5.7 and 6.2 L Industrial Engines

Owner's Manual and Maintenance Log

EPA Certified Engines

2026

Service Parts

To ensure that your engine continues to run reliably and efficiently for as long as possible, use only genuine Industrial Irrigation parts.

For genuine Industrial Irrigation service parts for your engine, or for technical assistance in servicing your engine, call:

Industrial Irrigation 800-289-6478

Maintenance Providers

Maintenance and repair services may be performed by you or any qualified engine service provider that you choose. However, your engine warranty does not cover damage or failure caused by improper maintenance or repairs.

Owners Manual & Maintenance Log Storage & Use

Store this Owner's Manual and Maintenance Log in a safe, visible place by your engine. The maintenance log must be updated whenever your engine is serviced.

Disclaimer

All information and specifications in this manual are based on the latest data available at the time of the publication. Industrial Irrigation reserves the right to make changes or improvements at any time without notice.

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U.S. EPA Legal Requirements

This engine has been certified by the U.S. Environmental Protection Agency (EPA) as a stationary and constant-speed mobile engine. It is illegal to operate this engine in a variable-speed (foot pedal speed control) application.

To ensure emissions compliance, the U.S. EPA requires you to do one of the following two options:

1. Operate and maintain your engine as specified in this Owner's Manual. In addition, you are required by law to keep detailed maintenance records.

2. If you do not operate and maintain your engine as specified in this Owner's Manual, your engine will be considered a non-certified engine.

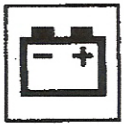
   In this case, you must:
   - Keep a maintenance plan and records of conducted maintenance.
   - To the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions.
   - Conduct an initial performance test within 1 year of engine startup to demonstrate compliance. Contact your regional EPA office for instructions on how to conduct an initial performance test.

Per section 113 of the U.S. Clean Air Act, failure to abide by these legal requirements can result in fines up to $52,058 per day.

A maintenance plan and log are provided at the back of this manual for you to record your engine maintenance. Update the log each time you service your engine.

SAFETY SYMBOLS

This section identifies the ISO 8999 symbols that may be used in this manual.



Battery

Electrical hazards

Engine coolant fill level

Engine coolant temperature

Engine oil fill level

Engine oil pressure

Hot surface warning

Warning

Read the handbook

No Smoking or Flame

SAFETY PRECAUTIONS - STARTING

WARNING

Starting an engine incorrectly may cause injury to the operator and/or cause damage to the engine. Engine operators must be instructed in the correct procedures before attempting to start any engine.

Before Starting

- Inspect the engine, intake, exhaust, cooling system, and drivetrain to verify that the engine is fully assembled and not in the process of being serviced.
- Ensure the engine is free to turn without obstruction.
- Check that all safety guards are in their correct position and secure.
- Check that the coolant level in the radiator overflow bottle is between "Add" and "Full".
- Check that the oil level on the dipstick is between "Add" and "Full".
- Check that the fuel supply is connected, shut-off valves are open, and there are no leaks.
- If an LPG fuel system is being used, verify that there is fuel in the cylinder/tank.
- If a natural gas fuel system is being used, verify that the correct fuel supply pressure is being supplied to the engine.
- Check that the battery is connected and charged.
- When possible, disengage any driven equipment while starting.

SAFETY PRECAUTIONS - ELECTRICAL



The battery produces flammable and explosive hydrogen gas. The battery electrolyte contains poisonous and corrosive sulfuric acid. The precautions listed below must be followed to ensure operator safety.

- Do not smoke or allow any flame near the battery.
- With the engine stopped and the ignition switch in the OFF position, disconnect the negative battery cable from the battery before working on the engine.
- Be careful not to short circuit battery positive to ground with tools when working on the engine.
- Avoid getting battery electrolyte in your eyes or on your skin or clothes. If electrolyte gets in your eyes, flush with clean water immediately and get medical help. If electrolyte gets on your skin, wash immediately with soap and water and get medical help if you feel pain or burning. Remove and wash any clothing that is exposed to electrolyte.
- Never remove any electrical cables while the battery is connected in the circuit.
- Be careful to not short-circuit or cross battery positive and negative.
- Never 'flash' any connection to check the current flow.
- The ECU Wiring Harness, battery, and alternator must be disconnected before commencing any electric welding when a pole strap is directly or indirectly connected to the engine.
- When charging the battery, only do a slow charge (5 A or less), and ensure there is good ventilation.

FUELS

Natural gas and LPG are combustible gases, and can be explosive if leaked and contained in a confined area. Keep cigarettes and all other flame sources away from these areas.

If you can hear a fuel leak, shut off the fuel supply at the source immediately and fix the leak or have it serviced. Check the entire fuel supply line from the cylinder/tank to the engine for leaks with a soapy water bubble mixture anytime a cylinder/tank is changed or the fuel supply line is worked on. Fuel leaks should also be checked as part of the regular engine maintenance.

Depending on your engine and fuel system configuration, your engine is designed to run on natural gas, liquid LPG, or vapor LPG. The fuel requirements for each are discussed below. See the "SPECIFICATIONS" section for the required fuel supply pressures for each fuel.

Natural Gas

Your engine is certified to run on "pipeline-quality" and most grades of non-pipeline quality natural gas. Specifically, your engine is certified to run on natural gas that has at least 45% methane content by volume AND an energy content of 700 – 1800 BTU per SCF. If your natural gas supply does not meet both of these specifications, your engine is considered to be being operated as a non-certified engine. See "U.S. EPA Legal Requirements".

LPG

In order to maintain emissions compliance and the engine warranty, use commercial-grade HD-10 or better LPG.

Liquid LPG is drawn off of the bottom side of a LPG tank or cylinder and is a liquid until it has passed through the regulator/vaporizer, at which point it is vaporized to a gas. If you connect vapor LPG to a liquid LPG fuel system, you may starve the engine for fuel, causing it to produce low power and excessive emissions.

IIS does not recommend running your Reliable Horsepower engine utilizing a vapor LPG system. Please contact IIS to discuss your specific application requirements prior to running your engine on a vapor LPG system.

STARTING, RUNNING, & STOPPING THE ENGINE

Observe the safety precautions listed in "SAFETY PRECAUTIONS - STARTING" before starting the engine.

Starting the engine

- Turn the key switch to the ON position and verify that the MIL is illuminated. If not determine why the lamp is not working.
- Turn the key switch to the START position and hold until the engine has started.
- Release the key promptly after the engine starts to avoid grinding the starter.
- Do not crank the engine for more than 15 seconds at a time.
- Allow at least 30 seconds between cranking attempts.
- If the engine does not start after 3 starting attempts, review the "Before Starting" checklist.
-

Running the engine

- Do not race or fully load the engine during the first 3 minutes of operation.
- Verify that the "CHECK ENGINE" light is off while the engine is running. If it is on, refer to the DIAGNOSTICS section.
- Verify that there are no fuel, coolant, or oil leaks while the engine is running. If there are leaks, stop the engine and fix them or have the engine serviced.
- Listen to the engine. If you hear an abnormal noise while the engine is running, turn it off and correct the problem or have the engine serviced.
- No adjustments are necessary to the fuel or ignition systems.
- Your engine is certified to operate under load with set speeds between 1200 and 3000 rpm.

Stopping the engine

- If the engine has been running under load and is hot, run the engine at no load for 3 minutes to allow the engine to cool before stopping the engine.
- Stop the engine by turning the key switch to the OFF position. The engine may run-on for 1-5 seconds while the fuel is depleted from the carburetor and the air/fuel mixture is depleted from the intake manifold.

ENGINE MAINTENANCE

You should properly maintain your engine for the following reasons.

- You are legally required to maintain your engine and keep maintenance records to ensure emissions compliance. See "U.S. EPA Legal Requirements" at the front of this manual.
- Your engine warranty will be void if the engine is not properly maintained.
- Keeping your engine properly maintained will ensure the best engine life, power, and fuel economy.

Scheduled Maintenance
A schedule of the required engine maintenance tasks is listed on the following page. The scheduled maintenance should be performed when the engine reaches the specified operating hours or the specified months have elapsed, whichever comes first.

Daily Maintenance
In addition to the scheduled maintenance, daily checks are required to keep your engine running properly. These checks are listed in the "SAFETY PRECAUTIONS - STARTING" and "STARTING, RUNNING, & STOPPING THE ENGINE" sections.

Maintenance Log
Keep a record of your engine's scheduled maintenance in the Maintenance Log at the back of this manual.

Spare Page

INDUSTRIAL IRRIGATION 5.7 AND 6.2 L

The following table lists the periodic maintenance required to ensure

MAINTENANCE

Periodic maintenance should be performed after specified intervals have elapsed in months or hours, whichever comes first.	Months / Hours	1 / 100	4 / 250	8 / 500	13 / 750	17 / 1000	21 / 1250	25 / 1500
ENGINE								
Air filter	(A)			I		R		I
Alternator/Fan/Water Pump Belt		I	I	I	I	I	I	I
Battery		I	I	I	I	I	I	I
Engine coolant		I	I	I	I	R	I	I
Radiator outside	(A)	C	C	C	C	C	C	C
Engine oil	(A)	R	R	R	R	R	R	R
Oil Filter	(A)	R	R	R	R	R	R	R
Spark Plugs (Iridium tipped)						I		
Spark Plug Wires						I		
Distributor cap & rotor						I		
Pre-Catalyst and Post-Catalyst Oxygen Sensors								
PCV system				I		I		I
FUEL SYSTEM								
Check fuel hoses and fittings for gas leakage	(B)	I	I	I	I	I	I	I
Fuel Filter						R		
LPG Primary Vaporizer/Regulator						I/D		
Fuel Lock-off valve(s)						I		

Notes:
A) Under heavy duty operating condition, more frequent maintenance might be necessary.
B) At time of LPG cylinder replacement, inspect tank connections for leakage with soapy water.

Abbreviations:
I = Inspection
R= Replace
A= Adjust
C= Clean
D= Drain
T= Retighten

ENGINE AND FUEL SYSTEM MAINTENANCE SCHEDULE

that your engine, fuel system and catalyst work properly and stay in good condition.

INTERVAL

29	34	38	42	46	50	55	59	63	67	71	76	80	84
1750	2000	2250	2500	2750	3000	3250	3500	3750	4000	4250	4500	4750	5000
MAINTENANCE													
	R		I		R		I		R		I		R
I	I	I	R	I	I	I	I	I	I	I	I	I	I
I	I	I	I	I	I	I	I	I	I	I	I	I	I
I	R	I	I	I	R	I	I	I	R	I	I	I	R
C	C	C	C	C	C	C	C	C	C	C	C	C	C
R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R	R	R
	R				I				R				I
	I				I				I				R
	I				I				I				R
													R
	I		I		I		I		I		I		I
MAINTENANCE													
I	I	I	I	I	I	I	I	I	I	I	I	I	I
	R				R				R				R
	I/D				I/D				I/D				I/D
	I				I				I				I

AIR FILTER

Part Number: MAA55PA2805

Inspection

1. Remove air filter element from enclosure.
2. Tap filter to knock off loose dirt.
3. Visually check filter.
4. If filter is clean, reinstall old filter.
   If filter is dirty, replace with a new filter.

ALTERNATOR-FAN-WATER PUMP BELT

Inspection

Check the belt for visible cracks, missing chunks, and fraying. Small cracks on the inside of the belt are OK. Replace the belt if cracks are visible on the outside of the belt, chunks are missing from the inside of the belt, or the belt is frayed.

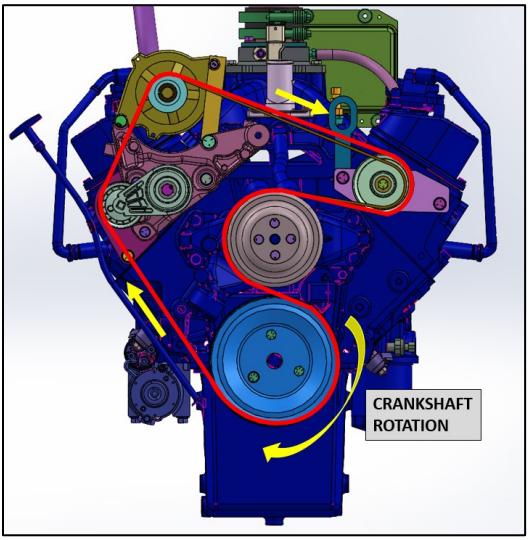
Belt Tension

The belt should displace about 1/2" when 20 lbs of force is applied to the midpoint of the belt. If the deflection is greater than 1/2", increase the belt tension. If less than 1/2", reduce the belt tension.

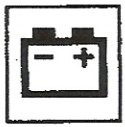
Belt Replacement

1. Release all tension from the old belt.
2. Remove the old belt.
3. Install the new belt.
4. Apply tension to the belt as specified in "Belt Tension".
5. Recheck tension after 25-50 hours of operation.

Belt Routing



BATTERY



The battery produces flammable and explosive hydrogen gas. The battery electrolyte contains poisonous and corrosive sulfuric acid. Review the safety precautions in "SAFETY PRECAUTIONS - ELECTRICAL" before working on the battery.

Battery Specifications	
Nominal Voltage:	12 V
Cranking Amps:	800
Cold Cranking Amps:	640
Battery voltage during alternator charging:	13.5 -15.0 V
Fully charged battery with key off @ 20 C (68 F):	12.5 -13.0 V
Half charged battery with key off @ 20 C (68 F):	12.0 - 12.5 V
Discharged battery with key off @ 20 C (68 F):	less than 12.0 V

Battery electrolyte inspection

1. Check electrolyte level.
2. If low, top off with distilled water. Do not overfill.

Battery corrosion inspection

1. Check battery posts and clamps for corrosion.
2. If corroded, remove negative cable first, then positive.
3. Clean both posts and both clamps with a small wire brush.
4. Reconnect cables, positive cable first.

If the engine is cranking slowly or not at all:

1. Remove the battery negative lead from the battery.
2. Remove the positive lead from the battery.
3. Clean the battery posts and cables with a small wire brush.
4. Replace leads, positive lead first.

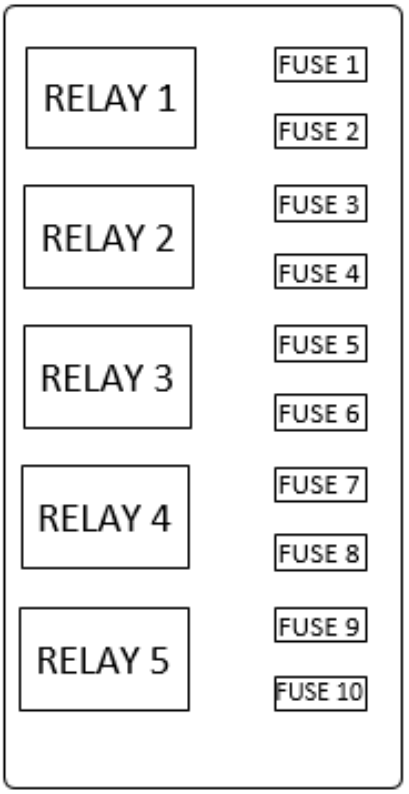
If the engine is still cranking slowly or not at all:

1. Remove the battery negative leads.
2. Recharge the battery in a well-ventilated area.
3. Reinstall the battery.

If the engine is still cranking slowly or not at all:

Replace the battery.

FUSES



Relay

1	Ignition
2	Main Power
3	Auto Start
4	Starter
5	5V Bypass

Fuse

1	Ignition
2	Main Power
3	Auto Start
4	Starter
5	ECU Panel
6	Control Panel
7	Spare
8	Keyswitch Power
9	Spare
10	Spare

ENGINE OIL AND FILTER REPLACEMENT

Filter: **GSA556438384**

Oil Grade: SAE 10W-30 for 100 Hour break-in period
SAE 15W-40 for Continuous Duty in all applications where operating temperatures are above 30 F.
SAE 10W-30 for Continuous Duty in applications where operating temperatures are below 30 F.
-NOTE- Use of lighter weight oil in continuous duty applications, especially in temperatures above 30 F can potentially increase oil consumption.

Ash Content: .9% or Less

API Certification: SN

Oil Pan Capacity: 5 quarts (Up to 1 additional quart is required for oil filter) *

*** Engine Models requiring an Oil Cooler will need additional capacity. (See Oil Cooler Below)**

DRAIN THE ENGINE OIL

1. Remove the oil filler cap.
2. Remove the oil drain plug and drain the oil into a container.

REPLACE THE OIL FILTER

1. Remove the oil filter.
2. Check and clean the oil filter installation surface.
3. Check that the part number of the new oil filter is correct.
4. Apply clean engine oil to the gasket of the new oil filter and screw on until finger tight.
5. Tighten it an additional ¾ turn.

REFILL WITH ENGINE OIL

1. Clean and install the oil drain plug.
2. Fill with fresh engine oil. Do not overfill.
3. Install the oil filler cap.
4. Start engine and check for oil leaks.
5. Recheck the engine oil level.

OIL COOLER

Certain applications will require an oil cooler. Recommended oil temperature range is 190-240°F. An approved oil cooler is available through Industrial Irrigation; please call for pricing and information specific to your application. When filling engine with oil cooler, begin with 6 quarts in the engine and then adjust level as needed after running. Cooler hoses and other factors will cause oil capacity to vary.

Dispose of your used oil at your local oil recycling center.

ENGINE COOLANT, RADIATOR, AND COOLING SYSTEM



To avoid being scalded or burned, never remove the radiator cap unless the engine is off and coolant has fully cooled. The coolant in the radiator is pressurized when hot and may boil over when the radiator cap is loosened.

When using antifreeze coolant, mix the antifreeze coolant with water, observing instructions attached to antifreeze container. Use only antifreeze approved for aluminum components in a 50/50 mixture ratio.

Clean radiator outside
Clean outside of radiator with dry compressed air.

Inspect cooling system, hoses and connections
Check hoses and fittings for loose connections or for any sign of oil deterioration or soft spots in the hoses. Retighten connections or replace hoses if needed.

Check coolant level. If low, top off coolant with a premixed 50/50 mixture of antifreeze and water.

Engine Coolant Replacement

1. Open overflow bottle cap.
2. Drain old coolant.
3. Flush system with fresh, clean water.
4. Slowly refill system with premixed 50/50 antifreeze/water mixture.
5. Idle engine with radiator cap off to allow air to escape.
6. Top off coolant in overflow bottle if needed.
7. Stop engine.
8. Replace radiator cap and close overflow bottle cap.

SPARK PLUGS & WIRES

Ignition System Part Specifications	
Ignition Coil	WPA55CDR37B
Distributor Assembly (distributor, cap, & rotor)	Distributor DRA551830A Cap GSA0519166099 Rotor GSA0510477219
Spark plugs part number	GSA0512568387 Champion Iridium 9404 Delco Iridium 41-101
Spark plug gap	.035 in (0.89 mm)
Spark plug wires	Solid Core TCA551953 Resistor Core TCA55TA2977

Spark plug inspection

1. Remove one plug from each bank.
2. Inspect plugs for fouling and erosion.
3. Clean or replace plugs if needed.

Ignition wires inspection

1. Visually check ignition wires.
   - Look for spark arcing while the engine is running.
   - Check for cracks in the wire insulation.

2. If arcing and/or cracked insulation is evident, replace the entire set of ignition wires.

Distributor Cap and Rotor

1. Replace cap and rotor at the time of spark plug wire replacement.

POSITIVE CRANKCASE VENTILATION (PCV) SYSTEM

Part Number: **RMA55L263**

Inspection

1. Remove the PCV valve from the engine.
2. Shake the valve. You should hear the valve rattle, indicating that the cartridge is moving freely.
3. If the valve does not rattle, clean it with carburetor cleaner.
4. If the valve still does not rattle, replace the valve.

CHECKING FOR GAS LEAKS

Natural gas and LPG are combustible gases, and can be explosive if leaked and contained in a confined area. Keep cigarettes and all other flame sources away from these areas.

Inspection

1. If you can hear a fuel leak, shut off the fuel supply at the source immediately and fix the leak or have it serviced.

2. If there are no audible leaks, spray the fuel line up to the lock-off valve with a soapy water mixture. A stream of bubbles indicates leak sources.

3. Tighten fittings and clamps as needed to eliminate slow leaks.

4. Start the engine.

5. Check the fuel supply line from the lock-off valve to the engine with a soapy water mixture.

6. If any fuel line components (hoses, pipe, fittings, etc.) need to be replaced, first bleed the fuel out of the line by shutting off the gas supply at the source with the engine running at idle. Wait for the engine to stop before disassembling the fuel line.

NATURAL GAS & LPG FUEL FILTERS

Fuel filters are recommended to protect both your fuel system and engine.

Liquid LPG Fuel Filter: AFC, Inc. Model 455

RAW Natural Gas Filter: Oxion, Inc. Model M150

Pipeline Natural Gas & Vapor LP Fuel Filter: Maxitrol Model GF60-1-88

Filter Replacement

1. Shut off the fuel supply at the source with the engine running at idle.
2. Wait for the engine to stop.
3. Remove the old fuel filter.
4. Install the new fuel filter per the filter manufacturer's instructions.
5. Check for leaks. See "Checking for Gas Leaks".

LPG REGULATOR/VAPORIZER

Commercial grade LPG often contains heavy hydrocarbons, compressor oil and other contaminants. Over time, the oil and contaminants will settle to the bottom of the LPG cylinders/tanks. Liquid LPG fuel systems, which draw from the bottom side of the cylinder/tank, are prone to having these contaminants build up in the regulator/vaporizer. The oil and contaminants can degrade the operation of the regulator/vaporizer, and when severe, can degrade the performance of the engine.

Inspection/Drain Procedure

1. With the engine idling, shut off the fuel supply at its source.
2. Wait for the engine to stop running.
3. If a drain valve is in the fuel line downstream of the regulator/vaporizer, open the valve and drain any oil in the line into a container.

   If there is no drain valve in the line, remove the regulator/vaporizer from the fuel system. Tilt the regulator/vaporizer so the outlet is down. Drain any oil into a container.

   Drain any accumulated liquids from the fuel hose and fuel trim valve.
4. Close the drain valve or reinstall the fuel system components.
5. Check the fuel system for leaks. See "Checking for Gas Leaks".

NATURAL GAS & LPG FUEL LOCK-OFF VALVES

Liquid LPG Lock-Off Valve P/N: KEA5513111011
Natural Gas & Vapor LPG Lock-Off Valve P/N: IMA5551767

The fuel lock-off valve is located between the NG regulator and fuel supply or LPG regulator/vaporizer and the fuel cylinder/tank. The Engine Control Module (ECM) opens the fuel lock-off when the engine is cranked and turns it off when the key switch is turned off or the ECM shuts down the engine for low oil pressure or engine overheat.

The lock-off can sometimes "gum up" due to LPG deposits in the lock-off. The procedure below will verify if the lock-off is opening and closing correctly.

Inspection

1. Turn off the engine.
2. Disconnect the fuel lock-off positive and negative wires from the wiring harness.
3. Apply 12 VDC across the lock-off.
4. You should hear the valve open immediately when 12 V is applied and hear the valve close immediately when 12 V is removed. This indicates that the valve is moving freely.

If you cannot hear the valve open and close, replace the valve.

DIAGNOSTICS

How to manage/retrieve/clear fault codes

Diagnostic fault codes can be read through your equipment's electronic display control panel. Please refer to that manual for instructions on how to retrieve and clear codes.

DTC List

SPN	FMI	Description	SFC
51	00	TPS1 Higher than Expected	543
51	01	TPS1 Lower than Expected	544
51	02	TPS Intermittent	551
51	03	Throttle Position Voltage High	541
51	04	Throttle Position Voltage Low	542
51	05	L Series Throttle fault	556
51	07	TPSSensor Conflict	549
51	12	L Series Throttle Status	557
51	16	Throttle Position adapt high fault	637
51	18	Throttle Position adapt low fault	544
100	01	Oil Pressure Low	195
100	03	Oil Pressure Voltage High	192
100	04	Oil Pressure Voltage Low	191
100	15	Oil Pressure Fault	196
102	03	PTP Voltage High	371
102	04	PTP Voltage Low	372
102	20	PTP Data Drift High	373
102	21	PTP Data Drift Low	374
105	00	MAT Higher Than Expected	233
105	03	MAT Voltage High	231
105	04	MAT Voltage Low	232
105	10	In Range MAT fault	234
106	00	Intake Manifold Backfire	347
106	02	MAP Sticking	345
106	03	MAP Voltage High	342
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106	07	PTP/MAP Connectors Switches	357
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SPN	FMI	Description	SFC
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106	21	MAP Data Drift Low	344
106	31	PTP/MAP KeyOn Check	375
110	00	ECT Higher Than Expected	263
110	01	ECT Warmup Slower than Expected	266
110	03	ECT Voltage High	261
110	04	ECT Voltage Low	262
110	10	ECT Insufficient activity	264
168	00	Battery Voltage Higher Than Expected	165
168	01	Battery Voltage Lower Than Expected	166
168	20	DRVP Higher than Expected	169
173	00	EGT Higher Than Expected	493
173	03	Engine EGT -Voltage High	491
173	04	Engine EGT -Voltage Low	492
175	03	Oil Temperature Voltage High	194
175	04	Oil Temperature Voltage Low	193
175	16	Oil Temperature High	222
175	17	Oil Temperature IR Low	198
189	03	Remote Speed reference input high	638
189	04	Remote Speed reference input low	639
190	00	Engine OverSpeed	429
629	09	CPU Load Higher than Expected	621
629	11	SRAM Memory Fault	623
629	31	Flash Memory Fault	622
632	05	Natural Gas Fuel LockOff Short Open Fault	251
632	07	Low Fuel Pressure (software v43.07 and newer)	476
632	12	FuelShutOffStuckOpen	475
636	02	Crank Sensor Sync Fault	423

DTC List (continued)

SPN	FMI	Description	SFC
636	07	Crank Sensor Loss Fault	422
636	11	Crank Sensor Other Fault	425
637	02	CAM Sensor Phase Fault	424
637	05	Cam Phaser Drive Relay Open or short Gnd	427
637	07	CAM Sensor Loss Fault	421
637	11	CAM Sensor Other Fault	426
639	11	CAN Line Circuit/Bus Error Passive	561
639	14	CAN Tx_Rx Warning	562
725	05	HEI-EST Bypass Open / Short Fault	883
731	05	Knock Sensor Open Circuit	781
731	06	Knock Sensor short Circuit	782
855	03	UEGO Heater Short to battery fault	452
855	04	UEGO Heater Short to gnd fault	451
855	05	UEGO Htr Open Fault	463
855	07	UEGO Heater Temperature Control	139
855	16	UEGO Heater Temperature LTE	136
855	18	UEGO Heater Temperature HTE	137
970	01	External Shutdown Fault	571
977	05	Fan 1 Short Open Fault	244
1131	00	PTT Higher Than Expected	378
1131	03	PTT Voltage High	376
1131	04	PTT Voltage Low	377
1188	05	Waste Gate Valve Open or Short Grnd	691
1204	00	Engine Over Load Fault	821
1213	05	MIL Open / Short Fault	253
1247	00	Engine Over Power Fault	822
1257	06	Spark 8 Max Current	882
1268	05	Spark 1 Open Primary	842

DTC List (continued)

SPN	FMI	Description	SFC
1268	06	Spark 1 Max Current	841
1269	05	Spark 2 Open Primary	845
1269	06	Spark 2 Max Current	844
1270	05	Spark 3 Open Primary	848
1270	06	Spark 3 Max Current	847
1271	05	Spark 4 Open Primary	852
1271	06	Spark 4 Max Current	851
1272	05	Spark 5 Open Primary	855
1272	06	Spark 5 Max Current	854
1273	05	Spark 6 Open Primary	858
1273	06	Spark 6 Max Current	857
1274	05	Spark 7 Open Primary	879
1274	06	Spark 7 Max Current	878
1275	05	Spark 8 Open Primary	881
1322	14	Severe Cylinder Misfire	761
1322	31	Single/Multiple Cylinder Misfire	759
1323	31	Cylinder 1 Misfire	751
1324	31	Cylinder 2 Misfire	752
1325	31	Cylinder 3 Misfire	753
1326	31	Cylinder 4 Misfire	754
1327	31	Cylinder 5 Misfire	755
1328	31	Cylinder 6 Misfire	756
1329	31	Cylinder 7 Misfire	757
1330	31	Cylinder 8 Misfire	758
1352	31	High Engine Knock Level Cylinder 1	771
1353	31	High Engine Knock Level Cylinder 2	772
1354	31	High Engine Knock Level Cylinder 3	773
1355	31	High Engine Knock Level Cylinder 4	774

DTC List (continued)

SPN	FMI	Description	SFC
1356	31	High Engine Knock Level Cylinder 5	775
1357	31	High Engine Knock Level Cylinder 6	776
1358	31	High Engine Knock Level Cylinder 7	778
1359	31	High Engine Knock Level Cylinder 8	779
1391	03	delta Pressure - Voltage High	473
1391	04	delta Pressure - Voltage Low	474
1391	16	deltaP Higher Than Expected	477
1391	18	deltaP Lower Than Expected	478
1391	20	deltaP Zero Offset Fault	479
1442	03	L Series Trim Position Voltage High	633
1442	04	L Series Trim Position Voltage Low	634
1442	05	L Series Trim Valve Drive fault	635
1442	12	L Series Trim Valve Status	636
1442	16	Trim Position adapt high fault	632
1442	18	Trim Position adapt low fault	631
1557	05	Fan 2 Short Open fault	245
1639	07	Fan Speed Close Loop Control	434
1639	08	Fan Speed Unexpected Noise	433
1675	05	Starter Control Relay Fault	653
1675	11	Auto Crank attempt failed	652
1675	12	Auto Crank attempts exceeded	651
1692	00	Overboost	694
1692	16	Boost pressure Higher than Expected	692
1692	18	Boost pressure Lower than Expected	693
1695	16	Adaptive Learn Correction on Hi Limit	471
1695	18	Adaptive Learn Correction on Lo Limit	472
2452	03	Load Sensor Voltage High	126
2452	04	Load Sensor Voltage Low	125

DTC List (continued)

SPN	FMI	Description	SFC
2791	05	EGR Valve Open or Short Grnd	512
2980	03	Fuel Pressure Voltage High	885
2980	04	Fuel Pressure Voltage Low	886
2980	07	Low Fuel Pressure (software before v43.07)	481
3056	00	UEGO IP Fault (bank 1)	443
3056	02	UEGO Air Cal Sensor Failed Fault (bank 1)	414
3056	03	UEGO SNS Short to BATT Fault (bank 1)	455
3056	04	UEGO SNS Short to GND Fault (bank 1)	454
3056	05	UEGO SNS Open Fault (bank 1)	453
3056	14	UEGO2 VM Fault (bank 1)	412
3056	15	UEGO Air Cal at Upper Limit (bank 1)	416
3056	16	UEGO O2 Failed on Rich Side (bank 1)	466
3056	17	UEGO Air Cal at Lower Limit (bank 1)	415
3056	18	UEGO O2 Failed on Lean Side (bank 1)	465
3057	00	UEGO IP Fault (bank 2)	443
3057	02	UEGO Air Cal Sensor Failed Fault (bank 2)	414
3057	03	UEGO SNS Short to BATT Fault (bank 2)	455
3057	04	UEGO SNS Short to GND Fault (bank 2)	454
3057	05	UEGO SNS Open Fault (bank 2)	453
3057	15	UEGO Air Cal at Upper Limit (bank 2)	416
3057	16	UEGO O2 Failed on Rich Side (bank 2)	466
3057	17	UEGO Air Cal at Lower Limit (bank 2)	415
3057	18	UEGO O2 Failed on Lean Side (bank 2)	465
3217	03	PreCat O2 input high	225
3217	04	PreCat O2 input Low	226
3217	05	PreCcat O2 Heater Short Open Fault	183
3217	08	PreCat O2 inactive fault	184
3217	15	PreCat O2 Failed on Rich Side	189

DTC List (continued)

SPN	FMI	Description	SFC
3217	17	PreCat O2 Failed on Lean Side	197
3227	03	Postcat O2 Voltage High	181
3227	04	PostCat O2 Voltage Low	182
3227	05	PostCat O2 Heater Short Open Fault	187
3227	15	PostCat O2 Failed on Rich Side	185
3227	17	PostCat O2 Failed on Lean Side	186
3464	02	Throttle Spring Test Fault	554
3464	05	Throttle Valve H bridge Fault	552
3464	06	Throttle Valve Open Fault	553
3464	07	Throttle Valve Stuck	555
3509	03	XDRP (+5V) Voltage HTE	161
3509	04	XDRP (+5V) Voltage LTE	162
3607	05	Major alarm hardware Fault	255
3673	00	TPS2 Higher than Expected	547
3673	01	TPS2 Lower than Expected	548
3673	03	TPS2 Voltage High	545
3673	04	TPS2 Voltage low	546
3938	03	Synchronizer input high	812
3938	04	Synchronizer input low	813
5078	05	Minor alarm hardware Fault	256
516098	05	Knock 2 Sensor Open Circuit	783
516098	06	Knock 2 Sensor short Circuit	784
516131	05	Propane Gas Fuel LockOff Short Open Fault	252
520555	03	UEGO INRC Short to Batt Fault	458
520555	04	UEGO INRC Short to GND Fault	457
520555	05	UEGO INRC Open Fault	456
520556	03	UEGO SR Short to BATT Fault	462
520556	04	UEGO SR Short to GND Fault	461

DTC List (continued)

SPN	FMI	Description	SFC
520556	05	UEGO SR Open Fault	459
520700	09	TSC1 Message Time Out Fault	662
520707	11	CAN Line Circuit/Bus Error Passive	563
520707	14	CAN Tx_Rx Warning	564
520708	09	OHECS Message Time Out Fault	565
520709	09	GTACP Message Time Out Fault	566
520710	09	GC2 Message Time Out Fault	567
520711	09	EBC1 Message Time Out Fault	568
520712	09	ACS Message Time Out Fault	569
520713	09	Inter ECU Comms Message	663
520713	09	Time Out Fault for	663
520713	09	Master/Slave System Only	663
520714	09	CCVS Message Time Out Fault	661

SPECIFICATIONS

Component	Part Number or Specification
Air Filter:	MAA55PA2805
Alternator-Fan-Water Pump belt:	GYA554060560
Battery:	12 V, 800 Cranking Amps, 640 Cold Cranking Amps
Oil:	See page 16 for oil specifications and capacity.
Oil Filter:	GSA556438384
Distributor, cap, & rotor assembly	Distributor – DRA551830A Cap – GSA0519166099 Rotor – GSA05104477219
Spark Plugs:	GSA0512568387 Champion Iridium 9404 Delco Iridium 41-101
Spark Plug Gap:	.035 in (0.89 mm)
Spark Plug wires:	Solid Core TCA551953 Resistor Core TCA55TA2977
PCV valve:	RMA55L263
Fuel Filter(s):	See Page 22
Liquid LPG Lock-Off:	KEA5513111011
Natural Gas & Vapor LPG Lock-Off:	IMA5551767
Knock Sensor	12623730
Exhaust Gas Temperature (EGT) Sensor	GSA5512643246

Engine Identification

Engine part number _____

Engine serial number _____

Engine application _____

Purchased from _____

In-service date _____

Engine hours at delivery _____

Engine Warranty

Warranty Provisions

IIS, Inc. warrants that this engine was designed, built, and equipped so that it fully complies with the applicable emissions standards of U.S. EPA 40 CFR 60 and 1048 at the time of sale from IIS Inc., and that the engine is free of defects in materials and workmanship that may keep it from meeting the emissions standards.

Base Warranty Period
The engine's base warranty period is 2500 hours or 3 years, whichever comes first.

Emissions-Related Warranty Period
Your engine's emissions-related warranty period is 2500 operating hours or 3 years, whichever comes first. The warranty period on the catalyst is 3500 operating hours or 5 years, whichever comes first.

The engine's operating hours are determined based on the hour meter within the engine ECM that was supplied with your engine. The warranty period begins when your engine is placed into service.

Owner Obligations
This warranty is valid only if you operate and maintain your engine as specified in this Owner's Manual. In particular, you must maintain your engine as specified in the Maintenance Schedule and record your maintenance in the Maintenance Log.

Engine Warranty

Component Lists

Components covered until first scheduled maintenance interval

- Spark plugs

Components Covered under the 2500 hour/3 year Warranty

- CAM sensor
- CRANK sensor
- EFR pressure sensor
- EFR valve Assembly
- Engine Control Module (ECM)
- Engine Coolant Temperature (ECT) sensor
- Electronic throttle
- Exhaust headers (each)
- Exhaust manifold (each)
- Ignition distributor cap and rotor
- Ignition distributor - complete assembly
- Ignition coil
- Ignition wires
- Intake manifold
- Manifold Absolute Pressure / Intake Air Temp ((TMAP) sensor
- Positive Crankcase Ventilation (PCV) valve
- Pre-catalyst wide-range oxygen sensor
- Post-catalyst switching oxygen sensor

Components Covered under the 3500 hour/5 year Warranty

- Catalyst

If you have any questions regarding your warranty rights or responsibilities, contact IIS at 800-289-6478.

MAINTENANCE LOG

Service Interval: 100 Hour Break-In Period

- ☐ Inspect Alternator-Fan-Water Pump belt, Tensioner and Idlers
- ☐ Inspect battery
- ☐ Inspect engine coolant
- ☐ Clean radiator outside
- ☐ Replace engine oil and filter
- ☐ Inspect fuel lines, hoses, and fittings for gas leakage

Date:	
Engine Hours:	
Mechanic:	

MAINTENANCE LOG

Service Interval: 250 Hours or 4 Months

- ☐ Inspect Alternator-Fan-Water Pump belt
- ☐ Inspect battery
- ☐ Inspect engine coolant
- ☐ Clean radiator outside
- ☐ Replace engine oil and filter
- ☐ Inspect fuel lines, hoses, and fittings for gas leakage

Date:	
Engine Hours:	
Mechanic:	

MAINTENANCE LOG

Service Interval: 500 Hours or 8 Months

- ☐ Inspect air filter
- ☐ Inspect Alternator-Fan-Water Pump belt
- ☐ Inspect battery
- ☐ Inspect engine coolant
- ☐ Clean radiator outside
- ☐ Replace engine oil and filter
- ☐ Inspect fuel lines, hoses, and fittings for gas leakage
- ☐ Inspect PCV system

Date:	
Engine Hours:	
Mechanic:	

MAINTENANCE LOG

Service Interval: 750 Hours or 13 Months

- ☐ Inspect Alternator-Fan-Water Pump belt
- ☐ Inspect battery
- ☐ Inspect engine coolant
- ☐ Clean radiator outside
- ☐ Replace engine oil and filter
- ☐ Inspect fuel lines, hoses, and fittings for gas leakage

Date:	
Engine Hours:	
Mechanic:	

MAINTENANCE LOG

Service Interval: 1000 Hours or 17 Months

- ☐ Replace air filter
- ☐ Inspect Alternator-Fan-Water Pump belt
- ☐ Inspect battery
- ☐ Replace engine coolant
- ☐ Clean radiator outside
- ☐ Replace engine oil and filter
- ☐ Replace spark plugs & inspect spark plug wires
- ☐ Inspect distributor cap and rotor
- ☐ Inspect PCV system
- ☐ Inspect fuel lines, hoses, and fittings for gas leakage
- ☐ Replace fuel filter
- ☐ Inspect and drain LPG regulator/vaporizer
- ☐ Inspect fuel lock-off valve

Date:	
Engine Hours:	
Mechanic:	

MAINTENANCE LOG

Service Interval: 1250 Hours or 21 Months

- ☐ Inspect Alternator-Fan-Water Pump belt
- ☐ Inspect battery
- ☐ Inspect engine coolant
- ☐ Clean radiator outside
- ☐ Replace engine oil and filter
- ☐ Inspect fuel lines, hoses, and fittings for gas leakage

Date:	
Engine Hours:	
Mechanic:	

MAINTENANCE LOG

Service Interval: 1500 Hours or 25 Months

- ☐ Inspect air filter
- ☐ Inspect Alternator-Fan-Water Pump belt
- ☐ Inspect battery
- ☐ Inspect engine coolant
- ☐ Clean radiator outside
- ☐ Replace engine oil and filter
- ☐ Inspect fuel lines, hoses, and fittings for gas leakage
- ☐ Inspect PCV system

Date:	
Engine Hours:	
Mechanic:	

MAINTENANCE LOG

Service Interval: 1750 Hours or 29 Months

- ☐ Inspect Alternator-Fan-Water Pump belt
- ☐ Inspect battery
- ☐ Inspect engine coolant
- ☐ Clean radiator outside
- ☐ Replace engine oil and filter
- ☐ Inspect fuel lines, hoses, and fittings for gas leakage

Date:	
Engine Hours:	
Mechanic:	

MAINTENANCE LOG

Service Interval: 2000 Hours or 34 Months

- ☐ Replace air filter
- ☐ Inspect Alternator-Fan-Water Pump belt
- ☐ Inspect battery
- ☐ Replace engine coolant
- ☐ Clean radiator outside
- ☐ Replace engine oil and filter
- ☐ Replace spark plugs & inspect spark plug wires
- ☐ Inspect distributor cap and rotor
- ☐ Inspect PCV system
- ☐ Inspect fuel lines, hoses, and fittings for gas leakage
- ☐ Replace fuel filter
- ☐ Inspect and drain LPG regulator/vaporizer
- ☐ Inspect fuel lock-off valve

Date:	
Engine Hours:	
Mechanic:	

MAINTENANCE LOG

Service Interval: 2250 Hours or 38 Months

- ☐ Inspect Alternator-Fan-Water Pump belt
- ☐ Inspect battery
- ☐ Inspect engine coolant
- ☐ Clean radiator outside
- ☐ Replace engine oil and filter
- ☐ Inspect fuel lines, hoses, and fittings for gas leakage

Date:	
Engine Hours:	
Mechanic:	

MAINTENANCE LOG

Service Interval: 2500 Hours or 42 Months

- ☐ Inspect air filter
- ☐ Replace Alternator-Fan-Water Pump belt
- ☐ Inspect battery
- ☐ Inspect engine coolant
- ☐ Clean radiator outside
- ☐ Replace engine oil and filter
- ☐ Inspect fuel lines, hoses, and fittings for gas leakage
- ☐ Inspect PCV system

Date:	
Engine Hours:	
Mechanic:	

MAINTENANCE LOG

Service Interval: 2750 Hours or 46 Months

- ☐ Inspect Alternator-Fan-Water Pump belt
- ☐ Inspect battery
- ☐ Inspect engine coolant
- ☐ Clean radiator outside
- ☐ Replace engine oil and filter
- ☐ Inspect fuel lines, hoses, and fittings for gas leakage

Date:	
Engine Hours:	
Mechanic:	

MAINTENANCE LOG

Service Interval: 3000 Hours or 50 Months

- ☐ Replace air filter
- ☐ Inspect Alternator-Fan-Water Pump belt
- ☐ Inspect battery
- ☐ Replace engine coolant
- ☐ Clean radiator outside
- ☐ Replace engine oil and filter
- ☐ Replace spark plugs & inspect spark plug wires
- ☐ Inspect distributor cap and rotor
- ☐ Inspect PCV system
- ☐ Inspect fuel lines, hoses, and fittings for gas leakage
- ☐ Replace fuel filter
- ☐ Inspect and drain LPG regulator/vaporizer
- ☐ Inspect fuel lock-off valve

Date:	
Engine Hours:	
Mechanic:	

MAINTENANCE LOG

Service Interval: 3250 Hours or 55 Months

- ☐ Inspect Alternator-Fan-Water Pump belt
- ☐ Inspect battery
- ☐ Inspect engine coolant
- ☐ Clean radiator outside
- ☐ Replace engine oil and filter
- ☐ Inspect fuel lines, hoses, and fittings for gas leakage

Date:	
Engine Hours:	
Mechanic:	

MAINTENANCE LOG

Service Interval: 3500 Hours or 59 Months

- ☐ Inspect air filter
- ☐ Inspect Alternator-Fan-Water Pump belt
- ☐ Inspect battery
- ☐ Inspect engine coolant
- ☐ Clean radiator outside
- ☐ Replace engine oil and filter
- ☐ Inspect fuel lines, hoses, and fittings for gas leakage
- ☐ Inspect PCV system

Date:	
Engine Hours:	
Mechanic:	

MAINTENANCE LOG

Service Interval: 3750 Hours or 63 Months

- ☐ Inspect Alternator-Fan-Water Pump belt
- ☐ Inspect battery
- ☐ Inspect engine coolant
- ☐ Clean radiator outside
- ☐ Replace engine oil and filter
- ☐ Inspect fuel lines, hoses, and fittings for gas leakage

Date:	
Engine Hours:	
Mechanic:	

MAINTENANCE LOG

Service Interval: 4000 Hours or 67 Months

- ☐ Replace air filter
- ☐ Inspect Alternator-Fan-Water Pump belt
- ☐ Inspect battery
- ☐ Replace engine coolant
- ☐ Clean radiator outside
- ☐ Replace engine oil and filter
- ☐ Replace spark plugs & inspect spark plug wires
- ☐ Inspect distributor cap and rotor
- ☐ Inspect PCV system
- ☐ Inspect fuel lines, hoses, and fittings for gas leakage
- ☐ Replace fuel filter
- ☐ Inspect and drain LPG regulator/vaporizer
- ☐ Inspect fuel lock-off valve

Date:	
Engine Hours:	
Mechanic:	

MAINTENANCE LOG

Service Interval: 4250 Hours or 71 Months

- ☐ Inspect Alternator-Fan-Water Pump belt
- ☐ Inspect battery
- ☐ Inspect engine coolant
- ☐ Clean radiator outside
- ☐ Replace engine oil and filter
- ☐ Inspect fuel lines, hoses, and fittings for gas leakage

Date:	
Engine Hours:	
Mechanic:	

MAINTENANCE LOG

Service Interval: 4500 Hours or 76 Months

- ☐ Inspect air filter
- ☐ Inspect Alternator-Fan-Water Pump belt
- ☐ Inspect battery
- ☐ Inspect engine coolant
- ☐ Clean radiator outside
- ☐ Replace engine oil and filter
- ☐ Inspect fuel lines, hoses, and fittings for gas leakage
- ☐ Inspect PCV system

Date:	
Engine Hours:	
Mechanic:	

MAINTENANCE LOG

Service Interval: 4750 Hours or 80 Months

- ☐ Inspect Alternator-Fan-Water Pump belt
- ☐ Inspect battery
- ☐ Inspect engine coolant
- ☐ Clean radiator outside
- ☐ Replace engine oil and filter
- ☐ Inspect fuel lines, hoses, and fittings for gas leakage

Date:	
Engine Hours:	
Mechanic:	

MAINTENANCE LOG

Service Interval: 5000 Hours or 84 Months

- ☐ Replace air filter
- ☐ Inspect Alternator-Fan-Water Pump belt
- ☐ Inspect battery
- ☐ Replace engine coolant
- ☐ Clean radiator outside
- ☐ Replace engine oil and filter
- ☐ Replace spark plugs & spark plug wires
- ☐ Replace distributor cap and rotor
- ☐ Replace pre-catalyst and post-catalyst oxygen sensors
- ☐ Inspect PCV system
- ☐ Inspect fuel lines, hoses, and fittings for gas leakage
- ☐ Replace fuel filter
- ☐ Inspect and drain LPG regulator/vaporizer
- ☐ Inspect fuel lock-off valve

Date:	
Engine Hours:	
Mechanic:	

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