



**OPERATIONS MANUAL  
TBC4 CABINET  
BARREL WASHING  
MACHINE**

**DESIGNED AND MANUFACTURED BY  
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# INTRODUCTION

**This manual is designed for operators of the TBC4 series barrel washing systems manufactured by the Tom Beard Company. It will feature the most popular options including:**

- **3rd Water Inlet Valve**
- **Lees Recovery System**
- **4 or 2 Barrel Rack Washing**
- **Recycle System with Heat Exchanger**

**The TBC 4 barrel washing systems represent the state of the art in barrel care. We hope this manual assists you in safe, efficient use of your system.**

**If you have any questions concerning our barrel washing systems not covered by this manual, please call us at 1 707 573-3150.**

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# SYSTEM FRONT VIEW



Figure 1

# SYSTEM REAR VIEW



Figure 2

# CONTROL PANEL LAYOUT



**Figure 3**

# **I. INITIAL SYSTEM SET-UP**

**When the TBC barrel washer system first arrives at your facility, set up the system using the following steps:**

**1. Locate the system. Locate the barrel washer on a level concrete surface where 220 volt or 480 volt power (575 volts on Canadian systems), hot and cold water, compressed air and a drain are all available. The system is delivered with a 25-foot power cord. Water, air and drain lines are supplied by the winery.**

**2. Level the System. The barrel washer comes equipped with adjustable feet. Level the system using a carpenter's level or similar leveling device. Adjust the feet by placing a jack or forklift under the machine near the feet, which need to be raised or lowered. The machine should be level in both directions: that is, side-to-side and front-to-back.**

**3. Establish a Drain. The machine should be located directly over a plant drain unless water is to be removed to a remote location. This is accomplished with a hose attached to the drain pipe at the rear of the machine.**

4. Connect the System to Plant Water. The rear of the barrel washer contains the water feed ports. Tri-Clover style ferrules are used to make water connections. For TBC4 style systems, there are both hot and cold water feed ports. Some units come equipped with an optional third inlet port so hot water, cold water and ozone can be used in any desired sequence. The Recycle option will utilize the #1 Inlet Valve for the recycled water. Only # 2 and #3 will be used for fresh water. The recycle tank will need a fresh water make-up line to prevent The water level from getting too low, causing the pump to cavitate.

**WARNING: USE ONLY HOSES, CLAMPS, COUPLINGS AND ADAPTERS APPROVED FOR HOT WATER ON HOT/COLD SYSTEMS. DO NOT USE HOSES OR FITTINGS MADE OF PLASTIC OR OTHER MATERIALS THAT MAY BREAK OR THAT MAY FAIL IN HOT WATER APPLICATIONS**

5. Connect the System to the Power Source. The system comes with a power cord, but because of the variety of cord caps employed by different wineries, a cord cap is not provided. Connect the power cord to a winery cord cap, and then connect the cord to an approved winery power supply. The power supply should incorporate a 20-amp circuit breaker.

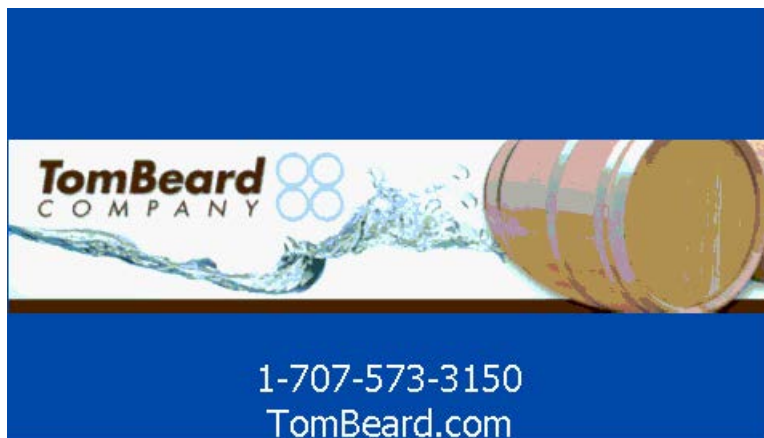
**WARNING: DISCONNECT THE SYSTEM FROM THE PLANT POWER SOURCE WHENEVER PERFORMING MAINTENANCE OR REPAIR WORK.**



6. **Energize the System.** Turn the Quick disconnect to energize the Barrel Washer. Turn the “Power On” selector switch on the system’s control panel (See Figure 3) to the ON position. The power switch should illuminate, and the touch screen should power up to the “TBC” screen. If these illuminations do not appear, maintenance personnel should open the electrical enclosure and check to see that the main circuit breaker is on, and that there is a functional fuse in the fuse block.

7. **Test the Water Pump for Proper Rotation.** This test is performed on the control panel. Proceed as follows:

- a) Remove the silver panels on the blue frames between both water pumps and the motors. Observe the pump rotation arrow near the shaft – the rotation is clockwise as viewed from the top.
- b) Touch the Screen Saver Screen (Figure 4) to move to the control pages. The Screen Saver looks like this:



**Figure 4**

c) The Main Screen (Figure 5) will appear. It looks like this:

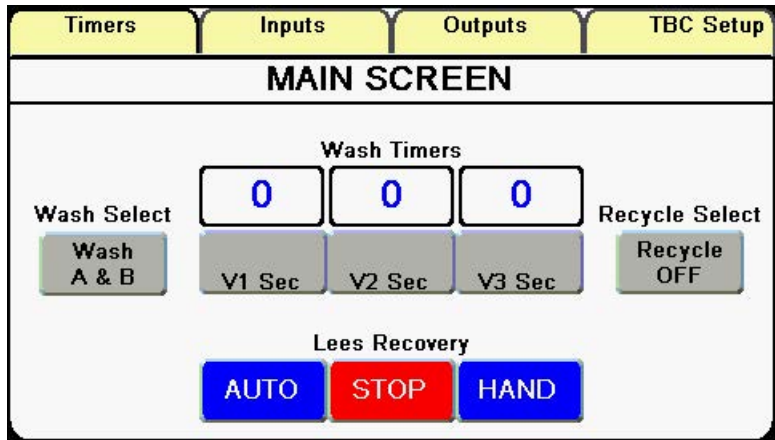


Figure 5

Push on the “Timers” tab in the upper left hand corner of the “Wash Timers” screen. The “Wash and Lees Timers” screen (Figure 6) will appear, which looks like this:

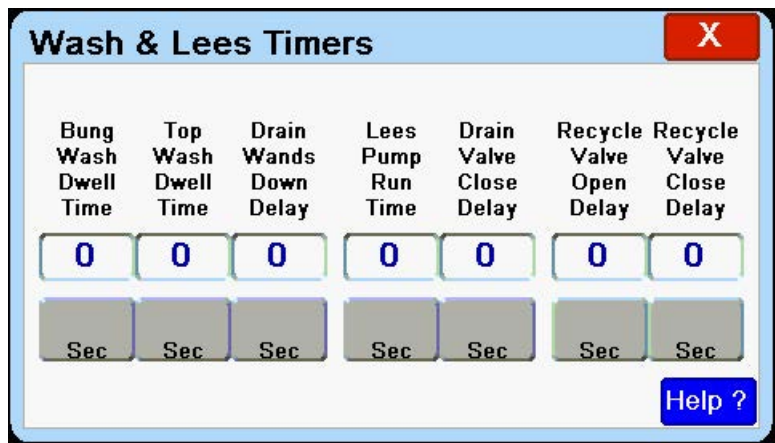


Figure 6

There are two Maintenance Screens: one showing the status of inputs to the microprocessor, and the second showing outputs from the microprocessor. Push on the appropriate tab to view the screen.

The Input Screen (Figure 7) looks like this:

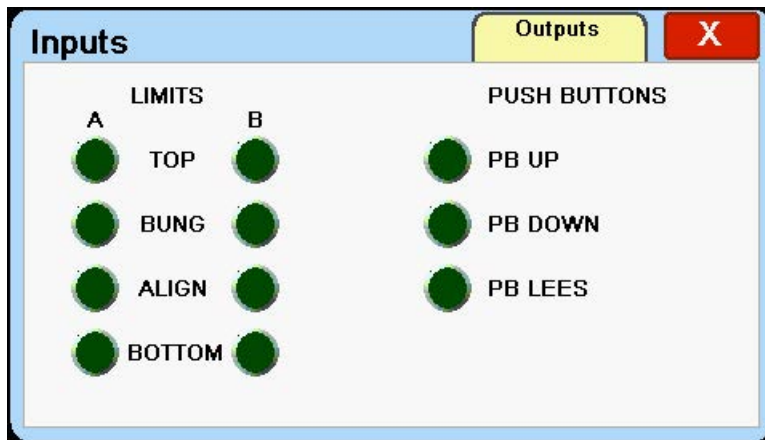


Figure 7

The Output Screen (Figure 8) looks like this:

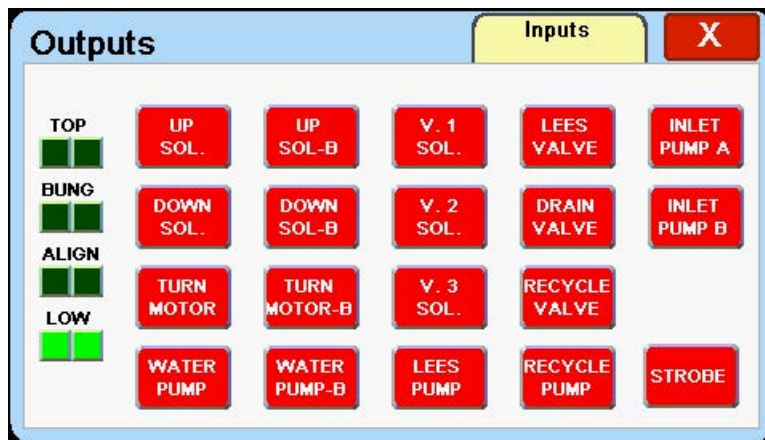


Figure 8

The “Outputs” touch screen is actually a series of push buttons. Maintenance personnel can check the operation of pumps, valves and other components by pushing on the appropriate push button.

- d) To continue the rotation check, momentarily push on the “Pump A” button on the Output Screen and observe the direction of rotation of the pump “A” shaft. Repeat the process for pump B.
- e) If the rotations are correct, replace the silver covers and proceed with start-up.
- f) If the rotation is backward, switch any 2 of the hot leads in the cord cap and repeat the rotation test.

**WARNING: FAILURE TO ESTABLISH CORRECT PUMP ROTATION BEFORE OPERATING THE BARREL WASHER WILL RESULT IN MAJOR DAMAGE AND WILL VOID THE PUMP WARRANTY.**

**8. Connect Compressed Air. Connect a compressed air supply hose to the appropriate port on the rear of the system.**

**NOTE: ROUTE THE POWER CORD, THE WATER SUPPLY HOSES, DRAIN HOSE, AND THE AIR LINE AWAY FROM THE BARREL WASHER ALONG PATHS THAT WILL NOT INTERFERE WITH FORK LIFT OPERATIONS, AND IN LOCATIONS WHICH WILL BE THE SAFEST FROM THE STAND POINT OF FOOT TRAFFIC.**

**8. Connect Lees Drain. For barrel washers with the optional lees recovery system, connect a hose to the appropriate port on the rear of the system and route the hose to a barrel or tank supplied by the winery (See Figure 2).**

# DAILY PRE-OPERATION CHECKS

**CAUTION: BEFORE EACH SYSTEM USE, THE OPERATOR MUST PERFORM THE FOLLOWING SAFETY AND PRE-OPERATION CHECKS:**

1. The machine must be inspected for movement from its proper plant location and for damage from fork lift operations: Each leg should be checked to be certain it is straight, contacting the floor, and undamaged. A level should then be used along the face of the machine, and along the front-to-back axis of the machine, to be certain the machine itself is properly positioned, or level side-to-side and front-to-back.

2. The electrical supply cord, hot and cold water supply hoses, airline, and drain hose (if installed) must be inspected for proper connection to the machine and your plant. Each cord and hose should be positioned so as to be clear of all phases of forklift operation and from foot traffic to the extent possible.

3. Each operator must have read this manual and been briefed in system operation by supervisory personnel.

4. Each operator must become familiar with the machine's components and the panel controls. Figures 1, 2, and 3 are included in the manual to assist in this process.

5. The hot and cold rinse timers must be set in the desired positions before operating the machine.

6. Like all machinery, the barrel washer should only be operated by trained, alert, and safety conscious personnel.

**NOTE: PRESSING THE RED EMERGENCY STOP BUTTON (SEE FIGURE 2 AND 3) AT ANY TIME WILL FREEZE MACHINE OPERATION AND SHOULD BE PUSHED IMMEDIATELY IF ANY POTENTIAL SAFETY OR OPERATIONAL PROBLEM ARISES.**

### **III. OPERATING THE BARREL WASHER**

Having performed the daily pre-operation checks, the barrel washer is ready to operate. Proceed as follows (See Figure 3):

1. **Turn “Power on”**. Energize the system by rotating the power selector knob to the ON position. The backlighting on the power switch will illuminate. Note that the wash heads are in the down position.

2. **Set the Wash Timers and Other Configuration Timers**. Select the wash cycle times by using the Main Screen (see Figure 5 above). The inlet valves themselves and the timers on the Timer Page are labeled #1, #2 and #3 (if a third inlet is installed). Generally, hot water will be used in valve #1 and cold and ozone in valves #2 and #3 in the desired order. With the recycle option valve #1 will be used for the recycled water as the first rinse is typically recycled water. The last rinse is fresh water.

To change the time valves, push on the appropriate existing time reading for the valve in question. A numeric key pad will appear. Push in the desired new time in seconds, and then push on “Enter.” The new time will appear.

If no wash is desired for a particular valve, such as, when not using valve #3, set the time value at zero seconds.

To change the operation between a 2 Barrel rack and a 4 Barrel rack push the left button on the Main screen. The option consists of using the “A SIDE “or the “B SIDE “or “A & B SIDES “.

The Recycle option consists of sending used water from Inlet Valve #2 and Valve #3 or Off. That button is located on the right side of the Wash Timers in the Main Screen.

In addition to wash time values, other time values or Delays can be adjusted using the “Wash and Lees Timers Screen,” accessed by pushing the tab on the “Timers Screen” page.

The “Wash and Lees Screen” (Figure 6) looks like this:

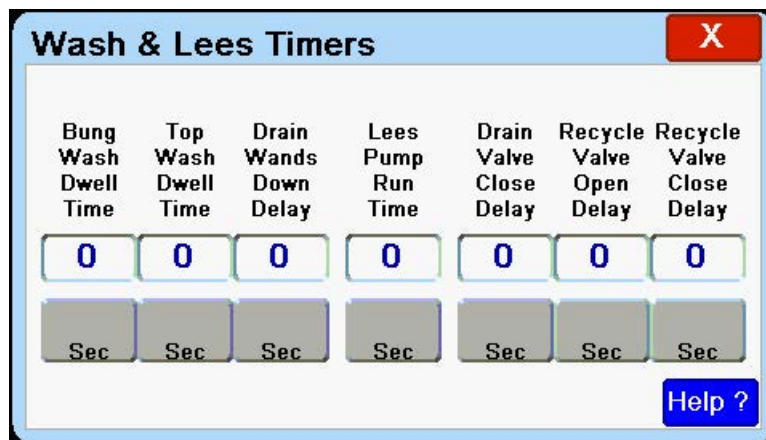


Figure 6

The timers that can be changed on this screen are as follows:

**Bung Dwell Timer:** This is the length of time the wash heads wash at the bung hole level on each wash cycle.

**Top Dwell Timer:** This is the length of time the wash heads wash at the middle of the barrel – the top of the cycle.

**Wands Down Delay Timer:** This is the length of time the Wands remain inside the Barrels at the end of the wash cycle before retracting.

**Lees Pump Timer:** This is the length of time the Lees Pump is on pumping Lees out of the Washer.



**Drain Valve Delay Timer:** This is the length of time the drain remains open at the end of the wash cycle. This helps separating the Water and the Lees between cycles.

**Recycle Valve Open Delay Timer:** This is the length of time the recycle valve is delayed for opening.

**Recycle Valve Closed Delay Timer:** This is the length of time the recycle valve is delayed for closing.

These time values are changed in the same way as the wash timers.

3. **Load the Machine.** Place a pallet of barrels on the roller assembly with a forklift.

**CAUTION: AVOID DAMAGING THE MACHINE WITH THE FORK LIFT DURING PALLET LOADING AND UNLOADING.**

4. **Lees Recovery-Optional.** If your machine is equipped with the optional Lees Recovery System and lees recovery is desired, refer to Section IV of the Manual for lees recovery steps at this point.

5. **Push the “UP” Button momentarily.** To align the barrels for washing, push the UP Button on the control panel. The wash heads will move up to a point just below the bottom of the barrels.

**NOTE: THE RED STROBE WILL BEGIN FLASHING WHEN THE WASH HEADS ARE RAISED. DO NOT ATTEMPT TO REMOVE A PALLET FROM THE MACHINE WITH THE RED STROBE ON. WASH HEAD AND/OR WASH TUBE DAMAGE WILL RESULT.**

6. **Align the Barrels.** With the wash heads stopped just below the bottom of the barrels, rotate each barrel on the rollers until the bung hole is down and the wash head is centered directly under the bung hole. This requires two adjustments: the bung hole must be directly down, and the barrel must be moved forward or backward on the rollers so that the wash head will enter each barrel without contacting any part of the barrel.

**CAUTION: FAILURE TO PROPERLY ALIGN THE BARRELS WILL RESULT IN BENT WASH TUBES OR OTHER MACHINE DAMAGE.**

7. **Push the “UP” Button Again to Start Wash.** Once the barrels are properly aligned, push the UP button again and hold it until the wash heads stop moving and the wash cycle begins. Release the button once the water pump is activated.

8. **Cancel Cycle.** To cancel the wash cycle once it begins, or to retract the wash heads at any time, push the “DOWN” push button. This will cause any wash cycle in operation to stop. The wash heads will retract. The DOWN push button may also be used before a wash cycle begins to retract the wash heads for any reason.

9. **Unload the Machine.** When the wash cycle ends, the wash heads will automatically retract. The RED STROBE will stop flashing signaling the operator that the wash heads are down and that the pallet can safely be removed from the machine.

**NOTE: THE MACHINE MAY BE STOPPED AT ANY TIME BY PUSHING THE RED EMERGENCY STOP BUTTON. WHEN POWER IS RESTORED, (BY PULLING OUT THE RED E-STOP BUTTON) THE MICROPROCESSOR HAS A SEVEN SECOND DELAY BEFORE IT CAN PERFORM ANY FUNCTION. THE “DOWN” PUSHBUTTON MUST BE PUSHED TO RESET THE WASH CYCLE, BEFORE THE WASH CYCLE CAN BE ACTIVATED AGAIN.**

## IV.OPTIONAL LEES RECOVERY SYSTEM

On barrel washers equipped with the optional lees recovery system, lees is recovered in the washer's sink and transferred to a tank or barrel provided by the winery using the following procedure:

1. **Turn on Lees Recovery at Touch screen.** On the Main Screen ( Figure 5 ) there are the Lees switches for Auto, Hand ( Manual ) and OFF . To run only the Lees pump and lees valve without starting a wash cycle push the HAND button. To Start the lees cycle with a wash cycle push the AUTO button.

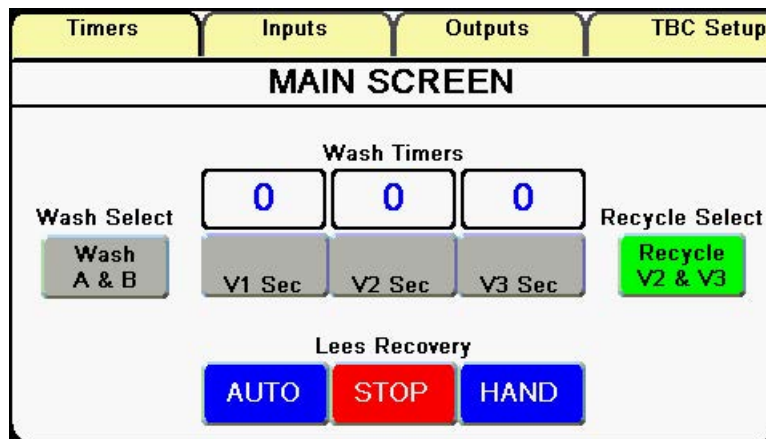


Figure 5

2. **Set Lees Recovery Time with the Touch Screens.** Experimentation will determine how many seconds the air pump on the barrel washer should run to recover lees. The lees pump run time is set in the "Wash and Lees" touch screens.

On the "Wash and Lees Timers" Screen (Figure 6), push on the "Lees Pump Run Timer" button and a key pad will

appear. Next, set the lees pump run time (in seconds) on the key pad and then press “Enter.”



Figure 6

3. **Roll the Barrels Bungs Down.** To start recovery of lees, roll the barrels bungs down. The lees will drain from the barrels into the washer’s sink.
4. **Start the Lees Pump.** Push one of the yellow “Lees” buttons located on the front and rear of the machine. The air pump will run for the number of seconds input into the touch screen.
5. **Manually Stopping Lees Recovery.** The lees recovery cycle can be stopped at any time by pushing the “UP” push button.
6. **Starting the Wash Cycle.** When the lees pump is shut down (either by the timed cycle running out or by pushing the “UP” push button) the wash cycle will begin.

## V.OPTIONAL RECYCLE SYSTEM



**Figure 6**

**Setting up the recycle system. Position the recycle pump skid in place so it does not interfere with Forklift traffic. Depending on how the Barrel washer was ordered ( Load side specific ) position the skid so the 2 hose spools will connect the washer to the recycle “ In “ and “ Out “ ports.**

**Connect the Power Cord from the recycle pump to the Barrel washer’s receptacle. Connect a water hose to the tanks low water make-up fitting.**

**Typically this is a Triclover fitting. This will prevent the water level inside the tank from getting too low causing the pumps to cavitate.**

**If a Heat Exchanger was included the winery will have to supply a hot water loop from their Boiler to heat up the recycled water.**

**Starting the recycle pump. Once the Barrel washer is connected and powered up the Recycle skid has power. Turn on the quick disconnect switch and turn on the pump. The water will be continuously recirculated in order for the recycled water to keep hot.**

**Using the Recycle System. At the Touch screen turn on the Recycle option at the “ Recycle select “ button and chose from recycle Valve #2 or Valve #3.**

**Starting the Wash Cycle. Start a Wash cycle as described in Paragraph III, Step 5.**

**The first rinse will go to Drain ( The dirtiest rinse water ), then the 2<sup>nd</sup> and, or 3<sup>rd</sup> water inlet valve can be sent to the recycle tank to get use once again.**

## **VI.DAILY MAINTENANCE CHECKS**

**On a daily basis the operator should thoroughly inspect the machine. Look in particular for the following potential maintenance requirements:**

**A. THE WASH TUBE SEALS. Normal usage will eventually crack or otherwise degrade the seals through which**

the wash tubes slide in the wash sink. Seal replacement is required if leakage is detected in the machine under the wash sink.

**B. THE WASH TUBE LIFTING ASSEMBLY.** The wash tubes are elevated on cross tubes driven by an air actuated rodless cylinder. The air system should be free of water and debris. The regulator water trap should be bled daily, to keep any condensation out of the rodless actuator.

**C. THE WASH SINK.** The wash sink and its drain should be kept clean and free of barrel solids.

**D. WASH SEALS.** The wash seals (Top and Bottom) should be checked daily for excessive wear and leakage. Replace as needed or every 3 months.

**E. RECYCLE TANK.** Check and empty the recycle tank screens and inspect the inside of the tank. Wash out and clean the tank daily.



## VII. LOCKOUT / TAGOUT PROCEDURES

For

### *Tom Beard Company* *Barrel Processing Lines and Barrel Washers*

(Based on Title 8, section 3314, California Code of Regulations)

The following *LOCKOUT PROCEDURES* must be strictly followed whenever trouble shooting, maintenance or servicing is to be performed on *Tom Beard Company* barrel processing lines and barrel washers:

**A. POWER OFF PROCEDURES.** If it is possible, service or maintenance should be performed with all energy sources off in accordance with the following steps. If trouble shooting, service or maintenance requires continuing uses of energy sources (power, compressed air and / or nitrogen), refer to section B (“POWER ON PROCEDURES”).

1. An employee or employees designated in advance by management (such as a Maintenance Supervisor or Cellar Master) shall notify all affected employees that servicing or maintenance is required on the *Tom Beard Company* equipment and that the equipment must be shut down and locked out to perform the servicing or maintenance.
2. The designated employee or employee giving notification of shutdown shall be familiar with the type and magnitude of the energy utilized by the equipment, shall understand the hazards of the energy, and shall know the methods to control the energy. With respect to *Tom Beard Company* equipment, the energy sources are electrical power (208 or 480 volts, 3 phase, 10-60 amps); hot, cold or ozonated water (40-250 psi); compressed air (100 psi); and nitrogen (20-60 psi) for empty and fill systems if installed.
3. If the equipment is operating, the designated employee shall shut it down utilizing the normal stopping procedures as described in the appropriate *Tom Beard Company Operations Manual*.

4. An authorized employee shall de-activate the energy isolating device so that the equipment is isolated from the energy source(s). In most cases, this involves turning off the lockable main electrical power switch on the outside of the main electrical enclosure, and if necessary, shutting off compressed air, nitrogen and / or water and ozone valves supplying the equipment.
5. The authorized employee shall lock out the energy isolating device(s) with locks assigned to the lockout function by management.
6. The authorized employee shall ensure that the equipment is disconnected from the energy source(s) by first checking that no personnel are exposed, then by verifying the isolation of the equipment by operating the normal operating controls (up-down push buttons, etc.) to make certain the equipment will not operate.

Following steps 1-6, the equipment is now locked out.

**B. POWER ON PROCEDURES.** There are times when it is necessary to leave energy sources connected to trouble shoot, service or repair *Tom Beard Company* equipment. In this event, the following modified procedures must be followed:

1. Follow step 1 from Section A, except advise all affected employees that energy sources must be left on during trouble shooting, maintenance or servicing, and that extra caution is required.
2. Follow step 2 from Section A.
3. With the required energy sources left on, one person is designated to perform the trouble shooting, repair or servicing, while a second person is designated to service as a *spotter*. The spotter is positioned in a place where the work can be observed while the spotter stands by in a position to immediately disconnect energy sources if a problem arises. The spotter must have a clear line of sight to the person doing the work, and must be able to communicate with that other person by voice or radio at all times. If multiple energy sources might need to be shut down at different locations, multiple spotters should be designated. In the case of *Tom Beard Company* stand alone barrel washers, power on trouble shooting by one person may be safe if the person has

immediate access to energy disconnects while worked is being performed. Single person trouble shooting, repairs or servicing should only be conducted with the express permission of management.

4. All energy sources must be immediately disconnected by the spotter(s) in the event of any indication of trouble, either by communication from the person performing the work or by the spotter's own observations.

**C. START-UP PROCEDURES.** When trouble shooting, repairs or servicing have been completed, start-up must be done using the following steps:

1. Check the equipment and the immediate area around the equipment to ensure that all tools, parts, and other nonessential items have been removed and that the equipment's components are operationally intact.
2. Check the work area to ensure that all employees have been safely positioned or removed from the area.
3. Verify that all controls are in neutral.
4. Remove lockout devices and reenergize the equipment if power off procedures were utilized.
5. Notify all affected employees that the servicing or maintenance is completed and the equipment is ready to be tested and used if found in working order.

# MICROPROCESSOR INPUT / OUTPUT LIST

<u>Inputs</u>	<u>Description</u>	<u>Tag</u>
Input 0	Lower Reed Switch A	_IO_EM_DI_00
Input 1	Barrel Align Reed Switch A	_IO_EM_DI_01
Input 2	Bung Position Reed Switch A	_IO_EM_DI_02
Input 3	Top Position Reed Switch A	_IO_EM_DI_03
Input 4	Up Push Button	_IO_EM_DI_04
Input 5	Down Cancel Push Button	_IO_EM_DI_05
Input 6	Lees Push Button	_IO_EM_DI_06
Input 7	Lower Reed Switch B	_IO_EM_DI_07
Input 8	Barrel Align Reed Switch B	_IO_EM_DI_08
Input 9	Barrel Align Reed Switch B	_IO_EM_DI_09
Input 10	Top Position Reed Switch B	_IO_EM_DI_10
Input 11	Spare	_IO_EM_DI_11
Input 12	Spare	_IO_EM_DI_12
Input 13	.	_IO_EM_DI_13
<u>Outputs</u>	<u>Description</u>	<u>Tags</u>
Output 0	Wash Wand Up Solenoid A	_IO_EM_DO_00
Output 1	Wash Wand Down Solenoid A	_IO_EM_DO_01
Output 2	Inlet_1_Solenoid	_IO_EM_DO_02
Output 3	Inlet_2_Solenoid	_IO_EM_DO_03
Output 4	Inlet_3_Solenoid	_IO_EM_DO_04
Output 5	Water Pump Contactor A	_IO_EM_DO_05
Output 6	Turn Motor Relay A	_IO_EM_DO_06
Output 7	Drain Valve Solenoid	_IO_EM_DO_07
Output 8	Spare	_IO_EM_DO_08
Output 9	Strobe Out	_IO_EM_DO_09
<u>Plug in 1</u>	<u>Description</u>	<u>Tags</u>
Plugin 1 Output 1	Lees Valve Solenoid	_IO_P1_DO_00
Plugin 1 Output 2	Lees Pump Solenoid	_IO_P1_DO_01
Plugin 1 Output 3	Recycle Valve Solenoid	_IO_P1_DO_02
Plugin 1 Output 4	Recycle Pump Solenoid	_IO_P1_DO_03

<b>Plug in 2</b>	<b>Description</b>	<b>Tags</b>
Plugin 2 Output 1	Wash Wand Up Solenoid B	_IO_P2_DO_00
Plugin 2 Output 2	Wash Wand Down Solenoid B	_IO_P2_DO_01
Plugin 2 Output 3	Water Pump Contactor B	_IO_P2_DO_02
Plugin 2 Output 4	Turn Motor Relay B	_IO_P2_DO_03
<b>Plug in 3</b>	<b>Description</b>	<b>Tags</b>
Plugin 3 Output 1	Wash Pump Inlet A	_IO_P3_DO_00
Plugin 3 Output 2	Wash Pump Inlet B	_IO_P3_DO_01
Plugin 3 Output 3	Spare	_IO_P3_DO_02
Plugin 3 Output 4	Spare	_IO_P3_DO_03

Figure 12