Report Date: 25 Aug 2017

101-92F-1424
Provide Petroleum Products using Modular Fuel System (MFS)
Status: Approved

Distribution Restriction: Approved for public release; distribution is unlimited.

Destruction Notice: None

Foreign Disclosure: FD1 - This training product has been reviewed by the training developers in coordination with the Fort Lee, Va foreign disclosure officer. This training product can be used to instruct international military students from all approved countries without restrictions.

Conditions: In an operational environment (OE) given the requirement to perform fueling operations. The Soldier (assigned to a Class III Section) must layout, assemble, perform operator's preventive maintenance checks and services (PMCS), operate, and disassemble the MFS without damage to equipment, injury to personnel, or pollution to environment. Personnel and materials required to perform task: four military occupational specialty (MOS)-qualified (92F) Soldiers to assist; MFS; Load Handling System/Palletized Load System (LHS/PLS) trucks to haul/download equipment; communication system; risk management procedures; fuel source; fire extinguishers; personal protective equipment (PPE); fuel spill kit/containers; Facility Response Plan (FRP); Oil Discharge Contingency Plan (ODCP) (if required); Spill Prevention Control and Countermeasures (SPCC) plan; the unit hazardous waste/hazardous material (HW/HM) management policy; applicable Safety Data Sheet (SDS) or Hazardous Material Information Sheet (HMIS); an oral or written order; unit standing operating procedure (SOP); DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)); DA Form 3643 (Daily Issues of Petroleum Products); and full access to all reference material. This task should not be trained in MOPP 4.

Standards: Position and emplace equipment at selected site, assemble and perform operator's PMCS, operate, maintain fuel accountability record, and disassemble the LHS/PLS Modular Fuel Farm without damage to equipment, injury to personnel, or pollution of environment.

Special Conditions: None

Safety Risk: Medium

MOPP 4: Never

Task Statements

Cue: None

DANGER

FAILURE TO PERFORM THIS TASK CORRECTLY MAY RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR DEATH TO PERSONNEL.

WARNING

None

CAUTION

None

Remarks: None

Notes: In this task, as with any task involving extensive handling of petroleum products, make sure that the proper equipment is on hand to contain and clean up spills. Unpack, inspect, and position the equipment for convenient access before beginning the task. Review the requirements of the task before performing it to ensure that drip pans and waste fuel containers are the appropriate size to contain waste fuel generated by the task. Use drip pans at any point that a spill is likely to occur (such as valves or nozzles). Continually observe equipment and take care while performing the task to minimize the possibility of petroleum spills. If a spill occurs, immediately stop operations and take the steps to stop, contain, and clean up the spill. Report all spills immediately to your supervisor. Handle/dispose of hazardous material according to SOPs/operations order (OPORD), local regulations, and/or Host Nation (HN) laws.

Performance Steps

1. Perform risk assessment measures according to health/safety task 101-92F-1160.

2. Employ environmental stewardship measures according to shared task 101-000-0003.

3. Read and understand unit or installation standing operating procedure SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.

CAUTION

Gloves, hearing protection, and goggles need to be worn when performing any fueling operation.

4. Wear appropriate PPE as required.

5. Perform before-, during-, and after-operations PMCS on system's components according to appropriate technical manuals (TMs). Annotate on DA Form 2404 or DA Form 5988-E any faults found while performing PMCS.

6. Position MFS.

a. Assist placement of MFS by providing guidance in positioning containers, fuel tank modular, or pump modular.

b. Ground MFS.

c. Connect grounding cable from first tank and pump module to grounding rod between each.

d. Remove valves from tank modular system.

e. Remove fire extinguisher from pump and tank modules. Place fire extinguishers approximately five feet from rear and center of each module.

7. Assemble MFS.

a. Connect evacuation hose to the closest tank module bottom loading receptacle.

b. Remove Tee adapters, Butterfly adapters, and Female-to-Female couplers fittings and lay them in position for hookup, starting with the pump module and working their way back to the last tank module.

c. Remove 4-inch x 15-foot suction hose and lay them in position for hookup, starting with the pump module and working their way back to the last module.

d. Connect hoses and fittings from pump module to tank modules.

(1) Connect two each, 4-inch x 15-foot hoses to the pump module suction port.

(2) Connect hose to Tee adapter.

(3) Connect MALE-to-FEMALE Butterfly adapter to drain valve on tank module.

(4) Connect one each, 4-inch x 15-foot hose to Butterfly adapter.

(5) Connect Female-to-Female coupling to Tee adapter.

(6) Connect 4-inch x 15-foot hose to Female-to-Female coupling.

(7) Connect Female-to-Female Butterfly adapter to Tee adapter.

(8) Connect male end of 4-inch x 15-foot hose to Female Butterfly adapter.

(9) Connect female end of hose to Tee adapter.

(10) Connect Female-to-Female coupling to male Tee adapter towards tank module.

(11) Connect Female-to-Male Butterfly adapter to drain valve on the tank module.

(12) Connect one each, 4-inch x 15-foot to male end on Butterfly adapter.

(13) Connect 4-inch x 15-foot hose to Female-to-Female coupling.

(14) Connect Female-to-Female Butterfly adapter to Tee adapter.

(15) Connect male end of 4-inch x 15-foot hose to female Butterfly adapter.

(16) Connect female end of hose to Tee adapter.

(17) Connect Female-to-Female coupling to male Tee adapter towards tank module.

(18) Connect Female-to-Male Butterfly adapter to drain valve on the tank module.

(19) Connect one each, 4-inch x 15-foot hose to male end on butterfly adapter.

(20) Connect 4-inch x 15-foot hose to Female-to-Female coupling.

(21) Connect Female-to-Female Butterfly adapter to Tee adapter.

(a) Download equipment from storage area on pump module.

(b) Place one each drip pan under each Tee connections in hose lines from tank modules to pump module.

(c) Lay out fuel discharge system (HTARS) from the pump module to the distributing points.

(22) Place two each, 3-inch x 50-foot discharge hoses next to discharge ports on pump module. Unroll each hose separating hoses approximately 25 feet from each other at end.

(23) Place Tee connector at end of each 3-inch x 50-foot discharge hose.

(24) Place two each, 2-inch x 50-foot discharge hose to Tee connector of each 3-inch x 50-foot discharge hose and unroll one for distributing point and one for continuing points.

(25) Place one each Tee connector on ground next to 2-inch x 50-foot discharge. (NOTE: T-connector for both lines running right and left.)

(26) Place two each, 2-inch x 50-foot discharge hose on ground next to Tee connector (right/left side) unroll one 2-inch x 50-foot discharge hose outward towards distributing point and one for continuing distributing points.

(27) Place one each Tee connector next to 2-inch x 50-foot discharge hose. (NOTE: T-connector for both lines running right and left.)

(28) Place two each, 2-inch x 50-foot discharge hose next to Tee connector. Unroll one 2-inch x 50-foot discharge hose outward towards distributing point and one for continuing distributing points.

(29) Place one each elbow connector on ground next to 2-inch x 50-foot discharge hose. (NOTE: Elbow connector for both lines running right and left.)

(30) Place one each, 2-inch x 50-foot discharge hose next to elbow connector. Unroll 2-inch x 50-foot discharge hose outward towards distributing point.

(31) Place grounding rod at each distributing point.

(32) Place fire extinguisher at each distributing point.

(33) Place 5-gallon water containers at each distributing point.

(34) Place drip pans at each distributing point and all connections of discharge hose line.

(a) Connect 3-inch x 50-foot discharge hose to pump module discharge port. (NOTE: Leave ball valves on both pump module and hose closed.)

(b) Remove dust caps from both 3-inch x 50-foot discharge hose and Tee connector. Connect and lock Tee connector with 3-inch x 50-foot discharge hose. (NOTE: To lock connection, open T-connector valve and keep discharge hose valve closed.)

(c) Remove dust caps from both 2-inch x 50-foot discharge hoses and Tee connector. Connect and lock Tee connector with both 2-inch x 50-foot discharge hoses. (NOTE: To lock connection, open T-connector valve and keep discharge hose valve closed.)

(d) Remove dust caps from both 2-inch x 50-foot discharge hoses and Tee connector. (NOTE: To lock connection, open T-connector valve and keep discharge hose valve closed.)

(e) Remove dust cap from both 2-inch x 50-foot discharge hoses and elbow connector. Connect and lock elbow connector with both 2-inch x 50-foot discharge hoses. (NOTE: To lock connection, open elbow connector valve and keep discharge hose valve closed.)

(f) Remove dust caps from 2-inch x 50-foot discharge hose and fuel nozzle. Connect and lock hose and nozzle. (NOTE: To lock connection, open nozzle valve and keep discharge hose valve closed.)

(g) Drive in grounding rod according to ATP 4-43. Attach grounding cable from nozzle to grounding rod for each distributing point.

(h) Remove dust caps from 2-inch x 50-foot discharge hose and fuel nozzle. Connect and lock hose and nozzle. This will be done in the same steps with each distributing point. (NOTE: To lock connection, open nozzle valve and keep discharge valve closed.)

(35) Connect fuel discharge system (HTARS) from the pump module to the distributing points (left side of distributing points).

(36) Connect fuel discharge system (HTARS) from the pump module to the distributing points (right side of distributing points).

(a) Connect 3-inch x 50-foot discharge hose to pump module discharge port. (NOTE: Leave ball valves on both pump module and hose closed.)

(b) Remove dust caps from 3-inch x 50-foot discharge hose and Tee connector. Connect and lock Tee connector with3-inch x 50-foot discharge hose. (NOTE: To lock connection, open T-connector valve and keep discharge hose valve closed.)

(c) Remove dust caps from both 2-inch x 50-foot discharge hoses and Tee connector. Connect and lock Tee connector with both 2-inch x 50-foot discharge hoses. (NOTE: To lock connection, open T-connector valve and keep discharge hose valve closed.)

(d) Remove dust caps from both 2-inch x 50-foot discharge hoses and Tee connector. Connect and lock Tee connector with both 2-inch x 50-foot discharge hoses. (NOTE: To lock connection, open T-connector valve and keep discharge hose valve closed.)

(e) Remove dust caps from both 2-inch x 50-foot discharge hoses and elbow connector. Connect and lock elbow connector with both 2-inch x 50-foot discharge hoses. (NOTE: To lock connection, open elbow connector valve and keep discharge hose valve closed.)

(f) Remove dust caps from 2-inch x 50-foot discharge hose and fuel nozzle. Connect and lock hose and nozzle. (NOTE: To lock connection, open nozzle valve and keep discharge hose valve closed.)

(g) Drive in grounding rod according to ATP 4-43. Attach grounding cable from nozzle to grounding rod. (NOTE: These steps will apply to each distributing point.)

(h) Remove dust caps from 2-inch x 50-foot discharge hose and fuel nozzle. Connect and lock hose and nozzle. (NOTE: To lock connection, open nozzle valve and keep discharge hose valve closed.) These steps will apply to each distributing point.

(i) Place drip pans in designated location for distributing fuel. (NOTE: Location of nozzles and all connections of discharge hose line.)

(37) Open hose line valves to Tee connection. Purge system for three point (left and right) duplicating each steps/procedures.

(a) Open 2-inch valves on hose line. Walk to next Tee connection checking for any leaks.

(b) Open 2-inch valves to Tee connectors. Open 2-inch hose line valve going to distributing point. Open valve on nozzle. Check for any leaks.

(c) Open 2-inch hose line valve going to next Tee connection. Walk to next Tee connection and check for any leaks. Open hose line valve to Tee connection. Open hose line valve going to distributing point and check for any leaks. Open valve on nozzle and check for any leaks.

(d) Repeat steps/procedures for remaining distributing points.

(e) During fuel discharge operations, observe fuel tank gauge to ensure tank does not run dry. Open TANK FILL valve and allow tank to fill, then close valve.

(f) Once fuel discharge operations are no longer required, perform pump module shutdown procedures.

Note: Observe pump pressure gauge during pumping operations. Observe location of three emergency shutdown switches in case of an emergency.

(g) Check the filter separator for water and pressure differential.

(h) Clean up any spill immediately.

8. Operate MFS.

a. Perform before-operations PMCS on pump module unit according to appropriate TM.

b. Pull lever on tank module to vertical position.

c. Open inlet valve on pump module and discharge valve(s) on each Tank Module (being set up in fuel farm). Also open vents to tanks distributing fuel.

d. Ensure that all valves on discharge pump module are closed to include the HTARS hose system. Double check each hose connection to ensure that connections are locked. Each hose connection to Tee connections should be closed, only the Tee connections valves are open. (NOTE: Each Tee connection valve to hose or nozzle should be open with hose or nozzle valves closed, this keeps the connection locked together.)

e. Drain water from filter separator into suitable container.

f. Clean radiator screen prior to starting engine.

g. Check engine fuel tank gauge to ensure enough fuel for operations is available. If not, fill either manually or use refill valve.

h. Start pump module unit.

Note: At temperatures near or below freezing point, use glow plugs if necessary. This not only lowers the starting limit temperature, but provides easier starting temperatures normally not requiring a starting aid.

i. If outside air temperature is near or below freezing, push in and turn starter switch to second position and hold for approximately one minute. Preheat will illuminate.

j. After approximately one minute, push in and hold oil pressure switch, then rotate starter switch to third position and release switch as soon as engine starts. Preheat light will shut off.

k. Once engine oil pressure builds to approximately 15 to 20 pounds, release oil pressure switch.

l. Observe engine oil pressure and engine oil temperature gauges during operation.

m. Reset fuel meter by turning knob on meter face to PRINT.

n. Open pump module discharge valve.

o. Rotate fueling control lever to RUN position.

p. Open ball valves to discharge lines on pump module unit. Then open ball valves on 3-inch hose line. Walk line to first Tee connection checking for any leaks.

q. Perform during-operations PMCS according to appropriate TM.

r. When refuel operation is complete, close discharge valves on tanks.

s. Record issue on DA Form 3643 according to DA Pamphlet 710-2-1.

t. Perform after-operations PMCS according to appropriate TM.

u. Record any defects on DA Form 2404 or DA Form 5988-E and report to supervisor.

9. Disassemble MFS.

a. Ensure evacuation hose is connected to tank module closest (evacuation tank) to pump module.

b. Open valves for both tank and nozzle to tank module evacuation port.

c. Ensure there is enough room in evacuation tank to add another 100 gallons of fuel from hoses connected to pump module.

d. Open educator control valve.

e. Evacuate distribution hoses (HTARS System).

f. Increase engine RPM until distribution hoses are flat.

g. Close discharge valves and return engine idle to normal.

h. Close tank discharge valves and MC valves. Vacuum breakers will open.

i. After hoses are evacuated, close supply valve and shut down pump engine.

j. Using hose reel handle, stow evacuated hose on hose reel. Disconnect and store supply and discharge hoses, handles, nozzles, and static cable after operation in reverse order of assembly.

k. Inspect site for spilled fuel. Collect all fuel contaminated soil, other fuel contaminated materials, and waste fuel. Dispose of them in an environmentally safe manner according to local procedures.

l. Report any spills according to SOPs established by the Installation Spill Contingency Plan.

10. Complete all records (DA Form 2404 or DA Form 5988-E and DA Form 3643) on MFS operations and turn in to supervisor.

(Asterisks indicates a leader performance step.)

Evaluation Guidance: Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

Evaluation Preparation: See task Conditions and Standards.

PERFORMANCE MEASURES	GO	NO-GO	N/A
1. Performed risk assessment measures according to health/safety task 101-92F-1160.			
2. Employed environmental stewardship measures according to shared task 101-000-0003.			
3. Read and understood unit or installation standing operating procedure SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.			
4. Wore appropriate PPE as required.			
5. Performed before-, during-, and after-operations PMCS on system's components according to appropriate technical manuals (TMs). Annotate on DA Form 2404 or DA Form 5988-E any faults found while performing PMCS.			
6. Positioned MFS.			
7. Assembled MFS.			
8. Operated MFS.			
9. Disassembled MFS.			
10. Completed all records (DA Form 2404 or DA Form 5988-E and DA Form 3643) on MFS operations and turn in to supervisor.			

Supporting Reference(s):

Step Number	Reference ID	Reference Name	Required	Primary
	ATP 3-34.5	Environmental Considerations	No	No
	ATP 4-43	Petroleum Supply Operations	No	No
	ATP 5-19 (Change 001 09/08/2014 78 Pages)	RISK MANAGEMENT	No	No
	DA FORM 2404	EQUIPMENT INSPECTION AND MAINTENANCE WORKSHEET	Yes	No
	DA FORM 3643	DAILY ISSUES OF PETROLEUM PRODUCTS	Yes	No
	DA FORM 5988-E	Equipment Inspection Maintenance Worksheet	Yes	No
	TM 10-4930-365-13&P	OPERATOR AND FIELD MAINTENANCE MANUAL INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL) FOR MODULAR FUEL SYSTEM TANK RACK MODULE (NSN 4930-01-517-6939) (EIC:TBD)	No	No
	TM 10-4930-368-10	Operator's Manual for Pump Rack Module	No	No

TADSS : None

Equipment Items (LIN):

LIN	Name
T96496	Truck Cargo: Tactical 8x8 Heavy Expanded Mobility W/LHS: M1120A2

Materiel Items (NSN) :

Step ID	NSN	LIN	Title	Qty
6.	2330-01-303-5197	T93761	Trailer: Palletized Loading 8x20 M1076	1

Environment: Environmental protection is not just the law but the right thing to do. It is a continual process and starts with deliberate planning. Always be alert to ways to protect our environment during training and missions. In doing so, you will contribute to the sustainment of our training resources while protecting people and the environment from harmful effects. Refer to the current Environmental Considerations manual and the current GTA Environmental-related Risk Assessment card. Ensure spills are cleaned up, reported as required by unit policies, procedures, and applicable environmental laws.

Safety: In a training environment, leaders must perform a risk assessment in accordance with current Risk Management Doctrine. Leaders will complete the current Deliberate Risk Assessment Worksheet in accordance with the TRADOC Safety Officer during the planning and completion of each task and sub-task by assessing mission, enemy, terrain and weather, troops and support available-time available and civil considerations, (METT-TC). Note: During MOPP training, leaders must ensure personnel are monitored for potential heat injury. Local policies and procedures must be followed during times of increased heat category in order to avoid heat related injury. Consider the MOPP work/rest cycles and water replacement guidelines IAW current CBRN doctrine. Apply risk management programs, Verify that applicable Safety Data Sheets (SDS) are maintained, Check the appropriate personal protective equipment (PPE) is being worn and maintained.

Prerequisite Individual Tasks : None

Supporting Individual Tasks :

Task Number	Title	Proponent	Status
101-92F-1408	Account for Petroleum Products	101 - Quartermaster (Individual)	Approved
101-92F-1405	Perform Quality Surveillance on Petroleum Products	101 - Quartermaster (Individual)	Reviewed
101-92F-1160	React to Petroleum Products Health / Safety Hazards	101 - Quartermaster (Individual)	Approved

Supported Individual Tasks : None

Supported Collective Tasks : None

Knowledges :

Knowledge ID	Knowledge Name
101-K-0017	Knowledge of SOP/Operations Order Requirements for Handling/Disposal of Hazardous Materials
101-K-P10012	Knowledge of safety procedures when handling petroleum products
101-K-P10048	Knowledge of how to assemble, operate, and disassemble Modular Fuel system (MFS)

101-K-P10011	Knowledge of unit's SOP and local policy requirements and their location
K632	Know how to perform operator Preventive Maintenance Checks and Services on Modular Fuel System (MFS) IAW appropriate TM
101-K-P10010	Knowledge of Personal Protective Equipment (PPE) and its usage
K631	Knowledge of Modular Fuel System (MFS) characteristics and features
101-K-P10008	Knowledge of Material Safety Data Sheets (MSDS)
K261	Knowledge of positioning requirements for the Modular Fuel System (MFS)
K599	Know how to perform personal protective measures when handling petroleum products
101-K-P10007	Knowledge of Risk Management procedures and control measures
K596	Knowledge of petroleum products fire hazards and sources of ignition
K598	Know how to identify petroleum products health hazards
K304	Know site selection considerations for petroleum operations
K597	Know how to perform first aid for petroleum products related injuries
101-K-P10017	Know how to read and interpret appropriate Field Manuals and Technical Manuals
101-K-P10016	Knowledge of the Environmental Stewardship Protection Program measures
101-K-P10018	Knowledge of Preventive Maintenance Checks and Services (PMCS) procedures
K641	Know how to prepare petroleum accountability forms (DA Form 3643, 2765-1, and DD Form 1898)
101-K-P10032	Know how to complete DA Form 2404, 5988-E, 5987-E, 3643, DD Form 1970 and 1898

Skills :

Skill ID	Skill Name
101-S-P10018	Ability to read and interpret appropriate Field Manuals and Technical Manuals
101-S-P10017	Ability to apply Environmental Stewardship Protection Program measures
101-S-P10013	Ability to apply safety procedures when handling petroleum products
S1000	Identify site selection considerations for petroleum operations
101-S-P10012	Ability to read, understand, and comply with unit's SOP and local policies
101-S-P10011	Ability to wear Personal Protective Equipment (PPE)
101-S-K10058	Ability to wear Personal Protective Equipment
S1608	Ability to perform Preventive Maintenance Checks and Services (PMCS) on Modular Fuel System (MFS) IAW appropriate TM
101-S-P10007	Ability to apply Risk Management procedures and control measures
S1611	Ability to prepare petroleum accountability forms (DA Form 3643, 2765-1, and DD Form 1898)
S1577	Ability to identify petroleum products fire hazards and sources of ignition
101-S-10009	Ability to determine safety measures from Material Safety Data Sheets (MSDS)
101-S-P10033	Ability to complete DA Form 2404, 5988-E, 5987-E, 3643, DD Form 1970 and 1898
101-S-10008	Ability to extract information from Material Safety Data Sheets (MSDS)
S-101-E-0100	Ability to assemble, operate, and disassemble the Modular Fuel System (MFS)
S1578	Ability to perform first aid for petroleum products related injuries
S-101-E-0099	Ability to position the Modular Fuel System (MFS)
S1579	Ability to identify petroleum products health hazards
101-S-P10019	Ability to perform Preventive Maintenance Checks and Services (PMCS)

ICTL Data :

ICTL Title	Personnel Type	MOS Data
92F Petroleum Supply Specialist SL10	Enlisted	MOS: 92F, Skill Level: SL1, Duty Pos: QFQ