2017

Service Manual



JLG 615G

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2017 615G Service Manual
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1. If backlash measurement is less than specified, remove an existing shim, measure it, and install a new thinner shim.
2. If backlash measurement is more than specified, remove an existing shim, measure it, and install a thicker shim.

■NOTE: Continue to remove, measure, and install until backlash measurement is within tolerance. Note the following chart.

Backlash Measurement	Shim Correction
Under 0.127 mm (0.005 in.)	Decrease Shim Thickness
At 0.127-0.381 mm (0.005-0.015 in.)	No Correction Required
Over 0.381 mm (0.015 in.)	Increase Shim Thickness

After backlash and tooth contact are within specifications, apply red Loctite #271 to the driveshaft threads and driven output shaft threads; then using new nuts, tighten the output shaft nut to 59 ft-lb and the output yoke nut to 74 ft-lb.

CRANKSHAFT ASSEMBLY

■NOTE: The crankshaft and connecting rod is a non-serviceable assembly. If any component is out of specification, the assembly must be replaced.

Measuring Connecting Rod (Small End Inside Diameter)

1. Insert a snap gauge into the upper connecting rod small end bore; then remove the gauge and measure it with micrometer.



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2. Maximum diameter must not exceed specifications.

Measuring Connecting Rod (Small End Deflection)

1. Place the crankshaft on a set of V blocks and mount a dial indicator and base on the surface plate. Position the indicator contact point against the center of the connecting rod small end journal.
2. Zero the indicator and push the small end of the connecting rod away from the dial indicator.
3. Maximum deflection must not exceed specifications.

Measuring Connecting Rod (Big End Side-to-Side)

1. Push the lower end of the connecting rod to one side of the crankshaft journal.
2. Using a feeler gauge, measure the gap between the connecting rod and crankshaft journal.

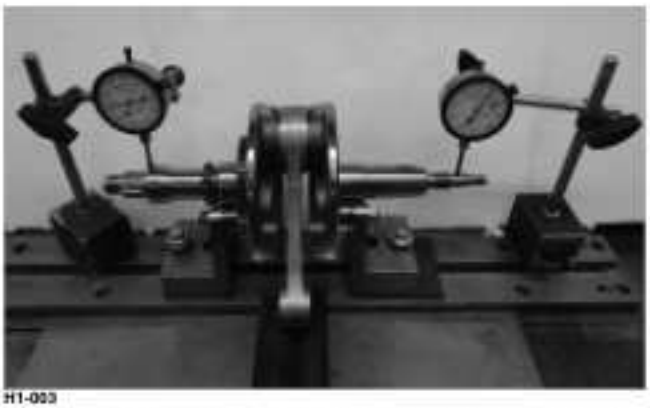


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3. Acceptable gap range must not exceed specifications.

Measuring Crankshaft (Runout)

1. Place the crankshaft on a set of V blocks.
2. Mount a dial indicator and base on the surface plate. Position the indicator contact at point 1 of the crankshaft.



H1-003

3. Zero the indicator and rotate the crankshaft slowly.

CAUTION

Care should be taken to support the connecting rod when rotating the crankshaft.

4. Maximum runout must not exceed specifications.

■NOTE: Proceed to check runout on the other end of the crankshaft by positioning the indicator contact at point 2 and following steps 3-4.

Measuring Crankshaft (Web-to-Web)

1. Using a calipers, measure the distance from the outside edge of one web to the outside edge of the other web.

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Troubleshooting Drive System

Problem: Power not transmitted from engine to wheels	
Condition	**Remedy**
1. **Rear axle shaft serration** worn - broken	1. Replace shaft
Problem: Power not transmitted from engine to either front wheel	
Condition	**Remedy**
1. **Secondary drive - driven gear** teeth broken 2. **Propeller shaft serration** worn - broken 3. **Coupling** damaged 4. **Coupling joint serration** worn - damaged 5. **Front drive - driven bevel gears** broken - damaged 6. **Front differential gears/pinions** broken - damaged 7. **Front drive actuator** not operating	1. Replace gear(s) 2. Replace shaft 3. Replace coupling 4. Replace joint 5. Replace gear(s) 6. Replace gears - pinions 7. Replace fuse - drive select switch - front drive actuator

Troubleshooting Brake System

Problem: Braking poor	
Condition	**Remedy**
1. **Pad** worn 2. **Brake fluid** leaking 3. **Master cylinder/brake cylinder** seal worn	1. Replace pads 2. Repair - replace hydraulic system 3. Replace seal(s)
Problem: Brake pedal travel excessive	
Condition	**Remedy**
1. **Brake fluid** low 2. **Piston seal - cup** worn	1. Add fluid to proper level 2. Replace seal - cup
Problem: Brake fluid leaking	
Condition	**Remedy**
1. **Connection fittings** loose 2. **Hose** cracked 3. **Piston seal** worn	1. Tighten fittings 2. Replace hose 3. Replace seal
Problem: Brake pedal spongy	
Condition	**Remedy**
1. **Air trapped** in hydraulic system 2. **Brake fluid** low	1. Bleed hydraulic system 2. Add brake fluid and bleed hydraulic brake system

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Code	Fault	Description
C1409	Input #3 Open	The gauge has detected an open circuit condition in the input #3 circuit. It is possible that this has been caused due to an open circuit or disconnect in the input #3 or its interconnect harness. To clear the fault code correct the input #3 condition and then turn the key to the OFF position (for a minimum of 10 seconds) then turn the key to the ON position.
C1410	Input #3 High	The gauge has detected a high voltage condition in the input #3 circuit. It is possible that this has been caused due to the Input #3 or its interconnect harness shorted to battery power. To clear the fault code correct the Input #3 condition and then turn the key to the OFF position (for a minimum of 10 seconds) then turn the key to the ON position.
C1411	Input #3 Low	The gauge has detected a low voltage condition in the Input #3 circuit. It is possible that this has been caused due to the Input #3 or its interconnect harness shorted to chassis ground. To clear the fault code correct the Input #3 condition and then turn the key to the OFF position (for a minimum of 10 seconds) then turn the key to the ON position.
C1412	Input #4 Open	The gauge has detected an open circuit condition in the input #4 circuit. It is possible that this has been caused due to an open circuit or disconnect in the input #4 or its interconnect harness. To clear the fault code correct the input #4 condition and then turn the key to the OFF position (for a minimum of 10 seconds) then turn the key to the ON position.
C1413	Input #4 High	The gauge has detected a high voltage condition in the Input #4 circuit. It is possible that this has been caused due to the Input #4 or its interconnect harness shorted to battery power. To clear the fault code correct the Input #4 condition and then turn the key to the OFF position (for a minimum of 10 seconds) then turn the key to the ON position.
C1414	Input #4 Low	The gauge has detected a low voltage condition in the Input #4 circuit. It is possible that this has been caused due to the Input #4 or its interconnect harness shorted to chassis ground. To clear the fault code correct the Input #4 condition and then turn the key to the OFF position (for a minimum of 10 seconds) then turn the key to the ON position..
C1415	App Reflash Error	The gauge has detected an unstable application code during or after a reflash. It is possible that this has been caused due to intermittent power or unstable communication during the reflash which has prevented a successful app reflash. To clear the fault code, correct the gauge power or communication condition and then turn the key to the OFF position (for a minimum of 10 seconds) then turn the key to the ON position, the gauge may need to be reflashed at this time.
C1416	Cal Reflash Error	The gauge has detected an unstable calibration code during or after a reflash. It is possible that this has been caused due to intermittent power or unstable communication during the reflash which has prevented a successful app reflash. To clear the fault code, correct the gauge power or communication condition and then turn the key to the OFF position (for a minimum of 10 seconds) then turn the key to the ON position, the gauge may need to be reflashed at this time.
C1417	Internal Hardware Fault	The gauge has detected an internal hardware condition. It is possible that this has been caused due to one or more the internal components or systems not responding due to a poor connection between the gauge and the main harness. To clear the fault code correct the internal hardware fault condition and then turn the key to the OFF position (for a minimum of 10 seconds) then turn the key to the ON position.
C1418	Memory Power Fault	The gauge has detected a low voltage condition on the clock memory circuit. It is possible that this has been caused due to a faulty ACC, MEM or memory fuse in the PDM. To clear the fault code correct the memory power fault condition and then turn the key to the OFF position (for a minimum of 10 seconds) then turn the key to the ON position.
C1419	Output #1 Open	The gauge has detected an open circuit condition in the output #1 circuit. It is possible that this has been caused due to an open circuit or disconnect in the output #1 or it's interconnect harness. To clear the fault code correct the output #1 condition and then turn the key to the OFF position (for a minimum of 10 seconds) then turn the key to the ON position.
C1420	Output #1 High	The gauge has detected a high voltage condition in the output #1 circuit. It is possible that this has been caused due to the output #1 or it's interconnect harness shorted to battery power. To clear the fault code correct the output #1 condition and then turn the key to the OFF position (for a minimum of 10 seconds) then turn the key to the ON position.
C1421	Output #1 Low	The gauge has detected a low voltage condition in the output #1 circuit. It is possible that this has been caused due to the output #1 or its interconnect harness shorted to chassis ground. To clear the fault code correct the output #1 condition and then turn the key to the OFF position (for a minimum of 10 seconds) then turn the key to the ON position.
C1422	Incorrect App Code	The gauge has detected non production application code in the internal app memory space. To clear the fault code reflash the gauge with the appropriate software and then turn the key to the OFF position (for a minimum of 10 seconds) then turn the key to the ON position.
C1423	Incorrect Cal Code	The gauge has detected non production calibration code in the internal cal memory space. To clear the fault code reflash the gauge with the appropriate software and then turn the key to the OFF position (for a minimum of 10 seconds) then turn the key to the ON position.

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Safety Guidelines

This safety section contains information that must be followed to avoid damage to the Vehicle Diagnostic System or serious injury or death to the user. Please acknowledge this section – read it carefully.

- Thoroughly read and understand this manual before using the tool.
- Always make sure the diagnostic connections are clean, dry, and in good condition before connecting to a vehicle.
- Verify the vehicle battery or external 12-volt battery is fully charged and in good condition before attempting to use the diagnostic tool. Low battery voltage WILL cause communication issues as well as produce invalid test results.

⚠ WARNING

Always make sure an approved exhaust ventilation system is in place and being used. Ensure the work area being used is well ventilated whenever running an engine. Carbon monoxide gas is extremely poisonous and can lead to serious injury or death.

⚠ WARNING

Always stay clear of moving parts and remove all loose clothing that can be caught in moving parts on the vehicle.

⚠ WARNING

Always wear approved safety glasses or goggles as necessary.

⚠ WARNING

Use extreme caution when working around batteries. Batteries can produce a highly explosive hydrogen gas that can cause the battery to explode without warning.

CAUTION

Always make sure diagnostic cables are free and clear of any belts, pulleys, or other moving parts on the vehicle being tested.

CAUTION

Be sure diagnostic cables DO NOT come in contact with hot engine components such as exhaust manifold or engine block.

CAUTION

Never allow diagnostic cables to lay near or on any ignition system components such as coils, spark plug wires, or solenoids as electrical interference may occur and may cause damage to the diagnostic tool and/or computer.

CAUTION

Never allow cables to lay on the floor near or in puddles of water. Water may leak into the diagnostic connectors and cause serious damage.

Kit Contents

Included with your kit you will find the following parts. If replacement parts are needed, order using the following part numbers.

- 1001240978– Complete Kit
- N/A – Diagnostics Tool (Vehicle Diagnostics System) – Hardware Interface to connect Laptop or PC to vehicle (must order complete kit to replace Hardware Interface)
- 1001241469 – Diagnostics Cable (2.0 USB) – Connects the Laptop or PC to the tool
- 1001241470 – Diagnostics Harness (10 Pin) – For use on UTVs with a 10-pin diagnostic connector
- 1001241471 – Diagnostics Filter Harness – Suppresses starter motor power feedback during starting when using the tool. To be used if tool stops functioning during vehicle starting cycles

■NOTE: The starter motor power feedback is not harmful to the tool.

- 1001241472 – Diagnostic Tool Bag

Installing the Software

Computer Requirements

Before installing the software, ensure your computer meets the following requirements:

- Computer – Laptop computer (recommended) or PC in service/shop area.
- A minimum screen resolution of 1280 x 800 is recommended
- Operating System – Windows XP (SP3), Windows 7, Windows 8, Windows 10; 4 GB RAM (min), dual core processor (recommended).

■NOTE: Windows Vista and Windows 8 RT will not be supported.

- Internet Connection - required for installation and certain features.

Installation Instructions

Locate the Diagnostic Tool link as provided by your distributor and click to download the software.

When the installation process has started, the Setup Wizard window will appear. Select the "**Next >**" button to begin.

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TROUBLESHOOTING

■NOTE: The EPS assembly is not serviceable and must not be disassembled or EPS warranty will be voided.

1. Check 30-amp EPS fuse and EPS relay (primary coil: 150 ohms ± 10%, secondary resistance <1 ohm with primary energized).
2. With the ignition off, disconnect 2-pin connector on the EPS assembly and connect a volt meter set to DC voltage to the harness (black meter lead to BLK and red meter lead to ORG/BRN).With the ignition switch in the ON position, the meter should read battery voltage (if correct voltage is not present, check connections and wiring harness).

CAUTION

Do not attempt to check resistance of the EPS motor (2-pin input receptacle). There are internal capacitors holding a charge that can cause internal damage to an ohmmeter.

3. With ignition switch off, disconnect the 8-pin connector on the EPS assembly and connect a volt meter set to DC voltage to the harness (red meter lead to the ORG wire and black meter lead to battery ground.) With the ignition switch in the on position, the meter should read battery voltage (if correct voltage is not present, check for loose fittings or connections in the wiring harness).

CAUTION

If the Vehicle Diagnostic System has confirmed an active DTC relating to the CAN communication wires, use extreme caution when testing the wires. Do not probe the ECM connector with meter leads; instead use a small T-pin or other suitable testing component to make light and proper contact.

CAUTION

Never disconnect the ECM connector with the battery cables installed onto the battery.

■NOTE: If after completing the preceding tests and possible solutions with normal results an EPS issue persists with active DTC's C1301-C1305, 1316, or C1326-C1329 confirmed by the Vehicle Diagnostic System, the EPS assembly must be replaced (see Steering/Body/Controls).

Ignition Switch

The ignition switch, dash switches, front accessory connectors, and front switched accessory connector can be accessed from under the dash.

VOLTAGE

■NOTE: Perform this test on the harness connector.

1. Set the meter selector to the DC Voltage position.
2. Connect the red meter lead to the red wire; then connect the black meter lead to battery ground.
3. Meter must show battery voltage.

■NOTE: If the meter shows no battery voltage, troubleshoot the main 30 amp fuse, the battery, or the main wiring harness.

4. Connect the red meter lead to the red/black wire; then with the black lead grounded, turn the ignition switch to the ON position. The meter must show battery voltage.
5. Connect the red meter lead to the yellow/green wire; then with the black lead grounded, turn the ignition switch to the START position. The starter should engage and the meter must show battery voltage.

■NOTE: When the starter is engaged, battery voltage will be approximately 10.5 DC volts.

Ignition Coil

The ignition coil is mounted under the seat base below the driver's seat.

VOLTAGE

Primary Coil

1. Set the meter selector to the DC Voltage position; then disconnect the two wires from the coil.
2. Connect the red tester lead to the orange wire and the black tester lead to ground.
3. Turn the ignition switch to the ON position. The meter must show battery voltage.

Secondary Coil

CAUTION

Disconnect the injector connector(s) before performing the following procedure.

1. Connect the primary ignition coil connector. Remove the spark plug cap from the spark plug.
2. Connect the spark plug cap to Ignition Test Plug or other suitable tool; then ground the tool away from the spark plug hole. While turning the engine over, check for sufficient spark.

RESISTANCE

CAUTION

Always disconnect the battery when performing resistance tests to avoid damaging the multimeter.

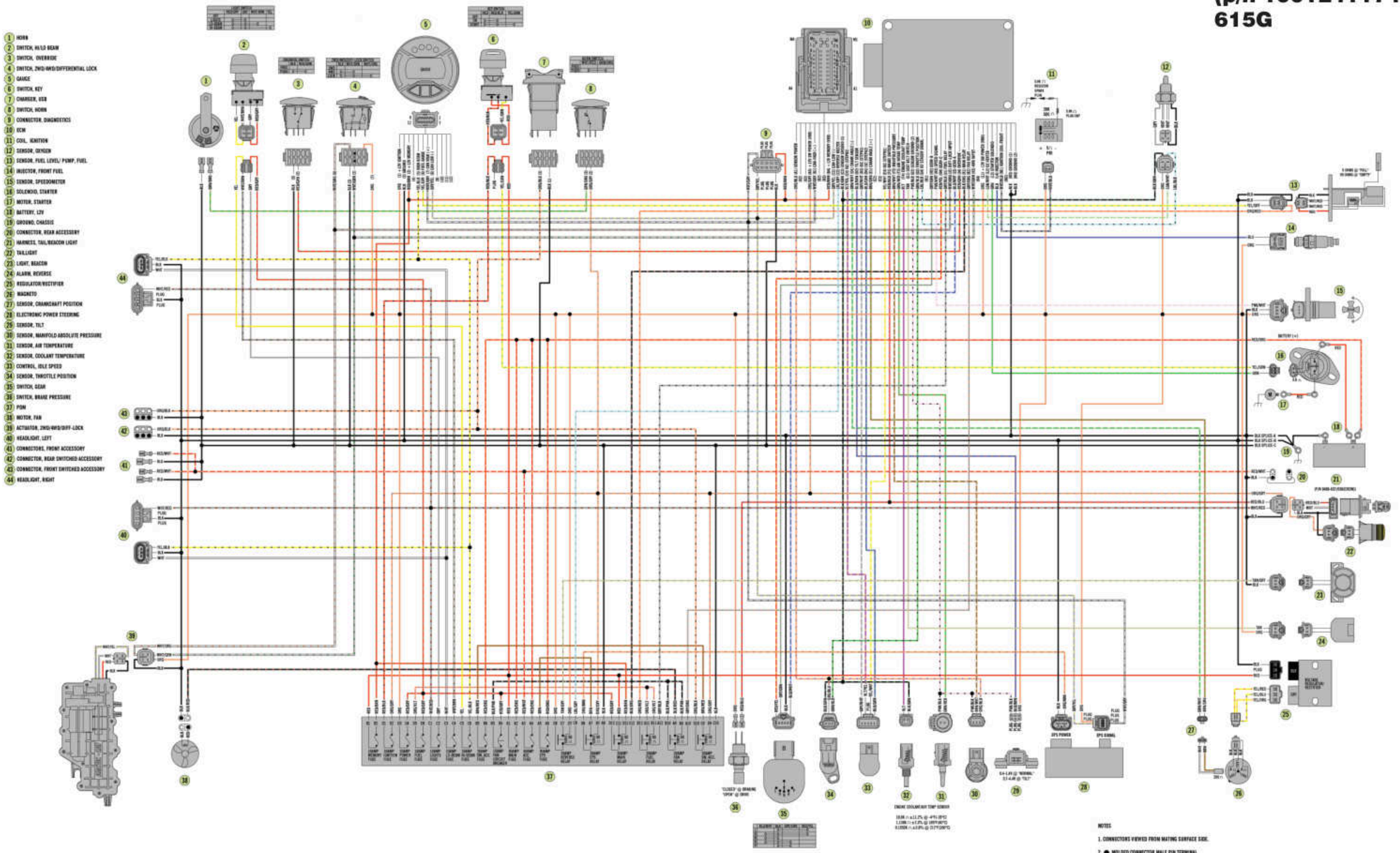
■NOTE: For these tests, the meter selector should be set to the OHMS position.

Primary Winding

1. Connect the red tester lead to one terminal; then connect the black tester lead to the other terminal.

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Main Harness
(p/n 1001240219)
315G
(p/n 1001241174)
615G



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