

ELECTRICAL SYSTEM

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Specifications

| Item | | Standard | |
|---|-------------|----------------------|----------------|
| Battery Capacity | | 12 V ; 18A/h | |
| Alternator type | | Three-phase AC | |
| Charging voltage (Regulator/rectifier output) | | 14~15 V | |
| Alternator output voltage | | DC14V-23A @ 3000 rpm | |
| Stator | Charge Coil | Y1-Y2 | 0.52 Ω |
| | | Y2-Y/R | 0.49 Ω |
| | | Y/R-Y1 | 0.49 Ω |
| | | Y-Ground | ∞ |
| | Pulser Coil | W/R-W | 110 Ω |
| | | W-Grnd | |
| Ignition Coil | | Primary | 0.3 Ω |
| | | Secondary | 6.3 k Ω |
| Spark plug | | Gap | 0.8~0.9 mm |
| | | Cap resistance | 5 k Ω |
| Starter motor | | Nominal Output | 0.7 kW |
| | | Reduction Ratio | 28.235 |

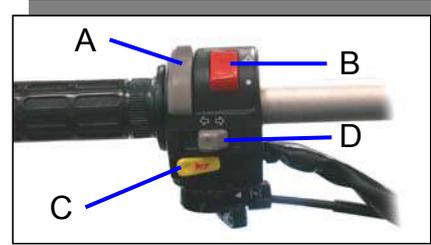
Parts Location

High/Low Beam Switch [A]

Hazard Lights Switch [B]

Horn Switch [C]

Indicator Switch [D]



Ignition Switch [E]



Starter Button [F]



Battery [A]

Starter Circuit Relay [B]

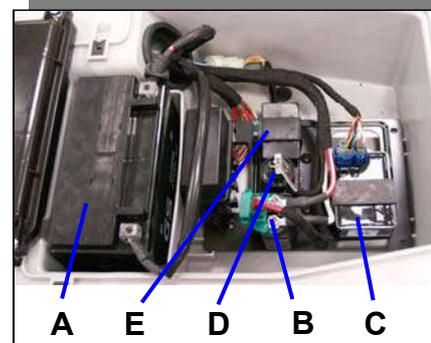
CDI Unit [C]

Indicator Relay [D]

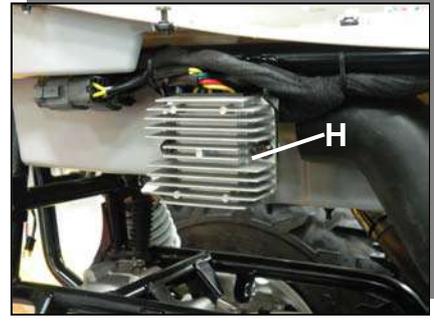
Position Light Relay [E]

Ignition Coil [F]

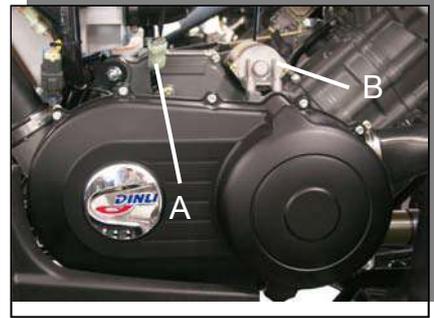
Spark Plug [G]



Regulator/Rectifier [H]



Magneto CP [A]
Starter Motor [B]



Horn [C]



Temperature Sensor[D]



Precautions

There are a number of important precautions that are musts when servicing electrical systems. Learn and observe all the rules below.

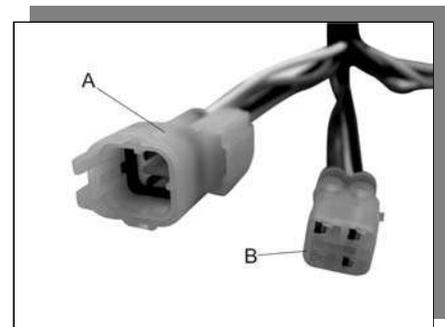
- Do not reverse the battery lead connections. This will burn out the diodes in the electrical parts.
- Always check battery condition before condemning other parts of an electrical system. A fully charged battery is a must for conducting accurate electrical system tests.
- The electrical parts should never be struck sharply, as with a hammer, or allowed to fall on a hard surface. Such a shock to the parts can damage them.
- To prevent damage to electrical parts, do not disconnect the battery leads or any other electrical connections when the ignition switch is on, or while the engine is running.
- Because of the large amount of current, never keep the starter button pushed when the starter motor will not turn over, or the current may burn out the starter motor windings.
- Do not use a illumination bulb rated for other than the voltage or wattage specified in the wiring diagram, as the handle cover could be warped by excessive heat radiated from the bulb.

| CAUTION | |
|--|--|
| Take care not to short the leads that are directly connected to the battery positive (+) terminal to the chassis ground. | |

- Troubles may involve one or in some cases all items. Never replace a defective part without determining what CAUSED the failure. If the failure was caused by some other item or items, they too must be repaired or replaced, or the new replacement will soon fail again.
- Make sure all connectors in the circuit are clean and tight, and examine wires for signs of burning, fraying, etc. poor wires and bad connections will affect electrical system operation.
- Measure coil and winding resistance when the part is cold (at room temperature).
- Color codes:

| | | | | | |
|----|------------|----|-------------|----|--------|
| B | Black | G | Green | P | Pink |
| BU | Blue | GY | Gray | PU | Purple |
| BR | Brown | LB | Light blue | R | Red |
| CH | Chocolate | LG | Light green | W | White |
| DG | Dark green | O | Orange | Y | Yellow |

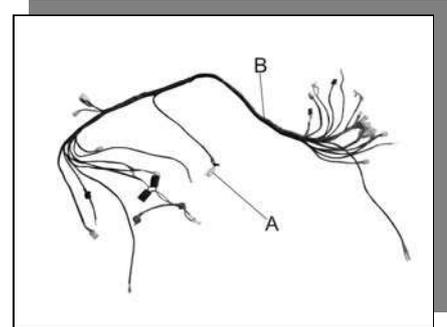
- Electrical Connectors:
 Female Connectors [A]
 Male Connectors [B]



Electrical Wiring

Wiring Inspection

- Visually inspect the wiring for signs of burning, fraying, etc.
 - If any wiring is poor, replace the damaged wiring.
- Pull each connector [A] apart and inspect it for corrosion, dirt, and damage.
 - If the connector is corroded or dirty, clean it carefully. If it is damaged, replace it.
- Check the wiring for continuity.
 - Use the wiring diagram to find the ends of the lead which is suspected of being a problem.
 - Connect the hand tester between the ends of the leads.
 - Set the tester to the $\times 1 \Omega$ range, and read the tester.
 - If the tester does not read 0Ω the lead is defective. Replace the lead or the wiring harness [B] if necessary.



Battery

Battery Removal

- Disconnect the battery negative (-) cable [Black] first and then the positive (+) cable [red].
- Take out the battery.

Battery Installation

- Connect the positive cable first and then the negative cable.



Battery Charging

⚠ WARNING

Keep the battery away from sparks and open flames during charging, since the battery gives off an explosive gas mixture of hydrogen and oxygen. When using a battery charger, connect the battery to the charger before turning on the charger. This procedure prevents sparks at the battery terminals, which could ignite any battery gases.

The battery is a maintenance-free design and construction. Use of conventional lead-acid batteries is not recommended. No electrolyte or refilling water is required. Because this battery is a completely sealed type, abuse of the battery can cause an explosion.

Please adhere to the following points:

1. Follow the instructions shown on battery package for preparation and filling with battery electrolyte.
2. Never interfere with the sealed state of the battery.

3. Check the charging conditions with a voltmeter (Normal charging voltage should be 12.8V)
4. This battery may be installed only if replaces a similar sealed type battery.
5. Keep away from high temperature of fire.
6. In the case of an accident sulfuric acid may escape. Avoid contact with skin, eyes or clothing.

Charging Method

Normal Charge: 1.8A 5~10 hrs
Fast Charge : 18A 0.5 hrs

New Battery:

Use of conventional lead-acid batteries is not recommended.

Battery type: GS, GTX20L-BS

| CAUTION |
|---|
| NEVER attempt to add electrolyte or water to the maintenance-free design and construction. Doing so will damage the case and shorten the life of the battery. |

Charging Procedure

- Remove the battery (see Battery Removal).
- Connect a charger to the battery BEFORE plugging it in or turning it on.
- Set the charging rate and time according to the battery condition previously determined

| CAUTION |
|---|
| Always remove the battery from the vehicle for charging. Do not use a high rate battery charger, as is typically employed at automotive service stations, unless the charger rate can be reduced to the level required. Charging the battery at a rate higher than specified may ruin the battery. Charging at a high rate causes excess heat, which can warp the plates and cause internal shorting. Higher-than-normal charging rates also cause the plates to shed active material. Deposits will accumulate, and can cause internal shorting. |

- Turn the charger off or unplug it, then disconnect it from the battery.
- Check battery condition.
- If the battery condition indicates that is not fully charged, additional charging time is necessary.

Battery Test Charging

- If the battery is suspected of being defective, sulfated, or unable to take a charge, consult the table.
- To test charge a battery, perform the ordinary charging procedure and monitor the battery voltage and other signs as mentioned below.
- If the battery voltage suddenly jumps to over 13 V just after the start of charging, the plates are probably sulfated. A good battery will rise to 12 V immediately and then gradually go up to 12.5 or 13 V in about 30 min. to an hour after the start of charging.
- If there does not appear to be enough sediment in a cell to short the plates, but that cell has a very low specific gravity after the battery is fully charged, the trouble may be that there is not enough acid in that one cell. In this case only, sulfuric acid solution may be added to correct the specific gravity.
- If a fully charged battery doesn't lose its charge after 2 to 7 days; or if the specific gravity drops markedly, the battery is defective. The self-discharge rate of a good battery is only about 1% per day.

Regulator / Rectifier Output Voltage Inspection

- Check the battery condition (see Battery section)
- Warm up the engine to obtain actual alternator operating conditions.
- Check that the ignition switch is turned off, and connect the hand tester to the battery terminal.
- Start the engine, and note the voltage readings at various engine speeds with the headlight turned on and then turned off. The readings should show nearly battery voltage when the engine speed is low, and as the engine speed rises, the readings should also rise. But they must be kept under the specified voltage.

Regulator/ Rectifier Output Voltage

| Tester Range | Connections | | Reading |
|--------------|---------------|---------------|-----------|
| | Tester (+) to | Tester (-) to | |
| 25 V DC | Battery (+) | Battery (-) | 14 ~ 15 V |

- Turn off the ignition switch to stop the engine, and disconnect the hand tester.
- ◎ If the regulator/rectifier output voltage is kept between the values given in the table, the charging system is considered to be working normally.
- ◎ If the output voltage is much higher than the values specified in the table, the regulator/rectifier is defective or the regulator/rectifier leads are loose or open.

- ⊙ If the battery voltage does not rise as the engine speed increases, then the regulator/rectified is defective or the alternator output is insufficient for the loads, check the alternator and regulator/rectifier to determine which part is defective.

Alternator Inspection

There are three types of alternator failures: short, open (wire burned out), or loss in rotor magnetism. A short or open in one of the coil wires will result in either a low output, or no output at all. A loss in rotor magnetism, which may be caused by dropping or hitting the alternator, by leaving it near an electromagnetic field or just by it again, will result in low output.

- To check the alternator output voltage, do the following procedures.
 - Disconnect the alternator connector
 - Connect the hand tester. (+) to red/white; (-) to white
 - Start the engine.
 - Run it at the rpm.
 - Note the voltage readings (total 3 measurements).

Alternator Output Voltage:

Minimum of 5 AC Amps at Idle

CDI Output Test: (Using Peak Reading Adaptor)

Connect all CDI wires to stator wires. Disconnect CDI module wire from ignition coil primary terminal. Connect one lead to engine ground and the other to the ignition coil primary wire leading from the CDI module. Set meter to read DC Volts. Crank engine and check output of CDI wire to coil.

Reconnect CDI wire to coil.

Average Output w/Digital Voltmeter with or without Peak Reader:

200~400 DCV

Ignition System

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|  WARNING |
| The ignition system produces extremely high voltage. Do not touch the spark plug, ignition coil, or spark plug lead while the engine is running, or you could receive a severe electrical shock. |

| |
|---|
| CAUTION |
| Do not disconnect the battery leads or any other electrical connections when the ignition switch is on, or while the engine is running. This is to prevent CDI unit damage. Do not install the battery backwards. The negative side is grounded. This is to prevent damage to the diodes and CDI unit. Use the standard regulator/rectifier, or the CDI unit will be damaged. |

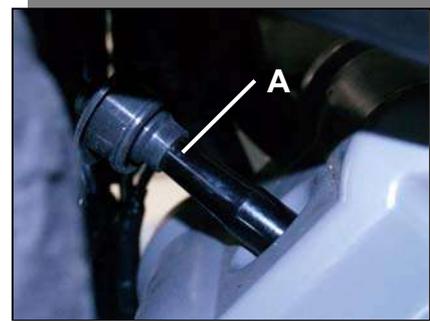
Spark Plug Removal/Installation

- Remove Ignition Coil [A]
- Remove or install the spark plug [B] using the spark plug wrench from the vehicle right side.

Torque - Spark Plug: 14 N-m (1.4 kgf-m, 10.0 ft-lb)

Spark Plug Cleaning/ Inspection

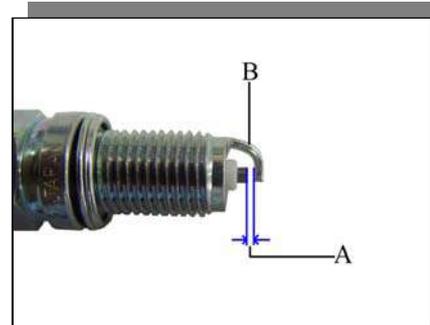
- Clean the spark plug, preferably in a sandblasting device, and then clean off any abrasive particles. The plug may also be cleaned using a high flash-point solvent and a wire brush or other suitable tool. If the spark plug electrodes are corroded or damaged, or if the insulator is cracked, replace the plug. Use the standard spark plug or its equivalent.



Spark Plug Gap

- Measure the gap [A] with a wire-type thickness gauge.
- If the gap is incorrect, carefully bend the side electrode [B] with a suitable tool to obtain the correct gap.

Spark Plug Gap 0.8 ~ 0.9 mm



Ignition Coil Removal

- Pull out the coil off cylinder.
- Remove the bolt [A]x2.

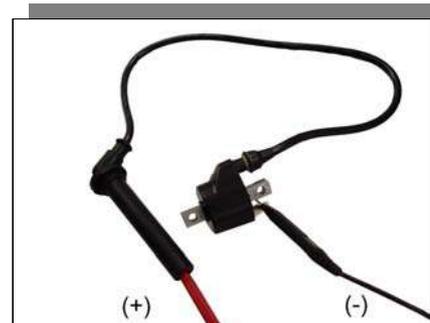


Ignition Coil Installation

- Connect the primary winding leads to the ignition coil terminals

Ignition Coil Inspection

- Remove the ignition coil.
- Measure the primary winding resistance as follows:
 - Connect the tester between the coil terminals.
 - Set the tester to the $\times 1\Omega$ range, and read the tester.
- Measure the secondary winding resistance as follows:



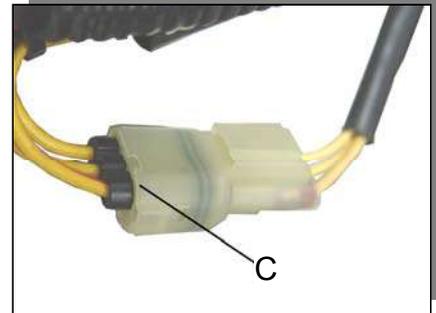
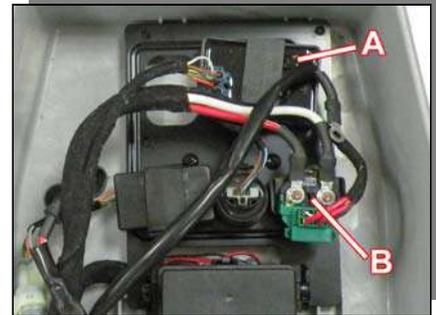
- Remove the plug cap by turning it counterclockwise.
- Connect the tester between the spark plug lead and terminal.
- Set the tester to the $\times 1 \text{ k}\Omega$ range, and read the tester.
- ⊗ If the hand tester does not read as specified, replace the coil.
- To install the plug cap, turn it clockwise.

CDI Unit Inspection

CAUTION

When inspecting the CDI unit, observe the following to avoid damage to the CDI unit. Do not disconnect the CDI unit with the ignition switch on. This may damage the CDI unit. Do not disconnect the battery leads while the engine is running. This may damage the CDI unit.

- Remove the seat (see Frame chapter).
- Remove the CDI unit [A] and disconnect the connectors [C].
- Set the hand tester to the $\times 1 \text{ k}\Omega$ range and make the measurements shown in the table.
- ⊗ If the tester readings are not as specified, replace the CDI unit.



Starter Relay Inspection

- Remove:
 - Seat (see Frame chapter)
 - Starter Relay [B]
- Connect the hand tester and 12V battery to the starter relay as shown.
- If the relay does not work as specified, the relay is defective, replace the relay.

Testing Relay

Hand Tester Range: $\times 1 \Omega$ range

Criteria: When battery is connected 0Ω

When battery is disconnected $\infty \Omega$

Lighting System

Headlight Bulb Replacement

- Remove:
 - Headlight Unit. (See Frame Removal Chapter)
 - Bulb Holder
- Slide back the dust protection, and remove the bulb from the headlight unit.
- Turn the holder counterclockwise and pull it out.



- Be sure the socket is clean.
- Insert the new bulb by aligning the tang with the notch in the headlight unit.
- Push the holder in, turn it clockwise, and release it, it should lock in position.
- Fit the dust cover completely.

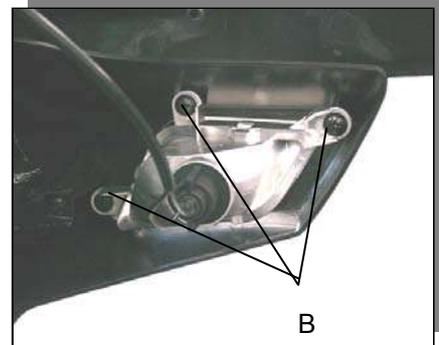
Taillight Bulb Replacement

- Remove:
 - Taillight Bracket Screw *3 [A]
 - Taillight Unit
- Insert the new bulb



Indicator Bulb Replacement

- Remove:
 - Indicator Screw [B]
- Insert the new bulb



Neutral Light Bulb Replacement

- Please refer the Headlight Bulb Replacement

FUSES

Main Fuse Removal

- Remove the seat (see Frame chapter)
- Remove the fuse case cap [A] and take out the fuse [B].

Fuse Inspection

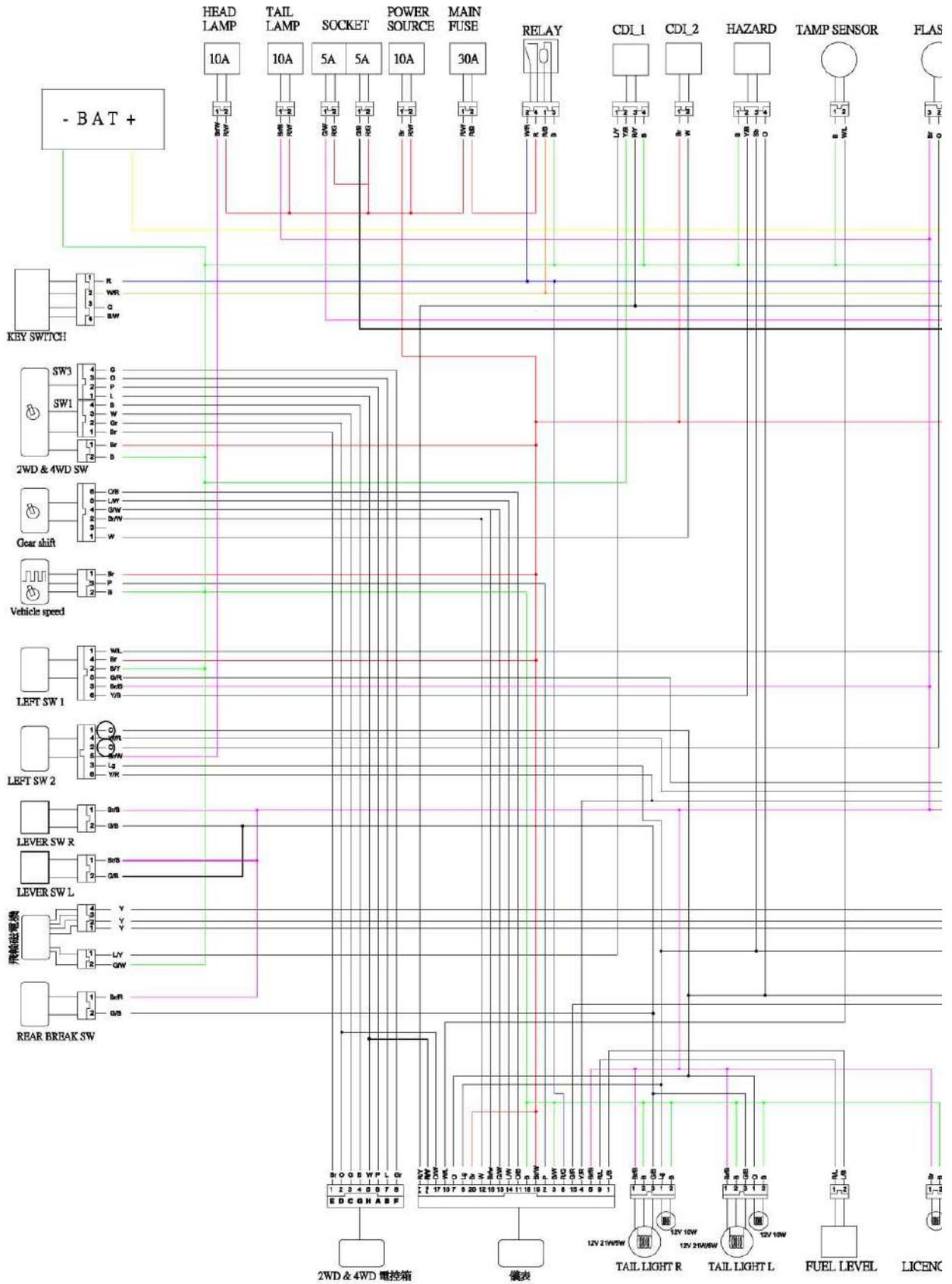
- Inspect the fuse element.
- Ⓢ If it is blown out, replace the fuse. Before replacing a blown fuse, always check the amperage in the affected circuit. If the amperage is equal to or greater than the fuse rating, check the wiring and related components for a short circuit.



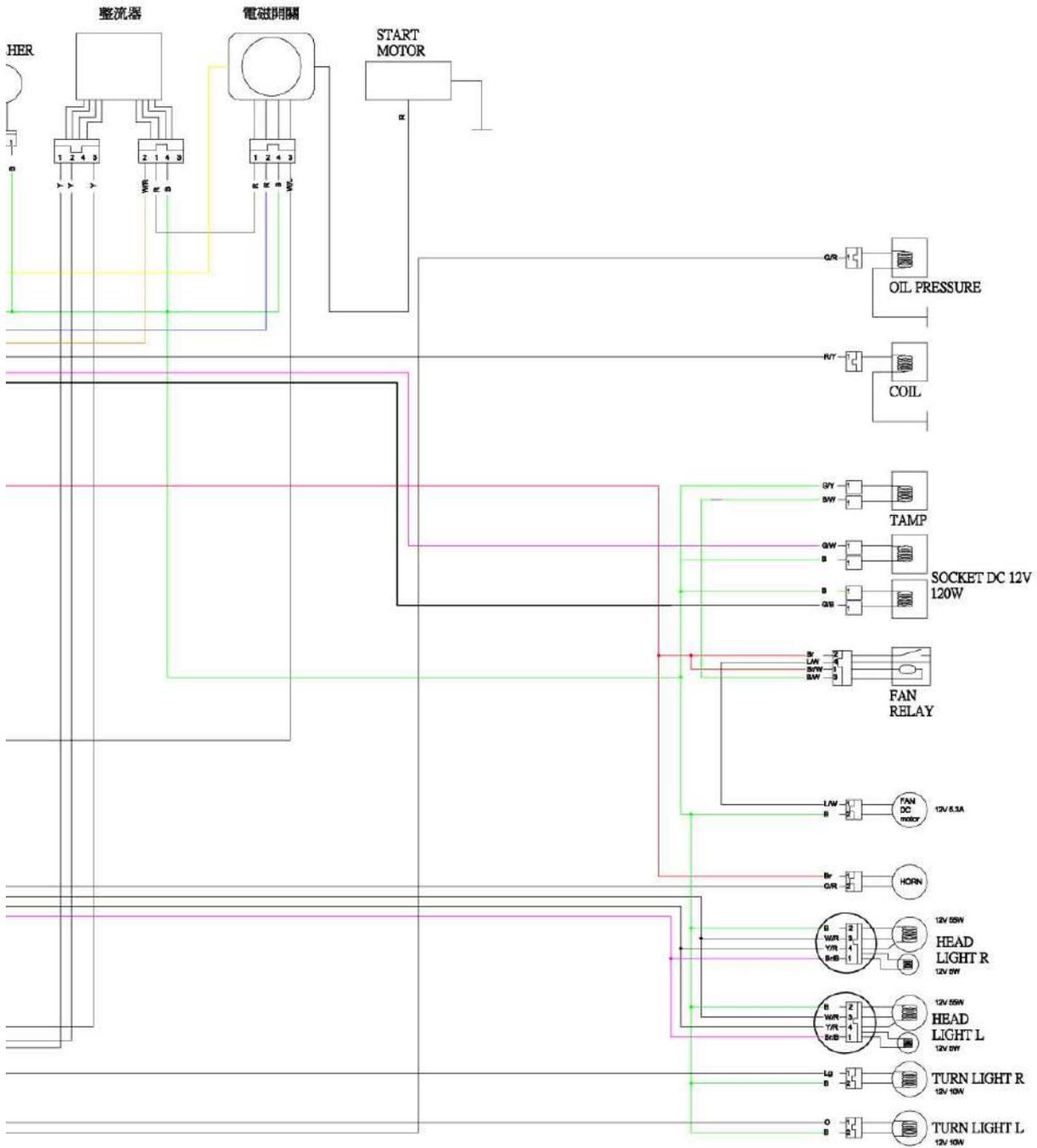
CAUTION

When replacing a fuse, be sure the new fuse matches the specified fuse rating for that circuit. Installation of a fuse with a higher rating may cause damage to wiring and components.

Wiring Diagram



Wiring Diagram



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⊗ LAMP

NOTE: