

Unit 318



Manufacturer:	E-One
Engine/Transmission:	Cummins ISL 425 hp/EVS 3000
Fuel System:	65 gallon diesel
Pump:	Hale QMAX 1000-2250 GPM Single Stage pump
Pump Rating:	1500 GPM
Water Tank:	500 gallons
Generator:	Smart Power AKW Hydraulic Model HR8/ PTO Engagement Switch
Pre-connects:	2-150' 1 3/4" s-loads
Supply Line:	800' 5" 500' 2 1/2"
Engine Access:	Tilting of cab
Auxiliary Braking:	Jake engine brake
ABS Brakes:	Meritor EX225H 17" Disc brakes front axle Bendix 16.5" x 7" S-cam brakes for rear axle
Emissions:	Diesel Particulate Filter (DPF)
Ladder:	HP78 78 ft 3-section, tip load 750 lbs.
Ladder Monitor:	Akron electric 1000 GPM monitor

STARTING THE VEHICLE

The ignition system on this unit is keyless. To start the vehicle, push the red Master Off/Bat/On switch on. Wait roughly 10-20 seconds for electronic self-check before starting ignition. Then activate the ignition by pushing in the starter button until the engine cranks over. These controls are located adjacent the driver's left knee.



PARKING BRAKE

The yellow “Maxi Brake” control is located on the dashboard above driver's right knee (below). Pulling the control out activates the parking brake. Pushing it in releases it. The parking brakes will apply and cannot be released whenever the brake system air pressure drops below 60 PSI. The parking brake is interlocked to many systems on the truck including, the pump transfer, ground lighting, and emergency lighting.



TRANSMISSION



(FIG 1)

The vehicle is equipped with an Allison 6 speed automatic transmission. The transmission selector consists of an electronic control head mounted on the engine cowling by the driver's right arm. (FIG. 1) The control head consists of a display window and a series of touch pad buttons. The **R** button activates the reverse gear. The **N** button places the transmission in neutral. The **D** button places the transmission in the normal drive range. In this range, the transmission will automatically shift up and down through gears 1-5. In this range, a maximum speed of about 52-53 MPH is attainable. The on board fire pump is operated with the transmission in this (**D**) range. The **MODE** button is utilized whenever the vehicle operator wishes to access the 6th gear. This gear functions like an overdrive, and permits the vehicle to operate at speeds up to 69-72 MPH. **The mode button must not be used for pumping applications.** The mode feature can be activated at anytime. The mode feature is deactivated whenever the **MODE** button is depressed for a second time, or after the vehicle is shut off.

There are two additional touch pad buttons on the control head. The up and down buttons allow the operator to manually shift/downshift between gears. Finally, the display window on the control head displays the gear range (**R, N, 4, 5**) on the left side and, on the right side of the window, the actual gear that the transmission is in at the moment it is being viewed.

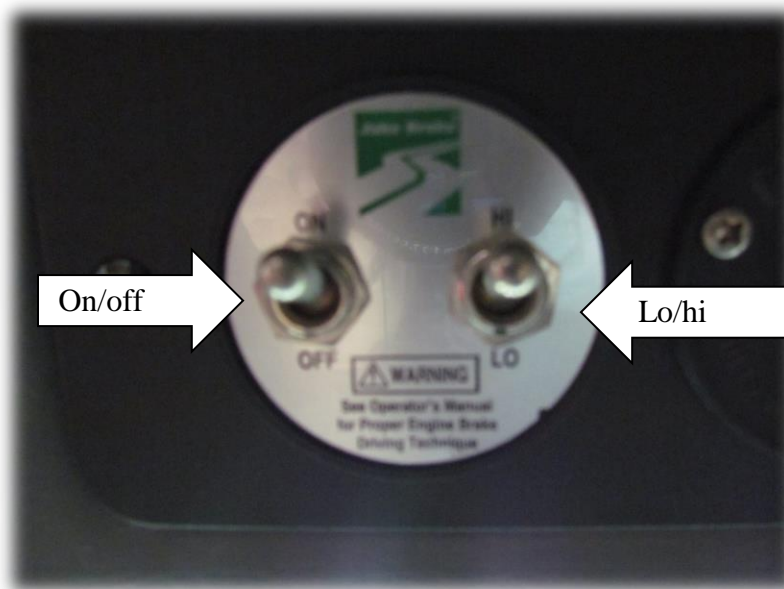
If the engine RPM's are too high, the transmission may not shift when selected. If this occurs bring the RPM's down to an idle before shifting

WARNING – Make sure the transmission is in neutral (except when pumping) prior to leaving the cab. The transmission selector button must be pressed firmly. Lightly tapping the button may not neutralize the transmission. Failure to visualize the neutral indicator on the display window could result in the driver leaving the cab with the transmission in Drive

The maximum speed limit on any City of Sunrise Street is 45 MPH. The use of the MODE feature on local streets must bring with it the awareness that the vehicle is then capable of attaining speeds in excess of posted limits. The vehicle operator must obey all Florida State Traffic Laws, at all times, and observe safe driving practices.

Lastly, the window will display the word **MODE** whenever the mode feature is engaged.

ENGINE RETARDER



This vehicle is equipped with a Jacobs® exhaust brake engine retarder. This device greatly enhances the braking abilities of the vehicle. The retarder can be switched on/off via a rocker switch on the dashboard (shown above) to the right of the driver. The green indicator light on this switch illuminates whenever the retarder circuitry has been engaged. Whenever the vehicle is in motion, and moving at 15 MPH or greater, and the accelerator pedal is released, the retarder will engage. This immediately begins to slow the vehicle. The other rocker switch labeled lo/hi will reduce the effect of the Jake® brake by half its efficiency.

WARNING: All retarders can be dangerous when used on slippery roads.

WARNING: Whenever the retarder is off, allowances must be made for increased stopping distances.

ANTI-LOCK BRAKING SYSTEM (ABS)

This unit is equipped with a Rockwell WABCO® anti-lock braking system. This system prevents the vehicle from skidding out of control during panic braking. IFSTA's *1999 Pumping Apparatus DRIVER/OPERATOR Handbook* pg. 64 describes how ABS brake systems operate:

“These systems are effective in that they **minimize** the chance of the vehicle being put into a skid when the brakes are applied forcefully. ABS works using digital technology in an onboard computer that monitors each wheel and controls air pressure to the brakes, maintaining optimal braking ability. A sensing device located in the axle monitors the speed of each wheel. The wheel speed is converted into a digital signal that is sent to the on board computer. When the driver/operator begins to brake and the wheel begins to lock up, the sensing device sends a signal to the computer that the wheel is not turning. The computer analyzes the signal against the signals from the other wheels to determine if this particular wheel should still be turning. If it is determined that it should be turning, a signal is sent to the air modulation valve at that wheel and allowing the wheel to turn. Once the wheel turns, it is braked again. The computer makes these decisions many times a second until the vehicle is brought to a halt.”

OPERATION

The brake pedal must be activated with solid continuous pressure. **Do not pump the brakes while attempting to stop the vehicle.** Should the ABS system detect impending lockup, it will activate and the driver may feel a pulsation of the brake pedal. This is normal.

CAB SWITCHES and PUMP SHIFT

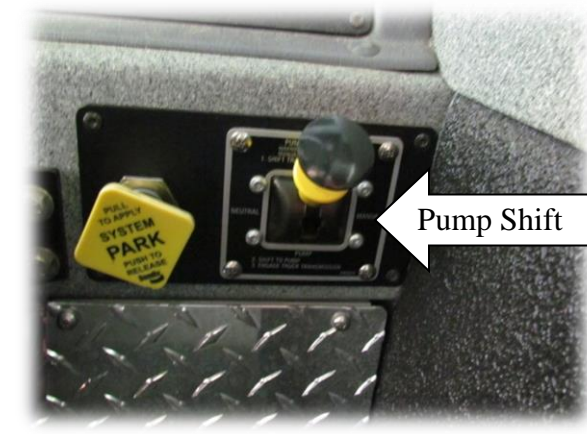


FIG 1



FIG 2

The switch consoles located in the driver's position are all rocker switches (FIG 2). To activate or deactivate the desired listed function simply toggle the switch, the green light should illuminate when in the on position. These panels control various emergency lighting as well as scene lighting.

Multiplex System

This device manages the entire 12 volt electrical system via an on board computer per NFPA 1901 requirements.

- All the emergency warning lights are controlled via an emergency/master sequencer (FIG 2). It takes several seconds for all the lights to activate. Similarly, it takes several seconds for the lights to sequence down. **Do not shut the vehicle off until all the lights have sequenced off.** Doing otherwise can damage the circuitry.
- Whenever the Parking Brake is on – All forward facing white lights will shut down including the wigwag headlights
- The scene lights **will not work** unless the parking brake is on
- The underbody ground lighting **will not work** unless the Parking Brake is ON.
- Compartment lights **are always on** at night whenever the parking brake is on.
- Whenever system voltage drops BELOW 11.9 volts DC, the system manager™ will automatically engage the high idle (1200 rpm) until such time that the system voltage is above 13 volts DC at which time it will automatically cut out. The parking brake must be on for high idle to work.

FEDERAL SIGNAL CORPORATION® TRAFFIC MASTER™



The Federal Signal Corporation® Traffic Master™ is the directional traffic light bar located on the rear of the apparatus. The electronic control head for the Traffic Master™ is located on the engine cowling near the right arm of the driver/operator. This device allows the driver/operator to choose a light pattern to direct traffic to the LEFT, RIGHT, and SPLIT out both sides from the center, and FLASH which places the Traffic Master™ into an alternating wigwag pattern for additional rear warning. There is also FAST/LOW feature

OIL and FLUID CHECKS

The daily oil checks can be accomplished by opening the access door in the cab compartment. Within this door, the driver/operator will be able to check the transmission, oil, power steering, and, engine coolant as well as fill the appropriate fluids. If further access to the engine compartment is needed, the apparatus must be taken to the city garage.

CHECKING FLUID LEVELS



ENGINE ACCESS HATCH



ENG COOLANT RESERVOIR, WASHER FLUID CAP AT FRONT OR RESERVOIR
ENGINE OIL DIPSTICK
TRANS FLUID DIPSTICK
POWER STEERING RESERVOIR

FRC ENGINE GOVERNOR CONTROL



FIRE RESEARCH CORPORATION® IN-CONTROL 400™

The Fire Research **INControl** pressure governor and all-in-one instrument panel uses state of the art programmable microprocessor technology. Measuring only 10.5 by 5.5 inches the **INControl** offers pump discharge and pump intake displays, pump pressure or RPM control, and remote engine displays. It will maintain a steady pump discharge pressure by controlling engine speed or hold a selected engine RPM. It offers complete engine control and remote display in a single compact unit.

The **INControl** operates in one of two modes, pressure or RPM. In pressure mode the **INControl** maintains a constant pump discharge pressure. The discharge pressure is monitored and compared to the selected pressure setting, the engine RPM is varied to keep the discharge pressure at the selected setting. In RPM mode the **INControl** maintains a constant engine RPM. The pump discharge pressure is monitored and can vary but as a safety feature it will be limited to an increase of 30 PSI. If the discharge pressure increases 30 PSI the governor will automatically lower the engine RPM to prevent a high-pressure surge.

RPM (throttle) mode - The driver operator can switch to the RPM mode when pressure surges cause the pump to keep returning to an idle. When using the Throttle (RPM) mode, the operator can either watch the RPM display on the engine status monitor to the right of the rotating throttle or watch the master pump discharge gauge to the right of the governor while rotating the throttle control knob.

PSI (pressure) Mode – The pressure mode will adjust engine speed to maintain a selected pressure. Regardless of whether incoming pressure changes or discharges are opened and shut, the pressure governor will maintain the selected PSI. When using the pressure mode the operator should watch the master pump discharge gauge.

Mode Selection – After engaging the pump, the FRC head will display the word MODE. To activate the unit, the operator pushes the pressure switch of desired mode once.

Cavitation Protection Feature – The pressure governor includes a cavitation protection feature, which protects the pump, plumbing, and firefighters from sudden water surges, ingestion of large amounts of air, or loss of supply pressure. **The mode selector must be in the PSI mode for this feature to be active and the pump pressure must be above 40 PSI.** If the water supply is reduced or interrupted, the governor will first attempt to increase pressure by increasing the engine speed. If the pump discharge pressure remains less than 25 PSI for more than 5 seconds, the engine speed will automatically return to an idle.

If it is apparent that air or a temporary reduction of suction pressure has been or will be introduced into the pump, it may be desirable to temporarily switch from the PSI mode to the RPM mode to reduce the likelihood of sudden RPM changes and the automatic shutdown of lines due to the anti-cavitation feature.

System Shutdown- Pushing the red idle button in for more than one second will cause the engine governor to return to an idle speed. The red idle button can and should be used to return the engine speed to idle when operating in low or no water flow conditions. **It should not be used when flowing large amounts of water as this may cause a water hammer.** Use the inc/dec buttons to reduce pressure to reduce this occurrence.

Once the red idle button has been activated, the governor leaves the mode sequence. The MODE button must be depressed again and a mode type selected in order to restore control of the pump.

The **FRC** Status Center also features remote engine monitoring for the following:

- Engine oil pressure
- Engine water temperature
- Engine RPM
- Battery voltage

OPERATING THE ON-BOARD GENERATOR

Vehicle 318 is equipped with a Smart Power AKW Hydraulic AC Model HR8/ PTO Engagement Switch generator. The generator is located under the bed section of the ladder. The generator supplies the wire reel, 120-volt outlets, and various scene lights.

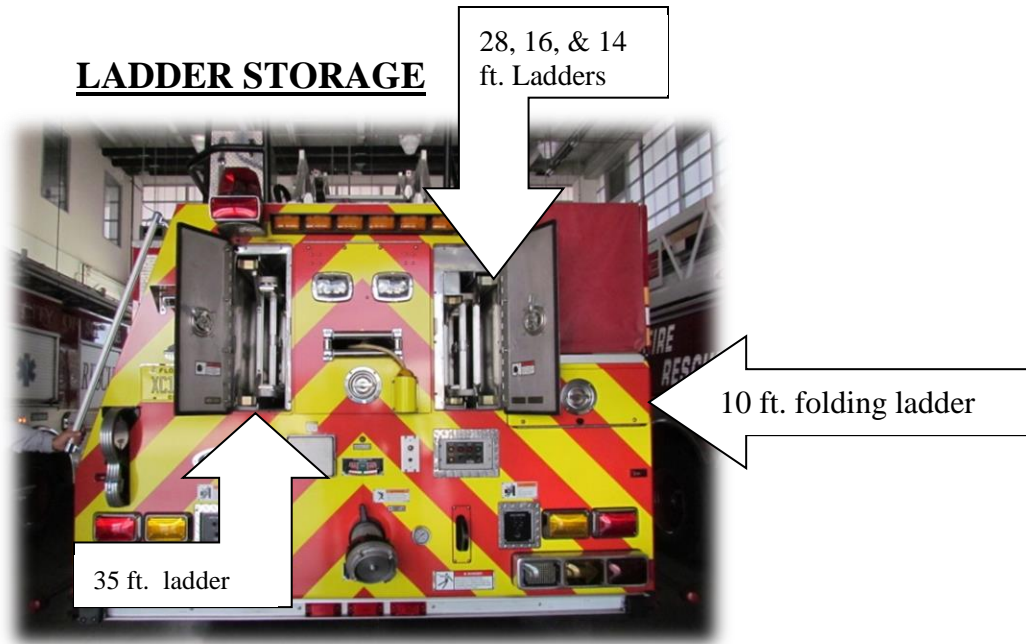


The generator draws its fuel supply from an integrated PTO hydraulic system. A circuit breaker box is located in the pump panel compartment. This box regulates and controls electrical power coming from the generator. There is a separate GFI circuit breaker for each of the six power branches.



NOTE: Two additional 120 V duplex outlet boxes are located in the ALS compartment. These power outlets **do not** run off the generator. It is wired to the shoreline connection for on board charging of ALS equipment.

LADDER STORAGE



The ladder storage for Unit 318 is located in the rear of the apparatus.

The ladder rack contains the following ladders:

- 35 foot, 3-section extension ladder
- 28 foot extension ladder
- 16 foot extension ladder
- 14 foot roof ladder with hooks
- 10 foot folding straight ladder
- Little Giant (located above pump panel)

Care should be taken when storing and retrieving these ladders due to their location.

PUMP PANEL

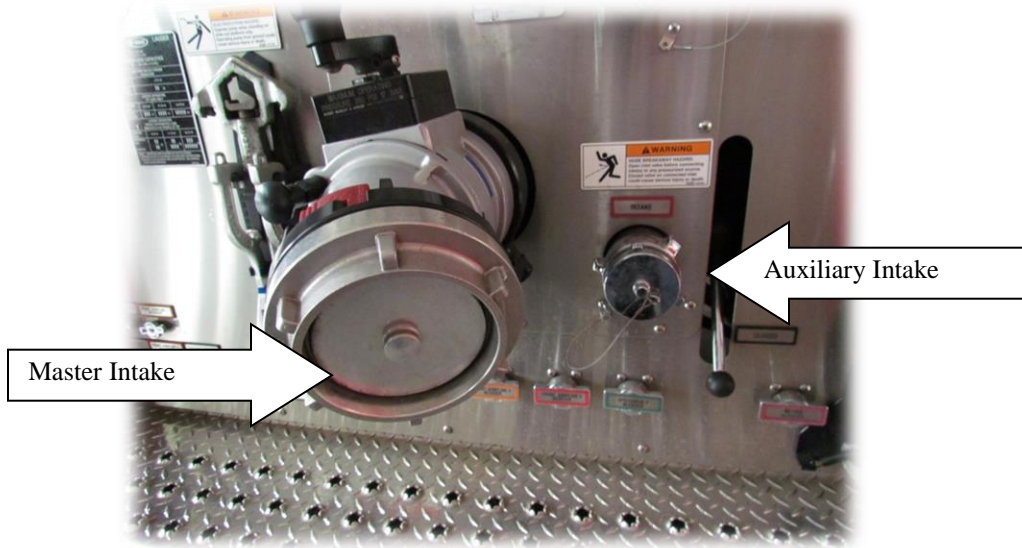


The photo above is the actual layout of all switches and controls on Unit 318.

The water level lights are located on both sides of the apparatus mid-ship cab area reflecting four colors:

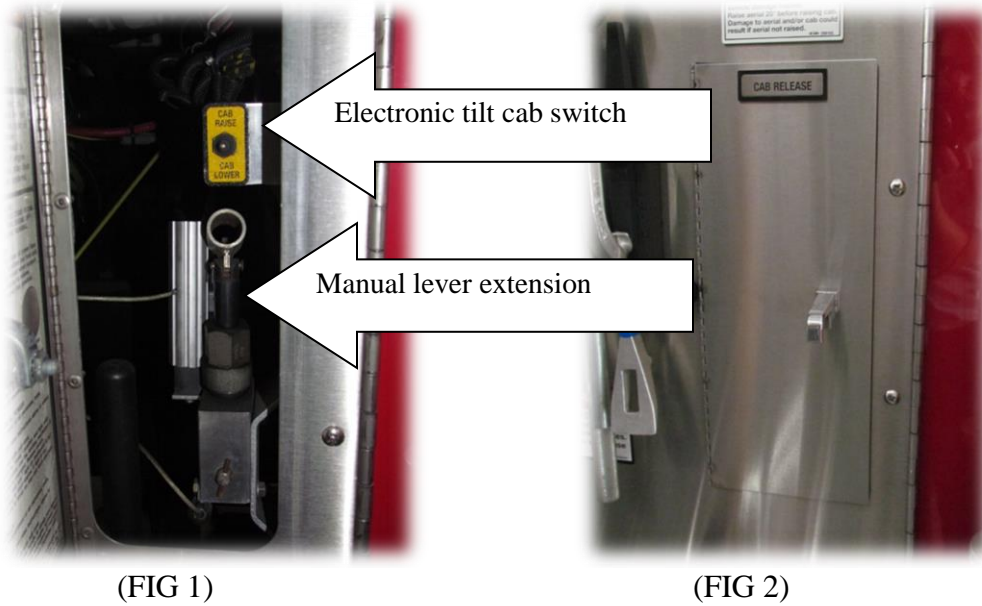
- Green – Full
- Blue – $\frac{3}{4}$
- Amber – $\frac{1}{2}$
- Red – $\frac{1}{4}$ to Empty

PUMP PANEL CONTINUED



CAB TILT

Unit 318 is equipped with a manual cab tilt (FIG 1).



NOTE: This handle is only to be utilized in the failure of the primary pump that tilts the cab.