

UL - cUL LISTED RATINGS BHP & KW

ENGINE MODEL:	AF4-105
EMISSIONS:	TIER 0
DATE:	09/01/2020
DRAWING NUMBER:	AF4-105.00
PERFORMANCE CURVE NUMBER:	C04105
RATED POWER:	86 BHP @ 2950 RPM 64 KW @ 2950 RPM
REFERENCE NUMBER:	16DS001E
VERSION:	A



GENERAL ENGINE DATA

TYPE:	4 CYCLE; INLINE; WATER COOLED	
NUMBER OF CYLINDERS:	4	
ASPIRATION:	NATURALLY	
BORE & STROKE - IN [MM]:	4.13 x 4.65 [105 x 118]	
CYLINDER LINER TYPE:	<input type="checkbox"/> WET <input checked="" type="checkbox"/> DRY	
DISPLACEMENT - IN ³ [L]:	250 [4.09]	
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]:	0.014 ~ 0.016 [0.35 ~ 0.40]
	EXHAUST - IN [MM]:	0.016 ~ 0.018 [0.40 ~ 0.45]
IGNITION TYPE:	COMPRESSION (DIESEL)	
CHARGE AIR COOLING TYPE:	N/A	
WEIGHT (FUEL PUMP CONFIGURATION) - LBS [KG]:	1124 [510]	
DIMENSIONS (L x W x H) - IN [MM]:	49 x 35 x 42 [1245 x 900 x 1075]	
FLYWHEEL / FLYWHEEL HOUSING DIMENSIONS:	10.00 / SAE #3	
TORQUE @ RATED RPM - LB-FT [N-M]:	172 [232]	

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]:	≤ 1166 [630]
EXHAUST GAS FLOW @ MAXIMUM OUTPUT - LBS/HR [KG/HR]:	904 [410]
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 ³ /HR]:	235 [400]
AIR INLET RESTRICTION (DIRTY) - PSI [KPA]:	≤ 0.73 [5]
AIR INLET RESTRICTION (CLEAN) - PSI [KPA]:	≤ 0.36 [2.5]

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]:	36.3 - 65.3 [2.5 - 4.5]
OIL PRESSURE @ IDLE - PSI [BAR]:	≥ 17.4 [1.2]

COOLING SYSTEM

COOLANT CAPACITY (ENGINE & HEAT EXCHANGER) - QTS [L]:	15.8 [15]	
THERMOSTAT RANGE:	START OPEN - °F [°C]:	162 [72]
	FULL OPEN - °F [°C]:	180 [82]
COOLANT PRESSURE MAXIMUM - PSI [BAR]:	13 [0.9]	
MAXIMUM ENGINE COOLANT TEMPERATURE - °F [°C]:	≤ 203 [95]	
ENGINE COOLANT FLOW @ FULL SPEED - GPM [M ³ /HR]:	30.8 [7]	
MINIMUM / MAXIMUM RAW WATER COOLING CAPACITY - GPM [M ³ /HR]:	10 ~ 18 [2.3 ~ 4]	
MINIMUM / MAXIMUM RAW WATER PRESSURE - PSI [BAR]:	14.5 ~ 43.5 [1 ~ 3]	
MAXIMUM RAW WATER TEMPERATURE - °F [°C]:	100 [37.8]	
RAW WATER INTAKE PIPE SIZE:	RAW WATER INLET - IN:	0.50 NPT
	RAW WATER OUTLET - IN:	0.75 NPT

HEATER SYSTEM

WATTAGE - W:	1190
VOLTAGE (AC) - V:	240

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):	638
RESERVE CAPACITY - AMPS:	224
CHARGING ALTERNATOR OUTPUT - AMPS:	27
STARTER CRANKING AMPS, ROLLING @ 0°F (-18°C):	290
MINIMUM CRANKING SPEED REQUIRED FOR UNAIDED COLD START - RPM:	380

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FUEL SYSTEM

INJECTION PUMP:	INLINE, PLUNGER TYPE
INJECTION PUMP ADVANCE ANGLE - °:	18 ± 1
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]:	0.398 [242]
IDLE SPEED - RPM:	800
MAXIMUM GOVERNED SPEED - RPM:	3300
MAXIMUM ALLOWABLE FUEL HEIGHT ABOVE FUEL PUMP - FT [M]:	9.8 [3]
GOVERNED SPEED RATE - %:	≤ 10

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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	CAST ALUMINUM	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		

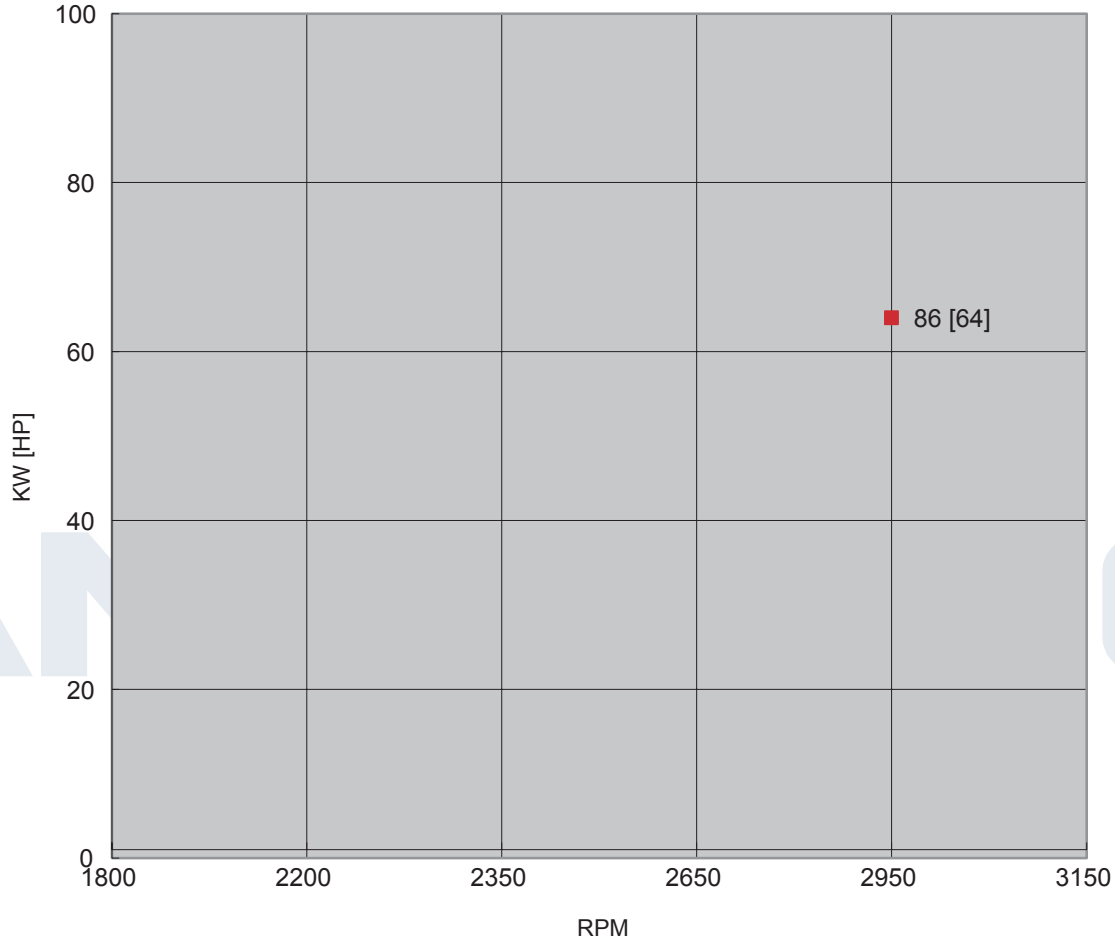
SPARE PARTS LIST

PART DESCRIPTION	QUANTITY	PART NUMBER	REMARKS
LUBRICATION SYSTEM			
OIL FILTER	1 PIECE	2AF-410201120002	
OIL PRESSURE SENSOR	1 PIECE	AF-21103-OPS	
FUEL SYSTEM			
FUEL FILTER	1 PIECE	AF-2410201250001	
INJECTION PUMP	1 PIECE	AF-2410201240019	
FUEL SUPPLY & RETURN HOSE	1 PIECE	AF4-105-4.1	
	1 PIECE	AF4-105.4.2	
COOLING SYSTEM			
HEAT EXCHANGER	1 PIECE	AF-AH300	
COOLING LOOP	1 SET	AF-CL0.5-00-CL	
COOLING HOSE (STRAIGHT)	2 SETS	AF-38-5-120-CHE	
	1 SET	AF-45-5-120-CHE	
COOLING HOSE	1 SET	AF-16-5-1000-CH	
	1 SET	AF-16-5-700-CH	
WATER PUMP	1 PIECE	AF-2410201920000	
WATER TEMPERATURE SENSOR	1 PIECE	AF-00121-WTR	
	1 PIECE	AF-00102-WTS	
THERMOSTAT	1 PIECE	AF-2210504300100	
PREHEATER	1 PIECE	AF-HT10-2	
FLOW SENSOR	1 PIECE	AF	
CONTROL SYSTEM			
STARTER	1 PIECE	AF-2410202610023	
ALTERNATOR	1 PIECE	AF-2409002310103	
BATTERY	2 PIECES	AF-N200	
STARTER CONTACTOR	2 PIECES	F	
OVERSPEED SHUTDOWN	1 PIECE	AF	
SPEED SENSOR	1 PIECE	AF	
INSTRUMENT PANEL	1 SET	AF-ENL-AB-ETS	
TRANSMISSION SYSTEM			
BELT	1 SET	AF-AV17X1143LI-BT	
STOP SOLENOID	1 PIECE	AF-5295568-SN	
INTAKE & EXHAUST SYSTEM			
AIR FILTER	1 PIECE	AF-12015570-AF	

POWER CURVE

CURVE NUMBER:	C04105	DATE:	09/01/2020
DISPLACEMENT - IN ³ [L]:	250 [4.09]	ASPIRATION:	NATURALLY
POWER STANDARD:	UL	BORE & STROKE - IN [MM]:	4.13 x 4.65 [105 x 118]
NUMBER OF CYLINDERS:	4	FUEL SYSTEM:	INLINE, MECHANICAL

● ALL DATA CERTIFIED WITHIN ±5%.

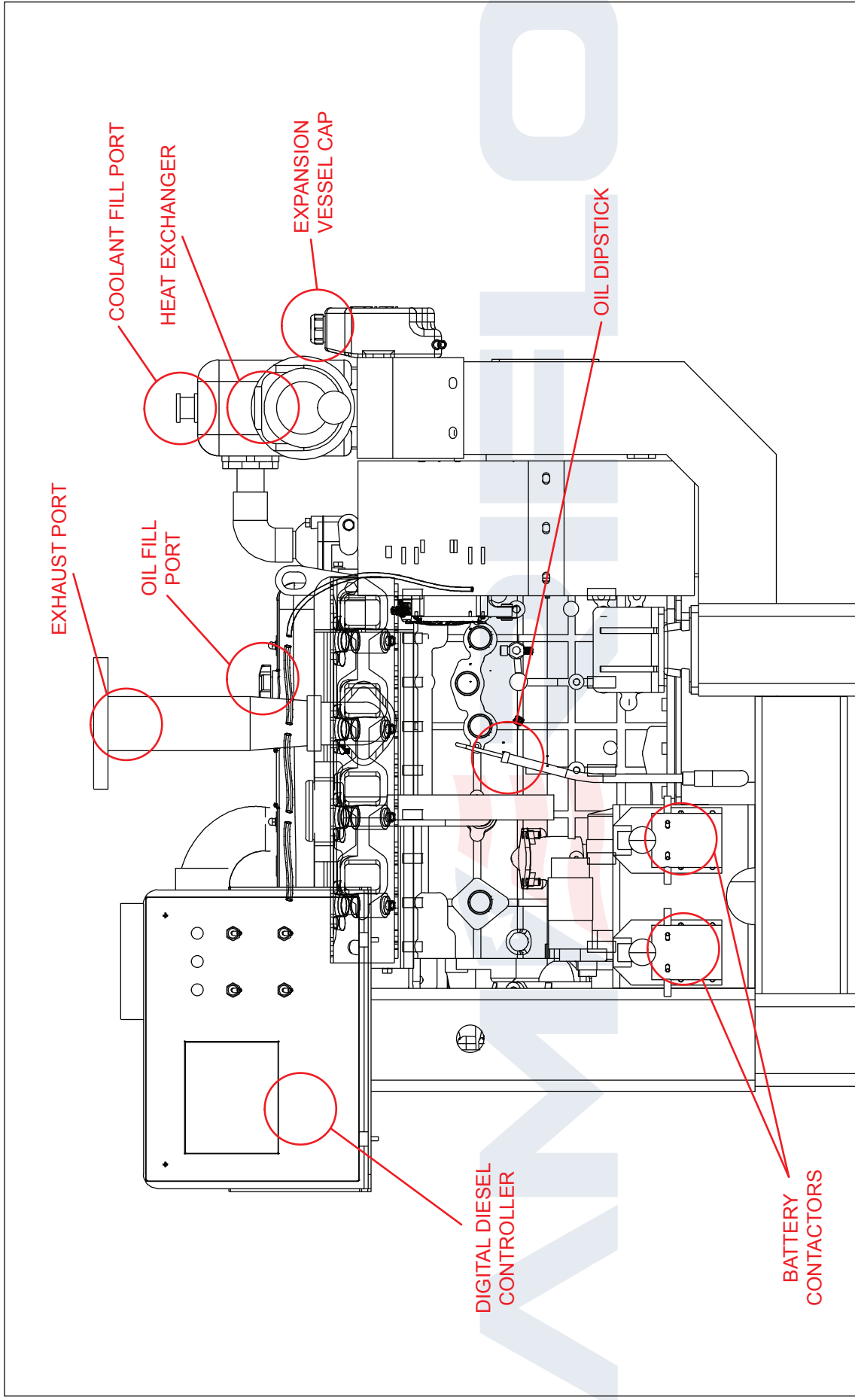


TORQUE		
SPEED	LB-FT	N-M
RPM		
1800		
2200		
2350		
2650		
2950	171	232
3150		

OUTPUT POWER		
SPEED	HP	KW
RPM		
1800		
2200		
2350		
2650		
2950	86	64
3150		

FUEL CONSUMPTION		
SPEED	LB/BHP-HR	G/KW-HR
RPM		
1800		
2200		
2350		
2650		
2950	0.398	242
3150		

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NOTES:

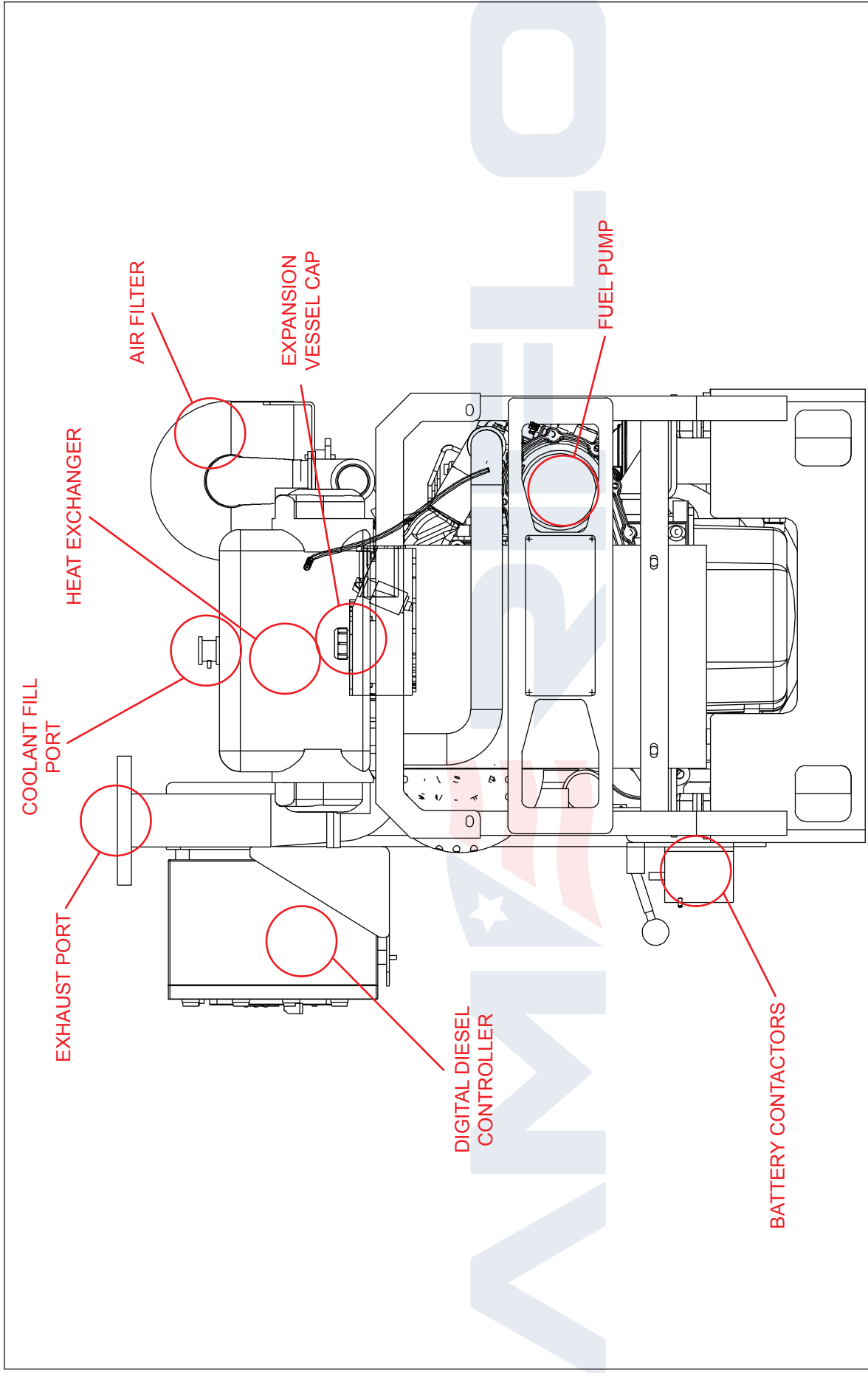
1. ALL PLUMBING MUST BE SUPPORTED AND/OR ISOLATED SO THAT NO WEIGHT OR STRESS IS APPLIED TO ANY ENGINE COMPONENT.
2. REFER TO SPECIFIC MODELS' INSTALLATION, OPERATION & MAINTENANCE MANUAL FOR INSTALLATION GUIDELINES.

REV	UNITS IN/[MM]
A	
REV	

DESCRIPTION	DWN	APVD	DATE
CREATION	MJF		09/01/2020

NAME:	DATE:	DATE:	DATE:
INSTALLATION DRAWING	09/01/2020		
DIESEL FIRE PUMP DRIVER			
MODEL AF4-105			
PART NO.:	APPROVED:	DATE:	
AF4-105-RIGHT			
MATERIAL:			

SCALE:	PAGE	OF
NONE	1	1



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REV	UNITS	PROJECT	SCALE	PAGE	OF
	(IN/MM)				
		PROJECT:		1	1
		NAME: INSTALLATION DRAWING DIESEL FIRE PUMP DRIVER			
		DATE: 09/01/2020			
		CHK BY: MJF			
		DATE: 09/01/2020			
		APPROVED: DATE:			
		PART NO: AF4-105-FRONT			
		MATERIAL:			
		DESCRIPTION	DWN	APVD	DATE
		CREATION	MJF		
A					
REV					

