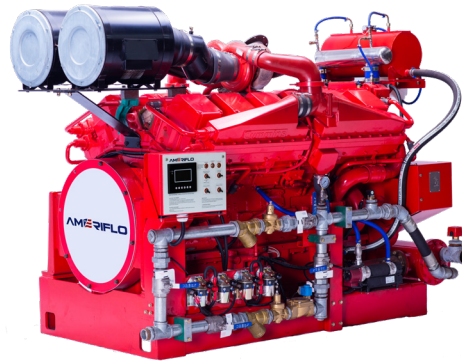


**UL - cUL LISTED RATINGS BHP & KW**

<b>ENGINE MODEL:</b>	AF12-159
<b>EMISSIONS:</b>	TIER 0
<b>DATE:</b>	09/01/2020
<b>DRAWING NUMBER:</b>	AF12-159.00
<b>PERFORMANCE CURVE NUMBER:</b>	C12159
<b>RATED POWER:</b>	1207 BHP @ 1760 RPM 900 KW @ 1760 RPM
<b>REFERENCE NUMBER:</b>	14DS001E
<b>VERSION:</b>	A


**GENERAL ENGINE DATA**

TYPE:	4 CYCLE; V-TYPE; WATER COOLED	
NUMBER OF CYLINDERS:	12	
ASPIRATION:	TURBOCHARGED + WATER COOLED	
BORE & STROKE - IN [MM]:	6.26 x 6.26 [159 x 159]	
CYLINDER LINER TYPE:	<input checked="" type="checkbox"/> WET <input type="checkbox"/> DRY	
DISPLACEMENT - IN <sup>3</sup> [L]:	2319 [38]	
COMPRESSION RATIO:	13.9:01	
FIRING ORDER:	1R-6L-5R-2L-3R-4L-6R-1L-2R-5L-4R-3L	
COMBUSTION SYSTEM:	DIRECT INJECTION	
ROTATION (AS VIEWED FROM FRONT OF ENGINE):	CCW	
VALVES PER CYLINDER:	INTAKE: 2   EXHAUST: 2	
VALVE LASH (COLD ENGINE):	INTAKE - IN [MM]:	0.014 [0.36]
	EXHAUST - IN [MM]:	0.028 [0.69]
IGNITION TYPE:	COMPRESSION (DIESEL)	
CHARGE AIR COOLING TYPE:	RAW WATER	
WEIGHT (FUEL PUMP CONFIGURATION) - LBS [KG]:	10119 [4590]	
DIMENSIONS (L x W x H) - IN [MM]:	100 x 58 x 69 [2545 x 1475 x 1760]	
FLYWHEEL / FLYWHEEL HOUSING DIMENSIONS:	18.00 / SAE #0	
TORQUE @ RATED RPM - LB-FT [N-M]:	3601 [4884]	

**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]:	≤ 1134 [612]
EXHAUST GAS FLOW @ MAXIMUM OUTPUT - CFM [M <sup>3</sup> /HR]:	7005 [11902]
MAXIMUM ALLOWABLE BACK PRESSURE - PSI [KPA]:	1.45 [10]
MINIMUM EXHAUST PIPE DIAMETER - IN [MM]:	2 x 6 [150]

**AIR INTAKE SYSTEM**

AIR CLEANER TYPE:	DRY TYPE, DISPOSABLE
AIR FLOW - CFM [M <sup>3</sup> /HR]:	1295 [2200]
AIR INLET RESTRICTION (DIRTY) - PSI [KPA]:	≤ 0.90 [6.2]
AIR INLET RESTRICTION (CLEAN) - PSI [KPA]:	≤ 0.54 [3.7]

**LUBRICATION SYSTEM**

OIL CAPACITY (ENGINE ONLY) - QTS [L]:	137.4 [130]
MAXIMUM SUMP OIL TEMPERATURE - °F [°C]:	250 [121]
NORMAL OPERATING OIL PRESSURE RANGE - PSI [BAR]:	44.7 ~ 65.3 [3.1 ~ 4.5]
OIL PRESSURE @ IDLE - PSI [BAR]:	> 20.0 [1.38]

**COOLING SYSTEM**

COOLANT CAPACITY (ENGINE & HEAT EXCHANGER) - QTS [L]:	221.9 [210]	
THERMOSTAT RANGE:	START OPEN - °F [°C]:	176 [80]
	FULL OPEN - °F [°C]:	194 [90]
COOLANT PRESSURE MAXIMUM - PSI [BAR]:	13 [0.9]	
MAXIMUM ENGINE COOLANT TEMPERATURE - °F [°C]:	≤ 199 [93]	
ENGINE COOLANT FLOW @ FULL SPEED - GPM [M <sup>3</sup> /HR]:	414 [94]	
RAW WATER COOLING CAPACITY - GPM [M <sup>3</sup> /HR]:	185 [42]	
RAW WATER PRESSURE - PSI [BAR]:	29 [2.0]	
MAXIMUM RAW WATER TEMPERATURE - °F [°C]:	100 [37.8]	
RAW WATER INTAKE PIPE SIZE:	RAW WATER INLET - IN:	2.00 NPT
	RAW WATER OUTLET - IN:	2.50 NPT

**HEATER SYSTEM**

WATTAGE - W:	2 x 3000
VOLTAGE (AC) - V:	220

**DC ELECTRICAL SYSTEM**

NORMAL SYSTEM VOLTAGE - V:	24
STARTER MOTOR - HP [KW]:	11.9 [8.9]
RECOMMENDED MINIMUM BATTERY SIZE - AH:	4 x 200
COLD CRANKING AMPS @ 0°F (-18°C):	1000
RESERVE CAPACITY - AMPS:	407
CHARGING ALTERNATOR OUTPUT - AMPS:	70
STARTER CRANKING AMPS, ROLLING @ 0°F (-18°C):	570
MINIMUM CRANKING SPEED REQUIRED FOR UNAIDED COLD START - RPM:	150

● ALL DATA CERTIFIED WITHIN ±5%.

**FUEL SYSTEM**

INJECTION PUMP:	V-TYPE, PLUNGER TYPE
INJECTION PUMP ADVANCE ANGLE - °:	4.67 ~ 4.78
MINIMUM SUPPLY LINE SIZE - IN [MM]:	0.75 [19]
MINIMUM RETURN LINE SIZE - IN [MM]:	0.63 [16]
FUEL MANAGEMENT CONTROL:	MECHANICAL
FUEL CONSUMPTION @ 1760 RPM - LB/BHP-HR [G/KW-HR]:	0.352 [214]
IDLE SPEED - RPM:	650
MAXIMUM GOVERNED SPEED - RPM:	1936
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	OVERHEAD	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, FRACTURE	MATERIAL	
MATERIAL	FORGED 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	ALLOY STEEL	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	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	CAST IRON ALLOY	STRAINER	BRASS
<b>PISTONS:</b>		<b>COOLING LOOP (316 STAINLESS STEEL):</b>	
TYPE	TRUNK	TEES, ELBOWS, PIPE	316 STAINLESS STEEL
MATERIAL	ALUMINUM ALLOY	BALL VALVES	316 STAINLESS STEEL
<b>PISTON PINS:</b>		SOLENOID VALVE	316 STAINLESS STEEL
TYPE	FULL FLOATING	PRESSURE REGULATOR	316 STAINLESS STEEL
MATERIAL	ALLOY STEEL	STRAINER	316 STAINLESS STEEL
<b>PISTON RINGS:</b>		<b>FUEL SYSTEM</b>	
FIRST	DUCTILE CAST IRON	<b>FUEL INJECTION PUMP:</b>	
SECOND	ALLOY CAST IRON	TYPE	FULL MECHANICAL, CENTRIFUGAL
THIRD	ALLOY CAST IRON	DRIVE	GEAR DRIVEN
<b>VALVES:</b>		<b>LUBRICATION SYSTEM</b>	
TYPE	POPPET	TYPE	GEROTOR
ARRANGEMENT	OVERHEAD	DRIVE	GEAR
VALVE # PER CYLINDER	2 INTAKE, 2 EXHAUST		
OPERATING MECHANISM	MECHANICAL ROCKER ARM		
LIFTER TYPE	LARGE HEAD		

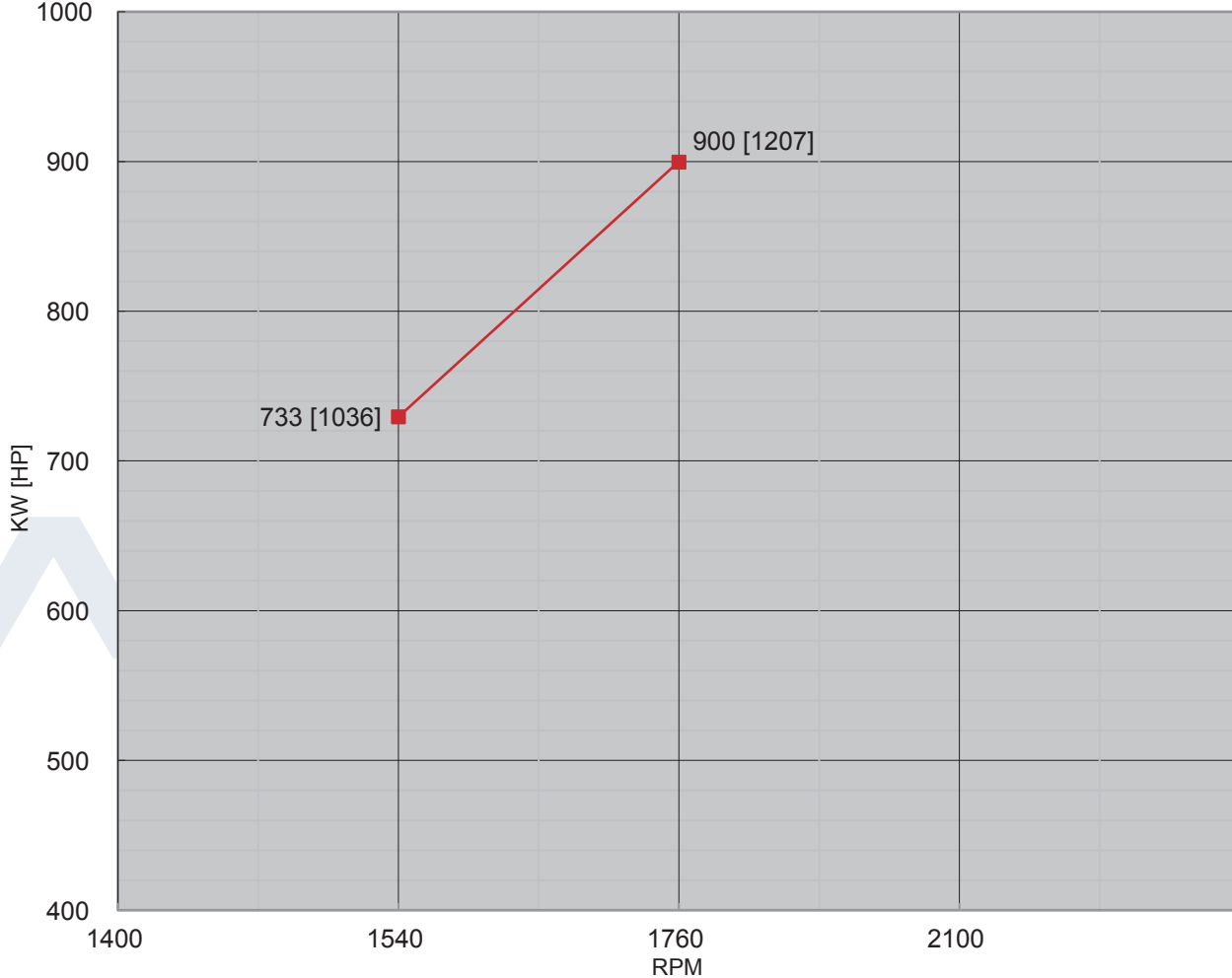
**SPARE PARTS LIST**

PART DESCRIPTION	QUANTITY	PART NUMBER	REMARKS
<b>LUBRICATION SYSTEM</b>			
OIL FILTER	4 PIECES	AF-3889310	
OIL PRESSURE SENSOR	1 PIECE	AF-21103-OPS	
<b>FUEL SYSTEM</b>			
FUEL FILTER	2 PIECES	AF-3889311	
INJECTION PUMP	1 PIECE	AF-4951430	
FUEL SUPPLY & RETURN HOSE	1 PIECE	AF12-159-12.1	
	1 PIECE	AF12-159-12.2	
<b>COOLING SYSTEM</b>			
HEAT EXCHANGER	1 PIECE	AF-K1300-HE	
COOLING LOOP	1 SET	AF-CL2-00-CL	
COOLING HOSE (STRAIGHT)	2 PIECES	AF-S-76/100P4	
	1 PIECE	AF-S-108/120P4	
COOLING HOSE (STRAIGHT REDUCER)	1 PIECE	AF-SE127-108/150P4	
COLLING HOSE	1 PIECE	AF-8-3-800-CH	
	4 PIECES	AF-16-5-1000-CH	
WATER PUMP	1 PIECE		
RUNNING WATER TEMPERATURE SENSOR	1 PIECE	AF-00108-WTR	
STANDBY WATER TEMPERATURE SENSOR	1 PIECE	AF-00108-WTS	
THERMOSTAT	4 PIECES	AF-3629305	
PREHEATER	1 PIECE	AF-TSW5023013000MC OR AF-TSG6012012000MC	
FLOW SENSOR	1 PIECE	AF	
<b>CONTROL SYSTEM</b>			
STARTER	1 PIECE	AF-3636817	
ALTERNATOR	1 PIECE	AF-3935530	
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-ETR-B(R)	
<b>TRANSMISSION SYSTEM</b>			
BELT	1 PIECE	AF-5413029	
STOP SOLENOID	1 PIECE	AF-3017993	
<b>INTAKE &amp; EXHAUST SYSTEM</b>			
AIR FILTER	1 PIECE	AF-3630751	
TURBOCHARGER	2 PIECES	AF	

**POWER CURVE**

CURVE NUMBER:	C12159	DATE:	09/01/2020
DISPLACEMENT - IN <sup>3</sup> [L]:	2258 [38.0]	ASPIRATION:	TURBOCHARGED + WATER COOLED
POWER STANDARD:	UL	BORE & STROKE - IN [MM]:	6.26 x 6.26 [159 x 159]
NUMBER OF CYLINDERS:	12	FUEL SYSTEM:	V-TYPE, MECHANICAL

● ALL DATA CERTIFIED WITHIN ±5%.

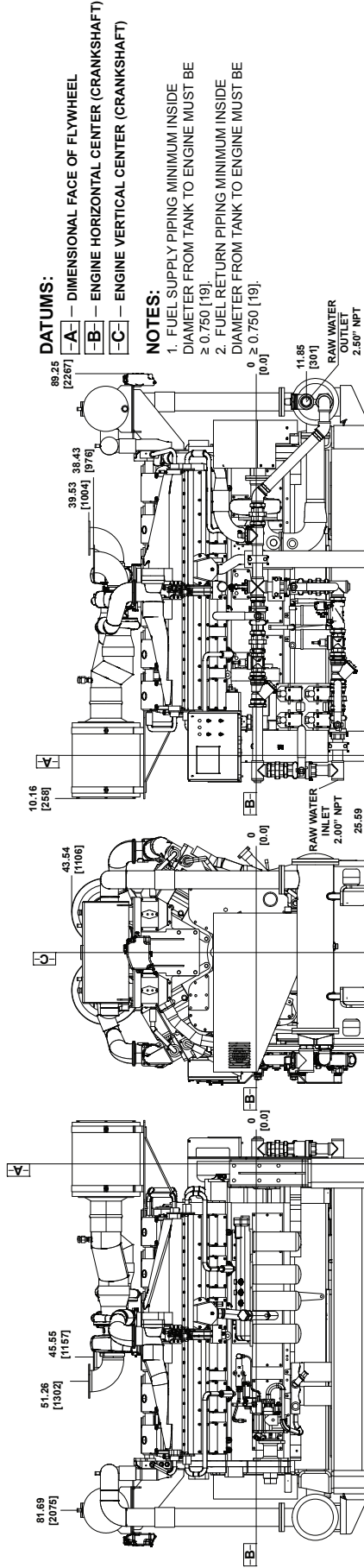


TORQUE		
SPEED	LB-FT	N-M
RPM		
1150		
1540	3534	4792
1760	3601	4884
2100		

OUTPUT POWER		
SPEED	HP	KW
RPM		
1150		
1540	1036	773
1760	1207	900
2100		

FUEL CONSUMPTION		
SPEED	LB/BHP-HR	G/KW-HR
RPM		
1150		
1540	0.332	202
1760	0.352	214
2100		

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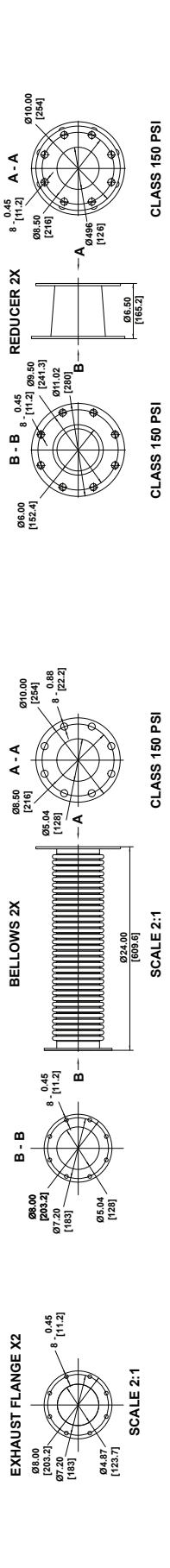
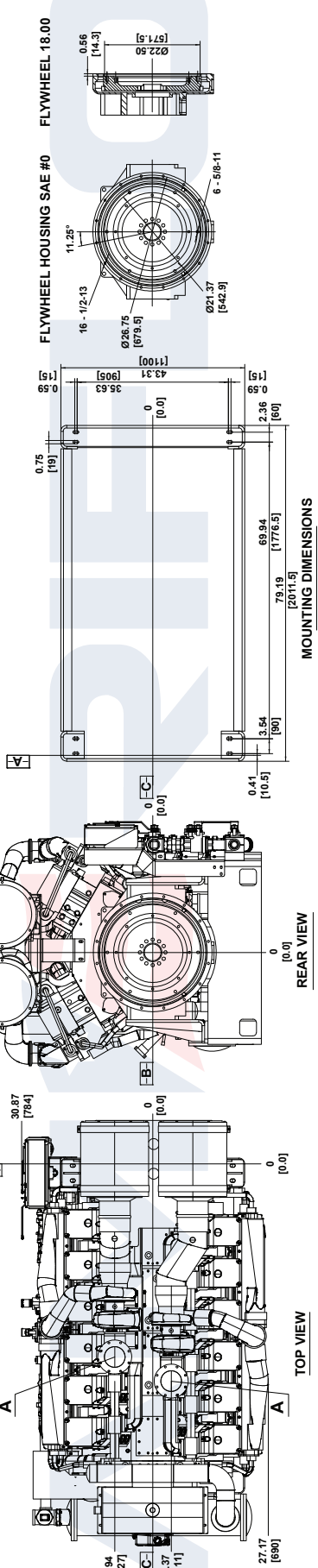


**DRAWING SUBJECT TO CHANGE WITHOUT NOTICE.**

**RIGHT SIDE VIEW**

**FRONT VIEW**

**LEFT SIDE VIEW**



REV	DESCRIPTION	DWN	APVD	DATE	APPROVED: DATE:	MATERIAL:
A	CREATION	MJF		09/01/2020		
REV	DESCRIPTION	DWN	APVD	DATE	APPROVED: DATE:	MATERIAL:
1						
1						

DATE:	NAME:	PROJECT:
09/01/2020	INSTALLATION DRAWING	
	DIESEL FIRE PUMP DRIVER	
	MODEL AF12-159	

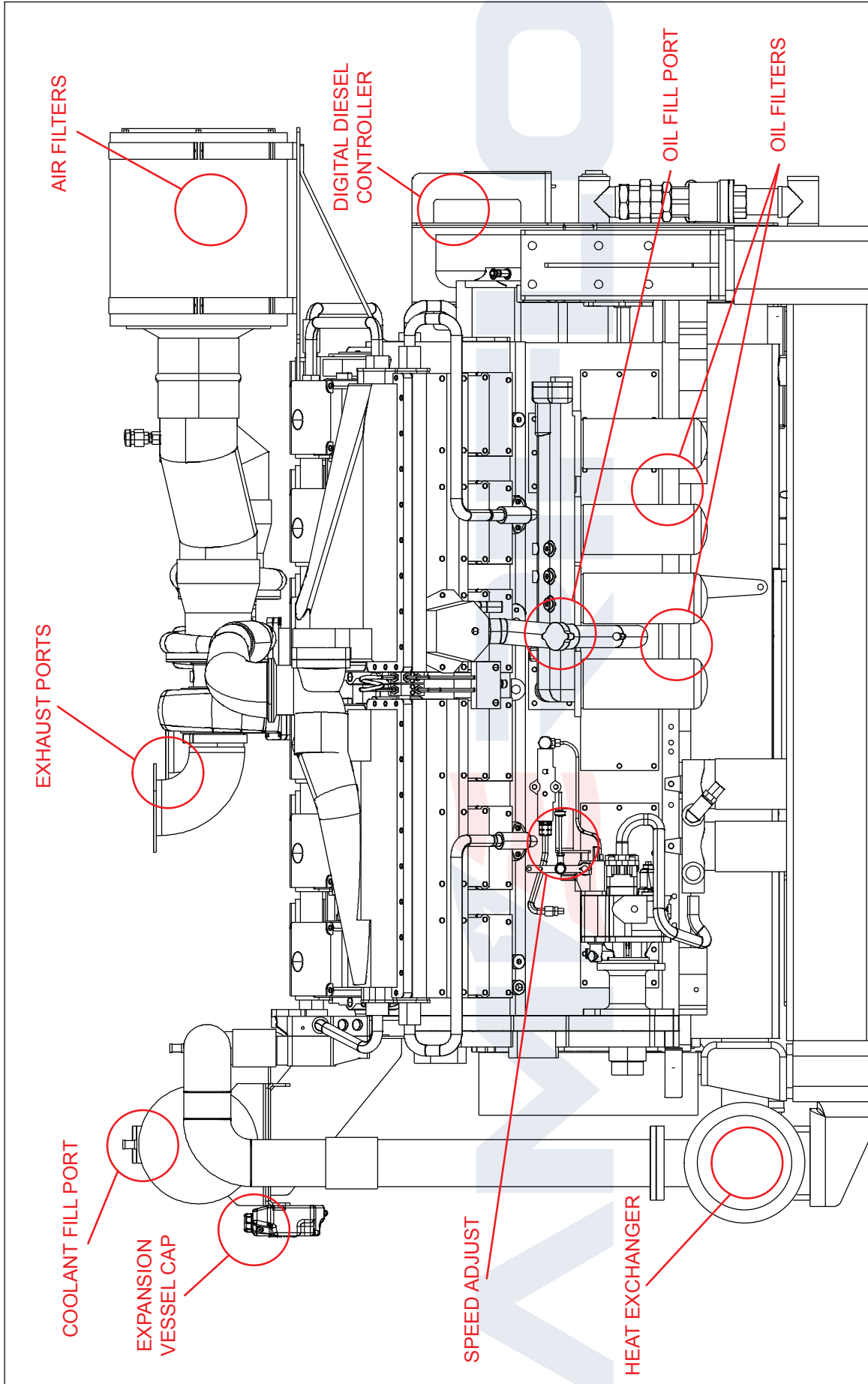
SCALE:	PAGE:	OF:
NONE	1	1

**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.



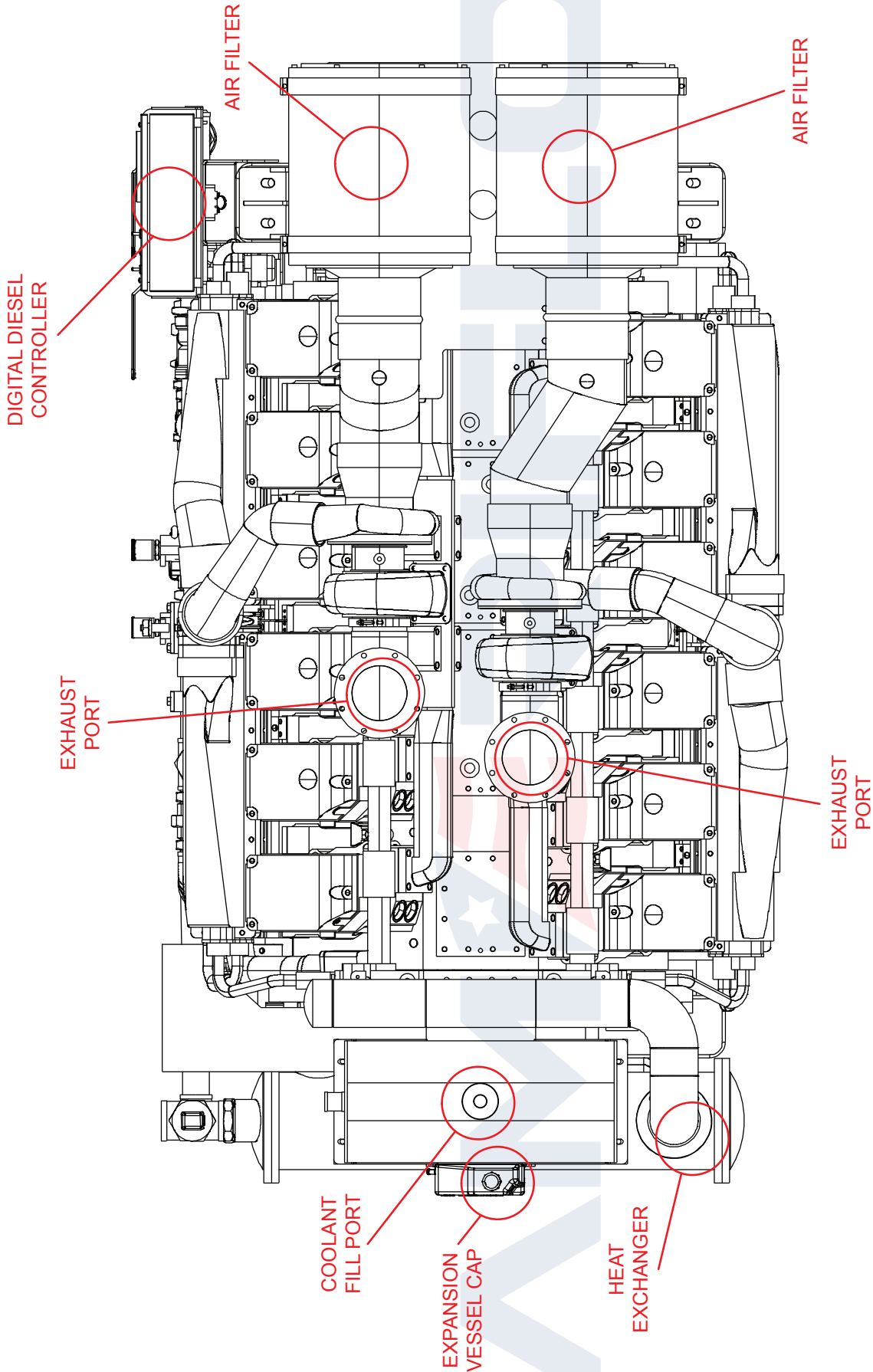






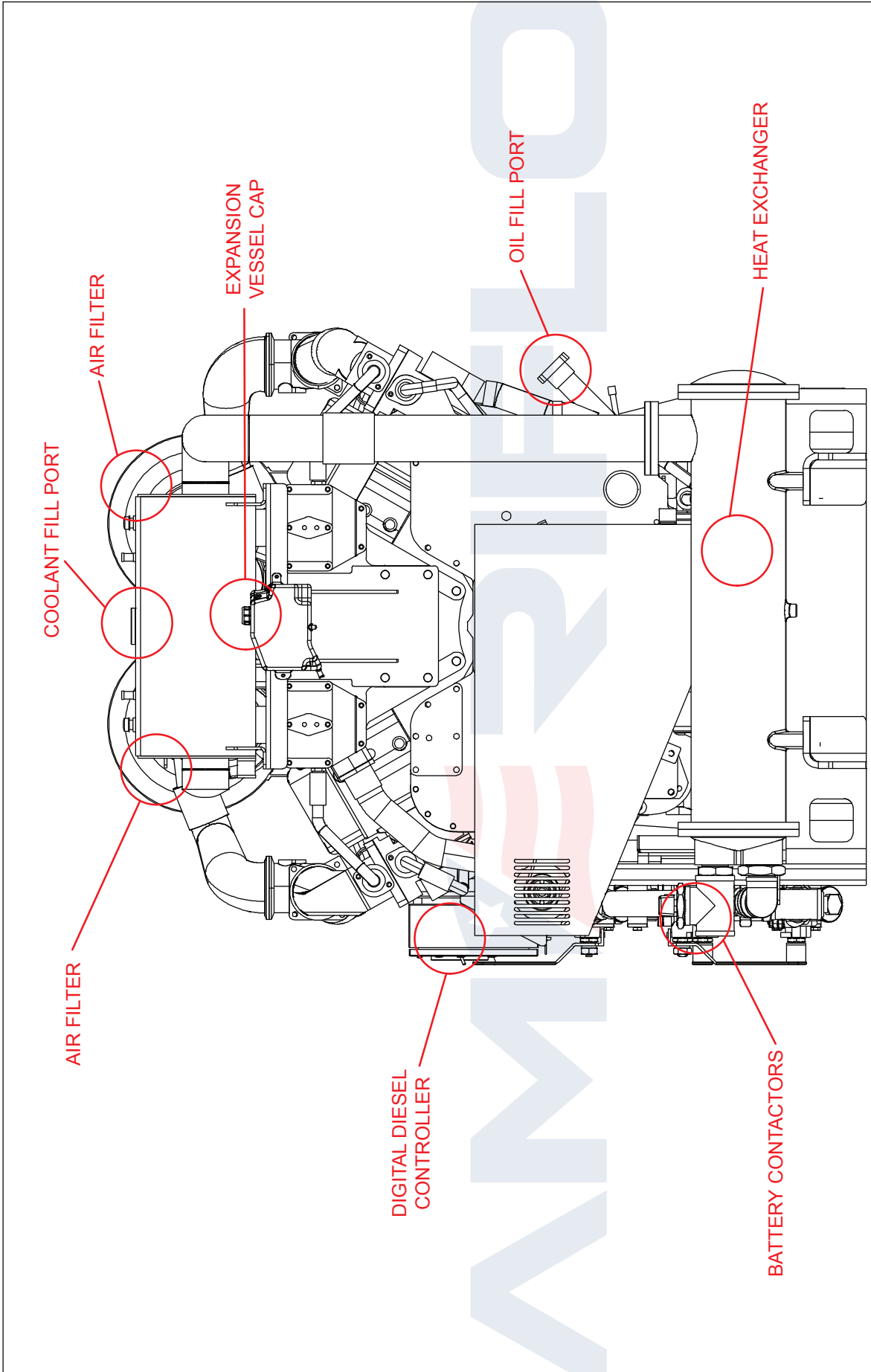
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		DATE: 09/01/2020			
		DRW BY: MJF			
		CHK BY:			
		DATE: 09/01/2020			
		APPROVED: DATE:			
		DATE:			
		APVD			
		DWN			
		DESCRIPTION			
		REV			

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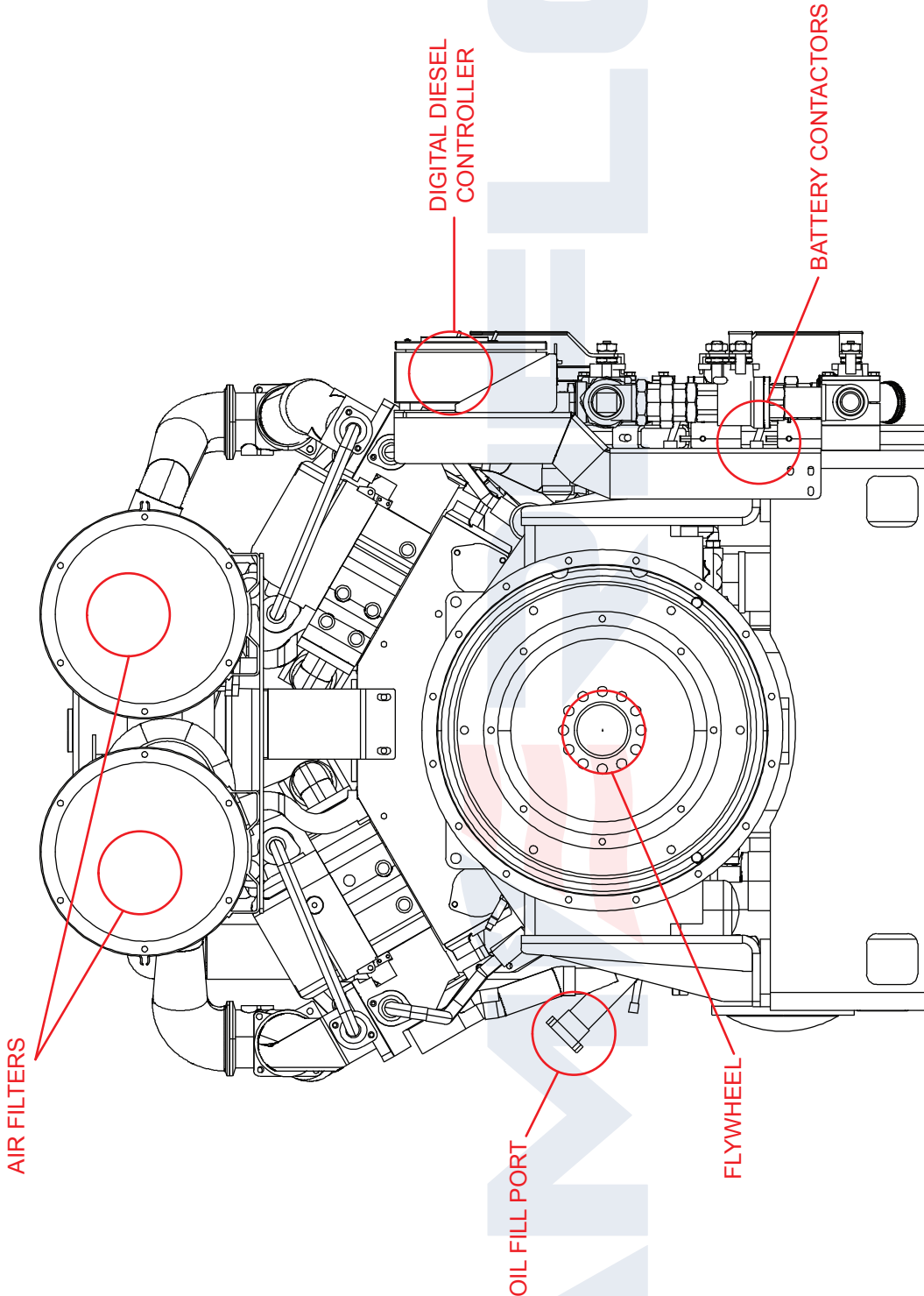
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								REV	UNITS
				NAME: INSTALLATION DRAWING DIESEL FIRE PUMP DRIVER MODEL AF12-159				IN (MM)	
				DATE: 09/01/2020 CHK BY: M.J.F. DATE: 09/01/2020				PROJECTION:	
				PART NO.: AF12-159-TOP				PROJECT:	
				APPROVED: DATE:				SCALE: NONE	PAGE 1
				MATERIAL:				OF 1	
REV	DESCRIPTION	DWN	APVD	DATE					
A	CREATION	M.J.F.		09/01/2020					



REV	UNITS	PROJECTION:	SCALE:	PAGE	OF
	IN/MM		NONE	1	1
		AMERIFLO			
		NAME: INSTALLATION DRAWING DIESEL FIRE PUMP DRIVER			
		DATE: 09/01/2020			
		DRW BY: MJF			
		NAME: MODEL AF12-159			
		DATE: 09/01/2020			
		CHK BY: MJF			
		APPROVED: DATE:			
		PART NO.: AF12-159-FRONT			
		MATERIAL:			
		DESCRIPTION	DWN	APVD	DATE
A		CREATION	MJF		09/01/2020
REV					

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REV	UNITS	SCALE:	PAGE	OF
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DRW BY: MJF	DATE: 09/01/2020	CHK BY: MJF	DATE: 09/01/2020	APPROVED: DATE:
A	CREATION	MJF	DWN	APVD
REV	DESCRIPTION			DATE

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