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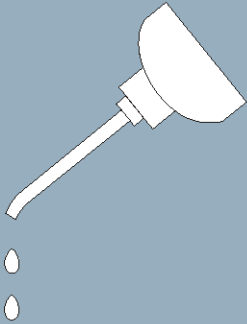
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Installation and Service

MCR27E5, MWR27E5

MWR27J5, MWR27X5



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



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Important Safety Instructions

— INSTALLERS / OWNER —

GROUNDING INSTRUCTIONS: This appliance must be connected to a grounded metal, permanent wiring system, or an equipment-grounding conductor must be run with the circuit conductors and connected to the equipment-grounding terminal or lead on the appliance.

GENERAL INSTRUCTIONS:

- 1) Before the appliance is removed from service or discarded, remove the door.
- 2) Do not install or store this appliance where it will be exposed to the weather.
- 3) Do not repair or replace any part of the appliance or attempt any servicing unless specifically recommended in the user-maintenance instructions or in published User-repair instructions that you understand and have the skills to carry out.

— OWNER / OPERATOR —

WARNING: To reduce the risk of fire, electric shock, or injury to persons when using your appliance, all users must follow basic precautions, including the following:

- 1) Read all instructions before using the appliance.
- 2) Do not allow children to play on or in the appliance. Close supervision of children is Necessary when the appliance is used near children.
- 3) Do not reach into the appliance if the tub or agitator is moving.
- 4) Do not tamper with controls.

**This envelope contains the user guides.
SAVE THESE INSTRUCTIONS**

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: Electrocutation 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: Electrocutation 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 —

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, EX Factory (labor and freight specifically NOT included). 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, NEGLIGENCE, 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.

BMP720097/19036

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 —

Trademarks

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These words are trademarks of Pellerin Milnor Corporation and other entities:

Table 1 Trademarks

AutoSpot™	GreenTurn™	Milnor®	PulseFlow®
CBW®	GreenFlex™	MilMetrix®	PurePulse®
Drynet™	Hydro-cushion™	MilTouch™	Ram Command™
E-P Express®	Linear Costa Master™	MilTouch-EX™	RecircONE®
E-P OneTouch®	Linear Costo™	Miltrac™	RinSave®
E-P Plus®	Mentor®	MultiTrac™	SmoothCoil™
Gear Guardian®	Mildata®	PBW™	Staph Guard®

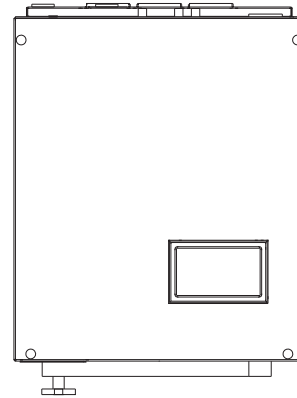
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Safety Placard Use and Placement

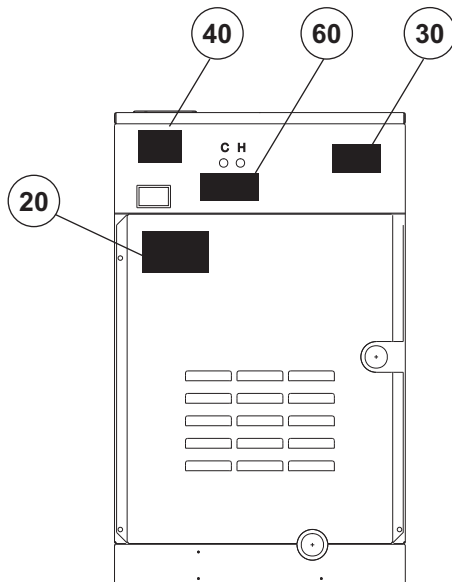
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Notes:

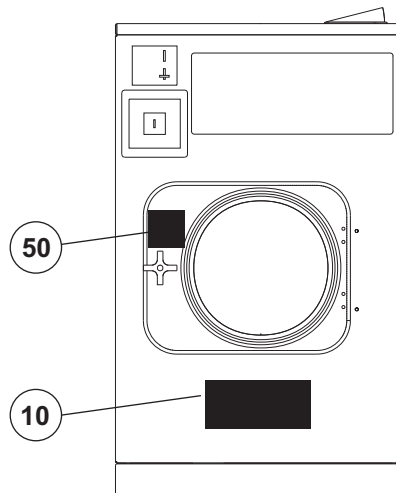
1. Replace placard immediately, if removed or unreadable.
2. Approximate locations of placards are shown. Mounting holes are provided on machine. If aluminum placard, use #8 Self-tapping screws.



PLAN VIEW



REAR VIEW



FRONT VIEW

Safety Placard Use and Placement

MCR12E5, MCR16E5, MCR18E4, MCR27E5, MCT12E5, MCT16E5, MCT18E4, MCT27E5, MCR36E4

Parts List—Safety Placard Use and 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
-----COMPONENTS-----				
all	10	01 10707B	NPLT:WARNING FRT SHELL MW COIN	
all	20	01 10708B	NPLT:REAR WARNINGS MW COIN	
all	30	01 10375D	NPLT:ELEC HAZARD MW-TCATA	
	40	01 10092E	NPLT:SPEC PLT-MD IN CHINA-ENG	MCR12,16,18 MCT12,16,18
	40	01 10093E	NPLT:SPEC PLT+CODE-ENGLISH	MCR27, MCT27
				MCR36E4
all	50	01 10709B	NPLT:DOOR ILOC INST MCR	
all	60	01 10710A	NPLT:CAUTION CHEMICAL SYSTEM	

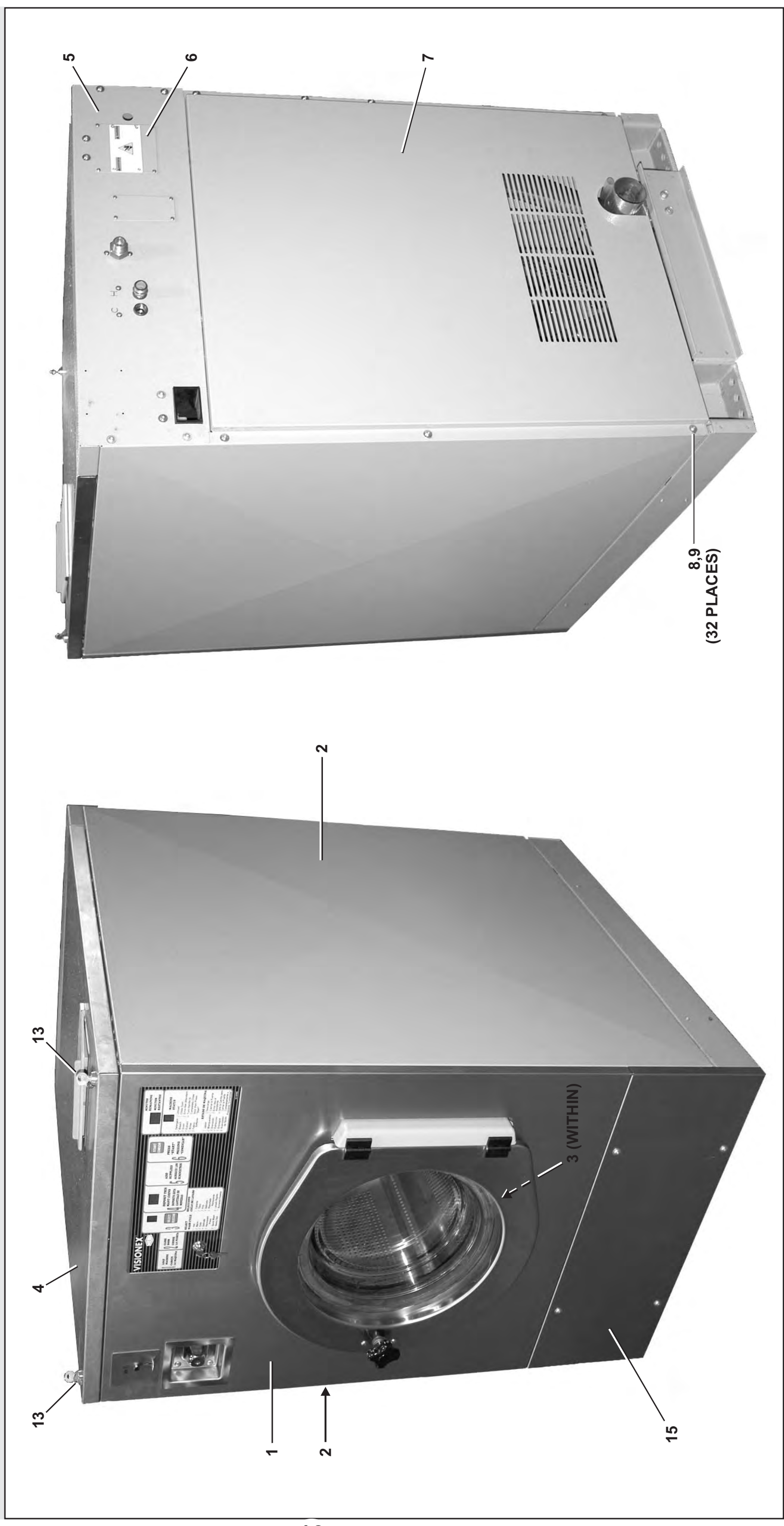
Guards and Covers
MCR27E5

BMP090022/2009392B
(Sheet 1 of 2)



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P. O. Box 400, Kenner, LA 70063-0400

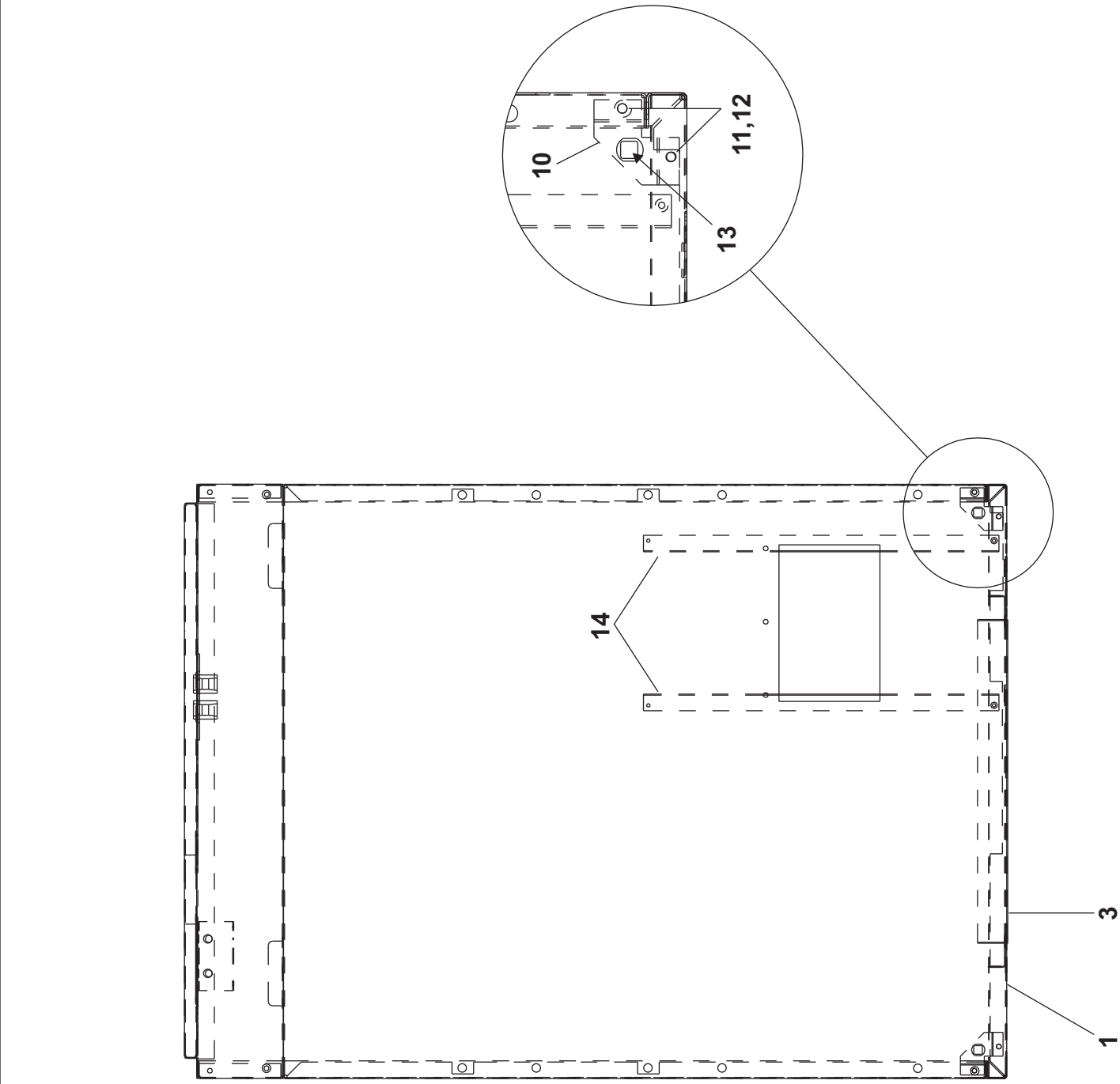
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PLAN VIEW

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
	A	GHG3022001	ASSEMBLIES CABINET 3022 COIN	
			COMPONENTS	
all	1	03 40501	CABINET FRONT 3022	
all	2	03 40502P	PANEL SIDE PAINTED 3022 (COLOR=WARM GRAY)	
all	3	03 40222V	FRONT DOOR TRIM 3022 CABINET	
all	4	03 40203B	CABINET TOP 3022	
all	5	03 40504A	CABINET REAR COVER 27KG COIN	
all	6	03 CF5X5A	COVER:MCR POWER/CHEM TERMINAL (COLOR=WARM GRAY)	
all	7	03 40527	CABINET BACK 3022 COIN (COLOR=WARM GRAY)	
all	8	15N110H	RDWASHHD TORXBOLT M6-1X25MM ZN	
all	9	15G004HB	EXTRUNUT M6-1 GRIP 0.8-4MM	
all	10	03 40203C	BKT LOCK NUT MCR27 (COLOR=WARM GRAY)	
all	11	15N158	HEXCAPSCR 1/4-20NCX1/2SS18-8	
all	12	15G164NE	HEXLOKNUT NYL 1/4-20 UNC2A SS.	
all	13	38C153	LOCK+2KEYS CONSEC NO 2+1/4LG	
all	14	03 40539E	RAIL SOAP CHUTE	
all	15	03 40540	LOWER FRONT COVER	

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 360° 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 360° 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

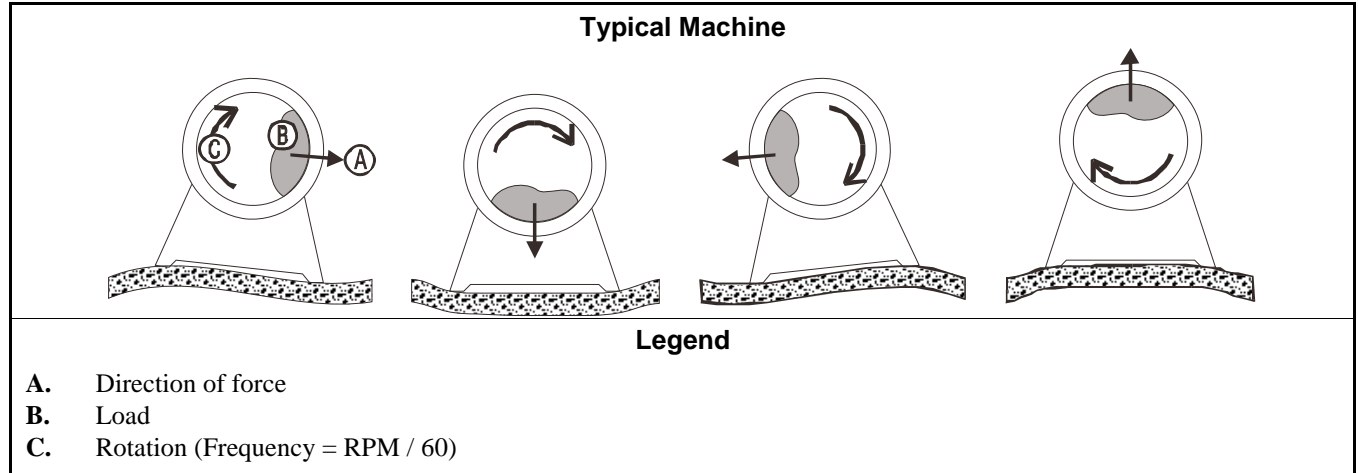


Figure 1 above is intended to depict both on-grade and above-grade installations and is equally applicable to flexibly-mounted washer-extractors, as well as to rigid models installed either directly on a floor slab or on a foundation poured integrally with the slab. Current machine data is available 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 BIWUI02 —

Installation Tag Guidelines

BNWCAI01.R01 0000204675 A.6 A.5 10/17/18 9:57 AM Released

MCR12E5
MCT18E4

MCR36E4
MCT27E5

MCT16E5



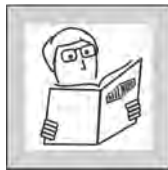
NOTICE: This information may apply to models in addition to those listed above. It applies to paper tags. It does not apply to the vinyl or metal safety placards, which must remain permanently affixed to the machine and replaced if no longer readable.

Paper tags on the machine provide installation guidelines and precautions. The tags can be tie-on or adhesive. You can remove tie-on tags and white, adhesive tags after installation. Yellow adhesive tags must remain on the machine.

The following entries explain the installation tags. Each entry includes: 1) the tag illustration, 2) the tag part number at the bottom of the tag, and 3) the meaning of the tag.

Display or Action

Explanation



Read the manuals before proceeding. This symbol appears on most tags. The machine ships with safety, operator, and routine maintenance guides for customer use. Milnor dealer manuals for installing, commissioning, and servicing the machine are also available from the Milnor Parts department.



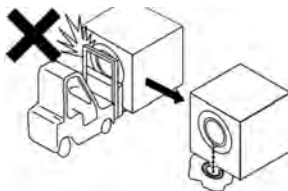
B2TAG88005: This carefully built product was tested and inspected to meet Milnor performance and quality standards by (identification mark of tester).



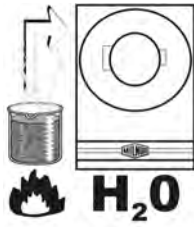
B2TAG94081: Motor must rotate in this direction. On single motor washer-extractors and centrifugal extractors, the drive motor must turn in this direction during draining and extraction. This tag is usually wrapped around a motor housing. If the motor turns in the opposite direction when the machine is first tested, the electrical hookup is incorrect and must be reversed as explained in the schematic manual.



B2TAG94097: The cylinder must rotate **counterclockwise** during draining and extraction (spin) when viewed from here (rear of machine). Otherwise, reverse the electric power connections, as explained in the schematic manual.



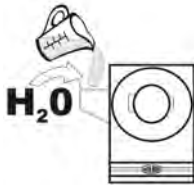
B2TAG94099: Do not strike the shell door when fork-lifting. This can cause the door to leak.



B2T2001013: Hot water connection.



B2T2001014: Cold water connection.



B2T2001016: Flushing water connection. This is the water that goes into the supply compartment or pumped chemical manifold to flush chemicals into the machine.



B2T2006001: Remove restraints inside. Your machine requires either one or two anchor bolts on each corner of the base, as shown. (Not used on MCR36E4.)



B2T2006002: Remove this restraint from the vibration switch.



B2T2008007: Do not exceed 160° Fahrenheit (71° Celsius) water temperature. Excessive temperature can damage the water valves in this machine. Eliminate water hammer on the water lines to this machine. Water hammer can rupture the water inlet valves on this machine. Follow applicable codes when installing water hammer arresters. Maintain incoming water pressure between 10 and 75 psi (between 0.7 and 5.1 bar). Pressures outside this range can damage the water valves in this machine.



B2T2018004: Install 8 anchor bolts. Remove vibration switch restraint. (Only used on MCR36E4.)

Installation Tag Guidelines

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MWR12J5	MWR12X5	MWR36J4	MWT12E5
MWT16E5	MWT16J5	MWT16X5	
MWT18E4	MWT18J6	MWT18X4	
MWT27E5	MWT27J5	MWT27X5	



NOTICE: This information may apply to models in addition to those listed above. It applies to paper tags. It does not apply to the vinyl or metal safety placards, which must remain permanently affixed to the machine and replaced if no longer readable.

Paper tags on the machine provide installation guidelines and precautions. The tags can be tie-on or adhesive. You can remove tie-on tags and white, adhesive tags after installation. Yellow adhesive tags must remain on the machine.

The following entries explain the installation tags. Each entry includes: 1) the tag illustration, 2) the tag part number at the bottom of the tag, and 3) the meaning of the tag.

Display or Action



Explanation

Read the manuals before proceeding. This symbol appears on most tags. The machine ships with safety, operator, and routine maintenance guides for customer use. Milnor dealer manuals for installing, commissioning, and servicing the machine are also available from the Milnor Parts department.



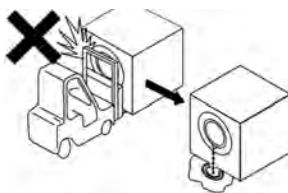
B2TAG88005: This carefully built product was tested and inspected to meet Milnor performance and quality standards by (identification mark of tester).



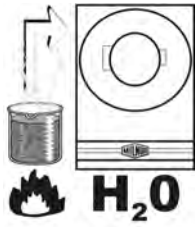
B2TAG94081: Motor must rotate in this direction. On single motor washer-extractors and centrifugal extractors, the drive motor must turn in this direction during draining and extraction. This tag is usually wrapped around a motor housing. If the motor turns in the opposite direction when the machine is first tested, the electrical hookup is incorrect and must be reversed as explained in the schematic manual.



B2TAG94097: The cylinder must rotate **counterclockwise** during draining and extraction (spin) when viewed from here (rear of machine). Otherwise, reverse the electric power connections, as explained in the schematic manual.



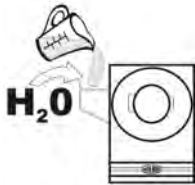
B2TAG94099: Do not strike the shell door when fork-lifting. This can cause the door to leak.



B2T2001013: Hot water connection.



B2T2001014: Cold water connection.



B2T2001016: Flushing water connection. This is the water that goes into the supply compartment or pumped chemical manifold to flush chemicals into the machine.



B2T2004027: Steam connection. (Optional) (Not used on MWT18_ models.)



B2T2006001: Remove restraints inside. Your machine requires either one or two anchor bolts on each corner of the base, as shown. (NOT USED ON MWR36J4.)



B2T2006002: Remove this restraint from the vibration switch.



B2T2008007: Do not exceed 160° Fahrenheit (71° Celsius) water temperature. Excessive temperature can damage the water valves in this machine. Eliminate water hammer on the water lines to this machine. Water hammer can rupture the water inlet valves on this machine. Follow applicable codes when installing water hammer arresters. Maintain incoming water pressure between 10 and 75 psi (between 0.7 and 5.1 bar). Pressures outside this range can damage the water valves in this machine.



B2T2018004: Install 8 anchor bolts. Remove vibration switch restraint. (USED ONLY ON MWR36J4.)

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Prevent Damage from Chemical Supplies and Chemical Systems

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All Milnor® washer-extractors and CBW® tunnel washers use stainless steel with the ANSI 304 specification. This material gives good performance when chemical supplies are correctly applied. If chemical supplies are incorrectly applied, this material can be damaged. The damage can be very bad and it can occur quickly.

Chemical supply companies usually:

- supply chemical pump systems that put the supplies in the machine,
- connect the chemical pump system to the machine,
- write wash formulas that control the chemical concentrations.

The company that does these procedures must make sure that these procedures do not cause damage. **Pellerin Milnor Corporation accepts no responsibility for chemical damage to the machines it makes or to the goods in a machine.**

1. How Chemical Supplies Can Cause Damage

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Dangerous Chemical Supplies and Wash Formulas — Some examples that can cause damage are:

- a very high concentration of chlorine bleach,
- a mixture of acid sour and hypo chlorite,
- chemical supplies (examples: chlorine bleach, hydrofluosilicic acid) that stay on the stainless steel because they are not quickly flushed with water.

The book “Textile Laundering Technology” by Charles L. Riggs gives data about correct chemical supplies and formulas.

Incorrect Configuration or Connection of Equipment — Many chemical systems:

- do not prevent a vacuum in the chemical tube (for example, with a vacuum breaker) when the pump is off,
- do not prevent flow (for example, with a valve) where the chemical tube goes in the machine.

Damage will occur if a chemical supply can go in the machine when the chemical system is off. Some configurations of components can let the chemical supplies go in the machine by a siphon ([Figure 1: Incorrect Configurations That Let the Chemical Supply Go In the Machine by a Siphon, page 2](#)). Some can let chemical supplies go in the machine by gravity ([Figure 2: Incorrect Configurations That Let the Chemical Supply Go In the Machine by Gravity, page 3](#)).

Figure 1. Incorrect Configurations That Let the Chemical Supply Go In the Machine by a Siphon

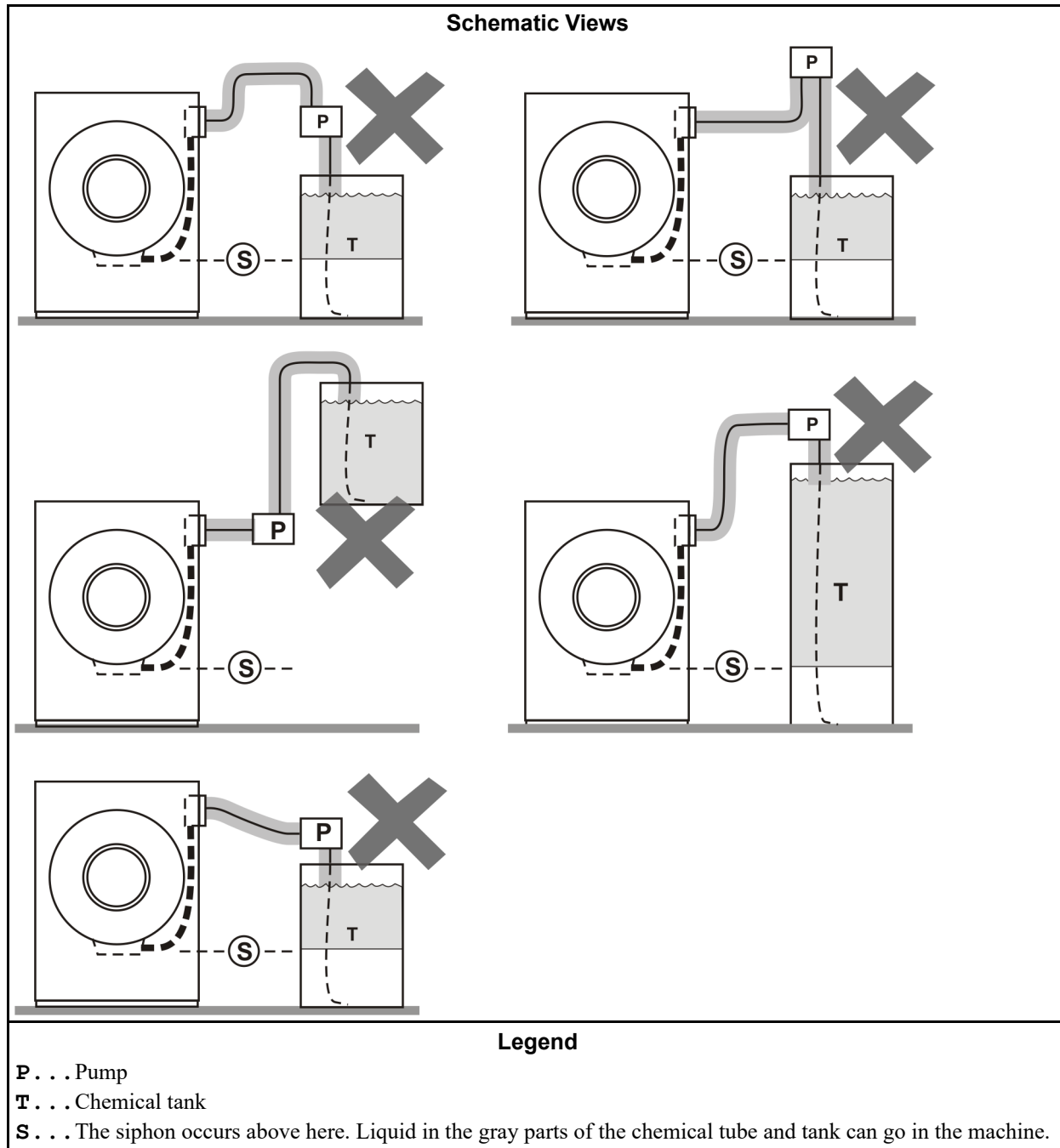
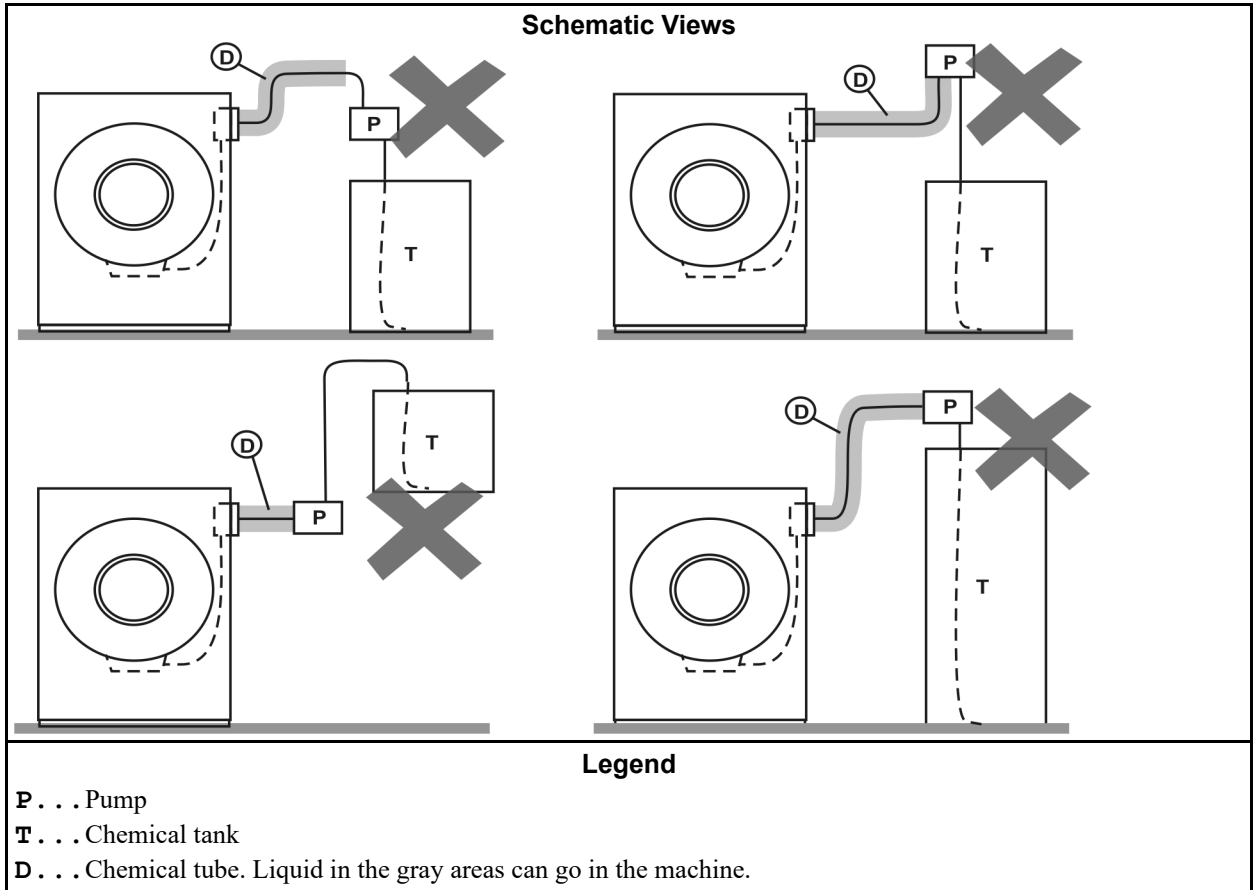


Figure 2. Incorrect Configurations That Let the Chemical Supply Go In the Machine by Gravity

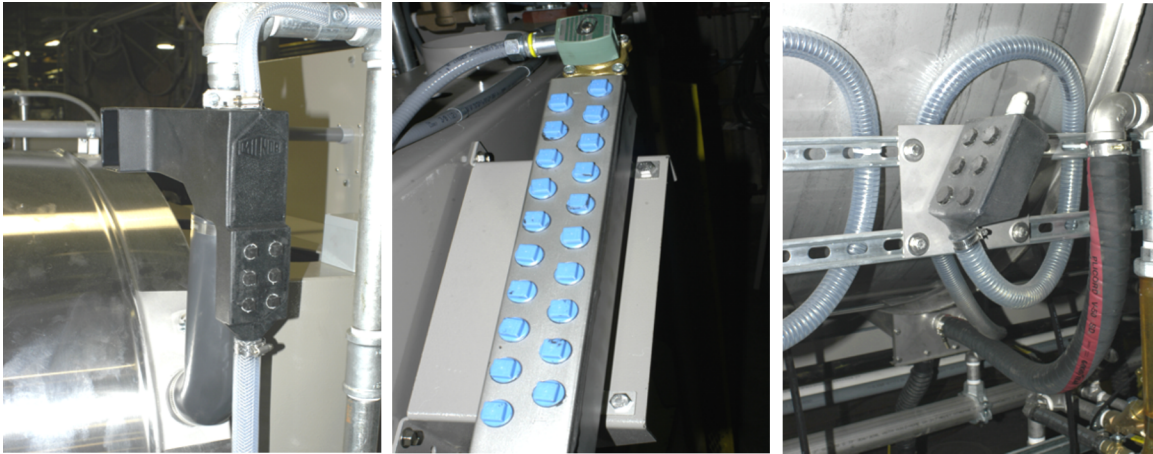


2. Equipment and Procedures That Can Prevent Damage

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Use the chemical manifold supplied. — There is a manifold on the machine to attach chemical tubes from a chemical pump system. The manifold has a source of water to flush the chemical supplies with water.

Figure 3. Examples of Manifolds for Chemical Tubes. Your equipment can look different.



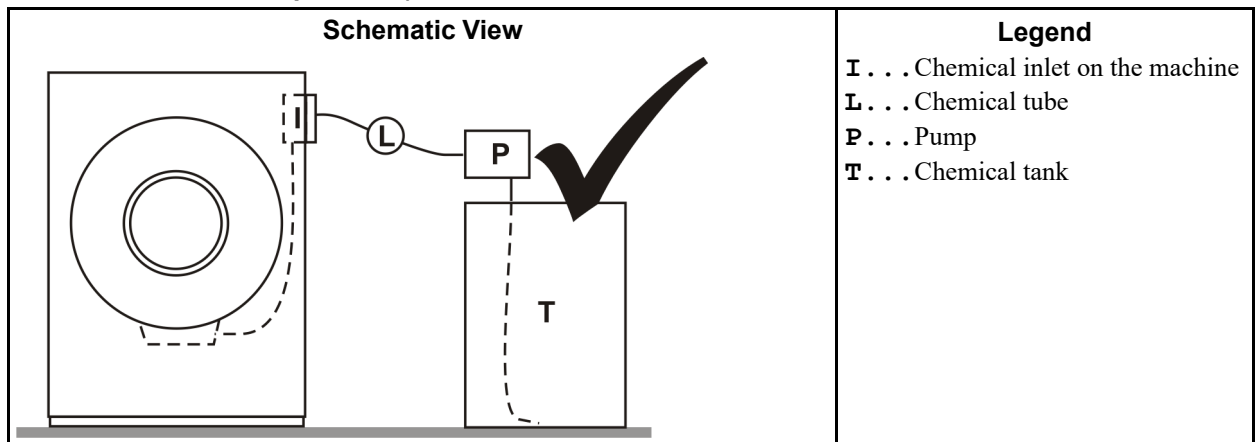
Close the line. — If the pump does not always close the line when it is off, use a shutoff valve to do this.

Do not let a vacuum occur. — Supply a vacuum breaker in the chemical line that is higher than the full level of the tank.

Flush the chemical tube with water. — If the liquid that stays in the tube between the pump and the machine can flow in the machine, flush the tube with water after the pump stops.

Put the chemical tube fully below the inlet. — It is also necessary that there is no pressure in the chemical tube or tank when the system is off.

Figure 4. A Configuration that Prevents Flow in the Machine When the Pump is Off (if the chemical tube and tank have no pressure)



Prevent leaks. — When you do maintenance on the chemical pump system:

- Use the correct components.
- Make sure that all connections are the correct fit.
- Make sure that all connections are tight.

End of document: BNUUUR02

Handling and Setting Procedures for Rigid Mount Washer-Extractors

1. Handling Precautions

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

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

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

2. Site Requirements

2.1. Space Requirements

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

2.2. Operational Requirements

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

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

3. Anchoring Requirements

Machines must be securely anchored to an adequate pedestal base (supplied by others) or a concrete foundation. The bolt holes in the pedestal top flange should be located and drilled only after the machine is on site and can be used as a template for bolt hole locations (See the pedestal base dimensional drawings in this manual). Customer must determine location of bolt holes in bottom flange if the machine is to be bolted to a foundation. Foundation templates are available for some machines. Consult Milnor if any obstruction prevents the installation of any anchor bolt. **Properly install anchor bolts at ALL anchor bolt holes on the machine. Anchor bolts cannot be indiscriminately omitted.**



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

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

4. Setting Procedures

1. With the machine near the final location, unbolt the shipping skids.
 - If using a pedestal mount (and after observing all precautions), lift machine level with top of pedestal and slide onto pedestal. Bolt or weld machine to pedestal as desired (See the pedestal base dimensional drawings for additional information).
 - If using a foundation (and after observing all precautions), lift the machine off the skid and onto temporary blocking. Install anchor bolts, taking care to align the bolts with the base plates to avoid bolt thread damage. **Determine that the minimum clearance between each base plate and floor surface is as specified (see dimensional drawings).** Shim the machine at temporary blockings to level the machine from left to right and front to back. Use a carpenter's level along the right and left side of the base to determine if the machine is level from front to back. Place a level laterally across the base plates to determine if the machine is level from right to left then see the grouting instructions below.



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

- Never tighten anchor bolt fasteners before grouting.
 - Grout must displace total clearance between base plate and existing foundation floor. Voids must not exist!
1. After determining the final position of the machine, apply grout between the existing foundation floor and base, while observing the following considerations:
 - All machines are designed to be grouted under the full area of all base plates. Grout prevents the anchor bolts from distorting the frame when the fasteners are tightened. Total area under each base plate must be completely filled with grout (see dimensional drawings). Voids under base plates can magnify vibration, causing unsatisfactory operation. Use only industrial strength non-shrinking grout.
 - If the grout (after mixing) is of proper consistency, pack or trowel it by hand.

- If the grout (after mixing) is too thin (causing it to flow from under the base pads), install temporary cardboard framing around the pads to retain the grout until it cures.
2. After the grout has completely cured, raise the machine sufficiently to remove all temporary blocking and shims. **Be careful to avoid disturbing or damaging grout.**
 3. Lower machine onto grout and tighten all foundation fasteners until they contact the top of the base plate.
2. Tighten all fasteners evenly, using only one-quarter turn on each fastener before moving to the next one. While tightening, frequently skip from front to back and right to left to insure uniform tension. After tightening all fasteners, check each fastener at least twice.

— End of BIRUI01 —

Service Connections

1. General

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

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

2. Requirements for Piped Connections

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

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



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

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

3. Piped Inlets

Table 1: Piped inlets for MCR09E5, MCR12E5, MCR18E5 and MWR09E5, MWR12E5, MWR18E5 models

Connection Description	Source Requirements	Piping Requirements, Comments
Cold water inlet	3/4" garden hose thread @ 10 - 75 psi (69 - 531 kPa)	Pipe material per plumbing code
Hot water inlet		
Flush water inlet	3/4" garden hose thread with 1/2" hose @ 10 - 75 psi (69 - 531 kPa)	

4. Piped Outlets

Table 2: Piped Outlets for MCR09E5, MCR12E5, MCR18E5 and MWR09E5, MWR12E5, MWR18E5 models

Model	Connection Description	Destination Requirements or Description	Piping Specifications
MCR09E5, MCR12E5, MWR09E5, and MWR12E5	Drain	2" ID hose connection	Rubber hose, PVC or other approved material per plumbing code
	Suds Overflow	2" ID hose connection	Per code
MCR18E5 and MWR18E5	Drain	3" OD hose connection	Rubber hose, PVC or other approved material per plumbing code
	Suds Overflow	2" OD hose connection	Per code

5. Power Connections and Precautions



WARNING [3]: Electrocutation 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.

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

- Any such conditions should be corrected prior to commissioning your machine.
 1. Electrical connections must be made by a competent electrician.
 2. Machine must be grounded by connecting to a grounded metal, permanent wiring system, or an equipment-grounding conductor must be run with the circuit conductors and connected to the equipment-grounding terminal on the machine.
 3. Stinger leg, if any, must be connected to terminal L3, never to terminals L1 or L2.
 4. Make power connections within junction boxes on the rear of the machine.
 5. Verify motor rotation ([Figure 1](#)). See the operating and trouble shooting manual for more information. If the cylinder turns in the wrong direction, interchange the wires connected to L1 and L2. Never move L3 under any circumstances. All motors are phased for proper rotation. Never attempt to reconnect motors or the motor control devices.
 6. Machines ordered for 208/240 volt operation are shipped set for 240 volt operation from the factory ([Figure 2](#)). If the supply voltage is 208 volts, then remove the top, and place the line voltage switch in the 208 volt position.

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

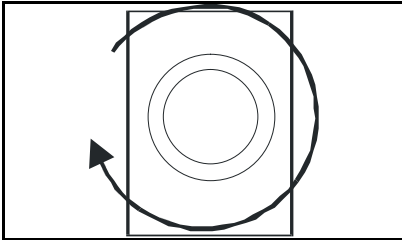


Figure 2: Line Voltage Switch



Figure 3: Vibration Switch

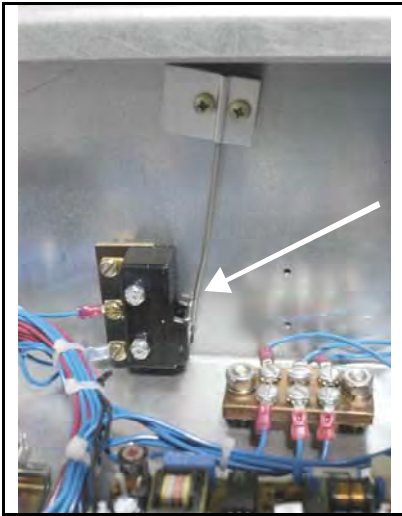


Figure 4: Motor Mount Blocking



6. Remove Shipping Restraints

Remove all shipping restraints (usually marked in red). Restraints may be located behind access panels. Restraints may include the vibration switch (Figure 3) restraint, motor mount blocking (Figure 4).

7. Check Cylinder Surface

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

— End of BIRQVI01 —

Service and Maintenance

1

Preventive Maintenance



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

Table 1 gives the necessary preventive maintenance items. If necessary, more data about an item is given behind the table or in other parts of the manual. The "Details" column tells where to look.



WARNING 2: Risk of severe injury—A machine in operation without safety guards can pull in and mutilate your body.

- You must be an approved maintenance technician.
- Use special caution when this instruction tells you to do work with electrical power on. Remove power from the machine for all other maintenance. Obey safety codes.
- Replace guards and covers that you remove for maintenance.

Table 1: Preventive Maintenance Items

Do this procedure					on this part	at this interval					to prevent this.					Details				
Examine. Replace if worn or missing. ↓ Examine. Adjust if necessary. ↓ Examine. Tighten if loose. ↓ Clean / vacuum ↓ Add fluid if low ↓ Replace fluid ↓ Add grease ↓ Other						Each day = 8 hours of operation ↓ Week = 40 hours ↓ Month = 165 hours ↓ 3 mo = 500 hr ↓ 4 mo = 670 hr ↓ 6 mo = 1000 hr ↓ Year = 2000 hr ↓ Other					Injury ↓ Immediate damage ↓ Unsatisfactory performance ↓ Costly repair ↓ Unwanted shutdown ↓ Other									
X					guards, covers, safety placards	X									X					See Note 1
X	X				anchor bolts and grout		X								X		X			See "Dimensional Drawing"
X	X				fasteners		X								X		X			See "Torque Requirements for Fasteners"
		X			inverter fans, vents		X								X		X			See Section 1
		X			all machine areas			X										dirty parts wear faster		
		X			all electrical terminals			X												See also External Fuse/Breaker... Requirements
X	X				components with fluid leaks			X								X				See also Section 5
		X			water strainers						X					X				
		X			steam strainer			X								X				See Section 4
		X			soap chute, chemical inlets	X									X		X			See Section 1
		X		X	motors												X			See "Motor Maintenance"
X					drive pulleys		X											X		See Note 1
	X				drive belt			X								X		X		See Note 1
	X				water pressure for flush inlet			X								X				See Section 3
				X	main bearing													not applicable		These are sealed bearings
X					door interlock	X									X					See Daily Test of Door Interlock (Reference Manual)

Note 1: See the data about this component in this service manual.

1. Easy Procedures to Prevent Immediate Damage



CAUTION [3]: Risk of damage—Spilled chemical supplies can cause corrosion damage to the machine and the goods.

- Remove chemical supplies from machine surfaces.
- Stop leaks. Do not let remaining chemical supplies go into the machine when it does not operate.

- Speak to your Milnor dealer or the Milnor factory if you see corrosion damage.

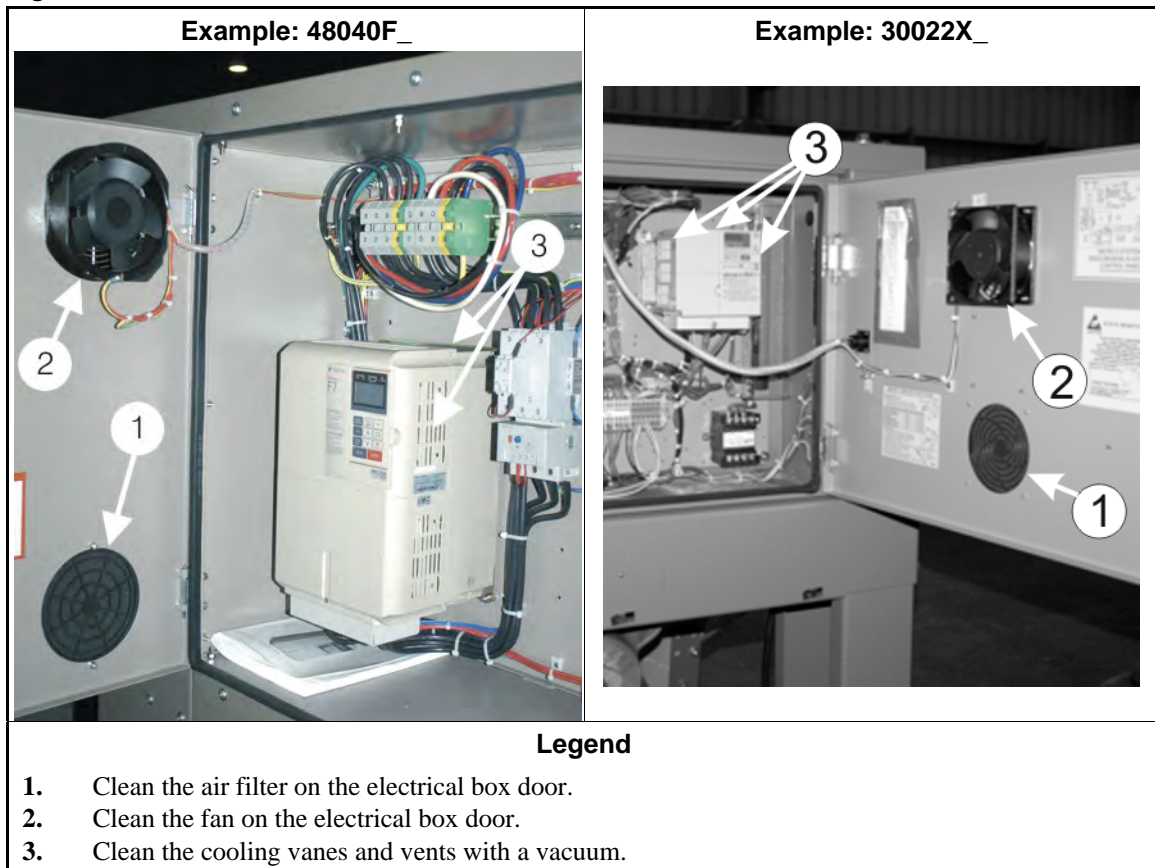


CAUTION [4]: Risk of damage—The inverter will burn out without sufficient airflow.

- Keep fans, filter, and vents clean (see [Figure 1](#)).

Tip: Put streamers in front of the fan to make sure the fan operates.

Figure 1: Electrical Box and Inverter



2. Lubricant Procedures



CAUTION [5]: Risk of damage—Lubricant that is dirty or the incorrect viscosity will decrease the life of bearings and hydraulic components. Lubricant that is spilled on a component (for example, the drive belt) can cause failure of the component.

- Speak to the lubricant manufacturer before you apply lubricant that is not specified in this instruction.
- Do not mix petroleum and synthetic lubricants.
- Clean the grease fittings before you apply grease.
- Clean spilled lubricant.



CAUTION [6]: Risk of damage—The force of a grease gun can push out the bearing seals.

- Use a hand grease gun. Do not use a power grease gun.
- Add only the specified quantity of lubricant.

- Operate the grease gun slowly (10 to 12 seconds for one cycle).
- Calibrate the grease gun before you count grease gun cycles to apply grease (see [Section 2.1](#)).

2.1. Grease Gun Procedure—This instruction gives grease quantities in cycles, fluid ounces, and grams. A cycle is each time that you pull the trigger. One cycle = 0.0624 ounces (1.77 grams). Your grease gun can give more or less than this in one cycle. Adjust the number of cycles if necessary. Calibrate your grease gun as follows:

1. Make sure that the grease gun operates correctly.
2. Operate the grease gun to put grease into a small container with ounce increments. Pull the trigger fully and slowly.
3. Add a sufficient quantity of grease to measure accurately. Count the number of cycles of the grease gun (the number of times that you pull the trigger).
4. Calculate the quantity for each cycle of the grease gun.

Example: 2 ounces / 64 cycles = 0.0313 ounces for each cycle

In this example, you must apply two times the number of cycles this instruction gives.

2.2. Grease Type, Locations, and Quantities—Necessary grease type: "Shell Alvania EP" or the equivalent.

On MCR_ and MWR_ models lubricate only the motors. Refer to "Motor Maintenance."

3. Water Pressure Regulator for the Optional Flush Water Inlet

Make sure that the regulator for the pressure to the flush water inlet is set to 28 psi.(193 kPa).

Figure 2: Optional flush water pressure regulator and gage



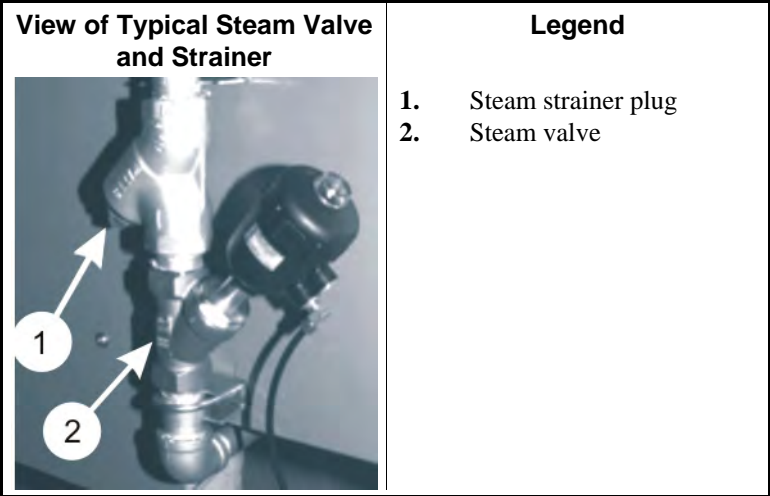
4. Steam Strainer



WARNING 7: Risk of severe injury—You can accidentally release pressurized steam.

- Close the external shutoff valve before you remove the steam strainer plug.

Figure 3: Steam Strainer



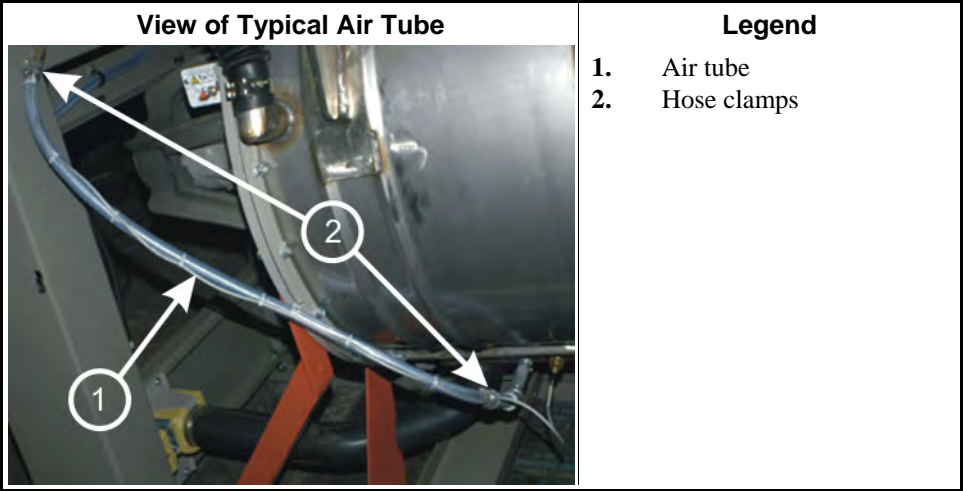
5. Water Level Air Tube



CAUTION [8]: Risk of malfunction—A leak or obstruction in the air tube for the water level sensor will cause the controller to read a false water level.

- Keep the air tube free of obstructions and leaks.
- Keep the hose clamps tight.

Figure 4: Air Tube



— End of BIIFUM02 —

Motor Maintenance



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

This document is for motors used on Milnor® machines that have grease fittings. If the motor manufacturer supplies maintenance instructions, use them. If not, use this document.

NOTICE P1: "Remove power from the machine" means use the necessary safety procedure for your location. In the USA, this is the OSHA lockout/tagout (LOTO) procedure. More local requirements can also apply.



WARNING 2: Risk of Severe Injury—A machine in operation without safety guards can pull in and mutilate your body.

- You must be an approved maintenance technician.
- Replace guards and covers that you remove for maintenance.



WARNING 3: Risk of Severe Injury—The machine has electrical power when the Master switch (M) on the control panel is off or on.

- Remove power from the machine (see Notice P1).

1. Necessary Maintenance

- 1.1. Keep the motors clean.**—Examine and clean motors each 500 hours of operation or a minimum of each three months. Keep the motors free of dirt, oil, grease, and water. Contamination that prevents good airflow will cause too much heat and cause motor damage.
- 1.2. Examine a motor that shows unusual symptoms.** —Examine a motor that becomes too hot, makes noise, makes smoke, smells unusual, or opens the circuit breaker frequently. Examine a motor if the inverter gives errors. Make sure that all electrical connections are tight. Make sure that the wire insulation is good. Use a low resistance ohmmeter. Disassemble the motor to clean it fully If necessary.
- 1.3. Lubricate the motors.**—This document gives the lubricant frequency, quantity, type, and procedure. These are all important. See the related section in document BIIFUM02 which gives the calibration procedures for grease guns.

2. How to Find the Interval and Quantity of Grease to Add

frame code—codes for the standard motor dimensions used by motor manufacturers.

standard interval—the number of hours that a motor can operate in typical conditions before you must add grease.

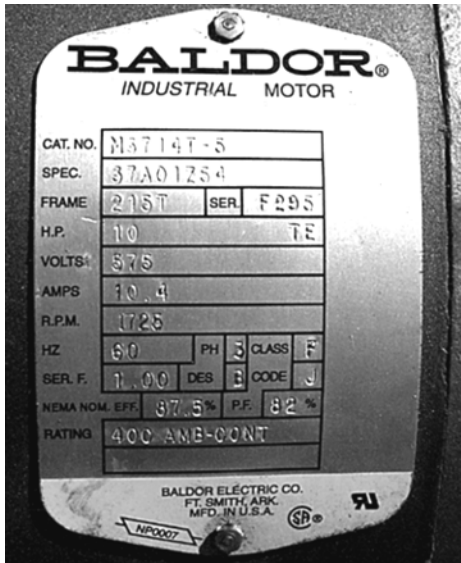
operation conditions—the conditions that can decrease the life of the motor and make it necessary to lubricate more frequently.

rating—One of three levels of operation conditions: typical, bad, very bad.

multiplication number—a decimal number given to the rating. Typical = 1.0, bad = 0.5, and very bad = 0.2.

This section gives the steps you use to find the interval and quantity of grease to add. The examples use the motor data plate shown in [Figure 1](#).

Figure 1: Typical Data Plate on a Motor



1. Find the frame code and RPM on the motor data plate. Example:

Frame code = 215T, RPM = 1725

2. Find the standard interval in [Table 1](#). Example:

Standard interval = 12,000 hours

3. Find the rating and multiplication number in [Table 2](#) for your worst operation condition. Example: ambient temperature = 102°F (39°C). Moderate contamination.

Rating = bad, Multiplication number = 0.5

4. Calculate the correct interval (the number of hours of operation before it is necessary to add grease). Example:

$$12,000 \times 0.5 = 6,000 \text{ hours}$$

Where:

12,000 is the standard interval

0.5 is the multiplication number for a rating = bad.

5. Find the quantity of grease for the frame code for your motor in [Table 3](#). You can use the bearing data in the table to do maintenance. Do not use this data to adjust the quantity of grease. Example:

grease volume = 0.16 ounces (4.7 grams)

grease gun cycles = 2.5

Table 1: Standard Interval

NEMA (IEC)** Range of Frame Codes	Interval in Hours for the Given RPM			
	3600 RPM*	1800 RPM*	1200 RPM*	900 RPM*
Up to 215 (132)	5500	12000	18000	22000
254 to 286 (160 - 180)	3600	9500	15000	18000
324 to 365 (200 - 225)	2200	7400	12000	15000
404 to 5000 (280 - 315) 6313 or 6314 bearings Roller bearings	2200	3500	7400	10500
	1100	1750	3700	5250

* Use this column if this is near or the same RPM as your motor.
 ** Frame codes given by the IEC are shown in parentheses.

Table 2: Operation Condition and Multiplication Number

Operation Conditions*			Rating	Multiplication Number
Maximum Ambient Temperature	Or Atmospheric Contamination	Or Bearing Type		
104°F (40°C)	Clean, not much corrosion	Ball bearing with a groove of large depth	Typical	1.0
122°F (50°C)	Moderate dirt, corrosion	Ball thrust, roller	Bad	0.5
>122°F (>50°C)	Much dirt, abrasive dust, corrosion	n.a.	Very bad	0.1

* The worst condition sets the rating.

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

NEMA (IEC) Range of Frame Codes	Largest Bearing Dimension in Range			Quantity of Grease *		Cycles of the Grease Gun
	Category of Bearing	Outer Diameter (mm)	Width (mm)	(Ounces)	(Grams)	
0 thru 215 (132)	6307	80	21	0.16	4.7	2.5
254 to 286 (160 - 180)	6311	120	29	0.32	9.1	5
324 to 365 (200 - 225)	6313	140	33	0.43	12.2	7
404 to 5000 (280 - 315)	NU322	240	50	1.11	31.5	18

* This is the quantity for the two bearings.

3. Grease Types and Procedures

Table 4: Type of Grease

Rating from Table 2	Type of Grease
Typical	Shell Dolium R, Chevron SRI, or equivalent
Bad	
Very Bad	Darmex 707 or equivalent



CAUTION [4]: Damage and Malfunction Risks—Too much grease gun pressure can put grease in the motor and cause electrical components to burn out. If grease touches a brake or a clutch surface, this can cause a malfunction.

- Apply grease carefully.

Apply grease as follows:

1. **Remove power from the machine (see Notice P1).**
2. Clean grease fittings.
3. If the motor has a grease outlet plug, remove it.
4. Add the recommended quantity of grease (See [Item 5](#)). Stop immediately if you see new grease around the motor shaft, wires or the grease outlet plug.
5. If the motor has a grease outlet plug, replace it.

— End of BIUUM03 —

Torque Requirements for Fasteners



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

The document about the assembly gives the torque requirements for other fasteners. **If fastener torque specifications or threadlocker requirements in an assembly document are different from this document, use the assembly document.**

Figure 1: The Bolts in Milnor® Equipment

The Marks on Bolt Heads	Legend
	<p>A. SAE Grades 1 and 2, ASTM A307, and stainless steel</p> <p>B. Grade BC, ASTM A354</p> <p>C. SAE Grade 5, ASTM A449</p> <p>D. SAE Grade 8 and ASTM A354 BD</p>

1. Torque Values

These tables give the standard dimension, grade, threadlocker, and torque requirements for fasteners frequently used on Milnor® equipment.

Note 1: Data from the Pellerin Milnor® Corporation “Bolt Torque Specification” (bolt_torque_milnor.xls/2002096).

1.1. Fasteners Made of Carbon Steel

1.1.1. Without a Threadlocker

Table 1: Torque Values for Standard Fasteners with Maximum 5/16-inch Diameters and No Lubricant

Dimension	The Grade of the Bolt							
	Grade 2		Grade 5		Grade 8		Grade BC	
	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	--	--

Torque Requirements for Fasteners

Table 2: Torque Values for Standard Fasteners Larger Than 5/16-inch Diameters and No Lubricant

Dimension	The Grade of the Bolt							
	Grade 2		Grade 5		Grade 8		Grade BC	
	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
3/4 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 with Maximum 5/16-inch Diameters and No Lubricant

Dimension	The Grade of the Bolt							
	Grade 2		Grade 5		Grade 8		Grade BC	
	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 Diameters and No Lubricant

Dimension	The Grade of the Bolt							
	Grade 2		Grade 5		Grade 8		Grade BC	
	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
3/4 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 a Threadlocker

Table 5: Threadlocker by the Diameter of the Bolt (see Note 2)

LocTite Product	Dimension			
	1/4-inch	1/4- to 5/8-inch	5/8- to 7/8-inch	1-inch +
LocTite 222	OK			
LocTite 242		OK		
LocTite 262			OK	
LocTite 272			High temperature	
LocTite 277				OK

Note 2: The acceptable bolt size ranges for various LocTite® threadlocking products is the LocTite manufacturer's **general** recommendation. Specific applications sometime require that a LocTite product is applied to a bolt size outside the ranges shown here. For example, Milnor specifies LocTite 242 for use on certain 1" bolt applications and has confirmed this usage with the LocTite manufacturer. You may see variances such as this in the documentation for specific machine assemblies.

Torque Requirements for Fasteners

Table 6: Torque Values if You Apply LocTite 222

Dimension	The Grade of the Bolt							
	Grade 2		Grade 5		Grade 8		Grade BC	
	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 if You Apply LocTite 242

Dimension	The Grade of the Bolt							
	Grade 2		Grade 5		Grade 8		Grade BC	
	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 if You Apply LocTite 262

Dimension	The Grade of the Bolt							
	Grade 2		Grade 5		Grade 8		Grade BC	
	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 if You Apply LocTite 272 (High-Temperature)

Dimension	The Grade of the Bolt							
	Grade 2		Grade 5		Grade 8		Grade BC	
	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 if You Apply LocTite 277

Dimension	The Grade of the Bolt							
	Grade 2		Grade 5		Grade 8		Grade BC	
	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

Dimension	316 Stainless		18-8 Stainless		18-8 Stainless with Loctite 767	
	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

Dimension	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 2: Fire Hazard—Some solvents and primers are flammable.

- Use threadlocker and primers with sufficient airflow.
 - Do not use flammable material near ignition sources.
1. Clean all threads with a wire brush or a different tool.
 2. Remove the grease from the fasteners and the mating threads with solvent. Make the parts dry.

Note 3: Loctite 7649 Primer™ or standard solvents will remove grease from parts.

3. Apply a spray of Loctite 7649 Primer™ or equal on the fasteners and the mating threads. Let the primer dry for one minute minimum.

3. How to Apply a Threadlocker

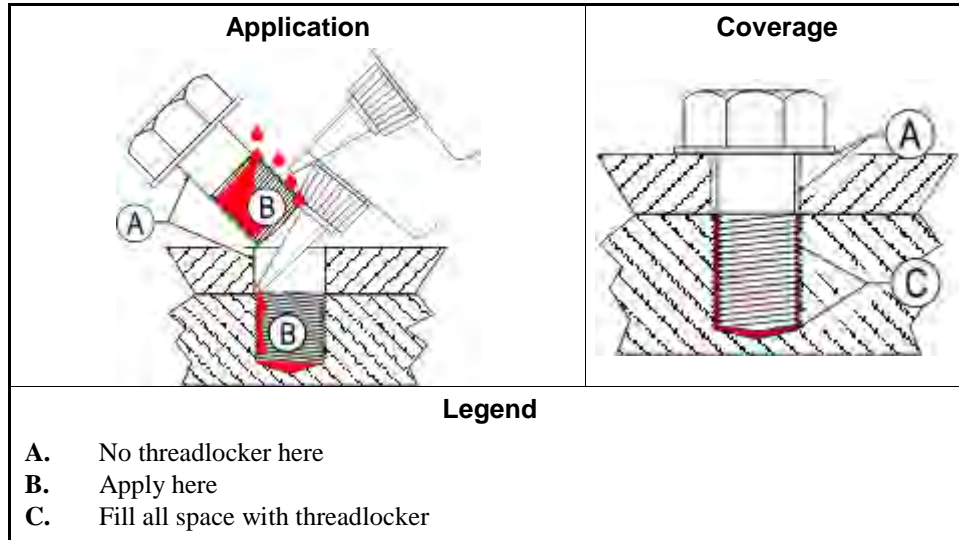


CAUTION 3: Malfunction Hazard—Heat, vibration, or mechanical shocks can let the fasteners loosen if you do not apply the threadlocker correctly. Loose fasteners can cause malfunctions of the equipment.

- Read the threadlocker manufacturer's instructions and warnings. Obey these instructions.

Apply the threadlocker only to the areas where the fastener threads and the mating threads engage.

Figure 2: Blind Hole



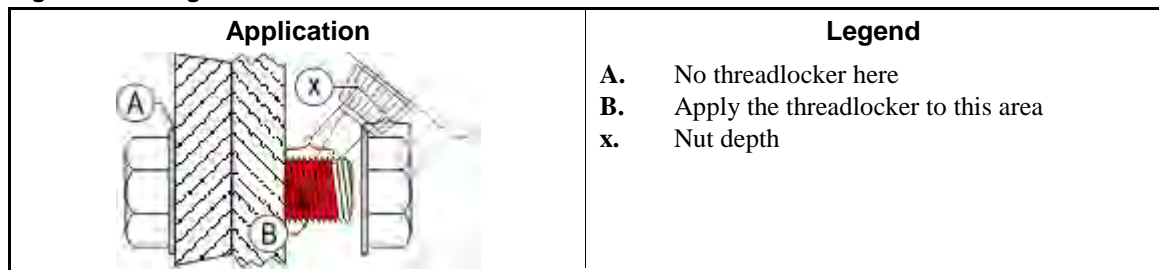
3.1. Blind Holes

1. Apply the threadlocker down the threads to the bottom of the hole.
2. Apply the threadlocker to the bolt.
3. Tighten the bolt to the value shown in the correct table ([Table 5](#) to [Table 11](#)).

3.2. Through Holes

1. Put the bolt through the assembly.
2. Apply the threadlocker only to the bolt thread area that will engage the nut.
3. Tighten the bolt to the value shown in the correct table ([Table 5](#) to [Table 11](#)).

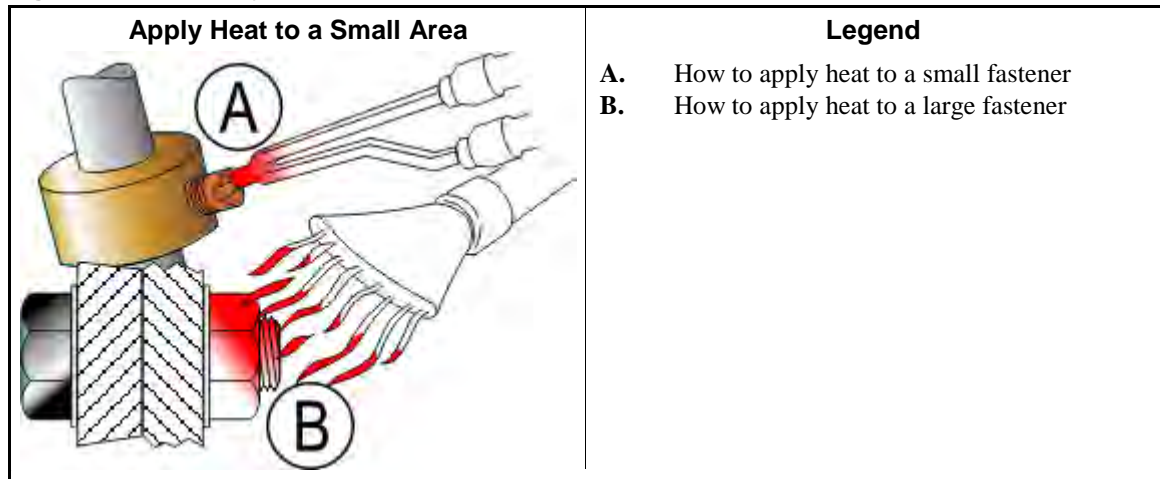
Figure 3: Through Hole



- 3.3. Disassembly**—For high-strength threadlocker, apply heat for five minutes. Disassemble with hand tools while the parts are hot.

For low-strength and moderate-strength threadlocker, disassemble with hand tools.

Figure 4: Disassembly



— End of BIUUM04 —

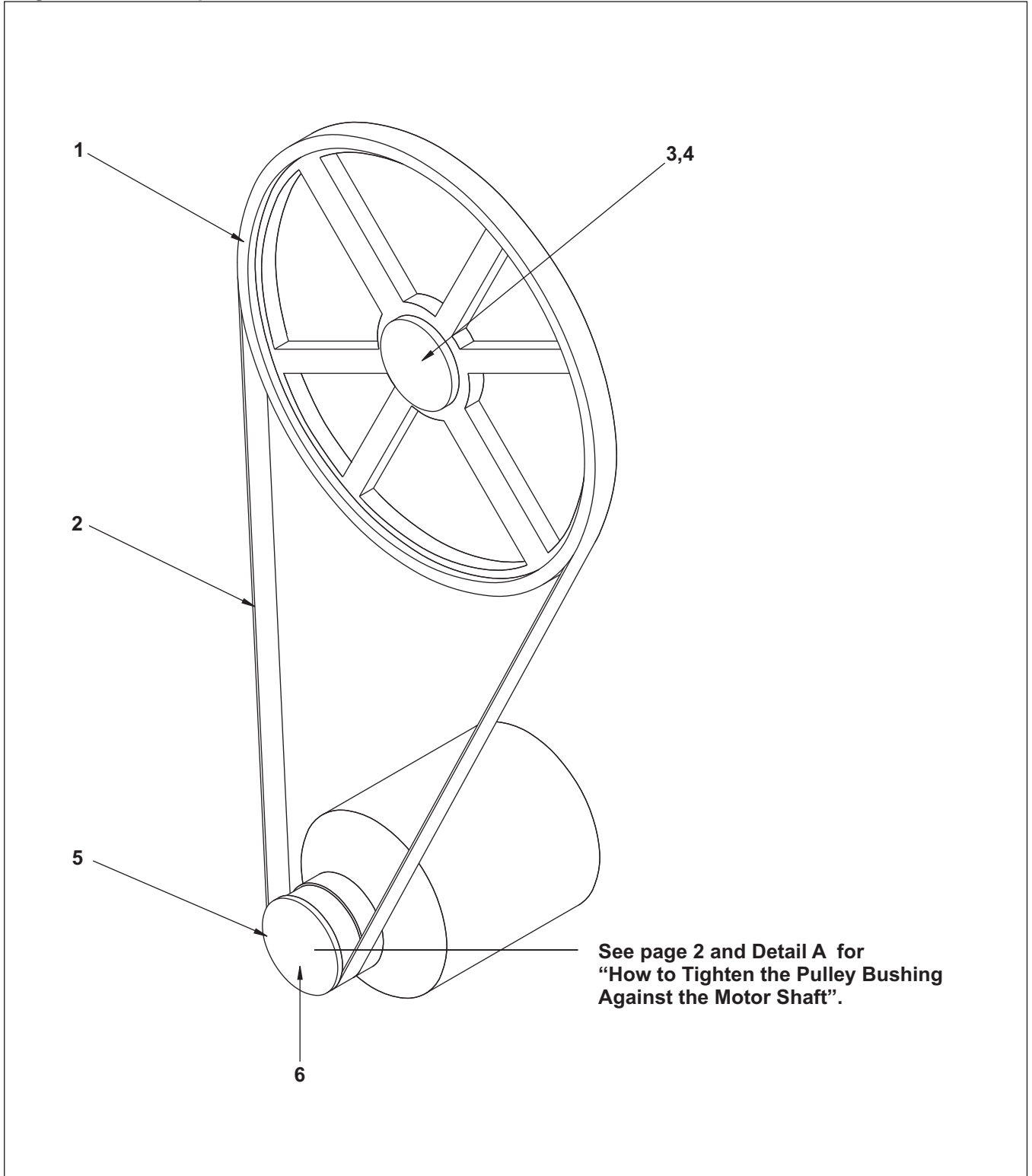
Drive Assemblies

2

Drive Chart

MCR27E5, MWR27E/X/J5
MCT27E5, MWT27E/X/J5

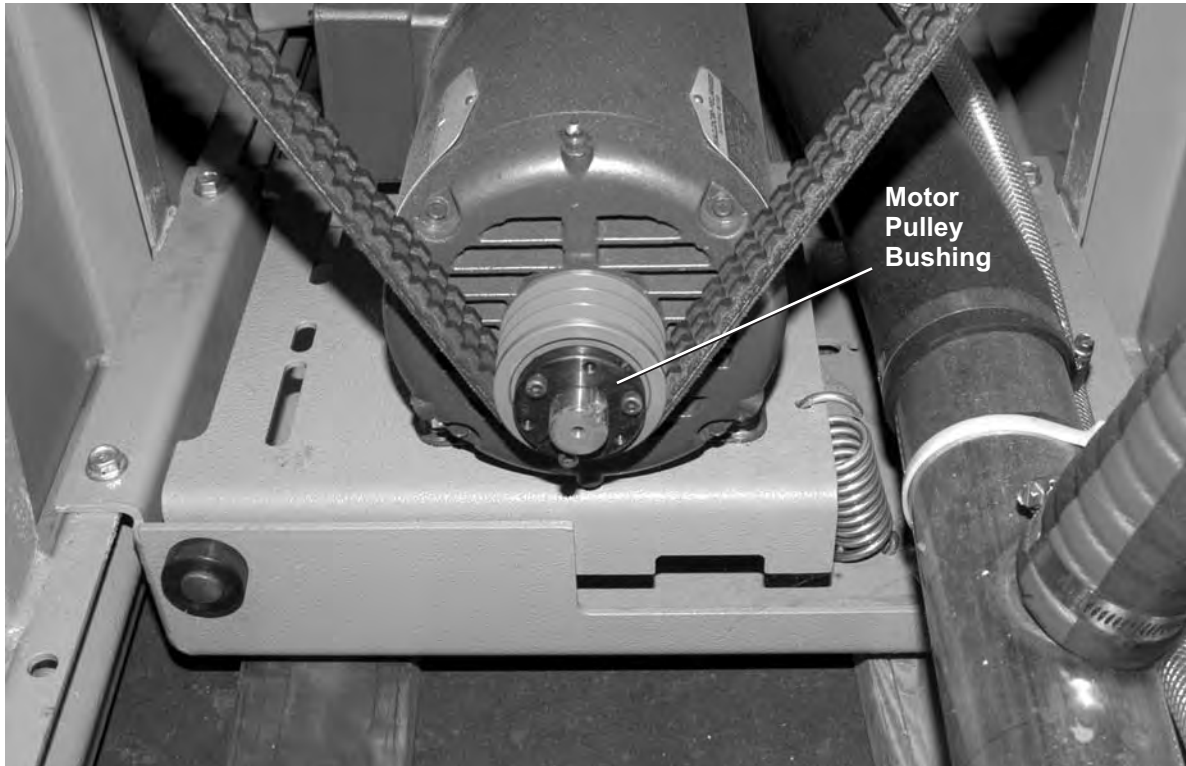
Figure 1: Drive Components



Drive Chart

MCR27E5, MWR27E/X/J5
MCT27E5, MWT27E/X/J5

Figure 2: How to Tighten the Pulley Bushing Against the Motor Shaft



How to Tighten the Pulley Bushing Against the Motor Shaft

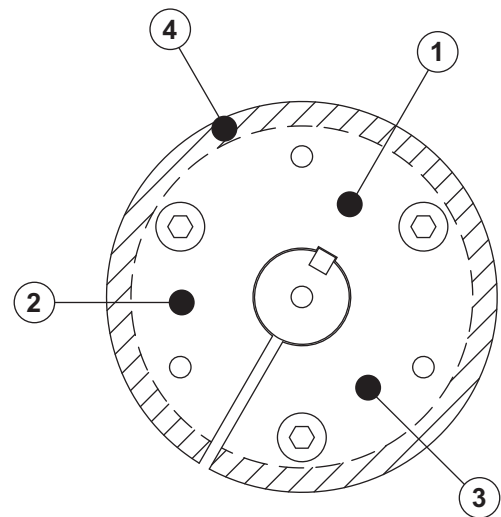
It is necessary to use both bolt torque and careful hammer blows with a brass or rubber hammer to fully tighten the motor pulley bushing. When the pulley and bushing are installed on the motor shaft and aligned with the main drive pulley, tighten the motor bushing as follows:

1. Tighten the bushing bolts alternately and evenly until all bolts are at the torque specified for the bushing.

CAUTION: In the following step, use a brass or rubber hammer only and avoid applying hammer blows close to the outside diameter of the of the bushing (Detail A, location 4). As you work, observe the face of the bushing on either side of the split. The two sides must remain flush.

2. Carefully apply hammer blows to the face of the bushing--first at location 1 (opposite the bushing split), then at location 2, then at location 3.

3. Repeat steps 1 and 2 until the specified torque no longer turns the bushing bolts.



Detail A: Motor Pulley Bushing

Drive Chart

MCR27E5, MWR27E/X/J5
 MCT27E5, MWT27E/X/J5

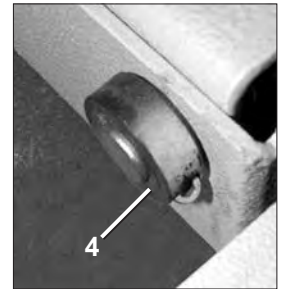
Parts List—Drive Chart

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.

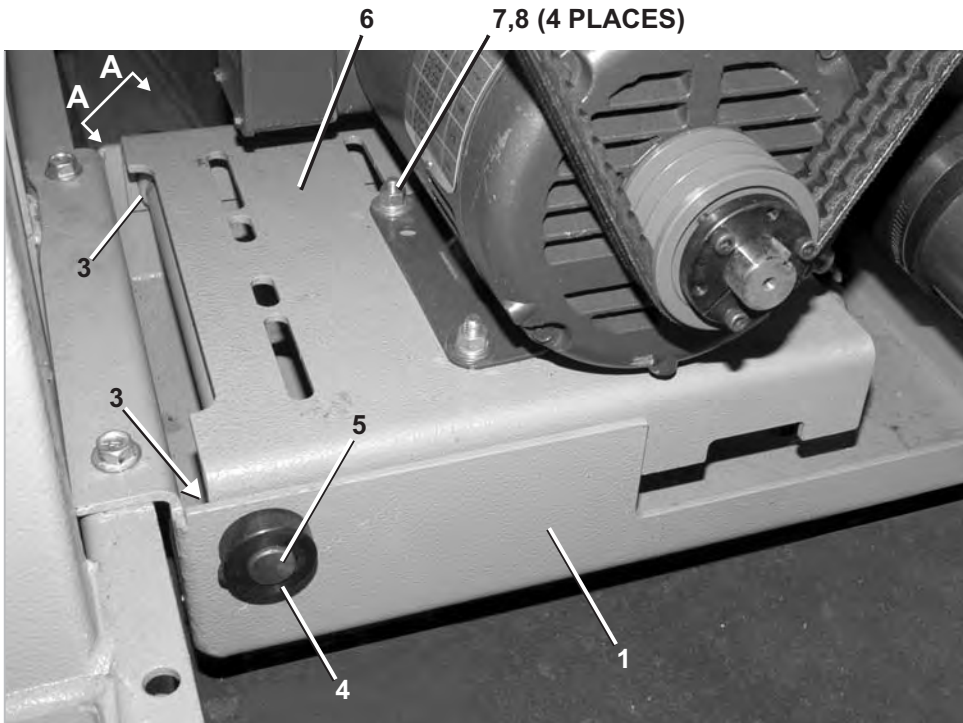
Used In	Item	Part Number	Description	Comments
-----ASSEMBLIES-----				
	A	D33 03860	DRIVE CHART MCR27E5	
-----COMPONENTS-----				
all	1	98CMCR2710	CSM-0085.6019-VPUL SPZ560-3	
all	2	98CMCR2711	CSM-0085.0716-VBELT SPZ 2120 1 BELT	
all	3	98CMCR1818	BUSH TB TYPE 2517X38, BSW7/16"	
all	4	98CMCR2713	CSM/STRMACHKEY 3/8SQX2+1/2 TOL.+0	
All	5	98CMCR2714	CSM-0085.6015-VPUL SPZ67-3	USED PRIOR TO 1/1/2015
all	5	98CMCR2716	VPUL SPZ75-3	EFFECTIVE 1/1/2015
all	6	98CMCR1821	BUSH TB TYP 1108X28, BSW1/4"	USED PRIOR TO 1/1/2015
all	6	98CMCR2717	BUSH TB TYP 1210X28, BSW3/8"	EFFECTIVE 1/1/2015

Motor Mount

MCR27E5, MWR27E/X/J5
MCT27E5, MWT27E/X/J5



View A-A



Motor Mount

MCR27E5, MWR27E/X/J5
 MCT27E5, MWT27E/X/J5

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.

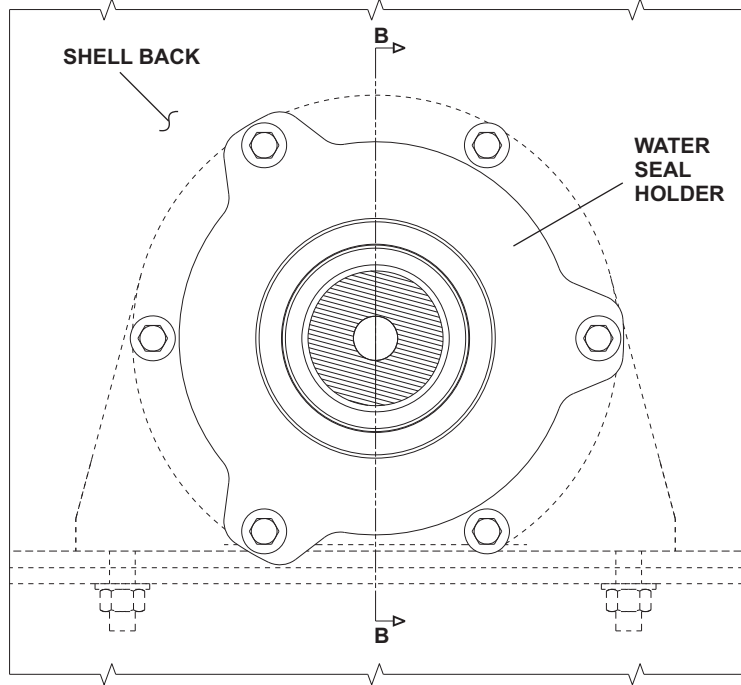
Used In	Item	Part Number	Description	Comments
-----ASSEMBLIES-----				
	A	ADB3022001	MOTOR MT 3022 MCR	
-----COMPONENTS-----				
All	1	03 40526	MOTOR MOUNT RAIL 3022	
all	2	02 04259	SPRNG/MOT MOUNT/3022S4#SPC2690	
all	3	54E226	FLBRNYL 3/4"X1"X1";EA=1 FLGBRG	
all	4	54JH10750C	SHFTCOLLAR 3/4"CLPTYP(SGLSPLT)	
all	5	03 40526C	ROD PIVOT MTR MT 3022	
all	6	02 04256E	PLATE=MOTOR MOUNT MCR27	
all	7	15K092Z	HEXFLGSCR 3/8-16X1 GR5 ZINC	
all	8	15G198	HXFLGNUT 3/8-16 ZINC	
all	9	17N070AP	RETAIN NUT#S10222-27	

Bearing Assemblies

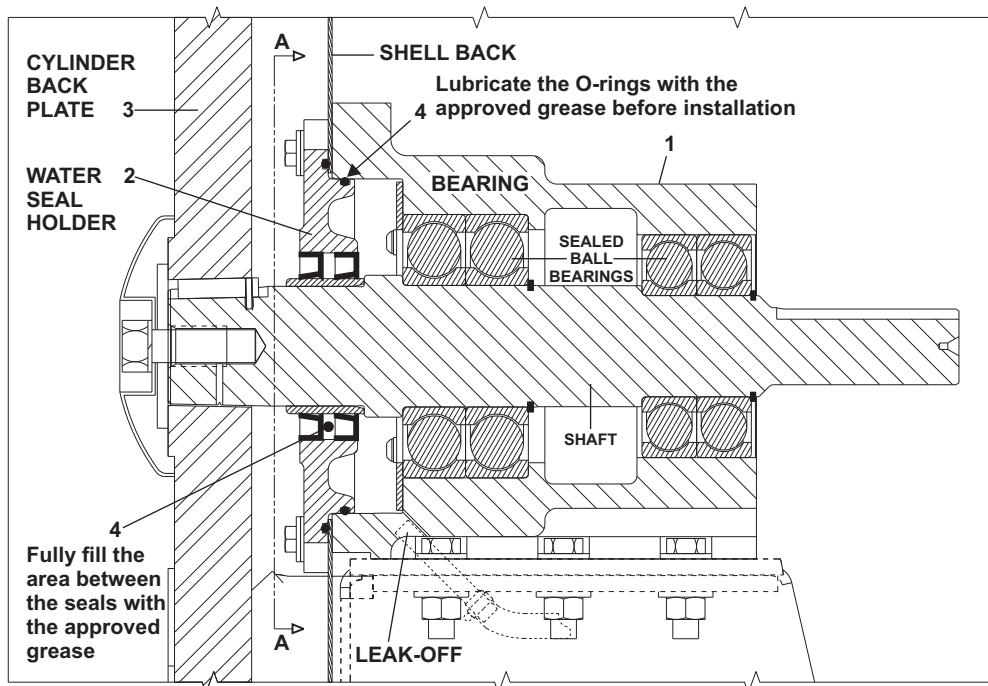
3

Bearing Assembly & Installation

MCR27E5, MWR27E/X/J5
MCT27E5, MWT27E/X/J5



VIEW A-A



VIEW B-B

Bearing Assembly & Installation

MCR27E5, MWR27E/X/J5
 MCT27E5, MWT27E/X/J5

Parts List—Bearing Assembly & Installation

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

Used In	Item	Part Number	Description	Comments
-----COMPONENTS-----				
All	1	98CMCR2718	MCR27 BEARING HOUSE ASSY	
all	2	98CMCR2702	ASSY=CSM WTR SEAL HOLDER, 2825-LS	
all	3	ACA3022M5	*CYL ASSY=3022 M5/C/K/S	
all	4	20H012A	ALVANIA EP-2 LF EA=1 TUBE	

Shell and Door Assemblies

4

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

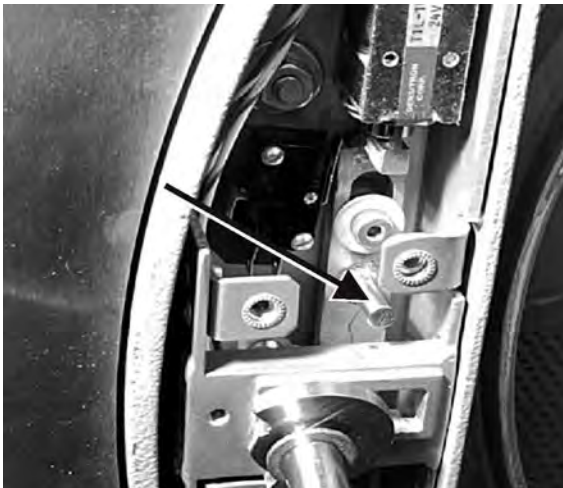
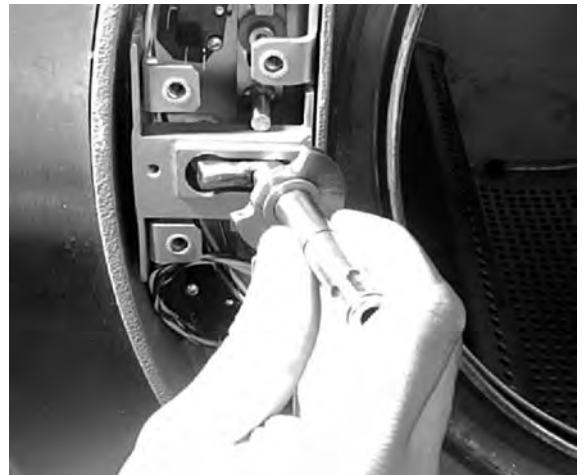


Figure 7: Removing the Shaft from the Lock Mechanism



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 —

Door Assembly and Installation

MCR27, MWR27

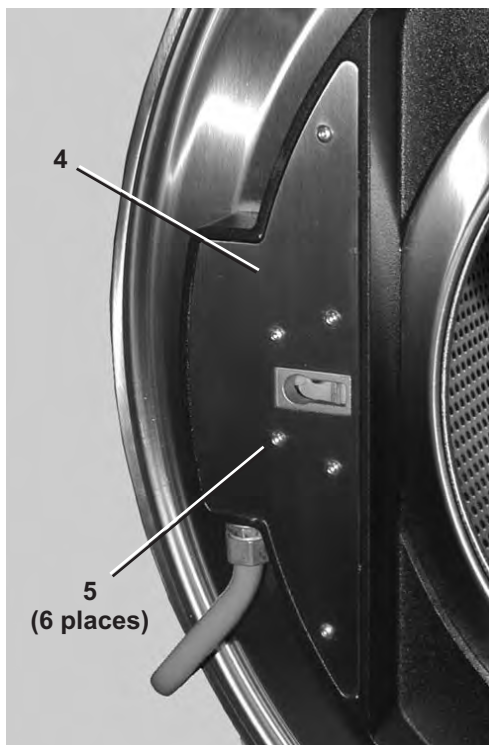
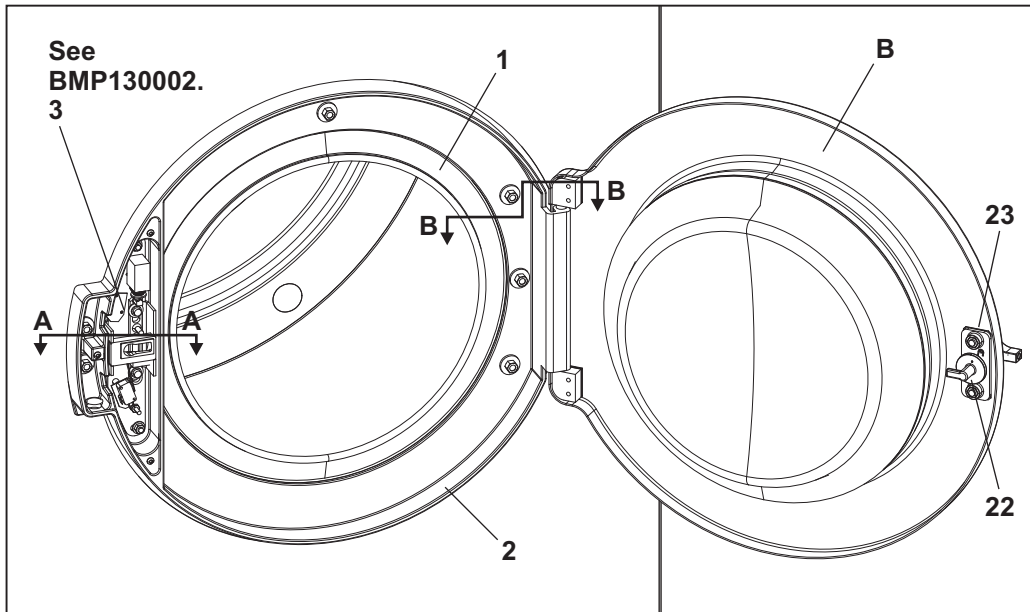
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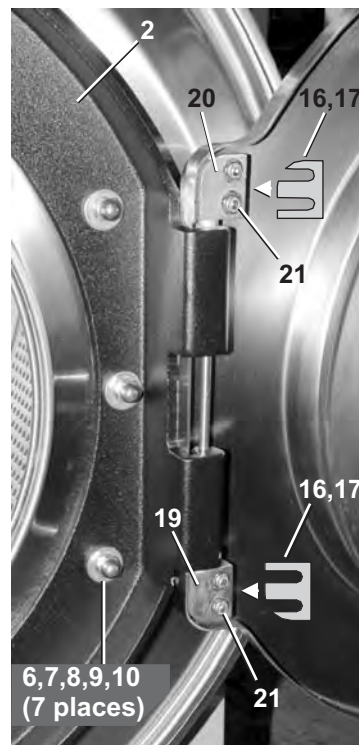
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Door Installation



Door Lock Cover

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



Hinge

Door Assembly and Installation

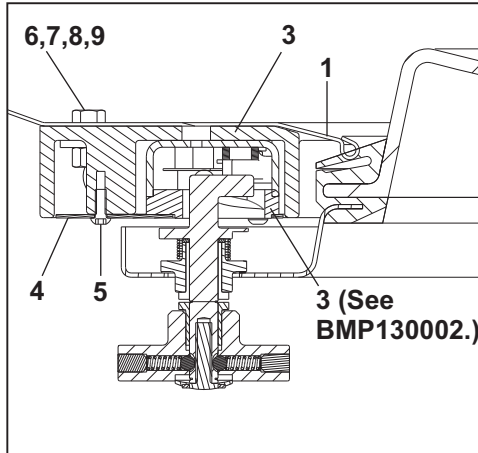
MCR27, MWR27

BMP130003/2014115A
(2 / 3)

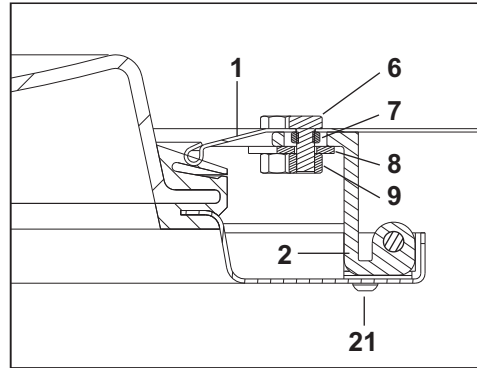


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Section A-A: Door Installation



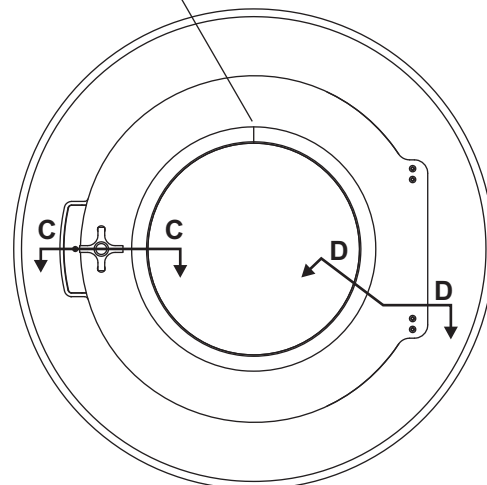
Section B-B: Door Installation

Ensure that the gasket joint is at top-dead-center.

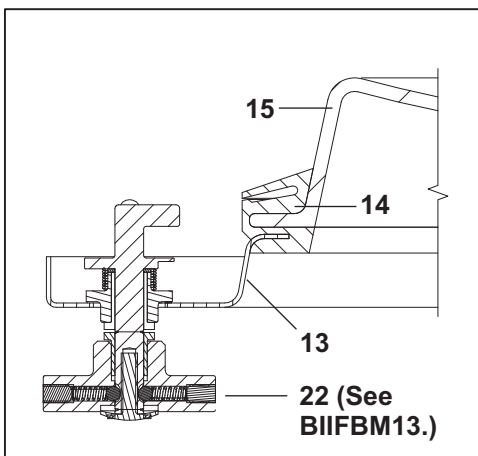
Door Assembly:

Door Glass Installation

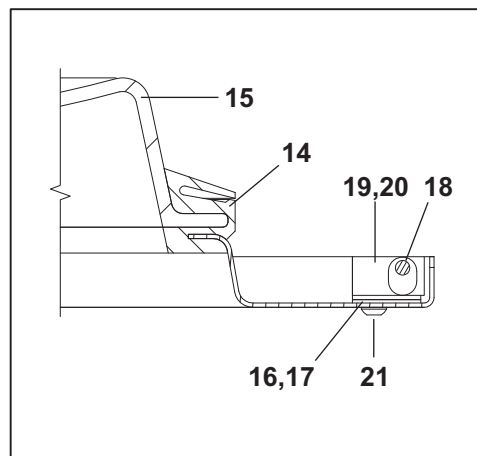
1. Apply a continuous bead of silicone completely around the rubber seal, in the area where the glass is to be seated.
2. Install the gasket into the door before installing the glass. Observe the location of the rubber seal joint line and adjust if necessary.
3. While installing the glass into the rubber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



Door Assembly



Section C-C:



Section D-D:



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Parts List—Door Assembly and Installation

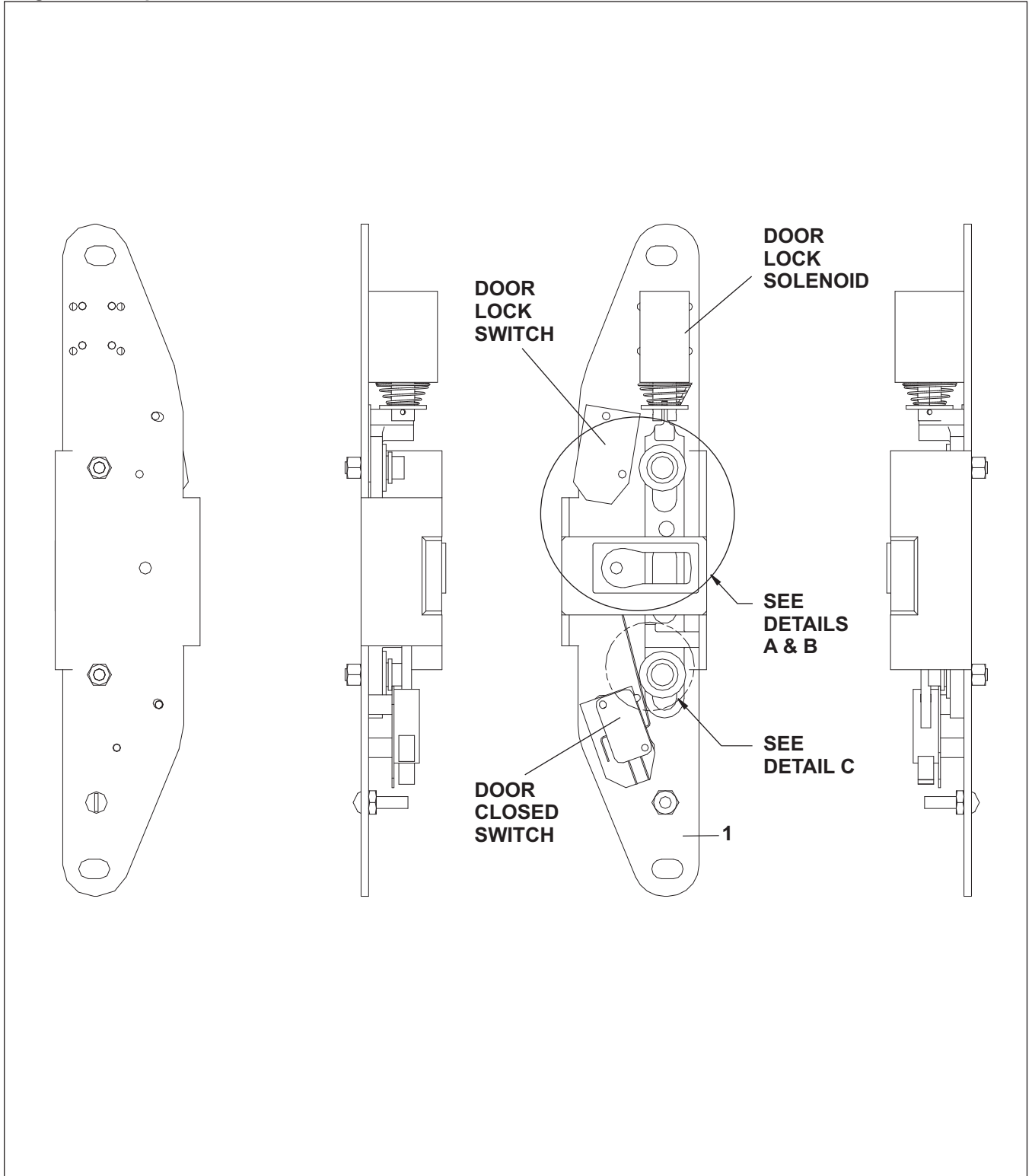
Find the correct assembly first, then find the needed components. The item letters (A, B, C, etc.) assigned to assemblies are referred to in the "Used In" column to identify which components belong to an assembly. The item numbers (1, 2, 3, etc.) assigned to components relate the parts list to the illustration.

Used In	Item	Part Number	Description	Comments
-----ASSEMBLIES-----				
	A	A33 10100W	FLAT SHELL FRONT/DOOR ASSY 27KG MCR/MWR	
	B	A33 07100G	ASSY=DOOR, 30" FLAT SHELLFRONT	
-----COMPONENTS-----				
all	1	X2 02361W	SHELLFRONT 27KG MCR/MWR ELECTRIC LOCK	
all	2	02 03261	30" DOOR FRAME MACHINED	
all	3	98CMCR0971	DOOR INTERLOCK ASSY MILNOR ASSY A33 03226B	
all	4	02 03228D	DOOR LOCK BOX COVER 3022V8	
all	5	15K017	BUTSOKCAPSCR 10-24X1/2 SS	
all	6	15K052	HXCAPSCR 5/16-18UNC2AX3/4 SS18	
all	7	15G188	HEXLOKNUT 5/16-18 BRASS	
all	8	15U246	FLATWASHER 1"ODX25/64IDX1/8"30	
all	9	15G190	HEXFJINJAMNUT 5/16-18NC2 SS18-8	
all	10	15G192	HXCPNUT 5/16-18UNC2SS18-8 9/16	
all	11	15U185	FLATWASHER(USS STD) 1/4" ZNC P	
all	12	17S2500A	DOUBLE END 1/4-20X1-1/8 STUD 1/4 ONE END AND 3/4 ONE END CS	
B	13	02 03229A	30" SHELL DOOR	
B	14	02 03200	DOOR GASKET, 3022H7	
B	15	02 03251	DOOR GLASS, 3022H7	
B	16	02 03297	30" DOOR HINGE SPACER 14GA	
B	17	02 03297A	30" DOOR HINGE SPACER 16GA	
B	18	X2 03296B	HING PIN 3022V8	
B	19	02 03260	30" SHELL DOOR HINGE LOWER	
B	20	02 03260A	30" SHELL DOOR HINGE UPPER	
B	21	15K033	BUTSOKCAPSCR 1/4-20X5/8 SS18-8	
B	22	98CMCR0925	ASSY=DR HNDL MECH	
B	23	02 04192A	.015 SHIM=DOOR MNT PL,3022H7	

Door Lock Mechanism

MCR27E5, MWR27E5; 3015T6X,VRJ,V8Z,VZZ; 30022T6X,VRJ,V8Z,VZZ; MWF27J8, MWF27Z8; 30022X8R
36021V5Z, 36021V7Z, 36026V5Z, 36026V7Z, 42026V6Z, 42030V6Z

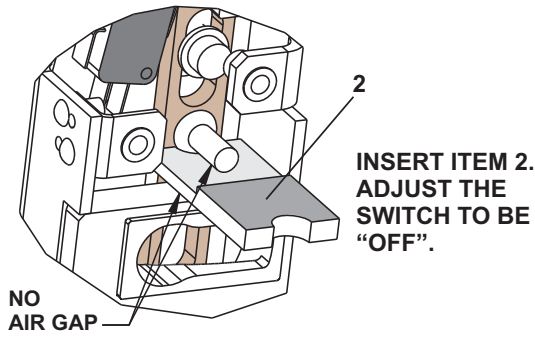
Figure 1: Components



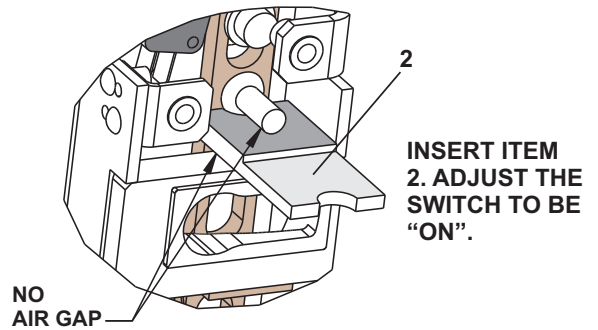
Door Lock Mechanism

MCR27E5, MWR27E5; 3015T6X, VRJ, V8Z; 30022T6X, VRJ, V8Z; MWF27J8, MWF27Z8; 30022X8R
36021V5Z, 36021V7Z, 36026V5Z, 36026V7Z, 42026V6Z, 42030V6Z

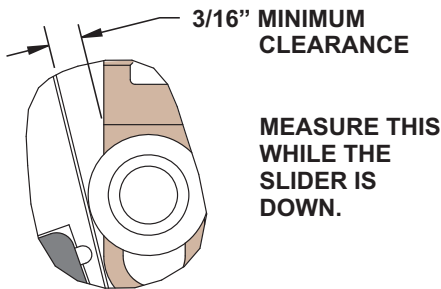
Figure 2: Slider and Settings



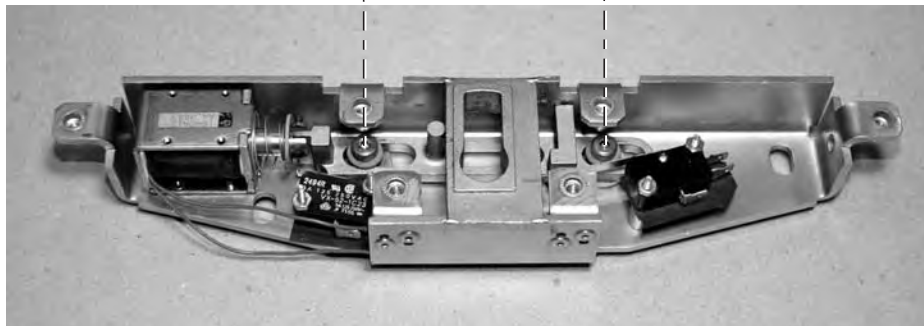
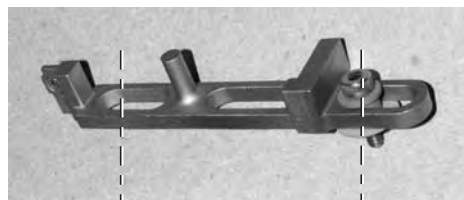
DETAIL A:
DOOR LOCK SWITCH "OFF"



DETAIL B:
DOOR LOCK SWITCH "ON"



DETAIL C:
DOOR CLOSED SWITCH



Door Lock Mechanism

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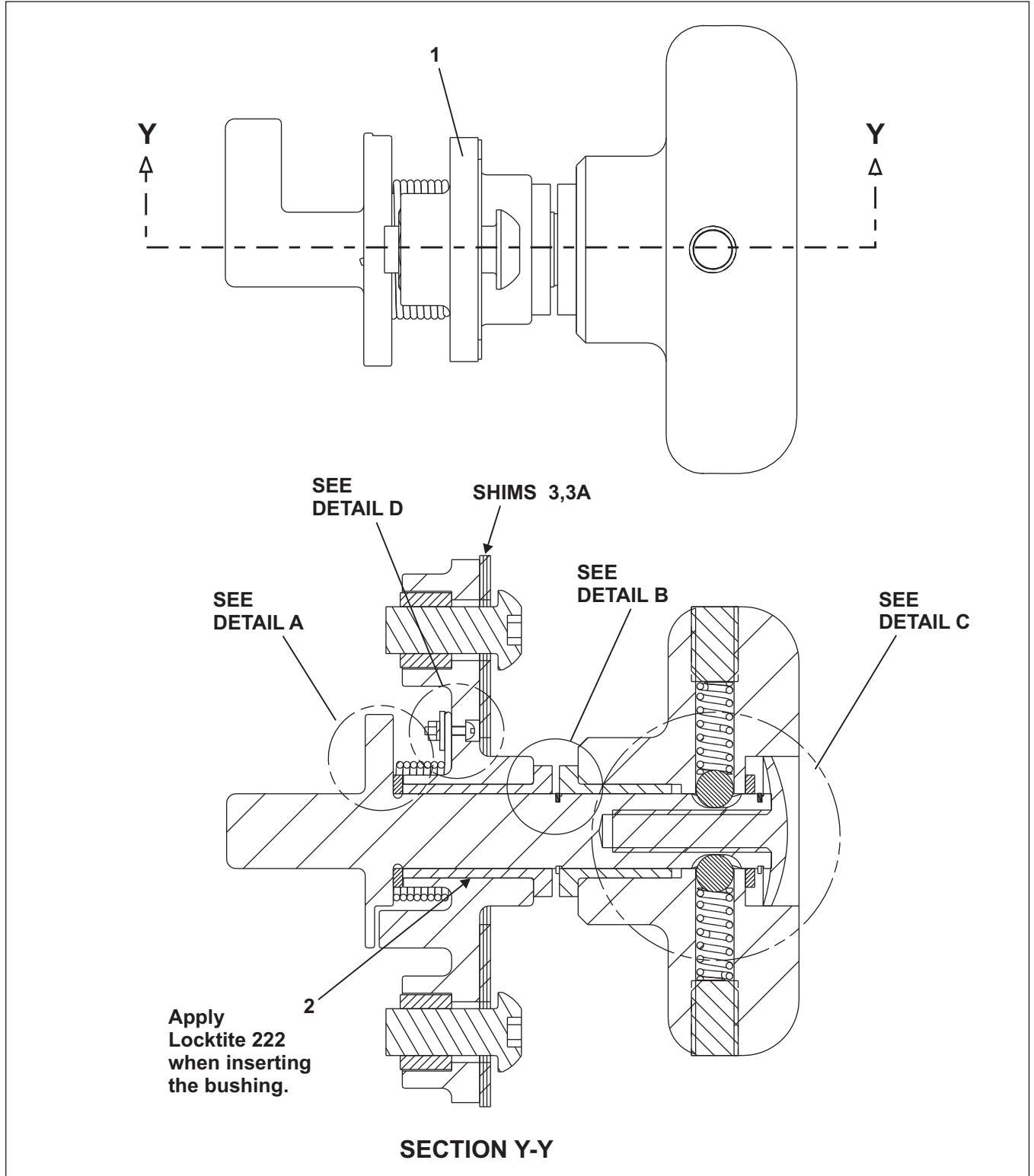
Parts List—Door Lock Mechanism

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
-----COMPONENTS-----				
All	1	98CMCR0971	DOOR INTERLOCK ASSY V8Z VRJ MILNOR ASSY A33 03226B	
All	2	X2 03306A	MACH=GAGE DR LOCK SWITH,MCR	

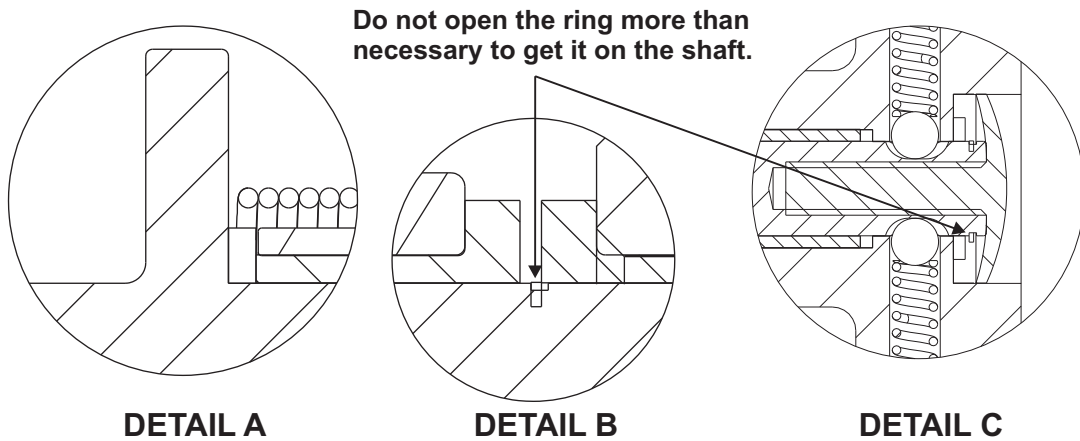
Door Handle and Lock Actuator

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MWR12E/X/J5, MWR16E/X/J5, MWR18E/X4, MWR18J6, MWR27E/X/J5
MWT12E/X/J5, MWT16E/X/J5, MWT18E/X4, MWT18J6, MWT27E/X/J5

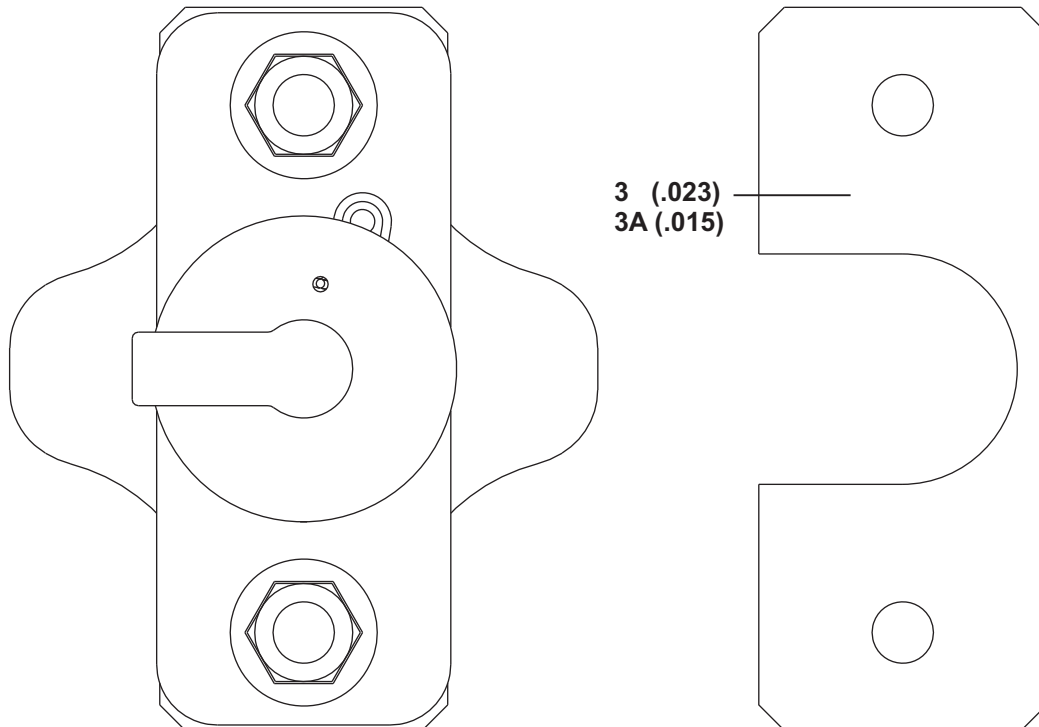


Door Handle and Lock Actuator

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MWR12E/X/J5, MWR16E/X/J5, MWR18E/X4, MWR18J6, MWR27E/X/J5
MWT12E/X/J5, MWT16E/X/J5, MWT18E/X4, MWT18J6, MWT27E/X/J5

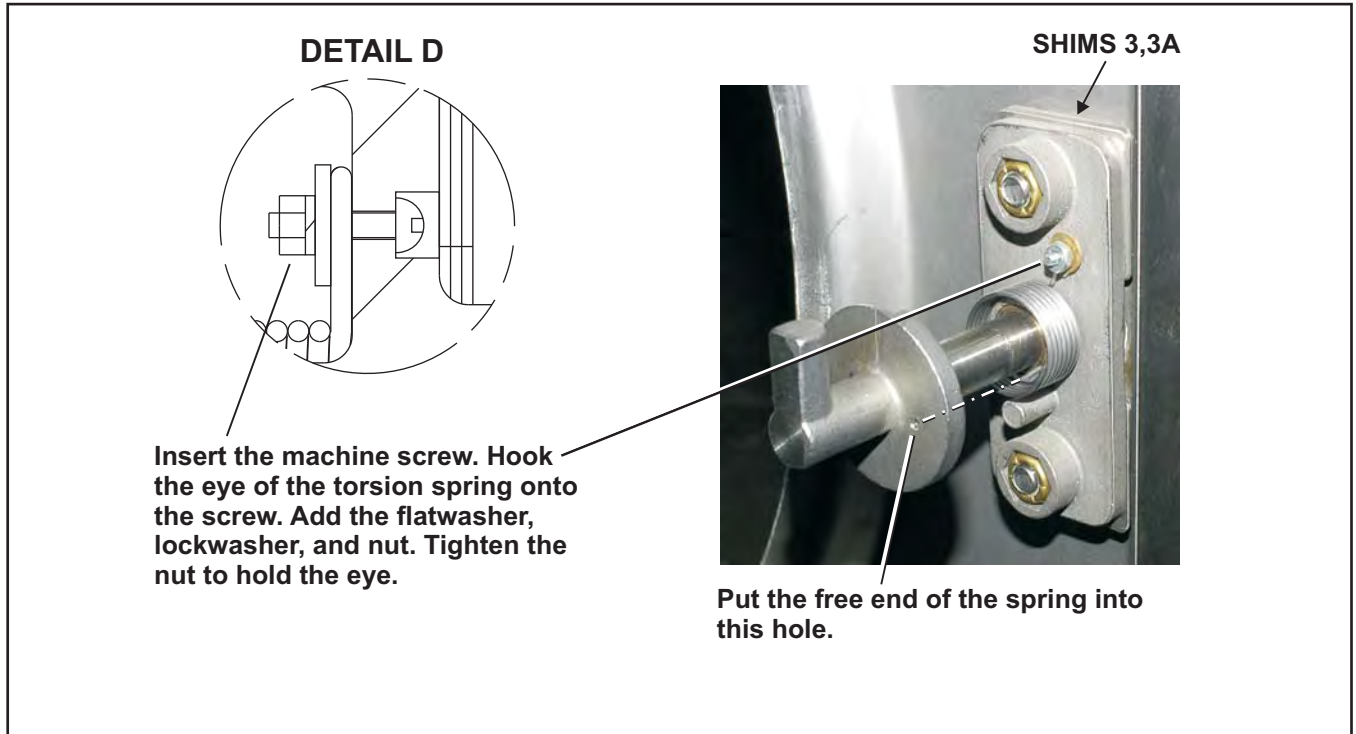


Add shims to make the latch looser. Remove shims to make the latch tighter. To add shims, you will not have to remove the handle assembly. When you remove or add the shims, always start with the thinnest shim.



Door Handle and Lock Actuator

MCR12E5, MCR16E5, MCR18E4, MCR27E5 MCT12E5, MCT16E5, MCT18E4, MCT27E5
 MWR12E/X/J5, MWR16E/X/J5, MWR18E/X4, MWR18J6, MWR27E/X/J5
 MWT12E/X/J5, MWT16E/X/J5, MWT18E/X4, MWT18J6, MWT27E/X/J5



Parts List—Door Handle and Lock Actuator

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

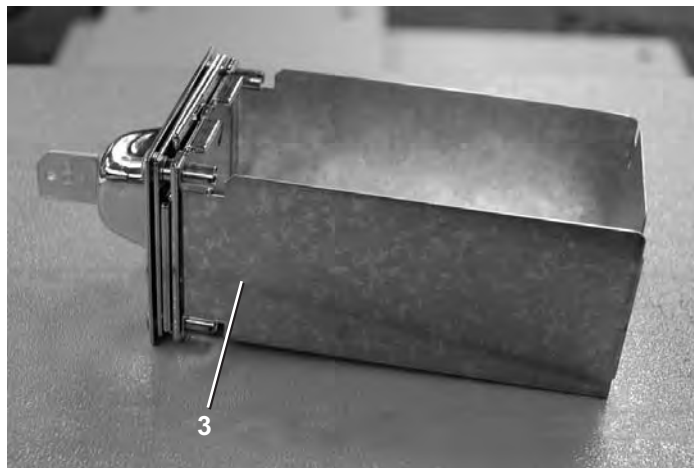
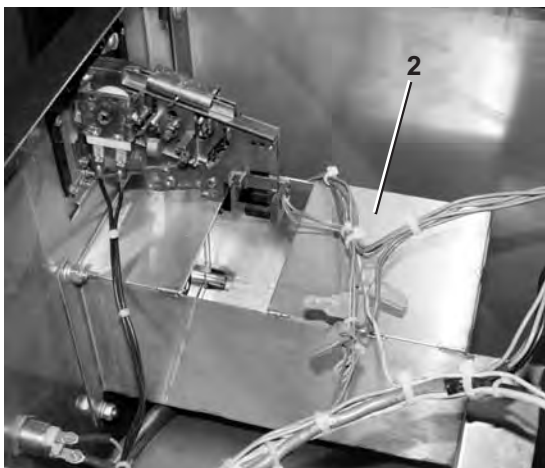
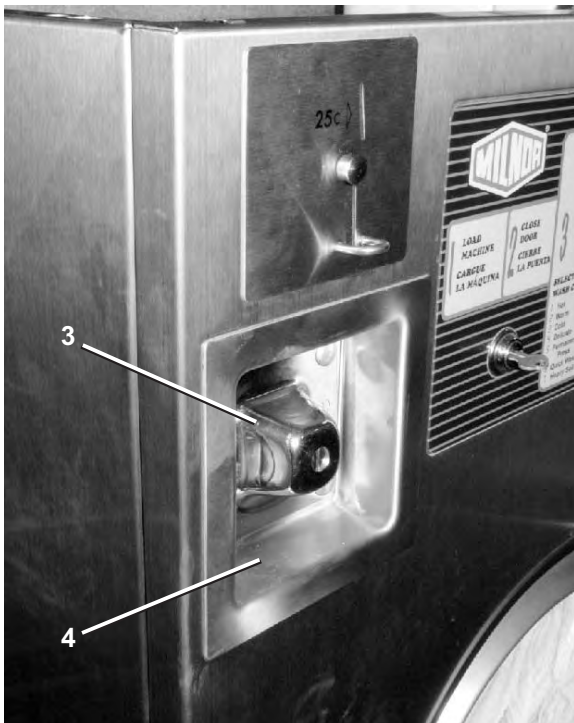
Used In	Item	Part Number	Description	Comments
-----COMPONENTS-----				
all	1	98CMCR0925	ASSY=DR HNDL MECH	
all	2	20C007	THDLOCKSEAL LCT#22221 CMPD10CC	
all	3	02 04192	SHIM=DOOR MOUNT PLATE, 3022H	
all	3A	02 04192A	.015 SHIM=DOOR MNT PL,3022H7	

Control and Sensing

5

Coin Acceptor & Vault

MCR12E5, MCT16E5, MCT18E4, MCTR27E5, MCR36E4



Coin Acceptor & Vault

MCR12E5, MCT16E5, MCT18E4, MCTR27E5, MCR36E4

Parts List				
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	GCM33002	COIN ASSY INSTALL 2314MCR09	
-----COMPONENTS-----				
all	1	38C085	REJ.W/LOCK-MECH 230V CASTIC	
all	2	W3 40029	2314MCR09 COIN VAULT WELD	
all	3	38C152KI	COIN LOC BX KEY-INDV.#71942-XD	KEYED INDIVIDUALLY KEYED ALIKE
all	3	38C152KA	COIN LOC BX#71942-XD KEY-ALIKE	
All	4	03 40029B	BEZZLE COIN VAULT	

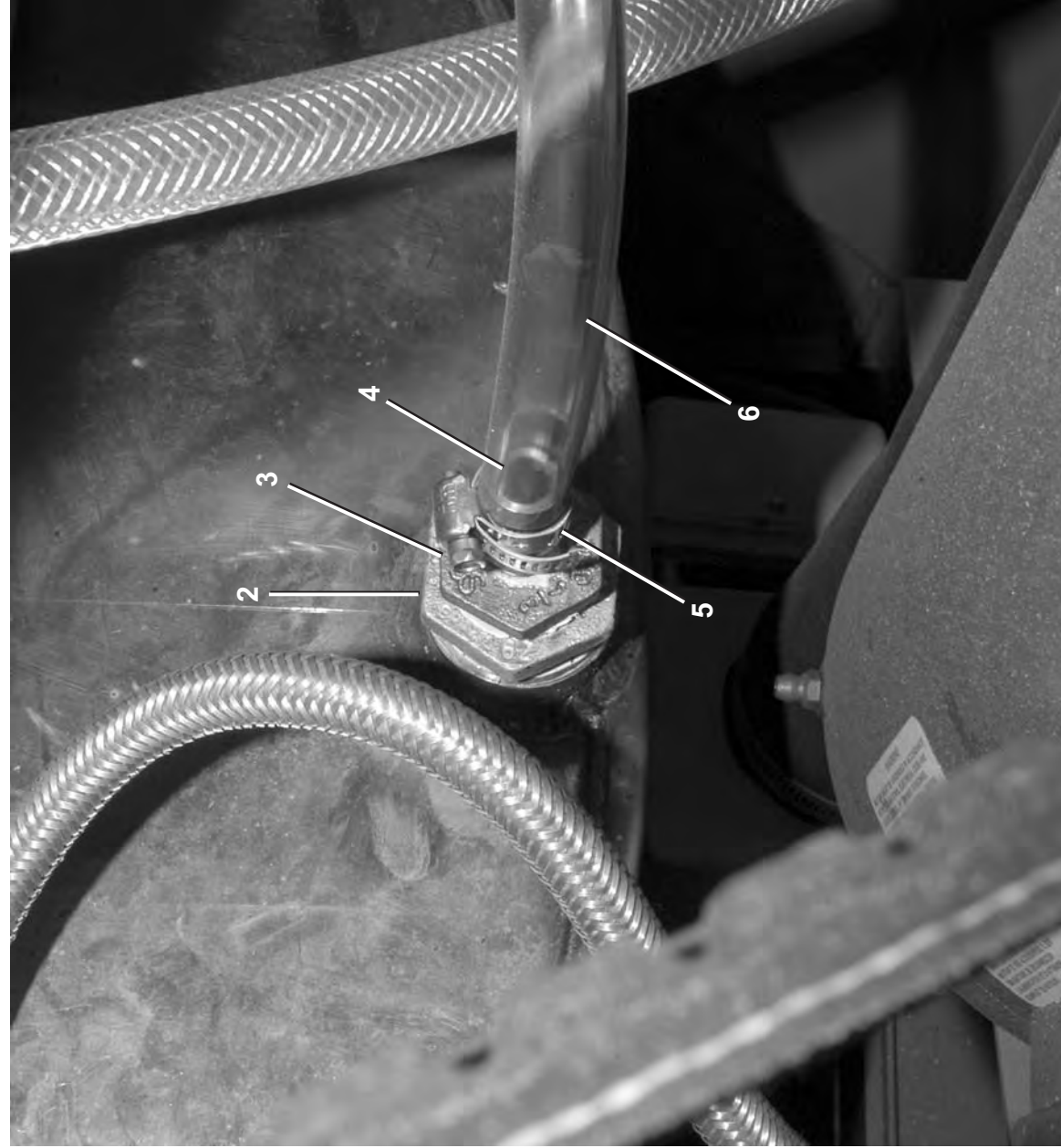
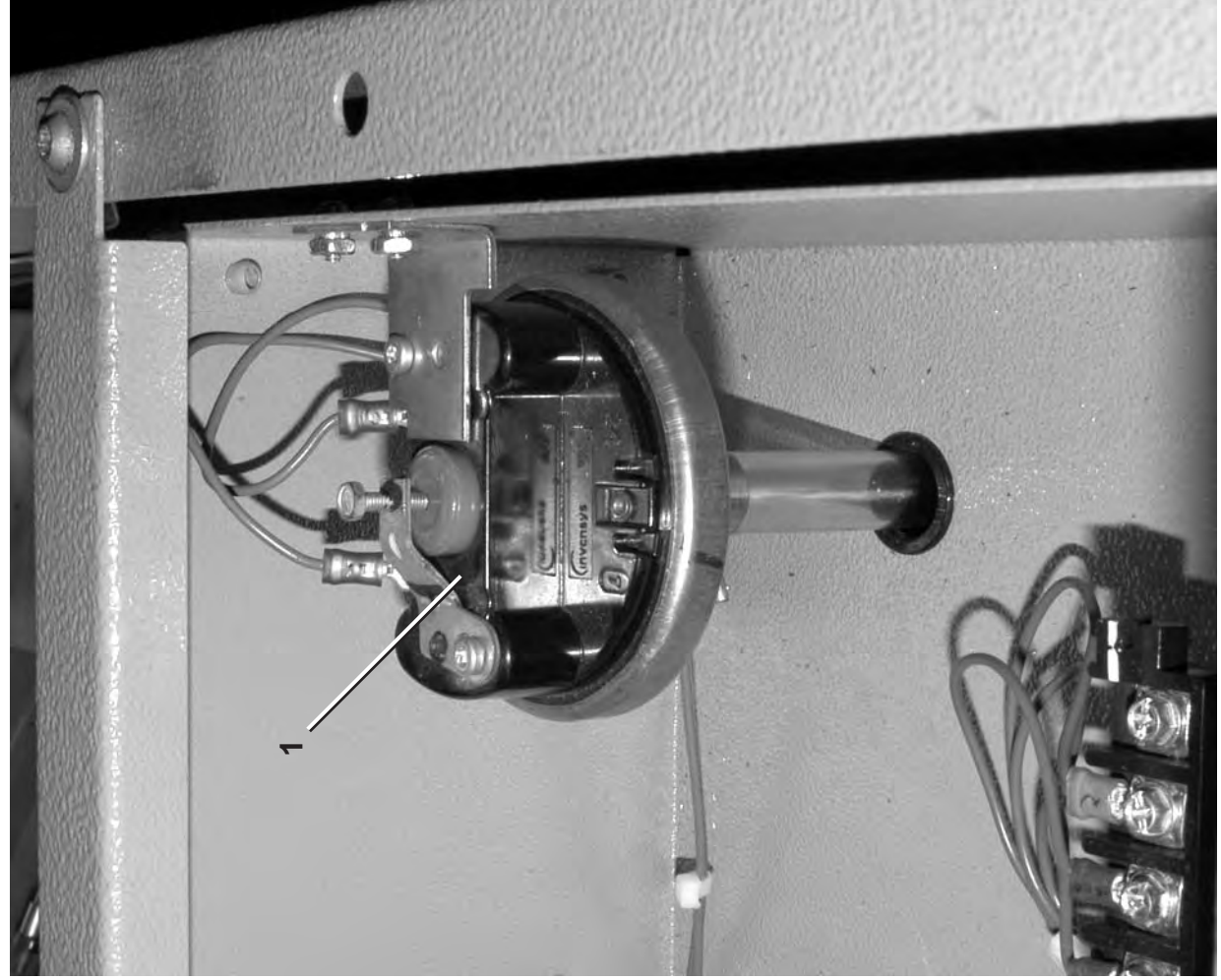
Level Switch
MCR27E5

BMP090020/2009392B
(Sheet 1 of 2)



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Parts List—Level 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
-----COMPONENTS-----				
all	1	09N086A	PRESS SW INVENSYS #738-761	
all	2	5SB1A0PNFO	NPTHEXBUSH 1X3/4 GALMAL 150#	
all	3	5SB0P0GNFO	NPTHEXBUSH 3/4X3/8 GALMAL 150#	
all	4	51E507A	HOSESTEM BRASS 3/8MPX1/2HOSEID	
all	5	27A040	HOSECLAMP 7/16-25/32SS W/SCREW	
all	6	60E005P	PVC TUBING 1/2"ID X 5/8"OD	

VIBRATION SAFETY SWITCH ADJUSTMENTS

B What the Vibration Safety Switch Does

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

Table A—Effect of Tripping Vibration Safety Switch

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

Adjustments

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

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

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

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

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

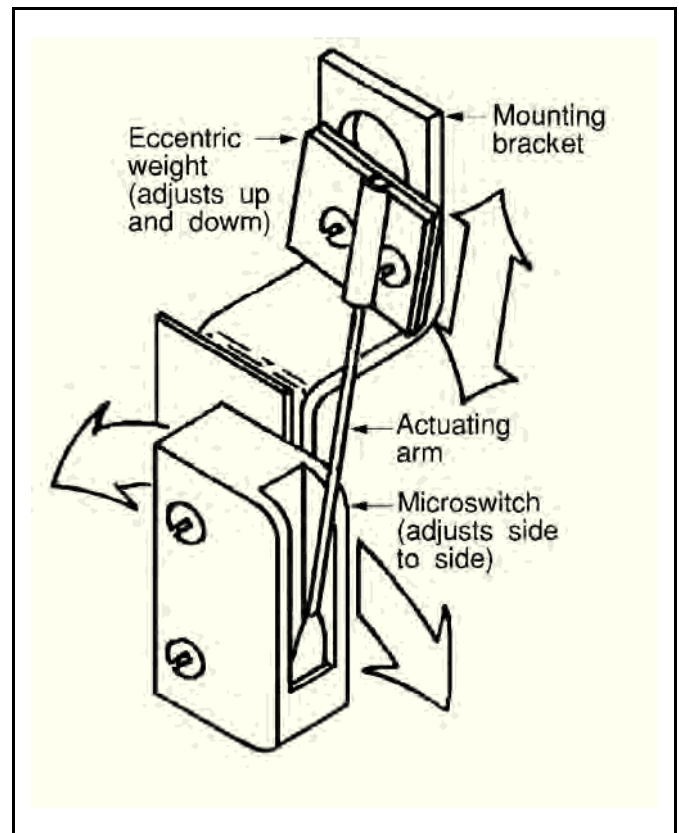


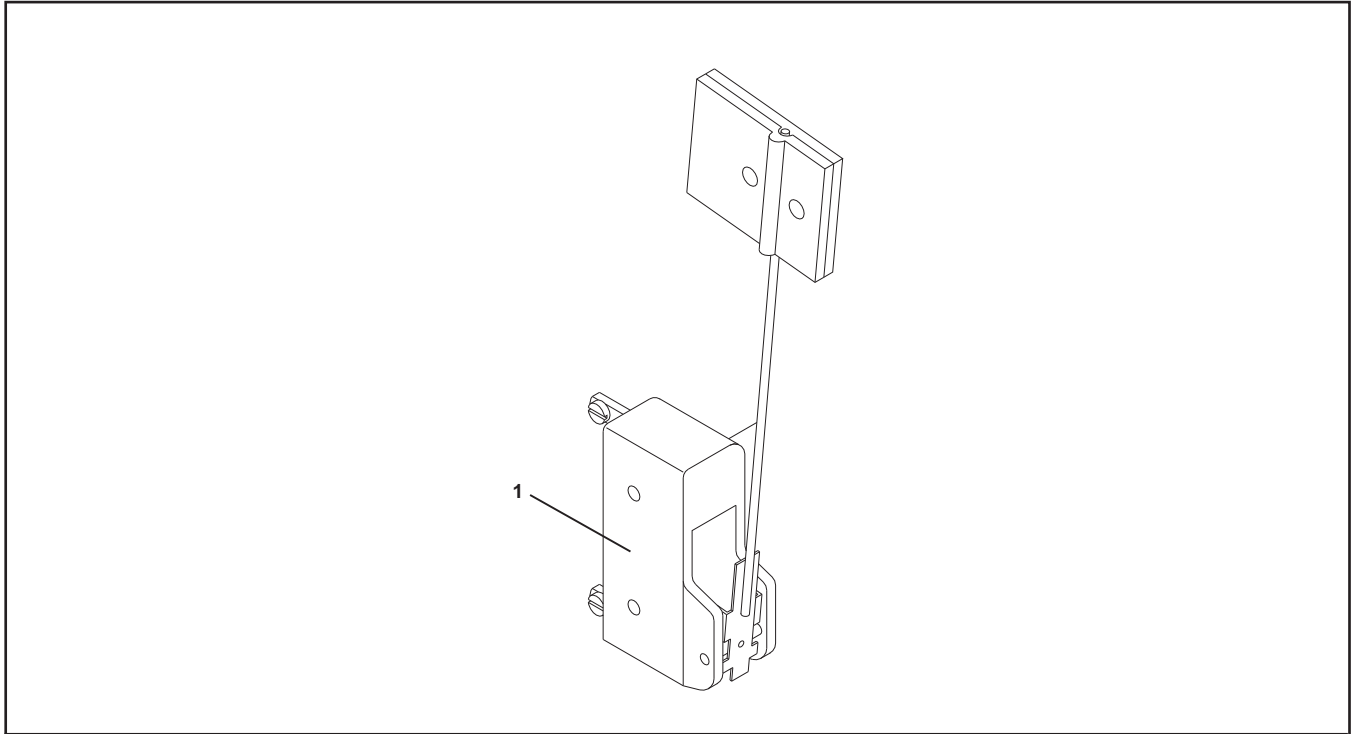
FIGURE 1 (MSSMA408BE)
Vibration Switch

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

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

Vibration Safety Switch

MCR27E5, MWR27E/X/J5
 MCT27E5, MWT27E/X/J5



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.

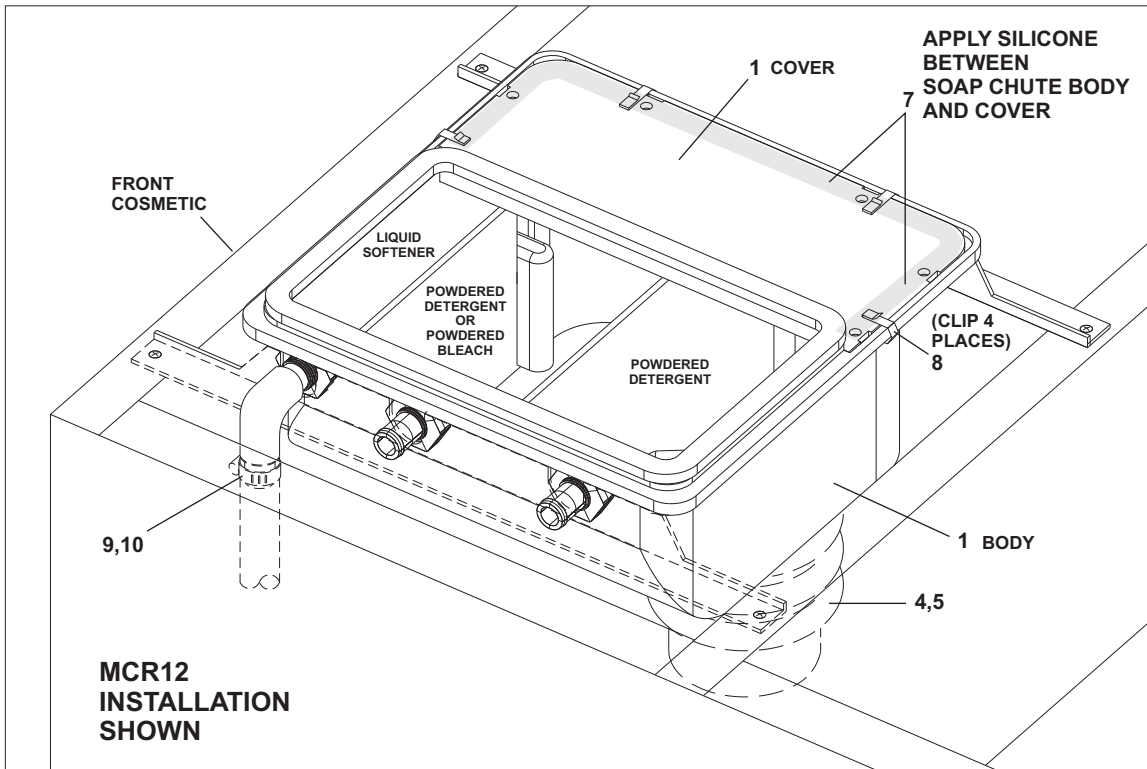
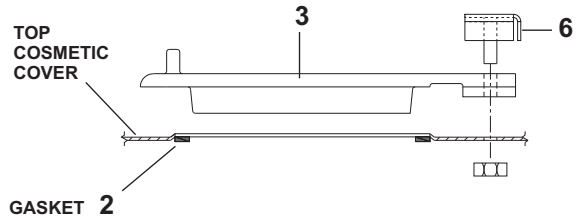
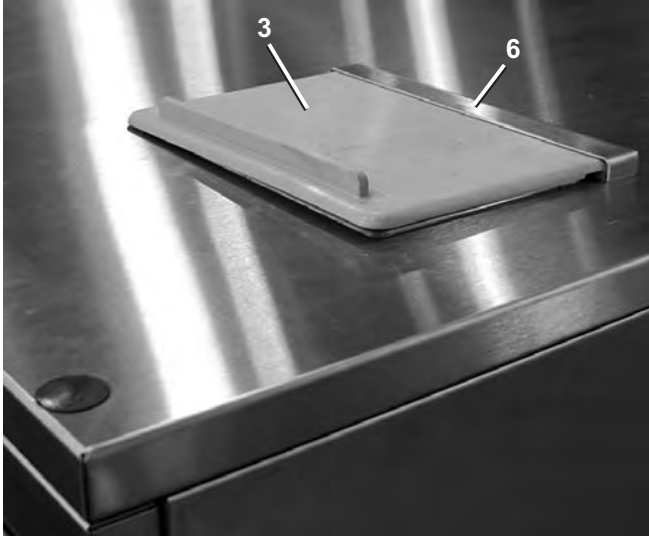
Used In	Item	Part Number	Description	Comments
-----COMPONENTS-----				
All	1	SAE03 151C	* ASY-VIBRAT SWT=LG CNTR NC/NO	

Chemical Supply

6

Soap Chute

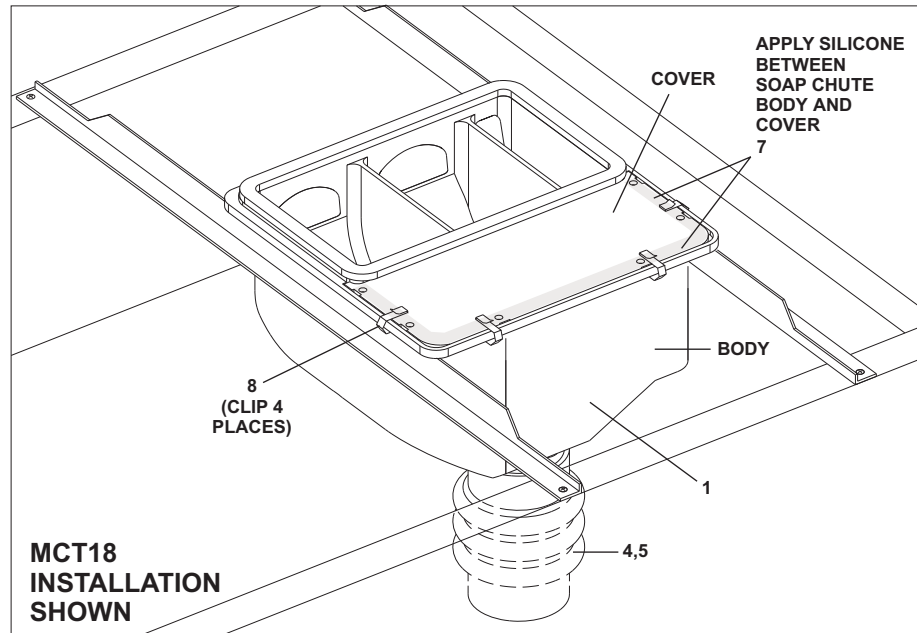
MCR12E5, MCT16E5, MCT18E4, MCT27E5, MCR36E4



SOAP CHUTE INSTALLATION

Soap Chute

MCR12E5, MCT16E5, MCT18E4, MCT27E5, MCR36E4



Soap Chute

MCR12E5, MCT16E5, MCT18E4, MCT27E5, MCR36E4

Parts List

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

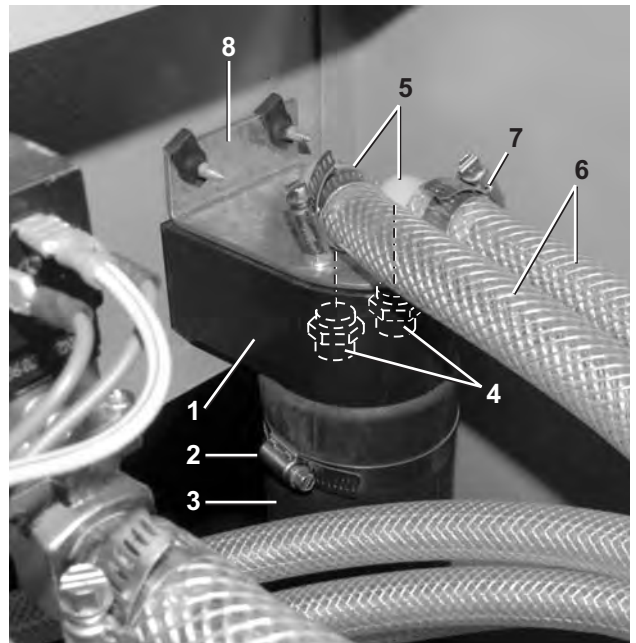
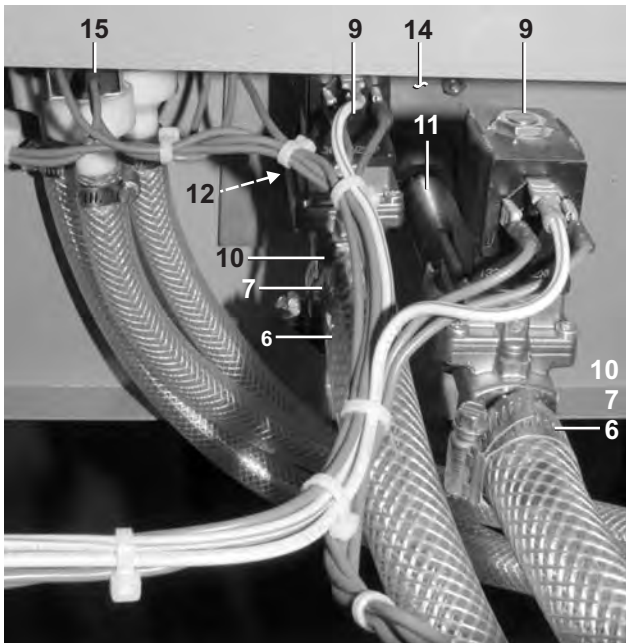
Used In	Item	Part Number	Description	Comments
-----COMPONENTS-----				
all	1	AWS33005	SOAP CHUTE ASSY 3 COMP	
all	2	03 40039B	GASKET SOAP CHUTE	
all	3	03 40039C	COVER SOAP CHUTE	
all	4	03 40039H	FLEXIBLE TUBE=SOAP CHUTE 4.25"	
all	5	27A065S	HOSECLAMP 1.56"-2.5"SSSCR#32	
all	6	W3 40039D	WELD HINGE COVER SOAP CHUTE	
all	7	20C040B	SUPERFLEX CLR RTV SIL 10.2OZ	
all	8	12P015D	CABLE CLIP TINN#C23214-017	
all	9	60E006C	PVC TUBING NYL.REINF.5IDX.75OD	
All	10	27A044S	HOSECLAMP 11/16-1.25SSSCR#64012	

Water and Drain

7

Water Inlets

MCR27E5, MWR27E/X/J5, MCR36E4, MWR36J4
MCT27E5, MWT27E/X/J5



Water Inlets

MCR27E5, MWR27E/X/J5, MCR36E4, MWR36J4
 MCT27E5, MWT27E/X/J5

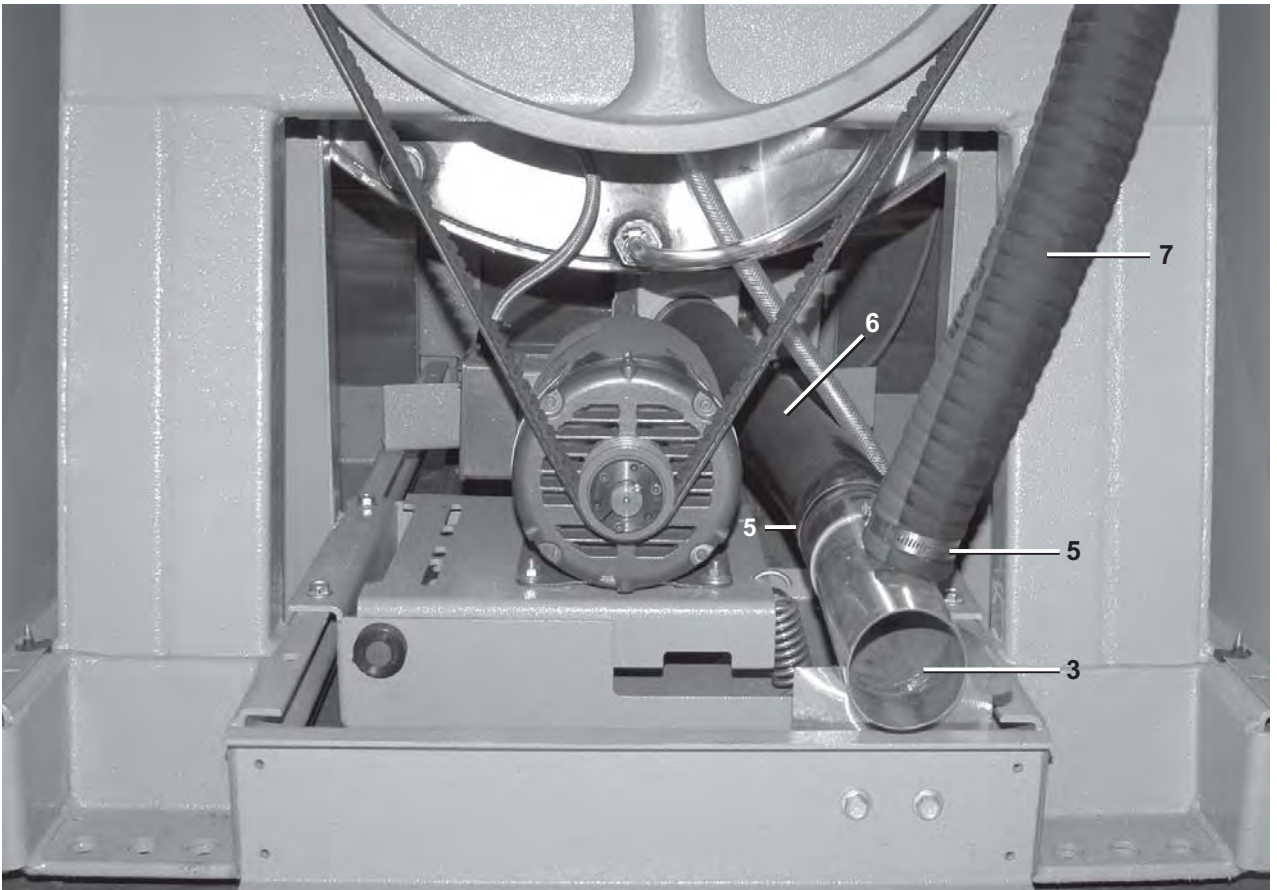
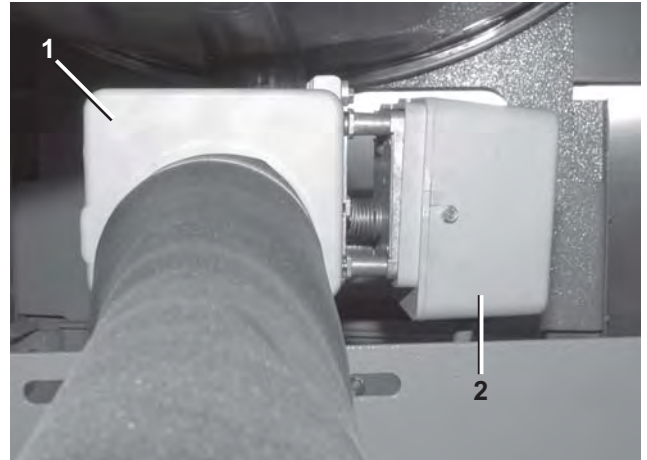
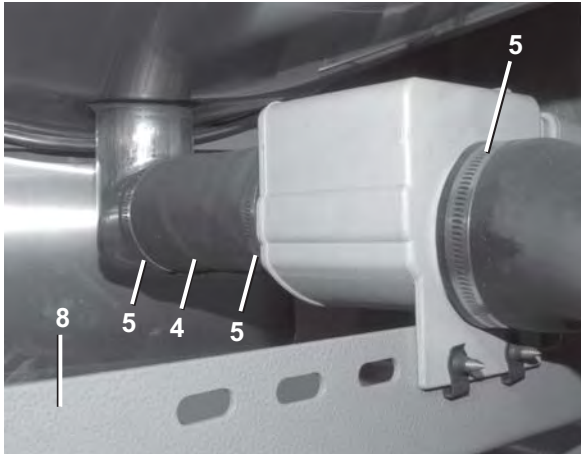
Parts List—Water Inlets

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	GVW3022001	WATER INLET ASSY 27KG COIN	
-----COMPONENTS-----				
All	1	02 03588P	PERISTALTIC/WATER INLET COIN	
all	2	27A082S	HOSECLAMP 2+9/16-3.5SS305SCR	
all	3	03 40225A	FILL HOSE 18KG	
all	4	51E513NU	NUT 11/16 THRD.#64138 US PLAST	
all	5	51E513EBN	3/4" 90DEG. ELBOW W/NUT	
all	6	60E008A	TUBINGNYLREINF.75"IDX1.025"OD	
all	7	27A049	HOSECLAMP 1.25"DIA SPRINGTYPE	
all	8	02 03588W	VAC BKR BOX BKT	
all	9	96P057B71	1/2"NPT X 1/2"ORIFICE 240V 5/6 PARKER	
all	10	51E510	HOSESTEM BRASS 1/2MPX3/4HOSEID	
all	11	5N0K05ABE2	NPT NIP 1/2X5 TBE BRASS STD	
all	12	5N0K01KBE2	NPT NIP 1/2X1.5TBE BRASS STD	
all	13	51E513B	3/4"MHX1/2"FP PARKER#80GH-12-8	
all	14	W3 40544A	PLT H2O INLET 3022	
all	15	98CMCR0938	3/4 INLET 13M 3 OUT 220/240V	
all	16	51E513BP	3/4"BSP/FPXMALE GARDEN HOSE	

Drain Installation

MCR27E5, MWR27E/X/J5
MCT27E5, MWT27E/X/J5



Drain Installation

MCR27E5, MWR27E/X/J5

MCT27E5, MWT27E/X/J5

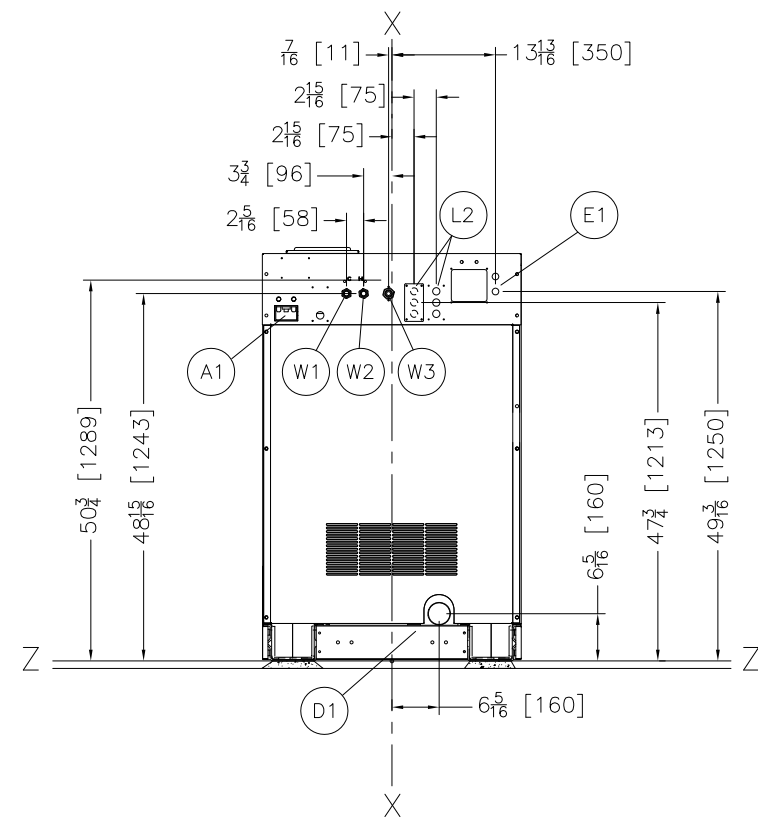
Parts List—Drain Installation

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.

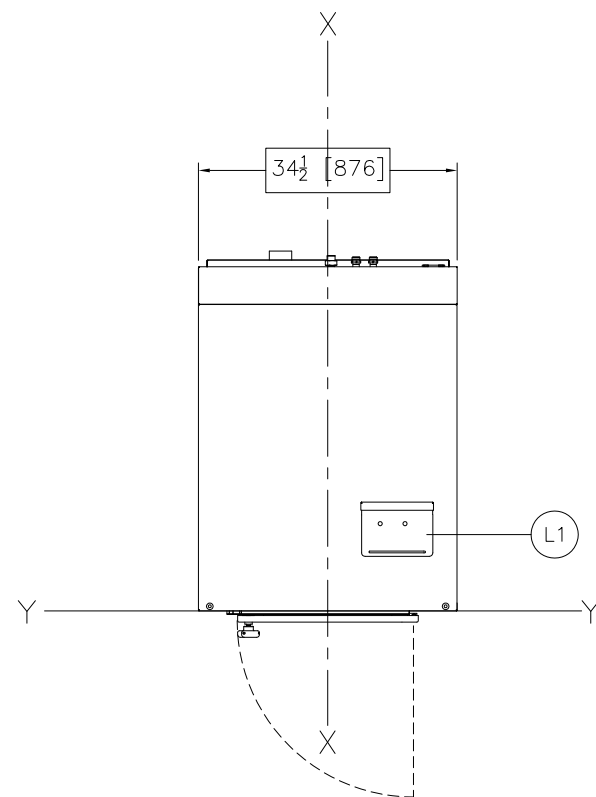
Used In	Item	Part Number	Description	Comments
-----ASSEMBLIES-----				
	A	GVD3022001	SINGLEDRAIN 3" ELEC-BTTM	
-----COMPONENTS-----				
All	1	96D350A71	DRINVAL 3"N/O MTRDR240V 50/60C	
all	2	96D35C0V	MTRCOVER 2-PCFOR 3"DRAINVAL	
all	3	W3 40541A	WELD DRAIN TUBE 3022	
all	4	60E303A07A	HOSE=3"ID X 7" LG.	
all	5	27A088S	HOSECLAMP 3+1/16-4"SSSCR#HSS56	
all	6	03 40548	HOSEDRAIN 3.06X3.31X22.89	
all	7	60E255	HOSE 2" WATER CORRUGATED(V50)	
all	8	03 40545	DUMP VALVE MOUNT BKT	

Dimensional Drawings

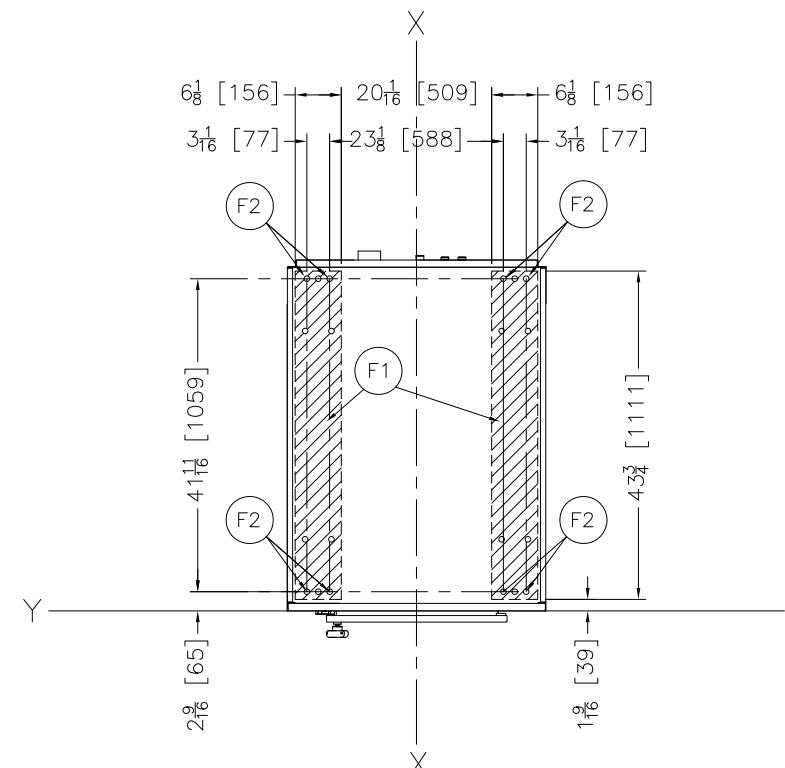
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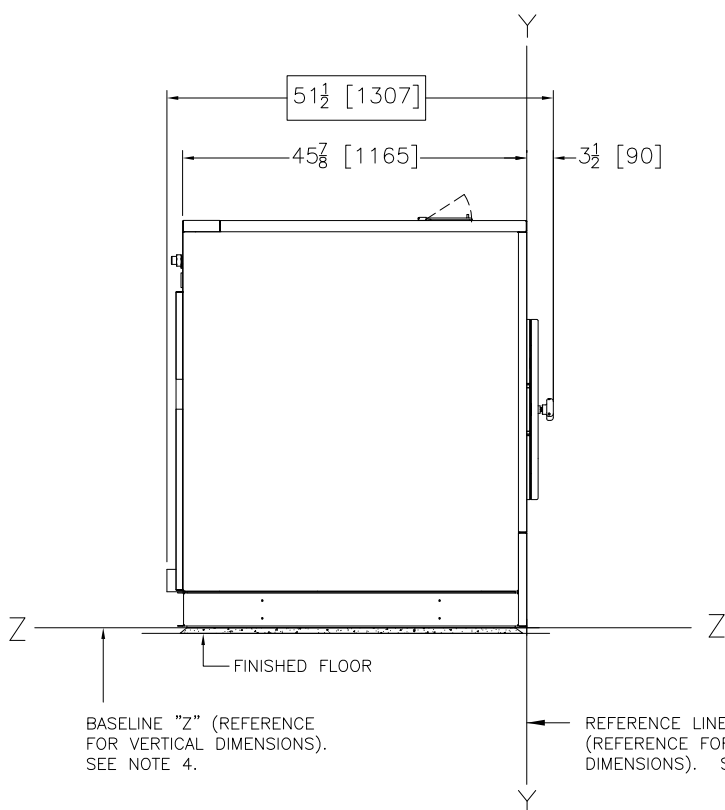
REAR VIEW



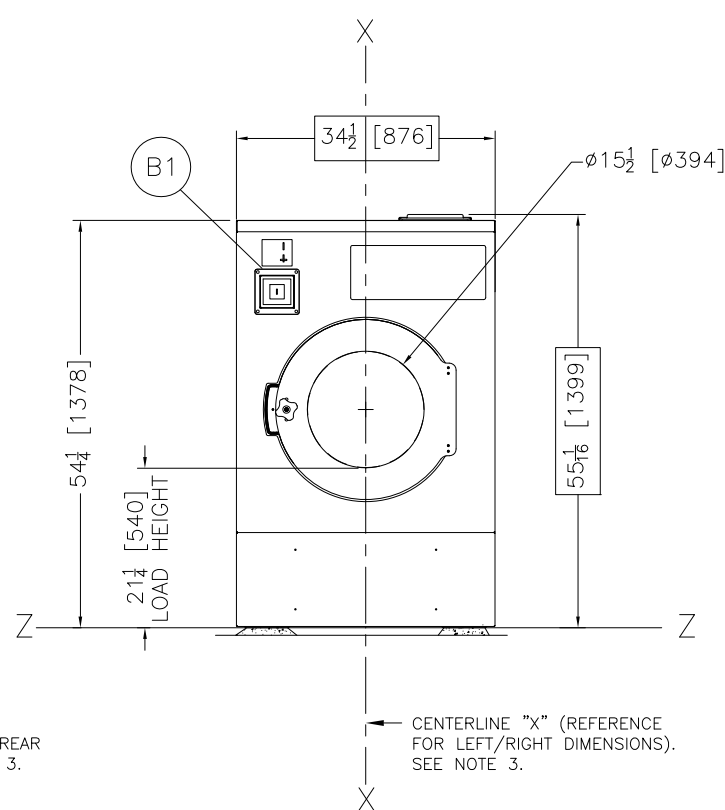
PLAN VIEW



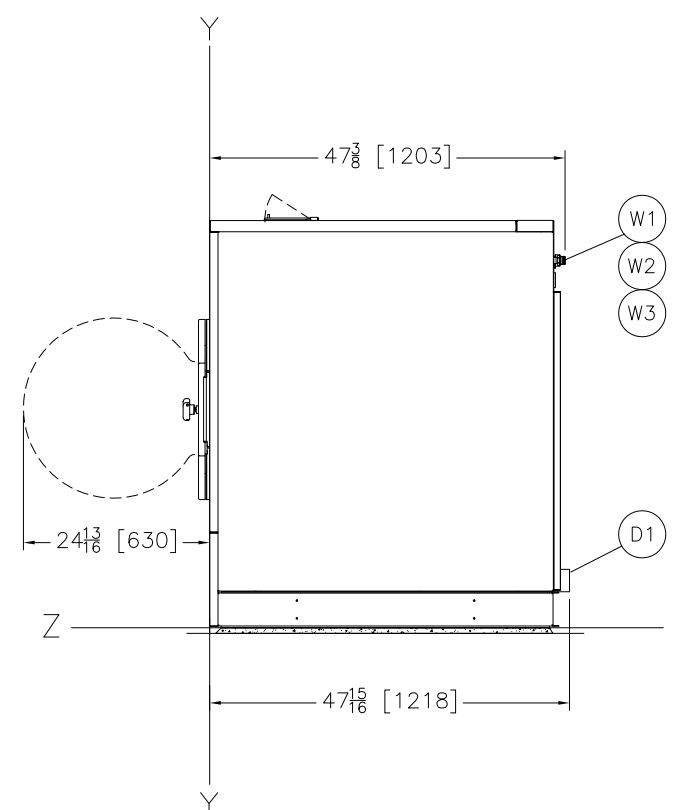
FOUNDATION PLAN



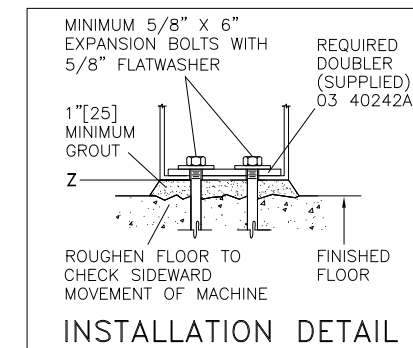
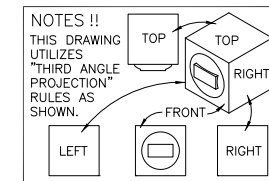
LEFT VIEW



FRONT VIEW



RIGHT VIEW



W3	HOT WATER FOR SOAP CHUTE INLET, 3/4" GARDEN HOSE CONNECTION WITH 1/2" HOSE
W2	HOT WATER INLET, 3/4" GARDEN HOSE
W1	COLD WATER INLET, 3/4" GARDEN HOSE
L2	PERISTALTIC CHEMICAL INLETS: MCR27E5 (0 PORTS), MWR27E5 (3 PORTS), MWR27X5 (5 PORTS), MWR27J5 (5 PORTS)
L1	SOAP CHUTE
F2	(8) 3/4" ANCHOR BOLT HOLES, USE 5/8" X 6" BOLTS MINIMUM
F1	FOUNDATION BASE PADS
E1	MAIN ELECTRICAL CONNECTION
D1	DRAIN 3" ID HOSE CONNECTION
B1	COIN ACCEPTOR, MCR27E5 ONLY
A1	VACUUM BREAKER, NO CONNECTION
ITEM	LEGEND

- NOTES**
- SHIM TO LEVEL THE MACHINE AND ALLOW FOR 1" [25] MINIMUM GROUT. ANCHOR ALL (8) ANCHOR BOLT HOLES, OR THE WARRANTY WILL BE DECLARED INVALID. USE 5/8" X 6" BOLTS, MINIMUM, WITH DOUBLER BOLT DOWN PLATES (SUPPLIED). SEE INSTALLATION MAINTENANCE MANUAL FOR FURTHER INSTRUCTIONS.
 - AS OF THIS WRITING, THE MINIMUM CLEARANCE REQUIRED BY U.S. NATIONAL ELECTRIC CODES, FROM ELECTRIC BOX TO ANY OBJECT IS:
 36 [914] IF OBJECT IS AN UNGROUNDED (INSULATED) WALL.
 42 [1067] IF OBJECT IS A GROUNDED WALL (ie. BARE CONCRETE, BRICK, ETC.)
 48 [1219] IF OBJECT IS ANY LIVE PART.
 CHECK LOCAL ELECTRIC CODES FOR FURTHER RESTRICTIONS.
 - CUSTOMER TO SUPPLY CIRCUIT BREAKER OR FUSED BRANCH CIRCUIT DISCONNECT (SAFETY) SWITCHES WITH LAG TYPE FUSES FROM POWER SOURCE TO MACHINE. A SEPARATE GROUND WIRE MUST BE CONNECTED FROM DISCONNECT TO EQUIPMENT.
 - BASELINE "Z" IS THE REFERENCE FOR ALL VERTICAL DIMENSIONS. ON MACHINES WITH FIXED BASE PADS, BASELINE "Z" CORRESPONDS TO THE BOTTOM OF THE BASE PAD. ON MACHINES WITH ADJUSTABLE FEET, BASELINE "Z" CORRESPONDS TO THE BOTTOM OF THE FEET WHEN ADJUSTED SO THAT THE MACHINE IS AT ITS MINIMUM ACCEPTABLE HEIGHT. ON TRAVELING SHUTTLES, BASELINE "Z" CORRESPONDS TO THE BOTTOM OF THE BOTTOM RAIL. THE DISTANCE BETWEEN BASELINE "Z" AND THE FINISHED FLOOR WILL VARY AS REQUIRED TO ENSURE BASELINE "Z" IS HORIZONTAL AND ANY INTERFACING MACHINES REQUIRING GROUT ARE SET ON A MINIMUM 1" [25] THICK GROUT BED.
 - USE REFERENCE LINES "X", "Y", AND "Z" TO LOCATE ALL SERVICE CONNECTIONS.
 - NUMBERS IN BRACKETS [] DENOTE DIMENSIONS IN MILLIMETERS.
 - ALL DIMENSIONS SHOWN ARE APPROXIMATE, SUBJECT TO NORMAL MANUFACTURING TOLERANCES, AND TO OCCASIONAL CHANGES WITHOUT NOTICE THROUGH REDESIGN AND/OR RELOCATION OF COMPONENTS, ETC. DO NOT USE FOR CONSTRUCTION UNLESS CERTIFIED, AND IN NO EVENT PRE-PIPE CLOSER THAN FIVE FEET FROM MACHINE. FACTORY MUST BE CONSULTED FOR DIMENSIONS IF MACHINE IS TO BE MOVED THROUGH NARROW OR LOW CORRIDORS OR OPENINGS.

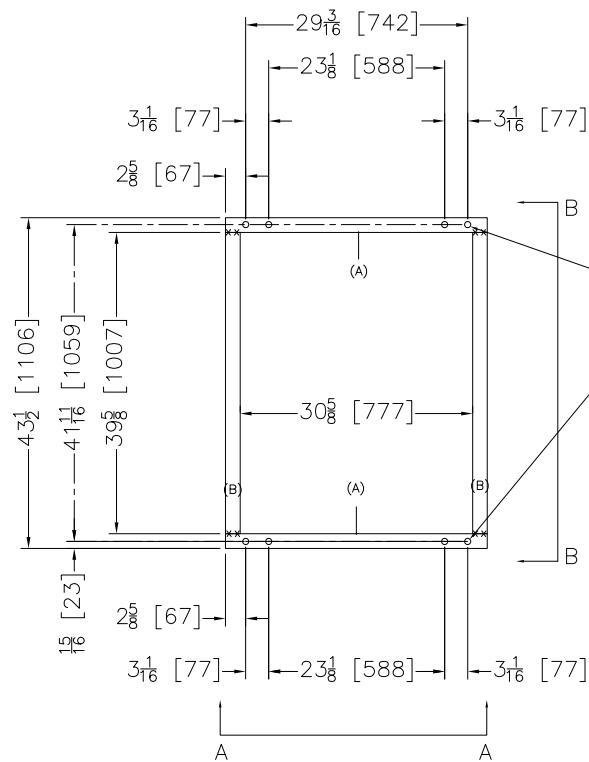
ATTENTION
 MOST REGULATORY AUTHORITIES (INCLUDING OSHA IN THE USA) HOLD THE OWNER/USER ULTIMATELY RESPONSIBLE TO MAINTAIN A SAFE WORKING ENVIRONMENT. ACCORDINGLY, THE OWNER/USER MUST RECOGNIZE ALL FORESEEABLE SAFETY HAZARDS, FURNISH SAFETY INSTRUCTIONS AND GUIDANCE TO ALL PERSONNEL WHO MAY COME IN CONTACT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

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

MCR27E5, MWR27E5/J5/X5

DM 0 0.5M DWG# BDMCR27E5E 2017216D
 INCHES 0 12 24

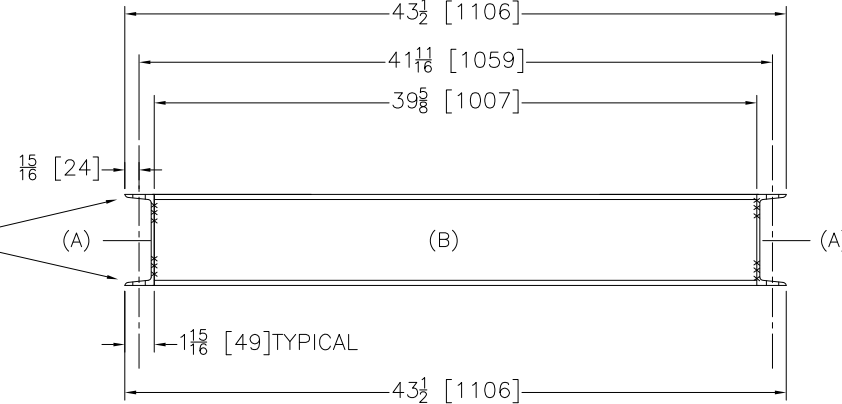
MILNOR PELLERIN MILNOR CORPORATION
 P.O. Box 400 Kenner, LA 70063, USA, Phone 504/467-9591, FAX 504/469-1849, Email: milnorinfo@milnor.com



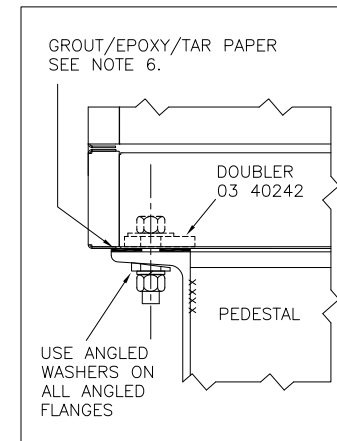
PEDESTAL PLAN

ANCHOR BOLT HOLES
13/16" DIA. DRILL IN TOP
AND BOTTOM FLANGES
OF CHANNEL (16 PLACES)

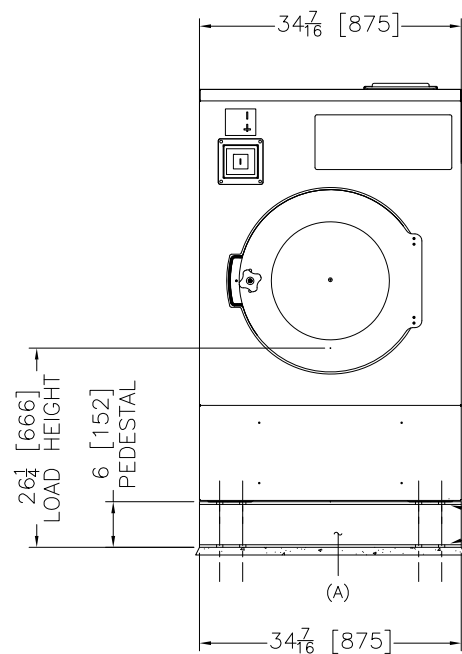
ANGLED WASHERS MUST
BE USED AS DRAWN
SEE DETAIL A.



ENLARGED VIEW B-B



DETAIL A

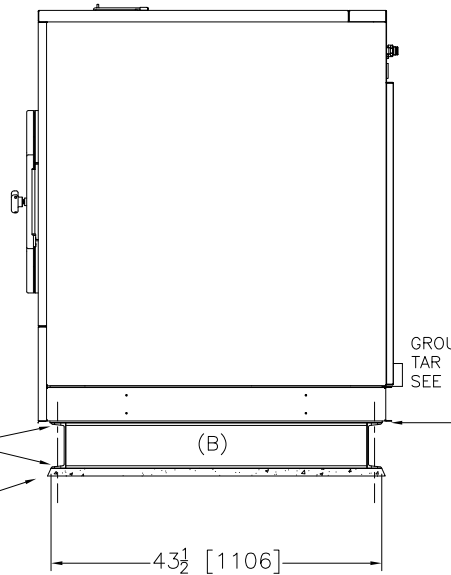


VIEW A-A

ANGLED WASHERS MUST
BE USED AS DRAWN
SEE DETAIL A.

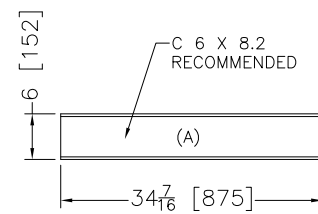
ANCHOR BOLT HOLES
13/16" DIA. DRILL IN TOP
AND BOTTOM FLANGES
OF CHANNEL (16 PLACES)

GROUT
SEE NOTE 3.

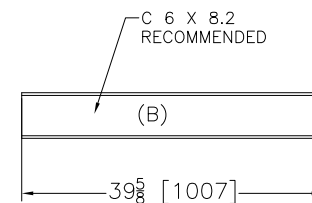


VIEW B-B

GROUT/EPOXY/
TAR PAPER
SEE NOTE 6.



(A) CHANNEL (TYPICAL 2)



(B) LEFT & RIGHT
CROSS MEMBERS
(TYPICAL 2)

- NOTES**
- 6 GROUT OR EPOXY OR USE TAR PAPER, BETWEEN MACHINE AND PEDESTAL BASE, TO ENSURE A TIGHT UNIFORM FIT.
 - 5 THIS DRAWING SHOWS A RECOMMENDED PEDESTAL DESIGN FOR (1) MILNOR MCR27E5 COIN MACHINE. THIS BASE MAY BE USED WHENEVER LOCAL CONDITIONS ARE SUCH THAT MACHINE OPERATION WOULD BE ENHANCED BY RAISING THE MACHINE 6 [152] INCHES.
 - 4 IF MACHINE IS TO BE BOLTED TO PEDESTAL BASE, BOLT HOLES IN PEDESTAL TOP FLANGE SHOULD BE LOCATED AND DRILLED ONLY AFTER MACHINE IS ON SITE AND CAN BE USED AS A TEMPLATE FOR BOLT HOLE LOCATIONS. IF BASE IS TO BE BOLTED TO FOUNDATION, CUSTOMER MUST DETERMINE LOCATION OF BOLT HOLES IN BOTTOM FLANGE.
 - 3 WHEN INSTALLING MACHINE AND PEDESTAL BASE, IT IS RECOMMENDED TO LAY THE PEDESTAL ON A MINIMUM 1 [25] THICK GROUT BED AND BOLT THE MACHINE TO IT.
 - 2 THIS BASE MUST BE FABRICATED LOCALLY AND SHOULD BE MADE SQUARE AND LEVEL. IT IS NOT SUPPLIED BY PELLERIN MILNOR CORP. THIS DRAWING CONVEYS NO EXPRESS OR IMPLIED WARRANTY WITH REGARD TO THE CONSTRUCTION AND/OR SUITABILITY OF THIS ASSEMBLY.
 - 1 NUMBERS IN BRACKETS [] DENOTE DIMENSIONS IN MILLIMETERS.

ATTENTION
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PEDESTAL:(1)MCR27E5,MWT27E5,X5,J5

DM 0 0.5M
INCHES 0 12 24 DWG# BDMCREM1AE 2017244D

MILNOR PELLERIN MILNOR CORPORATION
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FAX 504/469-1849, Email: milnorinfo@milnor.com