

GROUP II: ELECTRICAL SYSTEM**MEDIUM TUBE
FRAME TRACTORS**
Page 2-1 5/77**TROUBLE SHOOTING GUIDE**
ELECTRIC START MODELS

PROBLEM	PROBABLE CAUSE	REMEDY
Starter Motor does not energize	1. P.T.O. engaged 2. Brake pedal not depressed or on 1225 transmission, not locked. 3. Corroded or loose electrical connections 4. Discharged battery 5. P.T.O. interlock, brake interlock, seat interlock. Transmission interlock, ignition switch, not functioning. 6. Solenoid not operating.	1. Disengage P.T.O. 2. Depress brake pedal and lock, or lock transmission. 3. Clean and tighten 4. Locate problem and recharge 5. Check and replace if necessary 6. Check and replace if necessary
Starter Motor turns engine too slow	1. Weak or partially discharged battery. 2. Corroded or loose electrical connections. 3. Starter sheave spins in belt.	1. Check battery charge or replace if necessary. 2. Clean and tighten 3. Check belt tension. Adjust per manual.
Battery discharges rapidly	1. Low water level 2. Low or no output from alternator 3. Short in electrical system	1. Check and refill 2. Check output and repair if necessary 3. Check out and repair
Battery will not charge	1. Dirt and moisture on case 2. Corroded or loose battery terminals 3. Battery not functioning properly. 4. No alternator output 5. Regulator not functioning.	1. Clean case 2. Clean and tighten 3. Replace battery 4. Check out alternator and repair or replace 5. Check out regulator, replace if necessary
Lights not operating	1. Bulbs burned out 2. Loose or poorly connected wire 3. Circuit breaker not functioning.	1. Replace bulbs 2. Install properly and tighten 3. Check out circuit breaker, replace if necessary.

2

ELECTRICAL SYSTEM (Continued)

WIRING DIAGRAM 600 (181) - 800 (187) - 900 (189) - 1000 (190) MAGNETO IGNITION

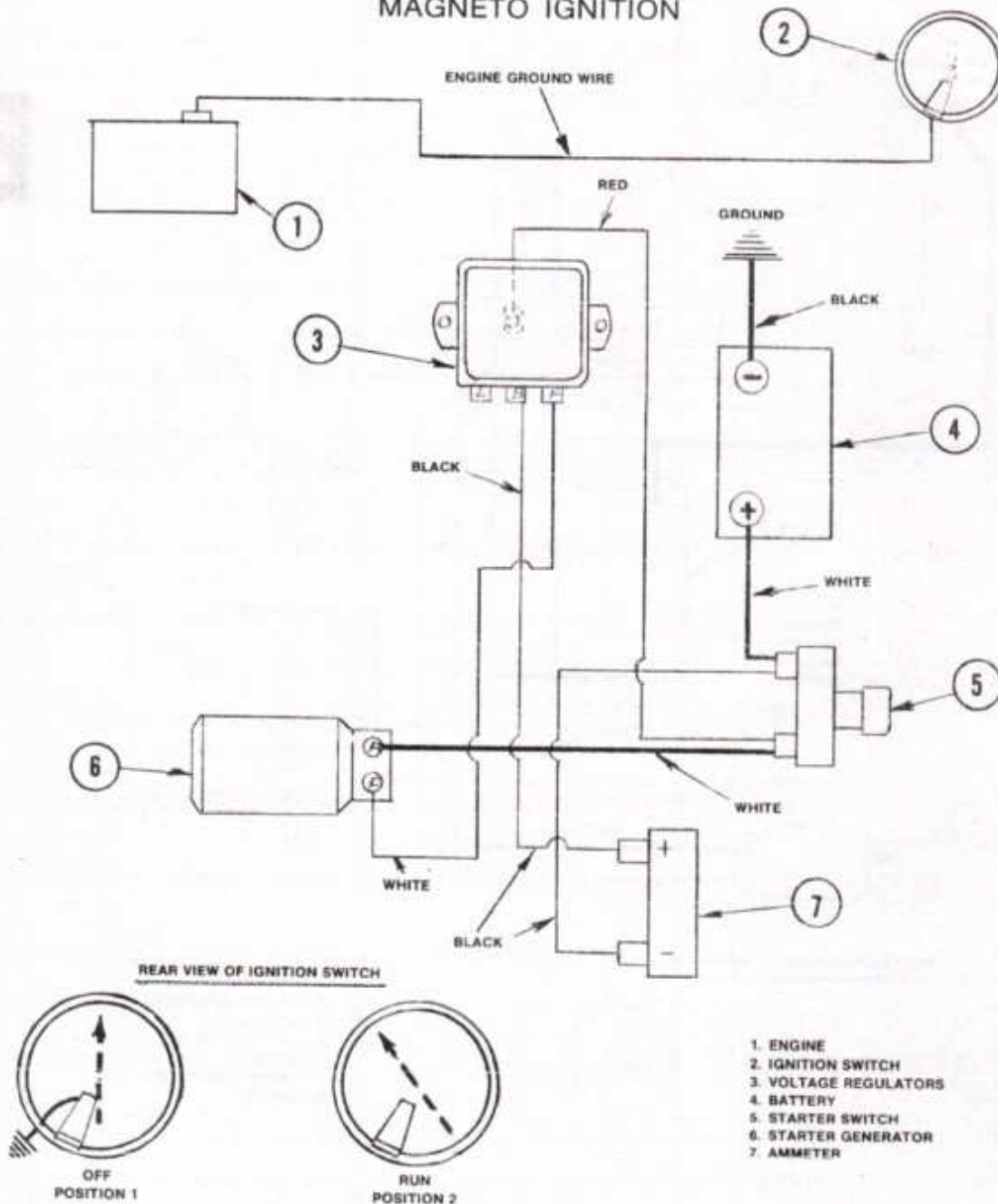
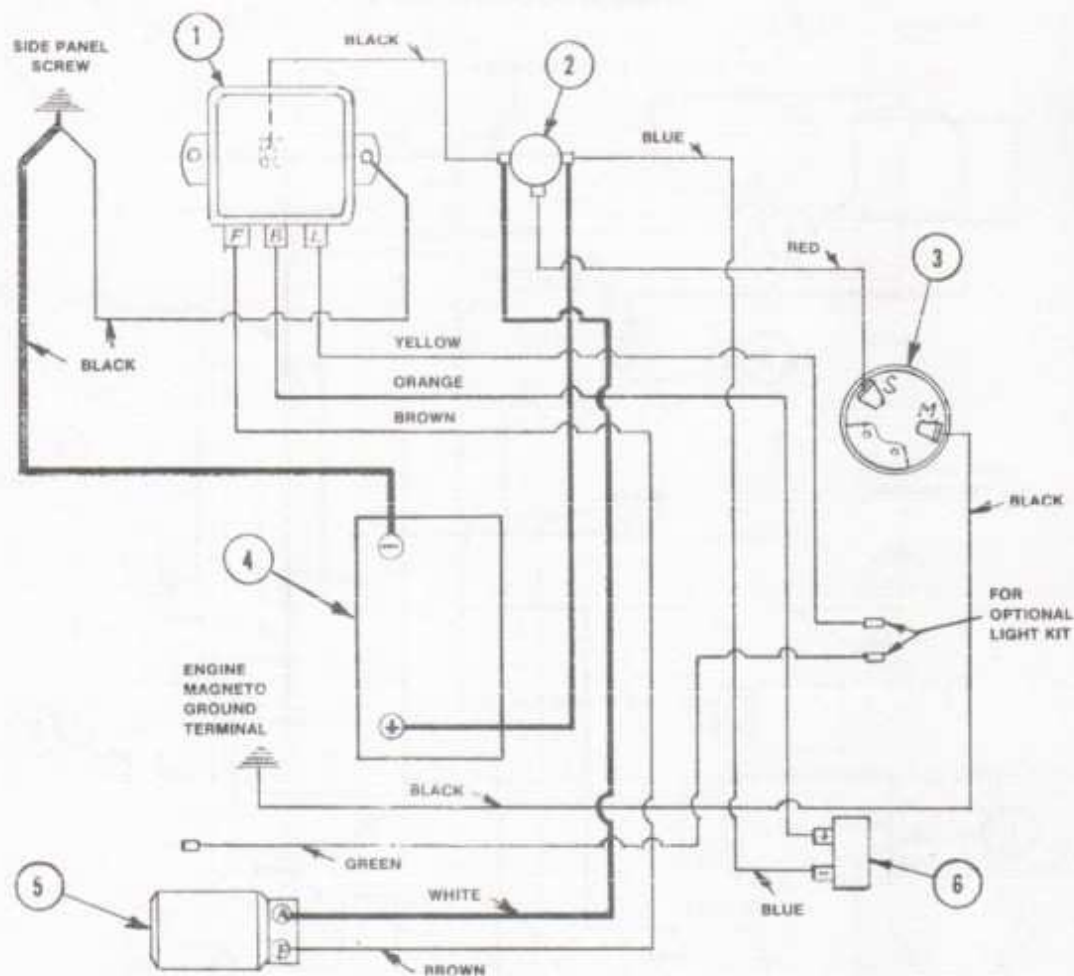


FIGURE 2-1

WIRING DIAGRAM - 750 (172) MAGNETO IGNITION



REAR VIEW OF IGNITION SWITCH



OFF
POSITION 1



RUN
POSITION 2



START
POSITION 3

1. VOLTAGE REGULATOR
2. SOLENOID
3. IGNITION SWITCH
4. BATTERY
5. STARTER - GENERATOR
6. AMMETER

FIGURE 2-2

ELECTRICAL SYSTEM (Continued)

WIRING DIAGRAM 650 (185) - 850 (191) - 1050 (192-01) MAGNETO IGNITION

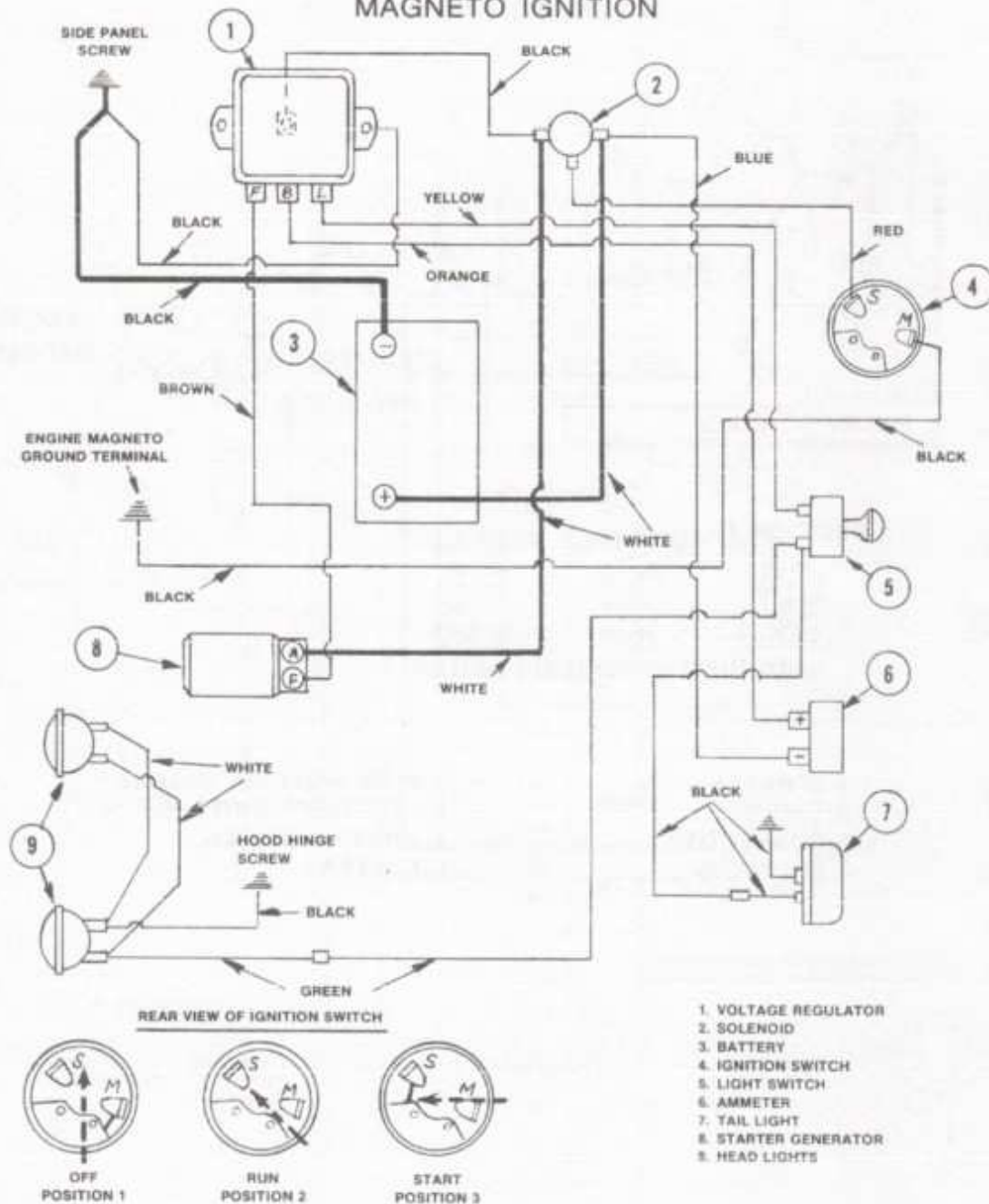
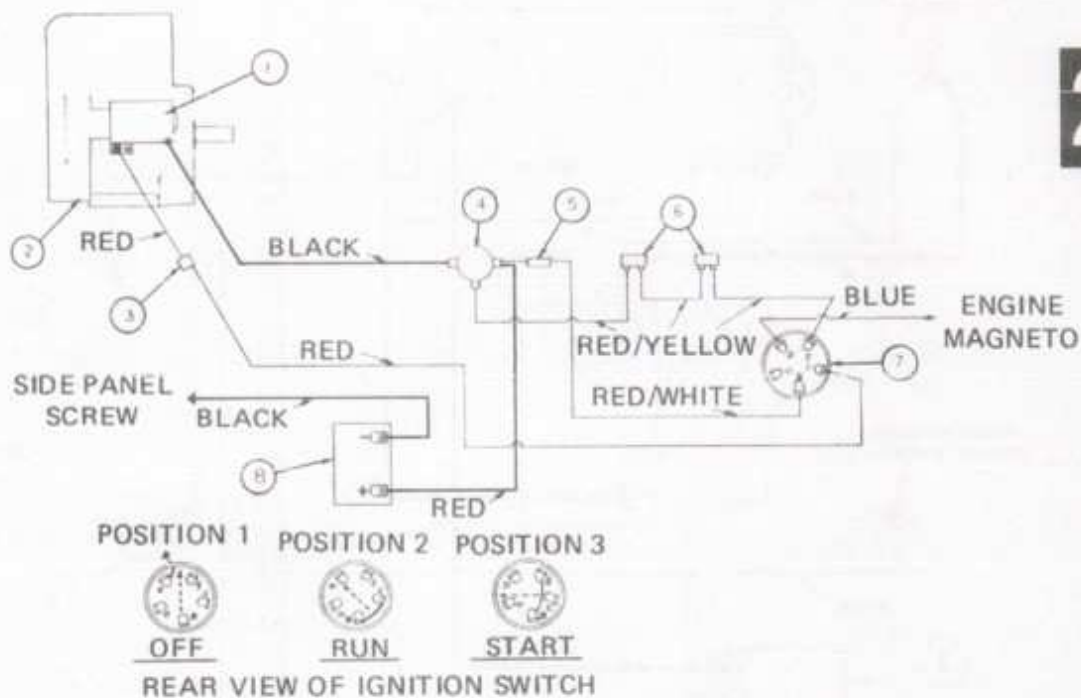


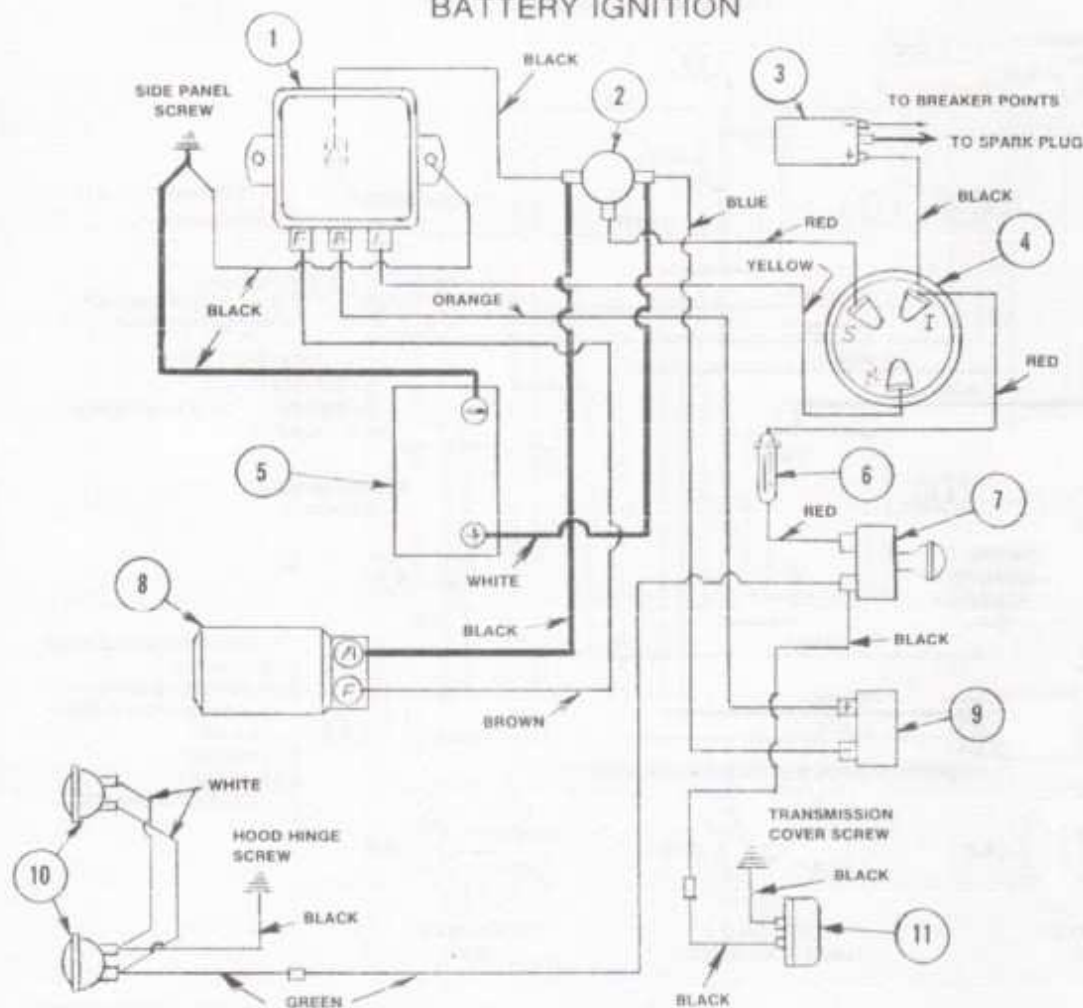
FIGURE 2-3

WIRING DIAGRAM
G9 (855)
MAGNETO IGNITION

1. STARTER
2. ENGINE
3. CONNECTOR
4. SOLENOID

5. FUSE AND FUSE HOLDER
6. INTERLOCK SWITCHES
7. IGNITION SWITCH
8. BATTERY

WIRING DIAGRAM 850 (191-02) & 1050 (192-02) BATTERY IGNITION



REAR VIEW OF IGNITION SWITCH



FIGURE 2-4

ELECTRICAL SYSTEM (Continued)

WIRING DIAGRAM

853-01-02

MAGNETO IGNITION

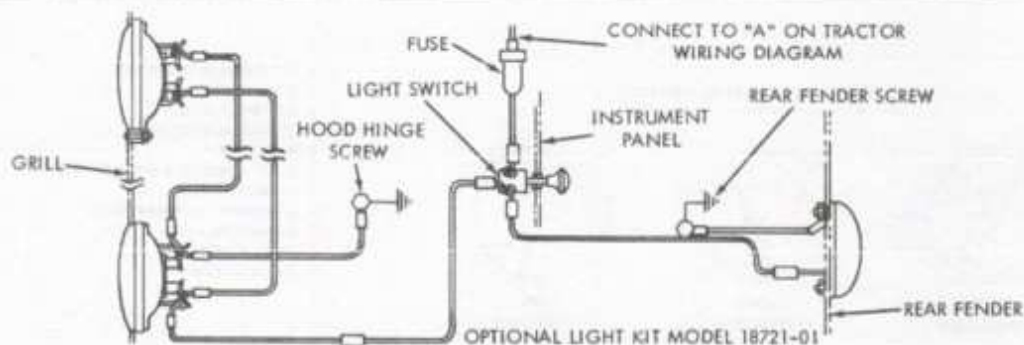
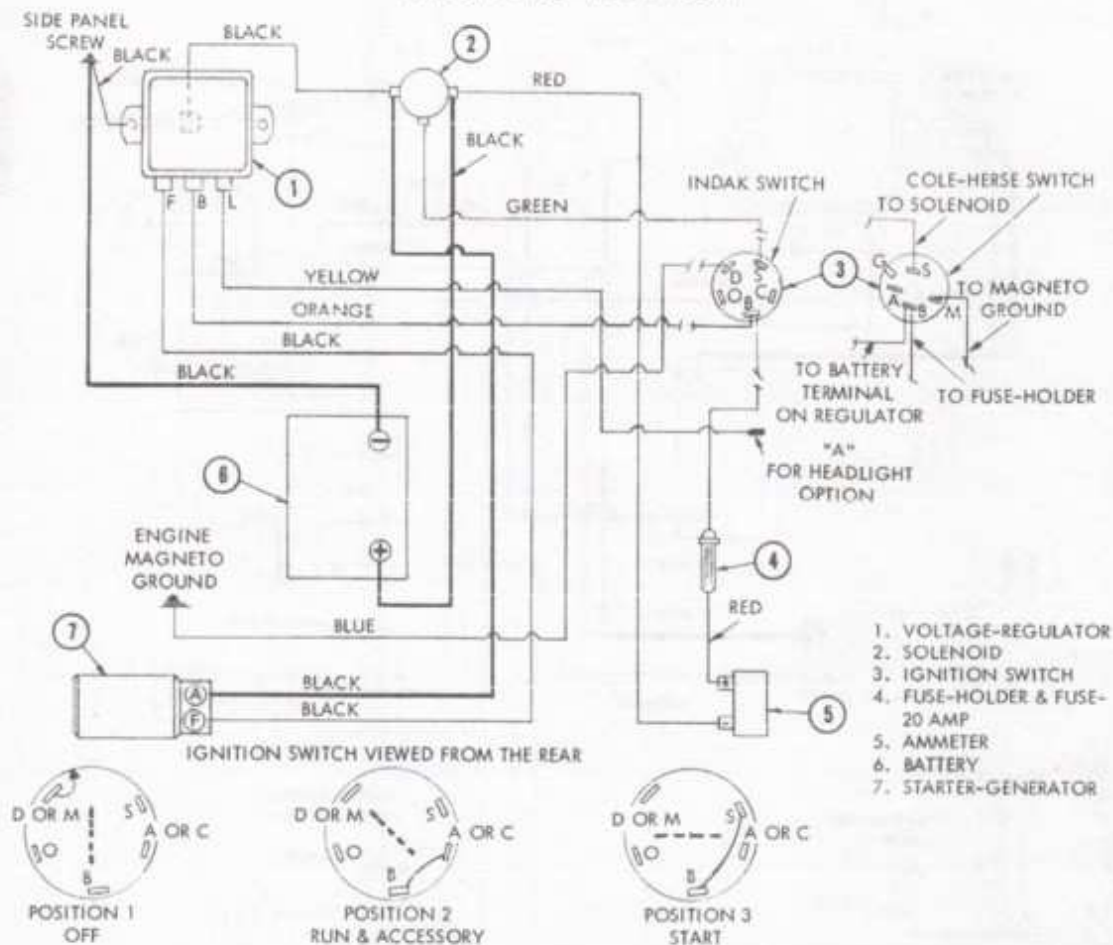


FIGURE 2-5

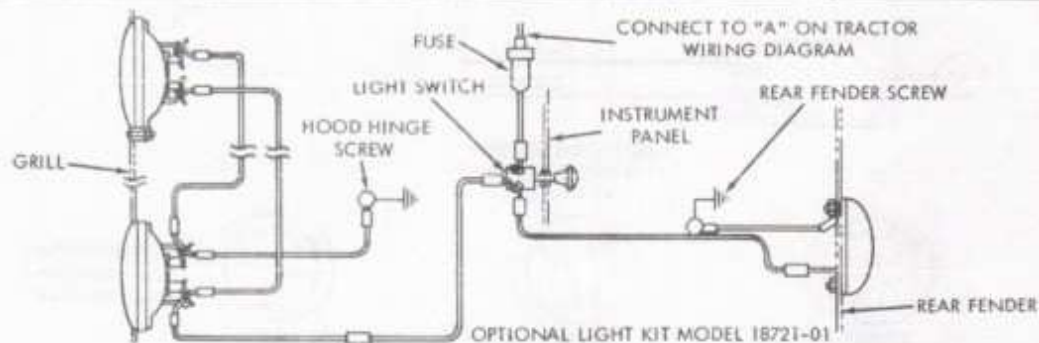
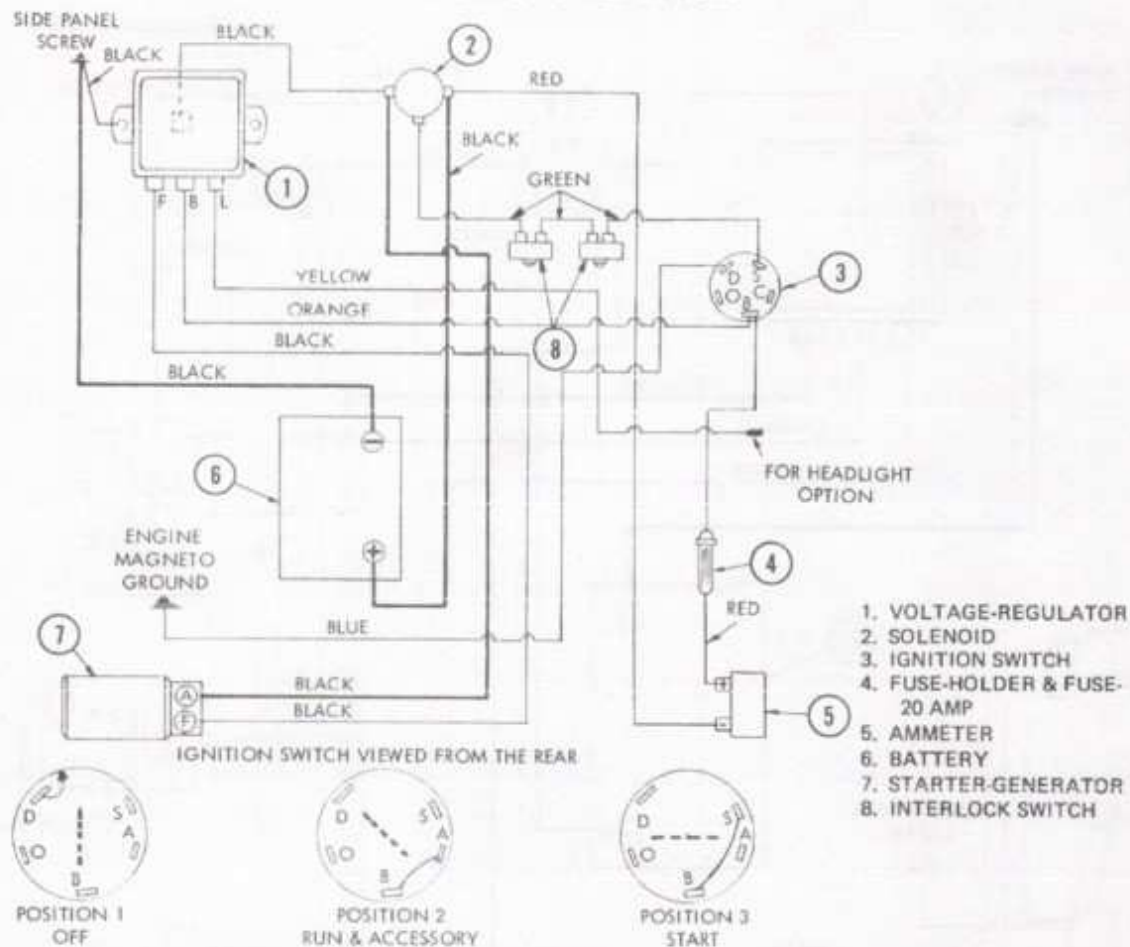
WIRING DIAGRAM
853-03
MAGNETO IGNITION

FIGURE 2-6

ELECTRICAL SYSTEM (Continued)

WIRING DIAGRAM 1053 BATTERY IGNITION

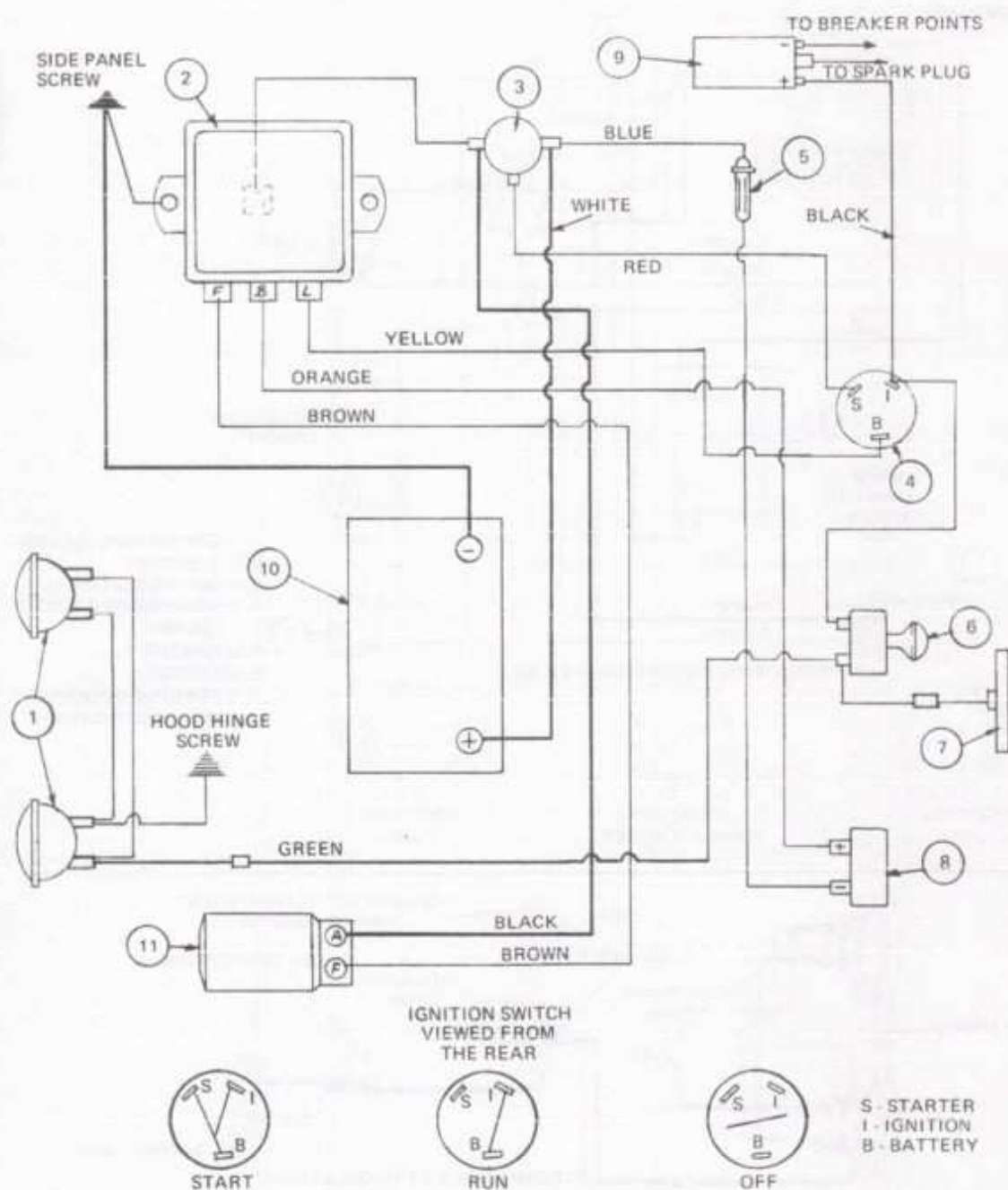
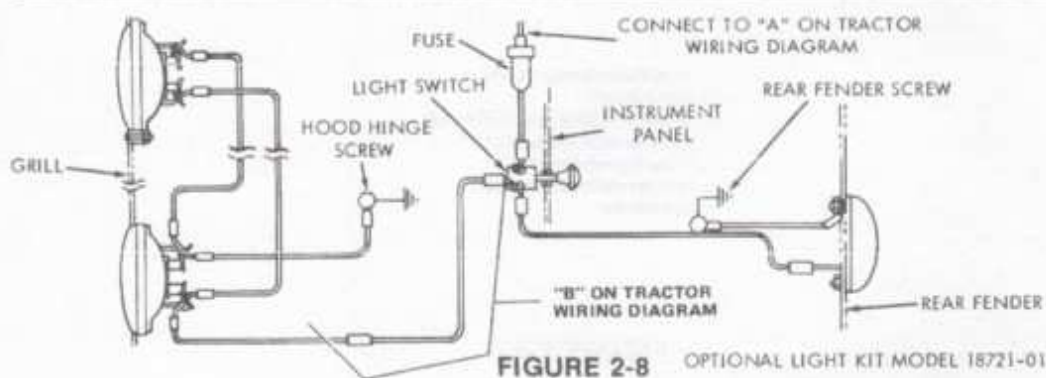
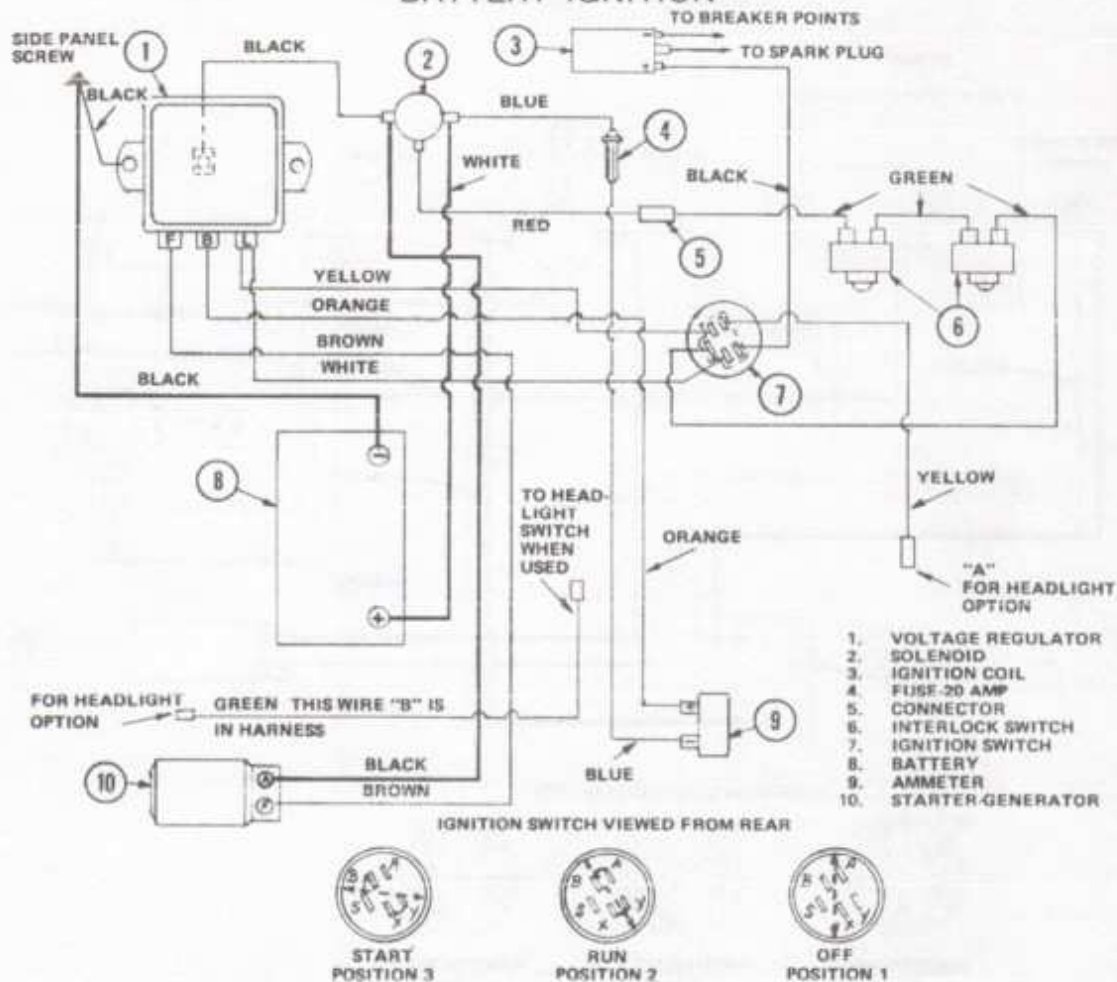


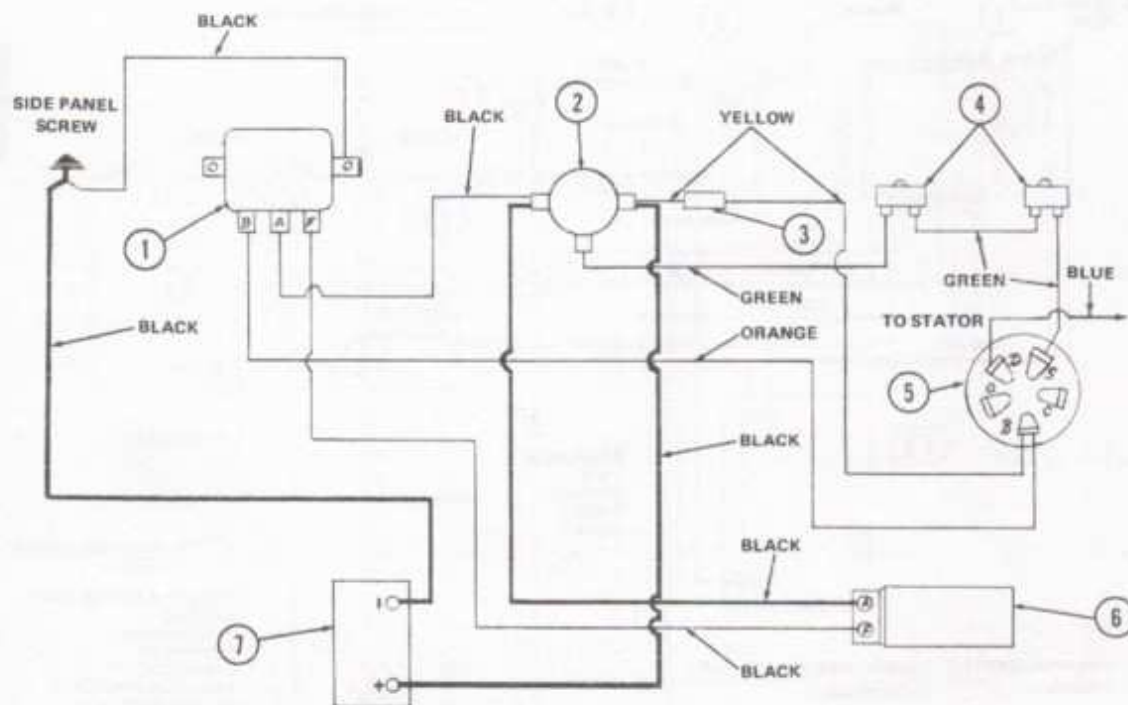
FIGURE 2-7

WIRING DIAGRAM 1054 BATTERY IGNITION



ELECTRICAL SYSTEM (Continued)

WIRING DIAGRAM G10 (1055) w/Tecumseh Engine SOLID STATE IGNITION



REAR VIEW OF IGNITION SWITCH



POSITION NO. 1
OFF



POSITION NO. 2
RUN



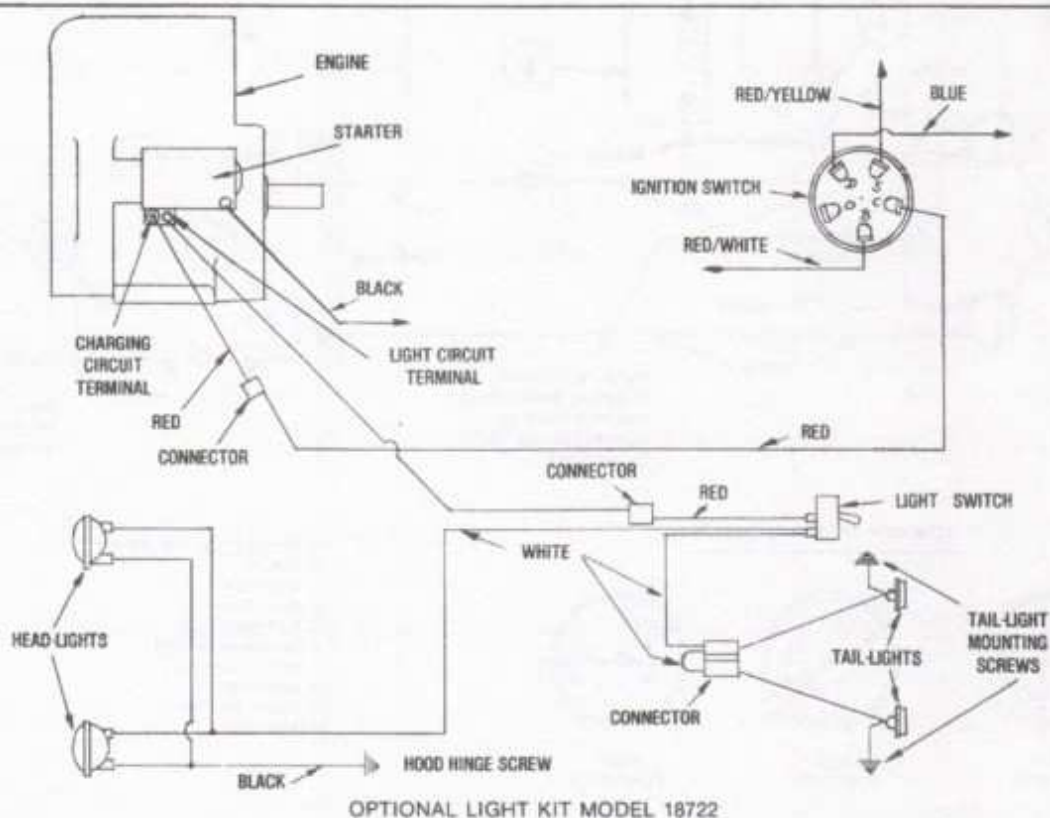
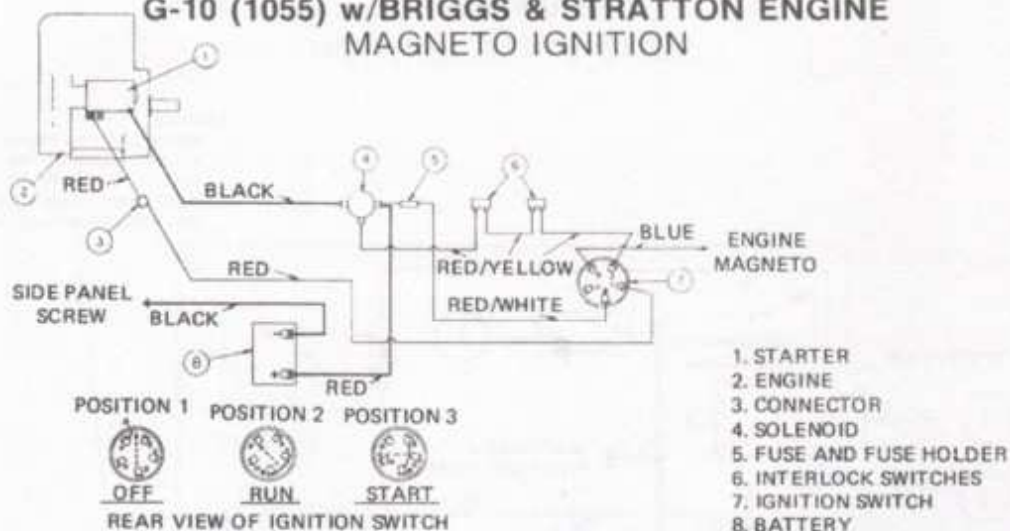
POSITION NO. 3
START

1. VOLTAGE REGULATOR
2. SOLENOID
3. FUSE HOLDER - 20 AMP FUSE
4. INTERLOCK SWITCH
5. IGNITION SWITCH
6. STARTER/GENERATOR
7. BATTERY

FIGURE 2-9

WIRING DIAGRAM

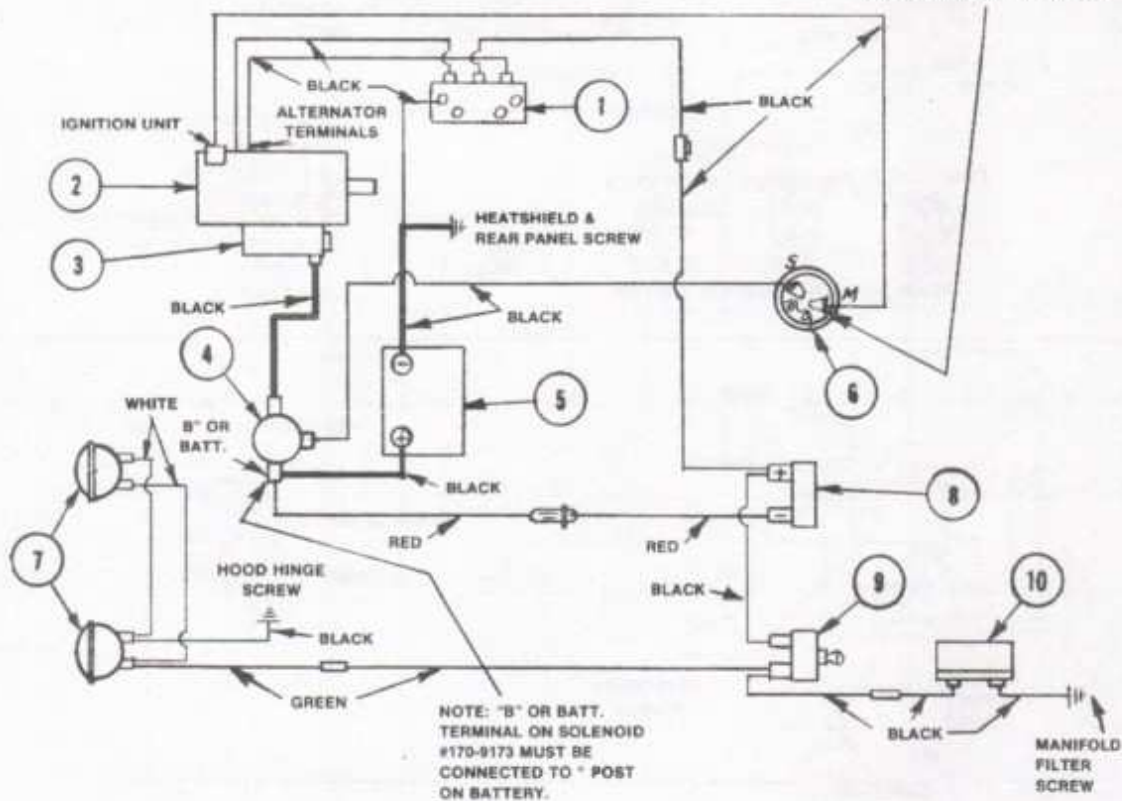
G-10 (1055) w/BRIGGS & STRATTON ENGINE MAGNETO IGNITION



WIRING DIAGRAM
1220 (193-01)
SOLID STATE IGNITION

WARNING:
NEVER APPLY BATTERY
VOLTAGE HERE OR THE
IGNITION UNIT WILL BE
IRREPARABLY DAMAGED
AND REQUIRE REPLACEMENT.

2



REAR VIEW OF IGNITION SWITCH

OFF
POSITION 1RUN
POSITION 2START
POSITION 3

1. REGULATOR - RECTIFIER
2. ENGINE
3. STARTER
4. SOLENOID
5. BATTERY
6. IGNITION SWITCH
7. HEAD LIGHTS
8. AMMETER
9. LIGHT SWITCH
10. TAIL LIGHT

FIGURE 2-10

ELECTRICAL SYSTEM (Continued)

WIRING DIAGRAM 1225 (194-01) SOLID STATE IGNITION

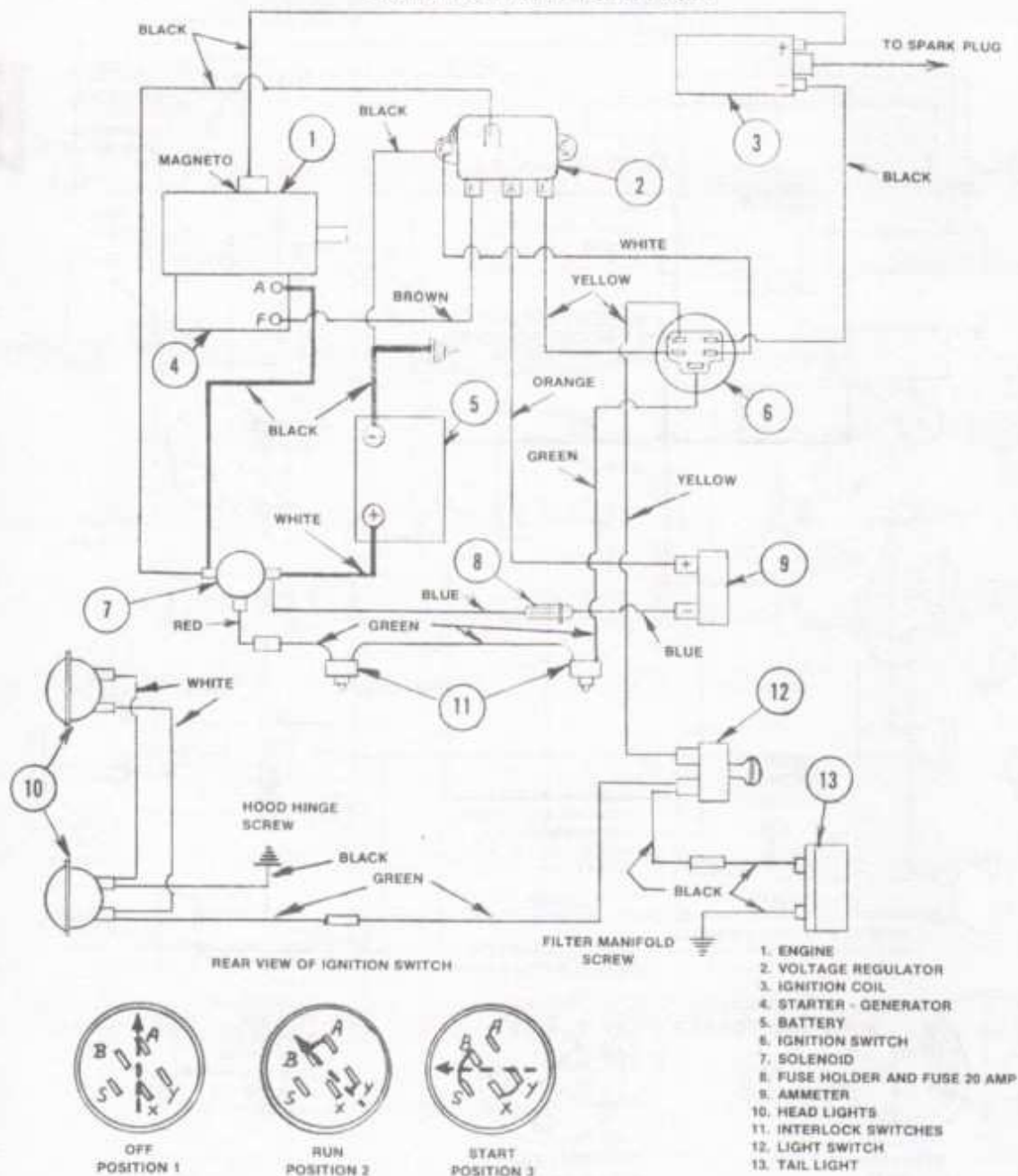


FIGURE 2-11

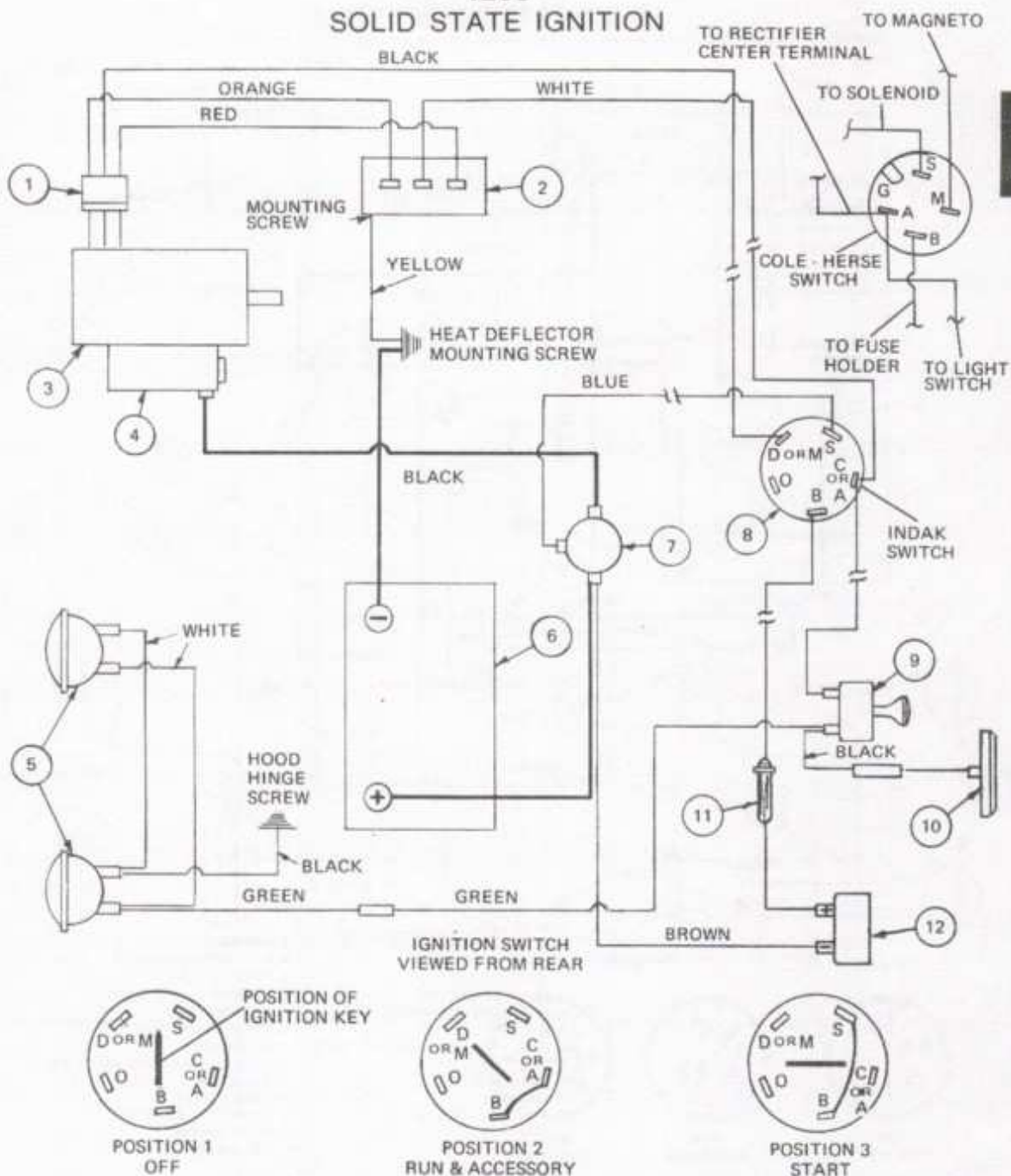
WIRING DIAGRAM
1253
SOLID STATE IGNITION

FIGURE 2-12

ELECTRICAL SYSTEM (Continued)

WIRING DIAGRAM 1254 and 1256 SOLID STATE IGNITION

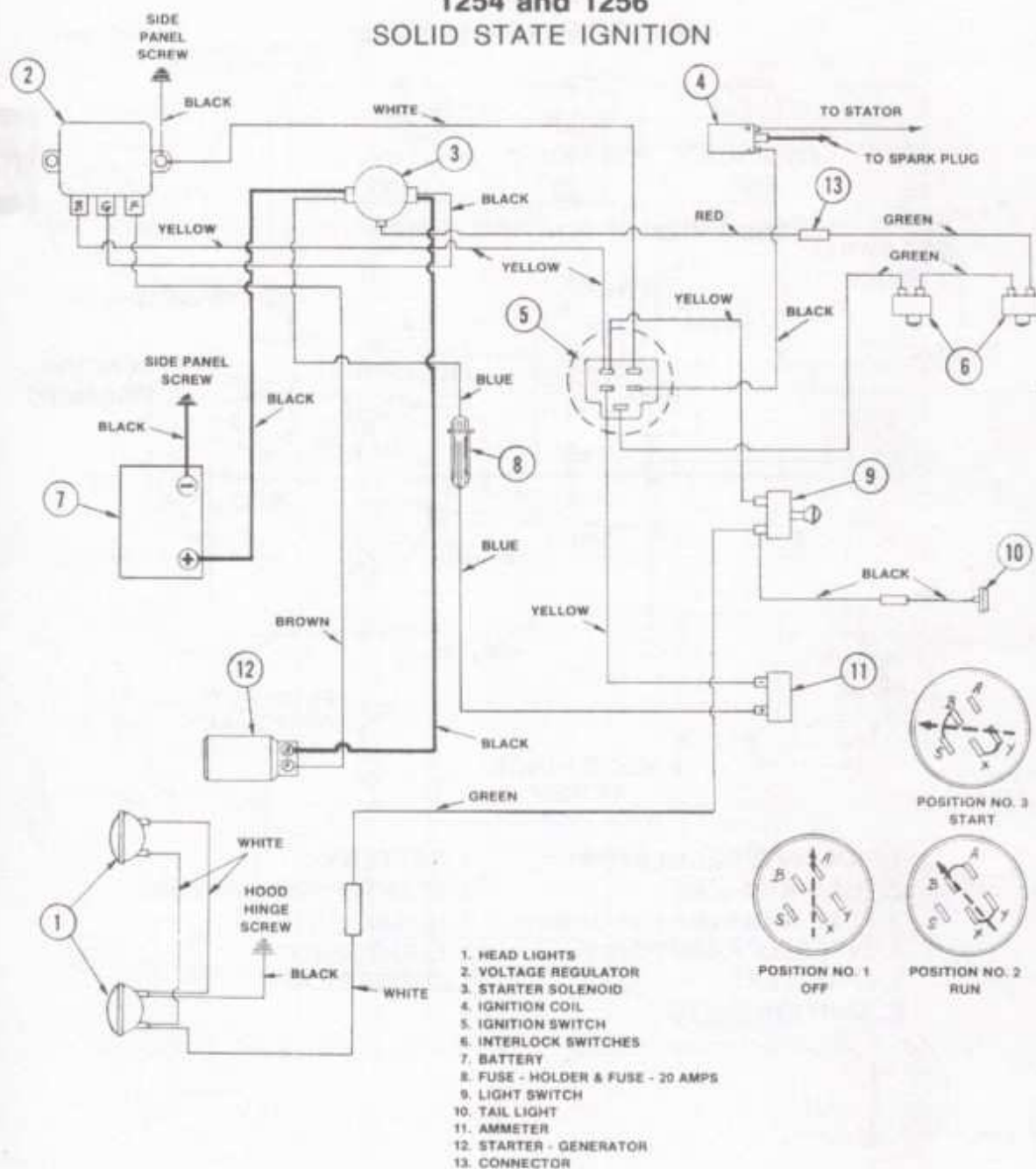


FIGURE 2-13

ELECTRICAL SYSTEM (Continued)

WIRING DIAGRAM 1257 SOLID STATE IGNITION

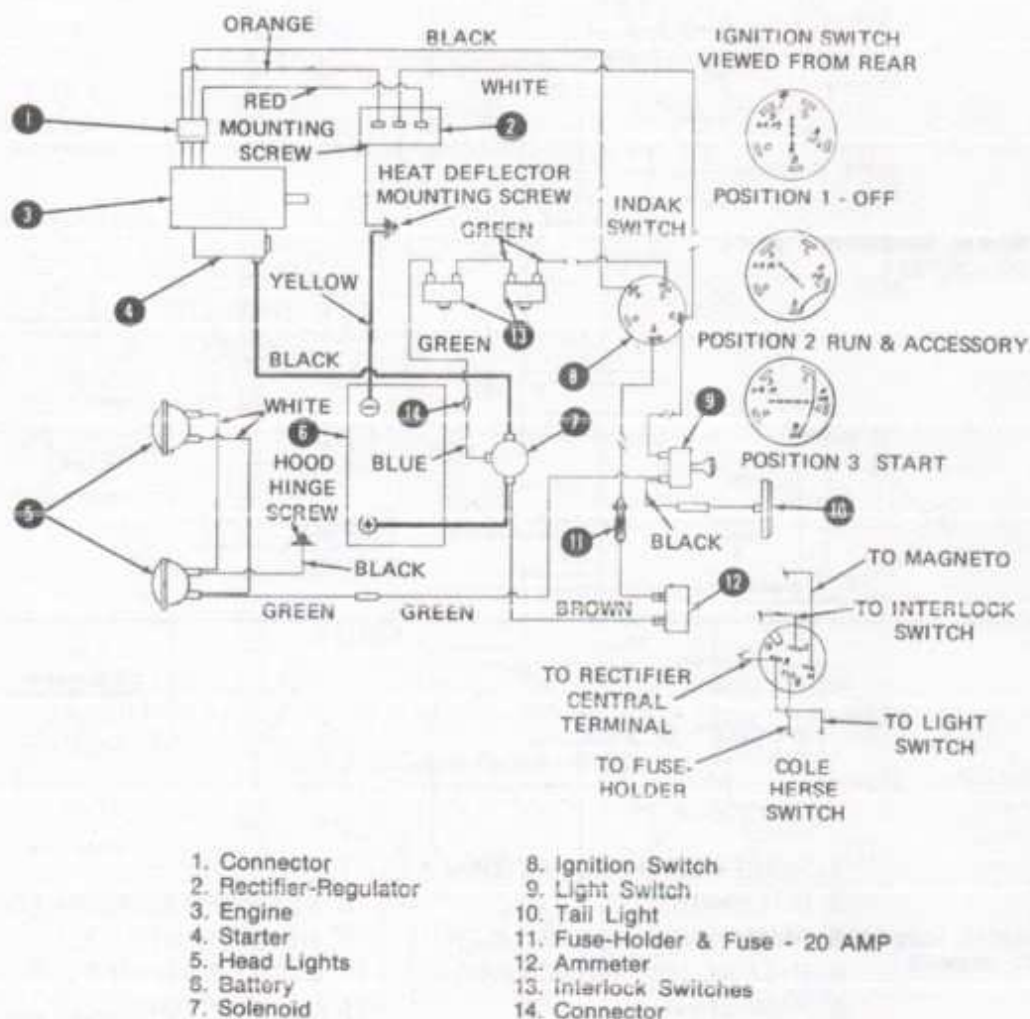
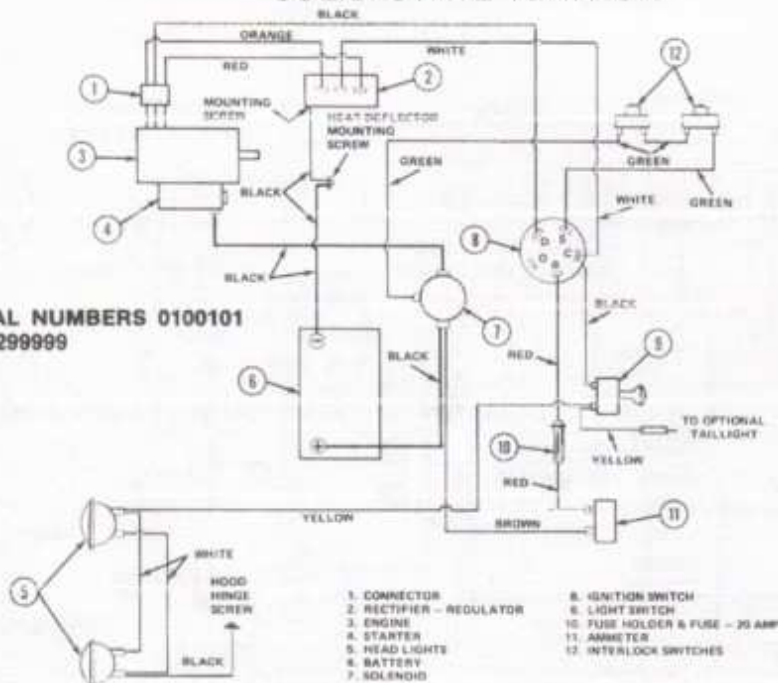


FIGURE 2-14

WIRING DIAGRAM 1556 - G14 (1453) - H14 (1456) - H16 (1656) SOLID STATE IGNITION

SERIAL NUMBERS 0100101
TO 0299999



IGNITION SWITCH
VIEWED FROM REAR



POSITION 1 - OFF



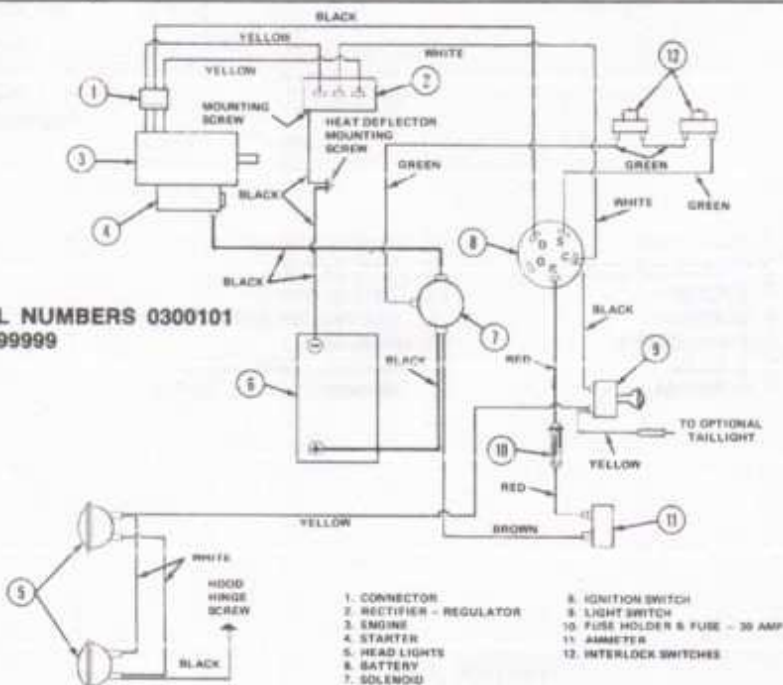
POSITION 2 - RUN &
ACCESSORY



POSITION 3 - START

2

SERIAL NUMBERS 0300101
TO 0399999



IGNITION SWITCH
VIEWED FROM REAR



POSITION 1 - OFF



POSITION 2 - RUN &
ACCESSORY

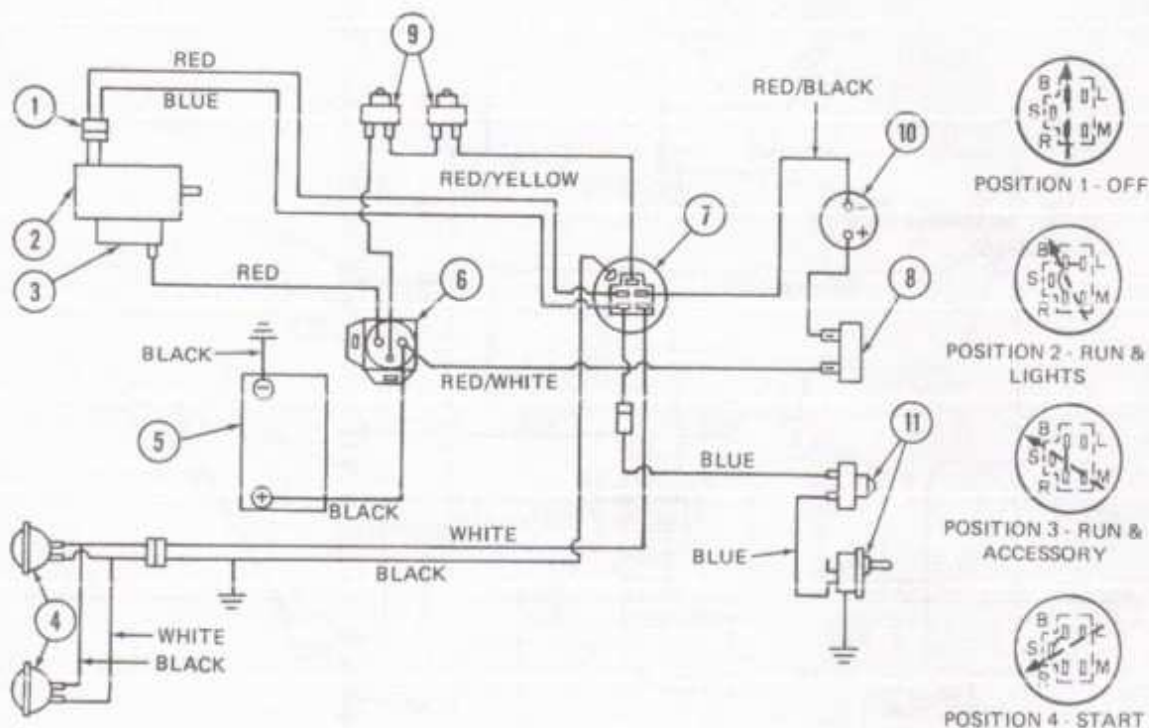


POSITION 3 - START

FIGURE 2-15

ELECTRICAL SYSTEM (Continued)

G-14 (1453) SERIAL NUMBERS 0400101 AND UP



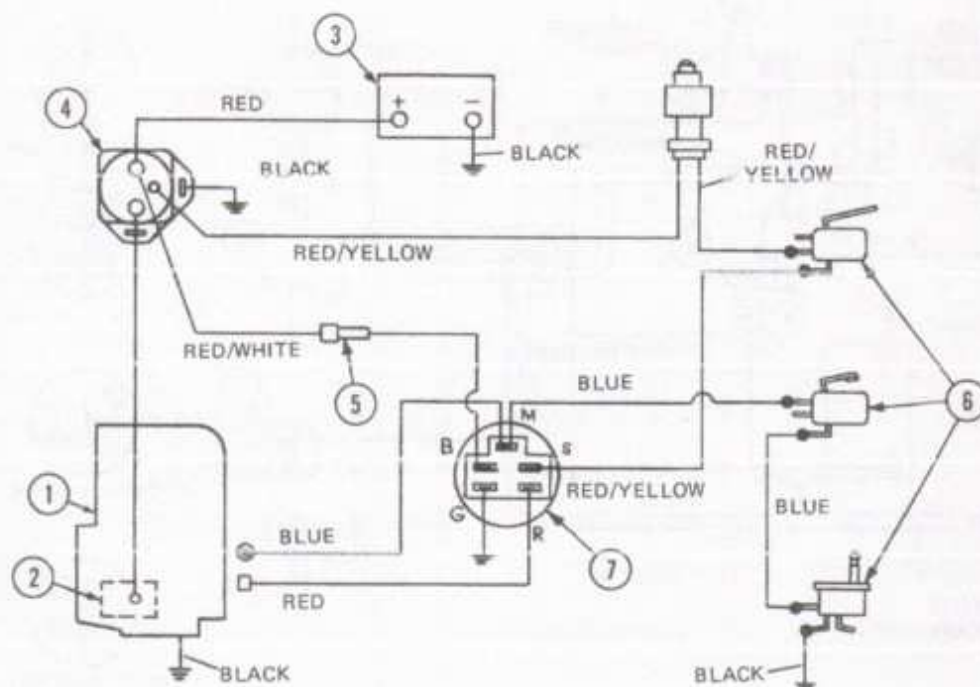
- | | |
|---------------|--------------------------|
| 1. Connector | 7. Ignition Switch |
| 2. Engine | 8. Circuit Breaker |
| 3. Starter | 9. Interlock Switch |
| 4. Headlights | 10. Amp Meter |
| 5. Battery | 11. Interlock Switch (On |
| 6. Solenoid | 0500101 and Up Only) |

ELECTRICAL SYSTEM (Continued)

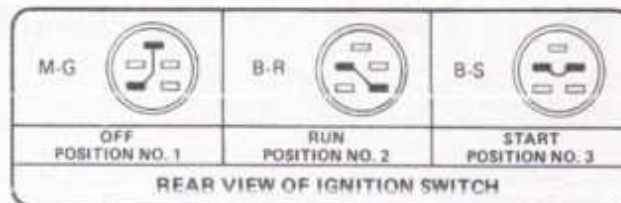
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WIRING DIAGRAM G-11 (1155) w/BRIGGS & STRATTON ENGINE MAGNETO IGNITION

2



1. Engine
2. Starter
3. Battery
4. Solenoid
5. FUSE AND FUSE HOLDER
6. INTERLOCK SWITCHES
7. IGNITION SWITCH



ELECTRICAL SYSTEM (Continued)

DELCO-REMY GENERATORS USED ON BOLENS TRACTORS

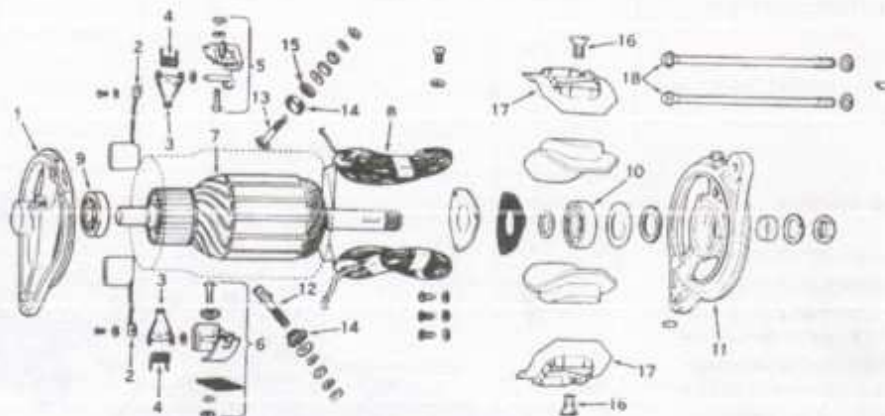


FIGURE 2-16

- | | | |
|--|--------------------------------|---------------------------|
| 1. Frame CE | 8. Field Coil Assembly | 15. Insulated Stud Washer |
| 2. Brush | 9. Ball Bearing CE | 16. Pole Shoe Screw |
| 3. Brush Arm | 10. Ball Bearing DE | 17. Field Coil Insulator |
| 4. Brush Spring | 11. Frame DE | 18. Thru Bolt |
| 5. Ground Brush Holder
(Package) | 12. Terminal Stud "A" | |
| 6. Insulated Brush Holder
(Package) | 13. Terminal Stud "F" | |
| 7. Armature | 14. Insulated Terminal Bushing | |

NOTE: Refer to parts list for FMC
Boleens and Delco Remy part
numbers.

TESTING ELECTRICAL SYSTEM

TESTING IGNITION SWITCH

Test the ignition switch for continuity using a volt/ohm meter or continuity light.



FIGURE 2-17

TESTING SOLENOIDS

To test the solenoid connect the solenoid bracket to the negative battery terminal and a jumper wire from the positive battery terminal to the small solenoid terminal. When contact is made the plunger should be activated. If the above test does not activate the plunger, connect the negative battery terminal to the small solenoid terminal and the jumper from the positive battery terminal to the terminal on the solenoid marked "Bat". If the solenoid plunger is then not activated, replacement of the solenoid is necessary.



FIGURE 2-18

TESTING SWITCHES

Testing the brake interlock switch and P.T.O. interlock switch.

Before electrical tests of switches are made make sure adjustments have been checked. Switches may be checked in or out of the tractor.

1. Connect the switches in series to a volt-ohm meter or circuit tester.
2. Actuate the switch mechanism.
3. The volt meter or circuit tester should show the opening and closing of the circuit.
4. If the test shows the switches defective replacement is necessary.

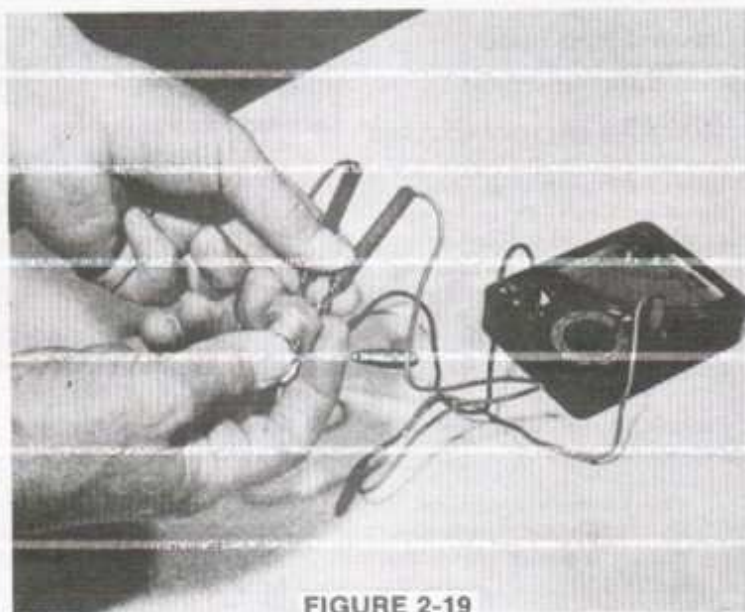


FIGURE 2-19

2

TESTING ELECTRICAL SYSTEM

TESTING BATTERY

CHECKING SPECIFIC GRAVITY

To determine whether the battery is capable of meeting the requirements of the starting motor, it is necessary to subject the battery to a load test. The battery must be at least 75% charged for this test. To determine the percentage of charge a hydrometer reading should be taken.

The following table illustrates ranges of specific gravity for each cell in various states of charge at 80° F. A fully charged battery should have a specific gravity reading of 1.250 to 1.280.

SPECIFIC GRAVITY

	PERCENTAGE CHARGED
1.250 TO 1.280	100%
1.230 TO 1.250	75%
1.200 TO 1.220	50%
1.170 TO 1.190	25%
1.140 TO 1.160	10%
1.110 TO 1.130 ...	DISCHARGED

CHECKING BATTERY VOLTAGE

When a battery is in good condition each cell contributes approximately 1.95 to 2.08 volts. Battery voltage can be checked with a volt-ohm meter and should be between 11.5 and 12.5 volts.

CHECKING BATTERY CAPACITY

For this test the battery should be approximately 80° F.

1. Check battery electrolyte level, add water if necessary. If water is added, charge battery.



FIGURE 2-20

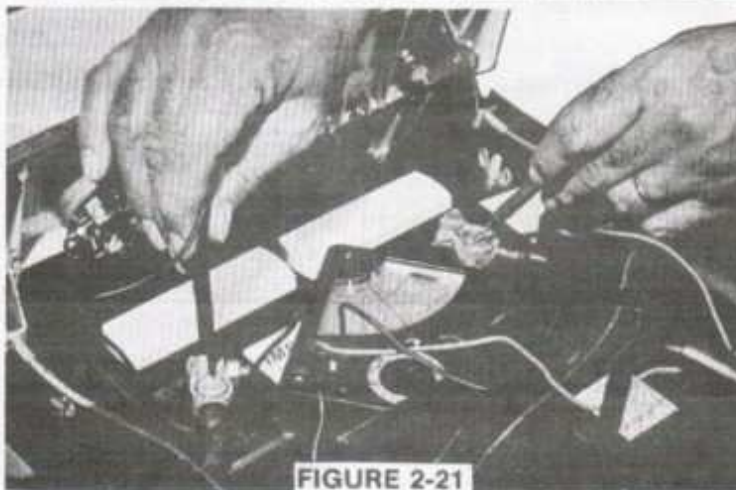


FIGURE 2-21

2. Check battery voltage. It should be between 11.5 and 12.5 volts.
3. Crank the engine using the starter motor for 15 seconds. Battery voltage should not drop below 9.0 volts at the end of this 15 second test.
4. If voltage is less than 9.0 volts the battery may have to be replaced.