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Service—

42031, 42044 CP2/CP3 Washer-Extractors



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

Please Read

About the Manual Identifying Information on the Cover

The front cover displays pertinent identifying information for this manual. Most important, are the published manual number (part number) /ECN (date code). Generally, when a replacement manual is furnished, it will have the same published manual number, but the latest available ECN. This provides the user with the latest information applicable to his machine. Similarly all documents comprising the manual will be the latest available as of the date the manual was printed, **even though older ECN dates for those documents may be listed in the table of contents.**

When communicating with the Milnor factory regarding this manual, please also provide the other identifying information shown on the cover, including the publishing system, access date, and whether the document ECN's are the latest available or exact.

References to Yellow Troubleshooting Pages

This manual may contain references to "yellow pages." Although the pages containing troubleshooting procedures are no longer printed on yellow paper, troubleshooting instructions, if any, will be contained in the easily located "Troubleshooting" chapter or section. See the table of contents.

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for MPP42SUPAE/2006153A
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APPROVAL AND PROCUREMENT RECORD

APPROVAL DATA FOR: NAVSHIPS 0935-045-4010
TITLE OF MANUAL: WASHER-EXTRACTOR MODELS 42031CME AND 42044CME
APPROVAL AUTHORITY: NAVAL SUPPLY CENTER, PUGET SOUND LTR:
NSCPS 203 (NAVSHIPYDBREM 244.82-2)
AS31/9350 N00406-73-C-0732 Dated


CONTRACT OR PURCHASE ORDER	SHIPS APPLICABLE	QTY. OF MANUALS	QTY. OF EQUIPMENT	BUILDING YARD
N62799-70-C-0009	A0E-1	10	2	LOCKHEED SHIP- BUILDING AND CON- STRUCTION CO.

REMARKS:

CERTIFICATION:

DATE:

It is hereby certified that NAVSHIPS 0935-045-4010
to be provided under contract number N62799-70-C-0009
has been approved by the approval data shown above.


PELLERIN MILNOR CORPORATION
700 Jackson Street
Kenner, Louisiana 70062

FEDERAL CODE NUMBER 94830

BMP74009/81213

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 from our factory with no operating hour limitation. This warranty is contingent upon the equipment being installed, operated and serviced as specified in the operating manual supplied with the equipment, and operated under normal conditions by competent operators.

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

Parts which require routine replacement due to normal wear – such as gaskets, contact points, brake and clutch linings and similar parts – are not covered by this warranty, nor are parts damaged by exposure to weather or to chemicals.

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

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BMP720097
92732A

How to order repair parts

Repair parts may be ordered either from the authorized dealer who sold you this machine, or directly from the MILNOR factory. In most cases, your dealer will have these parts in stock.

When ordering parts, please be sure to give us the following information:

1. Model and serial number of the machine for which the parts are required
2. Part number
3. Name of the part
4. Quantity needed
5. Method of shipment desired
6. In correspondence regarding motors or electrical controls, please include all nameplate data, including wiring diagram number and the make or manufacturer of the motor or controls.

All parts will be shipped C.O.D. transportation charges collect only.

Please read this manual

It is strongly recommended that you read the installation and operating manual before attempting to install or operate your machine. We suggest that this manual be kept in your business office so that it will not become lost.

PELLERIN MILNOR CORPORATION

P.O. BOX 400, KENNER, LA., 70063-0400, U.S.A.

FAX: Administration 504/468-9307, Engineering 504/469-1849, Service 504/469-9777

BMP720097R
72332A

Safety—Divided Cylinder and Staph-Guard™ 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—External Mechanical Hazards [Document BIUUUS12]

The following are instructions about hazards around the front, sides, rear or top of the machine.



WARNING 3: Crush Hazards—Suspended machines only—Spaces between the shell and housing can close and crush or pinch your limbs. The shell moves within the housing during operation.

- Do not reach into the machine housing or frame.
- Keep yourself and others clear of movement areas and paths.

4. Safety Alert Messages—Cylinder and Processing Hazards

[Document BIUUUS13]

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



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.
- Divided cylinder machines only—Keep yourself and others clear of cylinder and goods during inching or Autospot operation.
- Do not operate the machine with malfunctioning two-hand manual controls.



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.

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

5.1. Damage and Malfunction Hazards

5.1.1. Hazards Resulting from Inoperative Safety Devices



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

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



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

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



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

- Do not unlock or open electric box doors.



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

- Do not remove guards, covers, or panels.

5.1.2. 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—Inner door latches (divided cylinder machines)—A damaged or improperly seated latch can cause the inner door to open during operation, damaging the cylinder and shell. A damaged cylinder can rip apart during extraction, puncturing the shell and discharging metal fragments at high speed.

- Ensure that the inner door is securely latched when loading and unloading.
- Do not operate the machine with any evidence of damage or malfunction.



WARNING 14: 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

5.2. Careless Use Hazards

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



WARNING 15: 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.

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



WARNING 16: 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 17: 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 18: 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 —

Section
Lubrication

1

SECTION 7

LUBRICATION CHART

FOR DIVIDED CYLINDER WASHER-EXTRACTORS WITH GREASE LUBRICATED MAIN BEARINGS AND SEALS

1. MAIN BEARINGS AND SEALS: The main bearings and seals in this machine are designed for grease lubrication, and are arranged as shown in the main bearing assembly drawings shown elsewhere herein. There are two grease fittings on each housing, one for the bearing and for the seals. The proper lubrication of both bearings and seals is mandatory to get satisfactory life from the machine. The following instructions must be adhered to carefully:
 - A. Use Shell Alvania EP #2 grease.
 - B. PUMP GREASE IN SLOWLY - not faster than 5 strokes per minute. Work grease gun lever slowly. TAKE 10-12 SECONDS TO COMPLETE EACH STROKE OF THE LEVER. A grease gun can build up extremely high pressures which will force the seals out of position and cause them to leak, even though both seal and bearing cavities are equipped with spring loaded relief plugs.
 - C. RUN WASHER CYLINDER AT EITHER WASH OR DRAIN SPEED DURING GREASING, AND FOR ONE MINUTE THEREAFTER.
 - D. LUBRICATE THE FOLLOWING EVERY 200 OPERATING HOURS, OR EVERY 30 DAYS; WHICHEVER OCCURS FIRST:
 1. PUMP 6 STROKES INTO EACH BEARING GREASE FITTING.
 2. PUMP 2 STROKES INTO EACH SEAL CAVITY GREASE FITTING.

NOTE: Both seal and bearing grease cavities are equipped with spring loaded relief plugs that serve to automatically bleed out excess grease and to prevent abnormal pressures from building up in the housing. It is perfectly normal for some grease to ooze out when the machine is first put in operation, and after each lubrication; however when relubricating, do not pump grease in until it oozes out. Instead simply pump in the number of strokes for each as shown above. Generally, the excess grease will not ooze out until the machine has run in extraction for a while.

NOTE: MAKE SURE YOUR GREASE GUN IS WORKING AND THAT YOU GET A FULL CHARGE OF GREASE WITH EVERY STROKE. Never pump the grease gun quickly - even if it is air bound. Damaging excessive pressures can easily be built up if this is done.

NOTE: Be careful to keep grease from dropping on the brake drum. This will reduce the braking action considerably, and could permit the cylinder to creep while loading and unloading.

2. GEAR REDUCER: Check level before operating and refill if necessary. After 100 hours operation, drain gear reducer and refill with oil as specified on nameplate. Be sure to clean off the magnetic drain plug before replacing. Check and refill as needed every 6 months. Drain and replenish oil yearly.

(continued)

SECTION 7 (LUBRICATION INSTRUCTIONS) continued

3. JACKSHAFT BEARINGS: Lubricate every 200 operating hours, or every 30 days, whichever occurs first: Lubricate the two jackshaft bearings with 2 or 3 strokes of the grease gun (if machine has jackshaft).
4. Lubricate door interlock plunger with a few drops of light machine oil weekly.
5. Lubricate handwheel screw monthly with a few drops of light machine oil (if machine has handwheel screw).

Lubricate handwheel screw universal with good grade of pressure cup oil grease monthly, or more frequently if needed. A grease gun fitting is on the outer door channel near hinges (if machine has handwheel screw).

6. Lubricate the door hinge pin with a good grade of pressure cup grease monthly, or more frequently if necessary. A grease fitting is provided on the hinge.
7. Lubricate brake band stud with good grade of pressure cup grease every 3 months. Be careful not to let grease drip onto the brake drum as this will considerably reduce the braking action, and may permit cylinder to creep during loading and unloading. (Machines equipped with Nylon Brake Bank Bushing do not require lubrication).
8. Lubricate motor bearings in accordance with motor manufacturer's recommendations. Always open bearing relief plug before forcing grease into motor bearings. Remember that more motors are ruined by over lubrication, which forces grease into the motor windings, than fail due to lack of lubrication. Excessive lubrication of rear bearing of extractor motor will force grease into centrifugal switch housing, resulting in centrifugal switch malfunction.
9. MILTROL motor clutch and chart drag spring assembly require lubrication in accordance with instructions on MILTROL Parts Drawing elsewhere herein.
10. SHAFT SEAL LEAKOFF: Both front and rear bearing assemblies are fitted with leakoff passages that will carry off any water that leaks past the main water seals. The leakoff connection is shown on the bearing assembly drawing elsewhere herein. The leakoff cavity is also provided with a plugged cleanout connection. This cleanout plug is vented. NEVER REPLACE THIS PLUG WITH ANY OTHER. Every six months remove this cleanout plug and pour about one-half cup of mineral spirits into the seal leakoff cavity. The mineral spirits should immediately run out the leakoff connection. The mineral spirits will keep the leakoff cavity clean and free from obstruction so it can perform its intended purpose.
11. HYDROCUSHION SUSPENSION CYLINDERS: Use Shell X100 10W30 oil, Shell Rotella T10/30 oil or equivalent. Fill HYDROCUSHION cylinders to level plug. The oil in the HYDROCUSHION cylinders will not be consumed, and therefore needs only to be checked every 3 months. However, you must be alert to a possible oil leak (oil would run on the floor). DO NOT OPERATE THE MACHINE UNLESS THE OIL IN THE HYDROCUSHION CYLINDERS IS AT THE PROPER LEVEL!
12. Lubricate upper and lower ball joints on suspension cylinders of HYDROCUSHION Mounted machines with 2 strokes of the grease gun every 200 operating hours, or 30 days, whichever occurs first.

Section
Drive Components

2

SECTION 8

CLUTCH, BRAKE AND DRIVE

The clutch is essentially a tubeless tire which may be automatically inflated by air. The tire is mounted on the reducer shaft and nests into a hollow portion of the main drive pulley which is much like an automobile brake drum. When the tire is inflated, it expands outwardly and grips the inside of the drum, thus transmitting power from the gear reducer to the washer shaft. When the air is released, the tire automatically reverts to its normal size, thus becoming disengaged from the main pulley so that the machine may be run at Extract Speed without over speeding the helical gear unit. During washing and inching, the cylinder is driven by the Wash Speed motor through the gear reducer and the clutch, while the Drain Speed motor and the Extract motor merely coast. As soon as the drain Valve opens, the Wash Speed motor is shut off and coasts with the Extract motor, while the Drain Speed motor drives the cylinder through the reducer and clutch. During extraction, both the Wash Speed and Drain Speed motors are shut off, the clutch disengaged, and the Extract motor drives the cylinder through the Extract motor "V" belt drive. At the expiration of extraction, the Extract motor is shut off, the brake applied, and either the Drain Speed or Wash Speed motor (depending upon whether the Drain Valve is open or closed) starts and runs idle while the brake decelerates the machine. When the machine has slowed down sufficiently to actuate the centrifugal switch, the brake is automatically released, and the clutch engaged thus returning the machine to the Wash cycle or Drain Speed.

Air controlled by a solenoid valve and the MILTROL is admitted to the clutch through a drilled hole in the center of the reducer shaft. The air is prevented from entering the reducer housing itself by a mechanical end face seal which is in the air inlet on the reducer. The reducer is additionally fitted with a vented fill plug to prevent build up of air pressure in the housing should the mechanical seal fail.

Absolutely no clutch adjustment is necessary in the field. Except for the fact that the air supplied to the unit must be reasonable free of oil and moisture, there is otherwise no field clutch maintenance necessary.

NOTE: IF THE MACHINE SHOULD MAKE A LOUD SCREECHING SOUND LIKE SKIDDING AUTOMOBILE TIRES DURING DECELERATION FROM EXTRACT SPEED TO WASH SPEED, TURN MASTER SWITCH TO "OFF" IMMEDIATELY AND SEE TROUBLE SHOOTING SECTION.

A quick release valve permits instant clutch release by providing a large area "short circuit" exhaust connection near the clutch. The quick release valve is necessary for the clutch used on washer-extractors, and is furnished as original equipment.

The brake band is applied to a portion of the outside of the Combination-Brake drum pulley. The brake is normally on, and braking pressure is supplied by the action of springs inside the brake air cylinder. The brake is released when air is admitted to the top of the air cylinder. Brake may be readily adjusted to compensate for wear by adjusting nuts on the air cylinder stem.

Section

3

Main Bearings and Seals

REMOVAL, INSTALLATION & SETTING MAIN BEARINGS & SEALS

GENERAL DESCRIPTION:

The bearings used in this machine are double row, spherical roller self-aligning bearings, SKF, Link Belt, Torrington, or equal. The bearings are amply sized for the load. The rear (cleanside) bearing is firmly attached to the tapered shaft by means of lock nut. The rear (cleanside) bearing is the "Fixed" bearing in this design, and the front (soil side) bearing is the "Floating" bearing. The bearings are held in place on the shaft by bearing lockwashers and locknuts. Lubrication for the bearings is provided by grease passage "L" shown on the bearing assembly drawings elsewhere herein. Excess bearing lubricant leaks out through the two bearing cavity leakoffs "F" and "H".

The seals consist of two spring loaded lip type seals nearest the basket, followed by a shaft seal leakoff cavity, and backed up by a third grease retaining seal for the main bearing cavity. Lubrication for the first two seals is provided by means of grease passage "K" shown on the bearing assembly drawings elsewhere herein. Excess seal lubricant leaks out through the seal cavity lubricant leakoff "G".

The front bearing assembly is fitted with a leakoff passage that will carry off any water that leaks past the main water seals. This will prevent any such water from entering the bearing cavity. The leakoff cavity is further provided with a plugged cleanout connection "J" which may be used to periodically flush out the leakoff cavity thus keeping it clean and free from obstructions so it can perform its intended purpose. See Section 7 for instructions. (NOTE: The cleanout has a vented plug. Never use a solid plug here.)

TO REMOVE BEARINGS AND SEALS

First, remove the main drive pulley(s), and front and rear bearing caps.

HOW TO REMOVE THE BEARINGS:

Screw a pipe fitting into tapped hole in center of main shaft. Loosen bearing locknut. Using "Porto-Power" or similar hand operated hydraulic pump, force fluid into hydraulic removal passage. Pump hard, to build up fluid pressure. This pressure will be transferred to the bearing inner race and will cause it to expand slightly; just enough to free the tapered surfaces and allow the bearing to slip off easily. If the bearing is not readily removed, remove front water level inspection plate and use timber to pry up cylinder to remove cylinder weight from bearings. Once the bearing is removed, the cylinder drops only approximately 1/32" before the shaft comes to rest in the Shaft Support.

If the bearing housing is removed from the machine, or if the seals must be changed, it is necessary to remove the seal sleeve (be careful not to damage or scar it) before reassembling the machine. If only the bearing is to be changed, it is not necessary to remove the bearing housing from the shell plates, nor will it be necessary to remove the sleeve. Except in most unusual circumstances, seals should be replaced whenever new bearings are installed.

WARNING: SHIMS WERE PLACED UNDER ONE OR MORE OF THE THREE BEARING HOUSING PADS DURING FACTORY ASSEMBLY TO ALIGN THE HOUSING AND INSURE ITS BEING EXACTLY PERPENDICULAR TO THE SHAFT. WHEN REMOVING THE BEARING HOUSING, BE SURE TO KEEP THESE SHIMS SEPARATE AND IDENTIFIED SO THAT THEY MAY BE RETURNED TO THEIR PROPER LOCATION - OTHERWISE THE BEARING AND SEAL WILL BE OUT OF LINE AND MAY BE DAMAGED AFTER A SHORT OPERATING PERIOD. AS A PRECAUTION IN CASE THE SHIMS ARE LOST DURING DISASSEMBLY, YOU WILL FIND STAMPED NEXT TO THE BEARING HOUSING THE PROPER THICKNESS OF SHIMS REQUIRED (IF ANY) UNDER EACH ADJACENT BEARING HOUSING PAD. THE STAMPED NUMBER INDICATES THE SHIM THICKNESS IN THOUSANDTHS OF AN INCH. FOR EXAMPLE, THE NUMBER "38" STAMPED NEAREST THE LOWER OF THE THREE PADS WOULD INDICATE THAT 38/1000 (.038") SHIMS WOULD BE REQUIRED UNDER THE LOWER BEARING HOUSING PAD.

HOW TO INSTALL NEW BEARINGS AND SEALS:

NOTICE: The most important ingredient in successful bearing and seal installation is CLEANLINESS. The bearing housing must be free of all foreign matter. The grease and leakoff passages must be blown clear and all foreign matter removed. You must have a clean work area. Keep your hands and tools free from grit and grime. (Wash your hands before actually inserting the bearing in the housing.) Foreign matter is, without doubt, the most frequent cause of bearing failure, and one over which the manufacturer has no control.

BEFORE INSTALLING BEARINGS, YOU MUST USE A FEELER GAGE TO MEASURE THE INTERNAL CLEARANCE IN THE BEARING. READ THE SECTION "HOW TO ADJUST THE BEARING" BEFORE INSTALLING THE BEARINGS IN THE HOUSING.

If new seals are to be installed (as will almost always be the case when bearings are replaced), remove the bearing housings from the machine, and press out the old seals. Carefully clean out all grease passages to make certain that they are free and unblocked. Then press in new seals (carefully observe the assembly drawing to note the proper direction for each seal to face). Next, slip the seal sleeve into these seals, being careful not to damage or to fold under any of the seal lips. Now, insert Bearing Assembly Fixture into front and rear bearing housings, and then install front and rear bearing housings on the machine, using the Assembly Fixture to draw up both housings tight against the shell front and rear at the same time. (WARNING: DON'T FORGET THE BEARING HOUSING SHIMS. SEE PARAGRAPH ENTITLED "WARNING" ABOVE.)

NOTE: Bearing Assembly Fixtures are available from the factory on a loan or purchase basis. It is practically impossible to change seals successfully without using this Fixture. You should correspond with the factory for full details and availability of the Fixture at least two weeks before a contemplated bearing or seal removal.

After both bearing housings are drawn tightly against the shell front and rear plates, insert cap screws and tighten securely; then remove the Bearing Assembly Fixtures from both front and rear bearing housings.

The "Fixed" bearing is always installed first. (One bearing is always "Fixed", the other end is free to slide in an axial direction to compensate for shaft expansion due to temperature change.) In this model, the rear (clean side) bearing is the "Fixed" bearing. To install the rear bearing, use light taps of a

mallet to gently drive the bearing into position. Now tighten lock nut to the proper internal bearing clearances, using the procedure explained in the section entitled "HOW TO ADJUST THE BEARINGS". Then install shaft seal holder -- taking care not to damage seal as it is gently pushed over the shaft. Cover the keyway on the end of the shaft with a thin wall cardboard tube or masking tape, to prevent the sharp corners of the keyway from cutting the seal lip.

After the rear bearing is in place, install the front bearing as follows: Install the bearing in the housing, use light taps of a soft mallet to gently drive the bearing into position. Next install special Lockwasher and special Locknut. Now tighten nut to the proper internal clearances using the procedure explained in the section entitled "HOW TO ADJUST THE BEARINGS".

HOW TO ADJUST THE BEARING:

The adjustment of the bearing is accomplished by the amount that the bearing locknut is tightened. The adjustment of these bearings is a tedious and precise operation and is covered in the following section. These instructions must be followed carefully.

1. Before installing the bearing in the housing, stand the new bearing on the outer race on a clean flat surface. With a Feeler Gauge, accurately measure the existing clearance between the top rollers and the outer race. Make four such measurements and average them. The clearance of the unloaded bearing will be between .003" and .005". Obviously this must be done before the bearing is installed in the housing.

BE SURE TO KEEP THE BEARINGS CLEAN AND FREE FROM ALL FOREIGN MATTER:

After the bearing is installed in the housing, slowly tighten the bearing Locknut until the internal clearance of the bearing has been reduced by the amount shown on the bearing assembly drawing. The final internal clearance will be the average of the four readings taken pursuant to the foregoing paragraph, less the value shown on the assembly drawing. NOTE THAT THESE CLEARANCES ARE MEASURED IN THOUSANDTHS OF AN INCH - OR APPROXIMATELY ONE TENTH AS THICK AS NORMAL AUTOMOBILE BREAKER POINT CLEARANCES. YOU MUST HAVE A GOOD SET OF THICKNESS GAUGES TO SET THESE BEARINGS PROPERLY.

You must measure the clearance between the outer race and the rollers of both rows. Sometimes, when setting the bearings, all the load is taken by only one row (although the load would quickly equalize on both rows after the machine has run for only a few minutes). If all the load is taken by one row, you will get an erroneous clearance reading. It is, therefore, necessary to use the feeler gauge to measure the clearance of both rows of rollers. With the bearing in place on the machine it is admittedly rather difficult to get a feeler gauge back past the first row of rollers to measure the second. BUT IT MUST BE DONE! It is true that the bearing setting procedure for spherical self-aligning bearings are not only tedious but also probably require skills and attention to detail far more exacting than those which are normally expected in repairing "run of the mill" laundry and drycleaning equipment. However, these type bearings are the very best anti-friction devices available for the washer-extractor application and therefore, the tedious nature of the bearing adjustment must be accepted. We suggest that you visit your local bearing supplier, bring this instruction manual

with you, and have him demonstrate in detail how this class of bearing must be adjusted. Have the bearing supplier show you how to use the feeler gauge to get the proper "reading". Your local bearing supplier will be happy to do this.

If the load has been taken by only one row of rollers during adjustment; i.e., if one row of rollers is tight with no clearance and the other has measurable clearance, it is permissible to tap lightly the end of the shaft nearest the tight row of rollers. This will cause the shaft to shift axially (but only barely perceptible) and equalize the roller loading. It is a good idea to rotate the basket by hand (after both bearings have been installed, of course,) and then to recheck the clearance to make sure that it is tight.

When the proper internal clearance has been attained, lock the nut by bending over the matching tab on the lockwasher; making sure that all unused tabs on the lockwasher are bent as near the nut as possible so that they will not rub against the bearing roller cage. CHECK EACH UNUSED TAB INDIVIDUALLY TO INSURE THIS.

IT IS MANDATORY THAT THE PROPER INTERNAL CLEARANCE BE SET IN THESE BEARINGS. THIS SETTING PROCEDURE PROVIDES TWO DESIRED RESULTS:

1. The setting of proper internal clearance in the bearing makes best use of the bearings anti-frictional values.
2. The internal clearance insures that the bearing is tightly seated on the tapered shaft. (THIS IS MANDATORY.)

AFTER INSTALLING NEW BEARINGS, DON'T FORGET TO RELUBRICATE THEM BEFORE OPERATING.

Section
Steam and Air

4

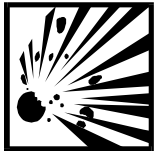
SERVICING AIR CYLINDERS

This is the general procedure for rebuilding an air cylinder using a Milnor[®] furnished repair kit, once the air cylinder has been removed from the machine. See the specific air cylinder and major assembly parts drawing(s) for component identification and removal/replacement information.

Maintenance procedures require:

- Two threaded rods and nuts, twice the length of the tie bolts.
- The appropriate repair kit.

▲ CAUTION ▲



EXPLOSION HAZARD—Spring tension can cause air cylinder to burst apart with great force during disassembly. You can be struck by air cylinder parts.

☞ Follow maintenance instructions carefully.

☞ Wear eye protection.

NOTE: Use a new locknut when re-assembling air cylinder (see the appropriate parts drawing).

1. Replace two diagonally opposite tie bolts with threaded rods and nuts as shown in FIGURE 1.
2. Tighten nuts on the threaded rods until they contact the air cylinder.
3. Remove the other two tie bolts and the nuts, washers, clips, and actuators from the external end of piston stem.

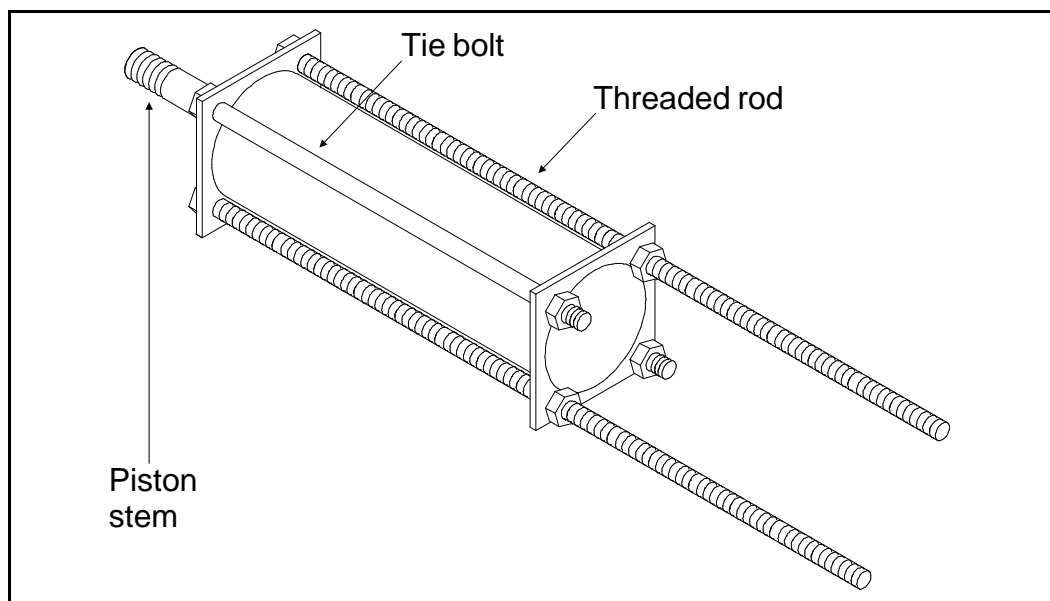


FIGURE 1 (MSSM0130AE)
Using Threaded Rods

- Loosen nuts on threaded rods evenly, permitting cylinder heads to separate. Use only a few turns on one nut before moving to the other one. Continue until springs have no tension.

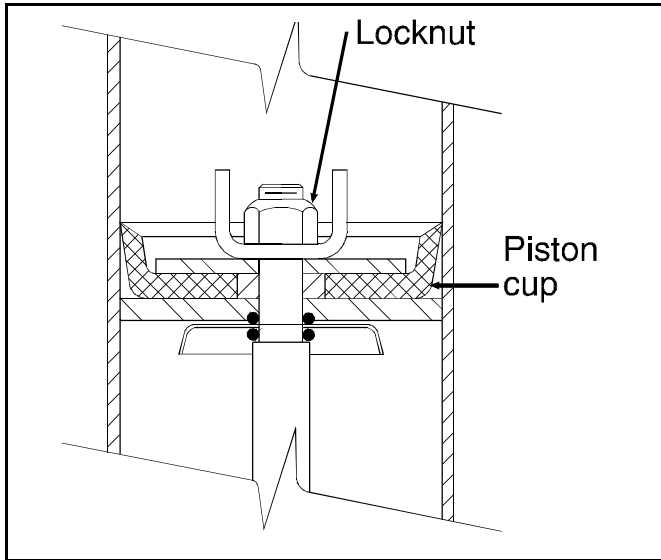


FIGURE 2 (MSSM0130AE)
Correct Piston Cup Shape

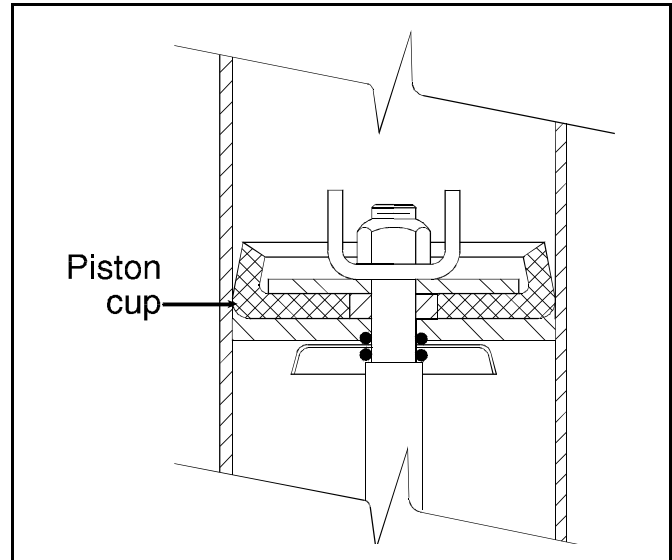


FIGURE 3 (MSSM0130AE)
Distorted Piston Cup Shape

- Note position and orientation of piston cup(s), washers, and springs. Replace worn parts, then reassemble in reverse order. Tighten locknut until it is just barely possible to turn the piston cup and washer assembly on the stem. Correct piston cup shape is shown in FIGURE 2. **DO NOT** overtighten, as this causes the piston cup to deform to the shape shown in FIGURE 3 and may cause piston to bind in cylinder.

Burket Steam Valve

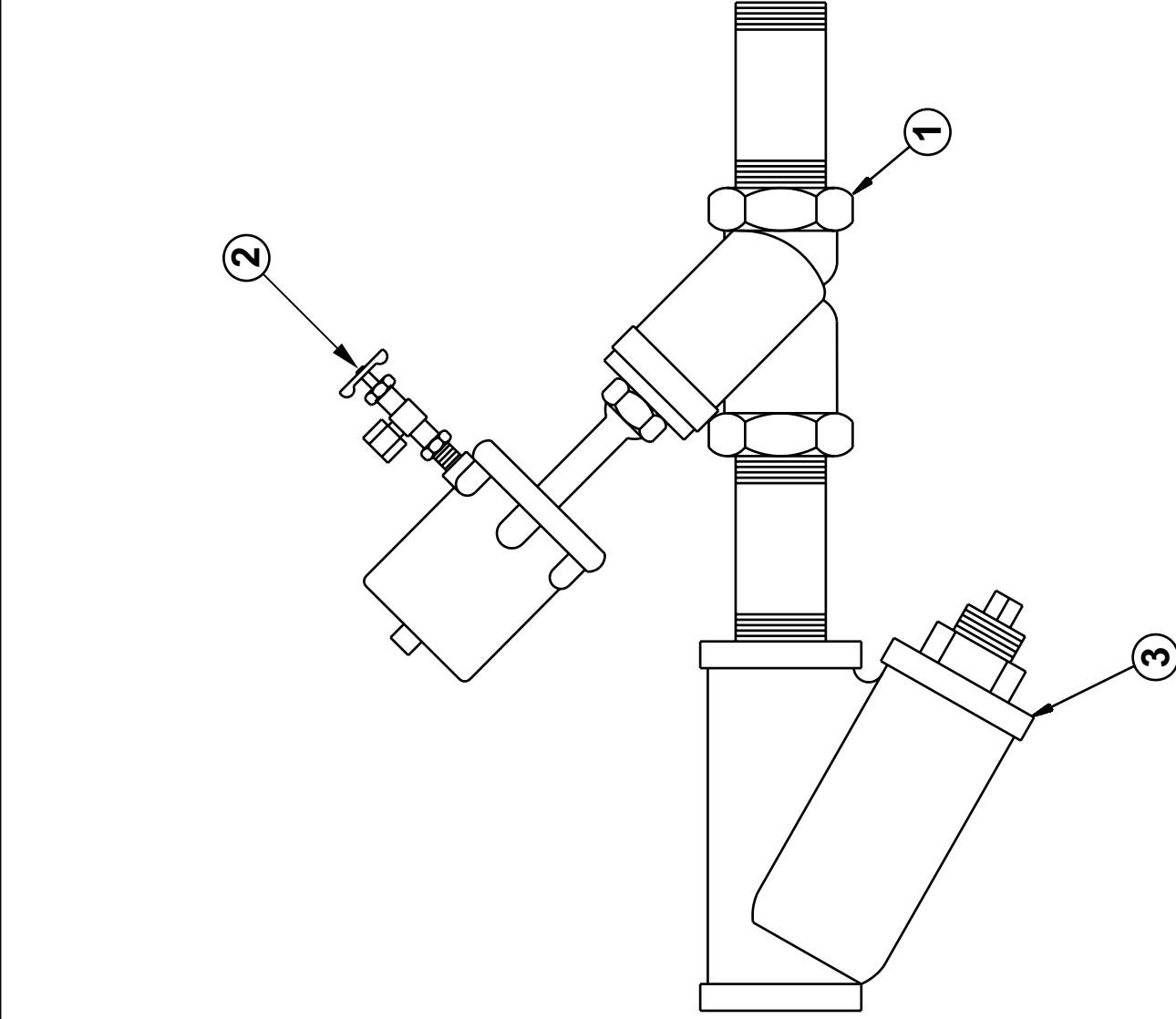


Pellerin Milnor Corporation
P. O. Box 400, Kenner, LA 70063-0400

BMP800020/96066V (1 of 1)

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BMP800020/96066V
(Sheet 1 of 1)



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

Used In	Item	Part Number	Description	Comments
			ASSEMBLIES	
	W	96D0009ER1	02Z REPAIRKIT 3/4" STEAM VALVE	KIT FOR 001A
	X	96D0011ER1	02Z REPAIR KIT 1.25" STEAM VALVE	KIT FOR 001B
	Y	96D0011ER2	ACTUATOR HOUSING FOR BURKET #251	KIT FOR 001B
	Z	96D0011ER3	REPAIR KIT MULLER 1.25 VALVE #554	KIT FOR 001B
			COMPONENTS	
all	1	96D0009E	03Z 3/4"NPT N/C STEAMVAL ANGLE BODY	3/4"
all	1	96D0011E	08Z 1/25"NPT N/C STEAMVAL ANGLEBODY	1-1/4"
all	2	96H018	NEEDLE VALVE	
all	3	51T030	01Z Y-STRAINER 3/4" CAST IRON	USED WITH 001A
all	3	51T060	01Z Y-STRAINER 1+1/4" CAST IRON	USED WITH 001B

Section
Installation

5

CHAPTER 8

INSTALLATION

8.1. GENERAL. MILNOR HYDRO-CUSHION washer-extractors require no special foundation. Any floor having sufficient strength and rigidity to support the static weight of a fully loaded machine with a reasonable factor of safety will permit vibration-free operation. See HYDRO-CUSHION dimensional drawing for loaded weight of your machine.

8.2. SETTING THE MACHINE.

8.2.1. BEFORE TRANSFERRING ABOARD SHIP.

a. Carefully remove crate and minutely examine machine for possible shipping damage. If there is anything damaged on the machine, NOTIFY THE TRANSPORTATION COMPANY AT ONCE. Once a shipment has been delivered to a carrier by the manufacturer, it is the sole responsibility of the carrier to make sure that no damage occurs in transit. Carriers are liable for concealed damages as well as readily apparent damage.....and you should not hesitate to file a claim with the carrier if the machine has been damaged in shipment. We will be glad to assist you in filing your claim, but are not responsible for shipping damage to the machine once it has been delivered to the carrier in good condition.

b. Remove the shipping skids. Fabricate four 1-1/4" thick steel plates as shown in Figure 8.1.

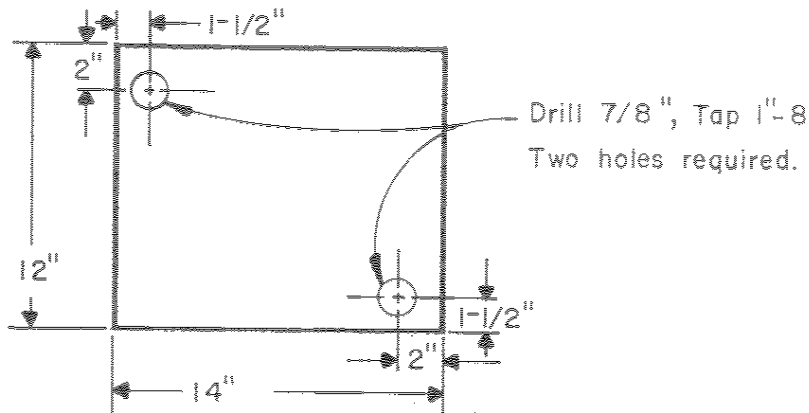


Figure 8.1. Mounting Plate Fabrication Instructions.

c. Fasten one plate under each base pad using 1"8 X 2-1/2" hex head cap screws. Do not allow these screws to protrude below the plate.

d. Transfer the machine aboard ship.

8.2.2. FASTENING MACHINE TO THE DECK.

a. Move the machine into the desired position.

b. Loosen - but do not remove - the hold down bolt at each corner of the machine. These bolts should be loosened exactly 3 turns - no more - to release the shell from the frame and remove any residual stress incurred in shipment.

- continued -

CHAPTER 8 - INSTALLATION continued

- c. Weld the steel plates to the deck.
- d. Loosen the 1" hex cap screws holding the base pads to the steel plates so that 3/4" spacers (7/8" hex nuts work well for this) may be placed between the base pads and the steel plates.
- e. Level the machine with the deck (use shims under the spacers to level).
- f. When the machine is level, tighten the 1" hex cap screws finger tight (do not tighten with a wrench).
- g. Apply grout under the base pads. Make sure it fills the large holes in the base pads and that there are no voids so that the pads rest on solid bases of grout.
- h. When the grout is hard, tighten the 1" hex cap screws in each base pad and remove the shipping hold down bolts.

8.3. CONNECTING SERVICES.

8.3.1. Connect the hot and/or cold water inlet valves as marked. (When looking at the valves while standing at the side or rear of the machine, the hot water valve is on the right and the cold water valve is on the left.) No strainers are required for the air operated water inlet valves. The owner should furnish unions at each water inlet valve to permit removal of the valve assembly for servicing when necessary. When the machine is field connected to be operated with cold water only, the hot water inlet valve may be used for "hard water", or not connected at all. (If the hot water inlet valve is used for "hard water", all references herein to "hot water switch", "hot water finger", or "hot water valve" shall be interpreted to mean "hard water" respectively. Machines that are supplied specifically for operation on cold water only may have only a cold water valve - in which case the hot water switch and hot water finger remain part of the control and may be later used to control a hard water valve.

8.3.2. Be certain that you have an adequate supply of hot and cold water. (Cold water only machines need only a cold water supply.) The MILNOR washer-extractor is a highly productive machine but cannot be expected to produce to its fullest capacity if the water pressure and/or water supply is inadequate.

8.3.3. If manual shut-off valves are to be installed upstream from a machine equipped with ball-type inlet valves, be sure the shut-off valves have flow rates equal to or greater than the valves on the machine. Globe valves do not have flow rates as great as ball valves of equal nominal size and therefore must be nominally "larger" in order to keep the machine filling at its proper rate. Use a 2-1/2" globe valve for a 1-1/4" and 1-1/2" ball valve; a 3" globe valve for 2" ball valve; a 4" globe valve for 2" "full port" ball valve. If ball-type shut-off valves are to be used they should be equal in nominal size to the ball valves on the machine.

8.3.3.a Steam connection located at top, rear of machine (see dimensional drawing), is 2 inch IPT, 100 psi maximum steam pressure.

8.3.4. It is best to drain the machine directly into an open ditch or gutter. This assures that the machine will empty fully before extraction begins, and will permit the free flow of air and moisture during extraction. The drain valve is connected to the flexibly mounted portion of the machine and may move up to three inches in all directions while washing and extracting. Flexible hose must be used if the machine must be physically connected to the sewer pipe. The drain valve

- continued -

CHAPTER 8 - INSTALLATION continued

is normally installed in a vertical position, suitable when the machine is to straddle a drain gutter. (This is the preferred method of draining.) If the machine is physically connected to the sewer pipe, it will probably be necessary to turn the Drain Valve 90 degrees to permit it to drain toward the front or toward the rear of the machine. This is accomplished by merely unbolting the drain valve flange connection and turning the valve 90 degrees. The valve may either drain downward, to the rear (or on some machines to the front) depending upon installation requirements.

8.3.5. Shipboard machines are equipped with two 3-1/2" outlets on the side of the shell. The upper connects to the machine vent; the lower is an overflow connection and should be piped to a drain.

8.3.6. Connect air to the appropriate air connection located on the top of the machine. Air should be clean, free from oil or moisture, and at a pressure of 85 psi minimum, 100 psi maximum. A 5/16" copper tube will supply an adequate supply of air providing the tubing does not run more than 30 feet. Use 3/8" for longer runs.

8.3.7. Carefully check machine nameplate to insure that the machine electrical specifications conform with the electrical service in your plant. Have a competent electrician connect your power service to the terminals marked L1, L2, and L3 on the magnetic starter located within the control box. Comply carefully with the connection instructions on the tag affixed to the control to make sure that the "Stinger Leg" (if any) is connected to L3, not to L1 or L2. Customer must furnish wall mounted disconnect switch. See Fuse Recommendation Chart elsewhere herein.

8.3.8. To check rotation, first be sure that air pressure is on the machine. Then, with the door open, inch the cylinder in accordance with the operating instructions on the nameplate, with the Two-Way Inching Switch in the "Manual" clockwise rotation setting. The cylinder must turn clockwise during inching, when the drain valve is open, and during extraction. Caution the electrician that if necessary to change rotation, he must only swap the supply wires that he attached to terminals L1 and L2. Never interchange L3 if L3 is a "Stinger Leg". Under no circumstances is the electrician to change the motor rotation at any other point in control system - nor is he to interchange any other machine wiring - for all of the motors on the machine have been properly phased in before the machine left the factory and all motors must operate in a specific direction.

8.3.9. Before operating machine, check oil level in gear reducer, refilling if necessary. See 4.2. for lubrication instructions on the remainder of the machine.

8.3.10. On machines equipped with automatic supply injection of the flushing type, connect the injector unit to a source of hot water (when available). Connection is made directly from the water line to the supply injector pressure reducing valve. Use at least one size larger pipe than the pressure reducing valve. Hot water should be used for flushing providing your hot water source is dependable and does not occasionally boil over and produce steam in the hot water line. If such a condition exists, or if hot water is unavailable, use cold water for flushing purposes.

- continued -

CHAPTER 8 - INSTALLATION continued

8.3.11. There are five solenoid valves located within the supply injector. These valves can handle a maximum pressure of 30 psi. They are adequately protected against higher pressures by the pressure reducing valve which has been properly set at the factory to deliver 28 psi. Increasing the pressure above 28 psi may cause the flush valves to fail to open and may even cause the electric coils therein to burn out. Be sure to check the pressure gauge and reset to 28 psi as vibration and/or handling in shipment may cause the regulator to get out of adjustment. DO NOT exceed pressure of 28 psi. Check by causing an injector valve to open two or three times, then setting pressure when there is no flow of water through the injector.

NOTE: Under certain peculiar and infrequent combinations of incoming water pressure and upstream piping configurations, the supply injector pressure regulator may chatter while flushing supplies into the machine. Should this occur, check injector pressure gauge to make sure regulator is set for 28 psi where there is NO flow of flushing water through the unit, and reset if necessary. If condition persists, remove pressure regulator and reinstall approximately 10 feet further "upstream". The tubing connection in the bonnet of the regulator is a bleed off line that allows the regulator to bleed itself should foreign matter or worn seat permit seepage through the regulator (which would otherwise permit the pressure to the valves to slowly build up and exceed their maximum pressure rating). The bleed off line is normally allowed to discharge into the injector chute, but may be connected to any convenient drain.

8.4. REST PAD ADJUSTMENTS. Before the machine is put into operation the rubber rest pads found atop each base pad must be adjusted so that the machine comes to rest evenly at all four corners when washing.

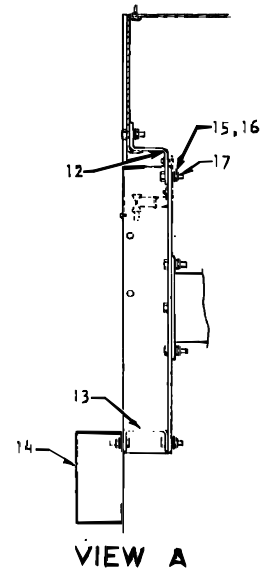
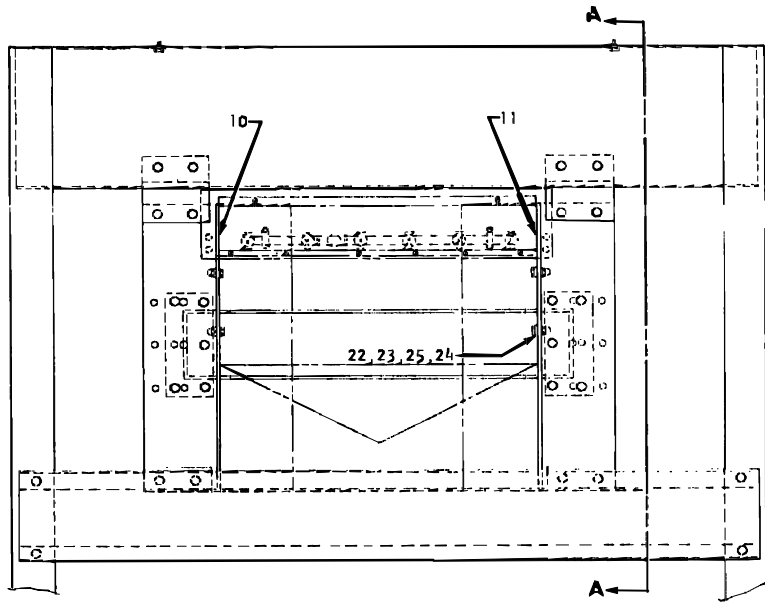
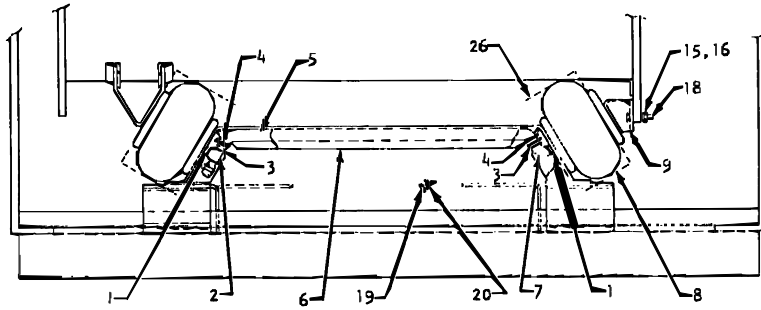
- a. Turn on air pressure and electrical power to the machine (if not already on).
- b. Place the master switch (Switch No. 1) on the MILTROL in the "Manual" position. Note that the machine is pushed down onto the rest pads.
- c. Recycle the master switch through "off" back to "manual" positions. As the machine is being pushed down, slide two equally thick pieces of sheet metal between the air mount brackets and the rest pads on one side of the machine. Shim as necessary beneath the rest pads until both pieces of sheet metal bind at the same time.
- d. Repeat step "c" on the other side of the machine.
- e. Check as in step "c" to see that both the left and right sides of the machine contact the rest pads at the same time. If one side contacts the rest pads after the other, shim both pads on that side with equal thicknesses of sheet metal until all four pads on the machine contact at the same time.
- f. Center the actuator for the excursion switch (located on the drive assembly) vertically and laterally within its adjusting plate. Cycle the master switch between the "manual" and "off" positions. The actuator should remain approximately centered within the adjusting plate as the machine raises and lowers.



AIR MOUNT INSTALLATION

SHIPBOARD 42"

BMP770129
87316C

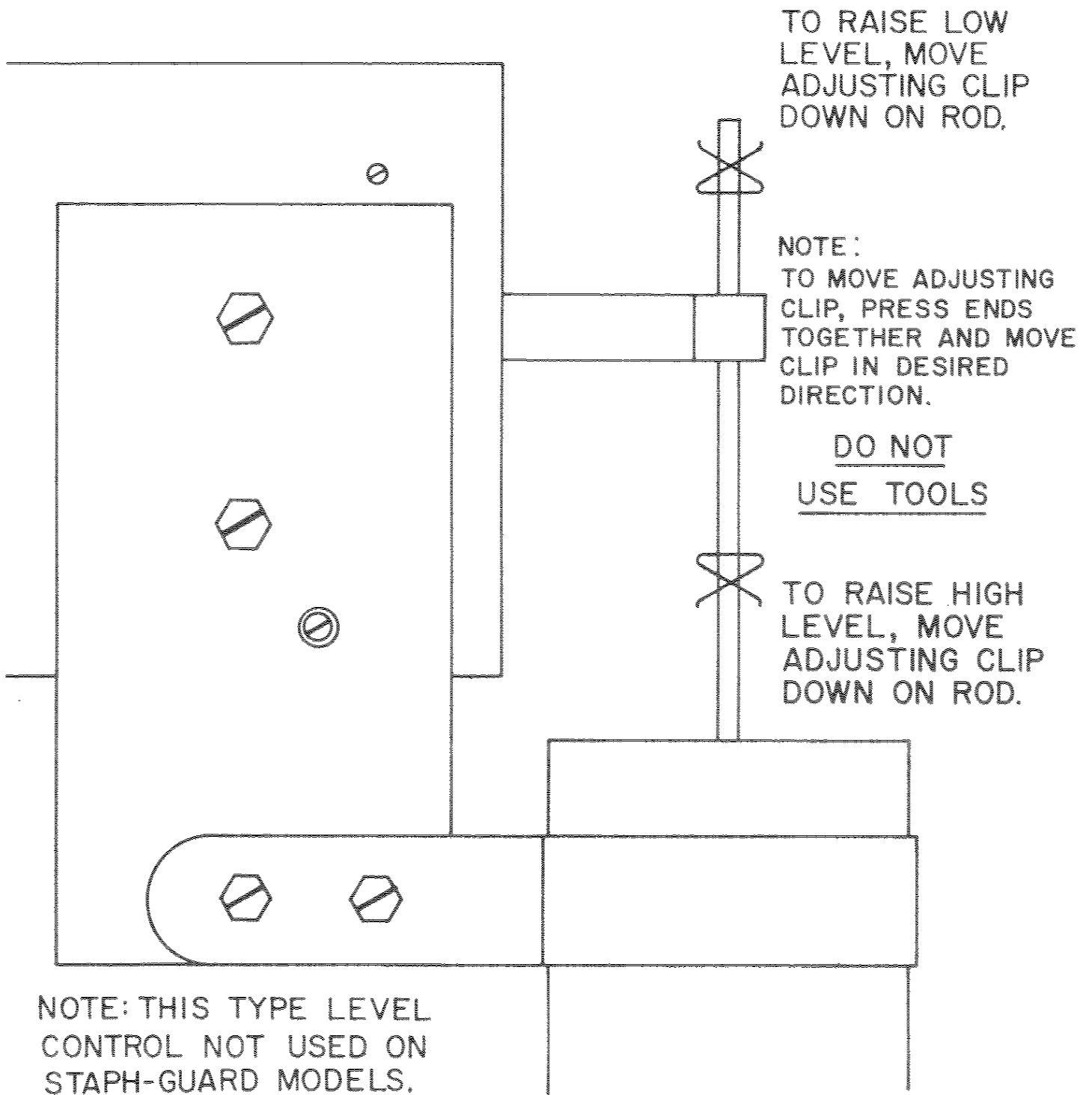


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509A/PS0205 PARTS LIST FOR: BMP770129R/88432A P/L AIR MT INSTAL SHIPBD 42"

ITEM	HOW PART IS USED IN ASSY (ONLY IF PERTINENT)	P/N	DESCRIPTION
001	SEE DESCRIPTION ----->	51L00EG01E	NIPPLE PIPE 1/4 X 1 + 1/4 GALSTL
002	SEE DESCRIPTION ----->	51V015	02Z TEE PIPE 1/4"FGDBRASS101-T7-444
003	SEE DESCRIPTION ----->	51E507	HOSE STEM BRASS 1/4 MPTX1/2 HOSE I.D
004	SEE DESCRIPTION ----->	27A090	HOSE CLAMP, 11/16=1.5" CADSCR HS-16
005	SEE DESCRIPTION ----->	60E085A72A	HOSE *AIR=1/2" ID PE X72"
006	SEE DESCRIPTION ----->	W2 16307A	81526C*WLDMT=SHELL STABILIZER 4244
007	SEE DESCRIPTION ----->	51J018G	ELBOW PIPE 90 1/4" 150#GALMAL
008	SEE DESCRIPTION ----->	60B100	REPLACED BY KIT K15 0004
009	SEE DESCRIPTION ----->	W2 16310	81533C*SUPPORT=AIR MOUNT REAR WELD
010	SEE DESCRIPTION ----->	02 16327	87306D L-BRACE STABILIZER 4231 (RH)
011	SEE DESCRIPTION ----->	02 16327A	87306# L-BRACE STABILIZER 4231 (LH)
012	SEE DESCRIPTION ----->	02 16325	78136C ZEE BRACKET=3.31DPX2.5X3.13
013	SEE DESCRIPTION ----->	02 16326	78136B U BRACKET 4.12 DPX 2" HIGH
014	SEE DESCRIPTION ----->	02 16311	75488D X-BRACE LOWER RH+LH SHIP
015	SEE DESCRIPTION ----->	15U300	LOCKWASHER MEDIUM 1/2 ZINCPL
016	SEE DESCRIPTION ----->	15G230	HEXNUT 1/2-13UNC2B SAEGR2 ZINC/CAD
017	SEE DESCRIPTION ----->	15K151	HXCAPSCR 1/2-13UNC24X1.25 GR5 PLATE
018	SEE DESCRIPTION ----->	15K162	HXCAPSCR 1/2-13UNC2AX1.5 GR5 PLATED
019	SEE DESCRIPTION ----->	15K095	HXCAPSCR 3/8-16UNC2AX1"GR5 ZNC/CAD
020	SEE DESCRIPTION ----->	15U255	LOCKWASHER MEDIUM 3/8 ZINCPL
022	SEE DESCRIPTION ----->	15K086	HXCAPSCR 3/8-16NCX3/4 SS18-8
023	SEE DESCRIPTION ----->	24G030N	ROLLED WASHER .379"ID NYLTITE #37W
024	SEE DESCRIPTION ----->	15U260	LOCKWASHER MEDIUM 3/8 SS18-8
025	SEE DESCRIPTION ----->	15G200	HEXCAPNUT 3/8-16 UNC2A 5/8 X 1/2
026	SEE DESCRIPTION ----->	69C050A	POLYETHYLENE BAG 9X6X13X.005



HOW TO ADJUST WATER LEVEL

PELLERIN MILNOR CORPORATION

Section
Fuse and Wire Sizes

6

RECOMMENDED FUSE AND WIRE SIZES

BMP700564/83141A

The following chart depicts recommended branch circuit fuse and wire sizes for three phase 50 and 60 cycle washer extractors.

NOTE: Information provided below is for reference only. Check your machine nameplate for current values.

MACHINE SIZE	208V60C 220V50C	240V60C	380V50C 415V50C	440V60C 480V60C	600V60C
	*WIRE SIZE FUSE A B	*WIRE SIZE FUSE A B	*WIRE SIZE FUSE A B	*WIRE SIZE FUSE A B	*WIRE SIZE FUSE A B
3015CWE				N/A	N/A
3015C4M	5.6A 14 14	5.6A 14 14	2.5A 14 14	2.5A 14 14	
3015N4E	(2.5)(2.5)	(2.5)(2.5)	(2.5)(2.5)	(2.5)(2.5)	
3015N4S					
3015C5M					
3015C6M					
3015N6E	8A 14 12	8A 14 14	4A 14 14	4A 14 14	N/A
3020N4S	(2.5) (4)	(2.5)(2.5)	(2.5)(2.5)	(2.5)(2.5)	
3020N5E					
3016BWE	15A 10 10	15A 10 10	10A 12 12	8A 14 12	7A 14 14
3626QWE	(6.3)(6.3)	(6.3)(6.3)	(4) (4)	(2.5) (4)	(2.5)(2.5)
3626SWE	15A 12 10	15A 12 10	10A 12 12	8A 14 12	7A 14 14
	(4)(6.3)	(4)(6.3)	(4) (4)	(2.5) (4)	(2.5)(2.5)
3621BWE					
4226DYA	25A 10 8	25A 10 8	15A 12 10	15A 12 10	12A 14 10
4226QWE	(6.3) (10)	(6.3) (10)	(4)(6.3)	(4)(6.3)	(2.5)(6.3)
4226QHE					
4231WE	35A 8 6	30A 8 6	20A 10 8	15A 12 8	12A 12 10
4231SG	(10) (16)	(10) (16)	(6.3) (10)	(4) (10)	(4)(6.3)
4244WE					
4244SG	60A 6 4	50A 8 6	30A 10 8	25A 10 8	20A 12 8
4244DA2	(16) (25)	(10) (16)	(6.3) (10)	(6.3)(10)	(4) (10)
4244DA3					
4832BHE	60A 6 4	50A 8 6	40A 10 8	25A 10 8	20A 10 8
	(16) (25)	(10) (16)	(6.3) (10)	(6.3)(10)	(6.3) (10)
4836QHE	70A 4 2	60A 6 4	40A 10 8	30A 10 8	25A 10 8
	(25) (35)	(16) (25)	(6.3) (10)	(6.3)(10)	(6.3) (10)
6036WE	60A 6 4	50A 8 6	35A 8 6	30A 10 8	25A 10 8
	(16) (25)	(10) (16)	(10) (16)	(6.3)(10)	(6.3) (10)
6036SG					
6044WE					
6044SG	80A 4 2	70A 4 2	45A 6 4	35A 8 6	30A 8 6
5238WE	(25) (35)	(25) (35)	(16) (25)	(10) (16)	(10) (16)
5238WTB					
5238WTC					
5238WTF					
7244WE	100A 2 2	90A 2 2	50A 4 3	45A 4 3	35A 8 6
7244SG	(35) (35)	(35) (35)	(25) (25)	(25) (25)	(10) (16)
7244WTB	125A 0 0	110A 1 1	70A 4 3	60A 4 3	45A 8 6
7244WTC	(70) (70)	(50) (50)	(25) (25)	(25) (25)	(10) (16)

*Use wire size in column "A" if run is 50 feet or less. Use wire size in column "B" if run is 50 to 100 feet. Use one size larger wire if run is more than 100 feet. (Applies to both Standard Machines and STAPH-GUARD Machines.) Number in parenthesis is wire size in (mm).

BMP700564/83141A

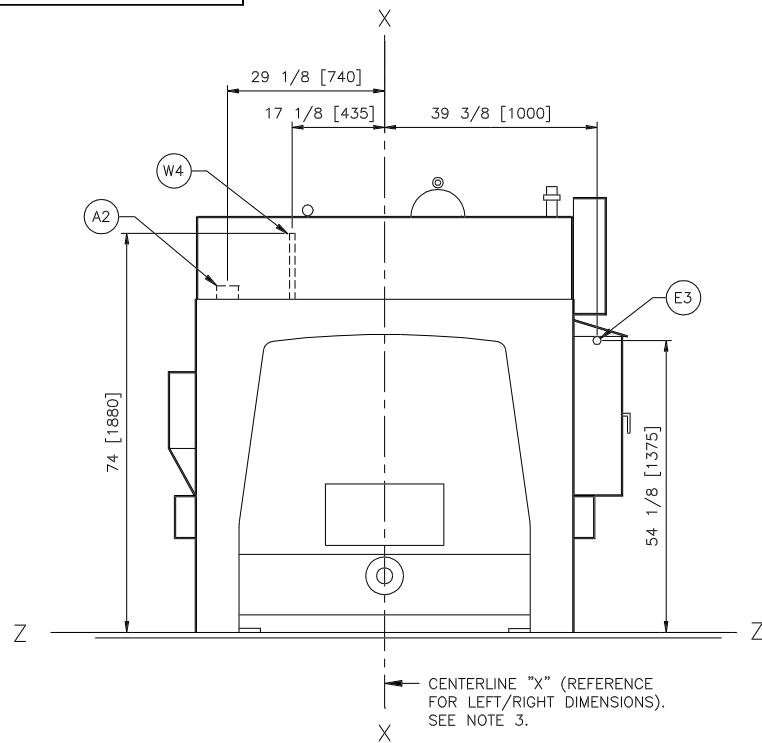
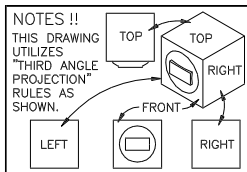
When providing electrical service for a Washer-Extractor, it must be remembered that the extractor motor or motors on a washer-extractor are required to accelerate an extremely heavy (high inertia) load. On some models, the extractor motor(s) take up to as much as 2 minutes to accelerate the cylinder to full speed. As a result, the extractor motor draws nearly locked rotor current for an appreciable length of time, and the current drawn by the motor drops quite slowly as the motor slowly accelerates the load. Therefore, the use of lag type fuses is a MUST.

The wire sizes specified above have current carrying capacities, in most instances, somewhat greater than the recommended fuse size. This is to provide wiring of sufficient size to insure against voltage drop. The starting torque developed by an electric motor is proportionate to the square of the voltage quotient; a drop of only 5% in voltage will cause the motor to produce only 90% of its rated torque. Since the critical time in the operation of an extractor motor is at the instant the motor is energized, the extractor motor will not have sufficient torque to start a loaded cylinder if the voltage drop is too great. The motor is drawing its maximum current and the voltage drop is most likely to be greatest at this time, hence it is mandatory that wire of sufficient size be used to insure against too large a voltage drop.

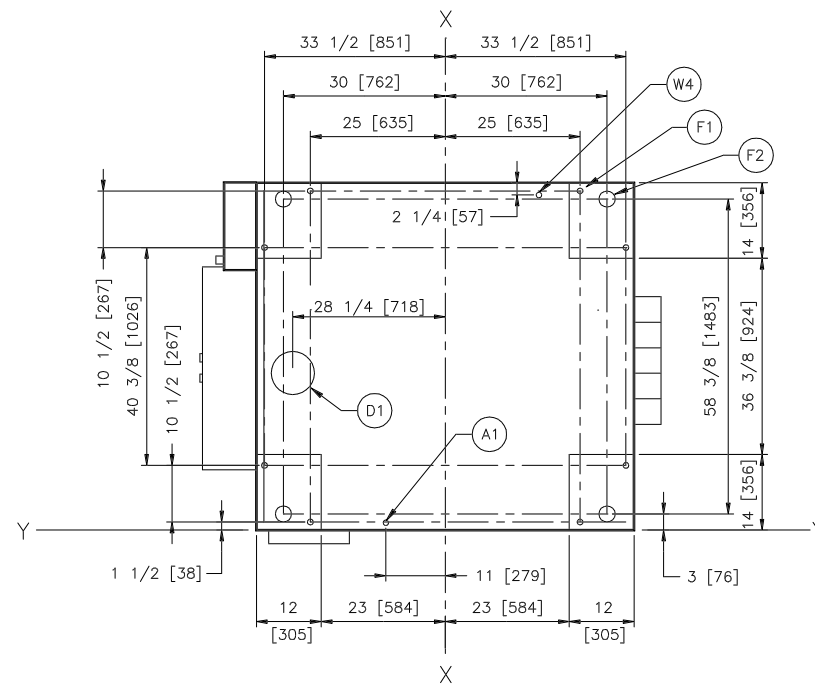
USE BUSSMAN FUSETRON FRN (UP TO 250V), FRS (UP TO 600V) OR SIMILAR LAG TYPE FUSES ONLY. THE ABOVE CHART NOT VALID FOR STANDARD FUSES.

Section
Dimensional Drawings

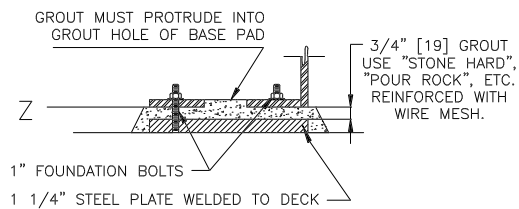
7



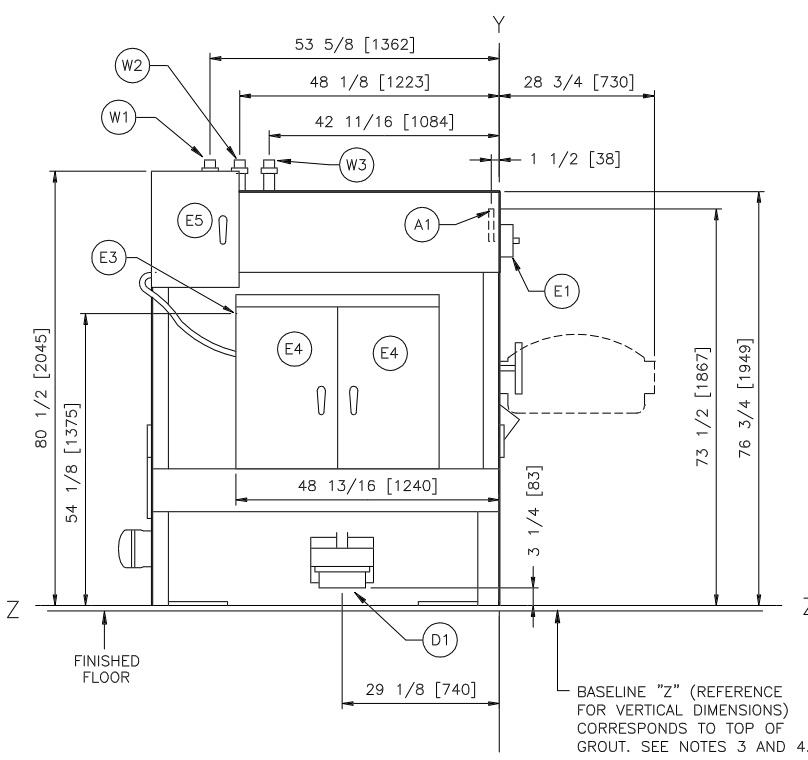
REAR VIEW



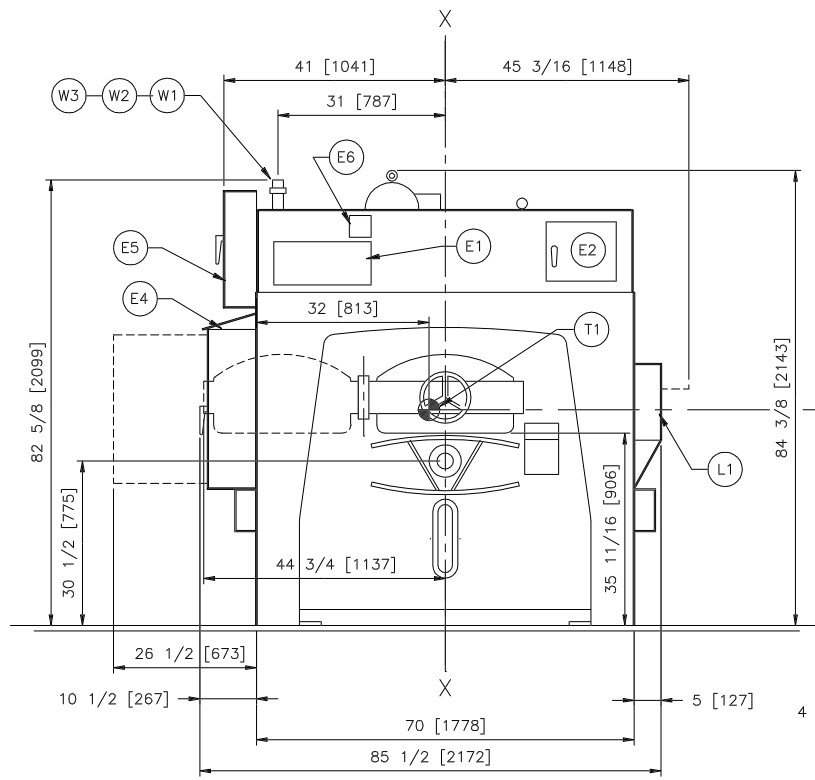
FOUNDATION PLAN VIEW



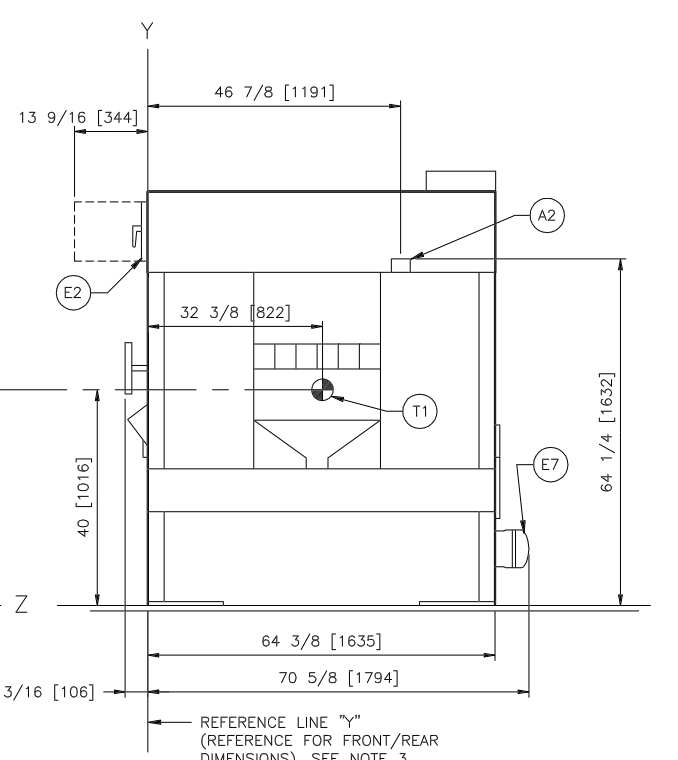
RECOMMENDED DECK MOUNTING DETAIL



LEFT VIEW



FRONT VIEW



RIGHT VIEW

W4	FLUSH HOT WATER SUPPLY INJECTOR, 1/2" NPT.
W3	OPTIONAL, THIRD WATER INLET CONNECTION, 1 1/2" NPT.
W2	HOT WATER INLET CONNECTION, 1 1/2" NPT.
W1	COLD WATER INLET CONNECTION, 1 1/2" NPT.
T1	CENTER OF GRAVITY, EMPTY MACHINE.
L1	5 FLUSH TYPE SUPPLY INJECTION
F2	FOUR GROUT HOLES, 3" DIAMETER. SEE RECOMMENDED MOUNTING DETAIL.
F1	EIGHT ANCHOR BOLT HOLES, 1 1/16" DIAMETER. USE 1" DIAMETER ANCHOR BOLTS.
E7	CENTRIFUGAL SWITCH
E6	AUTOSPOT CONTROL PANEL
E5	AUTOSPOT CONTROL BOX
E4	ELECTRICAL CONTROL BOX
E3	ELECTRICAL CONNECTION
E2	MICROPROCESSOR CONTROL BOX
E1	MICROPROCESSOR CONTROL PANEL
D1	DRAIN VALVE, 8" DIAMETER.
A2	VENT, 3 1/2" DIAMETER.
A1	COMPRESSED AIR INLET CONNECTION, 1/2" NPT.
ITEM	LEGEND

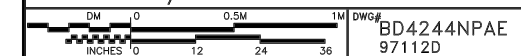
NOTES

- ITEMS SHOWN ON THIS PAGE ARE STANDARD OF THIS MACHINE. FOR OPTIONS SEE BD4244NPAS.
- DO NOT PRE-PIPE ANY CLOSER THAN 60 [1524].
- ALLOW 24" [610] ALL AROUND THE MACHINE FOR SERVICING AND OPERATING CLEARANCES.
- DRAIN VALVE MAY MOVE ±2 [51] IN ANY DIRECTION DURING OPERATION AND MUST NOT BE RIGIDLY CONNECTED TO DRAIN.
- 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 SAME FOR ALL MILNOR MACHINES AND IS SHOWN ON ALL DIMENSIONAL DRAWINGS. THE DISTANCE BETWEEN BASELINE "Z" AND THE FINISHED FLOOR MAY VARY (WITH CHANGES IN FLOOR HEIGHT) AS REQUIRED TO INSURE THAT BASELINE "Z" IS HORIZONTAL AND ALL COMPONENTS 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.

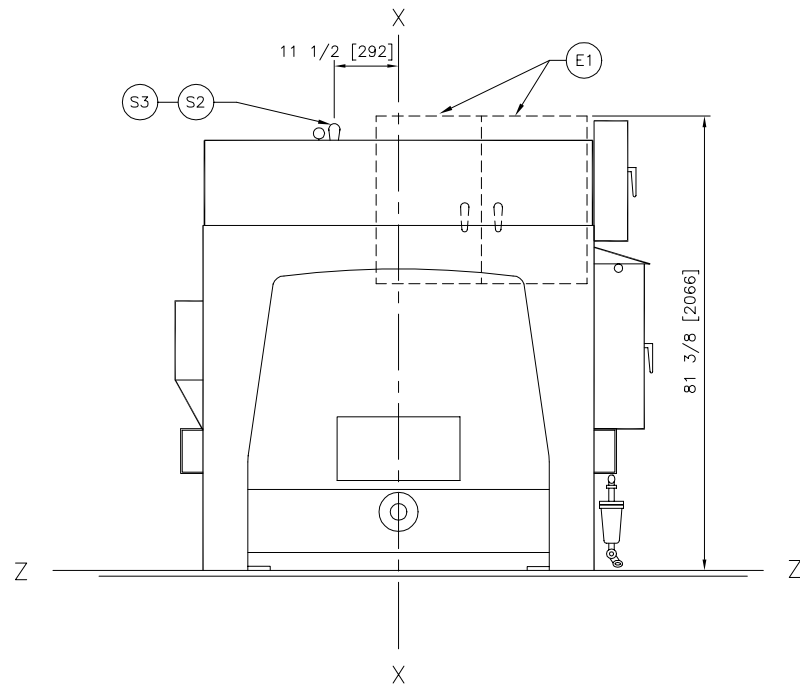
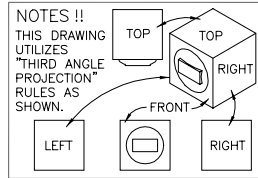
ATTENTION
MOST REGULATORY AUTHORITIES (INCLUDING OSHA IN THE USA) HOLD THE OWNER/USER ULTIMATELY RESPONSIBLE TO MAINTAIN A SAFE WORKING ENVIRONMENT. ACCORDINGLY, THE OWNER/USER MUST RECOGNIZE ALL FORESEEABLE SAFETY HAZARDS, FURNISH SAFETY INSTRUCTIONS AND GUIDANCE TO ALL PERSONNEL WHO MAY COME IN CONTACT 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.

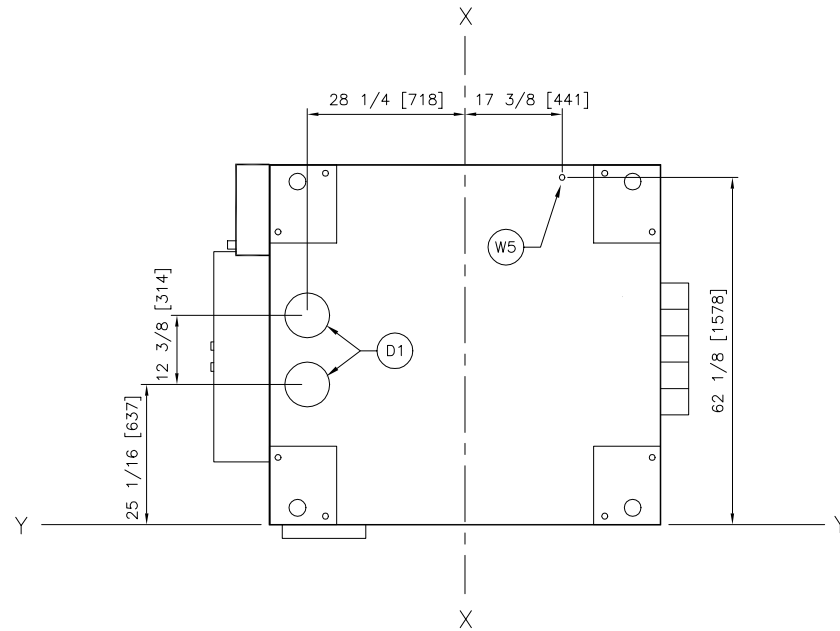
42044NP2/CP2 WASHER EXTRACTOR



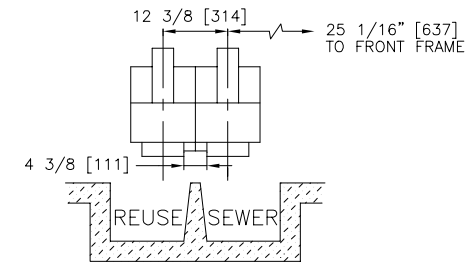
MILNOR PELLERIN MILNOR CORPORATION
P.O. Box 400 Kenner, LA 70063, USA, Phone 504/467-8591,
FAX 504/469-1849, Telex ITT 460124/PELM UL, Cable PELMILNOR



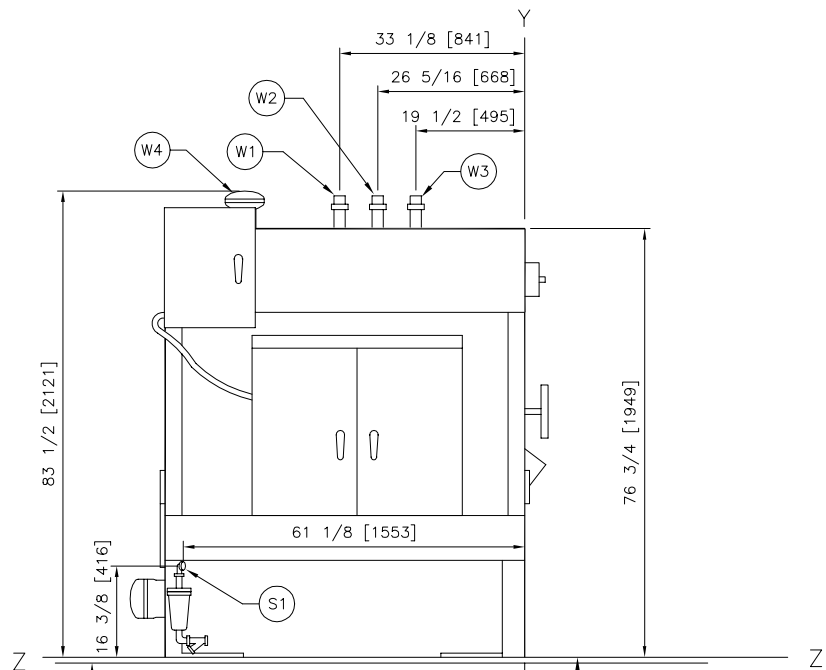
REAR VIEW



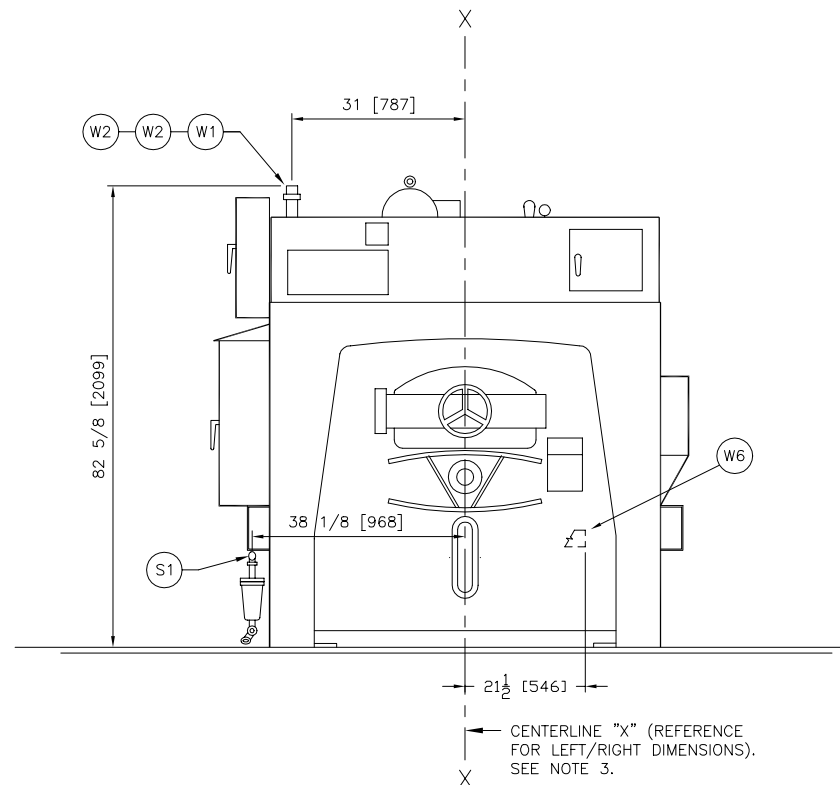
FOUNDATION PLAN VIEW



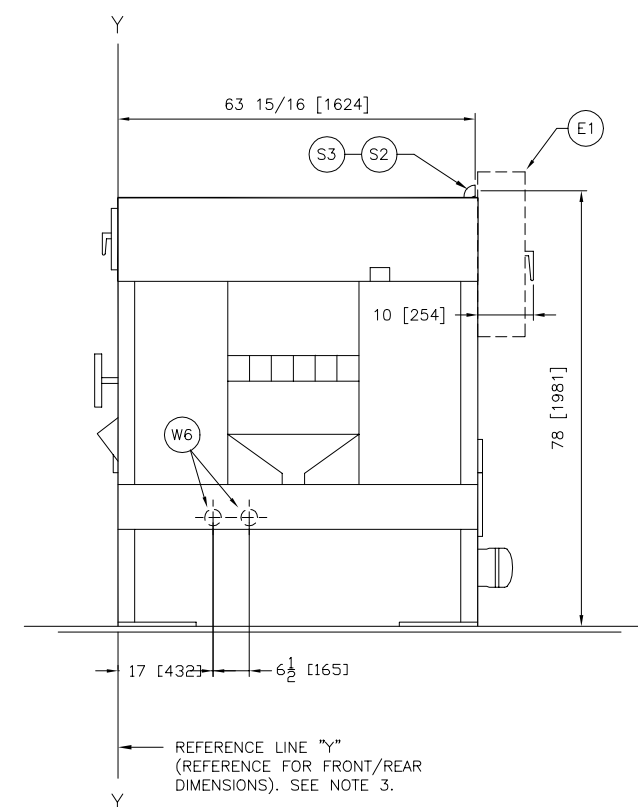
OPTIONAL WATER REUSE
DUAL DRAIN VALVE



LEFT VIEW



FRONT VIEW



RIGHT VIEW

ITEM	LEGEND
W6	SALT WATER INLETS 3"NPT, OPTIONAL, NP2 ONLY.
W5	COOLDOWN, MANUALLY OPERATED, 3/4 NPT.
W4	OPTIONAL, SIPHON BREAKER.
W3	OPTIONAL, THIRD WATER INLET CONNECTION, 1 1/2" NPT.
W2	HOT WATER INLET CONNECTION WITH VACUUM BREAKER, 1 1/2" NPT.
W1	COLD WATER INLET CONNECTION WITH VACUUM BREAKER, 1 1/2" NPT.
S3	STEAM INLET (DIRECT) CONNECTION, 1 3/4" NPT.
S2	STEAM INLET (INDIRECT) CONNECTION, 2" NPT.
S1	STEAM CONDESATE OUTLET, 3/4" NPT. USED WHEN EQUIPPED WITH INDIRECT STEAM ONLY.
E1	OPTIONAL LOCATION FOR ELECTRIC BOXES.
D1	DUAL DRAIN VALVE, TWO, 8" DIAMETER.

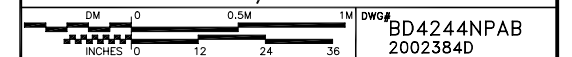
NOTES

- ITEMS SHOWN ON THIS PAGE ARE OPTIONS OF THIS MACHINE. FOR STANDARD SEE BD4244NPAB.
- DO NOT PRE-PIPE ANY CLOSER THAN 60 [1524].
- ALLOW 24" [610] ALL AROUND THE MACHINE FOR SERVICING AND OPERATING CLEARANCES.
- SHADED AREAS DENOTE BASE PLATES WHICH SHOULD BE CONTINUOUSLY SUPPORTED.
- DRAIN VALVE MAY MOVE ± 1 1/2 [38] IN ANY DIRECTION DURING OPERATION AND MUST NOT BE RIGIDLY CONNECTED TO DRAIN.
- AS OF THIS WRITING, THE MINIMUM CLEARANCE REQUIRED BY U.S. NATIONAL ELECTRIC CODES, FROM ELECTRIC BOX TO ANY OBJECT IS:
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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.
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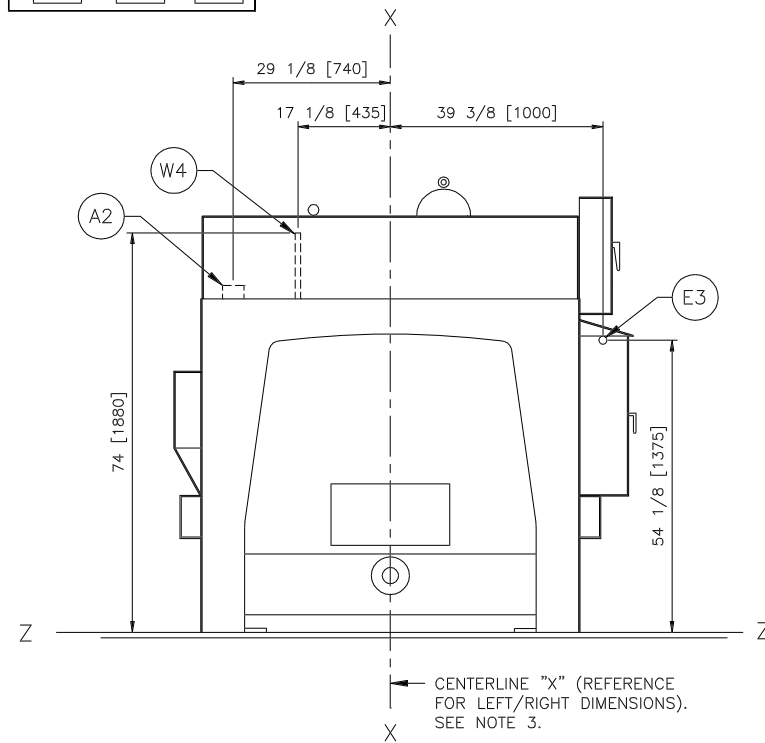
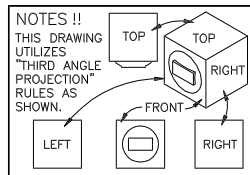
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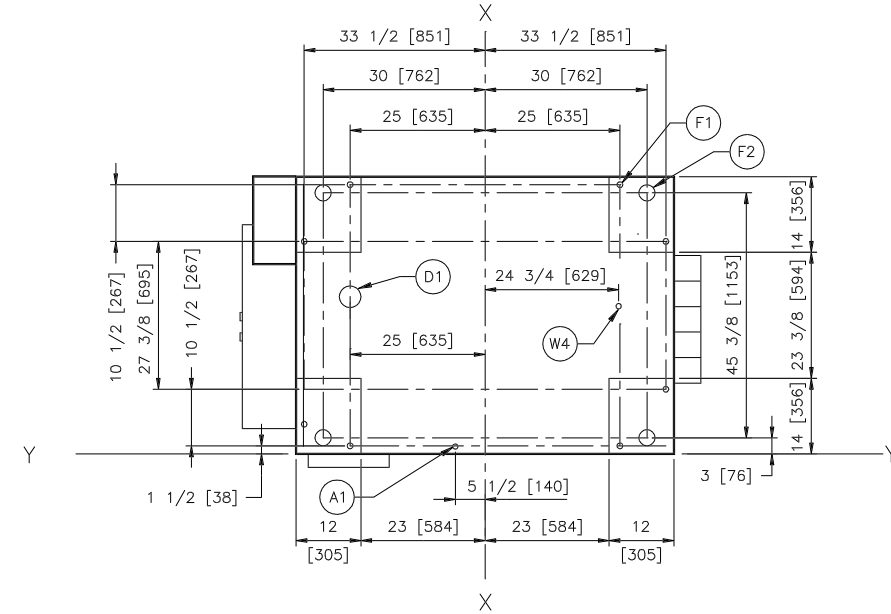
42044NP2/CP2 OPTIONS



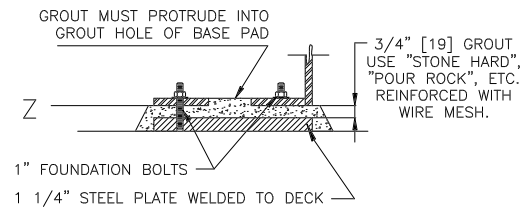
MILNOR PELLERIN MILNOR CORPORATION
P.O. Box 400 Kenner, LA 70063, USA, Phone 504/467-9591, FAX 504/469-1849, Telex IIT 460124/PELM UI, Cable PELMILNOR



REAR VIEW

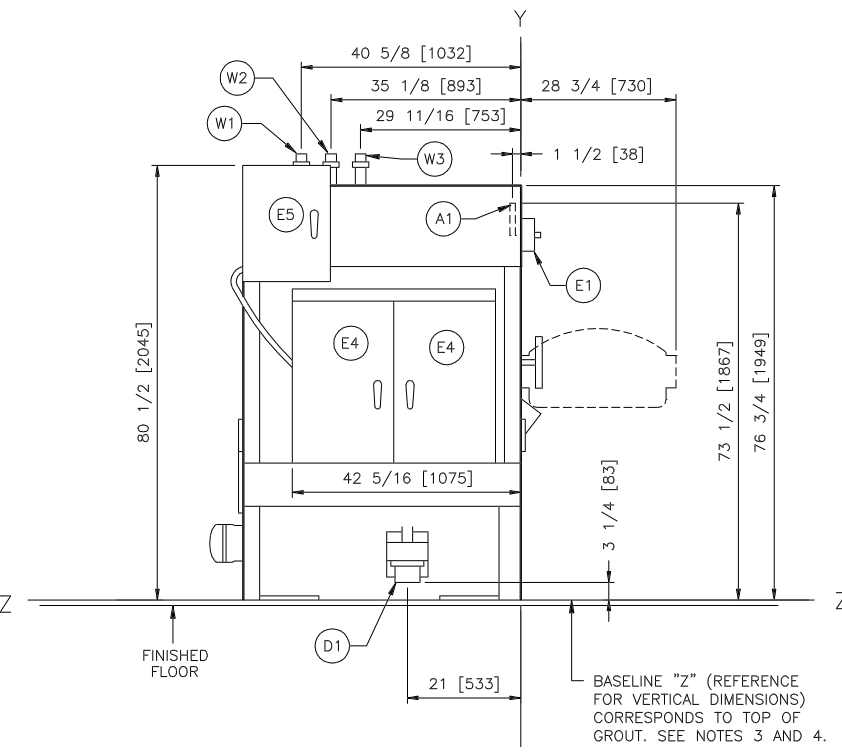


FOUNDATION PLAN VIEW

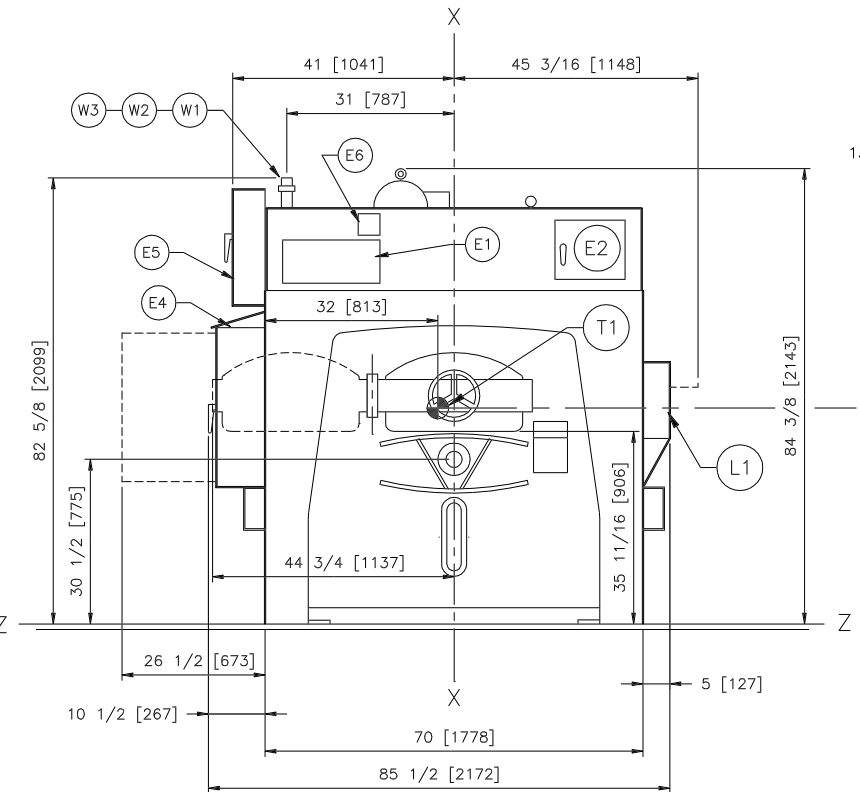


RECOMMENDED DECK MOUNTING DETAIL

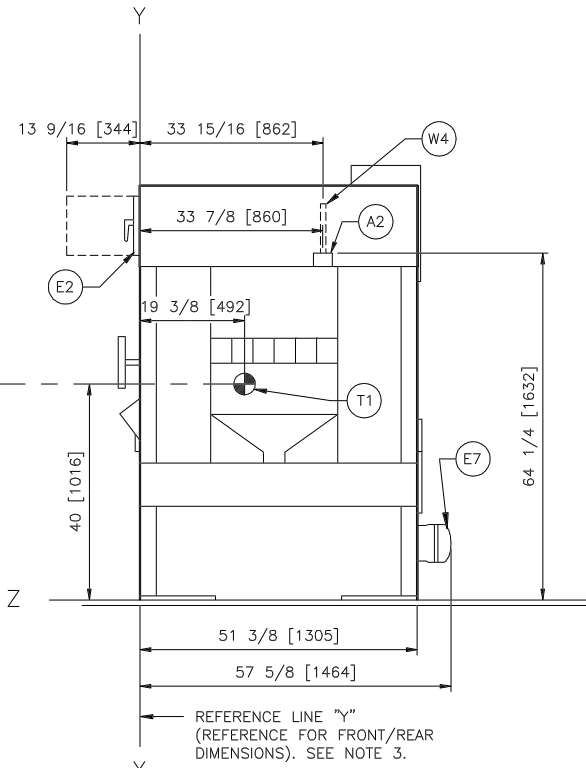
ITEM	LEGEND
W4	FLUSH HOT WATER SUPPLY INJECTOR, 1/2" NPT.
W3	OPTIONAL, THIRD WATER INLET CONNECTION, 1 1/2" NPT.
W2	HOT WATER INLET CONNECTION, 1 1/2" NPT.
W1	COLD WATER INLET CONNECTION, 1 1/2" NPT.
T1	CENTER OF GRAVITY, EMPTY MACHINE.
L1	5 FLUSH TYPE SUPPLY INJECTION MOUNTING DETAIL.
F2	FOUR GROUT HOLES, 3" DIAMETER. SEE RECOMMENDED MOUNTING DETAIL.
F1	EIGHT ANCHOR BOLT HOLES, 1 1/16" DIAMETER. USE 1" DIAMETER ANCHOR BOLTS.
E7	CENTRIFUGAL SWITCH
E6	AUTOSPOT CONTROL PANEL
E5	AUTOSPOT CONTROL BOX
E4	ELECTRICAL CONTROL BOX
E3	ELECTRICAL CONNECTION
E2	MICROPROCESSOR CONTROL BOX
E1	MICROPROCESSOR CONTROL PANEL
D1	DRAIN VALVE, 4" DIAMETER.
A2	VENT, 3 1/2" DIAMETER.
A1	COMPRESSED AIR INLET CONNECTION, 1/2" NPT.



LEFT VIEW



FRONT VIEW



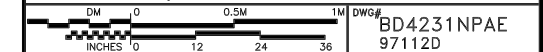
RIGHT VIEW

NOTES
10 ITEMS SHOWN ON THIS PAGE ARE STANDARD OF THIS MACHINE. FOR OPTIONS SEE BD4231NPAB.
9 DO NOT PRE-PIPE ANY CLOSER THAN 60 [1524].
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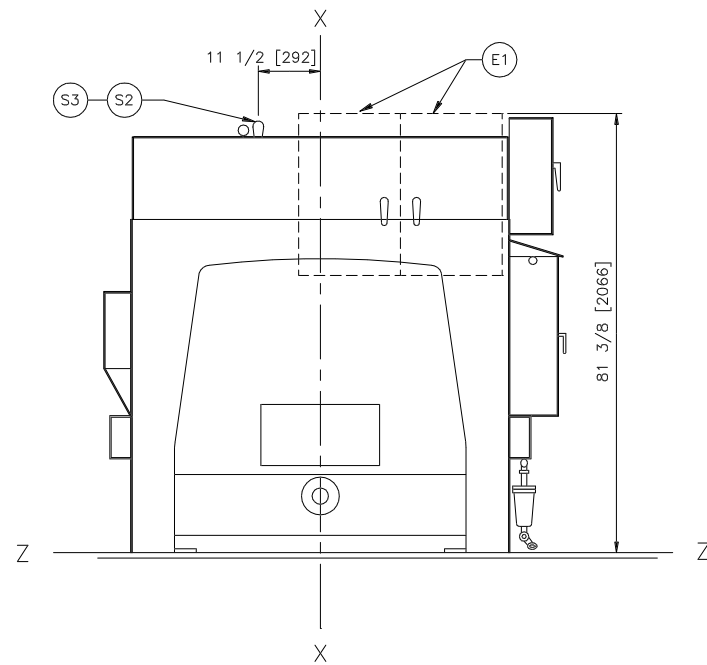
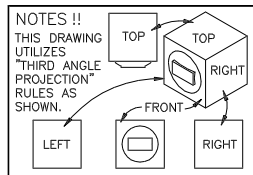
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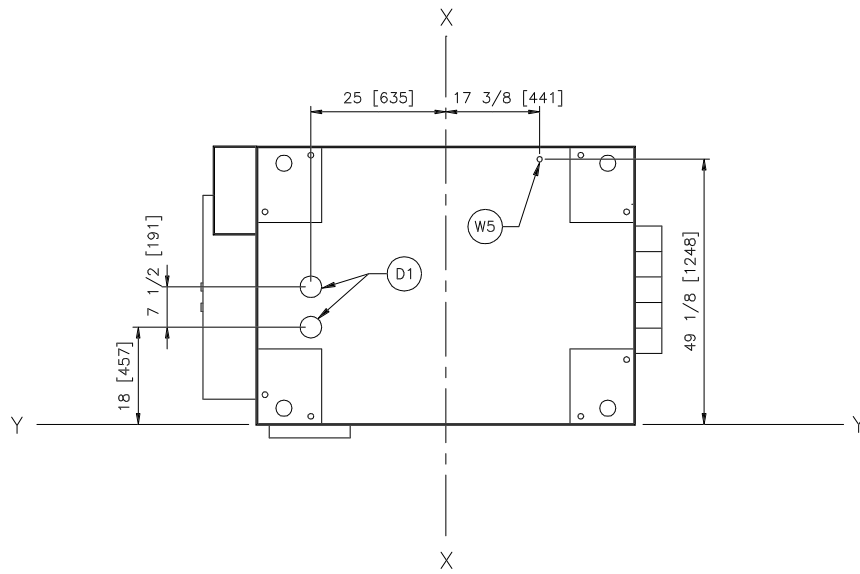
42031NP2/CP2 WASHER EXTRACTOR



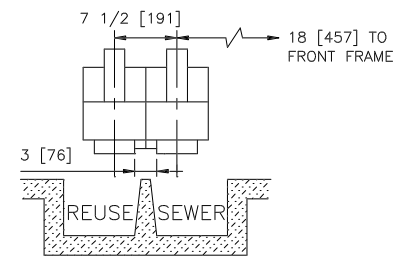
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FAX 504/469-1849, Telex ITT 460124/PELM UL, Cable PELMILNOR



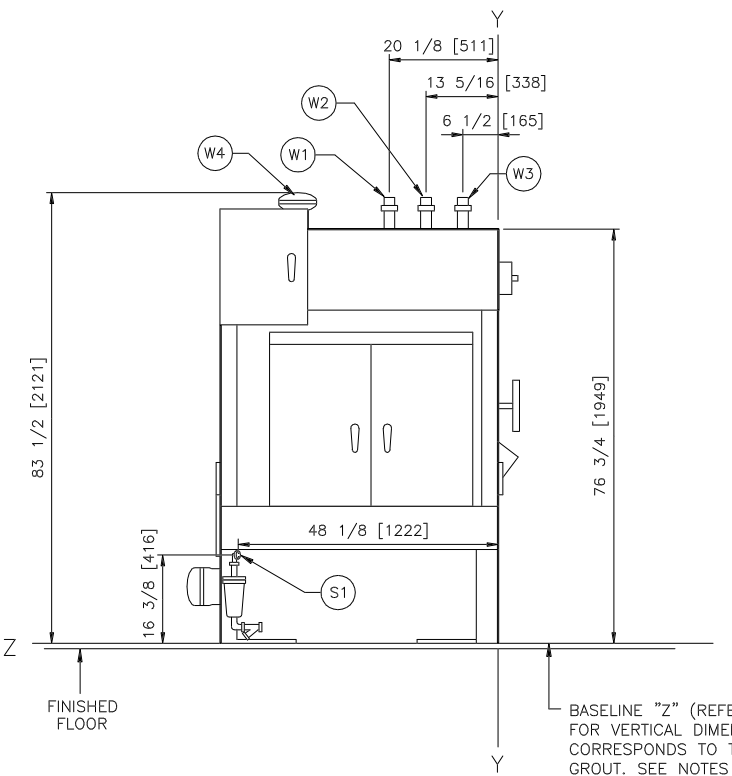
REAR VIEW



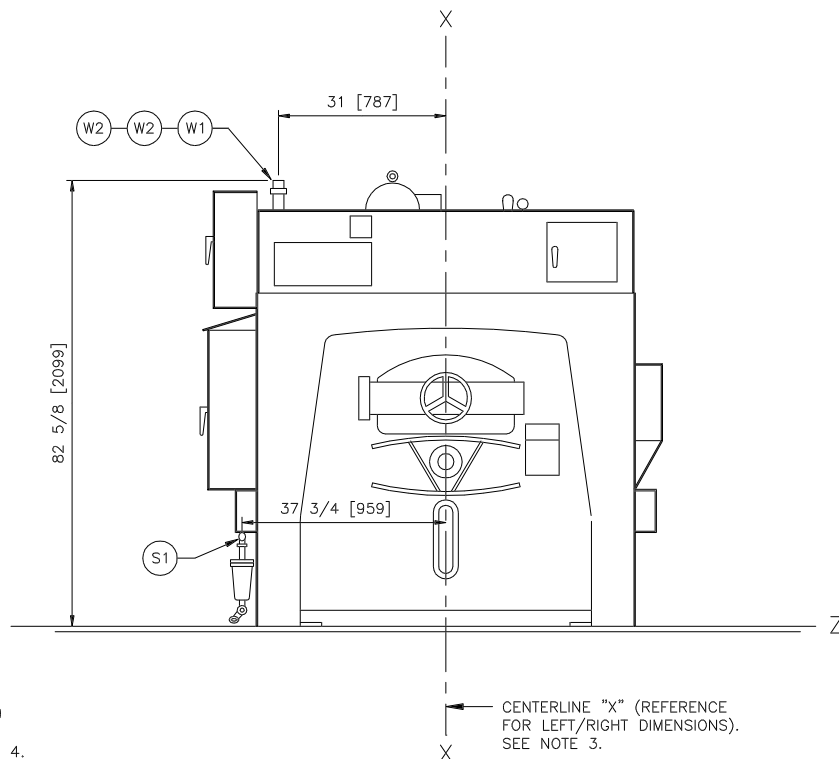
FOUNDATION PLAN VIEW



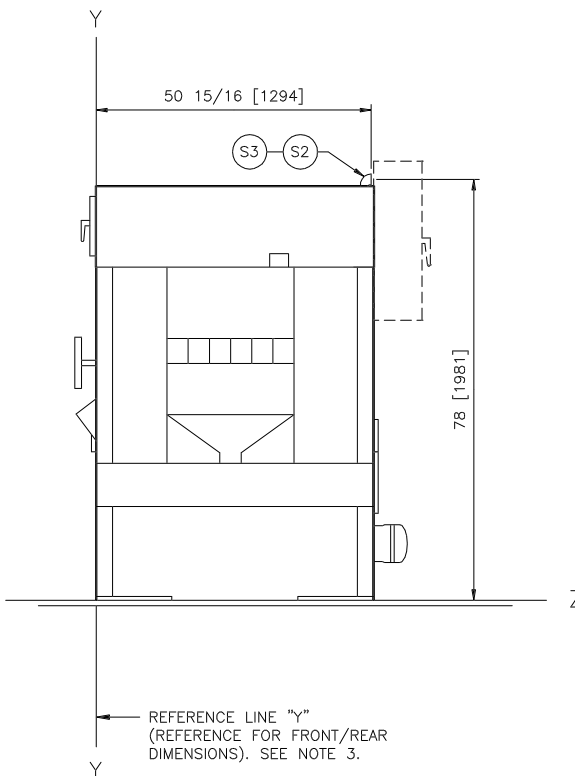
OPTIONAL WATER REUSE DUAL DRAIN VALVE



LEFT VIEW



FRONT VIEW



RIGHT VIEW

W5	COOLDOWN, MANUALLY OPERATED, 3/4" NPT.
W4	OPTIONAL, SIPHON BREAKER.
W3	OPTIONAL, THIRD WATER INLET CONNECTION, 1 1/2" NPT.
W2	HOT WATER INLET CONNECTION WITH VACUUM BREAKER, 1 1/2" NPT.
W1	COLD WATER INLET CONNECTION WITH VACUUM BREAKER, 1 1/2" NPT.
S3	STEAM INLET (DIRECT) CONNECTION, 1 3/4" NPT.
S2	STEAM INLET (INDIRECT) CONNECTION, 2" NPT.
S1	STEAM CONDENSATE OUTLET, 3/4" NPT. USED WHEN EQUIPPED WITH INDIRECT STEAM ONLY.
E1	OPTIONAL LOCATION FOR ELECTRIC BOXES.
D1	DUAL DRAIN VALVE, TWO, 4" DIAMETER.

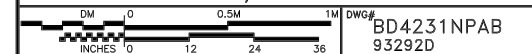
ITEM	LEGEND
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NOTES	
11	ITEMS SHOWN ON THIS PAGE ARE OPTIONS OF THIS MACHINE. FOR STANDARD SEE BD4231NPAB.
10	DO NOT PRE-PIPE ANY CLOSER THAN 60 [1524].
9	ALLOW 24" [610] ALL AROUND THE MACHINE FOR SERVICING AND OPERATING CLEARANCES.
8	SHADED AREAS DENOTE BASE PLATES WHICH SHOULD BE CONTINUOUSLY SUPPORTED.
7	DRAIN VALVE MAY MOVE ±2 [51] IN ANY DIRECTION DURING OPERATION AND MUST NOT BE RIGIDLY CONNECTED TO DRAIN.
6	AS OF THIS WRITING, THE MINIMUM CLEARANCE REQUIRED BY U.S. NATIONAL ELECTRIC CODES, FROM ELECTRIC BOX TO ANY OBJECT IS: 36 [914] IF OBJECT IS AN UNGROUNDED (INSULATED) WALL. 42 [1067] IF OBJECT IS A GROUNDED WALL (i.e. BARE CONCRETE, BRICK, ETC.) 48 [1219] IF OBJECT IS ANY LIVE PART. CHECK LOCAL ELECTRIC CODES FOR FURTHER RESTRICTIONS.
5	CUSTOMER TO SUPPLY CIRCUIT BREAKER OR FUSED BRANCH CIRCUIT DISCONNECT (SAFETY) SWITCHES WITH LAG TYPE FUSES FROM POWER SOURCE TO MACHINE. A SEPARATE GROUND WIRE MUST BE CONNECTED FROM DISCONNECT TO EQUIPMENT.
4	BASELINE "Z" IS THE SAME FOR ALL MILNOR MACHINES AND IS SHOWN ON ALL DIMENSIONAL DRAWINGS. THE DISTANCE BETWEEN BASELINE "Z" AND THE FINISHED FLOOR MAY VARY (WITH CHANGES IN FLOOR HEIGHT) AS REQUIRED TO INSURE THAT BASELINE "Z" IS HORIZONTAL AND ALL COMPONENTS REQUIRING GROUT ARE SET ON A MINIMUM 1" [25] THICK GROUT BED.
3	USE REFERENCE LINES "X", "Y", AND "Z" TO LOCATE ALL SERVICE CONNECTIONS.
2	NUMBERS IN BRACKETS [] DENOTE DIMENSIONS IN MILLIMETERS.
1	ALL DIMENSIONS SHOWN ARE APPROXIMATE, SUBJECT TO NORMAL MANUFACTURING TOLERANCES, AND TO OCCASIONAL CHANGES WITHOUT NOTICE THROUGH REDESIGN AND/OR RELOCATION OF COMPONENTS, ETC. DO NOT USE FOR CONSTRUCTION UNLESS CERTIFIED, AND IN NO EVENT PRE-PIPE CLOSER THAN FIVE FEET FROM MACHINE. FACTORY MUST BE CONSULTED FOR DIMENSIONS IF MACHINE IS TO BE MOVED THROUGH NARROW OR LOW CORRIDORS OR OPENINGS.

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

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

42031NP2/CP2 OPTIONS



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