

# Combat Vehicle Service Optimization: Efforts to streamline services for Abrams and Bradley Family of Vehicles

by LTG Heidi J. Hoyle, BG Michael J. Simmering and MAJ Dirk K. van Ingen

In his address at the Association of the U.S. Army (AUSA) Annual Meeting and Exposition Oct. 10, 2023, GEN Randy George, Army Chief of Staff (CSA), expressed the Army is over-servicing our equipment, therefore placing a load on formations that have very little time.<sup>1</sup> He stated “modest changes” to maintenance intervals could save Soldiers time to focus on training or spend with their families.<sup>2</sup> Following an in-depth M1 Abrams and M2 Bradley service requirements review led by the U.S. Army Armor School and the subsequent implementation of a pilot at Fort Moore, LTG Heidi Hoyle, Army Deputy Chief of Staff for Logistics (G-4), announced March 27, 2024 changes to M1 Abrams and M2 Bradley services across the Army as part of an effort to reduce maintenance complexity and increase readiness.<sup>3</sup>



**Figure 1. Tank and Bradley services underway in 2017 at Fort Bliss, TX. (U.S. Army photo by Matt Perdue)**

LTG Hoyle’s remarks were immediately followed by an exception to policy allowing U.S. Army Forces Command (FORSCOM) units to implement revised service schedules that, among other changes, align the M1 Abrams and M2 Bradley family of vehicles (FoV) to the Army’s Regionally Aligned Readiness and Modernization Model (ReARMM), the force generation process used to provide predictable forces capable of supporting the National Defense Strategy.<sup>4</sup>

For the M1 Abrams these changes will shift current semi-annual service tasks to eight months, current annual tasks to 16 months, and current biennial tasks remain at 24 months. For the M2 Bradley FoV, this revision would merge current semi-annual and annual service task into a single 12-month requirement. These revisions to M1 Abrams and M2 Bradley scheduled service requirements provide more time for unscheduled maintenance, reduce

scheduled maintenance complexity, and synchronize the demands of these platforms with the operations tempo (OPTEMPO) of today's force generation process, without sacrificing readiness or Soldier safety.

Starting in June 2023, the Army assembled a group of senior chief warrant officers with the task of determining how the Army could "unburden Soldiers and create true readiness."<sup>5</sup> The output of this group's work was Headquarters, Department of the Army (HQDA) Execution Order (EXORD) 335-23, which among other things, was an important step directing the development of a deliberate process to methodically replace time-based standards with usage-based standards. Previously, the Army started this effort with the publication of the Non-combat Operations Maintenance Plan (NCOMP). These programs were designed to better align maintenance requirements to actual usage rather than time-based service intervals during non-combat operations, with the intent to eventually replace the Low Usage Program described in AR 750-1.<sup>6</sup> However, these programs largely focused on the Army's wheeled fleets, leveraged additional administrative requirements on units to enroll vehicles into the program and did not provide an alternative for how the Armored Force serviced combat vehicles.

The Army traces the standard for how we service equipment back to 1938, 86 years ago as of the writing of this article.<sup>7</sup> For the Armored Force, the first M1 Abrams and M2 Bradleys were fielded in the 1980s with major modernization programs that delivered most of today's combat platforms in the early 2000s and again starting in 2015+. During this time, the Abrams and Bradley systems have become older, and with periodic upgrades to these platforms, significantly more complex. In the 40+ years these vehicles have been in the fleet, the Army maintained a standardized approach to services regardless of OPTEMPO, equipment utilization rates, or trends over time. Concerningly, the operational readiness (OR) rates for these fleets have continued to drop for the last several years with units finding it more and more difficult to achieve a 90 percent rating due to the combined demands of OPTEMPO, unscheduled and scheduled maintenance.

Due to the age, complexity, and demands of these platforms, and the call to action from Army Senior Leaders, the U.S. Army Armor School hosted an M1 Abrams and M2 Bradley service review Nov. 8 - 9, 2023, to review opportunities to reduce the demands these complex platforms place on our crews and mechanics without sacrificing Soldier safety or readiness levels.

During the M1 Abrams and M2 Bradley FoV service review, the U.S. Army Armor School hosted participants from across the Armor enterprise to conduct analysis of current M1 Abrams and M2 Bradley scheduled service plans to inform recommendations for modified service checklists and a possible U.S. Army Armor School pilot. Participants included representatives from the Program Executive Office Ground Combat Systems (PEO-GCS), Tank-Automotive & Armaments Command (TACOM), Army Capabilities Manger - Armored Brigade Combat Team (ACM-ABCT), the Maneuver Center of Excellence (MCoE), TACOM Field Maintenance Expansion (TACOM-FMX), and subject matter experts from FORSCOM units, including 1<sup>st</sup> Armored Division, 1<sup>st</sup> Cavalry Division, 1<sup>st</sup> Infantry Division and 3<sup>rd</sup> Infantry Division.<sup>8</sup> This audience conducted analysis of the equipment service standard currently required of ABCTs on M1 and M2 fleets to inform possible technical solutions for Army senior leader consideration. The response generated from the force on this subject showed that across the Armor enterprise, leaders are interested in streamlining and improving our approach to services to maintain the highest readiness levels possible while keeping our Soldiers safe.

BG Michael Simmering, the 54<sup>th</sup> Chief of Armor, asked the participants to critically review current M1 and M2 annual and semi-annual service maintenance tasks. In addition to this critical review, his guidance to participants focused on three areas. First, assessing the strengths and weaknesses of moving service windows for equipment from a routine, purely time-based, six-month model to one aligned with the Army's ReARMM force generation processes' requirements. Second, provide recommendations to inform updated M1 Abrams and M2 Bradley service checklists. Third, provide recommendations the U.S. Army Armor School can pilot and implement at no risk to FORSCOM units, to see if they have the desired effect. BG Simmering's litmus test for any possible changes was, "would the implementation of these changes save formations time and maintain readiness without inducing a safety risk to Soldiers?"

In answering BG Simmering's questions, the assembled experts from PEO-GCS, Abrams and Bradley product management teams, and senior maintenance chief warrant officers and non-commissioned officers from FORSCOM units produced the following five recommendations.

- 1) Align the M1 services to the Army's ReARMM force generation process by shifting current semi-annual service tasks to eight months, current annual tasks to 16 months, and current biennial tasks remain at 24 months. The allowed service variance would remain at 10 percent of the service period. Several individual service checks were modified by frequency or usage trigger.
- 2) Align the M2 services to the Army's ReARMM force generation process by merging current semi-annual and annual service tasks. This will remove redundancies and afford commanders flexibility by offsetting from the M1 service schedule.
- 3) Recommend a U.S. Army Armor School led pilot of the TACOM-FMX maintained MCoE Abrams and Bradley fleets. This pilot started in January 2024, with initial findings anticipated by May 2024, to determine impacts of the service task and schedule revisions on OR rate, equipment availability, and maintainer to task ratio spent between scheduled and unscheduled maintenance.
- 4) Recommend consideration of categorizing transit time from the port of departure to port of arrival as non-service time or not counting towards time-based service intervals.
- 5) The U.S. Army Armor School would continue to work with stakeholders to develop recommendations including standardization of minimum pre-dispatch quality assurance and quality control (QA/QC) checks in accordance with AR 750-1 for Abrams and Bradley platforms, standardization of platoon services, and an M2 Bradley pre-gunnery checklist to align with existing M1 Abrams pre-gunnery requirements and best practices.

While the M1 Abrams and M2 Bradley intervals in the recommendations are still time based, the team assessed this was a critical first step to meeting GEN George's intent by giving more time back to maintainers. Most importantly, the team assessed all changes added negligible risk to Soldiers or platforms. It would become the responsibility of the U.S. Army Armor School and Maneuver Center of Excellence (MCoE) to communicate the findings through MCoE back to the Sustainment enterprise and Army senior leaders with regards to the Abrams and Bradley fleets. The first critical step was the update of service plans for the fleet of 142 M1 Abrams and 122 M2 Bradleys by the MCoE TACOM-FMX team. These updated service plans drew from updated field service bulletins (FSBs) produced in a remarkable short turn from November to December by the Abrams and Bradley product management teams. These FSBs documented the changes identified during the Service Summit and were revised from the current published Abrams and Bradley technical manuals (TM).

Following the publication of an HQDA G-4 Exception to Policy to AR 750-1, the U.S. Army Armor School and MCoE's Abrams and Bradley Optimized Service pilot officially commenced in January 2024, focusing on evaluating its impact on operational readiness rates, equipment availability, and maintainer to task ratios. The U.S. Army Armor School, even more than the typical ABCTs in the operational force, requires a large daily training set of Abrams and Bradleys to meet its 19 series one station unit training, Armor Basic Officer Leader Course and functional course load. On any given training day, the Armor School requires an average of 100 of its 142 M1 tanks in the field. To put this in perspective, the Armor School has conducted nine M1 and nine M2 company size gunneries since the start of the 2024 calendar year.<sup>9</sup>

Through March 31, 2024, the pilot has produced promising initial results, with a seven percent increase in Abrams availability and a 15 percent rise in Bradley availability compared to the six months prior. Most importantly, there have been no safety issues, no significant increase in unscheduled maintenance, repair part costs, or major assembly consumption. According to the MCoE Chief of Staff for Sustainment, COL Corey Woods, the flexibility of the pilot program has enabled the capture of more unscheduled maintenance needs for the M1 Abrams and M2 Bradley fleets, which might have otherwise been overlooked during routine service.

To ensure safety of Soldiers during the extended service windows, the MCoE directed the TACOM-FMX team to implement additional QA/QC checks during vehicle dispatching. For the Abrams FoVs, maintainers' QA/QC inspections included, at a minimum, checks of the battery box, steering, park and service brakes, main nuclear, biological, and chemical systems, class III oil leaks, any fuel leak, handheld fire extinguishers and automatic fire extinguishing systems (AFES), main gun replenisher, and drivers vision enhancer (DVE). For the Bradley FoVs, maintainers' QA/QC inspections included the battery box, steering, brakes, Class III oil leaks, any fuel leak, manual fire extinguishers and AFES, seatbelts, and DVE. Also, all vehicles in the pilot must still fulfill the HQDA EXORD 335-23 90-day operator road march requirement. Simultaneously, the Armor School is working with stakeholders to

work towards implementation of the additional recommendations, by standardizing Abrams and Bradley platoon service requirements in the soon to be published TC 3-20.31-9, *Armored Platoon Services*, and ensuring the pre-fire checks for the M2 Bradley are referenced in future Bradley TMs as well as the pre-operational checks found in the platform's Commander's Tactical Display.

With approval of the FORSCOM request to deviate from current requirements on April 3, 2024, allowing operational units to implement the revised pilot service schedules for their M1 Abrams and M2 Bradley fleets spearheaded by the U.S. Army Armor School and MCoE, there is an opportunity to provide more time for unscheduled maintenance, reduce scheduled maintenance complexity, and see how commanders synchronize the demands of these platforms with the OPTEMPO of today's force generation models. Ultimately, while the Armor School's pilot sought to identify changes at no risk to operational units to see if change was possible and desired, voices from operational units saw the immediate benefit and opportunity to control their own destiny and meet the CSA's guidance to rebalance maintenance priorities.

While the FORSCOM exception to policy will expire one year from April 3, 2024, the DCS, G-4 Maintenance Directorate will reauthorize it if the "pilot" intervals are not first outlined in a revised technical manual or Maintenance Action Message by TACOM prior to the exception to policy's expiration. In the meantime, the two pilots are positioned to offer crucial insights and data to Army senior leaders, allowing them to make informed decisions regarding service optimization for these critical vehicles, and possibly expand the basic principles to other combat and combat support platforms across the operational forces' brigade combat teams. Rooted in a shared commitment to readiness, safety, and adaptability, these initiatives underscore a proactive approach to addressing future challenges that will be necessary to implement the CSA's vision of continuous transformation. While it is still too early to assess definitive conclusions regarding the pilot's effectiveness, early indications suggest that service intervals can be streamlined across the operational force without compromising Soldier safety or equipment performance.

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*BG Michael Simmering is the 54<sup>th</sup> Chief of Armor and Commandant of U.S. Army Armor School at Fort Moore, GA. His previous assignments include Deputy Commanding General (Operations) for 1<sup>st</sup> Armored Division, Fort Bliss, TX; Commander for Operations Group at the National Training Center, Fort Irwin, CA; and Commander, 3<sup>rd</sup> Brigade, 4<sup>th</sup> Infantry Division, Fort Carson, CO. BG Simmering holds a master's of science degree in continuing education from Kansas State University and a master's of science degree in joint campaign plan and strategy from National Defense University.*

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## Notes

<sup>1</sup> GEN Randy A. George, Association of the U.S. Army (AUSA) 2023: Army Senior Leader Press Conference, Washington D.C., Oct. 10, 2023.

<sup>2</sup> Joe Lacdan, "Army chief of staff outlines service priorities at AUSA," *Army News Service*, Oct. 10, 2023, accessed April 15, 2024, [https://www.army.mil/article/270691/army\\_chief\\_of\\_staff\\_outlines\\_service\\_priorities\\_at\\_ausa](https://www.army.mil/article/270691/army_chief_of_staff_outlines_service_priorities_at_ausa).

<sup>3</sup> AUSA, "New maintenance standards aim to unburden soldiers," *AUSA.org*. March 29, 2024, accessed April 14, 2024, <https://www.ausa.org/news/new-maintenance-standards-aim-unburden-soldiers>.

<sup>4</sup> Director Maintenance Programs and Policy, "Exception to Policy, Army Regulation (AR) 750-1, **Army Materiel Maintenance Policy**," Washington, D.C.; April 3, 2024.

<sup>5</sup> AUSA, "New maintenance standards."

<sup>6</sup> "HMMWV: Non-Combat Operations Maintenance Plan," *PS Magazine*, March 22, 2021, <https://www.psmagazine.army.mil/News/Article/2544963/hmmwv-non-combat-operations-maintenance-plan/>; "HEMTT, PLS: The New Plan is NCOMP," *PS Magazine*, Aug. 3, 2021, <https://www.psmagazine.army.mil/News/Article/2717273/hemtt-pls-the-new-plan-is-ncomp/>.

<sup>7</sup> AUSA, "New maintenance standards."

<sup>8</sup> Note: The only active component armored brigade combat team not represented at least at the division level was 3<sup>rd</sup> Armored Brigade Combat Team, 4<sup>th</sup> Infantry Division due to its participation in National Training Center (Fort Irwin) Rotation 24-02.

<sup>9</sup> COL Corey Woods, "Rethinking Heavy Tracked Vehicle Maintenance: The M1/M2 Optimized Service Pilot," unpublished article, April 5, 2024.

## Acronym Quick-Scan

**AFES** – automatic fire extinguishing systems

**ACM-ABCT** – Army Capabilities Manger - Armored Brigade Combat Team

**CSA** – Army chief of staff

**DVE** – drivers vision enhancer

**EXORD** – execution order

**FSB** – field service bulletin

**FORSCOM** – U.S. Army Forces Command

**FoV** – family of vehicles

**HQDA** – Headquarters, Department of the Army

**MCoE** – Maneuver Center of Excellence

**NCOMP** – Non-combat Operations Maintenance Plan

**OPTEMPO** – operations tempo

**PEO-GCS** – Program Executive Office - Ground Combat Systems

**QA** – quality assurance

**QC** – quality control

**ReARMM** – Regionally Aligned Readiness and Modernization Model

**TACOM** – Tank-Automotive & Armaments Command

**TACOM-FMX** – TACOM Field Maintenance Expansion

**TM** – technical manuals

**Figure 1. Tank and Bradley services underway in 2017 at Fort Bliss, TX. (U.S. Army photo by Matt Perdue)**

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