OPERATION AND ADJUSTMENT OF ELECTRIC CONTROL ROD BRAKE MECHANISM FOR M.L. QUADDER (MANUAL AND ELECTRIC)

Sales Service Mergenthaler Linotype Company Brooklyn 5, N. Y.

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This Service Instruction covers that portion of the M.L. Quadder (both Manual and Electric) which is called the Control Rod Brake Mechanism.

The new mechanism is an improved design upon the mechanical control rod brake mechanism which is shown on figures VII, VIII and XII of Service Instruction No. 8 and it replaces the lever linkage and associated parts shown in these figures. Service Instructions No. 8, which covers the Manual M.L. Quadder, and No. 11, which covers the Electric M.L. Quadder, should be used in conjunction with this set of instructions which is a supplement to them.

The control rod brake mechanism on the M.L. Quadder has a two fold purpose. One, it holds the vise jaws in contact with the line of matrices for the first $\frac{1}{2}$ inch or so of lift of the first elevator, after the cast. This produces a wipe action which keeps the vise jaws clean and free of metal. Two, it locks the vise jaws in position between first and second justification so that the extra pressure pawls will engage the teeth of the quadder control rod properly.

The left hand vise jaw safety circuit is used as the source of power and operates in sequence with the new brake mechanism. The system is arranged so that the brake mechanism as well as the left hand vise jaw safety, are inoperative during non-quadding operation of the machine.

OPERATION

A rotary solenoid L-501 is mounted on a bracket 9, Fig. 1 adjacent to the quadder control rod 8. When the snap action switch S-501 is actuated by the flat plate cams 3, (C-2093) and 4, (C-2092 or C-2019, for Comet) screwed on the mold turning cam, solenoid L-501 is energized and the horizontal movement of the solenoid core causes a pivoting motion of a lever 7, Fig. 2. The other end of the lever 7 exerts pressure on a block 17 which presses on the brass friction shoe 18, contacting the quadder control rod 8. This shoe pressure on the control rod occurs twice during a quadding cycle, first, to prevent the vise jaws from opening between first and second justification and again to hold the jaws against the line of matrices after second justification, to provide a wiping action of the matrices against the jaws as the first elevator rises.

The timing of the energizing of solenoid L-501 is accomplished by the location of switch S-501 in relation to the flat plate cams 3 and 4. Switch S-501 is mounted on a bracket 2 which is fastened to the mold gear arm. Its position in relation to the flat plate cams 3 and 4 is adjustable by means of elongated holes in the mounting bracket. Also the bracket 2 can be adjusted to position switch S-501 for proper action.

The electrical circuit for energizing solenoid L-501 is tied in with the electrical left hand vise jaw safety circuit through Switch S-501 so that power is supplied to the left hand vise jaw safety. However, whenever switch S-501 is actuated, it disconnects the left hand vise jaw safety from the circuit. Current is then by-passed to the solenoid L-501, thus preventing any overloading of the circuit or unnecessary use of circuit components.

Switch S-501 is connected so that it operates as a single pole, double throw switch. The left hand vise jaw safety circuit (wire 502) is connected to the "C" terminal. The brake solenoid circuit (wire 503) is connected to the "O" terminal of switch S-501 so that it is only energized when the switch plunger is depressed. With this arrangement current would normally be flowing in the left hand vise jaw safety circuit. However, the fact that it is grounded to the machine frame and completion of the circuit is dependent upon the left hand vise jaw switch plunger being depressed, effectively breaks the circuit until the plunger is depressed by matrices being between the vise jaws.

Switch S-202 in the manual controlled M.L. Quadder circuit is used (as originally designed) to disconnect the left hand vise jaw safety circuit and control rod brake circuit when machine is being operated "regular". Switch S-202 is omitted from the electric quadder circuit since the disconnection of the left hand vise jaw safety circuit and control rod brake circuit for non-quadding is accomplished through two memory relays in the power and control box.

After the flat plate cams 3 and 4 have allowed the switch S-501 to deenergize the solenoid L-501, the pressure of the friction shoe 18 on the control rod 8, is relieved.

A plate rectifier CR-501, mounted on a bracket below the solenoid L-501, and pivoted lever assembly 7, is in the circuit to suppress the arch which may occur across switch S-501 terminals due to the conductance set up by the solenoid L-501 winding.

MAINTENANCE AND ADJUSTMENTS

Adjustment of the Pivot Lever Set Screw 12 - This set screw 12, which is in the end of lever 7 is contacted by the core of solenoid L-501 when it is energized. Adjust set screw 12 so that there is approximately .020" space between the ball bearing retaining plate 10 on the solenoid L-501 and the solenoid housing when the solenoid L-501 is energized. When the solenoid L-501 is deenergized the pressure on the control rod 8 should then release.

Adjustment of Switch S-501 - The switch S-501 is actuated by the two flat plate cams 3 and 4 fastened to the mold turning cam. The switch should open to deenergize solenoid L-501 and release the pressure on the control rod 8 only when the first elevator has risen from 1/2 to 3/4 of an inch, after the cast. The 2nd flat plate cam 4 (C-2019 or C-2092, for Comet) is designed to cause this action at the proper time but the timing may be varied slightly by shifting the switch S-501 on its bracket 2.

The switch S-501 is also closed after first justification and opened in time for the second justification to occur by action of the 1st flat plate cam 3.

CHECKING CONTROL ROD BRAKE CIRCUIT

The electrical circuits (see figures 3 and 4) for both manual and electric quadder brake action are identical with the exception of switch S-202 which disconnects the left hand vise jaw safety and brake action circuits when machine is being operated "regular". This switch S-202 is not included in the electric quadder circuit, since the disconnect action is taken care of by 2 relays in the power supply box.

The circuit operates on 18-22 volt Direct Current supplied through the rectifier box F-8480 located on the rear of the Linotype.

If the control rod locking action is not satisfactory, the following points should be checked:

1. Check adjustment of switch S-501 to be sure cam action on switch is occurring at proper times in machine and quadder cycle.

2. Make certain that 18-22 volt Direct Current is in the circuit by checking at switch S-501 and solenoid L-501. If voltage is not as specified check back further in circuit (i.e., at power supply transformer or rectifier) to be certain there is continuity.

3. Check switches S-501 and S-202 to be certain they are opening and closing properly. On the electric quadder check opening and closing action of relays K-102 and K-103.

4. Check solenoid L-501 with ohmmeter to be sure it is not defective. Resistance of solenoid L-501 should be between 17 and 21 ohms.

5. Check adjustment of set screw 12, Fig. 2, to be sure there is shoe pressure on control rod when solenoid L-501 is energized and that pressure is relieved when solenoid is deenergized.

6. Check all wire connections and at terminal points and connector plugs to be certain they are not open or grounded. Especially check wires at points where clamps hold them to machine frame or at points of possible contact from moving machine parts.

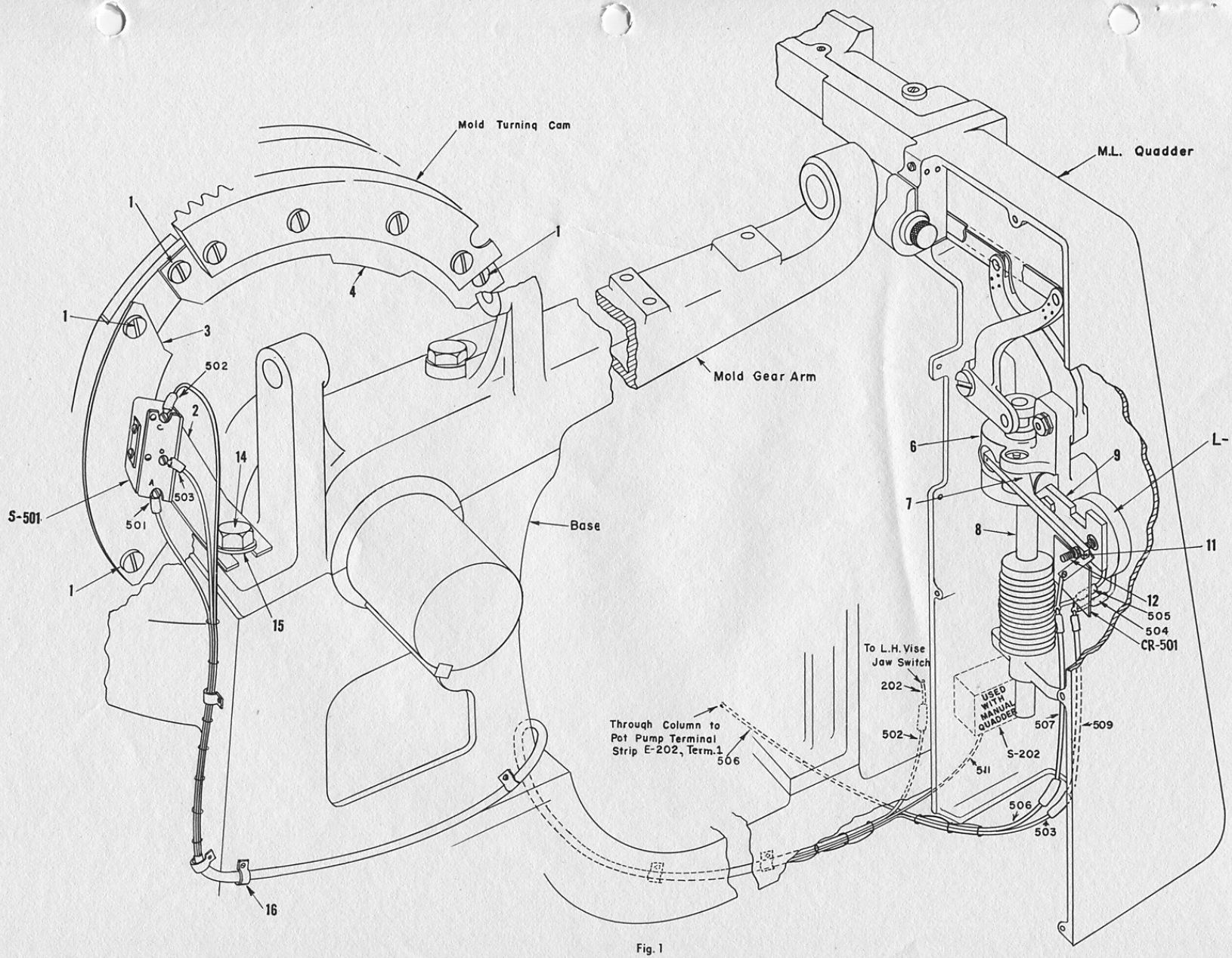


Fig. 1

View of Control Rod Brake Mechanism on ML Quadder.

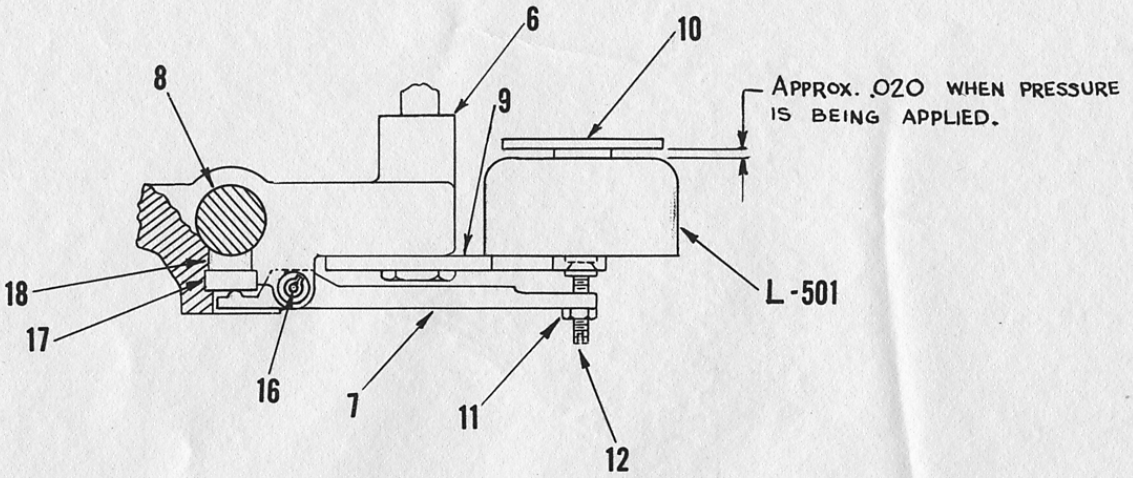


Figure 2
View Showing How Pressure is Applied to the Quadder Control Rod.

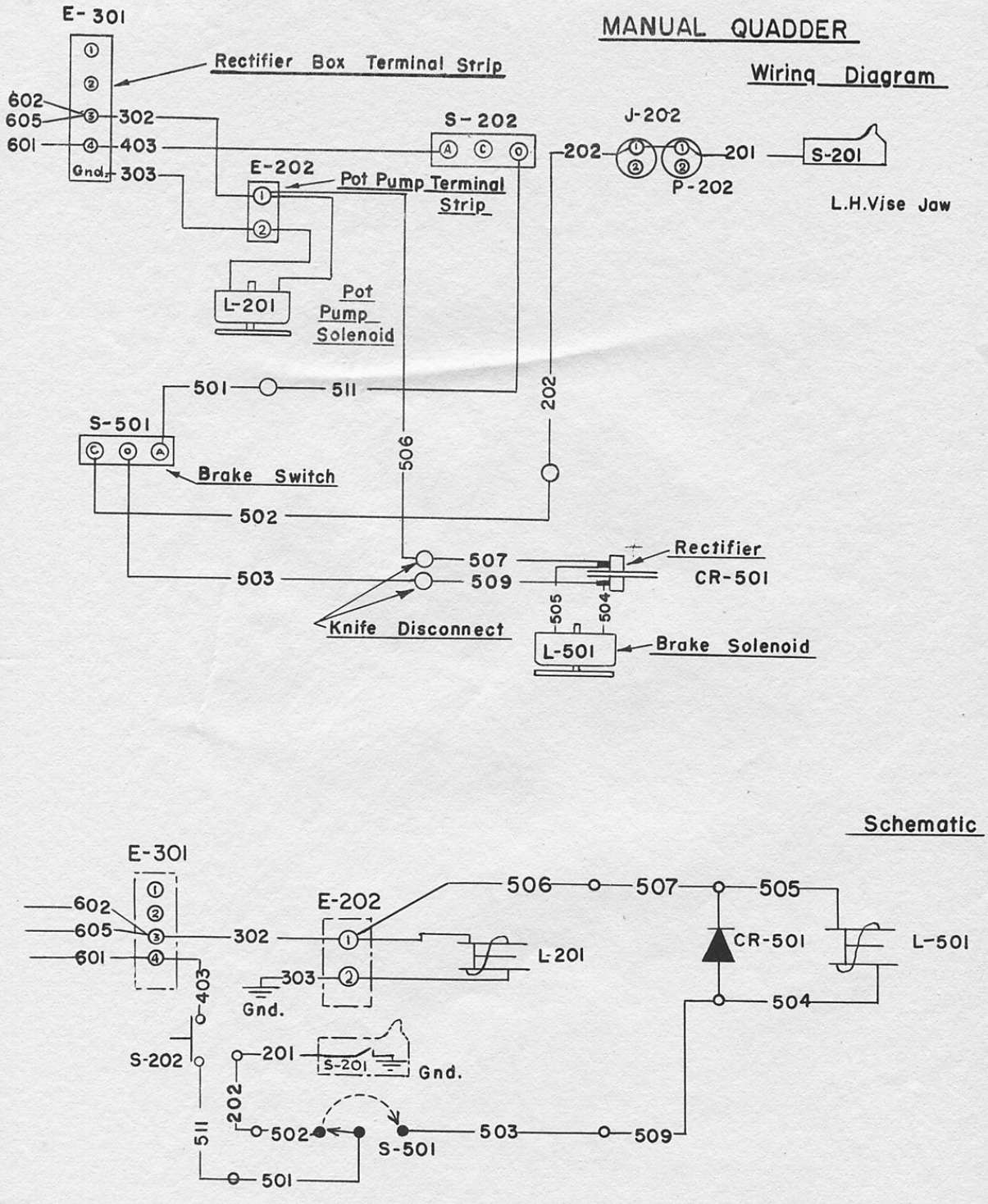
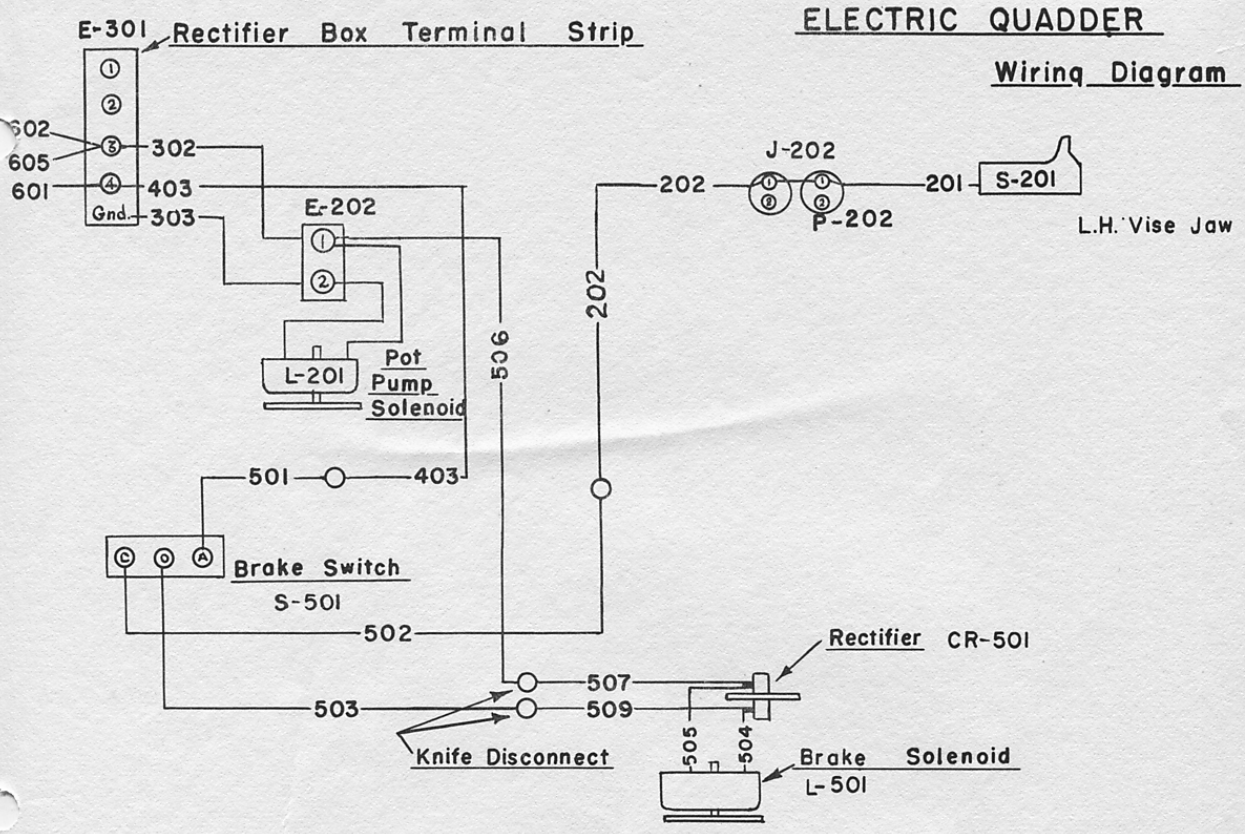


Fig. 3

Wiring Diagram and Schematic for Manual Quadder Brake Mechanism Circuit.



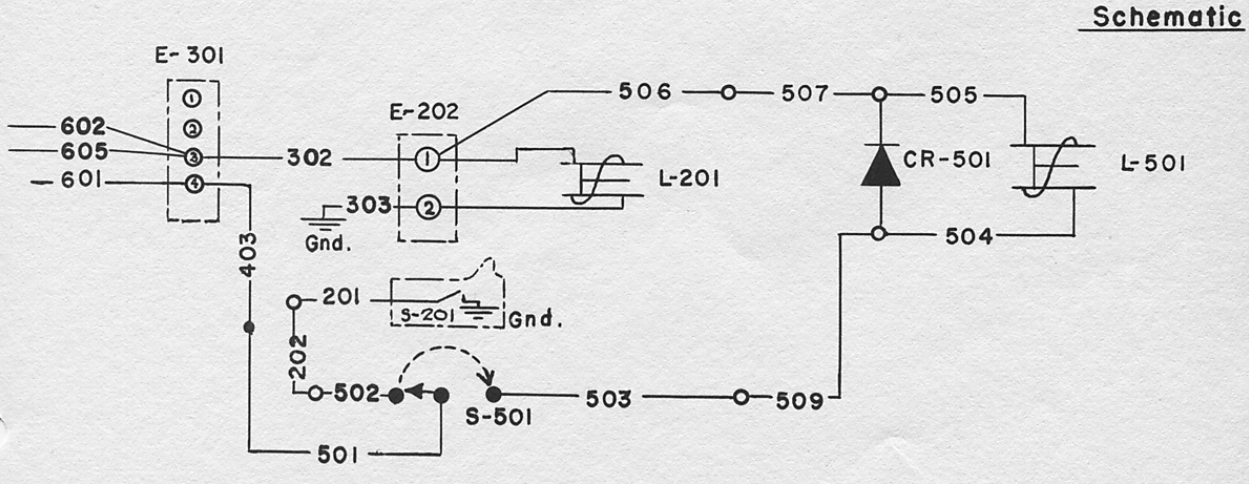


Fig. 4

Wiring Diagram and Schematic for Electric Quadder Brake Mechanism Circuit.