Published Manual Number/ECN: MAP36QXXAE/99351N

- **Publishing System: TPAS**
- **Access date: 01/31/2000**
- **Document ECN's: Latest Available**

Service—

Qxx Washer-Extractors

PELLERIN MILNOR CORPORATION POST OFFICE BOX 400, KENNER, LOUISIANA 70063-0400, U.S.A.

Section 1

Service and Maintenance

PREVENTIVE MAINTENANCE FOR Qxx WASHER-EXTRACTORS

Lubrication Precautions

To achieve optimum performance and service life from your Milnor® machine and as a warranty requirement, your machine must be lubricated in strict accordance with the instructions in this section. Maintenance procedures require a hand operated grease gun and the specified (or equivalent) lubricants.

⚠ WARNING ⚠

ENTANGLE AND CRUSH HAZARD—Belts and pulleys can entangle and crush body parts.

- ☞ **Lock OFF and tag out power at the wall disconnect before servicing, except where specifically instructed otherwise in this section.**
- ☞ **Insure belt and pulley guards are in place during service procedures.**
- ☞ **Permit only qualified maintenance personnel to perform these procedures.**

⚠ CAUTION ⚠

BEARING AND SEAL DAMAGE HAZARD—Mixing different base greases can cause bearing and seal damage. Consult lubricant manufacturer before using non-specified lubricants.

1. ***Do not* use a pneumatic grease gun. Pump grease slowly while cylinder is rotating. Take 10-12 seconds to complete each stroke.** A grease gun can build up extremely high pressure which will force the seals out of position and cause them to leak, even though both the seal and bearing cavities are equipped with spring loaded relief plugs.
2. **Apply the quantity of grease called for in the checklist.** Over-lubrication can be as damaging as under-lubrication. Where quantities are stated in strokes, one stroke of the grease gun is assumed to provide .0624 fluid ounce (by volume) (1.77 grams) of grease. Therefore, one fluid ounce (28.3 grams) of grease would be provided by 16 strokes of the grease gun. Determine the flow rate of your grease gun by pumping one ounce into a calibrated container. If fewer than 16 strokes are required, all quantities of strokes in the chart should be reduced accordingly, and if more than 16 strokes are required, the number of strokes should be increased. Before starting lubrication, **make sure grease gun is working and that you get a full charge of grease with every stroke.**
3. ***Do not* pump grease in until it oozes out of the spring loaded relief plugs.** Plugs bleed out excess grease and help prevent abnormal pressures from building up in the housing **during operation** (especially when the machine is first commissioned and after each lubrication). **Plugs will not protect against over-lubrication.**
4. ***Do not* over-lubricate motors.** Over-lubrication of a motor can seriously damage it by forcing grease into motor windings. Over-lubrication of the extract motor rear bearing can force grease into the centrifugal switch causing it to malfunction.
5. ***Do not* allow grease to drip on brake disk or clutch tire/drum during lubrication.** This will considerably reduce the braking action, and may permit the cylinder to creep while loading and unloading.

Main Bearing Maintenance

36021 and 36026Q4x main bearing housings are oil-filled and require periodic draining and refilling (see "Main Bearing Maintenance For 36021 and 36026Q4x Machines" below). Other Qxx models have grease-filled main bearings and require periodic greasing of seals and main bearings (see "Main Bearing Maintenance For Other Qxx Machines" below).

Main Bearing Maintenance for 36021and 36026Q4x Machines

See the appropriate "MAIN BEARING ASSEMBLY" (see Table of Contents) during this procedure.

1. Remove the drain plug (FIGURE 7, Item 2) on the bottom of the main bearing housing and allow the bearing housing to drain completely. Inspect the leak-off, drained oil, and magnetic drain plug for water and/or metal particles. Install the drain plug. Water and/or metal particles can indicate worn or damaged seals and bearings.
2. Locate the two 1/2" plastic tubes (FIGURE 2, Items 1 and 2) secured to the electrical control chassis. Clean the surrounding area and remove the cork stoppers from each.
3. Strictly following lubrication specifications, refill the bearing housing. After refilling the bearing housing, reinstall the cork stoppers and clean any excess lubricant from the machine.

Main Bearing Maintenance For Other Qxx Machines

⚠ DANGER ⚠

ENTANGLE AND CRUSH HAZARD—Belts and pulleys can entangle and crush body parts.

- ☞ **Power is ON and cylinder is turning during the following procedure.**
- ☞ **Insure belt and pulley guards are in place during service procedure.**

See the appropriate "MAIN BEARING ASSEMBLY. . ." (see Table of Contents) during this procedure.

Grease seals and main bearings as follows:

1. Locate the seal and bearing grease fittings (FIGURE 3).
2. Place the machine in a wash step (see operating manual).
3. With the cylinder turning, grease the seals and bearings as called for in the Preventive Maintenance Checklist.

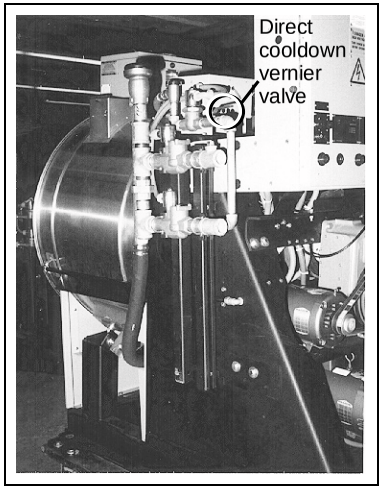

FIGURE 1 (MSSM0242AE)
Direct Cooldown Vernier Valve

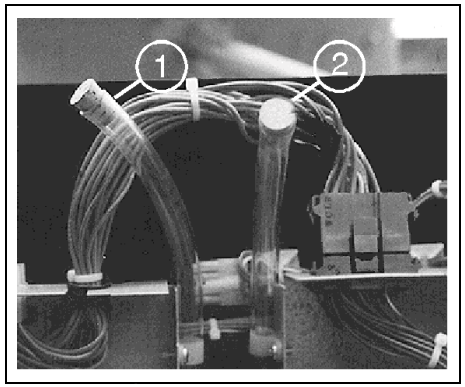

FIGURE 2 (MSSM0242AE)
Fill and Vent Stoppers

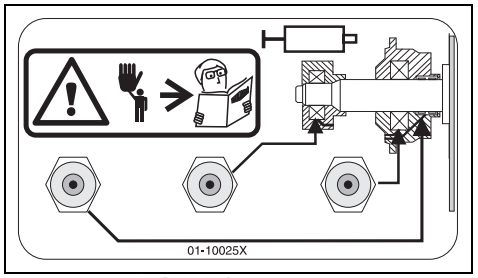

FIGURE 3 (MSSM0242AE)
Main Bearings and Seals

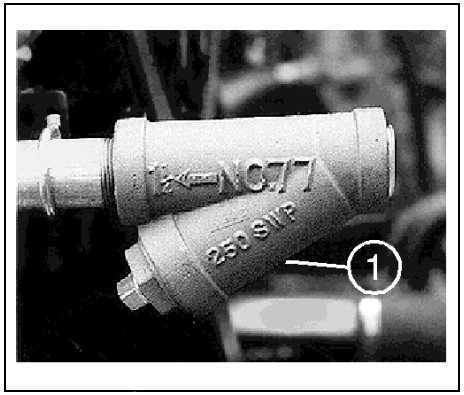

FIGURE 4 (MSSM0242AE)
Steam Strainer

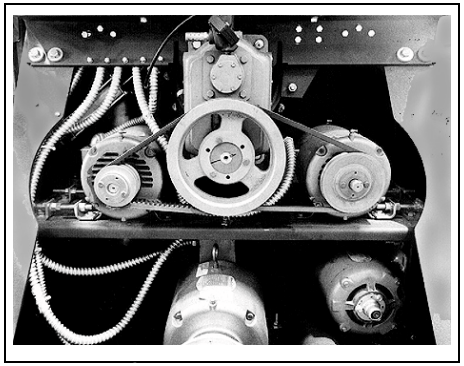

FIGURE 5 (MSSM0242AE)
Drive Components
(Except 36021 and 36026Q4x)

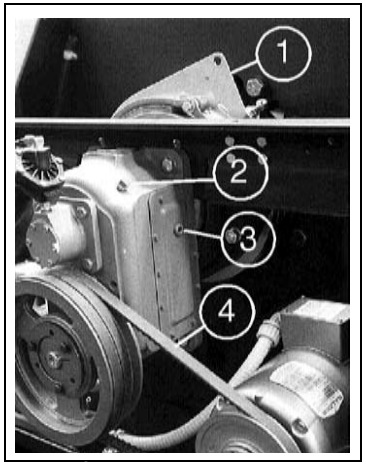

FIGURE 6 (MSSM0242AE)
Gear Reducer

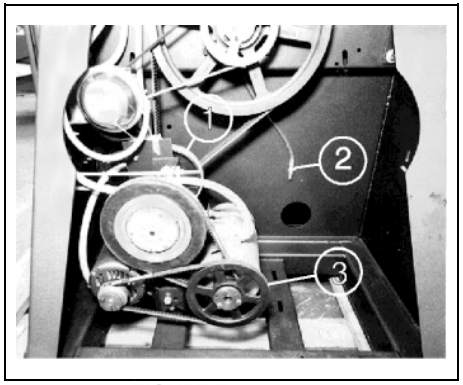

FIGURE 7 (MSSM0242AE)
Drive Components and
Main Bearings/Seals Drain Plug
(36021 and 36026Q4x only)

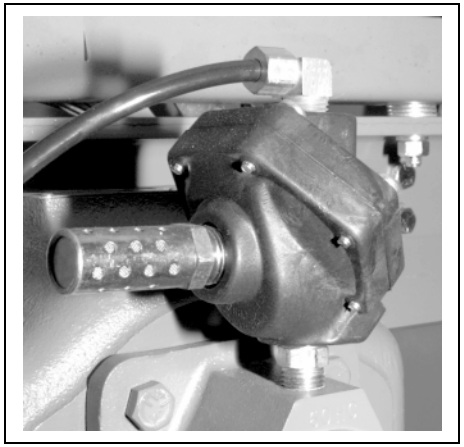

FIGURE 8 (MSSM0242AE)
Air Clutch Quick Release Valve
(36021, 36026Q6x and 42026Qxx models)

Preventive Maintenance Checklist

Machine Model 36021Q4x	36026Q4x	36021Q6x	36026Q6x	42026Qxx	Component	Action	FREQUENCY: W=Weekly M=Monthly/200 Hours Q*=Quarterly/500 Hours F=Every four months S=Semi-Annually A=Annually (* See NOTE 1) / Additional Information		Lubricant Specifications
					MOTOR BEARINGS AND GEAR REDUCER	Add grease per manual section, as stated herein (NOTES 1, 2, and 3).	**FIGURE (Item Number)**		
				X	• Drain motor	See "BALDOR MOTOR MAINTENANCE...," MSSM0274AE, in this manual. (See NOTES 2 and 3)	DRIVE CHART for your machine (See Table of Contents)	Q	See motor nameplate. If not specified, use Shell Alvania EP LF (or equivalent)
		X	X	X	• High extract motor			Q	
				X	• Wash motor			Q	
X	X	X	X	X	• Centrifugal switch	Check brushes for wear, replace as required	BMP701195	S	
		X	X	X	• Gear reducer	Check level at plug, add oil as required	FIGURE 6 (3), (2)	S	Shell Morlina 220 (or equivalent)
						Change oil (plug below)		A	
					BEARING HOUSING				
X	X				• Bearing housing	Remove fill, vent, and drain stoppers. Re-fill with 22 ounces (623.7 grams)	FIGURE 2 (1), (2) FIGURE 7 (2)	F	High quality SAE 30 to 50 (ISO 100 - 220) single weight heavy duty motor oil (non-detergent if available)
		X	X	X	• Seals	One stroke, 0.06 ounces (1.77 grams) at one location	FIGURE 3	S	Shell Alvania EP LF (or equivalent)
		X	X	X	• Bearings	Two strokes, 0.12 ounces (3.54 grams) at two locations		M	
					BRAKING				
X	X	X	X	X	• Brake shoe	Check for wear, adjust or replace as required	FIGURE 6 (1), FIGURE 7 (1)	M	
					BELTS AND PULLEYS				
X	X	X	X	X	• All belts and pulley sheaves throughout machine	Check for wear, replace as required	FIGURE 6 (4) FIGURE 7 (3)	M	
					HOSES, CLAMPS, AND CONNECTIONS				
X	X	X	X	X	• Inlet, drain and pneumatic hoses, clamps and connections	Check for leaks, cracks and bulges	Through-out machine	M	
					DOOR AND LATCH				
X	X	X	X	X	• Locking latch	Lubricate	BMP930002 and BMP750046	M	Grease stick lubricant
X	X	X	X	X	• Interlock plunger	Lubricate		M	Graphite lubricant
					FILTERS AND STRAINERS				
X	X	X	X	X	• Steam inlet strainer	Inspect and clean screens	FIGURE 4 (1), and BMP800020	S	
X	X	X	X	X	• 5 Compartment supply injector (optional)	Inspect and clean screens in water valves and each compartment	BMP860026 and BMP900019	S	
					BOLTS				
X	X	X	X	X	• Foundation	Check bolt tightness and wear	Dimensional drawings	F	
X	X	X	X	X	• Rear bearing housing and throughout machine				
					SUPPLY INJECTOR				
X	X	X	X	X	• Supply injector	Inspect inside for rust. If rusting, carefully clean away rust.		W	
					AIR CLUTCH QUICK RELEASE VALVE				
		X	X	X	• Internal diaphragm	Replace diaphragm.	FIGURE 8	A	
					COOLDOWN VALVE				
X	X	X	X	X	• Direct cooldown vernier valve	Ensure proper operation. Adjust if needed.	FIGURE 1	S	

NOTE 1: Quarterly/500 HOURS = Once every three months or 500 operating hours, whichever comes first.

NOTE 2: If motor manufacturers instructions conflict with manual section MSSM0274AE, follow manufacturers instructions. Motors are warranted by the manufacturers, not by Milnor®.

NOTE 3: 42026Q6x high speed extract motors are equipped with grease relief plugs. Remove these plugs before greasing, then re-install.

DRIVE TRAIN SERVICE FOR ALL Qxx WASHER-EXTRACTORS

Provide part number, model, and serial number when ordering parts from Milnor®. Part numbers for clutches, belts, and pulleys are located on the "DRIVE CHART" drawings (see Table of Contents). When ordering motors, provide the motor nameplate description. Clutches should be purchased from Milnor® to ensure optimum performance and service life.

⚠ WARNING ⚠

ENTANGLE AND CRUSH HAZARD—Belts and pulleys can entangle and crush body parts.

☞ **Lock OFF and tag out power at the wall disconnect before servicing.**

Replacing Belts

Do not force belts off by using a pry bar and turning the pulley. The Wash and Drain belts are removed by loosening the Wash/Drain motor mounting bolts and adjusting the jacking bolts. 36021 and 36026Q4x main drive belts are removed by adjusting the jacking rods that pivot the entire motor base assembly plate. To remove E-2 belts (FIGURE 2), see the bearing housing removal procedure described in "REPLACING Qxx SEALS, BEARINGS, AND BEARING HOUSINGS . . ." (see Table of Contents). The Centrifugal switch belt (if so equipped) is removed by adjusting the switch mounting bracket. When replacing belts, observe the following:

1. Replace both belts if either the Wash or the Drain belt is worn (see FIGURES 1 and 2).

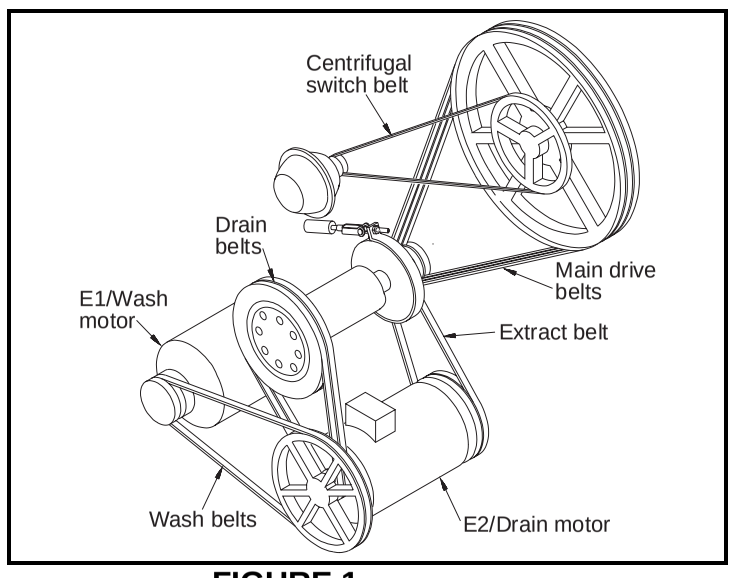

FIGURE 1 (MSSM0215AE)
36021 and 36026 Q4x Drive Train

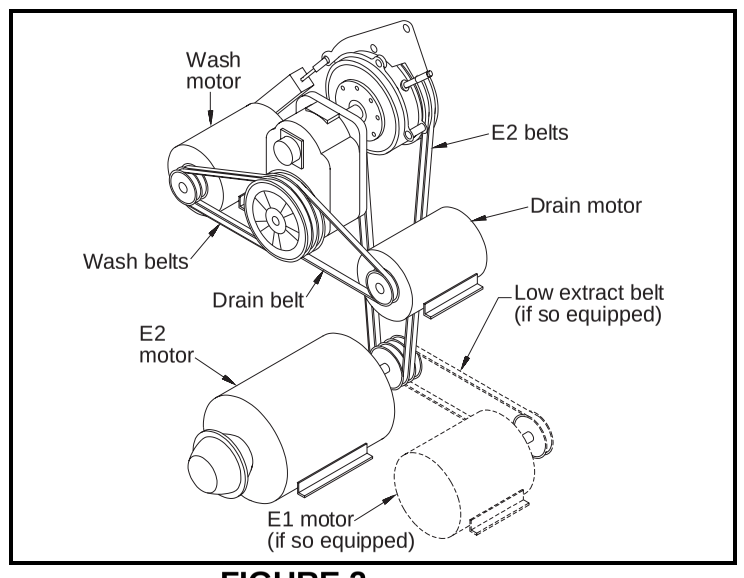

FIGURE 2 (MSSM0215AE)
36021, 36026 Q6x, 42026 Q4x Drive Train

2. **Do not replace individual belts of multiple belt sets. Replace these belts as a set.** Replacement belts must be of the same type and style. **Do not use belts from different manufacturers in multiple-belt sets.**

Testing Belt Tension

NOTE: Do not refer to instruction sheet provided with tension testing tool. Use the "Initial tension" column (See Tables A-E) when adjusting belts that have never been used. Use the "Final tension" column when adjusting belts that have been used.

Check belt tension (FIGURE 3) when replacing and adjusting drive train components. A belt tension testing tool (Milnor® part number 30T001), straight edge, and Belt Tension Specification table is required when setting belt tensions. Check tensions for new belts according to the following schedule:

- **After 24 hrs operation (three eight-hour shifts)**
- **After 80 hrs operation (ten eight-hour shifts)**
- **After 160 hrs operation (twenty eight-hour shifts)**

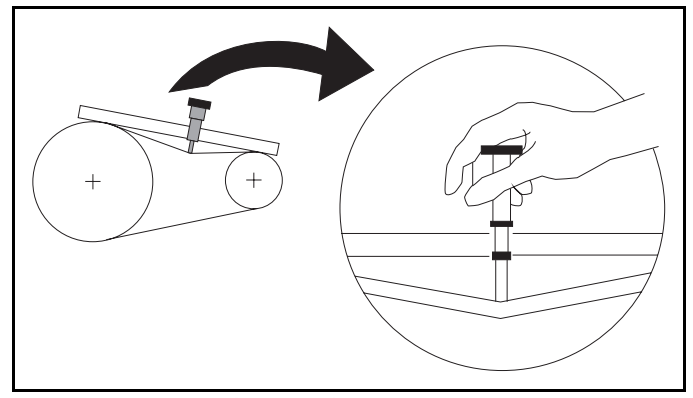

FIGURE 3 (MSSM0215AE)
Testing Belt Tension

Set belt tension as follows:

1. Move upper O-ring on tension testing tool to uppermost position (resting against bottom edge of sliding cap).
2. Determine belt deflection for the tested belt (see FIGURES 1 and 2 for the belt location and Tables A - E for the setting). Move lower O-ring to the correct setting (inches or centimeters) on scale. Read the bottom edge of the O-ring.
3. Place a straight edge along the top edge (pulley to pulley) of the belt to be tested. Depress the tension testing tool by sliding the cap against the middle of the belt span until the bottom edge of the lower O-ring aligns with the straight edge as shown in FIGURE 3.
4. Read the top of the upper O-ring position and determine if it is within specified range.
   - See specifications in the "Initial tension" column for **belts that have never been used**.
   - See specifications in the "Final tension" column for **belts that have been in use.**
5. If reading is below specified range, belt must be tightened. If reading is above specified range, belt must be loosened. Adjust belt and repeat Steps 1 through 4 until tension is within specified range.

NOTE: All belts are not alike. Certain belts are better suited to certain applications. Consequently, it is always best to purchase replacement belts from the original manufacturer of the equipment. Alternatively, purchase the exact style and type belts with which the machine was originally equipped. If you were not satisfied with the life of the original set, you should ask our factory if a better belt has been developed for the specific application.

Table A—36021and 36026Q4x Belt Tension Specifications

Belt	Belt deflection inches (millimeters)	Hertz	Initial tension pounds (kilograms)	Final tension pounds (kilograms)
Wash	13/64 (5.1)	All	5.1 - 6.6 (2.3 - 3.0)	3.9 - 5.1 (1.7 - 2.3)
Drain	10/64 (3.9)	All	5.1 - 6.6 (2.3 - 3.0)	3.9 - 5.1 (1.7 - 2.3)
Extract	10/64 (3.9)	50	6.6 - 9.2 (3.0 - 4.2)	5.1 - 7.1 (2.3 -3.2)
	10/64 (3.9)	60	5.7 - 7.6 (2.6 - 3.4)	4.4 - 5.9 (2.0 - 2.7)
Main	16/64 (6.3)	All	5.7 - 7.6 (2.6 - 3.4)	4.4 - 5.9 (2.0 - 2.7)
Centrifugal	15/64 (5.9)	All	4.2 - 5.5 (1.9 - 2.5)	3.3 - 4.3 (1.5 - 1.9)

Table B—36021Q6x Belt Tension Specifications

Belt	Belt deflection inches (millimeters)	Hertz	Initial tension pounds (kilograms)	Final tension pounds (kilograms)
Wash	10/64 (3.9)	50	6.6 - 9.2 (3.0 - 4.2)	5.1 - 7.1 (2.3 - 3.2)
		50/60 (See NOTE)	9.6 - 13.0 (4.3 - 5.9)	7.4 - 10.0 (3.3 - 4.5)
Drain	11/64 (4.3)	50/60	10.5-14.3 (4.8 - 6.5)	8.1- 11.0 (3.7 - 5.0)
		50 (See NOTE)	9.6 - 13.0 (4.3 - 5.9)	7.4 - 10.0 (3.3 - 4.5)
Low Extract (If so equipped)	14/64 (5.5)	All	9.6 - 13.0 (4.3 - 5.9)	7.4 - 10.0 (3.3 - 4.5)
E - 2	23/64 (9.1)	50	8.0 - 11.0 (3.6 - 5.0)	6.2 - 8.5 (2.8 - 3.8)
		60	6.6 - 9.2 (3.0 - 4.2)	5.1 - 7.1 (2.3 - 3.2)

NOTE: Applies to 50 Hertz machines equipped with optional low speed extract motor.

Table C—36026Q6x Belt Tension Specifications

Belt	Belt deflection inches (millimeters)	Hertz	Initial tension pounds (kilograms)	Final tension pounds (kilograms)
Wash	10/64 (3.9)	50/60	6.6 - 9.2 (3.0 - 4.2)	5.1 - 7.1 (2.3 - 3.2)
Drain	11/64 (4.3)	50/60	10.5 - 14.3 (4.8 - 6.5)	8.1 - 11.0 (3.7 - 5.0)
		50 (See NOTE)	9.6 - 13.0 (4.3 - 5.9)	7.4 - 10.0 (3.3 - 4.5)
Low Extract (If so equipped)	14/64 (5.5)	50	9.6 - 13.0 (4.3 - 5.9)	7.4 - 10.0 (3.3 - 4.5)
		60	6.6 - 9.2 (3.0 - 4.2)	5.1 - 7.1 (2.3 - 3.2)
E - 2	23/64 (9.1)	50	8.0 - 11.0 (3.6 - 5.0)	6.2 - 8.5 (2.8 - 3.8)
		60	6.6 - 9.2 (3.0 - 3.2)	5.1 - 7.1 (2.3 - 3.2)

Table D—42026Q4x Belt Tension Specifications

Belt	Belt deflection inches (millimeters)	Hertz	Initial tension pounds (kilograms)	Final tension pounds (kilograms)
Wash	10/64 (3.9)	50	6.6 - 9.2 (3.0 - 4.2)	5.1 - 7.1 (2.5 - 3.2)
		60	9.6 - 13.0 (4.3 - 5.9)	7.4 - 10.0 (3.3 - 4.5)
Drain	11/64 (4.3)	All	10.5 - 14.3 (4.8 - 6.5)	8.1 - 11.0 (3.7 - 5.0)
E - 2	23/64 (9.1)	50	6.6 - 9.2 (3.0 - 4.2)	5.1 - 7.1 (2.5 - 3.2)
		60	9.6 - 13.0 (4.3 - 5.9)	7.4 - 10.0 (3.3 - 4.5)

Table E—42026Q6x Belt Tension Specifications

Belt	Belt deflection inches (millimeters)	Hertz	Initial tension pounds (kilograms)	Final tension pounds (kilograms)
Wash	10/64 (3.9)	50	6.6 - 9.2 (3.0 - 4.2)	5.1 - 7.1 (2.5 - 3.2)
		50/60 (See NOTE)	9.6 - 13.0 (4.3 - 5.9)	7.4 - 10.0 (3.3 - 4.5)
Drain	11/64 (4.3)	50	10.5 - 14.3 (4.8 - 6.5)	8.1 - 11.0 (3.7 - 5.0)
		50 (See NOTE)	9.6 - 13.0 (4.3 - 5.9)	7.4 - 10.0 (3.3 - 4.5)
		60	8.0 - 11.0 (3.6 - 5.0)	6.2 - 8.5 (2.8 - 3.8)
Low Extract (If so equipped)	14/64 (5.5)	50	6.6 - 9.2 (3.0 - 4.2)	5.1 - 7.1 (2.5 - 3.2)
		60	9.6 - 13.0 (4.3 - 5.9)	7.4 - 10.0 (3.3 - 4.5)
E - 2	23/64 (9.1)	50	8.0 - 11.0 (3.6 - 5.0)	6.2 - 8.5 (2.8 - 3.8)
		50 (See NOTE)	10.5 - 14.3 (4.8 - 6.5)	8.1 - 11.0 (3.7 - 5.0)
		60	9.6 - 13.0 (4.3 - 5.9)	7.4 -10.0 (3.3 - 4.5)

NOTE: Applies to 50 Hertz machines equipped with optional low speed extract motor.

Replacing Pulleys and Clutches

Replace pulleys if the side walls are chipped, broken, or excessively worn. Remove guards and belts. Also remove all dirt or paint from the shaft end. Determine the type of pulley to be removed and see the appropriate instructions.

Straight Bore Pulleys

1. Loosen set screws at the bottom of the pulley groove and remove the pulley. Retaining compound was used during factory installation; it may be necessary to heat the hub or pulley while applying pressure with a puller.
2. Determine that the shaft and inside bore are dry and free of dirt, burrs, and old adhesives.
3. Place the key in the shaft and pulley to check for proper fit. Key must fit snugly—if not, replace the key or pulley.
4. Apply retaining compound (Loctite 609 or equivalent) to the pulley bore and shaft, being careful not to over-apply. Align the pulley with the corresponding pulley (see “Aligning Pulleys” in this section) and wipe off any excess Loctite.
5. Tighten the set screws. Always use new set screws. To adjust the belt tension, see “Testing Belt Tension” in this section. Allow Loctite to cure for six hours before placing the machine in service.

Taper Lock Bushing Pulleys

⚠ CAUTION ⚠

Do not use lubricants, “Loctite”, or other compounds on taper lock bushings, pulleys, or shafts.

NOTE: Before removing a 36021 or 36026Q4x main drive pulley, mark the bushing position on the shaft.

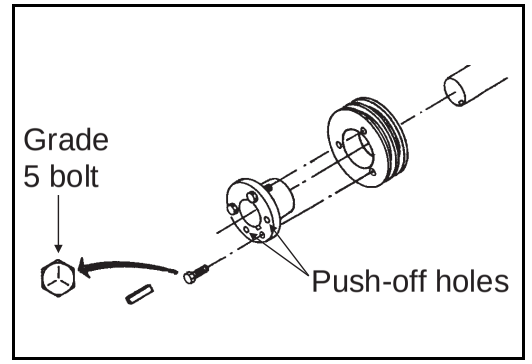

FIGURE 4 (MSSM0215AE)
Taper Lock Bushing

1. Remove the appropriate belts.
2. Remove any dirt or paint from shaft end.
3. Remove all bushing screws. Thread two of these screws into bushing push-off holes (FIGURE 4); alternately tighten bolts until bushing and pulley separate and can be removed from shaft. Carefully remove pulleys, as bushings may break off within the pulley hub. Remove the pulley by repeatedly tightening the two push-off bolts no more than 1/10 turn, then striking the rear face of the pulley with drift pin in three opposite places.
4. Remove any burrs from shaft, then clean and polish entire shaft. Clean tapered surfaces of bushing and inside bore of pulley. Determine that inside bore of bushing is clean and free of obstructions.
5. Place key in shaft and in bushing to check for proper fit. If key does not fit snugly, replace key and/or bushing.
6. Insert bushing loosely in pulley and start all three screws. Install pulley on shaft and approximately align it with corresponding pulley.
7. Gradually tighten bushing screws in alternating pattern until bushing is seated within pulley. Tighten screws to the torque shown in the “Bushing Bolt Torque Specifications” table below. **Rotate pulley and check for wobbling.**
8. Install belts, remove all slack, and align pulleys (see “Aligning Pulleys”). Corresponding pulleys must be aligned within 1/64 - 1/8 inch (0.4 - 3.2) per foot (305) between pulley centerlines. Adjust belt tension (see the correct belt tension specifications table).

Table F—Bushing Bolt Torque Specifications

Size Code (Stamped on bushing)	Bolt Size	Torque inch-pounds (kilogram-meters)
QT	1/4 x 3/4	72 (0.83)
JA	10 - 24	60 (0.69)
SH - SDS - SD	1/4 - 20	108 (1.24)
SK	5/16 - 18	180 (2.07)
SF	3/8 - 16	360 (4.15)

Electric Clutch Pulleys

1. **Do not use a puller to remove the clutch.** Remove the clutch by removing the center bolt and gently tapping the clutch off. If replacing the *wash clutch*, remove the pulley, then re-install on the new clutch, using thread locking compound on pulley fasteners.
2. Place key in the shaft and the clutch to check for proper fit. If the key does not fit snugly, replace it. Install the key on the shaft and install the new clutch onto the shaft, being careful not to disturb the key.
3. Use a new fine thread 5/16" self locking center bolt (with a nylon patch on the threads). Hold motor shaft from turning and torque the new bolt to 300 inch pounds (3.46 kilograms per meter).

Air Clutch Replacement

⚠ CAUTION ⚠

MACHINE DAMAGE HAZARD—Gear reducer alignment is critical.

☞ **Follow instructions carefully.**

1. Loosen the wash and drain motors then remove belts and gear reducer air line.
2. For information on removing the *gear reducer* see “REPLACING Qxx SEALS, BEARINGS, AND BEARING HOUSINGS” (see Table of Contents).
3. Loosen the air line connection and gently move air line to gain access to bolts. **Do not kink air line.**
4. Tighten new bolts to 85 foot pounds (11.75 kilograms per meter).

Replacing The Gear Reducer—Bolt shims are often installed between the gear reducer and the upper support. These shims must be removed and replaced in their exact original positions when installing a new gear reducer. Check gear reducer alignment (see “Aligning Pulleys” below).

Aligning Pulleys—To check pulley alignment, stretch a string from points **A, B, C, and D** (FIGURE 5). Pulleys are aligned if string touches points **A, B, C, and D**. If string does not touch at all points, pulley or motor positions must be adjusted.

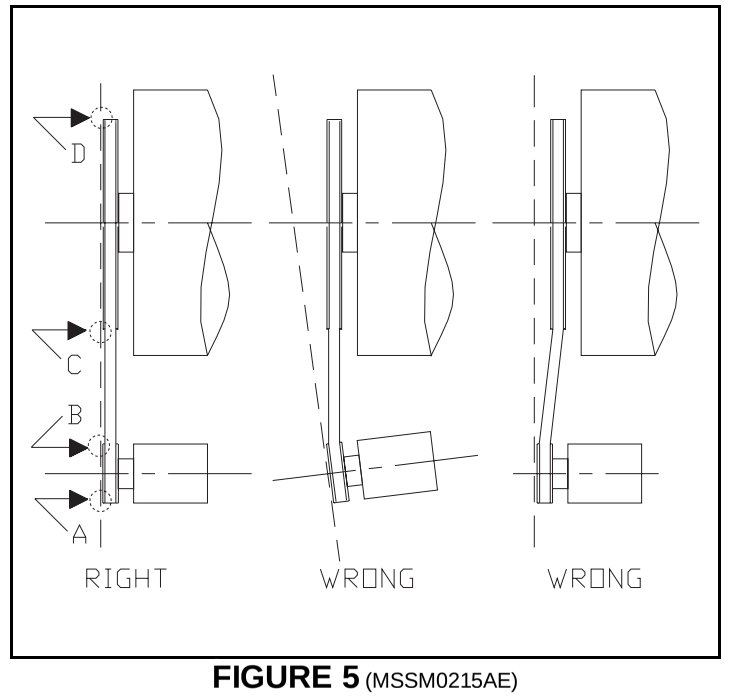

FIGURE 5 (MSSM0215AE)
Checking Belt Alignment Tension

⚠ WARNING ⚠

ENTANGLE AND CRUSH HAZARD—Belts and pulleys can entangle and crush body parts.

☞ **Insure belt and pulley guards are in place before operating machines.**

Testing Belt Alignment—After aligning the belts, observe the belts with the machine operating. If adjustment is necessary, lock OFF and tag out power before proceeding.

BALDOR MOTOR MAINTENANCE

MSSM0274AE/9731AV

Most of the information in this document is taken from the *Baldor Electric Company Instruction, Operation, and Maintenance Manual,* and provides a means of more accurately determining motor lubrication requirements based on local conditions.

General Maintenance

Inspect, clean, and test motors at regular intervals— approximately every 500 operating hours or every three months, whichever comes first. Lubricate motors at the intervals determined herein. Keep accurate maintenance records.

⚠ DANGER: Electrocution and Electrical Burn Hazards

Contact with high voltage will electrocute or burn you. Power switches on the machine and the control box do not eliminate these hazards. High voltage is present at the machine unless the main power is off. Electrical power can cause death or severe injury.

- ☞ **Do not service machine unless qualified and authorized.**
- ☞ **Lock OFF and tag out power at the wall disconnect before servicing, or in accordance with factory service procedures.**

⚠ DANGER: Entangle and Crush Hazard

Contact with moving components normally isolated by guards, covers, and panels, can entangle and crush your limbs. These components move automatically.

- ☞ **Do not service machine unless qualified and authorized.**
- ☞ **Lock OFF and tag out power at the wall disconnect before servicing, or in accordance with factory service procedures.**

Clean—Keep the exterior of the motor free of dirt, oil, grease, water, etc. Keep ventilation openings clear. Oily vapor, paper pulp, textile lint, etc., can accumulate and block ventilation, causing overheating and early motor failure.

Test—Periodically, check the motor and winding insulation integrity using a "megger." Record the megger readings and immediately investigate any significant drop in insulation resistance. Check all electrical connectors to be sure they are tight.

Lubricate—Determine the proper lubrication interval for your motor as explained in "How to Determine Lubrication Interval" in this section, and lubricate accordingly.

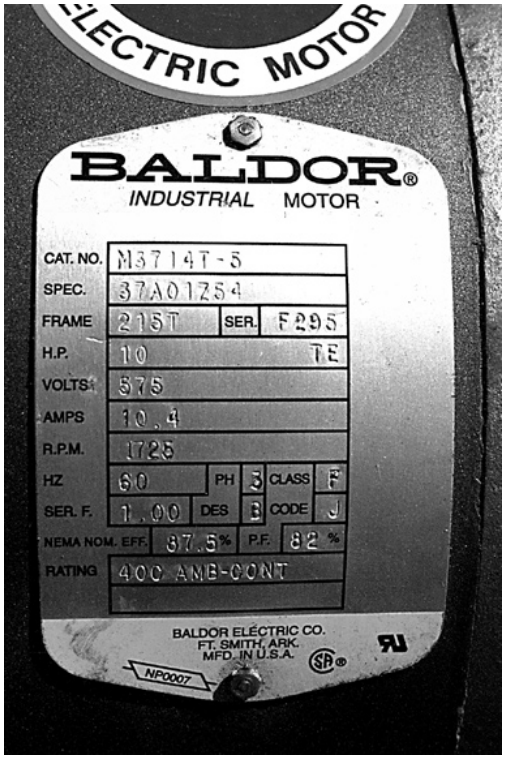

FIGURE 1 (MSSM0274AE)
Typical Motor Data Plate

How to Determine Lubrication Interval—The useful life of antifriction bearing grease can be estimated, based on service conditions, frame type, and motor rpm. An example of determining the correct lubrication interval is provided below.

Ex: A fan motor, operating at an ambient temperature of 109^{O}F (43^{O}C) in a moderately corrosive atmosphere. The motor has a NEMA 286T/(IEC 180) frame and is rated at 1750 rpm.

1. Table 1 classifies the service condition as "severe."
2. Table 2 specifies a 0.5 service condition multiplier value for "severe" service condition.
3. Table 3 specifies 9500 hours as the recommended lubrication interval for frame sizes 254 to 286 (see nameplate), given standard service conditions.
4. Multiply .5 *(service condition multiplier value)* by 9500 hours *(recommended lubrication interval)* = 4750 hours *(calculated lubrication interval)*.
5. Table 4 shows that the amount of grease to be added is 0.32 ounces (9.1 grams).

Table 1 — Determining the Service Condition

Severity of Service	Maximum Ambient Temperature	Atmospheric Contamination	Type of Bearing
Standard	104^{O}F (40^{O}C)	Clean, little corrosion	Deep groove ball bearing
Severe	122^{O}F (50^{O}C)	Moderate dirt, corrosion	Ball thrust, Roller
Extreme	>122^{O}F (>50^{O}C) or Class H Insulation (**Note 1**)	Severe dirt, abrasive dust, corrosion	All bearings
Low Temperature	-22^{O}F (-30^{O}C) (**Note 2**)		

Note 1: Special high temperature grease is recommended.

Note 2: Special low temperature grease is recommended.

Table 2 — Service Condition Multiplier Value

Operating Condition	Multiplier
Standard	1.0
Severe	0.5
Extreme	0.1

Table 3 — Recommended Lubrication Intervals at Standard Service Conditions

NEMA (IEC) Frame Size	Rated Speed - RPM			
	3600	1800	1200	900
Up to 215 (132)	5500 Hrs.	12000 Hrs.	18000 Hrs.	22000 Hrs.
254 to 286 (160 - 180)	3600 Hrs.	9500 Hrs.	15000 Hrs.	18000 Hrs.
324 to 365 (200 - 225)	2200 Hrs.(**Note 3**)	7400 Hrs.	12000 Hrs.	15000 Hrs.
404 to 5000 (280 - 315)	2200 Hrs.(Note 3)	3500 Hrs.	7400 Hrs.	10500 Hrs.

Note 3: Bearings in 404 through 5000 frame, 2 pole motors are either 6313 or 6314 bearings and the lubrication interval is shown in the table. **If roller bearings are used, the bearings must be lubricated more frequently. Divide the listed lubrication interval by two.**

Table 4 — Lubrication Amounts per Frame

NEMA (IEC) Frame Size	Bearing Description These are the "Large" bearings (Shaft End) in each frame size (Note 4)					
	Largest bearing in size category	OD D mm	Width B mm	Grease gun strokes (Note 5)	Volume of grease to be added	
					ounces	grams
Up to 215 (132)	6307	80	21	2.5	0.16	4.7
254 to 286 (160 - 180)	6311	120	29	5.0	0.32	9.1
324 to 365 (200 - 225)	6313	140	33	7.0	0.43	12.2
404 to 5000 (280 - 315)	NU322	240	50	18.0	1.11	31.5

Note 4: Smaller bearings in size category may require reduced amounts of grease.

Note 5: See "Correct Grease Gun Procedures" for information on estimating the output of hand-operated grease guns.

Lubrication Recommendations

Type of Grease—Use Shell Dolium R (factory installed) or Chevron SRI greases for standard service conditions. The extreme and low temperature conditions are not normally encountered in the laundry. However, for extreme conditions, use Darmex 707 and for low temperature conditions, use Arrowshell 7. Contact Baldor for equivalents, if necessary.

Correct Grease Gun Procedures

1. Use hand-operated grease gun, not a pneumatic grease gun. Pump grease slowly, taking 10 to 12 seconds to complete each stroke.
2. Apply quantity of grease called for. Over-lubrication can be as damaging as under-lubrication. Where quantities are stated in strokes, one stroke of the grease gun is assumed to provide .0624 fluid oz. (1.77 grams) (by volume) of grease. Therefore, one fluid ounce (28.3 grams) of grease would be provided by 16 strokes of the grease gun. Determine the flow rate of your grease gun by pumping one ounce into a calibrated container. If fewer than 16 strokes are required, all quantities in strokes in the chart should be reduced accordingly. If more than 16 strokes are required, the number of strokes should be increased. **Before starting lubrication, make sure your grease gun is working and that you get a full charge of grease with every stroke.**
3. Do not over-lubricate motors. Over-lubrication of a motor can seriously damage it by forcing grease into motor windings. Over-lubrication of the extract motor can force grease into the centrifugal switch causing it to malfunction.
4. Do not allow grease to drip on the brake disk or clutch tire/drum during lubrication. This will reduce the braking action considerably, and may permit the cylinder to creep while loading and unloading.

Lubrication Procedure

NOTICE: Motor Damage

To avoid damage to motor bearings, grease must be kept free of dirt. For an extremely dirty environment, contact your Baldor distributor or an authorized Baldor Service Center for additional information.

1. Clean grease fittings.
2. Remove grease outlet plug.
3. Add recommended amount of grease. Be sure grease to be added is compatible with the grease already in motor. Consult your Baldor distributor or an authorized Baldor Service Center if grease other than recommended is to be used. Stop when new grease appears at shaft hole in the endplate or grease outlet plug.
4. Replace grease outlet plug.