



This instructional data explains the installation and operation of the cooling system for UL listed, FM approved Fire Pump engines equipped with heat exchangers.

Engines equipped with heat exchangers use an engine mounted water pump to circulate jacket water around the tubes of the heat exchanger to maintain proper jacket water temperatures. Cooling water, supplied by the Fire Pump, is piped through the tubes and discharged to waste.

#### REQUIREMENTS

The loop portion of the cooling water supply piping, shown above, incorporates all components required by NFPA and is sized to provide the required volume of water at the proper pressure for the heat exchangers of the engine models listed in Table A.

Model 481 & 485 pumps are shipped from the plant with the loop piped between the pump and engine. The pipe and loop sizes are determined by the engine model.

#### COMPONENTS

1. A flushing type strainer is used to protect the regulator valve, solenoid valve and the tubes of the heat exchanger from foreign material.
2. The regulator valve is used to control the volume and pressure of the cooling water.
3. The solenoid valve opens automatically when the engine is started and closes automatically on engine

shutdown to prevent the waste of cooling water. (One red wire must be connected to terminal #1 of the engine junction box, the other red wire to terminal #11 of the engine junction box, and the green wire grounded to the engine block. Refer to applicable wiring diagrams.)

4. The valves in the BYPASS line of the loop are normally CLOSED. They should ONLY be opened to provide cooling water to the engine if the regulator valve or solenoid valve require repair.
5. Valves "A" and "B" are normally OPEN. They should ONLY be closed if repair is required to the regulator valve or solenoid valve.
6. The gauge indicates back pressure on the cooling water discharge. The recommended back pressure to assure adequate flow is 15-20 PSI and should not exceed the allowable pressure shown in Table A.
7. Since cooling loop components are subject to bumps and movement during shipping, all components must be checked for pipe strain and leakage prior to initial startup.

#### INSTALLATION -COOLING WATER OUTLET

The cooling water outlet piping from the engine heat exchanger must be at least the size listed in Table A. The piping must be short, have no valves and discharge into an open waste cone. If deviations from the requirement of discharge to an open waste cone are permitted by the authority having jurisdiction, the proposed plumbing must be reviewed to assure that the back pressure created will not reduce the cooling water flow to below that required for the engine.

# AURORA® MODEL 481 & 495

## DIESEL ENGINE DRIVEN FIRE PUMP

### COOLING WATER PIPING DATA

If the outlet piping from two or more engines is connected to a common manifold, the manifold piping should be sized such that the velocity resulting from the combined flow is the same as that in the outlet piping between the manifold and heat exchanger.

Adequate pipe supports must be provided for the loop and outlet piping to minimize vibration and prevent excessive strain at the heat exchanger, pump and engine connections.

Engine coolant should be added in accordance with the engine manufacturer's recommendations.

#### OPERATION

The regulator valve is adjusted during operational tests at the plant and set between 15 and 20 PSI back pressure. If additional

adjusting is necessary, see the following procedure:

With the pump operating at the rated duty, the adjustment is made after the engine block temperature has risen to the level required to open the engine thermostat. The thermostat opens at approximately 170°F. The temperature will stabilize and then decrease slightly. At this point, the regulator is adjusted between 15 and 20 PSI by turning the regulator screw clockwise to increase the pressure and counterclockwise to reduce the pressure. The regulator screw is then locked into place with the locknut provided.

#### MAINTENANCE

1. Strainers must be inspected frequently and kept clean.
2. If cooling water temperature changes, the regulator valve may require adjustment.