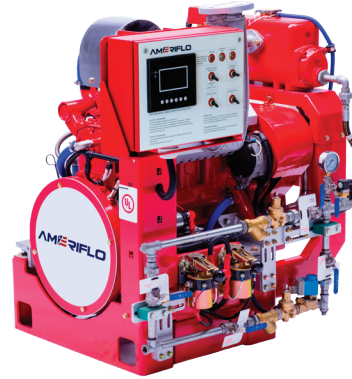


UL - cUL LISTED RATINGS BHP & KW

ENGINE MODEL:	AF4-90C
EMISSIONS:	TIER 0
DATE:	10/01/2022
DRAWING NUMBER:	AF4-90C.00
PERFORMANCE CURVE NUMBER:	C0490BF
RATED POWER:	39 BHP @ 2950 RPM 29 KW @ 2950 RPM
REFERENCE NUMBER:	DS0490C
VERSION:	A


GENERAL ENGINE DATA

TYPE:	4 CYCLE; INLINE; WATER COOLED	
NUMBER OF CYLINDERS:	4	
ASPIRATION:	NATURAL	
BORE & STROKE - IN [MM]:	3.54 x 3.94 [90 x 100]	
CYLINDER LINER TYPE:	<input checked="" type="checkbox"/> WET <input type="checkbox"/> DRY	
DISPLACEMENT - IN ³ [L]:	155 [2.54]	
COMPRESSION RATIO:	17.5:01	
FIRING ORDER:	1 - 3 - 4 - 2	
COMBUSTION SYSTEM:	DIRECT INJECTION	
ROTATION (AS VIEWED FROM FRONT OF ENGINE):	CCW	
VALVES PER CYLINDER:	INTAKE: 1 EXHAUST: 1	
VALVE LASH (COLD ENGINE):	INTAKE - IN [MM]:	0.012 [0.30]
	EXHAUST - IN [MM]:	0.012 [0.30]
IGNITION TYPE:	COMPRESSION (DIESEL)	
CHARGE AIR COOLING TYPE:	N/A	
WEIGHT (FUEL PUMP CONFIGURATION) - LBS [KG]:	882 [400]	
DIMENSIONS (L x W x H) - IN [MM]:	47 x 31 x 40 [1205 x 790 x 1025]	
FLYWHEEL / FLYWHEEL HOUSING DIMENSIONS:	10.00 / SAE #4	
TORQUE @ RATED RPM - LB-FT [N-M]:	69 [94]	

ENGINE PERFORMANCE DATA

ESTIMATED FREE FIELD SOUND PRESSURE LEVEL AT 3 FEET [1 METER] WITH FULL-LOAD GOVERNED SPEED (INCLUDES NOISE FROM EXHAUST, COOLING SYSTEM AND DRIVEN COMPONENTS)	dBa	≤ 108
ALL DATA IS BASED ON ENGINE OPERATING WITH FUEL SYSTEM, LUBRICATING OIL PUMP, AIR CLEANER AND ALTERNATOR. DOES NOT INCLUDE AIR COMPRESSOR, FAN & OPTIONAL EQUIPMENT. DATA IS BASED ON SAE STANDARD J1349 CONDITIONS AT 300 FEET [91.4 METERS] ALTITUDE, 29.61 INCHES [752 MILLIMETERS] HG DRY BAROMETER AND 77°F [25°C] INTAKE AIR TEMPERATURE USING #0 DIESEL FUEL FOLLOWING THE GB 252-2011 STANDARD.		
ALTITUDE ABOVE WHICH OUTPUT SHOULD BE DERATED:	FEET [METER]	300 [91]
DERATE PER 1,000 FEET [305 METERS] ABOVE ALTITUDE LIMIT:	3%	
TEMPERATURE ABOVE WHICH OUTPUT SHOULD BE DERATED:	°F [°C]	77 [25]
DERATE PER 10°F [5.6°C] ABOVE TEMPERATURE LIMIT:	1%	

• ALL DATA CERTIFIED WITHIN ±5%.

EXHAUST SYSTEM

EXHAUST GAS TEMPERATURE @ MAXIMUM RATING (POWER) - °F [°C]:	≤ 932 [500]
EXHAUST GAS FLOW @ MAXIMUM OUTPUT - LBS/HR [KG/HR]:	2336 [1060]
MAXIMUM ALLOWABLE BACK PRESSURE - PSI [KPA]:	1.45 [10]
MINIMUM EXHAUST PIPE DIAMETER - IN [MM]:	3.00 [80]

AIR INTAKE SYSTEM

AIR CLEANER TYPE:	DRY TYPE, DISPOSABLE
AIR FLOW - CFM [M ³ /HR]:	235 [400]
AIR INLET RESTRICTION - PSI [KPA]:	0.44 [3]

LUBRICATION SYSTEM

OIL CAPACITY (ENGINE ONLY) - QTS [L]:	7.4 [7]
MAXIMUM SUMP OIL TEMPERATURE - °F [°C]:	248 [120]
NORMAL OPERATING OIL PRESSURE RANGE - PSI [BAR]:	29.0 ~ 65.3 [2.0 ~ 4.5]
OIL PRESSURE @ IDLE - PSI [BAR]:	> 14.5 [1]

COOLING SYSTEM

COOLANT CAPACITY (ENGINE & HEAT EXCHANGER) - QTS [L]:	15.9 [15]	
THERMOSTAT RANGE:	START OPEN - °F [°C]:	167 [75]
	FULL OPEN - °F [°C]:	185 [85]
COOLANT PRESSURE MAXIMUM - PSI [BAR]:	13 [0.9]	
MAXIMUM ENGINE COOLANT TEMPERATURE - °F [°C]:	≤ 208 [98]	
ENGINE COOLANT FLOW @ FULL SPEED - GPM [M ³ /HR]:	21.1 [4.8]	
MAXIMUM RAW WATER PRESSURE - PSI [BAR]:	29.0 [2]	
MINIMUM RAW WATER FLOW @ ENGINE SPEED (RPM)	2950	
RAW WATER TEMPERATURES TO 60.8°F [16°C] - GPM [M ³ /HR]:	19.8 [4.5]	
RAW WATER TEMPERATURES TO 100.4°F [38°C] - GPM [M ³ /HR]:	25.1 [5.7]	
RAW WATER INTAKE PIPE SIZE:	RAW WATER INLET - IN:	0.75 NPT
	RAW WATER OUTLET - IN:	1.00 NPT

HEATER SYSTEM

WATTAGE - W:	2000
VOLTAGE (AC) - V:	220

DC ELECTRICAL SYSTEM

NORMAL SYSTEM VOLTAGE - V:	24
STARTER MOTOR - HP [KW]:	6.0 [4.5]
RECOMMENDED MINIMUM BATTERY SIZE - AH:	150
COLD CRANKING AMPS @ 0°F (-18°C):	900
CHARGING ALTERNATOR OUTPUT - AMPS:	25

① ALL DATA CERTIFIED WITHIN ±5%.

FUEL SYSTEM

INJECTION PUMP:	INLINE, PLUNGER TYPE
INJECTION PUMP ADVANCE ANGLE - °:	16 ± 1
MINIMUM SUPPLY LINE SIZE - IN [MM]:	0.313 [8]
MINIMUM RETURN LINE SIZE - IN [MM]:	0.313 [8]
FUEL MANAGEMENT CONTROL:	MECHANICAL
FUEL CONSUMPTION @ 2900 RPM - LB/BHP-HR [G/KW-HR]:	0.436 [265]
IDLE SPEED - RPM:	940
GOVERNED SPEED RATE - %:	< 10

① ALL DATA CERTIFIED WITHIN ±5%.



ENGINE MATERIALS & CONSTRUCTION

ENGINE		AIR INTAKE	
CAMSHAFT:		AIR CLEANER:	
TYPE	GROUND	TYPE	DRIP PROOF
MATERIAL	CARBON STEEL	MATERIAL	PLEATED PAPER
LOCATION	IN BLOCK	COOLING SYSTEM	
DRIVE	SPUR GEAR	COOLANT HEAT EXCHANGER:	
CONNECTING RODS:		TYPE	TUBE & SHELL
TYPE	I-BEAM, FRACTURE	MATERIAL	
MATERIAL	FORGED STEEL	ELECTRODE	ZINC
CRANKSHAFT:		HEADERS	COPPER
TYPE	GROUND	SHELL	ALUMINUM
MATERIAL	DUCTILE IRON	TUBES	COPPER
MAIN BEARINGS:		COOLANT PUMP:	
TYPE	PRECISION, HALF SHELL	TYPE	CENTRIFUGAL
MATERIAL	ALUMINUM BRONZE	DRIVE	V-BELT
CYLINDER BLOCK:		THERMOSTAT:	
TYPE	WET LINED	TYPE	NON-BLOCKING
MATERIAL	CAST IRON	QUANTITY	1
CYLINDER HEAD:		COOLING LOOP (GALVANIZED):	
TYPE	SLAB 2 VALVE	TEES, ELBOWS, PIPE	GALVANIZED STEEL
MATERIAL	CAST IRON	BALL VALVES	BRASS
CYLINDER LINERS:		SOLENOID VALVE	BRASS
TYPE	CENTRIFUGALLY CAST	PRESSURE REGULATOR	BRASS
MATERIAL	CAST IRON ALLOY	STRAINER	BRASS
PISTONS:		COOLING LOOP (316 STAINLESS STEEL):	
TYPE	1 PIECE	TEES, ELBOWS, PIPE	316 STAINLESS STEEL
MATERIAL	ALLOY STEEL	BALL VALVES	316 STAINLESS STEEL
PISTON PINS:		SOLENOID VALVE	316 STAINLESS STEEL
TYPE	FULL FLOATING	PRESSURE REGULATOR	316 STAINLESS STEEL
MATERIAL	ALLOY STEEL	STRAINER	316 STAINLESS STEEL
PISTON RINGS:		FUEL SYSTEM	
FIRST	DUCTILE CAST IRON	FUEL INJECTION PUMP:	
SECOND	ALLOY CAST IRON	TYPE	FULL MECHANICAL, CENTRIFUGAL
THIRD	ALLOY CAST IRON	DRIVE	GEAR DRIVEN
VALVES:		LUBRICATION SYSTEM	
TYPE	POPPET	TYPE	GEROTOR
ARRANGEMENT	OVERHEAD	DRIVE	GEAR
VALVE # PER CYLINDER	1 INTAKE, 1 EXHAUST		
OPERATING MECHANISM	MECHANICAL ROCKER ARM		
LIFTER TYPE	LARGE HEAD		

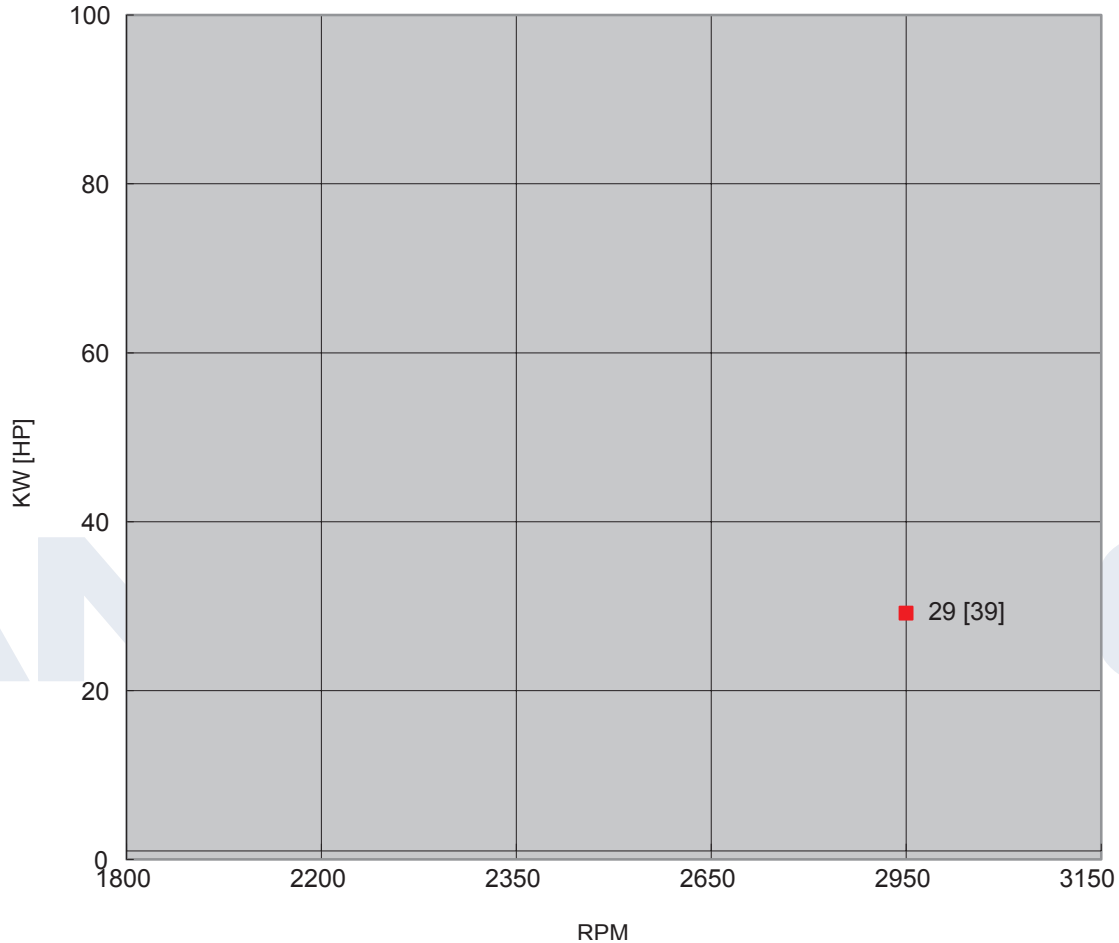
SPARE PARTS LIST

PART DESCRIPTION	QUANTITY	PART NUMBER	REMARKS
LUBRICATION SYSTEM			
OIL FILTER	1 PIECE	AF-1012015AB01-0000	
OIL PRESSURE SENSOR	1 PIECE	AF-21103-OPS	
FUEL SYSTEM			
FUEL FILTER	1 PIECE	AF-1117010-B01-0000B	
INJECTION PUMP	1 PIECE	AF-BH4Q80R8	
COOLING SYSTEM			
HEAT EXCHANGER	1 PIECE	AF-AH300	
COOLING LOOP	1 SET	AF-CL0.75-00-CL	
COOLING HOSE (90° ELBOW)	2 SET	AF-90-38/100P4	
COOLING HOSE (STRAIGHT)	1 SET	AF-88-3-800-CH	
	1 SET	AF-16-5-600-CH	
	1 SET	AF-16-5-1500-CH	
WATER TEMPERATURE SENSOR	1 PIECE	AF-00105-WTR	
STANDBY WATER TEMPERATURE SENSOR	1 PIECE	AF-00105-WTS	
THERMOSTAT	1 PIECE	AF-1306010-B01-0000Q	
PREHEATER	1 PIECE	AF-SH220200045	
CONTROL SYSTEM			
STARTER	1 PIECE	AF-QDJ2601K-P/3	
ALTERNATOR	1 PIECE	AF-JFWZ27-143	
BATTERY	4 PIECES	AF-N200	
INSTRUMENT PANEL	1 SET	AF-ENL-AB-ETS	
TRANSMISSION SYSTEM			
BELT	1 SET	AF-1308032-B01-0000	
STOP SOLENOID	1 PIECE	AF-DF23005	
INTAKE & EXHAUST SYSTEM			
AIR FILTER	1 PIECE	AF-ECC105003	

POWER CURVE

CURVE NUMBER:	C0490C	DATE:	10/01/2022
DISPLACEMENT - IN ³ [L]:	155 [2.54]	ASPIRATION:	NATURAL
POWER STANDARD:	UL/FM	BORE & STROKE - IN [MM]:	3.54 x 3.94 [90 x 100]
NUMBER OF CYLINDERS:	4	FUEL SYSTEM:	INLINE, MECHANICAL

● ALL DATA CERTIFIED WITHIN ±5%.

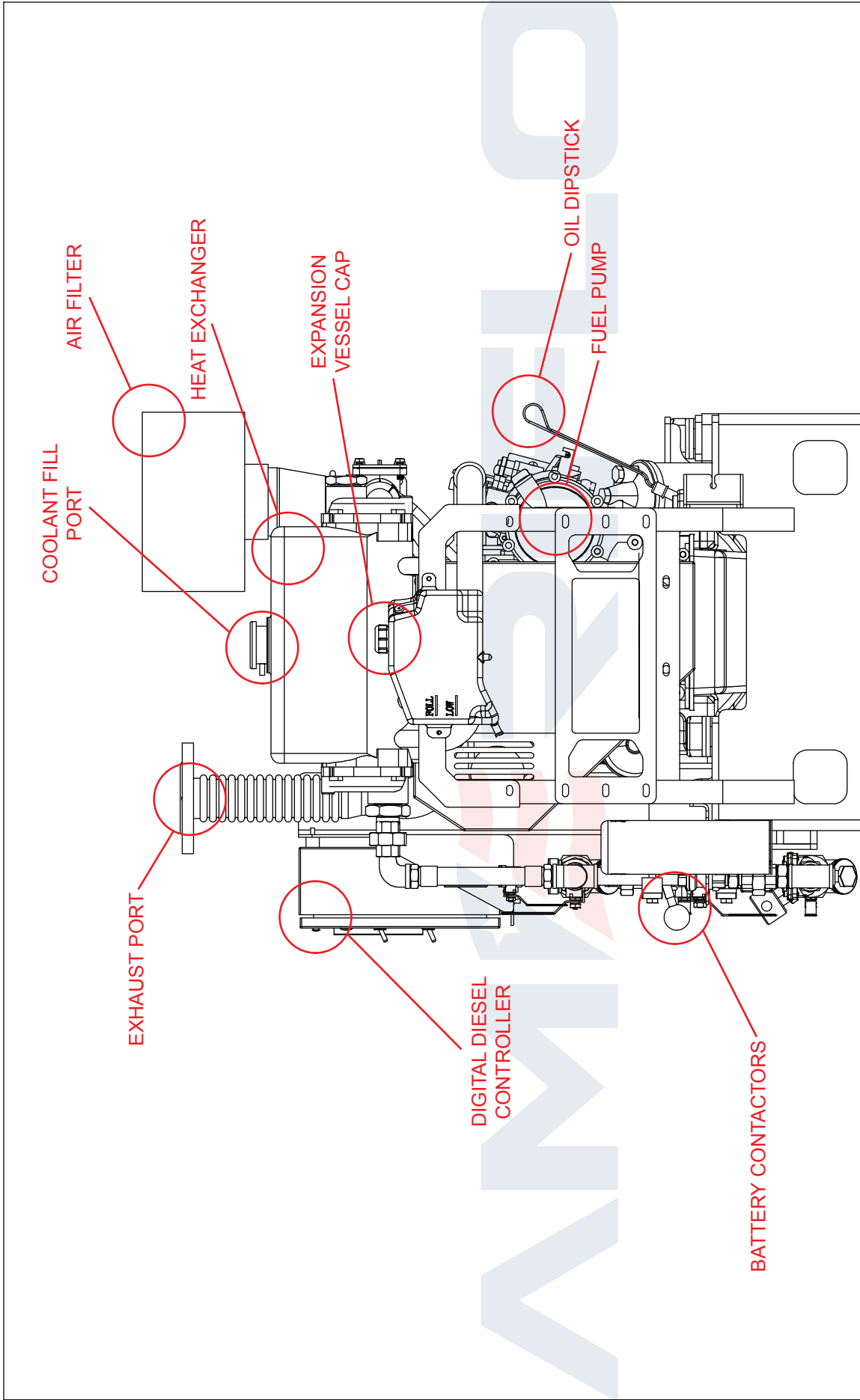


TORQUE		
SPEED	LB-FT	N-M
RPM		
1800		
2200		
2350		
2650		
2950	69	94
3150		

OUTPUT POWER		
SPEED	HP	KW
RPM		
1800		
2200		
2350		
2650		
2950	39	29
3150		

FUEL CONSUMPTION		
SPEED	LB/BHP-HR	G/KW-HR
RPM		
1800		
2200		
2350		
2650		
2950	0.436	265
3150		

● ALL DATA IS BASED ON ENGINE OPERATIONG WITH FUEL SYSTEM, LUBRICATING OIL PUMP, AIR CLEANER AND ALTERNATOR. DOES NOT INCLUDE AIR COMPRESSOR, FAN & OPTIONAL EQUIPMENT. DATA IS BASED ON SAE STANDARD J1394 CONDITIONS AT 300 FEET [91.4 METERS] ALTITUDE, 29.61 INCHES [752 MILLIMETERS] HG DRY BAROMETER AND 77°F [25°C] INTAKE AIR TEMPERATURE USING #0 DIESEL FUEL FOLLOWING THE GB 252-2011 STANDARD.



NOTES:
 1. ALL PLUMBING MUST BE SUPPORTED AND/OR ISOLATED SO THAT NO WEIGHT OR STRESS IS APPLIED TO ANY ENGINE COMPONENT.
 2. REFER TO SPECIFIC MODELS' INSTALLATION, OPERATION & MAINTENANCE MANUAL FOR INSTALLATION GUIDELINES.

REV	UNITS	IN(MM)
A	CREATION	MJF
REV	DESCRIPTION	DWN
		APVD
		DATE
		10/01/2022
		DATE
		APPROVED: DATE:
		CHK BY: DATE:
		MJF 10/01/2022
		DRW BY: DATE:
		MJF 10/01/2022
		NAME: INSTALLATION DRAWING
		DIESEL FIRE IMP DRIVER
		MODEL AF4-90C
		PROJECT:
		PROJECTION:
		SCALE: NONE
		PAGE 1
		OF 1



PART NO.: **AF4-90C-FRONT**
 MATERIAL:

