

**UNITED STATES MARINE CORPS**  
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 MAY 00

**STUDENT HANDOUT**

**TACTICAL QUIET GENERATOR COMPONENTS**

**1. LEARNING OBJECTIVES:**

**a. Terminal Learning Objective:**

(1) Provided a generator set, mechanic's tool box, and the reference, operate the generator set, so that it will apply voltage to appropriate equipment per the reference. (1141.02.02)

(2) Provided a generator set, mechanic's tool box, and the reference, operate the generator set, so that it will apply voltage to appropriate equipment per the reference. (1142.02.02)

**b. Enabling learning Objectives:**

1. Provided a list of Tactical Quiet Generator components and a selection of component functions, without the aid of reference, identify the correct function for each component, in accordance with TM 09249A-09246A. (1141.02.02t) (1142.01.03aw)

2. Provided a Tactical Quiet Generator set with numbered components and a list of component names, select the number that represents each component, so that each component is correctly identified. (1141.02.02U) (1142.01.03ax)

**BODY:**

**1. Components of the Tactical Quiet Generator:**

a. Engine: The engine is a 4 cycle, fuel injected, turbo charged, liquid cooled diesel engine, that occupies the front half of the generator set. The engine is equipped with a fuel filter/water separator, oil filter, and air cleaner assembly. Protection devices automatically stop the engine during conditions of high coolant temperature, ( $225 \pm 5^{\circ}$  F), low oil pressure, ( $15 \pm 3$  PSI), no fuel, over speed, ( $2200 \pm 40$  rpm) and over-voltage, ( $153 \pm 3$  VAC).

b. Radiator: The radiator, located in the front of the engine compartment, acts as a heat exchanger for the engine coolant.

c. Muffler: The muffler and exhaust tubing are connected to the turbocharger on the engine. The exhaust exits from the top of the generator set housing, with the gases exhausting upward.

d. Starter: The starter is located on the right side of the engine compartment. It is an electric cranking motor. It mechanically engages the engine's flywheel and cranks the engine.

e. Battery Charging Alternator: The battery charging alternator is located on the right side of the engine. It maintains a 24 VDC charge on the batteries.

f. Batteries: The batteries are located in the front of the generator set. The 2-batteries are electrolyte serviceable, lead acid, 12 VDC type that is connected in series. After starting, the generator set is capable of operating with the batteries removed. A diode located behind the control panel and protects the generator set if the batteries are connected incorrectly.

g. Air Cleaner Assembly: The air cleaner assembly is located under the control panel, behind the air cleaner access door. It contains a dry-type, disposable paper filter, housed in a canister. The air cleaner assembly features a dust collector that traps large dust particles. The air cleaner assembly has a restriction indicator that will pop up during operation when the air cleaner requires servicing.

h. Fuel Tank: The fuel tank is located under the engine assembly, between the skid base side members. It has a capacity to hold sufficient fuel for at least 8 hours of operation. The fuel tank houses the auxiliary fuel pump switch, fuel level gauge transmitter, and the low fuel shutdown switch.

i. AC Generator: The AC Generator is a single bearing, drip proof, synchronous, brush-less, three phase air-cooled generator. The generator is coupled directly to the rear of the diesel engine.

j. Load Output Terminal Board: The load output terminal board is located on the right rear of the generator housing. It consists of four AC output terminals mounted on a board. These terminals are labeled L1, L2, L3 and L0. There is a fifth terminal marked GND that serves as the equipment ground. A removable solid copper bar is connected between the L0 and GND terminals.

k. Control Panel Assembly: The control panel assembly is located at the rear of the generator set. It contains controls and instruments for operating the generator set.

l. Malfunction Indicator Panel: The malfunction indicator panel is located to the left of the control panel assembly. It indicates malfunctions of the generator set components.

m. NATO Slave Receptacle: The slave receptacle is located on the right front of the generator set. It is used to jumpstart the generator or for remote battery operations. It is compatible with any NATO, 24 VDC system.

n. Skid Base: The skid base supports the generator set and has forklift access openings and cross members for short distance movement. The skid base has provisions on the bottom for installation of the generator set on a trailer.

o. AC Voltage Reconnection Terminal Board: The reconnection board is located on the right rear side of the generator and above the Output Box Assembly. The board allows reconfiguration from 120/208, (low wye), to 240/416, (high wye), VAC output.

p. Fuel Filter/Water Separator: The fuel filter/water separator is located on the right, in the engine compartment. It is used to remove impurities and water from the diesel fuel.

q. Oil Dipstick: The dipstick is located on the right side of the engine compartment and is used to indicate the level of oil in the engine crankcase when the engine is stopped or running.

r. Oil Filter: The oil filter is located in the right side of the engine compartment and removes impurities from the lubrication system.

s. Fan Belt: The fan belt is located on the front of the engine. It is used to drive the fan, water pump and battery charging alternator.

t. Water Pump: The water pump is located on the front of the engine. It circulates the engine coolant through the engine block and the radiator. It is driven by the fan belt.

u. Dead Crank Switch: The dead crank switch is located on the left side of the engine compartment. It has three positions.

(1) The OFF position prevents the batteries from discharging by disconnecting them from the control circuits.

(2) The CRANK position allows the engine to be turned over without allowing the wait to start. This is used for maintenance purposes.

(3) The NORMAL position allows the generator to be operated.

(4) While the generator is running, it is important that the switch is not placed in the CRANK position. This will allow the starter to engage the flywheel of the engine, causing serious damage to the generator set.

v. Paralleling Receptacle: The paralleling receptacle is located to the left of the control panel. It is used to connect a paralleling cable between any two generators of the same size and mode, allowing them to operate in parallel.

w. Convenience Receptacle: The convenience receptacle is located to the left side of the control panel. It operates any small plug-in type equipment, requiring 120 VAC/ 15 Amps or less.

x. Diagnostic Connector: The diagnostic connector is located to the left side of the control panel and is a multi-pin plug, that is wired to specific points in the generator set electrical system. It enables monitoring and troubleshooting of the generator set operating at a single location.

y. Coolant High Temperature Switch: The coolant high temperature switch is located on the left side of the engine, near the upper radiator hose. It provides automatic shut down in the event the coolant temperature exceeds  $225 \pm 5^{\circ}$  F.

z. Low Oil Pressure Switch: The low oil pressure switch is located on the left side of the engine, below the fuel injection pump. It provides automatic shut down in the event the oil pressure drops dangerously low.

aa. Coolant Temperature Sender: The coolant temperature sender is located on the left side of the engine, on top in the cylinder head. It senses the temperature of the engine coolant.

ab. Oil Pressure Sender: The oil pressure sender is located on the left side of the engine, below the fuel injection pump. It senses the oil pressure in the engine.

ac. Radiator Fill Bottle: The radiator fill bottle is located on the right side of the engine. It has a cold and hot level marked on the side of the container. This is the only place where authorized personnel will add coolant to the engine when required.

ad. AC Circuit Interrupter Relay: The AC circuit interrupter relay is located inside the same compartment as the voltage reconnection board. It connects or interrupts the AC output to the load terminals.

ae. Magnetic Pickup: The magnetic pickup is located on the rear bell housing of the engine flywheel. It utilizes magnetic impulses to monitor engine speed for the governor control unit.

af. Actuator: The actuator is located on the left side of the engine. It regulates the amount of fuel that enters the engine, maintaining the desired engine speed.

ag. Fuel Injection Pump: The fuel injection pump is located on the left side of the engine. It delivers a metered amount of fuel to each cylinder.

ah. Fuel Solenoid Valve: The fuel solenoid valve is located on the left side of the engine and is mounted directly onto the fuel injection pump. The solenoid valve (also referred to as the fuel shutoff solenoid) prevents fuel from entering the fuel injection pump when 24 VDC is removed from the input terminals.

**REFERENCES:** TM 09244A/09245A  
TM 09247A/09248A  
TM 09249A/09246A