Published Manual Number/ECN: MAP30H7XBE/2012393A
- **Publishing System: TPAS**
- **Access date: 9/25/2012**
- **Document ECN's: Latest Available**

Service—

30022H8J Washer-Extractors

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

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

Table of Contents
for MAP30H7XBE/2012393A

ABOUT THIS MANUAL

Scope—This instruction manual is intended to provide preventive maintenance procedures, service procedures, and mechanical parts identification for Milnor® 30022H7x and 30022H8x model rigid mount washer-extractors. Measurements are in commonly used US and metric units unless otherwise noted.

See the appropriate programming and operating manual for information on the control system. See the schematic manual for electrical parts identification and electrical troubleshooting.

Manual Number/Date Code (When To Discard or Save)—The manual number/date code is located on the inside front cover, upper right corner just above the manual name. Whenever the manual is reprinted with new information, part of this number changes. **If the *date code* after the "/" changes, the new version applies to all machines covered by the old version, but is improved— thus the old version can be discarded. If the *manual number* before the "/" changes, the new manual covers only new machines.** Example: Discard MATMODELAE/8739**C**V when MATMODELAE/8739**D**V is received (minor improvements). Also, discard MATMODELAE/87**39D**V when MATMODELAE/87**46A**V is received (major improvements). But keep MATMODEL**A**E/8746FV when MATMODEL**B**E/8815AV is received, since the new manual no longer applies to machines originally shipped with the old manual.

Documents and Change Bars—The individual documents comprising this manual use the same revision criteria as the manual. Text documents also display change bars. Example: When sectionMSOP0599AE/9135**B**V becomes MSOP0599AE/9135**C**V, change bars with the letter "C" appear next to all changes for this revision. For a major rewrite (e.g., MSOP0599AE/92**26A**V), all change bars are deleted.

For Assistance—Please call:

Pellerin Milnor Corporation
Attn: Service Department
P. O. Box 400
Kenner, LA 70063-0400

Phone:(504) 467-9591
Fax:(504) 467-9777

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.

ANY SALE OR FURNISHING OF ANY EQUIPMENT BY MILNOR IS MADE ONLY UPON THE EXPRESS UNDERSTANDING THAT MILNOR MAKES NO EXPRESSED OR IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR USE OR PURPOSE OR ANY OTHER WARRANTY IMPLIED BY LAW INCLUDING BUT NOT LIMITED TO REDHIBITION. MILNOR WILL NOT BE RESPONSIBLE FOR ANY COSTS OR DAMAGES ACTUALLY INCURRED OR REQUIRED AS A RESULT OF: THE FAILURE OF ANY OTHER PERSON OR ENTITY TO PERFORM ITS RESPONSIBILITIES, FIRE OR OTHER HAZARD, ACCIDENT, IMPROPER STORAGE, MIS-USE, NEGLECT, POWER OR ENVIRONMENTAL CONTROL MALFUNCTIONS, DAMAGE FROM LIQUIDS, OR ANY OTHER CAUSE BEYOND THE NORMAL RANGE OF USE. REGARDLESS OF HOW CAUSED, IN NO EVENT SHALL MILNOR BE LIABLE FOR SPECIAL, INDIRECT, PUNITIVE, LIQUIDATED, OR CONSEQUENTIAL COSTS OR DAMAGES, OR ANY COSTS OR DAMAGES WHATSOEVER WHICH EXCEED THE PRICE PAID TO MILNOR FOR THE EQUIPMENT IT SELLS OR FURNISHES.

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 —

BIUUUS27 (Published) Book specs- Dates: 20051111 / 20051111 / 20060322 Lang: ENG01 Applic: RUU

Safety—Rigid Washer Extractors

1. General Safety Requirements—Vital Information for Management Personnel [Document BIUUUS04]

Incorrect installation, neglected preventive maintenance, abuse, and/or improper repairs, or changes to the machine can cause unsafe operation and personal injuries, such as multiple fractures, amputations, or death. The owner or his selected representative (owner/user) is responsible for understanding and ensuring the proper operation and maintenance of the machine. The owner/user must familiarize himself with the contents of all machine instruction manuals. The owner/user should direct any questions about these instructions to a Milnor® dealer or the Milnor® Service department.

Most regulatory authorities (including OSHA in the USA and CE in Europe) hold the owner/user ultimately responsible for maintaining a safe working environment. Therefore, the owner/user must do or ensure the following:

- recognize all foreseeable safety hazards within his facility and take actions to protect his personnel, equipment, and facility;
- work equipment is suitable, properly adapted, can be used without risks to health or safety, and is adequately maintained;
- where specific hazards are likely to be involved, access to the equipment is restricted to those employees given the task of using it;
- only specifically designated workers carry out repairs, modifications, maintenance, or servicing;
- information, instruction, and training is provided;
- workers and/or their representatives are consulted.

Work equipment must comply with the requirements listed below. The owner/user must verify that installation and maintenance of equipment is performed in such a way as to support these requirements:

- control devices must be visible, identifiable, and marked; be located outside dangerous zones; and not give rise to a hazard due to unintentional operation;
- control systems must be safe and breakdown/damage must not result in danger;
- work equipment is to be stabilized;
- protection against rupture or disintegration of work equipment;
- guarding, to prevent access to danger zones or to stop movements of dangerous parts before the danger zones are reached. Guards to be robust; not give rise to any additional hazards; not be easily removed or rendered inoperative; situated at a sufficient distance from the danger zone; not restrict view of operating cycle; allow fitting, replacing, or maintenance by restricting access to relevant area and without removal of guard/protection device;
- suitable lighting for working and maintenance areas;
- maintenance to be possible when work equipment is shut down. If not possible, then protection measures to be carried out outside danger zones;
- work equipment must be appropriate for preventing the risk of fire or overheating; discharges of gas, dust, liquid, vapor, other substances; explosion of the equipment or substances in it.

1.1. **Laundry Facility**—Provide a supporting floor that is strong and rigid enough to support–with a reasonable safety factor and without undue or objectionable deflection–the weight of the fully loaded machine and the forces transmitted by it during operation. Provide sufficient clearance for machine movement. Provide any safety guards, fences, restraints, devices, and verbal and/or posted restrictions necessary to prevent personnel, machines, or other moving machinery from accessing the machine or its path. Provide adequate ventilation to carry away heat and vapors. Ensure service connections to installed machines meet local and national safety standards, especially regarding the electrical disconnect (see the National Electric Code). Prominently post safety information, including signs showing the source of electrical disconnect.

1.2. **Personnel**—Inform personnel about hazard avoidance and the importance of care and common sense. Provide personnel with the safety and operating instructions that apply to them. Verify that personnel use proper safety and operating procedures. Verify that personnel understand and abide by the warnings on the machine and precautions in the instruction manuals.

1.3. **Safety Devices**—Ensure that no one eliminates or disables any safety device on the machine or in the facility. Do not allow machine to be used with any missing guard, cover, panel or door. Service any failing or malfunctioning device before operating the machine.

1.4. **Hazard Information**—Important information on hazards is provided on the machine safety placards, in the Safety Guide, and throughout the other machine manuals. **Placards must be kept clean so that the information is not obscured. They must be replaced immediately if lost or damaged. The Safety Guide and other machine manuals must be available at all times to the appropriate personnel.** See the machine service manual for safety placard part numbers. Contact the Milnor Parts department for replacement placards or manuals.

1.5. **Maintenance**—Ensure the machine is inspected and serviced in accordance with the norms of good practice and with the preventive maintenance schedule. Replace belts, pulleys, brake shoes/disks, clutch plates/tires, rollers, seals, alignment guides, etc. before they are severely worn. Immediately investigate any evidence of impending failure and make needed repairs (e.g., cylinder, shell, or frame cracks; drive components such as motors, gear boxes, bearings, etc., whining, grinding, smoking, or becoming abnormally hot; bending or cracking of cylinder, shell, frame, etc.; leaking seals, hoses, valves, etc.) Do not permit service or maintenance by unqualified personnel.

2. Safety Alert Messages—Internal Electrical and Mechanical Hazards [Document BIUUUS11]

The following are instructions about hazards inside the machine and in electrical enclosures.

WARNING 1: Electrocution and Electrical Burn 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.

- Do not unlock or open electric box doors.
- Do not remove guards, covers, or panels.
- Do not reach into the machine housing or frame.
- Keep yourself and others off of machine.
- Know the location of the main machine disconnect and use it in an emergency to remove all electric power from the machine.

WARNING 2: Entangle and Crush Hazards—Contact with moving components normally isolated by guards, covers, and panels, can entangle and crush your limbs. These components move automatically.

- Do not remove guards, covers, or panels.
- Do not reach into the machine housing or frame.
- Keep yourself and others off of machine.
- Know the location of all emergency stop switches, pull cords, and/or kick plates and use them in an emergency to stop machine motion.

3. Safety Alert Messages—Cylinder and Processing Hazards

[Document BIUUUS13]

The following are instructions about hazards related to the cylinder and laundering process.

DANGER 3: Entangle and Sever Hazards—Contact with goods being processed can cause the goods to wrap around your body or limbs and dismember you. The goods are normally isolated by the locked cylinder door.

- Do not attempt to open the door or reach into the cylinder until the cylinder is stopped.
- Do not touch goods inside or hanging partially outside the turning cylinder.
- Do not operate the machine with a malfunctioning door interlock.
- Know the location of all emergency stop switches, pull cords, and/or kick plates and use them in an emergency to stop machine motion.
- Know the location of the main machine disconnect and use it in an emergency to remove all electric power from the machine.

WARNING 4: Crush Hazards—Contact with the turning cylinder can crush your limbs. The cylinder will repel any object you try to stop it with, possibly causing the object to strike or stab you. The turning cylinder is normally isolated by the locked cylinder door.

- Do not attempt to open the door or reach into the cylinder until the cylinder is stopped.
- Do not place any object in the turning cylinder.
- Do not operate the machine with a malfunctioning door interlock.

WARNING 5: Confined Space Hazards—Confinement in the cylinder can kill or injure you. Hazards include but are not limited to panic, burns, poisoning, suffocation, heat prostration, biological contamination, electrocution, and crushing.

- Do not attempt unauthorized servicing, repairs, or modification.

WARNING 6: Explosion and Fire Hazards—Flammable substances can explode or ignite in the cylinder, drain trough, or sewer. The machine is designed for washing with water, not any other solvent. Processing can cause solvent-containing goods to give off flammable vapors.

- Do not use flammable solvents in processing.
- Do not process goods containing flammable substances. Consult with your local fire department/public safety office and all insurance providers.

4. Safety Alert Messages—Unsafe Conditions [Document BIUUUS14]

4.1. Damage and Malfunction Hazards

4.1.1. Hazards Resulting from Inoperative Safety Devices

DANGER 7: Entangle and Sever Hazards—Cylinder door interlock—Operating the machine with a malfunctioning door interlock can permit opening the door when the cylinder is turning and/or starting the cycle with the door open, exposing the turning cylinder.

- Do not operate the machine with any evidence of damage or malfunction.

WARNING 8: Multiple Hazards—Operating the machine with an inoperative safety device can kill or injure personnel, damage or destroy the machine, damage property, and/or void the warranty.

- Do not tamper with or disable any safety device or operate the machine with a malfunctioning safety device. Request authorized service.

WARNING 9: Electrocution and Electrical Burn Hazards—Electric box doors—Operating the machine with any electric box door unlocked can expose high voltage conductors inside the box.

- Do not unlock or open electric box doors.

WARNING 10: Entangle and Crush Hazards—Guards, covers, and panels—Operating the machine with any guard, cover, or panel removed exposes moving components.

- Do not remove guards, covers, or panels.

4.1.2. Hazards Resulting from Damaged Mechanical Devices

WARNING 11: Multiple Hazards—Operating a damaged machine can kill or injure personnel, further damage or destroy the machine, damage property, and/or void the warranty.

- Do not operate a damaged or malfunctioning machine. Request authorized service.

WARNING 12: Explosion Hazards—Cylinder—A damaged cylinder can rip apart during extraction, puncturing the shell and discharging metal fragments at high speed.

- Do not operate the machine with any evidence of damage or malfunction.

WARNING 13: Explosion Hazards—Clutch and speed switch (multiple motor machines)—A damaged clutch or speed switch can permit the low speed motor to engage during extract. This will over-speed the motor and pulleys and can cause them to rip apart, discharging metal fragments at high speed.

- Stop the machine immediately if any of these conditions occur: • abnormal whining sound during extract • skidding sound as extract ends • clutches remain engaged or re-engage during extract

4.2. Careless Use Hazards

4.2.1. Careless Operation Hazards—Vital Information for Operator Personnel (see also operator hazards throughout manual)

WARNING 14: Multiple Hazards—Careless operator actions can kill or injure personnel, damage or destroy the machine, damage property, and/or void the warranty.

- Do not tamper with or disable any safety device or operate the machine with a malfunctioning safety device. Request authorized service.
- Do not operate a damaged or malfunctioning machine. Request authorized service.
- Do not attempt unauthorized servicing, repairs, or modification.
- Do not use the machine in any manner contrary to the factory instructions.
- Use the machine only for its customary and intended purpose.
- Understand the consequences of operating manually.

4.2.2. Careless Servicing Hazards—Vital Information for Service Personnel (see also service hazards throughout manuals)

WARNING 15: Electrocution and Electrical Burn 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.

- Do not service the machine unless qualified and authorized. You must clearly understand the hazards and how to avoid them.
- Abide by the current OSHA lockout/tagout standard when lockout/tagout is called for in the service instructions. Outside the USA, abide by the OSHA standard in the absence of any other overriding standard.

WARNING 16: Entangle and Crush Hazards—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.
- Abide by the current OSHA lockout/tagout standard when lockout/tagout is called for in the service instructions. Outside the USA, abide by the OSHA standard in the absence of any other overriding standard.

WARNING 17: Confined Space Hazards—Confinement in the cylinder can kill or injure you. Hazards include but are not limited to panic, burns, poisoning, suffocation, heat prostration, biological contamination, electrocution, and crushing.

- Do not enter the cylinder until it has been thoroughly purged, flushed, drained, cooled, and immobilized.

— End of BIUUUS27 —

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

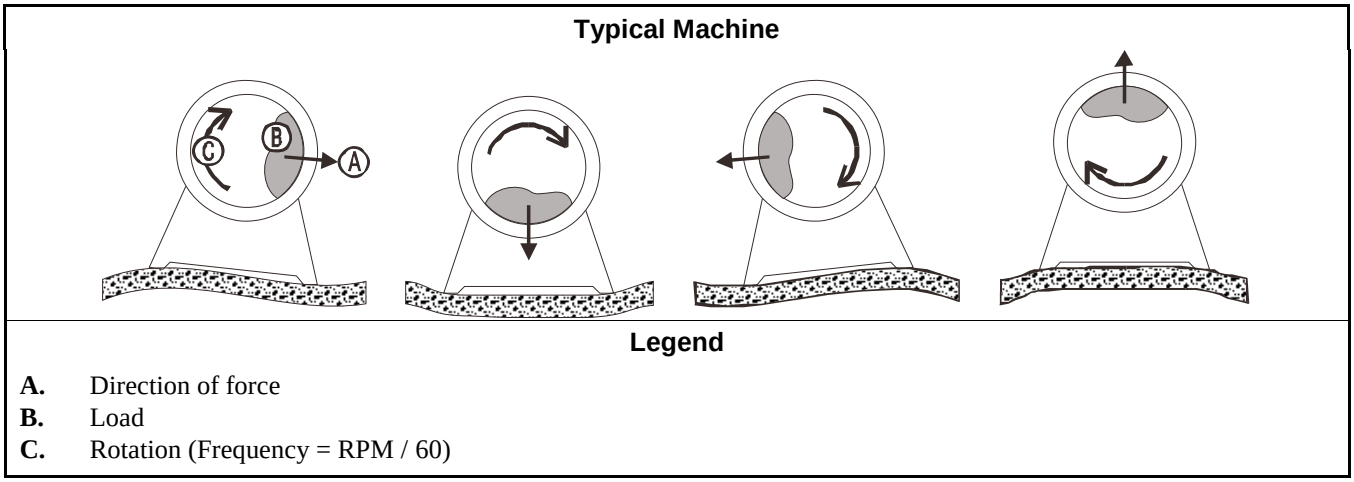


Figure 1 above is intended to depict both on-grade and above-grade installations and is equally applicable to flexibly-mounted washer-extractors, as well as to rigid models installed either directly on a floor slab or on a foundation poured integrally with the slab. Current machine data is available 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.

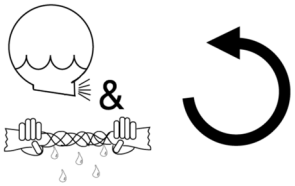
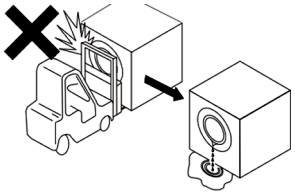
— End of BIWUUI02 —

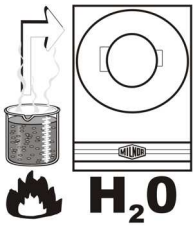
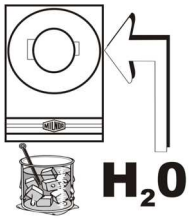
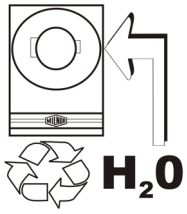
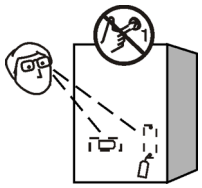
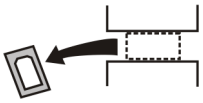
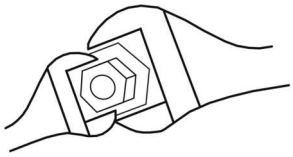
Understanding the Tag Guidelines for the Models Listed Below

30022H7J 30022H8J

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.
	
	B2TAG94078: Do not forklift here; do not jack here; do not step here—whichever applies.
	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.

Display or Action	Explanation
	B2T2001013: Hot water connection.
	B2T2001014: Cold water connection.
	B2T2001015: Reuse (third) water connection (optional).
	B2T2001028: Look for tags inside the machine. These tags may identify shipping restraints to be removed or components to be installed. Do not start the machine until these actions are completed.
 	B2T2002013: Do not start the machine until shipping restraints are removed. This tag will appear on the outside of the machine to alert you to the presence of internal shipping restraints. A tag will also appear on the restraint to help identify it. Most, but not all shipping restraints display the color red. Some shipping restraints are also safety stands. Do not discard these.
	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 or 01-10710A: 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.

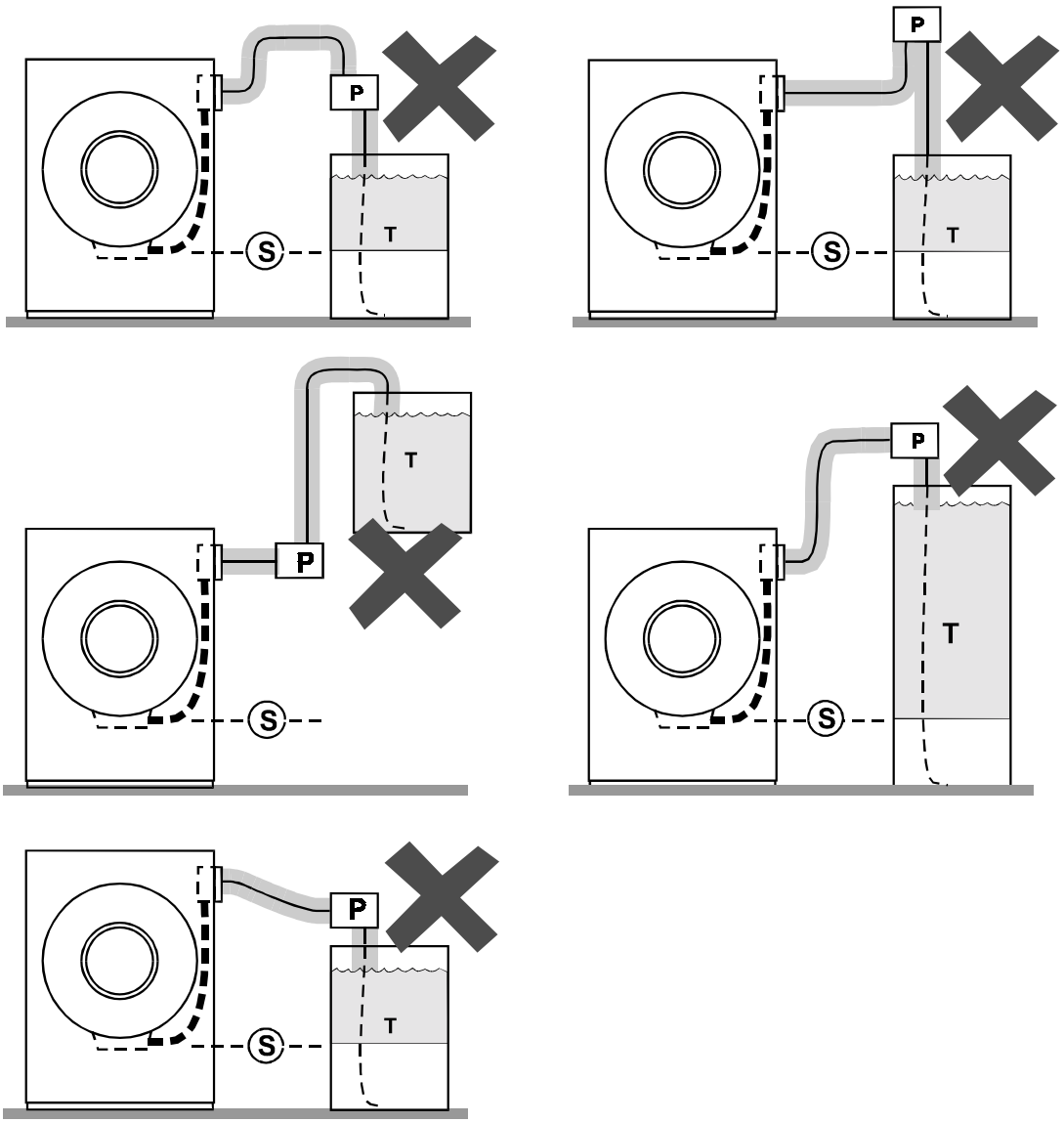
2. Requirements for Chemical Systems Used With Milnor Machines

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

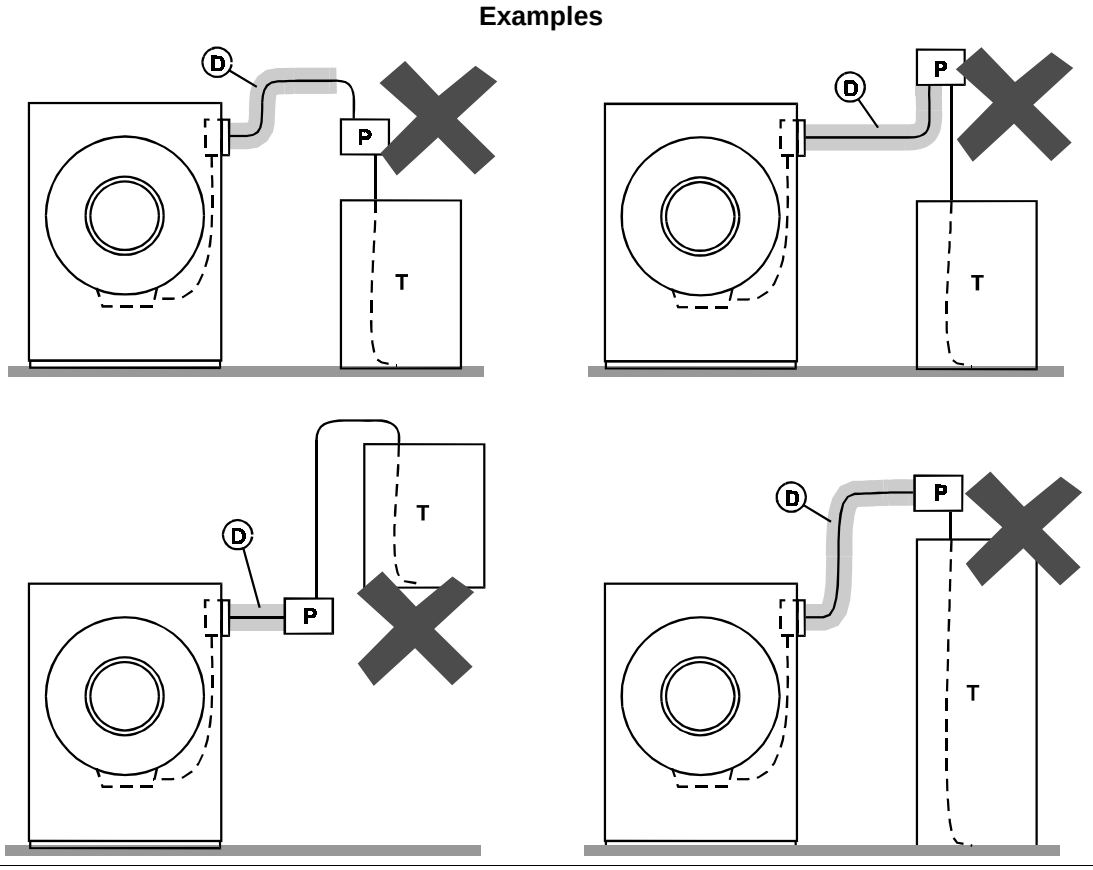


Legend

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.

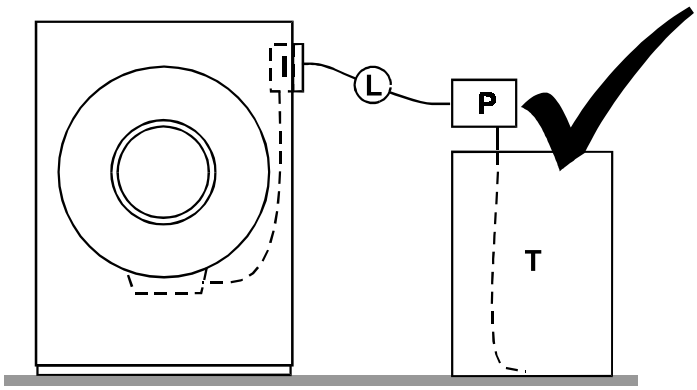
3.2. Siphoning: Break the siphon.—Provide an air gap or vacuum breaker in the chemical delivery line. This must be located above the "full" line of the tank.

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

Example of Correct Placement



Legend

I. Chemical inlet on machine
L. Chemical delivery line
P. Pump with positive closure when system is off
T. Chemical tank

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 —

Section 1

Service and Maintenance

30022H7J AND 30022H8J PREVENTIVE MAINTENANCE

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.**

Preventive Maintenance Schedule

Component	Procedure	See FIGURE	Frequency
Door interlock	Test functioning for safe operation.	BMP990012	daily
Water seal grease point	Slowly grease, 2 strokes (0.125 fluid ounces - 3.54 grams) at one location.	FIGURE 1	monthly
Water inlet strainers	Clean as required	FIGURE 4	every four months
Foundation bolts	Check bolt tightness and wear. Adjust or replace if necessary.	Dimensional drawing	every four months
Drive train	Check belt tension and wear. Check pulleys and other drive components for wear. Replace if necessary.	FIGURE 5	every four months
Main bearing housing	Change lubricant.	FIGURES 2 and 3	every four months

Main Bearing Housing Preventive Maintenance

⚠ DANGER ⚠

ELECTROCUTION HAZARD—High voltage is present inside electric boxes, motors, and many other components. Power switches on machine disable only control circuit power in certain boxes. You can be killed or seriously injured on contact with high voltage.

☞ **Lock OFF and tag out power at the wall disconnect before servicing.**

⚠ WARNING ⚠

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.**

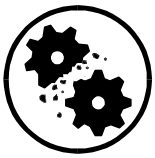
☞ **Permit only qualified maintenance personnel to perform these procedures.**

⚠ CAUTION ⚠

MALFUNCTION HAZARD—Oil spilled on components may cause machine malfunction.

☞ **Refill bearing housing carefully.**

⚠ CAUTION ⚠



MACHINE DAMAGE HAZARD—Mixing incompatible lubricants will result in severe machine damage.

- ☞ **DO NOT mix different base lubricants.**
- ☞ **Before using a non-specified lubricant, consult the lubricant manufacturer to determine compatibility.**

Lubrication Specifications

Component	Lubricant/Type	Amount of Lubricant
Main bearing housing	High quality SAE 50 (ISO 220) heavy duty motor oil, non-detergent if available	22 fluid ounces (651 milliliters)
Water seal grease	Shell Alvania EP (or equivalent)	Preventive Maintenance Schedule

Bearing Lubrication Procedures

See the appropriate *main bearing drawing* (if provided) during this procedure (see Table of Contents).

1. Remove the rear belt cover.
2. Remove the drain plug (FIGURE 3) on the bottom of the main bearing housing and allow the bearing housing to drain completely. Inspect the leak-off, drained oil, and magnetic drain plug for water and/or metal particles. Water and/or metal particles can indicate worn or damaged seals and bearings. Install the drain plug.
3. Locate the oil fill plug (FIGURE 2) on the bearing housing. Clean the surrounding area and remove the oil fill plug.
4. Refill the bearing housing. After refilling the bearing housing, reinstall the oil fill plug and clean any excess lubricant from the machine.

Water Seal Lubrication

Grease Gun Precautions

1. **Do not use a pneumatic grease gun.** Pump grease **slowly**, taking 10-12 seconds to complete each stroke. A grease gun can build up extremely high pressure which will force water seals out of position and cause them to leak, even though the seal is equipped with spring loaded relief plug.
2. **Apply quantity of grease called for in the schedule.** Over-lubrication can be as damaging as under-lubrication. Where quantities are stated in strokes, one stroke of the grease gun is assumed to provide .0624 fluid

oz. (1.77 grams) (by volume) of grease. Therefore, one fluid ounce (28.3 grams) of grease would be provided by 16 strokes of the grease gun. Determine the flow rate of your grease gun by pumping one ounce into a calibrated container. If fewer than 16 strokes are required, all quantities in strokes in the schedule should be reduced accordingly, and if more than 16 strokes are required, the number of strokes should be increased. Before starting lubrication, **make sure your grease gun is working and that you get a full charge of grease with every stroke.**

3. **Do not pump grease in until it oozes out of the spring loaded relief plug.** Plugs bleed out excess grease and help prevent abnormal pressures from building up in the housing during operation (especially when the machine is first commissioned and after each lubrication). **Plugs will not protect against over-lubrication.**

⚠ WARNING ⚠

ENTANGLE AND CRUSH HAZARD—Belts and pulleys can entangle and crush body parts. Power is ON and cylinder is turning during the following procedure.

☞ **Use extreme care when working near moving components.**

Water Seal Lubrication Procedure

Grease the water seals as follows:

1. Restore power to machine.
2. Locate the water seal grease fitting (FIGURE 1)
3. Place the machine in a wash step.
4. With the cylinder turning, grease the seals as called for on the “Preventive Maintenance Schedule.”

Preventive Maintenance Items

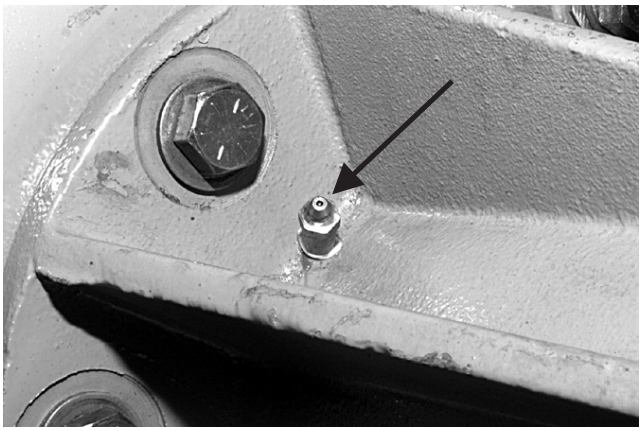


FIGURE 1 (MSSM0712AE)
Water Seal Grease Point

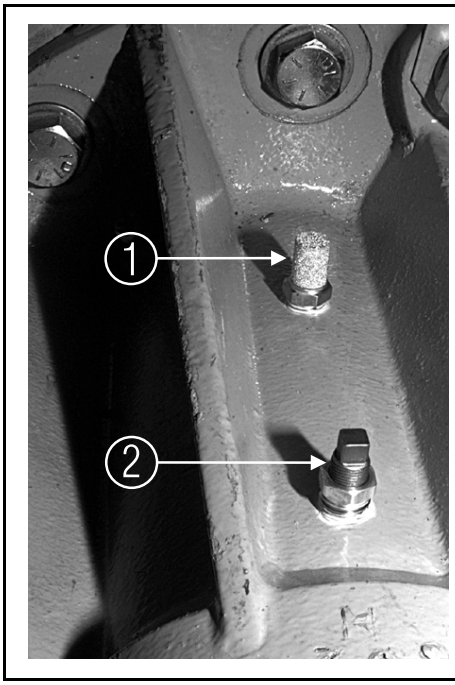


FIGURE 2 (MSSM0712AE)
Main Bearing Housing Vent (1) and Oil Fill (2)

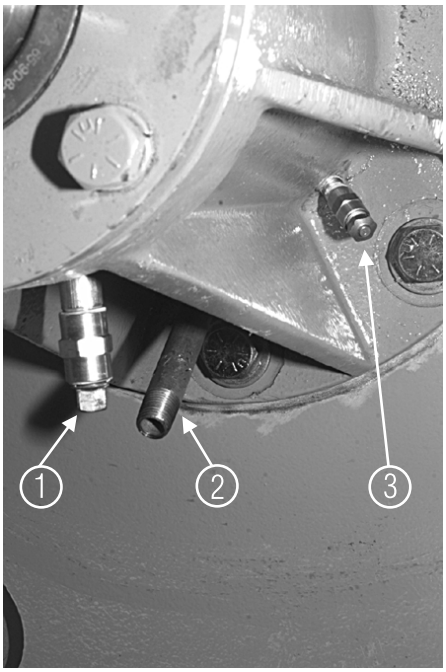


FIGURE 3 (MSSM0712AE)
Bearing Housing Oil Drain Plug (1), Leak-off (2), and Seal Grease Relief (3)

FIGURE 4 (MSSM0712AE)
Inlet Valve Strainers

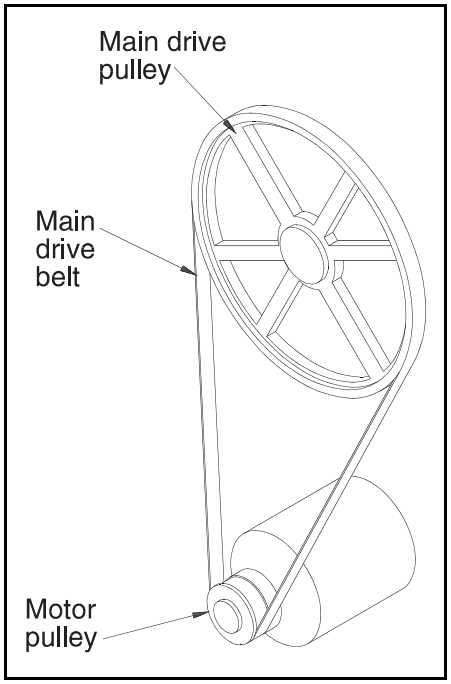


FIGURE 5 (MSSM0712AE)
Drive Train

Testing Belt Tension

NOTE: Use the "Initial Tension" column (Table below) when adjusting belts that have never been used. Use the "Final Tension" column when adjusting belts that have been used.

Check belt tension when replacing and adjusting drive train components. Belt tension testing tool (Milnor® part number 30T001), straight edge, and Belt Tension Tables are required when setting belt tensions. **Do not refer to instruction sheet provided with tension testing tool.** Check tensions for new belts according to the following schedule:

- **After 24 hours of operation (three eight-hour days)**
- **After 80 hours of operation (ten eight-hour days)**
- **After 160 hours of operation (twenty eight-hour days)**

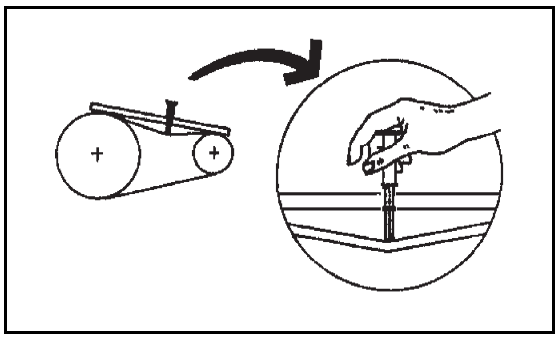


FIGURE 6 (MSSM0712AE)
Setting Belt Tension

1. Move upper O-ring on the tension testing tool to the uppermost position (resting against the bottom edge of sliding cap).
2. Determine deflection for the main drive belt (see FIGURE 5 for the belt location and Table for the setting range). Move lower O-ring to the correct setting (inches or centimeters) on scale. Read the bottom edge of the O-ring.
3. Place a straight edge along the top edge (pulley to pulley) of the belt. Depress the tension testing tool by sliding the cap against the middle of the belt span until the bottom edge of the lower O-ring aligns with the straight edge as shown in FIGURE 6.
4. Read the top edge of the upper O-ring position and determine if it is within the specified range. If the readings are below the specified range, tighten the belt. If the readings are above the specified range, loosen the belt. Adjust the belt and repeat steps one through four until tension is within the specified range.

Replacing Belts

Remove motor drive belt by loosening the threaded jacking rods that determine the belt tension for the pulley. **Do not force belts off by prying and turning pulley.** Check belt tension and pulley alignment after replacing the belts.

Table — Main Drive Belt Tension Specifications

Model	Cycle	Belt Deflection (centimeters)	Initial Tension pounds (kilograms)	Final Tension pounds (kilograms)
30022H7J **30022H8J**	All	24/64 (0.95)	6.7—9.8 (3.0—4.4)	5.2—7.6 (2.4—3.4)

Removing and Installing the Main Drive Pulley

Replace the pulleys if the side walls are chipped, broken, or excessively worn. Remove the console top and belt guards, then remove the appropriate belts, dirt, or paint from the shaft end and see instructions below.

Taper Lock Bushing Pulleys

⚠ CAUTION ⚠

DO NOT use lubricants, "Loctite" or other compounds on taper lock bushings, pulleys, or shafts.

1. Loosen and remove all three bushing bolts. Thread two bolts into the push-off holes in the bushing (FIGURE 7) and alternately tighten them until the bushing and pulley separate and can be removed from the shaft.
2. Remove the burrs from the shaft, then clean and polish shaft. Clean tapered surfaces of bushing and inside bore of pulley. Determine that inside bore of bushing is clean and clear.
3. Place the key in shaft. Check for a proper fit. Key must fit snugly; if not, replace the key or bushing.
4. Insert the bushing loosely into the pulley and start all three bolts. Install the pulley on the shaft and approximately align it with the corresponding pulley.
5. Gradually tighten the bolts in an alternating pattern until the bushing is seated within the pulley. Rotate the pulley and check for wobble or runout.
6. Install the belts, adjust out all slack, and align the pulleys (see "Aligning Pulley" in this section).
7. Tighten the bushing bolts and the set screw to the "Recommended Bushing Torques" in Table below, and adjust the belt tension according to "Testing Belt Tension" in this section.

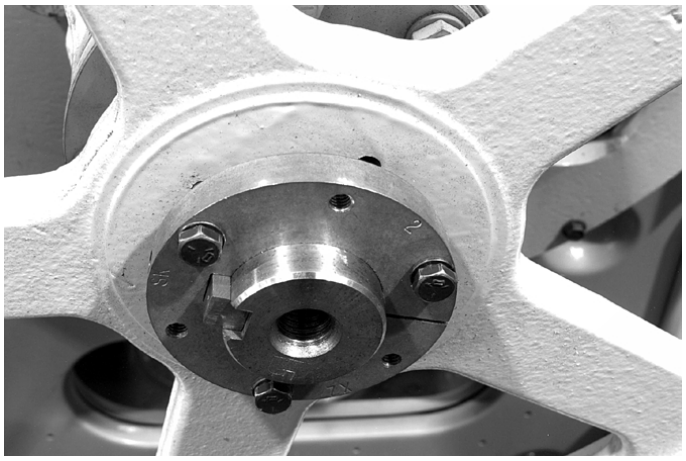


FIGURE 7 (MSSM0712AE)
Aligning the Pulley

Recommended Bushing Torques

Size Code (Stamped on bushing)	Fasteners	Bushing Bolt Torque inch pounds (kilogram/meters)	Set Screw Torque inch pounds (kilogram/meters)
SK	5/16"– 20 bushing bolt	180 (2)	—
	1/4"– 20 set screw	—	87 (1)

Aligning Pulley

After replacing the drive train components, check the pulley alignment.

1. Stretch a string from the motor pulley to the drive pulley as shown on FIGURE 8.
2. Adjust the position of the main drive pulley until the string touches *A, B, C,* and *D*. Secure the pulley.

⚠WARNING⚠

ENTANGLE HAZARD—Belts and pulleys can crush and entangle body parts.

☞ **Insure belt and pulley guards are in place before operating machine.**

Testing Belt Alignment—After aligning the belts, observe the belts with the machine operating. **If an adjustment is necessary, lock OFF and tag out power before proceeding.**

About Belts—All V-belts are not alike. So called "Super" or "High Capacity" belts frequently have considerably higher capacities than "Standard" belts. Sometimes a particular manufacturer's V-belt will be more suitable for a certain application, and another manufacturer's V-belt may be suitable for a different application. This may occur in spite of the fact that both manufacturers belts are reputably "interchangeable". Because of this, it is always best to purchase replacement belts from the original manufacturer of the equipment. If you do not wish to do this, we suggest that when you replace the belt, you purchase the exact style and type belts with which the machine was originally equipped. This is the best way to achieve belt life on your replacement belts equal to the life of the original set. If you are not satisfied with the life of the original set, you should ask our factory if a better belt has been developed for the specific application.

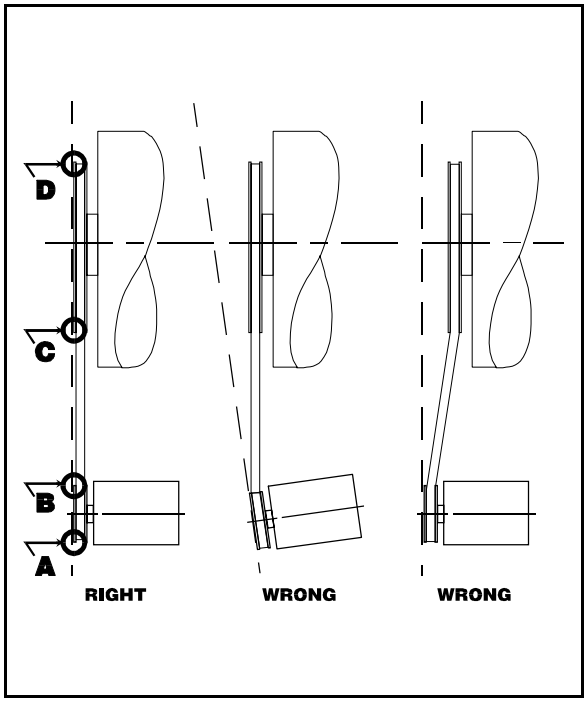


FIGURE 8 (MSSM0712AE)
Aligning Pulley

Servicing the Door to Open it with Power Off or with a Malfunctioning Door Lock

Note 1: This document supersedes document MSSM0288AE and applies to all washer-extractors with four-spoke door handles, including 30022Hxx, MCRxxxxx models. The photographs in this document show the older style bare metal door handles but the instructions apply, as well, to newer machines with black, coated handles.

The door is designed to lock as soon as the machine starts a wash cycle. If electrical power to the machine is interrupted during the washing cycle, or if the door interlock mechanism fails to unlock, the door can be opened by **qualified, service personnel** by removing the door handle and a few related components. These components must be properly reinstalled for safe operation.

WARNING 1: Entangle and crush hazards—Contact with moving components normally isolated by doors, guards, covers and panels can entangle and crush body parts. These components move automatically.

- Service the machine only if qualified and authorized.
- Lockout/tagout power at the wall disconnect before proceeding.

WARNING 2: Amputation hazard—If the door interlock mechanism does not function properly, an operator may be able to open the door and reach into the machine during operation. Goods in the rotating cylinder can wrap around a person's arm and twist it off.

- Verify proper door lock function during machine operation, before returning the machine to normal service.

1. Disassembly

1.1. Removing the Handle and Opening the Door—The handle is held in place on the shaft with a thrust washer and retaining clip in front of the handle and a flange bearing and retaining clip behind the handle. The amount of turning force the handle can exert on the shaft is adjustable with the four set screws, springs and steel balls—one within each spoke of the handle. The steel balls seat into depressions in the shaft. When properly adjusted, the set screws will apply sufficient spring tension so that the handle will reliably operate the latch, but the handle will ratchet if turned counterclockwise or if too much turning force is applied.

Remove the handle from the shaft as follows:

1. Gently pry the black plastic cap from the center of the handle with a small screwdriver.
2. Attempt to ratchet the handle by turning it counterclockwise by hand. If this is not possible, the springs have too much tension applied. Back off on the four set screws just enough for the handle to ratchet. Typically this happens when the set screws are flush with the surface of the handle spoke as is the case in Figure 1.
3. Repeat the following sub-steps four times to remove all set screws, springs, and steel balls:
   a. Remove the set screw from the topmost handle spoke.
   b. Hold a finger over the hole, then, while keeping your finger on the hole, ratchet the handle counterclockwise until the hole is pointing down.
   c. Hold one hand or a cup under the handle to catch the contents, then remove your finger, allowing the spring and ball to fall out, as in Figure 2. Shake the handle if necessary, to work the components free.

Figure 1: Door Handle Spoke Set Screw

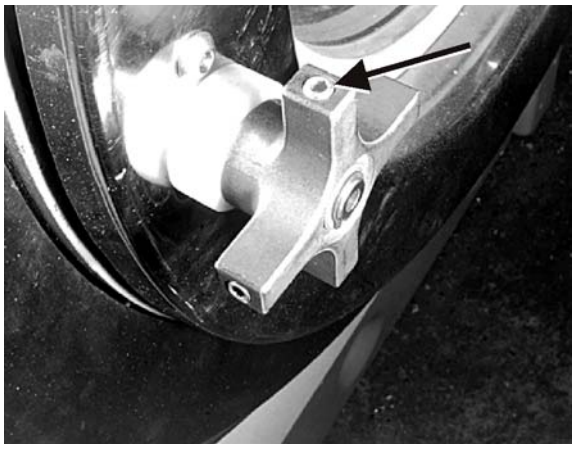


Figure 2: Handle Spoke Spring and Ball

4. Remove the front retaining clip and thrust washer (see Figure 3), then pull the handle off of the shaft.
5. Normally, the flange bearing will come off with the handle, but if not, remove it as shown in Figure 4. Remove the rear retaining clip. Push against the door to release the retaining clip.

Figure 3: Front Retaining Clip and Thrust Washer

Figure 4: Rear Flange Bearing (being removed) and Retaining Clip (arrow)

Notice 3: Risk of component damage—The return spring is located around the shaft, between the door and the shaft cam. The end of the spring is inserted into a small hole in the shaft cam. The spring can stretch and be damaged if it does not separate from the shaft cam.

- Be prepared to work the end of the spring out of the hole in the shaft cam as the door is opened.

6. Slowly open the door. Allow the door latch shaft, which is still captive within the door lock mechanism, to slide out of the door. Watch to be sure the return spring separates from the shaft cam and remains with the door, as shown in Figure 5.

Figure 5: Return Spring After Separation from Shaft Cam

1.2. Removing the Door Latch Shaft from the Door Lock Mechanism

Tip: It is easier and more reliable to remove the shaft from the door lock mechanism then to attempt to reinsert the shaft into the door and replace the handle while the shaft is still captive in the door lock.

1. Remove the cover (not shown) from the door lock mechanism (Figure 6).
2. Using a screwdriver, push down the door lock slider pin (Figure 6) and rotate the shaft (Figure 7) counterclockwise to remove it from the lock mechanism.

Figure 6: Door Lock Slider Pin in the Door Lock Mechanism

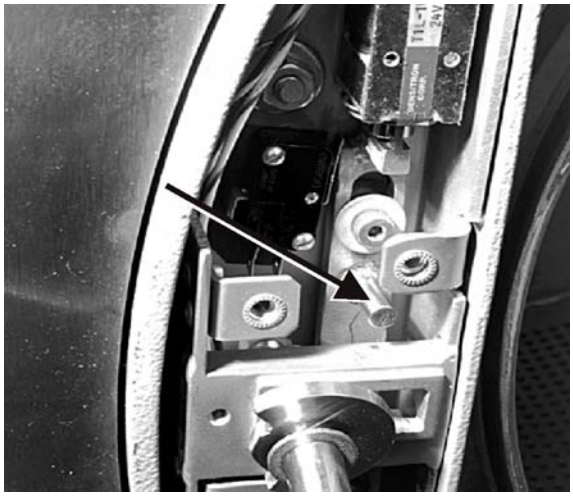
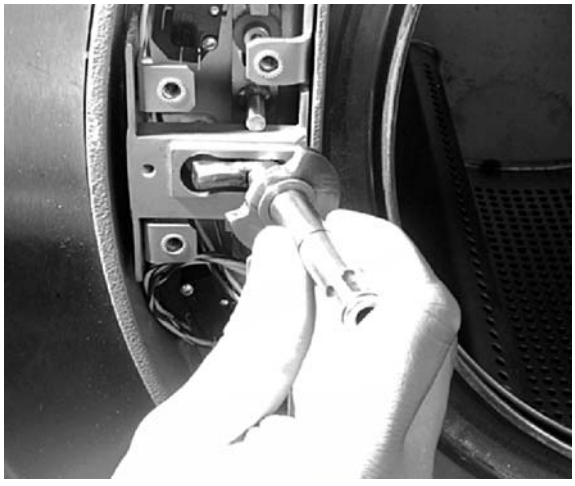


Figure 7: Removing the Shaft from the Lock Mechanism



2. Reinstalling the Shaft and Door Handle

Once the goods have been removed from the machine and any malfunction of the door lock mechanism, such as a burned out coil or mechanical interference, has been identified and repaired, reinstall the components as follows:

1. Install the cover on the door lock mechanism.
2. Insert the shaft into the open door and seat the end of the return spring into retaining hole in door shaft cam (Figure 8 and Figure 9).

Figure 8: Shaft in the 9 o'clock Position Showing Spring Retaining Hole

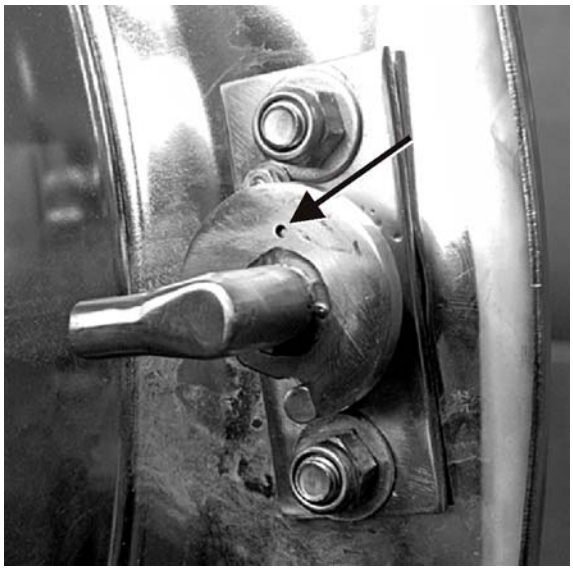
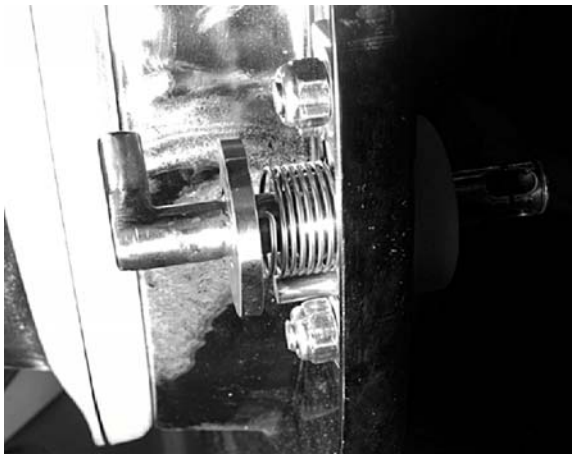


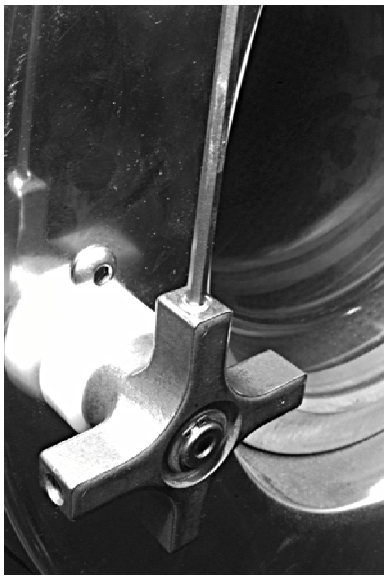
Figure 9: Shaft with Return Spring Installed



3. Looking at the rear of the door, rotate the shaft counterclockwise about 90 degrees, until the shaft fully seats into the door. When properly seated, the shaft finger (the latch) will align with the key way on the door lock mechanism.
4. Install the rear retaining clip on the shaft.
5. Slide the door handle and flange bearing onto the shaft.
6. Install the front thrust bearing and retaining clip on the shaft.
7. Repeat the following sub-steps four times—once for each ball, spring, and set screw: (Figure 10 and Figure 11):
   a. Drop the ball into the hole of door handle top spoke, followed by the spring, as shown in Figure 10.
   b. Install the set screw. As previously stated, the handle should ratchet if more turning force than necessary is applied or if turned counterclockwise. Tighten the set screw until the set screw is flush with the handle. This will provide roughly the correct spring tension.
   c. Rotate door handle counterclockwise 90 degrees to ratchet it to the next position (with the next spoke on top).

Figure 10: Inserting Ball and Spring in Handle Spoke

Figure 11: Adjusting Set Screw



8. When all four set screws are in place, check to be sure the handle will ratchet if turned counterclockwise, or if latched with more force than necessary. Make 1/4 turn adjustments to all four set screws if necessary to achieve the proper tension.
9. Install the black plastic cap over the center of the handle.

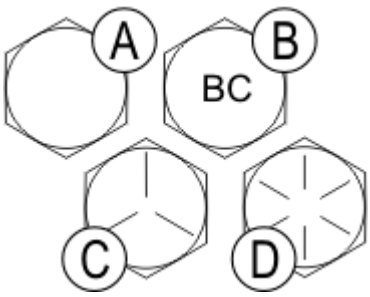
— End of BIRH3M02 —

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.

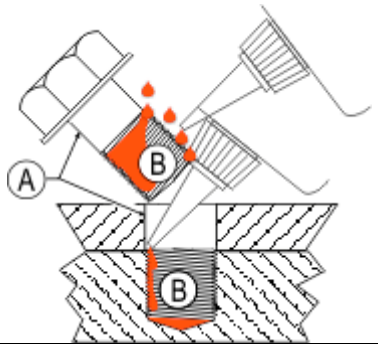
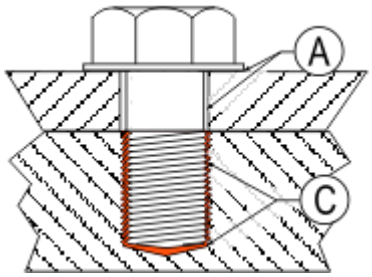
3. Application of Threadlocking Compound

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

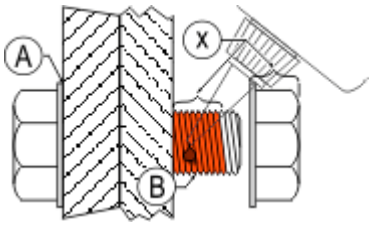
3.1. Blind Holes

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).

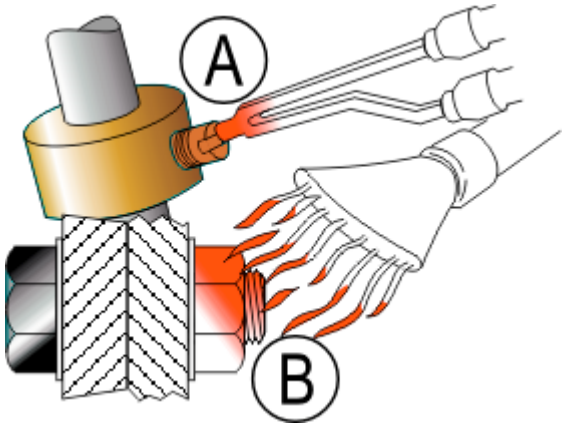
Figure 3: Through Hole

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 —

Safety Placard Use and Placement

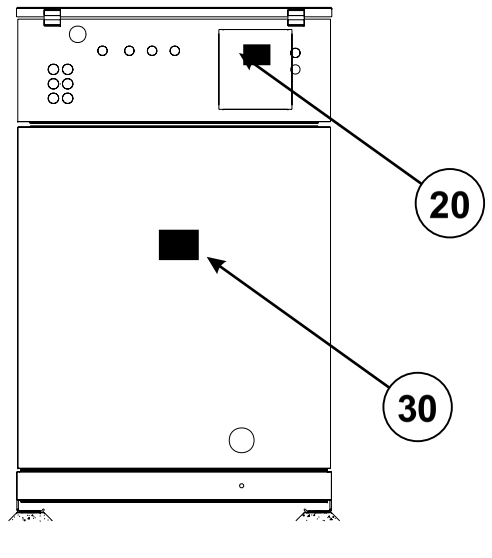
30022H8J

BMP020107/2002145V
(Sheet 1 of 2)

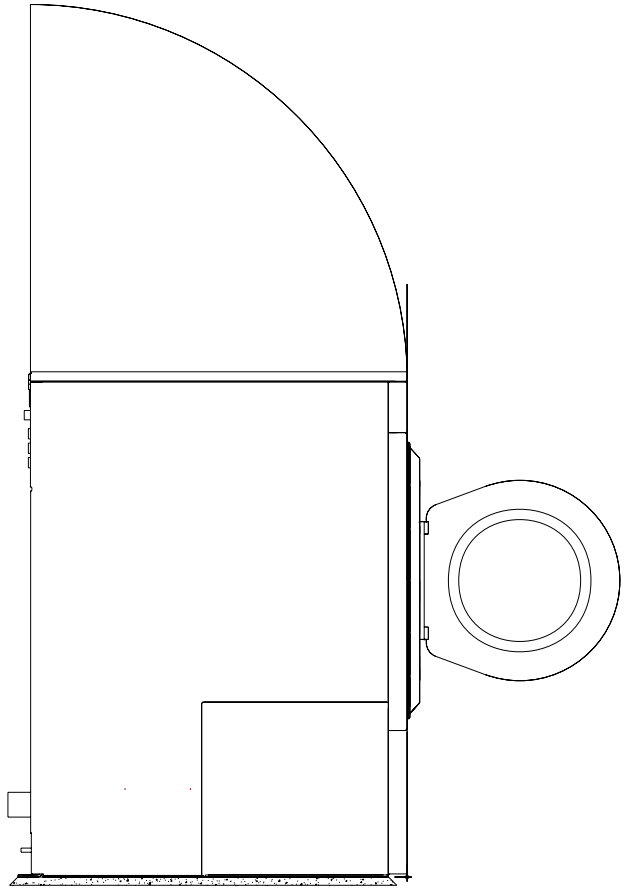
Pellerin Milnor Corporation
P. O. Box 400, Kenner, LA 70063-0400

Litho in U.S.A.

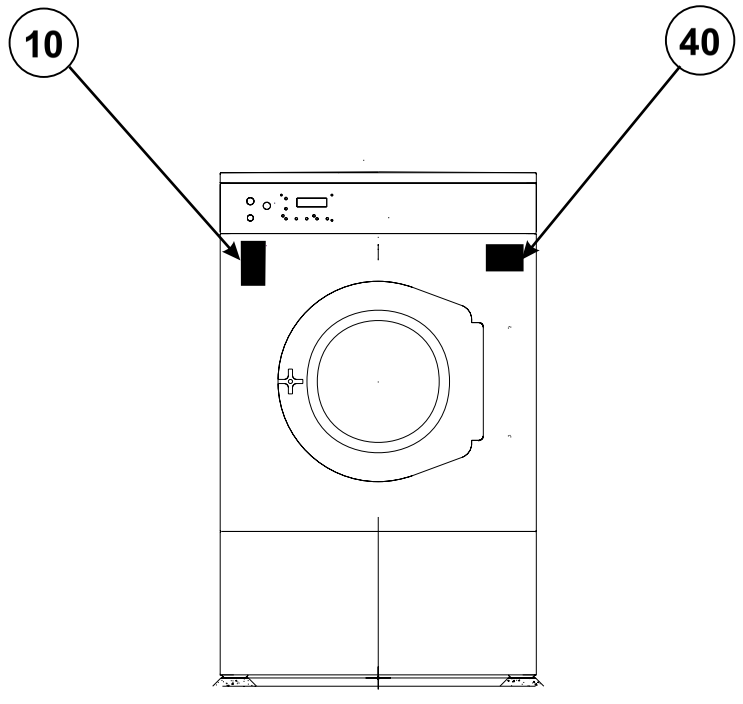
Notes:
1. **Replace placard immediately, if removed or unreadable.**
2. **Approximate locations of placards are shown. If Aluminum Placard Mounting holes are provided on machine. Use #8 self-tapping screws.**



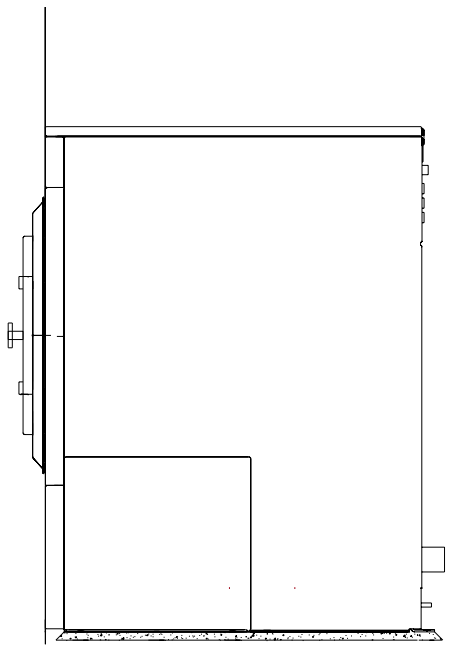
REAR VIEW



LEFT VIEW



FRONT VIEW



RIGHT VIEW

42

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

Litho in U.S.A.

Parts List—Safety Placard Placement

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	10	01 10635A	NPLT:SHELL FORNT RIDGID-TCATA	
all	20	01 10375B	NPLT:ELEC HAZARD SMALL-TCATA	
all	30	01 10689A	NPLT:BELT HAZARD SM TCATA	
all	40	01 10699A	NPLT:SERV HZRD-PLYEST-TCATA	

Safety Placard Use and Placement ISO

30022H8J

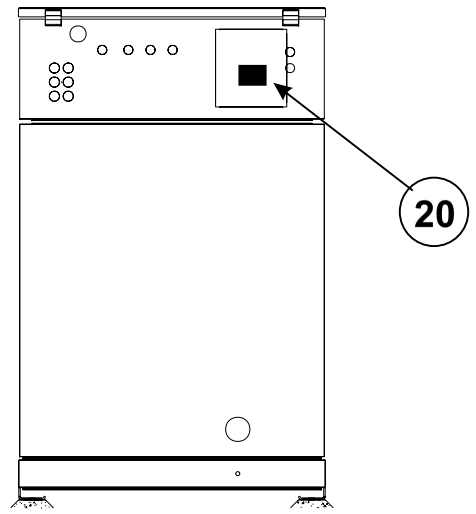
Pellerin Milnor Corporation
P. O. Box 400, Kenner, LA 70063-0400

Litho in U.S.A.

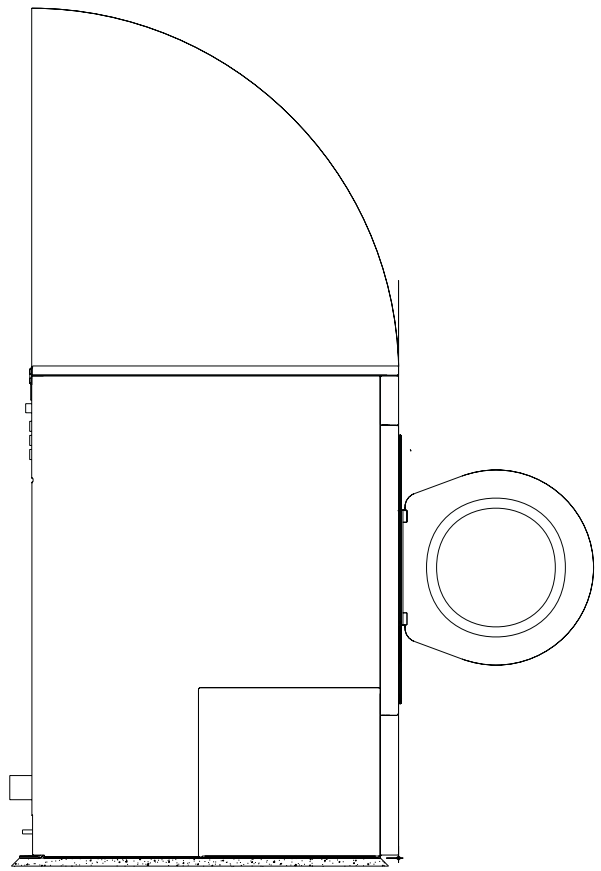
ISO Placards shown on this page

Notes:

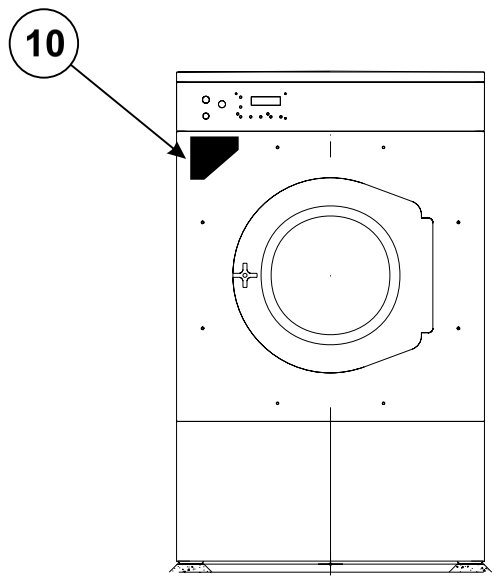
1. **Replace placard immediately, if removed or unreadable.**
2. **Approximate locations of placards are shown. Mounting holes are provided on machine. Use #8 self-tapping screws.**



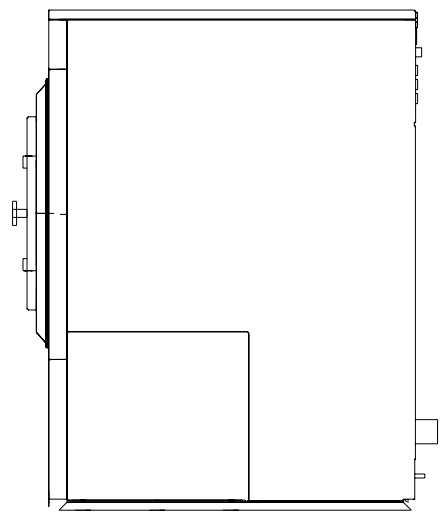
REAR VIEW



LEFT VIEW



FRONT VIEW



RIGHT VIEW

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

Litho in U.S.A.

Parts List—Safety Placard Placement

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	10	01 10635X	NPLT:30"WE RIGID WARNING ISO	
all	20	01 10375	NPLTE:"WARNING" 2X2	

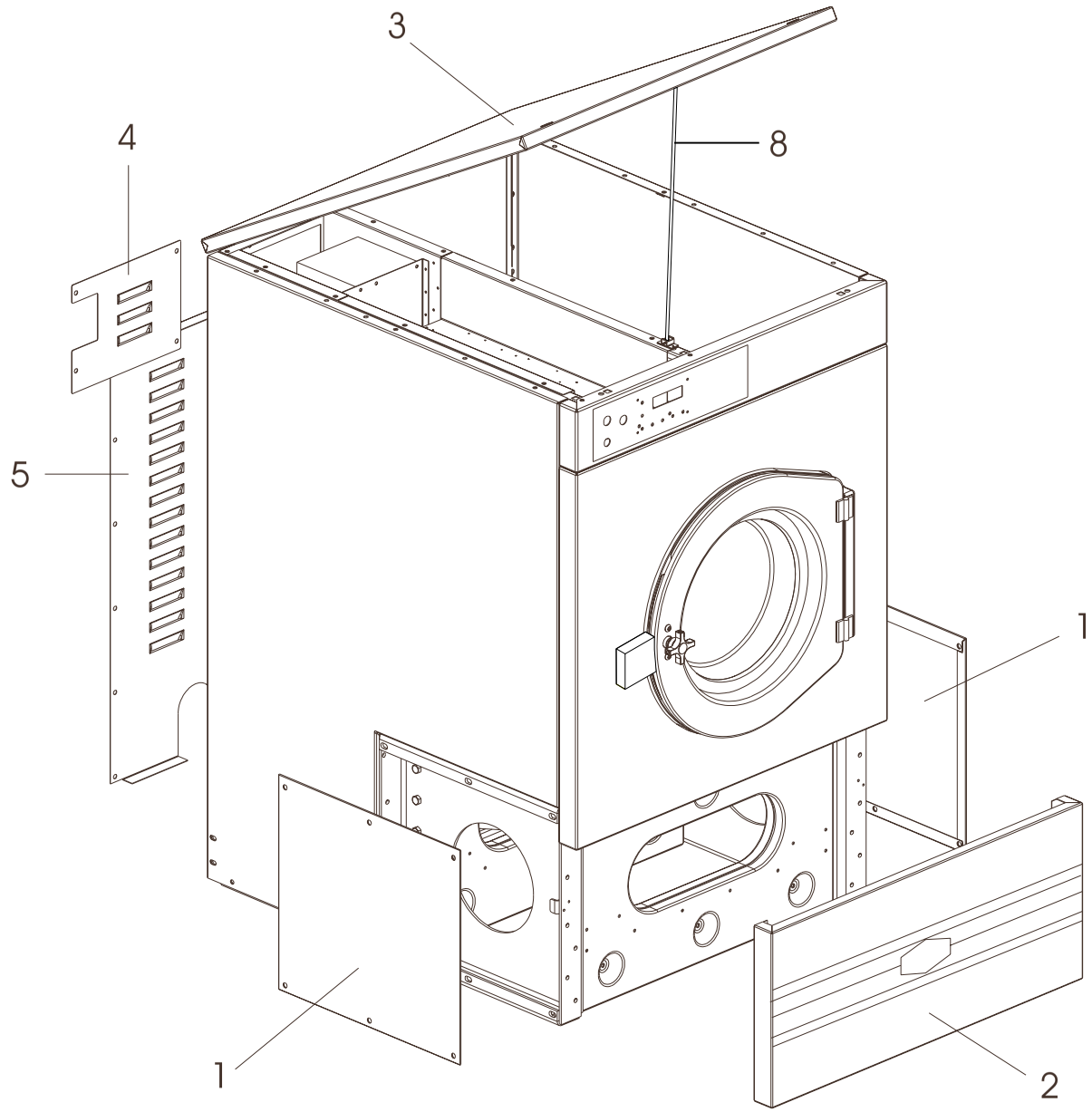
Guards and Covers

30022H8J

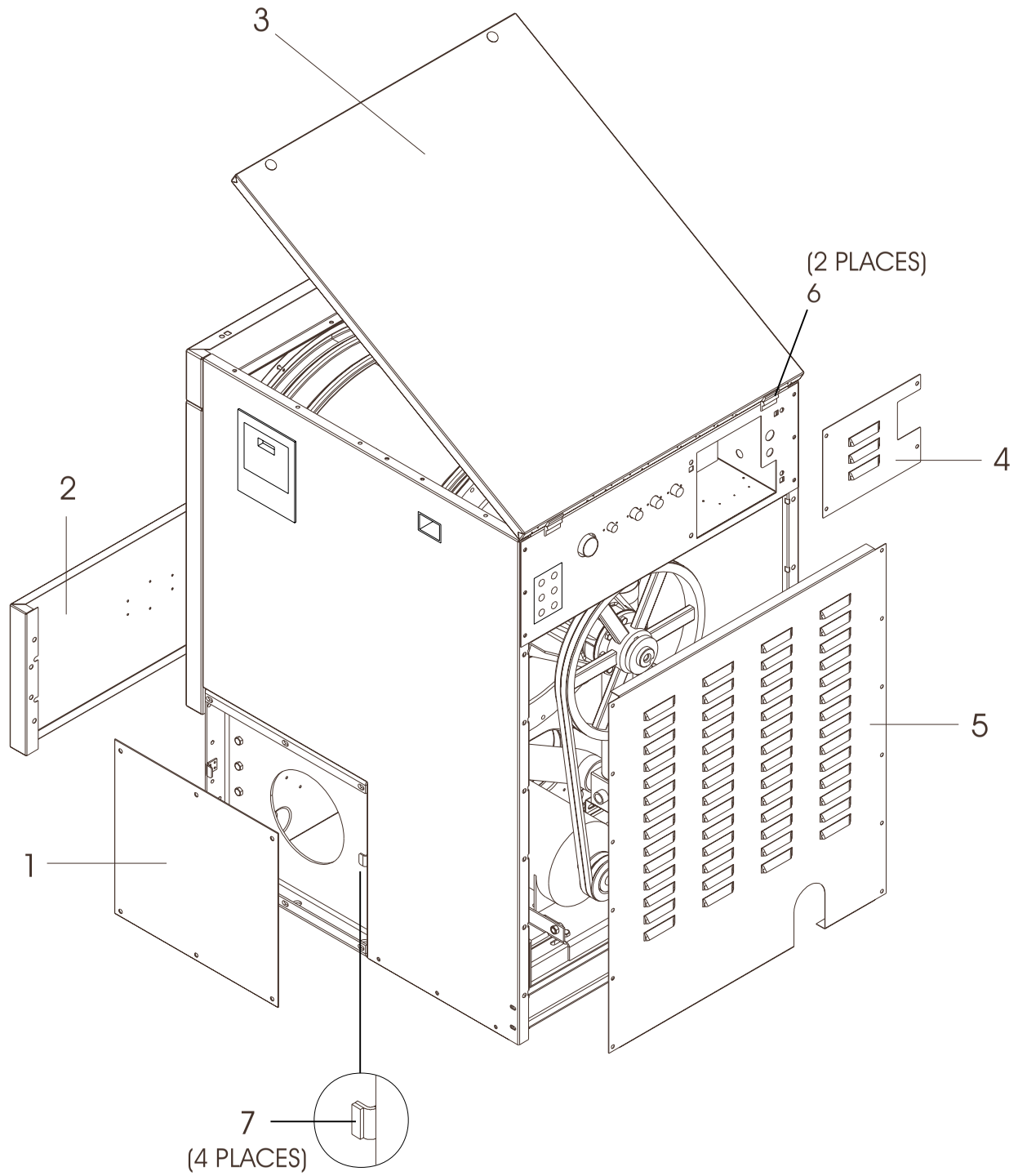
BMP010026/2004275V
(Sheet 1 of 2)

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

Litho in U.S.A.



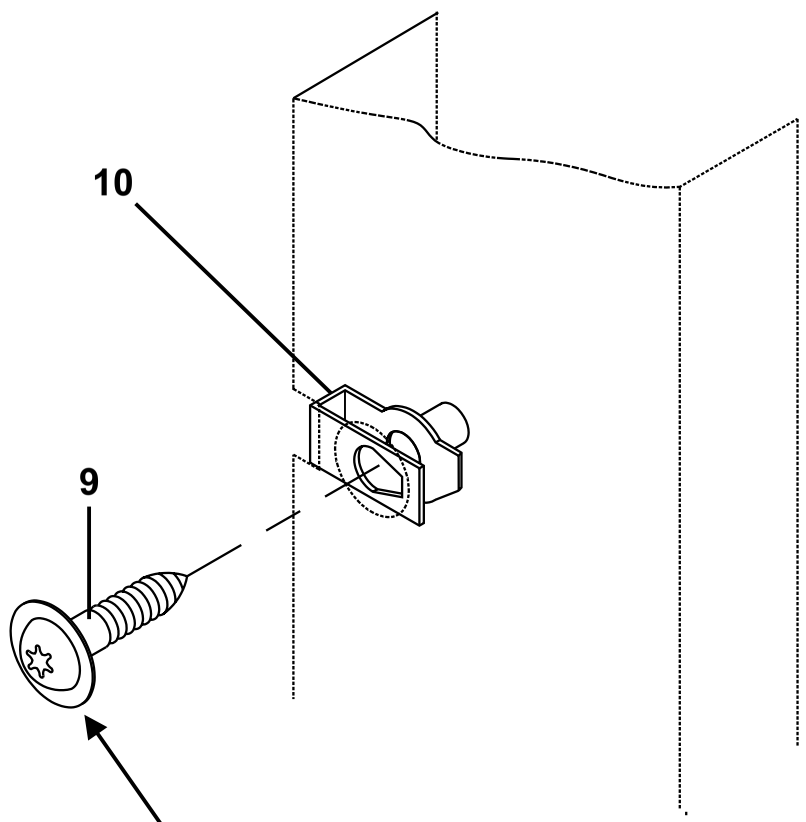
Note: To remove lower front access panel (item 2) the two side access panels (item 1) must be removed first.



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

Litho in U.S.A.

ACCESS PANEL FASTENERS
(TYPICAL ALL REMOVEABLE PANELS)



Installation and removal of screws (item 9) requires TORX™ T-30 Drivers.

TORX™ is a registered trademark of Textron, Inc.

Parts List—Guards and 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	GHG3022H8	20010Z INSTL=GEN HOUSE LC, 3022H8	
			COMPNENTS	
All	1	02 03243	98406B SIDE ACCESS PANEL, 3022H7	
All	2	02 03188	20014B LWR FRONT PANEL LC, 3022H8	
All	3	02 03190	20014C TOP COVER LC, 3022H8	
All	4	02 03278	20014B INVERTER COVER, 3022H7	
All	5	02 03239	20014B REAR BELT COVER, 3022H7	
All	6	27A108	DOORHINGE EMKA#1056-U8	
All	7	60A003B	NEO RUBBER STRIP 1/8" X 1" CLS	
All	8	04 21412B	99136# TOP PANEL LIFT ROD, 3022H7	
All	9	15N110H	RDWASHHD TORXBOLT M6-1X25MM ZN	
All	10	15G004HB	EXTRUNUT M6-1 GRIP 0.8-4MM	

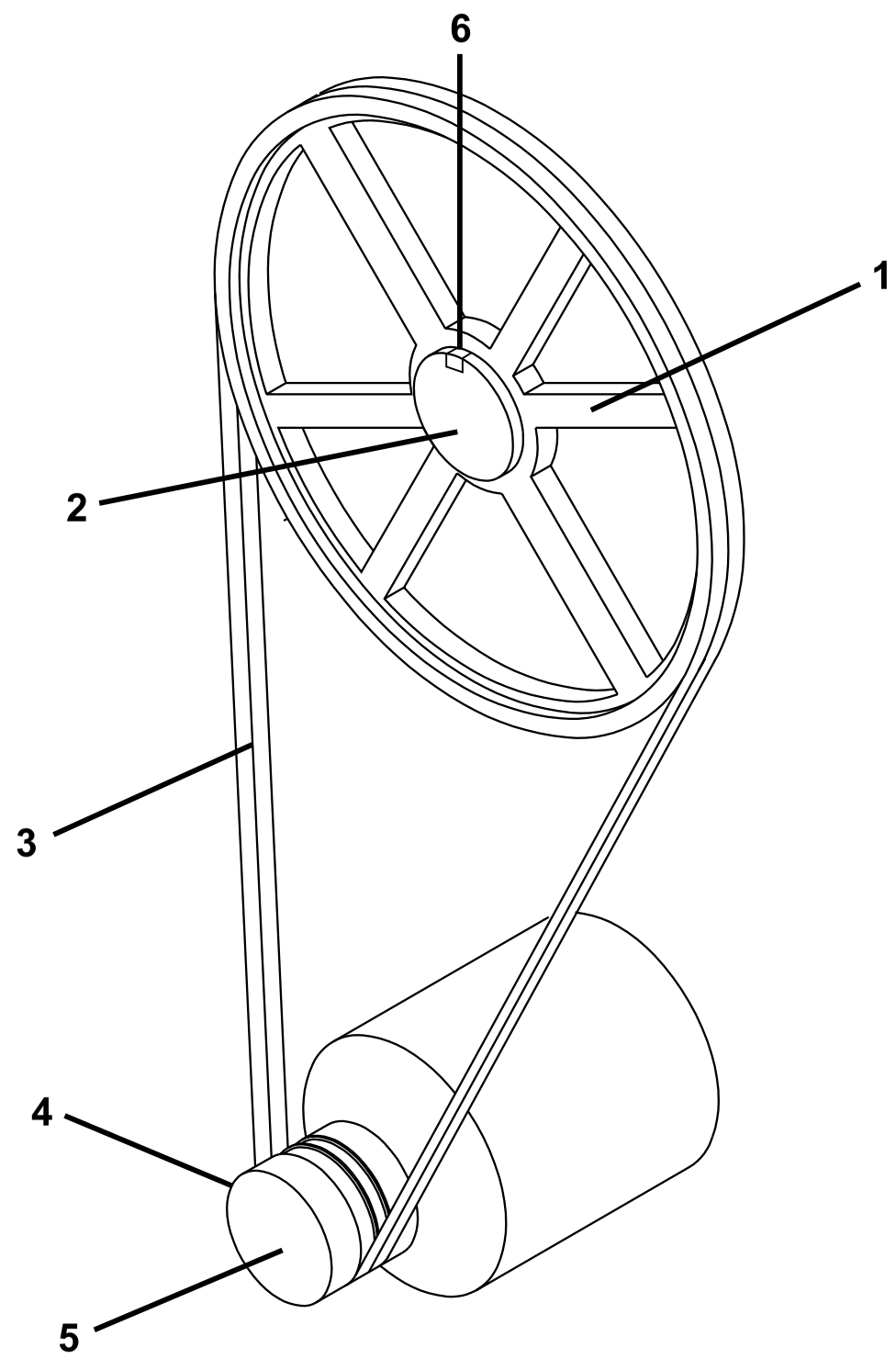
Section 2

Drive Assemblies

Drive Chart
30022H7J, H8J

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

Litho in U.S.A.



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.

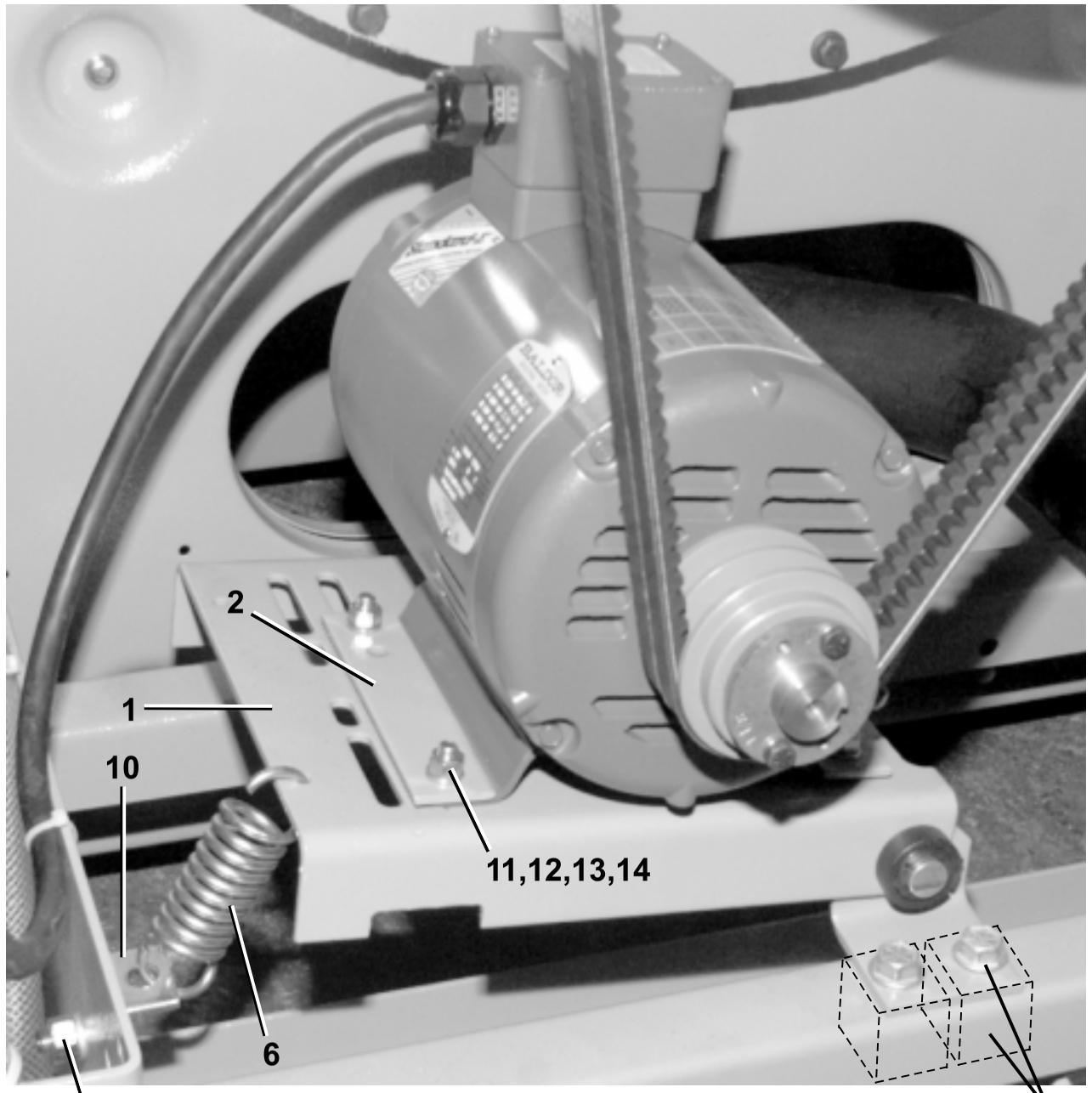
Used In	Item	Part Number	Description	Comments
			----------ASSEMBLIES----------	
	A	D33 03250	96431Z DRIVE CHART=3022H7 50/60HZ	
			----------COMPONENTS----------	
all	1	56184B2SK	VPUL 2B18.4/A18.0 (SK) TYPE QD	
all	2	56Q2ASK	2.0" BUSHING VPUL QD TYPE "SK"	
all	3	56VB085X	VBELT BX85 RAWEDGE COG	
all	4	56030B2H	VPUL 2B3.0/A2.6 2BK32H R EQUAL	
all	5	56Q1CH	1+1/8" BUSH VPUL TYP H,D,OR QT	

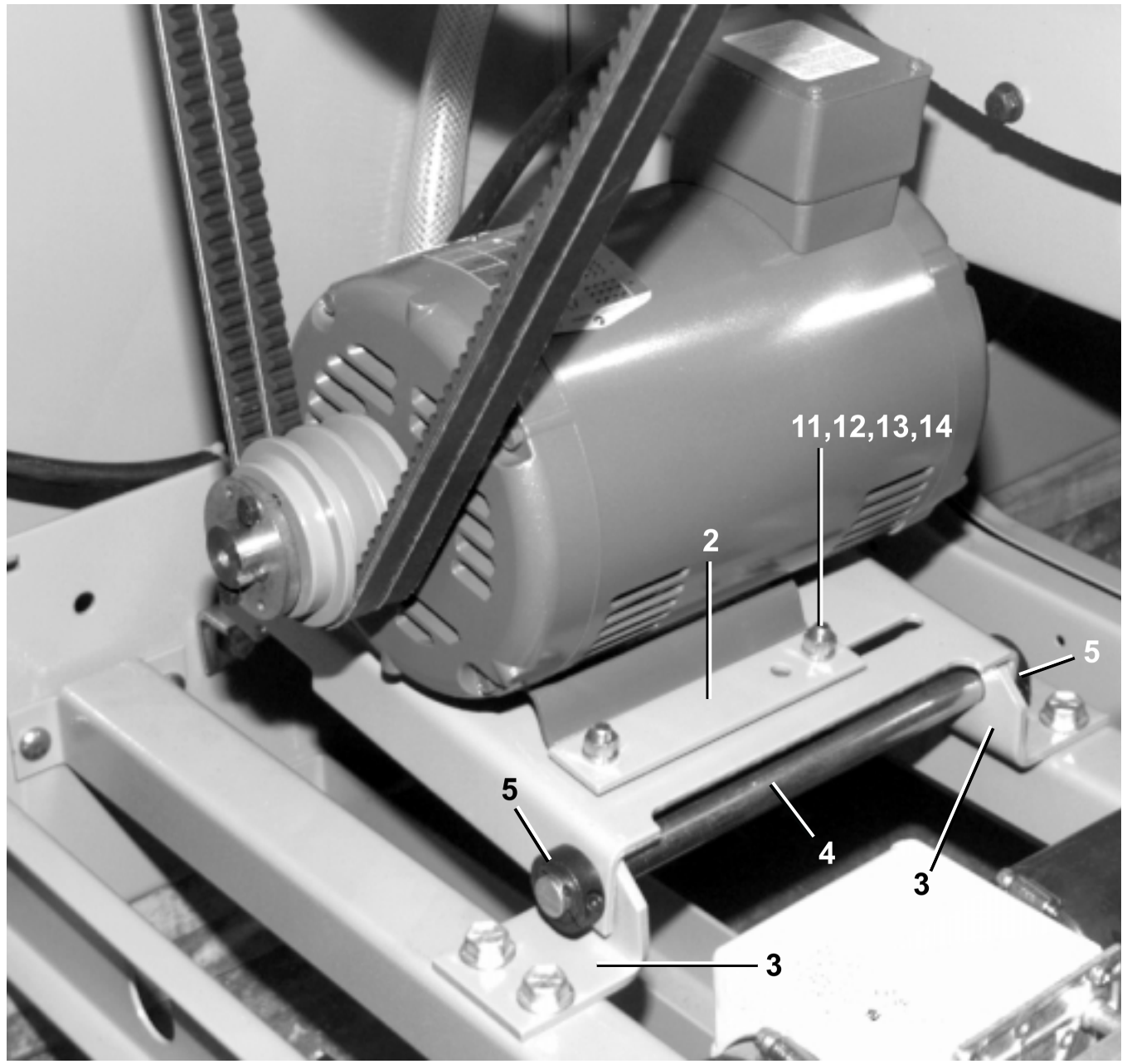
Motor Mount

30022H8J

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

Litho in U.S.A.





Pellerin Milnor Corporation
P. O. Box 400, Kenner, LA 70063-0400
Litho in U.S.A.

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.

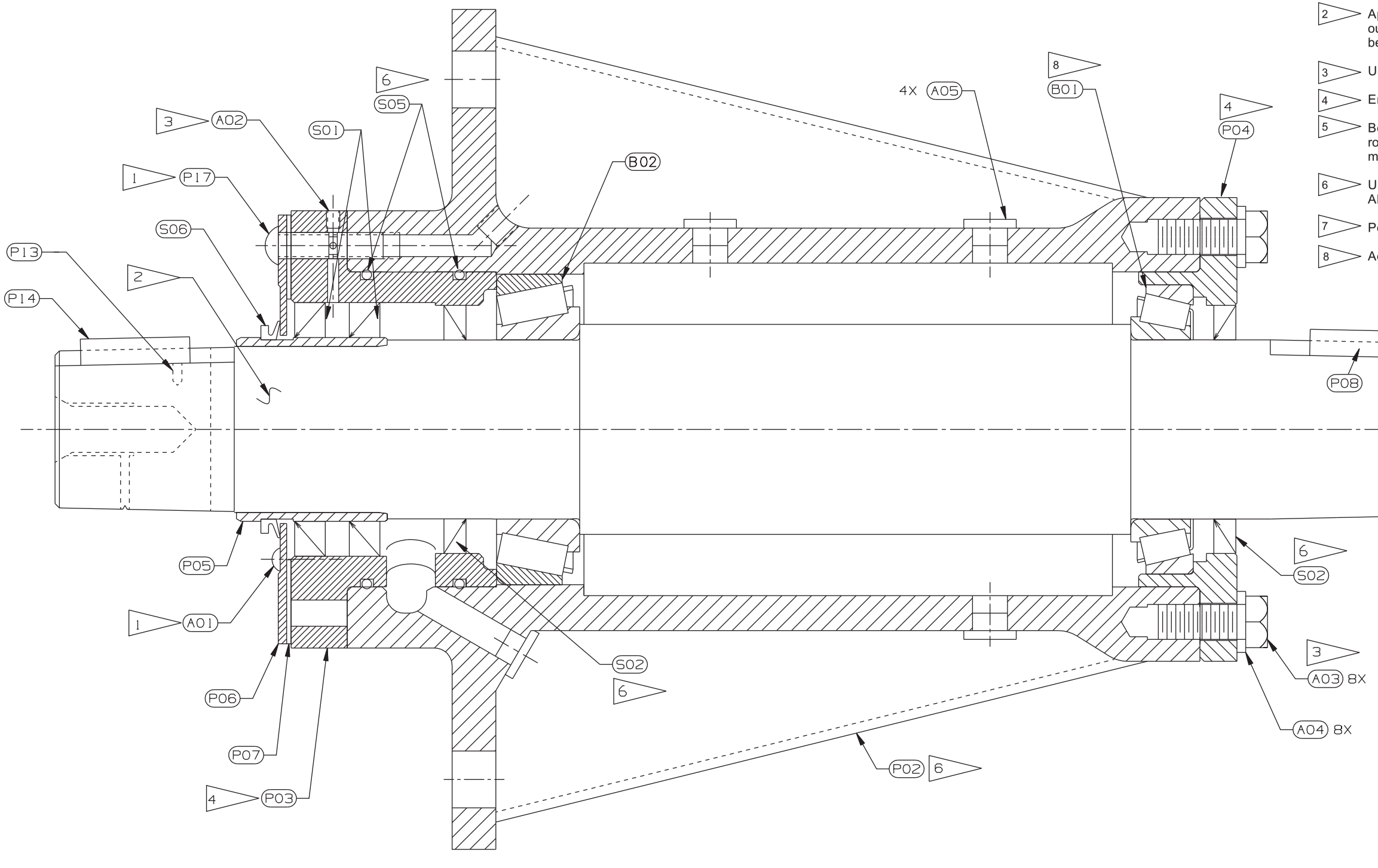
Used In	Item	Part Number	Description	Comments
			----------ASSEMBLIES----------	
	A	ADB3022H8	ASSY=DRIVE BASE LC, 3022H8	
			----------COMPONENTS----------	
all	1	02 04256	PLATE=MOTOR MNT, 3022S4	
all	2	02 03839B	PLATE=MTR MNT REINFORCEMENT	
all	3	02 03196	BRKT=MOTOR MOUNT LC, 3022H8	
all	4	02 04258	SHAFT=MOTOR MOUNT, 3022S4	
all	5	54JH10750C	SHFTCOLLAR 3/4" CLPTYP CFG#12S	
all	6	02 04259	SPRNG/MOT MOUNT/3022S4#SPC2690	
all	7	15K162	HXCAPSCR 1/2-13UNC2AX1.5 GR5 P	
all	8	15U300	LOKWASHER REGULAR 1/2 ZINC PLT	
all	9	15G230	HXNUT 1/2-13UNC2B SAE ZINC GR2	
all	10	02 19288	BRACKET=ADJUSTING-1.5X1.75	
all	11	15K092	HEXFLGSCR 3/8-16X1 GR8 CS	
all	12	15U241	FLATWASHER 13/32IDX1+3/4ODX14G	
all	13	15U255	LOCKWASHER MEDIUM 3/8 ZINCPL	
all	14	15G198	HXFLGNUT 3/8-16 ZINC	
all	15	15K154H	INDHEXFLGSCR 1/2-13X1+3/4GR8ZN	
all	16	02 19283	NUT=1/2-13UNCX1+1/2SQ SPEC	

Main Bearing

30022X8_, 30022H8_

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

Litho in U.S.A.



NOTES:

1. Use Loctite Anti-Seize Compound.
2. Apply Grade A Loctite to this surface before applying the sleeve. The shaft outside diameter and sleeve inside diameter must be clean and free from oil before applying Loctite. Insure bonding on at least 75% of the surface.
3. Use Loctite 242 with items A02 and A03.
4. Ensure items P03 and P04 are fully seated before tightening the fasteners.
5. Bearing Set: Take up on the cup carrier until the bearings bind slightly in rotation. Measure the shim gap and provide sufficient artum shim to allow a minimum of .004 looseness and a maximum of .005 looseness.
6. Use Loctite 680 on outside diameter of S01 and S02. Allow 24 hours to cure. All relevant surfaces must be clean and free from oil prior to assembly.
7. Position item A02 flush with P03 surface.
8. Add Loctite 609 and primer to the rear bearing cup and holder housing.

NOTE:
When replacing the seal holder, torque item P17 (a specially modified bolt) to 150 inch-pounds.
For details of the recommended procedure, see MSSM0261AE - Replacing 30Fxx Main Bearings.
Torque the remaining bolts to standard torque.

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

Litho in U.S.A.

Parts List—Main Bearing

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	ABM3022XA	MAIN BEAR ASSY 3022X 54A593597	3022X8_
	B	ABM3022XB	BRING ASSY VIT 3022X 54A593597	3022X8_VITON
	C	ABM30211A	3022H7 BEARING ASSY 54A593597	3022H8_
	D	ABM30211B	3022 BRNG ASSY 54A593597 VITON	3022H8_VITON
			----------COMPONENTS----------	
all	A01	15K143D	SOCHDCAPSCR 7/16-14X1.5 SS	
all	A02	15Q068A	SOKSETSCR CUP10-32X1/4 SS	
all	A03	15K154A	HEXCAPSCR 1/2-13X1.5 G8 ZN	
all	A04	15U317B	FLWASH,1.062ODX.531IDX.115 TH	
all	A05	27A253	PLUG FOR 1/2BOLTHOLE CAPLUG #4	
all	B01	54A915916	TIM#JLM710949C/JLM710910-2.5"B	
all	B02	54A593597	TIMKEN CUP#39521/39590=2.625"B	
A	P01	X2 03833B	MACH=SHAFT, 3022X8 54A593597	
B	P01	X2 03232A	MACH=SHAFT, 3022H7 54A593597	
all	P02	X2 03840H	MACH=MAIN BRNG HOUSING,3022H	
all	P03	X2 03831	MACH=FRONT SEAL HOLDER 3022F	
all	P04	X2 03832	MACH=REAR SEAL HOLDER 3022F	
all	P05	02 03825	SLEEVE=BEARING SHAFT 3022F	
all	P06	02 03826	COVER=V-RING SEAL 3022F	
all	P07	02 03823A	GASKET=3022F V-RING SEAL	
all	P13	15H089S	SPRINGPIN 1/8"DIA X 5/8" LONG	
all	P14	02 02294A	SHAFT KEY 3/8 X 3/8	
all	P17	15K106FA	BUTSKCAPSC 3/8-16X1.5 SSNYPT	
A	S01	24S053	SEAL 2.625X3.625X.437#10051L5	
B	S01	24S053V	SEAL 2.625X3.625X.437#10050H5L	
A	S02	24S052A	SEAL 2.559X3.55X.315 CR#25430	
B	S02	24S052V	SEAL 2.559X3.55X.315VTCR#25431	
all	S05	60C151A	ORING 4+1/4ID1/8CS BUNA70#244	
all	S06	24S105FN	SEAL 2.48X2.68X2.28X.20V65A-N	

Parts List, cont.—Main Bearing

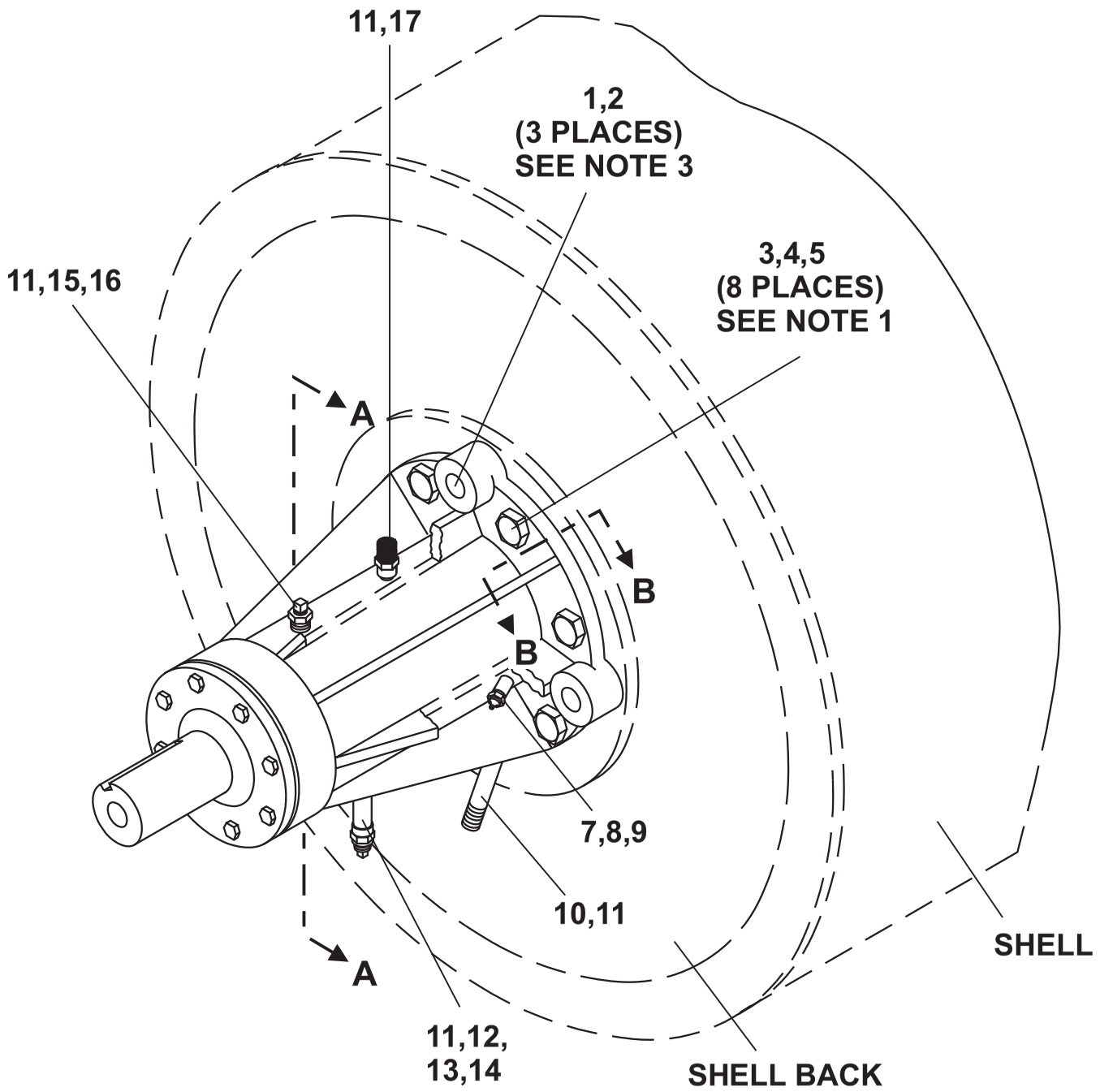
Used In	Item	Part Number	Description	Comments

Main Bearing Installation

30022H7x, H8x

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

Litho in U.S.A.



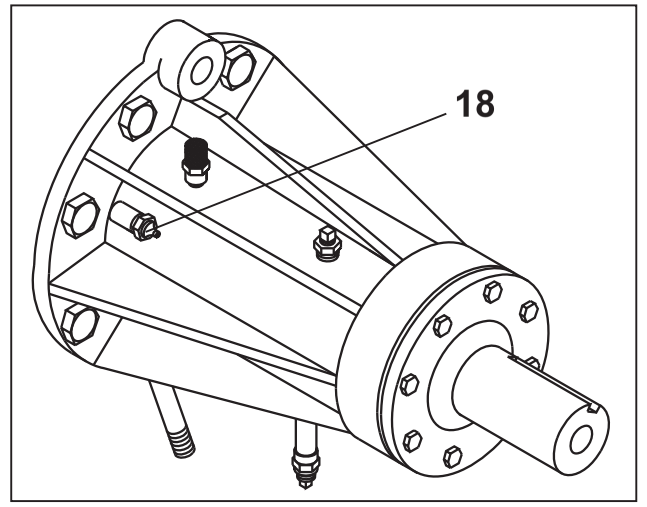
PULLEY AND ASSOCIATED PARTS NOT SHOWN FOR CLARITY

NOTES:

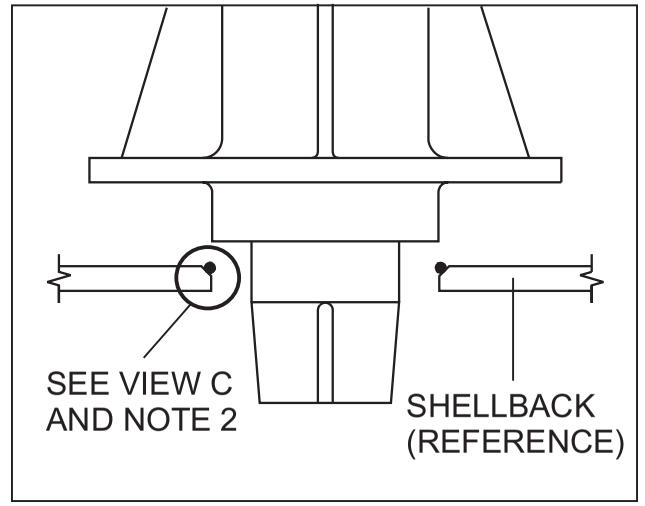
1. TORQUE, ITEM 3, TO 200 FT. LBS. USING ITEM 5 (LOCTITE #242).

2. APPLY A 1/4" INCH DIAMETER BEAD OF SILICONE, ITEM 6, TO INSIDE EDGE OF SHELLBACK PILOT BEVEL, PRIOR TO INSTALLING BEARING ASSEMBLY. SEE VIEW B-B AND VIEW C.

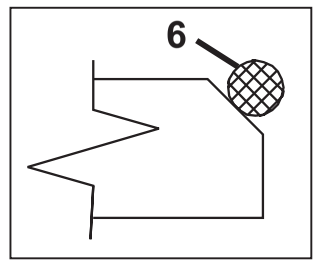
3. USE ITEM 1 AS PUSH-OFF BOLTS, 3 PLACES, FOR BACKING OUT BEARING ASSEMBLY.



VIEW A - A



VIEW B - B



VIEW C

Pellerin Milnor Corporation
P. O. Box 400, Kenner, LA 70063-0400
Litho in U.S.A.

Parts List—Main Bearing 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	GBM30211	97126ZINSTALL=MAIN BRG ASSY 3022H7	
A	B	ABM30211	98353#*MAIN BEARING ASSY=3022H7	
			----------COMPONENTS----------	
A	1	15K231	04Z HXCPSC-3/4-16X1+1/2 GR8 ZINC	
A	2	15U340	LOCKWASH MEDIUM 3/4 ZINCPL	
A	3	15K215	HXCAPSCR 5/8-18X1.5 ZNCFULL THR	
A	4	15U316	05ZFLTWASH 5/8 ZNC DICR	
A	5	20C008C	112697 THDLK-RMVBL #242-41	
A	6	20C040B	SILSEAL RTV CLR10.2 OZ #59575	
A	7	54M030	RELIEFFIT 1/8ST ALEMITE 317400	
A	8	5N0CCLSB42	NPT NIP 1/8XCLS TBE BRASS STD	
A	9	5SCC0CBE	NPT COUP 1/8 BRASS 125# 103A-A	
A	10	5N0E05AG42	NPT NIP 1/4X5 TBE GALSTL SK40	
A	11	20C014S	072497 PIPE SEALW/TEF#56765	
A	12	5SCC0EBE	NPT COUP 1/4 BRASS 125# W/HEX	
A	13	5SP0EFFSSM	NPT PLUG 1/4 SQSLDMAGNET BLKST	
A	14	5N0E01KBE2	NPT NIP 1/4X1.5TBE BRASS STD.	
A	15	5SB0E0CBEO	NPTHEXBUSH 1/4X1/8 BRASS 125#	
A	16	5SP0CBESS	NPT PLUG 1/8 SQ SOLID BRASS	
A	17	27A0050	CLP-RGDSTL COND #P1100-1/2	
A	18	54M021	GRSFIT 1/8PIPE X 1/4STR 1607-B	

Section 3

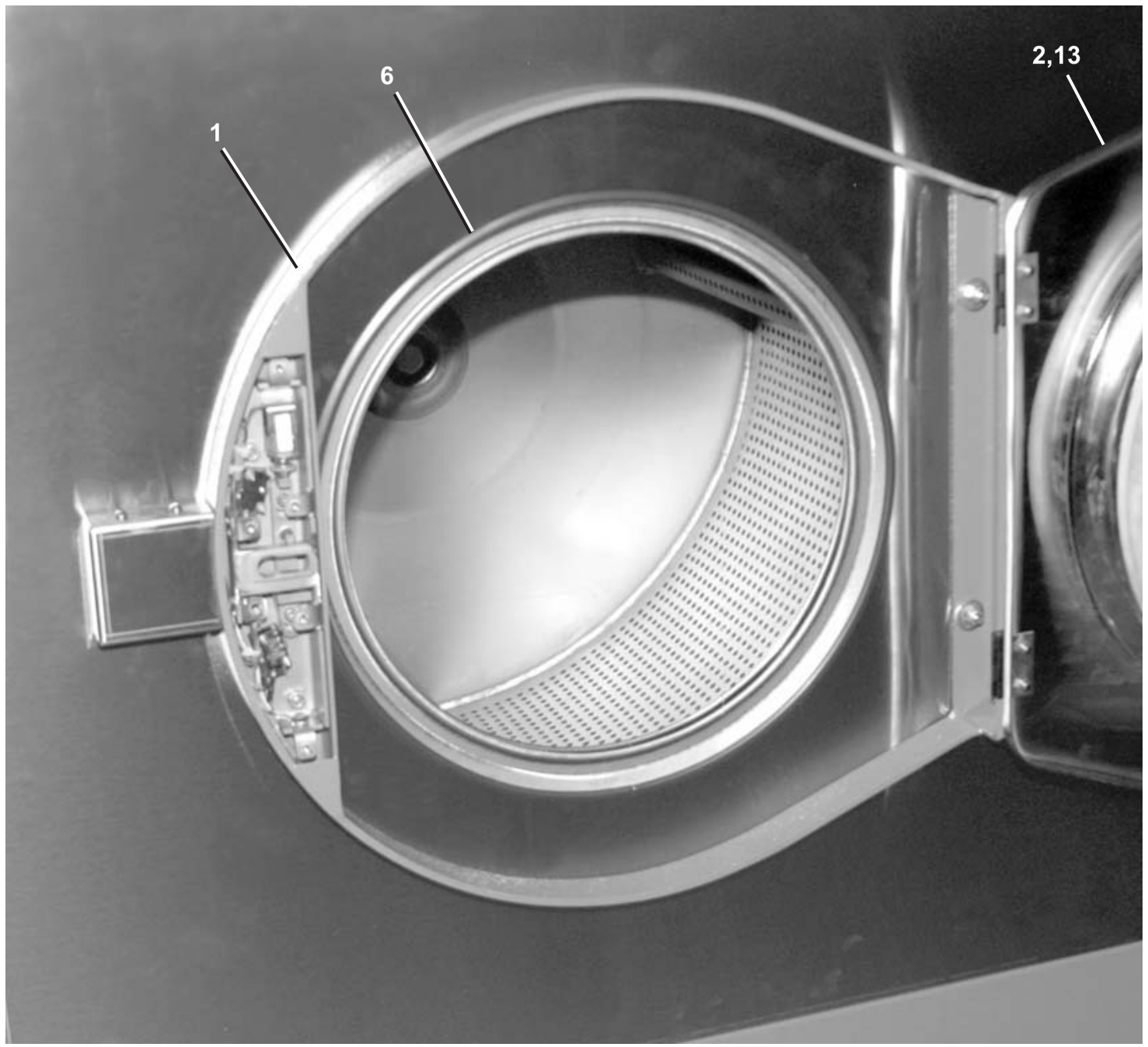
Shell Door and Assemblies

Door Installation and Assembly

30022H8J

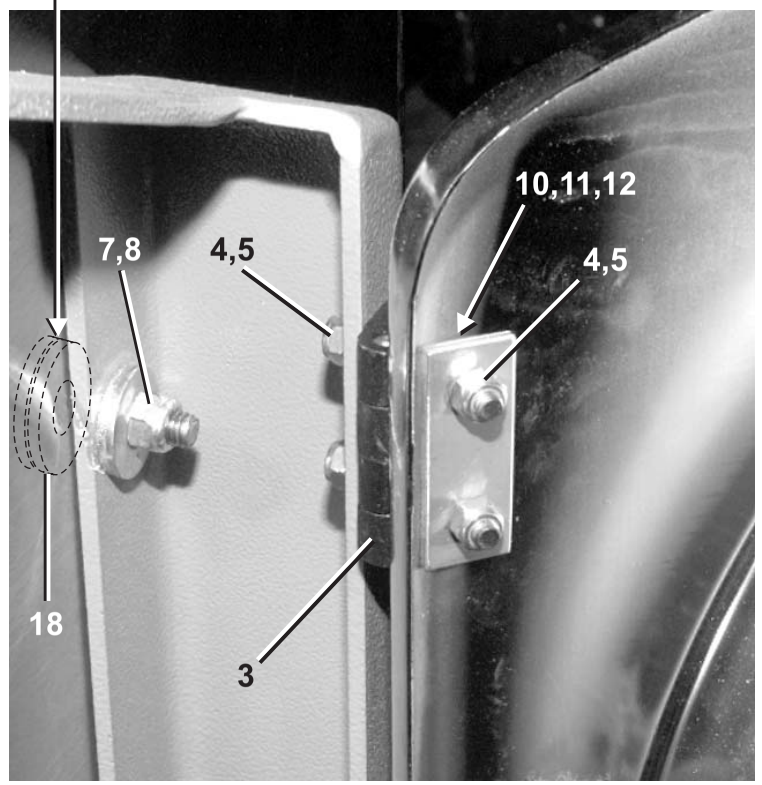
Pellerin Milnor Corporation
P. O. Box 400, Kenner, LA 70063-0400

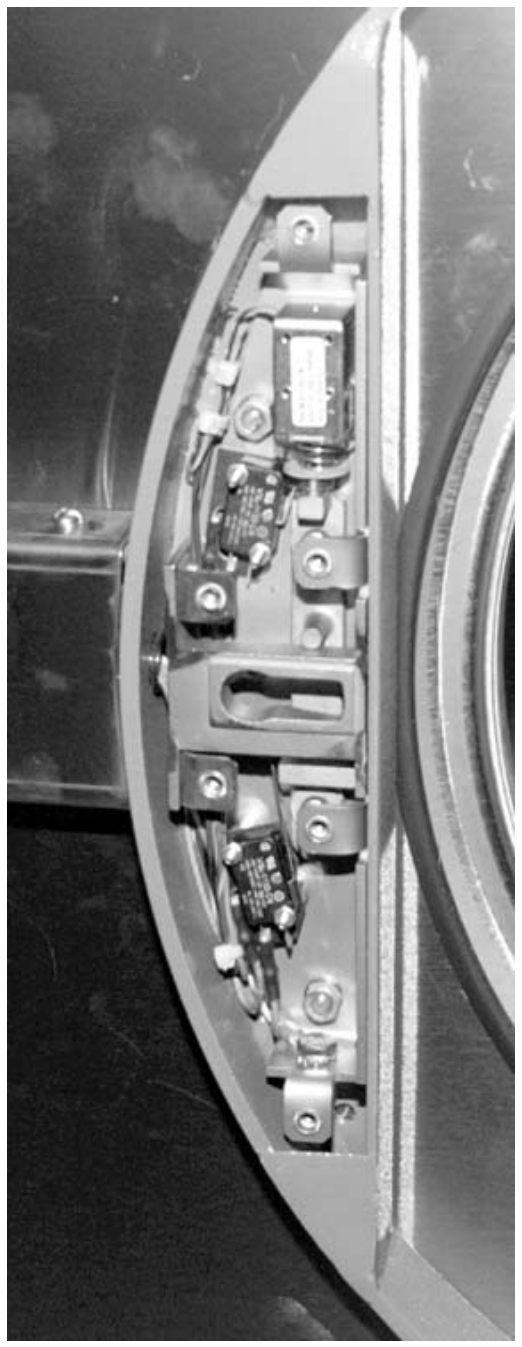
Litho in U.S.A.



3022H8J is shimmed from the factory on the inside, between the shellfront and the cosmetic.

Add or remove shims till the door locks properly and seals.





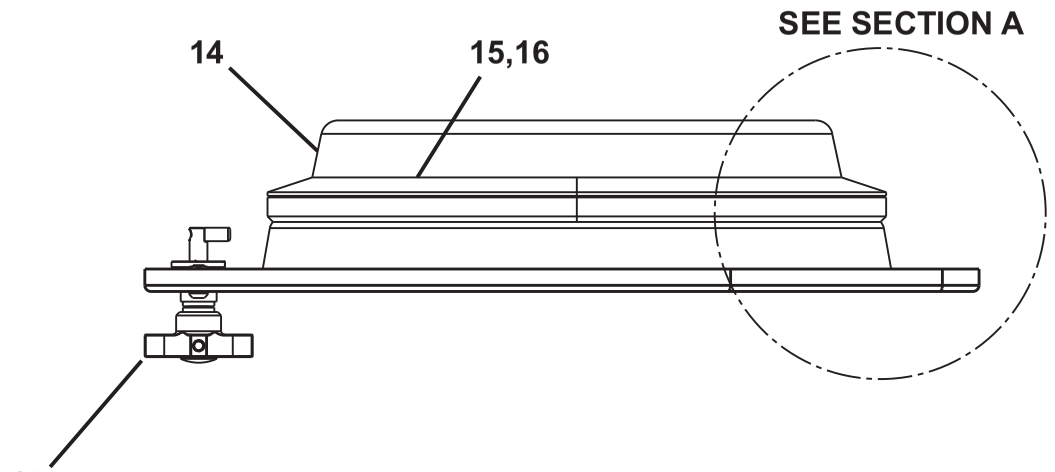
DOOR LOCK MECHANISM
(SEE BMP010019)

Door Installation and Assembly

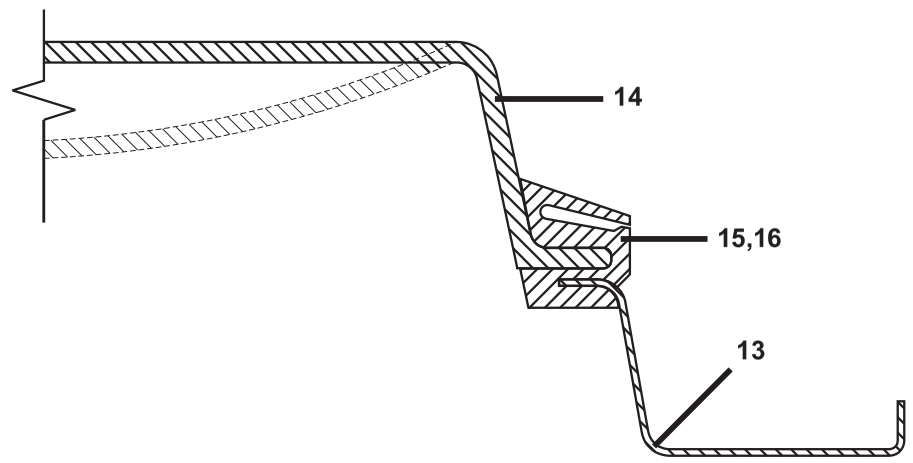
30022H8J

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

Litho in U.S.A.



1. Apply a continuous bead of silicone completely around the rubber seal, in the area where the glass is to be seated.
2. Install the gasket into the door before installing the glass. Observe the location of the rubber seal joint line and adjust if necessary.
3. While installing the glass into the rubber seal, ensure that no silicone is exposed on outer surface of the rubber seal.



SECTION A
DOOR GLASS INSTALLATION

Pellerin Milnor Corporation
P. O. Box 400, Kenner, LA 70063-0400
Litho in U.S.A.

Parts List—Door Installation & 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.

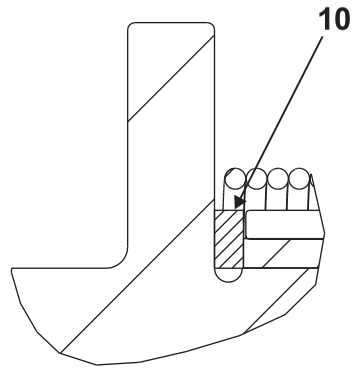
Used In	Item	Part Number	Description	Comments
----------	----------	----------	----------ASSEMBLIES----------	----------
	A	GSD3022H8	INSTL=SHELL DOOR LC 3022H8	3022H8
----------	----------	----------	----------COMPONENTS----------	----------
all	1	A33 03030	ASSY=DOOR FRAME LC, 3022H8	
all	2	A33 03229	ASSY=DOOR, 3022H7	
all	3	27A108	DOORHINGE EMKA#1056-U8	
all	4	15U137	FLTWSHR M6-1 18-8 SS	
all	5	15G004HA	HEXLOCKNUT M6-1 18-8SS	
all	6	60F122	WEAR STR. NYLON US#49021 EA=FT	
all	7	15U200	FLATWASHER(USS STD) 5/16"ZNC P	
all	8	15G188	HEXLOKNUT 5/16-18 BRASS	
all	9	15G192	HXCPNUT 5/16-18UNC2SS18-8 9/16	
all	10	02 04212A	SHIM=SHELL DOOR-14GA,3022H7	
all	11	02 04212B	SHIM=SHELL DOOR-16GA,3022H7	
all	12	02 04212C	SHIM=SHELL DOOR-18GA,3022H7	
all	13	02 03229	SHELL DOOR, 3022H7	
all	14	02 03200	DOOR GASKET, 3022H7	
all	15	02 03251	DOOR GLASS, 3022H7	
all	16	20C040B	SILSEAL RTV CLR10.2 OZ #59575	
all	17	A33 03289A	ASSY=DR HNDL MECH A,3022H	
all	18	15U285	FLATWASHER 1/2 STD COMM SS18-8	

Door Locking Handle

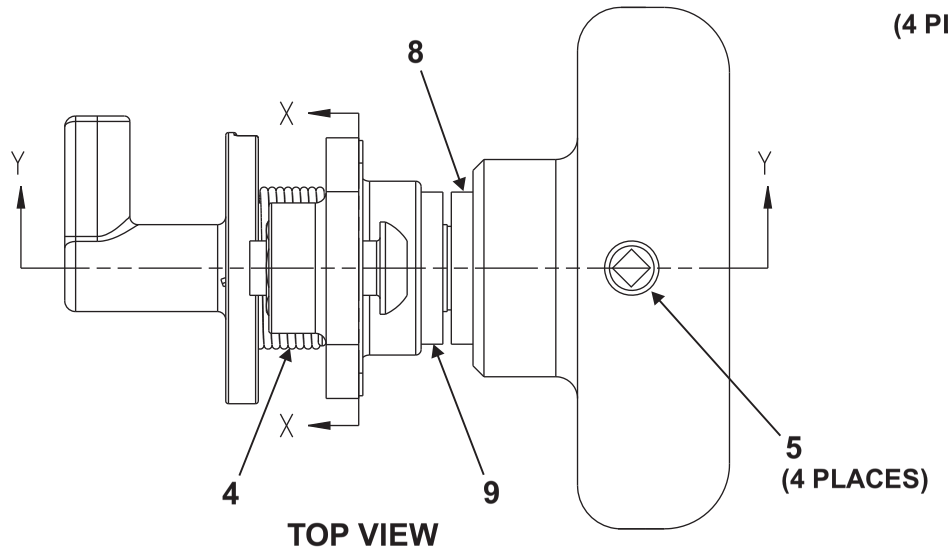
30022H7J, H8J, 30022X8J, X8W

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

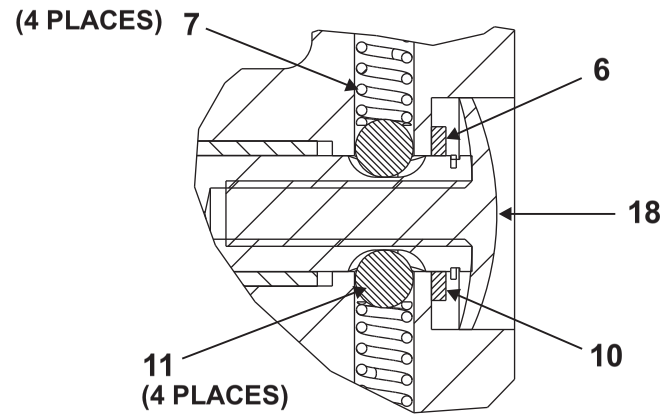
Litho in U.S.A.



DETAIL A

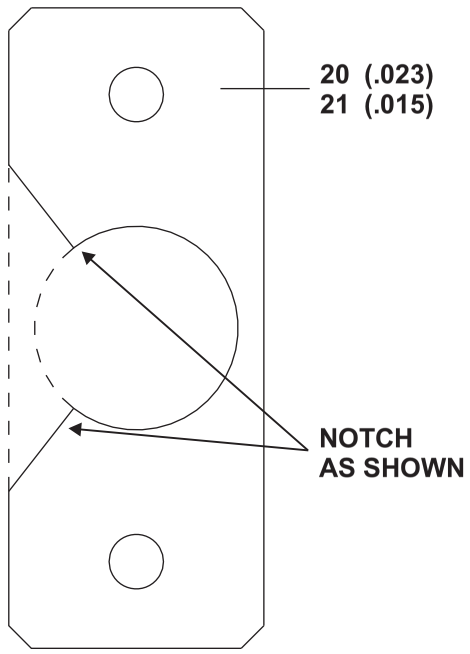


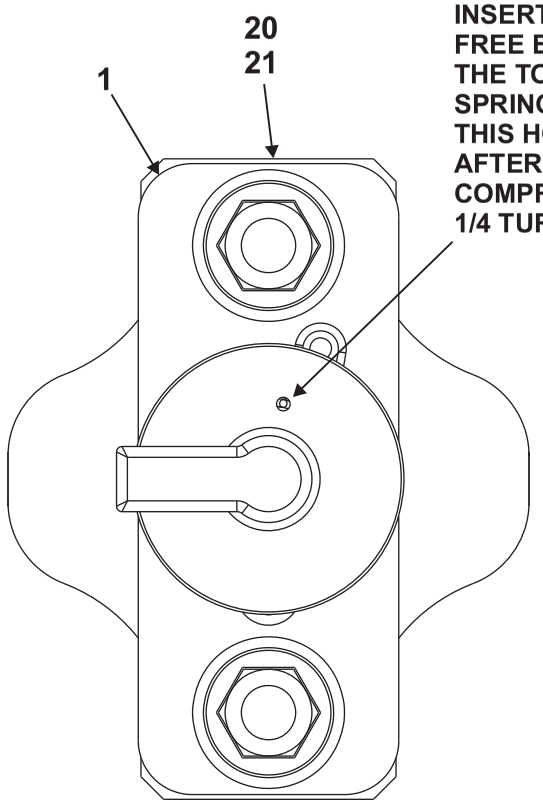
TOP VIEW



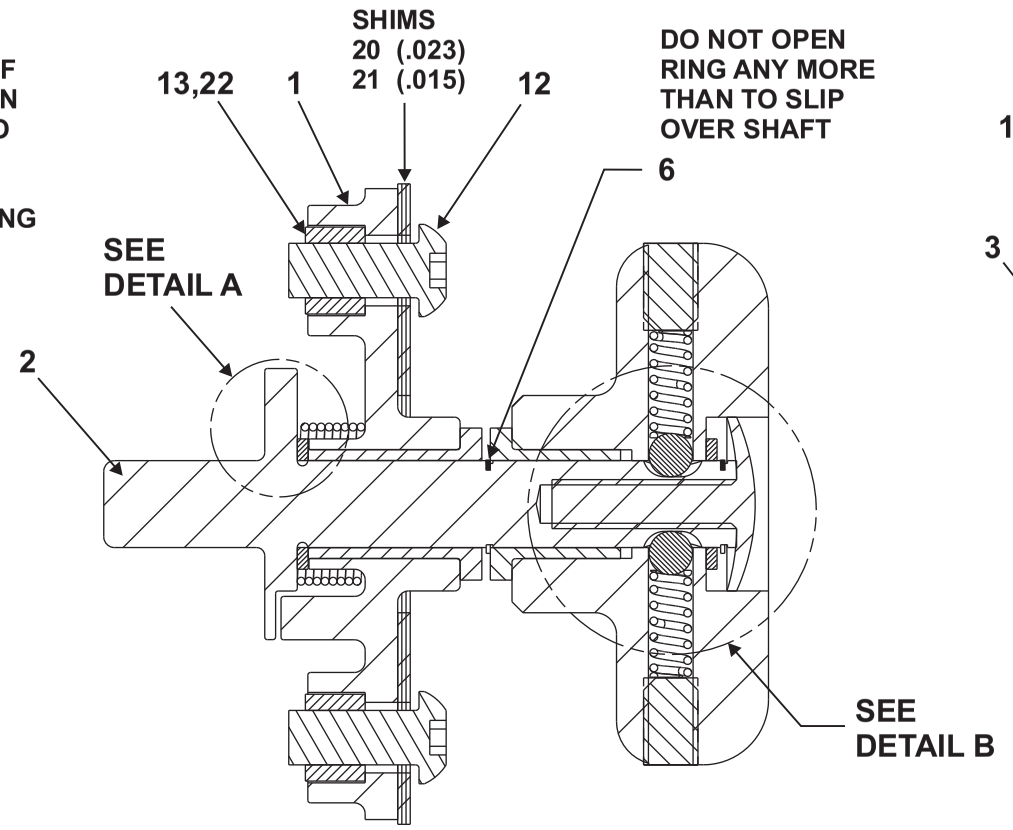
DETAIL B

ADD SHIMS TO MAKE LATCH LOOSER. REMOVE SHIMS TO MAKE LATCH TIGHTER. WHEN ADDING SHIMS, NOTCH SHIM AS SHOWN, TO AVOID HAVING TO COMPLETELY REMOVE HANDLE ASSEMBLY. WHEN REMOVING OR ADDING SHIMS, ALWAYS START WITH THE THINNEST SHIM.

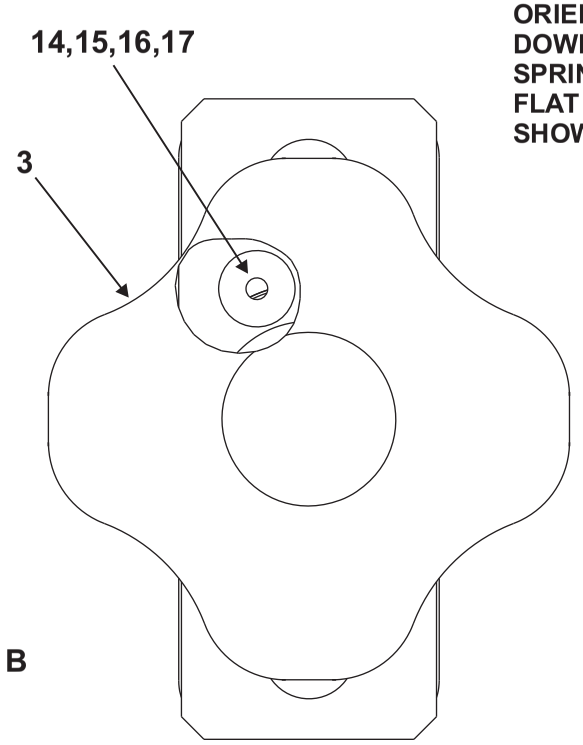




REAR VIEW



SECTION Y - Y



FRONT VIEW

Pellerin Milnor Corporation
P. O. Box 400, Kenner, LA 70063-0400
Litho in U.S.A.

Parts List—Door Locking Handle

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.

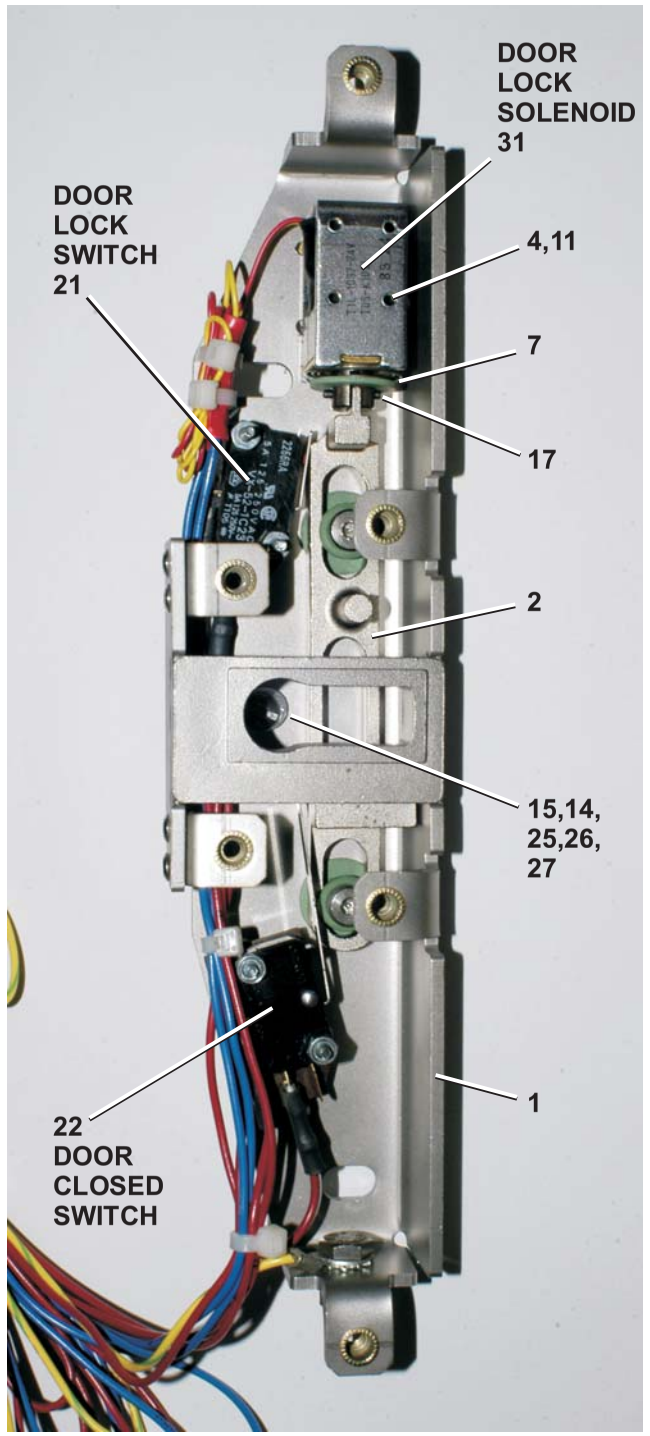
Used In	Item	Part Number	Description	Comments
			----------ASSEMBLIES----------	
	A	A33 03289A	ASSY=DR HNDL MECH A,3022H	
			----------COMPONENTS----------	
all	1	C2 03286	CAST=DR HNDL MNT PLT, 3022H8	
all	2	Y2 03282A	MACH=CAST DOOR SHAFT, MCR	
all	3	02 03289A	DOOR HANDLE BLACK ANODIZED	
all	4	02 03281	SPRING=DOOR HNDL RETURN, 3022H	
all	5	15Q124M	M8-1.25X12 SOCSETSCR/SS/CUP PT	
all	6	17B057	RETAIN RING-ROTOR CLIP# SH-50-	
all	7	02 03295	SPRING=DOOR HANDLE RATC, 3022H	
all	8	54E011	FLGBRG 1/2X5/8X3/4 B#FB810-6	
all	9	54E013	FLGBRG 1/2X5/8X1 B#FB810-8	
all	10	54E014	THRSTBRG 1/2X3/4X1/16 B#TB812	
all	11	27A223	ROLLER BALL #9291K23	
all	12	15K053	BUTSOKCAPSCR 5/16-18X3/4 SS18-	
all	13	15G188	HEXLOKNUT 5/16-18 BRASS	
all	14	15N017	RDMACSCR 4-40 UNC2A X3/8 ZINC	
all	15	15G020	HXMACHSCRNUT 4-4OUNC2BZINC GR2	
all	16	15U040	LOCKWASHER MEDIUM #4 ZINCPL	
all	17	15U060	FLAT WASHER#6 ANSI TYPEB BRASS	
all	18	17C110	RETAIN CLIP AU-VE-C0#12909 BLK	
all	20	02 04192	SHIM=DOOR MOUNT PLATE, 3022H	
all	21	02 04192A	.015 SHIM=DOOR MNT PL,3022H7	
all	22	15U211	LOKWAS INTOOTH 5/16	

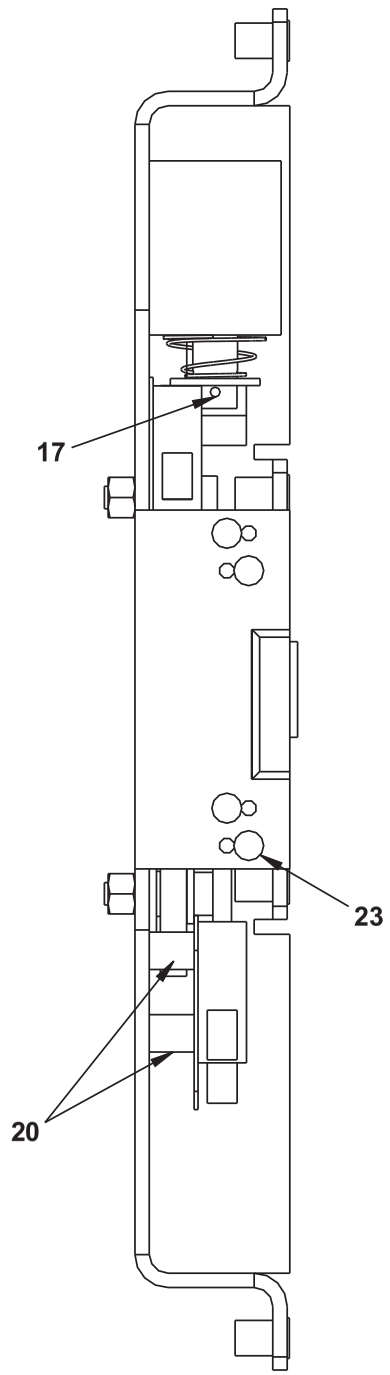
Door Lock Mechanism

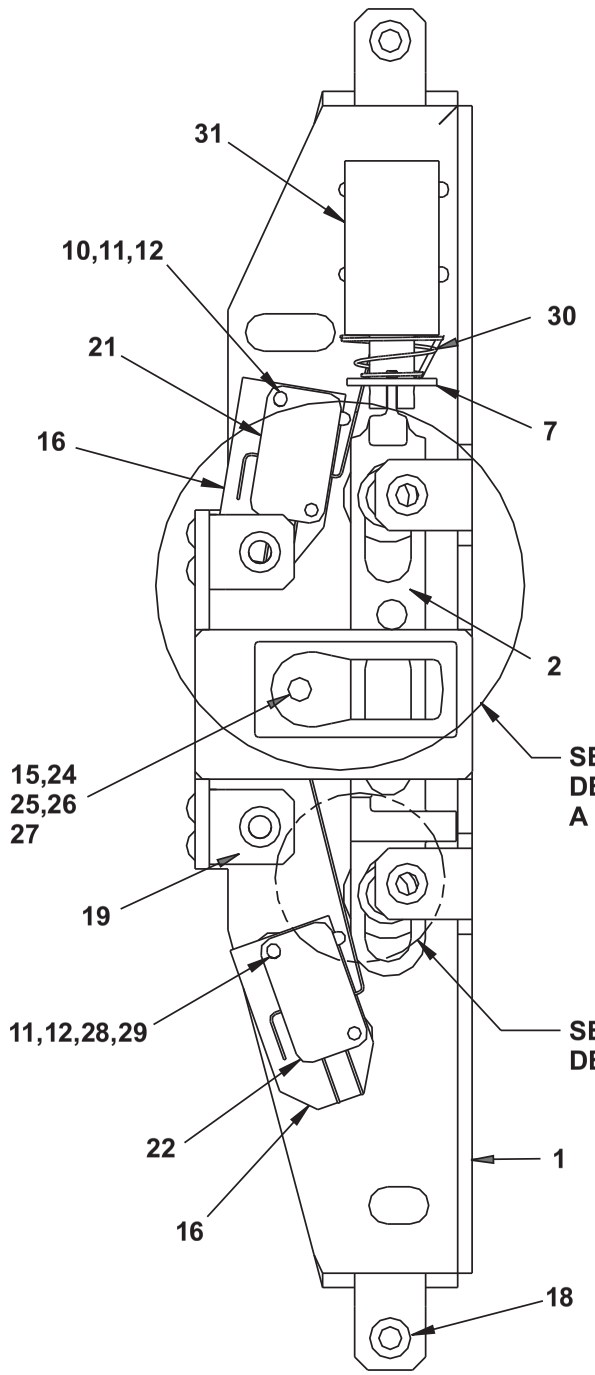
30022H8J, 3022X8J

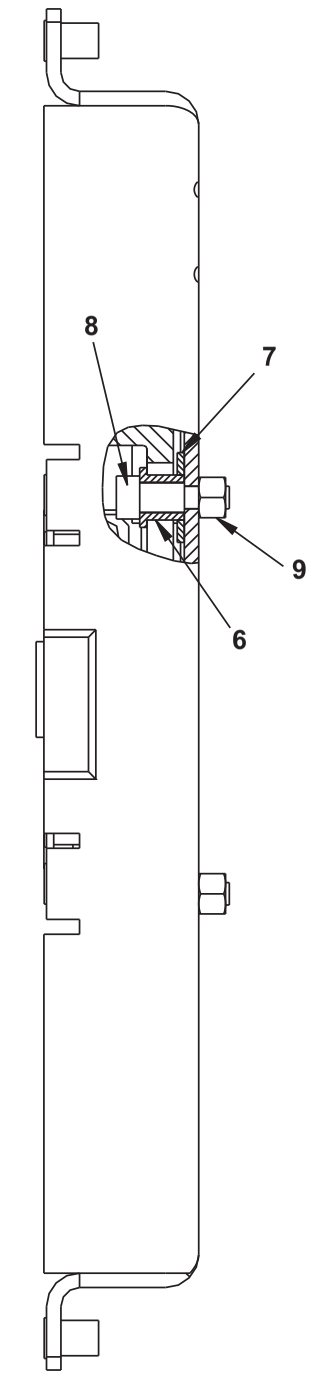
Pellerin Milnor Corporation
P. O. Box 400, Kenner, LA 70063-0400

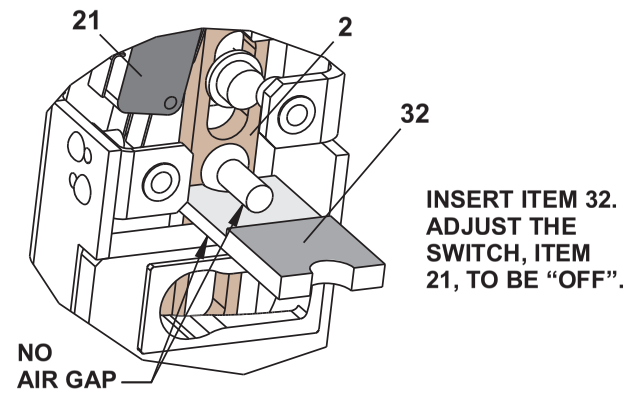
Litho in U.S.A.



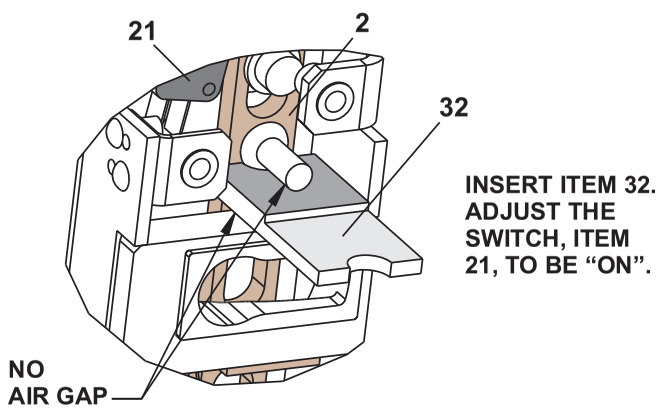




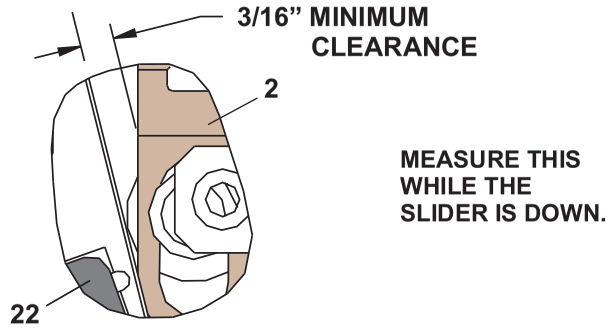




DETAIL A:
DOOR LOCK SWITCH “OFF”



DETAIL B:
DOOR LOCK SWITCH “ON”



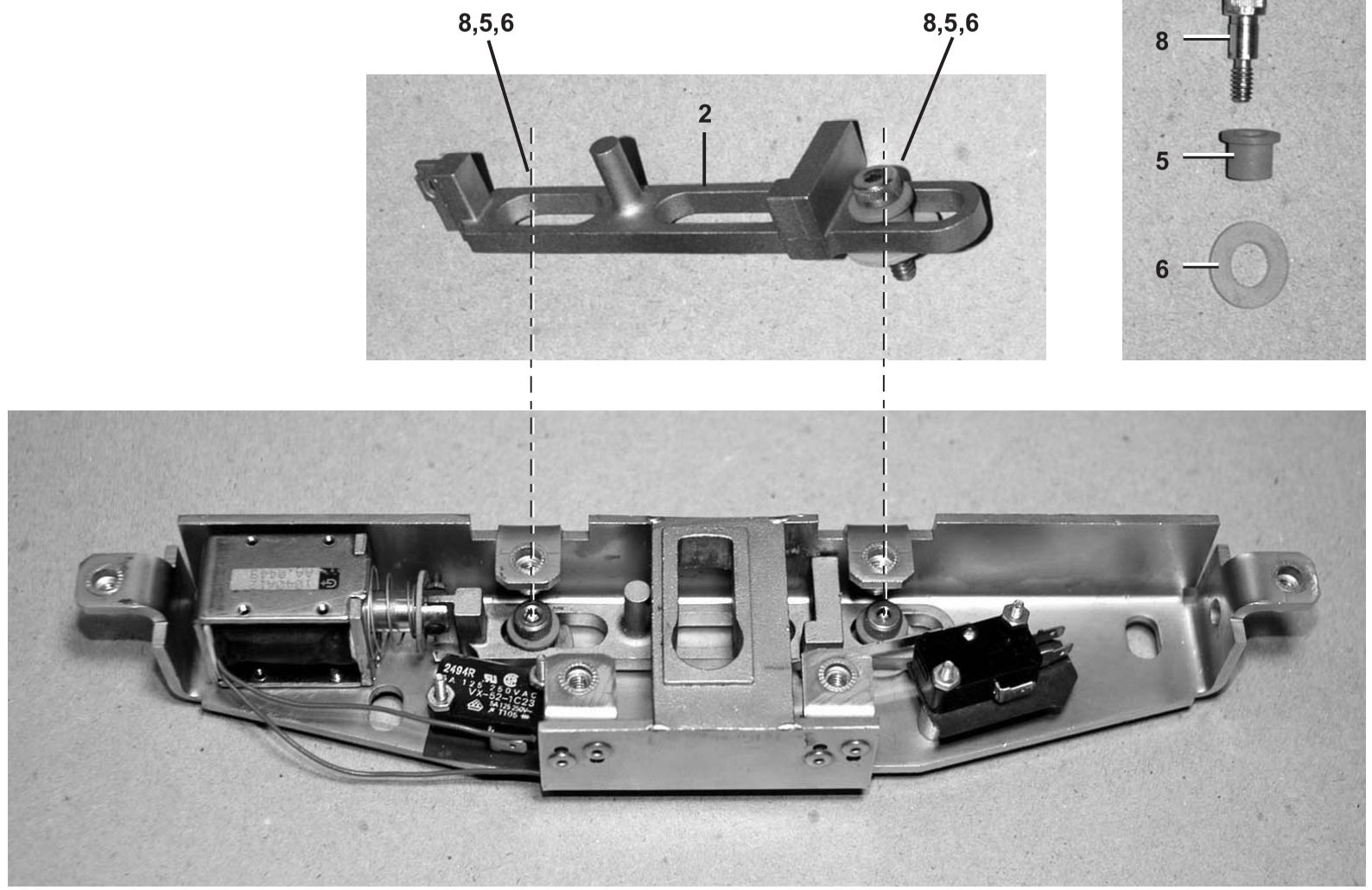
DETAIL C:
DOOR CLOSED SWITCH

Door Lock Mechanism

30022H8J, 3022X8J

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

Litho in U.S.A.



Parts List—Door Lock Mechanism

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 03226A	ASSY=DOOR LOCK, 3022H7	H8J, X8J
			----------COMPONENTS----------	
all	1	W2 03226A	WLMT=DOOR LOCK BOX, 3022H	
all	2	02-03290A	PLATED=DR LOCK SLIDER, MCR	
all	3	02 03285	SPRING=DOOR LOCK COIL, 3022H	
all	4	15N003	PHILPANMACHSCR M3X.05X8MM 18-8	
all	5	54E001D	FLGDBRGBUSH 1/4" BOSTON#FP46-3	
all	6	54E012	THRBRGTEFGLS3/8X3/4X.06B#TP612	
all	7	54E012	THRBRGTEFGLS3/8X3/4X.06B#TP612	
all	8	15C010	HXSOKSTRIPBOL 1/4"X3/8" 18-8SS	
all	9	15G126	HXLOCKNUT NYLON 10-24 UNC SS N	
all	10	15N021	RDMACSCR 4-40 UNC2X1 ZINC PLT	
all	11	15U040	LOCKWASHER MEDIUM #4 ZINCPL	
all	12	15G020	HXMACHSCRNUT 4-4OUNC2BZINC GR2	
all	15	12P014GG	CAB.CLP.NON-METAL 3/8ID,3/8W	
all	16	03 01335	INSULATOR=AIROP AUTOSPOT+$8S	
all	17	15H090C	SPRINGPIN 5/64"X1/2"LG PLAIN	
all	18	17E065	INSERT 10-24 STEEL+YELLOW DICR	
all	19	02 03225	LOCK BOX COVER BRKT, 3022H7	
all	20	27B213	SPACER #4 SCR X 3/8"L ZC/BRASS	
all	21	02 04177	MICROSWITCH=W/MAN CUT LEVER	
all	22	09R010D	DOOR LOCK SWITCH	
all	23	15J052	POPRIVET1/8DIAX .390 LONG S/S	
all	24	15N146	RDMACHSCR 10-24UNC2X1 SS18-8	
all	25	15G125	HXMACHSCRNUT 10-24UNC2B ZINC G	
all	26	15U130	FLAWAS#10 .031X7/16ODX.203ID Z	
all	27	15U150	LOCKWASHER MEDIUM #10 ZINCPL	
all	28	15N023	RDMACSCR 4-40 UNC2A X1+1/4 ZIN	
all	29	15U060	FLAT WASHER#6 ANSI TYPEB BRASS	
all	31	09K063C24	DOOR LOCK SOLENOID 24V	
all	32	X2 03306A	MACH=GAGE DR LOCK SWITH, MCR	

Section 4

Water and Steam Piping and Assemblies

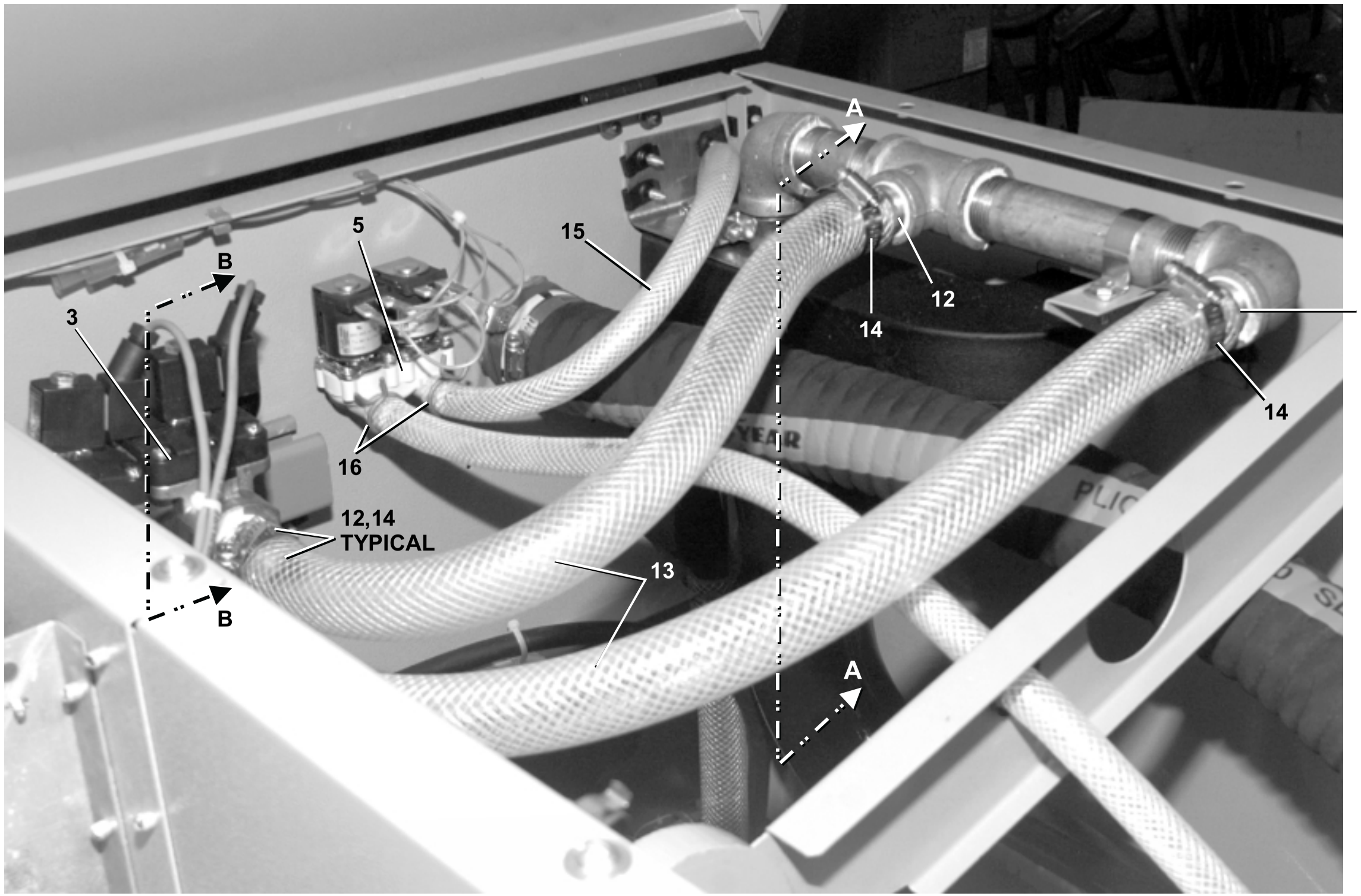
Water & Peristaltic

30022H8J

BMP010021/20002044V
(Sheet 1 of 4)

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

Litho in U.S.A.

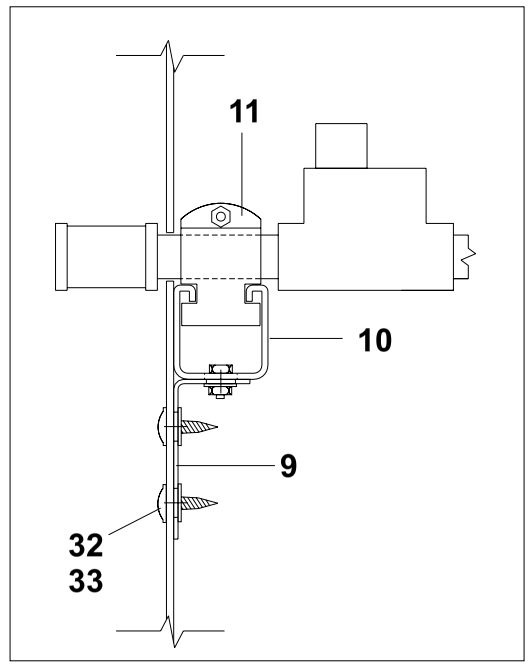


Water & Peristaltic

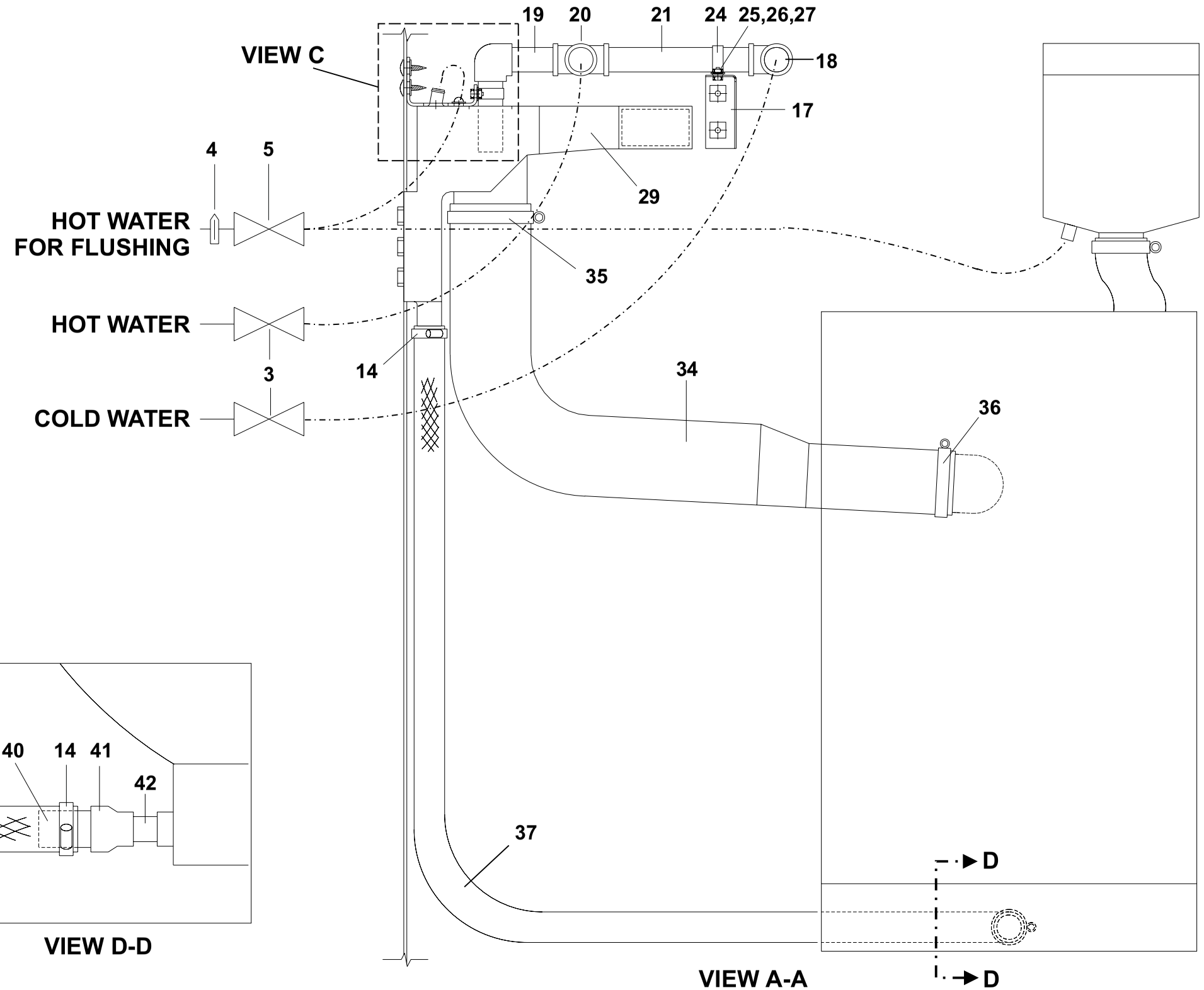
30022H8J

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

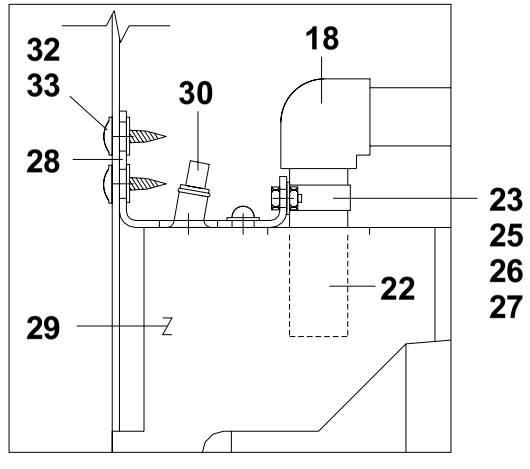
Litho in U.S.A.



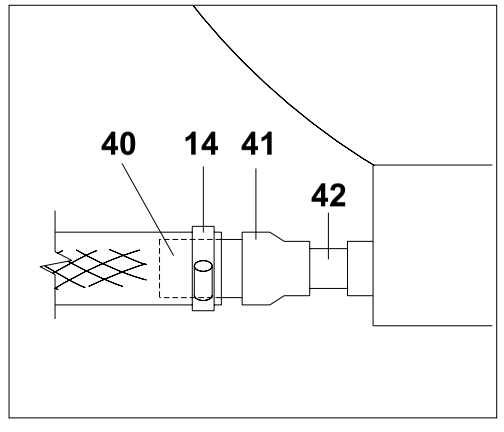
VIEW B-B



VIEW A-A



VIEW C



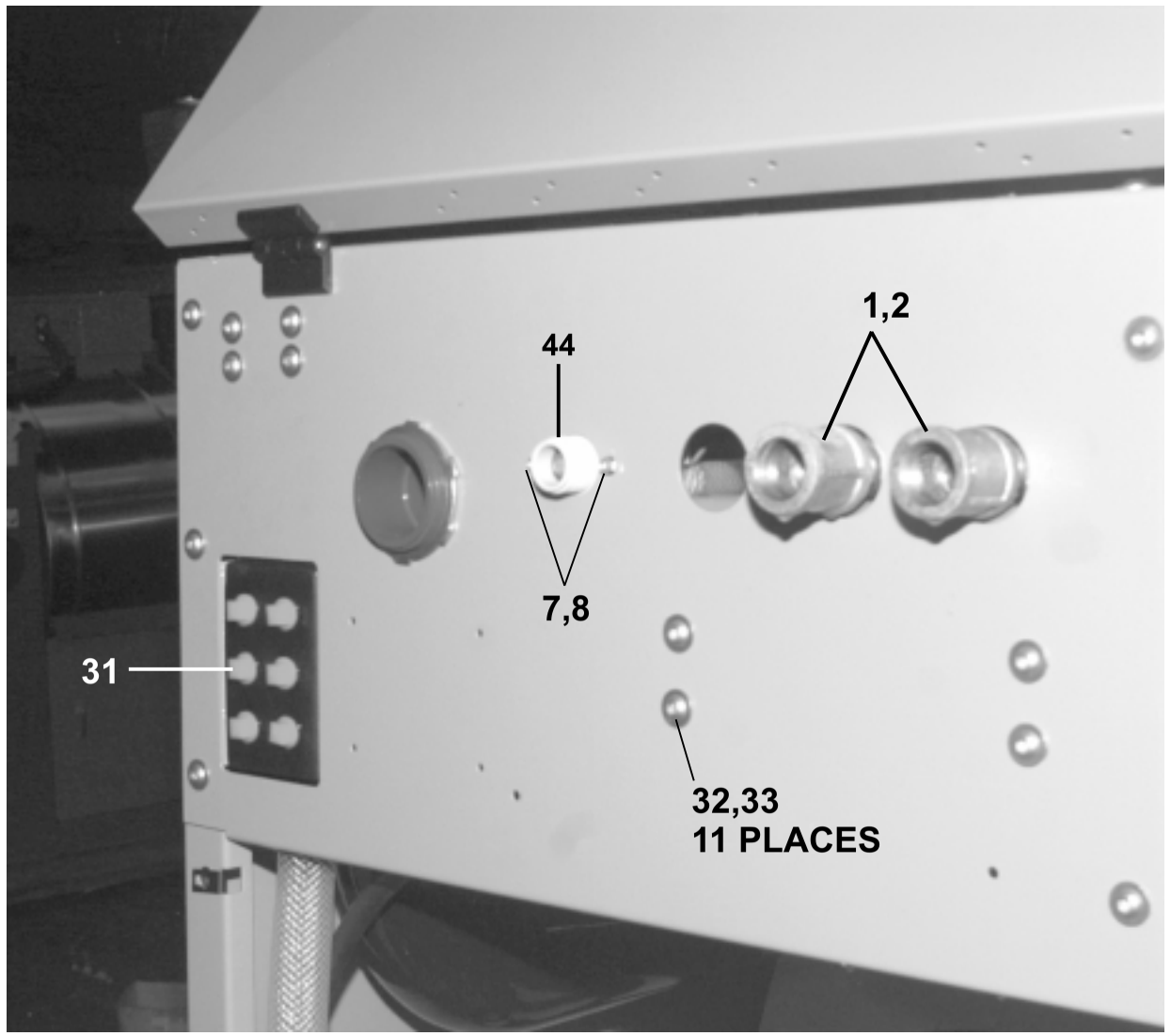
VIEW D-D

Water & Peristaltic

30022H8J

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

Litho in U.S.A.



Parts List—Water & Peristaltic

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	GVW3022H8	INSTL=WATER INLET LC, 3022H8	
----------COMPONENTS----------				
all	1	5SCC0PNF	NPT COUP 3/4 GALMAL 150#	
all	2	5N0P02KG42	NPT NIP 3/4X2.5 TBE GALSTL S40	
all	3	96P056A71	3/4" NC 230V50/60 W/LEADS BURK	
all	4	96J061	FLOW REGULATOR #MR04-101	
all	5	96P053D71	3/4"INLET 1/2"DUOHOSEOUT 220V	
all	7	15N004	FLGHDMACHSCR M4X.7X 9MM ZINC	
all	8	15U150	LOCKWASHER MEDIUM #10 ZINCPL	
all	9	02 03185	BRKT=WATER VALVES, 3022H8	
all	10	03 60250E	UNISTRUT-8"	
all	11	27A0075	CLP-RGDSTL PS#1100-3/4	
all	12	03 25429	HOSE ADAPTER=1"HOSEX3/4" NPT	
all	13	60E010	TUBINGPOLYBRAID 1"X1.312	
all	14	27A090	HOSECLAMP 13/16-1.5"CADSC#HS16	
all	15	60E006C	PVC TUBING NYL.REINF.5IDX.75OD	
all	16	27A045	HOSECLAMP .750"DIA SPRINGTYPE	
all	17	02 03186	BRKT=WATER FILL PIPE, 3022H8	
all	18	5SL1ANFA0P	NPTELB 90DEG 1X3/4 GALMAL 150#	
all	19	5N1A03AG42	NPT NIP 1X3 TBE GALSTL SK40	
all	20	5S1ANFA0P1	NPT TEE 1X1X3/4" GALMAL 150#	
all	21	5N1A06AG42	NPT NIP 1X6 TBE GALSTL SK40	
all	22	5N0P01PG41	NPT NIP 3/4X1.75 TOE GAL. S40	
all	23	27A018A	3/4"PIPESTR 2HOLE STAMPGAL PRO	
all	24	27A019	1"PIPSTRAP 2HOLE STAMPEDGALV	
all	25	15K147	HXCAPSCR 1/2-13UNC2X1 GR5 ZINC	
all	26	15U280	FL+WASHER(USS STD)1/2 ZNC PL+D	
all	27	15G230	HXNUT 1/2-13UNC2B SAE ZINC GR2	
all	28	02 03195	PERISTL BOX MOUNT, 3022H8	
all	29	02 03588M	PERISTALTIC/WATER INLET 3022H	

Pellerin Milnor Corporation
P. O. Box 400, Kenner, LA 70063-0400
Litho in U.S.A.

Parts List—Water & Peristaltic

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.

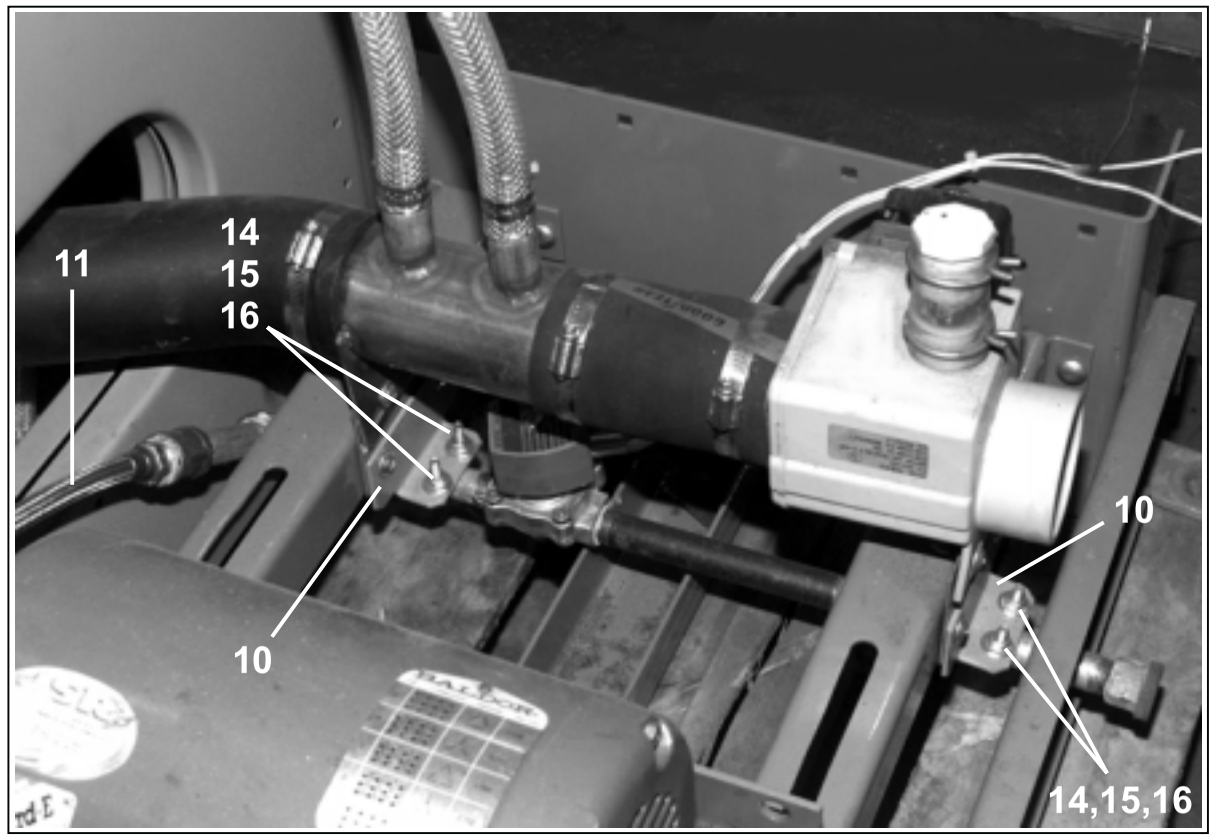
Used In	Item	Part Number	Description	Comments
all	30	53A4000KB	TUBE INSERT 1/2"OD #60AE-8	
all	31	5SP0KXFHS	HEX HEAD PIPE PLUG 1/2"	
all	32	15G004HB	EXTRUNUT M6-1 GRIP 0.8-4MM	
all	33	15N110H	RDWASHHD TORXBOLT M6-1X25MM ZN	
all	34	02 03588B	PARISTALTIC/WATER INLET HOSE	
all	35	27A082S	HOSECLAMP 2+9/16-3.5SS305SCR	
all	36	27A074S	HOSECLAMP 2+1/16-3"SSSCR#64040	
all	37	60E010	TUBINGPOLYBRAID 1"X1.312	
all	40	03 25429S	HOSE ADAPT=1"HOSE 3/4"NPT SS	
all	41	5SR0P0KSF	NPT RED 3/4X1/2 SS304 150#	
all	42	5N0KCLSS42	NPT NIP 1/2XCLS TBE 304SS SK40	
all	44	51E513MG	3/4"MHXMP GARDENHOSE#71GH12-12	

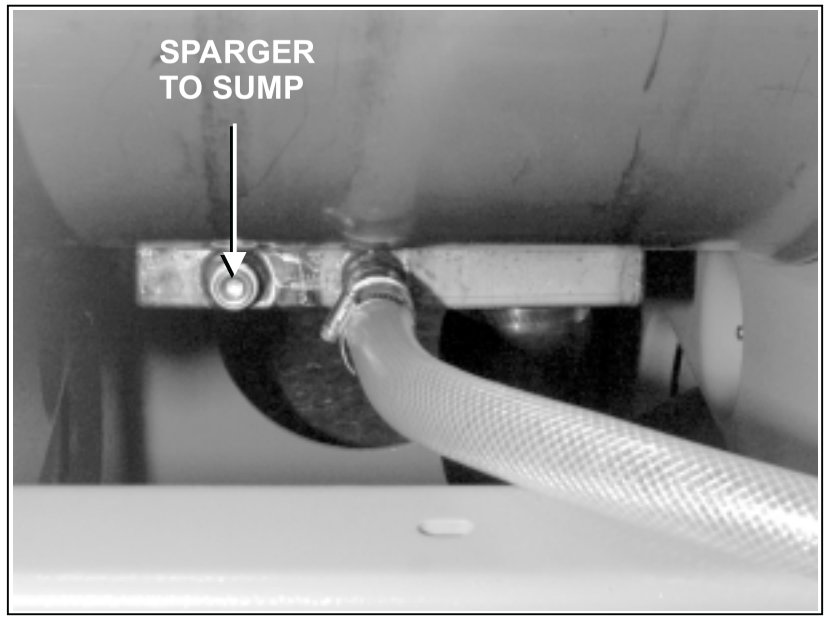
Steam Inject Option

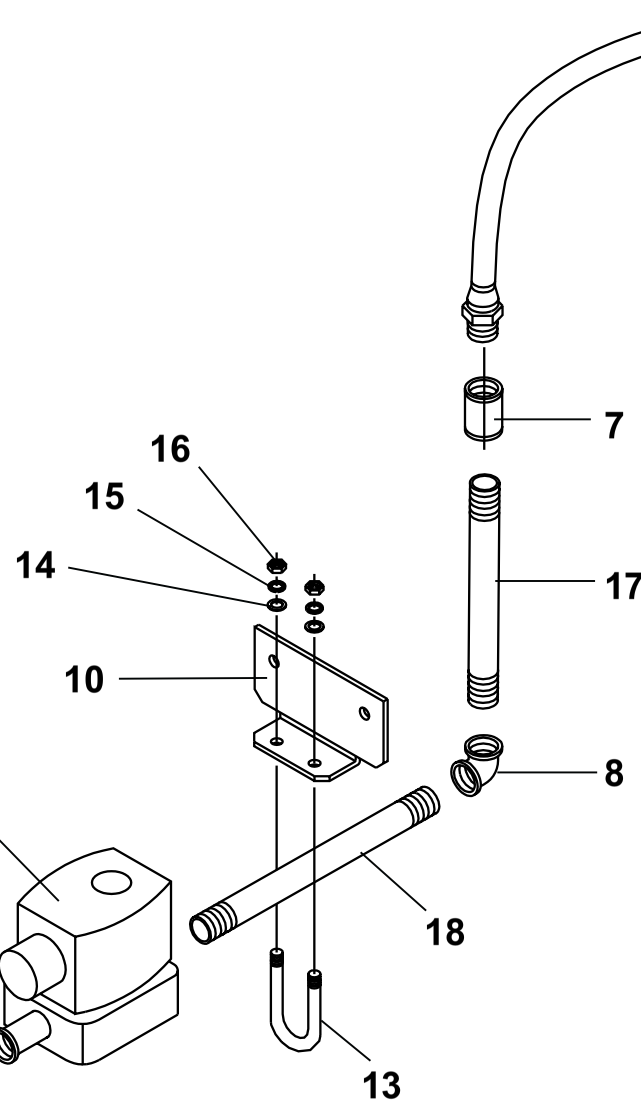
30022H7J, H8J

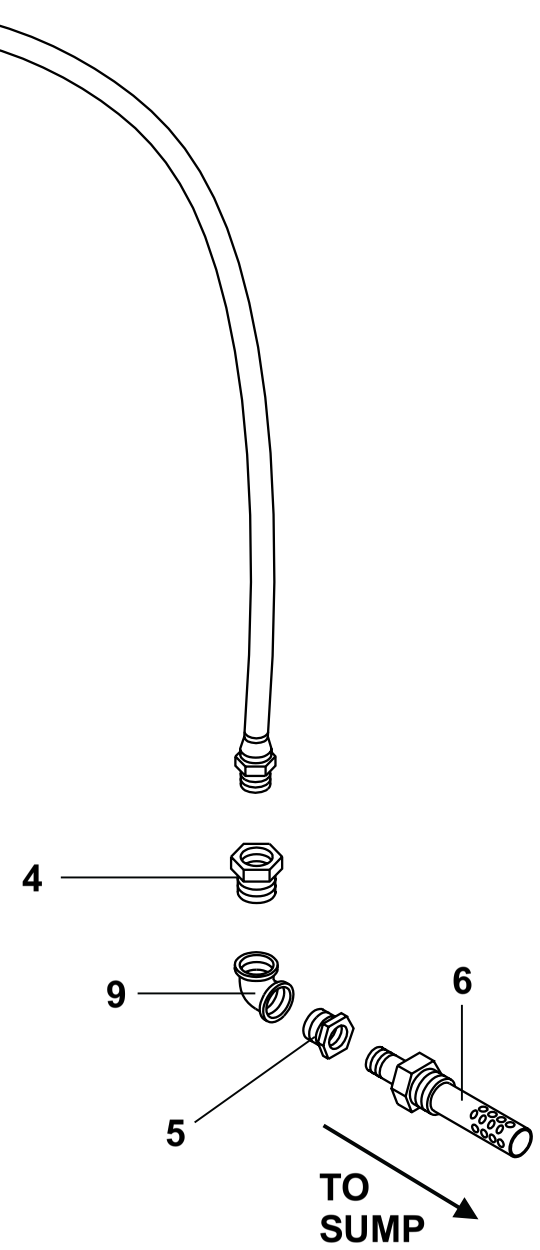
Pellerin Milnor Corporation
P. O. Box 400, Kenner, LA 70063-0400

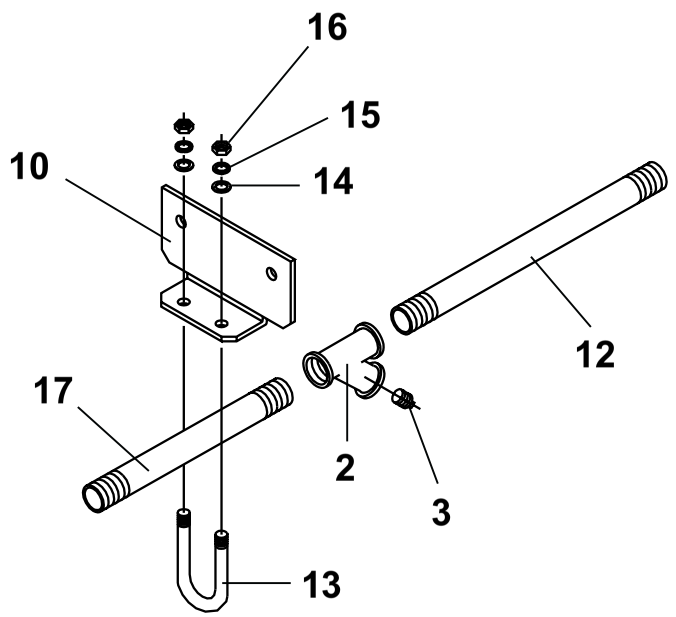
Litho in U.S.A.











Pellerin Milnor Corporation
P. O. Box 400, Kenner, LA 70063-0400
Litho in U.S.A.

Parts List—Steam Inject Option

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	GSV30211	99287B INSTL=STEAM INJ VALVE,3022H7	
			----------COMPONENTS----------	
all	1	96TDC2BA71	02Z 1/2" N/C 2WAY 240V50/60C STEAM	
all	2	51T025	98271AY-STRAINER 1/2" CAST IRON	
all	3	5SP0GGFSS	NPT PLUG 3/8 SQ SOLID GALSTL	
all	4	51X017	UNIONSTRADT 1/2"PH#0107-8-8	
all	5	5SB0K0GSFO	HEXREDBSH 1/2X3/8X5/8 304 150#	
all	6	W2 02555	93366B NOZZLE=STEAM INJECTION	
all	7	5SCC0KMF	NPT COUP 1/2 BLKMAL 150#	
all	8	5SL0KMFA	NPT ELBOW 90DEG 1/2" BLKMAL 150#	
all	9	5SL0KSFA	NPTELB 90DEG 1/2 304SS 150#	
all	10	02 04199	99242B BRKT=STEAM INJ INSTL, 3022H7	
all	11	60E508E28A	HOSE SS BRAID 3/8+2ENDS=28"LG	
all	12	5N0K07AF42	NPT NIP 1/2X7 TBE BLKSTL SK40	
all	13	27A030A	U-BOLT 1/2 PIPE 1/4-20 THD	
all	14	15U185	FLATWASHER(USS STD) 1/4" ZNC PLT	
all	15	15U180	LOCKWASHER MEDIUM 1/4 ZINCPL	
all	16	15G165	HXNUT 1/4-20UNC2BSAE ZC GR2	
all	17	5N0K04AF42	NPT NIP 1/2X4 TBE BLK SK 40	
all	18	5N0K05KF42	NPT NIP 1/2X5.5 TBE BLK SK 40	

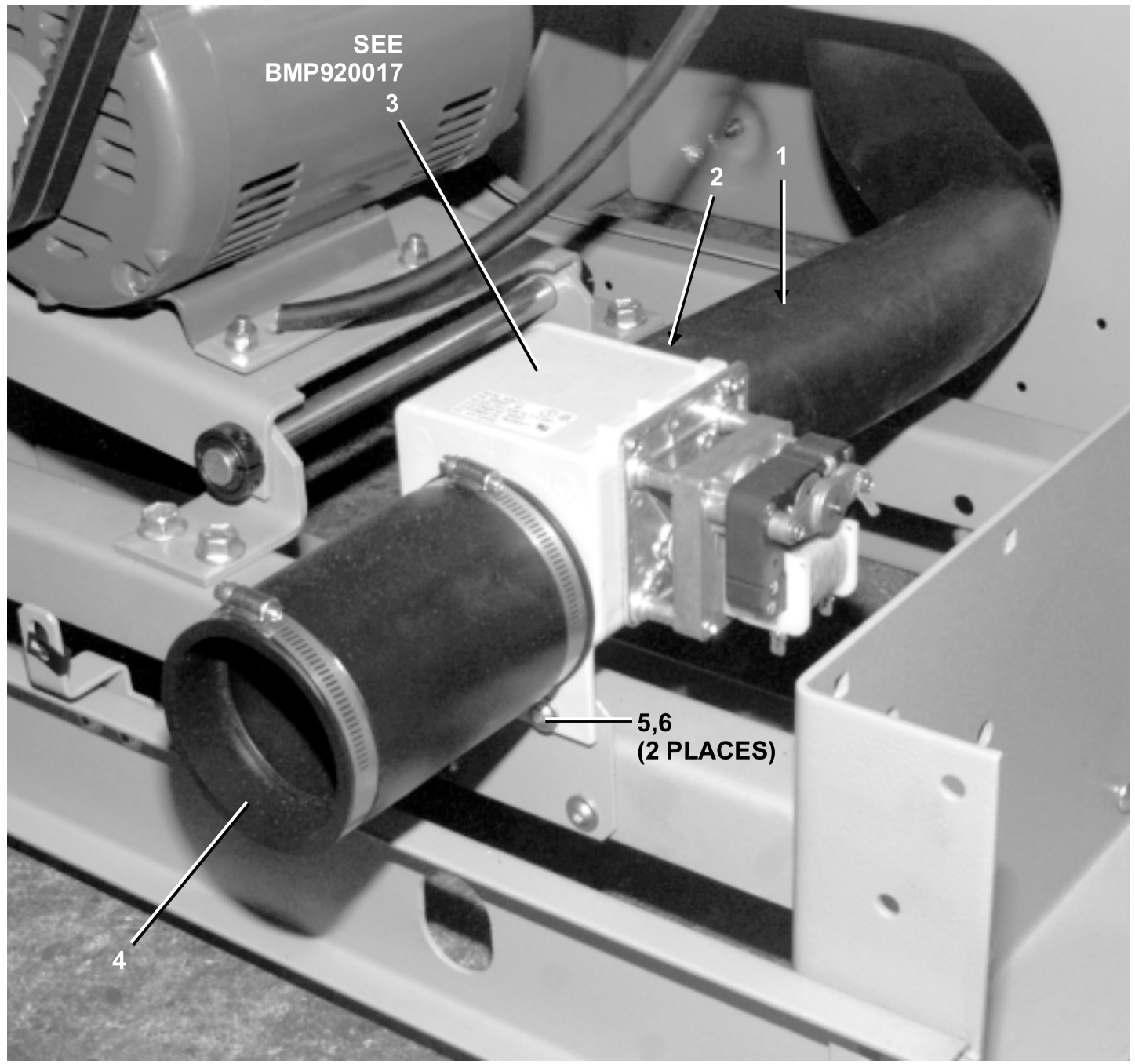
Drain Assembly

30022H8J

BMP010020/2002044V
(Sheet 1 of 1)

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

Litho in U.S.A.



Parts List—Drain Assembly

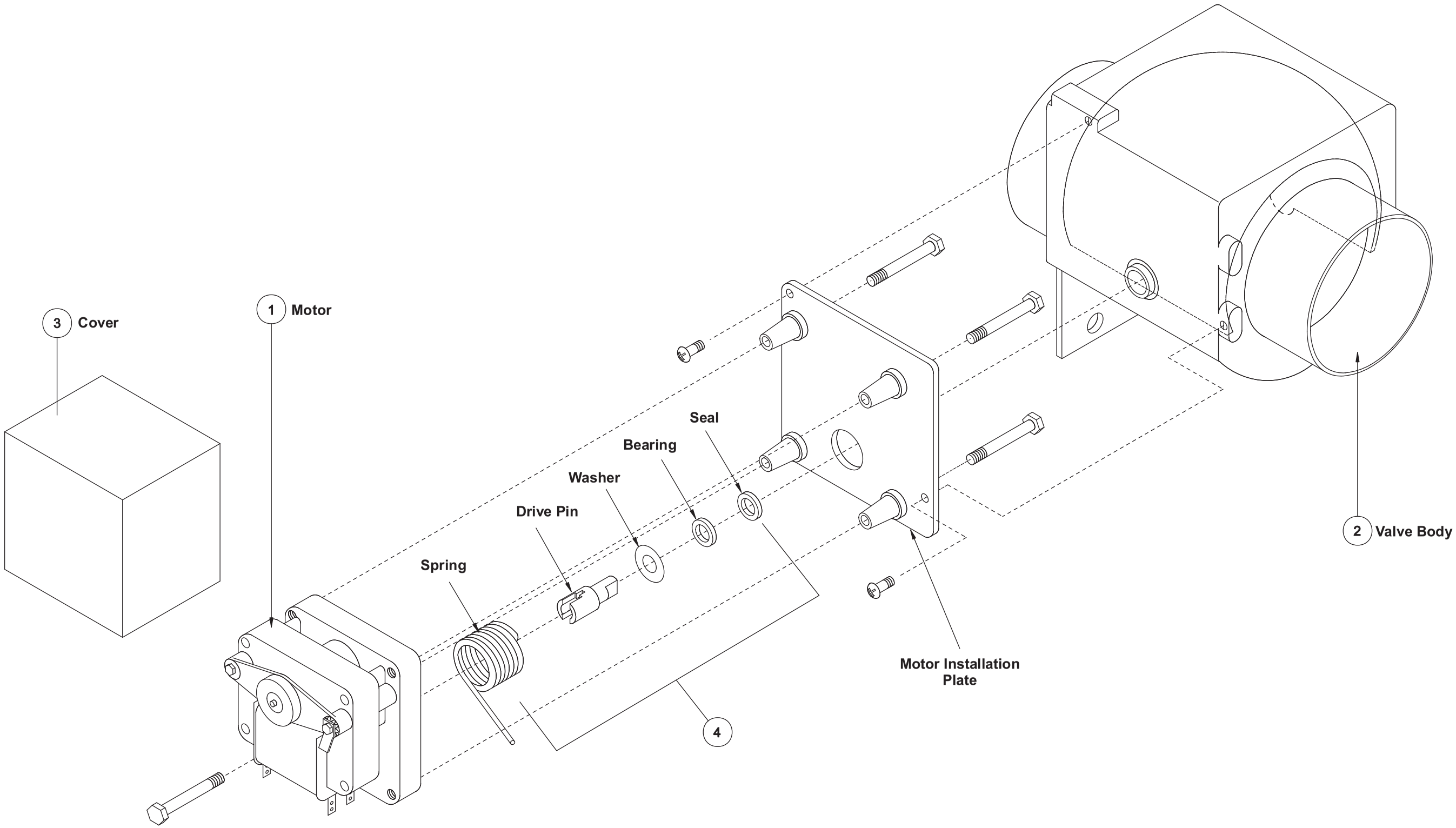
Find the correct assembly first, then find the needed components. The item letters (A, B, C, etc.) assigned to assemblies are referred to in the "Used In" column to identify which components belong to an assembly. The item numbers (1, 2, 3, etc.) assigned to components relate the parts list to the illustration.

Used In	Item	Part Number	Description	Comments
			----------ASSEMBLIES----------	
	A	GVD3022H8	INSTL=DRAIN ASSY LC, 3022H8	
			----------COMPONENTS----------	
all	1	02 03245	MOLDED DRAIN HOSE, 3022H	
all	2	27A088S	HOSECLAMP 3+1/16-4"SSSCR#HSS56	
all	3	96D350A71	DRINVAL 3"N/O MTRDR240V 50/60C	
all	4	60B075	DFW56-33PMSP RUBB CONN.	
all	5	15N110H	RDWASHHD TORXBOLT M6-1X25MM ZN	
all	6	15G004HB	EXTRUNUT M6-1 GRIP 0.8-4MM	

3” Electric Drain Valve

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

Litho in U.S.A.



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

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 5

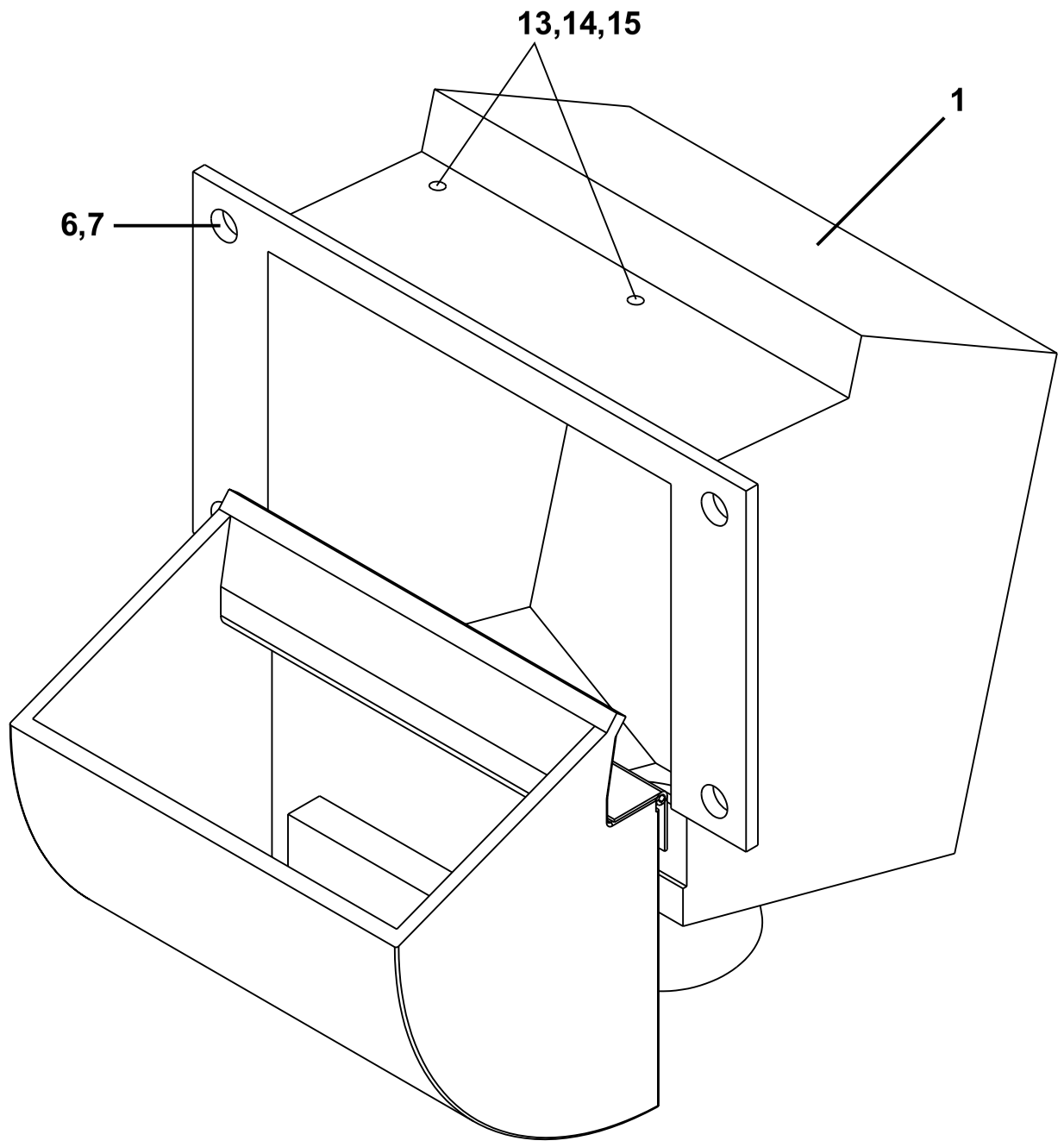
Chemical Supply Devices

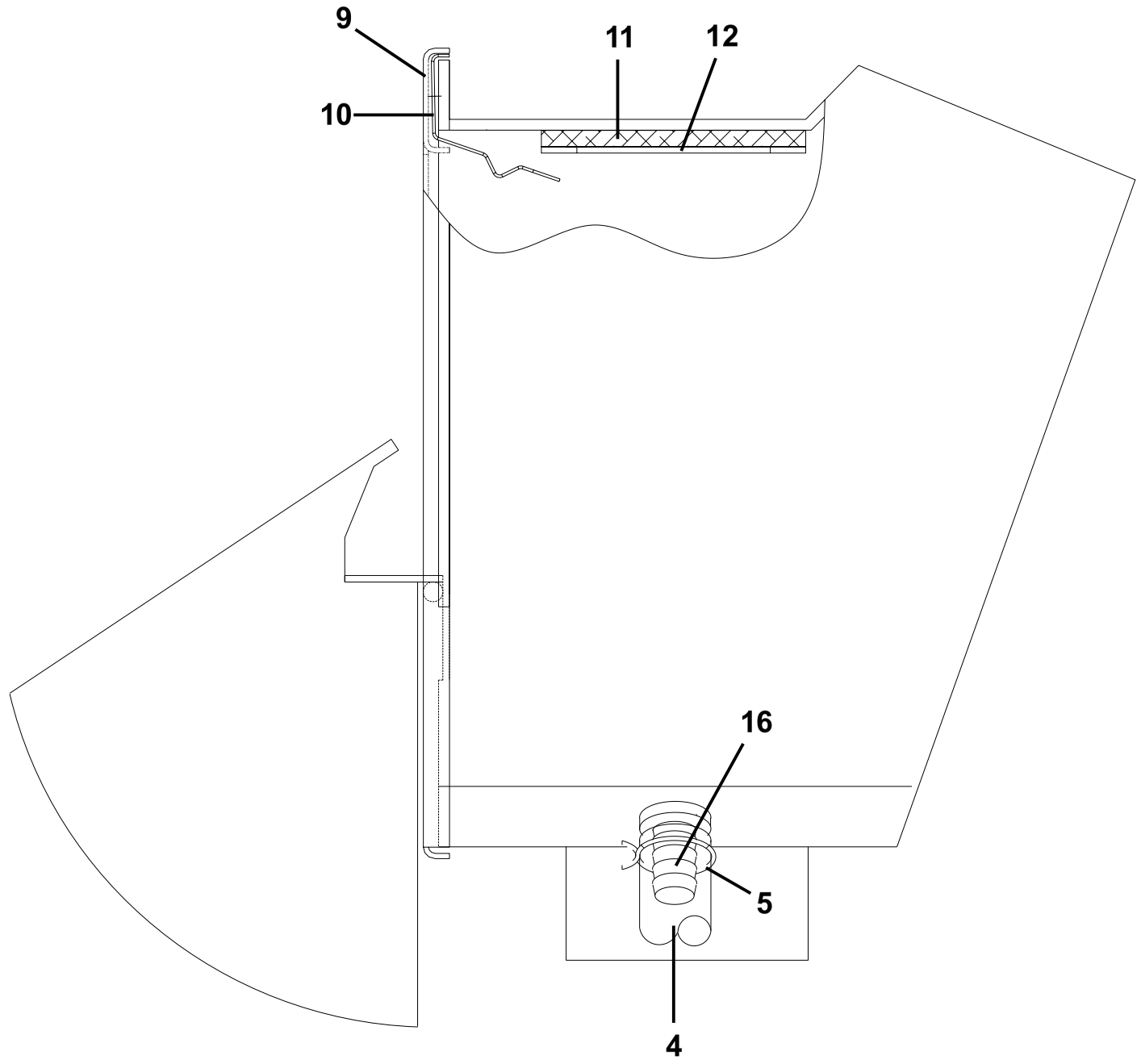
Soap Chute

30022H8J,X8J 30022F8J, F8W 3630F8J,FW,F8R,F8S 4232F7J,F7W,F7S,F7R
3626X8J,X8W 4226X7J,X7W 4232X7J,X7W

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

Litho in U.S.A.



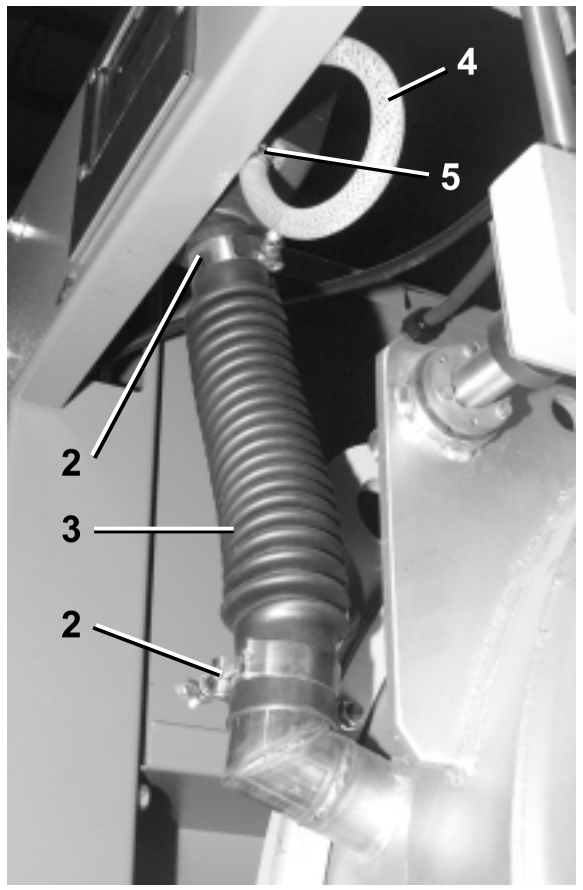


Soap Chute

30022H8J,X8J 30022F8J, F8W 4232F7J,F7W,F7S,F7R
3626X8J,X8W 4226X7J,X7W 4232X7J,X7W

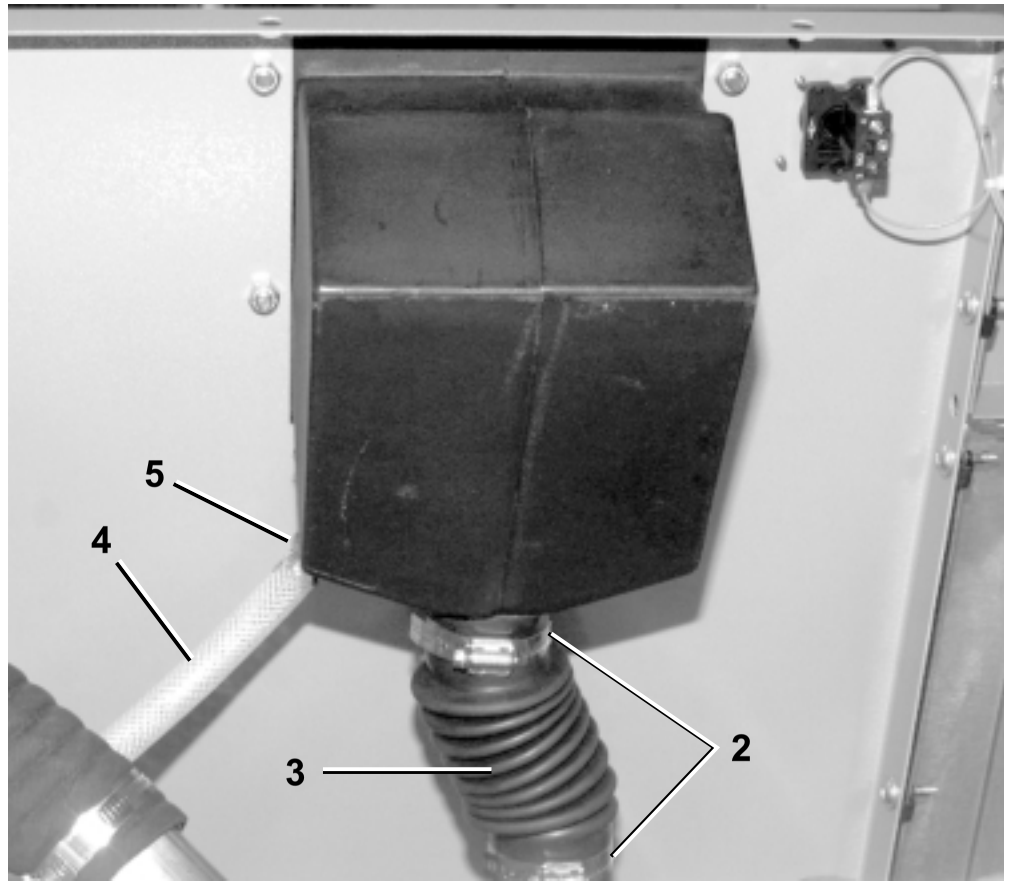
Pellerin Milnor Corporation
P. O. Box 400, Kenner, LA 70063-0400

Litho in U.S.A.



30022X8J SHOWN

30022H8J SHOWN



Parts List—Soap Chute

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	GWS3022H8	INSTL=SOAP CHUTE LC, 3022H8	30022H8J
	B	GWS30201A	INST=DRY SOAP CHUTE PLASTIC	30022F8J,F8W,F8P
	C	GWS42001B	2001000Z INST=PLASTIC SOAP CHUTE 4232F	42032F7J,F7P,F7W
	D	GWS3022X8	INST=SOAP CHUTE ASSY 3022X8J	3022X8J
	E	GWS3626X7	20003000Z INST=SOAP CHUTE ASSY 3626X	3626X8J,X8W
	F	GWS4226X	2003000Z INST=SOAP CHUTE ASSY 4226X	4226X7J,X7W
	G	GWS4232X	2003000Z INST=SOAP CHUTE ASSY 4232X	4232X7J,X7W
	H	GWS35001A	INST=PLASTIC SOAP CHUTE	3630F8J,F8W
	J	GWS35001C	INST=PLASTIC SOAP CHUTE 3630SG RT	3630F8R,F8S
	K	GWS42001C	INST=PLASTIC SOAP CHUTE RT LD	4232F7R,F7S
			----------COMPONENTS----------	
all	1	AWS30211A	PLASTIC SOAP ASSY	
all	2	27A070	T-BOLT HOSECLAMP 1.94"-2.25"	
A	3	02 03870C	FLEXTUBE=2"ID X 8"LG.W/CUFFS	
B,F,G,K	3	02 03870	FLEXTUBE=SOAPCHUTE 2"IDX24LG	
C,E,H,J	3	02 03870D	FLEXTUBE=2"ID X 14"LG W/CUFFS	
all	4	60E006C	PVC TUBING NYL.REINF.5IDX.75OD	
all	5	27A045	HOSECLAMP .750"DIA SPRINGTYPE	
all	6	15K053	BUTSOKCAPSCR 5/16-18X3/4 SS18-	
all	7	15G188	HEXLOKNUT 5/16-18 BRASS	
all	9	02 04215	PLASTIC SOAP CHUTE BEZEL	
all	10	02 04217	PLASTIC SOAP CHUTE LATCH	
all	11	02 04216	SOAP CHUTE SPLASH GUARD	
all	12	98A002AT	PAD 6"X9"REG.DUTY,TURCO#A90551	
all	13	15G105	HEXMACSCRNUT 8-32UNC2 SS18-8	
all	14	15N095	RDMACSCR 8-32UNC2X3/4 SS18-8	
all	15	15U120B	LOCKWASHER MEDIUM #8 SS18-8	
all	16	51BB0KN00B	BULKHD FITT 1/2"BARBED,POLYPRO	

Section 6

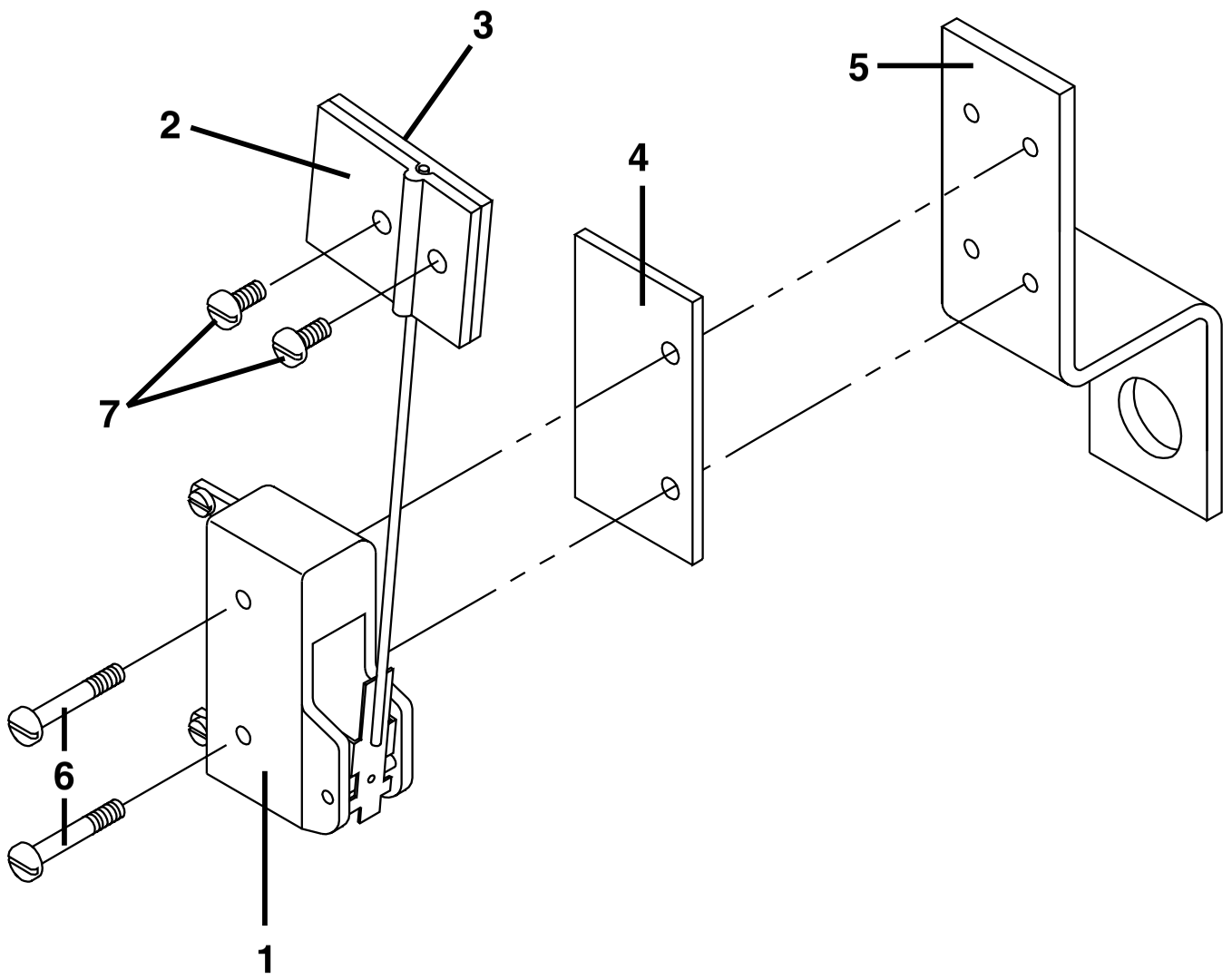
Control and Sensing Devices

Vibration Safety Switch

30022H7x, H8x

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

Litho in U.S.A.



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.

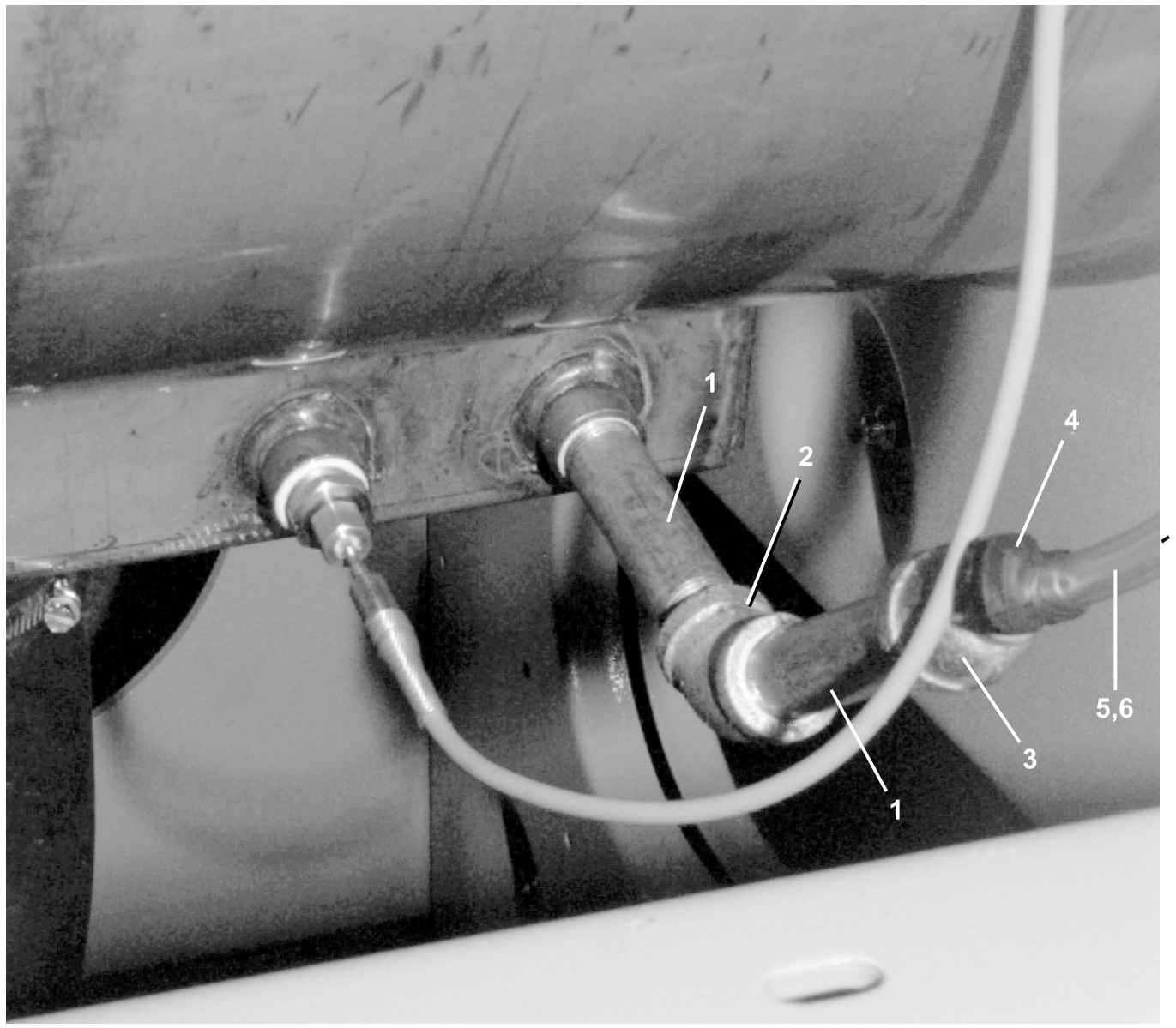
Used In	Item	Part Number	Description	Comments
			----------ASSEMBLIES----------	
	A	GES30211	98516N INSTL=EXCURSION SW, 3022H	
A	B	SAE03-151H	99000ZASSY=VIBRATION SWT, 3022H7	
			----------COMPONENTS----------	
B	1	09R020	04ZSWITCH NC VIBR#WZ-2RW84429-P52	
B	2	03 01059	91046A VIBSWITCH CLAMP CADSTL	
B	3	03 01058	89417A VIBSWITCH WEIGHT-CADSTL	
B	4	02 02038	85482A PLATE INSULATING SMALL9NOV51	
B	5	02 15119A	98511# BRKT=VIBSW CAD, 3022H	
B	6	15P008	02Z TRDCUT PANHD 6-32X1 NIKSTL +WAX	
B	7	15P100	07Z THDCUT-F PANHD 8-32 X 3/8 SS410	

Air Chamber

30022H8J, X8J

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

Litho in U.S.A.



3022H8J SHOWN

Parts List—Air Chamber

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	ALL30211	ASSY=3022H7J AIR CHAMBER	3022H8J,X8J
			----------COMPONENTS----------	
all	1	5N0K04AG42	NPT NIP 1/2X4 TBE GALSTL SK40	
all	2	5SL0KNFK	NPTELB 45DEG 1/2 GALMAL 150#	
all	3	5SR0K0CNF	NPT RED 1/2X1/8 GALMAL 150#	
all	4	27A046	HOSECLAMP.358-.433 #5700303	
all	5	51E502A	HOSESTEM BRASS 1/8MPT X3/16	
all	6	60E002S	PVC TUBING .170IDX.4370D CLR	