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## THROTTLE AND CHOKE PULL SOLENOIDS

Many of the engines we use in our scissorlift and boomlift models utilize a simple pull solenoid to operate the engine throttle and choke. The solenoid consists of a steel plunger that is placed inside a wound coil of copper wire. When this coil is energized, a magnetic field is produced which draws the plunger into the magnetic field. The other end of the plunger is connected to the throttle or choke lever to be operated.

The majority of the solenoids we use are generically known as dual-coil, internally switched devices. Dual-coil solenoids have two coil windings: a 'pull' coil and a 'hold' coil. The pull coil is a large winding, and energizing this winding produces the solenoids maximum pull force and is used to initially retract the plunger. The hold coil is a smaller winding which produces a weaker pull force and is used to hold the plunger in its retracted position.

When the solenoid is activated, both coils are powered to produce the strongest pull force possible. Once the plunger is fully retracted, power to the pull coil is shut off and only the hold coil is powered to hold the plunger in place. To accomplish this, when the plunger is fully retracted into the solenoid body, it makes contact with an internal switch in the bottom of the bore which opens the circuit to the pull coil; depowering it.

The most common cause of solenoid failure is incorrect adjustment of the plunger and linkage resulting in burnout. If the plunger does not bottom out in the solenoid bore, the internal switch will not open the circuit to the pull coil. Because of the high amp draw of the pull coil, if it remains powered for a long period of time it will heat up and literally 'cook' the solenoid internally. A burned out solenoid can cause the main circuit breaker to trip, shutting down the machine or not having any high throttle function.

When installing or replacing the solenoid, make sure the solenoid is mounted securely and the plunger movement is in a straight line with the lever to be actuated. Check under the solenoid boot and make sure there is no spring under it. If a spring is present, remove it. Manually pull the plunger into the solenoid, making sure it is completely 'bottomed out' in the bore, this will insure the internal switch is opened - breaking power to the pull coil. While holding the plunger in that position, adjust the clevis on the threaded end of the plunger to set the throttle or choke lever to the proper position. Lock the clevis into place and test the solenoid operation. Make sure the lever being actuated is moving freely so the solenoid can pull it easily. Then check that the solenoid plunger is not allowed to move out of the solenoid body too far; or the magnetic field will not be able to pull it in. The solenoid mounting may have to be adjusted to accomplish this. Proper solenoid installation and set-up is critical to proper operation and long life.

At Skyjack Product Support, we want your Skyjack equipment to operate safely and dependably. If you have any questions regarding your Skyjack product, please contact product support at 1-800-275-9522, or email [service@skyjack.com](mailto:service@skyjack.com).