

ELECTRICAL / DIAGNOSTICS & OPERATION

Forward/Reverse Circuit Operation

Function:

To energize the appropriate vacuum solenoid (forward or reverse) to properly position the steering pivot arm assembly. This maintains the proper input to the steering system while the machine moves forward or reverse.

Conditions:

Engine running, operator On the seat, brake OFF, forward or reverse pedal pushed.

Theory of Operation:

When the forward pedal is pushed the S6 Forward Propel Switch contacts close. Power from the battery positive, 215 fusible link, 210 Red wire, F2 fuse, 211 Red wire, S1 Key Switch contacts, 410 Yel wire, 408 Yel wire, S6 Forward Propel Switch contacts, and the 670 Gry wire energize the Y3 Forward Propel Vacuum Solenoid. The ground path is completed through the 143 and 140 Blk wires. When Y3 energizes engine vacuum enters the forward vacuum actuator. This allows the steering pivot arm assembly and the steering adjustment arm to be positioned properly when steering commands are received. Voltage also moves to the X8 Service Connector via wire 671 Gry.

When the reverse pedal is pushed the S7 Reverse Propel Switch contacts close. This allows power from the 409 Yel wire to cross to the 675 and 676 Grn wires. The 675 Grn wire energizes the Y4 Reverse Propel Vacuum Solenoid. The ground path is completed by the 145 and 140 Blk wire. When Y4 energizes engine vacuum enters the reverse vacuum actuator. The steering system is now ready for command inputs as described above. The 676 Grn wire provides power to energize the K4 RIO/Reverse Relay. The ground path is completed by the 103 and 101 Blk wires. A detailed explanation of the K4 relay function is explained in the "PTO with RIO Circuit Operation" Section. Power is also sent to the X8 Service Connector by the 677 Grn wire.

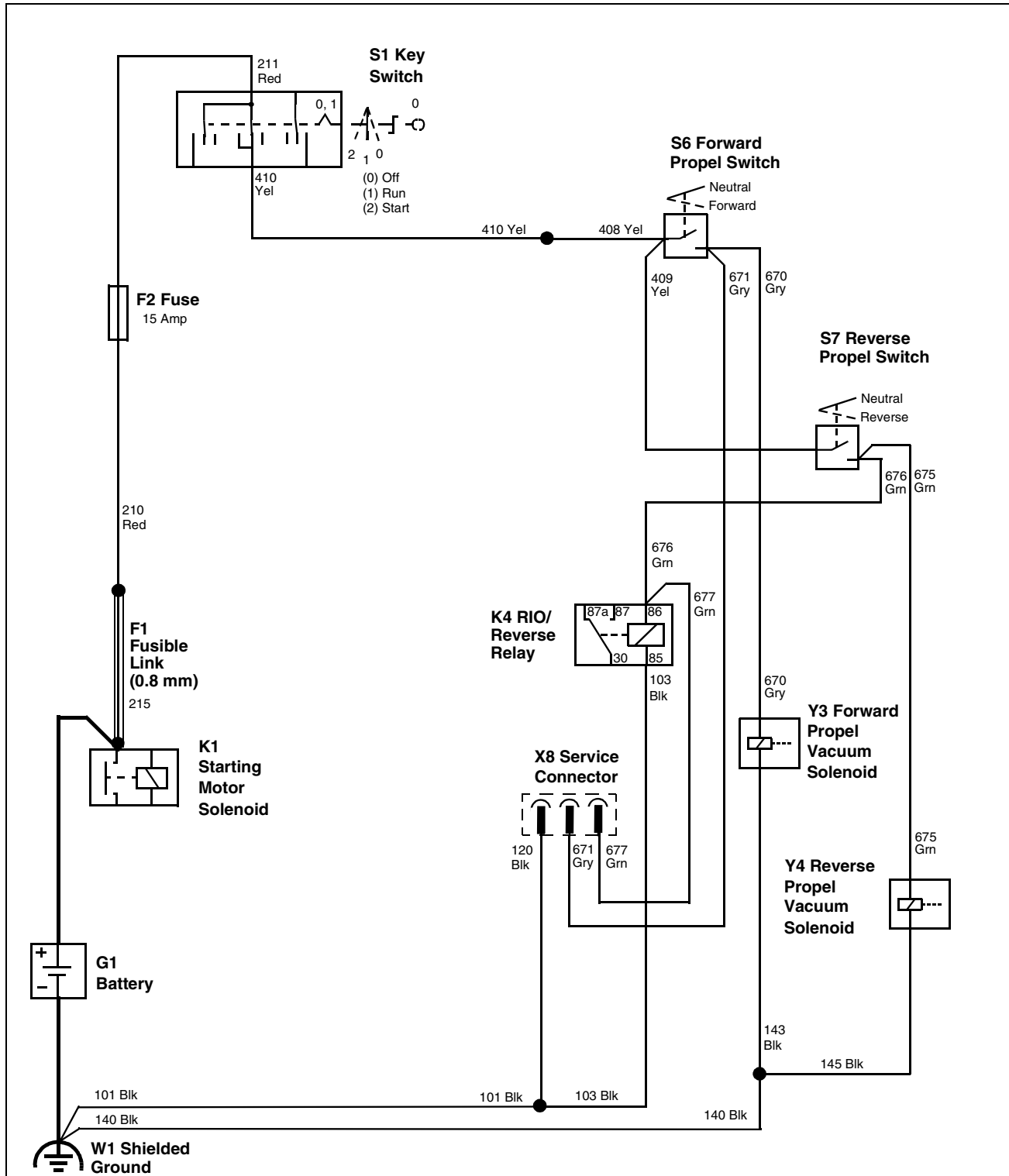
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Forward/Reverse Circuit Electrical Schematic

Forward/Reverse Circuit Diagnosis

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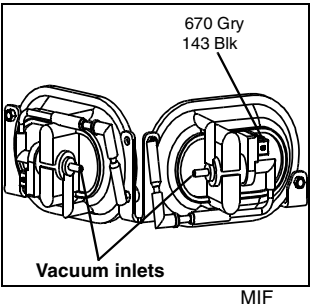
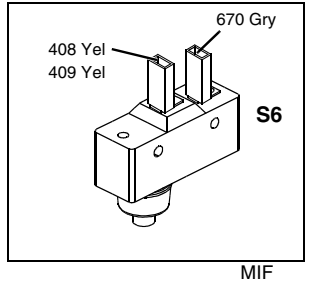
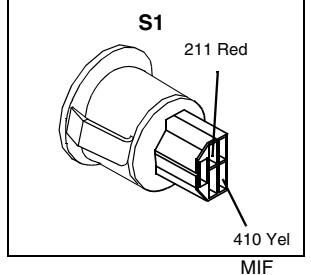
Test Procedure A



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Test Conditions:

- Key switch in RUN position
- Vacuum applied to vacuum actuators
- Transmission in FORWARD
- Vacuum actuators visible

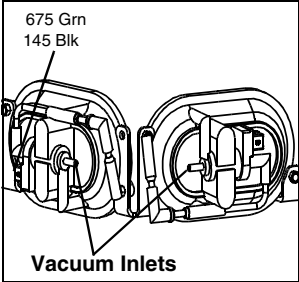
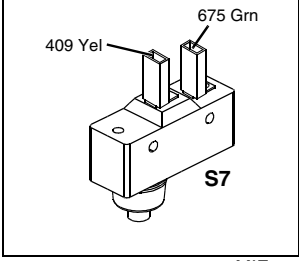
Test Point/Procedure	Results	
Step (1) Y3 Forward propel vacuum solenoid. Measure for voltage on wire 670 Gry.	Battery voltage, check for 0.2 ohms or less on wire 143 Blk. If continuity and diaphragm not pulled in, replace actuator. If no continuity, check for broken wire or bad connection on wire 143 Blk between Y3 and ground. <ul style="list-style-type: none"> • Less than battery voltage, Go To Step (2). 	
Step (2) S6 Forward propel switch. Measure for voltage on wire 670 Gry.	Battery voltage, check for broken wire or bad connection on wire 670 Gry. <ul style="list-style-type: none"> • Less than battery voltage, check voltage on wire 408 Yel. If battery voltage and switch is actuated, replace switch. If less than battery voltage on wire 408 Yel, Go To Step (3). 	
Step (3) S1 key switch. Measure for voltage on wire 410 Yel.	Battery voltage, check for broken wire or bad connection on wires 410 and 408 Yel between S1 and S6. <ul style="list-style-type: none"> • Less than battery voltage, check for voltage on wire 211 Red. If battery voltage, and key switch is in RUN position, replace key switch. If less than battery voltage see "Power Circuit Diagnosis". 	

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Test Procedure B

Test Conditions:

- Key switch in RUN position
- Vacuum applied to vacuum actuators
- Transmission in FORWARD
- Vacuum actuators visible

Test Point/Procedure	Results	
Step (1) Y4 reverse propel vacuum solenoid. Measure for voltage on wire 675 Grn.	Battery voltage, check for 0.2 ohms or less on wire 145 Blk. If continuity and vacuum diaphragm not pulled in, replace actuator. If no continuity, check for broken wire or bad connection on wire 145 Blk between Y4 and ground. <ul style="list-style-type: none"> • Less than battery voltage, Go To Step (2). 	
Step (2) S7 reverse propel switch. Measure for voltage on wire 675 Grn.	Battery voltage, check for broken wire or bad connection on wire 675 Grn. <ul style="list-style-type: none"> • Less than battery voltage, check for voltage on wire 409 Yel. If battery voltage and switch is actuated, replace switch. If less than battery voltage, Go To Test Procedure A, Step (2). 	

PTO Circuit Operation

Function:

To provide a way to engage and disengage the mower drive belt.

Operating Conditions:

The key switch in the RUN position, engine running, the operator must be ON the seat, and the PTO switch in the ON position.

Theory of Operation:

When the PTO/RIS switch is placed in the ON position, power is supplied to the PTO clutch from the battery positive terminal by the 215 fusible link, 210 Red wire, F2 fuse, 211 Red wire, S1 key switch contacts B to L, 410 Yel wire, 411 Yel wire, S3 PTO/RIS switch contacts, 750 Blu wire to the X6 connector, and to the PTO clutch. The ground path is completed by connector X6, 102 and 101 Blk wires. As the clutch energizes, the engine crankshaft is coupled to the PTO pulley, which drives the mower deck belt.