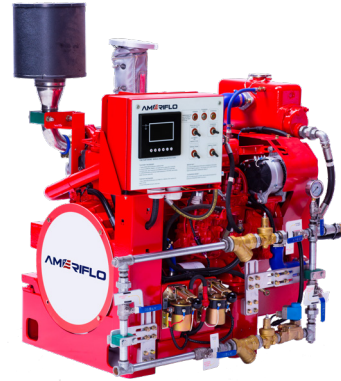


**UL - cUL LISTED RATINGS BHP & KW**

<b>ENGINE MODEL:</b>	AF4-102B
<b>EMISSIONS:</b>	TIER 0
<b>DATE:</b>	09/01/2020
<b>DRAWING NUMBER:</b>	AF4-102B.00
<b>PERFORMANCE CURVE NUMBER:</b>	C04105
<b>RATED POWER:</b>	95 BHP @ 2950 RPM 71 KW @ 2950 RPM
<b>REFERENCE NUMBER:</b>	14DS001E
<b>VERSION:</b>	A



**GENERAL ENGINE DATA**

TYPE:	4 CYCLE; INLINE; WATER COOLED	
NUMBER OF CYLINDERS:	4	
ASPIRATION:	TURBOCHARGED	
BORE & STROKE - IN [MM]:	4.02 x 4.65 [102 x 118]	
CYLINDER LINER TYPE:	<input type="checkbox"/> WET <input checked="" type="checkbox"/> DRY	
DISPLACEMENT - IN <sup>3</sup> [L]:	236 [3.86]	
COMPRESSION RATIO:	17:01	
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]:	0.016 [0.40]
	EXHAUST - IN [MM]:	0.016 [0.40]
IGNITION TYPE:	COMPRESSION (DIESEL)	
CHARGE AIR COOLING TYPE:	N/A	
WEIGHT (FUEL PUMP CONFIGURATION) - LBS [KG]:	1190 [540]	
DIMENSIONS (L x W x H) - IN [MM]:	47 x 35 x 50 [1205 x 890 x 1275]	
FLYWHEEL / FLYWHEEL HOUSING DIMENSIONS:	11.50 / SAE #3	
TORQUE @ RATED RPM - LB-FT [N-M]:	169 [230]	

**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]:	≤ 1004 [540]
EXHAUST GAS FLOW @ MAXIMUM OUTPUT - LBS/HR [KG/HR]:	1488 [675]
MAXIMUM ALLOWABLE BACK PRESSURE - PSI [KPA]:	1.45 [10]
MINIMUM EXHAUST PIPE DIAMETER - IN [MM]:	2.5 [65]

**AIR INTAKE SYSTEM**

AIR CLEANER TYPE:	DRY TYPE, DISPOSABLE
AIR FLOW - CFM [M <sup>3</sup> /HR]:	323 [550]
AIR INLET RESTRICTION (DIRTY) - PSI [KPA]:	≤ 0.87 [6]
AIR INLET RESTRICTION (CLEAN) - PSI [KPA]:	≤ 0.44 [3]

**LUBRICATION SYSTEM**

OIL CAPACITY (ENGINE ONLY) - QTS [L]:	12.6 [12]
MAXIMUM SUMP OIL TEMPERATURE - °F [°C]:	248 [120]
NORMAL OPERATING OIL PRESSURE RANGE - PSI [BAR]:	> 43.5 [3.0]
OIL PRESSURE @ IDLE - PSI [BAR]:	> 14.2 [0.98]

**COOLING SYSTEM**

COOLANT CAPACITY (ENGINE & HEAT EXCHANGER) - QTS [L]:	19.0 [18]	
THERMOSTAT RANGE:	START OPEN - °F [°C]:	169 [76]
	FULL OPEN - °F [°C]:	187 [86]
COOLANT PRESSURE MAXIMUM - PSI [BAR]:	13 [0.9]	
MAXIMUM ENGINE COOLANT TEMPERATURE - °F [°C]:	≤ 208 [98]	
ENGINE COOLANT FLOW @ FULL SPEED - GPM [M <sup>3</sup> /HR]:	47.1 [10.7]	
MINIMUM / MAXIMUM RAW WATER COOLING CAPACITY - GPM [M <sup>3</sup> /HR]:	35.2 [8]	
MINIMUM / MAXIMUM RAW WATER PRESSURE - PSI [BAR]:	36.3 [2.5]	
MAXIMUM RAW WATER TEMPERATURE - °F [°C]:	100 [37.8]	
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:	120
COLD CRANKING AMPS @ 0°F (-18°C):	750
RESERVE CAPACITY - AMPS:	223
CHARGING ALTERNATOR OUTPUT - AMPS:	35
STARTER CRANKING AMPS, ROLLING @ 0°F (-18°C):	210
MINIMUM CRANKING SPEED REQUIRED FOR UNAIDED COLD START - RPM:	260

● ALL DATA CERTIFIED WITHIN ±5%.

**FUEL SYSTEM**

INJECTION PUMP:	INLINE, PLUNGER TYPE
INJECTION PUMP ADVANCE ANGLE - °:	11
MINIMUM SUPPLY LINE SIZE - IN [MM]:	0.394 [10]
MINIMUM RETURN LINE SIZE - IN [MM]:	0.394 [10]
FUEL MANAGEMENT CONTROL:	MECHANICAL
FUEL CONSUMPTION @ 2950 RPM - LB/BHP-HR [G/KW-HR]:	0.452 [275]
IDLE SPEED - RPM:	800
MAXIMUM GOVERNED SPEED - RPM:	3245
MAXIMUM ALLOWABLE FUEL HEIGHT ABOVE FUEL PUMP - FT [M]:	9.8 [3]
GOVERNED SPEED RATE - %:	< 10

① ALL DATA CERTIFIED WITHIN ±5%.



**ENGINE MATERIALS & CONSTRUCTION**

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

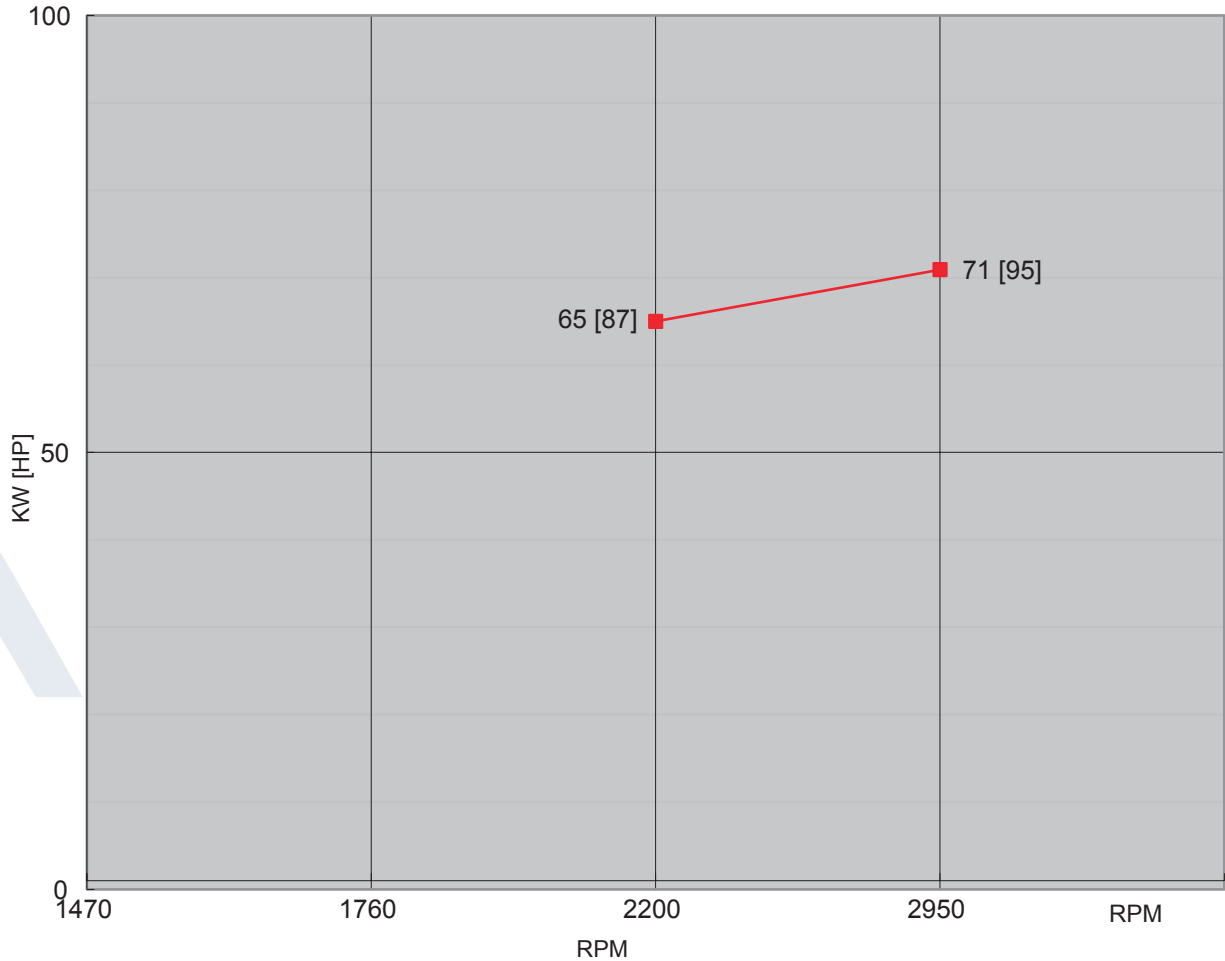
**SPARE PARTS LIST**

PART DESCRIPTION	QUANTITY	PART NUMBER	REMARKS
<b>LUBRICATION SYSTEM</b>			
OIL FILTER	1 PIECE	AF-1012101-A02-0000	
OIL PRESSURE SENSOR	1 PIECE	AF-21103-OPS	
<b>FUEL SYSTEM</b>			
FUEL FILTER	1 PIECE	AF-1117101-A01-00000	
INJECTION PUMP	1 PIECE	AF-4AW	
FUEL SUPPLY & RETURN HOSE	1 PIECE	AF4-105.4.1	
	1 PIECE	AF4-105.4.2	
<b>COOLING SYSTEM</b>			
HEAT EXCHANGER	1 PIECE	AF-AH300	
COOLING LOOP	1 SET	AF-CL0.75-00-CL	
COOLING HOSE (90° ELBOW)	2 SETS	AF-RE90-45/100P4	
COOLING HOSE (90° REDUCED ELBOW)	1 SET	AF-REC90-45-40/120P4	
COOLANT HOSE	1 PIECE	AF-8-3-300-CH	
	1 PIECE	AF-16-5-630-CH	
	1 PIECE	AF-16-5-1000-CH	
RUNNING WATER TEMPERATURE SENSOR	1 PIECE	AF-00105-WTR	
STANDBY WATER TEMPERATURE SENSOR	1 PIECE	AF-00105-WTS	
THERMOSTAT	1 PIECE	AF-1306010-001-0000Q	
PREHEATER	1 PIECE	AF-SH220200045 OR AF-SH110200045	
FLOW SENSOR	1 PIECE		
<b>CONTROL SYSTEM</b>			
STARTER	1 PIECE	AF-QDJ2516A-P	
ALTERNATOR	1 PIECE	AF-JFWZ29-109	
BATTERY	2 PIECES	AF-N200	
STARTER CONTACTOR	2 PIECES	AF	
OVERSPEED SHUTDOWN	1 PIECE	AF	
SPEED SENSOR	1 PIECE	AF	
INSTRUMENT PANEL	1 SET	AF-ENL-AB-ETS/R-B	
<b>TRANSMISSION SYSTEM</b>			
BELT	1 SET	AF-1308032-001-DD80-BT	
STOP SOLENOID	1 PIECE	AF-DF23005	
<b>INTAKE &amp; EXHAUST SYSTEM</b>			
AIR FILTER	1 PIECE	AF-ECC10504	
TURBOCHARGER	1 PIECE	AF	

**POWER CURVE**

CURVE NUMBER:	C04102B	DATE:	09/01/2020
DISPLACEMENT - IN <sup>3</sup> [L]:	236 [3.86]	ASPIRATION:	TURBOCHARGED
POWER STANDARD:	UL	BORE & STROKE - IN [MM]:	4.02 x 4.65 [102 x 118]
NUMBER OF CYLINDERS:	4	FUEL SYSTEM:	INLINE, MECHANICAL

● ALL DATA CERTIFIED WITHIN ±5%.



TORQUE		
SPEED	LB-FT	N-M
RPM		
1470		
1760		
2200	208	282
2950	169	230

OUTPUT POWER		
SPEED	HP	KW
RPM		
1470		
1760		
2200	87	65
2950	95	71

FUEL CONSUMPTION		
SPEED	LB/BHP-HR	G/KW-HR
RPM		
1470		
1760		
2200	0.452	275
2950	0.452	275

● 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 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.

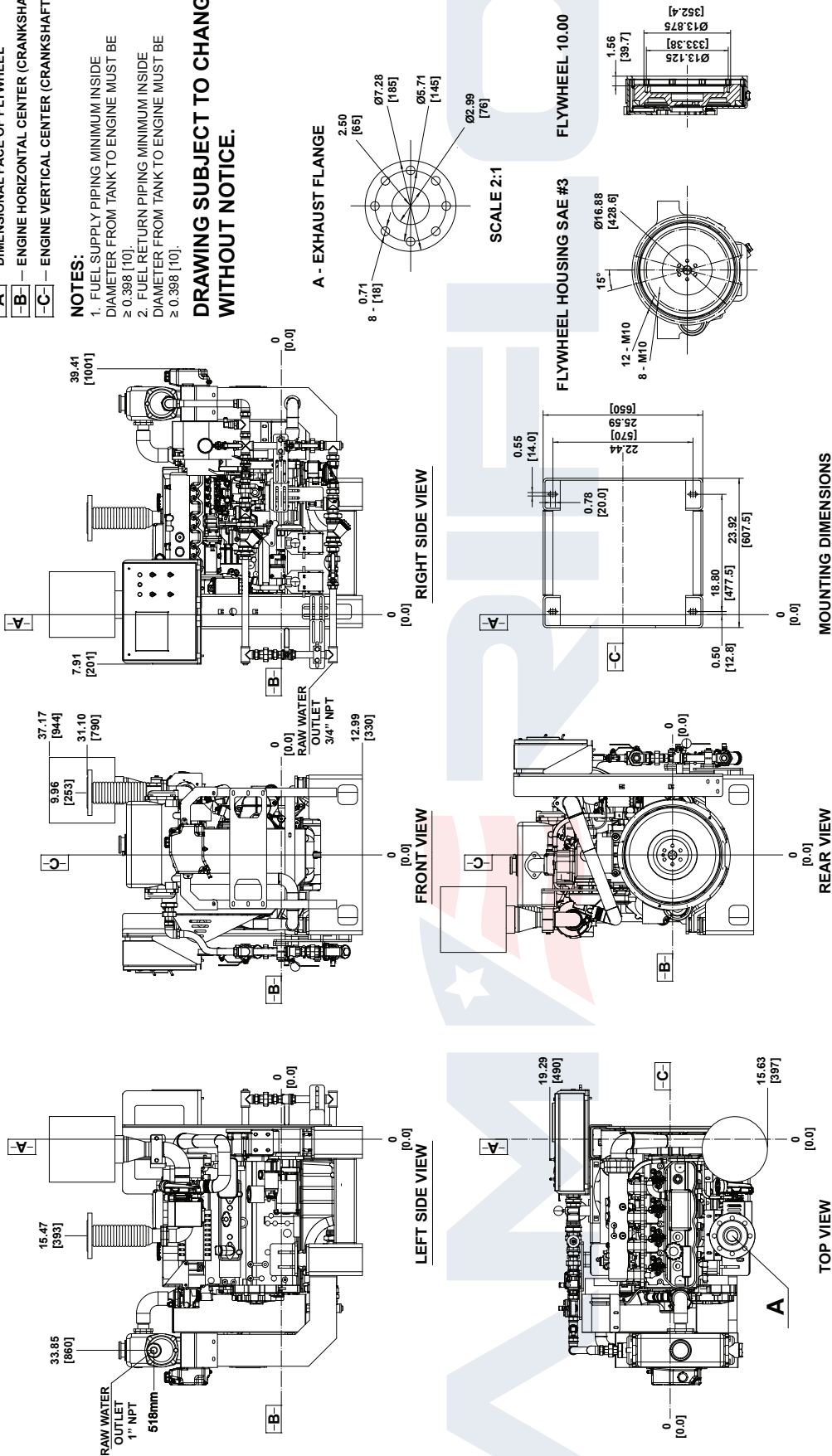
**DATUMS:**

- A- DIMENSIONAL FACE OF FLYWHEEL
- B- ENGINE HORIZONTAL CENTER (CRANKSHAFT)
- C- ENGINE VERTICAL CENTER (CRANKSHAFT)

**NOTES:**

- FUEL SUPPLY PIPING MINIMUM INSIDE DIAMETER FROM TANK TO ENGINE MUST BE  $\geq 0.398$  [10].
- FUEL RETURN PIPING MINIMUM INSIDE DIAMETER FROM TANK TO ENGINE MUST BE  $\geq 0.398$  [10].

**DRAWING SUBJECT TO CHANGE WITHOUT NOTICE.**



**MOUNTING DIMENSIONS**

**REAR VIEW**

**TOP VIEW**

REV	UNITS IN/MM
A	
REV	

DATE:	09/01/2020	NAME:	INSTALLATION DRAWING
DRW BY:	MJF	DIESEL FIRE PUMP DRIVER	PROJECT:
CHK BY:		MODEL AF4-102B	
APPROVED:		PART NO.:	AF4-102B-00
DATE:		MATERIAL:	

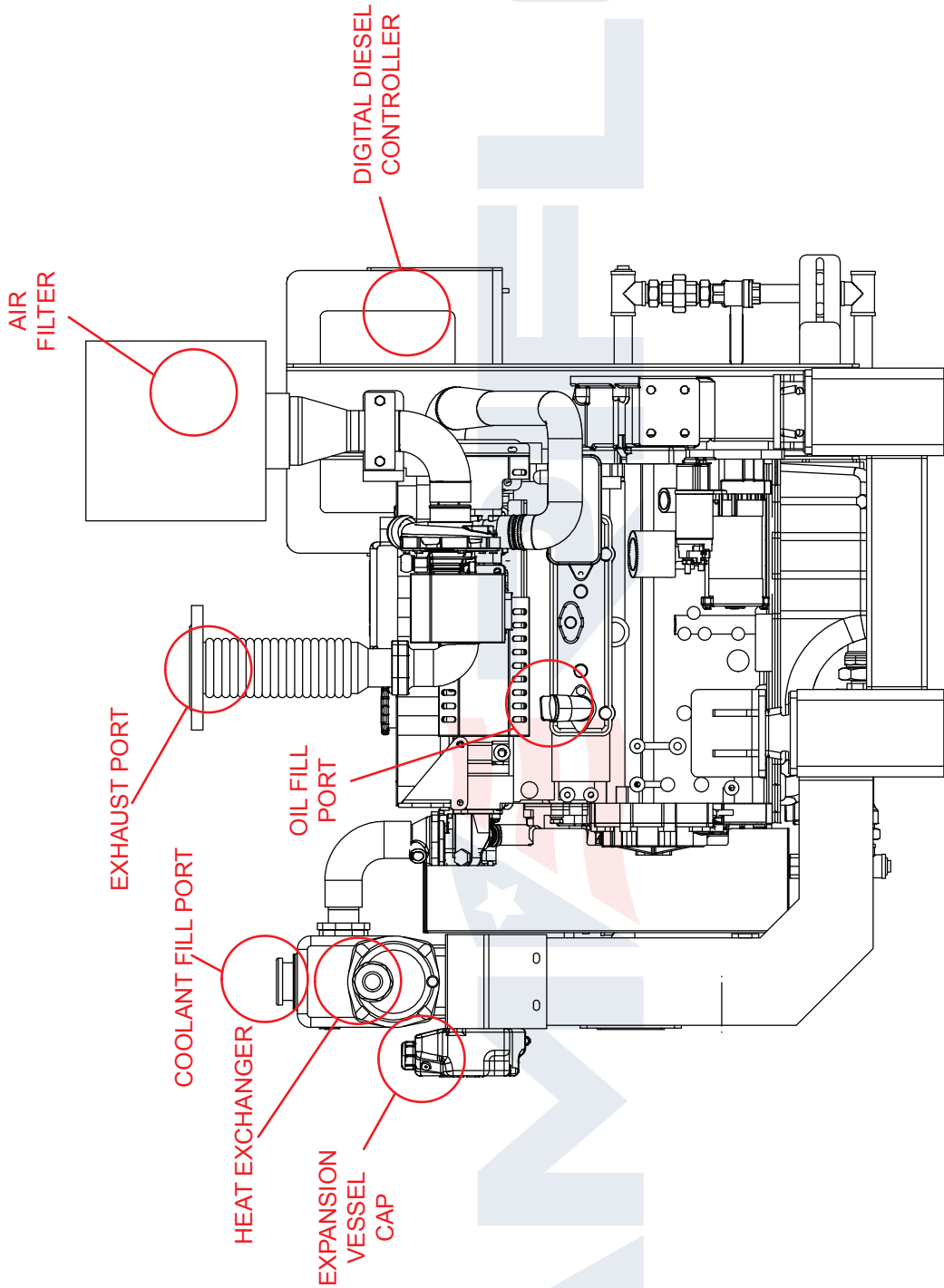
SCALE:	PAGE	OF
NONE	1	1

**NOTES:**

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







**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)	SCALE	PAGE	OF
		NONE	1	1
		NAME: INSTALLATION DRAWING DIESEL FIRE PUMP DRIVER MODEL AF4-102B		
		PROJECT:		
		PART NO.: <b>AF4-102B-LEFT</b> MATERIAL:		
DRW BY: MJF	DATE: 09/01/2020	APPROVED: DATE:		
CHK BY:	DATE:			
	09/01/2020		DATE	
	MJF		APVD	
			DWN	
			DESCRIPTION	
A			CREATION	
REV				





