

All 2538 and 2368 with 20 pin controller

Steps for diagnosing a no crank condition. All 2538 and 2368 with 20 pin controller.

This is the controller under the dash. Not the ECU in front of the radiator.

Make sure all starter interlocks are verified while attempting to crank. If they are and the unit will not crank, follow the below steps.

Retry the crank circuit if any corrections are made at any step.

If needed refer to the machine wire schematics to aid in locating any issues.

1. Ensure battery is fully charged. Correct as needed.
2. Check positive and negative battery cable connection. Connections must tight and corrosion free. The negative and positive battery cables will have additional wires connected at the cable. Make sure they are in place with tight and clean connections.

3. Check the ground connections on the right side of the unit.  
Make sure all the connection is clean and corrosion free



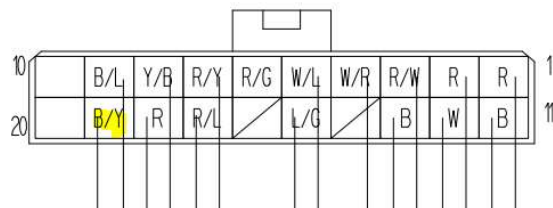
4. Check all fuses. Replace any fuse that has failed.
5. Locate the starter relay. Should be located in the starter area. Will have 4 wires. A red / white, a black / red ( larger), a black, and a black / red (smaller) Wire colors are subject to change.
6. Check relay or replace with a known good relay. Go to step 7 if replacing the relay does not correct the no crank condition. When checking the relay make sure there is no corrosion in the relay socket
7. Remove the starter relay. Ignition switch in the off position. Sub range lever in neutral. Check for battery voltage at red / white wire. If no voltage find and correct the issue. The red / white wire connects at the battery cable connection at the starter. Check the black wire for continuity to ground. Correct as needed.
8. Ignition switch in the off position. Sub range lever in neutral and with the starter relay removed. Make a jumper wire and jump between the red / white and large black / red white. Starter should engage and crank the engine. If the starter does not engage check the black / red wire. It runs to the starter solenoid. If wire is good then suspect an issue with the starter. If starter does engage proceed to step 9.
9. Ignition switch in the off position. Gain access to the controller under the dash and disconnect the wire harness.

10. Locate the black / yellow wire on the controller wire harness. It is pin 19 (goes to starter relay). Check for continuity on the black / yellow wire (pin 19) to the small black / red wire at the starter relay socket. Note the wire changes color at the front harness to operator's station harness connector. If no continuity find the cause in the harness and correct. If the wire has continuity continue to step 11

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|-------------------|---------------------------|
| 1. BATTERY +      | 11. GND                   |
| 2. BATTERY +      | 12. HST S/W               |
| 3. KEY ON         | 13. SEAT S/W              |
| 4. CHARGE SIGNAL  | 14. N.C                   |
| 5. BRAKE SIGNAL   | 15. PTO S/W               |
| 6. PARKING SIGNAL | 16. N.C                   |
| 7. CRUISE S/W     | 17. CRUISE LAMP           |
| 8. CHECK LAMP     | 18. CRUISE SOL            |
| 9. KEY START      | 19. START SIGNAL (OUTPUT) |
| 10. E/G STOP SOL  | 20. E/G STOP SOL          |



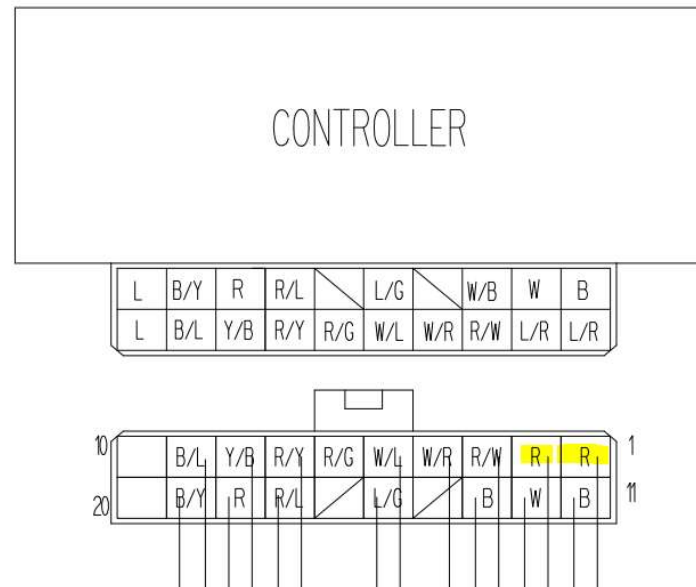
L	B/Y	R	R/L		L/G		W/B	W	B
L	B/L	Y/B	R/Y	R/G	W/L	W/R	R/W	L/R	L/R



Note for step 10. To quickly check the start relay, starter circuit, and wiring. Have the controller disconnected. Key off. All gear shift levers in neutral. Apply battery voltage to pin 19. Make sure you do not ark or damage the pin in the connector. Please note the engine may crank during the test so please proceed with caution. If the unit cranks over then start relay, starter, and wiring from the controller are good. You can proceed to step 11.

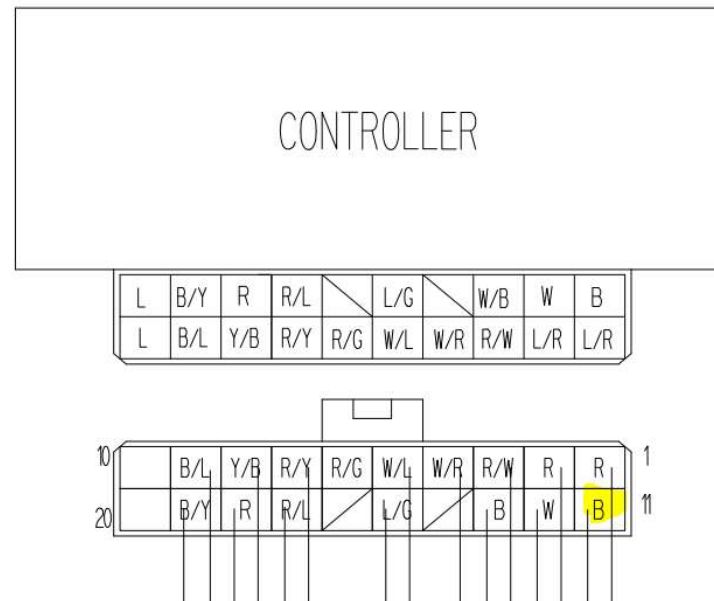
11. With controller wire harness disconnected and with the key in the on position check for battery voltage at pins 1 and 2 (key switch power for controller) on controller wire harness connector. Battery voltage comes from the fuse box. Correct any issue. If battery voltage is present continue to step 12.

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|-------------------|--------------------------|
| 1. BATTERY +      | 11. GND                  |
| 2. BATTERY +      | 12. HST S/W              |
| 3. KEY ON         | 13. SEAT S/W             |
| 4. CHARGE SIGNAL  | 14. N.C                  |
| 5. BRAKE SIGNAL   | 15. PTO S/W              |
| 6. PARKING SIGNAL | 16. N.C                  |
| 7. CRUISE S/W     | 17. CRUISE LAMP          |
| 8. CHECK LAMP     | 18. CRUISE SOL           |
| 9. KEY START      | 19. START SIGNAL(OUTPUT) |
| 10. E/G STOP SOL  | 20. E/G STOP SOL         |



Step 12. Check for ground on pin 11 (ground circuit for controller) on controller wire harness connector.  
Key can be on or off. If no ground is present correct the issue. If the ground is good then proceed to step 13.

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|-------------------|--------------------------|
| 1. BATTERY +      | 11. GND                  |
| 2. BATTERY +      | 12. HST S/W              |
| 3. KEY ON         | 13. SEAT S/W             |
| 4. CHARGE SIGNAL  | 14. N.C                  |
| 5. BRAKE SIGNAL   | 15. PTO S/W              |
| 6. PARKING SIGNAL | 16. N.C                  |
| 7. CRUISE S/W     | 17. CRUISE LAMP          |
| 8. CHECK LAMP     | 18. CRUISE SOL           |
| 9. KEY START      | 19. START SIGNAL(OUTPUT) |
| 10. E/G STOP SOL  | 20. E/G STOP SOL         |

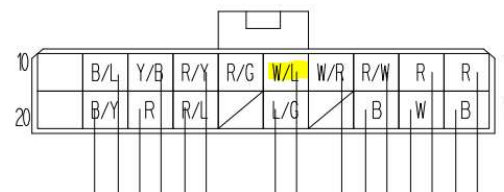


13. Key in the on position. With the brake pedal depressed check for battery voltage on pin 5 (brake switch input) of the controller wire harness connector. If battery voltage is not present the find and correct the issue in the brake switch circuit. If battery voltage is present proceed to step 14

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|-------------------|---------------------------|
| 1. BATTERY +      | 11. GND                   |
| 2. BATTERY +      | 12. HST S/W               |
| 3. KEY ON         | 13. SEAT S/W              |
| 4. CHARGE SIGNAL  | 14. N.C                   |
| 5. BRAKE SIGNAL   | 15. PTO S/W               |
| 6. PARKING SIGNAL | 16. N.C                   |
| 7. CRUISE S/W     | 17. CRUISE LAMP           |
| 8. CHECK LAMP     | 18. CRUISE SOL            |
| 9. KEY START      | 19. START SIGNAL (OUTPUT) |
| 10. E/G STOP SOL  | 20. E/G STOP SOL          |

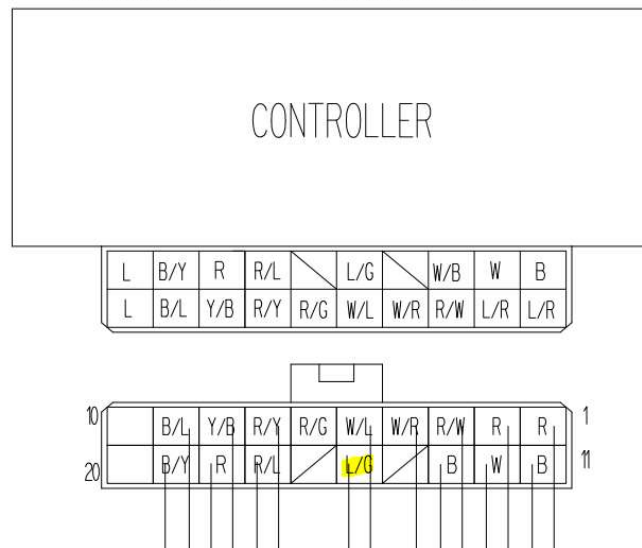


L	B/Y	R	R/L	L/G	W/B	W	B
L	B/L	Y/B	R/Y	R/G	W/L	W/R	L/R



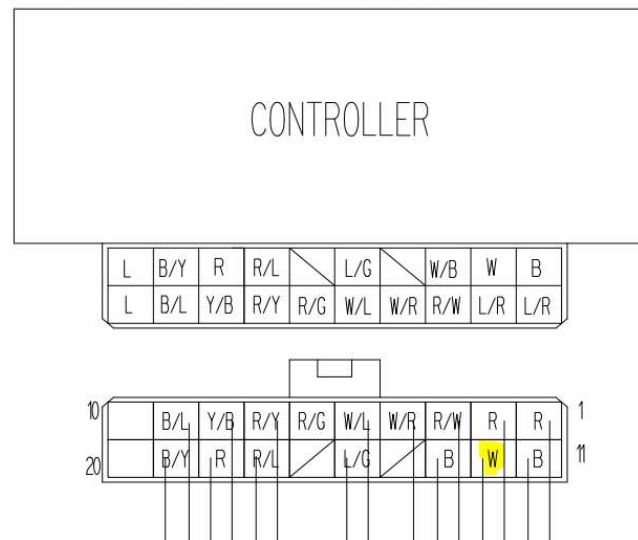
14. Key in the on position. Check for battery voltage on the controller wire harness connector at pin 15 (PTO switch input). Check with the PTO switch off and on. Battery voltage will come and go depending on PTO switch position. If battery voltage is never not present with the PTO switch in the on or off position, then check the PTO switch circuit. If battery voltage is present either with the PTO switch off or on then proceed to step 15.

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|-------------------|---------------------------|
| 1. BATTERY +      | 11. GND                   |
| 2. BATTERY +      | 12. HST S/W               |
| 3. KEY ON         | 13. SEAT S/W              |
| 4. CHARGE SIGNAL  | 14. N.C                   |
| 5. BRAKE SIGNAL   | 15. PTO S/W               |
| 6. PARKING SIGNAL | 16. N.C                   |
| 7. CRUISE S/W     | 17. CRUISE LAMP           |
| 8. CHECK LAMP     | 18. CRUISE SOL            |
| 9. KEY START      | 19. START SIGNAL (OUTPUT) |
| 10. E/G STOP SOL  | 20. E/G STOP SOL          |



15. Key in the on or off position. Controller disconnected from the harness. Check for ground on controller wire harness connector pin 18 (HST switch). If there is no ground then check the wiring and wire harness connector. Note this unit does not have a HST switch. A jumper connector has been used in place of a switch. If the ground is good then proceed to step 16.

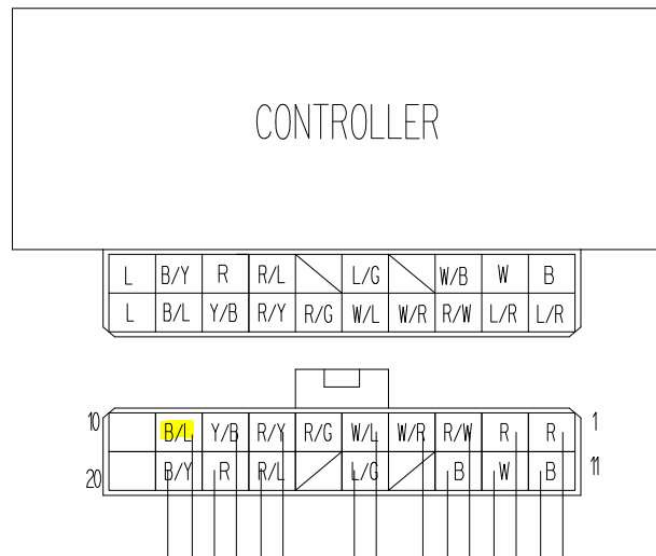
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|-------------------|--------------------------|
| 1. BATTERY +      | 11. GND                  |
| 2. BATTERY +      | 12. HST S/W              |
| 3. KEY ON         | 13. SEAT S/W             |
| 4. CHARGE SIGNAL  | 14. N.C                  |
| 5. BRAKE SIGNAL   | 15. PTO S/W              |
| 6. PARKING SIGNAL | 16. N.C                  |
| 7. CRUISE S/W     | 17. CRUISE LAMP          |
| 8. CHECK LAMP     | 18. CRUISE SOL           |
| 9. KEY START      | 19. START SIGNAL(OUTPUT) |
| 10. E/G STOP SOL  | 20. E/G STOP SOL         |





16. Locate pin 9 (crank input signal from the key switch) on the controller harness connector. Select the crank position with the key switch. When selected battery voltage must be present at pin 9. In battery voltage is not present then locate and correct the issue. If battery voltage is present at pin 9 with the key in the crank position then proceed to step 17.

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|-------------------|---------------------------|
| 1. BATTERY +      | 11. GND                   |
| 2. BATTERY +      | 12. HST S/W               |
| 3. KEY ON         | 13. SEAT S/W              |
| 4. CHARGE SIGNAL  | 14. N.C                   |
| 5. BRAKE SIGNAL   | 15. PTO S/W               |
| 6. PARKING SIGNAL | 16. N.C                   |
| 7. CRUISE S/W     | 17. CRUISE LAMP           |
| 8. CHECK LAMP     | 18. CRUISE SOL            |
| 9. KEY START      | 19. START SIGNAL (OUTPUT) |
| 10. E/G STOP SOL  | 20. E/G STOP SOL          |



17. If all the previous step have been confirmed and any issue corrected, and the unit still will not crank then the controller is at fault and will need to be replaced.