COMPRESSED AIR STORAGE TANKS AND ASSOCIATED EQUIPMENT, TESTING AND MAINTENANCE PROCEDURES

CONTENTS PAGE

1. GENERAL

1.01 This section covers the recommended procedures for the safe testing and maintenance of compressed air storage tanks and associated equipment. For the purpose of this section, the following types of air storage tanks are included:

(a) Air storage tanks associated with compressors used in servicing vehicles located in garages.

(b) Air storage tanks associated with pneumatic control systems used for the operation of temperature control equipment in buildings.

1.02 The following types of pressure vessels are excluded since operating procedures are covered in other sections of the Bell System Practices.

(a) Compressor-dehydrator units used for cable pressurization.

(b) Diesel engine air starting equipment.

(c) Air and expansion tanks associated with heating systems.

(d) Pneumatic tube systems used in connection with distribution of toll tickets, service orders, etc.

(e) Compressed air equipment used in cleaning central office equipment.

1.03 The associated equipment includes the pressure gauge, safety valve, air reducing valve, drain valve, automatic pressure controller, and hand-controlled stop valve.

1.04 It is not intended that this section serve as operating instructions for any given compressor. Due to the wide variety of makes and types used throughout the Bell System, the manufacturer's manual should be consulted as required.

2. SAFETY

2.01 During the operation of the compressor, the compressor cylinder head, air line and valves adjacent to the compressor become hot. Use extreme care when opening or closing a valve.

2.02 Most compressor systems include automatic start controls. Care must be exercised to prevent accidental starting when maintenance work is to be performed. Open the disconnect switch supplying the ac motor, remove fuses, if fuses are part of the circuit, and attach a warning tag. When maintenance work is completed, restore the circuit to normal.

2.03 Proper grounding of the air compressor motor should be checked prior to placing the compressor unit in service. Many types of compressors have resilient type motor mounts. An annual check should be made to determine that the motor is properly grounded. Most manufacturers use a flexible metal strap fastened to the motor frame and motor mounting bracket.

3. RECORDS AND LOGS

3.01 The manufacturer's maintenance and operating instructions, control wiring diagram and other related material should be kept permanently and made readily available to persons who operate and maintain the equipment.

3.02 A permanent log book should be provided at each location to record maintenance work, tests, inspections and other pertinent data. Brief details of any repairs should be recorded. Results of all tests and inspections or other routines required by codes or laws, including insurance company inspections and initial acceptance tests, must be recorded.

4. ROUTINE MAINTENANCE AND CLEANING

4.01 Prior to performing any maintenance or cleaning, be certain the unit is properly de-energized. Suggested methods are covered in Part 2.

External Cleaning

4.02 Clean the entire exterior surface of the motor and compressor assembly, fan blade, cooling fins, belt, pulley and storage tank. Failure to keep the equipment clean will result in excessive maintenance.

Air Intake Filter

4.03 Due to the various types of filters, the maintenance person should refer to the manufacturer's maintenance manual for method of cleaning and frequency. It is important that filters be kept in a clean condition to insure efficient operation of the compressor.

Belt Adjustment

4.04 Check tension of the drive belt by deflecting the belt vertically 1/2 inch to 1 inch, using finger pressure applied midway between the two pulleys. Gauge by eye. Avoid excessive belt tightness, which overloads bearings.

Lubrication

4.05 The oil level in the compressor crankcase shall be maintained between the two marks on the stick oil gauge. Failure of the air compressor may result from keeping the crankcase at too high, as well as too low, an oil level. Refer to the manufacturer's manual for type and weight of oil.

4.06 Oil motor, as recommended on motor nameplate, if motor does not have permanently lubricated bearings.

Air Tank Blow-Off

4.07 Place a clean receptacle under the tank blowdown valve and slowly open the valve to allow air to escape. When all condensate is removed, close the valve securely.

5. TESTS AND INSPECTIONS

5.01 Periodic tests and inspections of all compressors are required to maintain them in good working condition and insure complete safety.

Test Equipment

5.02 In addition to the usual mechanics tools, test leads and a calibrated test gauge will be required. The test leads should consist of insulated No. 14 gauge stranded wire equipped with insulated alligator clips. The test gauge should be a good quality inspectors test gauge graduated in increments of not more than two pounds.

Safety Valve

5.03 ***Manual Discharge:*** Each safety valve shall be discharged manually every month. To conduct this test, loop a piece of wire through the hole or ring in the safety valve relief pin, taking care not to touch the valve if it is hot. Operate the valve by pulling on the wire, standing in a position to avoid the air blast. The air pressure in the tank should be within 10 to 15 percent of the valve set pressure to facilitate operating the valve.

Release the wire. If the valve leaks, manually discharge two or three times to allow the valve disc to seat properly. If valve continues to leak, it must be replaced. Do not attempt to disassemble valve for repair or adjust spring setting.

5.04 ***Pressure Discharge:*** Each safety valve shall be discharged by tank pressure, annually. To conduct this test, proceed as follows:

(a) Open the ac disconnect switch to the compressor motor.

(b) Close the main air line supply valve.

(c) Bridge the high pressure cutout switch, using the test leads mentioned in Paragraph 5.02.

(d) Install the test gauge on the tank to work in conjunction with the existing tank gauge.

(e) Close the ac disconnect switch to the compressor motor. When normal working pressure is reached, check calibration of tank gauge.

(f) The valve should open within ±2 p.s.i. of the set pressure for pressures up to and including 70 p.s.i. and 3% of the set pressure above 70 p.s.i. If it fails to open within these tolerances it should be replaced, no attempt should be made to repair or adjust the defective valve.

(g) If the valve opens within the above mentioned tolerances allow the compressor to continue to run. The valves capacity is rated at 10% above the set pressure and should maintain the tank pressure at or below that point. If pressure continues to rise above the 10% limit open the compressor disconnect switch and replace the valve with one having sufficient capacity.

(h) Upon completion of a satisfactory test, open the ac disconnect switch and remove the test leads from the cutout switch.

(i) Open the main air line and close the ac disconnect switch. Allow the pressure cutout switch to cycle the compressor at least once to insure proper operation.

Safety Valve Replacement

5.05 All safety valves must be plainly labeled with the manufacturer's name or registered trademark, set pressure in pounds per square inch, capacity in cubic feet per minute, the inlet size in inches, and stamped with the A.S.M.E. symbol. Safety valves with an inlet size under 1/2" do not require the A.S.M.E. stamping.

When replacing a safety valve it must conform in pressure and capacity to the recommended original valve removed.

5.06 Prior to the removal of the test gauge, check reading on the compressor gauge. If gauge has adjustment, correct error, and recheck. If gauge is beyond adjustment, replace and check new gauge with test gauge.

6. MAINTENANCE, INSPECTION, AND TESTING SCHEDULE

6.01 Listed below are suggested frequencies for the various routines mentioned herein. Local conditions, laws, or ordinances may require changes in the intervals listed.

6.02 ***Weekly:***

(a) Check compressor crankcase oil level (4.05).

(b) Drain condensate from storage tank (4.07).

6.03 ***Monthly:***

(a) External cleaning (4.02).

(b) Air intake filter (4.03).

(c) Belt adjustment (4.04).

(d) Safety valve — manual discharge (5.03).

(e) Operating control check [5.04 (h) and (i)].

6.04 ***Annually:***

(a) Safety valve — pressure discharge (5.04).