

INCH-POUND

MIL-PRF-32366

26 November 2010

SUPERSEDING

PRF13018853

10 October 2007

(See 6.5)

PERFORMANCE SPECIFICATION

GRIP/BIPOD, FORWARD

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 requirements and identifies verification procedures for the Grip/Bipod, Forward, hereafter referred to simply as the Forward Grip/Bipod or FGB. The FGB provides the operator with a dual utility as a forward grip and bipod for the M4 and M16 series rifle.

1.2 Requirement levels. This specification identifies two values for selected performance requirements. The threshold (T) is the minimum acceptable level. The objective (O) is the desired level at which performance of the FGB 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 Arsenal, New Jersey 07806-5000, or emailed to ardecdtdzn@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

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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 solicitations 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 Weapons Systems

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-810	Environmental Engineering Considerations and Laboratory Tests
MIL-STD-1472	Human Engineering
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

(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

(Copies of ASTM standards may be ordered online at <http://www.astm.org/> or from the ASTM International Engineers, 100 Barr Harbor Drive, PO Box C700, West Conshohocken PA 19428-2959.)

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 Grip/Bipod 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 Grip/Bipod 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 Grip/Bipod shall be subjected to conformance inspection in accordance with [TABLE I and 4.3].

3.4 Operating requirements.

3.4.1 Vertical grip. The Forward Grip/Bipod shall provide a vertical grip from the weapon when firing from a standing or crouched stance.

3.4.2 Vertical clearance. In bipod mode (legs extended), the vertical clearance shall assure a loaded 30 round magazine from touching the ground measured from the ground to the lowest possible Forward Grip/Bipod rail surface.. The minimum bipod vertical height is 9.5 inches for both the M4 and M16 series rifle.

3.4.3 Open and close. The Forward Grip/Bipod leg deployment and retraction shall not require the operator to move his weapon out of tactical orientation. The Forward Grip/Bipod shall also be capable of being opened and closed one-handed (see 6.4 for opening and closing FGB definition).

3.4.4 Stability. The Forward Grip/Bipod, when deployed on level surface (T) or unlevelled surface (O), shall keep the weapon in the upright position regardless of the orientation of the Bipod legs. Unlevelled ground is defined as a surface 30 degrees off the horizontal plane.

3.4.5 Aim and fire in prone position. The Forward Grip/Bipod shall enable aimed-fire shooting support from the prone position.

3.5 Interface and interoperability requirements.

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3.5.1 Weight. The Forward Grip/Bipod shall weigh no more than 32 ounces.

3.5.2 Non-interference. The Forward Grip/Bipod shall not interfere with the use or function of the weapon to include but not limited to blocking the ejection port, interfering with the cartridge feeding, weapon charging and collapsing or extending the buttstock.

3.5.3 Compatibility. Forward Grip/Bipod shall be operable and maintainable by the 5th percentile female through 95th percentile male soldiers, as specified in MIL-STD-1472, while dressed in environmentally protective clothing (MOPP IV and arctic gear without mittens).

3.5.4 Weapon systems attachment. The Forward Grip/Bipod shall be attachable to the bottom rail of the M4/M16 series weapon via MIL-STD-1913 interface with no tools (T) or standard tools (O).

3.5.5 Silent. The Forward Grip/Bipod shall not be heard at a distance of 10m (T), 5m(O) when it is opened and will remain quiet in operation when both closed and extended.

3.6 Environmental requirements.

3.6.1 Operational Temperature. The Forward Grip/Bipod shall function throughout a temperature range from -55 degrees Fahrenheit to +155 degrees Fahrenheit.

3.6.2 Salt spray. The Forward Grip/Bipod 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 Grip/Bipod 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 Grip/Bipod 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 Drop test. The Forward Grip/Bipod shall withstand the following drop tests without becoming unserviceable:

- a. 5-foot drop test with the FGB legs extended (Bipod mode).
- b. 3-foot drop test mounted on a M16 with FGB legs extended (Bipod mode).

3.7.2 Color. The Forward Grip/Bipod shall be a dull non-reflective color.

3.7.3 Endurance. The Forward Grip/Bipod shall not melt, deform or become unserviceable in performance after firing a total of 1260 rounds with an M16 rifle with a rail.

3.7.4 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 inspection							
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	X	2-0-1	2-0-1	2-0-1
3.4.1	Vertical grip	4.4.1		X			2-0-1	2-0-1	2-0-1
3.4.2	Vertical clearance	4.4.2		X			2-0-1	2-0-1	2-0-1
3.4.3	Open and close	4.4.3		X			2-0-1	2-0-1	2-0-1
3.4.4	Stability	4.4.4		X	X	X	2-0-1	2-0-1	2-0-1
3.4.5	Aim and fire in prone position	4.4.5		X	X	X	2-0-1	2-0-1	2-0-1
3.5	Interface and interoperability Requirements	4.5		X		X	2-0-1	2-0-1	2-0-1
3.5.1	Weight	4.5.1				X	2-0-1	2-0-1	2-0-1
3.5.2	Non-interference	4.5.2				X	2-0-1	2-0-1	2-0-1
3.5.3	Compatibility	4.5.3				X	2-0-1	2-0-1	2-0-1
3.5.4	Weapon system attachments	4.5.4		X			2-0-1	2-0-1	2-0-1
3.5.5	Silent	4.5.5				X	2-0-1	2-0-1	2-0-1
3.6	Environmental requirement	4.6				X	4-0-1	4-0-1	
3.6.1	Operational temperature	4.6.1				X	4-0-1	4-0-1	
3.6.2	Salt spray	4.6.2				X	2-0-1	2-0-1	
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 and ownership requirements	4.7		X	X	X	2-0-1	2-0-1	2-0-1
3.7.1	Drop test	4.6.1				X	2-0-1	2-0-1	2-0-1
3.7.2	Color	4.6.2		X	X		2-0-1	2-0-1	2-0-1
3.7.3	Endurance	4.6.3				X	2-0-1	2-0-1	2-0-1
3.7.4	Workmanship	4.6.4			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 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 Vertical grip. The vertical grip shall be demonstrated by attaching the Forward Grip/Bipod to a M16 series rifled and be fired in a standing and crouched stance and remained gripped vertically. This verification process can be taken during the Endurance test (verification 4.7.2).

4.4.2 Vertical clearance. The vertical clearance of the Forward Grip/Bipod shall be measured using SMTE.

4.4.3 Open and close. The Forward Grip/Bipod shall demonstrate that it can open or close one-handed during normal weapon operation.

4.4.4 Stability. The Forward Grip/Bipod shall demonstrate the stability on a leveled surface or uneven surface (30 degrees off horizontal plane) while attached to a M16 series rifle. This verification process can be taken during the Endurance test (verification 4.7.2).

4.4.5 Aim and fire in prone position. The Forward Grip/Bipod shall be attached to a M16 series rifle and shall fire 30 rounds while the tester is in a prone position. This verification process can be taken during the Endurance test (verification 4.7.2).

4.5 Interface and interoperability verifications.

4.5.1 Weight. The Forward Grip/Bipod shall be weighed using SMTE.

4.5.2 Non-interference. The Forward Grip/Bipod shall be attached to a M16 series rifle and be used in various fighting position to ensure it does not interfere with the use or function of the weapon.

4.5.3 Compatibility. The Forward Grip/Bipod shall be verified for compatibility by conducting verification 4.4.3 and 4.4.5 while the operator is dressed in MOPP IV or arctic gear.

4.5.4 Weapon systems attachment. The Forward Grip/Bipod shall demonstrate it can be attached to the M4 and M16 series rifle without tools (T) or with the use of standard tools (O).

4.5.5 Silent. The Forward Grip/Bipod shall demonstrate it can be silent from a distant of 10m(T) and 5m(O) throughout user testing as follows:

- a. Three (3) testers shall be positioned 10 meters facing away from the FGB.
- b. Operator shall open the FGB carefully while attempting to make as little noise as possible. Testers shall raise their hand if they hear the FGB in operation.
- c. Operator shall close the FGB carefully while attempting to make as little noise as possible. Testers shall raise their hand if they hear the FGB in operation.
- d. Repeat the open and closing procedure for a total of five (5) times.
- e. FBG shall pass the silent test if all three (3) testers do not raise their hand for one opening and one closing operation.
- f. Repeat Silent test with testers 5 meters away from the FGB (O).

4.6 Environmental verifications.

4.6.1 Operational Temperature

4.6.1.1 Extreme hot. The Forward Grip/Bipod (in bipod mode) 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 six (6) hours. 210 rounds shall be fired from the M16 series rifle with the bipod fully extended on a surface. Firing shall take place no greater than 6mins from temp chamber removal. If the time before firing is exceeded, the Forward Grip/Bipod with the M16 shall be reconditioned at the extreme hot temperature for an additional 30mins before firing. The Forward Grip/Bipod shall be inspected for signs of degradation or flaws.

4.6.1.2 Extreme cold. The Forward Grip/Bipod 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 six (6) hours. 210 rounds shall be fired from the M16 series rifle with the bipod fully extended on a surface. Firing shall take place no greater than 6mins from temp chamber removal. If the time before firing is exceeded, the Forward Grip/Bipod with the M16 shall be reconditioned at the extreme cold temperature for an additional 30mins before firing. The Forward Grip/Bipod shall be inspected for signs of degradation or flaws.

4.6.2 Salt spray. The Forward Grip/Bipod shall be exposed to a Five Percent (5%) salt solution for forty-eight (48) hours, in accordance with ASTM-B117. After exposure, the Forward Grip/Bipod shall be inspected for signs of degradation.

4.6.3 Chemical compatibility testing. Six (6) Forward Grip/Bipods shall be sprayed or brushed with each liquid with a spray bottle or paint brush respectively. After exposure for one hour to each liquid, the Forward Grip/Bipod shall be inspected for any signs of degradation.

4.6.4 Heat Resistant. The Forward Grip/Bipod shall be attached to a M16 series rifle and fire 210 rounds. The temperature of all operator interface surface of the FGB shall be measured using SMTE and shall not reach 130 degrees Fahrenheit. This verification process can be taken during the Endurance test (verification 4.7.2).

4.7 Support and ownership verifications.

4.7.1 Drop test. The Forward Grip/Bipod shall be dropped from the following height with these conditions:

- a. 5-foot drop test with FGB legs extended with orientation towards concrete: legs down, left side, right side, attachment point.
- b. 3-foot drop test with FGB legs extended and mounted to M16 rifle with orientation towards concrete: legs down, left side, right side.

4.7.2 Color. The color of the Forward Grip/Bipod shall be visually inspected to ensure it is a dull non-reflective color.

4.7.3 Endurance. The Forward Grip/Bipod shall be mounted to a M16-series rifle and M4 series rifle and be tested to ensure it does not melt, deform or become unserviceable after firing a total of 1260 IAW TOP 3-2-045.

4.7.4 Workmanship. The Forward Grip/Bipod 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 Grip/Bipod provides a stable firing platform for the M4 and M16 series rifle.

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 documents listed in Section 6 for information.
- b. Requirement for design verification.
- c. Requirement for first article inspection.
- d. Requirement for conformance inspection.
- e. Packaging requirements (see 5.0).

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 Definitions:

6.4.1 Closing bipod – The act of closing the Forward Grip/Bipod is defined as retracting the legs of the bipod and disengaging the legs and any additional parts in a non-bipod configuration (non-bipod position).

6.4.2 Opening bipod – The act of opening the Forward Grip/Bipod is defined as engaging and fully extending the legs and any additional parts of the bipod to be deployed to set on the ground, acting as a firing platform (bipod position) for the operator.

6.5 Previous identification. This document supersedes an ARDEC Program-Unique Specification PRF13018853, Grip/Bipod, Forward, dated 10 October 2007. A copy of this ARDEC specification may be requested from ardecstdzn@conus.army.mil.

6.6 Subject term (key word) listing.

Close quarter battle
Small arms

Preparing activity:
Army – AR
(Project 1005-2011-005)

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>.