



# High Pressure Mixer Washout System

## User's Manual

Ver. 2-9  
March 28, 2023

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# 1 INTRODUCTION

High Pressure Washout automatically cleans all types of concrete mixer except rotating drum types. Faster cleanup gives 15 to 30 minutes extra production each day. This translates to over 5% more productivity every day, at no extra cost. And it guarantees safety - no need to enter the mixer. Payback is a few months in most cases. You will have better employee morale and safety. Easily installed rotating jets are fully automatic.

The North American high pressure pump unit, 900 to 1000 psi pressure at full flow of 20 gpm to suit all concrete mixers up to 12000/8000 (10.5 yd) size. The reservoir is sized for at least two wash cycles with automatic refill and low-water pump shutoff. Coupled with Scale-Tron's control unit, the complete system is a highly effective, reliable and flexible solution that automatically cleans concrete mixers.

Throughout this manual, warnings, cautions, and special notes are added to indicate a potentially hazardous condition, or to identify a potentially hazardous situation if not corrected.



Describes a condition that may prove to be harmful or fatal to either personnel, equipment or both.

**NOTE:**

Describes a condition which requires special attention

## 1.0 BEFORE YOU START

***High pressure washout jets are dangerous. They can strip exposed skin and cause blindness. Before operating this equipment, check to ensure that all covers are closed and latched, safety switches are operating, and all personnel are out of harm's way. Locate the hand gun and verify that it is turned off and stowed. Verify that when used with a concrete mixer, the mixer is not in use or expected to receive a batch of material, the discharge door is closed for safety and the mixer is running for the most effective cleaning job.***

### 1.1 Pre-operation check

Read and Understand the pertinent sections of the HP Washout Washing System Application (Mixer Instruction Manual) to fully understand the mechanical operation of this equipment.

Ensure all electrical connections are connected correctly, and that the system is powered.

Ensure all hoses are connected and secured. All 'quick releases' firmly attached.

Ensure main water valve is open.

It is recommended that the spray nozzles be removed for the first few minutes of operation. This prevents any foreign material from clogging the nozzles.

Readjust the nozzles to give the optimum spray pattern.

## 2.0 CONTROL SYSTEM, OPERATION

### 2.1 Modes of operation

**OFF** – Both manual and automatic washout sequences are disabled.

**MANUAL** - When in manual mode, either an internal timer determines the washing time, or the pump can run indefinitely for use with the hand operated gun. See '**wash cycle**' below. Do not run the pump for longer than necessary to do your cleaning; the pump is not designed to run for extended periods without passing water through the wash heads or hand gun.

#### **WASH CYCLE:**

**SINGLE** – Select for a single, timed wash cycle. The pump will run and the heads will be sequenced; the wash cycle will run for the preset time. This cycle also economizes water use. Before this switch is operated, the mixer must be running, and all discharge doors closed. After the washout sequence is complete, the mixer can be run for as long as desired to loosen any remaining deposits, following which the discharge door should be opened to drain the washout water. Leave the door open during any subsequent idle period. Do not try to cut the wash time short by turning the switch to OFF; this will only stop the timer and close the valves to the heads. The cycle will resume operation when the switch is returned to MANUAL. Also do not use the hand gun during the timed wash cycle, since it will lower the pressure at the washing head nozzles.

**Operation** – First ensure that the main power breaker is ON and the OFF/MANUAL/AUTO switch is in the MANUAL position, which applies power to the internal circuits. Wait 20 seconds for the Low Water timer to time out. Turn the selector switch to the SINGLE position and release it. If the Low Water timer is done, the pump should start and the wash head sequencing should proceed. To cancel the timed cycle, do not turn to OFF as this will just put the wash timer on hold; momentarily turn the WASH CYCLE switch to CONTINUOUS and back to the center position.

If at any time the reservoir is below the LOW level or the OFF/MANUAL/AUTO switch is turned OFF, the pump will stop and the wash timer will hold its time until the water level rises and the Low Water timer times out.

**CONTINUOUS** – Select to run the pump only, for use with the hand gun. This action is allowed in both MAN and AUTO modes. The wash heads will not cycle in this mode, allowing full power to the hand gun. Continuous operation is possible when the mixer covers are open, to allow cleaning of the mixer interior. Close the mixer cover if you need to jog the arms to a new position.

If at any time the reservoir is below the LOW level or the OFF/MANUAL/AUTO switch is turned OFF, the pump will stop.

**NOTE:** *This switch must be returned to the center position to stop the continuous pump cycle.*

**AUTO** – The Single Timed Cycle mode is disabled and the system takes its sequence from the external controller. Note that the controller needs to monitor the Pump Running signal to verify that everything is operating as expected.

**NOTE:** *At any time, pressing the emergency stop button will immediately halt the washout sequence BUT WILL NOT STOP THE MIXER; this is controlled from the normal control system and local isolation switch, stop buttons etc. The E-Stop button also stops the wash cycle timer, ensuring that the mixer receives the correct amount of washing when power is restored. When released, the pump will not run until the Low Water timer times out.*

### Indicator lamps:

**Power** – indicates that the system is ready for operation.

**Water Low** – indicates that the water level is too low to operate the pump.

**Pump Running** – indicates that the pump is operating and high pressure water is available.

**WATER LOW** – Indicates that the reservoir is below the Low level and washout cannot proceed. On refilling past this low level, a delay prevents the pump from restarting and cycling ON/OFF rapidly. When the pump stops, it also stops the wash cycle timer, ensuring that the mixer receives the correct amount of washing when power is restored.

**PUMP RUNNING** – Indicates that the washout pump is powered.



***The hand gun is powered, even when the mixer is being cleaned. Do not leave it lying around and do not operate unless you have verified that other personnel are clear.***

## 2.2 PLC display

The small operator panel on the PLC shows the status of inputs and outputs as well as the timer for the timed wash cycle. Use this panel for checking the input from the mixer cover switch (ON when enabled), the Auto cycle from the batch control system (ON when enabled) and the outputs to the pump and head sequencing valves.

## 2.3 PLC Setup adjustments



The PLC in the control cabinet includes an operator panel. In normal use this panel displays the remaining Wash Time, the status of the Cover and Auto inputs and the status of the outputs controlling the pump and sequencing valves H1 to H4. This is a useful diagnostic tool when the system is not operating correctly. This panel is also used to set the various parameters:



**Timed wash time** – the system can be set to give any wash time, based on the user's need to achieve a satisfactory wash without using too much water. Access this screen by pressing the ▲ and 0 keys together. Use the ► and ◀ keys to access hours, minutes and seconds, then enter the new wash time and press OK to save. Use the ◀ key as backspace if necessary. Typical wash times are from 5 to 10 minutes and water usage is 20 gallons (76 liters) per minute. You will not see the newly entered time until the Timed Wash Cycle has operated and completed.

**Number of wash heads** – This number can be set from 1 to 4. Enter the number of heads to be sequenced in the mixers of your system. If two mixers are used, the number is for EACH mixer, not the total. Note that if you set a higher number, e.g. 4 when the mixer has only 3 heads, the system will try to sequence the non-existent valve and this part of the wash time will be lost, the extra water being returned to the reservoir. If a lower number is set, the extra head will never be fed water. Access this screen by pressing the ▲ and 1 keys together. Enter the number of heads and press OK to save. Use the ◀ key as backspace if necessary. You will not see the new value until this menu is accessed again, when the current value is displayed below the entry line.

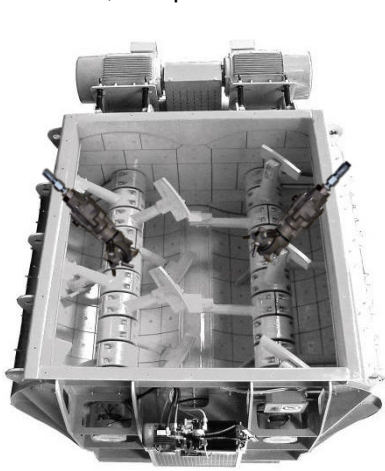
**Wash heads sequencing time** - the system can be set to give any sequencing time, in seconds. The default is 10 seconds but this can be altered if necessary, to give each head a longer operating time before switching to the next. This time should be small compared with the total wash time, to allow every head to receive the same amount of total washing time. Access this screen by pressing the ▲ and 2 keys together. Enter the new value and press OK to save. Use the ◀ key as backspace if necessary. You will not see the new value.

### 3.0 INSTALLATION AND STARTUP

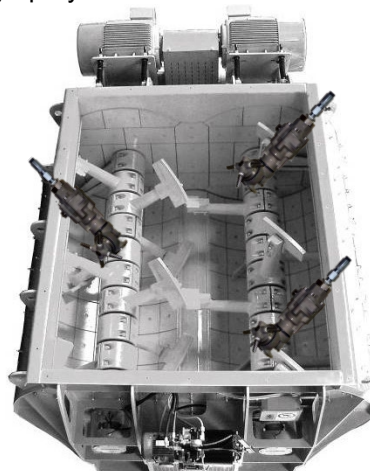
#### 3.1 Installing A80R washing heads in twin shaft mixer

The A80R head has four jets arranged on one double axis rotating structure. These are powered by an internal turbine motor and they in turn rotate the head through internal gearing to give a 360 degree, spherical spray cleaning pattern. One, two, three or four heads can be used to clean small to large mixers or similar structures.

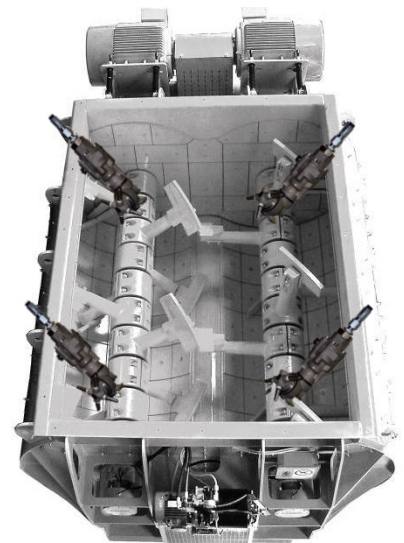
Depending on the size of the mixer, heads should be positioned in the mixer cover in approximately the positions indicated below. Many times it is not possible to place them in exactly the best position; in these cases, position them as close as possible to these best positions while keeping clear of other equipment. Illustrated is a twin-shaft mixer but positioning in other large tank type structures is the same, the objective being to space the heads equally so that the hardest to reach areas are at the minimum distance from the closest head. Position heads so that they can be seen from every part of the mixer that you wish to clean. If the head cannot be seen, that part will not receive any spray and will not be cleaned.



Two heads for smaller mixers  
Heads are shown out of scale for clarity.



Three for larger mixers



Four heads for largest mixers



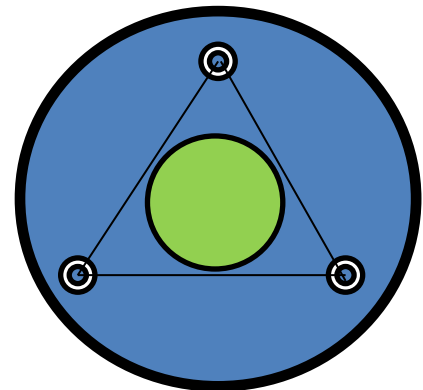
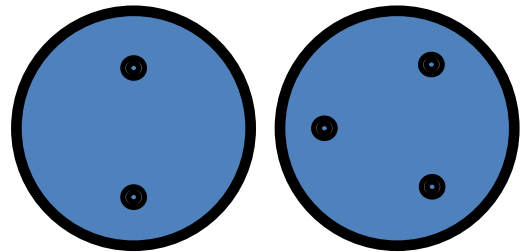


**Ensure that the safety covers are electrically interlocked to prevent operation of the high pressure pump if the cover is open. We can supply regular or key operated interlock switches if necessary. Also ensure that rotating equipment does not touch the heads.**

### 3.2 Installing A80R washing heads in planetary / pan mixer

Depending on the size of the mixer, heads should be positioned in the mixer cover in approximately the positions indicated below. Many times it is not possible to place them in exactly the best position; in these cases, position them as close as possible to these best positions while keeping clear of other equipment.

In planetary mixers where the floor is unobstructed, two or three heads should be positioned roughly equidistant from each other, roughly 2/3 of the distance from center to outer wall. Sometimes the head must be positioned on a safety cover that opens. Observe safety warning below.



In pan and rotating pan mixers with a central hub, space the heads equally so that the hardest to reach areas are at the minimum distance from the closest head. Position heads so that they can be seen from every part of the mixer that you wish to clean. If the head cannot be seen, that part will not receive any spray and will not be cleaned. Heads are shown out of scale for clarity. Measure the clearance between the mixing arms and the cover; the head protrudes 9 3/4" below the mixer cover and if you cannot obtain enough clearance you may need to fabricate a metal can to reduce this protrusion.



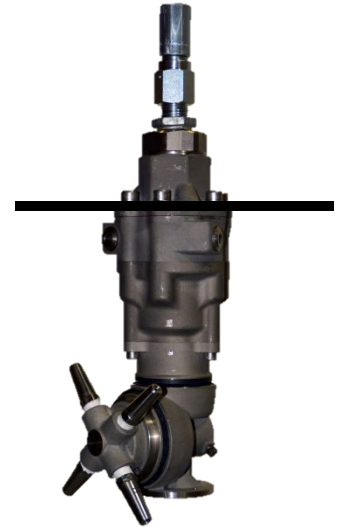
**Ensure that the safety covers are electrically interlocked to prevent operation of the high pressure pump if the cover is open. We can supply standard or key operated interlock switches if necessary.**

### 3.3 Mounting washing heads onto mixer cover

Place the mounting plate over the top of the head and determine which bolts to remove (plate can be oriented either way up). Remove only 3 of the 6 bolts and install the mounting plate, tightening to 17 Nm (12 ft lb). Cut a 5" diameter hole in the correct position on the mixer if the head is to be installed from above. Position the plate/head assembly through the hole and either weld or bolt in-place. Seal the seams if necessary with grout.

The heads require 9.75" clearance below the mounting plate. If there is insufficient clearance between the nozzles and the rotating arms, fabricate a steel "can" using a circular strip plus the mounting plate

Attach the pump outlet hose to the valve manifold and mount the valve manifold above the mixer in a convenient location. Complete the piping between each head and its associated sequencing valve and ensure that the hoses can be twisted into the position required by the washout head. The 3/4" NPT coupling has a swivel action to allow it to be attached to the head (using Teflon tape). The hose should be loose enough to allow the cover to be opened.



### 3.4 Installation of pump and reservoir

#### 3.5 This section deals with the pump unit. The pump has 20 gpm capacity at 1000 psi. psi.

Inspect the unit to ensure all has arrived in good working order.

Plan the placement accordingly. You will need a cold water supply and a 3 phase voltage supply to the controller. Also, depending on configuration, you may also need wiring to and from the main control / batching system.

Place the pump unit in close proximity to the mixer. Place the water tank within 10 feet of the pump unit and 3 to 6 ft higher if possible. Do not place the tank any lower than the pump.



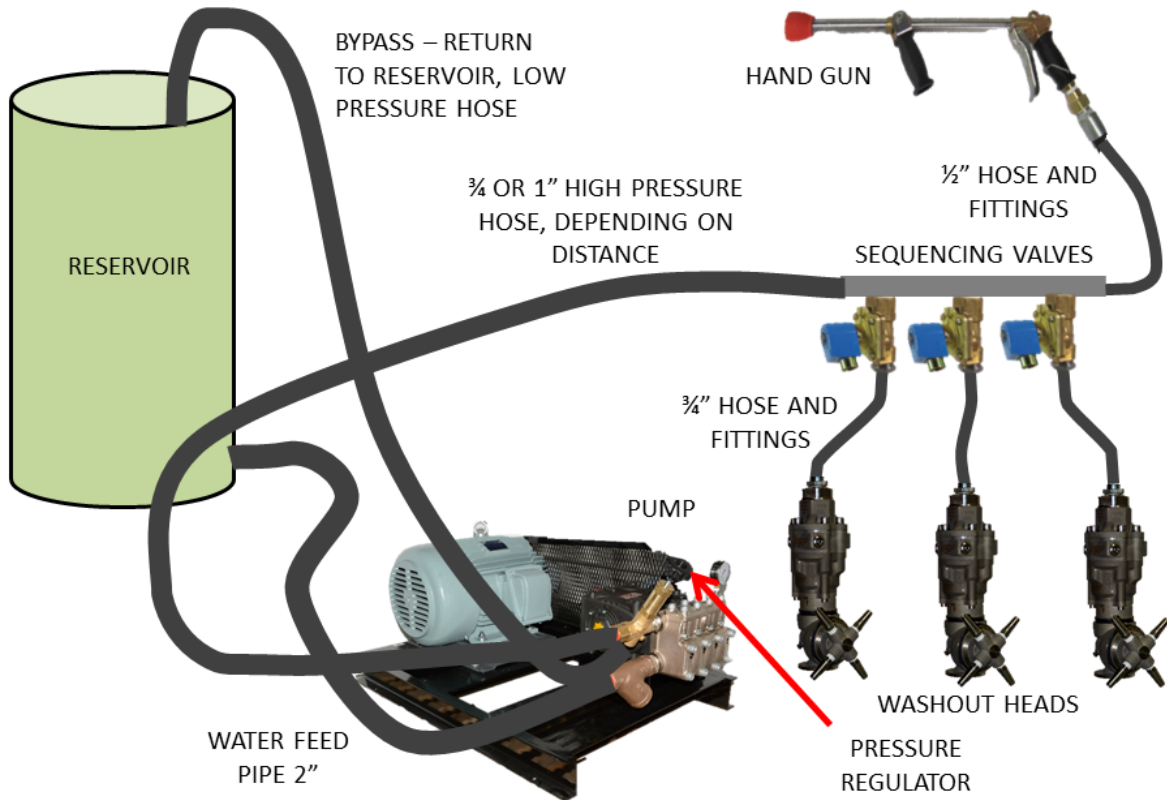
Plumb the main 1" water feed from a supply of cold water into the top of the water tank, into the electrical valve fitted at the top of the tank. Avoid the regular water feed to the mixer if hot water is used in the wintertime, unless this supply never exceeds 120°F. It is recommended that a filter is placed between the water main and the HP Washout unit to avoid fines from creating excessive pump wear..

Run the reservoir outlet to the inlet side of the pump. Finally, run the return line from the pump unloader valve back to the top of the tank.

For long runs of pipe or hose, please use the table at right to choose the best diameter. We recommend 1" rigid pipe and hose for long runs. Ensure that pipe and fittings are rated for at least 1000 psi. From valves to heads on mixer, 3/4" is adequate. The hand gun, which uses less than 20 gpm, can use 1/2" hose which is lighter and more flexible than the 3/4" type.

Pressure Drop in PSI per 10FT of Hose				
Water flow, gpm	Hose Inside Diameters, Inches			
	1/2"	5/8"	3/4"	1"
15	30	10	4.2	1.2
20	49	19	8	2

**Single mixer system**



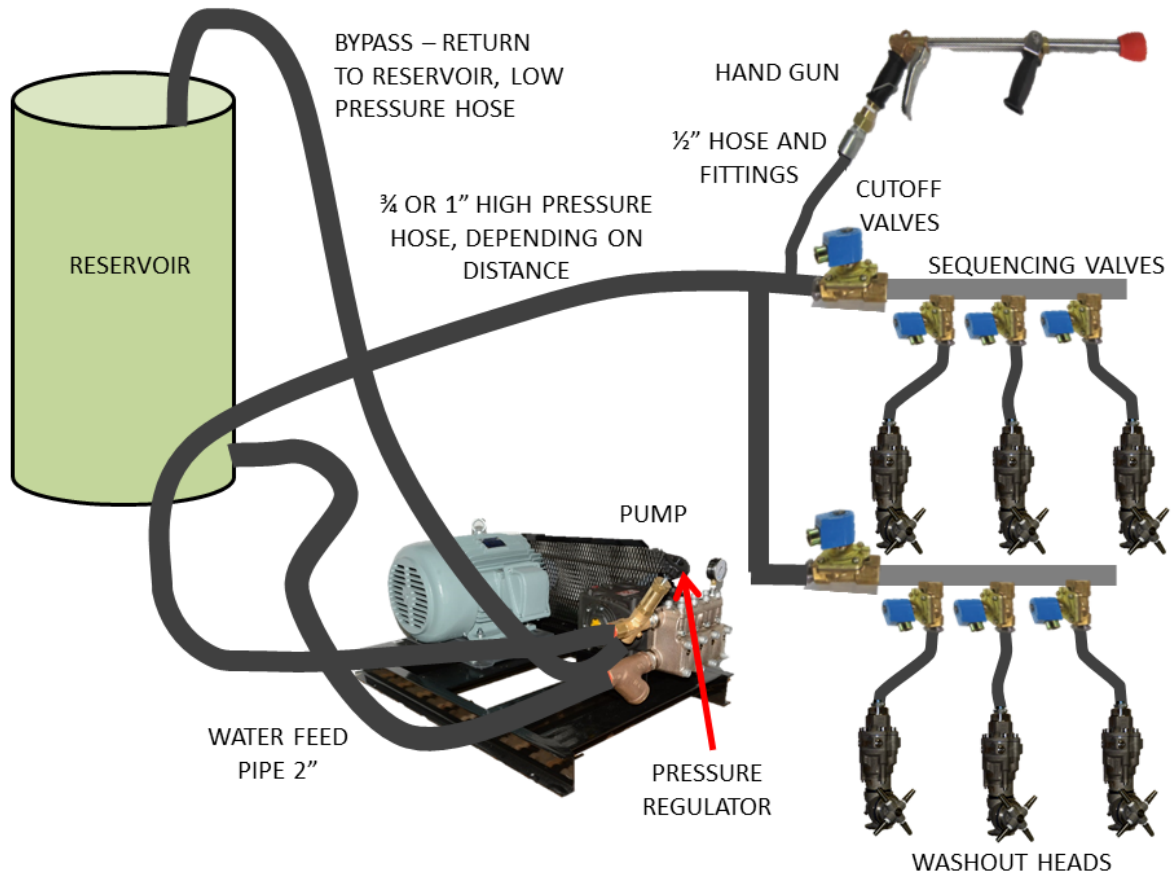
Connect the HP Washout unit's pump to the reservoir and valve assembly as shown, using the hoses and fittings provided. Locate the valve assembly equidistant from each of the washout heads and high

enough to match the hose lengths. Connect the valve assembly's ½" outlet to the hand-gun. Do not use regular plumbing fittings for the high pressure circuit. The supply from the reservoir and the return to the reservoir are both low pressure circuits.

Flush the tank at least once prior to connecting it to the pump. This ensures there is no residue or contaminants that can damage the pump.

Wire the pump motor from the control panel, using suitable wire for the current & voltage of the pump motor.

## Two mixer system



For two mixer operation, each mixer is washed separately by energizing the valves as follows:  
 Mixer 1 – open only the valve for mixer 1. Mixer 2 – open only the valve for mixer 2. Manual wash (hand gun only) – close both valves and operate hand gun trigger valve.

Before beginning operation of the pump, check that the crankcase and seal areas have been properly lubricated per recommended schedules. Do not run the pump dry under any circumstances. Lack of water will result in severe damage. Always remember to check that all plumbing valves are open.

Prior to initial operation, add oil to the crankcase so that oil level is between the two lines on the oil dipstick. **DO NOT OVERFILL. Use Industrial gear oil of grade listed in the pump manual.**

### 3.6 Installation of control system

Mount the HP Washout control panel in a convenient location, in view of the pump unit cover. Run the conduits and cables as appropriate. Size the 3-phase entry as follows:

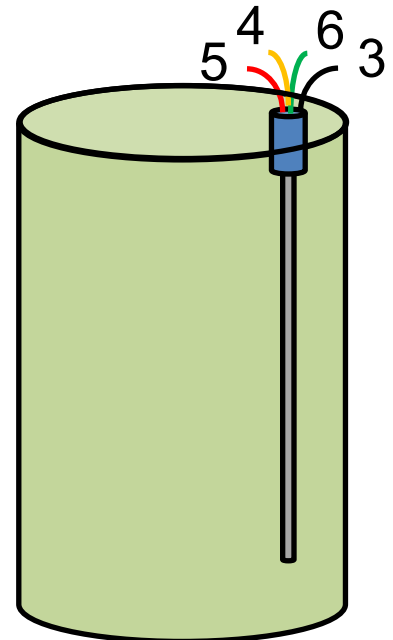
220/230V @ 50A	10AWG Minimum	380/415V @ 31A	12AWG Minimum
460/480V @ 25A	14AWG Minimum	560/600V @ 20A	16AWG Minimum

Connect the motors using appropriate size wiring for the pump.

The HP Washout panel's single phase entry is fused at 3A for either 110V or 220V. This should be supplied from a separate main control panel if feasible. This power is isolated by an auxiliary contact on the panel's 3 phase isolation switch, but the PLC remains powered. Take care.

Connect the level sensors in the tank to the appropriate input terminals:

Wire #	Color	Function	Depth below cover
5	RED	Low level probe	37 inches (940 mm)
4	YEL/WHT	Refill level probe	16 inches (406 mm)
3	BLK	High level probe	4 inches (102 mm)
31		Fill Valve	
2		Fill Valve	
6	GRN	Ground connection for water level probe	40 inches (1016 mm)



### Connection to probes in reservoir

From control cabinet run four low voltage wires from terminals 3 – 6 to the reservoir and connect them to the depth sensing probe as shown at right.

### Connection for use in manual mode only

Please refer to the “Modes of operation” section above. Do not connect to terminals 8, 9 and 21 but check that a jumper is connected between terminals 7 and 12. No further connections are necessary.

### Connection for use in automatic mode

Please refer to the “Modes of operation” section above for a clear understanding of operation. Connect the batch controller to terminals 8, 9 and 21.

**Dry Contact Output Available:** Connect the dry contact output from the control system to terminals 8 and 9. The external control system must first close the mixer doors and start the mixer, then close this contact. The washout system will feed high pressure water and sequence the washing heads as long as this contact is closed. The remainder of the washout sequence, including discharge, must be controlled from the external control system. Note that the system will work only when the main disconnect switch is ON, the emergency stop button is released and the system is turned to **AUTO**. Terminal 8 is live when all these conditions have been met and can be used as a status indication to the control system. The control system should also monitor the Pump Running output, terminal 21, which is powered down if the water level is low or a motor fault occurs.

**Powered Output and Input Available:** Connect terminals 8 and 21 to 110VAC control inputs. 8 is live when the main disconnect switch is ON, the emergency stop button is released and the system turned to **AUTO**; use this as the Enable input for the automatic sequence. 21 is live when the water is above the Low level and the pump is running. Connect terminal 9 to a 110VAC control output (current drain is less than 1A). This will feed high pressure water and sequence the heads as long as the output is live. The remainder of the washout sequence, including discharge, must be controlled from the external control system.

## Mixer cover safety limit switches

The control system includes terminals for wiring to safety limit switches on the mixer covers. To connect these switches, remove the jumper from terminals 1A and 1B and wire to these limit switches; if one switch, connect directly and if two or more, connect in series. If using this method, opening the covers will disable the pump and prevent any cleaning with the hand gun. Use method below if possible.

If these switches are already wired to the control system via a 110-volt AC input, the “live” output can be wired directly to the control system; do not remove the jumper between terminals 1A and 1B. Remove the jumper between terminals 7 and 12 and connect the mixer motor “RUN” output, or the output from the cover limit switches if not available, to terminal 12. This should also be connected to an input of the control system and should receive power only when the covers are all closed. Power on terminal 12 enables the functions of the control system for operating the washing heads but the pump can run with the covers open, to allow the hand gun to be used on the mixer interior if necessary.

If the cover switch connection or voltage is not compatible with the washout system 110-volt AC input, use a relay to provide the dry contact between terminals 1A and 1B or 7 and 12 above.



***The washout system has the power to injure anyone coming in contact with the powerful jets from the washing heads. It is your responsibility to ensure safety of personnel by either providing automatic shutdown of the washout system when mixer covers are opened or by locking-out the pump motor at the control system disconnect.***

## 3.7 System startup

Before starting, replace the oil filler cap with the one provided, which includes a vent and dipstick. Check oil level and fill if necessary – see pump manual for the grade.

Fill the reservoir and verify that the valve stops the water flow at the appropriate point. Ensure that the hose from reservoir to pump is filled, with no trapped air. Check for leaks. Remove the hoses from the valve outlets or heads, or remove nozzles from the heads to allow small particles to flush through the system. Operate the pump and run the system for a few minutes to flush any residue through the system. Replace nozzles and run again, checking for high pressure leaks.



***Do not start the pump without a water supply. Never attempt to feel the water pressure by placing your hand or any part of your body into the high pressure stream emerging from any of the spray jets. Serious injury can result. Ensure that the mixer covers are locked in their closed position, discharge doors are closed and the mixer is running before operating the washout system. The hand gun is powered, even when the mixer is being cleaned. Do not leave it lying around and do not operate unless you have verified that other personnel are clear.***

### NOTE:

The speed of the revolving head must be regulated using a 6 mm hex socket that is located on the top surface of the head body, next to the inlet. Provide a hole in the mixer cover to allow adjustment. Turning the Allen key clockwise decreases the speed and turning it counterclockwise increases it. The speed must be adjusted when the head is not running. The speed should be slow, 10 to 20 but must not exceed 30 revolutions per minute (once every 3 to 6 seconds typical). Plug the adjustment hole with rag or a wine cork when done, to prevent it filling with concrete.

The purpose of the cutoff valve is to prevent water flow to the washing heads when only the hand gun is in use. This applies full pressure to the gun, making it fully effective. Because the flow through the gun is less than the flow delivered by the pump, some of the water will bypass and return to the reservoir.

The pressure indicator shows the pressure in the high pressure circuit when the pump is operating. With the cutoff valve closed (no flow to the mixer) and the hand gun operating, verify that the pressure is between 900 and 1100 psi. This pressure can be adjusted by turning the nut on the pressure regulator (see diagram in section 3.3). When the washing heads are in operation, this pressure may drop as the nozzles wear. New nozzles will normally correct this situation.

## MAINTENANCE

### 3.8 Washing heads

The A80R heads are extremely robust and require very little maintenance. Their speed is internally regulated, and no adjustment is possible. If a reduction in performance is noticed, check the pump return hose to the reservoir. There should be little to no return water; if you see a lot of return water, it is possible that the filters on the heads are clogged. Using a 46 mm wrench, remove the top connection, along with the hose. Under this is the filter; clean it, check the O-ring and re-assemble.

If the rotation stalls, this is most likely due to buildup of material on the outside of the body. Clean it off carefully, taking care not to damage the rubber seals between the moving parts. If necessary, remove the rotating head by slackening the two 8 mm screws 2 turns and hitting the end of the shaft with a hammer (with suitable material to protect the metal).

Every 200/300 running hours, according to hardness of water, seals may need to be changed. Follow the instructions in the service manual provided.

Verify weekly that nozzle openings are not blocked. If frequent blockages occur, increase the frequency of use. If this equipment is not used regularly, the nozzles are sure to block. Nozzles can be removed and cleaned with a wire probe if necessary.

The washing heads are guaranteed for 12 months against manufacturing defects, defects of material and components.



***Do not dismantle the heads further if you do not have the special tools required. This can cause damage. Scale-Tron has a complete service and rebuild center to save you the trouble.***

### 3.9 Pump unit

Refer to the supplied pump user manual for additional information.

It is recommended that the first wash cycle be run with the spray nozzles removed. This ensures that the system is flushed and there is no residue or containments that can clog the nozzle orifices.

The oil in the pump should be filled prior to operation and changed after an initial 50 hours of operation. Subsequent oil changes should occur every 500 hours of operation after that. Use SAE 90 industrial gear oil.

If the system is shut down in winter, drain all hoses and run the pump dry approximately 10 seconds to drain the water before exposure to freezing temperatures.

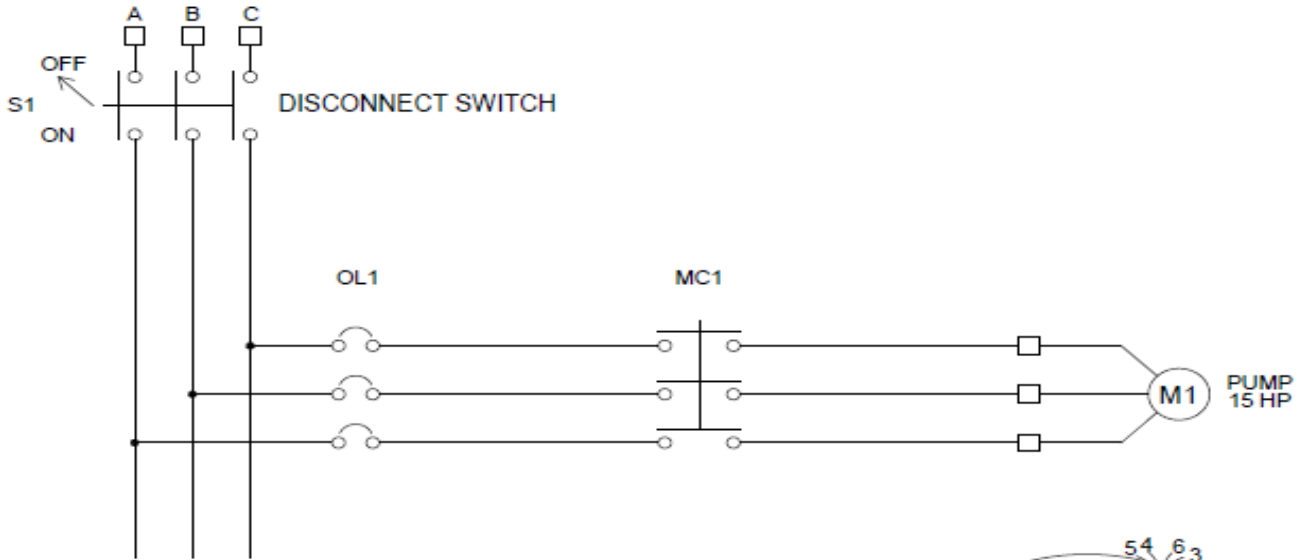


The pump is guaranteed for 12 months against manufacturing defects, defects of material and components.

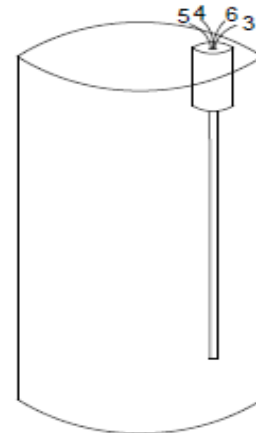
After the first 50 hours of operation and subsequently every 3 months, check the tension of the drive belts and adjust if necessary. Check the pump output pressure with the mixer valves closed and manual gun in operation. Adjust the pressure regulator if necessary. Do not exceed 1100 psi. Check for leaks and correct as necessary.

### 4.0 Appendix 1 – Schematic diagram and plant wiring

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REV - M

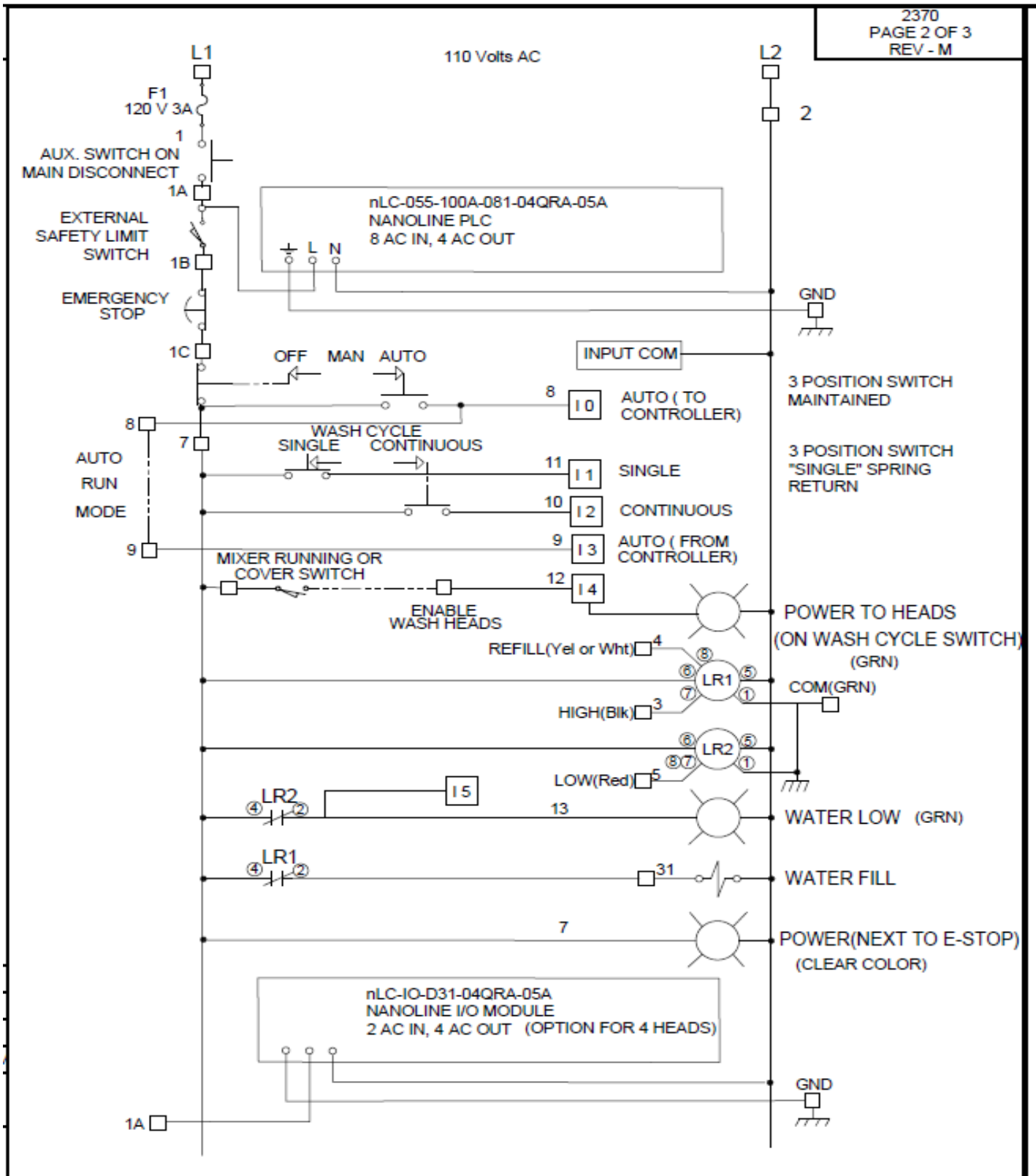


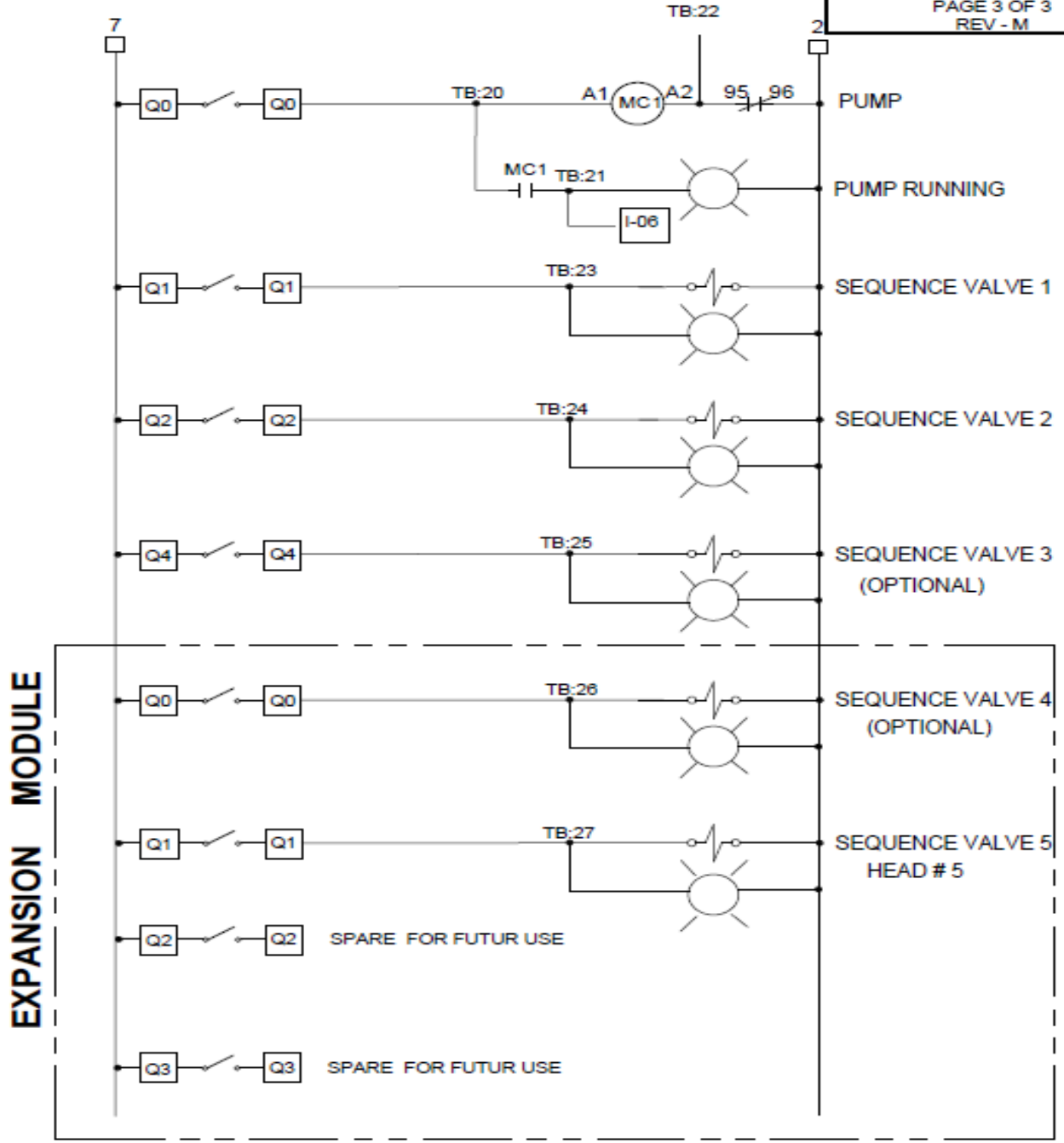
Wire number	Wire color	Function
5	red	Minimum level probe
4	white or yellow	Refill level probe
3	black	Full level probe
31	black	Fill valve
2	white	Fill valve
6	green	Ground or COM



TITLE				
<b>MIXER WASH-OUT SCHEMATIC MP SERIES -460V/480V-'LG'</b>		RJS	16/02/25	CHANGE
		NAME	DATE	CHANGE
<b>SCALE-TRON INC.</b> 2113C St. Regis Street Dollard des Ormeaux, QUEBEC H9B 2M9		DESIGN	RJS	06/09/08
		DRAWN	ME	15/07/08
CHECKED				RELEASE DATE
APPV'D				DRAWING NUMBER
				<b>2370</b>

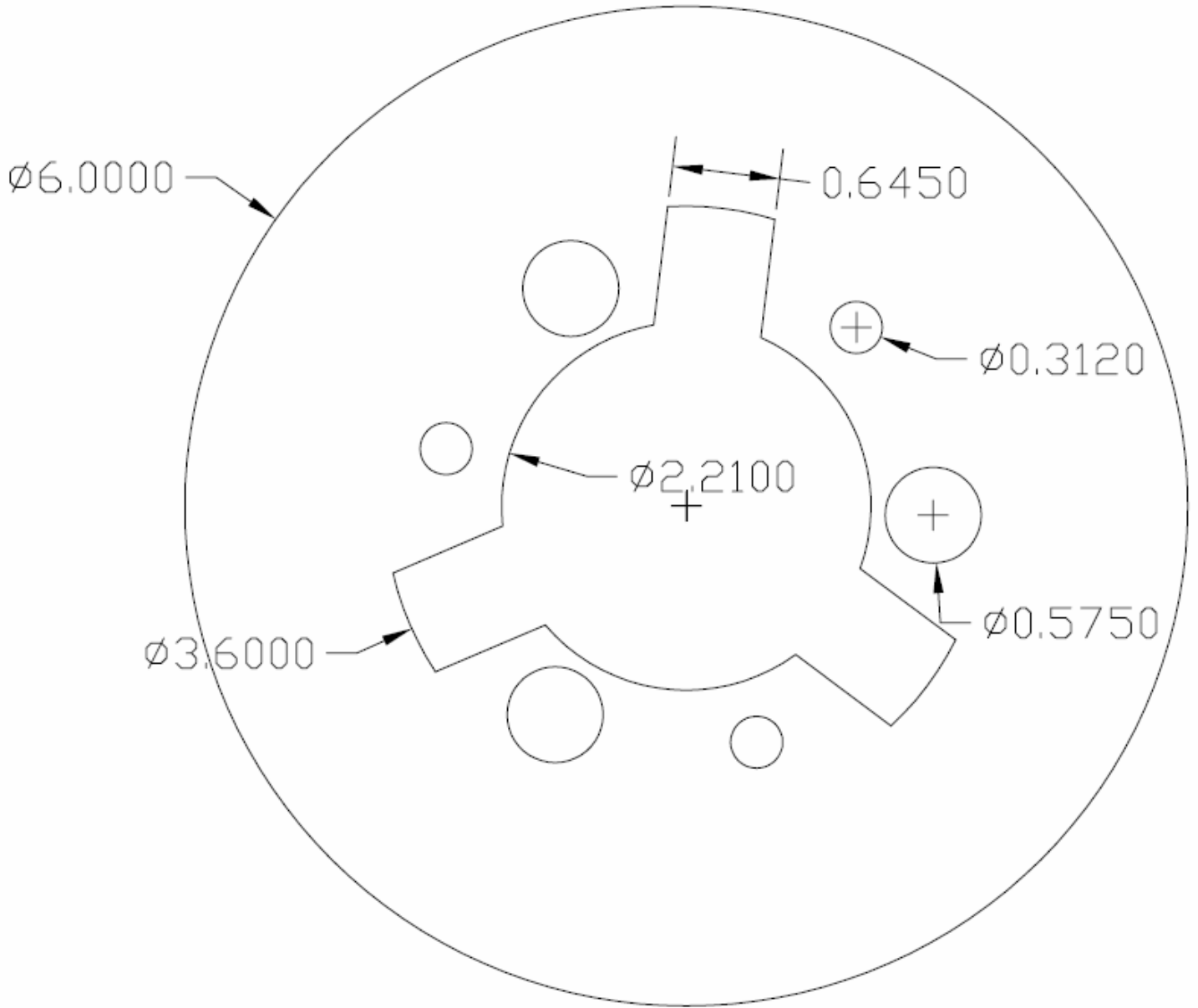
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NOTE: Q4 - Q7 ARE OUTPUTS Q0 -3 OF ADD-ON MODULE, OPTIONAL.  
(NOT USED WHEN 2 - 3 HEADS REQUIRED)

Appendix 2 –Washout Head Mounting plate



Locate mounting plate, drill and bolt or weld in place. Fill gaps with grout.