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Installation and Service—

3010/3015 CGE Washer Extractor

Read the separate safety manual before installing, operating, or servicing

PELLERIN MILNOR CORPORATION POST OFFICE BOX 400, KENNER, LOUISIANA 70063-0400, U.S.A.

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for MPI3010CAE/2012393A

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PELLERIN MILNOR CORPORATION
LIMITED STANDARD WARRANTY

We warrant to the original purchaser that MILNOR machines including electronic hardware/software (hereafter referred to as "equipment"), will be free from defects in material and workmanship for a period of one year from the date of shipment (unless the time period is specifically extended for certain parts pursuant to a specific MILNOR published extended warranty) from our factory with no operating hour limitation. This warranty is contingent upon the equipment being installed, operated and serviced as specified in the operating manual supplied with the equipment, and operated under normal conditions by competent operators.

Providing we receive written notification of a warranted defect within 30 days of its discovery, we will at our option repair or replace the defective part or parts, FOB our factory. We retain the right to require inspection of the parts claimed defective in our factory prior to repairing or replacing same. We will not be responsible, or in any way liable, for unauthorized repairs or service to our equipment, and this warranty shall be void if the equipment is tampered with, modified, or abused, used for purposes not intended in the design and construction of the machine, or is repaired or altered in any way without MILNOR's written consent.

Parts damaged by exposure to weather, to aggressive water, or to chemical attack are not covered by this warranty. For parts which require routine replacement due to normal wear such as gaskets, contact points, brake and clutch linings, belts, hoses, and similar parts the warranty time period is 90 days.

We reserve the right to make changes in the design and/or construction of our equipment (including purchased components) without obligation to change any equipment previously supplied.

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THE PROVISIONS ON THIS PAGE REPRESENT THE ONLY WARRANTY FROM MILNOR AND NO OTHER WARRANTY OR CONDITIONS, STATUTORY OR OTHERWISE, SHALL BE IMPLIED.

WE NEITHER ASSUME, NOR AUTHORIZE ANY EMPLOYEE OR OTHER PERSON TO ASSUME FOR US, ANY OTHER RESPONSIBILITY AND/OR LIABILITY IN CONNECTION WITH THE SALE OR FURNISHING OF OUR EQUIPMENT TO ANY BUYER.

BIUUUD19 (Published) Book specs- Dates: 20081231 / 20081231 / 20081231 Lang: ENG01 Applic: UUU

How to Get the Necessary Repair Components

This document uses Simplified Technical English.
Learn more at http://www.asd-ste100.org.

You can get components to repair your machine from the approved supplier where you got this machine. Your supplier will usually have the necessary components in stock. You can also get components from the Milnor® factory.

Tell the supplier the machine model and serial number and this data for each necessary component:

- The component number from this manual
- The component name if known
- The necessary quantity
- The necessary transportation requirements
- If the component is an electrical component, give the schematic number if known.
- If the component is a motor or an electrical control, give the nameplate data from the used component.

To write to the Milnor factory:

Pellerin Milnor Corporation
Post Office Box 400
Kenner, LA 70063-0400
UNITED STATES

Telephone: 504-467-2787
Fax: 504-469-9777
Email: parts@milnor.com

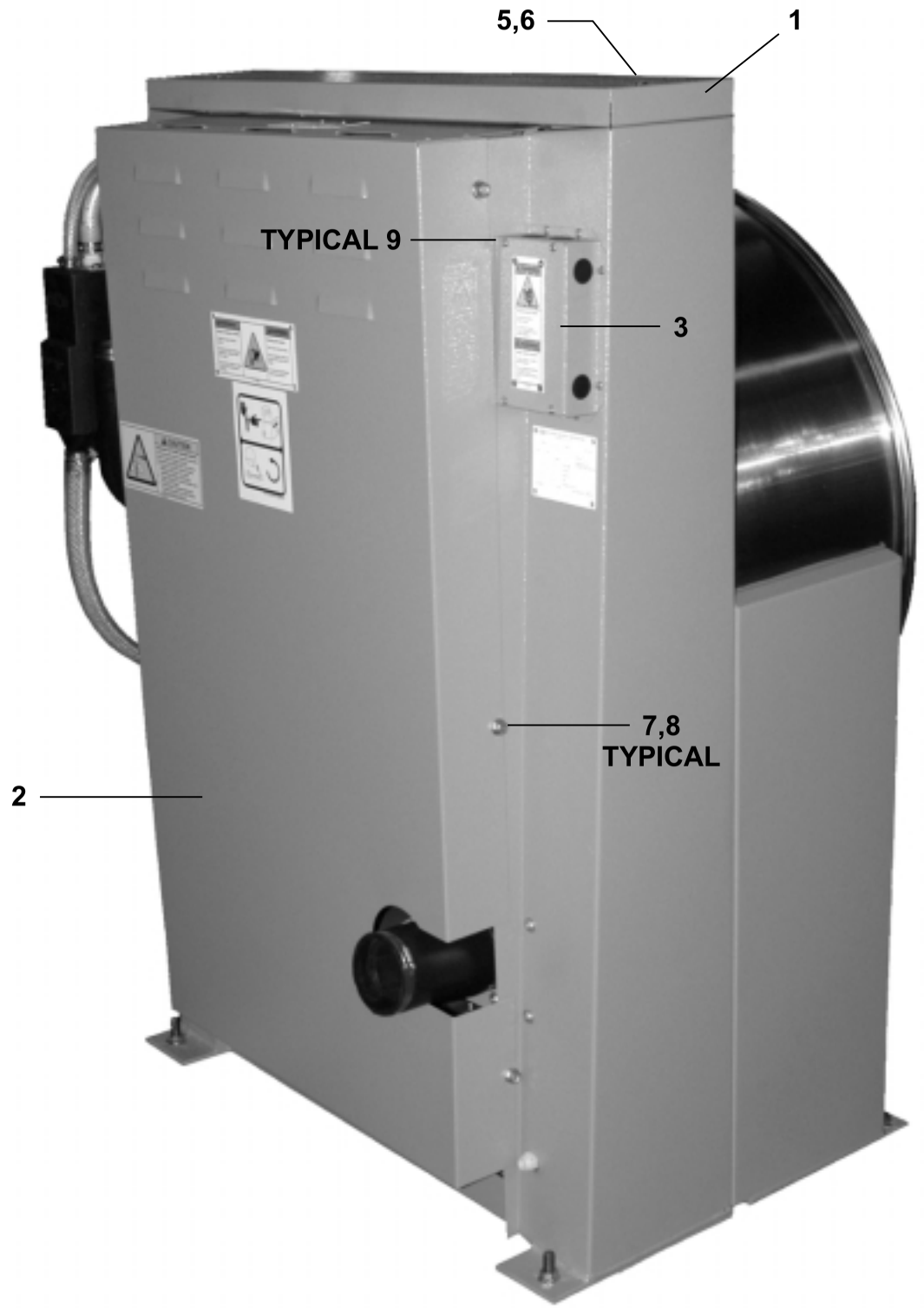
— End of BIUUUD19 —

Guards & Covers

3010 & 3015 G5E, G5X, CGE

Pellerin Milnor Corporation
P. O. Box 400, Kenner, LA 70063-0400

Litho in U.S.A.



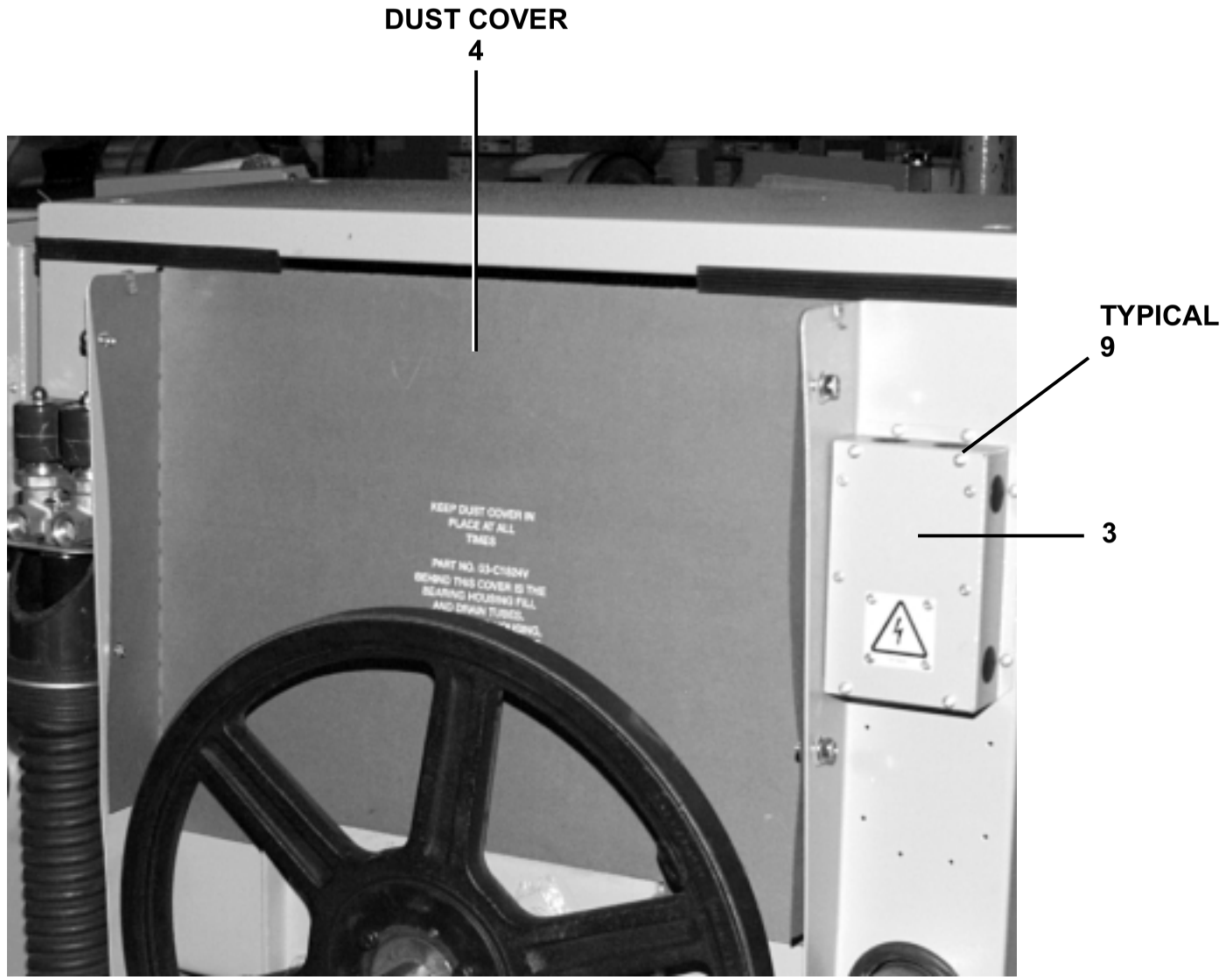
Guards & Covers

3010 & 3015 G5E,G5X,CGE

Pellerin Milnor Corporation
P. O. Box 400, Kenner, LA 70063-0400

Litho in U.S.A.

NOTE: KEEP DUST COVER IN PLACE AT ALL TIMES. REMOVE FOR SERVICING. BEHIND THIS COVER ARE THE BEARING HOUSING FILL AND DRAIN TUBES.



Parts List- Guards & Covers

Find the correct assembly first, then find the needed components. The item letters (A, B, C, etc.) assigned to assemblies are referred to in the "Used In" column to identify which components belong to an assembly. The item numbers (1, 2, 3, etc.) assigned to components relate the parts list to the illustration.

Used In	Item	Part Number	Description	Comments
			----------ASSEMBLIES----------	
	A	GGC30002	3010 GUARDS/COVERS INSTALL	
			----------COMPONENTS----------	
all	1	02 03699E	3010 REAR TOP COVER	
all	2	02 03497B	GUARD REAR BELT FULL	
all	3	03 C4X7	COVER:SYSTEM 7 LIQUID SUPPLY	
all	4	03 C1824V	DUST COVER-30"V6J BELT	
all	5	15K120	HXCAPSCR 3/8-16UNC2AX2 GR5 ZIN	
all	6	17N070P	RETAIN NUT 3/8-16 #S10100-27	
all	7	15P200	TRDCUT-F HXWASHD 3/8-16X3/4NIK	
all	8	15U346	FLAWASH 7/8X3/8X.030 NATURAL N	
all	9	15P185	TRDCUT-F HXHD 1/4-20UNC2AX3/4	

About the Forces Transmitted by Milnor® Washer-extractors

During washing and extracting, all washer-extractors transmit both static and dynamic (cyclic) forces to the floor, foundation, or any other supporting structure. During washing, the impact of the goods as they drop imparts forces which are quite difficult to quantify. Size for size, both rigid and flexibly-mounted machines transmit approximately the same forces during washing. During extracting, rigid machines transmit forces up to 30 times greater than equivalent flexibly-mounted models. The actual magnitude of these forces vary according to several factors:

- machine size,
- final extraction speed,
- amount, condition, and type of goods being processed,
- the liquor level and chemical conditions in the bath preceding extraction, and
- other miscellaneous factors.

Estimates of the maximum force normally encountered are available for each Milnor® model and size upon request. Floor or foundation sizes shown on any Milnor® document are only for on-grade situations based only on previous experience without implying any warranty, obligation, or responsibility on our part.

1. Rigid Machines

Size for size, rigid washer-extractors naturally require a stronger, more rigid floor, foundation, or other supporting structure than flexibly-mounted models. If the supporting soil under the slab is itself strong and rigid enough and has not subsided to leave the floor slab suspended without support, on grade installations can often be made directly to an existing floor slab if it has enough strength and rigidity to safely withstand our published forces without transmitting undue vibration. If the subsoil has subsided, or if the floor slab itself has insufficient strength and rigidity, a deeper foundation, poured as to become monolithic with the floor slab, may be required. Support pilings may even be required if the subsoil itself is “springy” (i.e., if its resonant frequency is near the operating speed of the machine). Above-grade installations of rigid machines also require a sufficiently strong and rigid floor or other supporting structure as described below.

2. Flexibly-mounted Machines

Size for size, flexibly-mounted machines generally do not require as strong a floor, foundation, or other supporting structure as do rigid machines. However, a floor or other supporting structure having sufficient strength and rigidity, as described in Section 3, is nonetheless vitally important for these models as well.

3. How Strong and Rigid?

Many building codes in the U.S.A. specify that laundry floors must have a minimum live load capacity of 150 pounds per square foot (732 kilograms per square meter). However, even compliance with this or any other standard does not necessarily guarantee sufficient rigidity. In any event, it is the sole responsibility of the owner/user to assure that the floor and/or any other supporting structure exceeds not only all applicable building codes, but also that the floor and/or any other supporting structure for each washer-extractor or group of washer-extractors actually has sufficient strength and rigidity, plus a reasonable factor of safety for both, to support the weight of all the fully loaded machine(s) including the weight of the water and goods, and including the published 360º rotating sinusoidal RMS forces that are transmitted by the machine(s). Moreover, the floor, foundation, or other supporting structure must have sufficient

rigidity (i.e., a natural or resonant frequency many times greater than the machine speed with a reasonable factor of safety); otherwise, the mentioned 360º rotating sinusoidal RMS forces can be multiplied and magnified many times. It is especially important to consider all potential vibration problems that might occur due to all possible combinations of forcing frequencies (rotating speeds) of the machine(s) compared to the natural frequencies of the floor and/or any other supporting structure(s). A qualified soil and/or structural engineer must be engaged for this purpose.

Figure 1: How Rotating Forces Act on the Foundation

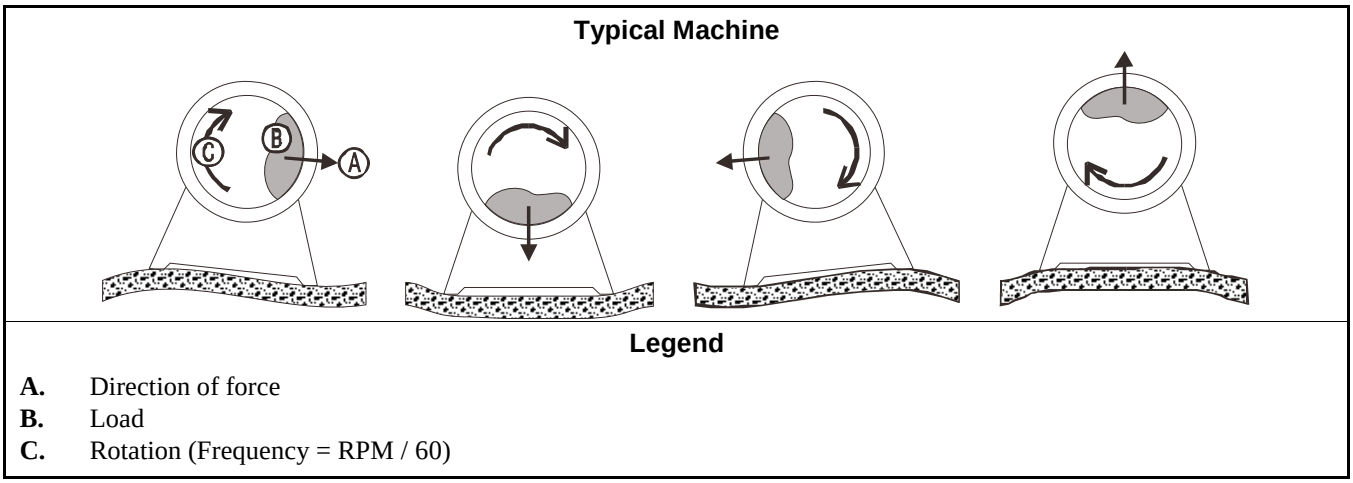


Figure 1 above is intended to depict both on-grade and above-grade installations and is equally applicable to flexibly-mounted washer-extractors, as well as to rigid models installed either directly on a floor slab or on a foundation poured integrally with the slab. Current machine data is available from Milnor® upon request. All data is subject to change without notice and may have changed since last printed. It is the sole responsibility of every potential owner to obtain written confirmation that any data furnished by Milnor® applies for the model(s) and serial number(s) of the specific machines.

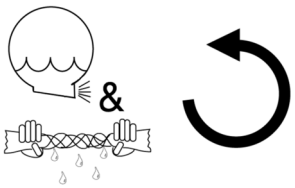
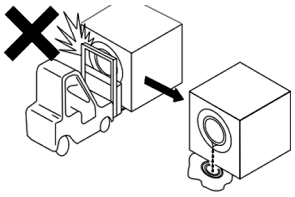
— End of BIWUUI02 —

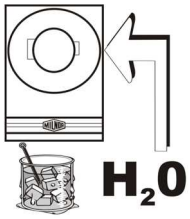
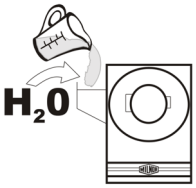
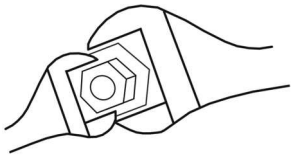
Understanding the Tag Guidelines for the Models Listed Below

30010CGE 30015C4A 30015C4E 30015C4T 30015CGE 30022C4A 30022C4E 30022C4T

Several installation guidelines and precautions are displayed symbolically, on tags placed at the appropriate locations on the machine. Some are tie-on and others are adhesive tags. Tie-on tags and white, adhesive tags may be removed after installation. Yellow adhesive tags must remain on the machine.

Most tags contain only symbols (no words). A few are worded. The explanations below, start with the tag part number (displayed on the tag). If a tag contains no words, the meaning of the tag is explained below. If the tag contains words, the explanation below simply repeats the wording.

Display or Action	Explanation
	Read the manual before proceeding. This symbol appears on most tags. The machine ships with a complete set of manuals. The safety, installation, and electrical schematic manuals are particularly important to installers.
	B2TAG88005: This carefully built product was tested and inspected to meet Milnor performance and quality standards by
	B2TAG93013: This bearing housing was lubricated at the Milnor factory before shipment.
	
	B2TAG94081: Motor must rotate in this direction. On single motor washer-extractors and centrifugal extractors, the drive motor must turn in this direction during draining and extraction. This tag is usually wrapped around a motor housing. If the motor turns in the opposite direction when the machine is first tested, the electrical hookup is incorrect and must be reversed as explained in the schematic manual.
	B2TAG94097: The cylinder must rotate **counterclockwise** during draining and extraction (spin) when viewed from here (rear of machine). Otherwise, reverse the electric power connections, as explained in the schematic manual.
	B2TAG94099: Do not strike the shell door when fork-lifting. This can cause the door to leak.
	B2T2001013: Hot water connection.

Display or Action	Explanation
	B2T2001014: Cold water connection.
	B2T2001016: Flushing water connection. This is the water that goes into the supply compartment or pumped chemical manifold to flush chemicals into the machine.
	B2T2003001: Hold the side of the connection stationary with a wrench as you tighten the connection with another wrench. Otherwise, you may twist components, such as valves, damaging them.
	B2T2003002: CAUTION: Equipment and Textile Damage Hazards—Chemicals leaked into the machine, particularly when it is idle, can destroy machine components and textiles left in the machine. Ensure the chemical system prevents dribbling, siphoning, or any other unintentional release of chemicals. Inspect regularly for proper operation and evidence of damage. Consult Milnor document BIWUUI03 “Avoiding Damage from Allied Remote Chemical Delivery Systems”.

— End of BIUUUI02 —

Avoiding Damage From Allied Remote Chemical Delivery Systems

Milnor® does not manufacture or supply remote chemical delivery systems and this document is meant only to illustrate some of the possible problems that can be minimized during installation of such systems by the chemical supply company. Milnor washer-extractors and CBW® batch washers (tunnels) are available with convenient inlets for such systems (see Figure 1). Most common of the types of systems currently used in commercial laundering operations are pumped chemical systems. Other types, such as constant pressure, re-circulating ring main systems have also been, and may continue to be used with Milnor equipment.

This document warns about some of the possible hazards posed by chemical systems and lists certain requirements needed to minimize those hazards. The procedures for interfacing with allied chemical systems and information pertinent to chemical use in general are provided elsewhere in the product manuals (see Note 1).

Figure 1: Pumped Chemical Inlets on CBW Batch Washer

Note 1: Misuse of laundering chemicals (such as injecting excessive concentrations of chlorine bleach or permitting acid sours to react with hypo chlorite) due to incorrect formulation can also be hazardous. Information pertinent to chemical use is provided elsewhere in the product manuals.

1. How a Chemical System Can Damage the Machine It Serves

Milnor has manufactured washer-extractors and tunnel washers with the same stainless steel specification since its founding. Every batch of steel used is certified and documented by the steel mill. Testing of samples damaged by corrosion have, in every case, proven the steel to be well within the AISI 304 specification.

Chemical products commonly found in the laundry industry, when used in **established** dosages and proper operating parameters, under the auspices of an experienced chemical specialist, should produce satisfactory results, with no consequential detrimental effects. The industry has published standards in Riggs and Sherrill, “Textile Laundering Technology”. However, the stainless steel can be damaged and even destroyed by **abnormal** contact with chlorine bleach, hydrofluosilicic acid and other commonly used chemicals, as will occur if chemicals are unintentionally leaked into the machine, particularly when it is no longer in use and especially when machine surfaces are dry.

Some chemical systems have been found to permit chemicals to dribble from the supply lines, or worse, to siphon from the supply tank into the machine, during operation and long after the system is shut down—as after working hours and during weekends. If this occurs, **deterioration (rusting) of the stainless steel and damage to any textiles therein will inevitably result. If this condition goes undetected, machine damage is likely to be catastrophic.** No machine is immune to such damage.

CAUTION 1: Equipment and Textile Damage Hazards—Chemicals leaked into the machine, particularly when it is idle can destroy machine components and textiles left in the machine. **Pellerin Milnor Corporation accepts absolutely no responsibility for damage to its equipment or to textiles therein from abnormal contact with chemicals.**

- Ensure that the chemical system prevents unintentional release of chemicals.
- Inspect regularly for proper operation and evidence of damage.

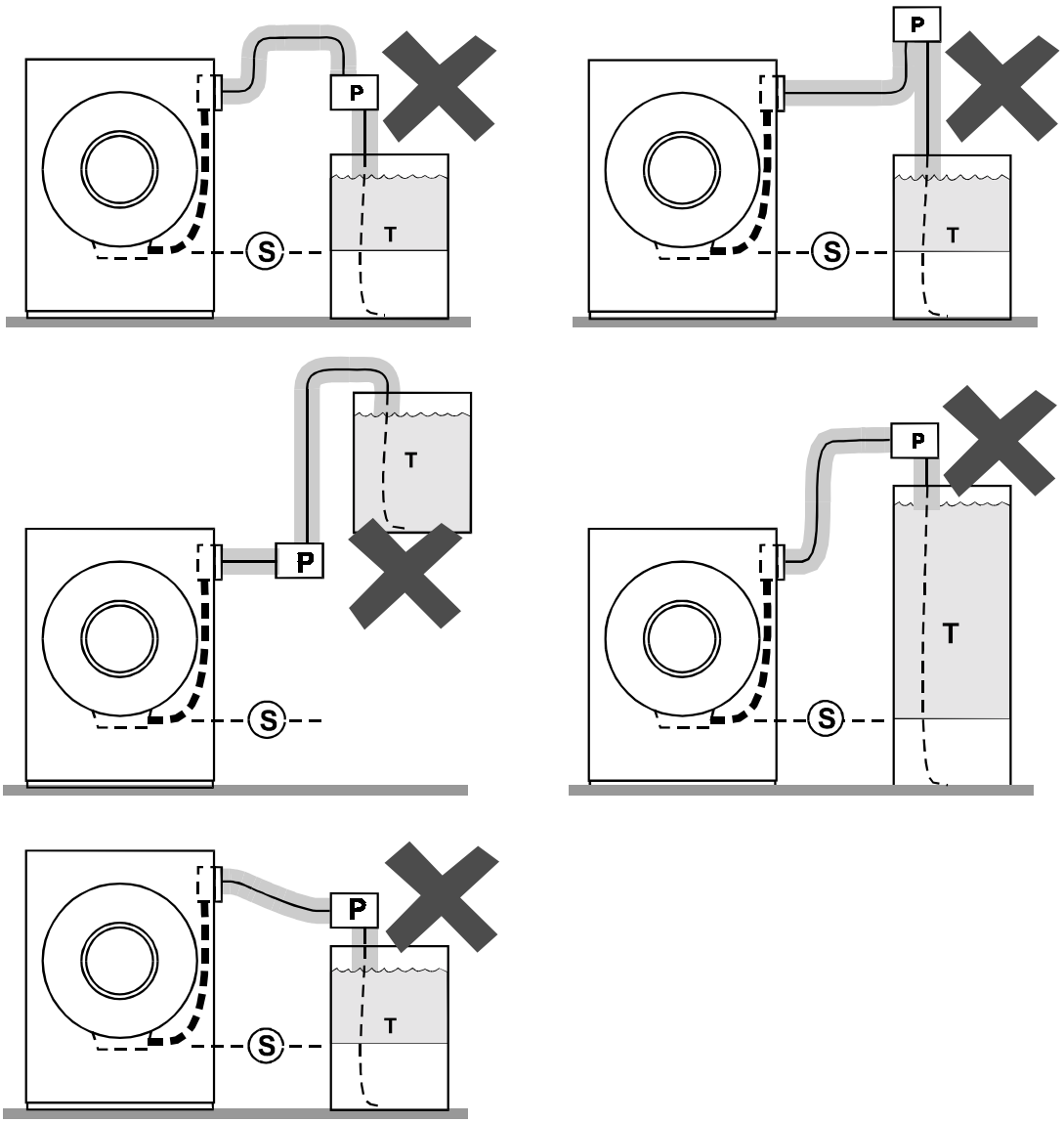
2. Requirements for Chemical Systems Used With Milnor Machines

It is the responsibility of the chemical system manufacturer and supplier to ensure that their system is safe for personnel and equipment. Some important points are described below.

2.1. Ensure the System Cannot Siphon.—The supply system must be designed to counteract any siphoning that could occur as a result of having a sealed supply line between the bottom of the chemical tank and the internal machine connection at the drain trough. As shown in the Figure 2 examples, if the pump (P) and/or the valving does not provide positive closure and there is no vacuum breaker protection, siphoning is likely to occur. In each of the Figure 2 illustrations, the volume of chemical in the tank above the siphon level (S), and indicated by shading, will flow into the machine.

Figure 2: Siphoning From the Chemical Tank into the Machine

Examples

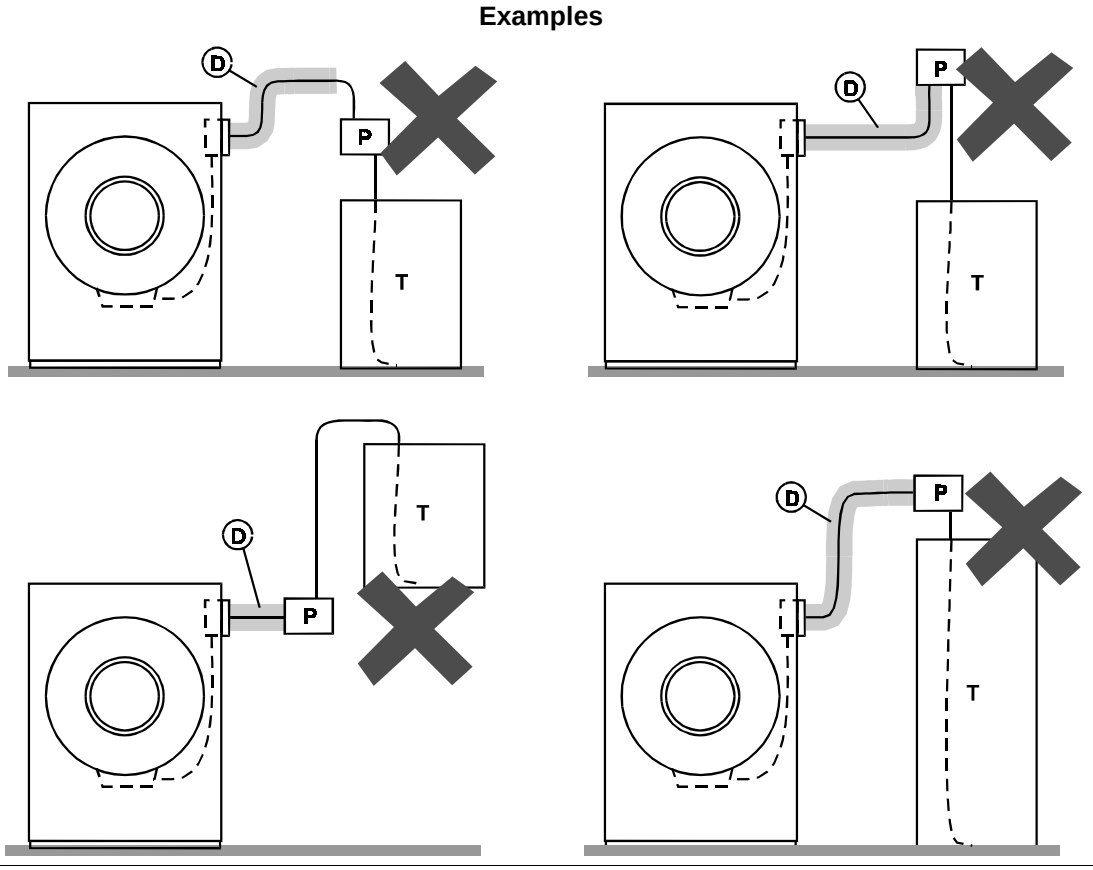


Legend

P. Pump
S. Siphon level. Shading indicates the chemical delivery line and tank content that can siphon into the machine.
T. Chemical tank

2.2. Ensure the Chemical Lines Cannot Dribble—The pumped chemical system may provide a means of positively closing the chemical line at the pump location, but not at the injection site. Hence, any concentrated chemical that remains in the injection line between the pump and the machine is free to flow into the machine. Some examples of this are shown in Figure 3.

Figure 3: Dribbling From Chemical Supply Line Into Machine (assumes positive closure at the pump)



Legend

D. Portion of supply line, the contents of which can dribble into the machine
P. Pump
T. Chemical tank

3. Design and Installation Recommendations

It is the responsibility of the chemical system manufacturer and supplier to use whatever measures are necessary to ensure that their system is safe for personnel and equipment. The following are some of the possible methods the manufacturer or supplier may wish to use, as appropriate.

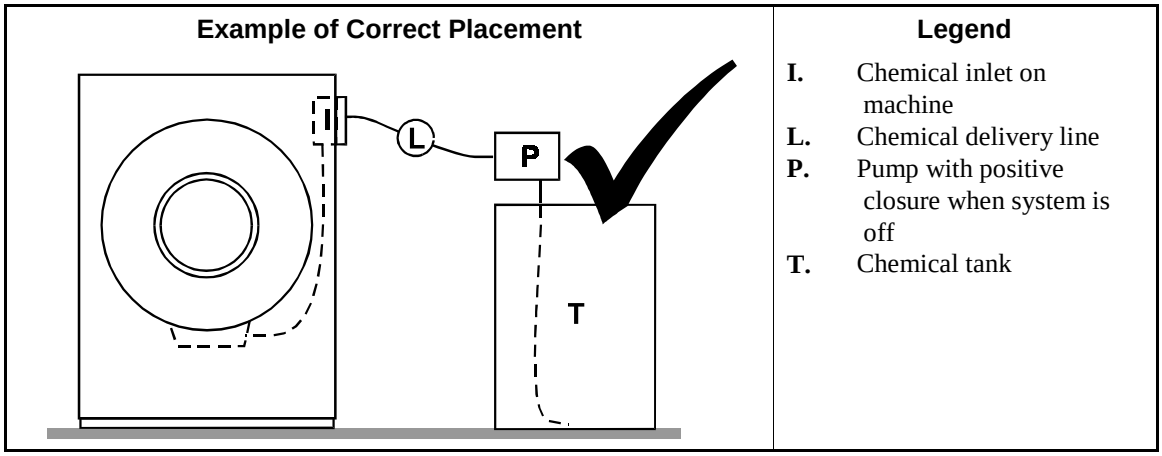
3.1. Siphoning: Positively close the line.—If the pump does not provide positive closure when the system is off, employ a shutoff valve in the line to serve this purpose.

3.2. Siphoning: Break the siphon.—Provide an air gap or vacuum breaker in the chemical delivery line. This must be located above the "full" line of the tank.

3.3. Dribbling: Flush the entire chemical delivery line.—If any concentrated chemical that remains in the injection line between the pump and the machine is free to flow into the machine, employ a system that flushes the entire line between the pump and the injection point with fresh water after each injection.

3.4. Dribbling: Locate the entire chemical line below the machine inlet.—Assuming the chemical system does not retain any line pressure and that the pump provides positive closure when the system is off, locate the entire chemical delivery line below the level of the chemical inlet. An example of this is shown in Figure 4.

Figure 4: Locating a Pumped Chemical System With Positive Closure To Protect Against Machine Damage



4. Guarding Against Leaks

All personnel who may work with the chemical system (e.g., chemical system manufacturer, chemical system supplier, chemical supplier, operator, maintenance personnel) should be vigilant in observing for leaks in the system. When connecting, or reconnecting chemical lines, whether at installation, after taking samples, or when replacing components, at a minimum ensure that:

1. the proper components are used,
2. all connections are the proper fit, and
3. all components are securely connected.

CAUTION 2: Injury and Damage Hazards—Chemicals leaking from a chemical system may be corrosive or toxic. Such chemicals can injure personnel and damage equipment.

- Use care when connecting chemical lines.
- Inspect regularly for leaks.

— End of BIWUUI03 —

Handling and Setting Procedures for Rigid Mount Washer-Extractors

1. Handling Precautions

1. Remove the protective coverings (leaving the machine on shipping skids) and carefully examine for possible shipping damage. **If the machine is damaged, notify the transportation company immediately.**

   Note 1: Once the machine is given to the carrier for delivery, it is the sole responsibility of the carrier to ensure that no damage occurs during transit. In addition to readily apparent damage, carriers are liable for concealed damage. **Do not hesitate to file a claim with the carrier if the machine is damaged in any way during shipment.** Milnor® will be glad to assist you in filing your claim, but is not responsible for any shipping damage to the machine once it has been delivered to the carrier in good condition.

2. Consult Milnor® for instructions if crane lifting is required.
3. Use skids with the forklift. If possible, leave the machine on the shipping skids until it is about to be placed in its final position. Once the skids are removed, take care in placing forks under the machine. **Do not allow the forks to come in contact with valves, piping, motors, etc., located under the machine.**
4. Never push, pull, or exert pressure on any components that protrude from the machine frame (shell front, door, supply injector, electric boxes, controls, belt guard, conduits, inlet piping, etc.).
5. Ensure that the shell door is closed and secured.

2. Site Requirements

2.1. Space Requirements

1. All openings and corridors through which equipment must pass during installation must be large enough to accommodate the width and the height of the machine (as shown on the dimensional drawings). It is occasionally possible to reduce the overall dimensions by removing piping or other special modifications. Consult Milnor® for additional information.
2. Sufficient clearance must he provided for normal operation and maintenance procedures.

2.2. Operational Requirements

1. Allow sufficient ventilation for heat and vapors of normal operation to dissipate.
2. Provide easy access to controls. Operators must be able to reach and view all status lights, machine controls, and any additional controls associated with the machine (e.g., electrical power connections, water and steam shut-offs, etc.).

2.3. Foundation Requirements—The machine must be anchored in accordance with the installation instructions. The floor and/or all other support components must have sufficient strength (and rigidity with due consideration for the natural or resonant frequency thereof) to withstand the fully loaded weight of the machine, including the wet goods and any repeated sinusoidal (rotating) forces generated during its operation. Determining the suitability of floors, foundations, and other supporting structures normally requires analysis by a qualified structural engineer. See “ABOUT THE FORCES TRANSMITTED BY MILNOR® WASHER-EXTRACTORS” (See Table of Contents) for more information.

3. Anchoring Requirements

Machines must be securely anchored to an adequate foundation. Anchor bolt locations and foundation specifications are provided on the dimensional drawing (see Table of Contents). **However, never install anchor bolts firmly in the foundation using only the dimensional drawing or a template.** Approximate anchor bolt locations may be determined from a foundation template (standard equipment on some machines, optional on others). Recommended anchor bolt installation (see dimensional drawing) calls for each anchor bolt to be set in a pipe sleeve. The foundation template or dimensional drawing will only locate foundation bolts accurately enough so that the play of the bolt within the pipe sleeve permits the machine to fit anchor bolts. **If another bolt installation procedure is used, do not install the bolts until the machine is on site and bolt locations can be determined.** Consult Milnor if any obstruction prevents the installation of any anchor bolt. **Properly install anchor bolts at ALL anchor bolt holes on the machine. Anchor bolts cannot be indiscriminately omitted.**

CAUTION 1: STRIKE AND MACHINE DAMAGE HAZARDS—A machine can "rip" away from position on foundation if the machine is not anchored and grouted in strict accordance with the dimensional drawing and setting instructions provided in this manual. Damage resulting from improper installation is not covered by warranty.

- Strictly follow setting instructions and dimensional drawing guidelines when anchoring and setting this machine.

4. Setting Procedures

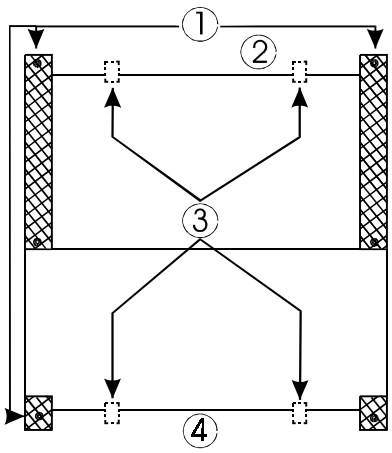
See Figure 1 during the following procedures:

1. With the machine near the final location, unbolt the shipping skids. Observing all precautions, lift the machine off its skids and lower the machine onto temporary blocking as shown in Figure 1. Install anchor bolts, taking care to align the bolts with the base plates to avoid bolt thread damage.
2. **Determine that the minimum clearance between each base plate and floor surface is as specified (see dimensional drawings).** Shim the machine at temporary blockings to level the machine from left to right and front to back. Use a carpenter's level along the right and left side of the base to determine if the machine is level from front to back. Place a level laterally across the base plates to determine if the machine is level from right to left.

Note 2: Do not pull on conduit when moving the machine. Tampering with the conduit may require adjustment of the door switch

Figure 1: Temporary Blocking Points

Typical blocking points (30015 model shown)



Legend

1. Base plates
2. Rear of machine
3. Temporary blocking
4. Front of machine

CAUTION 2: MACHINE DAMAGE AND MALFUNCTION HAZARDS—Tightening anchor bolt fasteners onto spacers (without grout or with improperly applied grout) twists the machine frame and causes cylinder misalignment.

- Never tighten anchor bolt fasteners before grouting.
- Grout must displace total clearance between base plate and existing foundation floor. Voids must not exist!

3. After determining the final position of the machine, apply grout between the existing foundation floor and base plates, while observing the following considerations:
   - All machines are designed to be grouted under the full area of all base plates. Grout prevents the anchor bolts from distorting the frame when the fasteners are tightened. Total area under each base plate must be completely filled with grout (see dimensional drawings). Voids under base plates can magnify vibration, causing unsatisfactory operation. Use only industrial strength non-shrinking grout.
   - If the grout (after mixing) is of proper consistency, pack or trowel it by hand.
   - If the grout (after mixing) is too thin (causing it to flow from under the base pads), install temporary cardboard framing around the pads to retain the grout until it cures.
4. After the grout has completely cured, raise the machine sufficiently to remove all temporary blocking and shims. **Be careful to avoid disturbing or damaging grout.**
5. Tighten all foundation fasteners until they contact the top of the base plate. Center bolt holes are located inside rear console. Install center hold down bolts properly to ensure successful operation.
6. Tighten all fasteners evenly, using only one-quarter turn on each fastener before moving to the next one. While tightening, frequently skip from front to back and right to left to insure uniform tension. After tightening all fasteners, check each fastener at least twice.

— End of BIRUUI01 —

BIRQVI01 (Published) Book specs- Dates: 20050228 / 20050228 / 20050228 Lang: ENG01 Applic: RMW

Service Connections

1. General

Required service connections, (depending on machine model and optional features) are as follows:

1. Piped inlets and outlets (cold water, hot water, flush water, third water, direct steam, compressed air, liquid supply, and drain to sewer). The sizes and locations of piped inlets and outlets are shown on the dimensional drawing for your machine.
2. Electrical power connections.

2. Requirements for Piped Connections

Notice 1: Machine Damage—Plastic water valves can fail if improper connectors are used.

- Only use garden hose bib type connectors.

1. Inlet pressures must be within the minimum/maximum range specified. Pressure outside of the specified range may cause the machine to operate inefficiently or malfunction and may damage machine components.
2. Thoroughly flush all water lines before making connections.
3. We recommend installing 40 mesh strainers or filters in front of the cold, hot and third water valves.
4. When connecting water and steam inlets, always install unions and shut off valves at the point of connection to permit removal of the machine components for servicing, when necessary.
5. Suds overflow (if so equipped) to drain, must be vented per plumbing code.

CAUTION 2: Machine Damage Hazards—Pumped chemical systems, if not properly installed, can cause corrosion damage.

- See the reference manual for precautions and additional information before making any chemical connections.

3. Piped Inlet Specifications

Table 1: Piped Inlets

Connection Description	Source Requirements	Piping Requirements, Comments
Cold water inlet	3/4" garden hose male thread @ 10 - 75 psi	Pipe material per plumbing code
Hot water inlet(s)		
Third/Flush water (if equipped)		
Liquid supply inlet	3/8" or 1/2"	Flexible tubing as supplied by the chemical supplier

4. Piped Outlet Specifications

Piped outlet requirements are as follows (see dimensional drawing for connection sizes and locations):

Table 2: Outlets

Connection Description	Destination Requirements or Description	Piping Specifications
Drain	3" pipe socket joint, unrestricted gravity feed to sewer (external back pressure may extend wash times - Do not reduce)	Rubber hose, PVC or other approved material per plumbing code
Suds Overflow (if so equipped)	2" flexible pipe adapter connection	Per code

5. Power Connections and Precautions

WARNING 3: Electrocution and Electrical Burn Hazards—Contact with high voltage will electrocute or burn you. Power switches on the machine and the control box do not eliminate these hazards. High voltage is present at the machine unless the main machine power disconnect is off.

- Do not service machine unless qualified and authorized.

Notice 4: Machine Damage—Voltage fluctuations of more than 10% above or below the specified voltage for your machine can damage electrical components, especially motors.

- Any such conditions should be corrected prior to commissioning your machine.

The customer must furnish a remotely mounted disconnect switch with lag type fuses or circuit breakers, and wiring between the electrical service box and the junction box on the machine. The sizes of these fuses and wires, along with the motor fuses supplied with the machine, depend on the machine voltage. See the fuse and wire sizing information in the External Fuse and Wire Size manual and on the machine nameplate. See dimensional drawings in this manual for electrical connection locations.

1. Electrical connections must be made by a competent electrician.
2. See fuse and wire sizing information in the External Fuse and Wire Size manual and on the machine nameplate. If the wire runs more than 50 feet, increase by one wire size for each additional 50 feet.
3. Only use Bussman Fusatron FRN (up to 250V), FRS (up to 600V) or similar lag fuses, the nameplate fuse sizes must not be applied to standard fuses.
4. Stinger leg, if any, must be connected to terminal L3, never to terminals L1 or L2.
5. Make power and liquid supply electrical connections within junction boxes on the rear of the machine.
6. Verify motor rotation (Figure 1). See the operating and trouble shooting manual for more information. If the cylinder turns in the wrong direction, interchange the wires connected to L1 and L2. Never move L3 under any circumstances. All motors are phased for proper rotation. Never attempt to reconnect motors or the motor control devices.
7. Machine is shipped set for 240 volt operation from the factory (Figure 2). If the supply voltage is 208 volts, then remove the top, and place the line voltage switch in the 208 volt position.

Figure 1: Correct Rotation During Drain and Extract (when viewing front of machine)

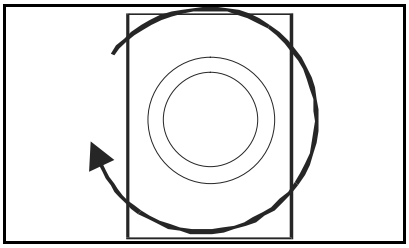
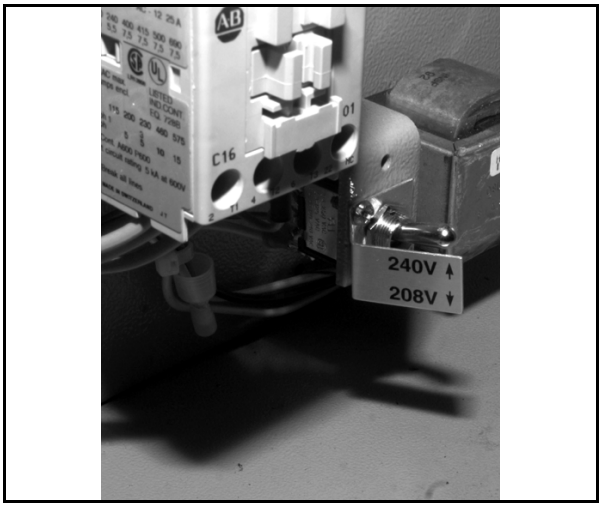


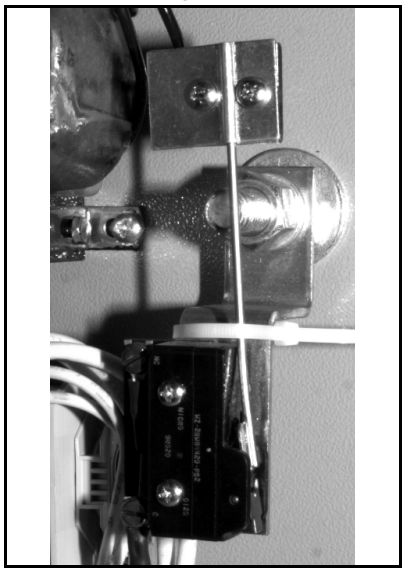
Figure 2: Line Voltage Switch Set for 240 Volt Operation



6. Remove Shipping Restraints

Remove all shipping restraints (usually marked in red). Restraints may be located behind access panels. Restraints may include the vibration switch restraint.

Figure 3: Typical Vibration Switch showing restraint in place



7. Check Cylinder Surface

Check the perforated cylinder for smoothness. Milnor will not accept responsibility for the cylinder finish after the machine is placed in service.

— End of BIRQVI01 —

Section 1

Service and Maintenance

BIRQUM01 (Published) Book specs- Dates: 20050302 / 20050302 / 20050302 Lang: ENG01 Applic: RMW

Preventive Maintenance

1. Lubrication Guidelines

As required by the warranty, to ensure safe operation, and to achieve optimum performance and service life from Milnor® washer-extractors, the schedules, instructions, and precautions herein must be strictly followed.

WARNING 1: Entangle and Crush Hazard—Belts and pulleys can entangle and crush body parts.

- Lock OFF and tag out power at the wall disconnect before servicing, except where specifically instructed otherwise in this section.
- Insure belt and pulley guards are in place during service procedures.
- Permit only qualified maintenance personnel to perform these procedures.

2. 30010G5E, 30010G5X and 30015G5E Maintenance

The bearing housing on these machines feature sealed bearings and require no periodic maintenance. Other maintenance items appear in the Preventive Maintenance Schedule below:

3. Preventive Maintenance Schedule

Table 1: Preventive Maintenance Checklist

Component		Action	Frequency	Specifications/Figure
Drive Train	Belts and pulleys	Check for wear, replace as required	Monthly	See "Drive Train Pulleys and Belts"
	Motors (if equipped with grease fittings) (See Note 2)	See "Baldor Motor Maintenance...," in this manual (See Note 3)	Every three Months	See motor nameplate. If not specified, use Shell Alvania (or equivalent). See "Motor Grease Points"
Drive Inverter	Inverter	Verify fan operation. Vacuum out inverter vents.	Monthly	See "Inverter Maintenance Points"
Hoses, Clamps, and Connections	Inlet, drain, and chemical hoses and connections	Check for leaks, cracks and bulges	Monthly	
Bolts	Foundation	Check bolt tightness and wear	Monthly	See dimensional drawings
30015G5x Water Seals	Leak-off	Verify that no water is dripping from leak-off	Daily	See "30015G5x Water Seal Leak-Off"

Note 1: Monthly/200 hours = Once a month or once every 200 operating hours, whichever comes first.

Note 2: Do not over-lubricate motors. Over-lubrication of a motor can seriously damage it by forcing grease into motor windings.

Note 3: If motor manufacturer's instructions conflict with manual section MSSM0274AE, follow manufacturers instructions. Motors are warranted by the manufacturers, not by Milnor.

4. Maintenance Points

Figure 1: Drive Train Pulleys and Belts (30022V6J shown)

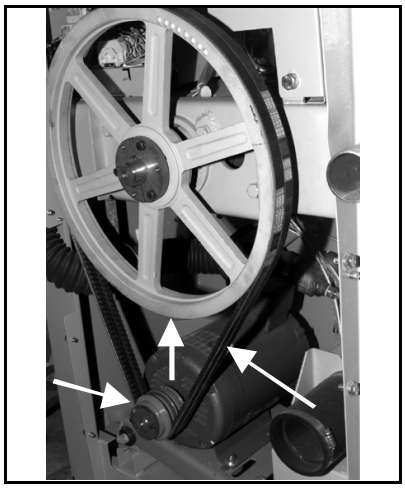


Figure 2: Inverter Maintenance Points

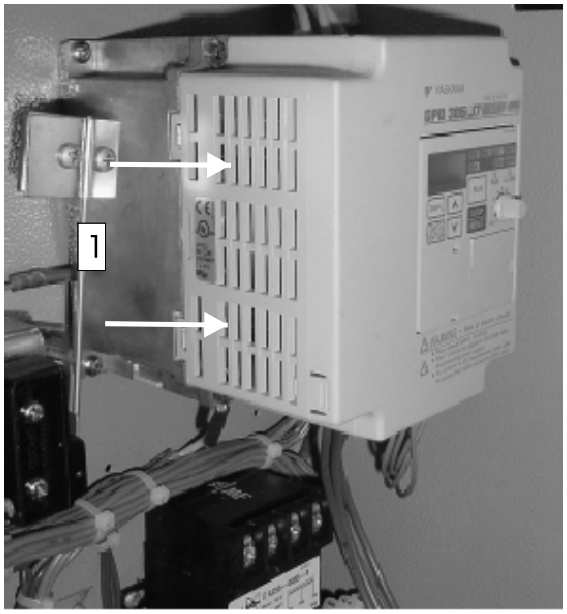
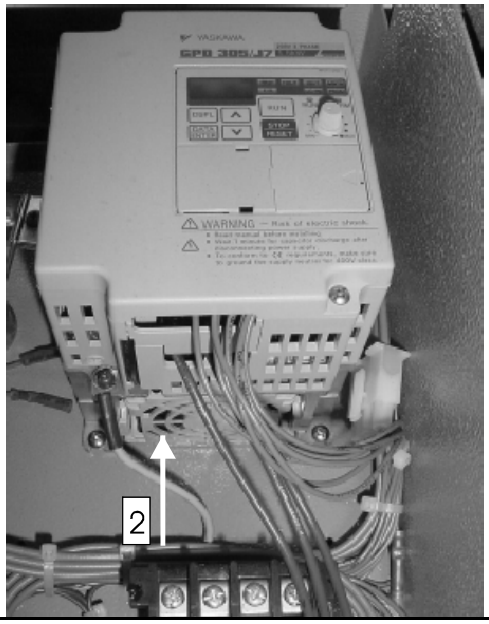
Inverter vents	Inverter fans	Legend
		**1.** Vents **2.** Fans

Figure 3: Motor grease points

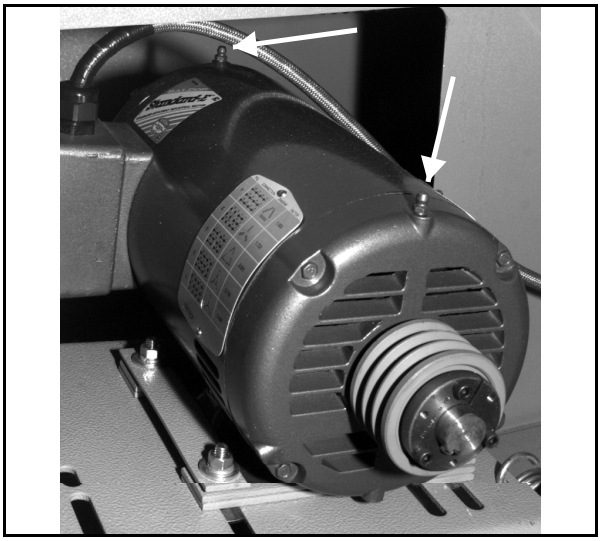
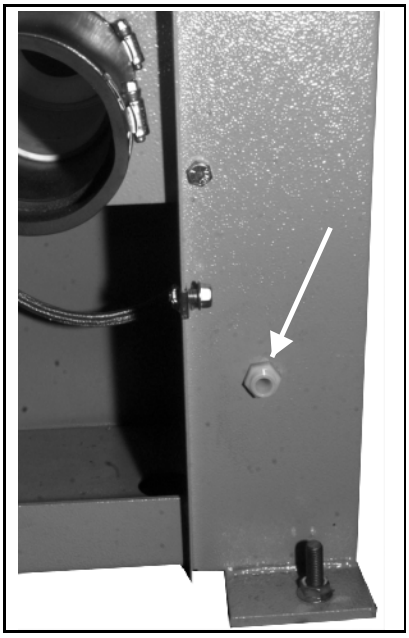


Figure 4: 30015G5x Water seal leak-off



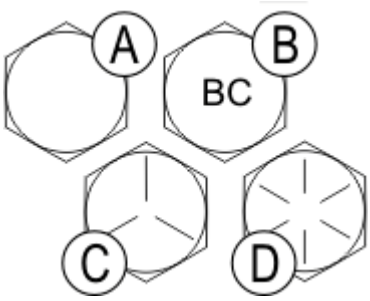
— End of BIRQUM01 —

BIUUUM04 (Published) Book specs- Dates: 20080506 / 20080506 / 20080506 Lang: ENG01 Applic: UUU

Fastener Torque Requirements

Torque requirements for other fasteners are specified in the specific document which describes the assembly. **If fastener torque specifications or threadlocking compound requirements in an assembly document vary from the specifications in this document, use the assembly document.**

Figure 1: Common Bolts Used in Milnor Equipment

Bolt Head Identifying Marks	Legend
	**A.** SAE Grades 1 and 2, ASTM A307, and stainless steel **B.** ASTM A354 Grade BC **C.** SAE Grade 5, ASTM A449 **D.** SAE Grade 8 and ASTM A354 BD

1. Torque Values

The tables below list the standard size, grade, threadlocking compound, and torque requirements for fasteners commonly used on Milnor® equipment.

Note 1: Data derived from Pellerin Milnor® Corporation "Bolt Torque Specification" (bolt_torque_milnor.xls/2002096).

1.1. Carbon Steel Fasteners

1.1.1. Without Threadlocking Compound

Table 1: Torque Values for Dry Fasteners 5/16-inch and Smaller

	Bolt Grade							
	Grade 2		Grade 5		Grade 8		Grade BC	
Bolt Size	Pound-Inches	N-m	Pound-Inches	N-m	Pound-Inches	N-m	Pound-Inches	N-m
1/4 x 20	66	7	101	11	143	16	126	14
1/4 x 28	76	9	116	13	163	18	--	--
5/16 x 18	136	15	209	24	295	33	258	29
5/16 x 24	150	17	232	26	325	37	--	--

Table 2: Torque Values for Dry Fasteners Larger Than 5/16-inch

	Bolt Grade							
	Grade 2		Grade 5		Grade 8		Grade BC	
Bolt Size	Pound-feet	N-m	Pound-feet	N-m	Pound-feet	N-m	Pound-feet	N-m
3/8 x 16	20	27	31	42	44	59	38	52
3/8 x 24	23	31	35	47	50	68	--	--
7/16 x 14	32	43	49	66	70	95	61	83
7/16 x 20	36	49	55	75	78	105	--	--
1/2 x 13	49	66	75	102	107	145	93	126
1/2 x 20	55	75	85	115	120	163	--	--
9/16 x 12	70	95	109	148	154	209	134	182
9/16 x 18	78	106	121	164	171	232	--	--
5/8 x 11	97	131	150	203	212	287	186	252
5/8 x 18	110	149	170	231	240	325	--	--
3/4 x 10	172	233	266	361	376	510	329	446
3/14 x 16	192	261	297	403	420	569	--	--
7/8 x 9	167	226	429	582	606	821	531	719
7/8 x 14	184	249	473	641	668	906	--	--
1 x 8	250	339	644	873	909	1232	796	1079
1 x 12	274	371	704	954	994	1348	--	--
1 x 14	281	381	723	980	1020	1383	--	--
1 1/8 x 7	354	480	794	1077	1287	1745	1126	1527
1 1/8 x 12	397	538	891	1208	1444	1958	--	--
1 1/4 x 7	500	678	1120	1519	1817	2464	1590	2155
1 1/4 x 12	553	750	1241	1682	2012	2728	--	--
1 3/8 x 6	655	888	1469	1992	2382	3230	2085	2827
1 3/8 x 12	746	1011	1672	2267	2712	3677	--	--
1 1/2 x 6	869	1178	1949	2642	3161	4286	2767	3751
1 1/2 x 12	979	1327	2194	2974	3557	4822	--	--

Table 3: Torque Values for Plated Fasteners 5/16-inch and Smaller

	Bolt Grade							
	Grade 2		Grade 5		Grade 8		Grade BC	
Bolt Size	Pound-Inches	N-m	Pound-Inches	N-m	Pound-Inches	N-m	Pound-Inches	N-m
1/4 x 20	49	6	76	9	107	12	95	11
1/4 x 28	56	6	88	10	122	14	--	--
5/16 x 18	102	12	156	18	222	25	193	22
5/16 x 24	113	13	174	20	245	28	--	--

Table 4: Torque Values for Plated Fasteners Larger Than 5/16-inch

	Bolt Grade							
	Grade 2		Grade 5		Grade 8		Grade BC	
Bolt Size	Pound-feet	N-m	Pound-feet	N-m	Pound-feet	N-m	Pound-feet	N-m
3/8 x 16	15	20	23	31	33	44	29	38
3/8 x 24	17	23	26	35	37	49	--	--
7/16 x 14	24	32	37	50	52	71	46	61
7/16 x 20	27	36	41	55	58	78	--	--
1/2 x 13	37	49	56	76	80	106	70	93
1/2 x 20	41	55	64	85	90	120	--	--
9/16 x 12	53	70	81	110	115	153	101	134
9/16 x 18	59	79	91	122	128	174	--	--
5/8 x 11	73	97	113	150	159	212	139	186
5/8 x 18	83	110	127	172	180	240	--	--
3/4 x 10	129	173	200	266	282	376	246	329
3/14 x 16	144	192	223	297	315	420	--	--
7/8 x 9	125	166	322	430	455	606	398	531
7/8 x 14	138	184	355	474	501	668	--	--
1 x 8	188	250	483	644	682	909	597	796
1 x 12	205	274	528	716	746	995	--	--
1 x 14	210	280	542	735	765	1037	--	--
1 1/8 x 7	266	354	595	807	966	1288	845	1126
1 1/8 x 12	298	404	668	890	1083	1444	--	--
1 1/4 x 7	375	500	840	1120	1363	1817	1192	1590
1 1/4 x 12	415	553	930	1261	1509	2013	--	--
1 3/8 x 6	491	655	1102	1470	1787	2382	1564	2085
1 3/8 x 12	559	758	1254	1672	2034	2712	--	--
1 1/2 x 6	652	870	1462	1982	2371	3161	2075	2767
1 1/2 x 12	733	994	1645	2194	2668	3557	--	--

1.1.2. With Threadlocking Compound

Table 5: Threadlocking Compound Selection by Bolt Size

	Bolt Size			
LocTite Product	1/4"	1/4" – 5/8"	5/8" – 7/8"	1" +
LocTite 222	OK			
LocTite 242		OK		
LocTite 262			OK	
LocTite 272			High temperature	
LocTite 277				OK

Table 6: Torque Values for Applications of LocTite 222

	Bolt Grade							
	Grade 2		Grade 5		Grade 8		Grade BC	
Bolt Size	Pound-inches	N-m	Pound-inches	N-m	Pound-inches	N-m	Pound-inches	N-m
1/4 x 20	60	7	96	11	132	15	108	12
1/4 x 28	72	8	108	12	144	16	--	--

Table 7: Torque Values for Applications of LocTite 242

	Bolt Grade							
	Grade 2		Grade 5		Grade 8		Grade BC	
Bolt Size	Pound-feet	N-m	Pound-feet	N-m	Pound-feet	N-m	Pound-feet	N-m
5/16 x 18	11	15	17	23	25	34	22	30
5/16 x 24	13	18	19	26	27	37	27	37
3/8 x 16	20	27	31	42	44	60	38	52
3/8 x 24	23	31	35	47	50	68	--	--
7/16 x 14	32	43	49	66	70	95	61	83
7/16 x 20	36	49	55	75	78	106	--	--
1/2 x 13	49	66	75	102	107	145	93	126
1/2 x 20	55	75	85	115	120	163	--	--
9/16 x 12	70	95	109	148	154	209	134	182
9/16 x 18	78	106	121	164	171	232	--	--
5/8 x 11	97	132	150	203	212	287	186	252
5/8 x 18	110	149	170	230	240	325	--	--

Table 8: Torque Values for Applications of LocTite 262

	Bolt Grade							
	Grade 2		Grade 5		Grade 8		Grade BC	
Bolt Size	Pound-feet	N-m	Pound-feet	N-m	Pound-feet	N-m	Pound-feet	N-m
3/4 x 10	155	210	240	325	338	458	296	401
3/4 x 16	173	235	267	362	378	512	--	--
7/8 x 9	150	203	386	523	546	740	477	647
7/8 x 14	165	224	426	578	601	815	--	--

Table 9: Torque Values for Applications of LocTite 272 (High Temperature)

	Bolt Grade							
	Grade 2		Grade 5		Grade 8		Grade BC	
Bolt Size	Pound-feet	N-m	Pound-feet	N-m	Pound-feet	N-m	Pound-feet	N-m
1 x 8	350	475	901	1222	1272	1725	1114	1510
1 x 12	383	519	986	1337	1392	1887	--	--
1 x 14	393	533	1012	1372	1428	1936	--	--
1-1/8 x 7	496	672	1111	1506	1802	2443	1577	2138
1-1/8 x 12	556	754	1247	1691	2022	2741	--	--
1-1/4 x 7	700	949	1568	2126	2544	3449	2226	3018
1-1/4 x 12	774	1049	1737	2355	2816	3818	--	--
1-3/8 x 6	917	1243	2056	2788	3335	4522	2919	3958
1-3/8 x 12	1044	1415	2341	3174	3797	5148	--	--
1-1/2 x 6	1217	1650	2729	3700	4426	6001	3873	5251
1-1/2 x 12	1369	1856	3071	4164	4980	6752	--	--

Table 10: Torque Values for Applications of LocTite 277

	Bolt Grade							
	Grade 2		Grade 5		Grade 8		Grade BC	
Bolt Size	Pound-feet	N-m	Pound-feet	N-m	Pound-feet	N-m	Pound-feet	N-m
1 x 8	325	441	837	1135	1181	1601	1034	1402
1 x 12	356	483	916	1242	1293	1753	--	--
1 x 14	365	495	939	1273	1326	1798	--	--
1-1/8 x 7	461	625	1032	1399	1674	2270	1464	1985
1-1/8 x 12	516	700	1158	1570	1877	2545	--	--
1-1/4 x 7	650	881	1456	1974	2362	3202	2067	2802
1-1/4 x 12	719	975	1613	2187	2615	3545	--	--
1-3/8 x 6	851	1154	1909	2588	3097	4199	2710	3674
1-3/8 x 12	970	1315	2174	2948	3526	4781	--	--
1-1/2 x 6	1130	1532	2534	3436	4110	5572	3597	4877
1-1/2 x 12	1271	1723	2852	3867	4624	6269	--	--

1.2. Stainless Steel Fasteners

Table 11: Torque Values for Stainless Steel Fasteners 5/16-inch and Smaller

	316 Stainless		18-8 Stainless		18-8 Stainless with Loctite 767	
Nominal Bolt Size	Pound-Inches	N-m	Pound-Inches	N-m	Pound-Inches	N-m
1/4 x 20	79	9	76	9	45	5
1/4 x 28	100	11	94	11	56	6
5/16 x 18	138	16	132	15	79	9
5/16 x 24	148	17	142	16	85	10

Table 12: Torque Values for Stainless Steel Fasteners Larger Than 5/16-inch

Bolt Size	316 Stainless		18-8 Stainless		18-8 Stainless with Loctite 767	
	Pound-feet	N-m	Pound-feet	N-m	Pound-feet	N-m
3/8 x 16	21	28	20	27	12	16
3/8 x 24	23	31	22	29	13	18
7/16 x 14	33	44	31	42	19	25
7/16 x 20	35	47	33	45	20	27
1/2 x 13	45	61	43	58	26	35
1/2 x 20	47	64	45	61	27	37
9/16 x 12	59	81	57	77	34	46
9/16 x 18	66	89	63	85	38	51
5/8 x 11	97	131	93	125	56	75
5/8 x 18	108	150	104	141	62	84
3/4 x 10	132	179	128	173	77	104
3/4 x 16	130	176	124	168	75	101
7/8 x 9	203	275	194	263	116	158
7/8 x 14	202	273	193	262	116	157
1 x 8	300	406	287	389	172	233
1 x 14	271	367	259	351	156	211
1-1/8 x 7	432	586	413	560	248	336
1-1/8 x 12	408	553	390	529	234	317
1-1/4 x 7	546	740	523	709	314	425
1-1/4 x 12	504	683	480	651	288	390
1-1/2 x 6	930	1261	888	1204	533	722
1-1/2 x 12	732	992	703	953	422	572

2. Preparation

WARNING 1: Fire Hazard—Some solvents and primer products are flammable.

- Use in a well ventilated area.
- Do not use flammable products near ignition sources.

1. Clean all threads with a wire brush, a tap, or a die.
2. Degrease the fasteners and the mating threads with a cleaning solvent. Wipe the parts dry.

   Note 2: LocTite 7649 Primer N™ will remove grease from parts, but it costs more than a standard organic or petroleum solvent.

3. Prime the fasteners and the mating threads with LocTite 7649 Primer N™ or equal. Allow the primer to dry for at least one minute.

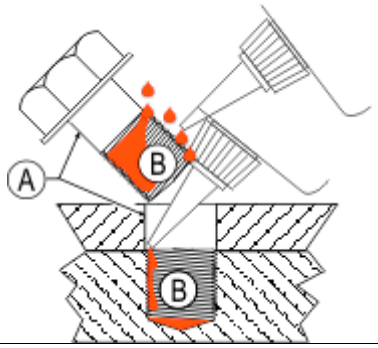
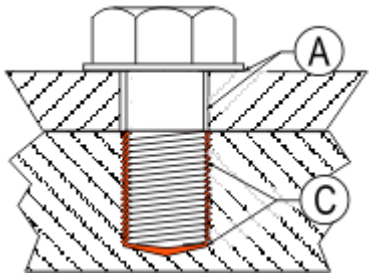
3. Application of Threadlocking Compound

CAUTION 2: Malfunction Hazard—Improper application of threadlocking compounds may result in fasteners becoming loose from impact, heat, or vibration. Loose fasteners can cause the equipment to malfunction.

- Read and follow the threadlocking compound manufacturer's instructions and warnings.

Apply threadlocking compound to the thread engagement areas of fasteners and mating threads only.

Figure 2: Blind Hole

Application	Coverage
	

Legend

A. No threadlocking compound here
B. Apply here
C. Fill all gaps with threadlocking compound

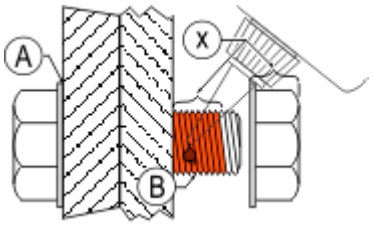
3.1. Blind Holes

1. Apply several drops of threadlocking compound down the female threads to the bottom of the hole.
2. Apply several drops of threadlocking compound to the bolt.
3. Tighten bolt to value shown in the appropriate table (Table 5 through Table 11).

3.2. Through Holes

1. Insert bolt through assembly.
2. Apply several drops of threadlocking compound to the bolt thread area that will engage the nut.
3. Tighten bolt to value shown in the appropriate table (Table 5 through Table 11).

Figure 3: Through Hole

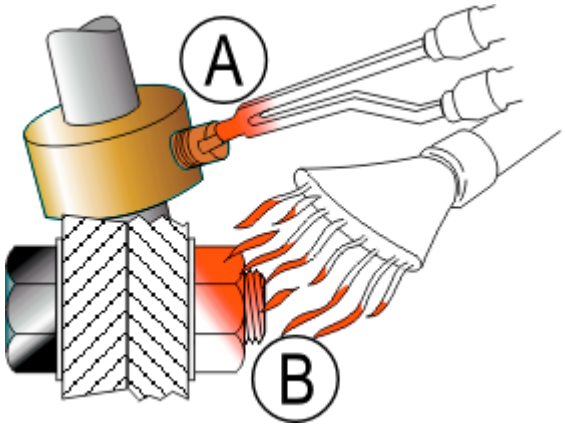
Application	Legend
	**A.** No threadlocking compound here **B.** Cover this area **x.** Nut depth

3.3. Disassembly—For low-strength and medium-strength products, disassemble with hand tools.

For high-strength products, apply localized heat for five minutes. Disassemble with hand tools while the parts are still hot.

Figure 4: Disassembly

Use Localized Heat



Legend

A. Soldering gun heating small fastener
B. Torch heating large fastener

— End of BIUUUM04 —

BIUUUM03 (Published) Book specs- Dates: 20071029 / 20071029 / 20071029 Lang: ENG01 Applic: UUU

Motor Preventive Maintenance

This document replaces document MSSM0274AE and applies to grease-lubricated motors used on Milnor products. Service motors in accordance with any brand-specific maintenance instructions posted on the motor or provided with your machine. Otherwise, follow the procedures in this document.

WARNING 1: Multiple hazards—Contact with electric power can kill or seriously injure you. Electric power is present inside the cabinetry unless the main machine power disconnect is off. Contact with moving components normally isolated by guards, covers, and panels, can entangle and crush your limbs. These components move automatically.

- Do not service the machine unless qualified and authorized. You must clearly understand the hazards and how to avoid them.
- Lockout/tagout power at the wall disconnect switch before servicing or in accordance with these procedures.

1. Routine Maintenance Needed

Inspect and clean motors approximately every 500 operating hours or every three months, whichever comes first. Lubricate motors at the intervals called for in Section 2. Test a motor if it shows any sign of malfunction.

1.1. Inspect and Clean—Keep the exterior of the motor free of dirt, oil, grease, water, etc. Contaminates blocking ventilation will cause overheating and early motor failure.

1.2. Lubricate—Frequency, quantity, type and application method are all important. These are explained in the remainder of this document.

1.3. Test and Repair—If a motor experiences frequent overload trips or inverter faults, verify that all electrical connections are tight. If the condition persists, check the motor and winding insulation integrity using a “megger” (low resistance ohmmeter), or have the motor tested by a reliable motor shop. If a motor produces smoke or a burning smell, but does not immediately fail, shut it down and check for dirt or grease accumulation within the motor frame, which can block air flow and short out electrical conductors. Disassemble the motor as required to thoroughly remove the contaminates.

2. Determining Motor-specific Lubrication Frequency and Quantity

1. Look up the frame size and RPM on the motor data plate. Example from Figure 1:

   Frame size = 215T, RPM = 1725

2. Look up the standard lubrication interval in Table 1. Example based on above:

   Standard lubrication interval = 12,000 hours

3. Choose the appropriate service severity rating and multiplier from Table 2. Example based on an ambient temperature of 102°F (39°C) and a moderately corrosive atmosphere:

   Service severity rating = severe, Multiplier = 0.5

4. Calculate the actual lubrication interval. Example based on above:

12,000 x 0.5 = ***6,000 hours***

Where:
12,000 is the standard lubrication interval
0.5 is the severity of service multiplier

5. Determine from Table 3, the amount of grease to apply to the motor bearings, based on the frame size range. Adjust for a smaller bearing size if necessary. Example based on above:

Grease volume = ***0.16 ounces (4.7 grams)***
Grease gun strokes = ***2.5***

Figure 1: Typical Motor Data Plate

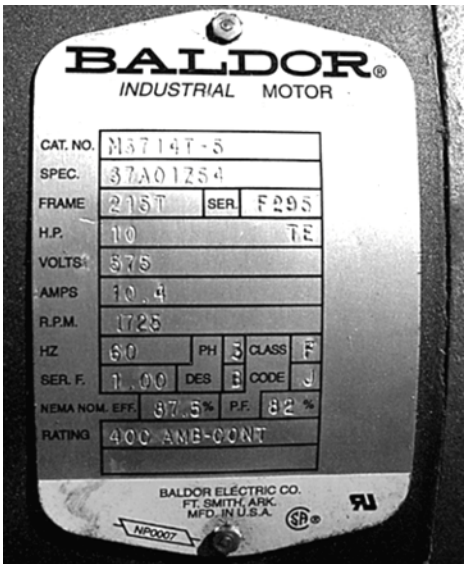


Table 1: Lubrication Interval for Standard Severity of Service

NEMA (IEC) Frame Size Range		Same or Closest Higher RPM Rating			
		3600 RPM	1800 RPM	1200 RPM	900 RPM
Up to 215 (132)		5500 hours	12000 hours	18000 hours	22000 hours
254 to 286 (160 - 180)		3600 hours	9500 hours	15000 hours	18000 hours
324 to 365 (200 - 225)		2200 hours	7400 hours	12000 hours	15000 hours
404 to 5000 (280 - 315)	6313 or 6314 bearings	2200 hours	3500 hours	7400 hours	10500 hours
	roller bearings	1100 hours	1750 hours	3700 hours	5250 hours

Table 2: Determining the Service Severity Rating and Multiplier

Considerations (any non-"Standard" condition raises rating)			Service Severity Rating	Multiplier
Maximum Ambient Temperature	Or Atmospheric Contamination	Or Bearing Type		
104°F (40°C)	Clean, little corrosion	Deep groove ball	Standard	1.0
122°F (50°C)	Moderate dirt, corrosion	Ball thrust, roller	Severe	0.5
>122°F (>50°C)	Much dirt, abrasive dust, corrosion	n.a.	Extreme	0.1

Table 3: Determining Grease Quantity (total for all bearings in the motor)

NEMA (IEC) Frame Size Range	Largest Bearing Size in Range			Grease Volume if Largest Bearing Size**		Grease Gun Strokes*
	Bearing Category	Outside Diameter (mm)	Width (mm)	(ounces)	(grams)	
Up to 215 (132)	**6307**	**80**	**21**	0.16	4.7	2.5
254 to 286 (160 - 180)	**6311**	**120**	**29**	0.32	9.1	5
324 to 365 (200 - 225)	**6313**	**140**	**33**	0.43	12.2	7
404 to 5000 (280 - 315)	**NU322**	**240**	**50**	1.11	31.5	18

*** Based on .0624 fluid ounces (1.77 grams) per stroke. To check your grease gun, pump grease into a small measured container. 16 strokes should provide 1 ounce (28 grams).**

**** This is the quantity for the motor (both bearings). Reduce grease quantity proportionately for smaller bearings.**

3. Grease Types and Application Procedures

Table 4: Grease Type Based on Severity of Service

Rating from Table 2	Grease Type
Standard	Shell Dolium R, Chevron SRI, or equivalent
Severe	
Extreme	Darmex 707 or equivalent

CAUTION 2: Damage and Malfunction Risks—Poor greasing procedures such as introducing contamination or forcing grease into motor windings can damage the motor. Allowing grease to drip onto components such as brake or clutch surfaces can cause the machine to malfunction.

- Clean grease fittings before greasing.
- Apply proper grease quantity.
- Use only a hand-operated (not a pneumatic) grease gun and pump grease slowly (10 seconds per stroke or slower).
- Keep machinery clean.

Apply grease as follows:

1. Lockout/tagout machine power at the external disconnect switch.
2. Clean grease fittings.
3. If the motor has a grease outlet plug, remove it.
4. Add recommended amount of grease. Stop immediately if new grease appears around motor shaft or grease outlet plug.
5. If the motor has a grease outlet plug, replace it.

— End of BIUUUM03 —

Section 2

Drive Assemblies

Drive Chart
3010 & 3015CGE

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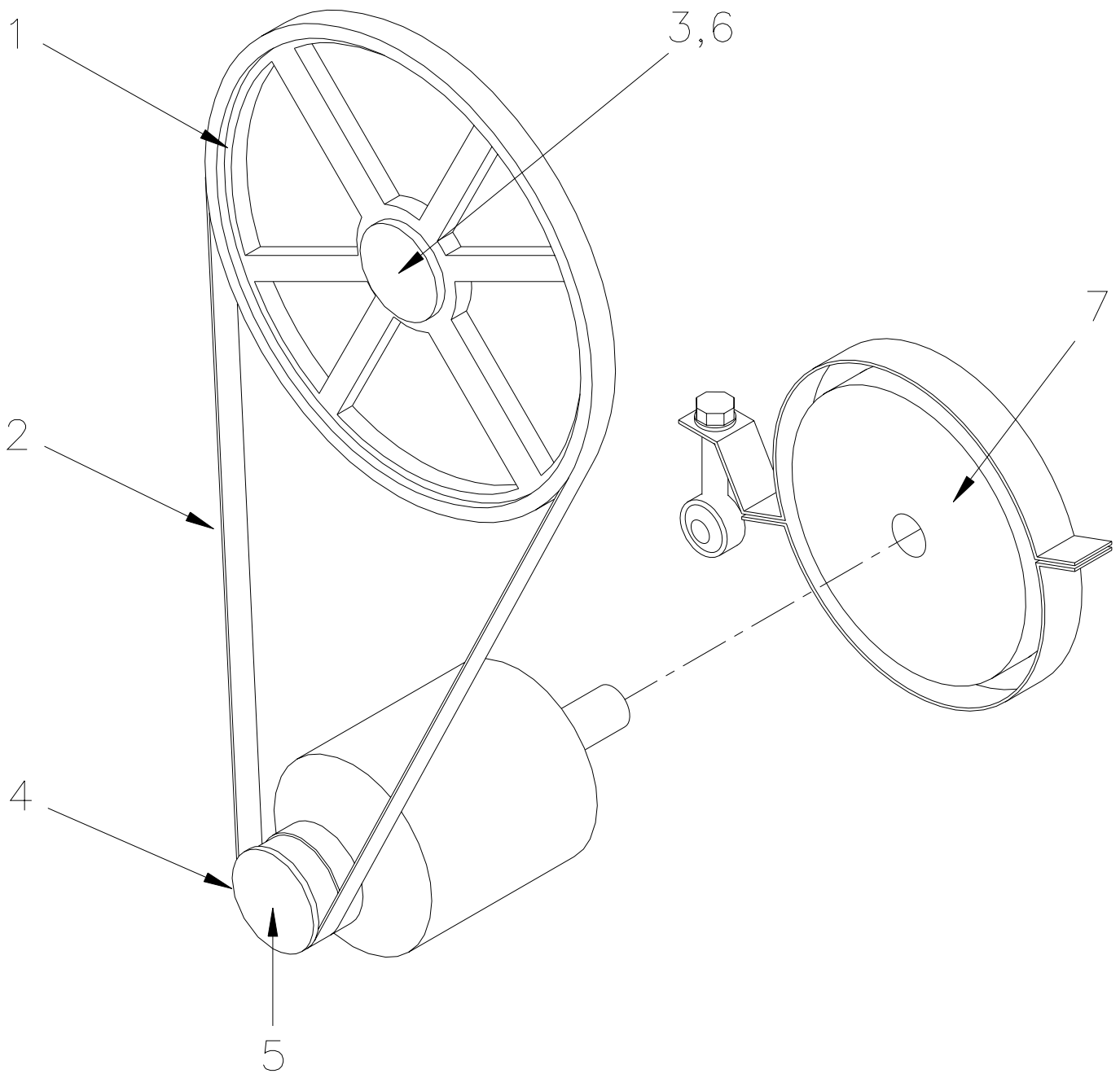

Parts List—Drive Chart

Find the correct assembly first, then find the needed components. The item letters (A, B, C, etc.) assigned to assemblies are referred to in the "Used In" column to identify which components belong to an assembly. The item numbers (1, 2, 3, etc.) assigned to components relate the parts list to the illustration.

Used In	Item	Part Number	Description	Comments
			----------ASSEMBLIES----------	
	A	D33 03460	DRIVE CHART=3010 60CYC	
			----------COMPONENTS----------	
all	1	5613V19	PULLEY 19" 1GR 3V	
all	2	56VR0800M2	VBELT 3V800 MATCHSET2 EA=1BLT	
all	3	56Q1KSK	1+1/2" BUSH VPUL QD TYPE SK	
all	4	560260R3JA	VPUL 3G3V2.60 QD TYPE JA	
all	5	56Q0RJA	7/8" BUSHING VPUL QD TYPE "JA"	
all	6	15E230	STRMACHKEY 3/8SQX2+1/2 TOL.+0	
all	7	54H164A	CLUTCH 12VDC MAPM02	

Motor Mount

3010 & 3015 G5E, G5X, CGE

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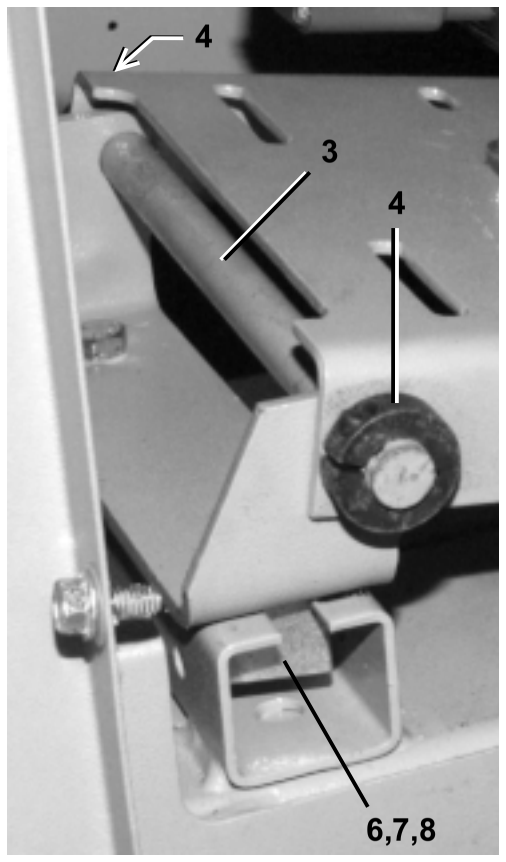
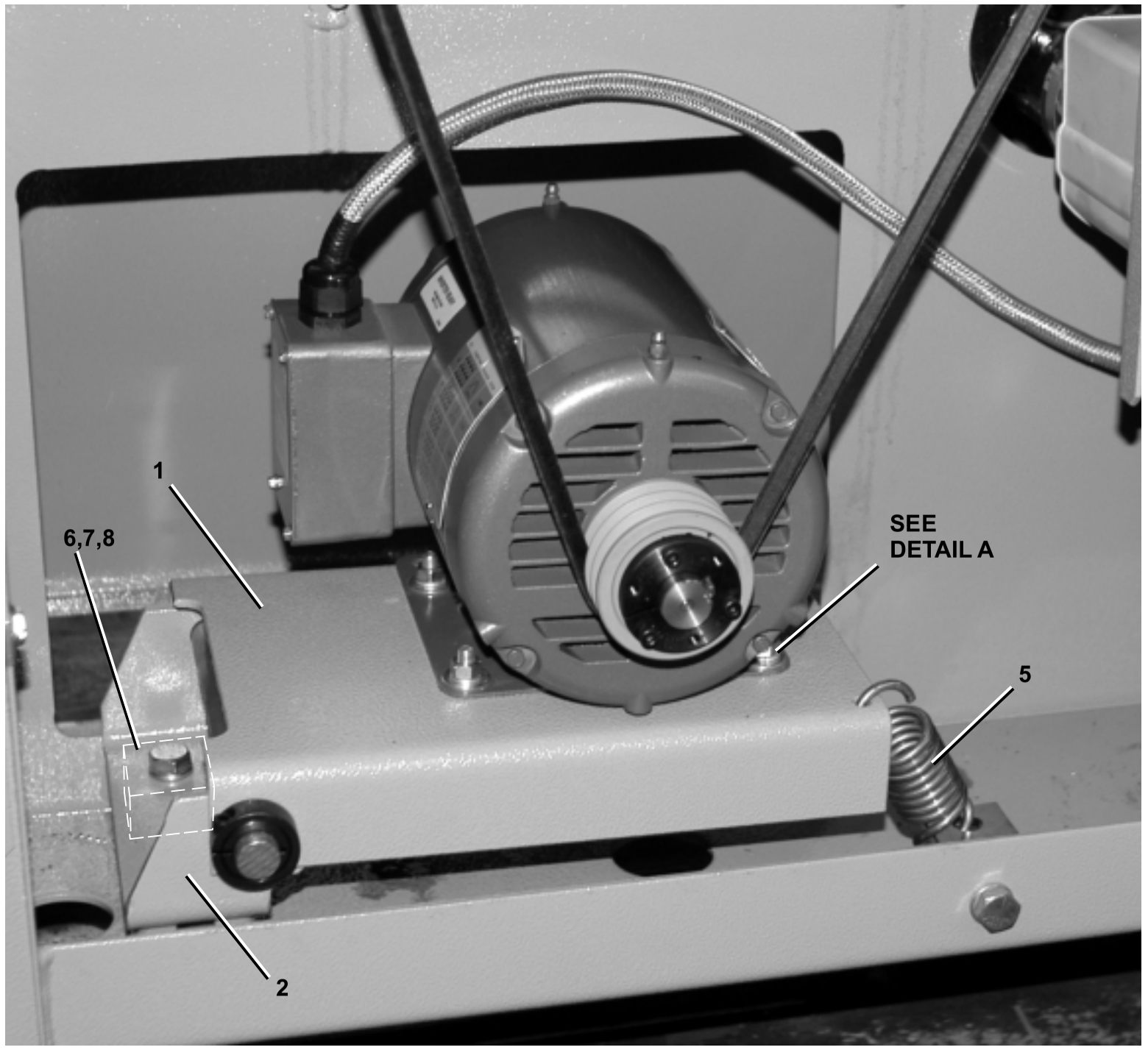
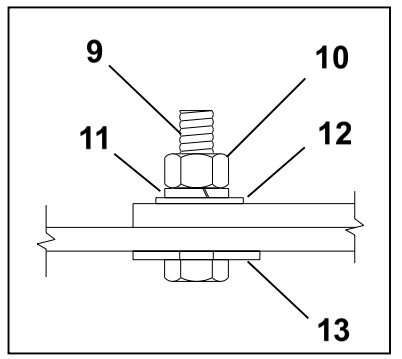
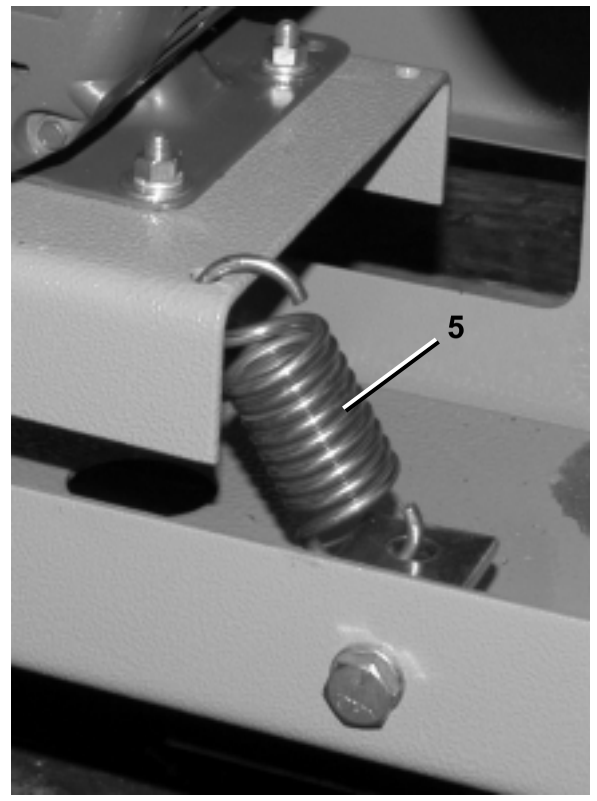






DETAIL A
(4 PLACES)



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Parts List—Motor Mount

Find the correct assembly first, then find the needed components. The item letters (A, B, C, etc.) assigned to assemblies are referred to in the "Used In" column to identify which components belong to an assembly. The item numbers (1, 2, 3, etc.) assigned to components relate the parts list to the illustration.

Used In	Item	Part Number	Description	Comments
----------	----------	----------	----------ASSEMBLIES----------	----------
	A	GDB30003	3010C4 DRIVE BASE INSTALL	
	B	ADB30003	3010C4 DRVIE BASE ASSY	
----------	----------	----------	----------COMPONENTS----------	----------
all	1	02 04256B	PLATE=MOTOR MOUNT, 3010	
all	2	02 04257C	BRKT=MOTOR MOUNT, 3010	
all	3	02 04258	SHAFT=MOTOR MOUNT, 3022S4	
all	4	54JH10750C	SHFTCOLLAR 3/4" CLPTYP CFG#12S	
all	5	02 04259	SPRNG/MOT MOUNT/3022S4#SPC2690	
all	6	02 19283	NUT=1/2-13UNCX1+1/2SQ SPEC	
all	7	15G198	HXFLGNUT 3/8-16 ZINC	
all	8	15K092Z	HEXFLGSCR 3/8-16X1 GR5 ZINC	
all	9	15K065	HEXCAPSCR 5/16-18UNC2AX1 GR5 Z	
all	10	15G185	HXNUT 5/16-18UNC2B SAE ZINC GR	
all	11	15U210	LOKWASHER MEDIUM 5/16 ZINCPL	
all	12	15U200	FLATWASHER(USS STD) 5/16"ZNC P	
all	13	15U241	FLATWASHER 13/32IDX1+3/4ODX14G	

Clutch Brake

3010, 3015CGE ; 30015, 30022C4E

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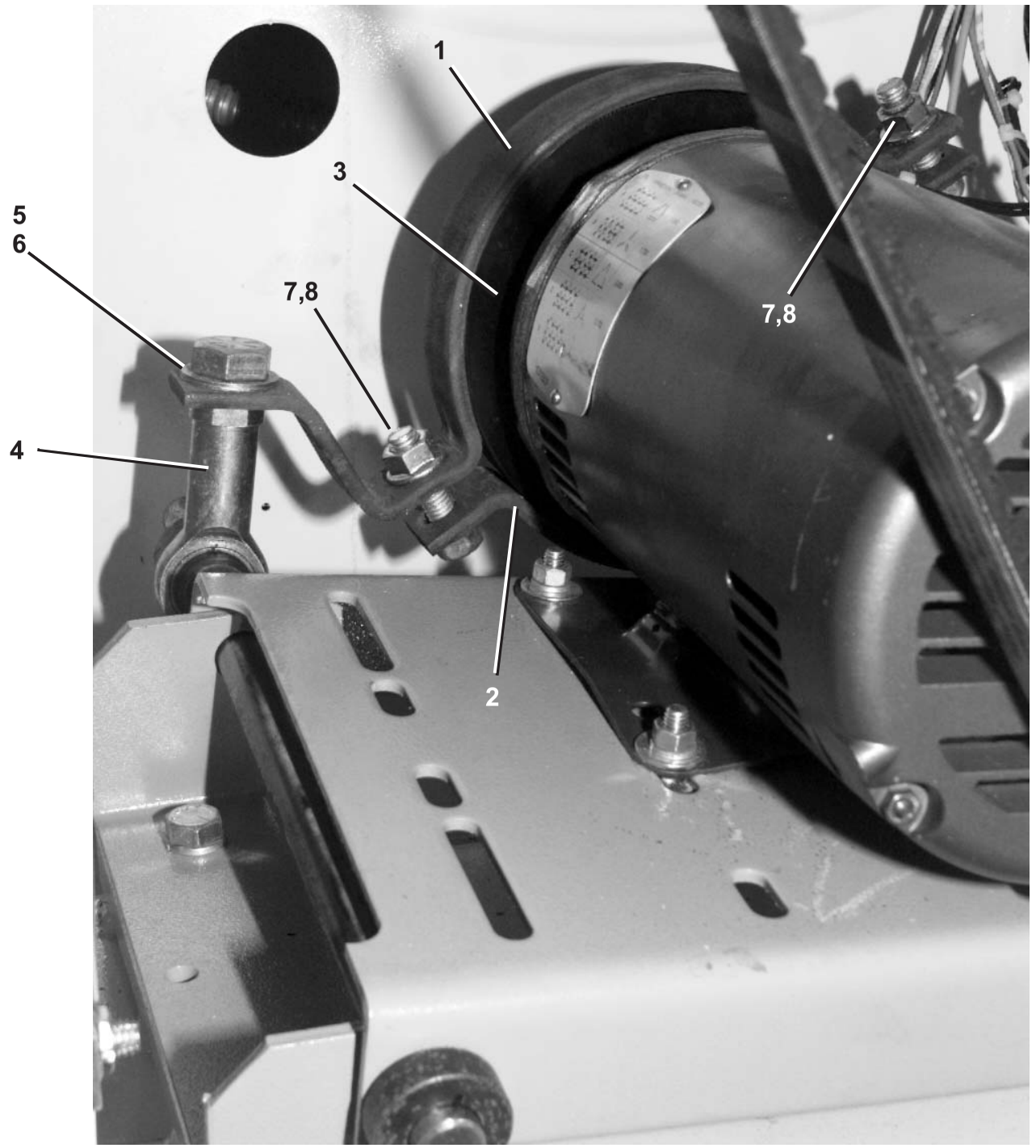

Parts List—Clutch Brake

Find the correct assembly first, then find the needed components. The item letters (A, B, C, etc.) assigned to assemblies are referred to in the "Used In" column to identify which components belong to an assembly. The item numbers (1, 2, 3, etc.) assigned to components relate the parts list to the illustration.

Used In	Item	Part Number	Description	Comments
			----------ASSEMBLIES----------	
	A	GBR30001	3022C4E BRAKE INSTALL	
			----------COMPONENTS----------	
all	1	04 20369B	BRAKE SHOE TOP 30XX COIN	
all	2	04 20369A	BRAKE SHOE-BOTTOM 30XX COIN	
all	3	54H164A	CLUTCH 12VDC MAPM02	
all	4	54AA00PFRE	FEM ROD END ALIN#VF-12G 3/4"	
all	5	15K230	HXCPSC-3/4-16X1+3/4 GR8 ZINC	
all	6	15U321H	FLTWASH 3/4 HARD ASTM F436	
all	7	15K154H	INDHEXFLGSCR 1/2-13X1+3/4GR8ZN	
all	8	15G225H	HEXFLGNUT 1/2-13 SERRATED 18-8	

Section 3

Bearing Assemblies

Shell & Cylinder Installation

3010 & 3015 G5E, G5X, CGE

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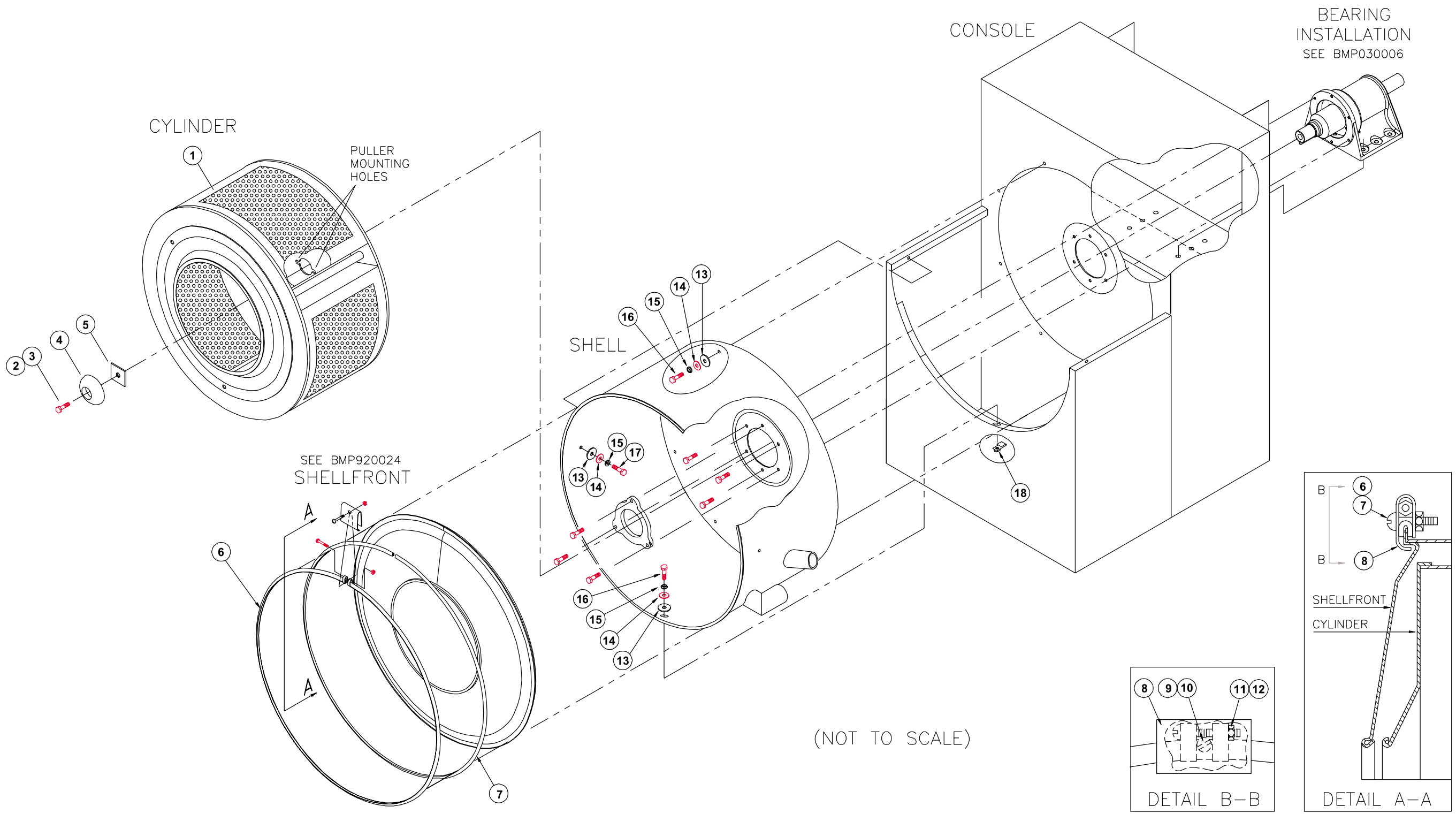

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Parts List—Shell & Cylinder Installation

Find the correct assembly first, then find the needed components. The item letters (A, B, C, etc.) assigned to assemblies are referred to in the "Used In" column to identify which components belong to an assembly. The item numbers (1, 2, 3, etc.) assigned to components relate the parts list to the illustration.

Used In	Item	Part Number	Description	Comments
			----------ASSEMBLIES----------	
	A	GCA30003	3010T5 CYLINDER INSTALL	3010G5E,G5X,CGE
	B	GCA30002	3015 CYLINDER INSTALL	3015G5E,G5X,CGE
	C	G33 04000U	CONDUIT+SHELLFT 3015V/T NO P.B	
	D	GSF30001	3015C4E SHELLFRONT INSTALL	
			----------COMPONENTS----------	
A	1	ACA3010CYL	CYLINDER ASSY SEAMED 3010	
B	1	ACA3015CYL	CYLINDER ASSY SEAMED 3015	
all	2	15B200	HEXCAPSCR 3/4-10X1+3/4 SS18-8	
all	3	15U350	LOCKWASHER 3/4 MED SS18-8	
all	4	02 11196	COVER=SHAFT RETAINER=304S/S	
all	5	02 14359A	SHAFT RETNR SPACER 2+3/4" SQ	
all	6	Y2 02059	*SHELL CLAMP RING=30" MACHINE	
all	7	02 02087C	EXTRUS*ION-SHELL=30"MACHINES (	
all	8	02 02181	GUARD=SHELL MOUNT RING CLIP	
all	9	15K046S	HEXCAPSCR 1/4-20UNC2A X 2.25 S	
all	10	15G168	SQNUT 1/4-20UNC2 SS18-8	
all	11	15N146	RDMACHSCR 10-24UNC2X1 SS18-8	
all	12	15G130	HEXMACHSCRNUT 10-24UNC2 SS18-8	
all	13	02 02293	DOOR HANDLE NUT GASKET	
all	14	15U245	FLTWASH 3/8 STD COMM 18-8 SS	
all	15	24G030N	ROLLED WASH.379ID NYLTITE 37W	
all	16	15K096	HEXCAPSCR 3/8-16UNC2X1SS18-8	
all	17	15K086	HXCAPSCR 3/8-16NCX3/4 SS18-8	
all	18	17N071	NUT J-TYP #C33896-3816-3B 3/8"	

Bearing Assembly and Installation

3010 & 3015 G5E,G5X,CGE

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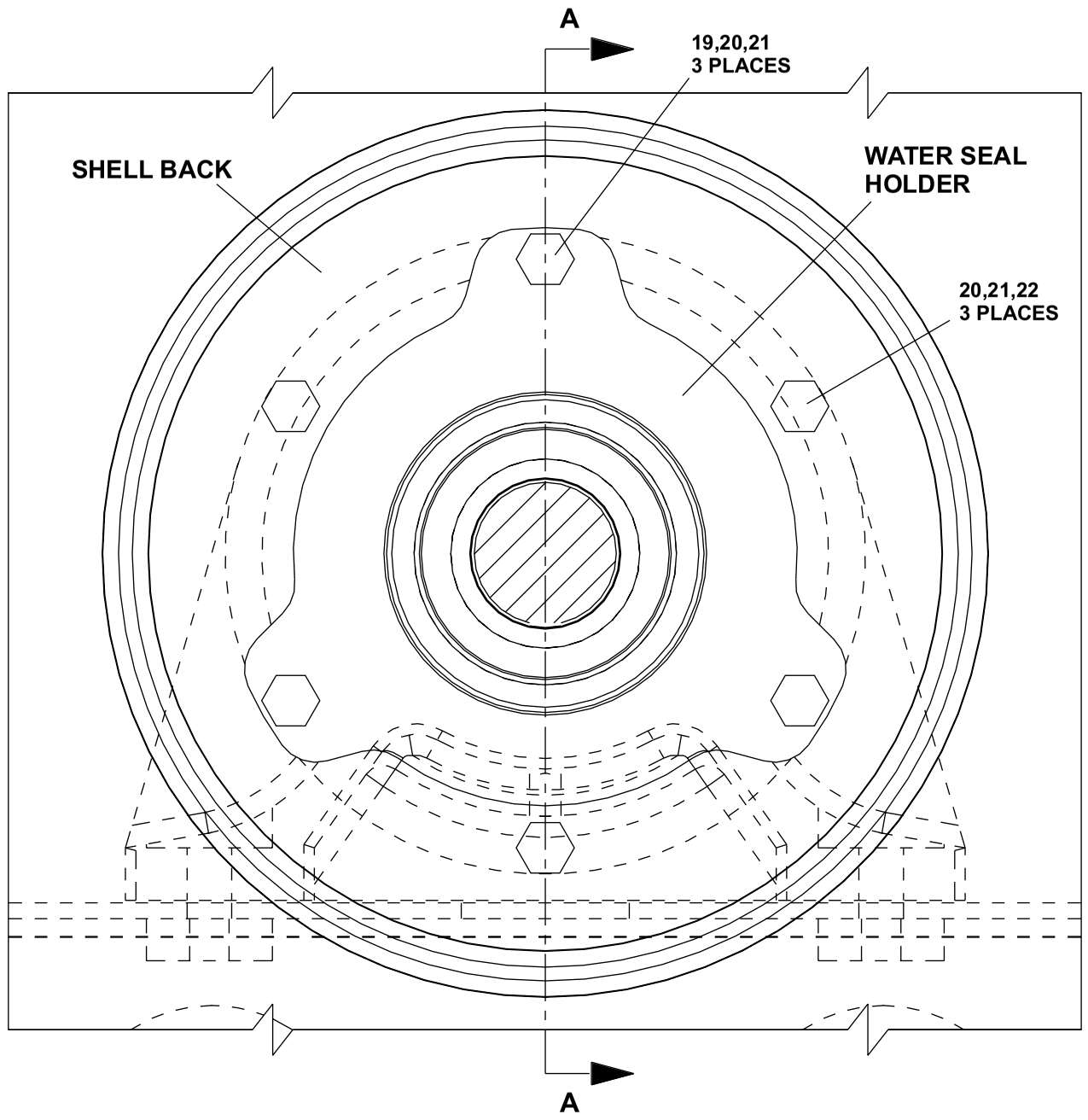
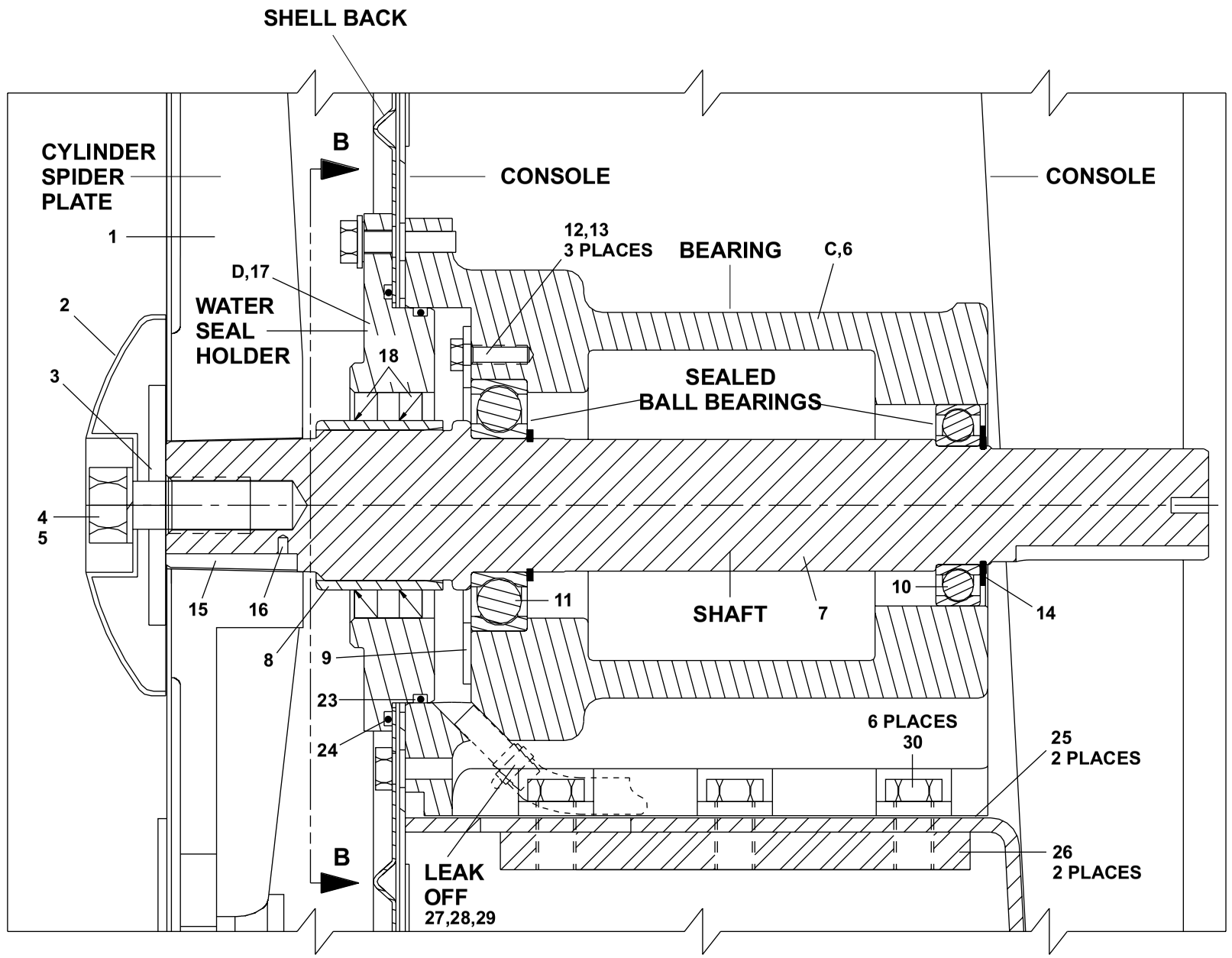


VIEW B-B



VIEW A-A

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Parts List—Bearing Assembly

Find the correct assembly first, then find the needed components. The item letters (A, B, C, etc.) assigned to assemblies are referred to in the "Used In" column to identify which components belong to an assembly. The item numbers (1, 2, 3, etc.) assigned to components relate the parts list to the illustration.

Used In	Item	Part Number	Description	Comments
			----------ASSEMBLIES----------	
	A	GCA30003	3010T5 CYLINDER INSTALL	3010 G5E,G5X,CGE
	B	GCA30002	3015 CYLINDER INSTALL	3015 G5E,G5X,CGE
	C	GBM30003	3010C/T BEARING HOUSE INSTALL	3010 G5E,G5X,CGE
	D	GBM30005	3015G BEARING HOUSE INSTALL	3015 G5E,G5X,CGE
	E	ABM30003	3010C/T BEARING HOUSE ASSEMBLY	3010 G5E,G5X,CGE
	F	AVM30005	3015C/T BEARING HOUSE ASSEMBLY	3015 G5E,G5X,CGE
	G	ABM30004	3010 WATER SEAL HOLDER ASSY	
			----------COMPONENTS----------	
A	1	ACA3010CYL	CYLINDER ASSY SEAMED 3010	
B	1	ACA3015CYL	CYLINDER ASSY SEAMED 3015	
all	2	02 11196	COVER=SHAFT RETAINER=304S/S	
all	3	02 14359A	SHAFT RETNR SPACER 2+3/4" SQ	
all	4	15B200	HEXCAPSCR 3/4-10X1+3/4 SS18-8	
all	5	15U350	LOCKWASHER 3/4 MED SS18-8	
A	6	X2 04500	3010 MAIN BEARING HOUSE MACH	
B	6	X2 04500A	3015 MAIN BEARING HOUSE MACH	
A	7	X2 04503	3010 MAIN SHAFT	
B	7	X2 04503A	3015 MAIN SHAFT	
all	8	02 03311	SEAL SLEEVE OUR MATL	
A	9	02 04502	3010 FRONT BEARING HOLDER	
B	9	02 04502A	3015 FRONT BEARING HOLDER	
A	10	54A103	BALL BEARING 6209-2Z/GJN	
B	10	54A106	BALL BEARING 6310-2Z-GJN	
A	11	54A104	BALL BEARING 6008-2Z GJN	
B	11	54A105	BALL BEARING 6308-2Z-GJN	
all	12	15K031	BUTSOKCAPSCR 1/4-20X1/2 SS18-8	
all	13	15U181	LOCKWASHER MEDIUM 1/4 SS18-8	
all	14	17B001	EXTRET RING GLH#DSH040	
all	15	02 02294A	SHAFT KEY 3/8 X 3/8	
all	16	15H089S	SPRINGPIN 1/8"DIA X 5/8" LONG	
all	17	X2 04504	3010 WATER SEAL HOLDER	
all	18	24S005	SEAL 2.25 X 3.0 X .375 SS BUNA	
all	19	15K071	HEXCAPSCR 5/16-18X1+1/2SS18-8	
all	20	15U200S	FLATWASHER US STD 5/16 SS18-8	
all	21	24G027N	ROLLED WASH.312ID NYLTITE 31W	
all	22	15K052	HXCAPSCR 5/16-18UNC2AX3/4 SS18	
all	23	60C153	ORING 4.984ID DIA.139BUNA#250	
all	24	60C153B	ORING-5.484ID.X.139DIA #254BUN	
all	25	02 04505	3010 BEARING HOUSE SHIM	
all	26	02 04506	BEARING HOUSE TAP STRIP	
all	27	51E507	HOSESTEM BRASS 1/4MPX1/2HOSEID	
all	28	60E006C	PVC TUBING NYL.REINF.5IDX.75OD	
all	29	27A040	H0SECLAMP 5/16-7/8SSSCR#3606	
all	30	15K180	HXCAPSCR 1/2-13UNCAX2 GR5 ZINC	
All	31	17B001A	EXTRET RING GLH#DSH-050	

Section 4

Shell and Door Assemblies

Shellfront Assembly, Conduit, & Interlock

3010 / 3015 G5E,G5X,CGE

30015 V7J,T5J,C4A,C4E & 30022 V6J,T5J,C4A,C4E

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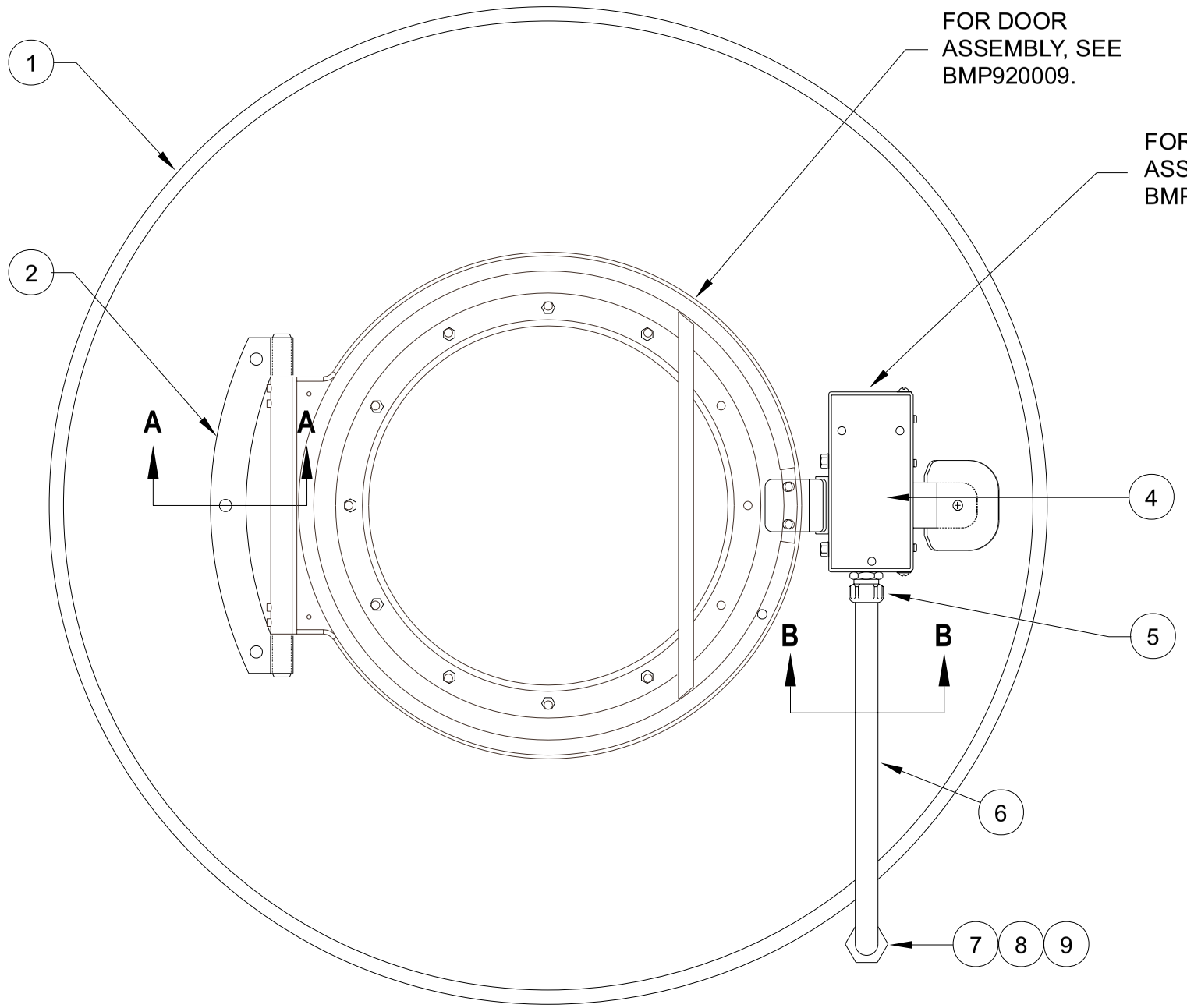
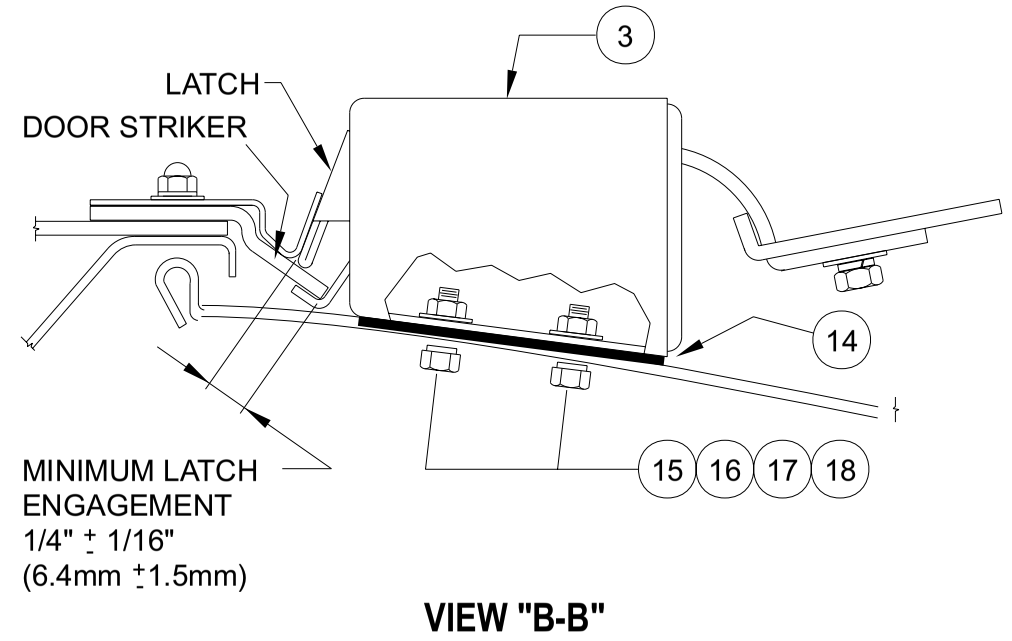
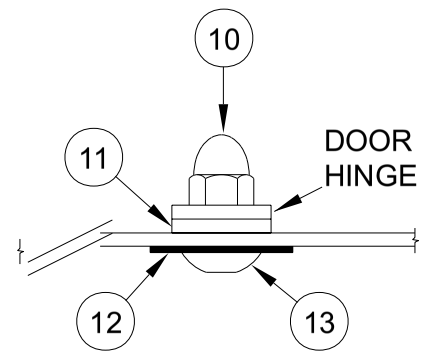




VIEW "B-B"



VIEW "A-A"

ADJUSTMENTS:

1. ADJUST DOOR STRIKER SO THAT IT TOUCHES THE LATCH SQUARELY AND EVENLY.
2. ADJUST THE LATCH SO THAT THE MINIMUM ENGAGEMENT WITH THE DOOR FULLY CLOSED EQUALS 1/4" ± 1/16" (6.4mm ± 1.5mm).

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Parts List—Shellfront, Conduit & Interlock

Find the correct assembly first, then find the needed components. The item letters (A, B, C, etc.) assigned to assemblies are referred to in the "Used In" column to identify which components belong to an assembly. The item numbers (1, 2, 3, etc.) assigned to components relate the parts list to the illustration.

Used In	Item	Part Number	Description	Comments
			----------ASSEMBLIES----------	
	A	A33 10100C	*SHLASSY (IDNT) UNLOK N4P	3015M4G/J/P, M6J,D4A 3022M5G/J
	B	A33 10100H	SHELL FRONT ASSY 3015/20M4A	3015M4A,C4T,M4T,M6A,M6T 3022M5T,3022C4T
	C	A33 10100M	SHLASSY N/LOCK 3015/22S#G/J	3022S4J,S4G,S5J 3015K4A,S4J,S5G,S5J
	D	A33 10100N	SHLASSY N/LOCK 3015/22V/T	**3010G5E,G5X 3015G5E,G5X,V7J,T5E,T5J,T5X 3022V6J,T5E,T5J,T5X**
	E	A33 10100F	*SHLASSY (IDNT) UNLOK C4A	**3015C4A, 3022C4A**
	F	A33 10100G	SHLFRTASY N/O ILOK W/PROX	**3010CGE,3015CGE,30015C4E 30022C4E**
			----------COMPONENTS----------	
ABCDE	1	X2 02361B	SHELLFRONT,30",ELECTRIC LOCK	
F	1	X2 02361C	2002296D SHELLFRT=30" ILOC W/PROX	
A.C,D	2	A33 07100C	*DRASSY(INDNT)LK,LOGO N4,5,6P	
B	2	A33 07100H	95027 DOOR ASY 3015/3020M4A	
EF	2	A33 07100F	95027# DRASSY (INDNT)LK,LOGO C4A	
A,B	3	EDL00171	INTRLKHSG ASSY=N/UNLOCK 240V	
C	3	EDL00371	INTERLKHSG=N/LOCK+SWITCH240V	
D	3	EDL00271	INTRLKHSG ASSY=N/LOCK 220V	
F	3	EDL00171C	INTRLKHSG ASSY=N/O W/ PROX 240	
all	4	01 10422	NPLATE:DOOR ILOC->N4,5,6 P	
all	5	12K040	1/2"COND.EMT COND. PECO #260B	
All	6	03 01446	1/2 EMT CONDUIT 900D=DR INTR	
all	7	10Y71M4GEX	*M4G EXTERNAL CONNECTIONS	
all	8	12K040	1/2"COND.EMT COND. PECO #260B	
all	9	12P1ASSB	SNAPBUSH 7/8"MH X 11/16	
all	10	15G200C	HXCPNUT HI 3/8-16 BRASS NIK PL	
all	11	02 02819C	SPACER-SHELLFRONT/HINGE	
all	12	02 02293	DOOR HANDLE NUT GASKET	
all	13	15K084	TRUSS HXSOK 3/8-16 X 23/32SS	
ABCDE	14	02 03669	GASKET=INTRLK HOUSING	
F	14	02 03669C	GASKET=INTRLK HOUSING 8" LONG	
all	15	15N174	HXCAPSCR 1/4-20UNC2X5/8SS18-8	
all	16	15U180	LOCKWASHER MEDIUM 1/4 ZINCPL	
all	17	24G020N	ROLLED WASH.252ID NYLTITE 25W	

Parts List, cont.—Shellfront, Conduit & Interlock

Used In	Item	Part Number	Description	Comments
All	18	15G168	SQNUT 1/4-20UNC2 SS18-8	

Door Assembly

3010 / 3015 G5E,G5X,CGE

30015 V7J,T5J,C4A,C4E & 30022 V6J,T5J,C4A,C4E

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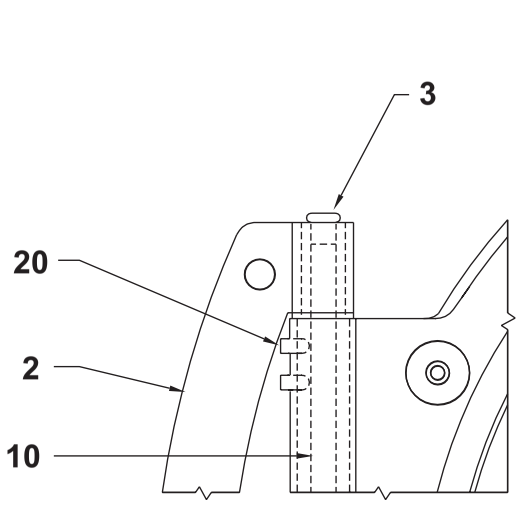
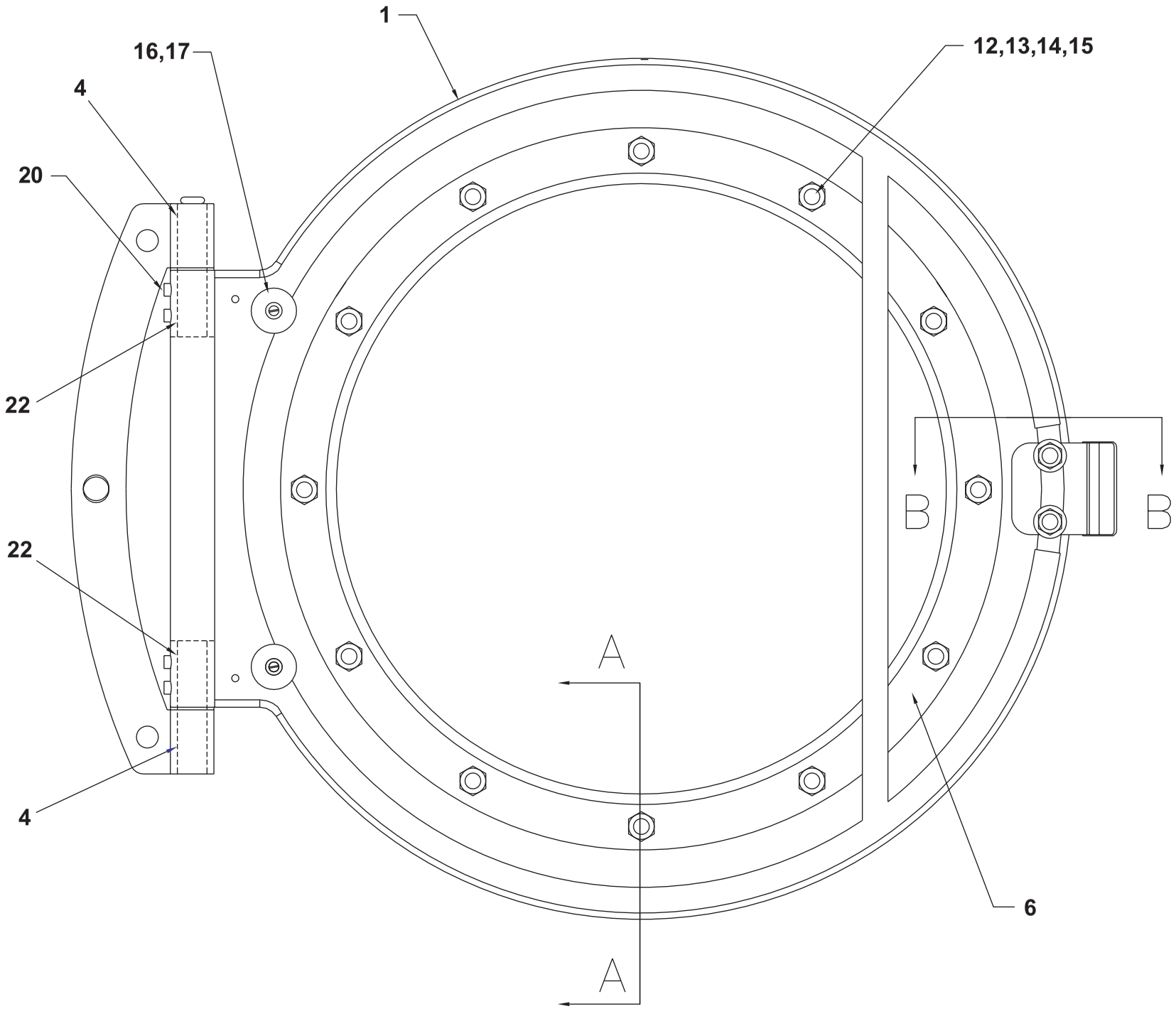
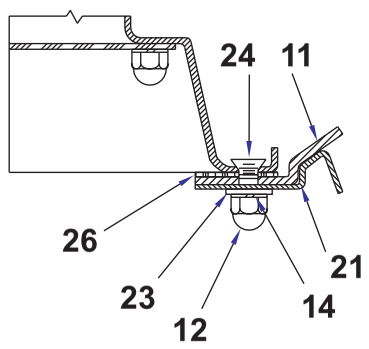
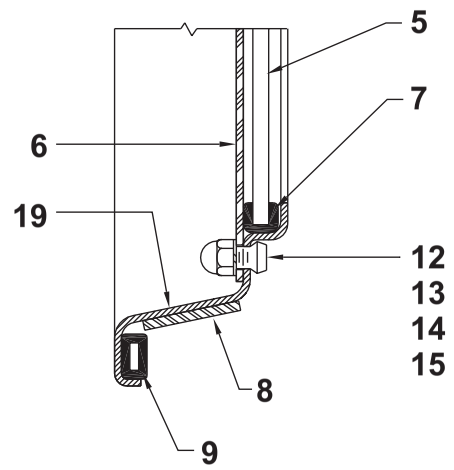


HINGE DETAIL





VIEW B–B



VIEW A–A

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Parts List—Door Assembly

Find the correct assembly first, then find the needed components. The item letters (A, B, C, etc.) assigned to assemblies are referred to in the "Used In" column to identify which components belong to an assembly. The item numbers (1, 2, 3, etc.) assigned to components relate the parts list to the illustration.

Used In	Item	Part Number	Description	Comments
			----------ASSEMBLIES----------	
	A	A33 07100C	*DRASSY(INDNT)LK,LOGO N4,5,6P	3010/3015 G5E,G5X 3015T5E,T5J,T5X,V7J 3022T5E,T5J,T5X,V6J
	B	A33 07100F	DRASSY (INDNT)LK,LOGO C4A	3010CGE,3015CGE 3015C4T,C4E 3022C4T,C4E
			----------COMPONENTS----------	
all	1	X2 02814F	MACH=SHELLDOOR DRAWN, 30XX	
all	2	02 02819	HINGE=STAMPED DOOR 25#	
all	3	12P1AGHP1	HOLEPLUG 3/8"BLACK LPE	
all	4	02 02817	FLANGE BRG=DOOR HINGE-NYLON	
A	5	02 09215	DRGLASS 12 3/8DIA SS STAMPED	
B	5	02 09215D	DR GLASS=N4,5,6P W/MIL LOGO	
all	6	02 09021	RING=DOOR GLASS PRESSURE	
all	7	02 02366	GASKET DOORGLAS GTR52-5220-3	
all	8	02 10545	EXTR BAND-STAMPED SS CYLDOOR	
all	9	02 10342G	GASKET 15" DOOR-BLACK	
all	10	02 02764	HINGEPIN=SHELLDOOR L=10+5/8"	
all	11	03 01420	PLATE=DOOR STRIKER=ILOC	
all	12	15G140	HXCAPNT 1/4-20 #C250=20 NKLPLT	
all	13	15K031	BUTSOKCAPSCR 1/4-20X1/2 SS18-8	
all	14	15U181	LOCKWASHER MEDIUM 1/4 SS18-8	
all	15	24G020N	ROLLED WASH.252ID NYLTITE 25W	
all	16	60C080	RECESS BUMPER RUBBERLAVELLE #7	
all	17	15P103	TRDCUT-F RDHDSLOT 8-32UNCX1/2	
all	18	15N173A	FLTMACSCR 1/4-20 UNCX5/8 UCUTS	
all	19	20C018	ADHESIVE-3M #1357-QT CN	
all	20	15Q077	SOKSETSCR 1/4-20X1/4 ZINC ALLE	
all	21	03 01423J	LATCH GUARD ILOC	
all	22	02 02815	PLAIN BRG=DOOR HINGE-NYLON	
all	23	15U188	FLTWASH 1/4 STD COMM SS18-8	
all	24	15N163A	FLTMACSCR 1/4-20UNCX 1/2 UCUTS	
all	26	02 11904K	SHIM=DOOR HANDLE=4226RWP	

Interlock Assembly

30015, 30022, 3621 C4E

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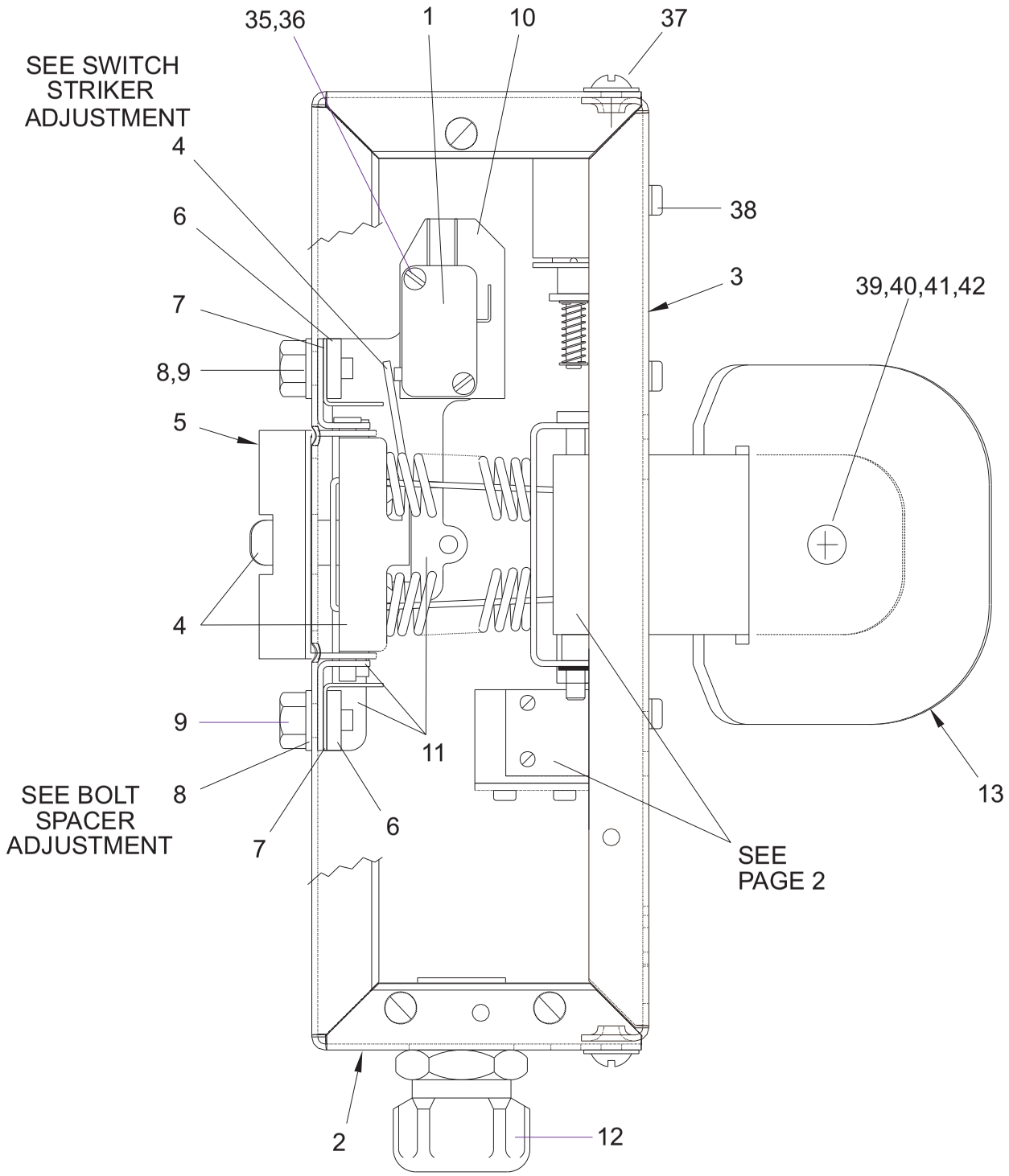

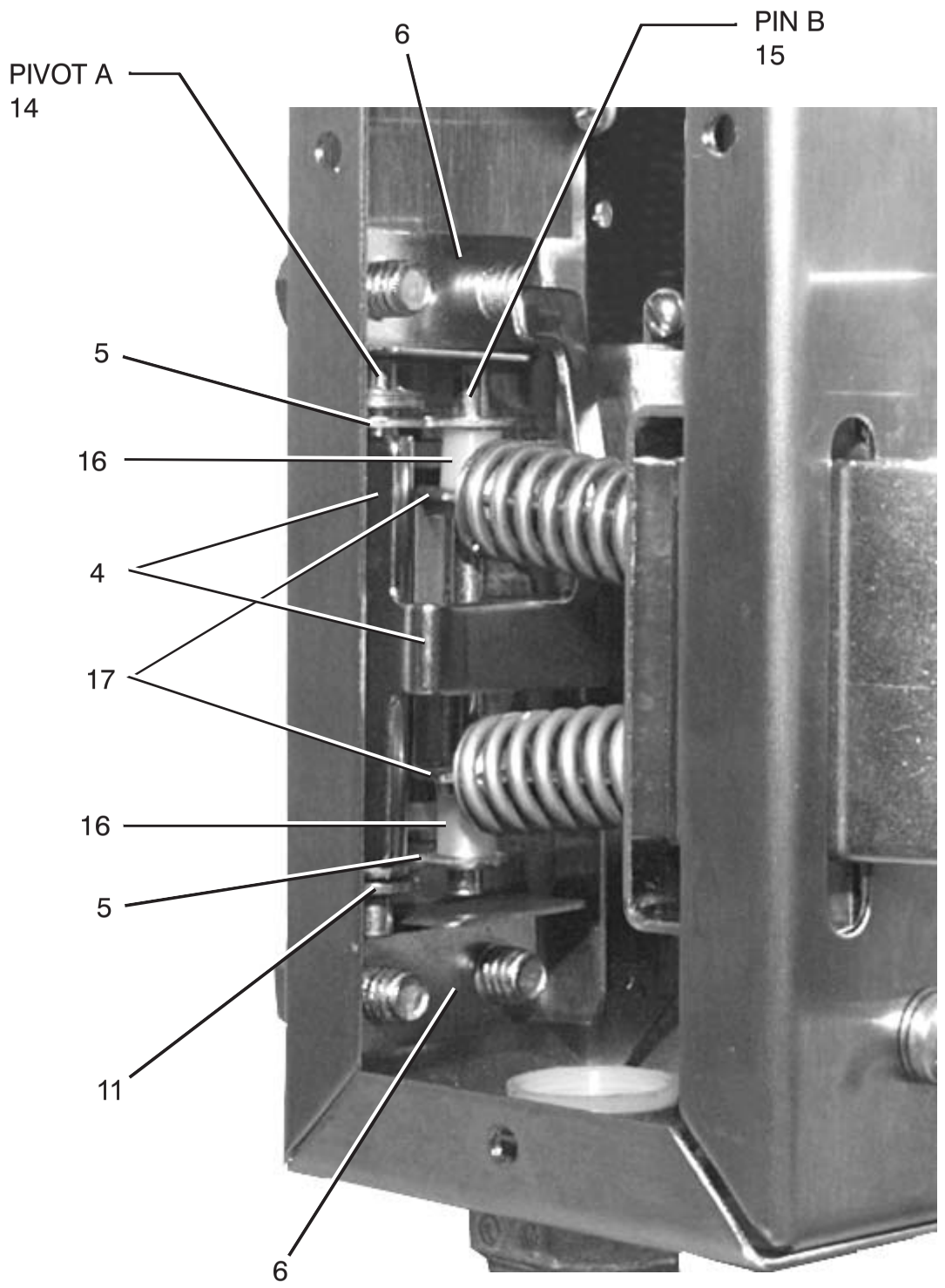

Interlock Assembly
30015, 30022, 3621 C4E

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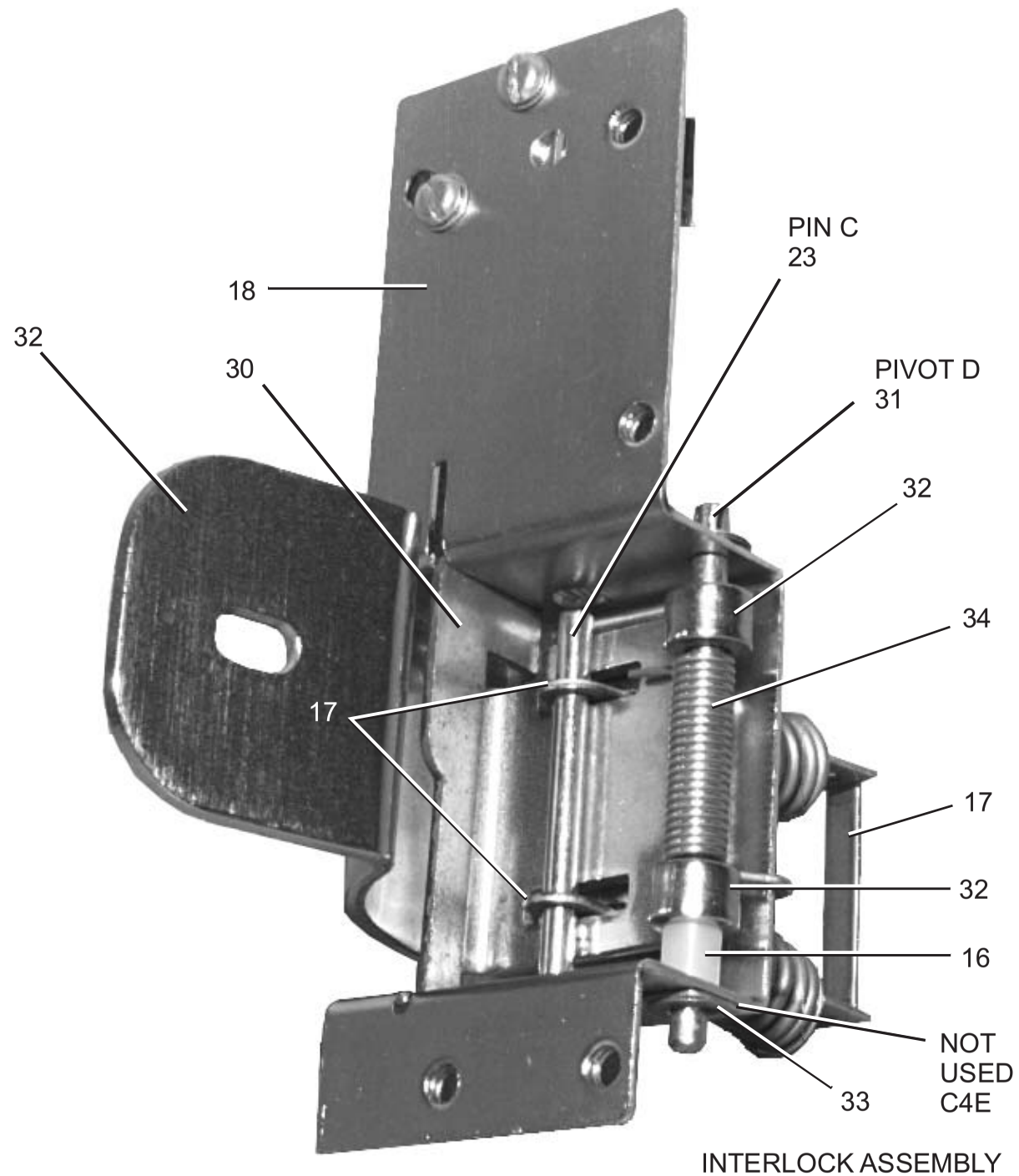
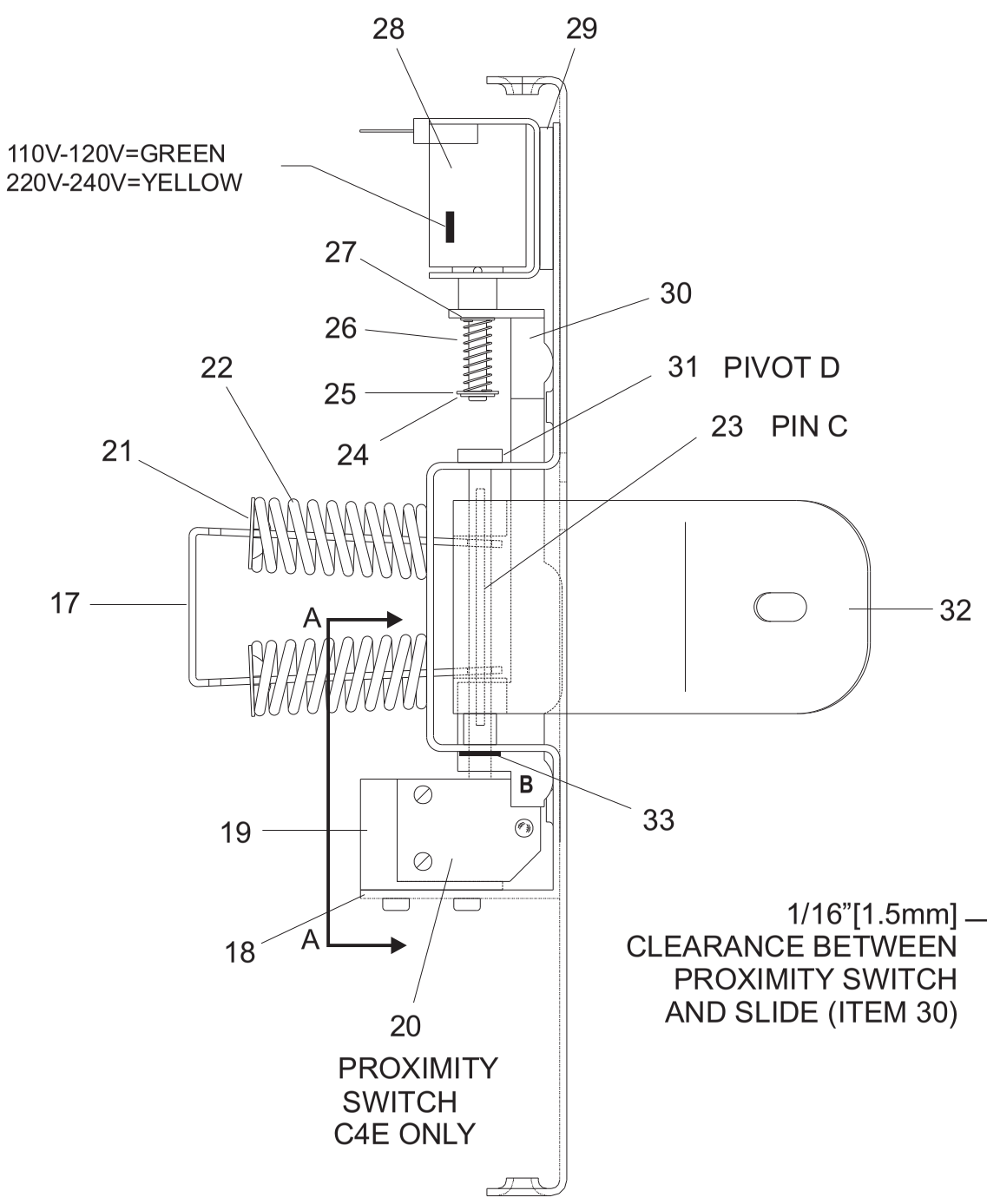


INTERLOCK ASSEMBLY
WITHOUT PROXIMITY
SWITCH SHOWN

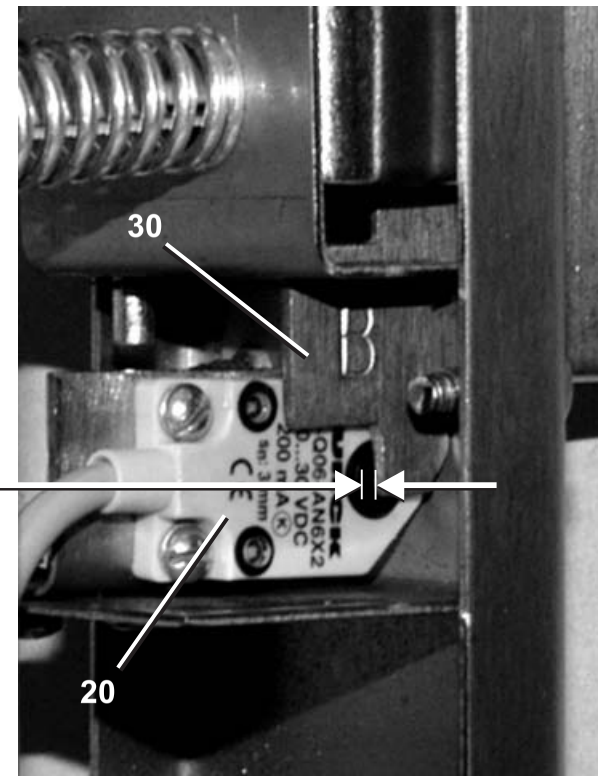


PROXIMITY
SWITCH
C4E ONLY

FRONT VIEW

PROXIMITY SWITCH
HAS TWO LED LAMPS:

GREEN = ON / ENERGIZED
ORANGE= CLOSED CIRCUIT



VIEW A-A

Interlock Assembly
30015, 30022, 3621 C4E

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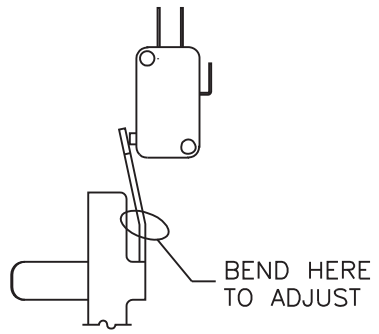
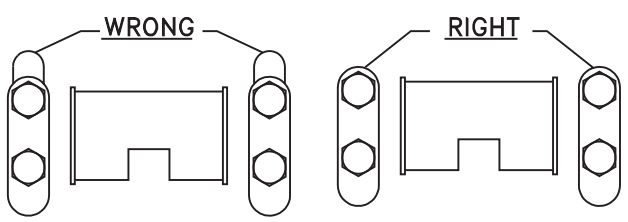
SWITCH STRIKER ADJUSTMENT



Adjust the switch striker arm by bending as shown so that :
1) The switch is activated when the door is closed
2) The switch does not actuate when the unlatching lever is fully depressed with the door open
3) The arm does not over travel and hit the switch housing when the door is closed and the switch is actuated.

BOLT SPACER ADJUSTMENT



Bolt Spacer Adjustment
1) On a new machine the slots on the front housing should not show a gap past the bolt spacers.
2) The spacers should be installed with the long side toward the shellfront

Parts List—Interlock Assembly

Find the correct assembly first, then find the needed components. The item letters (A, B, C, etc.) assigned to assemblies are referred to in the "Used In" column to identify which components belong to an assembly. The item numbers (1, 2, 3, etc.) assigned to components relate the parts list to the illustration.

Used In	Item	Part Number	Description	Comments
			ASSEMBLIES	
	A	EDL00171C	INTRLKHSG ASSY=N/O W/ PROX 240	3015,3022C4E
	B	EDL00171B	ILOC PIVOT ASSY W/PROX 240V	PART OF A
	C	EDL00137C	INTRLKHSG ASSY=N/O W/PROX 120V	3621C4E
	D	EDL00137B	I-LOC PIVOT ASSY=W/PROX 120V	PART OF C
			COMPONENTS	
AC	1	09R014A	MINI-SW SPDT STAKON #V15G1C26K	
AC	2	03 01426B	HOUSE=REAR ILOC W/PROX	
AC	3	03 01427C	HOUSING=REAR ILOC W/PROX	
AC	4	03 01424A	STRIKER=SWITCH=LONG TAB	
AC	5	03 01423	LATCH = INTERLOCK	
AC	6	03 01418B	KEEPER=LATCH PIN/NOTCH	
AC	7	03 01418	TAP STRIP = ELEC INTER LOCK	
AC	8	03 01417	PLATE=SPACER=ILOC	
AC	9	15N158	HEXCAPSCR 1/4-20NCX1/2SS18-8	
AC	10	03 01335	INSULATOR=AIROP AUTOSPOT+$8S	
AC	11	03 01429	PLATE=FNT PIVOT = ILOC	
AC	12	12K040	1/2"COND.EMT COND. PECO #260B	
AC	13	03 01425A	DOOR HANDLE EXTENSION	
AC	14	03 01443	FLATHDRIVET 5/32X2+5/16 ZINC	
AC	15	15H091	STRGHTPIN 5/32"X2.25 LG ZINC	
BD	16	27B205080Z	SPCRROLL.177ID.218L.027T STLZC	
BD	17	03 01422	KEEPER=SPRING=ILOC	
BD	18	03 01428C	PLT=RR PIVOT ILOC+PROX 220V	
BD	19	03 01428B	XROX BKT=REAR PIVOT ILOC N/O	
BD	20	09RPS03RDS	3MM SENSING RECTANGULAR SHLD	
BD	21	03 01444A	SPRING CUP = ILOC	
BD	22	03 01444	SPRING .51/1.69/46+CADPL	
BD	23	15H090I	STPIN 5/32 X DIA 1.75"LG ZN.	
BD	24	17B171	EXTRETRING IND#6100-9-ST-ZD ZI	
BD	25	15U063	FLATWASH STD #6 EXCEPT.010THK	
BD	26	03 01445	SPRING .2/.625/.319+CADPL	

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Parts List, cont.—Interlock Assembly

Used In	Item	Part Number	Description	Comments
BD	27	15U060	FLAT WASHER#6 ANSI TYPEB BRASS	
B	28	09K062B71	SOLENOID 240/60--220/50 = ILOC	
D	28	09K062B37	SOLENOID(C-7)120/60--110/50	
BD	29	03 S1X1	SHIM:DOOR INTLK SOLENOID N4P	
BD	30	03 01421B	SLIDE=NORMALLY OPEN(C7 SOL)	
BD	31	03 01443	FLATHDRIVET 5/32X2+5/16 ZINC	
BD	32	03 01425	HANDLE=ILOC	
BD	33	17B170	EXTRETRING IND#6100-15-ST-ZD Z	
BD	34	03 01445B	TORQUE SPRING (.53 IN-#)	
BD	35	15N019	RDMACSCR 4-40UNC2AX5/8 ZINC GR	
BD	36	15U040	LOCKWASHER MEDIUM #4 ZINCPL	
BD	37	15N080S	PANHDPHILMACSCRSEMS8-32X1/4SS	
BD	38	15P010S	TRDCUTPNHD SEMS 10-24X1/2 SS41	
BD	39	15G130	HEXMACHSCRNUT 10-24UNC2 SS18-8	
BD	40	15N123C	FLATMACHSCR 10-24X7/16 U-CUT S	
BD	41	15U160	LOCKWASHER MEDIUM #10 SS18-8	
BD	42	15U135	FLATWASH#10 .4370DX.203IDX.04T	
BD	43	03 01442	SOLENOID INSULATION=DR INTRK	

Section 5

Control and Sensing

Coin Acceptor and Vault

3010 & 3015CGE

BMP040024/2004114V
(Sheet 1 of 2)

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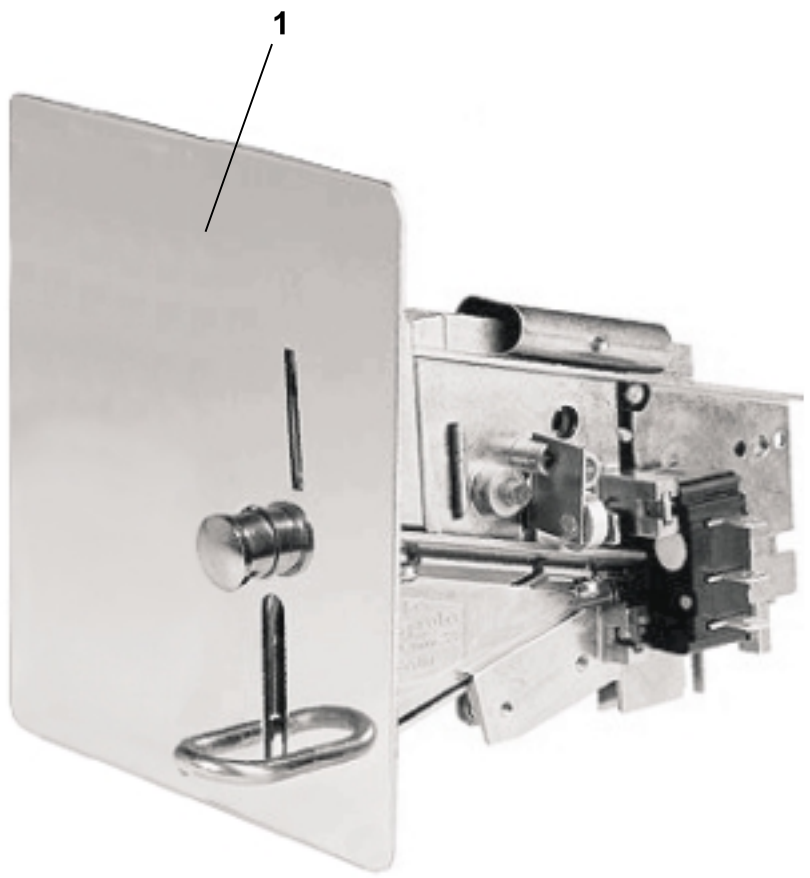

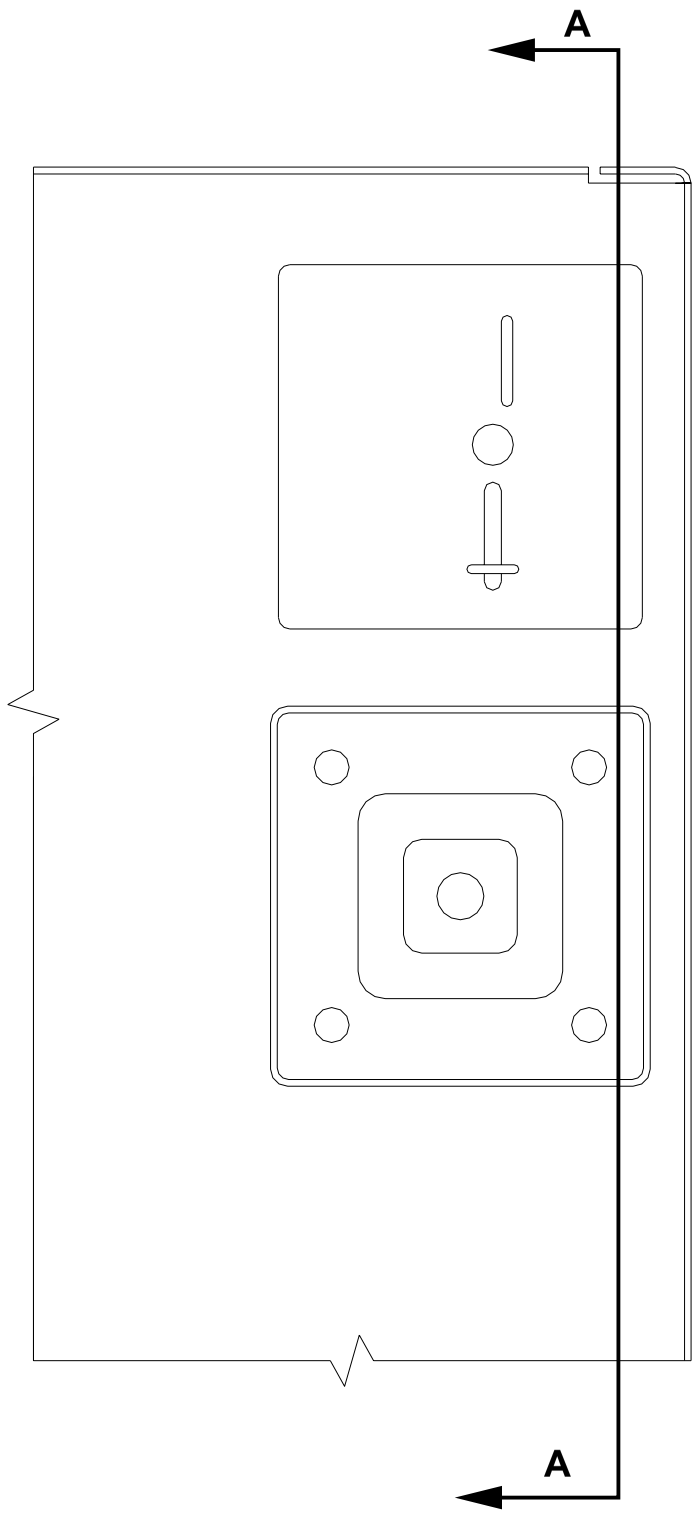

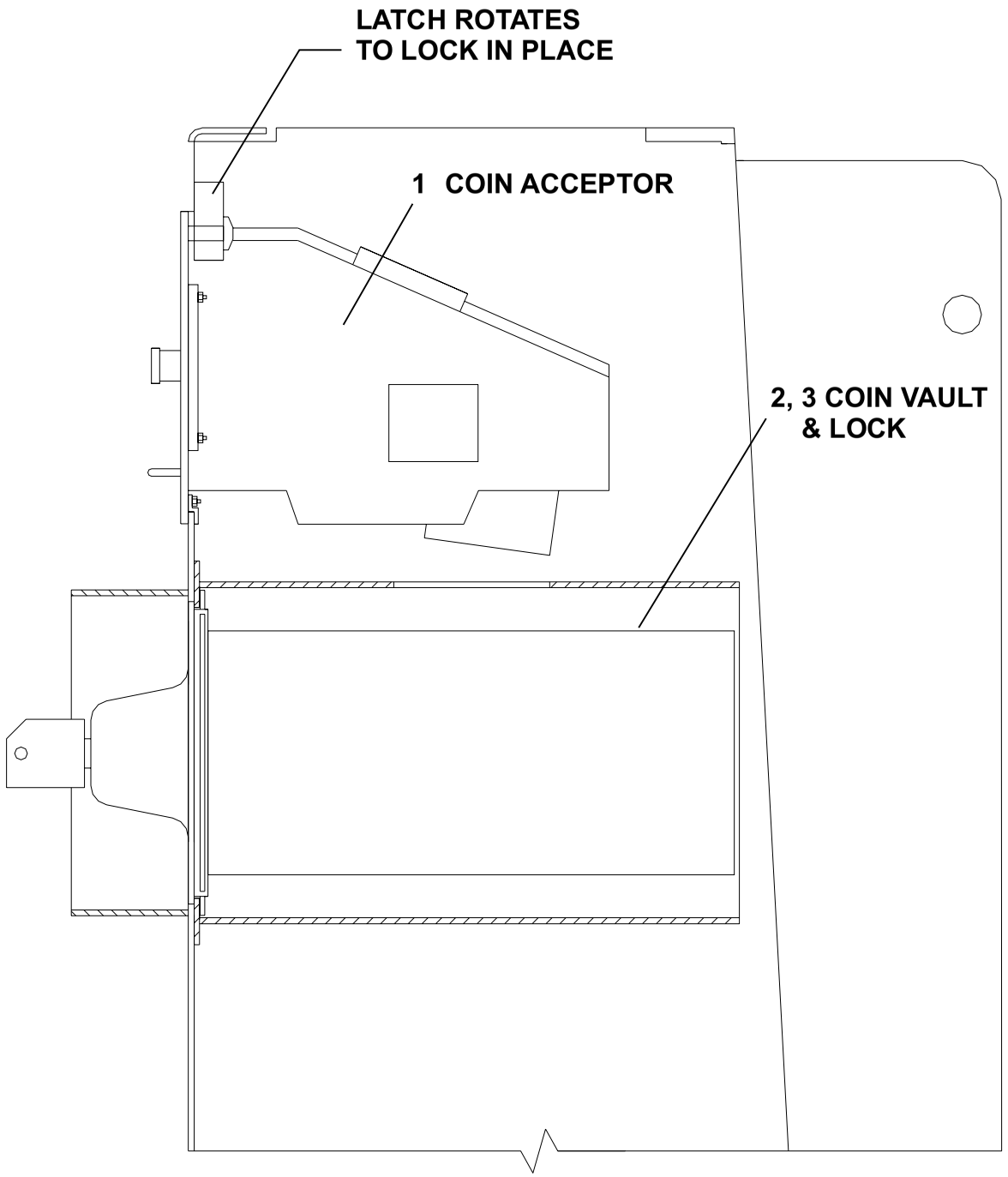

VIEW A-A

Coin Acceptor and Vault

3010 & 3015CGE

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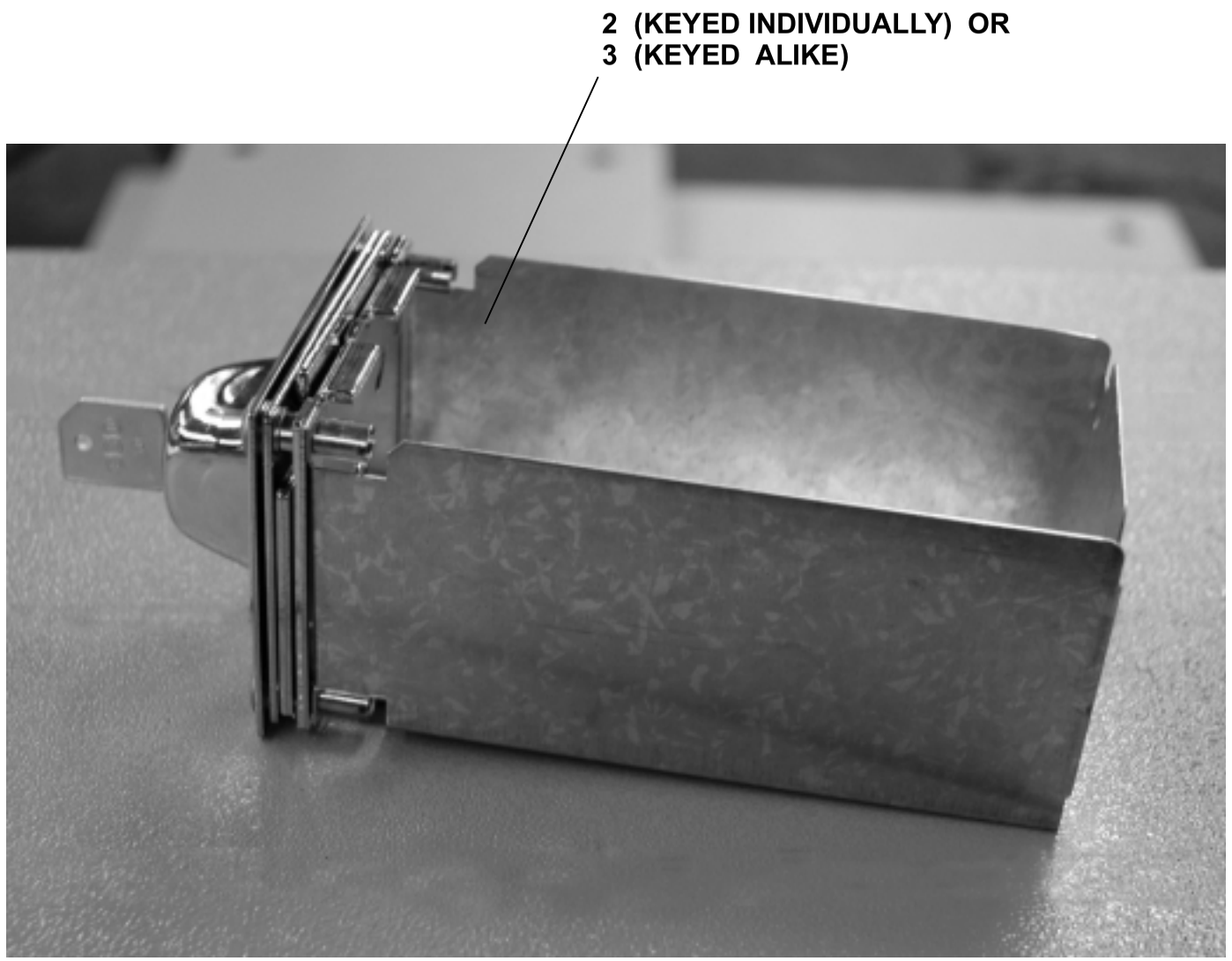

Parts List—Coin Acceptor and Vault

Find the correct assembly first, then find the needed components. The item letters (A, B, C, etc.) assigned to assemblies are referred to in the "Used In" column to identify which components belong to an assembly. The item numbers (1, 2, 3, etc.) assigned to components relate the parts list to the illustration.

Used In	Item	Part Number	Description	Comments
			----------ASSEMBLIES----------	
	A	GCM33001D	COIN ASSY INSTALL 12VDC 3010	
			----------COMPONENTS----------	
all	1	38C080	REJECTOR F77.1-W2004-I4	
all	2	38C152KI	COIN LOC BX KEY-INDV.#71942-XD	KEYED INDIVIDUALLY
all	3	38C152KA	COIN LOC BX#71942-XD KEY-ALIKE	KEYED ALIKE

Switch Panel Assembly

3010 & 3015GCE; 30015, 30022 & 3621C4E

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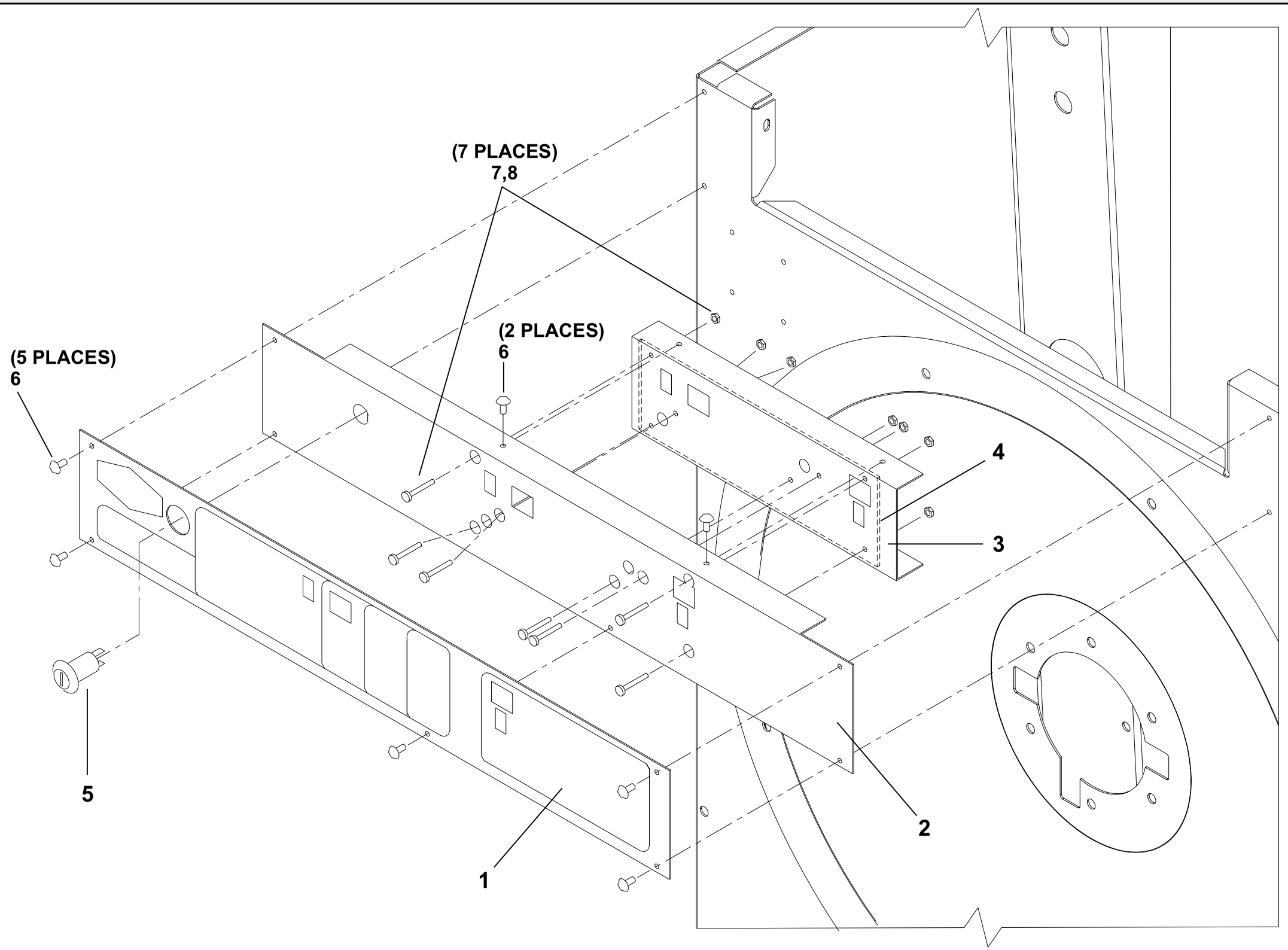

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Parts List—Switch Panel Assembly

Find the correct assembly first, then find the needed components. The item letters (A, B, C, etc.) assigned to assemblies are referred to in the "Used In" column to identify which components belong to an assembly. The item numbers (1, 2, 3, etc.) assigned to components relate the parts list to the illustration.

Used In	Item	Part Number	Description	Comments
			----------ASSEMBLIES----------	
	A	ESP71CEA	SWPNL 3022C4E	
			----------COMPONENTS----------	
all	1	01 10705	GRAPHIC PANEL=C4E SW PNL	
all	2	03 CF529V	PANEL:SWPNL 3022C4E CONTROLS	
all	3	03 CF513V	BRKT:C4E BOARD MOUNTING	
all	4	08BTCSTAT	BD:C4E COIN STATUS->TEST	
all	5	09N127C	KEYSW SPST 7A120VAC SCREW TERM	
all	6	15P101B	TRDCUT-FPANHD8-32 X3/8	
all	7	15N069A	PANMACHSCR 6-32UNC X 1.500"LG	
all	8	15G073	HEXMACHSCRNUT 6-32UNC.NYLON	

Level Switches

3010 & 3015 G5E,G5X,CGE

BMP040013/2004055V
(Sheet 1 of 1)

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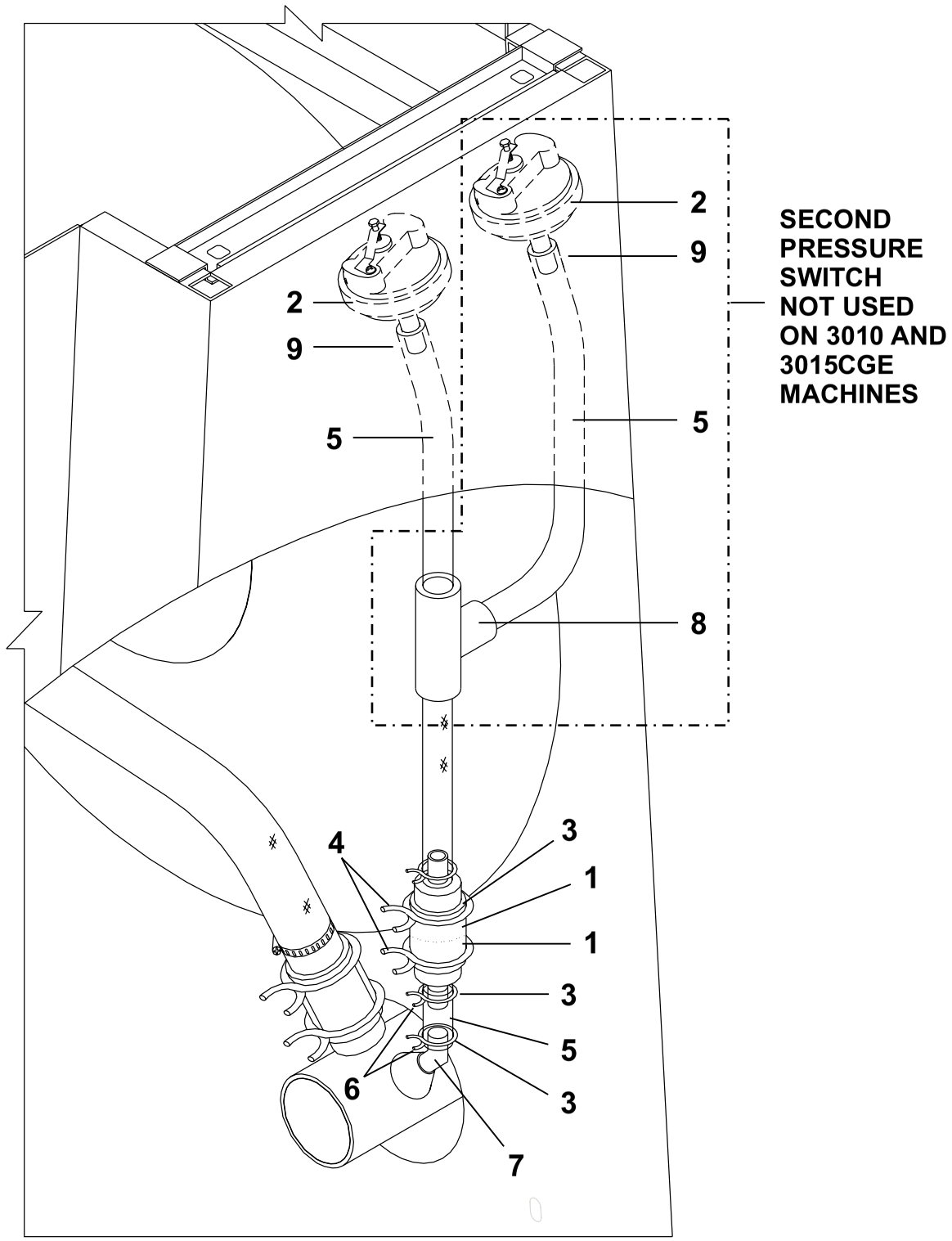

Parts List—Level Switches

Find the correct assembly first, then find the needed components. The item letters (A, B, C, etc.) assigned to assemblies are referred to in the "Used In" column to identify which components belong to an assembly. The item numbers (1, 2, 3, etc.) assigned to components relate the parts list to the illustration.

Used In	Item	Part Number	Description	Comments
			----------ASSEMBLIES----------	
	A	GPS30001	PRESS SWITCH/CHAMBER INSTALL	G5X
	B	GPS30002	C4 PRESSURE SWITCH/CHMBER INST	CGE
	C	GPS30003	3010/15 PRESSURE CHAMBER INST	G5E
			----------COMPONENTS----------	
all	1	02 03332C	AIRCHAMBER=PRESSWITH-CWU	
all	2	09N086A	PRESS SW INVENSYS #738-761	
all	3	60E014A02A	HOSE 1.25IDX2"LG PVC	
all	4	27A052	HOSECLMP 1.5"DIA.SPRG#HC24STZD	
all	5	60E005P	PVC TUBING 1/2"ID X 5/8"OD	
all	5	60E006C	PVC TUBING NYL.REINF.5IDX.75OD	
all	6	27A043A	HOSECLAMP.562"DIA.SPRG#HC9STZD	
all	7	51E509P	1/2HX1/4NPT HOSE ADAPT 90ELB	
all	7	5SL0EP8K	NPT ELB 45DEGFXF 1/4" PVC S80	
all	8	5S0KQ8A	TEE 1/2"SOC CTS CPVC BEIGE	
all	8	51E509Y	Y-CONN1/2"HBARB PLAS.IND#64017	
all	9	27A044B	HOSECLMP.625"ID SPRNG#HC10ST-G	
all	9	27A045	HOSECLAMP .750"DIA SPRINGTYPE	

VIBRATION SAFETY SWITCH ADJUSTMENTS

What the Vibration Safety Switch Does

The *vibration safety switch* pictured below is an important safety feature. If properly adjusted, the switch will momentarily actuate as a result of repeated machine movement caused by an out-of-balance condition. Table A below illustrates the effect of the *vibration safety switch* actuation.

Table A—Effect of Tripping Vibration Safety Switch

Machine Model	Function of Vibration Safety Switch
30015, 30020, and 30022	Disables high speed extract
All microprocessor-controlled washer-extractors not listed above, and all dye machines	De-energizes three-wire relay, effectively terminating machine operation

Adjustments

When the machine leaves Milnor®, the actuator arm is tie-wrapped to prevent damage (except on 30015, 30020, and 30022 models). **This tie wrap must be removed after the machine is set into position but before the machine is operated.**

Adjustment of this switch from the factory setting is not recommended; however, it should be checked for proper functioning and adjusted if its proper setting is lost.

As shown at right in FIGURE 1, the unit consists of a *sensitive micro-switch* with an extended actuating arm supporting an eccentric weight. The weight may be adjusted by moving it up and down on the arm and by rotating it on the arm. In addition, the *micro-switch* itself may be tilted from side to side.

The sensitivity of the switch increases as the eccentricweight is raised on the actuating arm and decreases as the weight is lowered.

The unit should be adjusted so that the actuating arm will always reset by itself, this being accomplished by rotating either the switch or the weight to give just enough bias to cause the switch to reset. Check the adjustment by moving the arm to the left then slowly releasing it. Make sure the microswitch clicks when the arm is **slowly** released, thus indicating

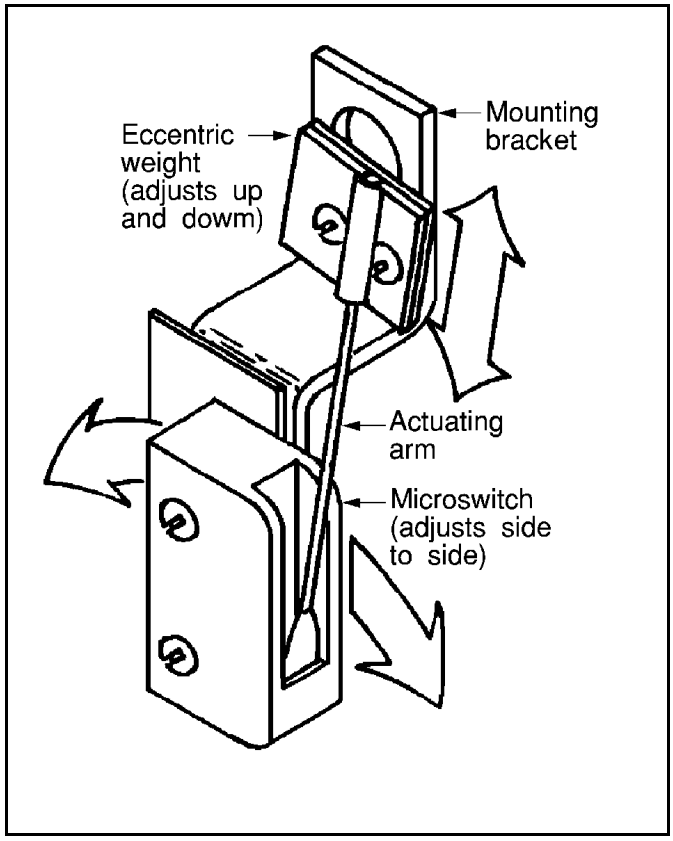

FIGURE 1 (MSSMA408BE)
Vibration Switch

that it has reset. In the released position the arm should rest **lightly** but definitely against the stop on the *micro-switch* case that prevents any further arm movement to the left.

For machines with rigid mounted shells, where the machine is bolted to a very substantial foundation, very little machine movement will occur for a given degree of out-of-balance. Under such conditions it may be better to adjust the switch to be very sensitive. With less substantial foundations (e.g., ones where the sub-soil is mushy or springy or otherwise not as desirable), considerably greater machine movement will occur for a given degree of out-of-balance, in which case a less sensitive *vibration switch* setting may be indicated.

Vibration Safety Switch

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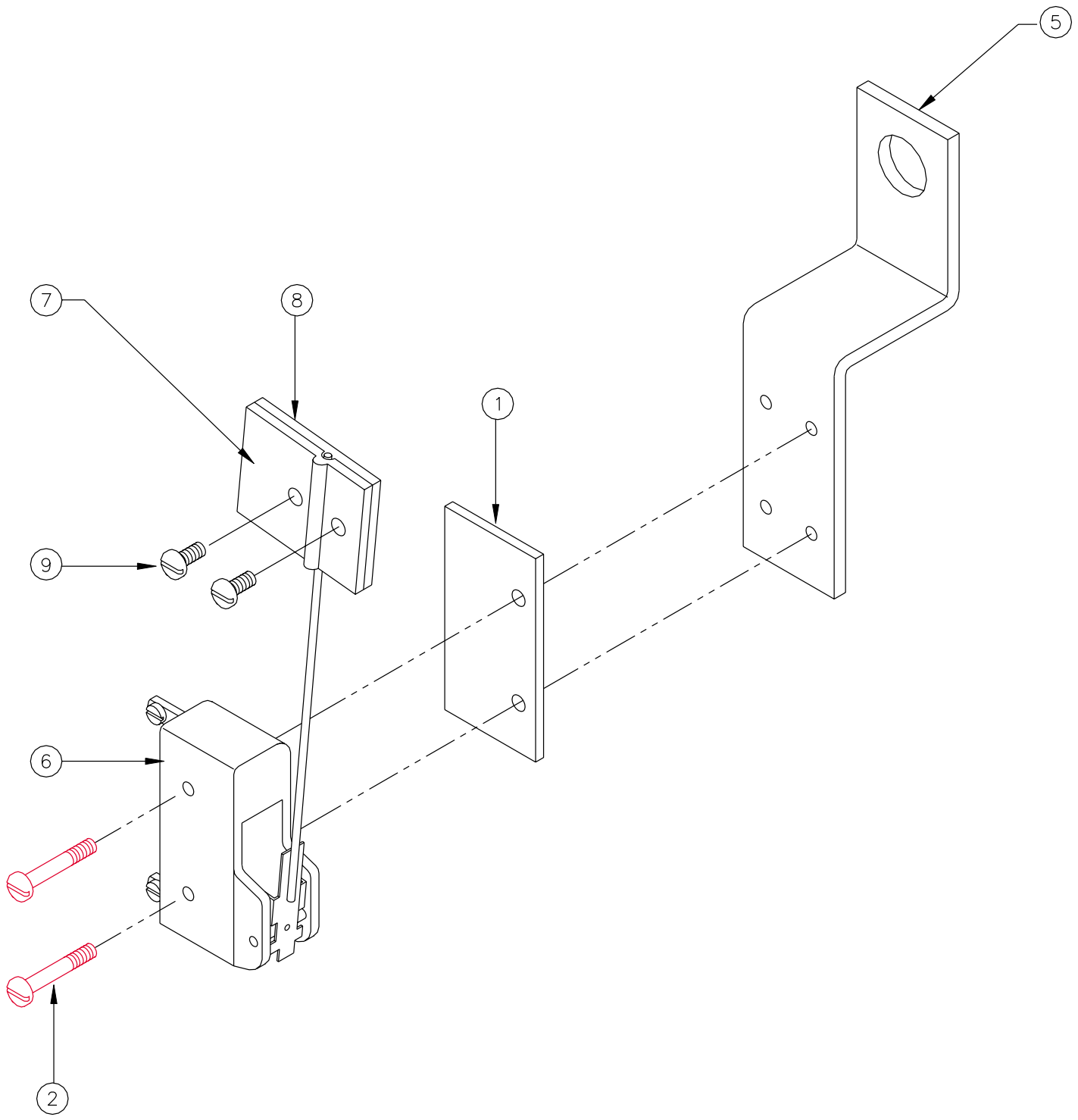

Parts List—Vibration Safety Switch

Find the correct assembly first, then find the needed components. The item letters (A, B, C, etc.) assigned to assemblies are referred to in the "Used In" column to identify which components belong to an assembly. The item numbers (1, 2, 3, etc.) assigned to components relate the parts list to the illustration.

Used In	Item	Part Number	Description	Comments
			----------ASSEMBLIES----------	
	A	SAE03 151C	* ASY-VIBRAT SWT=LG CNTR NC/NO	3010 & 3015G5E,G5X,CGE 3015 & 3022 C4E 3015 & 3022 T5E
			----------COMPONENTS----------	
all	1	02 02038	PLATE INSULATING SMALL9NOV51	
all	2	15P008	TRDCUT PANHD 6-32X1 NIKSTL +WA	
all	5	02 15119	BRACKET=VIBSW CAD	
all	6	09R020A	SW NO/NC VIBRA#BZ-2RW84429-P52	
all	7	03 01059	VIBSWITCH CLAMP CADSTL	
all	8	03 01058	VIBSWITCH WEIGHT-CADSTL	
all	9	15P100	#8 X 3/8 PHILPANHD TYPE B SMS	

Section 6

Chemical Supply

Soap Chute Installation

3010 & 3015G5E,G5X 3010 & 3015CGE

30015V7J,T5J,T5E,C4A,C4T,C4E 30022V6J,V8Z,VRJ,T5J,T5E,C4A,C4T,C4E

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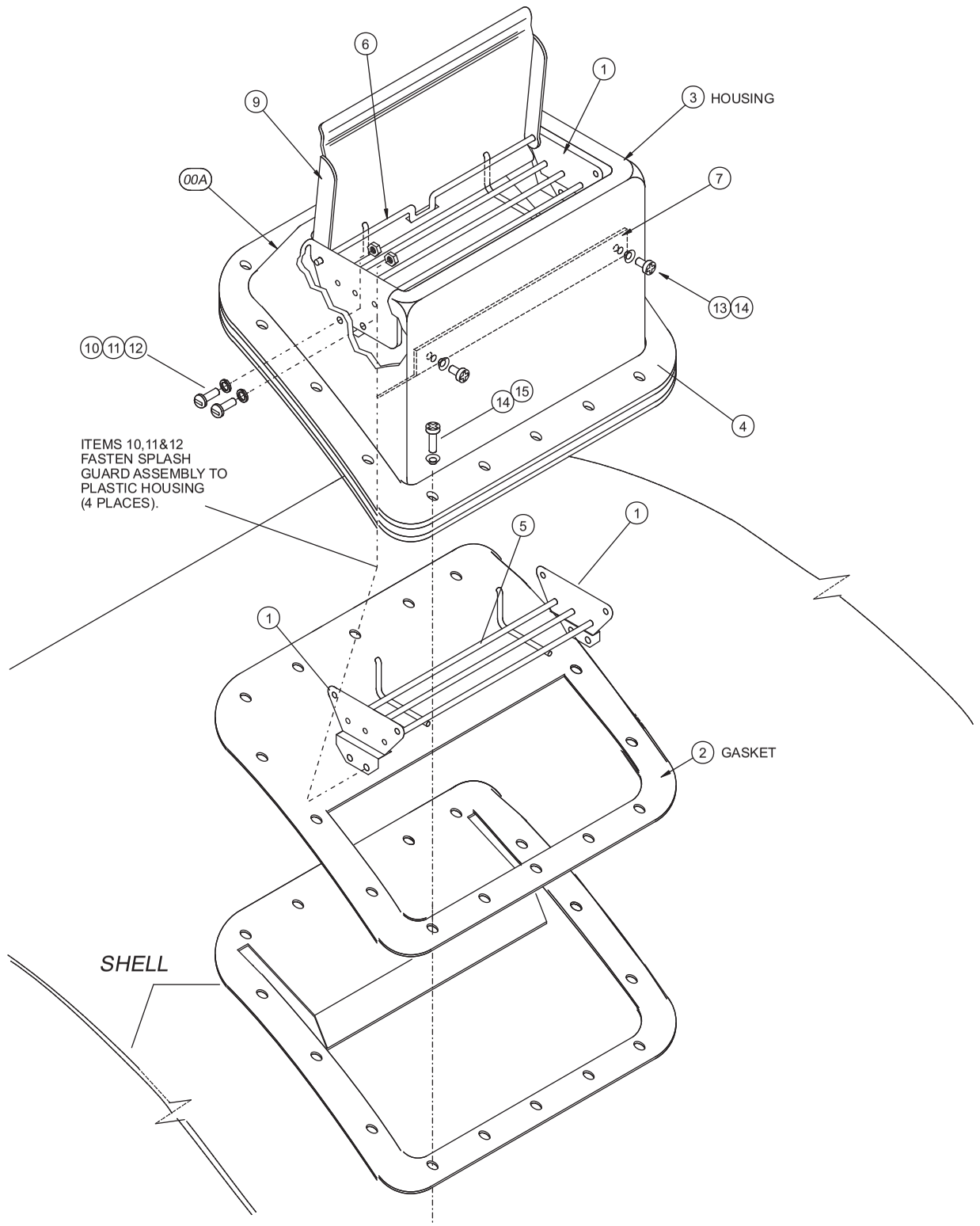

Parts List—Soap Chute Installation

Find the correct assembly first, then find the needed components. The item letters (A, B, C, etc.) assigned to assemblies are referred to in the "Used In" column to identify which components belong to an assembly. The item numbers (1, 2, 3, etc.) assigned to components relate the parts list to the illustration.

Used In	Item	Part Number	Description	Comments
			----------ASSEMBLIES----------	
	A	SA 33 058M	94000Z ASSY=PLSTC SOAP INLET	
			----------COMPONENTS----------	
all	1	02 03130	BRACKET=PLASTIC SOAP INLET	
all	2	02 03304D	GASKET=SOAPCHUTE 1/8"EPDM BL	
all	3	02 03589I	PLASTIC SHELLSIDE SOAP INLET	
all	4	02 03589T	BACKING RING=PLSTC CHEM INLT	
all	5	02 03594	GUARD SOAP CHUTE=CWU	
all	6	02 03595	PIN SOAP CHUTE HINGE=CWU	
all	7	02 03630A	SPLASH GUARD= SOAP CHUTE	
All	9	02 03593	89432B LID-SOAPCHUTE CWE TY304 SS	
all	10	15N133	RDMACSCR 10-24UNCZA X5/8" SS18	
all	11	15U160	LOCKWASHER MEDIUM #10 SS18-8	
all	12	15G130	HEXMACHSCRNUT 10-24UNC2 SS18-8	
all	13	15P050	PHDCUT-F PANHD 10-32X3/4 SS410	
all	14	24G018N	ROLLED WASH.194ID NYLTITE 10W	
all	15	15P051	TRDFRM AB HOLTHD 10-16X3/4SS41	

Section 7

Water and Drain

Schematic Symbols Key

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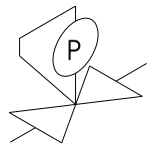
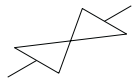
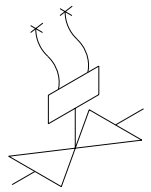
ISOMETRIC SYMBOLS



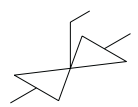
REGULATOR



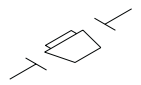
2-WAY VALVE



ON/OFF MODULATING VALVE



GAS STOP VALVE



GAS COCK

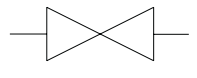
PRESSURE SWITCH

PIPE PLUG

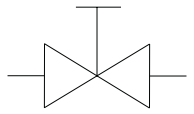
REDUCER

MALE CONNECTOR

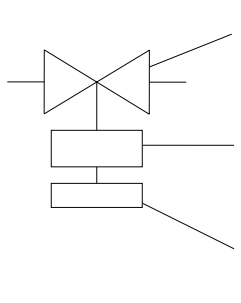
STANDARD SYMBOLS



INLINE VALVE NON-SPECIFIC



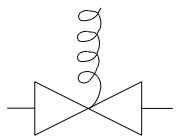
MANUAL BALLVALVE



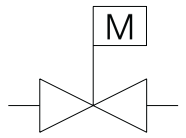
BALLVALVE (THERMAL)

PNEUMATIC ACTUATOR

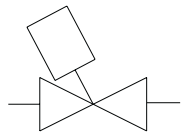
ELECTRIC VALVE POSITIONER



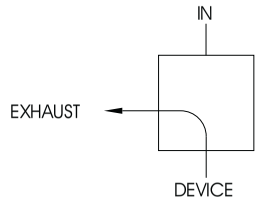
ELECTRICALLY OPERATED 2-WAY VALVE



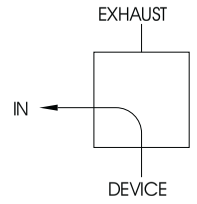
MOTOR OPERATED VALVE



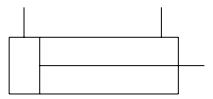
STEAM VALVE



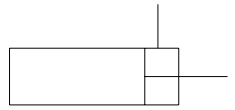
3-WAY N/C AIR PILOT VALVE



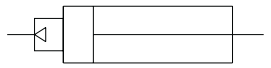
3-WAY N/O AIR PILOT VALVE



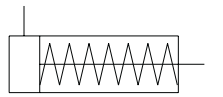
CYLINDER (DOUBLE ACTING)



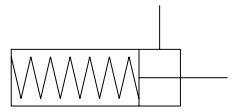
CYLINDER (SINGLE ACTING)



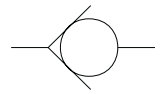
CYLINDER W/QUICK EXHAUST VALVE



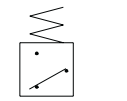
CYLINDER AIR EXTEND SPRING RETRACT



CYLINDER AIR RETRACT SPRING EXTEND



CHECK VALVE



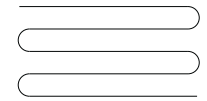
PRESSURE SWITCH

PRESSURE REGULATOR

RELIEF VALVE

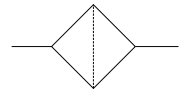
GAUGE

FLOW SENSOR

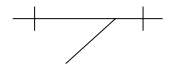


COIL

AIR LINE FILTER-AUTO

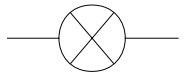


SPECIAL PURPOSE FILTER/STRAINER



Y-STRAINER

VACUUM BREAKER



STEAMTRAP

Water Schematics

3010 & 3015G5E,G5X,CGE

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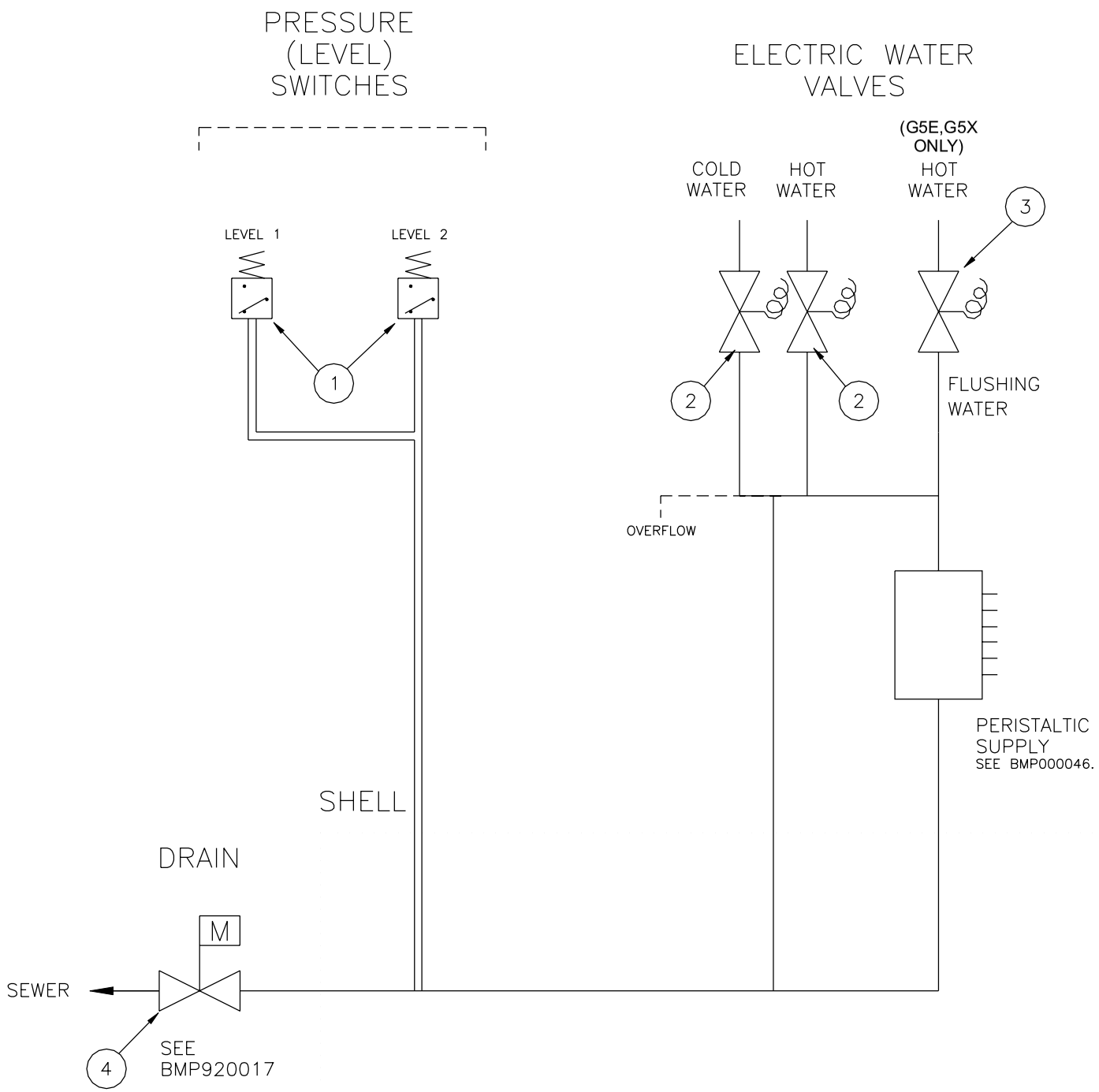
Litho in U.S.A.



Parts List—Water Schematics

Find the correct assembly first, then find the needed components. The item letters (A, B, C, etc.) assigned to assemblies are referred to in the "Used In" column to identify which components belong to an assembly. The item numbers (1, 2, 3, etc.) assigned to components relate the parts list to the illustration.

Used In	Item	Part Number	Description	Comments
			----------ASSEMBLIES----------	
			none	
			----------COMPONENTS----------	
all	1	09N086A	PRESS SW INVENSYS #738-761	
all	2	96P057A71	1/2"NPT X 1/2"ORIFICE 240V 5/6	
all	3	96P058A71	1/4"NPT X 1/8"ORIFICE 240V 5/6	
all	4	96D350A71	DRINVAL 3"N/O MTRDR240V 50/60C	

Water Inlets
3010 & 3015 CGE

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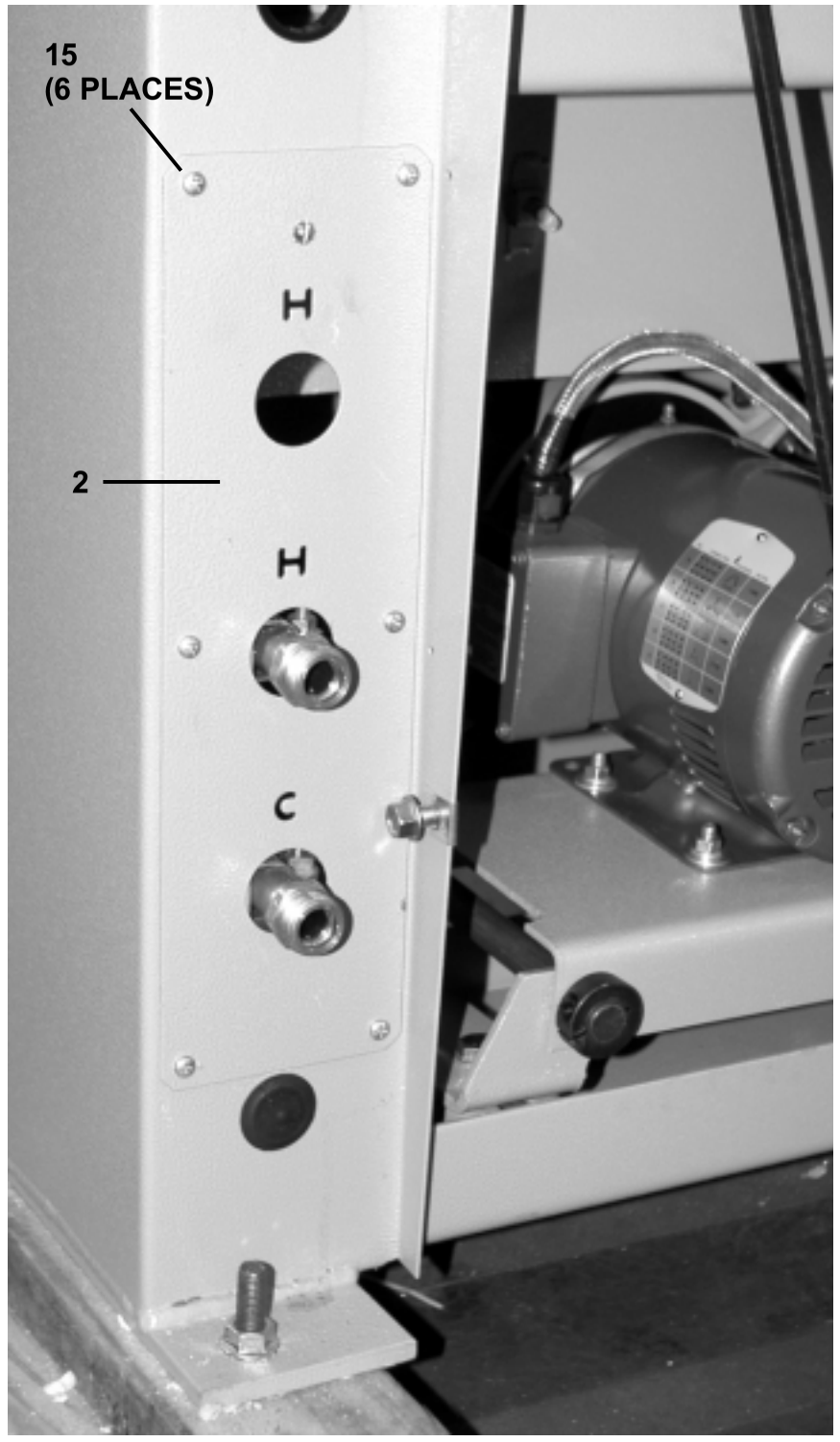

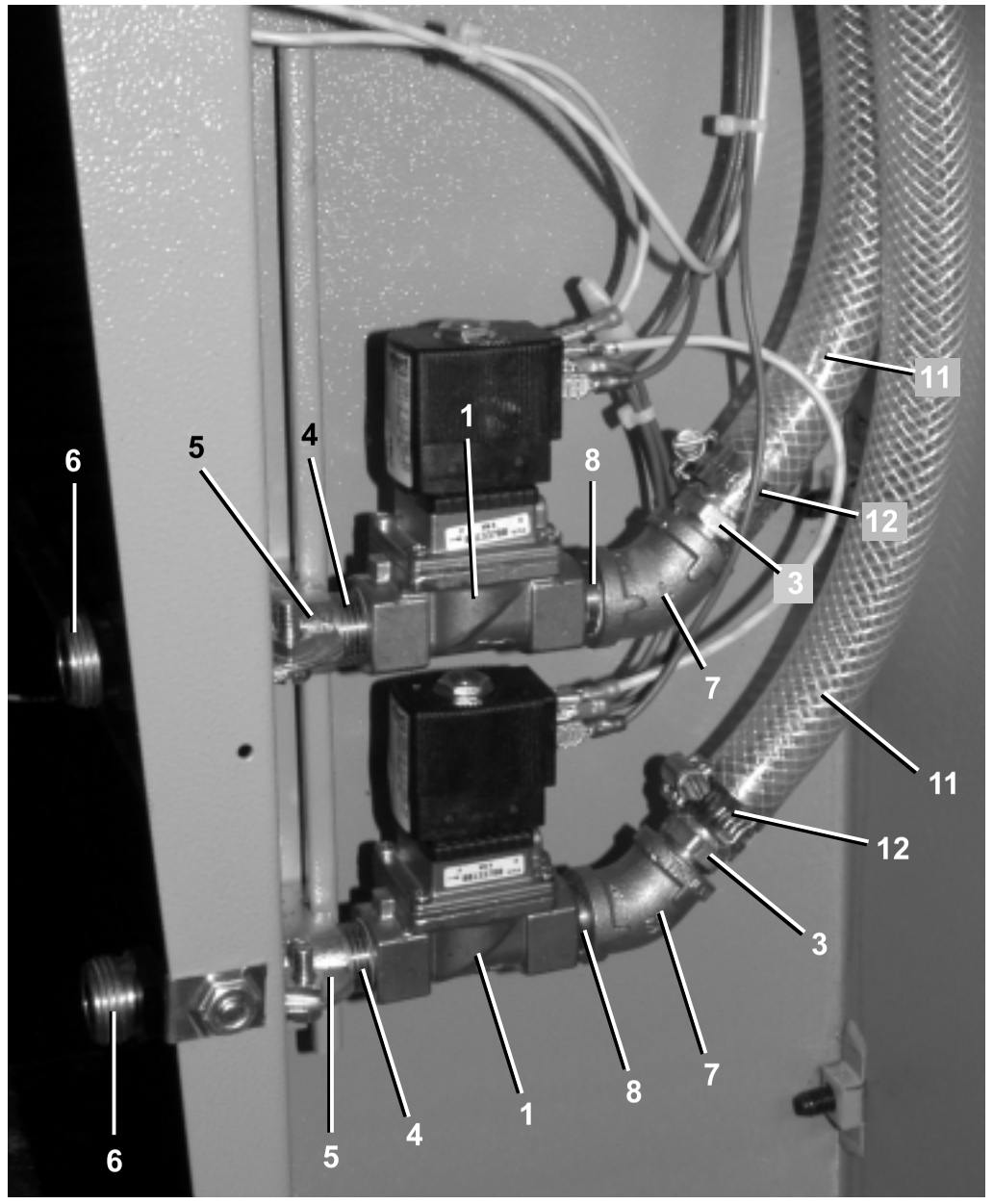

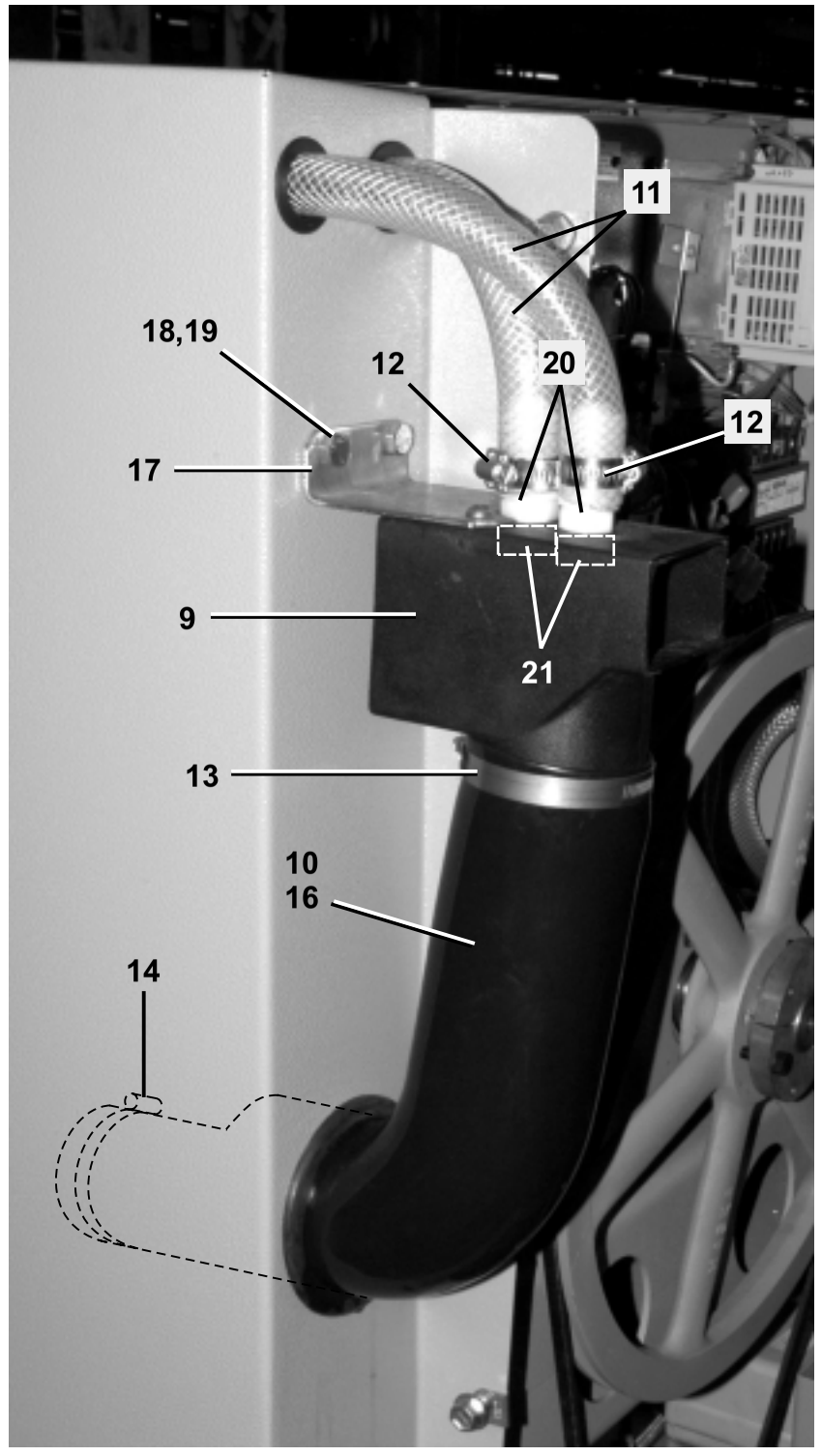

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Litho in U.S.A.

Parts List, cont.—Water Inlets

Used In	Item	Part Number	Description	Comments
			----------ASSEMBLIES----------	
	A	GWV30003	3010/15CGE H20/PERISTALTIC INS	
	B	SA 33 058Z	3010/15CGE BRASS H20 VLVE ASSY	
	C	AWV30003	CGE PERISTALIC INLET BOX ASSY	
			----------COMPONENTS----------	
all	1	96P057A71	1/2"NPT X 1/2"ORIFICE 240V 5/6	
all	2	W2 03588S	3015/22 BRASS H20 MNT WLMT	
all	3	51E510	HOSESTEM BRASS 1/2MPX3/4HOSEID	
all	4	5N0K03KB42	NPT NIP 1/2X3.5 TBE BRASS STD	
all	5	27A0050	CLP-RGDSTL COND #PS1100-1/2	
all	6	51E513B	3/4"MHX1/2"FP PARKER#80GH-12-8	
all	7	5SL0KBEK	NPTELB 45DEG 1/2 BRASS 125#	
all	8	5N0KCLSBE2	NPT NIP 1/2XCLS TBE BRASS STD	
all	9	AWV30003	CGE PERISTALIC INLET BOX ASSY	
all	10	02 03588U	PERIS/WATER INLETHOSE 3010	
all	11	60E008A	TUBINGNYLREINF.75"IDX1.025"OD	
all	12	27A090S	HOSECLAMP 13/16-1.5"SS#64016B	
all	13	27A082S	HOSECLAMP 2+9/16-3.5SS305SCR	
all	14	27A074S	HOSECLAMP 2+1/16-3"SSSCR#64040	
all	15	15P011	TRDCUT-F PANHD 10-24X1/2 NIKST	
all	16	02 03588P	PERISTALTIC/WATER INLET COIN	
all	17	02 03588R	3015/22 COIN PERST BOX BRKT	
all	18	15K031	BUTSOKCAPSCR 1/4-20X1/2 SS18-8	
all	19	15U181	LOCKWASHER MEDIUM 1/4 SS18-8	
all	20	51E513N	HOSEADPT3/4"HX11/16 W/NUT=NYL.	
all	21	51E513NU	NUT 11/16 THRD.#64138 US PLAST	

Drain Sump Installation

3010 G5E,G5X,CGE; 3015G5E,G5X,CGE

30015, 30022Vxx, Txx, C4A, C4T, C4E; 30015, 30020, 30022Qxx

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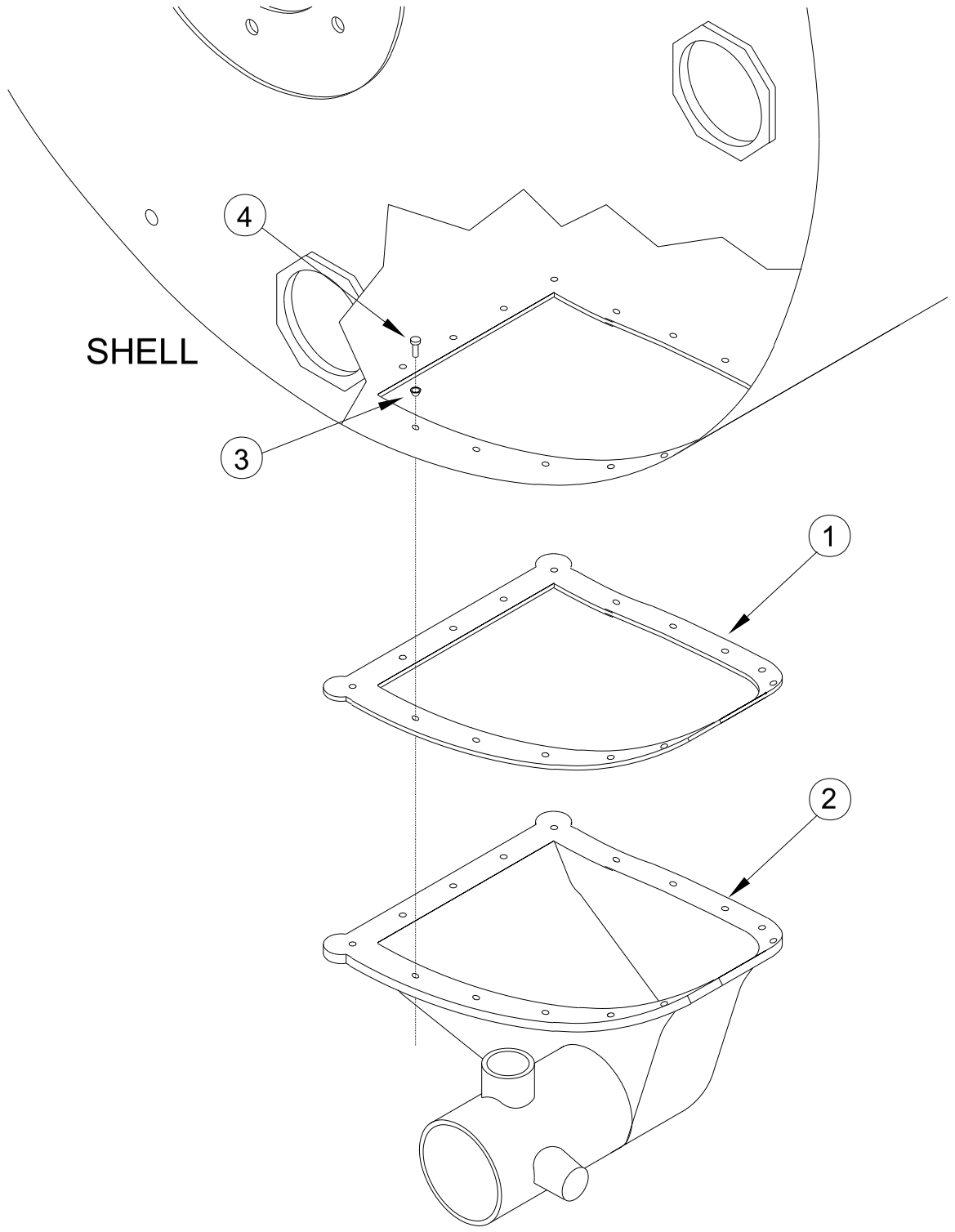

Parts List—Drain Sump Installation

Find the correct assembly first, then find the needed components. The item letters (A, B, C, etc.) assigned to assemblies are referred to in the "Used In" column to identify which components belong to an assembly. The item numbers (1, 2, 3, etc.) assigned to components relate the parts list to the illustration.

Used In	Item	Part Number	Description	Comments
			----------COMPONENTS----------	
all	1	02 03366A	DRAIN SUMP GASKET 1/8"EPDM	
all	2	02 03332A	BODY=SUMP-1608 GLASTIC	
all	3	24G018N	ROLLED WASH.194ID NYLTITE 10W	
all	4	15P050	PHDCUT-F PANHD 10-32X3/4 SS410	

Drain Valve Installation

3010 & 3015 G5E, G5X, CGE

30015 & 30022 C4E

BMP020057/2004055V
(Sheet 1 of 2)

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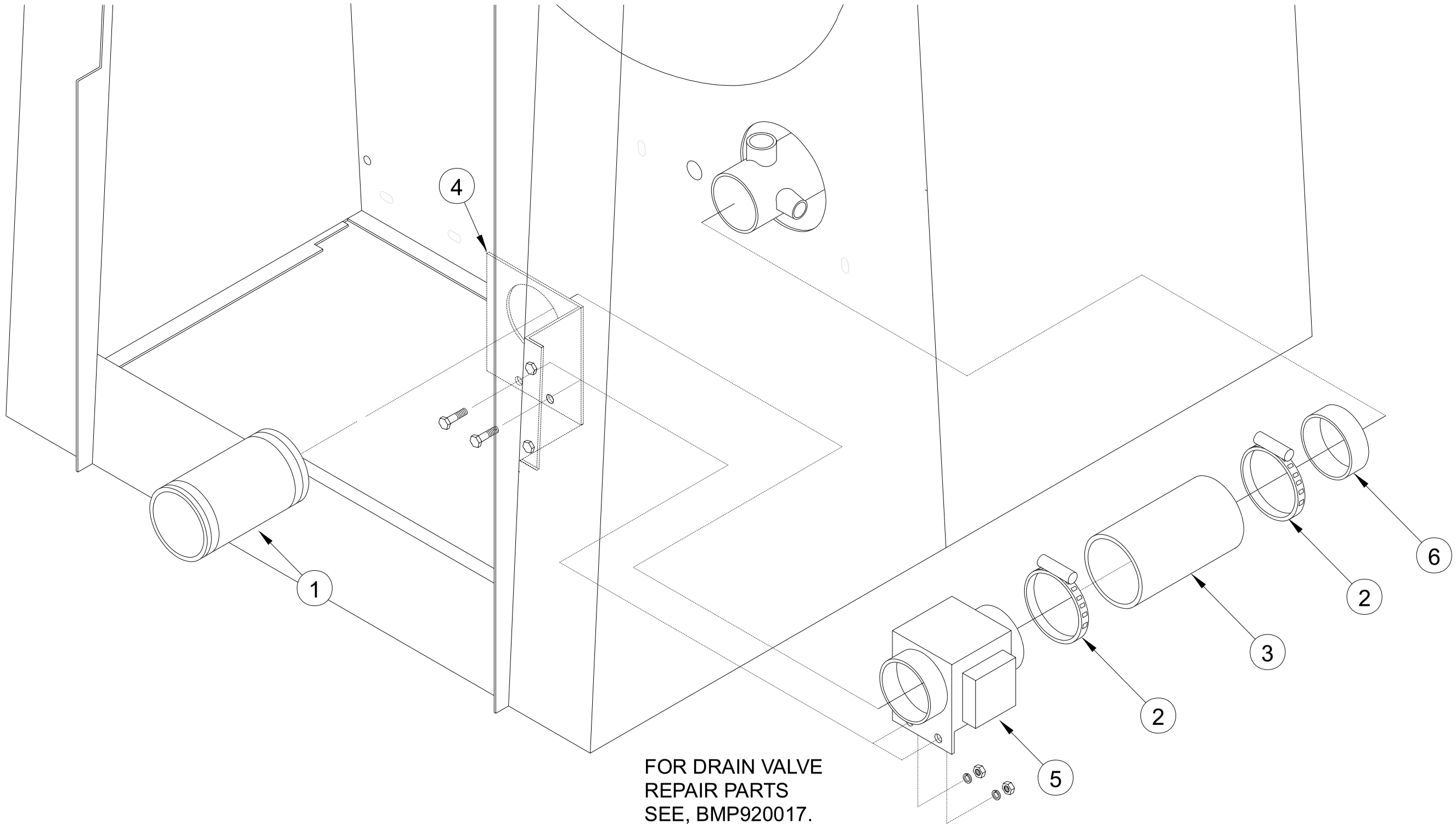
Litho in U.S.A.



FOR DRAIN VALVE
REPAIR PARTS
SEE, BMP920017.

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Litho in U.S.A.

Parts List—Drain Valve Installation

Find the correct assembly first, then find the needed components. The item letters (A, B, C, etc.) assigned to assemblies are referred to in the "Used In" column to identify which components belong to an assembly. The item numbers (1, 2, 3, etc.) assigned to components relate the parts list to the illustration.

Used In	Item	Part Number	Description	Comments
			----------ASSEMBLIES----------	
	A	GDV30001	30" DRAINVALVE INSTALL	3015,3022C4E
	B	GDV30003	3010 SINGLE DRAIN TO REAR INST	3010,3015G5E,G5X,CGE
			----------COMPONENTS----------	
all	1	60B075	DFW56-33PMSP RUBB CONN.	
all	2	27A082	HOSECLAMP 2.5625-3.5CADSC#HS48	
all	3	60E303A07A	HOSE=3"ID X 7" LG.	
A	4	02 03412E	3015/22 DRAIN VALVE BRKT	
B	4	02 03412J	3010 DRAIN VALVE BRKT	
all	5	96D350A71	DRINVAL 3"N/O MTRDR240V 50/60C	
all	6	02 03412S	SLEEVE=DUMPVALVE HOSE	

3” Electric Drain Valve

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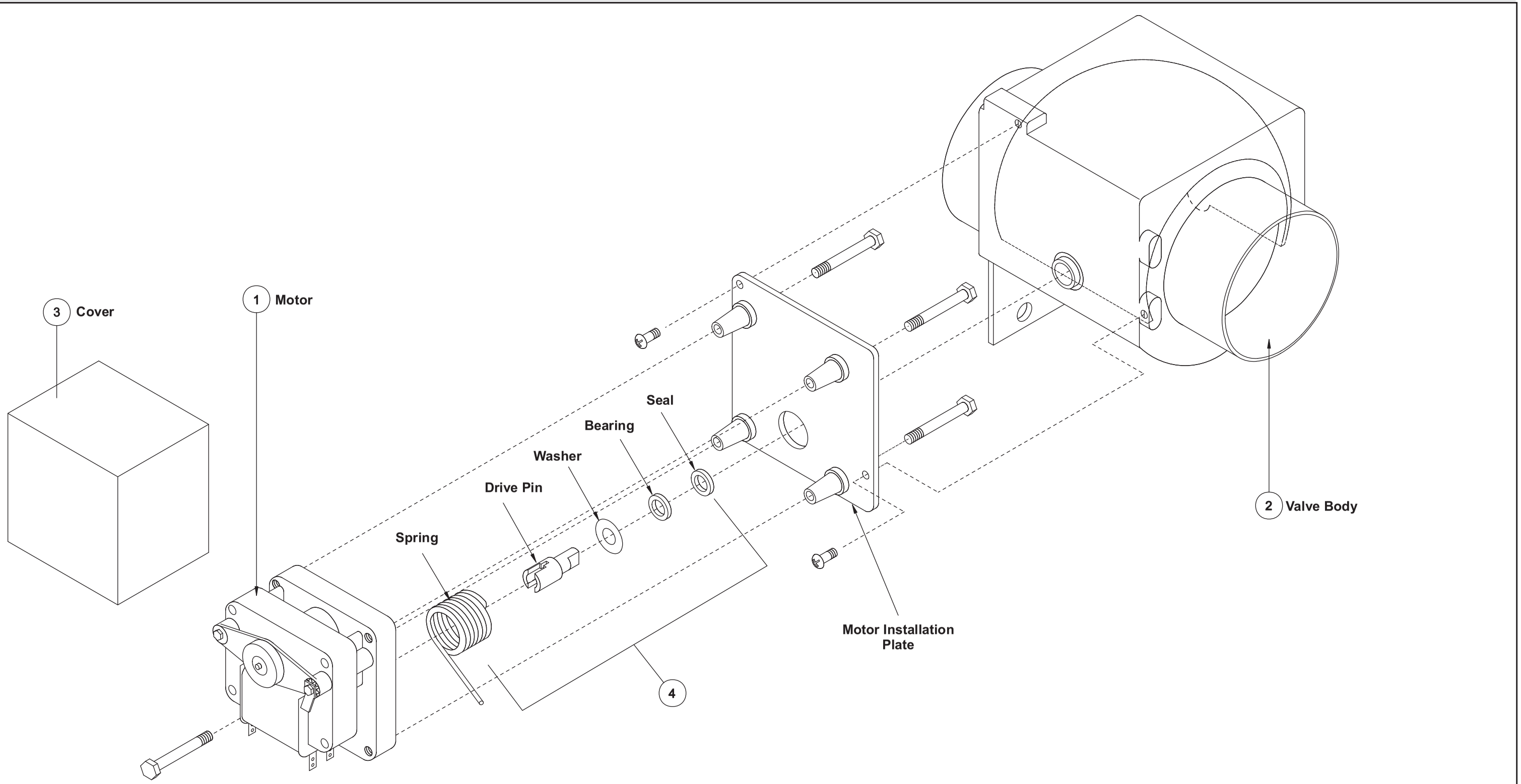
Litho in U.S.A.



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Litho in U.S.A.

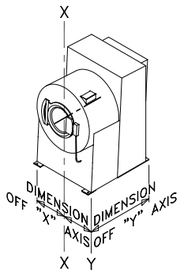
Parts List—3” Electric Drain Valve

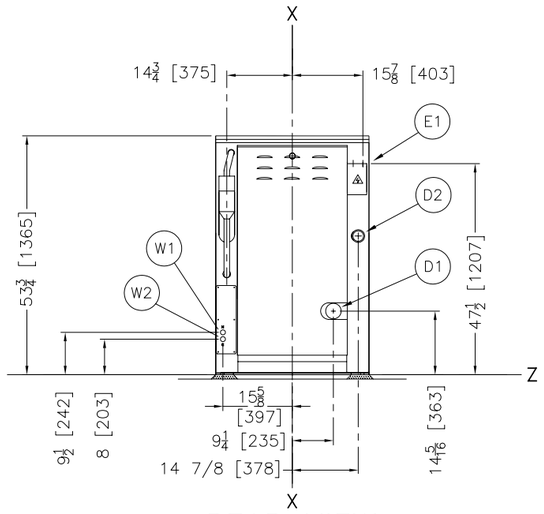
Find the correct assembly first, then find the needed components. The item letters (A, B, C, etc.) assigned to assemblies are referred to in the "Used In" column to identify which components belong to an assembly. The item numbers (1, 2, 3, etc.) assigned to components relate the parts list to the illustration.

Used In	Item	Part Number	Description	Comments
			----------ASSEMBLIES----------	
	A	96D350A37C	DRNVAL 3"N/O 120V50/60C W/COVER	
	B	96D350A71	DRINVAL 3"N/O MTRDR240V 50/60C	
	C	96D350B71	DRINVAL 3"N/C MTRDR240V 50/60	
			----------COMPONENTS----------	
A	1	96D35MTR37	120V 50/60CMTR FOR 3"DRAINVAL	
BC	1	96D35MTR71	240V 50/60CMTR FOR 3"DRAINVAL	
all	2	96D35B0D	B0DY & BALL FOR 3" DRAIN VALVE	
all	3	96D35C0V	MTRCOVER 2-PCFOR 3"DRAINVAL	
all	4	96D35PIN	DRIVE PIN KIT FOR 3" DRAIN VAL	

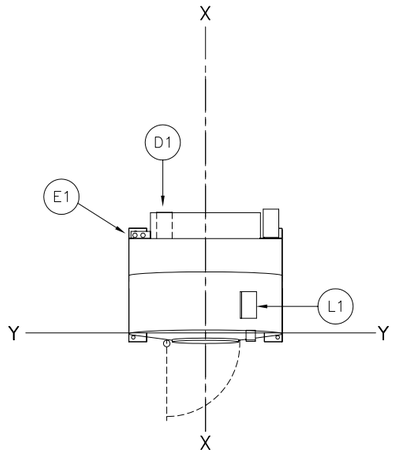
Section 8

Dimensional Drawings

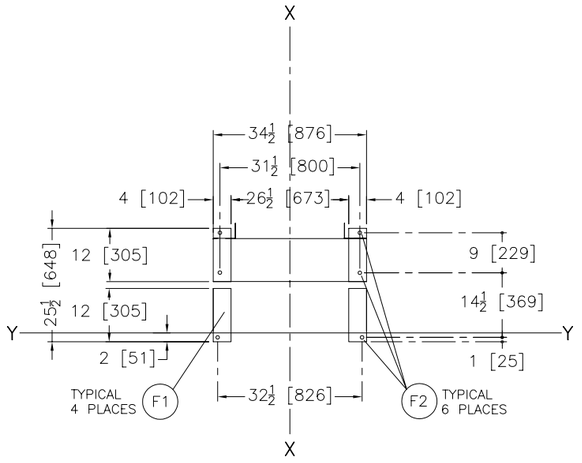




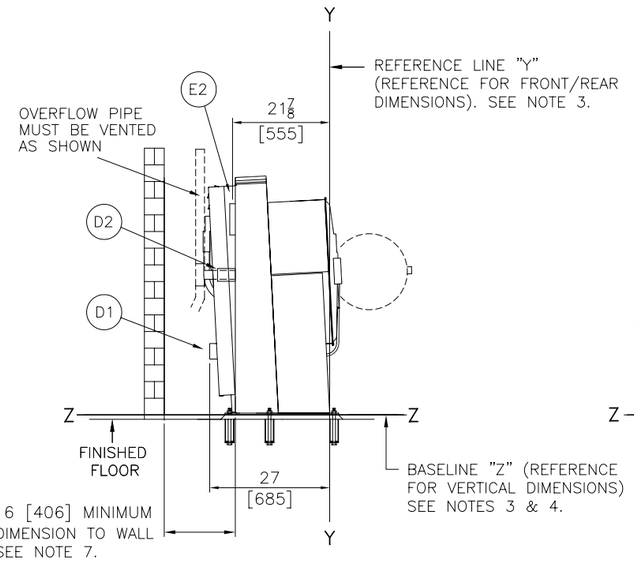
REAR VIEW



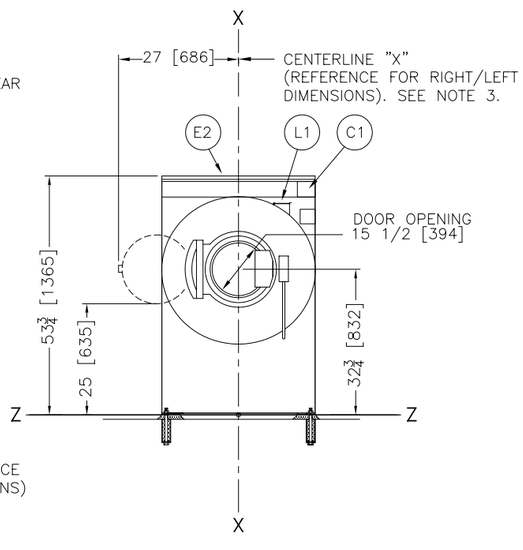
PLAN VIEW



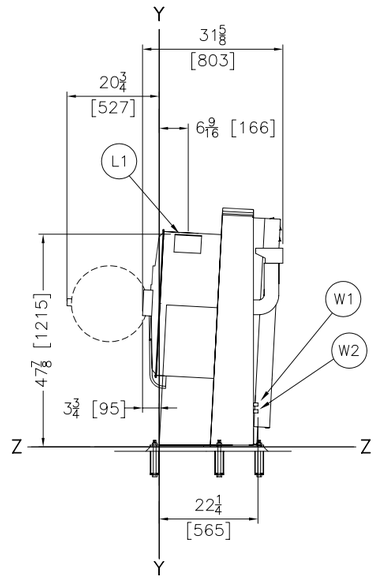
FOUNDATION VIEW



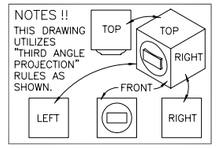
LEFT SIDE VIEW

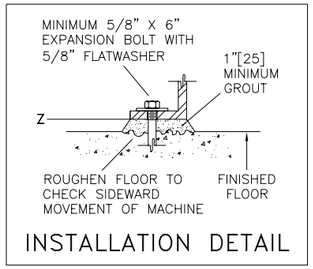


FRONT VIEW



RIGHT SIDE VIEW





INSTALLATION DETAIL

ITEM	LEGEND
W2	COLD WATER INLET, 3/4" GARDEN HOSE, MALE THREAD.
W1	HOT WATER INLET, 3/4" GARDEN HOSE, MALE THREAD.
L1	SOAP CHUTE
F2	(6) 13/16" DIAMETER ANCHOR BOLTS HOLES, USE
	5/8" X 6" BOLTS MINIMUM.
F1	FOUNDATION BASE PADS, 4 PLACES.
E2	MICROPROCESSOR CONTROL PANEL
E1	ELECTRICAL CONNECTION
D2	SUDS OVERFLOW CONNECTION, 2" FLEXIBLE PIPE ADAPTER
	CONNECTION. (2-3/8" ID FOR 2" PIPE)
D1	DRAIN TO SEWER, 3" PIPE SOCKET JOINT.
C1	COIN RECEIVER

NOTES

9 DO NOT PRE-PIPE ANY CLOSER THAN 60 [1524].

8 SHIM TO LEVEL THE MACHINE AND ALLOW FOR 1" [25] MINIMUM GROUT. ANCHOR ALL (6) ANCHOR BOLT HOLES, OR THE WARRANTY WILL BE DECLARED INVALID. USE 5/8" X 6" BOLTS, MINIMUM. SEE INSTALLATION MAINTENANCE MANUAL FOR FURTHER INSTRUCTIONS.

7 ABSOLUTE MINIMUM DISTANCE TO WALL IS 16 [406], 24 [609] TO 36 [914] RECOMMENDED FOR SERVICING.

6 AS OF THIS WRITING, THE MINIMUM CLEARANCE REQUIRED BY U.S. NATIONAL ELECTRIC CODES, FROM ELECTRIC BOX TO ANY OBJECT IS:
36 [914] IF OBJECT IS AN UNGROUNDED (INSULATED) WALL.
42 [1067] IF OBJECT IS A GROUNDED WALL (ie. BARE CONCRETE, BRICK, ETC.)
48 [1219] IF OBJECT IS ANY LIVE PART.
CHECK LOCAL ELECTRIC CODES FOR FURTHER RESTRICTIONS.

5 CUSTOMER TO SUPPLY CIRCUIT BREAKER OR FUSED BRANCH CIRCUIT DISCONNECT (SAFETY) SWITCHES WITH LAG TYPE FUSES FROM POWER SOURCE TO MACHINE. A SEPARATE GROUND WIRE MUST BE CONNECTED FROM DISCONNECT TO EQUIPMENT.

4 BASELINE "Z" IS THE REFERENCE FOR ALL VERTICAL DIMENSIONS. ON MACHINES WITH WITH FIXED BASE PADS, BASELINE "Z" CORRESPONDS TO THE BOTTOM OF THE BASE PAD. ON MACHINES WITH ADJUSTABLE FEET, BASELINE "Z" CORRESPONDS TO THE BOTTOM OF THE FEET WHEN ADJUSTED SO THAT THE MACHINE IS AT ITS MINIMUM ACCEPTABLE HEIGHT. ON TRAVERSING SHUTTLES, BASELINE "Z" CORRESPONDS TO THE BOTTOM OF THE BOTTOM RAIL. THE DISTANCE BETWEEN BASELINE "Z" AND THE FINISHED FLOOR WILL VARY AS REQUIRED TO ENSURE BASELINE "Z" IS HORIZONTAL AND ANY INTERFACING MACHINES REQUIRING GROUT ARE SET ON A MINIMUM 1"[25] THICK GROUT BED.

3 USE REFERENCE LINES "X", "Y", AND "Z" TO LOCATE ALL SERVICE CONNECTIONS.

2 NUMBERS IN BRACKETS [] DENOTE DIMENSIONS IN MILLIMETERS.

1 ALL DIMENSIONS SHOWN ARE APPROXIMATE, SUBJECT TO NORMAL MANUFACTURING TOLERANCES, AND TO OCCASIONAL CHANGES WITHOUT NOTICE THROUGH REDESIGN AND/OR RELOCATION OF COMPONENTS, ETC. DO NOT USE FOR CONSTRUCTION UNLESS CERTIFIED, AND IN NO EVENT PRE-PIPE CLOSER THAN FIVE FEET FROM MACHINE. FACTORY MUST BE CONSULTED FOR DIMENSIONS IF MACHINE IS TO BE MOVED THROUGH NARROW OR LOW CORRIDORS OR OPENINGS.

ATTENTION

MOST REGULATORY AUTHORITIES (INCLUDING OSHA IN THE USA) HOLD THE OWNER/USER ULTIMATELY RESPONSIBLE TO MAINTAIN A SAFE WORKING ENVIRONMENT. ACCORDINGLY, THE OWNER/USER MUST RECOGNIZE ALL FORESEEABLE SAFETY HAZARDS, FURNISH SAFETY INSTRUCTIONS AND GUIDANCE TO ALL PERSONNEL WHO MAY COME IN CONTACT WITH THE INSTALLATION, AND PROVIDE ALL NECESSARY ADDITIONAL SAFETY GUARDS, FENCES, RESTRAINTS, DEVICES, ETC., NOT FURNISHED BY THE EQUIPMENT MANUFACTURER OR VENDOR.

ATTENTION

THE FLOOR AND/OR OTHER SUPPORT COMPONENTS MUST HAVE SUFFICIENT STRENGTH (AND RIGIDITY WITH DUE CONSIDERATION FOR NATURAL OR RESONANT FREQUENCY THEREOF) TO WITHSTAND THE FULLY LOADED WEIGHT OF THE MACHINE INCLUDING THE GOODS, THE WATER, AND ANY REPEATED SINUSOIDAL (ROTATING) FORCES GENERATED DURING ITS OPERATION. WRITE THE FACTORY FOR ADDITIONAL MACHINE DATA FOR USE BY A COMPETENT SOIL AND/OR STRUCTURAL ENGINEER.

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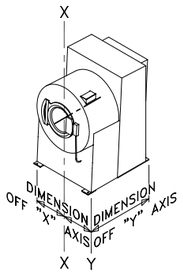
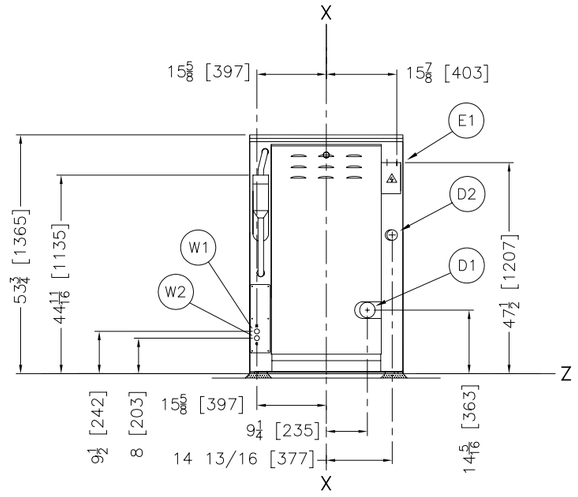
PELLERIN MILNOR CORPORATION
P.O. Box 400 Kenner, LA 70063, USA, Phone 504/467-9591,
FAX 504/469-1849, Telex ITT 460124/PELM UI, Cable PELMILNOR





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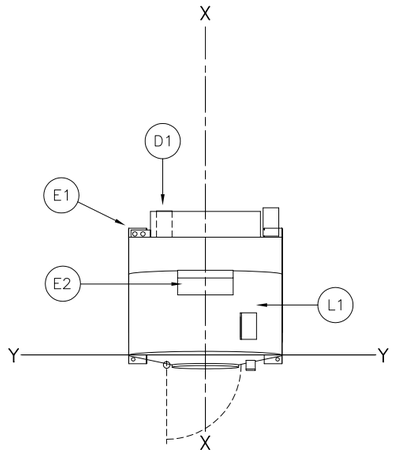
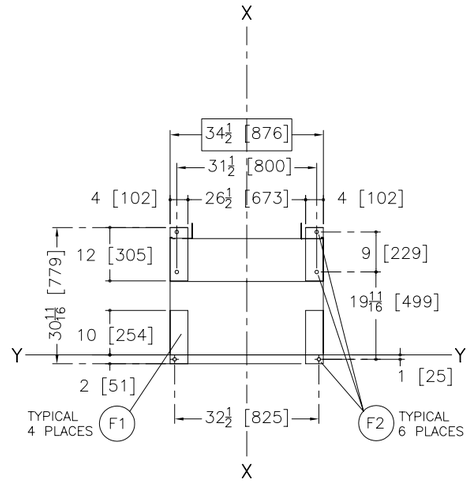


PLAN VIEW



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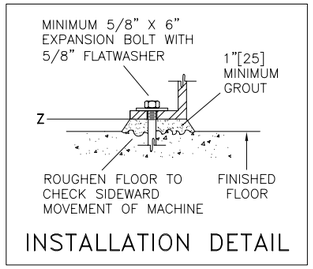

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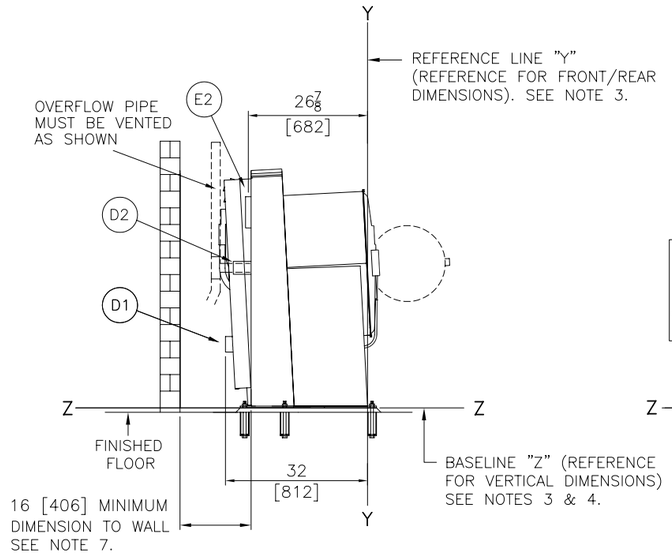
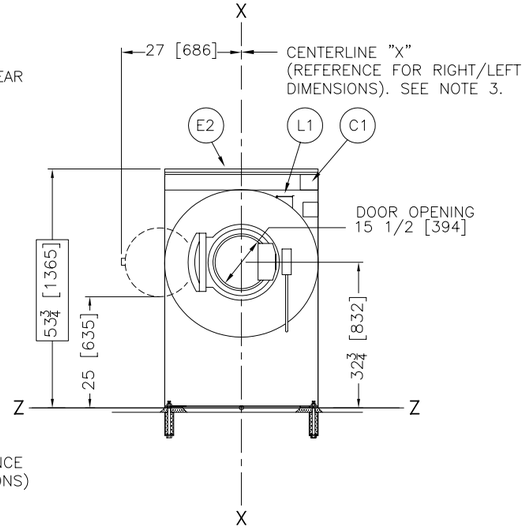


LEFT SIDE VIEW



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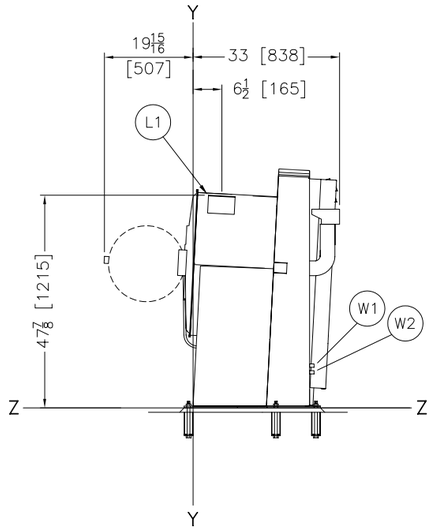

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P.O. Box 400 Kenner, LA 70063, USA, Phone 504/467-9591,
FAX 504/469-1849, Telex ITT 460124/PELM UI, Cable PELMILNOR