LIONEL SERVICE MANUAL

NO. 282 PORTAL GANTRY CRANE

Lionel No. 282 Portal Cantry Crane, first built in 1954, has three separate electrical components the motor, the clutch solenoid and the electro-magnet -- all of which receive power from the controller cable and are grounded in common to the metal structure of the crane.

The motor is structurally similar to most Lionel motors but is equipped with a double-wound field for reversing. The ends of the field winding are connected to wires 1 and 2 of the controller cable, while the center tap is connected to the armature which is grounded through one of the brushplate screws. The direction of the motor's rotation depends on which of the two field winding ends is connected to the source of power by the position of the first controller lever.

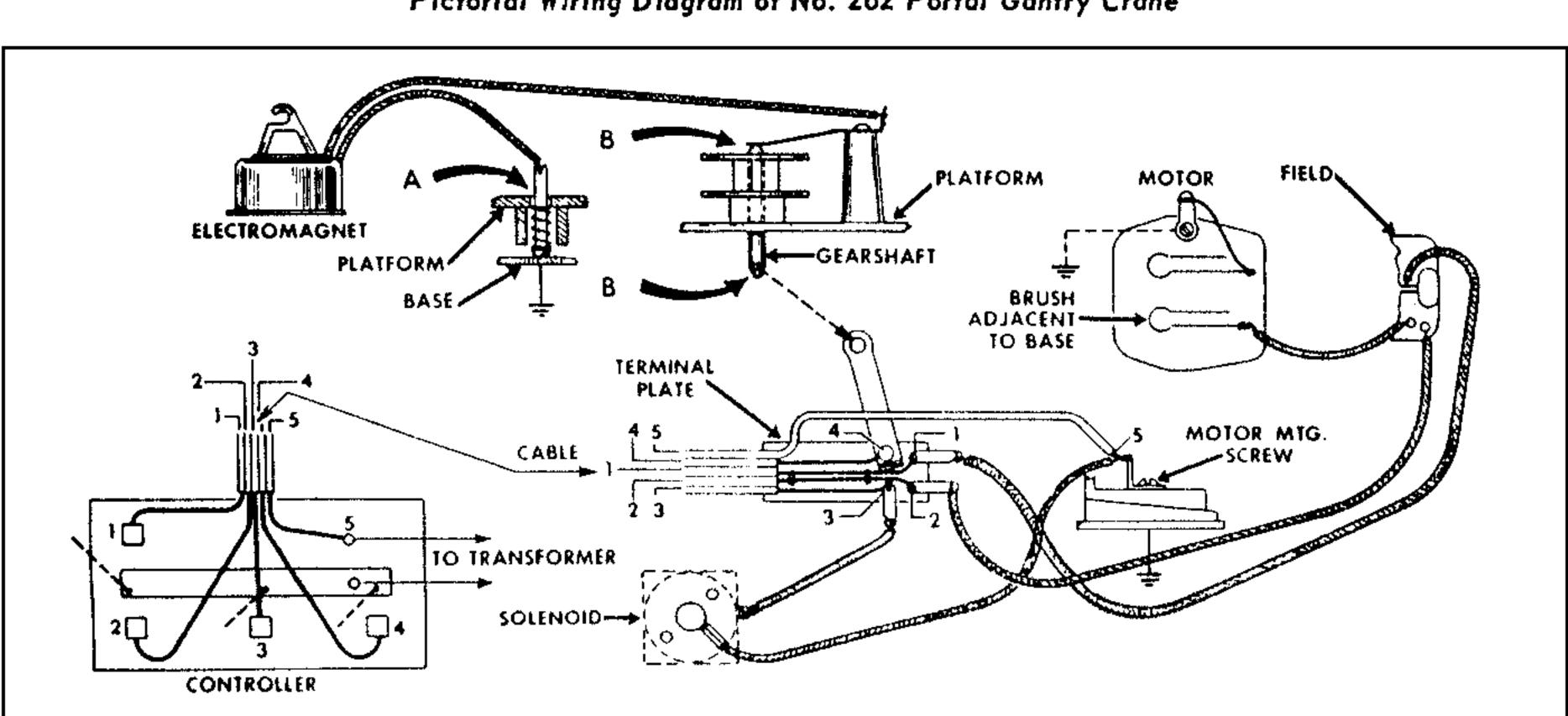
The clutch solenoid, which applies the motor either to rotation of the cab or to hoisting of the hook, receives power from cable wired 3 and is grounded through the solder lug held by one of the motor mounting screws. In its normal position the clutch is engaged to the gear train which rotates the crane cab, being held there by the tension of the clutch spring. When the clutch solenoid is energized by means of the second controller lever the clutch shaft is pulled into the solenoid coil and engages the gear train which winds up the hoisting line.

The electromagnet receives its power through cable wire 4 and through the two flat springs which make sliding contact with the two ends of the metal gear shaft at points B. The electromagnet coil is grounded through the spring-loaded rectangular pin A, which fits through the plastic platform and rides on the metal base of the crane. The electromagnet is energized by the third lever of the controller. Any failures of the electromagnet would most usually be due to poor electrical contacts at points B or by the binding of the grounding pin at point A.

Most of the service problems encountered with the Gantry Crane are due to the failure of the clutch to stay in engagement with either the rotating gear or the hoisting gear. To correct, first check the position of the clutch on the clutch shaft by moving the clutch shaft by hand. The clutch should be fully engaged with the hoisting gear at the same point where the shaft bottoms in the solenoid. To make sure of this, it might be necessary first to tap the clutch away from the hoisting gear in order to allow the shaft to bottom then to tap the clutch back into place while holding the shaft down in the sole noid.

After the clutch is correctly located, it might be necessary to adjust the tension of the clutch spring. If the spring is too weak there is a tendency for the clutch to pop out of engagement with the rotating gear. If the spring is too strong it will push the clutch out of engagement with the hoisting gear. One way to adjust spring tension is to tap the worm wheel along the clutch shaft in order to increase or decrease spring pressure against it. Another is to weaken or strengthen the spring itself either by stretching it or by cutting off a turn.

A properly functioning crane should be able to hoist a weight of approximately four ounces



Pictorial Wiring Diagram of No. 282 Portal Gantry Crane

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