

Summary Report for Individual Task  
551-88M-1663  
Operate a Vehicle-mounted Crane  
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 Fort Lee, VA foreign disclosure authority. This product is releasable to students from all requesting foreign countries without restrictions.

**Condition:** In an operational environment, given a vehicle equipped with a vehicle-mounted crane on which before-operation PMCS has been performed, applicable TM, flat surface in which to operate, and directions/hand signals from another Soldier. This task should be trained under IED Threat conditions.

**Standard:** Setup vehicle-mounted crane for operation to include outriggers, as applicable. Operate the crane while following visual hand and arm signals. Prepare crane and outriggers, as applicable, for travel. All crane operations must be performed without injury to personnel or damage to any equipment or load.

**Special Condition:** None

**Safety Risk:** Medium

**MOPP 4:**

<b>Task Statements</b>
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**Cue:** You are required to off-load your cargo from your 5-Ton tactical vehicle.

<b>DANGER</b>
Soldiers must be aware of the inherent dangers of working in and around tactical wheeled vehicles. Hot surfaces, sharp, moving objects such as fan blades, slippery surfaces, and excessively loud noises are all dangers. These dangers are also applicable to hazardous cargo being transported (explosive hazard)(as applicable). Each Soldier should take every precaution not to become a victim of these dangers by following regulatory guidance and risk management rules. If armed the vehicle has additional ammunition explosive and negligent discharge hazards.

<b>WARNING</b>
Adhere to all WARNING statements in the TM for the vehicle used in the task.

<b>CAUTION</b>
Adhere to all CAUTION statements in the TM for the vehicle used in the task.

**Remarks:** Reference TM 9-2320-428-10, WP 0042

**Notes:** Vehicle must be positioned on level ground.

## Performance Steps

### 1. Prepare Crane for Use.

- a. Chock wheels.

## WARNING

Stand clear of outrigger beams while operating levers. Failure to comply may result in injury or death to personnel. • Do not operate crane unless outriggers are firmly in place or vehicle could turn over. Failure to comply may result in injury or death to personnel. • Keep boom clear of all electrical lines and other obstacles while operating crane. Failure to comply may result in injury or death to personnel. - If operator cannot see load during operation, operate crane from REMOTE CONTROL UNIT. Failure to comply may result in injury or death to personnel.

- b. Start engine.

Note: Failure of hydraulic system will stop crane operation and lock crane in place. If hydraulic system fails during crane operation, refer to perform immediate action for loss of hydraulic system. • If electrical system fails during crane operation, refer to perform emergency hydraulic operation when grove crane electrical power fails.

- c. Position vehicle on level ground so all loading and unloading can be done from one position.

- d. Set transmission range selector to N.

- e. Pull out PARKING BRAKE control.

- f. Set PTO ENGAGE switch to OFF position. Indicator light will go out.

## CAUTION

PTO ENGAGE switch must be in OFF position before moving hydraulic selector valve control to prevent equipment damage.

- g. Push hydraulic selector valve control in for crane operation.

- h. Set PTO ENGAGE switch to ON position. Indicator light will illuminate.

- i. Set electric control box ON/OFF switch to ON position.

- j. Set ENGINE HIGH IDLE ON/OFF switch to ON position.

- k. Push up and release HATCH switch to raise engine speed to approximately 1500 rpm.

### 2. Setup Outriggers.

- a. Move outrigger extension control lever to OUT position until right and left outrigger beams are fully extended.

Note: Always operate control levers with light, even pressure. • Outrigger beams will come out slower with light pressure on lever. Pushing lever to full travel will cause faster movement. • Although either right or left side outrigger may extend first, both outriggers will extend when O/R EXT control lever is positioned to OUT.

## WARNING

Stand clear of outrigger beams while operating levers. Failure to comply may result in injury or death to personnel.

- b. Remove two safety pins and remove outrigger pad from studs on outrigger beam.
- c. Remove two retaining pins.
- d. Clean all foreign material from socket in outrigger pad and from rod end of outrigger jack cylinder.
- e. Position outrigger pad directly below outrigger jack cylinder.
- f. Repeat steps b thru e for driver side outrigger pad.

## WARNING

Keep hands and feet clear of outrigger jack cylinders. Failure to comply may result in injury or death to personnel.

g. Move left-hand outrigger jack control lever to DOWN position and lower outrigger jack cylinder until rod end is seated in outrigger pad.

Note: Adjust outrigger pad position as required so rod end will lower into pad socket.

h. Install two retaining pins.

i. Move right-hand outrigger jack control lever to DOWN position and lower outrigger cylinder until rod end is seated in outrigger pad.

j. Install two retaining pins.

3. Jack outriggers.

## WARNING

• Do not raise vehicle tires off ground with outrigger jack cylinders. Vehicle could roll over. Always chock front wheels when using outriggers. Failure to comply may result in injury or death to personnel. • Crane must be level from side to side. Use of crane in unlevel position can cause vehicle to turn. Failure to comply may result in injury or death to personnel.

a. Simultaneously move left-hand outrigger jack and right-hand outrigger jack control levers to DOWN position.

Note: Operate left and right outrigger jack control levers at same time.

b. Lower driver side and passenger side outrigger jack cylinders until vehicle weight is off rear tires.

Note: Vehicle weight should be off No. 4 axle just enough so tires still have firm contact with ground but no longer bulge from weight of vehicle.

4. Raise boom to operating position.

## **WARNING**

Do not operate crane unless outriggers are firmly in place or vehicle could turn over. Failure to comply may result in injury or death to personnel.

## **CAUTION**

Do not let cable unwind and become slack or cable may get tangled on drum.

- a. Move HOIST control lever to DOWN position and lower hoist cable approximately 1 foot.

## **CAUTION**

Release hook lock before disconnecting load hook from stowage ring bracket to avoid hook lock damage. Do not let load hook fall or hit bracket.

- b. Disconnect load hook from stowage ring bracket.
- c. Move boom control lever to UP position until boom is approximately 45 degrees above horizontal.

## **CAUTION**

To avoid damage to outrigger leg or load hook, do not hit outrigger leg with load hook.

- d. Move MAST control lever to UP position until the mast is fully erect and the cylinders are fully extended.
- e. Move BOOM control lever to UP position simultaneously as required to maintain the boom at approximately 45 degrees above horizontal until the mast is fully erect.
- f. Hold MAST control lever to UP position for two to three seconds after mast is fully erect to ensure cylinders are fully filled with oil.
- g. Operate crane with manual controls or remote-control unit.

5. Rotate and telescope boom.

## WARNING

When using crane on any vehicle, park vehicle clear of all overhead electrical lines. Keep boom clear of all electrical lines and other obstacles while operating crane. Failure to comply may result in injury or death to personnel. • Ensure area is clear of personnel prior to moving SWING control lever. Boom should be swung slowly enough so crane operator has complete control. If operator cannot see load during operation, operate crane from REMOTE CONTROL UNIT. Failure to comply may result in injury or death to personnel. • Operator must keep control of load at all times. If necessary, attach cargo tie downs to load for control. Failure to comply may result in injury or death to personnel. • If electrical power fails during crane operation, move switch on REMOTE CONTROL UNIT to SHUTDOWN position. Failure to comply may result in injury or death to personnel.

## CAUTION

Boom must be above vehicle sides for clearance. Hitting side of vehicle with boom may cause damage to boom or vehicle.

- a. Move SWING control lever to CW position to move boom clockwise.

Note: Operate control levers with light, even pressure. Moving lever slightly will cause slow movement of crane. Moving lever to full travel will cause faster movement of crane.

- b. Move SWING control lever to CCW position to move boom counterclockwise.

## CAUTION

Keep hook block at least 2 ft. (0.61 m) from end of boom. If hook block hits end of boom it may damage cable or hook block and crane will lose power. Wait six seconds for power to return and check crane for damage.

- c. Move TELESCOPE control lever to OUT position to extend boom and move HOIST control lever to DOWN position to pay out cable.

Note: • When crane is overloaded, M977 and M985 overload system will automatically shut off power to telescope boom out, raise boom, or hoist load any higher. The M977 overload system will also prevent lowering boom. Overload condition can be corrected by lowering load to ground or other supporting surface by using HOIST control lever only. • When telescoping the boom, the TELESCOPE and HOIST control levers should be operated at the same time. • Crane movement from one lever may be slower than the other when operating two levers together.

## CAUTION

Do not go over maximum load rating as shown on RANGE DIAGRAM. Going over load ratings will cause damage to equipment.

- d. Refer to RANGE DIAGRAM on turntable panel to raise boom to correct angle before connecting the load.

Note: When operating M977 crane, raise boom to approximately 60 degree angle to pick up maximum load.

6. Raise and lower load.

## WARNING

- When using crane on any vehicle, park vehicle clear of all overhead electrical lines. Keep boom clear of all electrical lines and other obstacles while operating crane. Failure to comply may result in injury or death to personnel.
- Ensure area is clear of personnel prior to moving SWING control lever. Boom should be swung slowly enough so crane operator has complete control. If operator cannot see load during operation, operate crane from REMOTE CONTROL UNIT. Failure to comply may result in injury or death to personnel.
- Operator must keep control of load at all times. If necessary, attach cargo tie downs to load for control. Failure to comply may result in injury or death to personnel.
- If electrical power fails during crane operation, move switch on REMOTE CONTROL UNIT to SHUTDOWN position. Failure to comply may result in injury or death to personnel.

## CAUTION

- Do not let cable become slack or cable may get tangled on drum.
- Do not drag load sideways on ground or damage to crane may result.

a. Operate SWING control lever and center end of boom directly over load.

## CAUTION

Operate HOIST control lever to raise or lower cable and connect load hook to load.

b. Operate HOIST control lever to raise or lower cable and connect load hook to load.

## WARNING

- Always wear protective gloves when handling winch cable. Never let cable run through hands. Frayed cables can cut severely. Failure to comply may result in injury or death to personnel.
- Never operate winch with less than five wraps of cable on winch drum. Failure to comply may result in injury or death to personnel.

## CAUTION

- Do not jerk HOIST control lever or load will bounce causing possible damage to crane or load.
- Do not operate crane with boom below horizontal when there is a load on hook.
- For M977, maximum load limit with boom length under 9 ft. (2.75 m) is 4500 lbs (2 043 kg). Maximum load limit with boom extended over 9 ft. (2.75 m) is 2500 lbs (1 135 kg).
- For M985, maximum load limit is 5400 lbs (2 452 kg) for entire boom reach.

c. Move HOIST control lever in UP position to lift load. Move BOOM control lever in UP position to raise load higher.

Note: • When M977 and M985 crane is overloaded, the overload systems will automatically shut off power to telescope boom out, raise boom, or hoist load any higher. • The M977 overload system will also prevent lowering load to ground or other supporting surface. All crane functions will be restored in approximately six seconds.

d. Move HOIST control lever in DOWN position to lower load. Move BOOM control lever in DOWN position to lower load further.

e. Shutdown crane.

7. Shutdown crane.

a. Set ON/OFF POWER switch to ON position.

b. Set ENGINE HIGH IDLE ON/OFF switch to ON position.

c. Push and release LATCH switch to raise engine speed to approximately 1500 rpm.

## CAUTION

• Keep hook block at least 2 ft. (0.61 m) from end of boom. If hook block hits end of boom it may damage cable or hook block and crane will lose power. Wait six seconds for power to return and check crane for damage. • Do not let cable unwind and become slack or cable may get tangled on drum.

d. Move TELESCOPE control lever to IN position to pull boom extensions in and move HOIST control lever to UP position to reel in cable until all boom extensions are fully retracted.

Note: • Operate control lever with light, even pressure. • TELESCOPE and HOIST control levers should be operated at same time to keep hook block at least 2 ft. (0.61) from end of boom. • Crane movement from one lever may be slower than the other when operating levers together.

e. Operate SWING control lever to position boom parallel with outrigger beam on passenger side of vehicle.

## CAUTION

Boom must rest on rest pad when transporting vehicle. If not, damage to equipment may result.

f. Move MAST control lever to DOWN position to lower mast until mast is completely folded down.

g. Move BOOM control lever in concert with MAST control lever as required to maintain boom at approximately 45 degrees above horizontal until mast is completely folded down.

h. Move BOOM control lever to DOWN position until boom comes to rest on mast rest pad.

## CAUTION

Release hook lock before connecting load hook to stowage ring bracket to avoid damage to hook lock.

i. Connect load hook to stowage ring bracket. Move HOIST control lever in UP position to remove slack from hoist cable.

Note:  
Stowage ring is smallest hole in bracket.

j. Connect load hook to stowage ring bracket. Move HOIST control lever in UP position to remove slack from hoist cable.

8. Stow outriggers.

- a. Remove two retaining pins from each outrigger pad.
- b. Move left outrigger jack (LH O/R JACK) and right outrigger jack (RH O/R JACK) control levers to UP position to retract outrigger jack cylinders completely.
- c. Install two retaining pins into each outrigger pad.
- d. Stow each outrigger pad on appropriate stud.
- e. Install safety pins through each stud.
- f. Move outrigger extension (O/R EXT) control lever to IN position to retract outrigger beams completely.
- g. Set ENGINE HIGH IDLE ON/OFF switch to OFF position.
- h. Set ON/OFF POWER switch to OFF position.
- i. Set PTO ENGAGE switch to OFF position. Indicator light will go out.
- j. Shut off engine.

(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 any performance measure is failed, tell the soldier what was done wrong and how to do it correctly.

**Evaluation Preparation:** SETUP: Brief Soldier on task Specifications. Provide a M977 or M985 HEMTT Cargo Truck, hearing protection, flat-level ground, a simulated load, assistance.

PERFORMANCE MEASURES	GO	NO-GO	N/A
1. Prepared Crane for Use.			
2. Setup Outriggers.			
3. Jacked outriggers.			
4. Raised boom to operating position.			
5. Rotated and telescoped boom.			
6. Raised and lowered load.			
7. Shutdown crane.			
8. Stowed outriggers.			

**Supporting Reference(s):**

Step Number	Reference ID	Reference Name	Required	Primary
	TC 21-305-20	Manual for the Wheeled Vehicle Operator {AFMAN 24-306(I)}	No	No
	TM 9-2320-428-10	OPERATOR MANUAL FOR TRUCK, CARGO, 8X8 M977 W/WINCH (NSN 2320-01-097-0260)(EIC B2D) M977 W/O WINCH (2320-01-099-6426)	Yes	Yes

**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. Adhere to all environmental impact applications pertinent to this step as listed in the vehicle TM, AR 200-1, and FM 20-400.

Loud noise pollution when vehicle engine is operating.

Possible hazardous fluid leakage from vehicle. Use drip pans when possible.

**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. Use hearing protection when operating vehicle or vehicle is running.

Chock vehicle wheels while operating crane. Do not exceed lifting capacity of crane.

Always emplace outriggers (where applicable) prior to lifting operations.

Allow no personnel under a suspended load.

Make steady even crane movements to prevent injury to personnel or damage to vehicle or load.

Keep crane boom clear from overhead power lines.

Keep all unnecessary personnel well clear of operating area to avoid injury.

Instructors (unit Master Driver) must ensure that operators (candidates) of tactical wheeled vehicles are trained IAW AR 600-55, AR 385-10 Chapter 11, vehicle training circulars (TC), and TC 21-305-20. When training on a specific vehicle the instruction will include all safety hazards and risks of operating or working with the vehicle.

- All personnel must stand clear during lifting operations. A swinging or shifting load may cause injury or death to personnel.
- Never crawl under equipment when performing maintenance unless equipment is securely blocked. Failure to comply may cause injury or death to personnel.
- Keep clear of equipment when it is being raised or lowered. Failure to comply may cause injury or death to personnel.
- Do not work on any item supported only by lift jacks or hoist. Always use blocks or proper stands to support the item prior to any work. Failure to comply may result in injury or death to personnel.
- Do not lift a load greater than the rated load capacity of the crane or materiel handling equipment. Failure to comply may result in injury or death to personnel or damage to equipment.
- Do not allow heavy components to swing while hanging by lifting device. Failure to comply may cause injury or death to personnel.
- Any part or component that weighs between 50 lbs (23 kg) and 75 lbs (34 kg) must be removed with the aid of an assistant. Any part or component that weighs over 75 lbs (34 kg) must be removed with the aid of an assistant and a lifting device. Failure to comply may cause injury or death to personnel.
- Ensure all chains, hooks, and slings are in good condition and are of correct capacity. Ensure hooks are positioned correctly. Failure to comply may result in injury or death to personnel.

**Prerequisite Individual Tasks :** None

**Supporting Individual Tasks :** None

**Supported Individual Tasks :**

Task Number	Title	Proponent	Status
551-88M-2423	Supervise Operation of Vehicle-mounted Crane	551 - Transportation (Individual)	Analysis

**Supported Collective Tasks :** None