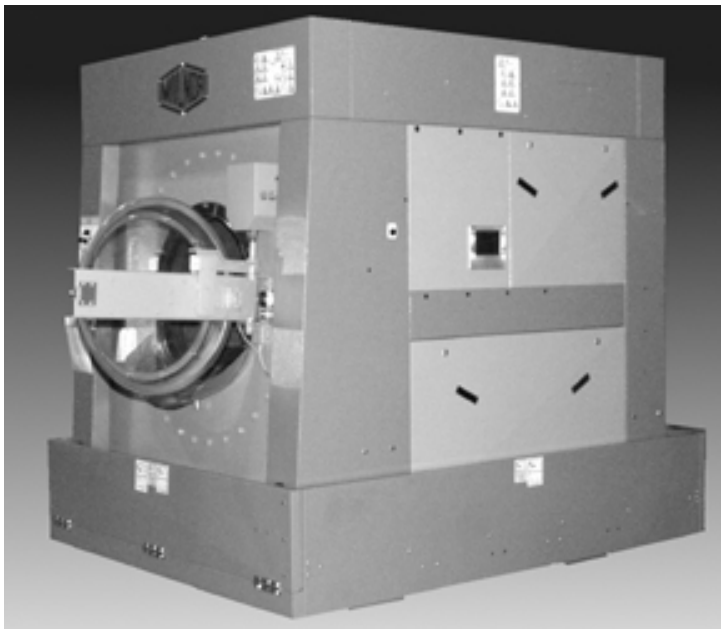
Manual Number: MCWFUA01
Edition (ECN): 2024366A

Installation, Parts, and Service

48040F7B, F7D, F7J, F7Z



PELLERIN MILNOR CORPORATION Post Office Box 400, Kenner, Louisiana 70063–0400, U.S.A.

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1 General Service and Safety-related Components

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PELLERIN MILNOR CORPORATION
LIMITED STANDARD WARRANTY

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

Providing we receive written notification of a warranted defect within 30 days of its discovery, we will—at our option—repair or replace the defective part or parts, 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, NEGLECT, POWER OR ENVIRONMENTAL CONTROL MALFUNCTIONS, DAMAGE FROM LIQUIDS, OR ANY OTHER CAUSE BEYOND THE NORMAL RANGE OF USE. REGARDLESS OF HOW CAUSED, IN NO EVENT SHALL MILNOR BE LIABLE FOR SPECIAL, INDIRECT, PUNITIVE, LIQUIDATED, OR CONSEQUENTIAL COSTS OR DAMAGES, OR ANY COSTS OR DAMAGES WHATSOEVER WHICH EXCEED THE PRICE PAID TO MILNOR FOR THE EQUIPMENT IT SELLS OR FURNISHES.

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

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

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1.1 How to Get the Necessary Repair Components

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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: 504-712-7775
Fax: 504-469-9777
Email: parts@milnor.com

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1.2 Trademarks

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

Table 1. Trademarks

AutoSpot™	GreenFlex™	MilMetrix®	PulseFlow®
CBW®	GearTrace™	MilTouch™	RAM Command™
Drynet™	GreenTurn™	MilTouch-EX™	Recirc*ONE*®
E-P Express®	Hydro-cushion™	MilRAIL®	RinSave®
E-P OneTouch®	Mentor®	Miltrac™	SmoothCoil™

Table 1 Trademarks (cont'd.)

E-P Plus®	Mildata®	MilVision™	Staph Guard®
Gear Guardian®	Milnor®	PBW™	

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1.3 Tilting Washer Extractors

BNWHTS08.C01 0000349891 A.2 D.2 6/8/21, 3:00 PM Released

1.3.1 Safety Alert Messages—Internal Electrical and Mechanical Hazards

BNWHTS01.C03 0000235031 B.1 A.2 D.2 1/20/20, 12:08 PM Released

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

WARNING: 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: 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.

WARNING: Crush Hazards — Tilting machines only—The machine housing will crush your body or limbs if it descends or falls while you are under it. Housing can descend with power off or on. Manual operation of tilting valves overrides safety interlocks. Improper operation of manual tilting valves may cause the housing to descend.

- Do not remove guards, covers, or panels.
- Do not reach into the machine housing or frame.

1.3.2 Safety Alert Messages—Cylinder and Processing Hazards

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

DANGER: 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.
- Open pocket machines only—Do not jog the cylinder and pull the goods at the same time.
- Open pocket machines only—Keep yourself and others clear of cylinder and goods during jogging operation.
- Do not operate the machine with malfunctioning two-hand manual controls.
- 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: 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.
- Open pocket machines only—Keep yourself and others clear of cylinder and goods during jogging operation.
- Do not operate the machine with malfunctioning two-hand manual controls.

WARNING: 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: 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.

1.3.3 Safety Alert Messages—Unsafe Conditions

BNWHTS04.C01 0000235024 A.2 D.2 1/2/20, 2:19 PM Released

1.3.3.1 Damage and Malfunction Hazards

BNWHTS04.C02 0000235048 A.2 D.2 1/2/20, 2:19 PM Released

1.3.3.1.1 Hazards Resulting from Inoperative Safety Devices

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DANGER: 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: 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: 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: 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.

WARNING: Crush Hazards — Down limit switches (machines with front and rear tilt cylinders)—Failure of both front or both rear limit switches

allows the seated tilt wheels on a tilted machine to lift from their cradles. The housing will fall and lunge forward or rearward.

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

1.3.3.1.2 Hazards Resulting from Damaged Mechanical Devices

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WARNING: 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: 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: 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

1.3.3.2 Careless Use Hazards

BNWHTS04.C05 0000235045 A.2 D.2 1/2/20, 2:19 PM Released

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

BNWHTS04.C06 0000235044 A.2 A.3 D.2 1/2/20, 2:19 PM Released

WARNING: 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.

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

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WARNING: Electrocution and Electrical Burn Hazards — Contact with electric power can kill or seriously injure you. Electric power is present inside the cabinetry unless the main machine power disconnect is off.

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

WARNING: 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: Crush Hazards — Tilting machines only—The machine housing will crush your body or limbs if it descends or falls while you are under it. Housing can descend with power off or on. Manual operation of tilting valves overrides safety interlocks. Improper operation of manual tilting valves may cause the housing to descend.

- Secure both red safety supports in accordance with the instructions furnished, then lock out and tag out power at the main machine disconnect before working under the tilted machine.
- Do not operate the manual tilt valves with anyone under the machine.
- Do not operate the tilt controls with anyone under the machine.

WARNING: Crush Hazards — Tilting machines with front and rear tilt cylinders—The housing will fall and lunge forward or rearward if the tilt wheels on the non-tilted end lift out of their cradles, even with safety supports in place.

- Understand the consequences of operating manually.

WARNING: 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.

BNWF4I01 / 2023356A BNWF4I01 0000200394 D.2 9/1/23, 11:24 AM Released

1.4 Installation Tag Guidelines

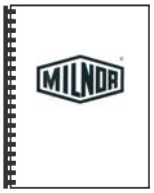
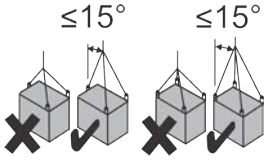
BNWF4I01.R01 0000200393 C.2 D.2 9/1/23, 11:24 AM Released

48040F7B 48040F7D 48040F7J 48040F7Z

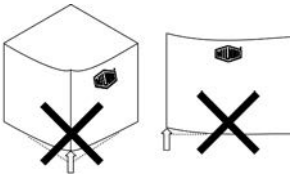
NOTICE: This information may apply to models in addition to those listed above. It applies to paper tags. It does not apply to the vinyl or metal safety placards, which must remain permanently affixed to the machine and replaced if no longer readable.

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.

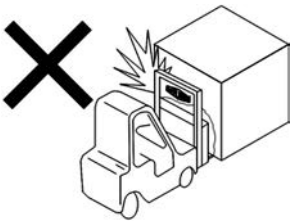
Symbol	Explanation
	Read the manuals before proceeding. This symbol appears on most tags. The machine ships with safety, operator, and routine maintenance guides for customer use. Milnor dealer manuals for installing, commissioning, and servicing the machine are also available from the Milnor Parts department.
	B2TAG88005: This carefully built product was tested and inspected to meet Milnor performance and quality standards by (identification mark of tester).
	B2TAG94078: Do not forklift here; do not jack here; do not step here—whichever applies.
	B2TAG94079: Rig for crane lifting (either 3-point or 4-point, depending on the number of lifting eyes provided) using a steep angle on the chains (closer to vertical than horizontal).

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.

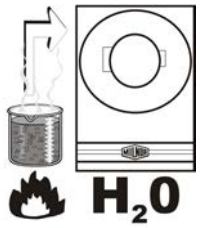


B2TAG94084: Do not lift from one corner of the machine, as this can cause the frame to rack, damaging it.

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.



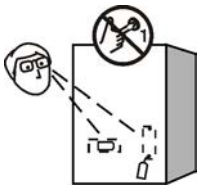
B2TAG94118: Do not strike shipping container during fork-lifting. Fragile components inside.



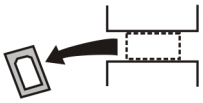
B2T2001013: Hot water connection.

B2T2001014: Cold water connection.

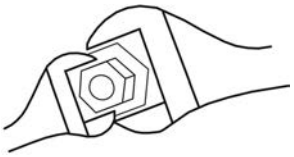
B2T2001015: Reuse (third) water connection. (Optional)



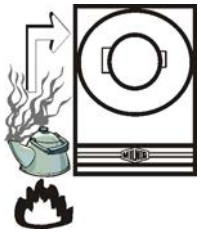
B2T2001028: Look for tags inside the machine. These tags may identify shipping restraints to be removed or components to be installed. Do not start the machine until these actions are completed.



B2T2002013: Do not start the machine until shipping restraints are removed. This tag will appear on the outside of the machine to alert you to the presence of internal shipping restraints. A tag will also appear on the restraint to help identify it. Most, but not all shipping restraints display the color red. Some shipping restraints are also safety stands. Do not discard these.



B2T2003001: Hold the side of the connection stationary with a wrench as you tighten the connection with another wrench. Otherwise, you may twist components, such as valves, damaging them.



B2T2004027: Steam connection. (Optional)

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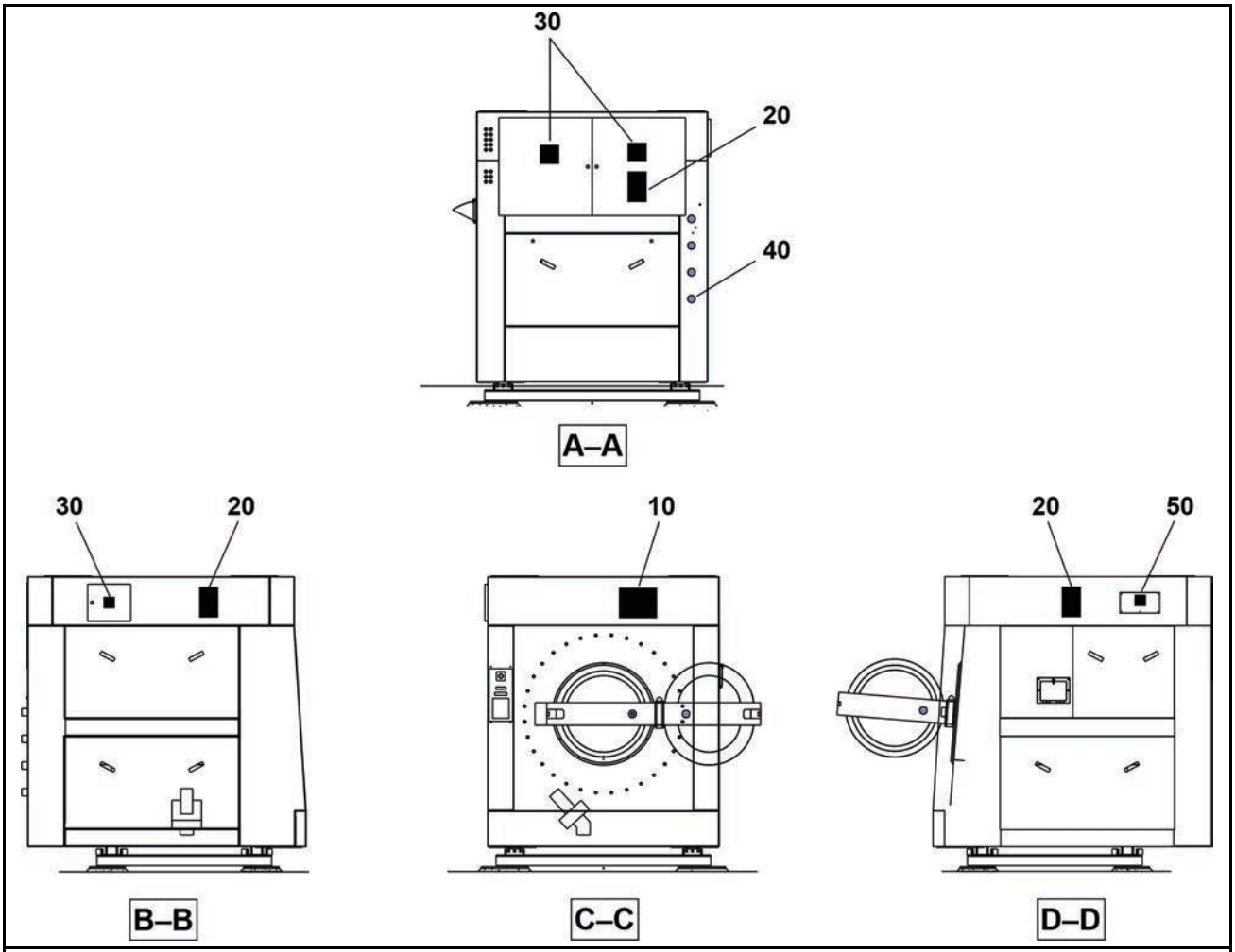
Safety Placards and Locations–ISO

2 Sheets

48040F7J, 48040F7W, 48040F7J (AZ), 48040F7Z (AZ)

NOTE: Replace placard immediately, if removed or unreadable. Approximate locations of placards are shown. If aluminum placard, mounting holes are provided on machine. Use #8 self-tapping screws.



Legend

A–A . . Rear view
B–B . . Left side view
C–C . . Front view
D–D . . Right side view

Safety Placards and Locations–ISO

2 Sheets

48040F7J, 48040F7W, 48040F7J (AZ), 48040F7Z (AZ)

Table 2. Parts List—Safety Placards and Locations–ISO

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Components				
all	10	01 10631X	NPLT:WE1-NONTILT WARNINGS FRT	
all	20	01 10628X	NPLT:NONTILT W/E WARNING SIDE	
all	30	01 10377	NPLTE:"WARNING" 4X4	
all	40	01 10649X	NPLT:HOT BEHIND CVR WARN-ISO	
all	50	01 10375	NPLTE:"WARNING" 2X2	

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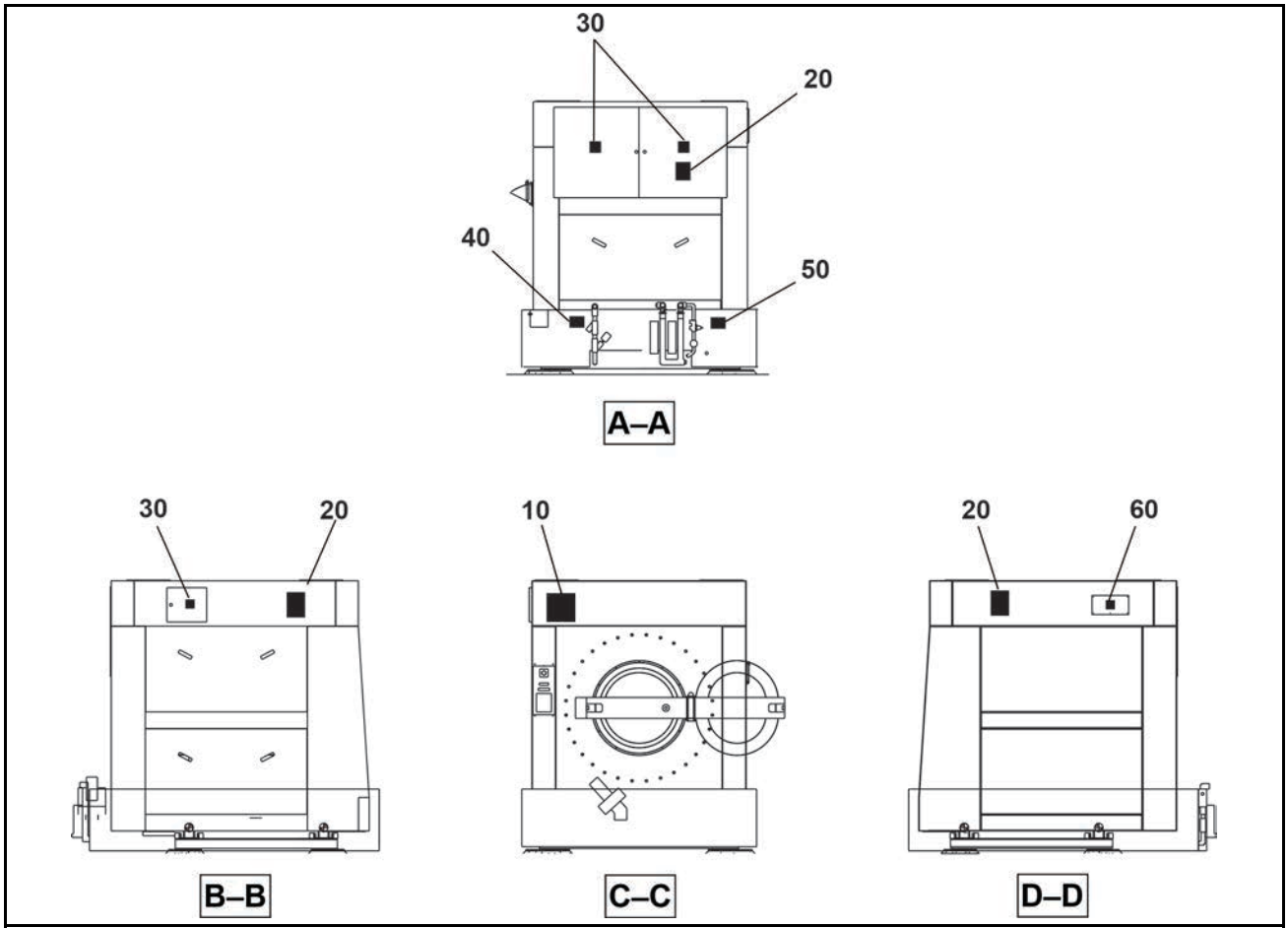
Safety Placards and Locations—ISO

2 Sheets

48040F7B, 48040F7N, 48040F7B (AZ), 48040F7D (AZ).

NOTE: Replace placard immediately, if removed or unreadable. Approximate locations of placards are shown. If aluminum placard, mounting holes are provided on machine. Use #8 self-tapping screws.



Legend

A–A . . Rear view
B–B . . Left side view
C–C . . Front view
D–D . . Right side view

Safety Placards and Locations—ISO

2 Sheets

48040F7B, 48040F7N, 48040F7B (AZ), 48040F7D (AZ).

Table 3. Parts List—Safety Placards and Locations—ISO

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Components				
all	10	01 10629Y	NPLT:TILT W/E-F WARNGS FRT-ISO	
all	20	01 10630X	NPLT:WE1-TILT WARNING SIDE ISO	
all	30	01 10377	NPLTE:"WARNING" 4X4	
all	40	01 10649X	NPLT:HOT BEHIND CVR WARN-ISO	
all	50	01 10648X	NPLT:ACTUATED VALVE WARN-ISO	
all	60	01 10375	NPLTE:"WARNING" 2X2	

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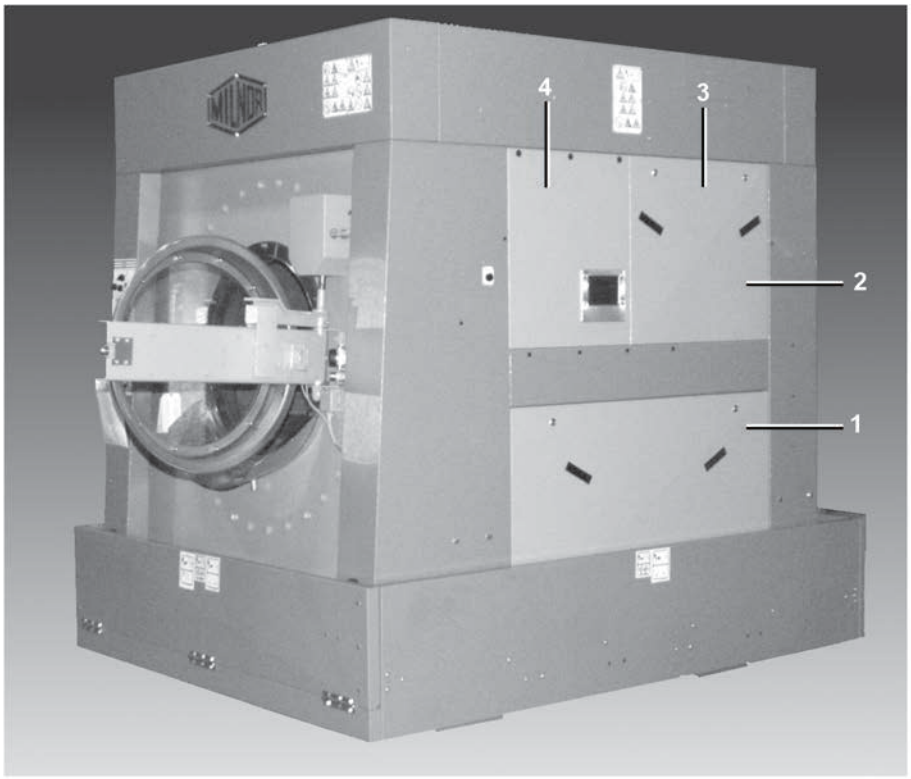
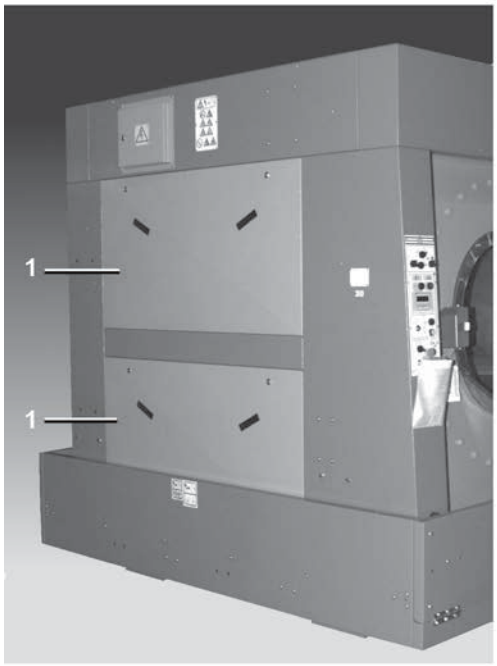
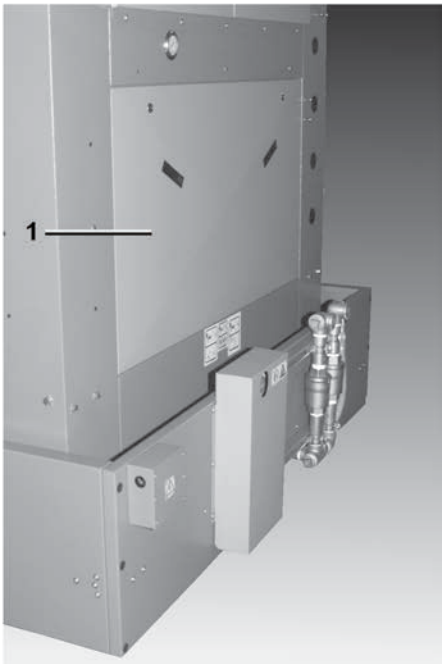
Panels & Covers

2 Sheets

48040F7B, F7D, F7J, F7Z (AZ)







Panels & Covers

2 Sheets

48040F7B, F7D, F7J, F7Z (AZ)

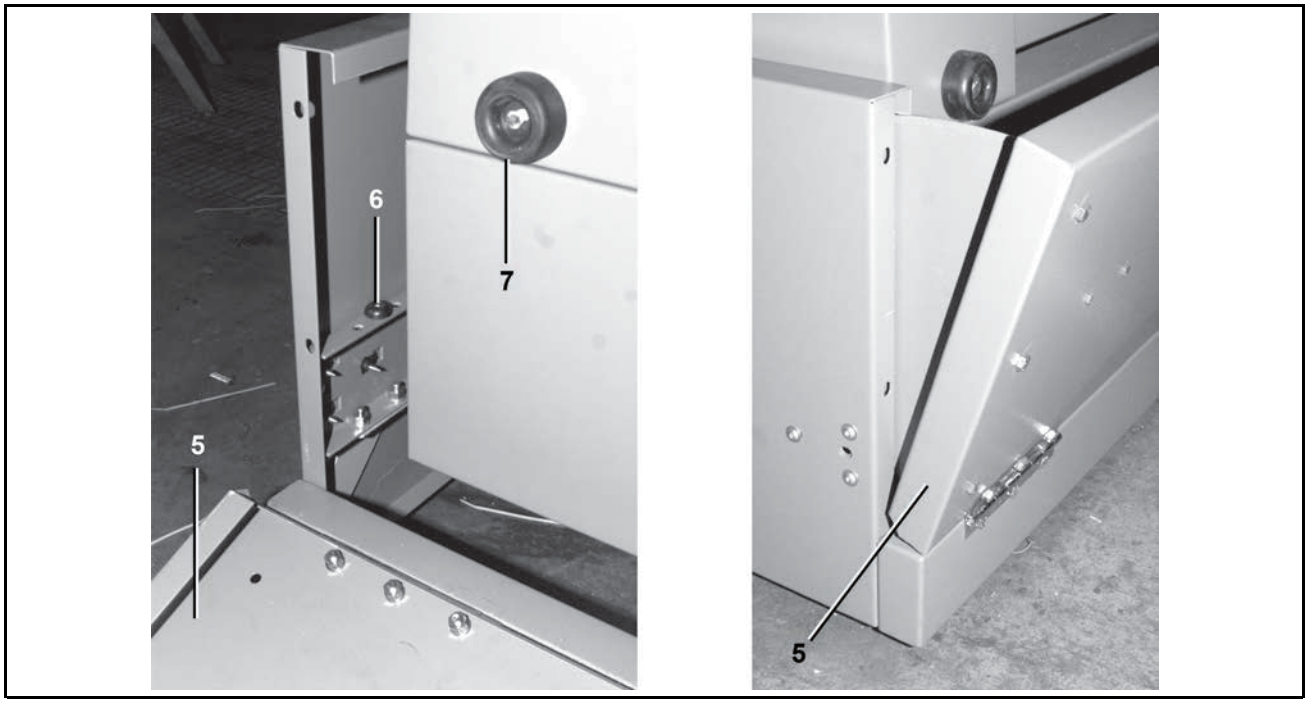


Table 4. Parts List—Panels & Covers

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Components				
all	1	98CF22110	ASSY=LOWER SIDE DOOR, 4840F CSM	
all	2	98CF22110B	ASSY=UPPER SIDE DOOR, PNL-B, 4840F CSM	
all	3	98CF22110C	ASSY=UPPER SIDE DOOR, PNL-C, 4840F CSM	
all	4	98CF22115A	SIDE DOOR=PLASTIC SOAP CHUTE, 4840F CSM	
all	5	98CF22124	ASSY=FRONT FOOT GUARD, 4840F CSM	
all	6	98CX489258	RUBBER BUMPER, FOOT GUARD, 4840F CSM	
all	7	98CX773680	BUMPER 2+1/2OD, CSM	

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Foot Guard Assembly

1 Sheet

48040F7B, F7D (AZ)

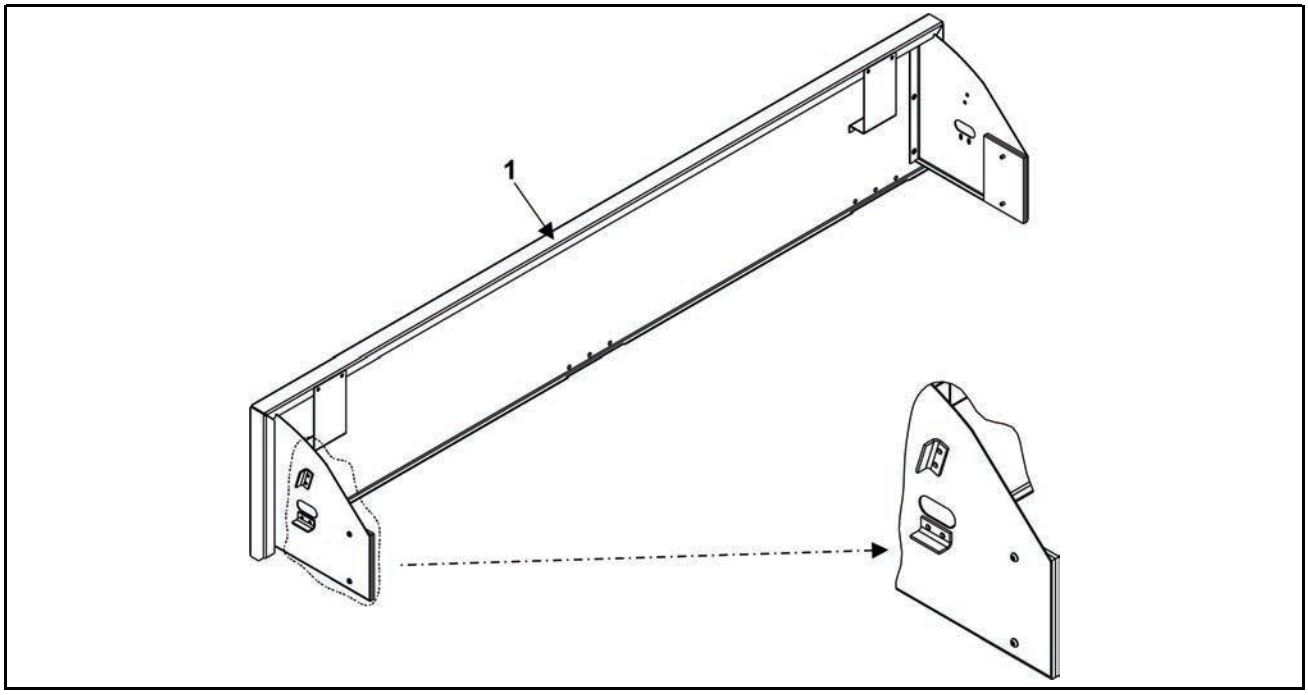

Table 5. Parts List—Foot Guard Assembly

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Components				
all	1	98CF22124	ASSY=FRONT FOOT GUARD, 4840F CSM	

BNWFBH01 / 2021344 BNWFBH01 0000373440 D.2 8/19/21, 11:46 AM Released

1.5 Use the Red Safety Supports for Maintenance — 48040F7B, 48040F7D

BNWFBH01.C02 0000373627 A.2 A.5 D.2 8/11/21, 11:34 AM Released

1.5.1 What Safety Supports are Provided and Why

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These machines are provided with two safety stands. After the housing is tilted forward or rearward, as needed, the stands are placed under the raised, rear or front tilt wheels. The safety stand (s) provide protection against the un-powered descent of the housing during maintenance in the event of a leak in the pneumatic tilt system. Such a condition can cause the housing to fall quickly. Use the safety support(s) whenever the maintenance to be performed requires you to place any part of your body in or near the path of the vertically moving portion of the machine.

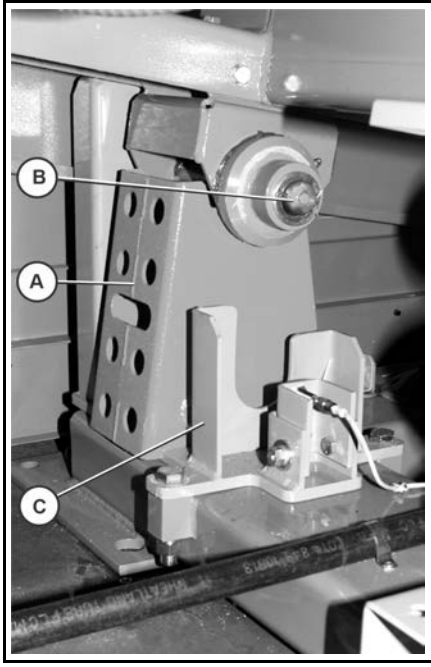
WARNING: Incorrect use of the safety supports — can cause the machine to descend and crush you.

- Never work near the path of the vertically moving portion of the machine unless the safety supports are deployed and power is removed from the machine.
- Where a pair of safety supports is provided, always use both supports.
- Maintain the safety support(s) in good condition.
- When not in use, stow the safety support(s) in the location(s) provided on the machine or in a convenient, designated location.

1.5.2 How To Deploy the Safety Stands

BNWFBH01.T01 0000373438 A.5 D.2 A.7 8/19/21, 11:44 AM Released

1. Use the controls to tilt the machine up as in normal operation.
2. See the illustration at right. Put each safety stand on its mounting plate on the tilt base so it is seated correctly. Reach from the near side of the machine.
3. Use the controls to carefully lower the housing just until it is resting on the stand(s).
4. Remove electric power from the machine.



Legend

A . . . **Safety Stand**. Used in two front locations or two rear locations.

B . . . Tilt wheel

C . . . Cradle

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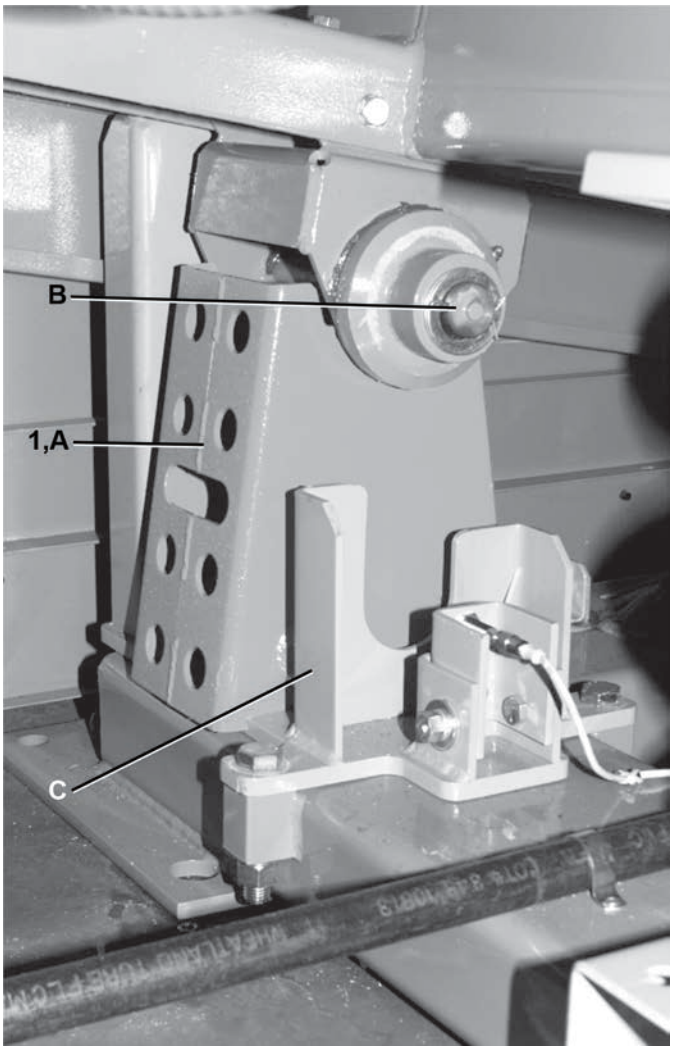
Safety Supports

1 Sheet

48040F7B, 48040F7D



Legend

A . . . Safety stand. Used in two front locations or two rear locations.

B . . . Wheel. Used in four locations

C . . . Cradle. Used in four locations

Table 6. Parts List—Safety Supports

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Reference Assemblies				
Components				
all	1	W2 21822	WLMT=SAFETY STAND, 4840F	

BNUUUN02 / 2019125 BNUUUN02 0000222452 D.2 1/2/20, 2:14 PM Released

1.6 Torque Requirements for Fasteners

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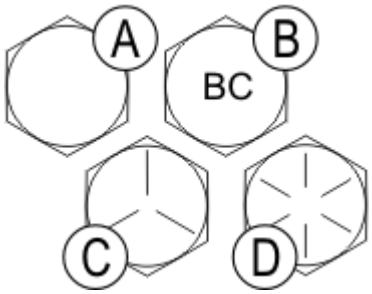
The document about the assembly gives the torque requirements for other fasteners. **If fastener torque specifications or threadlocker requirements in an assembly document are different from this document, use the assembly document.**

Figure 1. The Bolts in Milnor® Equipment

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

1.6.1 Torque Values

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

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

1.6.1.1 Fasteners Made of Carbon Steel

BNUUUN02.C03 0000222448 A.3 B.3 D.2 1/2/20, 2:14 PM Released

1.6.1.1.1 Without a Threadlocker

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Table 7. 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	–	–

Table 8. Torque Values for Standard Fasteners Larger Than 5/16-inch Diameters and No Lubricant

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

Table 9. Torque Values for Plated Fasteners with Maximum 5/16-inch Diameters and No Lubricant

	The Grade of the Bolt							
	Grade 2		Grade 5		Grade 8		Grade BC	
Dimension	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 10. 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
3/14 x 16	144	192	223	297	315	420	–	–
7/8 x 9	125	166	322	430	455	606	398	531
7/8 x 14	138	184	355	474	501	668	–	–
1 x 8	188	250	483	644	682	909	597	796
1 x 12	205	274	528	716	746	995	–	–
1 x 14	210	280	542	735	765	1037	–	–
1 1/8 x 7	266	354	595	807	966	1288	845	1126
1 1/8 x 12	298	404	668	890	1083	1444	–	–
1 1/4 x 7	375	500	840	1120	1363	1817	1192	1590
1 1/4 x 12	415	553	930	1261	1509	2013	–	–
1 3/8 x 6	491	655	1102	1470	1787	2382	1564	2085
1 3/8 x 12	559	758	1254	1672	2034	2712	–	–
1 1/2 x 6	652	870	1462	1982	2371	3161	2075	2767
1 1/2 x 12	733	994	1645	2194	2668	3557	–	–

1.6.1.1.2 With a Threadlocker

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Table 11. Threadlocker by the Diameter of the Bolt (see below Note)

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: 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.

Table 12. Torque Values if You Apply LocTite 222

	The Grade of the Bolt							
	Grade 2		Grade 5		Grade 8		Grade BC	
Dimension	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 13. Torque Values if You Apply LocTite 242

	The Grade of the Bolt							
	Grade 2		Grade 5		Grade 8		Grade BC	
Dimension	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 14. Torque Values if You Apply LocTite 262

	The Grade of the Bolt							
	Grade 2		Grade 5		Grade 8		Grade BC	
Dimension	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 15. Torque Values if You Apply LocTite 272 (High-Temperature)

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

Table 15 Torque Values if You Apply LocTite 272 (High-Temperature) (cont'd.)

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 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 16. 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	–	–

1.6.1.2 Stainless Steel Fasteners

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Table 17. 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 18. 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

1.6.2 Preparation

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WARNING: 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: 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.

1.6.3 How to Apply a Threadlocker

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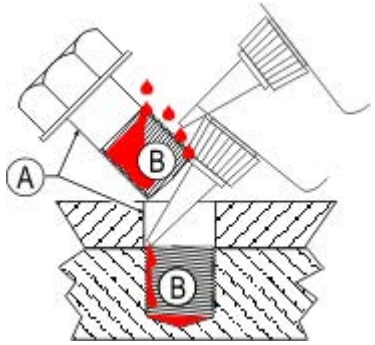
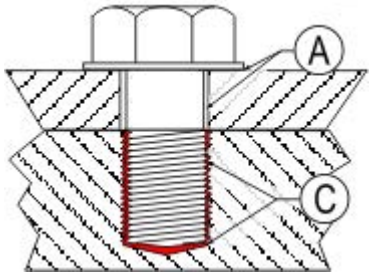
CAUTION: Malfunction Hazard — Heat, vibration, or mechanical shocks can let the fasteners loosen if you do not apply the threadlocker correctly. Loose fasteners can cause malfunctions of the equipment.

- 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. Apply Threadlocker in a Blind Hole

Application	Coverage
	

Legend

A . . . No threadlocker here
B . . . Apply here
C . . . Fill all space with threadlocker

1.6.3.1 Blind Holes

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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 11: Threadlocker by the Diameter of the Bolt (see below Note), page 29 to Table 17: Torque Values for Stainless Steel Fasteners 5/16-inch and Smaller, page 31).

1.6.3.2 Through Holes

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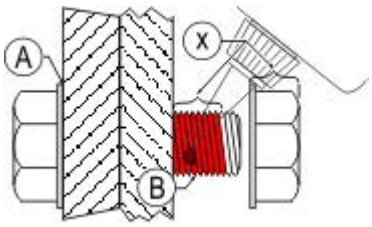
1. Put the bolt through the assembly.
2. Apply the threadlocker only to the bolt thread area that will engage the nut.
3. Tighten the bolt to the value shown in the correct table (Table 11: Threadlocker by the Diameter of the Bolt (see below Note), page 29 to Table 17: Torque Values for Stainless Steel Fasteners 5/16-inch and Smaller, page 31).

Figure 3. Apply Threadlocker in a Through Hole

Application	Legend
	**A . . .** No threadlocker here **B . . .** Apply the threadlocker to this area **X . . .** Nut depth

1.6.3.3 Disassembly

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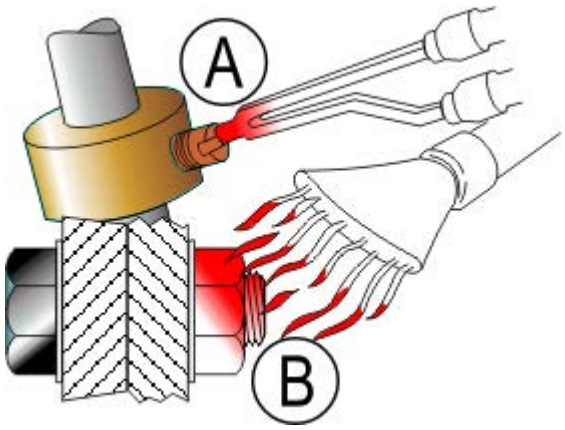
For high-strength threadlocker, apply heat for five minutes. Disassemble with hand tools while the parts are hot.

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

Figure 4. Use heat for disassembly of fasteners with threadlocker.

Apply Heat to a Small Area	Legend
	**A . . .** How to apply heat to a small fastener **B . . .** How to apply heat to a large fastener

2 Important Installation Precautions

2.1 External Fuse/Breaker, Wiring, and Disconnect Requirements

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An external fuse **or** circuit breaker and a disconnect switch must be provided in the facility for (and dedicated to) the machine. These may be in the same or separate, **permanently mounted** electric boxes. Electric power and ground connections will be made between the incoming power junction box on the machine and this external box (or one of the boxes).

2.1.1 Fuse or Circuit Breaker Size

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Refer to the “External Fuse and Wire Sizes...” document for your machine model. This document will be found in the machine's installation manual, available from the parts department. Choose the fuse or circuit breaker from the appropriate column of the table provided, as follows:

If a fuse is used — Match the fuse listed in the “Fuse” column for your machine's voltage. The specified fuse sizes are consistent with the USA National Electric Code (NEC), section 430-52, exception No. 2, Part B, which states: “The rating of a time-delay (dual-element) fuse shall be permitted to be increased, but shall in no case exceed 225 percent of the full-load current.”

If a standard circuit breaker is used — Match the amperage rating listed in the “Breaker” column for your machine's voltage.

If an inverse time circuit breaker is used — Match the characteristics (amperage rating) of the fuse listed in the “Fuse” column for your machine's voltage. When applied to an inverse time circuit breaker, the specified fuse sizes are consistent with the USA National Electric Code (NEC), section 430-52, exception No. 2, Part C, which states: “The rating of an inverse time circuit breaker shall be permitted to be increased, but shall in no case exceed 400 percent for full-load currents of 100 amperes or less.”

2.1.2 Wire Size

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Use wiring no smaller than that listed for your machine's voltage in the “Wire size... ”column in the “External Fuse and Wire Sizes...” document. The table value applies to runs up to 50 feet (15 meters). Use the next larger size for runs 50 to 100 feet (15 to 30 meters). Use wire two sizes larger for runs greater than 100 feet (30 meters). If an inverse time circuit breaker is used and local codes require a larger wire size than that specified by Milnor, abide by the local code.

NOTICE: The specified wire size may appear too small for the fuse or circuit breaker shown. However, it is consistent with both the load imposed and with the USA National Electric Code.

2.1.3 Ground

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The ground wire and connections must ensure a reliable earth ground (zero potential). Use wiring of at least as large a gauge as that required for incoming power. Do not rely on conduit, machine anchorage, etc. Use the ground lug provided in the incoming power junction box on the machine.

2.1.4 Disconnect Switch for Lockout/Tagout

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The disconnect switch must permit personnel to disconnect and lockout/tagout electric power from the machine. In the USA, refer to OSHA standard 1910.147 “The control of hazardous energy (lockout/tagout)”. Refer to the USA National Electric Code for requirements on locating the switch. In other locales, abide by these standards if no other local codes apply.

2.1.5 Using GFCI (Ground Fault Circuit Interrupter) Device

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The AC Drive will most likely cause the GFCI protection device to trip. The reason the AC Drive will cause this tripping of the GFCI is the Common Mode Current or Common Mode Noise (CM Noise) that the VFD is producing.

Use a GFCI with a higher trip level.

NOTE: Choose a GFCI designed specifically for an AC drive. The operation time should be at least 0.1 s with sensitivity amperage of at least 200 mA per drive. The output waveform of the drive may cause an increase in leakage current. This may in turn cause the leakage breaker to malfunction. Increase the sensitivity amperage or lower the carrier frequency to correct the problem.

Use a type B GFCI according to IEC/EN 60755.

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2.2 Vital Information About the Forces Imparted to Supporting Structures by Laundering Machines

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This document replaces Milnor® document BIWUUI02.

All laundering machines impart static and dynamic forces to the supporting structures (foundation and soil, floor, and building). Static forces include the machine weight plus the weight of the goods and water. Dynamic forces are those imparted by various machine movements as explained in Section 2.2.2 : Major Design Considerations, page 37. The dynamic forces imparted to supporting structures can cause vibration and noise outside of the laundry room if supporting structures are inadequate.

2.2.1 Disclaimer of Responsibility

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Pellerin Milnor Corporation accepts no responsibility for damage or loss as a result of:

- inadequate supporting structures
- interference with the use of the facility caused by machine operation

The facility owner/operator is solely responsible to ensure that:

- supporting structures are strong enough, with a reasonable safety factor, to safely support the operating machine or group of machines
- supporting structures are rigid enough to isolate vibrations and noise to the laundry room

If the owner/operator does not possess the necessary expertise to ensure that the facility can safely and functionally accommodate the equipment, it will be necessary to consult the appropriate expert(s), such as a structural engineer, soils engineer, and/or architect.

2.2.2 Major Design Considerations

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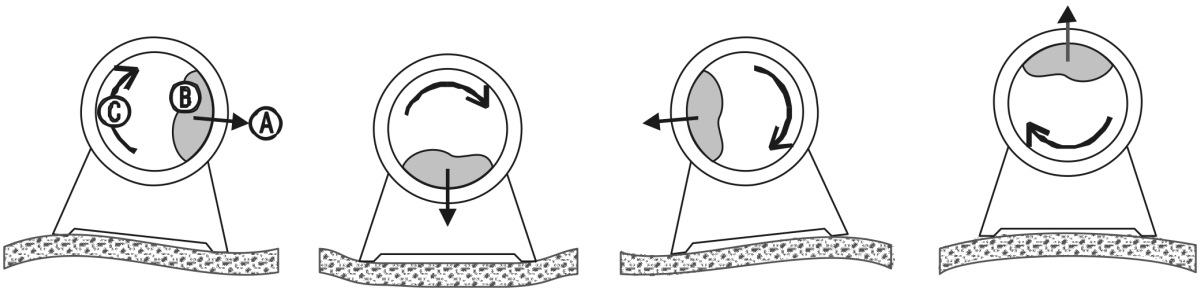
- Vibration and/or noise can be felt or heard outside of the laundry room as a result of the following, if supporting structures are not sufficiently rigid:
  - Extraction (the spinning cylinder) in washer-extractors and centrifugal extractors, imparts sinusoidal forces to supporting structures as shown in Figure 5: How Rotating Forces Act On the Foundation, page 38 . In rigid washer-extractors, these forces are up to 30 times that of suspended washer-extractors of the same capacity.
  - Extraction forces can be magnified many times if the rotation frequency matches the resonant frequency of supporting structures. To avoid this, supporting structures must have a natural resonant frequency many times greater than any possible rotation speed of the machine or combination of rotation speeds of all machines.
  - Each time goods fall in the rotating cylinder of a washer, washer-extractor, centrifugal extractor, or dryer, this can impart a force to the supporting structures.
  - The intermittent start and stop actions of large components inside the machine, particularly in a tilting washer-extractor, press-extractor, or centrifugal extractor, can impart intermittent forces to the supporting structures.
- The possibility of adverse consequences is significantly greater for upper floor installations than for installations at grade. Always consult a structural engineer for such an installation.
- The possibility of adverse consequences is significantly greater for installations at grade if subsidence causes a void between the foundation and the soil or if the soil itself does not provide adequate strength and rigidity. Some possible remedies are the addition of pilings or a deeper foundation, installed as to be monolithic with the existing foundation.
- Machine forces can cause damage to the machine or the floor without the correct anchorage.
- Applicable building codes, even when met, do not guarantee sufficient structural support and isolation of machine forces to the laundry room.

Figure 5. How Rotating Forces Act On the Foundation

Typical Washer-extractor (see note below)



Legend

A . . . Direction of force
B . . . Load
C . . . Rotation (frequency = RPM / 60)

NOTE: This figure applies to both rigid and suspended washer-extractors and to both at-grade and upper floor installations.

2.2.3 Primary Information Sources

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Milnor® provides, or can provide the following information of use to engineers and architects, for the given machine model:

- The machine dimensional drawing, found in the installation manual, specifies the machine's required anchorage.
- The Milnor® Service Department can provide static and dynamic load values and frequency (extract speed) values on request.

NOTICE: All data is subject to change without notice and may have changed since last printed. It is the responsibility of the potential owner/operator to obtain written confirmation that any data furnished by Milnor® applies for the model number(s) and serial number(s) of the purchased machine(s).

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2.3 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.**

2.3.1 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.

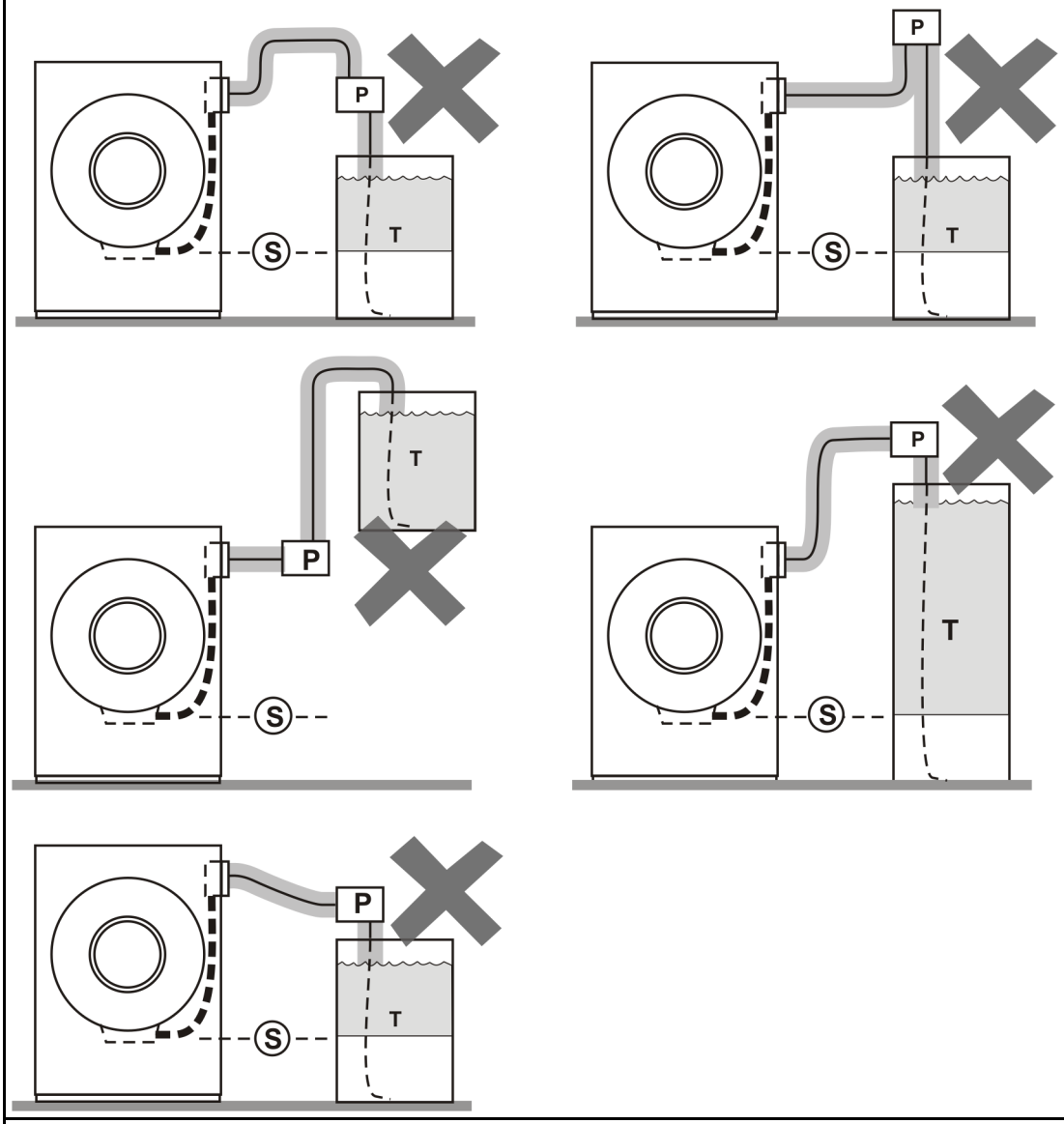
Incorrect Configuration or Connection of Equipment — Many chemical systems:

- 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 6, page 40). Some can let chemical supplies go in the machine by gravity (Figure 7, page 41).

Figure 6. Incorrect Configurations That Let the Chemical Supply Go In the Machine by a Siphon

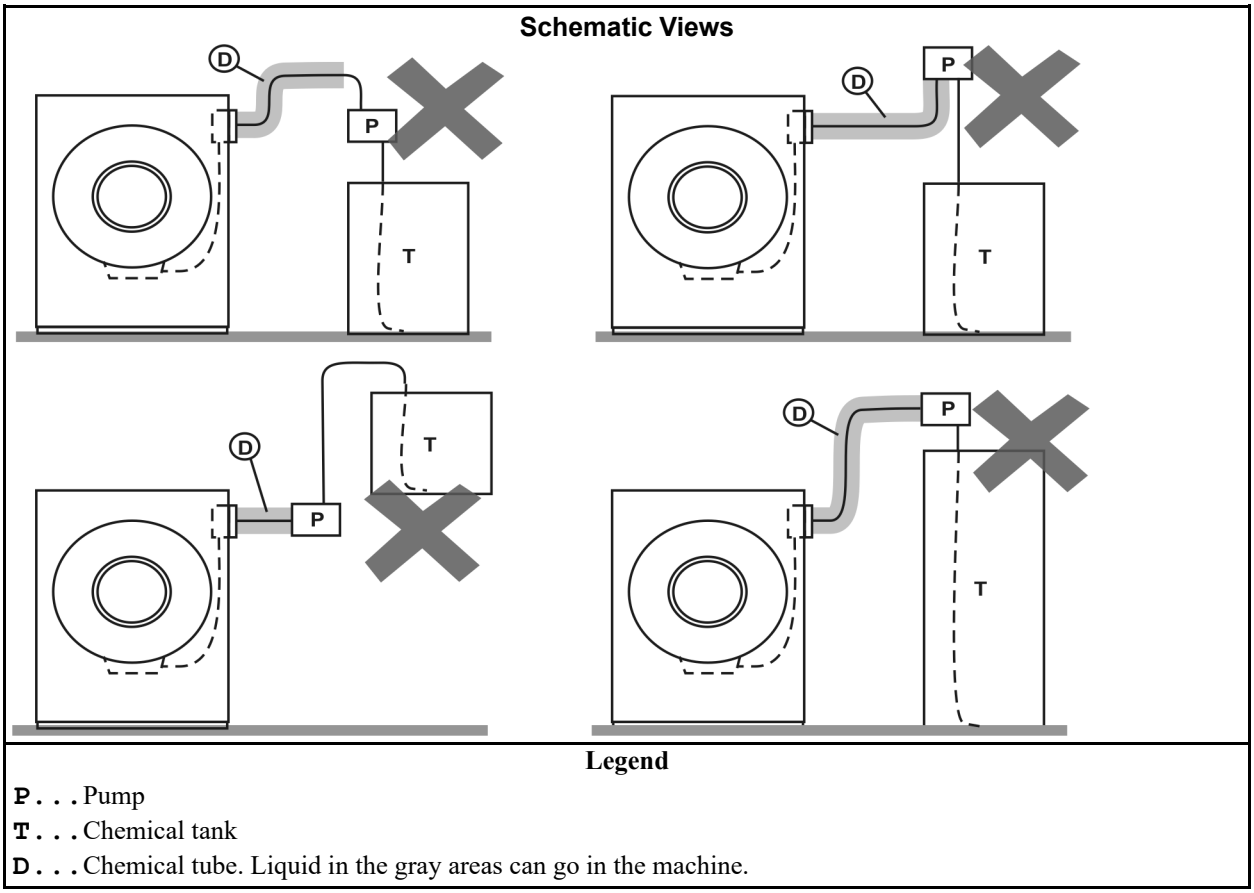
Schematic Views



Legend

P . . . Pump
T . . . Chemical tank
S . . . The siphon occurs above here. Liquid in the gray parts of the chemical tube and tank can go in the machine.

Figure 7. Incorrect Configurations That Let the Chemical Supply Go In the Machine by Gravity



Legend

P . . . Pump
T . . . Chemical tank
D . . . Chemical tube. Liquid in the gray areas can go in the machine.

2.3.2 Equipment and Procedures That Can Prevent Damage

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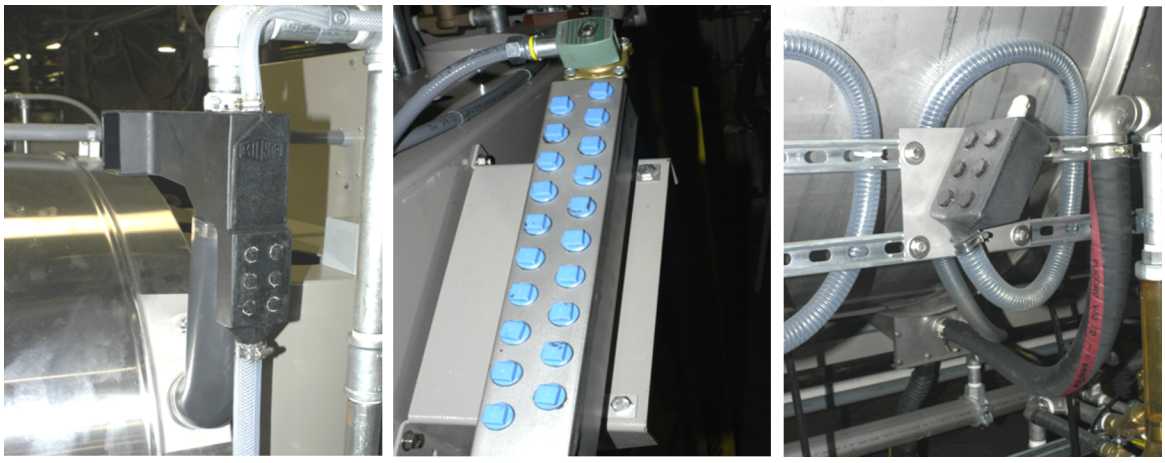
Use the chemical manifold supplied. — There is a manifold on the machine to attach chemical tubes from a chemical pump system. The manifold has a source of water to flush the chemical supplies with water.

Figure 8. Examples of Manifolds for Chemical Tubes. Your equipment can look different.



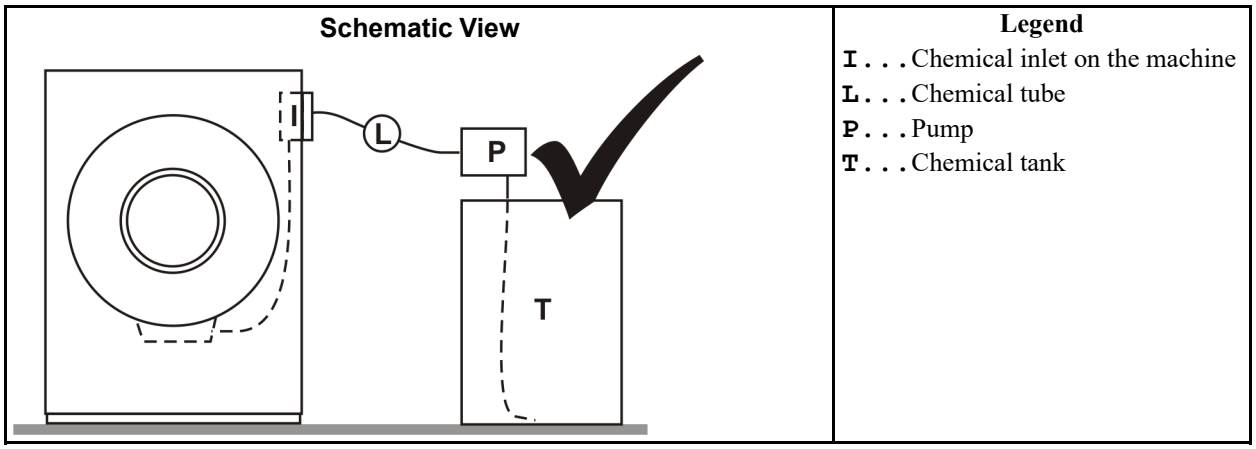
Close the line. — If the pump does not always close the line when it is off, use a shutoff valve to do this.

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 9. 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.

3 Installation Procedures

3.1 Handling a Washer-extractor from Delivery to Final Location

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This document supersedes documents BIIFLI01, BIRUUI01, MSIN0206AE, and MSIN0301AE as of October 1, 2019. It applies to all Milnor® washer-extractor models in production as of October 1, 2019.

owner/management the purchaser of the machine or their representative. Usually the consignee.

transportation company the person(s) or contractor(s) who transports the machine to the facility where it will be installed. The carrier.

rigger the person(s) or contractor(s) responsible to off-load the machine from the delivery vehicle, move it to its final location, and anchor it to the foundation. This can be the dealer but is often another company hired by the dealer.

technician a person trained in servicing Milnor® products and responsible to remove shipping restraints. This is usually a dealer employee.

3.1.1 Notices

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Qualified Personnel Only — Do not attempt to move, anchor, or remove restraints from the machine unless you are a rigger or technician, as defined above.

Disclaimer — **Pellerin Milnor Corporation is not responsible for damage to the machine after it leaves the factory.** Pellerin Milnor Corporation strongly recommends that the consignee (usually the owner/management) carefully inspect the machine in its protective wrapping before off-loading and inspect the uncovered machine after off-loading. If damage occurred in transit, ensure that the transportation company acknowledges the damage in writing. Submit a damage claim as soon as possible.

Other Tasks — This document addresses common tasks that the rigger and technician will perform. Other tasks, not explained here, can be needed. Information about other tasks is usually provided by the dealer, the Milnor® Applications Engineering department, or the Milnor® Service department. Examples are:

- Placement of the machine on a platform, such as for laundry cart clearance or to accommodate unusual drain conditions.
- Partial disassembly and reassembly, possible on some models, for movement through small spaces.

3.1.2 Facility Prerequisites

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Required Condition	Supporting Information
structural support	See document BNUUUI01 “Vital Information About the Forces Imparted to Supporting Structures by Laundering Machines” which can be found in the installation manual and also at https://milnor.sharefile.com/d-s8408ba617d244d98.
protected storage	If the machine must be stored temporarily, it must be protected from dampness and excessive temperatures.
access to the final location	See the machine dimensional drawing, which can be found at the end of the installation manual, for overall dimensions. Partial disassembly is sometimes possible. Contact the Milnor® Service department.
clearances for machine movement and maintenance	See the dimensional drawing.
operational clearances	Adequate clearance around controls and for movement of laundry equipment such as carts. See the dimensional drawing.
available utilities	See the dimensional drawing and the external fuse and wire document.
available drain(s)	See the dimensional drawing. The drain valve(s) must have unrestricted access to a drain trough of sufficient capacity in the foundation.
laundry room ventilation	The machine will contribute heat and vapors to the laundry room, which must provide adequate ventilation.

3.1.3 Rigger Precautions

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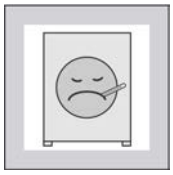
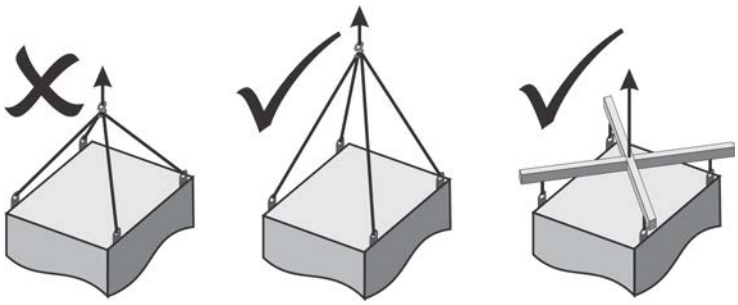
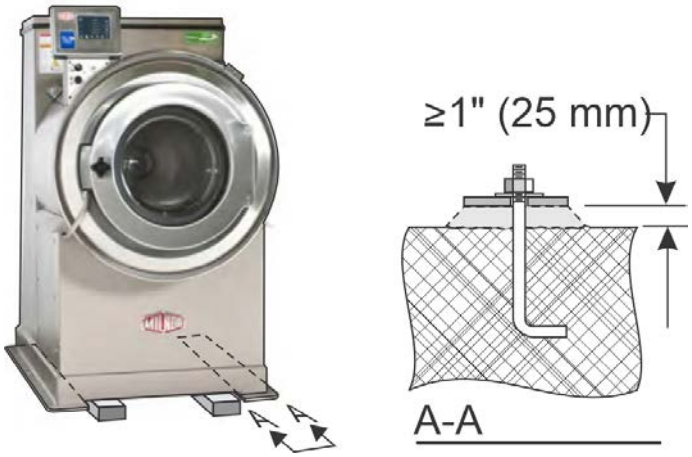


CAUTION: Incorrect rigging — can cause mishaps and costly machine damage.

- Know and accommodate the machine shipping weight.
- Use only lifting eyes for crane lifting.
- Use long cables or a spreader bar for crane lifting.
- Leave the machine skidded as long as possible.
- Protect fragile or sensitive machine components.
- Prepare the foundation and install anchor bolts correctly.
- Set the machine at the correct height and level.
- Apply machinery grout evenly so that support is distributed.
- Tighten anchors alternately so that the hold-down force is distributed.

Precaution	Explanation
Know and accommodate the machine shipping weight.	Use lifting and moving equipment appropriate for the machine shipping weight, as shown on the Bill of Lading. To obtain the shipping weight in advance, contact the Milnor® Transportation department.
Use only lifting eyes for crane lifting.	Machines designed for crane lifting are provided with lifting eyes either on the structural frame or on the shell, hidden behind cosmetic panels.
Use long cables or a spreader bar for crane lifting.	
Leave the machine skidded as long as possible.	If the machine is skidded, leave the machine on the skids until the machine is as close as possible to its final location. Use care to avoid contact between the fork lift forks and fragile machine components on the un-skidded machine.
Protect fragile or sensitive machine components.	After the machine is uncovered, carefully find and read all tags on the outside of the machine. White and manila paper tags are installation precautions. See the Installation Tag Guidelines in the installation manual for additional information.
Prepare the foundation and install anchor bolts correctly.	Anchor bolt sizes and locations are shown on the dimensional drawing in the back of the installation manual. However, Milnor® recommends to use the actual machine as a template to accurately locate where the anchor bolts are to be installed in the foundation. See the anchor bolt detail on the dimensional drawing. It is not permissible to omit anchor bolts.

Precaution	Explanation
Set the machine at the correct height and level.	Use blocking to get the machine base level and the base pads a minimum of 1” (25 mm) above the floor. Example: 
Apply machinery grout evenly so that support is distributed.	Fill all voids between the foundation and each base pad with industrial strength, non-shrinking grout. Allow the grout to fully cure per the grout instructions.
Tighten anchors alternately so that the hold-down force is distributed.	Raise the machine slightly and remove the wood blocking. Install a flat washer and nut on each anchor bolt and tighten incrementally in an alternating pattern. After tightening, check each anchor at least twice.

3.1.4 Technician Precautions

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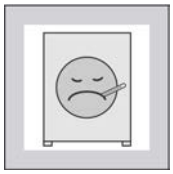
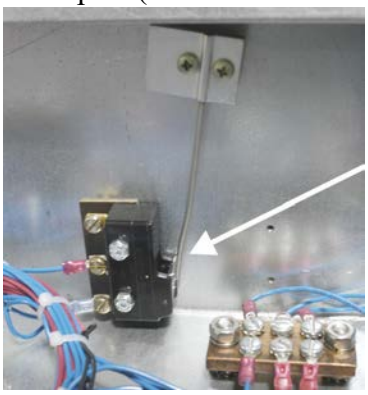
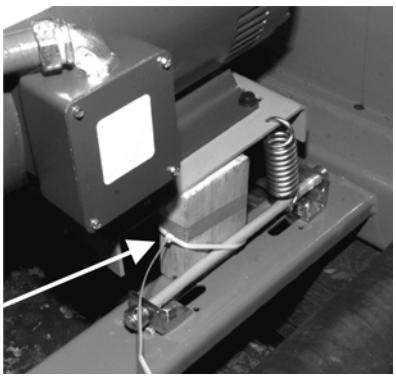
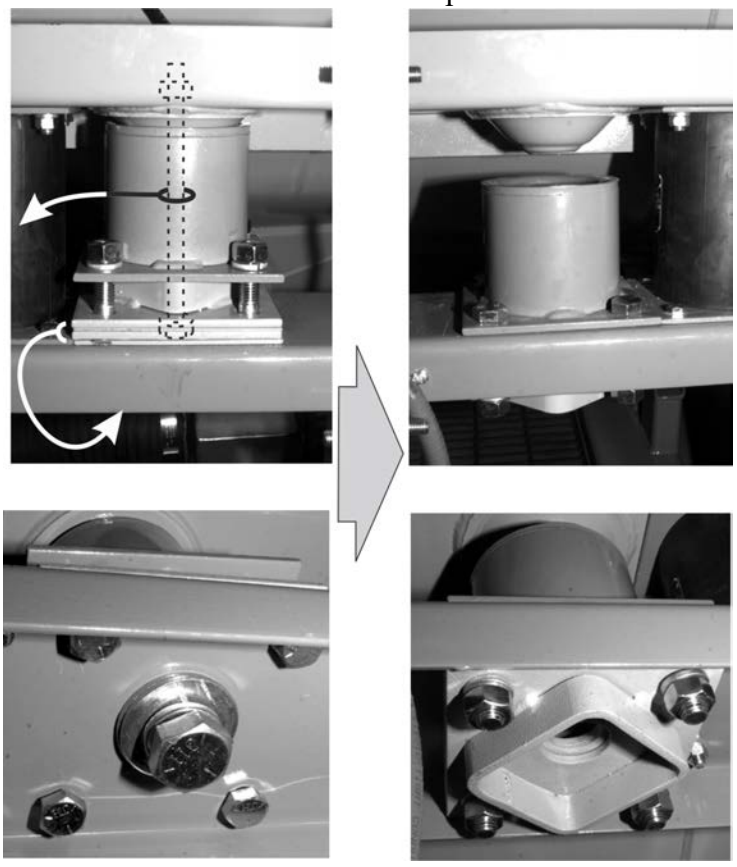


CAUTION: Overlooked or mishandled shipping restraints — can cause costly machine damage.

- Leave all internal shipping restraints in place until the machine is anchored.
- Check for and remove shipping tie wraps.
- Check for and remove suspension hold-down hardware, if applicable.
- Check for and remove red shipping brackets, if applicable.
- See the “Cylinder inspection” warning and inspect the cylinder for smoothness.

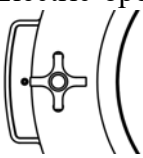
Precaution	Explanation
Leave all internal shipping restraints in place until the machine is anchored.	The machine can have one or more internal shipping restraints to help protect components from damage until the machine is anchored. These are located inside the housing or inside electric cabinets.
Check for and remove shipping tie wraps.	Examples (varies with machine model):  
Check for and remove suspension hold-down hardware, if applicable.	See also the service manual. Example: 
Check for and remove red shipping brackets, if applicable.	Shipping brackets are painted red. See the shipping brackets parts document in the service manual.

Precaution	Explanation
See the "Cylinder inspection" warning and inspect the cylinder for smoothness.	Inspect the cylinder and perforations for smoothness. **Pellerin Milnor Corporation cannot accept cylinder finish damage claims after the machine has been placed in service.** Machines are shipped with the shell door(s) closed. See the section below for information on how to open the shell door(s).

WARNING: Cylinder inspection — can trap you in the cylinder or seriously injure you.

- Never enter, or place body parts in the cylinder when power is supplied to the machine.
- If the machine is connected to power, lockout/tag-out power at the external disconnect switch.
- mechanically restrain the cylinder from turning.
- Have an assistant present in case of emergency.

Can the Door(s) Be Opened Before Utilities are Connected? — The shell doors on all Milnor® washer-extractors in current production, except for the side-loading, barrier models, have one of two types of door latch: electric-operated or air operated.

Door Type	How To Open
Electric-operated: 	The machine leaves the factory with the door latched closed but not locked. Turn the door knob to open the door even when the machine does not have power. If the door will not open, the door lock mechanism moved to the locked position due to shaking in transit. In this event, wait until the machine is connected to electric power and use the controls to open the door.
Air-operated: 	The machine leaves the factory with the door(s) closed and locked (with the door plunger extended). It is possible to temporarily replace the air line that retracts the door plunger with a source of compressed air to open the door when no other utilities are connected. Otherwise, wait until utilities are connected to the machine and use the controls to open the door.

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3.2 Connection Precautions for Washer-extractors

BNWUUI04.C01 0000255071 B.2 C.2 D.2 8/2/21, 10:05 AM Released

This document supersedes documents BNWBUI01, BNWBUI02, BNWBUI03, BNWBUI04, BIRQVI01, BIMUUI02, and BIIFUI01. It applies to all Milnor® washer-extractor models in production as of October 1, 2019.

plumber the person(s) or contractor licensed or otherwise accepted by the local jurisdiction to perform the plumbing work described herein, and qualified to do so.

electrician the person(s) or contractor licensed or otherwise accepted by the local jurisdiction to perform the electrical work described herein, and qualified to do so.

chemical supplier the person(s) or contractor with detailed knowledge of 1) the machine controller configuration and operation, and 2) the pumped chemical delivery system, if such a system is to be used.

3.2.1 Notices

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Qualified Personnel Only — Do not attempt to connect utilities to the machine unless you are a plumber, electrician, or chemical supplier, as defined above.

Machine Must Be Anchored — Utility connections are to be made only after the machine has been anchored. See BNWUUI03 "Handling a Washer-extractor from Delivery to Final Location."

Other Tasks — This document and the documents it references address common tasks that the plumber, electrician, and chemical supplier will perform. Other tasks, not explained here, can be needed. Information about these tasks is usually provided by the dealer, the Milnor® Applications Engineering department, or the Milnor® Service department An example is electrical interfacing with a remote Mildata® data collection system.

3.2.2 Utility Requirements and Related Information

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Type of Information	Value or Where to Find
equipment list showing model and options purchased	For the dealer, see the order acknowledgement.
plumbing connection fitting types, sizes, and locations	See the standard and options dimensional drawings for your model located at the back of the installation manual.
water pressure range	10 – 75 psi (69 – 531 kPa) required
Cv value	See the specification sheet for your model available online at: https://www.milnor.com/specification-sheets/. The Cv value assists the piping designer in determining flow rates and pressures.
steam pressure range	30 – 115 psi (207 – 793 kPa) required, if applicable
compressed air pressure range	85 – 110 psi (586 – 758 kPa) required, if applicable
specified voltage	See the machine nameplate or the order acknowledgement.

Type of Information	Value or Where to Find
available voltages for this model	See the specification sheet for your model available online at: https://www.milnor.com/specification-sheets/.
multi-machine conditions that can interrupt utility service to a given machine	See dealer publication B22SL94011 “Sizing and Planning a Laundry” found online at:https://www.milnor.com/wp-content/uploads/2016/01/Sizing-and-Planning-a-Laundry_18323.pdf
approved plumbing materials	Plumbing materials must comply with applicable codes. The Milnor® factory makes no recommendations for inlet connection materials due to the many variables such as water conditions, materials cost and availability, and ongoing advances in materials technology. When drains must be piped, as apposed to a simple air drop to a sump, rubber hose and PVC are often used.

3.2.3 Plumber Precautions

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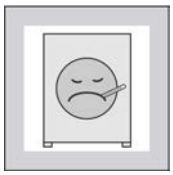

CAUTION: Machine damage and code violations — can occur as a result of incorrect plumbing.

- Confirm the reliability of the piped utilities.
- Maintain connection point diameter.
- Flush fluid lines.
- Do not twist valve bodies.
- Never interchange water valve electrical connections.
- Install any vacuum breaker(s) provided or required.
- Install any water strainer(s) provided or required.
- Install a union and a shutoff valve at each hard piped connection.
- Connect a dry supply injector flush inlet to hot water and regulate it.

Precaution	Explanation
Confirm the reliability of the piped utilities.	Water and any other piped fluids (steam, compressed air) needed by the machine must be within the specified pressure range and not prone to frequent interruptions when the machine operates. See Section 3.2.2 : Utility Requirements and Related Information, page 49.
Maintain connection point diameter.	The piping between the utility tap and the fitting on the machine must be as large or larger than the fitting. Drain piping or tubing, if any, must provide an unrestricted flow to the sump.
Flush fluid lines.	Foreign material such as debris in air lines, trapped air in water lines, and condensate in steam lines can damage machine components.
Do not twist valve bodies.	Hold a wrench on the valve side of a pipe connection to prevent the valve from twisting when you tighten the connection.

Precaution	Explanation
Never interchange water valve electrical connections.	On machines with air-operated water valves, it is permissible to exchange the pneumatic control lines, if the cold and hot connections were accidently plumbed in reverse.
Install any vacuum breaker(s) provided or required.	If vacuum (siphon) breaker(s) are provided for fresh water connection (s), but not already installed, install them as shown on the options dimensional drawing. If vacuum breakers are required by code, but not provided, obtain and install the required hardware.
Install any water strainers provided or required.	If water strainer(s) are provided for fresh water connections, install them between the machine and incoming water. For machines with garden hose type water inlets, use 40-mesh strainers.
Install a union and a shutoff valve at each hard-piped connection.	Obtain and install the necessary hardware to permit hard-piped connections to be shut off and disconnected at the machine for maintenance. For the valve, use a ball valve, not, for example, a globe valve.
Connect a dry supply injector flush inlet to hot water and regulate it.	If the machine has a dry supply injector with an external flush water connection and hot water is available, provide hot water to this inlet. The machine will be supplied with a pressure regulator. Install this hardware at the flush water connection and confirm that the regulator is set to 28 psi (193 kPa). Steam in the hot water line will cause the supply injector to malfunction.

3.2.4 Electrician Precautions

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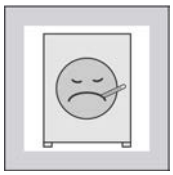

CAUTION: Machine damage, machine malfunctions, and code violations — can occur as a result of incorrect electrical connections.

- Know the machine electrical specifications.
- Comply with the published external fuse and wire requirements.
- Confirm the reliability of the electric service.
- Confirm the machine is phased in correctly.
- Confirm the correct line voltage setting on a selectable 240/208 volt machine.
- Attach the stinger leg, if any, only to L3.

Precaution	Explanation
Know the machine electrical specifications.	Refer to the nameplate affixed to the machine.
Comply with the published external fuse and wire requirements.	These requirements are given in document BGUUUF01 “External Fuse/Breaker, Wiring, and Disconnect Requirements” and the external fuse and wire document for your machine. These documents are found at the back of the installation manual. BGUUUF01 is also available at: https://milnor.sharefile.com/d-s5e1bad2885a447e8
Confirm the reliability of the electric service.	Voltage fluctuations of more than 10% above or below the specified voltage can damage electrical components, especially motors. The Milnor® factory strongly recommends that unreliable electric service is improved before the machine is put in use.
Confirm the machine is phased in correctly.	An installation tag on the machine shows the correct cylinder rotation at distribution (drain) or extract speed. If the cylinder turns in the wrong direction, reverse the wires connected to L1 and L2. Never move L3. Individual motors were phased in at the factory. Never reconnect individual motors or motor control devices.
Confirm the correct line voltage setting on a selectable 240/208 volt machine.	This precaution applies only if the nameplate voltage says 208/240V. It does not, for example, apply if the nameplate says 208V **or** 240V. The switch is near the incoming power transformer and must be in the position that matches the service voltage: 240 VAC or 208 VAC.
Attach the stinger leg, if any, only to terminal L3.	Never attach a stinger leg to terminal L1 or terminal L2.

3.2.5 Chemical Supplier Precautions

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Injury and severe machine damagecan occur as a result of incorrect chemical system installation.

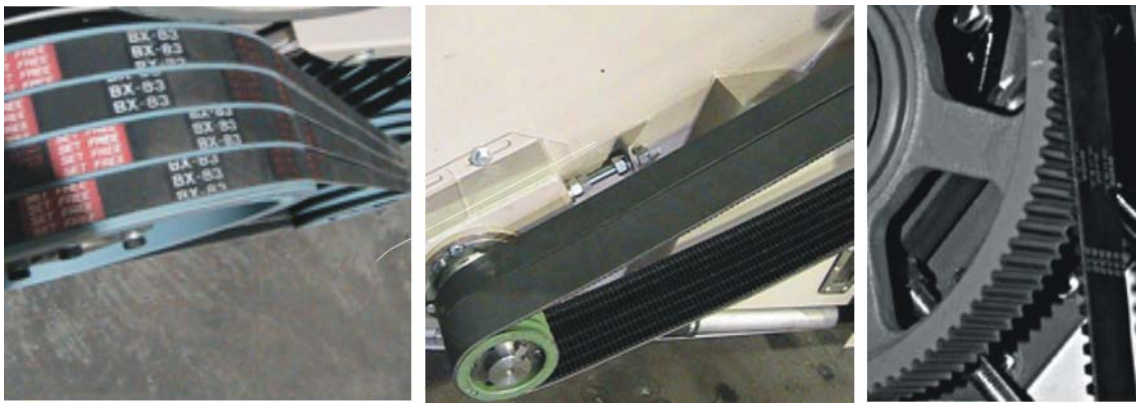
- Understand and comply with the published connection precautions.
- Understand the machine controller.

Precaution	Explanation
Understand and comply with the published connection precautions.	The connection precautions are given in document BIWUUI03 “Prevent Damage from Chemical Supplies and Chemical Systems” in the installation manual. BIWUUI03 is also available at: https://milnor.sharefile.com/d-s79f12e8f11f42a9b
Understand the machine controller.	The machine controller is explained in detail in the reference manual for your machine, which is available from the Milnor® Parts department.

4 Drive Assemblies

4.1 Drive Pulley and Belt Maintenance

Figure 10. Examples of drives this instruction applies to: one or more V-belts, attached V-belts and tooth belts



NOTICE: "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: Risk of Injury or death — A machine in operation without safety guards is dangerous. Drive belts can pull in your body or clothing.

- Remove power from the machine when you do work on the mechanisms.
- Stay out of the machine frame when you do a test on the machine.
- Replace all covers before you put the machine into operation.

TIP: Read these documents from the Gates Corporation (`www.gates.com`) to know more about pulley and belt maintenance: "Belt Drive Preventive Maintenance & Safety Manual" and "Preserve your investment - Check Engine Belts Often."

4.1.1 Pulley Requirements

- Keep pulleys free of dirt, oil and other contamination.
- Replace pulleys with groove damage.
- Align pulleys and shafts.

- Keep run-out in tolerance.

4.1.1.1 Condition of Grooves on Pulleys

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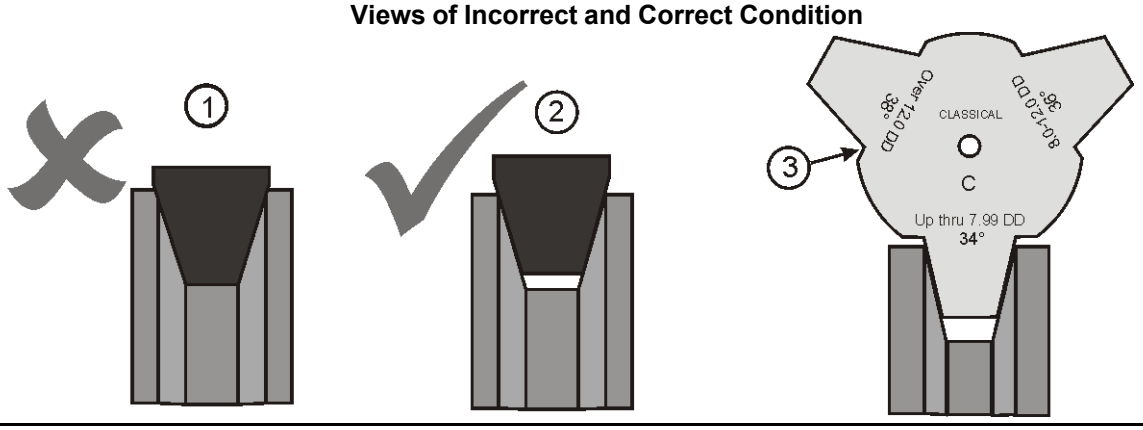
Replace a pulley if:

- the grooves have burrs, cracks, or worn areas that can cause damage to the belts.
- the belts touch the bottom of the groove at any point (Figure 11, page 54).

Figure 11. Pulley Groove Condition



Legend

1. Incorrect: Too much pulley wear. The belt touches the bottom of the groove.
2. Correct: The belt does not touch the bottom of the groove.
3. Use a sheave (pulley) gage to see if grooves are worn.

4.1.1.2 Pulley and Shaft Position

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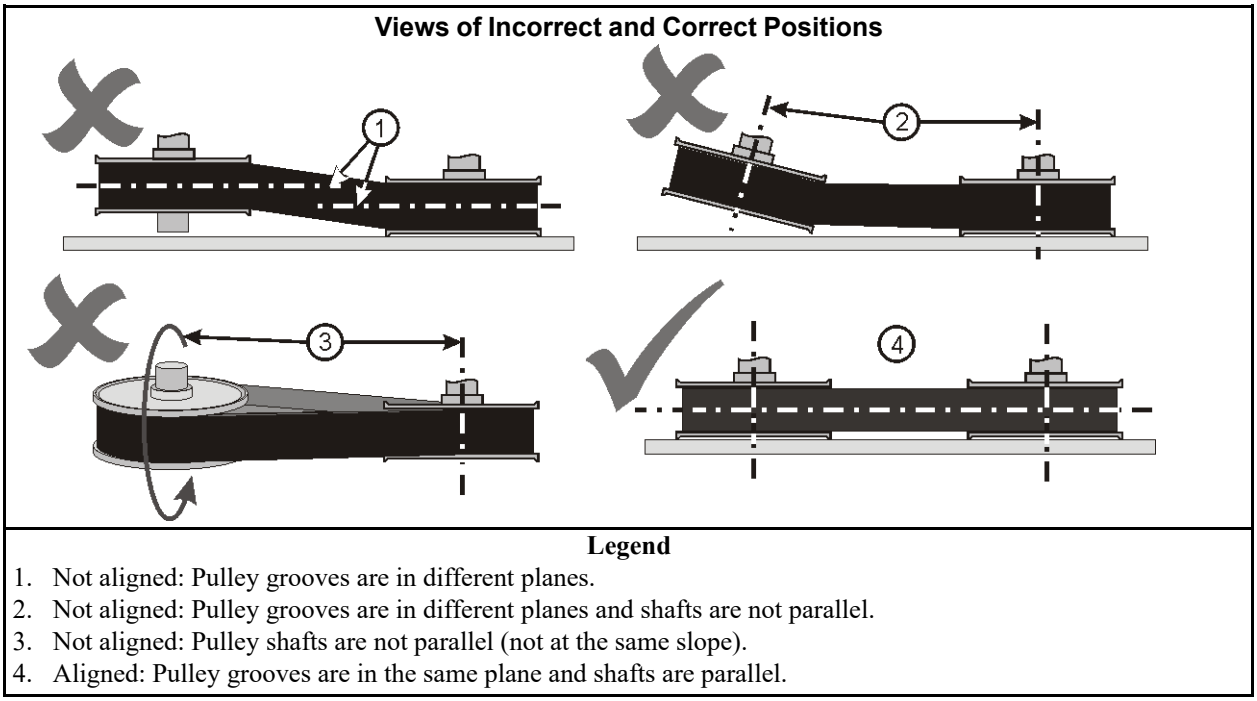
Align To adjust parts until they are in a correct position to other parts.

- Always align components when you replace a motor, bearing housing, pulley, or belt.
- The belts must not twist or make unusual noises or show vibration.

Figure 12. Pulley and Shaft Position



Legend

1. Not aligned: Pulley grooves are in different planes.
2. Not aligned: Pulley grooves are in different planes and shafts are not parallel.
3. Not aligned: Pulley shafts are not parallel (not at the same slope).
4. Aligned: Pulley grooves are in the same plane and shafts are parallel.

4.1.1.3 Keep Run-Out in Tolerance

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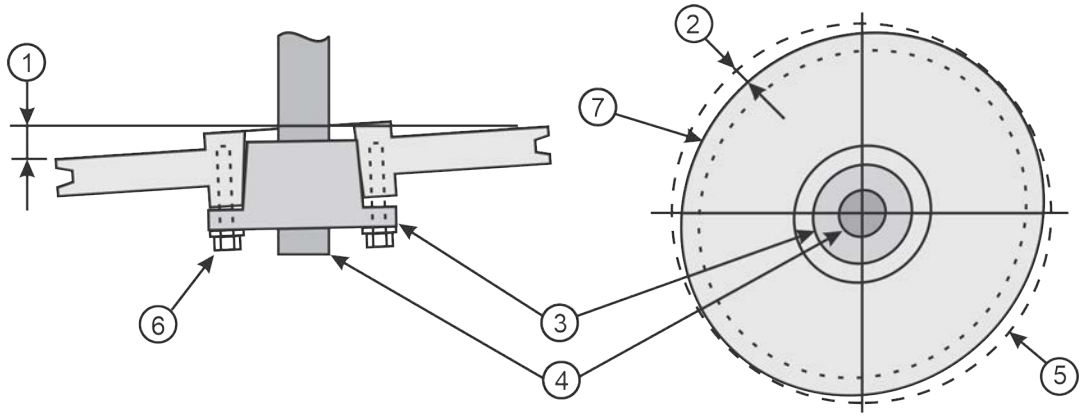
Axial run-out The difference between the minimum and maximum distance between the face of a pulley and a plane perpendicular to the pulley shaft (Figure 13, page 56, item 1). Incorrect installation or damage can cause a pulley to be not at a 90 degree angle to the shaft.

Radial run-out The difference between the minimum and maximum diameter in one turn (Figure 13, page 56, item 2). If a force causes damage to a pulley, it can bend. It will not have a circular shape.

Figure 13. Run-out

Views of Axial and Radial Run-out

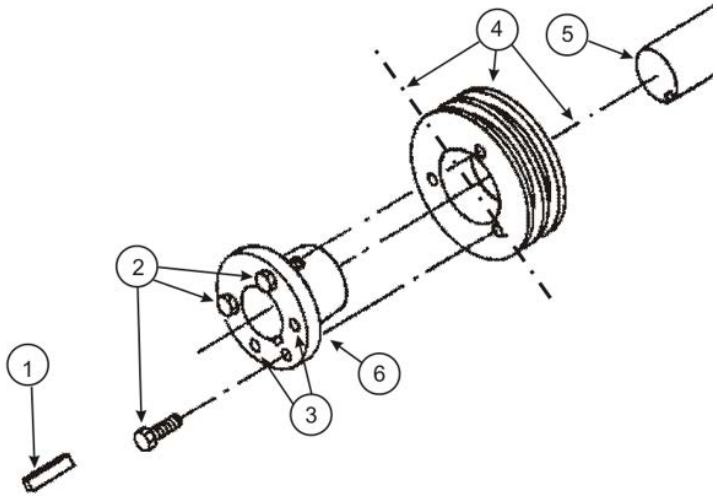


Legend

1. Axial run-out. This pulley is bent or not perpendicular to the shaft. This condition must not be more than 1 mil for each inch (0.1 mm for each dm) of the pulley diameter.
2. Radial run-out. This pulley is not circular. This condition must be less than 10 mils (0.25 mm).
3. Bushing
4. Shaft
5. A circle
6. Bushing bolts
7. Sheave

Figure 14. Typical Pulley Assembly

View of Pulley Components



Legend

1. Key
2. Bushing bolts. Tighten bolts in a pattern that gives the same torque. This will give minimum axial run-out.
3. Push-off holes
4. Pulley. Measure the radial run-out of the pulley after you assemble. Make sure that the center of the pulley is the same as the center of the shaft.
5. Shaft. Make sure that the shaft is not bent.
6. Bushing

4.1.2 Belt Requirements

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- Replace damaged belts.
- The pulleys must stay aligned when you adjust the belt tension.
- Do not use belts made from cut belts.

- For a drive with more than one belt:
  - Replace all of the belts together.
  - Do not mix new and used belts.
  - Do not mix belts from more than one manufacturer.

CAUTION: Risk of damage — A screwdriver or metal tool can cause damage to the belt.

▶ Do not push the belt on with a tool.

4.1.2.1 Condition of Belts

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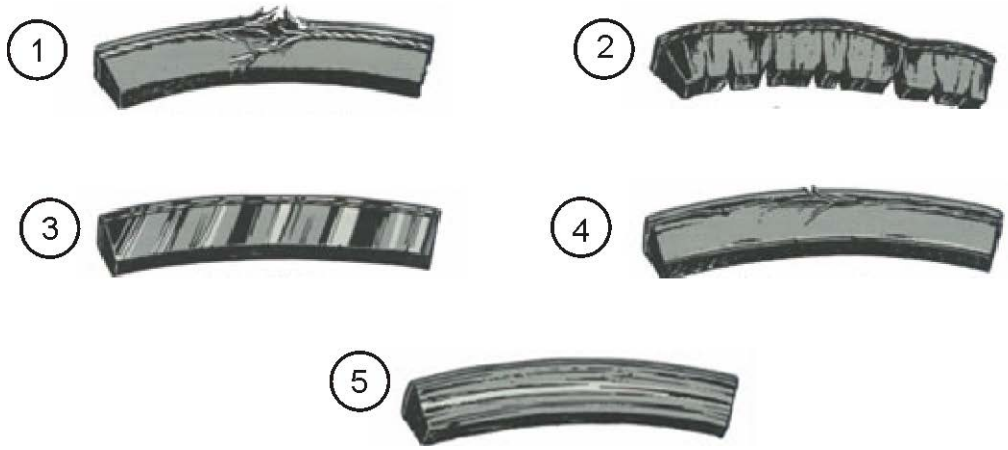
Slippage when the pulley turns more quickly than the belt can move

Slippage occurs if belts are not aligned (see Section 4.1.1.2 , page 54) or by incorrect tension explained in Section 4.1.1.2 , page 54. Slippage can cause belts to become too hot. Belts must not have a temperature more than than 140F (60° C).

TIP: The belt storage area must be cool and dry with no sun light.

TIP: New and used belts can look the same. These belts will have different strength properties and a small difference in length.

Figure 15. Types of Belt Damage



Legend

1. Broken cord—The belt was pushed across the groove with a metal tool.
2. Cracks—The belt is too large for the pulley.
3. Shiny sidewalls—slippage, oil, grease.
4. The belt layers disconnect—oil, grease.
5. Bands on sidewalls—rough surface or particles in the pulley groove.

4.1.2.2 Tension of Belts

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This data does not apply to belts where a spring holds the correct belt tension. Manual tension adjustment is not necessary for this type of drive.

The correct belt tension is the lowest tension that prevents belt slippage with a full load condition. If the belt is too tight, this can cause damage to the belt, the pulleys, bearings, and other drive components. If the belt is too loose, this can cause belt slippage. Incorrect belt tension or belt slippage can cause components to make an unusual noise.

When you install a new belt, use these rules to get the correct belt tension:

- Set the tension of the belt when you replace a motor, bearing housing, pulley, or belt.
- Replace all belts on a pair of pulleys when you replace one of them.
- After adjustment, operate the machine in all of its standard conditions to make sure that the belt operates correctly. For example, operate a washer-extractor in its full speed range with a full load of wet goods.
- Adjust the tension when you first install a belt. Do the adjustment again after 24 and 48 hours of operation. All belts will become longer after a short time. A V-belt will move down in the grooves of the pulleys. These conditions will cause the tension to decrease.

When you do scheduled maintenance, examine the belts for correct tension. With operation, belts become longer.

4.1.3 The pulleys must stay aligned when you adjust the belt tension

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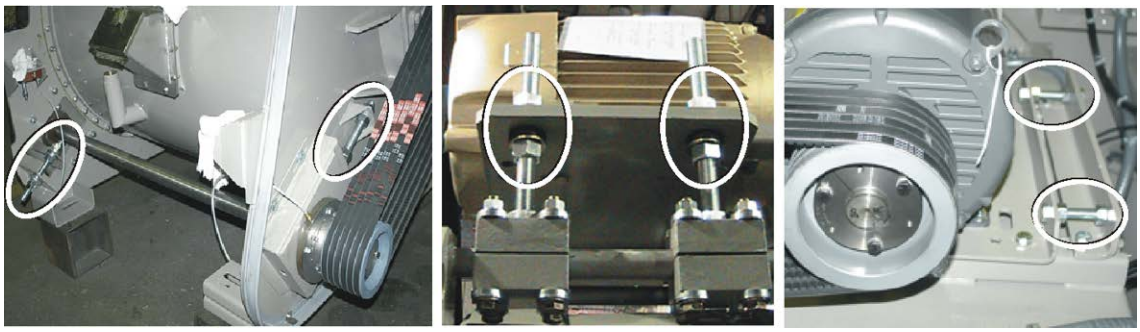
Some tension mechanisms do not have an effect on pulley and shaft requirements. Pulleys will stay aligned when you adjust them. Figure 16, page 59 is an example of these. Where tension mechanisms are a pair of threaded rods, you must adjust the nut, on each rod carefully. If not, the pulleys will not stay aligned. Examples of this type are shown in Figure 17, page 59.

Figure 16. A Tension Mechanism that will not Change the Angle of the Pulleys

Figure 17. Some Pairs of Tension Mechanisms that Can Change the Angle of the Pulleys



4.1.4 How to Do Maintenance on Pulleys and Belts

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Table 19. Typical Tools for Pulley and Belt Maintenance

Tool	Function	Related Data
Torque wrench	Make the bushing bolts the same torque to get the minimum axial run-out.	Figure 14, page 56, item 2
Laser, straight edge, or string	Align pulleys	Tools are listed in order of preference. Section 4.1.1.2 , page 54 and Figure 18, page 61
Bubble level	Align shafts	Section 4.1.1.2 , page 54 and Figure 19, page 62
Dial indicator	Measure run-out	Section 4.1.1.3 , page 55 and Figure 20, page 62

Table 19 Typical Tools for Pulley and Belt Maintenance (cont'd.)

Tool	Function	Related Data
Sheave (pulley) gage	Examine pulley wear	Figure 11, page 54.
Infrared thermometer	Examine belt temperature	Section 4.1.2.1 , page 57.

4.1.4.1 Typical Steps to Replace Pulleys and Belts

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Preparation Remove power from the machine.

Belt removal Use the belt tension mechanism to decrease the distance between the pulleys until you have sufficient clearance. Figure 16, page 59 and Figure 17, page 59 show typical belt tension mechanisms.

Pulley removal On the typical type of pulley and bushing shown in Figure 14, page 56, use the push-off holes to remove the pulley easily. On special types of pulleys (example: large drive pulley and cone), look at the parts document in the maintenance manual for more data. Some pulleys are too heavy for only one person to hold.

Pulley installation Figure 14, page 56 shows the typical pulley and bushing components. Make sure that you keep run-out tolerances when you assemble and tighten the components.

Belt installation Decrease the distance between the pulleys to put the belt on easily. Assemble the components carefully. Make sure that the components are aligned. Adjust the belt tension so the belt is tight.

Test Before you connect power again, make sure that you remove all tools. Operate the machine with a full load. If the belts slip, increase belt tension with the machine shut down and power removed. Then test again. Make sure that the machine is safe before you put it into regular operation.

4.1.4.2 Examples of Procedures Used at the Milnor® Factory to Align Pulleys

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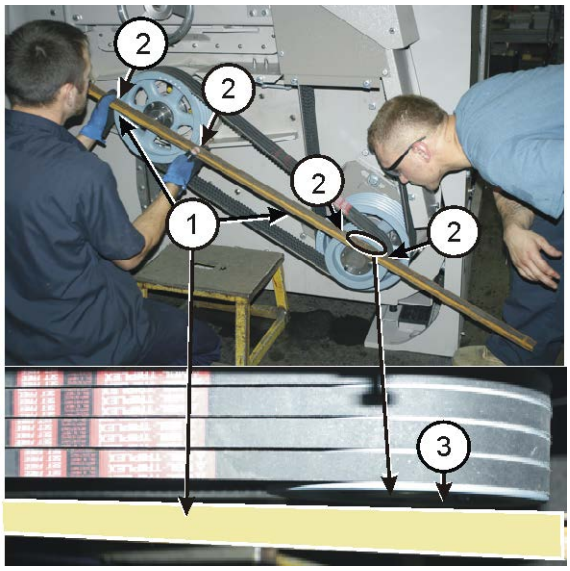
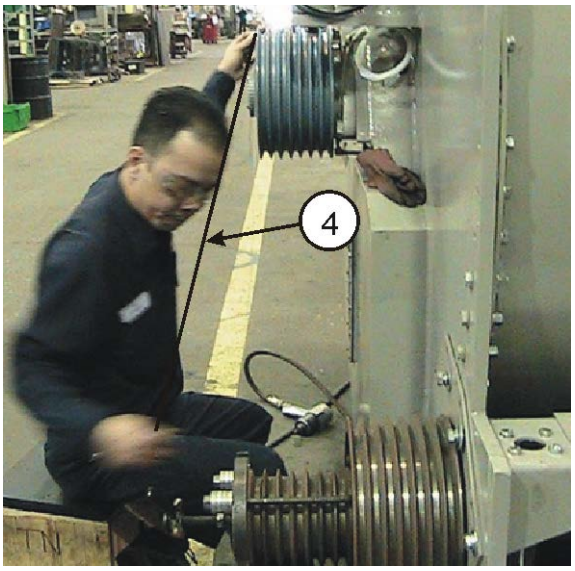
Figure 18. Use a straight edge, a string, or a laser to make sure that all pulleys are in the same plane.

Straight edge



String



Legend

1. Straight edge.
2. Four points where the straight edge must touch the pulleys.
3. Space between the straight edge and the pulley. This shows that the pulleys are not in the same plane.
4. You can use a string as a straight edge if you hold it tight.
5. Magnet-mounted laser
6. Three targets to point the laser at.

Laser

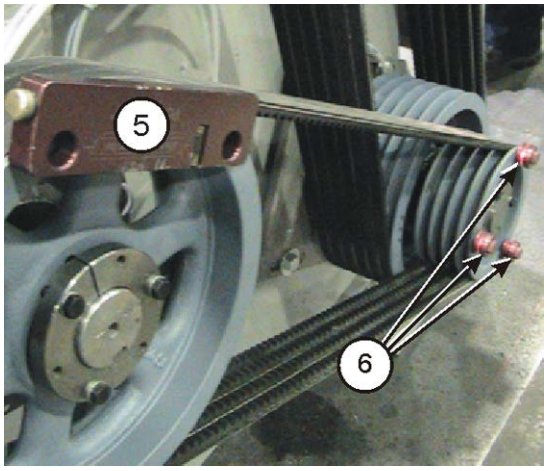


Figure 19. Use a level to make sure that the pulleys are at the same slope.

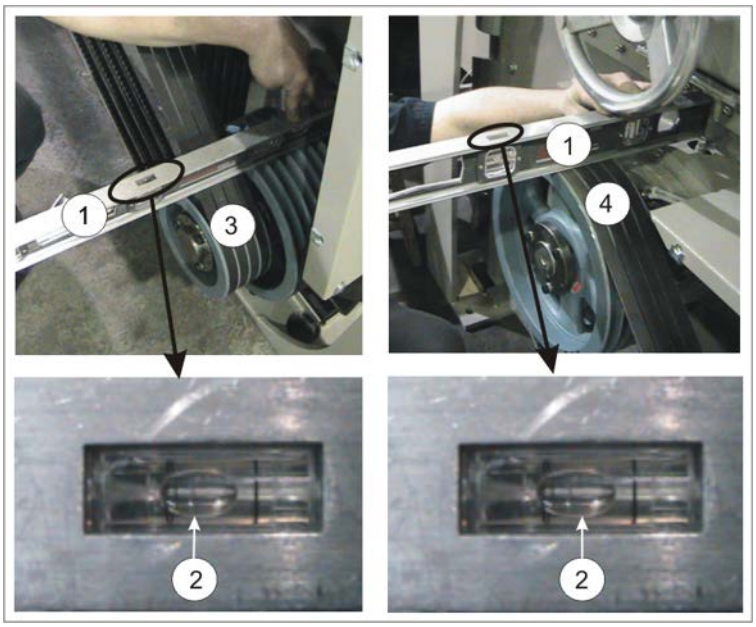
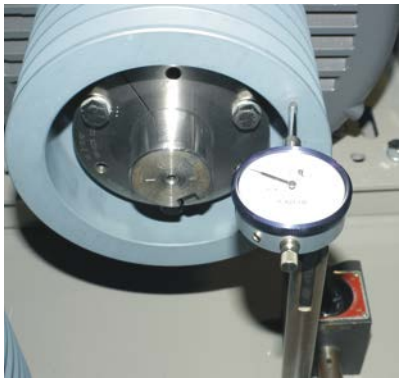
A level on the top of two pulleys	Legend
	1. Bubble level: Use this tool to make sure that the slopes of pulleys are equal. This is to make sure that you do not have the condition in Figure 12, page 55, item 3. Mechanisms shown in Figure 17, page 59 can change the pulley slopes. 2. If the slopes of the pulleys are equal, the bubble will be in the same position for each pulley. The bubbles do not have to be in the center of the level. 3. A pulley 4. A second pulley on the same drive

Figure 20. Dial indicator used to find the axial and radial run-out of a pulley.

Axial Run-out (1)	Radial Run-out (2)	Legend
		1. Dial indicator in position to measure axial run-out 2. Dial indicator in position to measure radial run-out

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4.2 Disk Brake Maintenance

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NOTICE: "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.

You can do these types of maintenance on the disk brake:

- do an inspection of the brake as specified in the maintenance schedule,
- replace the friction pads,

- do an overhaul on the calipers,
- replace the hydraulic fluid,
- adjust the connection between the brake cylinder and the air cylinder.

For the first four types of maintenance, you must remove air from (bleed) the hydraulic circuit.

Section 4.2.6 : Operation of Brake Systems, page 74 tells how to operate the disk brakes. You can use it in some of the types of maintenance in this procedure.

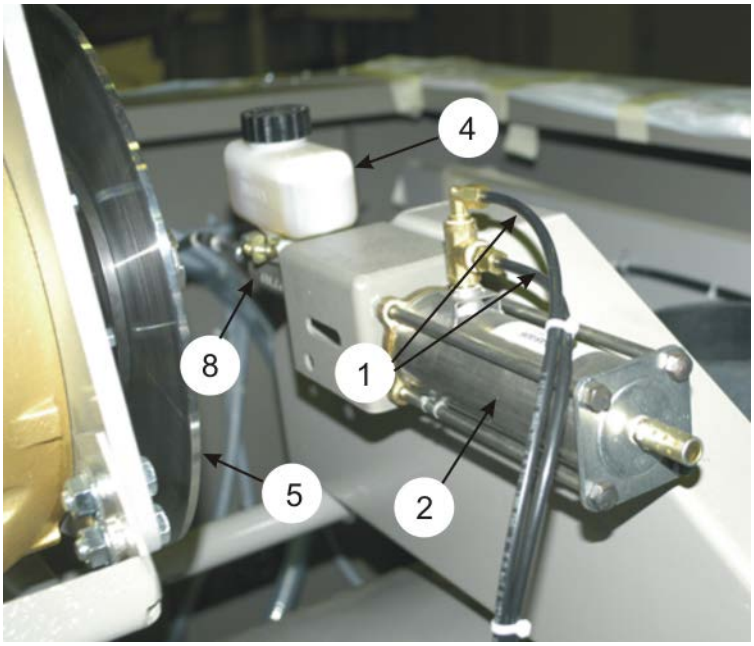
WARNING: Risk of injury or death — A machine in operation without safety guards is dangerous.

- 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 all guards and covers.

TIP: During parts of this procedure when you open up the calipers or hydraulic lines, put a cloth under the calipers to catch hydraulic fluid and parts that will fall. For safety, fully remove spilled hydraulic fluid after brake maintenance. This will help you easily identify leaks.

Figure 21. A typical hydraulic brake system

The air cylinder

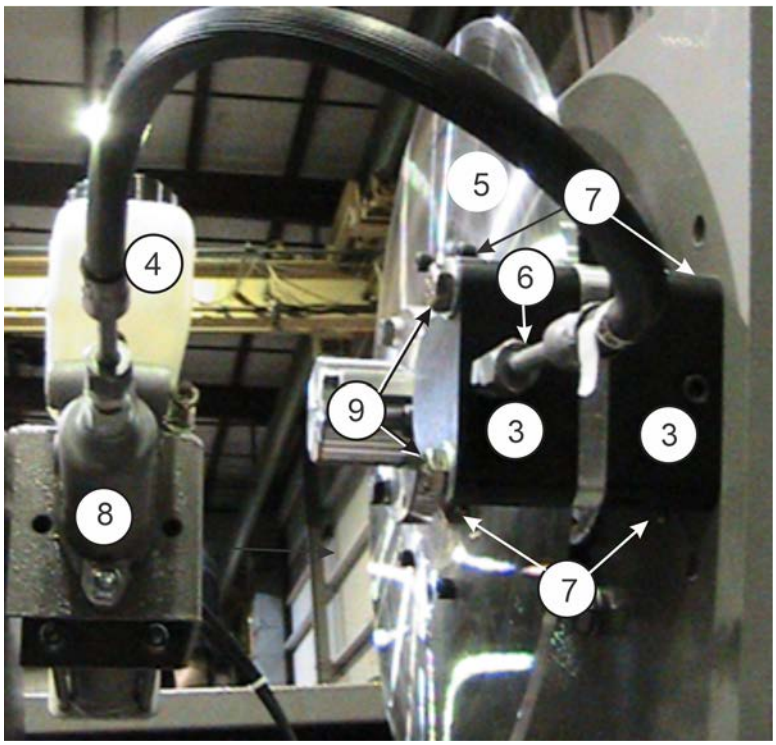


Legend

1. Tubing for air
2. Air cylinder
3. Caliper body halves (Figure 22, page 67, item 2)
4. Hydraulic reservoir
5. Rotor disk
6. Hydraulic inlet
7. Valves to drain fluid and bleed the brake
8. Hydraulic cylinder
9. Bolts to attach the caliper (Figure 22, page 67, item 1)

A typical hydraulic brake system (cont'd.)

The hydraulic cylinder and the caliper



4.2.1 The Inspection of the Brake

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NOTE: The brakes shown in this document can look different from your equipment.

NOTE: Do this inspection when the maintenance schedule tells it is necessary. Do this inspection after you replace friction pads or do a caliper overhaul.

1. Examine the fluid in the reservoir. Change the hydraulic fluid if it smells, has contamination, or has an unusual color. See Section 4.2.4 : How to Change Hydraulic Fluid and Remove (Bleed) Air from the Brake Circuit , page 68.

   NOTE: Brake fluid can become defective from heat in the brake system. Brake fluid absorbs water from air. Water in the brake system causes corrosion.

   If necessary, add new DOT 3 fluid to 0.25 inch (6.35 millimeters) from the top of the reservoir. Follow the precautions on the container.

2. Examine the rotor disk surface (Figure 21: A typical hydraulic brake system, page 63 , item 5). Replace the disk if it is worn or if it is not flat.
3. Examine the brake pads (Figure 22: The Caliper Components, page 67 , item 4). To do this, you will remove/replace the calipers and bleed the hydraulic system. See Section 4.2.3 : How

to Do a Caliper Overhaul, page 67 and Section 4.2.4 : How to Change Hydraulic Fluid and Remove (Bleed) Air from the Brake Circuit , page 68.

a. **Remove power from the machine (see above notice).**
b. Remove the bolts (Figure 21, page 63, item 9) that attach the caliper halves (Figure 21, page 63, item 7).
c. Remove the caliper halves.
d. Replace the pads as told in Section 4.2.2 : How to Do a Friction Pad Replacement, page 65 if
   - the pads make an unusual noise when you apply the brake
   - if the rotor is worn or damaged
   - if the pad thickness is less than 1/16 inches (2 mm) (Figure 22, page 67, item 14) above the mounting screw (Figure 22, page 67, item 3). Always replace the two brake pads at the same time.
e. Put the caliper halves in their positions on the brake assembly. Tighten the mounting bolts to 30 foot-pounds (41 Newton-meters).
f. Bleed the hydraulic systems as told in Section 4.2.4 : How to Change Hydraulic Fluid and Remove (Bleed) Air from the Brake Circuit , page 68.
g. Supply electrical power to the machine.

4. Examine the condition of all of the brake system.
   a. Make sure that brake mounting components are tightly installed.
   b. Make sure that fittings are tight. Make sure that there are no leaks.

4.2.2 How to Do a Friction Pad Replacement

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You must have the necessary replacement friction pads for your machine. Refer to the brake parts document in your machine manual. You will find part numbers for components or overhaul/repair kits. The overhaul/repair kit contains O-rings, pads, and other components.

1. **Remove power from the machine (see above notice).**
2. Remove the used fluid. See Section 4.2.4 : How to Change Hydraulic Fluid and Remove (Bleed) Air from the Brake Circuit , page 68.
3. Remove the two bolts that attach the caliper (Figure 21, page 63, item 9) and the two caliper halves (Figure 21, page 63, item 3) to get access to the friction pads. Do not disconnect the hydraulic line (Figure 21, page 63, item 6).
4. If there are leaks, see Section 4.2.3 : How to Do a Caliper Overhaul, page 67 before you continue.
5. Replace each friction pad:
   a. Remove the brass screw (Figure 22, page 67, item 3) that attaches the pad to the piston.
   b. Attach the new pad to the piston. Tighten the screw.
   c. Make sure that the screw head is fully in the recess in the pad.

6. Make sure that the connection o-rings are clean and in their positions (Figure 22, page 67, item 7).
7. Put the caliper halves in their positions on the brake assembly. Tighten the mounting bolts to 30 foot-pounds (41 Newton-meters).
8. Bleed the brake. See Section 4.2.4 : How to Change Hydraulic Fluid and Remove (Bleed) Air from the Brake Circuit , page 68.
9. Supply electrical power to the machine.

4.2.3 How to Do a Caliper Overhaul

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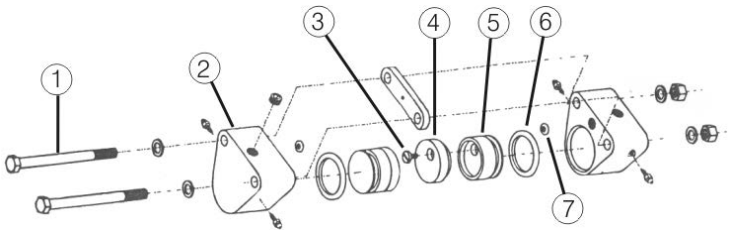
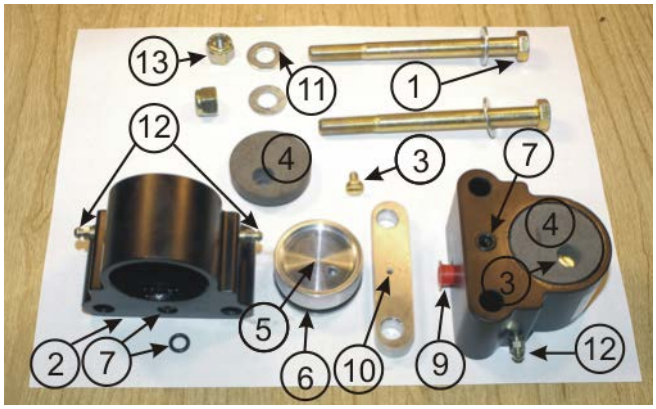
Figure 22. The Caliper Components

The Expanded View (Shows the Piston and the O-rings)



The Caliper and the Pad



Legend

1. The bolts to attach the caliper (Figure 21, page 63, item 9)
2. Caliper body halves (Figure 21, page 63, item 3)
3. Brass screw
4. Friction pad
5. Piston
6. The Piston O-ring
7. The connection O-ring and its position
8. Plug for the hydraulic inlet
9. A hydraulic inlet (connected on one caliper, a plug (item 8) on the other)
10. The hole in the spacer
11. Washer
12. One of the four valves to bleed the fluid
13. Nut
14. The pad thickness must be more than than 1/16 inches (2 mm) above item 3

Fittings for the Hydraulic Inlet

Look at the pad thickness above the top of the screw

TIP: Hydraulic fluid flows from one caliper to the other caliper. Fluid flows through the connection O-rings (Figure 22, page 67, item 7) and the hole in the spacer (Figure 22, page 67, item 10). When you disconnect the calipers, hydraulic fluid can flow from the hole at the connection O-rings. Air can get in the line. After you connect the calipers, you must bleed the system.

You must have the necessary kit for the overhaul of your machine. Refer to the brake parts document in your machine's manual.

1. **Remove power from the machine (see above notice).**
2. Get access to the caliper halves (see Section 4.2.2 : How to Do a Friction Pad Replacement, page 65).
3. Do an overhaul on each caliper:
   a. Remove and discard the connection O-rings (Figure 22, page 67, item 7) on the caliper bodies.
   b. Apply compressed air to the fitting for the hydraulic inlets (see Figure 22, page 67, item 8) to push the pistons out.
   c. Replace the piston O-rings (Figure 22, page 67, item 6).
   d. Put the pistons in the caliper body. Carefully tap the pistons with a wood or rubber hammer to install it.
   e. Replace the connection O-rings. (Figure 22, page 67, item 7)
   f. Replace the friction pads (see Section 4.2.2 : How to Do a Friction Pad Replacement, page 65).
4. Replace the caliper halves as specified in Section 4.2.2 : How to Do a Friction Pad Replacement, page 65.
5. Bleed the brake circuit (see Section 4.2.4 : How to Change Hydraulic Fluid and Remove (Bleed) Air from the Brake Circuit , page 68).
6. Supply electrical power to the machine.

4.2.4 How to Change Hydraulic Fluid and Remove (Bleed) Air from the Brake Circuit

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Risks and Precautions

WARNING: Risk of injury — Machine power must be on for these procedures.

- Stay away from operating mechanisms.

CAUTION: Risk of injury and damage — This procedure releases pressurized brake fluid.

- Keep brake fluid out of your eyes and mouth. Wear eye protection.
- Follow procedures carefully to prevent damage to the face of the disk or the pistons.

CAUTION: Risk of malfunction — Air in hydraulic fluid will compress. Compressed air in the brake line will cause brake malfunctions.

- Remove (bleed) air from the brake circuit before you operate the machine.

Requirements—These personnel and items are necessary for this procedure:

- Two technicians
- An 8-ounce container of new brake fluid
- Alternative procedures to remove air and used brake fluid:
  - a suction pump (faster procedure) (see Figure 23: Pumps Used to Remove Hydraulic Fluid Quickly, page 70)
  - with pressure in the hydraulic cylinder and gravity (see Figure 24: Typical Tools to Remove Air (Bleed) Brakes and Used Hydraulic Fluid, page 70)

TIP: The Vacula suction pump can do the work more quickly than by gravity and pressure in the hydraulic cylinder. It is also cleaner because all of the hydraulic fluid goes into the container supplied. It helps you not spill the hydraulic fluid.

- If you use a suction pump as shown in Figure 23, page 70, follow the manufacturer's instructions.
- If you use the tools as shown in Figure 24, page 70, follow the instructions in Section 4.2.4 : How to Change Hydraulic Fluid and Remove (Bleed) Air from the Brake Circuit , page 68.

Figure 23. Pumps Used to Remove Hydraulic Fluid Quickly

Alternative Pumps for Suction of Hydraulic Fluid

1

2

Legend

1. A manual suction pump
2. The Vacula suction pump uses compressed air and holds used hydraulic fluid.

Figure 24. Typical Tools to Remove Air (Bleed) Brakes and Used Hydraulic Fluid

These tools use gravity and pressure in the hydraulic cylinder

Legend

1. a clean 12 ounce container
2. a flexible hose to attach from the bleed valves to a container
3. a wrench for the bleed valves (Figure 22, page 67, item 12)
4. a suction device to remove brake fluid from the reservoir

1. Use the tools in Figure 24: Typical Tools to Remove Air (Bleed) Brakes and Used Hydraulic Fluid, page 70 to remove the used hydraulic fluid and clean the line. Do these steps:
   a. Use a suction tool (Figure 24, page 70, item 4) to remove the used fluid from the reservoir. Clean the contamination.
   b. Connect the tubing (Figure 24, page 70, item 2) and container (Figure 24, page 70, item 1) to the valve on the caliper (Figure 21, page 63, item 7).
   c. Open the valve.
   d. Add new fluid to flush out the lines.
   e. Apply/release the brake (see Section 4.2.6 : Operation of Brake Systems, page 74) approximately 5 to 15 times. This will flush the used fluid out of the lines.
   f. Close the valve.

   NOTE: These steps will cause air to go into the line.

2. Add new hydraulic fluid and remove (bleed) air from the brake circuit.

   NOTE: This procedure uses pressure in the hydraulic cylinder and the tools in Figure 24: Typical Tools to Remove Air (Bleed) Brakes and Used Hydraulic Fluid, page 70 .

   a. Fill the reservoir with new DOT 3 brake fluid. When you do the remaining steps, continue to add new fluid to the reservoir. Do not let the reservoir become more than half empty. You must make sure that the reservoir has fluid to prevent air flow into the system from the reservoir
   b. Apply electrical power to the machine. Release the brake.
   c. See the part of the machine reference manual that tells how to operate the outputs manually.
   d. Put a small quantity of new brake fluid (approximately inches (50 mm)) in the 12 ounce container (Figure 24, page 70, item 1).
   e. Do these steps for each bleed valve (Figure 21, page 63, item 1) . Two technicians are necessary. This will move the fluid in one direction and push air out of the line:
      - Attach a clean tube to the valve. Put the other end in the container (Figure 24, page 70, item 1) below the fluid.
      - Make sure that the reservoir is full of fluid.
      - Apply the brake (See Section 4.2.6 : Operation of Brake Systems, page 74).
      - Open the bleed valve. (Figure 22, page 67, item 12)
      - Look for air bubbles in the container when you push the air and fluid out through the tube.
      - Close the valve.
      - Release the brake.
      - Continue the steps above until no more air comes out of the line.

f. Add fluid to the top of the reservoir. Replace the cap.

g. Operate the brake many times. Make sure that it operates correctly.

4.2.5 How to Adjust the Connection between the Brake Cylinder and the Air Cylinder

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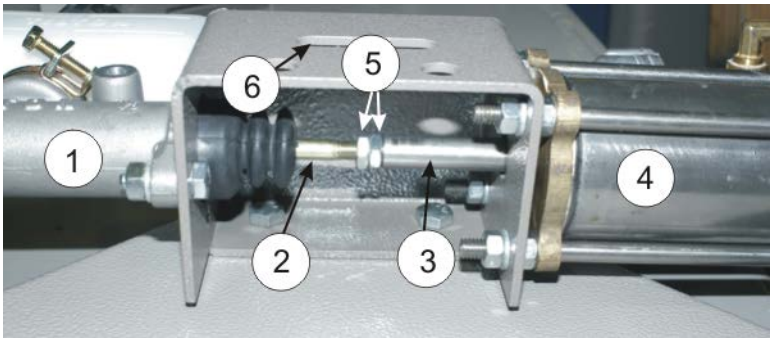
If you removed the brake cylinder or the air cylinder, you must adjust this connection.

Figure 25. The Connection between the Brake Cylinder and the Air Cylinder

A view of the brake rod and related components

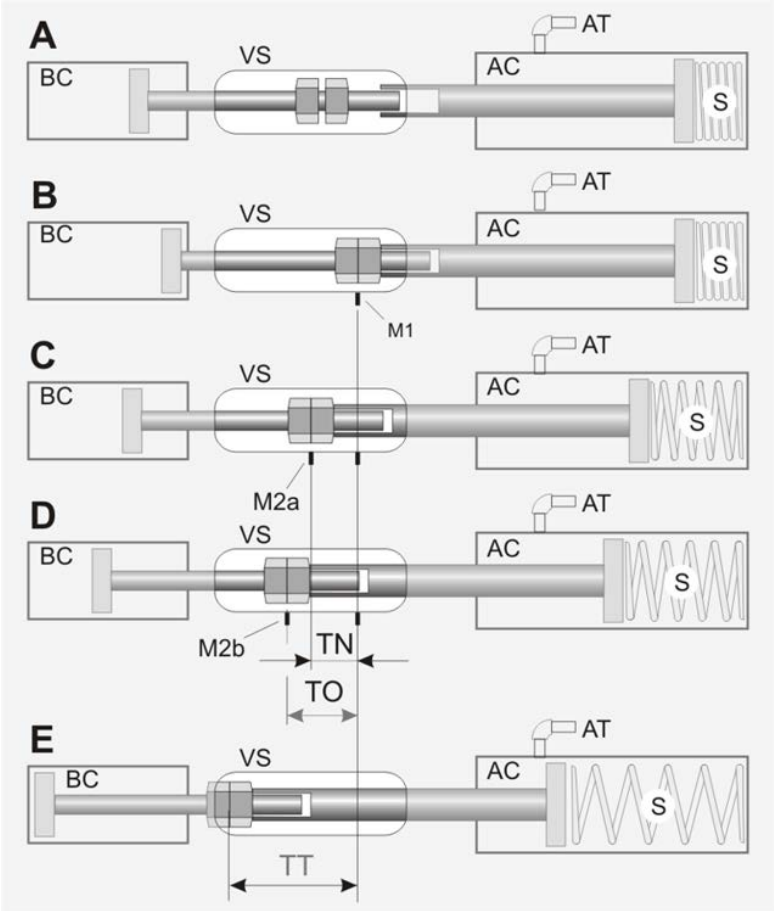


Legend

1. The brake cylinder
2. The rod for the brake cylinder
3. The rod for the air cylinder
4. The air cylinder
5. Two nuts to lock the rods together
6. The slot to see the nuts

Figure 26. The Adjustment between the Brake Rod and the Air Cylinder

Schematic Views of Different Conditions



Legend

AC . . Air cylinder (Figure 25, page 72, item 4)
BC . . Brake cylinder (Figure 25, page 72, item 1)
VS . . Slot to see the nuts (Figure 25, page 72, item 6)
A . . . Before travel adjustment—Rods not locked by nuts (Figure 25, page 72, item 5)
B . . . After travel adjustment—the brake released (See Section 4.2.6.2 : How to Release the Brake for Machines with a "Brake Release" Output, page 75)
C . . . Brake applied—NEW pads (See Section 4.2.6.1 : How to Apply the Brake for Machines with a "Break Release" Output, page 74)
D . . . Brake applied—OLD pads
E . . . This will occur if you apply the brake with the hydraulic line removed
TN . . Rod travel, new pads
TO . . Rod travel, very worn pads
TT . . Full travel with the hydraulic line removed
M1 . . First mark at the view slot—the brake released
M2a . . Second mark—one possible position—the brake applied
M2b . . Second mark—a different position—the brake applied
AT . . Air tubing (See Figure 21: A typical hydraulic brake system, page 63 , item1). Air releases the brake.
S . . . Spring applies the brake

1. Adjust for maximum rod travel.
   a. Operate the master switch to energize control power.
   b. Make sure that the air pressure that releases the brake (Figure 27: A Typical First and Second Brake on a Divided Cylinder Machine, page 75 , item 1) is 85 -100 PSI (5.95 - 07.0 kg/cm-cm).
   c. Make sure that the nuts that lock the rods together (Figure 25, page 72, item 5) are loose.
   d. Release the brake (see Section 4.2.6 : Operation of Brake Systems, page 74). Let the air cylinder rod fully retract into the air cylinder as shown in Figure 26, page 73, item A.
   e. Turn the brake rod into the air cylinder rod until the brake rod comes out of the brake cylinder fully. See Figure 26, page 73, item B.
   f. Lock the brake rod (Figure 25, page 72, item 2) to the air cylinder rod (Figure 25, page 72, item 3) with two nuts (Figure 25, page 72, item 5).
2. Make sure that the brake will continue to operate while the pads wear.
   a. Release the brake. On the view slot, put a mark at the position of the lock nuts. (Figure 26, page 73, item M1).
   b. Apply the brake. See Section 4.2.6 : Operation of Brake Systems, page 74.
   c. Put a mark at the position of the lock nuts when the brake is applied. This can be at position M2a, M2b, or between M2a and M2b. When the pads wear, this position will move.
   d. Make sure that the distance the rod moves when you apply the brake is 0.75 to 1.0 inches (19-25 mm). If the travel is more than this, the brake piston can hit the mechanical stop before the brake engages fully. This condition is shown in Figure 26, page 73, item E (dimension TT).

4.2.6 Operation of Brake Systems

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Look at the electrical schematics of your machine to find how your brake is controlled. Some machines release the brake when you close the door. Some machines have a control relay to release or apply the brake.

4.2.6.1 How to Apply the Brake for Machines with a "Break Release" Output

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1. Turn the "brake release" control output off to de-energize the air valve to remove air pressure to the air cylinder (Figure 21: A typical hydraulic brake system, page 63 , item 1).
2. With no air pressure, a spring in the air cylinder will apply force to the hydraulic cylinder (Figure 21: A typical hydraulic brake system, page 63 , item 8). This will apply pressure to the brake pads (Figure 22: The Caliper Components, page 67 , item 4) against the rotor disk (Figure 21: A typical hydraulic brake system, page 63 , item 5). (Figure 26: The Adjustment between the Brake Rod and the Air Cylinder, page 73 , item C,D)

NOTE: If electrical power or compressed air is missing, hydraulic pressure will apply the brake.

4.2.6.2 How to Release the Brake for Machines with a "Brake Release" Output

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1. Turn the control output called "brake release" on to energize the air cylinder valve.
2. Air pressure compresses the spring and releases the brake. (Figure 26: The Adjustment between the Brake Rod and the Air Cylinder, page 73 , item B)

4.2.6.3 How to Apply and then Release the Brake Quickly

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There are two air tubes at (Figure 21: A typical hydraulic brake system, page 63 , item 1). One supplies compressed air from an air valve. The other sends this compressed air to a pressure switch. If you remove one of the two tubes when compressed air is there, you will apply the brake.

1. Disconnect the air tubing (Figure 21: A typical hydraulic brake system, page 63 , item 1).
2. Turn the "brake release" output on. The air valve will supply compressed air to one of the tubes. (Figure 21: A typical hydraulic brake system, page 63 , item 1).
3. Quickly move one of the compressed air tubes (Figure 21: A typical hydraulic brake system, page 63 , item 1) on and off the air cylinder.
4. After you complete this procedure, connect the air tubing.

4.2.6.4 How the Brake Operates on Divided Cylinder Machines

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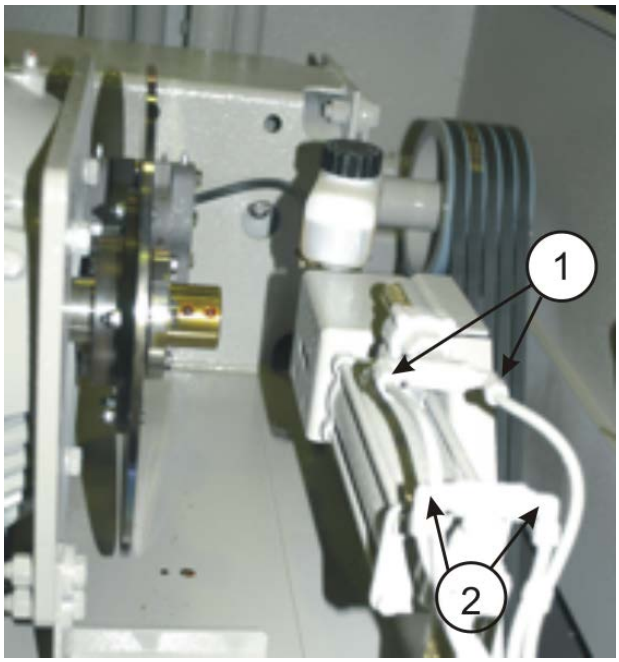
Figure 27. A Typical First and Second Brake on a Divided Cylinder Machine

Two pairs of air tubing connect to different ends of the air cylinder.



Legend

1. Tubing for air that releases the first brake (85 -100 PSI) (5.95 - 07.0 kg/cm-cm)
2. Tubing for air that applies the second brake (10 – 12 PSI) (0.7-0.84 kg/cm-cm)

- On divided cylinder machines, two pair of air tubes connect to different ends of the air cylinder.
- When the cylinder turns, air pressure at Figure 27: A Typical First and Second Brake on a Divided Cylinder Machine, page 75 , item 1 compresses the spring and releases the brake.
- When you operate the stop control, air pressure at 1 is removed. Then the spring in the air cylinder applies the brake.
- If you open the door, the 2nd brake is applied. Then the air pressure at Figure 27: A Typical First and Second Brake on a Divided Cylinder Machine, page 75 , item 2 and the spring apply the brake.

4.2.6.5 The Second Brake

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If your machine has a second brake which uses air pressure and spring pressure, it will have a pressure regulator. Make sure that you adjust the air pressure of the second brake (Figure 27: A Typical First and Second Brake on a Divided Cylinder Machine, page 75 , item 2) to 10 – 12 PSI (0.7-0.84 kg/cm-cm).

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Drive Chart

3 Sheets

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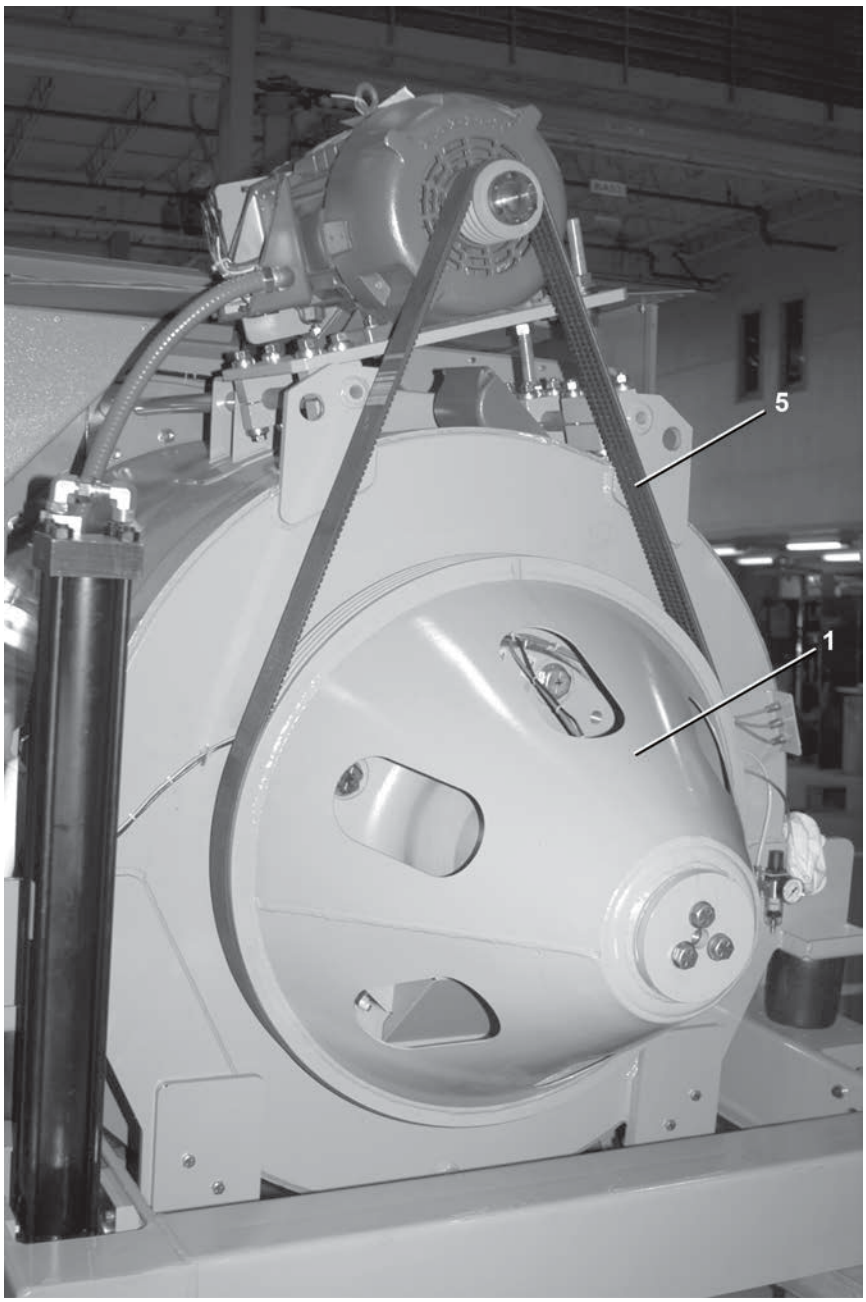
Figure 28. H7N model shown



Drive Chart

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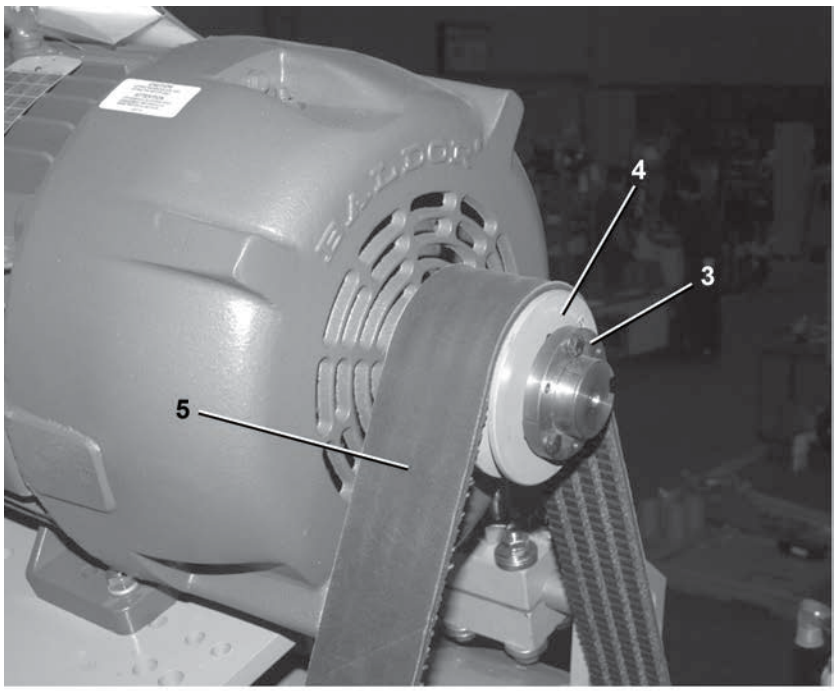
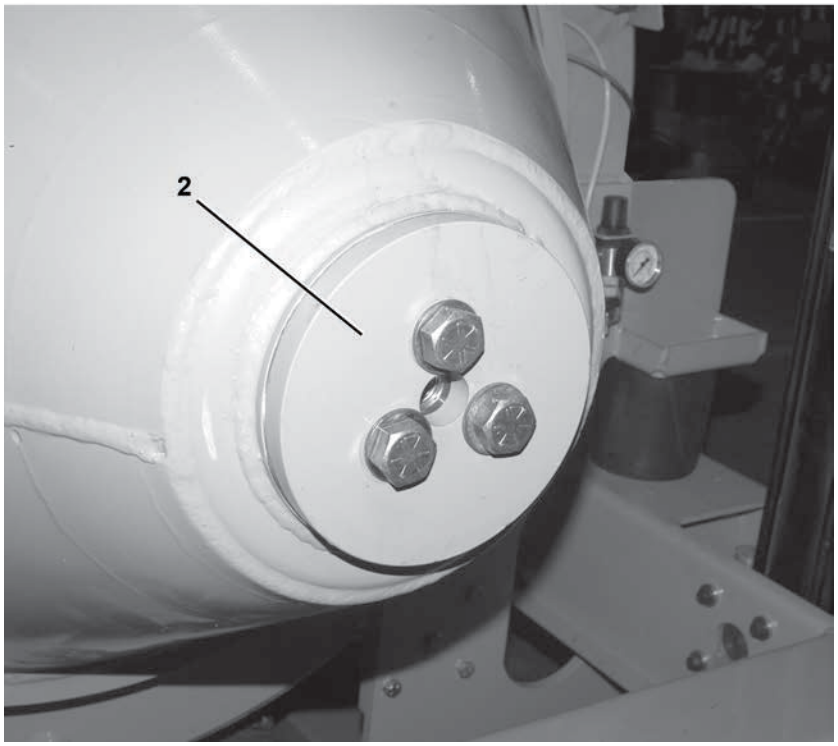
Figure 29. Detail Views





Drive Chart

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Table 20. Parts List—Drive Chart

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Components				
all	1	98CF21925	PULLEY, 4840F7 CSM	
all	2	98CF21923	PULL UP PLATE, 4840F CSM	
all	3	56Q1RSD	1+7/8" BUSH VPUL QD TYPE SD	
all	4	56044B4SD	VPUL 4B44 QD TYPE (SD)	
all	5	56VB147XB4	VBAND 4RBX147 EACH = 1	

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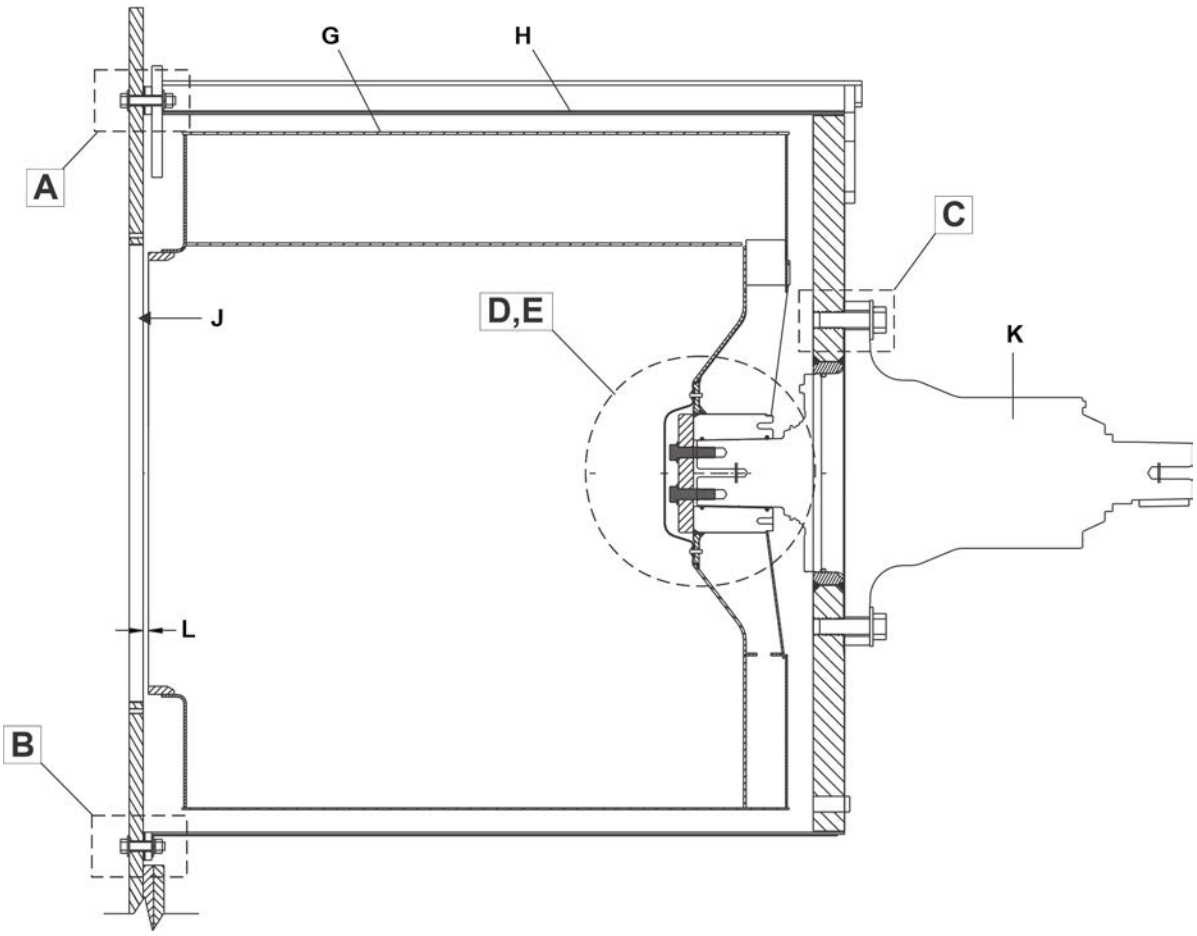
Cylinder and Bearing Installation

4 Sheet

Figure 30. Cross section view



Legend

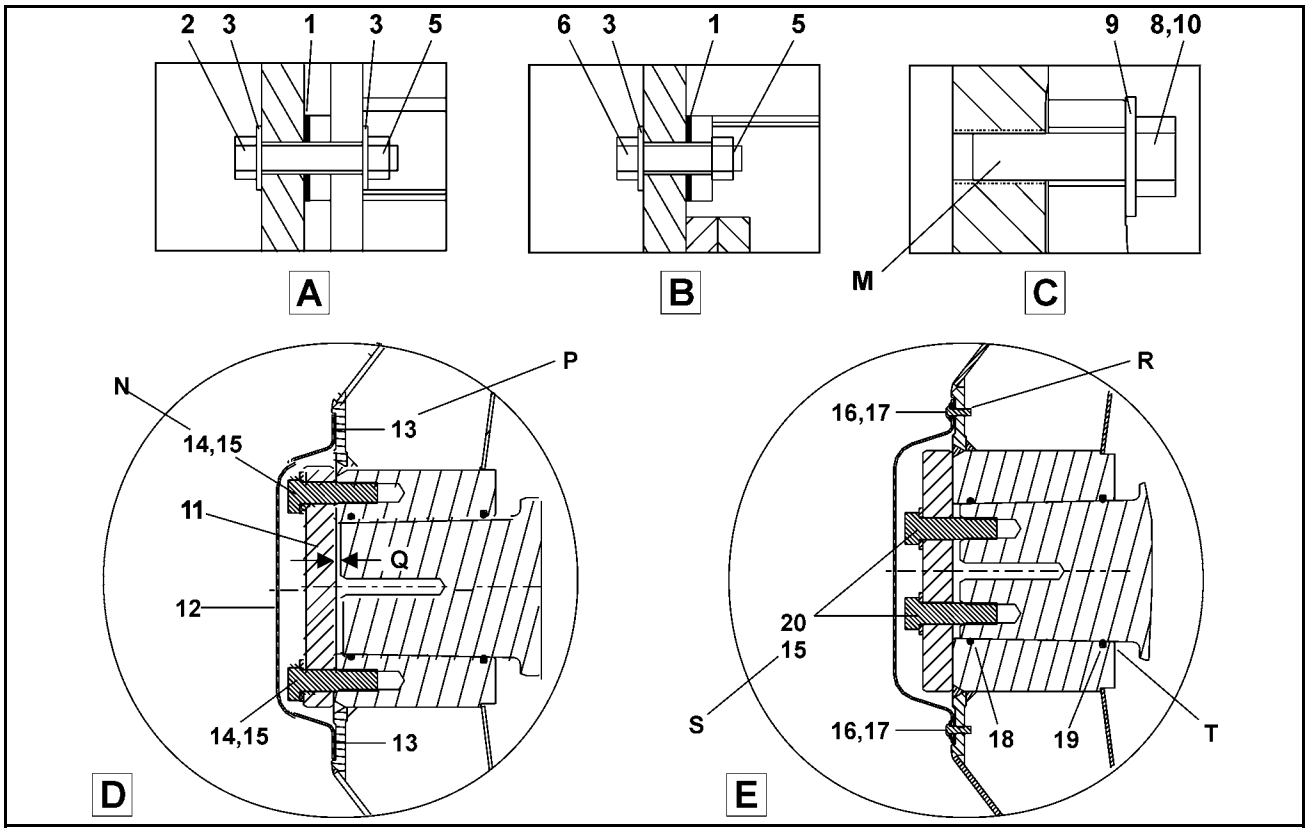
A. Detailed view — Top connection between the shell front and the shell side sheet
B. Detailed view — Bottom connection between the shell front and the shell side sheet
C. Detailed view — Connection between the shell rear and the bearing housing
D. Detailed view — Connection between the Pull-up plate and the Hub (outer bolts)
E. Detailed view — Connection between the Pull-up plate and the Shaft (inner bolts)
G. Cylinder
H. Shell
J. Shell front
K. Bearing housing
L. This dimension must be in this range: 0.3125 inches [8mm] — 0.375 [9.5mm].

Cylinder and Bearing Installation

4 Sheet

4840F, MWF100, MWF125

Figure 31. Detailed views



Legend

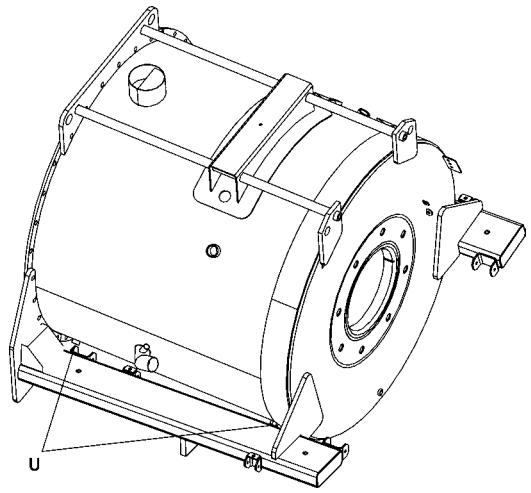
A. Top connection between the shell front and the shell side sheet
B. Bottom connection between the shell front and the shell side sheet
C. Connection between the shell rear and the bearing housing
D. Connection between the Pull-up plate and the Hub (outer bolts)
E. Connection between the Pull-up plate and the Shaft (inner bolts)
M. Use thread lock compound Locktite 242. Tighten to 1475 FT. LBS.
N. Use thread lock compound Locktite 242. Tighten items 14 and 15 to 413 FT. LBS. (4 instances).
P. Apply silicone to the hub side of the gasket.
Q. 0.25 inches [6.3mm].
R. Use thread lock compound Locktite 242. Tighten items 16 and 17 to 36 IN. LBS. (18 instances).
S. Use thread lock compound Locktite 242. Tighten items 20 and 15 to 413 FT. LBS. (4 instances).
T. Apply oil to the o-rings before you assemble.

Cylinder and Bearing Installation

4 Sheet

4840F, MWF100, MWF125

Figure 32. Shell plugs



Legend

U. There are four plugs in the shell. There are two on each side of the shell. For maintenance, replace the plugs with the bolts that hold the cylinder.

Table 21. Cylinder and Bearing Installation

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "All" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
			Assemblies	
	A		REFERENCE	MWF100
	B		REFERENCE	4840F, MWF125
			Components	
All	1	03 48053B	GSKT=53+1/2BC 4840F 1/8 THK	
A	2A	15B206	HEXCAPSCR M20-2.5X100, 8.8 ZINC	
B	2B	15K226FM	HEXCAPSCR M16X80, ZINC 8.8	
A	3A	15U283A	M20 FLATWASHER HARD	
B	3B	15U316M	FLTWASH D16 HARD HV200 D16 Z	
A	5A	15G240M	HEX NUT M20-2.5 ZINC	
B	5B	98CX773115	HEXNUT M16, ZINC	
A	6A	15B203	HEXCAPSCR M20-2.5X70 ZINC 8.8	
B	6B	98CX770164	HEXCAPSCR M16X70, ZINC8.8	
All	8	15K310M	HEXCAPSCR M30X100 CLS 10.9 Z	
All	9	15U600	FLTWASH 1+1/4 HARD ASTM F436	
All	10	20C007G	THDLOCKSEAL LCT24231 RMUBL50CC	
A	11	X2 21916	CYL PULL-UP PLATE, 4840F7	
B	11	98MW90720	CYL PULL-UP PLATE, MWF100	
All	12	X2 21917	COVER=CYL HUB, 4840F7 MACH	
All	13	02 21918	GASKET= CYL HUB COVER, 4840F7	
All	14	15B201B	M30-3.5X100 CLS10.9 HEX HD CAP SCREW ZINC	

Cylinder and Bearing Installation

4 Sheet

4840F, MWF100, MWF125

Table 21 Cylinder and Bearing Installation (cont'd.)

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "All" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
All	16	15U137	FLTWSHR M6-1 18-8 SS	
All	17	15K032MS	BUTSOKCAP SCR M6*20 SS	
All	18	60C155V	ORING 4.75ID3/16CS VITON75#351	
All	19	60C157V	ORING 4+7/8ID 3/16CS VITON-352	
All	20	15B201A	M20-2.5X60 CLS10.9 HEX HD CAP SCREW ZINC	

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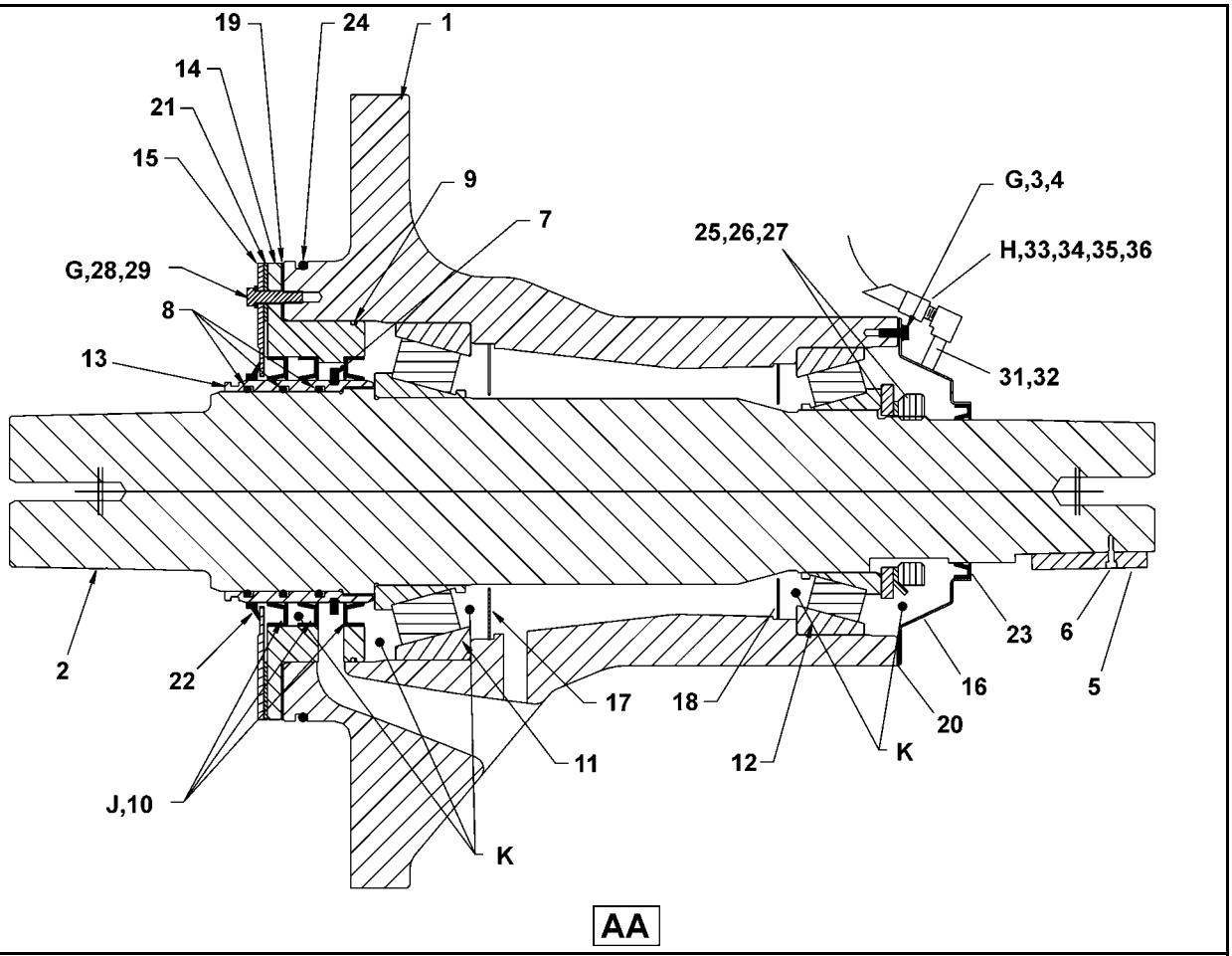
Bearing Assembly 4840F, MWF100, MWF125

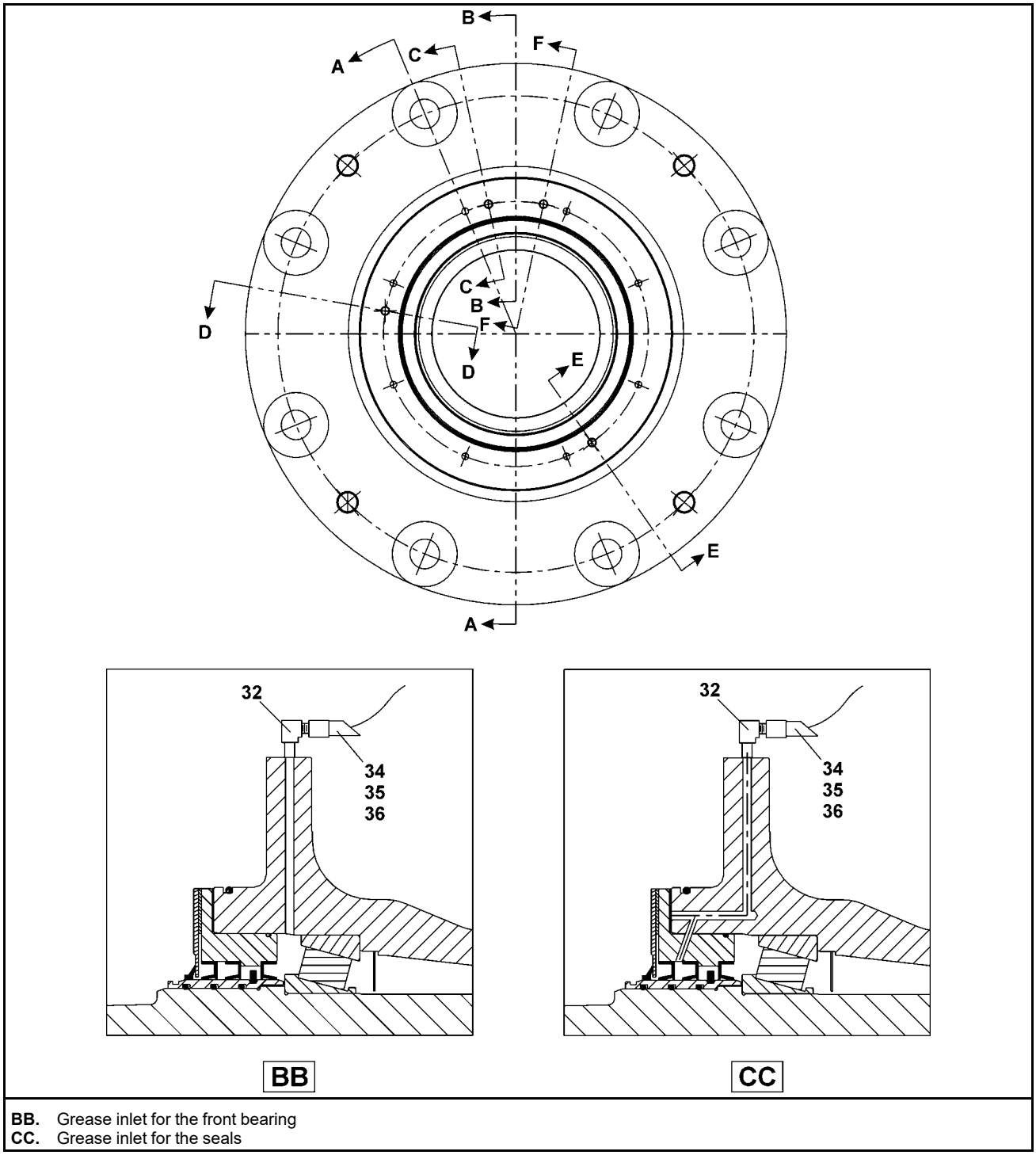
6 Sheet



G. Use Locktite 242 torque to 34 FT. LBS.
H. Grease inlet for the rear bearing
J. When you install new seals, make sure that they point in the direction shown. The installation sequence: Install one seal into the rear of the seal holder. Install the seal holder. Install the two remaining seals.
K. Fill this space with grease.

Bearing Assembly 4840F, MWF100, MWF125

6 Sheet



BB. Grease inlet for the front bearing
CC. Grease inlet for the seals

Bearing Assembly 4840F, MWF100, MWF125

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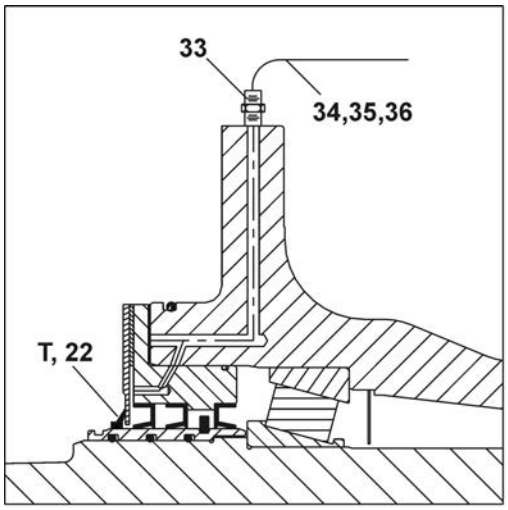

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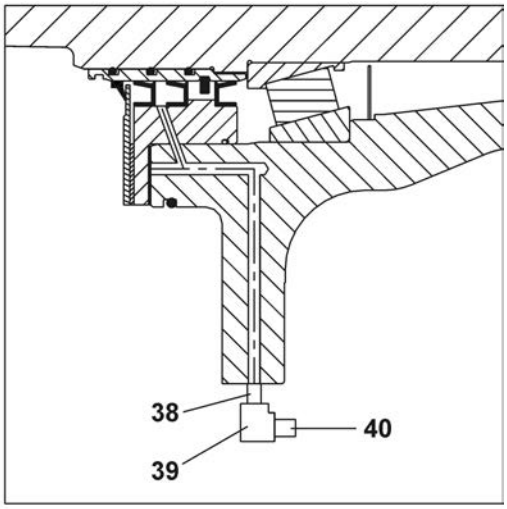

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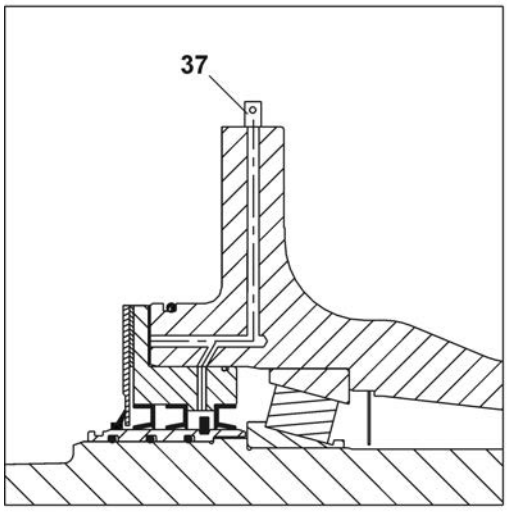
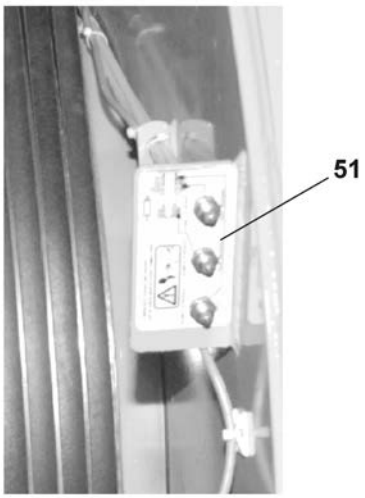


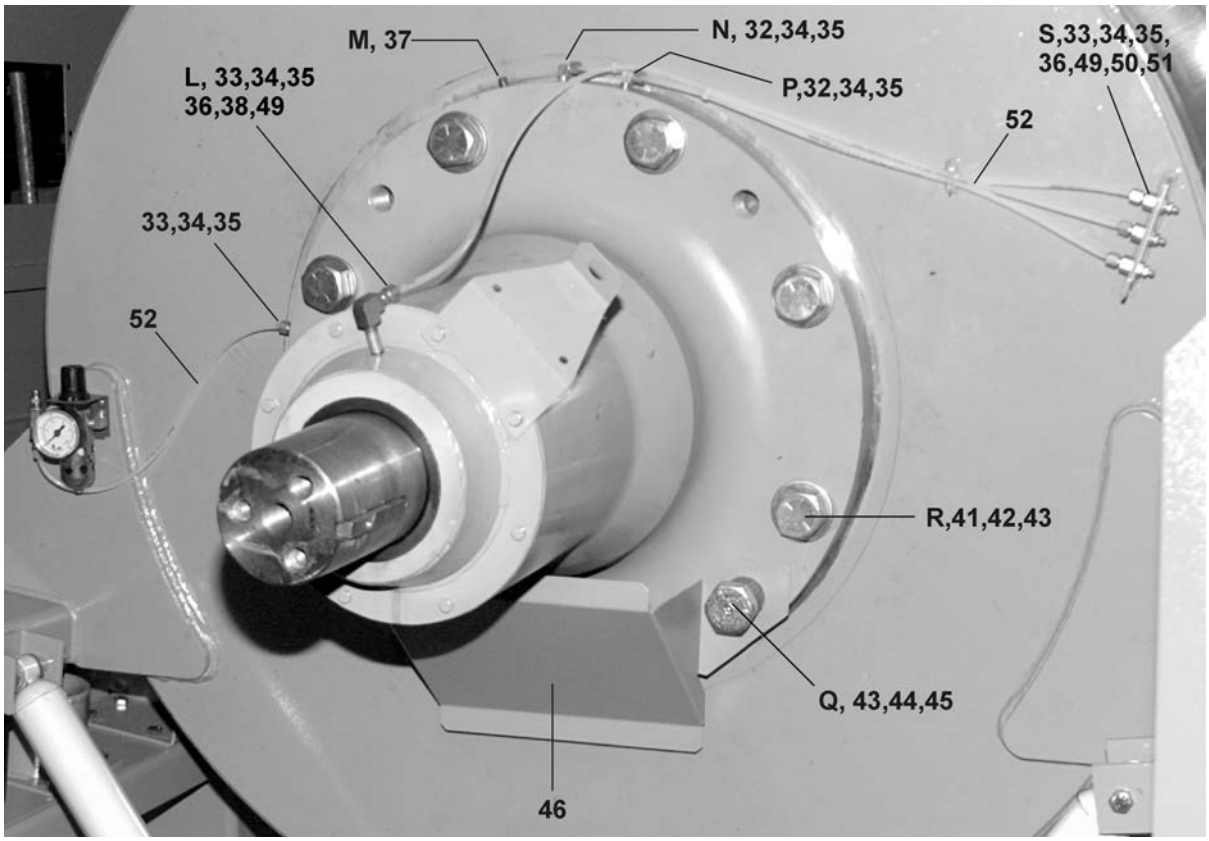
FF



DD. Compressed Air inlet for the outer seal
EE. Grease outlet for the seals
FF. Fluid inlet to flush the space between the seals

Bearing Assembly 4840F, MWF100, MWF125

6 Sheet



L. Grease inlet for the rear bearing
M. Fluid inlet to flush the space between the seals
N. Grease inlet for the front bearing
P. Grease inlet for seals
Q. 2 instances
R. 8 instances
S. 3 instances
T. Outer seal

Table 22. Bearing Assembly 4840F, MWF100, MWF125

Used In	Item	Part Number	Description/Nomenclature	Comments
			Assemblies	
	A	98CMCR4811	BEARING ASSEMBLY — REFERENCE	4840, MWF125
	B	98MW4801	BEARING ASSEMBLY — REFERENCE	MWF100
Components				
A	1	98CMCR4830	4840F BEARING HOUSING, METRIC	
B	1	98MW4810	MWF100 BEARING HOUSING	
A	2	98CMCR4831	4840F MAIN SHAFT, METRIC	
B	2	98MW4811	MWF100 MAIN SHAFT	
	3	15K032MS	BUTSOKCAP SCR M6*20 SS	

Bearing Assembly 4840F, MWF100, MWF125

6 Sheet

Table 22 Bearing Assembly 4840F, MWF100, MWF125 (cont'd.)

Used In	Item	Part Number	Description/Nomenclature	Comments
	4	15U137	FLTWSHR M6-1 18-8 SS	
	5	153E232	SQMACHKEY 3/8X3/8X3+3/4	
	6	15N102MS	FLATMACSCR M5X10 SS	
	7	02 21817	SLINGER=BRG FRNT SEAL,4840F	
A	8	60C160DB	ORING 6.25ID3/16CS BUNA70 -362	
A	8	60C160DV	ORING 6.25ID3/16CS VITON70#362	VITON
A	9	60C275	ORING 10.5ID 1/8CS BUN70-275	
A	9	60C275V	ORING 10.5ID 1/8CS VITON-#275	VITON
B	9	60C173A	ORING 8.484ID .139CS BUN70	
A	10	24S148	SEAL 7.0X8.5X.625#07009304LUPN	
A	10	24S148V	SEAL 7.0X8.5X.625#07009304LUPV	VITON
B	10	24S140	SEAL 5.75”x7.0”x.625”LUP	
A	11A	54A986	TAPEROLBRG SKF#32230J2 SET	
B	11B	98CX830136	TAPEROLBRG NTN 4T- HH224346/HH224310	
A	12A	54A987	TAPEROLBRG SKF#32226J2 SET	
B	12B	54AT101190	TIMK HH221449/HH221410=4"BORE	
A	13A	X2 21802	SHAFT SEAL SLEEVE, 4840F7	
B	13B	98MW90405	SHAFT SEAL SLEEVE, MWF100	
A	14A	X2 21803	MACH=FRONT SEAL HLDR, 4840F7	
B	14B	98MW90403	MACH=FRONT SEAL HLDR, MWF100	
A	15A	X2 21804	PLATE=EXCLUDER SEAL, 4840F7	
B	15B	98MW90409	PLATE=EXCLUDER SEAL, MWF100	
A	16A	02 21805	REAR SEAL HOLDER, 4840F7	
B	16B	98MW90404	REAR SEAL HOLDER, MWF100	
A	17A	02 21806	FRONT GREASE SHIELD, 4840F7	
B	17B	98MW90407	FRONT GREASE SHIELD, MWF100	
A	18A	02 21807	REAR GREASE SHIELD, 4840F7	
B	18B	98MW90408	REAR GREASE SHIELD, MWF100	
A	19A	02 21810	GASKET=FRNT SEAL HLDR,4840F7	
B	19B	98MW90406	GASKET=FRNT SEAL HLDR, MWF100	
A	20A	02 21811	GASKET=REAR SEAL HLDR,4840F7	
B	20B	98MW90411	GASKET=REAR SEAL HLDR, MWF100	
A	21	02 21812	GASKET=EXCLUDER SEAL, 4840F7	
B	21	98MW90406	GASKET=FRNT SEAL HLDR, MWF100	
A	22	24S146	SEAL 7.0X8.0X.437 TYPE SSW NIT	
A	22	24S146V	SEAL 7.0X8.0X.437 TYPE SSW VIT	VITON

Bearing Assembly 4840F, MWF100, MWF125

6 Sheet

Table 22 Bearing Assembly 4840F, MWF100, MWF125 (cont'd.)

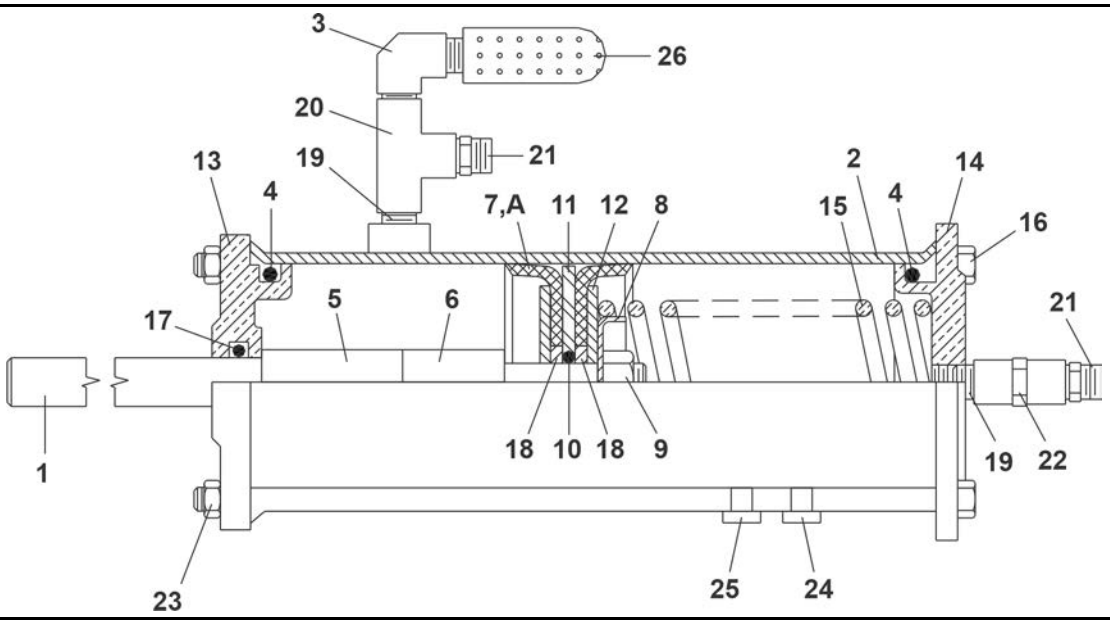
Used In	Item	Part Number	Description/Nomenclature	Comments
B	22	24S141	SEAL EXCLUDER 10817 H1L5 SSW STYLE 5.75" X 7.875" X .625"	
A	23A	24S114	SEAL 4.5X5.5X.50 JM# 9170 LUP	
A	23C	24S114V	SEAL 4.5X5.5X.50 JM#9170LUP-V	VITON
B	23B	98CX850453	SEAL WA95 125 12	
A	24A	60C190	ORING 14.0ID 1/4CS BUNA70-457	
A	24B	60C190D	ORING 14.0ID 1/4CS VITON -457	VITON
B	24C	60C177	ORING 10.975 ID .275 CS BUNA 70	
A	25A	56AHN24	AN24 BEARING LOCKNUT	
B	25B	98MW90412	BEARING LOCKNUT, MWF100	
A	26A	56AHW124	TW124 BEARING LOCKWASHER	
B	26B	98CX773812	BEARING LOCKWASHER, MWF100	
A	27A	56ATW24	TONGUE WASH TM K91524 FOR AN24	
B	27B	98MW90420	TONGUE WASH, MWF100	
B	28B	15K117MS	HXCAPSCR M10X35 SS 8.8	
A	29A	15U260	LOCKWAASHER MEDIUM 3/8 SS18-8	
B	29B	15U276S	FLTWSHR.475ID.656OD 22GA 18-8S	
All	30	20C003A	ADHESIVE BLK MAX 1OZ LOC#38050	
All	32	98CX932503	PIPE FITTING, 90 DEGREE, .25X1/8 BSP	
All	33	98CX932801	PIPE FITTING, 6.5X1/4 BSP	
All	34	98CX961460A	SLEEVE DELRIN 6MM	
All	35	98CX961460	TUBE INSERT 4MM	
All	36	98CX931701	HEXBUSH, 1/4X1/8 BRASS BSP	
All	37	5SP0CFESSV	NPTPLUG1/8SQSLDBLKSTL LVENT125	
All	38	5SCC0ESFH	NPT HALFCOUP 1/4 304SS 150#	
All	40	54M029	RELIEFFIT 1/8STR ALEMITE 47200	
All	41	15K310M	HEXCAPSCR M30X100 CLS 10.9 Z	
All	42	15U600	FLTWASH 1+1/4 HARD ASTM F436	
All	43	20C007G	THDLOCKSEAL LCT24231 RMUBL50CC	
All	44	15K253H	HEXCAPSCR M24-3.0X40, 8.8 ZINC	
All	45	15U393	FLTWASH 1" HARD ASTM F436	
All	46	02 21818	BEARING DRIP SHIELD, 4840F	
All	49	15U281A	WASHER=CLIPPED 1/2 ID .06THK	
All	50	98CX961708	GREASE FITTING, 1/8BSP ZINC	
All	51	01 10025Y	NPLT:BEARING&SEAL LUB-48"MACH	
All	52	98CX910823	FLEXIBLE TUBING, 4X6MM OD	

BPWMJP01 / 2021134A BPWMJP01.1 0000338916 B.2 D.2 3/17/22, 2:21 PM Released

Brake Air Cylinder

2 Sheet

4840F7B, F7B, F7J, F7Z (AZ); MWF125J7, Z7



Legend

A . . . See BNWUUM02, Servicing Air Cylinders.

Table 23. Parts List—Brake Air Cylinder

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.

Used In	Item	Part Number	Description/Nomenclature	Comments
			Reference Assemblies	
	A	AAC4840F	AIRCYL=BRAKE ASSY, 4840F7	4840F, 4840H. 6836H, MWF125
	B	AAC68001	AIRCYL=BRAKE ASSY, 6836F5A	6836M5K, 7246M5K
			Components	
all	1	02 18650B	STEM=2WAY AIRCYL BRAKE 7.88L	
all	2	W2 18646	*CYLINDER-AIR=DOUBLEACT BRAKE	
all	3	53A031XB	BODY-EL90MALE.25X25 #269C-4-4B	
all	4	60C132	ORING 2"IDX3/16CS BUNA70 #329	
all	5	27B250	SPCRROLL.5ID1.5L.062T STLZNC	
all	6	27B34010SS	SPACERROLL .51ID.625L.062T SS	
all	7	02 02194	PISTON CUP=DUMPVALVE 2+3/8"	
all	8	02 18651	WASHER=2 WAY BRAKE CYL	
all	9	15G220	NUTLOK THINHX 3/8-24 SS/NYL	
all	10	60C106	ORING 5/16ID 1/16CSBUNA70#011	
all	11	02 02105B	2.38"ACYL BRASS PISTONCUP WSHR	
all	12	02 02085	UP WASHER=2"OD=PISTON CUP	

Brake Air Cylinder

2 Sheet

4840F7B, F7B, F7J, F7Z (AZ); MWF125J7, Z7

Table 23 Parts List—Brake Air Cylinder (cont'd.)

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.

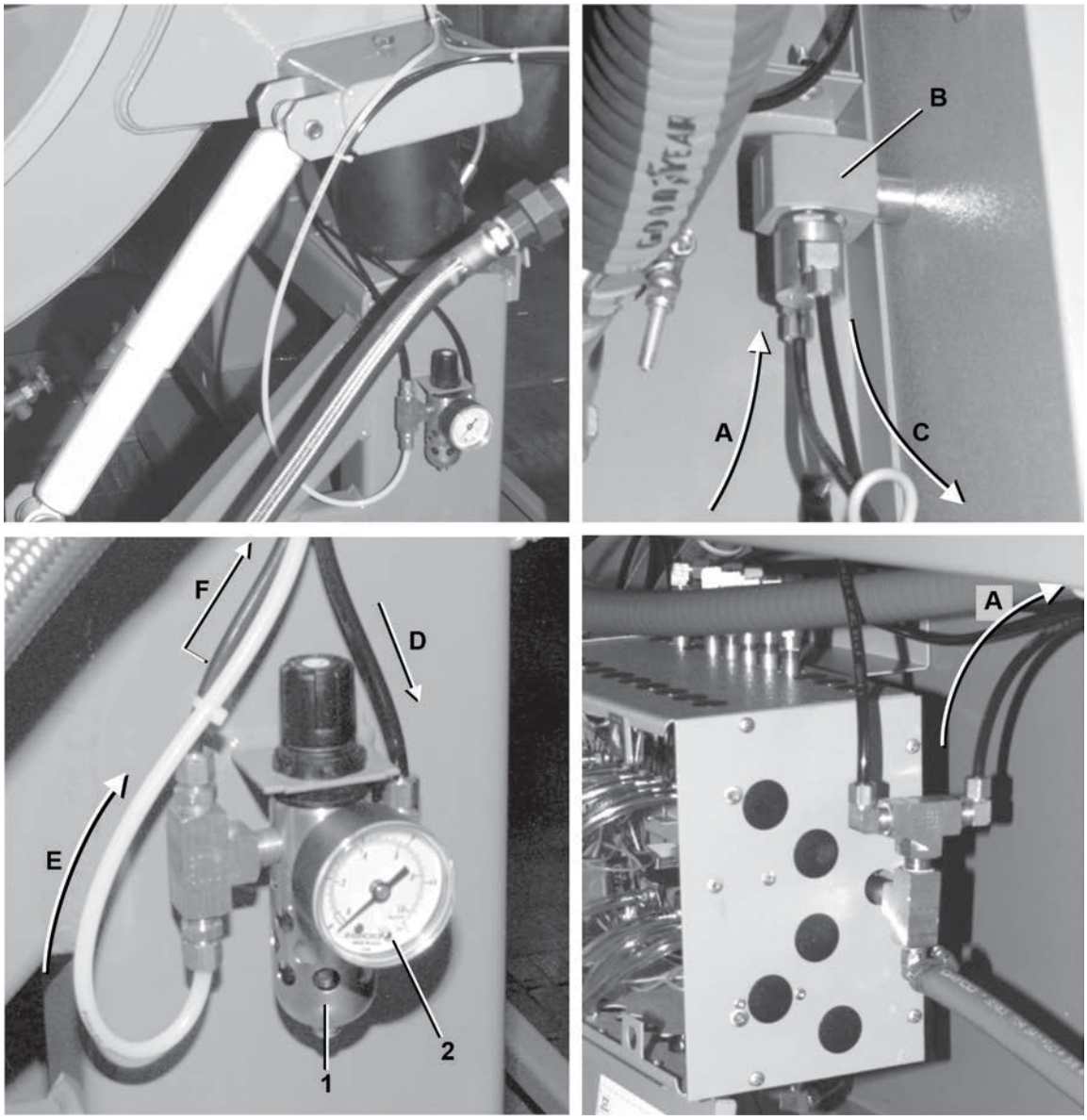
Used In	Item	Part Number	Description/Nomenclature	Comments
all	13	06 20702E	FLOW NOT ACTUATOR CYL HEAD	
all	14	02 02101	CYLHEAD W/TAPPED HOLE	
A	15	02 21865	SPRING=BRAKE ACT, 4840F	
B	15	02 17024	SPRING-SS=DUMP 1.5OD4FL40#/"	
all	16	W6 20702F	*FLOW NOT VLV=AIR-CYL ROD WLD	
all	17	60C110	ORING 1/2IDX3/32CS BUNA70 #112	
all	18	02 02185	WASHER=PISTON CUP COMP LIMIT	
all	19	5N0ECLSBE2	NPT NIP 1/4XCLS TBE BRASS 125#	
all	20	51V015	TEE 1/4 FGDBRASS 101T7-444	
all	21	53A008B	BODYMALECON.25X.25COMP#B68A-4B	
all	22	5SCC0EBE	NPT COUP 1/4 BRASS 150#PSI W/HEX	
all	23	15G185	HXNUT 5/16-18UNC2B SAE ZINC GR	
all	24	20L601F	ID TAG NAT'L#1614 ALUM EMB "F"	
all	25	20L601X	ID TAG NAT'L#1614 ALUM EMB "X"	
all	26	27A005A	MUFFLER 1/4"ALLIED B-28 BANTAM	

BPWFUI02 / 2021403 BPWFUI02.1 0000384805 A.3 D.2 9/28/21, 1:55 PM Released

Air Injection Components

2 Sheets

48040F7B, F7D, F7J, F7Z (AZ); MWF100J7,Z7,C7,Y7; MWF125J7, Z7,C7,Y7



Legend

A . . . Compressed air to the bearing seal coil
B . . . Bearing seal coil
C . . . Compressed air to the pressure regulator
D . . . Compressed air from the bearing seal coil
E . . . Compressed air to the bearing
F . . . Compressed air to the bearing pressure switch

Air Injection Components

2 Sheets

48040F7B, F7D, F7J, F7Z (AZ); MWF100J7,Z7,C7,Y7; MWF125J7, Z7,C7,Y7

Table 24. Parts List—Air Injection Components

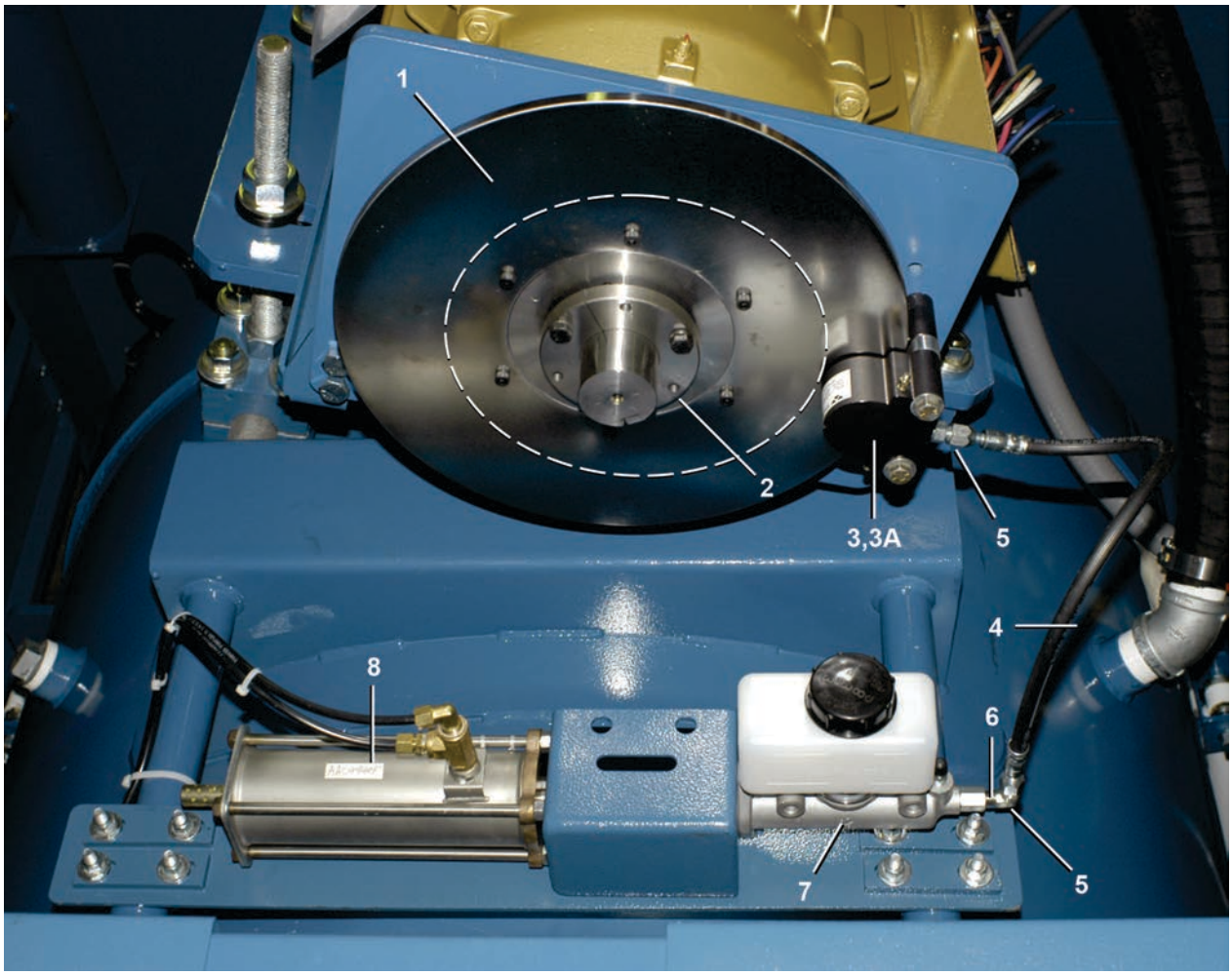
Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Components				
all	1	98CX880511	CSM AIR REGULATOR G1/4	
all	2	98CX902450	PRESSGAUGE R1/4",0-28PSI	

BPWFUI03 / 2021415 BPWFUI03.1 0000385082 A.4 D.2 10/8/21, 4:03 PM Released

Brake Components

3 Sheets

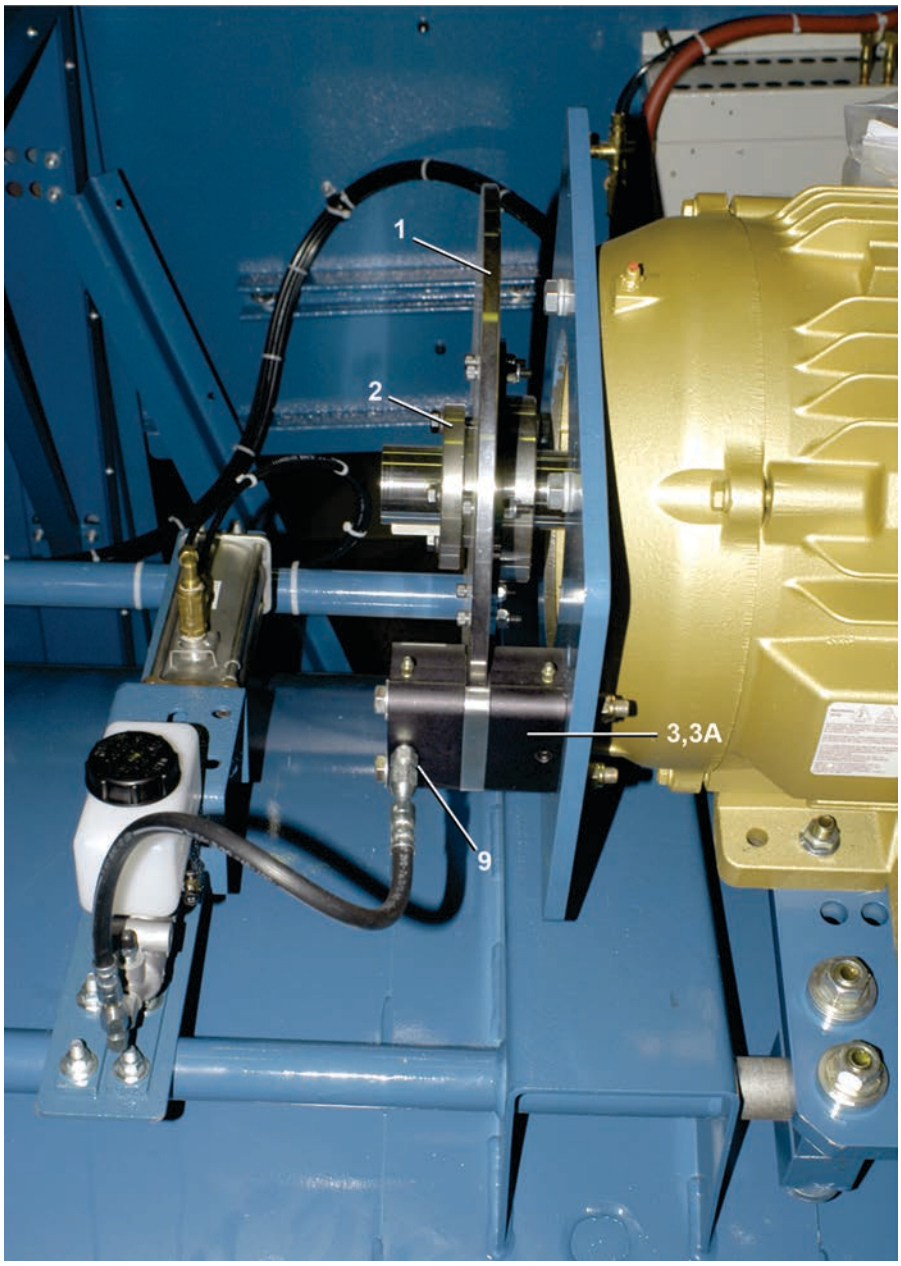
48040F7B, F7D, F7J, F7Z (AZ); MWF125J7 Z7, C7,Y7



Brake Components

3 Sheets

48040F7B, F7D, F7J, F7Z (AZ); MWF125J7 Z7, C7,Y7



Brake Components

3 Sheets

48040F7B, F7D, F7J, F7Z (AZ); MWF125J7 Z7, C7,Y7

Table 25. Parts List—Brake Components

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
			Components	
all	1	98CMCR4812	CALIPER DISK, 4840F CSM	
all	2	98CMCR4813	CSM BUSH VPUL QD TYPE SK, 1+7/8"	
all	3	54KC7974	CALIPER HYD D/A 3/8 DISC RETRACT	
all	3	54KC7963RK	REPAIR-CALIPER 1/4" H20 DISC	BRAKE PAD KIT
all	4	54KC7961BG	BRAKE HOSE=1/8"X18"OAL # 50612	
all	5	52AY0ER003	STR.1/4"MJICX1/8"MP#2404-4-2	
all	6	52XY0ER004	STRADTUN3/16MJX1/8FP#2405-3-2	
all	7	54KMC1125U	MASTER CYL = WILWOOD # 260-3380	
all	8	AAC4840F	AIRCYL=BRAKE ASSY, 4840F7	

5 Frame and Tilt Assemblies

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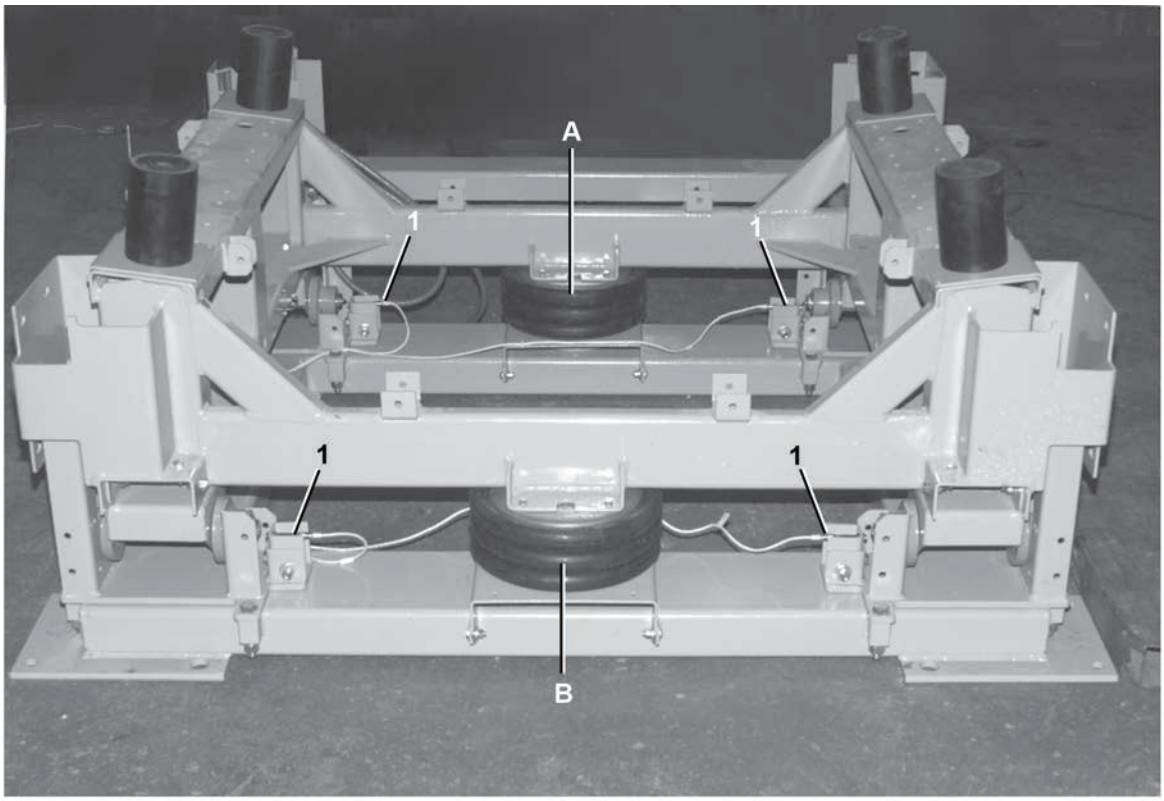
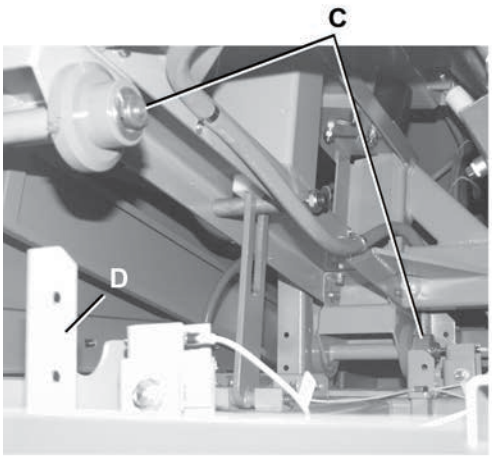
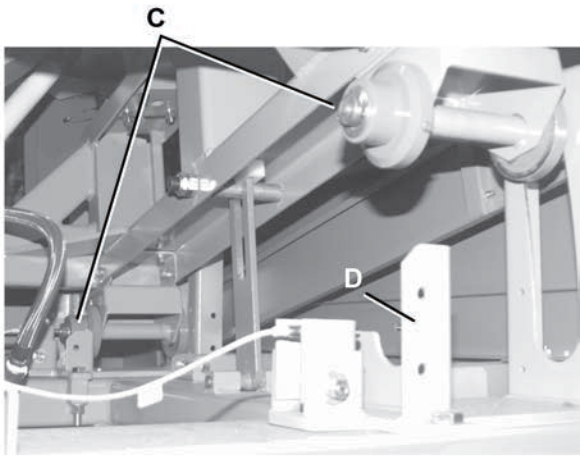
Air Tilt

3 Sheets

48040F7B, F7D (AZ)







Legend

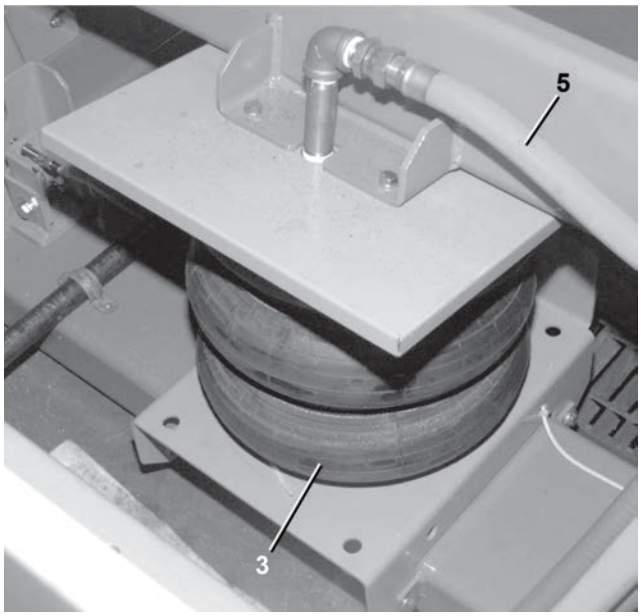
A . . . Tile forward air bag
B . . . Tilt rear air bag
C . . . Tilt wheel
D . . . Tilt cradle

Air Tilt

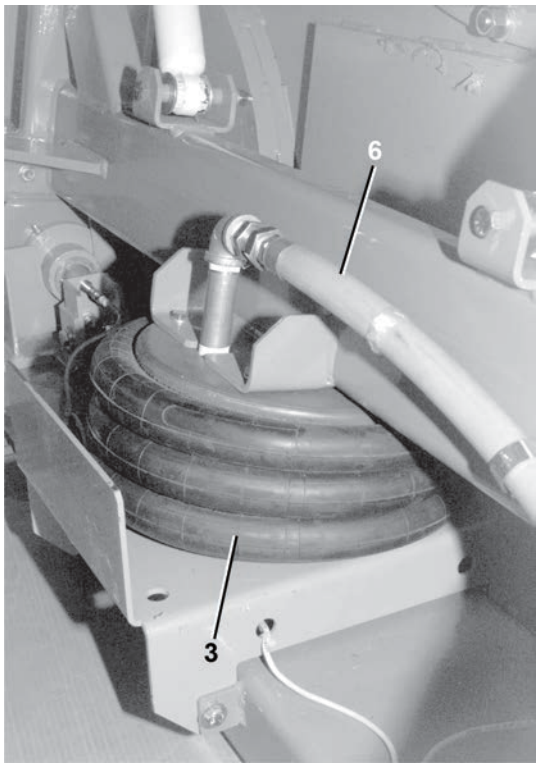
3 Sheets

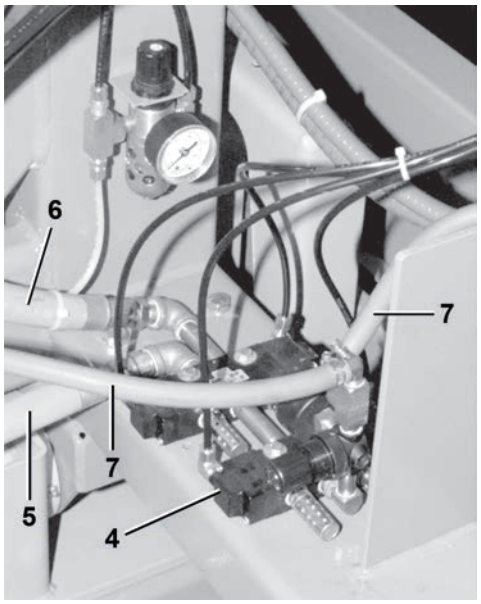
48040F7B, F7D (AZ)

Tilt Forward Air bag

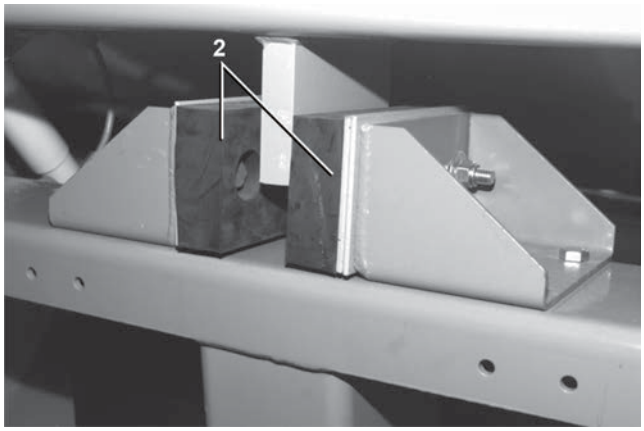


Tilt Rear Air bag





Tilt Stops



Air Tilt

3 Sheets

48040F7B, F7D (AZ)

Table 26. Parts List—Air Tilt

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Components				
all	1	09RPS12AAS	PROXSW QD CONN 12M NO-AC SHLD	
all	2	98CMCR4818	RESTPAD, 4840F CSM	
all	3	60B132	AIRMT S-333 3CONV F#W013587842	
all	4	98CMCR4814	AIR VLVS ASSY C-BLK TLT, 4840F CSM	
all	5	98CMCR4816	3/4 HOSE ASSY 24.5L, 4840F TILT CSM	
all	6	98CMCR4817	3/4 HOSE ASSY 80L, 4840F TILT CSM	
all	7	98CX873160	FLEXIBLE HOSE ID13XOD20X44M	

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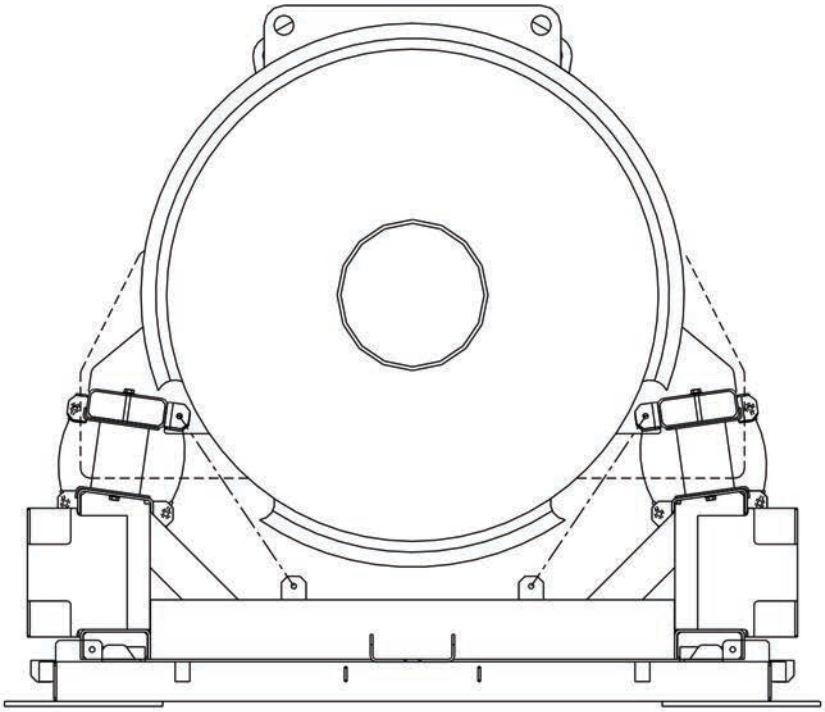
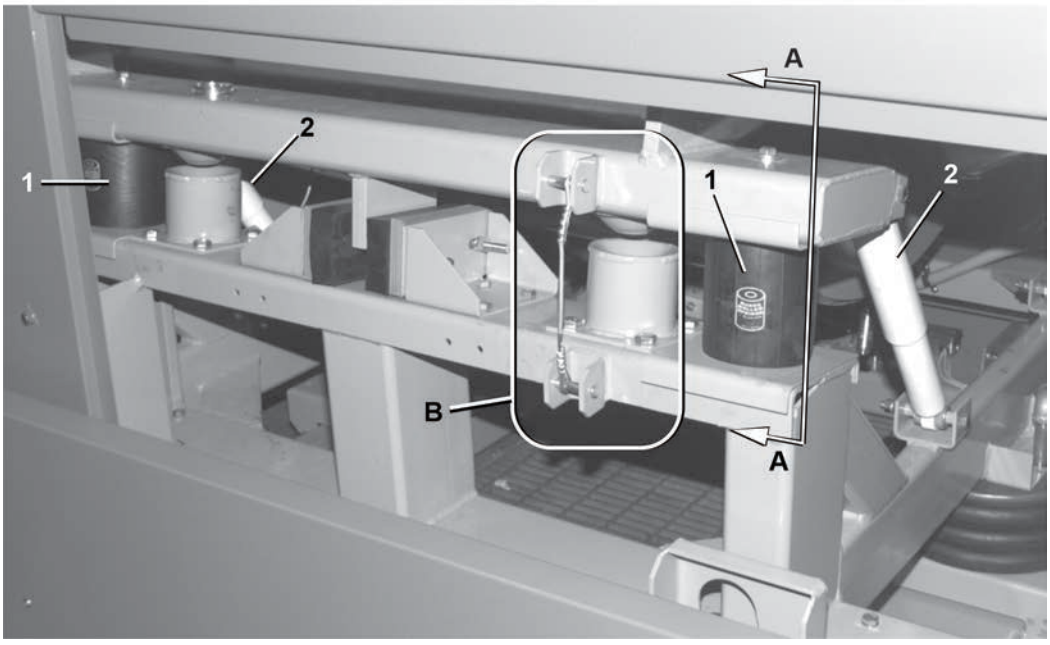
Suspension Components

2 Sheets

48040F7B, F7D, F7J, F7Z (AZ)

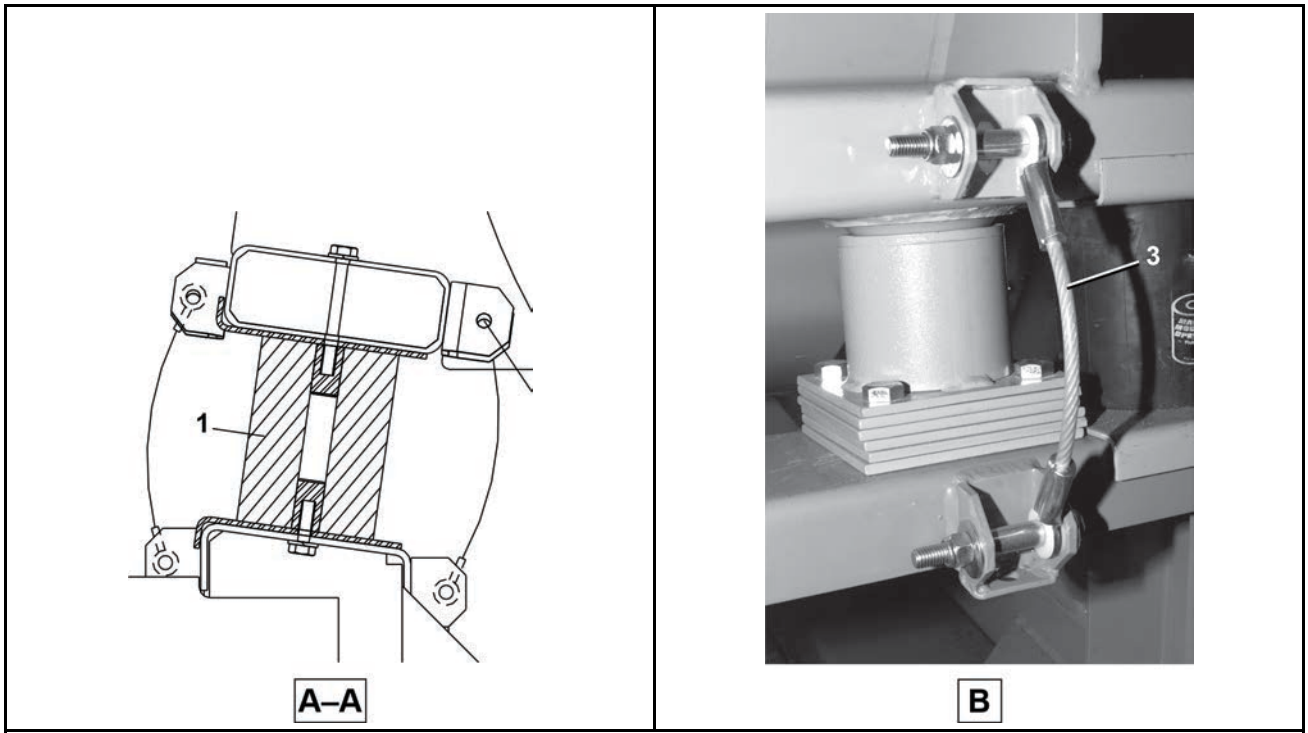




Suspension Components

2 Sheets

48040F7B, F7D, F7J, F7Z (AZ)



Legend

A–A . . Section view
B . . . Detail view

Table 27. Parts List—Suspension Components

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Components				
all	1	60B133	MM SPRG 5X1X7 F#W223580064	
all	2	60BS6832	SHOCK ABSORBR GABRIEL #65488440X	
all	3	27A969	CABLE ASSY SAVA#205801	

6 Door Assemblies

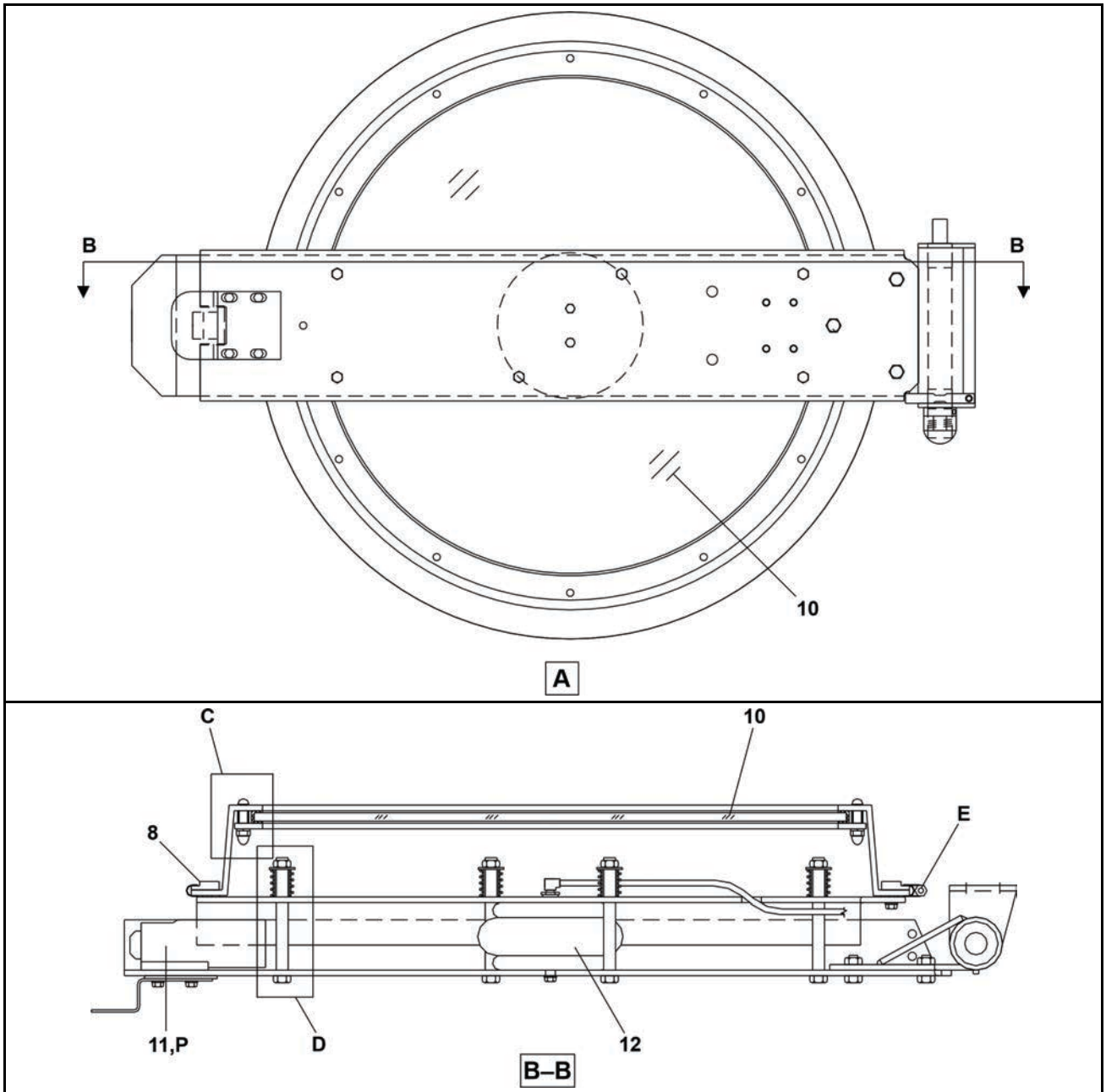
BPWFUD01 / 2021442 BPWFUD01.1 0000389818 D.2 A.9 10/26/21, 1:34 PM Released

Manual Door

5 Sheets

48040F7B ,F7D, F7J, F7Z (AZ)

Figure 33. Door Components



Legend

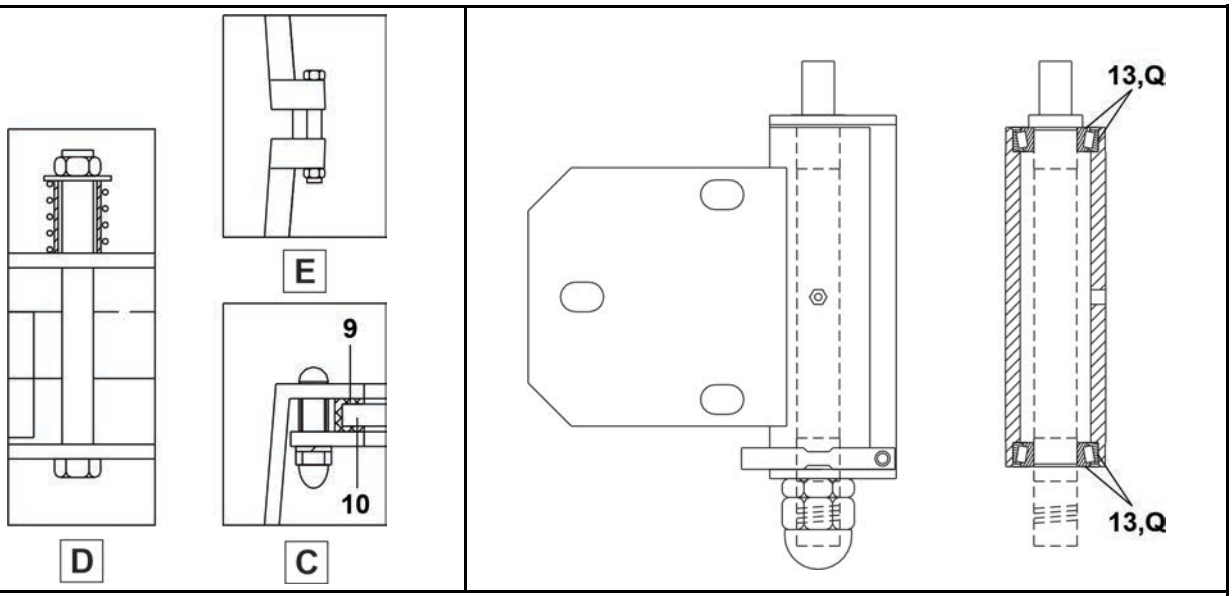
C . . . See detail C
D . . . See detail D
E . . . See detail E
P . . . Door latch

Manual Door

5 Sheets

48040F7B ,F7D, F7J, F7Z (AZ)

Figure 34. Door Components



Legend

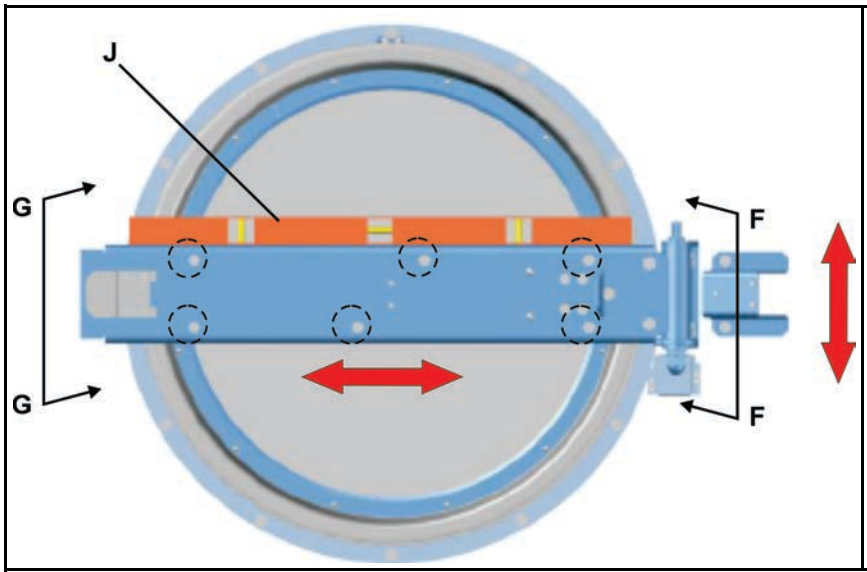
Q . . . Bearings

Manual Door

5 Sheets

48040F7B ,F7D, F7J, F7Z (AZ)

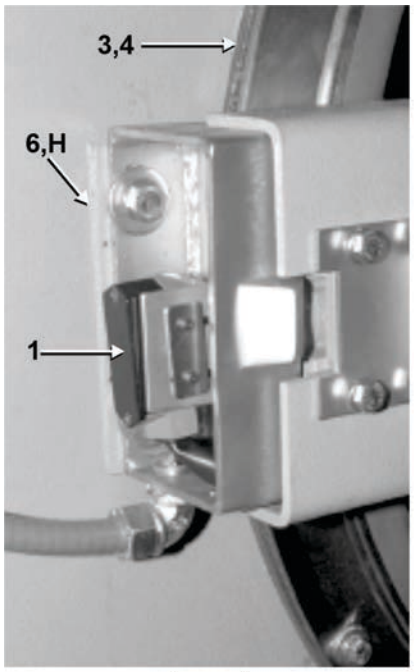
Figure 35. Adjust Horizontal Door Position



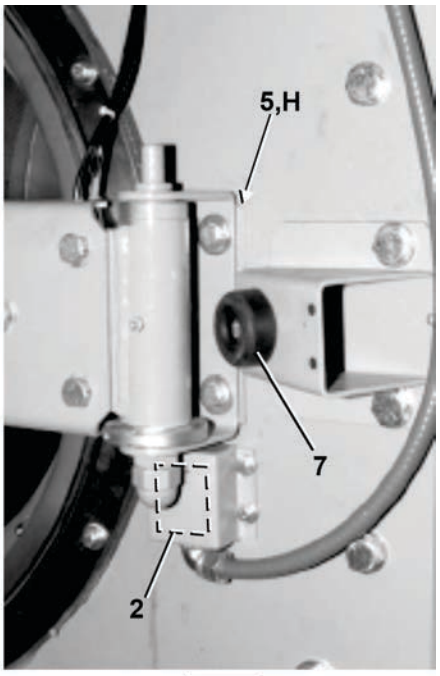
Legend

H . . . Shims, 3 instances

J . . . Level



G–G



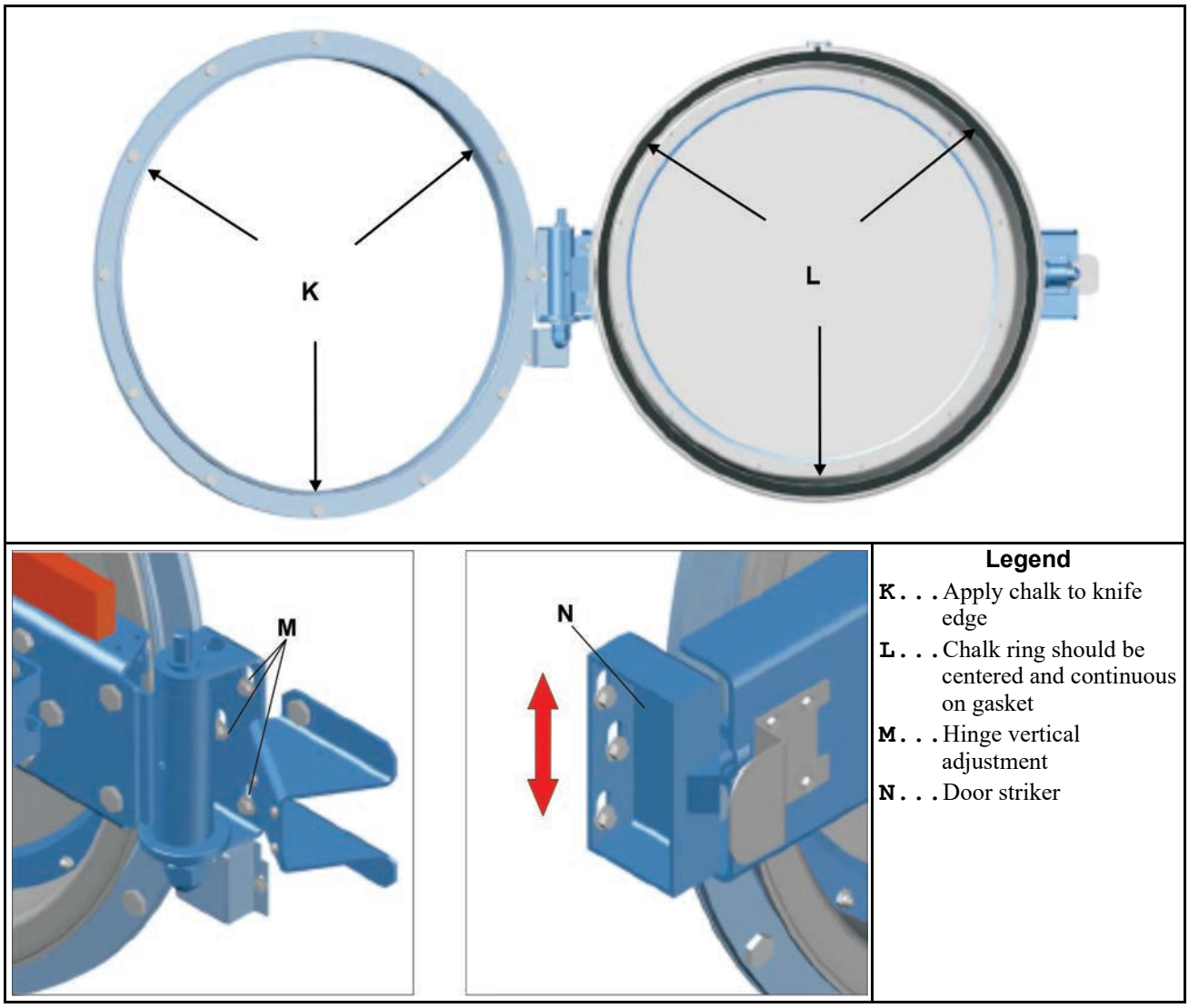
F–F

Manual Door

5 Sheets

48040F7B ,F7D, F7J, F7Z (AZ)

Figure 36. Adjust Vertical Door Position



Adjust Door Position

Install door with all shims and hardware. Do not tighten bolts

1. Make sure the door channel is level.
2. Test that the door is centered to the door opening.
3. Check door position. Apply chalk around the knife edge ring. Close the door and activate the door seal. Open the door and check the impression on the door gasket. The chalk impression should be centered on the door gasket and a continuous circle.

Manual Door

5 Sheets

48040F7B ,F7D, F7J, F7Z (AZ)

4. Adjust the position of the whole door. For left/right adjustments, slightly loosen the bolts shown in Figure 35: Adjust Horizontal Door Position, page 107 and adjust door with a rubber or leather mallet. For vertical adjustment, slightly loosen hinge bolts and adjust door.
5. Recheck door position.
6. When the door is centered, adjust the door striker to match the door. It should have the same gap top and bottom.
7. Tighten the door bolts.

Table 28. Parts List—Manual Door

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
all	1	98CMCR4819	DOOR LOCK SWITCH ASSY, 4840F CSM	
all	2	09RM01212S	CAPSW 12' 180DEG ROLLER SILVER	
all	4	98CF25026E	DOOR MTG RING GASKET=1/8", 4840F CSM	
all	5	98CF25170A	SHIM=HINGE BKT BOLT, 4840F CSM	
all	6	98CF25159W	SHIM=DOOR LATCH STRIKER, 4840F CSM	
all	7	98CX489258	RUBBER BUMPER, FOOT GUARD, 4840F CSM	
all	8	98CF25085A	DOOR GASKET, 4840F CSM	
all	9	98CF25083	DOOR GLASS GASKET, 4840F CSM	
all	10	98CF25013A	DOOR GLASS, 4840F CSM	
all	11	98CX15028	DOOR LATCH ASSY-DIVCYLS	
all	12	60B090	AIRMT S-131 1CONV.F#W013587731	
all	13	98CMCR4820	DOOR HINGE BEARING, 4840F CSM	

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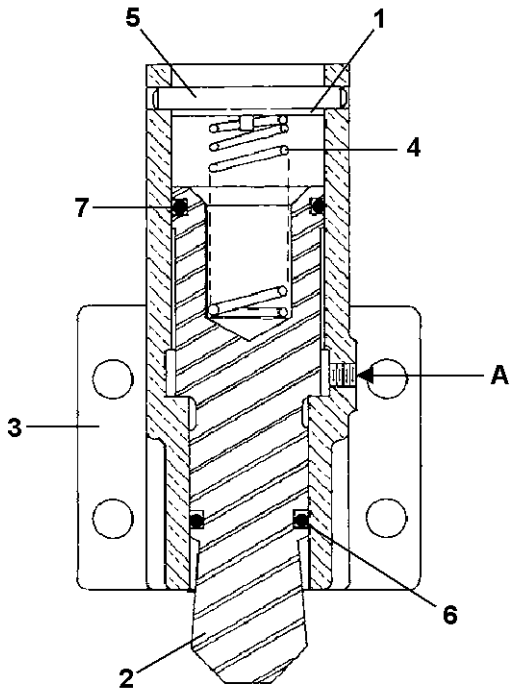
Door Latch

1 Sheet

Cross Section



Legend

A . . . Compressed air

Table 29. Parts List—Door Latch

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.

Used In	Item	Part Number	Description/Nomenclature	Comments
			Reference Assemblies	
	A	SA 15 028	Assembly, Door latch	
			Components	
all	1	02 15105	RETAINER RING	
all	2	02 15297	STRIKER	
all	3	02 15298	CYLINDER	
all	4	02 15836	SPRING	
all	5	15H090	PIN	
all	6	60C122	O-RING, 1”X1/8	
all	7	60C128	O-RING, 1+3/8X1/8	

7 Chemical Supply Devices

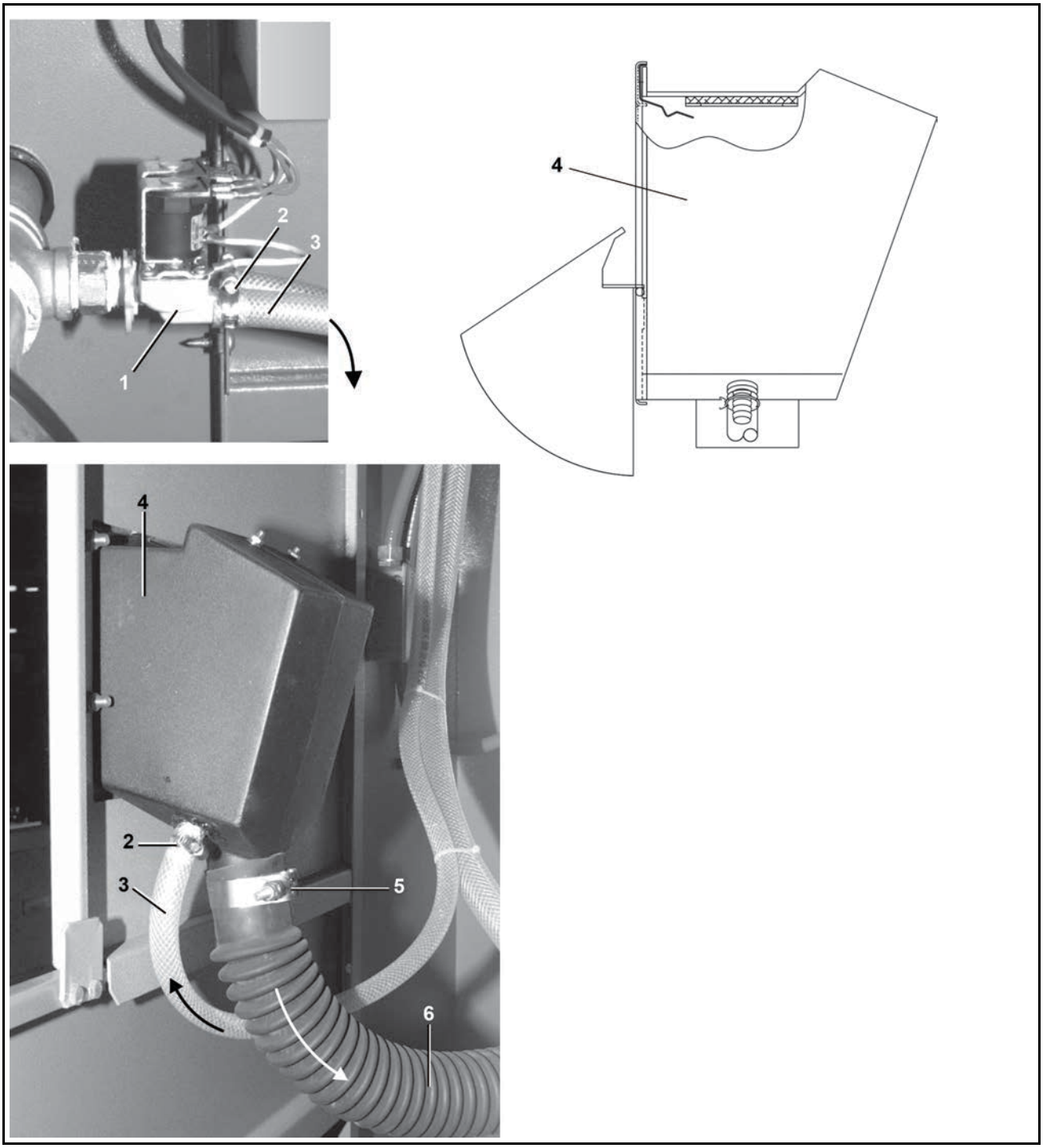
BPWFUC01 / 2021436 BPWFUC01.1 0000398059 A.3 D.2 10/25/21, 9:09 AM Released

Soap Chute

2 Sheets

48040F7B, F7D, F7J, F7Z (AZ)

Figure 37. Soap Chute Components and Installation



Soap Chute

2 Sheets

48040F7B, F7D, F7J, F7Z (AZ)

Table 30. Parts List—Soap Chute

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Components				
all	1	96TDC2AA71	1/2"N/C2WY240V50/60C VLV(DRYVC)	
all	2	98CX851324	HOSE CLAMP D13, CSM	
all	3	98CX873160	FLEXIBLE HOSE ID13XOD20X44M	
all	4	AWS30211A	PLASTIC SOAP ASSY	
all	5	98CX851341	HOSE CLAMP 2+1/4", CSM	
all	6	02 03870A	FLEXTUBE=5COMP 2.5"ID X 2"ID X18"LG	

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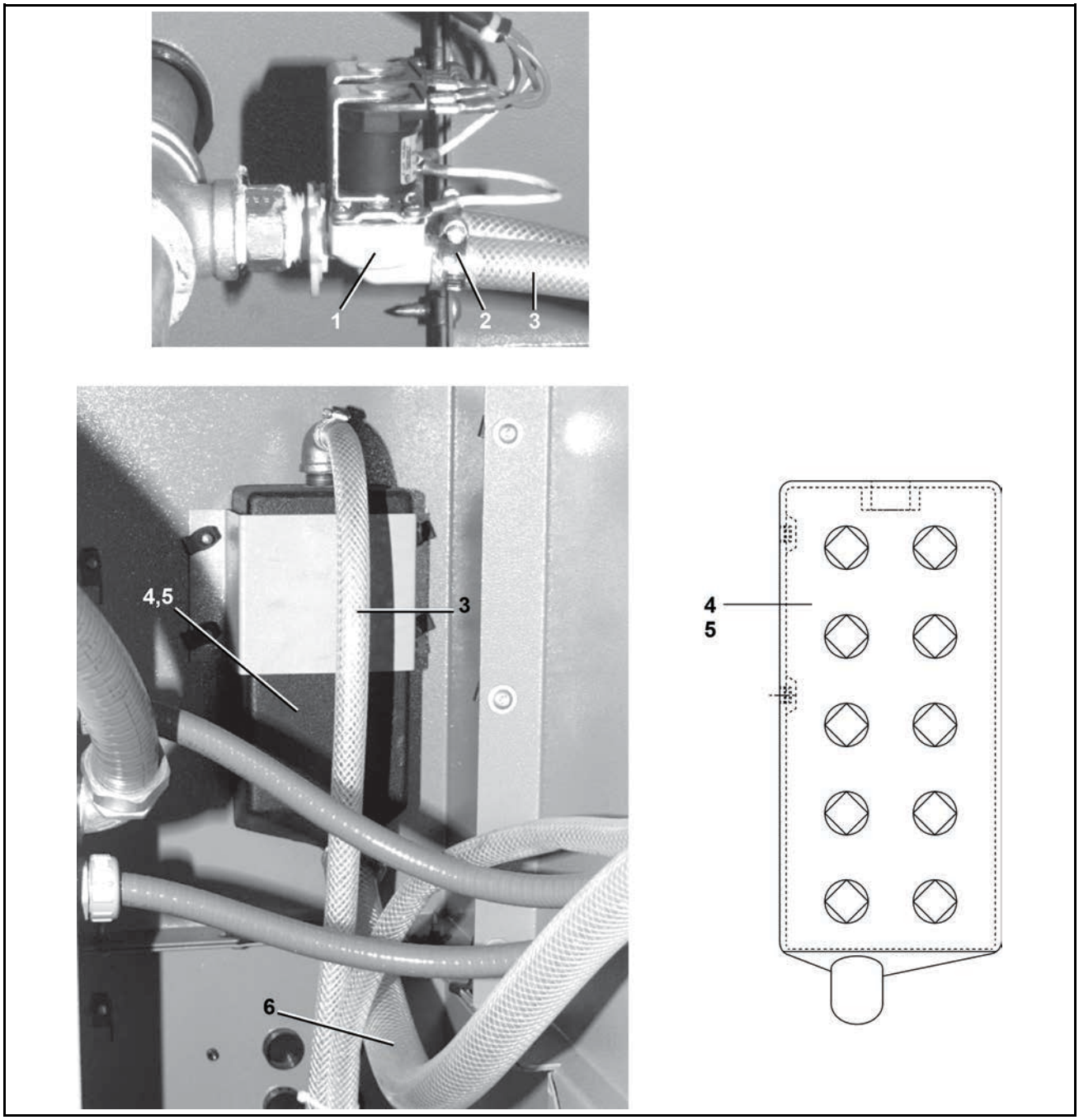
Peristaltic Chemical Inlets

2 Sheets

48040F7B, F7D, F7J, F7Z (AZ)

Figure 38. Water Valves and 10-Port Manifold (standard)

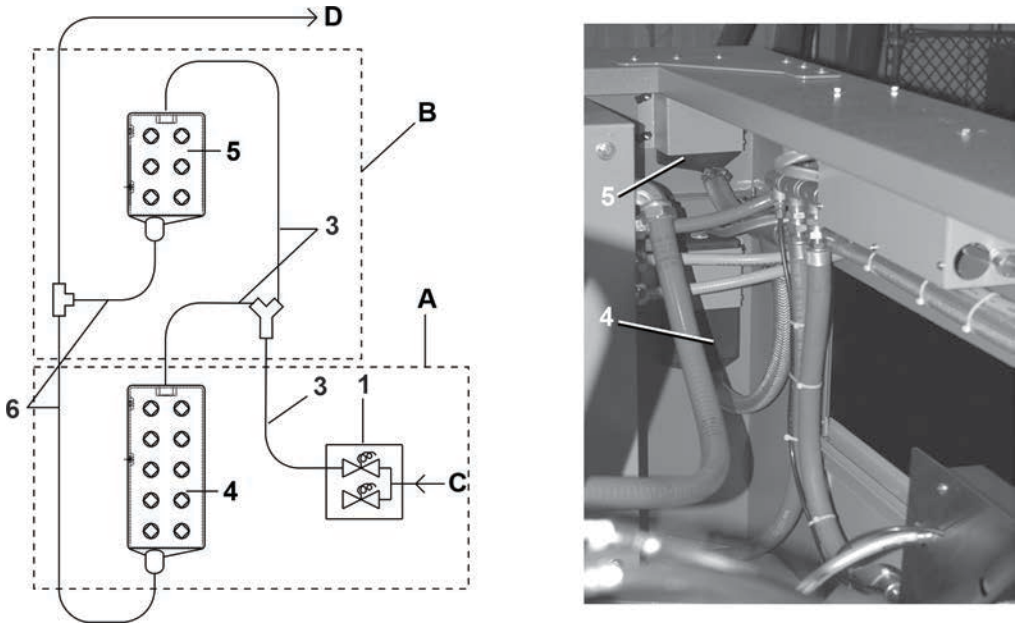


Peristaltic Chemical Inlets

2 Sheets

48040F7B, F7D, F7J, F7Z (AZ)

Figure 39. Schematic and Installed View



Legend

A . . . Ten-port (standard)
B . . . Six-port (optional)
C . . . Hot water to flush the chemical supply manifolds
D . . . Water and chemical supplies to the shell

Table 31. Parts List—Peristaltic Chemical Inlets

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.

Used In	Item	Part Number	Description/Nomenclature	Comments
			Components	
all	1	96TDC2AA71	1/2"N/C2WY240V50/60C VLV(DRYVC)	
all	2	98CX910814	FLEXIBLE HOSE ID12XOD19X44M	
all	3	98CX851324	HOSE CLAMP D13, CSM	
all	4	02 03589O	MOLDED LIQ SUPPLY MANFOLD=10	
all	5	02 03589L	MOLDED PERISTALTIC SOAPCHUTE	
all	6	98CX910816	FLEXIBLE HOSE ID25XOD34X44M	

8 Water and Steam

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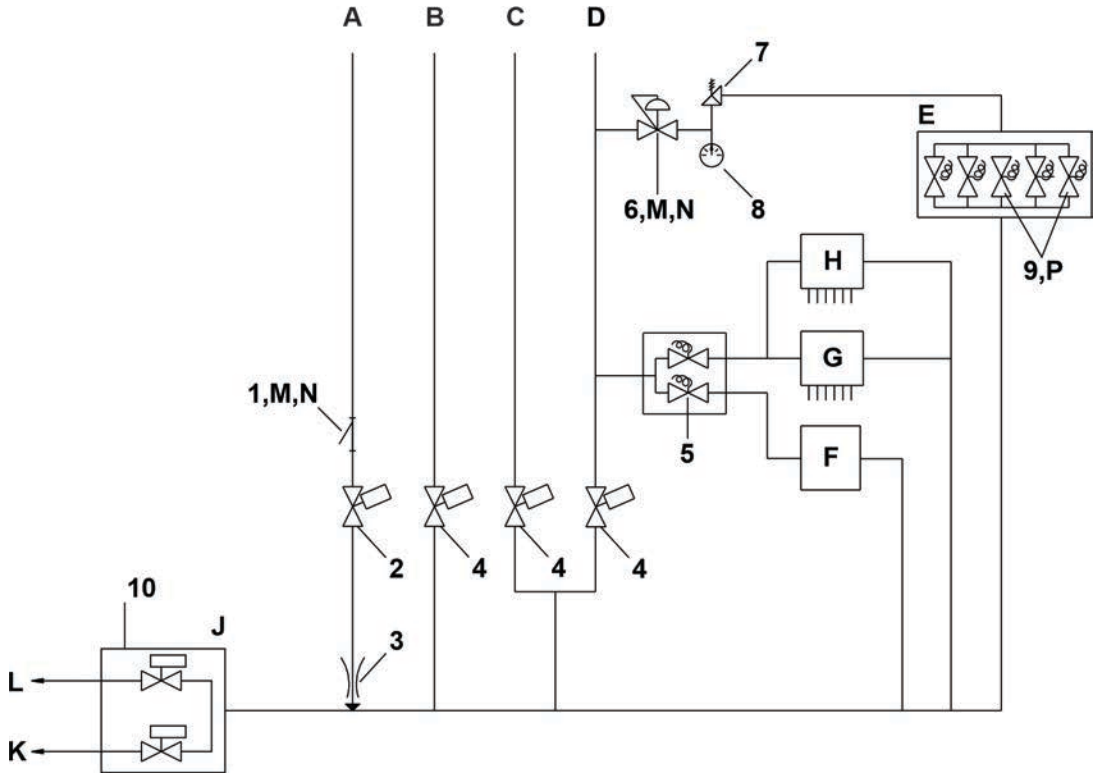
Water and Steam Schematic and Components

2 Sheets

48040F7B, F7D, F7J, F7Z (AZ)

Figure 40. Water and Steam Schematic and Components



Legend

A . . . Steam inlet
B . . . Reuse water inlet (optional)
C . . . Cold water inlet
D . . . Hot water inlet
E . . . Five compartments to flush in chemical supplies (optional)
F . . . Soap chute
G . . . Ten inlets for peristaltic liquid chemical systems (10 inlets standard F7J) (8 inlets standard F7Z)
H . . . Six inlets for peristaltic liquid chemical systems (+5 standard F7J) (optional F7Z)
J . . . Drain valve body with one valve is (standard). Drain valve body with two valves is (optional).
K . . . Dirty water outlet to sewer
L . . . Reuse water outlet to the reuse tank
M . . . Keep this component clean. Refer to the maintenance guide.
N . . . Keep this component set to the correct pressure. Refer to the maintenance guide.
P . . . Five instances

Water and Steam Schematic and Components

2 Sheets

48040F7B, F7D, F7J, F7Z (AZ)

Table 32. Parts List—Water and Steam Schematic and Components

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Components				
all	1	98CX820631	STEAM STRAINER 1+1/4", CSM	
all	2	96D0011E	1.25"NPTBRZ N/C STEAMVALANGBD	
all	3	X6 20247A	3/4" NPT .5" SPARGER MACH.	
all	4	96D087WE	ANGBODVLV 1.5"N/C H2O BURK BRZ	
all	5	96TDC2AA71	1/2"N/C2WY240V50/60C VLV(DRYVC)	
all	6	98CX820820	PRESSURE REGULATOR, 3/4 28PSI	
all	7	96M001	1/2X3/8" RELIEF VALVE SET31#	
all	8	98CX902450	PRESSGAUGE R1/4",0-28PSI	
all	9	96TCC2AA71	3/8" N/C 2WAY 240V50/60C VALVE	
all	10	GVD48400	INST=SINGLE DRAIN VLV, 4840F	
all	11	GVD48402	INST=DUAL DUMP VLV, 4840F	
all	12	27E956K82	PUMP STDFLO 316SS 2.0HP50C	
all	13	96D087WEST	ANGBODVLV 1.5" N/O H20 BURK SS	
all	14	96D087WESS	ANGBODVLV 1.5"N/C H20 BURK SS	

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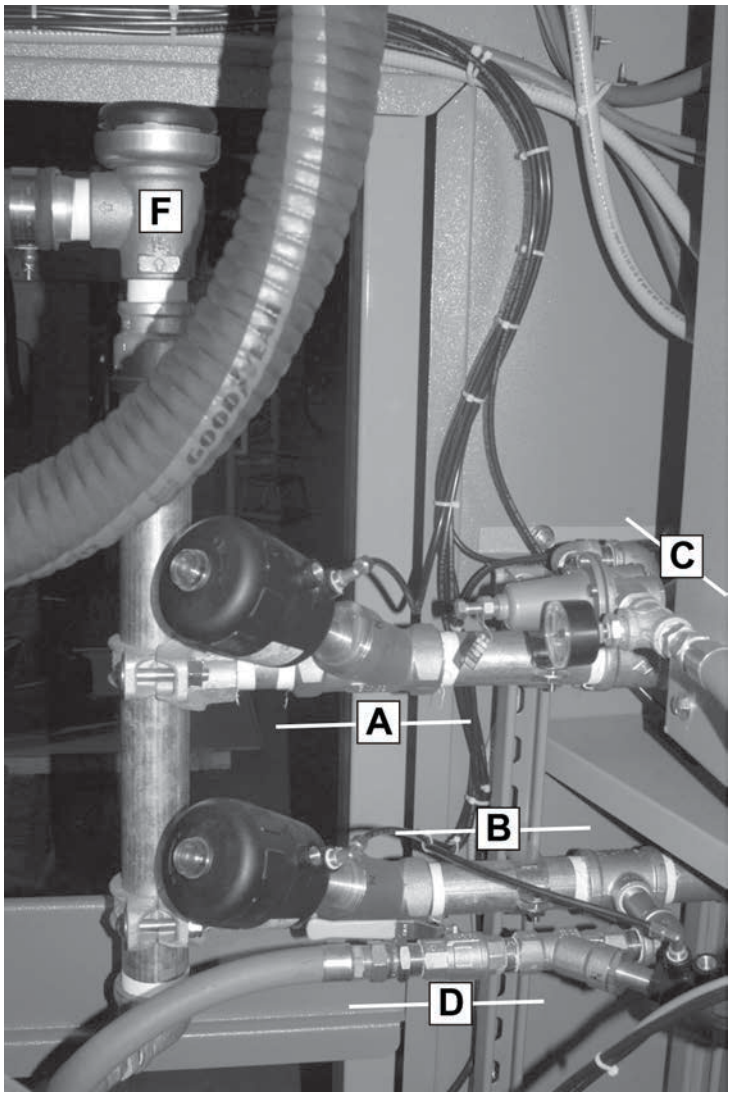
Water Inlet Components and Installation

3 Sheets

48040F7J, F7Z (AZ)



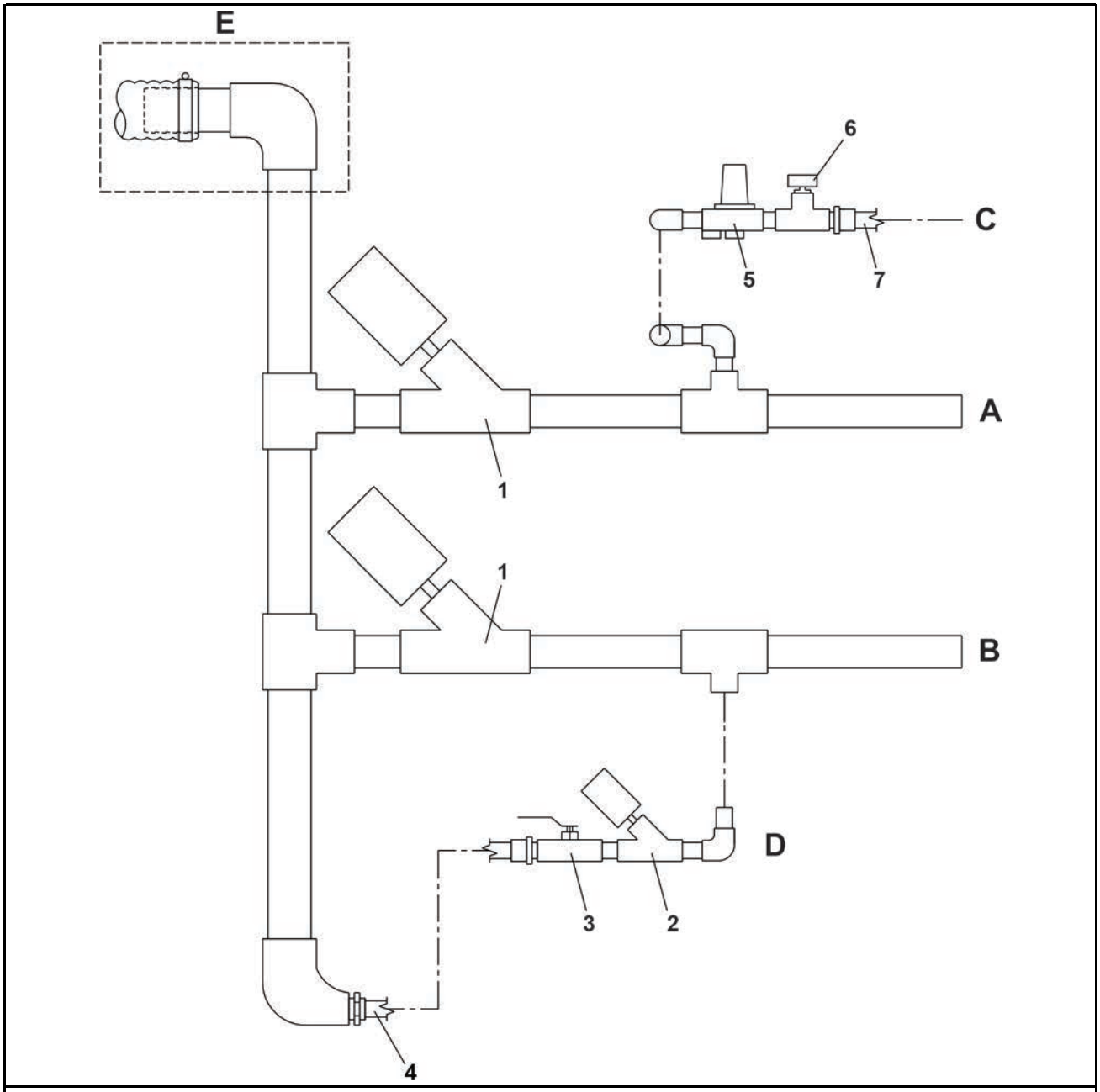
Legend

A . . . Hot water line
B . . . Cold water line
C . . . Hot water line for the 5 chemical supply components
D . . . Cooldown water line
F . . . The vacuum breaker and related components (optional)

Water Inlet Components and Installation

3 Sheets

48040F7J, F7Z (AZ)



Legend

A . . . Hot water line
B . . . Cold water line
C . . . Hot water line for the 5 chemical supply components
D . . . Cooldown water line
E . . . The components used with no vacuum breaker

Water Inlet Components and Installation

3 Sheets

48040F7J, F7Z (AZ)

Table 33. Parts List—Water Inlet Components and Installation

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Components				
all	1	96D087WE	ANGBODVLV 1.5"N/C H2O BURK BRZ	
all	2	96D0009E	3/4"NPTBRZ N/C STEAMVAL ANGBOD	
all	3	98CX820204	HAND WATER VALVE 3/4", CSM	
all	4	98CX873160	FLEXIBLE HOSE ID13XOD20X44M	
all	5	98CX820820	PRESSURE REGULATOR, 3/4 28PSI	
all	6	98CX902450	PRESSGAUGE R1/4",0-28PSI	

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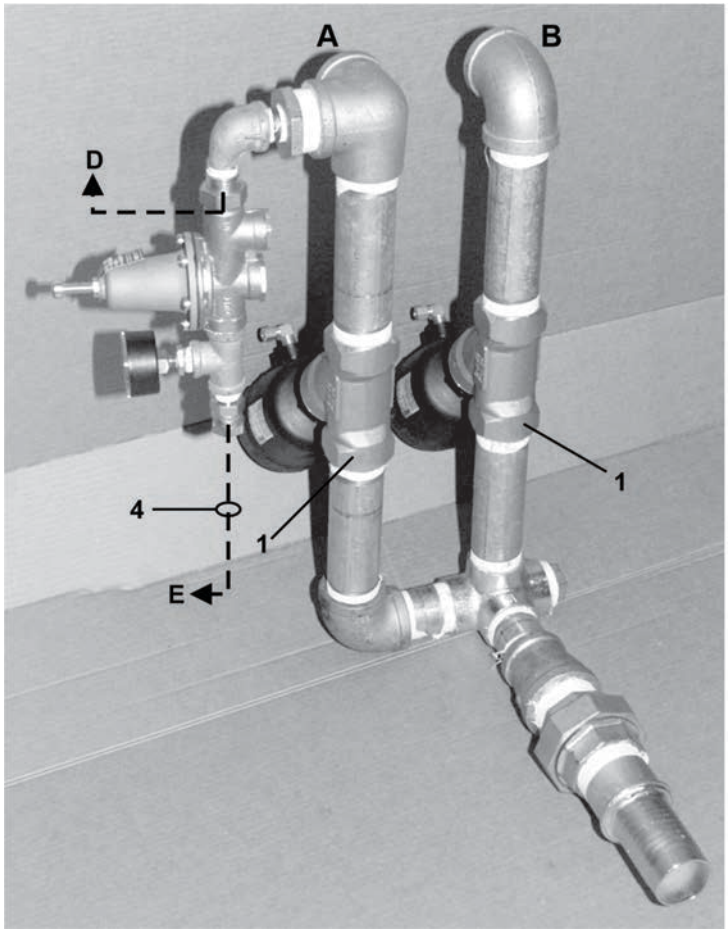
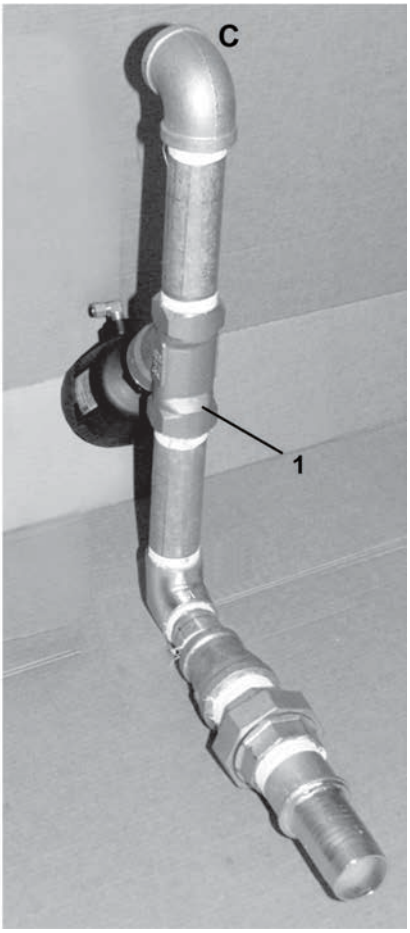
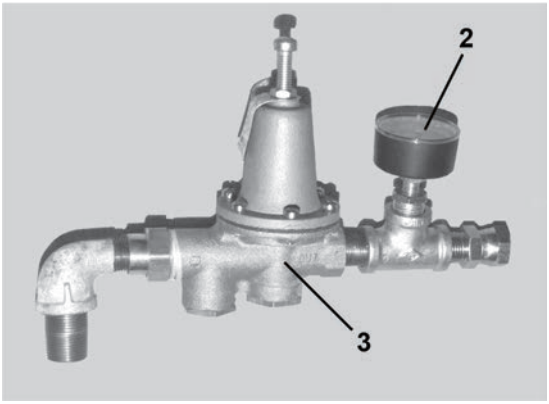
Water Inlet Components for Tilt Washers

3 Sheets

48040F7B, F7D (AZ)







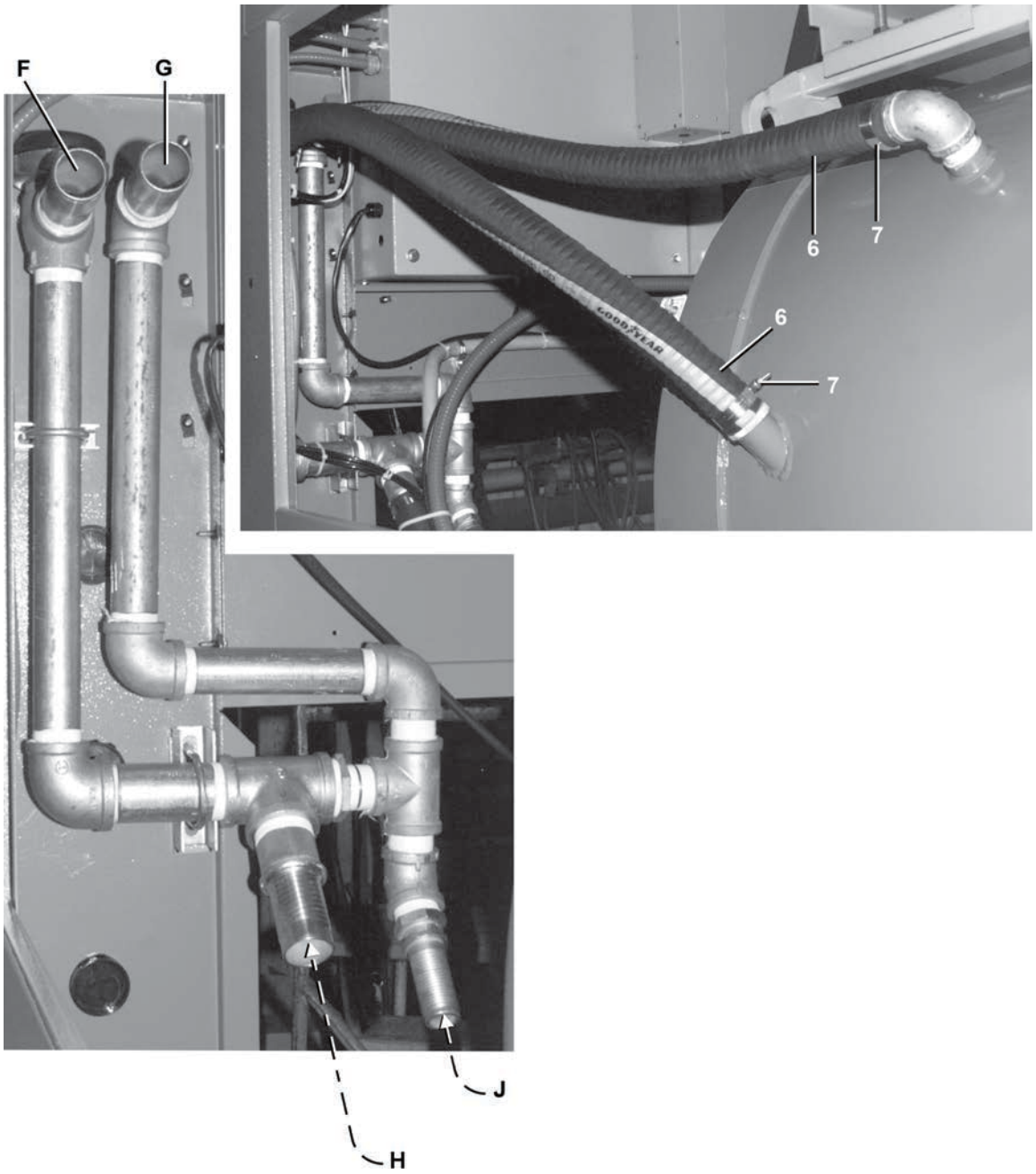
Legend

A . . . Hot
B . . . Cold
C . . . Optional reuse
D . . . To peristaltic
E . . . To optional 5 compartment supply

Water Inlet Components for Tilt Washers

3 Sheets

48040F7B, F7D (AZ)



Legend

F . . . Fresh water hot and cold
G . . . Optional reuse water
H . . . From hot and cold inlets
J . . . From optional reuse inlet

Water Inlet Components for Tilt Washers

3 Sheets

48040F7B, F7D (AZ)

Table 34. Parts List—Water Inlet Components for Tilt Washers

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Components				
all	1	96D087WE	ANGBODVLV 1.5"N/C H2O BURK BRZ=(BURKERT# 468162)	
all	2	98CX902450	PRESSGAUGE R1/4",0-28PSI	
all	3	98CX820820	PRESSURE REGULATOR, 3/4 28PSI	
all	4	98CX873160	FLEXIBLE HOSE ID13XOD20X44M	
all	6	60E098	HOSE 1.5" WATER SUCTION HOSE	
all	7	27A070	T-BOLT HOSECLAMP 1.94"-2.25"	

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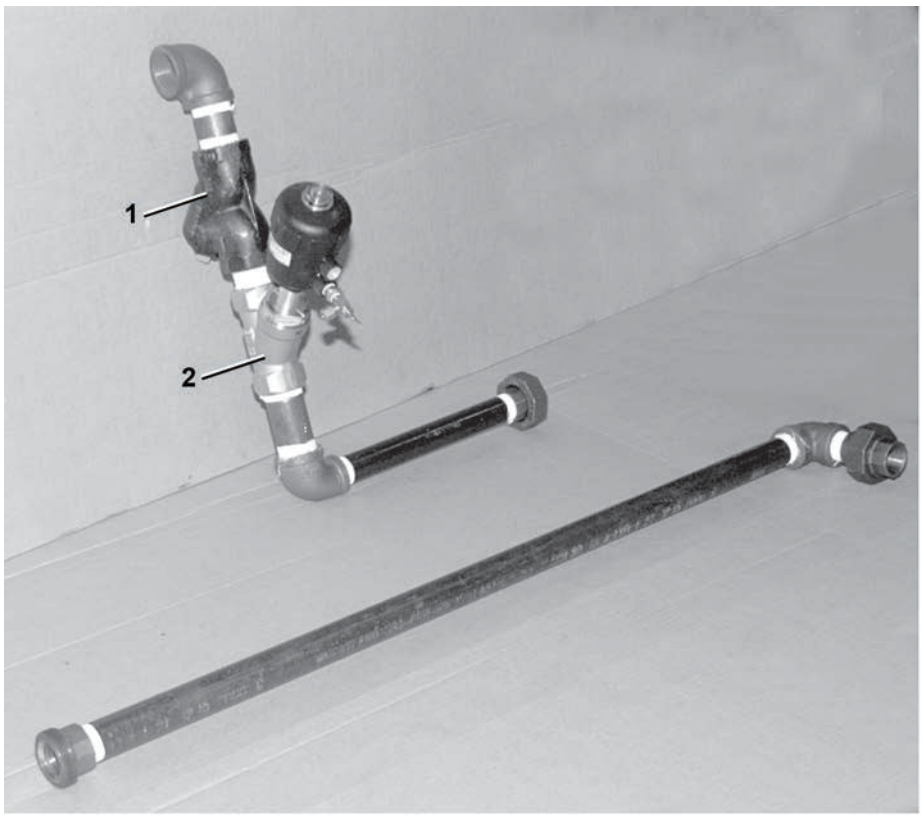
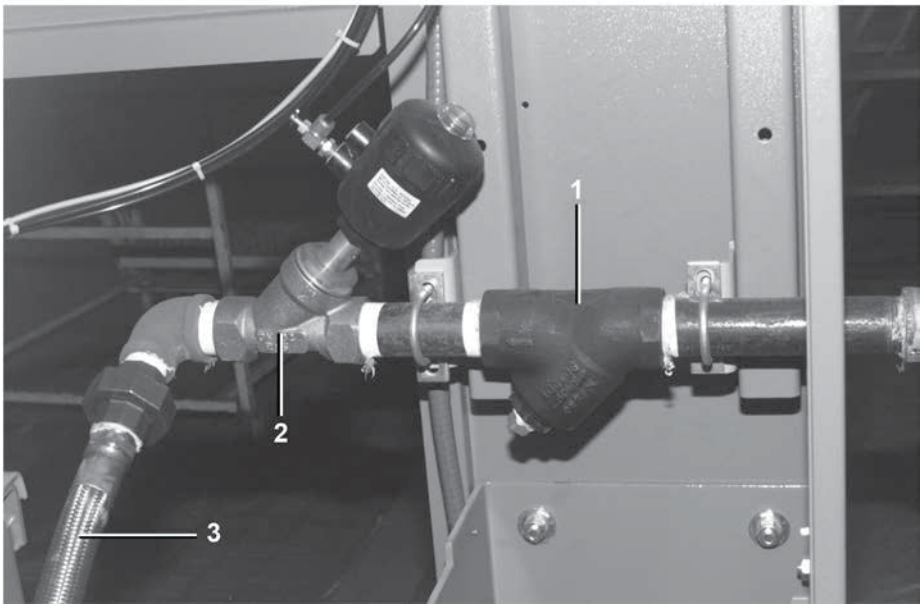
Steam Inlet Components and Installation

2 Sheets

48040F7B, F7D, F7J, F7Z (AZ)

Figure 41. Steam Piping





Steam Inlet Components and Installation

2 Sheets

48040F7B, F7D, F7J, F7Z (AZ)

Figure 42. Sparger (Steam Nozzle)

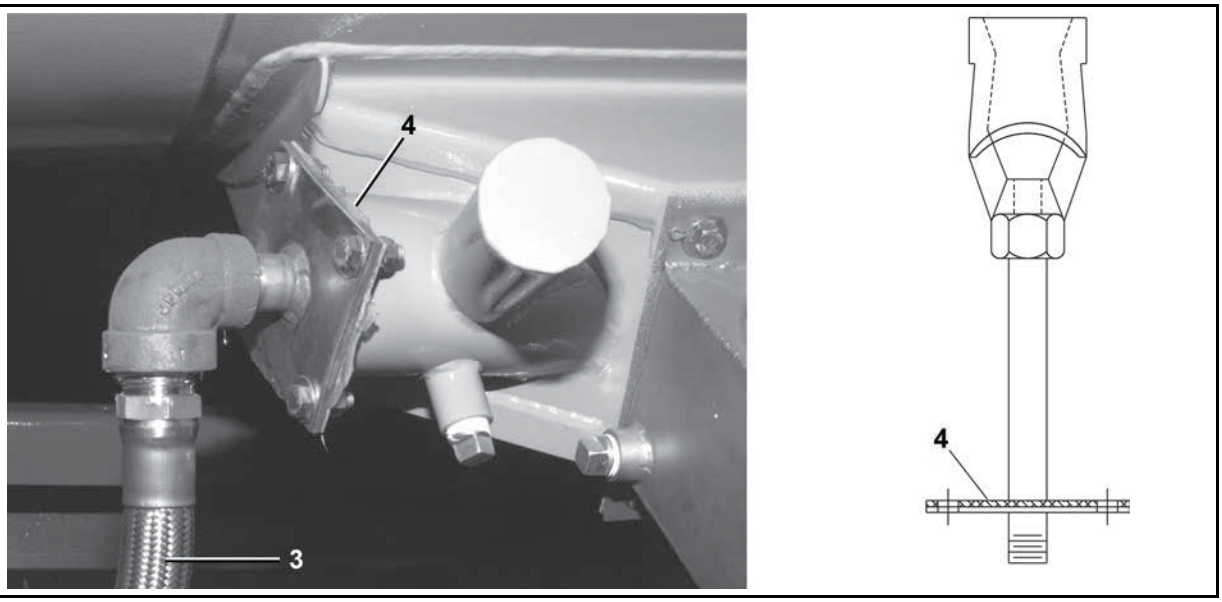


Table 35. Parts List—Steam Inlet Components and Installation

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Components				
all	1	98CX820631	STEAM STRAINER 1+1/4", CSM	
all	2	96D0011E	1.25"NPTBRZ N/C STEAMVALANGBD	
all	3	98CF518C52	STEAM HOSE BRAIDED, 4840F CSM	
all	4	98CF11369D	GASKET STEAM FLANGE, 4840F CSM	

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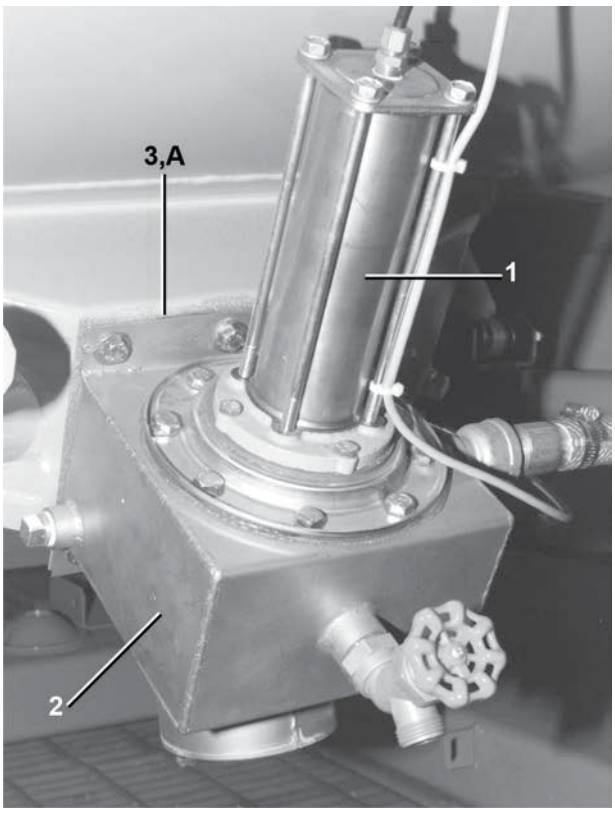
Drain Valve Body with One Valve

1 Sheet

48040F7B, F7D, F7J, F7Z (AZ)

Figure 43. Drain Valve



Legend

A . . . Place two gaskets together

Table 36. Parts List—Drain Valve Body with One Valve

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.

Used In	Item	Part Number	Description/Nomenclature	Comments
			Components	
all	1	A14 06400	* BONNET+CYL=4"SS DIVCYL DUMP	
all	2	98CF06500B	DUMP VALVE ASSY, 4840F CSM	
all	3	98CF15026	GASKET DUMP VALVE, 4840F CSM	

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Drain Valve Body with Two Valves

1 Sheet

48040F7B, F7D, F7J, F7Z (AZ)

Figure 44. Dual Drain Valve

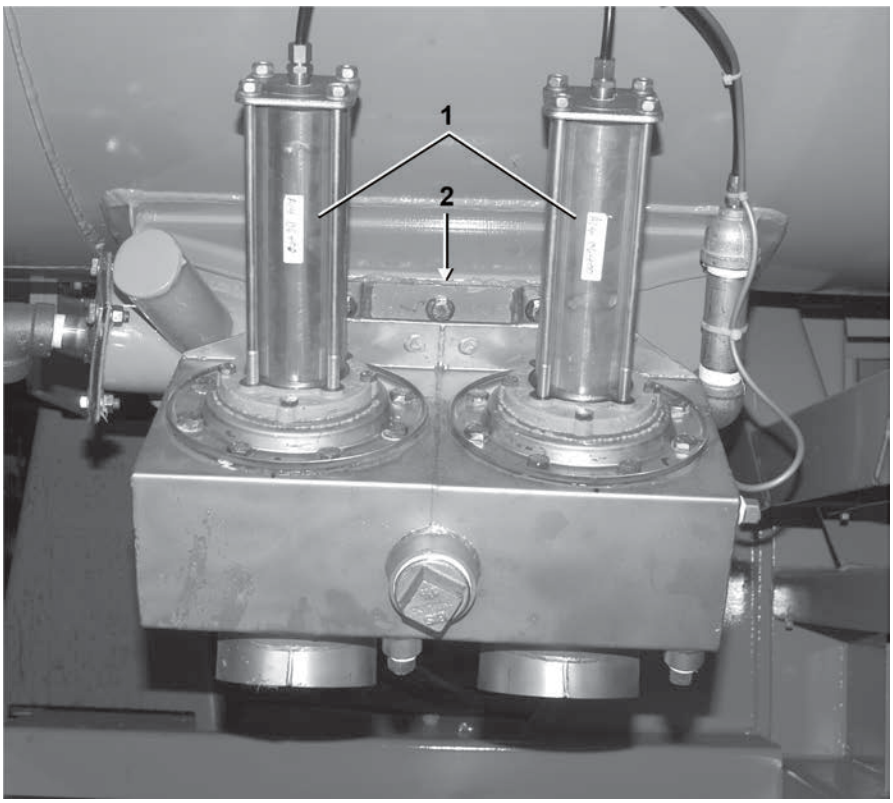

Table 37. Parts List—Drain Valve Body with Two Valves

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Components				
all	1	A14 06400	* BONNET+CYL=4"SS DIVCYL DUMP	
all	2	98CF15026	GASKET DUMP VALVE, 4840F CSM	

9 Pneumatics

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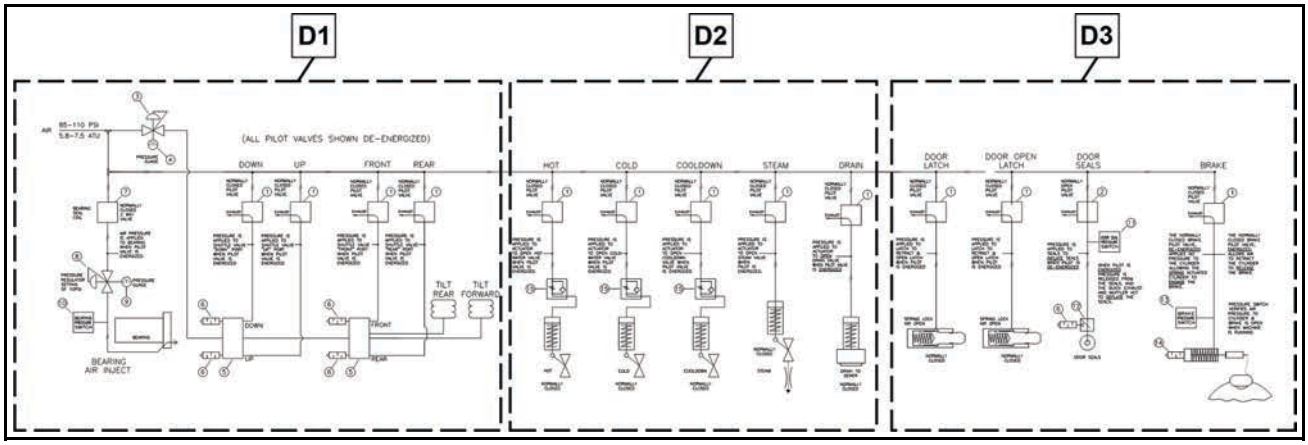
Pneumatic Schematic

4 Sheets

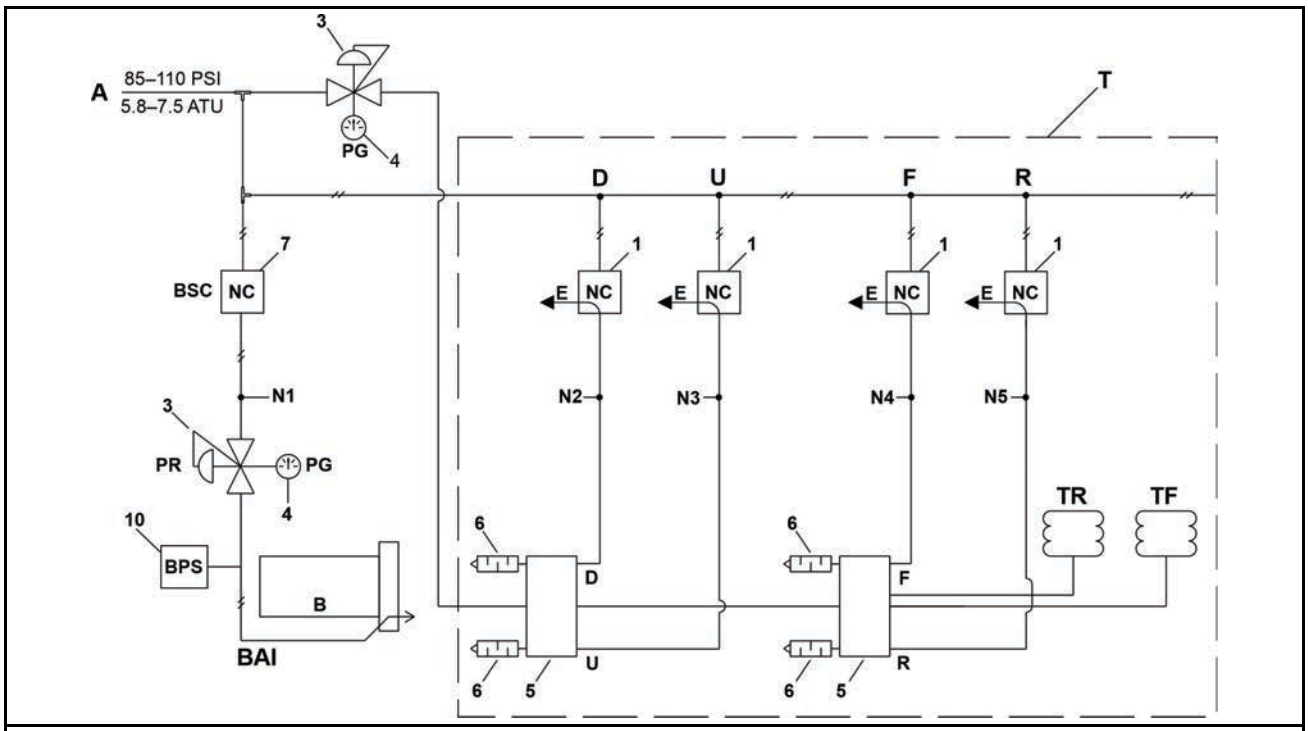
48040F7B,F7D, F7J, F7Z (AZ); MWF125J7, MWF125Z7, MWF125C7, MWF125Y7

Figure 45. Schematic Key



NOTE: All Pilot Valves Shown De-energized

Figure 46. Enlarged View D1



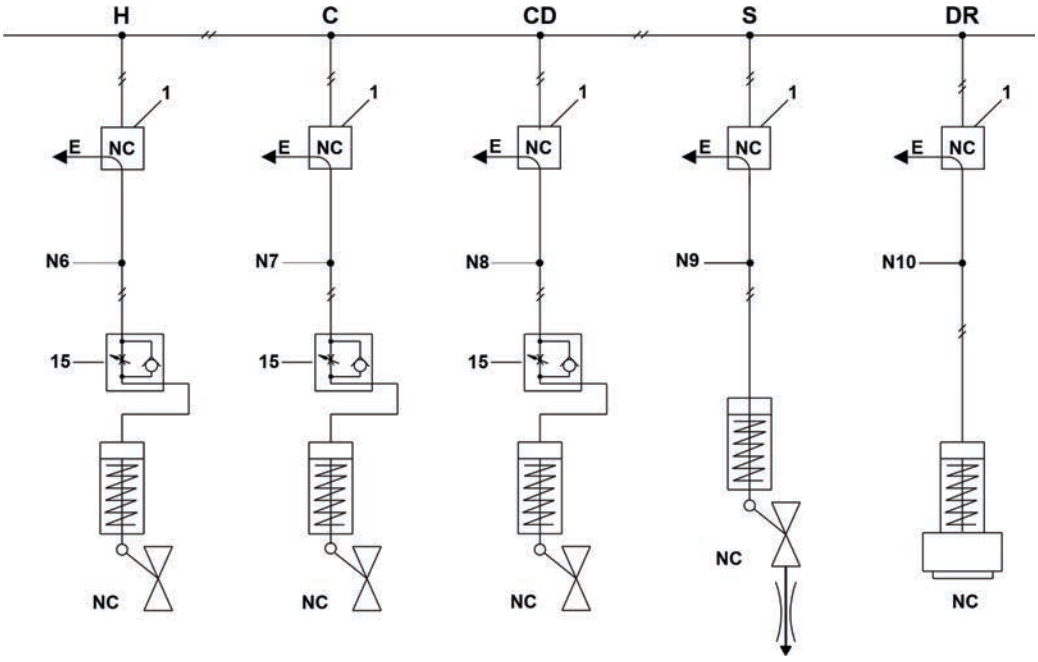
See Figure 49: Pneumatic Schematic Descriptions and Notes, page 134

Pneumatic Schematic

4 Sheets

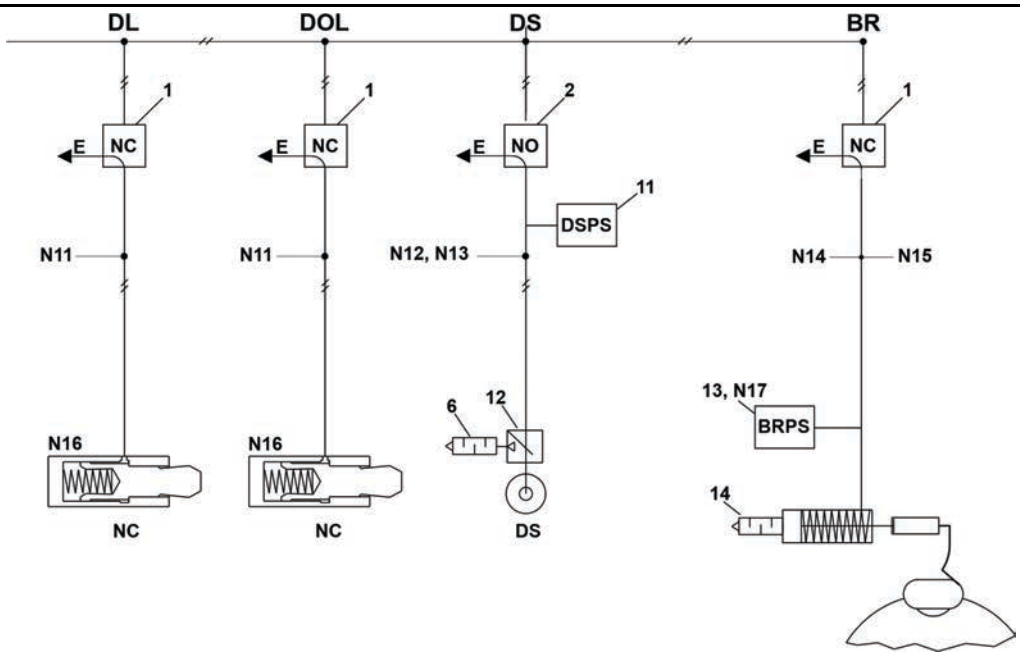
48040F7B,F7D, F7J, F7Z (AZ); MWF125J7, MWF125Z7, MWF125C7, MWF125Y7

Figure 47. Enlarged View D2



See Figure 49: Pneumatic Schematic Descriptions and Notes, page 134

Figure 48. Enlarged View D3



See Figure 49: Pneumatic Schematic Descriptions and Notes, page 134

Pneumatic Schematic

4 Sheets

48040F7B,F7D, F7J, F7Z (AZ); MWF125J7, MWF125Z7, MWF125C7, MWF125Y7

Figure 49. Pneumatic Schematic Descriptions and Notes

Legend	Legend
A . . . Air	**N8 . .** Pressure is applied to actuator to open cooldown water valve when pilot valve is energized.
B . . . Bearing	**N9 . .** Pressure is applied to actuator to open steam valve when pilot valve is energized.
BAI . . Bearing air inject	**N10 . .** Pressure is applied to actuator to open drain valve when pilot valve is energized.
BPS . . Bearing pressure switch	**N11 . .** Pressure is applied to latch to retract and open latch when pilot valve is energized.
BR . . Brake	**N12 . .** Pressure is applied to seals to inflate seals when pilot is de-energized.
BRPS . . Brake pressure switch	**N13 . .** When pilot is energized pressure is released from the seals, and the quick exhaust and muffler act to deflate the seals.
BSC . . Bearing seal coil, normally closed 2–way valve	**N14 . .** The normally closed brake pilot valve, de-energized, applies no pressure to the cylinder allowing the spring actuated cylinder to engage the brake.
C . . . Cold	**N15 . .** The normally closed brake pilot valve, energized, allows air to retract the cylinder to release the brake.
CD . . Cooldown	**N16 . .** Spring lock, air open
D . . . Down	**N17 . .** Pressure switch verifies air pressure to cylinder and that the brake is open when, machine is running.
DL . . Door latch	**NC . .** Normally closed
DOL . . Door open latch	**NO . .** Normally open
DR . . Drain	**PG . .** Pressure gage
DS . . Door seals	**PR . .** Pressure regulator setting of 10PSI
DSPD . . Door seal pressure switch	**R . . .** Rear
E . . . Exhaust	**S . . .** Steam
F . . . Front	**T . . .** Used on tilt models only
H . . . Hot	**TF . .** Tilt forward
N1 . . Air pressure is applied to bearing when pilot valve is energized.	**TR . .** Tilt rear
N2 . . Pressure is applied to shuttle valve down port when pilot valve is energized.	**U . . .** Up
N3 . . Pressure is applied to shuttle valve up port when pilot valve is energized.	
N4 . . Pressure is applied to shuttle valve front port when pilot valve is energized.	
N5 . . Pressure is applied to shuttle valve rear port when pilot valve is energized.	
N6 . . Pressure is applied to actuator to open hot water valve when pilot valve is energized.	
N7 . . Pressure is applied to actuator to open cold water valve when pilot valve is energized.	

Pneumatic Schematic

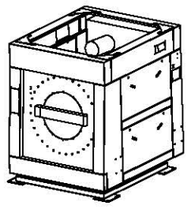
4 Sheets

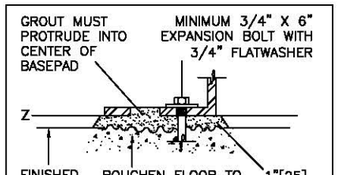
48040F7B,F7D, F7J, F7Z (AZ); MWF125J7, MWF125Z7, MWF125C7, MWF125Y7

Table 38. Parts List—Pneumatic Schematic

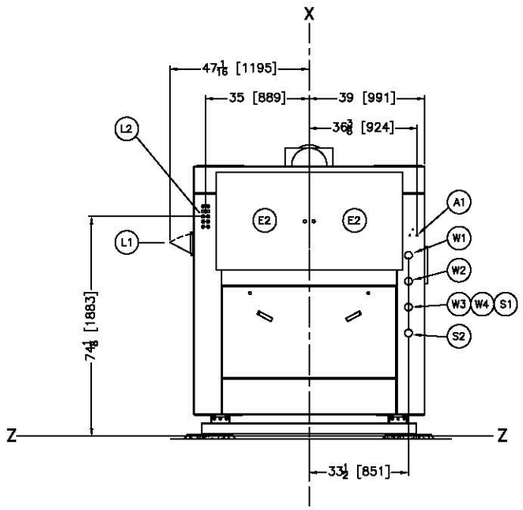
Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Components				
all	1	96R301B71	1/8" AIRPILOT 3W NC 240V50/60	
all	2	96R302B71	1/8" AIRPILOT 3W NO 240V50/60	
all	3	98CX820820	PRESSURE REGULATOR, 3/4 28PSI	
all	4	98CX902450	PRESSGAUGE R1/4",0-28PSI	
all	5	96N0012P	DBL.REM.VLV.3/8"4-WAY=CTR.OFF	
all	6	98CX900824	MUFFLER 3/8", 4840F CSM	
all	7	96TBC2BA37	1/4" N/C 2WAY 120V50/60C VALVE	
all	8	98CX851324	HOSE CLAMP D13, CSM	
all	10	09N082B05	PRESSW NASON CLOSE @ 5 LB	
all	11	09N082B10	PRESSW NASON CLOSE FALLING AT 9PSI	
all	12	98CX900741	QUICK EXHAUST VALVE 1/4, 4840F CSM	
all	13	09N082A	PRESSW NASON CLOSE @ 62 LB.	
all	14	98CX900822	MUFFLER 1/4", 4840F CSM	
all	15	96JH100	NEEDLE VLV.ELB.1/8"#AS2200-N01	

10 Dimensional Drawings

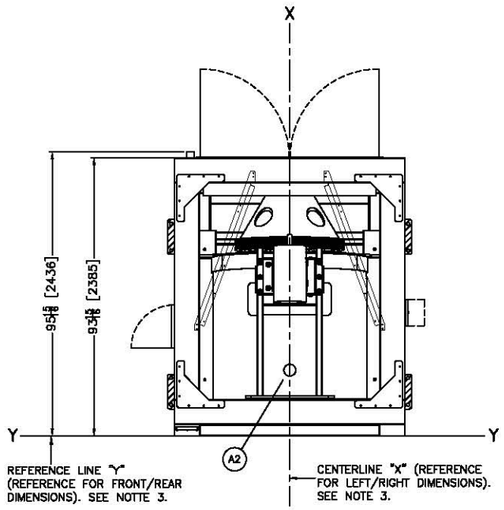




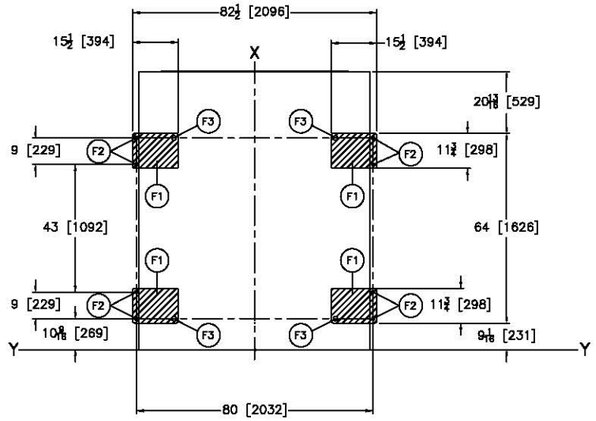
INSTALLATION DETAIL



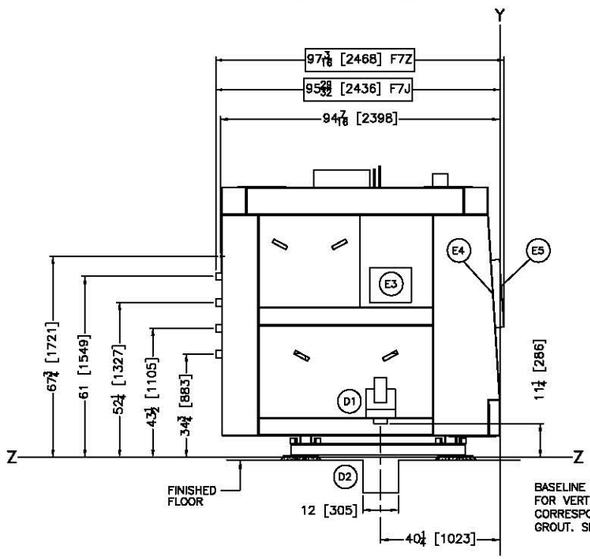
REAR VIEW



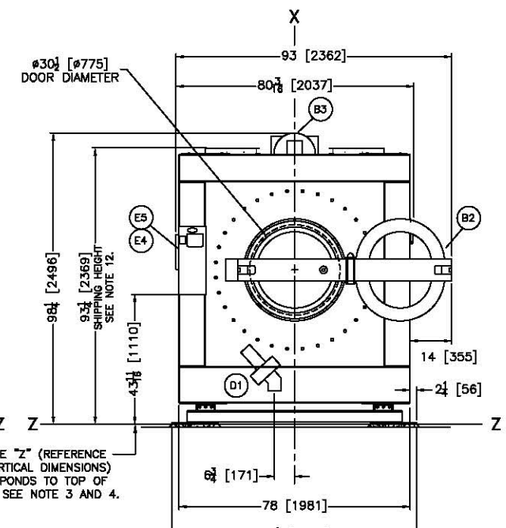
PLAN VIEW



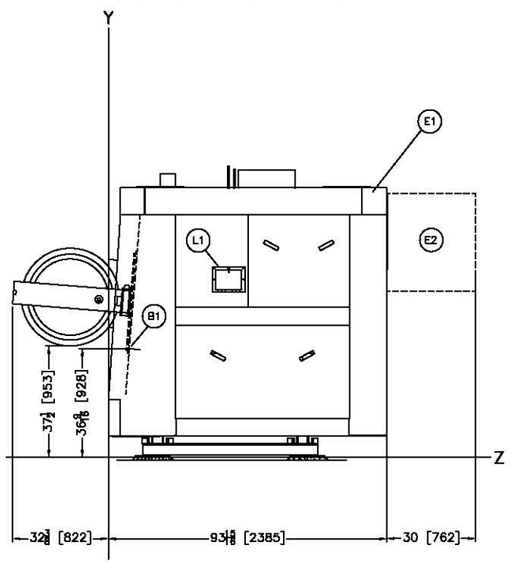
FOUNDATION VIEW



LEFT VIEW



FRONT VIEW



RIGHT VIEW

ITEM	LEGEND
W4	OPTIONAL REUSE WATER CONNECTION, 1-1/2" NPT
W3	OPTIONAL THIRD WATER CONNECTION, 1-1/2" NPT
W2	COLD WATER CONNECTION, 1-1/2" NPT
W1	HOT WATER CONNECTION, 1-1/2" NPT
S2	STEAM INLET, 1-1/4" NPT, IF ALSO THIRD WATER
S1	STEAM INLET, 1-1/4" NPT, IF NO THIRD WATER
L2	10 PORT LIQUID SUPPLY INLETS
L1	SOAP CHUTE
F3	GROUT HOLES
F2	(8) 1-1/16" DIAMETER ANCHOR BOLT HOLES, USE 3/4" X 6" BOLTS MINIMUM. (1) BOLT PER PAD MINIMUM.
F1	BASEPADS, SEE NOTE 8.
E5	MilTouch™ TOUCH SCREEN CONTROLLER, F7Z
E4	MICROPROCESS CONTROLS, F7J, FLUSH MOUNT
E3	MICROPROCESSOR CONTROL BOX
E2	MAIN ELECTRICAL CONTROL BOXES
E1	MAIN ELECTRICAL CONNECTION
D2	DRAIN TROUGH
D1	DRAIN TO SUMP, 4 1/2" OD
B3	TOP OF DISC BRAKE
B2	DOOR FULL OPEN
B1	LOAD HEIGHT
A2	VENT, 4" DIAMETER
A1	MAIN AIR CONNECTION, 1/4" NPT

NOTES

14 DIMENSIONS ARE VALID FOR AZ MODEL.

13 SHIM TO LEVEL THE MACHINE AND ALLOW FOR 1" [25] MINIMUM GROUT. ANCHOR WITH ONE ANCHOR BOLT PER PAD, MINIMUM. USE 3/4" X 6" BOLTS, MINIMUM. SEE INSTALLATION MAINTENANCE MANUAL FOR FURTHER INSTRUCTIONS.

12 FOR OVERSEAS SHIPMENTS, TO REDUCE THE OVERALL HEIGHT, THE MOTOR MOUNT ASSEMBLY AND VENT PIPE MAY BE REMOVED AND SHIPPED SEPARATELY.

11 MODEL NUMBERS: 48040F7J=NON-TILT EP+; 48040F7Z=NON-TILT MILTOUCH™

10 DRAIN VALVE MAY MOVE ± 1" [25] IN ANY DIRECTION DURING OPERATION AND MUST NOT BE RIGIDLY CONNECTED TO DRAIN.

9 DUE TO VARYING WEIGHT OF MACHINE ON SPRINGS TOLERANCE IS ± 1/2 [13]. SEE DIMENSIONS WITH ASTERISK [*] ATTACHED.

8 SHADED AREA DENOTES BASE PADS WHICH MUST BE CONTINUOUSLY SUPPORTED.

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

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

CHECK LOCAL ELECTRIC CODES FOR FURTHER RESTRICTIONS.

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

4 BASELINE "Z" IS THE 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.

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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 PROMOE ALL NECESSARY ADDITIONAL SAFETY GUARDS, FENCES, RESTRAINTS, DEVICES, ETC., NOT FURNISHED BY THE EQUIPMENT MANUFACTURER OR VENDOR.

ATTENTION

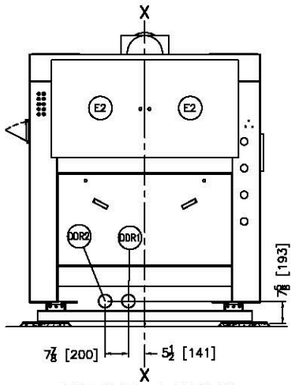
THE FLOOR AND/OR OTHER SUPPORT COMPONENTS MUST HAVE SUFFICIENT STRENGTH (AND RIGIDITY WITH DUE CONSIDERATION FOR NATURAL OR RESONANT FREQUENCY THEREOF) TO WITHSTAND THE FULLY LOADED WEIGHT OF THE MACHINE INCLUDING THE GOODS, THE WATER, AND ANY REPEATED SINUSOIDAL (ROTATING) FORCES GENERATED DURING ITS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

48040F7J, 48040F7Z

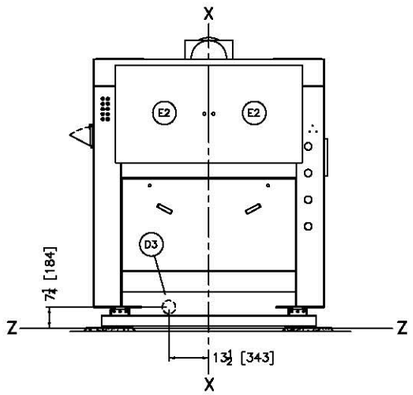
DM 0 0.5M
INCHES 0 12 24

DWG# BD4840F7DE
2017145D

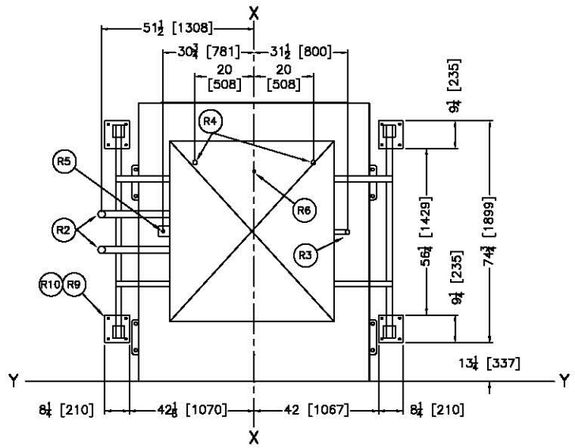
PELLERIN MILNOR CORPORATION
P.O. Box 400 Kenner, LA 70063, USA. Phone 504/467-9591,
FAX 504/468-3094, Email: milnorinfo@milnor.com



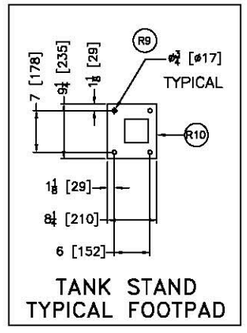
REAR VIEW
(DUAL DRAIN REAR)



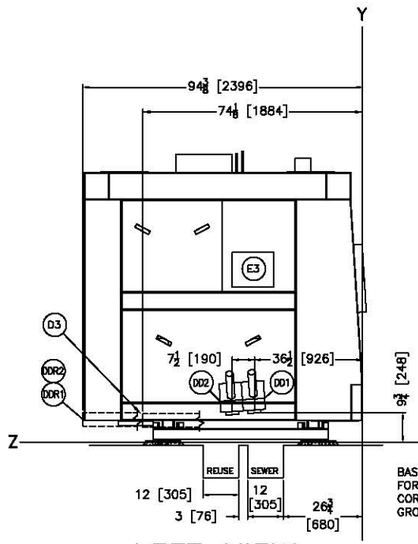
REAR VIEW
(SINGLE DRAIN REAR)



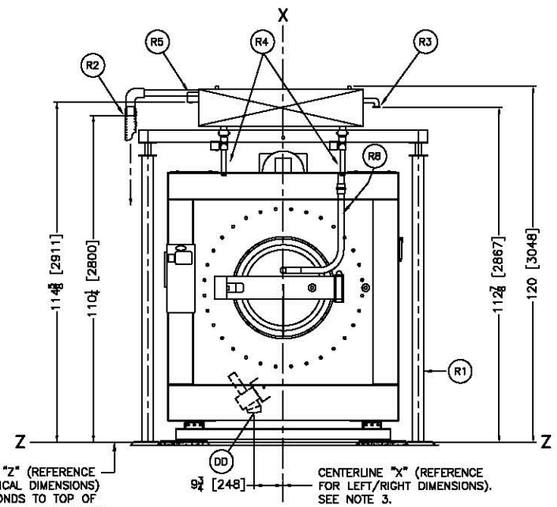
FOUNDATION VIEW



TANK STAND
TYPICAL FOOTPAD



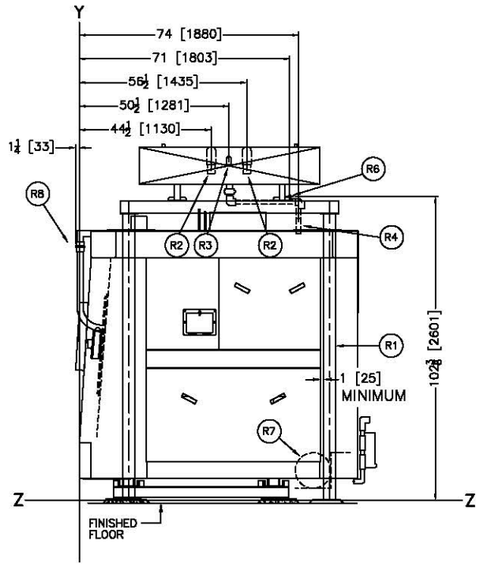
LEFT VIEW



BASELINE "Z" (REFERENCE FOR VERTICAL DIMENSIONS) CORRESPONDS TO TOP OF GROUT. SEE NOTE 3 AND 4.

CENTERLINE "X" (REFERENCE FOR LEFT/RIGHT DIMENSIONS). SEE NOTE 3.

FRONT VIEW



RIGHT VIEW

R10	TYPICAL TANK STAND FOOTPAD
R9	ANCHOR BOLT HOLES, 11/16" DIA.
R8	FRONT FILL
R7	RECIRCULATION PUMP, TO FAST FILL TANK & FRONT FILL
R6	1/4" NPT AIR FROM VALVE BOX, FAST FILL DRAINS
R5	ELECTRICAL CONNECTION FOR LIQUID LEVEL SWITCH
R4	FAST FILL DRAINS TO SHELL, 1-1/2"NPT
R3	TANK FILL FROM RECIRCULATION PUMP, 1-1/2" NPT
R2	OVERFLOW TO DRAIN TROUGH, 3" ID HOSE CONNECTION
R1	REUSE TANK STAND
DDR2	DUAL DRAIN REAR TO REUSE 4"[102] HOSE CONNECTION
DDR1	DUAL DRAIN REAR TO SEWER 4"[102] HOSE CONNECTION
DD2	DUAL DRAIN CENTER TO REUSE 4"[102] HOSE CONNECTION
DD1	DUAL DRAIN CENTER TO SEWER 4"[102] HOSE CONNECTION
DD	DUAL DRAIN CENTER, VALVE
D3	SINGLE DRAIN TO REAR, 4" NPT CONNECTION
ITEM	LEGEND

NOTES

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OPTIONS 48040F7J, 48040F7Z

DM 0 0.5M 1M
INCHES 0 12 24 36

DWG# BD4840F7DB
2024156D

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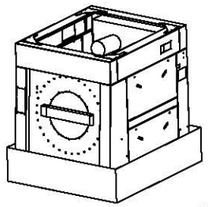
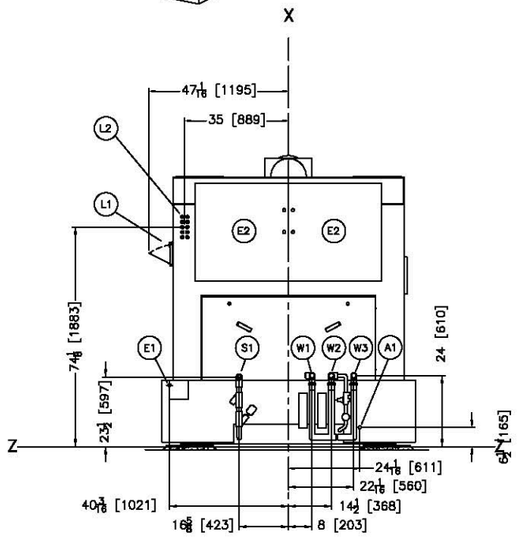
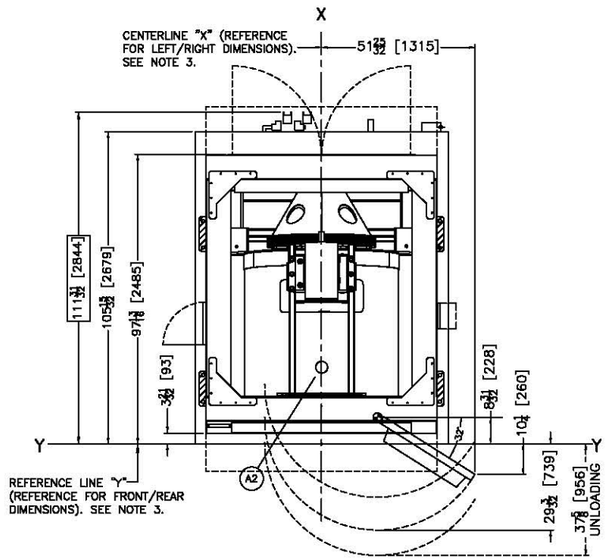
P.O. Box 400 Kenner, LA 70063, USA, Phone 504/467-9591,
FAX 504/469-1849, Email: milnorinfo@milnor.com

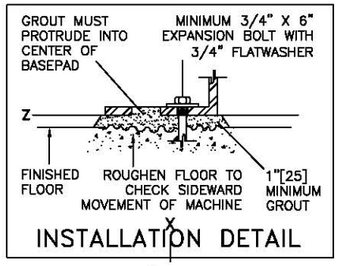




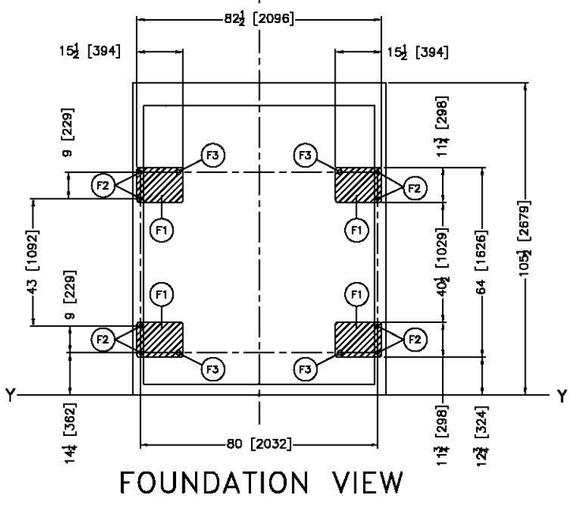
REAR VIEW



PLAN VIEW

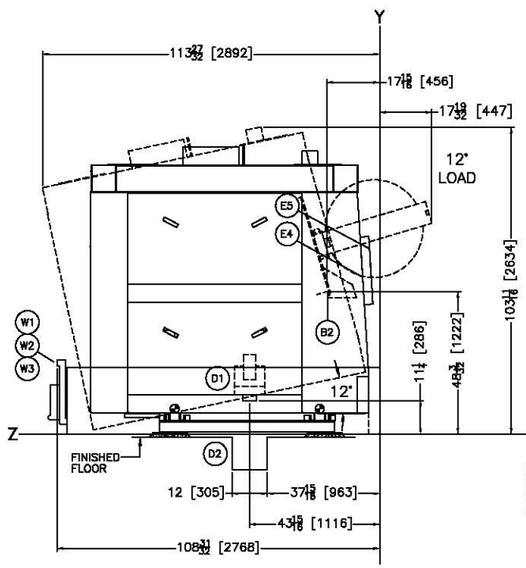


INSTALLATION DETAIL

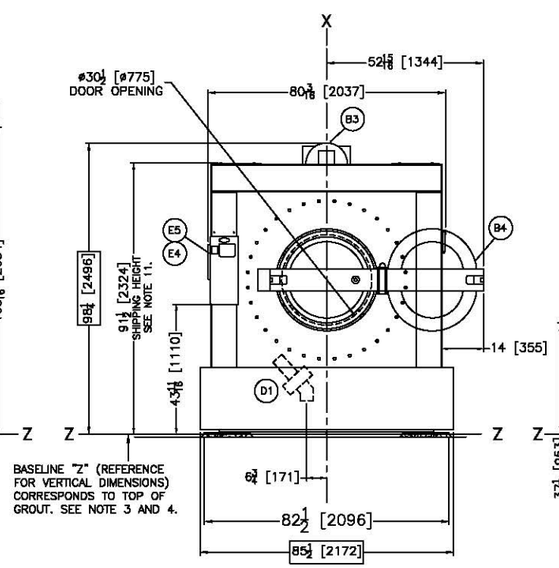


FOUNDATION VIEW

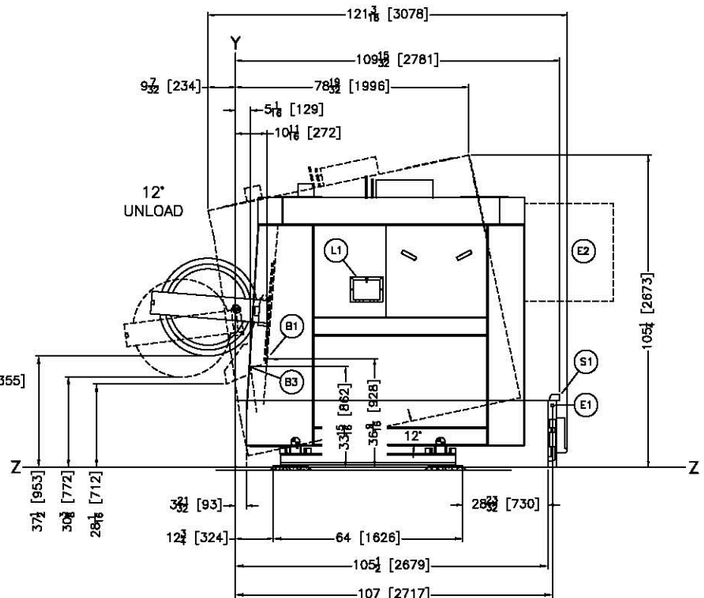
W3	OPTIONAL REUSE OR THIRD WATER, 1–1/2" NPT
W2	HOT WATER CONNECTION, 1–1/2" NPT
W1	COLD WATER CONNECTION, 1–1/2" NPT
S1	STEAM INLET, 1–1/4" NPT
L2	10 PORT LIQUID SUPPLY INLETS
L1	SOAP CHUTE
F3	GROUT HOLES
F2	(8) 1–1/16" DIAMETER ANCHOR BOLT HOLES, USE 3/4" X 6" BOLTS MINIMUM. (1) BOLT PER PAD MINIMUM.
F1	BASEPADS, SEE NOTE 8.
E5	MilTouch™ TOUCH SCREEN CONTROLLER, F7D
E4	MICROPROCESSOR CONTROLS, F7B, FLUSH MOUNT
E3	MICROPROCESSOR CONTROL BOX
E2	MAIN ELECTRICAL CONTROL BOXES
E1	MAIN ELECTRICAL CONNECTION
D2	DRAIN TROUGH
D1	DRAIN TO SUMP, 4 1/2" OD, NOT TILTED
B4	DOOR FULLY OPENED
B3	UNLOAD HEIGHT, 12" TILT FORWARD
B2	LOAD HEIGHT, 12" TILT REAR
B1	LOAD HEIGHT, NOT TILTED
A2	VENT, 4" DIAMETER
A1	MAIN AIR CONNECTION, 3/4" NPT
ITEM	LEGEND



LEFT VIEW



FRONT VIEW



RIGHT VIEW

NOTES

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8 SHADED AREA DENOTES BASE PADS WHICH MUST BE CONTINUOUSLY SUPPORTED.

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48 [1219] IF OBJECT IS ANY LIVE PART.
CHECK LOCAL ELECTRIC CODES FOR FURTHER RESTRICTIONS.

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

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

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

2 NUMBERS IN BRACKETS [] DENOTE DIMENSIONS IN MILLIMETERS.

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

ATTENTION

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

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48040F7B/F7D TILT WASHER EXTR

0.5M 1M
12 24 36

DWG# BD4840FTDE
2017145D

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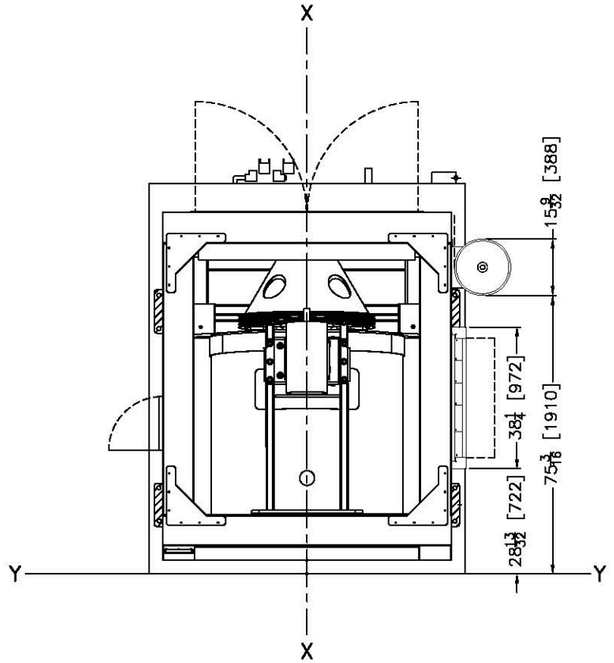
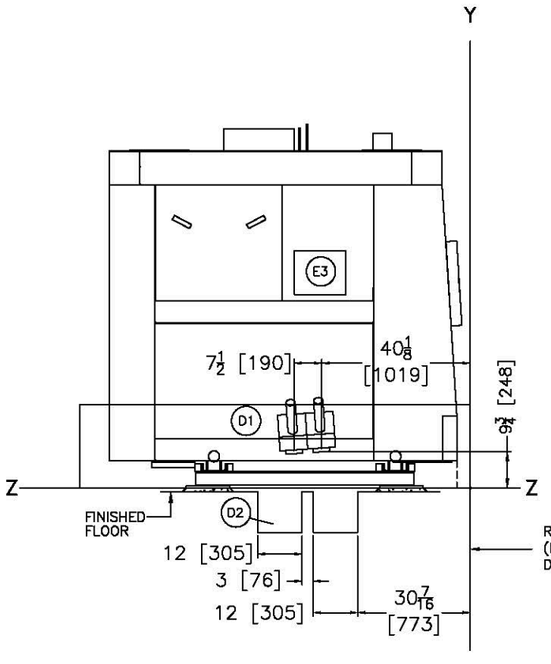
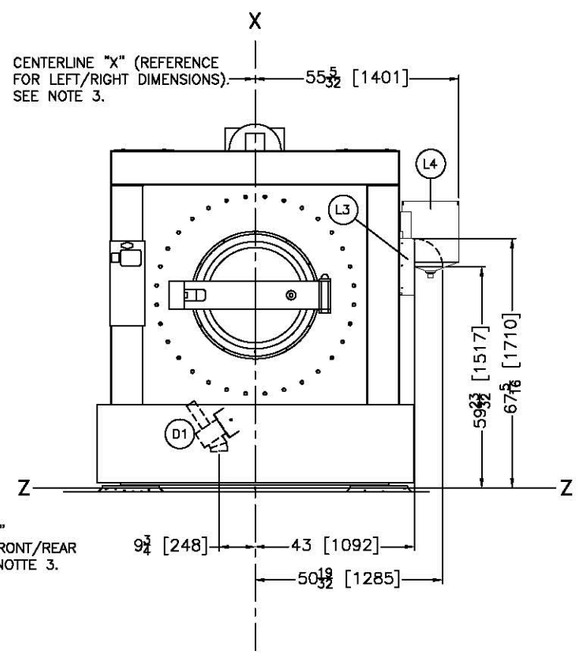
FAX 504/468-3094, Email: milnorinfo@milnor.com



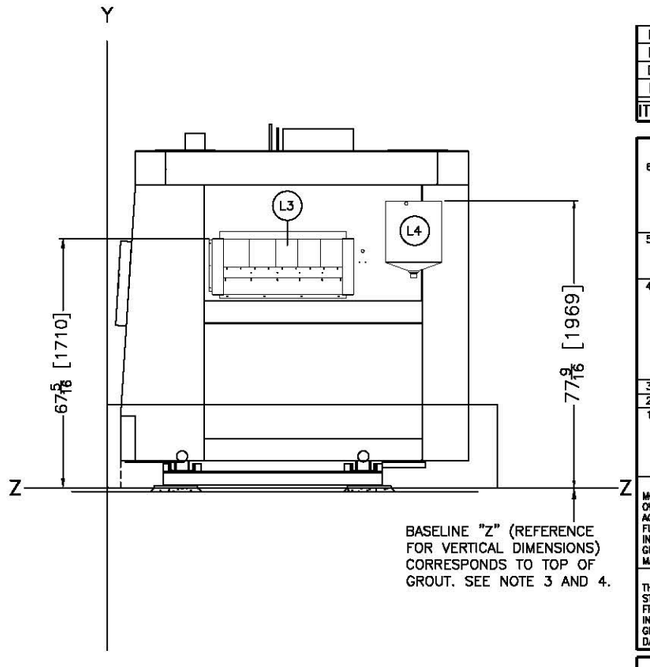
PLAN VIEW



LEFT VIEW



FRONT VIEW



RIGHT VIEW

ITEM	LEGEND
L4	OPTIONAL STARCH TANK
L3	OPTIONAL 5 COMPARTMENT SUPPLY
D2	DUAL DRAIN TROUGH
D1	DUAL DRAINS, 2 – 4-1/2" OD HOSE CONNECTIONS

NOTES

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

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OPTIONS 48040F7B/F7D TILT

DM 0 0.5M 1
INCHES 0 12 24

DWG# BD4840FTDB
2018246D

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11 Dimensional Drawings: Pedestals

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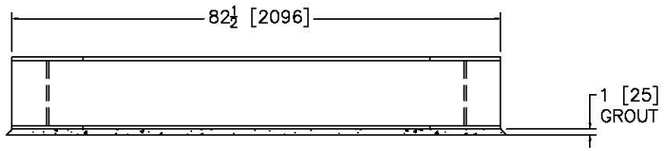
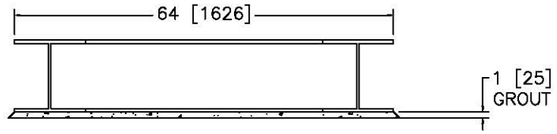
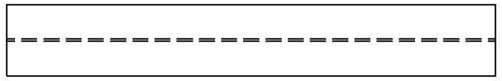


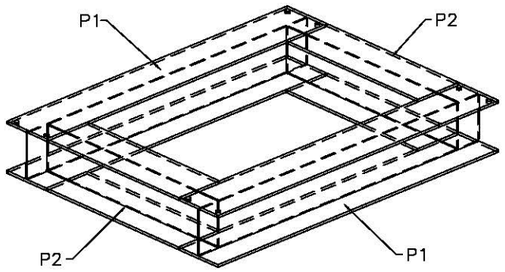
A–A

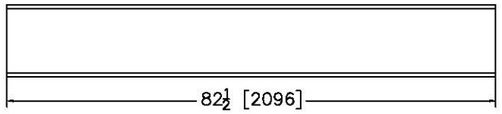


B–B



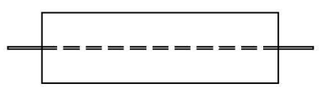
P1: PLAN



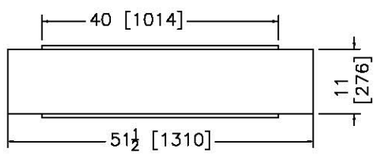


P1: ELEVATION

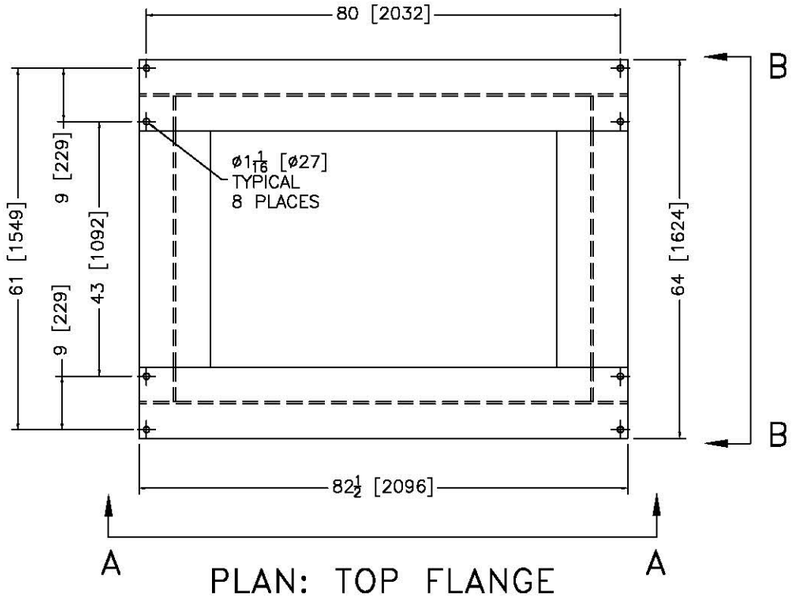
12 WF 65 BEAM TYP



P2: PLAN



P2: ELEVATION



PLAN: TOP FLANGE TO MACHINE

NOTES

5 THIS DRAWING SHOWS THE PEDESTAL DESIGN FOR MILNOR 4840F7J/F7W NON-TILT & 4840F7B/F7N AIR TILTING MACHINES. THIS BASE MAY BE USED WHENEVER LOCAL CONDITIONS ARE SUCH THAT MACHINE OPERATION WOULD BE ENHANCED BY RAISING THE MACHINE SETTING 12 [305] 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. ALTERNATELY, THE MACHINE MAY BE WELDED TO THE BASE, PROVIDED IT IS SHIMMED AS REQUIRED TO INSURE THERE IS NO DISTORTION OF THE MACHINE BASE PLATES OR FRAME.

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.

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PEDESTAL BASE 4840F7J/F7W,F7B/F7N

DM 0 0.5M
INCHES 0 12 24

DWG# BD4840BSAE
2011354D

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