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Mechanical Parts and Service

72044WR2, WR3

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

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1 General Service and Safety-Related Components

BMP720097 / 19036 BRUUUM01.1 0000229985 B.2 D.6 12/5/19, 11:43 AM Released

PELLERIN MILNOR CORPORATION
LIMITED STANDARD WARRANTY

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

Providing we receive written notification of a warranted defect within 30 days of its discovery, we will—at our option—repair or replace the defective part or parts, EX Factory (labor and freight specifically NOT included). We retain the right to require inspection of the parts claimed defective in our factory prior to repairing or replacing same. We will not be responsible, or in any way liable, for unauthorized repairs or service to our equipment, and this warranty shall be void if the equipment is tampered with, modified, or abused, used for purposes not intended in the design and construction of the machine, or is repaired or altered in any way without MILNOR's written consent.

Parts damaged by exposure to weather, to aggressive water, or to chemical attack are not covered by this warranty. For parts which require routine replacement due to normal wear—such as gaskets, contact points, brake and clutch linings, belts, hoses, and similar parts—the warranty time period is 90 days.

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

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

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

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

BMP720097/19036

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1.1 How to Get the Necessary Repair Components

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

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

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

To write to the Milnor® factory:

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

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

BNUUUU02 / 2023296 BNUUUU02 0000158094 G.2 7/20/23, 10:58 AM Released

1.2 Trademarks

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

Table 1. Trademarks

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

Table 1 Trademarks (cont'd.)

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

BNWVUS08 / 2020122 BNWVUS08 0000279016 A.2 3/16/20, 3:40 PM Released

1.3 Safety — Divided Cylinder and Staph Guard® Washer-Extractors

BNWVUS08.C01 0000279015 B.2 A.2 3/16/20, 3:40 PM Released

1.3.1 Safety Alert Messages—Internal Electrical and Mechanical Hazards

BNWVUS01.C03 0000235064 B.2 A.2 A.3 1/2/20, 2:19 PM Released

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

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

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

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

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

1.3.2 Safety Alert Messages—External Mechanical Hazards

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

WARNING: **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.

1.3.3 Safety Alert Messages—Cylinder and Processing Hazards

BNWVUS03.C03 0000235094 B.2 A.2 A.3 1/2/20, 2:19 PM Released

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

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

- Do not attempt to open the door or reach into the cylinder until the cylinder is stopped.
- Do not place any object in the turning cylinder.
- Do not operate the machine with a malfunctioning door interlock.
- 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: **Confined Space Hazards —** Confinement in the cylinder can kill or injure you. Hazards include but are not limited to panic, burns, poisoning, suffocation, heat prostration, biological contamination, electrocution, and crushing.

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

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

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

1.3.4 Safety Alert Messages—Unsafe Conditions

BNWVUS04.C01 0000235093 B.2 A.2 A.3 12/11/20, 8:32 AM Released

1.3.4.1 Damage and Malfunction Hazards

BNWVUS04.C02 0000235092 B.2 A.2 A.3 12/11/20, 8:32 AM Released

1.3.4.1.1 Hazards Resulting from Inoperative Safety Devices

BNWVUS04.C03 0000235091 B.2 A.2 A.4 12/11/20, 8:32 AM Released

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

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

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

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

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

- Do not unlock or open electric box doors.

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

- Do not remove guards, covers, or panels.

1.3.4.1.2 Hazards Resulting from Damaged Mechanical Devices

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

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

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

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

WARNING: **Explosion Hazards** — 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 after loading and unloading.
- Do not operate the machine with any evidence of damage or malfunction.

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

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

1.3.4.2 Careless Use Hazards

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

BNWVUS04.C06 0000235126 B.2 A.2 A.4 12/11/20, 8:32 AM Released

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

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

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

BNWVUS04.C07 0000235125 B.2 A.2 A.4 12/11/20, 8:32 AM Released

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

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

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

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

WARNING: **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.

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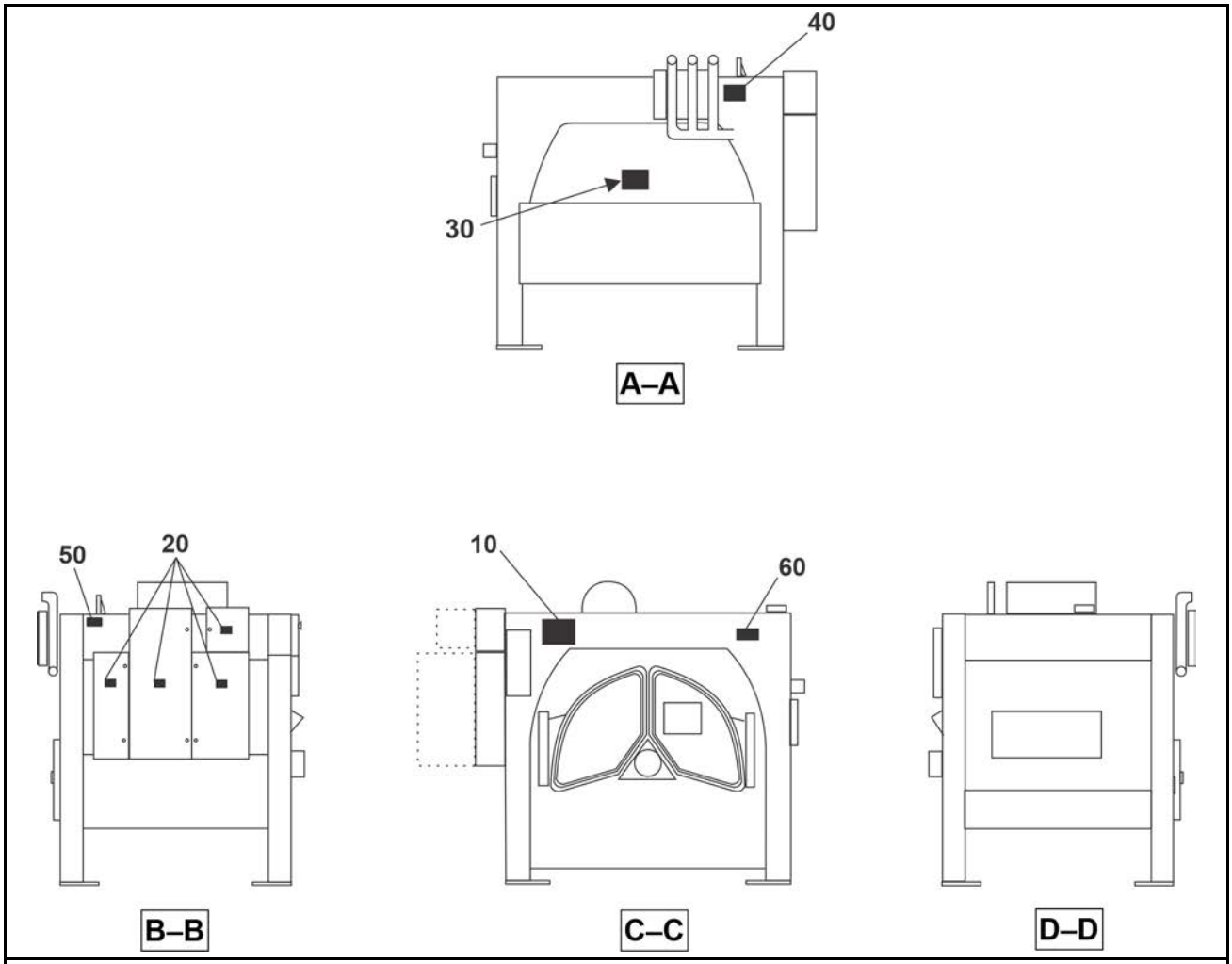
Safety Placard Use and Placement

2 Sheets

6044WP2, 6044WR2, 7244WP2, 7244WR2

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



Legend

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

Safety Placard Use and Placement

2 Sheets

6044WP2, 6044WR2, 7244WP2, 7244WR2

Table 2. Parts List—Safety Placard Use and Placement

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Components				
all	10	01 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	

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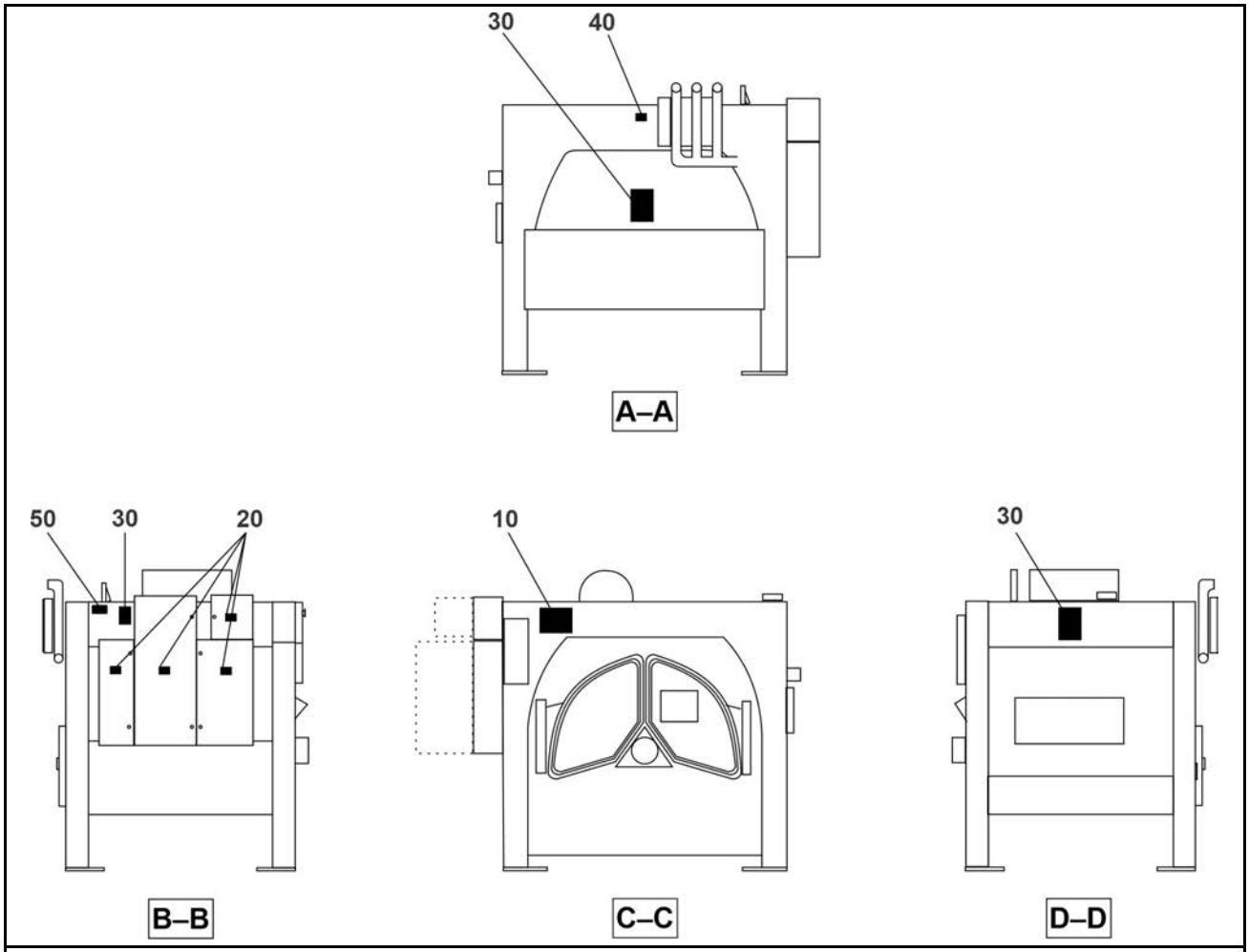
Safety Placards and Locations ISO

2 Sheets

6044WP2, 6044WR2, 7244WP2, 7244WR2

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



Legend

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

Safety Placards and Locations ISO

2 Sheets

6044WP2, 6044WR2, 7244WP2, 7244WR2

Table 3. Parts List—Safety Placards and Locations ISO

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Components				
all	10	01 10627X	NPLT:DIVCYL SG WARNING FRT ISO	
all	20	01 10377	NPLTE:"WARNING" 4X4	
all	30	01 10628X	NPLT:NONTILT W/E WARNING SIDE	
all	40	01 10648X	NPLT:ACTUATED VALVE WARN-ISO	
all	50	01 10649X	NPLT:HOT BEHIND CVR WARN-ISO	Used on the steam inlet

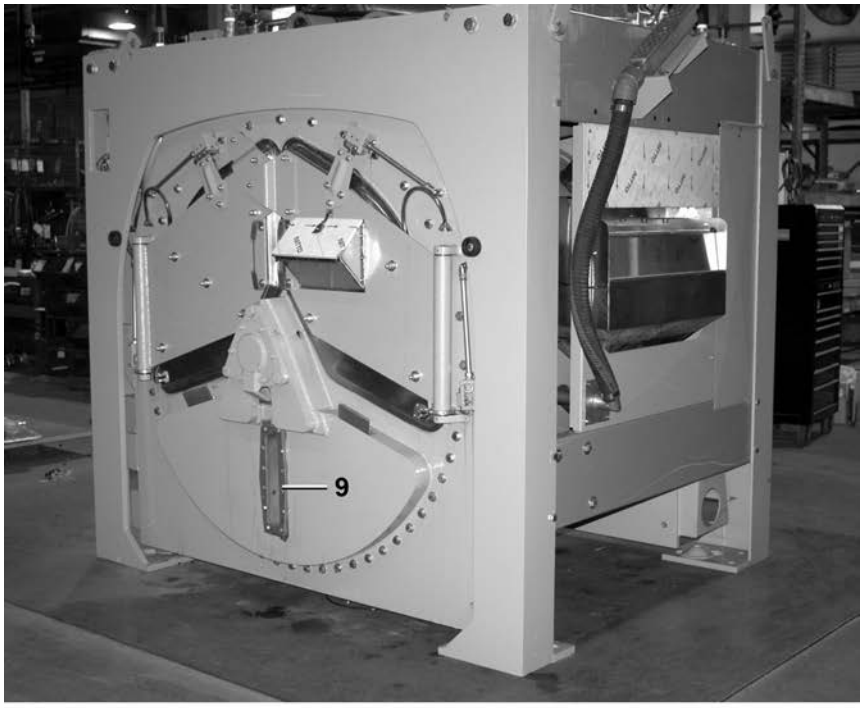
BPWD6M03 / 2020293 BPWD6M03.1 0000303197 B.2 A.3 7/14/20, 11:36 AM Released

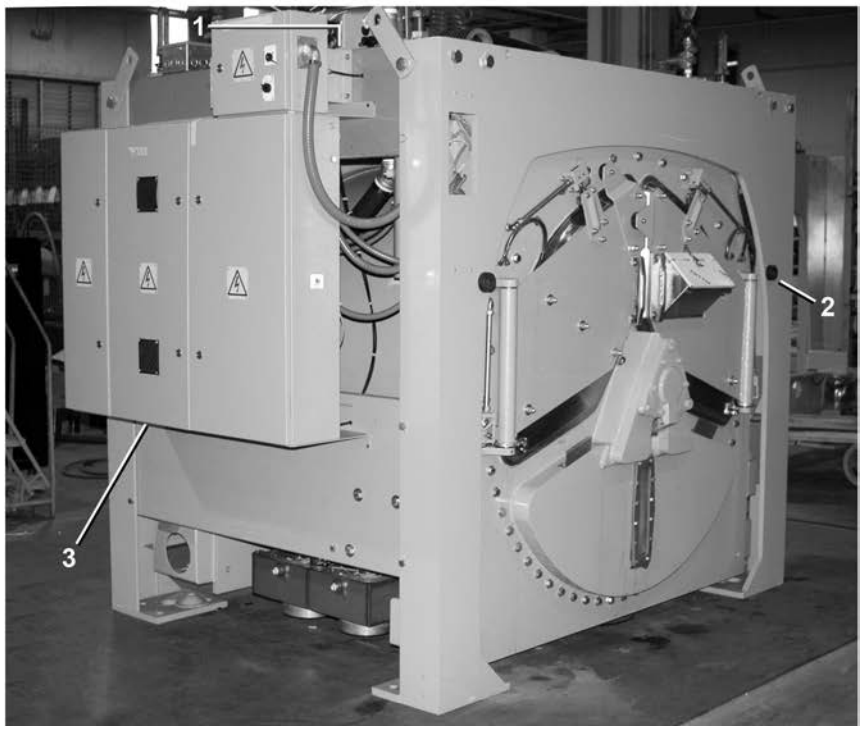
Panels and Covers

2 Sheets

6044WP2, 6044WR2, 7244WP2, 7244WR2

Figure 1. General Views





Panels and Covers

2 Sheets

6044WP2, 6044WR2, 7244WP2, 7244WR2

Figure 2. Rear View

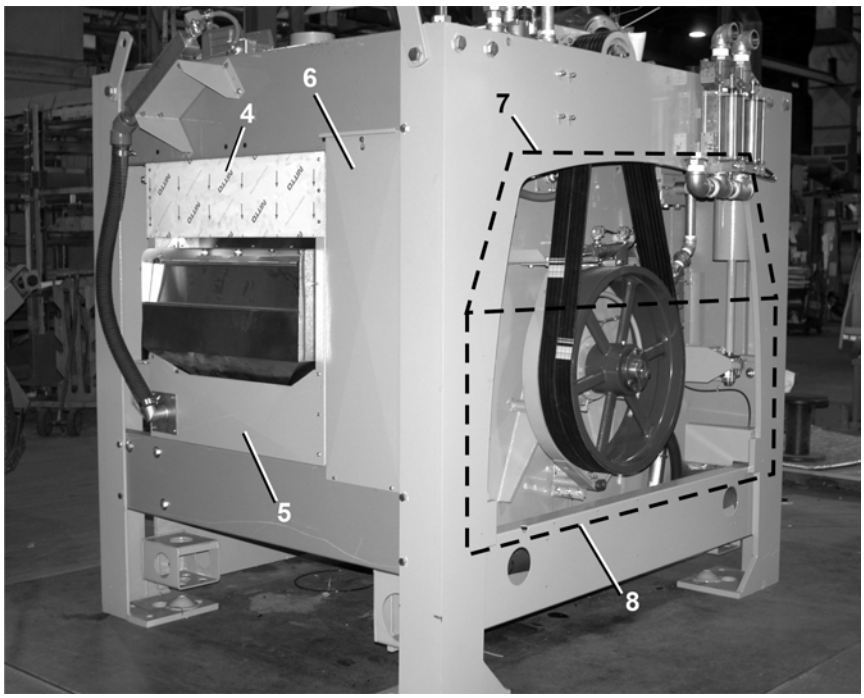


Table 4. Parts List—Panels and Covers

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Components				
all	1	03 CL721K	COVER:W/E DYE MICRO VAL SET	
all	2	60C075	TRUCK BUMPER 2+1/2ODW3/8HO.613	
all	3	05 20296D	+LEFT REAR COSMETIC COVER	
all	4	02 18824C	COVER=UPPER SUP INJ 6044SG	
all	5	02 18824D	COVER=SUP INJ LO SUP 6044SG	
all	6	05 20296C	+RIGHT REAR COSMETIC COVER	
all	7A	02 175174	BELTGUARD UPREAR 60WE	6044WP2
all	7B	03 06380	GUARD=UPPER BELT-72WE	7244WP2
all	8A	02 175175	BELTGUARD,LO-REAR 60WE	6044WP2
all	8B	03 06385	GUARD=LOWER BELT-72WE	7244WP2
all	9A	AD 28 111	SIGHT GLASS ASSY=WED + WEH	6044WP2
all	9B	AD 36 004	SIGHT GLASS ASSY=72WED	7244WP2

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1.4 Torque Requirements for Fasteners

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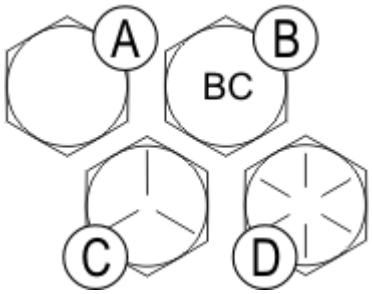
The document about the assembly gives the torque requirements for other fasteners. **If fastener torque specifications or threadlocker requirements in an assembly document are different from this document, use the assembly document.**

Figure 3. The Bolts in Milnor® Equipment

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

1.4.1 Torque Values

BNUUUN02.C02 0000222449 B.2 B.3 A.3 1/2/20, 2:14 PM Released

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

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

1.4.1.1 Fasteners Made of Carbon Steel

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

1.4.1.1.1 Without a Threadlocker

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

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

Table 6. Torque Values for Standard Fasteners Larger Than 5/16-inch Diameters and No Lubricant

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

Table 7. Torque Values for Plated Fasteners with Maximum 5/16-inch Diameters and No Lubricant

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

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

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

1.4.1.1.2 With a Threadlocker

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Table 9. Threadlocker by the Diameter of the Bolt (see below Note)

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

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

Table 10. Torque Values if You Apply LocTite 222

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

Table 11. Torque Values if You Apply LocTite 242

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

Table 12. Torque Values if You Apply LocTite 262

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

Table 13. Torque Values if You Apply LocTite 272 (High-Temperature)

	The Grade of the Bolt							
	Grade 2		Grade 5		Grade 8		Grade BC	
Dimension	Pound-Feet	N-m	Pound-Feet	N-m	Pound-Feet	N-m	Pound-Feet	N-m
1 x 8	350	475	901	1222	1272	1725	1114	1510
1 x 12	383	519	986	1337	1392	1887	–	–

Table 13 Torque Values if You Apply LocTite 272 (High-Temperature) (cont'd.)

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

Table 14. 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	–	–

1.4.1.2 Stainless Steel Fasteners

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Table 15. 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 16. Torque Values for Stainless Steel Fasteners Larger Than 5/16-inch

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

1.4.2 Preparation

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

- Use threadlocker and primers with sufficient airflow.
- Do not use flammable material near ignition sources.

1. Clean all threads with a wire brush or a different tool.
2. Remove the grease from the fasteners and the mating threads with solvent. Make the parts dry.

NOTE: LocTite 7649 Primer™ or standard solvents will remove grease from parts.

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

1.4.3 How to Apply a Threadlocker

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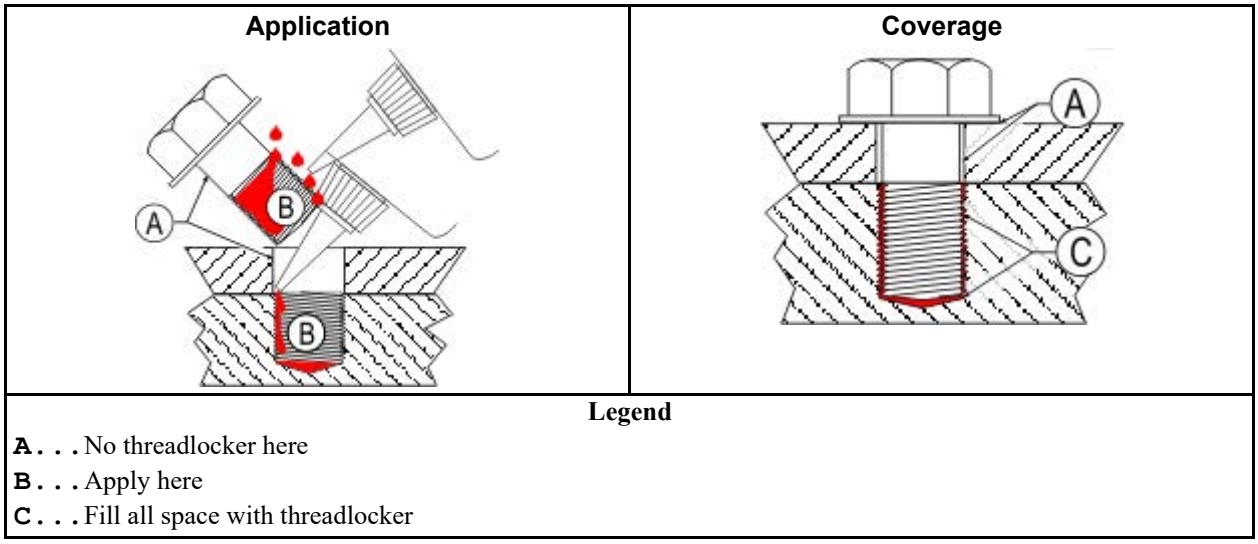
CAUTION: **Malfunction Hazard** — Heat, vibration, or mechanical shocks can let the fasteners loosen if you do not apply the threadlocker correctly. Loose fasteners can cause malfunctions of the equipment.

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

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

Figure 4. Apply Threadlocker in a Blind Hole



1.4.3.1 Blind Holes

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1. Apply the threadlocker down the threads to the bottom of the hole.
2. Apply the threadlocker to the bolt.
3. Tighten the bolt to the value shown in the correct table (Table 9: Threadlocker by the Diameter of the Bolt (see below Note), page 24 to Table 15: Torque Values for Stainless Steel Fasteners 5/16-inch and Smaller, page 26).

1.4.3.2 Through Holes

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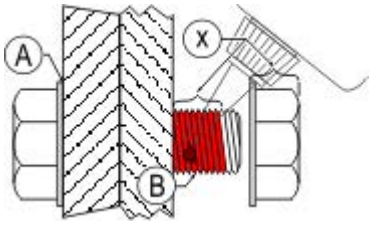
1. Put the bolt through the assembly.
2. Apply the threadlocker only to the bolt thread area that will engage the nut.

3. Tighten the bolt to the value shown in the correct table (Table 9: Threadlocker by the Diameter of the Bolt (see below Note), page 24 to Table 15: Torque Values for Stainless Steel Fasteners 5/16-inch and Smaller, page 26).

Figure 5. Apply Threadlocker in a Through Hole

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

1.4.3.3 Disassembly

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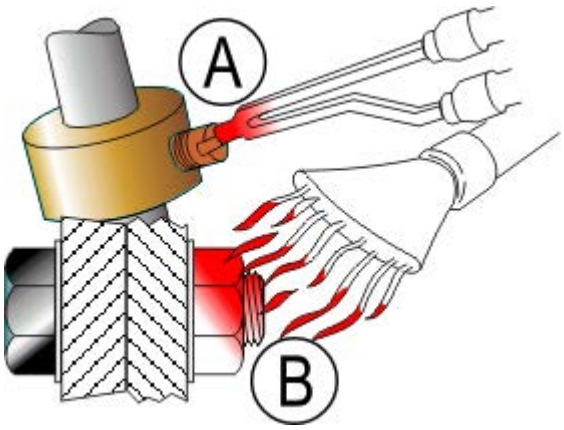
For high-strength threadlocker, apply heat for five minutes. Disassemble with hand tools while the parts are hot.

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

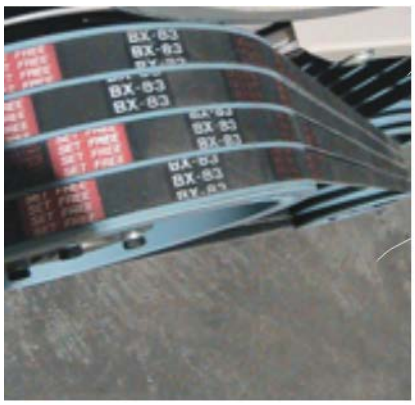
Figure 6. Use heat for disassembly of fasteners with threadlocker.

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

2 Drive Assemblies

2.1 Drive Pulley and Belt Maintenance

Figure 7. Examples of drives this instruction applies to: one or more V-belts, attached V-belts and tooth belts



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

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

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

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

2.1.1 Pulley Requirements

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

2.1.1.1 Condition of Grooves on Pulleys

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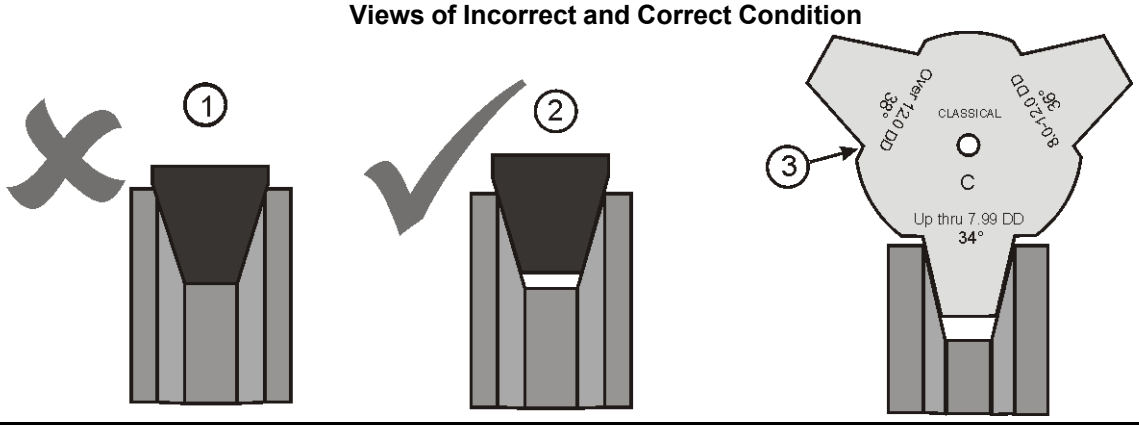
Replace a pulley if:

- the grooves have burrs, cracks, or worn areas that can cause damage to the belts.
- the belts touch the bottom of the groove at any point (Figure 8, page 31).

Figure 8. Pulley Groove Condition



Legend

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

2.1.1.2 Pulley and Shaft Position

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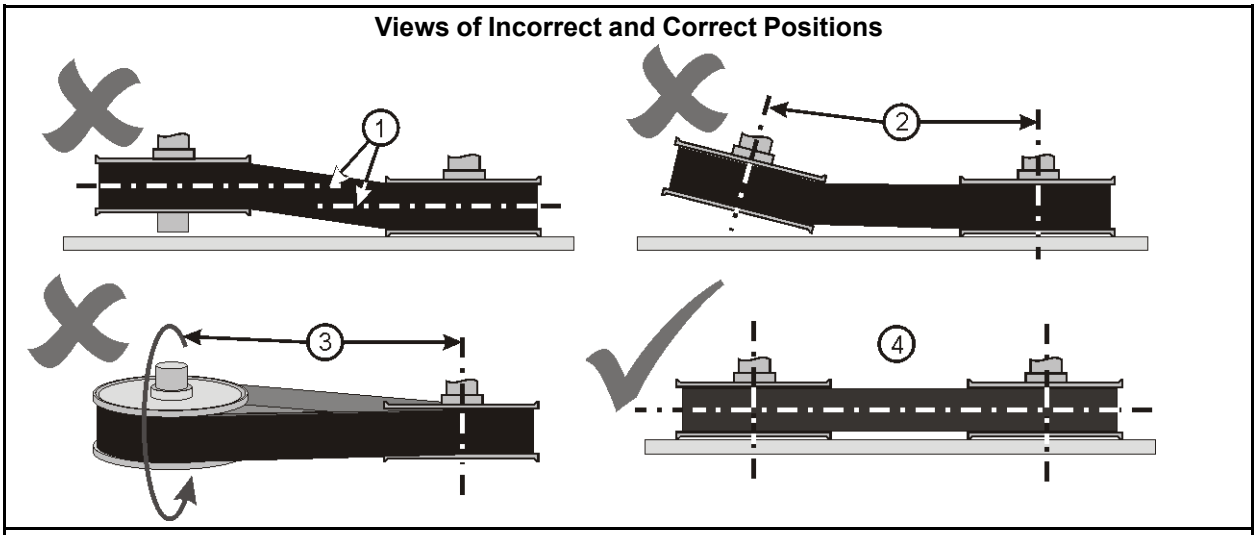
Align To adjust parts until they are in a correct position to other parts.

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

Figure 9. Pulley and Shaft Position



Legend

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

2.1.1.3 Keep Run-Out in Tolerance

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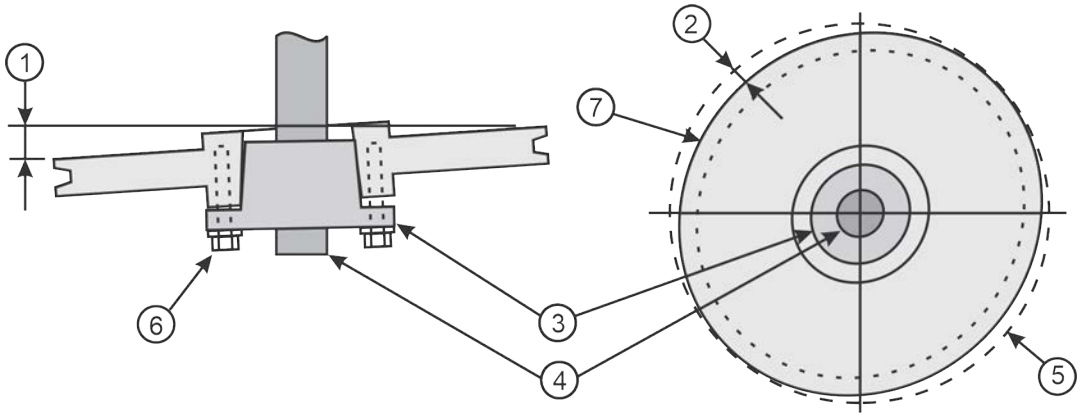
Axial run-out The difference between the minimum and maximum distance between the face of a pulley and a plane perpendicular to the pulley shaft (Figure 10, page 33, item 1). Incorrect installation or damage can cause a pulley to be not at a 90 degree angle to the shaft.

Radial run-out The difference between the minimum and maximum diameter in one turn (Figure 10, page 33, item 2). If a force causes damage to a pulley, it can bend. It will not have a circular shape.

Figure 10. Run-out

Views of Axial and Radial Run-out

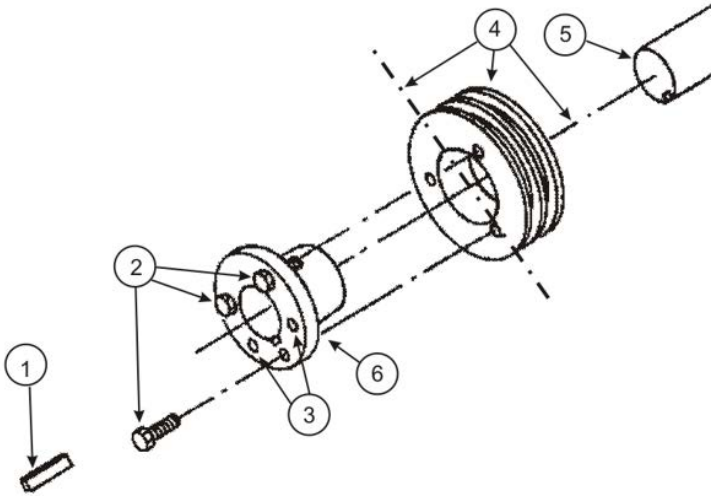


Legend

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

Figure 11. Typical Pulley Assembly

View of Pulley Components



Legend

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

2.1.2 Belt Requirements

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

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

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

▶ Do not push the belt on with a tool.

2.1.2.1 Condition of Belts

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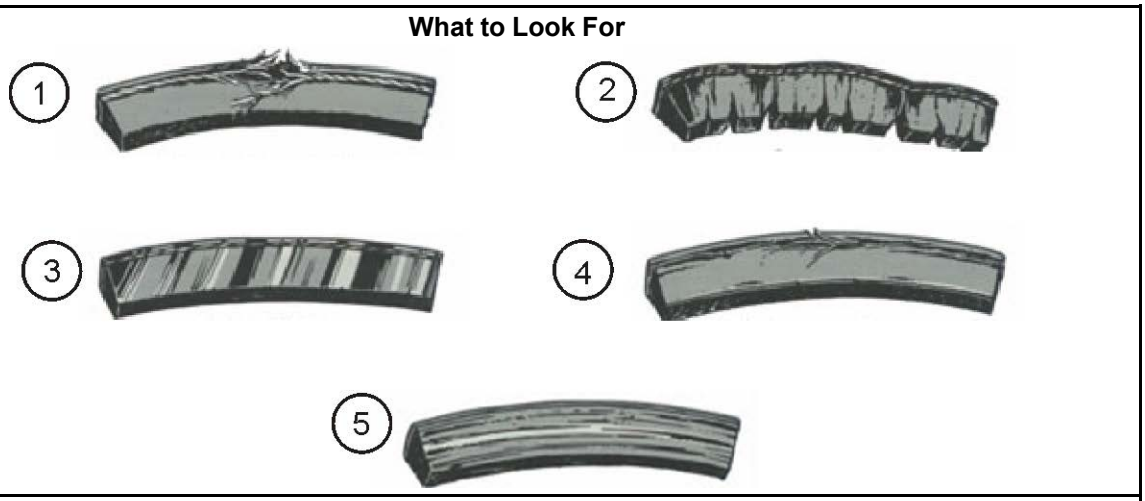
Slippage when the pulley turns more quickly than the belt can move

Slippage occurs if belts are not aligned (see Section 2.1.1.2 , page 31) or by incorrect tension explained in Section 2.1.1.2 , page 31. Slippage can cause belts to become too hot. Belts must not have a temperature more than than 140F (60° C).

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

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

Figure 12. Types of Belt Damage



Legend

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

2.1.2.2 Tension of Belts

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

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

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

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

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

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

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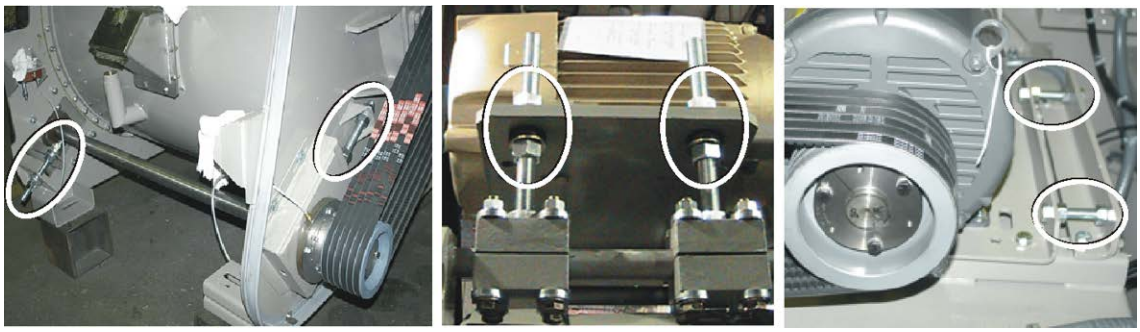
Some tension mechanisms do not have an effect on pulley and shaft requirements. Pulleys will stay aligned when you adjust them. Figure 13, page 36 is an example of these. Where tension mechanisms are a pair of threaded rods, you must adjust the nut, on each rod carefully. If not, the pulleys will not stay aligned. Examples of this type are shown in Figure 14, page 36.

Figure 13. A Tension Mechanism that will not Change the Angle of the Pulleys

Figure 14. Some Pairs of Tension Mechanisms that Can Change the Angle of the Pulleys



2.1.4 How to Do Maintenance on Pulleys and Belts

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Table 17. Typical Tools for Pulley and Belt Maintenance

Tool	Function	Related Data
Torque wrench	Make the bushing bolts the same torque to get the minimum axial run-out.	Figure 11, page 33, item 2
Laser, straight edge, or string	Align pulleys	Tools are listed in order of preference. Section 2.1.1.2 , page 31 and Figure 15, page 38
Bubble level	Align shafts	Section 2.1.1.2 , page 31 and Figure 16, page 39
Dial indicator	Measure run-out	Section 2.1.1.3 , page 32 and Figure 17, page 39

Table 17 Typical Tools for Pulley and Belt Maintenance (cont'd.)

Tool	Function	Related Data
Sheave (pulley) gage	Examine pulley wear	Figure 8, page 31.
Infrared thermometer	Examine belt temperature	Section 2.1.2.1 , page 34.

2.1.4.1 Typical Steps to Replace Pulleys and Belts

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Preparation Remove power from the machine.

Belt removal Use the belt tension mechanism to decrease the distance between the pulleys until you have sufficient clearance. Figure 13, page 36 and Figure 14, page 36 show typical belt tension mechanisms.

Pulley removal On the typical type of pulley and bushing shown in Figure 11, page 33, use the push-off holes to remove the pulley easily. On special types of pulleys (example: large drive pulley and cone), look at the parts document in the maintenance manual for more data. Some pulleys are too heavy for only one person to hold.

Pulley installation Figure 11, page 33 shows the typical pulley and bushing components. Make sure that you keep run-out tolerances when you assemble and tighten the components.

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

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

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

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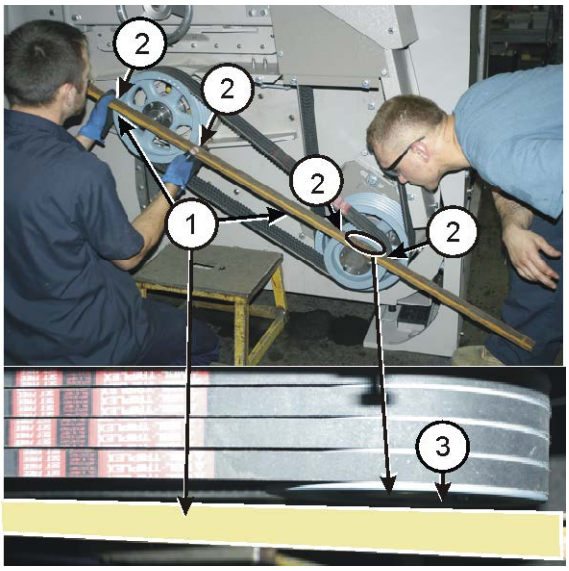
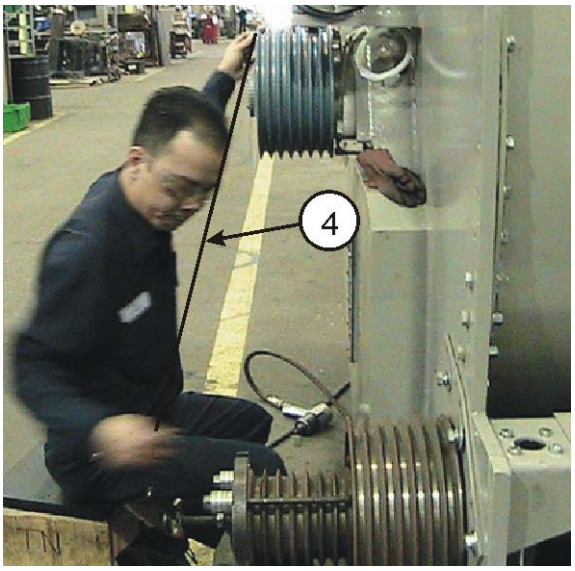
Figure 15. Use a straight edge, a string, or a laser to make sure that all pulleys are in the same plane.

Straight edge



String



Legend

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

Laser

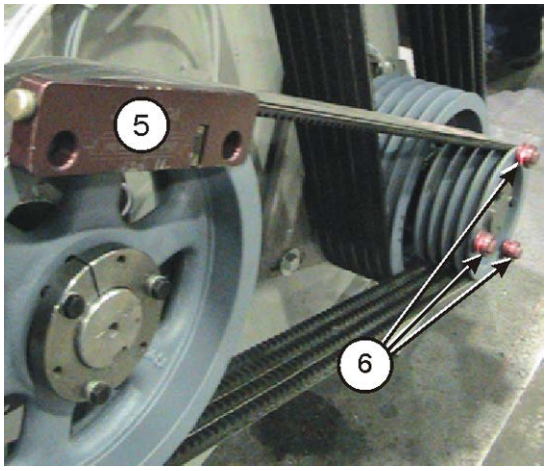
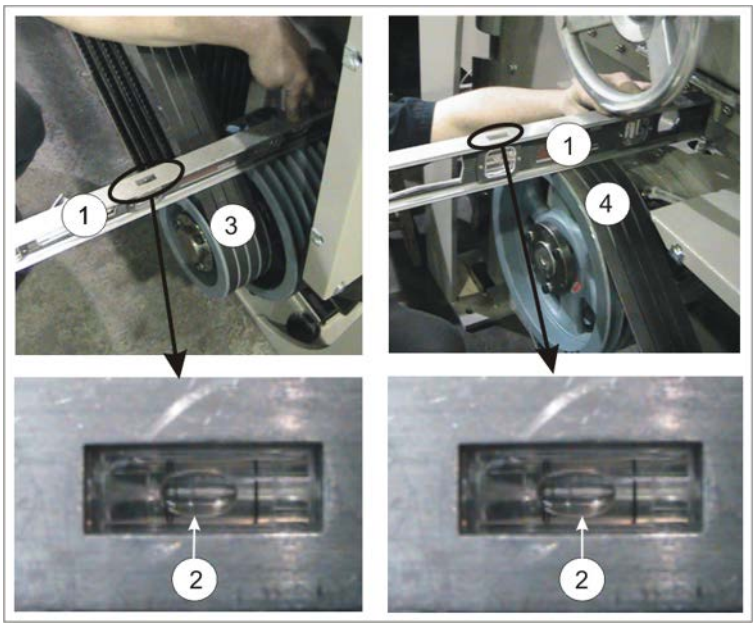


Figure 16. Use a level to make sure that the pulleys are at the same slope.

A level on the top of two pulleys

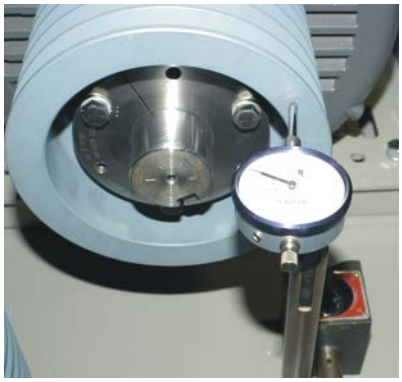


Legend

1. Bubble level: Use this tool to make sure that the slopes of pulleys are equal. This is to make sure that you do not have the condition in Figure 9, page 32, item 3. Mechanisms shown in Figure 14, page 36 can change the pulley slopes.
2. If the slopes of the pulleys are equal, the bubble will be in the same position for each pulley. The bubbles do not have to be in the center of the level.
3. A pulley
4. A second pulley on the same drive

Figure 17. Dial indicator used to find the axial and radial run-out of a pulley.

Axial Run-out (1)



Radial Run-out (2)

Legend

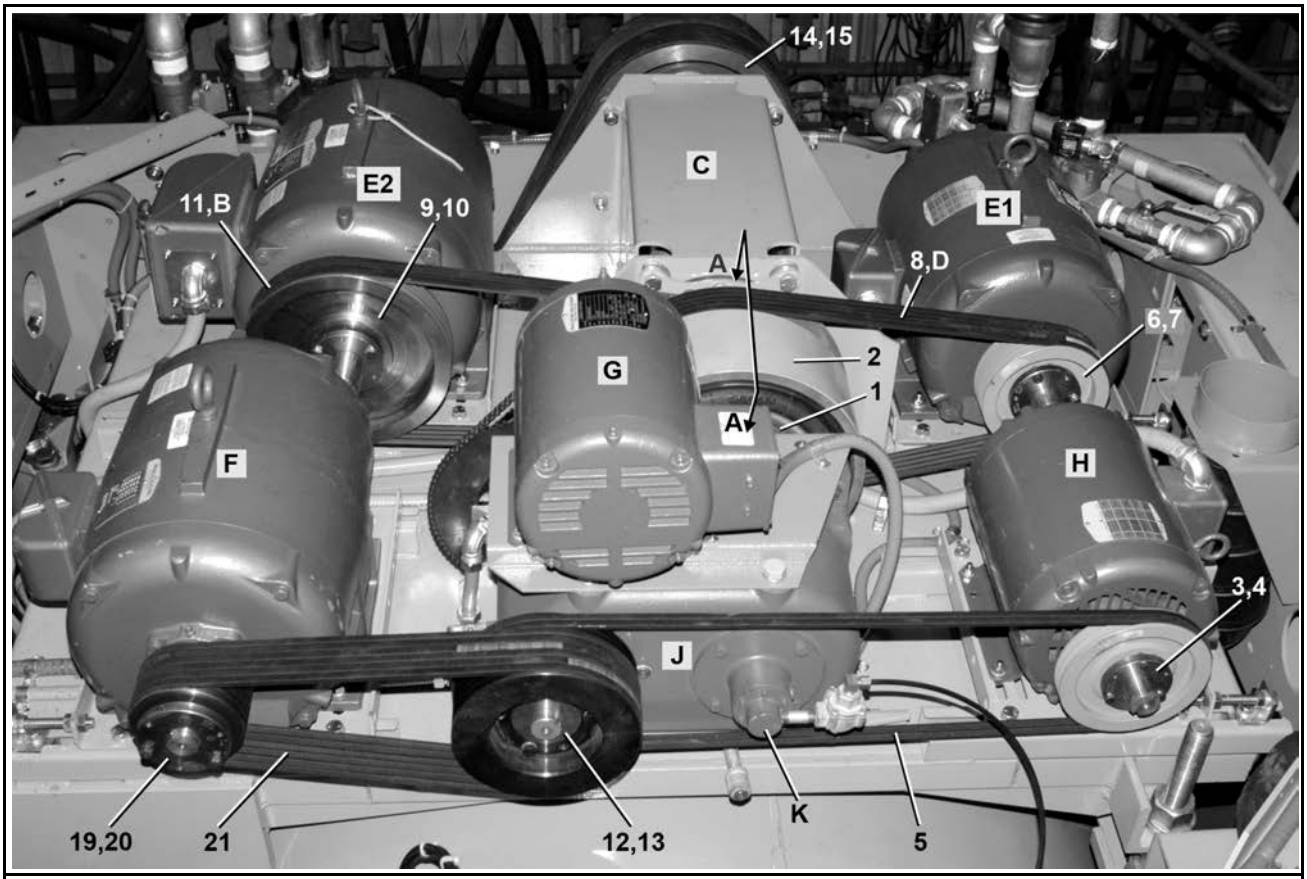
1. Dial indicator in position to measure axial run-out
2. Dial indicator in position to measure radial run-out

BPWD7I01 / 2020404 BPWD7I01.1 0000307732 B.2 A.4 9/30/20, 2:05 PM Released

Drive Chart

5 Sheets

72044WP2,WP3,WR2,WR3



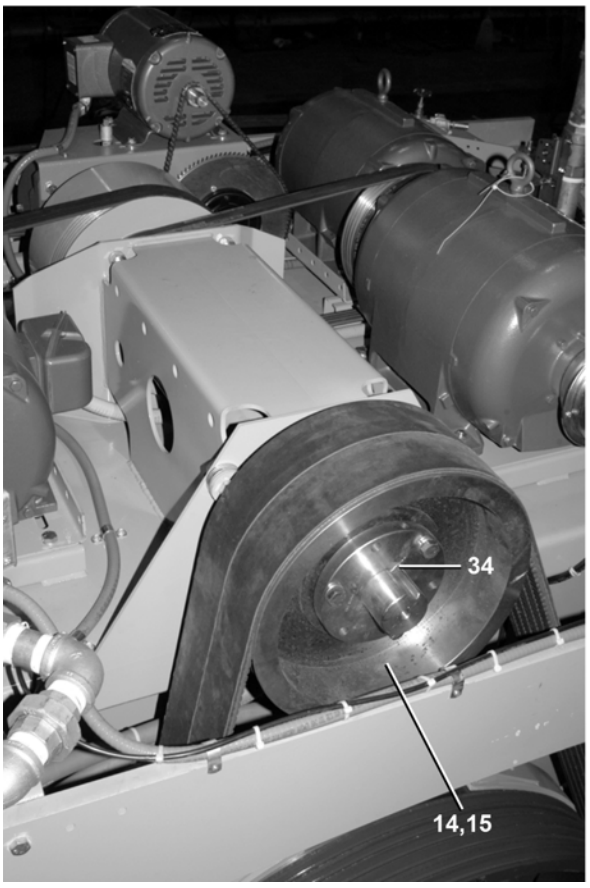
Legend

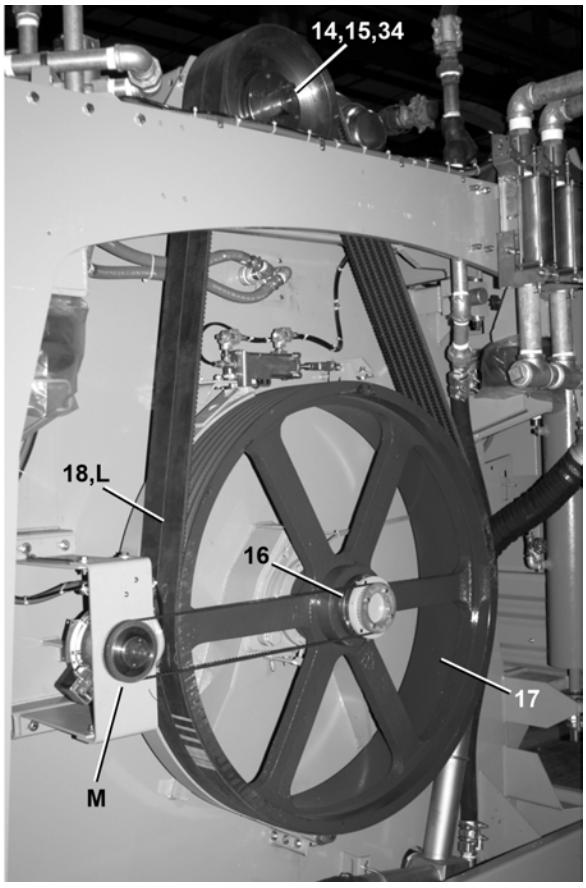
B . . . 4 instances
C . . . Jackshaft
D . . . 5 instances
E1 . . E1 motor
E2 . . E2 motor
F . . . Wash motor
G . . . Autospot drive motor
H . . . Drain motor
J . . . Gear reducer
K . . . Reducer air seal, see BPWG7I04

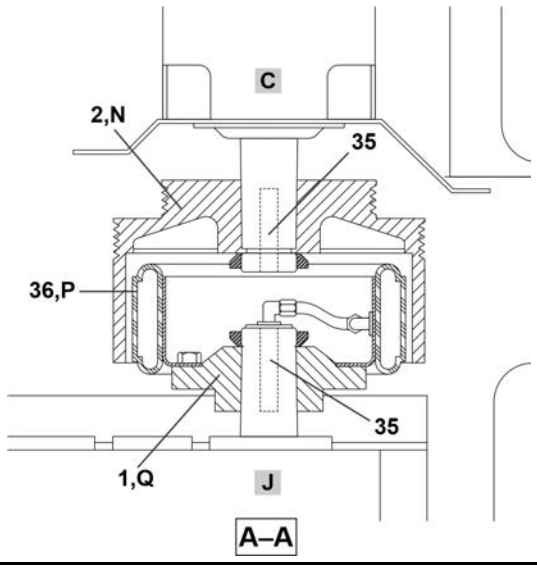
Drive Chart

5 Sheets

72044WP2,WP3,WR2,WR3







Legend

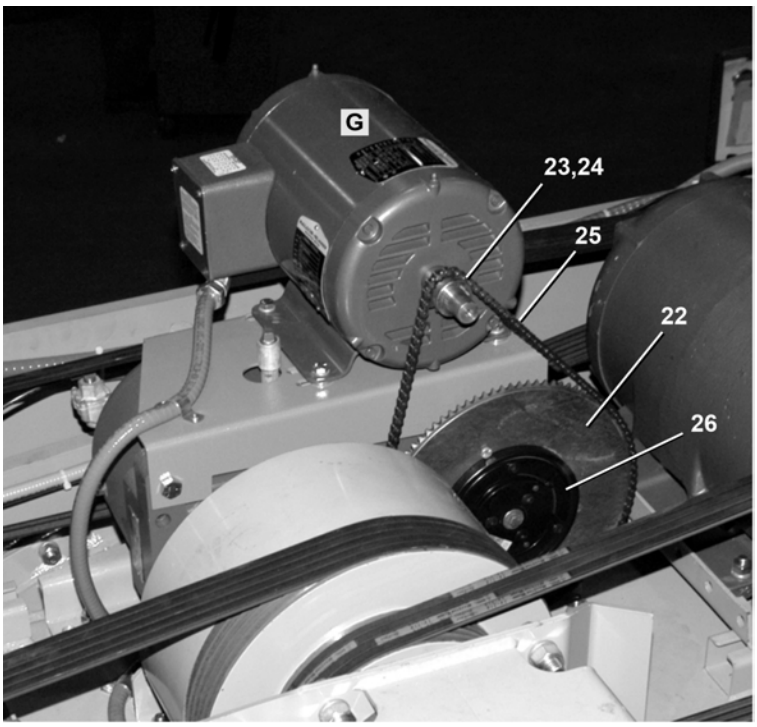
A–A . . Section view A–A: Air Clutch
C . . . Jackshaft
J . . . Gear reducer
L . . . Set of 2
M . . . Autospot sensing unit
N . . . Clutch drum-pulley
P . . . Air clutch
Q . . . Clutch flange

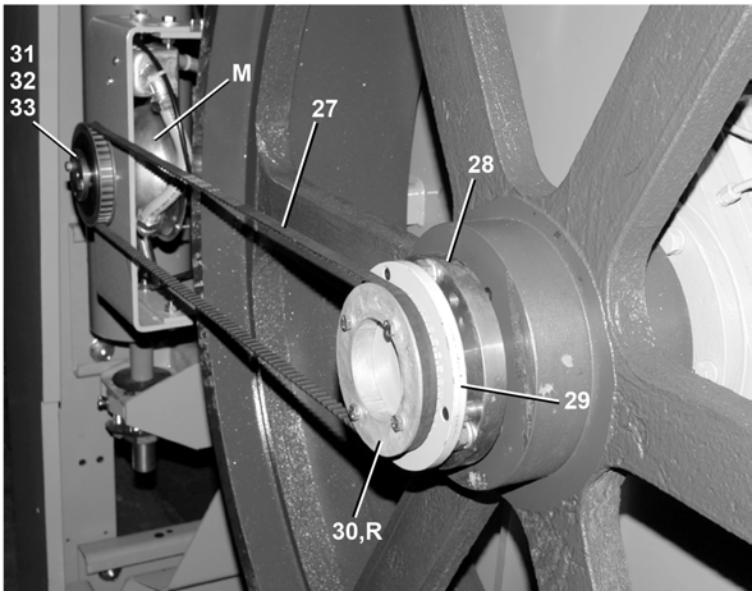
Drive Chart

5 Sheets

72044WP2,WP3,WR2,WR3

Figure 18. Autospot





Legend

G . . . Autospot drive motor

M . . . Autospot sensing unit

R . . . Drive pulley air operated autospot

Drive Chart

5 Sheets

72044WP2,WP3,WR2,WR3

Table 18. Parts List—Drive Chart

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Reference Assemblies				
	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
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	
all	24	15E006	KEY #6 WOODRUFF 5/32X5/8 SAE10	

Drive Chart

5 Sheets

72044WP2,WP3,WR2,WR3

Table 18 Parts List—Drive Chart (cont'd.)

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

Used In	Item	Part Number	Description/Nomenclature	Comments
all	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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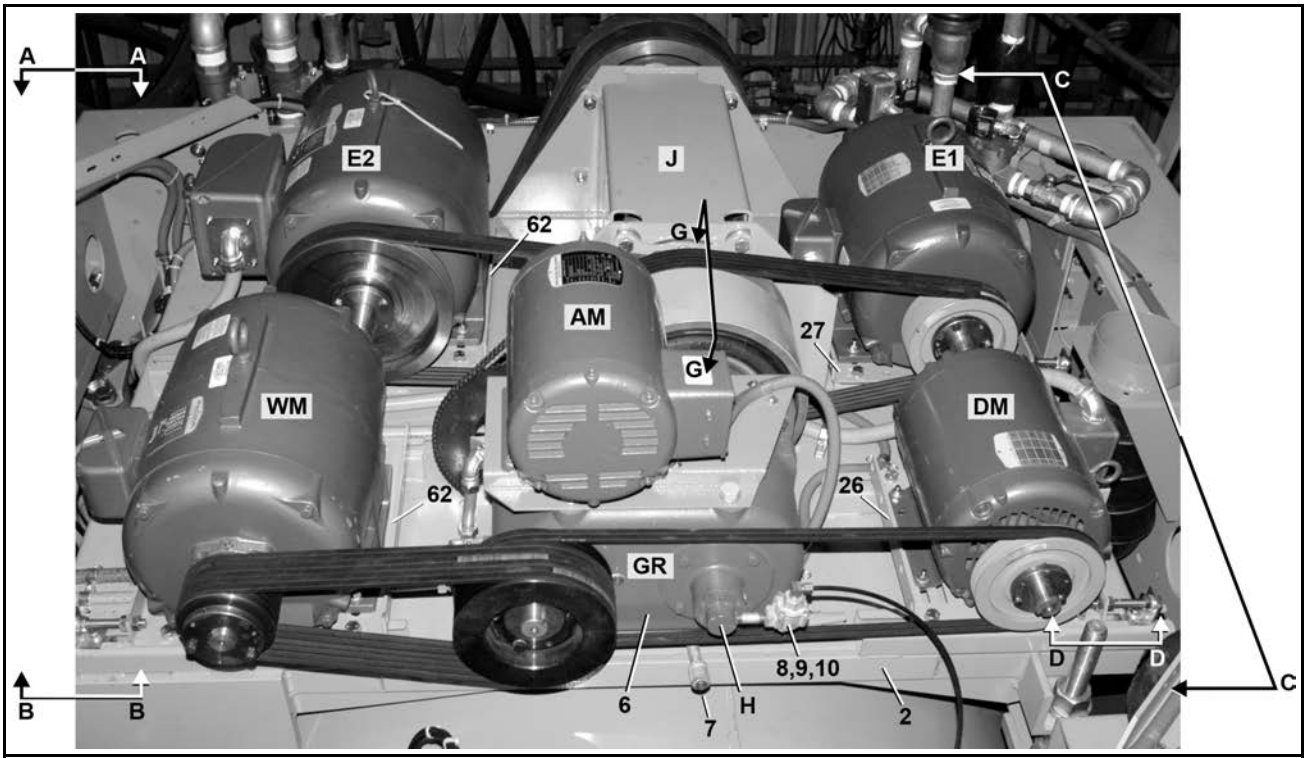
Drive Base

6 Sheets

72044WP2



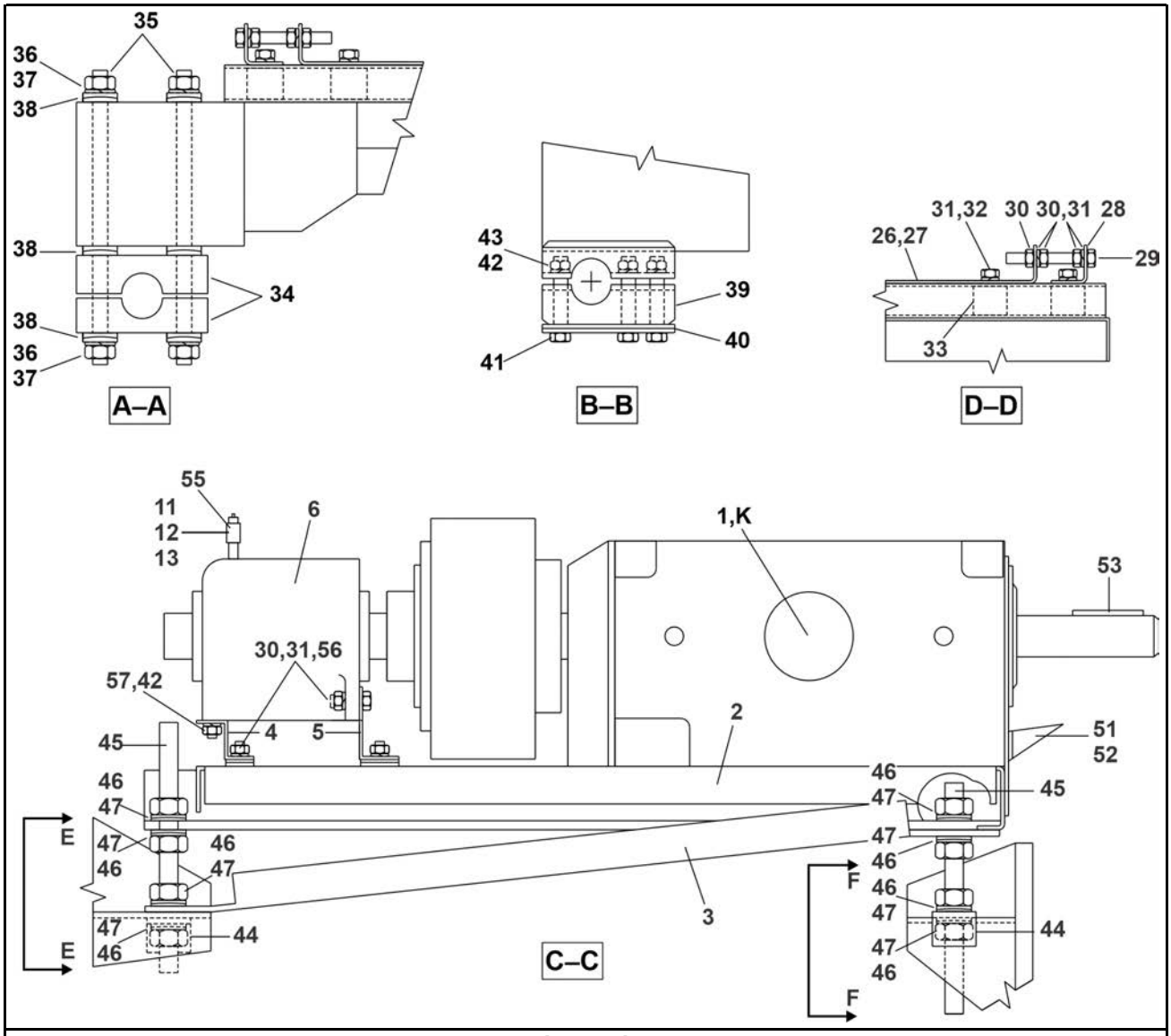
Legend

AM. . Autospot motor
DM. . Drain motor
E1. . E1 motor
E2. . E2 motor
GR. . Gear reducer
H. . . Reducer air seal, see BPWG7I04.
J. . . Jackshaft
WM. . Wash motor

Drive Base

6 Sheets

72044WP2



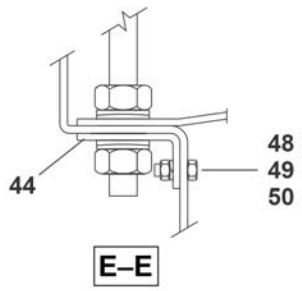
Legend

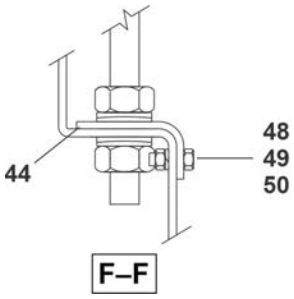
A-A . . Detail view
B-B . . Detail view
C-C . . Detail view
D-D . . Detail view: typical
K. . . Jackshaft, see BPWG7I05.

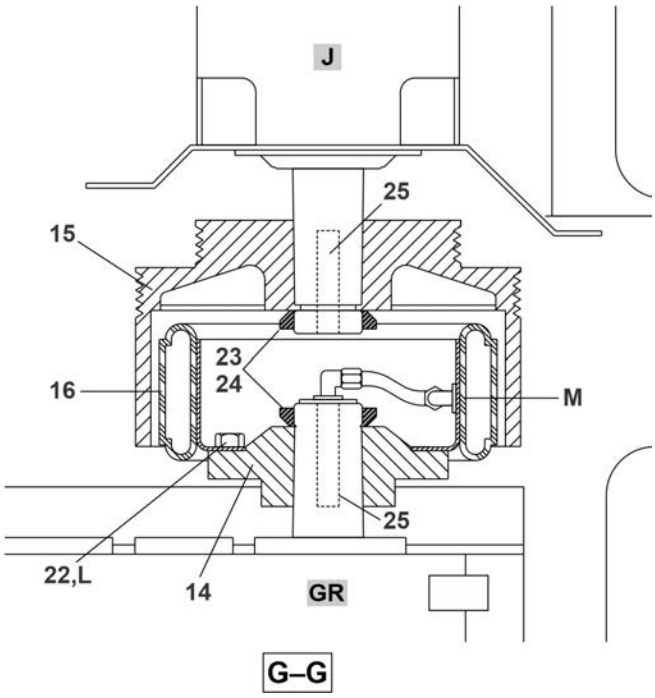
Drive Base

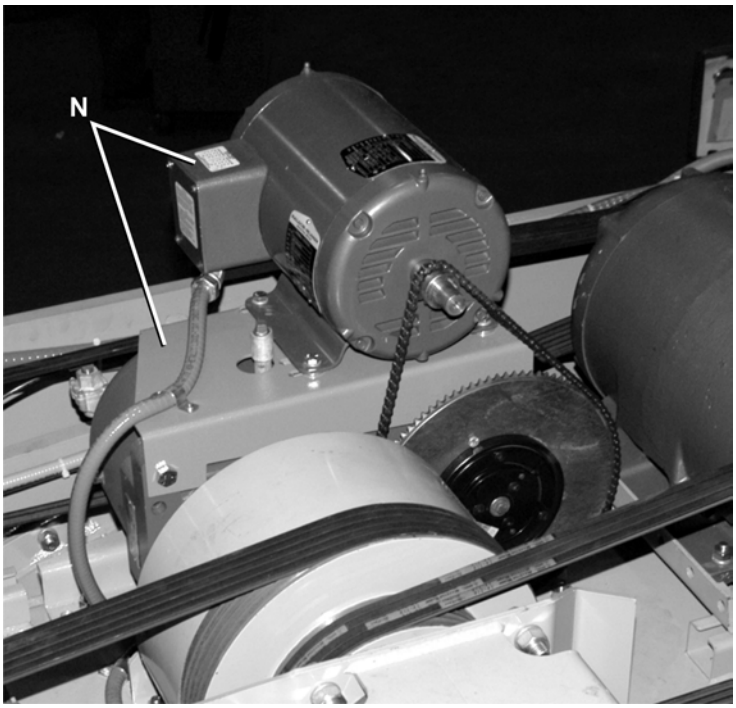
6 Sheets

72044WP2









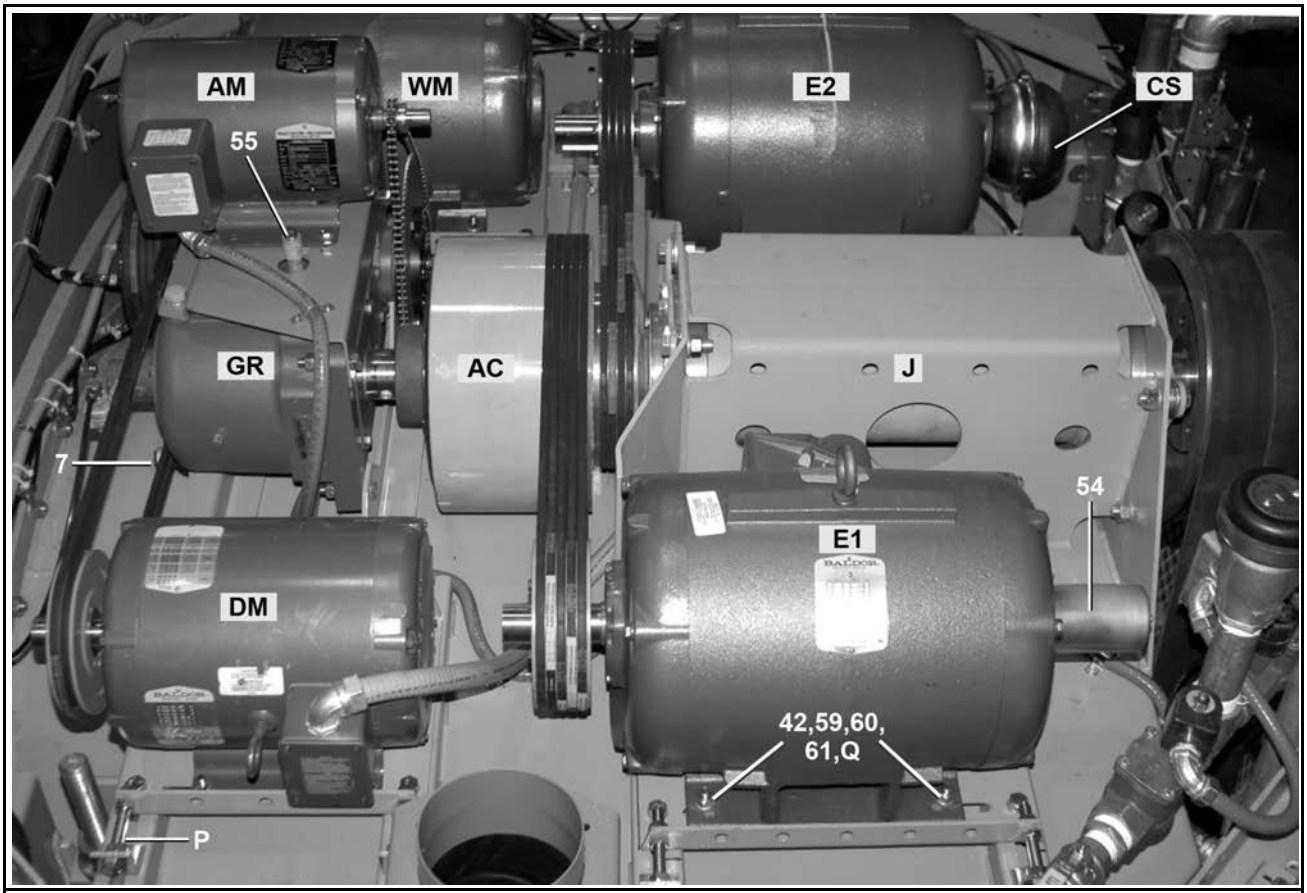
Legend

E–E . . Detail view
F–F . . Detail view
G–G . . Detail view, air clutch
GR . . Gear Reducer
J . . . Jackshaft
L . . . 11 instances
M . . . See BPWG7I03
N . . . Autospot motor, see BPWG7I06.

Drive Base

6 Sheets

72044WP2



Legend

AC . . Air clutch
AM . . Autospot motor
CS . . Centrifugal switch
DM . . Drain motor
E1 . . E1 motor
E2 . . E2 motor
GR . . Gear reducer
J . . . Jackshaft
P . . . Typical, see detail D–D.
Q . . . Typical
WM . . Wash motor

Drive Base

6 Sheets

72044WP2

Table 19. Parts List—Drive Base

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Reference Assemblies				
	A	SA 36 009	*DRIVE ASSY=7244 WED	
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	DELTROL 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@PRINT	
all	28	02 19288	BRACKET=ADJUSTING-1.5X1.75	
all	29	15D119	HXTAPSCR 1/2-13X4 GR5 ZNC FTL	
all	30	15G230	HXNUT 1/2-13UNC2B SAE ZINC GR2	
all	31	15U300	LOKWASHER REGULAR 1/2 ZINC PLT	

Drive Base

6 Sheets

72044WP2

Table 19 Parts List—Drive Base (cont'd.)

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

Used In	Item	Part Number	Description/Nomenclature	Comments
all	32	15K151	HXCAPSCR 1/2-13UNC2AX1.25 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	SQNUT 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 1/2-13X2ZINC 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	

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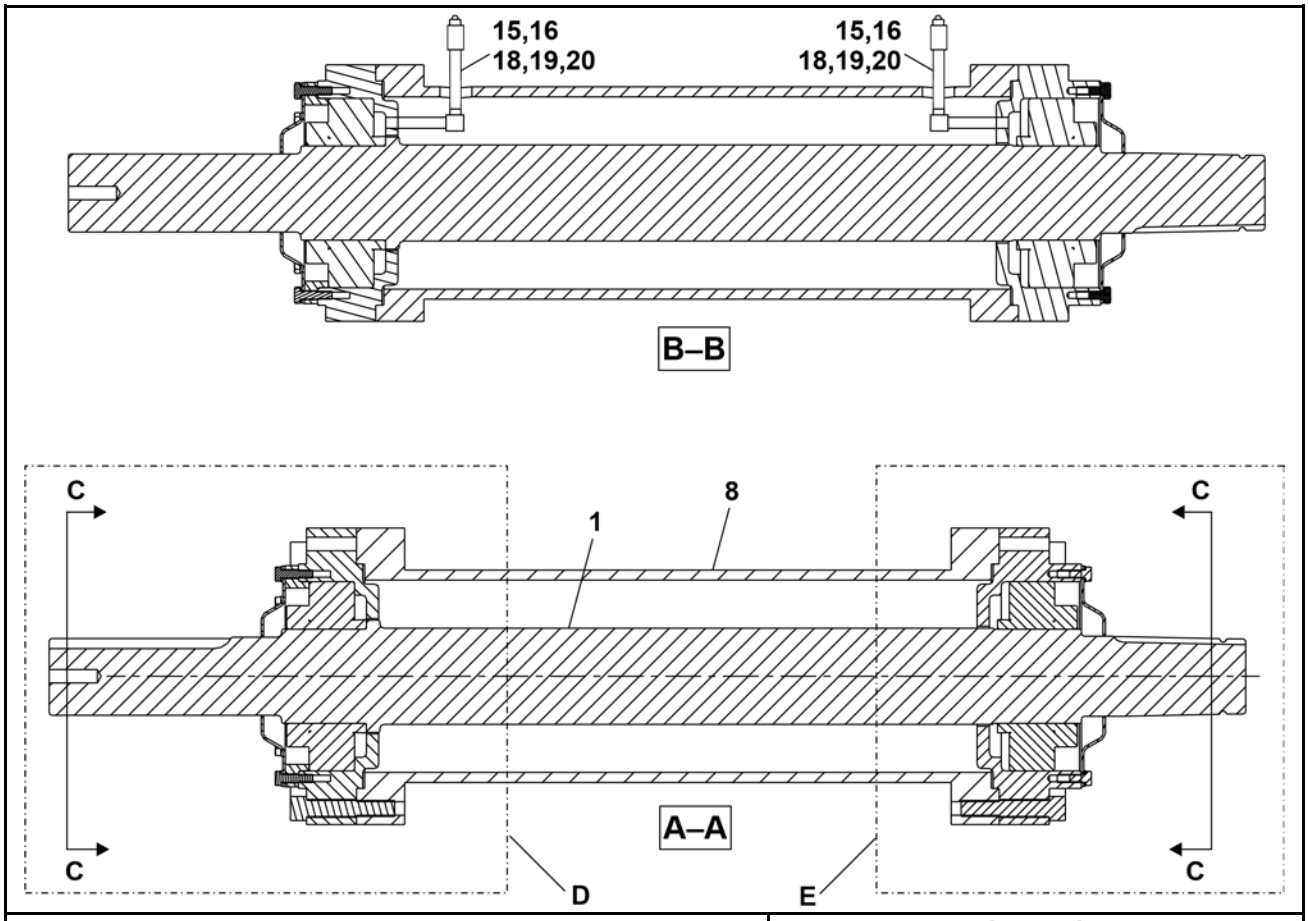
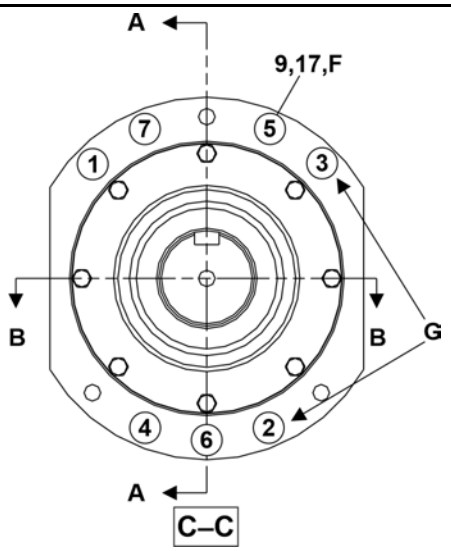
Jackshaft

3 Sheets

72044WR2, 72044SR2

Figure 19. Cross Section Views





Legend

D . . . See Detail D

E . . . See Detail E

F . . . 14 instances

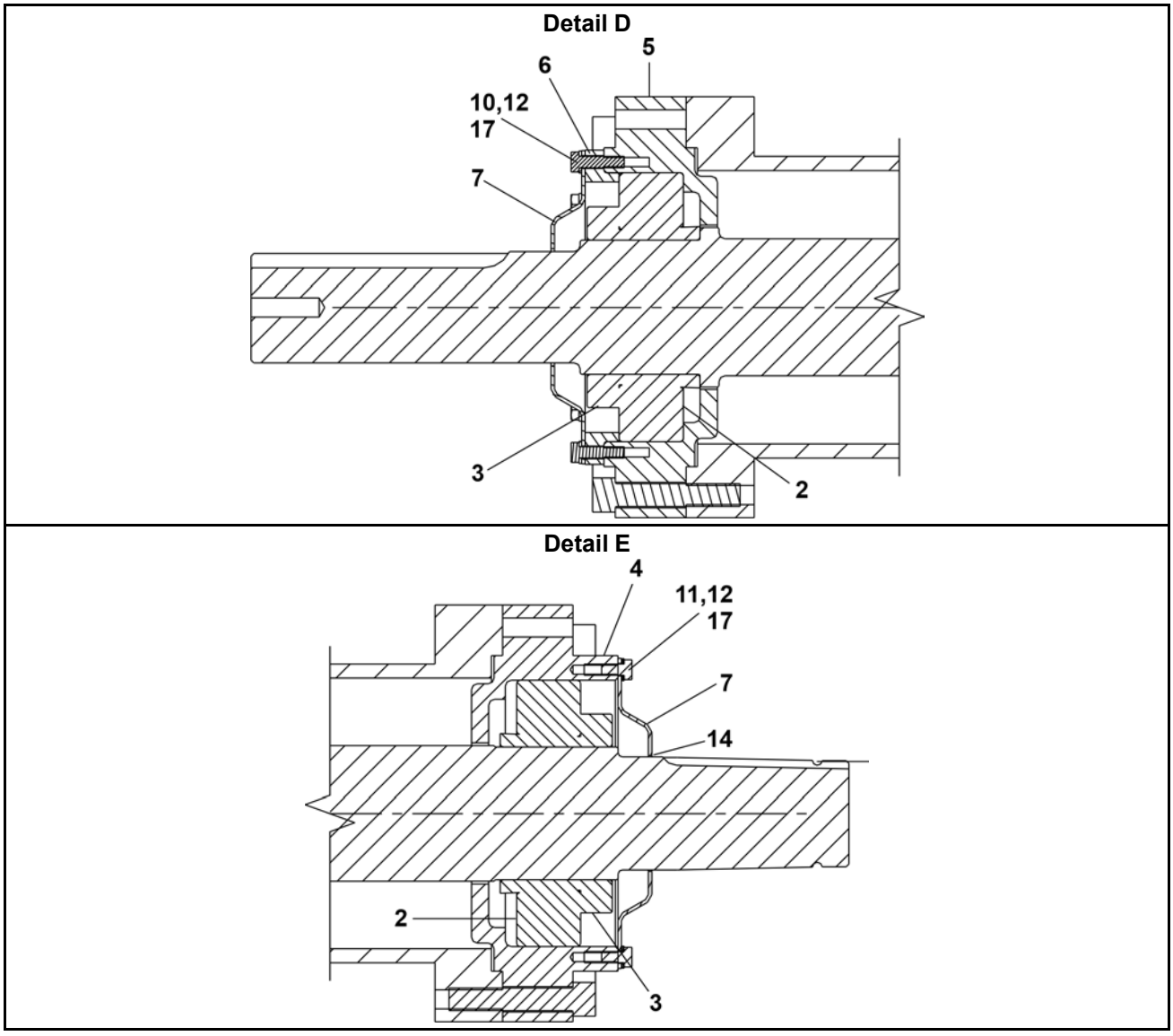
G . . . Insert all 1/2” fasteners hand tight. Then torque in the sequence shown, front and back.

Jackshaft

3 Sheets

72044WR2, 72044SR2

Figure 20. Detail Views



Jackshaft

3 Sheets

72044WR2, 72044SR2

Table 20. Parts List—Jackshaft

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Reference Assemblies				
	A	ABJ25004	JKSHAFT-BRGHOUS-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 ZINCPL	
all	11	15K030	HEXCAPSCR 1/4-20UNC2X1/2 GR5 Z	
all	12	15K041	HXCAPSCR 1/4-2OUNC2AX1 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	

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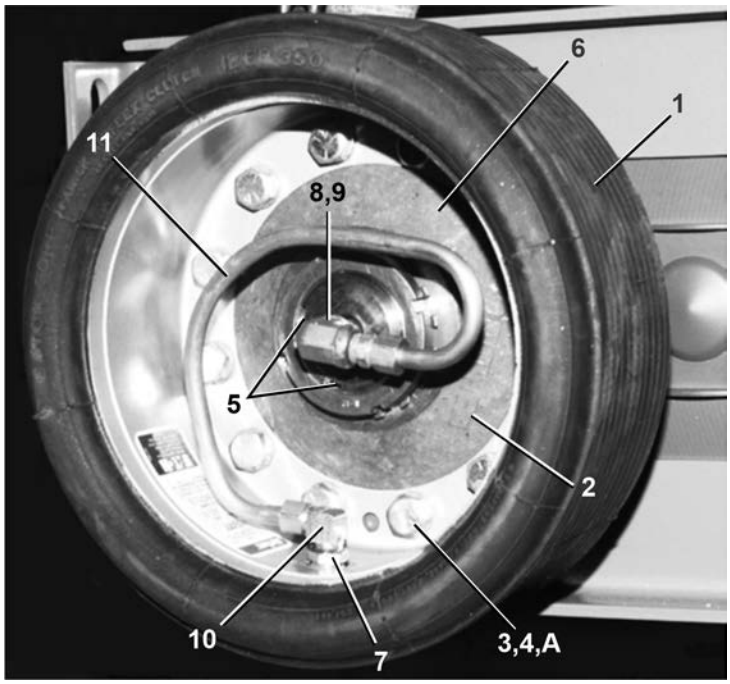
Air Clutch

1 Sheet

72044WR2, 72044SR2



Legend

A . . . 12 instances

Table 21. Parts List—Air Clutch

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

Used In	Item	Part Number	Description/Nomenclature	Comments
Reference Assemblies				
	A	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 1/2-13UNC2AX1.25 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	

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Reducer Air Seal

1 Sheet

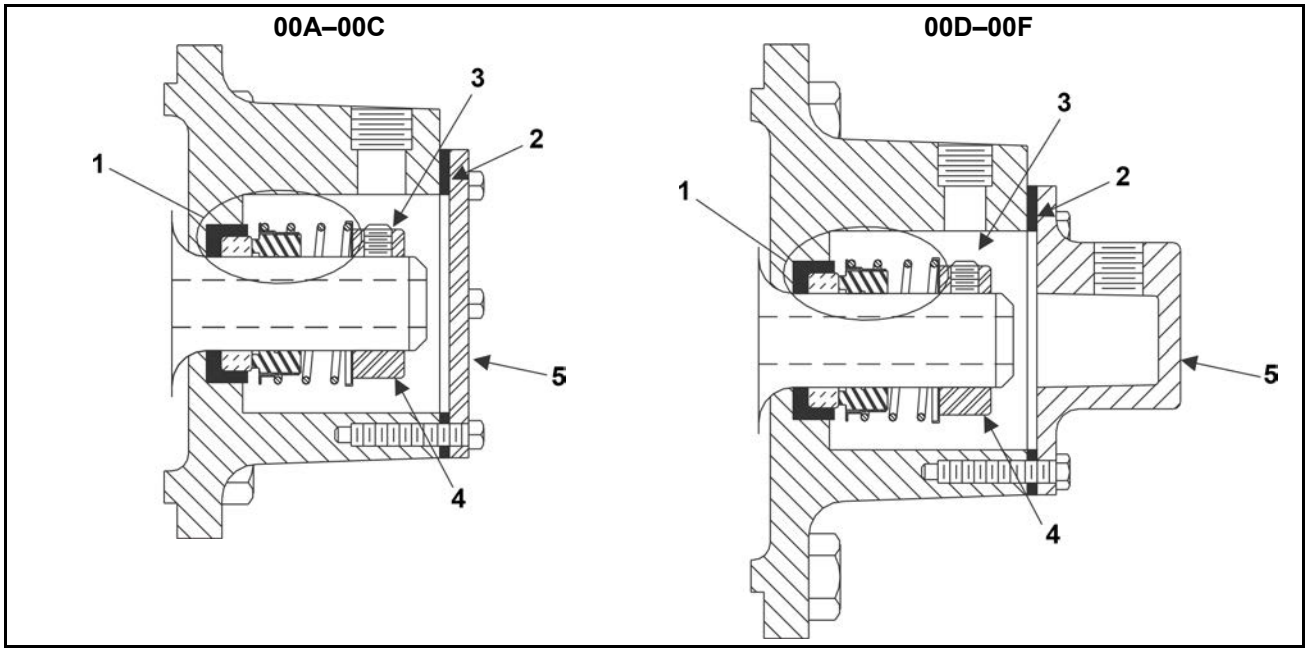

Table 22. Parts List—Reducer Air Seal

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Reference Assemblies				
	A	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
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

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Brake Components and Installation

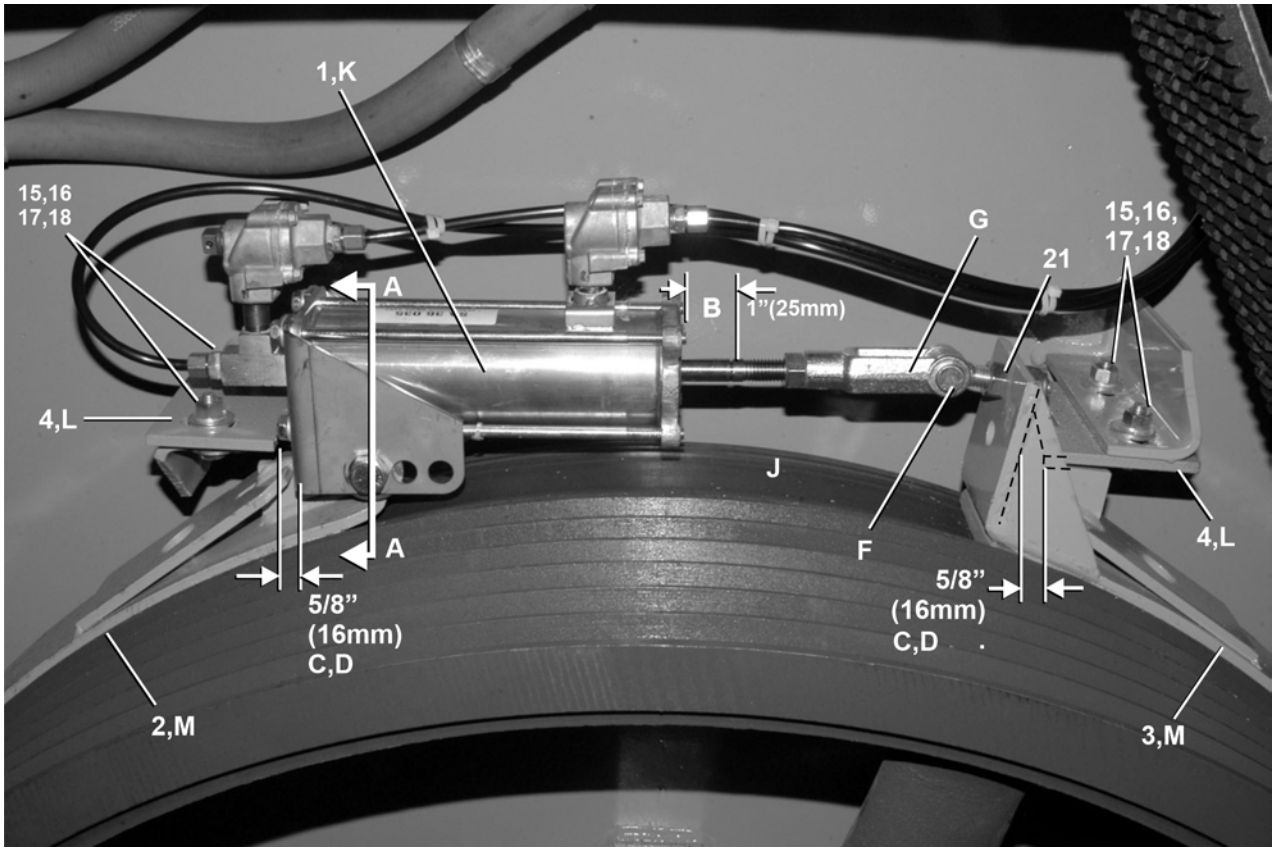
5 Sheets

6044WP2, 6044WP3, 7244WP2, 7244WP3

NOTE: The 6044WP2 or 6044WP3 model is shown. The air cylinder and mounting brackets are opposite for the 7244WP2 or 7244WP3 model.

Figure 21. Brake Components

Installed View



Legend

A–A . . Air cylinder cross section. See Figure 22: Brake Band, page 58

B . . . 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.

C . . . With the brake applied, the brake stops must be 5/8 inch +/-1/16 inch [16mm+/- .5mm] from the brake bands.

D . . . When you release the brake, the brake band and the air cylinder must be tight and square against the stops.

F . . . Pivot bolt. See Figure 23: Air Cylinder, page 58

G . . . Yoke. Keep the two yoke arms in a horizontal plane.

J . . . See Figure 22: Brake Band, page 58

K . . . See BPWD6P03 Air Cylinder Assemblies

L . . . Brake stop

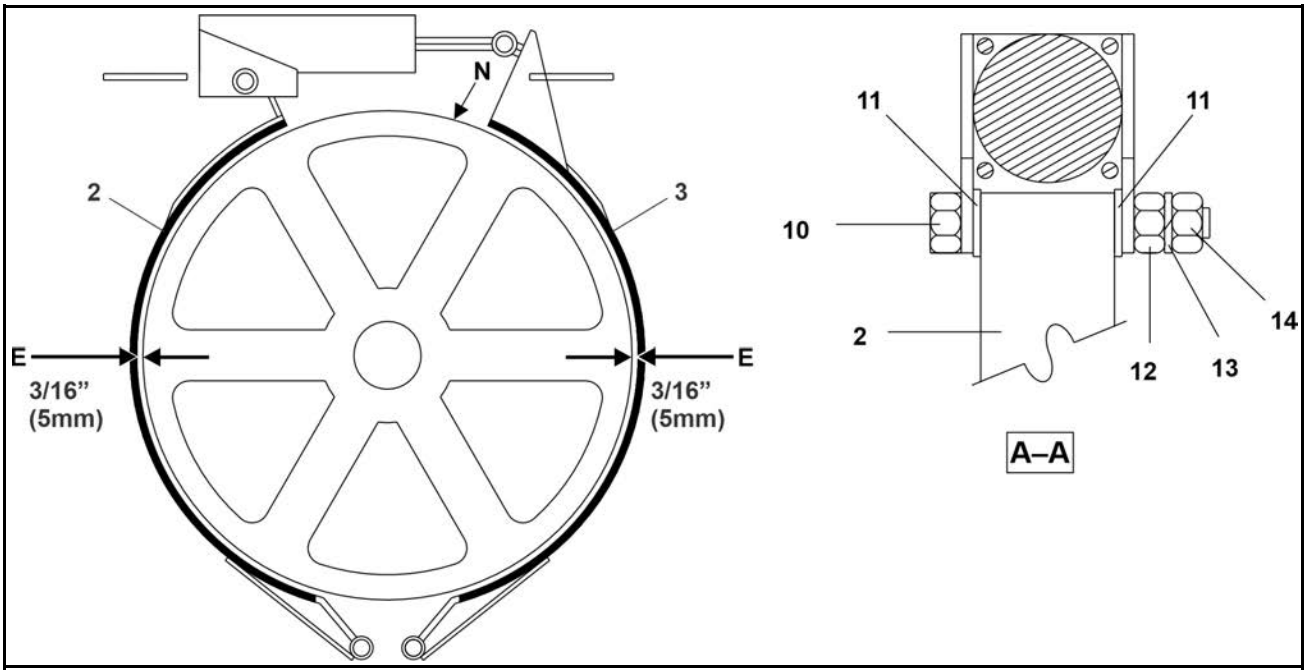
M . . . Brake band. See Figure 22: Brake Band, page 58

Brake Components and Installation

5 Sheets

6044WP2, 6044WP3, 7244WP2, 7244WP3

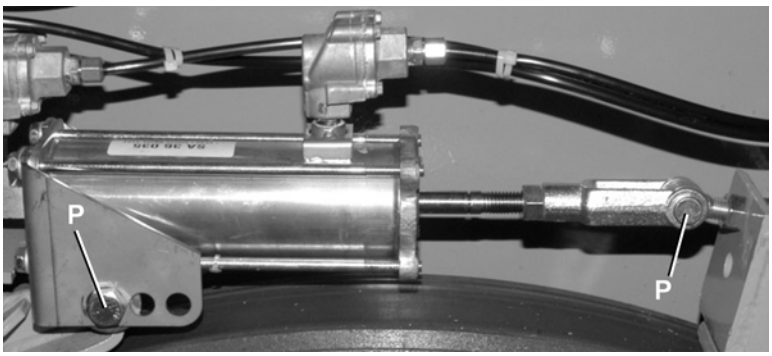
Figure 22. Brake Band



Legend

E . . . When you release the brake, there must be 3/16 inch [5mm] clearance between the brake band and the drum.
N . . . Do not get grease or oil on the brake drum.

Figure 23. Air Cylinder



Legend

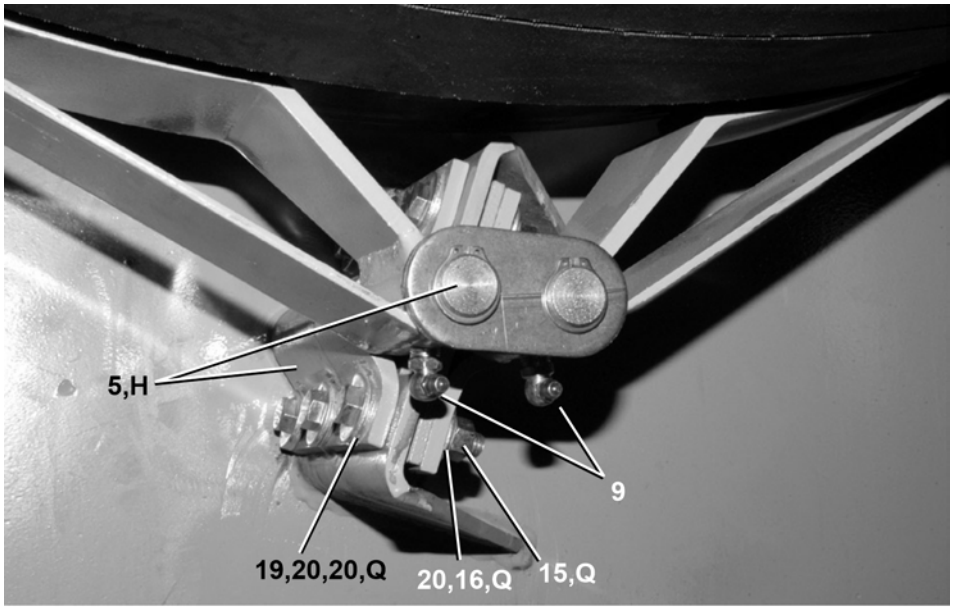
P . . . Do not tighten the pivot bolt too much. The air cylinder must move easily around the bolt.

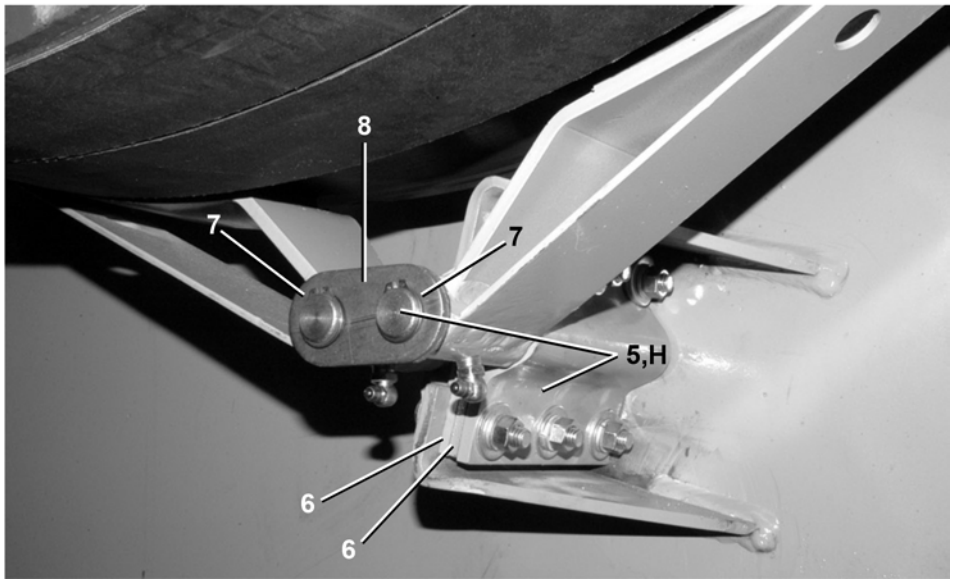
Brake Components and Installation

5 Sheets

6044WP2, 6044WP3, 7244WP2, 7244WP3

Figure 24. Brake Band Hinge Pins





Legend

H . . . Hinge pins. Brake bands must move easily about the hinge pins

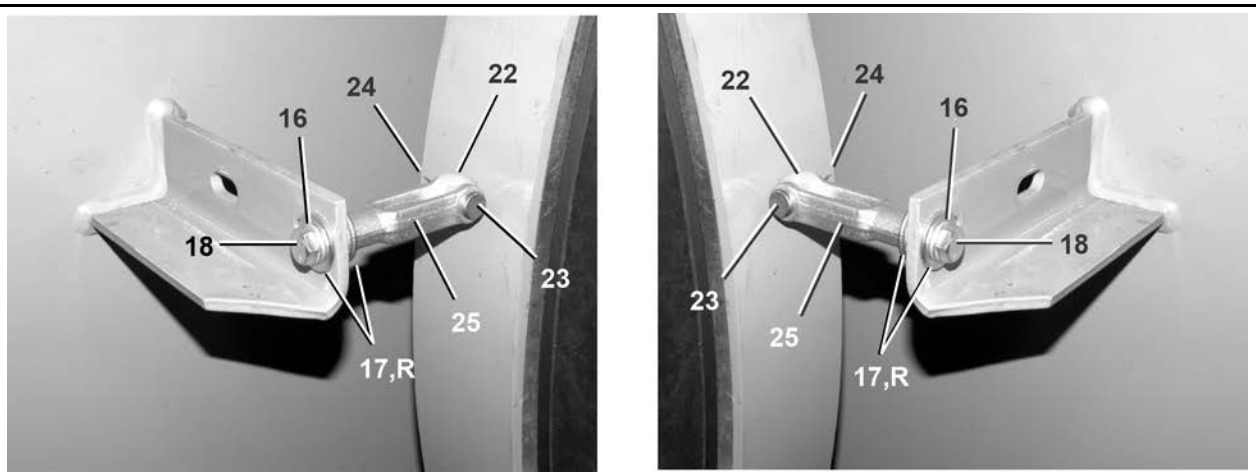
Q . . . Typical 6 instances

Brake Components and Installation

5 Sheets

6044WP2, 6044WP3, 7244WP2, 7244WP3

Figure 25. Roller (Models: 7244WP2, 7244WP3)



Legend

R . . . As required

Table 23. Parts List—Brake Components and Installation

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

Used In	Item	Part Number	Description/Nomenclature	Comments
			Reference Assemblies	
	A	AD 28 151	BRAKE INSTALLATION=WED + WEH	
	B	AD 36 043	BRAKE INSTALLATION=7244WED	
			Components	
all	1	SA 28 152	* BRAKE AIRCYL 2-WAY 60WE2+3	
all	1	SA 36 035	* AIRCYL=BRAKE ASSY	
all	2	SA 28 153N	*BRAKEBAND RT(NON-ASB)52+60WE	
all	2	SA 36 008N	*BRAKEBAND RT(NON-ASB)72W+T+D	
all	3	SA 28 154N	*BRAKEBAND LT(NON-ASB)52+60WE	
all	3	SA 36 007N	*BRAKEBAND LT(NON-ASB)72W+T+D	
all	4	02 175080	PLATE-BRAKE STOP	
all	5	W2 18661	* WELDMENT=BRAKE HINGE PIN	
all	6	02 18786	SHIM=BRAKE BAND 60+72WE	
all	7	17B062	EXTRETRING S/S INDUST#3100-75-	
all	8	02 18516B	WASHER=BRAKE BAND PIN +$10SU	
all	9	54M025	HYDFIT 1/8"-90 ALEMITE 1613-B	
all	10	15D119	HXTAPSCR 1/2-13X4 GR5 ZNC FTL	
all	11	15U280	FL+WASHER(USS STD)1/2 ZNC PL+D	
all	12	15G230	HXNUT 1/2-13UNC2B SAE ZINC GR2	

Brake Components and Installation

5 Sheets

6044WP2, 6044WP3, 7244WP2, 7244WP3

Table 23 Parts List—Brake Components and Installation (cont'd.)

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

Used In	Item	Part Number	Description/Nomenclature	Comments
all	13	15U300	LOKWASHER REGULAR 1/2 ZINC PLT	
all	14	15G231	HXFINJAMNUT 1/2-13UNC2B ZINC G	
all	15	15G205	HXNUT 3/8-16UNC2B ZINC GR2	
all	16	15U255	LOCKWASHER MEDIUM 3/8 ZINCPL	
all	17	15U240	FLATWASHER(USS STD) 3/8" ZNC P	
all	18	15K105	HXCAPSCR 3/8-16UNC2A1.25 GR5 P	
all	19	15K117	HEXCAPSCR 3/8-16X1+3/4 GR 5 PL	
all	21	15G234N	HXLOCKNUT NYL 1/2-13UNC2 STL/Z	
all	22	02 18689	ROLLER-BRAKE ADJUST (NYLON)	
all	23	17A030	CLEVIS PIN 3/8"X1+3/32"DRIL SS	
all	24	15H030	STDCOTTERPIN 3/32X3/4 ZINCPL	
all	25	17A010	ADJ YOKE 3/8-16 EMPIGARD COAT	

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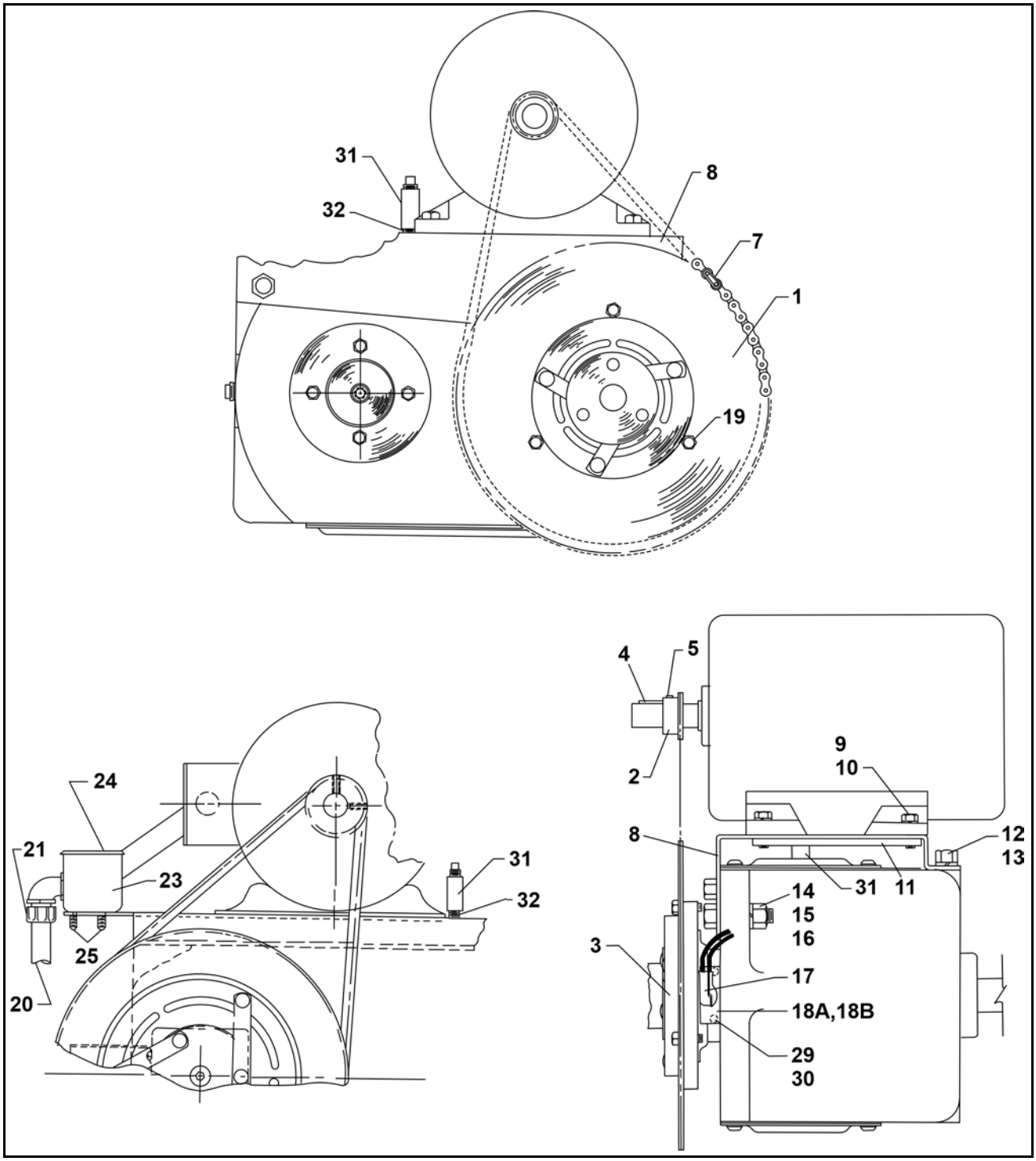
Autospot Drive Motor

2 Sheets

72044WR2, 72044SR2



Autospot Drive Motor

2 Sheets

72044WR2, 72044SR2

Table 24. Parts List—Autospot Drive Motor

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Reference Assemblies				
	A	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 1/4-2OUNC2AX1 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	

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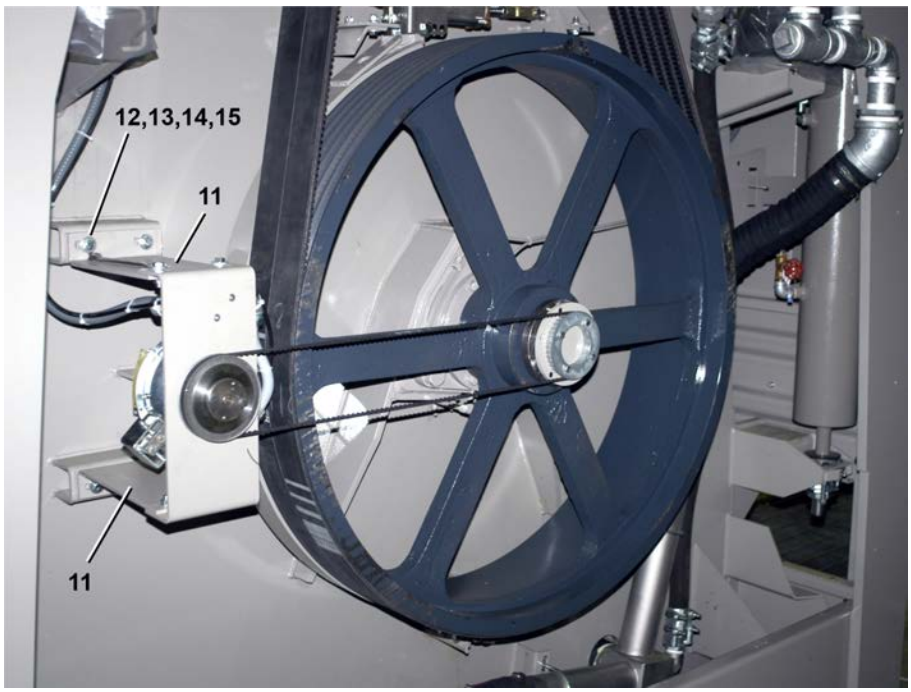
Autospot Sensing Unit

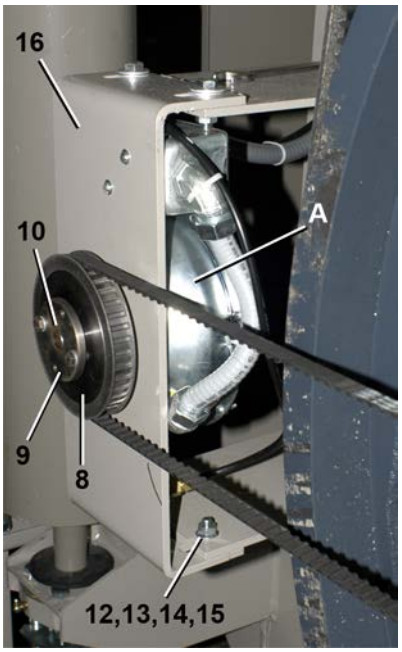
5 Sheets

72044WP2, WR2

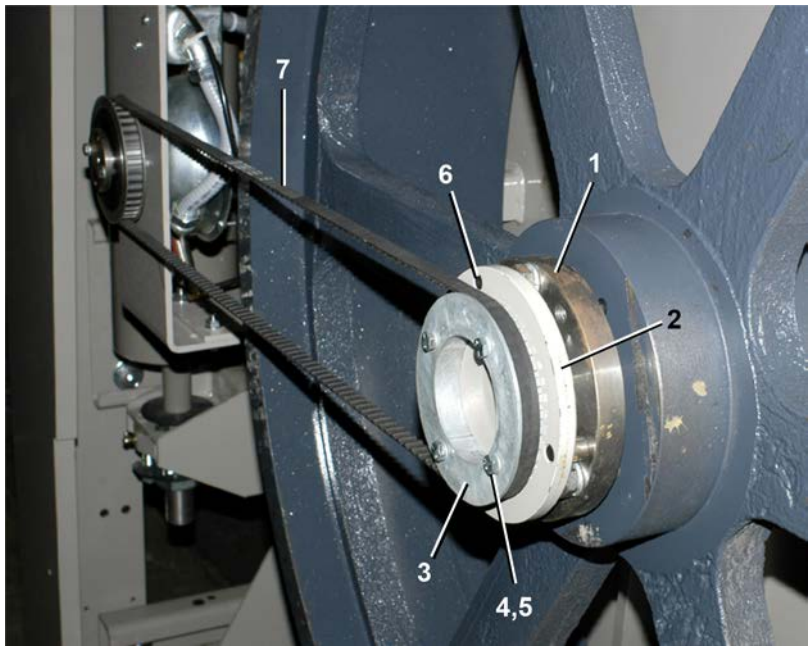
Figure 26. Sensing Unit Installation and Drive Components



Sensing Unit Mounting



Autospot Drive Pulley



Legend

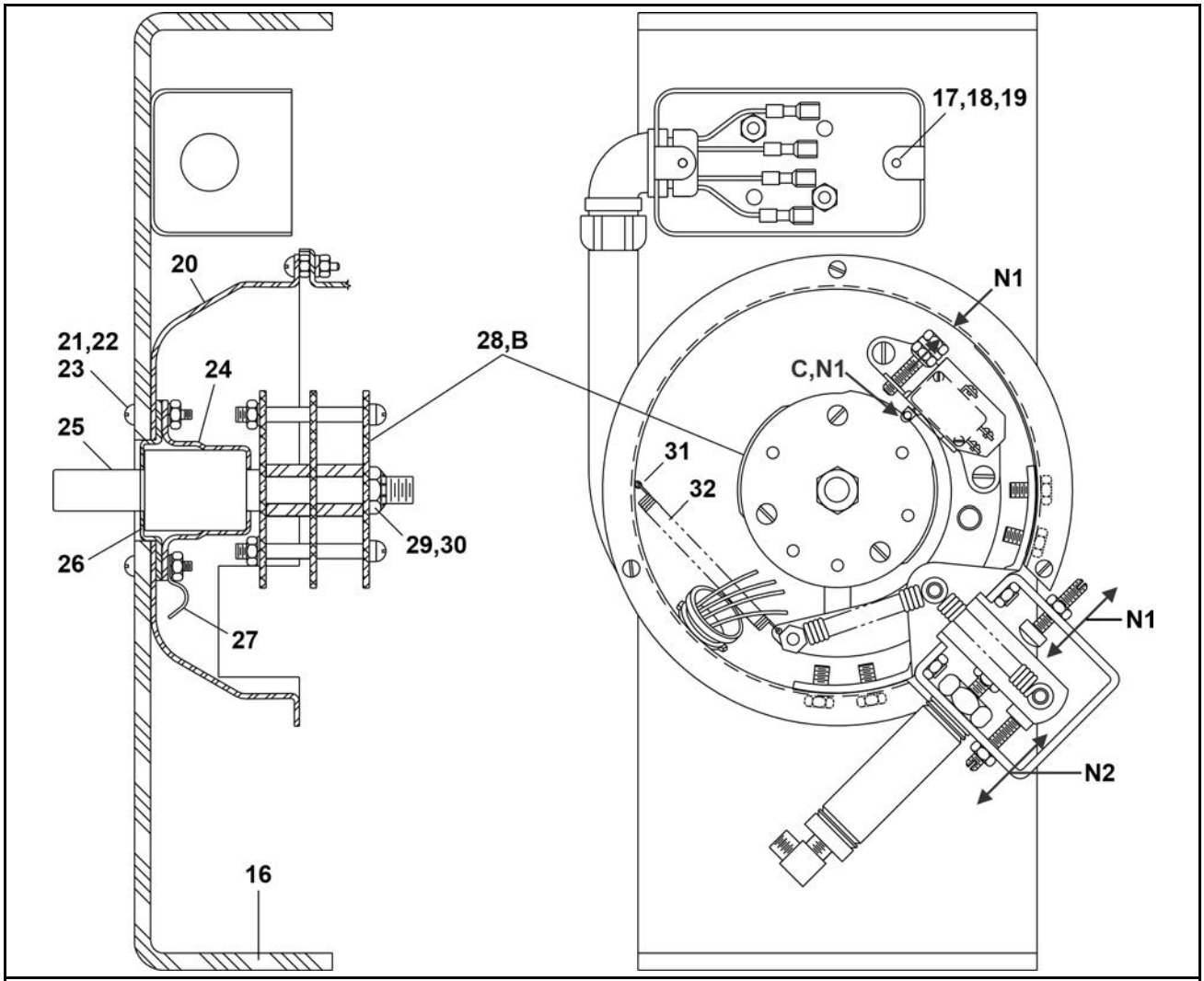
A . . . Sensing unit

Autospot Sensing Unit

5 Sheets

72044WP2, WR2

Figure 27. Sensing Unit: Switch Assembly and Cam



Legend

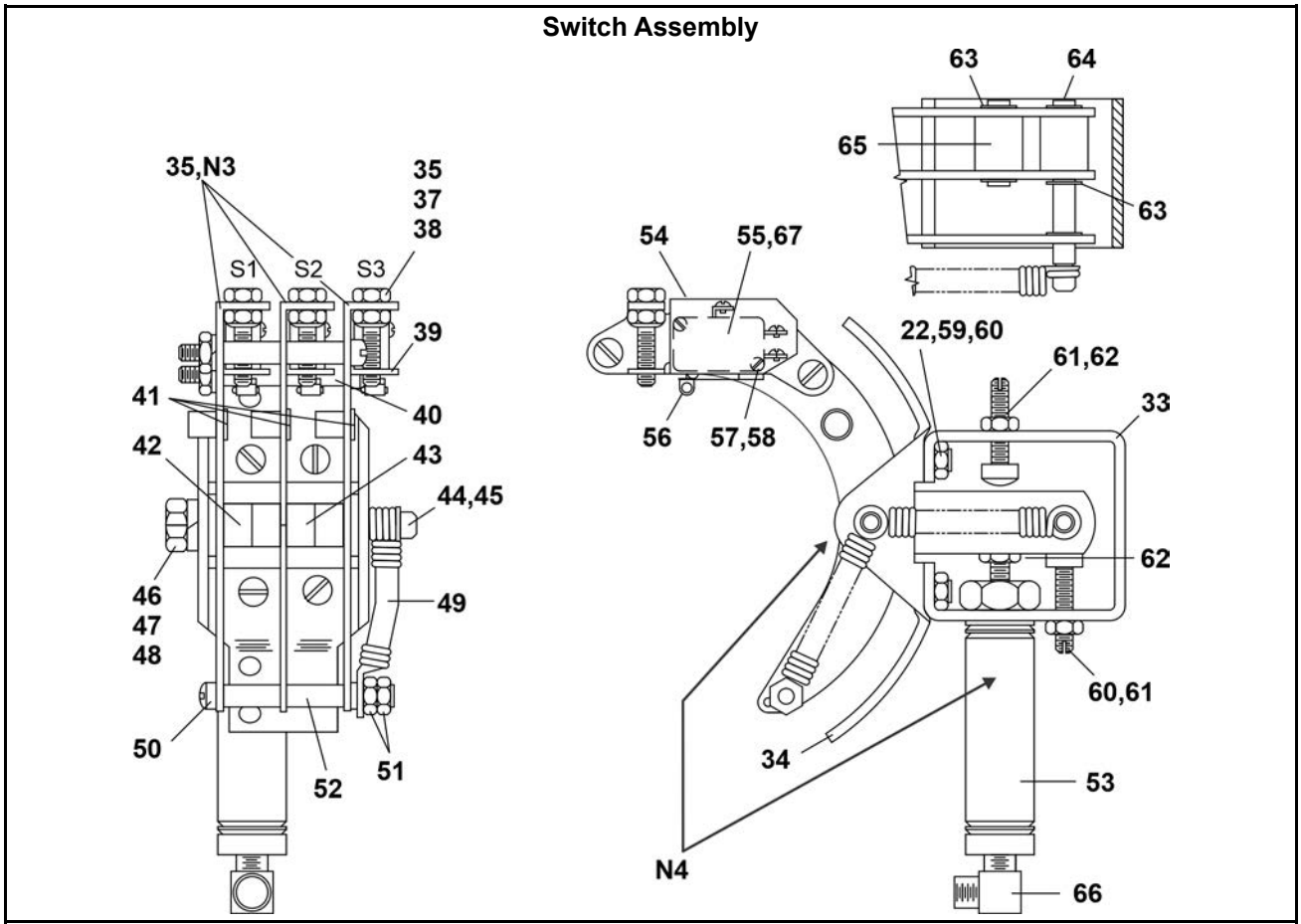
B . . . Cam
C . . . Cam follower, see note 1.
N1 . . Adjust the cam follower to just contact the lower part of the cam when the air cylinder is actuated.
N2 . . Adjust the inner switch (S1) to clear the housing.

Autospot Sensing Unit

5 Sheets

72044WP2, WR2

Figure 28. Sensing Unit: Switch Assembly and Cam



Legend

N3 . . Loosen locknuts and adjust allen head screws as necessary to spot the cylinder in the correct position. On some machines, S3 is not used.

N4 . . Lubricate once a month with a few drops of light lubricating oil.

Autospot Sensing Unit

5 Sheets

72044WP2, WR2

Table 25. Parts List—Autospot Sensing Unit

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
			Reference Assemblies	
	A	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 1/4-2OUNC2AX1 GR 5 ZI	
all	5	15U183	LOKWASH EXTOOTH 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	HXCPSCR 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/	

Autospot Sensing Unit

5 Sheets

72044WP2, WR2

Table 25 Parts List—Autospot Sensing Unit (cont'd.)

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

Used In	Item	Part Number	Description/Nomenclature	Comments
all	30	15U238	LOKWAS INTOOTH 3/8" (US STD) 4	
all	31	15H040	STDCOTTERPIN 1/8X3/4 ZINCPL	
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	

Autospot Sensing Unit

5 Sheets

72044WP2, WR2

Table 25 Parts List—Autospot Sensing Unit (cont'd.)

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
all	65	03 01333	PIVOT=AIRCYL=AIROP AUTOSPOT	
all	66	53A031B	BODY-EL90MALE.25X1/8 #269C-42B	

3 Bearing Assemblies

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3.1 Main Bearing and Seal Replacement for Divided Cylinder Machines

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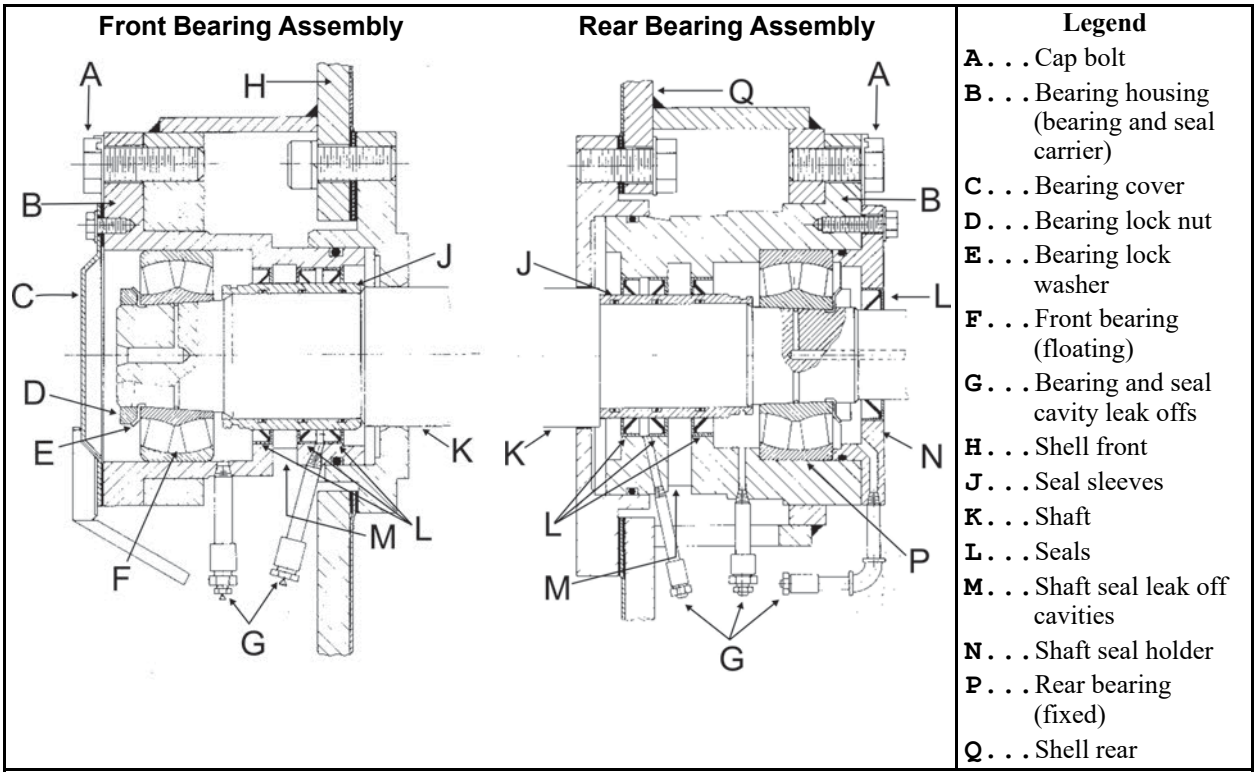
This section applies to the front and rear cylinder shaft bearings of all divided cylinder machines (Rapid Load, Staph Guard®, dye machines, etc.). It does not apply to jackshaft bearings, idler shaft bearings or bearings on open pocket machines.

The bearings covered by this section are double row, spherical roller, self aligning bearings; Koya, SKF, FMC, Torrington or equal. Referring to Figure 29, page 71, 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 lock washer and lock nut.

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 29, page 71.

Figure 29. 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 29, page 71. 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.

3.1.1 Removing the Bearing (Front or Rear)

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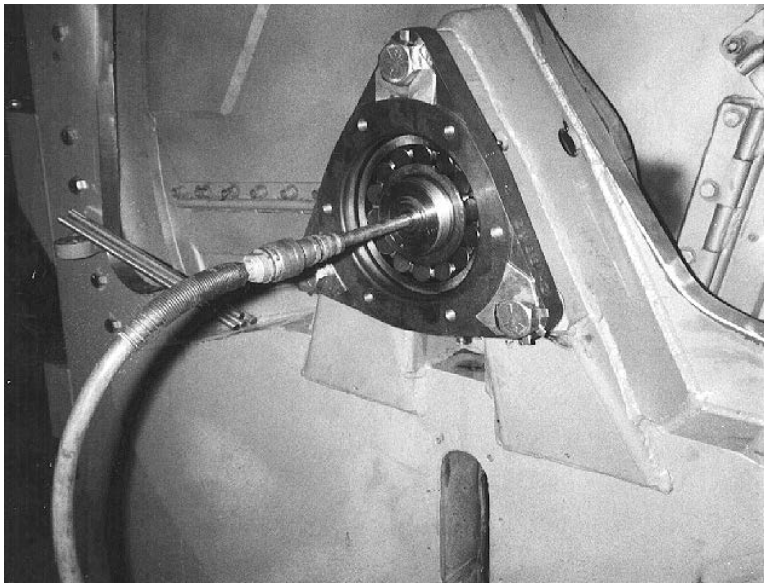
1. Loosen, then remove the main drive belts and cylinder shaft pulley (if applicable) by lowering the drive base with the jacking bolts. Do not attempt to pry belts off with a pry bar or by rolling the sheave. Remove the bearing cover (or shaft seal holder) to expose the bearing.
2. Bend back the locking tang on the bearing lock washer then remove the lock nut and lock washer.
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 30: Connection From Hydraulic Pump to Assist in Bearing Removal, page 72 . Using a “Porta 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 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.

Figure 30. Connection From Hydraulic Pump to Assist in Bearing Removal



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

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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 31, page 73.
2. Install the pulling fixture as shown in Figure 32, page 73, 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 31. Two Bearing Housing Guide Rods in Position

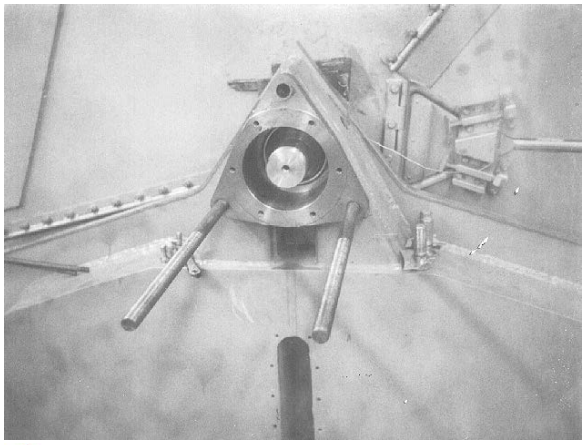
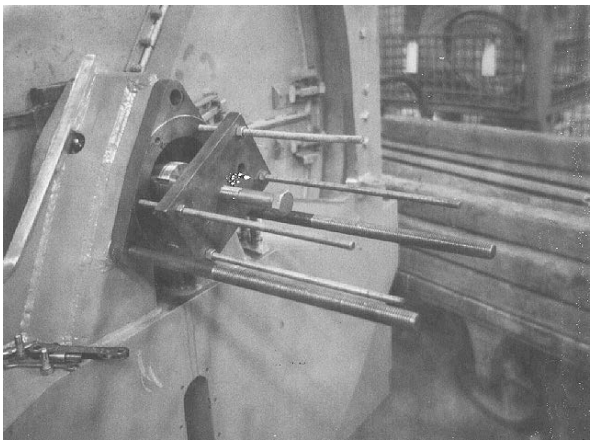


Figure 32. Bearing Housing Pulling Fixture in Position



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.

a. Tighten all four hex nuts 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

b. If no impact wrench is available, simply continue to tighten down on each of the four hex nuts 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.

3.1.3 Precautions for Bearing Replacement

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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	Tricholorethylene
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.

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

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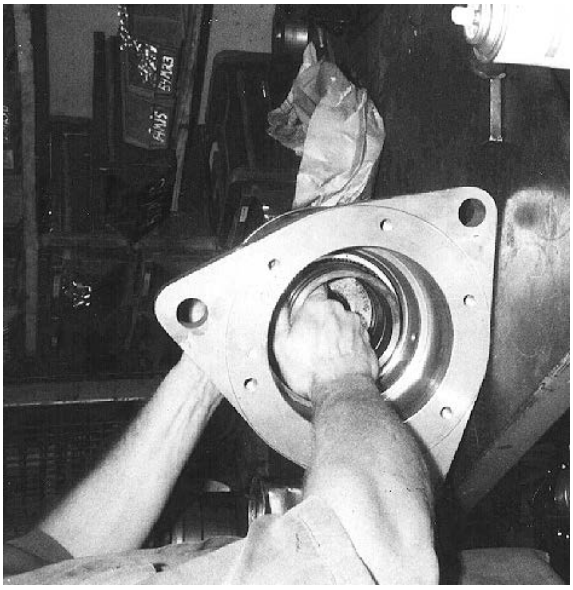
1. With the seal sleeve removed, press all old seals out of the bearing housing. Remove the large o-ring from the outside of the housing. Thoroughly clean the bearing housing and flush out all grease passages to make certain they are unblocked. Remove the o-rings from the inside of the seal sleeve and 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 33, page 75.

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 34, page 75, 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 33. Installing Seals in Bearing Housing

Figure 34. Installing Seal Sleeve in Bearing Housing

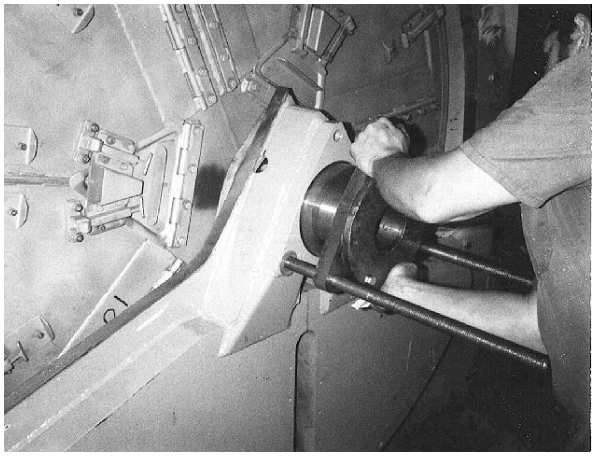


NOTE: If both housings are being installed, install the rear housing first.

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 35, page 76. 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 36, page 76. 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.

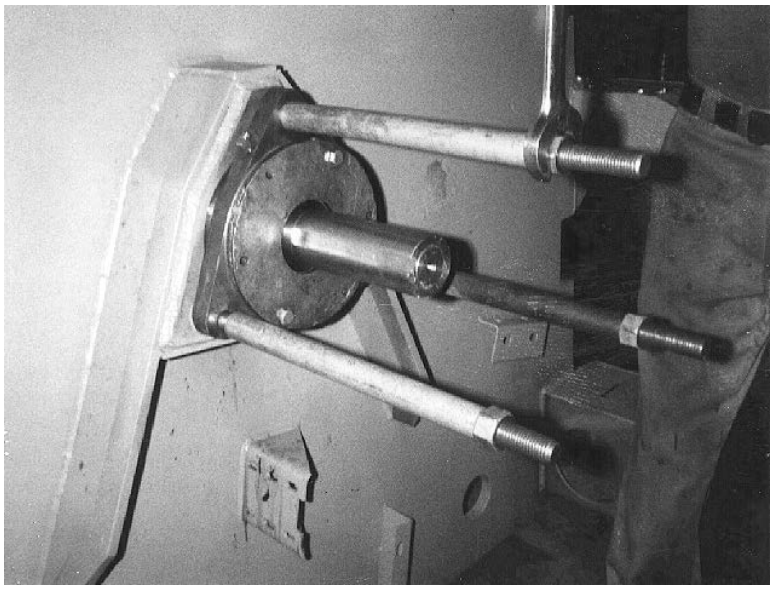
Figure 35. Installing the Bearing Housing Setting Fixture onto Housing (42" machine shown)

Figure 36. 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 37, page 76. Remove the seal sleeve setting fixture.

Figure 37. Tightening the Bearing Housing into the Shell (42" machine shown)



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 Section 3.1.5 : Measuring Unmounted Clearance and Setting Bearing (Front or Rear), page 77, 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.

3.1.5 Measuring Unmounted Clearance and Setting Bearing (Front or Rear)

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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.

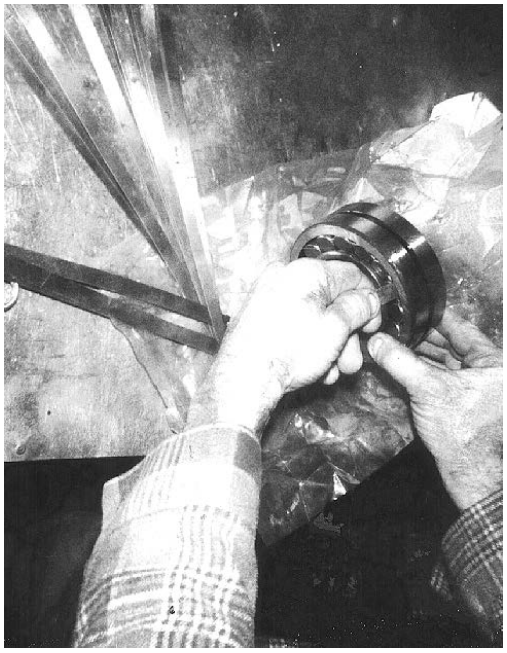
   These measurements are taken in thousandths of an inch. Although this requires precise work, attention to detail and a good set of feeler gauges, it is the only way to insure that the bearing will be tightened onto the shaft to precisely the right tension. If you have any questions on performing the 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 4 requires a good set of feeler gauges including .001" through .010" in thousandths of an inch increments. Contact your local bearing supplier.

4. 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 38, page 78. 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.

Figure 38. Measuring Bearing Unmounted Clearance (bridge for 42" machine shown)



5. 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.
6. Compare the measured clearance with the “Unmounted Clearance” in Table 26: Table of Bearing Clearances, page 78 . If the measured clearance is not within the range shown, do not use the bearing. Contact your bearing supplier for an exchange.

NOTE: 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: 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 26. 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

Table 26 Table of Bearing Clearances (cont'd.)

Manufacturer Part Number	Unmounted Clearance		Clearance Reduction	
	Minimum	Maximum	Minimum	Maximum
22328...	.0063	.0081	.002	.003
23220...	.0044	.0057	.0015	.0025

7. Calculate and record the final internal clearance by deducting the “Clearance Reduction” for your bearing (see Table 26, page 78) 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.
8. 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 9. 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.

9. 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.
10. 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.

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

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1. Once both bearings are seated, or if only one bearing was replaced, install the bearing lock washer(s) and lock nut(s). Use a hammer and a metal drift as shown in Figure 39, page 80, to tighten the lock nut. **It is imperative to only tap lightly and to assure that metal chips from the drift or lock nut 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 lock nut(s).
2. After tightening the bearing(s) onto the tapered shaft, check the internal clearance as pictured in Figure 40, page 80, 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 lock washer, 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.

NOTE: Check each unused tab individually to insure this.

Figure 39. Tightening the Bearing Lock nut (42" machine shown)

Figure 40. 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.

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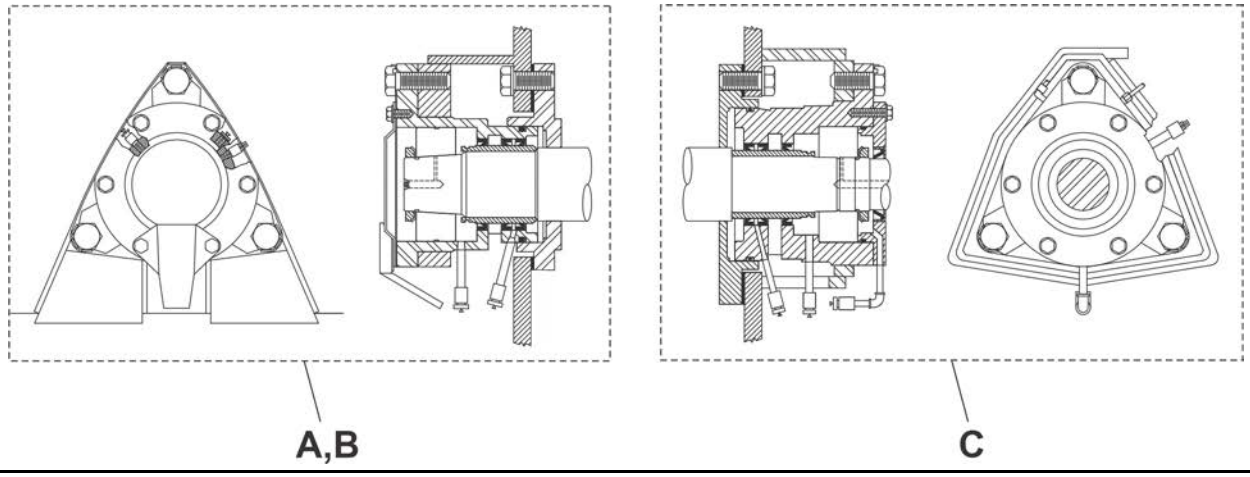
Shaft and Bearing Components

4 Sheets

72044WR2, 72044WR3, 72044SR2, 72044SR3

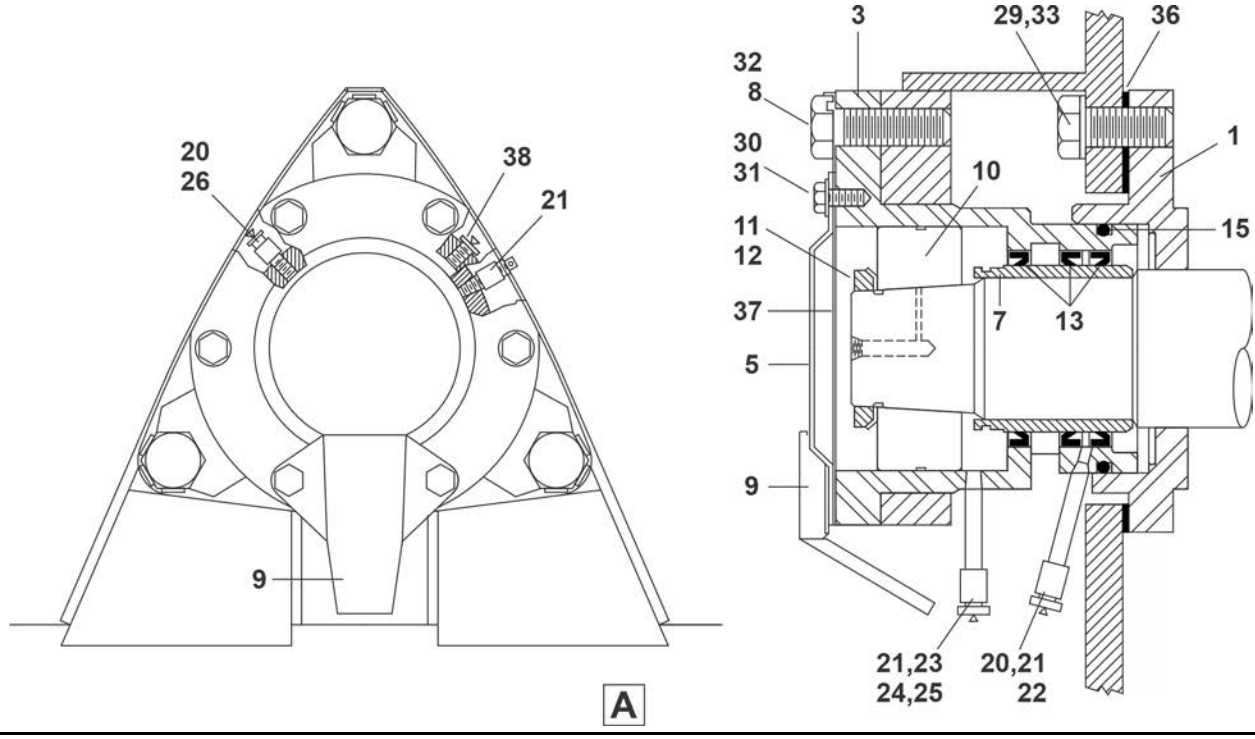
Figure 41. Shaft and Bearing Components



Legend

A . . . Front Bearing (Models: 72044WR2, 72044WR3)
B . . . Front Bearing (Models: 72044SR2, 72044SR3)
C . . . Rear Bearing (Models: 72044WR2, 72044WR3, 72044SR2, 72044SR3)

Figure 42. Front Bearing (Models: 72044WR2, 72044WR3)



Shaft and Bearing Components

4 Sheets

72044WR2, 72044WR3, 72044SR2, 72044SR3

Figure 43. Front Bearing (Models: 72044SR2, 72044SR3)

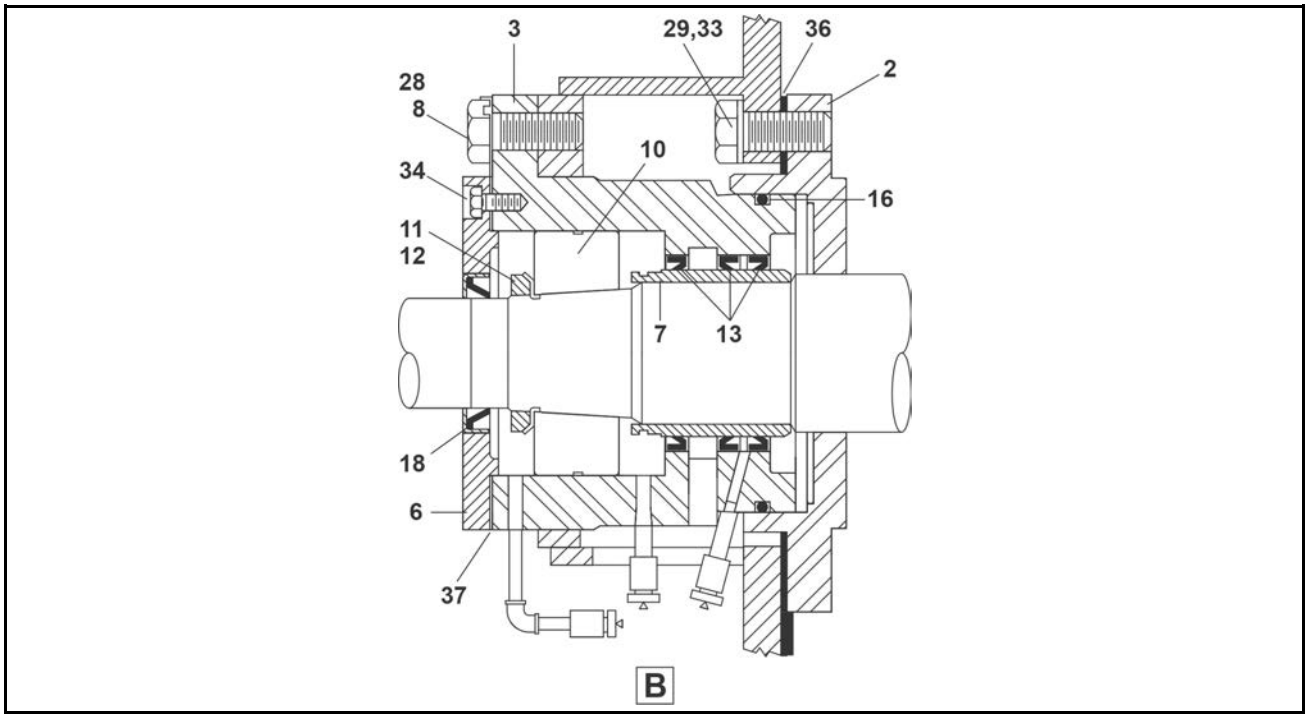
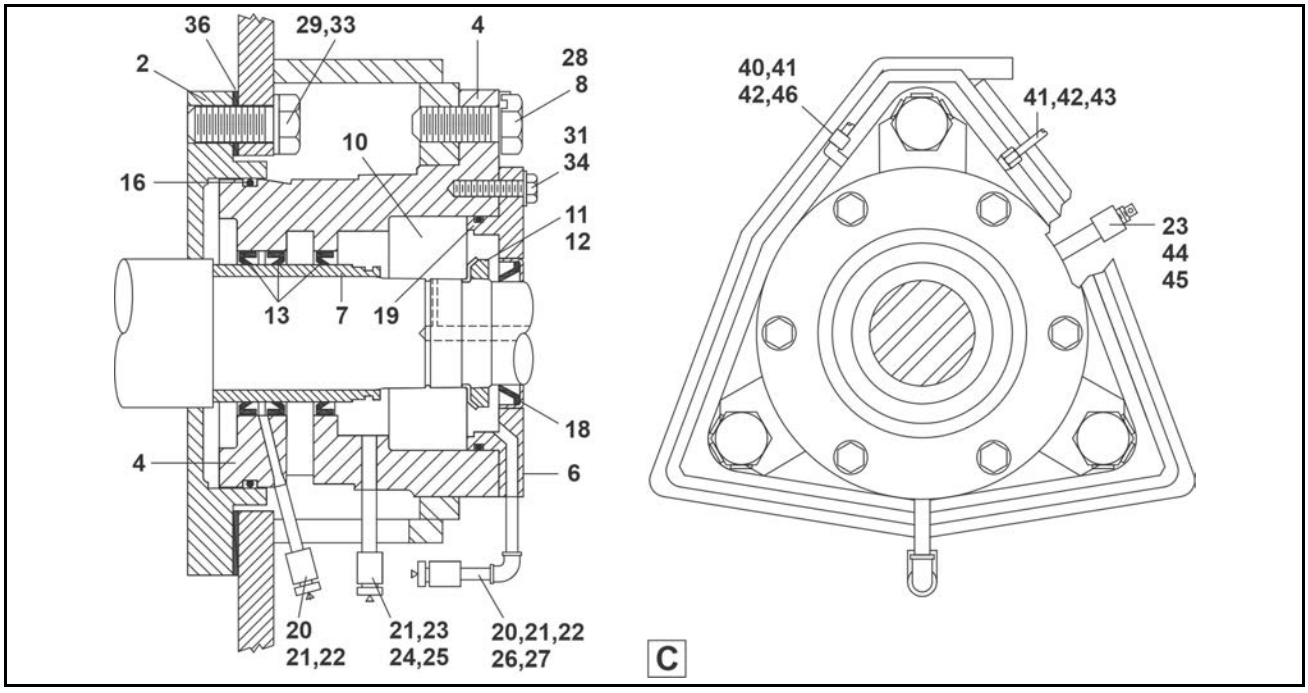


Figure 44. Rear Bearing (Models: 72044WR2, 72044WR3, 72044SR2, 72044SR3)



Shaft and Bearing Components

4 Sheets

72044WR2, 72044WR3, 72044SR2, 72044SR3

Table 27. 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
			Reference Assemblies	
	A	AD 36 022	BEARASY,MAIN FRONT 72WEU	72044WR2,72044WR3
	B	G36 05400	BEARASY MAIN REAR 7244WE2+3	72044WR2,72044WR3
	C	AD 36 040	BEARASY,MAIN (LOD+CLN) 72SGU	72044SR2,72044SR3
			Components	
A	1	X3 06047	SUPPORT=FRNTSHFT=72": C2-18843	
BC	2	X3 06003	SHAFT SUPPORT= 72"WE: C2-18592	
A	3	X3 06005	HOUSING=FRNT BRG+SIL:C2-18842	
C	3	X2 175005	BRGHOUSE=FRNT=SG: C2-18590	
B	4	X3 06369	HOUSING=REAR=BRG :C2-18590	
C	4	X2 175007	BRGHOUSE=REAR=WEH:C2-18590	
A	5	02 18618A	COVER=BEARING 60 WED	
B	6	X3 06370	HOLDER=REAR SEAL	
C	6	X2 175053	HOLDER=SEAL=60SG SS W/AUTOSP	
all	7	X3 06165	SLEEVE=SHAFT SEAL=2/72WEDU	
all	8	02 18219	LOCKWASH=MAIN BEARHOUSE ZINC	
A	9	02 18928	DRIPSHIELD=60" WE + ZINC	
AC	10	56S22316T	SPHEROLBRG KOYO#22316RKW33C3FY (3.1496"BORE)	
B	10	56S23220T	SPHEROLBRG NTN#23220BL1KD1C3	
AC	11	56AHN16	AN16 BEARING LOCKNUT	
B	11	56AHN20	AN20 BEARING LOCKNUT	
AC	12	56AHW16	W16 BEARING LOCKWASHER	
B	12	56AHW20	W20 BEARING LOCKWASHER	
all	13	24S114	SEAL 4.5X5.5X.50 JM# 9170 LUP	
A	15	60C161	ORING 6"IDX1/4CS BUNA-70 #437	
BC	16	60C172	ORING 8"IDX1/4CS BUNA70 #445	
B	18	24S112	SEAL 3.75X4.75X.500 CS/BUNA	
C	18	24S111	SEAL 3X4.00X.437#21158-2175	
B	19	60C166A	ORING 6+3/4IDX1/8"CS BUNA-N 70	
C	19	60C160J	ORING 6+1/4ID1/8CS BUNA70 #259	
all	20	5SCC0CBE	NPT COUP 1/8 BRASS 125# 103A-A	
all	21	54M029	RELIEFFIT 1/8STR ALEMITE 47200	
all	22	5N0C03AG42	NPT NIP 1/8X3 TBE GALSTL SK40	

Shaft and Bearing Components

4 Sheets

72044WR2, 72044WR3, 72044SR2, 72044SR3

Table 27 Parts List—Shaft and Bearing Components (cont'd.)

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

Used In	Item	Part Number	Description/Nomenclature	Comments
BC	23	5SCC0EBE	NPT COUP 1/4 BRASS 150#PSI W/HEX	
BC	24	5N0E02KG42	NPT NIP 1/4X2.5 TBEGALSTL SK40	
all	25	5SB0E0CBEO	NPTHEXBUSH 1/4X1/8 BRASS 125#	
all	26	5N0C01KG42	NPT NIP 1/8X1.5 TBE GALSTL S40	
B	27	5SL0CBEA	NPTELB 90DEG 1/8 BRASS 125#	
C	27	5SL0ENFK	NPTELB 45DEG 1/4 GALMAL 150#	
all	28	15B243	HEXCAPSCR 1-8X2+1/2 GR5 ZINC	
all	29	15U400	LOCKWASHER MEDIUM 1" ZINCPL	
all	30	15K145	HXCAPSCR 1/2-13UNC2AX3/4 GR5 P	
all	31	15U300	LOKWASHER REGULAR 1/2 ZINC PLT	
all	32	15B236	HEXCAPSCR 1-8UNC2AX3 SAEGR5 ZN	
all	33	15K236	SOKCAPSCR 1-8X2.75 BLK	
all	34	15K170	HXCAPSCR 1/2-20UNFA X 1.5 GR 5	
all	34	15K180	HXCAPSCR 1/2-13UNCAX2 GR5 ZINC	
all	36	02 18768D	GASKET=SHAFT SUPT DA3	
all	37	02 18105	BEARING CAP GASKET	
all	38	54M015	GREASEFIT 60X36/60X44 1610BL	
all	40	53A039B	BODY=EL90MALE5/16X1/8 #B69A-5A	
all	41	53A508	SLEEVE DELRIN 5/16"OD#60PT-5	
all	42	53A509	TUBE INSERT 5/16"OD X .53"LG.	
all	43	53A019B	BODYMALECON5/16X1/8COM#B68A-5A	
all	44	5N0E01KBE2	NPT NIP 1/4X1.5TBE BRASS STD.	
all	45	51P008B	PLUG SQSLD 1/4"BLK LVENT STEEL	
all	46	53A060A	NUT BRASS 5/16 COMP#61A-5	

4 Frame and Suspension

4.1 Suspension Adjustments for Divided Cylinder Machines

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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.

All Milnor® Hydro-cushion™ machines contain the following suspension system components:

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.

4.1.1 How Shell Adjustments are Made

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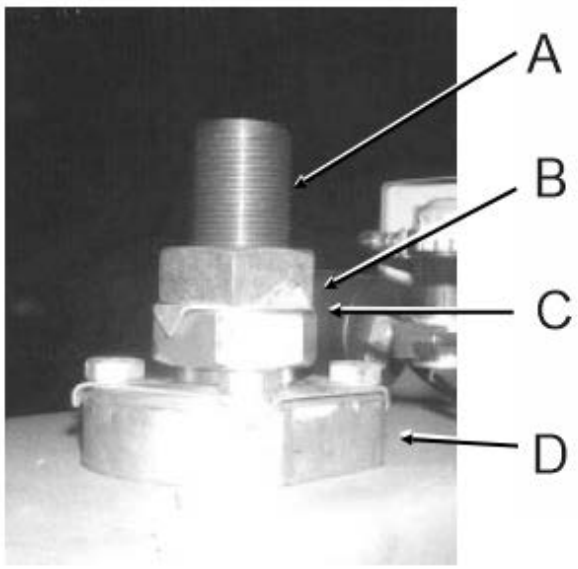
Regardless of machine model, repositioning of the shell is always accomplished by adjusting the nuts at the top of the upper Hydro-cushion™ shafts. To move the shell up or down at the location of any Hydro-cushion™, see Figure 45: Hydro-cushion™ Upper Shaft and Adjusting Nuts, page 87 and proceed as 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, re-tighten 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 45. Hydro-cushion™ Upper Shaft and Adjusting Nuts



Legend

A . . . Hydro-cushion™shaft
B . . . Locknut
C . . . Keyed lockwasher
D . . . Adjusting nut

4.1.2 Shell Hanging Dimensions and Adjustment Procedures

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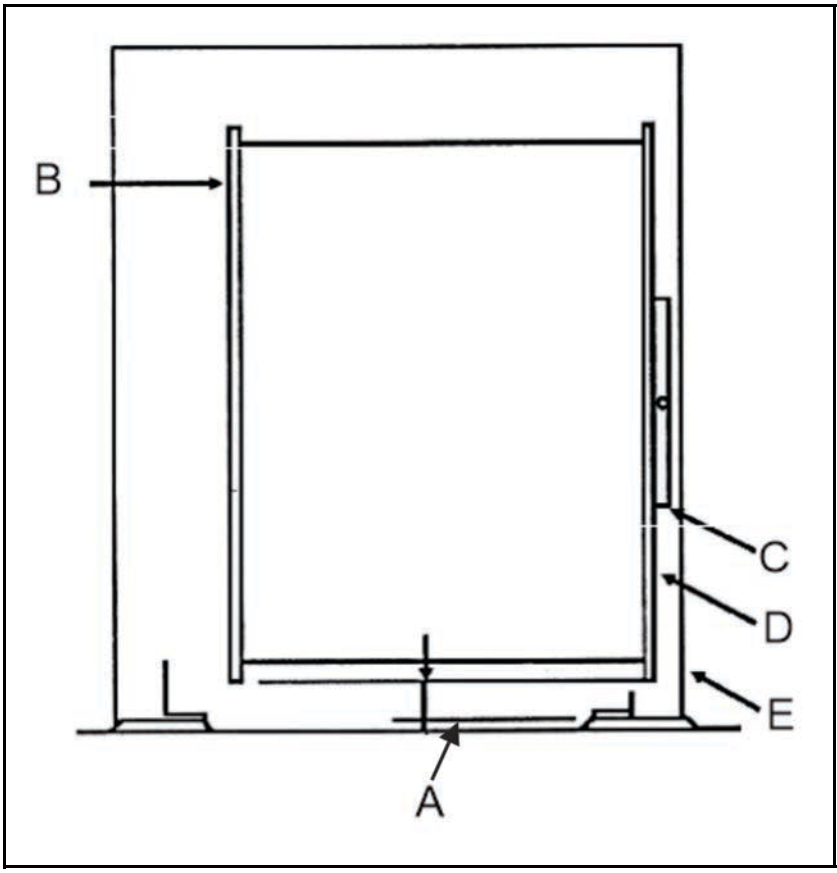
To adjust the shell of a divided cylinder machine, proceed as follows:

1. Locate the shell hanging dimension for your machine in Table 28: Hanging Dimensions, page 88 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 46: Shell Hanging for Divided Cylinder Machines (Left side view of 60044WE shown), page 88 .
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 46. Shell Hanging for Divided Cylinder Machines (Left side view of 60044WE shown)



Legend

A . . . Hanging Dimensions
B . . . Shell back
C . . . Bubble level
D . . . Shell front
E . . . Frame

Table 28. Hanging Dimensions

Machine Model	Dimension A
42031WE	4 1/8" (105)
42031SG	4 1/8" (105)
44044WE	4 1/8" (105)
42044SG	4 1/8" (105)
60031WE	3 5/8" (92)
60031SG	3 5/8" (92)
60044WE	3 5/8" (92)
60044SG	3 5/8" (92)
72044SG	3 3/4" (95)
72044WE	3 3/4" (95)

4.1.3 Push-Down Travel Dimensions and Adjustment Procedures

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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.

4.1.3.1 42" Divided Cylinder Machines

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The push-down stops on these machines consist of brackets attached to the shell and rubber rest pads, mounted atop the base pads (see Figure 47: Push-down Travel Adjustment: 42" Div-cyls (42" Staph Guard®), page 90) 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.

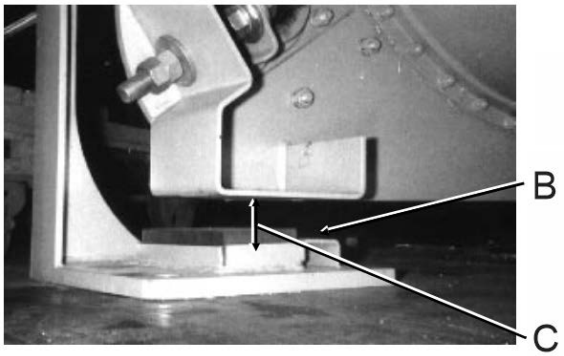
There is no specific push-down travel dimension for these machines; however, length of travel must be adjusted as follows:

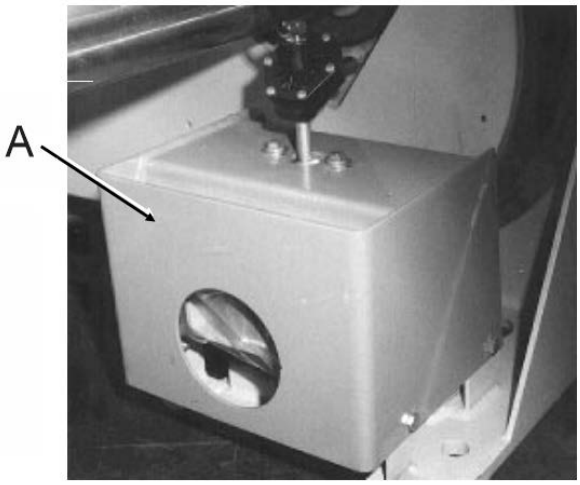
1. With the **Master switch** set to **off**, and the shell hanging free, measure the gap between each bracket and base pad.
2. Add or remove shims from the appropriate pads as required to make all four gaps equal and to insure that no rest pad protrudes completely from its metal pan.

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 47. Push-down Travel Adjustment: 42" Div-cyls (42" Staph Guard®)





Legend

A . . . Push-down housing (rest pads and brackets within)
B . . . Rubber rest pad (shim between rubber pan and metal pan)
C . . . Gaps must be equal.

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.

4.1.3.2 60" Divided Cylinder Machines

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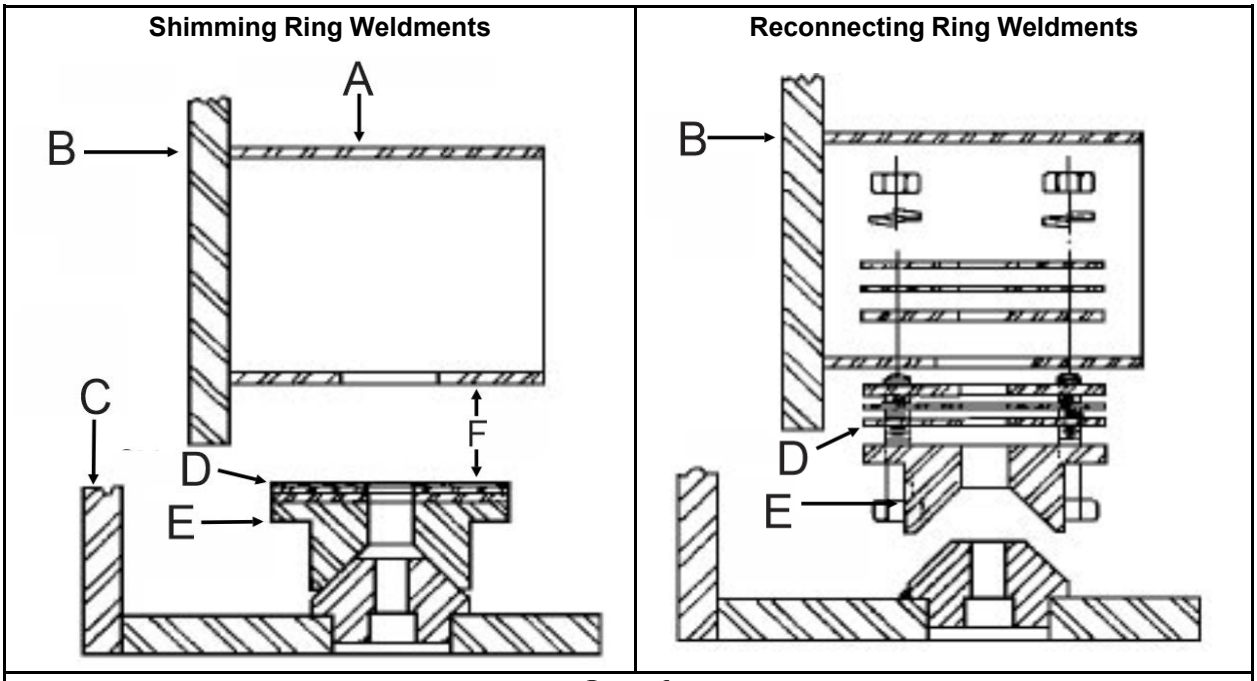
These machines have push-down stops on the four corners of the frame which appear as shown in Figure 48: Ring Weldments, page 91 . When pushed down, the ring weldments (which move with the shell) must seat firmly onto the plugs which are mounted atop the base pads. The push-down travel dimension must 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 48. Ring Weldments



Legend

A . . . Mounting bracket
B . . . Shell (hanging free)
C . . . Frame
D . . . Shims
E . . . Ring weldment
F . . . 2"

3. Stack shims on top of the ring weldment as required to make each gap **exactly 2 inches** as shown in the left side of Figure 48: Ring Weldments, page 91 . 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 the right side of Figure 48: Ring Weldments, page 91). Any extra shims may be stacked on the top side of the mounting bracket plate to which the ring weldment is attached.

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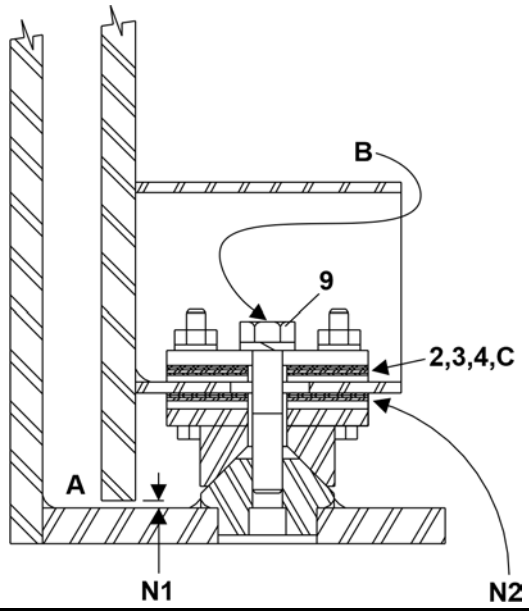
Hold Down Adjustment

2 Sheets

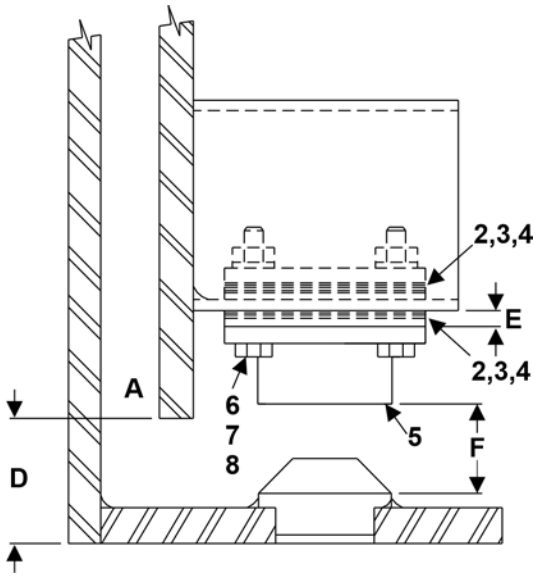
6044SR2/SR3, 6044WR2/WR3, 72044SR2/SR3, 72044WR2/WR3

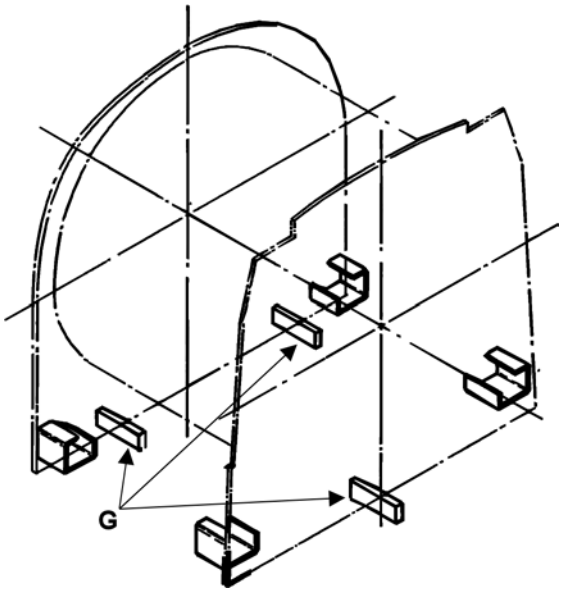
NOTE: For instruction: push down travel dimensions and adjustment procedures, see BNWVUM01

Cross Section: Machine Locked down for Shipment



Adjustment Complete, Machine Up





Legend

A . . . Machine Shell

B . . . Remove shipping bolt before running machine. See instructions for Adjustment of Hold Down

C . . . Place extra shims above

D . . . Unloaded 3-3/4”

E . . . 1/2” approx.

F . . . 2” travel of empty basket

G . . . Setting blocks for adjustment. Blocks must hold shell approximately 3/8” above base pads when machine is pushed down.

N1 . . Be sure shell does not bottom on basepad, there must be clearance at this point. Check each corner

N2 . . Place shims here to adjust ring weldment so that all four corners seat simultaneously.

Hold Down Adjustment

2 Sheets

6044SR2/SR3, 6044WR2/WR3, 72044SR2/SR3, 72044WR2/WR3

Table 29. Parts List—Hold Down Adjustment

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**
none				
Components				
all	2	03 06216A	SHIM=HOLDOWN 1/4"THICK	
all	3	03 06216B	SHIM=HOLDOWN 10GA THICK	
all	4	03 06216C	SHIM=HOLDOWN 16GA THICK	
all	5	W3 06406	*RING=HOLD DOWN CENT-STAMPED	
all	6	15G238	HXNUT 5/8-11UNC2B SAE ZINC GR2	
all	7	15U315	LOKWASHER MEDIUM 5/8 ZINCPL	
all	8	15D125	HXTAPSCR 5/8-11X4-FLTHRD GR5	
all	9	15K300	HXCAPSCR 1-8UNC2A X4.5 SAE GR5	

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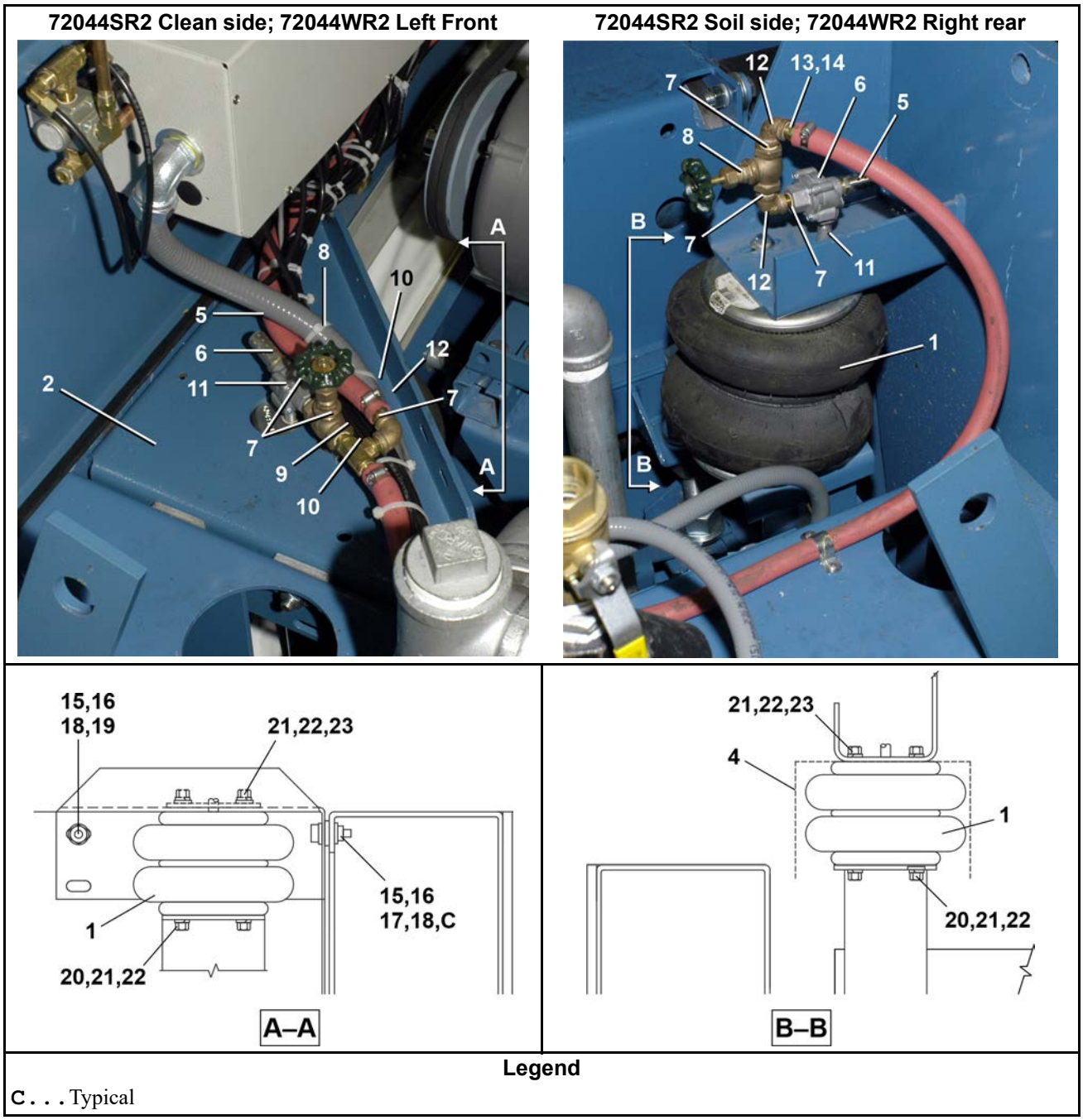
Push Down Components

3 Sheets

72044WR2, SR2

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

Figure 49. Push Down installation and pneumatic fittings



Legend

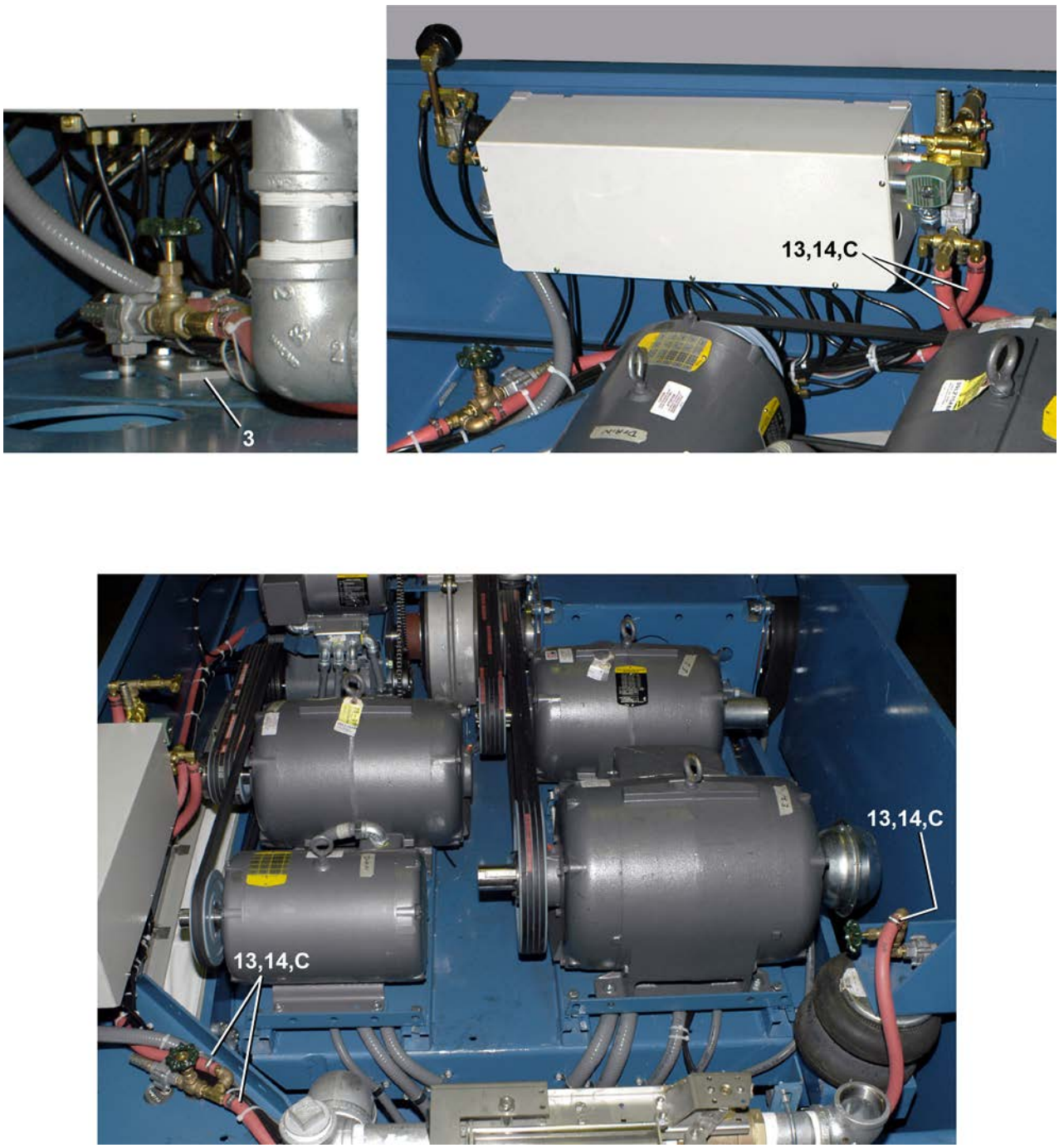
C . . . Typical

Push Down Components

3 Sheets

72044WR2, SR2

Figure 50. Push Down installation and pneumatic fittings



Legend

C . . . Typical

Push Down Components

3 Sheets

72044WR2, SR2

Table 30. Parts List—Push Down 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**
			Reference 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	NPTELB 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	HXCPSCR 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	

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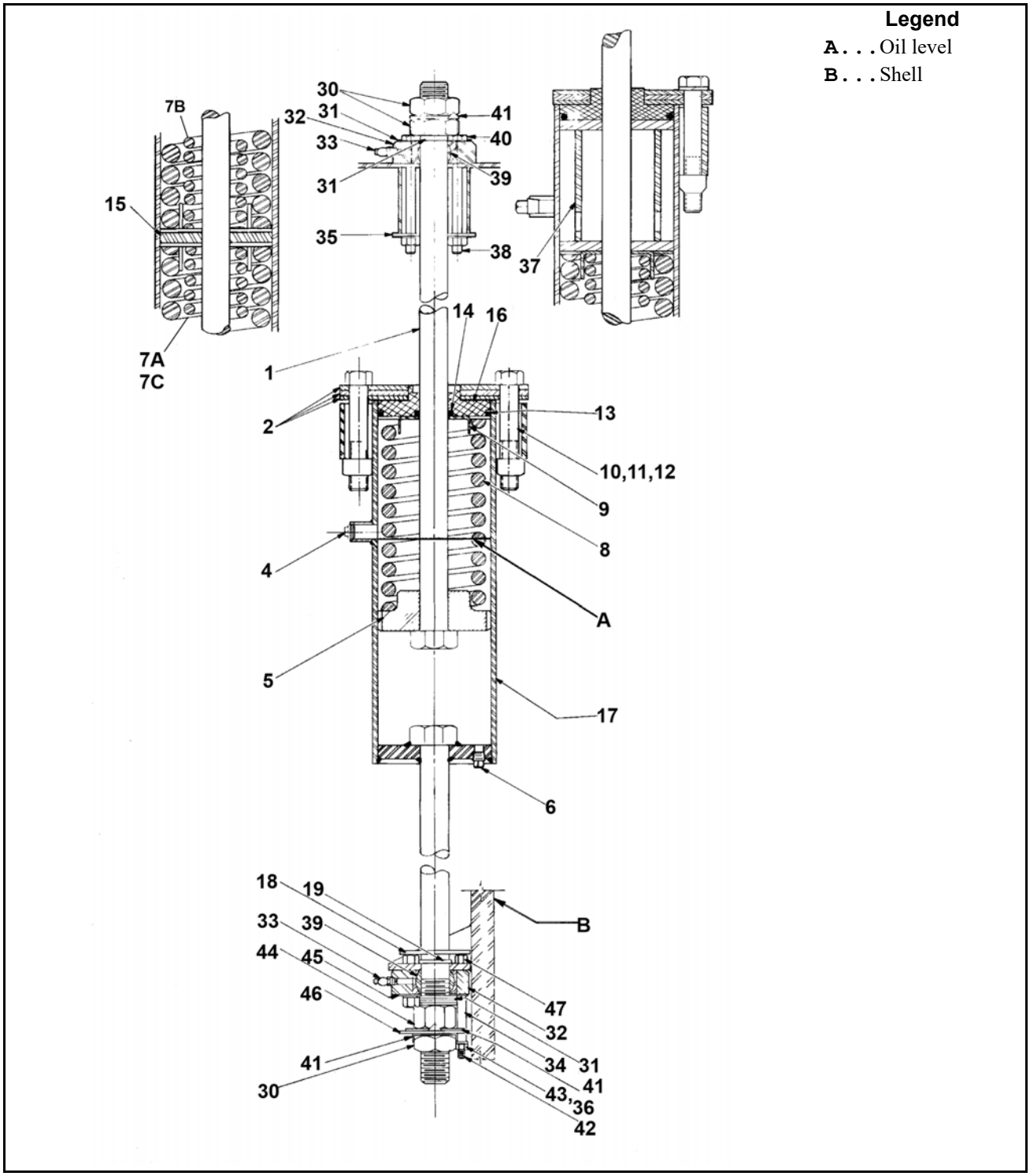
Suspension Cylinder Assemblies

3 Sheets

42031,42044,52038,60044,72044



Suspension Cylinder Assemblies

3 Sheets

42031,42044,52038,60044,72044

Table 31. Parts List—Suspension Cylinder Assemblies

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
			Reference Assemblies	
	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
			(To identify which cylinder is supplied with your machine, see BPWVUJ02 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	BOLT=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=IN HYDRO CYL 331LB/IN	FULL SPRING (PURPLE)
G	7B	03 06139A	SPRING=IN 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
ABCDFG-K	9	02 18619	BUSHING RETAINER + CAD	
H	9	03 06358	BUSHING RETAINER.CAD	
all	10	15B237	HXCAPSCR 1-8UNC2AX5.5 SAEGR5 Z	

Suspension Cylinder Assemblies

3 Sheets

42031,42044,52038,60044,72044

Table 31 Parts List—Suspension Cylinder Assemblies (cont'd.)

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

Used In	Item	Part Number	Description/Nomenclature	Comments
all	11	15G255A	SQNUT 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-BALLBUSH-4/HYDRO MACH	
BDFGH	19	02 02230	6 WATER BARRIER (NEOPRENE)	
all	30	15G268	HXFINJAMNUT 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	SPCRROLL.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-CUSHION CYL-MACH	
all	38	15K203	HXTAPSCR TFL 1/2-13X5 GR5 ZINC	
all	39	54A705	BALBRUSH 1.5 SKF#GEZ108ESAVE467	
all	40	15N037	HXCAPSCR 1/2-13UNC2AX6.5 GR5 Z	
all	41	02 18256	LOKWASH-TONGUE 8/WEH ZINC	
all	42	15K202	HEXCAPSCR 1/2-13UNC2AX5 GR5 ZIN	
all	43	15U300	LOKWASHER REGULAR 1/2 ZINC PLT	
all	44	15G231	HXFINJAMNUT 1/2-13UNC2B ZINC G	
all	45	02 18534	HOLDPLATE= BALLBRUSH 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	

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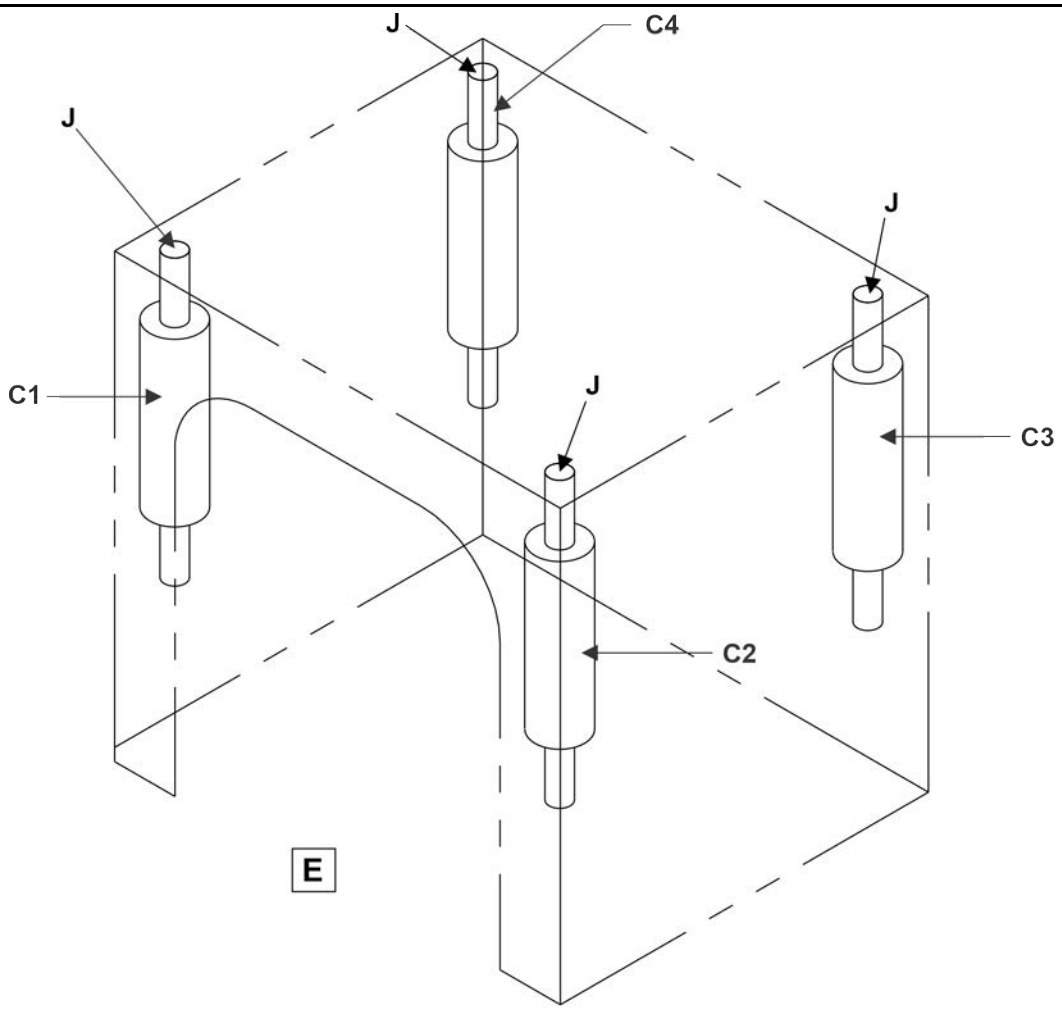
Suspension Cylinder Locations

2 Sheets



Legend

C1 . . Cylinder #1
C2 . . Cylinder #2
C3 . . Cylinder #3
C4 . . Cylinder #4
E . . . Front or soil side
J . . . A letter is stamped on the end of the upper bolt to designate the cylinder assembly.

Suspension Cylinder Locations

2 Sheets

NOTE: See BPWVUJ01. For repair parts: hydrocushion cylinder assembly “B” through hydrocushion cylinder assembly “K”

	Machine Models:								
Position	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
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

5 Shell, Cylinder and Doors

BNWD6M01 / 2020125 BNWD6M01 0000278868 A.5 3/19/20, 3:37 PM Released

5.1 Door Seal Replacement on Rapid Load Models

BNWD6M01.C09 0000279103 B.2 A.5 A.1 3/17/20, 2:50 PM Released

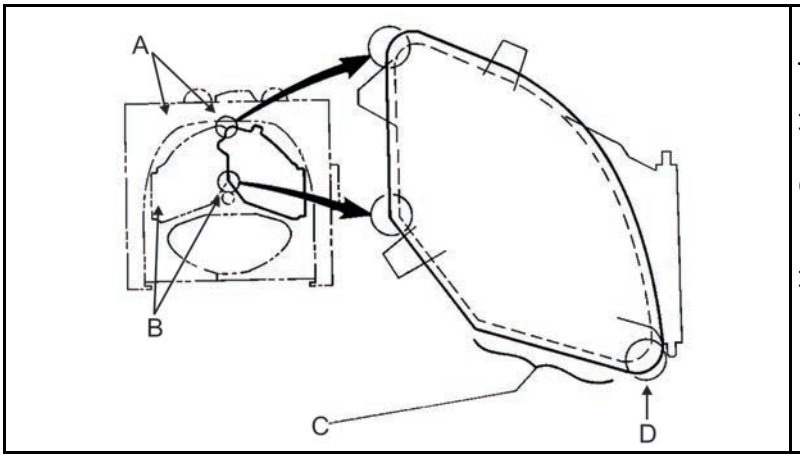
5.1.1 Door Seal Replacement

BNWD6M01.T01 0000278867 B.2 A.5 A.3 3/17/20, 4:36 PM Released

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 51: Door Seal Checks, page 103), 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 51: Door Seal Checks, page 103), 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 51. Door Seal Checks



Legend

A . . . Location A—Seals must contact each other and shell front.

B . . . Location B—Seals must contact each other and shell front.

C . . . Location C—Seals must not drag against shell when door opens.

D . . . Location D—Seal must contact shell front.

5.1.2 Door Seal

BNWD6M01.C01 0000278865 B.2 A.5 A.2 3/13/20, 2:01 PM Released

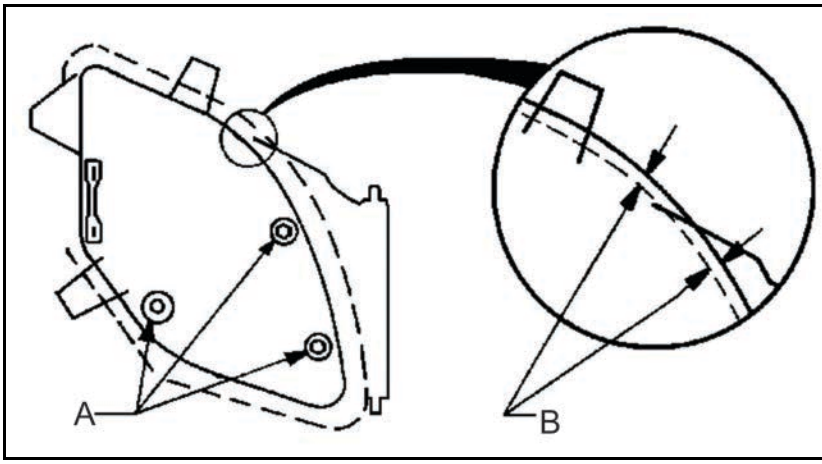
Preventive Maintenance

5.1.2.1 Check Door Alignment About the Shell Opening

BNWD6M01.C02 0000278864 B.2 A.5 A.4 3/19/20, 8:22 AM Released

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 Figure 52, page 103.

Figure 52. Door Alignments



Legend

A . . . Adjusting 1/2" hex cap nuts.

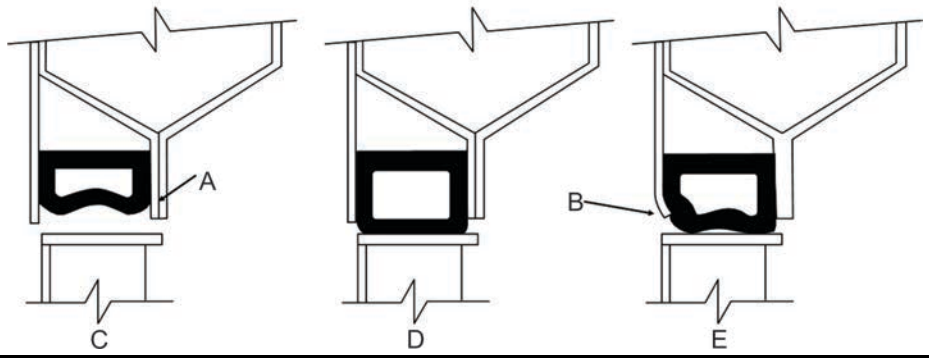
B . . . Equal distance around entire door.

5.1.2.2 Check Condition of Door Seal Channel

BNWD6M01.C03 0000278863 B.2 A.5 A.4 3/19/20, 8:22 AM Released

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 53: Door Alignment, page 104 . 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 in Figure 53, page 104.

Figure 53. Door Alignment



Legend

A . . . Double thickness
B . . . Bent retaining channel
C . . . Normal deflated
D . . . Normal inflated
E . . . Abnormal inflated condition

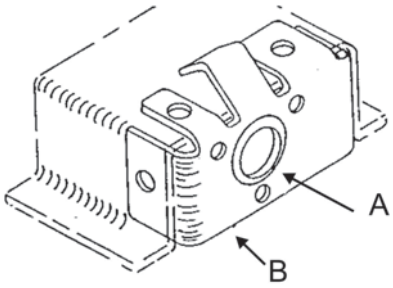
5.1.2.3 Replace Worn Striker Plates

BNWD6M01.C04 0000278892 B.2 A.5 A.3 3/17/20, 4:36 PM Released

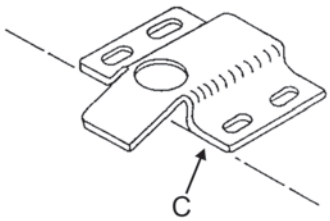
Each of the outer doors are securely held in the closed position by air latches. These air latches snap into striker plates bolted to the shell front. If the hole in these striker plates becomes worn, the shell doors will be allowed to move while the machine is in operation. It will look as though the doors are “breathing.” This will cause rapid wear and premature seal failure. Striker plate components are shown in Figure 54, page 104.

Figure 54. Worn Striker Plate

60”+72” Rapid Load 2–pocket



72” Rapid Load 2–pocket only



Legend

A . . . Nylon brushing 02 18954
B . . . Upper door striker plate, right 02 18978; left 02 18953
C . . . Lower door striker plate 03 06209

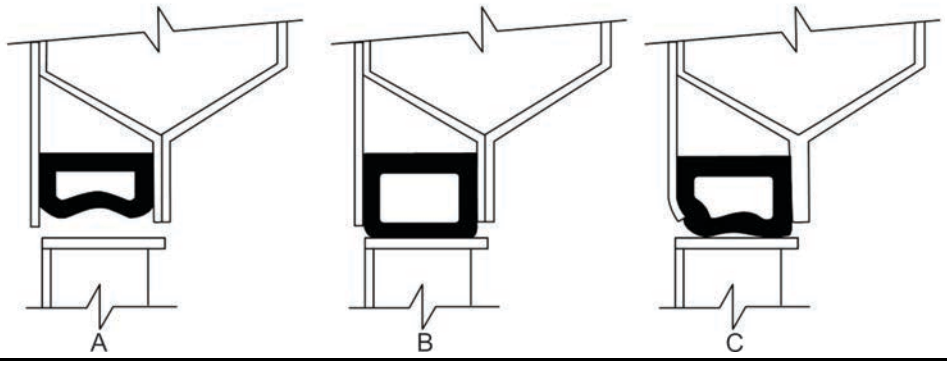
5.1.2.4 Check Door Alignment In and Out

BNWD6M01.C05 0000278891 B.2 A.5 A.2 3/13/20, 2:01 PM Released

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 55, page 105). If the door latch mechanism is loose, worn, or mismounted 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 55. Door Seals



Legend

A... Normal inflated condition
B...Wrong. . : door too far in shell front
C...Wrong. . : door too far out in shell front opening

5.1.2.5 Check Seal Air Pressure

BNWD6M01.C06 0000278889 B.2 A.5 A.2 3/13/20, 2:01 PM Released

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.

5.1.2.6 Check Door Bumper

BNWD6M01.C07 0000278888 B.2 A.5 A.2 3/13/20, 2:01 PM Released

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

5.1.3 Seal Vacuum Pump Feature

BNWD6M01.C08 0000278887 B.2 A.5 A.2 3/13/20, 2:01 PM Released

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.

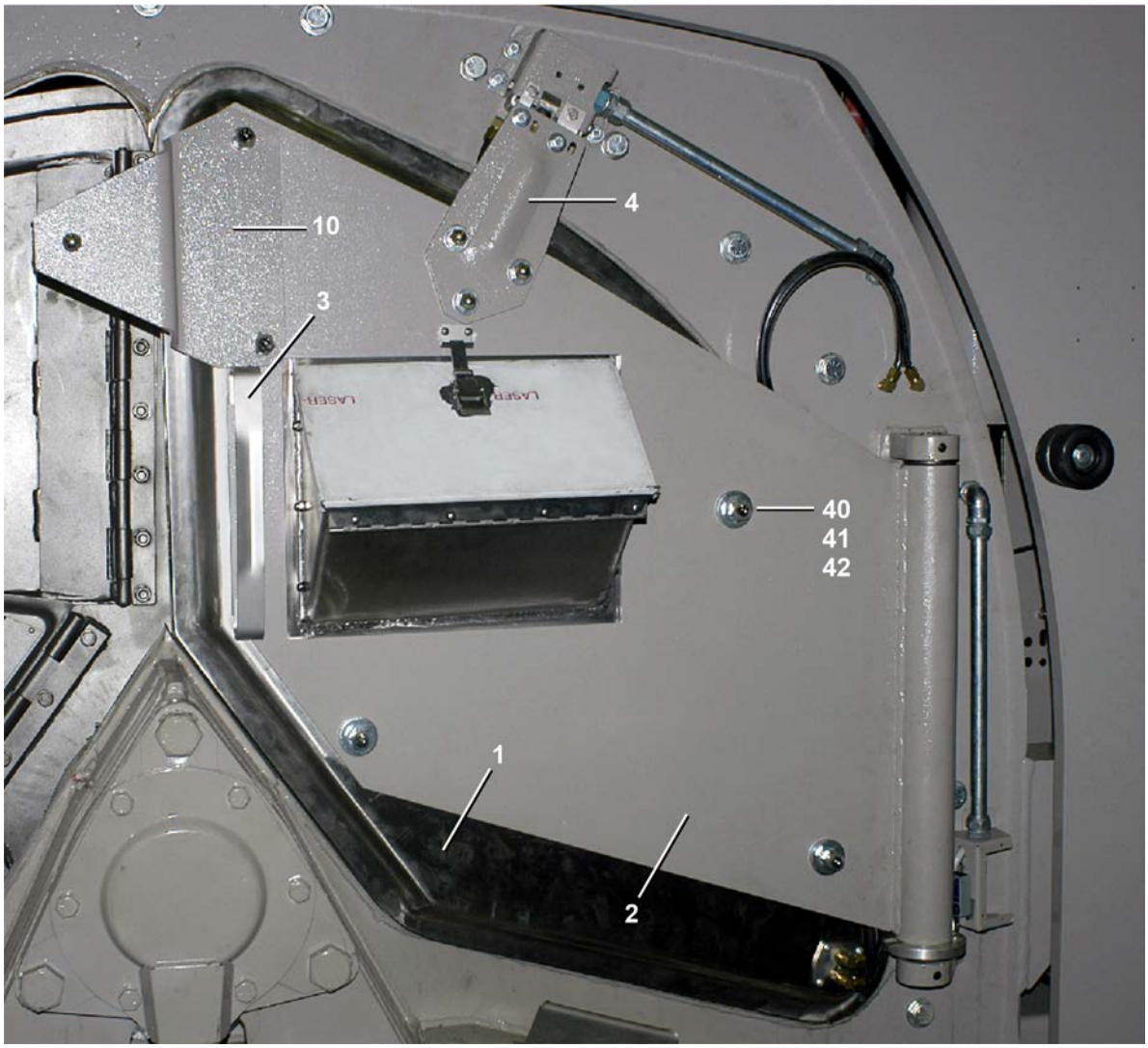
BPWD6D01 / 2020356 BPWD6D01.1 0000305537 B.2 A.3 8/28/20, 4:44 PM Released

Components, Shell Doors

7 Sheets

6044WR2, 7244WR2

Figure 56. General View



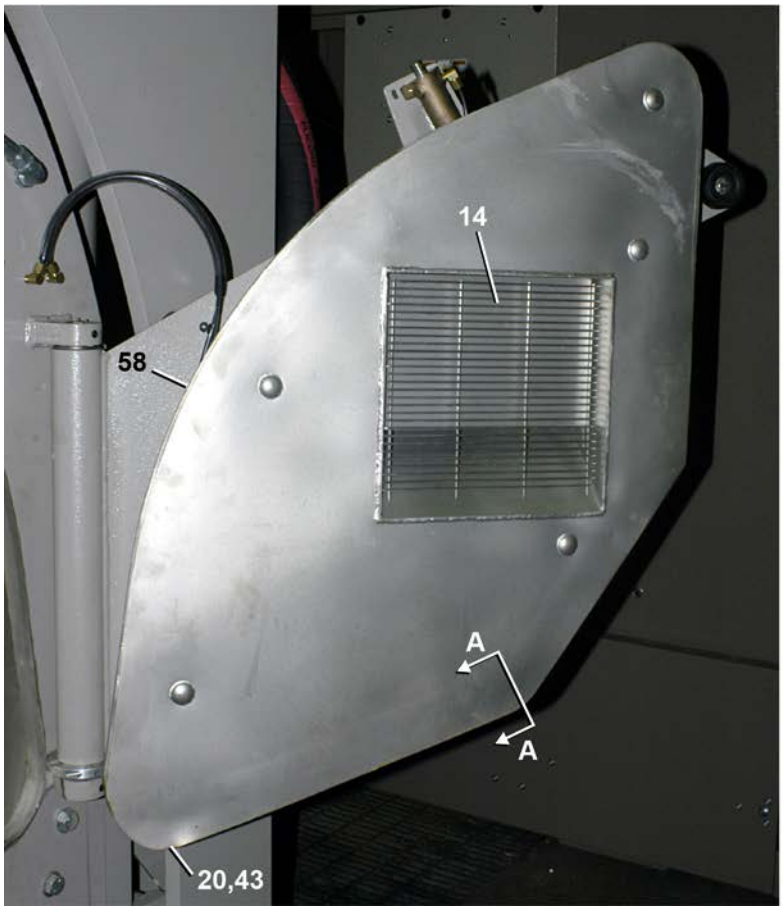
Components, Shell Doors

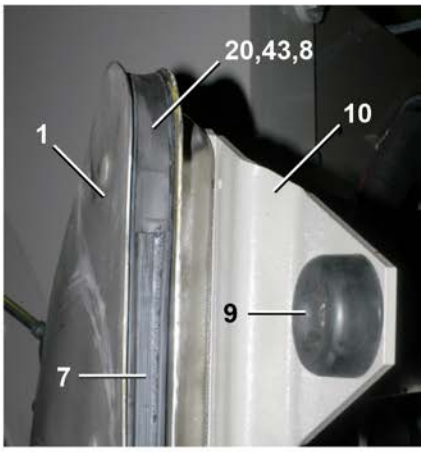
7 Sheets

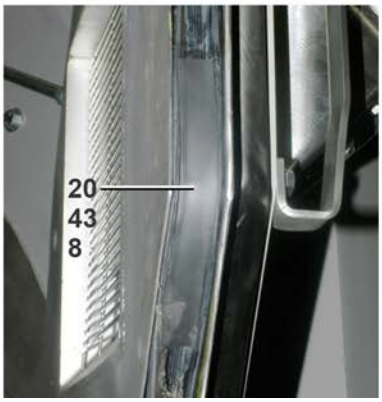
6044WR2, 7244WR2

Figure 57. Shell doors

Inside View, Detailed Views







Legend

A–A . . Cross section: door seal

Components, Shell Doors

7 Sheets

6044WR2, 7244WR2

Figure 58. Door Seal

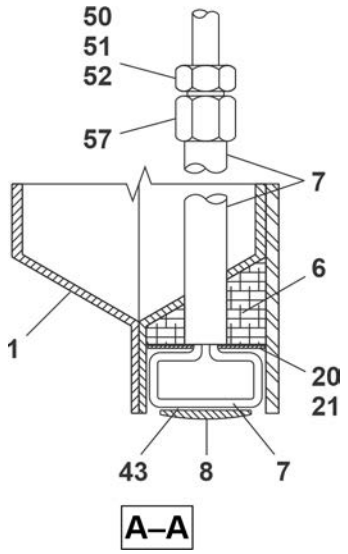
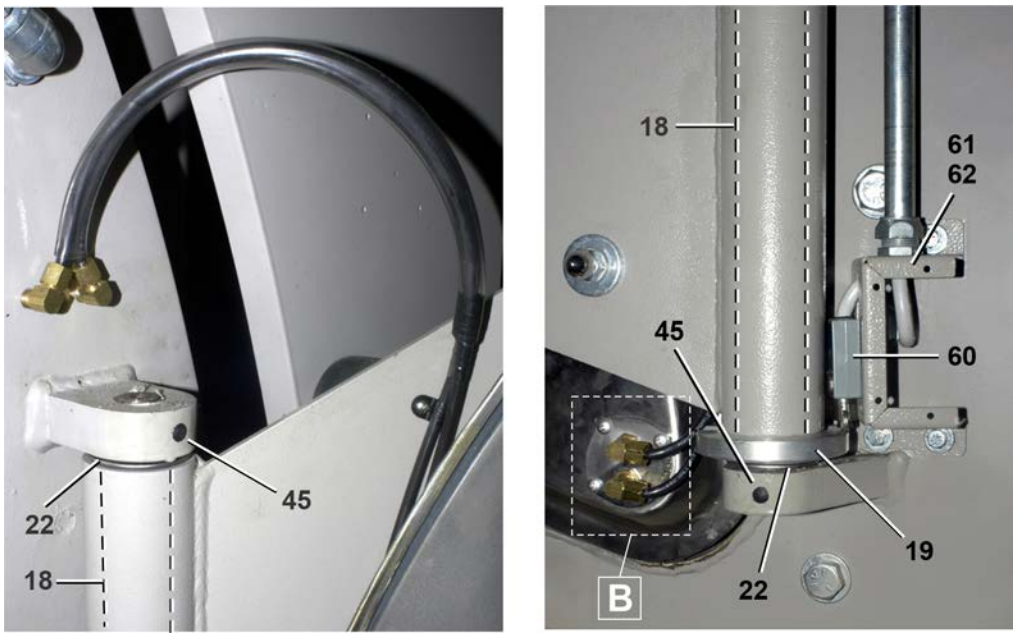


Figure 59. Door Hinge

Detailed Views



Legend

B . . . Detailed View: Compressed Air Lines

Components, Shell Doors

7 Sheets

6044WR2, 7244WR2

Figure 60. Compressed Air Lines, Door Latch

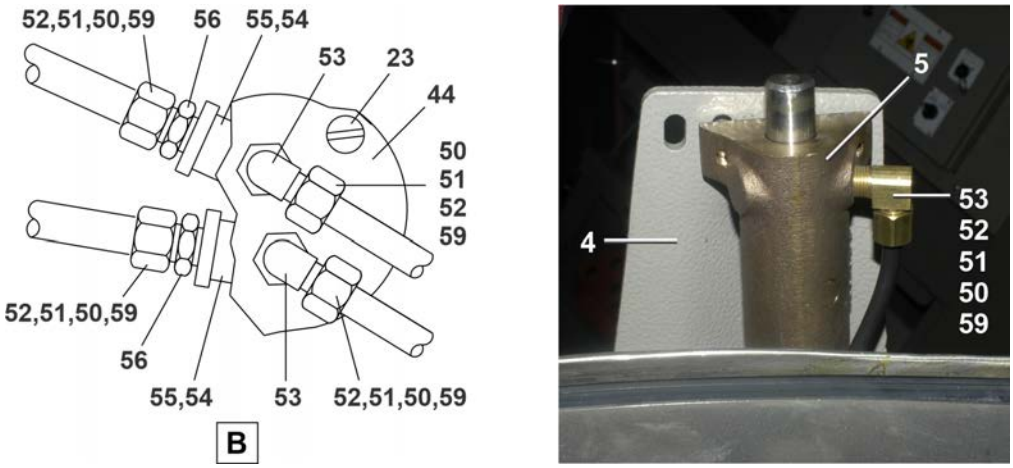
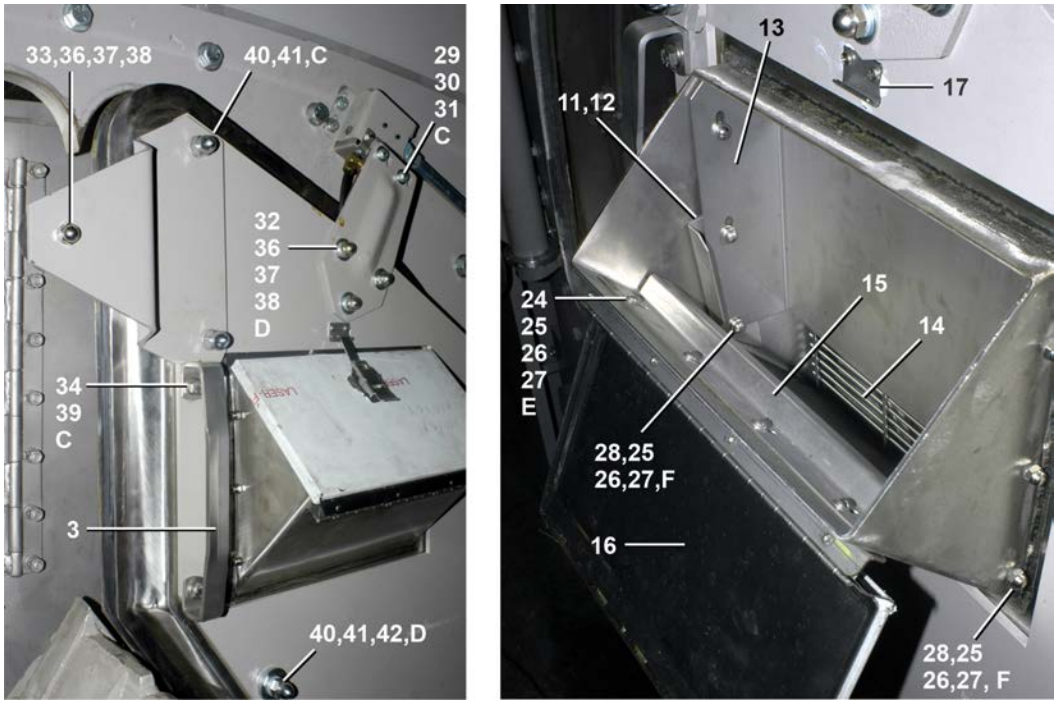


Figure 61. Shell Door, Soap Chute

General View



Legend

C . . . 2 instances
D . . . 3 instances
E . . . 4 instances
F . . . 6 instances

Components, Shell Doors

7 Sheets

6044WR2, 7244WR2

Figure 62. Components of Kit, Door Seal

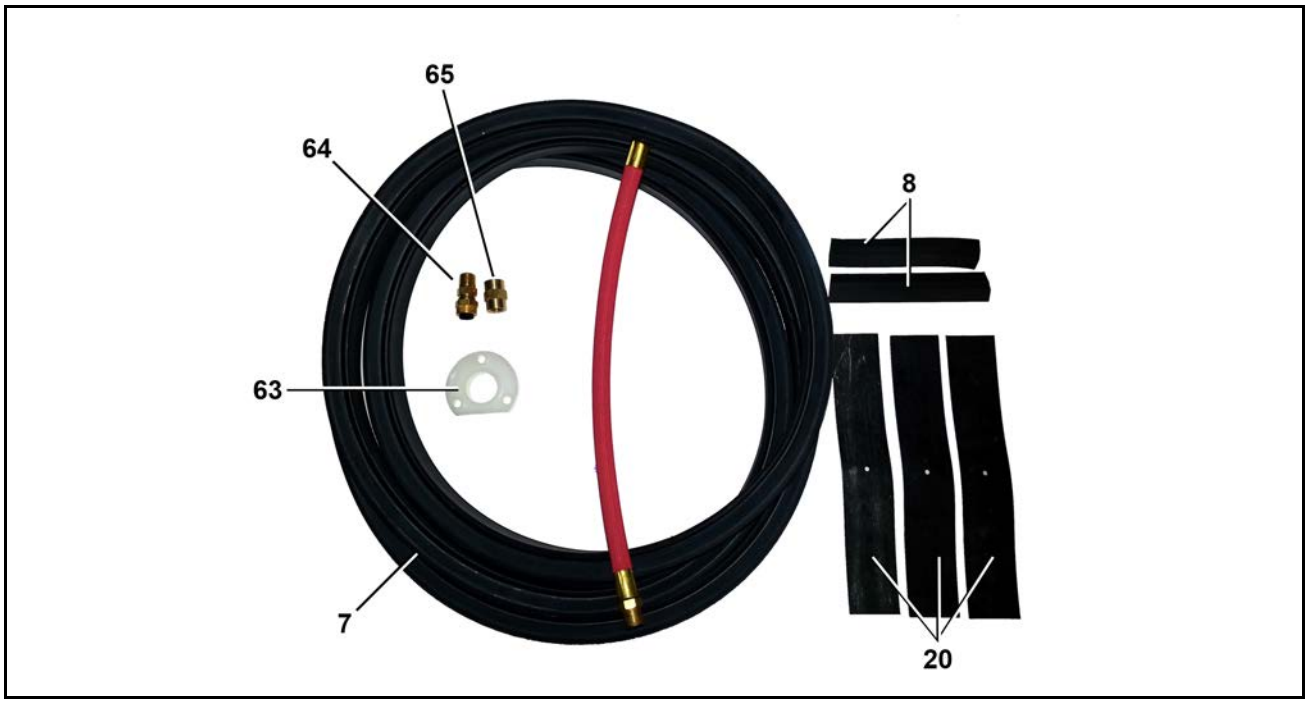


Table 32. Parts List—Components, Shell Doors

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
			Reference Assemblies	
	A	SA 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	KITINFLATABLE DOOR SEAL 7244	72044WP2, WR2
			Components	
A	1	W2 18960	* SHELL DOOR-60"WED-RIGHT	
B	1	W2 18959	* SHELL DOOR WELD-LEFT=WED	
C	1	W3 06061	* SHELLDOOR WELDMENT-RITE=WED	
D	1	W3 06060	* SHELLDOOR WELDMENT-LEFT=WED	
A	2	W2 18874	* HINGEPLATE WELDMNT-RITE=WED	
B	2	W2 18873	* HINGEPLATE WELDMNT-LEFT=WED	
C	2	W3 06063	* HINGE PLATE WELDMENT-RIGHT	

Components, Shell Doors

7 Sheets

6044WR2, 7244WR2

Table 32 Parts List—Components, Shell Doors (cont'd.)

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

Used In	Item	Part Number	Description/Nomenclature	Comments
D	2	W3 06062	* HINGE PLATE WELDMENT-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	
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	

Components, Shell Doors

7 Sheets

6044WR2, 7244WR2

Table 32 Parts List—Components, Shell Doors (cont'd.)

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

Used In	Item	Part Number	Description/Nomenclature	Comments
all	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	MALCON 5/16X1/8POLY PH#68P-5-2	
EF	65	5SCC0CBE	NPT COUP 1/8 BRASS 125# 103A-A	

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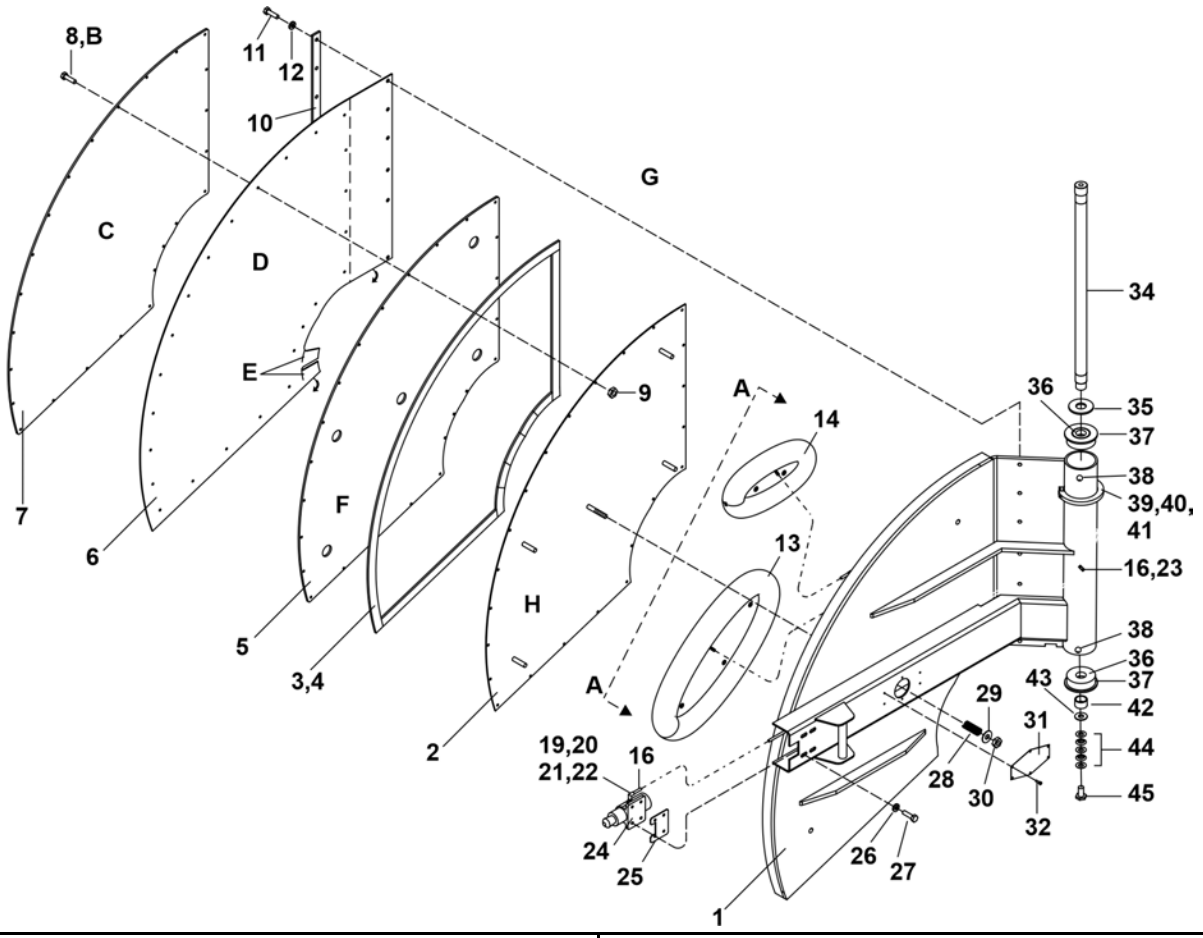
Shell Doors

4 Sheets

72044WR3, 72044SR2

Figure 63. Exploded Views



Adjust the Pressure Plate

1 . . . With the inner tubes deflated, tighten the tension nut (item 30), until two threads extend beyond the nut.

2 . . . Check the spring with air pressure applied to the inner tubes. Verify that the spring is not over compressed. If the spring height is only 3/4", it will be necessary to loosen the tension nut.

NOTE: The door spring should be slightly compressed. If the spring is compressed too much the air bags will not be able to inflate and properly seal the door.

Legend

A–A . . Detail view A–A

B . . . 24 instances

C . . . Liner

D . . . Door gasket

E . . . Tabs: Fold gasket tabs over the edge of the door and anchor with holding strips (item 33) and screws on the final assembly.

F . . . Fill plate

G . . . Apply glue (4) to both surfaces

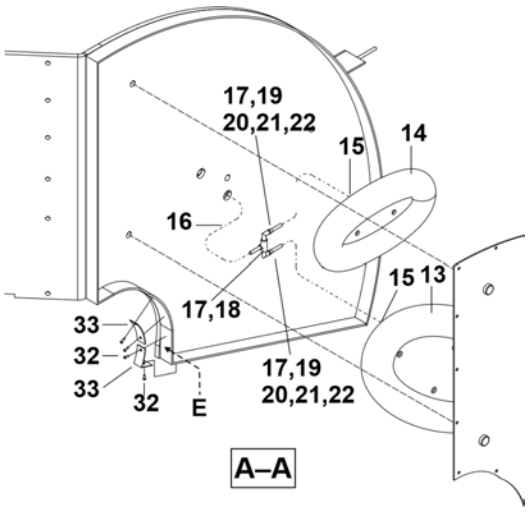
H . . . Pressure plate

Shell Doors

4 Sheets

72044WR3, 72044SR2

Figure 64. Detail View



Legend

A–A . . Detail view A–A

E . . . Tabs: Fold gasket tabs over the edge of the door and anchor with holding strips (item 33) and screws on the final assembly.

Table 33. Parts List—Shell Doors

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

Used In	Item	Part Number	Description/Nomenclature	Comments
			Reference Assemblies	
	A	SA 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 RT 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	

Shell Doors

4 Sheets

72044WR3, 72044SR2

Table 33 Parts List—Shell Doors (cont'd.)

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

Used In	Item	Part Number	Description/Nomenclature	Comments
all	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	
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	

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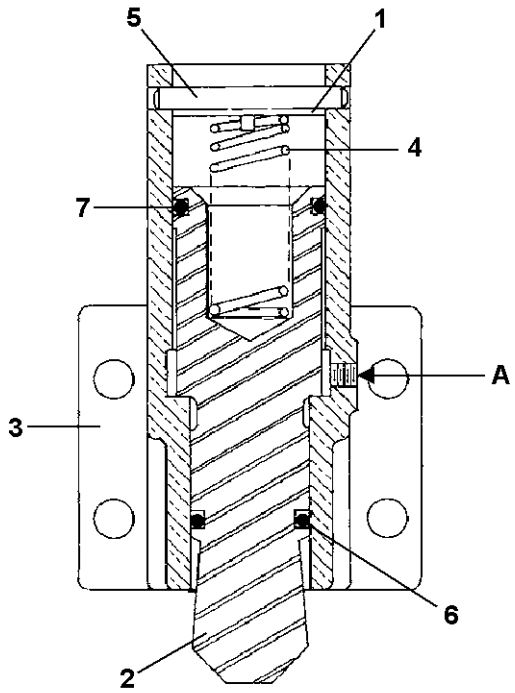
Door Latch

1 Sheet

Cross Section



Legend

A . . . Compressed air

Table 34. Parts List—Door Latch

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

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

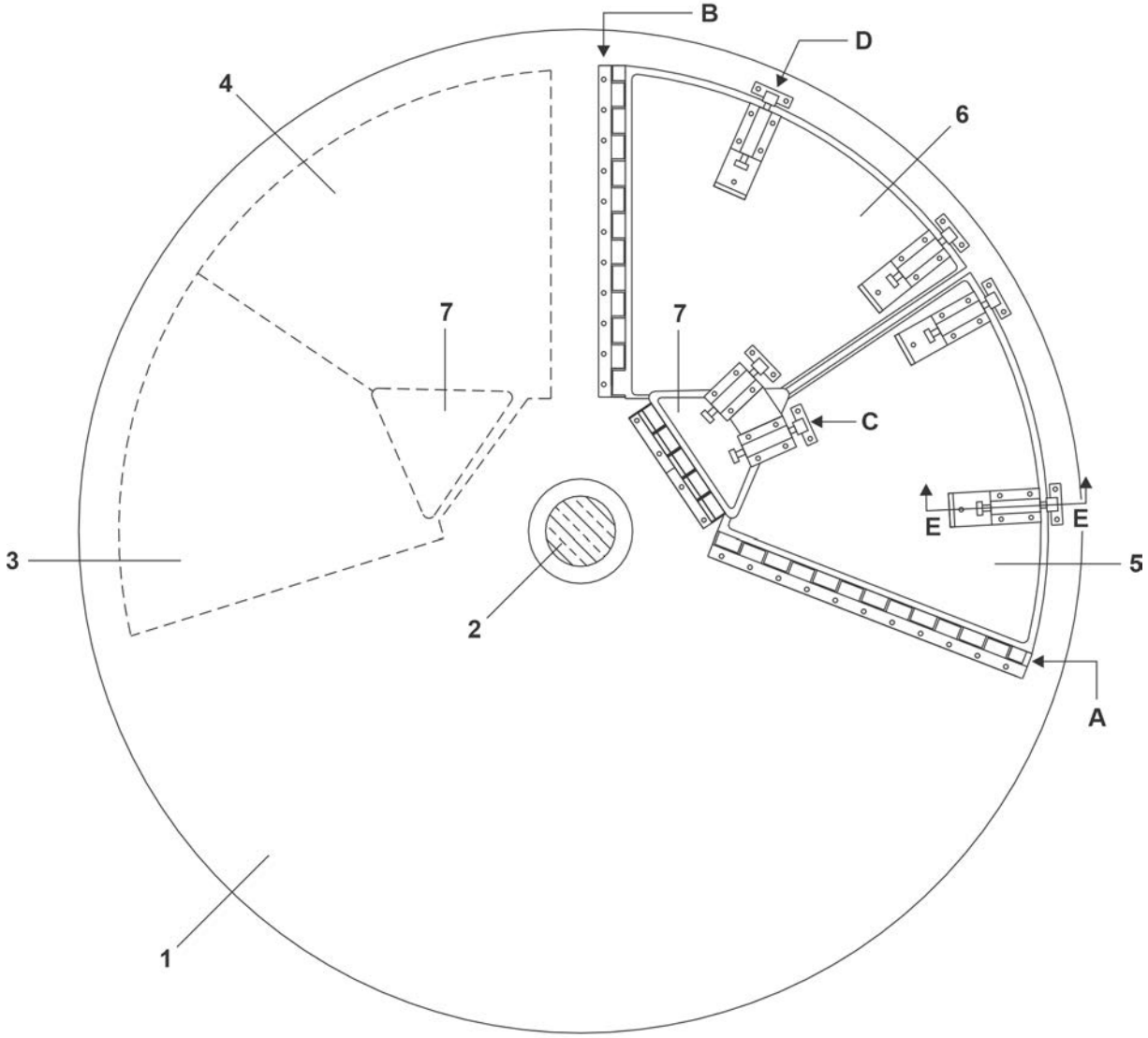
BPWD6D03 / 2020356 BPWD6D03.1 0000305605 B.2 A.3 8/28/20, 4:59 PM Released

Cylinder Assembly and Cylinder Door Installation

3 Sheets

60044WR2, 72044WR2

Figure 65. Cylinder Assembly and Cylinder Door Installation



Legend

A . . . Detailed view, door hinge
B . . . Detailed view, door hinge
C . . . Detailed view, door latch
D . . . Detailed view, door latch
E-E . . Cross section, door latch

Cylinder Assembly and Cylinder Door Installation

3 Sheets

60044WR2, 72044WR2

Figure 66. Door Details, Installed View

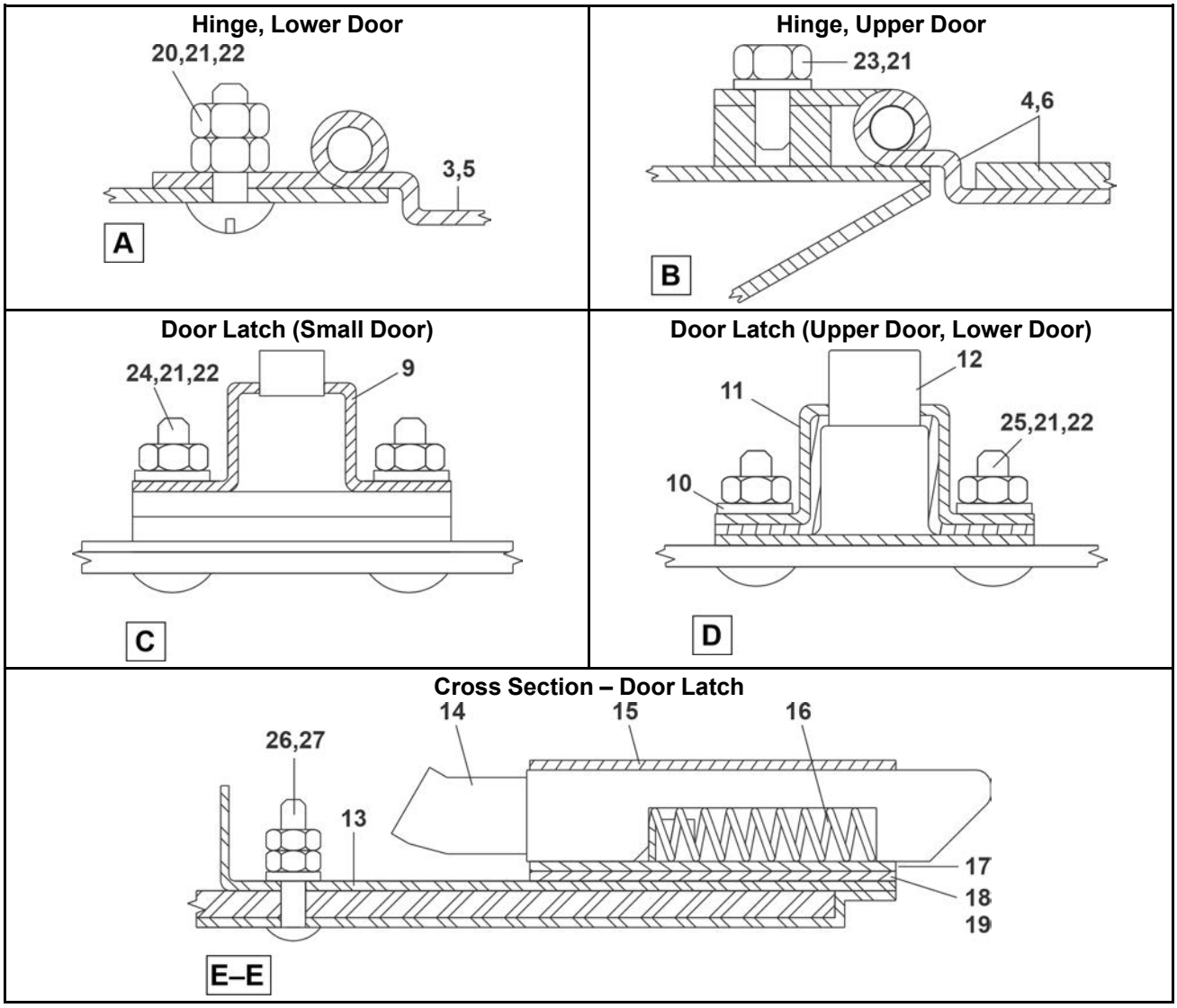


Table 35. Parts List—Cylinder Assembly and Cylinder Door Installation

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Reference Assemblies				
	A	ABS29010A	CYL+SHELL+BEAR 6044WE2 ONLY	6044WR2
	B	ABS36010A	CYL+SHELL+BEAR 7244WE2 ONLY	7244WR2
Components				
A	1	ACA19WE2A	* CYL ASSY=6044WE2 WELD/SHAFT	

Cylinder Assembly and Cylinder Door Installation

3 Sheets

60044WR2, 72044WR2

Table 35 Parts List—Cylinder Assembly and Cylinder Door Installation (cont'd.)

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

Used In	Item	Part Number	Description/Nomenclature	Comments
B	1	ACA36WE2A	* CYL ASSY=7244WE2 WELD/SHAFT	
A	2	Y2 19216	MAINSHAFT 6044	
B	2	Y3 06368	MAINSHAFT 7244WE2+3	
A	3	SA 28 110	CYLDOOR LOLT 60WE2+ MIN-REIF	
B	3	SA 36 003	CYLDOOR LOLT 72WE2+ MAX-REIF	
A	4	SA 28 111	CYLDOOR UPLT 60WE2+ MIN-REIF	
B	4	SA 36 004	CYLDOOR UPLT 72WE2+ MAX-REIF	
A	5	SA 28 112	CYLDOOR LORT 60WE2+ MIN-REIF	
B	5	SA 36 001	CYLDOOR LORT 72WE2+ MAX-REIF	
A	6	SA 28 113	CYLDOOR UPRT 60WE2+ MIN-REIF	
B	6	SA 36 002	CYLDOOR UPRT 72WE2+ MAX-REIF	
all	7	SA 28 114	CYLDOOR ASY,SMALL =60+72WE2	
all	9	X2 15201	KEEPER=CYLDOOR LATCH(MONEL)	
all	10	03 06174	KEEPER=DOORLATCH REINFORCE	
all	11	03 06167	COVER-LARGE CYLDOOR KEEPER	
all	12	X3 06166	KEEPER=CYL DOOR LATCH(MONEL)	
all	13	02 18869	SPACER-LATCH PULL BND@PRNT	
all	14	X3 06150	PLUNGER=LARGE CYLDOOR(CAST)	
all	15	03 06151	LATCHBODY-LARGE=CYLDOOR	
all	16	03 06156	SPRING=LARGE CYLDOOR LATCH	
all	17	X3 06152	PLATE = LARGE DOORLATCH	
all	18	03 06172	SHIM=DOOR LATCH-18GA	
all	19	03 06173A	SHIM=DOOR LATCH-11GA	
all	20	15A010	CARRSCR 3/8-16UNC2X1 SS SPECIAL	
all	21	15U260	LOCKWASHER MEDIUM 3/8 SS18-8	
all	22	15G206	HEXNUT 3/8-16 UNC2 SS 18-8	
all	23	15K084S	HXCAPSCR 3/8-16NCX5/8 SS18-8	
all	24	15K106E	BUTSOKCAPSCR 3/8-16NCX1+1/2 SS	
all	24	15A015	CARRSCR 3/8-16X1+1/4 18-8 SS	
all	26	15K042K	BUTSOKCAPSCR 1/4-20UNCX1+1/4 S	
all	27	15G170	HEXNUT 1/4-20UNC2 SS18-8	

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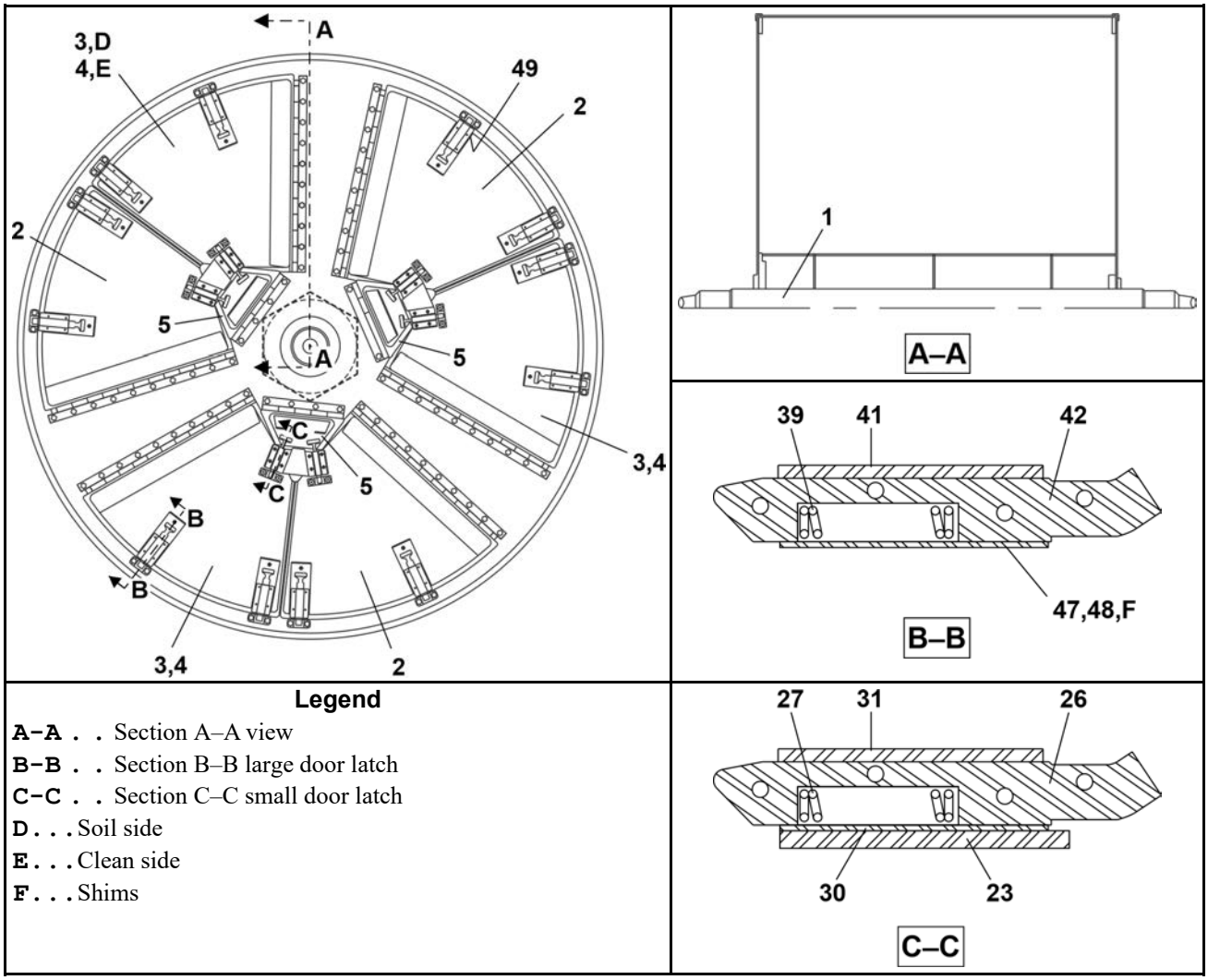
Cylinder Doors 3 pocket

5 Sheets

7244WR3, 7244SR3

Figure 67. Section Views



Legend

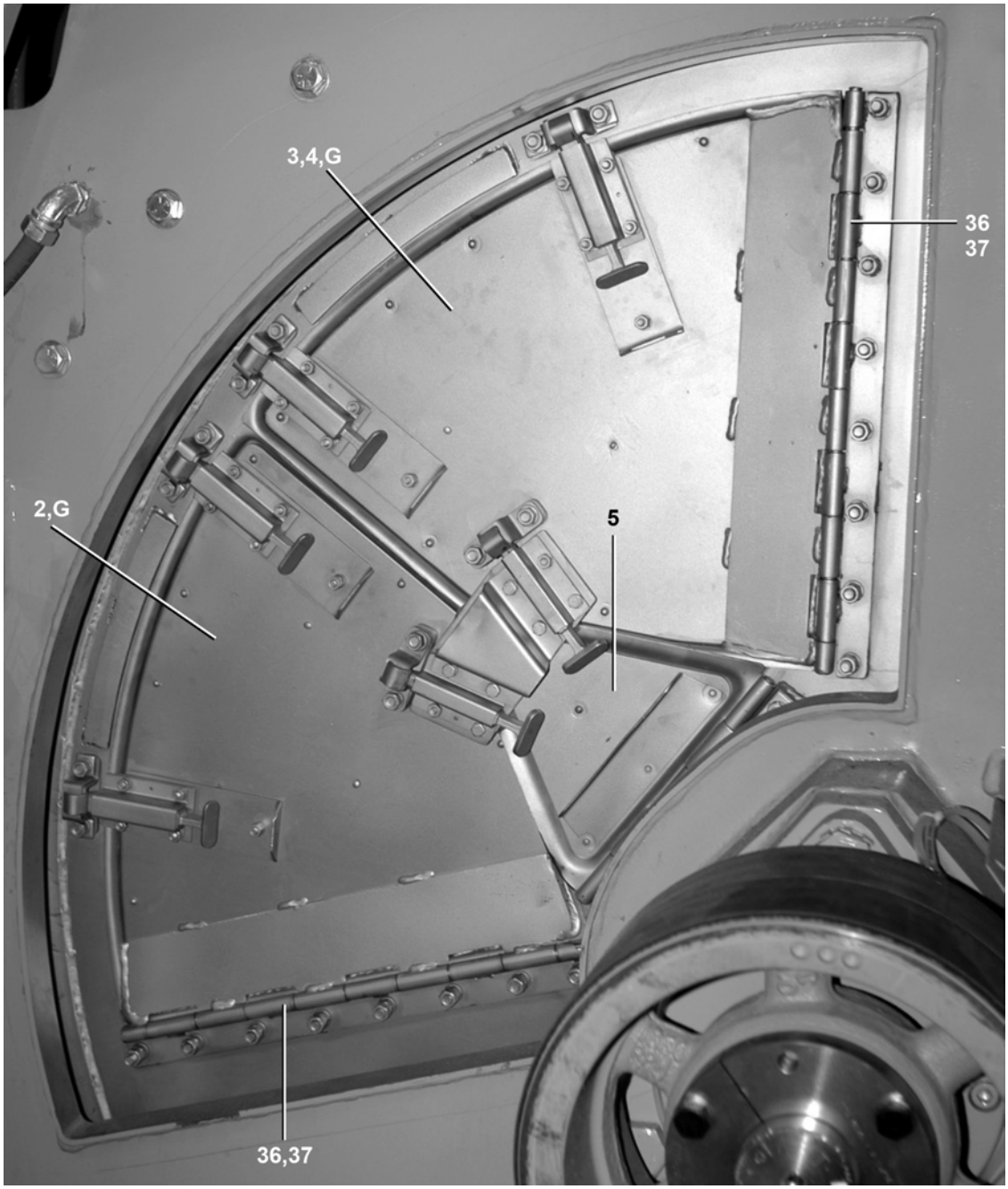
A–A . . Section A–A view
B–B . . Section B–B large door latch
C–C . . Section C–C small door latch
D . . . Soil side
E . . . Clean side
F . . . Shims

Cylinder Doors 3 pocket

5 Sheets

7244WR3, 7244SR3

Figure 68. Cylinder Doors



Legend

G . . . Large doors

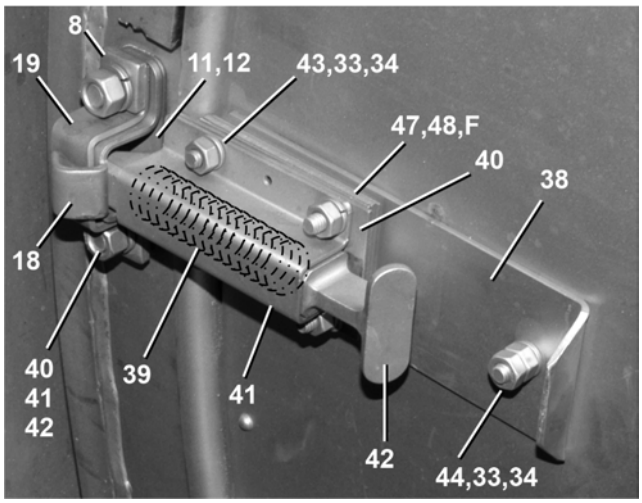
Cylinder Doors 3 pocket

5 Sheets

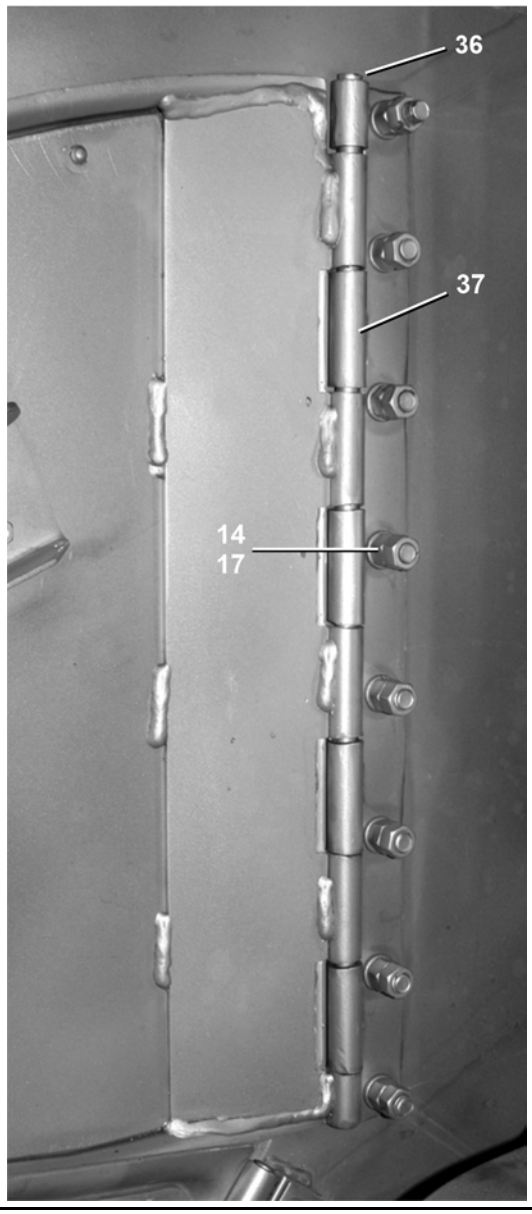
7244WR3, 7244SR3

Figure 69. Additional Views

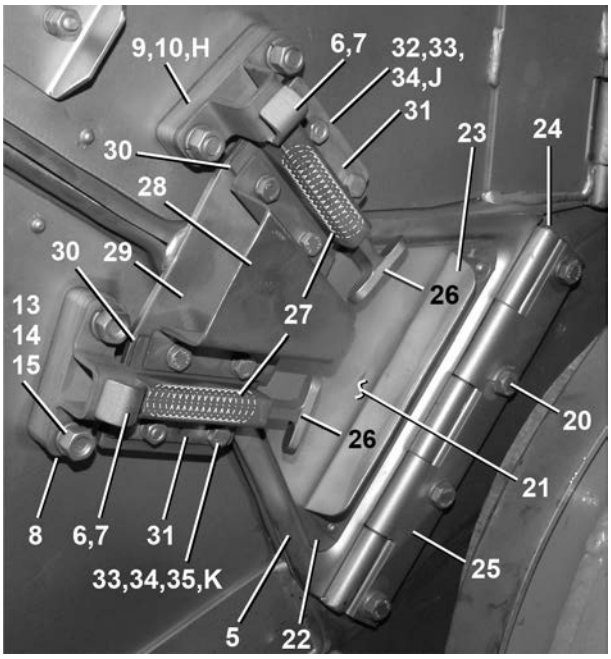
Large Door Latch



Large Door Hinge



Small Doors



Legend

F . . . Shims
H . . . Uses 3
J . . . 2 instances
K . . . 6 instances

Cylinder Doors 3 pocket

5 Sheets

7244WR3, 7244SR3

Table 36. Parts List—Cylinder Doors 3 pocket

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Reference Assemblies				
	A	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	

Cylinder Doors 3 pocket

5 Sheets

7244WR3, 7244SR3

Table 36 Parts List—Cylinder Doors 3 pocket (cont'd.)

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

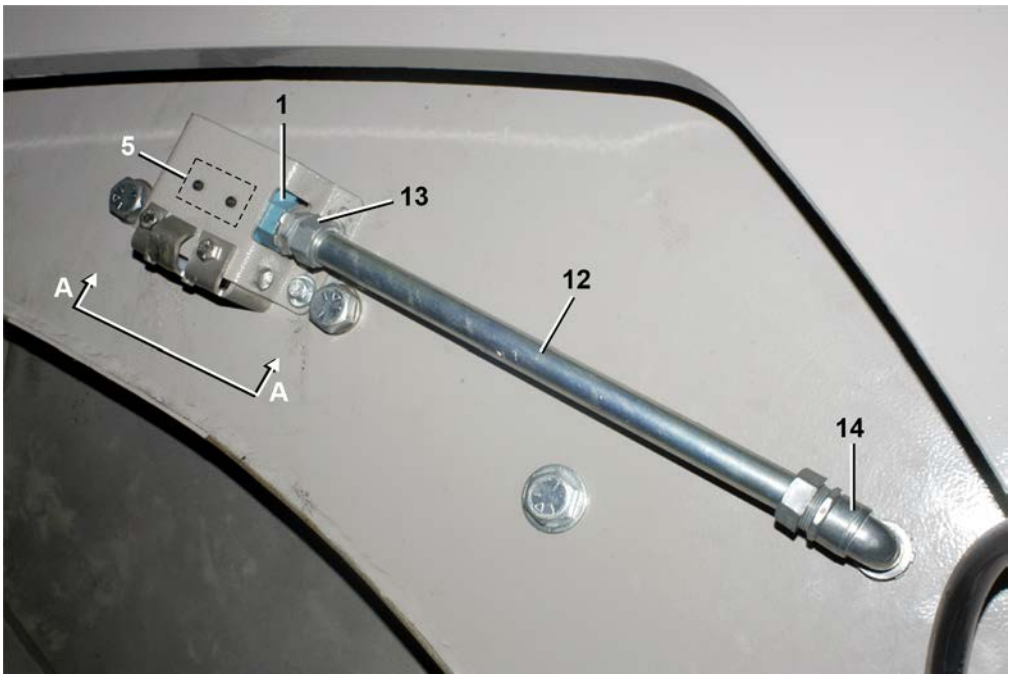
Used In	Item	Part Number	Description/Nomenclature	Comments
all	32	15N158	HEXCAPSCR 1/4-20NCX1/2SS18-8	
all	33	15U181	LOCKWASHER MEDIUM 1/4 SS18-8	
all	34	15G170	HEXNUT 1/4-20UNC2 SS18-8	
all	35	15N173	FLATMACSCR 1/4-20NCX5/8SS18-8	
all	36	03 06035	PIN=CYL DOOR HINGE 72WED	
all	37	W3 06031	WLMT=HINGE 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	

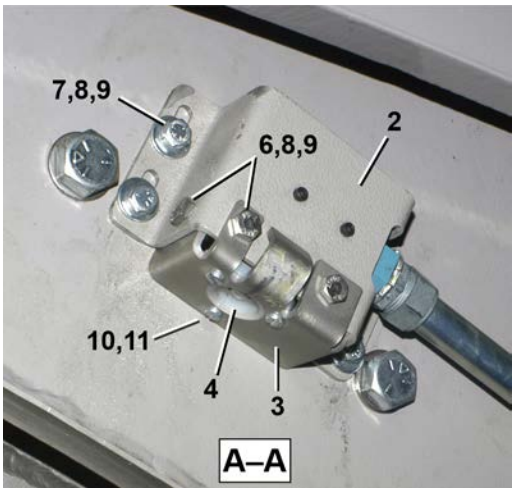
BPWD6D04 / 2020362 BPWD6D04.1 0000305681 B.2 A.4 8/31/20, 3:22 PM Released

Door Interlock Switch

2 Sheets

6044WP2, 7244WP2





Legend

A–A . . Detailed view, door interlock switch

Door Interlock Switch

2 Sheets

6044WP2, 7244WP2

Table 37. Parts List—Door Interlock 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
			Reference Assemblies	
	A	AD 29 024L	*DOORINTERLOCK SW ASSY LEFT	
	B	AD 29 024R	*DOORINTERLOCK SW ASSY RIGHT	
			Components	
all	1	09R012	MICSW SPDT PAINTED BZE6-RN 01	
A	2	02 18952	BRACKET=DOOR 60 WED	
B	2	02 18979	BRACKET=DORSW-RT-WED	
A	3	02 18953	STRIKER-DORSW=60" WED	
B	3	02 18978	STRIKER-DORSW RT-WED-SS	
all	4	02 18954	BUSHING=60"WEDU	
all	5	20A015GA	SHIM=FRICTION=CWU DOORSWITCH	
all	6	15K030	HEXCAPSCR 1/4-20UNC2X1/2 GR5 Z	
all	7	15K039	HXCAPSCR 1/4-20UNC2AX3/4 GR5 Z	
all	8	15U180	LOCKWASHER MEDIUM 1/4 ZINCPL	
all	9	15U185	FLATWASHER(USS STD) 1/4" ZNC P	
all	10	15N092A	SLPANHDMACSCR 8-32UNC2AX1/2 ZC	
all	11	15G164	HX THIN LOCKNUT NYL1/4-20 SS	
all	12	12C050	TUBING 1/2 EMT THIN WALL 10RML	
all	13	12K040	1/2"COND.EMT COND. PECO #260B	
all	14	12K054	1/2"HDY CORNER ELBOW PECO #670	

6 Control and Sensing

BPWD6Z01 / 2020362 BPWD6Z01.1 0000305752 B.2 A.3 8/31/20, 2:30 PM Released

Excursion Switch (Unwanted Movement Switch) Components and Installation

1 Sheet

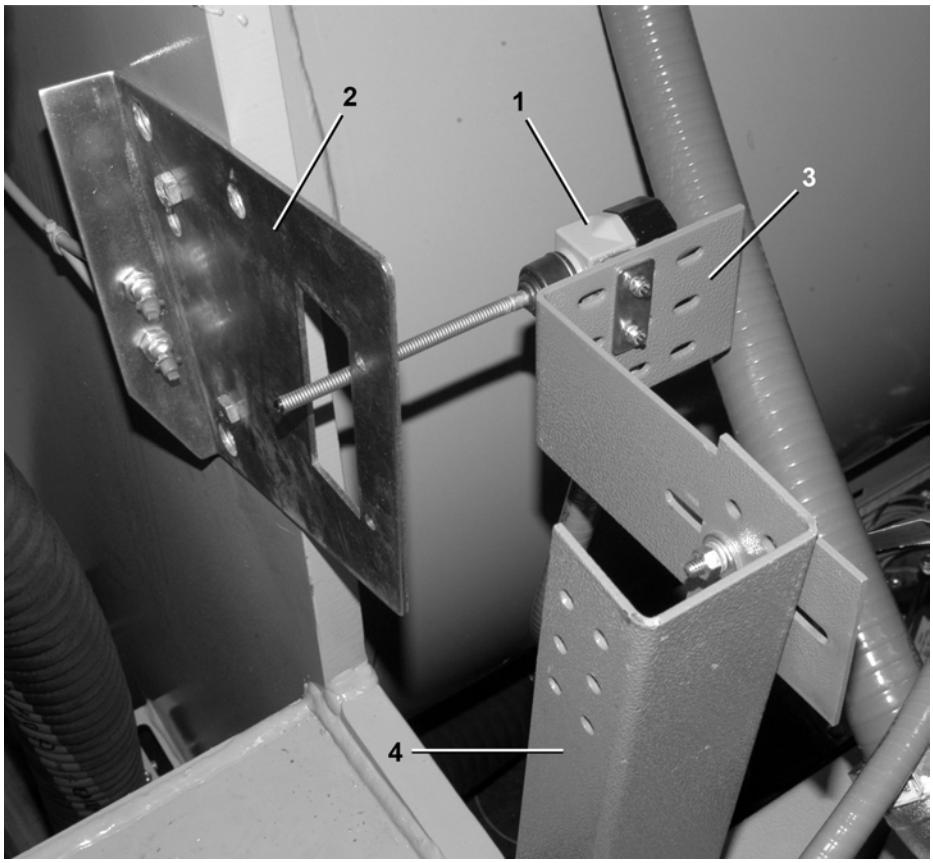


Table 38. Parts List—Excursion Switch

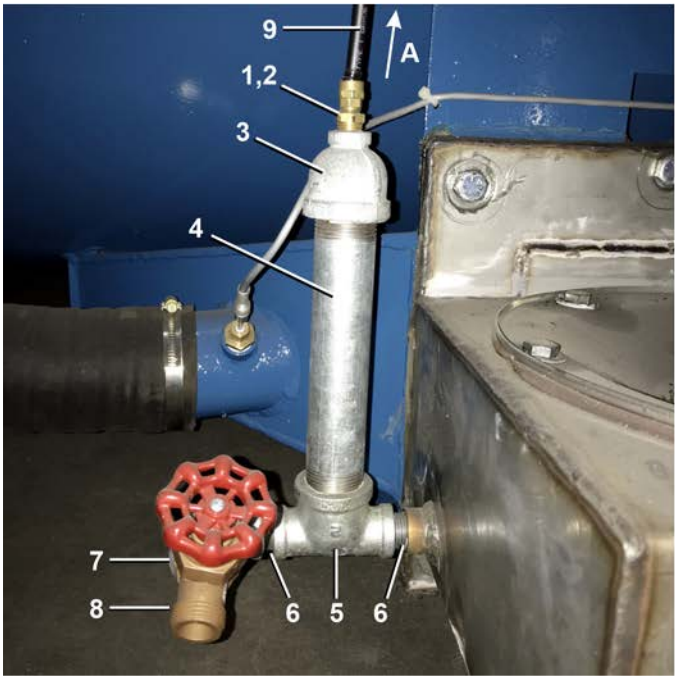
Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Components				
all	1	09R008ASTD	* 09R008A+MOUNTING HDWRE+INST	
all	2	02 18542A	ACTUATOR=EXCURSION SW SHELMT	
all	3	02 18784E	EXCURSION SW MOUNT BKT\	
all	4	02 18784D	BRACKET=EXCURSION SW	6044WR2/3 ONLY

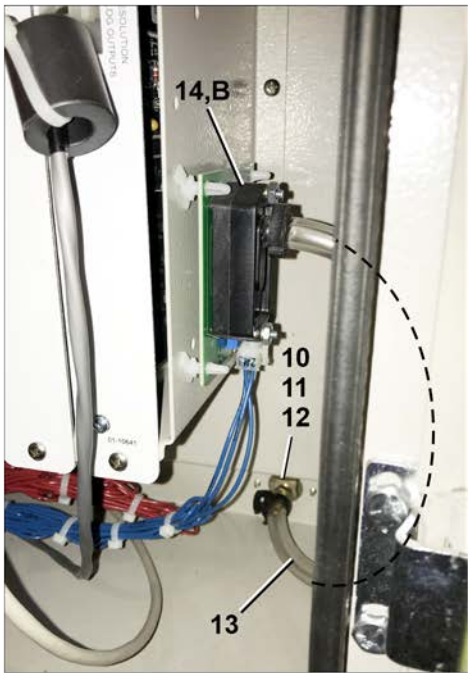
BPWVUZ01 / 2020043 BPWVUZ01.1 0000267913 B.2 A.3 1/21/20, 10:27 AM Released

Air Chamber Level Switch

1 Sheet

42044WR2,WR3,SR2,SR3; 6044WR2,WR3,SR2, SR3; 72044WR2, WR3, SR2, SR3





Legend

A . . . To transducer
B . . . Transducer

Table 39. Parts List—Air Chamber Level 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
			Reference Assemblies	
	A	AD 15 090A	AIRCHAMBER PRESWITCH INSTALL	
			Components	
all	1	5SB0E0CBEO	NPTHEXBUSH 1/4X1/8 BRASS 125#	
all	2	53A047H	MALCON 5/16X1/8POLY PH#68P-5-2	
all	3	5SR1A0ENF	NPT RED 1X1/4 GALMAL 150#	
all	4	5N1A07AG42	NPT NIP 1X7 TBE GALSTL SK40	
all	5	5S0KNFA1A	NPT TEE 1/2X1/2X1" GALMAL 150#	
all	6	5N0KCLSG42	NPT NIP 1/2XCLS TBE GALSTLSK40	
all	7	5SL0PNFC0K	NPT 90D STREET 3/4X1/2 GAL150#	
all	8	96DB0PNA	HOSEBIBB 3/4" MALEINLT 45DEG. ACETAL	
all	9	60E005	TUBING BLK.POLY.5/160DX3/16ID	
all	10	51V010A	TEE 1/8"BRSEXTR BLOCTYP#2203P2	
all	11	51E502A	HOSESTEM BRASS 1/8MPT X3/16	

Air Chamber Level Switch

1 Sheet

42044WR2,WR3,SR2,SR3; 6044WR2,WR3,SR2, SR3; 72044WR2, WR3, SR2, SR3

Table 39 Parts List—Air Chamber Level Switch (cont'd.)

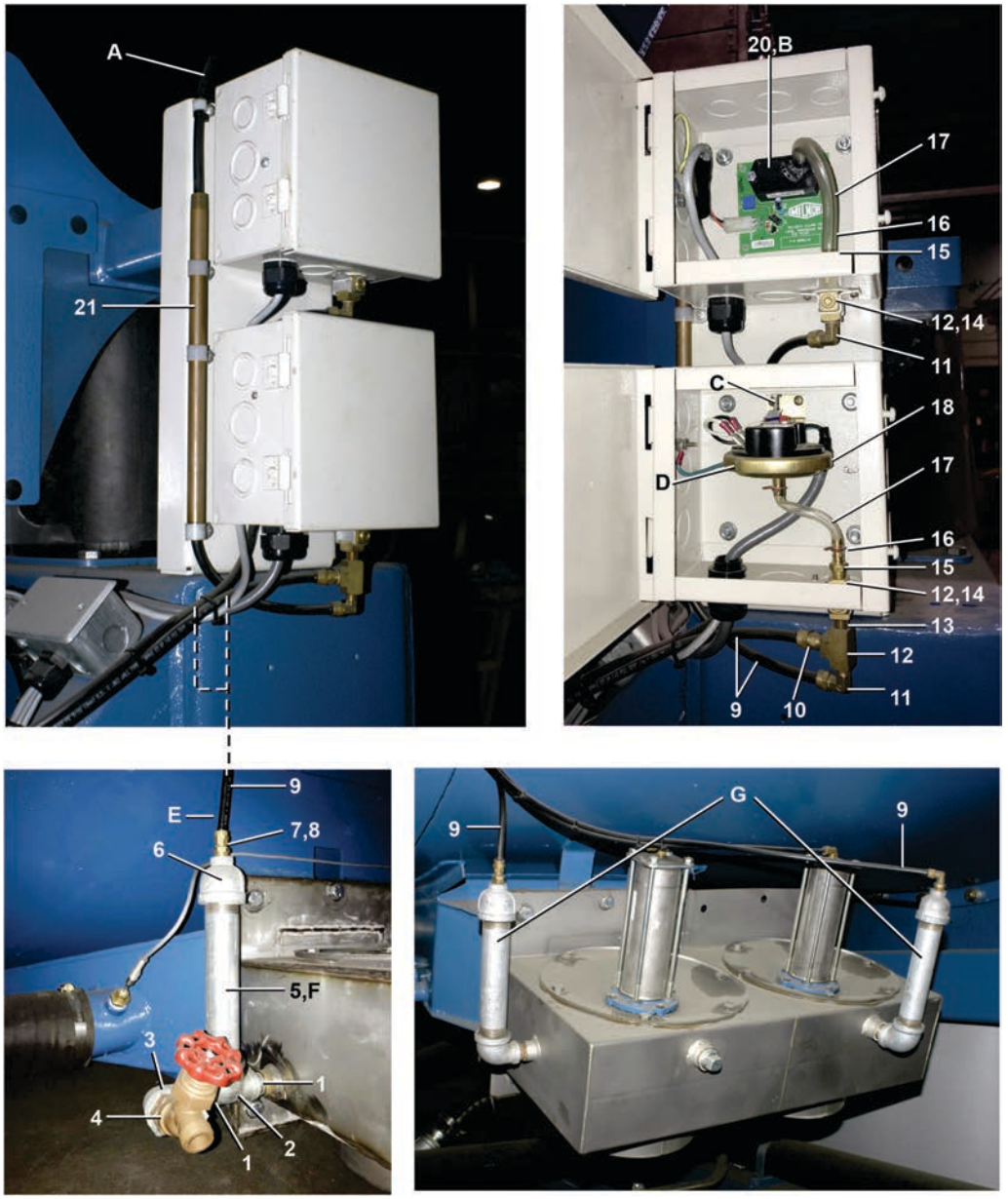
Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
all	12	5SP0CBEHS	NPT PLUG 1/8 HXCTRSNK BRASS	
all	13	60E004NA	TUBING CLEAR PVC 3/16"IDX5/16"OD	
all	14	08BNLTT	LEVEL TRANSDUCER BD->TEST	

BPWSUZ01 / 2021354 BPWSUZ01.1 0000374579 B.2 B.1 9/13/21, 9:53 AM Released

Air Chamber Level Switch with Overflow Pressure Switch

2 Sheets

72044WR2,WR3,SR3 72046M5K, 48040M7K



Legend

A . . . Vent
B . . . Transducer
C . . . Manual adjustment
D . . . Overflow pressure switch
E . . . If only one air chamber, the air line must tee off to both switches.
F . . . Air chamber (typical)
G . . . Dual drain with two air chambers

Air Chamber Level Switch with Overflow Pressure Switch

2 Sheets

72044WR2,WR3,SR3 72046M5K, 48040M7K

Table 40. Parts List—Air Chamber Level Switch with Overflow Pressure 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**
Reference Assemblies				
	A	ALS68002	72WP/SP PRESURE LEVEL SWITCH ASSY OVERFLOW	REFERENCE
	B	ALS48001	4840M7K LEVEL SWITCH ASSY	
Components				
all	1	5N0KCLSG42	NPT NIP 1/2XCLS TBE GALSTLSK40	
all	2	5S0KNFA1A	NPT TEE 1/2X1/2X1" GALMAL 150#	
all	3	5SL0PNFC0K	NPT 90D STREET 3/4X1/2 GAL150#	
all	4	96DB0PNA	HOSEBIBB 3/4" MALEINLT 45DEG. ACETAL	
all	5	5N1A07AG42	NPT NIP 1X7 TBE GALSTL SK40	
all	6	5SR1A0ENF	NPT RED 1X1/4 GALMAL 150#	
all	7	5SB0E0CBEO	NPTHEXBUSH 1/4X1/8 BRASS 125#	
all	8	53A047H	MALCON 5/16X1/8POLY PH#68P-5-2	
all	9	60E005	TUBING BLK.POLY.5/160DX3/16ID	
all	10	53A019B	BODYMALECON5/16X1/8COM#B68A-5A	
all	11	53A032	ELB90MAL5/16X1/8POLY #169P-5-2	
all	12	51V010A	TEE 1/8"BRSEXTR BLOCTYP#2203P2	
all	13	5N0CCLSB42	NPT NIP 1/8XCLS TBE BRASS STD	
all	14	5SP0CBEHS	NPT PLUG 1/8 HXCTRSNK BRASS	
all	15	51E502A	HOSESTEM BRASS 1/8MPT X3/16	
all	16	27A043	HOSECLAMP 5/16"DIA.SPRING#A-5S	
all	17	60E004NA	TUBING CLEAR PVC 3/16"IDX5/16"OD	
all	18	09N069	PRESS SW 4"WC INVENSYS 738-719	
all	19	27A047A	HOSE CLAMP 5/16" NOMINIAL MIN .256"	
all	20	08BNLTT	LEVEL TRANSDUCER BD->TEST	
all	21	5N0E11ABE2	NPT NIP 1/4X11 TBE BRASS STD	

BPWVUZ03 / 2020195 BPWVUZ03.1 0000290654 B.2 A.3 5/7/20, 9:15 AM Released

Temperature Probe

1 Sheet

6044WR2,WR3,SR2 72044WR2,WR3,SR3

Table 41. Parts List—Temperature Probe

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Components				
all	1	30R0043PB	TEMPERATURE PROBE ASSY=BRASS	

BNWUUM01 / 2019345 BNWUUM01 0000250244 C.2 11/7/19, 10:43 AM Released

6.1 Vibration Safety Switch Adjustments

BNWUUM01.C01 0000250243 B.2 C.2 A.3 1/2/20, 2:19 PM Released

6.1.1 What the Vibration Safety Switch Does

BNWUUM01.C02 0000250242 B.2 C.2 A.3 1/2/20, 2:19 PM Released

The **vibration safety switch** in Figure 70: Vibration Switch, page 136 is an important safety feature. If properly adjusted, the switch will momentarily actuate as a result of repeated machine movement caused by an out-of-balance condition. Table 42, page 135 below illustrates the effect of the **vibration safety switch** actuation.

Table 42. Effect of Tripping Vibration Safety Switch

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

6.1.2 Adjustments

BNWUUM01.C03 0000250240 B.2 C.2 11/7/19, 10:43 AM Released

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

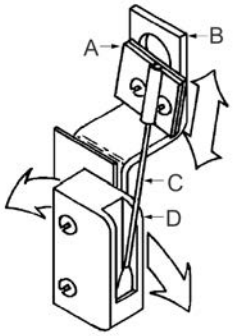
Adjustment of this switch from the factory setting is not recommended; however, it should be checked for proper functioning and adjusted if its proper setting is lost.

As shown in Figure 70: Vibration Switch, page 136 , the unit consists of a **sensitive micro-switch** with an extended actuating arm supporting an eccentric weight. The weight may be adjusted by moving it up and down on the arm and by rotating it on the arm. In addition, the **micro-switch** itself may be tilted from side to side.

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

The unit should be adjusted so that the actuating arm will always reset by itself, this being accomplished by rotating either the switch or the weight to give just enough bias to cause the switch to reset. Check the adjustment by moving the arm to the left then slowly releasing it. Make sure the micro-switch clicks when the arm is **slowly** released, thus indicating that it has reset. In the released position, the arm should rest **lightly** but definitely against the stop on the **micro-switch** case that prevents any further arm movement to the left.

Figure 70. Vibration Switch



Legend

A . . . Eccentric weight (adjusts up and down)
B . . . Mounting bracket
C . . . Actuating arm
D . . . Microswitch (adjusts side to side)

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

BPWOAZ03 / 2019375 BPWOAZ03.1 0000252209 B.2 B.3 1/2/20, 2:25 PM Released

Vibration Safety Switch

1 Sheet

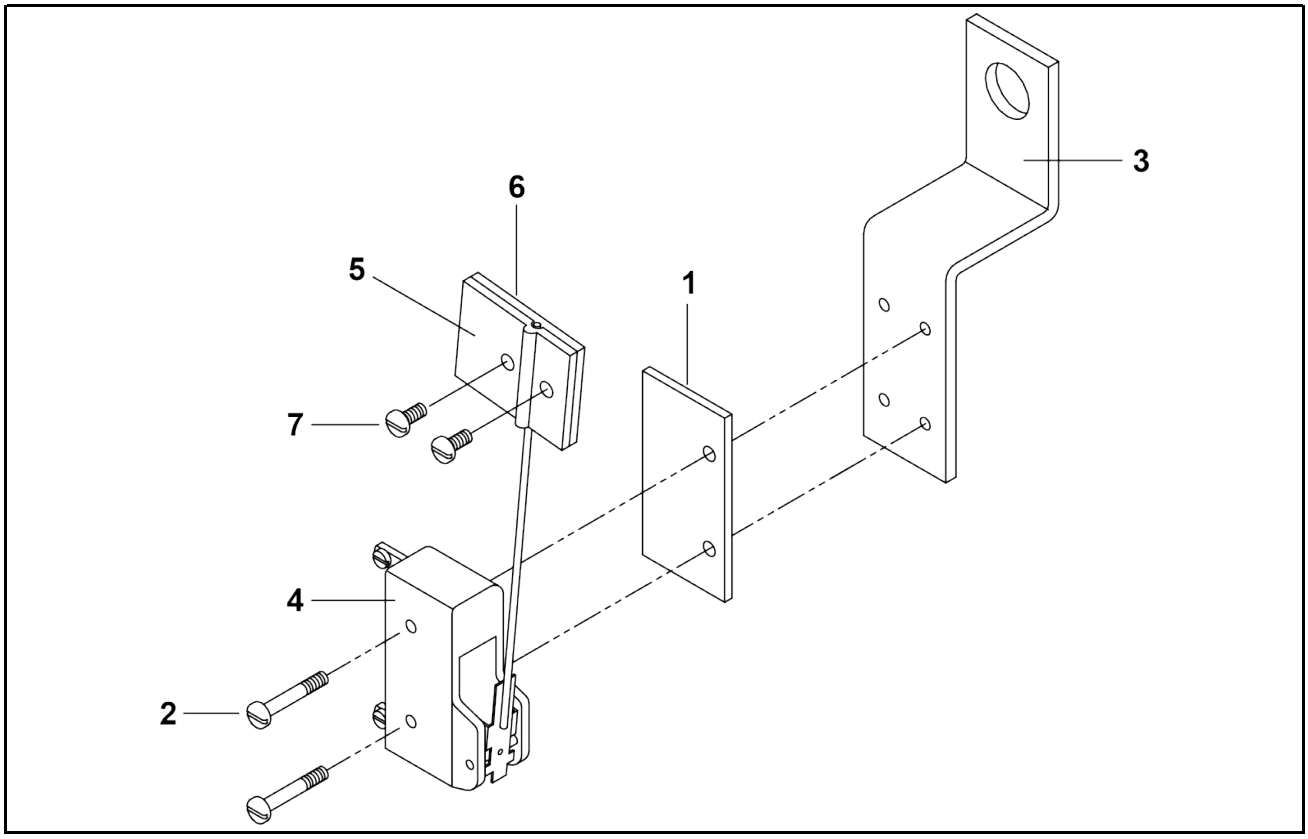


Table 43. Parts List—Vibration Safety Switch

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**
Reference Assemblies				
	A	SAE03 151	* ASSY-VIBRATION SWT=LG CONTR	
Components				
all	1	02 02038	PLATE INSULATING SMALL 9NOV51	
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	

7 Chemical Supply Devices

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Peristaltic Supply Manifold

1 Sheet

72044WR2, 72044SR2

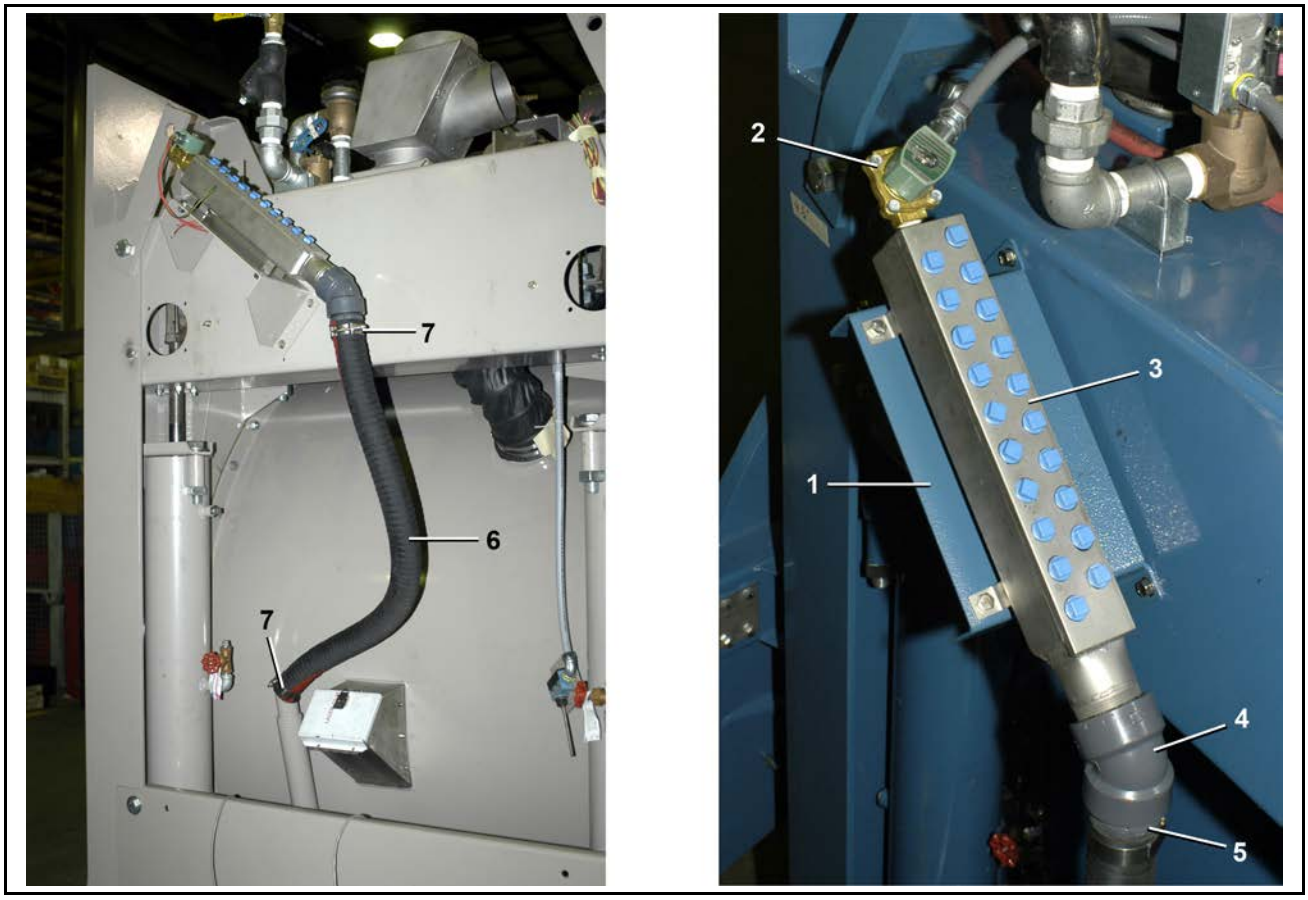


Table 44. Parts List—Peristaltic Supply Manifold

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Reference Assemblies				
	A	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	

BPWG7C03 / 2020254 BPWG7C03.1 0000295691 B.2 A.5 6/17/20, 3:55 PM Released

Five Compartment Supply

5 Sheets

72044SP2, 72044SR2, 7244WP2, 7244WR2

Figure 71. Installed view

Legend

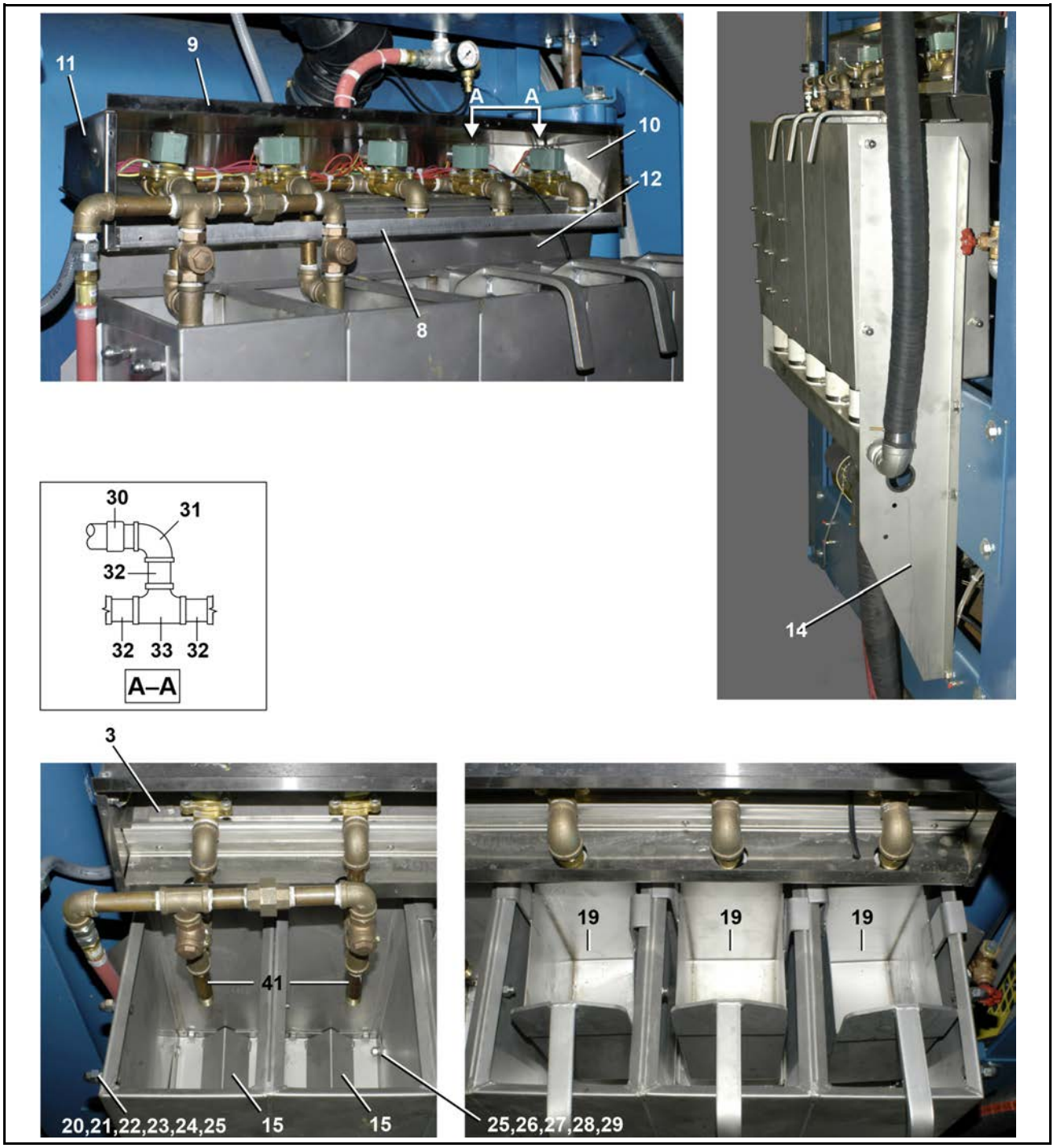
B . . . Hand actuated flush switch
C . . . Shown disconnected

Five Compartment Supply

5 Sheets

72044SP2, 72044SR2, 7244WP2, 7244WR2

Figure 72. Supply box components



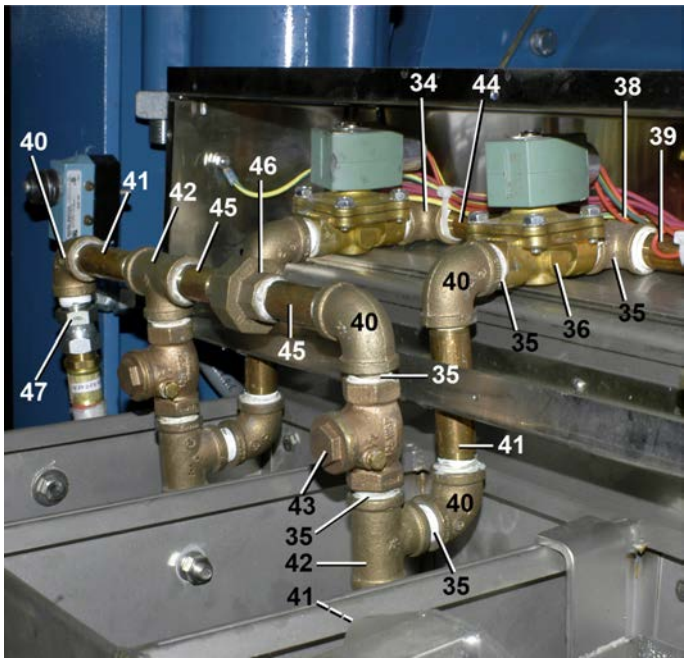
Five Compartment Supply

5 Sheets

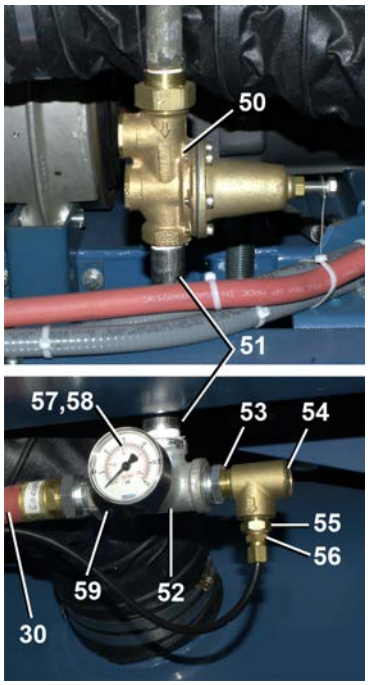
72044SP2, 72044SR2, 7244WP2, 7244WR2

Figure 73. Water inlet and manifold piping

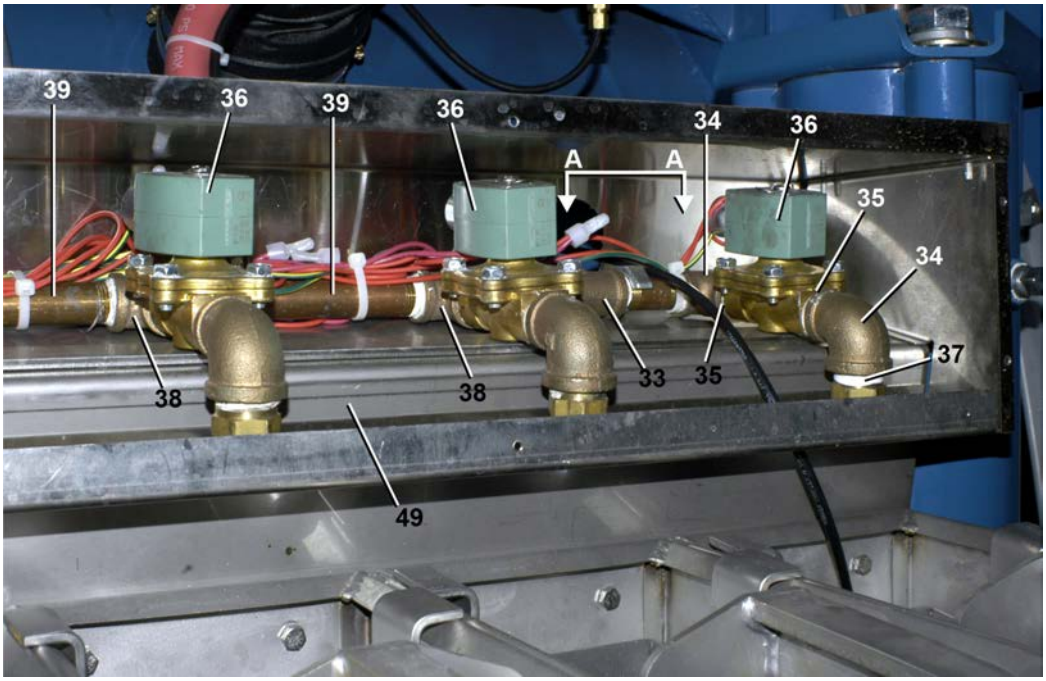
Supply Manifold



Water Inlet



Supply Manifold



Five Compartment Supply

5 Sheets

72044SP2, 72044SR2, 7244WP2, 7244WR2

Table 45. Parts List—Five Compartment Supply

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
			Reference Assemblies	
	A	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=7244 SUPINJ	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=SUPPINJ INLET=7244	
A	6	60E301A27A	HOSE= *2.5"ID PE X27"	
B	6	60E301A33A	HOSE= *2.5"ID PE X33"	
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	

Five Compartment Supply

5 Sheets

72044SP2, 72044SR2, 7244WP2, 7244WR2

Table 45 Parts List—Five Compartment Supply (cont'd.)

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

Used In	Item	Part Number	Description/Nomenclature	Comments
all	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	
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	5SL0PBEA	NPTELB 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	5SL0PBEA0K	NPTELB 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	5SL0KBEA	NPTELB 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#	

Five Compartment Supply

5 Sheets

72044SP2, 72044SR2, 7244WP2, 7244WR2

Table 45 Parts List—Five Compartment Supply (cont'd.)

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

Used In	Item	Part Number	Description/Nomenclature	Comments
all	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	

8 Water and Steam

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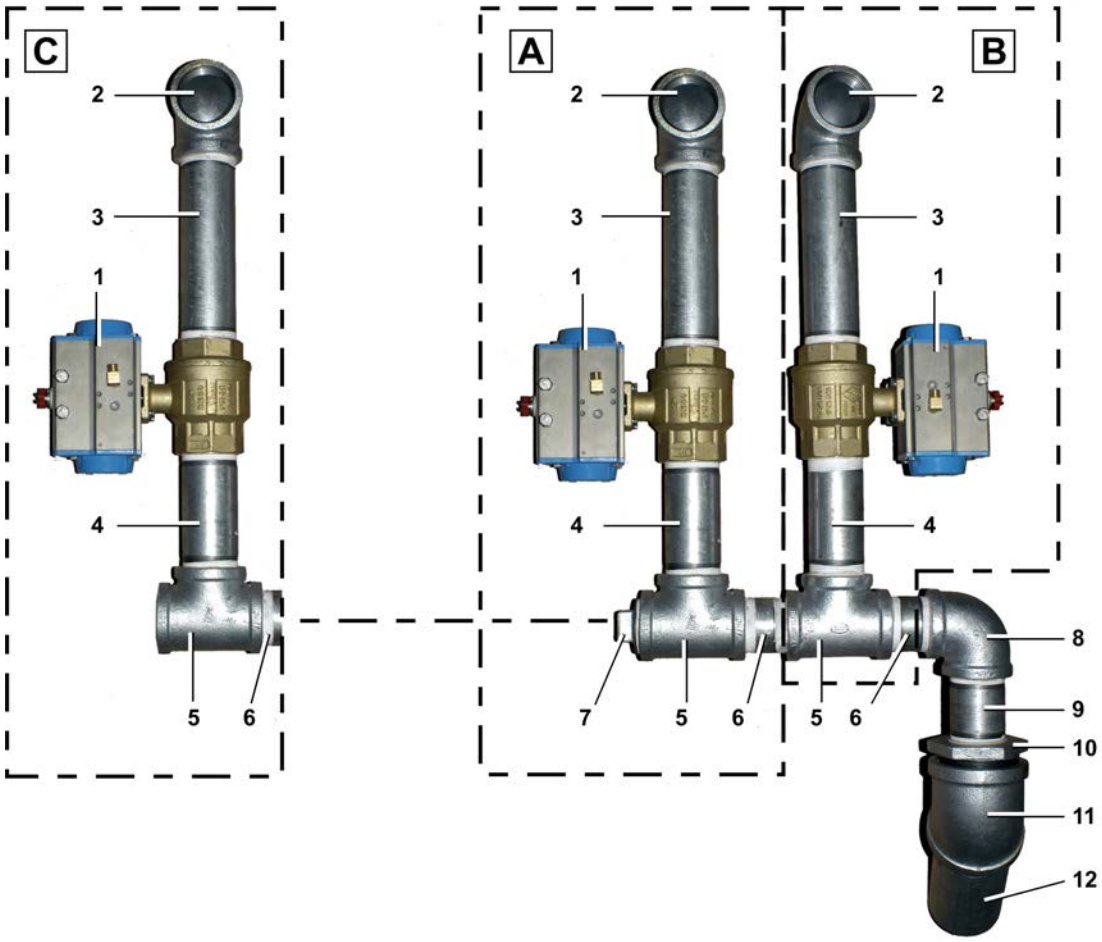
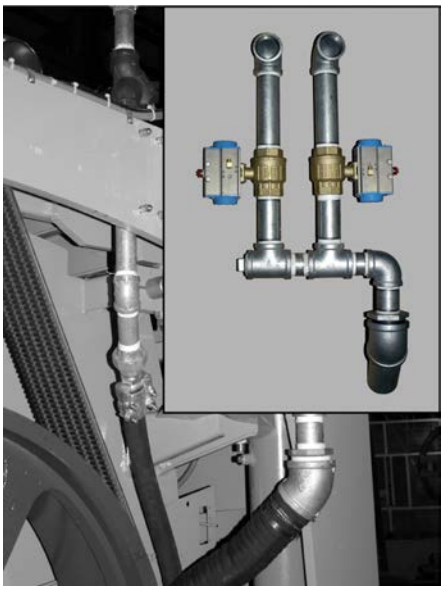
Water Inlets

1 Sheet

72044WR2





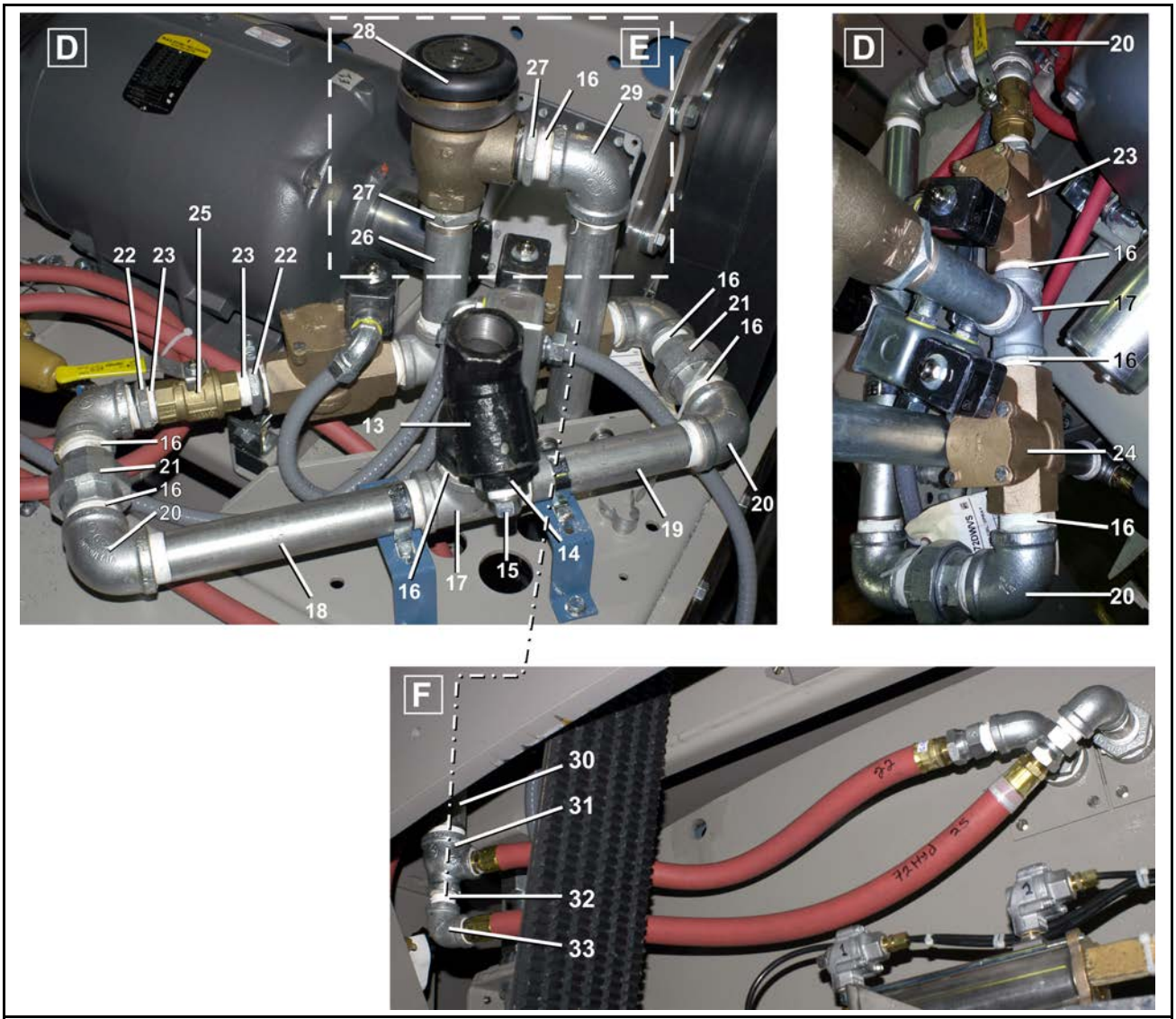
Legend

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

Water Inlets

1 Sheet

72044WR2



Legend

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

Water Inlets

1 Sheet

72044WR2

Water Inlets

1 Sheet

72044WR2

Table 46. Parts List—Water Inlets

Used In	Item	Part Number	Description/Nomenclature	Comments
Reference 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	

Water Inlets

1 Sheet

72044WR2

Table 46 Parts List—Water Inlets (cont'd.)

Used In	Item	Part Number	Description/Nomenclature	Comments
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	NPTELB 90DEG 3/4 GALMAL 150#	
all	34	60E306A29A	HOSE= *3.5"ID PE X29"	
all	35	27A084	HOSECLAMP 3+9/16-4.5CADSC#HS64	

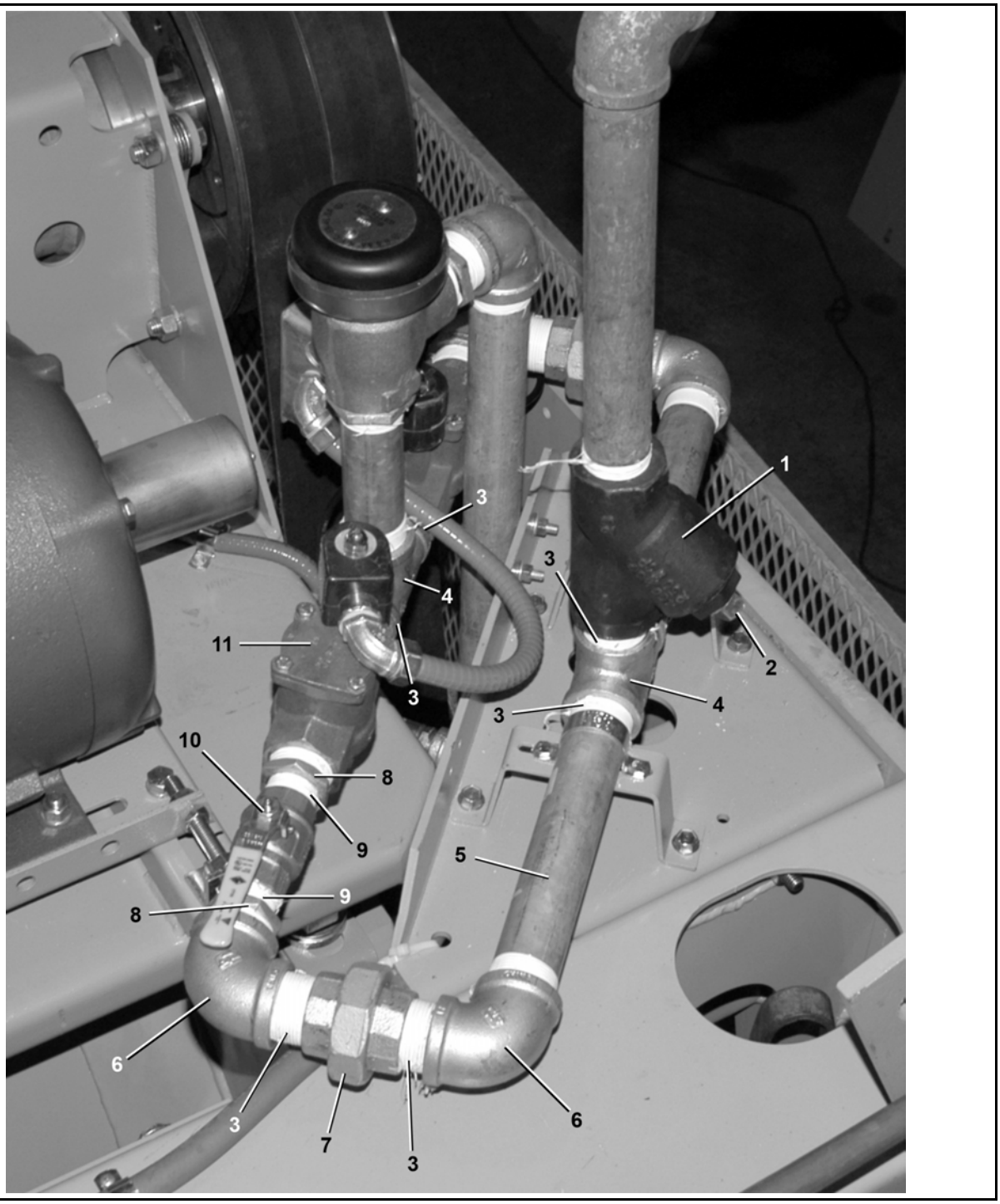
BPWD7W02 / 2020414 BPWD7W02.1 0000308398 B.2 A.5 10/7/20, 10:33 AM Released

Spraydown - Cooldown

4 Sheets

7244WP2,7244WR2

Figure 74. Cooldown Inlet

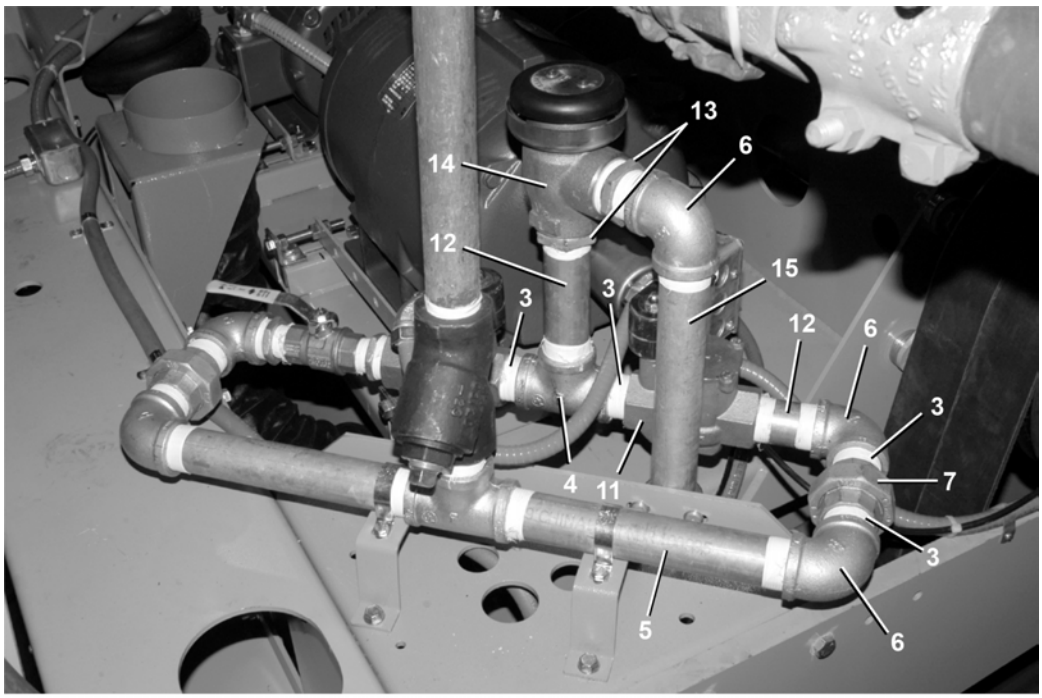


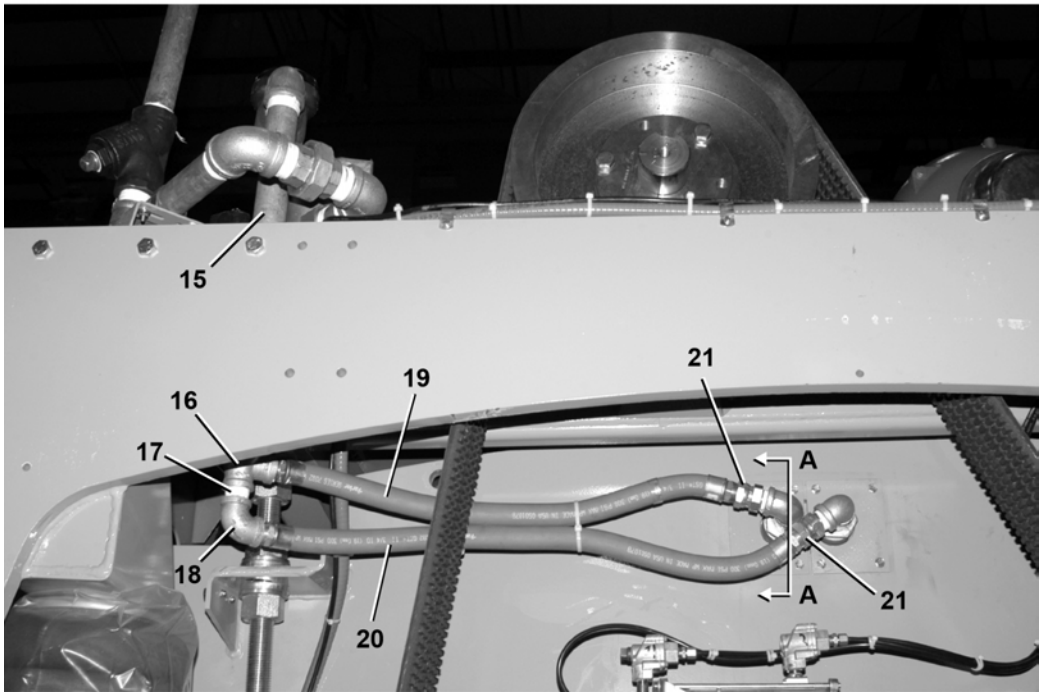
Spraydown - Cooldown

4 Sheets

7244WP2,7244WR2

Figure 75. Spraydown



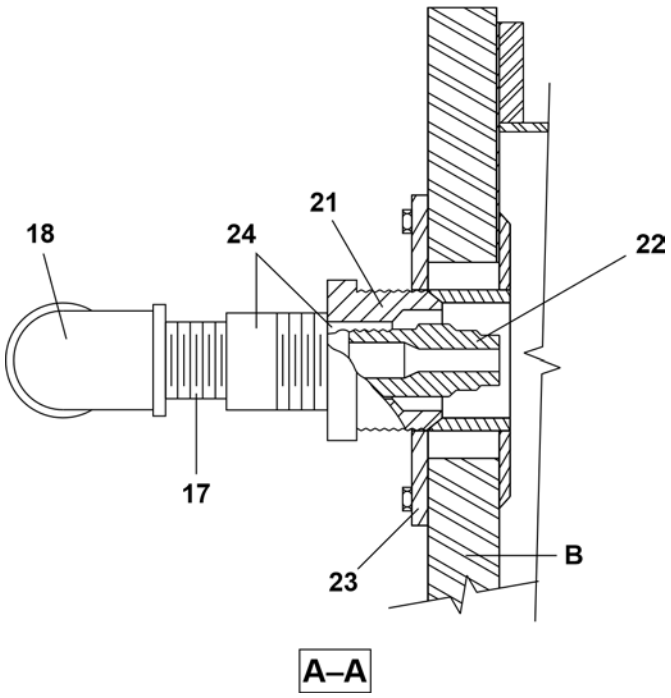


Spraydown - Cooldown

4 Sheets

7244WP2,7244WR2

Figure 76. Spray Nozzel



Legend

B . . . Shell back

Spraydown - Cooldown

4 Sheets

7244WP2,7244WR2

Table 47. Parts List—Spraydown - Cooldown

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
			Reference Assemblies	
	A	GVW36023	SPRY+CLDN=MTG HDWE NOSB72WE 2	
	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	

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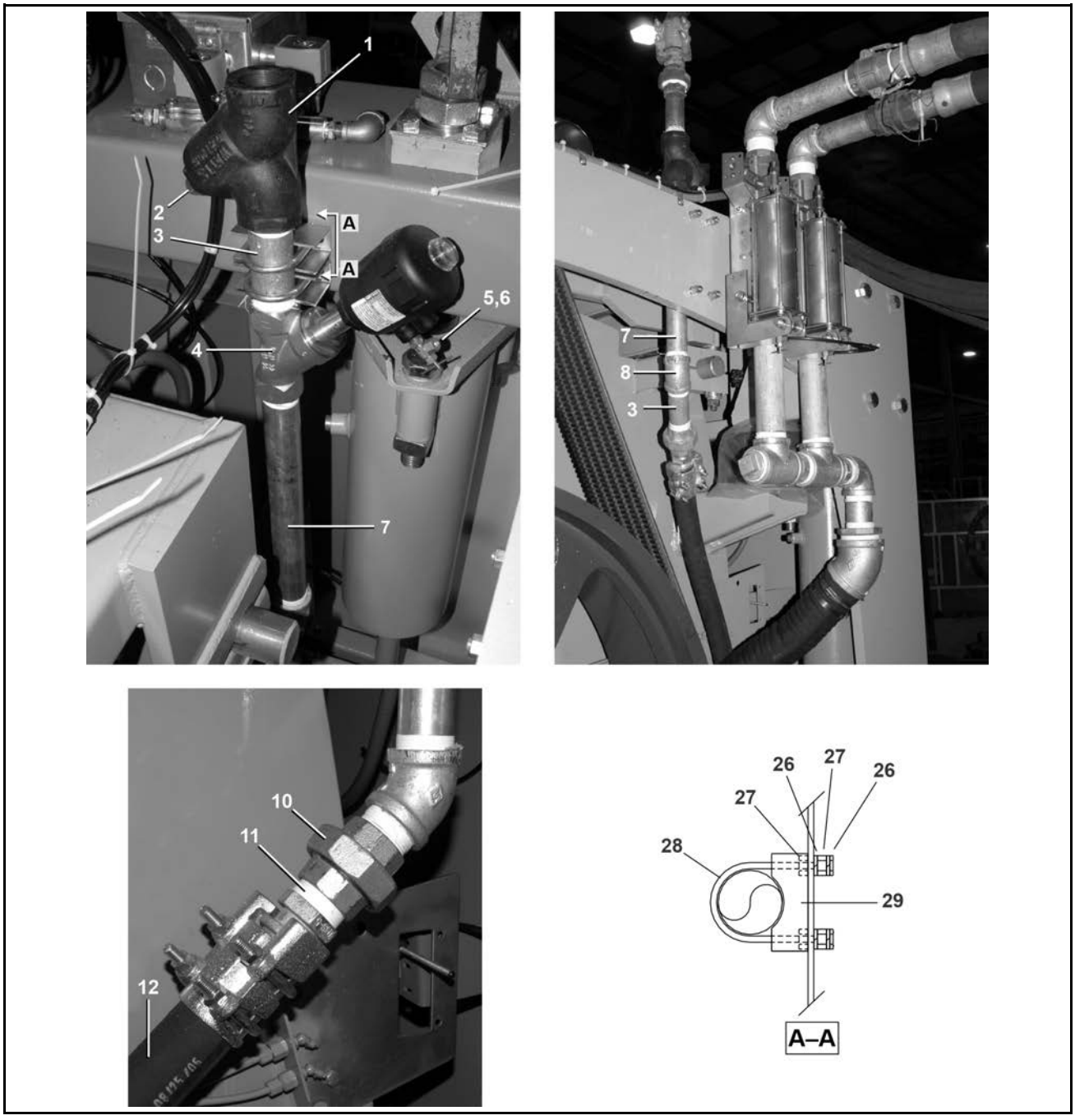
Steam

3 Sheets

7244WP2, 7244WR2, 7244WP3, 7244WR3

Figure 77. Steam Inlet

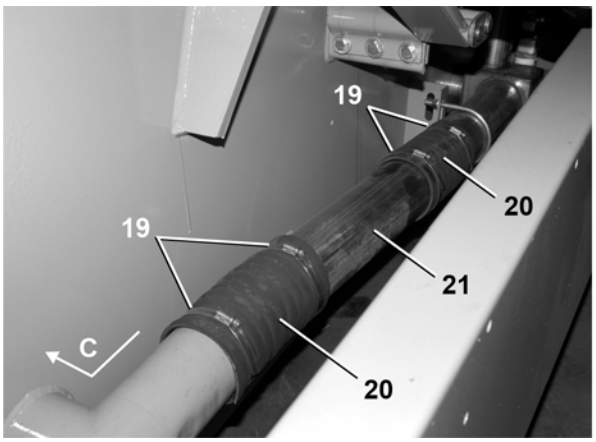


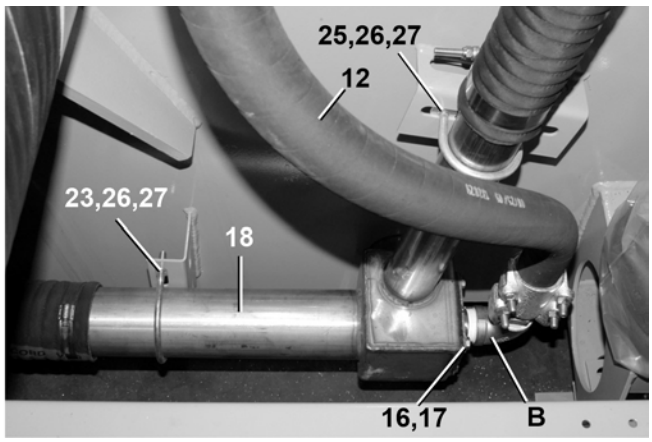
Steam

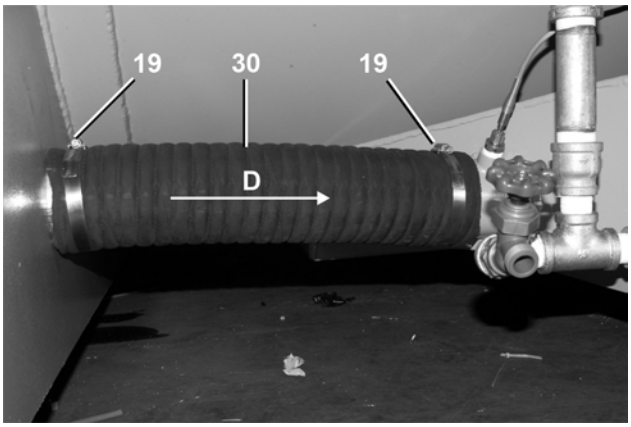
3 Sheets

7244WP2, 7244WR2, 7244WP3, 7244WR3

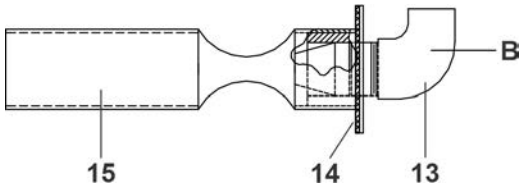
Figure 78. Steam Mixing







Steam Pipe and Nozzle



Legend

B . . . Steam pipe and nozzle.
C . . . Steam goes through the rear shell.
D . . . Steam goes into the shell bottom.

Steam

3 Sheets

7244WP2, 7244WR2, 7244WP3, 7244WR3

Table 48. Parts List—Steam

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

Used In	Item	Part Number	Description/Nomenclature	Comments
			Reference Assemblies	
	A	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"1D PE X 4.5"	
all	21	02 10539S	SPACER PIPE DAS	
all	23	27A035	UBOLT 3/8-16 3.625"BETWEN 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"	

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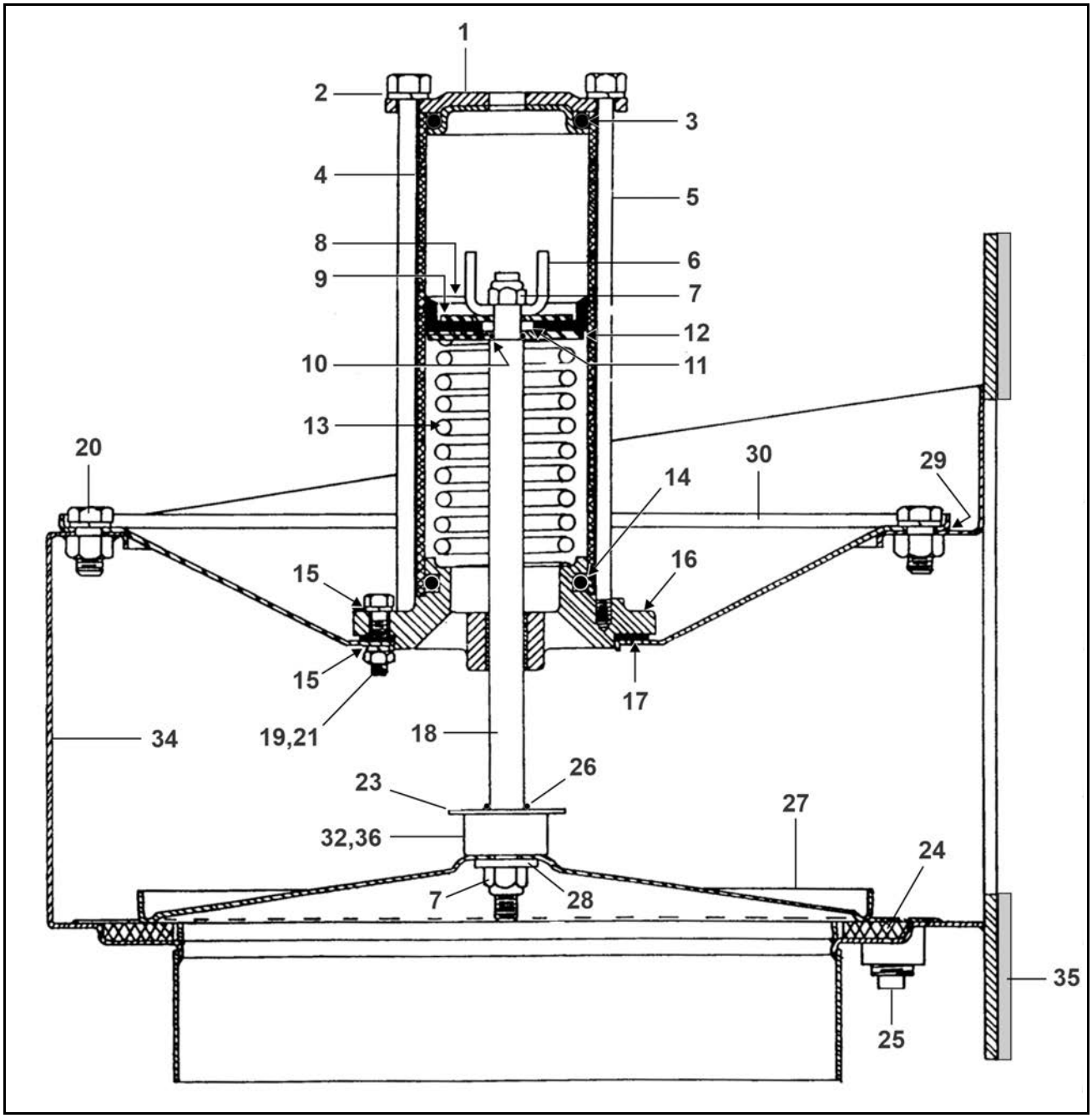
Stainless Dump Valve

3 Sheets

42044WR2/WR3/SR2/SR3; 60044WR2/WR3/SR2/SR3; 72044WR2/WR3/SR2/SR3



8”X10” Stainless Dump Valve

3 Sheets

42044WR2/WR3/SR2/SR3; 60044WR2/WR3/SR2/SR3; 72044WR2/WR3/SR2/SR3

Table 49. Parts List—8”X10” Stainless Dump 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
			Reference Assemblies	
	A	SA 28 124	*8"SGL.DUMPVALVE 4244+52+60	42044WR2/WR3 42044SR2/SR3; 60044WR2/WR3; 60044SR2/SR3
	B	SA 36 015	10"SGL.DUMP VALVE 72WE+SG+WT	72044WR2/WR3; 72044SR2/SR3
	C	SA 28 158	* BONNET+AIRCYL=8"SS DUMPVALV	8" DUMP VALVE
	D	SA 36 044	* BONNET+AIRCYL=10"SS DUMPVAL	10" DUMP VALVE
			Components	
CD	1	02 02101	CYLHEAD W/TAPPED HOLE	
CD	2	15U210	LOKWASHER MEDIUM 5/16 ZINCPL	
CD	3	60C132	ORING 2"IDX3/16CS BUNA70 #329	
CD	4	02 02068	AIRCYL-STAINLESS=DUMP VALVE	
CD	5	02 10585D	TIE BOLT=5/16-18X7.875 PLTD	
CD	6	03 01313	STOP=AIR CYL W/2+11/16STROKE	
CD	7	15G220	LTHX THIN LOKNUT 3/8-24 SSNTE	
CD	8	02 02194	PISTON CUP=DUMPVALVE 2+3/8"	
CD	9	02 02085	UP WASHER=2"OD=PISTON CUP	
CD	10	60C106	ORING 5/16ID 1/16CSBUNA70#011	
CD	11	02 02185	WASHER=PISTON CUP COMP LIMIT	
all	12	02 02105B	2.38"ACYL BRASS PISTONCUP WSHR	
CD	13	03 06429	SPRING=2.11ODX6.5FL 64#/"	
CD	14	60C132	ORING 2”IDX/316CS BUNA70 #329	
CD	15	24G020N	ROLLED WASH.252ID NYLTITE 25W	
CD	16	X2 02743	BONNET=2"DUMP VALVE	
CD	17	02 18931F	GASKET=DUMPVALVE-1/60+72WEHU	
CD	18	02 16021I	DUMPVAL STEM-4"+8"316SS	
CD	19	15G168	SQNUT 1/4-20UNC2 SS18-8	
all	20	15K086	HXCAPSCR 3/8-16NCX3/4 SS18-8	
CD	21	15K041S	HEXCAPSCR 1/4-20UNC2AX1 SS18-8	
CD	23	02 16021E	WASHER 3/8IDX1.250D DUMPVAL	
A	24	02 18068	9 SEAT-RESILIENT=8"DUMPVALVE	
B	24	03 06084	SEAT-RESILIENT=10"DUMPVALVE	
A	25	5SP0KGFSS	NPT PLUG 1/2 SOSOLID GALSTL	
CD	26	60C106	ORING 5/16ID 1/6CS BUNA70#011	
AC	27	02 18796	DISC-8" DUMP VALVE S/S	

8”X10” Stainless Dump Valve

3 Sheets

42044WR2/WR3/SR2/SR3; 60044WR2/WR3/SR2/SR3; 72044WR2/WR3/SR2/SR3

Table 49 Parts List—8”X10” Stainless Dump Valve (cont'd.)

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

Used In	Item	Part Number	Description/Nomenclature	Comments
BD	27	03 06083	DISC-10"DUMP VALVE S/S	
all	28	15U245	FLTWASH 3/8 STD COMM 18-8 SS	
A	29	02 18104	GASKET=8"DUMP VALVE BONNET	
B	29	03 06086G	GASKET=10" DUMP VALVE BONNET	
A	30	02 18931E	BONNET-8"DUMP VALVE	8" DUMP VALVE
B	30	03 06086F	BONNET=10"DUMP VALVE	10" DUMP VALVE
CD	32	02 16021C	BUMPER=DUMP VALVE BONNET	
CD	33	02 16021D	DUMP VALVE BUMPER RETAINER	
A	34	W2 18931	* BODY=8"DUMPVALV=4244,60,52	8" DUMP VALVE
B	34	W3 06086	*BODY=10"DUMP VALVE 72WE,SG,T	10" DUMP VALVE
A	35	02 18107	GASKET=8"FLANGED DUMP VALVE	8" DUMP VALVE
B	35	03 06085D	GASKET=10"FLANGEDUMP72D 8050	10" DUMP VALVE

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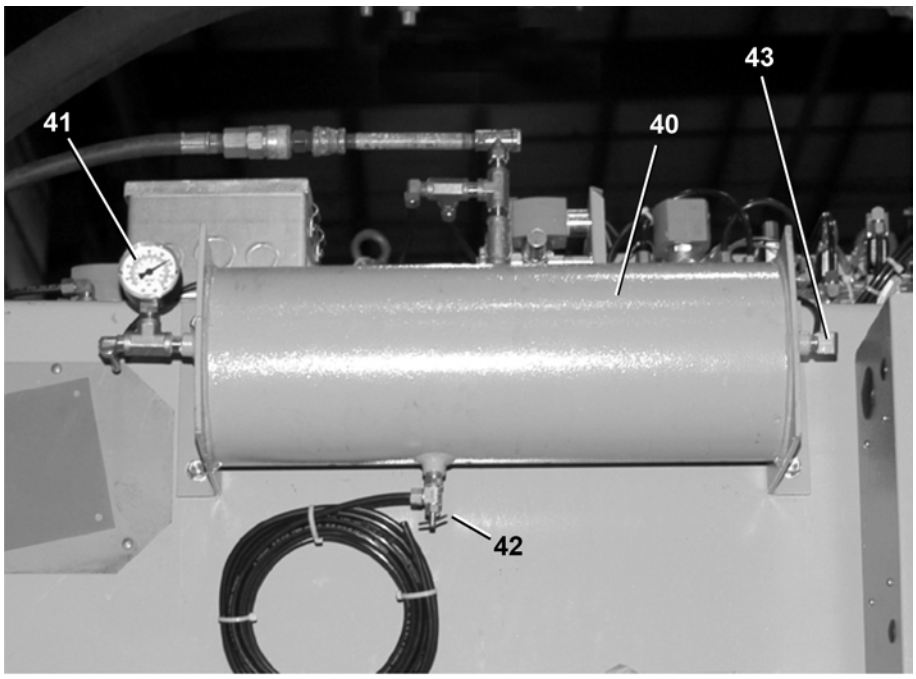
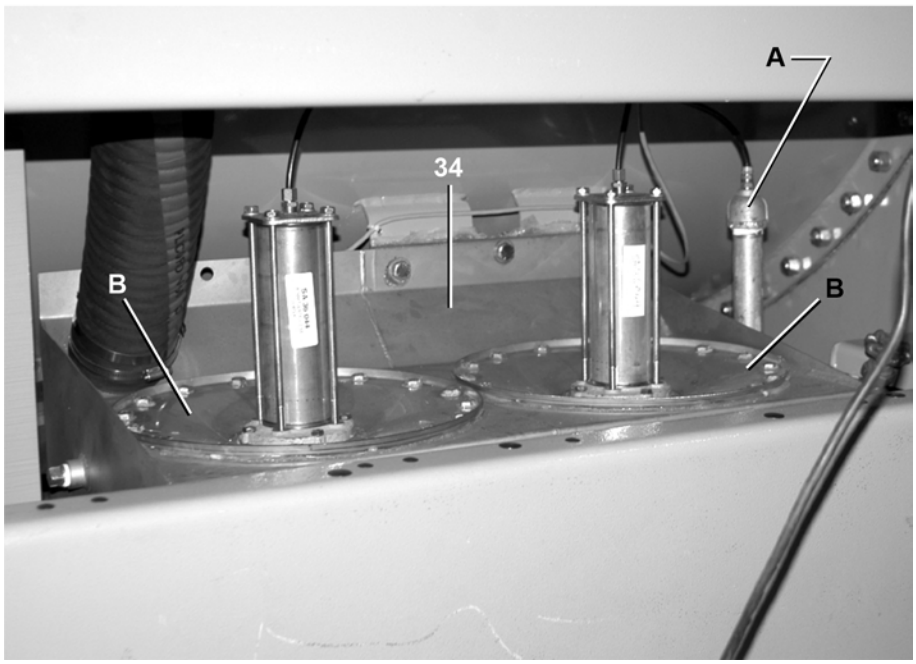
Drain Valve Body with Two Valves

3 Sheets

72044WR2, 72044SR2

Figure 79. Reserve Air Pressure Tank and Dual Drain Valve





Legend

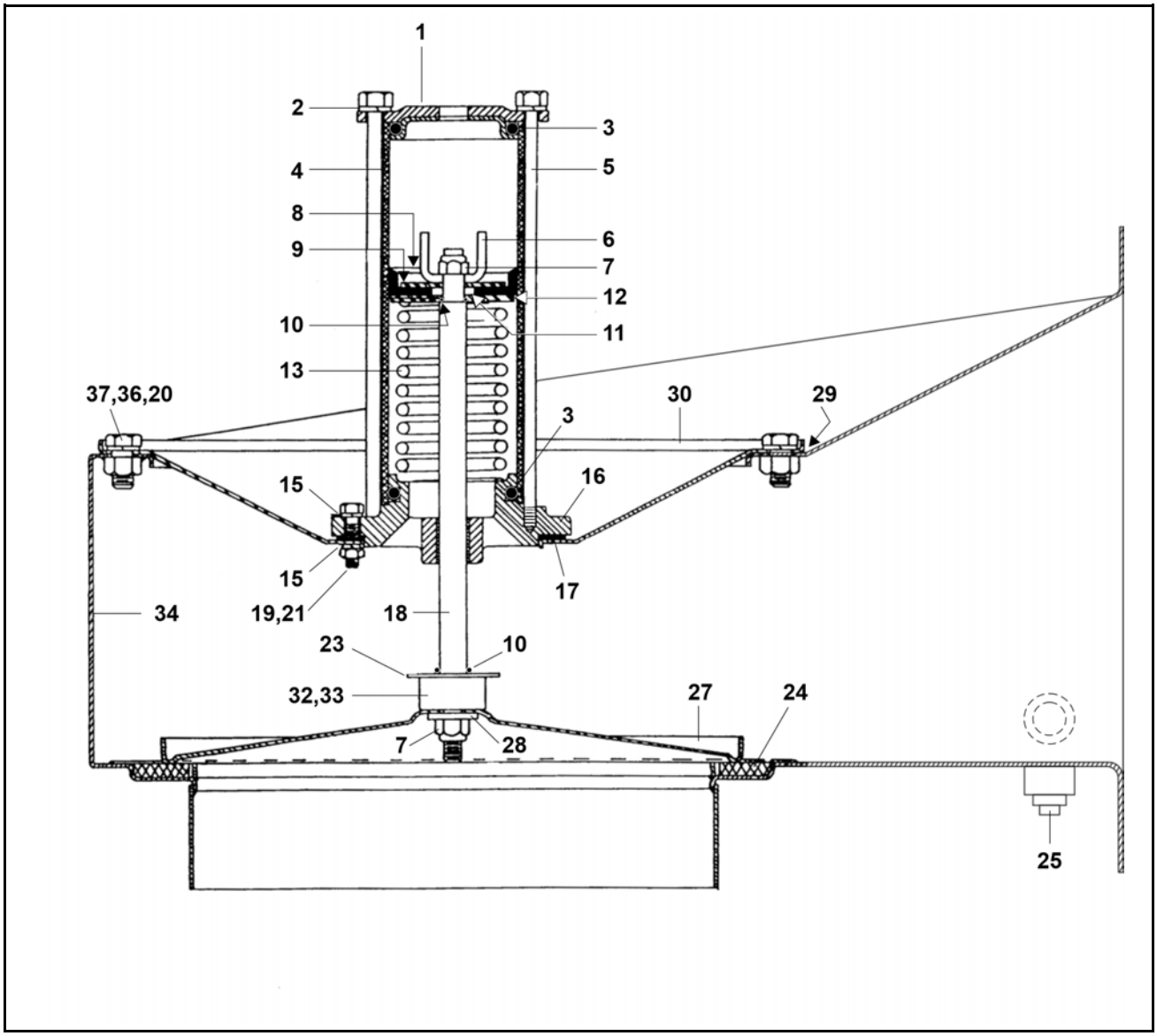
A . . . See BPWVUZ01

Drain Valve Body with Two Valves

3 Sheets

72044WR2, 72044SR2

Figure 80. Cross Section of one valve of the Dual Drain Valves



Drain Valve Body with Two Valves

3 Sheets

72044WR2, 72044SR2

Table 50. Parts List—Drain Valve Body with Two Valves

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
			Reference Assemblies	
	A	SA 36 015A	DUAL 10"DUMPVAL 7244WE2+WE3	
	B	SA 36 044	* 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	SQNUT 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 SQSOLID 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	

Drain Valve Body with Two Valves

3 Sheets

72044WR2, 72044SR2

Table 50 Parts List—Drain Valve Body with Two Valves (cont'd.)

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

Used In	Item	Part Number	Description/Nomenclature	Comments
all	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 1/8MPE	
all	43	96D047AAK	CHECK VALVE 1/4"DELT#CMMQ20B	

9 Pneumatics

9.1 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.

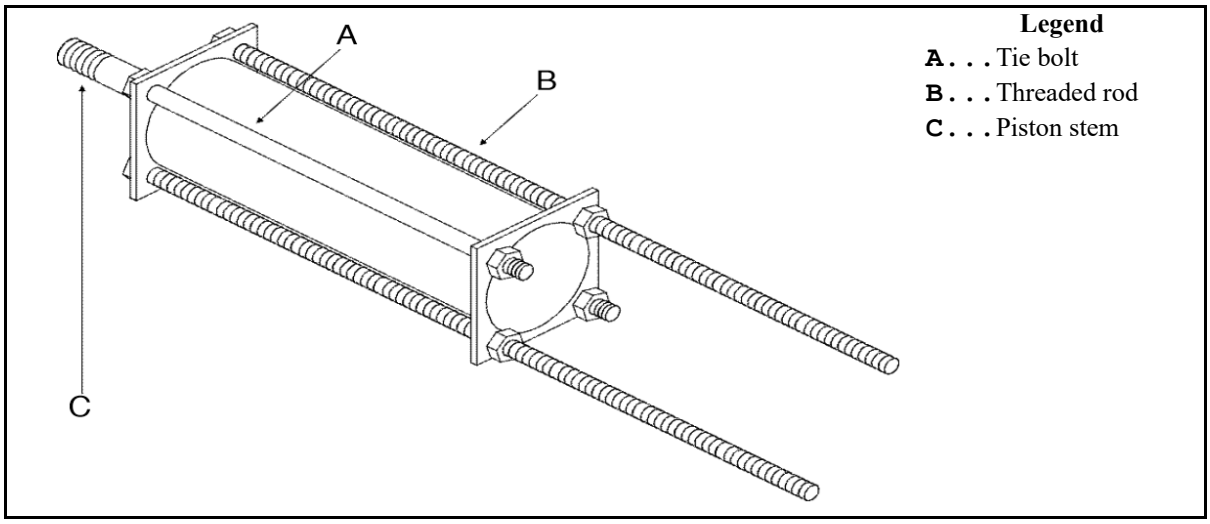
CAUTION: **EXPLOSION HAZARD —** Spring tension can cause air cylinder to burst apart with great force during dissassembly. You can be struck by air cylinder parts.

- ▶ Follow maintenance instructions carefully.
- ▶ Wear eye protection.

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

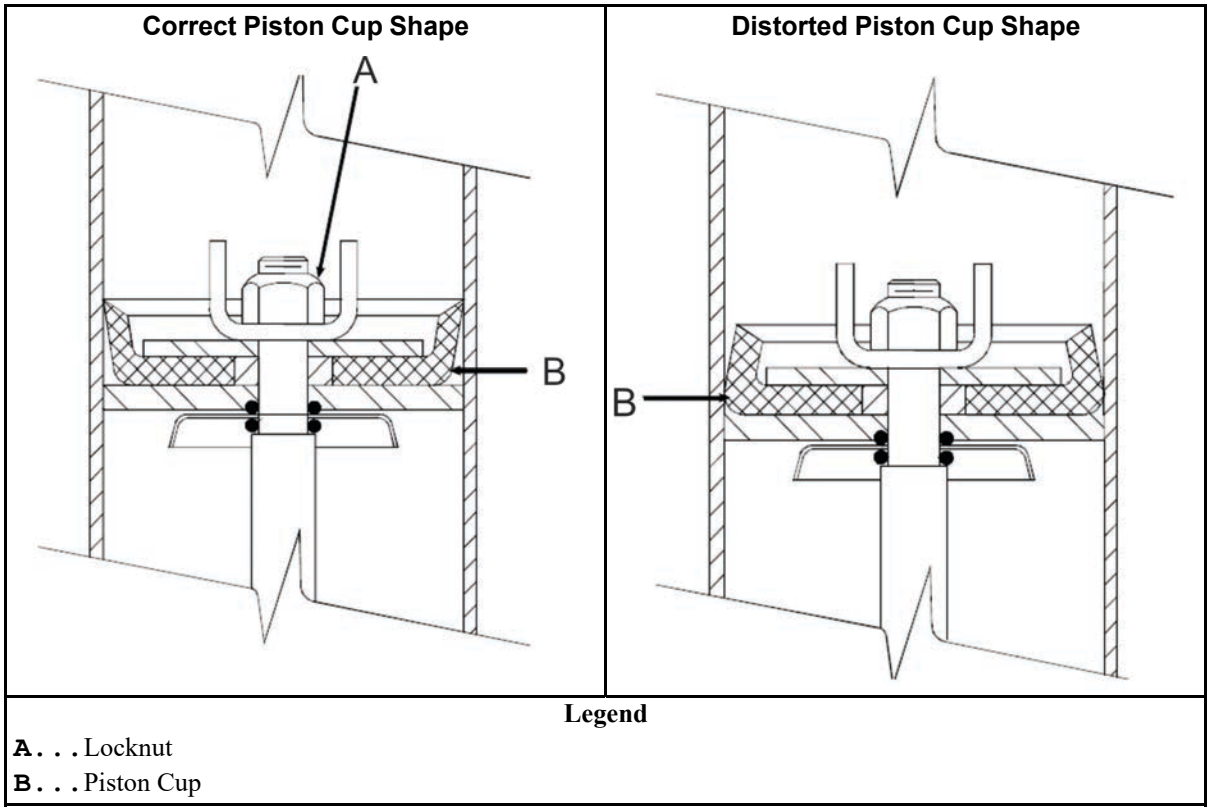
1. Replace two diagonally opposite tie bolts with threaded rods and nuts as shown in Figure 81: Using Threaded Rods, page 167 .
2. Tighten nuts on the threaded rods until they contact the air cylinder.
3. Remove the other two tie bolts and the nuts, washers, clips, and actuators from the external end of piston stem.

Figure 81. Using Threaded Rods



4. 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 82. Ensuring Correct Piston Cup Shape



5. Note the position and orientation of the piston cup(s), washers, and springs. Replace the worn parts, then reassemble them in reverse order. Tighten the locknut until it is just barely possible to turn the piston cup and washer assembly on the stem. The correct piston cup shape is shown on the left side of the above figure. **Do not** overtighten the locknut, as this causes the

piston cup to deform to the shape shown on the right side of the figure and may cause the piston to bind in the cylinder.