

INCH-POUND

MIL-PRF-32365

26 November 2010

SUPERSEDING

PRF13018852

6 December 2007

(See 6.4)

PERFORMANCE SPECIFICATION

BRACKET, FORWARD RAIL

This specification is approved for use by the U.S. Army Armaments Research, Development and Engineering Center (ARDEC) and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification prescribes the performance requirement and associated verification provisions for the Bracket, Forward Rail, hereafter referred to simply as the Forward Rail Bracket or FRB. The FRB allows the non-modular M16 series weapon (that do not have a rail system) to have a bipod and/or a weapons light, and/or forward vertical grip.

1.2 Requirement levels. This specification lists two values for certain performance parameters. The threshold (T) is the minimum acceptable level. The objective (O) is the desired level at which performance of the FRB results in an operationally significant increase in capabilities. When only one requirement is stated, it is the threshold requirement.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 or 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in sections 3 and 4 of this specification, whether or not they are listed.

Comments, suggestions, or questions on this document should be addressed to: Commander, U.S. Army ARDEC, ATTN: RDAR-QES-E, Picatinny, New Jersey 07806-5000, or emailed to ardecstdzn@conus.army.mil . Since contact information can change, you may want to verify the currency of this address information using the ASSIST online database at https://assist.daps.dla.mil .

AMSC: N/A

FSC: 1005

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-PRF-372	Cleaning Compound, Solvent (For Bore of Small Arms and Automatic Aircraft Weapons)
MIL-PRF-14107	Lubricating Oil, Weapons, Low Temperature
MIL-G-21164	Grease, Molybdenum Disulfide, For Low and High Temperatures, NATO Code Number G-353
MIL-L-46000	Lubricant, Semi-Fluid (Automatic Weapons)
MIL-PRF-63460	Lubricant, Cleaner, and Preservative for Weapons and Weapon Systems

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-810	Environmental Engineering Considerations and Laboratory Tests
MIL-STD-1913	Dimensioning of Accessory Mounting Rail for Small Arms Weapons
MIL-STD-1916	DoD Preferred Methods for Acceptance of Product

(Copies of these documents are available online at <https://assist.daps.dla.mil> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.2.2 Other Government documents, drawings and publication. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

US ARMY DEVELOPMENT TEST COMMAND

TOP 3-2-045	Automatic Weapons, Machineguns, Hand, and Shoulder Weapons
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(Copies of these documents may be ordered from the US Army Developmental Test Command, ATTN: Publications, 314 Longs Corner Road, Aberdeen Proving Ground, MD, 21005-5005, or online at <http://www.dtc.army.mil/publications/topsindex.aspx>).

2.3 Non-Government publication. The following documents form a part of this document to the extent specified herein. Unless otherwise indicated, the issues of these documents are those cited in the solicitation or contract.

ASTM INTERNATIONAL

ASTM-B117	Standard Practice for Operation Salt Spray (Fog) Apparatus
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(Copies of ASTM standards may be ordered online at <http://www.astm.org/> or from the ASTM International Engineers, 400 Commonwealth Drive, Warrendale, PA 15096-0001.)

2.4 Order of Precedence. Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption is obtained.

3. REQUIREMENTS

3.1 Design verification. When specified (see 6.2), a sample of the Forward Rail Bracket shall be subjected to design verification in accordance with [TABLE I and 4.1].

3.2 First article inspection. When specified (see 6.2), a sample of the Forward Rail Bracket shall be subjected to first article inspection in accordance with [TABLE I and 4.2].

3.3 Conformance inspection. When specified (see 6.2), a sample of the Forward rail Bracket shall be subjected to conformance inspection in accordance with [TABLE I and 4.3].

3.4 Operating requirements.

3.4.1 Bottom rail. The Forward Rail Bracket shall have at least one rail mounting surface section mounted to the bottom of the weapon (T). The Forward Rail Bracket shall have supporting side rails as mounting surfaces (O).

3.4.2 Length requirement. The Forward Rail Bracket bottom rail shall be no less than 5 inches in length but shall not interfere with the mounting and operational use of weapon devices that include but is not limited to bipod, flashlight, and forward vertical grip.

3.5 Interface and interoperability requirements.

3.5.1 Rail profile. The Forward Rail Bracket shall be configured to the following sections and figures of MIL-STD-1913:

- a. Accessory mounting rail profile (section 5.1 and figure 1),
- b. Recoil groove (section 5.2 and figure 2)
- c. Dimensioning and tolerance (section 4.1)
- d. Edge break (section 4.1.1)
- e. Fillet radii (section 4.1.2)

3.5.2 Weight. The Forward Rail Bracket weight (with supporting side rails, if provided) shall be no greater than 16 ounces.

3.5.3 Attachments to M16 rifles. The Forward Rail Bracket shall attach to M16 series rifles without MIL-STD-1913 lower rails. The attachment process shall be without any permanent modification to the weapon, providing rail surface forward of the barrel nut.

3.5.4 Non-interference. The Forward Rail Bracket shall not interfere with the weapon or ancillary device operation/function.

3.5.5 No configuration change. The Forward Rail Bracket shall not require the removal of the heat shield from the hand guard and shall allow for the re-installation of the hand guard.

3.6 Environmental requirements.

3.6.1 Operational temperature. The Forward Rail Bracket shall function throughout a temperature range from -55 degrees Fahrenheit to +155 degrees Fahrenheit.

3.6.2 Salt spray. The Forward Rail Bracket shall be safe to handle, be fully operable, and show no evidence of corrosion after a minimum of forty-eight (48) hours of salt fog exposure.

3.6.3 Chemical compatibility testing. The Forward Rail Bracket shall be compatible with Army standard chemicals listed below:

MIL-PRF-372	Cleaning Compound, Solvent (For Bore of Small Arms and Automatic Aircraft Weapons)
MIL-PRF-14107	Lubricating Oil, Weapons, Low Temperature
MIL-G-21164	Grease, Molybdenum Disulfide, For Low and High Temperatures, NATO Code Number G-353
MIL-L-46000	Lubricant, Semi-Fluid (Automatic Weapons)
MIL-PRF-63460	Lubricant, Cleaner, and Preservative for Weapons and Weapons Systems

3.6.4 Heat resistant. The Forward Rail Bracket shall be heat resistant so that it does not transfer excessive heat from the weapon system.

3.7 Support and ownership requirements.

3.7.1 Installation/Removal. The Forward Rail Bracket shall be installed and removed at the operator/user level without the use of special tools. Special tools are defined as any tool other than a flat or cross-tip screwdriver.

3.7.2 Drop Test. The Forward Rail Bracket shall withstand a five-foot drop, while attached to the weapon with a two pound weight attached to the rail, onto concrete without becoming unserviceable.

3.7.3 Color. The Forward Rail Bracket shall be a dull non-reflective color.

3.7.4 Endurance. The Forward Rail Bracket shall not melt, deform or become unserviceable in performance after firing a total of 1260 rounds with an M16 rifle with a two pound weight attached on the hand grip.

3.7.5 Workmanship: Finished items and/or parts shall not exhibit poor material and processing such as seams, laps, laminations, cracks, visible steps, sharp edges, nicks, scratches, burrs, deformations, and missing operation which may affect serviceability, functioning, operations,

appearance or safety. Fins and other extraneous metal shall be removed from cast or forged parts. Hammering to shape, salvage operations (including repair by welding) or other similar practices shall not be permitted without prior approval.

4. VERIFICATION

TABLE I. Requirement/verification cross reference matrix

METHOD OF VERIFICATION		CLASSES OF VERIFICATION							
1 - Analysis		A - Design verification							
2 - Demonstration		B - First article							
3 - Examination		C - Conformance verification							
4 - Test									
Section 3 Requirement		Section 4 Method	Verification Methods				Verification Class		
			1	2	3	4	A	B	C
3.1	Design verification	4.1		X	X	X	4-0-1		
3.2	First article inspection	4.2		X	X	X		4-0-1	
3.3	Conformance inspection	4.3		X	X	X			4-0-1
3.4.	Operating requirements	4.4			X	X	2-0-1	2-0-1	2-0-1
3.4.1	Bottom rail	4.4.1			X		2-0-1	2-0-1	2-0-1
3.4.2	Length requirement	4.4.2				X	2-0-1	2-0-1	2-0-1
3.5	Interface & interoperability requirements	4.5		X	X	X	2-0-1	2-0-1	2-0-1
3.5.1	Rail Profile	4.5.1				X	2-0-1	2-0-1	2-0-1
3.5.2	Weight	4.5.2		X	X		2-0-1	2-0-1	2-0-1
3.5.3	Attachment to M16 rifles	4.5.3		X	X		2-0-1	2-0-1	2-0-1
3.5.4	Non-interference	4.5.4		X	X		2-0-1	2-0-1	2-0-1
3.5.5	No configuration change	4.5.5			X		2-0-1	2-0-1	2-0-1
3.6	Environmental requirements	4.6				X	4-0-1	4-0-1	
3.6.1	Operating temperature	4.6.1				X	2-0-1	2-0-1	
3.6.2	Salt spray	4.6.2				X	1-0-1	1-0-1	
3.6.3	Chemical compatibility testing	4.6.3				X	3-0-1	3-0-1	
3.6.4	Heat resistant	4.6.4				X	2-0-1	2-0-1	
3.7	Support & ownership requirements	4.7		X	X	X	2-0-1	2-0-1	2-0-1
3.7.1	Installation/Removal	4.7.1		X	X		2-0-1	2-0-1	2-0-1
3.7.2	Drop test	4.7.2				X	2-0-1	2-0-1	2-0-1
3.7.3	Color	4.7.3		X	X		2-0-1	2-0-1	2-0-1
3.7.4	Endurance	4.6.4				X	2-0-1	2-0-1	2-0-1
3.7.5	Workmanship	4.6.5			X		2-0-1	2-0-1	2-0-1

Notes: Verification (4-0-1) Test 4, Accept with 0 Failure, and Reject with 1 Failure.

4.1 Design verification. When specified (see 6.2), design verification shall be performed by demonstration, examination and tests of all performance requirements as specified in TABLE I.

4.1.1 Design verification test rejection. If a sample fails to meet any specified performance requirement, the design shall be rejected.

4.2 First article inspection. When specified (see 6.2), first article inspection of sample items shall be executed by demonstration, examination and tests of all performance requirements in accordance with TABLE I.

4.2.1 First article rejection. If any sample fails to comply with the specified performance requirements, the sample shall be rejected.

4.3 Conformance verification. When specified (see 6.2), conformance inspection of lot samples shall be accomplished by examinations, demonstrations and tests in accordance with Table I.

4.3.1 Lot formation. Lot formation shall be in accordance with the lot formation requirement as specified in MIL-STD-1916.

4.3.2 Lot Rejection. If any sample fails to comply with the specified performance requirements, the lot shall be rejected.

4.4 Operating Verification

4.4.1 Bottom rail. The Forward Rail Bracket shall be visually inspected for a bottom rail.

4.4.2 Length requirement. The Forward Rail Bracket length shall be measured using SMTE.

4.5 Interface and interoperability verifications.

4.5.1 Rail profile. The Forward Rail Bracket shall be tested to ensure it is configured to MIL-STD-1913 standards.

4.5.2 Weight. The Forward Rail Bracket shall be weighed using SMTE.

4.5.3 Attachment to M16 rifles. The Forward Rail Bracket shall demonstrate that it can attach to a non-modular M16 series rifles, without any modification to the weapon, providing rail surface forward to the barrel nut.

4.5.4 Non-interference. The Forward Rail Bracket shall be tested to ensure it shall not interfere with the weapon or ancillary device operation.

4.5.5 No configuration change. The Forward Rail Bracket shall demonstrate that the installation to the weapon does not remove the heat shield and the hand guard is re-installed, if removed, during the process.

4.6 Environmental verifications.

4.6.1 Operational temperature verification.

4.6.1.1 Extreme hot. The Forward Rail Bracket shall be mounted to a M16 series rifle and shall be conditioned to a temperature of one hundred and fifty-five degrees Fahrenheit (155°F), IAW MIL-STD-810 for twelve (12) hours. 210 rounds shall be fired from the M16 series rifle.

Firing shall take place no greater than 3mins from temp chamber removal. If the time before firing is exceeded, the Forward Rail Bracket with the M16 shall be reconditioned at the extreme low temperature for an additional two (2) hrs before firing. The Forward Rail Bracket shall be inspected for signs of degradation or flaws.

4.6.1.2 Extreme cold. The Forward Rail Bracket shall be mounted to a M16 series rifle and shall be conditioned to a temperature of minus fifty-five degrees Fahrenheit (-55° F), IAW MIL-STD-810 for twelve (12) hours. 210 rounds shall be fired from the M16 series rifle. Firing shall take place no greater than 3mins from temp chamber removal. If the time before firing is exceeded, the Forward Rail Bracket with the M16 shall be reconditioned at the extreme low temperature for an additional two (2) hrs before firing. The Forward Rail Bracket shall be inspected for signs of degradation or flaws.

4.6.2 Salt spray. The Forward Rail Bracket shall be exposed to a Five Percent (5%) salt solution for forty-eight (48) hours, IAW ASTM-B117. After exposure, the Forward Rail Bracket shall be inspected for any signs of degradation.

4.6.3 Chemical Compatibility Testing. Six (6) Forward Rail Brackets shall be sprayed or brushed with each liquid with a spray bottle or paint brush respectively. After exposure of one hour to each liquid, the Forward Rail Bracket shall be inspected for any signs of degradation.

4.6.4 Heat resistant. The Forward Rail Bracket shall be attached to a M16 series rifle and fire 210 rounds. The temperature of the Forward Rail Bracket shall be measured using SMTE and shall not exceed 130 degrees Fahrenheit. This verification process can be taken during the Endurance test (verification 4.7.5).

4.7 Support and ownership verifications.

4.7.1 Installation/Removal. The Forward Rail Bracket shall demonstrate that it can be installed and removed at the operator/user level without the use of special tools.

4.7.2 Drop test. The Forward Rail Bracket shall be attached to a M16-series rifle with a two pound weight attached to the rail, and be dropped from a height of 5 feet onto concrete. The drop test shall be conducted with these weapon orientations: straight down, left side, and right side.

4.7.3 Color. The color of the Forward Rail Bracket shall be visually inspected to ensure it is a dull non-reflective color.

4.7.4 Endurance. The Forward Rail Bracket shall be attached to a M16-series rifle and be tested to ensure it does not melt, deform or become unserviceable after firing a total of 1260 rounds IAW TOP 3-2-045.

4.7.5 Workmanship. The Forward Rail Bracket shall be visually inspected to ensure the workmanship.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of material is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Service of Defense Agency, or within the military service's system commands. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful but is not mandatory.)

6.1 Intended use. The Forward Rail Bracket (FRB) allows non-modular M16 weapons (i.e., without a MIL-STD-1913 rail system) to mount bipods or a weapons light.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification, and of all reference documents cited in Section 2 and applicable documents from Section 6.
- b. Requirement for design verification.
- c. Requirement for first article inspection.
- d. Requirement for conformance inspection.
- e. Packaging requirements (see 5.0).
- f. If FRB comes with more than one (1) rail, offeror will submit pricing for the various configuration numbers of rails (ex. Price for 1, 2, or more rail packages).

6.3 Additional information. Material described by this item specification is for a commercial off the shelf (COTS) product. Supplier must have non-developmental production capability.

6.4 Manuals. The contractor will submit commercial manuals/instruction sheet in the contractor's format that describes the operation and maintenance of the Forward Rail Bracket.

6.5 Previous identification. This document supersedes an ARDEC Program-Unique Specification PRF13018852, Bracket, Forward Rail dated 6 December 2007. A copy of this ARDEC specification may be requested from ardecstdzn@conus.army.mil.

6.5 Subject term (key word) listing.

Close quarter battle
Small arms

Preparing activity:
Army – AR
(Project 1005-2011-001)

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <https://assist.daps.dla.mil>.