

WEST BEND

THE WEST BEND COMPANY
HARTFORD DIVISION
Hartford, Wisconsin

ELECTRICAL SYSTEM

An electric starting system is available for all motors of 25 horsepower or greater. A six volt system was used on 1956, 25 horsepower motors. All other motors are normally equipped with a 12 volt system. A low output alternator-generator was used in combination with the flywheel type magneto on some 1957, 30 horsepower motors. Beginning in 1958, all 35, 40, 45 and 80 horsepower motors with electric starting have a battery ignition system and flywheel mounted, alternator generator.

The positive battery terminal is grounded on all motors. With the exception of the electric starting kits used in 1956 and 1957 (See Fig. WB100 for wiring diagram), a standard color code is used for the wiring on all West Bend motors. With minor exceptions, the circuit color codes are as follows:

- BLACK: Battery negative (hot) wire.
- RED: Battery positive (ground) wire.
- BLUE: Ignition circuit.
- YELLOW: Starter control circuit.
- WHITE: Tachometer circuit.
- ORANGE: Heat indicator circuit.
- GREEN: Choke control circuit.
- PURPLE: Charge indicator circuit.

Fig. WB101 shows wiring diagram of 1961, 80 horsepower Tiger Shark. This wiring diagram is typical of that used on other motors, although all components may not be included in other systems. The 1963, 30 horsepower Golden Shark uses a similar remote control wiring harness to the one shown in Fig. WB101 but only the starting circuit is used. On these motors, connect the remote control wiring harness to the terminal block as shown, with the following exceptions: The white and blue wires attach to the magneto grounding terminals for ignition control. The red, orange and purple wires are not used and should be folded back individually and insulated with tape or insulating sleeves.

BATTERY

The positive battery terminal is grounded on all models. On models with alternator-generator, the rectifier will be damaged if battery terminals are reversed. Make cer-

tain battery is properly connected. Also make sure battery is safely located in boat. Refer to the appropriate wiring diagram when performing service on the electrical system.

STARTER

An American Bosch, SMB-6A-53 starting motor was used on 1956 motor with 6 volt system. The 1957, 30 horsepower models used an American Bosch, 12 volt starter. A Delco-Remy starter was used on 35 and early 40 horsepower motors, and as a service replacement for earlier motors. Starting in 1961, Autolite starters were used. A gear reduction drive unit is built into the starting motor on four cylinder models. Test specifications are as follows:

Delco-Remy	
Brush spring tension	32 oz.
No-Load Test	
Volts	11.0
Maximum amperes	55
Minimum RPM	7700
Lock Test	
Volts	9.1
Amperes	350
Torque, Ft.-Lbs.	6.3

Autolite Model MDO-4004M

Brush spring tension	27-43 oz.
Armature end play	0.005 min.
No-Load Test	
Volts	10.0
Amperes	38
RPM	10000
Lock Test	
Volts	4.0
Amperes	170
Torque, Ft.-Lbs.	1.5

Autolite Model MDW-4104M

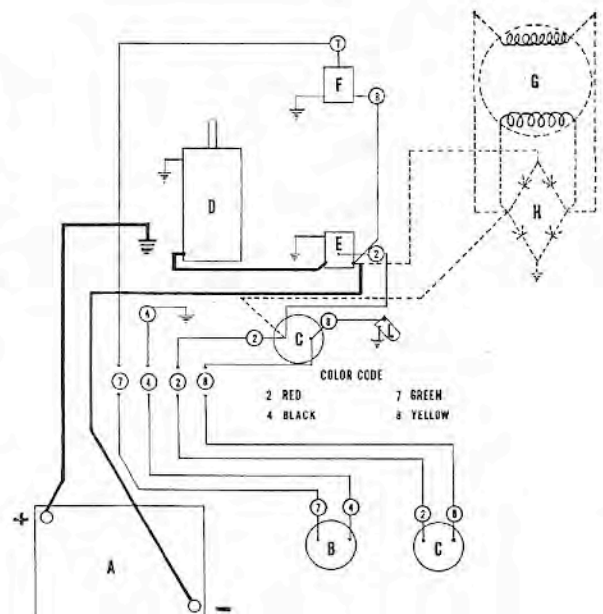
Brush spring tension	27-43 oz.
Armature end play	0.005 min.
No-Load Test	
Volts	10.0
Amperes	26
RPM	8500
Lock Test	
Volts	4.0
Amperes	160
Torque, Ft.-Lbs.	2.1

Autolite Model MGA-4001

Brush spring tension	27-43 oz.
Armature End Play	0.015-0.040
No-Load Test	
Volts	11.0
Maximum Amperes	24
Minimum RPM	8400

Fig. WB100—Wiring diagram used on 1956-57, 25 and 30 horsepower electric starting models. Wiring for the standard alternator-generator used on some 30 hp models is indicated by broken lines.

- A. Battery
- B. Choke button
- C. Starter button
- D. Starter motor
- E. Starter solenoid
- F. Choke solenoid
- G. Alternator-generator
- H. Rectifier
- L. Mercury switch



Lock Test

Volts	9.5
Maximum Amperes	270
Torque, Ft.-Lbs.	5.0

ALTERNATOR

All models use a charge indicator lamp which lights when alternator is charging. The indicator lamp is connected to the alternating current output circuit; do not use indicator lamp circuit to check output with a DC ammeter.

On 2-cylinder models, to check the charging circuit proceed as follows: With motor not running, disconnect the heavy black lead from center terminal of rectifier. Use an ammeter with long test leads to prevent accidentally grounding the circuit. If clips are not attached, provide yourself with two spring clips for connecting test probes. Attach the ammeter positive lead to rectifier terminal from which output lead was disconnected; and negative test lead to the removed output lead. Start motor and operate at 3500-4000 rpm. Alternator output should be 3.2-3.5 amperes for 1957, 30 horsepower motors; 5-6.5 amperes for 1958 and 1959, 35 horsepower motors with standard alternator; or 5-2.5 amperes on 35, 40 and 45 horsepower motors with super alternator and regulator. On super alternator models, maximum output will depend on battery condition.

On four cylinder models, the field current resistance should be tested using an ohmmeter. To test the resistance, disconnect the black lead from "FLD" terminal of regulator, connect one ohmmeter lead to the removed wire and other lead to a suitable ground. The meter should register 5 ohms. If a higher reading is obtained, a poor contact between field exciter brush and flywheel slip ring may be indicated. Remove the flywheel and check brush for wear or damage. Clean the lower surface of slip ring with alcohol or other non-corrosive, non-oily solvent. Check resistance of flywheel rotor field windings while flywheel is removed, by touching one ohmmeter probe to contact surface of slip ring and other probe to flywheel hub. Resistance should be approximately 5 ohms. Test the stator windings by disconnecting the three generator leads. Make sure none of the lead terminals are in contact with any part of motor. Touch one ohmmeter probe to the stator frame and the other probe to each of the generator leads in turn. If the reading is not at or near infinity, stator windings are grounded and stator must be renewed. A continuity test light can be used instead of an ohmmeter for this test.

RECTIFIER

The rectifier assembly is designed to convert the alternating current of the generator to direct current suitable for charging the battery or supplying other electrical needs of the system. The rectifier is available only as a complete unit.

The rectifier is composed of three positive and three negative waters which restrict the flow of current to one direction only.

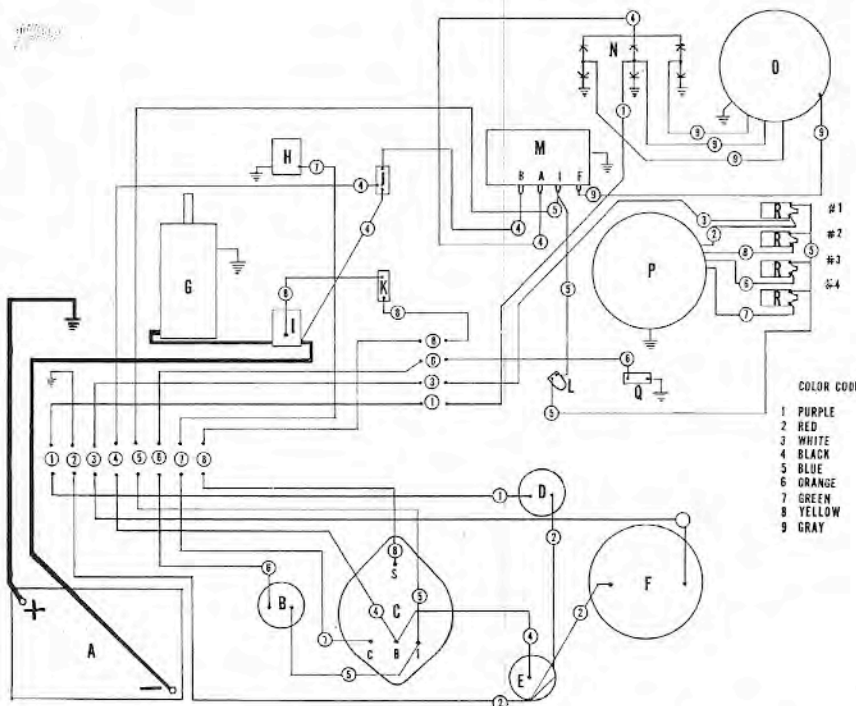


Fig. WB101 — Wiring diagram used on 1961, 80 horsepower Tiger Shark.

- | | | | |
|----------------------|---------------------|---------------------|--------------------------|
| A. Battery | F. Tachometer | J. Thermal switch | N. Rectifier |
| B. Temperature Light | G. Starting motor | K. Interlock switch | O. Alternator |
| C. Ignition switch | H. Choke solenoid | L. Mercury switch | P. Distributor |
| D. Charge indicator | I. Starter solenoid | M. Regulator | Q. Heat indicator switch |
| E. Cigar lighter | | | R. Ignition coil |

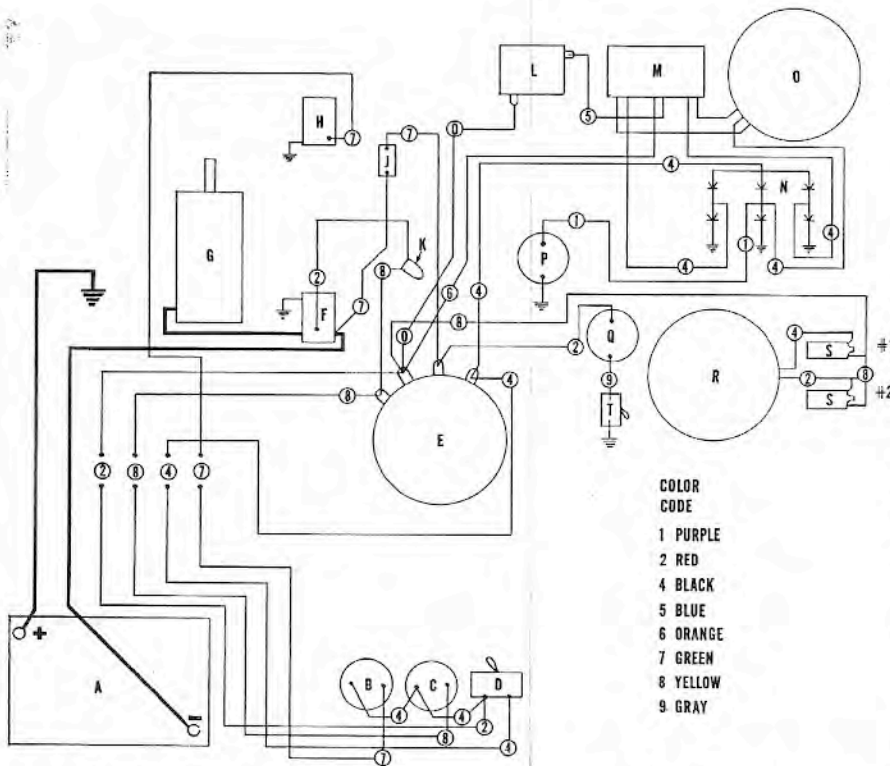


Fig. WB102 — Wiring Diagram for 1958, 35 horsepower with Super Alternator. Standard Alternator models are similar except Regulator (L) and Reactor (M) are not used.

- | | | |
|---------------------|----------------------|---------------------|
| A. Battery | G. Starting motor | O. Alternator |
| B. Choke button | H. Choke solenoid | P. Charge indicator |
| C. Starter button | J. Thermal switch | Q. Panel light |
| D. Ignition switch | K. Mercury switch | R. Distributor |
| E. Key start switch | L. Regulator | S. Ignition coil |
| F. Starter solenoid | M. Regulator reactor | T. Light switch |
| | N. Rectifier | |

OUTBOARD MOTORS

A positive and a negative wafer is connected to each of the alternator leads, thus channeling the generated alternating current in a single direction.

The rectifier can be damaged by reversing the battery cables, by attempting to "polarize" the generating system, by an open generating circuit caused by a broken wire or loose connection, or by reversing the direction of current flow in other wiring of the system.

The rectifier can be tested with a battery powered ohmmeter equipped with a 1½ volt battery. To test the rectifier, disconnect all rectifier leads. Touch one test probe to a suitable ground (or to mounting bolt threads if rectifier is not installed) and the other probe to each of the input terminals in turn. NOTE: Input terminals are usually indicated by yellow dots. The readings should be approximately equal, and either very high (or infinity) or very low (or zero). Reverse the probes and repeat the test. Readings should be approximately equal, but should not agree with readings obtained in first series of tests. If first test readings were high (infinity), low (zero) readings should be obtained with leads reversed. If low readings were obtained in first tests, second test readings should be high. Move the test probe from ground to the rectifier output terminal and repeat the first series of tests. Readings should be approximately equal from output terminal to any of the input terminals; and reversed when test probes are reversed.

When installing a rectifier, or when removing a rectifier which will be re-used, DO NOT use a wrench, pliers or other tool on the hex head of the rectifier through-bolt. Hold rectifier by hand only, when loosening or tightening retainer nut. If a wrench is required in removal, renew the rectifier. The rectifier is covered with a protective coating to prevent deterioration of the selenium. If this coating is cracked or scratched, rectifier will be damaged.

Eygabroad Boats & Motors
1149 South La Brea
Inglewood, Calif.

Diversified Products Co.
1136 Venice Blvd.
Los Angeles 15, Calif.

Marine Warehouse
3509 E. 12th Ave.
Denver 6, Colo.

Boat-A-Rama, Inc.
2716 N. Dixie
Ft. Lauderdale, Fla.

Stevall Tire & Marine
2127 N. Decatur Road
Decatur, Ga.

Seyl Outboard Motors & Boats, Inc.
Rte. 59 & 132nd
Ingleside, Ill.

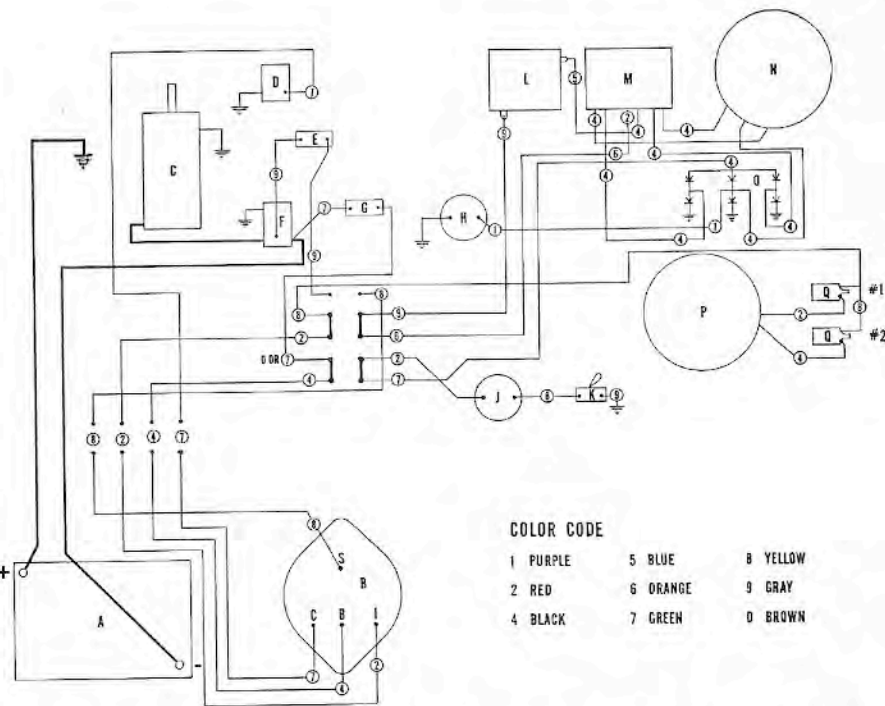


Fig. WB103 — Wiring diagram for early 40 horsepower models with super alternator. Later models are similar to Fig. WB101.

- | | | | |
|--------------------|---------------------|----------------------|------------------|
| A. Battery | E. Interlock switch | J. Panel light | N. Alternator |
| B. Ignition switch | F. Choke solenoid | K. Light switch | O. Rectifier |
| C. Starting motor | G. Thermal switch | L. Regulator | P. Distributor |
| D. Choke solenoid | H. Charge indicator | M. Regulator reactor | Q. Ignition coil |

In 1962 a new-type rectifier (West Bend Part No. 92450-4) was made available for service, superseding all previous rectifiers. When installing the new type rectifier on early models, position rectifier with terminals facing starter. Attach the input (gray, black or yellow wires leading from stator or regulator reactor) leads to the three lower terminals which are in line and identified by yellow dots. Attach the purple (indicator

light) lead to upper, center terminal identified by yellow dot. Attach the heavy black (output) lead to upper, inner terminal identified by the black dot.

When installing a new rectifier on motors with soldered connections, install flag connectors on lead wires. When lead wires are soldered to any rectifier, use an electric soldering iron and minimum heat to avoid damage to rectifier.

WEST BEND CENTRAL PARTS DISTRIBUTORS

Tippecanoe Boat Co.
P. O. Box 505
Leesburg, Indiana

Coffin & Wimple, Inc.
136 Front St.
Bangor, Maine

Hannay's
514 E. Hennepin Ave.
Minneapolis 14, Minn.

Hico Marine
P. O. Box 504
Jackson, Miss.

Ron's Gamble & Marina
1645 Harrison Ave.
Butte, Mont.

Seacraft, Inc.
3 City Island Ave.
City Island, N. Y.

Minot Marine Distributors
R3, Hwy 83S.
Minot, North Dakota

Gardner, Inc.
1147 Chesapeake Ave.
Columbus 12, Ohio

Pearsol Company
3121 Main St.
Dallas, Texas

General Implement Dis. Inc.
427 W. 2nd St. South
Salt Lake City 10, Utah

Royall Marine Sales & Ser., Inc.
5102 Midlothian Pike
Richmond 25, Va.

Copper River Co-op
6315 Seaview Ave., NW
Seattle, Washington