BELL SYSTEM PRACTICES
Outside Plant Construction and Maintenance

SECTION G96.510.1
Issue 3, September, 1958
AT&TCo Standard

GORMAN-RUPP MANHOLE PUMPS

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1. GENERAL

1.01 This section replaces Issue 2 and covers the operation and maintenance of the Gorman-Rupp two-inch Model 82-T manhole pump, used primarily for removing water from manholes. The operation and maintenance instructions for the superseded Gorman-Rupp two-inch Model T-32 and three-inch Model T-33 manhole pumps are essentially the same as those covering the new pump.

1.02 This pump has a rated capacity of 135 gal. per min. and weighs approximately 79 pounds, including frame. The over-all dimensions are: height 18-5/8", width 22", and depth 19-5/8".

1.03 The precautions, operation and maintenance of the 4-cycle engines used to drive these pumps are covered in other sections of the Practices. Section G96.010.1 covers the gasoline engine and G96.010.2 covers the propane engine.

2. PRECAUTIONS

2.01 Do not operate the pump for any length of time without water, except as discussed in Paragraph 5.03.

2.02 Make certain that the strainer is attached to the open end of the suction hose before starting the pumping operation. Otherwise the pump may become clogged and its capacity reduced—if not stopped. The strainer should be inspected and cleaned frequently.

2.03 In freezing weather make sure that the impeller is free to rotate. This may be checked by holding the engine stop switch in the "off" position and turning the engine over with the rope starter. If ice has formed, it may be melted by pouring warm water into the pump body.

2.04 Thoroughly drain the water from the pump after operating it in freezing weather.

2.05 Do not operate the pump for any length of time if water is observed leaking from around the grease seal retainer. See Paragraphs 7.01 and 7.03.

2.06 When the pump is operating it should be kept reasonably level in order to prevent the oil in the engine crankcase assuming such a position that the connecting rod crankshaft and bearings do not receive proper lubrication.

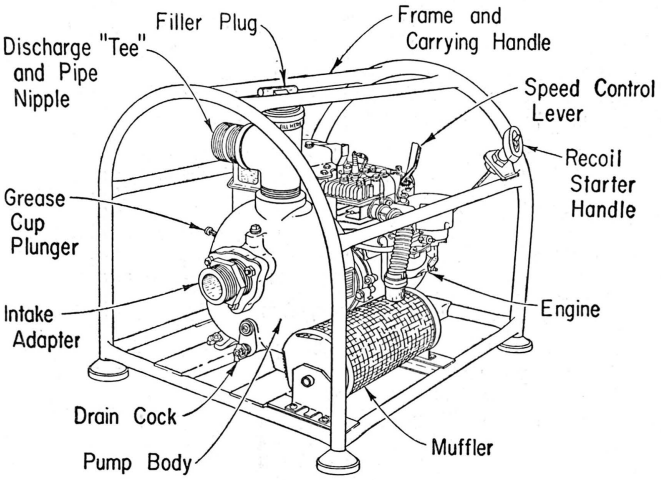
2.07 Locate the pump so that exhaust fumes will not discharge into the manhole. In addition, the pump should be positioned so that it will not fall into the manhole. A combination of pump vibration and weight of the water filled hose may result in a pump falling into the manhole unless it is properly located.

3. DESCRIPTION

3.01 The manhole pumps are of the recirculating, self-priming, centrifugal type driven by a 4-cycle gasoline engine. A hand throttle or speed control lever permits operation of the engine at maximum governed speed for heavy pumping conditions and at reduced speeds to facilitate handling seepage water. The units are provided with a combination protective frame and carrying handle, a rubber cushioned base and a special muffler to minimize exhaust noise.

3.02 The pumps have a brass adapter on the intake side and a steel pipe nipple on the discharge side for attaching the female hose coupling of the suction and discharge hoses, respectively. A strainer is furnished with each unit for use on the male coupling at the open end of the suction hose.

3.03 The following illustration shows the general appearance of the Gorman-Rupp two-inch manhole pump and indicates the various parts referred to in this section.



TWO-INCH MODEL 82-T

4. PREPARATION BEFORE USE

4.01 Prepare the gasoline engine in accordance with the instructions outlined in the proper section covering 4-cycle engines.

4.02 Attach the suction hose to the pump intake adapter, making certain the gasket is properly seated against the flat face of the adapter. Connect the strainer to the open end of the hose; it is important that solid materials be eliminated to prevent damage to the pump impeller.

4.03 Attach the discharge hose, if required, to the discharge pipe nipple at the "Tee" fitting on the pump.

4.04 Lower the strainer end of the suction hose into the water in the manhole.

4.05 Unscrew and remove the filler plug at the top of the discharge "Tee" fitting.

4.06 Check the grease cup feeding the grease seal for adequacy of lubricant.

4.07 Completely fill the pump body with water which is reasonably free of solid material. Replace the filler plug. The water level should be checked even though it is known that water remains in the pump body from a previous job.

5. OPERATION

5.01 Set the speed control lever (hand throttle) in the low speed position and start the gasoline engine with the rope starter.

5.02 After the engine warms up, slowly increase the engine speed with the hand throttle until maximum governed speed is reached. The pump should in a very short period of time deliver water from the discharge outlet at its maximum capacity. The rate of delivery depends primarily on the engine speed and the distance the surface of the water is below the pump. Reduction of engine speed will reduce the rate of water delivery. At the low speed setting seepage water can be adequately handled after the manhole has been emptied.

5.03 In freezing weather conditions special care should be taken to prevent freezing of any water in the pump body. When the pump is to be stopped for an extended period of time, open the drain cock and completely drain the water from the pump body. If it appears that the drain cock is plugged, insert a wire or small stick through the drain opening to remove the obstruction. When the flow of water from the drain hole has ceased, restart the engine and operate for about one minute so that all the water will be thrown off the impeller. Close the drain cock.

6. LOCATING PUMP TROUBLES

6.01 If the pump fails to prime or stops pumping while the engine is running, one or more of the following conditions may be present:

(a) Suction strainer plugged.

(b) Lining of suction hose collapsed.

(c) Air leak on suction side of the pump.

(1) Intake adapter not sufficiently tightened or sealed in pump housing.

(2) Suction hose coupling not sufficiently tightened on intake adapter.

(3) Gasket in the hose coupling not properly seated on the end of the intake adapter. This may be due to foreign material on the gasket.

(4) Loose hose bands which attach the hose to the couplings.

(5) Old and porous suction hose.

(6) Leaky grease seal.

(d) Impeller clogged.

(e) Impeller worn or broken.

(f) Attempt to prime against too high a head.

(g) Discharged hose completely obstructed. If this occurs for an extended period of time while the water is being pumped, the water in the pump will be churned by the impeller and may become boiling hot. The steam generated may cause a vapor-lock which will prevent the pump from priming, especially on a high suction lift. The condition can be quickly relieved by removing the obstruction and filling the pump with water.

6.02 If it cannot be determined that the failure of the pump to prime is caused by any of the foregoing reasons, the pump should be returned for checking in accordance with local procedures.

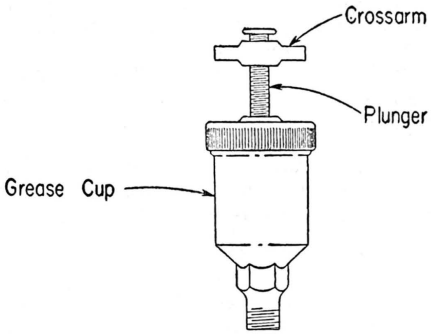
7. LUBRICATION AND MAINTENANCE

7.01 A grease seal, located in the intermediate case between the pump body and engine, is the only pump part requiring lubrication. When properly lubricated, the seal prevents air from entering the pump around the engine shaft during priming and pumping operations. It also prevents leakage of water when the pump is idle.

7.02 Grease is supplied automatically to the grease seal by a compression type grease cup located on the intermediate case. Fill this cup as required with a good soft grade of No. 1 Pressure Gun Grease. This is the same type of grease used to lubricate the chassis fittings on automobiles and trucks and generally has the consistency of soft butter. **CAUTION:** Do not use sodium base grease, which is emulsified in water, or a stiff hard waterproof grease which will not force into the seal.

7.03 The following illustration shows the proper position of the crossarm and plunger of a filled grease cup during the pumping operation. Grease must be added to the cup when the plunger has receded to a point where the crossarm touches the grease cup cap. The plunger is raised by rotating the crossarm and in the raised position the cap may be removed for filling the grease cup.

7.04 Failure of the grease seal is usually indicated by water leaking from around the seal retainer. Pumps leaking at the grease seal or in need of other repairs should be returned for repairs in accordance with local procedures.



8. STORAGE

8.01 When it is expected that a manhole pump will not be used for a period of 30 days or more, the engine fuel system and pump body should be completely drained.

8.02 The pump is drained by opening the drain cock located under the suction intake at the lowest point of the pump body. After the water has drained out, operate the engine for about a minute to spin remaining water off the pump impeller.

8.03 Service the engine in accordance with instructions in the section of the Practices covering 4-cycle engines. ←