MERCURY MerCruiser

Service Bulletin

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Troubleshooting the TKS Diode

Models Affected

Engine Model	Product Line	Starting Serial Number
4.3L	Sterndrive	0W300010
5.0L	Sterndrive	0W300755
5.7L	Sterndrive	0W300755
5.7L	Inboard, Ski, and Tow Sports	0W090900
Any MCM or MIE V6 or V8 carbureted engine that has been equipped with a TKS carburetor kit		

Situation

A blocking diode is used in the electrical system of MerCruiser V6 and V8 engines with TKS (Turn Key Start) carburetors. When the engine is warm but is not running, a temperature switch allows positive current to flow to the TKS heater module, while the diode prevents the positive current from reaching the electric fuel pump and the ignition system. This prevents the carburetor from returning to cold start mode when the engine is turned off but still warm.

Under some conditions the blocking diode in the electrical system can fail. Two failure modes for the diode are possible. One is that the diode is shorted internally and will pass current both ways, and the other is that the diode is open internally and will not pass current through either way.

- If the diode is shorted internally, the engine will continue to run after the key is turned off. If this condition is found, removing the diode from its connector will shut the engine off.
- If the diode is open internally, the TKS module will not have positive current when the engine is warm and the key is off. The engine will be hard to start when it is warm.

Correction

If an engine will not turn off or becomes hard to start when warm, check the blocking diode with an ohmmeter to determine if the diode is the problem. If the diode has continuity both ways, it is shorted. If the diode does not have continuity either way, the diode is open. If either condition is found, the diode needs to be replaced for the engine to operate properly. Replace the diode and test the engine to verify:

1. The engine turns off with the key switch and the lanyard switch

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2. Both positive and negative current are supplied to the TKS module connector after the engine reaches operating temperature and the engine is turned off (Refer to **"Testing for Voltage at the TKS Module"**) .

TESTING THE BLOCKING DIODE WITH AN OHMMETER

1. Set the ohmmeter to a high scale.
2. Connect the leads of an ohmmeter to the terminals of the diode and observe the reading.



24203

a - Diode
b - Ohmmeter set to ohms
c - Test leads

3. Reverse the test leads on the diode and observe the reading.

One connection should result in no continuity and the other should have continuity with a low resistance (300 ohms or greater).

If the readings are the same when the ohmmeter connections are reversed, replace the faulty diode.

TESTING FOR VOLTAGE AT THE TKS MODULE

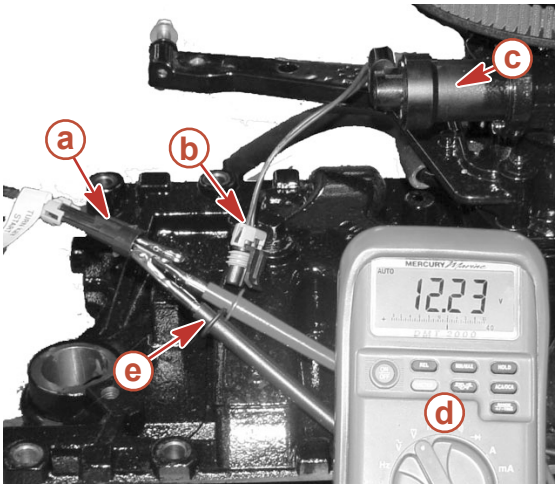
1. Supply cooling water to the engine if performing this test out of water.
2. Operate the engine until it reaches operating temperature.
3. Turn the engine off.
4. Separate the connector at the TKS module.

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5. Using a voltmeter, test the TKS module connector on the engine harness.



24204

a - TKS module connector on harness
b - TKS module connector on engine
c - TKS Module
d - Voltmeter
e - Test leads

a. Connect the negative lead from the voltmeter to the black wire of the connector.
b. Connect the positive lead of the voltmeter to the white wire of the connector.
c. With the key in both the on and off positions, observe the voltage. The voltage should be equal to the battery voltage with the key both on and off. (Approximately 12 volts)

Part Required

Part	Part Number
TKS Diode	83-865913A01

Warranty

US and Canada: Mercury Marine will credit the dealer for the cost of labor and parts during the engine warranty period. Submit a warranty claim through your normal warranty-processing channel, listing:

- MerCruiser serial number.
- Flat Rate Code and Labor: SB 10—1.0Hrs
- Part Code: 783.
- Failure Code: 00.

International: Follow instructions issued by your Marine Power International office or by your distributor.

Old Part or Parts:

- **USA and Canada:** Retain part for 30 days after claim submitted.
- **International:** Follow instructions issued by your Marine Power International office or by your distributor.

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