

Welcome to this new format of our wrapper electrical troubleshooting guide



*R.R. #3 Listowel, Ont. N4W 3G8
Tel. 519-291-4162 Fax: 519-291-5388*

**Tube-Line 5500 and 6500
Automatic
Electric Troubleshooting**

Year 2003

Tube-line 5500
2003
Contents

1. Control Panel Operation
3. Testing with 12 volt test light clamped to frame
4. Troubleshooting Automatic side of control panel
5. Introduction of wiring diagram
6. Main Circuit
7. Manual Ram Extend
8. Manual Ram Retract
9. Manual Hoop Rotate
10. Automatic Cycle Start
11. Automatic Cycle Start and Hoop Rotate
12. Automatic Cycle Ram Retract
13. Right Steering
14. Left Steering
15. Engine Stop
16. Electric Schematic
17. Relay and Base Pin Configuration

Tube-line 5500

2003 Troubleshooting Electrics

Control Panel Operation

White and Black wires from battery into control panel White wire is Negative -, Black wire is Positive +. This panel is Polarity sensitive. For this brief we will visualize battery current coming from positive and going to negative. All voltage reference is relative to term 0 or ground unless otherwise specified.

- Notice – Designations – (term #xx) refers to the terminal strip numbers.
Sign without the word term refers to the relay base terminals. Example (#xx)

- 1) 12 volt + coming from battery to 15 amp fuse
- 2) Terminal strip #0 is Negative or Ground potential
- 3) Current flows from fuse to on/off switch in panel door and lighting the LED in panel door we also have 12 volts on one side of the steering switch and green wire to one end of both steering solenoid coils.
- 4) With Man/Auto switch in “man” we have 12 volts on one side of the “for/rev and rot” switch.
- 5) Push “For” switch sending 12 volts to #10 on CR1 current flows through CR1 coil and out #2 on CR1 to term #3 on strip through closed limit switch at hoop to term #0 and ground thereby energizing CR1. With CR1 energized, contacts 1 – 3 close on relay base closing circuit between term #7 and term #4 current then flows from #4 through forward solenoid to term #3 and back through this limit switch, after the ram has extended to the limit switch “for” at the hoop and opens the switch, the circuit to CR1 and to “For” solenoid valve is broken and CR1 opens and solenoid valve shifts to neutral. Diode keeps current from flowing back to term #11 through contact 9 / 11
- 6) Push “Rev” switch sending 12 volts to term #6 through “Rev” solenoid valve to term #5 and back through the limit switch “rev” at the front of the table breaking the circuit to the valve.
- 7) Push “Rot” switch sending 12 volts to term #1 and through “Reel” solenoid valve to term #0
- 8) Automatic mode
- 9) With Man / Auto switch in “Auto” we have 12 volts on term #9. The safety door switches and the option film switches are in series with term #10 in this circuit. Opening any one or all of these switches will stop all current flow to all the relays. To restart after the cycle has been interrupted, turn to “man” and manually finish the cycle. The automatic mode runs with 12 volts on term #8. NOTICE – If no Remote Control is used a JUMPER wire is placed between Term #10 and term #8.
- 10) By closing table switch or “initiate” 12 volts flows from term #8 through the switch to term #11 and through diode to #10 on CR1 coil and out #2 on CR1 to term #3 on strip through closed limit switch at hoop to term #0 and ground. With CR1 energized, contacts 1 – 3 close on relay base closing circuit between term #7 and term #4 current then flows from term #4 through forward solenoid to term #3 and back through this limit switch, at the same time contact 11 / 9 close on relay base closing circuit between term #8 and term #11 thereby current then holds this relay energized until it is broken by opening “For” limit switch by the hoop.

- 11) Hoop will start when "Rot" limit switch is closed. 12 volts flow from term #8 through contact #6 and #7 on CR1 that are activated at this time to term #14 and through "Rot" switch to term #15. Current flows from term #15 to #10 on CR2 coil and out #2 on CR2 to term #0 or ground. With CR2 energized contacts 11- 9 close thereby bypassing "Rot" switch and holding relay closed, It is broken by the opening of contacts 7 – 6 on CR1. With CR2 energized contact 3 – 1 on CR2 will close and current will flow from term #7 through these contacts to term #1 from term #1 it goes through Reel solenoid coil back to term #0 and ground. Notice – contacts 11 – 9 on CR1 and 11 – 9 on CR2 are latching circuits and will hold the relay in this mode until the current is broken some other way. The table or initiate switch and the rotate switch need only to have momentary activation, as the relay contacts will effectively bypass these switches as soon as the relay is closed.
- 12) After the ram starts to extend the "Rev" limit at the front of the table is allowed to close, however no current is in this circuit at this time.
- 13) When the ram has extended to the "For" limit switch at the hoop and activated the arm, the current will be cut between term #3 and term #0 opening CR1, breaking contact to forward solenoid valve coil. Contact #7 - #6 will also open breaking current to CR2, stopping the reel valve.
- 14) When the ram has extended to the "For" limit switch at the hoop and activated the arm, current will flow from term #8 to #2 on CR3 relay coil and out through #10 to term #2 and through this "For" limit switch to term #0 and ground. When CR3 is activated contacts 9 – 11 are now closed allowing current to flow from term #2 to term #5 through "Rev" switch at the Front of the table which is now closed, back to term #0 and ground. Again these contacts are a latching circuit after "For" switch has started the current. When CR3 is activated contacts 3 – 1 will close on CR3 allowing current to flow from term #7 through these contacts to term #6 to "Rev" coil on solenoid valve and back to term #5 through "Rev" limit switch to term #0 and ground.
- 15) This mode will be held until the ram has retracted until the "Rev" limit switch at the Front of the table opens, breaking the current between term #5 - term #0, with 5-0 opened flow term #6 - term #5 will stop to "Rev" solenoid valve coil stopping the ram cylinder. Notice #9 - #11 on CR3 act as a latch circuit and hold CR3 active until the circuit is broken by opening "Rev" limit switch at the Front of the table.

Steering

- 16) The steering solenoid valves are activated through control relay CR4 and CR5. One relay coil is for steering right and one for left. Notice - the solenoid coils on the steering valve are live, and are activated by finishing the circuit to ground. On CR4 and CR5 #4 - #1 are interlock contacts to prevent both relays to be energized at the same time #3 - #1 are the contacts for the valve solenoid coil from term #12 to term #1 or ground for CR4 and term #13 to term #1 or to ground.

Testing with 12 volt test light clamped to frame
Negative wire to term #0, Positive wire to fuse block
Light on condition as < 12 >

- 1) Positive wire coming from battery < 12 > wire connected to battery and have some voltage
- 2) Other side of fuse block < 12 > ; Fuse OK
- 3) Turn on/off switch on term #7 < 12 > switch OK
- 4) Turn “man/auto” to “man”; turn “For/ Rev” to “For” < 12 > CR1 #10, term #11 should have NO < 12 > ; if it does double check polarity from battery as diode is allowing current to flow back to this terminal. There is also the remote possibility that the diode has shorted; most diodes fail as open. At this point we should have < 12 > term #4. If not check, “ For” limit switch” by the hoop it should be in closed position. Test light between term #5 and term #4 should light while ram “For” solenoid valve is energized.
- 5) Release “For” switch. Push “Rot” Switch < 12 > at term #1.
- 6) Rev test; for this test the ram has to be extended a few inches to get it away from the “Rev limit switch” at the Front of machine. On the control panel turn “Rev” switch < 12 > at term #6. If there is < 12 > on term #5 check “Rev” switch at the Front of the machine, it should be closed. Test light between term #6 and term #5 should light while ram “Rev” solenoid valve is energized.
- 7) The steering solenoid valve coils have a common wire to the two coils, this common wire comes from term #7 and is live whenever on/off switch is on; the relay switches close the other side to ground. Therefore for this test, Clamp lead to term #7. Turn left switch < 12 > term #12. Turn right switch < 12 > term #13. To check relays, clamp lead back to term #0. Turn left switch check #2 on CR4 < 12 > if not check contacts #4 and #0 on CR5. Turn right switch check #2 on CR5 < 12 > if not check contacts #4 and #0 on CR4.

To Troubleshoot Automatic side of Control

- 1) Turn “man/auto” switch to “auto” < 12 > at term #9 and term #10, if no light at term #8 make sure safety door switches are closed and if film sensor is used, film sensor switch is closed or film sensor bypass switch is closed.
- 2) To test for a problem in this safety circuit place a jumper wire across term # 8 and term #10, if this clears the problem one of the switches are open or a wire is broken.
- 3) Initiate or table trigger switch depressed < 12 > @ term #11 current flows through diode to #10 on CR1 out through #2 on CR1 to term #3 through “For” limit switch by the hoop and back to term #0 or ground. This action will activate CR1 closing contacts 11–9, 1–3 and 7–6 on CR1. Contact 11-9 is a latch circuit for CR1 and when these contacts are closed the trigger can be released as the current now flows through #11 to #9 to hold the relay activated. With CR1 1-3 contacts closed, test term #4 for < 12 >.
- 4) Hoop relay CR2 is tied into the CR1 via 7-6 of CR1. While CR1 is activated we have < 12 > @ term 14. By closing “Rot” limit switch < 12 > @ term #15. Current flows from term #15 to < 12 > #10 on CR2 through to #2 back to term #0 or ground. After CR2 is activated contacts 11-9 act as a latch circuit holding CR2 active until it is broken by the opening of contacts 7-6 on CR1. When CR2 is activated current flows from term #7 to < 12 > #3 on CR2 and out < 12 > #1 on CR2 to term < 12 > #2. From term #2 through reel solenoid back to term #0 and ground.

- 5) When ram has extended to the end of the stroke it will shift switch “For” limit switch at the hoop to break contact between term #3 and term #0 allowing relay CR1 to open contacts 11-9, 1-3 and 7-6 on CR1. With these open “For” solenoid valve will shift to neutral, Hoop solenoid valve will shift to off.
- 6) When “For” limit switch shifts it will also make contact between term #2 and term #0 causing current to flow from term #8 through 2-10 on CR3 to term #2 through “For” switch to term #0 and ground. Notice when ram has extended a few inches “Rev” limit switch at the Front of the machine will close and be ready for the retract cycle of the ram. With CR3 activated contacts 9-11 and 3-1 are closed. Contacts 9-11 are the latch circuit allowing current to flow from #10 on CR3 to term #2 through 9-11 to term #5, through “Rev” switch at front of table and back to term #0 and ground. With CR3 activated 3-1 will bring current from term #7 to #3 on CR3 out of #1 < 12 > to term #6 < 12 > through “Rev” solenoid valve coil to term #5 through “Rev” limit switch at the Front of the machine. The ram will retract until the “Rev” limit switch at the Front of the machine opens. This will end the cycle and wait for the next cycle.

Tube Line 5500

Electric

Introducing the wiring diagram.

The main circuit diagram is a complete wiring description of the T5500 wrapper. The battery is **12-volt negative ground**. In the following prints are the electric circuits that are active during the part of the wrapping cycle as titled. With a 12-volt test light you will be able to check for voltage between the heavy solid lines and the chassis. The heavy dotted lines are the negative or ground part of the cycle.

Terminology used for this machine

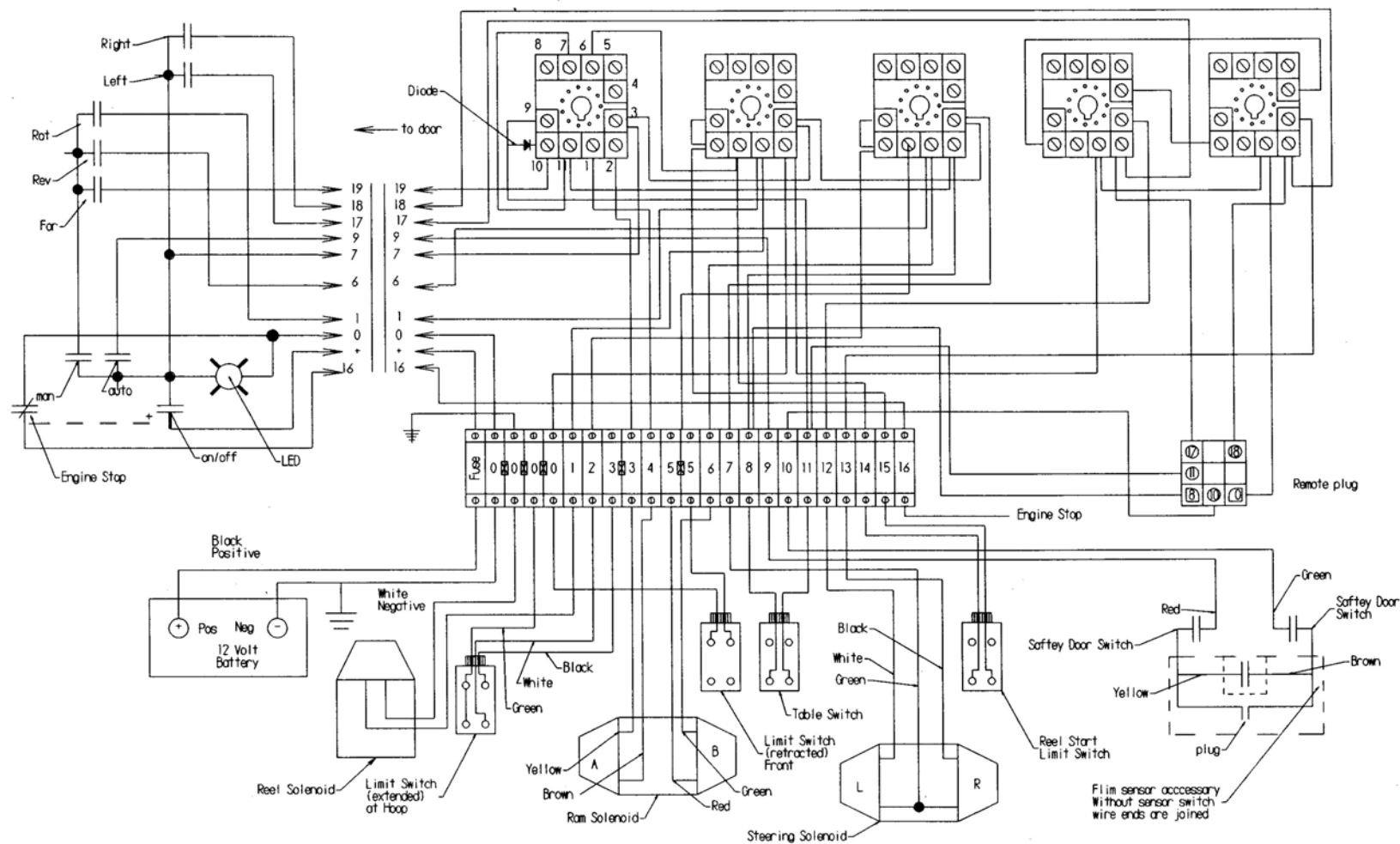
The Front of machine is where the bales are loaded on.

The Hoop is the part that carries the plastic film around the bale.

- Control Panel – gray box with the switches and the wiring
 - Relay – inside the control box, the square things about 1 ¼ inch square and 2 inch long sticking straight out at you
 - Relay Base – the part that the Relay is plugged into
 - Terminal Strip – the part that the wires come to
 - Fuse - located at the end of terminal strip 15 amp 1 ¼ littlefuse
 - Panel Switches – the switches in the control panel door, one is a push button the others have a knob that turns one or both ways. With Film Sensor accessory there is also a toggle switch in the bottom of control panel
 - Limit switch – gray switches on the machine.
1. The switch in the table is the initiate or the trigger switch and starts the cycle by advancing the ram in the automatic mode.
 2. The next limit switch in the cycle is the hoop start switch this will start the wrapping of the plastic film and is mounted on an adjustable slider.
 3. The next limit switch is at the Rear of the ram stroke and Stops the Forward stroke of the ram and is found on the rear adjustable slider by the hoop. In the schematic diagram it is called the Forward Limit Switch.
 4. The next limit switch in the cycle is at the Front of the table and stops the retract or reverse of the ram cylinders and in the schematic diagram is called Reverse Limit Switch.
- Solenoid coils – the black plastic square shaped articles about 2 ½ inches square and 3 inches long on the hydraulic valves underneath the table.
 - Trigger and Hoop start switch are only activated momentarily, after activation the relays have a latch circuit to hold them activated.
 - The switch at the back of the table breaks the extend circuit, and makes the retract circuit.
 - The switch at the front of the table will turn “on” as soon as the ram is extended, and will stay on until ram has retracted and turns it off.

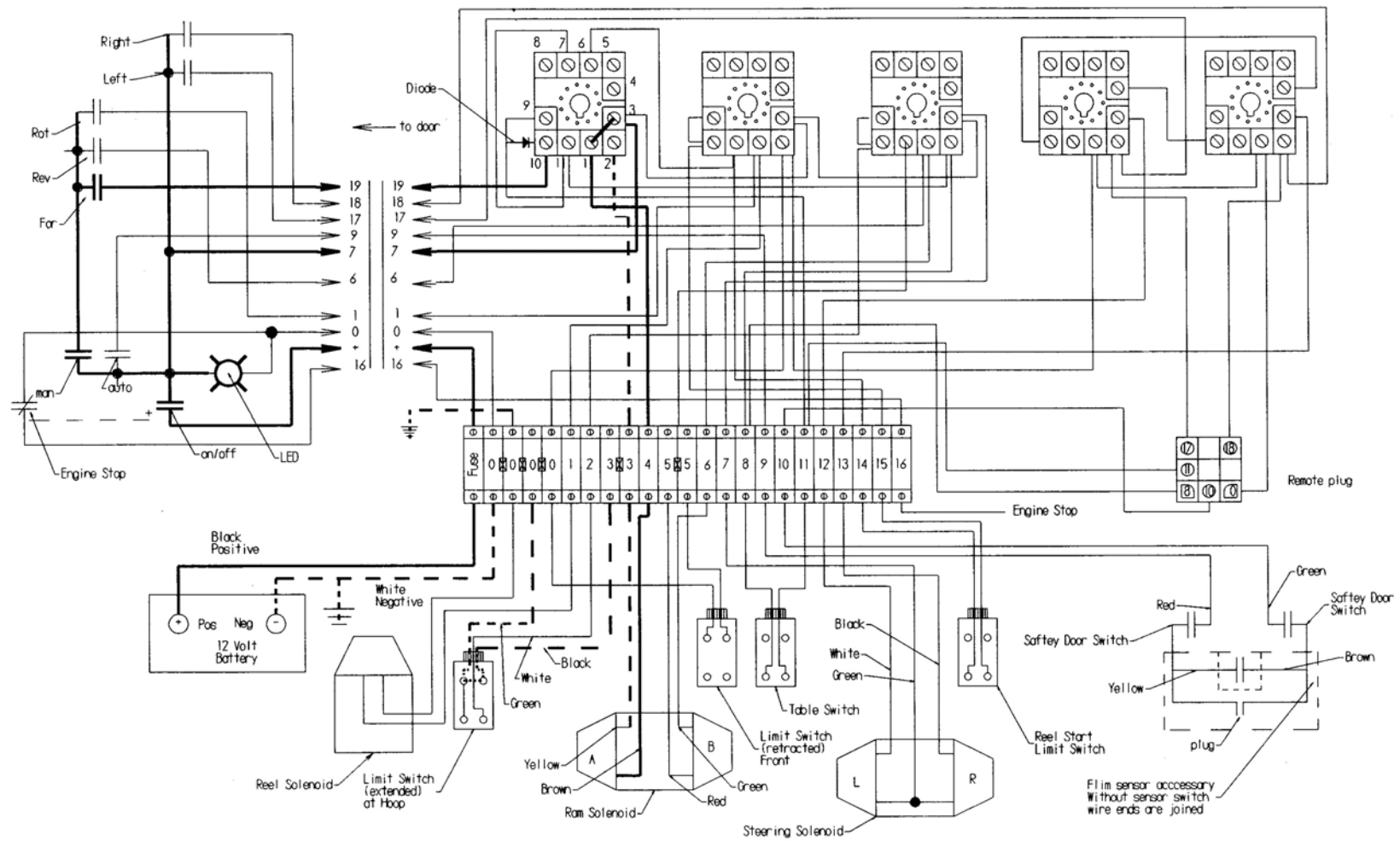
Main Circuit

Tubeline 5500
Main Circuit



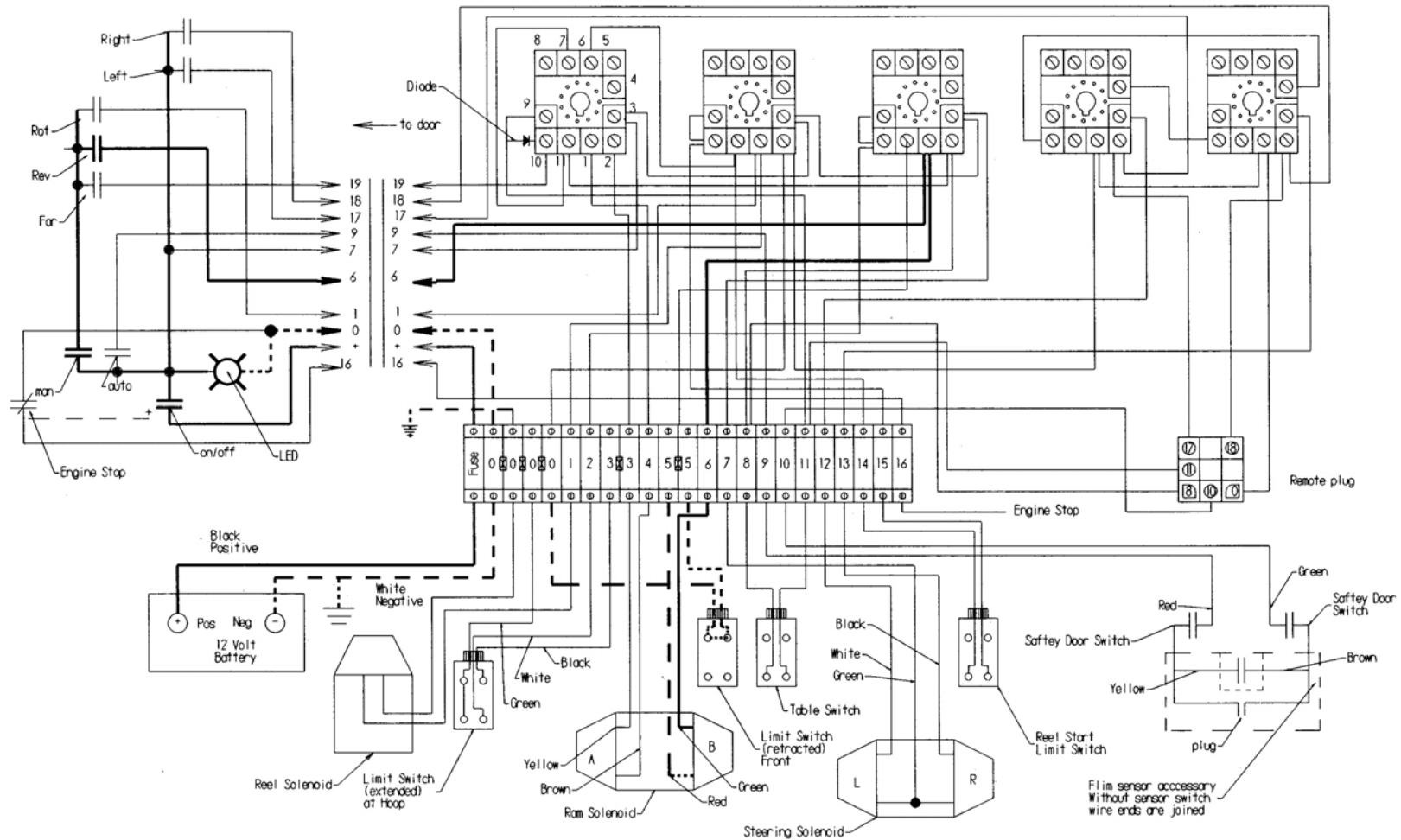
Manual Ran Extend

Tubeline 5500
Manual Ram Extend



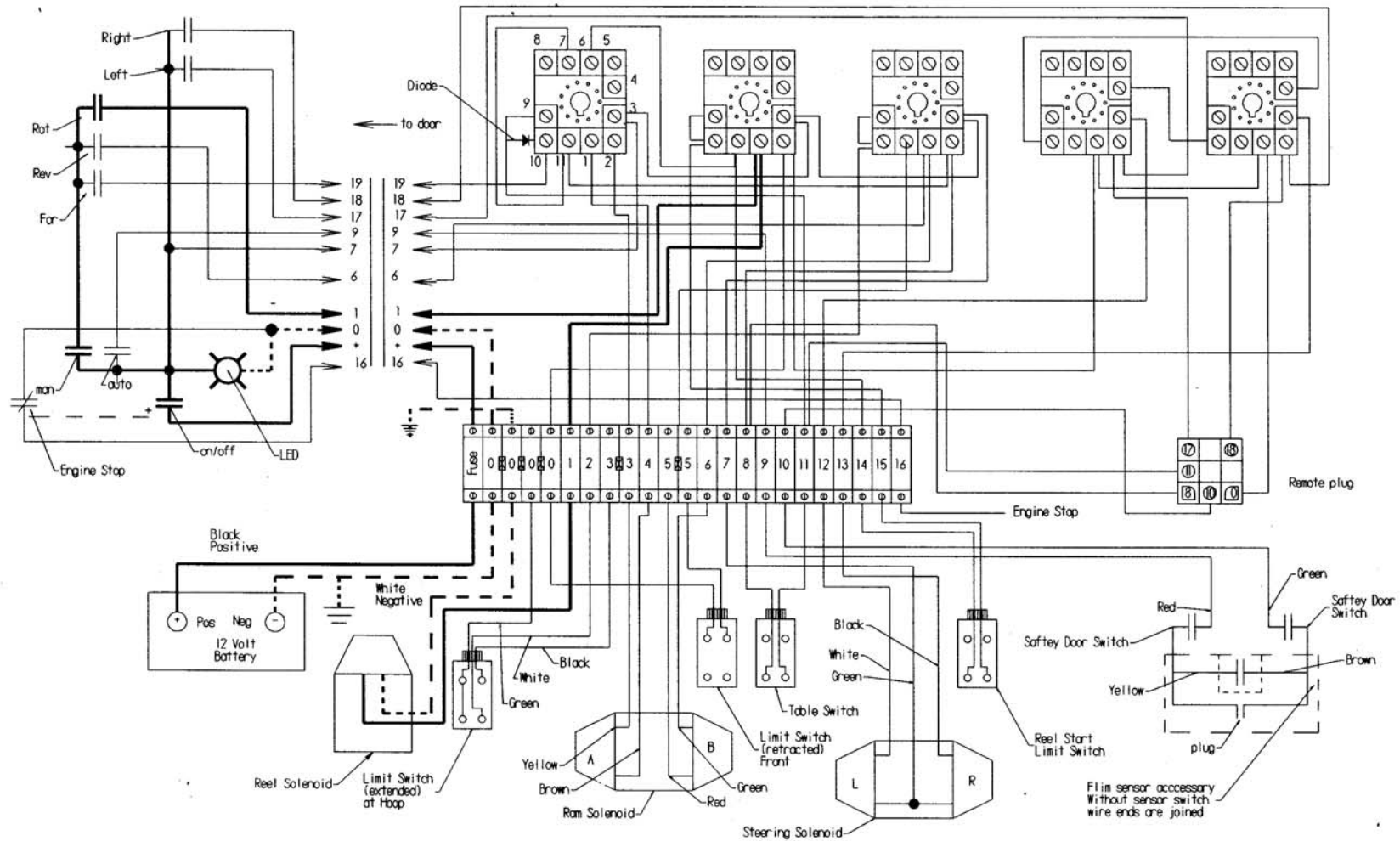
Manual Ram Retract

Tubeline 5500 Manual Ram Retract



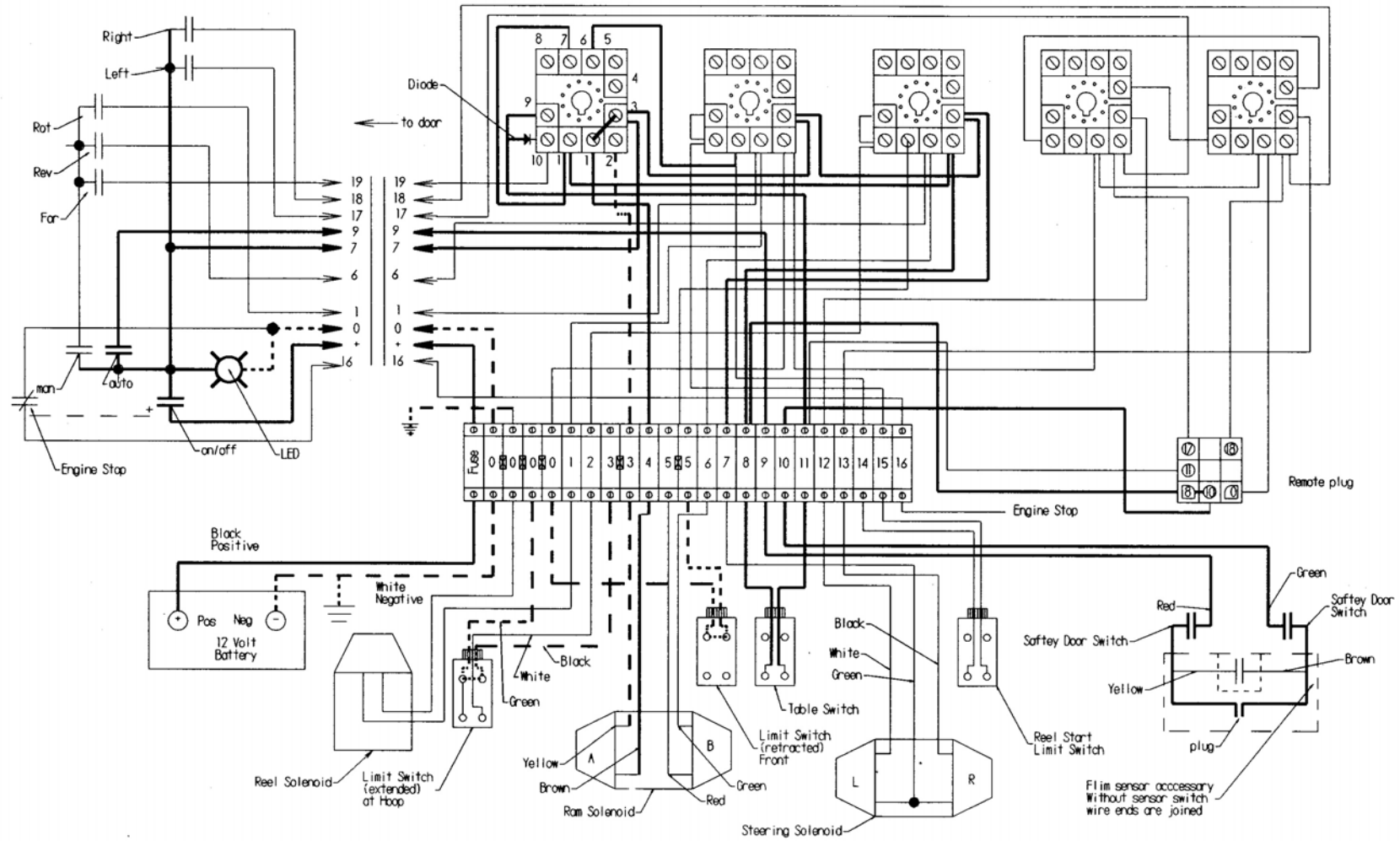
Manual Hoop Rotate

Tubeline 5500
Manual Hoop Rotate



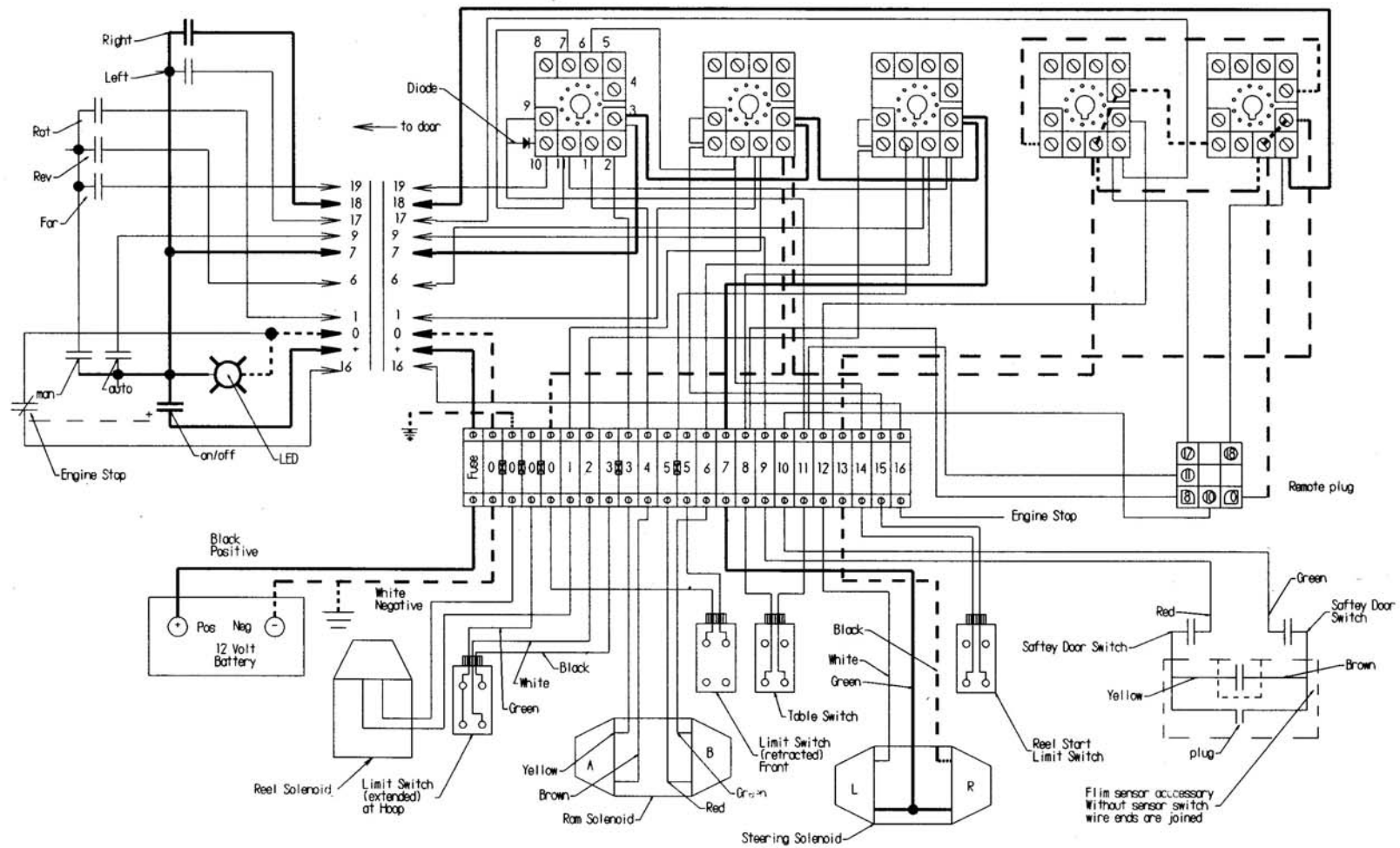
Automatic Cycle Start

Tubeline 5500
Automatic Cycle Start



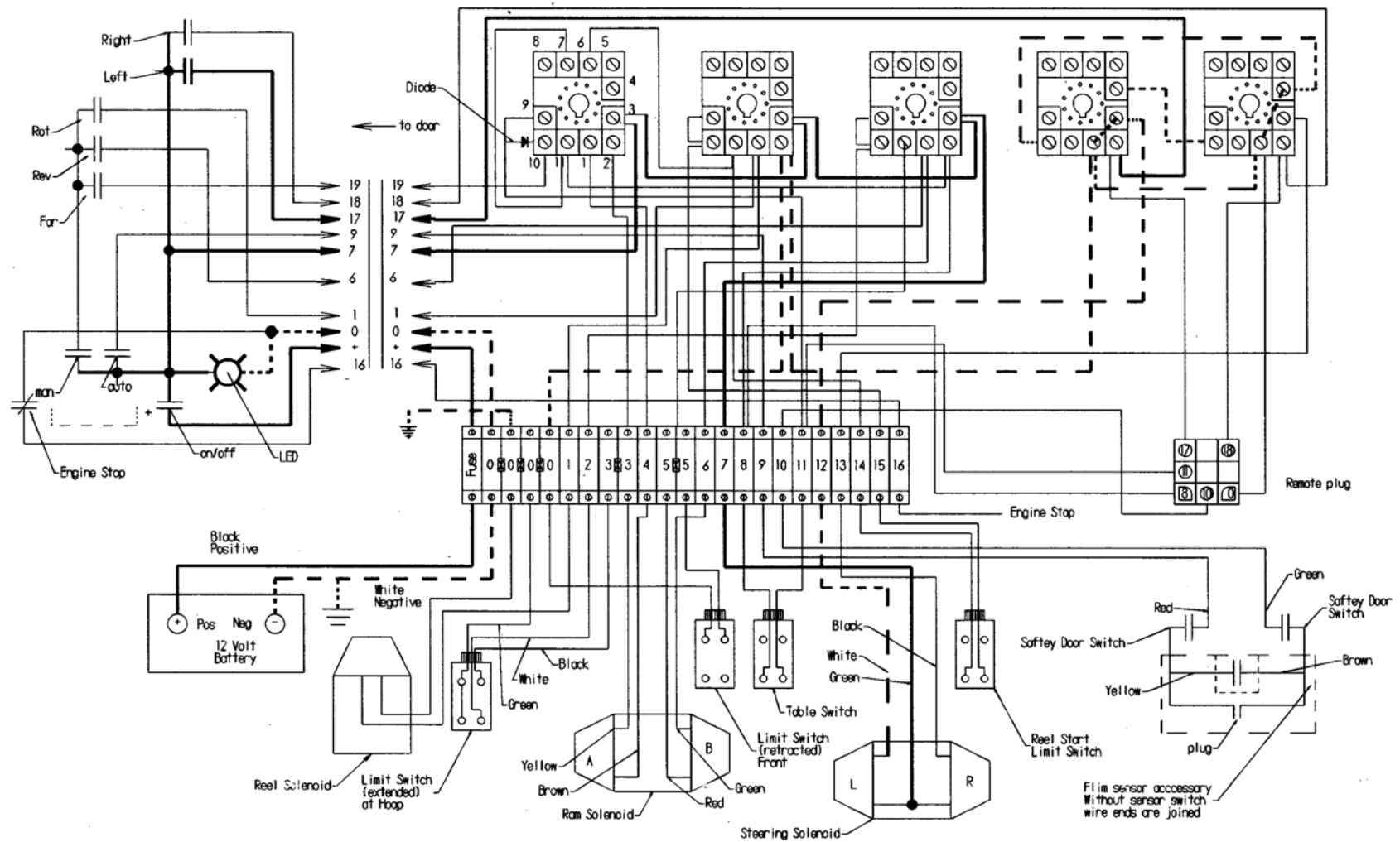
Right Steering

Tubeline 5500 Right Steering



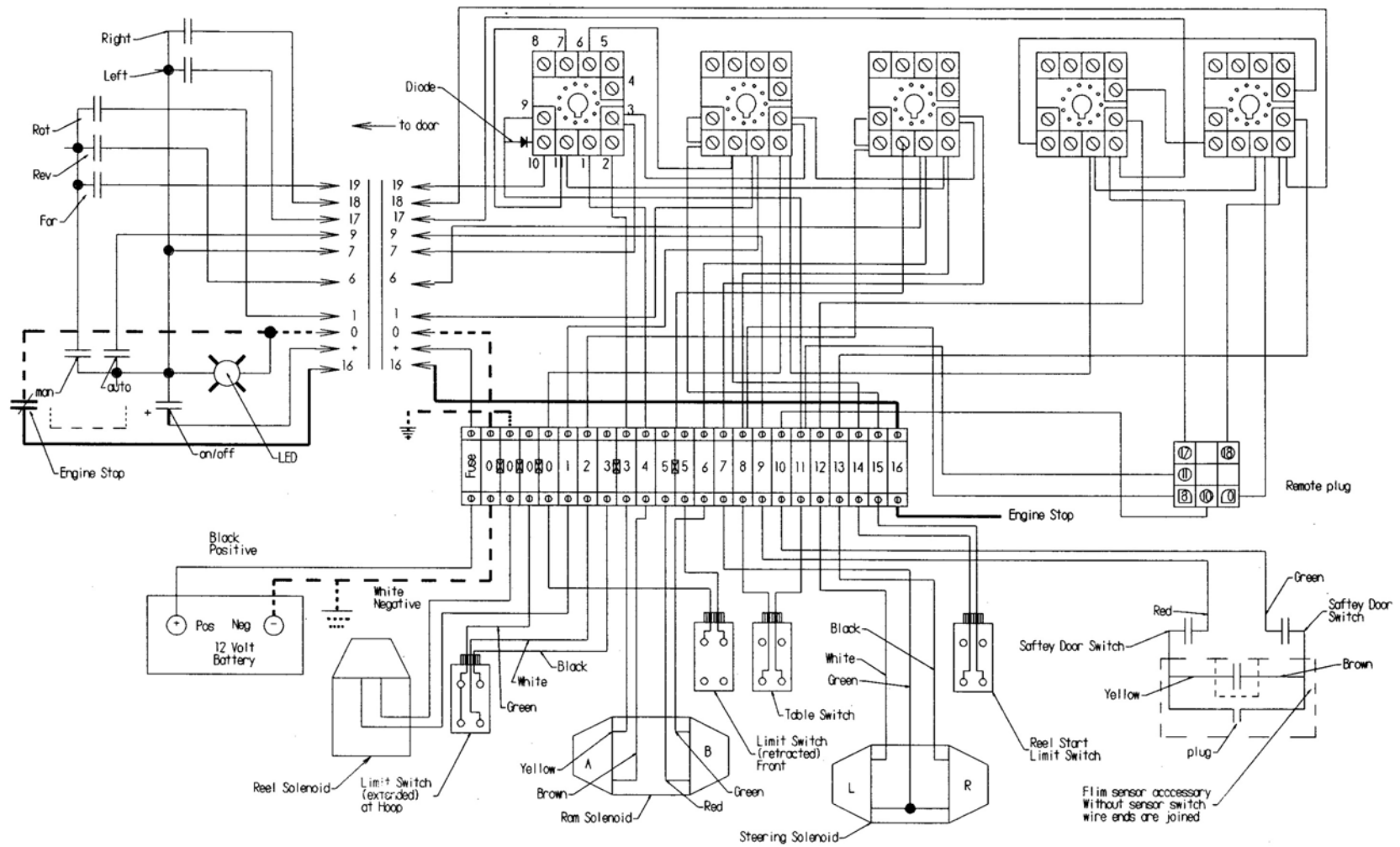
Left Steering

Tubeline 5500 Left Steering

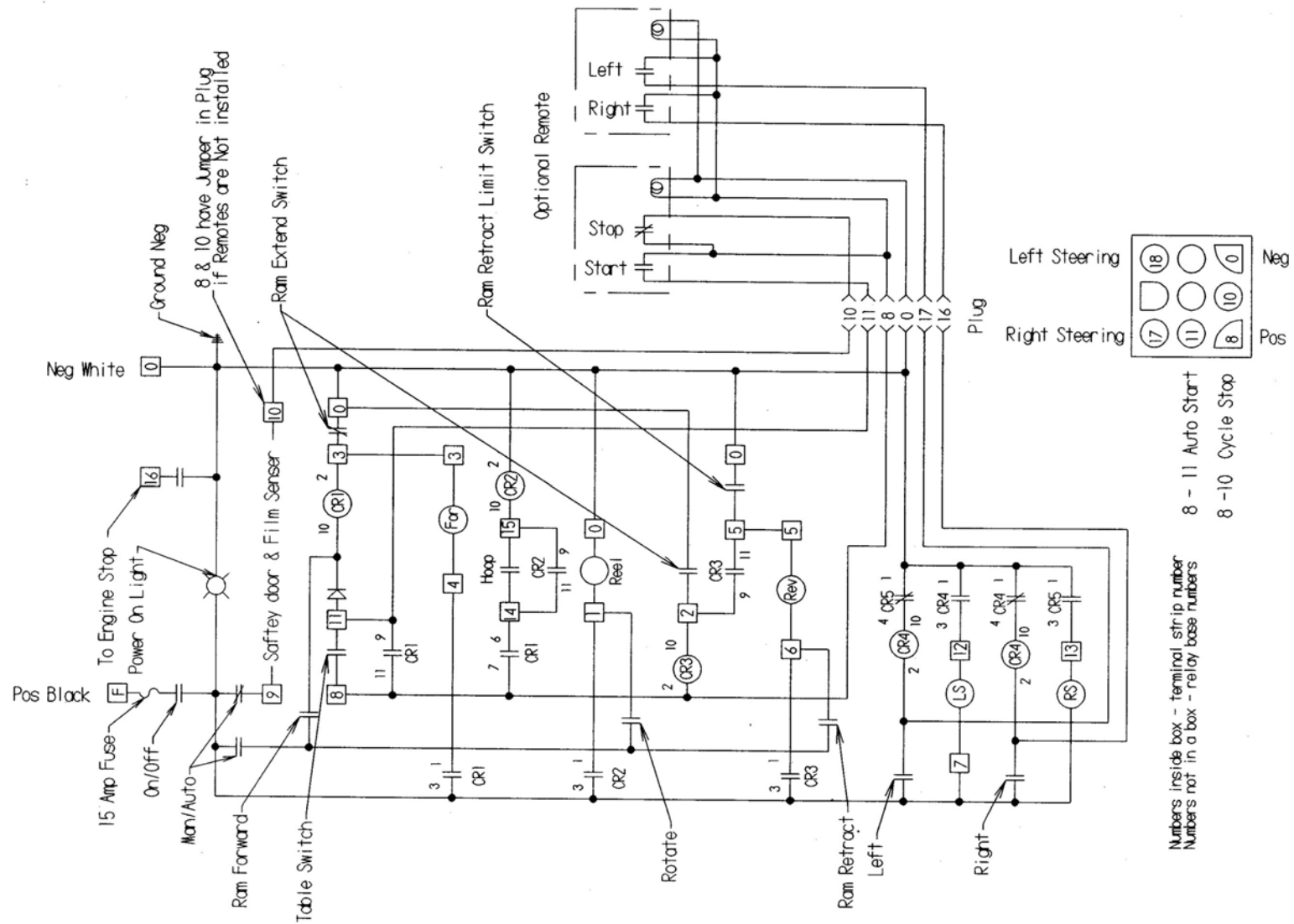


Engine Stop

Tubeline 5500
Engine Stop



Electric Schematic



Relay Base

