OWNER'S MANUAL

VEHICLE WASHER MANUAL

MODEL AES-260 SERIES

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Revision 6 – Published 12/6/2022

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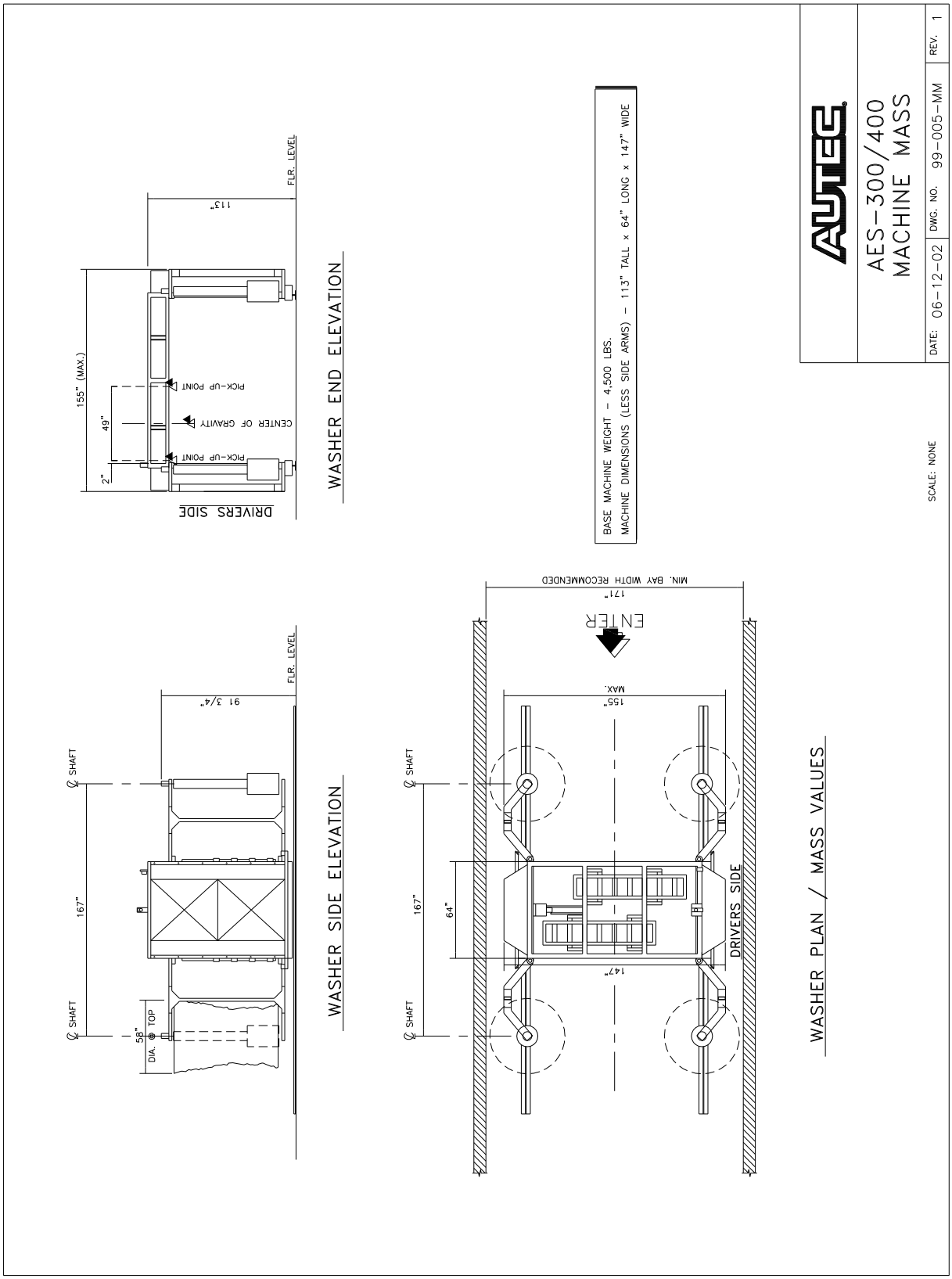
Section 1 – General Specifications

Table 1.1 lists the general specifications for the Carwash.

Figure 99-005-MM shows the overall dimensions and general mass of the Carwash.

Table 1.1 - General Specifications		
1	Structural Members	3"x3" and 2"x4" stainless steel tubing
2	Hydraulic Reservoir	27 gallon capacity
3	Hydraulic Fluid	Exxon Nuto H32 Hydraulic Fluid Or AUTEC H_2O Hydraulic Fluid (water–based fluid)
4	Hydraulic Hose 3/8”--1/2”--3/4”	2250--1750--1250 PSI rated operating pressure
5	Hydraulic Pressure Setting	Factory set at 1000 PSI
6	Hydraulic Motors – Drive	CharLynn 2000 series (2)
7	Hydraulic Motor – Mitter	Parker TEO195 Series (1)
8	Hydraulic Motors – Side Brush Rotate	Parker TEO100 Series (4)
9	Hydraulic Motor – Blower Oscillate	Parker TEO195 Series (1)
10	Hydraulic Safety Switch	Low-level and temperature sensing switches
11	Electric Motor - Gantry	10 hp, 3 phase (1)
12	Electrical Requirements - Gantry	208/230 volts, 3 phase, 60 amps or 460 volts, 3 phase, 30 amps
13	Water Requirements - Friction	Minimum of 22 Gallons per min. @ 40 PSI
14	Air Pressure Requirement	Minimum of 100 PSI
15	Air Consumption	Minimum of 5 cubic ft. per min. at 75 PSI
16	Air Cylinder-Side Brush	2" bore x 10-3/4" stroke (4)
17	Pneumatic Valve	Wabco – 1/4” – 4-way
18	Pneumatic Regulator-Main	3/8" with filter and automatic drain system
19	Pneumatic Regulator-Side Brush	1/4" heavy duty (5)

20	Pneumatic Oil Lubricator	3/8" adjustable with clear bowl
21	Bearings - Side Brush	1-1/4” Heavy duty Pillow Block
22	Bearings - Mitter	1-1/2” Heavy duty Pillow Block
23	Wheels Idler and Drive	solid steel (4)
24	Control Unit	Siemens S7-1200 Programmable PLC in main panel, and B&R Coupler in Gantry control panel
25	Washing Pads	Non-woven polyester felt or PolyFlex Foam
26	Height of Side Washing Cloth	70” (80” above finished floor)
27	Double Mitter Rack	44 pc. Cloth 12" wide
28	Height of vehicle	Maximum of 84"
29	Track	Solid steel (6” wide X 1” tall)
30	Safety Listed	ETL & CETL


AUTEC
AES-300/400
MACHINE MASS
DATE: 06-12-02
DWG. NO. 99-005-MM
REV. 1
SCALE: NONE
BASE MACHINE WEIGHT - 4,500 LBS.
MACHINE DIMENSIONS (LESS SIDE ARMS) - 113" TALL x 64" LONG x 147" WIDE
WASHER END ELEVATION
FLR. LEVEL
113"
155" (MAX.)
49"
2"
PICK-UP POINT
CENTER OF GRAVITY
PICK-UP POINT
DRIVERS SIDE
WASHER SIDE ELEVATION
FLR. LEVEL
91 3/4"
SHAFT
167"
SHAFT
58" DIA. @ TOP
WASHER PLAN / MASS VALUES
MIN. BAY WIDTH RECOMMENDED
171"
ENTER
155" MAX.
SHAFT
167"
64"
SHAFT
147"
DRIVERS SIDE

Section 2 – Safety

A. WARNING

EQUIPMENT MISUSE HAZARD

Equipment misuse can cause the equipment to malfunction resulting in serious injury to persons and or property.

- **CAUTION**: Risk of Electric Shock. This appliance has more than one connection to the source of supply. Disconnect all such connections before servicing.
- This equipment should be serviced, adjusted and repaired by trained personnel only
- Read all instruction manuals, tags and labels before operating equipment
- Use equipment only for its intended purpose. If you are not sure, call AUTEC at USA 704-871-9141
- Do not alter or modify this equipment
- Check equipment daily. Repair or replace damaged or worn parts immediately.
- Use only recommended fluids and chemicals or equivalent. Read all fluid and chemical manufacturer's warnings

Comply with all applicable local, state and national fire, electrical and safety regulations

B. SAFETY

1. **EMERGENCY STOPS:**
   The washer is equipped with an Emergency Stop (E-Stop) Switch mounted on the front of the main control panel. Additional E-Stop switches may be placed in other locations if desired. If at any time an E-Stop is depressed, the washer will stop all operations immediately by program logic and by removing power to all

PLC outputs and the red Fault Light on the Main Control Panel will illuminate. The washer cannot be restarted without first resetting the system once the condition that necessitated the emergency stop has been corrected. To reset the washer, the E-stop that was depressed must be reset (twist right 1/4 turn) first and the reset button on Main Control Panel must be depressed. The wash cycle that was in progress when the E-Stop was depressed will be lost

2. **MACHINE FAULTS:**
In addition to the E-Stop above, the Washer is equipped with six sensors that will cause a fault condition and shut down the machine. All faults, which shut down the machine, are referred to as Fatal Faults.

a. **Low Air Pressure Switch** (input B4) – Normally open switch held closed by air pressure. If the system air pressure falls below 65 PSI, the Washer will shut down until air pressure is restored and the machine reset. Low Air Pressure is indicated by a single flash of the Stop Light and Fault Light followed by a single flash of the enter light.

b. **Hydraulic Fluid Over-Temp Switch** (input B5) – Normally closed switch that opens at high temperature. If the hydraulic fluid exceeds 170˚ F (130˚ F for Water Based Hydraulic Fluid), the Washer will shut down until the temperature drops below 170˚ F (130˚ F for Water Based Hydraulic Fluid) and the machine is reset. Hydraulic Over-Temp is indicated by two flashes of the Stop Light and Fault Light followed by a single flash of the Enter Light.

c. **Hydraulic Motor Starter** (input A1) – If the motor starter for the main hydraulic pump fails to engage within approximately one second after called for, the Washer will shut down until reset. A Motor Starter Fault is indicated by three flashes of the Stop Light and Fault Light followed by a single flash of the Enter Light.

d. **Communication Fault** – If at any time the PLC in the main control panel loses communications with the Coupler that is on the machine (called the Gantry), the Washer will shut down until communications are re-established and the machine is reset. A Communication Fault is indicated by four flashes of the Stop Light and Fault Light followed by a single flash of the Enter Light.

e. **Hydraulic Fluid Level Switch** (input B7) – Normally open switch held closed by full hydraulic tank. If the Washer loses more than approximately 5 gallons of hydraulic fluid, the Washer will shut down until the hydraulic fluid is replenished and the machine is reset. Hydraulic Low Level is indicated by five flashes of the Stop Light and Fault Light followed by a single flash of the Enter Light.

f. **Treadle Switch Fault** – If the machine sees a continuous input from the Treadle Switch (input A15) for five minutes anytime the wash is not in use, a

Treadle Switch Fault will be generated and the machine will shut down. The machine will not restart until the Treadle is repaired and the machine is reset. A Treadle Switch Fault is indicated by seven flashes of the Stop Light and Fault Light followed by a single flash of the Enter Light.

g. **Low Water Fault** – The Machine will shut down any time the PLC in the main control panel loses the input from the Low Water Level Switch in the High Pressure Holding Tank. Once the PLC receives an input from the High Water Level Switch in the High Pressure Holding Tank (A36), the machine will automatically restart. A Low Water Fault is indicated by eight flashes of the Stop Light and Fault Light followed by a single flash of the Enter Light.

h. **Entry System Fault** – The Machine will shut down anytime an Entry System Fault Signal is received (input A41). The Machine cannot be reset until the Entry System Fault is cleared and the Machine is reset. An Entry System Fault is indicated by nine flashes of the Stop Light and Fault Light followed by a single flash of the Enter Light.

i. **Proximity Switch Fault** – The Machine will shut down anytime both the forward and reverse travel proximity switches (inputs B2 & B3) are made simultaneously and produce a Proximity Switch Fault. The machine cannot be reset until at least one of the proximity switch inputs are cleared and the machine is reset. A Proximity Switch Fault is indicated by ten flashes of the Stop Light and Fault Light followed by a single flash of the Enter Light.

j. **Travel Time Out** – When the machine fails to reach the travel prox switch in the allotted time per registers the machine stops for Travel Time Out.

3. ADJUSTMENTS:

Never attempt to ride the washer to make adjustments. There is a severe risk of injury from the Mitter retracting and crushing anything in its way. ***All speed adjustments should be made from a ladder.***

4. DRIVE OFFS:

If at any time after the washer starts operating, the vehicle moves off the treadle, one of two things will happen depending on programming.

a. Washer will stop drive, and turn off all spray functions. That wash cycle is lost and washer will not restart until that car leaves wash bay and entry system notifies washer to start a new cycle.

b. Washer will turn off all spray functions and drive to the home position. Washer will not restart until entry system notifies washer to start a new cycle.

5. **CRUSHING HAZARDS:**
   During normal operation no one should be allowed in the bay area due to several crushing hazards.

   a. A crushing hazard is present if feet or hands are on track when washer is in operation.

   b. A crushing hazard may exist between the Washer and other structures within the wash bay.

6. **LOOSE CLOTHING:**
   There is a danger of loose clothing becoming entangled in rotating objects. Make sure shirt tails or any other loose clothing is tucked in when working around Washer.

7. **SERVICE:**
   All service should be performed by factory-trained technicians.

Section 3 – General Operating Sequence

The washer is intended to wash passenger cars and light trucks. **After the vehicle enters the wash bay you should never attempt to get out of vehicle. Severe personal injury and/or vehicle damage may result.** The washer will start automatically when the vehicle is in the correct position. Depending on the options and type of wash purchased the washer will make one or more passes over the vehicle. When the wash cycle is complete the washer will stop and an exit light will come on directing the vehicle to exit the wash bay.

The washer should be installed in an enclosed building with minimum 10'x10' doors on each end to allow vehicles to enter from one end and exit the opposite end. The washer is intended to operate year round. If the washer is to be operated in temperatures below freezing, damage to the washer and vehicles may result unless the washer is enclosed in a heated wash bay with automatic doors installed on both ends. The washer can also be protected from freezing with the optional freeze protection package. The freeze protection package closes the washer and removes the water from all water lines on the washer, by injecting air into the water lines, to prevent them from freezing. The freeze protection package and/or the automatic door package is activated when the temperature falls below the low temperature set point for a continuous five minutes. If a vehicle is being washed when the five-minute verification timer expires, the washer will complete the wash in progress and then shut down.

AUTEC supplies an instruction sign with each vehicle washer. This sign should be mounted on the outside of the wash bay clearly visible from the entry system. A typical instruction sign will read: 1. Lower antennas. Remove CB or cellular antennas. 2. Enter slowly. STOP when red light comes on. Place vehicle in park. Set brake. 3. Exit SLOWLY when EXIT light comes on. The sign also has a DANGER section that states: DO NOT WASH 1. Vehicles with non-standard factory accessories. 2. Vehicles with body damage or loose parts. 3. Elevated or modified pickups or vans. If these instructions are not followed, then damage to the vehicle may occur.

For proper operation of the vehicle washer and the ultimate in cleaning quality, using only AUTEC Automatic concentrated carwash chemicals is recommended. They are non-corrosive, non-hazardous, and biodegradable. **When handling the highly concentrated chemicals, it is recommended you always wear eye and hand protection.**

The AUTEC Soft Cloth Vehicle Washer is capable of parking at two locations, at the exit end and the entrance end. This position is determined by the "Home at Exit" button located on the HMI (Human Machine Interface or Display) under the menu option, "Machine Configure" screen. If the "Home at Exit" is selected, then the machine will be parked at the exit end of the bay; if the "Home at Exit" is not selected, then the machine will be parked at the entrance end of the bay. Normally, the machine will be positioned at the entrance end of the bay at the start of all operating cycles. This is referred to as the "Home" position.

OPERATING CYCLES

A. Pre-Wash Cycle

1. The Pre-Wash cycle begins when the computer receives a signal from the entry system. The green enter light turns on and the entrance door opens. As the vehicle enters the bay it activates a bell hose and/or photoeyes turning on up to four pre-soak functions plus undercarriage wash and remote chemical tire applicator.

2. When the front tire is positioned on the treadle switch, the red stoplight will light, the optional treadle buzzer will sound and, after approximately 4 seconds, the washer will start.

3. If the “Home at Exit” button is de-selected the machine will then travel backward until the rear of the vehicle is located using the infrared photo eye mounted on the Gantry or until the Gantry reaches the Rear Prox switch. If the “Home at Exit” button is selected the machine will then travel Forward until the front of the vehicle is located using the infrared photo eye mounted on the Gantry or until the Gantry reaches the Front Prox switch.

B. Wash Cycle

The machine will make up to eight passes over the vehicle. A Pass is defined as one complete cycle, forward and reverse over the vehicle. Both Rinse/Chemical and Wash Pass have been integrated so the operator can use any function in either one. The types of passes are defined as follows:

Rinse/Chemical Application Pass

Machine will travel with arms and Mitter retracted and brushes and high-pressure nozzles turned off. Any combination of chemicals and/or water may be applied in either direction.

a. Machine will turn on any programmed chemical or water applications, and start travel forward toward the exit end of the bay if “Home at Exit” is not selected or travel toward the Entrance end of the bay if “Home at Exit” is selected.

b. The washer will continue moving until the proximity switch is made or until the travel timer has expired. When the proximity switch is activated, the washer will reverse direction, turn on or off water or chemicals as programmed, and travel in reverse, toward the entrance end of bay if “Home at Exit” is not selected, or travel forward toward the Exit end of the bay if “Home at Exit” is selected.

c. The washer will continue until the proximity switch is made or until the travel timer expires. When the proximity switch is made, the rinse/chemical pass is complete.

Wash Pass

Machine will make a Friction Pass, a High-Pressure Pass, or a Combination (Friction and High-Pressure) Pass.

Friction Pass

Machine will make a friction pass with wash water plus any combination of chemicals and/or water programmed. If PolyFlex material is used, the soap pump will run to supply soap to the wash water manifold. This is required to lubricate the PolyFlex Material anytime the side brushes engage the vehicle.

a. Machine will close Mitter, turn on brush rotation and Mitter oscillation, turn on wash water, close arms, and travel toward the front of the vehicle. As the washer moves, all side brushes press against the side of the vehicle.

b. As the front side brushes wrap around the vehicle, the front arm proximity switch is activated to slow the machine to creep speed to allow additional time cleaning the front grill and headlights.

c. When the washer reaches the end of the track, the forward travel proximity switch is activated. The washer will reverse direction and all side brushes will rotate in the opposite direction.

d. Throughout the entire wash cycle the overhead Mitter racks will move fore and aft.

e. As the washer continues to move from the front to the rear, all side brushes will continue to rotate. When the washer reaches the rear of the vehicle, the carriage will stop and the rear side brushes will alternate a wash pass across the rear of the vehicle. The machine will then continue moving to the rear.

f. The washer will continue moving to the rear until the reverse travel proximity switch is activated, the travel after rear jog timer expires, or the reverse travel timer expires, at which time the Friction Pass is complete.

High-Pressure Pass

(requires optional Rockerpanel and / or Bumper Blaster options) – Machine will make a pass with high-pressure water plus any combination of chemicals and/or water programmed.

a. Machine will start high-pressure pump and activate valve for rockerpanel high-pressure nozzles.

b. Machine will travel forward while spraying vehicle with high-pressure spray from the rockerpanel nozzles until front proximity switch is made.

c. Machine will reverse direction, close the water valve for the rockerpanel high-pressure nozzles, and open the water valve for the bumper blaster high-pressure nozzles.

d. Machine will travel towards the rear of the vehicle with bumper blaster high-pressure spray from the arm mounted nozzles until the rear photoeye is made.

e. Machine will continue towards the rear until the travel after rear photoeye timer expires or until the rear proximity switch is made, at which time the High Pressure Pass is complete.

Combination Pass

(requires optional Rockerpanel and / or Bumper Blaster options) – Machine will make a friction pass with high-pressure water plus wash water and any combination of chemicals and/or water programmed if PolyFlex Material is used, the soap pump will run to supply soap to the wash water manifold. This is required to lubricate the PolyFlex Material anytime the side brushes engage the vehicle.

a. Machine will close Mitter, turn on brush rotation and Mitter oscillation, turn on wash water, turn on high-pressure pump, open water valve for bumper blaster high-pressure nozzles, close arms, and travel toward the front of the vehicle. As the washer moves, all side brushes press against the side of the vehicle.

b. As the front side brushes wrap around the vehicle, the front arm proximity switch is activated to slow the machine to creep speed to allow additional time cleaning the front grill and headlights.

c. When the washer reaches the end of the track, the forward travel proximity switch is activated. The washer will reverse direction and all side brushes will rotate in the opposite direction. Also, the water valve for the rockerpanel high-pressure nozzles will open and the water valve for the bumper blaster high-pressure nozzles will close.

d. Throughout the entire wash cycle the overhead Mitter racks will move fore and aft.

e. As the washer continues to move from the front to the rear, all side brushes will continue to rotate and the rockerpanel high-pressure nozzles will continue to spray. When the washer reaches the rear of the vehicle, the carriage will stop and the rear side brushes will alternate a wash pass

across the rear of the vehicle. The machine will then continue moving to the rear.

f. The washer will continue moving to the rear until the reverse travel proximity switch is activated, the travel after rear jog timer expires, or the reverse travel timer expires, at which time the Combination Pass is complete.

C. Post Wash

After wash, rinse and blower cycles are complete, the following will occur depending on options chosen:

1. The exit light will turn on and the exit door will open.

2. The freestanding final rinse, spot free rinse and/or rinse wax will start.

3. 5 seconds after the vehicle leaves the treadle switch, any existing external blower units will start.

4. After the exit bell switch has been activated twice, the rinse and/or blower functions will be shut off and the exit door closure timer will start

5. After a 15 second delay the exit door will close.

6. The washer is ready for the next wash cycle.

Section 4 – General Maintenance and Operation Inspection

A. General Maintenance

CAUTION: Maintenance should be performed by factory-trained personnel only. Be sure to disconnect and lock out power prior to lubricating and inspecting washer.

B. Bearing Inspection and Lubrication

Bearings should routinely be visually inspected for excessive wear. Most of the bearings are sealed and require no additional lubrication however some must be re-lubricated. If required, grease bearings slowly with Molylube No. 2, or equivalent waterproof grease, until fresh grease appears at seal. **THE IMPORTANCE OF USING THE PROPER GREASE CANNOT BE OVER-EMPHASIZED**.

Bearing Inspection / Lubrication Schedule

Location	Type of Bearing	Frequency
Side Brushes (4)	2 Brush shaft bearings - 8 Total 2 Pivot shaft bearings - 8 Total	***Bi-Weekly***
Mitter Curtain	4 Rod end bearings on driver arms 4 Pivot shaft bearings	***Bi-Weekly***
Track Wheels	4 Idler wheel bearings 4 Drive wheels bearings	***Bi-Weekly***
Umbilical Boom (Optional)	2 Post bearings 2 Machine bearings	***Bi-Weekly***

REMOVE EXCESS GREASE TO PREVENT CONTAMINATION OF CLOTH!

C. Routine Inspection

There is no better way to prevent downtimes and avoid unnecessary repairs than to carefully inspect the carwash regularly to discover potential problems at an early stage.

1. Check all bearings for excessive wear.

2. Check all hydraulic motors for signs of leakage. Evidenced by moistness or presence of fresh fluid around motor shaft or hose fittings.

3. Check all hydraulic hoses for loose mounting clamps. Evidenced by clean or worn areas on sides of hoses.

4. Check tightness of hydraulic motor securing bolts.

5. Check tightness of shaft coupler connecting motor and brush center shaft.

6. Check tightness of bolts securing side brush bearing housing.

7. Check tightness of bolts securing side brush pivot bearing to frame.

8. Check all wash brushes for loose securing bolts.

9. Check all four wheels for loose mounting bolts or misalignment.

10. Check tightness of drive wheel coupler.

11. Check air filter for presence of water and drain as required.

12. Check oil level in air system lubricator. Add Marvel Mystery Oil (TM) or 10W non-detergent oil and adjust as necessary.

13. Check airlines for leaks.

14. Check inside side panels for hydraulic leaks.

15. Check fluid level in hydraulic reservoir. ***Caution – Verify type of hydraulic fluid used before adding additional fluid***. Add Exxon Nuto H32 Hydraulic Fluid or, if water based, add H_2O Hydraulic Fluid from AUTEC as required.

16. Check gauge on oil filter housing on top of hydraulic reservoir. Change filter annually or if gauge reads above 18 psi.

17. Inspect all proximity switches for proper adjustment. Recommended clearance is 3/8” for 30mm switches and 1/4” for 18mm switches.

18. Examine washing cloth for foreign objects and remove as required.

19. Check all water hoses for signs of abrasion.

20. Check all water nozzles for evidence of plugging from water-born debris.

21. Check level of chemicals (soap, wax, etc.) in tanks and fill as required. Recommend use of AUTEC chemicals only.

22. Check curtain drive assembly for loose bolts and misalignment.

23. Clean bay area including washing the floor and track. Remove any foreign materials.

24. Check blower electrical cord and blower mounting bolts for loose or worn parts.

25. Check high-pressure water pump oil level.

26. Check high-pressure water pump pressure (not to exceed 500 PSI).

27. Check high-pressure strainer and clean as required.

D. Operational Inspection

CAUTION: Moving Equipment hazard!!
Machine motion during wash/rinse cycle includes travel along floor tracks between stop blocks with automatic direction reversal. Do not enter carwash bay during machine operation or attempt machine adjustments and/or repairs unless you are aware of all programmed machine movements to avoid possible personal injury. No loose fitting clothes or jewelry, which may become entangled in machinery, should be worn.

After completion of lubrication and routine inspections, trained service personnel should operate the washer and the following operational checks should be made while the washer is running.

a. Observe system air pressure (95 to 100 PSI). Adjust if necessary by turning adjustment knob on the main air regulator clockwise to increase, counter-clockwise to decrease. System air pressure is controlled by the regulator portion of the filter-regulator-lubricator assembly mounted at the top of the air panel located in the driver's side cabinet.

b. Observe hydraulic system pressure (1000 PSI) ***FACTORY SET - DO NOT ADJUST*.**

c. Observe the following speeds:

1. The side brushes should be turning at 80-85 RPM in each direction when brushes are wet, retracted and clear of all obstacles. These speeds are

controlled by the flow control valves mounted in the distribution manifolds located in the center of the entrance and exit end headers.

2. The Mitter curtain should be moving at 28-30 RPM. This speed is determined by counting the revolutions on the gearbox and is controlled by the flow control valves on the distribution manifolds located in the center of the entrance end header.

3. The Mitter Curtain should take approximately 1-2 seconds to either retract or extend. These speeds are controlled by the flow control valves located on the air panel.

Note: All motor speeds are controlled by Hydraulic Flow Valves and should only be adjusted by experienced technicians. (See section 6)

d. Observe the engagement of the side washing brushes with the vehicle (6" to 10" engagement is acceptable). If engagement is insufficient or excessive, adjust the air pressure setting by turning the adjustment handle on the individual brush regulators counter-clockwise to decrease or clockwise to increase. Observe pressure change at gauge. When adjusting pressure downward, lower pressure below desired level, then adjust upward to desired setting. Make changes in pressure setting in 5 PSI increments. Be sure to tighten lock nuts when adjustment is complete. (See section 6)

   NOTE: During operation of the washer, as the side brushes swing around the front or rear of the vehicle, they may stall out momentarily, especially on rubber-covered bumpers. This is the result of the gentle action of the hydraulic system and is to be expected. Also note that the leading brushes will apply lighter pressure against the vehicle while the trailing brushes will apply more pressure and hug the vehicle tighter.

e. Observe the travel limit function at each end of the track.

f. Observe the water system for clogged nozzles.

g. Observe the detergent cycle for proper operation to assure the cleaning of the vehicle.

h. Observe all instructional lights.

Section 5 – Program Sequence

A. Program for AUTEC Controller

B. Hardware Specifications

The program runs on a Siemens S7-1215c Series PLC with 24 VDC inputs and 24VDC/120VAC outputs.

C. Program Functionality

The program is divided into six functional units: pre-wash, wash, post-wash, Freeze protection, Automatic Door, and Fault Indications.

Pre-wash

The pre-wash cycle consists of all functions occurring before the vehicle is in proper position for washing. There are separate inputs for four programmable Pre-Wash functions, plus Underbody Wash, CTA, and Drive-By Rocker panel Blaster. Each input has an associated timer to control the duration of the function. There is also one input to turn off all Pre-Wash functions, the Pre-Wash Stop input (Input A23). The treadle switch will also turn off all Pre-Wash functions that have not timed out or been turned off by the Pre-Wash Stop input. The sequence of events is as follows:

a. PLC receives signal on the wash inputs (inputs A26-A34). The PLC will use the last input seen before the vehicle is in position on the treadle switch to determine which wash type to use.

b. Enter light is turned on.

c. Pulse entrance door up signal for approximately 1 second.

d. When entrance bell switch is activated, pulse the Chemical Tire Applicator (CTA) for approximately 1.5 seconds each time the bell switch is activated (if programmed in wash package).

e. As Photoeye or Bell Switch for each programmed Pre-Wash function is activated, turn on the associated function until duration timer expires, Pre-Wash Stop photoeye/bellswitch is activated, or treadle switch is activated.

f. When the treadle switch is activated, extinguish the enter light, enable the stop light, stop all pre-wash functions, and turn on wash water. The treadle switch must be activated for the duration of the treadle verify timer before wash function will begin (default four seconds).

g. If the treadle switch is unmade during the treadle verify timer, extinguish the stop light, turn off wash water, and enable the enter light. If the backup bell

switch is activated, turn off the enter light and turn on the backup light. This light will remain on until the treadle switch is again activated or the backup light timer expires, at which time the backup light will be extinguished and the program will loop back to step F above. This sequence will be repeated as needed until the treadle switch has been made for the duration of the treadle verify timer. If the treadle switch is unmade after the treadle verify timer has been satisfied and the washer starts, the washer will turn off all operations and start its homing sequence. The homing sequence is based upon the "Home at Exit" button (located on the Machine Config screen), if the button is highlighted (Home is at the Exit end) the Washer drives until it finds the front limit proximity switch, switches direction and drives in reverse until the Parking timer expires; if the button is not highlighted (Home is at the Entrance End) the Washer drives until it finds the rear limit proximity switch, reverses direction and drives forward until the Parking Timer expires.

h. Pre-wash is now complete.

Wash

The wash cycle consists of all steps taken while the vehicle is on the treadle switch. Depending on the selected wash options, the following processes occur.

a. Move to Start Position

If the "Home at Exit" button is not highlighted All passes start from the rear of the vehicle or the Entrance End; If the "Home at Exit" button is highlighted All passes start from the front of the vehicle or the Exit End.

1. Energize the Motor Start Coil and the Car Wash in Use Signal.

2. Delay 1 second.

3. If the Gantry Photoeye is not made, energize the Hydraulic Drive Valve, the Hydraulic Speed Control Valve and remain in this state until the Gantry Photoeye is made or until the front or rear Proximity Switch is made.

4. If the Gantry is moving in the reverse direction and the Gantry Entrance Photoeye is made (blocked) then becomes unblocked, continue until the Travel After Rear Jog Timer expires or until the Rear Proximity Switch is made. If the Gantry is moving in the Forward direction and the Gantry Exit Photoeye is made (blocked) then becomes unblocked, continue until the Rear Proximity Switch is made.

5. Once the Forward or Reverse travel is complete, turn off the Drive Valve and the Hydraulic Speed Control Valve.

b. Rinse / Chemical Pass

1. Maintain the Motor Start Coil.

2. Energize the Hydraulic Drive Valve, the Hydraulic Speed Control Valve, and any programmed chemical/water valves. The Gantry will move according to the “Home at Exit” button.

3. Travel forward until the Forward Proximity Switch is made.

4. De-energize the Hydraulic Drive Forward Valve, the Hydraulic Speed Control Valve, and any chemical/water valves not required during the reverse travel.

5. Pause until the Hydraulic Pause Timer expires.

6. Energize the Hydraulic Reverse Drive Valve, the Hydraulic Speed Control Valve, and any programmed chemical/water valves.

7. Travel in reverse until the Gantry Entrance Photoeye is made or until the Rear Proximity Switch is made.

8. If the Gantry Entrance Photoeye is made, continue until the Gantry Entrance Photoeye Travel Timer expires or until the Rear Proximity Switch is made.

9. De-energize the Hydraulic Speed Control, the Hydraulic Drive Reverse Valve, and any chemical/water valves not required on the next forward pass.

c. Wash Pass – Friction Only

1. Maintain the Motor Start Coil and energize the Wash Water (both Gantry valve and remote water source).

2. Delay 1 second.

3. Energize the Side Brush In Air Solenoid Valve, the Hydraulic Drive Forward Valve, the Hydraulic Speed Control Valve, the Mitter Down Valve, the Hydraulic Brush Forward Rotate Valve, and any programmed chemicals.

   (Note: If Polyflex is selected in the Machine Setup Options, the Soap Pump and Water Manifold Soap Solenoid will activate anytime the Side Brush In Air Solenoid Valve activates.)

4. Drive forward while monitoring Front Arm Proximity Switch and Forward Travel Proximity Switch.

5. If Front Arm Proximity Switch is made, start Creep Speed Timer and adjust Hydraulic Speed Control Valve to slow machine until Creep Speed Timer expires.

6. Remain in this state until the Front Travel Timer expires or until the Front Proximity Switch is made.

7. Turn off the Hydraulic Drive Forward Valve, the Hydraulic Speed Control Valve, the Brush Rotate Forward Valve, and any water/chemical valves not used on the reverse travel.

8. Pause until the Hydraulic Pause Timer expires.

9. Energize the Drive Reverse Valve, the Hydraulic Speed Control Valve, the Brush Rotate Reverse Valve, and any programmed water/chemical valves.

10. Enable the Rear Arm Proximity Switch input to start looking for rear of the vehicle.

11. If and when the rear is found:

    a. Start the Drive Wheel Advance Timer to allow the washer to travel to the rear of the vehicle.

    b. When the Drive Wheel Advance Timer expires, de-energize the Drive Reverse Valve and start the Drive Wheel Stop Timer.

    c. Energize the Rear Passenger Arm Retract and start the Passenger Arm Retract Timer.

    d. After the Passenger Arm Retract Timer expires, de-energize the Passenger Arm Retract, energize the Rear Driver Side Retract and start the Driver Arm Retract Timer.

    e. After the Driver Arm Retract Timer expires, de-energize the Driver Arm Retract.

    f. After the Drive Wheel Stop Timer expires, energize the Drive Reverse Valve.

    NOTE: This process will be terminated if the Rear Travel Proximity Switch is found or the Reverse Travel Timer expires prior to it finishing.

12. Once the Rear Travel Proximity Switch is found, the Reverse Travel timer expires, or the Travel After Jog timer expires, de-energize the Hydraulic Speed Control, the Hydraulic Drive Reverse Valve, the Hydraulic Brush Rotate Valve, and any chemical/water/air valves not required on the next forward pass.

d. Wash Pass – Frictionless (Or High Pressure) Only

1. Maintain the Motor Start Coil.

2. Delay 1 second.

3. Energize the Hydraulic Drive Valve, the Hydraulic Speed Control Valve, and any programmed chemicals, or functions.

4. Drive forward or reverse while monitoring Travel Proximity Switches.

5. If High Pressure is activated and Gantry photoeye is blocked, start Creep Speed Timer and adjust Hydraulic Speed Control Valve to slow machine until Creep Speed Timer expires then maintain original movement speed.

6. Remain in this state until the Forward or Reverse Travel Timer expires or until the Proximity Switch is made.

7. Turn off the Hydraulic Drive Valve, the Hydraulic Speed Control Valve, and any water/chemical valves not used on the next pass.

8. Pause until the Hydraulic Pause Timer expires.

9. Continue with passes until all passes are complete, then park to the home position.

e. Move to Home Position

On the final programmed pass, the washer will continue to the front or the rear until the Forward or Reverse Travel Proximity Switch is made and return to the Home Position based upon the “Home at Exit” button in Machine Config and the Parking Timer value (P17).

1. At the completion of the final programmed pass the machine will de-energize all wash functions, and continue the direction of travel until the Travel Prox Switch is made.

2. Once the Travel Proximity Switch is made de-energize the Hydraulic Speed Control, the Hydraulic Drive Reverse Valve and activate the Exit Light.

3. Pause until the Hydraulic Pause Timer expires.

4. Energize the Hydraulic Drive Valve and move forward or reverse depending on the “Home at Exit” button has indicated, the Hydraulic Speed Control Valve and start the Parking Timer (P17).

5. Once the Parking Timer expires, turn off the Drive Valve, the Hydraulic Speed Control Valve, and the Hydraulic Motor Starter.

Post Wash

The Post Wash cycle allows for two rinse arch outputs and two sets of blower outputs (each set containing 3 staggered outputs). There is a separate timer for each rinse arch and a single timer for blowers to control duration of function. Also, there is an input for a photoeye or bellswitch to turn off the rinse arches, otherwise the exit photoeye/bellswitch will deactivate all arches and blowers.

The following sequence of events occurs during Post Wash, assuming devices are programmed in wash package and Door Package is activated.

a. At completion of wash turn on Exit Light, sound Treadle Buzzer, and send Exit Door Up signal. (If Short Bay option is programmed, also start the Rinse Arch, the Post Wash Chemical Arch, and the Blower Start Delay timer.)

b. When vehicle leaves treadle, start rinse arches and initiate the Rinse Arch timer, the Post Wash Chemical Arch timer, the Blower Start Delay timer, and the Exit Light timer.

c. After the Blower Start Delay timer expires, start one or both sets of freestanding blowers (with timed delay between each motor) and the Blower On timer.

d. When Exit Light timer expires, turn off Wash In Use signal and Exit Light.

e. If the Rinse Arch Stop Bellswitch / Photoeye is activated, turn off all rinse arches. (Rinse Arch Stop Counter must be set to 1 for photoeye or two for bellswitch.)

f. After the Exit Bellswitch / Photoeye has been activated, start Rinse / Dry Shutoff timer (P37) and Exit Door Close Delay timer (P35). (Exit Switch Counter (P69) must be set to 1 for photoeye or 2 for bellswitch.)

g. Once Rinse / Dry Shutoff timer expires (P37), turn off all rinse arches and blowers.

h. If the Rinse Arch timer, the Post Wash Chemical Arch timer, or the Blower On timer expires, turn off the corresponding outputs unless already stopped by bellswitch or photoeye.

i. Send Exit Door Close signal and start Exit Door Down Verify timer once Exit Door Close Delay timer expires.

j. If Exit Door Photoeye is blocked prior to Exit Door Down Verify timer expiring, generate Exit Door Open signal.

k. Once Exit Door Photoeye is remade, start the Close Exit Door After Photoeye Remade timer.

l. Once the Close Exit Door After Photoeye Remade timer expires, loop back to step I above.

Freeze Protection Package

The PLC will also be checking the timer inputs from the low temperature switches during this time (The timers will be running regardless of whether the carwash is active or not). If the input for the freeze protection is on for more than 300 seconds, the following sequence will take place.

a. Close Doors.
b. 60 second delay.
c. Air Solenoid Valve on, water off.
d. 2 second delay.
e. Energize Machine Water Valve for 5 seconds.
f. 5 second delay.
g. Energize the Final Rinse arch for 5 seconds.
h. 5 second delay.
i. Energize Spot Free Final Rinse Valve for 5 seconds.
j. 5 second delay.
k. Energize Presoak Water Valve for 5 seconds.
l. 5 second delay.
m. Energize Undercarriage Wash for 5 seconds.
n. 5 second delay.
o. Energize Tire Scrubber for 5 seconds.
p. System will remain active until temp interlock has been de-energized for 300 seconds.

***NOTE**:* The PLC will also recognize the Jog Forward and Jog Reverse inputs during this time.

Automatic Door Package

The Automatic Door Package requires the use of Photoeyes on input A7 (Entrance Door Photoeye) and input A6 (Exit Photoeye). The automatic door package becomes active when input A5 has an uninterrupted thermostat signal

for 5 minutes. At this time, assuming no car wash usage, both doors will close. Upon activating a wash, or driving over the entrance bell switch, the entrance door will open allowing entry to the wash bay. The entrance door will close upon startup of the equipment, and the exit door will not open until the end of the wash cycle, or the activation of the exit photoeye. As the car leaves the bay, it passes through the exit photoeye, starting a 15 sec timer (P92) to close the door. Should the car not activate the photoeye, a 5 minute safety timer (P66) will then shut the exit door, and the wash is ready for the next vehicle.

Fault Indications

The Carwash is programmed with two types of Fault Indications. Faults which disable the Carwash are called ***Fatal Faults*** and generally require the Carwash to be manually reset before resuming operation. Faults which do not disable the carwash are called ***Non-Fatal Faults*** and will reset automatically once the fault condition has been corrected. The carwash will continue to operate during a Non-Fatal Fault but may behave erratically depending on the fault condition.

Other than an E-Stop Fault, all Fatal Faults are indicated by flashing the Fault Light and the Stop Light a number of times corresponding to number of the fault condition and then flashing the Enter Light one time to indicate the end of sequence. This process will repeat until the fault conditions are cleared and the machine reset. (Ex. If a High Oil Temp fault occurs then the stop and fault lights will flash 2 times and then the enter light will flash once to end the sequence.) All Non-Fatal Faults are indicated by a solid Fault Light on the main Control Panel Door and will clear automatically once the fault condition is corrected. An E-Stop Fault is also indicated by a solid Fault Light on the Main Control Panel Door but is a Fatal Fault. The E-Stop button must be released and the machine reset before restarting the Carwash.

If configured, all Fault conditions will also generate an email to up to 4 addresses. See Section 7, 9d (Page 7-18) for details.

a. Fatal Faults

1. **E-Stop**

Normally closed switch (or multiple switches wired in series) which supply power to the coil of the E-Stop relay and input (input A0). The E-Stop relay supplies power to all outputs from the PLC in both the Main Control Panel and the Gantry Junction Box. When an E-Stop switch is depressed, all outputs in the PLCs are disabled and the Carwash will shut down. The machine will not restart until the depressed E-Stop switch is released and the machine is reset. An E-Stop fault

is indicated by a solid Fault Light and by an illuminated E-Stop switch.

2. **Low Air Pressure Switch**
   Normally open switch held closed by air pressure (input B4). If the system air pressure falls below 65 PSI, the Washer will shut down until air pressure is restored and the machine reset. Low Air Pressure is indicated by a single flash of the Stop Light and Fault Light followed by a single flash of the enter light.

3. **Hydraulic Fluid Over-Temp Switch**
   Normally closed switch that opens at high temperature (input B5). If the hydraulic fluid exceeds 170˚ F (130˚ F for Water Based Hydraulic Fluid), the Washer will shut down until the temperature drops below 170˚ F (130˚ F for Water Based Hydraulic Fluid) and the machine is reset. Hydraulic Over-Temp is indicated by two flashes of the Stop Light and Fault Light followed by a single flash of the Enter Light.

4. **Hydraulic Motor Starter**
   If the motor starter for the main hydraulic pump motor fails to engage within approximately one second after called for, the Washer will shut down until reset. A Motor Starter Fault is indicated by three flashes of the Stop Light and Fault Light followed by a single flash of the Enter Light. PLC Input A1.

5. **Communication Fault**
   If at any time the PLC in the main control panel loses communications with the Gantry for 2 or more seconds, the Washer will shut down until communications are re-established and the machine is reset. A Communication Fault is indicated by four flashes of the Stop Light and Fault Light followed by a single flash of the Enter Light.

6. **Low Hydraulic Fluid Switch**
   Normally open switch held closed by full hydraulic tank (input B7). If the Washer loses more than approximately 5 gallons of hydraulic fluid, the Washer will shut down until the hydraulic fluid is replenished and the machine is reset. Hydraulic Low Level is indicated by five flashes of the Stop

Light and Fault Light followed by a single flash of the Enter Light.

7. **Treadle Switch Fault**
   If the machine sees a continuous input from the Treadle Switch (input A15) for five minutes after completion of wash, a Treadle Switch Fault will be generated and the machine will shut down. The machine will not restart until the Treadle is repaired and the machine is reset. A Treadle Switch Fault is indicated by seven flashes of the Stop Light and Fault Light followed by a single flash of the Enter Light.

8. **Low Water Fault**
   The Machine will shut down any time the PLC in the main control panel loses the input from the Low Water Level Switch in the High-Pressure Holding Tank (input A36). Once the PLC receives an input from the High-Water Level Switch in the High-Pressure Holding Tank (input A37), the machine will automatically restart. A Low Water Fault is indicated by eight flashes of the Stop Light and Fault Light followed by a single flash of the Enter Light.

9. **Entry System Out of Service Fault**
   If an Out of service signal (input A41) is received from the entry system, the Carwash will shut down with an Entry System Out of Service Fault. The fault must be cleared and the machine reset before the Carwash can be restarted. An Entry System Out of Service Fault is indicated by nine flashes of the Stop Light and Fault Light followed by a single flash of the Enter Light.

10. **Both Forward and Rear Prox Switch Fault**
    The Machine will shut down anytime both the forward and reverse travel proximity switches (inputs B2 & B3) are made simultaneously and produce a Proximity Switch Fault. The machine cannot be reset until at least one of the proximity switch inputs are cleared and the machine is reset. A Proximity Switch Fault is indicated by ten flashes of the Stop Light and Fault Light followed by a single flash of the Enter Light.

11. **Gantry Travel Time Out Fault**
    The Machine will shut down any time it takes too long for it to travel in either direction based on the travel time out timers (timers 134-136). A Travel Time Out Fault is indicated by eleven flashes of the Stop Light and Fault Light followed by a single flash of the Enter Light.

b. Non-Fatal Faults

These faults will not shutdown the machine and a reset IS NOT required.

1. **Low on Presoak Water**
   Normally closed switch that signals the PLC when the Heated Presoak Chemical holding tank is low on chemical (input A35). The switch will shut off the Presoak Chemical heater and the PLC will disable the Foaming Presoak Chemical Pump (output R43) until the switch is remade. The Carwash will otherwise continue normal operation.

2. **Entrance Bell Switch**
   If the Entrance Bell Switch (input A7) is activated continuously for 100 seconds, an Entrance Bell Switch Fault is generated. Once the bell switch input is removed the Fault will automatically reset. The Carwash will continue to run but operations controlled by the Entrance Bell Switch may behave erratically.

3. **Exit Bell Switch**
   If the Exit Bell Switch (input A6) is activated continuously for 100 seconds, an Exit Bell Switch Fault is generated. Once the bell switch input is removed the Fault will automatically reset. The Carwash will continue to run but operations controlled by the Exit Bell Switch may behave erratically.

4. **Back-up Bell Switch**
   If the Back-up Bell Switch (input A17) is activated continuously for 100 seconds, a Back-up Bell Switch Fault is generated. Once the bell switch input is removed the Fault will automatically reset. The Carwash will continue to run but operations controlled by the Back-up Bell Switch may behave erratically.

5. **Front Travel Prox Switch**
   If the Front Travel Prox Switch (input B2) is activated continuously for 5 seconds during reverse travel, a Front Travel Prox Switch Fault is generated. Once the prox switch input is removed the Fault will automatically reset. The Carwash will continue to run but operations controlled by the Front Travel Prox Switch may behave erratically.

6. **Reverse Travel Prox Switch**
   If the Reverse Travel Prox Switch (input B3) is activated continuously for 5 seconds during forward travel, a Reverse Travel Prox Switch Fault is generated. Once the prox switch input is removed the Fault will automatically reset. The Carwash will continue to run but operations controlled by the Reverse Travel Prox Switch may behave erratically.

7. **Reclaim Alarm**
   Input from reclaim alarm (input A42). Carwash will continue normal operation.

8. **Gantry Power Supply Slot 1 Module Error**
   If the power supply for the Coupler in the Gantry Control Panel loses communications for up to 2 seconds then a minor fault will occur. This will not shut down the machine unless the duration is longer than 2 seconds then a communication timeout will occur triggering a fatal fault.

9. **Gantry DI Slot 2 Module Error**
   If the Digital Input module in the Coupler, in the Gantry Control Panel, loses communications for up to 2 seconds then a minor fault will occur. This will not shut down the machine unless the duration is longer than 2 seconds then a communication timeout will occur triggering a fatal fault.

10. **Gantry DO Slot 3 Module Error**
    If the first Digital Output module (a red module) in the Coupler, in the Gantry Control Panel, loses communications for up to 2 seconds then a minor fault will occur. This will not shut down the machine unless the duration is longer than 2 seconds then a communication timeout will occur triggering a fatal fault.

11. **Gantry DO Slot 4 Module Error**
If the second Digital Output module (a red module) in the Coupler, in the Gantry Control Panel, loses communications for up to 2 seconds then a minor fault will occur. This will not shut down the machine unless the duration is longer than 2 seconds then a communication timeout will occur triggering a fatal fault.

12. **Gantry DO Slot 5 Module Error**
If the third Digital Output module (a red module) in the Coupler, in the Gantry Control Panel, loses communications for up to 2 seconds then a minor fault will occur. This will not shut down the machine unless the duration is longer than 2 seconds then a communication timeout will occur triggering a fatal fault.

13. **Gantry DO Slot 6 Module Error**
If the fourth Digital Output module (a red module) in the Coupler, in the Gantry Control Panel, loses communications for up to 2 seconds then a minor fault will occur. This will not shut down the machine unless the duration is longer than 2 seconds then a communication timeout will occur triggering a fatal fault.

14. **Gantry DO Slot 7 Module Error**
If the fifth Digital Output module (a red module) in the Coupler, in the Gantry Control Panel, loses communications for up to 2 seconds then a minor fault will occur. This will not shut down the machine unless the duration is longer than 2 seconds then a communication timeout will occur triggering a fatal fault.

15. **Gantry DO Slot 8 Module Error**
If the sixth Digital Output module (a red module) in the Coupler, in the Gantry Control Panel, loses communications for up to 2 seconds then a minor fault will occur. This will not shut down the machine unless the duration is longer than 2 seconds then a communication timeout will occur triggering a fatal fault. A reset is not required.

NOTE: All of the following messages are for status only and do not need the reset button pressed.

16. **Back in Service**
    After the Reset button is pressed this message will appear for a few seconds then disappear.

17. **PLC Powered up Flag**
    If the PLC should have its power cycled, this message will display but will disappear after a few seconds.

18. **System Startup Flag**
    There is a first pass bit that is set whenever power is applied, this message will appear for a few seconds then disappear.

Section 6 – Installation

CAUTION: Equipment should be unloaded, serviced and installed by factory trained personnel only

A. Unloading equipment

1. Forklift requirement: 6000 lbs. capacity with 7’ fork extensions and 12’ high lift minimum.

2. Prior to unloading the washer, clear entire area of all vehicles and personnel.

3. Park truck on the most level grade accessible to job site. Make sure forklift is on a level or slightly upgrade plane. Never try to unload washer on a downgrade or side grade.

4. Depending on type washer and accessories, center of gravity will vary. Usually, center of gravity is off center toward the passenger side.

5. Pick washer up with forks on the main frame below the Mitter. Forks must extend through frame and support both the entrance and exit side header.

6. As soon as the washer clears the truck bed, lower to approximately 12” from grade. Set washer on dollies close to or inside wash bay.

B. Bay Floor Layout

1. **Track Installation**

   b. Measure door openings of the wash bay. Mark the center point of each opening. Snap a chalk line from one end to the other.

   c. Measure over 56¼” from centerline each way and make a mark. Do this on both ends of the bay and two places in the center of bay. Snap a chalk line down these marks also, end to end. There should now be three chalk lines. The two lines that are furthermost apart should measure 112½”. This is the center of the track rail.

   d. Find the highest corner of the floor. Use a line or laser level to check diagonally from corner to corner. Once the high point has been established, place two sections of track down directly over the center lines that were marked, one on the left and one on the right, on the high end of the bay.

e. There are a number of options that will determine placement of track from either end of bay. AUTEC recommends 6’ minimum from inside entry end door opening.

f. Place track in position and drill through mounting holes on both tracks. It is recommended that a couple of rods be placed in the holes as they are drilled to keep the track from moving.

g. After all the holes on the two tracks have been drilled, use a 4-foot level to find the highest place on the track. Start anchoring track at the highest point.

h. Place 1 washer under track where first anchor bolt will be placed, this is the highest point in bay.

i. Work away from this high point using 4-foot level and placing washers under track to level entire length from one end to other and side-to-side.

j. After leveling and anchoring this track, use anchored track to level the other track on same end of bay. It is critical that the two tracks are level with each other for the washer to operate correctly. Drill and anchor this track as noted above.

k. The first two sections of track should now be mounted.

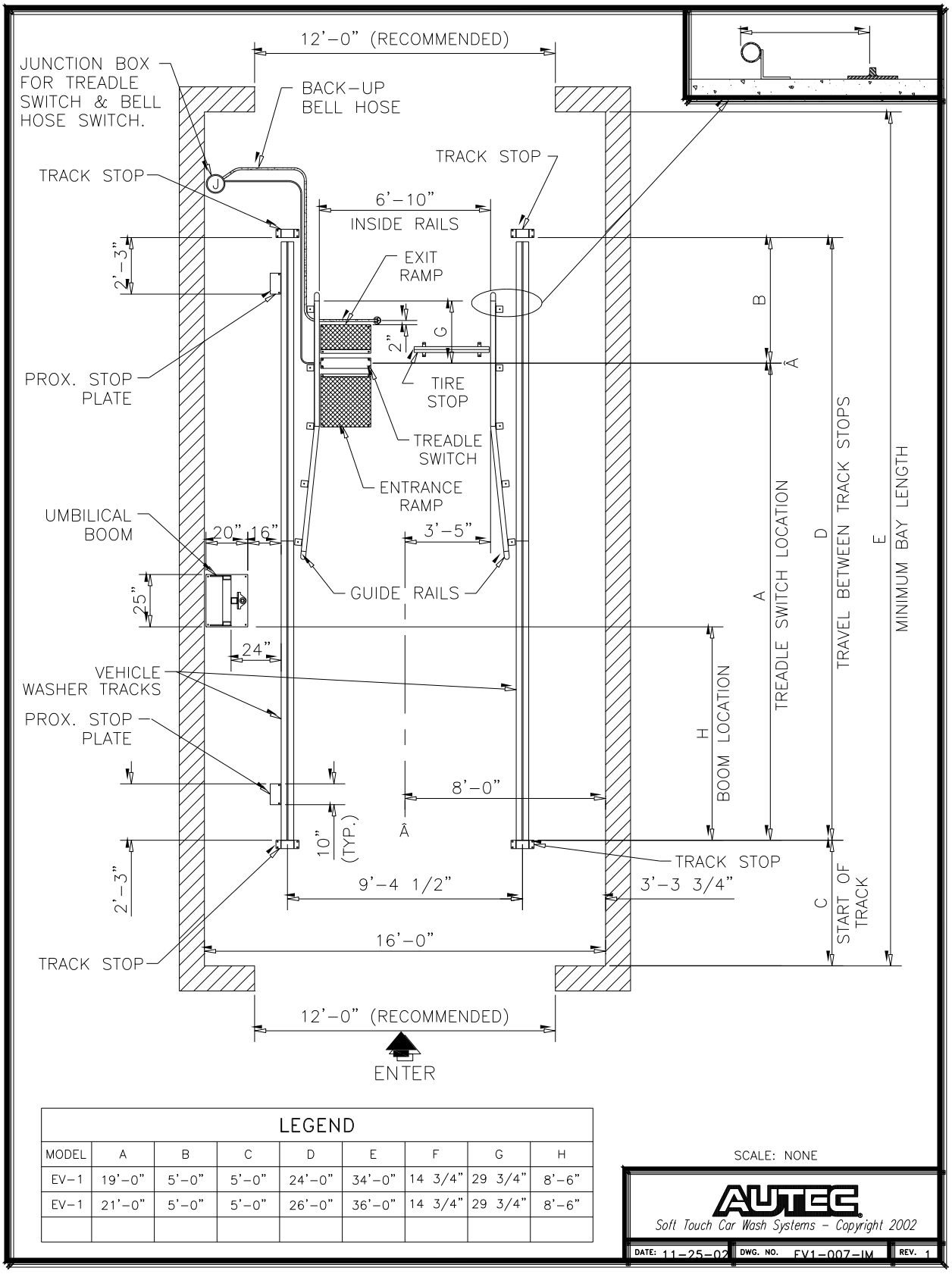
l. Before mounting the next two sections of track, place the equipment on the mounted tracks. Washer is currently on dollies so it can be rolled up over installed tracks. Make sure washer is turned the correct way. Jack up one side of the washer high enough to roll dollies out. Set this side of washer down on track. Proceed with other side of washer in same manner.

m. Now that washer is on tracks install the other two tracks. Do this in the same manner as the first two. Start drilling, anchoring and leveling where the two tracks butt together.

2. **Guide Rails** – Start installing from the exit end of the bay. The guide rail should start one to two feet forward of treadle plate. Place the guide rail so that the inside of the guide rail is 14 3/4” from the inside of the track rail. Continue rearward maintaining 14 3/4” distance until guide rail angles outward toward track. Secure the guide rail by drilling and fastening with concrete anchor bolts. Verify measurements as the rail is installed. Proceed with opposite side in same manner. The guide rails should be 82” apart (inside measurement) on straight section of guide rail.

3. **Track Stops** – There are four track stops. Attach one track stop to each track end at the point of maximum travel in each direction. Shim track stops as necessary.

4. **Treadle Switch** – Mount center of treadle switch 60” back from the exit end track stop. Place rubber cover over treadle switch and mount the longer treadle ramp toward the entrance 2 1/2” from the treadle. Duplicate with the short treadle ramp toward the exit. (Refer to drawings EV1-007-IM and 99-014-IM)



LEGEND								
MODEL	A	B	C	D	E	F	G	H
EV-1	19'-0"	5'-0"	5'-0"	24'-0"	34'-0"	14 3/4"	29 3/4"	8'-6"
EV-1	21'-0"	5'-0"	5'-0"	26'-0"	36'-0"	14 3/4"	29 3/4"	8'-6"

SCALE: NONE

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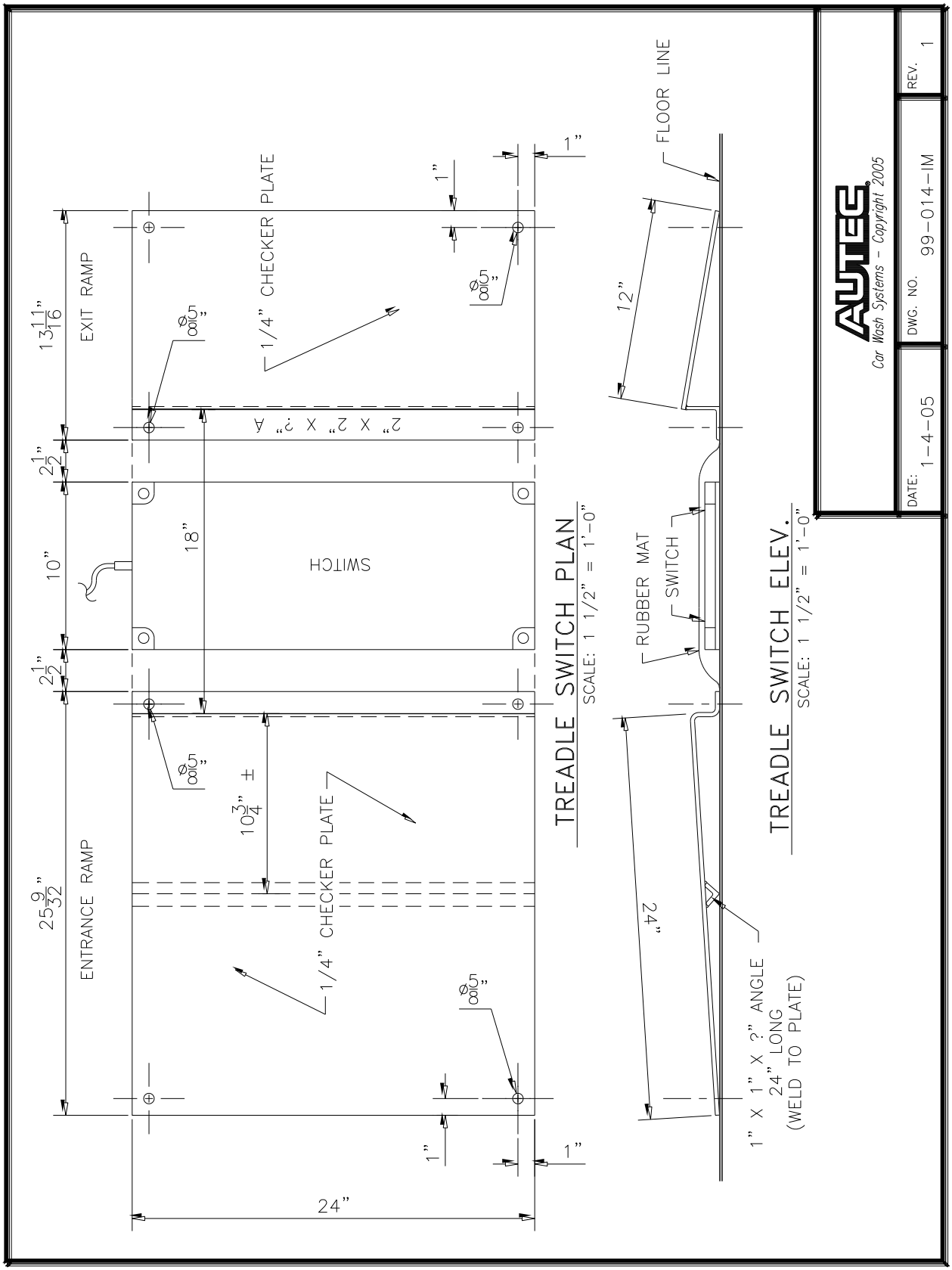
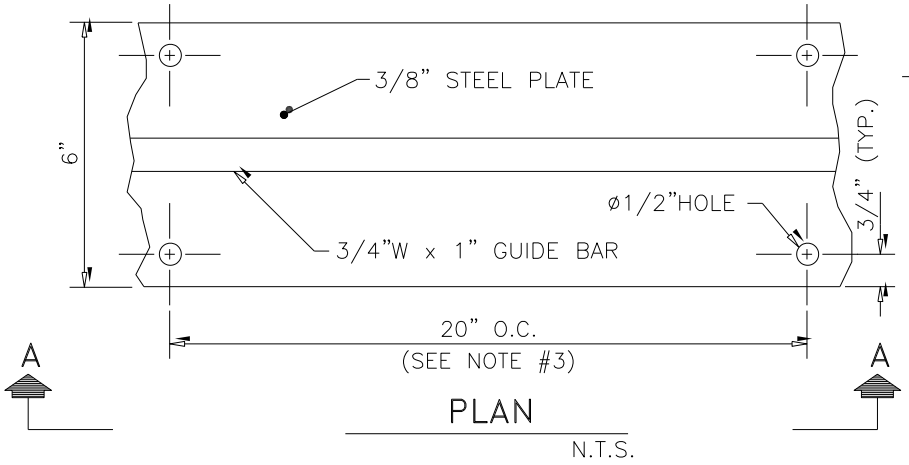

TREADLE SWITCH PLAN
SCALE: 1 1/2" = 1'-0"
TREADLE SWITCH ELEV.
SCALE: 1 1/2" = 1'-0"
EXIT RAMP
ENTRANCE RAMP
1/4" CHECKER PLATE
1/4" CHECKER PLATE
SWITCH
FLOOR LINE
RUBBER MAT
SWITCH
1" X 1" X ?" ANGLE
24" LONG
(WELD TO PLATE)
24"
18"
10"
12"
1"
AUTEC
Car Wash Systems - Copyright 2005
DATE: 1-4-05
DWG. NO. 99-014-IM
REV. 1

ANCHOR INSTALLATION PROCEDURE for EQUIPMENT TRACK



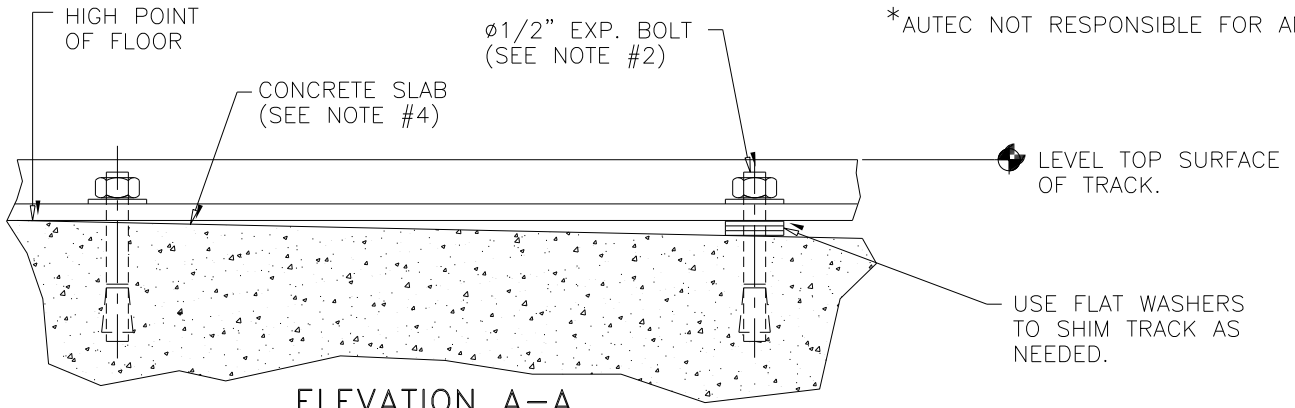
PLAN

N.T.S.

RECOMMENDED ANCHOR INSTALLATION

1. SET TRACK IN PLACE AS REQUIRED.
2. DRILL HOLES IN CONCRETE SLAB AND INSTALL "HILTI" #KBII 1/2" X 3 3/4" EXPANSION BOLTS * PER MANUFACTURERS REQUIREMENTS. USE PRE-DRILLED BEARING PLATES AS TEMPLATE. CLEAN HOLES OF ALL DEBRIS.
3. START 1st. PAIR OF HOLES 2" FROM END OF TRACK, 2nd. PAIR AT 18" AND PROCEED AT 20" CENTERS FOR ENTIRE LENGTH.
4. AUTEC RECOMMENDS A MIN. CONCRETE SLAB THICKNESS OF 6" W/ 6X6X6/6 WELDED WIRE FABRIC REINFORCING.

*AUTEC NOT RESPONSIBLE FOR ANY SUBSTITUTIONS.



ELEVATION A-A

N.T.S.

AUTEC

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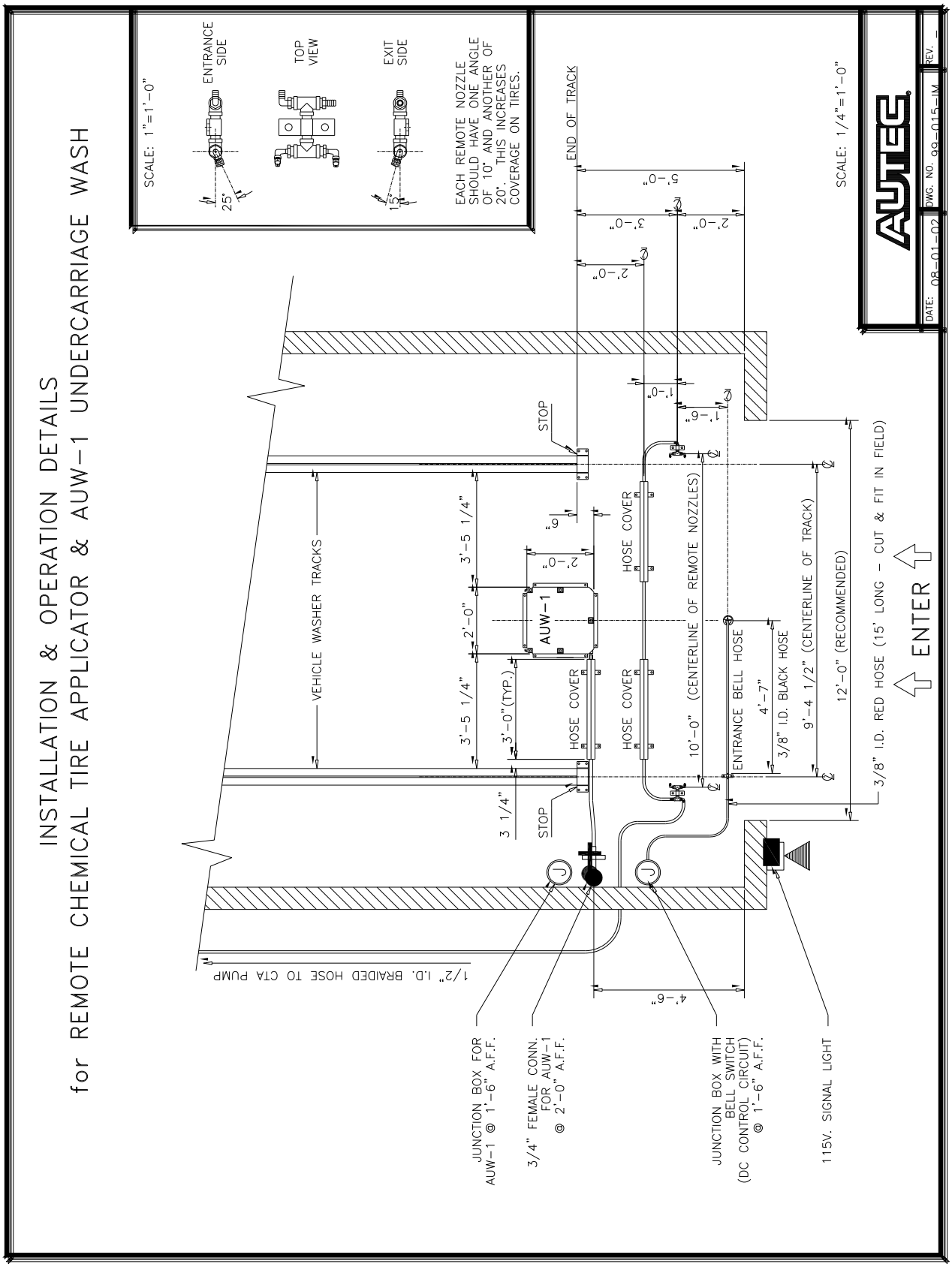
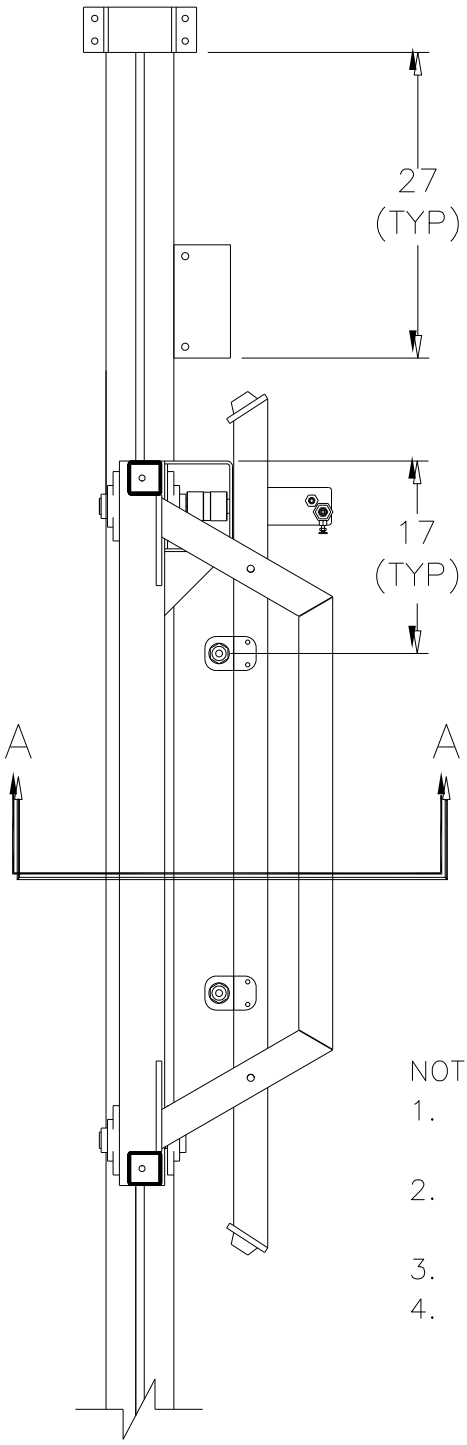
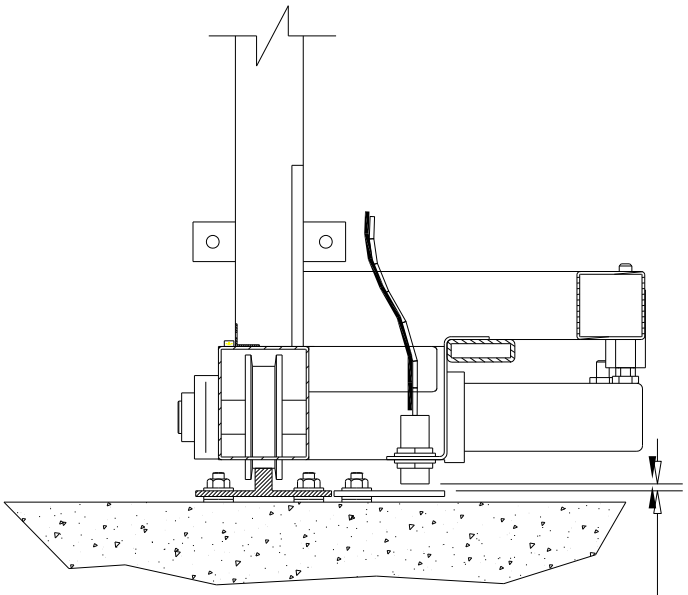
08-01-02	99-016-IM	-


INSTALLATION & OPERATION DETAILS
for REMOTE CHEMICAL TIRE APPLICATOR & AUW-1 UNDERCARRIAGE WASH
SCALE: 1"=1'-0"
ENTRANCE SIDE
TOP VIEW
EXIT SIDE
25°
15°
EACH REMOTE NOZZLE SHOULD HAVE ONE ANGLE OF 10° AND ANOTHER OF 20°. THIS INCREASES COVERAGE ON TIRES.
END OF TRACK
SCALE: 1/4"=1'-0"
AUTEC
DATE: 08-01-02
DWG. NO. 99-015-IM
REV. -
VEHICLE WASHER TRACKS
AUW-1
HOSE COVER
HOSE COVER
HOSE COVER
STOP
STOP
3'-5 1/4"
3'-5 1/4"
3'-0"(TYP.)
2'-0"
3 1/4"
10'-0" (CENTERLINE OF REMOTE NOZZLES)
ENTRANCE BELL HOSE
4'-7"
3/8" I.D. BLACK HOSE
9'-4 1/2" (CENTERLINE OF TRACK)
12'-0" (RECOMMENDED)
3/8" I.D. RED HOSE (15' LONG - CUT & FIT IN FIELD)
ENTER
1/2" I.D. BRAIDED HOSE TO CTA PUMP
JUNCTION BOX FOR AUW-1 @ 1'-6" A.F.F.
3/4" FEMALE CONN. FOR AUW-1 @ 2'-0" A.F.F.
JUNCTION BOX WITH BELL SWITCH (DC CONTROL CIRCUIT) @ 1'-6" A.F.F.
115V. SIGNAL LIGHT
4'-6"
1'-0"
1'-6"
2'-0"
2'-0"
3'-0"
5'-0"





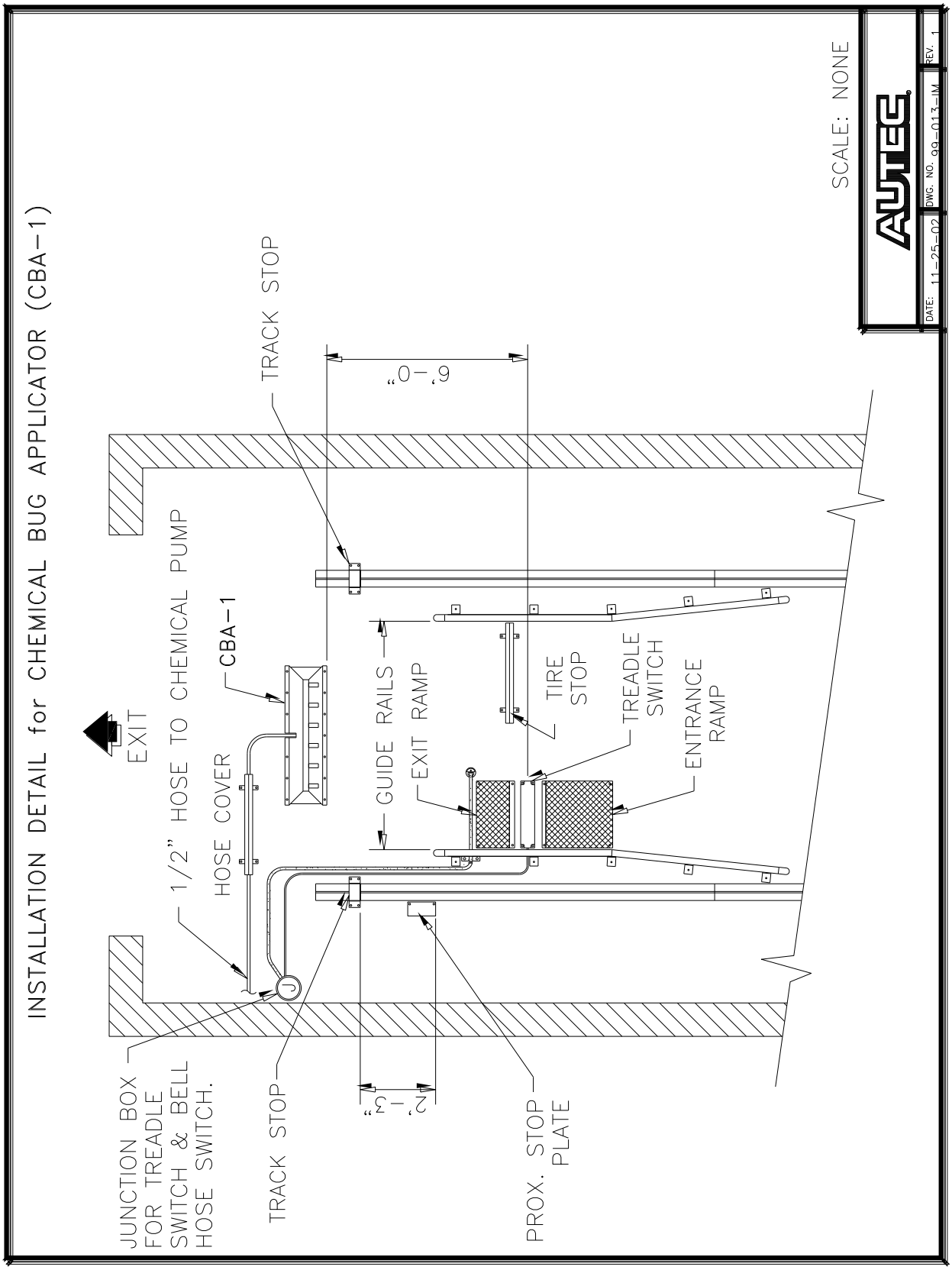
SECTION A–A

1/4
(TYP)

NOTES:

1. PLACE PROXIMITY PLATES AGAINST TRACK WITH BOLT HOLES CLOSEST TO TRACK
2. SHIM AS REQUIRED TO MOUNT PLATE FLUSH WITH TRACK BASE.
3. MAKE SURE BOLTS CLEAR MACHINE FRAME.
4. ADJUST PROXIMITY SWITCH TO 1/4" CLEARANCE FROM PLATE.

AUTEC	PROXIMITY SWITCH & PLATE LOCATION	SHT. 1 OF 1
DATE: 10/04/02	DWG. NO. 99–021–IM	REV. ––


INSTALLATION DETAIL for CHEMICAL BUG APPLICATOR (CBA-1)
SCALE: NONE
AUTEC
DATE: 11-25-02
DWG. NO. 99-013-IM
REV. 1
TRACK STOP
6'-0"
EXIT
1/2" HOSE TO CHEMICAL PUMP
CBA-1
HOSE COVER
GUIDE RAILS
EXIT RAMP
TIRE STOP
TREADLE SWITCH
ENTRANCE RAMP
JUNCTION BOX FOR TREADLE SWITCH & BELL HOSE SWITCH.
TRACK STOP
2'-3"
PROX. STOP PLATE

5. **Vehicle Wheel Stop** – Install the angled wheel stop, if necessary, directly across from the treadle switch exit ramp.

6. **Proximity Switch Plate** – Inside edge of front proximity switch plate should be mounted 27” from inside of exit end track stop with mounting hole side flush against track. Inside edge of rear proximity switch plate should be mounted 27” from inside of entrance end track stop with mounting hole side flush against track. Shim plate as required. (Refer to drawing #99-021-IM)

7. **Chemical Bug Applicator** (CBA-1) – Position CBA-1 manifold and cover plate 72” from centerline of treadle.

8. **Entrance Bell Hose** – If required, the entrance bell hose should be mounted immediately inside the entrance door, leaving enough room for the door to close without damaging the hose. Attach the round bell hose anchor on the centerline of the bay. Slip 3/8” bell hose into bell hose anchor and stretch hose slightly to the side of the bay. Attach hose to hose retainer bracket and anchor on same line that was used to center track. Continue to Bell Switch with 3/8” red air hose.

9. **Remote Nozzles** – If so equipped, mount the remote nozzles for the CTA. Drill and anchor nozzles 18” beyond entrance bell hose, 10’ apart.

10. **Hose Covers** – Install hose covers 8” to 12” beyond (towards exit end of bay) remote nozzles, to protect hoses and to act as a momentary speed bump. Connect chemical lines to remote nozzles. Be sure to install a check valve between the first nozzle and pump to prevent chemical from siphoning out when washer is at rest.

11. **Back Up Bell Hose** – Mount back up bell hose approximately 2” from edge of treadle switch exit ramp. Attach the round bell hose anchor on the centerline of the bay. Slip 3/8” bell hose into bell hose anchor and stretch hose slightly to side of bay. Attach hose to hose retainer bracket and anchor on same line that was used to center track. Continue to Bell Switch with 3/8” red air hose. Additional hose retainers should be used to secure hose where it turns corner at end of track.

12. **Exit Bell Hose** – Bell hose should be just inside exit door opening. Anchor the round bell hose anchor on the centerline of the bay. Slip 3/8” bell hose into bell hose anchor and stretch hose to the controller side of the bay. Attach hose to hose retainer bracket and anchor on same line that was used to center track. Continue to Bell Switch with 3/8” red air hose.

13. **Entrance Light** – The entrance light package should be installed to the left of the entrance bay door. The bottom of the light fixture should be a minimum of 6’ from the floor.

14. **Exit Light** – The exit light package should be mounted either on the rinse arch or on the exit wall clearly visible from a car positioned in the wash. The fixture should be mounted so the red light is on the left or on top.

15. **Exit Slowly Sign** – The exit slowly sign should be mounted on the right side of the rinse arch, the right side of bay on the wall, or on right side of air blower.

16. **Instruction Sign** – Install the instruction sign where it can be clearly read when someone is sitting at the entry system, typically to the left of the entrance door below traffic signal.

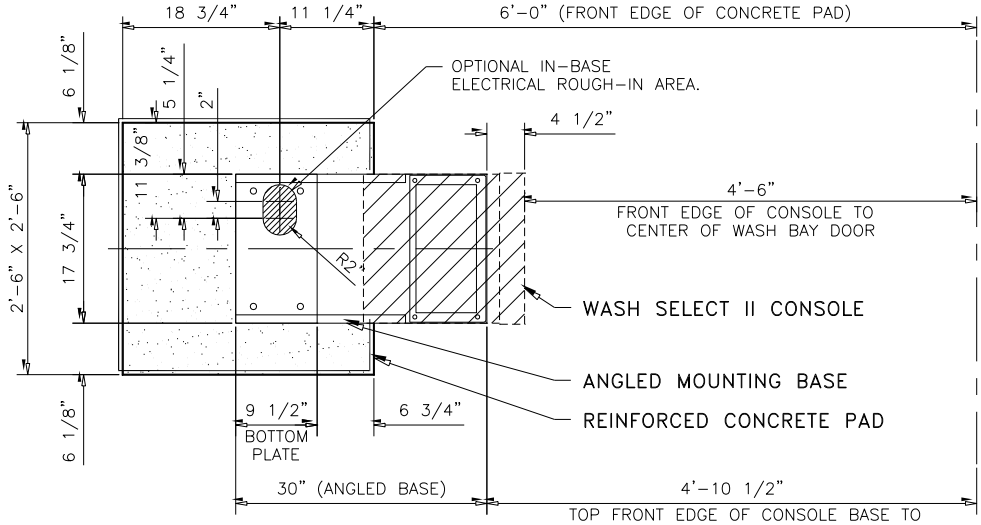
17. **Entry System** – The entry system needs to be a minimum of 10’ from entry door opening. The face of entry system should be 54” from centerline of entry door opening. The entry system should be protected by either steel poles or brick columns.

18. **Utility Boom**

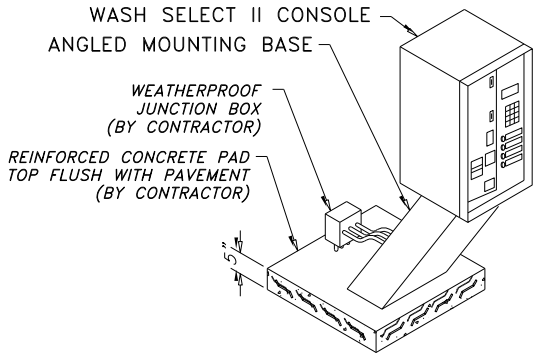
    a. Mount Boom Stand on either Driver or Passenger Side as required.

    b. Mount the 7’ Boom Arm to the Boom Stand using the two 1-1/4” pillow block bearings provided.

    c. Mount the 6’ Boom Arm to the inside of the entrance end header of the machine using the two 1-1/4” pillow block bearings provided.



PLAN VIEW
SCALE: NONE



ISOMETRIC VIEW
SCALE: NONE

NOTE
ALL WIRING MUST HAVE A MINIMUM LENGTH OF 66" FROM THE POINT OF ENTRY IN THE MOUNTING BASE TO MAKE THE FINAL CONNECTIONS WITH THE ENTRY SYSTEM CONSOLE.

WASH SELECT II ENTRY SYSTEM
SCALE: NONE

AUTEC	ENTRY SYSTEM TYPICAL LAYOUT	SHT. 1 OF 1
DATE: 11/30/05	DWG. NO. ATF-032-IM	REV. 0

C. Machine Prep

NOTE: The Carwash Machine will arrive with several items disconnected or re-positioned for shipment.

1. Open the arms of the machine and move the Side Brush Hydraulic Motors from the air cylinder mount to the side brushes (Figure A). Make sure the keys are in place on both the motor shaft and the side brush shaft (The side brush shaft keys will be taped to a proximity switch plate fastened on the outside of the driver side rear corner.) Make sure the slot in the side brush motor bracket fits over the pin (with rubber hose) on the side brush arm to prevent rotation of the hydraulic motor body.

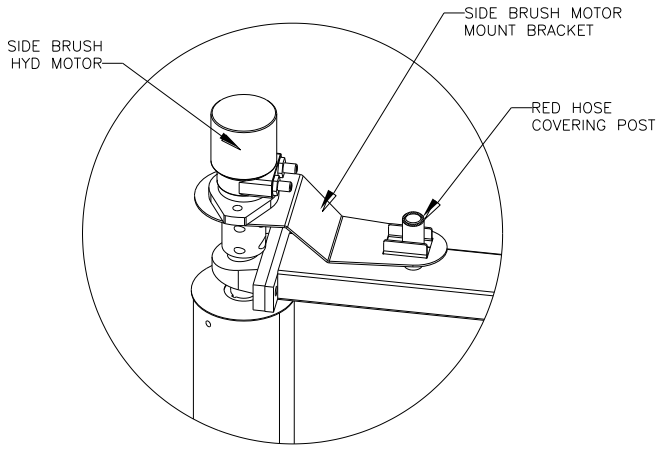


Figure A – Side Brush Motor Installation

2. With the arms allowed to swing freely, adjust the position of the pivot bearings attaching the arms to the machine to level the arms. The arms are level when they can be placed in any position and remain stationary without being held.

3. Fasten the Air Cylinders to each arm according to the label on the cylinder (Rear Passenger Side, etc.). The label on the cylinder should face out away from the Carwash. Use washers to space the cylinders as required for level installation. Make sure at least one spacer is used between the mounts on the headers (mounts closest to the center of the machine) and the rod end bearing so that the bearing housing will clear the mount plate. Insert airlines into the push-lock fittings on each cylinder.

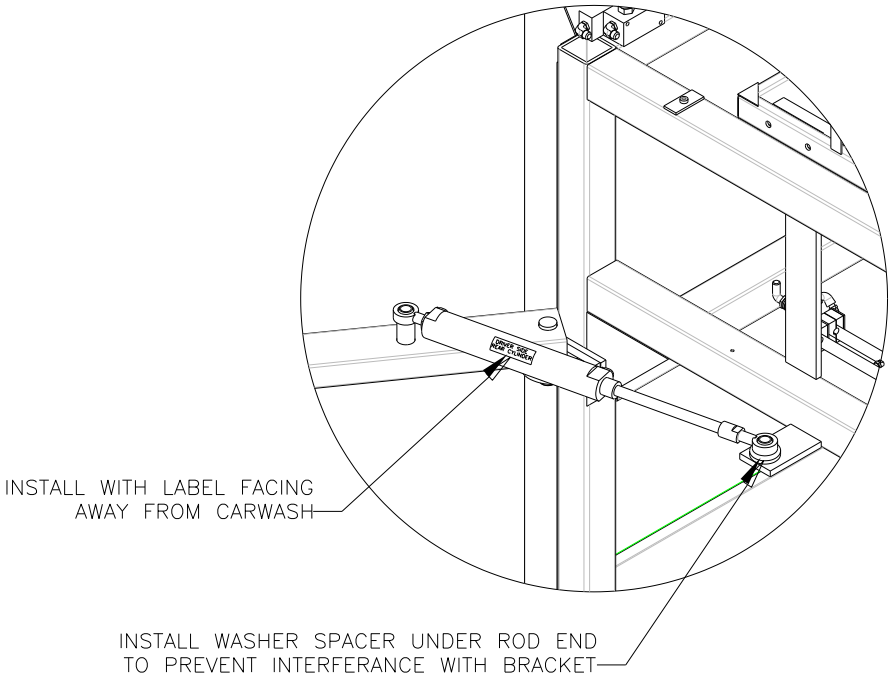


Figure B – Air Cylinder Installation

4. Mount the front and rear arm proximity plate to the top of the driver side arms. (Plates are fastened on the outside of the rear driver side corner for shipping.) Fasten the plates with the two bolts provided leaving the third open hole in the plate closest to the machine. Close the arm and adjust the gap between the proximity switch and the plate to approximately 3/16”. Position the proximity switch so that the switch activates when the section of the side brush arm closest to the machine is parallel with the track.

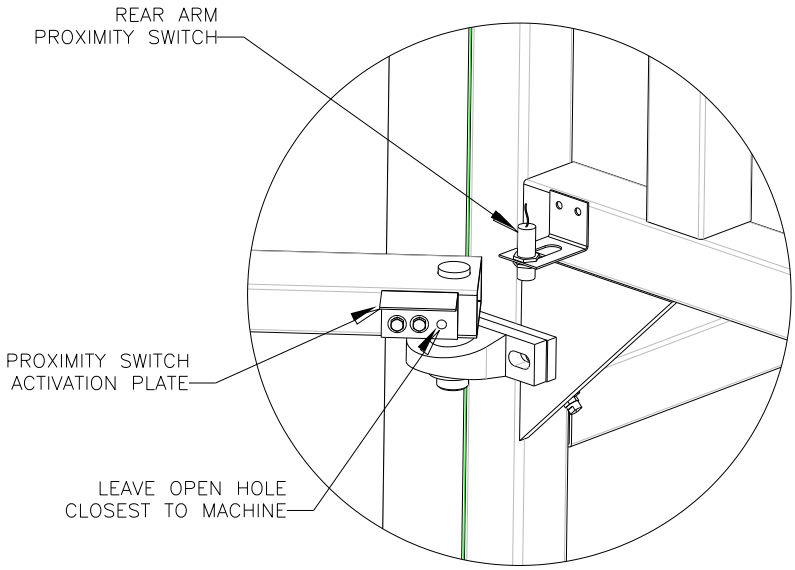


Figure C – Rear Arm Proximity Switch Installation

5. Turn over the brackets for the forward and reverse travel proximity switches (located in the bottom of the driver side cabinet). Being careful not to run the switch into the activation plate, push the machine to each end of the track and set the clearance of each switch to approximately ¼".

6. Replace the plug in the hydraulic reservoir with the vented cap (in plastic bag attached to the hydraulic pump motor).

7. Remove plastic wrap from side brushes and Mitter cloth and install any remaining side brush material if required. (If using Polyflex, rows 6 & 7 will ship in a separate box.)

8. Remove plastic film from stainless steel panels.

D. Water Connection

1. Connect one end of the 1" water hose to water supply line with hose barb. After attaching hose, open water valve to flush any contaminants out of lines.

2. Move washer to center position on track. Hang water hose to machine letting the bottom of the hose drape approximately three feet above floor. Mark hose length but do not cut.

3. Move washer to farthest end of track from hose attachment on wall and check the hose length marked in step 38. Make sure hose still has enough drape not to be pulled tight against hose barbs.

4. Move machine back to center of track. Cut and attach as measured in steps 2 and 3. Turn water on to swell hose.

E. Water Connection with Optional Boom Stand

1. All Water Lines going to the Carwash Machine should be hard piped to the couplings provided on the top of the Boom Stand.

2. Starting from the open end of the Boom Arm attached to the Boom Stand, run one end of the High-Pressure Hose through the middle of the arm and bring it up the incline on the pivot end.

3. Position hose so that middle clamp on incline is 44" from hose end towards stand.

4. Connect end of High-Pressure Water Hose to middle coupling on top of Boom Stand.

5. Pull hose snug in Arm and attach the remaining two hose clamps in the middle position on each cross brace.

6. Route other end of High-Pressure Hose through the Boom Arm attached to the Carwash and bring it up the incline on the pivot end.

7. Position Clamp on open end of Boom Arm attached to Carwash wash so that there is 42” of hose between each Boom Arm.

8. Pull hose snug in Arm and attach the remaining two hose clamps in the middle position on the middle cross brace and the incline. You should have approximately 53” from last clamp to the end of the hose.

9. Before connecting High-Pressure Hose to Carwash, flush line to remove any debris in system.

10. Attach High-Pressure Hose to Carwash.

11. Position Carwash so that Boom Arm attached to the Boom Stand is perpendicular to the track.

12. Route the Low-Pressure Hose for Fresh and / or RO Rinse Water on each side of the High-Pressure Hose and attach to the hose barbs on top of the Boom Stand matching the loop of the High-Pressure Hose.

13. Pull Low-Pressure Hoses snug and attach the remaining clamps on Boom Arm.

14. Route the Low-Pressure Hoses through the Boom Arm on Carwash but do not attach.

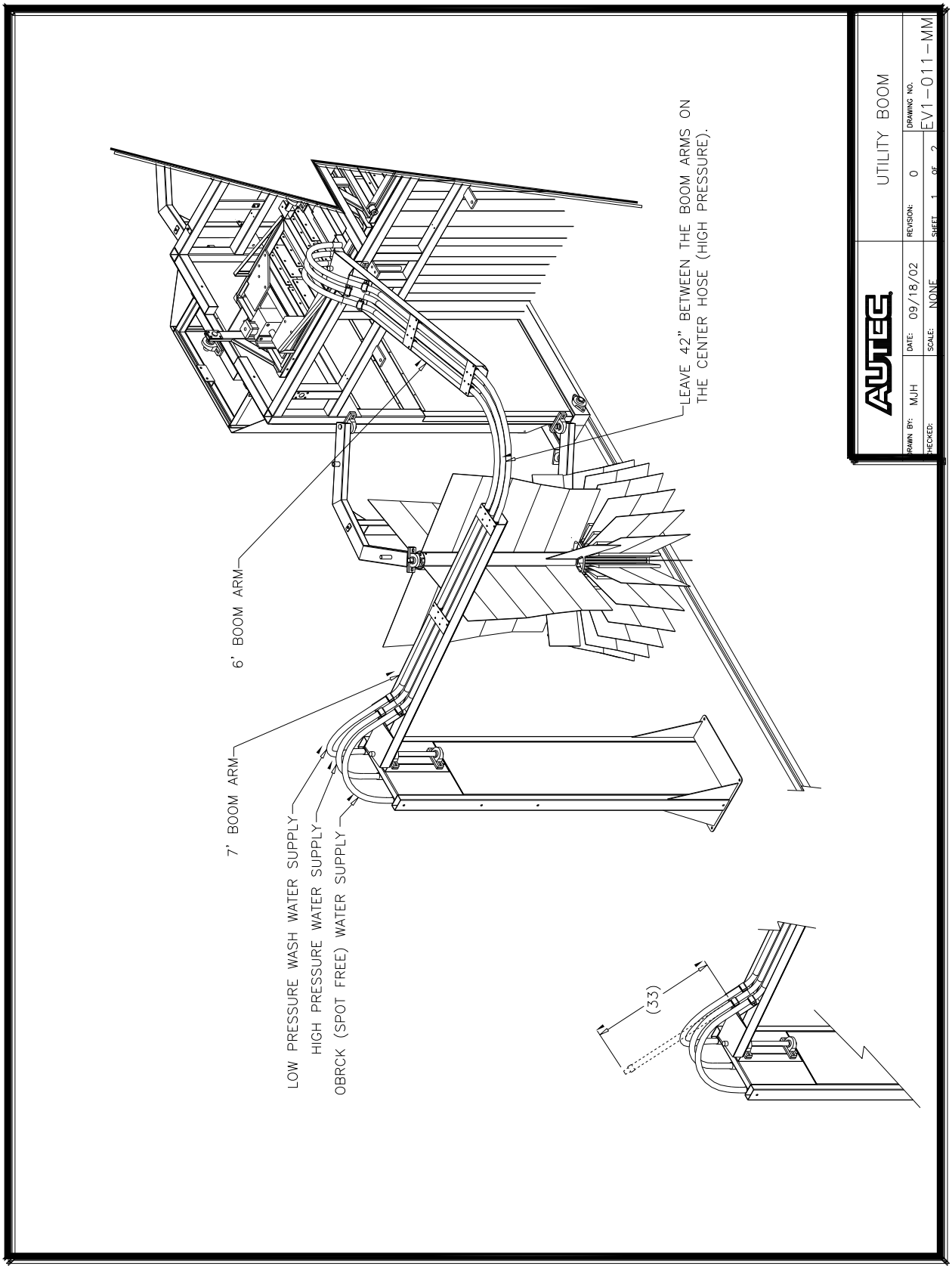
15. Move Carwash to Entrance End of track and then position and clamp Low-Pressure Hoses so that they form concentric radii with the High-Pressure Hose.

16. Pull hoses snug and attach remaining clamps on Boom Arm.

17. Before connecting Low-Pressure Hoses to Carwash, flush lines to remove any debris in system.

18. Move Carwash toward Exit End until the Boom Arm attached to the Carwash is parallel to the track.

19. Attach Low-Pressure Hoses to the Carwash matching the loop of the High-Pressure Hose.


LEAVE 42" BETWEEN THE BOOM ARMS ON
THE CENTER HOSE (HIGH PRESSURE).
6' BOOM ARM
7' BOOM ARM
LOW PRESSURE WASH WATER SUPPLY
HIGH PRESSURE WATER SUPPLY
OBRCK (SPOT FREE) WATER SUPPLY
(33)
AUTEC
UTILITY BOOM
DRAWN BY: MJH
DATE: 09/18/02
REVISION: 0
DRAWING NO. EV1-011-MM
CHECKED:
SCALE: NONE
SHEET 1 OF 2

F. Compressed Air

1. The customer is to supply air service (min. of 3/8” dia and 100 psi). The air supply should be hard piped to the top of the Boom Stand.

2. Connect AUTEC supplied 3/8” air hose to end of air supply pipe.

3. Route air hose through Boom Arms, matching contour of water lines.

4. Temporarily attach airline to machine but do not cut to length yet.

5. Move Carwash to each end of track and make sure air hose flexes freely with no kinks or rubbing.

G. Hot Water Pumping Station

1. Mount Hot Water pumping station to floor or wall as required.

2. Make electrical connections to tank heater, thermostat, level switch, and pump motor as required (refer to electrical schematics in section 9).

3. Plumb ½” delivery line from pump to machine and ½” return line back to tank (refer to section 10 for plumbing schematics).

H. High Pressure Pumping Station

1. Mount pumping station to floor as required.

2. Set 165 gallon holding tank on top of pump stand.

3. Plumb pumping station as shown (refer to section 10).

4. Make electrical connections to pump motor, low and high level float switches, and fill valve (refer to electrical schematics in section 9).

5. Plumb ½” delivery line from pump to machine and ½” return line back to tank (refer to plumbing schematics in section 10).

I. Chemical Pumping Stations

1. Chemical Pumping Stations come pre-assembled with an air diaphragm pump, hydrominder, and air solenoid valve mounted on a stainless steel backplane. These pumping stations can be wall-mounted individually or fastened together to form one large chemical pumping station panel. There is also a separate panel that includes an air filter/regulator and water filter for the incoming air and water supply. (See drawings 99-008-MC)

a. Mount chemical pumping stations and the air/water filter panel to the wall.

b. Plumb the incoming air and water to the air and water filter and then in series to each pumping station.

c. Place chemical barrels beneath pumping station and plumb suction line from hydrominder to chemical bucket.

d. Attach chemical lines feeding wash bay to discharge side of air diaphragm pumps.

2. Chemical lines

   a. Run chemical lines to top of Boom Stand and route through Boom arms matching contour of Water Lines.

   b. Temporarily tie chemical lines to water lines but do not cut to length yet.

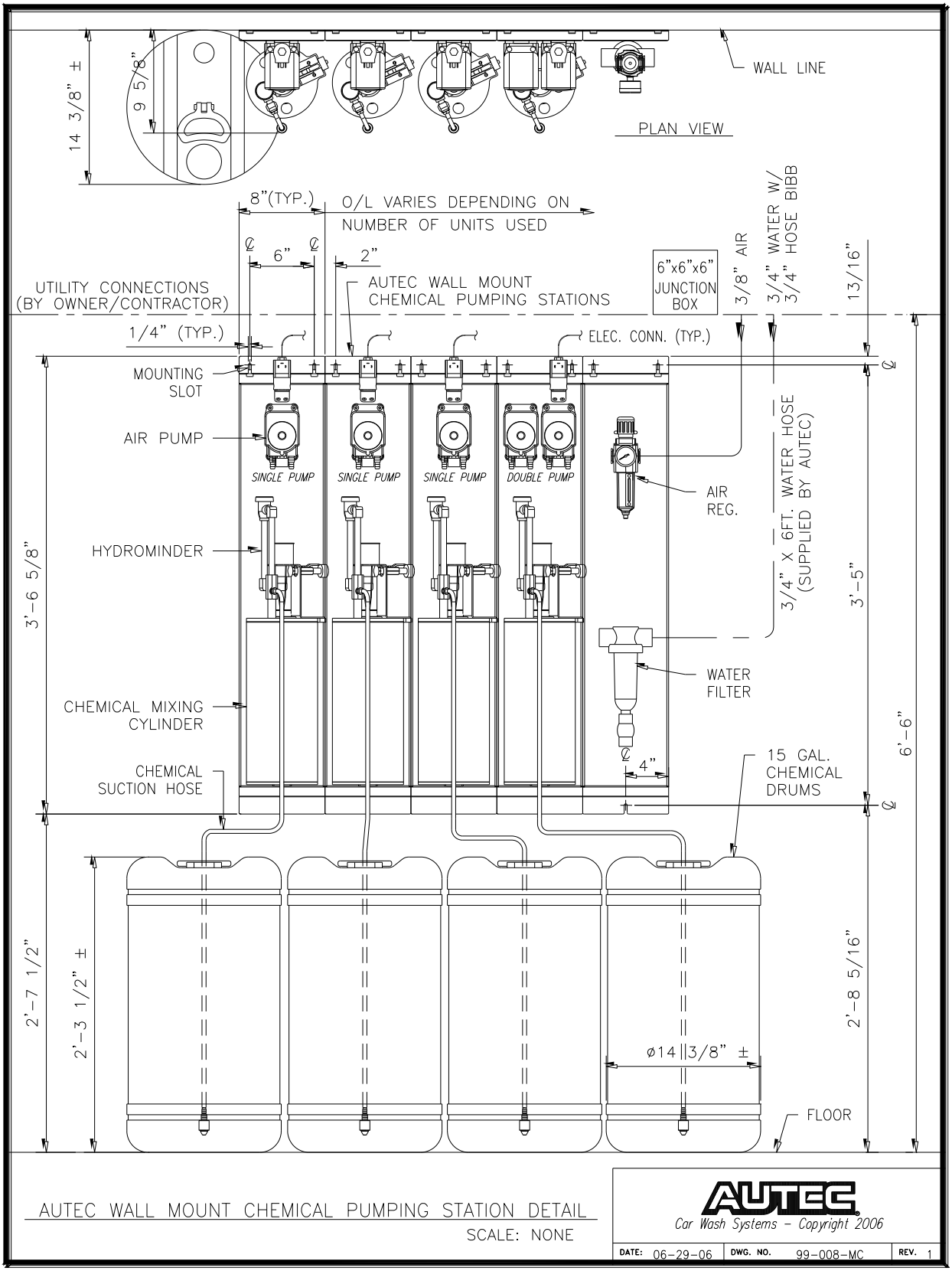
   c. Move Carwash to each end of track and make sure chemical lines flex freely with no kinks or rubbing.

3. Chemical Settings – Use the following chart to adjust chemical setups. This chart is for reference only as each site may require additional adjustment based on specific installations.

CHEMICAL SETUPS

Chemical	Pump Type	Pump Air Pressure	Hydrominder Type	Tip Size	Approximate Dilution (@40 PSI Water Pressure)
Wheel Brite	½" ARO w/ Teflon Seals (66605J)	80 PSI	Model 511	Black	10 to 1
Ultra Grime Buster (Bug Buster)	½" ARO (670003)	60 PSI	Model 511	Orange	64 to 1
Clearcoat Protectant	¼" Flojet (G575205A)	60 PSI	Model 511	Yellow	90 to 1
Drying Agent	¼" Flojet (G575205A)	60 PSI	Model 511	Purple	120 to 1
Red, Yellow, Blue Triple Foam	¼" Flojet (G575205A)	60 PSI	Model 511	Purple	120 to 1

260 CHEMICAL SETUPS							
Chemical	**Pump Type**	**Pump Air Pressure**	**Hydrominder Type**	**Tip Size**	**Approx. dilution (@40 psi Water Pressure)**	**Hot Water Pump Pressure**	**Flow Meter Setting**
Wheel Brite	1/2" ARO w/ Teflon Seals (66605J)	80 psi	Model 511	Black	10 to 1	N/A	N/A
Drying Agent	1/4" Flojet (G57***5***205A)	60 psi	Model 515	none	120 to 1	50 psi	10
Red, Yellow, Blue Wax	1/4" Flojet (G57***5***205A)	60 psi	Model 511	Yellow	90 to 1	N/A	N/A
Pre-Soak #1	1/4" Flojet w/ Viton Seals (G57***3***205A)	60 psi	Model 515	none	40 to 1	50 psi	60
Pre-Soak #2	1/4" Flojet w/ Viton Seals (G57***3***205A)	60 psi	Model 515	none	100 to 1	50 psi	15


WALL LINE
PLAN VIEW
14 3/8" ±
9 5/8"
8"(TYP.)
O/L VARIES DEPENDING ON
NUMBER OF UNITS USED
6"
2"
UTILITY CONNECTIONS
(BY OWNER/CONTRACTOR)
AUTEC WALL MOUNT
CHEMICAL PUMPING STATIONS
6"x6"x6"
JUNCTION
BOX
3/8" AIR
3/4" WATER W/
3/4" HOSE BIBB
13/16"
1/4" (TYP.)
ELEC. CONN. (TYP.)
MOUNTING
SLOT
AIR PUMP
SINGLE PUMP
SINGLE PUMP
SINGLE PUMP
DOUBLE PUMP
AIR
REG.
3/4" X 6FT. WATER HOSE
(SUPPLIED BY AUTEC)
HYDROMINDER
3'-6 5/8"
3'-5"
WATER
FILTER
CHEMICAL MIXING
CYLINDER
4"
15 GAL.
CHEMICAL
DRUMS
6'-6"
CHEMICAL
SUCTION HOSE
2'-7 1/2"
2'-3 1/2" ±
2'-8 5/16"
ø14 3/8" ±
FLOOR
AUTEC WALL MOUNT CHEMICAL PUMPING STATION DETAIL
SCALE: NONE
AUTEC
Car Wash Systems - Copyright 2006
DATE: 06-29-06
DWG. NO. 99-008-MC
REV. 1

J. Electrical

The main disconnect, control panel and all other junction boxes, conduits and related electrical wiring should be installed and connected per state and local codes by a licensed electrician. (See drawing ATF-200-MI in Section 9)

GROUNDING INSTRUCTIONS: This appliance must be connected to a grounded, metal, permanent wiring system; or an equipment-grounding conductor must be run with the circuit conductors and connected to the equipment-grounding terminal or lead on the appliance.

1. The customer is to supply and mount specified disconnect switch to local electrical code.

2. Mount the Main Control Panel in the equipment room.

3. Install Main Panel supply wiring from disconnect switch. Connect power wire to L1, Neutral to N, and Ground to ground as shown on Schematic Sheet 1.

4. Mount the AUTEC supplied Boom Junction Box to the back of the Boom Stand.

5. Run wire in rigid conduit between the Main Control Panel and the Boom Junction Box as required.

6. Route the four AUTEC supplied power cables (#6-4 – 3-phase power, #16-3 Yellow Cable – hydraulic heater, #16-5 – 120V, and #16-3 DC analog) through the Boom Arms matching the contour of the High-Pressure Hose. ***DO NOT RUN THE CAT5 COMMUNICATION CABLE AT THIS TIME***.

7. Make connections in the in-bay junction box, if used, and temporarily tie power cables to water lines in umbilical bundle or boom arms.

8. Move Carwash to each end of track and make sure power cables flex freely with no kinks or rubbing.

9. Starting at wall or boom stand, begin fastening power cables, chemical lines, and airline to waterlines using wire ties. Place a wire tie approximately every 12 inches.

10. Route power cables to Gantry Junction Box and Main Hydraulic Motor and connect the wires labeled X1, X3, N, and Ground as shown on Schematic Sheet 1.

11. Run the CAT5 communication cable from the Main Control Panel and route through the Boom Junction Box as shown in the Electrical Schematics sheet titled ETHERNET COMMUNICATIONS DIAGRAM.

12. Route the Communication Cable alongside the umbilical bundle or through the boom arms matching the contour of the main water lines.

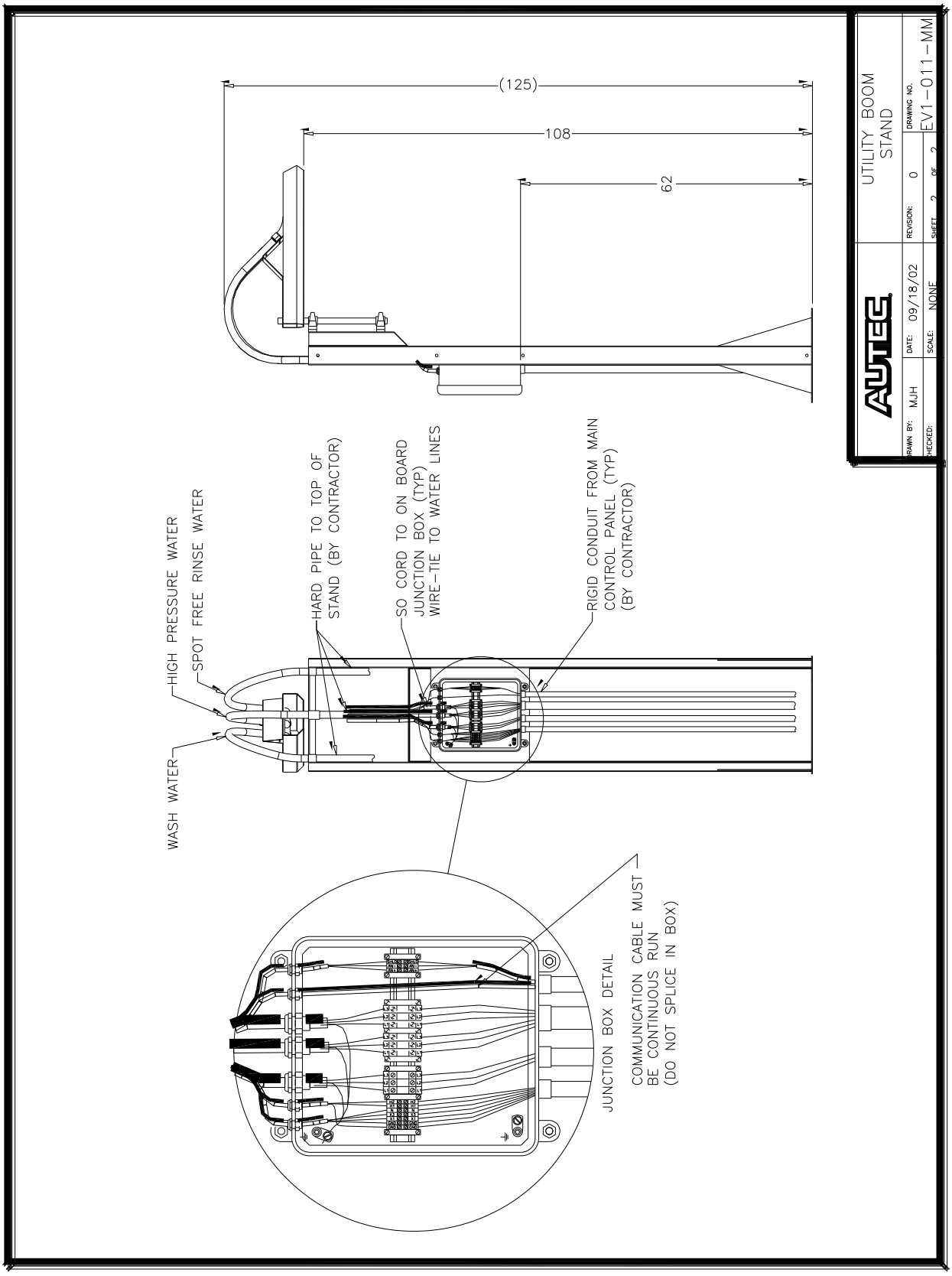
13. Temporarily tie Communication Cable to water lines in umbilical bundle or boom arms and move Carwash to each end of track and make sure Communication Cable flexes freely with no kinks or rubbing.

14. Starting at wall or boom stand, begin fastening Communication Cable to water line using wire ties. ***MAKE SURE TO LEAVE ENOUGH SLACK AT ALL PIVOT POINTS SO THAT COMMUNICATION CABLE IS NOT STRETCHED WHEN IT FLEXES***.

15. Push washer to each end of track and re-check cable bundle to ensure there are no kinks or rubbing.

16. Route Communication Cable into Gantry Junction Box and plug it into the top port of the B&R coupler as shown on schematic sheet 7.

17. After the electrician has made all final connections, re-check all the connections to ensure that they have been properly made. Do not attempt to turn power on until all connections have been checked.


(125)
108
62
HIGH PRESSURE WATER
SPOT FREE RINSE WATER
WASH WATER
HARD PIPE TO TOP OF STAND (BY CONTRACTOR)
SO CORD TO ON BOARD JUNCTION BOX (TYP) WIRE-TIE TO WATER LINES
RIGID CONDUIT FROM MAIN CONTROL PANEL (TYP) (BY CONTRACTOR)
JUNCTION BOX DETAIL
COMMUNICATION CABLE MUST BE CONTINUOUS RUN (DO NOT SPLICE IN BOX)
AUTEC
UTILITY BOOM STAND
DRAWN BY: MJH
DATE: 09/18/02
REVISION: 0
DRAWING NO. EV1-011-MM
CHECKED:
SCALE: NONE
SHEET 2 OF 2

K. Setup Procedure

Verify I/0

Refer to the software section of the manual to identify all input and output devices.

a. Checking Outputs (Main Control Panel and Gantry Junction Box) – Connect the TP700 Touch Panel to the main PLC and go to the Manual Force Page. (See Section 7)*.* Force each output, one at a time, and verify that the proper output is energized. Check all outputs both in the Main Control Panel (R0-R40) and the Gantry Junction Box (S0-S26). If a device doesn't come on or if the fuse blows, trace that circuit to its destination to identify and remedy the problem. This is a beneficial procedure since all devices can be individually tested.

b. Checking Inputs (Main Control Panel and Gantry Junction Box) – Manually activate input devices, one at a time, and verify the correct input light illuminates on the TP700 panel. Note that some inputs are **Normally Closed (NC)** and the light on the TP700 panel will extinguish when the input changes state. Check all inputs both in the Main Control Panel (A0-A45) and the Gantry Junction Box (B0-B11). (Note: Not all inputs will be used.) If an input light doesn't come on (or go off if NC), trace that circuit to identify and remedy the problem.

Hydraulic Adjustments

Go to the Manual Operation Screen on the TP700 to energize hydraulic outputs. (See Section 7 – TP700 Logic Touch Control Panel)

CAUTION: When making adjustments on brushes make sure you are wearing no loose clothing or jewelry that can become entangled in brushes.

Hydraulic speed adjustments are made on the Main Hydraulic Manifold located in top center of the passenger side cabinet (see drawing 895010). The main components of the Main Hydraulic Manifold are:

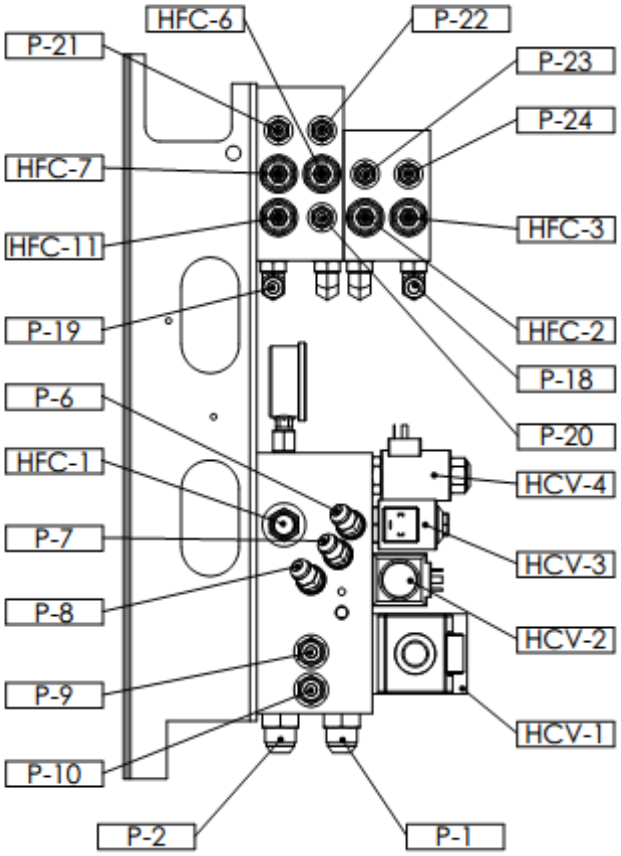
a. Hydraulic Directional Control Valves

These are either 2 or 4-way valves that start and stop hydraulic flow and/or reverse direction of flow. They include:

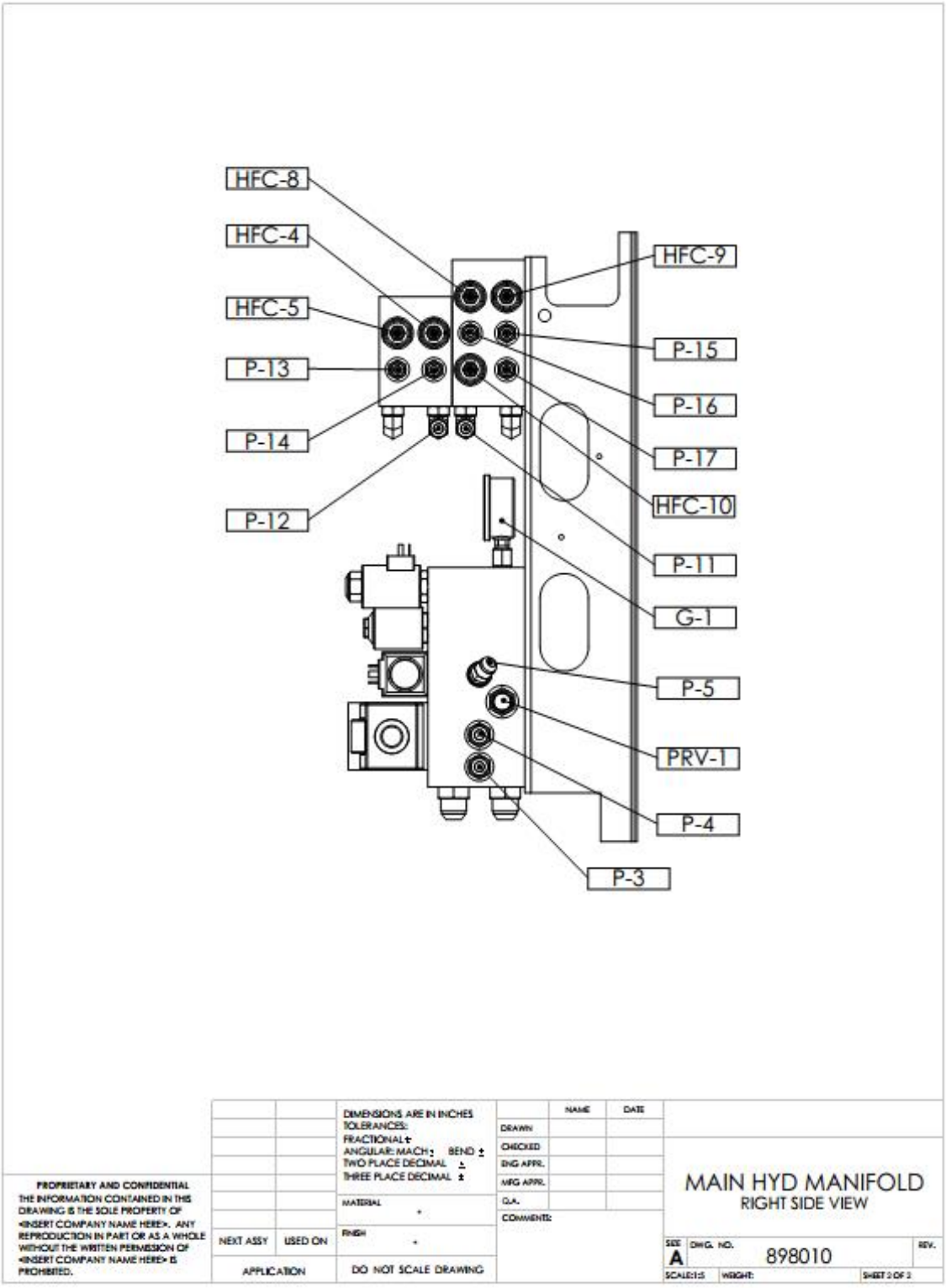
1. HCV-1 – Brush Rotate 4-way Valve: Turns on/off and determines direction of side brush rotation and Mitter oscillation.

2. HVC-2 – Gantry Drive 4-way Valve: Turns on/off and determines direction of gantry travel.

3. HCV-3 – Nozzle Oscillate Valve: Turns on/off nozzle oscillation.



				NAME	DATE	
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ± ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL ± THREE PLACE DECIMAL ±	DRAWN			MAIN HYD MANIFOLD LEFT SIDE VIEW
			CHECKED			
			ENG APPR.			
			MFG APPR.			
		MATERIAL	Q.A.			
NEXT ASSY	USED ON	FINISH	COMMENTS:			SIZE A · DWG. NO. 898010 · REV.
APPLICATION		DO NOT SCALE DRAWING				SCALE:1:5 · WEIGHT: · SHEET 1 OF 2



b. Hydraulic Flow Control Valves

These valves regulate the speed of oscillation or various functions controlled by hydraulic motors. To adjust, loosen the jam nut and then turn the adjusting screw

in (clockwise) to slow the speed or out (counter-clockwise) to increase the speed. Make sure to retighten the jam nut after adjustment. The Flow Control Valves include:

1. HFC-1 – High Pressure Nozzle Oscillate
2. HFC-2 – Passenger Side Front Brush Forward Rotate
3. HFC-3 – Passenger Side Front Brush Reverse Rotate
4. HFC-4 – Passenger Side Rear Brush Forward Rotate
5. HFC-5 – Passenger Side Rear Brush Reverse Rotate
6. HFC-6 – Driver Side Front Brush Forward Rotate
7. HFC-7 – Driver Side Front Brush Reverse Rotate
8. HFC-8 – Driver Side Rear Brush Forward Rotate
9. HFC-9 – Driver Side Rear Brush Reverse Rotate
10. HFC-10 – Mitter Oscillate – Forward Travel
11. HFC-11 – Mitter Oscillate – Reverse Travel

c. Hydraulic Ports

Plumbing to and from the Main Hydraulic/Distribution Manifold includes:

1. P-1 – Return line to Heat Exchanger (3/4”)
2. P-2 – Pressure line from High Pressure Filter (3/4”)
3. P-3 – Line to Port P-11 on Distribution Manifold (1/2”)
4. P-4 – Line to Port P-12 on Distribution Manifold (1/2”)
5. P-5 – Line to Driver Side Gantry Drive Motor (3/8”)
6. P-6 – Line to Driver Side Nozzle Oscillate Motor (3/8”)
7. P-7 – Line to Passenger Side Nozzle Oscillate Motor (3/8”)
8. P-8 – Line to Passenger Side Gantry Drive Motor (3/8”)
9. P-9 – Line to Port P-19 on Distribution Manifold (1/2”)
10. P-10 – Line to Port P-18 on Distribution Manifold (1/2”)
11. P-11 – Line to Port P-3 on Distribution Manifold (1/2”)
12. P-12 – Line to Port P-4 on Distribution Manifold (1/2”)
13. P-13 – Line to Front Passenger Side Brush Motor – Inside (3/8”)
14. P-14 – Line to Front Passenger Side Brush Motor – Outside (3/8”)
15. P-15 – Line to Front Driver Side Brush Motor – Outside (3/8”)
16. P-16 – Line to Front Driver Side Brush Motor – Inside (3/8”)
17. P-17 – Line to Mitter Oscillate Motor - Fwd (3/8”)
18. P-18 – Line to Port P-10 on Distribution Manifold (1/2”)
19. P-19 – Line to Port P-9 on Distribution Manifold (1/2”)
20. P-20 – Line to Mitter Oscillate Motor – Rev (3/8”)

d. Miscellaneous Items

1. PRV-1 – Pressure Relief Valve set to 1350 psi.
2. G-1 – Pressure Gauge – System pressure set to 975 psi.

e. Arm Rotation Speed

To check speed of side brush arms, place a mark on all drive couplings above brushes. The brush speeds are controlled by flow control valves

located on the distribution manifolds inside the passenger side cabinet (See drawing 898010).

1. Activate Forward Brush Rotation from the TP700 panel. When brushes are turning in this direction, flow control valves HFC-2 and HFC-6 control the speed of the front brushes and HFC-4 and HFC-8 control the speed of the rear brushes. Start adjustment by turning the screw all the way in and back out three complete turns. Turning the screw clockwise slows brush speed. The recommended speed is 78 RPM. Lock down adjustment screw jam nut after speed is set.

2. Activate Reverse Brush Rotation from the TP700 panel. When brushes reverse direction, the speed is controlled by HFC-3 and HFC-7 for the front brushes and HFC-5 and HFC-9 for the rear brushes. Follow instructions above to make adjustments.

f. Mitter Oscillate Speed

Flow control valve HFC-10 controls the speed during forward travel and flow control valve HFC-11 controls the speed during reverse rotate. A good starting point is to run adjusting screw all the way in and back out two and one half turns. Turning the screw clockwise slows speed. The recommended speed is 28 RPM. Be sure to lock down adjustment screw jam nut when completed.

g. High-Pressure Nozzle Oscillate Speed

Energize the HP Nozzle Oscillate valve and verify the hydraulic pressure is at ±750 PSI (gauge is on Main Hydraulic Manifold located inside the driver side cabinet. The speed control valve on the top side of the main hydraulic manifold controls the speed the high-pressure nozzles oscillate (see drawing 260-007-AH). The recommended speed is 80 RPM. Lock down adjustment screw jam nut.

h. High Pressure nozzle Adjustments

Adjust the High Pressure Nozzles as follows: (refer to Drawing No. 260-024-MM)

1. Top header nozzles – at the maximum oscillator down stroke the top nozzles should point straight down, and at the maximum oscillator up stroke the top nozzles should shoot water approximately 1-2” below the center point of the header.

2. Side Top Nozzles – Look through the hole in the nozzle and you should see the top header nozzle on the opposite side of gantry when the oscillator is at the maximum up stroke.

3. Bottom Side Nozzle – Mark a line 16-18 inches from inside edge of the track. At the minimum oscillator stroke (bottom of stroke) look through the hole in the nozzle. You should see the line that you marked centered in the hole.

4. The top and bottom side nozzles should overlap in their oscillations.

5. Rocker panel – Mark a line 16-18 inches from inside edge of the track. At bottom of the oscillation the rocker blaster water stream should be hitting this line, and not any closer to the track.

i. Pneumatic Adjustments

Pneumatic adjustments are made on the Air Control Panel located in the Driver Side Cabinet (See drawing EV1-015-MP).

1. **Main Air Filter / Regulator**
   The main air filter/regulator is located on the top of the Air Control Panel and should be set at approximately 100 psi. To make adjustments, pull up the black knob on top of the unit and turn clockwise to increase pressure and counter-clockwise to decrease pressure. Once the regulator is adjusted to the desired pressure, push down the black knob to lock adjustment.

2. **Air Pressure Switch**
   A low pressure safety switch is located immediately to the right of the main filter / regulator and is factory set at 65 psi. This switch is designed to shut down the machine is the main air supply falls below 65 psi to prevent damage due to inadequate air pressure to properly control the machine.

3. **Oiler / Lubricator**
   A pneumatic lubricator is located to the right of the filter/regulator and air pressure switch.

4. **Side Brush Arm Engagement Pressure**
   Each side brush is controlled by an individual regulator located on the upper half of the pneumatic air panel set at approximately 65 psi. The arm pressure should be adjusted so that there is approximately 9” to 12” of crush against the vehicle. Note that the trailing arm will crush more against the vehicle than the leading arm meaning that the entrance side arms will engage tighter against the vehicle than the exit side arms as the wash gantry moves from the rear of the vehicle towards the front of the vehicle and the exit side arms will engage tighter as the wash gantry moves from the front of the vehicle towards the rear of the vehicle. Therefore you should examine the amount of engagement during both directions of travel and set the arms so that the average engagement for both directions is approximately 9 to 12 inches.

5. **Side Brush Arm Retract Pressure**
   The retract pressure that opens the arms away from the vehicle is controlled by a single regulator located on the right side of the Air Control Panel approximately half way down and is set at approximately 25 psi. This regulator provides constant air pressure to the “blind” side of the side brush air cylinders

and causes the arms to open or remain open if the Side Brush Air In Valve is not energized.

6. **Mitter Retract Speed**
   To adjust speed of Mitter retract there are four flow control valves on the lower left side of the main air panel. The upper two flow controls adjust the speed the Mitter closes or goes down at the start of the wash. The lower two flow control valves adjust the speed the Mitter opens or raises at the end of the wash. These should be adjusted so that the Mitter takes approximately two seconds to either open or close.

7. **Rear Jog Adjustment**
   To adjust the rear jog a car should be in position in the bay. Run a wash package which includes a friction wash pass. The first two adjustments are made prior to starting the washer.

   a. Locate the air control panel on the driver side of the washer (See drawing EV1-015-MP). The two air regulators on the right side of control panel, labeled rear arm, have bleeder valves on the bottom of each solenoid valve. These bleeder valves control how fast the rear arms open during the rear jog. Turning clockwise or tightening adjustment screws will keep the arms from coming out as fast. Turning counterclockwise or loosening screws will allow arms to open faster. Start adjustment by turning screw all the way in and backing off one half turn. Tighten jam nuts once adjustment is complete.

   b. The proximity switch to activate the rear jog is mounted on the driver's side of the frame above the rear arm. The actuator plate for the proximity switch must be mounted across the top of the arm where bolts are located. (The actuator plate is attached to the side of the frame for shipping). It should be installed within approximately 1/4" of the proximity switch. There is a pilot light on the side of the proximity switch that will come on when it is activated. Push the arm closed until the pilot light comes on. The first section of the arm closest to the washer should be parallel to the track. The proximity switch mounting bracket is slotted to allow adjustment. Loosen nuts on proximity switch and adjust as required.

   c. There are four timers that control the function of the rear jog. They are located in registers 12, 13, 14 and 15.

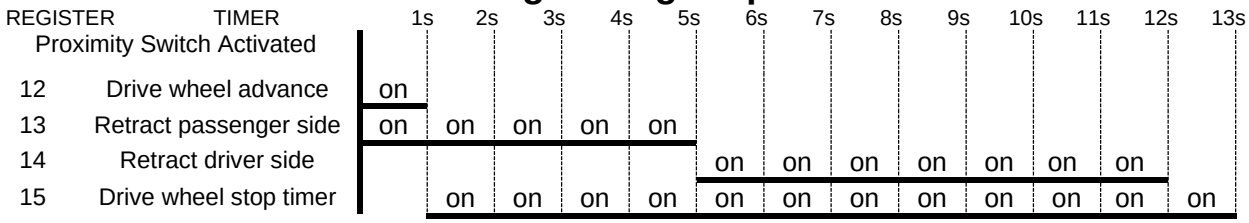
      1. Timer 12 is factory set at one second. This timer is started when the rear arm proximity switch is activated indicating the rear of the vehicle has been found. The washer will continue to travel until this timer times out, then stop the drive wheels to allow the rear jog operation. If the washer is consistently going beyond the vehicle, lower the value in the register and it will stop sooner.

2. Timer 13 is factory set at five seconds. This timer is also started when the rear arm proximity switch is activated indicating the rear of the vehicle has been found. It retracts the passenger side rear arm to allow the driver's side arm to clean beyond the center of the vehicle.

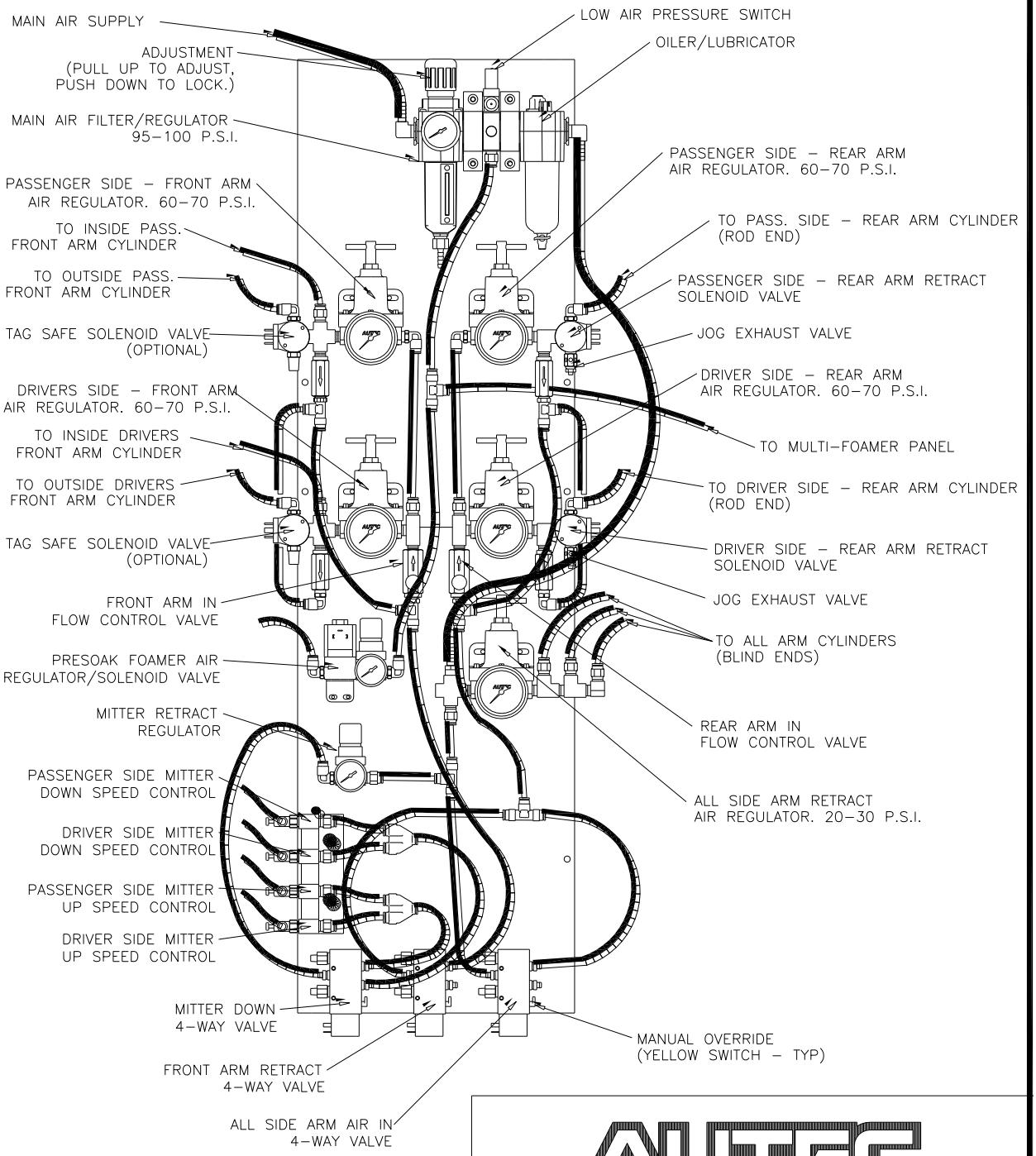
3. Timer 14 is factory set at seven seconds and starts when timer 13 times out. This timer retracts the driver's side rear arm for seven seconds to allow the passenger side arm to clean beyond the center of the vehicle.

4. Timer 15 is the drive wheel stop timer and is factory set for thirteen seconds. When this timer times out the washer will resume traveling toward the entrance end of the bay.

Rear Jog Timing Sequence



AIR CONTROL PANEL
AES–EV1 SERIES VEHICLE WASHER



j. High Pressure Creep

Check and adjust the timer values for the high-pressure front and rear end creep (see table at end of section). Note: Adjust photoeye parameters listed above before adjusting the HP parameters below. Anytime you need to change the photoeye parameters you will need to go back and check/adjust the HP parameters as well.

1. Adjust parameter #60 (Delay Creep on FWD HP Pass) so that the high-pressure water stream will be approximately 2 inches away from the rear of the vehicle when the gantry starts into creep speed. So on the forward moving pass, the gantry will move at regular speed until it is 2 inches behind the vehicle, then slow to creep speed to make sure the rear of the vehicle gets adequate high pressure "scrubbing". Adjust parameter #120 (Fwd High Pressure Creep Timer) for the amount of time the gantry should stay in creep before resuming the normal pass speed, usually so that the about foot or so of the end of the vehicle is covered by the creep HP spray.

2. Adjust parameter #61 (Delay Creep on Rev HP Pass) so that the high pressure water stream will be approximately 2 inches away from the front of the vehicle when the gantry starts into creep speed. So on the rearward moving pass, the gantry will move at regular speed until it is 2 inches in front of the vehicle, then slow to creep speed to make sure the front of the vehicle gets adequate high pressure scrubbing. Adjust parameter #121 (Rev High Pressure Creep Timer) for the amount of time the gantry should stay in creep before resuming the normal pass speed. **On the front of the vehicle the rocker panel blasters will be more important as far as the distance to travel in creep speed**, so use parameter 121 to make sure the rocker blaster creeps at least as far as the front wheel well.

3. Adjust the creep speed parameter (#122) so that the gantry goes slow enough to properly clean the ends of the vehicle. This will typically be near 25% depending on the machine's proportional speed valve setup.

k. Wash Pass Setup

Note the following when setting up your wash passes. Refer to Section 7 for specific instructions for wash package setup.

1. Adjust the rinse/chemical pause timer (#109) to help with the chemical coverage. Start at 2.5 seconds, and increase if necessary to get good chemical coverage on ends of vehicle

2. Presoak and Rinse passes will probably need to be run at a speed near 65%, while high pressure passes (and rocker) should run at 50-55%. These percentages depend on how the proportional speed valve was adjusted in step 2-b above. The presoak/rinse passes should go end-to-end in about 20-30 seconds, while the high pressure passes should go about 30-40 seconds from end-to-end. IF YOU RUN TOO FAST YOU WILL NOT GET GOOD

COVERAGE OF PRESOAK CHEMICAL ON THE VEHICLE, YOU WILL NOT GET A GOOD HIGH PRESSURE "SCRUB", OR YOU WILL NOT GET A GOOD RINSE!

3. If presoak is unbalanced (chemical comes out of nozzles on one side, air comes out of nozzles on other side of vehicle) make sure that the foamer air is adjusted correctly. This solenoid is located in the gantry side panel (red air line)…adjust to ±20PSI.

Partial list for reference only - Refer to Section 8 for a complete list of timers and registers.

Parameter	Description	Typical Range	Start Value
60-Delay creep on Fwd HP pass	Amount of time that the gantry will travel forward at the start of a High Pressure pass before going into the High Pressure Creep mode (see register 120)	1 - 3	2
61-Delay creep on Rev HP pass	Amount of time that the gantry will travel in reverse at the start of a High Pressure pass before going into the High Pressure Creep mode (see register 121)	1 - 3	1.5
109-Pause before Rinse\Chem Pass	Amount of time that gantry will pause between a Rinse/Wash/Chemical pass to allow the chemical/water from the prior pass to turn off and allow the new chemical/water for the upcoming pass to come on. Useful for ensuring that chemicals have time to get from the pump to the nozzle before the pass starts to ensure coverage on entire vehicle.	2 - 4	2.5
114-Entrance Eye Gantry On Delay	Time Entrance Gantry Photoeye (input #111) must be blocked before activating eye.	0 - 1	0.5
115-Entrance Eye Gantry Off Delay	Time Entrance Gantry Photoeye (input #111) must be unblocked before de-activating eye.	0.5 - 2	1.2
116-Entrance Eye Travel Time	Time Gantry continues Reverse travel after Gantry Entrance Photoeye Off Delay (timer #115) is satisfied.	0 - 3	0.5
117-Exit Eye Gantry On Delay Time	Time Exit Gantry Photoeye (input #110) must be blocked before activating eye.	0 - 1	0.5
118-Exit Eye Gantry Off Delay Time	Time Exit Gantry Photoeye (input #110) must be unblocked before de-activating eye.	0.5 - 2	1.2

Parameter	Description	Typical Range	Start Value
119-Exit Eye Travel Time	Time Gantry continues Forward after Gantry Exit Photoeye Off Delay (timer #118) is satisfied.	0 - 3	0.5
120-Fwd High Pressure Creep Timer	Time Creep Speed is activated during Forward Travel of High Pressure Wash to increase time on rear of vehicle. This creep time will take place after the gantry has moved at regular speed for a programmable delay time (see register 60).	6 - 12	10
121-Rev High Pressure Creep Timer	Time Creep Speed is activated during Reverse Travel of High Pressure Wash to increase time on front of vehicle. This creep time will take place after the gantry has moved at regular speed for a programmable delay time (see register 61).	6 - 12	10
122-Creep Speed 0-100%	Speed Setting of gantry travel during front and rear slowdown for nose and rear scrubbing, expressed as a percentage of full speed.		25

I. Drive Speed

Drive speed is controlled by a fixed hydraulic valve located on the main hydraulic block HCV-4 (see drawing 895010). The valve allows infinite speed adjustment up to approximately 1 foot/sec. The valve can be controlled by adjusting the manual flow control of the hydraulic fluid. Some speeds are set with register values – The following registers control global drive speeds.

a. **Jog Speed** (register #133) – Controls how fast the washer moves during manual jog from either the LT-170 or the jog switch in the Main Control Panel. Speed is expressed as a percentage (0-100%) of flow through the hydraulic valve where 0% is stationary and 100% is top speed.

b. **Creep Speed** (register #122) – Control how fast the washer moves during front and rear slowdown for nose and rear scrubber. Speed is expressed as a percentage (0-100%) of flow through the hydraulic valve where 0% is stationary and 100% is top speed.

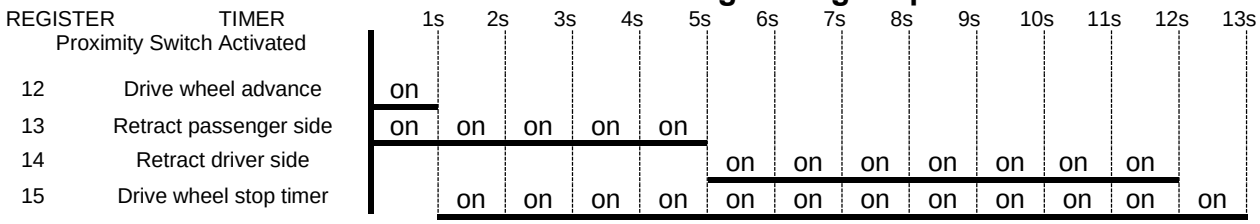
c. **Parking Speed** (register #123) – Controls how fast the washer moves back to its park position after a completed wash or after a drive off. Speed is expressed as a percentage (0-100%) of flow through the hydraulic valve where 0% is stationary and 100% is top speed.

d. **Speed Reference** – The following table shows the approximate travel time for a standard 26’ track.

Speed	Time	Speed	Time
10 %	126 seconds	60 %	27 seconds

20 %	80 seconds	70 %	22 seconds
30 %	56 seconds	80 %	19 seconds
40 %	42 seconds	90 %	18.5 seconds
50 %	32 seconds	100 %	18 seconds

e. **Rear Jog Timing Sequence**



m. Drive Speed Registers

The following registers control global drive speeds.

1. Jog Speed (register #133) – Controls how fast the washer moves during manual jog from either the TP700 or the jog switch in the Main Control Panel.

2. Creep Speed (register #122) – Controls how fast the washer moves during front and rear slowdown for nose and rear scrubber.

3. Parking Speed (register #123) – Controls how fast the washer moves back to park position after a completed wash or after a drive off.

4. Speed Reference – The following table shows the approximate travel time for a standard 26’ track.

Gantry Photoeyes – (Optional)

Check photoeyes and adjust alignment and timer values if necessary (see table at end of section).

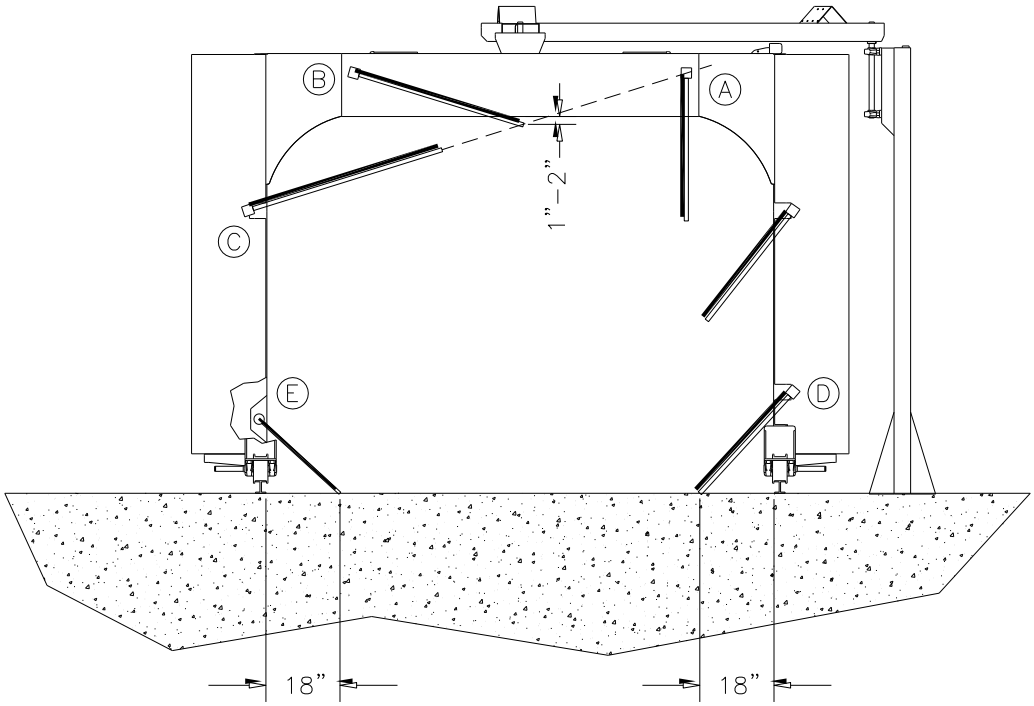
a. If gantry stops and reverses direction in the middle of a pass the photoeyes may need to be adjusted. This seems to be especially true with trucks. After checking mechanical adjustment/alignment of photoeyes check the photoeye timers (see below).

b. If gantry stops and reverses direction in the middle of a pass while traveling toward entrance end of the bay then adjust photoeye timer #115 (Entrance Eye Gantry Off Delay). Increase the amount of time by 1/2 second from the current setting and test again up to a maximum value of 1.5 seconds, using same vehicle that caused previous error if possible. If problem is still apparent and time value in parameter is at 1.5 seconds, then increase value by 0.1 second intervals and retest until problem no longer occurs.

c. If gantry stops and reverses direction in the middle of a pass while traveling toward exit end of the bay then adjust photoeye timer #118 (Exit Eye Gantry Off Delay). Increase the amount of time by 1/2 second from the current setting and test again up to a maximum value of 1.5 seconds, using same vehicle that caused previous error if possible. If problem is still apparent and time value in parameter is at 1.5 seconds, then increase value by 0.1 second intervals and retest until problem no longer occurs.

d. Adjust the photoeye parameter #116 (Forward Travel Time) so that the gantry travels past the rear of the vehicle by the desired distance. You want to go far enough past the vehicle that when the gantry reverses direction and starts the next pass back over the vehicle that the high pressure water is not already up on the trunk when it turns on. Be careful that the gantry does not go so far that the exit photoeye on the gantry passes the rear of the vehicle or it may cause other problems. If this occurs decrease parameter #116 by 0.1 second increments to get proper stop location.

e. Adjust the photoeye parameter #119 (Reverse Travel Time) so that the gantry travels past the front of the vehicle by the desired amount. You want to go far enough past the vehicle that when the gantry reverses direction and starts the next pass back over the vehicle that the high pressure water is not already up on the hood when it turns on. Be careful that the gantry does not go so far that the entrance photoeye on the gantry passes the front of the vehicle or it may cause other problems. If this occurs decrease parameter #119 by 0.1 second increments to get proper stop location. Also note that because of the location of the treadle switch relative to the exit end of the bay that the maximum travel may depend more on the travel proximity switch plate mounted to the floor than on this parameter.



A. Top header nozzles - At the maximum oscillator down stroke the top nozzles should point straight down.

B. Top header nozzles - At the maximum oscillator up stroke the top nozzles should shoot water approximately 1-2" below the center point of the header.

C. Side Top Nozzles - Look through the hole in the nozzle and you should see the top header nozzle on the opposite side of gantry when the oscillator is at the maximum up stroke.

D. Bottom Side Nozzle - Mark a line 16-18 inches from inside edge of the track. At the minimum oscillator stroke (bottom of stroke) look through the hole in the nozzle. You should see the line that you marked centered in the hole.

E. Rocker panel - Mark a line 16-18 inches from inside edge of the track. At bottom of the oscillation the rocker blaster water stream should be hitting this line, and not any closer to the track.

AUTEC	HP NOZZLE ADJUSTMENT	SHT. 1 OF 1
DATE: 1/17/06	DWG. NO. ATF-024-MM	REV. 0

Section 7 – Machine and Wash Configuration

ATP700 Touch Screen Control Panel

1. **Introduction**
   The ATP700 is a digital display touch screen available on all AUTEC machines with a Siemens S7-1200 PLC. The ATP700 can be used to set up all machine and wash options, as well as monitor all inputs and outputs in real time. Also, outputs can be selectively energized to operate specific functions. This enables the carwash operator or service technician to check specific functions as well as perform set-up and adjustments from a keypad.

2. **Installation**
   The ATP700 can either be installed in a permanent enclosure at a specific site or mounted in a portable enclosure for use at multiple sites. Regardless of whether the ATP700 is a permanent or portable installation, the communications and electrical connections are the same.

   a. Communication Cable – Install an Ethernet patch cable between these 2 ports as shown on Schematic Sheet 7:

      1. ATP700– Plug the Ethernet patch cable into either port labeled PROFINET (LAN). Plug the other end into any of port 1-3 of the eWON or port 2-4 of the Stridelinx.
      2. Router
         1. eWON Cosy– Plug the Internet Providers Ethernet cable into port 4.
         2. Stridelinx – Plug the Internet Providers Ethernet cable into port 1.

   b. Power Cable – Install the green power plug onto the gray 2-conductor cable provided and plug into the ATP700. Attach the other end to +/-24 VDC in the Main Control Panel.

HMI Power Plug

3. **Main Menu**
   The Main Menu screen displays the type of Machine is operational, displays the version of the PLC & of the HMI software that is currently running, and the Menu buttons that are divided into 11 sections along the bottom of the screen. (Figure 7-1). To make a selection on the screen, lightly press the screen with your finger or soft pointer (eraser tip, etc.).
   NOTE: Do not use sharp objects or apply excessive pressure or damage may result to the touch screen.

   a. Manual Wash
   b. Machine Configure
   c. Wash Configure
   d. Parameter Configure
   e. Manual Control
   f. System

g. Totalizing (Optional)
h. Trend Menu (Optional)
i. Alarms
j. Alarm History
k. Help

Figure 7-1 Main Menu

4. Manual Wash

Press the Manual Wash screen to activate a manual wash. This shows whether the car wash is in use and if so, which wash package is running. It also allows you to start Wash 1-9, simulate the treadle switch operation, go to a diagnostic screen, and reset faults. The on-screen traffic signals follow the actual traffic signals on the machine.

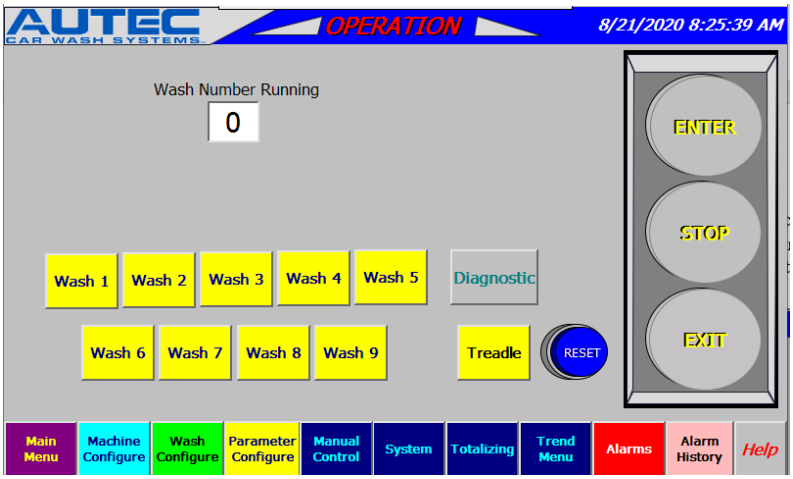


Figure 7-2 Manual Operation

5. **Machine Configure**
   Press the **Machine Configure** Button to open the Machine Configuration Screen (Fig. 7-3). Select all features that were installed at that location. These are site-specific features and will apply to all programmed wash packages. When the button is selected it will turn green but the red indicator on the button will remain red until the “Enter New Configuration” button is pressed, which activates the feature in the PLC. Selected features will appear green and will become available as the wash progresses. Press the Help button to view help on each button. Greyed out buttons indicate disabled feature with any particular machine model or unused buttons.

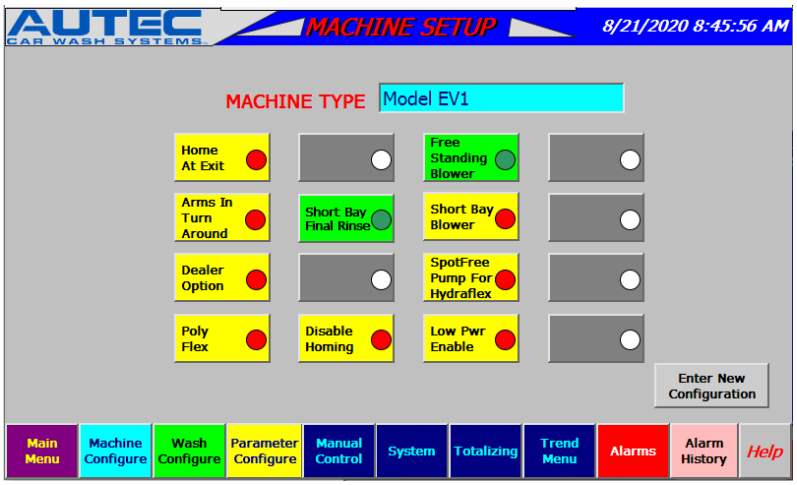


Figure 7-3 Site-Specific Machine Configuration

6. **Wash Configure**
   Press the numbered button corresponding to the wash to be programmed (wash #1, wash #2, etc.).

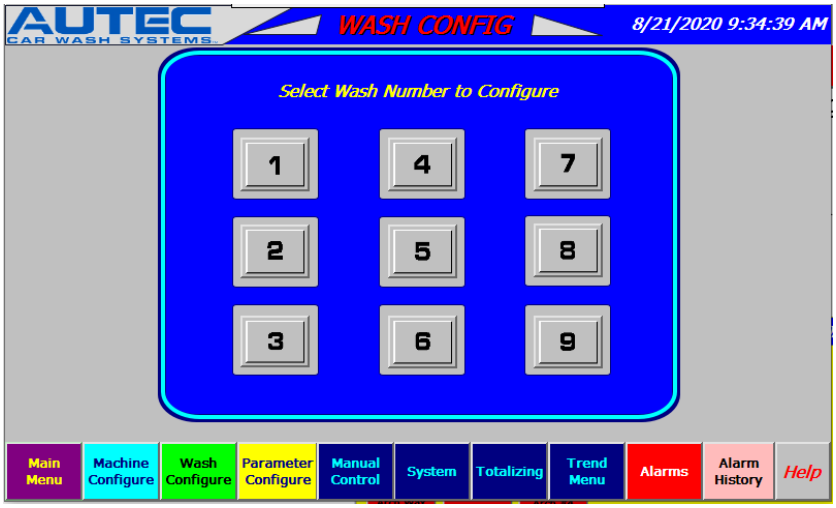


Figure 7-4 Wash Configure

a. Wash Configuration

Select the desired options from the Wash Configuration Options Screen (Fig. 7-5) that you want available in this wash. Selected options will turn green.

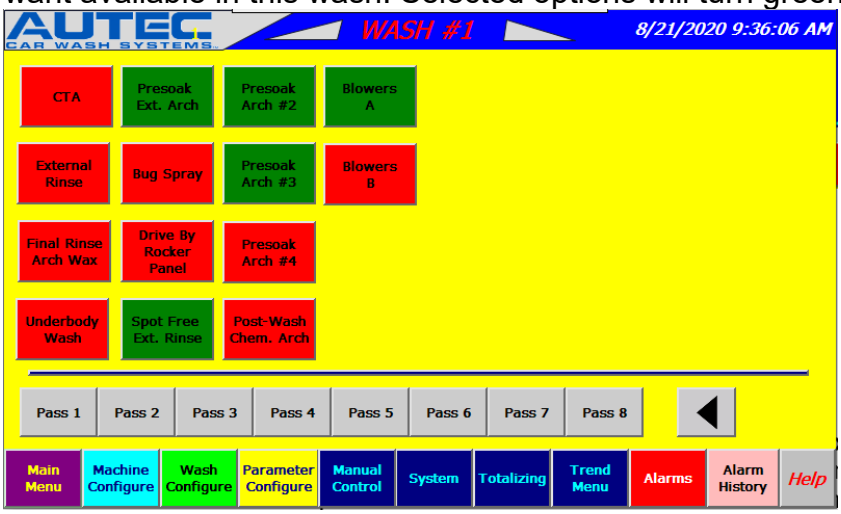


Figure 7-5 Wash Options

b. Pass Configuration

The second part of setting up a wash package involves defining wash passes. **A pass consists of a forward and reverse movement of the gantry.** Each Wash Configuration can consist of up to 8 passes. Press a **Pass #** button near the bottom to open the Pass Configuration Screen (Fig. 7-6). The currently selected Wash #, Pass #, and Pass Type are displayed across the top.

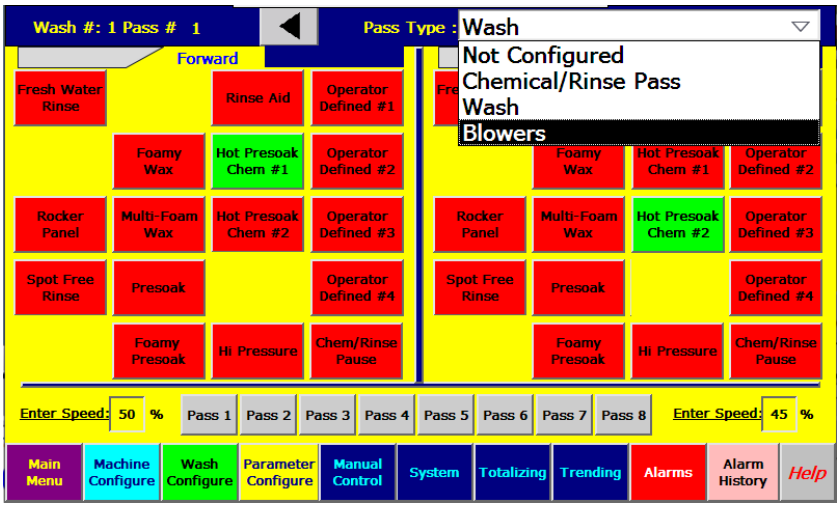


Figure 7-6 Pass Configuration

1. Press the **drop down arrow** at the top of the screen to select the desired pass type. The 4 types of passes are:
   a. Not Configured – the current pass is not configured.
   b. Chemical/Rinse Pass –Gantry will travel allowing the application of any combination of available water or chemical sources.
   c. Wash – Carriage will travel while doing high-pressure wash with chemical and water applications.
   d. Blowers – Carriage will travel and blowers activated.
   NOTE: As of 6/1/2020 all Chemical/Rinse Passes and Wash passes will and can do the same functions, whereas before they were limited to certain functions.
2. A pass consists of a forward and reverse movement of the gantry. The options for the forward movement are on the left half of the screen, and reverse options are on the right. Although, if the “Home at Exit” (located on the Machine Configure screen) is selected these will be reversed. Different buttons will be displayed depending on the Pass Type. Selected items will appear green.
   NOTE: As of 6/1/2020 all Chemical/Rinse Passes and Wash passes will and can do the same functions, whereas before they were limited to certain functions.

c. Pass Options

1. Both Chemical/Rinse Pass Options and Wash Options are now combined:

   a. Fresh Water Rinse – Applies Fresh Rinse Water through 12 side nozzles and 16 overhead nozzles.
   b. Rocker Panel – Applies High Pressure Water through eight turbo nozzles (four each side) to rocker panel area.
   c. Spot Free – Applies Spot Free Rinse Water through 12 side brush nozzles and 16 overhead nozzles.

d. Foamy Wax - Applies Foamy Wax through 4 foaming nozzles mounted on each corner of machine.
e. Multi-Foam Wax – Applies Foamy Wax through 6 foaming nozzles mounted in center of front and rear headers and on each corner of machine. Driver side, center, and passenger side will each be a different color.
f. Hot Presoak #1 Chemical – Injects chemical #1 into High Pressure Water.
g. Hot Presoak #2 Chemical – Injects chemical #2 into High Pressure Water.
h. High Pressure – Applies High Pressure Water through either 24 oscillating nozzles on entrance end or 24 oscillating nozzles on exit end. (Cannot be programmed with Rocker Panel on same pass.)
i. High Pressure Only – Applies water through entrance side nozzles during forward travel and exit side nozzles during reverse travel.
j. High Pressure with Friction – Applies water through exit side nozzles during forward travel and entrance side nozzles during reverse travel.
k. Rinse Aid – Injects Rinse Aid into Rinse Manifold (used with either Fresh Water Rinse or Spot Free Rinse)
l. Operator-Defined Options – These are buttons that allow site-specific customization. Each Operator Defined Option button is linked to an output on both the carriage and in the Main Control Panel. This allows an operator to program custom options on a specific pass.
m. Enter Speed – Allows speed control from 0 – 100% of full speed for both Forward & Reverse passes.

2. Blower Pass Options
Operator-Defined Options – These are buttons that allow site-specific customization. Each Operator Defined Option button is linked to an output on both the carriage and in the Main Control Panel. This allows an operator to program custom options on a specific pass.

7. **Parameter Configure**

a. Press the **Parameter Configure** Button to move to the first Parameter Configure Page (Figs 7 - 17). Press the **black arrows** at the top center to scroll through the parameters. Alternatively, use the **drop-down boxes** at the top right of the screen to jump to particular screens. Values are indicated in Seconds or Counts depending on the parameter type.

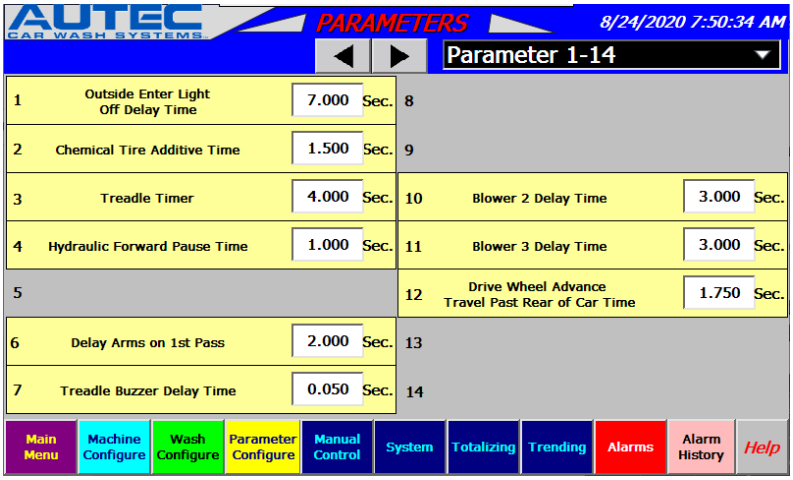


Figure 7-7 Parameter Configuration Par 1-14

b. To adjust a parameter, press its white **value field**, enter new value using **number keys**, and press the **Enter** button which is outlined in yellow in Figure 7-8 below.

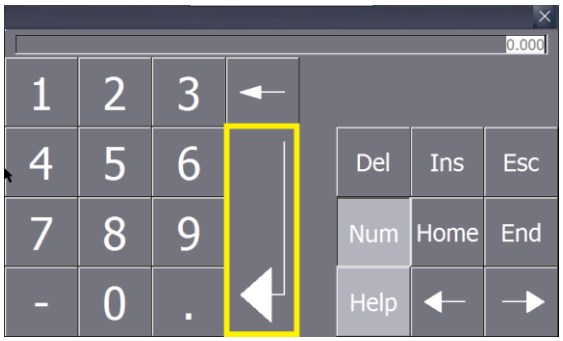


Figure 7-8 Edit Parameter Value & Press Enter

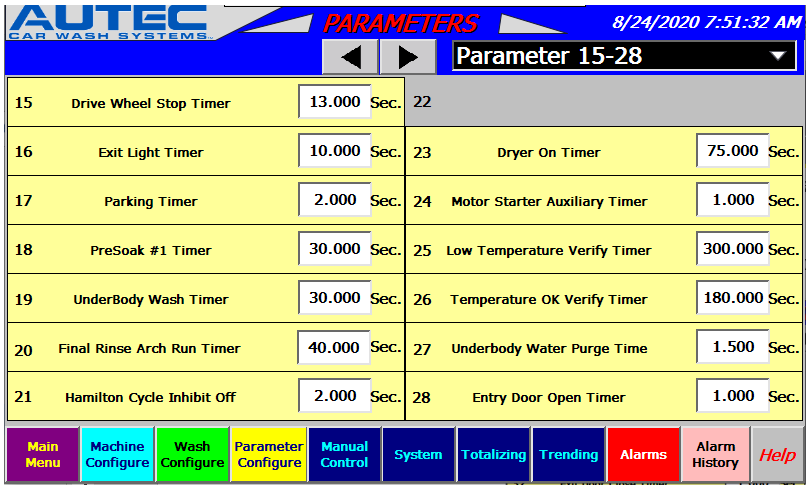


Figure 7-9 Parameter Configuration Par 15-28

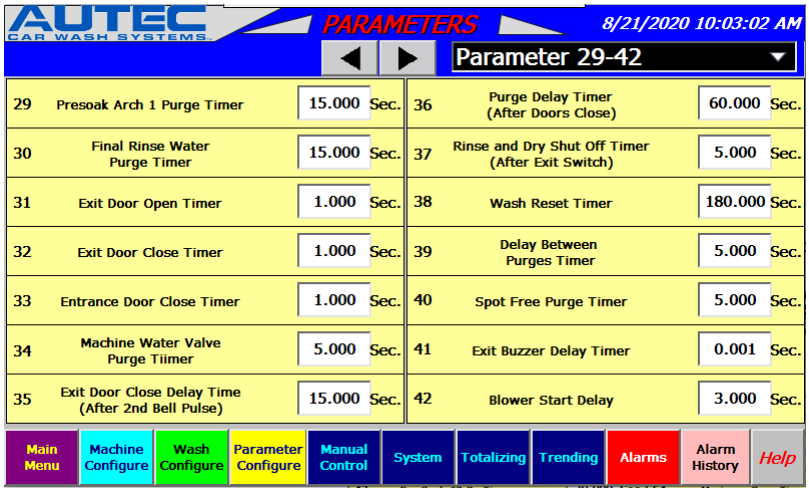


Figure 7-10 Parameter Configuration Par 29-42

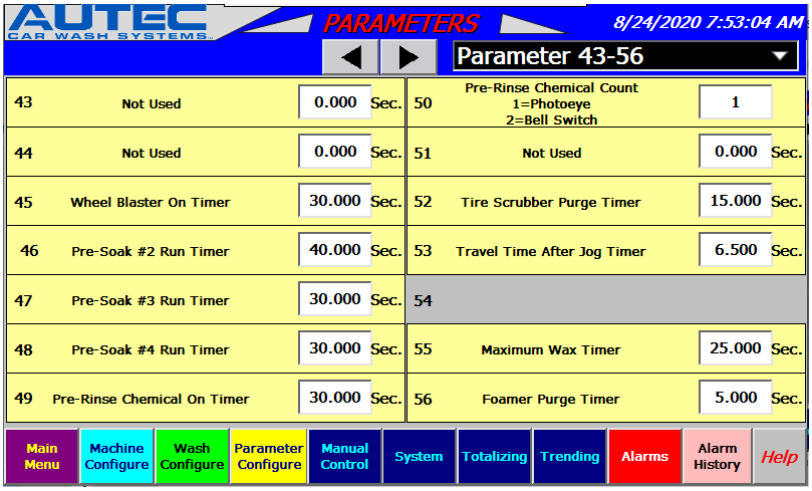


Figure 7-11 Parameter Configuration Par 43-56

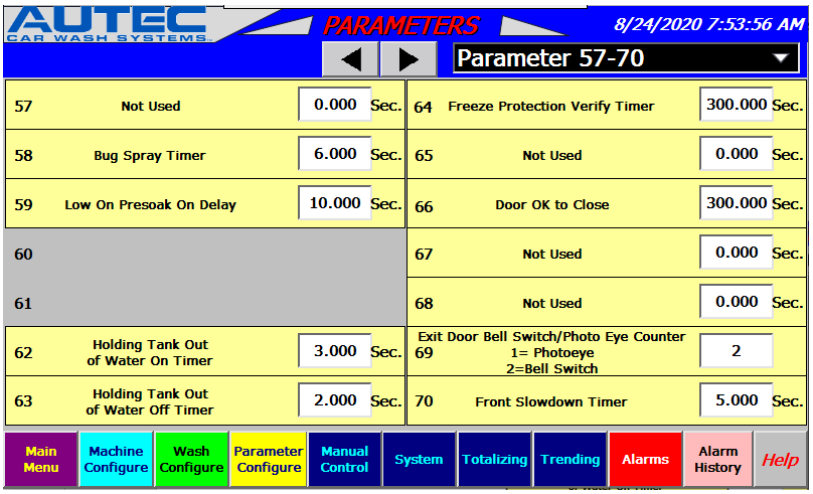


Figure 7-12 Parameter Configuration Par 57-70

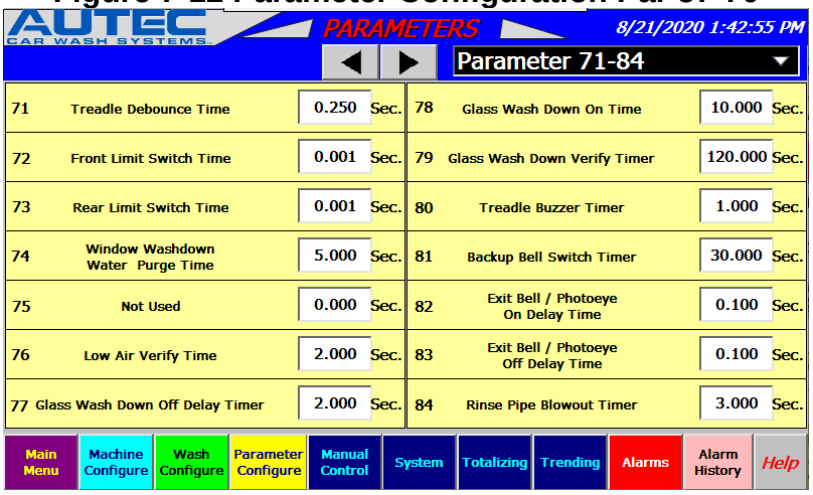


Figure 7-13 Parameter Configuration Par 71-84

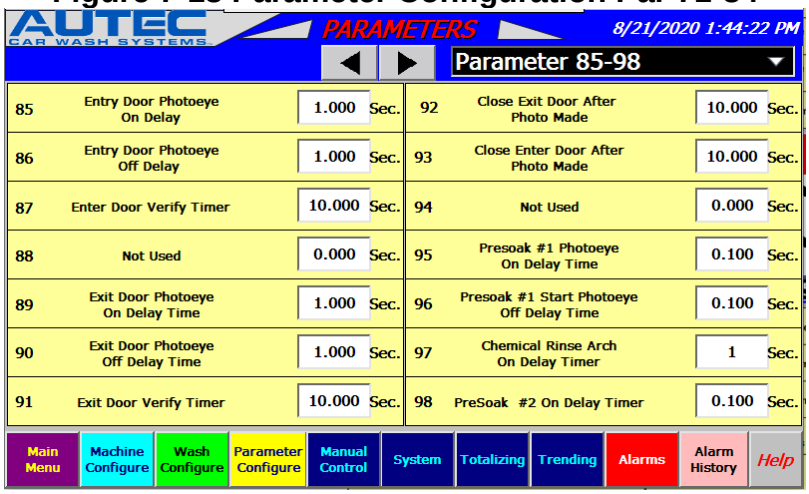


Figure 7-14 Parameter Configuration Par 85-98

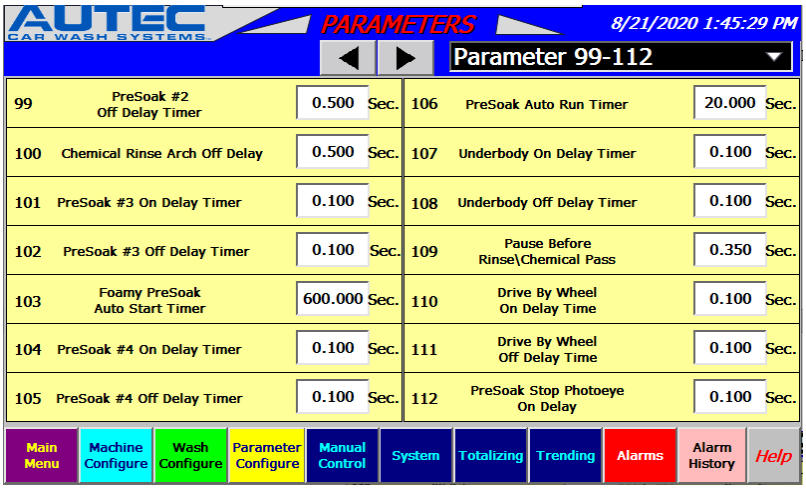


Figure 7-15 Parameter Configuration Par 99-112

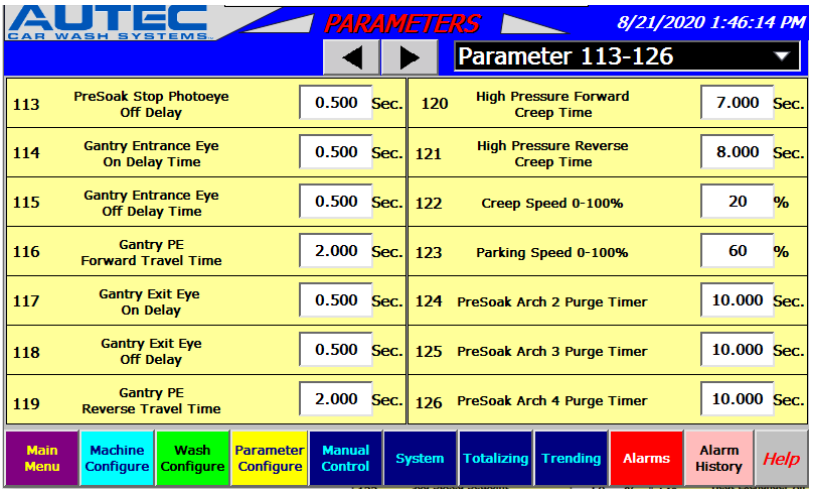


Figure 7-16 Parameter Configuration Par 113-126

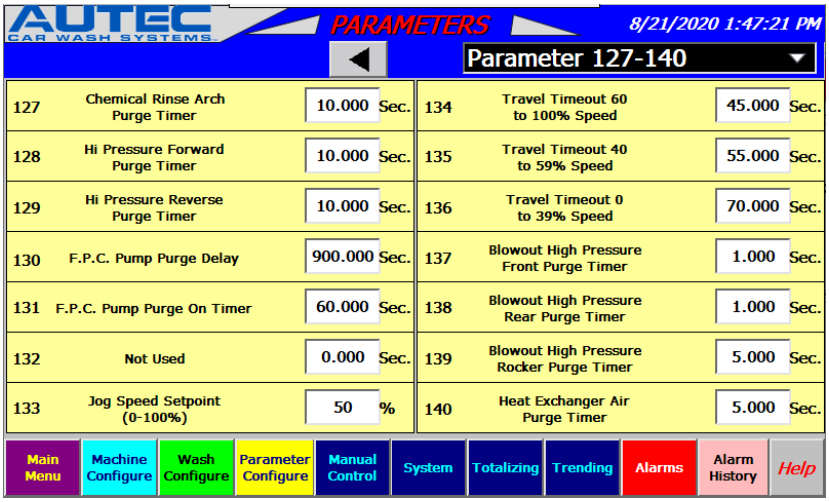


Figure 7-17 Parameter Configuration Par 127-140

8. **Manual Control**
   The Manual screen allows operation of specific outputs. Before outputs can be energized, the red **Auto/Manual Operation Switch** near the bottom of the screen must be moved to manual. The switch is circled in red in Fig. 7-18 below.

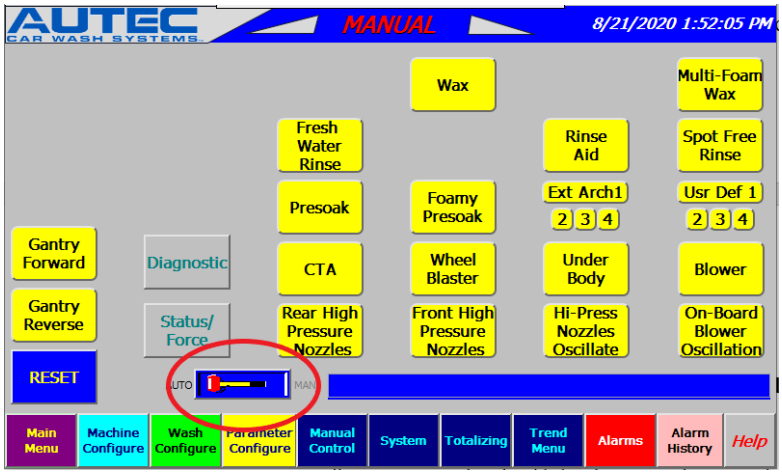


Figure 7-18 Auto/Manual switch in Auto position

a. Manual Operation Page – Controls for Mechanical Movement

1. **Gantry Travel Control**
   The gantry can be jogged forward or reverse by pressing the Gantry Forward or Gantry Reverse Buttons. The button must remain pressed for the duration of movement.
2. **Reset**
   Press the reset Button to de-energize all buttons.
3. **Help**
   The help button will display a text screen with descriptions/instructions.
4. **Status/Force**
   The Status/Force button will change the panel to the Status/Force screen.
5. **Fresh Water Rinse**
   Press the Fresh Water Rinse Button to Activate the Fresh Water Rinse Source and Arch. (Note: Both the Free Standing and Gantry Rinse Arch outputs will activate.)
6. **Presoak**
   Press the Presoak Button to activate the Presoak Chemical Pump. (Presoak chemical injected into the main wash water)
7. **CTA Control**
   Press the CTA Button to activate the CTA Chemical Pump.
8. **Front/Rear High Pressure Nozzles**
   Press either the Front or Rear High Pressure Nozzles Button to activate the High Pressure Pump and the Front or Rear Nozzles.
9. **Wax (Colorshield) Control**
   Press the Wax Button to activate the Wax Chemical Pump and Foaming Air.

10. **Wheel Blaster Control**
    Press the Wheel Blaster Button to activate the High Pressure Pump and the Wheel Blaster Nozzles.
11. **Multi-Foam Control**
    Press the Multi-Foam Soap or the Multi-Foam Wax to activate Multi-Foam Chemical Pumps and Foaming Air.
12. **Rinse Aid**
    Press the Rinse Aid Button to activate the Rinse Aid Pump.
13. **Underbody**
    Press the Underbody Button to activate the Underbody Wash Feature.
14. **High Pressure Nozzle Oscillate**
    Press the High Pressure Nozzle Oscillate Button to oscillate the High Pressure Nozzles.
15. **Spot Free Rinse**
    Press the Spot Free Rinse Button to Activate the Spot Free Rinse Source and Arch. (Note: Both the Free Standing and Gantry Rinse Arch outputs will activate.)
16. **Blower**
    Press the Blower Button to start the Blower Motors.
17. **Blower Oscillation Control**
    Press the Blower Oscillation Button to oscillate the Gantry Blowers.

b. Input / Output Status Screens (Figs. 7-19 – 7-28)

Press the Status / Force Button from the Manual Screen to move to the Input / Output Status Screens. These screens allow you to monitor the status of any input or output and allow you to force any Main or Gantry output to energize – if the Auto/Manual switch is in Manual. Energized inputs/outputs will appear green while de-energized inputs/outputs appear yellow. Use the Previous/Next Buttons ◄► near the top left to move between screens. Alternatively, use the drop-down arrows ▽ at the top right of the screen to jump to particular screens.

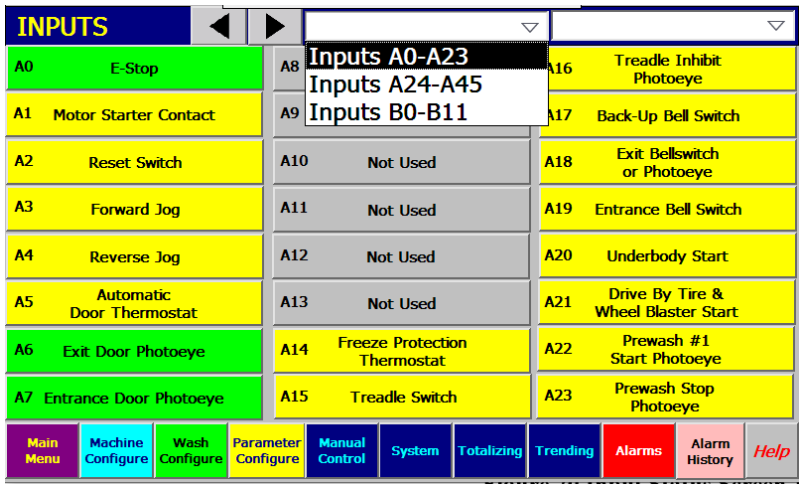


Figure 7-19 Inputs Drop Down Box

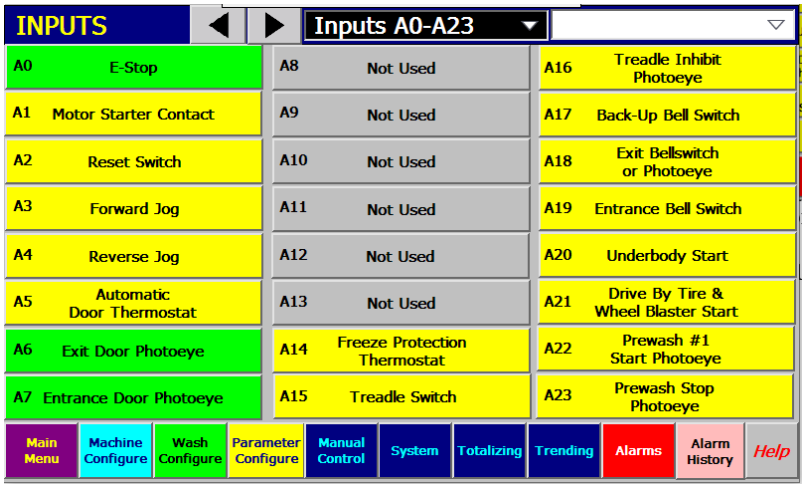


Figure 7-20 Input Status A0-A23

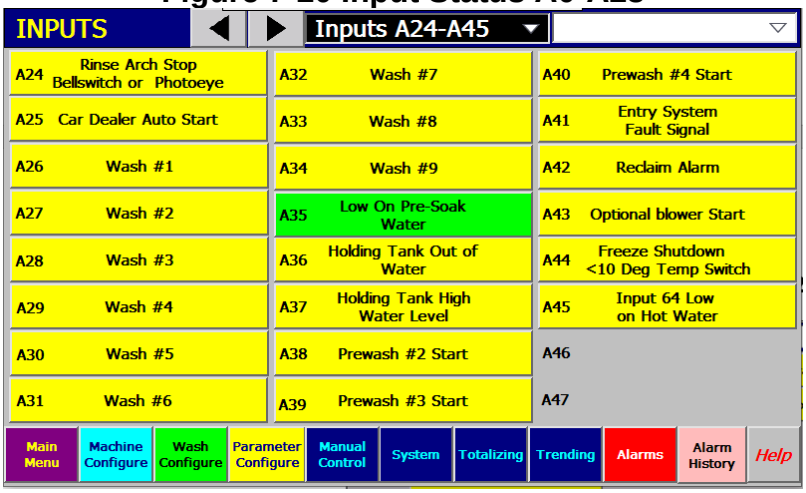


Figure7- 21 Input Status A24-A45

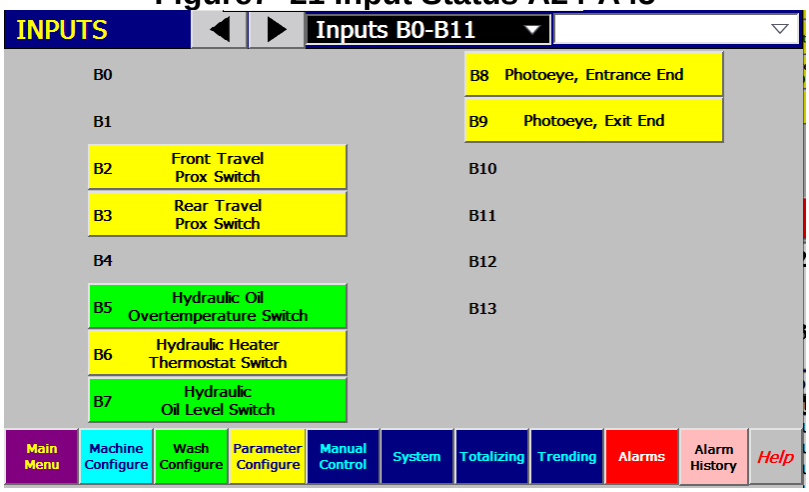


Figure 7-22 Input Status B2-B9

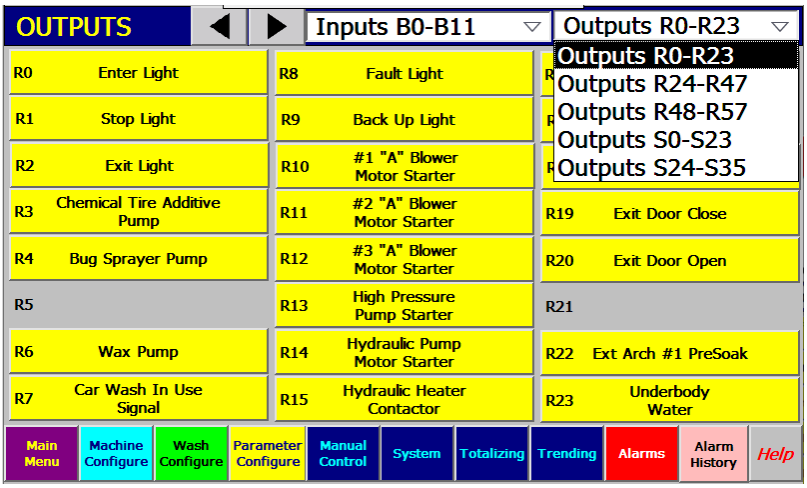


Figure 7-23 Outputs Drop Down Box

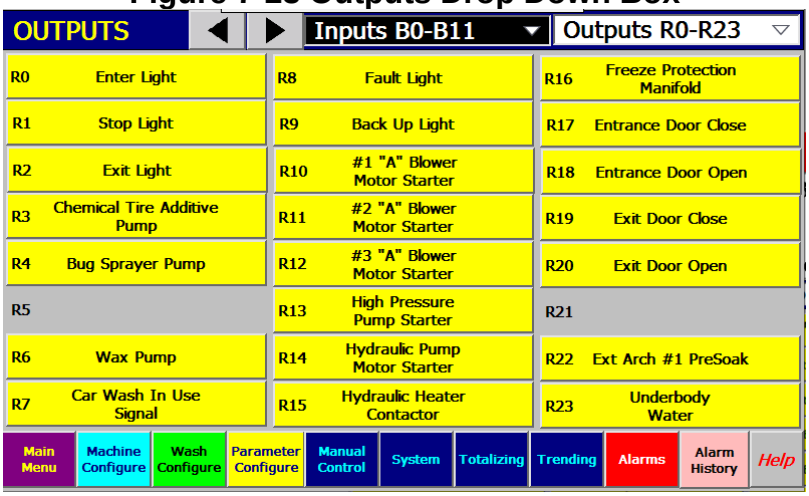


Figure 7-24 Output Status R0-R23

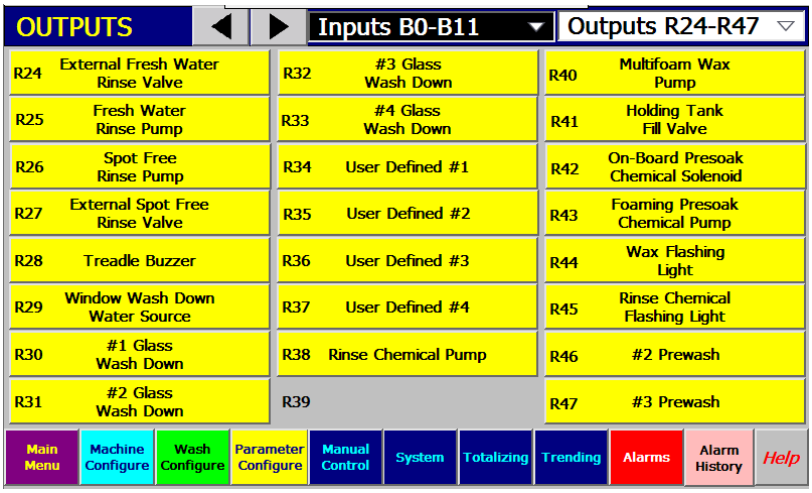


Figure 7-25 Output Status R24-R47

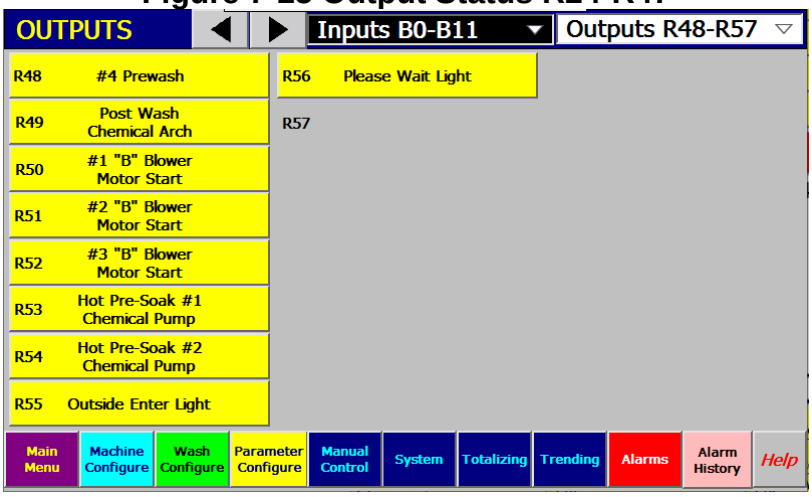


Figure 7-26 Output Status R48-R57

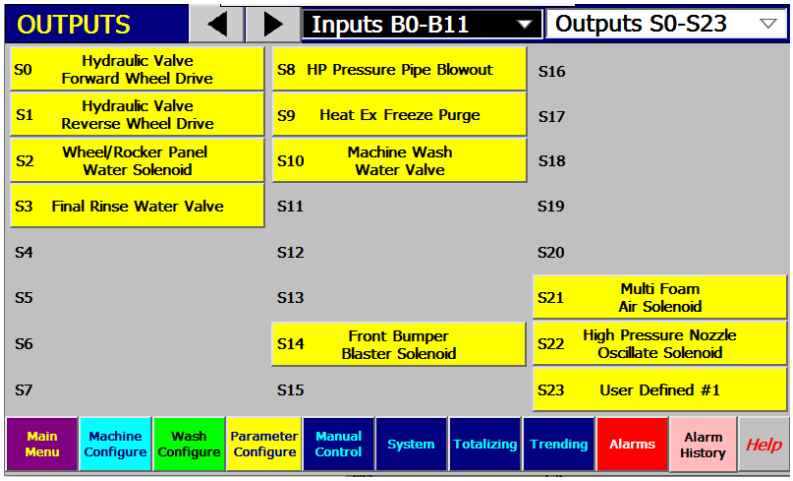


Figure 7-27 Output Status S0-S23

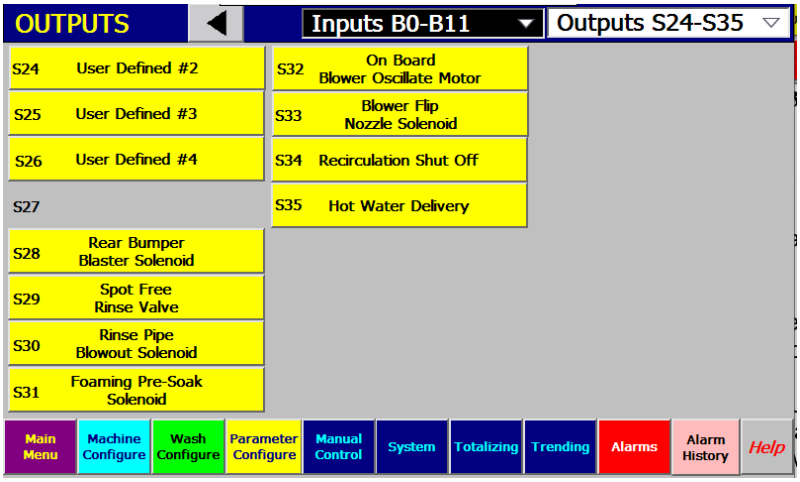


Figure 7-28 Output Status S24-S35

c. Diagnostics

This screen helps to see at a glance some of the most common inputs/outputs used.

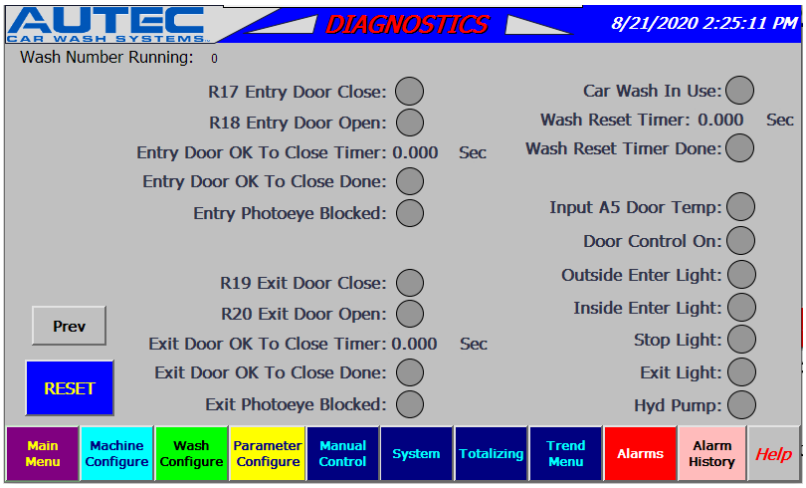


Figure 7-29 Diagnostic Screen

9. **System**

The System screen provides a means to update the date and time, clean the screen, and access the Control Panel. The button functions are described below.

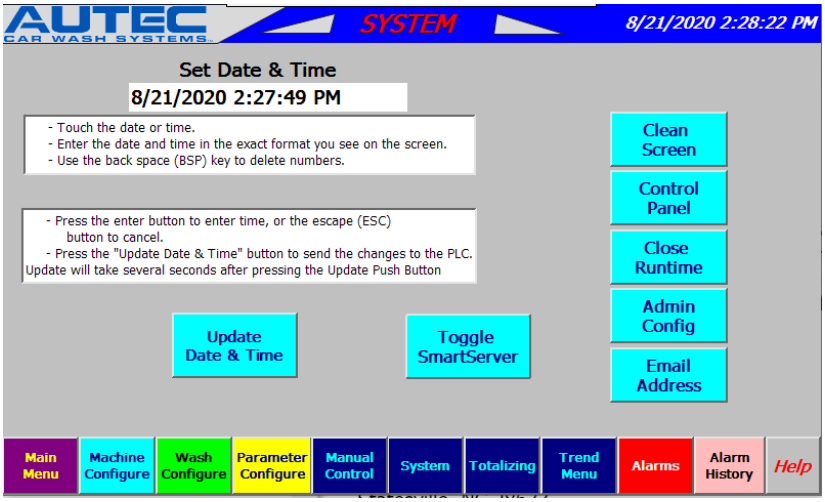


Figure 7-27 System

a. Update Date & Time

Instructions for setting the date and time are on the screen. Press the **Update Date & Time** button to send the updated info to the PLC.

b. Toggle SmartServer

Sometimes the display locks up when too many remote connections are made, this button will restart the SmartServer and allow remote connections again.

c. **Clean Screen**
To clean the screen, press **Clean Screen** button and the screen will be disabled for 30 seconds, allowing you to clean the screen without accidentally pressing a button. A status bar will show time available. Use only a soft, clean cloth to wipe the screen.

d. **Control Panel**
Is for configuring the touch screen device, which is only done at the AUTEC factory and not recommended by unathorized personnel.

e. **Close Runtime**
This button requires a password to use and should be accessed by authorized personnel only.

f. **Admin Config**
This button is used at the AUTEC, Inc facility for their own purposes and requires a password.

g. **Email Address**
This feature comes only with the iRAM feature and is configurable at any time by AUTEC, Inc. If the client did not purchase this option at the time of sale they can purchase this option any time after to be able to use this feature. It allows communication of the Machine to up to four email/text addresses whenever an error occurs. This feature also means it is possible for the client to obtain permission to access their machine remotely to be able to reset their machine, change wash packages, monitor all inputs/outputs, and select which wash package a client wishes to give to a customer.
You may fill in up to four e-mail addresses where you wish to receive alerts, and add a subject line. The subject line should include the site location. (Note – You can e-mail a text message to most cellular phones that have text messaging. Consult you cellular phone service provider for the correct e-mail address to utilize this feature or you can use our application notes on “How to setup your Android or iPhone for Router” in this document.) (***Note – Email alerts go out on port 25 & 587. Make sure your ISP is not blocking these ports.***)

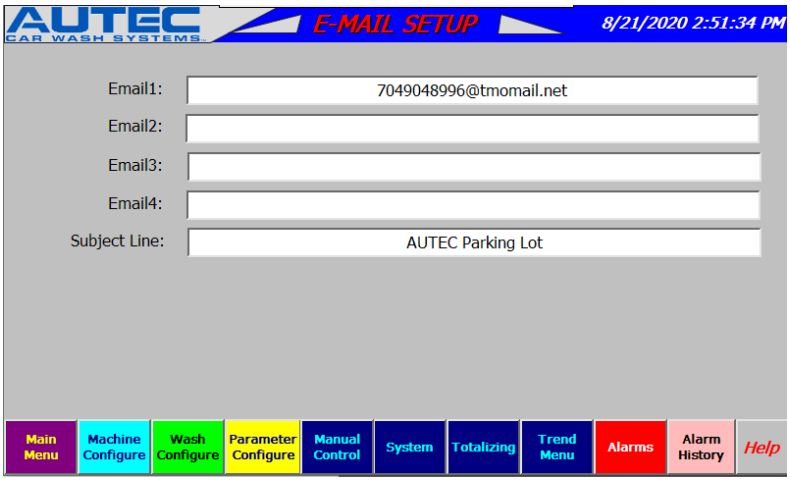


Figure 7-30 Email Configuration

Press in an Email field, and an alpha-numeric screen appears (Fig 7-31).
Type the desired email address. The “@” symbol is found by pressing shift lock (the up arrow) highlighted yellow in Fig 7-32 below.

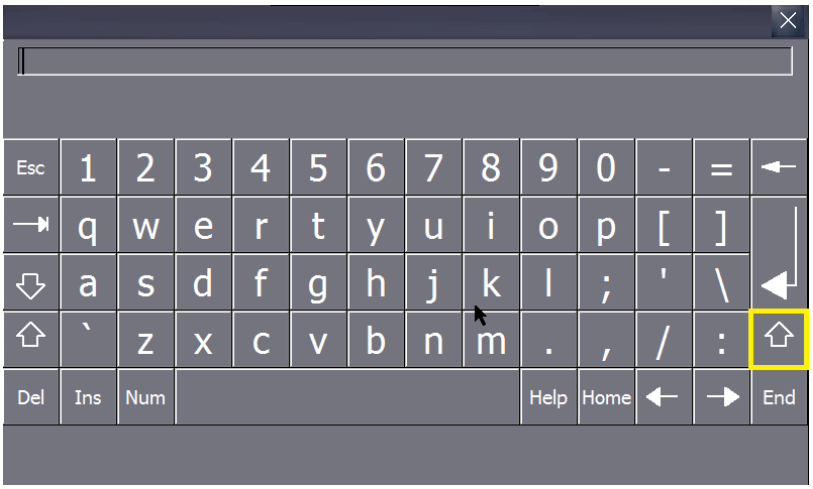


Figure 7-31 Shift Lock

After pressing shift lock, the “@” symbol appears on the screen, as shown in Fig 7-32.

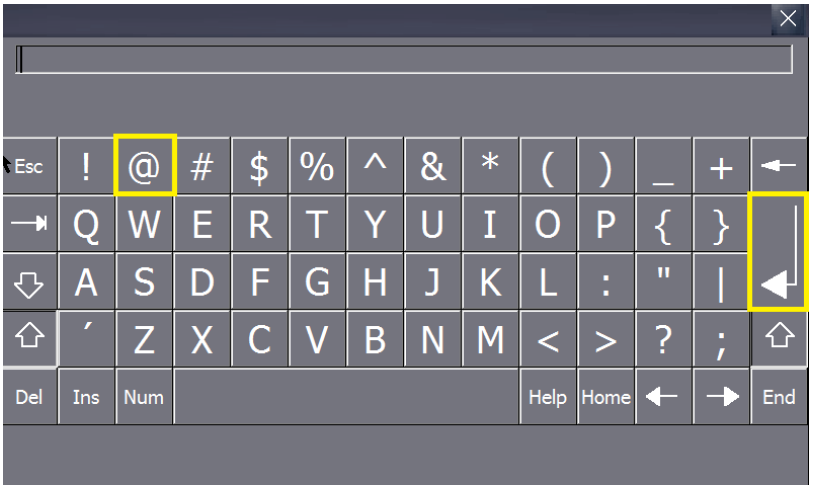


Figure 7-32 "@" symbol location and Enter Button

When finished typing the email address, press the Enter button, also highlighted in yellow in Fig. 7-32.

10. **Totalizing**

Press the **Totalizing** button to view the WASH TOTALS screen (Figure 7-33) and the RESET TOTALS screen (Figure 7-34).

a. **Wash Totals** - Tracking of all car washes is accomplished each time a wash has begun for each wash package. You can view all totals on the **Totalizing** screen. This enables you to view totals *Daily*, *Monthly*, *Yearly*, and *Lifetime* totals. You also have the ability to zero out each wash package's totals or all of them at one time. Every start of a new day the *Daily* totals are reset automatically, every start of a new month the *Monthly* totals are reset automatically, every start of the new year the *Yearly* totals are reset automatically. The only data that is not reset automatically are the *Lifetime Totals*. All of this data is also saved to a USB stick connected to the HMI (Human Machine Interface) or display. The operator can remove the stick, download the data to their PC or laptop, delete the data file and begin collecting the data again once the USB stick is placed back into the USB port on the panel. This allows for charting totals on a continual basis using state-of-the-art charting software or simply in Excel.

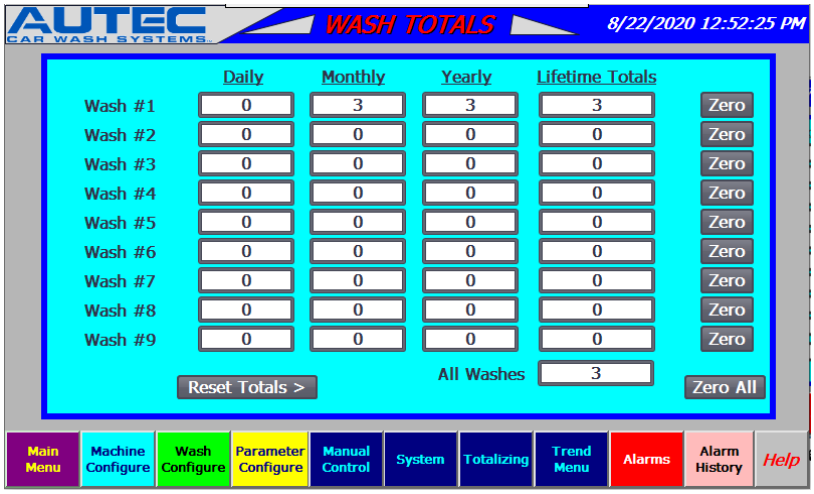


Figure 7-33 Wash Totals Screen

b. Reset Totals

To view the number of times the machine's Reset Button has been pressed during each wash, press the Reset Totals button located on the WASH TOTALS screen, under the Daily column. This feature can be helpful when troubleshooting. The counters and Zero buttons work the same way on both Totalizing screens. Press the Wash Totals button below the Daily column to return to the WASH TOTALS screen.

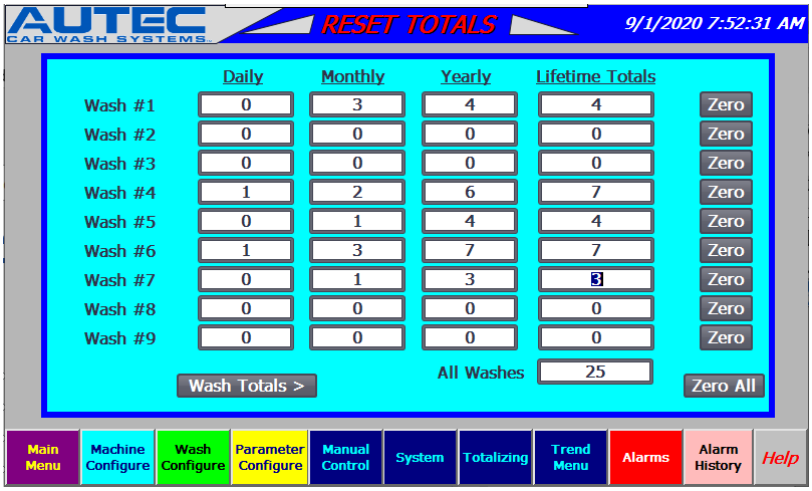


Figure 7-34 Reset Totals Screen

11. **Trending**

Press the Trending button to view the All Washes Trending screen.

a. There is a button on the bottom of each screen to access the Trend Menu. This takes you to the Trending Menu where the selection of trending data to be displayed on the trend screen will appear. Trends are for all wash and reset total data only. Only 1 of *Yearly*, *Monthly*, *Daily*, or *Lifetime Totals* can be viewed but up to 9 points of wash totals or reset totals data, can be viewed at one time, but you cannot look at all 9 washes and all 9 resets simultaneously.

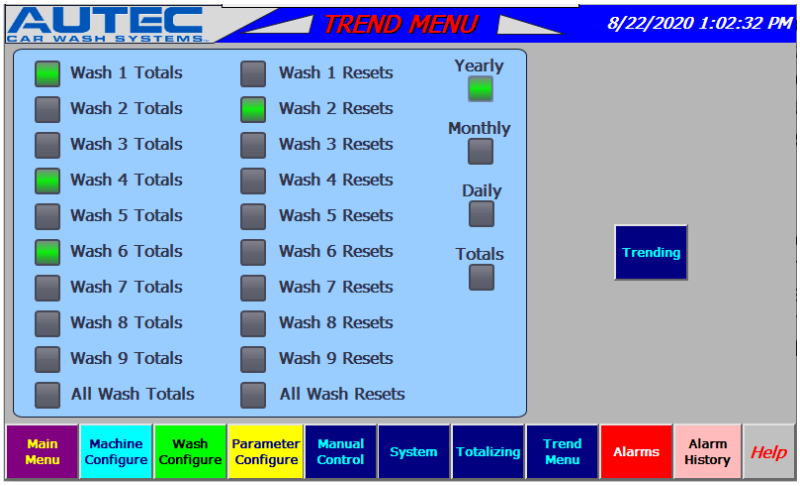


Figure 7-35 Trend Menu

b. Selecting the “Trending” button on the Trend Menu opens the trending screen and displays the data that is selected on the Trend Menu screen. If there are pounds (#########) in the data area it is because the USB was not inserted into the HMI or there is no data for that period. Once the USB stick is inserted into the USB slot on the HMI, data processing will begin.

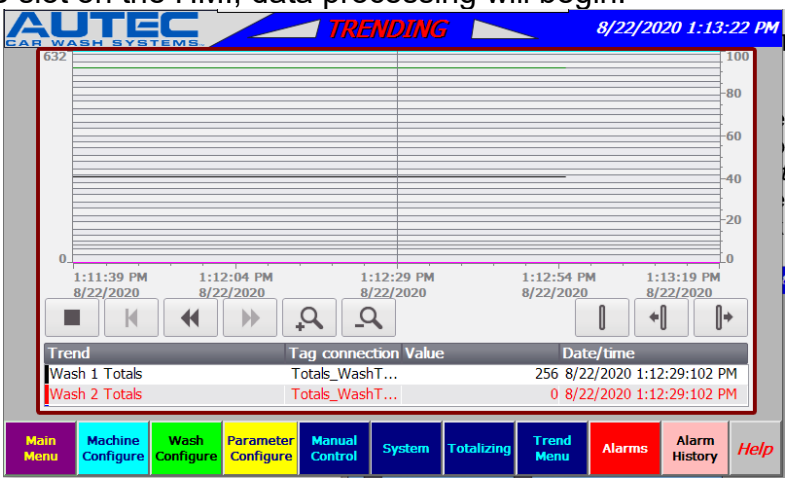


Figure 7-36 Trending

12. **Alarms**

Press the **Alarms** button to view active alarm information.

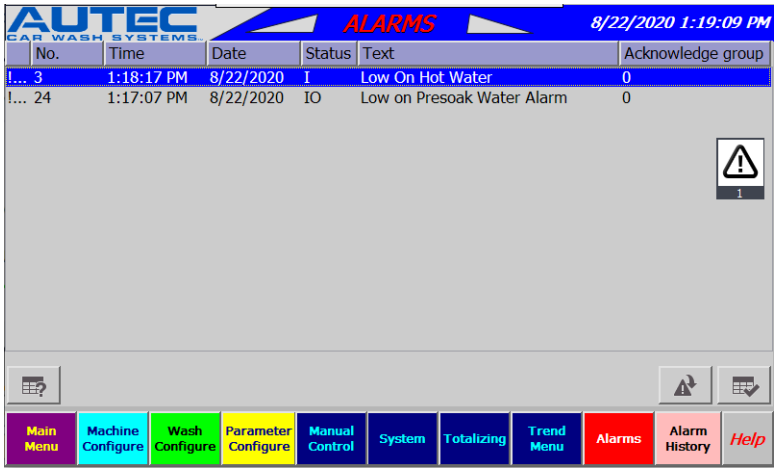


Figure 7-37 Alarms Screen

a. Press **Alarm History** to see all past faults (Fig 34). Press the **Check** button near the bottom right (highlighted in yellow below) to clear a fault record.

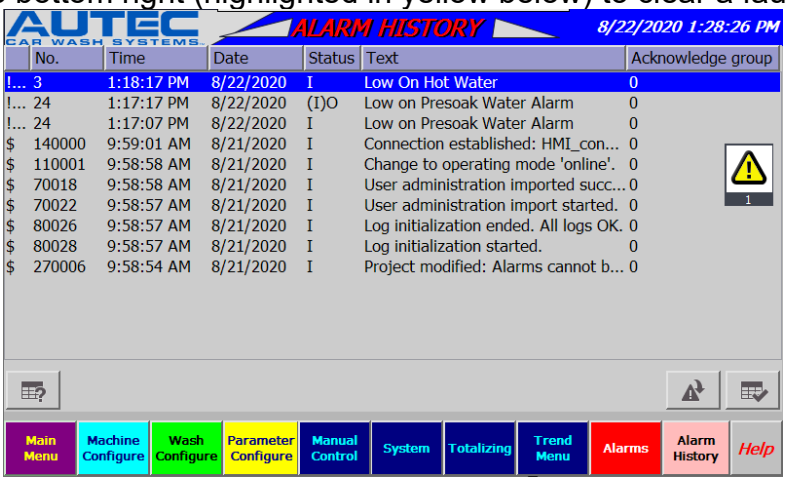


Figure 7-38 Alarm History

13. **Help**
    Displays help information on any screen that the operator is on. Each screen has unique detailed information describing all activity on the screen via a pop-up screen.

14. **Remote Access**
    For iRAM systems, there is a router (a device that is used to connect the machine to the internet) that can be accessed via phone or computer to interact with the HMI (Human Machine Interface, the display). Depending on the type of router installed, the HMI can be viewed and controlled remotely
    using the appropriate program which is outlined below. You will have to determine which one is connected to your machine, after September 2019 Stridelinx routers were incorporated.
    NOTE: You will need your ISP (Internet Service Provider) to unblock ports 25, 465, & 587. An example of an ISP is Comcast, AT&T, Xfinity, Spectrum, etc.

a. Stridelinx Router

Figure 7-39 Stridelinx Router

1. The Stridelinx is a black box located in the main control cabinet next to the gray Siemens PLC.
2. There is only one program to download, the Stridelinx app. There is a built-in viewer to tie into the HMI so remote control of the HMI is possible from this program.
   i. For PC usage,
      a. AUTEC must send you an invite so you can create your own username and password to login to the AUTEC account. Send an email to rryen@AUTEC-carwash.com asking for the invitation to join our network and please include the name of the car wash(s) you are associated with. Once in our possession we will send an invitation back to you.
      b. Follow the link in the E-Mail and set up your account. You will need to setup your password before you can access the mobile app or login to your PC. You can also access VNC from this app! You do not need to download VNC viewer unless you like that app to view your display. If you want to use VNC Viewer then go to the VNC Setup.
      c. Download and install the Stridelinx program (the VPN client) from the web at this location: www.StrideLinx.com located under Tools -> VPN Client
      d. Go to Devices -> Select your device -> Info tab and Click CONNECT to secure your connection by VPN.
   ii. For Smartphone usage
      a. Download software in the App store or in Google Play, “Stridelinx VPN”
      b. AUTEC must send you an invite so you can create your own username and password to login to the AUTEC account. Send an email to rryen@AUTEC-carwash.com asking for the invitation to join our network and please include the name of the car wash(s) you are associated with. Once in our possession we will send an invitation back to you.
      c. Follow the link in the E-Mail and set up your account. You will need to setup your password before you can access the mobile app or login to your PC. You can also access VNC from this app! You do not need to download VNC viewer unless you like that app to view your display. If you want to use VNC Viewer then go to the VNC Setup.

d. The Figure below shows what the Login screen looks like on your phone, the information should be sent to your email address after you followed the link from the invitation to set them up.

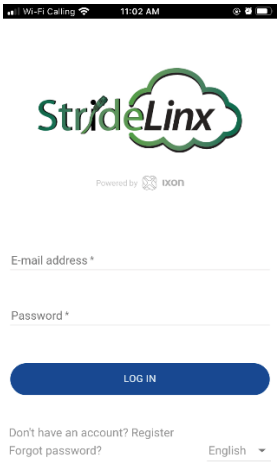


Figure 7-40 Stridelinx Login

e. The figure below shows the connections that are available with your username and password combo (picture is for illustration only, each username and password could be different based upon how many Stride's you have).

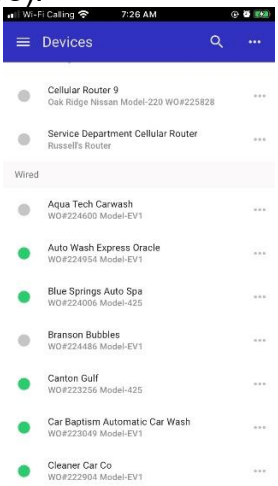


Figure 7-41 Stridelinx Connections

f. After you click on your device of choice, The figure below shows the connections you can make. You can use the Connect button but you would have to use the external VNC Viewer to then connect to your HMI. There is a "VNC Viewer" button that can directly connect you to your HMI without an exterior program, as marked below.

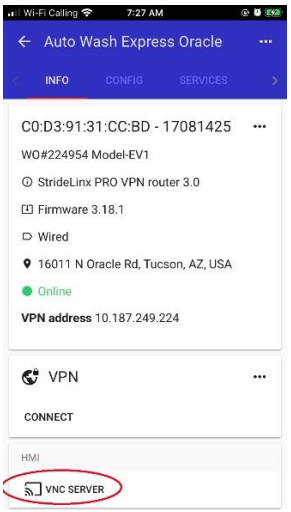


Figure 7-42 Stridelinx Connection

3. There is a reset button on the Stridelinx router, if this is pushed in it will reset all configuration files for the router and a usb configuration file will be needed to restore the router to its proper configuration or else it will not be able to connect to the internet.

b. eWON Router

Figure 7-43 eWON Router

1. The e-WON Router is a blue box located in the main control cabinet next to the gray Siemens PLC.
2. This router uses 2 free programs, eCatcher and VNC Viewer. Both programs must be installed and running to access the Touch Panel. These programs run on most computers and mobile devices.
3. Download and install both of these programs to your computer and/or mobile phone:

   eCatcher for computer is freely available at:
   https://www.ewon.biz/cloud-services/talk2m/ecatcher
   eCatcher for mobile phones is freely available at the App Store or Google Play.

   VNC Viewer for computer is freely available at:
   https://www.realvnc.com/en/connect/download/viewer/
   VNC Viewer for mobile phones is freely available at the App Store or Google Play.

4. Run eCatcher and enter your account info that was given to you by AUTEC, Inc. (email Rick Ryen (rryen@AUTEC-carwash.com) or Mark Hopkins

(mhopkins@AUTEC-carwash.com) and they will text or email you the info). This is the account (AUTEC Carwash), your username and password will be sent to you via email. This will allow you to tie into the router located at the main control panel to the right of the Gray Siemens PLC. Minimize eCatcher.

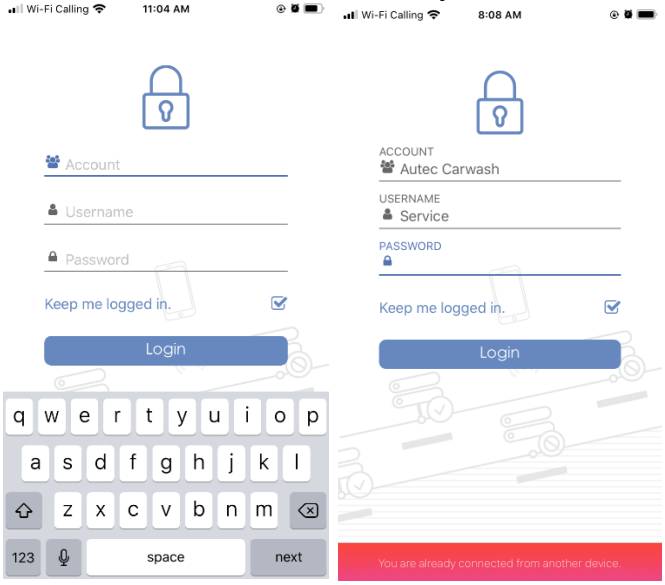


Figure 7-44 eWON Login

5. Once you have entered all of the above information the app will open up to your menu. This menu will show you the router(s) that you can tie into. NOTE: if no router is showing contact AUTEC, Inc.

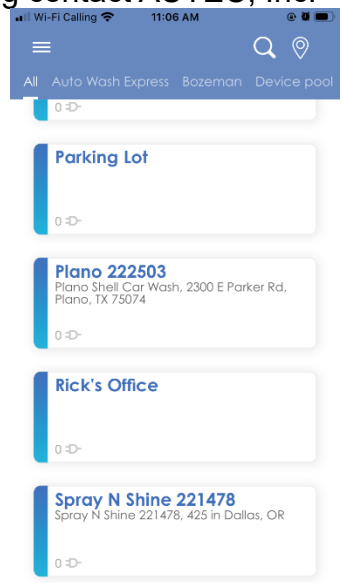


Figure 7-45

6. Click on the device of choice and press on the connect button.
7. Once you have completed this please go to the VNC Setup.

c. VNC Setup

1. For iPhones Go to the App Store and download “VNC Viewer”, for Androids go to the Play Store and download “Android VNC” App.
2. For this app you will need to create an account in order to use it but it is worth it! Once you have created an account then login to your account using your phone.
3. Run the VNC Viewer app and click File, New Connection as shown in Figure 41. Or You will need to press the “+” button to create a new connection.

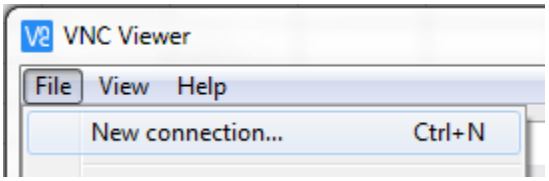


Figure 7-46 VNC Viewer New Connection

4. Enter the IP address 192.168.11.110 and click OK as shown in Figure 42 below. Enter a name for your car wash site if desired.

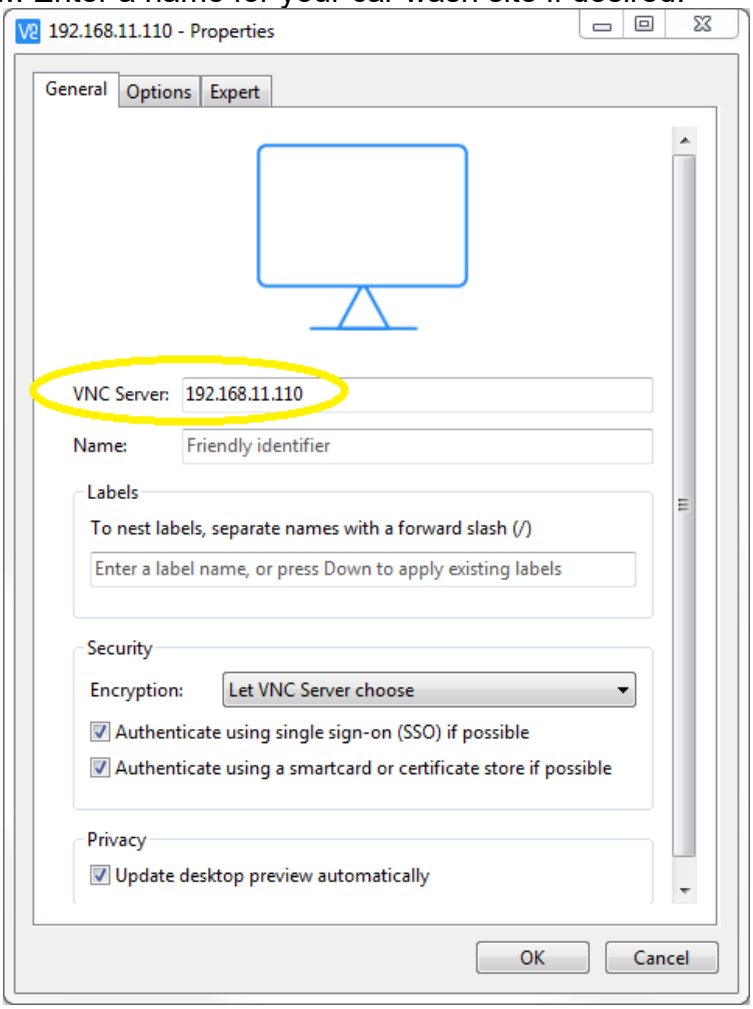


Figure 7-47 Enter IP address in VNC Viewer

5. You will only have to enter the IP address once, because after connecting for the first time, VNC Viewer will remember the connection and create an icon for it. From then on you will just have to run eCatcher and VNC Viewer, and double-click your site in VNC Viewer as shown in Figure 43 below.

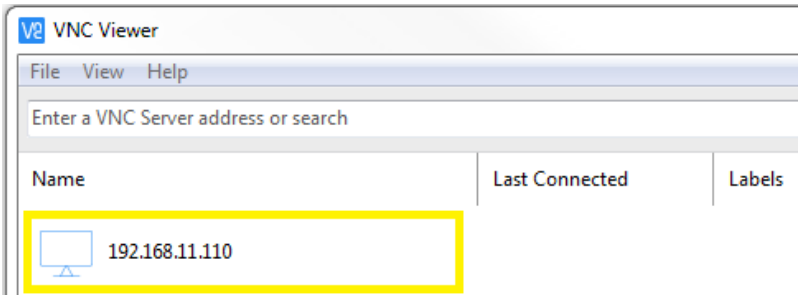


Figure 7-48 VNC Viewer Connection Icon

6. To end a session and exit remote access you will need to properly log off.

   Do not simply click the red X in the upper right corner of the screen, as this would lead to network issues later on.

   To properly log off, go to the Main Screen and hover your mouse cursor near the top middle of the screen above the AUTEC logo, and a toolbar will appear. Click the X as shown in the yellow box in Figure 44 below, and confirm Yes to disconnect.

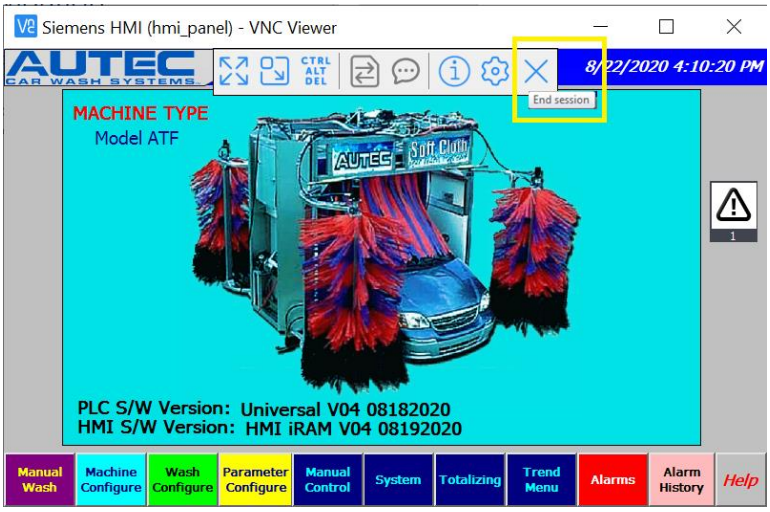


Figure 7-49 End Session Button Location

7. Some of the features of using remote access include the following:

   a. Interact with any buttons that are located on the HMI.

b. View and/or clear any active alarms, clear by pushing the Reset button on either the Manual Screen, the Diagnostic Screen, or the Manual Wash Screen.
c. You can go to the Manual Screen to force Outputs on or off and monitor all inputs or outputs.
d. Virtually, anything you can do while present at the physical HMI you can do with remote access!

Section 8 – PLC Registers (Parameters) and I/O

Registers – Tables 8.1 & 8.2 detail the registers used for various timers and counters that control the Carwash. The registers are only accessible using the Touch Panel. (See the Logic Touch Operating Manual for detailed instructions). When making register changes, it is advisable to change only one register at a time and verify results to avoid confusion.

Input / Outputs – Tables 8.3-8.4 identifies the Inputs and Outputs in Both the Main Control Panel and the Gantry Junction Box.

Table 8.1 - PLC Timers and Counters (By Name)

REGISTER #	DEFAULT (SEC)	NAME	DESCRIPTION
81	30.0	Backup Bell Switch Timer	Time Back Up Light (output R9A) stays on if no Treadle (input A15) if activated.
42	3.0	Blower Start Delay	Time Delay from Treadle (input A15) deactivation and External Blower Start (output R10)
137	0.1	Blowout High Pressure Front Purge Timer	Freeze protection for front nozzles, ATF only. †
138	0.1	Blowout High Pressure Rear Purge Timer	Freeze protection for rear nozzles, ATF only. †
139	0.1	Blowout High Pressure Rocker Purge Timer	Freeze protection for rocker panel nozzles, ATF only. †
22	0.500	Brushes Rotate Delay Time	Brush rotate pause before changing direction of rotation.
58	6.0	Bug Spray Timer	Time Bug Spray pump (output R4) stays on.
100	0.5	Chemical Rinse Arch Off Delay	Time the photoeye has to be unblocked before deactivating Chemical Rinse Arch.
127	10.0	Chemical Rinse Arch Purge Timer	Time Chemical Rinse Arch (output R49) remains open to purge during freeze protection. †
97	1	Chemical Rinse Arch Stop On Delay Timer	Time Rinse Arch Stop Photoeye (input A24) must be blocked before activating eye.

REGISTER #	DEFAULT (SEC)	NAME	DESCRIPTION
2	1.5	Chemical Tire Applicator	Time CTA pump (output R3) activates each time Entrance Bell Switch is made (input A19).
122	20%	Creep Speed 0-100%	Speed Setting of gantry travel during front and rear slowdown expressed as a percentage of full speed.
6	4.0	Delay Arms on 1st Pass	Delays the “arms in” (S7) output to prevent arms moving too close together with short vehicles on the first pass.
39	5.0	Delay Between Purges Timer	Time delay between each purge during freeze protection.
111	0.1	Drive By Wheel Off Delay	Time the photoeye has to be unblocked before deactivating Wheel
110	0.1	Drive By Wheel On Delay Time	Time Drive By Wheel Blaster Start Photoeye (input A21) must be blocked before activating eye.
12	1.75	Drive Wheel Advance	Time machine continues traveling towards the exit after rear arm prox switch (input B1) is made.
15	13.0	Drive Wheel Stop	Time machine remains stationary during rear jog starting after the Drive Wheel Advance Timer (timer #12) expires.
9	7.0	Driver Front Arm Retract	Time driver side arm retracts (output S5) during rear jog starting when the Passenger Arm Retract Timer (timer #13) expires.
14	7.0	Driver Side Rear Arm Retract	Time driver side arm retracts (output S5) during rear jog starting when the Passenger Arm Retract Timer (timer #13) expires.
10	3.0	Dryer #2 Delay Time	Starting delay between first blower (output R10) and second blower (output R11).
11	3.0	Dryer #3 Delay Time	Starting delay between second blower (output R11) and third blower (output R12).
23	75.0	Dryer On Timer	Time Blowers stay on unless otherwise deactivated by the Exit Bell switch.
33	1.0	Entrance Door Close	Duration of Entrance Door Close signal (output R17).
93	10.0	Entrance Door Close after Photoeye is re-made	Delay before Entrance Door Close (output R17) signal is generated after Entrance Door Photoeye (input A7) is re-made if broken during door closing.

REGISTER #	DEFAULT (SEC)	NAME	DESCRIPTION
87	10.0	Entrance Door Close Verify Timer	Time allowed for the Entrance Door to close during which Entrance Door Open (output R18) signal will be generated if Entrance Door Photoeye (input A7) is blocked.
86	1.0	Entrance Door Photoeye Off Delay	Time Entrance Door Photoeye (input A7) must be unblocked before de-activating.
85	1.0	Entrance Door Photoeye On Delay	Time Entrance Door Photoeye (input A7) must be blocked before activating.
116	1.0	Gantry PE Reverse Travel Time	Time Gantry continues Reverse travel after Gantry Entrance Photoeye Off Delay (timer #115) is satisfied.
28	1.0	Entry Door Open Timer	Duration of Entrance Door Open signal (output R18).
69	2.0	Exit Bell / Photoeye Counter	Specifies if Exit Switch (input A18) is photoeye (Solenoid of 1) or bellswitch (Solenoid of 2).
83	0.1	Exit Bell / Photoeye Off Delay	Time Exit Photoeye (input A18) must be unblocked before de-activating.
82	0.1	Exit Bell / Photoeye On Delay	Time Exit Photoeye (input A18) must be blocked before activating.
32	1.0	Exit Door Close	Duration of Exit Door Close signal (output R19).
92	10.0	Exit Door Close after Photoeye is re-made	Delay before Exit Door Close (output R19) signal is generated after Exit Door Photoeye (input A6) is re-made if broken during door closing.
35	15.0	Exit Door Close Delay	Time delay between Exit Bell Switch 2nd pulse (input A18) and Exit Door Close signal (output R19).
66	300.0	Exit Door Close if No Exit Bell	Time Exit Door remains open if no Exit Bell (input A18) signal is received after wash completes.
91	10.0	Exit Door Close Verify Timer	Time allowed for the Exit Door to close during which Exit Door Open (output R20) signal will be generated if Exit Door Photoeye (input A6) is blocked.
31	1.0	Exit Door Open	Duration of Exit Door Open signal (output R20).
90	1.0	Exit Door Photoeye Off Delay	Time Exit Door Photoeye (input A6) must be unblocked before de-activating.
89	1.0	Exit Door Photoeye On Delay	Time Exit Door Photoeye (input A6) must be blocked before activating.
16	10.0	Exit Light	Time Exit light (output R2A) stays on after treadle is deactivated (input A15).

REGISTER #	DEFAULT (SEC)	NAME	DESCRIPTION
20	40.0	Final Rinse Arch Run Timer	Time Rinse Arches (outputs R24 & R27) stay on unless otherwise deactivated by exit bell switch (input A18) or Rinse Arch Stop (input A24).
30	15.0	Final Rinse Water Purge Timer	Time Final Rinse Arch (output R24) remains open to purge during freeze protection.
56	5.0	Foamer Purge Timer	Time Foamer Air (outputs S11 & S13) will stay on to purge foamer after chemical pump shuts off.
106	20	Foaming Pre-Soak Auto Run	Time Pre-Soak Pump (output R43) runs during automatic re-circulation. †
130	900	Foaming Pre-Soak Purge Delay	Time delay between Foamy Pre-Soak Chemical Pump activation (output R42) during Freeze Protection. †
131	60	Foaming Pre-Soak Purge On Timer	Time Foamy Pre-Soak Chemical Pump activates (output R43) during Freeze Protection. †
103	600	Foamy Pre-Soak Auto Start Timer	Time interval between Pre-Soak Pump (output R43) start for automatic re-circulation. †
64	300.0	Freeze Protection Verify Timer	Time temperature must remain below the set point before shutting down the wash and activating freeze protection.
1	7.0	Outside Enter Light Delay Time	Start delay timer to turn off Outside Enter light and turn on the Please Wait light. †
72	0.001	Front Limit Switch Time	(For older designs where prox switches were pointed down towards the floor) These delays prevented false prox switch activation when the proxes would pick up objects other than the vehicle.
70	3.25	Front Slowdown	Time Machine Creep Speed (output S8) is activated after receiving signal from Front Arm Prox Switch (input B0)
120	7.0	Fwd High Pressure Creep Time	Time Creep Speed is activated during Forward Travel of High Pressure Wash to increase time on rear of vehicle.
115	2.0	Gantry Entrance Photoeye Off Delay Time	Time Entrance Gantry Photoeye (input B9) must be unblocked before de-activating eye.
114	1	Gantry Entrance Photoeye On Delay Time	Time Entrance Gantry Photoeye (input B9) must be blocked before activating eye.

REGISTER #	DEFAULT (SEC)	NAME	DESCRIPTION
118	2.0	Gantry Exit Photoeye Off Delay	Time Exit Gantry Photoeye (input B8) must be unblocked before de-activating eye.
117	1.0	Gantry Exit Photoeye On Delay	Time Exit Gantry Photoeye (input B8) must be blocked before activating eye.
119	1.0	Gantry PE Forward Travel Time	Time Gantry continues Forward after Gantry Exit Photoeye Off Delay (timer #118) is satisfied.
78	10.0	Glass Wash Down On Time	Time each Glass Wash Down Solenoid (outputs R30-R33) opens during Glass Wash Down.
77	2.0	Glass Wash Down Pause Timer	Time between activating each Glass Wash Down Solenoid (outputs R30-R33) during Glass Wash Down.
79	120.0	Glass Washdown Verify Timer	Time Machine must sit idle after wash before activating Glass Wash Down sequence.
21	2.0	Hamilton Cycle Inhibit Off	Time Wash In Use (output R7) turns off after each wash if a Hamilton Entry System is used.
140	0.05	Heat Exchanger Air Purge Timer	Freeze protection for heat exchanger, ATF only. †
63	2.0	Holding Tank High Off	Float switch for high pressure pump (input A37) off delay †
62	3.0	Holding Tank High On Timer	Float switch for high pressure pump (input A37) on delay †
4	1.0	Hydraulic Forward Pause Time	Time Machine Travel (outputs S0 & S1) and Brush Rotation (outputs S14 & S15) pause when reversing direction.
133	50%	Jog Speed Setpoint (0-100%)	Speed Setting of gantry travel during Manual Jog expressed as a percentage of full speed.
76	2.0	Low Air Verify Time	Time Air Pressure Switch (input B4) must be deactivated before Low Air Fault.
26	180.0	Low Temp OK	Time temperature must remain above the setpoint before deactivating door operation.
25	300.0	Low Temp Verify Timer	Time temperature must remain below the setpoint before activating door operation. Also, extinguishes Enter Light (output R0A)
34	5.0	Machine Water Valve Purge Timer	Time Machine Water Solenoid (output S10) remains open to purge during freeze protection.

REGISTER #	DEFAULT (SEC)	NAME	DESCRIPTION
55	25.0	Maximum Wax Time	Maximum time Wax pump (output R6, R40) will run during any given wash or chemical pass.
54	25.0	Maximum Soap Time	Maximum time soap pumps (outputs R5, R39) will run during any given wash or chemical pass.
61	7.0	Mitter Down	Time Mitter Down Signal (output S4) is sent to lower Mitter.
24	1.0	Motor Starter Auxiliary	Time allowed for the Motor Starter Auxiliary Contact (input A1) to activate after the Hydraulic Motor Starter (output R14) is energized, otherwise machine shuts down.
41	0.0	Not Used	Not Used
43	0.0	Not Used	Not Used
44	0.0	Not Used	Not Used
51	0.0	Not Used	Not Used
57	0.0	Not Used	Not Used
65	0.0	Not Used	Not Used
67	0.0	Not Used	Not Used
68	0.0	Not Used	Not Used
75	0.0	Not Used	Not Used
88	0.0	Not Used	Not Used
94	0.0	Not Used	Not Used
132	0.0	Not Used	Not Used
123	60%	Parking Speed 0-100%	Speed Setting of gantry travel during parking (homing) expressed as a percentage of full speed.
17	4.0	Parking Timer	Time Machine travels towards the exit end of the track after reversing direction on the last pass or during homing.
8	5.0	Passenger Front Arm Retract	Time passenger arm retracts (output S6) during rear jog starting after rear arm prox switch (input B1) is made.
13	5.0	Passenger Rear Arm Retract	Time passenger arm retracts (output S6) during rear jog starting after rear arm prox switch (input B1) is made.
109	0.35	Pause Before Rinse/Chemical Pass	Time the photoeye has to be unblocked before starting Rinse/Chemical Pass
49	30.0	Post Wash Chemical Arch On Timer	Time Post Wash Chemical Arch (output R49) stays on unless otherwise deactivated by the exit bell switch (input A18) or Rinse Arch Stop (input A24).

REGISTER #	DEFAULT (SEC)	NAME	DESCRIPTION
50	1	Rinse Arch Stop Counter	1 = Photoeye 2 = Bell Switch. Specifies if Rinse Arch Stop (input A24) is photoeye (Value of 1) or bellswitch (Value of 2).
18	30.0	Pre-Soak #1	Time pre-soak (output R22) stays on after being activated by Pre-Soak Start (input A22) unless otherwise deactivated by the treadle (input A15) or Pre-Soak Stop (input A23).
95	0.1	Pre-Soak #1 Photoeye On Delay Time	Time Pre-Soak Photoeye (input A22) must be blocked before activating eye.
96	0.1	Pre-Soak #1 Start Photoeye Off Delay Time	Time the photoeye has to be unblocked before deactivating Pre-Soak #1
99	0.1	Pre-Soak #2 Off Delay Time	Time Pre-Soak #2 Photoeye (input A38) has to be unblocked before deactivating Pre-Soak #2 †
46	30.0	Pre-Soak #2 On Timer	Time Pre-Soak #2 (output R46) stays on after being activated by Pre-Soak #2 Start (input A38) unless otherwise deactivated by the treadle (input A15) or Pre-Soak Stop (input A23).
98	0.1	Pre-Soak #2 Photoeye On Delay Timer	Time Pre-Soak #2 Start Input Photoeye (input A38) must be blocked before activating Pre-Soak #2. †
47	30.0	Pre-Soak #3	Time Pre-Soak #3 (output R47) stays on after being activated by Pre-Soak #3 Start (input A39) unless otherwise deactivated by the treadle (input A15) or Pre-Soak Stop (input A23).
102	0.1	Pre-Soak #3 Off Delay Time	Time the photoeye has to be unblocked before deactivating Pre-Soak #3 †
101	0.1	Pre-Soak #3 Photoeye On Delay	Time Pre-Soak #3 Photoeye (input A39) must be blocked before activating eye. †
105	0.1	Pre-Soak #4 Off Delay Time	Time the photoeye has to be unblocked before deactivating Pre-Soak #4
48	30.0	Pre-Soak #4 On Timer	Time Pre-Soak #4 (output R48) stays on after being activated by Pre-Soak #4 Start (input A40) unless otherwise deactivated by the treadle (input A15) or Pre-Soak Stop (input A23).
104	0.5	Pre-Soak #4 Photoeye On Delay	Time Pre-Soak #4 Photoeye (input A40) must be blocked before activating eye.
124	10.0	Pre-Soak Arch 1 Purge	Time Pre-Soak #2 (output R46) remains open to purge during freeze protection.

REGISTER #	DEFAULT (SEC)	NAME	DESCRIPTION
125	10.0	Pre-Soak Arch 2 Purge	Time Pre-Soak #3 (output R47) remains open to purge during freeze protection.
126	10.0	Pre-Soak Arch 3 Purge	Time Pre-Soak #4 (output R48) remains open to purge during freeze protection.
113	0.5	Pre-Soak Stop Photoeye Off Delay	Time the photoeye has to be blocked before deactivating Pre-Soak
112	0.1	Pre-Soak Stop Photoeye On Delay	Time Pre-Soak Stop Photoeye (input A23) must be blocked before activating eye.
29	15.0	Presoak Water Purge Timer	Time Pre-Soak (output R22) remains open to purge during freeze protection.
74	5.0	Purge – Glass Washdown	Time Glass Wash Down solenoids (outputs R30-R33) remain open to purge during freeze protection.
128	10.0	Purge – High Pressure Fwd	Time Forward High Pressure Solenoid (output S26) remains open to purge during freeze protection.
129	10.0	Purge – High Pressure Rev	Time Rear High Pressure Solenoid (output S27) remains open to purge during freeze protection. †
27	3.0	Purge – Underbody	Time Underbody solenoid (output R23) remains open to purge during freeze protection.
36	60.0	Purge Delay Timer	Delay between Freeze Option On/Off (timer #64) and activating freeze protection manifold (output R16).
73	0.001	Rear Limit Switch Time	(For older designs where prox switches were pointed down towards the floor) These delays prevented false prox switch activation when the proxes would pick up objects other than the vehicle.
121	8.0	Rev High Pressure Creep Timer	Time Creep Speed is activated during Reverse Travel of High Pressure Wash to increase time on front of vehicle.
37	5.0	Rinse / Dry Shutoff	Delay between Exit Bell Switch (input A18) and Rinse / Blower Shutoff.
84	3.0	Rinse Pipe Blowout	Time Rinse Arch Blow Out (output S29) activates after rinse cycle to purge rinse pipes. †
60	3.0	Mitter Up Timer	No Longer Used
40	5.0	Spot Free Purge Timer	Time Free Standing Spot Free Solenoid (output R27) remains open to purge during freeze protection.

REGISTER #	DEFAULT (SEC)	NAME	DESCRIPTION
52	15.0	Tire Scrubber Purge Timer	Time Wheel Blaster Water Solenoid (output S2) opens to purge during freeze protection.
53	6.5	Travel Time after Jog Timer	Time Machine travels towards entrance end after completing rear jog.
136	70.0	Travel Timeout 0 to 39% Speed	Travel Timeout for any pass programmed between 0 – 39% of full speed.
135	55.0	Travel Timeout 40 to 59% Speed	Travel Timeout for any pass programmed between 40 – 59% of full speed.
134	45.0	Travel Timeout 60 to 100% Speed	Travel Timeout for any pass programmed between 60 – 100% of full speed.
80	1.0	Treadle Buzzer	Time Treadle Buzzer (output R28) sounds when Treadle (input A15) is made.
7	0.05	Treadle Buzzer Delay	Time between pedal being pressed and horn blowing.
71	0.5	Treadle De-bounce	Time Treadle (input A15) must be deactivated to signal end of wash or drive-off.
3	4.0	Treadle Timer	Time Treadle (input A15) must be continuously made before activating wash
108	0.1	Underbody Off Delay Timer	Time the photoeye has to be unblocked before deactivating Underbody
107	0.1	Underbody On Delay Timer	Time Underbody Start Photoeye (input A20) must be blocked before activating eye.
19	30.0	Underbody Wash Timer	Time Underbody (output R23) stays on after being activated by Underbody Start (input A20) unless otherwise deactivated by the treadle (input A15) or Pre-Soak Stop (input A23).
38	180.0	Wash Reset Timer	Time the Hydraulic pump is on but no treadle is active, then the wash is reset.
5	0.0	Wash Water Delay	No Longer Used.
45	30.0	Wheel Blaster On Timer	Time Drive By Tire Blaster (outputs R13, S2) stays on after being activated by Drive By Tire Blaster Start (input A21) unless otherwise deactivated by the treadle (input A15).

† Not ordered on this machine, or not available on 220 & 260 model machines.

Table 8.2 - PLC Timers and Counters (By Number)

REGISTER #	DEFAULT (SEC)	NAME	DESCRIPTION
1	0.0	Not Used	Not Used
2	1.5	Chemical Tire Applicator	Time CTA pump (output R3) activates each time Entrance Bell Switch is made (input A19).
3	4.0	Treadle Timer	Time Treadle (input A15) must be continuously made before activating wash
4	1.0	Hydraulic Forward Pause Time	Time Machine Travel (outputs S0 & S1) and Brush Rotation (outputs S14 & S15) pause when reversing direction.
5	0.0	Wash Water Delay	No Longer Used
6	4.0	Delay Arms on 1st Pass	Delays the “arms in” (S7) output to prevent arms moving too close together with short vehicles on the first pass.
7	0.05	Treadle Buzzer Delay	Time between pedal being pressed and horn blowing.
8	5.0	Passenger Front Arm Retract	Time passenger arm retracts (output S6) during rear jog starting after rear arm prox switch (input B1) is made.
9	7.0	Driver Front Arm Retract	Time driver side arm retracts (output S5) during rear jog starting when the Passenger Arm Retract Timer (timer #13) expires.
10	3.0	Dryer #2 Delay Time	Starting delay between first blower (output R10) and second blower (output R11).
11	3.0	Dryer #3 Delay Time	Starting delay between second blower (output R11) and third blower (output R12).
12	1.75	Drive Wheel Advance	Time machine continues traveling towards the exit after rear arm prox switch (input B1) is made.
13	5.0	Passenger Rear Arm Retract	Time passenger arm retracts (output S6) during rear jog starting after rear arm prox switch (input B1) is made.
14	7.0	Driver Side Rear Arm Retract	Time driver side arm retracts (output S5) during rear jog starting when the Passenger Arm Retract Timer (timer #13) expires.
15	13.0	Drive Wheel Stop	Time machine remains stationary during rear jog starting after the Drive Wheel Advance Timer (timer #12) expires.
16	10.0	Exit Light	Time Exit light (output R2A) stays on after treadle is deactivated (input A15).
17	4.0	Parking Timer	Time Machine travels towards the exit end of the track after reversing direction on the last pass or during homing.

REGISTER #	DEFAULT (SEC)	NAME	DESCRIPTION
18	30.0	Pre-Soak #1	Time pre-soak (output R22) stays on after being activated by Pre-Soak Start (input A22) unless otherwise deactivated by the treadle (input A15) or Pre-Soak Stop (input A23).
19	30.0	Underbody Wash Timer	Time Underbody (output R23) stays on after being activated by Underbody Start (input A20) unless otherwise deactivated by the treadle (input A15) or Pre-Soak Stop (input A23).
20	40.0	Final Rinse Arch Run Timer	Time Rinse Arches (outputs R24 & R27) stay on unless otherwise deactivated by exit bell switch (input A18) or Rinse Arch Stop (input A24).
21	2.0	Hamilton Cycle Inhibit Off	Time Wash In Use (output R7) turns off after each wash if a Hamilton Entry System is used.
22	0.500	Brushes Rotate Delay Time	Brush rotate pause before changing direction of rotation.
23	75.0	Dryer On Timer	Time Blowers stay on unless otherwise deactivated by the Exit Bell switch.
24	1.0	Motor Starter Auxiliary	Time allowed for the Motor Starter Auxiliary Contact (input A1) to activate after the Hydraulic Motor Starter (output R14) is energized, otherwise machine shuts down.
25	300.0	Low Temp Verify Timer	Time temperature must remain below the setpoint before activating door operation. Also, extinguishes Enter Light (output R0A)
26	180.0	Low Temp OK	Time temperature must remain above the setpoint before deactivating door operation.
27	3.0	Purge – Underbody	Time Underbody solenoid (output R23) remains open to purge during freeze protection.
28	1.0	Entry Door Open Timer	Duration of Entrance Door Open signal (output R18).
29	15.0	Presoak Water Purge Timer	Time Pre-Soak (output R22) remains open to purge during freeze protection.
30	15.0	Final Rinse Water Purge Timer	Time Final Rinse Arch (output R24) remains open to purge during freeze protection.
31	1.0	Exit Door Open	Duration of Exit Door Open signal (output R20).
32	1.0	Exit Door Close	Duration of Exit Door Close signal (output R19).
33	1.0	Entrance Door Close	Duration of Entrance Door Close signal (output R17).
34	5.0	Machine Water Valve Purge Timer	Time Machine Water Solenoid (output S10) remains open to purge during freeze protection.
35	15.0	Exit Door Close Delay	Time delay between Exit Bell Switch 2nd pulse (input A18) and Exit Door Close signal (output R19).

REGISTER #	DEFAULT (SEC)	NAME	DESCRIPTION
36	60.0	Purge Delay Timer	Delay between Freeze Option On/Off (timer #64) and activating freeze protection manifold (output R16).
37	5.0	Rinse / Dry Shutoff	Delay between Exit Bell Switch (input A18) and Rinse / Blower Shutoff.
38	180.0	Wash Reset Timer	Time the Hydraulic pump is on but no treadle is active, then the wash is reset.
39	5.0	Delay Between Purges Timer	Time delay between each purge during freeze protection.
40	5.0	Spot Free Purge Timer	Time Free Standing Spot Free Solenoid (output R27) remains open to purge during freeze protection.
41	0.0	Not Used	Not Used
42	3.0	Blower Start Delay	Time Delay from Treadle (input A15) deactivation and External Blower Start (output R10)
43	0.0	Not Used	Not Used
44	0.0	Not Used	Not Used
45	30.0	Wheel Blaster On Timer	Time Drive By Tire Blaster (outputs R13, S2) stays on after being activated by Drive By Tire Blaster Start (input A21) unless otherwise deactivated by the treadle (input A15).
46	30.0	Pre-Soak #2 On Timer	Time Pre-Soak #2 (output R46) stays on after being activated by Pre-Soak #2 Start (input A38) unless otherwise deactivated by the treadle (input A15) or Pre-Soak Stop (input A23).
47	30.0	Pre-Soak #3	Time Pre-Soak #3 (output R47) stays on after being activated by Pre-Soak #3 Start (input A39) unless otherwise deactivated by the treadle (input A15) or Pre-Soak Stop (input A23).
48	30.0	Pre-Soak #4 On Timer	Time Pre-Soak #4 (output R48) stays on after being activated by Pre-Soak #4 Start (input A40) unless otherwise deactivated by the treadle (input A15) or Pre-Soak Stop (input A23).
49	30.0	Post Wash Chemical Arch On Timer	Time Post Wash Chemical Arch (output R49) stays on unless otherwise deactivated by the exit bell switch (input A18) or Rinse Arch Stop (input A24).
50	1	Rinse Arch Stop Counter	1 = Photoeye 2 = Bell Switch. Specifies if Rinse Arch Stop (input A24) is photoeye (Value of 1) or bellswitch (Value of 2).
51	0.0	Not Used	Not Used
52	15.0	Tire Scrubber Purge Timer	Time Wheel Blaster Water Solenoid (output S2) opens to purge during freeze protection.
53	6.5	Travel Time after Jog Timer	Time Machine travels towards entrance end after completing rear jog.

REGISTER #	DEFAULT (SEC)	NAME	DESCRIPTION
54	25.0	Maximum Soap Time	Maximum time soap pumps (outputs R5, R39) will run during any given wash or chemical pass.
55	25.0	Maximum Wax Time	Maximum time Wax pump (output R6, R40) will run during any given wash or chemical pass.
56	5.0	Foamer Purge Timer	Time Foamer Air (outputs S11 & S13) will stay on to purge foamer after chemical pump shuts off.
57	0.0	Not Used	Not Used
58	6.0	Bug Spray Timer	Time Bug Spray pump (output R4) stays on.
60	3.0	Mitter Up Energize Timer	No longer used
61	7.0	Mitter Down Energize Timer	Time Mitter Down Signal (output S4) is sent to lower Mitter.
62	3.0	Holding Tank High On Timer	Float switch for high pressure pump (input A37) on delay †
63	2.0	Holding Tank High Off	Float switch for high pressure pump (input A37) off delay †
64	300.0	Freeze Protection Verify Timer	Time temperature must remain below the set point before shutting down the wash and activating freeze protection.
65	0.0	Not Used	Not Used
66	300.0	Exit Door Close if No Exit Bell	Time Exit Door remains open if no Exit Bell (input A18) signal is received after wash completes.
67	0.0	Not Used	Not Used
68	0.0	Not Used	Not Used
69	2.0	Exit Bell / Photoeye Counter	Specifies if Exit Switch (input A18) is photoeye (Solenoid of 1) or bellswitch (Solenoid of 2).
70	3.25	Front Slowdown	Time Machine Creep Speed (output S8) is activated after receiving signal from Front Arm Prox Switch (input B0)
71	0.5	Treadle De-bounce	Time Treadle (input A15) must be deactivated to signal end of wash or drive-off.
72	0.001	Front Limit Switch Time	(For older designs where prox switches were pointed down towards the floor) These delays prevented false prox switch activation when the proxes would pick up objects other than the vehicle.
73	0.001	Rear Limit Switch Time	(For older designs where prox switches were pointed down towards the floor) These delays prevented false prox switch activation when the proxes would pick up objects other than the vehicle.
74	5.0	Purge – Glass Washdown	Time Glass Wash Down solenoids (outputs R30-R33) remain open to purge during freeze protection.

REGISTER #	DEFAULT (SEC)	NAME	DESCRIPTION
75	0.0	Not Used	Not Used
76	2.0	Low Air Verify Time	Time Air Pressure Switch (input B4) must be deactivated before Low Air Fault.
77	2.0	Glass Wash Down Pause Timer	Time between activating each Glass Wash Down Solenoid (outputs R30-R33) during Glass Wash Down.
78	10.0	Glass Wash Down On Time	Time each Glass Wash Down Solenoid (outputs R30-R33) opens during Glass Wash Down.
79	120.0	Glass Washdown Verify Timer	Time Machine must sit idle after wash before activating Glass Wash Down sequence.
80	1.0	Treadle Buzzer	Time Treadle Buzzer (output R28) sounds when Treadle (input A15) is made.
81	30.0	Backup Bell Switch Timer	Time Back Up Light (output R9A) stays on if no Treadle (input A15) if activated.
82	0.1	Exit Bell / Photoeye On Delay	Time Exit Photoeye (input A18) must be blocked before activating.
83	0.1	Exit Bell / Photoeye Off Delay	Time Exit Photoeye (input A18) must be unblocked before de-activating.
84	3.0	Rinse Pipe Blowout	Time Rinse Arch Blow Out (output S29) activates after rinse cycle to purge rinse pipes. †
85	1.0	Entrance Door Photoeye On Delay	Time Entrance Door Photoeye (input A7) must be blocked before activating.
86	1.0	Entrance Door Photoeye Off Delay	Time Entrance Door Photoeye (input A7) must be unblocked before de-activating.
87	10.0	Entrance Door Close Verify Timer	Time allowed for the Entrance Door to close during which Entrance Door Open (output R18) signal will be generated if Entrance Door Photoeye (input A7) is blocked.
88	0.0	Not Used	Not Used
89	1.0	Exit Door Photoeye On Delay	Time Exit Door Photoeye (input A6) must be blocked before activating.
90	1.0	Exit Door Photoeye Off Delay	Time Exit Door Photoeye (input A6) must be unblocked before de-activating.
91	10.0	Exit Door Close Verify Timer	Time allowed for the Exit Door to close during which Exit Door Open (output R20) signal will be generated if Exit Door Photoeye (input A6) is blocked.
92	10.0	Exit Door Close after Photoeye is re-made	Delay before Exit Door Close (output R19) signal is generated after Exit Door Photoeye (input A6) is re-made if broken during door closing.
93	10.0	Entrance Door Close after Photoeye is re-made	Delay before Entrance Door Close (output R17) signal is generated after Entrance Door Photoeye (input A7) is re-made if broken during door closing.

REGISTER #	DEFAULT (SEC)	NAME	DESCRIPTION
94	0.0	Not Used	Not Used
95	0.1	Pre-Soak #1 Photoeye On Delay Time	Time Pre-Soak Photoeye (input A22) must be blocked before activating eye.
96	0.1	Pre-Soak #1 Start Photoeye Off Delay Time	Time the photoeye has to be unblocked before deactivating Pre-Soak #1
97	1	Chemical Rinse Arch Stop On Delay Timer	Time Rinse Arch Stop Photoeye (input A24) must be blocked before activating eye.
98	0.1	Pre-Soak #2 Photoeye On Delay Timer	Time Pre-Soak #2 Start Input Photoeye (input A38) must be blocked before activating Pre-Soak #2. †
99	0.1	Pre-Soak #2 Off Delay Time	Time Pre-Soak #2 Photoeye (input A38) has to be unblocked before deactivating Pre-Soak #2 †
100	0.5	Chemical Rinse Arch Off Delay	Time the photoeye has to be unblocked before deactivating Chemical Rinse Arch.
101	0.1	Pre-Soak #3 Photoeye On Delay	Time Pre-Soak #3 Photoeye (input A39) must be blocked before activating eye. †
102	0.1	Pre-Soak #3 Off Delay Time	Time the photoeye has to be unblocked before deactivating Pre-Soak #3 †
103	600	Foamy Pre-Soak Auto Start Timer	Time interval between Pre-Soak Pump (output R43) start for automatic re-circulation. †
104	0.5	Pre-Soak #4 Photoeye On Delay	Time Pre-Soak #4 Photoeye (input A40) must be blocked before activating eye.
105	0.1	Pre-Soak #4 Off Delay Time	Time the photoeye has to be unblocked before deactivating Pre-Soak #4
106	20	Foaming Pre-Soak Auto Run	Time Pre-Soak Pump (output R43) runs during automatic re-circulation. †
107	0.1	Underbody Photoeye On Delay	Time Underbody Start Photoeye (input A20) must be blocked before activating eye.
108	0.1	Underbody Off Delay Timer	Time the photoeye has to be unblocked before deactivating Underbody
109	0.35	Pause Before Rinse/Chemical Pass	Time the photoeye has to be unblocked before starting Rinse/Chemical Pass
110	0.1	Drive By Wheel On Delay Time	Time Drive By Wheel Blaster Start Photoeye (input A21) must be blocked before activating eye.
111	0.1	Drive By Wheel Off Delay	Time the photoeye has to be unblocked before deactivating Wheel
112	0.1	Pre-Soak Stop Photoeye On Delay	Time Pre-Soak Stop Photoeye (input A23) must be blocked before activating eye.
113	0.5	Pre-Soak Stop Photoeye Off Delay	Time the photoeye has to be blocked before deactivating Pre-Soak

REGISTER #	DEFAULT (SEC)	NAME	DESCRIPTION
114	1	Gantry Entrance Photoeye On Delay Time	Time Entrance Gantry Photoeye (input B9) must be blocked before activating eye.
115	2.0	Gantry Entrance Photoeye Off Delay Time	Time Entrance Gantry Photoeye (input B9) must be unblocked before de-activating eye.
116	1.0	Gantry PE Reverse Travel Time	Time Gantry continues Reverse travel after Gantry Entrance Photoeye Off Delay (timer #115) is satisfied.
117	1.0	Gantry Exit Photoeye On Delay	Time Exit Gantry Photoeye (input B8) must be blocked before activating eye.
118	2.0	Gantry Exit Photoeye Off Delay	Time Exit Gantry Photoeye (input B8) must be unblocked before de-activating eye.
119	1.0	Gantry PE Forward Travel Time	Time Gantry continues Forward after Gantry Exit Photoeye Off Delay (timer #118) is satisfied.
120	7.0	Fwd High Pressure Creep Time	Time Creep Speed is activated during Forward Travel of High Pressure Wash to increase time on rear of vehicle.
121	8.0	Rev High Pressure Creep Timer	Time Creep Speed is activated during Reverse Travel of High Pressure Wash to increase time on front of vehicle.
122	20%	Creep Speed 0-100%	Speed Setting of gantry travel during front and rear slowdown expressed as a percentage of full speed.
123	60%	Parking Speed 0-100%	Speed Setting of gantry travel during parking (homing) expressed as a percentage of full speed.
124	10.0	Pre-Soak Arch 1 Purge	Time Pre-Soak #2 (output R46) remains open to purge during freeze protection.
125	10.0	Pre-Soak Arch 2 Purge	Time Pre-Soak #3 (output R47) remains open to purge during freeze protection.
126	10.0	Pre-Soak Arch 3 Purge	Time Pre-Soak #4 (output R48) remains open to purge during freeze protection.
127	10.0	Chemical Rinse Arch Purge Timer	Time Chemical Rinse Arch (output R49) remains open to purge during freeze protection. †
128	10.0	Purge – High Pressure Fwd	Time Forward High Pressure Solenoid (output S26) remains open to purge during freeze protection.
129	10.0	Purge – High Pressure Rev	Time Rear High Pressure Solenoid (output S27) remains open to purge during freeze protection. †
130	900	Foaming Pre-Soak Purge Delay	Time delay between Foamy Pre-Soak Chemical Pump activation (output R42) during Freeze Protection. †

REGISTER #	DEFAULT (SEC)	NAME	DESCRIPTION
131	60	Foaming Pre-Soak Purge On Timer	Time Foamy Pre-Soak Chemical Pump activates (output R43) during Freeze Protection. †
132	0.0	Not Used	Not Used
133	50%	Jog Speed Setpoint (0-100%)	Speed Setting of gantry travel during Manual Jog expressed as a percentage of full speed. †
134	45.0	Travel Timeout 60 to 100% Speed	Travel Timeout for any pass programmed between 60 – 100% of full speed. †
135	55.0	Travel Timeout 40 to 59% Speed	Travel Timeout for any pass programmed between 40 – 59% of full speed. †
136	70.0	Travel Timeout 0 to 39% Speed	Travel Timeout for any pass programmed between 0 – 39% of full speed.
137	0.1	Blowout High Pressure Front Purge Timer	Freeze protection for front nozzles, ATF only. †
138	0.1	Blowout High Pressure Rear Purge Timer	Freeze protection for rear nozzles, ATF only. †
139	0.05	Blowout High Pressure Rocker Purge Timer	Freeze protection for rocker panel nozzles, ATF only. †
140	0.05	Heat Exchanger Air Purge Timer	Freeze protection for heat exchanger, ATF only. †

† Not ordered on this machine, or not available on 220 & 260 model machines.

Inputs - Main Control Panel (-DC)

A0 ..... E-Stop
A1 ..... Motor Starter Contact
A2 ..... Reset Switch
A3 ..... Forward Jog
A4 ..... Reverse Jog
A5 ..... Automatic Door Thermostat
A6 ..... Exit Door Photoeye (Required for Automatic Doors)
A7 ..... Entrance Door Photoeye (Required for Automatic Doors)
A8 ..... Not Used
A9 ..... Not Used
A10 .... Not Used
A11 .... Not Used
A12 .... Not Used
A13 .... Not Used
A14 .... Freeze Protection Thermostat
A15.....Treadle Switch
A16.....Treadle Inhibit Photoeye
A17.....Back-Up Bell Switch
A18.....Exit Bell Switch/Photoeye
A19 ....Entrance Bell Switch
A20 ....Under Body Wash Start Input
A21 ....Drive By Tire/Wheel Blaster Start Input
A22.....Presoak #1 Start Photoeye
A23.....Presoak Stop Photoeye
A24.....Photoeye/Bellswitch for Rinse Arch Stop
A25.....Car Dealer Auto/Start
A26.....Wash #1
A27.....Wash #2
A28.....Wash #3
A29.....Wash #4

Inputs - Gantry Control Panel (-DC)

B0 ..... Front Arm In Prox Switch (Exit End)
B1 ..... Rear Arm In Prox Switch (Entrance End)
B2 ..... Front Travel Prox Switch (Exit End)
B3 ..... Rear Travel Prox Switch (Entrance End)
B4 ..... Low Air Pressure Switch
B5 ..... Hyd Oil Overtemp Switch
B6 ..... Hyd Heater Thermostat Switch
B7 ..... Hyd Oil level Switch
B8.....Photoeye, Rear Position (Entrance End) (Not Ordered)
B9.....Photoeye, Front Position (Exit End) (Not Ordered)
B10.....Spare
B11.....Spare
B12.....Spare
B13.....Spare
B14.....Spare
B15.....Spare

Outputs - Main Control Panel (24VDC & 115 VAC)

R0A ... Inside Enter Light
R1A ... Stop Light
R2A ... Exit Light & Wash Counter
R3..... CTA Pump
R4..... Bug Sprayer Pump
R5..... Soap Pump
R6..... Wax Pump
R7..... Car Wash In Use Signal
R8..... Fault Light
R9A ... Back Up Light
R10.... #1 “A” Blower Motor Starter
R11.... #2 “A” Blower Motor Starter
R12.... #3 “A” Blower Motor Starter
R13.... High Pressure Pump Starter
R14.... Hydraulic Pump Motor Starter
R15A.. Hydraulic Tank Heater
R16.....Freeze Protection Manifold
R17.....Entrance Door Close
R18.....Entrance Door Open
R19.....Exit Door Close
R20.....Exit Door Open
R21.....Wash Water Source
R22.....#1 Presoak Arch
R23.....Underbody Wash Water Solenoid
R24.....External Fresh Water Rinse Solenoid
R25.....Fresh Water Rinse Pump
R26.....Spot Free Rinse Pump
R27.....External Spot Free Rinse Solenoid
R28.....Treadle Buzzer
R29.....Glass Wash Down Water Source
R30.....#1 Glass Wash Down
R31.....#2 Glass Wash Down

R32.... #3 Glass Wash Down
R33.... #4 Glass Wash Down
R34.... User Defined #1
R35.... User Defined #2
R36.... User Defined #3
R37.....User Defined #4
R38.....Rinse Chemical Pump
R39.....Multi Foam Soap Pump
R40.....Multi Foam Wax Pump
R41.....Spare

Outputs - Gantry Control Panel (24 VDC & 115 VAC)

S0 ..... Hydraulic Solenoid Forward Wheel Drive
S1 ..... Hydraulic Solenoid Reverse Wheel Drive
S2 ..... Wheel/Rocker Panel Water Solenoid
S3 ..... Final Rinse Water Solenoid
S4 ..... Mitter Down Solenoid
S5 ..... Driver Side Rear Jog Solenoid
S6 ..... Passenger Side Rear Jog Solenoid
S7 ..... Side Brush Arms In Solenoid
S8 ..... Creep Speed Solenoid
S9 ..... Drive Stop Solenoid
S10 .... Machine Wash Water Solenoid
S11 .... Soap Foamer Air Solenoid
S12 .... Driver Side Tag Safe Solenoid
S13 .... Passenger Side Tag Safe Solenoid
S14 .... Front High Pressure Solenoid
S15 .... Front Arm Retract During Rear Jog
S16 .... Brush Rotate Forward Solenoid
S17 .... Brush Rotate Reverse Solenoid
S18 .... Water Manifold Soap Solenoid
S19 .... Wax Foam Air Solenoid
S20 .... Foamer Soap Solenoid
S21 .... Multi Foam Air Solenoid
S22 .... High Pressure Oscillate
S23 .... User Defined #1
S24 .... User Defined #2
S25 .... User Defined #3
S26 .... User Defined #4

Table 8.3 – Inputs: Main Control Panel (-DC)

Terminal Number	I/O Point	Name	Normal Status	Description
A0	a.0	E-Stop	N/C	Emergency Stop Switch(s) kills the input to the PLC and removes power from ES1 relay, which will kill all outputs generating a fatal E-Stop Fault (fault #999). Machine cannot restart until E-Stop Switch is released and Machine is reset.
A1	a.1	Motor Starter Contact	N/O	Auxiliary Contact on Main Motor Starter generates this input. PLC must see input within 1 second of Motor Starter Output (output R14) or Motor Start Fault (fatal fault #996) is generated (usually indicating tripped overload). Machine must be reset to start.
A2	a.2	Reset Switch	N/O	Input to reset machine after Fatal Fault conditions.
A3	a.3	Forward Jog	N/O	Input from jog switch activates Hydraulic Motor Starter (output R14) and Hydraulic Drive Forward (output S0).
A4	a.4	Reverse Jog	N/O	Input from jog switch activates Hydraulic Motor Starter (output R14) and Hydraulic Drive Reverse (output S1).
A5	a.5	Automatic Door Thermostat	N/O	Input from Automatic Door Thermostat starts Low Temp Verify Timer (timer #25), which must time out before Automatic Doors Activate.
A6	a.6	Exit Door Photoeye (Required for Automatic Doors)	N/O	Input from Exit Door Photoeye must be seen before Exit Door will close.
A7	a.7	Entrance Door Photoeye (Required for Automatic Doors)	N/C	Input from Entrance Door Photoeye must be seen before Entrance Door will close.
A8	b.0	Not Used		
A9	b.1	Not Used		
A10	b.2	Not Used		

Terminal Number	I/O Point	Name	Normal Status	Description
A11	b.3	Not Used		
A12	b.4	Not Used		
A13	b.5	Not Used		
A14	a.0	Freeze Protection Thermostat	N/O	Input from Freeze Protection Thermostat starts Freeze Options On\Off Timer (timer #64), which must time out to start freeze protection.
A15	a.1	Treadle Switch	N/O	Input from treadle switch stops all pre-wash functions, activates output for treadle buzzer (output R28), stop light (output R1A), and starts Treadle Timer (timer #3).
A16	a.2	Treadle Inhibit Photoeye	N/O	Photoeye locks out treadle switch input to prevent back wheel from starting the car wash.
A17	a.3	Back-Up Bell Switch	N/O	Input from bell switch to turn on backup light (R9A).
A18	a.4	Exit Door Bell Switch/Photoeye	N/C	Input from bell switch or photoeye starts timers for Exit Door Close Delay (timer #35, output R19) and Rinse / Blower Shutoff (timer #37; rinse outputs R24, R25, R26, R27; & blower outputs R10, R11, & R12).
A19	a.5	Entrance Bell Switch	N/O	Input from Entrance Bell Switch generates Entrance Door Up signal (output R18) and activates CTA pump (output R3, timer #2).
A20	a.6	Underbody Wash Start Input	N/O	Input from Underbody Start Photoeye activates the Underbody (output R23) and activates Underbody Timer (timer #19), which will stop the Underbody when it expires.
A21	a.7	Drive By Tire/Wheel Blaster Start Input	N/O	Input from Drive By Wheel Blaster Bellswitch/Photoeye activates the Drive By Wheel Blaster (outputs R13, S2) and activates Drive By Wheel Blaster Timer (timer #45), which will stop the Drive By Wheel Blaster when it expires.
A22	b.0	Pre-Soak Start Photoeye	N/O	Input from Pre-Soak Start Photoeye activates #1 Pre-Soak (output R22) and starts the Pre-Soak Timer (timer #18) which will stop the #1 Pre-Soak when it expires.

Terminal Number	I/O Point	Name	Normal Status	Description
A23	b.1	Pre-Soak Stop Photoeye	N/O	Input from Pre-Soak Stop Photoeye will stop all Pre-Soak outputs (outputs R22 & R23).
A24	b.2	Rinse Arch Stop Photoeye/Bellswitch	N/O	Input from Rinse Arch Stop photoeye or bellswitch stops all rinse arch outputs (outputs R24, R25, R26, R27, & R38)
A25	b.3	Car Dealer Auto/Start	N/O	Input from Auto/Dealer Switch allows automatic start of wash when Treadle input (input A15) is made.
A26	b.4	Wash #1	N/O	Input from Entry System for Wash #1. PLC will use the last Wash # seen prior to treadle switch input (input A15).
A27	b.5	Wash #2	N/O	Input from Entry System for Wash #2. PLC will use the last Wash # seen prior to treadle switch input (input A15).
A28	b.6	Wash #3	N/O	Input from Entry System for Wash #3. PLC will use the last Wash # seen prior to treadle switch input (input A15).
A29	b.7	Wash #4	N/O	Input from Entry System for Wash #4. PLC will use the last Wash # seen prior to treadle switch input (input A15).

Table 8.4 – Inputs: Gantry Junction Box (-DC)

Terminal Number	I/O Point	Name	Normal Status	Description
B0	11	Front Arm In Prox Switch	N/O	Input from Front Arm Prox Switch starts Front Slow Down Timer (timer #70) and slows machine until timer expires.
B1	21	Rear Arm In Prox Switch	N/O	Input from Rear Arm Prox Switch starts rear jog sequence.
B2	12	Front Travel Prox Switch	N/O	Input from Front Travel Prox Switch stops forward carriage travel (output S0) and starts Hydraulic Pause Timer (timer #4).
B3	22	Rear Travel Prox Switch	N/O	Input from Rear Travel Prox Switch stops reverse carriage travel (output S1) and starts Hydraulic Pause Timer (timer #4).
B4	13	Low Air Pressure Switch	N/C	Loss of input from Low Air Pressure Switch causes a fatal fault (fault #997). The machine must be reset before restarting.
B5	23	Hydraulic Oil Overtemp Switch	N/C	Loss of input from Hydraulic Oil Overtemp Switch causes a fatal fault (fault #998). The machine must be reset before restarting.
B6	14	Hydraulic Heater Thermostat Switch	N/O	Input from Hydraulic Heater Thermostat Switch turns on Hydraulic Heater Output (output R15). †
B7	24	Hydraulic Oil Level Switch	N/C	Loss of input from Hydraulic Oil Level Switch causes a fatal fault (fault #995). The machine must be reset before restarting.
B8	15	Not Used - Jumper to DC-		
B9	25	Not Used - Jumper to DC-		
B10	16	Not Used - Jumper to DC-		
B11	26	Not Used - Jumper to DC-		

Table 8.5 – Outputs: Main Control Panel (24VDC & 115vac)

Terminal Number	I/O Point	Name	Description
R0A	a.0	Inside Enter Light	Green Light activated by any Wash Input. Extinguished by Treadle Switch (input A15), Backup Bell Switch (input A17), or Low Temp Verify timer (timer #25).
R1A	a.1	Stop Light	Red Light activated by Treadle Input (input A15). Extinguished if Treadle Input is lost or at completion of Wash.
R2A	a.2	Exit Light	Comes on at completion of Wash and stays on until the Exit Light Timer (timer #16) expires.
R3	a.3	CTA Pump	Activated by Entrance Bell Switch (input A19) and controlled by the CTA Timer (timer #2). Deactivated by Treadle Switch (input A15).
R4	a.4	Bug Sprayer Pump	Activated by the Wash Start and controlled by the Bug Spray Timer (timer #58).
R5	b.5	Soap Pump	Works in tandem with Foamer Soap Solenoid (output S12) and Water Manifold Soap Solenoid (output S16). If Polyflex cloth is used, the Soap Pump and Water Manifold Soap Solenoid will be energized anytime the side brushes engage the vehicle.
R6	b.6	Wax Pump	Chemical Pump for Wax.
R7	b.7	Car Wash In Use Signal	Output to Entry System. Activated by Wash Start and deactivated when exit light goes out.
R8	b.0	Fault Light	Comes on or flashes during any Fatal Fault condition.
R9A	b.1	Back Up Light	Activated by the Backup Bell Switch (input A17) before Wash starts.
R10	a.0	#1 “A” Blower Motor Starter	Starts after the Blower Start Delay timer (timer #42) expires if programmed in wash. Stays on until Blower On Timer (timer #23) expires or until Rinse/Blower Shutoff Timer (timer #37) expires.
R11	a.1	#2 “A” Blower Motor Starter	Starts after the Blower #2 Delay timer (timer #10) expires if programmed in wash. Stays on until Blower On Timer (timer #23) expires or until Rinse/Blower Shutoff Timer (timer #37) expires.

Terminal Number	I/O Point	Name	Description
R12	a.2	#3 “A” Blower Motor Starter	Starts after the Blower #3 Delay timer (timer #11) expires if programmed in wash. Stays on until Blower On Timer (timer #23) expires or until Rinse/Blower Shutoff Timer (timer #37) expires.
R13	a.3	High Pressure Pump Starter	Works in tandem with the High Pressure Forward Solenoid (output S26), the High Pressure Reverse Solenoid (output S27 †), or the Wheel Blaster Water Solenoid (output S2).
R14	a.4	Hydraulic Motor Starter	Starts Hydraulic Motor and is required with all hydraulic related outputs.
R15	a.5	Hydraulic Heater Contactor	Output energizes coil on Hydraulic Heater Relay and is controlled by Hydraulic Heater Thermostat Switch (input B6). †
R16	a.6	Freeze Protection Manifold	Activates N/O Water Solenoids to shutoff water flow and N/C Air Solenoids to purge water lines.
R17	a.7	Entrance Door Close	Energized by Wash Start if in Automatic Door mode. Must have Entrance Door Photoeye input (input A7) to energize.
R18	b.0	Entrance Door Open	Energized by any Wash Input, entrance bell switch (input A19) or if Entrance Door Photoeye input (input A7) is lost.
R19	b.1	Exit Door Close	Energized after Exit Door Close Delay Timer Expires (timer #35) if in Automatic Door mode. Must have Exit Door Photoeye input (input A6) to energize.
R20	b.2	Exit Door Open	Energized at completion of wash, if treadle Switch input (input A15) is lost during wash, by exit bell switch (input A18), or if Exit Door Photoeye input (input A6) is lost during Exit Door Down Verify Timer (timer #91).
R21	b.3	Machine Wash Water Source	Works in tandem with either the Machine Wash Water Solenoid (output S10) or the Underbody Wash Solenoid (output R23)
R22	b.3	#1 Pre-Soak Arch	Started by Pre-Soak Start Photoeye (input A22). Stopped by Pre-Soak Stop Bellswitch/Photoeye (input A23), Treadle Switch (input A15), or when #1 Pre-Soak Timer (timer #18) expires.
R23	b.5	Under Body Wash Water Solenoid	Activated by the Underbody Start Bellswitch (input A20). Deactivated by the Treadle Switch (input A15), the Pre-Soak Stop Bellswitch\Photoeye (input A23), or the Underbody Timer (timer #19).

Terminal Number	I/O Point	Name	Description
R24	b.6	External Fresh Water Rinse Solenoid	Works in tandem with Fresh Water Rinse Pump (output R25). Activated after Treadle Input (input A15) is deactivated and controlled by the Rinse Arch Timer (timer #20) or by the Rinse \ Dry shutoff timer (timer #37). If short bay option is chosen, output is activated at completion of wash.
R25	b.7	Fresh Water Rinse Pump	Works in tandem with either the Gantry Final Rinse Water Solenoid (output S3) or the External Fresh Water Rinse Solenoid (output R24).
R26	a.0	Spot Free Rinse Pump	Works in tandem with either the Gantry Spot Free Final Rinse Solenoid (output S28) † or the External Spot Free Rinse Solenoid (output R27).
R27	a.1	External Spot Free Rinse Solenoid	Works in tandem with Spot Free Rinse Pump (output R26). Activated after Treadle Input (input A15) is deactivated and controlled by the Rinse Arch Timer (timer #20) or by the Rinse \ Dry shutoff timer (timer #37). If short bay option is chosen, output is activated at completion of wash.
R28	a.2	Treadle Buzzer	Activated by the Treadle Switch input (input A15) and controlled by the Treadle Buzzer Timer (timer #80).
R29	a.3	Glass Wash Down Water Source	Energizes after the Glass Wash Down Verify Timer (timer #79) expires. Works in tandem with the Glass Wash Down Outputs 1-4 (outputs R30-R33)
R30	a.4	Glass Wash Down #1	Works in tandem with Glass Wash Down Water Source (output R29) and controlled by the Glass Wash Down On Timer (timer #78).
R31	a.5	Glass Wash Down #2	Works in tandem with Glass Wash Down Water Source (output R29) and controlled by the Glass Wash Down On Timer (timer #78).
R32	a.6	Glass Wash Down #3	Works in tandem with Glass Wash Down Water Source (output R29) and controlled by the Glass Wash Down On Timer (timer #78).
R33	a.7	Glass Wash Down #4	Works in tandem with Glass Wash Down Water Source (output R29) and controlled by the Glass Wash Down On Timer (timer #78).
R34	b.0	User Defined #1	Works in tandem with Gantry User Defined #1 (output S22) if programmed during any pass.
R35	b.1	User Defined #2	Works in tandem with Gantry User Defined #2 (output S23) if programmed during any pass.

Terminal Number	I/O Point	Name	Description
R36	b.2	User Defined #3	Works in tandem with Gantry User Defined #3 (output S24) if programmed during any pass.
R37	b.3	User Defined #4	Works in tandem with Gantry User Defined #4 (output S25) if programmed during any pass.
R38	b.4	Rinse Chemical Pump	Works in tandem with the any of the rinse outputs (outputs R24, R27, S28 †, or S3) if programmed. (Typically used for Drying Agent).
R39	b.5	Multi Foam Soap Pump	Activates 2nd and 3rd Soap Chemical Pumps. Works in tandem with Multi-foam Air Solenoid Output (output S13).
R40	b.6	Multi Foam Wax Pump	Activates 2nd and 3rd Wax Chemical Pumps. Works in tandem with Multi-foam Air Solenoid Output (output S13).
R41	b.7	Not Used	Controlled by the Holding Tank High Water Level Input (input A37). †
R42 – R56	b.6	Not Used	†

† Not on this machine

Table 8.6 – Outputs: Gantry Junction Box (24VDC & 115 VAC)

Terminal Number	I/O Point	Name	Description
S0	13	Hydraulic Solenoid Forward Wheel Drive	Activated to move carriage Forward. Requires Hydraulic Motor Starter Output (output R14). CR582
S1	23	Hydraulic Solenoid Reverse Wheel Drive	Activated to move carriage in Reverse. Requires Hydraulic Motor Starter Output (output R14). CR585
S2	16	Wheel Blaster Solenoid	Works in tandem with the High Pressure Pump Starter (output R13) and energized for Drive By Wheel Blaster (input A21) or any pass Wheel Blaster is programmed. Cannot be programmed same pass with HP Wash.
S3	26	Spot Free Final Rinse Solenoid	Works in tandem with Spot Free Rinse Pump (output R26) during an Gantry Rinse Pass.
S4	13	Mitter Down	Energized prior to any pass including a friction wash. Controlled by the Mitter Down Timer (timer #61). Requires Hydraulic Motor Starter Output (output R14)
S5	23	Driver Side Jog Solenoid	Energized during the Rear Jog. Controlled by the Driver Side Rear Arm Retract Timer (timer #14).
S6	16	Passenger Side Jog Solenoid	Energized during the Rear Jog. Controlled by the Passenger Side Rear Arm Retract Timer (timer #13).
S7	26	Side Brush In Air	Activated during any Friction Wash Pass
S8	13	Creep Speed Solenoid	As the front side brushes wrap around the vehicle, the front arm proximity switch is activated to slow the machine to creep speed to allow additional time cleaning the front grill and headlights.
S9	23	Drive Stop Solenoid	Allows travel of the gantry in forward or reverse to be stopped without removing the forward/reverse output. This allows the brushes to rotate while stopped.
S10	16	Machine Wash Water Solenoid	Works in tandem with Wash Water Source Pump (output R21) and is activated during any Friction Wash Pass or if programmed on Rinse\Chemical Pass.
S11	26	Foamer Air Solenoid	Energized in tandem with Soap Pump output (output R5) if Foamy Soap is programmed.

Terminal Number	I/O Point	Name	Description
S12	13	Driver Side Tag Safe Solenoid	Optional solenoid used with tag-safe function to partially open the front driver's side arm to prevent damage to the vehicle's front tag during rear travel. Also used during the front jog process.
S13	23	Passenger Side Tag Safe Solenoid	Optional solenoid used with tag-safe function to partially open the front passenger's side arm to prevent damage to the vehicle's front tag during rear travel. Also used during the front jog process.
S14	16	Front High Pressure Solenoid	Energizes 2 X 3 Turbo Nozzles mounted on front arms to enhance cleaning of windows, mirrors and front grill.
S15	26	Front Arm Retract Solenoid	Output to retract front arms from vehicle during rear jog process to prevent damage to side mirrors.
S16	13	Brush Rotate Forward Solenoid	Energized during the forward travel portion of any pass including a friction wash. Requires Hydraulic Motor Starter Output (output R14) CR644
S17	23	Brush Rotate Reverse Solenoid	Energized during the reverse travel portion of any pass including a friction wash. Requires Hydraulic Motor Starter Output (output R14). CR647
S18	16	Water Manifold Soap Solenoid	Works in tandem with the Soap Pump (output R5) and is activated anytime Polyflex side brushes engage vehicle or anytime Foamy Soap is programmed.
S19	26	Wax Foam Air Solenoid	Works in tandem with the Wax Pump (output R6) and is activated anytime Foamy Wax is programmed.
S20	13	Foamer Soap Solenoid	Works in tandem with the Soap Pump (output R5) and is activated anytime Foamy Soap is programmed.
S21	23	Multifoam Air Solenoid	Energized in tandem with Soap Pump output (output R5) if Foamy Soap if required
S22	16	High Pressure Nozzle Oscillate Solenoid	Activated during any Wash Pass including High Pressure Wash. Requires Hydraulic Motor Starter Output (output R14).
S23	26	User Defined #1	
S24	13	User Defined #2	
S25	23	User Defined #3	
S26	16	User Defined #4	
S27 – S35		Not Used	†

† Not used on this machine.

Section 9 - Electrical Drawings and Schematics – 260

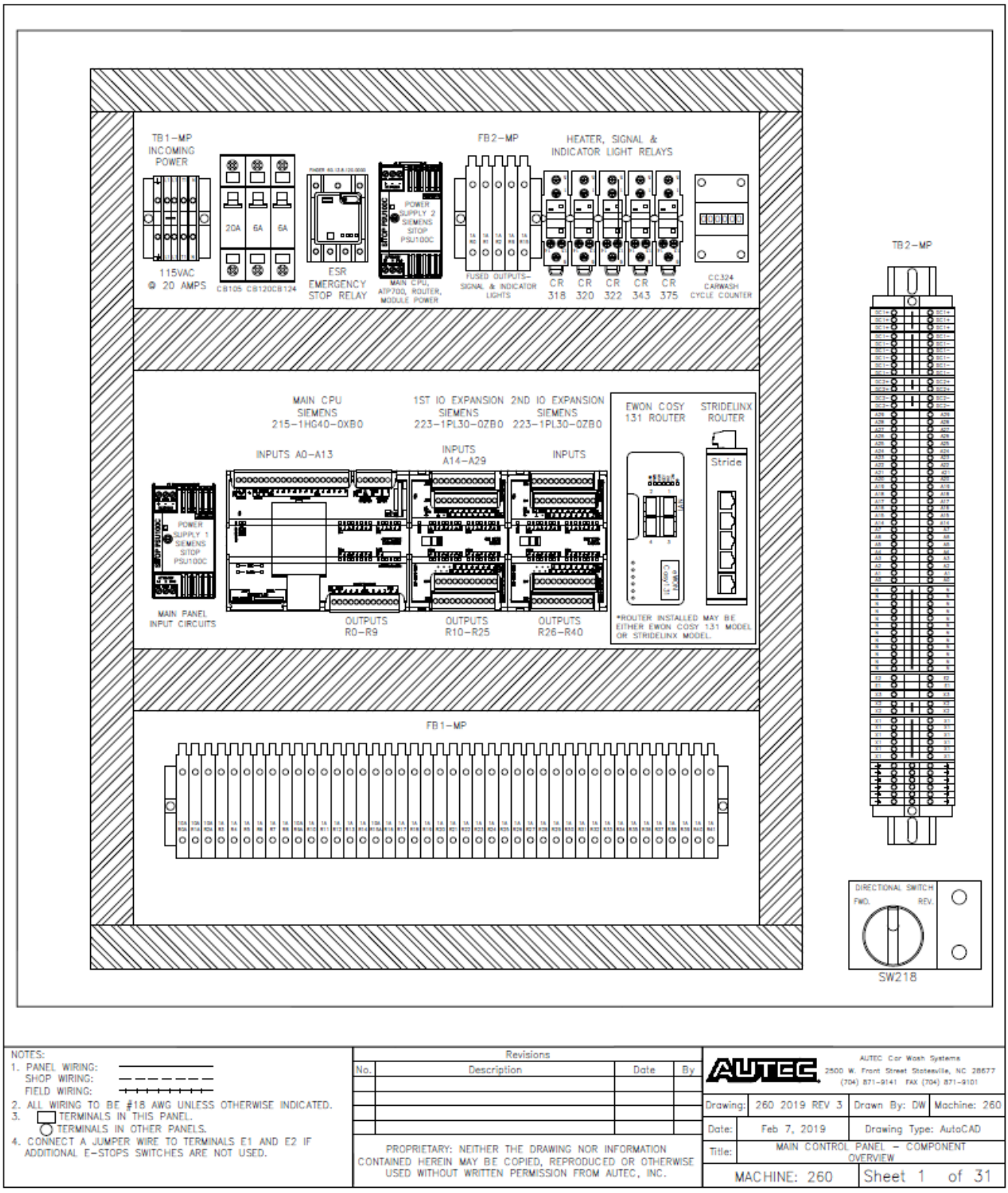


Fig 9-1 Main Control Panel – Component View

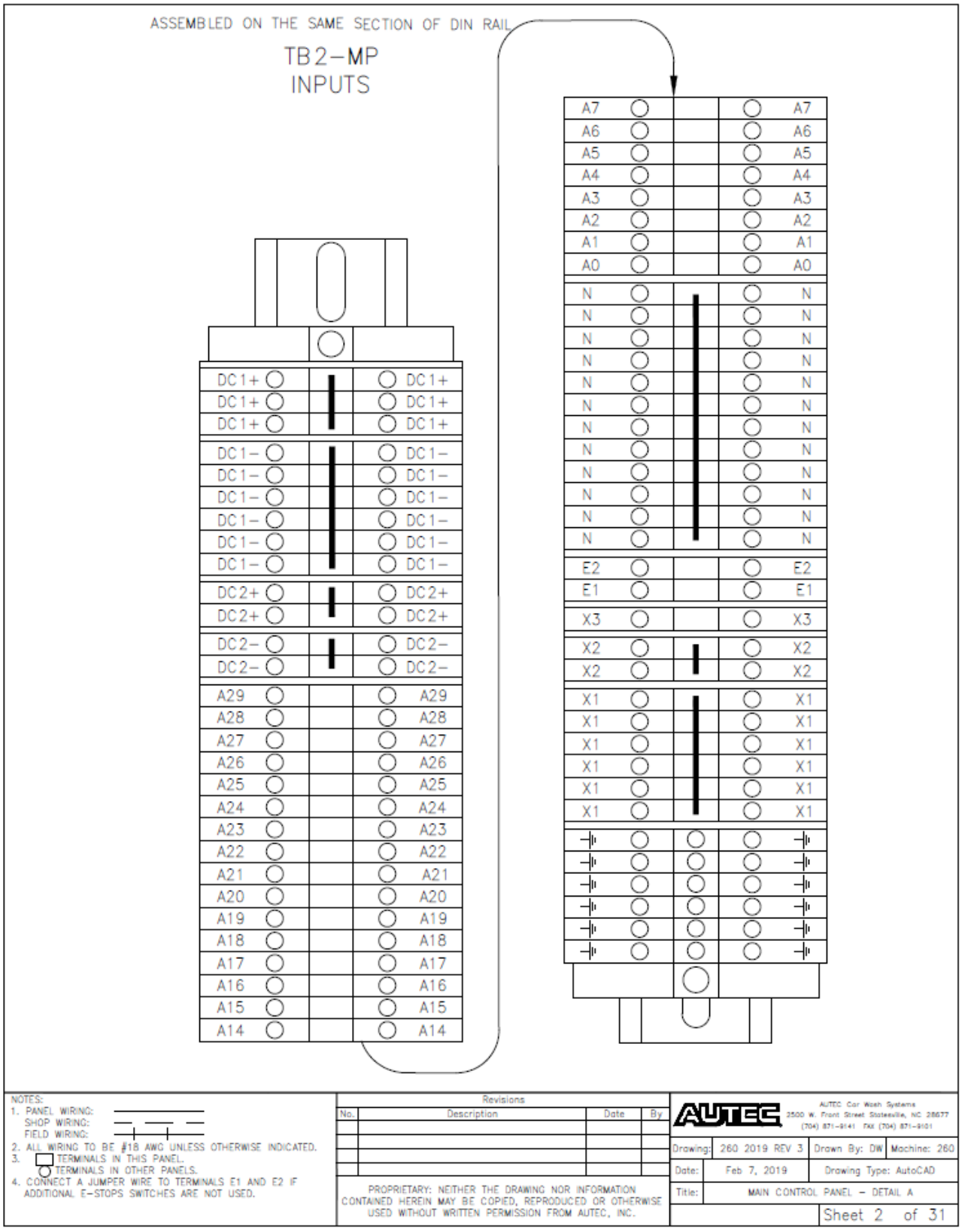


Fig 9-2 Main Control Panel – Detail A

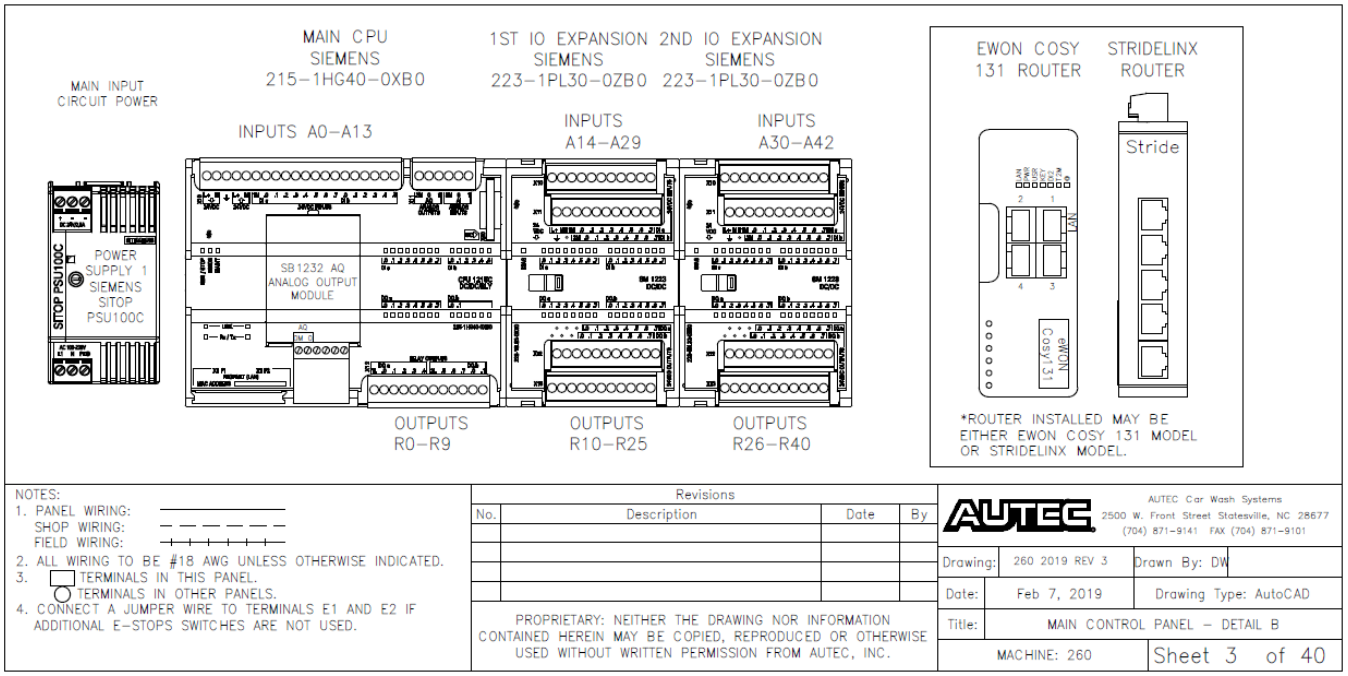


Fig 9-3 Main Control Panel – Detail B

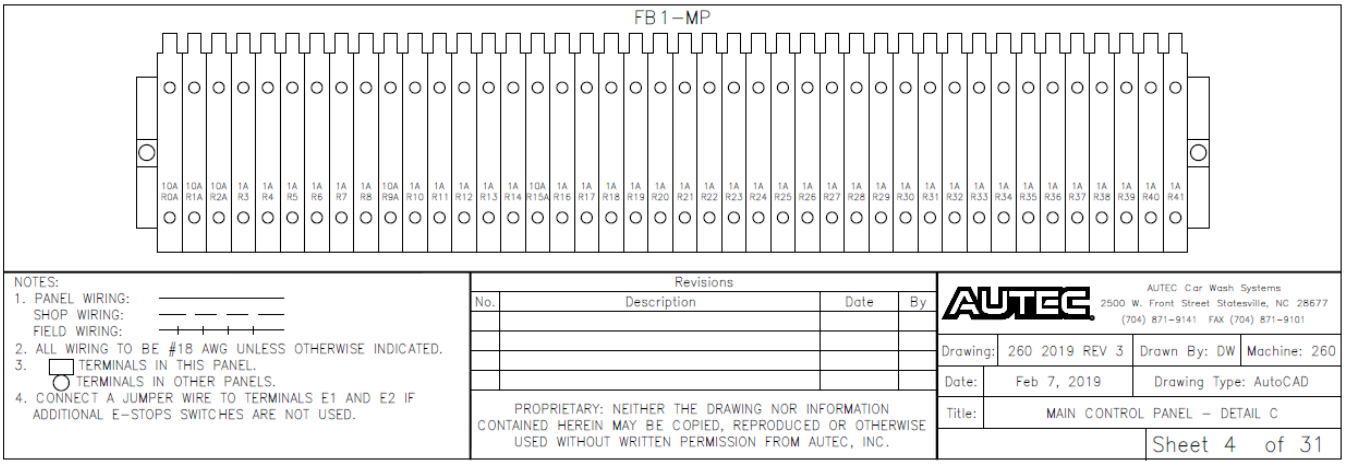


Fig 9-4 Main Control Panel – Detail C

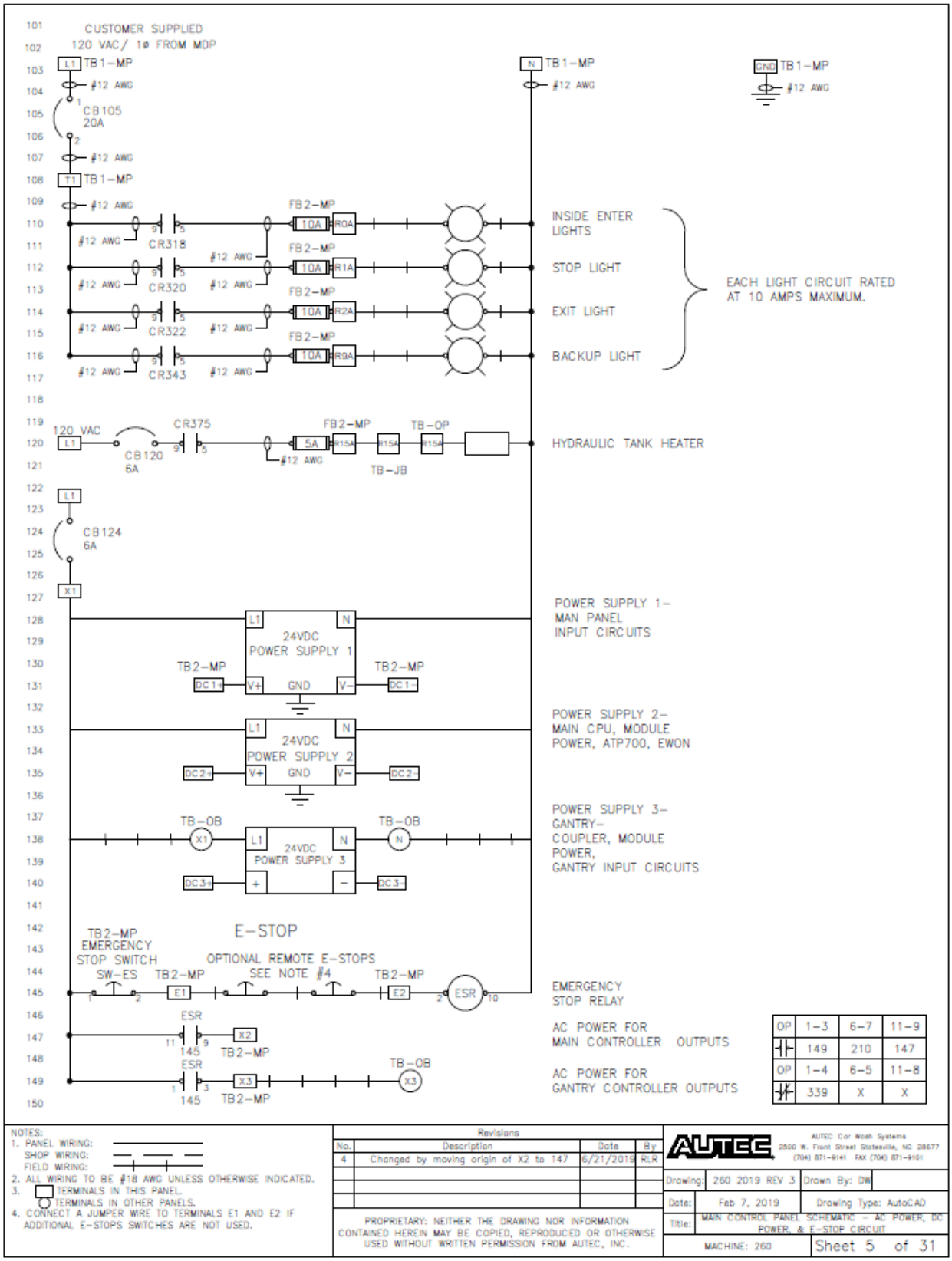


Fig 9-5 Main Control Panel - Schematic

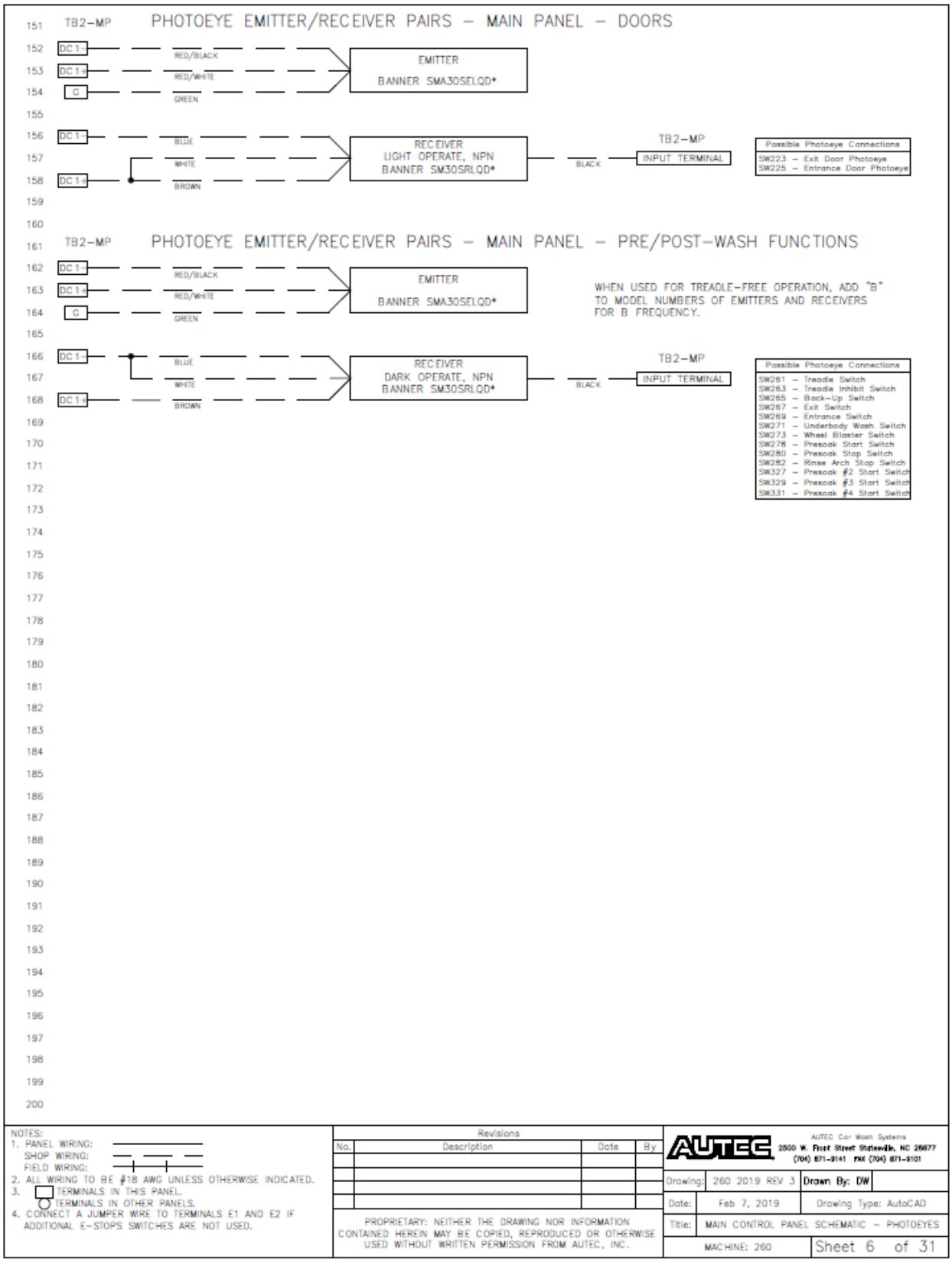


Fig 9-6 Main Control Panel – Schematic (Photoeyes)

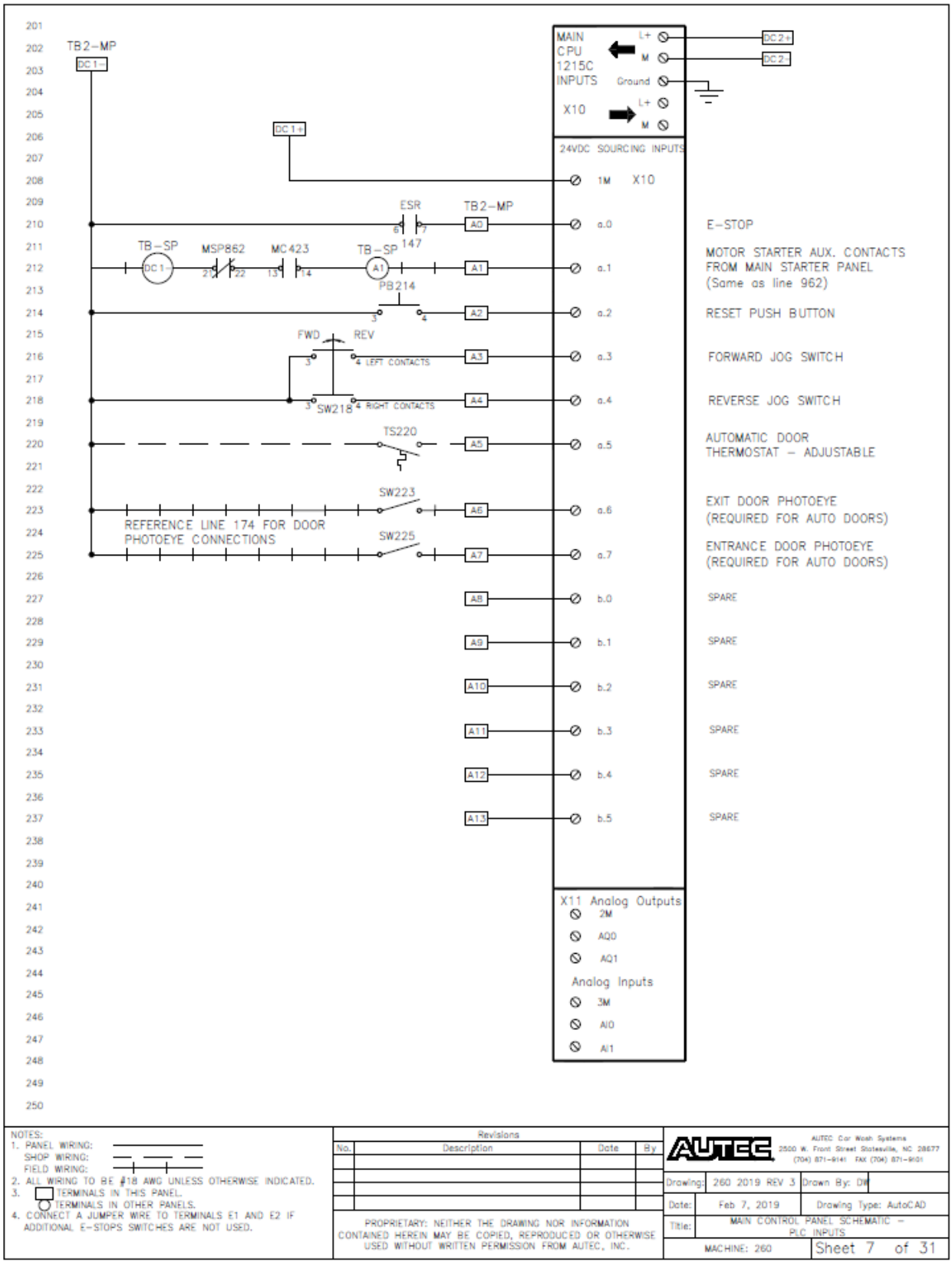


Fig 9-7 Main Control Panel – Schematic (CPU Inputs)

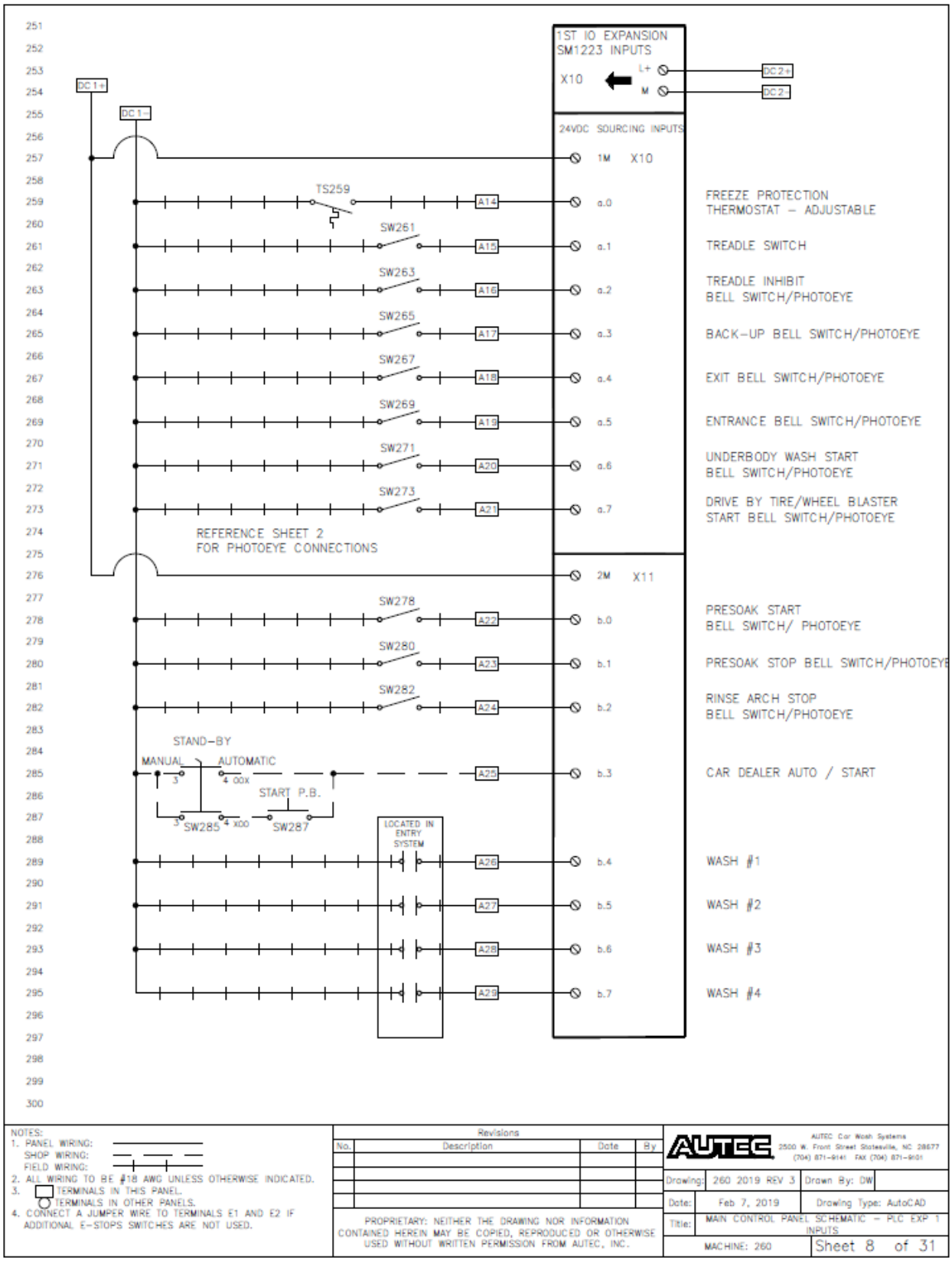


Fig 9-8 Main Control Panel – Schematic (Mod 1 Inputs)

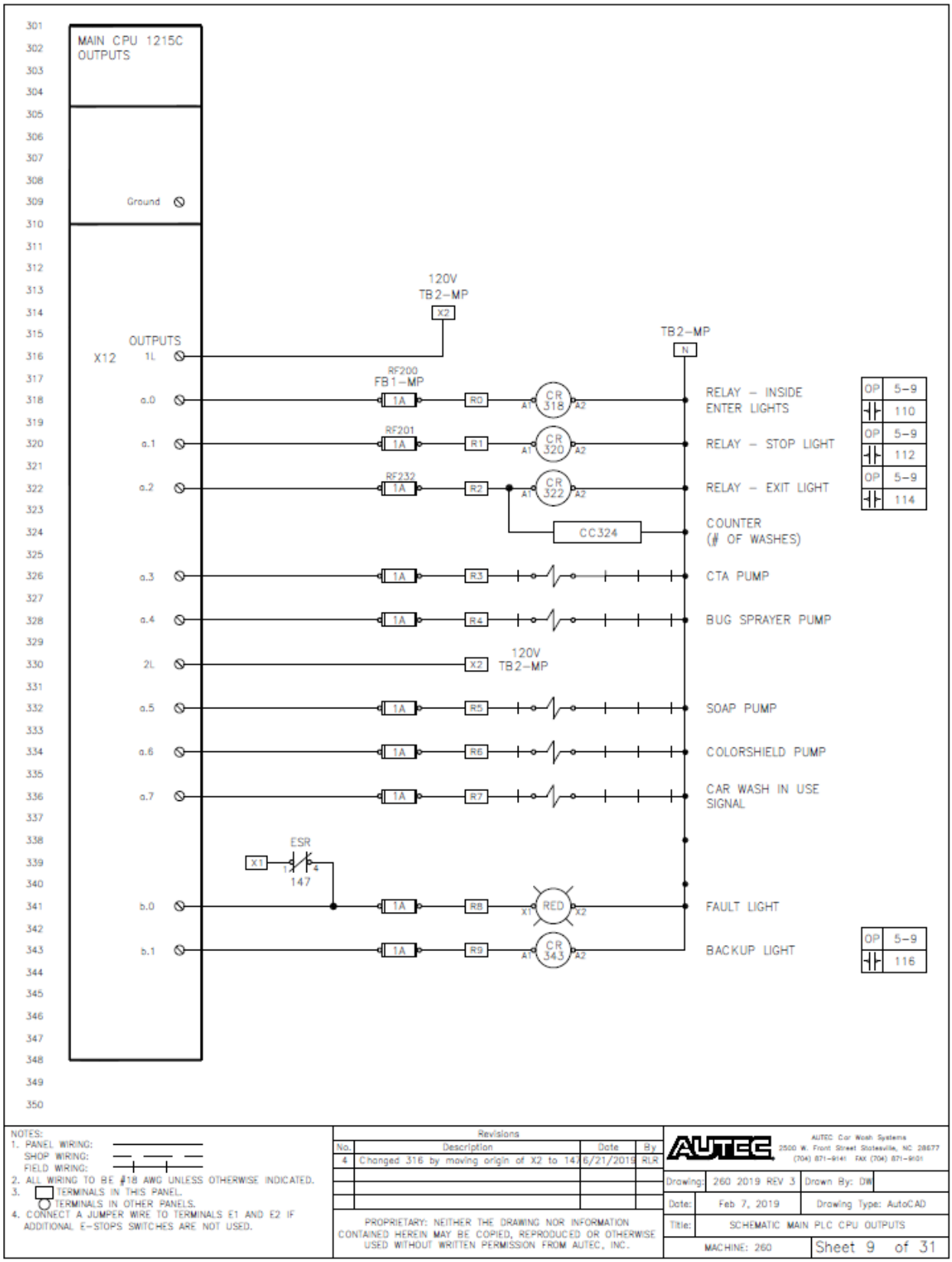


Fig 9-9 Main Control Panel Schematic (CPU Outputs)

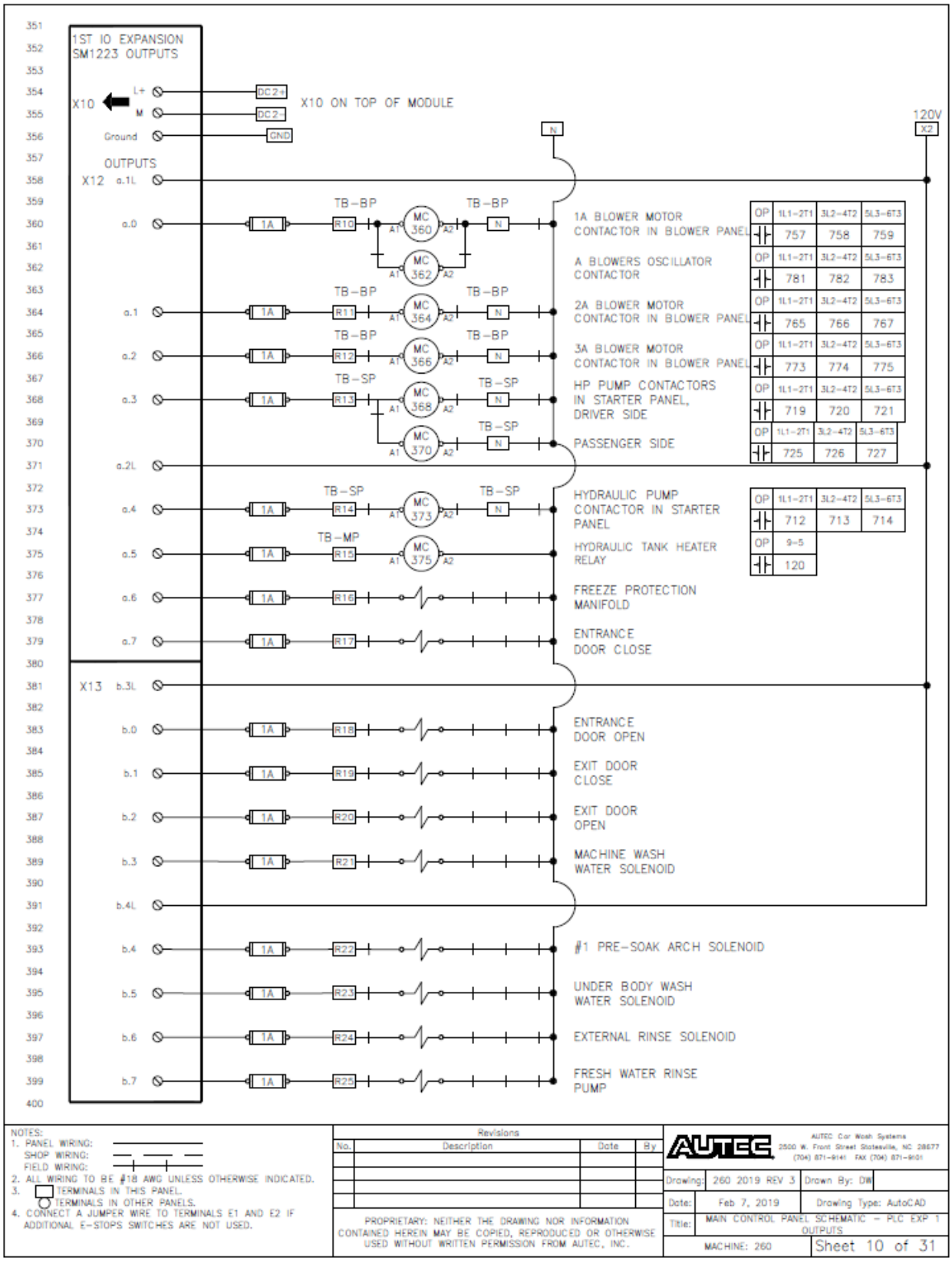


Fig 9-10 Main Control Panel – Schematic (Mod 1 Outputs)

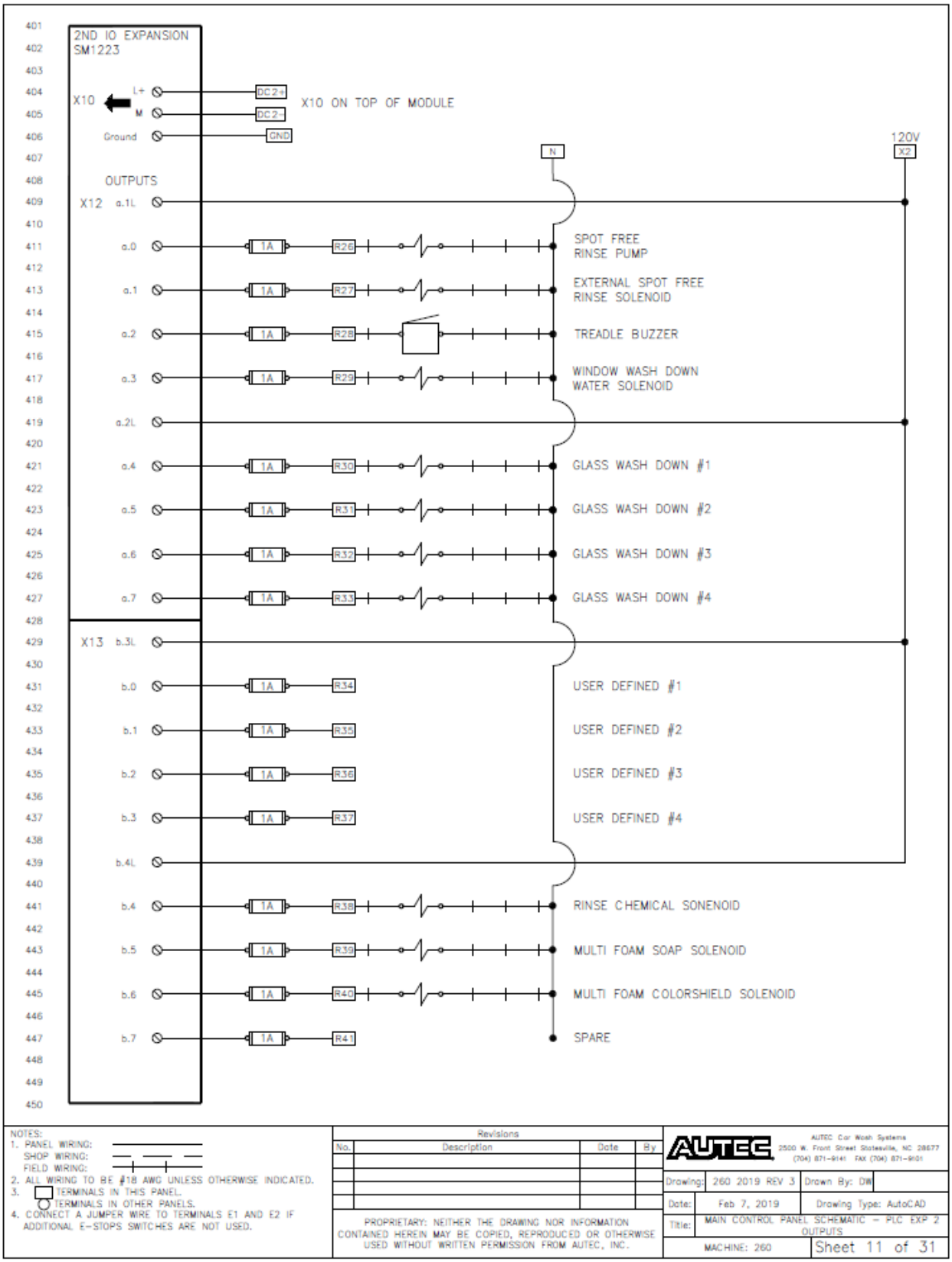
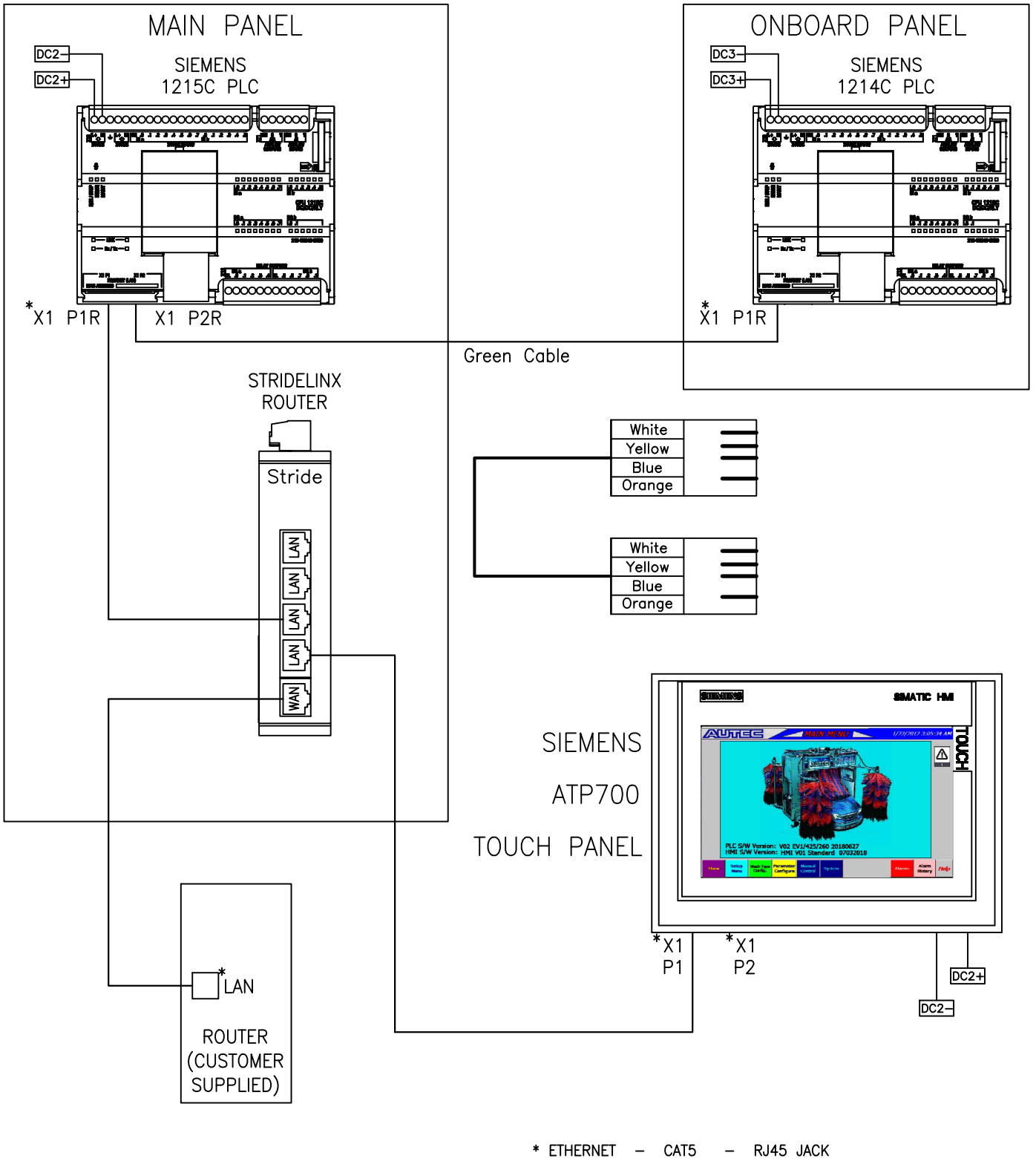


Fig 9-11 Main Control Panel – Schematic (Mod 2 Outputs)

ETHERNET COMMUNICATION DIAGRAM



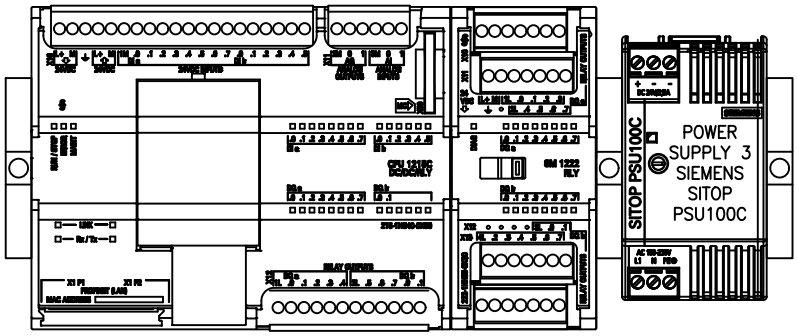
* ETHERNET – CAT5 – RJ45 JACK

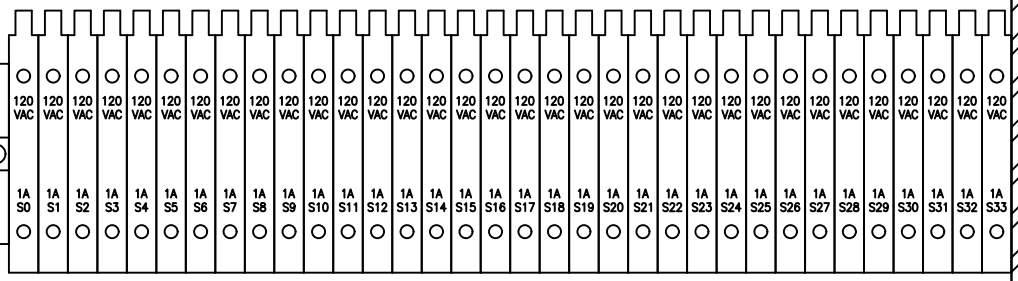
NOTES:
1. PANEL WIRING: ———
   SHOP WIRING: — — —
   FIELD WIRING: —|—|—
2. ALL WIRING TO BE #18 AWG UNLESS OTHERWISE INDICATED.
3. □ TERMINALS IN THIS PANEL.
   ○ TERMINALS IN OTHER PANELS.
4. CONNECT A JUMPER WIRE TO TERMINALS E1 AND E2 IF ADDITIONAL E-STOPS SWITCHES ARE NOT USED.

Revisions			
No.	Description	Date	By
4	REPLACE B&R WITH ONBOARD PLC	9/21/21	MH

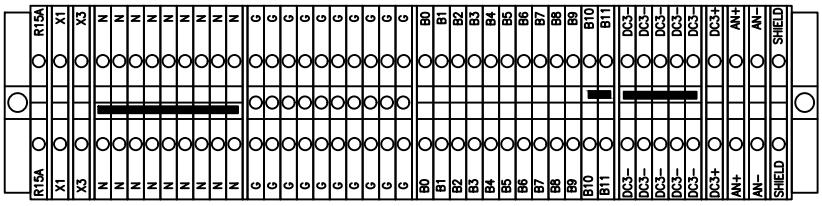
AUTEC Car Wash Systems
2500 W. Front Street Statesville, NC 28677
(704) 871-9141 FAX (704) 871-9101

		Drawn By: DW	
Date:	Feb 19, 2019	Drawing Type: AutoCAD	
Title:	ETHERNET COMMUNICATION DIAGRAM		
MACHINE: 260		Sheet 12 of 31	





FB-0B
FUSED OUTPUTS



NOTES:
1. PANEL WIRING: ———
   SHOP WIRING: —— —
   FIELD WIRING: ——|——
2. ALL WIRING TO BE #18 AWG UNLESS OTHERWISE INDICATED.
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   ○ TERMINALS IN OTHER PANELS.
4. CONNECT A JUMPER WIRE TO TERMINALS E1 AND E2 IF ADDITIONAL E-STOPS SWITCHES ARE NOT USED.

Revisions

No.	Description	Date	By
4	CHANGED FROM B&R TO PLC ON BOARD	9/20/21	MH

AUTEC Car Wash Systems
2500 W. Front Street Statesville, NC 28677
(704) 871-9141 FAX (704) 871-9101

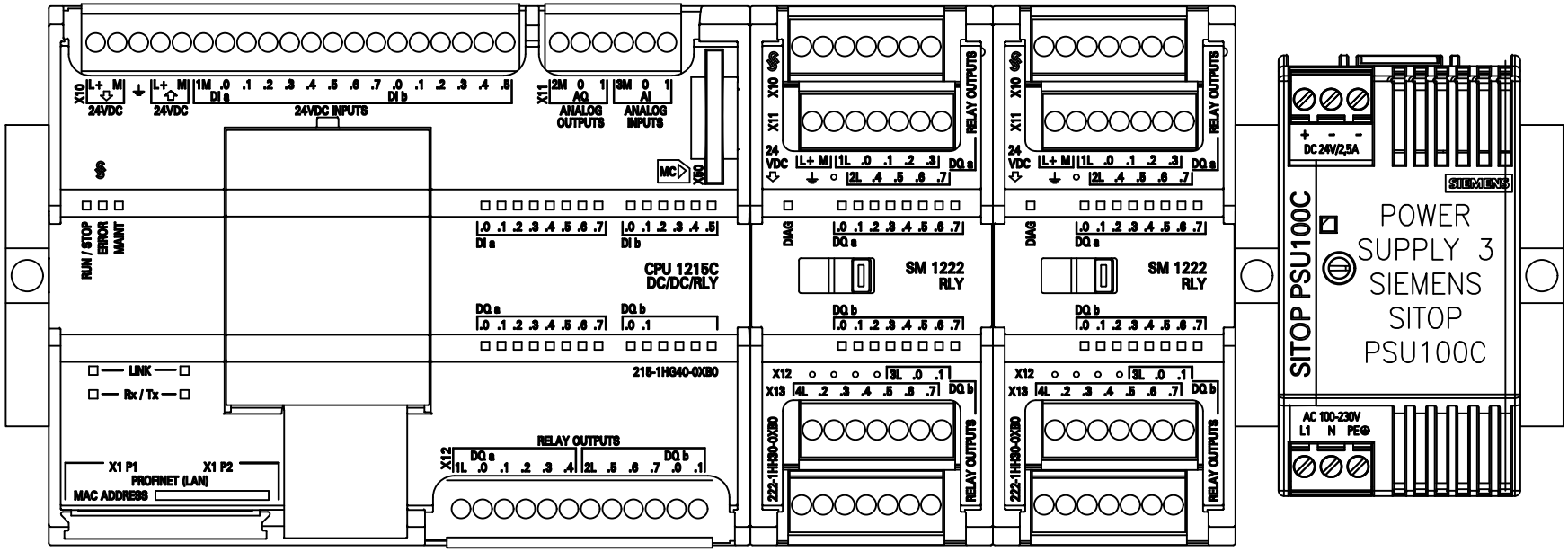
Drawn By: DW

Date: Feb 19, 2019

Drawing Type: AutoCAD

Title: GANTRY CONTROL PANEL WITH PLC - COMPONENT OVERVIEW

MACHINE: 260



NOTES:

1. PANEL WIRING: ———————
   SHOP WIRING: — — —
   FIELD WIRING: —|—|—
2. ALL WIRING TO BE #18 AWG UNLESS OTHERWISE INDICATED.
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   ○ TERMINALS IN OTHER PANELS.
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Revisions

No.	Description	Date	By
4	CHANGED FROM B&R TO PLC ON BOARD	9/20/21	MH

AUTEC Car Wash Systems
2500 W. Front Street Statesville, NC 28677
(704) 871-9141 FAX (704) 871-9101

Drawn By: DW

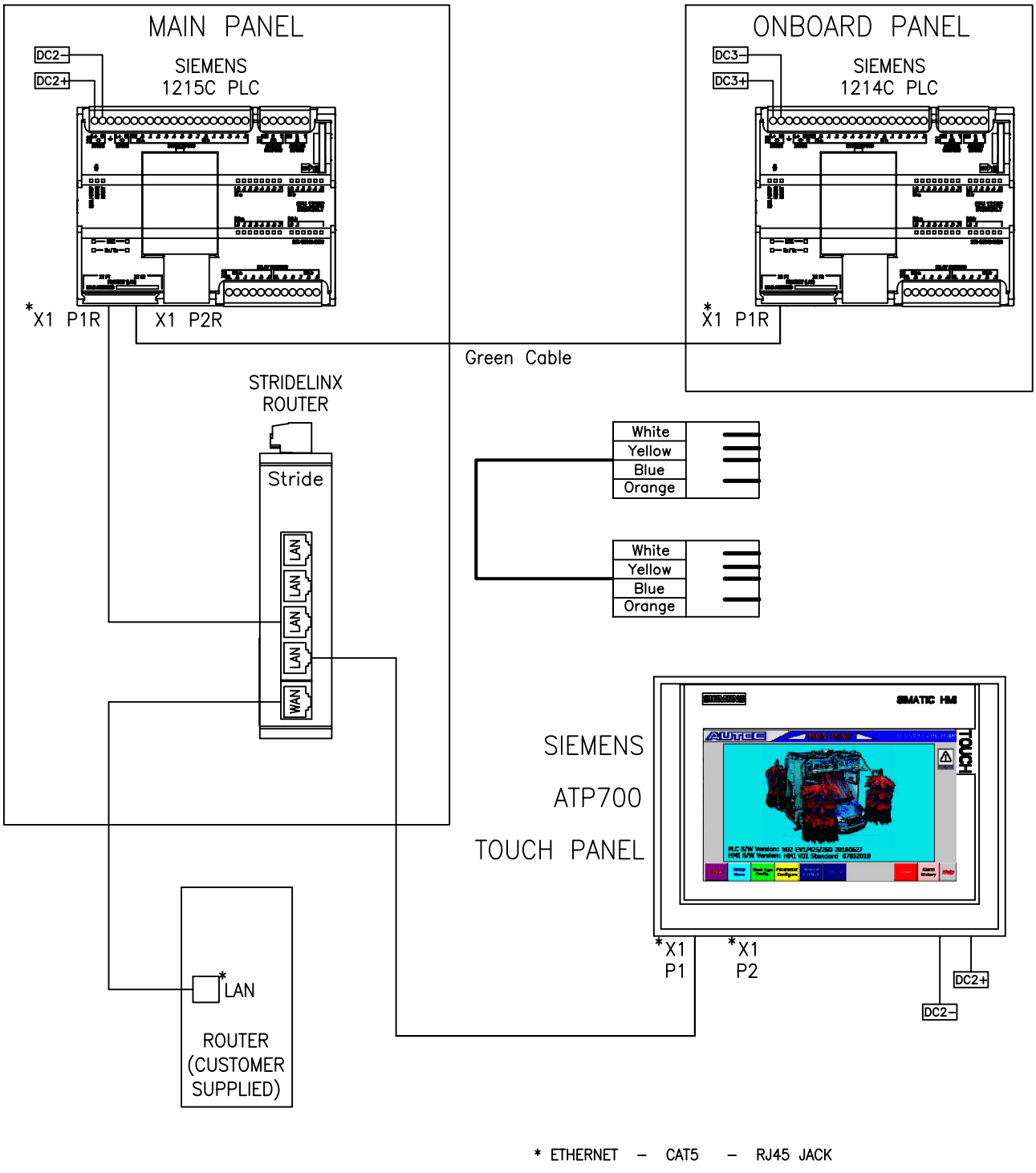
Date: Feb 19, 2019

Drawing Type: AutoCAD

Title: GANTRY CONTROL PANEL WITH PLC – DETAIL A

MACHINE: 260

ETHERNET COMMUNICATION DIAGRAM



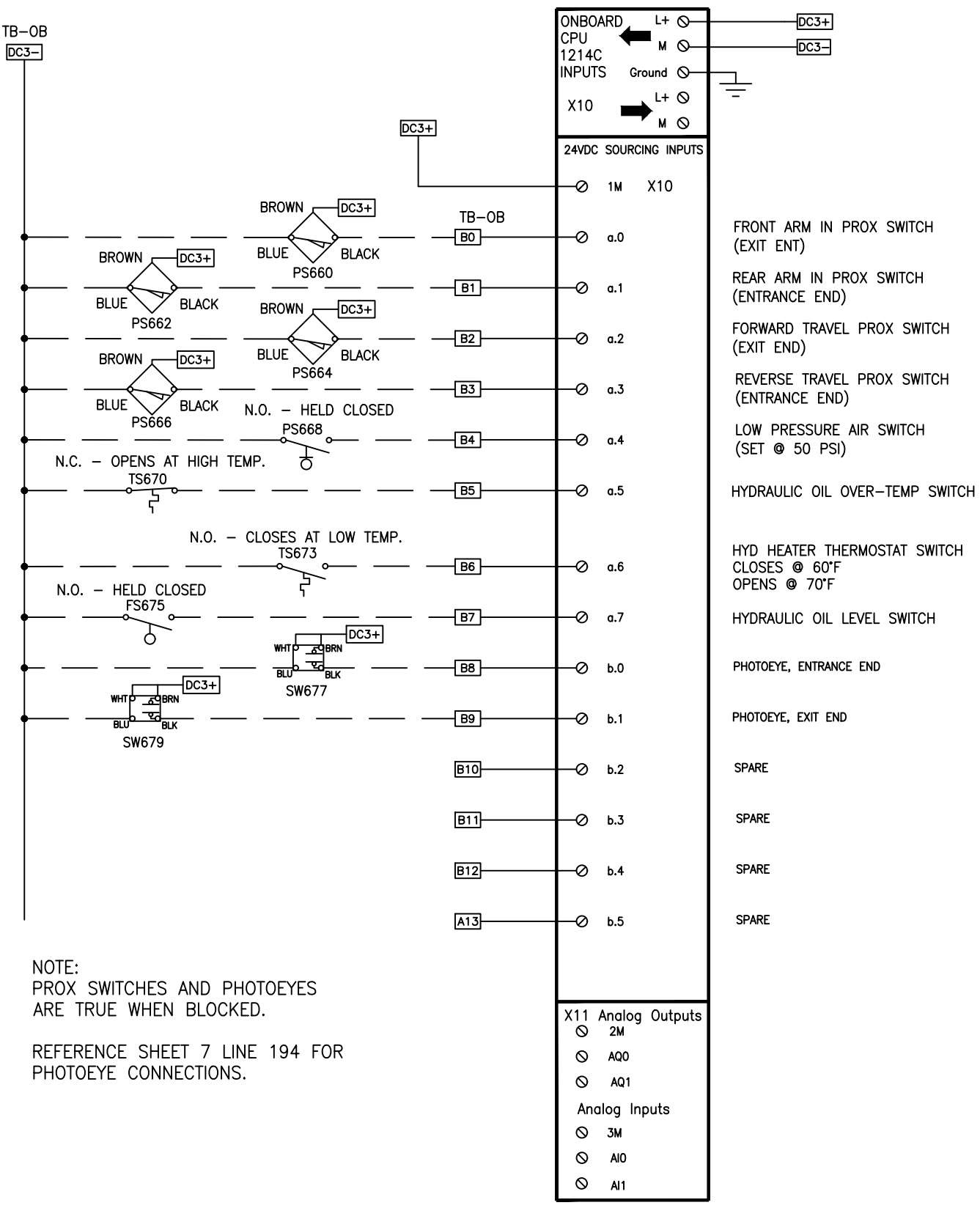
* ETHERNET – CAT5 – RJ45 JACK

NOTES:
1. PANEL WIRING: ——— SHOP WIRING: — — — FIELD WIRING: —|—|—
2. ALL WIRING TO BE #18 AWG UNLESS OTHERWISE INDICATED.
3. □ TERMINALS IN THIS PANEL. ○ TERMINALS IN OTHER PANELS.
4. CONNECT A JUMPER WIRE TO TERMINALS E1 AND E2 IF ADDITIONAL E-STOPS SWITCHES ARE NOT USED.

Revisions			
No.	Description	Date	By
4	REPLACE B&R WITH ONBOARD PLC	9/21/21	MH

AUTEC Car Wash Systems
2500 W. Front Street Statesville, NC 28677
(704) 871-9141 FAX (704) 871-9101

Drawing:	220 2019 REV 4	Drawn By: DW	
Date:	Feb 19, 2019	Drawing Type: AutoCAD	
Title:	ETHERNET COMMUNICATION DIAGRAM		
MACHINE: 260		Sheet 15 of 31	



NOTE:
PROX SWITCHES AND PHOTOEYES ARE TRUE WHEN BLOCKED.

REFERENCE SHEET 7 LINE 194 FOR PHOTOEYE CONNECTIONS.

NOTES:
1. PANEL WIRING: ——— SHOP WIRING: — — FIELD WIRING: —|—
2. ALL WIRING TO BE #18 AWG UNLESS OTHERWISE INDICATED.
3. □ TERMINALS IN THIS PANEL. ○ TERMINALS IN OTHER PANELS.
4. CONNECT A JUMPER WIRE TO TERMINALS E1 AND E2 IF ADDITIONAL E-STOPS SWITCHES ARE NOT USED.

Revisions

No.	Description	Date	By
4	CHANGED FROM B&R TO PLC ON BOARD	9/20/21	MH

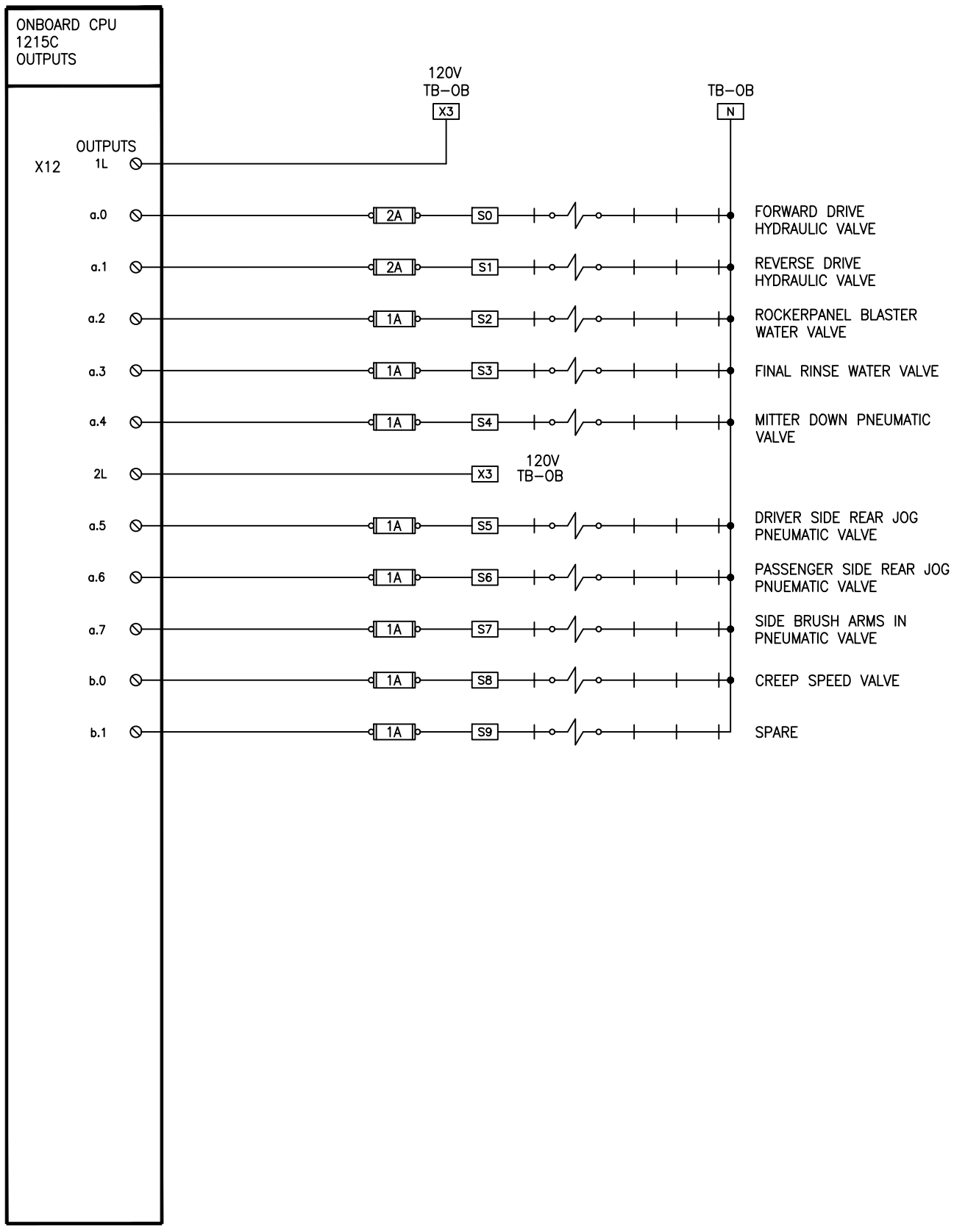
AUTEC Car Wash Systems
2500 W. Front Street Statesville, NC 28677
(704) 871-9141 FAX (704) 871-9101

Drawn By: MH

Date: SEP 20, 2021 | Drawing Type: AutoCAD

Title: ONBOARD CONTROL PANEL SCHEMATIC - PLC INPUTS

MACHINE: 260



NOTES:
1. PANEL WIRING: ———
   SHOP WIRING: — —
   FIELD WIRING: —|—|—
2. ALL WIRING TO BE #18 AWG UNLESS OTHERWISE INDICATED.
3. □ TERMINALS IN THIS PANEL.
   ○ TERMINALS IN OTHER PANELS.
4. CONNECT A JUMPER WIRE TO TERMINALS E1 AND E2 IF ADDITIONAL E-STOPS SWITCHES ARE NOT USED.

Revisions

No.	Description	Date	By
4	CHANGED FROM B&R TO PLC ON BOARD	9/20/21	MH

AUTEC Car Wash Systems
2500 W. Front Street Statesville, NC 28677
(704) 871-9141 FAX (704) 871-9101

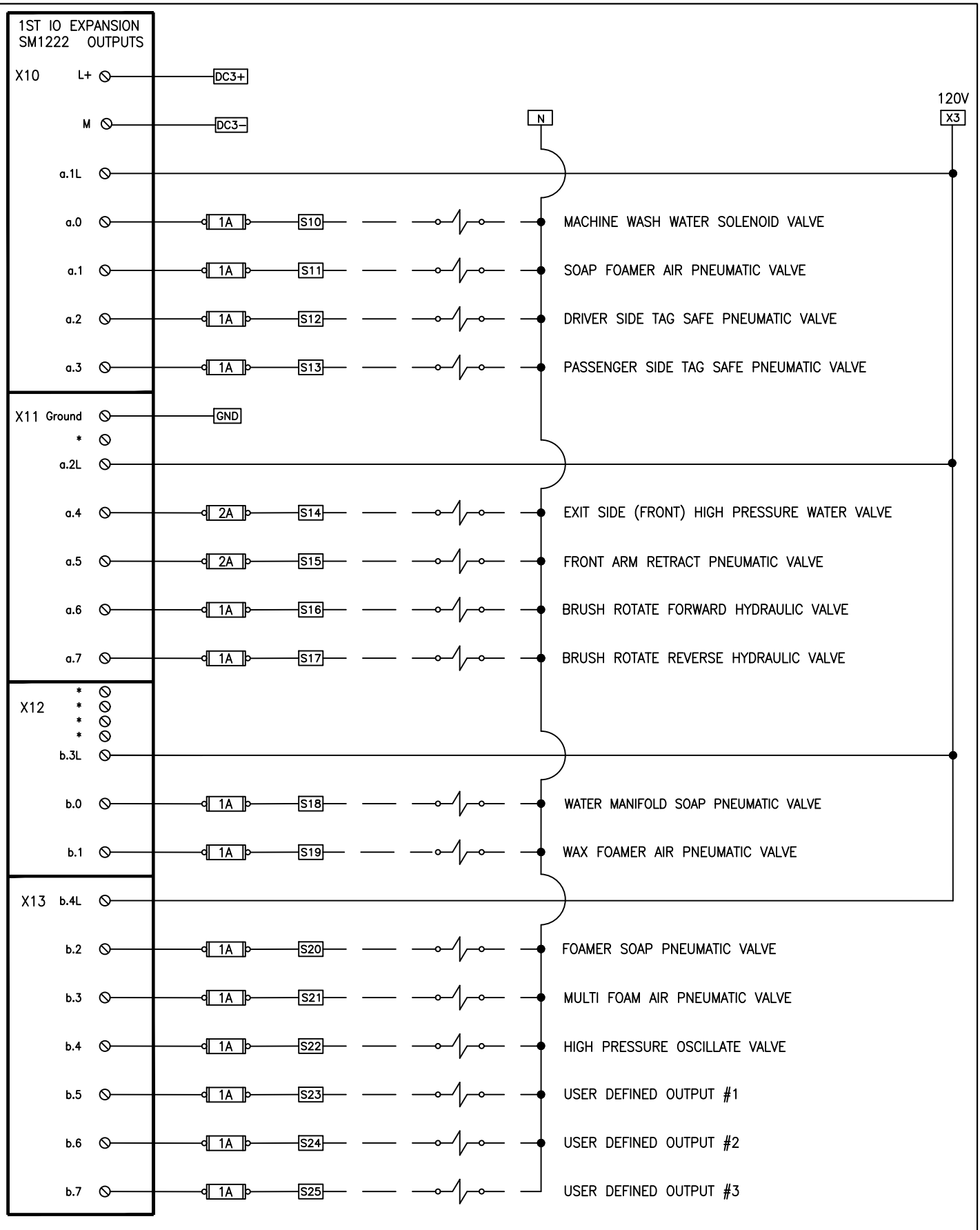
Drawn By: DH

Date: OCT 31, 2022

Drawing Type: AutoCAD

Title: ONBOARD CONTROL PANEL SCHEMATICS – PLC OUTPUTS

MACHINE: 260



NOTES:
1. PANEL WIRING: ———— SHOP WIRING: — — — FIELD WIRING: —|—|—
2. ALL WIRING TO BE #18 AWG UNLESS OTHERWISE INDICATED.
3. □ TERMINALS IN THIS PANEL. ○ TERMINALS IN OTHER PANELS.
4. CONNECT A JUMPER WIRE TO TERMINALS E1 AND E2 IF ADDITIONAL E-STOPS SWITCHES ARE NOT USED.

Revisions

No.	Description	Date	By
4	CHANGED FROM B&R TO PLC ON BOARD	9/20/21	MH

AUTEC Car Wash Systems
2500 W. Front Street Statesville, NC 28677
(704) 871-9141 FAX (704) 871-9101

Drawn By: DH

Date: OCT 31, 2022

Drawing Type: AutoCAD

Title: MAIN CONTROL PANEL SCHEMATIC – PLC EXP 3 OUTPUTS

MACHINE: 260

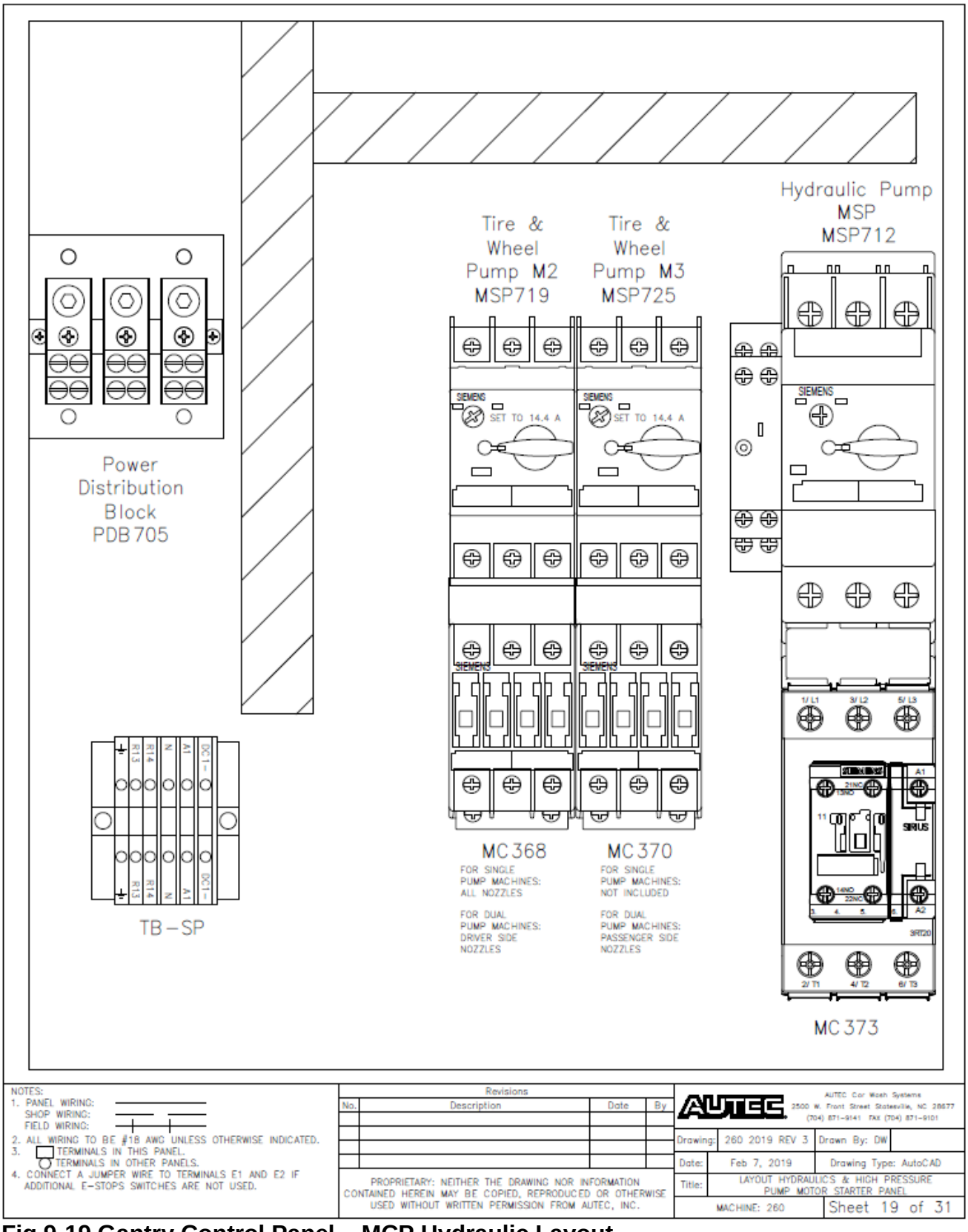


Fig 9-19 Gantry Control Panel – MCP Hydraulic Layout

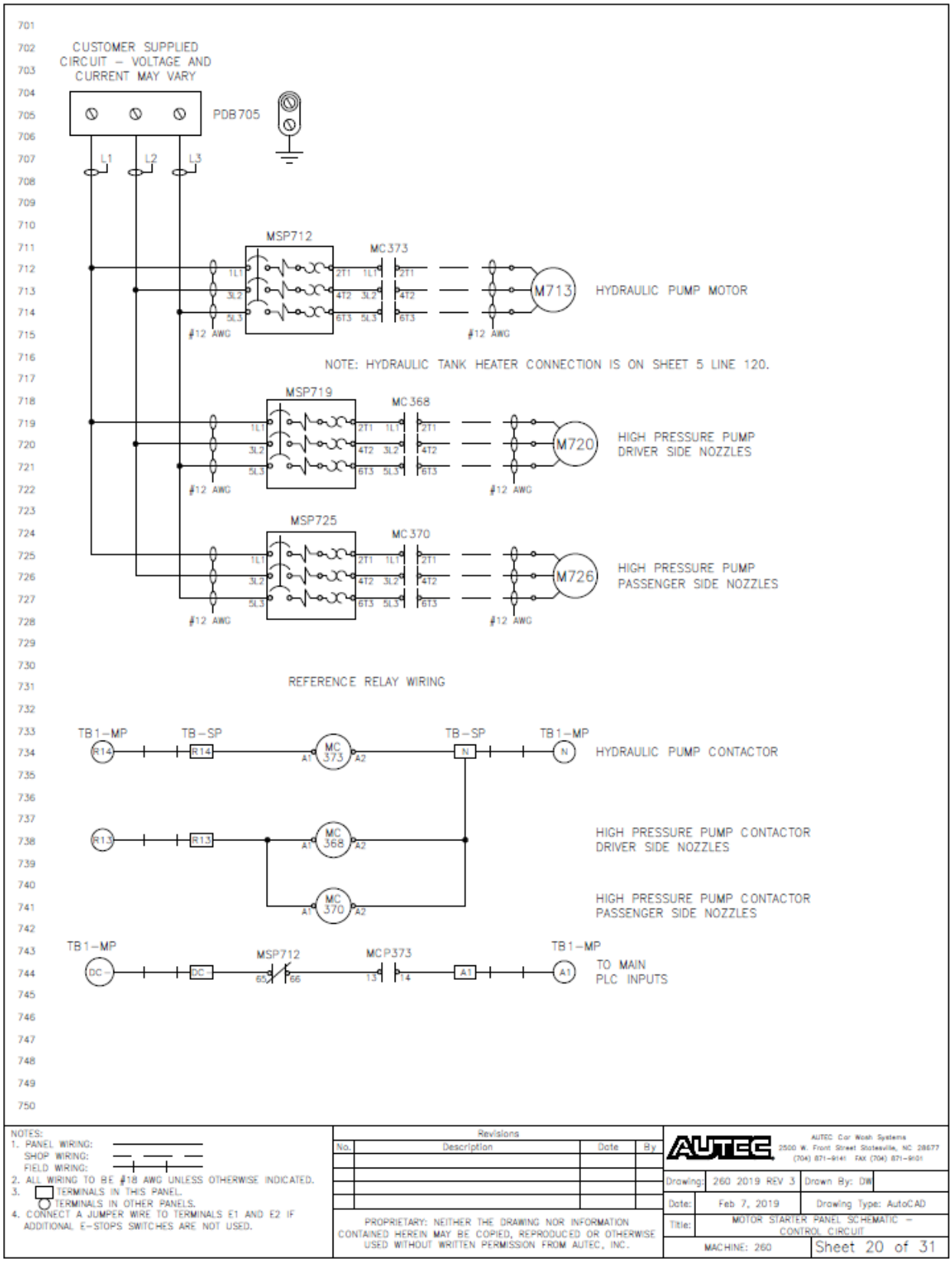


Fig 9-20 Motor Starter Panel – Schematic Control

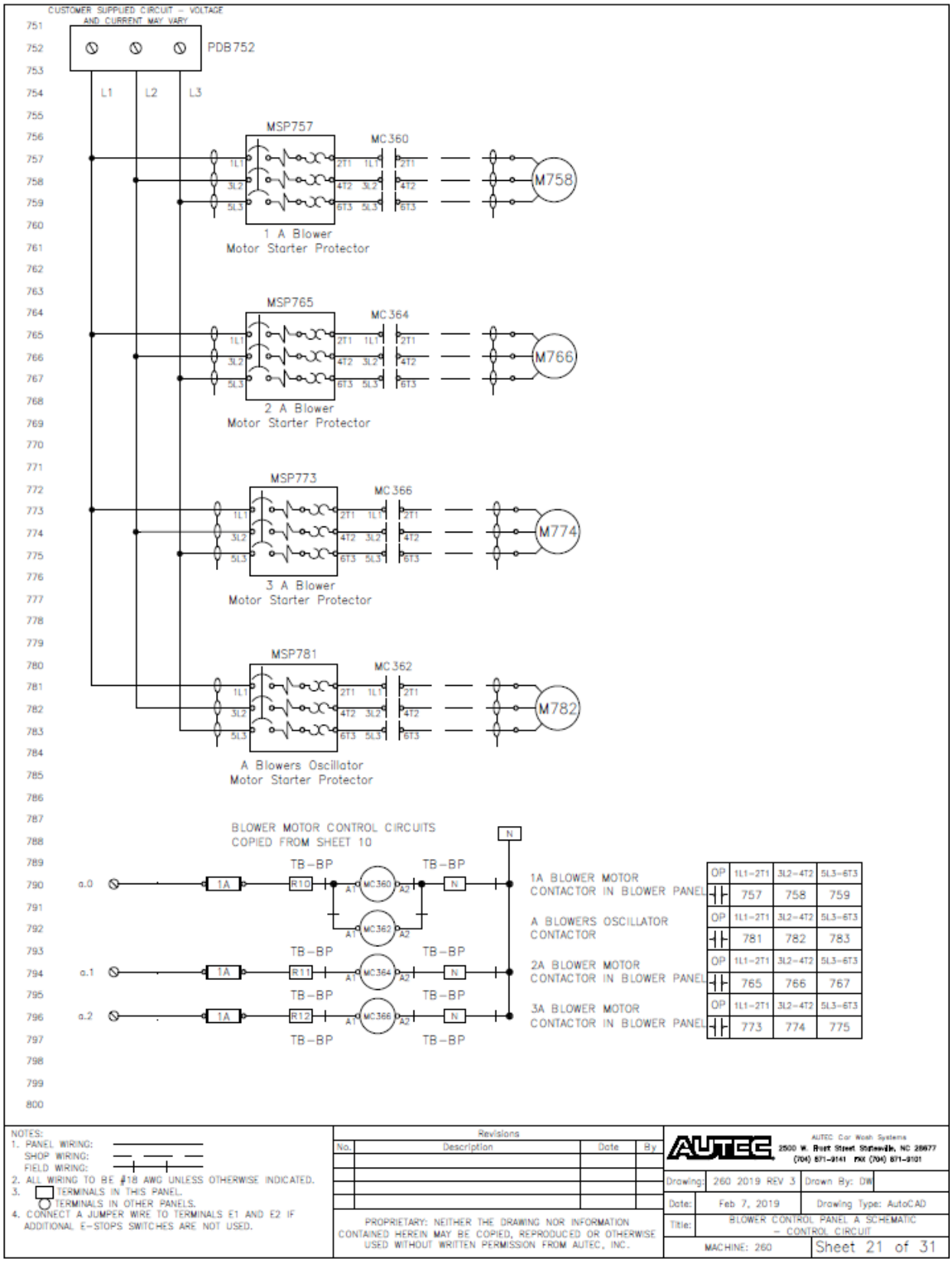


Fig 9-21 Blower Control Panel

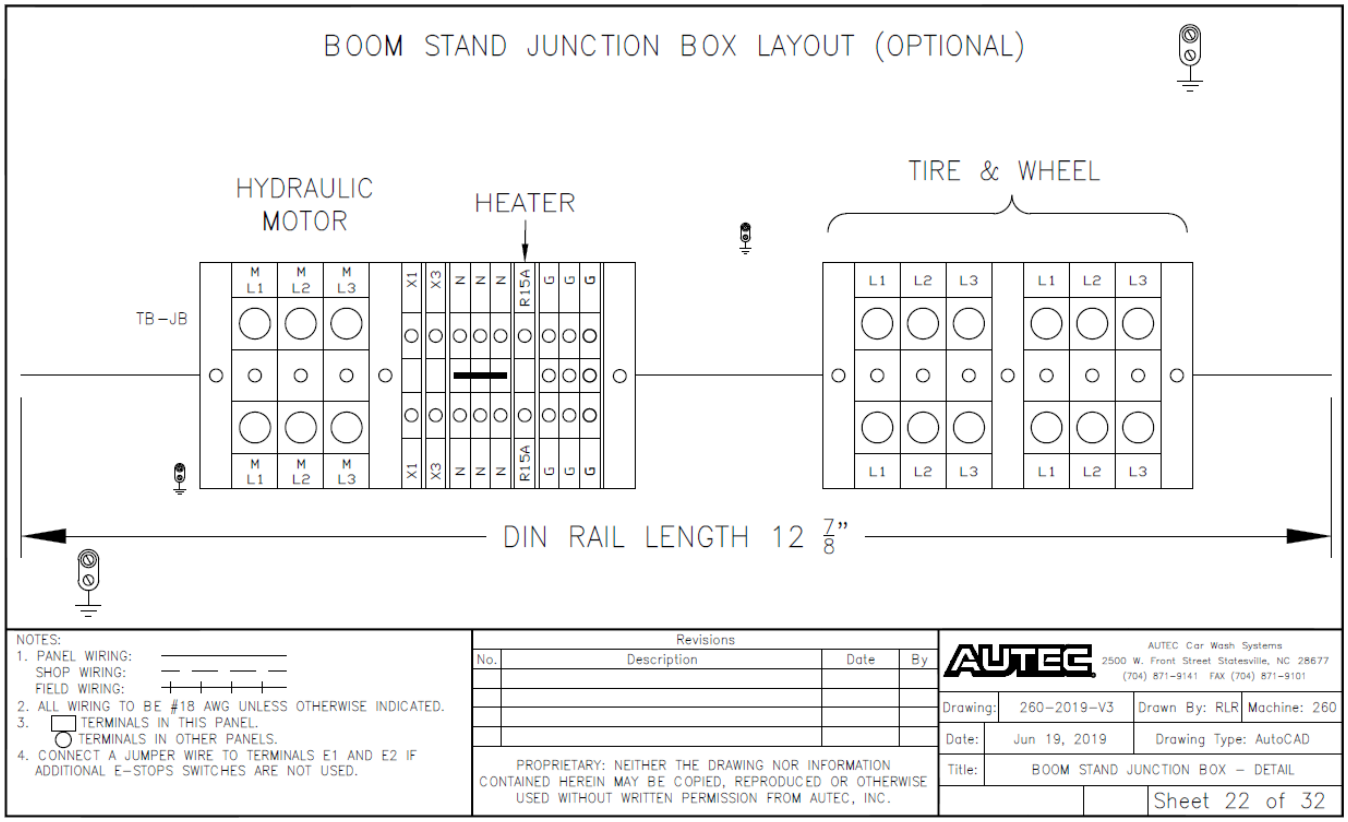


Fig 9-22 Boom Stand Junction Box - Detail

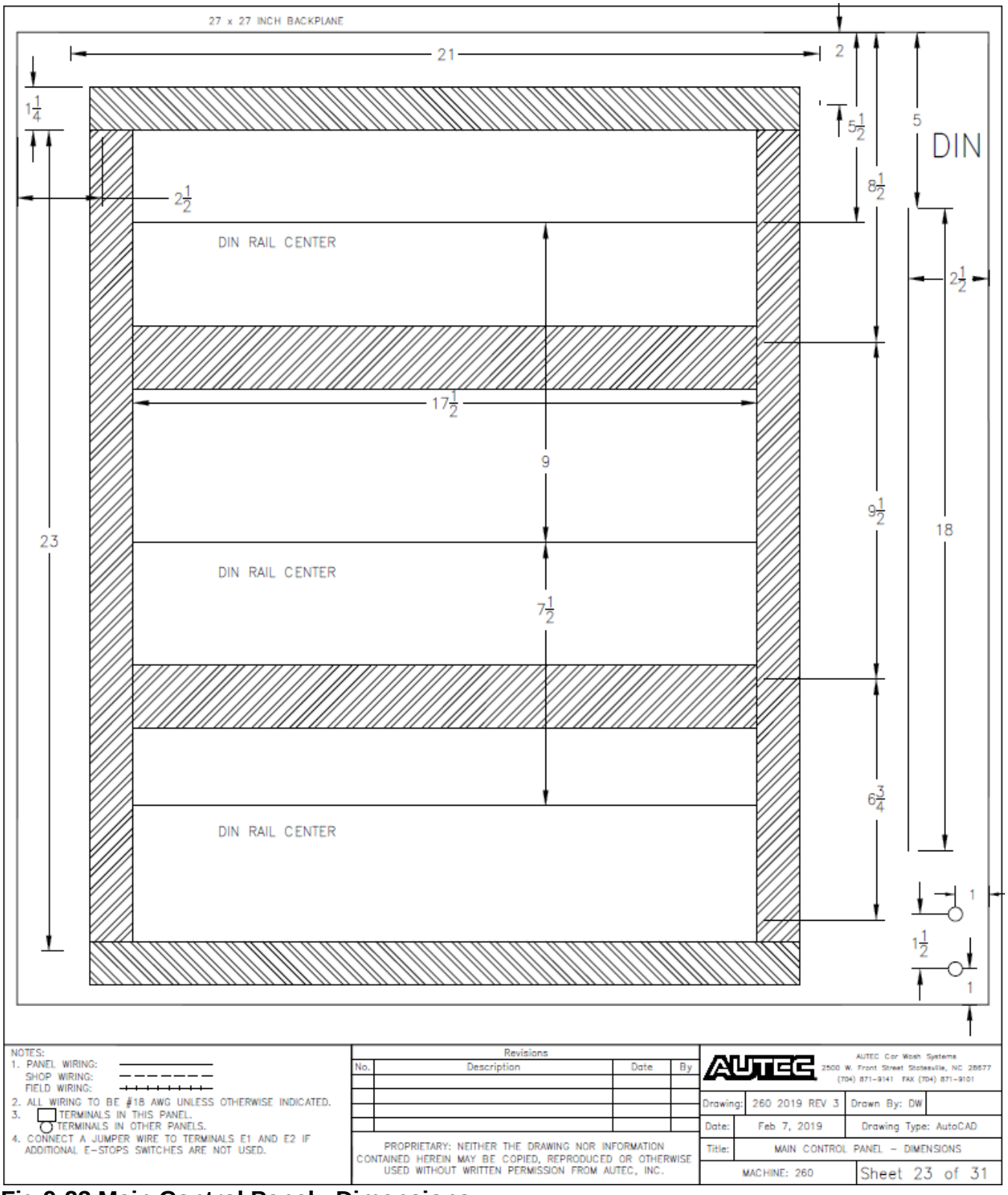


Fig 9-23 Main Control Panel - Dimensions

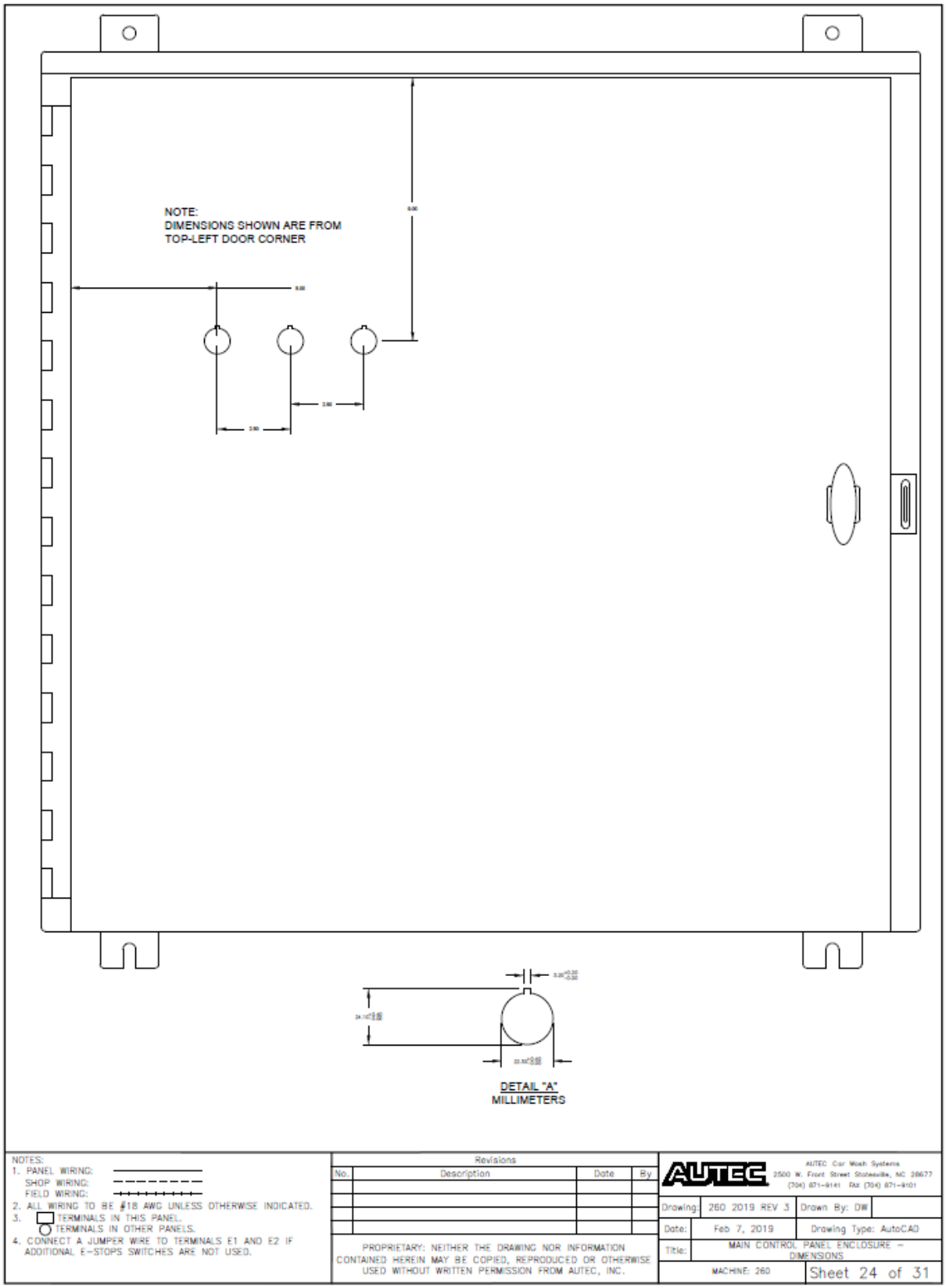


Fig 9-24 Main Panel Enclosure - Dimensions

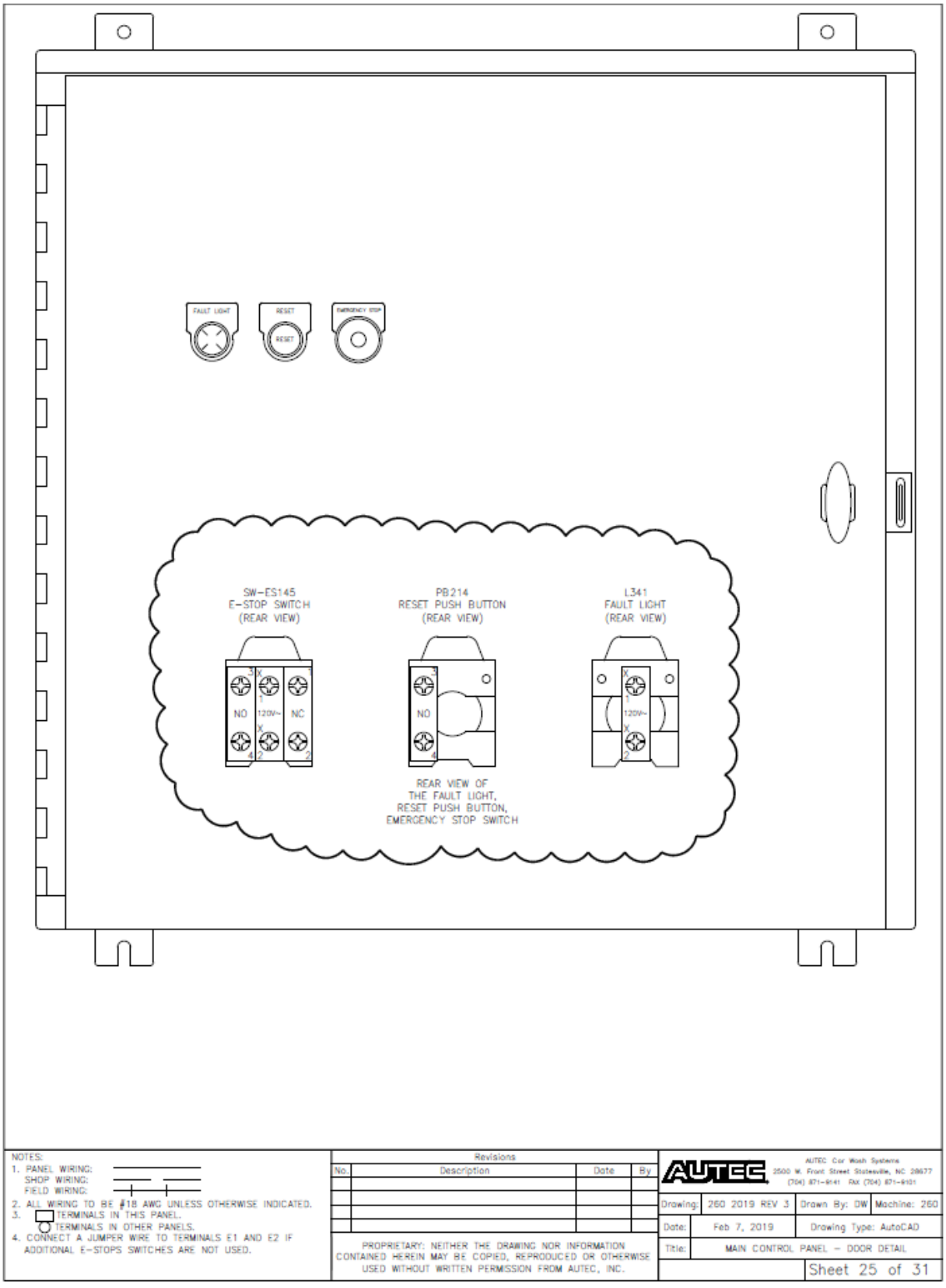


Fig 9-25 Main Control Panel – Door Detail

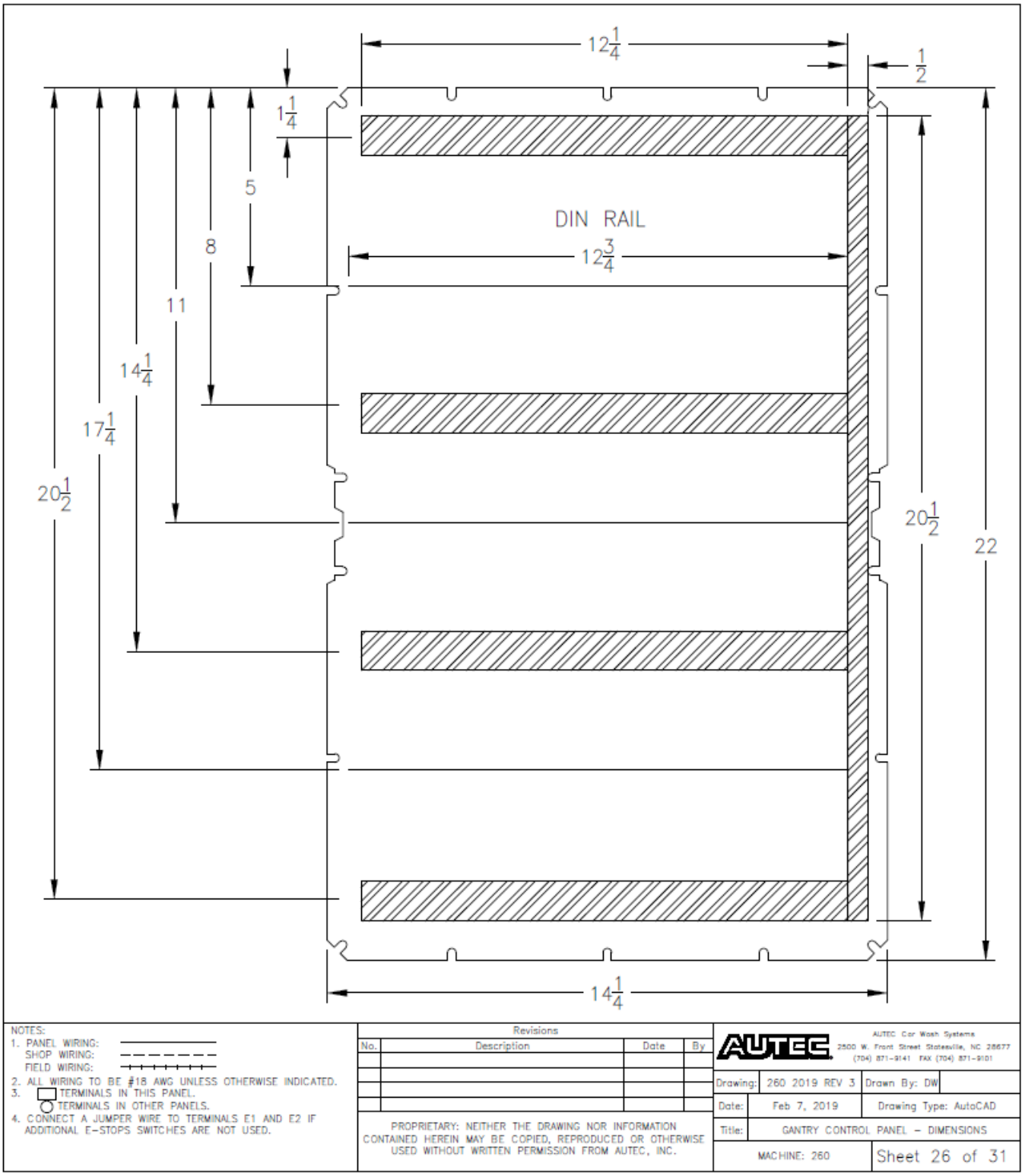


Fig 9-26 Gantry Control Panel – Dimensions

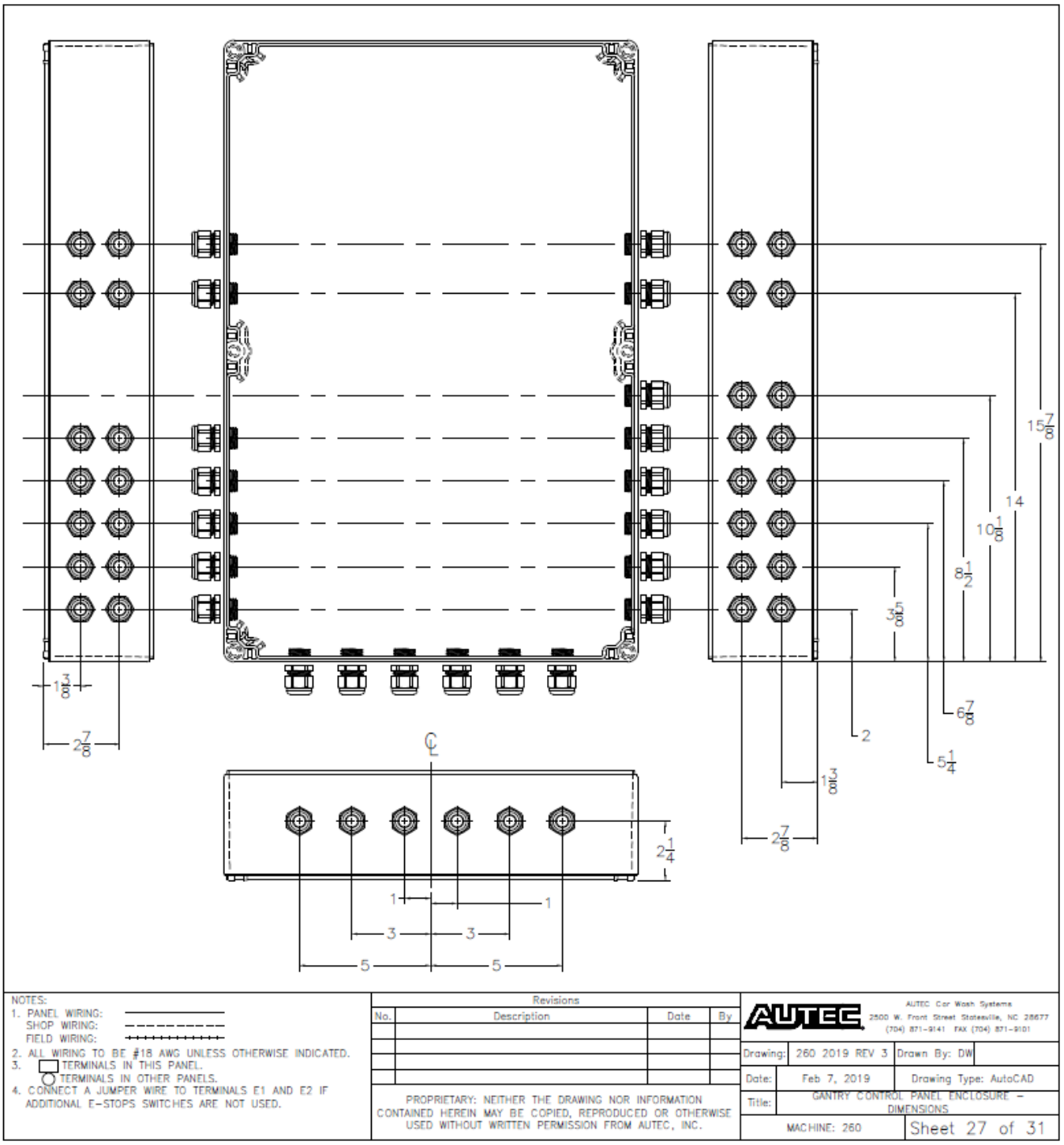


Fig 9-27 Gantry Enclosure - Dimensions

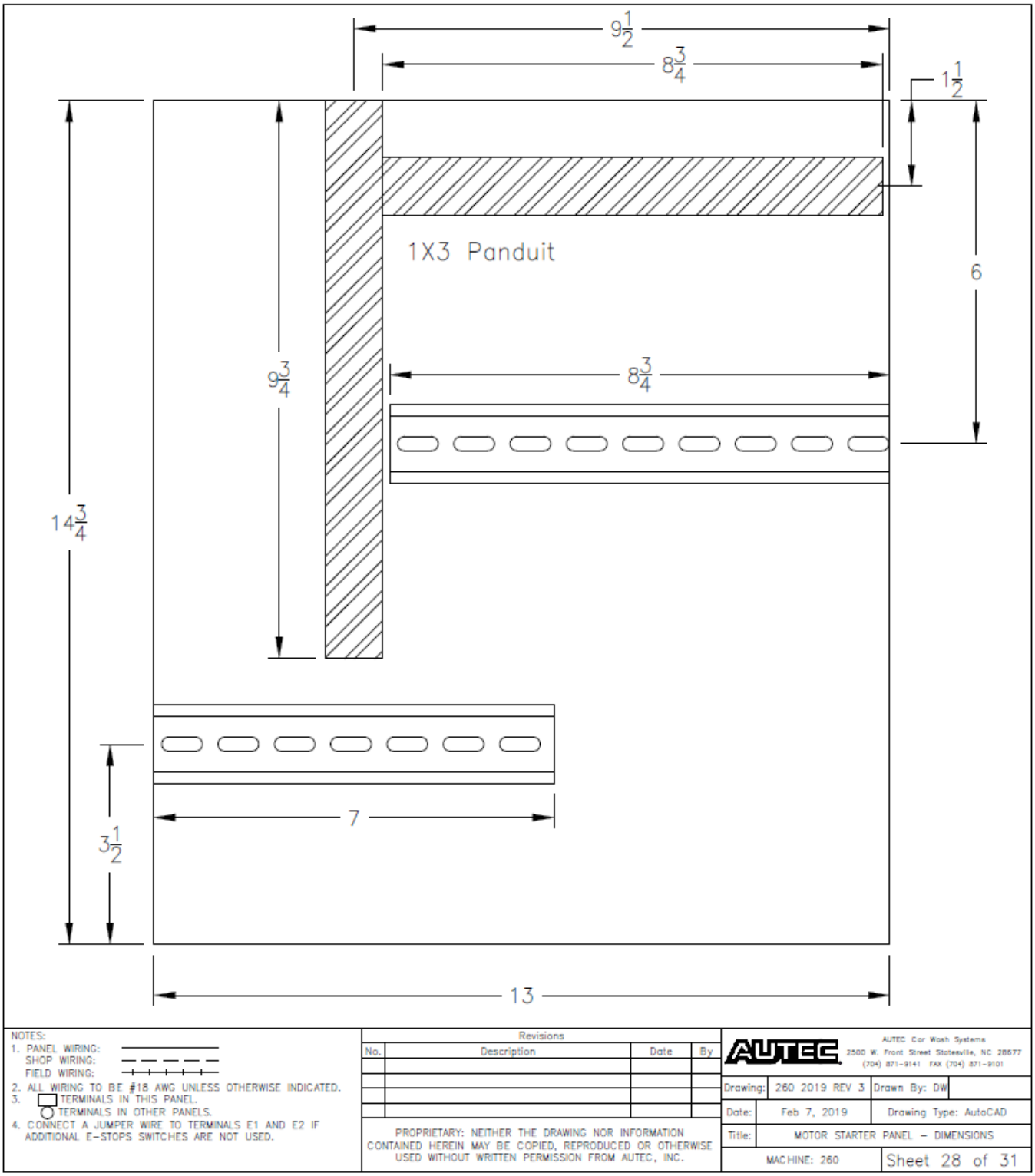


Fig 9-28 Motor Starter Panel - Dimensions

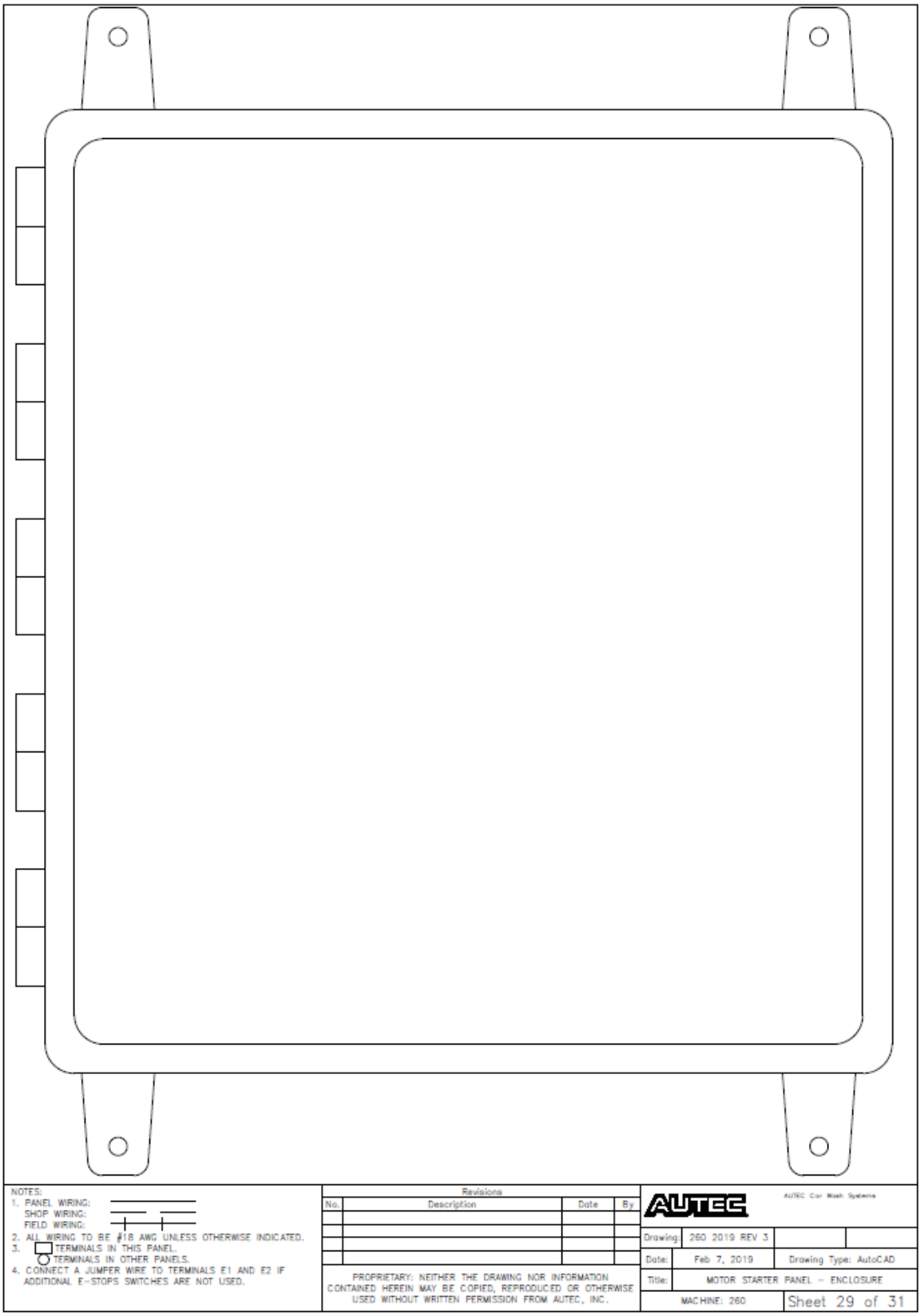


Fig 9-29 Motor Starter Enclosure

MOTOR CIRCUIT SPECIFICATIONS

Pump Motors 208/230/460 Volt					Voltage		
Motor		HP	SF	Spec	208	230	460
Hydraulic Pump		10	1.30	Motor Nameplate FLA	26.9	25	12.5
Brand:	Elektrim			Motor Starter Protector (MSP) Setting	33.6	31.3	15.6
Model:	20NCM-3-10-18			Branch Circuit Wire Size (AWG)	10	10	12
EV-1 & Polisher Hydraulic Pump		15	1.15	Motor Nameplate FLA	38.2	34.6	17.3
Brand:	Teco Westinghouse			Motor Starter Protector (MSP) Setting	47.8	43.3	21.6
Model:	AEHH8P NP0154C			Branch Circuit Wire Size (AWG)	6	8	12
Tire & Wheel Pump(s)		5	1.15	Motor Nameplate FLA	13.5	12.2	6.1
Brand:	Teco Westinghouse			Motor Starter Protector (MSP) Setting	16.9	15.3	7.7
Model:	AEHH8P NO0054C			Branch Circuit Wire Size (AWG)	10	10	12
EV-1 High Pressure Pump		20	1.15	Motor Nameplate FLA	50.9	46	23
Brand:	Teco Westinghouse			Motor Starter Protector (MSP) Setting	63.6	57.5	28.8
Model:	AEHH8P NP0204			Branch Circuit Wire Size (AWG)	6	6	10
ATF High Pressure Pump		25	1.15	Motor Nameplate FLA	68.6	62	31
Brand:	Toshiba			Motor Starter Protector (MSP) Setting	85.8	77.5	38.8
Model:	0254FT5A21A-P			Branch Circuit Wire Size (AWG)	4	4	8

Blower Motors 208/230/460 Volt					Voltage		
Motor		HP	SF	Spec	208	230	460
Blower		15	1.25	Motor Nameplate FLA	36.2	32.8	16.4
Brand:	Elektrim			Motor Starter Protector (MSP) Setting	45.3	41	20.5
Model:	20NCM-3-15-36/CWR			Branch Circuit Wire Size (AWG)	6	6	12
Blower Oscillator		1/3	1.30	Motor Nameplate FLA	1.5	1.6	0.8
Brand:	Marathon			Motor Starter Protector (MSP) Setting	1.9	2.0	1.0
Model:	5K33JNA 943 K253			Branch Circuit Wire Size (AWG)	12	12	12

Pump Motors 575 Volt					
Motor		HP	SF	Spec	
Hydraulic Pump		10	1.30	Motor Nameplate FLA	10.0
Brand:	Elektrim			Motor Starter Protector (MSP) Setting	12.5
Model:	20NCM-3-10-18			Branch Circuit Wire Size (AWG)	12
EV-1 & Polisher Hydraulic Pump		15	1.15	Motor Nameplate FLA	13.8
Brand:	Teco Westinghouse			Motor Starter Protector (MSP) Setting	17.3
Model:	AEHH8P NP0154C			Branch Circuit Wire Size (AWG)	12
Tire & Wheel Pump(s)		5	1.15	Motor Nameplate FLA	5.9
Brand:	Elektrim			Motor Starter Protector (MSP) Setting	7.4
Model:	20NCM-3-5-18/575			Branch Circuit Wire Size (AWG)	12
EV-1 High Pressure Pump		20	1.15	Motor Nameplate FLA	18.4
Brand:	Teco Westinghouse			Motor Starter Protector (MSP) Setting	23.0
Model:	AEHH8P NP0204			Branch Circuit Wire Size (AWG)	12
ATF High Pressure Pump		20	1.15	Motor Nameplate FLA	18.4
Brand:	TECO Westinghouse			Motor Starter Protector (MSP) Setting	23.0
Model:	AEHH8N EP02045			Branch Circuit Wire Size (AWG)	10

NOTES:
1. PANEL WIRING: ——— SHOP WIRING: — — — FIELD WIRING: —|—|—
2. ALL WIRING TO BE #18 AWG UNLESS OTHERWISE INDICATED.
3. □ TERMINALS IN THIS PANEL. ○ TERMINALS IN OTHER PANELS.
4. CONNECT A JUMPER WIRE TO TERMINALS E1 AND E2 IF ADDITIONAL E-STOPS SWITCHES ARE NOT USED.

Revisions

No.	Description	Date	By

AUTEC Car Wash Systems
2600 W. Front Street Statesville, NC 28677
(704) 871-9141 FAX (704) 871-9101

Drawing:	260 2019 REV 3	Drawn By: DW	
Date:	Feb 7, 2019	Drawing Type: AutoCAD	
Title:	MOTOR CIRCUIT SPECIFICATIONS		
MACHINE: 260		Sheet 30 of 31	

Fig 9-30 Motor Circuit Specs

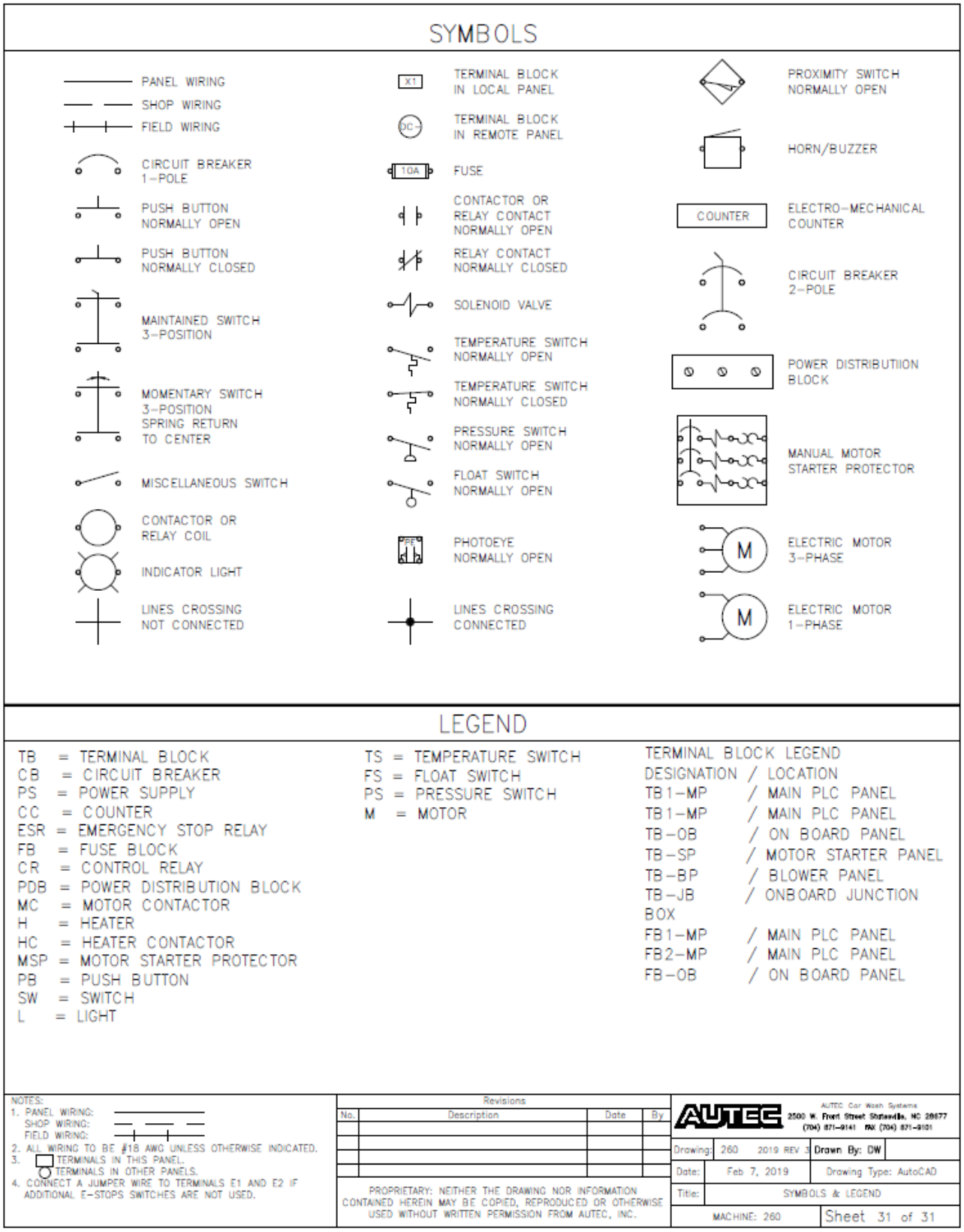


Fig 9-31 Symbols & Legend

Section 10 – Hydraulic \ Water Drawings and Schematics

Fig 10-1 Main Hydraulic Block

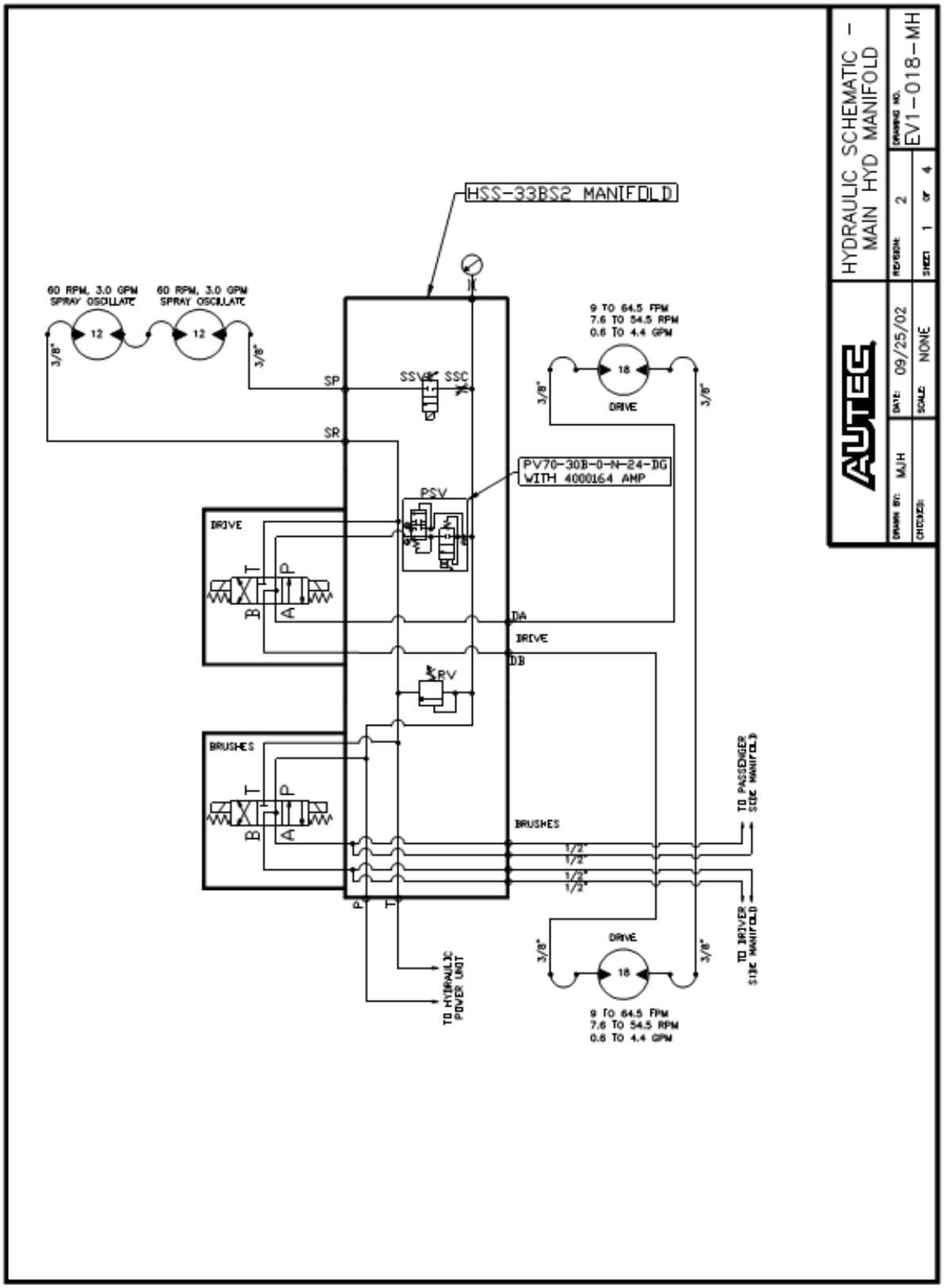


Fig 10-2 Hydraulic Power Unit

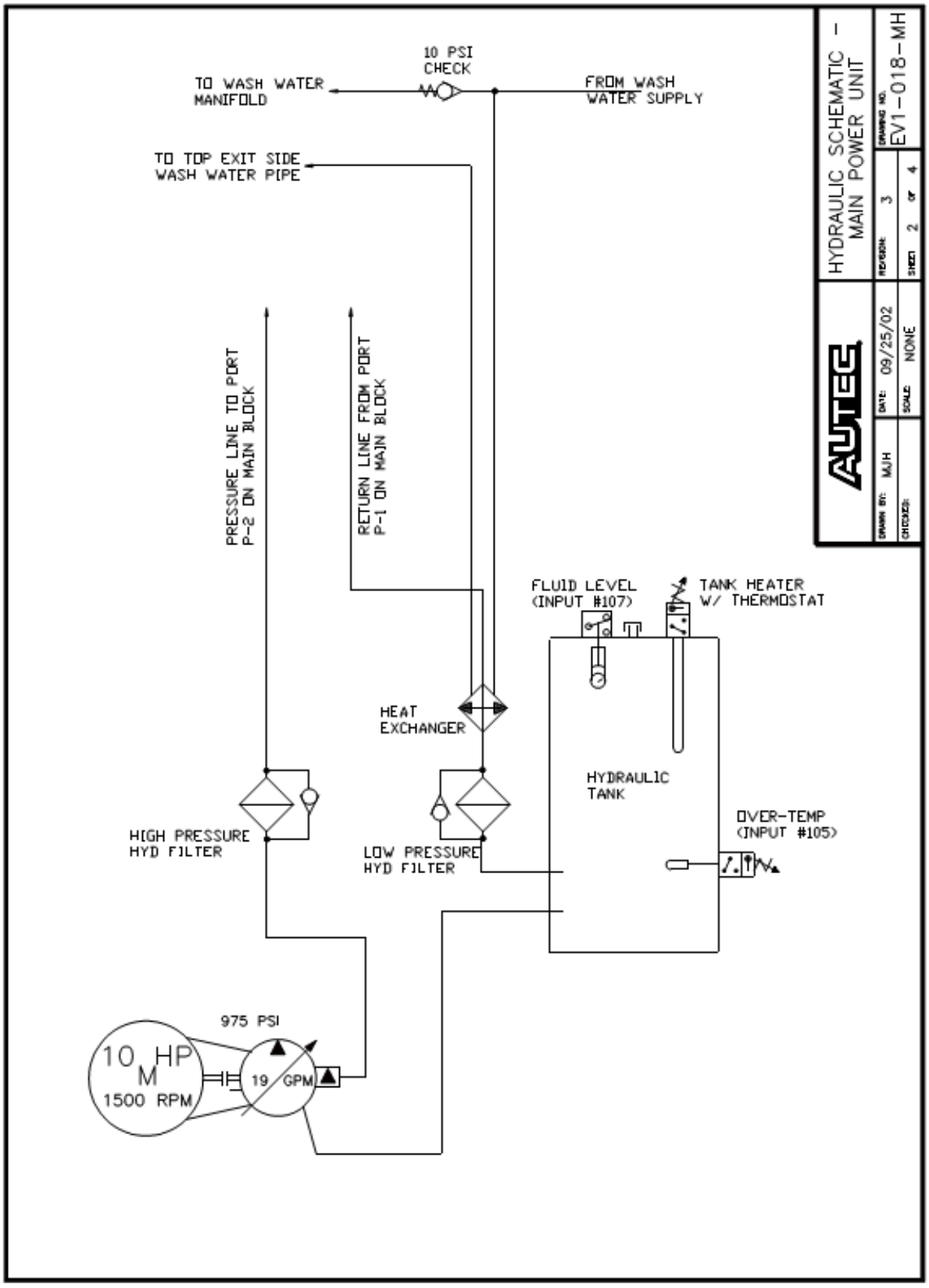


Fig 10-3 Passenger Side Distribution Manifold

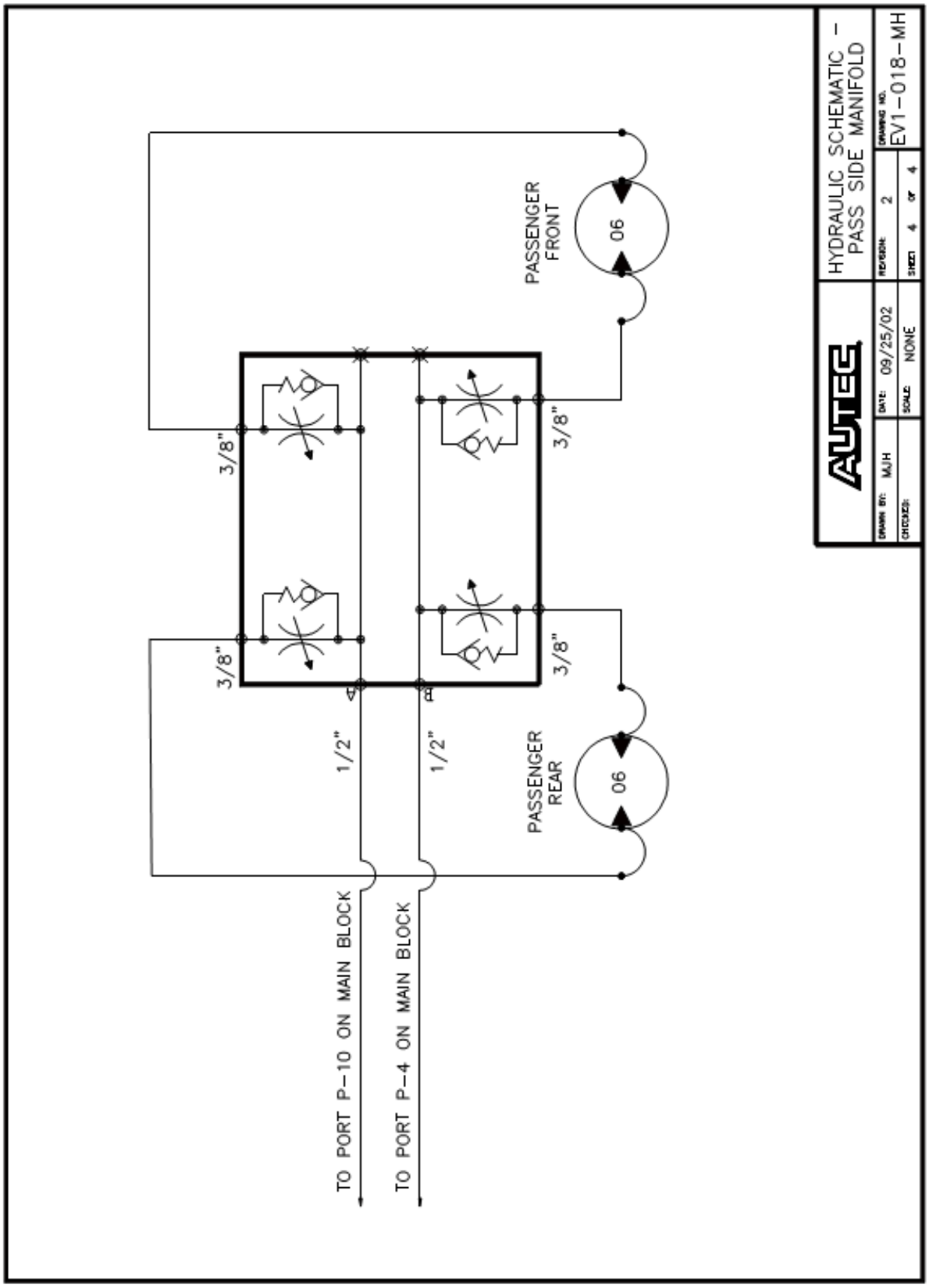


Fig 10-4 Driver Side Distribution Manifold

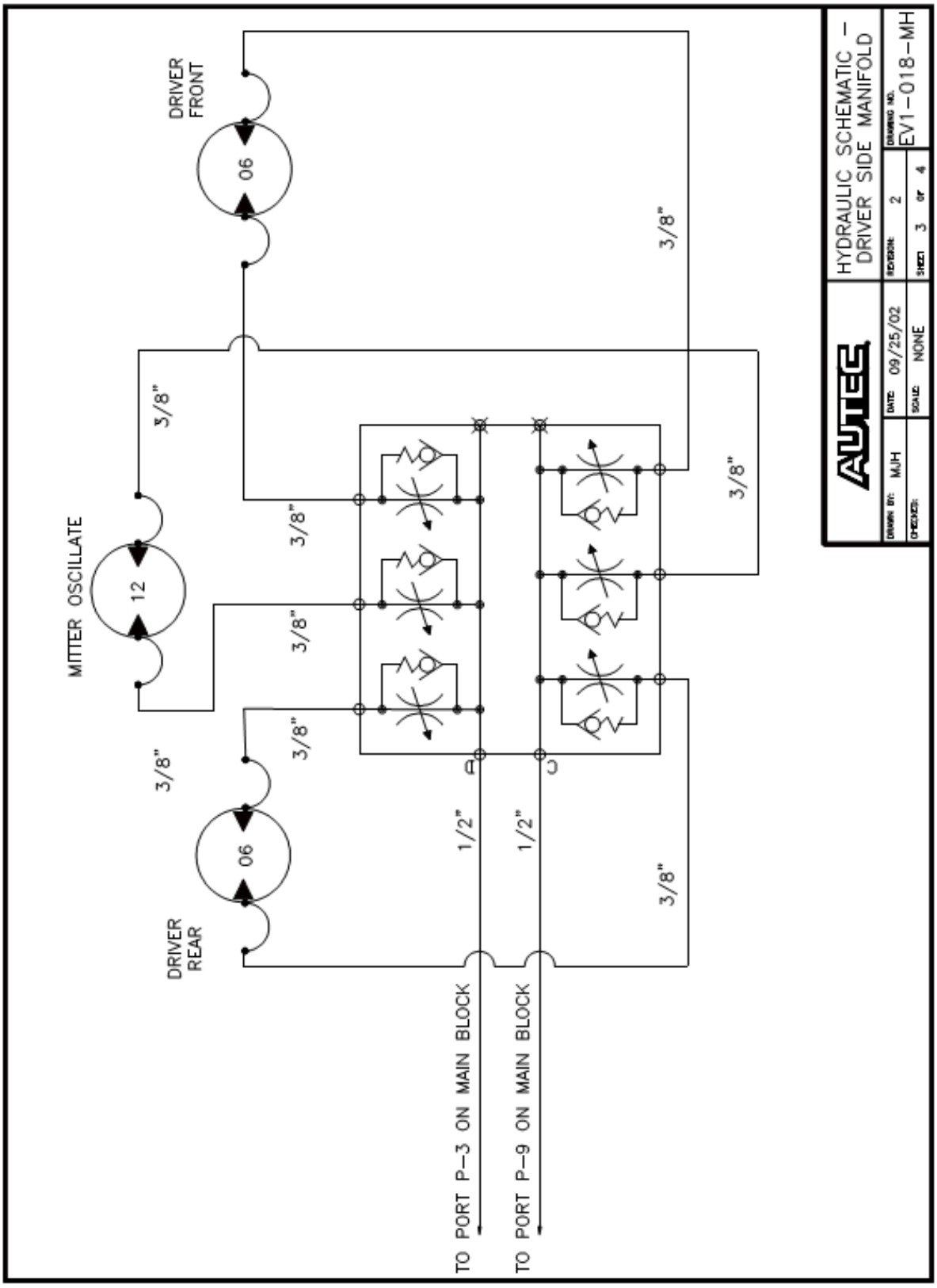


Fig 10-5 Hydraulic Manifold

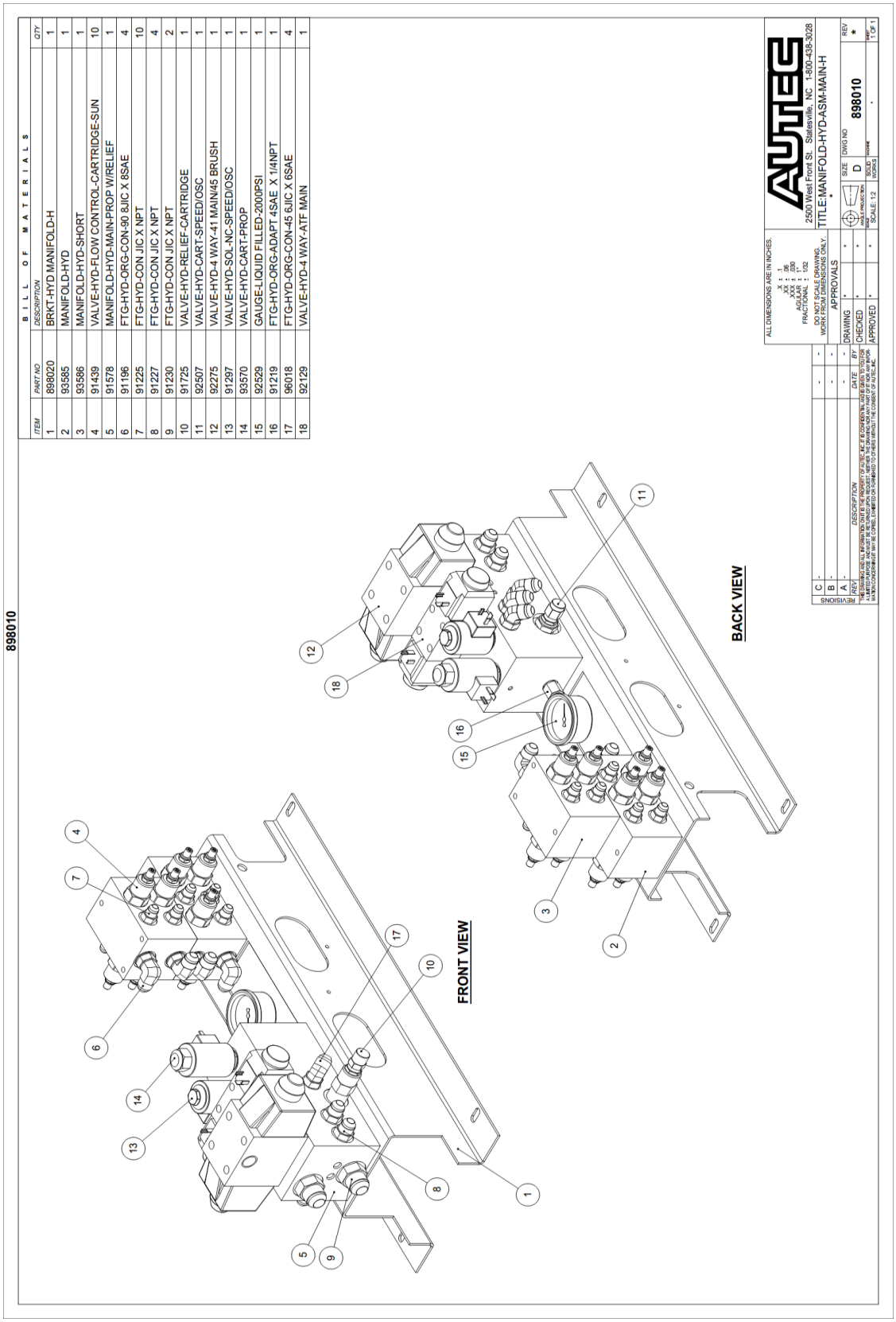


Fig 10-6 Main Hyd Manifold Left Side

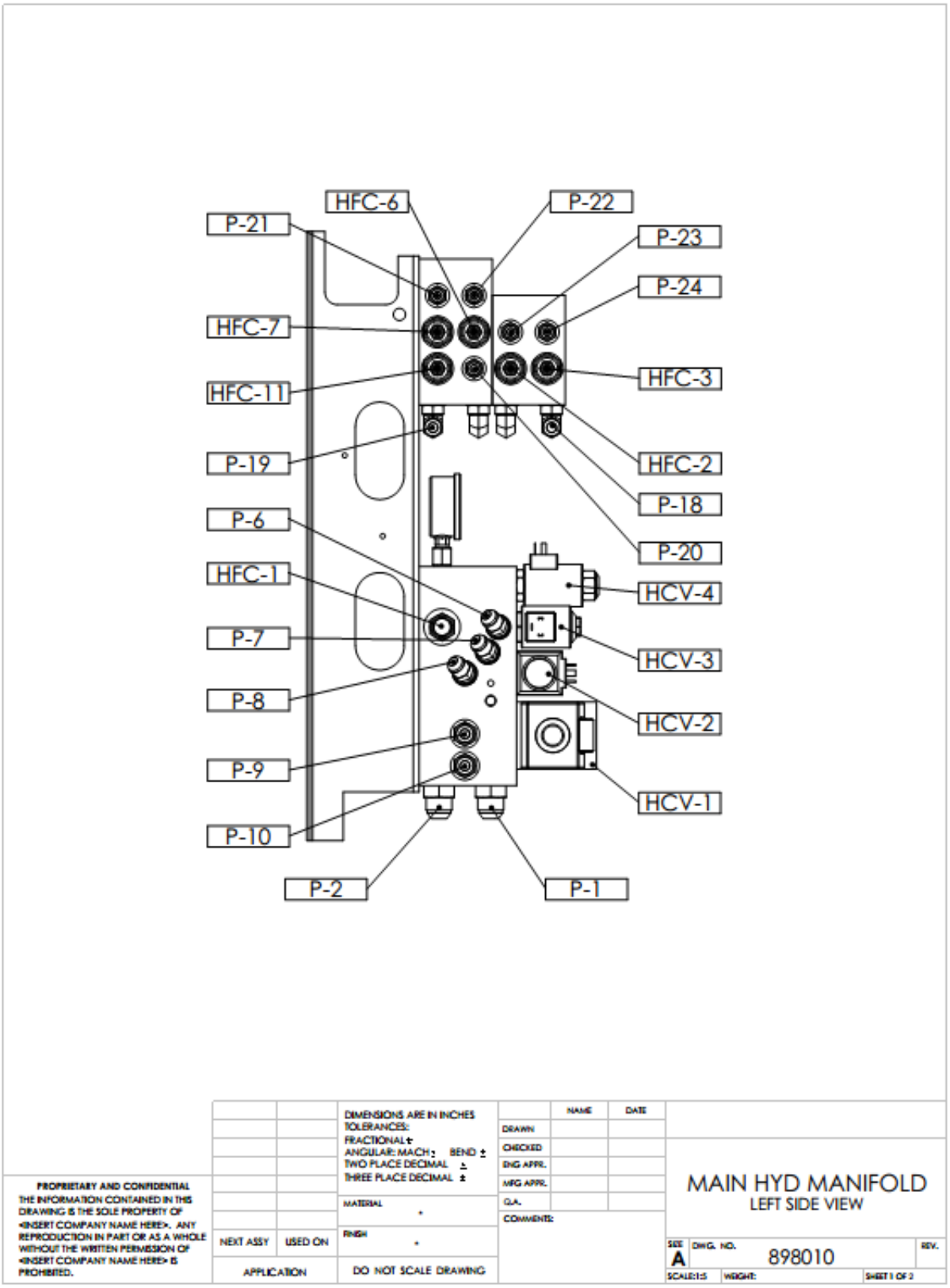
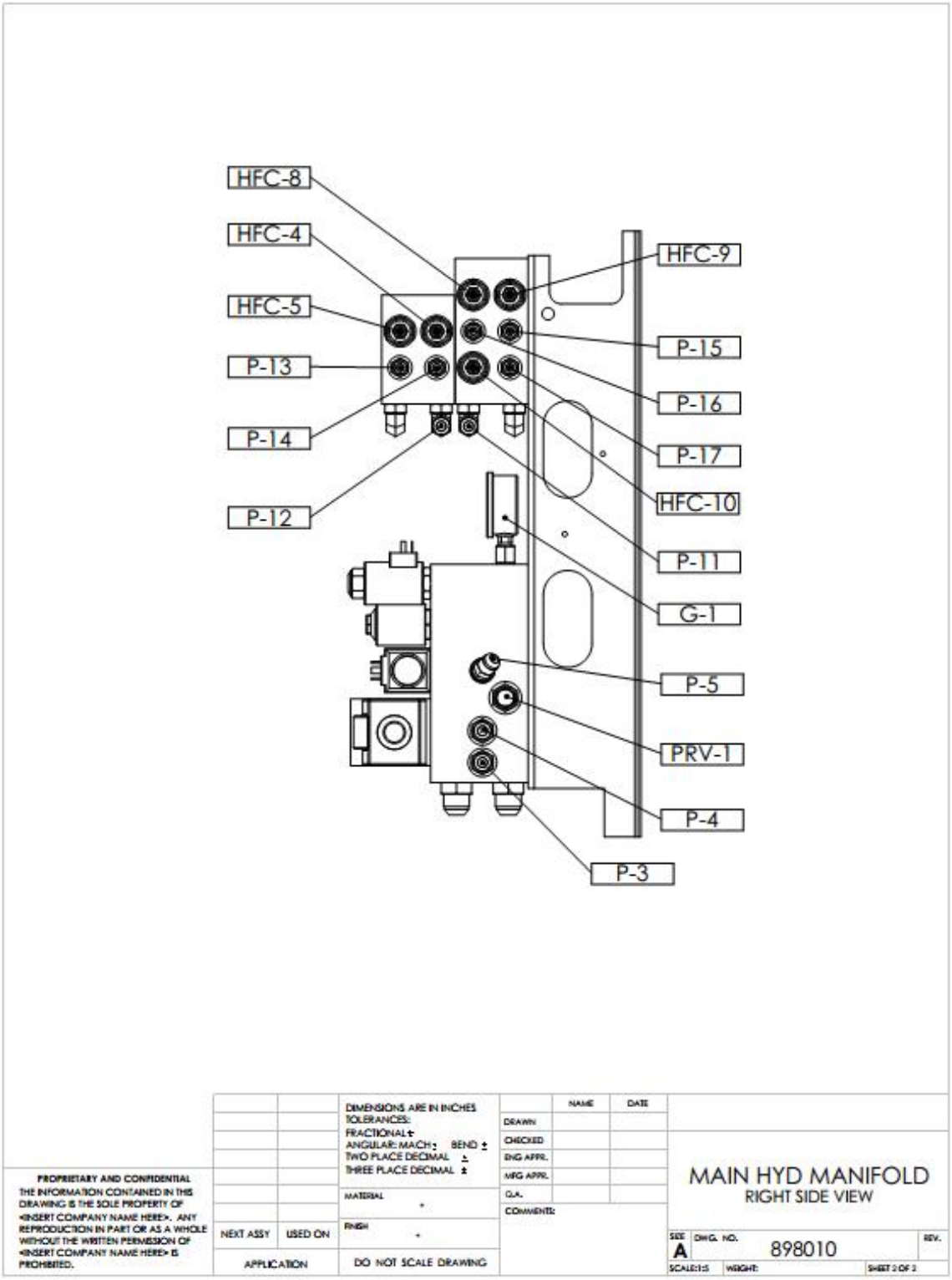


Fig 10-7 Main Hyd Manifold Right Side



A. Main Hydraulic Manifold Components

1. Hydraulic Directional Control Valves

These are either 2 or 4-way valves that start and stop hydraulic flow and/or reverse direction of flow. They include:

a. HCV-1 – Brush Rotate 4-way Valve: Turns on/off and determines direction of side brush rotation and Mitter oscillation.
b. HVC-2 – Gantry Drive 4-way Valve: Turns on/off and determines direction of gantry travel.
c. HCV-3 – Nozzle Oscillate Valve: Turns on/off nozzle oscillation.

2. Hydraulic Flow Control Valves

These valves regulate the speed of rotation or oscillation or various functions controlled by hydraulic motors. To adjust, loosen the jam nut and then turn the adjusting screw in (clockwise) to slow the speed or out (counter-clockwise) to increase the speed. Make sure to retighten the jam nut after adjustment. The Flow Control Valves include:

a. HFC-1 – High Pressure Nozzle Oscillate
b. HFC-2 – Passenger Side Front Brush Forward Rotate
c. HFC-3 – Passenger Side Front Brush Reverse Rotate
d. HFC-4 – Passenger Side Rear Brush Forward Rotate
e. HFC-5 – Passenger Side Rear Brush Reverse Rotate
f. HFC-6 – Driver Side Front Brush Forward Rotate
g. HFC-7 – Driver Side Front Brush Reverse Rotate
h. HFC-8 – Driver Side Rear Brush Forward Rotate
i. HFC-9 – Driver Side Rear Brush Reverse Rotate
j. HFC-10 – Mitter Oscillate – Forward Travel
k. HFC-11 – Mitter Oscillate – Reverse Travel

3. Hydraulic Ports

Plumbing to and from the Main Hydraulic/Distribution Manifold includes:

1. P-1 – Return line to Heat Exchanger (3/4”)
2. P-2 – Pressure line from High Pressure Filter (3/4”)
3. P-3 – Line to Port P-11 on Distribution Manifold (1/2”)
4. P-4 – Line to Port P-12 on Distribution Manifold (1/2”)
5. P-5 – Line to Driver Side Gantry Drive Motor (3/8”)
6. P-6 – Line to Driver Side Nozzle Oscillate Motor (3/8”)
7. P-7 – Line to Passenger Side Nozzle Oscillate Motor (3/8”)
8. P-8 – Line to Passenger Side Gantry Drive Motor (3/8”)
9. P-9 – Line to Port P-19 on Distribution Manifold (1/2”)
10. P-10 – Line to Port P-18 on Distribution Manifold (1/2”)
11. P-11 – Line to Port P-3 on Distribution Manifold (1/2”)
12. P-12 – Line to Port P-4 on Distribution Manifold (1/2”)
13. P-13 – Line to Front Passenger Side Brush Motor – Inside (3/8”)
14. P-14 – Line to Front Passenger Side Brush Motor – Outside (3/8”)

15. P-15 – Line to Front Driver Side Brush Motor – Outside (3/8”)
16. P-16 – Line to Front Driver Side Brush Motor – Inside (3/8”)
17. P-17 – Line to Mitter Oscillate Motor - Fwd (3/8”)
18. P-18 – Line to Port P-10 on Distribution Manifold (1/2”)
19. P-19 – Line to Port P-9 on Distribution Manifold (1/2”)
20. P-20 – Line to Mitter Oscillate Motor – Rev (3/8”)
21. P-21 – Line to Rear Driver Side Brush Motor – Outside (3/8”)
22. P-22 – Line to Rear Driver Side Brush Motor – Inside (3/8”)
23. P-23 – Line to Rear Passenger Side Brush Motor – Inside (3/8”)
24. P-24 – Line to Rear Passenger Side Brush Motor – Outside (3/8”)

4. Miscellaneous Items

a. PRV-1 – Pressure Relief Valve set to 1350 psi.
b. G-1 – Pressure Gauge – System pressure set to 975 psi.

Fig 10-8 High-Pressure Schematic

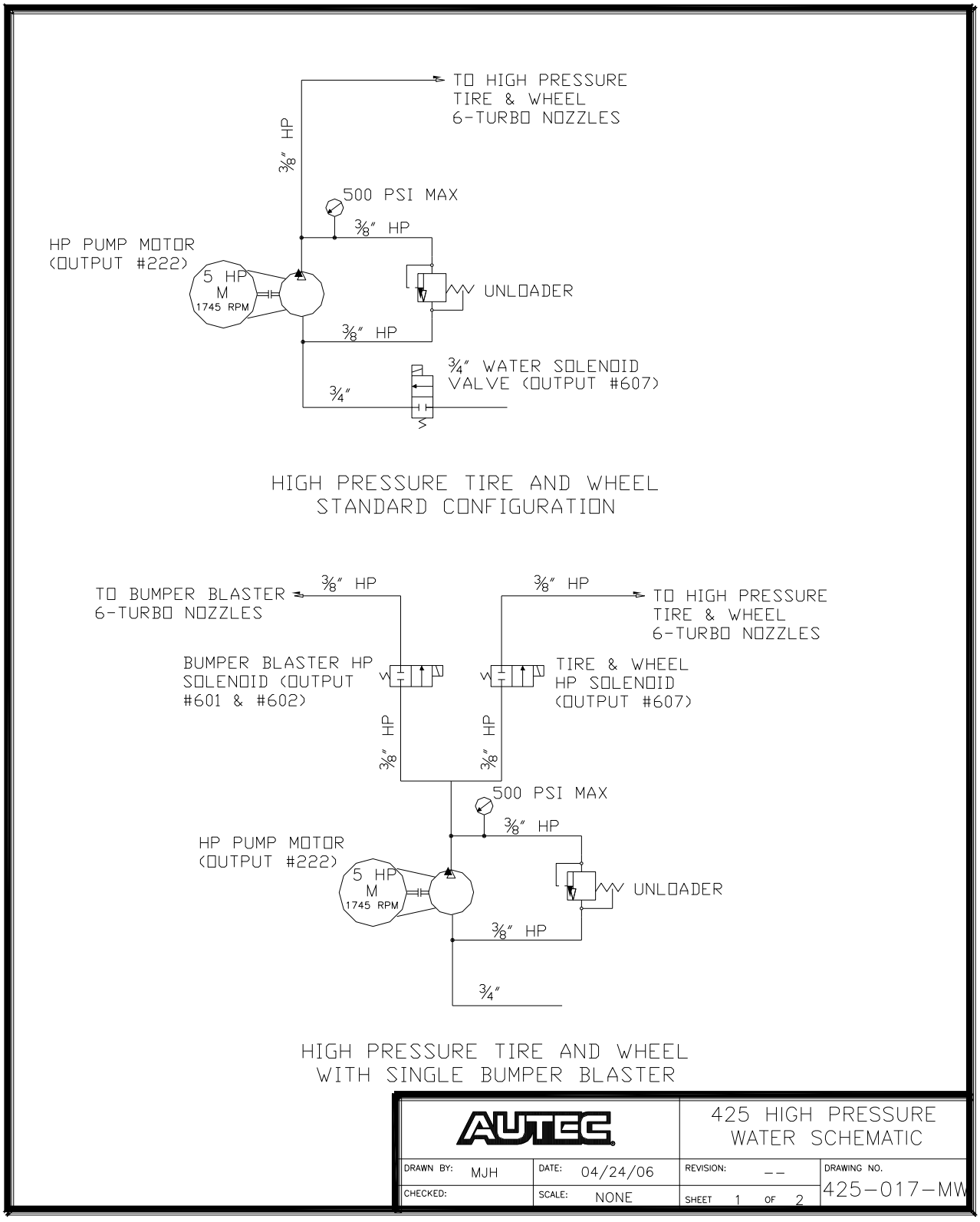


Fig 10-9 High Pressure Water Schematic

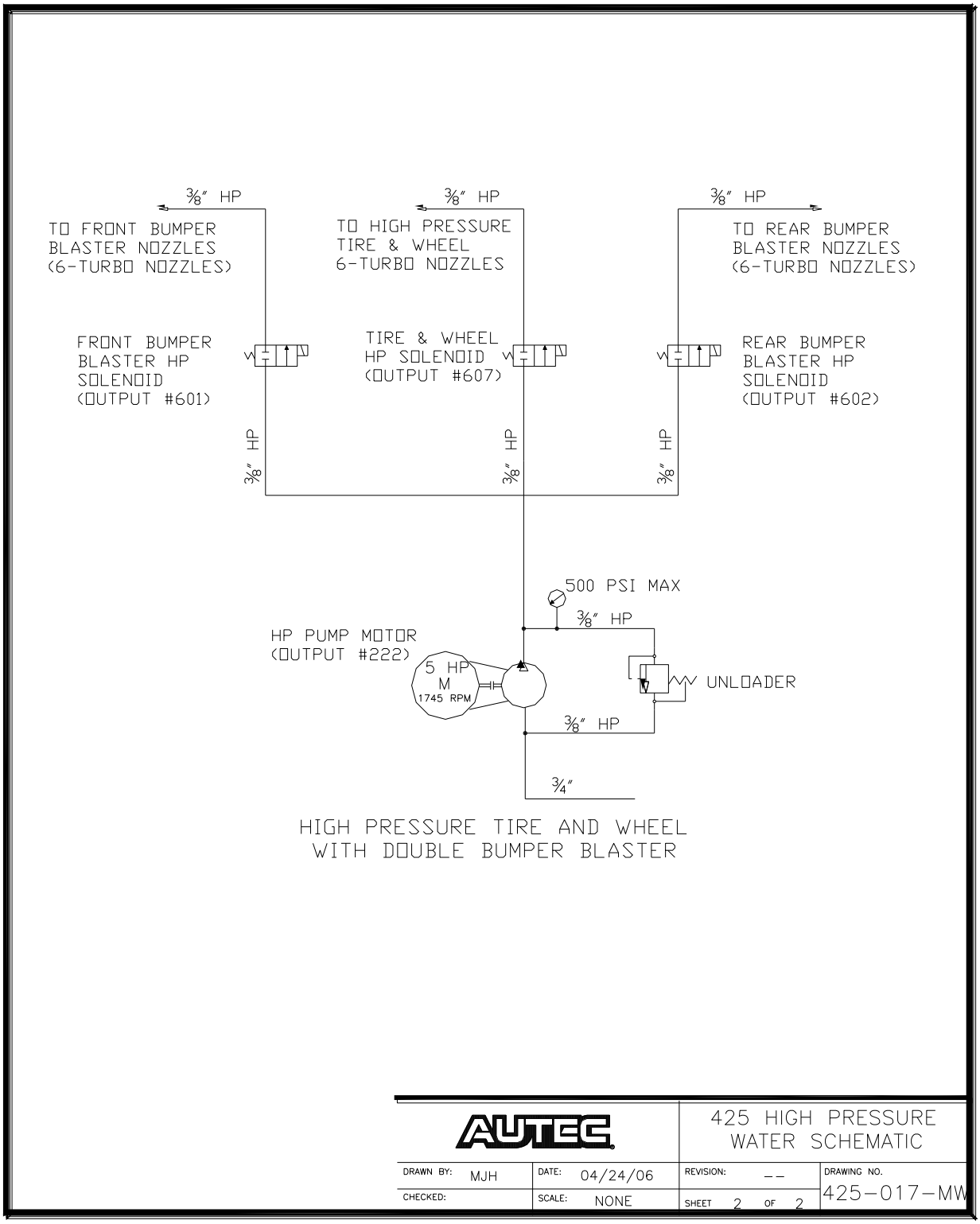


Fig 10-10 High Pressure Pumping Station (Optional)

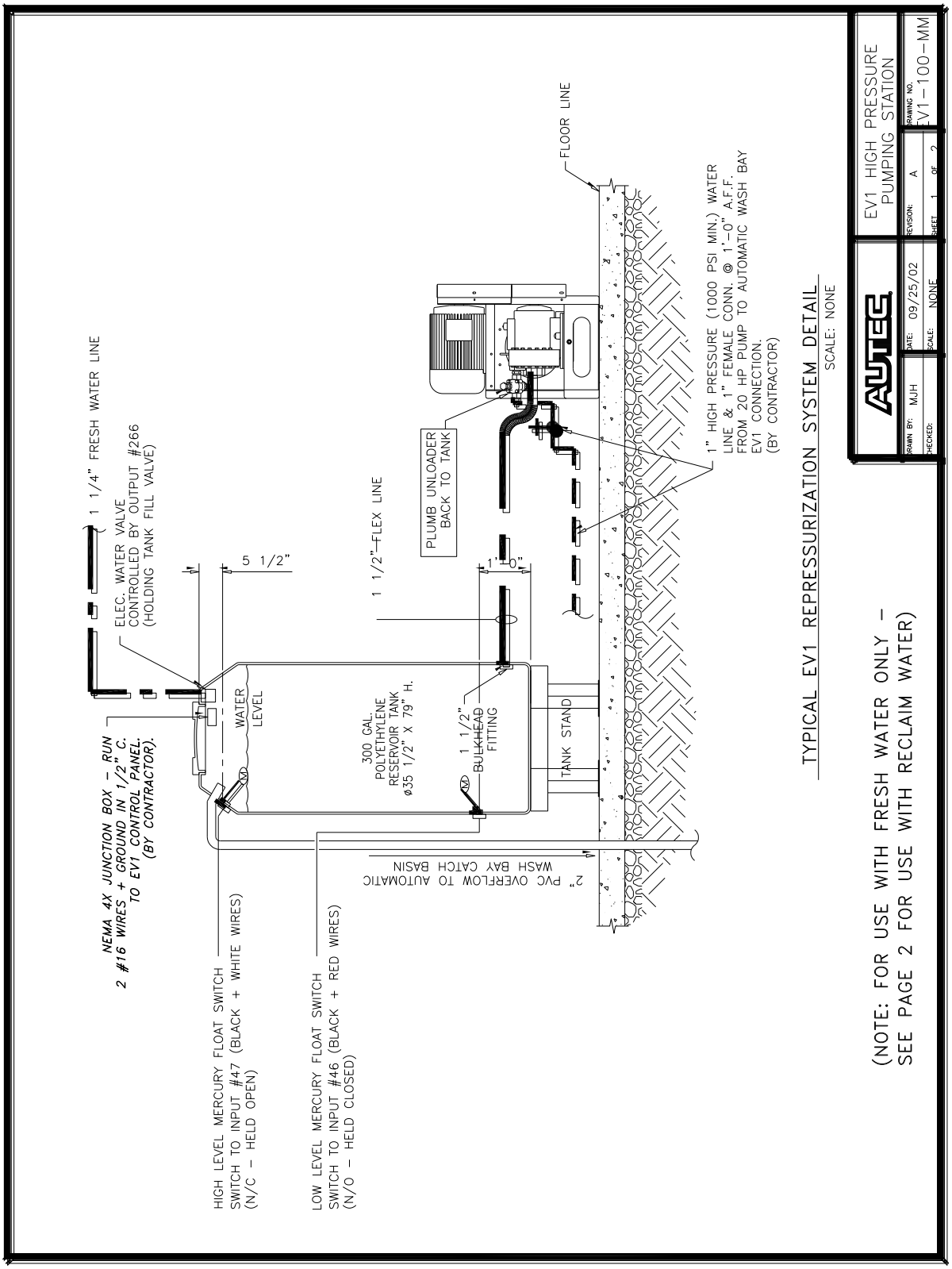


Fig 10-11 Heated Pre-Soak Chemical Stand (Optional)

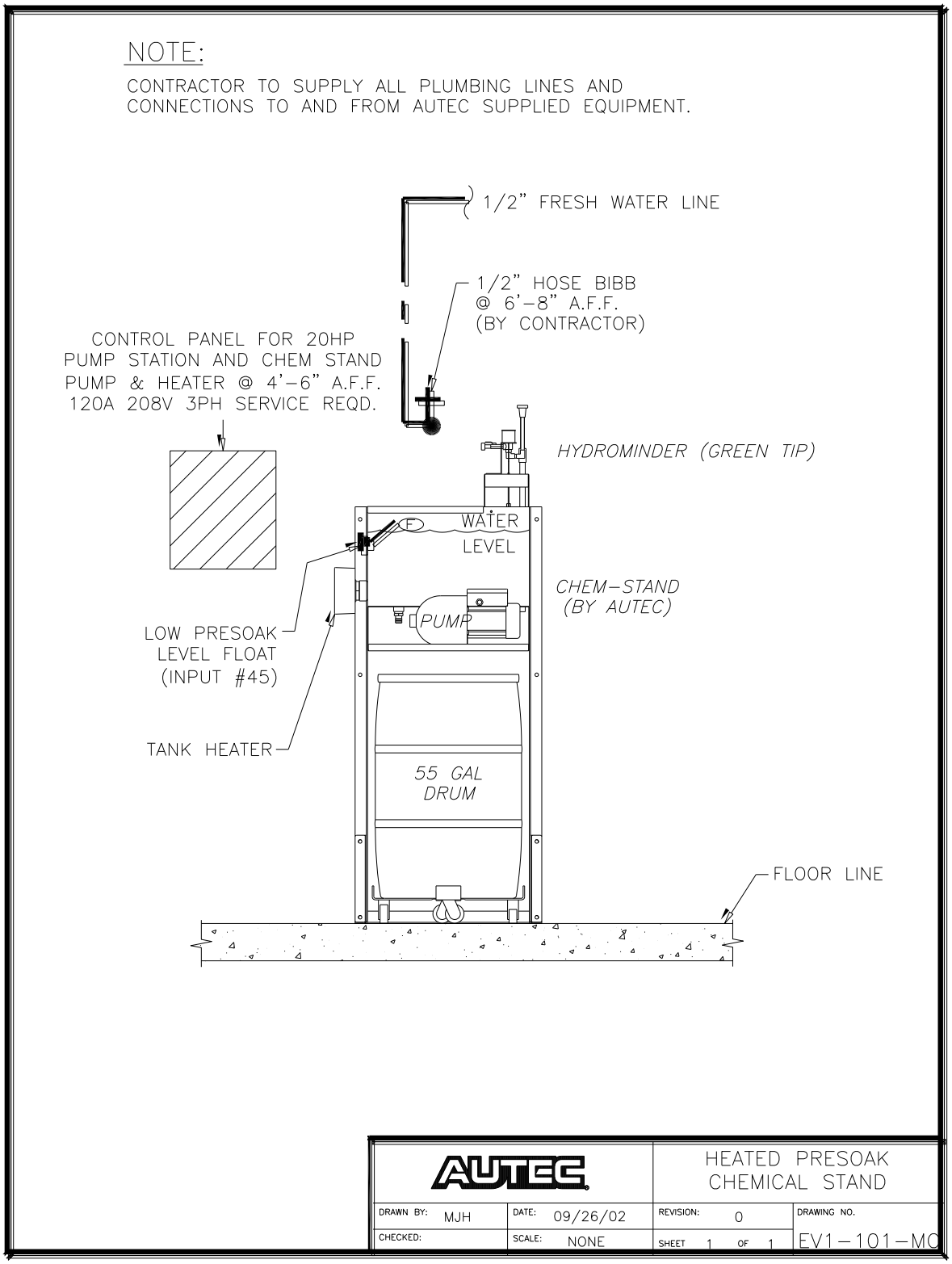
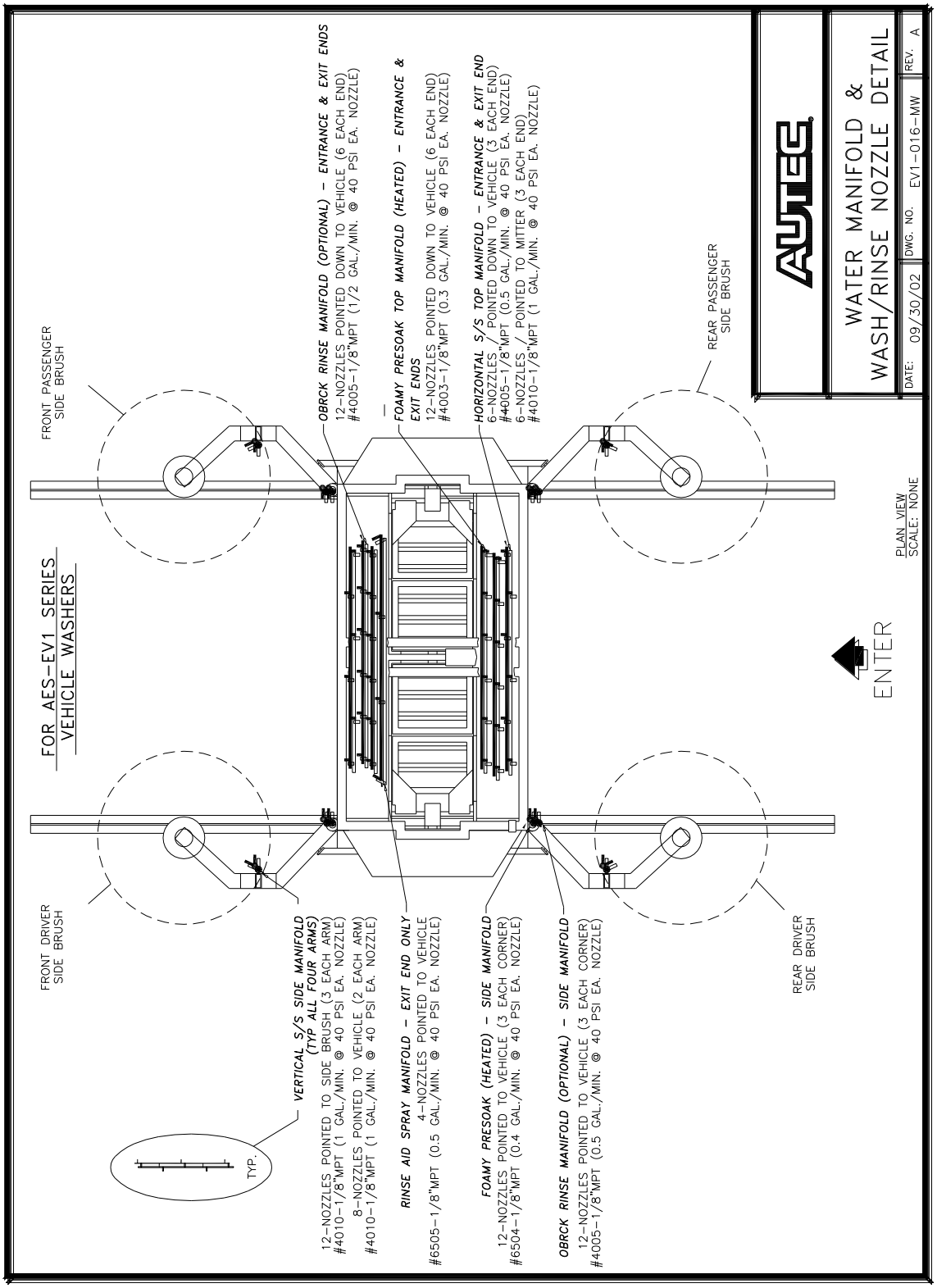


Fig 10-12 Water Manifold & Nozzle Detail



Section 11 – Cloth Specifications

Fig 11-1 Soft Cloth Configuration

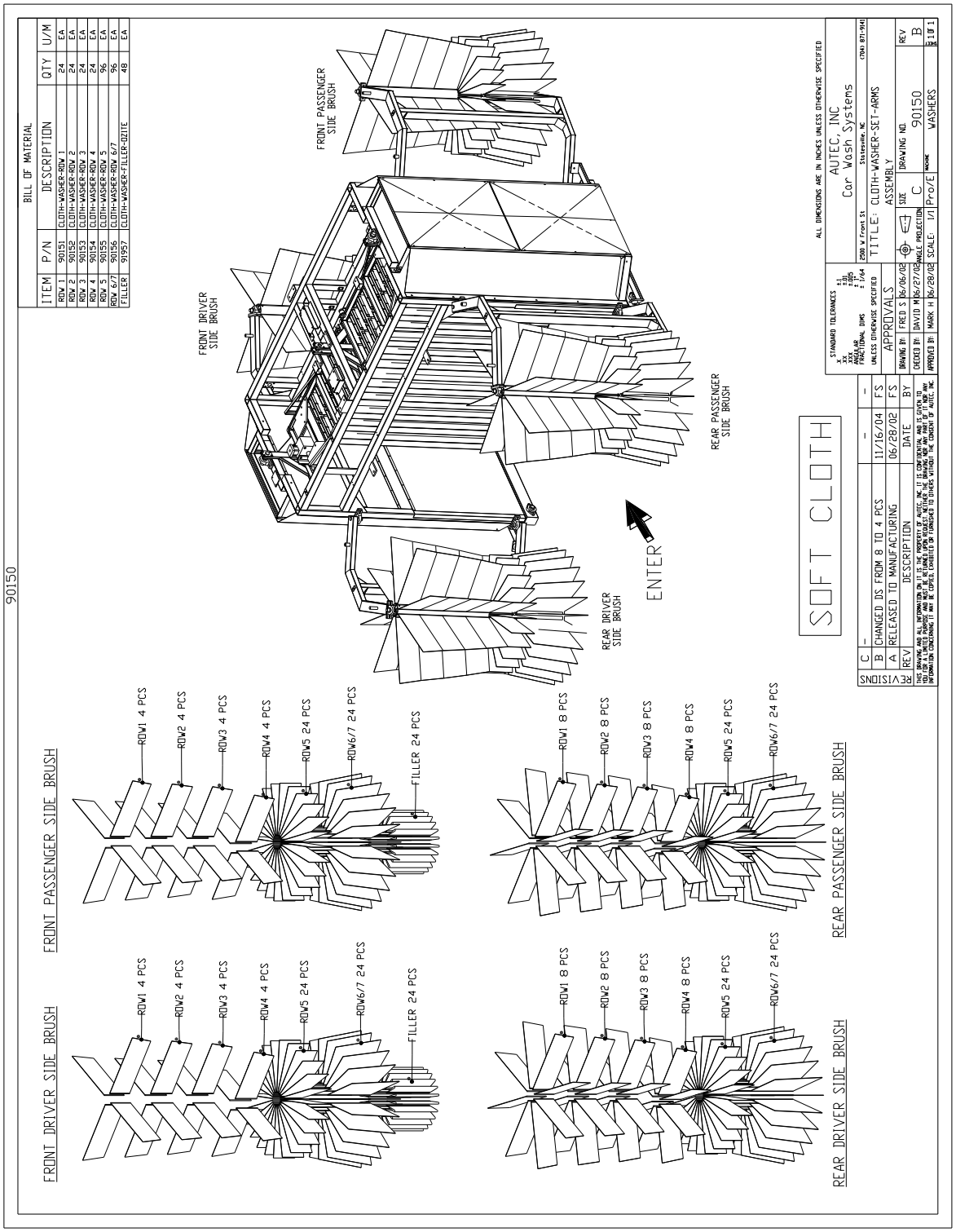


Fig 11-2 PolyFlex Configuration

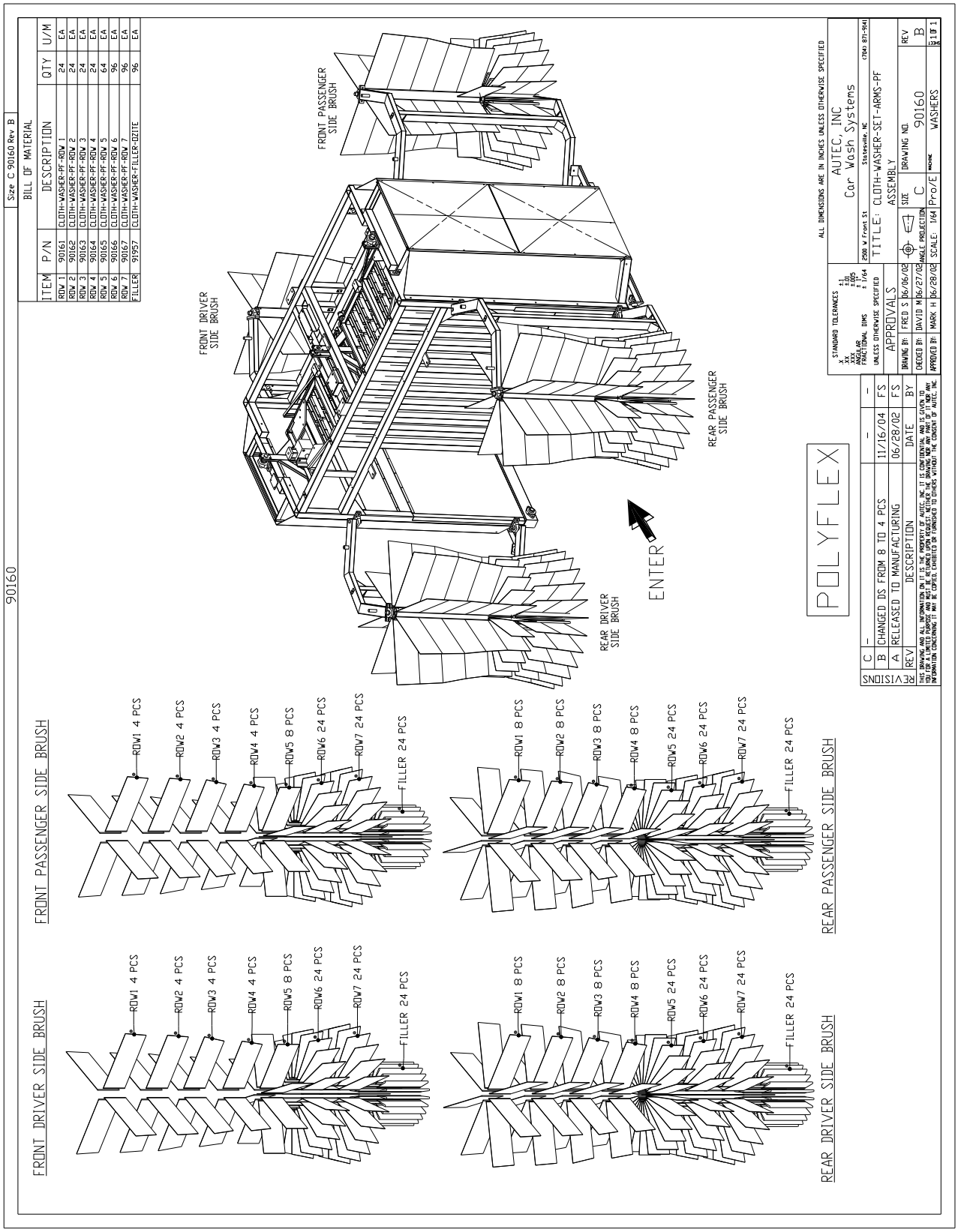


Fig 11-3 Mitter Cloth Configuration

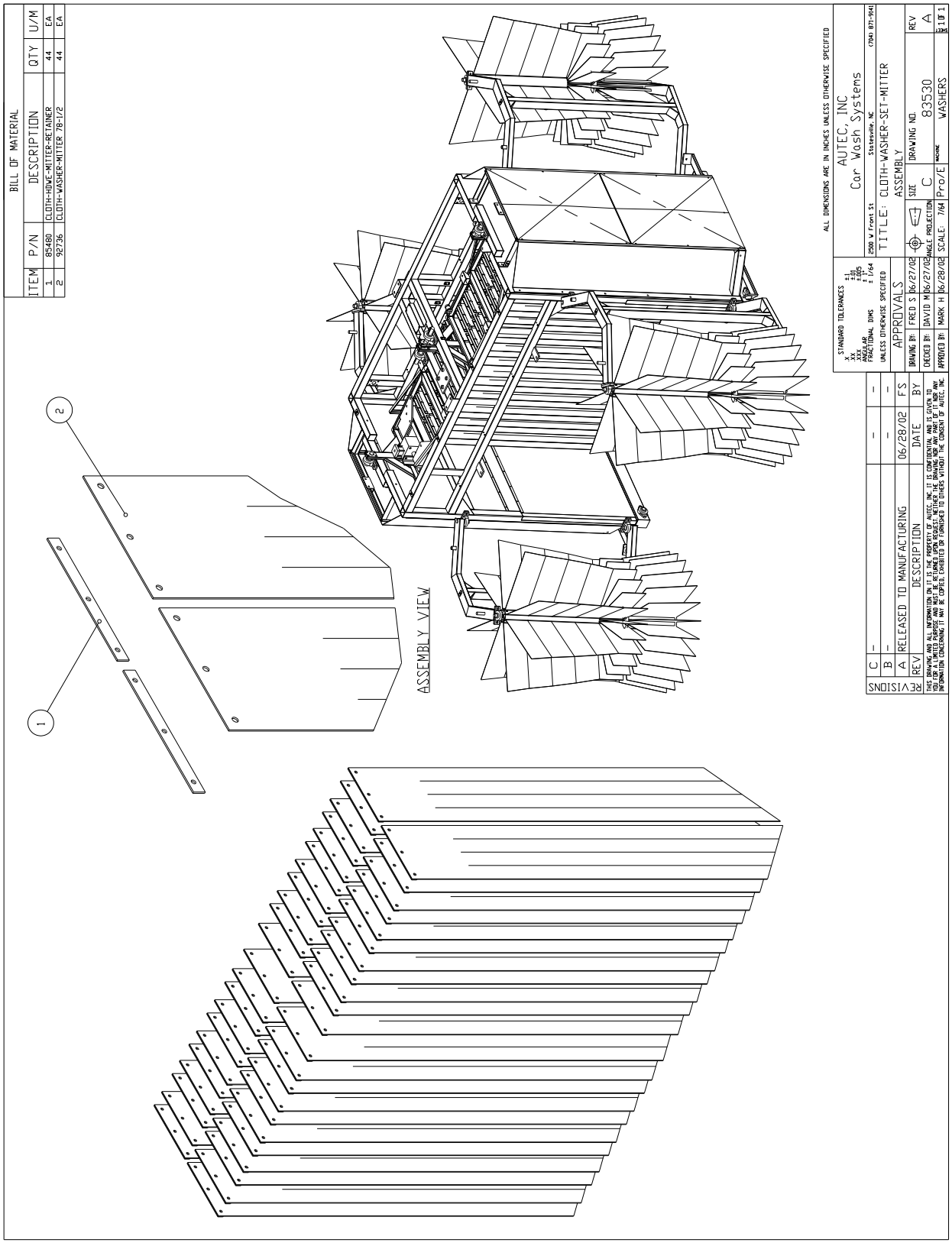
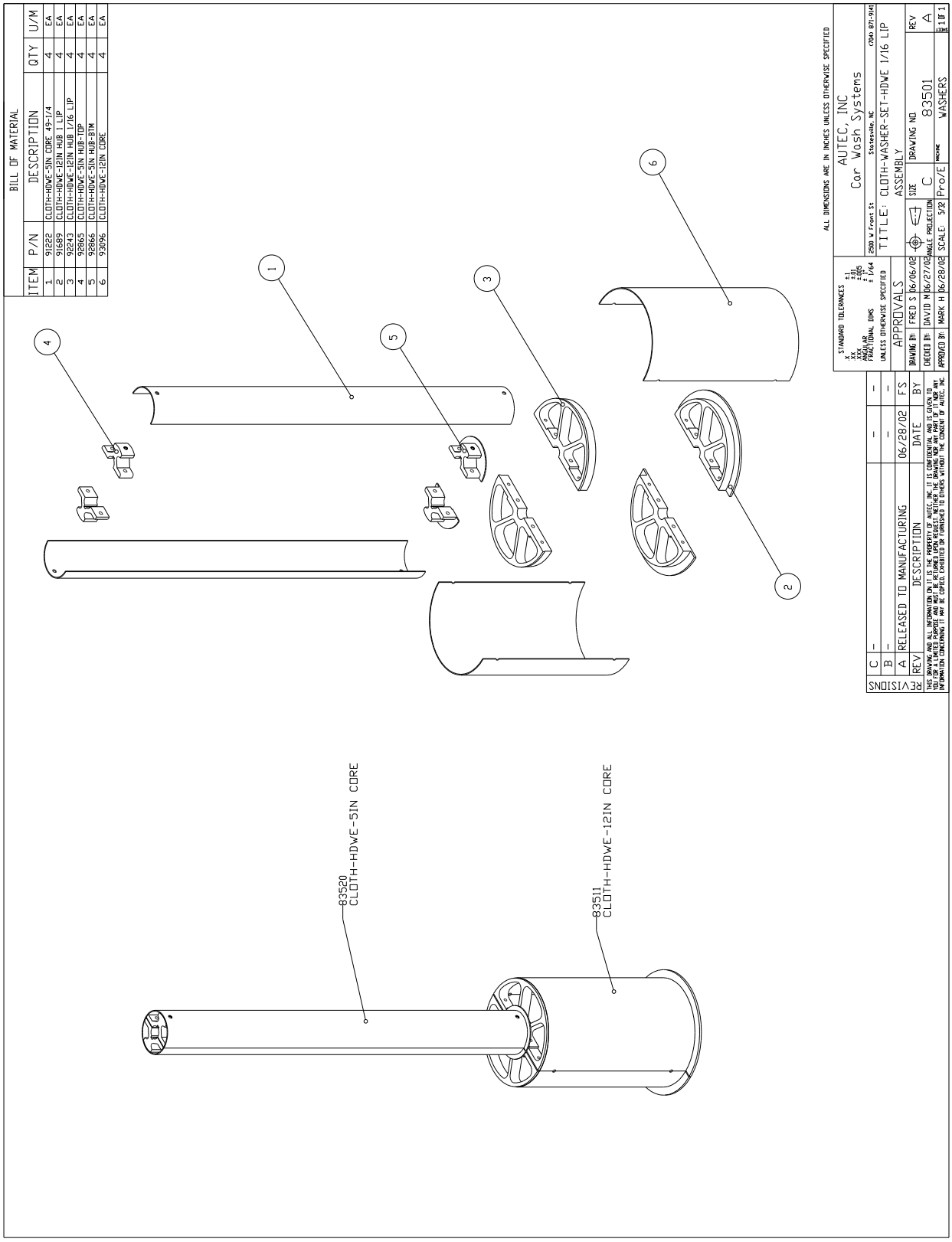


Fig 11-4 Cloth Hub Assembly



Section 12 - Trouble Shooting

DANGER / WARNING -- Attempting to test electrical components by means of a jumper wire or, in some cases, a test meter, can be hazardous. It is strongly recommended that these procedures be performed by factory trained technicians or licensed electricians only. AUTEC does not encourage the testing of equipment by anyone other than the above-mentioned personnel.

A. Main Breaker / Overload / Primary Fuses / breakers

1. Power, OK and Run lights on PLC?
    i. Check main 3-phase breaker and disconnect
    ii. Check 3 amp & 5 amp fuses/breakers in panel
2. Flashing back-up light?
    i. Check reset button on overload relay, main panel
3. Light on DC power supply?

B. Output Fuses

1. Individual glass fuses for each output (mdl 1 - mdl 2)

C. No Power Outputs (Water, Lights, Solenoids, Etc.)

1. Check PLC output light
2. Check wash program for correct option choice
3. Check neutral wire to output device
4. Check inputs for signal (bell switch, entry system, treadle, etc.)
5. Check ESR relay, X-2, X-3

D. Power To Outputs But No Operation (Water, Hyd., Air, Etc.)

1. Check source of water, air, etc. (valves, pumps, compressor, etc.)
2. Is hydraulic motor running backward? Check pressure gauge.

E. Hydraulics not working, 10 or 15 H.P. motor humming

1. Motor single phasing (call electrician)

F. Machine Won't Move

1. Mechanical
    i. Machine off track?
    ii. Concrete anchors too high?
    iii. Worn out couplings / wheels?
    iv. Trash / cans under proximity switches? On track?
    v. Proximity switches faulty?
    vi. Track grooved from spinning wheels? (See i. - iv. For cause)
    vii. Flow control valves turned off?

G. Machine not stopping at end of track

1. Proximity switch under machine not sensing prox plate on floor

2. Proximity switch under machine out of order
3. Broken wire between proximity switch and PLC

H. Machine won't leave end of track, or only travels short distance

1. Check for trash under proximity switches
2. Check for faulty proximity switch
3. Check for dual proximity switch inputs in Gantry Coupler (inputs B2 &B3)
4. Check that the machine is not too far into the prox plate otherwise creep speed may keep it there longer than the travel timeout value allows.

I. Machine Stopping Prematurely

1. Treadle (too sensitive, cars driving off or rocking?)
2. Fault Indications (see #14)

J. Machine or Brush Movements Opposite Of Output Signal

1. 4-Way hyd. valve piston jammed at one end of valve
2. Reversed wiring between PLC and valve

K. Rear Jog Not Working

1. Input (check input A4 for malfunctioning prox)
2. Output (check outputs for rear arm solenoids)
3. Mechanical (check for closed muffler adjustments on rear arm solenoids)

L. Continuous Water/Air/Lights

1. Electrical (shorted wires, shorted contacts in output card)
2. Mechanical (trash in solenoid diaphragm or seat, split diaphragm)

M. Exit light won't go off, or rinse arch won't time out

1. Treadle stuck on? Check input light A15 on first PLC Block
2. Junction box for treadle full of water? Same as above.

N. Fault Conditions / Flash Codes

1. Solid Fault Light – E-Stop Fault
    i. Reset E-Stop
    ii. Push Reset Button
2. One Stop Light flash, one Enter Light flash – Low Air Pressure
    i. Check Air Compressor / Hoses
    ii. Restore Air Pressure
    iii. Push Reset Button
3. Two Stop Light flashes, one Enter Light flash – High Oil Temp.
    i. Check Hydraulic Heater operation
    ii. Check Coolant Valve operation (Water Based Hydraulics only)
    iii. Push Reset Button after machine cool down
4. Three Stop Light flashes, one Enter Light flash – Overload Relay on Main Starter.
    i. Reset overload relay
    ii. Check for cause of fault

iii. Push Reset Button

5. Four Stop Light flashes, one Enter Light flash – Communications problem between Main PLC & Gantry Coupler.
   i. Check for loose connectors
   ii. Check for broken cable
6. Five Stop Light flashes, one Enter Light flash – Low Oil Level
   i. Check for leaks
   ii. Replenish Hydraulic Fluid
   iii. Push Reset Button
7. Six Stop Light flashes, one Enter Light flash – Out of Soap
   i. Replenish Soap Supply
   ii. Push Reset Button
8. Seven Stop Light flashes, one Enter Light flash – Treadle Switch
   i. Check for faulty Treadle Switch
   ii. Push Reset Button
9. Eight Stop Light flashes, one Enter Light flash – Low Water in High Pressure Holding Tank
   i. Check Tank Water Level
   ii. If Tank is empty, check fill valves
   iii. If Tank is partially full (above float switch), check float switch
10. Nine Stop Light flashes, one Enter Light flash – Entry System Out of Service
   i. Check Entry System for Problems
11. Ten Stop Light flashes, one Enter Light flash – Both Travel Prox Switches made at same time
   i. Check for metal trash under prox switches (drink can, etc.)
   ii. Check Prox Switches for proper operation
12. Eleven Stop Light flashes, one Enter Light flash – Gantry Travel Time Out (machine takes too long to travel from end to end)
   i. Check Travel Time Out timers (timers #134-136)
   ii. Check travel prox switches
   iii. Make sure machine travels freely from end to end
   iv. Check for any obstructions that machine can hit or grab

O. Entry System

1. Code Acceptance (try codes for each wash)
2. Power (reset main power to entry system)
3. Refer to mfg. manual for further troubleshooting instructions

P. High Pressure Pumping Station

1. Power
   i. Is pump running?
   ii. Check motor starter for tripped overload
   iii. Check breaker

2. Water Supply
    i. Check Holding Tank for Low Water
    ii. Check fused outputs
    iii. Check High Pressure Solenoids for Oscillating Nozzles and Rockerpanel Nozzles
3. Trash
    i. Check nozzles for trash
    ii. Check pump valves for trash
4. Pump pressure
    i. Check unloader valve setting
    ii. Check pump valves for trash

Q. Traffic Signals

1. Bulbs (maximum 52 w)
2. Inputs
    i. Check for correctly operating input for light in question (bell switch, treadle etc.)
3. Staying On
    i. Continuous inputs?
    ii. Outputs fused in PLC?

R. PLC Problems

1. Power, OK, and Run lights?
2. Inputs
    i. Lights coming on for proper inputs?
    ii. Neutral wires connected?
    iii. Swap input cards and test
3. Outputs
    i. Output lights on?
    ii. Swap output cards and test
4. PLC
    i. Program present? (Check w/ Logic Touch) If there are pound signs on the Main Menu where the versions are displayed then the PLC is not communicating with the HMI. If there is a value in the PLC software version then the program is present but it must be checked for the correct program.
    ii. Run light on?
    iii. Timers and other registers appear to be correct?

S. Chemicals

1. Supply Mixture
    i. Check for presence of chemical and premix in buckets
    ii. Check operation of Hydrominder
2. Air Pressure
    i. Check for adequate air pressure to chemical pumps
    ii. Check for adequate air pressure to foamers on machine

3. Pumps
    i. Is pump running properly?
    ii. Are pump valves clogged with debris, making pump erratic?
4. Clogged hoses / check valves
    i. Inspect hoses and check valves, suction and pressure
    ii. Does pump operate correctly with suction hose disconnected?
    iii. Does pump operate correctly with pressure hose disconnected?
5. PLC outputs
    i. Are PLC outputs operating correctly?
    ii. Is air solenoid for pump energizing properly?
    iii. Check fuse for output to pump solenoid

Section 13 – Control of Peripheral Equipment

A. Automatic Door CONTROL Package

The AUTEC 400, EV-1, and ATF-1 series carwash equipment comes standard with automatic door control functionality built into the PLC program. However, automatic door operation will require the purchase of safety photoeyes, a thermostat, and possibly an interface box, depending on the type of doors used.

Related I/O and Timers

Inputs	Description
A18	Exit Bellswitch / Photoeye
A15	Treadle Switch
A19	Entrance Bellswitch / Photoeye
A7	Entrance Door Photoeye
A6	Exit Door Photoeye
A5	Automatic Door Thermostat

Outputs	Description
R17	Entrance Door Close
R18	Entrance Door Open
R19	Exit Door Close
R20	Exit Door Open

Timers	Description	Default Value
25	Door Low Temp Verify	300 sec
26	Door Low Temp Ok	300 sec
28	Entrance Door Open Signal Duration	1 sec
31	Exit Door Open Signal Duration	1 sec
32	Exit Door Close Signal Duration	1 sec
33	Entrance Door Close Signal Duration	1 sec
35	Exit Door Close Delay	15 sec
66	Exit Door Close If No Exit Bell	300 sec
85	Entrance Door Photoeye On-Delay	1 sec
86	Entrance Door Photoeye Off-Delay	1 sec
87	Entrance Door Close Verify	10 sec
89	Exit Door Photoeye On-Delay	1 sec
90	Exit Door Photoeye Off-Delay	1 sec
91	Exit Door Close Verify	10 sec
92	Exit Door Close after Photoeye is Re-made	10 sec
93	Entrance Door Close after Photoeye is Re-made	10 sec

Program Functionality

1. Door control functionality requires a safety Photoeye on both the entrance and exit door wired normally closed, light operate (i.e. when Photoeye is clear, input is energized). Refer to Fig. 1 for Photoeye wiring. The automatic door control becomes active when the door thermostat input (A5) has an uninterrupted thermostat signal for 5 minutes (timer #25).
2. Once active, the PLC will monitor both the Entrance and Exit Door Photoeyes (inputs A7 & A6). ***At no time will either door close if the respective photoeye is blocked***.
3. If a photoeye is blocked when a door close signal would normally occur, the PLC will wait for the photoeye to clear. Once the photoeye is clear, a door down signal will be generated once the 10 second safety timer (# 92 or 93) expires.
4. If a photoeye becomes blocked within 10 seconds (timers # 87 & 91) of a door down signal, the door will be reopened and behave as described in No. 3 above.
5. Door open and close signals are 120 VAC (1/2 A max load) outputs lasting one second (timers # 28, 31, 32, 33). These are control signals and not intended to power a motor or actuator.
6. Door photoeye and thermostat inputs are 24 VDC.
7. Once active, the door controller will close both the entrance and exit doors if no wash is in progress. If a wash is in progress, the doors will close as specified below.
8. Upon activating a wash or driving over the entrance bell switch, the entrance door will open allowing entry to the wash bay.
9. The Entrance Door will close upon startup of the equipment, or if the equipment never starts, the door will close after a 5 minute safety timer expires (#66).
10. The Exit Door will open at the completion of the wash, or if the exit bell switch is triggered. A safety timer (#66) will also start at this point.
11. As the car leaves the bay, it activates the exit photoeye or bellswitch, starting a 15s exit door timer (#35) to close the door. Should the car not activate the photoeye or bellswitch, the doors will close after the safety timer (#66) expires.

12. The automatic door control becomes inactive when the door thermostat input loses the thermostat signal for a continuous 5 minutes (timer #26). The doors will remain closed, however, until the next wash input or entrance bellswitch opens the entrance door and the wash completion or exit bellswitch opens the exit door.
13. An optional Door Control Box is available that provides manual operation for the doors, converts door control signals to the correct voltage, and contains a thermostat to activate automatic door control operation. Safety photoeyes are purchased separately.
14. The manual controls on the Door Control Box will open doors at any time, however they will only close the doors if the safety photoeyes are clear.

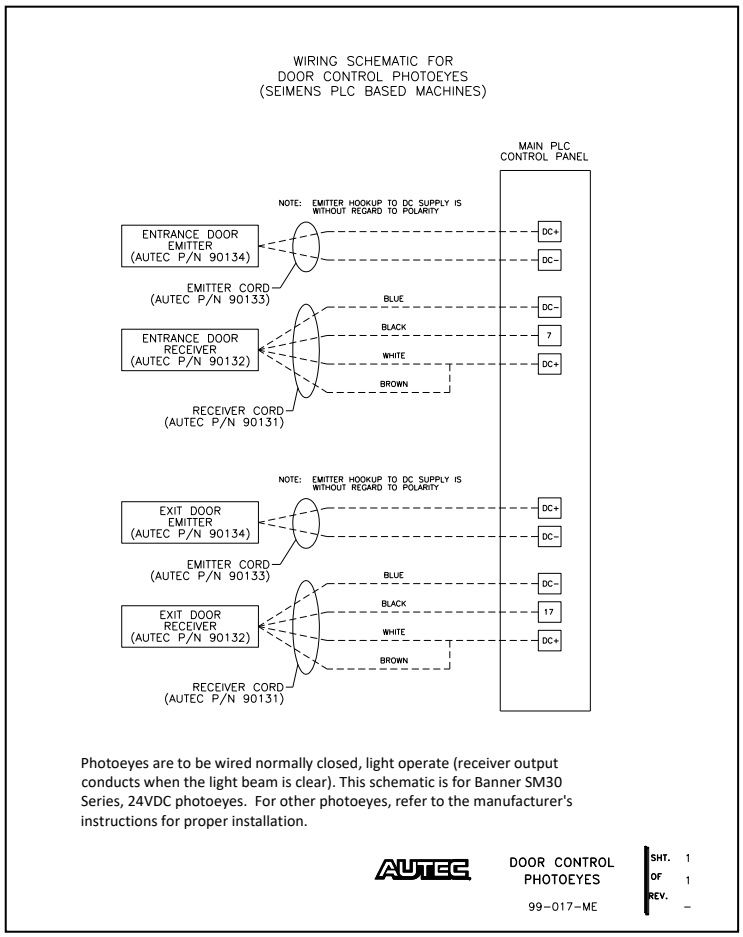


Fig 13-1 Door Control Photoeye Wiring

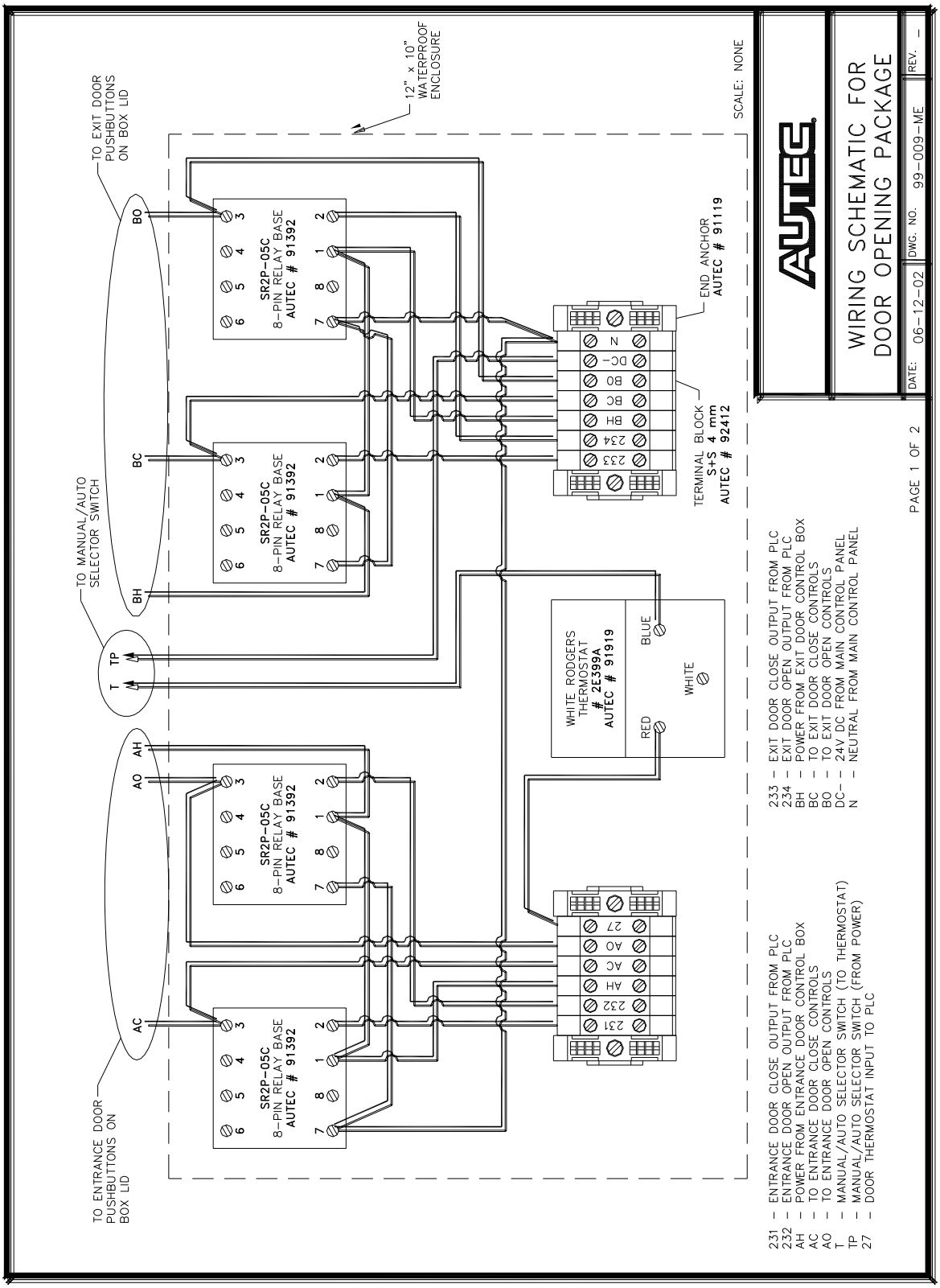


Fig 13-2 Optional Door Control Box

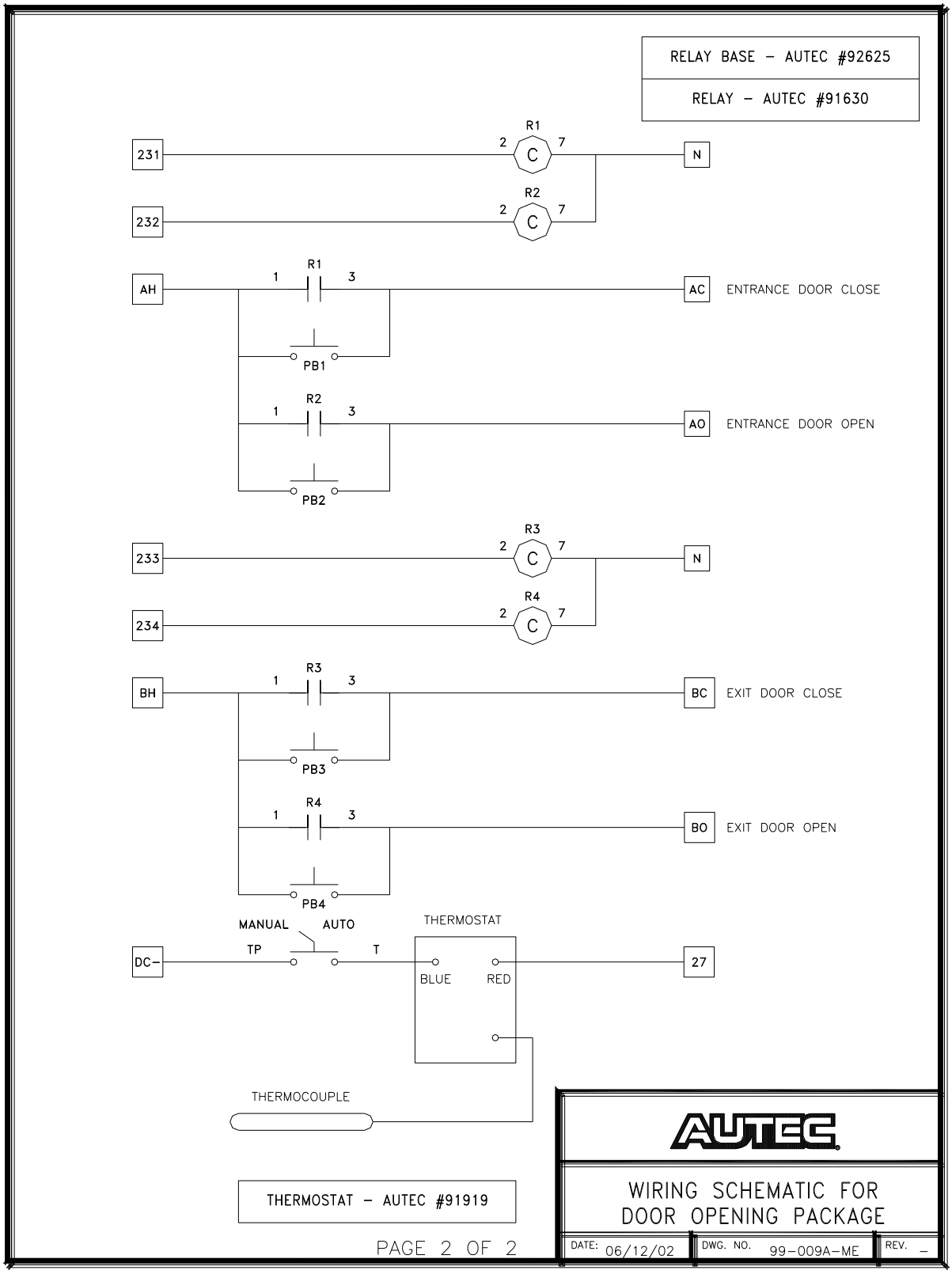


Fig 13-3 Wiring Schematic for Optional Door Control Package

B. External Blower Control

AUTEC Carwash Equipment comes standard with external blower control functionality built into the PLC program. The blower controls consist of inputs to start and stop blowers and two sets of programmable blower outputs. One set of blowers, both sets of blowers, or no blowers may be programmed on any given wash package. Each blower set contains three outputs to energize the blower motors. These outputs are stagger-started to reduce the high current draw during start-up.

Related I/O and Timers

Inputs	Description
A15	Treadle Switch
A18	Exit Bellswitch / Photoeye

Outputs	Description
R10	#1 Blower Motor Starter
R11	#2 Blower Motor Starter
R12	#3 Blower Motor Starter

Timers	Description	Default Value
10	Blower #2 Delay	6 sec
11	Blower #3 Delay	6 sec
23	Blower On	35 sec
42	Blower Start Delay	5 sec

Program Functionality

1. Blower Activation

a. Depending on which sets of blowers are programmed, the first Blower output R10 is activated once the Blower Start Delay timer (#42) expires. The Blower Start Delay timer starts when the vehicle leaves the treadle switch Input A15 at the completion of the wash. Or, if the short bay option is selected in the site setup information, the Blower Start Delay timer will start at the completion of the wash regardless when the car leaves the treadle.

b. The second blower output R11 starts at the completion of the Blower #2 Delay timer (#10). This timer starts at the completion of the Blower Start Delay timer (#42).

c. The third blower output R12 starts at the completion of the Blower #3 Delay timer (#11). This timer starts at the completion of the Blower #2 Delay timer (#10).

2. Blower De-Activation

a. All blowers will turn off after the completion of the Blower On timer (#23). This timer starts at the same time the first blower output R10 is activated.

b. An input from the Exit Bell Switch or Photoeye A18 starts a Blower Shutoff timer (#37) which will turn off all blowers once it expires, regardless if time is still left on the Blower On timer (#23).

C. Reclaim Systems

AUTEC Carwash Equipment comes standard with dedicated reclaim outputs. Refer to reclaim manufacturer's documentation for installation and functionality.

Related I/O and Timers

Inputs	Description
A42	Reclaim Alarm

Outputs	Description
R21	Wash Water Source
R23	Underbody Water
R13	High Pressure Pump Starter

D. R/O (Spot-free systems)

AUTEC Carwash Equipment comes standard with dedicated outputs for R/O systems. Refer to R/O system manufacturer's documentation for installation.

Related I/O and Timers

Outputs	Description
R26	Spot Free Rinse Pump
R27	External Spot Free Rinse Valve

Program Functionality

Wash packages can be programmed to use Spot Free water for both Gantry Rinse and External Rinse (see Section 7). Anytime the program calls for Spot Free water, the Spot Free Rinse Pump (output R26) and the External Spot Free Rinse Valve (output R27) will be activated. Because the Spot Free Rinse Pump is a dedicated output, other functions can also be connected to the Spot Free Pump output to supply spot free water if so desired (see Window Wash Down later in this section).

E. R/O chemical supply (rocs)

The R/O Chemical Supply (ROCS) system supplies R/O water to chemical mixing stations from an existing R/O storage tank. It consists of an air diaphragm pump, air

regulator, bladder storage tank, and the appropriate plumbing to transfer R/O water from the R/O storage tank to the Hydrominder feeding a chemical mixing station.

Related I/O and Timers

Outputs	Description
R26	Spot Free Rinse Pump
R27	External Spot Free Rinse Valve

Program Functionality

Wash packages can be programmed to use Spot Free water for both Gantry Rinse and External Rinse (see Section 7). Anytime the program calls for Spot Free water, the Spot Free Rinse Pump (output R26) and the External Spot Free Rinse Valve (output R27) will be activated. Because the Spot Free Rinse Pump is a dedicated output, other functions can also be connected to the Spot Free Pump output to supply spot free water if so desired (see Window Wash Down later in this section).

F. Entry systems

AUTEC Carwash Equipment can be interfaced with most commercial entry systems. However, only the Unitec WashSelect II offers a two-step selection process to allow the customer to choose between a Touch Free or Friction wash and is the only entry system AUTEC recommends for the EV-1.

Related I/O and Timers

Inputs	Description
A26	Wash #1
A27	Wash #2
A28	Wash #3
A29	Wash #4

Outputs	Description
R7	Carwash-In-Use Signal

Timers	Description	Default Value
21	Hamilton Cycle Inhibit Off	2 sec

Program Functionality

1. Entry System Wiring – Following are some points to keep in mind when installing the entry system. Refer to the entry system manufacturer's documentation for specific installation instructions.

    a. The carwash can have up to 4 wash packages programmed at one time.

b. All wash inputs are 24VDC. You must provide -24VDC to the entry system from the Main PLC Control Panel.

c. Supply the dry contacts on the Entry System with -24VDC from the Main PLC Control Panel. Wire the dry contact for each wash package on the entry system to the desired wash package on the carwash PLC. If the Entry System does not have dry contacts, you must provide relays to control the -24VDC wash inputs. DO NOT wire an output from the entry system directly to the carwash PLC. Refer to the entry system manufacturer's documentation for specific wiring instructions.

d. The Wash-In-Use signal from the PLC is 120VAC. You must provide a neutral from the Main PLC Control Panel along with the Wash-In-Use Signal. Refer to the entry system manufacturer's documentation for specific wiring instructions.

e. An entry system alarm input can be monitored by the carwash PLC which is -24VDC and must be supplied from the Main PLC Control Panel. Refer to the entry system manufacturer's documentation for specific wiring instructions.

2. Operation – During normal operation the carwash PLC communicates with the entry system as follows:

   a. If the carwash is idle (no wash in progress), the entry system may send a wash input to the carwash PLC.

   b. Once the carwash PLC receives a wash input, it will turn on the green Enter Light and arm the carwash for a vehicle to enter.

   c. After the carwash has been armed with a wash, the first occurrence of an Entrance Bell Switch, any Pre-Wash Start input, or the Treadle Switch input will activate the Wash-In-Use signal.

   d. The Wash-In-Use signal will remain energized until the exit light has timed out after the completion of the wash.

   e. Once the Wash-In-Use signal has turned off, the carwash PLC can receive a new wash input.

   f. If an Entry System Fault input (A41) is received, the carwash PLC will register a Fatal Fault and shut down operations.

3. Shut Down – If used with a Unitec system, the carwash PLC can shut down the entry system when the carwash goes out of service. For other brands of entry systems, check with the manufacturer for compatibility.

a. If the carwash PLC registers a fatal fault or goes into freeze protection, the PLC will cycle the Wash-In-Use signal on for one second, off for one second, and then on continuously. This will signal the entry system that the carwash is shutdown which will take the entry system out of service.

b. While the entry system is out of service, it will not accept any codes, credit transactions, or money.

c. Once the fault clears or the carwash comes out of freeze protection, the Wash-In-Use signal will turn off which will bring the entry system back in service.

G. Pre-soak functions

The AUTEC 260 series carwash can control 1 Pre-Soak function (in addition to Underbody and CTA applications). Pre-soak functions typically consist of chemical application arches or high pressure blasters mounted at the entrance end of the wash bay prior to the carwash.

Related I/O and Timers

Inputs	Description
A15	Treadle Switch
A22	Pre-Soak #1 Start Photoeye
A23	Pre-Soak Stop Photoeye

Outputs	Description
R22	Pre-Soak #1 Start

Timers	Description	Default Value
18	Pre-Soak #1 Duration	30 sec
95	Pre-Soak #1 Photoeye On-Delay	0.1 sec
112	Pre-Soak Stop Photoeye On-Delay	0.1 sec

Program Functionality

1. Pre-Soak Programming – Each wash package can have up a pre-soak application programmed (in addition to Underbody or CTA). (Refer to Section 7 for programming wash packages.)

2. Operation

   a. The Pre-Soak function is activated by its own input R22 which can be triggered by any suitable device (bell switch, photoeye, proximity sensor, etc.). If photoeyes are used, a Photoeye On-Delay timer # 95 can be used to fine tune when the application will start relative to the photoeye. If a bellswitch or other

momentary type of device is used, this timer should be left at its default value (0.1 sec).

b. Once a Pre-Soak function is activated, a corresponding Pre-Soak Duration timer (#18, 47, 48, or 49) will start. When this timer expires, the Pre-Soak function will be turned off.

c. A Pre-Soak Stop input (A24) is provided which will override the Pre-Soak Duration timers and extinguish all Pre-Soak functions at one time. This input also has an On-Delay timer (#112) which may be utilized if using a photoeye.

d. All Pre-Soak functions are terminated when the Treadle Switch input (A15) is recognized regardless of whether the Pre-Soak Duration timers have expired or the Pre-Soak Stop input has occurred.

H. Post-wash (Rinse arch) functions

The AUTEC carwash can control Post-Wash Rinse functions, consisting of Fresh Water or Spot Free Rinse, with the ability to add Rinse Aid chemical. Post wash functions typically consist of a rinse arch or chemical application arch mounted at the exit end of the wash bay, between the carwash and the exit door or any external blowers. Each Post-Wash function is independently programmed and controlled.

Related I/O and Timers

Inputs	Description
A18	Exit Bell Switch
A15	Treadle Switch
A24	Rinse Arch Stop Photoeye

Outputs	Description
R26	Spot Free Rinse Pump
R25	Fresh Water Rinse Pump
R38	Rinse Chemical Pump
R24	External Fresh Water Rinse Valve
R27	External Spot Free Rinse Valve

Timers	Description	Default Value
20	Rinse Arch Duration	30 sec
37	Rinse Arch Shut-Off-Delay	5 sec
50	Rinse Arch Stop Counter	1
49	Post-Wash Chemical Arch Duration	30 sec
97	Rinse Arch Stop On-Delay	0.1 sec

Program Functionality

1. Post-Wash Programming – Each wash package can have up to two Post-Wash applications programmed (in addition to blowers). (Refer to Section 7 for programming wash packages.)

2. Operation

    a. All Post-Wash functions are activated when the vehicle leaves the treadle (Input A15) or, if Short Bay Option is programmed (see Section 7), the Post-Wash functions will start as soon the Gantry wash completes. Note: If a drive-off is detected while a wash is in progress, by the loss of the treadle input (A15), the External Rinse Arch programmed for that wash package, if any, will activate automatically to rinse the vehicle.

    b. Depending on what is programmed in the wash package, the appropriate post-wash outputs will energize.

        i. External Fresh Water Rinse – Outputs R24 & R25

        ii. External Spot Free Rinse – Outputs R26 & R27

        iii. Rinse Chemical Pump (can be plumbed to either arch) – Output R38

        iv. Post-Wash Chemical Arch – Output R49 †

    c. All Post-Wash functions will terminate in one of three ways:

        i. The post-wash functions will terminate at the end of their respective duration timers (# 20 or 49). These timers start with the post-wash function.

        ii. Post-wash functions are stopped by a Rinse Arch Stop input (A24) which can be either a bellswitch or photoeye. If a bellswitch is used then the Rinse Arch Stop Counter (Counter # 50) should be set to 2 which will count two pulses before the input is recognized. If a photoeye is used then leave the Rinse Arch Stop Counter at 1. Also, there is a Rinse Arch Stop On-Delay (timer #97) that can be used with a photoeye to fine tune the timing between the photoeye and the termination of the post-wash arches.

        iii. The Exit Bell Switch input (A18) will start a Rinse Arch Shut Off-Delay timer (#37 – 5s default) which will shut off both arches when it expires regardless of whether the arch duration timers have expired.

I. Underbody function

AUTEC 400, EV-1, and ATF series carwashes have dedicated I/O to control an Underbody Wash. The Underbody Wash consists of a spray manifold that mounts on the wash bay floor at the entrance of the carwash. As a vehicle enters the wash bay, a bellswitch or photoeye triggers the underbody spray which remains on until it times out or is stopped by another input. The underbody function is programmable for each wash package (see Section 7 for wash package programming).

Related I/O and Timers

Inputs	Description
A15	Treadle Switch
A20	Underbody Start Bellswitch / Photoeye
A23	Pre-Soak Stop Photoeye

Outputs	Description
R23	Underbody Wash Water Valve

Timers	Description	Default Value
19	Underbody Duration	30 sec
107	Underbody Photoeye On-Delay	0.1 sec
112	Pre-Soak Stop Photoeye On-Delay	0.1 sec

Program Functionality

1. Underbody Programming – Underbody can be programmed into any wash package. (Refer to Section 7 for programming wash packages.)

2. Operation

   a. The Underbody Function is activated by its own input (A20) which can be triggered by any suitable device (bellswitch, photoeye, proximity sensor, etc.). If photoeyes are used, a Photoeye On-Delay timer (#107) can be used to fine tune when the application will start relative to the photoeye. If a bellswitch or other momentary type of device is used, these timers should be left at their default value (0.1 sec).

   b. Once the underbody wash is activated, a corresponding Underbody Duration timer (#19) will start. When this timer expires, the underbody function will turn off.

c. A Pre-Soak Stop input (A23) is provided which will override the Underbody Duration timer and all Pre-Soak times and extinguish the underbody and all Pre-Soak functions at one time. This input also has an On-Delay timer (#112) which may be utilized if using a photoeye.

d. The Underbody Function is terminated when the Treadle Switch input (A15) is recognized regardless of whether the Underbody Duration timer has expired or the Pre-Soak Stop input has occurred.

J. Chemical Tire Additive (CTA)

AUTEC 400, EV-1, and ATF series carwashes have dedicated I/O to control a Chemical Tire Application (CTA). The CTA option consists of spray nozzles that mount on each side of the wash bay prior to the carwash. A bellswitch, mounted just before the spray nozzles, activates the CTA pump to apply chemical to the vehicle's tires and wheels as it enters the wash bay. The CTA Function is programmable for each wash package (see Section 7 for wash package programming).

Related I/O and Timers

Inputs	Description
A19	Entrance Bellswitch / Photoeye

Outputs	Description
R3	CTA Pump

Timers	Description	Default Value
2	CTA Duration	1.5 sec

Program Functionality

1. CTA Programming – CTA can be programmed into any wash package. (Refer to Section 7 for programming wash packages.)

2. Operation

   a. The CTA chemical pump is activated by the Entrance Bellswitch input (A19) which can be triggered by any suitable device (bell switch, photoeye, proximity sensor, etc.). However, no On-Delay timer is provided with this input.

   b. Once the CTA pump is activated, a corresponding CTA Duration timer (#2) will start. When this timer expires, the CTA pump will turn off.

   c. The CTA pump will activate each time the Entrance Bellswitch input is activated until the Treadle Switch input (A15) is made or the wash package is cancelled.

Fig 13-4 Installation Procedures

AUTEC®

ACTA-1

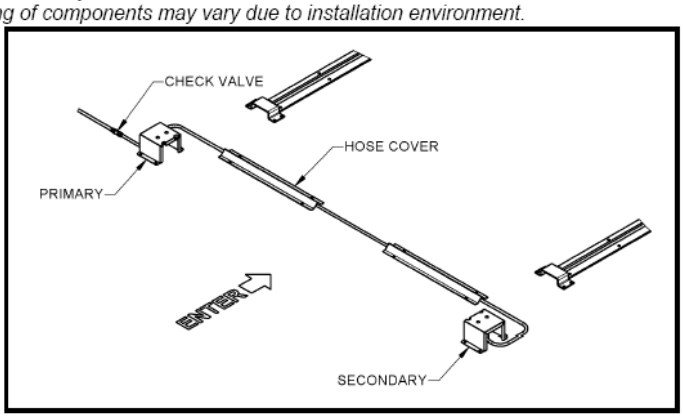
Installation Procedures

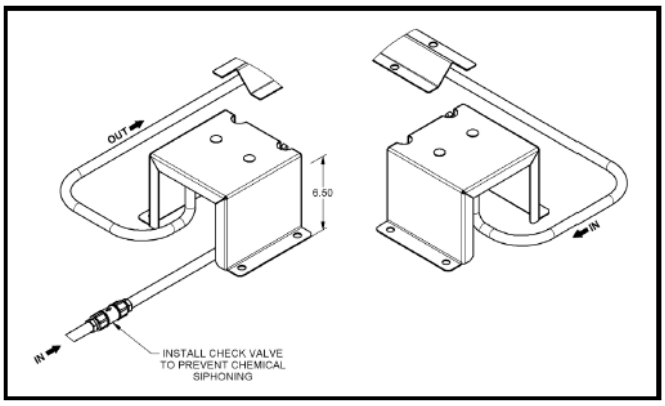
These are factory recommended instructions.
Actual plumbing and mounting of components may vary due to installation environment.

Installation Steps:

1. Install components as shown using 1/2 X 3-3/4 anchor bolts or equivalent.

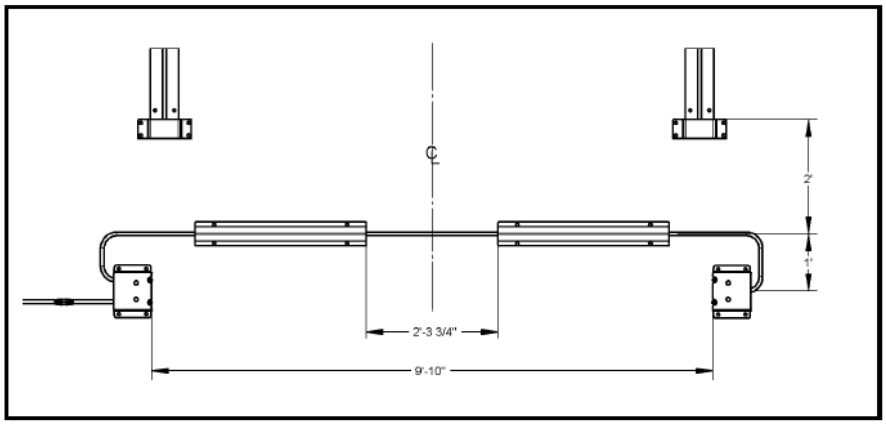
2. Connect hose from chemical pump to Primary Unit.





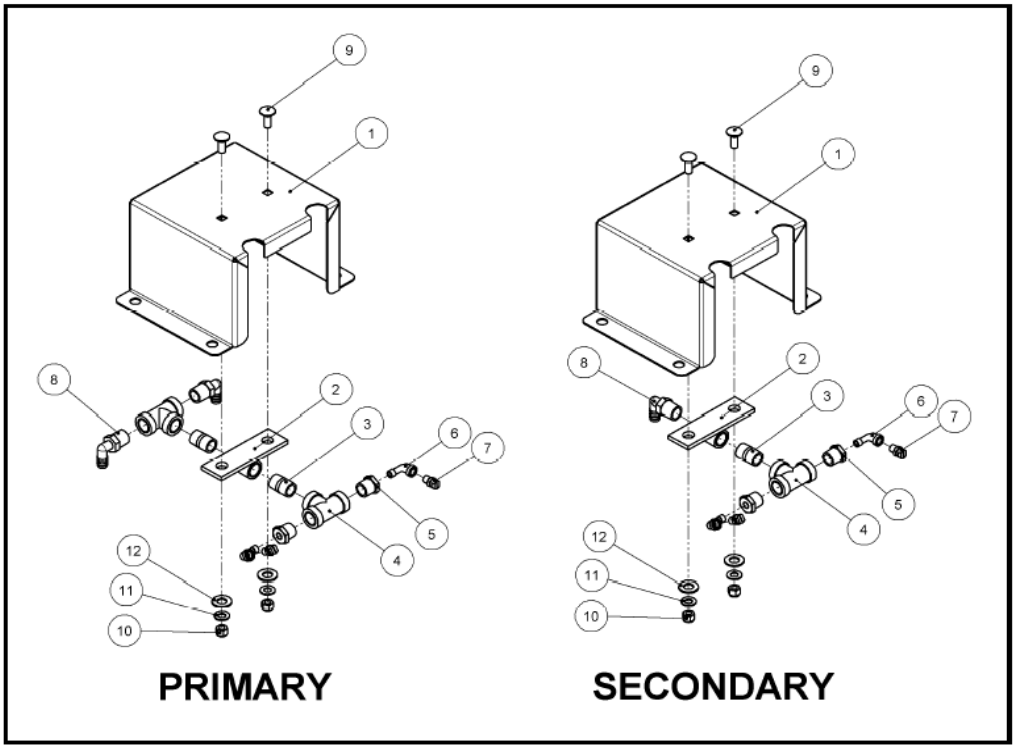
3. Assemble barbs on check valve and position it inline near the Primary unit.

4. Route the hose from the Primary unit, under the Hose Guards, to the Secondary Unit.



Rev 06/29/05

Fig 13-5 Maintenance and Repair



Item	Part No	Description
1	884210	CTA-RISER
2	883060	CTA-COUPLING BRKT-WLDASM
3	91742	FTG-NIPPLE-SS 1/2XCLOSE
4	91755	FTG-TEE-SS 1/2
5	91856	FTG-BUSHING-SS 1/2X1/8
6	92085	FTG-ELBO-STRT-90-SS 1/8
7	91708	NOZZLE-SS-4010-1/8
8	91251	FTG-BARB-MALE-90-POLYP 1/2X1/2 NPT
9	99013	BOLT-CARRIAGE 3/8-16 X 1 SS
10	99089	NUT-LOCK 3/8-16 SS
11	99106	WASHER-FLAT 3/8 SAE-SS
12	99099	WASHER-FLAT 1/2 SAE-SS
	92738	VALVE-WTR-CHECK-PVC 1/2 ADJ
	886590	HOSE COVER-SS
	91513	ANCHOR-CONCRETE-1/2X3-3/4
	99065	NUT-HEX 1/2-13 SS

K. Bug Sprayer Function

AUTEC 400, EV-1, 260, and ATF series carwashes have dedicated I/O to control a Bug Spray function. The option consists of a spray bar the mounts on the wash bay floor, in front of the vehicle, and a chemical pumping station. It applies a chemical to the front of the vehicle prior to the start of the wash to help loosen insect splatter and other road grime. The Bug Sprayer Function is programmable for each wash package (see Section 7 for wash package programming).

Related I/O and Timers

Inputs	Description
N/A	N/A

Outputs	Description
R4	Bug Sprayer Pump

Timers	Description	Default Value
4	Treadle Verify	4 sec
58	Bug Sprayer Duration	6 sec

Program Functionality

1. Bug Sprayer Programming – The Bug Sprayer can be programmed into any wash package. (Refer to Section 7 for programming wash packages.)

2. Operation

    a. The Bug Sprayer is activated by the Treadle Switch input (A15) when a vehicle parks on the treadle.

    b. Once the bug sprayer is activated, a corresponding bug Sprayer Duration timer (#58) will start. When this timer expires, the bug sprayer function will turn off.

    c. If the vehicle leaves the treadle prior to the Treadle Verify timer (#4) expiring, the bug sprayer will deactivate and activate again each time the treadle input is made. Once the Treadle Verify timer (default 4 sec) is satisfied, the bug sprayer will not activate again during the wash in progress.

L. Drive-By Wheel/Rocker Panel Blaster

AUTEC 400 and EV-1 series carwashes have dedicated I/O to control a Drive-By Wheel/Rockerpanel Blaster function. This option consists of an input to turn on the Gantry High Pressure Wheel and Rockerpanel Blaster Nozzles as a vehicle is entering the wash bay to blast off as much grime as possible before the first wash pass. It is

available on all EV1 series machines; however the 400 series carwash must have the High Pressure Tire and Wheel option. The Drive-By Blaster Function is programmable for each wash package but is typically only used on a friction wash type (see Section 7 for wash package programming).

Related I/O and Timers

Inputs	Description
A15	Treadle Switch
A21	Drive-By Rockerpanel Blaster Start

Outputs	Description
R13	High Pressure Pump Starter
S2	Rockerpanel Blaster Water Valve

Timers	Description	Default Value
45	Drive-By Rockerpanel Blaster Duration	30 sec
110	Drive-By Rockerpanel On-Delay	0.1 sec

Program Functionality

1. Drive-By Rockerpanel Blaster Programming – The Drive-By Rockerpanel Blaster can be programmed into any wash setup but is only recommended for friction wash packages. (Refer to Section 7 for programming wash packages.)

2. Operation

    a. The Drive-By Rockerpanel Blaster is activated by the Drive-By Rockerpanel Blaster Start input (A21) which can be triggered by any suitable device (bell switch, photoeye, proximity sensor, etc.). If photoeyes are used, a Photoeye On-Delay timer (# 110) can be used to fine tune when the application will start relative to the photoeye. If a bellswitch or other momentary type of device is used, this timer should be left at its default value (0.1 sec).

    b. Once the Drive-By Rockerpanel Blaster is activated, a corresponding Drive-By Rockerpanel Duration timer (#45) will start. When this timer expires, the Drive-By Rockerpanel Blaster function will turn off.

    c. When the vehicle activates the Treadle Switch input (A15), the Drive-By Rockerpanel Blaster will turn off if its timer has not yet expired.

M. Treadle Buzzer

AUTEC 400, EV-1, and ATF-1 series carwashes have an optional Treadle Buzzer function that sounds a buzzer when the vehicle activates the treadle switch. This feature

provides an audible signal to help people locate the treadle switch more efficiently. It will also sound the buzzer after the wash completes to signal the driver to exit.

Related I/O and Timers

Inputs	Description
A15	Treadle Switch

Outputs	Description
R28	Treadle Buzzer

Timers	Description	Default Value
3	Treadle Switch Verify	4 sec
80	Treadle Buzzer Duration	1 sec

Program Functionality

1. Wash Activation – Once a valid wash input has armed the carwash, the Treadle Buzzer will sound anytime the Treadle Switch input (A15) is activated. The duration of the buzzer is determined by the Treadle Buzzer Duration timer (#80). If the vehicle leaves the treadle switch prior to the Treadle Switch Verify timer (#3) expiring, it will resound each time the treadle switch input is activated. Once the Treadle Switch Verify timer has expired, the treadle switch buzzer will not sound again until the completion of the wash.

2. Wash Completion – The treadle buzzer will sound again one time at the completion of the wash in conjunction with the exit light.

N. Window Wash Down

AUTEC 400, EV-1, and ATF-1 series carwashes have an optional Window Wash Down function to help keep glass buildings and windows clean. It utilizes a spray bar mounted above the windows or glass panels to rinse the glass with water between washes. This helps prevent soap and chemicals from drying on the glass thus eliminating residue build up.

Related I/O and Timers

Inputs	Description
N/A	N/A

Outputs	Description
R29	Window Wash Down Water Source
R30	Glass Wash Down #1
R31	Glass Wash Down #2

R32	Glass Wash Down #3
R33	Glass Wash Down #4

Timers	Description	Default Value
77	Glass Wash Down Pause	1 sec
78	Glass Wash Down Duration	10 sec
79	Glass Wash Down Verify	30 sec

Program Functionality

1. Glass Wash Down Activation – Once the exit light and any external blowers have expired after a wash, the Glass Wash Down Verify timer (#79) starts. If the machine has not been armed with a valid wash input when this timer expires, the glass wash down function will start.

2. Operation – The Wash Down Function will turn on a water source, which could be a pump or a water valve, and then cycles through four water valve outputs. This allows you to wash smaller areas of glass at one time which reduces the size of the water supply required. The following sequence happens when the wash down function activates.

   a. When activated, the wash down function will turn on the window wash down water source output (R29), the glass wash down #1 valve output (R30) and start the glass wash down duration timer (#78).

   b. Once the wash down duration timer expires, the glass wash down #1 valve output will turn off and the glass wash down pause timer (#77) will start.

   c. After the wash down pause timer expires, wash down #2 valve output will turn on and the wash down duration timer will restart.

   d. This sequence will continue with outputs #3 and #4, each valve staying open for the wash down duration timer and pausing between each for the wash down pause timer.

   e. If a valid wash input is recognized by the PLC at any time during the wash down sequence, the wash down function will immediately terminate and reset.

O. Freeze Protection

AUTEC 400 and EV-1 series washers have an optional Freeze Protection function that will shut down the carwash and purge all water lines to prevent freezing. It utilizes a thermostat to initiate freeze protection which takes the wash out of service and shuts off all water sources to the equipment. The system will pressurize all water lines with air and sequentially open each point of use water valve to purge any water from the lines.

Related I/O and Timers

Inputs	Description
A14	Freeze Protection Thermostat

Outputs	Description
R22	#1 Presoak Arch Valve
R23	Underbody Wash Water Valve
R16	Freeze Protection Manifold
R7	Wash-In-Use Signal
R24	External Fresh Water Rinse Valve
R27	External Spot Free Rinse Valve
R30	Glass Wash Down #1 Valve
R31	Glass Wash Down #2 Valve
R32	Glass Wash Down #3 Valve
R33	Glass Wash Down #4 Valve
S3	Final Rinse Water Valve
S11	Foamer Air Valve
S28	Spot Free Final Rinse Valve (Gantry)
S2	Rockerpanel Blaster Water Valve
S10	Machine Wash Water Valve

Timers	Description	Default Value
27	Underbody Purge Duration	15 sec
29	Presoak Water Purge Duration	15 sec
30	External Rinse Arch Purge Duration	15 sec
34	Machine Wash Water Purge Duration	15 sec
36	Purge Start Delay	60 sec
39	Delay Between Each Purge	5 sec
40	Spot Free Purge Duration	15 sec
52	Rockerpanel Blaster Purge Duration	15 sec
56	Foamer Purge Duration	5 sec
64	Freeze Protection Verify	300 sec
74	Window Wash Down Purge Duration	5 sec
103	Foaming Presoak Auto Start	600 sec
106	Foaming Presoak Auto Run	30 sec
127	Post Wash Chemical Arch Purge Duration	10 sec

124	#1 Presoak Arch Purge Duration	10 sec
125	#2 Presoak Arch Purge Duration	10 sec
126	#3 Presoak Arch Purge Duration	10 sec
128	High Pressure Forward Purge Duration	10 sec
129	High Pressure Reverse Purge Duration	10 sec

Program Functionality

1. Freeze Protection Activation – The freeze protection function will activate when the Freeze Protection Thermostat input (A14) is held on continuously for the duration of the Freeze Protection Verify timer (#64). Once the Freeze Protection Verify timer is satisfied, the PLC will monitor the Wash-In-Use signal until a continuous inactive period of five seconds is detected, at which time the freeze protection sequence will start.

2. Operation – Once activated, the freeze protection option will perform the following functions.

    a. Start Hot Water Circulation – The Foaming Presoak Chemical Pump output (R43) will activate to circulate hot presoak to the machine. The pump will run for the duration of the Foaming Presoak Auto Run timer (#106) and restart intermittently as determined by the Foaming Presoak Auto Start timer (#103) as long as the machine stays in freeze protection mode.

    b. Take entry system out of service – The PLC will turn the Wash-In-Use output (R7) on for one second, then off for one second, and then hold on continuously. This will signal the entry system that the carwash is shut down and take the entry system out of service. The entry system will remain out of service as long as the wash-in-use signal is held on. Once the wash-in-use signal is turned off, the entry system will return to service.

    c. Shut Wash Bay Doors – Both wash bay doors will be closed following the rules for door operation. (See the section on AUTOMATIC DOOR CONTROL earlier in this section.)

    d. Shut off main water – The Freeze Protection Manifold output (R16) will energize next. This output controls a normally open water valve on the main fresh water line feeding the carwash and a normally closed air valve supplying air to all waterlines. The water valve will close to shut off water to the system and the air valve will open to pressurize the water lines with air. A Purge Start Delay timer (#36) will then start which allows air pressure to build in the waterlines before purging starts.

    e. Purge waterlines – After the purge start delay timer expires, the system will cycle through opening each water valve on the machine and in the wash bay.

Each valve has a corresponding duration timer to control how long the valve stays open. There is also a Delay Between Purge timer (#39) that pauses between the activation of each water valve. The sequence of outputs and duration timers is as follows:

i. Machine Wash Water Valve (output S10, timer #34)
ii. Spot Free Final Rinse Valve – Gantry (output S28, timer #40)
iii. Fresh Water Final Rinse Valve – Gantry (output S3, timer #30)
iv. High Pressure Forward Valve (output S26, timer #128)
v. High Pressure Reverse Valve (output S27, timer #129)
vi. Rockerpanel Blaster Water Valve (output S2, timer #52)
vii. Underbody (output R23, timer #27)
viii. External Fresh Water Rinse Valve (output R24, timer #30)
ix. External Spot Free Rinse Valve (output R27, timer #40)
x. Glass Wash Down #1 Valve (output R30, timer #74)
xi. Glass Wash Down #2 Valve (output R31, timer #74)
xii. Glass Wash Down #3 Valve (output R32, timer #74)
xiii. Glass Wash Down #4 Valve (output R33, timer #74)
xiv. #1 Presoak Arch Valve (output R22, timer #29)
xv. #2 Presoak Arch Valve (output R46, timer #124)
xvi. #3 Presoak Arch Valve (output R47, timer #125)
xvii. #4 Presoak Arch Valve (output R48, timer #126)
xviii. Post Wash Chemical Arch Valve (output R49, timer #127)

3. Return to service – Once the freeze protection thermostat input has been continuously deactivated for the duration of the freeze protection verify timer, the system will terminate the freeze protection function.

   a. If the purge sequence is still in process, it must complete before freeze protection is deactivated.

   b. The freeze protection output will deactivate which will close the air valve and open the main water valve.

   c. The wash-in-use signal will deactivate allowing the entry system to come back in service.

   d. The system is now ready to accept a new wash.

† Not ordered on this machine, or not available on 220 & 260 model machines.