

	FUNCTION		FUNCTIONAL FAILURE		FAILURE MODE	FAILURE EFFECT
1	To deliver diesel fuel to the engine at an uninterrupted delivery pressure flow of 2,300-2,700 psi, while operating under load.	A	Unable to deliver diesel fuel.	1	Engine is serviced with incorrect fuel.	Within a very short time of starting the engine, the engine runs rough and begins to vibrate. The vibration generates excessive noise which is immediately detectable by personnel around the power unit. The unit faults out for under frequency before the Operator can shut the unit down. Associated engine fault lights illuminate on the control panel. Secondary damage to the fuel system and engine is likely to occur. Construction is delayed for up to three hours while another generator is delivered to the site. The secondary damage to the engine is repaired which can take up to one week.
1	To deliver diesel fuel to the engine at an uninterrupted delivery pressure flow of 2,300-2,700 psi, while operating under load.	A	Unable to deliver diesel fuel.	2	Fuel level is allowed to fall below 1/8 of a tank.	As the fuel level in the tank decreases, it is indicated on the fuel gauge. If this goes unnoticed, when the fuel level falls below 1/8 of a tank, the Low Fuel Alarm system is energized and the the audible alarm sounds. The unit is shut down before the engine is starved of fuel. Construction is delayed for one hour while the Operator refuels the unit.

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1	To deliver diesel fuel to the engine at an uninterrupted delivery pressure flow of 2,300-2,700 psi, while operating under load.	A	Unable to deliver diesel fuel.	3	Diesel fuel pump fails.	Without warning, the pump stops delivering fuel to the engine. The unit faults out for under frequency. Associated engine fault lights illuminate on the control panel. Construction is delayed for up to three hours while another generator is delivered to the site. The diesel fuel pump is replaced and the fuel system is purged. Downtime to repair, up to two days.
1	To deliver diesel fuel to the engine at an uninterrupted delivery pressure flow of 2,300-2,700 psi, while operating under load.	A	Unable to deliver diesel fuel.	4	Check valve fails closed.	This Failure Mode is considered too unlikely to justify further analysis.

	FUNCTION	FUNCTIONAL FAILURE	FAILURE MODE	FAILURE EFFECT
1	To deliver diesel fuel to the engine at an uninterrupted delivery pressure flow of 2,300-2,700 psi, while operating under load.	B Provides uninterrupted delivery pressure flow but at less than 2,300 psi, while operating under load.	1 Primary Fuel Filter clogs due to normal use.	As contaminants collect in the Primary Fuel Filter media, the pressure drop across the filter increases and is indicated on the Primary Fuel Filter Differential Pressure gauge. If this goes unnoticed, eventually the Primary Fuel Filter clogs when the differential pressure reaches approximately 4 psi. Fuel flow to the engine is restricted and fuel supply to the injectors is lost. The unit begins to vibrate excessively and the engine begins to surge. The generator faults out for under frequency and under voltage. Associated fault lights illuminate on the control panel and the engine goes to idle. Construction is delayed for up to three hours while another generator is delivered to the site. The primary fuel filter is replaced and the system is purged. Downtime to repair, one day.
1	To deliver diesel fuel to the engine at an uninterrupted delivery pressure flow of 2,300-2,700 psi, while operating under load.	B Provides uninterrupted delivery pressure flow but at less than 2,300 psi, while operating under load.	2 Primary Fuel Filter media deteriorates due to normal use.	Over time, the Primary Fuel Filter media slowly breaks apart, passes through the fuel pump, and collects in the Secondary Fuel Filter. The Secondary Fuel Filter begins to clog (with no visual indication). The pressure drop across the Primary Fuel Filter decreases and is indicated on the Primary Fuel Filter differential pressure gauge. Eventually the Secondary Fuel Filter clogs. Fuel flow to the engine is restricted and fuel supply to the injectors is lost. The unit begins to vibrate excessively and the engine begins to surge. The generator faults out for under frequency and under voltage. Associated fault lights illuminate on the control panel and the engine goes to idle. Construction is delayed for up to three hours while another generator is delivered to the site. The primary and secondary fuel filters are replaced and the system is purged. Downtime to repair, one day.

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1	To deliver diesel fuel to the engine at an uninterrupted delivery pressure flow of 2,300-2,700 psi, while operating under load.	B Provides uninterrupted delivery pressure flow but at less than 2,300 psi, while operating under load.	3 Water and debris accumulate in the bottom of the Primary Fuel Filter due to normal use.	Eventually, water and debris mix in the fuel stream and travel to the fuel injectors. Within a very short time, the engine runs rough and begins to vibrate. The vibration generates excessive noise which is detectable. If this goes unnoticed, the generator faults out for under frequency and under voltage. Associated fault lights illuminate on the control panel and the engine goes to idle. Construction is delayed for up to three hours while another generator is delivered to the site. The water and debris are drained from the filter. Downtime to repair, 1 day.
1	To deliver diesel fuel to the engine at an uninterrupted delivery pressure flow of 2,300-2,700 psi, while operating under load.	B Provides uninterrupted delivery pressure flow but at less than 2,300 psi, while operating under load.	4 Fuel injectors wear due to normal use.	Without warning, inadequate amount of atomized fuel is delivered to the cylinders. Engine runs rough and is unable to maintain proper RPM. Unit is unable to hold full load and faults out for under frequency. Associated fault lights illuminate on the control panel and the engine goes to idle. Construction is delayed for up to three hours while another generator is delivered to the site. Fuel injectors are replaced. Downtime to repair, up to 3 days.

	FUNCTION		FUNCTIONAL FAILURE		FAILURE MODE	FAILURE EFFECT
2	To contain diesel fuel.	A	Unable to contain diesel fuel.	1	Any fuel line connection loosens due to normal unit vibration.	Over time, fuel begins to seep around the affected connection, which may be visibly detectable. As operation continues and the connection continues to loosen, fuel drips down into the power unit enclosure. Although the power unit is vented, it is very unlikely that the odor produced by fuel puddling inside the enclosure is detectable because it is masked by the odor of the normal operating exhaust produced by the unit. The fuel puddles inside the enclosure until enough fuel accumulates and reaches one of the drain holes located in a corner of the unit. Fuel drips out of the enclosure and onto the ground which is visibly detectable by personnel in the immediate area. It is extremely unlikely that a fire is generated. The Operator suspends activity and shuts the unit down. Construction is delayed for up to three hours while the source of the leak is identified and the connection is tightened.
2	To contain diesel fuel.	A	Unable to contain diesel fuel.	2	Any fuel line deteriorates due to normal use.	Over time, fuel line develops cracks. The cracks may not be entirely visually detectable. Eventually, fuel line cracks and fuel leaks on to the ground which is visually detectable. Worst case, the Operator suspends activity and shuts the unit down. Construction is delayed for up to three hours while another generator is delivered to the site.

	FUNCTION		FUNCTIONAL FAILURE		FAILURE MODE	FAILURE EFFECT
3	To display the quantity of fuel in the tank within +/- 10% of actual (Fuel Level Indicator)	A	Unable to display the quantity of fuel in the tank.	1	Fuel Level Indicator system fails.	Without warning, the Fuel Level Indicator system fails. Worst case, the Operator suspends activity and shuts the unit down. Construction is delayed for up to three hours while another generator is delivered to the site.
3	To display the quantity of fuel in the tank within +/- 10% of actual (Fuel Level Indicator)	B	Displays the quantity of fuel in the tank within more than +/- 10% of actual.	1	Fuel level indicator float switch sticks due to debris accumulation.	Without warning, the Fuel Level Indicator float switch sticks. Depending on where the float switch sticks, worst case, the Operator thinks there is adequate fuel in the tank, but there isn't. Without warning, the engine is starved of fuel. The engine shuts down. Construction is delayed for up to three hours while another generator is delivered to the site. Fuel Level Indicator float switch system is repaired, as required. Downtime to repair, up to 3 days.

	FUNCTION	A	FUNCTIONAL FAILURE	1	FAILURE MODE	FAILURE EFFECT
4	To manually drain accumulated moisture and debris from the diesel fuel tank, as required. (Fuel Tank Manual Drain)	A	Unable to manually drain accumulated moisture and debris from the diesel fuel tank, as required.	1	Fuel Tank Manual Drain sticks closed due to corrosion.	Over time, corrosion accumulates on the Fuel Tank Manual Drain. The drain seizes and is unable to be opened normally. Corrosion control is performed on the drain. Worst case, drain must be replaced. Time to repair, up to 1 day.
5	To be capable of sounding an alarm in the event that the fuel level drops below 1/8 of a tank. (Low Fuel Alarm System)	A	Incapable of sounding an alarm in the event that the fuel level drops below 1/8 of a tank.	1	Low Fuel Alarm circuit fails open.	This Failure Mode only matters in the event that the fuel level is allowed to fall below 1/8 of a tank. As the fuel level in the tank decreases, it is indicated on the Fuel Level Indicator. If this goes unnoticed, when the fuel level falls below 1/8 of a tank, the Low Fuel Alarm does not sound. Eventually, the engine is starved of fuel. The unit faults out for under frequency. Associated engine fault lights illuminate on the control panel. Construction is delayed for up to three hours while another generator is delivered to the site. The unit is refueled and the fuel system is purged. Downtime to repair, one day.

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5	To be capable of sounding an alarm in the event that the fuel level drops below 1/8 of a tank. (Low Fuel Alarm System)	B	Falsely sounds the Low Fuel Alarm System.	1	Low Fuel Alarm circuit fails closed.	Without warning, the Low Fuel Alarm system is energized and the audible alarm sounds. In the moment, the Operator thinks that the unit is low on fuel. The Operator shuts down the engine and services it with fuel. However, the unit doesn't take an entire tank of fuel which alerts the Operator to the false alarm. The Operator continues operation and turns the unit in for repair at the next available opportunity. The Low Fuel Alarm circuit is repaired, as required. Time to repair, up to one day.
6	To display differential fuel pressure across the Primary Fuel Filter within +/- 0.5 psi. (Primary Fuel Filter Differential Pressure Gauge)	A	Unable to display differential fuel pressure across the Primary Fuel Filter.	1	Fuel Filter Differential Pressure Gauge fails.	The Primary Fuel Filter Differential Pressure Gauge is used for diagnostic purposes only. It is likely that the gauge fails at the last indicated pressure. Worst case, the gauge indicates normal differential pressure, but the filter could be clogged. As a result, the filter may not be changed when necessary. Eventually, the differential pressure reaches approximately 4 psi, but it is still reading normal on the gauge. Fuel flow to the engine is restricted and fuel supply to the injectors is lost. The unit begins to vibrate excessively, and the engine begins to surge. The generator faults out for under frequency and under voltage. Associated fault lights illuminate on the control panel and the engine goes to idle. Construction is delayed for up to three hours while another generator is delivered to the site. The Primary Fuel Filter and the Primary Fuel Filter Differential Pressure gauge are replaced. The fuel system is purged. Downtime to repair, one day.

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6	To display differential fuel pressure across the Primary Fuel Filter within +/- 0.5 psi. (Primary Fuel Filter Differential Pressure Gauge)	B Displays differential fuel pressure across the Primary Fuel Filter within more than +/-0.5 psi.	1 Primary Fuel Filter Differential Pressure Gauge drifts out of adjustment.	If the Primary Fuel Filter Differential Pressure Gauge is out of adjustment too high and the filter is changed too early, the failed gauge is likely to be noticed when the new filter is installed, and the differential pressure is still reading high. If the gauge is out of adjustment too low, it is possible that a clogged filter will not be diagnosed properly. As a result, the filter may not be changed when necessary. Eventually, the differential pressure increases to 4 psi, but it is still reading less than that on the gauge. Fuel flow to the engine is restricted and fuel supply to the injectors is lost. The unit begins to vibrate excessively, and the engine begins to surge. The generator faults out for under frequency and under voltage. Associated fault lights illuminate on the control panel and the engine goes to idle. Construction is delayed for up to three hours while another generator is delivered to the site. The filter and the gauge are replaced. The fuel system is purged. Downtime to repair, one day.
7	To manually drain accumulated moisture and debris from the Primary Fuel Filter, as required. (Primary Fuel Filter Manual Drain)	A Unable to manually drain accumulated moisture and debris from the Primary Fuel Filter, as required.	1 Primary Fuel Filter Manual Drain corrodes.	Over time, corrosion accumulates on the Primary Fuel Filter Manual Drain. The drain seizes and is unable to be opened normally. Corrosion control is performed on the drain. An alternate means may be used to drain moisture and debris from the filter housing. Worst case, drain must be replaced. Time to repair, up to 1 day.

	FUNCTION	A	FUNCTIONAL FAILURE	1	FAILURE MODE	FAILURE EFFECT
8	To isolate the fuel system and prevent fuel drain-back when the fuel filters are replaced. (Manual Shutoff Valve)		Unable to isolate the fuel system and prevent fuel drain-back when the fuel filters are replaced.		Manual Shutoff Valve corrodes.	Over time, corrosion accumulates on the Manual Shutoff Valve. The drain cannot be accessed. Maintenance action is delayed while corrosion control is performed or the valve is replaced. Time to repair, up to 1 day.