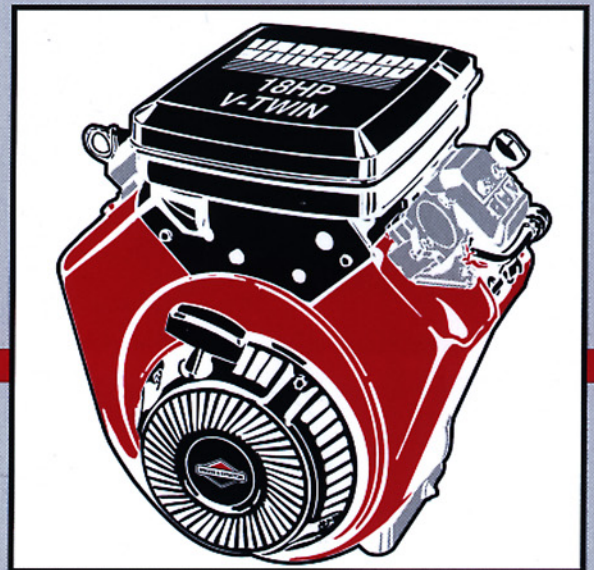
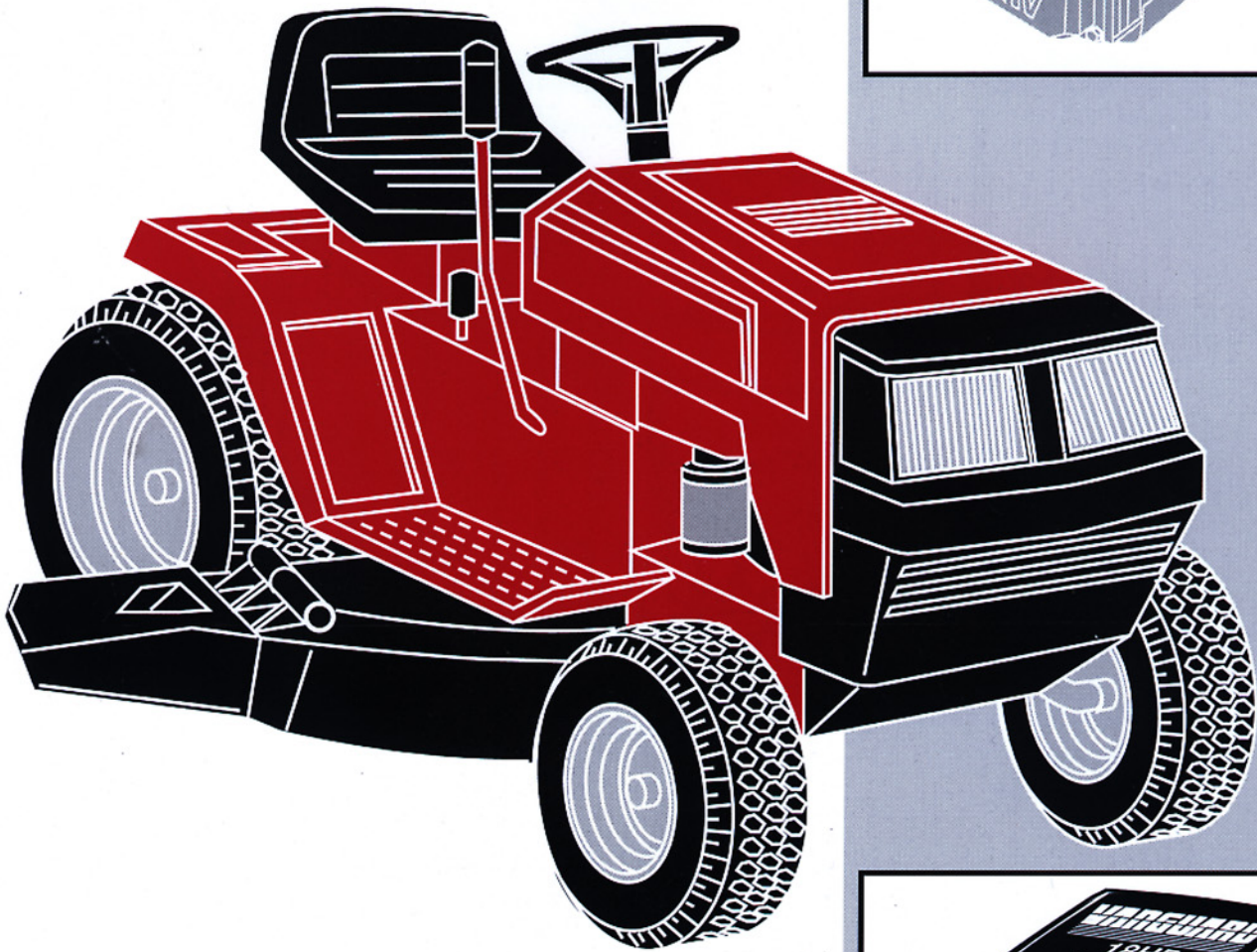
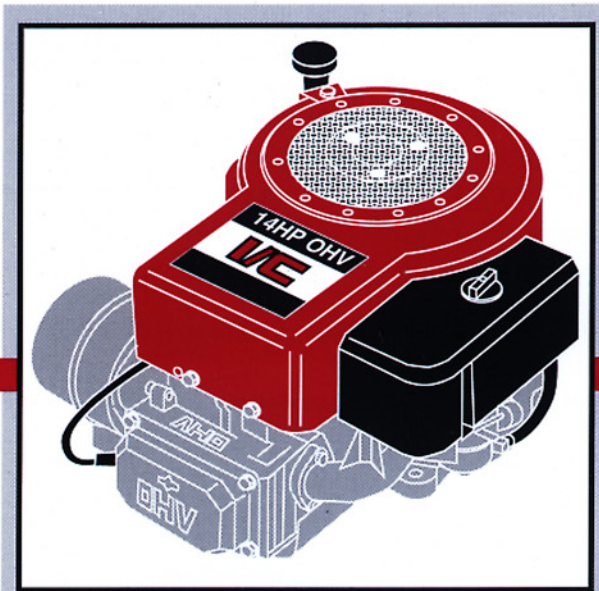


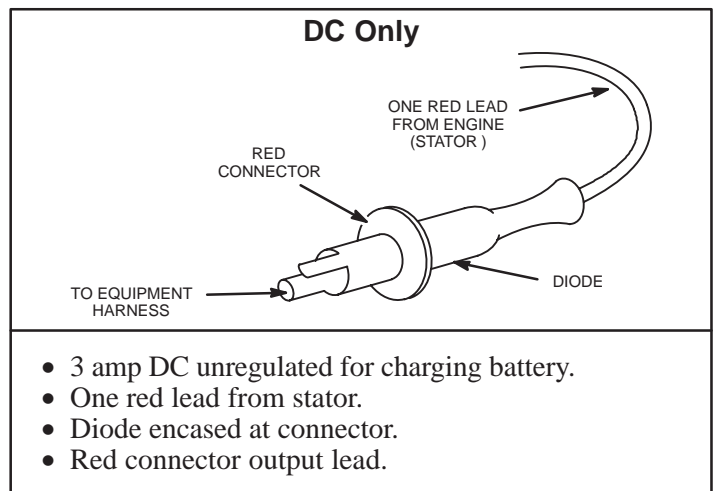
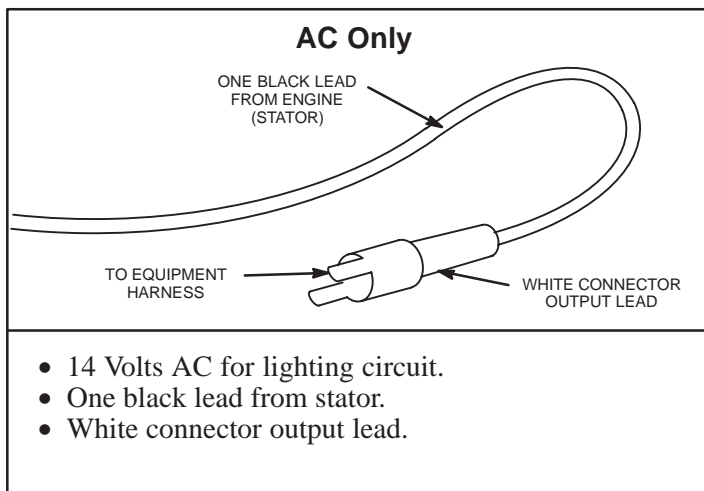
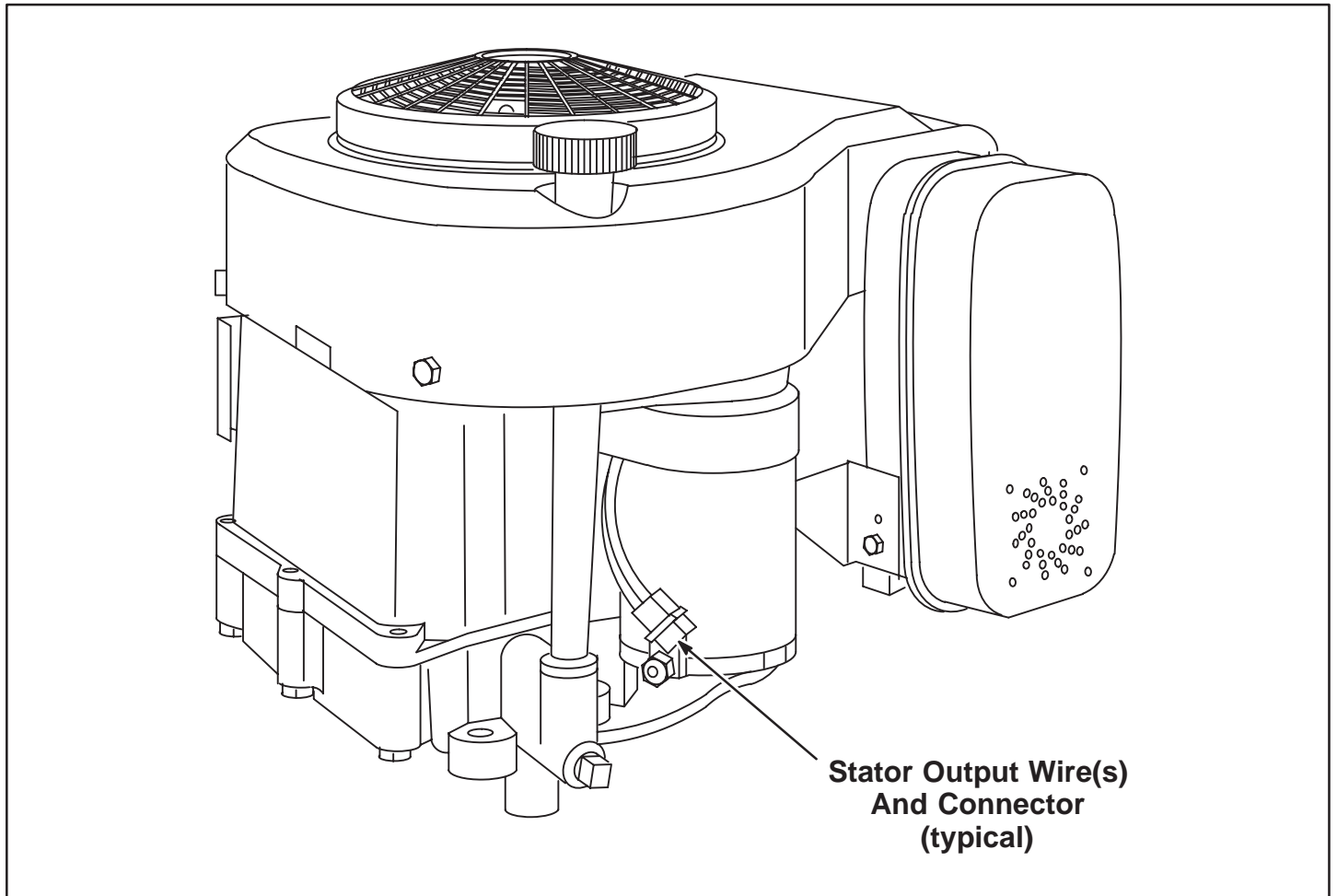
ENGINE/ALTERNATOR REPLACEMENT GUIDE

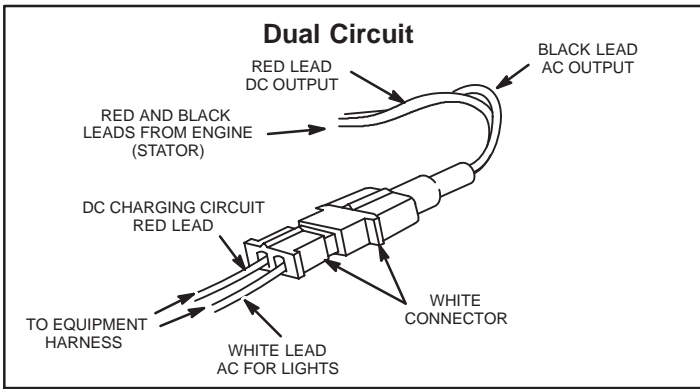


Alternator Identification

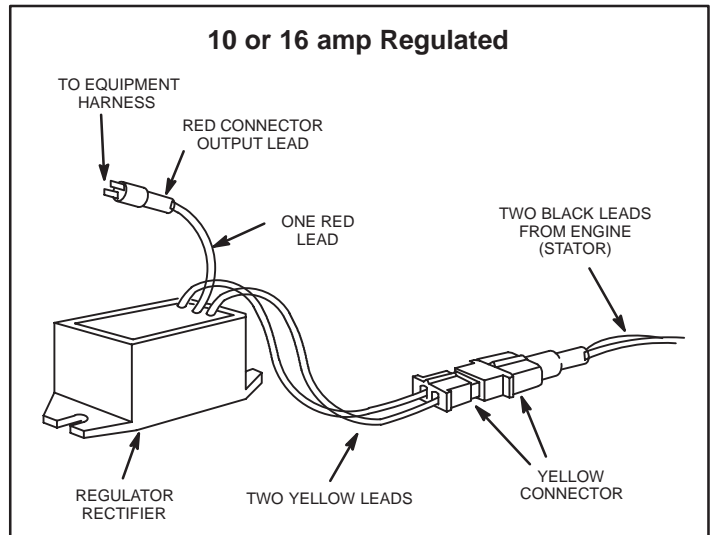
Briggs & Stratton engines are equipped with a number of different alternator systems to meet the requirements of equipment manufacturers. For example, a large lawn tractor with accessories may require a 16 amp regulated system, whereas a snow thrower with a single headlight requires an AC Only system. Knowing the type of alternator system an engine is equipped with is important, particularly when an engine is being replaced.

Briggs & Stratton alternator systems are easily identified by the color of the stator output wire(s) and the connector.

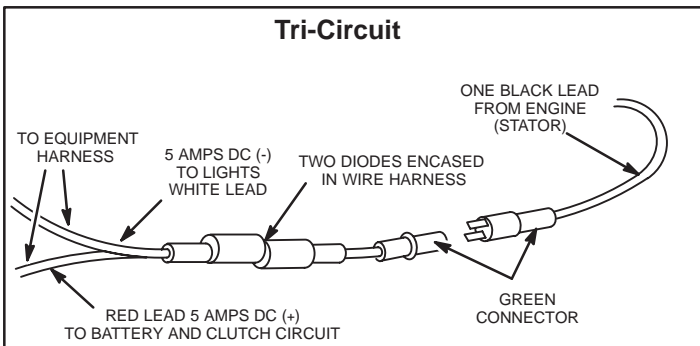




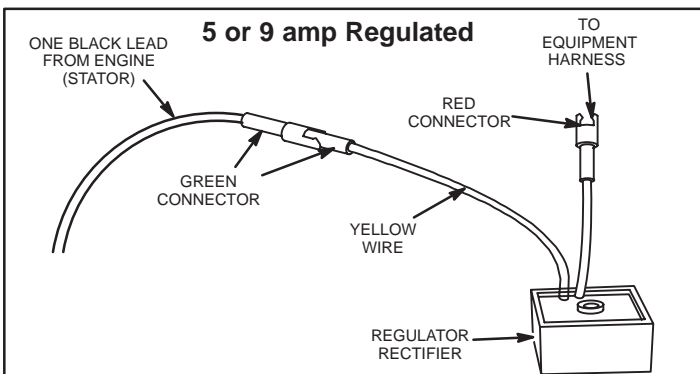
- 3 amp DC unregulated for charging battery (ONE red lead from stator).
- 14 Volts AC for lighting circuit (ONE black lead from stator).
- Diode encased at connector.
- White connector with two pin terminals.



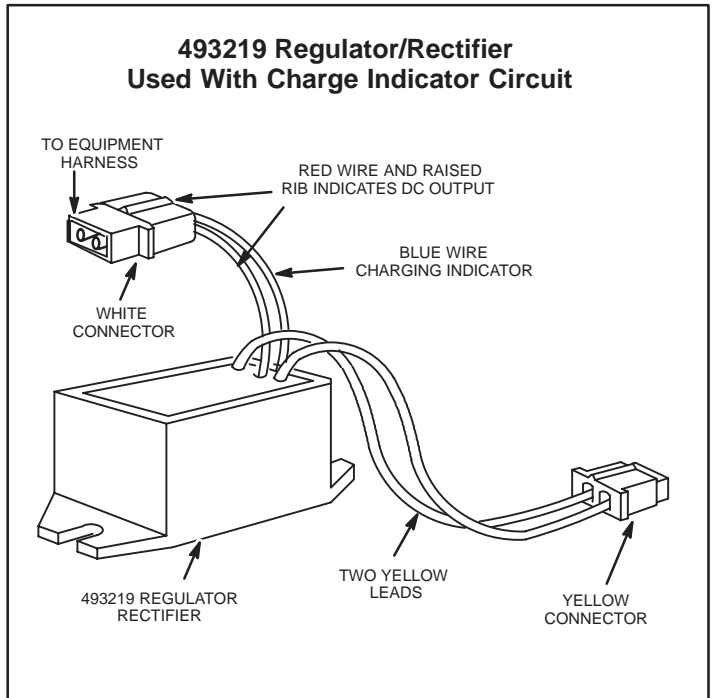
- 10 or 16 amp DC regulated for charging battery.
- Alternator output is determined by the flywheel alternator magnet size.
- 10 and 16 amp system use the same stator, color coding and regulator-rectifier.
- Two black leads from stator.
- Yellow connector with two pin terminals.
- Two yellow leads to regulator-rectifier.
- One red lead from regulator-rectifier to red connector output lead.



- 10 amp AC.
- One black lead from stator.
- Green connector.
- Two diodes encased in wire harness.
- Red and white output leads.



- 5 or 9 amp DC regulated for charging battery.
- Alternator output (5 or 9 amp) is determined by flywheel alternator magnet size.
- Uses same stator as Tri-Circuit system.
- One black lead from stator.
- Green connector.



- Uses same stator as 10 and 16 amp system.
- DC output the same as 10 or 16 amp system.
- Charge indicator light and wiring supplied by equipment manufacturer.
- Red DC output wire to white connector.
- Blue charge indicator wire to white connector.

Engine/Alternator Replacement Information

With the exception of the AC Only alternator, all of the alternator systems referred to in this book have a battery as part of the electrical system.

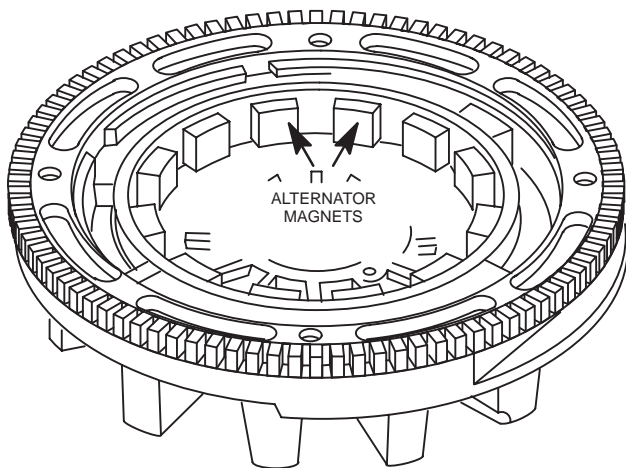
There are specialized applications that use an alternator without a battery. An example would be certain generators or welders that use alternator output to excite an electrical field. For the equipment to function, the alternator output must be very evenly matched to the equipment requirements. When replacing an engine in these applications, the alternator must be the same as the original.

Replacing Briggs & Stratton Engines

When replacing an older Briggs & Stratton engine on a piece of equipment with a newer Briggs & Stratton engine, sometimes the newer engine has an alternator system different from the alternator system on the original engine. This means that the output connector on the replacement engine is not compatible with the original wiring harness on the piece of equipment. For example, the original engine may have been equipped with a Dual Circuit system and the replacement engine is equipped with a regulated system. We can integrate the two systems by making an adapter harness from readily available parts.

Generally an unregulated DC system (DC Only, Dual Circuit) should not be used to replace a regulated system because alternator output may not be sufficient for equipment requirements. However, because the equipment requirements are usually much less on an unregulated DC system, a regulated system may be used as a replacement. The regulator/rectifier prevents the battery from being over charged.

NOTE: The AC Only, DC Only, Dual Circuit, Tri-Circuit as well as the 5 and 10 amp regulated systems use flywheels with small alternator magnets. The 9 and 16 amp regulated systems use flywheels with the large alternator magnets. See figure below for magnet sizes.



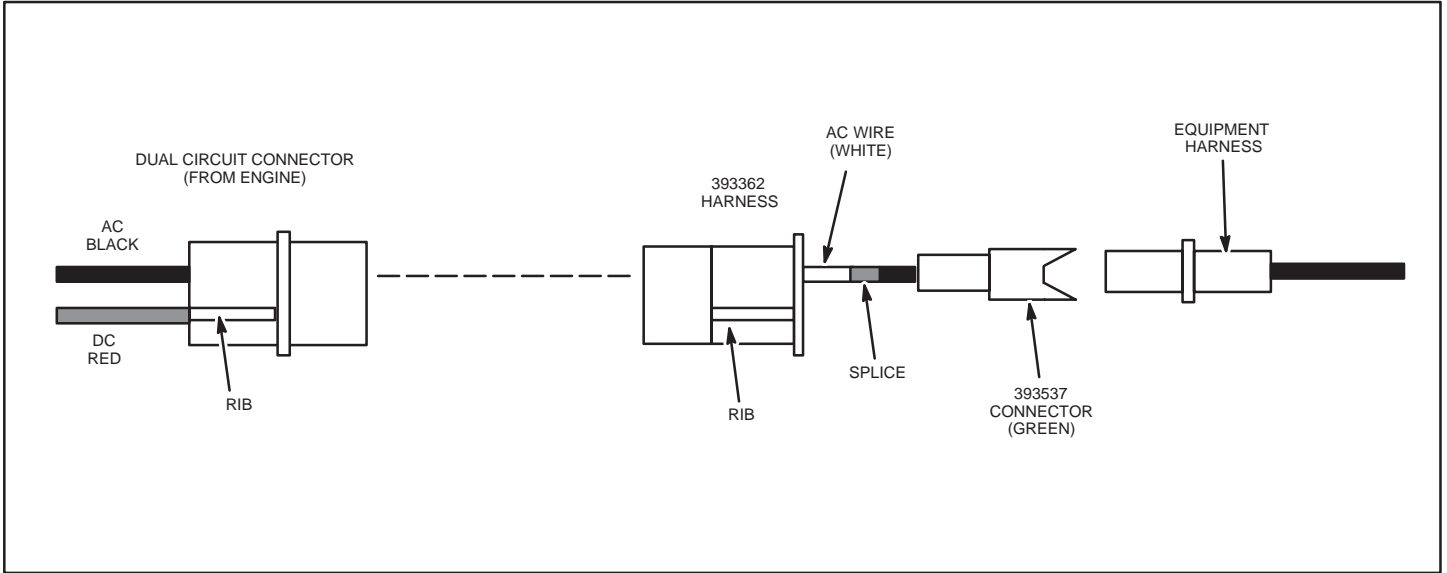
*Small Magnet	7/8" x 11/16" (22mm x 18mm)
*Large Magnet	1-1/16" x 15/16" (27mm x 24mm)

* V Twin Alternator Magnet Size: Small 7/8" x 21/32" (22 mm x 17 mm)
Large 7/8" x 29/32" (22 mm x 23 mm)

The following are alternator replacement combinations which require an adapter harness. All of the necessary components are shown.

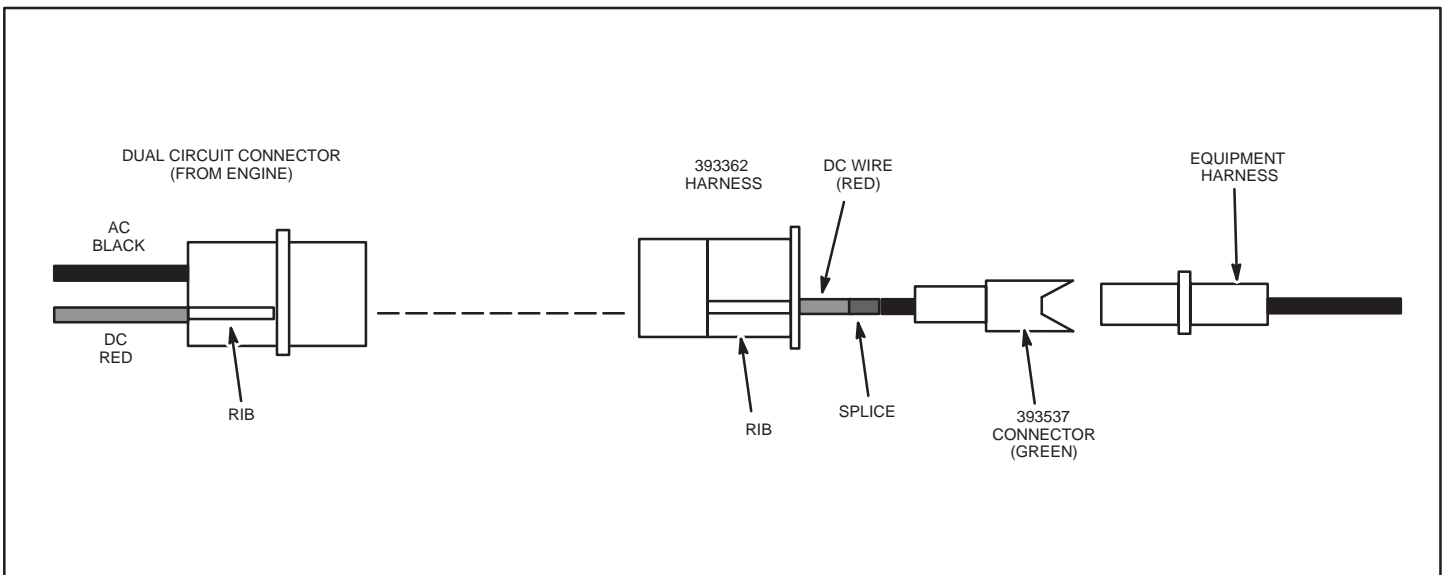
1. Original engine equipped with AC Only alternator.
Replacement engine equipped with Dual Circuit alternator.

Modify 393362 harness supplied with replacement engine by removing red DC wire. Then, splice 393537 connector into white AC wire and connect to equipment harness.



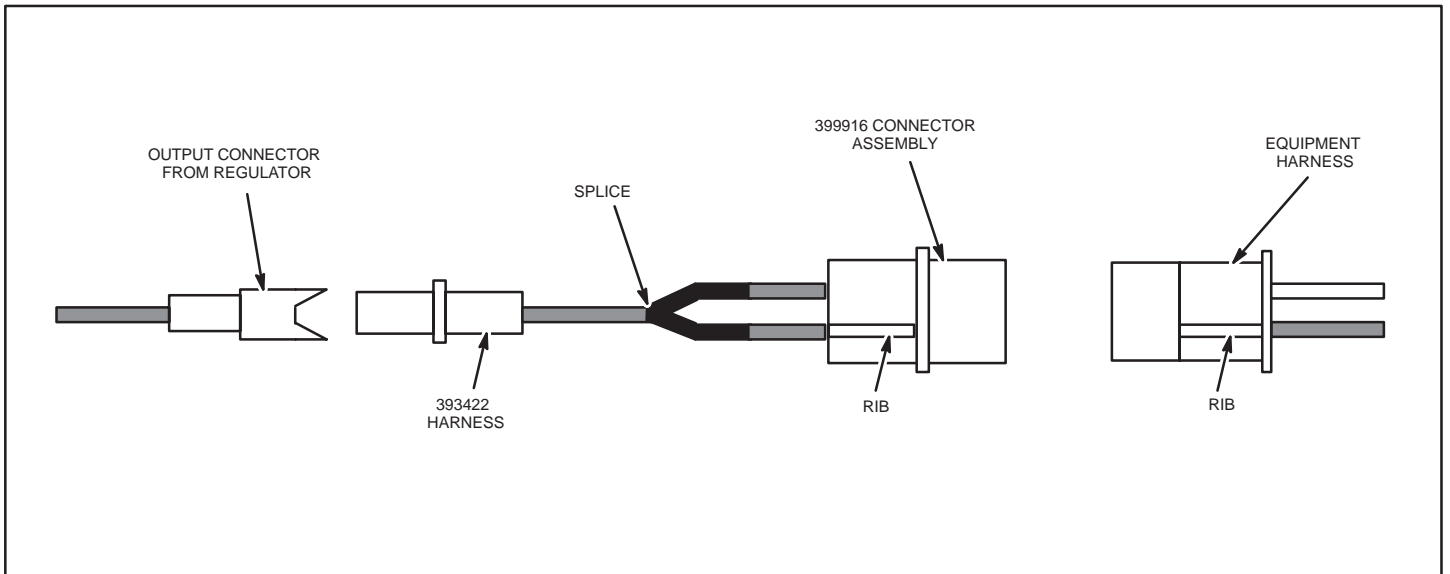
2. Original engine equipped with DC Only alternator.
Replacement engine equipped with Dual Circuit alternator.

Modify 393362 harness supplied with replacement engine by removing white AC wire. Then, splice 393537 connector into red DC wire and connect to equipment harness.



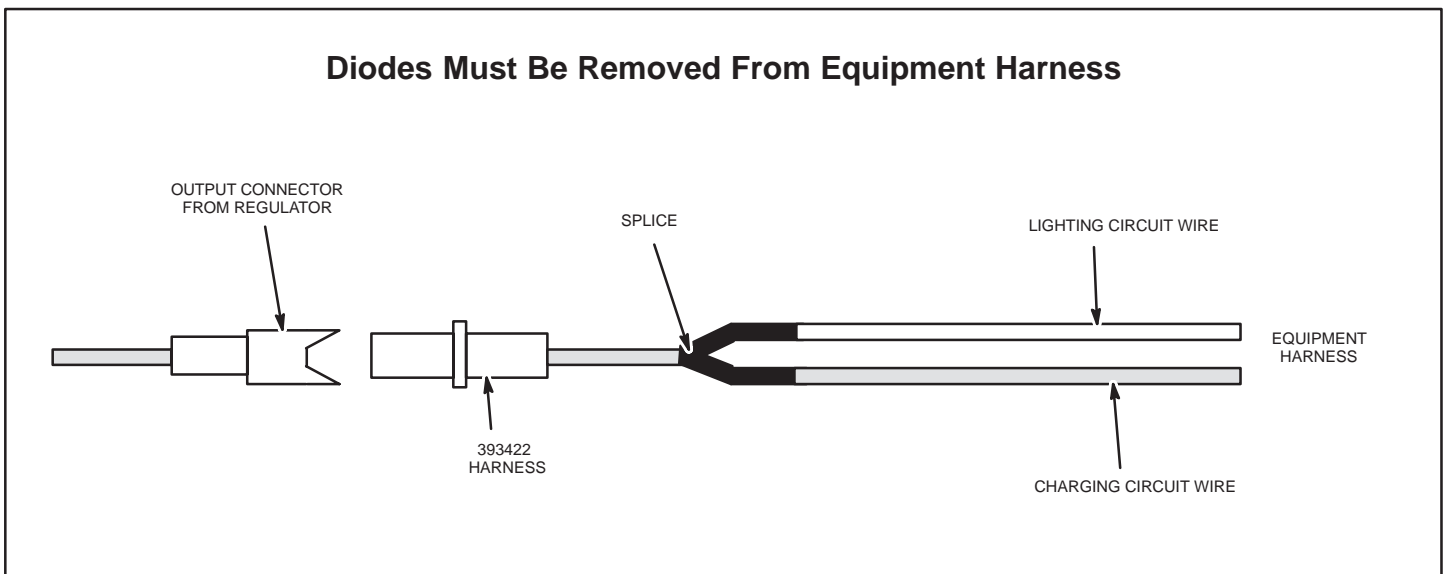
3. Original engine equipped with Dual Circuit alternator.
Replacement engine equipped with 5, 9, 10 or 16 amp regulated system.

Modify 393422 harness supplied with replacement engine by splicing in 399916 connector assembly. Connect to equipment harness.



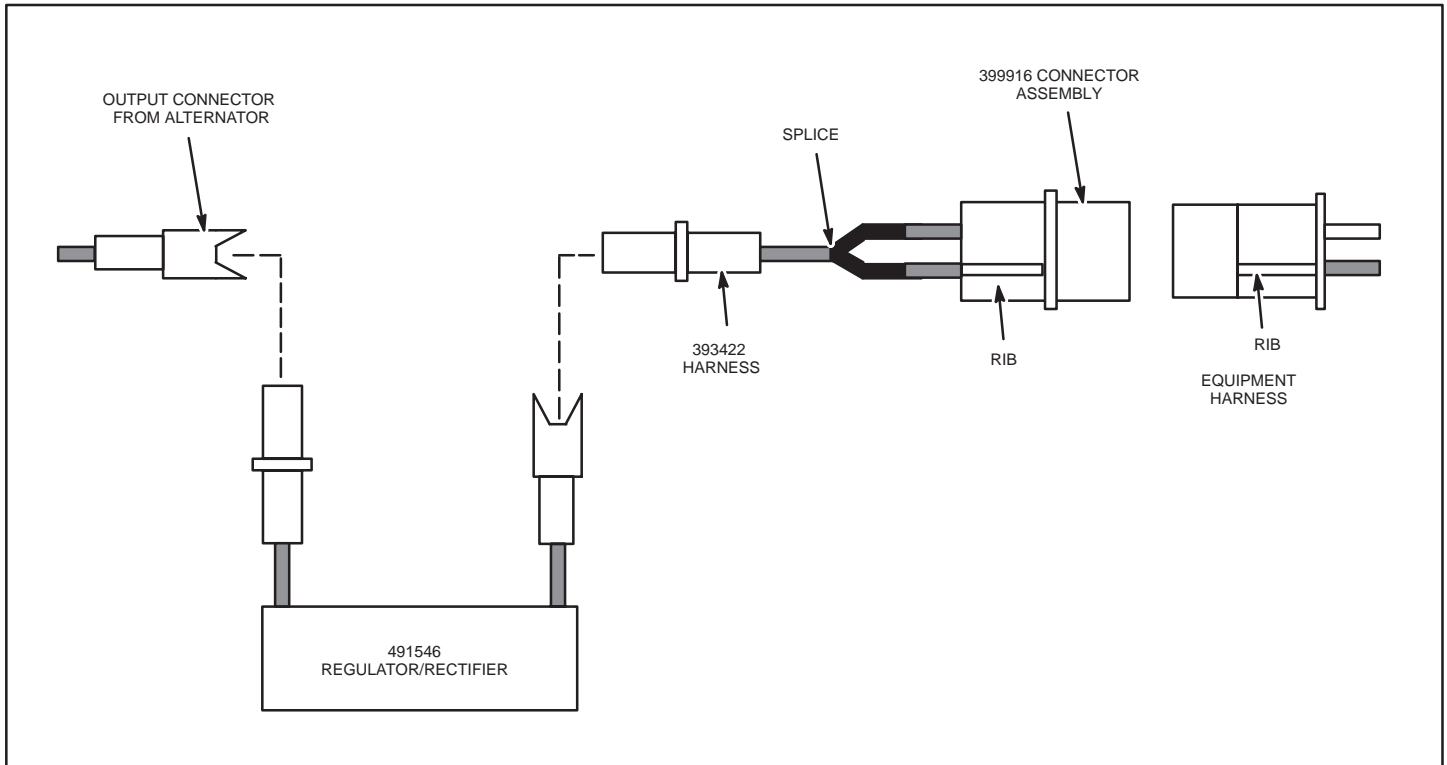
4. Original engine equipped with Tri-Circuit alternator.
Replacement engine equipped with 5, 9, 10 or 16 amp regulated system.

Modify 393422 harness supplied with replacement engine by splicing into charging circuit wire and lighting circuit wire in equipment harness. **NOTE: THE DIODES MUST BE REMOVED FROM THE EQUIPMENT HARNESS.**



5. Original engine equipped with Dual Circuit alternator.
Replacement engine equipped Tri-Circuit alternator.

Discard 392606 diode harness supplied with new engine. Install 491546 regulator/rectifier. Add 393422 harness and modify by splicing in 399916 connector assembly. Connect to equipment harness.



6. Original engine equipped with 5 amp regulated system.
Replacement engine equipped with Tri-Circuit alternator.

Discard 392606 diode harness supplied with new engine. Transfer 491546 regulator/rectifier from original engine. Connect to equipment harness.

The following alternator replacement combinations require no modifications.

7. Original engine equipped with DC Only alternator.
Replacement engine equipped with 5, 9, 10 or 16 amp regulated system.
Direct Replacement. Connect to equipment harness.
8. Original engine equipped with 5 amp regulated system.
Replacement engine equipped with 9, 10 or 16 amp regulated system.
Direct Replacement. Connect to equipment harness.
9. Original engine equipped with 9 amp regulated system.
Replacement engine equipped with 10 or 16 amp regulated system.
Direct Replacement. Connect to equipment harness.
10. Original engine equipped with 10 amp regulated system.
Replacement engine equipped with 9 or 16 amp regulated system.
Direct Replacement. Connect to equipment harness.

Briggs & Stratton Engine Replacing Engine Of Another Manufacturer

When replacing the engine of another manufacturer with a Briggs & Stratton engine, the equipment requirements must be known so that the replacement alternator system has the same output as the original system provided.

Often the equipment wiring harness is not compatible with the Briggs & Stratton alternator output harness. To create a compatible system it may be necessary to modify the the equipment wiring harness. To do this a wiring diagram for the equipment is essential.

The original keyswitch may also create a problem. Even though the keyswitch harness connectors appear to be identical, there are internal differences to keyswitches. Therefore it is necessary to have a diagram of the keyswitch showing the terminal positions and their functions. For example, see the 5 terminal switch diagrams in Figure 1 and Figure 2. The keyswitch in Figure 1 is compatible with all Briggs & Stratton alternators. Note in Figure 2, that when the "brand X" keyswitch is in the START position there is no battery voltage available to the #2 switch terminal. Consequently, if the replacement Briggs & Stratton engine was equipped with a carburetor solenoid, it would not function. This is why it is important to have a diagram of the keyswitch when replacing engines, or replace the keyswitch with one that is compatible with all Briggs & Stratton alternator systems.

NOTE: The 5 terminal Briggs & Stratton keyswitch, part no. 490066, shown in Fig. 1 has been replaced by a 6 terminal keyswitch, part no. 493625. The additional terminal provides a direct connection for the charging lead at the keyswitch.

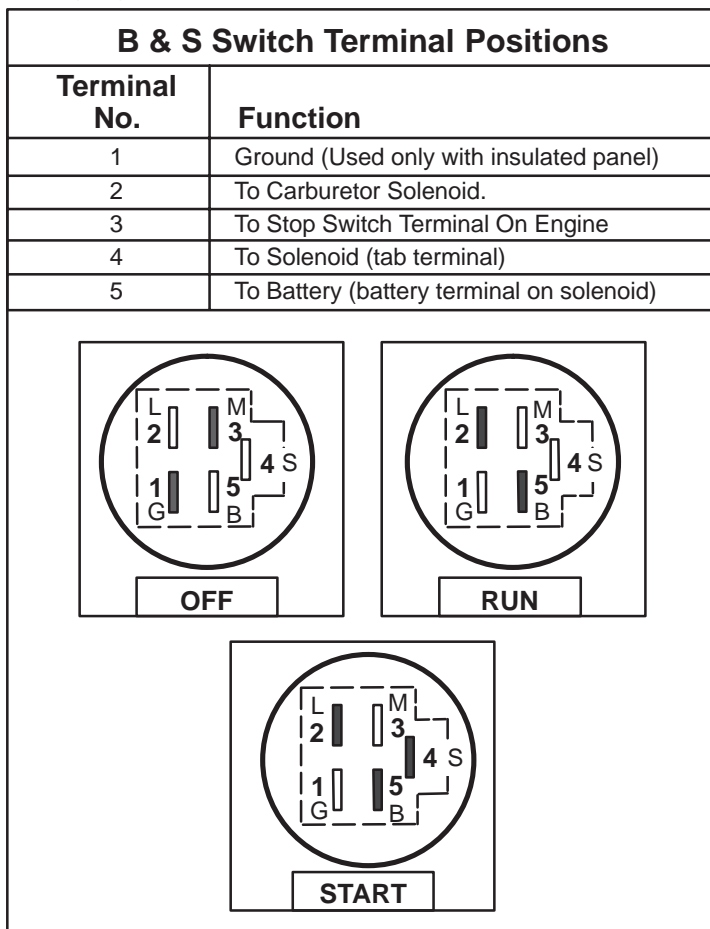


Fig. 1

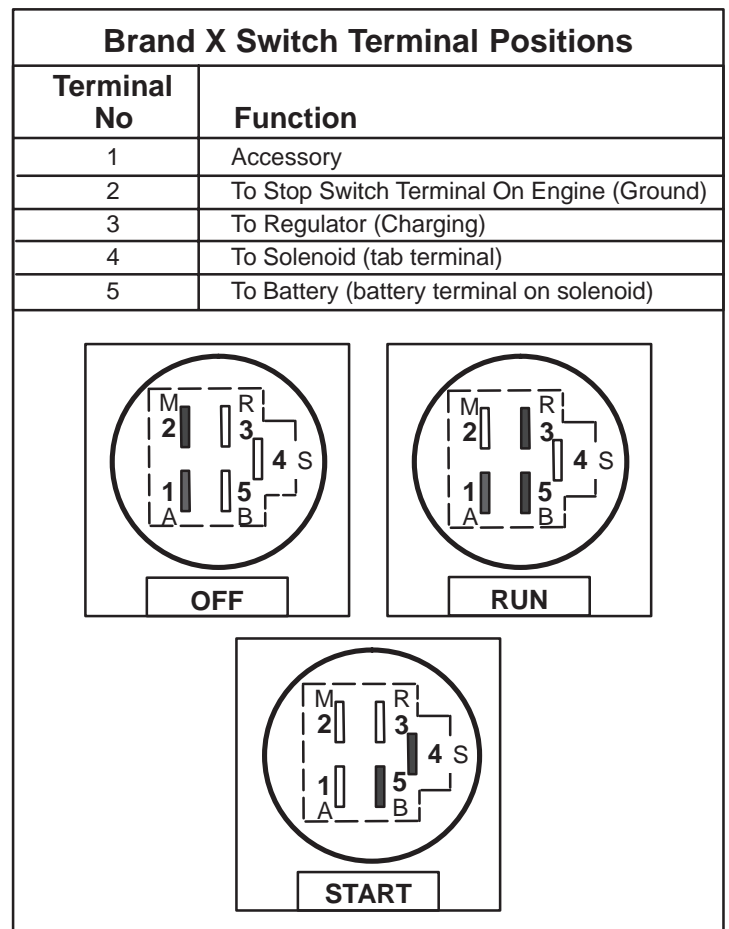
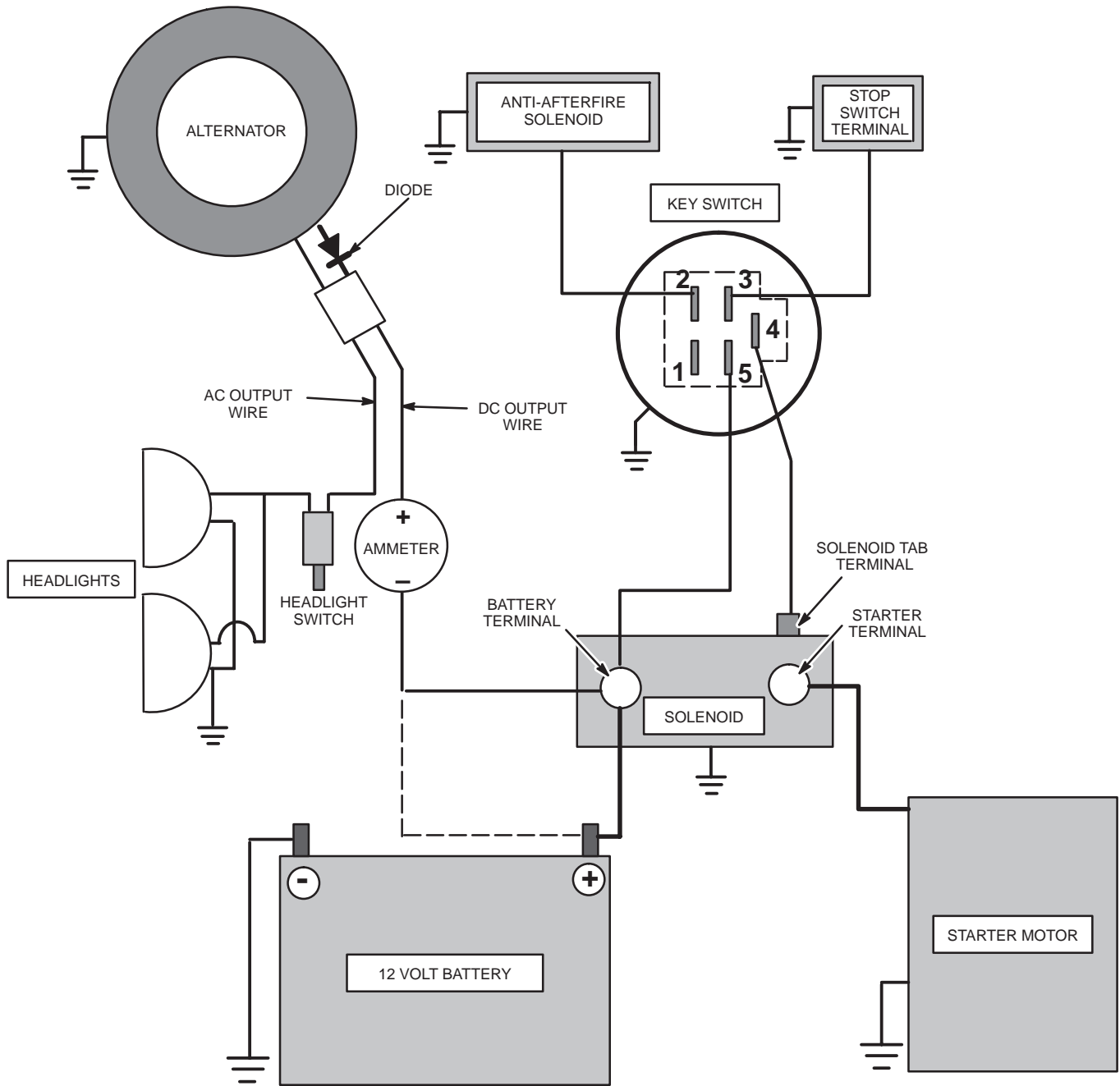


Fig. 2

It is not possible to show all of the wiring diagrams or keyswitch combinations that are used by equipment manufacturers. However, the following wiring diagrams for the most popular Briggs & Stratton engines may be used as a guide when replacing an engine. The wiring diagrams show the type of keyswitch that is compatible with the alternator system shown.

Typical Dual Circuit Alternator Wiring Diagram 5 Pole Switch – Briggs & Stratton Part No. 490066



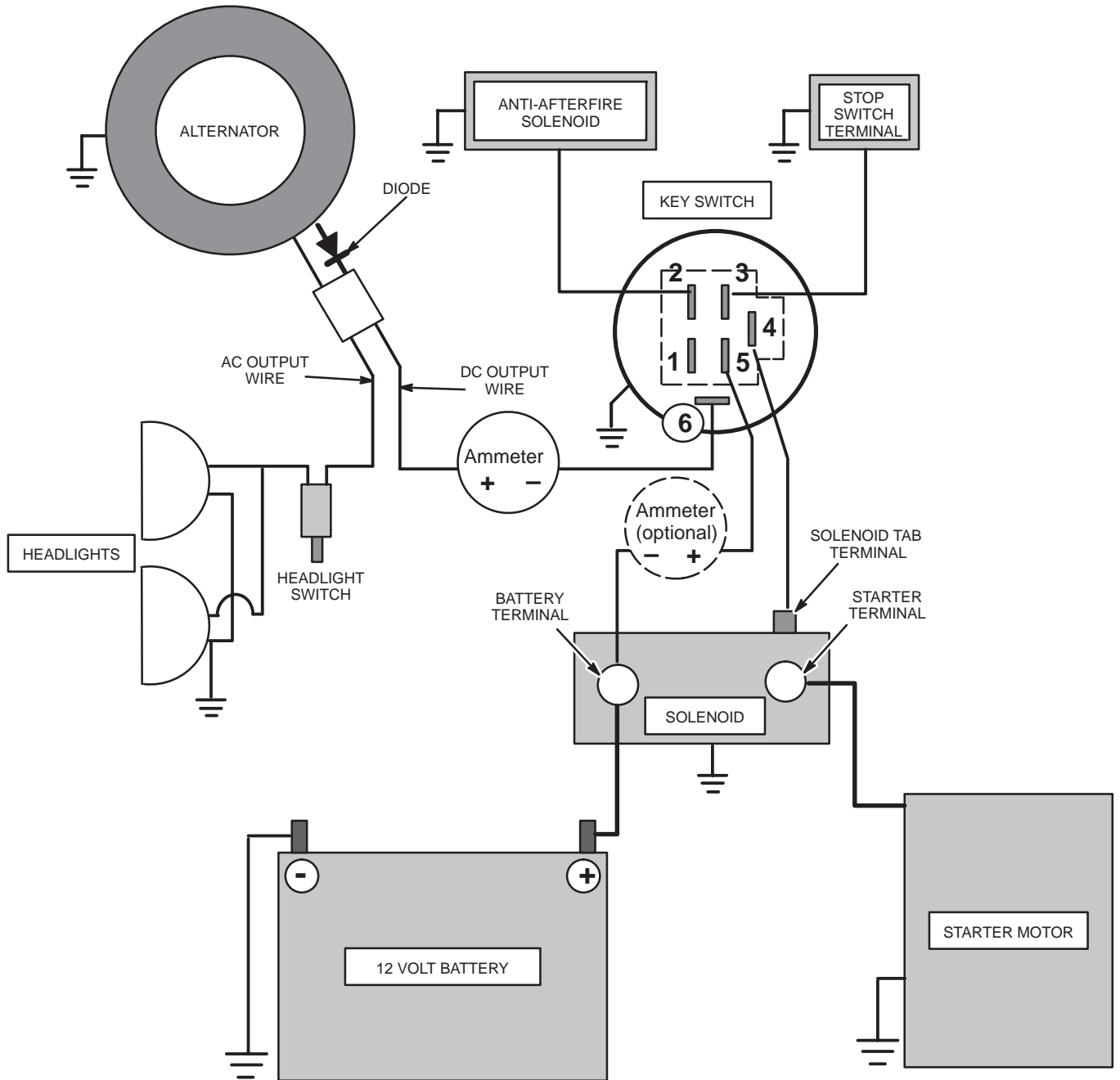
Key Switch Test

Switch Position	Continuity
1. OFF	*1 + 3
2. RUN	2 + 5
3. START	2 + 4 + 5

* Terminal 1 Grounded Internally
To Key Switch Case

Terminal No.	Function
1	Ground (Used only with insulated panel)
2	To Carburetor Solenoid.
3	To Stop Switch Terminal On Engine
4	To Solenoid (tab terminal)
5	To Battery (battery terminal on solenoid)

Typical Dual Circuit Alternator Wiring Diagram 6 Pole Switch – Briggs & Stratton Part No. 493625



Key Switch Test

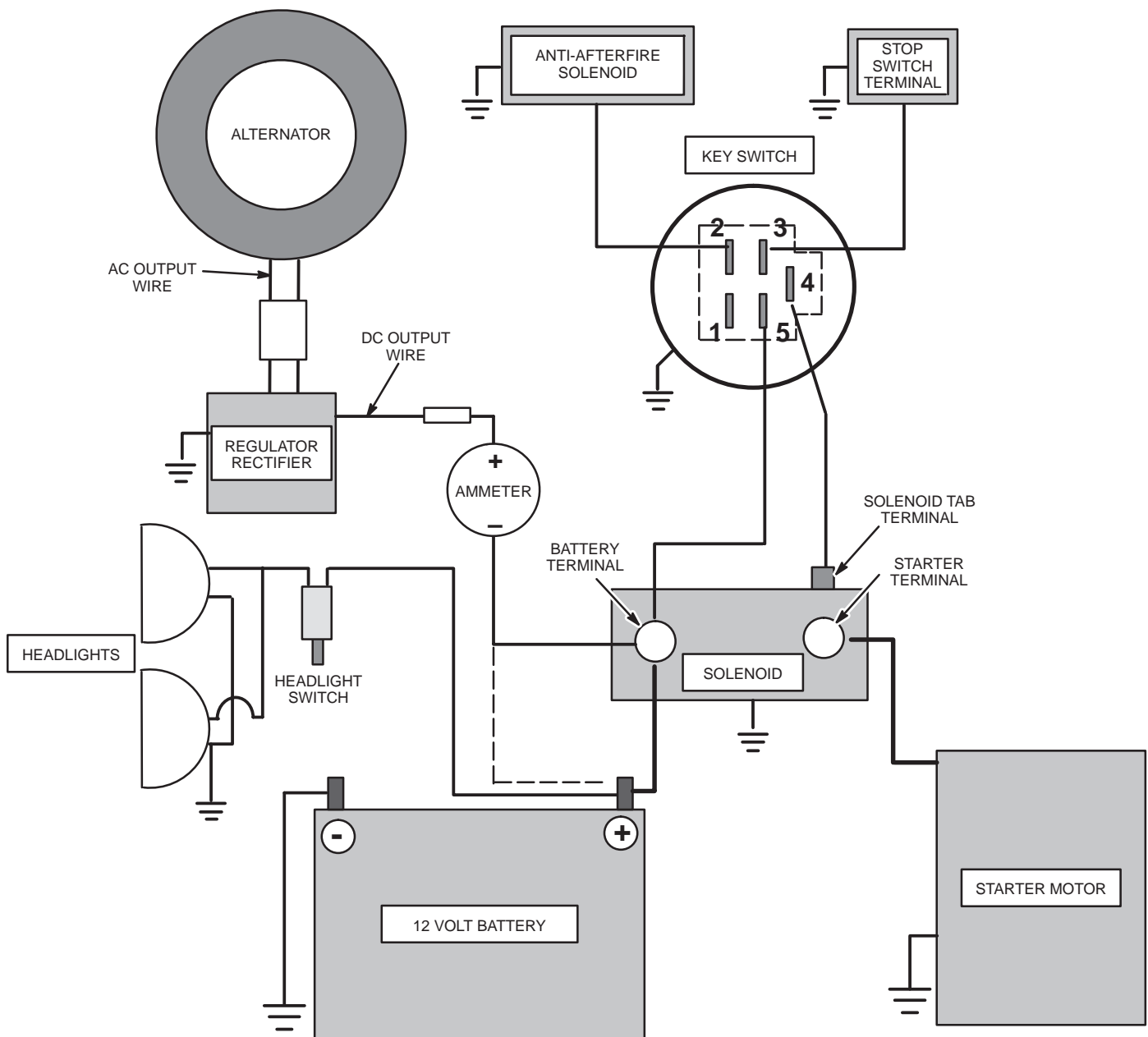
Switch Position	Continuity
1. OFF	*1 + 3 + 6
2. RUN	2 + 5 + 6
3. START	2 + 4 + 5

*Terminal 1 Grounded Internally
To Key Switch Case

With ammeter shown in optional position, note that – and + symbols are reversed. The + symbol must always be connected to the alternator side.

Terminal No.	Function
1	To Ground (used only with insulated panel)
2	To Carburetor Solenoid.
3	To Stop Switch Terminal On Engine
4	To Solenoid (tab terminal)
5	To Battery (battery terminal on solenoid)
6	To Alternator (DC Output)

Typical 16 amp Regulated Alternator Wiring Diagram 5 Pole Switch – Briggs & Stratton Part No. 490066



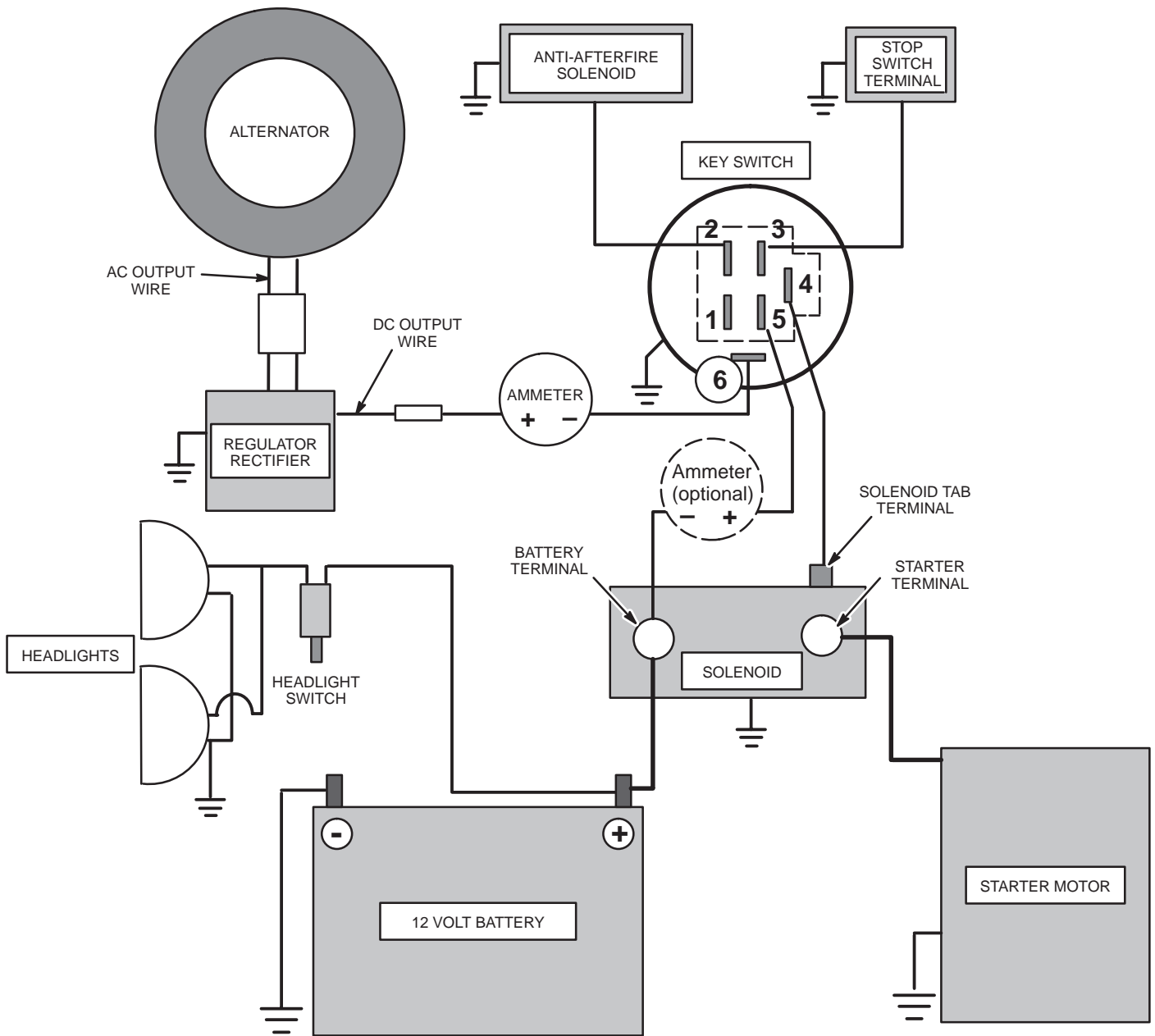
Key Switch Test

Switch Position	Continuity
1. OFF	*1 + 3
2. RUN	2 + 5
3. START	2 + 4 + 5

* Terminal 1 Grounded Internally
To Key Switch Case

Terminal No.	Function
1	Ground (Used only with insulated panel)
2	To Carburetor Solenoid.
3	To Stop Switch Terminal On Engine
4	To Solenoid (tab terminal)
5	To Battery (battery terminal on solenoid)

Typical 16 amp Regulated Alternator Wiring Diagram 6 Pole Switch – Briggs & Stratton Part No. 493625



Key Switch Test

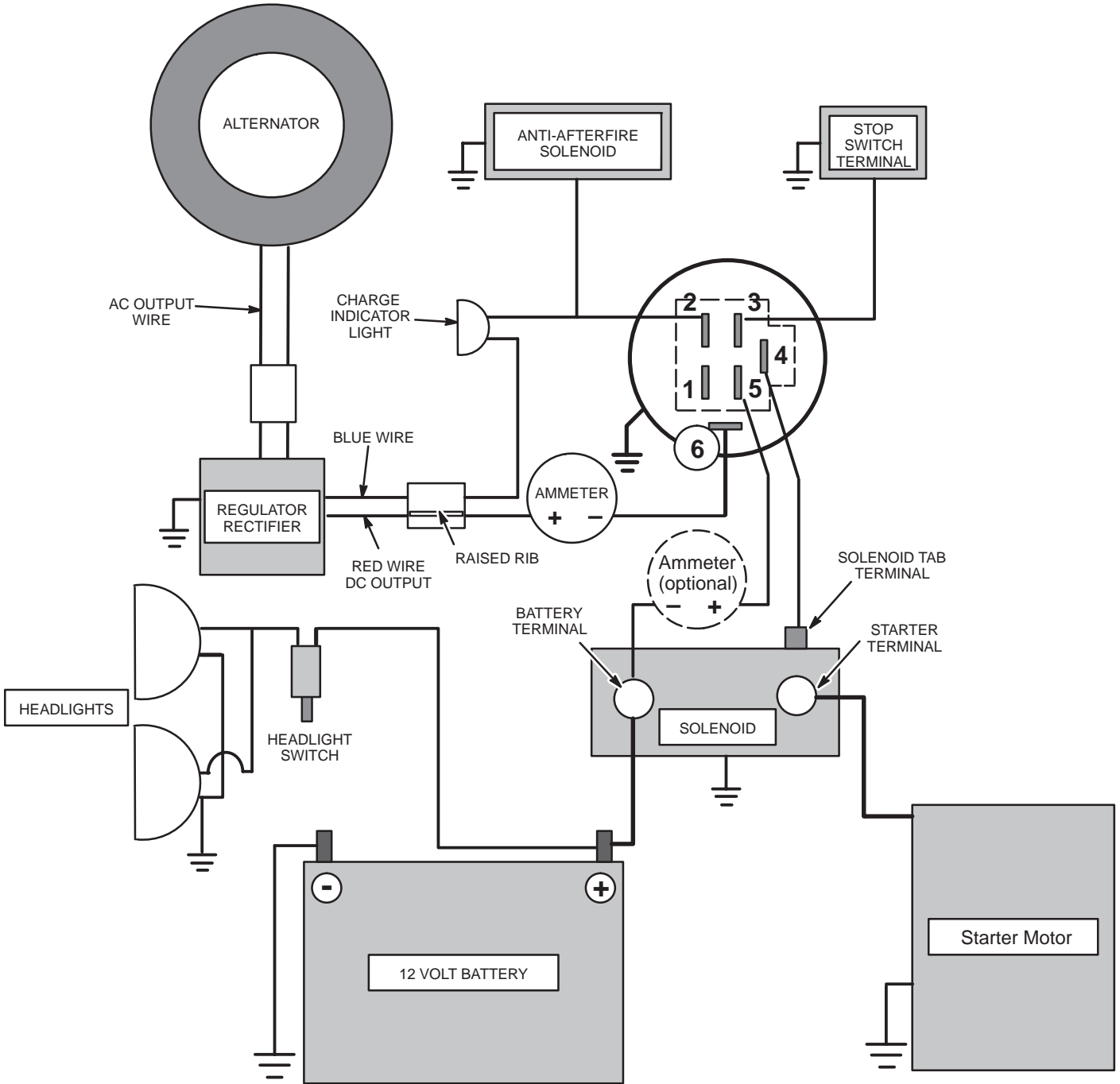
Switch Position	Continuity
1. OFF	*1 + 3 + 6
2. RUN	2 + 5 + 6
3. START	2 + 4 + 5

* Terminal 1 Grounded Internally
To Key Switch Case

With ammeter shown in optional position, note that – and + symbols are reversed. The + symbol must always be connected to the alternator side.

Terminal No.	Function
1	To Ground (used only with insulated panel)
2	To Carburetor Solenoid.
3	To Stop Switch Terminal On Engine
4	To Solenoid (tab terminal)
5	To Battery (battery terminal on solenoid)
6	To Alternator (DC Output)

Typical 16 amp Regulated Alternator Wiring Diagram With Charge Indicator Light 6 Pole Switch – Briggs & Stratton Part No. 493625



Key Switch Test

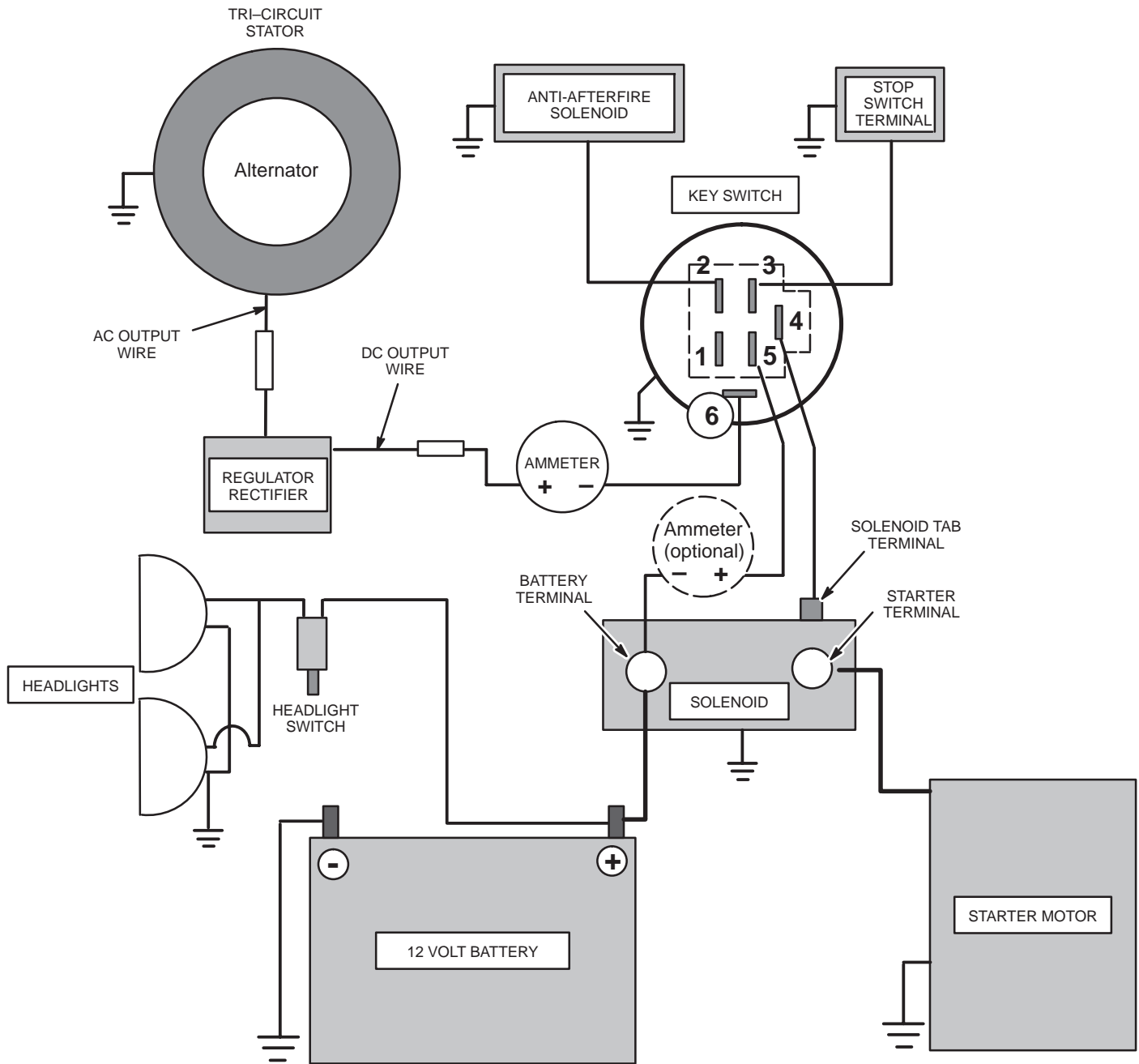
Switch Position	Continuity
1. OFF	*1 + 3 + 6
2. RUN	2 + 5 + 6
3. START	2 + 4 + 5

* Terminal 1 Grounded Internally
To Key Switch Case

With ammeter shown in optional position, note that – and + symbols are reversed. The + symbol must always be connected to the alternator side.

Terminal No.	Function
1	To Ground (used only with insulated panel)
2	To Carburetor Solenoid.
3	To Stop Switch Terminal On Engine
4	To Solenoid (tab terminal)
5	To Battery (battery terminal on solenoid)
6	To Alternator (DC Output)

Typical 5/9 amp Regulated Alternator Wiring Diagram 6 Pole Switch – Briggs & Stratton Part No. 493625



Key Switch Test

Switch Position	Continuity
1. OFF	*1 + 3 + 6
2. RUN	2 + 5 + 6
3. START	2 + 4 + 5

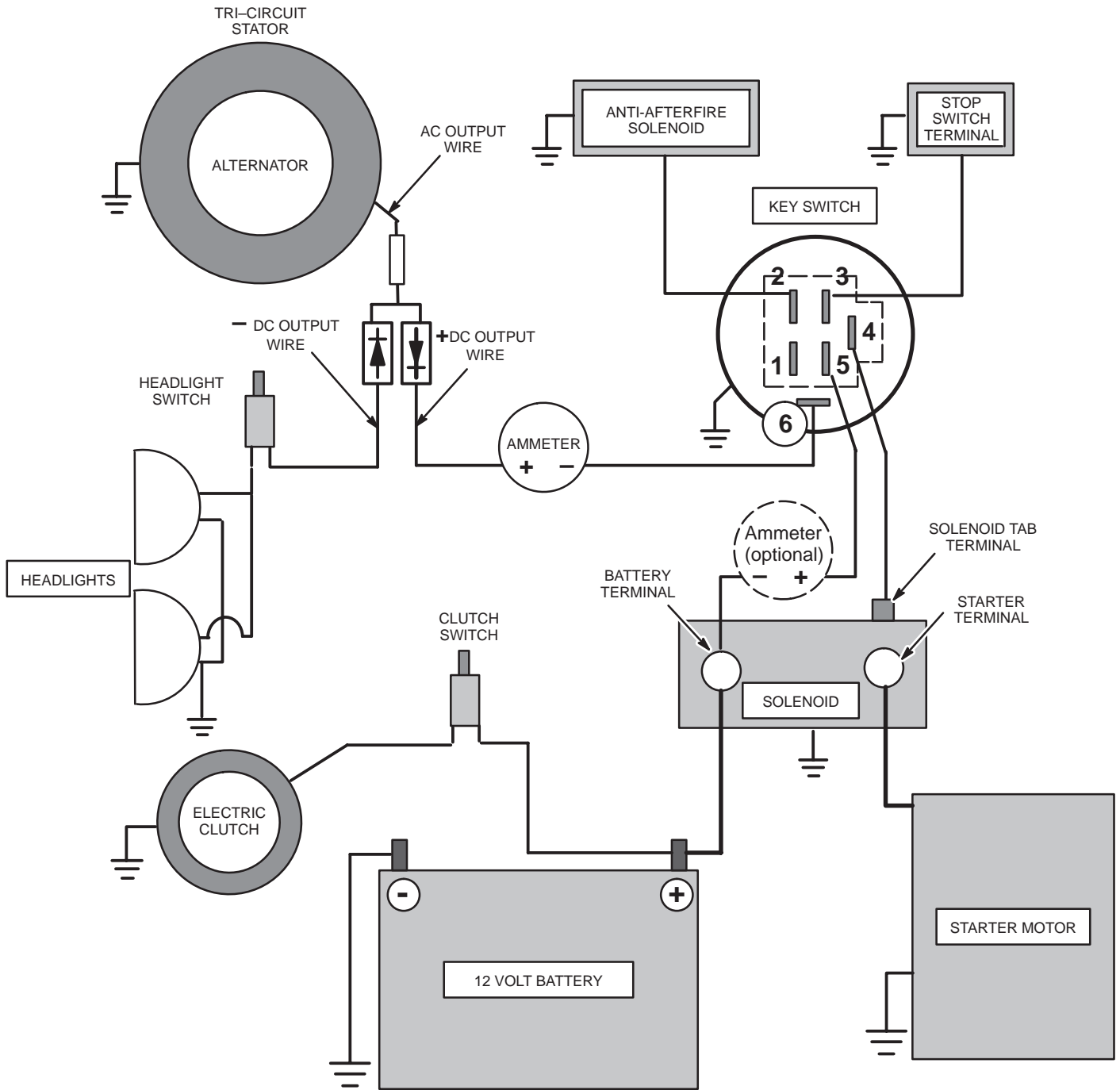
* Terminal 1 Grounded Internally
To Key Switch Case

With ammeter shown in optional position, note that – and + symbols are reversed. The + symbol must always be connected to the alternator side.

Terminal No.	Function
1	To Ground (used only with insulated panel)
2	To Carburetor Solenoid.
3	To Stop Switch Terminal On Engine
4	To Solenoid (tab terminal)
5	To Battery (battery terminal on solenoid)
6	To Alternator (DC Output)

Typical Tri-Circuit Alternator Wiring Diagram

6 Pole Switch – Briggs & Stratton Part No. 493625



Key Switch Test

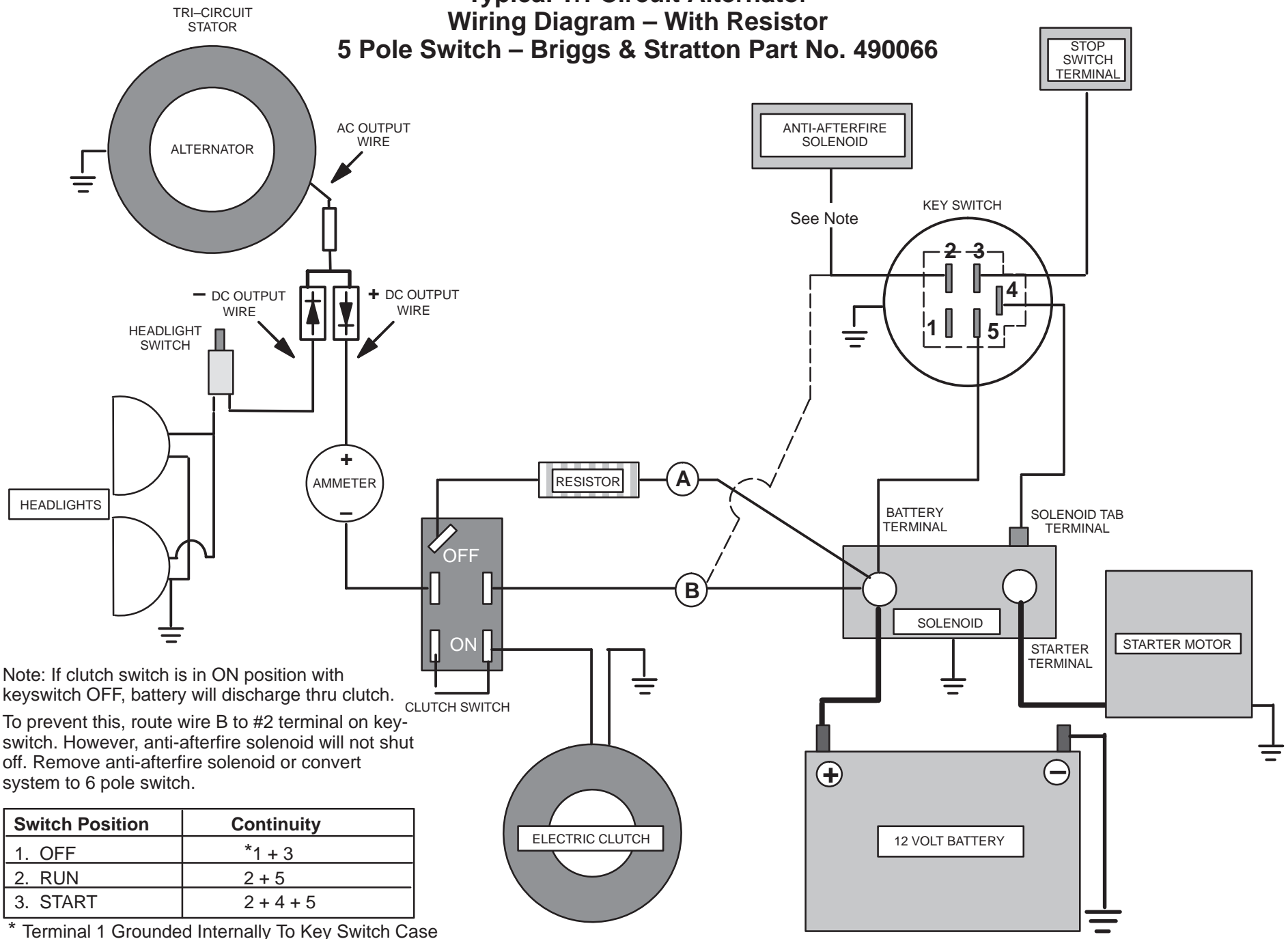
Switch Position	Continuity
1. OFF	*1 + 3 + 6
2. RUN	2 + 5 + 6
3. START	2 + 4 + 5

* Terminal 1 Grounded Internally
To Key Switch Case

With ammeter shown in optional position, note that – and + symbols are reversed. The + symbol must always be connected to the alternator side.

Terminal No.	Function
1	To Ground (used only with insulated panel)
2	To Carburetor Solenoid.
3	To Stop Switch Terminal On Engine
4	To Solenoid (tab terminal)
5	To Battery (battery terminal on solenoid)
6	To Alternator (DC Output)

Typical Tri-Circuit Alternator Wiring Diagram – With Resistor 5 Pole Switch – Briggs & Stratton Part No. 490066



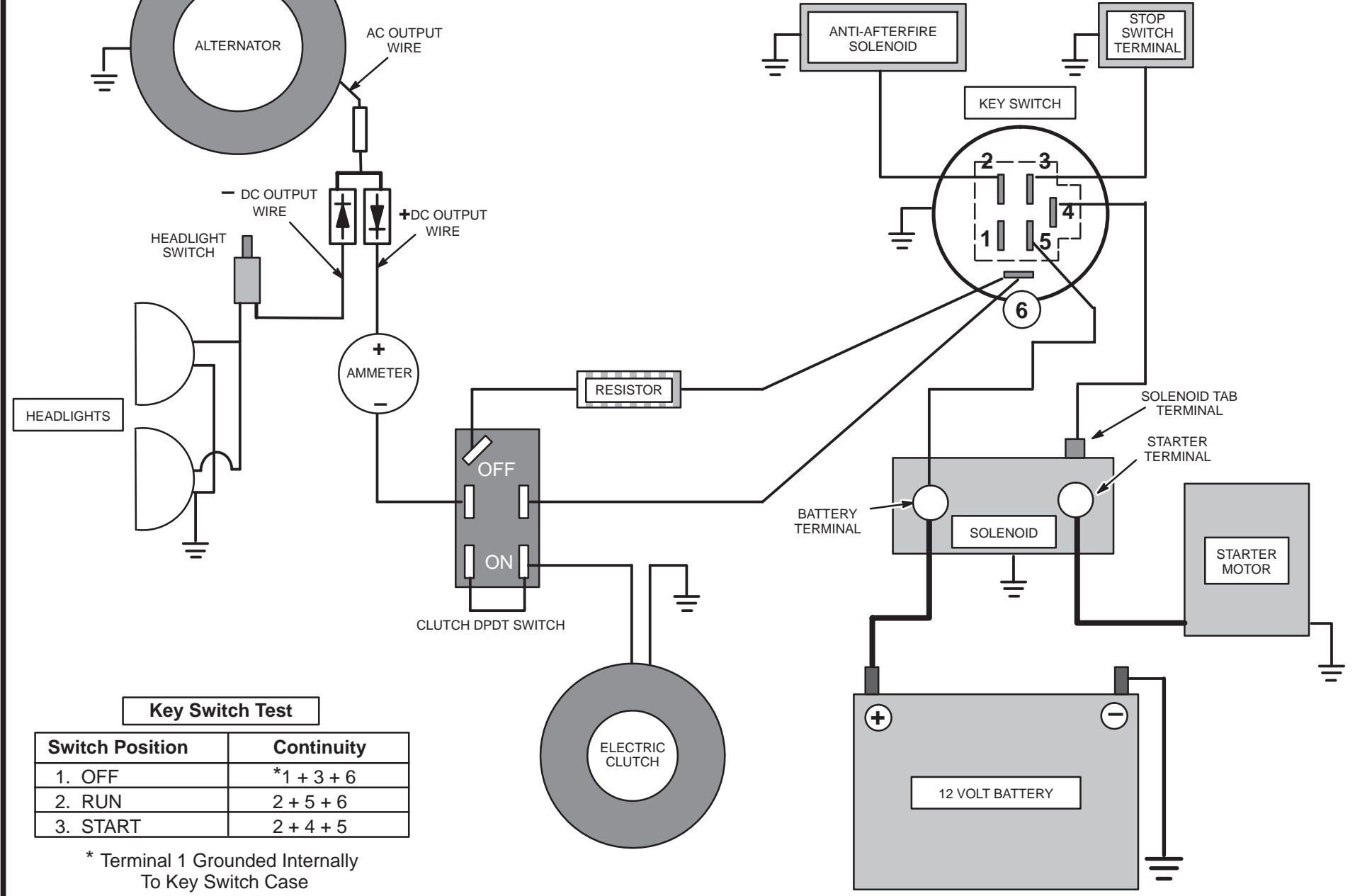
Note: If clutch switch is in ON position with keyswitch OFF, battery will discharge thru clutch.

To prevent this, route wire B to #2 terminal on key-switch. However, anti-afterfire solenoid will not shut off. Remove anti-afterfire solenoid or convert system to 6 pole switch.

Switch Position	Continuity
1. OFF	* 1 + 3
2. RUN	2 + 5
3. START	2 + 4 + 5

* Terminal 1 Grounded Internally To Key Switch Case

Typical Tri-Circuit Alternator Wiring Diagram – With Resistor 6 Pole Switch – Briggs & Stratton Part No. 493625



Key Switch Test

Switch Position	Continuity
1. OFF	*1 + 3 + 6
2. RUN	2 + 5 + 6
3. START	2 + 4 + 5

* Terminal 1 Grounded Internally
To Key Switch Case

