

Fire Pumps

*Inspections, Testing,
and Maintenance*



Agenda

A guide of today's agenda...

- Introduction
- What is a fire pump?
- NFPA 20
- Types and Models of Fire Pumps
- Fire Pump Fittings
- Inspections, Testing, and Maintenance

What Is A Fire Pump?

- They serve only one purpose: to increase water pressure
- They do NOT increase water supply



Fire Pump Types



Horizontal Split-Case AEF (60%) Market

- UL listed and FM approved
- Single and Multi Stage
- Flows up to 5000 GPM
- Up to 390psi
- Electric/diesel drive
- Standard and special materials



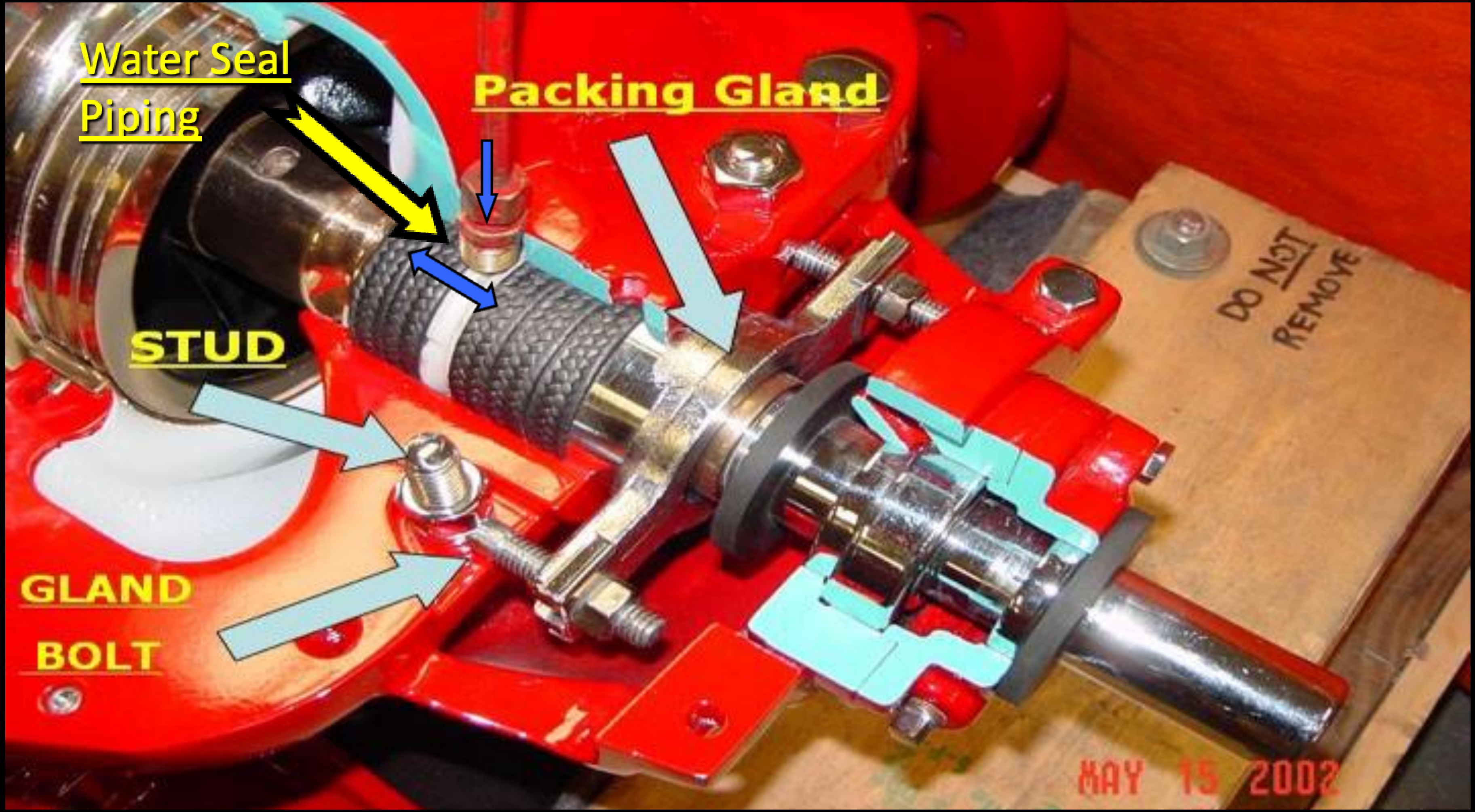
Vertical In-Line PVF (25% Market)

- UL listed and FM approved
- Flows up to 1500 GPM
- Up to 175psi
- Electric drive
- Standard materials



Vertical Turbine VTFP (15% Market)

- UL listed and FM approved
- Flows up to 5000 GPM
- Up to 510 psi
- Electric/diesel drive
- Standard and special materials



Water Seal
Piping

Packing Gland

STUD

GLAND

BOLT

DO NOT
REMOVE

MAY 15 2002

Driver: Electric vs. Diesel

Electric Motor:

- Less maintenance
- Lower price point
- Cleaner and more energy efficient
- Increases electric bill (service calculated at peak load)
- Backup generators must be designed to handle peak load (often overlooked)

Diesel Motor:

- Used when unreliable power source (single utilities in remote areas)
- More maintenance (Fuel, batteries, oil changes, etc.)
- Require more space (typically a stand alone building)
- Higher initial cost



Jockey Pump

Pressure maintenance pump aka jockey pump is designed and installed to account for minor leaks and pressure fluctuations within the sprinkler system.

Sizing:

- 1% of fire pump flow and 10 PSI higher than design pressure
- Example: Fire pump 1000gpm @ 100psi = Jockey pump will be 10gpm @ 110psi

Nameplate

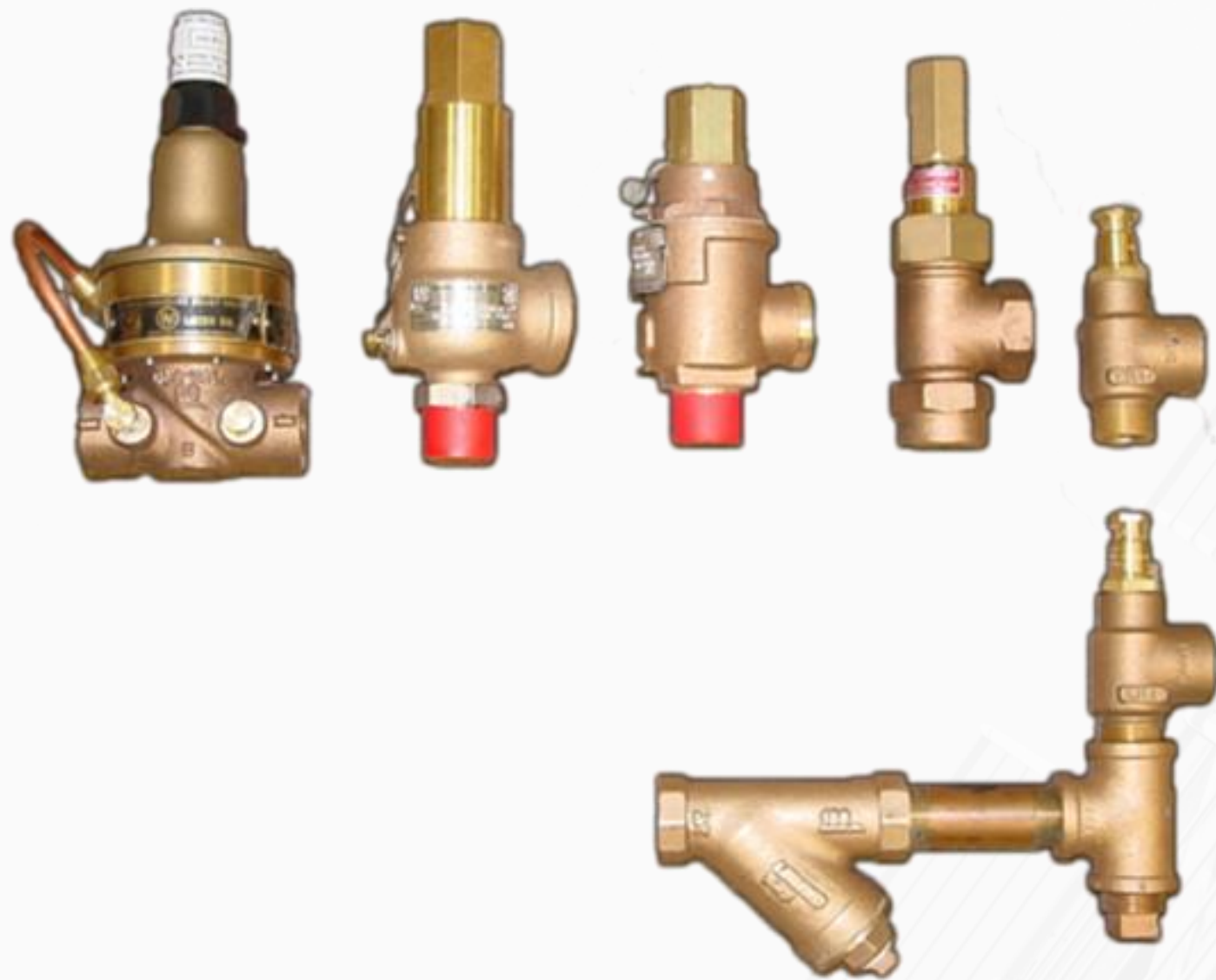
Provides specific data on the fire pump.

The information must be provided for the life of the system.

NFPPA 20 4. 10



Casing Relief Valve



- Purpose is to dissipate heat from the casing while pump is running at shut off
- Rated for either 175# or 300#
- UL listed
- Mounted Vertically

Couplings

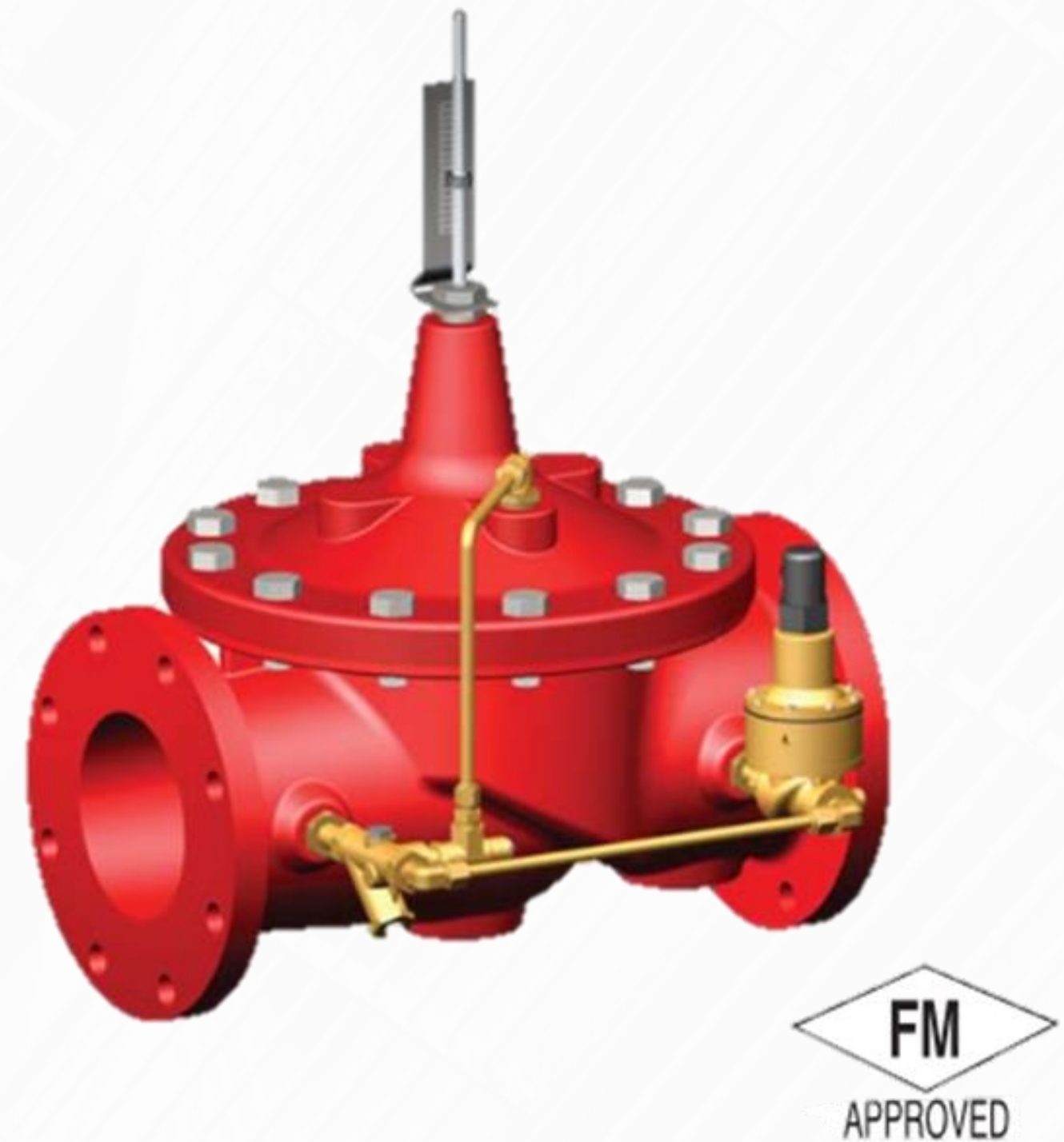
- Different Types
- Must be aligned prior to pump startup
- Check set screws
- Listed / Non Listed

NFPA 20: 6.5.1.2 All coupling types shall be listed for the service referenced in 6.5.1.1



Low Suction Control Valve

- Sensing line plumbed to the inlet of the fire pump
- If the pump begins to overdraw from the supply line (supply network) the LSCV will begin to close, preventing a risk of damage to the supply network
- Valve located after pump discharge
- Common Trouble Shooting
- Grit / Dirt in Pilot Assembly

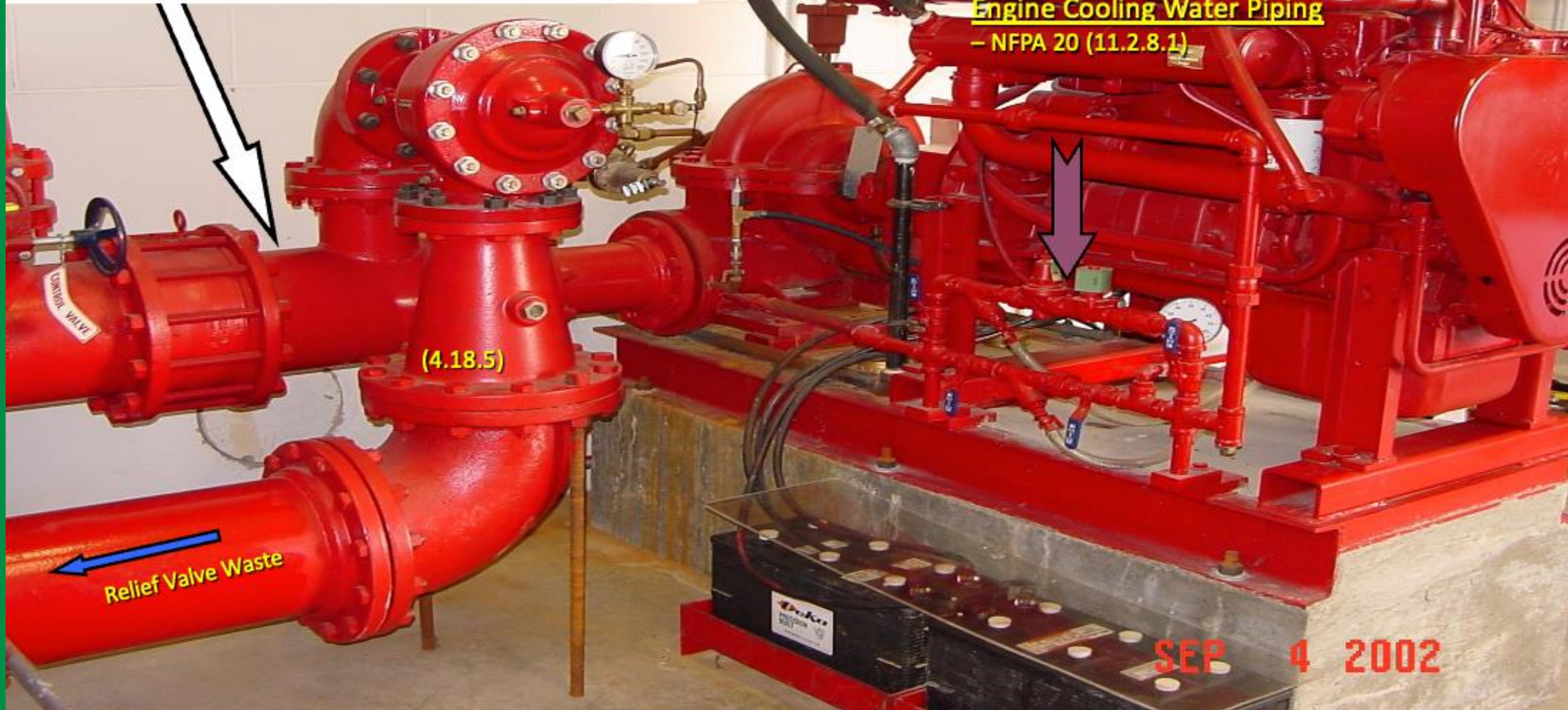


Main Relief Valve



- Where a diesel engine fire pump is installed and where a total of 121 percent of the net rated shutoff (churn) pressure plus the maximum static suction pressure, adjusted for elevation, exceeds the pressure for which the system components are rated, a pressure relief valve shall be installed
- Pressure relief valves shall not be used as a means to meet the requirements of 5.7.4.1.
- The net pump shutoff (churn) pressure plus the maximum static suction pressure, adjusted for elevation, shall not exceed the pressure for which the system components are rated.

NOTE: System (Main) Relief Valve (if used) is connected to the pump discharge BEFORE the Discharge Check Valve !!
(4.18.3)*



Fire Pump Controller

- Fire pump controller inspections (PCB's, cable/wire insulation, wear on electrical parts)



Annual Fire Pump Inspection

- Full flow test annually at minimum (churn), rated (100%), and peak (150%) of the fire pump rated capacity.
- If water supply does not allow flowing of 150 percent of the rated pump capacity, the fire pump shall be permitted to operate at maximum allowable discharge
- If you have a transfer switch – two tests are required

Weekly (Diesel Fire Pumps)

Pump Operation - No-Flow Condition Test for 30 Minutes:

- Read suction and discharge gauges
- Observe packing glands for proper leakage for cooling of packing
- Observe discharge from casing relief valve
- Observe discharge of cooling water from heat exchanger
- Check engine instrument panel for correct speed, oil pressure, water temperature, and ammeter charging rate
- Check battery terminal connections for corrosion
- After pump has stopped running, check intake screens

*Engine should come up to speed within 10 seconds from engine start

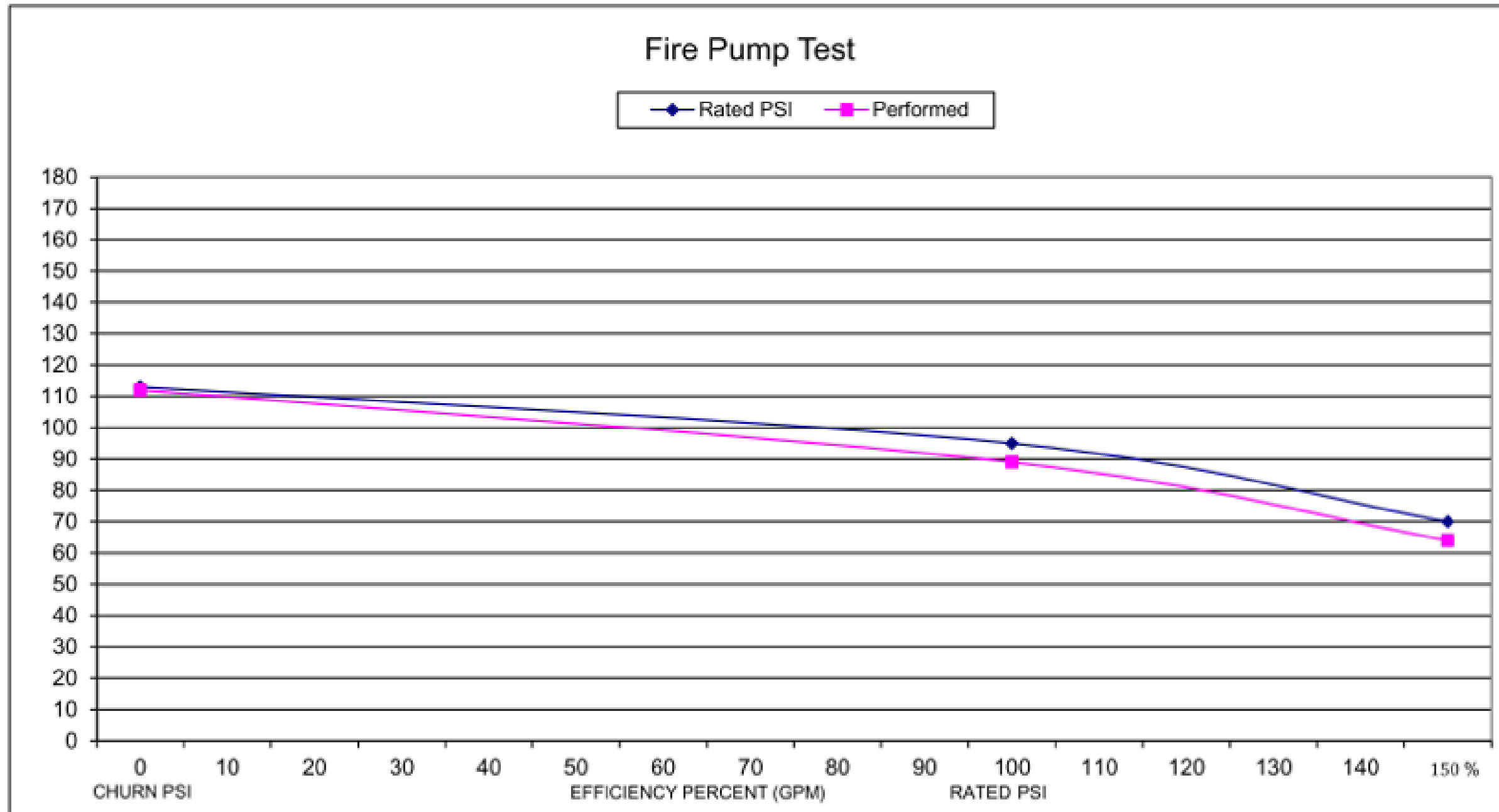
Monthly (Electric Fire Pumps)

Pump Operation - No-Flow Condition Test for 10 Minutes:

- Read suction and discharge gauges
- Observe packing glands for proper leakage for cooling of packing
- Observe discharge from casing relief valve
- Check for unusual noise or vibration
- Check for overheating of components
- Exercise isolating switch and circuit breaker

Reporting Process

Efficiency (%)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
Rated PSI	113										95					70
Performed	112										89					64



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