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Service

72044 WP2/WP3, WR2/WR3 Washer-Extractors



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

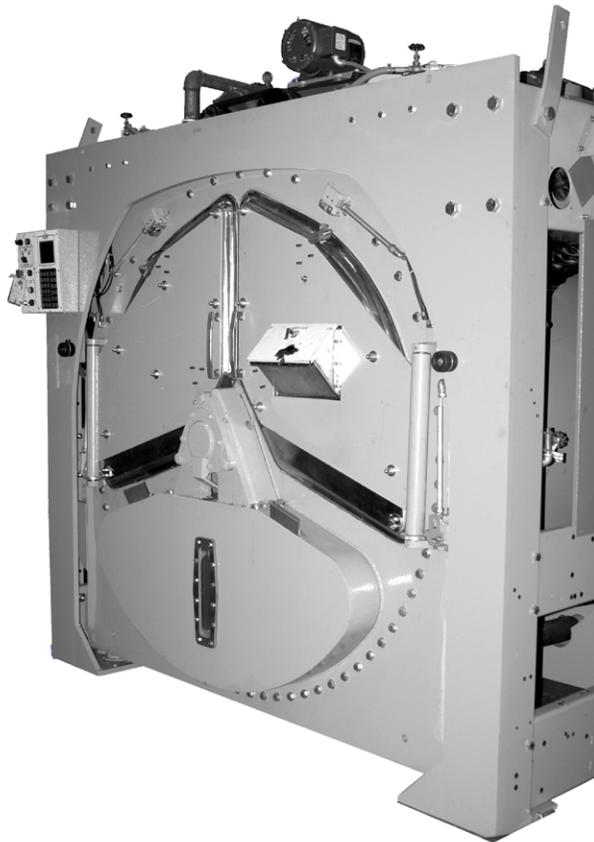


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PELLERIN MILNOR CORPORATION LIMITED STANDARD WARRANTY

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, NEGLIGENCE, POWER OR ENVIRONMENTAL CONTROL MALFUNCTIONS, DAMAGE FROM LIQUIDS, OR ANY OTHER CAUSE BEYOND THE NORMAL RANGE OF USE. REGARDLESS OF HOW CAUSED, IN NO EVENT SHALL MILNOR BE LIABLE FOR SPECIAL, INDIRECT, PUNITIVE, LIQUIDATED, OR CONSEQUENTIAL COSTS OR DAMAGES, OR ANY COSTS OR DAMAGES WHATSOEVER WHICH EXCEED THE PRICE PAID TO MILNOR FOR THE EQUIPMENT IT SELLS OR FURNISHES.

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

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

BMP720097/19036

How to Get the Necessary Repair Components



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

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

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

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

To write to the Milnor factory:

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

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

— End of BIUUUD19 —

Trademarks

BNUUUU02.R01 0000158093 A.2 7/13/17 1:11 PM Released

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

Table 1 Trademarks

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

End of document: BNUUUU02

Safety—Divided Cylinder and Staph-Guard™ Washer-Extractors

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

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

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

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

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

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

- 1.1. **Laundry Facility**—Provide a supporting floor that is strong and rigid enough to support—with a reasonable safety factor and without undue or objectionable deflection—the weight of the fully loaded machine and the forces transmitted by it during operation. Provide sufficient clearance for machine movement. Provide any safety guards, fences, restraints, devices, and verbal and/or posted restrictions necessary to prevent personnel, machines, or other moving machinery from accessing the machine or its path. Provide adequate ventilation to carry away heat and vapors. Ensure service connections to installed machines meet local and national safety standards, especially regarding the electrical disconnect (see the National Electric Code). Prominently post safety information, including signs showing the source of electrical disconnect.
- 1.2. **Personnel**—Inform personnel about hazard avoidance and the importance of care and common sense. Provide personnel with the safety and operating instructions that apply to them. Verify that personnel use proper safety and operating procedures. Verify that personnel understand and abide by the warnings on the machine and precautions in the instruction manuals.
- 1.3. **Safety Devices**—Ensure that no one eliminates or disables any safety device on the machine or in the facility. Do not allow machine to be used with any missing guard, cover, panel or door. Service any failing or malfunctioning device before operating the machine.
- 1.4. **Hazard Information**—Important information on hazards is provided on the machine safety placards, in the Safety Guide, and throughout the other machine manuals. **Placards must be kept clean so that the information is not obscured. They must be replaced immediately if lost or damaged. The Safety Guide and other machine manuals must be available at all times to the appropriate personnel.** See the machine service manual for safety placard part numbers. Contact the Milnor Parts department for replacement placards or manuals.
- 1.5. **Maintenance**—Ensure the machine is inspected and serviced in accordance with the norms of good practice and with the preventive maintenance schedule. Replace belts, pulleys, brake shoes/disks, clutch plates/tires, rollers, seals, alignment guides, etc. before they are severely worn. Immediately investigate any evidence of impending failure and make needed repairs (e.g., cylinder, shell, or frame cracks; drive components such as motors, gear boxes, bearings, etc., whining, grinding, smoking, or becoming abnormally hot; bending or cracking of cylinder, shell, frame, etc.; leaking seals, hoses, valves, etc.) Do not permit service or maintenance by unqualified personnel.

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

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



WARNING 1: Electrocution and Electrical Burn Hazards—Contact with electric power can kill or seriously injure you. Electric power is present inside the cabinetry unless the main machine power disconnect is off.

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



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

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

3. Safety Alert Messages—External Mechanical Hazards [Document BIUUUS12]

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



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

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

4. Safety Alert Messages—Cylinder and Processing Hazards

[Document BIUUUS13]

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



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

- Do not attempt to open the door or reach into the cylinder until the cylinder is stopped.
- Do not place any object in the turning cylinder.
- Do not operate the machine with a malfunctioning door interlock.
- Divided cylinder machines only—Keep yourself and others clear of cylinder and goods during inching or Autospot operation.
- Do not operate the machine with malfunctioning two-hand manual controls.



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

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



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

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

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

5.1. Damage and Malfunction Hazards

5.1.1. Hazards Resulting from Inoperative Safety Devices



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

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



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

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



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

- Do not unlock or open electric box doors.



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

- Do not remove guards, covers, or panels.

5.1.2. Hazards Resulting from Damaged Mechanical Devices



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

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



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

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



WARNING 13: Explosion Hazards—Inner door latches (divided cylinder machines)—A damaged or improperly seated latch can cause the inner door to open during operation, damaging the cylinder and shell. A damaged cylinder can rip apart during extraction, puncturing the shell and discharging metal fragments at high speed.

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



WARNING 14: Explosion Hazards—Clutch and speed switch (multiple motor machines)—A damaged clutch or speed switch can permit the low speed motor to engage during extract. This will over-speed the motor and pulleys and can cause them to rip apart, discharging metal fragments at high speed.

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

5.2. Careless Use Hazards

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



WARNING 15: Multiple Hazards—Careless operator actions can kill or injure personnel, damage or destroy the machine, damage property, and/or void the warranty.

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

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



WARNING 16: Electrocutation and Electrical Burn Hazards—Contact with electric power can kill or seriously injure you. Electric power is present inside the cabinetry unless the main machine power disconnect is off.

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



WARNING 17: Entangle and Crush Hazards—Contact with moving components normally isolated by guards, covers, and panels, can entangle and crush your limbs. These components move automatically.

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



WARNING 18: Confined Space Hazards—Confinement in the cylinder can kill or injure you. Hazards include but are not limited to panic, burns, poisoning, suffocation, heat prostration, biological contamination, electrocution, and crushing.

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

— End of BIUUUS27 —

Panels and Covers: 6044WP2, 6044WR2, 7244WP2, 7244WR2

Figure 1: General Views

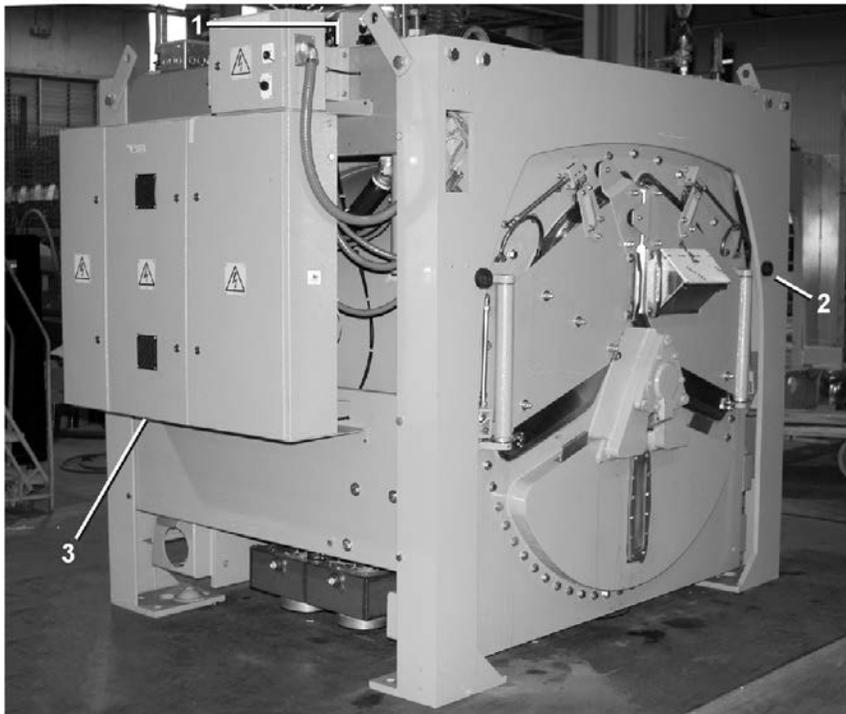
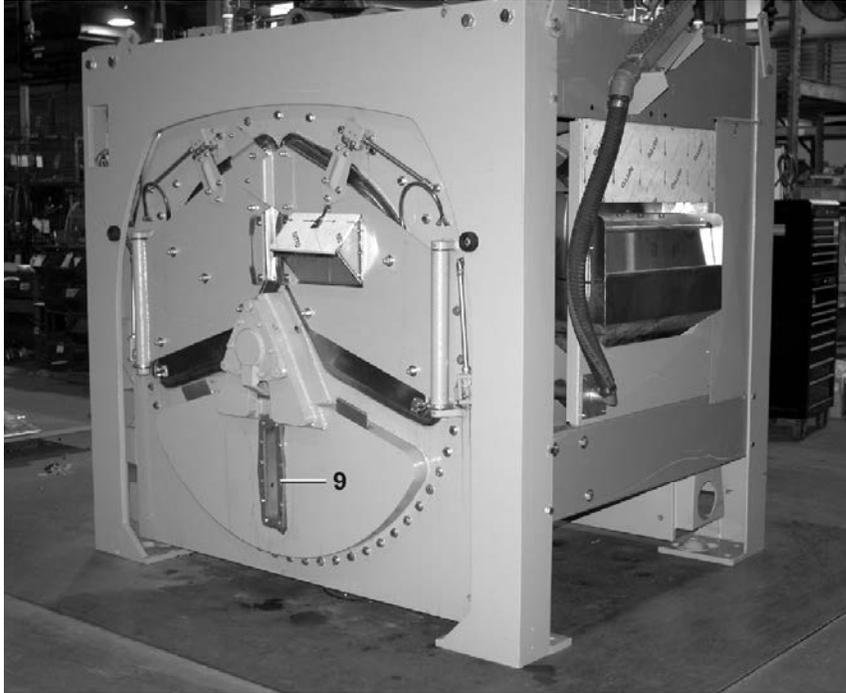


Figure 2: Rear view



Table 1: Parts List— Panels and Covers: 6044WP2, 7244WP2

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				
none				
Components				
all	1	03 CL721K	Cover	
all	2	60C075	Rubber bumper	
all	3	05 20296D	Cover, Left hand, Rear	
all	4	02 18824C	Cover	
all	5	02 18824D	Cover	
all	6	05 20296C	Cover	
6044WP2	7	02 175174	Belt guard, Upper	
7244WP2	7	03 06380	Belt guard, Upper	
6044WP2	8	02 175175	Belt guard, Lower	
7244WP2	8	03 06385	Belt guard, Lower	
6044WP2	9	AD 28 111	Assembly, Sight glass	
7244WP2	9	AD 36 004	Assembly, Sight glass	

— End of BIHDBM02 —

About the Forces Transmitted by Milnor® Washer-extractors

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

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

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

1. Rigid Machines

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

2. Flexibly-mounted Machines

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

3. How Strong and Rigid?

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

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

Figure 1: How Rotating Forces Act on the Foundation

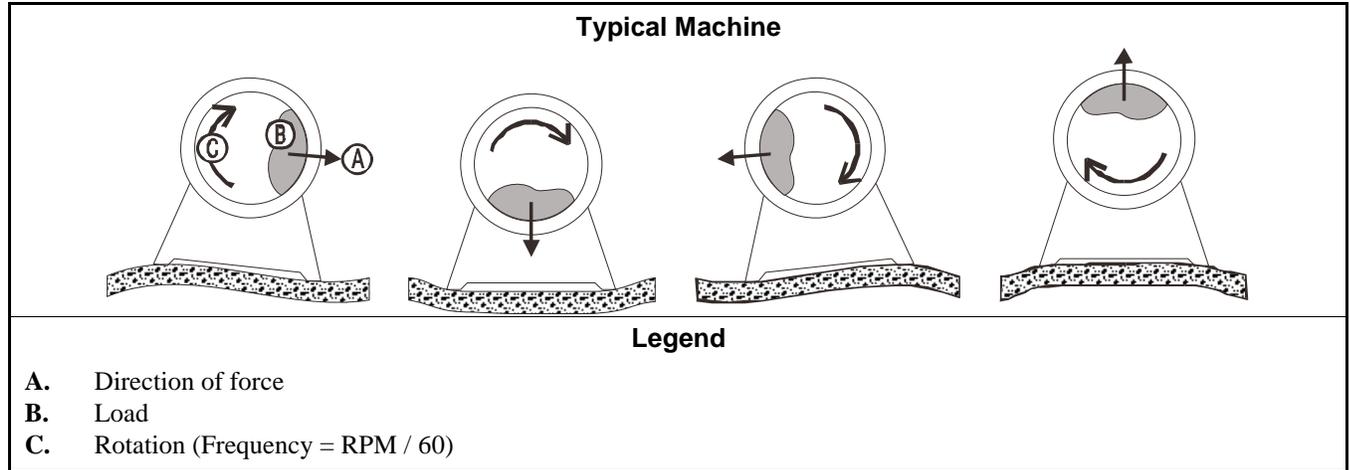


Figure 1 above is intended to depict both on-grade and above-grade installations and is equally applicable to flexibly-mounted washer-extractors, as well as to rigid models installed either directly on a floor slab or on a foundation poured integrally with the slab. Current machine data is available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

— End of BIWUI02 —

BIUUUI02HD (Published) Book specs- Dates: 20160713 / 20160713 / 20160713 Lang: ENG01 Applic: HDU

Tag Guidelines for the Models Listed Below

42044CP2 42044NP2 42044SP2 42044SP3 42044WP2 42044WP3 60044SP2
60044SP3 60044WP2 60044WP3 72044SP2 72044SP3 72044WP2 72044WP3

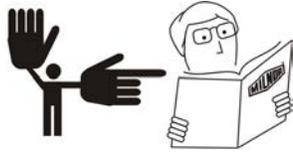
Notice 1: This information may apply to models in addition to those listed above. It applies to paper tags. It does not apply to the vinyl or metal safety placards, which must remain permanently affixed to the machine and replaced if no longer readable.

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.

Tag Guidelines for the Models Listed Below

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

Display or Action



Explanation

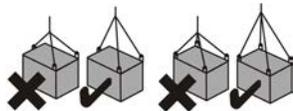
Read the manuals before proceeding. This symbol appears on most tags. The machine ships with safety, operator, and routine maintenance guides for customer use. Milnor dealer manuals for installing, servicing, and commissioning this machine are also available from the Milnor Parts department.



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



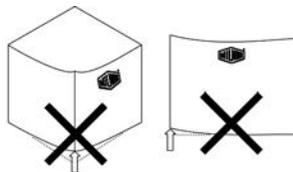
B2TAG94078: Do not forklift here; do not jack here; do not step here—whichever applies.



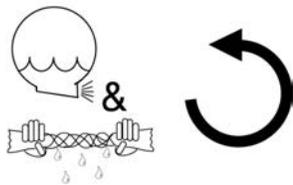
B2TAG94079: Rig for crane lifting (either 3-point or 4-point, depending on the number of lifting eyes provided) using a steep angle on the chains (closer to vertical than horizontal).



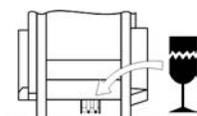
B2TAG94081: Motor must rotate in this direction. On single motor washer-extractors and centrifugal extractors, the drive motor must turn in this direction during draining and extraction. This tag is usually wrapped around a motor housing. If the motor turns in the opposite direction when the machine 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.



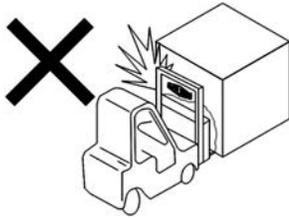
B2TAG94097: The cylinder must rotate **counterclockwise** during draining and extraction (spin) when viewed from here (rear of machine). Otherwise, reverse the electric power connections, as explained in the schematic manual.



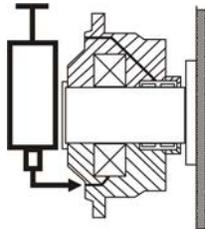
B2TAG94117: The brake assembly under the machine is fragile. Fork lift only under main structural supports.

Display or Action

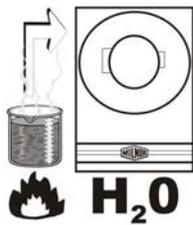
Explanation



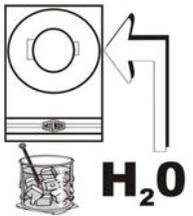
B2TAG94118: Do not strike shipping container during forklifting. Fragile components inside.



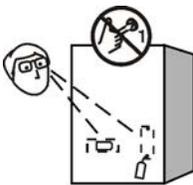
B2TAG96007: Add grease here. Refer to the preventive maintenance schedule in the service manual.



B2T2001013: Hot water connection.



B2T2001014: Cold water connection.



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.

Tag Guidelines for the Models Listed Below

Display or Action



Explanation

B2T2004027: Steam connection (optional)

— End of BIUUUI02 —

Installation Tag Guidelines

BNWG4I01.R01 0000187278 A.2 5/22/18 4:30 PM Released

42044SR2	42044SR3	42044WR2	42044WR3
60044SR2	60044SR3	60044WR2	60044WR3
72044SR2	72044SR3	72044WR2	72044WR3

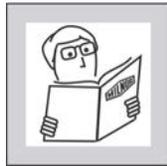
 **NOTICE:** This information may apply to models in addition to those listed above. It applies to paper tags. It does not apply to the vinyl or metal safety placards, which must remain permanently affixed to the machine and replaced if no longer readable.

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

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

Display or Action

Explanation



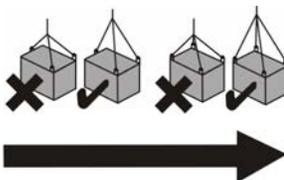
Read the manuals before proceeding. This symbol appears on most tags. The machine ships with safety, operator, and routine maintenance guides for customer use. Milnor dealer manuals for installing, commissioning, and servicing the machine are also available from the Milnor Parts department.



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

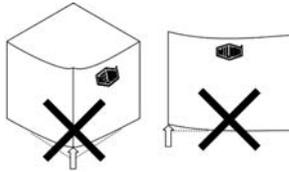


B2TAG94078: Do not forklift here; do not jack here; do not step here—whichever applies.



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).

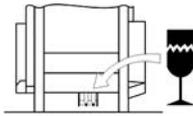
B2TAG94081: Motor must rotate in this direction. On single motor washer-extractors and centrifugal extractors, the drive motor must turn in this direction during draining and extraction. This tag is usually wrapped around a motor housing. If the motor turns in the opposite direction when the machine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



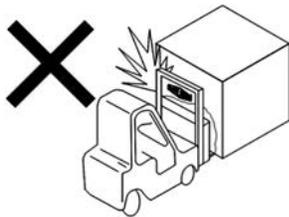
B2TAG94084: Do not lift from one corner of the machine, as this can cause the frame to rack, damaging it.



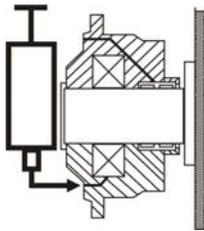
B2TAG94097: The cylinder must rotate **counterclockwise** during draining and extraction (spin) when viewed from here (rear of machine). Otherwise, reverse the electric power connections, as explained in the schematic manual.



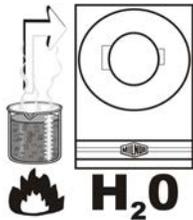
B2TAG94117: The brake assembly under the machine is fragile. Fork lift only under main structural supports.



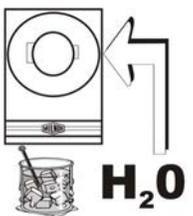
B2TAG94118: Do not strike shipping container during fork-lifting. Fragile components inside.



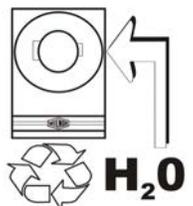
B2TAG96007: Add grease here. Refer to the preventive maintenance schedule in the service manual.



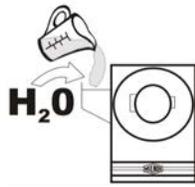
B2T2001013: Hot water connection.



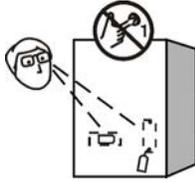
B2T2001014: Cold water connection.



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



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



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.



B2T2004027: Steam connection.

End of document: BNWG4I01

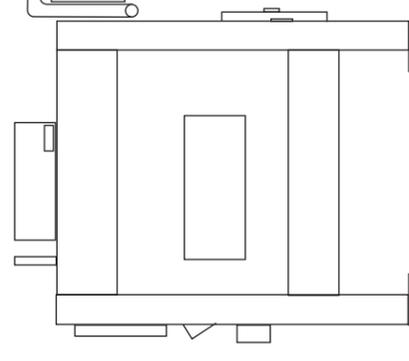
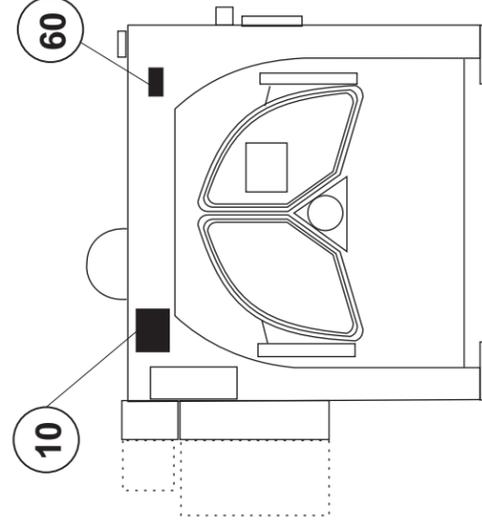
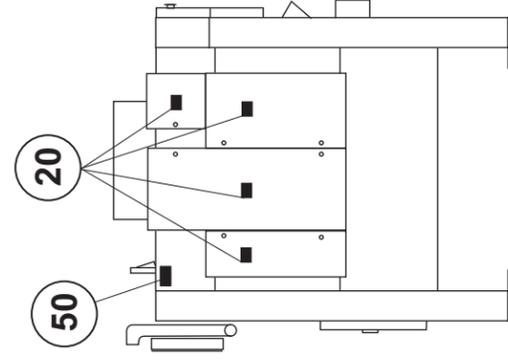
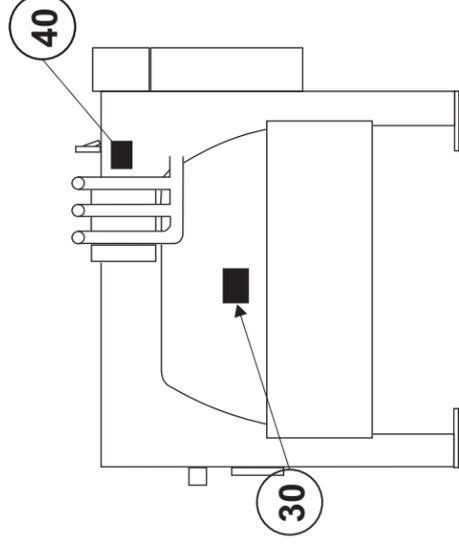


Pellerin Milnor Corporation
P. O. Box 400, Kenner, LA 70063-0400

Litho in U.S.A.

Notes:

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





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

Litho in U.S.A.

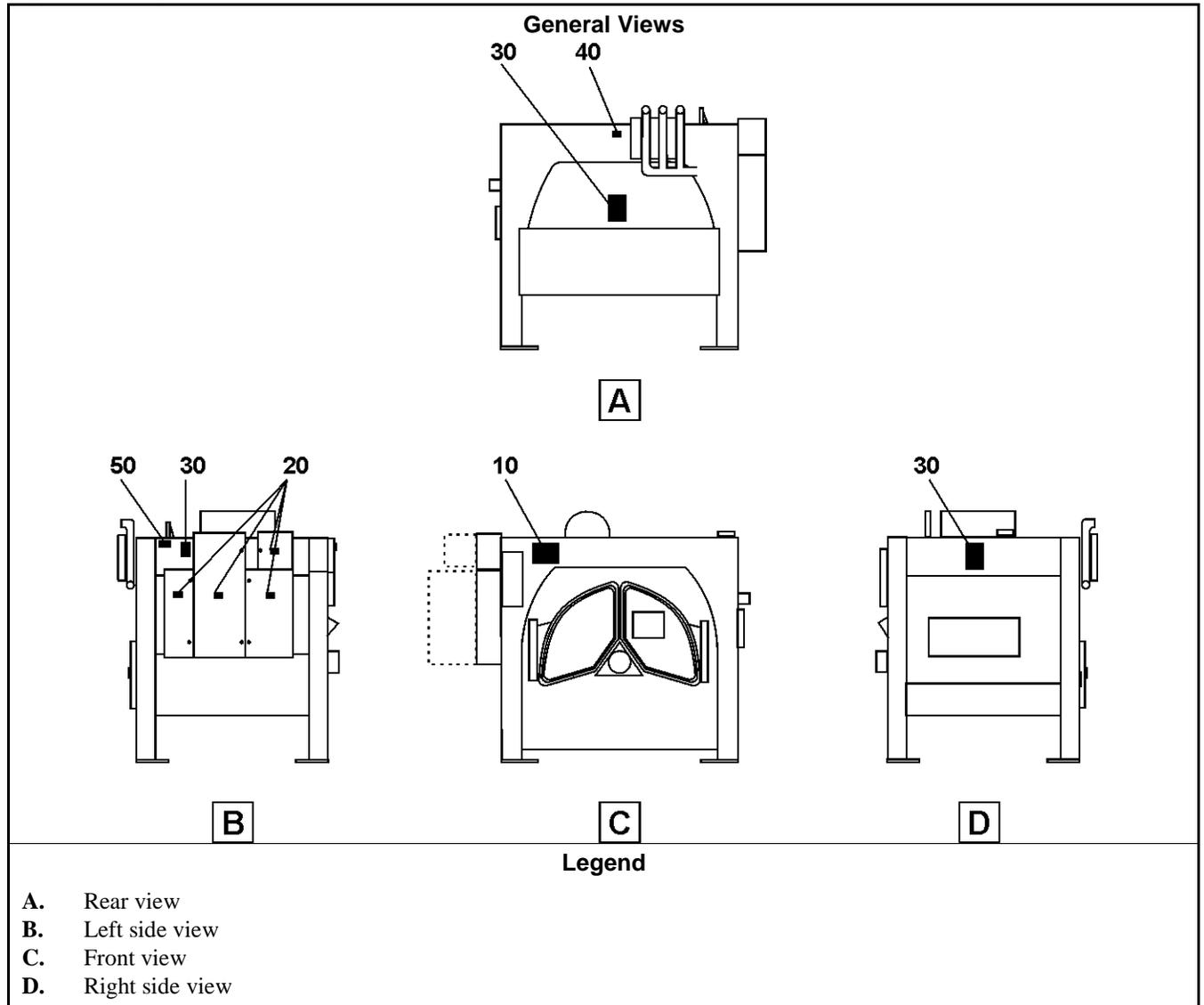
Parts List—Safety Placard Placement

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

Used In	Item	Part Number	Description	Comments
-----ASSEMBLIES-----				
none				
-----COMPONENTS-----				
all	10	01 10627A	NPLT:DIV-CYL/STAPH WARN-TCATA	
all	20	01 10377A	NPLT:ELEC HAZARD LG-TCATA	
all	30	01 10689A	NPLT:BELT HAZARD SM TCATA	
all	40	01 10648A	NPLT:GEAR HAZARD-TCATA	
all	50	01 10685A	NPLT:BURN HAZARD-TCATA	
all	60	01 10699A	NPLT:SERV HZRD-ALUM-TCATA	

Safety Placards and Locations— ISO: 6044WP2, 6044WR2, 7244WP2, 7244WR2

Figure 1: Safety Placards and Locations— ISO: 6044WP2



- This document is for placards that agree with: ISO
- If the placard is removed or you cannot read it, replace the placard immediately.
- If the placard is aluminum, the mounting holes are on the machine. Use #8 self-tapping screws. If the placard is vinyl, put the placard in the approximate location shown.

Table 1: Parts List—Safety Placards and Locations— ISO: 6044WP2

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				
none				
Components				
all	10	01 10627X	Dataplate, Warning, ISO	
all	20	01 10377	Dataplate, Warning, ISO	
all	30	01 10628X	Dataplate, Warning, ISO	
all	40	01 10648X	Dataplate, Warning, ISO	
all	50	01 10649X	Dataplate, Warning, ISO,	Used on the steam inlet

— End of BIHDBM01 —

Service and Maintenance

1

Torque Requirements for Fasteners



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

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

Figure 1: The Bolts in Milnor® Equipment

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

1. Torque Values

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

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

1.1. Fasteners Made of Carbon Steel

1.1.1. Without a Threadlocker

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

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

Torque Requirements for Fasteners

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

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

Table 3: Torque Values for Plated Fasteners with Maximum 5/16-inch Diameters and No Lubricant

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

Table 4: Torque Values for Plated Fasteners Larger Than 5/16-inch Diameters and No Lubricant

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

1.1.2. With a Threadlocker

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

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

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

Torque Requirements for Fasteners

Table 6: Torque Values if You Apply LocTite 222

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

Table 7: Torque Values if You Apply LocTite 242

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

Table 8: Torque Values if You Apply LocTite 262

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

Table 9: Torque Values if You Apply LocTite 272 (High-Temperature)

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

Table 10: Torque Values if You Apply LocTite 277

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

1.2. Stainless Steel Fasteners

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

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

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

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

2. Preparation



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

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

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

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

3. How to Apply a Threadlocker

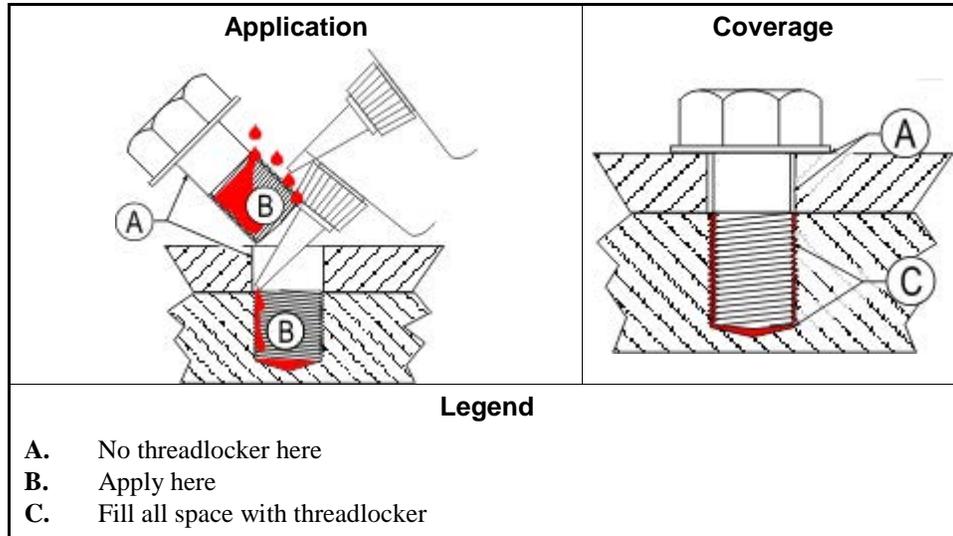


CAUTION 3: Malfunction Hazard—Heat, vibration, or mechanical shocks can let the fasteners loosen if you do not apply the threadlocker correctly. Loose fasteners can cause malfunctions of the equipment.

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

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

Figure 2: Blind Hole



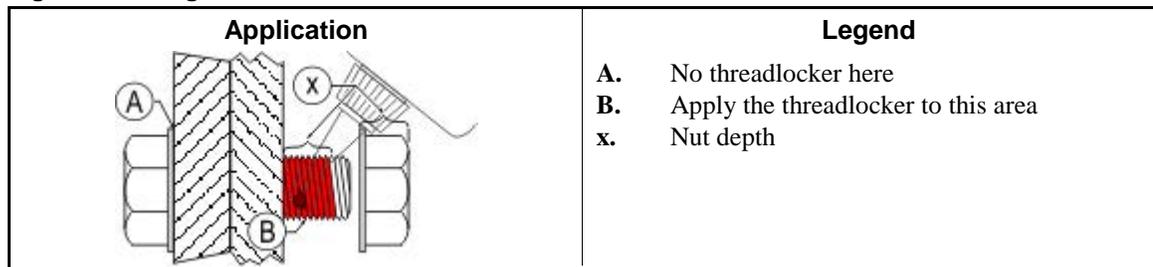
3.1. Blind Holes

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

3.2. Through Holes

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

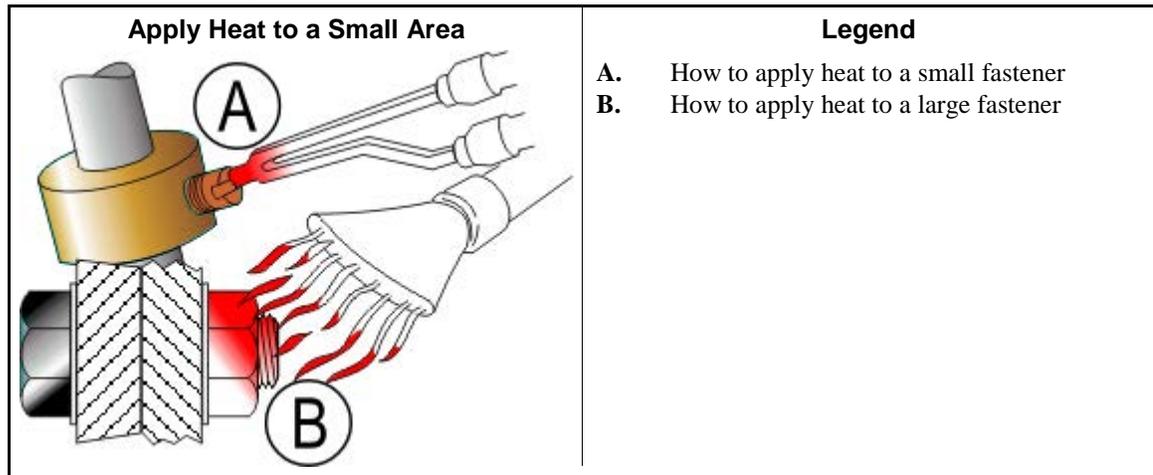
Figure 3: Through Hole



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

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

Figure 4: Disassembly



— End of BIUUM04 —

Drive Assemblies

2



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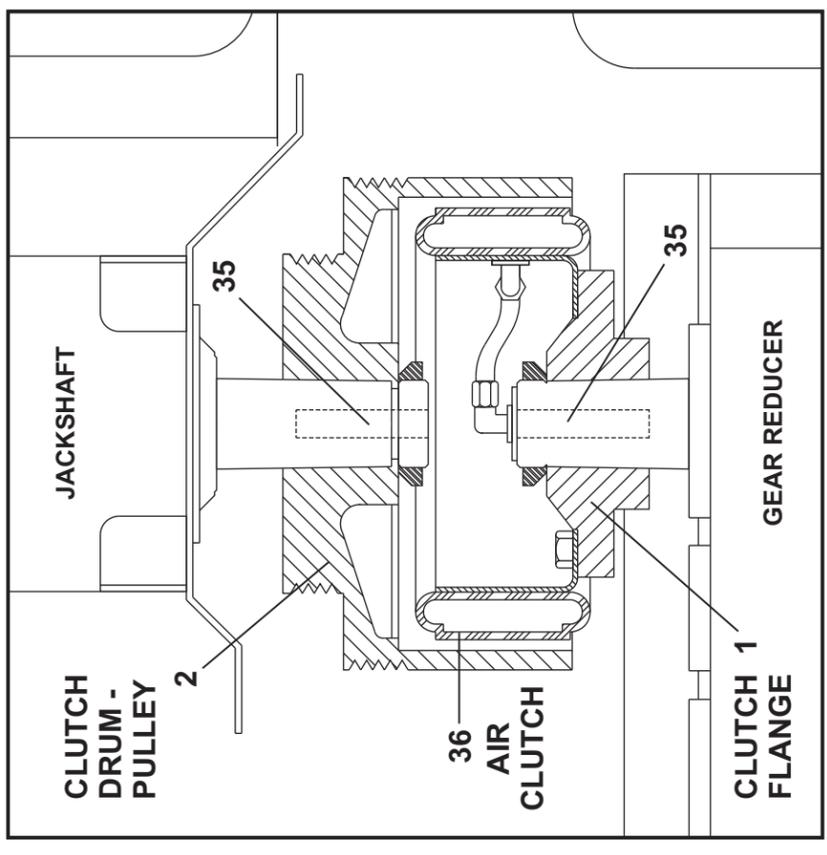
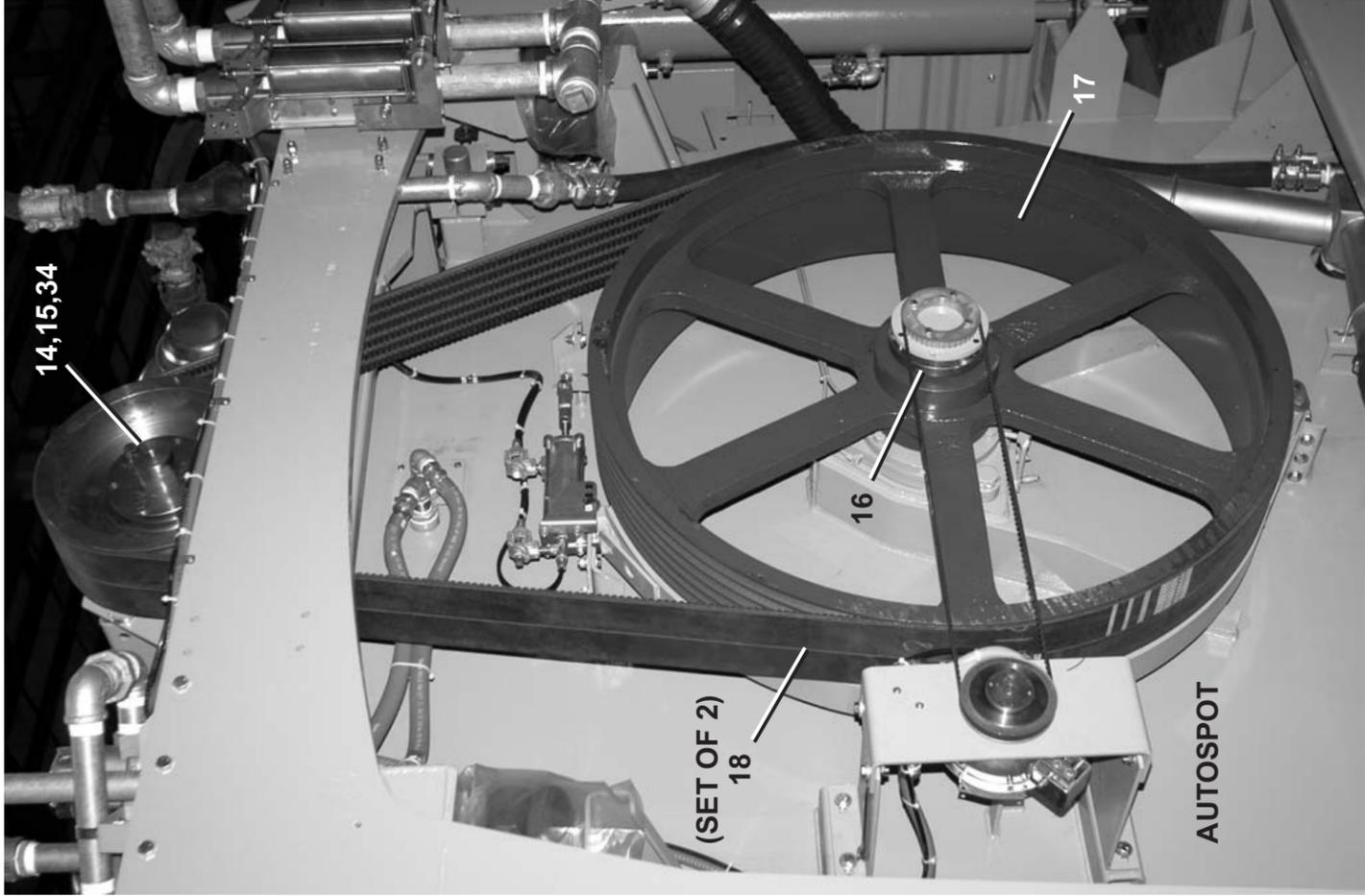
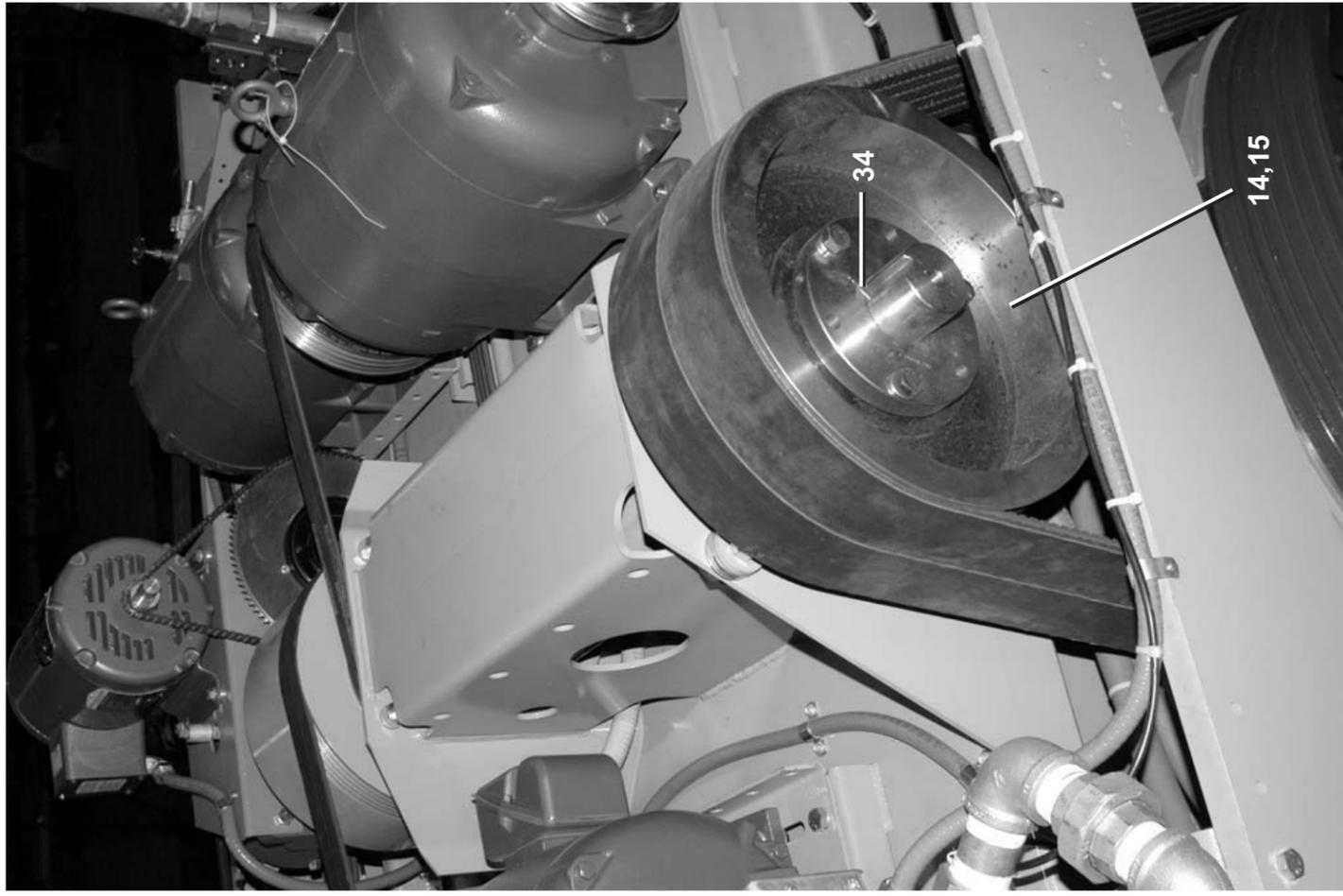
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SECTION A-A: AIR CLUTCH



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AUTOSPOT
 DRIVE
 MOTOR

AUTOSPOT
 SENSING
 UNIT



30 DRIVE PULLEY
 AIR OPERATED
 AUTOSPOT



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

Used In	Item	Part Number	Description	Comments
	A	D36 00250	*DRIVECHART=7244WE2 50CYC	7244WP2,WR2 50 CYCLE
	B	D36 00160	*DRIVECHART=7244WE2 60CYC	7244WP2,WR2 60 CYCLE
	C	D36 00150	*DRIVECHART=7244WE3 50CYC	7244WP3,WR3 50 CYCLE
	D	D36 00660	*DRIVECHART=7244WE3 60CYC	7244WP3,WR3 60 CYCLE
			-----ASSEMBLIES-----	
			-----COMPONENTS-----	
all	1	X2 15106	FLANGE=CLUTCH DRIVE 2.5	
all	2	X3 06039	CLUTCH DRUM+VPUL 72MM	
all	3	56Q1GSDS	1+3/8" BUSH VPUL QD TYPE SDS	
all	4	560685R2SE	VPUL 2G3V6.85 (SDS) TYPE QD	
all	5	56VR0750M2	VBELT 3V750 EA=1BLT	
all	6	56Q1MSK	1+5/8" BUSH VPUL QD TYPE SK	
all	7	560685R5SK	VPUL 5G3V6.85 (SK) TYPE QD	
all	8	56VR067S	VBELT 3V670	
all	9	56Q1RSK	1+7/8" BUSH VPUL QD TYPE SK	
all	10	561110R4SK	VPUL 4G3V11.1(SK) TYPE QD	
all	11	56VR071S	VBELT 3V710	
all	12	56Q1GSF	1+3/8" BUSH VPUL QD TYPE SF	
all	13	02 19201D	V-PUL 8G3V7.95 QD TYPE "SF"	
all	14	56Q2HF	2+7/16" BUSH VPUL QD TYPE F	
AC	15	56140C6F	VPUL 6C14.0 (F) TYPE QD	
BD	15	56114C6F	VPUL 6C11.4 (F) TYPE QD	
all	16	56Q3NS2S	3+11/16" SPLIT BUSH B#S2	
all	17	03 06029	VPUL+BRKDRUM 6C44.0-410# 72W	
AC	18	56VC190XB6	SET OF TWO 3RCX190 VBANDS	
BD	18	56VC187XBA	SET OF TWO 3RCX187 VBANDS	
AB	19	56Q1GSK	1+3/8" BUSH VPUL QD TYPE SK	
CD	19	56Q1GP1	1+3/8" BUSH VPUL BROWNING P1	
AB	20	560470R6SK	VPUL 6G3V4.7 (SK) TYPE QD	
CD	20	560407R6P1	VPUL 6G3V4.07PD/4.12	
all	21	56VR050S	VBELT 3V500	
all	22	54N015	SPROCKET BROWN#35A96-6"BORE	
all	23	54N008	SPRKT BROWN#35-13X7/8" BORE	

Parts List, cont.—Drive Chart

Used In	Item	Part Number	Description	Comments
all	24	15E006	KEY #6 WOODRUFF 5/32X5/8 SAE10	
all	25	54G010B43P	ROLLCHAIN+CONNLINK 3/8"=AUTO	
all	26	54H164A	CLUTCH 12VDC MA-PM02B	
all	27	54C160	GEARBLT GATES 727050L X 1/2 B4	
all	29	Y3 06375	PLATE=AIROP AUTOSPOT 72WE2	
all	30	02 10191	PULLEY-TIMING-DRIVER	
all	31	54X020	SYNCHRONUS GEARBELT SPRKT=BRN	
all	32	56Q0MHS	.627" BUSH VPUL TYPE H,D,OR QT"SPECIAL"	
all	33	15E007	KEY #7 WOODRUFF 3/4X1/8 SAE103	
all	34	02 175121	KEY=5/8SQ	
all	35	15E230	STRMACHKEY 3/8SQX2+1/2 TOL.+0	





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

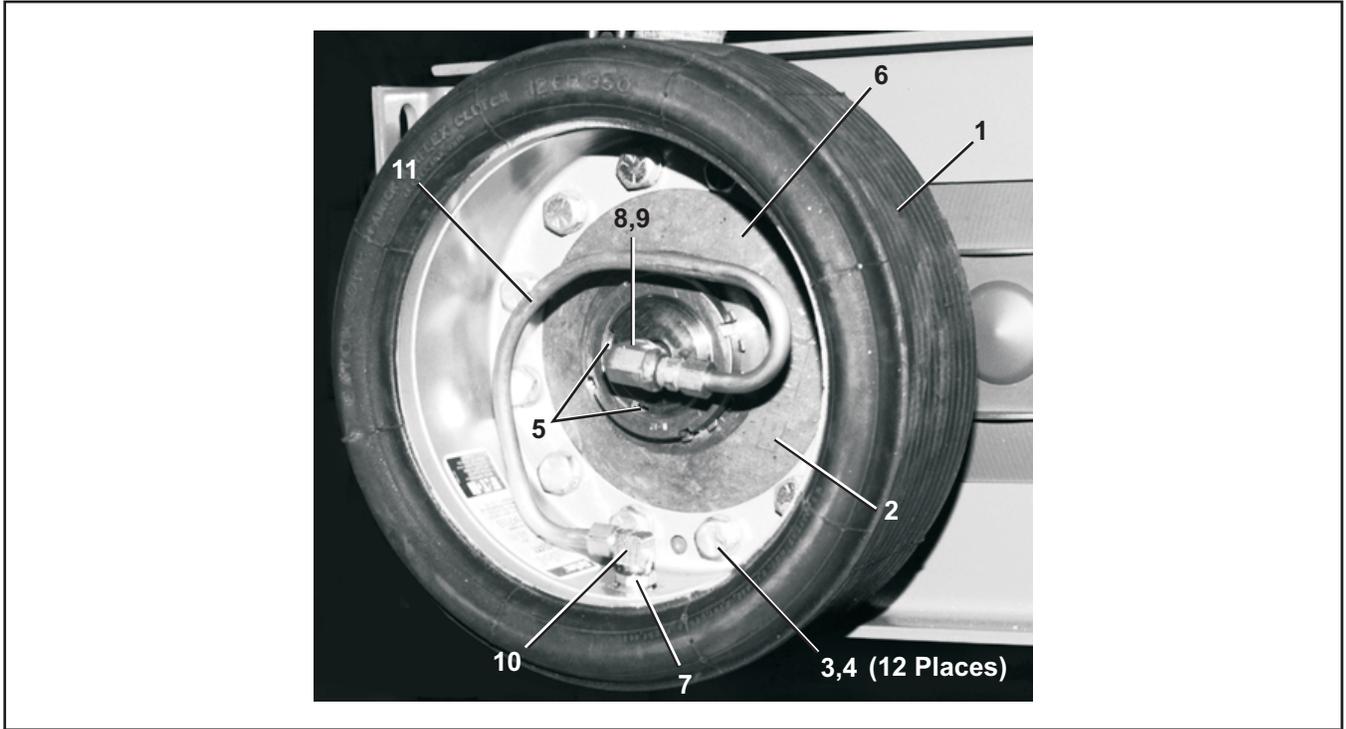
Used In	Item	Part Number	Description	Comments
	A	SA 36 009	*DRIVE ASSY=7244 WED -----ASSEMBLIES-----	
			-----COMPONENTS-----	
all	1	GBJ28001	JKSHFT ASSY TIMKEN 60W+72W+T	
all	2	W3 06072A	*DR BASE 7244WEU(50+60)TIMKEN	
all	3	02 18701A	SWAY BRACE = WE DRIVE BASE A	
all	4	02 19131	BRACKET=FRONT REDUCER MOUNT	
all	5	02 19130	BRACKET=REAR REDUCER MOUNT	
all	6	54S025A	MILNOR, 10,17:1, AIR SEAL 30HP GEAR RED	
all	7	AD 28 008B	DRAIN=GEAR RED 60/72WE	
all	8	96M055	DELTRON QUICK EXHAUST VLV.1/4"	
all	9	27A005	MUFFLER 3/8" BANTAM B38	
all	10	5N0E02KG42	NPT NIP 1/4X2.5 TBEGALSTL SK40	
all	11	5SP0GFFSSV	NPT PLUG 3/8 SQSOLIDVENTBLKSTL	
all	12	5SCC0GNF	NPT COUP 3/8 GALMAL 150#	
all	13	5N0GCLSG42	NPT NIP 3/8XCLS TBE GALSTL S40	
all	14	X2 15106	FLANGE=CLUTCH DRIVE 2.5	
all	15	X3 06039	CLUTCH DRUM+VPUL 72MM	
all	16	54H150	RUBBER AIRCLUTCH EATON#12ER350	
all	17	53A019B	BODYMALECON5/16X1/8COM#B68A-5A	
all	18	53A060A	NUT BRASS 5/16 COMP#61A-5	
all	19	53A509	TUBE INSERT 5/16"OD X .53"LG.	
all	20	53A040B	BODY=EL90MALE5/16X.25#B69A-5B	
all	21	60E005	TUBING BLK.POLY.5/160DX3/16ID	
all	22	15K147	HXCAPSCR 1/2-13UNC2X1 GR5 ZINC	
all	23	56AHN12	N12 BEARING LOCKNUT	
all	24	56AHW12	W12 BEARING LOCKWASHER	
all	25	15E230	STRMACHKEY 3/8SQX2+1/2 TOL.+0	
all	26	02 19285	MTRPLATE 184/215T BEND@PRINT	
all	27	05 20131A	MTRPLATE 284/286T BEND@PRIN	
all	28	02 19288	BRACKET=ADJUSTING-1.5X1.75	
all	29	15D119	HXTAPSCR 1/2-13X4 GR5 ZNC FTL	

Parts List, cont.—Drive Base Assembly

Used In	Item	Part Number	Description	Comments
all	30	15G230	HXNUT 1/2-13UNC2B SAE ZINC GR2	
all	31	15U300	LOKWASHER REGULAR 1/2 ZINC PLT	
all	32	15K151	HXCAPSCR 1/2-13UNC24X1.25 GR5	
all	33	02 19283	NUT=1/2-13UNCX1+1/2SQ SPEC	
all	34	03 25293	BAR=MOTOR MNT HING PIN CLAMP	
all	35	17R027A16A	THREADED ROD 3/4-10 GR08 16.0	
all	36	15G240A	HEXNUT 3/4-10UNC2B SAE GR8 ZIN	
all	37	15U340	LOCKWASH MEDIUM 3/4 ZINCPL	
all	38	17W050	SPHERICALWASHER SET 7/8 M/F	
all	39	X2 18634	CLAMP=MACHINED DR HINGPIN	
all	40	02 18706	REINFORCEMENT=HINGE PINCLAMP	
all	41	15K227	HXCAPSCR 5/8-11UNC2AX4 GR5 ZIN	
all	42	15U315	LOKWASHER MEDIUM 5/8 ZINCPL	
all	43	15G236	SQNUIT 5/8-11UNC2B SAE ZINC GR2	
all	44	02 18702	FORK=ADJ SCREW-MOTOR MT-FRT	
all	45	17R125A15K	STUD=DRIVEBASEADS 1+1/4X15.5	
all	46	15G261	HVHXNUT 1+1/4-8UNC2B ZINC GR2H	
all	47	17W125	1+1/4"SPHERICAL WASHER SET	
all	48	15K110	HEXCAPSCR 3/8-16UNC2AX1.5 GR5-	
all	49	15G205	HXNUT 3/8-16UNC2B ZINC GR2	
all	50	15U255	LOCKWASHER MEDIUM 3/8 ZINCPL	
all	51	02 175257	GREASE RELIEF=DRIP SHIELD	
all	52	15P185	TRDCUT-F HXHD 1/4-20UNC2AX3/4	
all	53	02 175121	KEY=5/8SQ	
all	54	03 01234	COVER=CENT-SW SHAFT PLATED	
all	55	20H004T	OIL SHELL MORLINA 220	
all	56	15K182	HEXTAPSCR 1/2-13XZINC GR5 FUL	
all	57	15K211	HXCAPSCR 5/8-11UNC2AX1 GR5 ZIN	
all	59	15K221	HEXCAPSCR 5/8-11 UNC2X2GR5 ZIN	
all	60	15U314	FLATWASHER(USS STD) 5/8" ZNC P	
all	61	15G238	HXNUT 5/8-11UNC2B SAE ZINC GR2	
all	62	02 19286	MTRPLATE 254/256T BEND@PRINT	

Air Clutch

72044WR2, 72044SR2

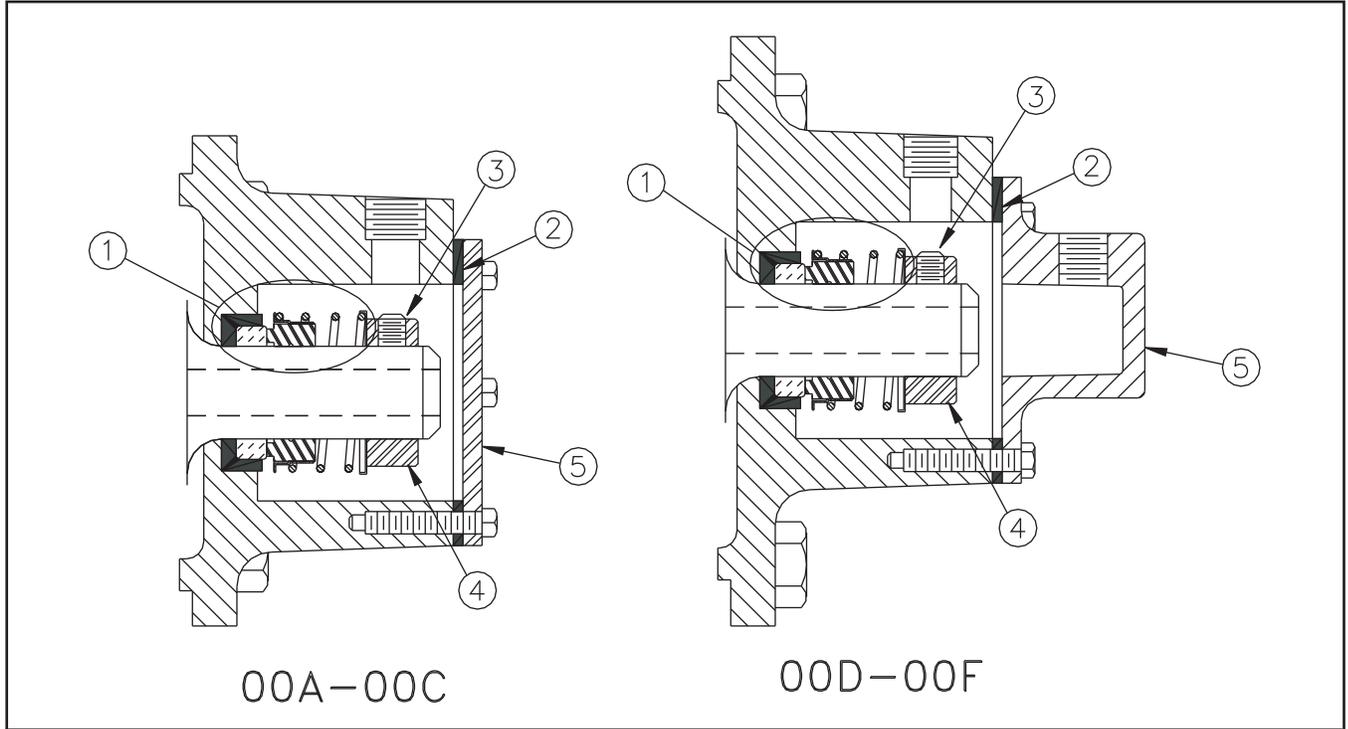


Parts List—Air Clutch

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

Used In	Item	Part Number	Description	Comments
-----ASSEMBLIES-----				
	A	A28 18000	CLUTCH DRUM-AIR ASSY=60+72WE	
-----COMPONENTS-----				
all	1	54H150	RUBBER AIRCLUTCH EATON#12ER350	
all	2	X2 15106	FLANGE=CLUTCH DRIVE 2.5	
all	3	15K151	HXCAPSCR 1/2-13UNC24X1.25 GR5	
all	4	15U300	LOKWASHER REGULAR 1/2 ZINC PLT	
all	5	15E230	STRMACHKEY 3/8SQX2+1/2 TOL.+0	
A	6	53A023	MALECON3/8X.25COMP ANCHR#68-64	
A	7	5SB0G0EDEO	NPTHEXBUSH 3/8X1/4 GALCI 125#	
A	8	5SL0EBEA	NPTELB 90DEG 1/4 BRASS 125#	
A	9	5N0E01KBE2	NPT NIP 1/4X1.5TBE BRASS STD.	
A	10	53A043G	EL90 3/8X1/4COMP.AND#69A-6B	
A	11	90A021	COPERTUBE 3/8"ODX.032X50' EA=1	

Reducer Air Seal



Parts List—Reducer Air Seal

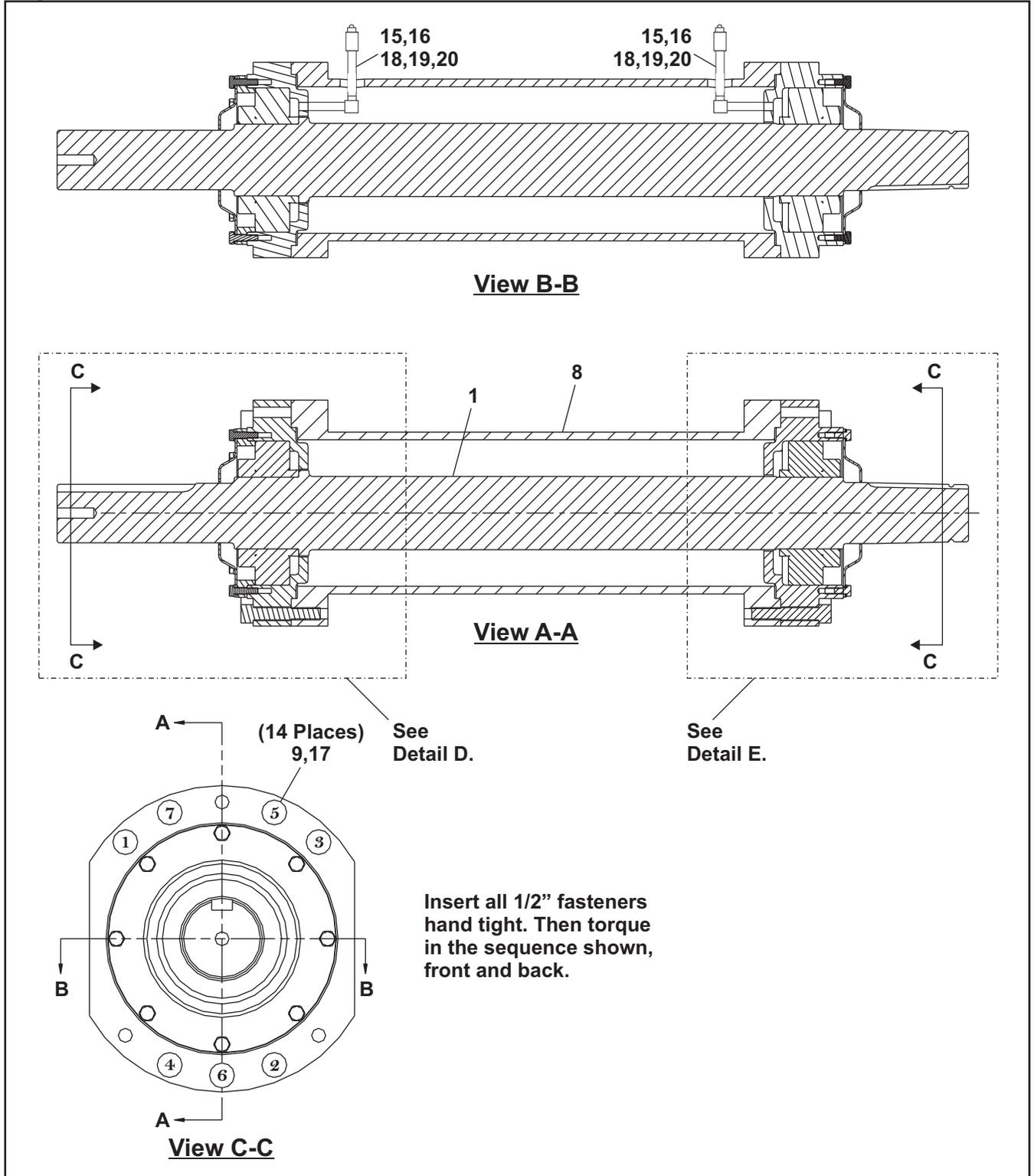
Find the correct assembly first, then find the needed components. The item letters (A, B, C, etc.) assigned to assemblies are referred to in the "Used In" column to identify which components belong to an assembly. The item numbers (1, 2, 3, etc.) assigned to components relate the parts list to the illustration.

Used In	Item	Part Number	Description	Comments
-----ASSEMBLIES-----				
	A	54S014HC	MILNOR: 15.40:1 TAPERED OUTPUT	3621,3626,4226,4832,4836
	B	54S012HC	REDUCER 15.4 DORRIS #1115-25HC	SHUTL36/40/48R+L
	C	54S015	REDUCER 19.6 SKK/DOR 3220-60C	4226DYE
	D	54S022A	MILNOR, 19.59:1, AIR SEAL	4231, 4244, 5238
	E	54S023B	MILNOR, 10.17:1 AIR SEAL 7.5	6044WR2/WR3
	F	54S025A	MILNOR, 10,17:1, AIR SEAL 30HP GEAR RED	6442,6446,7244,6440,6450 7244SR2/SR3
-----COMPONENTS-----				
BF	1	24S020	MECHSHFT SEAL CRANE 3/4"TYPE#2	(PART OF KIT, ITEM 6)
B-F	2	02 15111	GASKET AIRSEALHOUSING COVER	(PART OF KIT, ITEM 6)
B-F	3	15Q077	SOKSETSCR 1/4-20X1/4 ZINC ALLE	(PART OF KIT, ITEM 6)
B-F	4	02 10380	Z SHAFT COLLAR FOR AIR SEAL	(PART OF KIT, ITEM 6)
A-C	5	02 15108	COVER=ROTARY AIRSEAL HOUSING	
D-F	5	02 15108A	CVR,OUTPUT,ENDCAP MILNOR 23/25	
All	6	K10 0002	KIT=ROTARY AIR SEAL	ITEMS 1-4

Jackshaft

72044WR2, 72044SR2

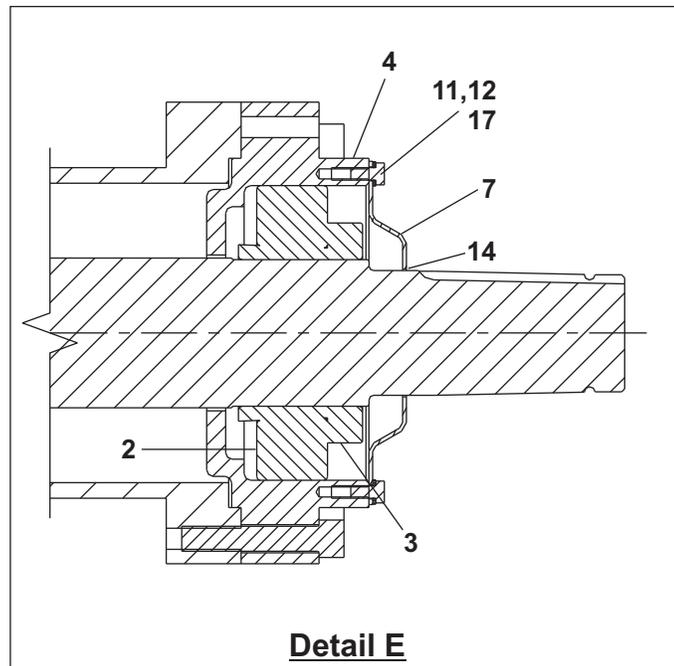
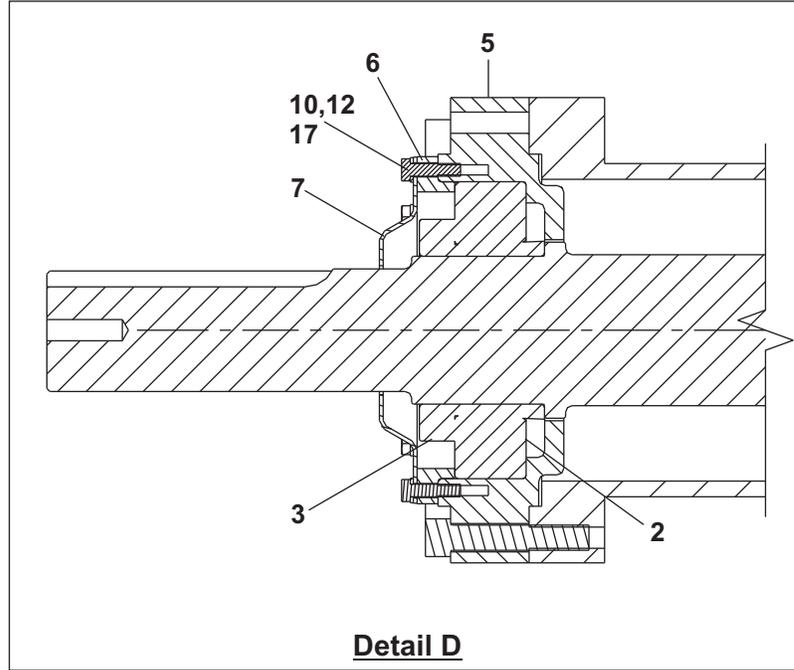
Figure 1: Cross section views



Jackshaft

72044WR2, 72044SR2

Figure 2: Detail Views



Jackshaft

72044WR2, 72044SR2

Parts List—Jackshaft

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

Used In	Item	Part Number	Description	Comments
-----ASSEMBLIES-----				
	A	ABJ25004	JKSHAFT-BRGHOU-SPHRCL BNG	
-----COMPONENTS-----				
all	1	X2 18711E	JACKSHAFT SPHERICAL BRNG	
all	2	54A988	SKF BRNG #22217EK/C3	
all	3	54A989	17 X 2.938 SNW ADAPTER ASSY	
all	4	X2 19381D	BRNG HOLDER=SPHRCL BRNG-REAR	
all	5	X2 19381C	BRNG HOLDER=SPHRCL BRNG-FRT	
all	6	X2 15702A	RETAINER-SPHRCL BRNG	
all	7	02 19384	COVER=BRG HOUSE FT+REAR	
all	8	X2 19378	BRGHSG SUP=TIMKENS MACHINED	
all	9	15K193	SOKCAPSCR 1/2-13X2.75GR8 HK	
all	10	15U180	LOCKWASHER MEDIUM 1/4 ZINCP	
all	11	15K030	HEXCAPSCR 1/4-20UNC2X1/2 GR5 Z	
all	12	15K041	HXCAPSCR 1/4-20UNC2AX1 GR 5 ZI	
all	14	02 19196	RING=GREASE SLNGR JKSHFT BLK	
all	15	51A001	ADAPTER 1/8 PT BRASS	
all	16	5SL0CBEC	NPTELB 90DEG STRT 1/8 BRASS125	
all	17	20C007G	THDLOCKSEAL LCT24231 RMUBL50CC	
All	18	5N0C04AG42	NPT NIP 1/8X4 TBE GALSTL SK40	
All	19	5SCC0CBE	NPT COUP 1/8 BRASS 125# 103A-A	
All	20	54M025	HYDFIT 1/8"-90 ALEMITE 1613-B	

Brake Components and Installation : 6044WP2, 6044WP3, 7244WP2, 7244WP3

1. Band Brake Assembly Instructions (Notes:)

1. With the brake applied, the groove on the air cylinder stem must be 1 inch [25mm] from the air cylinder stem. Adjust the rod end and the yoke to set this dimension.
2. With the brake applied, the brake stops must be 5/8 inch +/-1/16 inch [16mm+/- .5mm] from the brake bands.
3. When you release the brake, the brake band and the air cylinder must be tight and square against the stops.
4. When you release the brake, there must be 3/16 inch [5mm] clearance between the brake band and the drum.
5. Do not tighten the pivot bolt too much. The air cylinder must move easily around the bolt.
6. Keep the two yoke arms in a horizontal plane.
7. Brake bands must move easily about the hinge pins.
8. Do not get grease or oil on the brake drum.

2. Brake Components

Figure 1: Brake Components

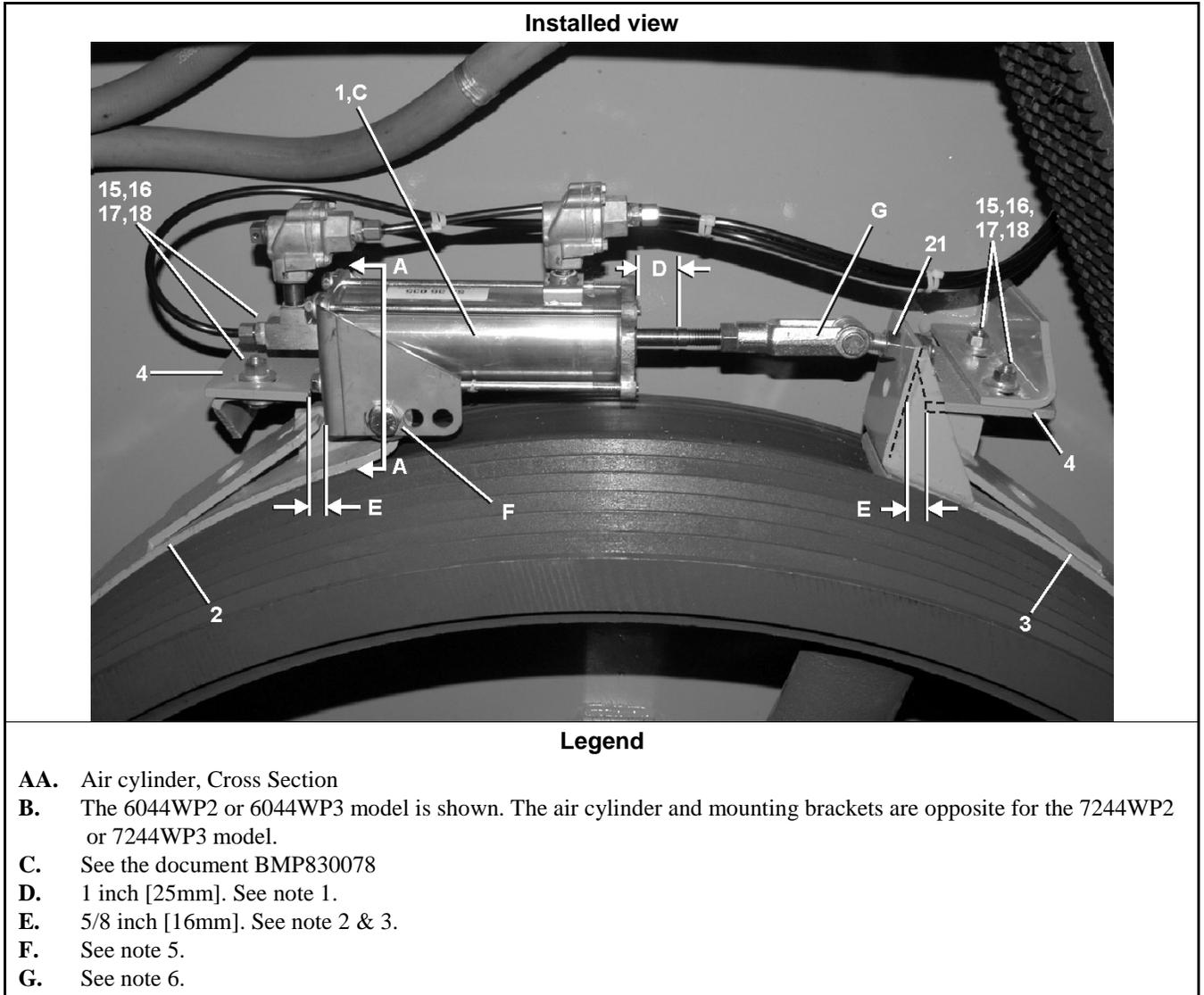


Figure 2: Band brake

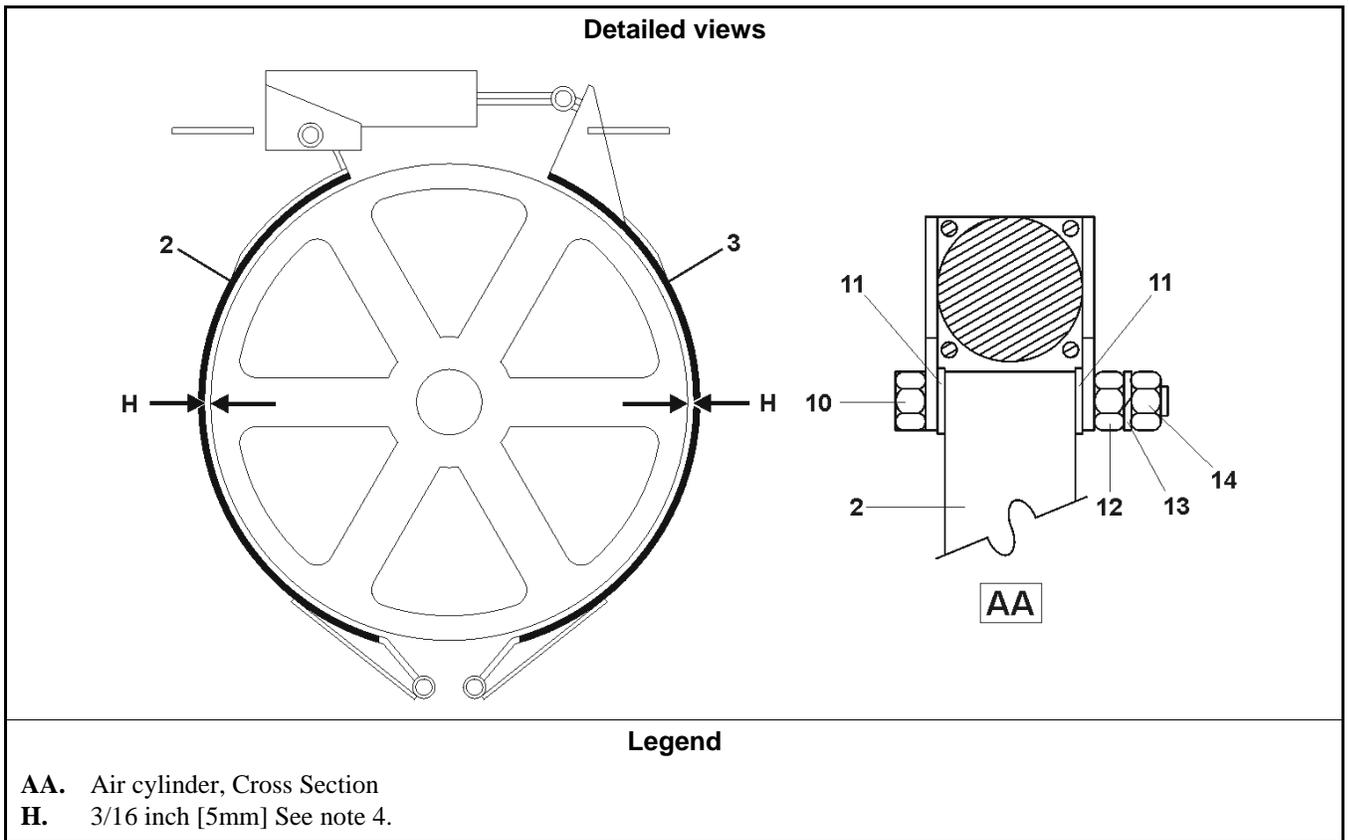


Figure 3: Air cylinder

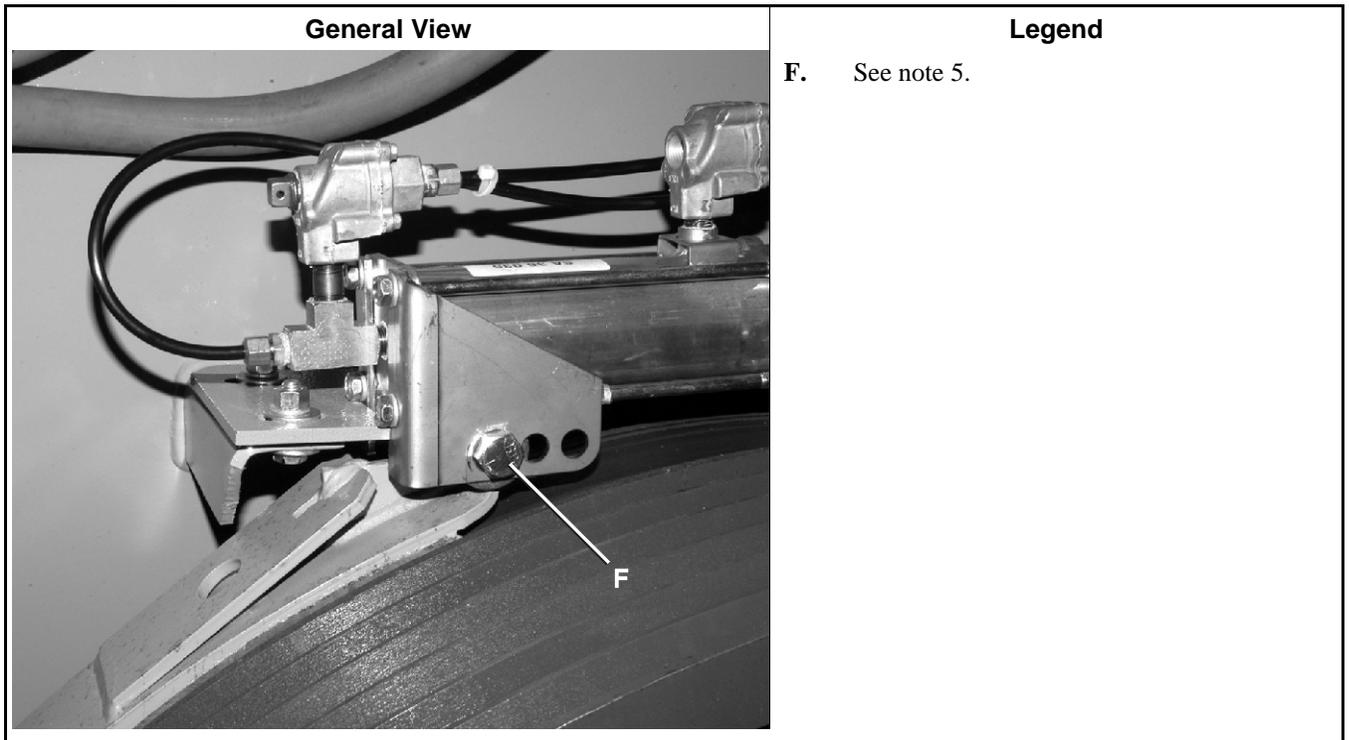


Figure 4: Band brake hinge pins

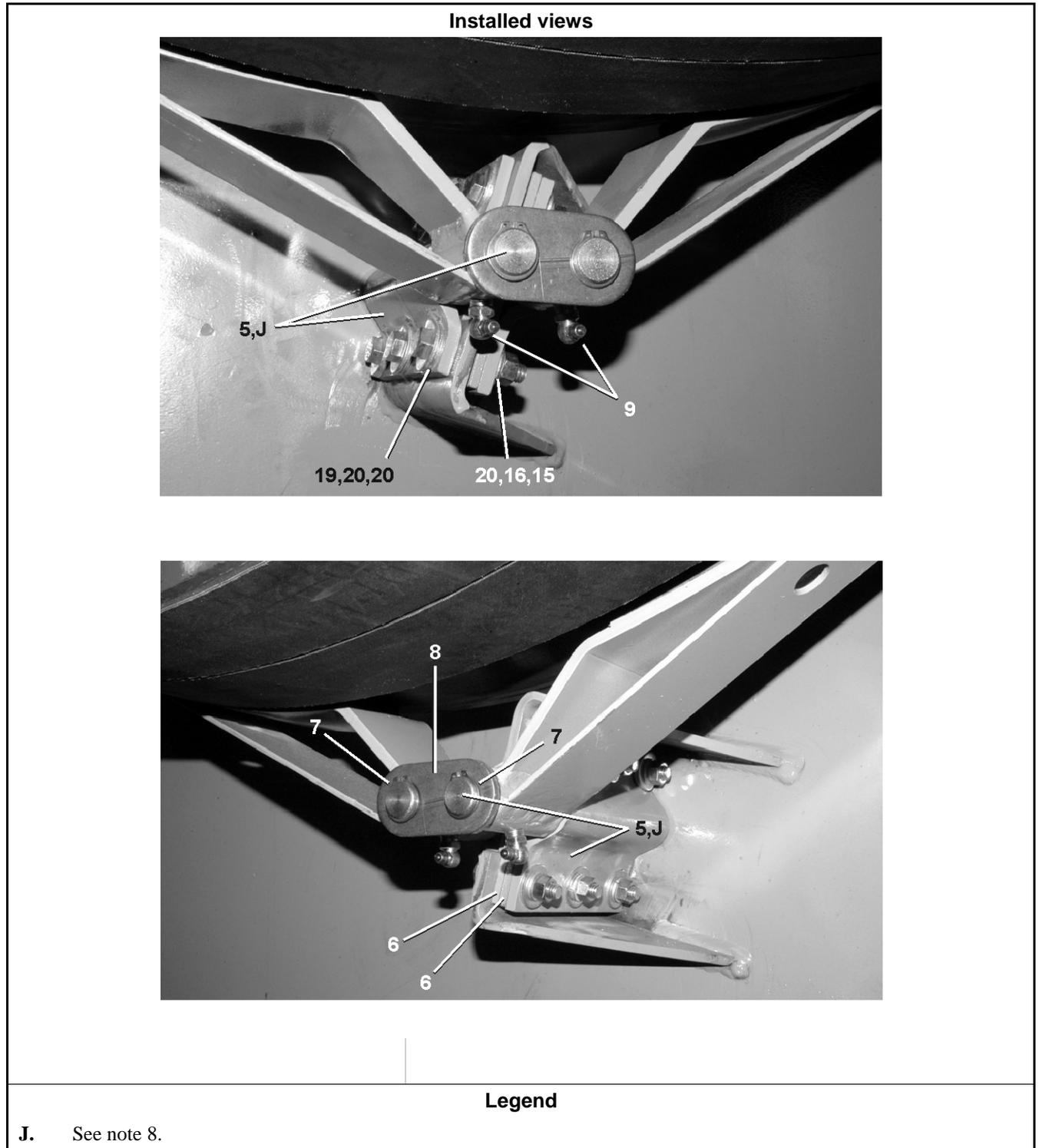


Figure 5: Roller (Models: 7244WP2, 7244WP3)

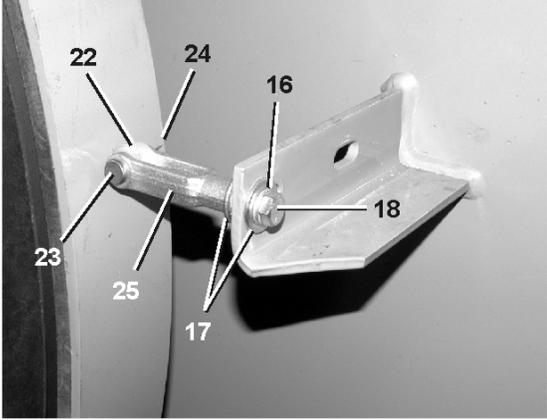
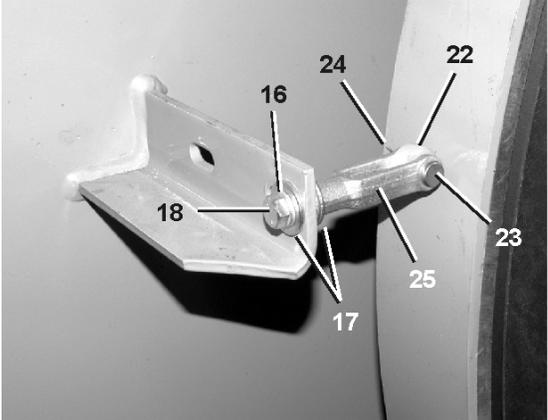


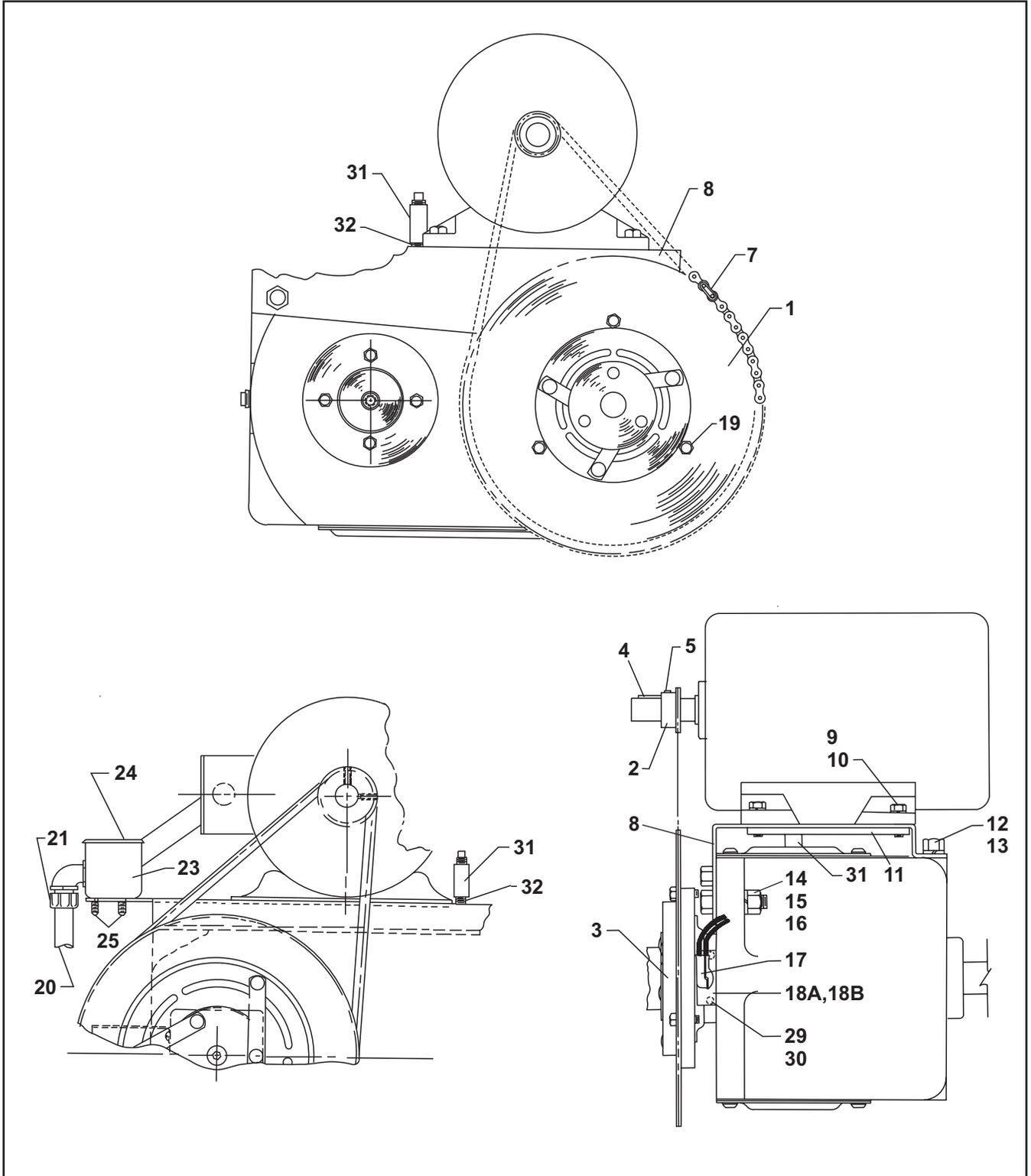
Table 1: Parts List—Brake Components

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
Assemblies				
	A	AD 28 151	Installation Group, Band brake, 6044	
	B	AD 36 043	Installation Group, Band brake, 7244	
Components				
A	1	SA 28 152	Air cylinder, 6044	
B	1	SA 36 035	Air cylinder, 7244	
A	2	SA 28 153N	Brake band, Right hand 6044	
B	2	SA 36 008N	Brake band, Right hand 7244	
A	3	SA 28 154N	Brake band, Left hand	
B	3	SA 36 007N	Brake band, Left hand	
all	4	02 175080	Stop	
all	5	W2 18661	Hinge pin	
all	6	02 18786	Shim	
all	7	17B062	Retainer ring	
all	8	02 18516B	Washer	
all	9	54M025	Elbow, 1/8"	
all	10	15D119	Bolt, 1/2-13X4	
all	11	15U280	Washer, Flat, 1/2	
all	12	15G230	Nut, 1/2-13	
all	13	15U300	Washer, Lock, 1/2	
all	14	15G231	Nut, 1/2-13	
all	15	15G205	Nut, 3/8-16	
all	16	15U255	Washer, Lock, 3/8	
all	17	15U240	Washer, Flat, 3/8"	
all	18	15K105	Bolt, 3/8-16X1.25	
all	19	15K117	Bolt, 3/8-16X1+3/4	
all	21	15G234N	Nut, Nylon lock, 1/2-13	
all	22	02 18689	Roller	
all	23	17A030	Clevis pin, 3/8"X1+3/32"DRIL SS	
all	24	15H030	Cotter pin, 3/32X3/4	
all	25	17A010	Yoke, 3/8-16	

— End of BIHDBM11 —

Autospot Drive Motor

72044WR2, 72044SR2



Autospot Drive Motor

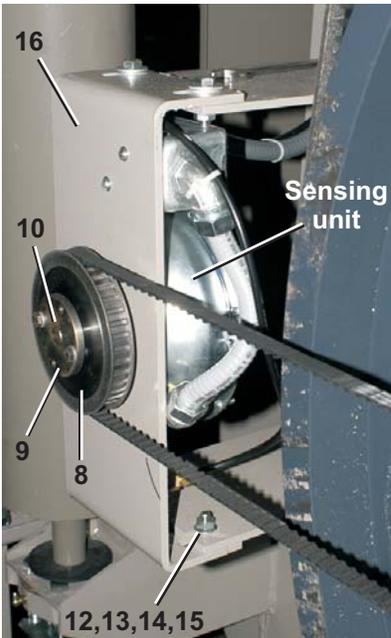
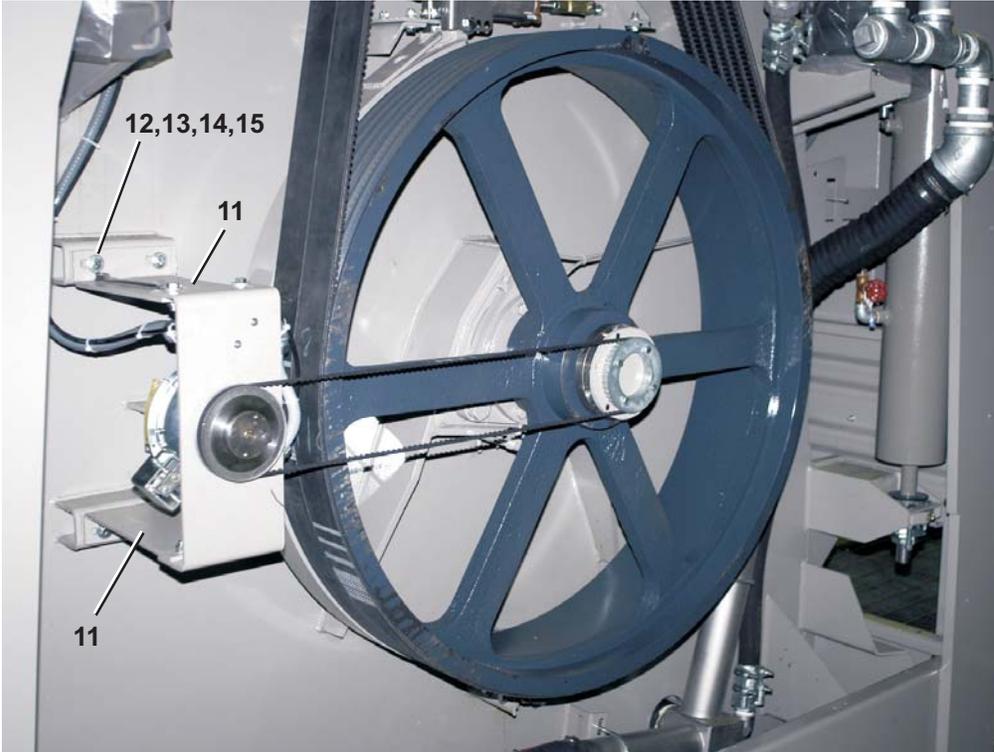
72044WR2, 72044SR2

Parts List—Autospot Drive Motor				
Find the correct assembly first, then find the needed components. The item letters (A, B, C, etc.) assigned to assemblies are referred to in the "Used In" column to identify which components belong to an assembly. The item numbers (1, 2, 3, etc.) assigned to components relate the parts list to the illustration.				
Used In	Item	Part Number	Description	Comments
-----ASSEMBLIES-----				
	A	G15 13400	MOTOR DRIVE ASSY=AUTOSPOT	7244SR2
	B	G28 15600	MOTOR DRIVE ASSY=AUTOSPOT	7244WR2
-----COMPONENTS-----				
all	1	54N015	SPROCKET BROWN#35A96-6"BORE	
all	2	54N008	SPRKT BROWN#35-13X7/8" BORE	
all	3	54H164A	CLUTCH 12VDC MA-PM02B	
all	4	15E006	KEY #6 WOODRUFF 5/32X5/8 SAE10	
all	5	15Q068	SOKSETSCR CUP10-24X1/4ZINCALLE	
all	7	54G010B43P	ROLLCHAIN+CONNLINK 3/8"=AUTO	
A	8	02 15865	BASE=AUTOSPOT MOTOR BND@ PRT	
B	8	02 175036	BASE=AUTSPTMTR60+72WE BND@PT	
all	9	15K105	HXCAPSCR 3/8-16UNC2A1.25 GR5 P	
all	10	15U255	LOCKWASHER MEDIUM 3/8 ZINCPL	
all	11	02 175027	TAPSTRIP=AUTOSPOT MOTORMOUNT	
all	12	15K211	HXCAPSCR 5/8-11UNC2AX1 GR5 ZIN	
all	13	15U315	LOKWASHER MEDIUM 5/8 ZINCPL	
all	14	15K180	HXCAPSCR 1/2-13UNCAX2 GR5 ZINC	
all	15	15U300	LOKWASHER REGULAR 1/2 ZINC PLT	
all	16	15G230	HXNUT 1/2-13UNC2B SAE ZINC GR2	
all	17	03 01275	COVER=AUTO CLUTCHWIRES	
all	18A	12M036L	1/2" 90-DEG SHORT ELLS	
all	18B	12M035	3/8" SCREW-IN CONNECTOR	
all	19	15K041	HXCAPSCR 1/4-20UNC2AX1 GR 5 ZI	
A	20	12C0375FN	3/8" FLX NON-METAL CONDUIT	
A	21	12M040	3/8" X 90-DEG SEALTITE CONN.	
A	23	12H050	HANDYBOX 4X2+1/8X2+1/8	
A	24	12H095	HANDY BOX COVER 4+2+1/8	
A	25	15P185	TRDCUT-F HXHD 1/4-20UNC2AX3/4	
A	29	15U150	LOCKWASHER MEDIUM #10 ZINCPL	
A	30	15K018	SKCPSCR 10-24 UNC 3X3/8 BLK	
all	31	5SCC0GNF	NPT COUP 3/8 GALMAL 150#	
all	32	5N0G02AG42	NPT NIP 3/8X2 TBE GALSTL SK40	

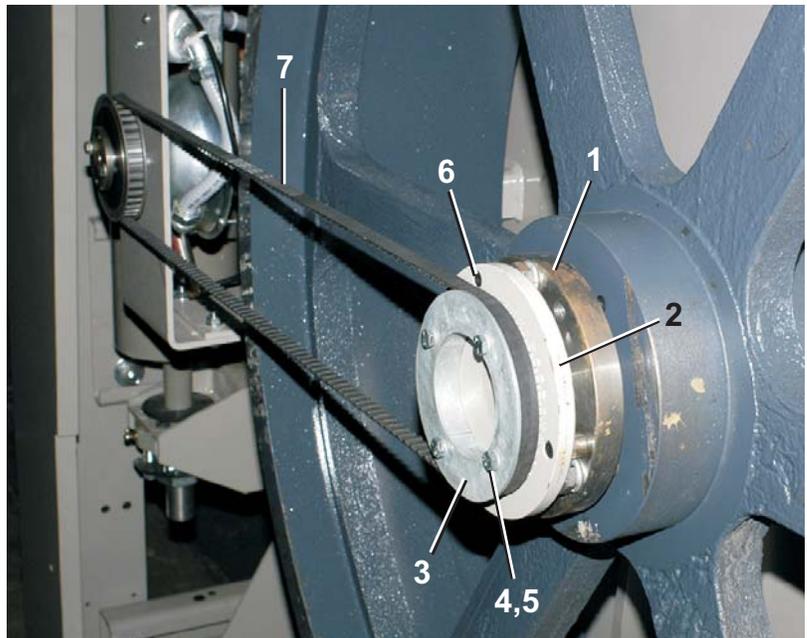
Autospot Sensing Unit

72044WP2,WR2

Figure 1: Sensing Unit Installation and Drive Components



Sensing Unit Mounting

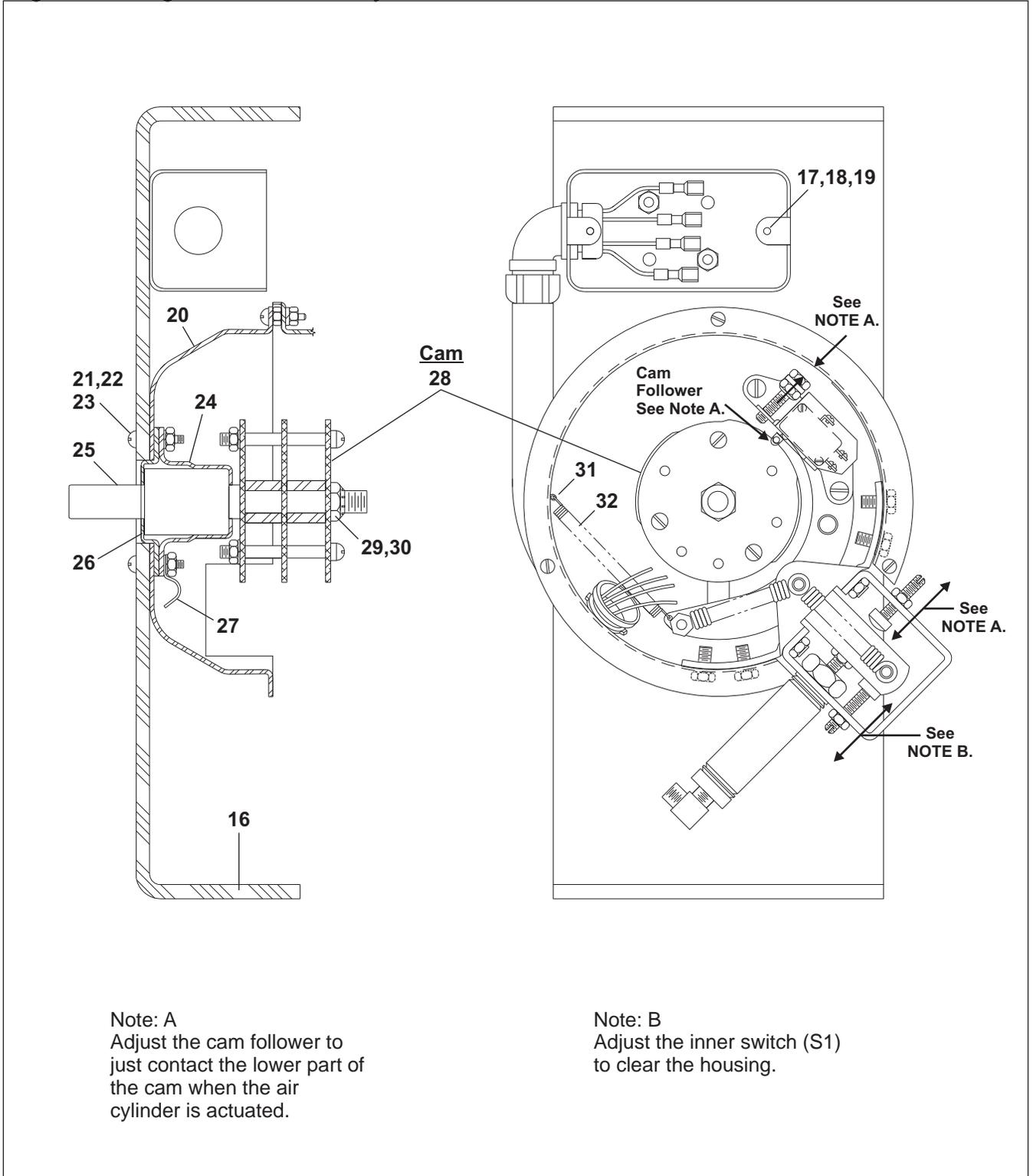


Autospot Drive Pulley

Autospot Sensing Unit

72044WP2,WR2

Figure 2: Sensing Unit: Switch Assembly and Cam



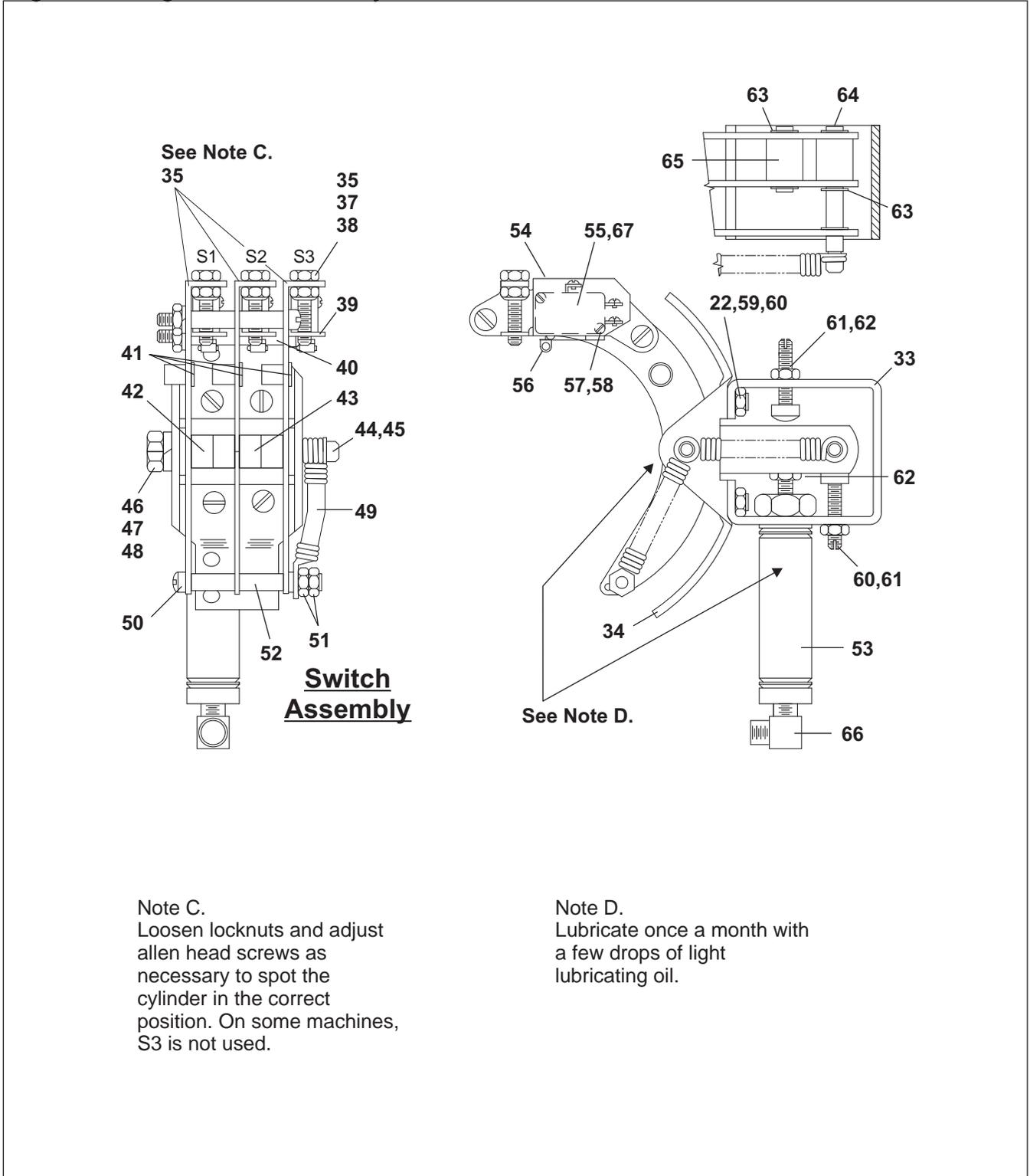
Note: A
Adjust the cam follower to just contact the lower part of the cam when the air cylinder is actuated.

Note: B
Adjust the inner switch (S1) to clear the housing.

Autospot Sensing Unit

72044WP2,WR2

Figure 3: Sensing Unit: Switch Assembly and Cam



Autospot Sensing Unit

72044WP2,WR2

Parts List—Autospot & Sensing Unit				
Find the correct assembly first, then find the needed components. The item letters (A, B, C, etc.) Assigned to assemblies are referred to in the "Used In" column to identify which components belong to an assembly. The item numbers (1, 2, 3, etc.) assigned to components relate the parts list to the illustration.				
Used In	Item	Part Number	Description	Comments
-----ASSEMBLIES-----				
	A	G36 05500	AIROP AUTOSPOT ASSY=7244WE2	
	B	E28 00800	* SENSE UNIT AUTOSPOT60+72WE2	
	C	E15 02900	\$ BASIC 3-SWITCH AUTOSPOT ASY	
-----COMPONENTS-----				
All	1	56Q3NS2S	3+11/16" SPLIT BUSH B#S2	
all	2	Y3 06375	PLATE=AIROP AUTOSPOT 72WE2	
all	3	02 10191	PULLEY-TIMING-DRIVER	
all	4	15K041	HXCAPSCR 1/4-20UNC2AX1 GR 5 ZI	
all	5	15U183	LOKWASH EXTTOOTH 1/4 (US STD) Z	
all	6	15K041B	SKCPSCR 1/4-20X1"BLK	
all	7	54C160	GEARBLT GATES 727050L X 1/2 B4	
all	8	54X020	SYNCHRONUS GEARBELT SPRKT)	
all	9	56Q0MHS	.627" BUSH VPUL TYPE H,D,OR QT"SPECIAL"	
all	10	15E007	KEY #7 WOODRUFF 3/4X1/8 SAE103	
all	11	02 175144	BKT MTG=AIROP AUTOSPOT	
All	12	15K095	HXCPCSCR 3/8-16UNC2AX1 GR5 ZINC	
all	13	15G205	HXNUT 3/8-16UNC2B ZINC GR2	
all	14	15U240	FLATWASHER(USS STD) 3/8" ZNC P	
all	15	15U255	LOCKWASHER MEDIUM 3/8 ZINCPL	
all	16	02 175145	BKT MTG=AIROP AUTOSPOT	
all	17	12H050	HANDYBOX 4X2+1/8X2+1/8	
all	18	12H095	HANDY BOX COVER 4+2+1/8	
all	19	15N051	RDMACHSCR 6-32UNC2AX1/2 ZINC G	
all	20	03 01328	HOUSING=AIROP AUTOSPOT	
all	21	15N140	RDMACSCR 10-24UNC2AX3/4 ZINC G	
all	22	15G125	HXMACHSCRNUT 10-24UNC2B ZINC G	
all	23	15U150	LOCKWASHER MEDIUM #10 ZINCPL	
all	24	02 10507	BEARING HOUSING- CUP- PLATED	
all	25	03 01329	SHAFT=AIROPAUTOSPOT OUR MATL	
all	26	02 10508	BEARING HOUSING- PLATED- ZINC	
all	27	12P015C	CABLECLAMP 5/16-1/2	
all	28	E28 00700	\$CAM ASSY A/S 60+72WE2	
all	29	15G219NTE	HXTHINLOKNUT 3/8-24NF NYL STL/	
all	30	15U238	LOKWAS INTOOTH 3/8" (US STD) 4	
all	31	15H040	STDCOTTERPIN 1/8X3/4 ZINCPL	

Autospot Sensing Unit

72044WP2,WR2

Parts List—Autospot & Sensing Unit

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

Used In	Item	Part Number	Description	Comments
all	32	02 02463	SPRING-CHART HOLDING	
all	33	03 01336	BKT-AIRCYL=AIRAUTOSPOT	
all	34	03 01332	SUPPORT=AIROP AUTOSPOT	
all	35	03 01330	ARM=SWLEVER=AIROP AUTOSPOT	
all	36	15G131	HXLIGHTLOKNUT 10-32 ESNA22NM02	
all	37	15G124C	HXMACHSCRNUT 10-32UNF BRASS	
all	38	15Q070C	SOKSETSCR CUP 10-32X1.25 18-8S	
all	39	03 01334	BKT=SW=AIROP AUTOSPOT	
all	40	27B206	SPCRROLL.202ID.625L.027T STLZC	
all	41	12P1AHSB	SNAPBUSH .437"MH X .312" T=1/8	
all	42	54E005	FLGMTBRG 3/8X1/2X1/2 B#FB68-4	
all	43	54E007	PLNBRG 3/8X1/2X3/4 B#6-8-6	
all	44	15K020	SKCPSCR 10-24 UNC 3AX3/4 ALLOY	
all	45	15U131L	FLATWASH #10L (US STD) BRASS	
all	46	03 01356	SHAFT-PIVOT=AIROP AUTOSPOT	
all	47	15G195	HXNUT 5/16-24UNF2B SAE ZINC GR	
all	48	15U210	LOKWASHER MEDIUM 5/16 ZINCPL	
all	49	03 01355	SPRING=EXT=AIROP AUTOSPOT	
all	50	15N154B	FILMACSCR 10-24UNC2AX2 ZINC GR	
all	52	27B207	SPCRROLL.202ID.688L.027T STLZC	
all	53	27C205	AIRCYL 3/4"BORE X 1"STROKE	
all	54	03 01335	INSULATOR=AIROP AUTOSPOT+\$8S	
all	55	09R014A	MINI-SW SPDT STAKON #V-15G-1C26-K	
all	56	09R015	ACTUATOR MICRO SWITCH #JV-5	
all	57	15N019	RDMACSCR 4-40UNC2AX5/8 ZINC GR	
all	58	15U040	LOCKWASHER MEDIUM #4 ZINCPL	
all	60	15N125	RDMACSCR 10-24UNC2AX1/2 ZC GR2	
all	61	03 01343	SCREW-ADJ=AIROP AUTOSPOT	
all	62	15G177	HXNUT 1/4-28UNF2B SAE ZINC GR2	
all	63	17B006	EXTRETRING IND#1000-25-ST-ZD Z	
all	64	03 01357	PIVOT-SPRING=AIROP AUTOSPOT	
all	65	03 01333	PIVOT=AIRCYL=AIROP AUTOSPOT	
all	66	53A031B	BODY-EL90MALE.25X1/8 #269C-42B	

Bearing Assemblies

3

MAIN BEARING AND SEAL REPLACEMENT FOR DIVIDED CYLINDER MACHINES

This section applies to the front and rear cylinder shaft bearings of all divided cylinder machines (Rapid Load, Staph-guard[®], dye machines, etc.). It does not apply to jackshaft bearings, idler shaft bearings or bearings on open pocket machines.

The bearings covered by this section are double row, spherical roller, self aligning bearings; Koya, SKF, FMC, Torrington or equal. Referring to FIGURE 1, the rear (clean side on Staph-guard[®] models) bearing is firmly held in the bearing housing (bearing and seal carrier) by the shaft seal holder, preventing axial movement. The front (soil side on Staph-guard[®] models) bearing is free to move axially in the bearing housing to accommodate thermal expansion of the shaft during operation and is thus the "floating" bearing. Both bearings are held in place on the tapered portion of the shaft by a bearing lockwasher and locknut.

The front and rear bearings are each protected from contamination from wash water by three spring loaded, lip type seals and a shaft seal leak-off cavity (that carries off any water that leaks past the main water seals) as shown in FIGURE 1.

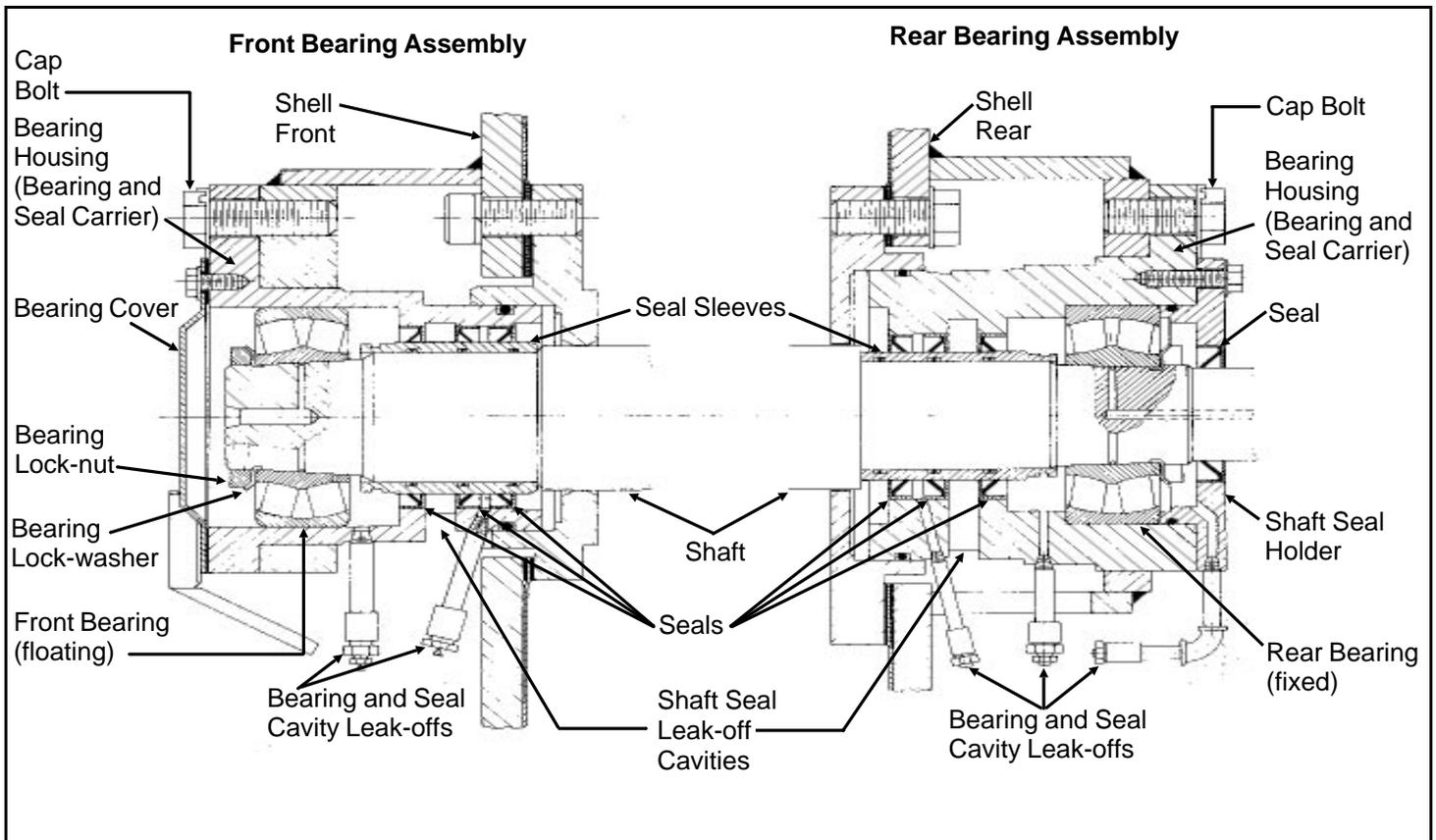


Figure 1 (MSSM0303AE)
Cross Section View of Front and Rear Bearing Assemblies
(Bearing Assembly for 60" and 72" WED Shown. Others similar.)

Access to the bearings and seals for lubrication is provided by the various grease passages. Excess lubricant is excreted through the bearing and seal cavity leak-offs as shown on FIGURE 1. The bearings and seals must be lubricated regularly and the leak-off cavities flushed out periodically through the plugged cleanout connections, in strict accordance with the preventive maintenance procedures elsewhere.

If bearing replacement becomes necessary due to wear, it is essential that the bearings *and seals* are replaced. Seal replacement requires removal of the bearing housing and seal sleeve. (In rare instances where the seals are known to be in good condition, it is not necessary to remove the bearing housing, seals or seal sleeve when a bearing is replaced.) **A pulling fixture is required to remove the bearing housing. A set of guide rods, a seal sleeve setting fixture and a bearing setting fixture are required for reinstallation of the housing.** These tools are available for rental or purchase from the Milnor[®] factory and are pictured elsewhere in this section. Contact the factory two weeks in advance of repairs, when ordering these tools.

This maintenance is performed in the following order:

1. Remove old bearing(s). When removing both bearings, remove the front (soil side) bearing first.
2. Remove bearing housings, seal sleeves, and seals.
3. If both bearings were removed, install the bearing housing, seal sleeve, seals, and new bearing on the rear (clean side).
4. Install the bearing housing, seal sleeve, seals, and new bearing on the front (soil side).
5. Tighten bearing(s).

See the Main Bearing Assembly drawing for your machine for bearing component part numbers.

Removing the Bearing (Front or Rear)

1. Loosen, then remove the main drive belts and cylinder shaft pulley (if applicable) by lowering the drive base with the jacking bolts. Do not attempt to pry belts off with a pry bar or by rolling the sheave. Remove the bearing cover (or shaft seal holder) to expose the bearing.
2. Bend back the locking tang on the bearing lock-washer then remove the locknut and lockwasher.
3. The center tapped hole in the shaft end is an oil passage through which oil may be forced between the tapered shaft and the bearing inner race. Install a pipe fitting into this tapped hole as shown in figure to the right. Using a "Porto-Power" or similar hand operated hydraulic pump, force fluid into the passage. Pump hard to build up fluid pressure. This pressure will cause the inner race to expand slightly; just enough to free the tapered surfaces and allow the bearing to slip off easily. If the bearing is not readily removed, remove the front water level

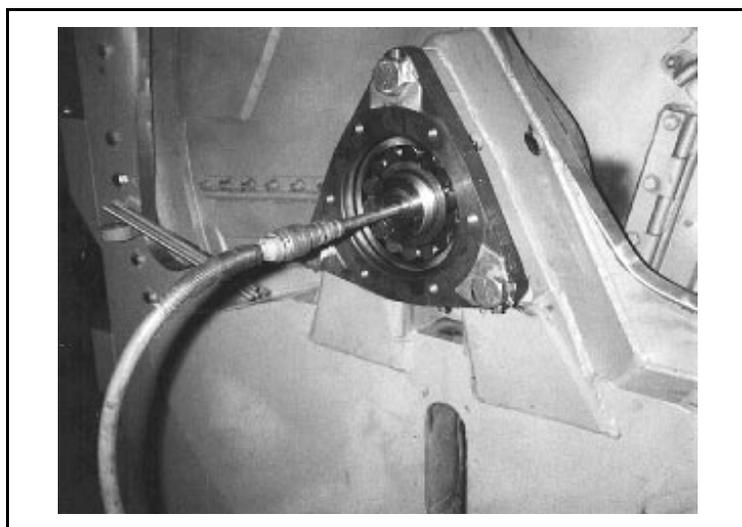


FIGURE 2 (MSSM0303AE)
Connection From Hydraulic Pump to Assist in Bearing Removal

inspection plate and use a timber to pry up the cylinder to remove cylinder weight from the bearings. Once the bearing is removed, the cylinder drops only approximately 1/32" before the shaft comes to rest on the shaft support.

4. Slide the bearing off of the shaft and if it is to be reused, place it on a clean surface and cover with a clean, lint free cloth.

Removing the Bearing Housing (Bearing and Seal Carrier), Seal Sleeve, and Seals (Front or Rear)

These procedures require the use of a pulling fixture and guide rods available from the Milnor[®] factory. With the bearing cover (or shaft seal holder) and the bearing removed, proceed as follows:

1. Remove the three bearing housing cap bolts and the grease lines from the bearing housing front plate. Install guide rods in two of the bolt holes, as shown in FIGURE 3.
2. Install the pulling fixture as shown in FIGURE 4, by placing each of the four threaded rods through a hole in the steel plate with hexnuts to the outside of the plate then screwing each rod into the appropriate tapped hole in the bearing housing (same holes as used to mount the bearing cover or shaft seal holder).

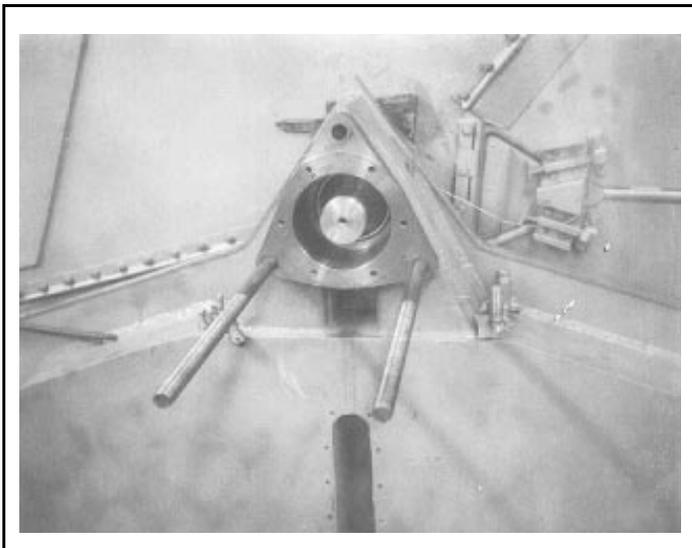


FIGURE 3 (MSSM0303AE)
**Two Bearing Housing Guide
Rods in Position**

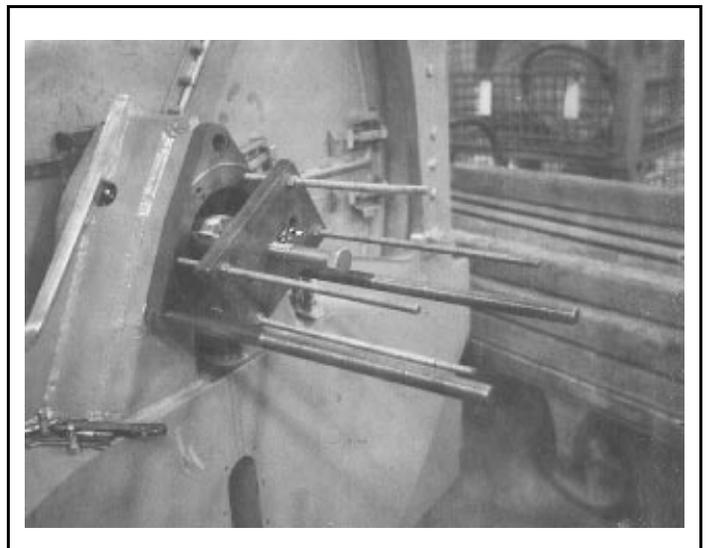


FIGURE 4 (MSSM0303AE)
**Bearing Housing Pulling
Fixture in Position**

NOTE: Step 2a or 2b below will cause the bearing housing to slide away from the shell. Shims were placed under one or more of the three bearing housing pads during factory assembly to align the housing and insure its being exactly parallel with the shaft. **When removing the bearing housing, be sure to keep these shims separate and identified so that they may be returned to their proper location, otherwise the bearing and seal will be out of line and may be damaged after a short operating period.** As a precaution in case the shims are lost during disassembly, you will find stamped next to the bearing housing the proper thickness of shims required (if any) under each adjacent bearing housing pad. The stamped number indicates the shim thickness in thousandths of an inch. For example, the number “38” indicates that 38/1000 (.038") shims would be required under this pad.

- 2a. Tighten all four hexnuts on the threaded rods such that the pulling fixture plate is pressed against the shaft end. With an impact wrench, tighten down on the center bolt until the housing slides out, or
- 2b. If no impact wrench is available, simply continue to tighten down on each of the four hexnuts behind the pulling fixture plate, alternately and progressively, until the housing slides out. It may be necessary to place a spacer (approx. two inches long) between the plate and the shaft to provide enough clearance between the plate and the bearing housing.
3. Once the bearing housing is free of the shell, carefully slide it off of the guide rods and place on a clean work surface.
4. The seal sleeve will almost always remain on the shaft when the housing is removed. Remove the seal sleeve *taking care not to damage or scar it* and place it on a clean work surface.

Precautions for Bearing Replacement

The most important ingredient in successful bearing and seal installation is *cleanliness*. The bearing housing must be free of all foreign matter. The grease and leak-off passages must be blown clear and all *foreign* matter removed. You must have a clean work area. Keep your hands and tools free from grit and grime. Wash your hands before starting and as required during these procedures. Foreign matter is, without doubt, the most frequent cause of bearing failure, and one over which the manufacturer has no control.

Where cleaning is required, bearings, bearing housings and seal sleeves may be cleaned with the following solvents or cleaning agents (in strict accordance with the manufacturer’s recommendations as such substances are generally toxic and/or explosive under certain conditions):

Benzene	Gasoline	Naptha
Chlorethane	Kerosene	Trichlorethylene
Freons	Mineral Spirts	

Do not, however, expose any components to the above substances for more than 24 hours and only use at room temperature. Never use the following solvents or cleaning agents: alcohols, cresols, phenols, flouro propanols, or other similar chemicals or mixtures.

NOTE: Hammer blows, overheating, or improper use of force can damage precision parts.

Replacing the Bearing Housing, Seal Sleeve, and Seals (Front or Rear)

1. With the seal sleeve removed, press all old seals out of the bearing housing. Remove the large o-ring from the outside of the housing. Thoroughly clean the bearing housing and flush out all grease passages to make certain they are unblocked. Remove the o-rings from the inside of the seal sleeve and clean the seal sleeve.
2. While the bearing housing is disassembled, charge all grease passages with grease. This will assure that there are no blockages.
3. Replace the o-rings in the seal sleeve and the large o-ring on the outside of the bearing housing. Replace with new o-rings if the old ones are worn.
4. Press new seals into the bearing housing. You may gently work the seals in with a mallet and metal drift as shown in FIGURE 5.

▲ CAUTION ▲

Each seal must be of the proper material and face the proper direction. The type of material and direction the seal faces may differ from one seal to another within the same bearing housing and also from one type of machine to another. It is essential to consult the Main Bearing Assembly drawing for your machine for the proper part number and direction to face each seal.

5. Slip the seal sleeve into the bearing housing as shown in FIGURE 6 below right, using care not to damage or fold under any of the seal lips. Be sure to insert the sleeve in the proper direction (see Bearing Assembly drawing).



FIGURE 5 (MSSM0303AE)
**Installing Seals in
Bearing Housing**



FIGURE 6 (MSSM0303AE)
**Installing Seal Sleeve in
Bearing Housing**

NOTE: If both housings are being installed, install the rear housing first.

6. With two of the three temporary guide rods in position on the shell, place the bearing housing onto the guide rods and install the seal sleeve setting fixture on to the bearing housing as shown in FIGURE 7. The seal sleeve setting fixture prevents the seal sleeve from being pushed out of the housing as the housing is inserted into the shell. Note that the seal sleeve setting fixture and the bearing setting fixture are very similar, but the seal sleeve setting fixture has a longer hub.
7. With a clean, lint free cloth, apply a coating of light machine oil to the outside of the housing, to assist in installation. Push the housing into the shell as shown in FIGURE 8. Once the housing is far enough into the shell to support itself, place any shims back into position between the housing and the shell. Remove, then replace guide rods if required to place shims under bearing housing pads.



FIGURE 7 (MSSM0303AE)
Installing the Bearing Housing Setting Fixture onto Housing (42" machine shown)

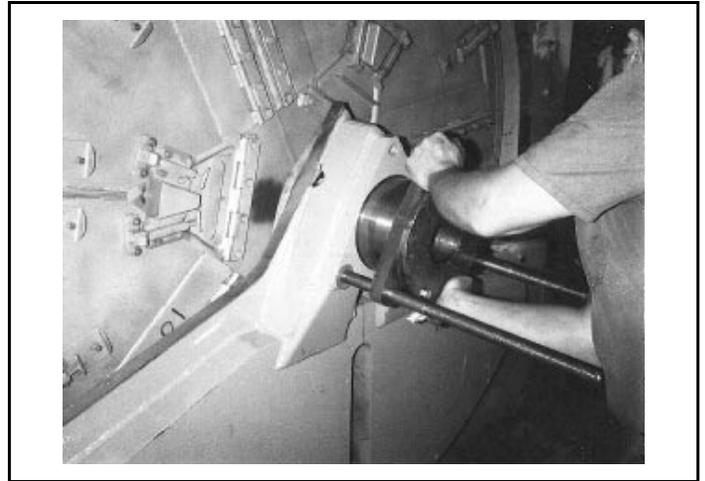


FIGURE 8 (MSSM0303AE)
Pushing the Bearing Housing into the Shell (60" Rapid-load machine shown)

8. Install the third guide rod, spacers if required, and hex-nuts, using these to seat the housing fully, as shown in FIGURE 9. Remove the seal sleeve setting fixture.
9. Remove the guide rods and install the bearing housing cap bolts. See "BOLT TORQUE REQUIREMENTS" elsewhere, for proper torques.
10. With the grease gun, pump grease into the inner portion of the bearing cavity, such that when the bearing is installed, the space between the bearing and the seals will be approximately 1/3 full of grease.
11. Proceed to "Measuring Unmounted Clearance . . ." below, even if both the front and rear bearings are being replaced. Once the rear bearing is installed, the bearing housing replacement procedures may then be repeated for the front (soil side) bearing housing.



FIGURE 9 (MSSM0303AE)
Tightening the Bearing Housing into the Shell (42" machine shown)

Measuring Unmounted Clearance and Setting Bearing (Front or Rear)

The bearings used on Milnor[®] washer and dye extractors are the very best anti-friction devices available for these applications. However, the anti-frictional characteristics of the bearings will be reduced if they are not properly installed. It is of critical importance when installing these tapered roller bearings, to accomplish the following (A step by step procedure follows this synopsis):

1. Accurately measure the unmounted internal clearance of the bearing (gap between the rollers and outer race before the bearing is installed). This is an essential quality control measure.
2. Calculate the final internal clearance by subtracting the specified clearance reduction (amount that the internal clearance must be reduced when the bearing is tightened onto the tapered shaft) from the unmounted clearance.
3. Tighten the bearing onto the shaft until the final internal clearance as calculated is achieved and verified by measurement.

These measurements are taken in thousandths of an inch. Although this requires precise work, attention to detail and a good set of feeler gauges, it is the only way to insure that the bearing will be tightened onto the shaft to precisely the right tension. If you have any questions on performing the measurements or adjustments described below, your local bearing supplier or the Milnor[®] factory can assist you. Although these procedures require precision over and above that normally required for laundry room maintenance, they are standard in bearing installation and absolutely essential:

NOTE: Step 1 which follows, requires a good set of feeler gauges including .001" through .010" in thousandths of an inch increments. Contact your local bearing supplier.

1. When you are ready to proceed (and not before) remove the new bearing from it's box or protective wrapping. Do not attempt to clean the bearing or wash out the preservative coating. On a clean work surface, stand the bearing on edge and insert a .003 feeler gauge into the bearing as shown in FIGURE 10, at right. The gauge should be inserted just inside the outer race between two rollers and worked through to the opposite row of rollers. Rotate the inner race of the opposite row so that the end of the feeler gauge is caught between a roller and the outer race.
2. Try to pull the gauge straight out. If it comes out, increase the size of the gauge by .001". If it does not come out, decrease the gauge by .001". The thickest feeler gauge that will come out is the unmounted internal clearance of the bearing.
3. Compare the measured clearance with the "Unmounted Clearance" in the table below. If the measured clearance is not within the range shown, do not use the bearing. Contact your bearing supplier for an exchange.



FIGURE 10 (MSSM0303AE)
**Measuring Bearing
Unmounted Clearance
(bridge for 42" machine shown)**

NOTE 1: The clearances listed in the chart are industry standards and therefore apply to all brands of bearings supplied by Milnor®. If other sources of bearings are used, refer to the manufacturer’s instructions for proper clearances.

NOTE 2: To locate your bearing on the chart, match the first five characters of the manufacturer’s part number (*not the Milnor® part number*) with those in the chart. For example, for a manufacturer’s part number 22217LBK, find under “Manufacturer Part Number” the line “22217 . . .”

Table of Bearing Clearances

Manufacturer Part Number	Unmounted Clearance		Clearance Reduction	
	Minimum	Maximum	Minimum	Maximum
22330 . . .	.0071	.0091	.002	.003
22213 . . .	.0030	.0039	.001	.002
22216 . . .	.0028	.0037	.001	.002
22217 . . .	.0044	.0057	.0015	.0025
22312 . . .	.0030	.0039	.001	.002
22316 . . .	.0037	.0049	.001	.002
22320 . . .	.0044	.0057	.0015	.0025
22328 . . .	.0063	.0081	.002	.003
23220 . . .	.0044	.0057	.0015	.0025

4. Calculate and record the final internal clearance by deducting the “Clearance Reduction” for your bearing (see above chart) from the measured clearance. For example, if you measured .004 and the clearance reduction is .001 to .002, then the final internal clearance should be between .002 and .003.
5. Hand pack the bearing with grease by rotating the inner race and rollers, forcing grease between all rollers.

NOTE: The bearing will be set into position in Step 6. If both front and rear bearings are being installed, the rear (clean side on Staph-guard® models) bearing should be set in position first because it is the fixed bearing.

6. Set the bearing into the housing (with the taper facing the proper direction) and seat the bearing using the bearing setting fixture. This fixture is installed in similar fashion to the seal sleeve setting fixture. If you have just set the rear bearing and the front bearing housing is yet to be installed, leave the bearing setting fixture in place for now.
7. If you have just set the rear bearing and the front bearing housing is yet to be installed, repeat all steps in bearing housing installation, measuring unmounted clearance and setting bearing, for the front bearing and housing. The bearing setting fixture should not be removed from the rear housing until it is needed to seat the front bearing. This will prevent rear bearing components from being pushed out of position by the shaft as the front housing components are seated. Remove the bearing setting fixture from the front housing once the bearing is seated.

Tightening Bearing(s) (Front and/or Rear)

1. Once both bearings are seated, or if only one bearing was replaced, install the bearing lockwasher(s) and locknut(s). Use a hammer and a metal drift as shown in FIGURE 11, to tighten the locknut. **It is imperative to only tap lightly and to assure that metal chips from the drift or locknut do not fall off and contaminate the bearing.** If both bearings are being tightened, work between the front and rear bearings and turn the basket by hand periodically, while tightening the locknut(s).
2. After tightening the bearing(s) onto the tapered shaft, check the internal clearance as pictured in FIGURE 12, by working a feeler gauge between the outer race and a roller of the outer row then between the outer race and a roller of the inner row.

NOTE: Sometimes, when setting the bearings, all the load is taken by only one row of rollers (although the load would quickly equalize on both rows after the machine has run for only a few minutes). If all the load is taken by one row, you will get an erroneous clearance reading. It is therefore, necessary to use the feeler gauge to measure the *clearance of both rows of rollers*. With the bearing in place on the machine it is admittedly rather difficult to get a feeler gauge back past the first row of rollers to measure the second *but it must be done*.

3. If one row of rollers is tight but the other has measurable clearance, tap lightly on the end of the shaft nearest the tight row of rollers to cause the shaft to shift axially and equalize the roller loading. Adjust the bearing tightness to achieve the internal clearance previously calculated.
4. When the proper internal clearance has been attained, lock the nut by bending over the matching tang on the lockwasher, making sure that all unused tangs are bent as near the nut as possible so that they will not rub against the bearing roller cage.

Check each unused tab individually to insure this.

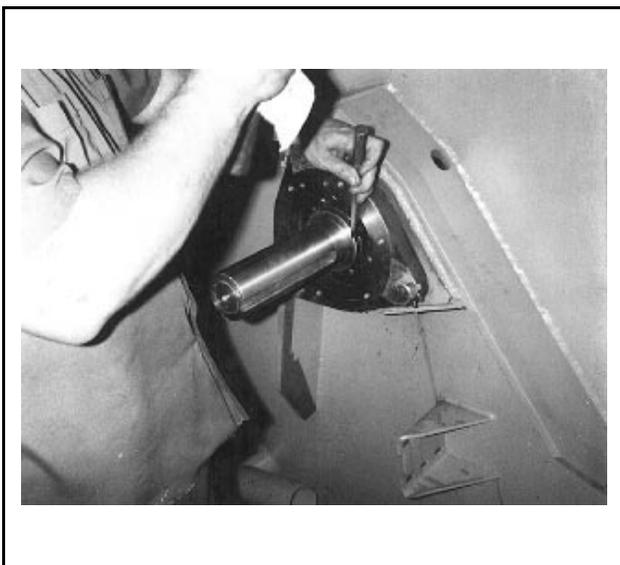


FIGURE 11 (MSSM0303AE)
**Tightening the Bearing
Locknut (42" machine shown)**

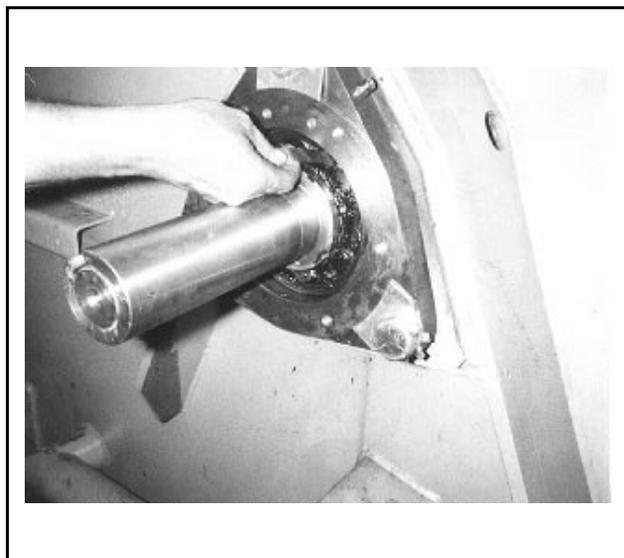


FIGURE 12 (MSSM0303AE)
**Measuring the Mounted Internal
Clearance of the Bearing
(42" machine shown)**

-
5. With the grease gun, fill the space between the bearing and the front of the housing 1/3 full of grease.
 6. Install the bearing cover plate or shaft seal holder, as appropriate. When installing the shaft seal holder, take care not to damage the seal as it is gently pushed over the shaft. Cover the keyway on the end of the shaft with tape to prevent the sharp corners of the keyway from cutting the seal lip. Also, make sure that the seal lip does not turn over as it passes over rough areas.

Shaft and Bearing Components: 72044WR2, 72044WR3, 72044SR2, 72044SR3

Figure 1: Shaft and Bearing Components

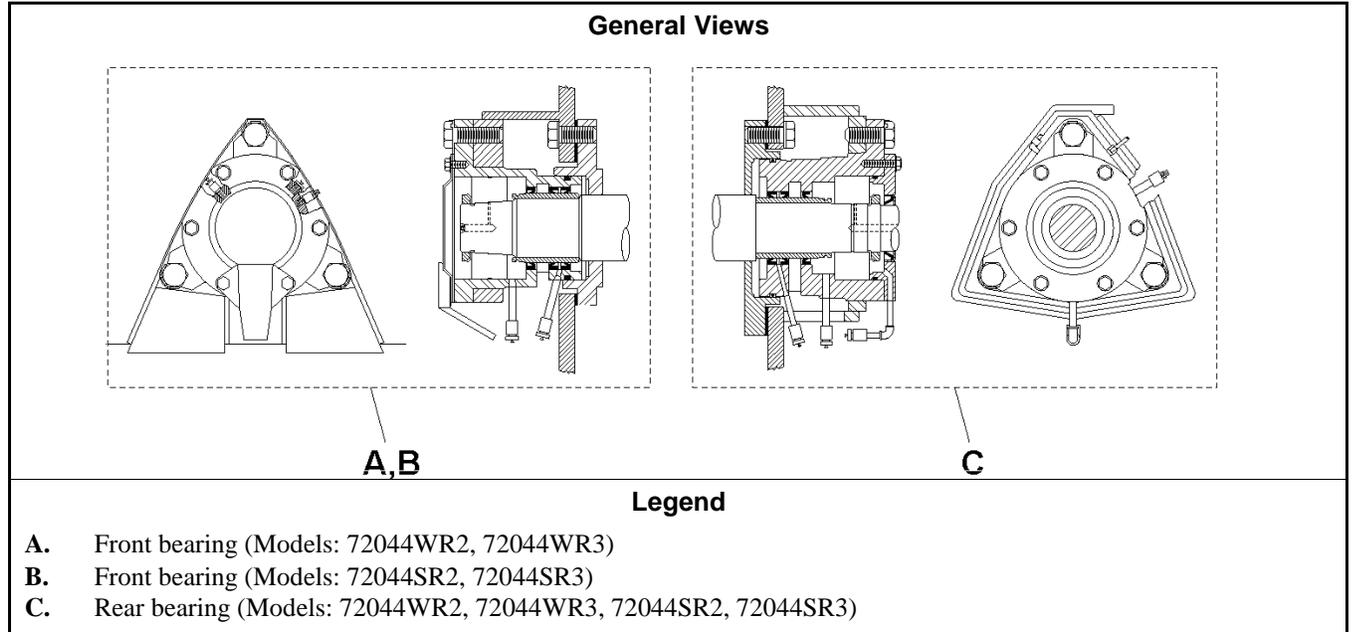


Figure 2: Front bearing (Models: 72044WR2, 72044WR3)

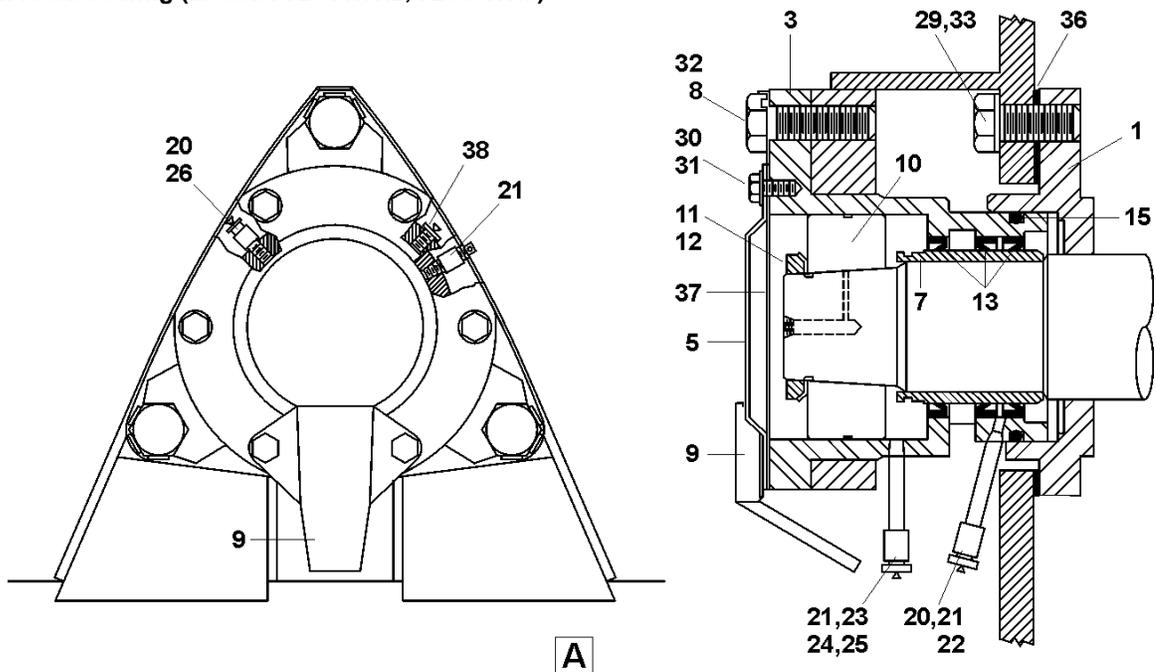


Figure 3: Front bearing (Models: 72044SR2, 72044SR3)

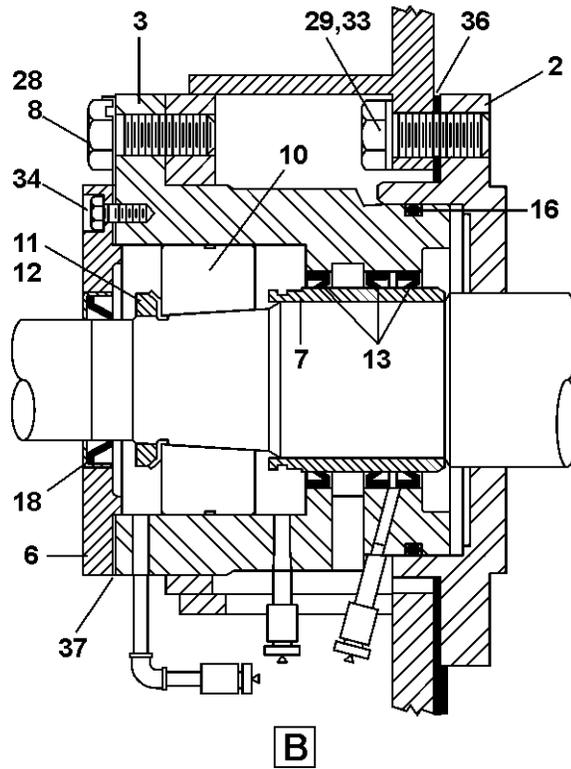


Figure 4: Rear bearing (Models: 72044WR2, 72044WR3, 72044SR2, 72044SR3)

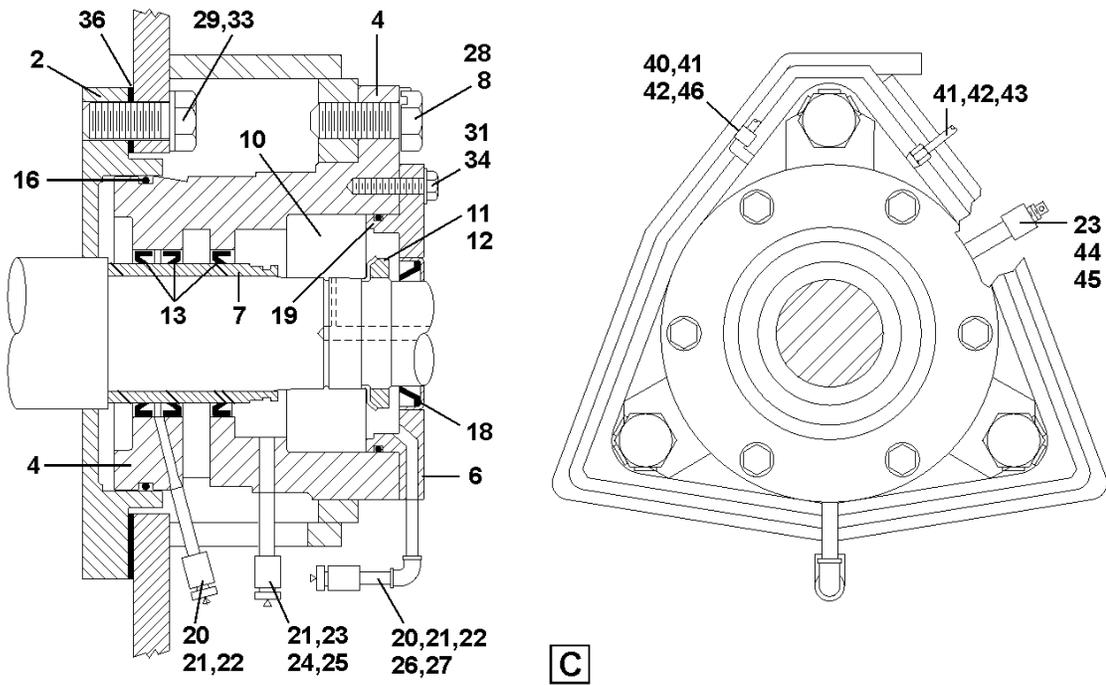


Table 1: Parts List—Shaft and Bearing Components

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
Assemblies				
	A	AD 36 022	Installation Group, Front bearing	72044WR2, 72044WR3
	B	G36 05400	Installation Group, Rear bearing	72044WR2, 72044WR3
	C	AD 36 040	Installation Group, Front bearing, Rear bearing	72044SR2, 72044SR3
Components				
A	1	X3 06047	Shaft support, Front	
BC	2	X3 06003	Shaft support, Rear	
A	3	X3 06005	Bearing housing, Front	
C	3	X2 175005	Bearing housing, Front	
B	4	X3 06369	Bearing housing, Rear	
C	4	X2 175007	Bearing housing, Rear	
A	5	02 18618A	Cover	
B	6	X3 06370	Seal holder	
C	6	X2 175053	Seal holder	
all	7	X3 06165	Seal sleeve	
all	8	02 18219	Washer, Lock	
A	9	02 18928	Grease shield	
AC	10	56S22316T	Bearing	
B	10	56S23220T	Bearing	
AC	11	56AHN16	Bearing Locknut	
B	11	56AHN20	Bearing Locknut	
AC	12	56AHW16	Washer	
B	12	56AHW20	Washer	
all	13	24S114	Seal, 4.5X5.5X.50	
A	15	60C161	O-Ring, 6"X1/4	
BC	16	60C172	O-Ring, 8"X1/4	
B	18	24S112	Seal, 3.75X4.75X.500	
C	18	24S111	Seal, 3X4.00X.437	
B	19	60C166A	O-Ring, 6+3/4X1/8	
C	19	60C160J	O-Ring, 6+1/4X1/8	
all	20	5SCC0CBE	Coupling, 1/8	
all	21	54M029	Pipe Fitting, 1/8	
all	22	5N0C03AG42	Pipe nipple, 1/8X3	
BC	23	5SCC0EBE	Coupling, 1/4	
BC	24	5N0E02KG42	Pipe nipple, 1/4X2.5	
all	25	5SB0E0CBEO	Hexbush, 1/4X1/8	
all	26	5N0C01KG42	Pipe nipple, 1/8X1.5	
B	27	5SL0CBEA	Elbow, 90 degree, 1/8	
C	27	5SL0ENFK	Elbow, 45 degree, 1/4	
all	28	15B243	Bolt, 1-8X2+1/2	
all	29	15U400	Washer, 1"	

Shaft and Bearing Components: 72044WR2, 72044WR3, 72044SR2, 72044SR3

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	30	15K145	Bolt, 1/2-13X3/4	
all	31	15U300	Washer, Lock, 1/2	
all	32	15B236	Bolt, 1-8X3	
all	33	15K236	Bolt, 1-8X2.75	
all	34	15K170	Bolt, 1/2-20X1.5	
all	34	15K180	Bolt, 1/2-13X2	
all	36	02 18768D	Gasket	
all	37	02 18105	Gasket	
all	38	54M015	Pipe Fitting, Lubricant	
all	40	53A039B	Elbow, 5/16X1/8	
all	41	53A508	Flexible tubing, Adapter, 5/16"	
all	42	53A509	Flexible tubing, Adapter, 5/16"X.53"	
all	43	53A019B	Pipe Fitting, 5/16X1/8	
all	44	5N0E01KBE2	Pipe nipple, 1/4X1.5	
all	45	51P008B	Plug, 1/4"	
all	46	53A060A	Nut, 5/16	

— End of BIHDBM13 —

Frame, Pivots and Suspension

4

SUSPENSION ADJUSTMENTS FOR DIVIDED CYLINDER MACHINES

The suspension system on Milnor[®] Hydro-cushion[®] machines is adjusted and thoroughly tested at the factory. It should not require subsequent adjustment unless the machine is distorted during shipment or installation or unless some component of the system, such as a Hydro-cushion[®] cylinder is replaced.

There are two primary objectives when adjusting the suspension system on any Hydro-cushion[®] machine model:

1. To position the shell in the proper location within the frame (hanging dimensions) to maximize freedom of movement of the shell and to insure proper draining, and
2. To adjust the length of up and down travel at each of the push-down locations (push down travel) so that the shell will not be distorted (racked) when pushed down.

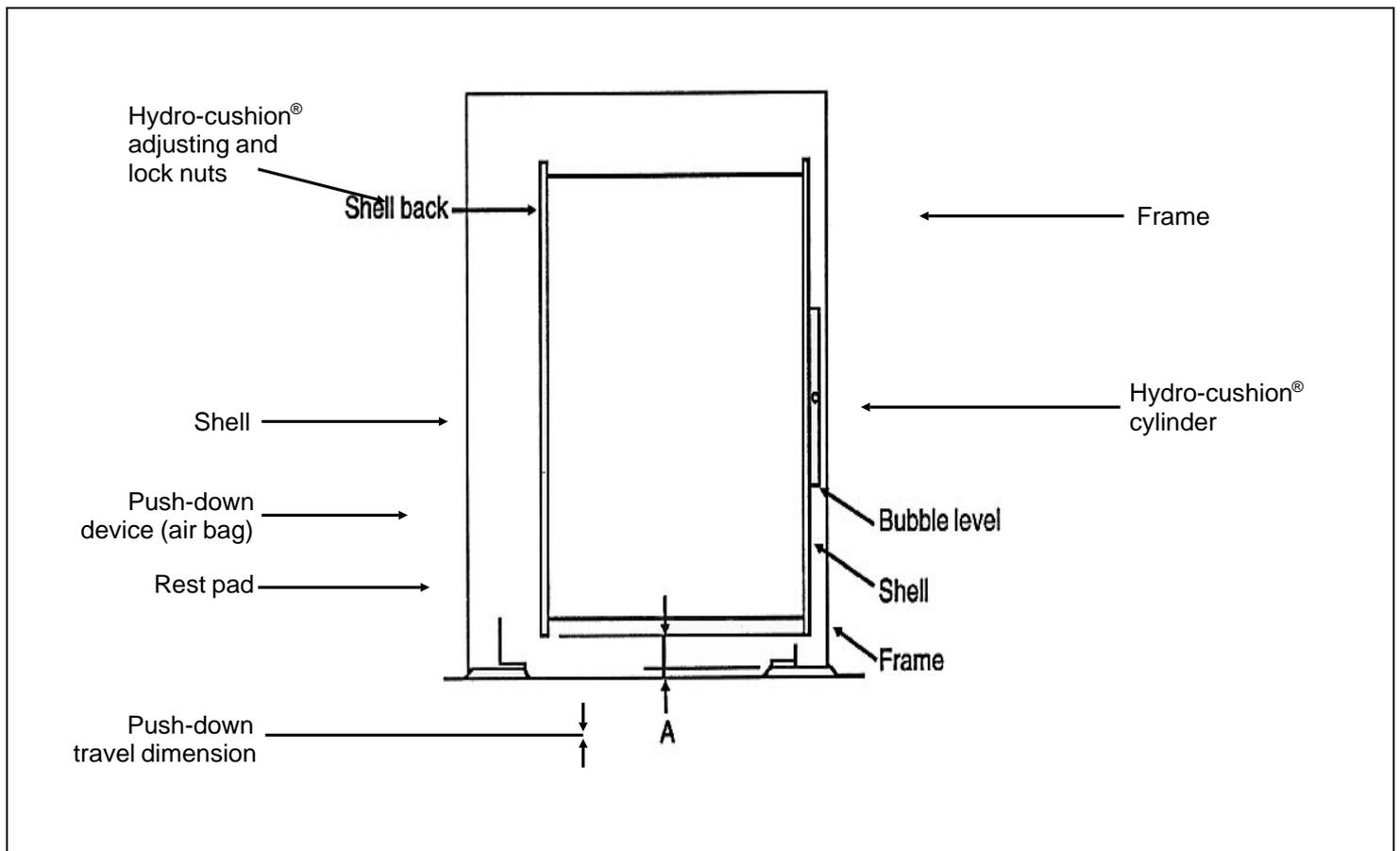


FIGURE 1 (MSSM0302AE)

**Hydro-cushion[®] Suspension System Components
(does not depict a specific machine)**

All Milnor[®] Hydro-cushion[®] machines contain the following suspension system components (as shown on the typical system on the previous page):

1. Hydro-cushion[®] cylinder—which suspend the shell and cylinder within the frame and provide vibration damping during extraction.
2. Pneumatic push down devices (air bags)—which when inflated, force the shell downward where it is held against rigid pads during loading, unloading, washing, and draining.
3. Metal or rubber pads—some rigidly fixed to the shell and some rigidly fixed to the frame, which come in contact when the shell is pushed down.

The actual configuration of these components varies from model to model.

How Shell Adjustments are Made

Regardless of machine model, repositioning of the shell is always accomplished by adjusting the nuts at the top of the upper Hydro-cushion[®] shafts. To move the shell up or down at the location of any Hydro-cushion[®], see FIGURE 2 and proceed as follows:

▲ CAUTION ▲

These procedures should be accomplished with power to the machine locked off.

1. Straighten the tongues on the keyed lock washer using pliers, screw driver, etc.
2. Loosen the lock nut (upper hex nut) and move it all the way up to the top of the shaft, but do not remove it.
3. Use the adjusting nut (lower hex nut) to “crank” the shaft up or down as required.
4. Once final adjustment is made, while holding the adjusting nut to prevent it from turning, retighten the lock nut against the adjusting nut (with the lock washer between).
5. Rebend the tongues on the lockwasher as before, to prevent movement of the nuts.

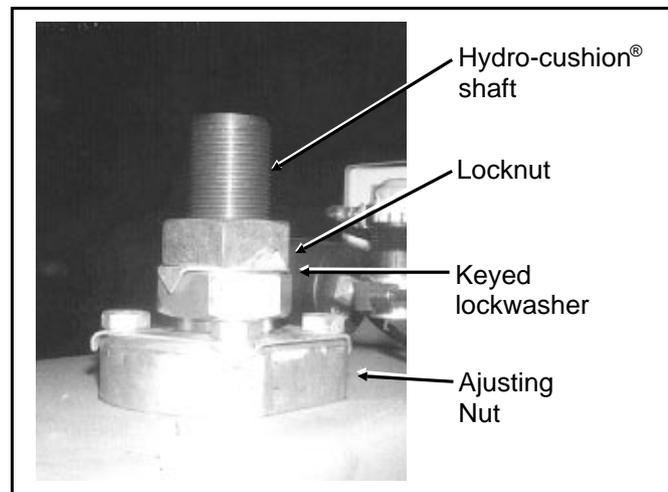


FIGURE 2 (MSSM0302AE)
**Hydro-cushion[®] Upper
Shaft and Adjusting Nuts**

Shell Hanging Dimensions and Adjustment Procedures

To adjust the shell of a divided cylinder machine, proceed as follows:

1. Locate the shell hanging dimension for your machine in the table below and adjust your machine accordingly. Take measurements on the left and right sides of the shell, to assure that the shell is horizontal, left to right.
2. The shell and cylinder should be level front to back. Check this with a bubble level, as shown in FIGURE 3.
3. If further adjustment is required in order to level the cylinder, make small adjustments at all four corners. For example, if the cylinder slopes down to the front, try raising the two front corners by 1/16" (2mm) and lowering the two rear corners by 1/16" (2mm). Always split the difference.

NOTE: Only slight deviations from the dimensions shown should be used to level the shell. If large deviations are required, this may indicate that the frame is out of level. If so, this condition must be corrected before attempting to level the shell.

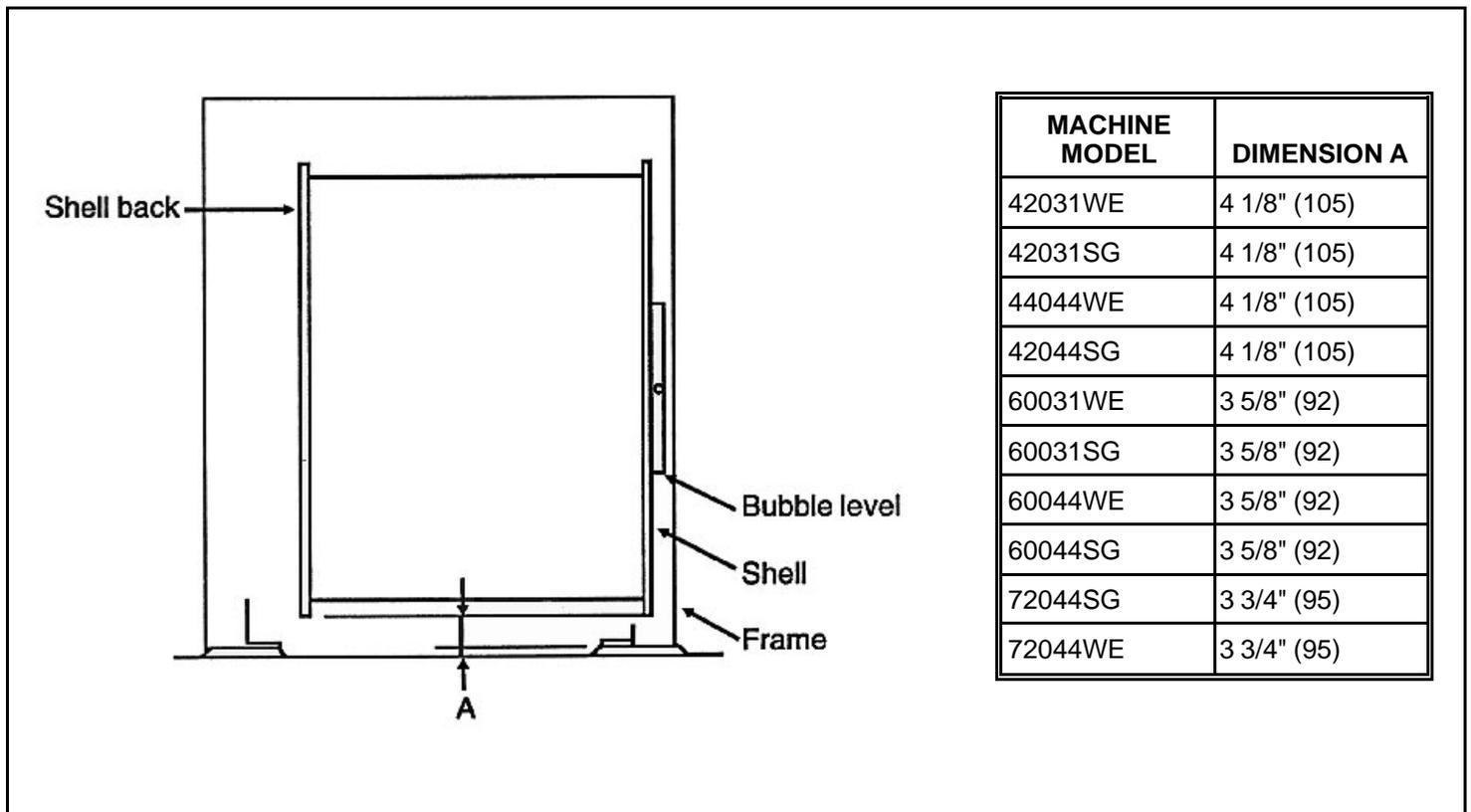


FIGURE 3 (MSSM0302AE)
Shell Hanging Dimensions for Divided Cylinder Machines
 (Left side view of 60044WE shown)

Push-Down Travel Dimensions and Adjustment Procedures

▲ CAUTION ▲

Some of the following procedures require power to the machine. Take the necessary precautions to assure that no one operates the machine controls while personnel are adjusting the push-down components.

42" Divided Cylinder Machines

The push-down stops on these machines consist of brackets attached to the shell and rubber rest pads, mounted atop the base pads (see figures below) which make contact when the shell pushes down. The rubber rest pads sit in metal pans and are raised or lowered by adding metal shims to or removing the shims from inside the pans. Extra shims and adhesive for securing the shims were supplied with your machine.

There is no specific push-down travel dimension for these machines; however, length of travel must be adjusted as follows:

1. With the *Master switch* set to *off*, and the shell hanging free, measure the gap between each bracket and base pad.
2. Add or remove shims from the appropriate pads as required to make all four gaps equal and to insure that no rest pad protrudes completely from its metal pan.

Test for equal length of travel at all four locations as follows:

3. With four sheet metal shims of *equal* thickness, set one shim *on top of* each rubber rest pad, such that at least a one inch length of the shim overhangs the outside edge of the pad.
4. Set the *Master switch* to *manual*, causing the shell to push-down.

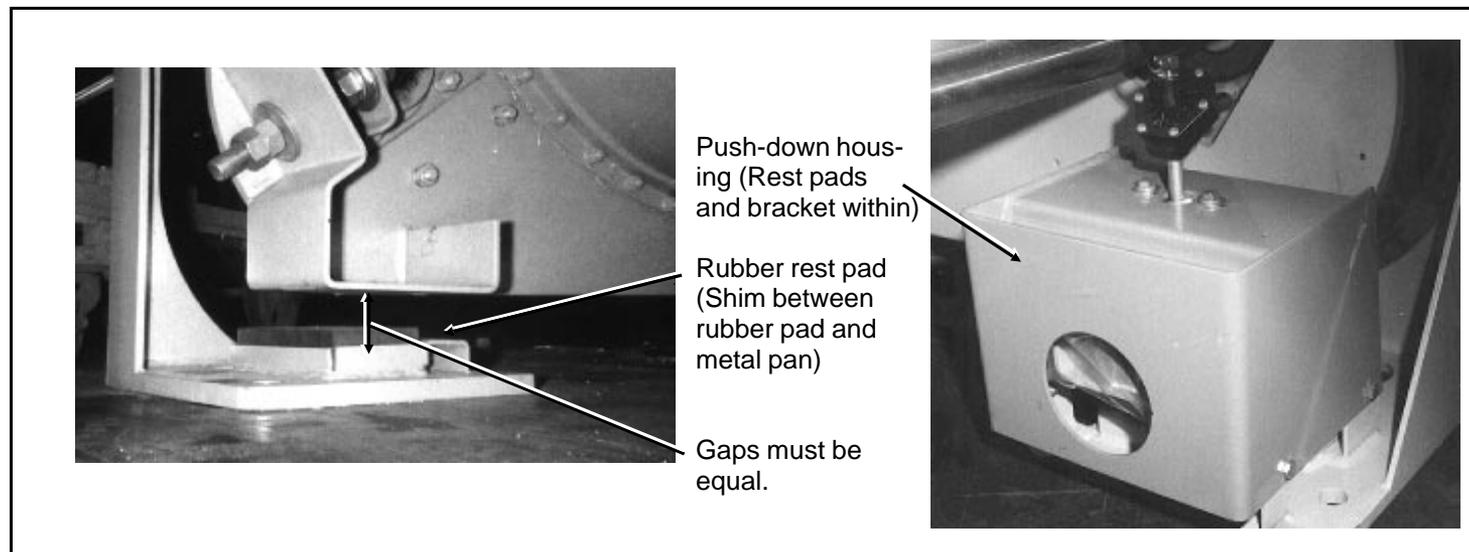


FIGURE 4 (MSSM0302AE)
Push-down Travel Adjustment: 42" Div-cyls (42" Staph-guard® shown)

5. With the shell pushed down, attempt to pull each test shim out from between the bracket and rubber pad. The test shims should all be tight. If any shim(s) are not pinched tightly between the bracket and pad, take note of which one(s) are not.

Make final adjustments as follows:

6. Set the *Master switch* to *off*, remove the test shims and make the necessary changes to the shims below the rubber pads as indicated by the above test.
7. Repeat Steps 3 through 6 as required, until this test is successful.
8. Once the adjustments are completed, secure all shims and rubber rest pads with the adhesive provided.

60" Divided Cylinder Machines

These machines have push-down stops on the four corners of the frame which appear as shown in FIGURES 5 and 6. When pushed down, the ring weldments (which move with the shell) must seat firmly onto the plugs which are mounted atop the base pads. The push-down travel dimension must assure that 1) the ring weldments and plugs are far enough apart when the shell is not pushed down, so as not to interfere with the free movement of the shell, and 2) that all four stops are in solid contact when the shell is pushed down. To accomplish this, proceed as follows:

1. With the *Master switch* set to *off* and the shell hanging free, remove the bolts securing the ring weldments to the mounting brackets. Set each ring weldment on top of its respective plug, removing any shims which may have been used and placing them next to the ring weldment.
2. Measure the gap between the top of the ring weldment and the bottom of the mounting bracket, at each location.

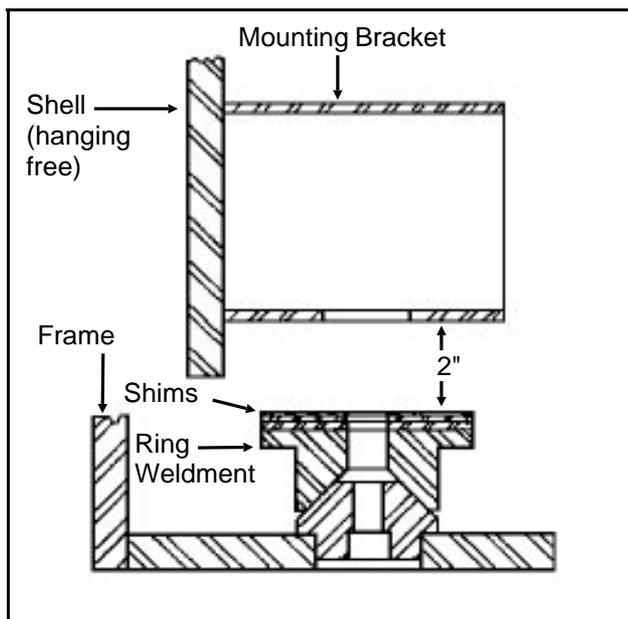


FIGURE 5 (MSSM0302AE)
Shimming Ring Weldments

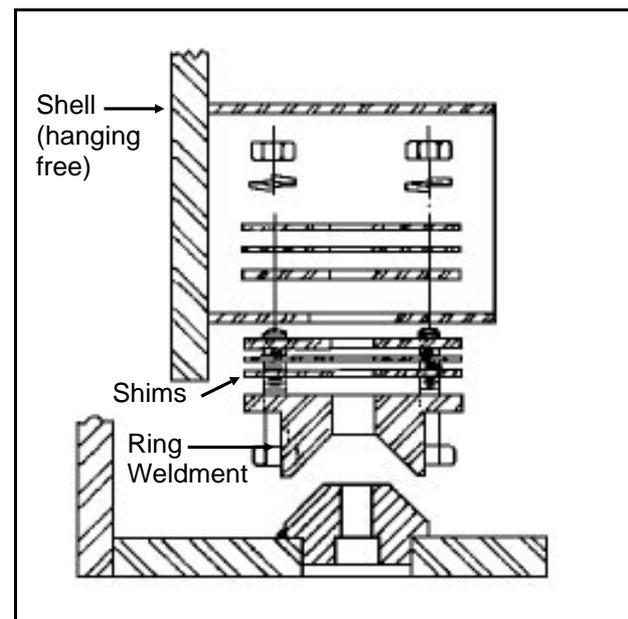


FIGURE 6 (MSSM0302AE)
Reconnecting Ring Weldments

-
3. Stack shims on top of the ring weldment as required to make each gap *exactly 2 inches* as shown in FIGURE 5. If the gap at any location is less than 2 inches without shims, the shell must then be raised in the frame, using the procedures previously described.
 4. Once the proper arrangement of shims is made, remount the ring weldment and shims to the mounting bracket (see FIGURE 6). Any extra shims may be stacked on the top side of the mounting bracket plate to which the ring weldment is attached.

Hold Down Adjustments

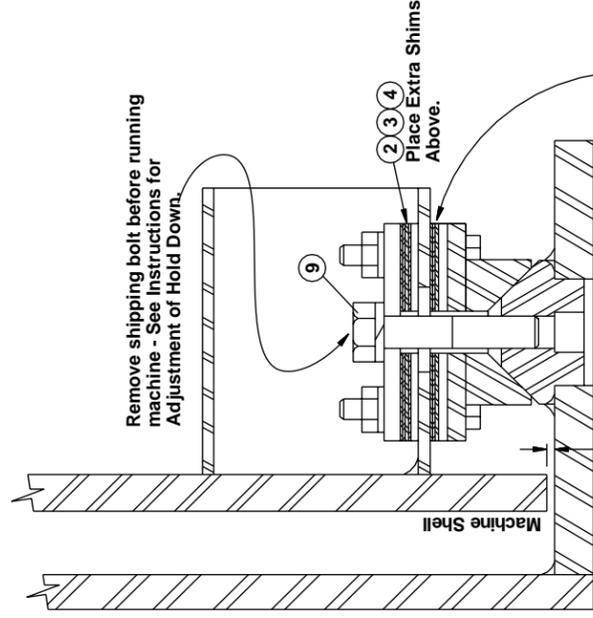
6036WP2/3, 6044WP2/3, 7244WP2/3, 6036SP2/3, 7244SP2/3, 6044SP2/3, 6044SP2/3 SM

BMP701672/2006295B
(Sheet 1 of 1)



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NOTE: Be sure shell does not bottom on base pad - there must be clearance at this point. Check each corner.

NOTE: Place shims here to adjust ring weldment so that all four corners seat simultaneously.

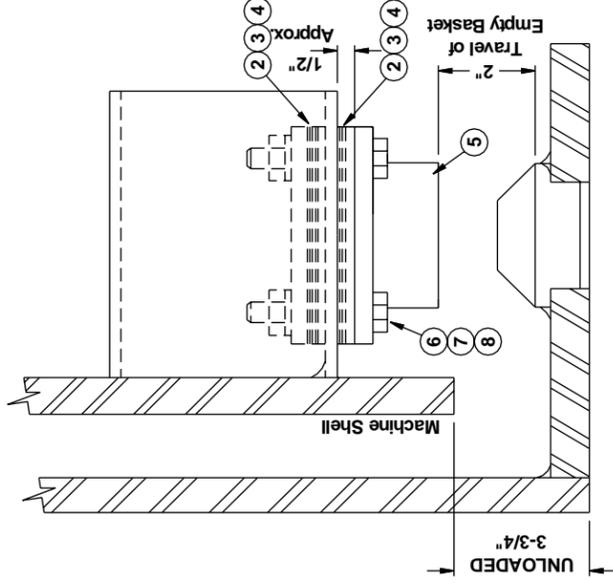
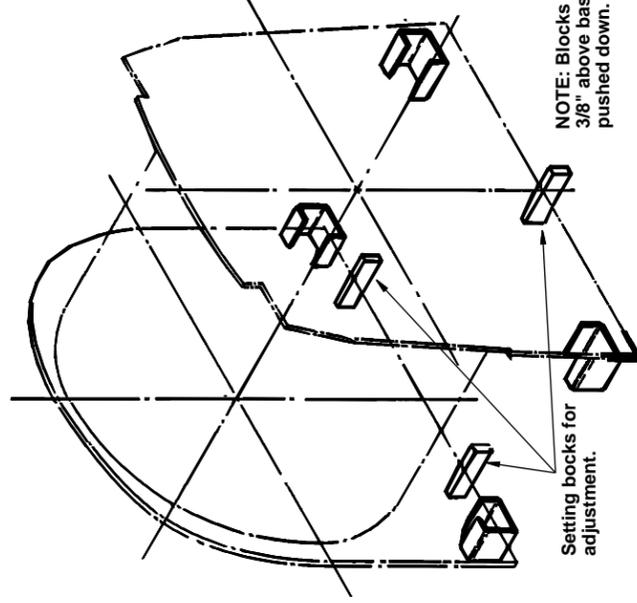


FIGURE 2:
Adjustment Complete, Machine Up

FIGURE 1:
Cross Section - Machine Locked Down for Shipment

For Instruction:
Push-Down Travel Dimensions
and Adjustment Procedures,
See MSSM0302AE.



NOTE: Blocks must hold shell approximately 3/8" above base pads when machine is pushed down.

Setting blocks for adjustment.

Parts List—Hold Down Adjustments

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

Used In	Item	Part Number	Description	Comments
	2	03 06216A	SHIM=HOLDOWN 1/4"THICK	
	3	03 06216B	SHIM=HOLDOWN 10GA THICK	
	4	03 06216C	SHIM=HOLDOWN 16GA THICK	
	5	W3 06406	*RING=HOLD DOWN CENT-STAMPED	
	6	15G238	HXNUT 5/8-11UNC2B SAE ZINC GR2	
	7	15U315	LOKWASHER MEDIUM 5/8 ZINCPL	
	8	15D125	HXTAPSCR 5/8-11X4-FLTHRD GR5	
	9	15K300	HXCAPSCR 1-8UNC2A X4.5 SAE GR5	

Suspension Cylinder Locations

Use with BMP701408

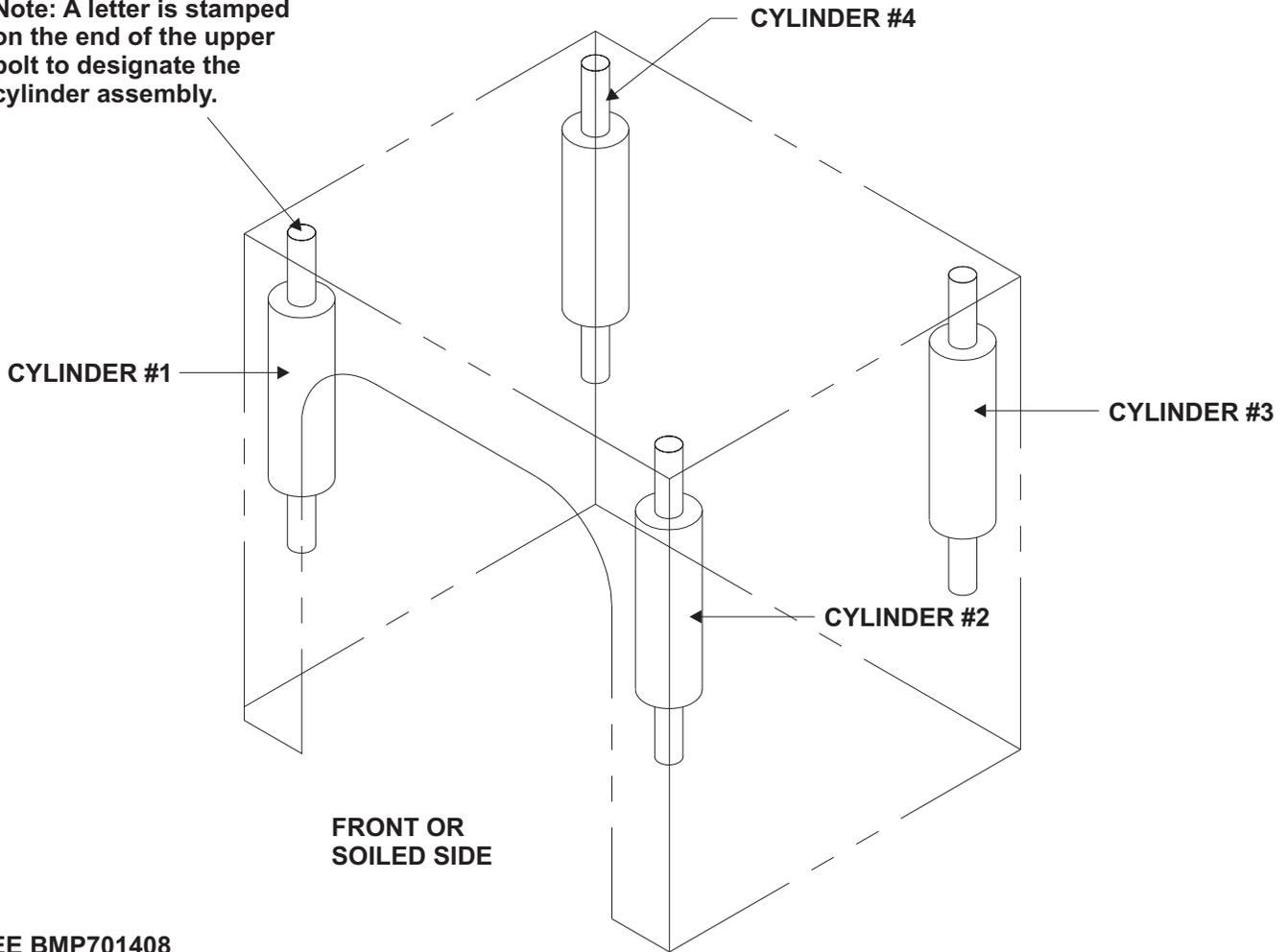
BMP701235/2017155A
(Sheet 1 of 1)



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Note: A letter is stamped on the end of the upper bolt to designate the cylinder assembly.



SEE BMP701408
FOR REPAIR PARTS:
HYDROCUSHION CYLINDER ASSEMBLY "B"
THROUGH HYDROCUSHION CYLINDER ASSEMBLY "K"

	MACHINE MODELS:								
	42031 CP2.NP2 WP2,WP3	42031 SP2,SP3	42044 CP2.NP2 WP2,WP3 D7P	42044 SP2/3; SR2/3	42044 WP2 SM, WP3 SM WR2,WR3	52038 WTL,WTN WP1	60044 WP2/3 SM SP2/3 SM WR2/3 SR2/3	72044 WP2,WP3 DA1	72044 SP2,SP3 SR2/SR3
POSITION:									
CYLINDER #1	B	B	C	C	C	D	K	H	G
CYLINDER #2	B	C	B	C	C	D	K	H	G
CYLINDER #3	B	C	B	C	C	D	K	F	G
CYLINDER #4	B	C	C	C	C	D	K	F	G

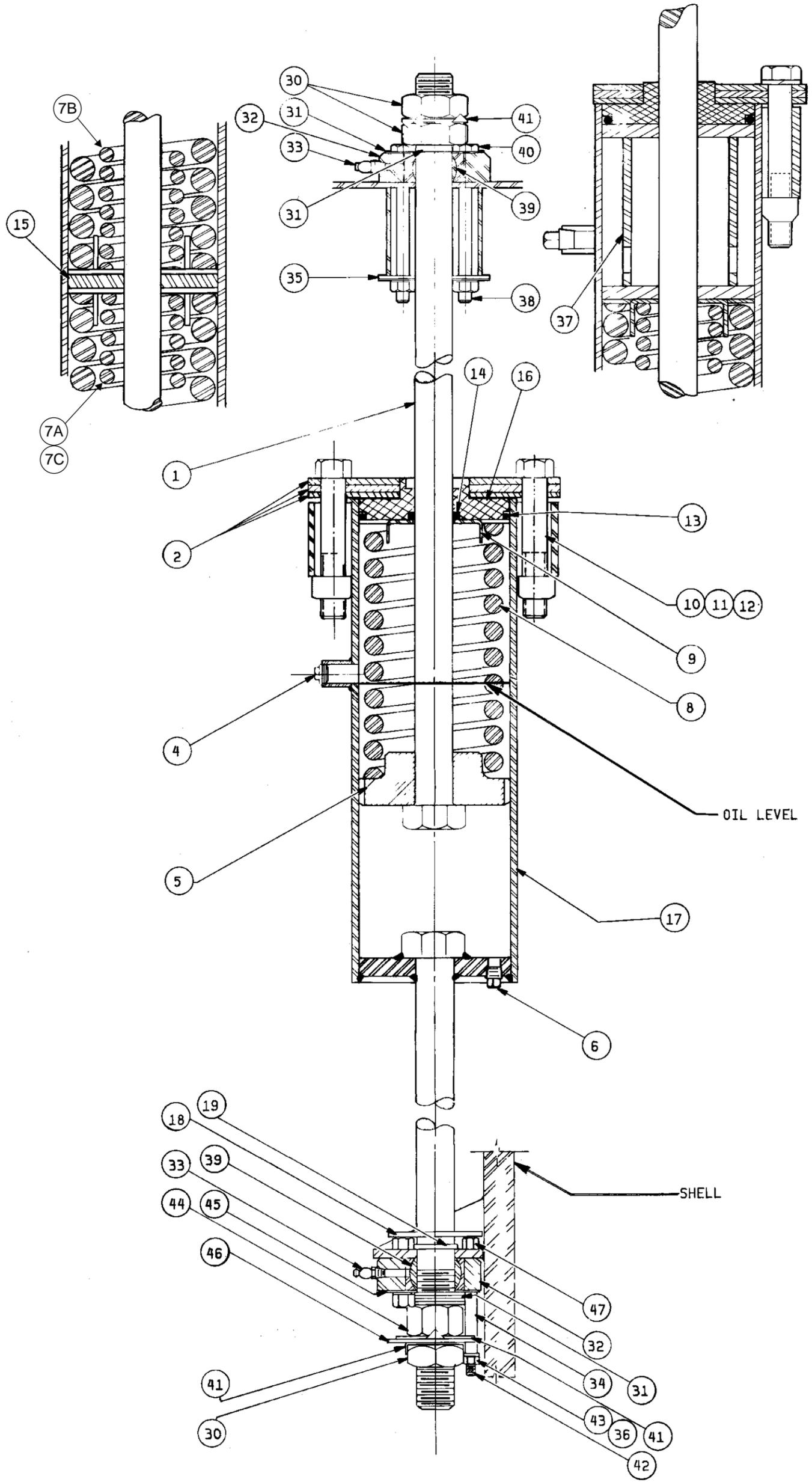
Suspension Cylinder Assemblies
42031,42044,52038,60044,72044

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BMP701408/2006275B
 (Sheet 1 of 2)





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

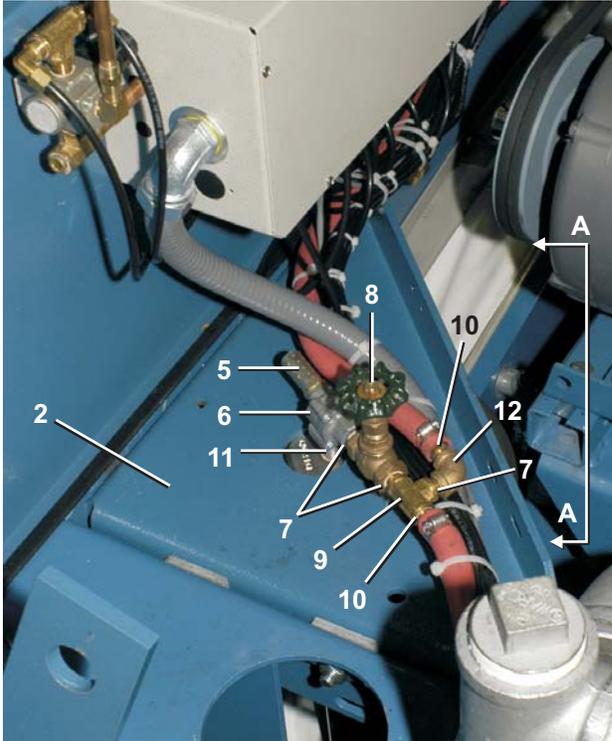
Used In	Item	Part Number	Description	Comments
			-----ASSEMBLIES-----	
	B	SA 16 039	*HYDROCUSHION CYL ASSY-"B"	CYLINDER ASSY B
	C	SA 16 038	*HYDROCUSHION CYL ASSY-"C"	CYLINDER ASSY C
	D	SA 28 091	*HYDROCUSHION CYL ASSY-"D"	CYLINDER ASSY D
	F	SA 36 021	*HYDROCUSHION CYL ASSY-"F"	CYLINDER ASSY F
	G	SA 36 023	*HYDROCUSHION CYL ASSY-"G"	CYLINDER ASSY G
	H	SA 36 047	*HYDROCUSHION CYL ASSY-"H"	CYLINDER ASSY H
	K	SA 29 031K	*HYDROCUSHION CYL ASSY-"K"	CYLINDER ASSY K
			(Note: To identify which cylinder is supplied with your machine, see BMP701235 which should be located in the manual next to this document. Once you know which cylinder assembly you have, "B-K" listed above, identify your parts by referencing the "Used In" coding.)	
			-----COMPONENTS-----	
ABCDK	1	02 18244	BOLT=HYDCYL 27+7/8LG+KEYWAY	
K	1	02 18244A	BOLY=HYDCYL 28+7/8LG+KEYWAY	
FGH	1	03 06201	BOLT=HYDCYL 41+7/8LG+KEYWAY	
all	2	02 18840A	UPCAP=HYDROCYL 42+52+60	
all	4	5SP0KGFSS	NPT PLUG 1/2 SOSOLID GALSTL	
BC	5	X2 15356	PISTON=HYDROCYL 6"- 6 NOTCH	
DFGHK	5	X2 18228	PISTON=HYDROCYL 6"- 3 NOTCH	
all	6	5SP0GHFHKM	NPT PLUG 3/8"-HEXCSMAGNETIC ZN	
FG	7A	03 06139	SPRING=INNER HYDRO CYL 331LB/IN	FULL SPRING (PURPLE)
G	7B	03 06139A	SPRING=INNER HYDRO CYL	PLUS 1/2 SPRING "G" ONLY (PURPLE)
H	7C	03 06338	SPRING INNER-GOLD 14"LONG	GOLD
B	8	02 16068	MAIN SPRING 212LB/IN RED	RED
C	8	02 16125	MAIN SPRING 300LB/IN BLACK	BLACK
D	8	02 19039	MAIN SPRING 480LB/IN GREEN	GREEN
FG	8	03 06138	SPRING=OUT HYDROCYL 667LB/IN	ORANGE
G	8	03 06138A	SPRING=OUT HYDRO CYL	ORANGE
H	8	03 06337	SPRING-OUTER-GOLD 14.5"LONG	GOLD
K	8	03 09016	MAIN SPRING 1035LB/IN BLUE	BLUE
ABCDGK	9	02 18619	BUSHING RETAINER + CAD	
H	9	03 06358	BUSHING RETAINER.CAD	
all	10	15B237	HXCAPSCR 1-8UNC2AX5.5 SAEGR5 Z	

Used In	Item	Part Number	Description	Comments
all	11	15G255A	SQ Nut 1-8UNC2B SAE ZINC GR2	
all	12	15U400	LOCKWASHER MEDIUM 1" ZINCPL	
all	13	60C159A	ORING 5.475ID 1/4CS BN70 #433	
all	14	24S040	SEAL URETHNE 1-7/16 2.25 13/32	
GH	15	M2 18690	LOWER CAP=HYDROCYL	
all	16	02 18839A	MACHBUSH HYDRCYL CAP #433-OR	
BC	17	SA 15 084	*HYDCUSH CYL WLDMT (18"X/12")	
DI	17	SA 28 090	*HYDCUSH CYL WLDMT (18"/23")	
FGH	17	W3 06203	*HYDCUSH CYL WLDMT (35"/12")	
K	17	W2 18233	*HYDCUSH CYL WLDMT (20"X22")	
all	18	02 175034	SHIELD-BALBUSH-4/HYDRO MACH	
BDFGH	19	02 02230	6 WATER BARRIER (NEOPRENE)	
all	30	15G268	HXFJNMINUT 1+1/2-12UNF2B ZINC	
all	31	02 18571A	PISTON ROD WASHER-.25"TK	
all	32	X3 06252	RETAINER-BALBUSH=4/72WEDU	
all	33	54M025	HYDFIT 1/8"-90 ALEMITE 1613-B	
all	34	27B240	SPCROLL.5ID.813L.062T STLZNC	
all	35	02 18534	HOLDPLATE= BALLBUSH ZNC/CAD	
all	36	15G230	HXNUT 1/2-13UNC2B SAE ZINC GR2	
F	37	Y3 06200	SPACER=HYDRO-CUSH CYL-MACH	
all	38	15K203	HXCAPSCR TFL 1/2-13X5 GR5 ZINC	
all	39	54A705	BALBUSH 1.5 SKF#GEZ108ESAVE467	
all	40	15N037	HXCAPSCR 1/2-13UNC2AX6.5 GR5 Z	
all	41	02 18256	LOKWASH-TONGUE 8WEH ZINC	
all	42	15K202	HXCAPSCR 1/2-13UNC2AX5 GR5 ZIN	
all	43	15U300	LOKWASHER REGULAR 1/2 ZINC PLT	
all	44	15G231	HXFJNMINUT 1/2-13UNC2B ZINC G	
all	45	02 18534	HOLDPLATE= BALLBUSH ZNC/CAD	
all	46A	02 18795A	WASH-TIMING=HYDRO CYL 45DEG	USE ONE
all	46B	02 18795B	WASH-TIMING=HYDRO CYL 75DEG	USE ONE
all	47	15K191	HXCAPSCR 1/2-13UNC2AX2.5 GR5 Z	
FGH	48	AVH52001	ASSY=OILFIL SPOUT 72HYD CYL	

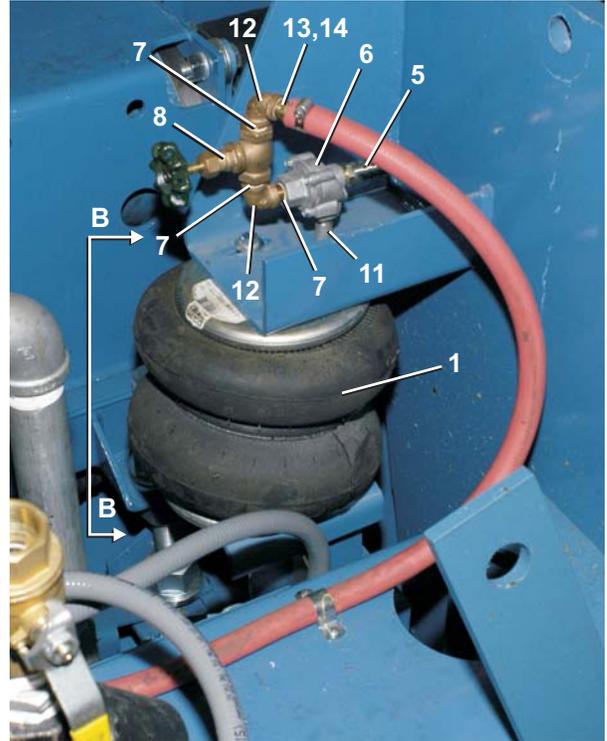
Push Down Components

72044WR2, SR2

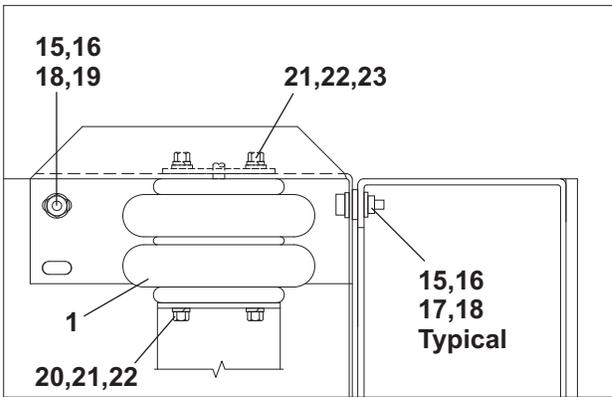
Figure 1: Push Down installation and pneumatic fittings



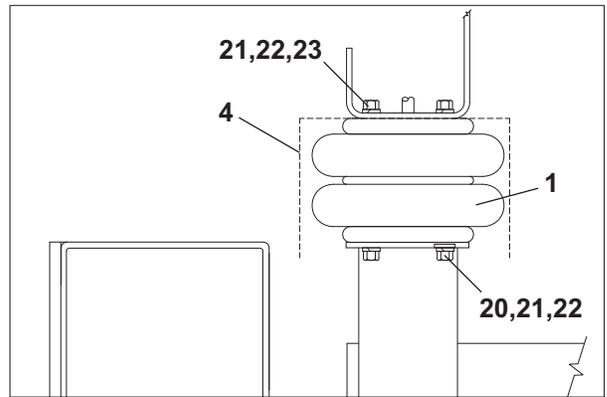
72044SR2 Clean side
72044WR2 Left Front



72044SR2 Soil side
72044WR2 Right rear



View A-A



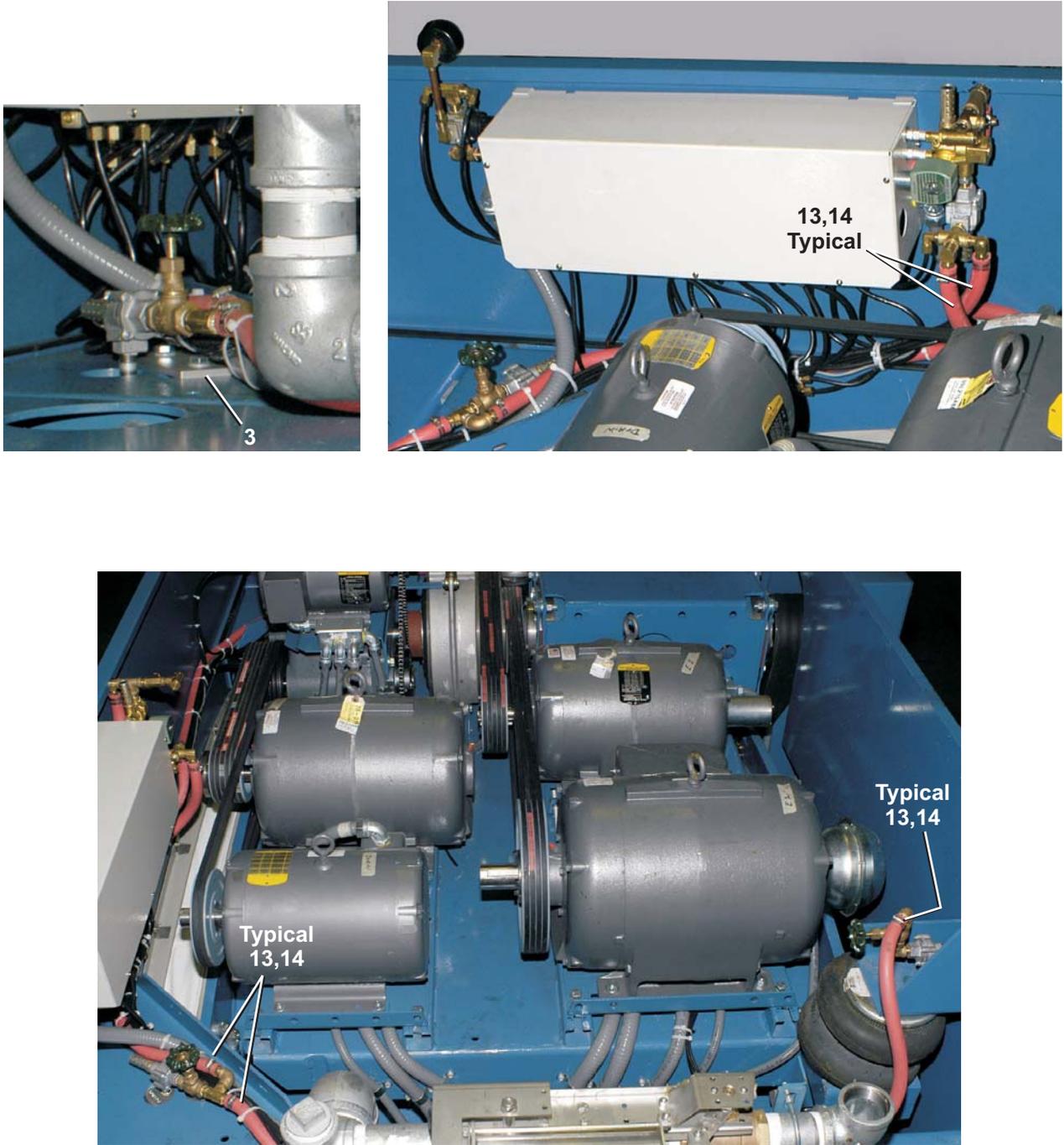
View B-B

Note: The 72044SR2 model is shown. The 72044WR2 repair parts are identical.

Push Down Components

72044WR2, SR2

Figure 2: Push Down installation and pneumatic fittings



Push Down Components

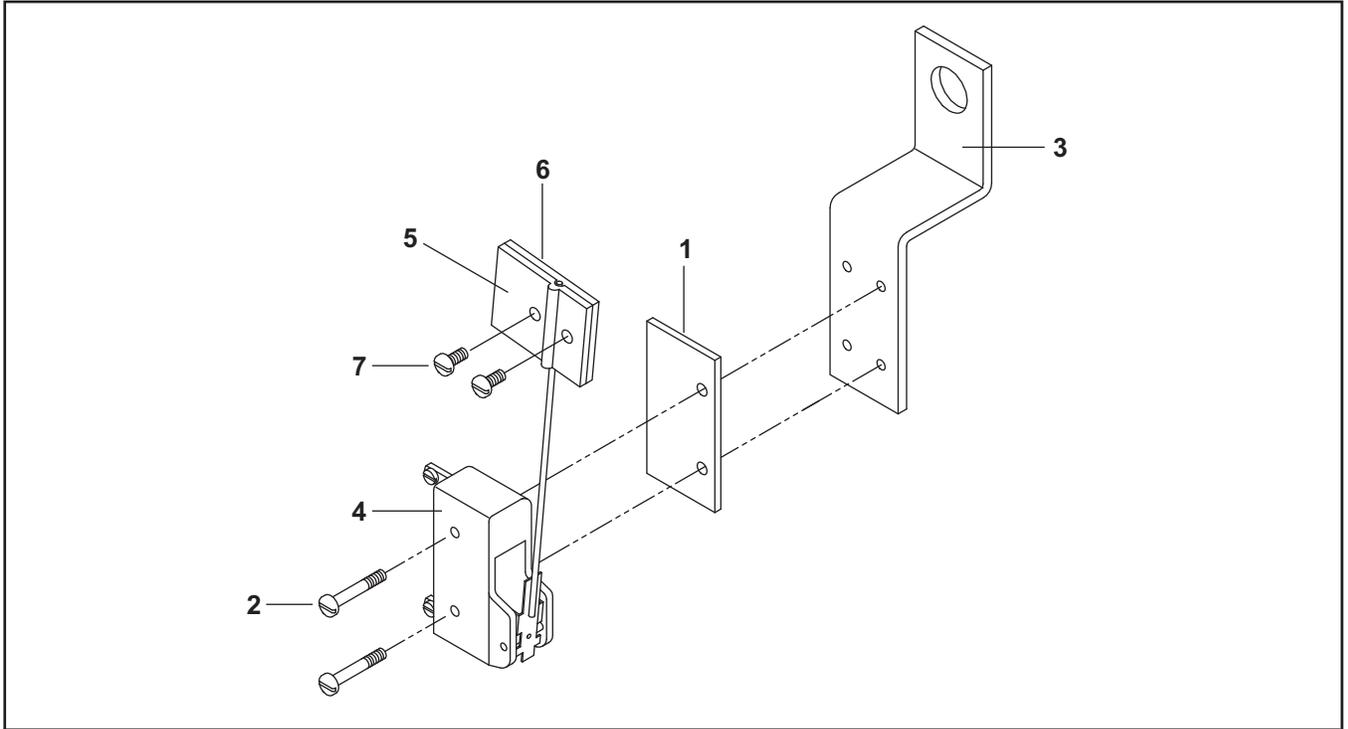
72044WR2, SR2

<p align="center">Parts List—Push Down Components</p> <p>Find the correct assembly first, then find the needed components. The item letters (A, B, C, etc.) assigned to assemblies are referred to in the "Used In" column to identify which components belong to an assembly. The item numbers (1, 2, 3, etc.) assigned to components relate the parts list to the illustration.</p>				
Used In	Item	Part Number	Description	Comments
-----ASSEMBLIES-----				
	A	AD 36 037	PUSH DOWN MT ASSY 72SGH	72044SR2
	B	AD 36 036	PUSHDOWN MOUNTING ASSY=72WED	72044WR2
-----COMPONENTS-----				
all	1	60B120	AIRMT S-20 2CONV F#W013586910	
all	2	03 06193	UP PUSH BRKT 72W+S BEND@PRNT	
all	3	03 06193A	ADJ.PLATE=20C AIRCUSHION	
all	4	69C050A	POLYETHYLENE BAG 9X6X13X.005	
all	5	27A005	MUFFLER 3/8" BANTAM B38	
all	6	96M055	DELTROL QUICK EXHAUST VLV.1/4"	
all	7	5N0ECLSBE2	NPT NIP 1/4XCLS TBE BRASS 125#	
all	8	96D026	1/4"GLOBEVAL BRZ125 STEAM	
all	9	51V015	TEE 1/4 FGDBRASS 101T7-444	
all	10	51E507	HOSESTEM BRASS 1/4MPX1/2HOSEID	
all	11	5N0E02KG42	NPT NIP 1/4X2.5 TBEGALSTL SK40	
all	12	5SL0ENFA	NPTEL B 90DEG 1/4 GALMAL 150#	
all	13	60E085A210	HOSE- *AIR-1/2ID PE X210"LG	
all	14	27A090	HOSECLAMP 13/16-1.5"CADSC#HS16	
all	15	15K191	HXCAPSCR 1/2-13UNC2AX2.5 GR5 Z	
all	16	15G230	HXNUT 1/2-13UNC2B SAE ZINC GR2	
all	17	15U280	FL+WASHER(USS STD)1/2 ZNC PL+D	
all	18	15U300	LOKWASHER REGULAR 1/2 ZINC PLT	
all	19	15U490	FLTWASH 1+1/2X17/32X1/4 ZINC	
all	20	15K095	HXCPCSCR 3/8-16UNC2AX1 GR5 ZINC	
all	21	15U240	FLATWASHER(USS STD) 3/8" ZNC P	
all	22	15U255	LOCKWASHER MEDIUM 3/8 ZINCPL	
all	23	15K105	HXCAPSCR 3/8-16UNC2A1.25 GR5 P	

Control and Sensing Assemblies

5

Vibration Safety Switch



Parts List—Vibration Safety Switch

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

Used In	Item	Part Number	Description	Comments
-----ASSEMBLIES-----				
	A	SAE03 151	* ASSY-VIBRATION SWT=LG CONTR	
-----COMPONENTS-----				
all	1	02 02038	PLATE INSULATING SMALL9NOV51	
all	2	15P008	TRDCUT PANHD 6-32X1 NIKSTL +WA	
All	3	02 15119	BRACKET=VIBSW CAD	
all	4	09R020	SWITCH NC VIBR#WZ-2RW84429-P52	
all	5	03 01059	VIBSWITCH CLAMP CADSTL	
all	6	03 01058	VIBSWITCH WEIGHT-CADSTL	
all	7	15P101	TRDCUT-F PANHD 8-32X3/8 NIKSTL	

Excursion Switch (Unwanted Movement Switch) Components and Installation

Figure 1: Excursion switch 6044WR2, 6044WR3, 7244WR2

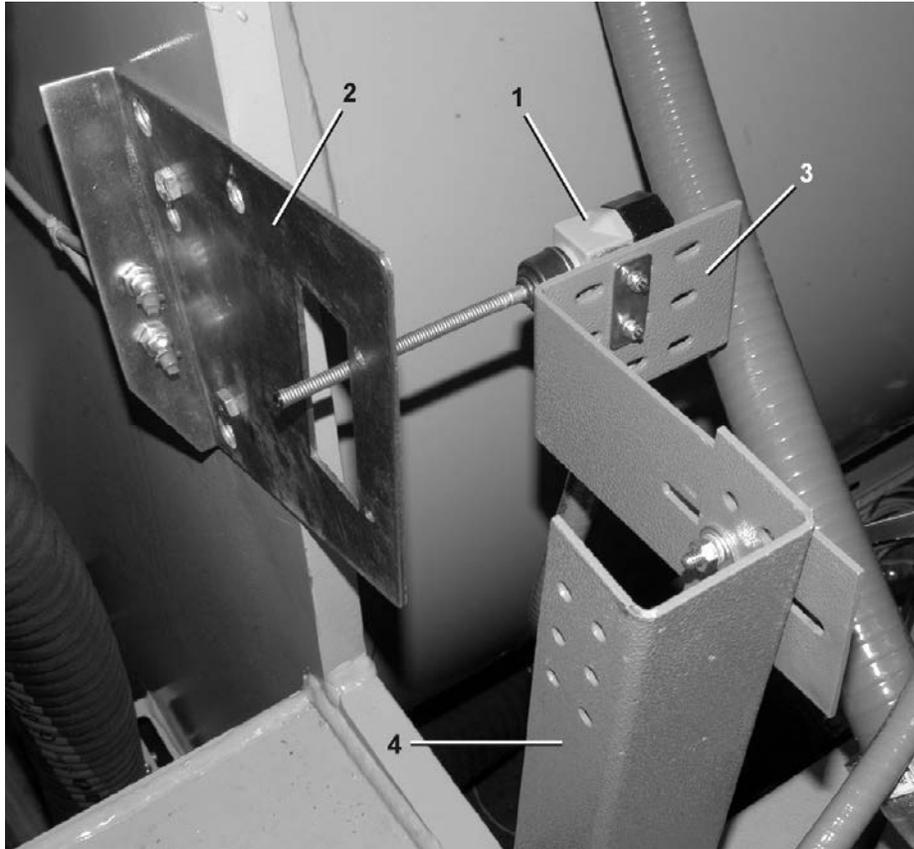


Table 1: Parts List—Excursion switch

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				
none				
Components				
all	1	09R008ASTD	Switch	
all	2	02 18542A	Bracket	
all	3	02 18784E	Bracket	
all	4	02 18784D	Bracket	6044WR2/3 ONLY

— End of BIHDBM18 —

Shell and Door Assemblies

6

DOOR SEAL REPLACEMENT ON RAPID LOAD MODELS

Door Seal Replacement

The seal components referred to herein are contained in kits K28 0005R (for 60" machines) or K36 0003R (for 72" machines).

1. Remove old seal from the door cavity and carefully pull air tubing out of inner door so as not to cut tubing.
2. Remove as much as possible of the old adhesive from the rubber filler strip inside door cavity.
3. Carefully remove old seal from the air tubing fittings and attach new seal.
4. Carefully stretch new seal around door and into cavity. Because the new seal is fabric reinforced it is slightly narrower than the old style rubber seal; the wall is thinner and it does not stretch as easily. It will therefore feel much tighter than the all rubber seal when stretching it over the edge of the door.
5. After new seal is fitted and aligned into the door cavity, close both doors and inflate. Check to see that seals contact each other along the seam between the doors and that the seal contacts the shell front all around. To check this, attempt to slide a piece of paper between these surfaces.
6. If the seal does not contact the shell at locations A or D (see FIGURE 1), open the doors and stretch the seal toward these points.
7. If seals do not contact each other or the shell front in other areas, install rubber shims (part number 02 175267) between seal and filler strip as required to bring the seal further out from the door. Use adhesive (part number 20C015A) to attach shims to filler strip.
8. If seals do not contact each other at locations A and B, (see FIGURE 1), then at these points, glue tapered patches (part number 02 175134), as required, to the outside of seal (using adhesive 20C080C) to add thickness.
9. After seal has been completely fitted, roll seal up on one side, and with a small brush, paint adhesive (part number 20C015A) on filler strip to hold seal in place.

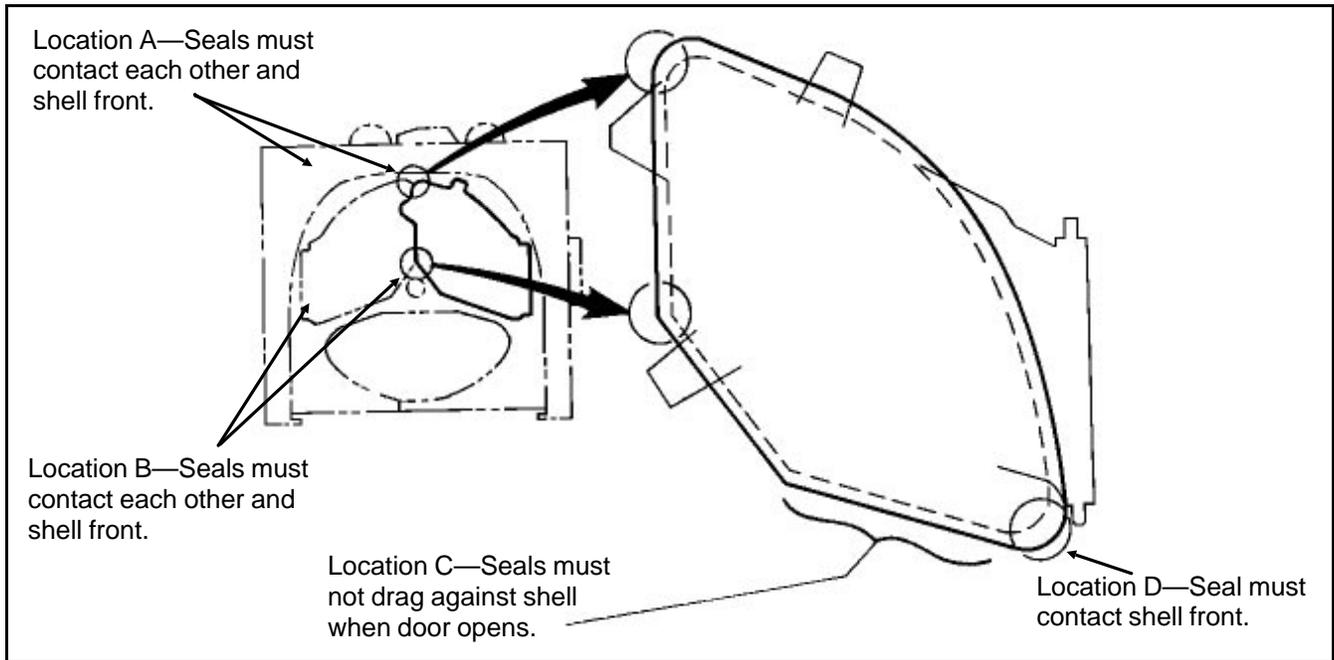


FIGURE 1 (MSSMA413AE)
Door Seal Checks

Door Seal—Preventive Maintenance

Check Door Alignment About the Shell Opening—Each door must be centered in its respective shell front opening. If the doors are not centered, the inflatable door seals will drag on the sealing edge of the shell front as the doors are opened and closed. The doors can be moved in any direction for centering by loosening the 1/2" hex cap nuts which hold the door assembly to the hinge cross brace as shown below.

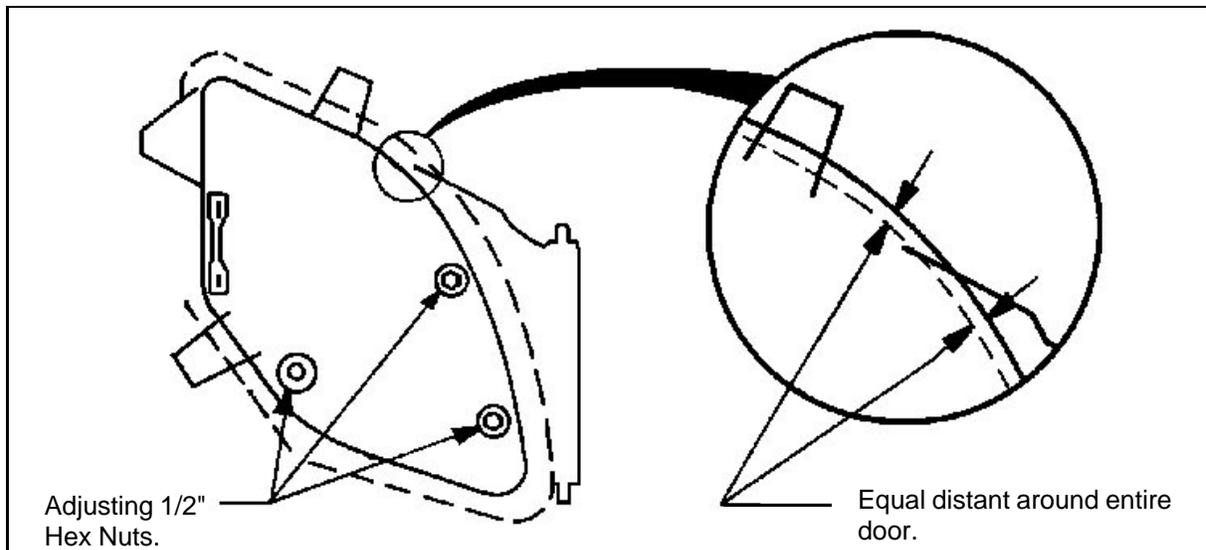


FIGURE 2 (MSSMA413AE)
Door Alignments

Check Condition of Door Seal Channel—Be certain the sides of the channel in which the door seal fits are straight and that mainly the inner edge is not bent. See FIGURE 3 below. Because outer edge is double thickness it is not likely to be bent out of shape. But it is possible for the inner edge to become bent as shown.

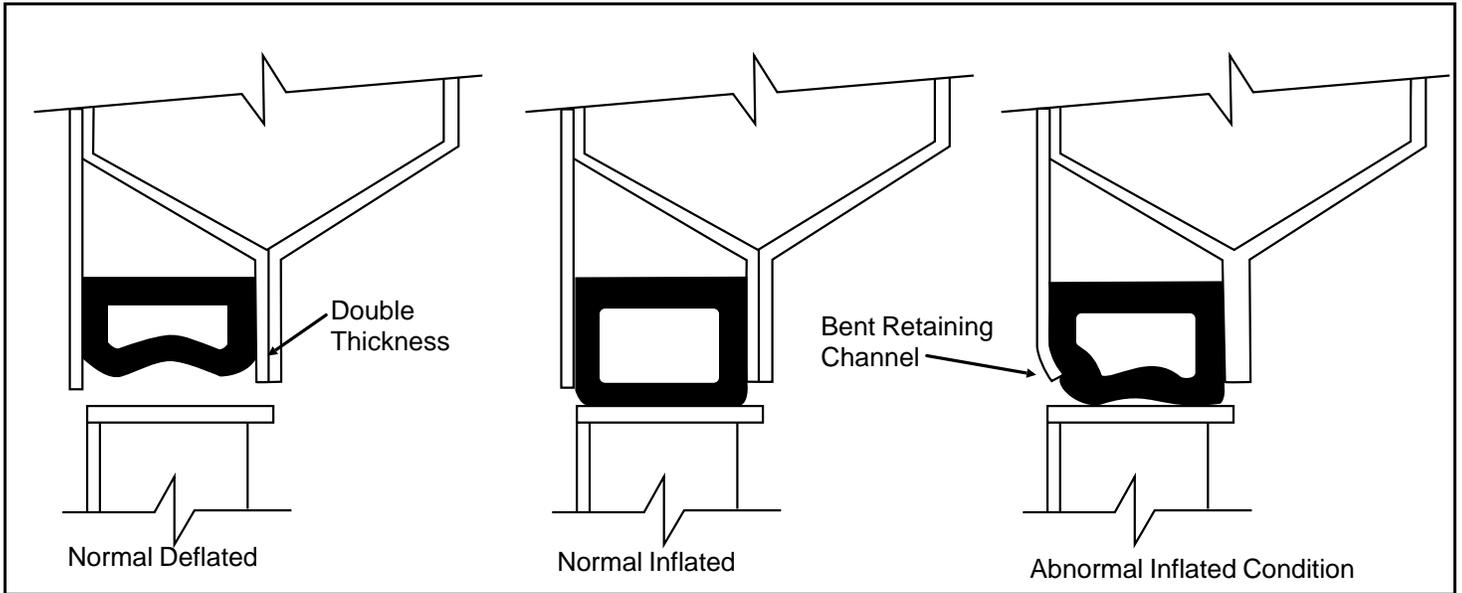


FIGURE 3 (MSSMA413AE)
Door Alignment

Replace Worn Striker Plates—Each of the outer doors are securely held in the closed position by air latches. These air latches snap into striker plates bolted to the shell front. If the hole in these striker plates becomes worn, the shell doors will be allowed to move while the machine is in operation. It will look as though the doors are “breathing.” This will cause rapid wear and premature seal failure. Striker plate components are shown below.

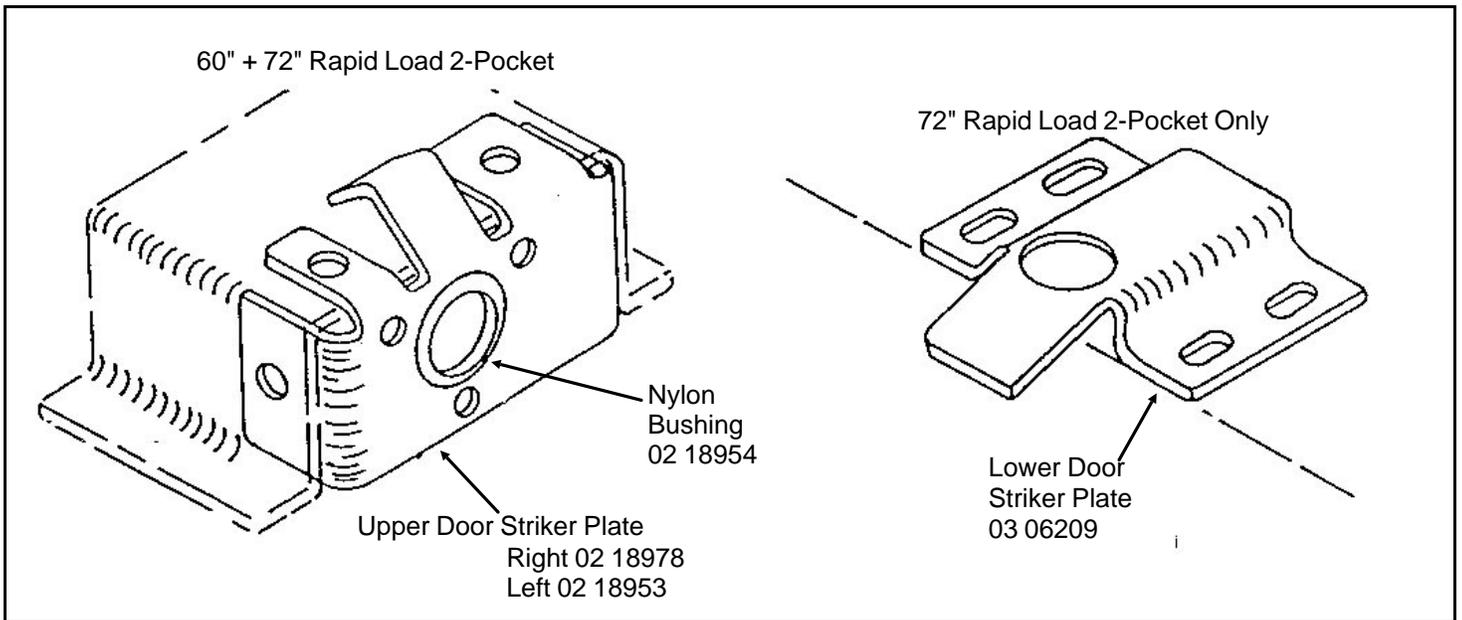


FIGURE 4 (MSSMA413AE)
Worn Striker Plate

Check Door Alignment In and Out—Misalignment of the doors in and out of the shell front opening can be most often attributed to worn striker plates as described above. The doors should be adjusted so that, with one door open and one door closed, the closed door's inflatable seal channel will be centered on the shell front sealing surface when viewed edgewise (see FIGURE 5). If the door latch mechanism is loose, worn, or mismatched the door can travel too far into the machine, with the result that the inflatable seal can protrude past the door channel and the shell front sealing surface and be scissored when the door is reopened.

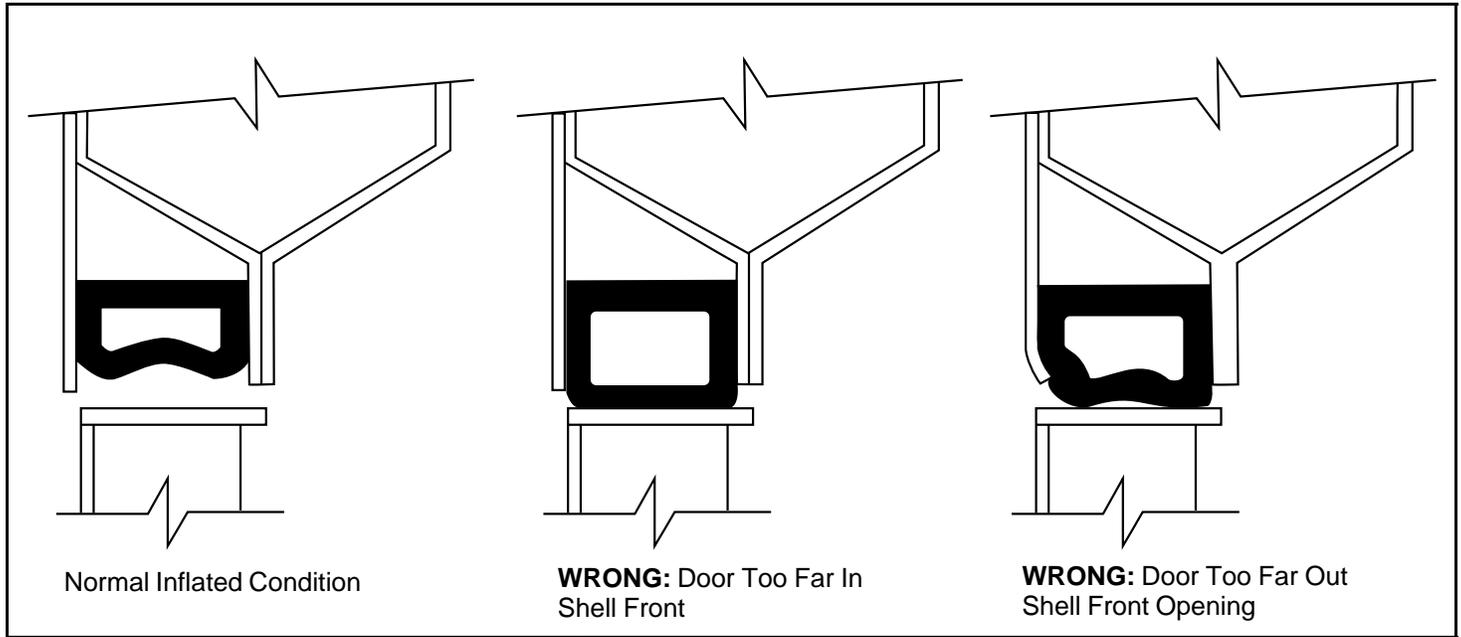


FIGURE 5 (MSSMA413AE)
Door Seals

Check Seal Air Pressure—Air pressure on these inflatable door seals should be set and maintained at 25 to 28 PSI. Too high air pressure will cause blowouts and too low air pressure will cause not enough contact between seal and shell front, thus movement and rapid wear. Kit K28 0011, which contains a fixed at 25 to 28 PSI regulator, plus a pressure gauge is available from the Milnor[®] factory. If yours is inoperative, it should be replaced.

Check Door Bumper—Be sure large rubber bumper (part number 60C075) on right hand door is in place and not worn.

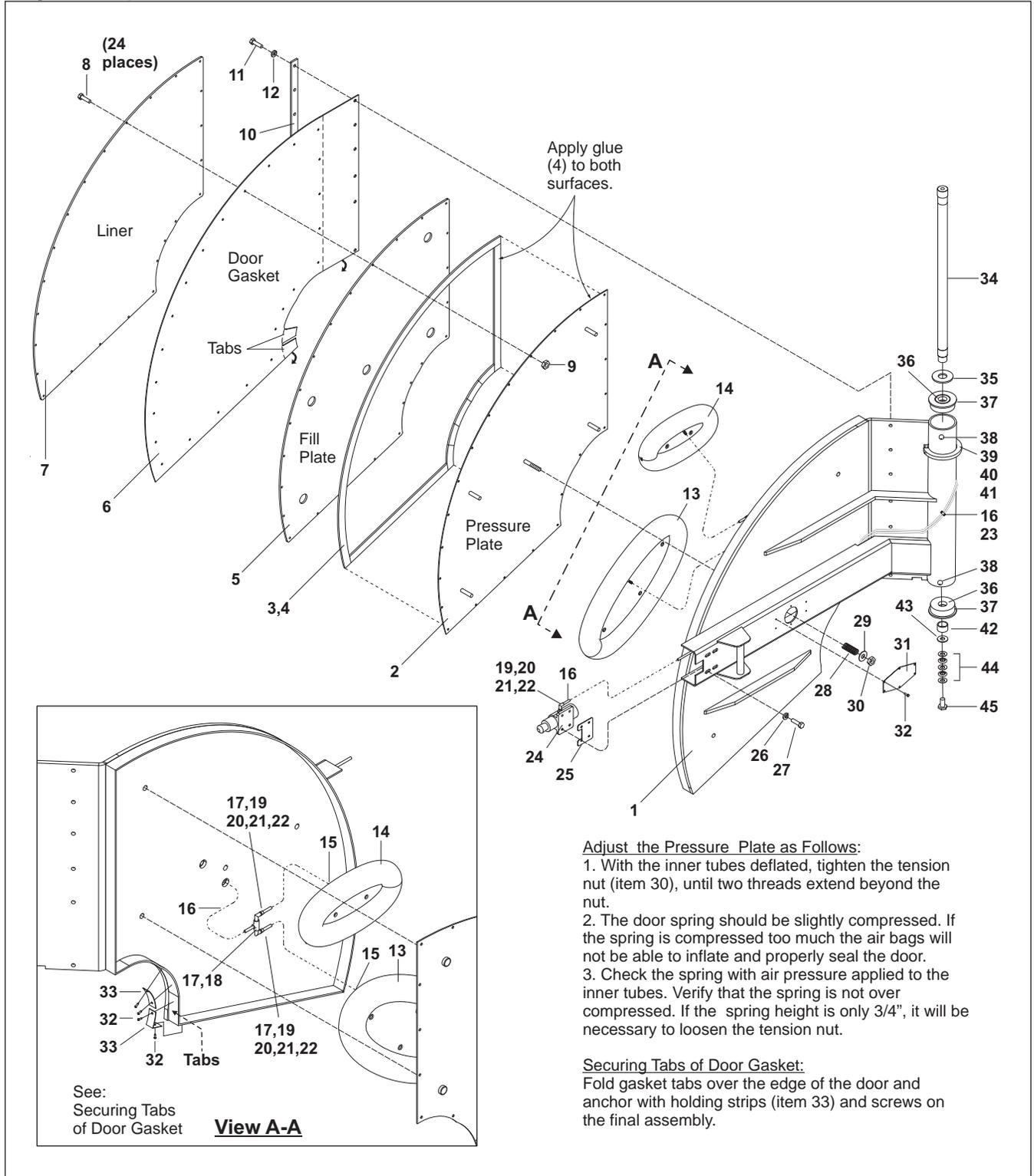
Seal Vacuum Pump Feature

Since approximately June of 1980, all production machines have a vacuum pump which delays the opening of the door by 7.5 seconds and during that time literally sucks the air from the inflatable door seal. This is the single greatest extender of the life of the inflatable door seal. This feature is retrofitable to all 60" and 72" WE2 machines manufactured prior to June 1980. Order retrofit kit, part number K28 0013.

Shell Doors

72044WR3, 72044SR2

Figure 1: Exploded Views



Shell Doors

72044WR3, 72044SR2

Parts List—Shell Door				
Find the correct assembly first, then find the needed components. The item letters (A, B, C, etc.) assigned to assemblies are referred to in the "Used In" column to identify which components belong to an assembly. The item numbers (1, 2, 3, etc.) assigned to components relate the parts list to the illustration.				
Used In	Item	Part Number	Description	Comments
-----ASSEMBLIES-----				
	A	SA 36 019	*SHELL DOOR ASY 72WE3+SG SOIL	7244WR3 7244SR2 SOIL SIDE
	B	SA 36 020	*SHELL DOOR ASY 72SG CLEAN	7244SR2 CLEAN SIDE
-----COMPONENTS-----				
A	1	W3 06126	* SHELLDOOR 72SG2+3 SOILSIDE	
B	1	W3 06127	* SHELLDOOR 72SG2+3 CLEANSID	
A	2	W3 06304B	WLDMT=PRESSPLT DR 72SG SOIL	
B	2	W3 06303B	WLDMT=PRESSPLT DR 72SG CLEAN	
all	3	60A006P	PORON STRIP .25X1 1/4# W E=FT	
all	4	20C044	RUB/GASKET ADH 3M#EC1300 PINTS	
all	5	X3 06130C	FILL-PLATE=SHELLDOOR	
all	6	03 06130	GASKET=SHELL DOOR 2/72SG	
all	7	03 06130A	LINER=SHELLDOOR 72SGD SS	
all	8	15K039A	BUTSOKCPSCR 1/4-20X7/8 SS 18-8	
all	9	15G164	HX THIN LOCKNUT NYL1/4-20 SS	
all	10	03 06302	BAR=GASKET CLAMPING	
all	11	15N174	HXCAPSCR 1/4-20UNC X5/8SS18-8	
all	12	15U181	LOCKWASHER MEDIUM 1/4 SS18-8	
all	13	03 06225G	DOORTUBE-72SGA-OURTUBE	
all	14	02 18981G	DOOR TUBE-60SGH-PRES.TUBE E	
all	15	02 18181	FITTING-BRASS FOR INNER TUBE	
all	16	60E004TE	1/4"OD X.170"ID NYL(BLK)TUBING	
all	17	53A047H	MALCON 5/16X1/8POLY PH#68P-5-2	
all	18	51V010	TEE PIPE 1/8 BRASS FORGING TYP	
all	19	53A031XB	BODY-EL90MALE.25X25 #269C-4-4B	
all	20	53A500	SLEEVE DELRIN 1/4"OD#60PT-4	
all	21	53A501	TUBE INSERT .163"OD #63PT-4-40	
all	22	53A059A	NUT 1/4"BR.HOLYOKE AND #61A-4	
all	23	12P016	CABLE CLMP-BLACK UL APPROVED	
all	24	SA 15 028	* DOOR LATCH ASSY-DIVCYLS	
all	25	02 15633S	ADJPLATE=DOORLATCH SS	
all	26	15U255	LOCKWASHER MEDIUM 3/8 ZINCPL	
all	27	15K085	HEXCAPSCR 3/8-16UNC2AX3/4 GR5	
all	28	01 09028	SPRING=BRAKE.88OD2.5FL95#/"	
all	29	15U280	FL+WASHER(USS STD)1/2 ZNC PL+D	
all	30	15G234	LOKNUT 1/2-13NC CAD FLXLOC#21F	

Shell Doors

72044WR3, 72044SR2

Parts List—Shell Door

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

Used In	Item	Part Number	Description	Comments
all	31	01 10020	NPLT SMALL "MILNOR" LOGO	
all	32	15P010	TRDCUT PHILPANHDSCR 10-24X1/2S	
all	33	02 175231	PLATE=SHELL DOOR GASKET	
all	34	03 06137	HINGE PIN 72 SG2,SG3,WE2&WE3	
all	35	03 06136	WASHER,BRG BACKUP 72SG	
all	36	54A974975	TIM #L68111/L68149-1.3775"BORE	
all	37	X3 06146	BEARING ADAPTER 60&72 SG DR.	
all	38	54M021	GRSFIT 1/8PIPE X 1/4STR 1607-B	
all	39	54JH15500A	HINGE COL SPLIT 5.50 FL TOP	
all	40	15K045E	SKCPSCR 1/4-20X2 BLK	
all	41	15Q091	SOKSETSCR CUP1/4-20X5/8BLK	
all	42	03 06132	BUSHING,HINGE PIN 60&72 SG	
all	43	15U314	FLATWASHER(USS STD) 5/8" ZNC P	
all	44	15U521	SPRINGWSHR.630ID 1.250D.051T	
all	45	15K214E	HXCAPSCR 5/8-11UNC2AX1.5 GR5 Z	

BIHDBM03 (Published) Book specs- Dates: 20160601 / 20160601 / 20160610 Lang: ENG01 Applic: HDB

Components, Shell Doors

Figure 1: General View 6044WR2, 7244WR2

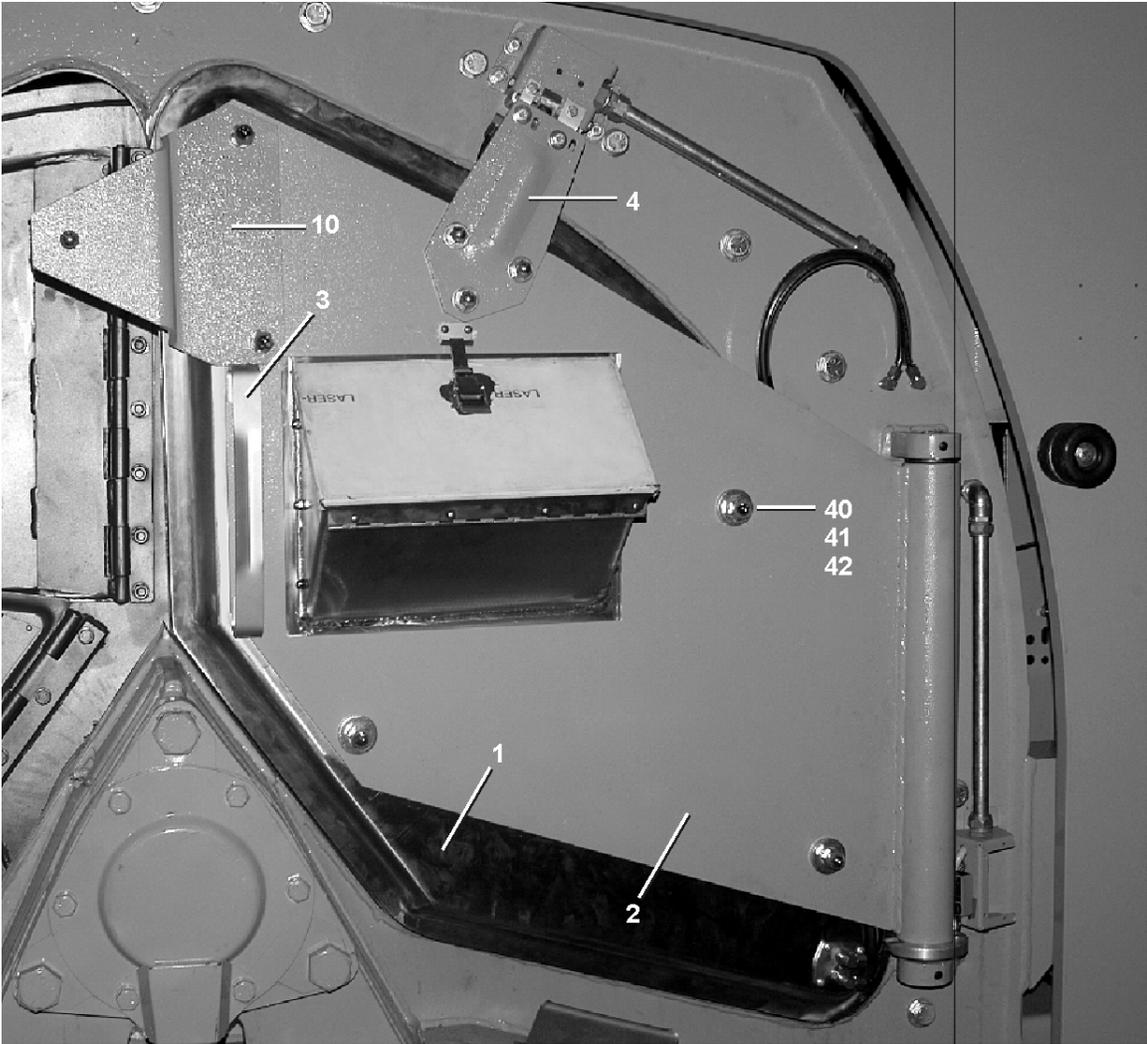


Figure 2: Shell doors

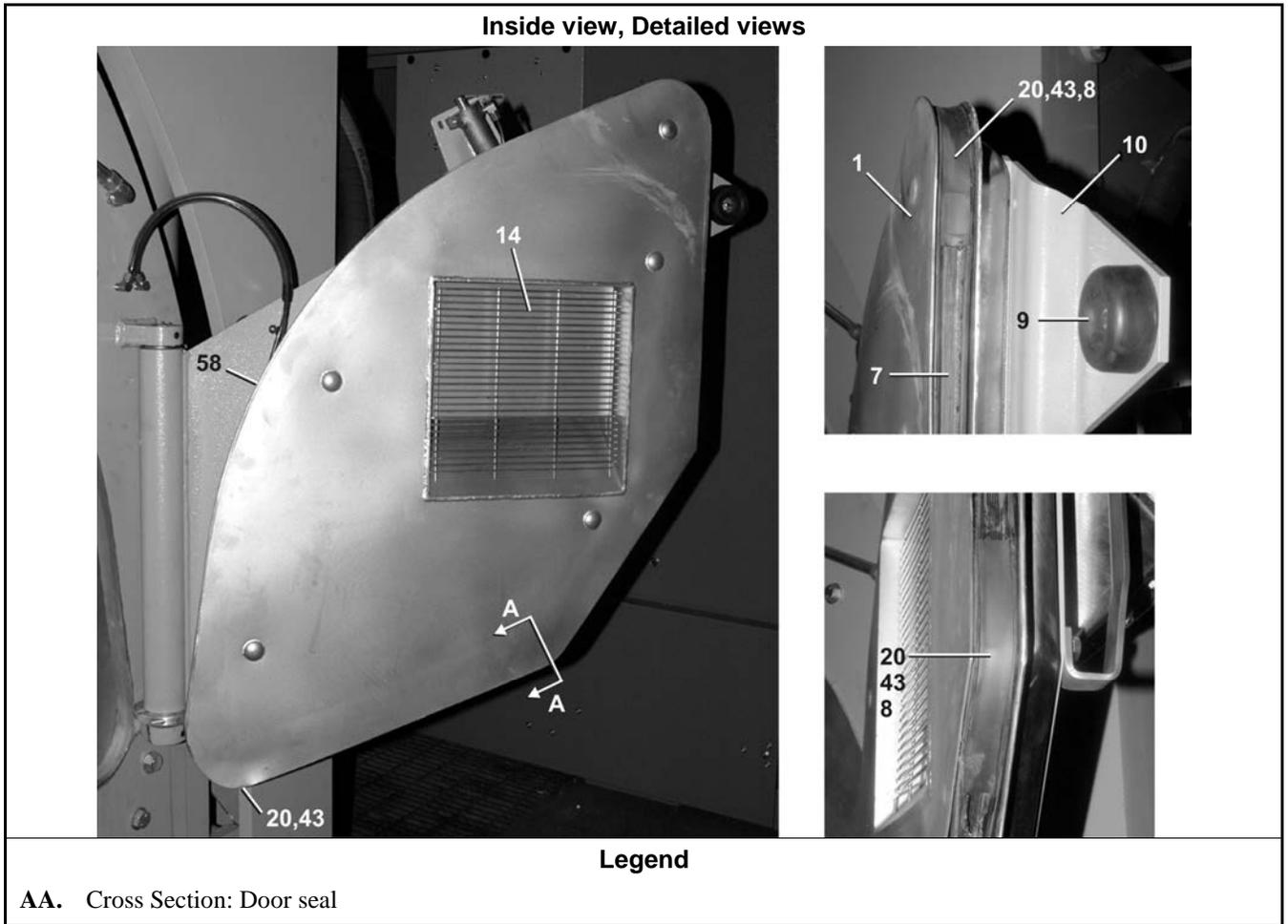


Figure 3: Door seal

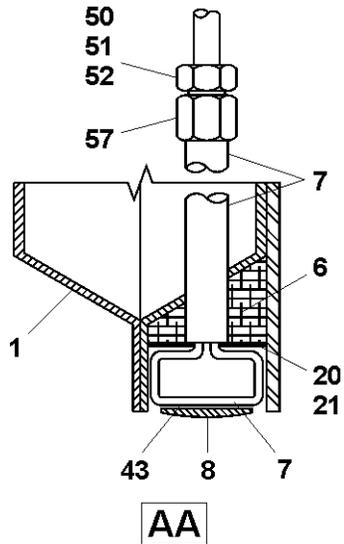


Figure 4: Door hinge

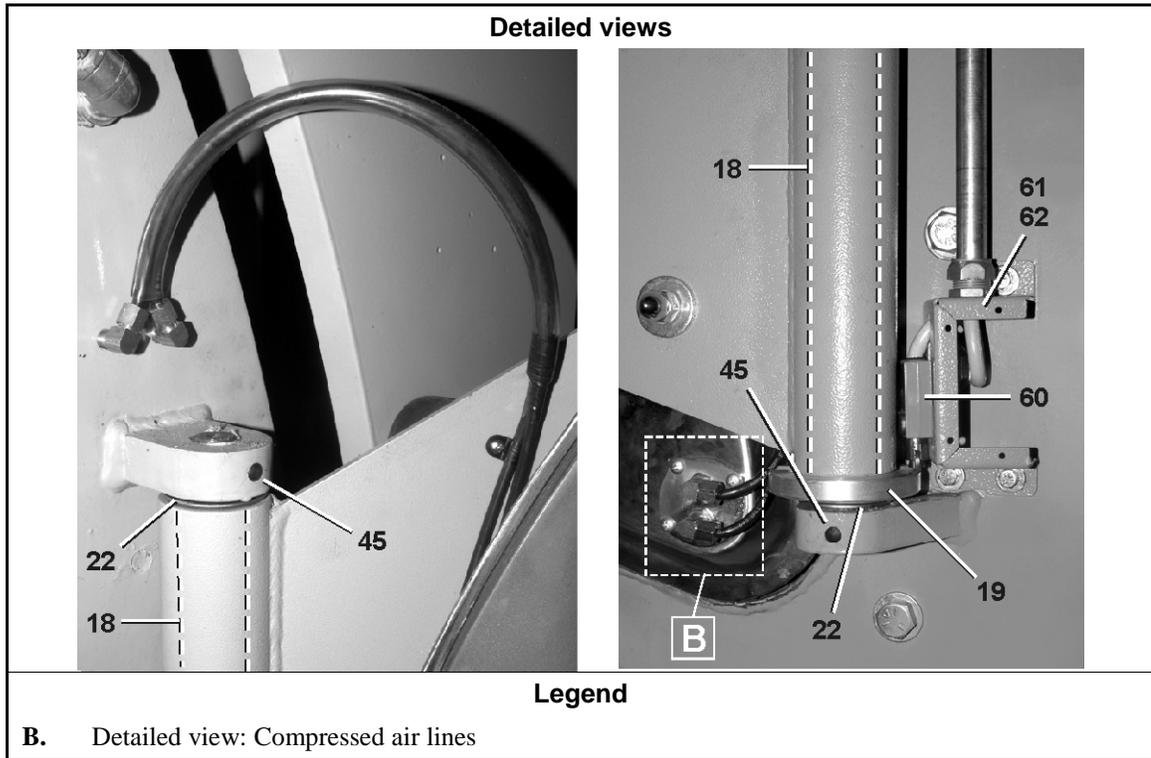


Figure 5: Compressed air lines, Door Latch

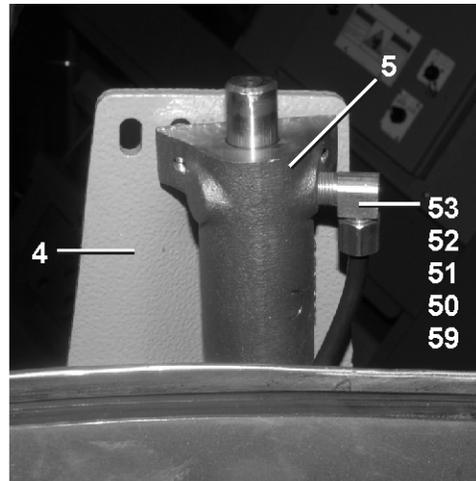
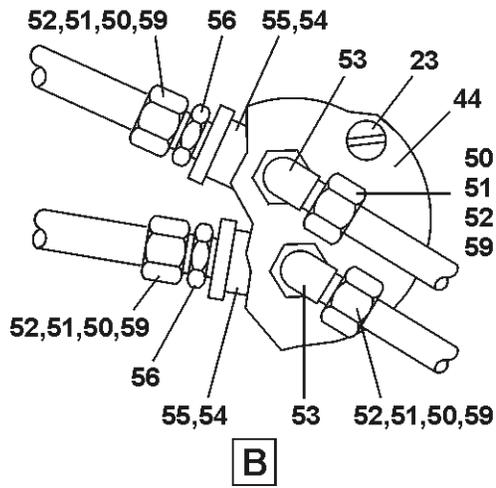


Figure 6: Shell door, Soap chute

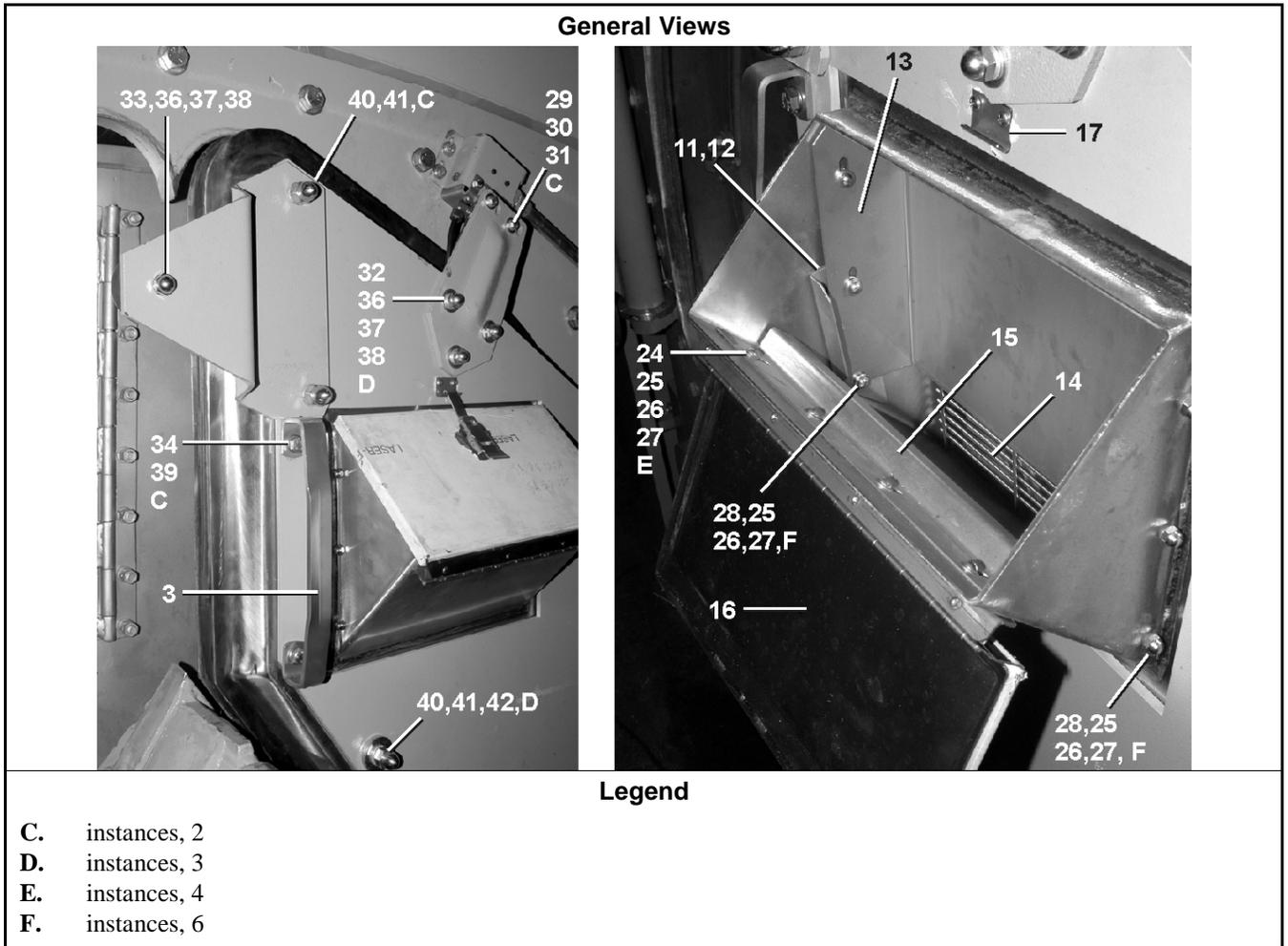


Figure 7: Components of Kit, Door seal

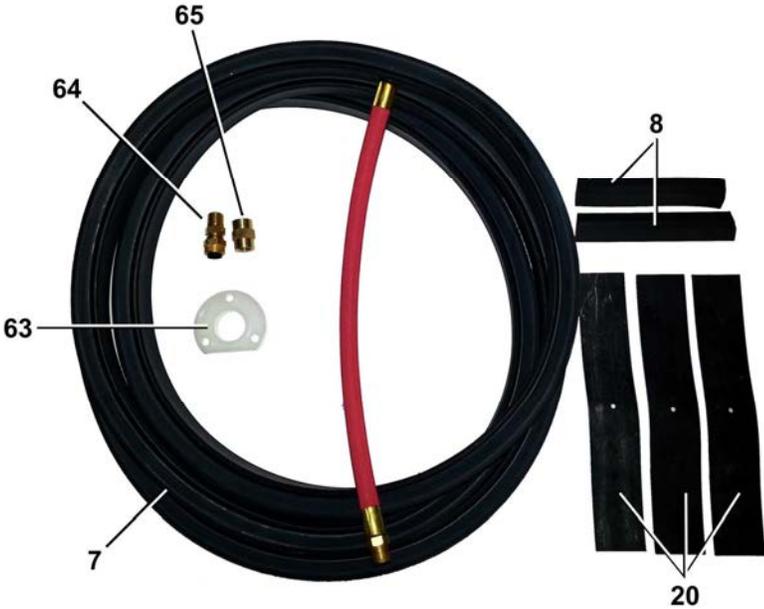


Table 1: Parts List—

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	SA 28 122	*SHELL DOOR ASY 60WE2 RIGHT	60044WP2, WR2 Right Door
	B	SA 28 119	*SHELL DOOR ASY 60WE2 LEFT	60044WP2, WR2 Left Door
	C	SA 36 010	*SHELL DOOR ASY 72WE2 RIGHT	72044WP2, WR2 Right Door
	D	SA 36 011	*SHELL DOOR ASY 72WE2 LEFT	72044WP2, WR2 Left Door
	E	K28 0005R	KIT INFLATABLE DOOR SEAL 6044	60044WP2, WR2
	F	K36 0003R	KIT INFLATABLE DOOR SEAL 7244	72044WR2, WP2
Components				
A	1	W2 18960	* SHELL DOOR-60"WED-RIGHT	
B	1	W2 18959	* SHELL DOOR WELD-LEFT=WED	
C	1	W3 06061	* SHELLDOOR WELDMNT-RITE=WED	
D	1	W3 06060	* SHELLDOOR WELDMNT-LEFT=WED	
A	2	W2 18874	* HINGEPLATE WELDMNT-RITE=WED	
B	2	W2 18873	* HINGEPLATE WELDMNT-LEFT=WED	
C	2	W3 06063	* HINGE PLATE WELDMNT-RIGHT	
D	2	W3 06062	* HINGE PLATE WELDMNT-LEFT	
all	3	02 175037	HANDLE=SHELDOR=WED-SS	
all	4	02 175131	PLATE-LATCH MOUNT RT 60+72WE	
all	5	SA 10 020	* DOORLATCH ASSY-SMALL	
all	6	02 18888	DOORFILLER RUBBER 75FT/COIL*	
ABE	7	02 18889B	60"DORSEAL,G-28-6X100"	
CDF	7	03 06050B	72"DORSEAL,G-28-6X124+1/2"	
all	8	02 175134	PATCH=SHELL DOOR GASKET	
all	9	60C075	TRUCK BUMPER 2+1/2ODW3/8HO.613	
AB	10	02 18961	PLATE=DOOR OPENING 60WED	
CD	10	03 06068	PLATE=DOOR OPENING 1/72WED	
all	11	02 18916H	LF SIDE SPLAS DEF=7244 WE2	
all	12	02 18916J	RT SIDE SPLAS DEF=7244 WE2	
all	13	02 18916L	UPPER SPLASH DEF=7244 WE2	
all	14	02 19308	GUARD=60+72WE SOAP CHUTE	
all	15	02 18916K	LOWER SPLASH DEF=7244 WE2	
all	16	SA 28 125A	*LID ASSY=SOAP CHUTE-GASKETED	
all	17	02 18640	HOOK=SOAPCHUTE LATCH	
AB	18	02 18878	PIN-HINGE=SHELL DOOR 60WED	
CD	18	03 06067	PIN=DOOR HINGE 72WED	
all	19	54JH13562B	HINGE COL SPLIT 3.56 FL TOP	
all	20	02 175267	RUBBER STRIP=CORNERS+DR STEM	
all	21	20C017	FUEL RESCOAT 3M#EC776 QUART	
all	22	54A716	FLGBRG 1"ID SEAL SCHATZ#TW-25	
all	23	15P010	TRDCUT PHILPANHDSCR 10-24X1/2S	
all	24	15N130	RDMACSCR 10-24UNC2A X 1/2 SS18	
all	25	15U135	FLATWASH#10 .4370DX.203IDX.04T	

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	26	24G018N	ROLLED WASH.194ID NYLTITE 10W	
all	27	15G121	HXCAPNUT 10-24UNC2 #3266BR NKL	
all	28	15N141	RDMACSCR 10-24NCX3/4 SLOTTED S	
all	29	15K039	HXCAPSCR 1/4-20UNC2AX3/4 GR5 Z	
all	30	15U185	FLATWASHER(USS STD) 1/4" ZNC P	
all	31	15U180	LOCKWASHER MEDIUM 1/4 ZINCPL	
all	32	15K097	PLOWSCR-#3 3/8-16NCX1 BLK GR5	
all	33	15K095	HXCPSCR 3/8-16UNC2AX1 GR5 ZINC	
all	34	15K084S	HXCAPSCR 3/8-16NCX5/8 SS18-8	
all	35	15P100	#8 X 3/8 PHILPANHD TYPE B SMS	
all	36	15U240	FLATWASHER(USS STD) 3/8" ZNC P	
all	37	15U255	LOCKWASHER MEDIUM 3/8 ZINCPL	
all	38	15G200	HXCPNUT 3/8-16 UNC2A 5/8X1/2	
all	39	15U260	LOCKWASHER MEDIUM 3/8 SS18-8	
all	40	15G228	HXCPNUT 1/2-13 UNC GR-2	
all	41	15U300	LOKWASHER REGULAR 1/2 ZINC PLT	
all	42	15U490	FLTWASH 1+1/2X17/32X1/4 ZINC	
all	43	20C018B	3M INDUS ADH 5OZ #4799	
all	44	02 18956	COVRPLAT=WED SHELDOR AIRLINE	
all	45	15Q140	SOKSETSCR CUP 3/8-16X1/2 BLK	
all	50	53A059A	NUT 1/4"BR.HOLYOKE AND #61A-4	
all	51	53A500	SLEEVE DELRIN 1/4"OD#60PT-4	
all	52	53A501	TUBE INSERT .163"OD #63PT-4-40	
all	53	53A031B	BODY-EL90MALE.25X1/8 #269C-42B	
all	54	15U243	FLTWASHER 7/8ODX33/64IDX16GA Z	
all	55	5SL0EBEA	NPTELB 90DEG 1/4 BRASS 125#	
all	56	53A008B	BODYMALECON.25X.25COMP#B68A-4B	
all	57	53A005F	BODYFEMCON.25X1/8COMP#B66A-4A	
all	58	12P1AGSB	SNAPBUSH 3/8"MH X 1/4" T=1/8	
all	59	60E004TE	1/4"OD X.170"ID NYL(BLK)TUBING	
all	60	09RM02212S	CAPSW 12' 180DEG ROLLER SILVER	
all	61	02 19139	BRKT=60/72WE3 2ND DR SW RT	
all	61	02 19139B	BRKT=60/72WE3 2ND DR SW LF	
all	62	02 19139A	COV=60/72WE3 2ND DR SW	
EF	63	02 18954	BUSHING LIBTXT	
EF	64	53A047H	MALECON 5/16X1/8POLY PH#68P-5-2	
EF	65	5SCC0CBE	NPT COUP 1/8 BRASS 125# 103A-A	

— End of BIHDBM03 —

Door Latch

Figure 1: Door Latch

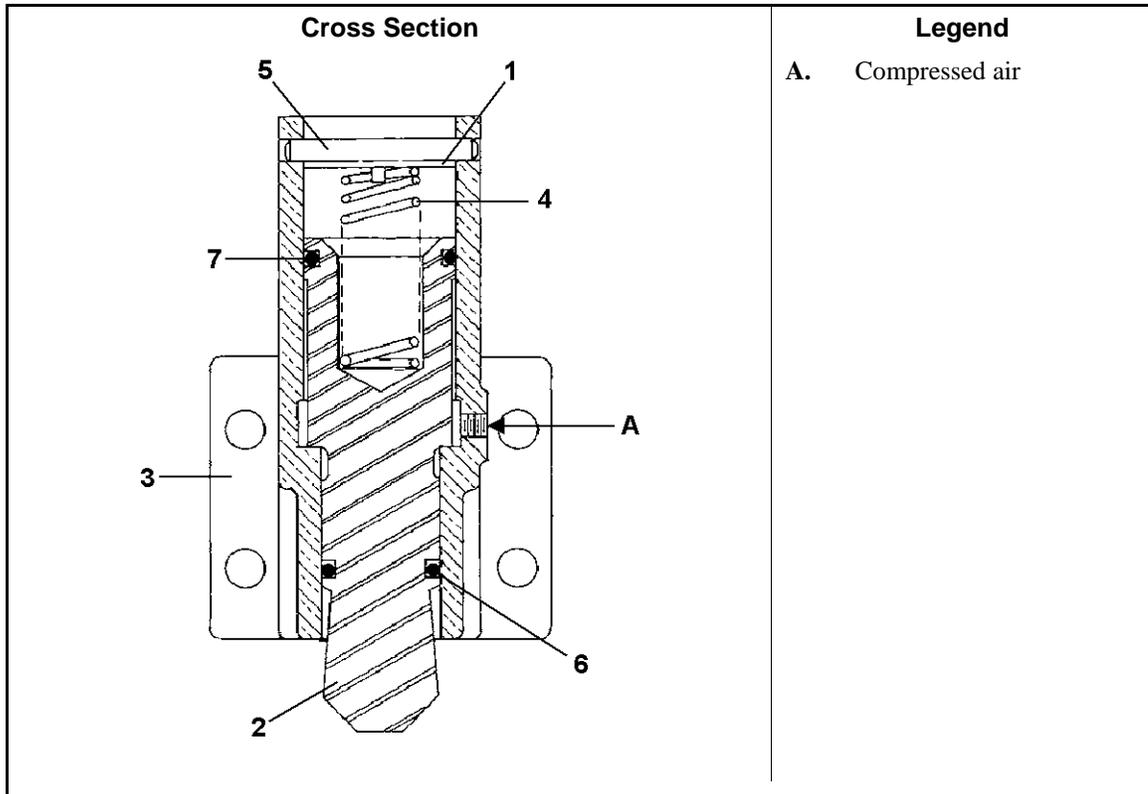


Table 1: Parts List—Door Latch

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
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	

— End of BIIFGM19 —

Cylinder Assembly and Cylinder Door Installation

Figure 1: Cylinder Assembly and Cylinder Door Installation 60044WR2, 72044WR2

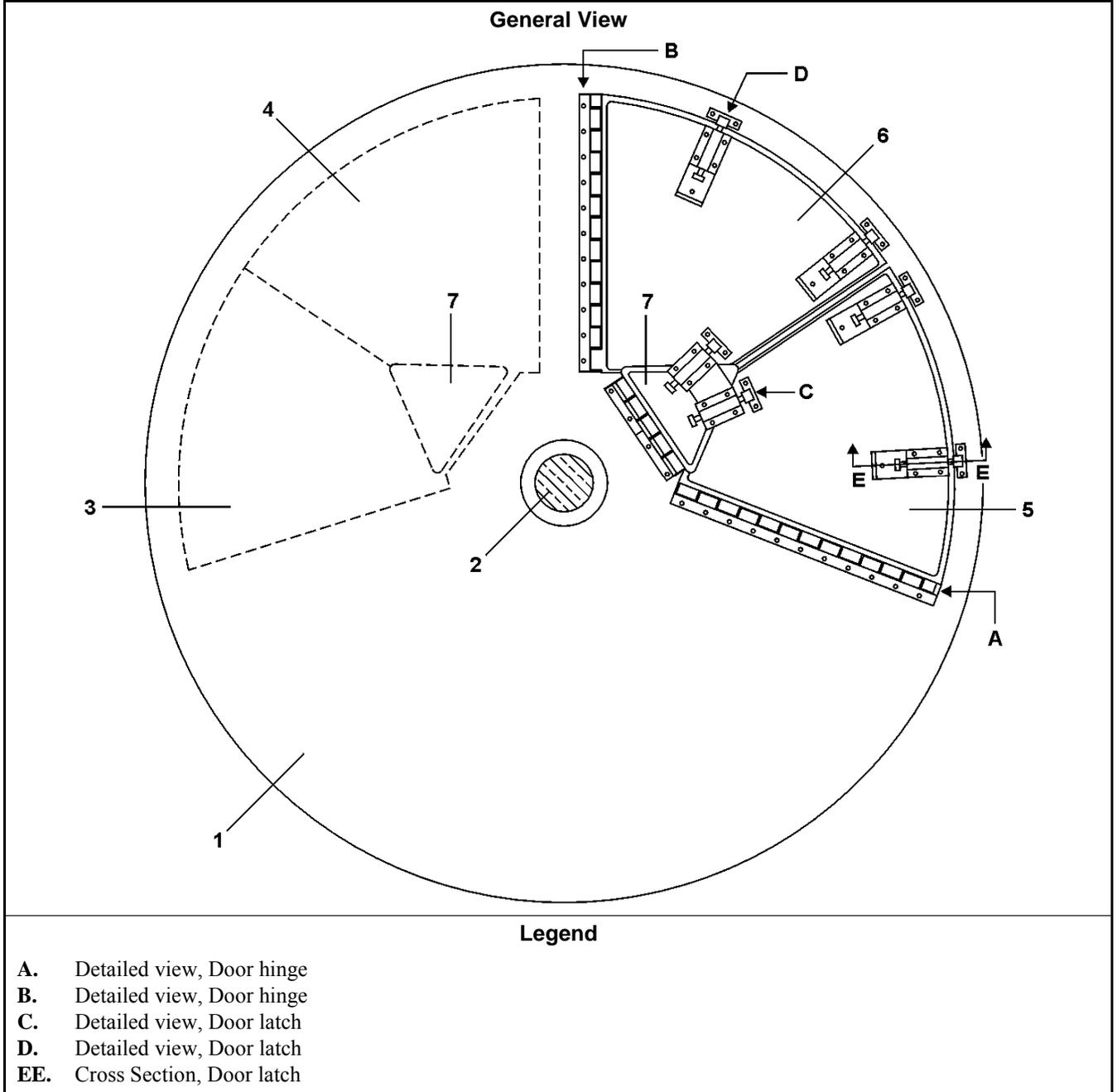


Figure 2: Installed view- Hinge, Lower door

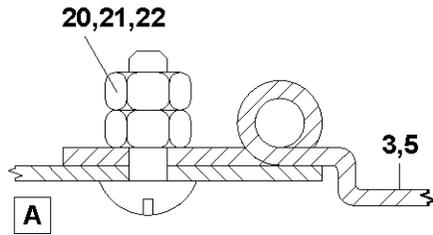


Figure 3: Installed view- Hinge, Upper door

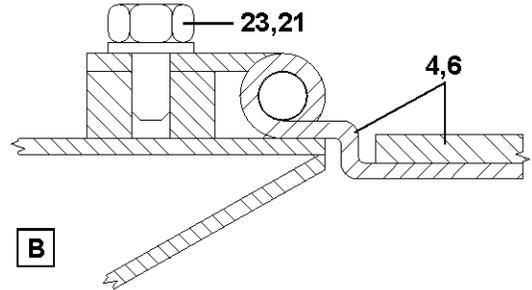


Figure 4: Installed view- Door latch (Small door)

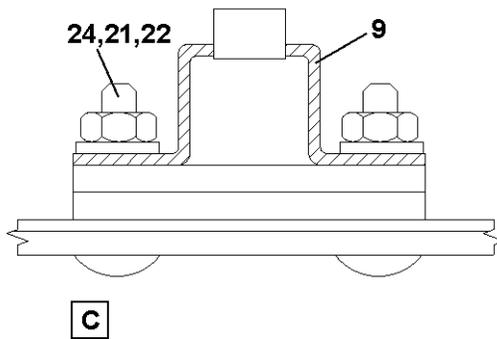


Figure 5: Installed view- Door latch (Upper door, Lower door)

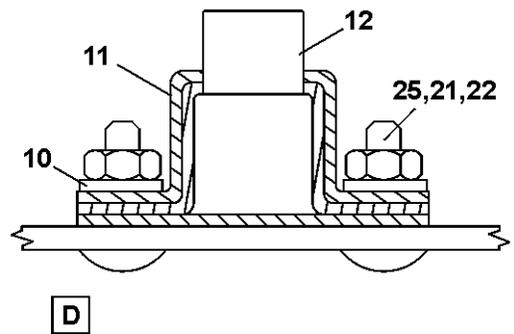


Figure 6: Cross Section- Door Latch

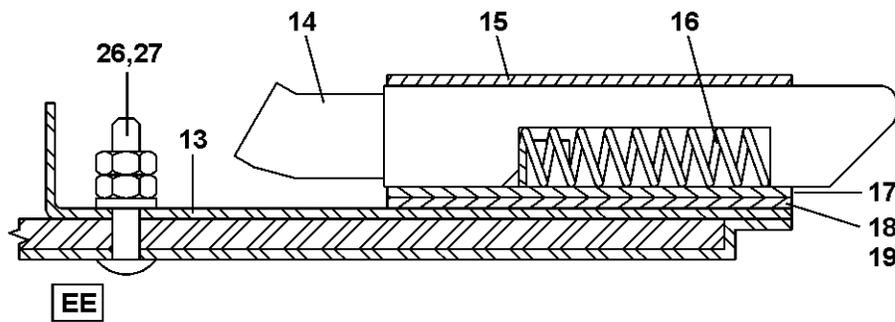


Table 1: Parts List—

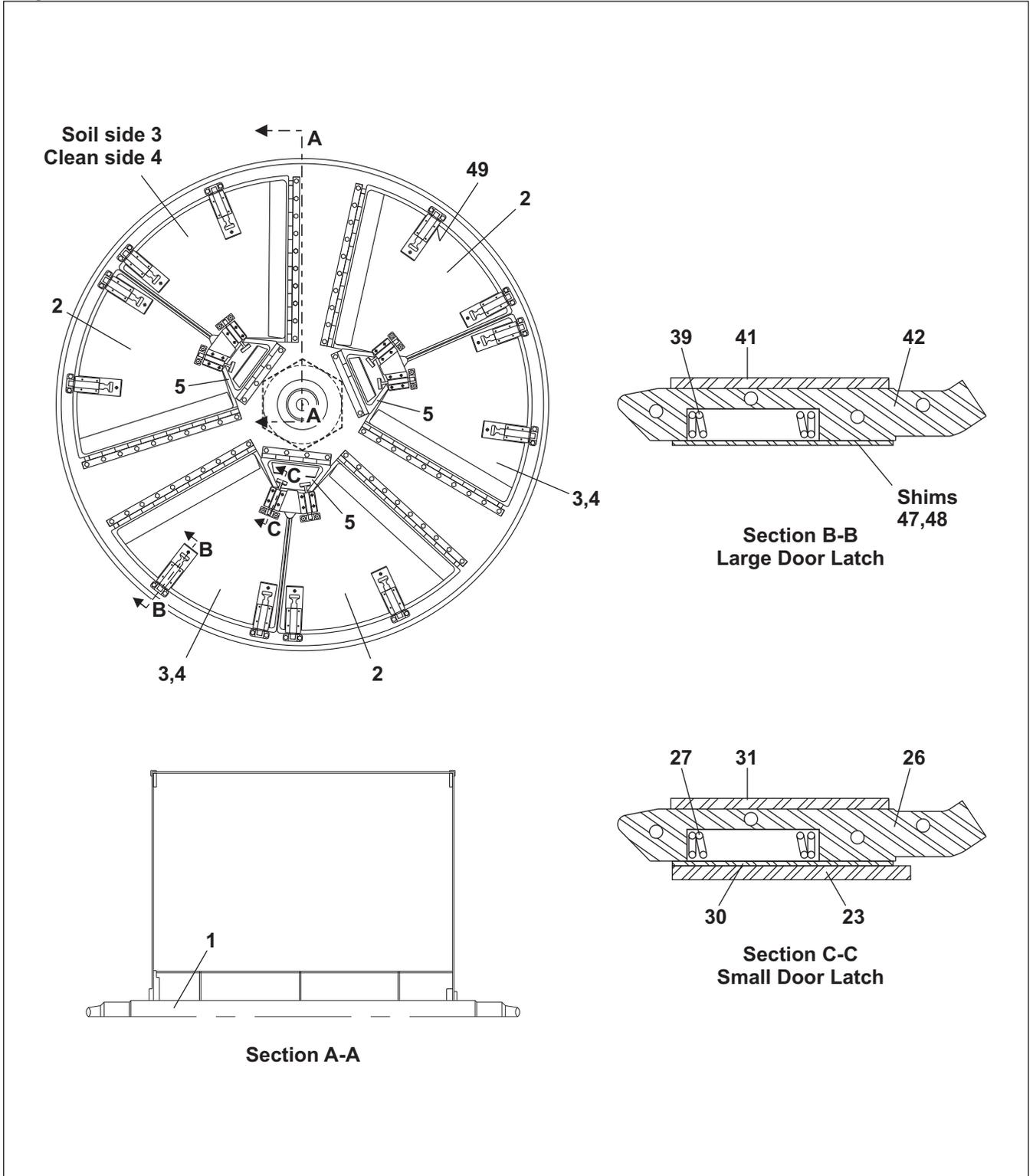
Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	Item	Part Number	Description/Nomenclature	Comments
Assemblies				
	A	ABS29010A	Installation Group, Cylinder and Bearing Installation	6044WR2
	B	ABS36010A	Installation Group, Cylinder and Bearing Installation	7244WR2
Components				
A	1	ACA19WE2A	Cylinder	
B	1	ACA36WE2A	Cylinder	
A	2	Y2 19216	Shaft	
B	2	Y3 06368	Shaft	
A	3	SA 28 110	Assembly, Lower door, Left hand	
B	3	SA 36 003	Assembly, Lower door, Left hand	
A	4	SA 28 111	Assembly, Upper door, Left hand	
B	4	SA 36 004	Assembly, Upper door, Left hand	
A	5	SA 28 112	Assembly, Lower door, Right hand	
B	5	SA 36 001	Assembly, Lower door, Right hand	
A	6	SA 28 113	Assembly, Upper door, Right hand	
B	6	SA 36 002	Assembly, Upper door, Right hand	
all	7	SA 28 114	Assembly, Small door	
all	9	X2 15201	Striker	
all	10	03 06174	Striker	
all	11	03 06167	Cover	
all	12	X3 06166	Striker	
all	13	02 18869	Spacer	
all	14	X3 06150	Latch	
all	15	03 06151	Piece part	
all	16	03 06156	Spring	
all	17	X3 06152	Plate	
all	18	03 06172	Shim, 18GA	
all	19	03 06173A	Shim, 11GA	
all	20	15A010	Bolt, 3/8-16X1	
all	21	15U260	Washer, Lock, 3/8	
all	22	15G206	Nut, 3/8-16	
all	23	15K084S	Bolt, 3/8-16X5/8	
all	24	15K106E	Bolt, 3/8-16X1+1/2	
all	24	15A015	Bolt, 3/8-16X1+1/4	
all	26	15K042K	Bolt, 1/4-20X1+1/4	
all	27	15G170	Nut, 1/4-20	

— End of BIHDBM06 —

Cylinder Doors 3 Pocket

7244WR3, 7244SR3

Figure 1: Section Views



Cylinder Doors 3 Pocket

7244WR3, 7244SR3

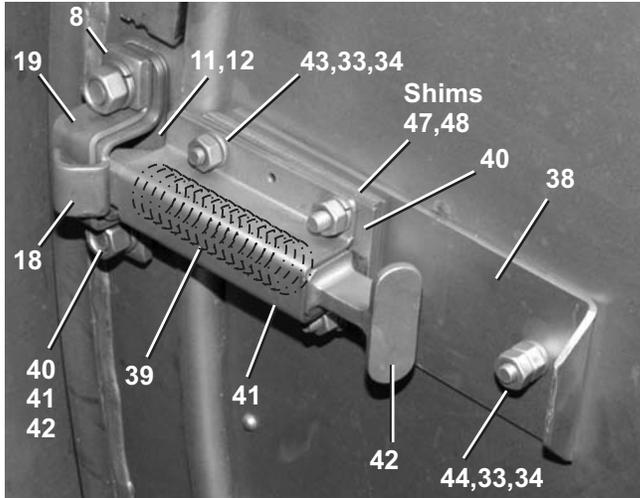
Figure 2: Cylinder Doors



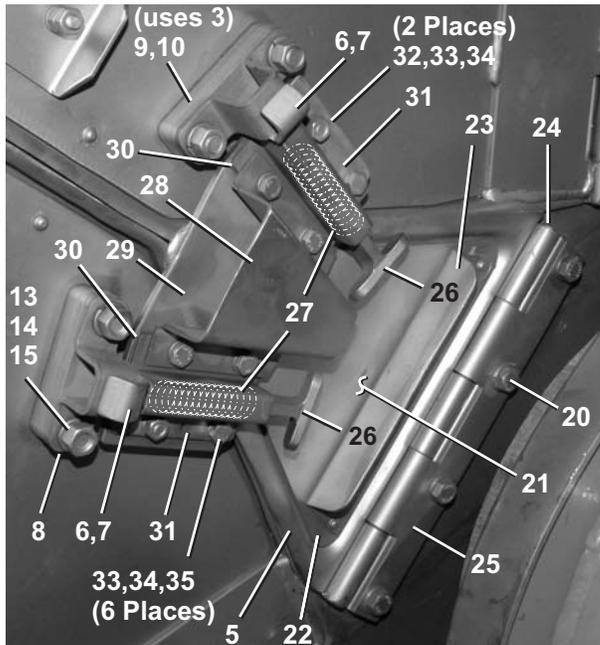
Cylinder Doors 3 Pocket

7244WR3, 7244SR3

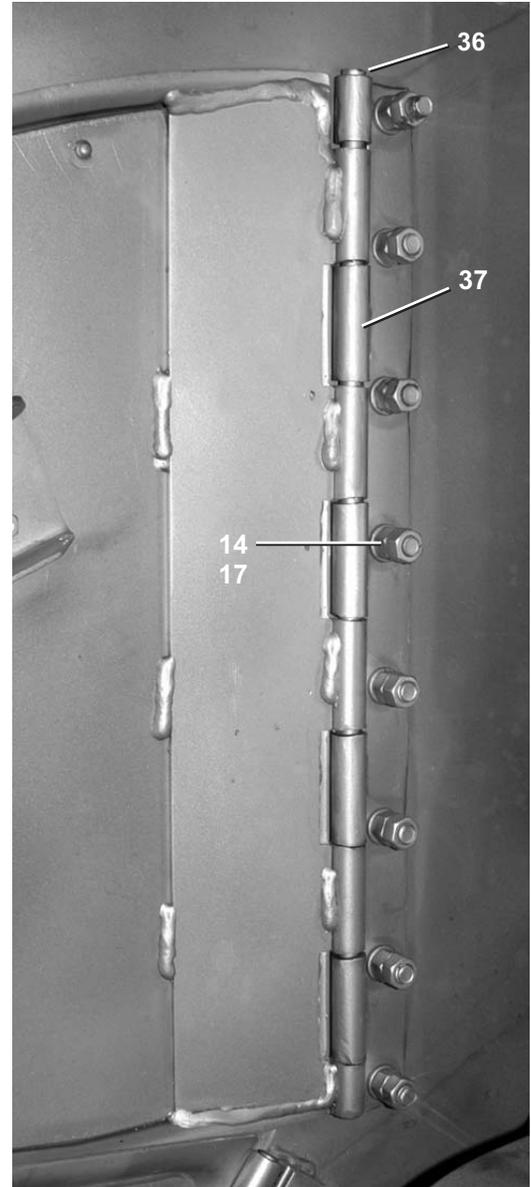
Figure 3: Additional Views



Large Door Latch



Small Doors



Large Door Hinge

Cylinder Doors 3 Pocket

7244WR3, 7244SR3

Parts List—Cylinder Door 3 Pocket				
Find the correct assembly first, then find the needed components. The item letters (A, B, C, etc.) assigned to assemblies are referred to in the "Used In" column to identify which components belong to an assembly. The item numbers (1, 2, 3, etc.) assigned to components relate the parts list to the illustration.				
Used In	Item	Part Number	Description	Comments
-----ASSEMBLIES-----				
	A	ACA36SG3A	* CYL ASSY=7244SG3 WELD/SHAFT	
-----COMPONENTS-----				
all	1	Y3 06162	MAINSHAFT 7244SG2+3	
all	2	SA 36 003	CYLDOOR LOLT 72WE2+ MAX-REIF	
all	3	SA 36 001	CYLDOOR LORT 72WE2+ MAX-REIF	
all	4	SA 36 004	CYLDOOR UPLT 72WE2+ MAX-REIF	
all	5	SA 28 116	* CYLDOR ASY,SMALL =60+72SG2	
all	6	X2 15201	KEEPER=CYLDOOR LATCH(MONEL)	
all	7	02 19183	COVER-DOORLATCH KEEP-OURMATL	
all	8	03 06174	KEEPER=DOORLATCH REINFORCE	
all	9	02 18962	STOP=CYLDOOR=42WEHU	
all	10	02 18977A	SHIM=CYL DRLATCH KEEPER-11GA	
all	11	02 18977B	SHIM=CYL DRLATCH KEEPER-14GA	
all	12	02 18977C	SHIM=CYL DRLATCH KEEPER-18GA	
all	13	15K106E	BUTSOKCAPSCR 3/8-16NCX1+1/2 SS	
all	14	15U260	LOCKWASHER MEDIUM 3/8 SS18-8	
all	15	15G206	HEXNUT 3/8-16 UNC2 SS 18-8	
all	16	15A015	CARRSCR 3/8-16X1+1/4 18-8 SS	
all	17	15K086	HXCAPSCR 3/8-16NCX3/4 SS18-8	
all	18	X3 06166	KEEPER=CYL DOOR LATCH(MONEL)	
all	19	03 06167	COVER-LARGE CYLDOOR KEEPER	
all	20	15K084S	HXCAPSCR 3/8-16NCX5/8 SS18-8	
all	21	02 18818	CYL DOOR SM 60+72 WEDU	
all	22	02 18854	PLATE=SM CYLDOOR REINFORCING	
all	23	02 18991	PULL=DOORLATCH 2/WED+4/SGD	
all	24	02 18865	PIN=SM CYL DOOR HINGE	
all	25	W2 18858	WLMT=HINGE SM CYL DR 2/60WED	
all	26	02 15040	PLUNGER=CYLDOOR LATCH(CAST)	
all	27	02 15093	SPRING=DOOR LATCH 9.4#/INCH	
all	28	02 18990	PLATE=STOP + COVER 2/60+72WD	
all	29	02 18989	PLATE-LATCH MTG2/WED+2/SGD	
all	30	02 15077	PLATE = SMALL DOORLATCH	
all	31	02 15041	BODY=CYLDOOR LATCH	
all	32	15N158	HEXCAPSCR 1/4-20NCX1/2SS18-8	

Cylinder Doors 3 Pocket

7244WR3, 7244SR3

Parts List—Cylinder Door 3 Pocket

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

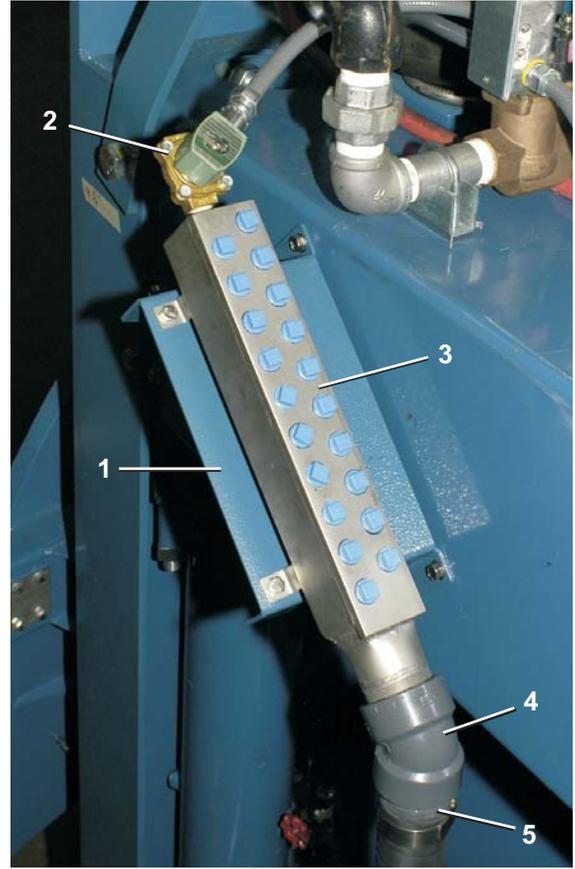
Used In	Item	Part Number	Description	Comments
all	33	15U181	LOCKWASHER MEDIUM 1/4 SS18-8	
all	34	15G170	HEXNUT 1/4-20UNC2 SS18-8	
all	35	15N173	FLATMACSCR 1/4-20NCX5/8SS18-8	
all	36	03 06035	PIN=CYL DOOR HINGE 72WED	
all	37	W3 06031	WLMT=HINGE HALF 72WED CYL DR	
all	38	02 18869	SPACER-LATCH PULL BND@PRNT	
all	39	03 06156	SPRING=LARGE CYLDOOR LATCH	
all	40	X3 06152	PLATE = LARGE DOORLATCH	
all	41	03 06151	LATCHBODY-LARGE=CYLDOOR	
all	42	X3 06150	PLUNGER=LARGE CYLDOOR(CAST)	
all	43	15K042K	BUTSOKCAPSCR 1/4-20UNCX1+1/4 S	
all	44	15K042	BUTSOKCAPSCR 1/4-20NCX1 SS18-8	
all	47	03 06173A	SHIM=DOOR LATCH-11GA	
all	48	03 06172	SHIM=DOOR LATCH-18GA	
all	49	03 06317	STOP=CYLINDER DOOR LATCH	

Chemical Supply Devices

7

Peristaltic Supply Manifold

72044WR2, 72044SR2



Parts List—Peristaltic Supply Manifold

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

Used In	Item	Part Number	Description	Comments
-----ASSEMBLIES-----				
	A	GWL52005C	INST=PERIS CONN 72SP/WP	72044WR2,72044SR2
-----COMPONENTS-----				
all	1	03 25267E	PERISTALTIC MOUNTING BRACKET	
all	2	96TDC2AA37	1/2"N/C2WY120V50/60C VLV(DRYVC)	
all	3	W8 01254	*ASSY=PERIST CONNECT 20 HOLES	
all	4	5SL2AP8K	NPT EL45DEG 2"PVC SH80 FPTXFPT	
all	5	5SCC2AP8	NPT COUP 2" PVC SK80	
all	6	60E255A70A	HOSE=2"ID X 70"LG(NO DWG)	
all	7	27A072	T-BOLT HOSECLAMP2.16-2.47CADSC	

Five Compartment Supply

72044SP2, 72044SR2, 7244WP2, 7244WR2

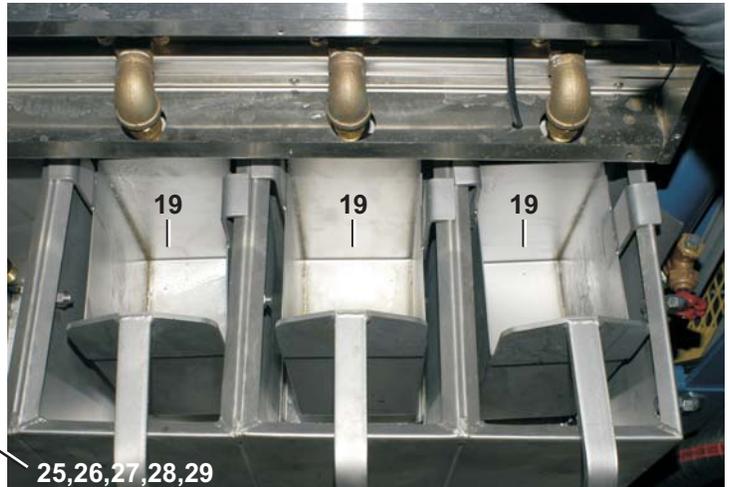
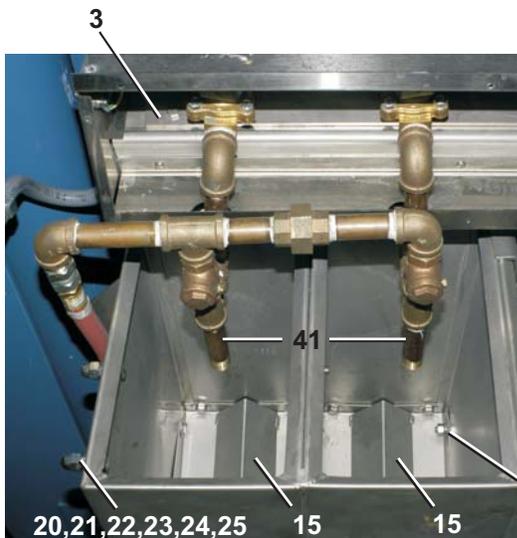
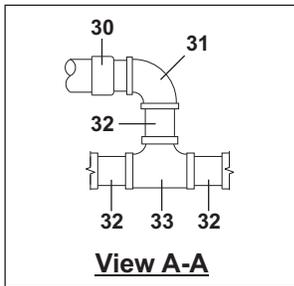
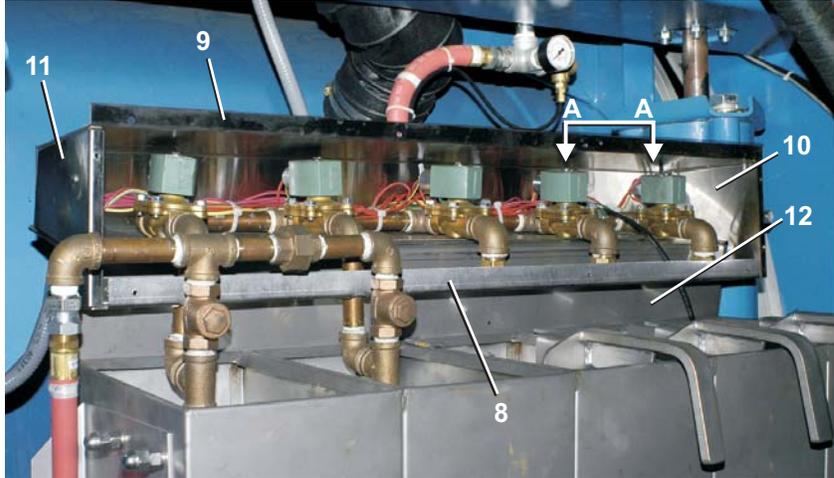
Figure 1: Installed view



Five Compartment Supply

72044SP2, 72044SR2, 7244WP2, 7244WR2

Figure 2: Supply box components



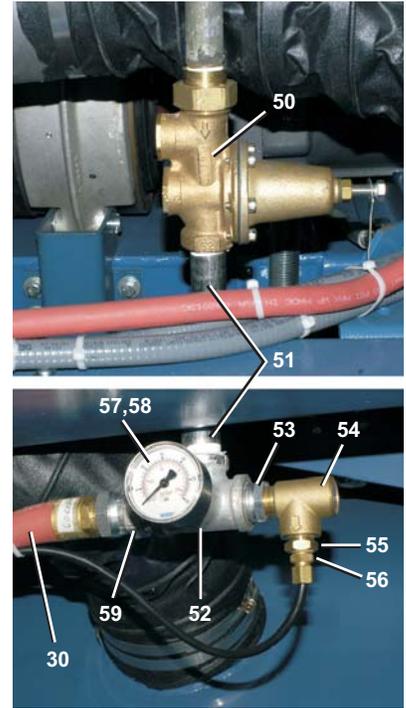
Five Compartment Supply

72044SP2, 72044SR2, 7244WP2, 7244WR2

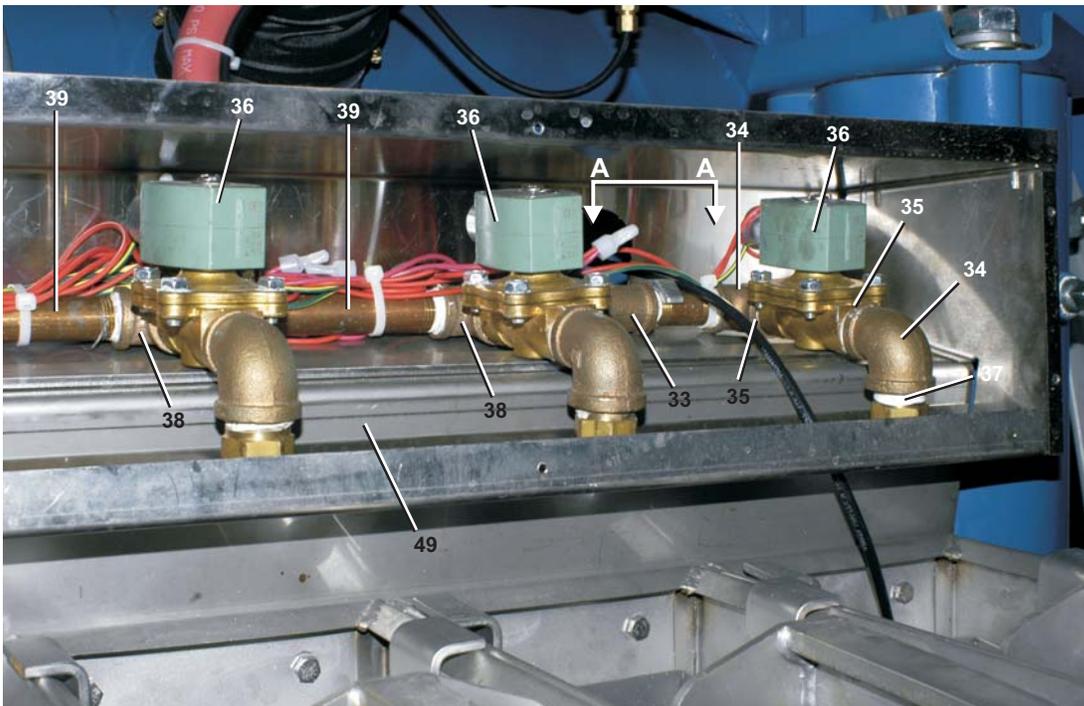
Figure 3: Water inlet and manifold piping



Supply Manifold



Water Inlet



Supply Manifold

Five Compartment Supply

72044SP2, 72044SR2, 7244WP2, 7244WR2

Parts List—Five Compartment Supply

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

Used In	Item	Part Number	Description	Comments
-----ASSEMBLIES-----				
	A	AD 36 032A	* SUPPLY INJECTOR ASSY	7244SP2, SR2
	B	AD 36 031A	7244WP2/3 ADD FLUSH SUPPLY IN	7244WP2, WR2
	C	SA 36 037	*INLET-WATER SUP INJ 72WEV	ALL
	D	A36 04900D	ASSY=5FLUSH SUP-7244SG	7244SP2, SR2
	E	A36 04900B	ASSY,5FLUSH SUPINJ=72DIVCYL	7244WP2, Wr2
	F	SA 36 017A	PIPING ASSY-7244SUPINJ	ALL
-----COMPONENTS-----				
all	1	09R012STDG	* 09R012 +MOUNTING HDWRE+INST	
all	2	02 15096	BRACKET=DRINTLOKSW-CAD	
all	3	03 06263	SUPPLY INJ PIPE MNT	
A	4	60E301A19A	HOSE= *2.5"ID PE X19"	
B	4	60E301A24A	HOSE= 2.5" ID PE X 24"	
A	5	W2 15831A	*TRAP-WELDED=SUPINJ INLET SG	
B	5	W3 06292	ELBOW=SUPPONJ INLET=7244	
A	6	60E301A27A	HOSE= *2.5"ID PE X27"	
B	6	603301A33A	HOSE= 2.5"ID PE X 33"	
all	7	27A075	T-BOLT HOSECLAMP 2.78-3.09"	
all	8	03 06382	COVER=SUPPLY VALVE FRONT SG2	
all	9	03 06360	COVER=SUPPLY VALVE TOP	
all	10	03 06286A	END=SUPPLY VALVE COVER	
all	11	03 06286B	END=SUPPLY VALVE COVER-FRONT	
all	12	03 06253	SUPPORT=SUPPLY INJ PIPING	
D	13	03 06323A	SUPPLY MNT FRONT=7244SG	
E	13	03 06323	MTANGLE, FRONT=FLUSHSUP 72WEU	
DI	14	03 06324A	SUPPLY MNT REAR=7244 SG	
E	14	03 06324	MTG=SUP INJ REAR WES BND@PRT	
all	15	03 06373	BAFFLE=SUPPLY TANK	
all	16	02 15773	PINCHVALVE TUBE-HYPALON	
all	17	27A074	HOSECLAMP 2+1/16-3"CADSC#62040	
all	18	W3 06254	*MANIFOLD=72"SUP.INJ.W/OBRACK	
all	19	W3 06325	* BUCKET=SUPPLY TANK=72WEDU	
all	20	15K096	HEXCAPSCR 3/8-16UNC2X1SS18-8	
all	21	24G030N	ROLLED WASH.379ID NYLTITE 37W	
all	22	15G206	HEXNUT 3/8-16 UNC2 SS 18-8	
all	23	15U260	LOCKWASHER MEDIUM 3/8 SS18-8	
all	24	15U245	FLTWASH 3/8 STD COMM 18-8 SS	
all	25	20C040	SUPERFLEX SILICONE ADH 85GR	

Five Compartment Supply

72044SP2, 72044SR2, 7244WP2, 7244WR2

Parts List—Five Compartment Supply

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

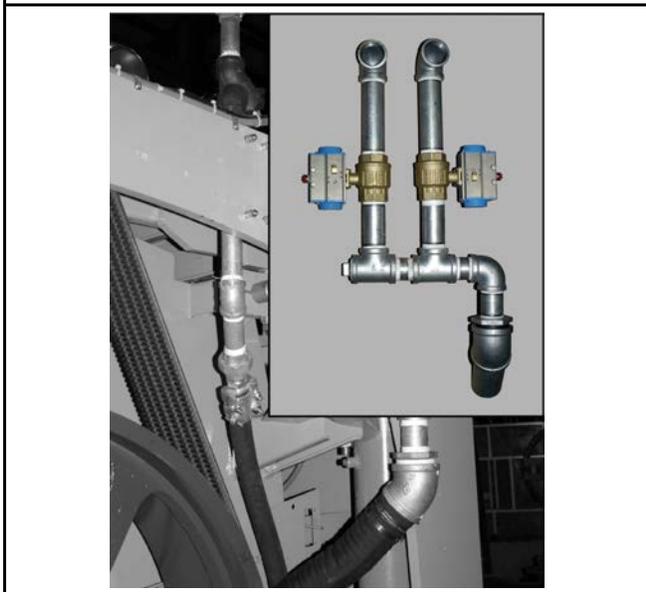
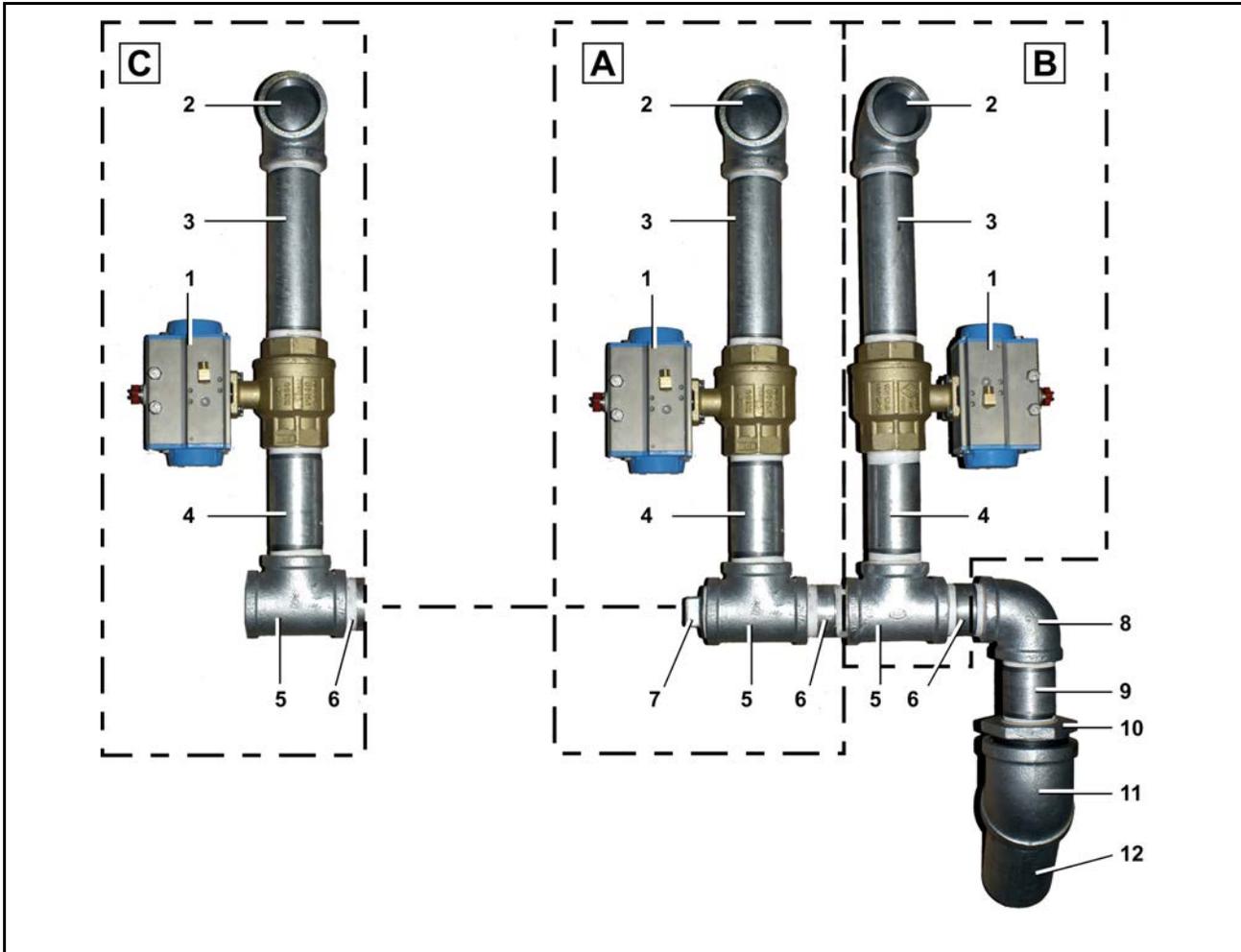
Used In	Item	Part Number	Description	Comments
all	26	15N174	HXCAPSCR 1/4-20UNC X5/8SS18-8	
all	27	24G020N	ROLLED WASH.252ID NYLTITE 25W	
all	28	15U181	LOCKWASHER MEDIUM 1/4 SS18-8	
all	29	15G170	HEXNUT 1/4-20UNC2 SS18-8	
all	30	60E086C16K	* HOSE ASSY=3/4"X 16+1/2"LG	
all	31	5SLOPBEA	NPTTEL 90DEG 3/4 BRASS 125#	
all	32	5N0P02AB42	NPT NIPPLE 3/4X2 TBE BRASS STD	
all	33	5S0PBEA	NPT TEE 3/4" BRASS 125#	
all	34	5SLOPBEA0K	NPTTEL 90DEG 3/4X1/2 BRASS150#	
all	35	5N0KCLSBE2	NPT NIP 1/2XCLS TBE BRASS STD	
all	36	96TDC2AA37	1/2"N/C2WY120V50/60C VLV(DRYVC)	
all	37	27A004	NOZZLE SPRACO	
all	38	5S0PBEA0K	NPT TEE 3/4X3/4X1/2 BRASS 125#	
all	39	5N0P05KBE2	NPT NIP 3/4X5.5 TBE BRASS STD	
all	40	5SLOKBEA	NPTTEL 90DEG 1/2 BRASS 125#	
all	41	5N0K04ABE2	NPT NIP 1/2X4 TBE BRASS STD	
all	42	5S0KBEA	NPT TEE 1/2" BRASS 125#	
all	43	96D047	1/2" SWING CHECK VALVE=SMITH COOPER	
all	44	5N0P06ABE2	NPT NIP 3/4X6 TBE BRASS STD	
all	45	5N0K02KB42	NPT NIP 1/2X2.5 TBE BRASS STD	
all	46	5SU0KBE	NPT UNION 1/2" BRASS 125#	
all	47	51X017	UNIONSTRADT 1/2"#1404-8-8	
all	48	60E085C26K	HOSE ASSY=1/2"X26 1/2LG+ENDS	
all	49	03 06261	BOTTOM=SUPVAL COVER BND@PRT	
all	50	96J031D	3/4"PRESSREG SET 28# FEMXUN=WATTS	
all	51	5N0P20AG42	NPT NIP 3/4X20 TBE GALSTL SK40	
all	52	5S0PNFB	NPT SIDEOUT TEE 3/4" GALMAL	
all	53	5SB0P0KNFO	NPTHEXBUSH 3/4X1/2 GALMAL 150#	
all	54	96M001	1/2X3/8" RELIEF VALVE SET31#	
all	55	5SB0G0EDEO	NPTHEXBUSH 3/8X1/4 GALCI 125#	
all	56	53A008B	BODYMALECON.25X.25COMP#B68A-4B	
all	57	5SB0P0CNFA	NPTHEXBUSH 3/4X1/8GALV150#CORD	
all	58	30N100	PRESSGAUGE 1/8"BACKCN.0-30PSI	
all	59	51X019	UNIONSTRADT 3/4"#0107-12-12	

Water and Steam Piping and Assemblies

8

Water Inlets

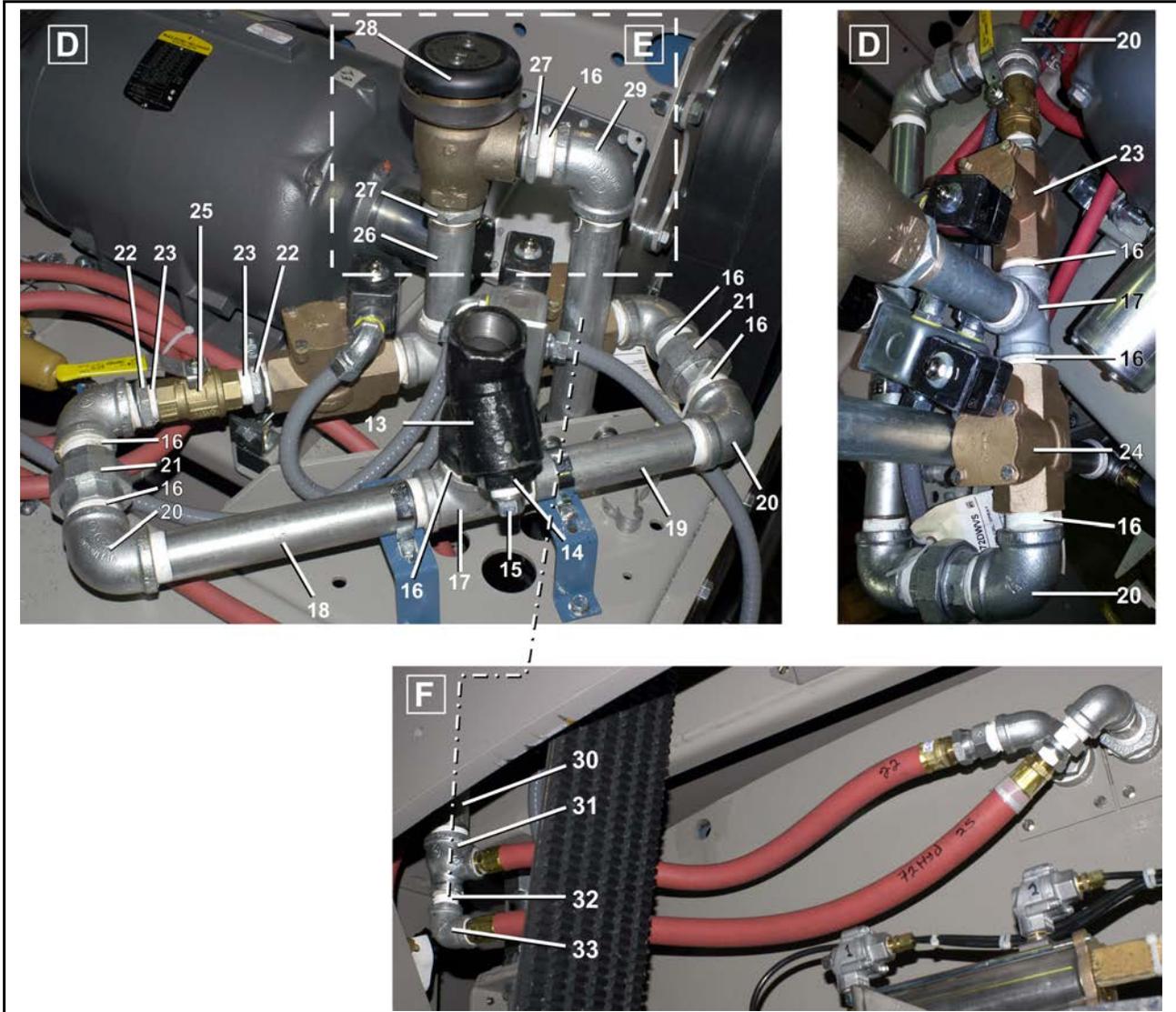
BPWD7W01.R01 0000217790 A.2 1/28/19 2:23 PM Released



Legend

- A . . . Cold Water
- B . . . Hot Water
- C . . . Third Water

Water Inlets



Legend

- D . . . Cooldown Inlet
- E . . . Cooldown with Vacuum Breaker
- F . . . Piping to Spray Down

Water Inlets



Water Inlets

4 of 4

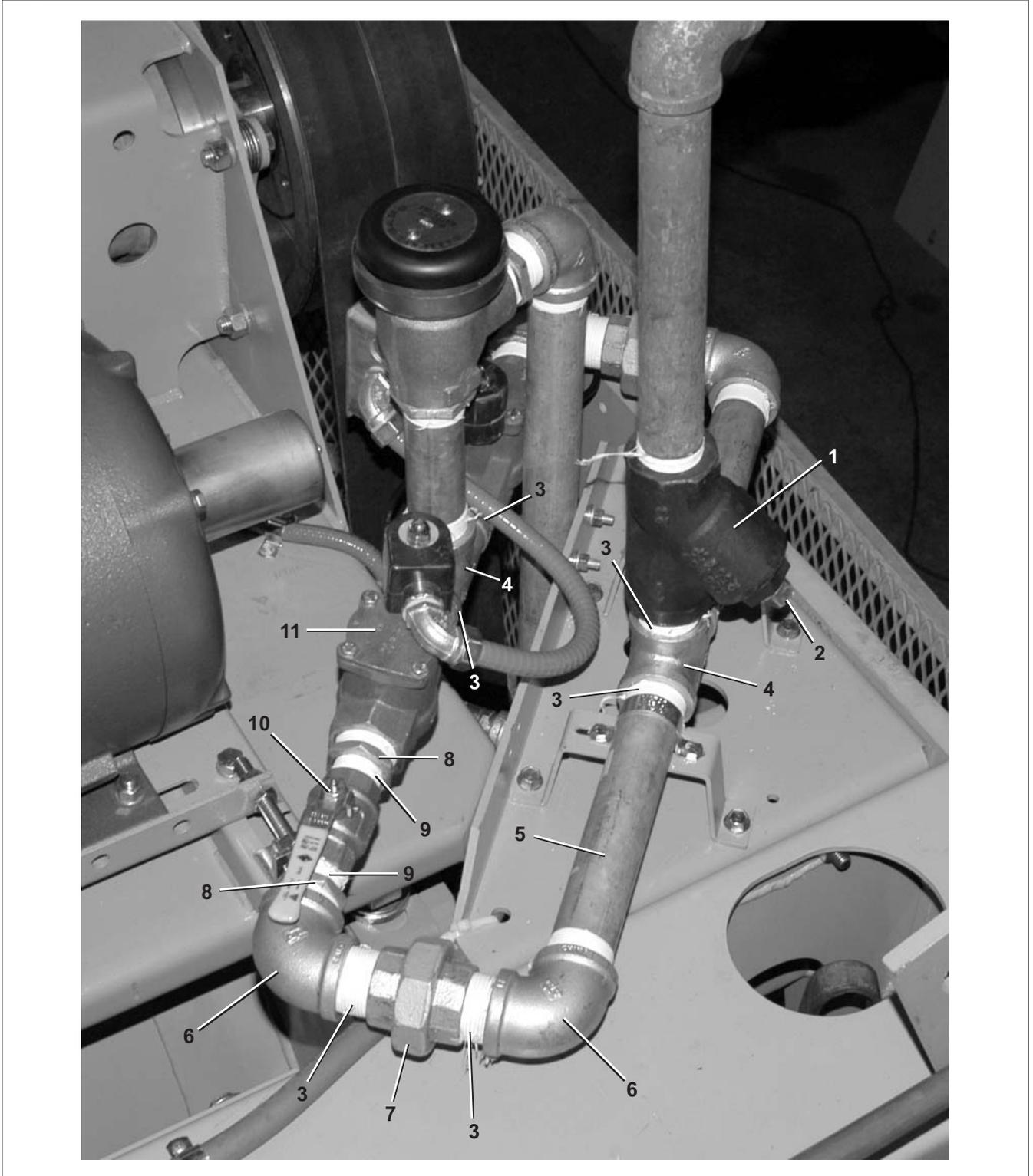
Table 1. Parts List—Water Inlets

Used In	Item	Part Number	Description/Nomenclature	Comments
Assemblies				
		AVW36023A	H2O INLT=BONOMI COLD ONLY 72WE	REFERENCE
		AVW36024A	H2O INLT=BONOMI +HOT VALVE 72WE	REFERENCE
		AVW36025A	H2O INLT=BONOMI +1 FRESH VALVE 72WE	REFERENCE
		AVW36027A	*SPRYDOWN+COOLDOWN VALV 72WP2	REFERENCE
		AVW36029	*SPRY+CLDWN=ADD VACBRKR 72WE2	REFERENCE
		AVW36028	*INLET=SPRYDWN+COOLDWN 72WE2	REFERENCE
Components				
all	1	96D088FBA	2" BALVAL+ACT BRS N/C BONOMI	
all	2	5SL2ANFA	NPT ELBOW 90DEG 2" GALMAL 150#	
all	3	5N2A09AG42	NPT NIP 2X9 TBE GALSTL SK40	
all	4	5N2A06AG42	NPT NIP 2X6 TBE GALSTL SK40	
all	5	5S2ANFA	NPT TEE 2" GALMAL 150#	
all	6	5N2A03AG42	NPT NIPPLE 2X3 TBE GALSTL SK40	
all	7	51P060	PLUG PIPE SQ 2"GALCORED CI 125	
all	9	5N2A04AG42	NPT NIP 2X4 TBE GALSTL SK40	
all	10	5SB3A2ADEO	NPTHEXBUSH 3X2 GALCI 125#	
all	11	5SL3ANFK	NPT ELBOW 45DEG 3" GLAMAL 150#	
all	12	02 10438A	PIPE-DRAIN TOE 3X7+1/4	
all	13	51T060	Y-STRAINER 1+1/4" CAST IRON	
all	14	5SB1E0PMFO	NPTHEXBUSH 1.25X3/4 BLKML 150#	
all	15	5SP0PHFSS	NPT PLUG 3/4 SQ SOLID STL/ZINC	
all	16	5N1ECLSG42	NPT NIP 1.25XCLS TBE GALSTLS40	
all	17	5S1ENFA	NPT TEE 1.25" GALMAL 150#	
all	18	5N1E10AG42	NPT NIP 1.25X10 TBE GALSTL SK4	
all	19	5N1E08AG42	NPT NIP 1.25X8 TBE GALSTL SK40	
all	20	5SL1ENFA	NPT ELB 90DEG 1.25 GALMAL 150#	
all	21	5SU1ENF	NPT UNION 1.25" GALMAL 150#	
all	22	5SB1E1ADEO	NPTHEXBUSH 1.25X1" GALCI 125#	
all	23	5N1ACLSG42	NPT NIP 1XCLS TBE GALSTL SK40	
all	24	96P151A37	1.25VAL 110V HAYS#9-2110IS-120	
all	25	96D084	BALL VALVE BRZ 1"BONOMI 171N	
all	26	5N1E06AG42	NPT NIP 1.25X6 TBE GALSTL SK40	
all	27	5SB1K1EDEO	NPTHXBUSH 1.5X1.25GALMAL 150	
all	28	SA 03 009	1.5"SIPHONBRKR+SCUPPER ASSY	
all	30	5N1E20AG42	NPT NIP 1.25X20 TBE GALSTL SK4	
all	31	5S1ENFA0P	NPTTEE 1.25X3/4X3/4 GALMAL150#	
all	32	5N0PCLSG42	NPT NIP 3/4XCLS TBE GALSTL S40	
all	33	5SL0PNFA	NPT ELB 90DEG 3/4 GALMAL 150#	
all	34	60E306A29A	HOSE= *3.5"ID PE X29"	
all	35	27A084	HOSECLAMP 3+9/16-4.5CADSC#HS64	

Spraydown - Cooldown

7244WP2,7244WR2

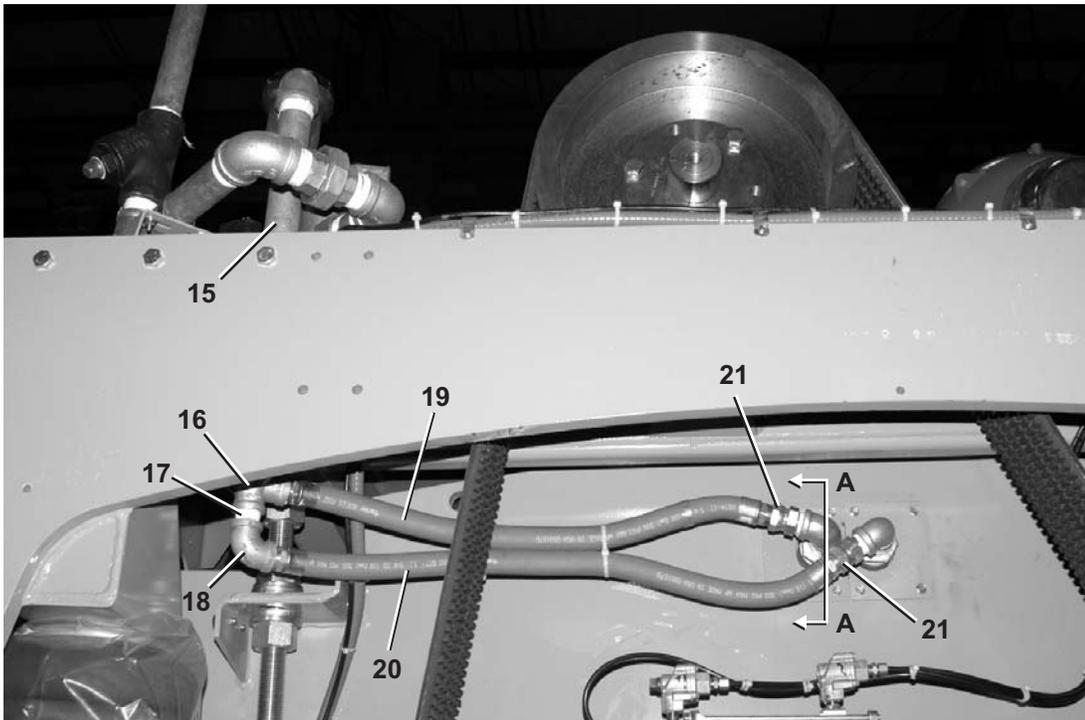
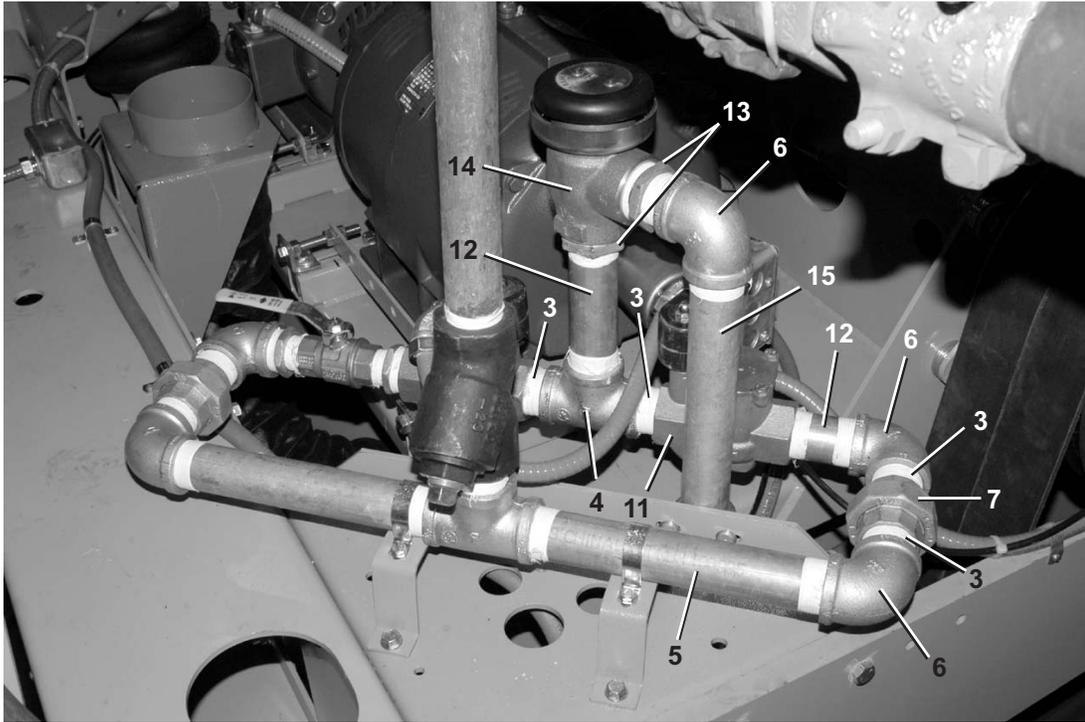
Figure 1: Cooldown Inlet



Spraydown - Cooldown

7244WP2,7244WR2

Figure 2: Spraydown



Spraydown - Cooldown

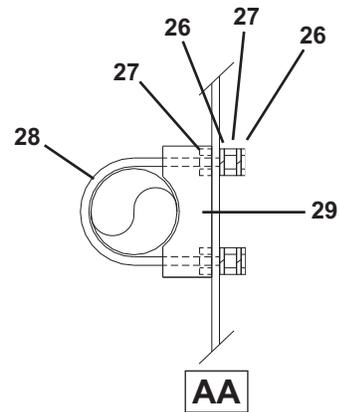
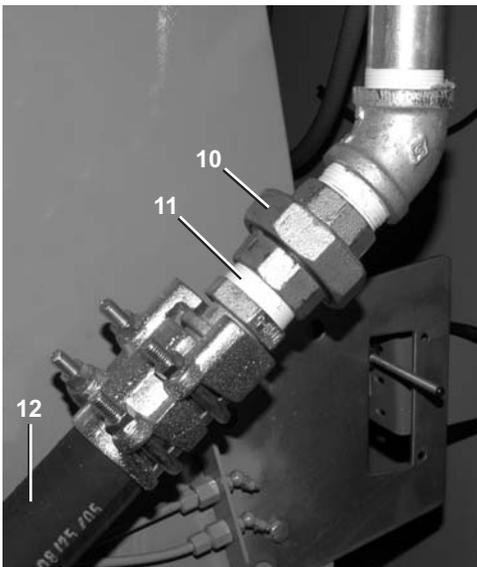
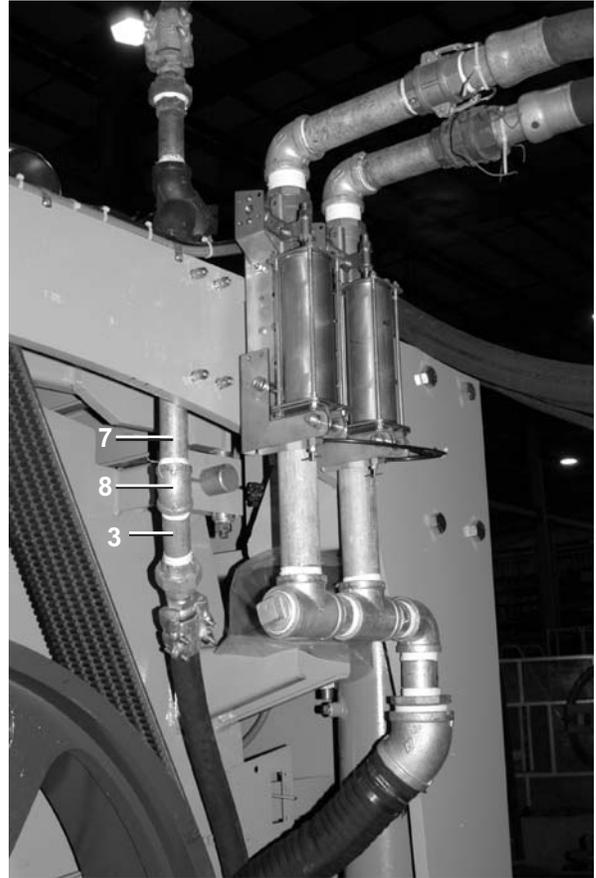
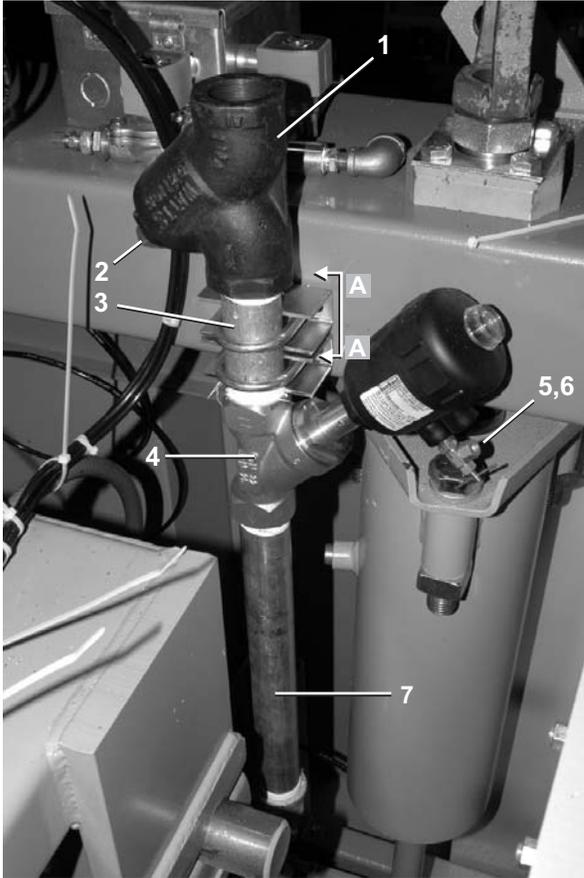
7244WP2,7244WR2

Parts List—Spraydown Cooldown				
Find the correct assembly first, then find the needed components. The item letters (A, B, C, etc.) assigned to assemblies are referred to in the "Used In" column to identify which components belong to an assembly. The item numbers (1, 2, 3, etc.) assigned to components relate the parts list to the illustration.				
Used In	Item	Part Number	Description	Comments
-----ASSEMBLIES-----				
	A	GVW36023	SPRY+CLDN=MTG HDWE NOSB72WE2	
	B	AVW36027A	*SPRYDOWN+COOLDOWN VALV 72WP2	
	C	AVW36028	*INLET=SPRYDWN+COOLDWN 72WE2	
	D	AVW36029	*SPRY+CLDWN=ADD VACBRKR 72WE2	
-----COMPONENTS-----				
all	1	51T060	Y-STRAINER 1+1/4" CAST IRON	
all	2	5SP0PHFSS	NPT PLUG 3/4 SQ SOLID STL/ZINC	
all	3	5N1ECLSG42	NPT NIP 1.25XCLS TBE GALSTLS40	
all	4	5S1ENFA	NPT TEE 1.25" GALMAL 150#	
all	5	5N1E10AG42	NPT NIP 1.25X10 TBE GALSTL SK4	
all	6	5SL1ENFA	NPT ELB 90DEG 1.25 GALMAL 150#	
all	7	5SU1ENF	NPT UNION 1.25" GALMAL 150#	
all	8	5SB1E1ADEO	NPTHEXBUSH 1.25X1" GALCI 125#	
all	9	5N1ACLSG42	NPT NIP 1XCLS TBE GALSTL SK40	
all	10	96D084	BALL VALVE BRZ 1"BONOMI 171N	
all	11	96P151A37	1.25VAL 110V HAYS#9-2110IS-120	
all	12	5N1E06AG42	NPT NIP 1.25X6 TBE GALSTL SK40	
all	13	5SB1K1EDEO	NPTHXBUSH 1.5X1.25GALMAL 150	
all	14	SA 03 009	1.5"SIPHONBRKR+SCUPPER ASSY	
all	15	5N1E20AG42	NPT NIP 1.25X20 TBE GALSTL SK4	
all	16	5S1ENFA0P	NPTTEE 1.25X3/4X3/4 GALMAL150#	
all	17	5N0PCLSG42	NPT NIP 3/4XCLS TBE GALSTL S40	
all	18	5SL0PNFA	NPTELB 90DEG 3/4 GALMAL 150#	
all	19	60E086C22K	*WATERHOSE 3/4"=22.5"LG+ENDS	
all	20	60E086C25K	*WATERHOSE 3/4"=25.5"LG+ENDS	
all	21	51X019	UNIONSTRADT 3/4"#0107-12-12	
all	22	27A004	NOZZLE SPRACO#H3/4U00350G	
all	23	02 18965	PLATE=SPRAYDOWN LOCATING	
all	24	51E037	COUP 3/4"F W/1"M NPTONOD 304S	

Steam

7244WP2, 7244WR2, 7244WP3, 7244WR3

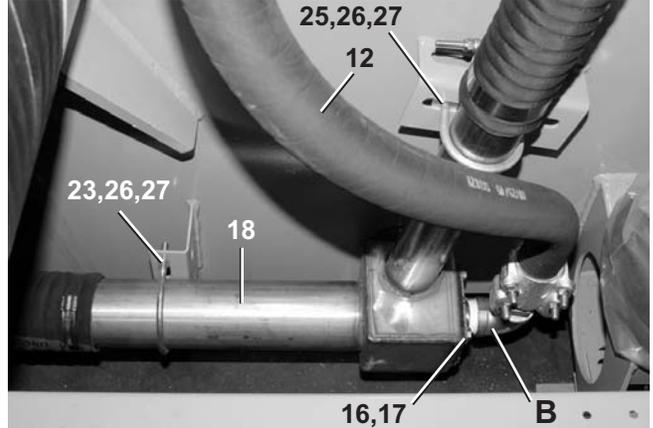
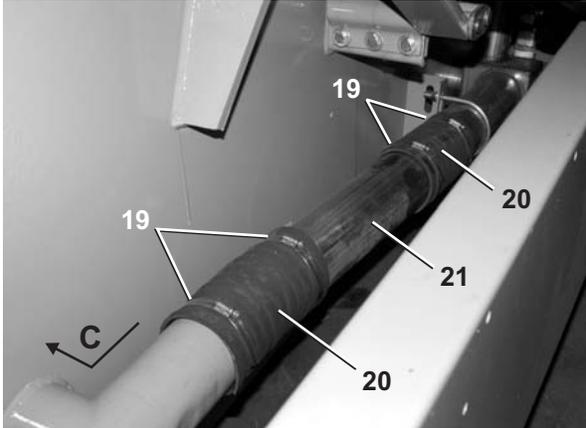
Figure 1: Steam inlet



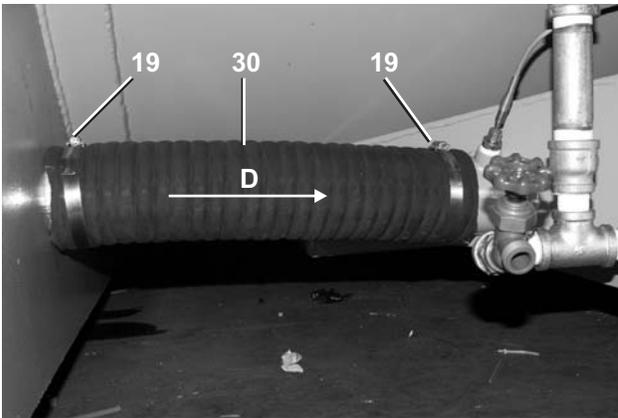
Steam

7244WP2, 7244WR2, 7244WP3, 7244WR3

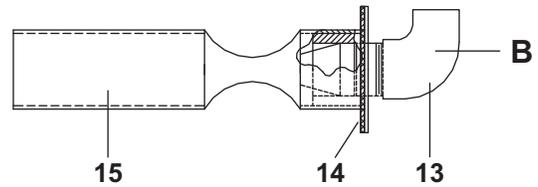
Figure 2: Steam Mixing



- B. Steam pipe and nozzle
- C. Steam goes through the rear shell



- D. Steam goes into the shell bottom



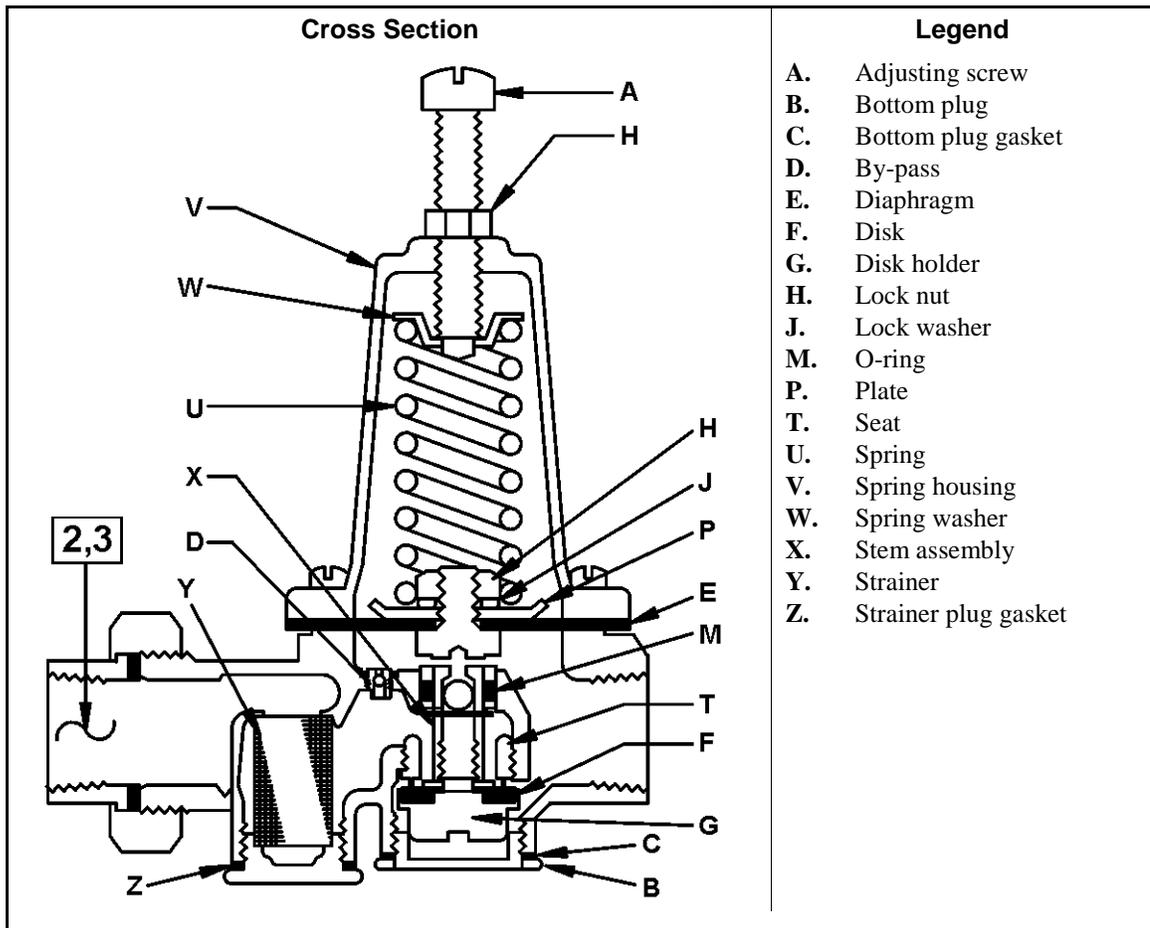
Steam Pipe and Nozzle

Parts List—Steam

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

Used In	Item	Part Number	Description	Comments
-----ASSEMBLIES-----				
	A	GVS36002	INSTALL=1.25STEAM=7244WE2+3	
	B	AVS36001	\$1.25 BURKERT STEAM= 72WED	
	C	AVS03001	*1+1/4BURKERT +STRAINER	
	D	ASS25001	*52&60 STEAM SPARGER3/4ORFICE	
-----COMPONENTS-----				
all	1	51T060	Y-STRAINER 1+1/4" CAST IRON	
all	2	5SP0PHFSS	NPT PLUG 3/4 SQ SOLID STL/ZINC	
all	3	5N1E05AG42	NPT NIP 1.25X5 TBE GALSTL SK40	
all	4	96D0011E	1.25"NPTBRZ N/C STEAMVALANGBD	
all	5	96H018	ANGLE NEEDLE VLV 1/4"T X 1/8MP,	
all	6	5SB0E0CBEO	NPTHEXBUSH 1/4X1/8 BRASS 125#	
all	7	5N1E08AG42	NPT NIP 1.25X8 TBE GALSTL SK40	
all	8	5SL1ENFK	NPT ELB 45DEG 1.25 GALMAL 150#	
all	10	5SU1ENF	NPT UNION 1.25" GALMAL 150#	
all	11	5N1ECLSG42	NPT NIP 1.25XCLS TBE GALSTLS40	
all	12	60E096C54A	STEAMH*OSE=1.25"X54"+2ENDS=(NO	
all	13	5SL1ESFA	NPT ELB 90DEG 1.25 304SS 150#	
all	14	02 14647E	GASKET=DRNTRGH TO RECIRC BOX	
all	15	W3 64566B	*WLM=STM SPARGER .75 ORF-12"L	
all	16	15K096	HEXCAPSCR 3/8-16UNC2X1SS18-8	
all	17	15U260	LOCKWASHER MEDIUM 3/8 SS18-8	
all	18	W3 06077A	* STEAM+WATER IN=7244WE2+3	
all	19	27A084	HOSECLAMP 3+9/16-4.5CADSC#HS64	
all	20	60E306A04K	HOSE=*3.5"ID PE X 4.5"	
all	21	02 10539S	SPACER PIPE DAS	
all	23	27A035	UBOLT 3/8-16 3.625"BETWEEN LEGS	
all	25	27A032M	UBOLT 2"PIPE 3/8-16 ZNC3.5" LG	
all	26	15U255	LOCKWASHER MEDIUM 3/8 ZINCPL	
all	27	15G205	HXNUT 3/8-16UNC2B ZINC GR2	
all	28	27A031	UBOLT 1"PIPE 5/16-18X2+3/16LG	
all	29	02 16306A	BRKT=1+1/4"PIPE SUPPORT	
all	30	60E306A15A	HOSE= *3.5"ID PE X15"	

Figure 2: Components and the procedure to clean pressure regulators (Items 2 & 3).



1. Remove the bottom plug and gasket.
2. Loosen the disk holder with a screwdriver or socket wrench.
3. Examine the disk and clean.
4. Remove the seat, if necessary, with an allen wrench or socket wrench.
5. Remove the adjustment screw, the nut, and the screws for the spring housing. Lift off the spring housing, the washer, and the spring.
6. Remove the lock nut, lock washer, plate, and diaphragm.
7. Lift the stem assembly up to remove it from the body.
8. Clean all strainers.
9. To assemble the regulator, use the opposite procedure. Tighten or loosen the adjustment screw to get the necessary pressure of 28 PSI (1.9 ATU).

Table 1: Parts List—Pressure regulator

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				
none				
Components				
all	1	96J030FF	Pressure regulator, 1/2", 28#	1/2" Regulator (used on 3621V models only)
all	2	96J030D	Pressure regulator, 1/2", 28#	1/2" Regulator (used all other models)
all	3	96J031D	Pressure regulator, 3/4", 28#	3/4" Regulator (all models that use 3/4" regulators)

— End of BIWUUM04 —

Drain Valve Body with One Valve: 4244WR2, 4244SR2, 6044WR2, 6044SR2, 7244WR2, 7244SR2

Figure 1: Cross Section (8 inch and 10 inch drain valves)

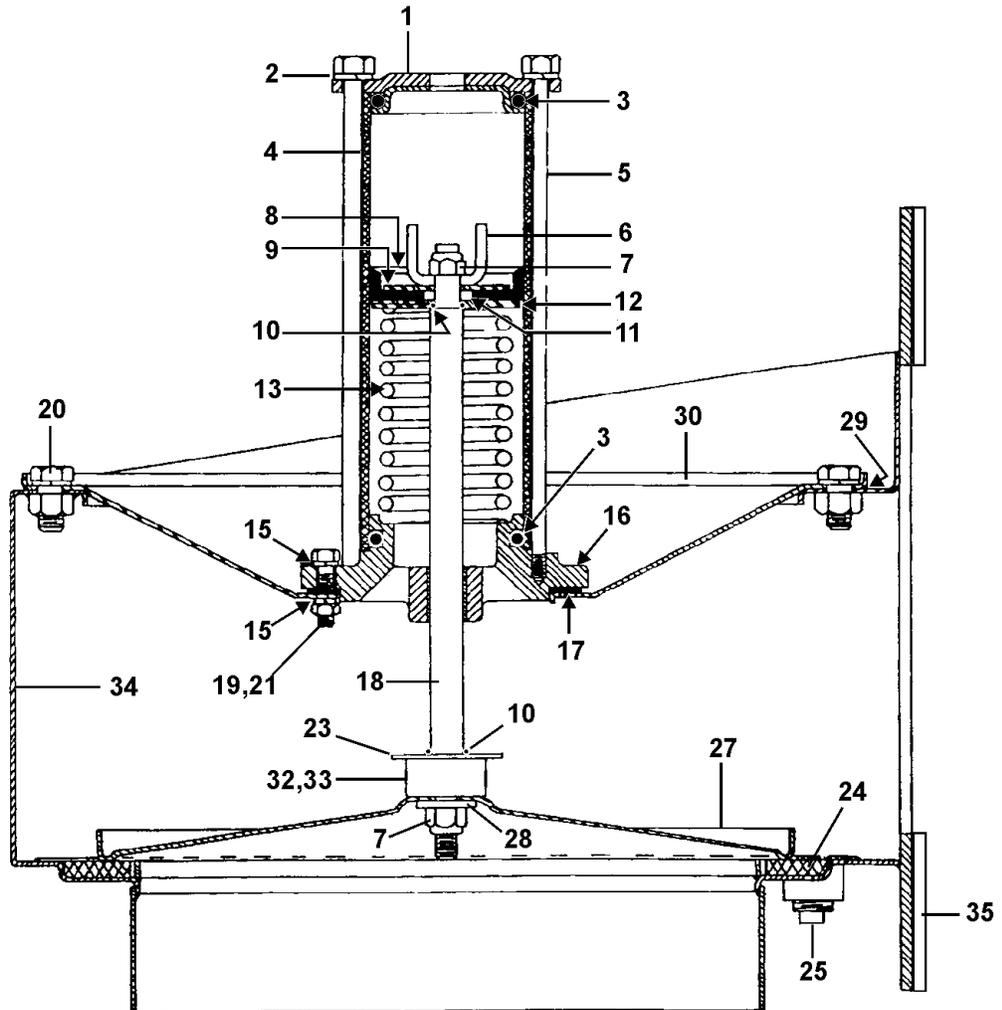


Table 1: Parts List— Drain Valve Body with One Valve

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
Assemblies				
	A	SA 28 124	Assembly, 8 inch drain valve	4244WR2, 4244SR2, 6044WR2, 6044SR2
	B	SA 36 015	Assembly, 10 inch drain valve	7244WR2, 7244SR2
	C	SA 28 158	Bonnet Assembly	4244WR2, 4244SR2, 6044WR2, 6044SR2
	D	SA 36 044	Bonnet Assembly	7244WR2, 7244SR2
Components				
all	1	02 02101	Cylinder head	
all	2	15U210	Washer, Lock, 5/16	
all	3	60C132	O-Ring, 2"X3/16	
all	4	02 02068	Housing	
all	5	02 10585D	Bolt, 5/16-18X7.875	
all	6	03 01313	Stop	
all	7	15G220	Nut, Lock, 3/8-24	
all	8	02 02194	Piston cup, 2+3/8"	
all	9	02 02085	Washer	
all	10	60C106	O-Ring, 5/16X1/16	
all	11	02 02185	Washer, Compression limit	
all	12	02 02105B	Washer, 2.38"	
all	13	03 06429	Spring, 2.11X6.5	
all	15	24G020N	Washer, Nylon, .252	
all	16	X2 02743	Bonnet	
all	17	02 18931F	Gasket	
all	18	02 16021I	Stem	
all	19	15G168	Nut, Square, 1/4-20	
all	20	15K086	Bolt, 3/8-16X3/4	
all	21	15K041S	Bolt, 1/4-20X1	
all	23	02 16021E	Washer, 3/8X1.25	
A	24	02 18068	Seal, Buna	
B	24	03 06084	Seal, Buna	
all	25	5SP0KGFSS	Plug, 1/2	
A	27	02 18796	Disk	
B	27	03 06083	Disk	
all	28	15U245	Washer, Flat, 3/8	
A	29	02 18104	Gasket	
B	29	03 06086G	Gasket	
A	30	02 18931E	Bonnet	
B	30	03 06086F	Bonnet	
all	32	02 16021C	Bumper	
all	33	02 16021D	Retainer	
A	34	W2 18931	Valve body	

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.

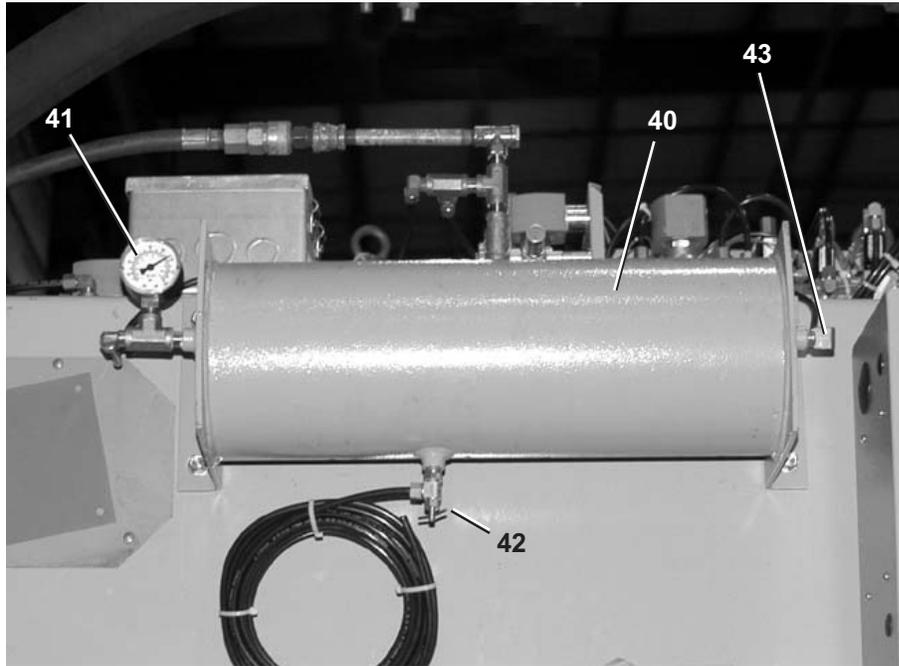
Used In	Item	Part Number	Description/Nomenclature	Comments
B	34	W3 06086	Valve body	
A	35	02 18107	Gasket	
B	35	03 06085D	Gasket	

— End of BIHDBM28 —

Drain Valve Body with Two Valves

72044WR2, 72044SR2

Figure 1: Reserve Air Pressure Tank and Dual Drain Valve



Drain Valve Body with Two Valves

72044WR2, 72044SR2

Parts List—Drain Valve Body with Two Valves				
Find the correct assembly first, then find the needed components. The item letters (A, B, C, etc.) assigned to assemblies are referred to in the "Used In" column to identify which components belong to an assembly. The item numbers (1, 2, 3, etc.) assigned to components relate the parts list to the illustration.				
Used In	Item	Part Number	Description	Comments
	A B	SA 36 015A SA 36 044	DUAL 10"DUMPVAL 7244WE2+WE3 * BONNET+AIRCYL=10"SS DUMPVAL	
-----COMPONENTS-----				
all	1	02 02101	CYLHEAD W/TAPPED HOLE	
all	2	15U210	LOKWASHER MEDIUM 5/16 ZINCPL	
all	3	60C132	ORING 2"IDX3/16CS BUNA70 #329	
all	4	02 02068	AIRCYL-STAINLESS=DUMP VALVE	
all	5	02 10585D	TIE BOLT=5/16-18X7.875 PLTD	
all	6	03 01313	STOP=AIR CYL W/2+11/16STROKE	
all	7	15G220	NUTLOK THINHX 3/8-24 SS/NYL	
all	8	02 02194	PISTON CUP=DUMPVALVE 2+3/8"	
all	9	02 02085	UP WASHER=2"OD=PISTON CUP	
all	10	60C106	ORING 5/16ID 1/16CSBUNA70#011	
all	11	02 02185	WASHER=PISTON CUP COMP LIMIT	
all	12	02 02105B	2.38"ACYL BRASS PISTONCUP WSHR	
all	13	03 06429	SPRING=2.11ODX6.5FL 64#/"	
all	15	24G020N	ROLLED WASH.252ID NYLTITE 25W	
all	16	X2 02743	BONNET=2"DUMP VALVE	
all	17	02 18931F	GASKET=DUMPVALVE-1/60+72WEHU	
all	18	02 16021I	DUMPVAL STEM-4"+8"316SS	
all	19	15G168	SQ Nut 1/4-20UNC2 SS18-8	
all	20	15K086	HXCAPSCR 3/8-16NCX3/4 SS18-8	
all	21	15K041S	HEXCAPSCR 1/4-20UNC2AX1 SS18-8	
all	23	02 16021E	WASHER 3/8IDX1.250D DUMPVAL	
all	24	03 06084	SEAT-RESILIENT=10"DUMPVALVE	
all	25	5SP0KGFSS	NPT PLUG 1/2 SOSOLID GALSTL	
all	27	02 18796	DISC-8" DUMP VALVE S/S	
all	28	20C018C	NEOPRENE HIGH PERFORMANCE CONTACT ADHESIVE	
all	29	03 06086G	GASKET=10" DUMP VALVE BONNET	
all	30	03 06086F	BONNET=10"DUMP VALVE	
all	32	02 16021C	BUMPER=DUMP VALVE BONNET	
all	33	02 16021D	DUMP VALVE BUMPER RETAINER	
all	34	W3 06086A	*BODY=10"DUAL DUMP 72WE ONLY	
all	36	24G030N	ROLLED WASH.379ID NYLTITE 37W	
all	37	15U200	FLATWASHER(USS STD) 5/16"ZNC P	
all	40	W3 25307D	*TANK=AIR PRESSURE RESERVE	
all	41	30N102	PRESSGAUGE 1/4BOTCON.0-150PSI	
all	42	96H018	ANGLE NEEDLE VLV 1/4"T X 1/8MP	
all	43	96D047AAK	CHECK VALVE 1/4"DELT#CMMQ20B	

Pneumatic Piping and Assemblies

9

SERVICING AIR CYLINDERS

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

Maintenance procedures require:

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

▲ CAUTION ▲



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

☞ Follow maintenance instructions carefully.

☞ Wear eye protection.

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

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

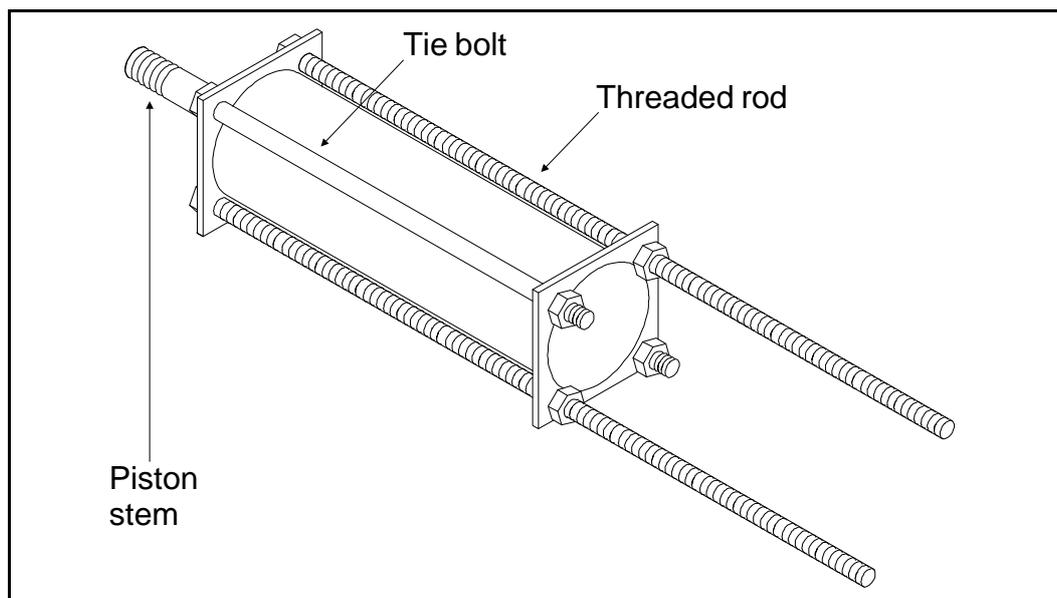


FIGURE 1 (MSSM0130AE)
Using Threaded Rods

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

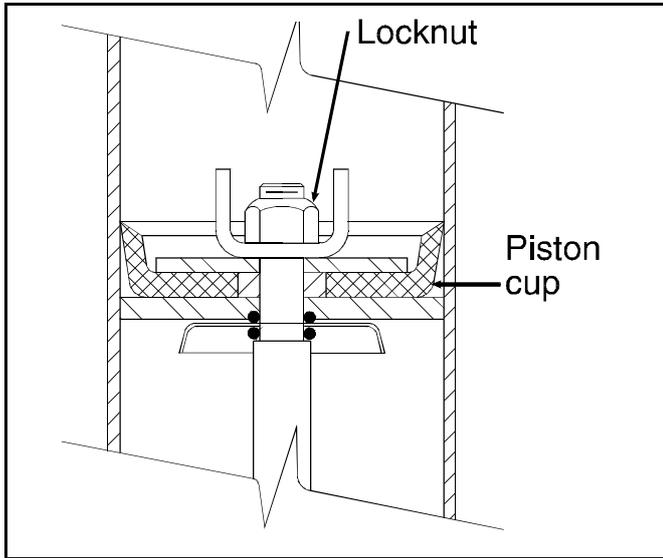


FIGURE 2 (MSSM0130AE)
Correct Piston Cup Shape

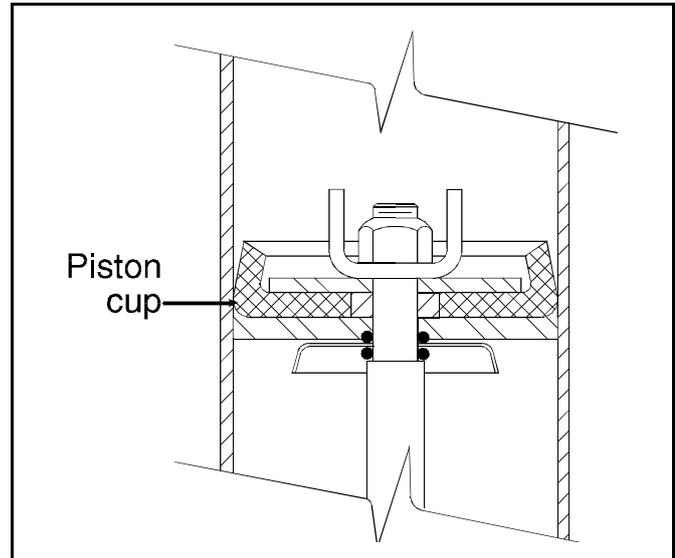


FIGURE 3 (MSSM0130AE)
Distorted Piston Cup Shape

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