Manufacturer	Cimco Marine AB	**Manufacturer Code**	CAB
Engine Family	JCABN02.0OXE	**Model Year**	2018
Regulation(s) Compliance Finding	Pass		
Certificate Number	N/A	**Conditional Certificate**	--
Requested Certificate Type	--		
Certificate Issue Date	N/A	**Certificate Effective Date**	N/A
Certificate Revision Date	N/A	**Certificate Revision Number**	N/A

General Information

Manufacturer Engine Family	OXE	**CSI Type**	Running Change

Alternate Trade Names

Branding Arrangements Description

--

Manufacturer Type	Post-manufacture Marinizer	**Engine Type**	Commercial
Do your engine production volumes meet the small volume threshold?	Yes	**Locomotive Remanufacture System Engine Family Name**	--
Is your engine on a formerly foreign vessel that is being reflagged as a U.S. vessel?	No		
Marine Combustion Type	Marine compression ignition (diesel)		
Running Change Type(s)	New ratings		

Running Change Type, (if other)

--

Field Edits/Changes/Corrections

125 and 175 HP Models Added

Carryover test results from previous Engine Family?	Yes		
Carryover Engine Family Name	GCABN02.0OXE	**Carryover Engine Family Model Year**	2016
What types of certificates are required for this engine family?	Certificate of Conformity Only	**Applicable Regulation (Certificate of Conformity)**	Part 1042
Applicable Tier (Clean Air Act)	Tier 3	**Applicable Tier (Annex VI)**	--
Has an EIAPP certificate already been issued for this engine family for this or any prior model year?	--	**Family name originally reported to IMS or Verify for which the EIAPP Certificate was issued**	--
Justification for requesting only a Certificate of Conformity	Domestic use only		

Justification for requesting only a Certificate of Conformity, (if Other)

Justification for requesting only an EIAPP Certificate	--	**Justification for Exemption from Clean Air Act Standards**	--

Justification for Exemption from CAA Standards Description, (if Other)

Justification(s) for selecting IMO Annex VI Tier II after Model Year 2015		**Family name of the identical engine certified to IMO Annex VI Tier III standards**	--
Are you electing to delay the effective date of applicable standards as per the interim provisions?	No	**Engine Category**	Category 1
Special Compliance Provision	Not Applicable	**Category 2 Displacement Range**	--
Maximum Engine Power (kW)	156	**Displacement Per Cylinder (L)**	0.4
Power Density (kW/L)	80	**Are you combining engines that would otherwise be grouped into separate engine families?**	No
Rated Power (kW)	156	**Maximum Test Speed (rpm)**	4400
Maximum In Use Speed (rpm)	4400	**Is this Engine Family used in mobile and/or stationary applications?**	Mobile
Limited Application(s)	Other		

Limited Application Description, (if other)

Standard configuration is variable speed fixed pitch propeller used for recreational and commercial applications. There are no limits to application.

Limited Application Enforcement Description

Engine Family	JCABN02.0OXE	**Model Year**	2018

Standard configuration is variable speed fixed pitch propeller used for recreational and commercial applications. There are no limits to application.

Are you using the NOx Technical Code test procedure to generate test results for CO, NOx, and HC to meet Clean Air Act standards as allowed in Part 1042.501(g) for Category 3 engines? --

ABT and FEL Information

Is this Engine Family participating in the Averaging, Banking, and Trading Program? No

Not to Exceed (NTE) Compliance Information

NTE Operating Region Explanation

NTE compliance delayed for this model year as small volume PM Marinizers - CFR40 Part 1042.145 (b) (2). Our world wide engine sales are expected to be less than 1000 units in 2018.

Time-Weighted Carve Out Limited NTE Testing Regions

Are you petitioning EPA to limit NTE testing in a single defined region of speeds and loads for the only or parent rating (model)? No

Are you requesting approval for an NTE deficiency? No

Engine Description

Engine Combustion Cycle 4 Stroke Compression Ignition

Fuel Options Single Fuel Engine

Fuel #1

Fuel	Distillate Diesel Fuel	**Fuel, (if other)**	--
Fuel Metering System	Direct Injection (Common Rail)		

Useful Life

Useful Life of Engine Family 10 years / 10,000 hrs

Production Information

Total Projected Sales	999		
Production Start Date	01/01/2018	**Production End Date**	12/31/2018
Manufacturing Plants building these Engines	Cimco Marine Head Office		
Agent for Service in U.S. Name	Mack Boring & Parts Co Scott Du Brow, Cascade Engine Center LLC Tim Sandeman, Laborde Products Chris Cerullo		
U.S. Test Facility	NEVS Powertrain Test Lab		

Remanufacture Information

Original Engine Family Name	--		
Original Engine OEM	--		
Original Engine Configuration	--		
Remanufacture Kit Beginning Model Year Covered	N/A	**Remanufacture Kit Ending Model Year Covered**	N/A

Engine Description Comments

Engine Family	JCABN02.0OXE	**Model Year**	2018

Manufacturers engine code OXE. Outboard engine configuration with engine mounted directly to gearbox and lower drive assembly interconnected by two oil lubricated toothed drive belts. In line four cylinder 2.0 L diesel, rated maximum speed 4400 rpm and 850 rpm idle. D.O.H.C operated four valves per cylinder valve system with hydraulic tappet adjustment. Volumetric compression ratio of 16.5:1 and open chamber combustion system. Closed cooling system with freshwater/Glycol mixture, centrifugal circulation pump and heat exchanger. Engine driven impeller raw water pump cooling of oil cooler, fuel cooler, after cooler, heat exchanger, exhaust manifold and riser. Exhaust exits through lower drive assembly close to the propeller. On engine air filter element, Garrett Variable Geometry Turbocharger with air to water intercooler (air charge cooler). Electronic fuel lift pump and engine mounted fuel filter. Bosch common rail fuel system controlled by Cimco Nira Electronic Control Module (ECM). ECM control of solenoid fuel injectors, fuel proportioning valve, fuel lift pump, glow plug cold start system and full control of turbocharger geometry. On Board Diagnostic (OBD) facility with warning and de-rate systems for safety and emission control systems. Closed positive crankcase ventilation system. No additional emission control components or systems.

Manufacturer Comments about Engine Family

--

Emission Control Systems

Are any ATDs used on this Engine Family? No

Are Non-ATDs used on this Engine Family? No

Will this Engine Family be produced using Delegated Assembly? No

Will the cost of the ATD components be included with the cost of the engine? --

List of Components covered under Delegated Assembly exemption

Are any AECDs used on this Engine Family? No

Does this Engine Family have any Adjustable Parameters? No

Engine Family	JCABN02.0OXE	**Model Year**	2018

Engine Configuration(s)

Engine Configuration #1

Engine Configuration Name	OXE 200	**Was this the engine configuration rebuilt for baseline emission testing?**	--
Engine Application	Variable Speed - Propulsion - Fixed Pitch Propeller		
Cylinder Arrangement	Inline engine		

Number of Cylinders on this model	Bore (0.1mm-9999.9mm)	Stroke (0.1mm-9999.9mm)	Displacement Per Cylinder (L)	Total Displacement (L)	Rated Power (kW)
4	83	90.4	0.4	2.0	156

Rated Speed (rpm)	Maximum Torque (N*m)	Speed at Maximum Torque (rpm)	Maximum Test Speed (rpm)	Maximum In Use Speed (rpm)	Torque at Maximum Test Speed (N*m)
4100	415	2800	4400	4400	362

Maximum Engine Power (kW)	Lower Tolerance of Maximum Power (%)	Upper Tolerance of Maximum Power (%)	Power Density (kW/L)	Fuel Rate at Maximum Torque (mm3/stroke)	Fuel Rate at Rated Speed (mm3/stroke)
156	95	99	80	90	89

Method of Aspiration	Turbocharged		
Number of aspiration devices on this model	1	**Aspiration Device Configuration**	Single

Turbochargers

Turbocharger Type	Turbocharger Type, (if Other)
Variable Geometry Turbocharger	--

Charge Air Cooler Type	Liquid	**Does this engine configuration use variable valve timing technology?**	No
Is this engine configuration equipped with a variable valve lift mechanism?	No		
Number of inlet valves per cylinder	2	**Number of Exhaust Valves Per Cylinder**	2
Model Production Start Date	01/01/2018	**Model Production End Date**	12/31/2018

Parts

Part Name	Part Name, (if Other)	Part Number	Part Quantity	Usage Start Date	Usage End Date
Electronic Control Module	--	30-0116-022	1	01/01/2018	12/31/2018
Fuel Injectors	--	55566050	4	01/01/2018	12/31/2018
Fuel Injection Pump	--	55597787	1	01/01/2018	12/31/2018
Turbo Charger	--	30-0114-395	1	01/01/2018	12/31/2018
Software Calibration	--	ECCV200-17502	1	01/01/2018	12/31/2018

Engine Configuration Standards and FEL Caps

Certificate Type	Pollutant Name	Standard Value (g/kW-hr)	FEL Cap (g/kW-hr)	Rule Number
Certificate of Conformity (Clean Air Act)	Particulate Matter	0.15	0.15	94
Certificate of Conformity (Clean Air Act)	Nitrogen Oxides and Hydrocarbons	5.8	5.8	94
Certificate of Conformity (Clean Air Act)	Carbon Monoxide	5.0	N/A	26

Engine Configuration #2

Engine Configuration Name	OXE 125	**Was this the engine configuration rebuilt for baseline emission testing?**	--
Engine Application	Variable Speed - Propulsion - Fixed Pitch Propeller		
Cylinder Arrangement	Inline engine		

Engine Family	JCABN02.0OXE	**Model Year**	2018

Number of Cylinders on this model	**Bore (0.1mm-9999.9mm)**	**Stroke (0.1mm-9999.9mm)**	**Displacement Per Cylinder (L)**	**Total Displacement (L)**	**Rated Power (kW)**
4	83	90.4	0.4	2.0	102

Rated Speed (rpm)	**Maximum Torque (N*m)**	**Speed at Maximum Torque (rpm)**	**Maximum Test Speed (rpm)**	**Maximum In Use Speed (rpm)**	**Torque at Maximum Test Speed (N*m)**
4100	376	2500	4400	4400	N/A

Maximum Engine Power (kW)	**Lower Tolerance of Maximum Power (%)**	**Upper Tolerance of Maximum Power (%)**	**Power Density (kW/L)**	**Fuel Rate at Maximum Torque (mm3/stroke)**	**Fuel Rate at Rated Speed (mm3/stroke)**
102	95	99	52	91	63

Method of Aspiration	Turbocharged		
Number of aspiration devices on this model	1	**Aspiration Device Configuration**	Single

Turbochargers

Turbocharger Type	**Turbocharger Type, (if Other)**
Variable Geometry Turbocharger	--

Charge Air Cooler Type	Liquid	**Does this engine configuration use variable valve timing technology?**	No
Is this engine configuration equipped with a variable valve lift mechanism?	No		
Number of inlet valves per cylinder	2	**Number of Exhaust Valves Per Cylinder**	2
Model Production Start Date	10/23/2018	**Model Production End Date**	12/31/2018

Parts

Part Name	**Part Name, (if Other)**	**Part Number**	**Part Quantity**	**Usage Start Date**	**Usage End Date**
Fuel Injectors	--	55566050	4	10/24/2018	12/31/2018
Electronic Control Module	--	30-0116-022	1	10/24/2018	12/31/2018
Fuel Injection Pump	--	55597787	1	10/24/2018	12/31/2018
Turbo Charger	--	30-0114-395	1	10/24/2018	12/31/2018
Software Calibration	--	ECCV125-17502	1	10/24/2018	12/31/2018

Engine Configuration Standards and FEL Caps

Certificate Type	**Pollutant Name**	**Standard Value (g/kW-hr)**	**FEL Cap (g/kW-hr)**	**Rule Number**
Certificate of Conformity (Clean Air Act)	Particulate Matter	0.15	0.15	94
Certificate of Conformity (Clean Air Act)	Nitrogen Oxides and Hydrocarbons	5.8	5.8	94
Certificate of Conformity (Clean Air Act)	Carbon Monoxide	5.0	N/A	26

Engine Configuration #3

Engine Configuration Name	OXE 150	**Was this the engine configuration rebuilt for baseline emission testing?**	--
Engine Application	Variable Speed - Propulsion - Fixed Pitch Propeller		
Cylinder Arrangement	Inline engine		

Engine Family	JCABN02.0OXE	**Model Year**	2018

Number of Cylinders on this model	**Bore (0.1mm-9999.9mm)**	**Stroke (0.1mm-9999.9mm)**	**Displacement Per Cylinder (L)**	**Total Displacement (L)**	**Rated Power (kW)**
4	83	90.4	0.4	2.0	122
Rated Speed (rpm)	**Maximum Torque (N*m)**	**Speed at Maximum Torque (rpm)**	**Maximum Test Speed (rpm)**	**Maximum In Use Speed (rpm)**	**Torque at Maximum Test Speed (N*m)**
4100	380	2500	4400	4400	N/A
Maximum Engine Power (kW)	**Lower Tolerance of Maximum Power (%)**	**Upper Tolerance of Maximum Power (%)**	**Power Density (kW/L)**	**Fuel Rate at Maximum Torque (mm3/stroke)**	**Fuel Rate at Rated Speed (mm3/stroke)**
122	95	99	62	92	75

Method of Aspiration	Turbocharged		
Number of aspiration devices on this model	1	**Aspiration Device Configuration**	Single

Turbochargers

Turbocharger Type	**Turbocharger Type, (if Other)**
Variable Geometry Turbocharger	--

Charge Air Cooler Type	Liquid	**Does this engine configuration use variable valve timing technology?**	No
Is this engine configuration equipped with a variable valve lift mechanism?	No		
Number of inlet valves per cylinder	2	**Number of Exhaust Valves Per Cylinder**	2
Model Production Start Date	01/01/2018	**Model Production End Date**	12/31/2018

Parts

Part Name	**Part Name, (if Other)**	**Part Number**	**Part Quantity**	**Usage Start Date**	**Usage End Date**
Electronic Control Module	--	30-0116-022	1	01/01/2018	12/31/2018
Turbo Charger	--	30-0114-395	1	01/01/2018	12/31/2018
Software Calibration	--	ECCV150-17502	1	01/01/2018	12/31/2018
Fuel Injection Pump	--	55597787	1	01/01/2018	12/31/2018
Fuel Injectors	--	55566050	4	01/01/2018	12/31/2018

Engine Configuration Standards and FEL Caps

Certificate Type	**Pollutant Name**	**Standard Value (g/kW-hr)**	**FEL Cap (g/kW-hr)**	**Rule Number**
Certificate of Conformity (Clean Air Act)	Particulate Matter	0.15	0.15	94
Certificate of Conformity (Clean Air Act)	Nitrogen Oxides and Hydrocarbons	5.8	5.8	94
Certificate of Conformity (Clean Air Act)	Carbon Monoxide	5.0	N/A	26

Engine Configuration #4

Engine Configuration Name	OXE 175	**Was this the engine configuration rebuilt for baseline emission testing?**	--
Engine Application	Variable Speed - Propulsion - Fixed Pitch Propeller		
Cylinder Arrangement	Inline engine		

Certification Summary Information Report

Engine Family	JCABN02.0OXE	Model Year	2018

Number of Cylinders on this model	Bore (0.1mm-9999.9mm)	Stroke (0.1mm-9999.9mm)	Displacement Per Cylinder (L)	Total Displacement (L)	Rated Power (kW)
4	83	90.4	0.4	2.0	137

Rated Speed (rpm)	Maximum Torque (N*m)	Speed at Maximum Torque (rpm)	Maximum Test Speed (rpm)	Maximum In Use Speed (rpm)	Torque at Maximum Test Speed (N*m)
4100	380	2500	4400	4400	N/A

Maximum Engine Power (kW)	Lower Tolerance of Maximum Power (%)	Upper Tolerance of Maximum Power (%)	Power Density (kW/L)	Fuel Rate at Maximum Torque (mm3/stroke)	Fuel Rate at Rated Speed (mm3/stroke)
137	95	99	70	92	82

Method of Aspiration	Turbocharged		
Number of aspiration devices on this model	1	Aspiration Device Configuration	Single

Turbochargers

Turbocharger Type	Turbocharger Type, (if Other)
Variable Geometry Turbocharger	--

Charge Air Cooler Type	Liquid	Does this engine configuration use variable valve timing technology?	No
Is this engine configuration equipped with a variable valve lift mechanism?	No		
Number of inlet valves per cylinder	2	Number of Exhaust Valves Per Cylinder	2
Model Production Start Date	10/23/2018	Model Production End Date	12/31/2018

Parts

Part Name	Part Name, (if Other)	Part Number	Part Quantity	Usage Start Date	Usage End Date
Software Calibration	--	ECCV175-17502	1	10/24/2018	12/31/2018
Fuel Injection Pump	--	55597787	1	10/24/2018	12/31/2018
Fuel Injectors	--	55566050	4	10/24/2018	12/31/2018
Turbo Charger	--	30-0114-395	1	10/24/2018	12/31/2018
Electronic Control Module	--	30-0116-022	1	10/24/2018	12/31/2018

Engine Configuration Standards and FEL Caps

Certificate Type	Pollutant Name	Standard Value (g/kW-hr)	FEL Cap (g/kW-hr)	Rule Number
Certificate of Conformity (Clean Air Act)	Particulate Matter	0.15	0.15	94
Certificate of Conformity (Clean Air Act)	Nitrogen Oxides and Hydrocarbons	5.8	5.8	94
Certificate of Conformity (Clean Air Act)	Carbon Monoxide	5.0	N/A	26

Engine Family	JCABN02.0OXE	**Model Year**	2018

Durability Information

DF Determination Method Assigned by EPA (Small Volume Manufacturer or Post-manufacture Marinizer)

Durability Engine

Durability Engine Family Name --

Durability Engine Configuration Name --

Durability Engine ID --

Durability Engine Service Accumulation N/A

Deterioration Factors

Pollutant Name	Deterioration Factor Type	Deterioration Factor Value
Total Hydrocarbon	Additive	0.04
Particulate Matter	Additive	0.018
Carbon Monoxide	Additive	0.285
Nitrogen Oxides	Additive	0.034

Test Information

Certification Test

Certification Test #1

Test Data Type Test data exists in Verify for an engine configuration in the Carryover Engine Family

Test Dataset ID Number (Verify-assigned) --

Carryover Test Dataset ID Number GCABNM0001449

Certification Level Steady State Test Result Details

Certificate Type	Pollutant Name	Standard Value (g/kW-hr)	FEL (g/kW-hr)	FEL Cap (g/kW-hr)	Baseline Standard Value (g/kW-hr)	Certification Emission Result (g/kW-hr)	Pass/Fail Indicator
Certificate of Conformity (Clean Air Act)	Particulate Matter	0.15	N/A	0.40	N/A	0.15	Pass
Certificate of Conformity (Clean Air Act)	Nitrogen Oxides	N/A	N/A	N/A	N/A	4.9	--
Certificate of Conformity (Clean Air Act)	Hydrocarbons	N/A	N/A	N/A	N/A	0.06	--
Certificate of Conformity (Clean Air Act)	Nitrogen Oxides and Hydrocarbons	5.8	N/A	7.5	N/A	4.9	Pass
Certificate of Conformity (Clean Air Act)	Carbon Monoxide	5.0	N/A	N/A	N/A	1.2	Pass
Certificate of Conformity (Clean Air Act)	Carbon Dioxide	N/A	N/A	N/A	N/A	711	--

Test Comments

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