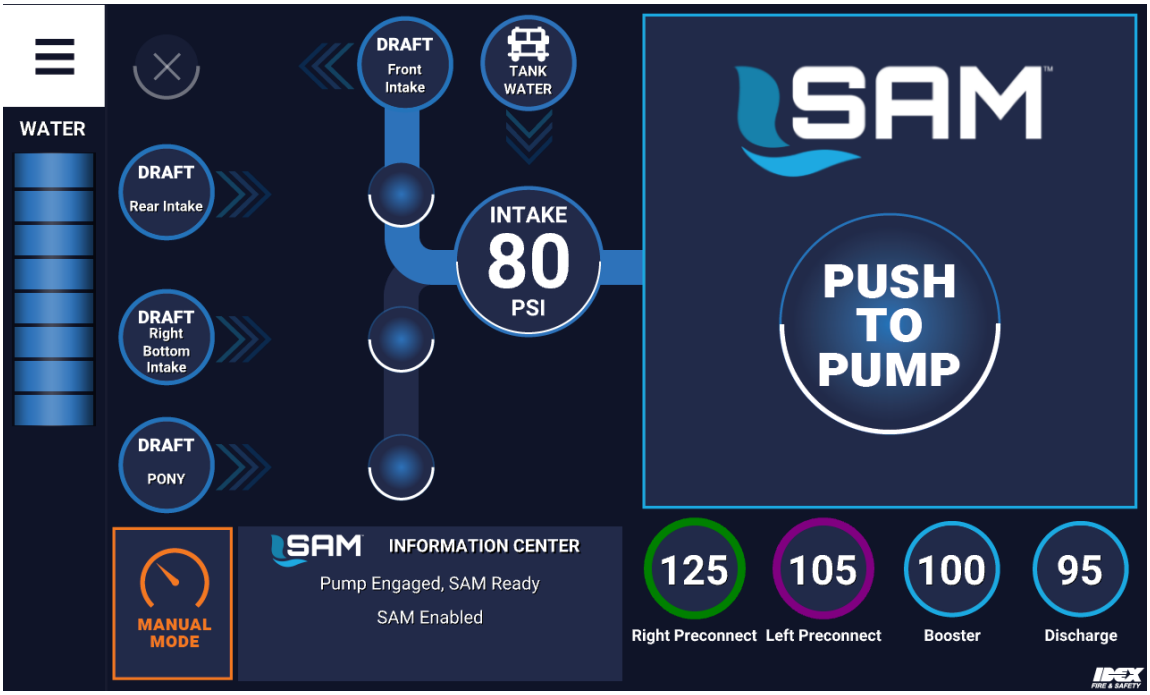
OEM QUICK START GUIDE SAM

(GENERATION 3)



BY

HALE PRODUCTS, INC.

A Unit of IDEX Corporation

607 NW 27th Ave, Ocala, FL 34475

(800) 533.3569

(800) 520.3473 (FAX)

www.haleproducts.com

NOTICES

THIS GUIDE IS INTENDED FOR QUICK REFERENCE ONLY. DO NOT USE IT TO REPLACE REQUIRED TRAINING, STANDARD OPERATING GUIDELINES REQUIRED BY THE AUTHORITY HAVING JURISDICTION, THE OPERATION INSTALLATION MAINTENANCE MANUAL, OR APPROPRIATE QUALIFICATIONS.

QSG P/N FSG–MNL–00227 REVISION A REFERENCE OIM MANUAL P/N FSG–MNL–00210

SAFETY

Firefighting is an inherently risky activity. Knowledge and training may manage that risk. This document is not a training manual and does not provide all detailed operation. This guide serves as a quick reference for SAM operation. AHJ (Authority Having Jurisdiction) shall provide training and guidelines for system operation.

DANGERS, WARNINGS, CAUTIONS, and NOTICES

DANGERS, WARNINGS, CAUTIONS, and NOTICES consist of two parts: a heading (that identifies possible result if disregarded) and a statement of the hazard (that provides the minimum precautions). The following warnings and cautions are used throughout the Hale SAM manuals.

ATTENTION ⚠ DANGER

INDICATES A HAZARDOUS SITUATION, WHICH IF NOT AVOIDED WILL RESULT IN SERIOUS INJURY OR DEATH.

ATTENTION ⚠ WARNING

INDICATES A HAZARDOUS SITUATION, WHICH IF NOT AVOIDED COULD RESULT IN SERIOUS INJURY OR DEATH.

ATTENTION ⚠ CAUTION

INDICATES A POTENTIALLY HAZARDOUS SITUATION, WHICH IF NOT AVOIDED MAY RESULT IN MINOR OR MODERATE INJURY.

IMPORTANT ⚠ NOTICE

ADDRESSES PRACTICES NOT RELATED TO PERSONAL INJURY.

SAM General WARNING And NOTICES

ATTENTION ⚠ WARNING

ENSURE THE OK TO PUMP (GREEN LIGHT ON THE IN-CAB CONTROL PANEL) AND THROTTLE READY (GREEN LED ON THE TWISTER) INDICATORS AND THE PUMP CONTROLLER ARE ON BEFORE ATTEMPTING TO OPERATE THE PUMP. FOLLOW ALL SOG (STANDARD OPERATING GUIDELINES) FOR PARKING BRAKE, PUMP ENGAGEMENT, AND WHEEL CHOCKS.

IMPORTANT ⚠ NOTICE

SAM PROVIDES AUTOMATED CONTROL OF EACH INDIVIDUAL DISCHARGE LINES PRESSURE. WHILE FLOWING, THE VALVES GATE TO MAINTAIN THE SET PRESSURE. ADDITIONAL FEATURES ASSIST THE OPERATOR WITH THE TRANSITION FROM TANK TO HYDRANT (OR DRAFTING). LOW INTAKE MONITORING FOR A HYDRANT AND LOW FLOW DETECTION FOR DISCHARGES (CAN HELP INFORM THE OPERATOR IF A NOZZLE IS CLOSED OR A HOSE LINE IS SEVERELY KINKED). ADVANCED FEATURES CALCULATE PUMP FLOW RATES ABOVE 600 GPM AND PROVIDE ADVANCED MAINTENANCE REMINDERS TO REDUCE LIFE CYCLE COSTS.

IMPORTANT ⚠ NOTICE

WHILE SAM CAN REDUCE PUMP OPERATOR WORKLOAD, IT DOES NOT TAKE THE PLACE OF THE PUMP OPERATOR. THE PUMP OPERATOR STILL NEEDS TO CALCULATE THE REQUIRED LINE PRESSURE TO SUPPORT THE HOSE LAY AND NOZZLE IN USE. SAM WILL MAINTAIN THE SET PRESSURE IN AUTO MODE.

IMPORTANT ⚠ NOTICE

AHJ MUST INSURE PROPER TRAINING IS IN PLACE FOR ALL OPERATORS. THIS QUICK START GUIDE DOES NOT REPLACE OR SUPERSEDE THE OPERATION INSTALLATION MAINTENANCE MANUAL OR PROPER TRAINING.

IMPORTANT ⚠ NOTICE

ONLY TOUCH THE SCREEN IN ONE PLACE AT A TIME. THE TOUCHSCREENS DO NOT SUPPORT MULTI–TOUCH.

OEM Installation Checklist:

1. Ship Loose Component Mechanical Hookup
    a. Mount SAM Modules
    b. Mount Water Column Manifold
    c. Mount Primer
        i. Plumb Quick prime solenoid
    d. Mount Prime Valve Stack Assembly
        i. Plumb Valve Stack assembly
    e. Install Tank To Pump
    f. Install Auxiliary intakes
    g. Mount CAN Distribution nodes
    h. Install MIVs and Air Bleed Solenoids
        i. Plumb Air Bleed Solenoids.
    i. Install Anodes
    j. Install Tank Fill and Quick Prime Solenoid
        i. Plumb Quick Prime Solenoid
    k. Mount Panel Components
    l. Mount Discharge Valves
    m. Mount SAM Audio Speakers and Amplifier

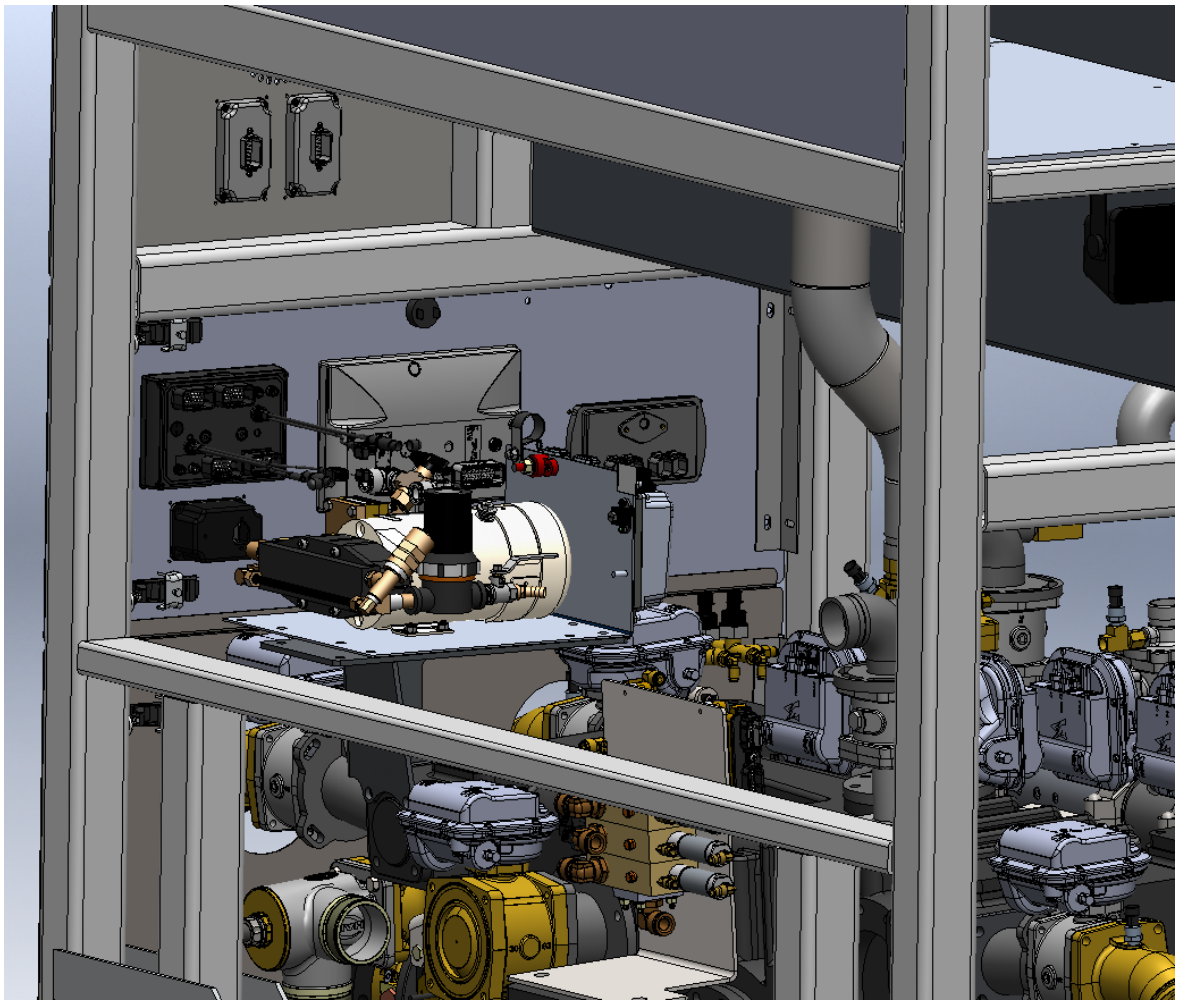
2. Ship Loose Component Electrical Hookup
    a. Connect Sensor Module Harness
        i. Connect Anodes
        ii. Connect Pump Cooler Solenoid
        iii. Connect temp sensors
        iv. Connect oil Level
        v. Connect Water in Oil sensor
        vi. Connect Quick Prime Solenoid
    b. Connect MIVa Harness
        i. Plug in Water Column Transducer
        ii. Connect to primer solenoid
        iii. Connect Pre-prime connections to Valve Stack Assembly
    c. Connect MIV Harness
    d. Connect Panel Harness
        i. UV1100
        ii. UV800
        iii. ITL40
        iv. MIVa Button
        v. MIV Manual Control
        vi. Twister
        vii. Primer Override
        viii. Idle button
    e. Connect Tank To Pump Harness
    f. Connect Auxiliary Intake Harness
    g. Connect Tank Fill Harness.
    h. Connect Discharge Valve Harness.
    i. Supply power to CAN Distribution nodes
    j. Connect SAM Audio Harness
    k. Optional Foam Bus Connection

Module Orders Start Checklist here

3. Power/Ground Hookup
4. Engine Chassis Hookup
5. Interlock Hookup
6. Tank Level Transducers install and Calibration
7. Truck Air Hookup
8. Plumbing hookups
9. Optional Tablet Installation

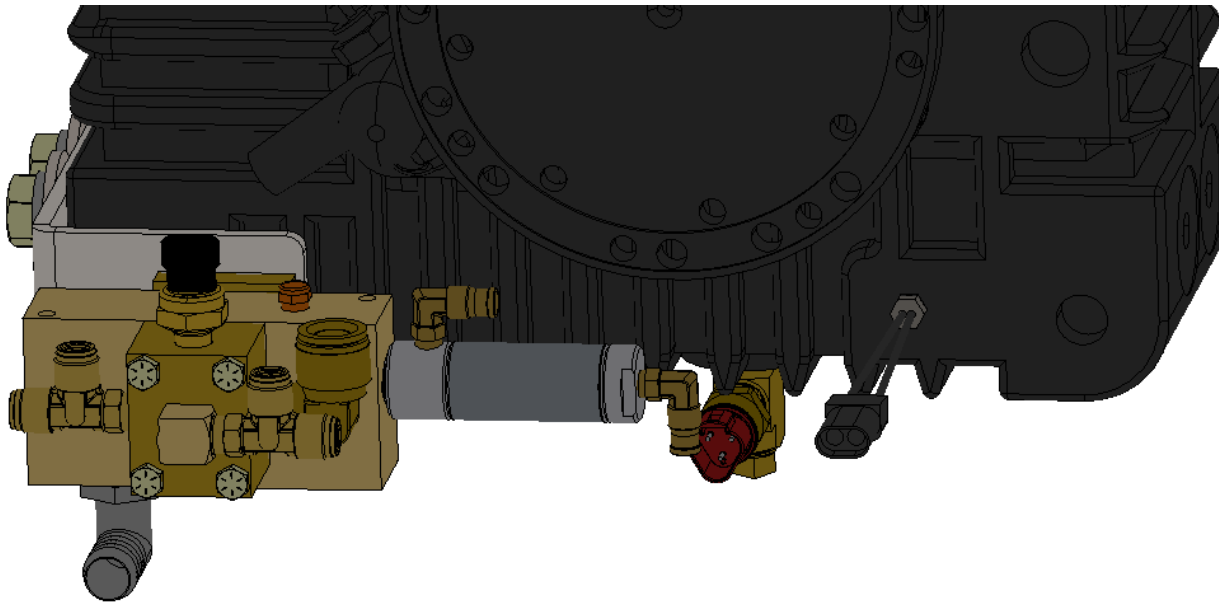
1. Ship Loose Component Mechanical Hookup
    a. Mount SAM Modules
        i. Matrix Module
        ii. Sensor module
        iii. MIVa Module

Mount the above modules according to FSG-PL-01502. The Matrix module typically mounts on the back of the UV800 bracket. The sensor module and MIVa module typically mount on Discharge 3 and 4. Example of a Hale QMAX Sam module mounting location shown below.

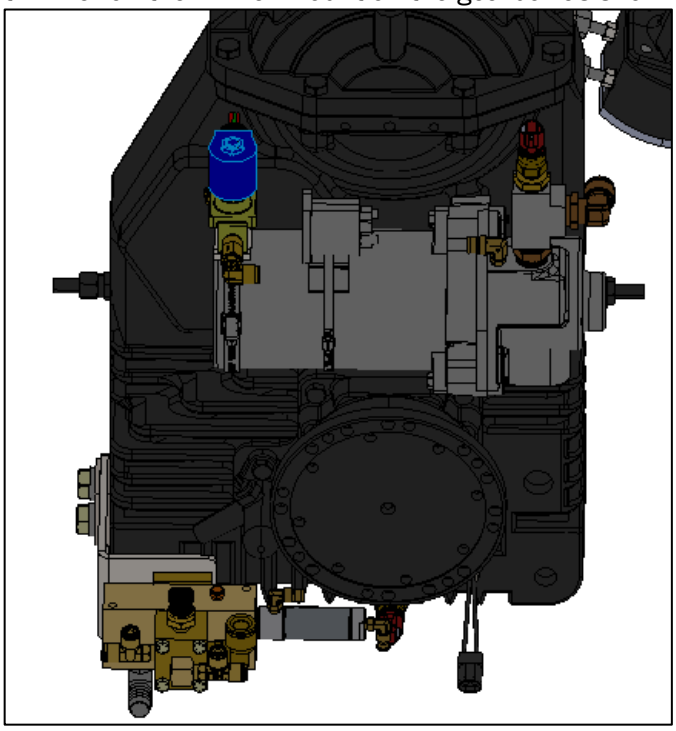


b. Mount Water Column Manifold

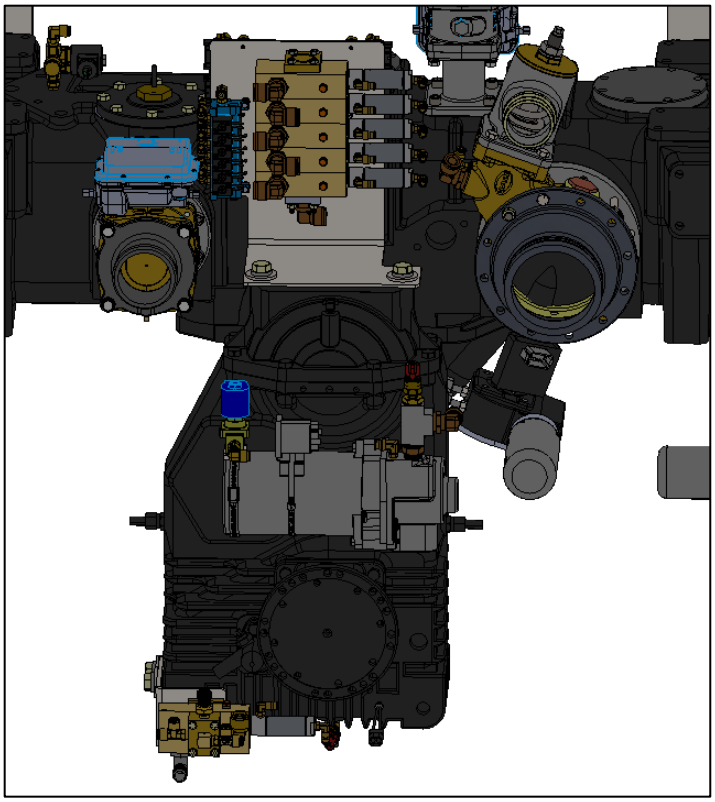
Mount the Water Column Manifold onto the bottom of the gearbox as shown in FSG-PL-01502. If there is an interference there then mount in a location where the Water column sensor harness can reach and is a minimum of 4ft in vertical height from the fill line of the water tank. Example of a typical water column manifold assembly shown below.



c. Mount Primer
   i. Plumb Quick prime solenoid according to FSG-PL-01514
   ii. Mount Primer on the Primer mount on the gearbox as shown below



d. Mount Prime Valve Stack Assembly
   i. Plumb Valve Stack assembly according to FSG-PL-01514
   ii. Mount Prime Valve Stack assembly towards the center rear of the pump house approximately above the pumps gearbox. Example Shown below and can be found in FSG-PL-01502.

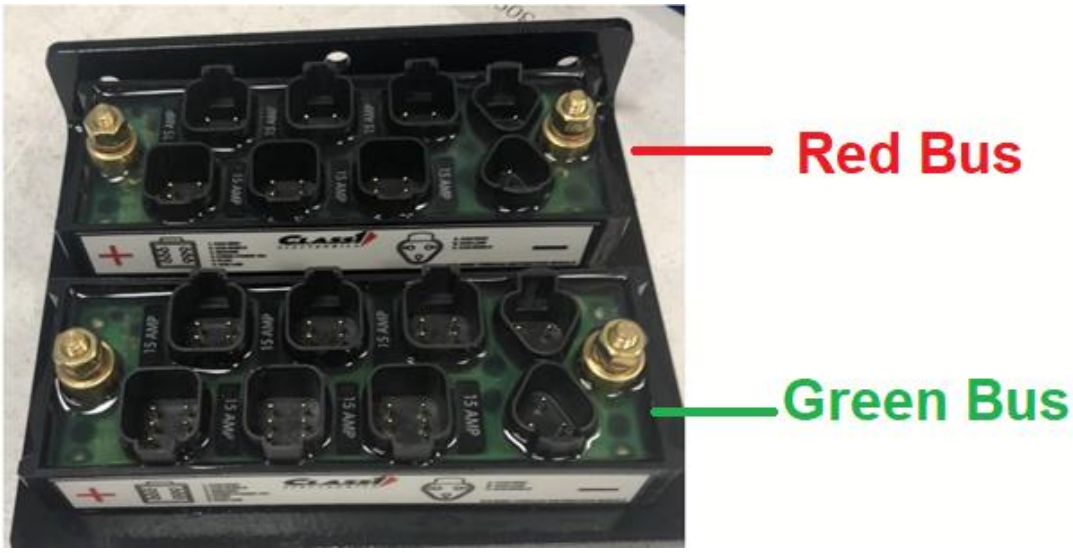


e. Install Tank To Pump
   i. Verify that friendly name labeled on valve is location of where you mount valve.
   ii. Verify that Connections are not pointed up for drainage.
   iii. Verify that valve is a maximum of 39” from the nearest CAN distribution hub.

f. Install Auxiliary Intakes
   i. Verify that friendly name labeled on valve is location of where you mount valve.
   ii. Verify that Connections are not pointed up for drainage.
   iii. Verify that valve is a maximum of 39” from the nearest CAN distribution hub.

g. Mount CAN Distribution nodes

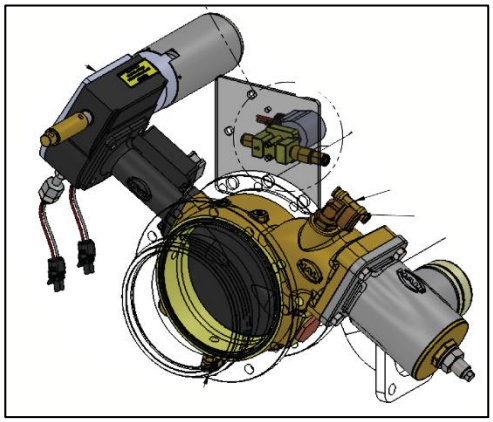
Mount the CAN Distribution Node assemblies according to FSG-PL-01514. There is typically 1 assembly on each side of the truck.



Each assembly will have 2 CAN Distribution Nodes on it (1 for the Red Discharge Bus and 1 for the Green AFS Bus). The Distribution nodes will vary in size based on how many options were selected. There are 3 possible configurations: two 6 way nodes, two 4 way nodes, and one 6 Way and one 4 way node (EXAMPLES SHOWN BELOW)



h. Install MIVs and Air Bleed Solenoids
    i. Plumb Air Bleed Solenoids according to FSG-PL-01514
    ii. Mount Air Bleed Brackets on MIVs according to FSG-PL-01502



i. Install Anodes according to FSG-PL-01502
    i. Install 2 anodes on the suction side of pump
    ii. Install 1 anode on discharge side of pump.
j. Install Tank Fill and Quick Prime Solenoid
    i. Plumb Quick Prime Solenoid according to FSG-PL-01514
k. Mount Panel Components
    i. UV1100
    ii. UV800
    iii. ITL40
    iv. MIVa Button
    v. MIV Manual Control
    vi. Twister
    vii. Primer Override
    viii. Idle button
    ix. Buzzer
    x. Optional Foam Display
    xi. Optional Navigator

Mount all panel components according to FSG-PL-01505. Also found on this drawing is all of the sheet metal cutouts.

l. Mount Discharge Valves
    i. Verify that friendly name labeled on valve is location of where you mount valve.

ii. Verify that Connections are not pointed up for drainage.
iii. Verify that valve is a maximum of 39" from the nearest CAN distribution hub.

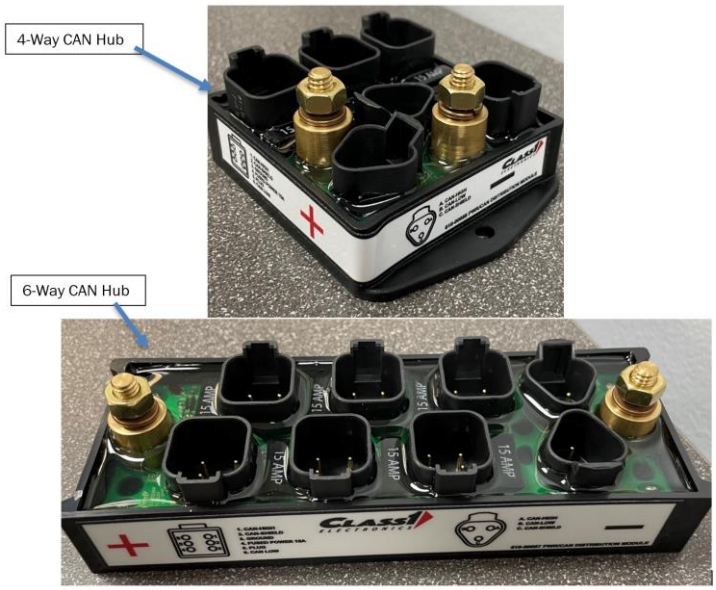
m. Mount SAM Audio Speakers and Amplifier

Mount the speakers behind the speaker cutouts on the right and left of the pump module with the wire facing down for proper drainage. Two (2) should be place on the left of the apparatus and two (2) should be on the right side of the apparatus. The amplifier should be place in a location behind the operators pump panel away from direct contact with moisture. Mount the ground loop isolator to the back of the 800 screen with the supplied clamp and connect the blue connector supplied in the harness.

2. Ship Loose Component Electrical Hookup

The master electrical SAM diagram can be found on FSG-PL-01504 and all pinouts are in FSG-PL-01503.

Every CAN broadcasting device must be connected to the 6 way or 4 way CAN distribution blocks. Note that there will be a minimum of 4 blocks (2 green and 2 red blocks and will be one of each will be at each side of the pump house).



The 6 pin connection on the distribution block is where the CAN devices will plug in and receive power. The pinout is below.

POS	CIRCUIT	COLOR	GA
1	CAN HIGH	YELLOW	103349
2	CAN SHIELD	BLACK	18GXL
3	GROUND	BLACK	14GXL
4	POWER	RED	14GXL
5	114017	----	----
6	CAN LOW	GREEN	103349

The SAM devices cannot be more than 39" (per J1939 standards) from the distribution block that it is connected to. Hale supplies the following node extension harnesses:

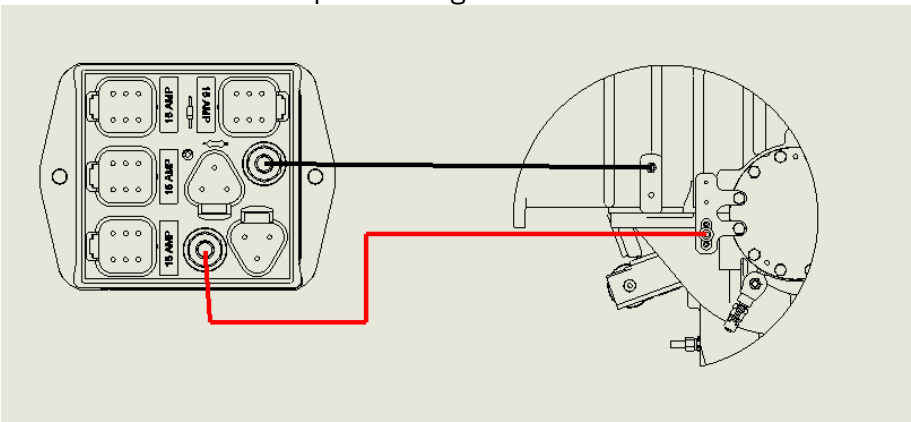
Part Number	Length	Bus
513-00192-000	18"	Red
513-00192-001	24"	Red
513-00192-002	39"	Red
513-00192-003	18"	Green

513-00192-004	24”	Green
513-00192-005	39”	Green

The 3 pin connection on the distribution block is the CAN backbone and the distribution blocks will be linked together through this connection. Note that there is no limitation on the distance between can distribution boxes. With these rules in mind please complete the following:

a. Connect Sensor Module Harness
   i. Connect Anodes (Two on suction manifold and one on discharge manifold)
   ii. Connect Pump Cooler Solenoid (located on discharge manifold)
   iii. Connect pump temp sensor (located on suction manifold)
   iv. Connect Gearbox temp sensor (located on bottom front of gearbox)
   v. Connect Oil Level sensor (located by fill plug on gearbox)
   vi. Connect Water in Oil sensor (located by drain plug on gearbox)
   vii. Connect Quick Prime Solenoid (located on primer)
   viii. Connect Primer input to the Primer Solenoid.
   ix. Plug 6 way power/ground and CAN connection into the nearest green CAN distribution block.
b. Connect MIVa Harness
   i. Plug in Water Column Transducer (located on water column manifold at bottom of gearbox)
   ii. Connect primer start to primer solenoid
   iii. Connect Pre-prime connections to Valve Stack Assembly
      - Preprime 1
      - Preprime 2
      - Preprime 3
      - Pump Body Prime
      - Air Bleed Valve Drain
   iv. Plug 6 way power/ground and CAN connection into the nearest green CAN distribution block.
c. Connect MIV Harness
   i. Connect according to FSG-PL-01518
   ii. Plug 6 way power/ground and CAN connection into the nearest green CAN distribution block.
   iii. Plug in manual override rocker switch harness to Rocker Switch at panel.
d. Connect Panel Harness
   i. Plug in UV1100
   ii. Plug in UV800
   iii. Plug in ITL40
   iv. Plug in MIVa Button
   v. Plug in Twister
   vi. Plug in Primer Override connections
   vii. Plug in Idle button
   viii. Plug 6 way power/ground and CAN connection into the nearest green CAN distribution block.
   ix. Plug 6 way CAN connection into the nearest Red CAN distribution block.
e. Connect Tank To Pump Harness
   i. Plug 6 way power/ground and CAN connection into the nearest green CAN distribution block.
f. Connect Auxiliary Intake Harness
   i. Plug 6 way power/ground and CAN connection into the nearest green CAN distribution block.

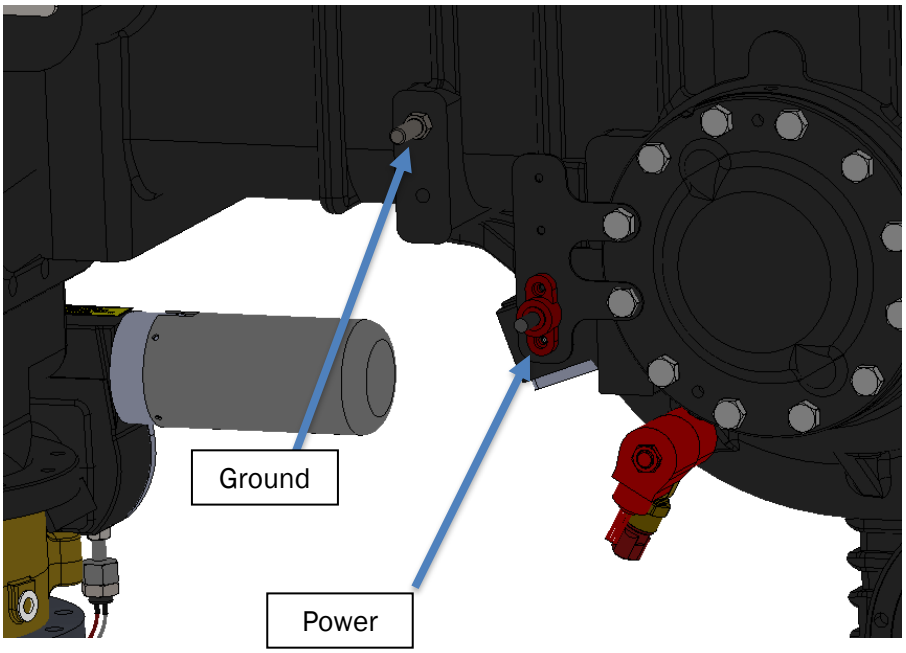
g. Connect Tank Fill Harness.
    i. Plug 6 way power/ground and CAN connection into the nearest green CAN distribution block.
h. Connect Discharge Valve Harness.
    i. Plug 6 way power/ground and CAN connection into the nearest red CAN distribution block.
i. Supply power to CAN Distribution nodes
    i. Using the supplied power and ground harnesses verify that each CAN distribution node is connected to master power and ground studs



j. Connect SAM Audio Harness
    i. Plug the supplied audio harness into the panel harness where labeled.
k. Optional Foam Bus Connection
    i. CAN Port 2 (Port C on the Smartfoam display) must have the CAN plugged into a Green CAN bus distribution node.

3. Power/Ground Hookup

The OEM/apparatus builder shall supply two separate sources of +12 VDC power (ignition), one capable of 85 Amps and one capable of 300 Amps (one for SAM and one for the ESP primer system respectively).



IMPORTANT ⚠ NOTICE

OTHER ELECTRICAL COMPONENTS MUST NOT BE SUPPLIED FROM THE SAM SYSTEM SUPPLY. DO NOT CONNECT THE PRIMER AND HALE SAM TO THE SAME POWER WIRE.

When an optional SmartFOAM system is selected a third +12 VDC power source capable of 40 Amps (for a 1.7 AHP or 2.1 A foam pump), 60 Amps (for a 3.3 or 5.0 foam pump), or 80 Amps (for a 6.5 foam system) is also required.

IMPORTANT ⚠ NOTICE

DO NOT CONNECT THE SAM, ESP, OR FOAM SYSTEM TO A LOAD SHEDDING CIRCUIT.

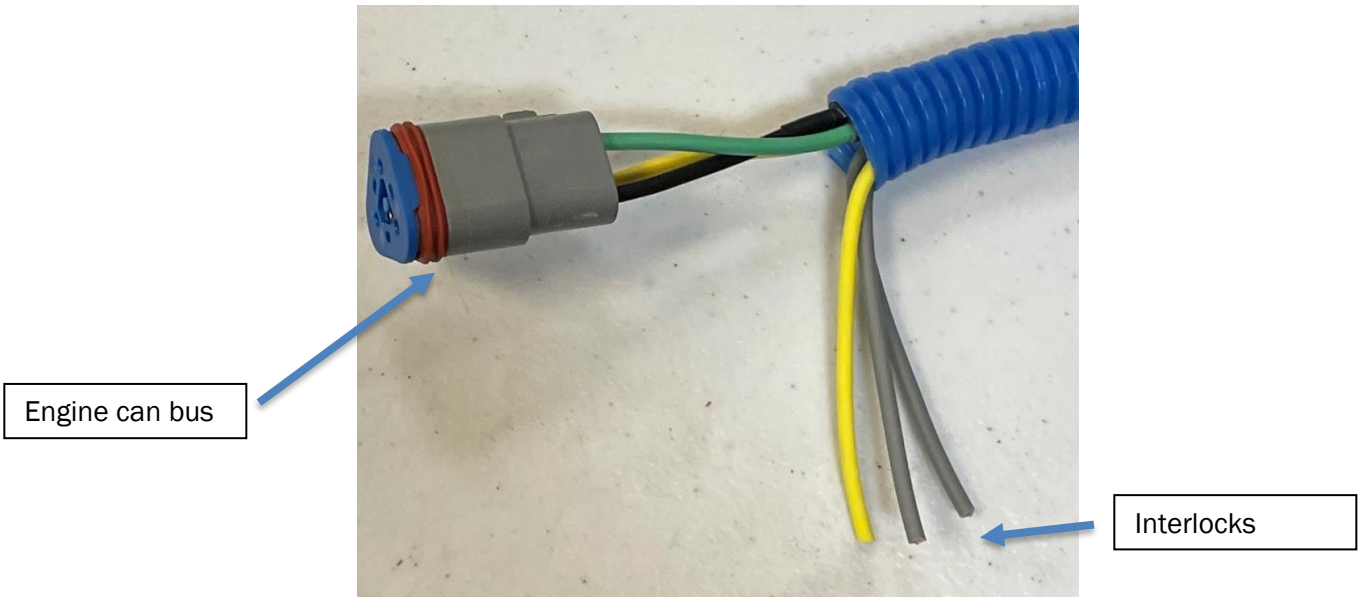
When an optional SmartCAFS system is selected a third +12 VDC power source capable of 60 Amps for a 3.3 or 5.0 foam proportioning system is also required.

IMPORTANT ⚠ NOTICE

DO NOT CONNECT THE SAM, ESP, OR CAFS SYSTEM TO A LOAD SHEDDING CIRCUIT.

4. Engine CAN Bus Hookup

The SAM system utilizes three (3) separate CAN buses: Blue (engine ECU), Green (intake valves), and Red (discharge valves). ***The Blue bus connects the apparatus (ECU) and the SAM control modules and is labeled for connection by the OEM/builder***. The Blue bus connection can be found at the end of the panel harness on the driver side of the truck.

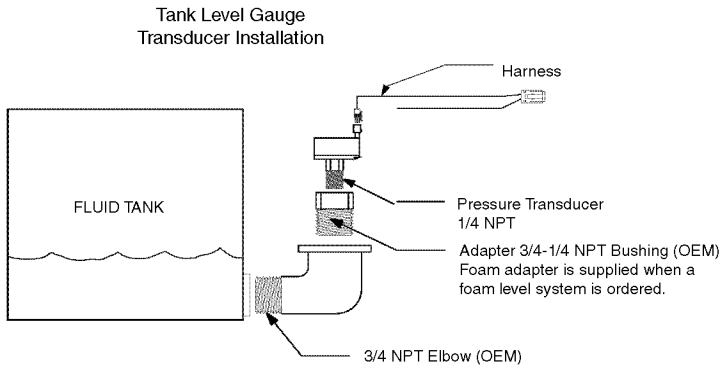


5. Interlock Hookup

Shown above are the OEM Pump Engaged, Throttle Ready interlock, and auxiliary interlock “OK to Pump” (may be provided but is not required). These are all positive polarity inputs. Gray wires are Throttle Ready and Pump Engaged. Yellow wire is Auxiliary Interlock.

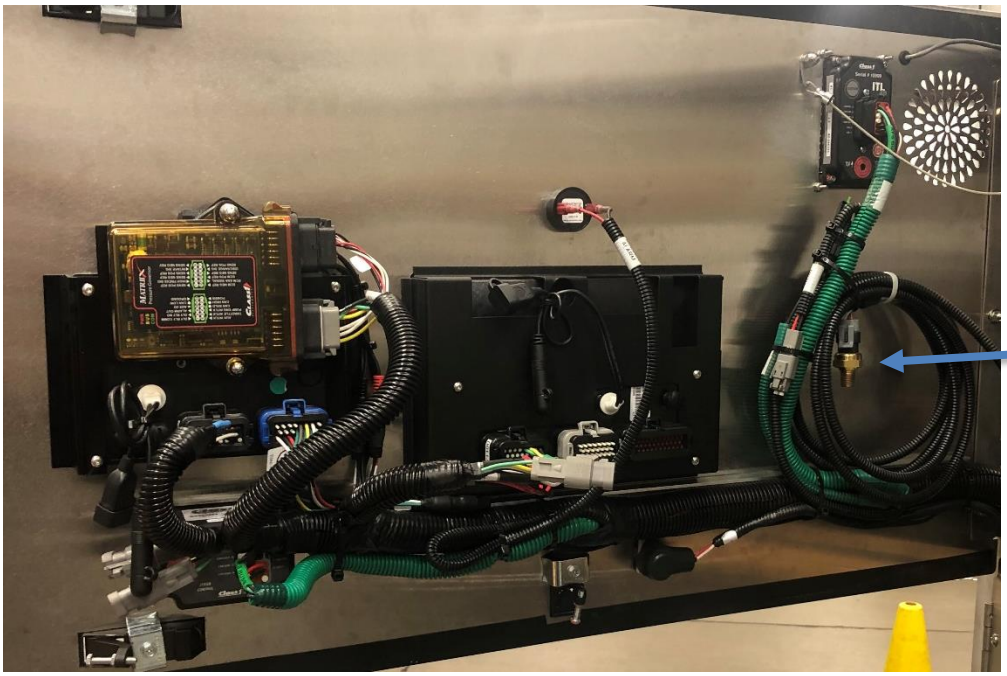
6. Tank level transducer(s)

Install tank level transducers as per ITL40 manual.



Mount the pressure transducer (sensor) vertically to insure an accurate reading and to reduce the possibility of sensor port contamination.

ITL transducers are located on the panel harness on the driver side of the truck behind the main panel.

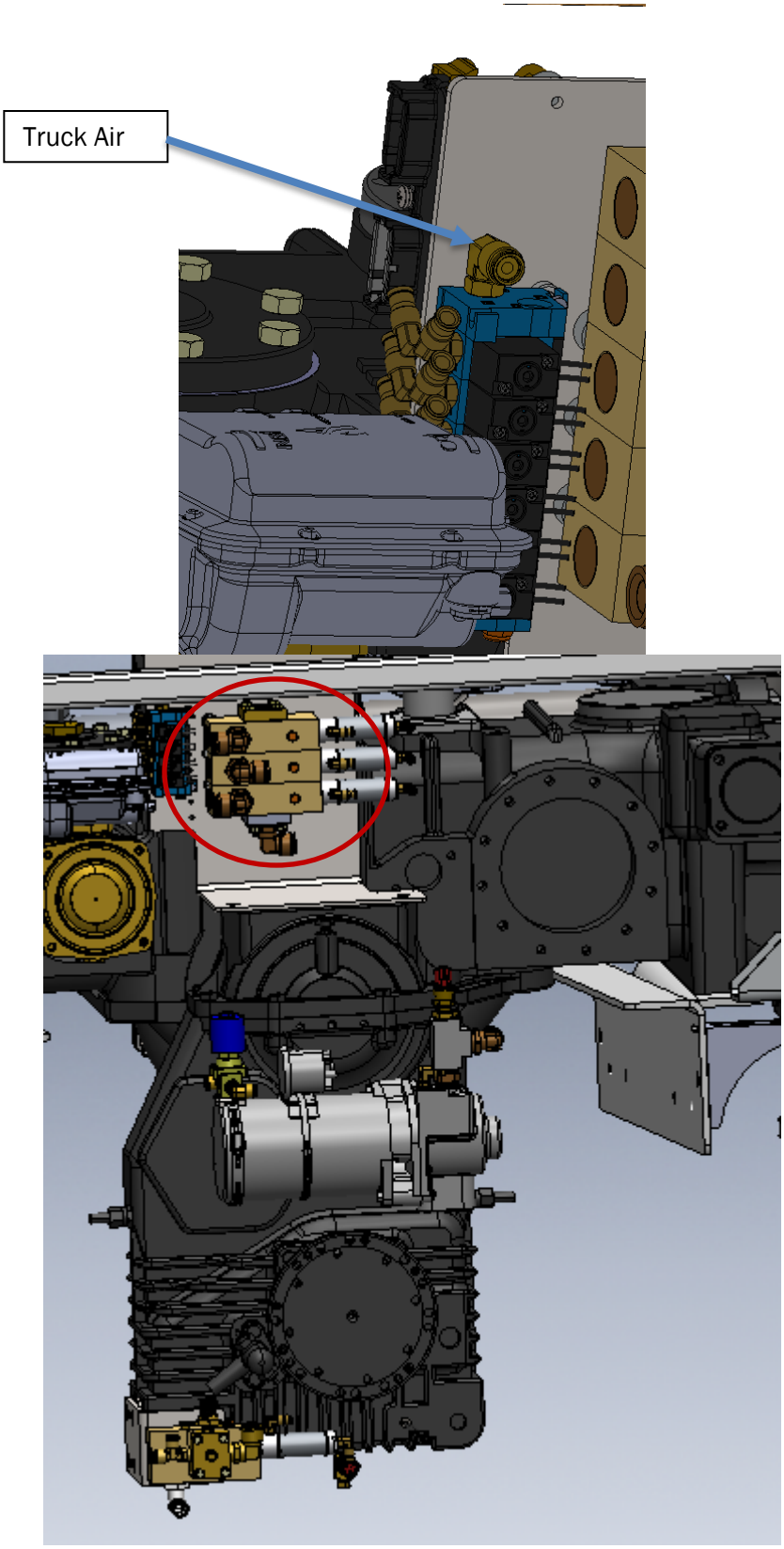


Calibrate ITL40(s) by setting full level then engage pump and discharge tank in manual mode till first sign of cavitation then setting empty point. Foam ITL tank level should be set as per ITL40 manual.

Enter Password 7474 onto the UV800 screen and follow on screen instructions to calibrate your tank.

7. Truck Air Hookup

The OEM/apparatus builder shall supply dry compressed air with a minimum of 75 psi, a maximum of 150 psi. (Typically, from the vehicle air brake system which is typically capable of the 90 psi to 150 psi at approximately 13 cfm at 1250 rpm.) The pump kit or module provides a loose red coil of hose to connect the OEM/apparatus builder supplied air. The air supply should include a protection valve as required by DOT standards.

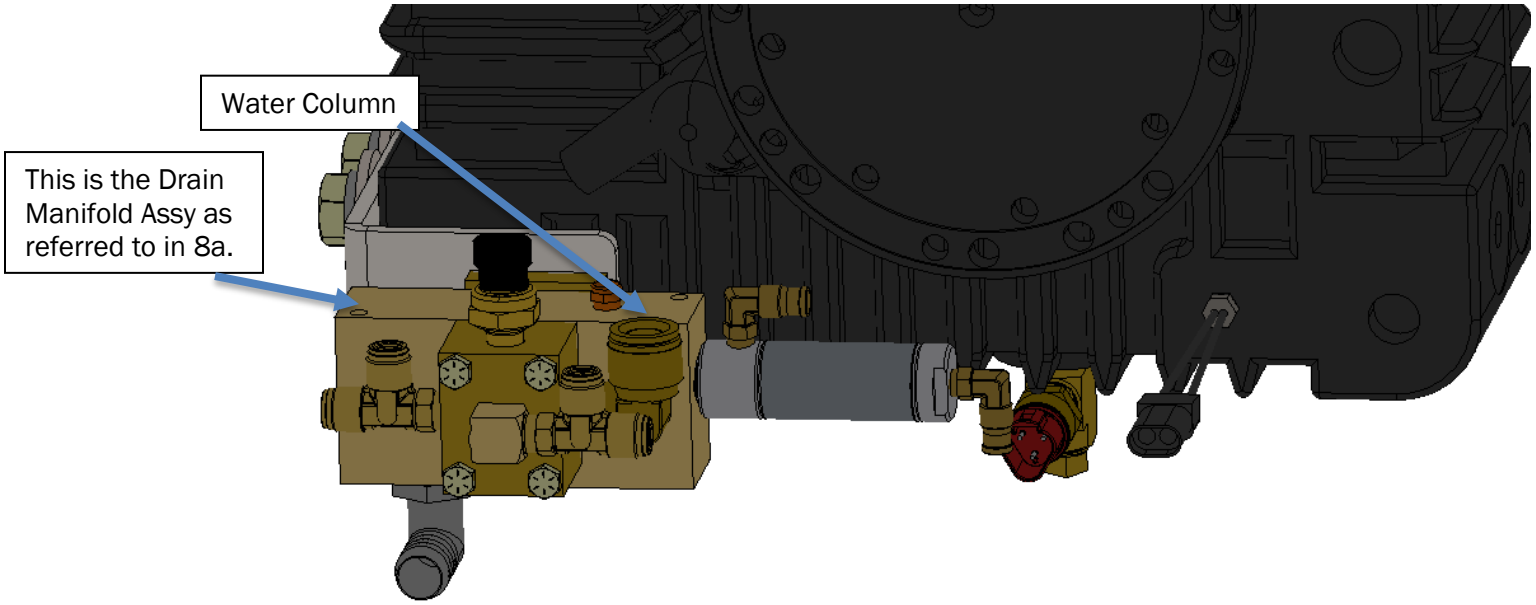


The truck air must be connected to the top of the valve stack assembly (shown above). The Valve stack is typically located on top the pump gearbox or on the rear pump house cross member.

8. Plumbing Connection Hookups.

a. Water Column Plumbing

A Coil of 3/4-in tubing (loose or pre-connected at SAM end) SAM end connects to fitting on the SAM Drain Manifold Assy (Labeled as “PLUMB TO TOP OF TANK”). Plumb using ¾” tubing to top of onboard water tank fill tower (above the overflow level–in atmosphere)



Note: At the onboard water tank access/fill tower, route the 3/4-in flex line to prevent (to maximum extent possible) incidental items (bags of oil dry, spare supply containers, etc.) from being placed on the tubing and damaging/breaking it.

Tank Fill Tower and Water Column Tubing

b. **Tank Valves' Plumbing**

Connect tank-to-pump and tank fill valves to the apparatus on board tank.

c. **Drain Plumbing**

Connect Drains as labeled and per **FSG-PL-01514**. No connection needed on those labeled "to atmosphere".

9. **Optional Tablet installation**

a. Docking Station

i. Mount docking station in an easily accessed location in the cab, must be in a cabinet or restrained by some means in addition to the tablet dock itself per NFPA

ii. Supply constant 12Vdc power and ground to provided power supply and connect to docking station. This should be always powered and protected on a 10amp circuit.

b. WIFI router/antenna

i. Mount above the Operators side of the apparatus (approximately where shown below). The rubber antennas should be above the body and/or cab but not the tallest item on the truck. The higher it is mounted the better the tablet range will be.

ii. Connect the power for the 12/24vdc converter to the supplied harness.