Number One Air Conditioning Maker

Carrier

Division of Carrier Corporation

Carrier Parkway • Syracuse, N Y 13221

Installation Instructions 06D

Accessory Capacity Control Package

Bypass Type Unloader

GENERAL

These instructions apply to field installation of bypass type unloaders on 06D compressors. The instructions include package description, parts list, step-by-step installation procedure, control valve settings and adjustment procedures and an illustrated description of the capacity control operation.

Pumpdown control is not recommended for compressors equipped with capacity control. Crankcase heaters and single pumpout should be used.

PACKAGE CONTENTS

PACKAGE NUMBER			06DA900082 06DA900092 Electric	38AB900171 Pressure
Item	Description	Req	Part Number	
1	Cylinder Head Assembly	1	6D68-943	06DA400053*
2	Valve Plate Assembly	1	6D75-933	6D75-933
3	Suction Valve	2	6D48-1072	6D48-1072
4	Valve Plate Gasket	1	6D43-1073	6D43-1073
5	Cylinder Head Gasket	1	6D75-2672	6D75-2672
6	Cap Screw, ⅜-16 x 3 in Lg	8	AA06BR239	AA06BR239
7	Suction Valve Spring	2	6D40-1021	6D40-1021
8	Coil Assembly	1	See Note	—
9	Installation Instructions	1	06D-3SI	06D-3SI

*Includes Capacity Control Valve P/N 06EA404304

NOTE: 06DA900082 has 115-1-60/50 coil (P/N 06DA401784)
06DA900092 has 208/240-1-60/50 coil (P/N 06DA401794)

RECEIVE PACKAGE

Examine Package Contents — Check each item for shipping damage. If any damage is found, file a claim immediately with the shipping agent. If any item is missing, notify your Carrier distributor.

INSTALLATION

Complete Head Assembly Replacement, Pressure and Electric

1. Install discharge and suction pressure service gages.
2. Start compressor and allow it to run until warm. Then frontseat suction shutoff valve and let compressor pump down to approximately 2 psig.
3. Stop compressor and quickly frontseat discharge shutoff valve. Bleed off remaining refrigerant from discharge side of compressor.
4. Remove cylinder head holddown screws.
5. Tap cylinder head with wooden or lead mallet to free gasket.

CAUTION: Excessive force on cylinder head can break dowel pins.

6. Free valve plate from dowel pins and cylinder deck, using discharge valve cap screws. Thread screws into tapped holes in valve plate to act as jack screws.
7. Remove suction valves from dowel pins.
8. Install new suction valves. *Be sure that valve positioning springs have already been placed over dowel pins.* Place springs with ends against cylinder deck (centers bow upward).
9. Install in order: valve plate gasket, valve plate assembly, cylinder head gasket and cylinder head.

   Before installing valve plate assembly, apply compressor oil to check valve piston (Fig. 5) and manually operate check valve several times to be sure it does not stick or bind.

   With valve plate mounted, manually flex the suction valves to be sure there is no interference with valve plate gasket. Install cylinder head, using the long cap screws furnished in accessory package (item 6).

IMPORTANT: Use torque wrench to tighten cylinder head cap screws evenly by increments. Final torque 30-35 lb-ft. Insufficient torque can cause blown gasket; excessive torque can cause unloader valve piston to bind.

Installation of pressure operated valve is now complete. For electrically operated valve, continue the installation as follows:

10. Place solenoid coil over valve stem and secure with snap-on retainer.
11. Make necessary wiring connections. When solenoid coil is energized, cylinder bank unloads; when coil is de-energized, cylinder bank loads.
12. Check solenoid valve for proper operation. An audible click can be heard when valve actuates.

13. Open compressor service valves. Start compressor and allow it to warm up. Operate solenoid valve several times to be sure it is performing properly. Suction pressure should rise and discharge pressure should fall when valve is energized.

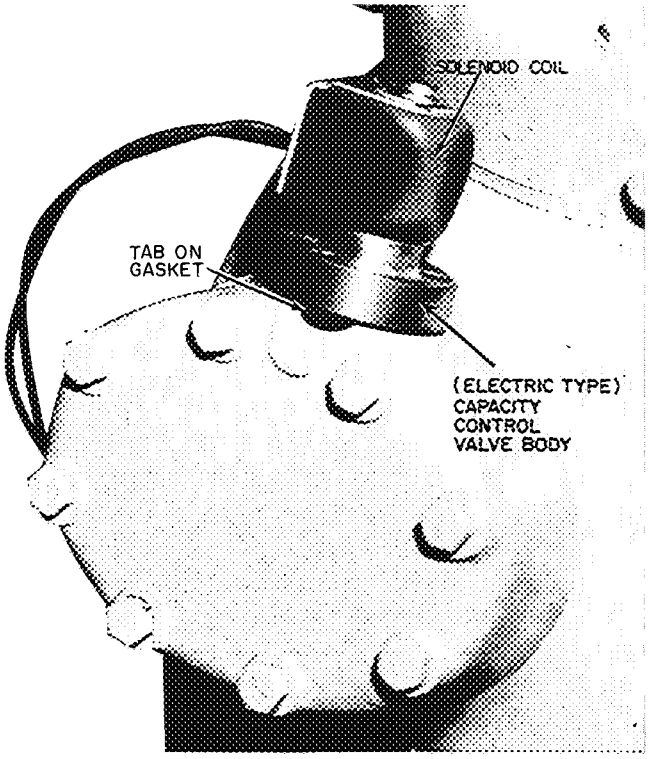


Fig. 1 — Installed Capacity Control Valve

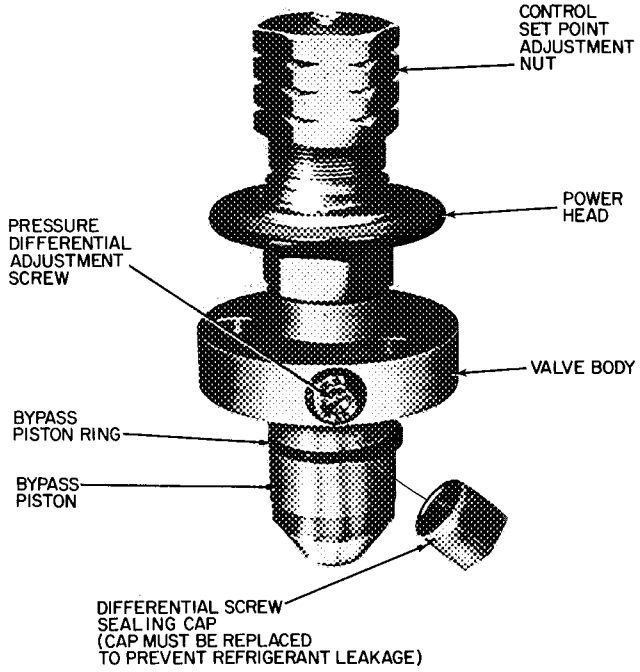
CAPACITY CONTROL SYSTEM (Bypass Unloader)

Pressure-Operated Control Valve is controlled by suction pressure and actuated by discharge pressure. Each valve controls 2 cylinders (one bank). On start-up, controlled cylinders do not load up until differential between suction and discharge pressures is approximately 25 psi.

ADJUSTMENTS

Control Set Point (cylinder load-up point) is adjustable from 0 psig to 86 psig.

Turn adjustment nut (Fig. 2) clockwise to the bottom stop. In this position, the cylinder load-up pressure is 86 psig. Control set point is regulated to desired pressure by turning the adjustment nut counterclockwise. The number of turns can be determined from the curve in Fig. 3. Each full turn counterclockwise decreases the load-up point by approximately 7.2 psi. Approximately 12 turns changes the pressure from 86 psig to 0 psig.



PART NO. 06EA404304

Fig. 2 — Pressure Operated Capacity Control Valve

Pressure Differential between cylinder load-up point and unload point is adjustable from 7 psi to 19 psi.

Turn adjustment screw (Fig. 2) counterclockwise to the back-stop. In this position, the differential is 7 psi. Differential is set by turning the adjustment screw clockwise. The number of turns to the desired differential can be determined from the curve in Fig. 4. Each full turn clockwise increases the differential by approximately 1.2 psi. Approximately 10 turns changes the differential from 7 psi to 19 psi.

Electrically-Operated Control Valve is actuated by an electric solenoid, which must be of the same voltage as the unit control circuit. *No adjustments are necessary.* When the solenoid is de-energized, the orifices and passageways in the valve are aligned for loaded condition, shown in Fig. 5A. When the solenoid is energized, the system is unloaded as shown in Fig. 5B.

Bypass Unloader Operation — The capacity control valve shown in Fig. 5 is the pressure-operated type, which is the one in the following description. In the electrically-actuated valve, the function of a similar poppet valve is the same as in the pressure-operated type but it is moved by a solenoid. The function within the cylinder head is the same for both types of control valve.

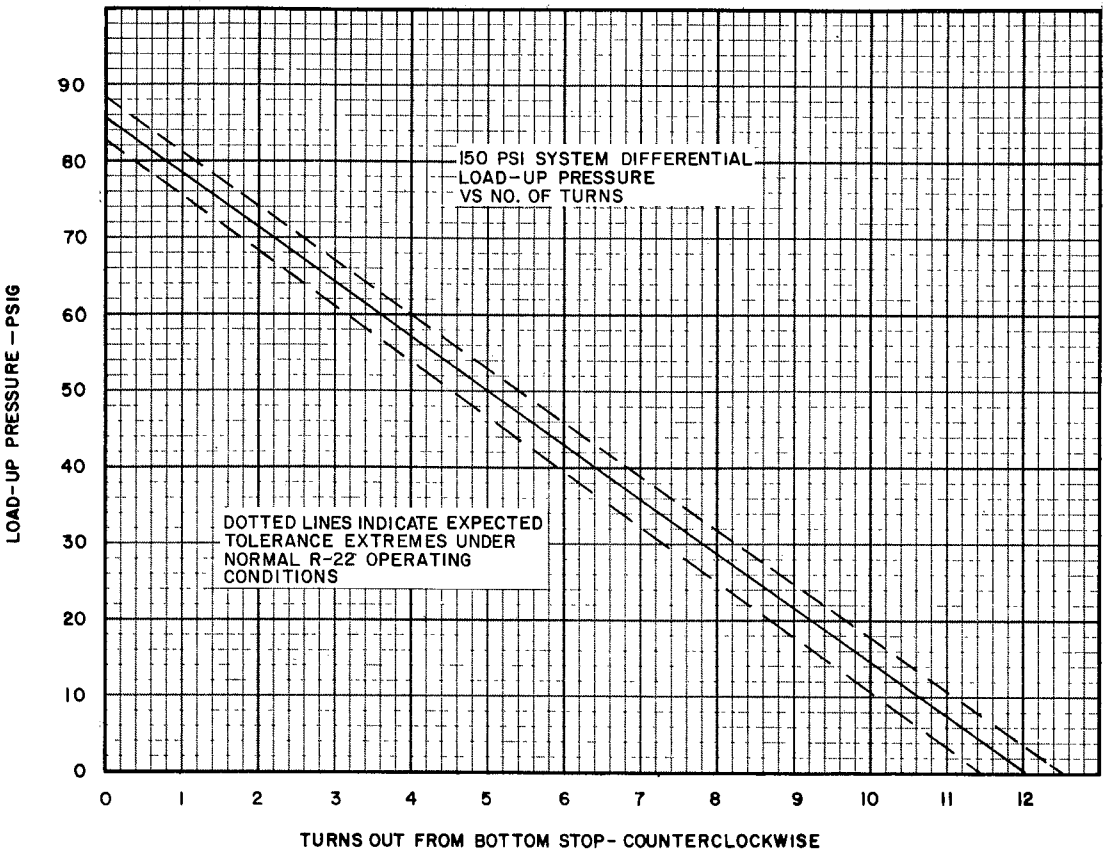


Fig. 3 — Control Set Point

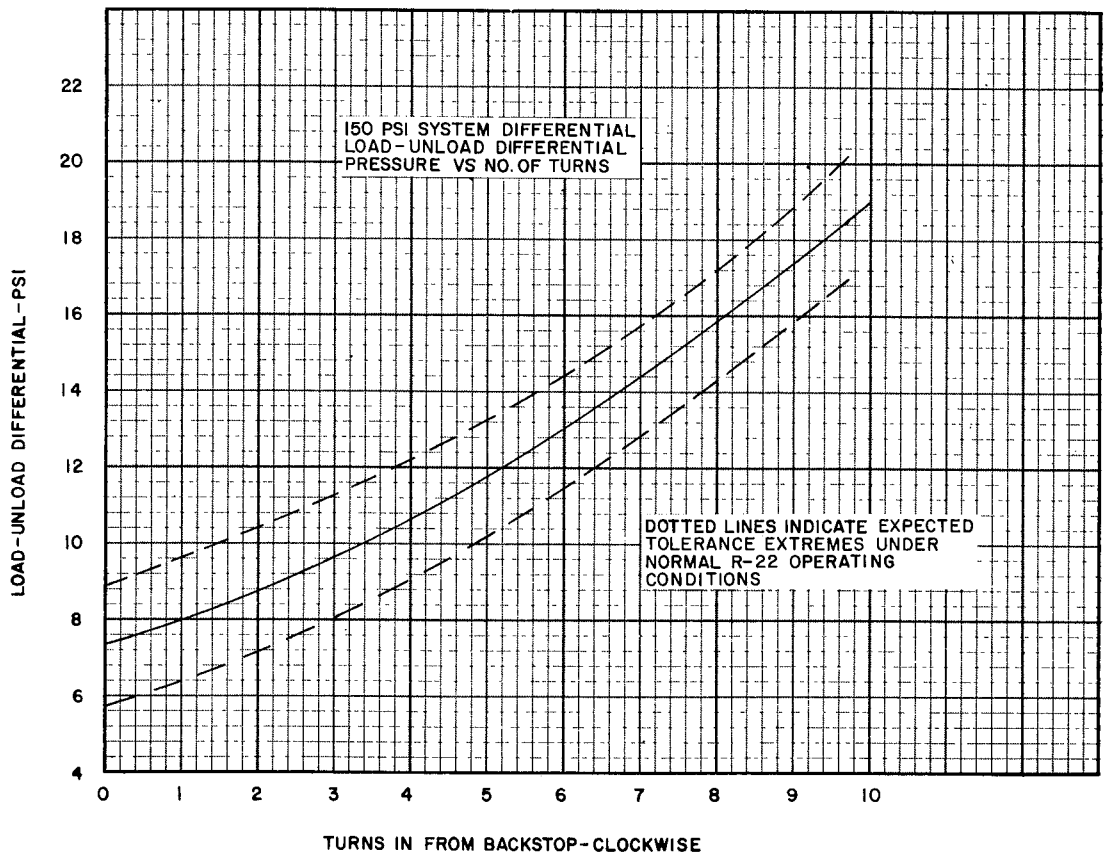


Fig. 4 — Differential Set Point

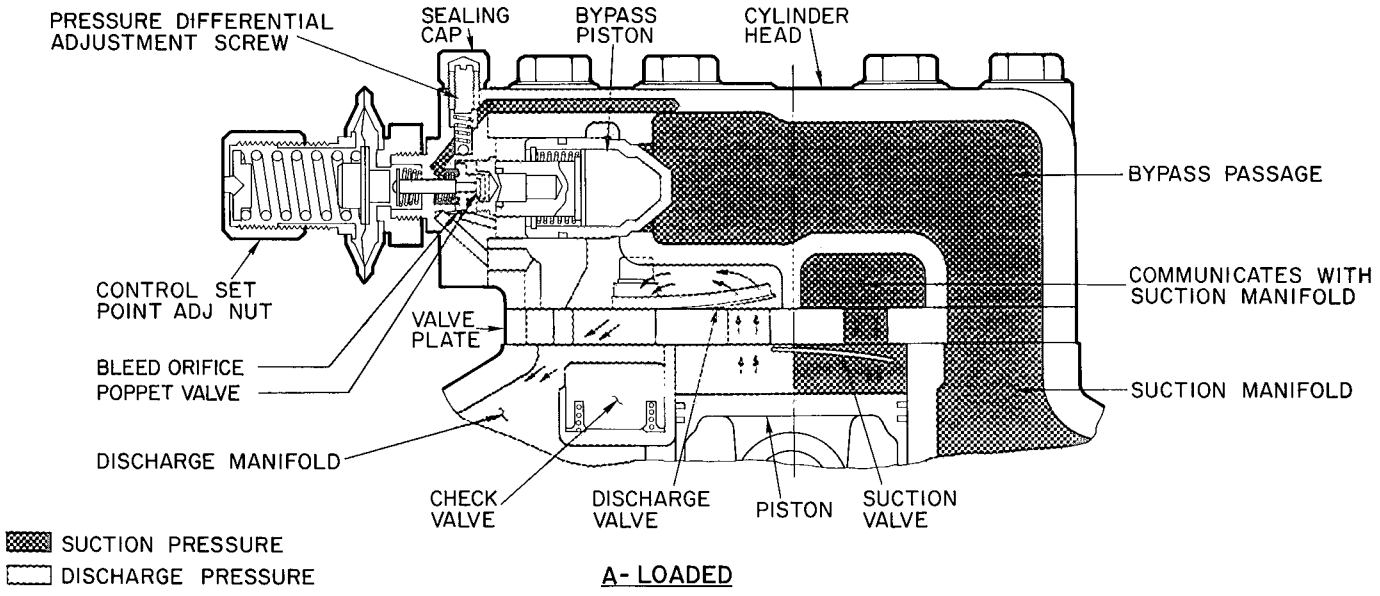
LOADED (Fig. 5A)

When suction pressure rises high enough to overcome control set point spring, the diaphragm snaps to the left and relieves pressure against the poppet valve. The drive spring moves the poppet valve to the left and it seats in the closed position.

With poppet valve closed, discharge gas is directed into bypass piston chamber and pressure builds up behind the piston. Piston moves to right and seats, closing entrance to the bypass passage. Discharge gas pressure builds up and opens check valve allowing gas to pass into discharge manifold. The cylinder bank is now running loaded.

UNLOADED (Fig. 5B)

As suction pressure drops below set point, control spring expands, snapping diaphragm to right. This forces poppet valve open. Gas from discharge manifold vents thru base of control valve to suction side. Reduction of pressure behind the bypass piston allows piston spring to move piston off the seat, opening entrance into bypass passage. Discharge gas from cylinder circulates thru bypass passage back into suction manifold. Pressure against check valve drops enough to allow the internal spring to keep valve closed. The cylinder bank is now unloaded.



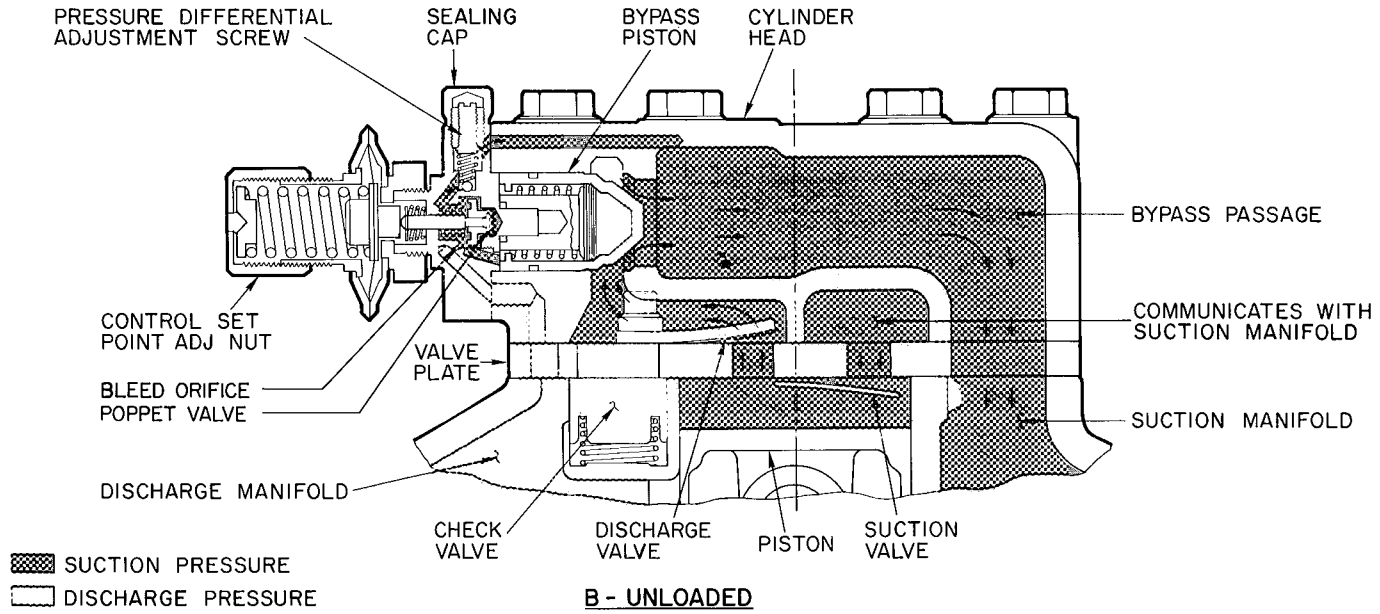


Fig. 5 — Bypass Unloader Operation (Pressure-Type Valve Shown)