INSTRUCTIONS

99TA516174 (for RCD use only)

Instruction Sheet Number: **99TA516174**

Description: Capacity Control Valves For 06D, 06E Compressors

Author: R.R./T.S. Date: March 27, 2014

Part Number: 06DA660175, 06DA660176 (REPLACES 06EA660135 & 06EA660100)

This control valve package can be used either for hot gas bypass cylinder unloading or suction cutoff cylinder unloading.

HOT GAS BYPASS APPLICATION:

This type of unloading can be identified by the external physical appearance of the cylinder head (Fig. 1).

For hot gas bypass applications the piston contained in this package must be field assembled to the control valve. Assemble 06DA508844 threaded stud into the brass body of the capacity control valve and torque to 5 in-lbs. using a 5/32" allen wrench (this step required only for electrically actuated valve.) Install 5/16 in. lockwasher and piston assembly onto threaded stud. Pull piston assembly away from the brass body of the capacity control valve, insert ½" wrench onto flats of piston assembly and torque to 84 in-lbs.

SUCTION CUTOFF APPLICATIONS:

Fig. 2 identifies a suction cutoff type cylinder head. For this application, the valve piston contained in this package is not used and should be discarded.

CAPACITY CONTROL INSTALLATION (HOT GAS BYPASS):

06DX and 06EX service compressors are supplied with one plugged hot gas bypass unloader head and will operate fully loaded as received.

CAUTION: Screws are not interchangeable between cover plate and control valves.

To change or add a control valve, disconnect power to the unit, valve off and purge pressure from the compressor. Remove the three Allen head screws holding valve or cover in place. (Fig. 4, 5). CAUTION: Cover is under spring tension. Remove the control valve or bypass piston plug. Install control valve and piston in the compressor head per Fig. 5 using new gaskets supplied in package.

ORIENT THE GASKET WITH THE CUTOFF ALIGNED WITH THE GAS PORT AND TORQUE ¼-28 SCREWS TO 12-16 LB.-FT.

SUCTION CUTOFF UNLOADING:

06ET and 06DS service compressors are supplied with one blocked suction cutoff unloader head and will operate fully loaded as received.

CAUTION: Screws are not interchangeable between coverplate and control valves.

To change or add a control valve, disconnect power to the unit, valve off and purge pressure from the compressor. Remove the three Allen head screws holding valve or cover in place. (Fig. 4, 5).

CAUTION: Cover is under spring tension. Remove the control valve or blocking sleeve. Install control valve (without piston attached) in the compressor cylinder head per Fig. 5 using new gaskets supplied in package.

ORIENT THE GASKET WITH THE CUTOFF ALIGNED WITH THE GAS PORT AND TORQUE ¼-28 SCREWS TO 12-16 LB.-FT.

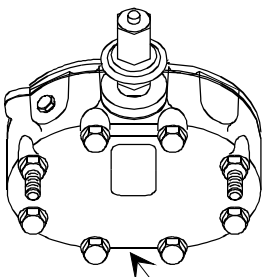
ELECTRICALLY OPERATED CONTROL VALVE

Electrically operated control valve is actuated by an electric solenoid which must be the same voltage as the unit control circuit. NO ADJUSTMENTS TO THE CONTROL VALVE ARE REQUIRED. When the solenoid is de-energized, the compressor will operate in the loaded condition. When the solenoid is energized, the compressor will operate in the unloaded condition.

The capacity control valve included in capacity control valve package, part number 06EA660135, must be used with an unloader solenoid coil. See table below for electrical characteristics and part number.

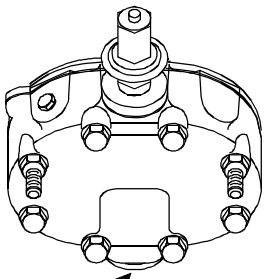
ELECTRICAL CHARACTERISTICS	PART NUMBER
24-1-50/60	EF19ZZ001
120-1-50/60	EF19ZZ002
208/240-1-50/60	EF19ZZ003
12V DC	06DA401824
24V DC	06DA401834

A solenoid coil anti-rotation pin is supplied in this kit. Press pin into engagement hole adjacent to stem of control valve. Mount coil to stem taking care to align proper hole (located at bottom side of solenoid coil) with pin.



HOT GAS BYPASS UNLOADING

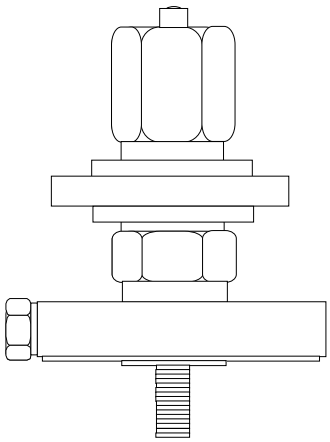
FIG. 1



NOTE DIFFERENCE IN HEAD DESIGN

SUCTION CUTOFF UNLOADING

FIG. 2



PRESSURE TYPE UNLOADER SHOWN
FIGURE 3

CAPACITY CONTROL ADJUSTMENT (PRESSURE TYPE):

Control Set Point (cylinder load point) is adjustable from 0 PSIG to 85 PSIG. Pressure differential between cylinder load-up point and cylinder unload point is adjustable from 6 PSI to 22 PSI.

To regulate Control Set Point (refer to Fig. 6): Turn adjustment nut clockwise to its bottom stop. In this position, set point is 85 PSIG. Control set point is then regulated to desired pressure by turning adjustment nut counter-clockwise. Each full turn decreases set point by 7.5 PSIG. Approximately 11-1/2 turns counterclockwise will decrease set point to 0 PSIG.

Pressure Differential Adjustment (Fig. 6): Turn differential adjusting screw counterclockwise to its back-stop position. In this position, differential is 6 PSI. Pressure differential is set by turning adjustment screw clockwise. Each full turn increases differential by 1.5 PSI. Approximately 10 turns clockwise will increase pressure differential to 22 PSI.

CAPACITY CONTROL VALVE OPERATION:

Capacity Control Valves are of the snap-action type. They are controlled by suction pressure and actuated by discharge pressure. Electrically actuated solenoid unloaders are available as an accessory. Each valve controls 2 cylinders. On start-up, controlled cylinders do not load up until differential between suction and discharge pressure is 19 PSIG.

Do not use automatic pumpdown control on any compressor equipped with unloader valves. Use single pumpout for solenoid drop (minimum protection) control.

HOT GAS BYPASS UNLOADER OPERATION(Fig. 7):

Loaded Operation * - Capacity control valve is activated by suction pressure. Suction pressure trip point is set by control set point adjusting nut. This nut controls tension of control set point spring which, when varied, sets point at which suction pressure overcomes spring, thus determining loading point.

When suction pressure rises high enough to overpower control set point spring, spring compresses and moves away from poppet valve. This action leaves free space at left of poppet valve. Poppet valve has two

springs: a centering spring and a drive spring. With no restriction at left of popped valve, drive spring can overcome centering spring, causing poppet valve to move left and close.

With poppet valve closed, discharge gas from manifold cannot vent into suction side and thus builds up forcing bypass piston to the right and closed. Pressure then builds up on top of discharge valve, forcing check valve open which vents discharge gas to discharge manifold.

Unloaded Operation - As suction pressure drops below set point, control set point spring expands and moves to right. This action forces poppet valve open and allows discharge gas to vent to suction side. Absence of discharge pressure allows internal springs in bypass piston to move it back to left which unloads cylinder head.

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

SUCTION CUT-OFF UNLOADER OPERATION (figure 8):

Loaded Operation * - Capacity control valve is activated by suction pressure. Suction pressure trip point is set by control set point adjusting nut. This nut controls tension of control set point spring which, when varied, sets point at which suction pressure overcomes spring, thus determining loading point.

When suction pressure rises high enough to overpower control set point spring, spring compresses and moves away from poppet valve. This action leaves free space at left of poppet valve. Poppet valve has two springs: a centering spring and a drive spring. With no restriction at left of poppet valve, drive spring can overcome centering spring, causing poppet valve to move left and close.

With poppet valve closed, discharge gas from manifold cannot vent into suction side, builds pressure back of the unloader piston and forces the valve body to the right. This opens the suction port allowing the bank of two cylinders to operate fully loaded.

Unloaded Operation - As suction pressure drops below the set point, the control set point spring expands and moves to the right. This action forces the poppet valve open and allows discharge gas to vent to suction side. Absence of discharge pressure on the unloader piston allows the valve spring to move the valve body to closed position blocking the suction port which unloads the cylinder head.

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

REMOVING, INSPECTING AND REPLACING COMPONENTS:

For instructions regarding inspection of lubricating system, replacing major components such as valve plates, bearings, pistons, rings, etc. consult your distributor for instruction sheets.

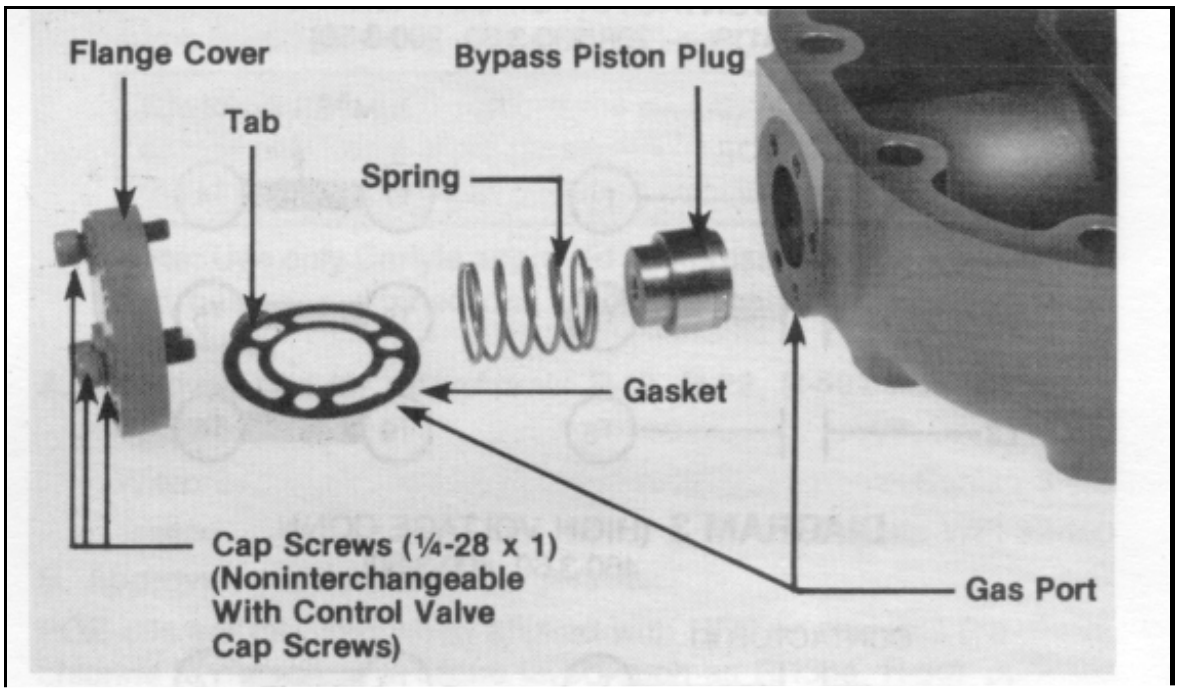


Figure 4 - Removal of Bypass Piston Plug

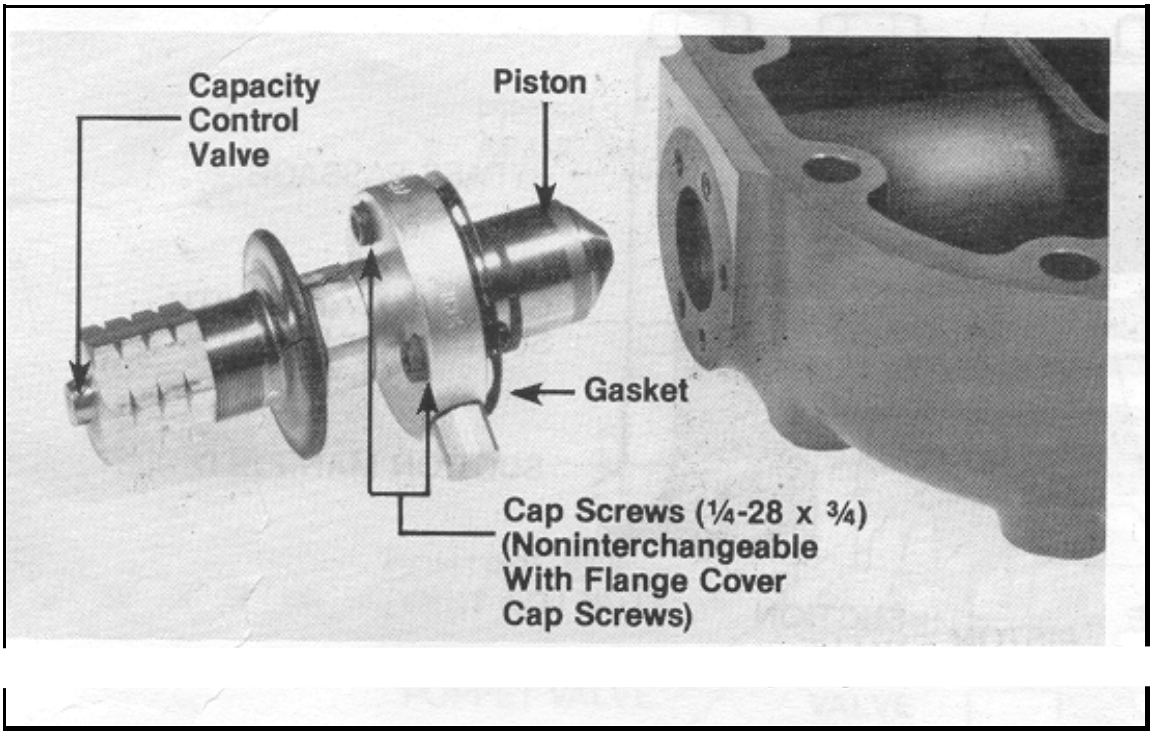


Figure 5 - Installation of Capacity Control Valve
(Piston is NOT USED on Suction Cut-Off Unloading)

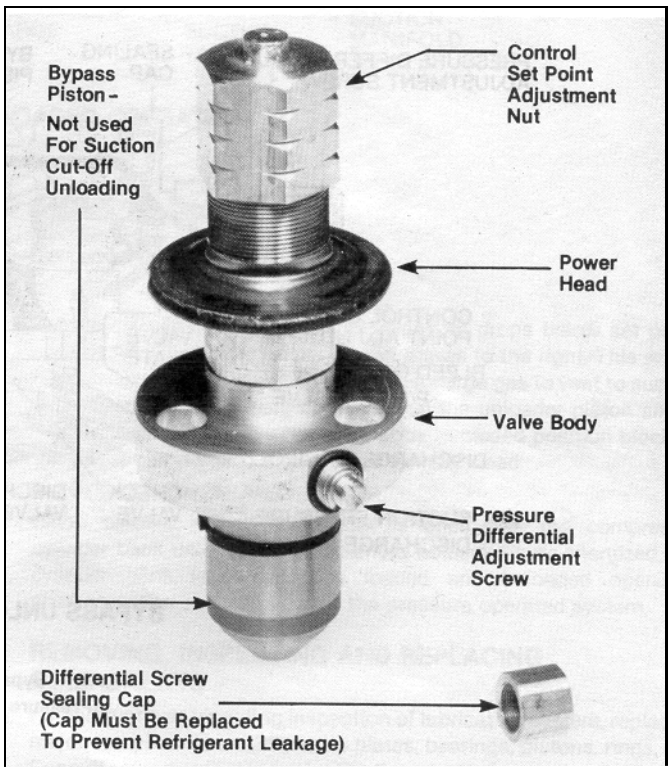


Figure 6 - Capacity Control Valve

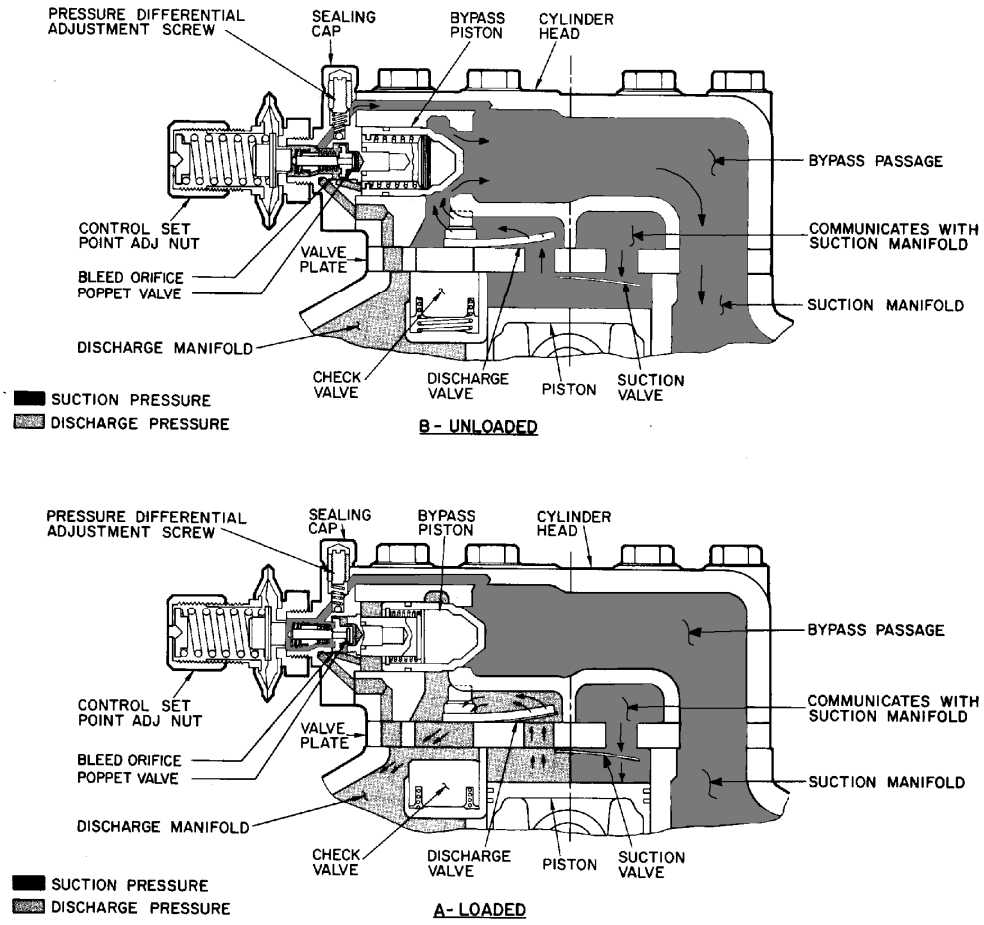
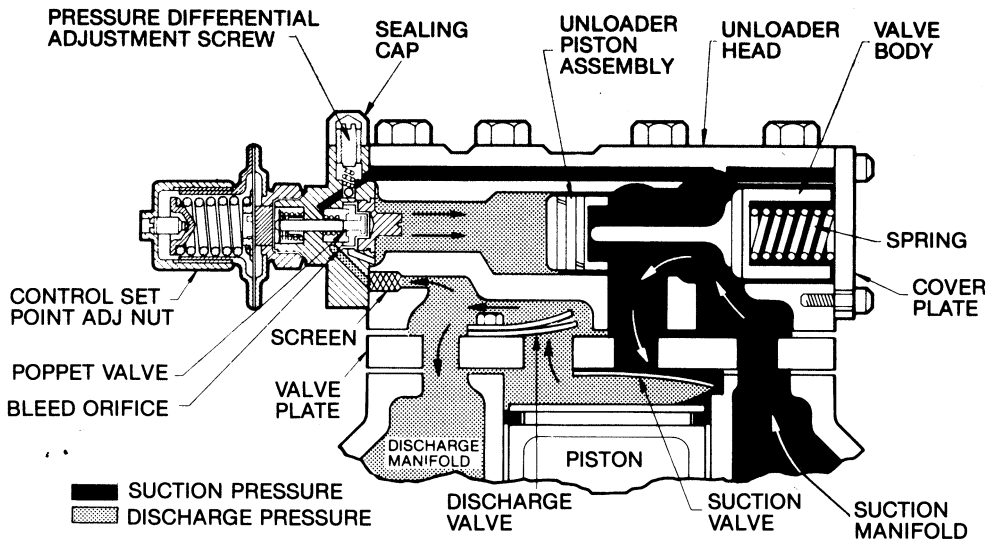
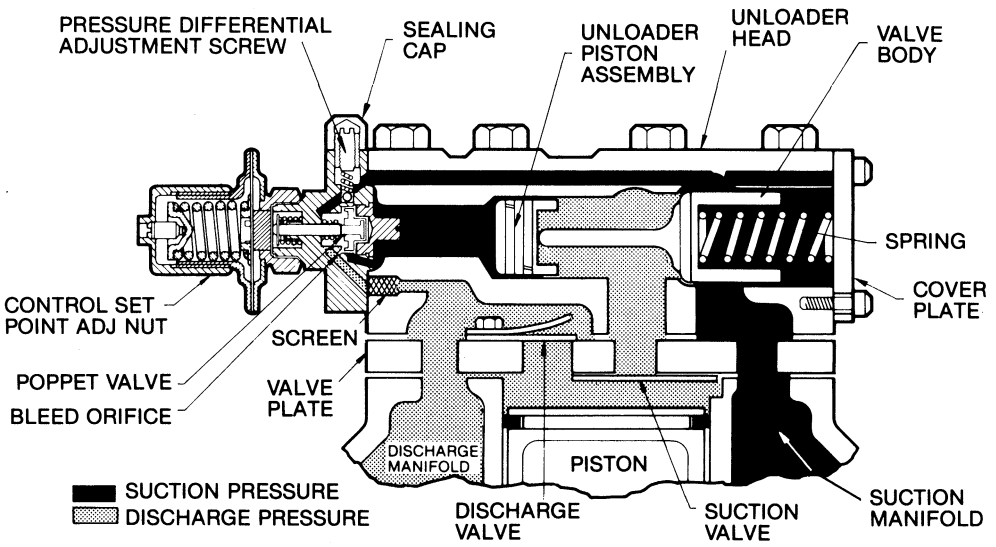


Figure 7 - Hot Gas Bypass Unloading Head

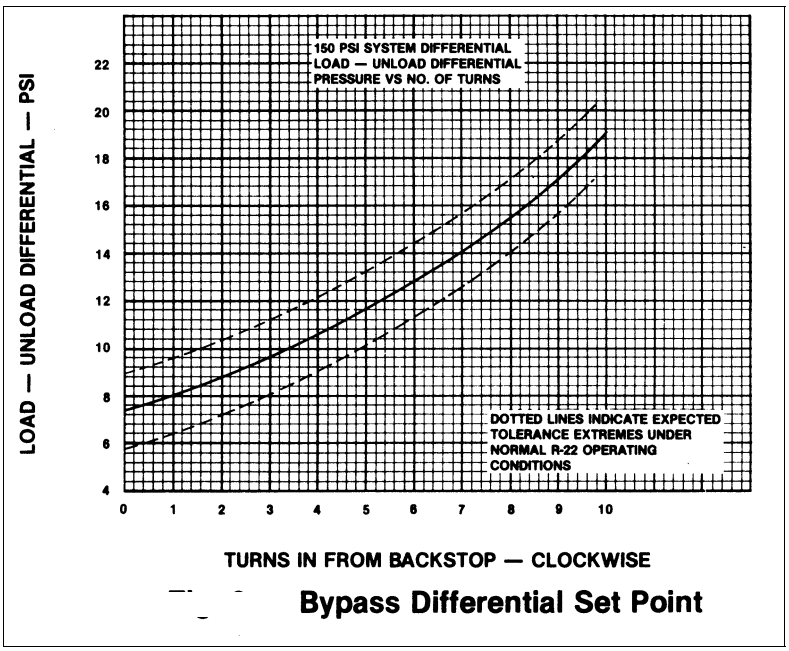


SUCTION CUT-OFF LOADED OPERATION

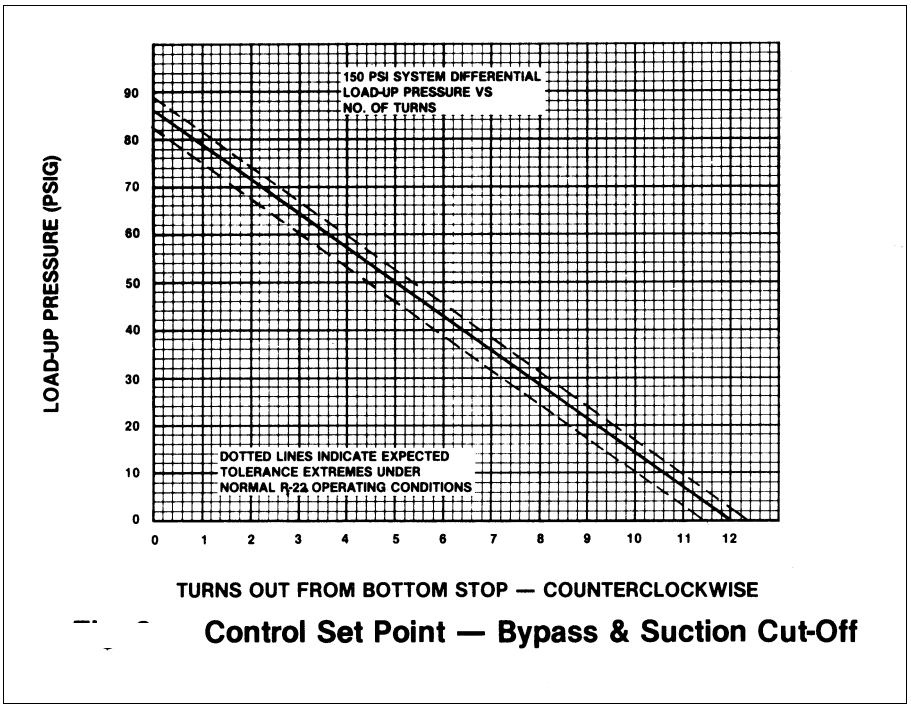


SUCTION CUT-OFF UNLOADED OPERATION

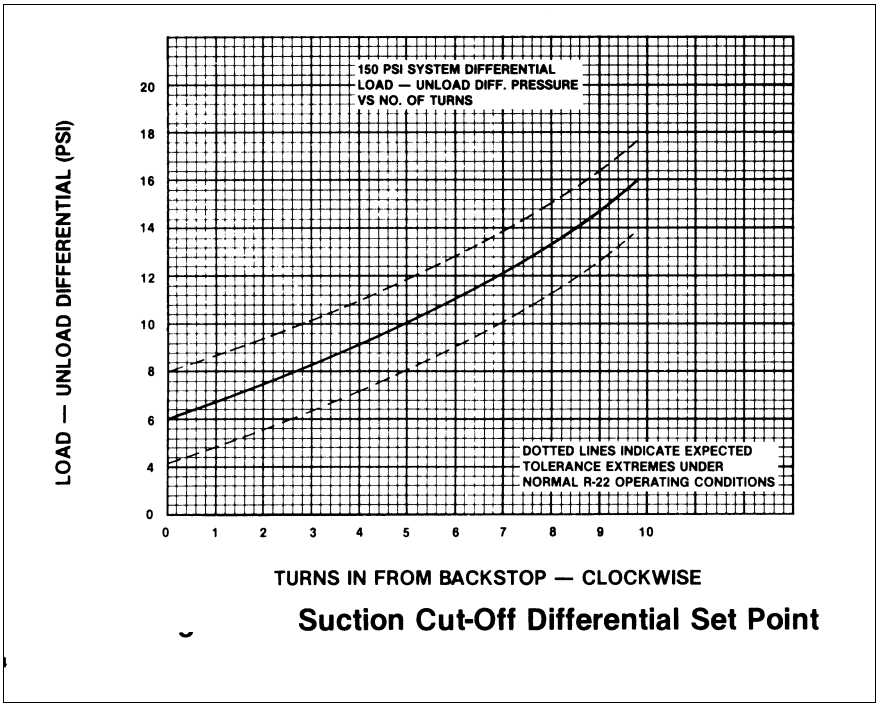
Figure 8 - Suction Cut-off Unloader Head



Bypass Differential Set Point



Control Set Point — Bypass & Suction Cut-Off



Suction Cut-Off Differential Set Point