

**551-88U-3425
Analyze Train Make-Up
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 Transportation School, Fort Lee, VA foreign disclosure officer. This training product can be used to instruct international military students from all approved countries without restrictions.

Conditions: Assigned as a Railway Specialist advising COCOM/HN Personnel on the make-up of a train, given an Operations Order/Operations Plan, Personal Protective Equipment (PPE), completed risk assessment, transportation plan, means of communication, operational rail yard, railcars, timetables, HAZMAT instructions, System Special Instructions (SSI), day or night, in all weather conditions, in an operational environment scenario. Some iterations of this task should be performed in MOPP 4.

Standards: Validate train make-up and motive power requirements using completed documentation and on-site checks. Ensure horsepower to tonnage ratio, train length restrictions, tonnage restrictions, HAZMAT restrictions, and train make-up and car compatibility are 100% in accordance with System Special Instructions (SSI), timetables, HAZMAT instructions, or ATP 4-14.

Special Conditions: None

Safety Risk: Medium

MOPP 4: Sometimes

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|------------------------|
| Task Statements |
|------------------------|

Cue: Your team has been assigned to assess a rail company. You have been tasked to analyze the train make-up.

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| DANGER |
| None |

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| WARNING |
| None |

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| CAUTION |
| Working around live tracks is always dangerous. Follow all safety procedures outlined in the GCOR and ATP 4-14. |

Remarks: None

Notes: None

Performance Steps

1. Verify transportation plan and timetable are consulted:
 - a. Review current status of yard.
 - b. Identify railcars requiring special handling.
 - c. Determine outbound blocks.
 - d. Determine short work.
 - e. Determine order to build trains.
 - f. Generate switch list(s).
 - g. Determine tonnage scheduled to train(s).
 - h. Determine motive power available.
 - i. Calculate horsepower to tonnage ratio of scheduled train.
 - j. Determine length scheduled to train(s).
 - k. Identify shortest in-service siding in timetable.
2. Confirm the estimated time to departure – backward plan events to depart train on time.
 - a. Time required by switch crew(s) to break-up inbound train(s) into outbound blocks of railcars.
 - b. Time required by switch crew(s) to double outbound blocks (in station order) and spot for air testing.
 - c. Time required to perform Class I air brake test.
 - (1) Performed by switch crew.
 - (2) Performed by car inspectors from Equipment Maintenance Platoon.
 - (3) Performed by outbound train crew.
 - d. Time required to remove bad order railcars.
 - e. Time required to double train together and test marker.
 - f. Time outbound train crew is rested or available.
3. Confirm railcars are switched into outbound blocks and spotted for air testing.
4. Verify that a Class I air test is completed.
5. Verify any bad order railcars are removed.
6. Confirm outbound train crew is ordered.
7. Confirm a wheel report is generated.
8. Confirm outbound train departs.
 - a. Participate in crew briefing as needed.

- b. Coordinate yard activities to facilitate departure.
 - c. Report train as OS.
9. Validate motive power was calculated according to references.
- a. Establish tractive effort.
 - (1) Determine tractive effort.
 - (2) Use adhesion factor to determine stuttering tractive effort (STE).
 - (3) Determine the continuous tractive effort (CTE).
 - b. Establish drawbar pull (DBP).
 - Note:
Determine limits of DBP after maximum has been calculated.
 - c. Establish rolling resistance (RR).
 - (1) Determine that the average RR value is 5 when track conditions are exceptionally good.
 - (2) Determine that the average RR value is 6 when track conditions are good to fair.
 - (3) Determine that the average RR value is 7 when track conditions are fair to poor.
 - (4) Determine that the average RR value is 8 when track conditions in general are poor.
 - (5) Determine that the average RR value is 9 to 10 when track conditions are very poor.
 - d. Establish grade resistance (GR).
 - Note:
Use the factor for military railway planning when calculating for use by military rail usage.
 - e. Establish curve resistance (CR).
 - Note:
Use a factor of 0.8 pounds per degree of curve.
 - f. Establish effects of weather on motive power capability.
 - (1) Determine effect of cold on motive power.
 - (2) Determine effect of wet weather on motive power.
 - g. Establish the gross trailing load (GTL).
 - Note:
Determine motive power by combining resistance, DBP, and weather factor when locomotive or combination of locomotives is used.
 - h. Establish the net train load (NTL).
 - Note:
Divide the GTL amount by 2.
10. Confirm motive power was established for foreign locomotives.
- a. Determine type of locomotive (AC/DC, Diesel-Electric, or Electric).
 - b. Determine locomotive capacity.
11. Confirm required motive power was requested.

(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: provide the Soldier a yardmaster, completed documentation, and a made-up train.

| PERFORMANCE MEASURES | GO | NO-GO | N/A |
|---|----|-------|-----|
| 1. Verified transportation plan and timetable were consulted. | | | |
| 2. Confirmed the time to departure – backward planned events to depart train on time. | | | |
| 3. Confirmed railcars were switched into outbound blocks and spotted for air testing. | | | |
| 4. Verified that a Class I air test was completed. | | | |
| 5. Verified any bad order railcars were removed . | | | |
| 6. Confirmed outbound train crew was ordered. | | | |
| 7. Confirmed a wheel report was generated. | | | |
| 8. Confirmed outbound train departed. | | | |
| 9. Validated motive power was calculated according to references. | | | |
| 10. Confirmed motive power was established for foreign locomotives. | | | |
| 11. Confirmed required motive power was requested. | | | |

Supporting Reference(s):

| Step Number | Reference ID | Reference Name | Required | Primary |
|-------------|--------------|---|----------|---------|
| | ATP 4-14 | Expeditionary Railway Center Operations | Yes | No |
| | ERG 2012 | Emergency Response Guidebook 2012: A Guidebook For First Responders During the Initial Phase of a Dangerous Goods/Hazardous Materials Transportation Incident | Yes | No |
| | GCOR | General Code of Operating Rules (GCOR), Seventh Edition | Yes | Yes |
| | MTO1 | Management of Train Operation and Train Handling | Yes | No |

TADSS : None

Equipment Items (LIN): None

Materiel Items (NSN) :

| Step ID | NSN | LIN | Title | Qty |
|-----------------------------|-----|-----|-------|-----|
| No materiel items specified | | | | |

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. It is the responsibility of all Soldiers and DA civilians to protect the environment from damage. AR 200-1 delineates TRADOC responsibilities to integrate environmental requirements across Doctrine, Organization, Training, Material, Leadership and Education, Personnel and Facilities (DOTMLPF) and ensure all training procedures; materials and doctrine include 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. This Training Support Package meets this standard.

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. Working around live tracks is always dangerous. Follow all safety procedures outlined in the GCOR. Install portable derail or flag protection IAW GCOR.

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 : None

Supported Individual Tasks : None

Supported Collective Tasks : None

Knowledges :

| Knowledge ID | Knowledge Name |
|---------------------|------------------------------------|
| K-551-U-0024 | Knowledge of rolling stock |
| K-551-U-0023 | Knowledge of port/yard operations |
| K-551-U-0027 | Knowledge of SSI |
| K-551-U-0001 | Knowledge of Army Rail Operations |
| K-551-U-0026 | Knowledge of transportation plans |
| K-551-U-0028 | Knowledge of air tests |
| K-551-U-0013 | Knowledge of Yard Tracker database |

Skills : None

ICTL Data : None