation, in the extended areas of established commercial service, IN-SINK-ERATOR will provide service labor necessary to repair or replace defective parts, providing such labor is performed by an IN-SINK-ERATOR Factory Authorized Service Center.

How to Obtain Service?

Please call the nearest IN-SINK-ERATOR Factory Authorized Service Center when service is needed. For the location of your nearest Factory Authorized Service Center call toll free 1-800-558-5700 (except Canada) - (in Wisconsin call 1-800-922-2331).

What Conditions Are Not Covered by This Warranty?

This warranty does not apply if failure of commercial disposers to operate is due to: Faulty or improper electrical installations, faulty or improper plumbing installations, abuse, accidental damage, grinding elements jammed by foreign objects, clogged drain lines, unit improperly sized for application according to factory recommendations or disposer being in storage longer than 18 months from date of manufacture.

This Warranty Is Valid In the 50 States and Canada Only, as Written In Its Entirety and no Other Warranty Applies.

IMPORTANT

These installation instructions are for the benefit of the installing contractor. The IN-SINK-ERATOR Company or any of its Authorized Service Centers do not make original installations. For technical information not covered In the following instructions, contact the Factory.

These electrical and plumbing instructions were written under the assumption that the installer is competent and experienced in these areas. If the installer is not experienced in these areas, we recommend that competent Professional assistance be sought. Improper installations resulting in damage to the disposer or accessories are not covered by the warranty.

All installations are to be in accordance with local plumbing and electrical codes.

GENERAL PLUMBING INSTRUCTIONS

1. Before installing the new IN-SINK-ERATOR Disposer, properly clean out the waste lines to the connecting main sewer.
2. Recessed thread fittings (sanitary fittings) should be used throughout, and all pipe ends should be carefully reamed and free of burrs.
3. Use as few elbows and tees as possible. Be sure that the fittings used are of the long sweep type.
4. All horizontal drain lines should have a minimum of 1/4" fall per foot. A 2" pipe (minimum) is recommended for models with the following horsepower: 1/2, 3/4, 1, 1-1/4, 1- 1/2 and 2. A 3" pipe (minimum) is recommended for models of these horsepowers: 3, 5, 7-1/2 and 10.
5. Keep horizontal runs as short as possible to reduce the possibility of plumbing stoppages.
6. Do not connect into a grease trap, drum trap or interceptor.
7. IN-SINK-ERATOR Disposers from 1/2 through 1-1/4 H.P. are equipped with a drain outlet designed for a slip joint connection to a standard 1-1/2" "P" trap (not furnished). Connect the trap with a branch waste line running directly into a 4" stack. IN-SINK-ERATOR Disposers from 1-1/2 to 2 H.P. have an outlet flange with 2" internal pipe threads (N.PT.) assembled to the disposer. IN-SINK-ERATOR Disposers from 3 through 10 H.P. have an outlet flange with 3" internal pipe threads (N.P.T.) assembled to the disposer. Connect "P" traps as close as possible to the outlet flange.

IMPORTANT

Recommended cold water requirements.

1/2 through 1-1/4 H.P.	**5**	**GPM**
1-1/2 through 2 H.P.	**8**	**GPM**
3 through 10 H.P.	**10**	**GPM**

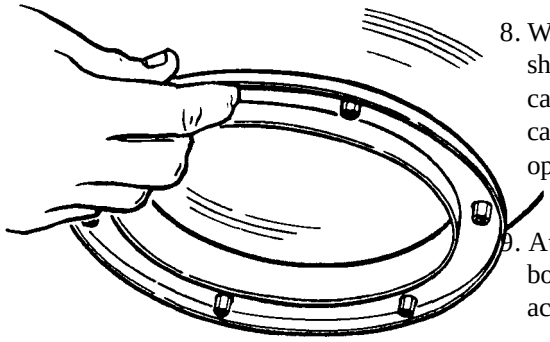


Figure 5-1.

8. Water volume adjustment — all H.P. The top of the swirling water should occasionally crest to the body water inlet. Too much water can overload motor and reduce grinding efficiency. Water volume can be controlled by a properly rated flow control valve or a hand operated valve.

9. At no time should hot water be connected directly to disposer or bowl sink. If pre-rinse assembly is installed, tempered hot water is acceptable.

INSTALLATION OF DISPOSER BASE UNIT TO SINK BOWL OR COLLAR ADAPTOR

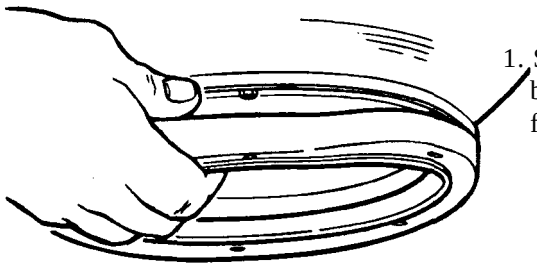


Figure 5-2.

1. Slip the mounting flange (see Figure 5-1) over bottom flange of bowl sink or collar adaptor, and then fit mounting gasket to bottom flange (see Figure 5-2). Top side is marked on mounting gasket.

NOTE

Mounting flange, mounting gasket and capscrews are packed and shipped with each bowl sink or collar adaptor.

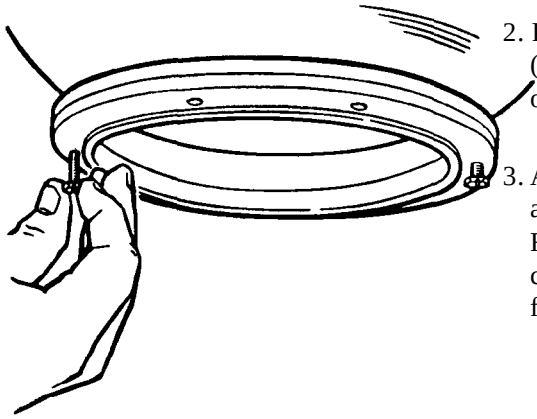


Figure 5-3.

2. Position mounting flange down over outside of mounting gasket. (Threaded fasteners in mounting flange will fit into recesses in top of mounting gasket.)

3. Assemble two (2) capscrews from bottom of mounting gasket into any two opposite threaded fasteners in the mounting flange (see Figure 5-3). Hold mounting flange and mounting gasket together at capscrew location while assembling capscrews. Make about three full turns.

4. Raise disposer and engage capscrew heads in keyhole slots in disposer body flange and turn disposer (see Figure 5-4). The disposer will now hang by itself. Assemble four remaining capscrews but do not tighten (see Figure 5-5).

   For 3 H.P. through 10 H.R, unit is floor supported.

5. Turn disposer into position, line up the plumbing connections and tighten the capscrews in disposer mounting. Capscrews are to be tightened until edges of mounting flanges come together.
6. Make plumbing and electrical connections to the disposer per local codes.
7. DISPOSER MOUNTED TO BOWL SINK: Connect cold water to bowl sink nozzle(s). When disposer is fitted to a bowl sink, it is not necessary to connect disposer body water inlet (see Figure 5-6). See Step8, General Plumbing Instructions, for recommended cold water requirements.
8. DISPOSER MOUNTED TO COLLAR ADAPTOR: Connect cold water to body water inlet. See Step 8, General Plumbing Instructions, for recommended cold water requirements.
9. In connecting an IN-SINK-ERATOR to a septic tank, consult codes for required size of tank and for the proper seeding (starting) of tank for trouble-free installation.

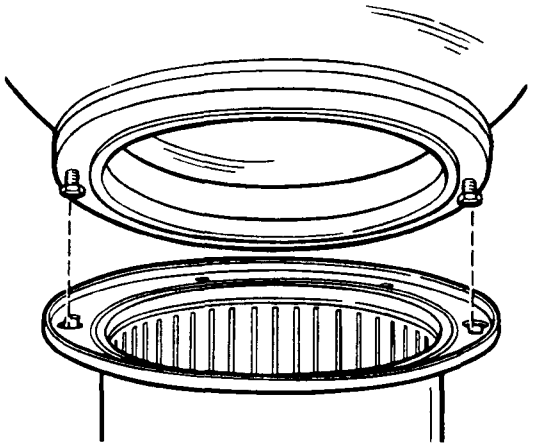


Figure 5-4.

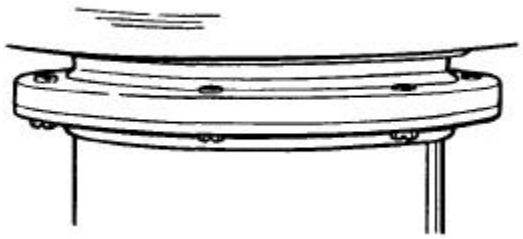


Figure 5-5.

Removal

1. Removal is the reverse of installation.

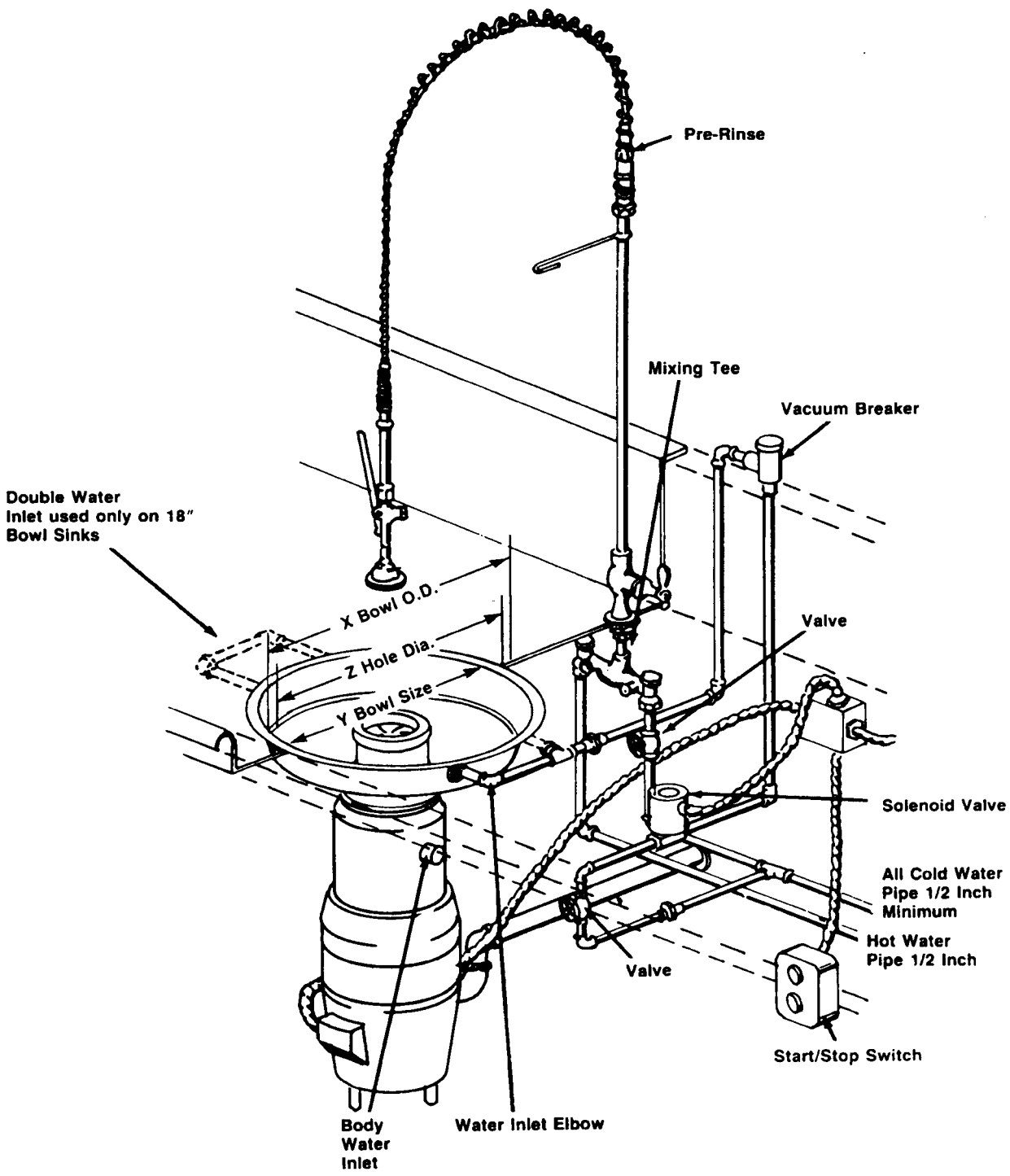

Pre-Rinse
Mixing Tee
Vacuum Breaker
Double Water
Inlet used only on 18"
Bowl Sinks
X Bowl O.D.
Z Hole Dia.
Y Bowl Size
Valve
Solenoid Valve
All Cold Water
Pipe 1/2 Inch
Minimum
Hot Water
Pipe 1/2 Inch
Valve
Start/Stop Switch
Body
Water
Inlet
Water Inlet Elbow

Figure 5-6.

NOTE

For special mounting adaptor installation, refer to instructions packed with adaptor.

INSTALLATION OF DISPOSER BASE UNIT TO No. 5 SINK FLANGE MOUNTING (Standard 3-1/2" — 4" Sink Opening)

1. Unscrew the 3 mounting screws on the sink flange mounting assembly until flush with mounting ring surface. Pry out the snap ring holding the sink sleeve and separate all parts (see Figure 5-7).

2. To install stainless steel sink flange, form a ring of top grade oil base putty around sink opening. Use putty that always remains pliable. Insert sink flange into sink opening (see Figure 5-8).

3. From underneath sink, place fibre gasket over sink flange, up against bottom of sink. Follow fibre gasket with steel back up ring, flat side up (see Figure 5-9). Follow with upper mounting ring having three set screws flush with top of mounting ring. Place these parts above groove in sink flange and insert spring steel snap-lock ring into groove (see Figure 5-10).

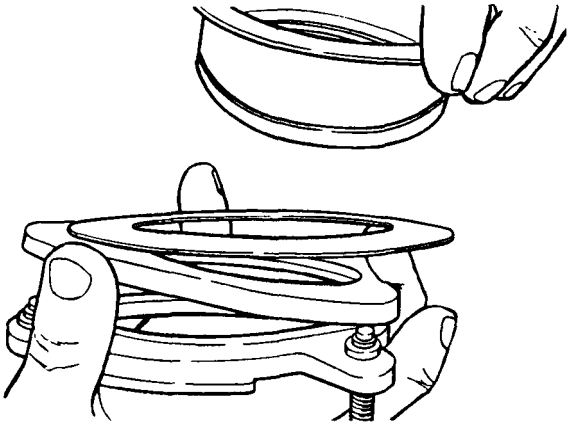


Figure 5-7.

Figure 5-8.

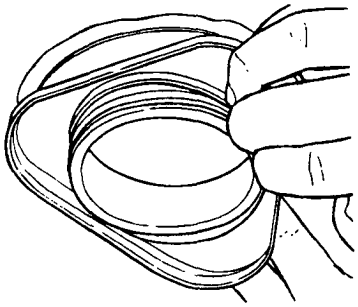


Figure 5-9.

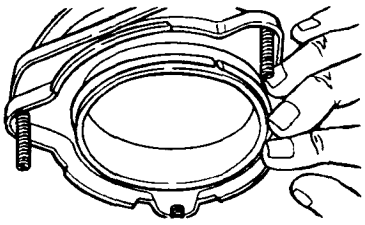


Figure 5-10.

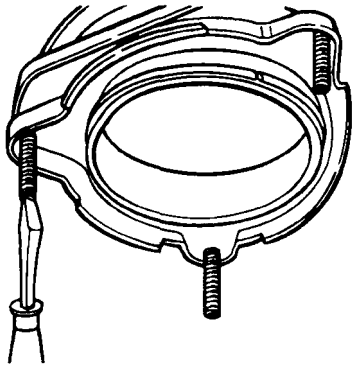


Figure 5-11.

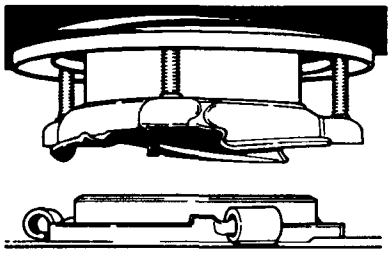


Figure 5-12.

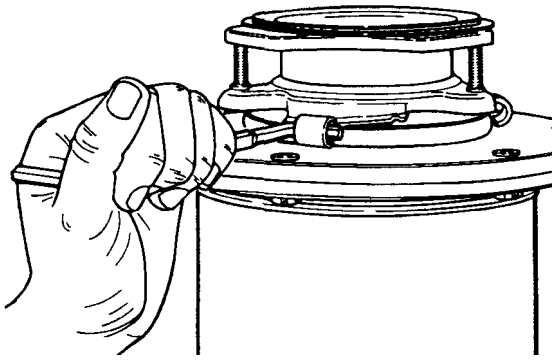


Figure 5-13.

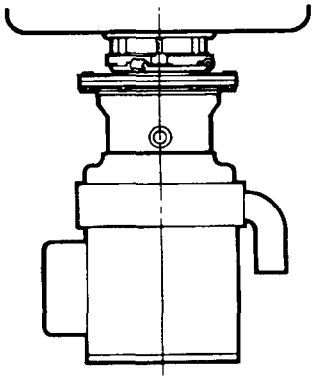


Figure 5-14.

4. With a screwdriver tighten the three mounting screws evenly until fibre gasket and back up ring draw up snugly against underside of sink. Sink flange will now be securely in place (see Figure 5-11).

5. Attach adaptor flange to top of disposer with six (6) bolts provided. See Figures 5-1 to 5-5 for sequence of assembling parts to top of disposer.

6. Raise disposer to sink mounting assembly so that lower mounting (having lugs) is positioned with lugs located to right of back up screws on upper mounting ring. See Figure 5-12.

7. When mounting rings are positioned, hold unit up and turn lower mounting assembly to right (clockwise) until unit is self supported. Insert service wrench in lug from left side and continue to turn lower mounting assembly to right (approximately one-quarter turn) until the two mounting lugs meet and snap into position (see Figures 5-13 and 5-14).

8. Swivel unit to a position that will permit proper alignment for installation of a trap. Unit can be turned 360 degrees for easy installation.

9. Make cold water connection to disposer body water inlet (see Figure 5-6). See Step 8, General Plumbing Instructions, for recommended cold water requirements).

REMOVAL

1. Removal is the reverse of installation.

DISPOSER LEG INSTALLATION — See Figure 5-15.

1. Pry the two guide hole plugs from the bottom of the disposer.
2. Place the leg assemblies in the guide holes at the bottom of disposer. Screw the threaded studs into the threaded holes in the upper end bell and tighten with screwdriver. It will be necessary to demount the disposer if floor clearance is not sufficient.
3. Push the black plug into the bottom of leg tube and adjust to proper length.
4. Push the rubber ring on each leg up securely against the bottom of the disposer to maintain leg adjustment.

GENERAL ELECTRICAL INFORMATION

Disposers shipped from the factory are NOT connected for a specific voltage. Please refer to the STANDARD MOTOR CONNECTION WIRING DIAGRAMS in the disposer terminal box for correct voltage connections.

The standard disposer voltages are 115/208/230 volts for single phase electrical power and 208/230/460 volts for three phase electrical power.

NOTE

Disposer motor phase, single or three phase, must be the same as power source and line phase. Disposer wiring connection voltage must be the ieas the voltage of the line or power supply.

CAUTION

ALL ELECTRICAL CONNECTIONS SHOULD BE MADE TO CONFORM TO LOCAL CODES. BE CERTAIN THAT ALL IN-SINK-ERATOR DISPOSERS ARE CAREFULLY AND PERMANENTLY GROUNDED.

The motor connection wiring diagrams for the 1/2 through 10 H.P. models are found inside of the disposer terminal box at the front of the disposer.

NOTE

All IN-SINK-ERATOR disposers are equipped with built-in thermal overload protection. Therefore, any starting switches furnished that have provisions for heaters will not be supplied with heaters.

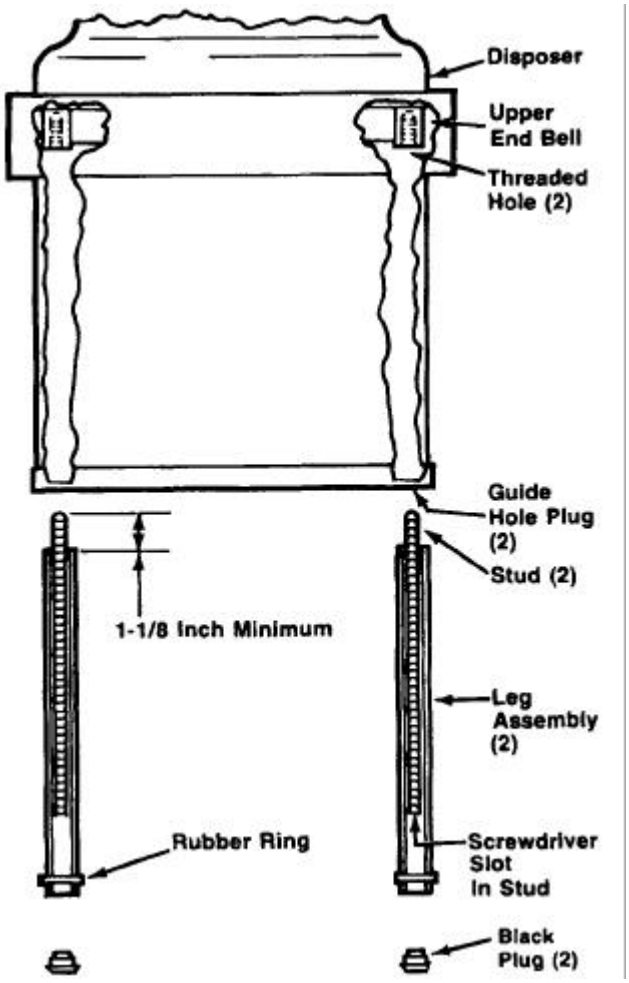


Figure 5-15.

ELECTRICAL INSTALLATION 1/2 Through 10 H.P.

The following simple steps are required to complete the electrical connections to the IN-SINK-ERATOR Disposer.

1. Remove the screw at the center of the terminal box in front of the disposer.
2. Pull the terminal box out of the stainless steel trim shell.
3. Assemble an electrical conduit connector to the hole in the extension plate at the bottom of the exposed wiring compartment.
4. Connect the grounding wire to the ground screw.
5. Connect incoming wires to motor lead wires.

NOTE

Be certain that the wiring connections are the same as those on the Motor Control Wiring Diagram for your group of controls (see Section 16).

6. Replace terminal box in position in the trim shell.

CAUTION

BE CAREFUL NOT TO PINCH WIRES WHEN REPLACING THE TEERMINAL BOX.

NOTE

Complete Electrical Information Located Inside Disposer Terminal Box.

TESTING — ALL MODELS

1. Check to be sure disposer is free of all objects.
2. Turn on disposer and determine that cutting elements revolve and that water flows automatically.
3. Test mounting assembly and plumbing connections for leaks.
4. If disposer fails to operate: (A) Check wiring connections. (B) Determine if built-in thermal overload protector has tripped — reset by hand only. Refer to operator's instruction sheet.

CAUTION

IF DISPOSER STOPS, DO NOT LOOK FOR CAUSE UNTIL STARTING NTROL IS TURNED "OFF".

NOTE

No lubrication is necessary as all bearings are permanently lubricated.

OPERATING INSTRUCTIONS

1. PUSH THE START BUTTON on the switch to put the disposer in operation (see Figure 5-16). Before you start feeding food waste into the disposer, make sure that a steady stream of water is flowing into the disposer.
2. Don't feed garbage into disposer until unit is started and water running.
3. FEED THE GARBAGE into the disposer in a steady, continuous flow.
4. Don't overload disposer with excess amounts of garbage and water. The unit will consume food waste faster when you feed it steadily.

IMPORTANT

Recommended cold water requirements.

1/2 through 1-1/4 H.P	**5 GPM**
1-1/2 through 2 H.P.	**8 GPM**
3 through 10 H.P.	**10 GPM**

5. Don't touch the water valve after the correct flow of water is achieved by adjusting plumbing valves. Grinding efficiency will be decreased if the water swirl is more than one half way up the disposer body.
6. Don't put your hands into disposer while it is in operation.
7. Don't stop disposer with garbage in it, let it run for approximately three minutes to clear itself of all ground garbage. This will help maintain a clean and odor-free unit and avoid drainline stoppage.
8. Do not operate without factory recommended safety guards.
9. Push the STOP BUTTON on the switch to stop the disposer's operation (see Figure 5-17).
10. To prevent accidents, make sure the disposer is shut off before you leave it.

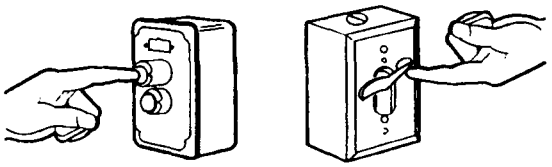


Figure 5-16.

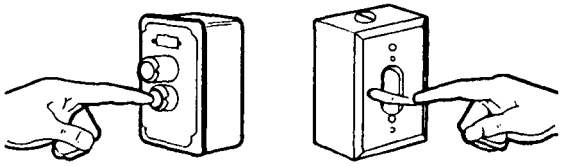


Figure 5-17.

SECTION 5

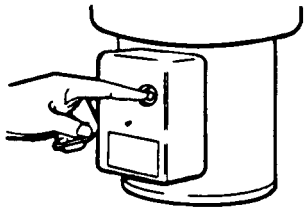


Figure 5-18.

DISPOSER JAM

1. Overloading or the presence of a foreign object (metal) can cause the disposer to jam and must be cleared (see section 15, Jammed Disposer).

CAUTION

IF THE DISPOSER STOPS, ALWAYS TURN THE STARTING CONTROL TO THE "OFF" POSITION BEFORE LOOKING FOR THE CAUSE OF THE DISPOSER STOPPAGE.

2. Once the jammed condition is cleared, locate the red reset button which can be found in the lower front of the disposer (see Figure 5-18). This is a sensitive electrical control (overload safety switch) which may have tripped and stopped electrical current to the motor to prevent motor burn-out. WAIT 3 to 5 minutes to allow motor to cool down. Then press the red button hard, possibly with two thumbs, to reset the safety switch.

   NEVER strike the red button with an object.

PROBLEM-CAUSE-SOLUTION

PROBLEM	POSSIBLE CAUSE	SOLUTION
Unit will not start — Motor dead — no sound — water runs O.K.	Overload protector tripped, open.	Reset overload protector, allow 5 minutes cool down, then press red button hard using both thumbs.
	Overload protector burned out, open circuit.	Test and replace overload protector.
	Stator burned out, open.	Test and replace stator, also inspect for pinched (grounded/shorted) motor lead wires.
	Jammed grind elements.	Clear jam and reset overload protector, (see Section 15, Jammed Disposer Conditions).
	Water in motor.	See "Water in motor".
	No Electric power to disposer.	Check terminal box motor connections for power with volt meter.
		Inspect for unconnected wires.
Will not start — Motor dead — water does not run.	No electrical power.	Check for blown fuses or tripped circuit breaker in main electrical supply panel.
		Power supply not connected to starting switch on sink.
	Starting switch on sink inoperative.	Remove cover from switch and check operation.
Motor hums — Water runs ok — disposer will not run.	Jammed grind elements.	Clear jam — (see Section 15, Jammed Disposer Conditions).
	Start switch in motor (single phase units).	Switch contacts not making contact or burned off. Replace start switch.
	Motor parts binding.	Motor thru bolts loose — tighten. Lower end bell misaligned — remove and reassemble.
	Rotor drag.	Rotor shaft pulling into and binding against stator core. Check I.D. of stator core and O.D. or rotor shaft core for score marks. Check for worn bearings and replace If necessary.
	Start windings (on single phase units) open.	Check and replace if needed.
	Capacitor (single phase units only).	Weak — test — (see Section 14, Capacitor Testing), replace if necessary.
	Voltage.	Low or improper voltage to disposer. Check power supply at disposer.
	Improper wiring at motor and/or starting switch or solenoid valve.	Using correct wiring diagram, check, trace and make proper wiring connections.

PROBLEM	POSSIBLE CAUSE	SOLUTION
Motor hums — water runs ok — disposer will not run. (Continued)	Single phasing (three phase units only).	One or two windings open. Check stator windings, replace if open. Also check for shorts and grounds.
Motor starts — runs then trips overload protector.	Centrifugal actuator on motor shaft (single phase units only) stuck or loose spring. Doesn't allow motor switch to open.	Inspect, adjust, replace centrifugal actuator if necessary.
	Motor switch contacts (single phase units only) welded/burned closed.	Replace motor switch.
	Stator windings shorted.	Test stator for circuitry using proper motor winding diagrams.
	Water in motor	Inspect motor parts. Also lower bearing area of upper end bell for leaking water. Repair with new bearing/seal kit. Replace other parts if necessary. See "Water in motor".
	Improper use of disposer.	Potential jam — (see Section 15, Jammed Disposer Conditions), operator overloading unit — explain correct use.
	Voltage	Marginal (low) power supply. Unbalanced power supply (three phase only). Cannot be corrected by service technician.
	Wiring connection improper.	Make proper connection per wiring diagram.
	Overloaded electrical power supply line.	Connect to another circuit. Disposer motor should be connected to its own separate circuit.
	Overload protector.	May be weak, improperly connected or wrong overload. Test O.D. Check for correct connections using wiring diagram arid parts sheet.
	Heater Coils.	Incorrectly rated heater coils in magnetic starter. To be corrected or bypassed by electrician.
Runs slow and stops when food waste is put in disposer.	Voltage connections	Low voltage power supply with high voltage motor connections. Reconnect motor lead connections using wiring diagram.

PROBLEM	POSSIBLE CAUSE	SOLUTION
Trips overload protector, circuit breaker or blows fuses immediately on starting disposer.	Stator	Direct short in motor windings — test with ohmmeter.
	Motor lead connections	Check and correct connections. Also check for bare motor lead wires. Insulate where required.
	Starting Control (Switch)	Improperly wired — check and correct.
	Improper Voltage	Check disposer electrical specifications, power supply and motor lead connections.
	Improper fuse or circuit breaker	Check — corrections to be made by electrician.
	Overload protector	Weak or incorrect part — replace.
Disposer motor runs ok, but little or no water.	Water supply valve shut off.	Open water valve in water supply line and adjust for correct/recommended G.P.M.
	Water solenoid valve malfunction.	Check solenoid — • Coil weak, marginal voltage or wiring for low voltage. • Bleeder hole in diaphragm out of position. Disassemble, reposition and reassemble. Dirty — Disassemble valve, clean thoroughly and reassemble Coil — Burned out (open) — replace valve. No electric power to valve coil — trace circuit for cause.
	Low water pressure.	Must be increased — responsibility of equipment owner.
	Time delay relay.	Improperly installed or defective "load" circuit. Check for proper connections and "load" with volt meter.
Water in motor	Seals in bearing/seal area worn.	Replace parts using new bearing and seal kit.
	Upper end bell.	Cracked or eroded — replace upper end bell.
	See "Water leaks at grind chamber area".	
	Cleaning abuse.	Kitchen cleaning crew used water hose for cleanup and "hosed down" the disposer, driving water into the motor.

SECTION 6

PROBLEM	POSSIBLE CAUSE	SOLUTION
Noisy	Worn Bearings.	Replace bearings.
	Rotor core on motor shaft.	Rotor core slips — not tight on shaft. Replace motor shaft.
	Disposer	Remove unit from sink and trap. Rest unit on floor, hold securely and run. If unit is at fault, it can now be corrected.
	Installation	The quality of material, design and installation of the sink, drain line, adjacent walls, fasteners, etc. may be less than described for disposer operation. Securing the table, solid drain connections and use of disposer legs may help dampen any magnified grinding noise.
Vibrates excessively.	Excessive water entering disposer.	Adjust water flow to disposer. See Section 5 for recommended G.P.M. If unit is installed in a pot sink with number 5 mounting assembly, drain water from sink before turning on disposer.
	Overloading disposer with hard food waste or non-biodegradable material.	Do not overload disposer with excessive amounts of hard food waste (bones). Do not grind non-biodegradable material.

Leaks Water.

IMPORTANT NOTE

REVIEW BEFORE DIAGNOSING ANY LEAKING CONDITION.

Leaks from one area may be seen at a totally different area of the disposer.

EXAMPLE: The water from a leaking mounting assembly or from a cracked stationary shredder can run down the outside of the disposer and drip from the bottom of the unit giving an impression of "water leaking from the motor".

Whenever diagnosing any leaking problem, review all possibilities listed before making conclusions or repairs.

Water leaks at mounting or waste discharge.	Loose mounting screws.	Tighten all mounting screws. Tighten locking ring if mount is a number 5 mounting assembly.
	Pinched or broken gasket.	Replace gasket.
Water in the motor.	See "Water in motor".	

PROBLEM	POSSIBLE CAUSE	SOLUTION
Water leaks at grind chamber area or center of unit.	Stationary shredder gasket pinched, misfitted or broken.	Replace gasket.
	Water inlet connection loose in body.	Replace with new body, or totally remove inlet connector from body and use plumbing fittings (nipple, el, nuts, rubber gaskets) to repair.
	Lower body cover.	Tighten bolts holding lower body cover to upper end bell (compress stationary shredder gasket). If this fails to secure the leak, the "rivnuts" in the lower body cover have separated enough, not allowing compression of the gasket. Replace lower body cover.
	Stationary shredder.	Cracked or broken, allows water leaks to the outside of the unit and runs down the outside of the motor. Replace stationary shredder.
Syphon breaker leaks.	Loose plumbing connections.	Tighten plumbing connections.
	Installed improperly.	Syphon breakers must be installed 6 inches above the "flood plane" which is the top working surface of the sink — reinstall. Plumbing connections backwards — reinstall. "Poppet" in syphon breaker worn, cracked or missing — replace with new syphon breaker. "Poppet" in syphon breaker sticking — disassemble, clean and reassemble.
Does not drain or drains slowly. Water in disposer after being shut off (possibly some food waste also). or Frequent drain line blockage.	Drain line blockage.	Clean out drain lines from disposer to main sewer. Vent lines may also require cleaning. Instruct user to use 3 minute post flush. Possibly install a time delay relay. Check for proper water flow — could be too little water being used.
	Center line of disposer waste outlet is below center line of drain line.	Plumbing adjustment required to drain line.
	Improper drain line slope.	Horizontal drain line require minimum of 1/4" fall per foot.
	Grind elements.	Worn or piece broken away — allows large chunks to enter drain line. Replace grind element(s).

PROBLEM	POSSIBLE CAUSE	SOLUTION
Splashing — from disposer during operation.	Excessive water entering disposer and/or excessive water pressure.	Adjust water entering unit to proper recommended G.P.M.
		If water pressure cannot be adjusted, install a safety baffle, silver guard and/or cover.
Splashing from bowl.	Spray nozzles not installed properly.	Spray nozzles should be "pointed" downward approximately 15 to 20 degrees.
Water runs continuously after disposer is turned off.	Solenoid valve.	Installed backwards — arrow on solenoid valve must point down stream.
		Valve not closing — dirty — disassemble and clean.
		Bleeder hole in diaphragm out of position. Disassemble and reset diaphragm.
		High water pressure — pressure must be reduced.
	Normal.	Normal if a time delay relay is being used. Water may run a few seconds to 10 minutes depending on time delay setting. Used for post flush.
	Time Delay Relay.	Time delay may be defective and not shutting down. Initiate circuit always active and not shutting down. Check circuitry with volt meter.
Excessive wear on grinding elements.	Disposer undersized.	Reduce use. Replace disposer with proper size.
	Highly abrasive material being ground in abundance.	Do not grind abrasive material such as glass, crockery, ceramic or clam shells.
	Non-biodegradable material being ground.	Discontinue this practice. Food waste disposers are designed to grind food waste. Other materials should be considered trash and cause waste treatment difficulties when introduced into drain lines.
Will not grind.	Excessive water entering disposer.	Adjust water supply to proper recommended G.P.M.
	Insufficient grinding time.	Do not turn off unit until all food waste has been ground away with a 3 minute flush.
	Worn grinding elements.	Replace cutting elements or reverse direction of motor if reversing controls are not used. (Three phase — "flip flop" any two of the three power leads at the motor.) (Single phase — "flip flop" wires Number 2 and 5 in the disposer motor terminal box.)
	Plugged teeth in stationary shredder.	See Section 15, Jammed Disposer Conditions.

PROBLEM	POSSIBLE CAUSE	SOLUTION
New bearings and seal kit binds rotor shredder when assembled. Disposer hums but does not start. or Loose after assembly.	Misassembled.	Disassemble bearing/seal kit. Can be reused, but new lower seal is required. Reread bearing/seal kit instructions and follow closely. Use all parts in the kit. Make absolutely certain the upper end bell bearing cavity is totally free of grit, dirt, score marks, burrs and grease. Also the permanent snap ring in the I.D. of the bearing cavity. Some motor shafts (lower horsepower) have a permanent sleeve pressed on that surrounds a snap ring on the shaft. The lower seal rides on the sleeve which also acts as a thrust spacer. The sleeve must be firmly against the snap ring. Make certain the sleeve is fully down to the snap ring by driving it with a brass rod and hammer or with an arbor press. Reassemble per instructions. Check to make certain you are using the correct bearing and seal kit for the disposer model and any other new parts.
Disposer runs O.K. only when using "cheater" cord and bypassing all controls.	Controls	Identify all controls used on the installation. Review appropriate wiring/electrical diagrams. Inspect controls visually and with Ohm and/or Volt Meters.
Disposer and/or electrical controls are wrong for the available power supply.	Ordered wrong or sent in error.	Explain to manager and suggest contacting his supplier.

SECTION 6

DISPOSER SIZING CHART

Hotels	**Restaurants**	**Hospitals**	**Cafeterias**	**Commissaries**	
Persons Per Meal	Soiled Dish Table	Vegetable Prep.Area	Salad Prep.Area	Pot Sink	Meat Prep.Area
Up to 100	SS-75	SS-50	------	------	--------
100-150	SS-100	SS-75	SS-50	SS-50	--------
150-175	SS-85	SS-100	SS-75	SS-50	SS-150
175-200	SS-150	SS-150	SS-75	SS-75	SS-150
200-300	SS-200	SS-150	SS-75	SS-75	SS-300
300-750	SS-300	SS-150	SS-75	SS-75	SS-300
750-1500	SS-500	SS-300	SS-150	SS-150	SS-500
1500-2500 (2)	SS-500	SS-300	SS-150	SS-150	SS-500
2500-over	Contact your Food Service Consultant or In-Sink-Erator				

FOR SPECIAL APPLICATIONS, SUCH AS SUPERMARKETS OR OTHER HEAVY, CONTINUOUS VOLUME INSTALLATIONS, SELECT MODELS SS-750 OR SS-1000

Additional IN-SINK-ERATOR units or a disposer larger than indicated in the chart may be necessary in the following instances: if large amounts of fibrous, hard or bulky materials are in the mixed wastes, if there is an occasional need for increased capacity, due to special occasions, or if waste volume is expected to grow.

REMOVAL

1. Place unit on bench upside down.
2. Remove terminal box retaining screw (see Figure 7-1).
3. Remove terminal box (see Figure 7-2).
4. Remove two trim shell retaining screws (see Figure 7-3).
5. Turn unit so waste outlet is facing away from you.
6. Grasp trim shell with both hands. Spread shell wide enough to allow it to clear bottom cover. Angle upper edge of shell towards yourself so opening in shell will pass over terminal connection area (see Figure 7-4). Continue to lift shell and angle it towards yourself until shell is in a horizontal position. Remove the trim shell.

Figure 7.1.

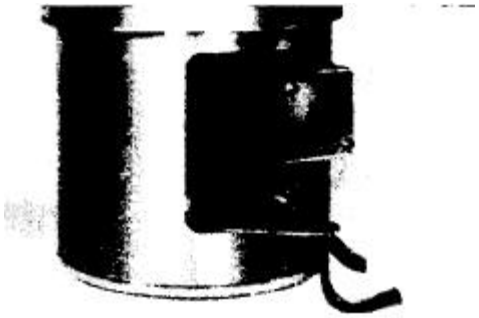


Figure 7.2.

ASSEMBLY

1. Place unit on bench upside down with waste outlet facing away from you.
2. Grasp trim shell with both hands, holding trim shell in a horizontal position. Insert leading lower edge of trim shell in space between terminal connection and upper shroud. Raise shell to a vertical position, at the same time spreading it so it will clear the bottom cover.

NOTE

Use care so as not to damage lead wires in terminal box area.

3. Install two trim shell retaining screws.
4. Assemble terminal box cover to unit.
5. Install terminal box retaining screw.
6. Place unit on bench in upright position.

Figure 7-3.

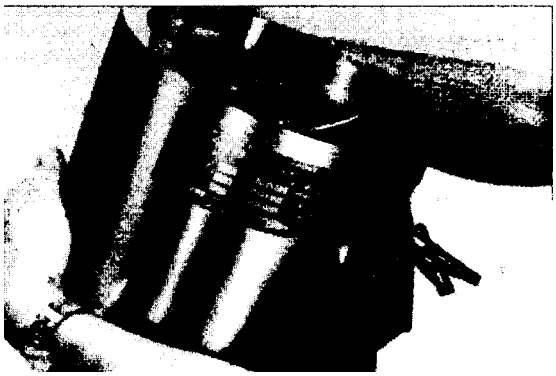


Figure 7-4.

SECTION 8

BODY AND COVER

Figure 8-1.

REMOVAL

1. Disassemble as outlined in Section 7.
2. Using a socket wrench and a long extension or a long screwdriver, reach up under the cover and remove the slotted head capscrews securing the body and cover to the end bell (see Figure 8-1).
3. Lift the body and cover assembly off of the unit.

INSPECTION AND ASSEMBLY

1. Inspect body shredder seal. If damaged or deteriorated, replace it.
2. Place unit on bench in upright position.
3. Position body and cover assembly on motor assembly, making sure locating tabs are lined up with the locating grooves in the stationary shredder. With terminal box facing you, the water inlet boss should be to your right.
4. Place capscrew in socket wrench. Insert wrench up under cover and guide cap-screw to capscrew hole. Thread capscrew about one-half way in. Follow same procedure with remaining capscrews until all are partially threaded. At this point you can complete the threading and tightening process.
5. Reassemble according to Section 7.

REMOVAL

1. Disassemble according to Section 7.

2. Remove three motor thru bolts retaining bottom cover (see Figure 9-1). Between bottom cover and lower end bell are three spacer tubes (see Figure 9-2). Retain these as they must be used for reassembly. After thru bolts are removed, bottom cover can be lifted off.
3. Remove snap ring from motor shaft to remove jam.

4. Using two wide, flat screwdrivers, place one on each side of the shaft under the fan. Pry up on fan until it moves up on shaft approximately 1/8" (see Figure 9-3).

5. Lift up and off.

INSPECTION AND ASSEMBLY

1. Inspect fan bore prior to reassembly. A locking rib should be evident in fan bore. If it is not, the fan should be replaced.

2. Place fan on shaft, being sure that flat surfaces of fan bore line up with flat surfaces on shaft.

3. With a rawhide or plastic mallet, tap on the fan hub until the end of the shaft and fan hub are even. Then place one thumb on each side of the fan hub and press down firmly. The locking rib in the fan bore will seat itself in the locking groove on the shaft.

4. Install snap ring.

5. Place bottom cover on unit.

NOTE

Bottom cover wilt only fit one way. Be sure to align motor thru bolt holes in bottom cover with motor thru bolt holes in lower end belt, and align leg access holes in bottom cover with threaded recess in end belt.

6. After bottom cover is aligned, motor thru bolts can be inserted.

NOTE

Be sure spacer tubes are placed on motor thru bolts between bottom cover and motor thru bolt hole in lower end belt. After this is done, thru bolts can be threaded into upper end bell.

7. Reassemble according to Section 7.

Figure 9-1.

Figure 9-2.

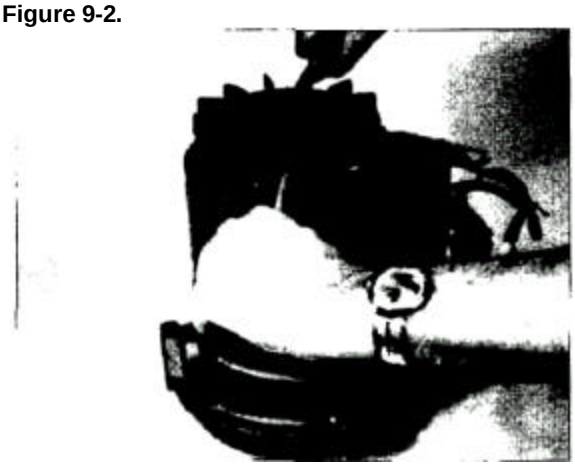


Figure 9-3.

Figure 10-1.

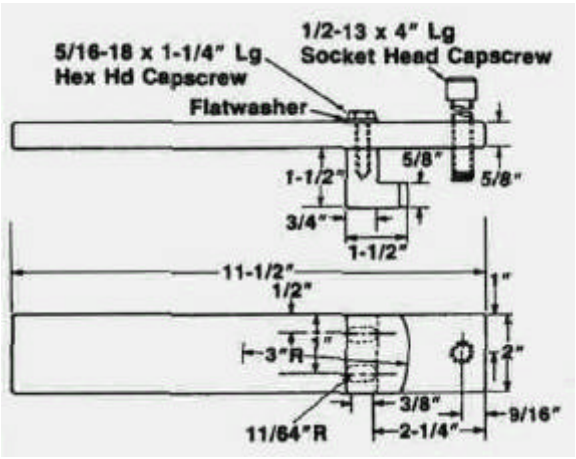


Figure 10-2.

Figure 10-3.

REMOVAL FROM UNIT

1. Disassemble as per Section 7 and Section 8.

IMPORTANT

Scribe mark the stationary shredder and the upper end bell (see Figure 10-1).

2. Place a short section of pipe (approximately 1-1/4" long) over the rotor shredder mounting nut. This center piece is to be used as a fulcrum point. Place the flat end of service tool #6462 (or a "crow bar") under the protruding edges located in the wall of the stationary grind ring. Rest the #6462 tool on the center fulcrum point.

NOTE

A puller that works very well for removing the stationary grind ring can be fabricated from the measurements shown on the diagram in Figure 10-2. This tool is not available from ISE.

Insert the "L" shaped lip of the shredder puller into the groove beneath the rectangular grinding elements. Use an Alien wrench to turn the threaded rod clockwise. As the threaded rod is turned down against the outer shoulder on the upper end bell, the stationary shredder will be pulled free of the upper end bell.

3. A mallet is now used to strike downward on tool #6462 (see Figure 10-3). Two or three sharp blows will raise the grind ring up and out of position.

NOTE

Never strike the grind ring or rotor shredder with a ball peen or steel hammer. Either babbitt, nylon, leather or wood mallets must be used.

INSPECTION AND ASSEMBLY

Prior to reinstalling the stationary shredder, we suggest that it be carefully inspected. If cracked, chipped, or broken, or if excessive wear is evident, then stationary shredder should be replaced.

To assure a trouble-free installation, the bottom surface of the stationary shredder and the stationary shredder recess in the end bell must be cleaned of all old mastic and dirt, so as to allow the stationary shredder to fit squarely in the upper end frame.

See Figure 10-4.

1. Apply a coating of water resistant silicone sealant across the bottom of the stationary shredder to form a seal with the upper end bell.

2. Position the stationary shredder in the upper end bell, being sure the scribe marks are aligned.

Figure 10-4

NOTE

Proper alignment of the scribe marks is important, as the upper body will not fit over the stationary shredder when assembling if the grooves in the shredder do not line up with the locating tabs on the body.

3. Strike fairly hard alternately on the upper rim of the stationary shredder until it is seated fully in the upper end bell (see Figure 10-5).

Figure 10-5.

NOTE

Never strike the stationary shredder with a steel hammer. Either babbitt, nylon, leather or wood mallets must be used.

Reassemble according to Section 7 and Section 8.

SECTION 11

ROTOR SHREDDER

Figure 11-1.

Figure 11-2.

REMOVAL

1. Disassemble as per Section 7, 8 and 10.
2. Hold the rotor shredder with a vise-grip or a channel lock pliers so it will not turn. With a socket wrench or box end wrench, remove the mounting nut, steel washer and fibre gasket (see Figure 11-1).

NOTE

Mounting nut has right hand threads.

3. Place a pry tool under one edge of the rotor shredder and a similar tool under the opposite edge of the rotor shredder. Work the tools alternately until rotor shredder is pried off of the keys which position the shredder on the shaft (see Figure 11-2).

INSPECTION AND INSTALLATION

Prior to reassembly, the rotor shredder should be carefully inspected to determine if it is reusable. If the horizontal bars on the top surface of the shredder show signs of excessive wear or are broken, the rotor shredder should be replaced.

1. Place rotor shredder on shaft and align keyways in shredder with keys on shaft. After keys are lined up, tap shredder down until it is fully seated.
2. Install new fibre gasket, steel washer and self locking hex mounting nut.
3. Hold rotor shredder with vise-grip or channel lock pliers so it will not turn. With a socket or box end wrench, tighten mounting nut firmly. Then reassemble as per Section 7, Section 8 and Section 10.

UPPER AND LOWER END BELL

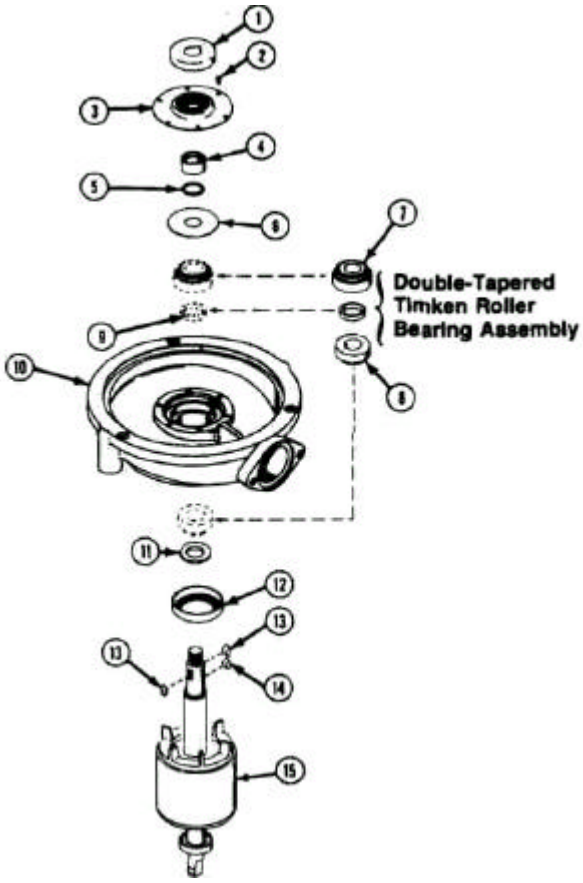
REMOVAL FROM UNIT

1. Disassemble as outlined in Sections 7, 8, 10 and 11.

TRI-LIP SEAL REMOVAL

Review Figures 12-1 and 12-15 before proceeding.

1. Remove the two exposed woodruff keys (13) and slide the shield (1) up and free from the shaft (15) (see Figure 12-1).
2. Pull the sleeve (4) up and off the shaft.
3. Remove six (or twelve depending on size of disposer) screws (2) allowing the tri-lip seal (3) to be pulled free from the upper end bell (10). Remove the third woodruff key (14) from the shaft.
4. The "0" Ring (5) and the centrifugal moisture shield (6) can now be pulled up and free from the shaft. The bearing area is now exposed.
5. Scribe mark upper end bell and stator and lower end bell and stator (see Figure 12-2).
6. Using the stationary shredder as a "stand", stand unit upside down and remove bottom cover and fan as outlined in Section 5. The upper bearing will probably slide off the shaft onto the work



1. Shield
2. Screw
3. Lip Seal
4. Sleeve
5. 0-Ring
6. Centrifugal Moisture Shield
7. Bearing Cone and Cup
8. Bearing Cone and Cup
9. Bearing Spacer
10. End Bell
11. Thrust Washer
12. Oil and Water Retainer
13. Woodruff Key (2)
14. Woodruff Key
15. Rotor and Shaft Assembly

Figure 12-1.

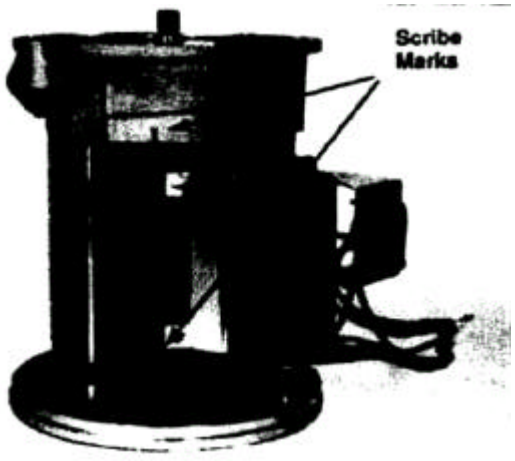


Figure 12-2.

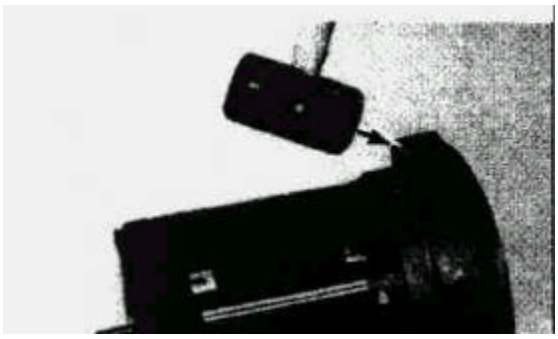


Figure 12-3.

Figure 12-4.

Figure 12-5.

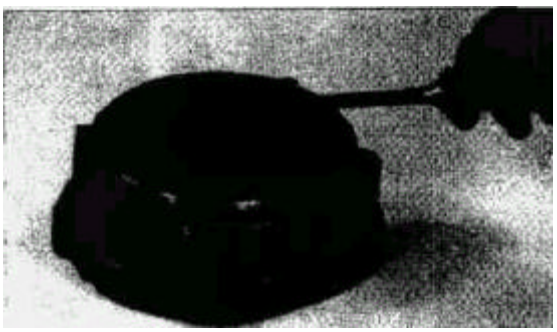


Figure 12-8.

7. Lay unit on its side and tap upper end bell alternately on opposite sides with a nylon or rawhide mallet until upper end bell is disengaged (see Figure 12-3).
8. Turn unit right side up using the stationary shredder as a stand.
9. Pull upper end bell (10) out and free of rotor and shaft (15).

CAUTION

THE MOTOR SHAFT MIGHT PULL AWAY WITH THE UPPER END BELL. DO NOT ALLOW IT TO DROP.

REMOVAL OF BEARINGS AND OIL AND WATER RETAINER

1. Remove the upper tapered roller bearing, (see Figure 12-4) and the cone spacer (see Figure 12-5). If they are to be reused, we suggest they be wrapped in a clean rag or paper to prevent contamination by dirt or dust. If they are not to be reused, discard them. Place end bell on bench upside down.
2. Use a pry bar to remove the oil and water retainer (see Figure 12-6). Discard old seal.

NOTE

SS-300 AND SS-500 OVER SERIAL NO. 70,000 AND MODEL SS-750 AND SS-1000 UNITS ONLY: Located between the oil and water retainer and the lower tapered roller bearing is a steel thrust washer. Remove and retain this, as it must be reinstalled at time of reassembly (see Figure 12-7).

3. Remove lower tapered roller bearing. If it is to be reused, place with upper bearing. If not to be reused, discard it (see Figure 12-8).

4. It is not necessary to remove either the upper or lower outer cups unless a new bearing set is to be installed in the end bell. If it is necessary to remove them, proceed as follows: Lay end bell upside down on bench. Insert a mild steel rod through the lower outer cup at an angle so that the lower end of the rod will rest on the upper cup backface (see Figure 12-9). Tap the rod gently with a hammer and the upper outer cup will become dislodged. Turn the end bell upright and remove the lower outer cup in the same manner (see Figure 12-10).

NOTE

Do nor attempt to remove the large snap ring installed in the center of the end bell. This part is pressed in at the factory and should not, nor cannot, be removed without damaging the end bell.

BEARING AND BEARING CONE ASSEMBLY

1. If the existing bearings are suitable for reuse, proceed to Bearing Cleaning and Lubrication and skip Upper and Lower Bearing Cup Assembly.

   If new bearing cups and cones are being installed, lubricate the bearings as indicated in Cleaning and Lubrication and install the bearing cones as indicated in Bearing Cup Assembly.

Figure 12-7.

Figure 12-8.

Figure 12-9.

Figure 12-10.

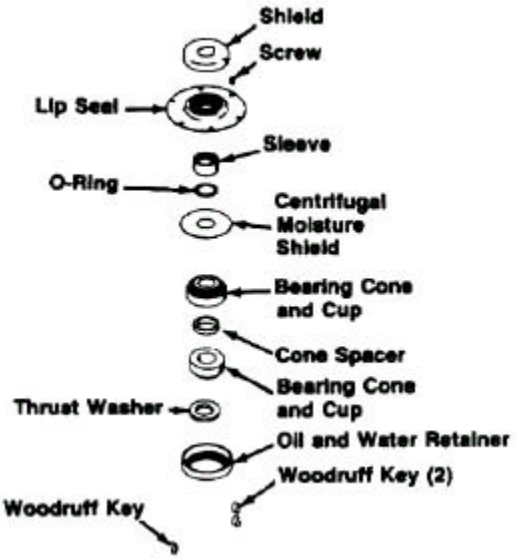


Figure 12-11.

Figure 12-12.

BEARING CLEANING AND LUBRICATION

1. Clean old grease and dirt from the bearings by washing the bearings with kerosene or mineral spirits.

   After the bearing has been washed and cleaned, it should be dried thoroughly. Inspect bearing cones and bearing cups carefully. If they show evidence of corrosion, pitting, scoring or any other signs of damage or wear, discard complete bearing set.

   Replacement parts are available in an Upper End Bell Bearing and Seal Kit. Parts included in kit are shown in Figure 12-11.

   Do not attempt to use old cones with new cups or vice-versa. The double tapered roller bearings are machined as a matched set and they will not "mate" with other bearing set cones or cups.

2. Use only Texaco Kafram #390 grease or Texaco BRB grease to lubricate the bearings. This type of grease has been chosen to be compatible with the disposer design and operating conditions. Do not use any substitutes for the two types of grease specified.

   The bearings must be packed with grease. A mechanical grease packer will do a good job of packing the bearing cones. These packers wilt also keep the grease clean and free of shop dirt and dust. The grease is forced through the bearing cone from one end to the other to fill the space between the rollers and the cage. Any excess grease present should be smeared on the outside of the rollers and cage.

   If a mechanical grease packer is not available, proceed as follows:

   Place an amount of the Texaco Kafram #390 grease i n the palm of your hand. Holding the bearing in the other hand, wipe the large end Into the grease (see Figure 12-12). Make sure the grease gets deep in between the roller and the cage and not just on the outside of these parts. After the rollers are sufficiently packed, smear the excess grease on the outside of the rollers and cage.

UPPER AND LOWER BEARING CUP ASSEMBLY

NOTE

Once assembly of the bearings, seal (bearing/seal kit), upper end bell, rotor shaft and rotor shredder is started, continue and complete without interruption. This will Insure the bearing cups are property positioned while the Loctite hardens. A 30 minute drying time Is required for the Loctite to harden. Therefore, do not run the unit until 30 minutes after this assembly.

1. Prior to assembly, the cup recess in the end bell must be thoroughly cleaned to remove all traces of grease, dirt and mastic. A clean rag soaked with paint thinner will remove all of this residue. It is very important that the entire cavity is completely free of any burrs. Crocus cloth may be required to smooth the area. After the end bell has been cleaned, wipe with a clean rag. Also clean the outside diameter of the bearing cup in the same manner to remove all oil, grease or dirt. Be sure it is also wiped dry with a clean rag. Coat the cup recess in the end bell with Loctite and insert the bearing cup. Press cup in firmly so it will be seated fully in the recess. Turn the end bell over and repeat this process with the remaining bearing cup.

Figure 12-13.

LOWER BEARING AND OIL AND WATER RETAINER ASSEMBLY

1. Place end bell on bench in upside down position. Insert the lower tapered roller bearing (8) into outer cup (see Figure 12-1). Now place and center the steel thrust washer on the bearing. Place the oil and water retainer (12) squarely into end bell recess. Using a wood block and a nylon or rawhide mallet, tap the seal into the end bell recess until it is flush with the casting (see Figure 12-13).

NOTE

Upper tapered roller bearing will be assembled later.

LOWER END BELL, STATOR AND ROTOR SHAFT ASSEMBLY

1. Support the motor assembly firmly so the end bell can be reinstalled. Holding the end bell (10) with both hands, guide it down over the rotor shaft being careful not to damage the shaft threads. (Thrust washer could shift causing interference). Line up the scribe marks. Tap alternately on opposite sides with a mallet until it is seated fully in the stator.

2. Stand the unit upside down and reinstall the fan, bottom cover and motor thru bolts. Turn assembly right side up.

3. The cone spacer is machined to properly space the two tapered roller bearings when they are installed in the end bell. It is not interchangeable with any other cone spacer. If new bearings are installed, the new cone spacer furnished with the bearing set must be used.

4. Install upper tapered roller bearing in end bell recess. Be sure bearing has sufficient lubrication. If not, clean and grease bearing as outlined in Greasing procedure.

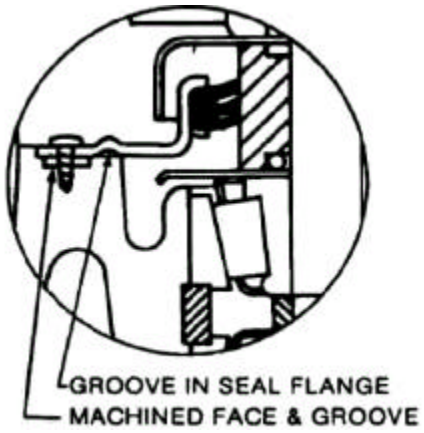


Figure 12-14.

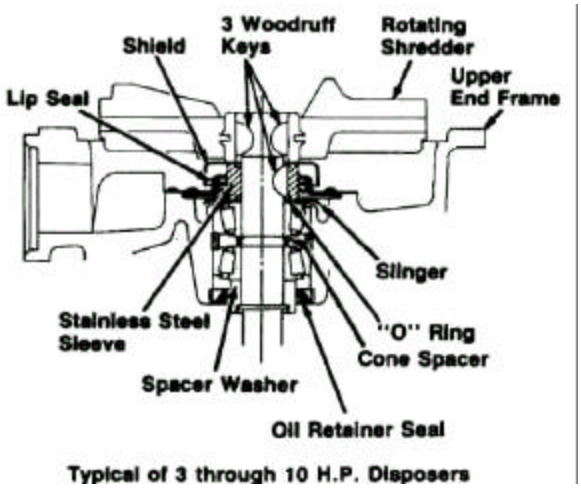


Figure 12-15.

5. The centrifugal moisture shield is designed to fit snugly on the shaft, but not tight. Place it on the rotor shaft to determine its proper fit. If it is too loose or too tight, replace it. We recommend this procedure prior to reassembly of the centrifugal moisture shield into the end bell. There is no way of determining its proper fit once the end bell is assembled and fined to the motor assembly.
6. Install "O" Ring (5) onto the shaft. Be sure the "O" Ring is pushed down far enough so it rests on the centrifugal moisture shield (see Figure 12-1).
7. Install woodruff key (14) into the shaft keyway. Be sure key is seated fully in keyway. If It is necessary to tap the key into place, use a soft metal drift such as copper or brass, not steel. After the key is fully seated, install the spacer sleeve (4).

NOTE

Proper sequence of assembly of the spacer sleeve and seal must be followed exactly as outlined. Do not install the lip seal (3) until after the stainless steel sleeve (4) is installed. The lips of the seal must have the upward deflection or configuration as shown In the cutaway view. Otherwise a malfunction potential will exist (see Figure 12-15).

NOTE

Just prior to Installing the tri-lip seal, coat the machined face and groove of the upper end bell filling the machined groove with a waterproof silicone sealer — all around (see Figure 12-14).

Also fill the formed groove in the bottom of the seal flange with silicone sealer — all around.

Do not use excessive amount of sealer. Do not use substitutes.

8. Install the lip seal (3) over the spacer sleeve (4) and down into the recess in the upper bell. Line up the screw holes and install the retaining screws (2).

NOTE

The lip seal has been packed with a special lubricant. Do not remove it.

9. Install the trash excluder shield (1) and the two rotor shredder woodruff keys (13).
10. Reassemble the unit completely.
11. Figure 12-15 shows assembled bearings, seals, rotor, shredder and rotor shaft in upper end bell.

REASSEMBLE END BELL TO UNIT

1. Support the motor assembly firmly so the end bell can be reinstalled. Holding the end bell with both hands, guide it down over the rotor shaft, being careful not to damage the shaft thread's. Line up the scribe marks. Tap alternately on opposite sides with a mallet until it is seated fully. Then reassemble as outlined in Sections 7, 8,9, 10 and 11.

ROTOR AND SHAFT

REMOVAL FROM UNIT

1. Disassemble unit completely as outlined in Sections 7, 8, 9, 10,11 and 12.
2. After the unit has been disassembled as outlined above, it is a simple matter to remove the rotor and shaft assembly. Grasp the exposed portion of the shaft firmly and lift up and out of stator (see Figure 13-1).
3. After rotor and shaft have been removed, remove the pre-load spring from the lower end bell bearing cavity (see Figure 13-2).

Figure 13-1.

ROTOR AND SHAFT DISASSEMBLY

The rotor and shaft assembly has only two moving parts on it that can be removed and replaced. One part is the lower bearing and the other part is the centrifugal switch assembly (found on single phase units only). There should be no necessity of removing either part unless they are inoperative or damaged. The balance of the rotor and shaft assembly is not to be disassembled in the field. If either the rotor or shaft is damaged, it will be necessary to replace the

1. Press the lower bearing off in an arbor press, supporting the rotor and shaft by the bearing (see Figure 13-3). If bearing is worn or damaged, discard it.
2. To remove the centrifugal switch (single phase units only), it is first necessary to remove the lower bearing as described in Step 1. Remove the two centrifugal switch springs. After they are removed, the two centrifugal switch actuating arms and the phenolic ring will also become free and can be removed. The base portion of the centrifugal switch remaining on the shaft can be removed by prying with two screwdrivers or pry tools. Place the pry tools opposite each other under the centrifugal switch base. By rocking the base portion of the centrifugal switch with the pry tools, it can be loosened enough to remove it. It should then be discarded.

Figure 13-2.

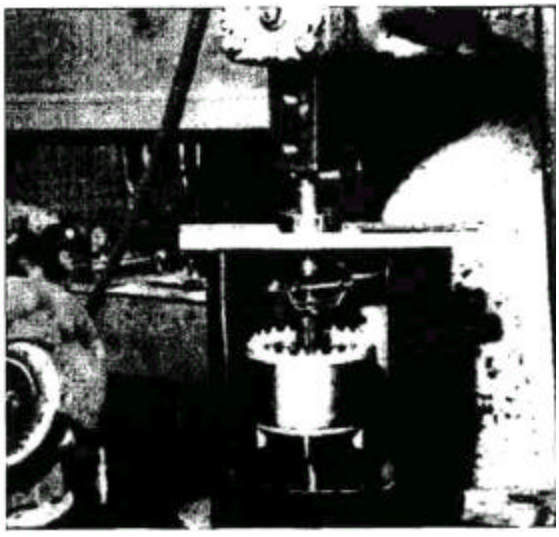


Figure 13-3.

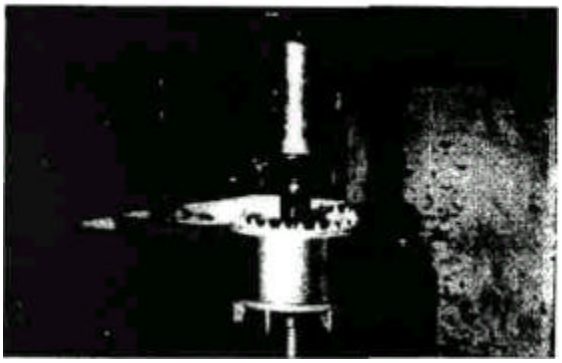


Figure 13-4.

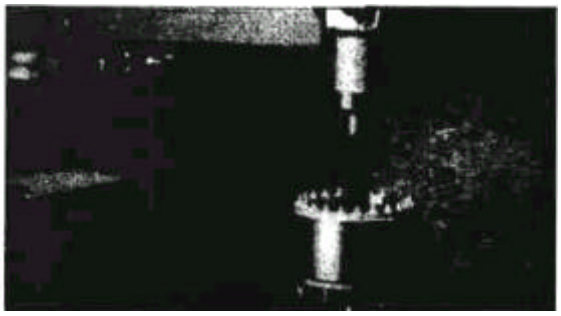


Figure 13-5.

Figure 13-6

Figure 13-7.

ROTOR AND SHAFT REASSEMBLY

1. To assemble the centrifugal switch (single phase units only), place the rotor and shaft in an upside down position in an arbor press. Support the shaft firmly so as not to damage the bearing journals or mounting nut threads. Place the new centrifugal switch on the shaft in an assembled condition. Do not disassemble it. Gently apply pressure to the centrifugal switch until it "opens" or collapses. Then proceed to press the switch onto the shaft, taking care not to press it on too far (see Figure 13-4). With the centrifugal switch pressed on to the proper depth, the correct dimension is 2-61/64" from the end of the shaft to the face of the phenolic ring. This measurement must be made when the centrifugal switch is in the "open" or collapsed condition. A tolerance of 1/64" plus or minus is allowed.
2. To replace the lower bearing on the shaft, use an arbor press. Use a hollow tube the diameter of the inner race and press bearing on until it seats on shoulder of rotor shaft (see Figure 13-5).

REASSEMBLY TO UNIT

1. Reinstall the pre-load spring into the lower end bell bearing cavity. Pre-load spring should be installed with spring feet bottoming in cavity (see Figure 13-6).
2. Prior to reassembly of rotor and shaft assembly into stator housing, examine the centrifugal switch assembly, lower bearing and woodruff keyways. If components need replacing or if woodruff keyways are distorted, replace parts as previously outlined.
3. Grasp rotor and shaft assembly firmly by upper bearing journal. Lower the rotor and shaft assembly gently into the stator assembly, being careful not to damage centrifugal switch or motor windings (see Figure 13-7). Lower bearing will seat itself into the lower bearing cavity, at which time rotor and shaft will be in place. Complete reassembly as outlined in Sections 7, 8, 9, 10, 11 and 12.

REMOVAL FROM UNIT

1. Disassemble unit as outlined in Sections 7 and 9. Scribe mark upper end bell and stator housing and lower end bell and stator housing (see Figure 14-1).

2. Lay unit on its side and tap on bottom surface of upper end bell until upper end bell and stator housing separate (see Figure 14-2). At this point, stand unit upside down and lift stator and lower end bell assembly straight up and off.

Figure 14-1.

STATOR AND LOWER END BELL DISASSEMBLY

The stator assembly and the lower end bell assembly contain all the electrical components of the disposer. In the event replacement of one or more of these components is required, proceed as follows:

1. The capacitor (used on single phase units only) is held in place in the terminal box mounting bracket by a spring clip. Insert a screwdriver blade between the clip and bottom of capacitor and by prying gently, the capacitor will be released (see Figure 14-3).

CAUTION

DO NOT TOUCH CAPACITOR TERMINALS AS ELECTRICAL SHOCK MAY OCCUR.

This will allow access to the terminals so the lead wires can be unsoldered, allowing removal or replacement of the capacitor. After lead wires are resoldered, reinstall the capacitor.

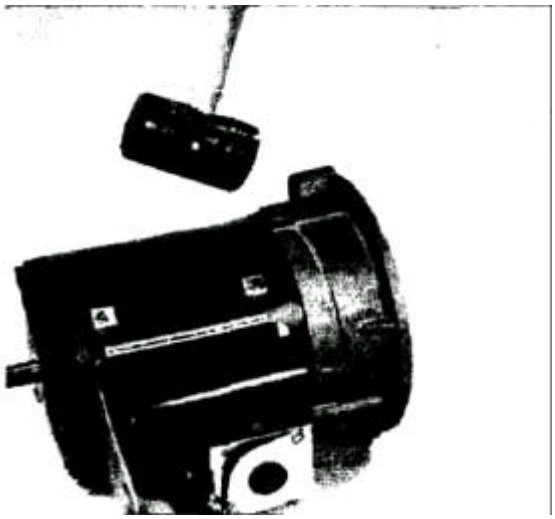


Figure 14-2.

2. Capacitor Testing

CAUTION

DO NOT TOUCH CAPACITOR TERMINALS. CHARGED CAPACITOR CAN CAUSE SEVERE SHOCK WHEN BOTH TERMINALS ARE TOUCHED. A CHARGED CAPACITOR WILL HOLD AN ELECTRICAL CHARGE UNTIL IT IS DISCHARGED AND OR SHORTED OUT. HANDLE CAPACITOR CAREFULLY UNTIL IT IS KNOWN THE CAPACITOR IS FULLY DISCHARGED.

Figure 14-3.

Figure 14-4.

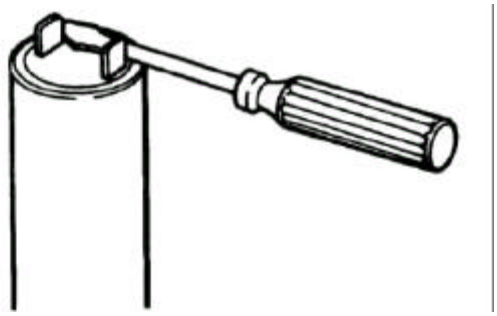


Figure 14-5.

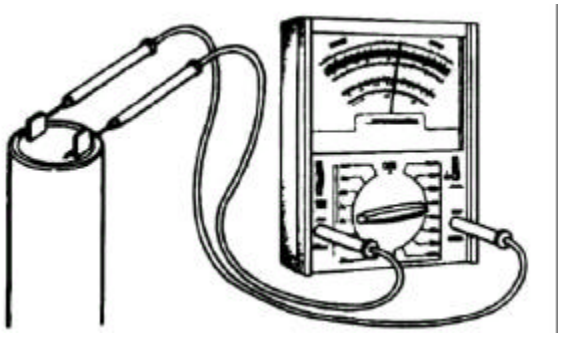


Figure 14-6.

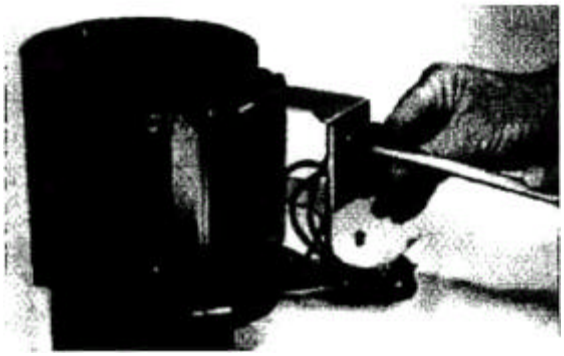


Figure 14-7.

a. Before inspecting and testing, make sure the capacitor is fully discharged by using a jumper wire with a high resistance (1000 ohm) resistor to short out and or discharge the capacitor (see Figure 14-4).

   An insulated screwdriver can also be used but is not recommended because possible damage to the capacitor may occur (see Figure 14-5). A sharp crack and spark will occur if the capacitor is fully or partially charged when performing this procedure.

b. To test the capacitor, use an ohmmeter (set on highest ohm scale). Place the meter probes on capacitor terminals (see Figure 14-6).

1. If meter does not move, capacitor is open. Replace capacitor.
2. If meter needle Jumps to 0 (zero) and stays there, capacitor is snorted within itself. Replace capacitor.
3. If meter needle jumps to 0 (zero) and slowly moves back toward infinity (8), capacitor is good.
4. The overload protector is held in place in the terminal box mounting bracket by an overload clamp and two retaining screws. To remove the overload protector, remove the two screws and the overload clamp (see Figure 14-7). At this point, the overload protector is available for removal and or replacement. If the overload protector is to be removed to allow further disassembly of the terminal box mounting bracket, be sure to mark or identify the lead wires as they are unsoldered from the overload protector. This will enable you to solder them to the proper terminals upon reassembly.

   If the overload protector is just being replaced, unsolder the lead wires, one at a time, and resolder to the replacement overload to assure connecting to the proper terminals.

   Refer to "Wiring Diagrams" for correct connections.

5. Overload Switch Check

   a. Make certain the red button is pressed in fully.

   b. Use an ohmmeter to check continuity (see Figure 14-8).

      1. Three phase overload protectors have six (6) terminals.

      2. Single phase overload protectors have three (3) terminals.

   An ohmmeter reading should show continuity between all terminals, including the center post.

   Whenever the overload protector is tripped open, the ohmmeter will show no continuity between any and all terminals, including the center post.

   If the overload needs replacing, be absolutely certain the new overload protector is correct. Refer to parts lists for correct numbers.

   See Diagrams 1, 2, 3, 4 and 5 of Section 16.

6. The terminal box mounting bracket should not have to be removed from the stator unless the stator is to be replaced or unless the terminal box mounting bracket is damaged. To disassemble the mounting bracket from the stator, remove the overload protector, capacitor (single phase units only) and the four mounting screws. The mounting bracket will become free. To reinstall, reverse above procedure (see Figure 14-9).

7. To replace the lower end bell, separate it from the stator and disconnect the lead wires connected to the starting switch (see Figure 14-10). Remove the two screws retaining the starting switch and end bell will be free for removal. To reinstall, reverse above procedure.

Figure 14-8.

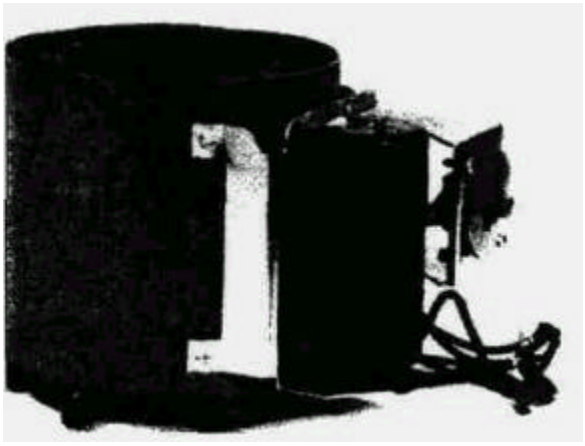


Figure 14-9.

Figure 14-10.

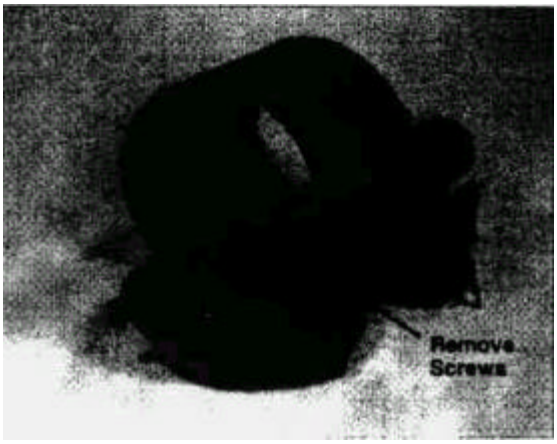


Figure 14-11.

8. To remove and replace starting switch (used on single phase units only) proceed as outlined in Step 6 (see Figure 14-11).
9. To replace the stator, disassemble stator and lower end bell assembly as described previously.
10. Stator Testing

    a. Use an ohmmeter to check/test continuity.

    b. Each winding should be checked individually.

    c. Make certain no electrical components are in the circuit you are testing.

    d. Check for:

        1. Opens

        2. Shorts (between coils)

        3. Grounds

    e. Refer to and use correct wiring diagram when testing. See Diagrams 1, 2, 3, 4 and 5 of Section 16.

NOTE

Check the motor wiring diagram that corresponds to the voltage and phase of the motor that is being tested. This will help to identify the proper leads to be used for checking the desired stator winding.

JAMMED DISPOSER CONDITIONS

A jammed condition may be described as disposer:

1. Hums but will not turn/start.
2. Starts and stops abruptly.
3. Starts hard, may run and trip overload.
4. Cannot turn rotor shredder by hand.

Figure 15-1.

The causes would be:

1. Foreign object/material such as silverware, cleaning rag, cooking utensil, tin foil wrappings, mop strings, etc. entered the disposer and wedged tightly between grinding elements.

2. Excessive material such as plastic straws, cigarette filters, bits of tin foil, cocktail mixing sticks, etc can become chewed up and packed in the vertical teeth of the stationary shredder. Eventually they may swell and start to bind on the outside diameter of the rotating shredder causing the motor to overload. Lack of sufficient post flush contributes greatly to this problem.

3. Disposer was turned off before all material was ground away or disposer was heavily overloaded before or during the grinding operation.

Clearing the jam may require:

1. Using the 18" jam release bar (I.S.E. part No. 4173B) (see Figure 15-1).

   a. The notches on the ends of the jam bar are different. Determine which end should enter the disposer to engage the lug on the rotor shredder. Clamp vise grips or adjustable pliers to the bar as shown. While pushing downward on the bar, turn the vice grips to move the rotor shredder. Looking into the disposer with a flashlight will help determine which direction the shredder was turning so that you can unjam the unit by turning the jam bar in the opposite direction.

   b. Remove the object(s) and reset the overload protector if necessary.

   c. If using the jam bar was unsuccessful, the disposer requires removal and disassembly down to and possibly removal of the stationary shredder.

2. Cleaning the vertical grinding teeth of the stationary shredder.

   a. Use an awl and scrape each individual tooth clean or disassemble the unit down to the shredders and clean the teeth.

Motor Lead Connections

The following five (5) wiring diagrams will be used for all SS Model commercial disposers for:

- Proper motor lead connections.
- Checking continuity, grounds, opens and shorts.
- Replacing electrical component motor parts.

For your information and to determine which wiring diagram to use, check the specification decal on the disposer to determine if it is a single, dual or tri-voltage motor.

Commercial disposers produced since April 1985 have tri-voltage motors and are designated **as** such on the specification decal.

115/208/230 Volts	Single Phase	(7 Leads)
208/230/460 Volts	Three Phase	(12 Leads)

Commercial disposers produced prior to April 1985 have single or dual voltage motors. The motor voltage is designated on the specification decal.

115/230 Volts	Single Phase	(7 Leads)
208 Volts	Single Phase	(7 Leads)
230/460 Volts	Three Phase	(12 Leads)
208 Volts	Three Phase	(3 Leads)

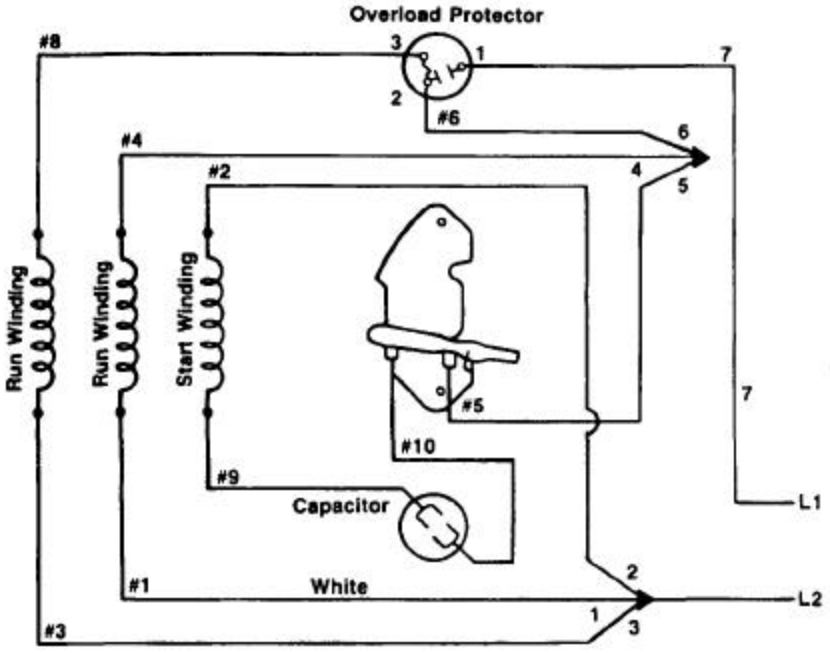
Wiring diagrams/connections remained the same except for the 208 volt three phase motors. The single voltage 208 volt three phase motor is the only motor with three leads. Therefore, if you are diagnosing such a motor, you must use diagram 5 only. In all other cases, use the appropriate diagram corresponding to the voltage indicated.

These connections are the same as the STANDARD MOTOR CONNECTION WIRING DIAGRAMS found in the terminal **box.**

See Section 17 for "ELECTRICAL CONNECTION DIAGRAMS" for electrical controls.

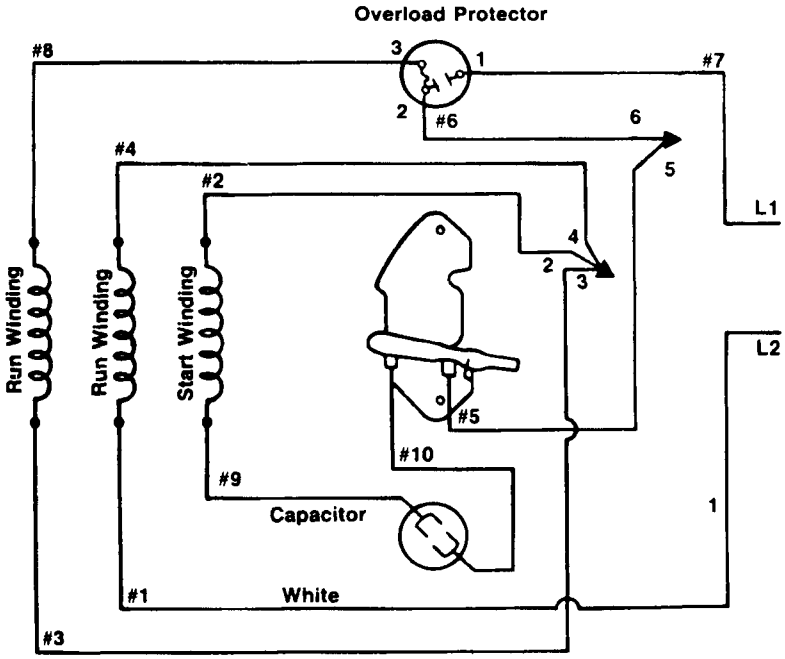
CHECK: Electrical specifications of the motor and power (voltage and phase) must match. Wiring connections must correspond.

Important Note: Do Not use these motor lead connections whenever motor leads are connected to an optional motor reversing control (switch). Refer to "Electrical Connection Diagrams" in Section 17 for proper motor lead connections.



115 Volts
60 Hz
Single Phase

DIAGRAM 1

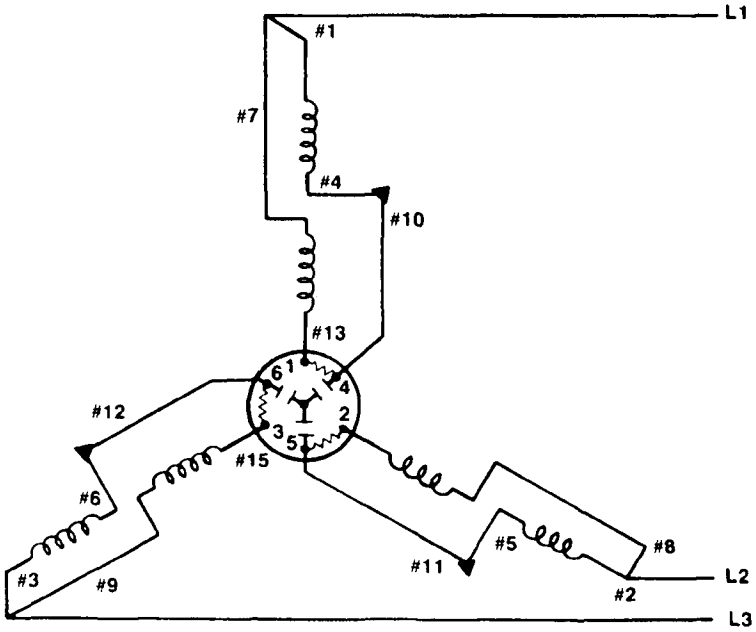


208/230 Volts
60 Hz
Single Phase

DIAGRAM 2

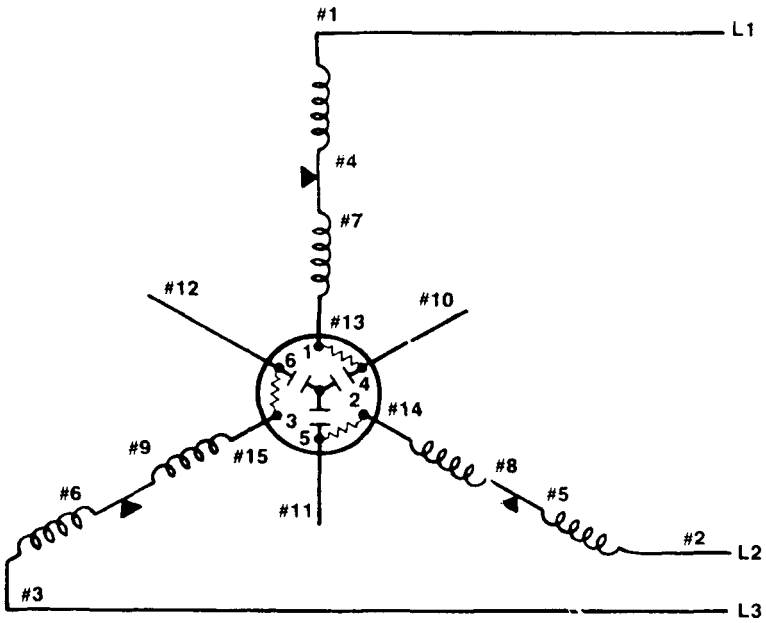
CHECK: Electrical specifications of the motor and power (voltage and phase) must match. Wiring connections must correspond.

Important Note: Do Not use these motor lead connections whenever motor leads are connected **to** an optional motor reversing control (switch). Refer to "Electrical Connection Diagrams" in Section 17 for proper motor lead connections.



208/230 Volts
60 Hz
Three Phase
12 Lead Motor
(also see diagram 5)

DIAGRAM 3

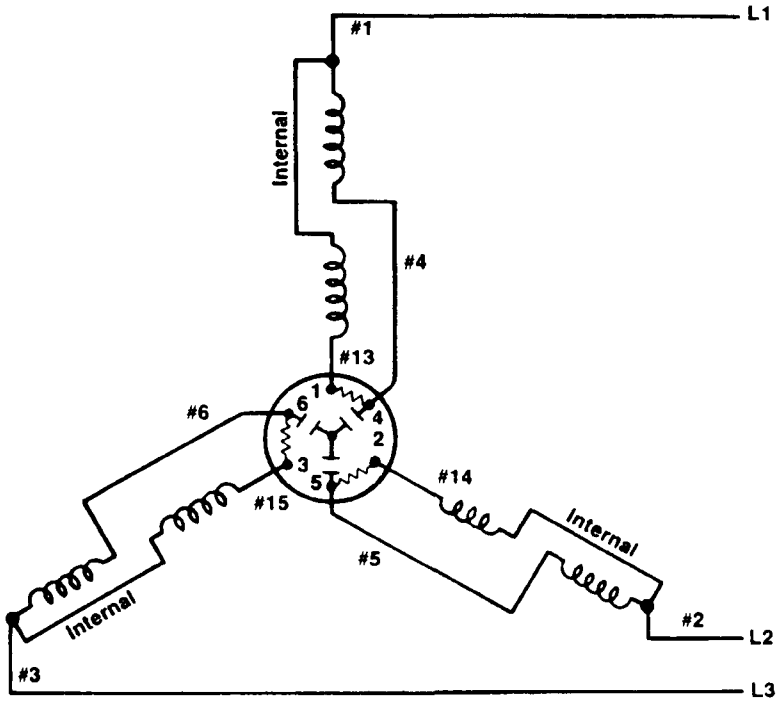


460 Volts
60 Hz
Three Phase

DIAGRAM 4

CHECK: Electrical specifications of the motor and power (voltage and phase) must match. Wiring connections must correspond.

Important Note: Do Not use these motor lead connections whenever motor leads are connected to an optional motor reversing control (switch). Refer to "Electrical Connection Diagrams" in Section 17 for proper motor lead connections.



208 Volts
60 Hz
Three Phase
Single Voltage
Motor Only
3 Lead Motor
Review Sheet 1
(also see diagram 3)

DIAGRAM 5

ELECTRICAL CONNECTION DIAGRAMS

The following "Electrical Connection Diagrams" are used to:

- Connect Electrical Controls to a Disposer Motor
- Add, Remove or Bypass Electrical Controls
- Diagnose Improperly Wired Installations
- Reconnect Removed Controls or Wires

Servicing commercial disposers involves basic knowledge of electrical controls and their function. It is possible that a disposer may fail to start or may trip the overload protector or circuit breaker because of faulty electrical connections in the control itself.

Isolating all of the controls from the disposer motor can be done with a bypass cord (see Figure A). When using the cord, the motor connections should be the same as when using a manual on/off switch. Using the bypass cord will allow the service technician to determine quickly if the disposer or the controls are faulty.

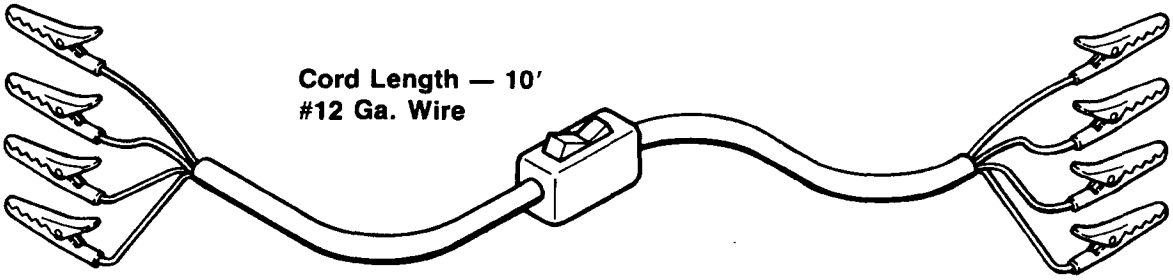
If on a new or rewired installation the fault is in the controls, check all wiring connections to make certain they are correct for the electrical controls installed. Check twice.

If any electrical control requires replacing, it can be ordered from IN-SINK-ERATOR by description. You must furnish complete motor specifications, type of control and any numbers found on the control. Electrical controls vary depending on the size of the disposer and in some cases, a special control may be found.

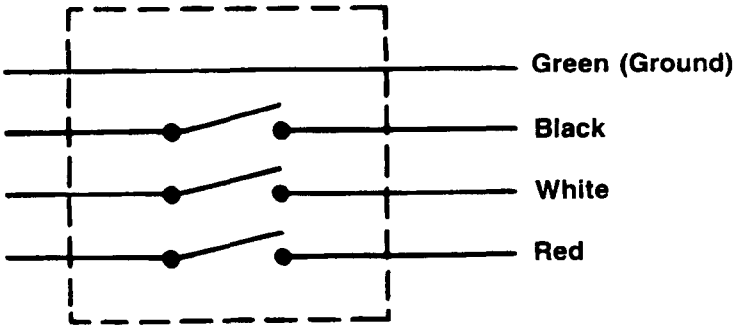
ELECTRICAL CONNECTION DIAGRAMS FOR ELECTRICAL CONTROLS

INDEX OF CONTROLS	DIAGRAM NO.
STARTING (ON-OFF) SWITCH-MANUAL	1 2 3 4
REVERSING SWITCH-MANUAL-SINGLE PHASE	5 6 7 8
REVERSING SWITCH-MANUAL-THREE PHASE	9 10 11 12 13 14 15
MAGNETIC STARTER-WITH START/STOP BUTTONS	21 22 23 24
MAGNETIC STARTER-REMOTE CONTROL TYPE	15 16 17 18 19 20
TIME DELAY RELAYS	2 4 7 8 12 13 14 19 20 23 24
PRESSURE SWITCHES	3 17 22
FLOW INTERLOCK SWITCH	16 21
PUSH BUTTON CONTROL STATIONS	18 19 20
WATER SOLENOID VALVE	ALL

There are special designed installations requiring additional or specific types of controls or combinations. Wiring diagrams for those do not appear on these sheets. If help is needed, call the factory for engineering assistance.



Switch (Locate Approx. 3' From End Of Cord)



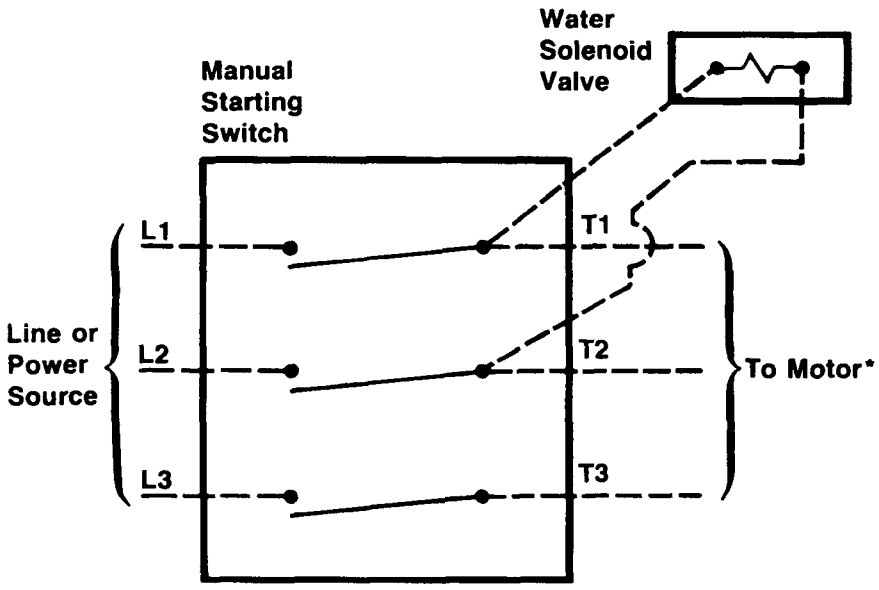
Alligator Clips Fastened to Each Wire End
8 Required

Figure A

Broken lines indicate leads to be supplied by installing electrician.

· Use STANDARD MOTOR CONNECTION WIRING DIAGRAMS in disposer motor terminal box or see Section 17 "WIRING DIAGRAMS".

STARTING (ON-OFF) SWTICH — MANUAL

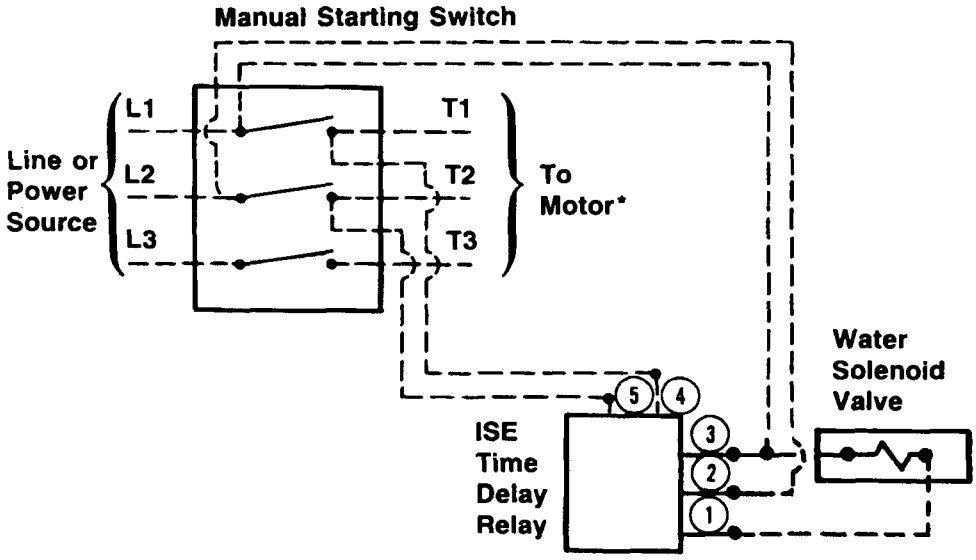


All Voltages

Do Not Use L3 and T3 For Single Phase Applications.

DIAGRAM 1

STARTING (ON-OFF) SWITCH — MANUAL W/TIME DELAY RELAY



All Voltages Except 460 Volts

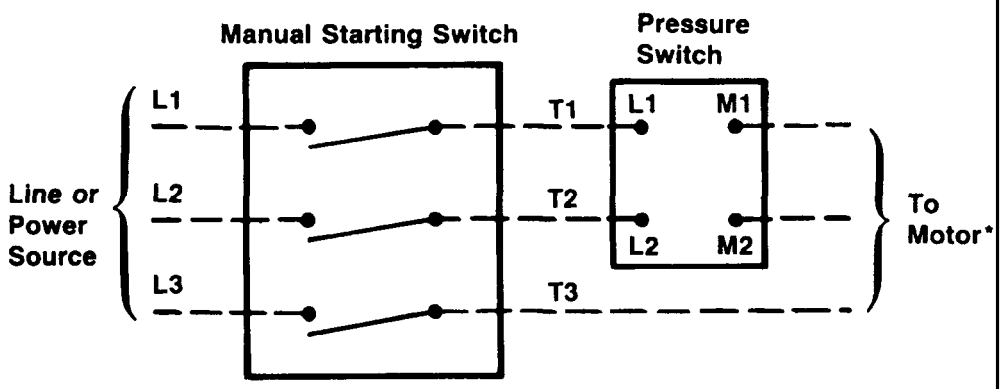
Do Not Use L3 and T3 For Single Phase Applications.

DIAGRAM 2

Broken lines indicate leads to be supplied by installing electrician.

*** Use** STANDARD MOTOR CONNECTION WIRING DIAGRAMS in disposer motor terminal box or see Section 17 "WIRING DIAGRAMS".

STARTING (ON-OFF) SWITCH — MANUAL W/PRESSURE SWITCH

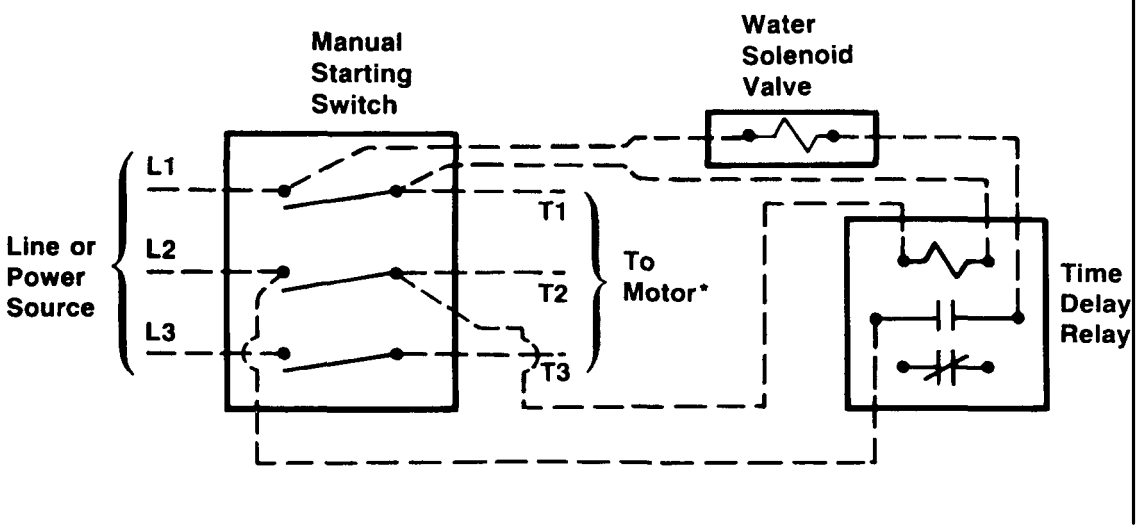


All Voltages
1/2 H.P. Through 5 H.P.

Do Not Use
L3 and T3
For Single Phase
Applications.

DIAGRAM 3

STARTING (ON-OFF) SWITCH — MANUAL W/TIME DELAY RELAY

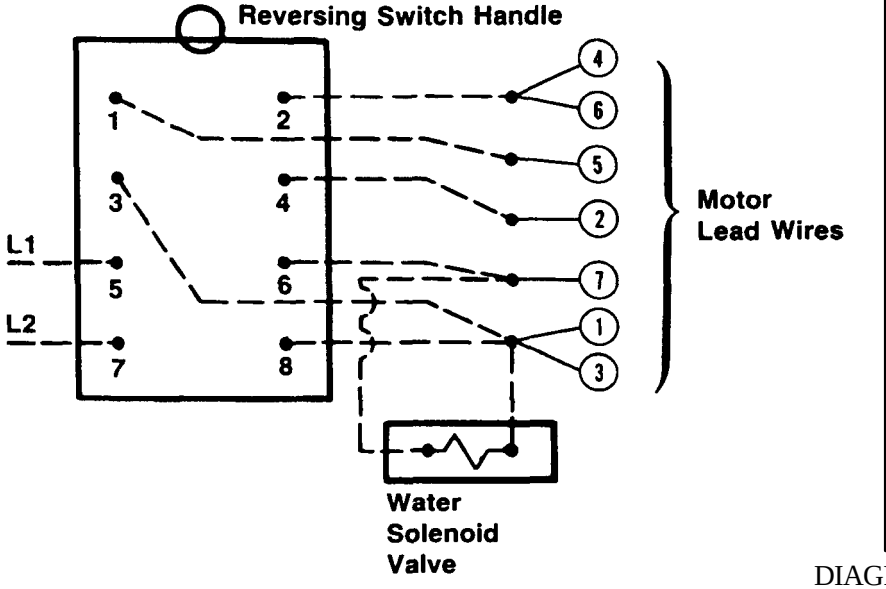


460 Volts
Three Phase

DIAGRAM 4

Broken lines indicate leads to be supplied by installing electrician.

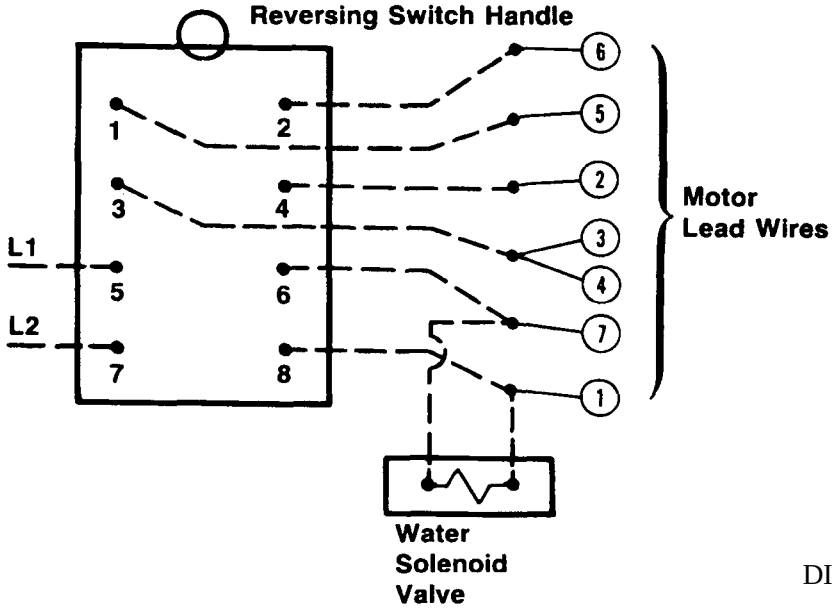
REVERSING SWITCH — MANUAL SINGLE PHASE



115 Volts
Single Phase

DIAGRAM 5

REVERSING SWITCH — MANUAL SINGLE PHASE

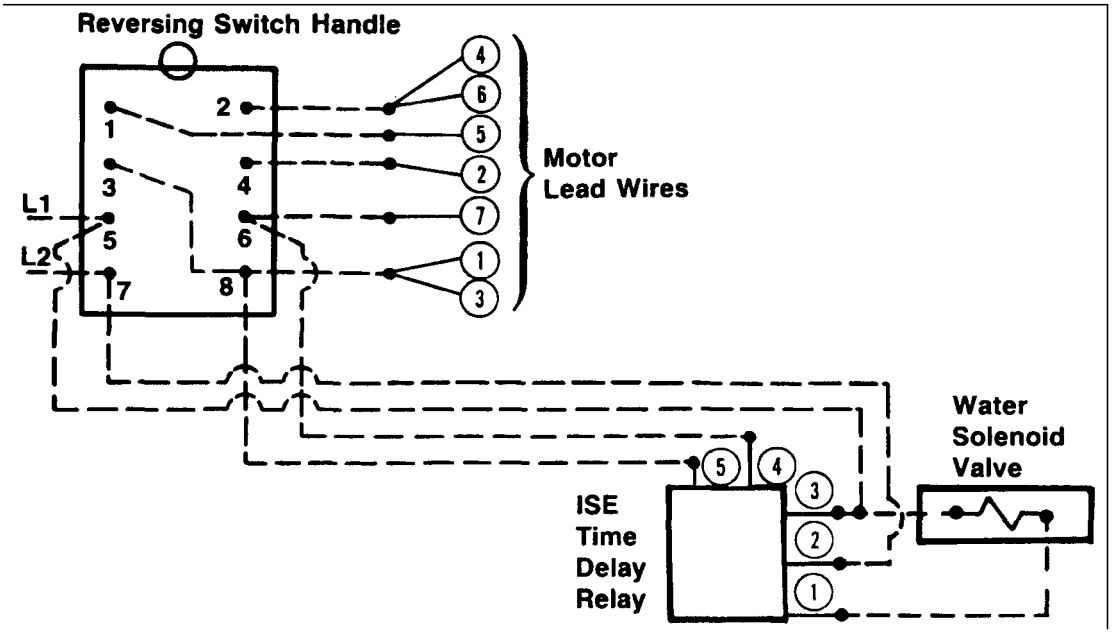


208/230 Volts
Single Phase

DIAGRAM 6

Broken lines indicate leads to be supplied by installing electrician.

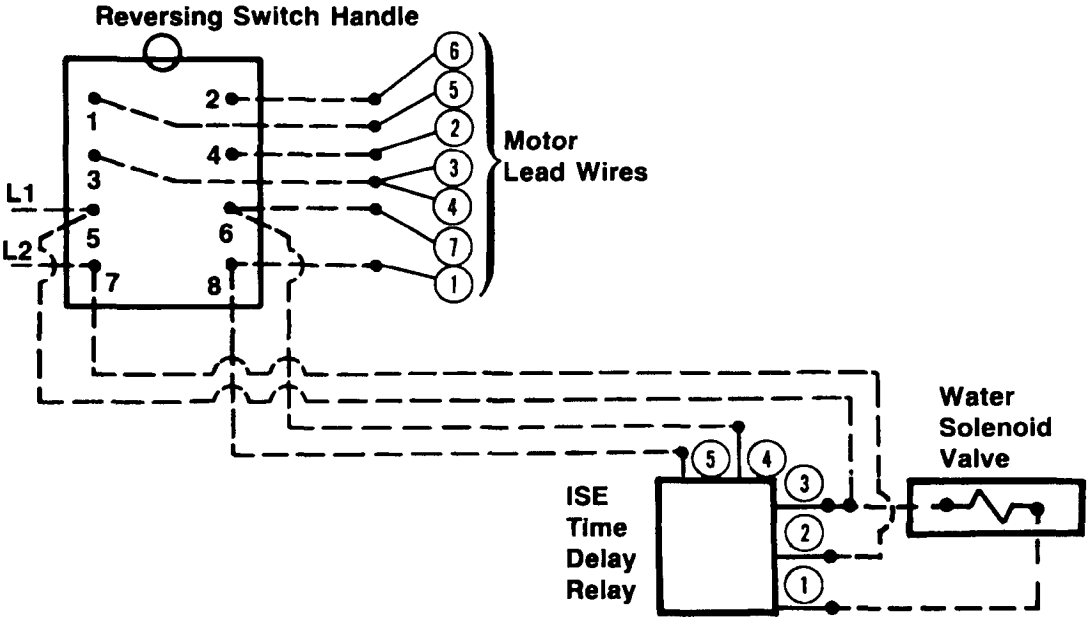
REVERSING SWITCH — MANUAL SINGLE PHASE W/TIME DELAY RELAY



115 Volts
Single Phase

DIAGRAM 7

REVERSING SWITCH — MANUAL SINGLE PHASE W/TIME DELAY RELAY

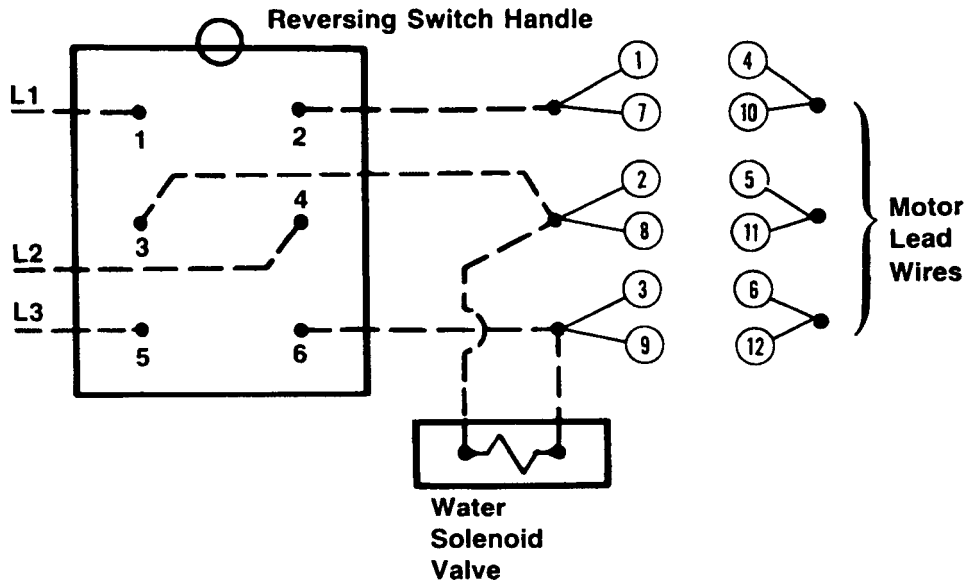


208/230 Volts
Single Phase

DIAGRAM 8

Broken lines indicate leads to be supplied by installing electrician.

REVERSING SWITCH — MANUAL THREE PHASE

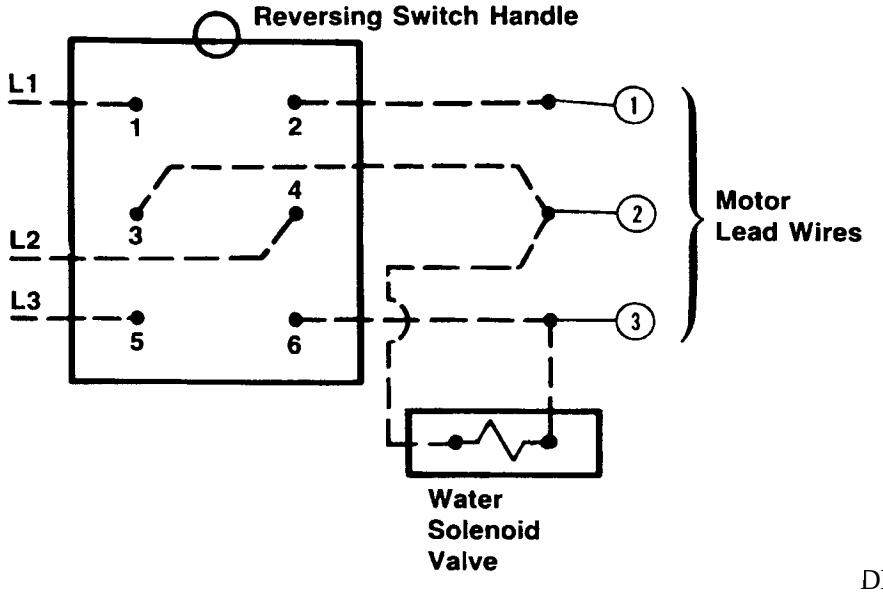


208/230 Volts
Three Phase
12 Lead Motor

(also see Diagram 10)

DIAGRAM 9

REVERSING SWITCH — MANUAL THREE PHASE



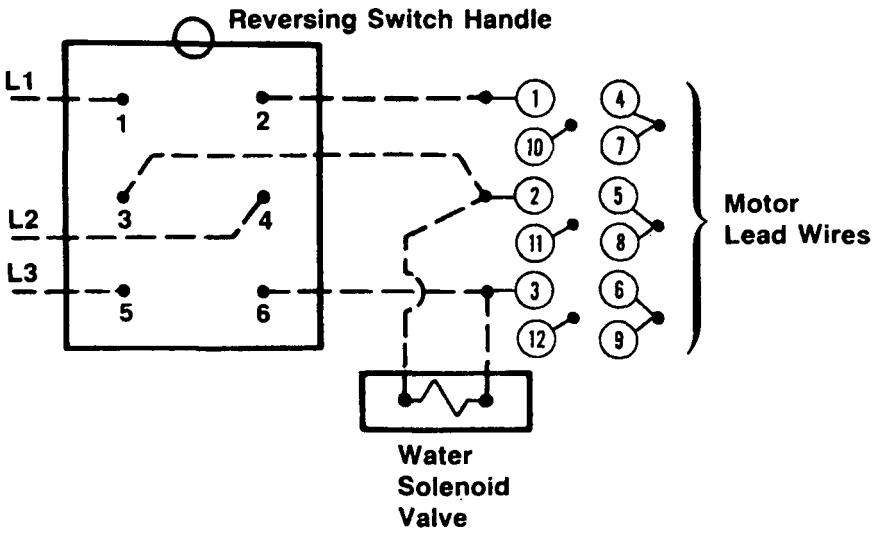
208 Volts
Three Phase

Only For Single
Voltage Motor
3 Lead Motor

DIAGRAM 10

Broken lines indicate leads to be supplied by installing electrician.

REVERSING SWITCH — MANUAL THREE PHASE

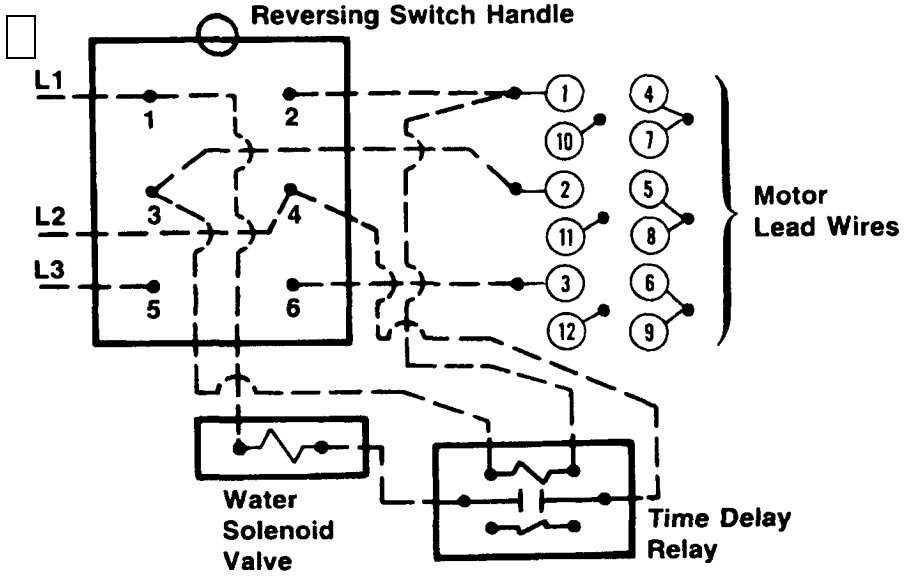


460 Volts

Three Phase

DIAGRAM 11

REVERSING SWITCH — MANUAL THREE PHASE W/TIME DELAY RELAY



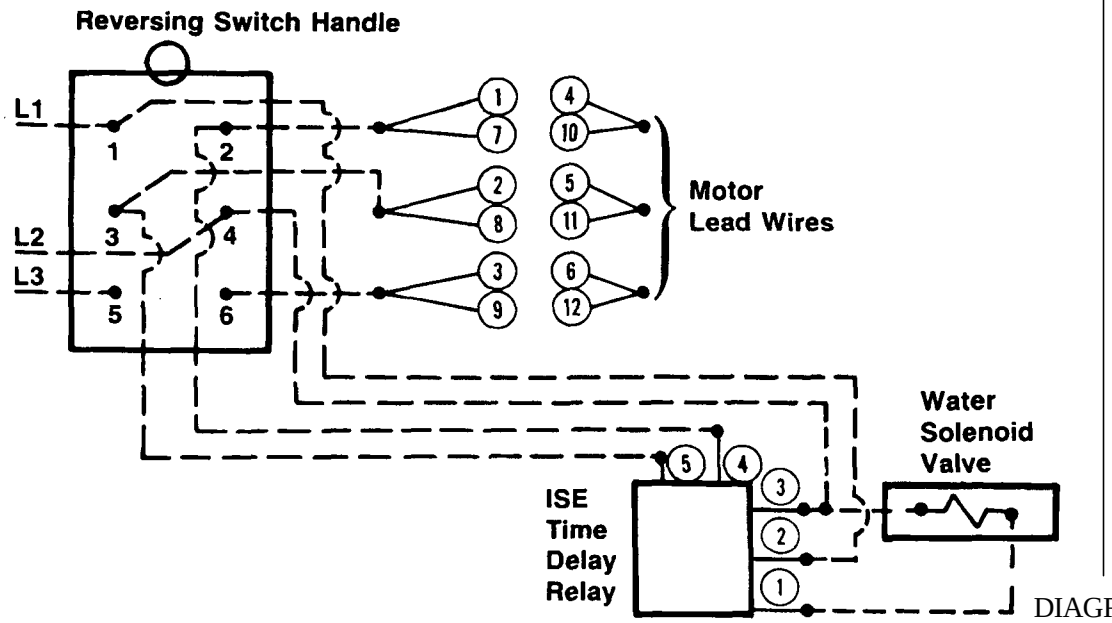
460 Volts

Three Phase

DIAGRAM 12

Broken lines indicate leads to be supplied by installing electrician.

REVERSING SWITCH — MANUAL THREE PHASE W/TIME DELAY RELAY



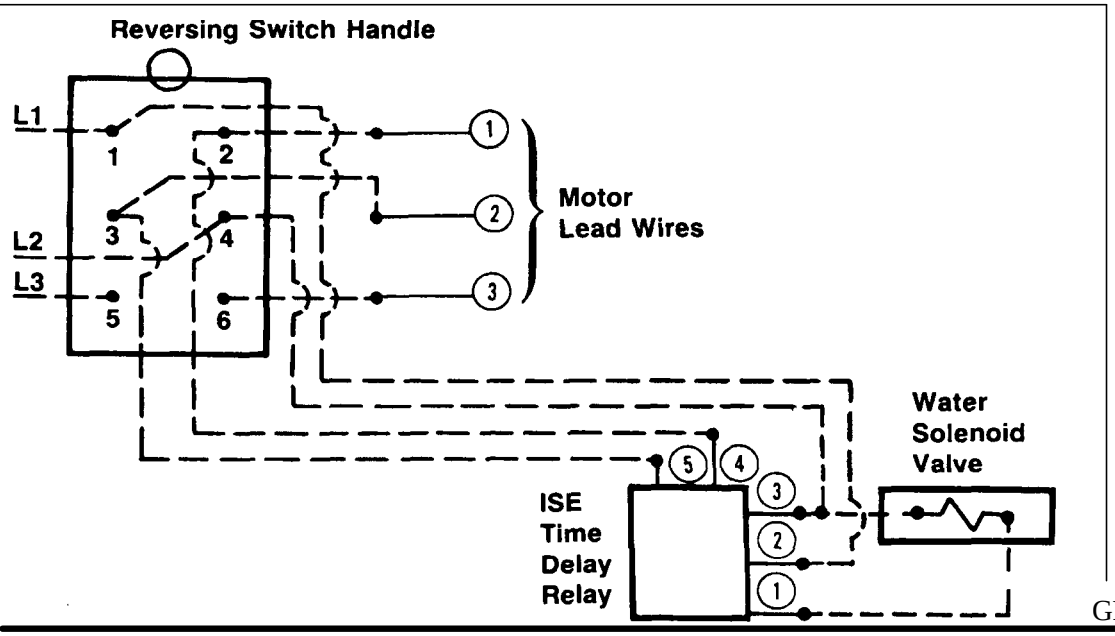
208/230 Volts
Three Phase

12 Lead Motor

(also see Diagram 14)

DIAGRAM 13

REVERSING SWITCH — MANUAL THREE PHASE W/TIME DELAY RELAY



208 Volts

Three Phase

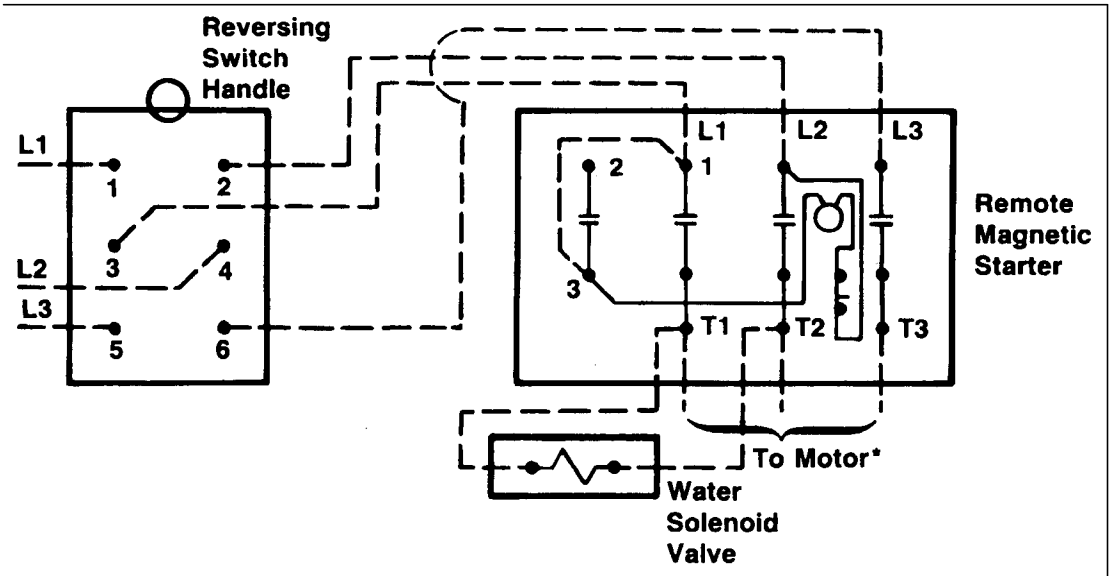
Single Voltage
Motor Only
3 Lead Motor

GRAM 14

Broken lines indicate leads to be supplied by installing electrician.

* Use STANDARD MOTOR CONNECTION WIRING DIAGRAMS in disposer motor terminal box or see Section 17 "WIRING DIAGRAMS".

REVERSING SWITCH — MANUAL THREE PHASE W/MAGNETIC STARTER

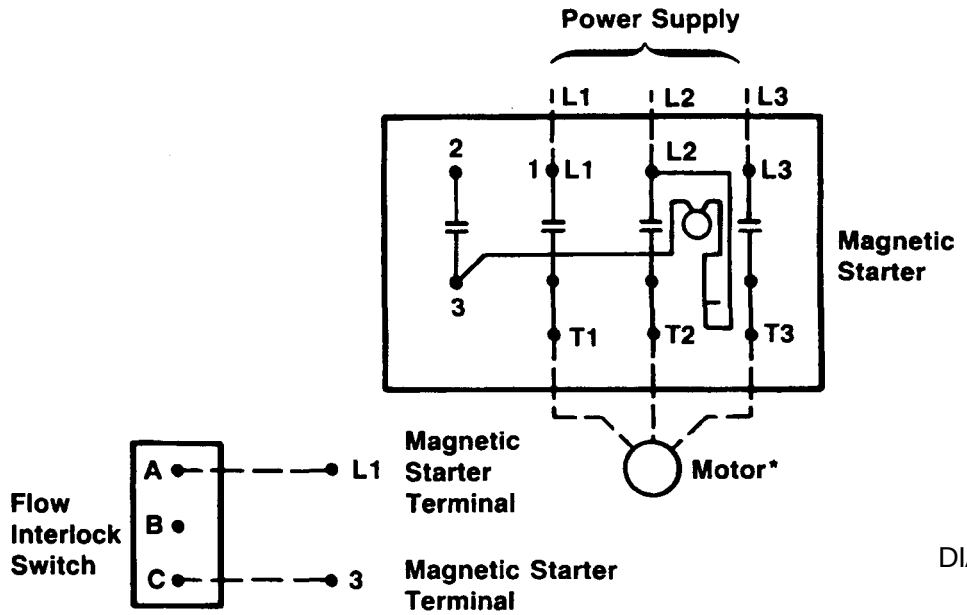


All Voltages

Three Phase Only

DIAGRAM 15

MAGNETIC STARTER — REMOTE CONTROL TYPE W/FLOW INTERLOCK SWITCH



All Voltages

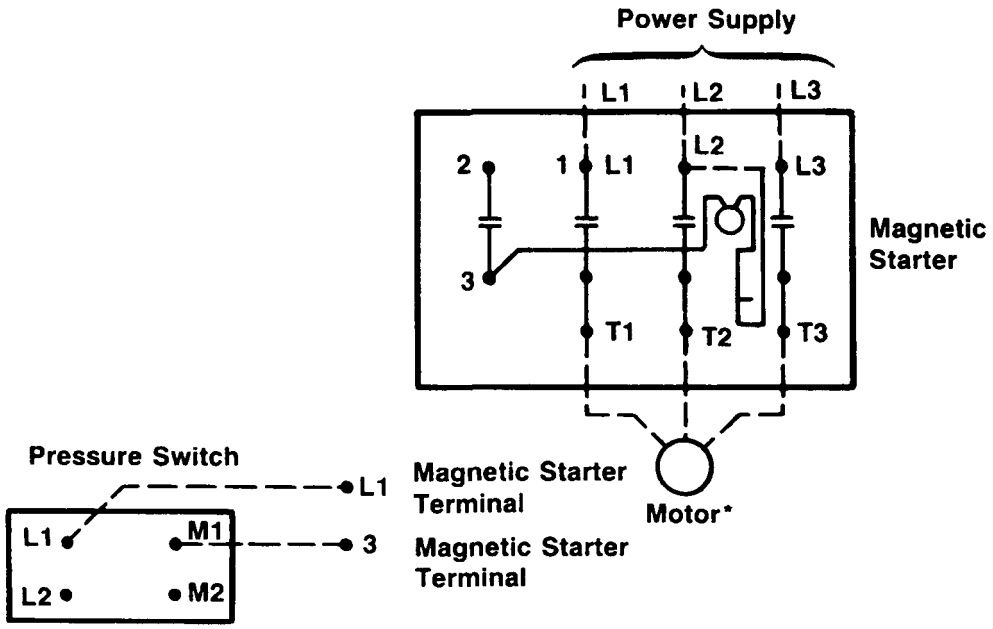
Do Not Use L3 and T3 For Single Phase Applications.

DIAGRAM 16

Broken lines indicate leads to be supplied by installing electrician.

* Use STANDARD MOTOR CONNECTION WIRING DIAGRAMS in disposer motor terminal box or see Section 17 "WIRING DIAGRAMS".

MAGNETIC STARTER — REMOTE CONTROL TYPE W/PRESSURE SWITCH

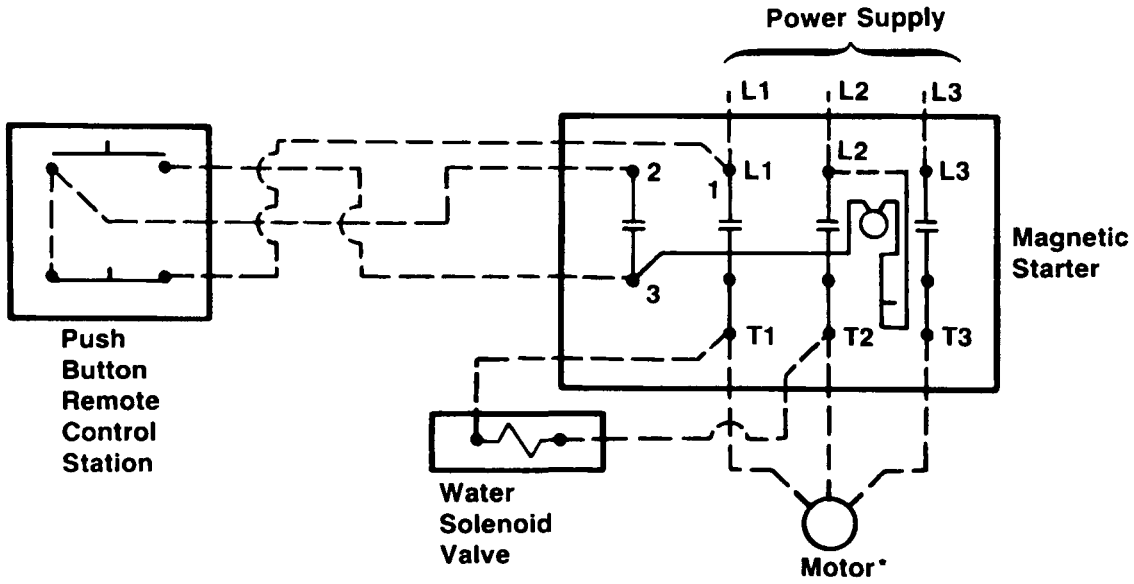


All Voltages

Do Not Use L3 and T3 For Single Phase Applications.

DIAGRAM 17

MAGNETIC STARTER — REMOTE CONTROL TYPE W/PUSH BUTTON STATION



All Voltages

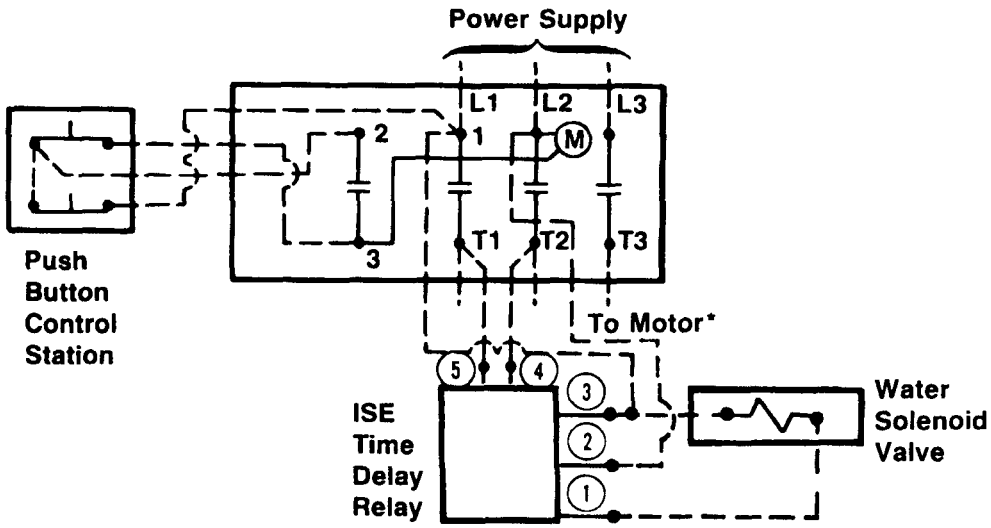
Do Not Use L3 and T3 For Single Phase Applications.

DIAGRAM 18

Broken lines indicate leads to be supplied by installing electrician.

*Use STANDARD MOTOR CONNECTION WIRING DIAGRAMS in disposer motor terminal box or see Section 17 -'WIRING DIAGRAMS".

MAGNETIC STARTER — REMOTE CONTROL TYPE
W/PUSH BUTTON STATION W/TIME DELAY RELAY

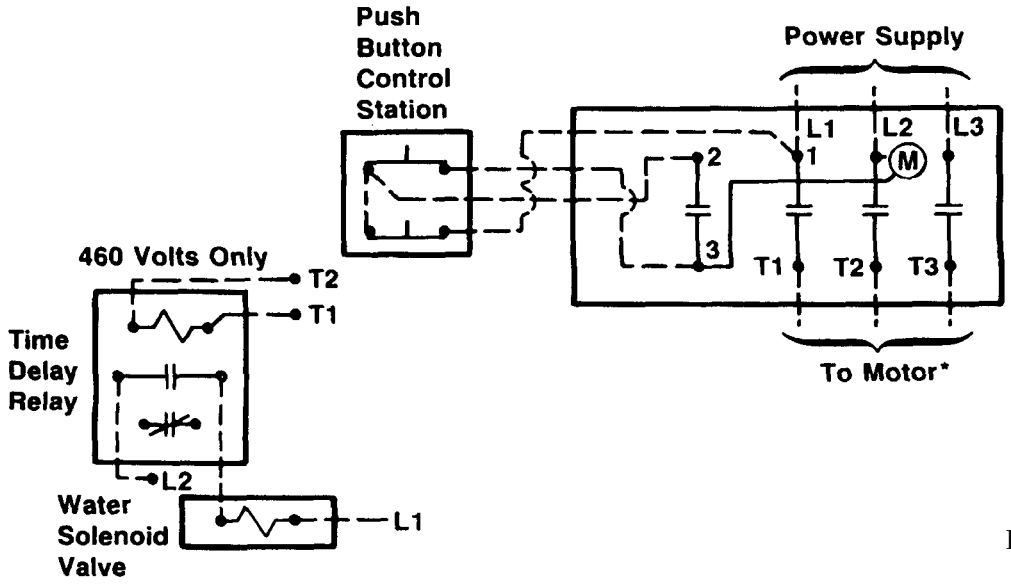


All Voltages Except 460 Volts

Do Not Use L3 and T3 For Single Phase Applications.

DIAGRAM 19

MAGNETIC STARTER — REMOTE CONTROL TYPE
W/PUSH BUTTON STATION W/TIME DELAY RELAY



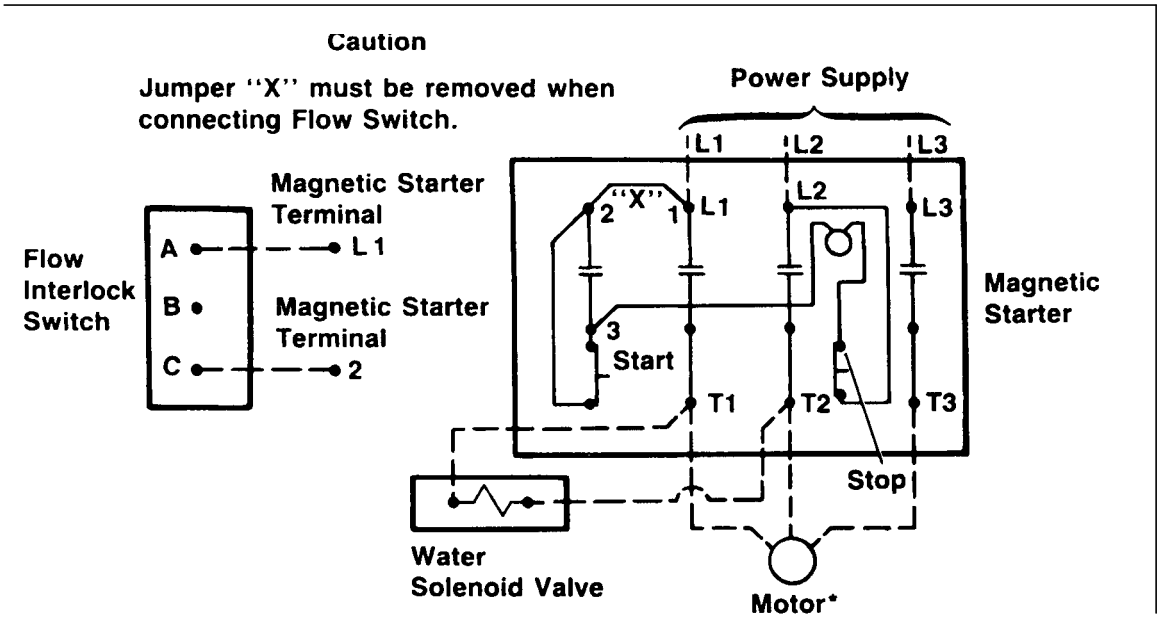
460 Volts Only

DIAGRAM 20

Broken lines indicate leads to be supplied by installing electrician.

* Use STANDARD MOTOR CONNECTION WIRING DIAGRAMS in disposer motor terminal box or see Section 17 "WIRING DIAGRAMS".

MAGNETIC STARTER — START/STOP BUTTONS W/FLOW INTERLOCK SWITCH

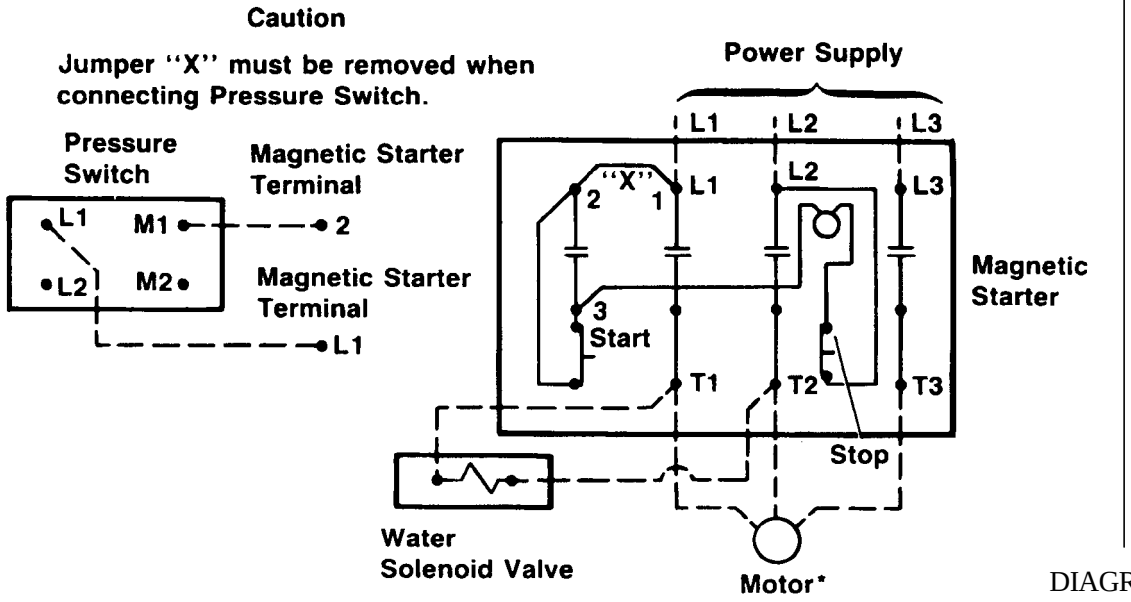


All Voltages

Do Not Use L3 and T3 For Single Phase Applications.

DIAGRAM 21

MAGNETIC STARTER — START/STOP BUTTONS W/PRESSURE SWITCH



All Voltages

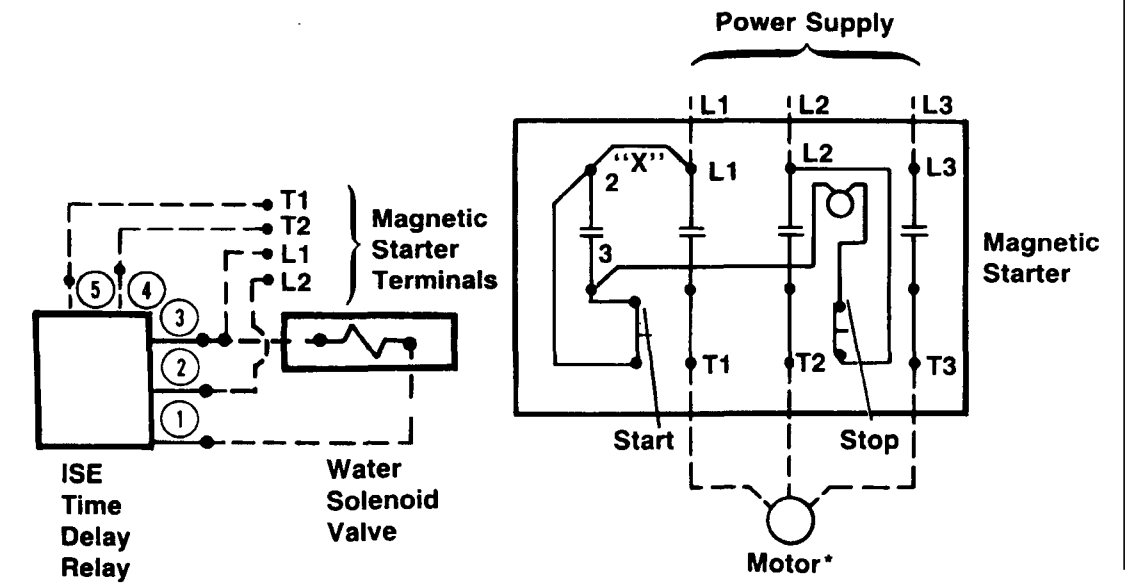
Do Not Use L3 and T3 For Single Phase Applications.

DIAGRAM 22

Broken lines indicate leads to be supplied by installing electrician.

* Use STANDARD MOTOR CONNECTION WIRING DIAGRAMS in disposer motor terminal box or see Section 17 "WIRING DIAGRAMS",

MAGNETIC STARTER — START/STOP BUTTONS W/TIME DELAY RELAY

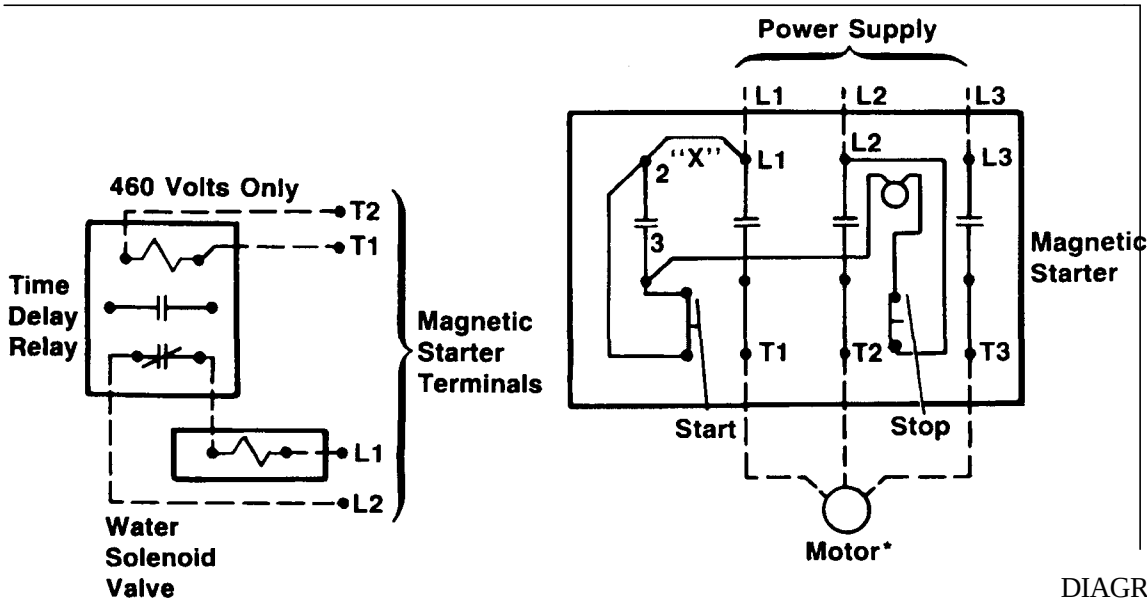


All Voltages Except 460 Volts

Do Not Use L3 and T3 For Single Phase

DIAGRAM 23

MAGNETIC STARTER — START/STOP BUTTONS W/TIME DELAY RELAY



460 Volts Only

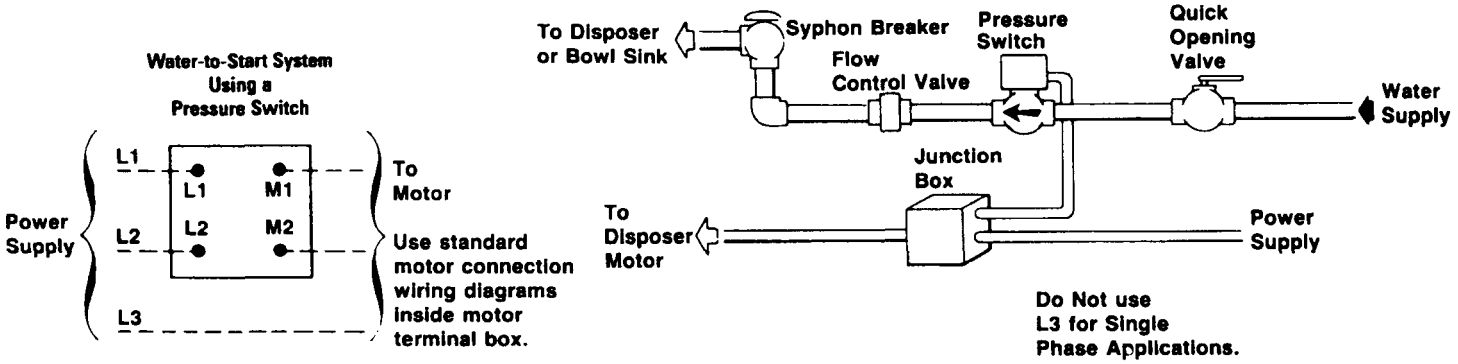
DIAGRAM 24

Water-to-Start System using a Pressure Switch.

A "Water to Start" system consists of:

1. Quick opening valve.
2. Pressure switch.
   a. Can be wired "across the line" thru 5 H.P. disposers.
   b. Must be wired in the pilot circuit of a magnetic starter in applications over 5 H.P.
3. Flow control valve.
   a. Plumbed-in immediately downstream from the pressure switch to increase sensitivity to pressure.

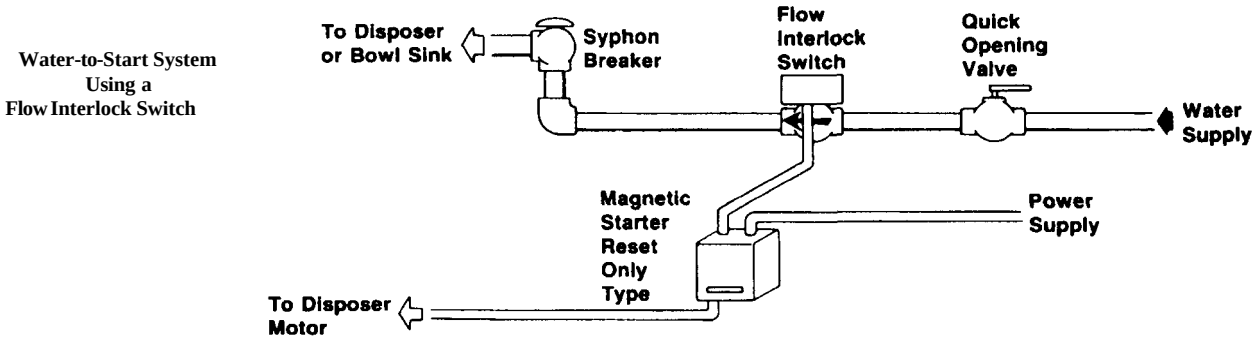
Recommended Installation — 1/2 H.P. through 5 H.P. Only All Voltages



Water-to-Start System using a Flow Interlock Switch.

1. Quick opening valve.
2. Flow interlock switch.
   a. Must be wired in the pilot circuit of a magnetic starter for all applications.
3. Remote control type magnetic starter.

Recommended Installation — 1/2 H.P through 10 H.P. — All Voltages



(Refer to Wiring Diagram No. 16 for electrical connections.)

NOTE

In any "Water to Start" system, a solenoid valve and/or a time delay relay cannot be used.

SERVICE MANUAL

COMMERCIAL DISPOSER MANUAL
(TRI-LIP SEAL DESIGN)

FORM NO. C 161-88C-14

MARCH 1988

PART NO. 31211