

TROUBLESHOOTING CHART

The following is provided to help in diagnosing the probable source of troubles. It is a guideline and should not be assumed to show all causes for all problems.

NOTE: On fuel injection models, always check for fault codes. If a fault code is detected, service the fault code and recheck operating conditions. Refer to DIAGNOSTIC PROCEDURES in ENGINE MANAGEMENT section.

ENGINE WILL NOT START

OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
Engine does not turn over	Wrong safety lanyard	Use one that has been programmed
	DESS operation non functional	If 2 short beeps are not heard when installing safety lanyard, refer to ELECTRICAL SYSTEM and ENGINE MANAGEMENT
	Safety lanyard switch faulty or disconnected or harness damaged	Replace
	Burnt fuse: battery, starting system. Also fuel pump on fuel injection models	Check wiring then replace fuse
	Starting system fuse keeps on burning	Check wiring, starting system solenoid and MPEM
	Discharged or disconnected battery	Check/recharge
	Defective or disconnected start/stop switch	Check, refer to STARTING SYSTEM or ENGINE MANAGEMENT
	Battery connections	Check/clean/tighten
	Poor/bad or corroded ground contacts (engine, starter etc.)	Check/clean/repair
	Water/fuel hydro-lock	Check, refer to MAINTENANCE
	Starter malfunction	Check, refer to ELECTRICAL SYSTEM
	Starter solenoid	Check, refer to ELECTRICAL SYSTEM
	Obstructed starter drive gear ass'y	Check/repair, refer to PTO HOUSING/MAGNETO
	Seized or obstructed engine	Check/repair, refer to ENGINE
	Seized or obstructed supercharger (4-TEC Supercharged models)	Check/repair, refer to INTAKE
	Hydraulically locked air compressor (DI models)	Check/repair as needed
	Seized jet pump	Check, refer to PROPULSION SYSTEM
Faulty sensor, ECM or MPEM (fuel injection models)	Check fault codes, refer to ENGINE MANAGEMENT	

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OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
Engine turns slowly	Loose battery cable connections	Check/clean/tighten
	Discharged/weak battery	Check/charge/replace
	Restriction in jet pump	Check/clean pump
	Partial seizure in jet pump	Inspect, refer to PROPULSION SYSTEM
	Partial engine hydro-lock	Check, refer to MAINTENANCE
	Partial engine seizure	Check compression, refer to ENGINE
	Worn starter	Check, refer to ELECTRICAL SYSTEM
	Timing chain not guided by chain guide (4-TEC models)	Check, refer to ENGINE BLOCK subsection
	Outside temperature too low	Oil is too thick. Change oil viscosity (4-TEC models) Battery capacity is not sufficient for cold temperature
Engine turns over	Faulty component in the fuel injection system (fuel injection models)	Check for fault codes. Refer to DIAGNOSTIC PROCEDURES in ENGINE MANAGEMENT
	Engine drowned mode is active (fuel injection models)	Release throttle lever
	Low battery voltage	Recharge or replace battery
	Low or no fuel pressure (fuel injection models)	Check fuel pump pressure output Check air/fuel rail (DI models) Check fuel pump fuse Check wiring harness
	Fuel injectors not working (fuel injection models)	Check fuel injector operation. Replace as necessary Check output signal from MPEM
	Low or no air pressure (DI models)	Check air/fuel rail Check air compressor system Check RAVE valve system for leaks
	Direct injector not working (DI models)	Check direct injector operation Check output signal from MPEM
	No spark at the spark plug	Check spark plugs condition and replace as necessary
	Defective MPEM or ECM	Check ignition system and repair Replace MPEM or ECM (as applicable)
	Inverted spark plug cables (RFI and DI models)	Reposition cables properly.

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OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
Engine turns over (cont'd)	Defective CPS (fuel injection models)	Check operation of CPS and replace if necessary
	Water-contaminated fuel	Check/siphon and refill
	Dirty fuel filter	Clean/replace
	Fouled or defective spark plug	Replace
	Water in engine	Check, refer to MAINTENANCE
	Carburetion (carburetor models)	Check, refer to FUEL SYSTEM
	Defective ignition circuit	Check, refer to ELECTRICAL SYSTEM
	Flooded engine: Carburetor needle valve stuck open (carburetor models)	Check, refer to FUEL SYSTEM
	Excessive rotary valve clearance (if so equipped)	Check, refer to ENGINE
	Incorrect rotary valve timing (if so equipped)	Check, refer to ENGINE
	Internal engine damage	Check, refer to ENGINE
	Defective encoder/trigger wheel (fuel injection models)	Check, refer to ENGINE MANAGEMENT
	Incorrectly aligned flywheel and encoder/trigger wheel (fuel injection models)	Properly position flywheel and encoder/trigger wheel, refer to PTO HOUSING/MAGNETO
	Insufficient engine compression	Replace defective part(s)
Idle bypass valve stuck or not functioning (4-TEC models)	Check, refer to ENGINE MANAGEMENT	
No spark at spark plugs	Faulty rev limiter in MPEM (carburetor models)	Replace MPEM
	Spark plug faulty, fouled or worn out	Check spark plug condition
	Ignition	Check, refer to ELECTRICAL SYSTEM
	Faulty ECM or MPEM (fuel injection models)	Replace ECM or MPEM (as applicable)

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ENGINE HARD TO START

OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
	Defective idle bypass valve (4-TEC models)	Refer to ENGINE MANAGEMENT
	Wrong TPS zero setting (fuel injection models)	Refer to ENGINE MANAGEMENT
	Throttle cable adjustment (fuel injection models)	Refer to ENGINE MANAGEMENT
	Temperature too low for available battery capacity	Battery capacity is not sufficient for cold temperature
	Air lock in fuel rail (RFI and 4-TEC models)	Refer to ENGINE MANAGEMENT
	Water in intake system (defective MAP sensor) (4-TEC models)	Check and remove water. Refer to INTAKE SYSTEM in ENGINE MANAGEMENT
	Water in fuel reservoir or contaminated fuel	Flush reservoir and refill with fresh gas
	Mechanical engine failure	Check cylinder compression Check for cylinder head leaks Check starting system
	Spark plug faulty, fouled or worn out	Check spark plug condition
	Low fuel pressure (fuel injection models)	Check fuel pump operation. Refer to ENGINE MANAGEMENT Check fuel pressure regulator. Refer to ENGINE MANAGEMENT
	Low air pressure (DI models)	Check air/fuel rail. Refer to ENGINE MANAGEMENT Check air compressor system. Refer to ENGINE MANAGEMENT Check RAVE valve for leaks

ENGINE STARTS BUT RUNS ONLY AT IDLE SPEED

OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
	The system is in limp home mode (fuel injection models)	Refer to ENGINE MANAGEMENT and check the fault codes
	Broken or loose throttle cable	Change/readjust

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ENGINE MISFIRES, RUNS IRREGULARLY

OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
Weak spark	Fouled, defective, worn spark plugs	Check/verify heat range/gap/replace
	Faulty ECM or MPEM (fuel injection models)	Check, refer to ENGINE MANAGEMENT
	Defective encoder wheel/CPS (fuel injection models)	Check, refer to ENGINE MANAGEMENT
	Too much oil supplied to engine (2-stroke engines)	Adjust oil injection pump
	Bad ignition coil wiring	Check wiring condition and proper grounding of ignition coil
	Faulty ignition coil, or bad connector	Check coil. Refer to ENGINE MANAGEMENT or ELECTRICAL SYSTEM
	Poor engine ground	Check/clean/repair
Lean fuel mixture Dry spark plug (except when water fouled)	Low fuel level (carburetor models)	Check/refill
	Carburetion dirty (carburetor models)	Check/clean, refer to FUEL SYSTEM
	Low fuel pressure (fuel injection models)	Check pump, regulator, injectors and hose pinchers or if filter is plugged. Replace if necessary
	Leaking crankshaft seal(s) or intake manifold (carburetor models)	Pressure check engine, to ENGINE
	Restricted fuel valve (carburetor models)	Check/replace
	Loose carburetor (carburetor models)	Tighten carburetor
	Stale or water fouled fuel	Check/siphon and refill
	Fuel filter dirty or restricted	Check/clean/replace
	Clogged fuel injectors (fuel injection models)	Remove and clean fuel injectors
	Clogged direct injectors (DI models)	Remove and clean direct injectors
	Defective sensor or ECM/MPEM (fuel injection models)	Check faulty codes in ECM or MPEM (as applicable) memory, refer to ENGINE MANAGEMENT
Rich fuel mixture Fouled spark plug	Flame arrester dirty or restricted (if so equipped)	Check/replace
	Partially closed choke (carburetor models)	Check/adjust choke cable
	Loose main jet (carburetor models)	Check, refer to FUEL SYSTEM
	Faulty fuel injector(s) (fuel injection models)	Remove and replace fuel injector(s), refer to ENGINE MANAGEMENT

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OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
Rich fuel mixture Fouled spark plug (cont'd)	Faulty direct injector(s) (DI models)	Remove and replace direct injector(s), refer to ENGINE MANAGEMENT
	Defective sensor or ECM/MPEM (fuel injection models)	Check faulty codes in ECM or MPEM (as applicable) memory, refer to ENGINE MANAGEMENT
	Rotary valve shaft seal leaking (if so equipped)	Check/replace, refer to ENGINE
	Damaged reed valve (if so equipped)	Check, refer to BOTTOM END in ENGINE
	Leaking crankshaft seal(s) or intake manifold (DI models)	Pressure check engine, refer to ENGINE
	Leak in RAVE valve system (DI models)	Check, refer to ENGINE MANAGEMENT
	Oil injection pump adjustment (2-stroke engines)	Check/adjust, refer to LUBRICATION SYSTEM
	Worn needles and seals (carburetor models)	Check, refer to section FUEL SYSTEM
	Excessive rotary valve clearance (if so equipped)	Check, refer to ENGINE
	Fuel pressure fluctuating (fuel injection models)	Inspect fuel pressure regulator and air pressure (DI models). Refer to ENGINE MANAGEMENT
	High fuel pressure (fuel injection models)	Check pump, regulator, injectors or if filter is plugged. Replace if necessary
Starts, but runs poorly	Check spark plug condition, check fault codes, check fuel pressure (fuel injection models). Also check RAVE valves operation (2-stroke fuel injection models)	Check, refer to ENGINE MANAGEMENT. If some work has been performed on the unit, make sure injector wire connectors were not mixed. Refer to the WIRING DIAGRAM for wire colors and positions
	Bent or missing tooth on encoder wheel (fuel injection models)	Check, refer to ENGINE MANAGEMENT
Also fuel injection misinjecting	Injector wiring reversed (fuel injection models)	Refer to WIRING DIAGRAM
	Damaged fuel injector (fuel injection models)	Check, refer to ENGINE MANAGEMENT
	Incorrect rotary valve timing (if so equipped)	Check/adjust, refer to ENGINE
	Excessive rotary valve clearance (if so equipped)	Check, refer to ENGINE

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ENGINE CONTINUALLY BACKFIRES

OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
Weak spark	Fouled, defective spark plugs	Clean/replace
Spark plugs	Ignition coil leads or wiring reversed	Refer to WIRING DIAGRAM
Ignition timing	Incorrect setting	Check/reset, refer to ELECTRICAL SYSTEM
	Defective encoder wheel/CPS (fuel injection models)	Check, refer to ENGINE MANAGEMENT
Rotary valve (if so equipped)	Incorrect timing	Check/reset, refer to ENGINE
Carburetor (if so equipped)	Carburetion too lean	Check, refer to FUEL SYSTEM
Engine	Intake or exhaust valve(s) leak (4-TEC models)	Pressure check engine, refer to ENGINE

ENGINE DETONATION OR PINGING

OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
Ignition	Timing too far advanced	Check/reset (except 4-TEC models)
	Spark plug heat range too high	Check/change to correct range
Engine/exhaust high temperature	Engine overheats and exhaust overheats	Check, see ENGINE OVERHEATS in this section
	Fuel octane too low of poor fuel quality	Use good quality fuel
	Knock sensor disconnected or faulty (fuel injection models)	Check, refer to ENGINE MANAGEMENT
	Bad knock sensor connection (fuel injection models)	Check, refer to ENGINE MANAGEMENT
	Bad ECM connection (4-TEC models)	Check, refer to ENGINE MANAGEMENT

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ENGINE LACKS ACCELERATION OR POWER

OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
	Weak spark	Check/replace, refer to ELECTRICAL SYSTEM
	Carburetion, jetting too rich/lean (carburetor models)	Check/replace, refer to FUEL SYSTEM
	Throttle does not open fully	Check/readjust, refer to FUEL SYSTEM or ENGINE MANAGEMENT
	Low compression	Check/repair, refer to ENGINE
	Water in fuel	Check/siphon/replace
	Debris in carburetor needle valve (carburetor models)	Check/clean, refer to FUEL SYSTEM
	Impeller leading edge damaged	Check/replace, refer to PROPULSION SYSTEM
	Too much engine oil (4-TEC models)	Siphon or adjust level. Refer to LUBRICATION
	Twisted crankshaft (DI models)	Check, refer to ENGINE
	Poor fuel quality	Siphon then refill with fresh fuel
	Clogged direct injectors (DI models)	Remove and clean direct injectors
	Clogged fuel injectors (fuel injection models)	Remove and clean fuel injectors
	Low fuel pressure (fuel injection models)	Check fuel line and fuel pump pressure
	Incorrect throttle position sensor (TPS) adjustment (fuel injection models)	Check and adjust TPS, refer to ENGINE MANAGEMENT
	Improper timing chain alignment (4-TEC models)	Refer to CYLINDER HEAD AND VALVES
	Defective supercharger (4-TEC Supercharged models)	Check/repair, refer to INTAKE
	Overheated engine	See ENGINE OVERHEATS in this chart
Engine revs lower than its maximum operational RPM	RAVE valve does not open (if so equipped)	Check, refer to ENGINE
	Limp home mode activated (fuel injection models)	Refer to ENGINE MANAGEMENT
Peak performance is delayed until higher RPM range is reached	RAVE valve is stuck opened (if so equipped)	Check, refer to ENGINE

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ENGINE STOPS RUNNING

OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
Engine dies during operation (piston seizure/2-stroke engines)	Spark plug heat range too high	Check/change to correct range
	Improper ignition timing	Check/reset
	Compression ratio is too high	Install genuine parts
	Poor injection oil quality	Use proper BOMBARDIER injection oil
Engine was running below 2000 RPM. No maintenance light	Electrical noise (DI models)	Refer to ENGINE MANAGEMENT
	Low air pressure (DI models)	Check air delivery circuit for leaks
Engine stalls at idle	Contaminated or inappropriate fuel	Syphon reservoir and refill with fresh fuel
	Air in fuel rail (RFI and 4-TEC models)	Refill fuel tank
Engine start but stops after approximately 2 seconds	Engine running out of fuel	Check fuel delivery system for proper fuel pressure and delivery
	Air in fuel rail (RFI and 4-TEC models)	Refill fuel tank
	Low air pressure (DI models)	Check air system (compressor, air/fuel rail etc.)

ENGINE CANNOT REACH MAXIMUM RPM

OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
	RAVE valve does not open (if so equipped)	Check, refer to ENGINE and COOLING SYSTEM
	Faulty water regulator valve (if so equipped)	Check, refer to COOLING SYSTEM
	Low fuel pressure (fuel injection models)	Check fuel pump pressure output
	Jet pump related problem	Check propulsion components. Refer to JET PUMP
	Limp home mode activated (fuel injection models)	Refer to ENGINE MANAGEMENT
	Exhaust system blockage/muffler damage	Check and repair
	Exhaust gases in bilge (leak)	Check exhaust system for leaks
	Defective supercharger (4-TEC Supercharged models)	Check/repair, refer to INTAKE
	Battery voltage is too low	Check/repair, refer to CHARGING SYSTEM

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ENGINE RUNS TOO FAST (VEHICLE CANNOT REACH ITS TOP SPEED)

OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
Engine RPM too high	Faulty rev limiter	Check, refer to ENGINE MANAGEMENT
	Improper impeller pitch (too low)	Check/replace, refer to PROPULSION SYSTEM
	Incorrect throttle position sensor (TPS) adjustment (RFI models)	Check and adjust TPS, refer to ENGINE MANAGEMENT
	Damaged impeller	Replace impeller. Refer to PROPULSION
Jet pump cavitation	Damaged leading or trailing edge of impeller	Check/replace NOTE: Leading edge damage contributes to poor performance from start. Trailing edge damage contributes to poor top performance and stator vanes erosion.
	Sealing of ride plate, jet pump support or jet pump	Check/reseal, refer to section PROPULSION SYSTEM or HULL/BODY

ENGINE OVERHEATS

OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
Coolant level too low (4-TEC models)	Coolant level low	Refill/check for leaks
	Coolant leaking out of weep hole (PTO housing)	Replace seal
	Hoses or clamps missing/defective	Repair/replace
	Cylinder head gasket leaks (white exhaust gas)	Replace cylinder head gasket
	Thermostat failure	Replace
	Coolant pump failure	Replace
	Internal passage blockage	Inspect and clean
Monitoring beeper sounds continuously	Temperature sensor defective	Check/replace. Refer to ENGINE MANAGEMENT
	Worn water pump impeller	Check/replace
	Cooling system restriction	Check/flush, refer to MAINTENANCE
	Damaged ride plate or hoses (4-TEC models)	Check, refer to COOLING SYSTEM and HULL/BODY
	Grounded temperature sensor or sensor wire (carburetor models)	Check/repair/replace
	Thermostat defective (4-TEC models)	Check/replace

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O.P.A.S. SYSTEM FAULTS (GTX 4-TEC MODELS)

OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
Watercraft is more responsive than usual while turning	Side vanes do not go up while watercraft is at speed	Refer to STEERING SYSTEM
Watercraft pulls on one side	One side vane does not go up while watercraft is at speed	Refer to STEERING SYSTEM
O.P.A.S. side vanes do not go up while watercraft is at speed	Clogged filter, square rings damaged, leakage in hoses or mechanical malfunction	Refer to STEERING SYSTEM
O.P.A.S. side vanes do not go down while engine is at idle	Broken spring inside side vane cylinder	Refer to STEERING SYSTEM

ENGINE SMOKE IN THE EXHAUST (4-TEC SERIES)

OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
White smoke	Coolant leak	Check/repair. Refer to LEAK TEST
	Intercooler leak (if so equipped)	Check/repair. Refer to INTAKE SYSTEM
	Damaged cylinder head gasket	Check/replace cylinder head gasket
	Water ingestion	Inspect intake manifold for water infiltration
	Valve guide seals	Check/replace valve guide seals, refer to cylinder head and valves
Blue smoke	Oil level too high	Siphon excess of oil
	PTO oil scavenge port blocked or scavenge pump malfunction	Inspect and clean or replace pump
Blue smoke at engine starting	Valve seals worn or damaged	Replace seals
	Oil rings worn out	Replace rings
Blue smoke with engine under load	Oil rings	Inspect/repair oil rings, refer to ENGINE BLOCK

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LOW OR NO ENGINE OIL PRESSURE (4-TEC SERIES)

OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
	Oil level too low	Refill. See TECHNICAL DATA for specifications
	Leaking gasket	Replace
	Oil leaking out of weep hole (PTO housing)	Replace oil seal on pump shaft
	Oil pressure sensor defective	Check/replace
	Oil pump malfunctioning	Clean rotor and check wear limits
	Oil regulator valve sticks open, or spring load too small	Clean/replace
	Heavy wear on plain bearings	Replace

ENGINE OIL CONTAMINATION (MILKY) (4-TEC SERIES)

OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
Water and oil mixture leaking out of weep hole (PTO housing)	Oil seal and rotary seal on coolant pump shaft leaking	Replace both seals. Refer to PTO HOUSING. Change oil
	Cylinder head gasket leaking	Replace gasket. Refer to CYLINDER HEAD. Change oil
	Loose screws on cylinder head, PTO housing or oil separator	Retorque. Change oil
	Oil contamination due to metal or plastic particles	Replace possibly damaged parts. Change oil
	Water ingestion (intake manifold, TOPS valve, dipstick)	Refer to MAINTENANCE
Water and oil mixture without leaking out at weep hole (PTO housing)	The same causes as above apply. However, look at the following added cause	
	Weep hole plugged	Check/clean weep hole

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UNUSUAL ENGINE NOISE AND/OR VIBRATION (4-TEC SERIES)

OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
	Worn chain tensioner	Replace
	Worn chain guide	Replace
	Stretched chain and/or worn out sprockets	Replace chain and sprockets
	Sprocket screws got loose	Retorque
	Hydraulic element inside rocker arm(s) is worn out (valve adjustment) or lifter damaged	Replace faulty rocker arm(s) and/or lifters
	Rocker arm screws not tightened	Retorque
	Heavy wear on crankshaft and/or balancer shaft bearings	Replace
	Crankshaft and balancer shaft not aligned	Check marks and readjust shafts
	Heavy wear on thrust washers, or thrust washers missing	Check/replace
	Defective supercharger (4-TEC Supercharged models)	Check/repair, refer to INTAKE
	Missing/defective air intake hose	Check/replace air intake hose or clamps, refer to section INTAKE

ABNORMAL NOISE FROM PROPULSION SYSTEM

OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
	Weeds/debris caught in intake grate or impeller	Check/clean
	Low oil level in jet pump (2-stroke models)	Check/troubleshoot source of leak/refill supply, refer to PROPULSION SYSTEM
	Worn anti-rattle system (2-stroke models)	Check/replace pusher in cover, refer to PROPULSION SYSTEM
	Damaged or bent drive shaft	Check/replace, refer to PROPULSION SYSTEM
	Idle speed too low	Adjust (carbureted models) Check fault codes (fuel injection models)
	Broken engine mounts	Check/replace, refer to ENGINE

NOTE: Prior to replacing an ECM or MPEM, refer to the appropriate ECM/MPEM section or ECM/MPEM replacement in the ENGINE MANAGEMENT section and read carefully the tests to do before replacing an ECM/MPEM that could otherwise be good.