



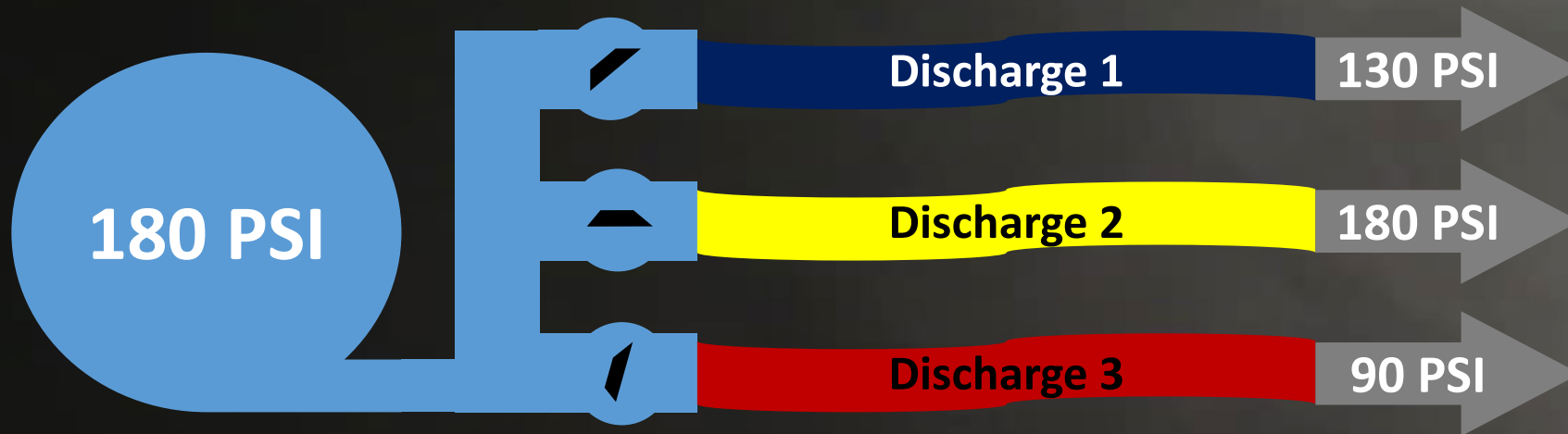
Pump Operations





Multiple Line Operations

- Fire pumps are often used to supply several different flows and discharge pressures on the fireground
 - Pump discharge pressure will be similar to the discharge with the highest discharge pressure
 - Individual discharge pressures are controlled by their valves





Pressure Control Devices

- Control the pump discharge pressure to prevent the over-pressurization of discharges
 - Required when pumping multiple discharges
- Two main types:
 - Pressure Governor
 - Pressure Relief Valve





Types of Pressure Control Devices

- **Pressure Governor**
 - Controls pump discharge pressure by controlling engine RPM
 - Uses sensor to monitor pump pressure
 - 2 modes of operation:
 - RPM
 - Holds engine RPMs stable
 - Pressure
 - Holds discharge pressure stable





Types of Pressure Control Devices

- **Pressure Relief Valve**
 - **Relieves excess pressure by dumping discharge water in the intake side of the pump**
 - Requires intake pressure to be less than discharge pressure
 - **Uses reference pressure stored in a mechanical spring**
 - **Store at highest setting minus $\frac{1}{4}$ turn**





Intake Pressure Variations

- Typically occur during transition to hydrant supply
 - **Additional hydrant pressure can cause an increase in the discharge pressure**
- Pressure control devices react differently
 - **Relief valve**
 - Relief valve will open to relieve excess pressure
 - **Pressure governor**
 - Will reduce engine RPM if operating in pressure (PSI) mode
 - **Lowest it can go is idle**
 - May not reduce discharge pressure enough
 - Approximately 100 psi = 50 psi at idle + 50 psi from hydrant
 - **Can cause loss of pressure on discharge lines**
 - Governor may react too quickly and cause significant pressure variations
 - **Introduction of air into pump can cause severe pressure spikes**
 - Use RPM mode when transitioning from tank water to external supply





Pump Operations

- Pump operators should maintain discharge pressures within +/- 10 PSI of the desired pressure setting
- Charging an additional line of lower pressure
 - Slowly open valve of the additional line until desired pressure reading is obtained
 - Maintain pressure of other line(s) by increasing throttle
 - Valve on the additional line will be only partially open
 - No adjustment to the relief valve is necessary





Pump Operations

- Charging an additional line of higher pressure
 - Increase the pressure setting of relief valve
 - Slowly open valve of the additional line until fully open
 - Maintain pressure of other line(s) by increasing throttle
 - Continue increasing throttle to increase the pressure of the additional line while slowly closing the other lines to maintain their pressure settings

