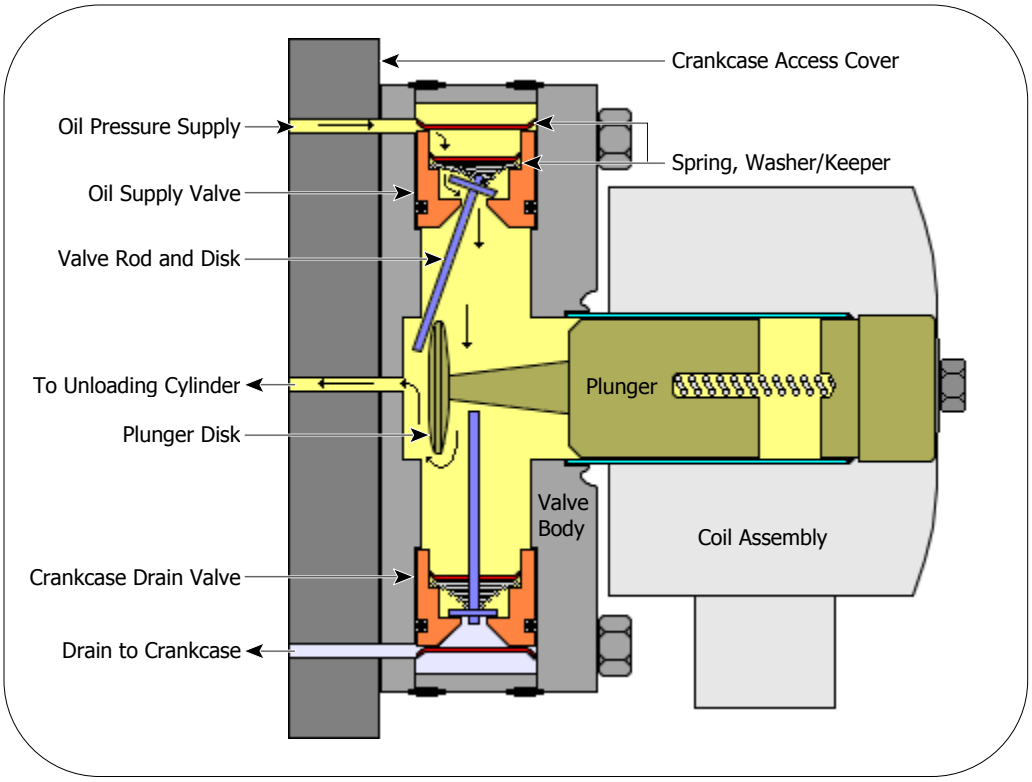
York
J Model Compressors
Unloading Characteristics
Styles A-F Solenoid Valve

Loaded - De-energized

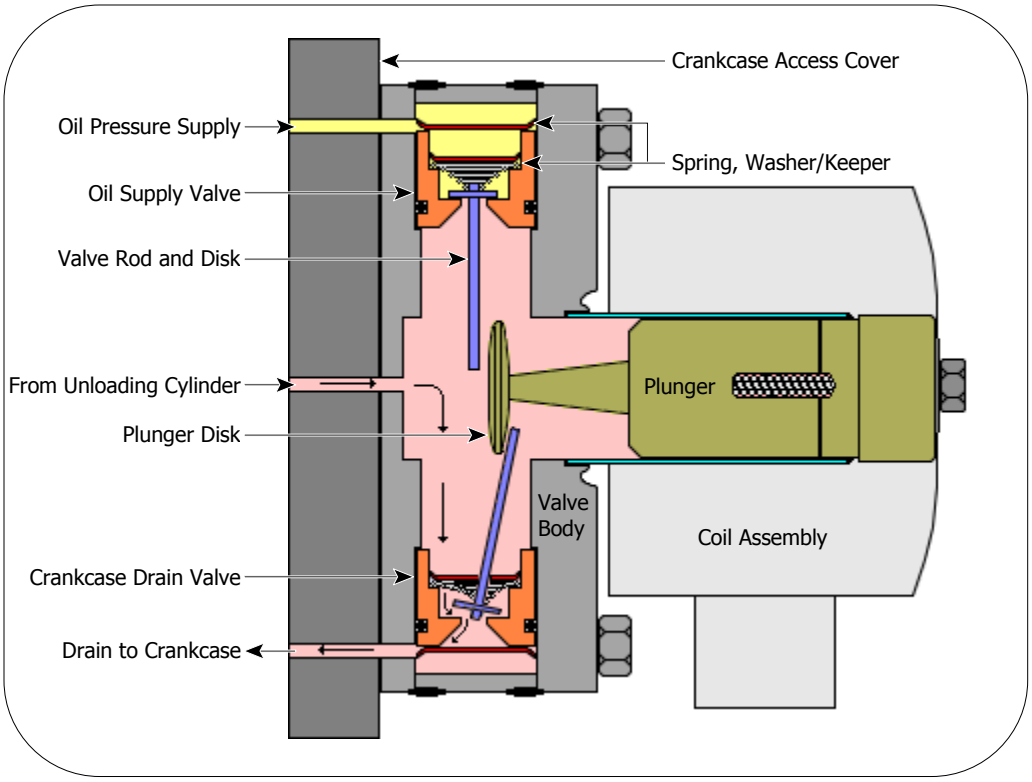


When the solenoid valve is de-energized the plunger spring forces the plunger towards the port which leads to the unloader power elements. The plunger disk contacts the oil supply valve rod and pushes it towards the unloader port. The disk which is part of the valve rod opens the port in its valve and allows oil pressure to flow into the main valve body and into the port leading to the unloader power elements. This loads the cylinders. The opposite valve rod/disk is held against its seat by spring and oil pressure keeping the port closed that leads to the crankcase.

The picture shows a later style solenoid valve. Earlier style valves had an external oil line supplying oil pressure to each solenoid valve. Later style valves receive oil from passages drilled into the crankcase access cover.

York
J Model Compressors
Unloading Characteristics
Styles A-F Solenoid Valve

Unloaded - Energized

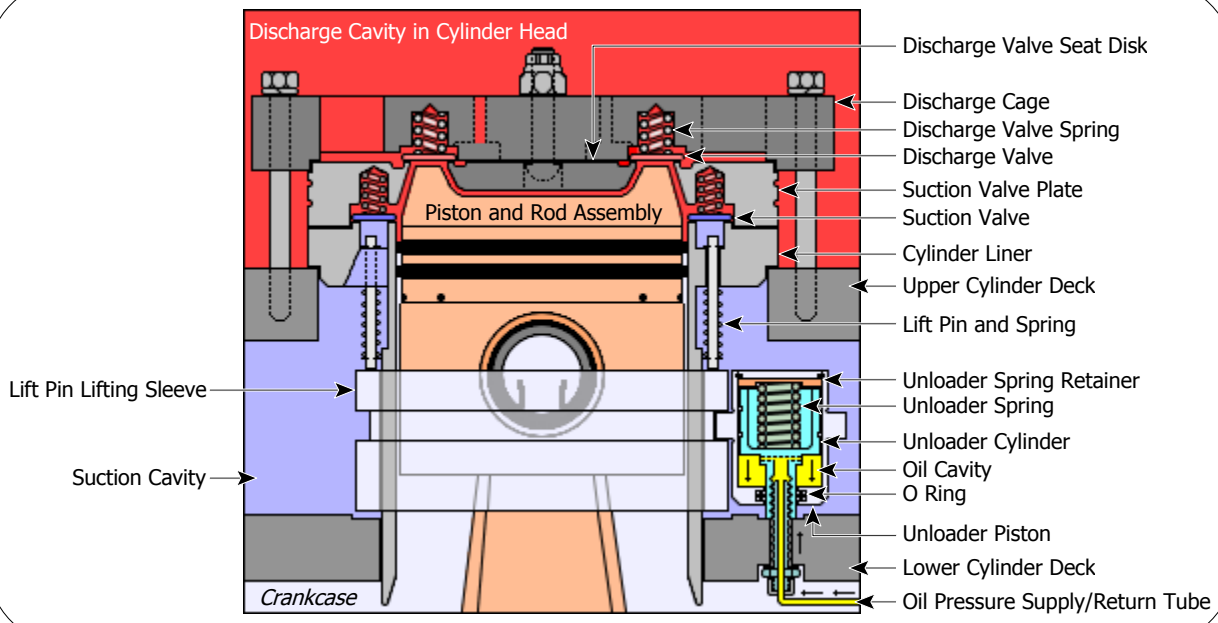


When the solenoid valve is energized the plunger is pulled towards the coil assembly. The plunger disk moves away from the oil supply valve rod and allows its spring and oil pressure to close the oil supply port. The plunger disk makes contact with the crankcase valve rod and moves the valve rod disk off its seat opening the crankcase port. The oil pressure built up in the unloader power elements is allowed to flow through the crankcase valve into the crankcase. This action unloads the cylinders.

The picture shows a later style solenoid valve. Earlier style valves had an external oil line supplying oil pressure to each solenoid valve. Later style valves receive oil from passages drilled into the crankcase access cover.

York
J Model Compressors
Unloading Characteristics
Unloading Cylinder Styles A-F

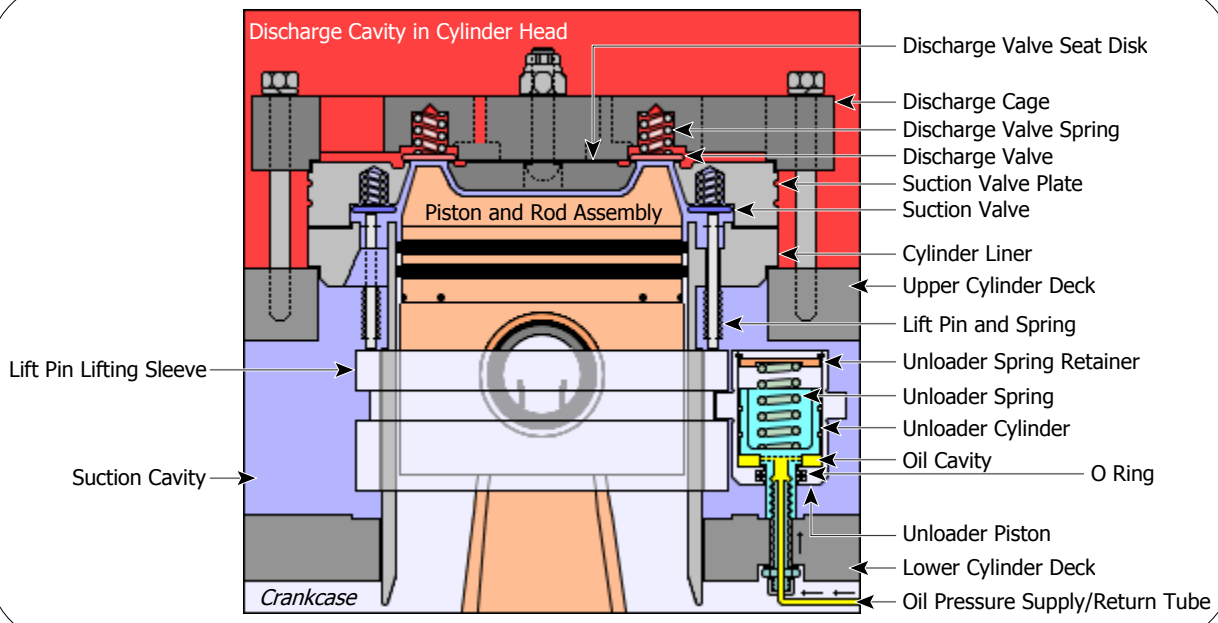
Loaded



When oil pressure is applied to the unloader power element the unloader piston is forced down against its internal spring. The unloader piston is indexed into a groove in the lifting sleeve therefore the lifting sleeve also moves down. The lift pins rest on the lifting sleeve and their springs force them down as well. The lift pins allow the suction valve to rest on its seats ground onto the cylinder. When the piston travels down in the cylinder the pressure lowers below the suction pressure in the suction cavity. The suction pressure then forces the suction valve open against its springs and fills the cylinder. When the pressure in the cylinder is equal to suction pressure the suction valve springs force the suction valve closed against its seats. As the piston travels upwards the pressure in the cylinder becomes greater than the discharge pressure in the cylinder head. The discharge valve is forced open against its springs and the pressure in the cylinder flows into the discharge cavity in the cylinder head. When the pressure in the cylinder equals discharge pressure the discharge valve springs force the discharge valve closed against its seats. As the piston travels downwards the cycle starts over.

York
J Model Compressors
Unloading Characteristics
Unloading Cylinder Styles A-F

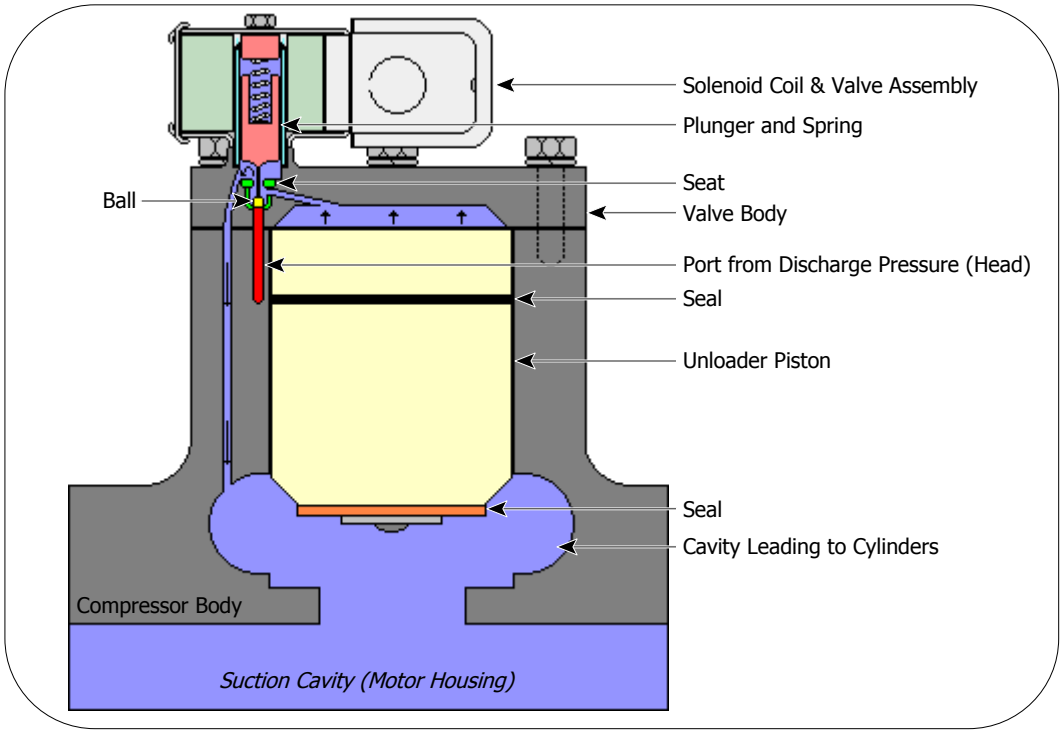
Unloaded



When oil pressure is allowed to drain from the unloader power element its internal spring forces the unloader piston upwards. Since the unloader piston is indexed into a groove in the lifting sleeve the lifting sleeve moves upwards also. The lift pins rest on the lifting sleeve and they are forced upwards too. They contact the suction valve and lift it off of its seats, againts it springs, to the fully open position. As the piston travels up and down in the cylinder suction gas flows in and out of the cylinder through the cylinder suction ports. Since the suction valve remains open, in this state, no compression takes place and the discharge valve remains closed throughout the cycle. This effectively unloads the cylinder.

York
J Model Compressors
Unloading Characteristics
Unloading Mechanism - Style G (Blocked Suction)

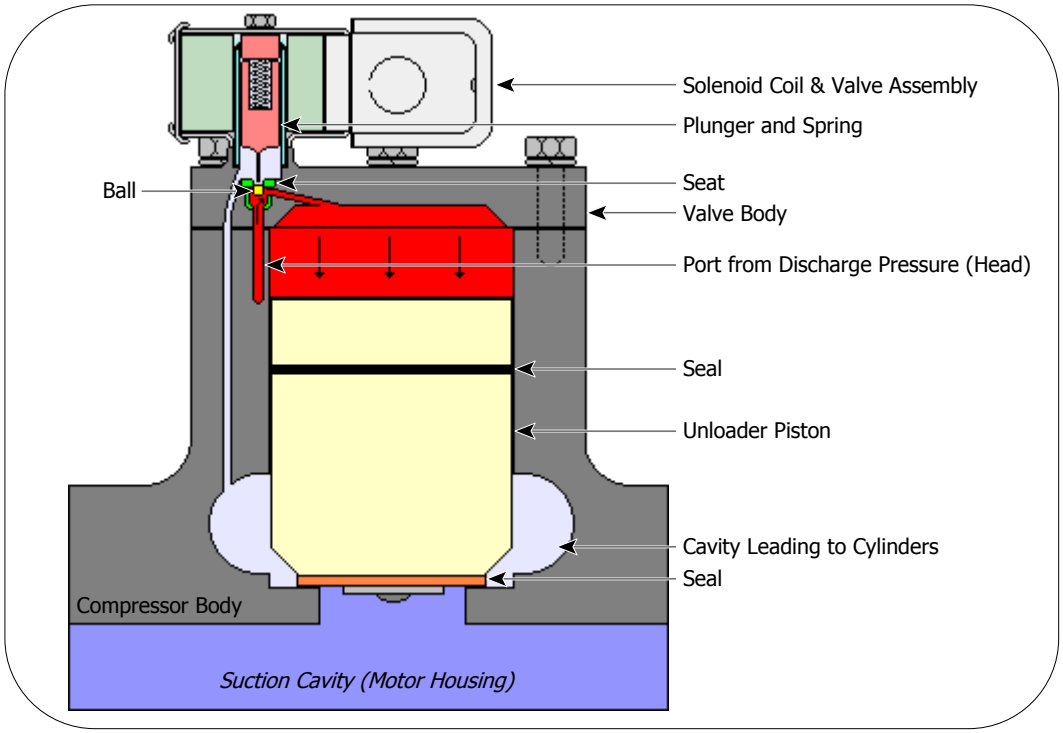
Loaded



When the solenoid valve is de-energized pressure on top of the suction blocking piston is allowed to flow into the cavity leading to the cylinders. As the cylinders pump the pressure in their suction cavity is lowered below the suction pressure in the motor housing. This difference in pressure forces the suction blocking piston upwards opening the port to the motor housing and suction gas flows into the cylinders and is pumped into the discharge cavity. This action loads the cylinders.

York
J Model Compressors
Unloading Characteristics
Unloading Mechanism - Style G (Blocked Suction)

Unloaded



When the solenoid valve is energized a port from discharge gas pressure is opened and the discharge gas is allowed to flow to the top of the suction blocking piston. This pressure forces the piston down and seals off the port leading to the motor housing thus cutting off the flow of suction gas to the cylinders. As the cylinders pump, the pressure in their suction cavity lowers to a point where there is no longer any pumping action. This effectively unloads the cylinders.