



DFI Troubleshooting Guide		
Symptom	Cause	Action
1. Engine cranks but won't start	1.0 Lanyard stop switch in wrong position.	Reset lanyard stop switch.
	1.1 Weak battery or bad starter motor, battery voltage drops below 8 volts while cranking (ECM cuts out below 8 volts) (Fuel pump requires 9 volts).	Replace/charge battery. Inspect condition of starter motor. Check condition of battery terminals and cables.
	1.2 Low air pressure in rail (less than 70 psi at cranking)	Inspect air system for leaks. Inspect air filter for plugging (air pressure measured on port rail). Inspect air compressor reed valves if necessary.
	1.3 No fuel	Check that primer bulb is firm. Key-on engine to verify that fuel pump runs for 2 seconds and then turn off. Measure fuel pressure (valve on starboard rail). Fuel pressure should be 10 ± 1 psi greater than the air pressure.
	1.4 Low fuel pressure	Check fuel pressure from low pressure electric fuel pump (6–10 psi). Check for fuel leaks. If fuel pressure leaks down faster than air pressure, seals on fuel pump may be leaking. Check air system pressure, see 1.2.
	1.5 Flywheel misaligned during installation	Remove flywheel and inspect.
	1.6 Blown fuse	Replace fuse. Inspect engine harness and electrical components.
	1.7 Main Power Relay not functioning	Listen for relay to “click” when the key switch is turned on.
1.8 Spark Plugs	Remove fuel pump fuse. Unplug all direct injector connectors. Remove spark plugs from each cylinder. Connect spark plug leads to Spark Gap Tester 91-830230T. Crank engine or use DDT output load test for each ignition coil and observe spark. If no spark is present, replace appropriate ignition coil. If spark is present, replace spark plugs.	



DFI Troubleshooting Guide (continued)		
Symptom	Cause	Action
1. Engine cranks but will not start (continued)	1.9 ECM not functioning	<p>Injection System: Listen for injector “ticking” when cranking or connect spare injector to each respective harness. Ticking should start after 2 cranking revolutions.</p> <p>Ignition System: – Check for proper operation by using Inductive Timing Light 91-99379. – Check battery voltage (RED/YEL Lead) @ ignition coils. – Check for blown fuse (C15). – Check battery voltage to fuse from main power relay (PURPLE Lead). – Check for shorted stop wire (BLK/YEL). – Check crank position sensor setting [0.025 in. – 0.040 in. (0.64 mm – 1.02 mm)] from flywheel or for defective crank position sensor. – Defective ECM.</p> <p>Power Supply: Clean and inspect remote control male and female harness connectors.</p>
	1.9A Crank Position Sensor not functioning	<p>– Sensor faulty. – Bad connection – Air gap incorrect</p>
2. Engine cranks, starts and stalls	2.0 Low air pressure in rail	See 1.2
	2.1 Low fuel pressure in rail	See 1.2 and 1.3
	2.2 Abnormally high friction in engine	Check for scuffed piston or other sources of high friction.
	2.3 Air in fuel system/lines	See 1.3 Crank and start engine several times to purge.
	2.4 TPS malfunction	Check motion of throttle arm. Stop nuts should contact block at idle and WOT. Check TPS set-up. Must connect DDT with adapter harness (84-822560A5) to ECM.
2.5 Remote control to engine harness connection is poor	Clean and inspect male and female connectors.	



DFI Troubleshooting Guide (continued)		
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3. Engine idle is rough	3.1 Low air pressure in rail (less than 79 ± 2 psi while running)	See 1.2
	3.2 Fouled spark plug	Replace spark plug: –If carbon bridges electrode gap or if it is completely black. –If it is not firing and is wet with fuel. <i>Note: If spark plug is grey or completely black with aluminum specs, this indicates a scuffed piston.</i>
	3.3 Failed direct injector	Refer to specifications for ohm test.
	3.4 Failed fuel injector	Refer to specifications for ohm test.
	3.5 Bad coil/weak spark	Refer to specifications for ohm test.
	3.6 Flywheel misaligned during installation	Remove flywheel and inspect.
4. Engine idles fast (rpm >700) or surges	4.1 Broken fuel pressure regulator or tracker diaphragm	Measure fuel pressure. Remove and inspect diaphragms (a special tool is required for assembly).
	4.2 Fuel leak	Check for fuel entering induction manifold or air compressor inlet. Fuel pump diaphragm leaking and/or Vapor Separator flooding over.
	4.3 Tracker Valve spring missing	Inspect tracker valve for proper assembly.
	4.4 Improper set-up	Check throttle cable & cam roller adjustment.
5. Engine runs rough below 3000 rpm	5.1 Fouled spark plug	See 3.2
	5.2 Low air pressure in rail	See 1.2
	5.3 Throttle misadjusted	Check throttle cam setup on induction manifold. Inspect linkage and roller. If throttle plate stop screws have been tampered with, contact Mercury Marine Service Department for correct adjustment procedures.
	5.4 Bad coil/weak spark	See 3.5
	5.5 TPS malfunction	See 2.4
6. Engine runs rough above 3000 rpm	6.1 Fouled spark plug	See 3.2
	6.2 Speed Reduction	See 7
	6.3 Low air pressure in rails	See 1.2
	6.4 TPS malfunction	See 2.4



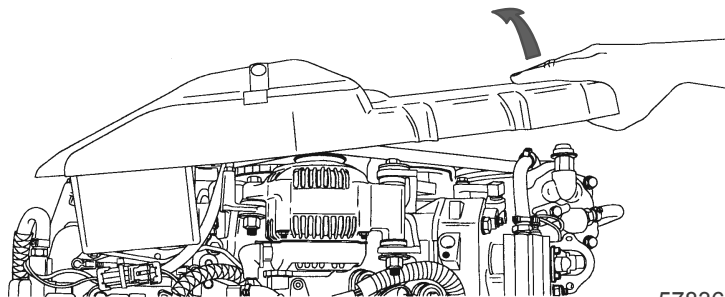
DFI Troubleshooting Guide (continued)		
Symptom	Cause	Action
7. Speed Reduction (RPM reduced)	7.1 Low battery voltage ECM requires 8 volts minimum Fuel Pump requires 9 volts	Check battery and/or alternator. Check electrical connections.
	7.2 Overheat condition (engine and/or air compressor)	Check water pump impeller/cooling system.
	7.3 Oil pump electrical failure	Check electrical connection.
	7.4 TPS failure If TPS fails, rpm is reduced to idle	Check electrical connections.
8. Engine RPM reduced to idle only	8.1 TPS failed	See 2.4
	8.2 Battery voltage below 9.5 volts	Use DDT to monitor system
9. Loss of spark on 1 cylinder	9.1 Loose wire or pin in connectors between ECM and coil primary.	Check connectors.
	9.2 Faulty ignition coil.	Replace coil.
	9.3 Faulty spark plug.	Replace spark plug.
	9.4 Faulty spark plug wire	Replace spark plug wire.
	Note: If spark plug is partially fouled or the plug gap is too small, the DDT may indicate the incorrect cylinder as having an ignition fault. Example: If the DDT indicates an ignition fault on cylinder #4, the problem may be on the prior cylinder in the firing order – I.E. cylinder number #3.	

Ignition Components Removal and Installation

Flywheel Cover Removal and Installation

REMOVAL

Remove flywheel cover by lifting off.



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