

Summary Report for Individual Task
551-88L-3052
Trouble Shoot a Hydraulic System
Status: Approved

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

Destruction Notice: None

Foreign Disclosure: FD1 - The materials contained in this course have been reviewed by the course developers in coordination with the Transportation School, Fort Lee, Virginia 23801 foreign disclosure authority. This course is releasable to students from all requesting foreign countries without restrictions.

Condition: Given a hydraulic 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 MOPP 4 conditions do not exist for this task. See the MOPP 4 statement for specific conditions.

Standard: The Soldier correctly conducts troubleshooting procedures pertaining to a hydraulic 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: Low

MOPP 4: N/A

Task Statements

Cue: None

DANGER
None

WARNING
HIGH PRESSURE HYDRAULIC SYSTEM HAZARDS: Hydraulic system can cause serious injuries if high pressure line or equipment fail. Never work on hydraulic systems or equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment, and who can give first aid. A second person should stand by controls to turn off hydraulic pumps in an emergency. When the technicians are aided by the operators, the operators must be warned about dangerous areas.

CAUTION
None

Remarks: None

Notes: None

DANGER

1. Demonstrate Knowledge of Hydraulic System Terms
2. Demonstate Knowledge of Pump Terms
3. Demonstrate Knowledge of Various Hydraulic Pumps
4. Demonstrate Knowledge of Hydraulic System Components
5. Demonstrate Knowledge of Hydraulic Math
6. Demonstrate Knowledge of Hydraulic System ANSI Symbols
7. Demonstrate Troubleshooting Procedures For a Hydraulic System
 - a. Identify Three Major Groups In a Hydraulic System
 - (1) Identify Energy Group
 - (2) Identify Mechanical Group
 - (3) Identify Fluid Group
 - b. No Pressure In a Hydraulic System
 - (1) Check For Power Loss
 - (2) Check For Low Hydraulic Oil In Reservoir
 - (3) Check Strainers and Filters
 - (4) Check Pressure Relief Valve Malfunction
 - (5) Check For Malfunction of Directional Control Valve
 - (6) Check For Air Leak In The Suction Line
 - (7) Check Hydraulic Oil Viscosity For Thickness Preventing Priming of Pump
 - (8) Check For Proper Rotation of Hydraulic Pump
 - (9) Check For Broken Shaft or Parts Inside Hydraulic Pump
 - c. Low Pressure In a Hydraulic System
 - (1) Check Suction Valves Are Open

- (2) Check For Proper Oil Level In Reservoir
- (3) Check To See If Pressure Relief Valve Is Set To Low
- (4) Check For Excessive External Leakage In System
- (5) Check For Worn Hydraulic Pump

d. Erratic Pressure In Hydraulic System

- (1) Check For Air In Hydraulic System
- (2) Check For Contamination Of Hydraulic Fluid
- (3) Check For Damaged Hydraulic Pump or Motor

e. Excessive Hydraulic Pressure Within System

- (1) Check Pressure Relief Valve For Correct Setting
- (2) Check The Pressure Relief Valve For Damage

f. Excessive Temperature In Hydraulic System

- (1) Check For High Pressure In Hydraulic System
- (2) Check For Correct Setting Of Pressure Relief Valve
- (3) Check Hydraulic System For Cavitation
- (4) Check For Air In Hydraulic Oil
- (5) Check For Proper Level Of Hydraulic Oil
- (6) Check The Condition Of Hydraulic Oil

g. Air In Hydraulic System

- (1) Check Connection At All Fittings
- (2) Check For Proper Fluid Level In Hydraulic System
- (3) Bleed All Air From Hydraulic System

h. Low Oil Level In Hydraulic System

- (1) Check For Leaks In the System
- (2) Fill Hydraulic System To Proper Level

i. Hydraulic Oil Is Dirty

- (1) Check The Condition Of System Strainers
- (2) Check The Condition Of System Filters
- (3) Change The Systems Hydraulic Oil

j. No Flow In Hydraulic System

- (1) Check For The Proper Operation Of System Pump
- (2) Check For Proper Operation Of System Motor
- (3) Check The Condition Of The Drive Couplin Between The Pump and Motor
- (4) Check For Proper Setting Of Pressure Relief Valve

k. Faulty Operation Of Linear Actuators

- (1) Check Actuator For External Leakage
- (2) Check Actuator For Internal Leakage
- (3) Check Actuator For Sluggish Operation
- (4) Check Actuator For Loose Mounting
- (5) Check For Proper Allignment Of Actuator
- (6) heck For Burrs On The Piston Rod Of Actuator

(Asterisks indicates a leader performance step.)

Evaluation Guidance: Score the Soldier a Go if all performance measures are correctly completed/pass (P). Score the Soldier a NO-GO if any of the performance measures are missed or incorrectley performed/fail (F).

Evaluation Preparation: Safety precautions must be adhere to when performing this task listed in the prescribed technical manual (TM). Always bleed the system prior to working on presurize system.

PERFORMANCE MEASURES	GO	NO-GO	N/A
1. Demonstrated Troubleshooting Procedures For The 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 Oil Does Not Flow In Hydraulic System			
2. Demonstrated Troubleshooting Procedures For The Hydraulic Pump			
a. Noisy Operation Of Hydraulic Pump			
b. Excessive Wear Of Hydraulic Pump Parts			
c. External Leakage Around Hydraulic Pump Shaft or Housing			
d. Electric Motor Will Not Operate			
3. Demonstrated Knowledge Of Hydraulic Math			
4. Demonstrated Knowledge Of Hydraulic Terms			

Supporting Reference(s):

Step Number	Reference ID	Reference Name	Required	Primary
	881A1I01	HYDRAULICS	No	No
	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 55-1905-219-14-3	OPERATORS, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL FOR LANDING CRAFT UTILITY (LCU) 1667-1670 (NSN 1905-00-168-5764)	No	No
	TM 55-1905-223-24-10	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 55-1915-254-10-1	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

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. 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. AR 200-1 delineates TRADOC responsibilities to integrate environmental requirements across DOTMLPF and ensures all training procedures, training manuals, and training doctrine includes sound environmental practices and considerations. The Army's environmental vision is to be a national leader in environmental and natural resource stewardship for present and future generations as an integral part of all Army missions. Environmental protection

is never completed. Continuously be alert to ways to protect our environment and reduce waste. Leaders must ensure that their unit has an active and strong environmental program. They must understand the laws and know what actions to take. Leaders bring focus, direction, and commitment to environmental protection. Commanding officers should ensure the following environmental programs are in place and are being maintained: -Hazardous materials program. -Hazardous waste program. -Hazardous communications program. -Pollution prevention and hazardous waste minimization recycling program. -Spill prevention and response plan program.

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 :

Task Number	Title	Proponent	Status
551-88L-1009	Operate a Hydraulic System	551 - Transportation (Individual)	Approved
551-88L-2046	Maintain a Hydraulic System	551 - Transportation (Individual)	Approved

Supporting Individual Tasks :

Task Number	Title	Proponent	Status
551-88L-1018	Operate an Electric Motor	551 - Transportation (Individual)	Approved
551-88L-1009	Operate a Hydraulic System	551 - Transportation (Individual)	Approved
551-88L-1010	Operate a Ramp System	551 - Transportation (Individual)	Approved

Supported Individual Tasks :

Task Number	Title	Proponent	Status
551-88L-3056	Troubleshoot Auxiliary Deck Equipment	551 - Transportation (Individual)	Approved
551-88L-3057	Troubleshoot a Pump	551 - Transportation (Individual)	Approved
551-88L-3053	Troubleshoot a Ramp System	551 - Transportation (Individual)	Approved
551-88L-3063	Troubleshoot an Electric Motor	551 - Transportation (Individual)	Approved
551-88L-3076	Troubleshoot a Steering System	551 - Transportation (Individual)	Approved
551-88L-3061	Troubleshoot a Propulsion System	551 - Transportation (Individual)	Approved

Supported Collective Tasks :

Task Number	Title	Proponent	Status
55-2-1508	Conduct Vessel Operations	55 - Transportation (Collective)	Approved
55-2-1503	Prepare Vessel for Sea	55 - Transportation (Collective)	Approved
55-2-1502	Conduct Watercraft Support Maintenance Operations	55 - Transportation (Collective)	Approved

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