

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 ENGINE MANAGEMENT
	Safety lanyard switch faulty or disconnected or harness damaged	Replace
	Burnt fuse: battery, starting system. Also fuel pump	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
	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 assembly	Check/repair, refer to PTO HOUSING/MAGNETO in the <i>1503 4-TEC ENGINE SHOP MANUAL</i>
	Seized or obstructed engine	Check/repair, refer to the <i>1503 4-TEC ENGINE SHOP MANUAL</i>
	Seized or obstructed supercharger (if so equipped)	Check/repair, refer to the <i>1503 4-TEC ENGINE SHOP MANUAL</i>
	Seized jet pump	Check, refer to PROPULSION SYSTEM
Faulty sensor, ECM or MPEM	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 the <i>1503 4-TEC ENGINE SHOP MANUAL</i>
	Worn starter	Check, refer to ELECTRICAL SYSTEM
	Timing chain not guided by chain guide)	Check, refer to the <i>1503 4-TEC ENGINE SHOP MANUAL</i>
	Outside temperature too low	Oil is too thick. Change oil viscosity Battery capacity is not sufficient for cold temperature
Engine turns over	Faulty component in the fuel injection system	Check for fault codes. Refer to DIAGNOSTIC PROCEDURES in ENGINE MANAGEMENT
	Engine drowned mode is active	Release throttle lever
	Low battery voltage	Recharge or replace battery
	Low or no fuel pressure	Check fuel pump pressure output Check fuel pump fuse Check wiring harness
	Fuel injectors not working	Check fuel injector operation. Replace as necessary 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)
	Defective CPS	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
	Defective ignition circuit	Check, refer to ELECTRICAL SYSTEM
Internal engine damage	Check, refer to the <i>1503 4-TEC ENGINE SHOP MANUAL</i>	

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OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
Engine turns over (cont'd)	Defective encoder/trigger wheel	Check, refer to ENGINE MANAGEMENT
	Incorrectly aligned flywheel and trigger wheel	Properly position flywheel and trigger wheel, refer to the <i>1503 4-TEC ENGINE SHOP MANUAL</i>
	Insufficient engine compression	Replace defective part(s)
	Idle bypass valve stuck or not functioning	Check, refer to ENGINE MANAGEMENT
No spark at spark plugs	Spark plug faulty, fouled or worn out	Check spark plug condition
	Ignition	Check, refer to ELECTRICAL SYSTEM
	Faulty ECM	Replace ECM

ENGINE HARD TO START

OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
	Defective idle bypass valve	Refer to ENGINE MANAGEMENT
	Wrong TPS zero setting	Refer to ENGINE MANAGEMENT
	Throttle cable adjustment	Refer to ENGINE MANAGEMENT
	Temperature too low for available battery capacity	Battery capacity is not sufficient for cold temperature
	Air lock in fuel rail	Refer to ENGINE MANAGEMENT
	Water in intake system (defective MAP sensor)	Check and remove water. Refer to SPECIAL PROCEDURES subsection
	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	Check fuel pump operation. Refer to FUEL TANK AND FUEL PUMP Check fuel pressure regulator. Refer to FUEL TANK AND FUEL PUMP
	Defective CAPS	Check CAPS and its circuit. Refer to ENGINE MANAGEMENT

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ENGINE STARTS BUT RUNS ONLY AT IDLE SPEED

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

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	Check, refer to ENGINE MANAGEMENT
	Defective trigger wheel/CPS	Check, refer to ENGINE MANAGEMENT
	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 pressure	Check pump, regulator, injectors and hose pinchers or if filter is plugged. Replace if necessary
	Stale or water fouled fuel	Check/siphon and refill
	Fuel filter dirty or restricted	Check/clean/replace
	Clogged fuel injectors	Remove and clean fuel injectors
	Defective sensor or ECM	Check faulty codes in ECM memory, refer to ENGINE MANAGEMENT
Rich fuel mixture Fouled spark plug	Flame arrester dirty or restricted	Check/replace
	Faulty fuel injector(s)	Remove and replace fuel injector(s), refer to ENGINE MANAGEMENT
	Defective sensor or ECM	Check fault codes. Refer to ENGINE MANAGEMENT
	Fuel pressure fluctuating	Inspect fuel pressure regulator. Refer to FUEL SYSTEM
	High fuel pressure	Check pump, regulator, injectors or if filter is plugged. Replace if necessary

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OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
Starts, but runs poorly	Check spark plug condition, check fault codes, check fuel pressure.	Check, refer to IGNITION SYSTEM and 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 trigger wheel	Check, refer to ENGINE MANAGEMENT
Also fuel injection misinjecting	Injector wiring reversed	Refer to the WIRING DIAGRAM
	Damaged fuel injector	Check, refer to ENGINE MANAGEMENT

ENGINE CONTINUALLY BACKFIRES

OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
Weak spark	Fouled, defective spark plugs	Clean/replace
Spark plugs	Ignition coil wiring reversed	Refer to WIRING DIAGRAM
Ignition timing	Incorrect setting	Check/reset, refer to ELECTRICAL SYSTEM
	Defective trigger wheel/CPS	Check, refer to ENGINE MANAGEMENT
Engine	Intake or exhaust valve(s) leak	Pressure check engine, refer to the <i>1503 4-TEC ENGINE SHOP MANUAL</i>

ENGINE DETONATION OR PINGING

OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
Ignition	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	Check, refer to ENGINE MANAGEMENT
	Bad knock sensor connection	Check, refer to ENGINE MANAGEMENT
	Bad ECM connection	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 IGNITION SYSTEM
	Throttle does not open fully	Check/readjust, refer to ENGINE MANAGEMENT
	Low compression	Check/repair, refer to the <i>1503 4-TEC ENGINE SHOP MANUAL</i>
	Water in fuel	Check/siphon/replace
	Impeller leading edge damaged	Check/replace, refer to PROPULSION SYSTEM
	Too much engine oil	Siphon or adjust level. Refer to LUBRICATION SYSTEM
	Poor fuel quality	Siphon then refill with fresh fuel
	Clogged fuel injectors	Remove and clean fuel injectors
	Low fuel pressure	Check fuel line and fuel pump pressure
	Incorrect throttle position sensor (TPS) adjustment	Check and adjust TPS, refer to ENGINE MANAGEMENT
	Improper timing chain alignment	Refer to CYLINDER HEAD in the <i>a1503 4-TEC ENGINE SHOP MANUAL</i>
	Defective supercharger	Check/repair, refer to the <i>1503 4-TEC ENGINE SHOP MANUAL</i>
	Overheated engine	See ENGINE OVERHEATS in this chart
Engine revs lower than its maximum operational RPM	Limp home mode activated	Refer to ENGINE MANAGEMENT

ENGINE STOPS RUNNING

OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
Engine stalls at idle	Contaminated or inappropriate fuel	Syphon reservoir and refill with fresh fuel
	Air in fuel rail	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	Refill fuel tank

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ENGINE CANNOT REACH MAXIMUM RPM

OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
	Low fuel pressure	Check fuel pump pressure output
	Jet pump related problem	Check propulsion components. Refer to JET PUMP
	Limp home mode activated	Refer to ENGINE MANAGEMENT
	Exhaust system blockage/muffler damage	Check and repair
	Exhaust gases in bilge (leak)	Check exhaust system for leaks
	Defective supercharger	Check/repair, refer to the <i>1503 4-TEC ENGINE SHOP MANUAL</i>
	Battery voltage is too low	Check/repair, refer to CHARGING SYSTEM

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
	Damaged impeller	Replace impeller. Refer to PROPULSION SYSTEM
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

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ENGINE OVERHEATS

OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
Coolant level too low	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	Check, refer to COOLING SYSTEM and HULL/BODY
	Thermostat defective	Check/replace

ENGINE SMOKE IN THE EXHAUST

OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
White smoke	Coolant leak	Check/repair. Refer to COOLING SYSTEM
	Intercooler leak (if so equipped)	Check/repair. Refer to the <i>1503 4-TEC ENGINE SHOP MANUAL</i>
	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 in the <i>1503 4-TEC ENGINE SHOP MANUAL</i>
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 CYLINDER BLOCK in the <i>1503 4-TEC ENGINE SHOP MANUAL</i>

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LOW OR NO ENGINE OIL PRESSURE

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)

OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
Water and oil mixture leaking out of leak indicator hole (PTO housing)	Oil seal and rotary seal on coolant pump shaft leaking	Replace both seals. Refer to PTO HOUSING in the appropriate ENGINE SHOP MANUAL. Change oil
	Cylinder head gasket leaking	Replace gasket. Refer to the <i>1503 4-TEC ENGINE SHOP MANUAL</i> . 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 leak indicator hole (PTO housing)	The same causes as above apply. However, look at the following added cause	
	Leak indicator hole plugged	Check/clean leak indicator hole

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UNUSUAL ENGINE NOISE AND/OR VIBRATION

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 (if so equipped)	Check/repair, refer to the <i>1503 4-TEC ENGINE SHOP MANUAL</i>
	Missing/defective air intake hose	Check/replace air intake hose or clamps, refer to AIR INTAKE SYSTEM

INAPPROPRIATE SPEEDOMETER READING

OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
	Faulty speed sensor or related circuits.	Refer to INSTRUMENTS AND ACCESSORIES
	MPEM was replaced and speedometer calibration data were not transferred to new MPEM.	Install latest B.U.D.S version available in BOSSWeb then connect to vehicle with VCK and it will automatically update MPEM. Refer to ENGINE MANAGEMENT

ABNORMAL NOISE FROM PROPULSION SYSTEM

OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
	Weeds/debris caught in intake grate or impeller	Check/clean
	Damaged or bent drive shaft	Check/replace, refer to PROPULSION SYSTEM
	Idle speed too low	Check fault codes
	Broken engine mounts	Check/replace

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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.