

Summary Report for Individual Task
551-88H-2508
Direct Marking Center of Balance for a Multi-axle or Tracked Vehicle
Status: Approved

DISTRIBUTION RESTRICTION: Approved for public release; distribution is unlimited.

DESTRUCTION NOTICE: None

Condition: Assigned as a cargo checker in an operational environment, during day or night, in normal weather conditions, given a completed risk assessment, an operation order/plan, safety equipment, multi-axle vehicle or tracked vehicle with operator, portable scales, platform scales, pencil, worksheet, tape measure, chalk, calculator, wooden beam, FM 3-35, TC 4-13.17, and DTR 4500.9-R, Part III, Appendix P. This task should not be trained in MOPP 4.

Standard: Direct marking center of balance for a multi-axle or tracked vehicle without injury to personnel or damage to equipment.

Special Condition: None

Safety Level: Low

MOPP: Never

Task Statements

Cue: You are assigned as a cargo checker tasked with directing the marking center of balance for multi-axle or tracked vehicles.

DANGER

Adhere to all DANGERS listed in the technical manuals and field manuals applicable to this procedure. Failure to comply may result in injury to personnel or damage to the equipment.

WARNING

Adhere to all WARNINGS listed in the technical manuals and field manuals applicable to this procedure. Failure to comply may result in injury to personnel or damage to the equipment.

CAUTION

Adhere to all CAUTIONS listed in the technical manuals and field manuals applicable to this procedure. Failure to comply may result in injury to personnel or damage to the equipment.

Remarks: None

Notes: None

Performance Steps

1. Ensure portable scales are serviceable and zeroed.

2. Direct personnel to determine the weight of a multi-axle vehicle by weighing all axles (W1, W2, W3), using the prescribed procedures.
 - a. Direct driver to position front axle of vehicle on scales.
 - b. Direct driver to apply the parking brake and to dismount vehicle.
 - c. Obtain weight from the scales for front axle and note weight on worksheet as W1.
 - d. Apply a strip of masking tape above the front axle on both sides of the vehicle.
 - e. Write front axle weight (FAW) on the masking tape or write on vehicle with a piece of chalk (example: FAW 2,900 pounds).
 - f. Direct the driver to remount vehicle and drive forward until the intermediate axle is centered on the scales.
 - g. Direct the driver to apply the parking brake and dismount the vehicle.
 - h. Obtain weight from scales for intermediate axle and note weight on worksheet as W2.
 - i. Apply a strip of masking tape above the intermediate axle on both sides of the vehicle.
 - j. Write intermediate axle weight (IAW) on the masking tape or write on vehicle with a piece of chalk (example: IAW 3,700 pounds).
 - k. Direct the driver to remount vehicle and drive forward until the rear axle is centered on the scales.
 - l. Direct the driver to apply the parking brake and to dismount the vehicle.
 - m. Obtain weight from the scales for rear axle and note weight on worksheet as W3.
 - n. Apply a strip of masking tape above the rear axle on both sides of the vehicle.
 - o. Write rear axle weight (RAW) on the masking tape or write on vehicle with a piece of chalk (example: RAW 4,000 pounds).

Note: If enough portable scales are available the vehicle can be taken onto the scales one at a time.

3. Direct personnel to obtain vehicle distances (D1, D2, D3) for a multi-axle vehicle using the prescribed procedures.
 - a. Using a tape measure, measure from the RDL to the center of the front axle wheel hub.
 - b. Enter distance on the worksheet as D1 in inches (example: D1 = 20 inches).
 - c. Using a tape measure, measure from the RDL to the center of the intermediate axle wheel hub.
 - d. Enter distance on the worksheet as D2 in inches (example: D2 = 70 inches).

e. Using a tape measure, measure from the RDL to the center of the rear axle wheel hub.

f. Enter distance on the worksheet as D3 in inches (example: D3 = 104 inches).

4. Direct personnel to determine axle distance for tandem axle vehicles using the prescribed procedures.

a. For tandem axles with less than 48-inch axle separation, compute center of balance (CB) from RDL to tandem midpoint (see Figure 3-118).

b. For tandem axles with separation that exceeds 48 inches, compute axle distances separately (see Figure 3-119).

Note: Example: Formula for 3-axle vehicle:

$$[(W1 \times D1) + (W2 \times D2) + (W3 \times D3)] / \text{Gross Weight} = \text{CB}$$

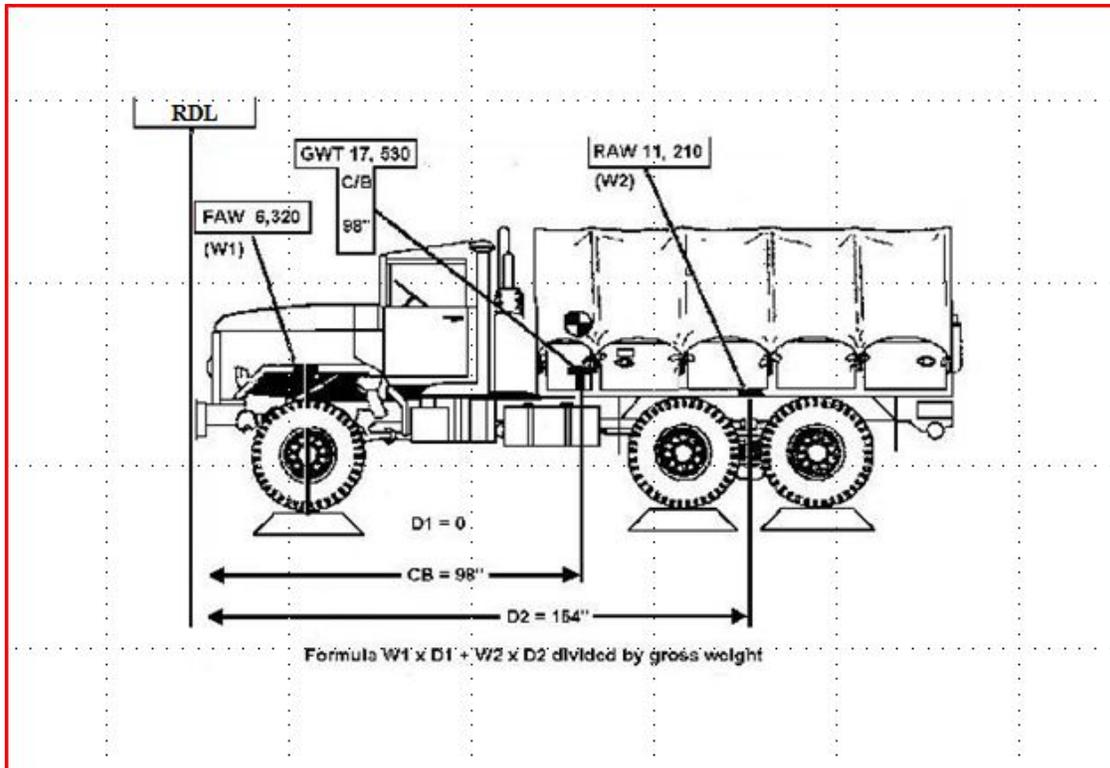


Figure 3-118
Computing CB from RDL to Tandem Midpoint

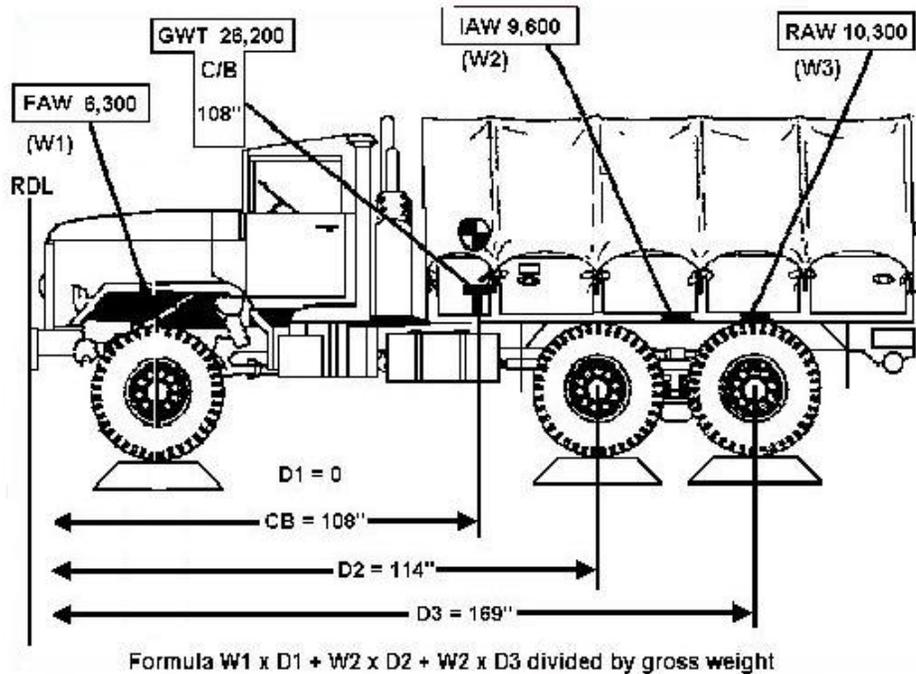


Figure 3-119
Computing Tandem Axles Separately With Separation that Exceeds 48 Inches

5. Direct personnel to enter required information into the center balance formula and compute center balance for a multi-axle vehicle.
 - a. Determine moments by multiplying weights by distances to obtain moments and then adding moments together.
 - b. Determine gross weight by adding all axle weights together.
 - c. Divide the total moments by the gross weight to obtain the CB in inches.
 - d. Round off answer to the nearest whole inch (example: 56.9 inches is rounded to 57 inches).
6. Direct personnel to mark center of balance for a multi-axle vehicle using the prescribed procedures.
 - a. Measure back from RDL to center balance distance obtained from computations.
 - b. Mark center balance by forming a T-shape with masking tape or by making a "T" with chalk. The vertical portion of the "T" represents the center of balance mark.
 - c. Write gross weight on the horizontal portion of the "T" formed by the masking tape or chalk.
 - d. Write the letters "CB" on the vertical portion of the T-shape and annotate the CB in inches (example: 57 inches) (see Figure 3-120).

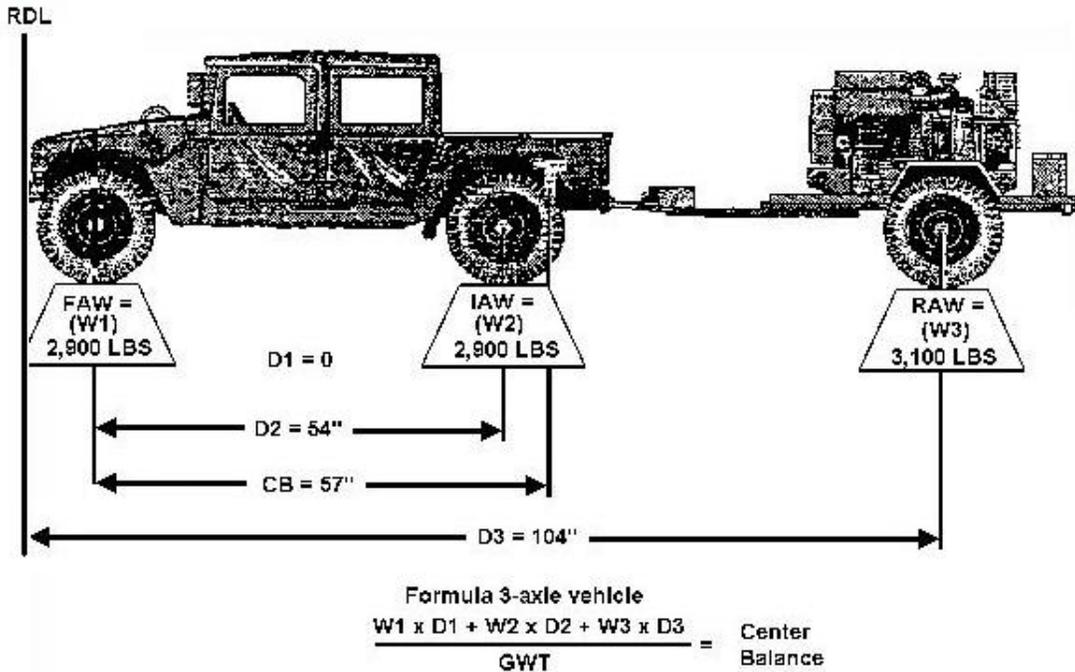


Figure 3-120

Writing Letters CB on Vertical Portion of T-shape and Annotate the CB in Inches

7. Direct personnel to determine the weight of a tracked vehicle using prescribed procedures (see Figure 3-121).
 - a. Direct driver to drive vehicle onto a platform scale large enough to accommodate the entire vehicle.
 - b. Record weight of tracked vehicle.

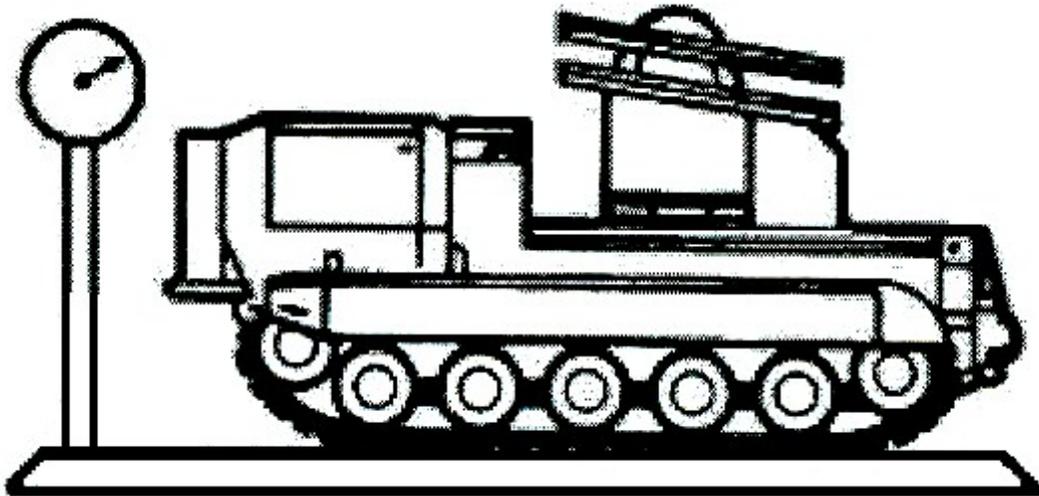


Figure 3-121

Determining the Weight of a Tracked Vehicle

8. Direct personnel to determine the center of balance of a tracked vehicle using prescribed procedures (see Figure 3-122).
 - a. Direct the driver to drive the vehicle onto a wooden beam or pole until the vehicle tilts forward.

b. Mark the side of the vehicle at the point of tilt.

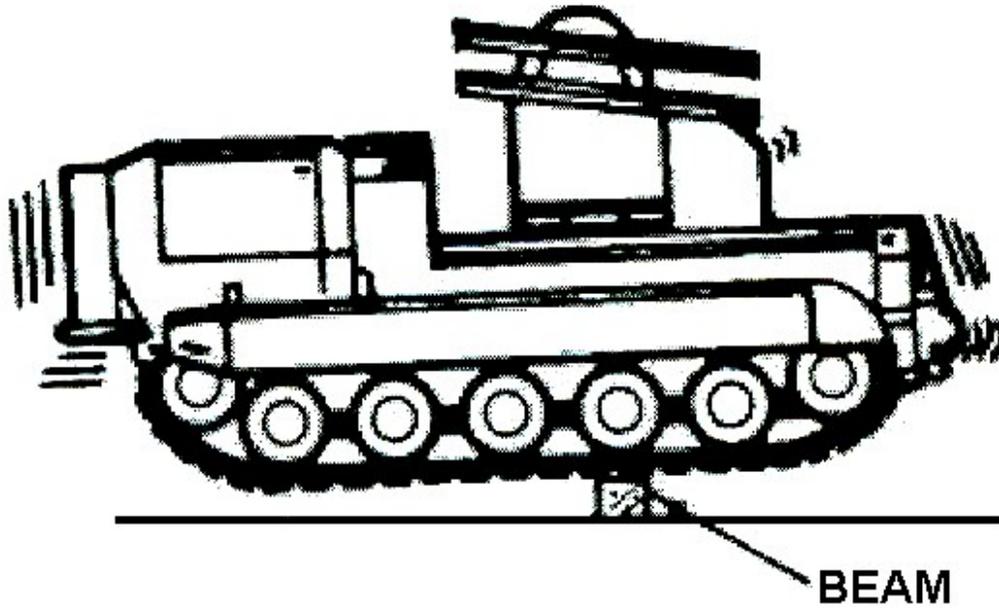


Figure 3-122
Determining the Center of Balance of a Tracked Vehicle

9. Direct personnel to mark the center of balance and gross weight of a tracked vehicle using prescribed procedures (see Figure 3-123).

Note: Use appropriate materials when marking vehicles.

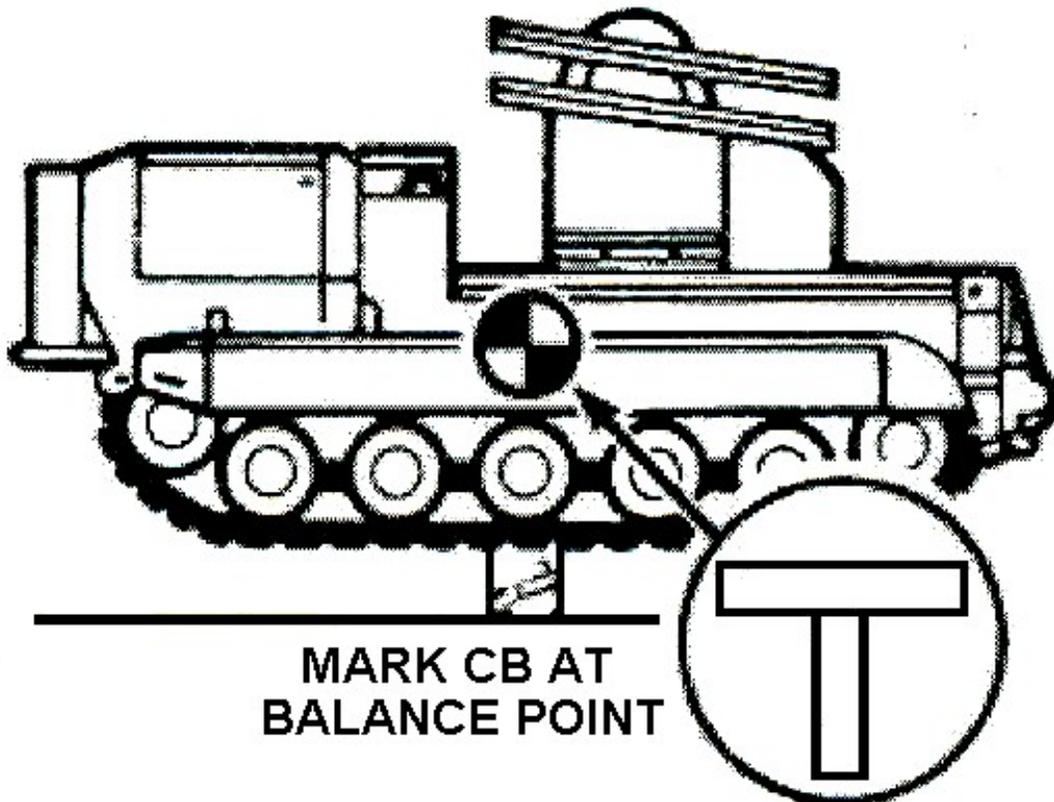


Figure 3-123
Marking the CB and Gross Weight of a Tracked Vehicle

(Asterisks indicates a leader performance step.)

Evaluation Guidance: Score the Soldier GO if all performance steps are passed (P). Score the Soldier NO-GO if any performance step is failed (F). If the Soldier fails any step, show what was done wrong and how to do it correctly.

Evaluation Preparation: Ensure that all materials required to perform the task are available. Tell the Soldier that he/she will be evaluated on directing the marking of center of balance for a multi-axle or tracked vehicle.

PERFORMANCE MEASURES	GO	NO-GO	N/A
1. Ensured portable scales were serviceable and zeroed.			
2. Directed personnel to determine the weight of a multi-axle vehicle by weighing all axles (W1, W2, W3), using the prescribed procedures.			
3. Directed personnel to obtain vehicle distances (D1, D2, D3) for a multi-axle vehicle using the prescribed procedures.			
4. Directed personnel to determine axle distance for tandem axle vehicles using the prescribed procedures.			
5. Directed personnel to enter required information into the center balance formula and compute center balance for a multi-axle vehicle.			
6. Directed personnel to mark center of balance for a multi-axle vehicle using the prescribed procedures.			
7. Directed personnel to determine the weight of a tracked vehicle using prescribed procedures.			
8. Directed personnel to determine the center of balance of a tracked vehicle using prescribed procedures.			
9. Directed personnel to mark the center of balance and gross weight of a tracked vehicle using prescribed procedures.			

Supporting Reference(s):

Step Number	Reference ID	Reference Name	Required	Primary
	DTR 4500.9-R	Part II Cargo Movement	Yes	No
	FM 3-35	Army Deployment and Redeployment	Yes	No
	TC 4-13.17	Cargo Specialist's Handbook	Yes	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. 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 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 FM 5-19, Risk Management. Leaders will complete a DA Form 7566 COMPOSITE RISK MANAGEMENT WORKSHEET 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. All operations will be performed to protect and preserve Army personnel and property against accidental loss. Procedures will provide for public safety incidental to Army operations and activities and safe and healthful workplaces, procedures, and equipment. Observe all safety and/or environment precautions regarding electricity, cable, and lines. Provide ventilation for exhaust fumes during equipment operation and use hearing protection when required IAW AR 385-10, the Clean Air Act (CAA) and the CAA amendments, and the OSHA Hazard Communication standard.

Accidents are an unacceptable impediment to Army missions, readiness, morale, and resources. Decision makers at every level will employ risk management approaches to effectively preclude unacceptable risk to the safety of personnel and property affiliated with this task.

- (a) Take personal responsibility
- (b) Practice safe operations.
- (c) Recognize unsafe acts and conditions.
- (d) Take action to prevent accidents.
- (e) Report unsafe acts and conditions.
- (f) Work as a team.

Prerequisite Individual Tasks : None

Supporting Individual Tasks :

Task Number	Title	Proponent	Status
551-88H-1508	Mark Center of Balance for a Multi-axle or Tracked Vehicle	551 - Transportation (Individual)	Analysis Completed

Supported Individual Tasks :

Task Number	Title	Proponent	Status
551-88H-3512	Manage Aircraft Load Teams	551 - Transportation (Individual)	Analysis Completed
551-88H-4502	Monitor Air Terminal Operations	551 - Transportation (Individual)	Analysis Completed

Supported Collective Tasks :

Task Number	Title	Proponent	Status
55-2-0106	Perform Arrival or Departure Airfield Control Group Functions	55 - Transportation (Collective)	Approved

ICTL Data :

ICTL Title	Personnel Type	MOS Data
MOS 88H - CARGO SPECIALIST SL2	Enlisted	MOS: 88H, Skill Level: SL2, Duty Pos: ABW