

What the HECK is a CONTACTOR?

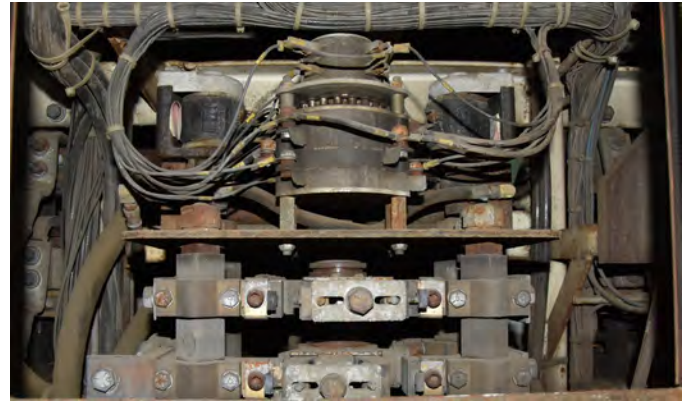
- WP FUNDAMENTALS of ELECTRICAL EQUIPMENT

The voltage of the generator can push current to the traction motors whenever the circuit between generator and motors is complete. A complete circuit includes a power contactor.

A power contactor is a remotely controlled switch. When the engineman desires to move his locomotive, he operates controlling levers which automatically cause power contactors to close to pass current from the generator to the traction motors. It is necessary that the contactor be remotely controlled, because of the fact that several locomotive units, each incorporating its own diesel engine, main generator and traction motors, may have to be operated from one throttle stand. Obviously, the engineman could not walk through the various units, manually closing the power contactors of each unit. Instead of this, the contactors must all be controlled from his position in the leading unit.

The figure below illustrates the remote control circuit which operates a contactor. When it is desired to run the fuel pump motor, the switch "5" is closed to allow battery current to flow through the operating coil of the contactor. This flow of current magnetizes the core and the latter then pulls the contact to closed position to permit current to reach the fuel pump motor. This power contactor is called a magnetic contactor.

Magnetic contactors are used in the fuel pump motor circuit, generator field circuits, and other small motor circuits. However, if the contactor is



*Cam switch contactor for the traction motors from SP 2873. That is what you hear clicking when you go from power to dynamic brakes. Additional SP 2873 electrical photos are available online at WPLives.org/trainsheet192.
Photo by Greg Elems*

to be used in a traction motor circuit, it will be called upon to pass very heavy currents and it is important that the contactor contacts are pressed together very tightly. For this reason, pneumatic contactors are used.

The pneumatic contactor makes use of a solenoid and an air valve. When the engineer pulls his throttle from "Idle" to notch 1 the throttle closes a small contact which supplies voltage and current to a solenoid. When current flows through the solenoid coil, it moves the solenoid core by magnetic attraction and the moving core opens an air valve. The air valve admits control air pressure to the contactor's air cylinder where the air causes a piston to push the main contacts together. Proper control air pressure ensures that the contacts will be pressed together tightly.

The solenoid and air valve are usually mounted in the same assembly. The assembly is called a "magnet valve".

When low current circuits must be controlled remotely, a relay is used. A relay operates in the same manner as a magnetic contactor. However, its contacts are much lighter in construction than those of the magnetic contactor. This is true because the relay contacts rarely have to pass more than a very few amperes and therefore need not be heavily constructed.

