

Summary Report for Individual Task  
551-88L-3076  
Troubleshoot a Steering System  
Status: Approved

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

**Destruction Notice:** None

**Foreign Disclosure: FD5** - This product/publication has been reviewed by the product developers in coordination with the [installation/activity name] foreign disclosure authority. This product is releasable to students from all requesting foreign countries without restrictions.

**Condition:** Given a steering system aboard a vessel, at sea, at anchor or moored alongside a pier, day or night, under all sea and weather conditions, while wearing appropriate PPE, (i.e. hearing protection, Nitrile gloves, eye protection, etc.), with a lock out tag out kit, marine rail tool box.

**Standard:** The Soldier correctly conducts troubleshooting procedures pertaining to a steering system aboard an Army vessel, IAW the appropriate Technical Manual and local SOPs, without injury to self or others and without damage to equipment.

**Special Condition:** None

**Safety Risk:** Medium

**MOPP 4:**

<b>Task Statements</b>
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**Cue:** None

<b>DANGER</b>
None

<b>WARNING</b>
None

<b>CAUTION</b>
None

**Remarks:** None

**Notes:** None

## Performance Steps

1. Demonstrate troubleshooting procedures for the steering hydraulic system.

a. No pressure in hydraulic system.

(1) Possible cause(s):

(a) Check for loss of power.

(b) Check for low hydraulic level in reservoir tank.

(c) Check to see if the suction strainer elements are dirty.

(d) Check for pressure relief valve malfunction.

(e) Check for free re-circulation of hydraulic fluid to reservoir tank occurring in hydraulic system due to valve stuck in open position.

(f) Check for air leak in suction line, preventing priming, or causing noise and irregular action of control- circuit.

(g) Check to see if hydraulic fluid viscosity is too heavy to pick up prime (especially in cold weather).

(h) Check for wrong direction of hydraulic pump rotation.

(i) Check for broken shaft or parts inside hydraulic pump.

(2) Corrective action(s):

(a) Energize steering system.

(b) Check hydraulic system for leaks and replenish as necessary.

(c) Clean or replace suction elements.

(d) Relief valve malfunction:

\_1\_ If valve pressure setting is incorrect, reset valve pressure to specification.

\_2\_ If valve is leaking, check valve seat for scoring and dirt. Clean or replace valve.

\_3\_ If valve spring is broken, replace valve.

(e) Inspect pilot operated check valve and pressure relief valve. Repair or replace defective valves.

(f) Repair leak or replace line.

(g) Use lighter viscosity hydraulic fluid.

(h) Reverse direction rotation by reversing controlling pipes connected to hydraulic pump.

(i) Replace hydraulic pump.

b. Low pressure in hydraulic system.

(1) Possible cause(s):

- (a) Check to see if the suction valves are open.
- (b) Check the hydraulic oil level in the reservoir.
- (c) Check to see if pressure relief valve pressure set too low.
- (d) Check for excessive external leakage.
- (e) Check for worn hydraulic pump.

(2) Corrective action(s):

- (a) Open the suction valves.
- (b) Replenish the oil as required.
- (c) Adjust valve pressure.
- (d) Excessive external leakage.
  - \_1\_ Secure connections.
  - \_2\_ Check hydraulic fluid level.
- (e) Replace hydraulic pump.

c. Erratic pressure in-hydraulic system.

(1) Possible cause(s).

- (a) Check for air in hydraulic fluid.
- (b) Check for contamination in hydraulic fluid.
- (c) Check for worn hydraulic pump or hydraulic motor.

(2) Corrective action(s):

- (a) Air in hydraulic fluid.
  - \_1\_ Secure connections.
  - \_2\_ Check hydraulic fluid level.
- (b) Contamination in hydraulic fluid.

\_1\_ Clean or replace dirty elements or filters.

\_2\_ Change hydraulic fluid.

(c) Worn hydraulic pump or hydraulic motor.

\_1\_ Replace hydraulic pump.

\_2\_ Replace hydraulic motor.

d. Excessive pressure in hydraulic system.

(1) Possible cause(s):

(a) Check for pressure relief valve misadjustment.

(b) Check for worn pressure relief valve.

(2) Corrective action(s):

(a) Adjust pressure relief valve.

(b) Replace pressure relief valve.

e. Excessive temperature in hydraulic system.

(1) Possible cause(s):

(a) Check to see if hydraulic system pressure is too high.

(b) Check to see if pressure relief valve pressure is set too high.

(c) Check for cavitation (vacuums in hydraulic fluid).

(d) Check for air in hydraulic fluid.

(e) Check to see if hydraulic fluid is low.

(f) Check to see if hydraulic fluid is dirty.

(g) Check for worn or broken hydraulic pump.

(h) Check for worn or broken hydraulic pump.

(2) Corrective action(s):

(a) Hydraulic system pressure is too high.

\_1\_ Check hydraulic system pressure.

\_2\_ Check pressure settings of valves. Adjust pressure settings as required.

(b) Adjust pressure settings of pressure relief valve.

(c) Cavitation (vacuums in hydraulic fluid).

\_1\_ Clean or replace dirty air breather filter.

\_2\_ Clean or replace dirty filters and elements.

(d) Air in hydraulic fluid.

\_1\_ Secure inlet fittings.

\_2\_ Check hydraulic fluid level.

\_3\_ Bleed air from hydraulic system.

(e) Hydraulic fluid is low.

\_1\_ Check for leaks in hydraulic system.

\_2\_ Add hydraulic fluid.

(f) Hydraulic fluid is dirty.

\_1\_ Clean or replace dirty filters and elements.

\_2\_ Change hydraulic fluid.

(g) Replace hydraulic pump.

(h) Replace hydraulic-motor.

f. Hydraulic fluid does not flow.

(1) Possible cause(s):

(a) Check to see if hydraulic pump is not receiving hydraulic fluid.

(b) Check to see if motor will not operate.

(c) Check to see if electric motor is turning in wrong direction.

(d) Check to see if drive coupling is defective.

(e) Check to see if hydraulic fluid is passing over pressure relief valve.

(f) Check for broken piston pump.

(2) Corrective action(s):

(a) Hydraulic pump is not receiving hydraulic fluid.

\_1\_ Check hydraulic fluid level.

\_2\_ Clean dirty air breather filter.

\_3\_ Clean or replace dirty filters and elements.

(b) Motor will not operate.

\_1\_ Check power supply and electrical wiring connections.

\_2\_ Replace defective electric motor.

(c) Reverse rotation of electric-motor.

(d) Replace drive coupling.

(e) Hydraulic fluid is passing over pressure relief valve.

\_1\_ Check pressure of pressure relief valve.

\_2\_ Replace defective pressure relief valve.

(f) Replace piston pump.

2. Demonstrate troubleshooting procedures for the steering system hydraulic pump.

a. Noisy hydraulic pump.

(1) Possible cause(s):

(a) Check to see if the suction valves are open.

(b) Check the hydraulic oil level in the reservoir.

(c) Check for cavitation (vacuums in hydraulic fluid).

(d) Check for air in hydraulic fluid.

(e) Check to see if drive coupling is misaligned.

(f) Check for worn or damaged hydraulic pump.

(2) Corrective action(s):

(a) Open the suction valves.

(b) Replenish the oil as required.

(c) Cavitation (vacuums in hydraulic fluid).

\_1\_ Clean or replace dirty air breather filter.

\_2\_ Clean or replace dirty filters and elements.

(d) Air in hydraulic fluid.

\_1\_ Secure inlet fittings.

\_2\_ Check hydraulic fluid level.

\_3\_ Bleed air from hydraulic system.

(e) Align drive coupling.

(f) Replace hydraulic pump.

b. Excessive wear of hydraulic pump parts.

(1) Possible cause(s):

(a) Check to see if drive coupling is misaligned.

(b) Check to see if air recirculation is causing chatter in hydraulic system.

(c) Check for abrasive material in hydraulic fluid.

(d) Check to see if viscosity of hydraulic fluid is too low for working conditions.

(2) Corrective action(s):

(a) Align drive coupling.

(b) Air recirculation is causing chatter in hydraulic system.

\_1\_ Secure inlet fittings.

\_2\_ Check hydraulic fluid level.

(c) Abrasive material in hydraulic fluid.

\_1\_ Clean or replace dirty filters and elements.

\_2\_ Change hydraulic fluid.

(d) Check recommendations for hydraulic fluid.

c. External hydraulic fluid leakage around hydraulic pump shaft or housing.

(1) Possible cause(s):

- (a) Check for worn hydraulic pump shaft or housing.
- (b) Check for worn hydraulic pump head seals.
- (c) Check for excessive hydraulic fluid pressure due to excessive drain flow.
- (d) Check for cracked hydraulic motor housing.

(2) Corrective action(s):

- (a) Replace hydraulic pump.
- (b) Replace hydraulic pump.
- (c) Replace hydraulic motor.
- (d) Replace hydraulic motor.

d. Electric motor will not operate.

(1) Possible cause(s):

- (a) Check to see if power supply is disconnected.
- (b) Check for defective electric motor.

(2) Corrective action(s):

- (a) Reconnect power supply.
- (b) Replace electric motor.

3. Demonstrate troubleshooting procedures for the steering cub hydraulic pump.

a. Erratic operation of rudder:

(1) Possible cause(s):

- (a) Check for defective steering control panel.
- (b) Check for dirt or foreign material in system.

(2) Corrective action(s):

- (a) Refer to steering control panel troubleshooting.
- (b) Refer to Direct Support Maintenance.

b. Rudder movement in one direction.

(1) Possible cause(s):

(a) Check for defective directional valve.

(b) Inspect for open cabling.

(2) Corrective action(s):

(a) Repair/replace directional valve.

(b) Check and repair. Refer to Direct Support Maintenance.

c. Steering system inoperative.

(1) Possible cause(s):

(a) System set for manual operation.

(b) Check for defective pump unit motor controller.

(c) Inspect for cylinder by-pass valve that is open.

(d) Check for low oil tank level.

(e) Check for air leak in pump suction line.

(f) Check for pump shaft that is turning too slowly to prime itself.

(g) Check for broken pump shaft or rotor.

(h) Check for jammed directional control valve.

(2) Corrective action(s):

(a) Check steering system to see that all shut-off valves are in position for steering electrically.

(b) Refer to motor controller troubleshooting.

(c) Close by-pass valve.

(d) Add hydraulic oil, type 2135th.

(e) Tighten connections if the problem continues refer to Direct Support Maintenance.

(f) Check speed and power to motor.

(g) Refer to Direct Support Maintenance.

(h) Refer to directional control valve troubleshooting.

d. System operates sluggishly.

(1) Possible cause(s):

- (a) Pump relief valve setting not high enough.
- (b) Check for pump relief valve sticking open.
- (c) Inspect for leak in hydraulic control system cylinders or valves.

(2) Corrective action(s):

- (a) Adjust. Refer to Direct Support Maintenance.
- (b) Refer to Direct Support Maintenance.
- (c) Must be tested independently by blocking of circuit progressively.

e. Pump making noise.

(1) Possible cause(s):

- (a) Check for partially clogged intake line or restricted intake pipe.
- (b) Check for small air leak at pump intake piping joints or at pump shaft seal.
- (c) Check for coupling misalignment between motor and pump.
- (d) Check for air bubbles in oil.
- (e) Check for plugged tank breather.

(2) Corrective action(s):

- (a) Refer to Direct Support Maintenance.
- (b) Test by pouring oil on joints or around shaft while listening for change in sound of operation; tighten as required. If problem continues, replace the pump.
- (c) Realign or replace as required.
- (d) Check oil level and add hydraulic oil type 2135-th.
- (e) Clean the breather.

f. Rudder goes hard-over.

(1) Possible cause(s):

- (a) Check for jammed directional valve.
- (b) Check for short in cabling.

(2) Corrective action(s):

(a) Refer to Direct Support Maintenance.

(b) Test cables and repair. Refer to Direct Support Maintenance.

4. Demonstrate troubleshooting procedures for the directional control valve.

a. Erratic Pressure.

(1) Possible cause(s):

(a) Check for foreign matter in system.

(b) Inspect for worn spool or cover(s).

(c) Check for spool sticking in body or cover.

(2) Corrective action(s):

(a) Drain, flush and refill system with clean fluid.

(b) Replace spool or cover(s).

(c) Clean spool. Remove burrs by light lapping. Check freedom of movement on reassembly. Replace if necessary.

b. Low pressure or no pressure.

(1) Possible cause(s):

(a) Check for plugged balance hole in spool.

(b) Check for foreign matter in system.

(2) Corrective action(s):

(a) Remove spool and clean out.

(b) Drain, flush and refill system with clean fluid.

c. Excessive noise or chatter.

(1) Possible cause(s):

(a) Check for high oil velocity through valve.

(b) Check for distorted spring.

(c) Check for worn spool or cover(s).

(2) Corrective action(s):

(a) Check system.

(b) Replace spring.

(c) Replace spool cover(s).

5. Demonstrate troubleshooting procedures for steering cylinder and adjustable links.

a. Cylinder loose.

(1) Possible cause(s):

(a) Check for worn or damaged bracket.

(b) Check for damaged pivot and cotter pin.

(c) Check for loose tie rods.

(2) Corrective action(s):

(a) Replace.

(b) Replace.

(c) Tighten.

b. Cylinder leaking.

(1) Possible cause(s):

(a) Inspect hoses.

(b) Check for defective cylinder.

(2) Corrective action(s):

(a) Tighten.

(b) Refer to Direct Support Maintenance.

c. Adjustable links loose.

(1) Possible cause(s):

(a) Check for defective slotted hex nuts or cotter pins.

(b) Check for defective bearings.

(2) Corrective action(s):

(a) Replace.

(b) Replace.

d. Rudders not at the same position.

(1) Possible cause; Check for adjustable link out of adjustment.

(2) Corrective action; Readjust and tighten nuts.

6. Demonstrate troubleshooting procedures for the steering controller.

a. Hydraulic pump inoperative.

(1) Possible cause(s):

(a) Check circuit breaker in power distribution panel.

(b) Press LOCAL-OFF-REMOTE switch.

(c) Check for defective contacts or coil on contactor.

(d) Check thermal overload.

(e) Defective overload heater, transformer, or switch.

(f) Inspect for worn, broken, or damaged wiring.

(2) Corrective action(s):

(a) Reset button on controller.

(b) Place in LOCAL or REMOTE position.

(c) Replace.

(d) Refer to Direct Support Maintenance.

(e) Refer to Direct Support Maintenance.

(f) Refer to Direct Support Maintenance.

b. Hydraulic pump operating - RUN light on steering console in pilothouse not lit.

(1) Possible cause(s):

(a) Check for defective fuses in controller.

(b) Inspect for worn or broken wiring.

(2) Corrective action(s):

(a) Replace.

(b) Refer to Direct Support Maintenance.

c. Hydraulic pump operating - Gyropilot in the pilothouse inoperative.

(1) Possible cause(s):

(a) Check for defective fuses in controller.

(b) Inspect for worn or broken wiring.

(2) Corrective action(s):

(a) Replace.

(b) Refer to Direct Support Maintenance.

7. Demonstrate troubleshooting procedures for the rudder angle indicator and repeat-back transmitter.

a. Rudder angle indicator not responding.

(1) Possible cause(s):

(a) Check to see if the rudder angle circuit breaker is on.

(b) Check to see if the tank gauges are on.

(c) Check to see if the transmitter connecting linkage is obstructed.

(2) Corrective action(s):

(a) Set the rudder angle circuit breaker to ON.

(b) Set the tank gauge circuit breaker to ON.

(c) Remove the obstruction.

b. Inoperative. No incoming power.

(1) Possible cause(s):

(a) Switch on Intercommunication Panel.

(b) Check for defective fuse.

(c) Check for loose wiring connections.

(2) Corrective action(s):

(a) Place switch in ON position.

(b) Replace 3 amp fuse.

(c) Tighten.

c. Angle shown on indicator and actual rudder angle differ.

(1) Possible cause(s):

(a) Check for binding transmitter arm.

(b) Check for defective arm, spring pin or tie 'rod.

(c) Check wiring and connections.

(d) Check for loose servo motor.

(e) Check that problem is still not solved.

(2) Corrective action(s):

(a) Lubricate.

(b) Replace.

(c) Replace worn or broken wires, or terminal strip.

(d) Tighten.

(e) Refer to Direct Support Maintenance.

8. Demonstrate troubleshooting procedures for the steering control panel.

a. Inoperative - POWER AVAIL lamps not lit.

(1) Possible cause(s):

(a) Controller in steering compartment turned off.

(b) Check for defective controller in steering compartment.

(c) Inspect for lit fuse indicator.

(d) Check for burnt out POWER AVAIL lamp.

(2) Corrective action(s):

(a) Place LOCAL-OFF-REMOTE switch in either LOCAL or REMOTE position.

(b) Refer steering controller troubleshooting procedures.

(c) Replace fuse.

(d) Replace lamp.

b. Unable to turn on steering pumps.

(1) Possible cause(s):

(a) Check for controller in steering compartment not in REMOTE.

(b) Check for defective lamp or fuse.

(c) Check for defective pump START switch.

(2) Corrective action(s)

(a) Place LOCAL-OFF-REMOTE switch in REMOTE position.

(b) Replace lamp or fuse.

(c) Replace.

c. Steering lever moves but rudder does not.

(1) Possible cause(s):

(a) Check for leaking hydraulic lines.

(b) Check for defective steering handle or hub.

(c) Inspect for loose or broken wiring.

(2) Corrective action(s):

(a) Tighten leaking lines or notify unit maintenance for repair.

(b) Replace.

(c) Tighten or replace wiring. If problem continues, refer to Direct Support Maintenance.

d. Steering action erratic.

(1) Possible cause; Inspect for loose or broken wiring.

(2) Corrective action; Tighten or replace wiring. If problem continues, refer to Direct Support Maintenance.

e. Automatic steering controls inoperative or erratic.

(1) Possible cause(s):

(a) Check for defective switch.

(b) Check for defective variable resistors.

(2) Corrective action(s):

(a) Replace.

(b) Replace.

9. Demonstrate troubleshooting procedures for a hard turning steering wheel.

a. Possible cause(s):

(1) Check to see if the isolation valves are open.

(2) Check to see if counterbalance valve is set improperly.

(3) Check to see if relief valve is stuck open.

(4) Check the helm unit for binding.

(5) Check the rudder for fouling.

b. Corrective action(s):

(1) Open the isolation valves.

(2) Notify unit maintenance.

(3) Notify unit maintenance.

(4) Notify unit maintenance if binding is found.

(5) Notify general support maintenance if fouling is found.

(Asterisks indicates a leader performance step.)

**Evaluation Guidance:** None

**Evaluation Preparation:** None

PERFORMANCE MEASURES	GO	NO-GO	N/A
1. Demonstrated troubleshooting procedures for the steering hydraulic system.			
a. No pressure in hydraulic system.			
b. Low pressure in hydraulic system.			
c. Erratic pressure in-hydraulic system.			
d. Excessive pressure in hydraulic system.			
e. Excessive temperature in hydraulic system.			
f. Hydraulic fluid does not flow.			
2. Demonstrated troubleshooting procedures for the steering system hydraulic pump.			
a. Noisy hydraulic pump.			
b. External hydraulic fluid leakage around hydraulic pump shaft or housing.			
c. External hydraulic fluid leakage around hydraulic pump shaft or housing.			
d. Electric motor will not operate.			
3. Demonstrated troubleshooting procedures for the steering cub hydraulic pump.			
a. Erratic operation of rudder.			
b. Rudder movement in one direction.			
c. Steering system inoperative.			
d. System operates sluggishly.			
e. Pump making noise.			
f. Rudder goes hard-over.			
4. Demonstrated troubleshooting procedures for the directional control valve.			
a. Erratic Pressure.			
b. Low pressure or no pressure.			
c. Excessive noise or chatter.			
5. Demonstrated troubleshooting procedures for steering cylinder and adjustable links.			
a. Cylinder loose.			
b. Cylinder leaking.			
c. Adjustable links loose.			
d. Rudders not at the same position.			
6. Demonstrated troubleshooting procedures for the steering controller.			
a. Hydraulic pump inoperative.			
b. Hydraulic pump operating - RUN light on steering console in pilothouse not lit.			
c. Hydraulic pump operating - Gyropilot in the pilothouse inoperative.			
7. Demonstrated troubleshooting procedures for the rudder angle indicator and repeat-back transmitter.			
a. Rudder angle indicator not responding.			
b. Inoperative. No incoming power.			
c. Angle shown on indicator and actual rudder angle differ.			
8. Demonstrated troubleshooting procedures for the steering control panel.			
a. Inoperative - POWER AVAIL lamps not lit.			
b. Unable to turn on steering pumps.			
c. Steering lever moves but rudder does not.			
d. Steering action erratic.			
e. Automatic steering controls inoperative or erratic.			
9. Demonstrated troubleshooting procedures for a hard turning steering wheel.			

**Supporting Reference(s):**

Step Number	Reference ID	Reference Name	Required	Primary
	TM 55-1905-217-12	Operator's and Organizational Maintenance Manual: Landing Craft, Mechanized, Steel, DED, Overall Length 74 Feet, Mod 1, Mark VIII, Navy Design LCM-8, Hull Nos. 8500-8560 and 8580-8618 (NSN 1905-00-935-6057) (Reprinted W/Basic Incl C1-3)	No	No
	TM 55-1905-217-34	DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL: LANDING CRAFT, MECHANIZED, STEEL, DED, OVERALL LENGTH 74 FEET, MOD 1, MARK VIII, NAVY DESIGN LCM-8 (GUNDERSON BROS. ENGINEERING CORP., MARINETTE MARI	No	No
	TM 55-1905-219-14-3	OPERATORS, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL FOR LANDING CRAFT UTILITY (LCU) 1667-1670 (NSN 1905-00-168-5764)	No	No
	TM 55-1905-221-14-1	OPERATOR, UNIT AND INTERMEDIATE (DIRECT AND GENERAL SUPPORT) MAINTENANCE MANUAL FOR LANDING CRAFT, MECHANIZED STEEL, DED, OVERALL LENGTH 74 FEET, MOD 1, MARK VIII, NAVY DESIGN LCM-8 HULL NUMBERS 8500 THRO	No	No
	TM 55-1905-222-14	OPERATOR, UNIT AND INTERMEDIATE (DIRECT AND GENERAL SUPPORT) MAINTENANCE MANUAL FOR LANDING CRAFT, MECHANIZED (LCM-8) (ROHR AND GUNDERSON MODELS) (NSN 1905-01-284-2647) AND (1905-01-284-2648) (REPRINTED W	No	No
	TM 55-1905-223-24-10	UNIT, INTERMEDIATE DIRECT SUPPORT AND INTERMEDIATE GENERAL SUPPORT MAINTENANCE INSTRUCTIONS FOR BOW RAMP ASSEMBLY FOR LANDING CRAFT UTILITY (LCU) (NSN 1905-01-154-1191) (REPRINTED W/BASIC INCL C1-2) (THIS	No	No
	TM 55-1905-242-14	OPERATOR, UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE	No	No
	TM 55-1915-200-10	Operator's Manual for Logistic Support Vessel (LSV) (NSN 1915-01-153-8801) (Reprinted W/Basic Incl C1-6)	No	No
	TM 55-1915-254-10-1	OPERATOR'S MANUAL FOR LOGISTICS SUPPORT VESSEL (LSV-7 & -8)	No	No
	TM 55-1915-254-10-2	OPERATOR'S MANUAL FOR LOGISTICS SUPPORT VESSEL (LSV-7 & -8)	No	No
	TM 55-1925-204-12	OPERATORS AND ORGANIZATIONAL MAINTENANCE MANUAL FOR TUG, HARBOR, DIESEL, STEEL, 1,200 HP, 100 FOOT DESIGN 3006, FLIGHT ONE (NSN 1925-00-375-3003) (REPRINTED W/BASIC INCL C1-5)	No	No

	TM 55-1925-236-12	OPERATOR AND UNIT MAINTENANCE MANUAL FOR SMALL TUG (ST) (NSN 1925-01-435-1713)	No	No
	TM 55-1925-273-10-1	Operator's Manual For Inland Coastal Large Tug (LT) (NSN 1925-01-509-7013)(EIC XAG) (This item is included on EM 0272)	No	No
	TM 55-1925-273-10-2	Operator's Manual for Inland and Coastal Large Tug (LT) (NSN 1925-01-509-7013) (EIC XAG) (This item is included on EM 0272)	No	No

**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 FM 3-34.5 Environmental Considerations and GTA 05-08-002 ENVIRONMENTAL-RELATED RISK ASSESSMENT.

**Safety:** In a training environment, leaders must perform a risk assessment in accordance with ATP 5-19, Risk Management. 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 FM 3-11.4, Multiservice Tactics, Techniques, and Procedures for Nuclear, Biological, and Chemical (NBC) Protection, FM 3-11.5, Multiservice Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Decontamination.

**Prerequisite Individual Tasks :** None

**Supporting Individual Tasks :**

Task Number	Title	Proponent	Status
551-88L-3052	Trouble Shoot a Hydraulic System	551 - Transportation (Individual)	Approved

**Supported Individual Tasks :** None

**Supported Collective Tasks :** None

**ICTL Data :**

ICTL Title	Personnel Type	MOS Data
88L30 Watercraft Engineer	Enlisted	MOS: 88L, Skill Level: SL3, Duty Pos: TFR, LIC: EN
88L40 Watercraft Engineer	Enlisted	MOS: 88L, Skill Level: SL4, Duty Pos: TGB, LIC: EN, SQI: O