

FIRESAFETY

CONSIDERATIONS FOR PUMPS FOR FIRE SERVICE

1. GENERAL

1.01 This section outlines arrangements for the installation of fire service pumps used in telephone company buildings.

1.02 This section is being reissued to reflect the most recent refinements of the Firesafety Practices. Revision arrows are used to identify the revised paragraph(s).

1.03 The recommendations in this section are based, in general, on the Fire Codes of the National Fire Protection Association (NFPA) and the Model Building Codes. All detail features of these source documents have not been covered herein; therefore, source documents should be reviewed for complete details.

1.04 Where local, state, or Occupational Safety and Health Act (OSHA) regulations require a higher degree of protection, the legislated criteria should be followed.

2. APPLICATION

2.01 The use of fire pumps and fire service pumps should only be considered when the flow and/or pressure requirements for standpipe systems do not meet the criteria of the local code.

2.02 **Fire Pumps:** Whenever class III standpipe systems are provided in high-rise telephone buildings, a **listed** fire pump should be installed to meet pressure and/or flow requirements. See Section 760-640-310, Standpipe and Hose Systems.

2.03 **Fire Service Pumps (Booster):** In buildings less than 75 feet in height, where standpipe systems are provided, consideration may be given to the installation of a **nonlisted** fire service pump to meet pressure and/or flow requirements.

3. CONSTRUCTION

3.01 Listed fire pumps shall meet the requirements of NFPA 20.

3.02 Nonlisted fire service pumps shall be of the in-line or end suction type.

3.03 Pumps, other than the in-line type, and driver should be connected with a flexible coupling and mounted on a common bedplate with isolators. The assembly should be mounted on a concrete inertia base.

3.04 The following should be constructed of corrosion-resistive materials: impeller, impeller wearing rings, case wearing rings, lantern rings, stuffing box bottoms, interior nuts, lining of stuffing box throats, glands, and gland nuts. Mechanical type leakless shaft seals are acceptable.

3.05 Where not provided as part of the pump assembly, considerations should be given to the installation of an automatic air release.

4. INSTALLATION

4.01 Listed fire pumps shall be installed in accordance with NFPA 20. (See Fig. 1.)

4.02 Fire service pumps shall be installed and provided with a nonfusible disconnect and a magnetic across-the-line starter. The starter shall be the automatic-start and manual-stop type and shall be mounted in a NEMA-Type 1 wall-mounted cabinet. The starter shall be activated by a pressure switch mounted on the downstream side of the check valve and installed on the pump discharge. Valves shall be provided on the pump suction and pump discharge. Gauges of the bourdon-tube type and having a 3-1/2 inch face shall be provided on the pump suction and pump discharge. (See Fig. 2.)

4.03 Gate valves shall be of the rising stem Outside Screw and Yoke (OS&Y) type or other **approved** valve.

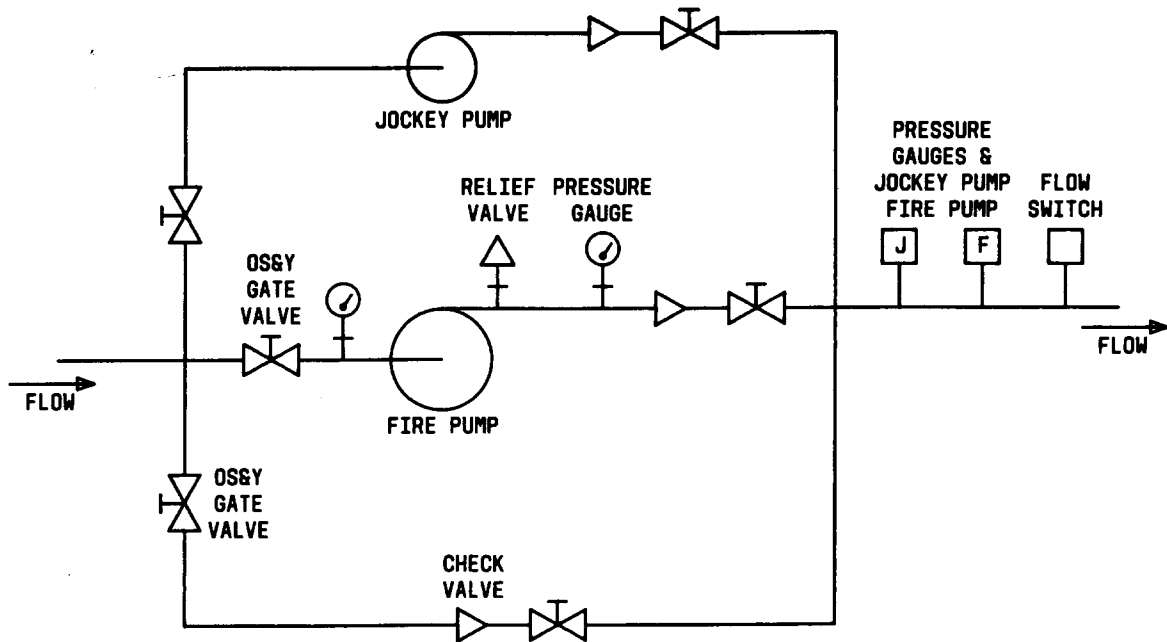


Fig. 1—Fire Pump Schematic

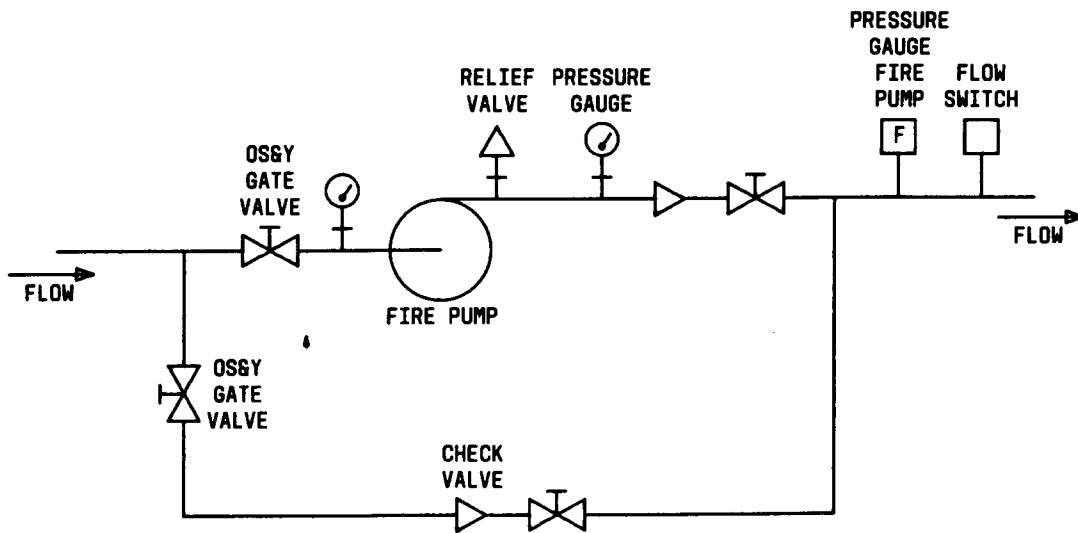


Fig. 2—Fire Service Pump Schematic

4.04 The ASME rated (approved) or listed pressure relief valve shall be installed on the discharge side of the pump.

5. OPERATION

5.01 Fire and fire service pumps shall be automatic start and shall continue to operate until

manually shutdown. Automatic pump shutdown (optional), where provided, shall be in accordance with NFPA 20.

5.02 The automatic start shall be activated by a drop in pressure below the preset minimum setting of a pressure switch located in the pump discharge.

5.03 A fire pump shall not be used as a pressure maintenance pump. Where a jockey pump is used in conjunction with an automatic fire pump, the jockey pump pressure switch should be set to maintain pressure on the fire protection system which is equal to the pump rated pressure plus static suction plus 10 psi.

5.04 Upon pump start-up, a flow switch shall cause an alarm to appear at the Fire Command Station. ***The flow alarm shall not sound the building fire alarm.***

6. ACCEPTANCE TEST

6.01 *Fire Pumps:* Listed fire pumps shall meet the test requirements of NFPA 20 or the local authorities.

6.02 *Fire Service Pumps:* Prior to the final acceptance of the fire service pump installation, a complete operational check shall be made under simulated emergency conditions which should consist of:

- (a) Amperage readings to determine that the pump driver is not overloaded under load conditions
- (b) Flow readings to determine if the pump capacity is as specified
- (c) Pressure readings at the pump discharge and at the highest hose station
- (d) The appearance of the alarm at the Fire Command Station.

6.03 ♦ Pump curves for fire service pumps should be obtained from the manufacturer whenever

possible. If these curves are not available, they shall be developed based on the requirements for flow and pressure, prior to final acceptance, in order to determine the pump capabilities. Pump shutdown should be the same as under operating conditions.♦

6.04 *Capacity Test:* A capacity test shall be conducted to check flow, pressure, and alarm appearance at the Fire Command Station.

6.05 ♦*Test Headers:* Where a standpipe system is supplied by a fire pump, one 2-1/2 inch hose outlet for each 250 gallons per minute pump capacity may be provided in the form of a test header installed at ground level from which the Fire Department may take water for use on outside fires and to provide a convenient point for periodic fire pump capacity tests. Each 2-1/2 inch header outlet should be controlled by a separate valve and should be properly capped when not in use. Existing fire pump installations without test headers should be reviewed and, if feasible, a test header added.

Note: As an alternate to a test header a metered connection between the discharge and suction lines sized for the full capacity of the pump may be provided. The need for 2-1/2 inch outlets at the pump may be reduced.♦

7. POWER SUPPLY

7.01 ♦ Consideration should be given to providing the necessary switching equipment so fire pumps and/or fire service pumps may be connected to standby power, but only to the extent that spare engine capacity is available or could be made available by shedding less essential loads during a fire. Standby engine capacity should be provided only when required by the building code of the authority having jurisdiction.♦