Number One Air Conditioning Maker

Carrier

Division of Carrier Corporation

Carrier Parkway • Syracuse N Y 13221

Installation Instructions 06D

Capacity Control Accessory Package

Hot Gas Bypass Type Unloader

GENERAL

These instructions apply to field installation of hot gas bypass type unloaders on 06D compressors. The instructions include package descriptions, parts lists, step-by-step installation procedures, control valve setting 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.

Table 1 — Package Description

PACKAGE NUMBER	VOLTS (1-Phase, 50/60 Hz)	CONTROL	
		Type	Function
06DA900082 06DA900092	115 208/240	Elec	Provides unloading to a nonloading cylinder bank
38AB900171	—	Press	
06EA900282 06EA900292	208/240 120	Elec	Converts from pressure to electric unloading

Table 2 — Parts Lists

PACKAGE NO. 06DA900082, 06DA900092, 38AB900171		
ITEM	DESCRIPTION	QTY
1	Capacity control cylinder head complete w/control valve (see NOTE) Cap screws	1 8
2	Valve plate assembly w/check valves and discharge valves	1
3	Suction valves	2
4	Suction valve springs	2
5	Valve plate gasket	1
6	Cylinder head gasket	1
7	Solenoid coil (Pkg No 06DA900082 and 92)	1

NOTE: For pressure operated valve, control assembly is complete; for electric operated valve, solenoid coil (item 7) is loose in package

PACKAGE NO. 06EA900282, 06EA900292		
ITEM	DESCRIPTION	QTY
1	Solenoid coil and valve assembly	1

INSTALLATION

Receive Package — Check package for damage and missing parts. If any items are damaged or missing in shipment, file claim immediately with shipping company.

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 shut-off valve and let compressor pump down to approximately 2 psig.
3. Stop compressor and quickly frontseat discharge shut-off 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.

WARNING: Excessive blow 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 1).

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.

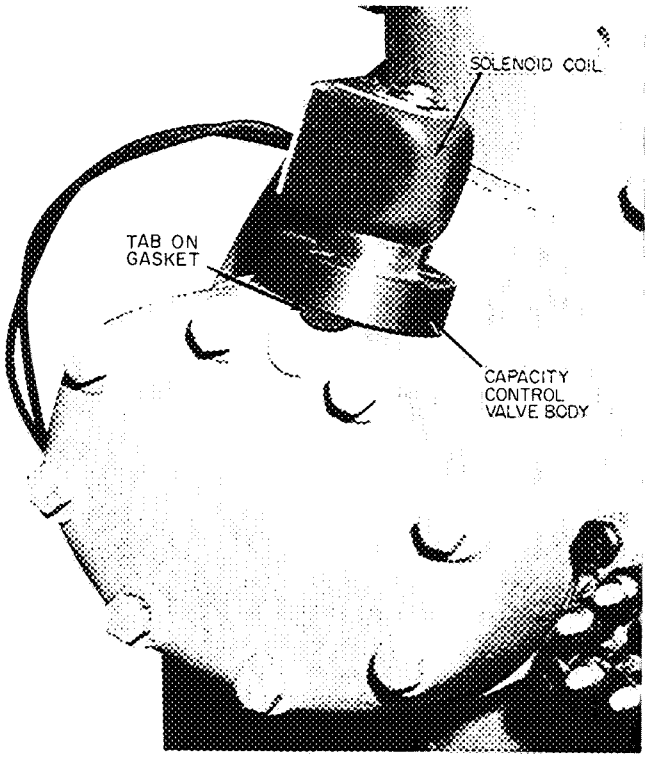


Fig. 1 – 06D Electric Capacity Control Valve

Conversion from Pressure to Electric Unloading

1. Follow Steps 1, 2 and 3 under Complete Head Assembly Replacement.
2. Remove 3 cap screws and remove the pressure operated control valve.
3. Remove solenoid coil from electric control valve to gain easier access to hold-down screws.
4. Remove plastic protector from piston. *Check the ring groove – it must be perfectly clean and free from nicks*
5. Gasket (already on valve) must be positioned correctly on flange.

   Align the 2 gasket holes opposite the tab with 2 holes in flange. The elongated gasket hole at the tab (Fig. 1) should now be over the 3rd flange hole, which is offset to ensure proper orientation of valve on cylinder head. *Proper gasket position ensures unobstructed pressure passages between capacity control valve and head.*
6. Wipe the head cavity walls clean and apply thin film of compressor oil. Carefully compress bypass piston ring (Fig. 2) and insert piston into head cavity. *Be sure gasket does not shift. Tab must be outward as shown in Fig. 1*
7. Using the 3 cap screws and washers supplied, secure control valve body to head. Torque cap screws to 14 - 16 lb-ft.
8. Follow Steps 10 thru 13 of Complete Head Assembly Replacement. Conversion is now complete.

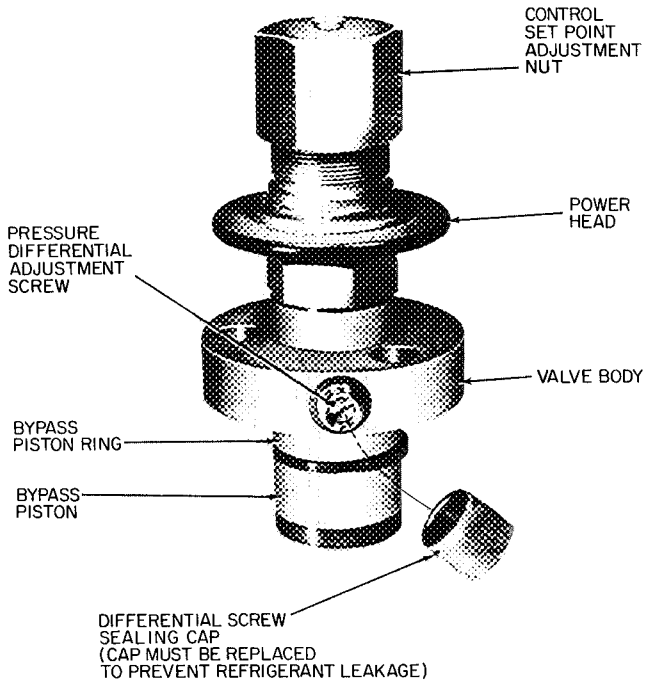


Fig. 2 – Pressure Operated Capacity Control Valve

CONTROLS AND VALVE SETTING – ELECTRIC UNLOADER

Controls for solenoid valve operation must be field furnished. They may be either temperature or pressure operated. Valve setting is made on field-furnished control in accordance with job requirements.

VALVE SETTINGS – PRESSURE UNLOADER

Valve Adjustment Range – The control set point (cylinder load point) is adjustable from 0 psig to 85 psig. The pressure differential between the cylinder load point and cylinder unload point is adjustable from 6 psi to 22 psi. Refer to Fig. 3 and 4.

To Regulate Control Set Point – First turn the adjustment nut (Fig. 2) clockwise to its bottom stop. In this position, set point is 85 psig.

Now regulate to desired pressure by turning adjustment nut counterclockwise. Each full turn decreases set point by 7.5 psig (Fig. 3). Approximately 11½ turns counterclockwise will decrease control set point to 0 psig.

To Adjust Pressure Differential – Turn differential adjusting screw (Fig. 2) counterclockwise to its back-stop position. Differential is now 6 psi.

Now adjust to desired differential by turning screw clockwise. Each full turn increases differential by 1.6 psi (Fig. 4). Approximately 10 turns clockwise will increase pressure differential to 22 psi.

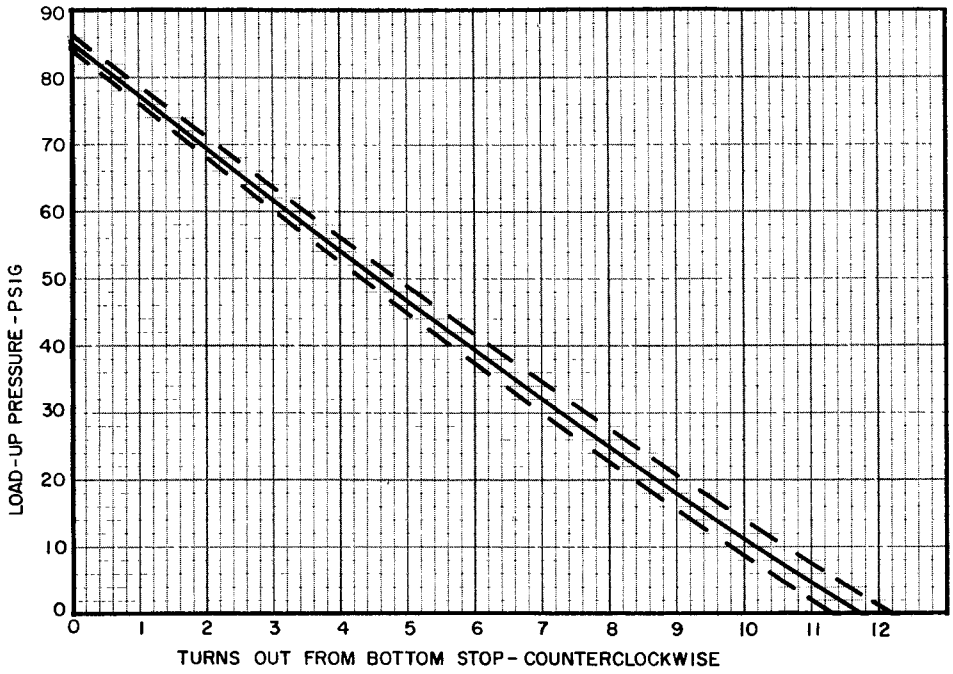


Fig. 3 – Control Set Point

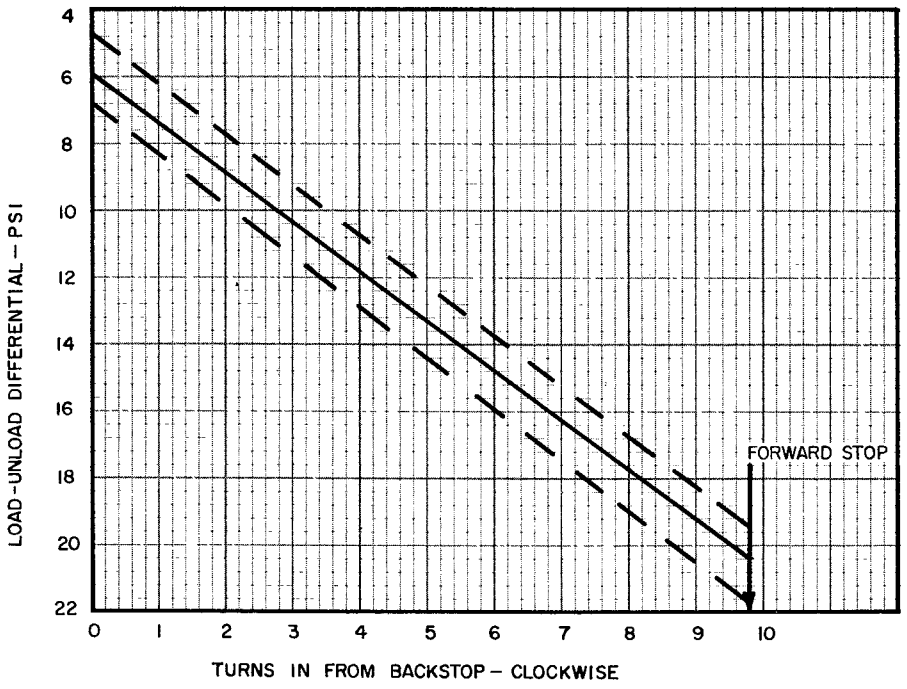


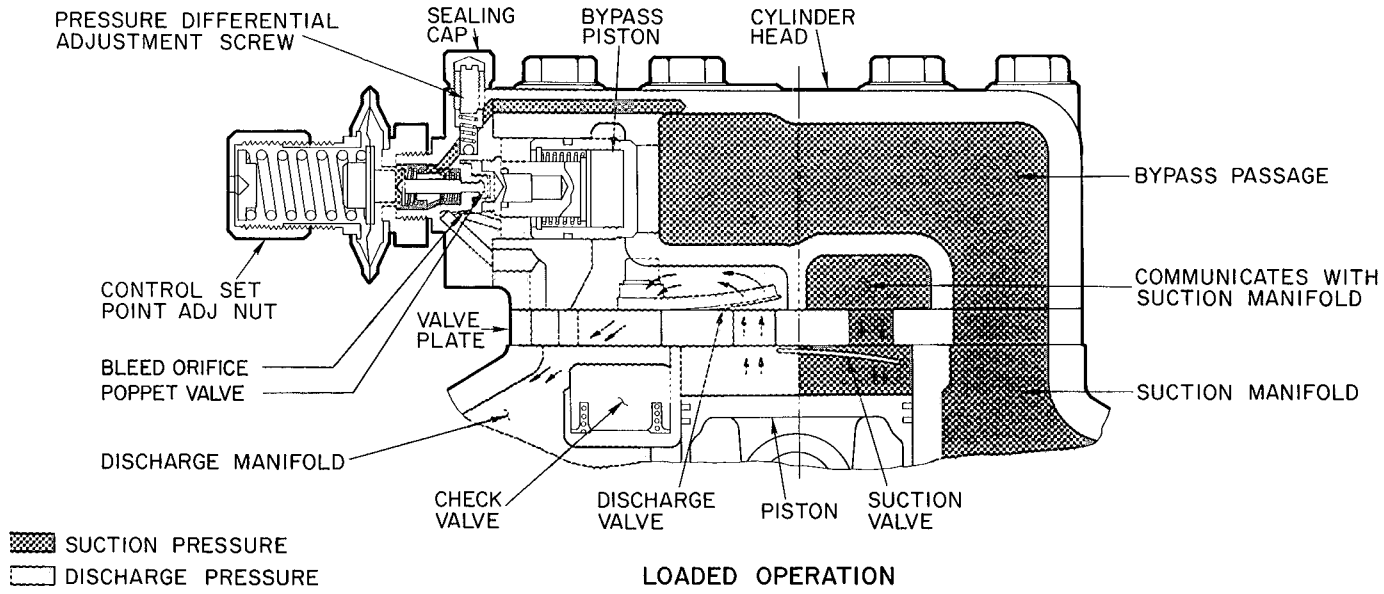
Fig. 4 – Differential Set Point

CAPACITY CONTROL VALVE OPERATION

NOTE: When electric unloader solenoid is energized, compressor cylinder bank unloads; when solenoid is de-energized, cylinder bank loads up.

Loaded Operation – When suction pressure is above control set point, bleed orifice poppet valve (Fig. 5) closes. Discharge gas bleeds into valve chamber, pressure closes bypass piston and cylinder bank loads up. Discharge gas pressure forces check valve open, allowing gas to enter discharge manifold.

Unloaded Operation – When suction pressure drops below control set point differential, poppet valve opens. Discharge gas bleeds from behind bypass piston into suction manifold. Bypass piston opens, discharge gas recirculates back to suction manifold and cylinder bank unloads. Reduction in discharge pressure allows check valve to close, isolating cylinder bank from discharge manifold.



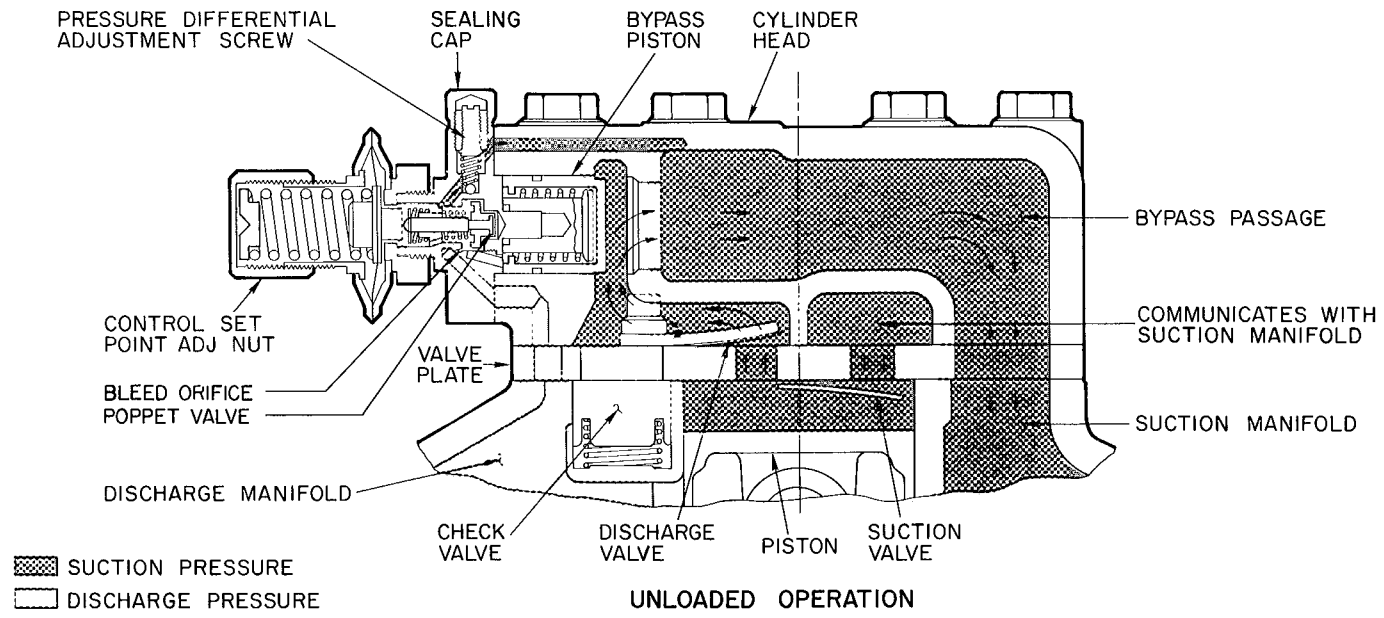


Fig. 5 – Capacity Control Valve Operation (Pressure-Type Hot Gas Bypass Unloader Shown)