Internal Air Transport Certification

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Date: 16 October 2017
Item Nomenclature: Mine Resistant Ambush Protected All-Terrain Vehicle (MRAP ATV)
File Number: 2009.08.32 Rev 10
Requestor: On File
Superseded Certification Date: 17 May 2016

New Information Summary: Updated item preparation for C-130 for vehicles with UIK

Reference Documents:
1. MARCORSYSCOM & JPO MRAP Underbody Improvement Kit and Suspension Upgrade Data Package, 8 June 2011, M-ATV Equipped with UIK
2. Oshkosh Finite Element Analysis (FEA), 3 September 2010, M-ATV Remote Weapons Station FEA
3. APM SOCOM Engineer/Oshkosh Engineer Message, 7 September 2010, M-ATV RWS FEA
4. YPG Test Center, Axle Weight Distribution Memo, 3 December 2009, M-ATV Mobility Test Weights
5. E-mail from Dale Sims (3-401 AFSB AMC SPO Trans), 23 September 2010, Subject: M-ATV W/CROWS II Installed
6. E-mail from URS Contr./JPEO MRAP, 19 September 2012, SOCOM UIK and M-ATV UIK
7. E-mail from URS Contr./JPEO MRAP, 5 September 2012, Data Package for M-ATV SOCOM UIK
8. ATEC, Project No. 2010-DT-ATC-MRPAT-E6565, Report No. 10-WFE-31, 21 July 2010, Auxiliary Tie Down Testing of the Mine Resistant Ambush Protected (MRAP) All-Terrain Vehicle (M-ATV)
9. M-ATV Internal Air Transport Certification Photo, Weight, & Measurement Session; 08 – 12 February 2016 SOFSA-FOSOV, BGS, Lexington, Kentucky
10. ATEC, Project No. 2013-DT-ATC-MRPAT-F4304, Report No. 14-WFF-22, July 2014, Supplemental Air Transport Tie Down Provision Testing of the Mine Resistant Ambush Protected (MRAP) All-Terrain Vehicle (M-ATV)
11. TARDEC Test Report 2017-PST-031-108, C130 M-ATV Characterization, 17 July 2017.

Item Description: The M-ATV Family of Vehicles (FOV) is identified to be a two axle, all-terrain MRAP family of vehicles that has been manufactured by Oshkosh. Table 1 includes model numbers, weapon stations, and special kits for each M-ATV variant. The vehicle's approximate dimensions, weights, and rated capacities are listed in Table 2.

The vehicle can be configured with any of the following weapon stations, depending on the M-ATV variant (see Table 1): Objective Gunner Protection Kit (OGPK) (Figure 1); Common Remotely Operated Weapons Station (CROWS II) (Figure 3); Titanium Gunner Protection Kit (TiGPK) (not pictured).

The belly armor kit, Underbody Improvement Kit (UIK), has been pure fleeted on all M-ATV variants except the USASOC/SOCOM variants (M1245A1/M1245). M1245A1/M1245 received the Monolithic Aluminum Armor Kit (MAK).

Table 1: M-ATV Family of Vehicles (FoV)

	Model #'s	CROWS/OGPK	Special Kits
M-ATV Family of Vehicles (FoV)	M1240A1	OGPK	
	M1245	CROWS II or TiGPK	Push bumper, pintle extension, towbar w/bracket, Ground Mobility Visual Augmentation Systems (GMVAS), rear armored cargo area
	M1245A1	CROWS II or TiGPK	Push bumper, pintle extension, towbar w/bracket, Ground Mobility Visual Augmentation Systems (GMVAS), rear armored cargo area
	M1274	CROWS II	Warfighter Information Network-Tactical (WIN-T)
	M1276	CROWS II	Warfighter Information Network-Tactical (WIN-T)
	M1277	CROWS II	

Table 2: Approximate Vehicle Dimensions, Weights, and Ratings

Air Transport Configuration	Length (in)	Width (in)	Height* (in)	Front Axle Wt (lbs)	FAW Rating (lbs)	Rear Axle Wt (lbs)	RAW Rating (lbs)	GVW (lbs)	GVWR (lbs)
C-17/C-5	250-272	100-123	144	14,420	17,000	19,980	20,000	32,000	37,000
C-130	250-272	100	100	12,080	17,000	11,580	20,000	23,660	37,000

*****Estimated height equipped with:

(1) OGPK – 126" + Canopy – 143.6"
(2) RWS – 137"
(3) Without OGPK or CROWS II installed – 100" (UIK configured – 101.2")

NOTE: The listed dimensions are approximations. Actual dimensions can vary as long as aircraft limitations published in applicable cargo loading manuals and the conditions of certification listed below are not violated. Adjustments to shoring and/or loading methods shall be reported to ATTLA.

Figure 1: M1240A1 w/OGPK

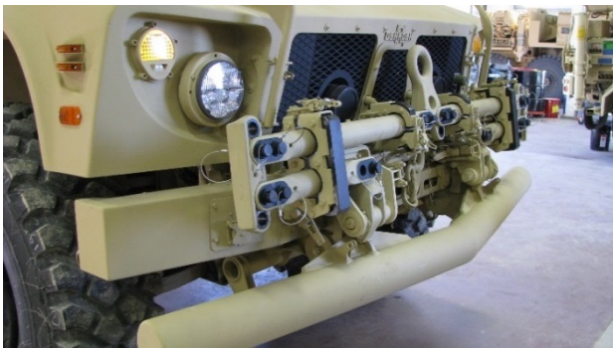

Figure 2: M1245 and M1245A1 w/push bumper and towbar w/bracket

Figure 3: CROWS II

Figure 4: M1277 w/CROWS II

Figure 5: M1276

Figure 6: M1274

Certified Aircraft: USAF C-130, C-17 and C-5

Conditions of Certification:

1. Maximum Weight for Air Transport:

Table 3: Maximum Axle Weights and Gross Vehicle Weights

Air Transport Configuration	Front Axle Wt (lbs)	Rear Axle Wt (lbs)	Maximum GVW (lbs)	Rationale
C-17/C-5	17,000	20,000	37,000	Corresponding vehicle rated capacity
C-130	13,000	13,000	26,000	Aircraft limitations

2. Item Preparation:

a. Fold exterior mounted mirrors inboard.

b. Tire pressure shall not exceed 100 psi.

c. M1245 and M1245A1:

(1) Push bumper must be removed and transported as general cargo. See Figure 2.

(2) Remove towbar and towbar bracket in order to access the front tie-down provisions, and transport as general cargo.

(3) Pintle extension installation allows for enough clearance to access rear tiedown provisions.

d. C-130: Vehicle shall be reduced to a height equal to or less than 102 inches and each axle must be less than or equal to 13,000 lbs in weight.

All M-ATV variants: the following items must be removed:

(1) OGPK or CROWS or TiGPK
(2) Front Gun Shield Base Mount
(3) Spare tire and rack
(4) All Basic Issue Items (BII) as listed in the M-ATV Operator Manual

M1245 and M1245A1 only: the following items must be removed:

(1) Push Bumper
(2) Tow Bar and tow bracket
(3) Pintle Extension
(4) Roof Top Ammo
(5) Four (4) qty. springs from TAK-4
(6) Deflector PS
(7) Deflector DS
(8) Engine Belly Pan
(9) UIK Belly Pan with Steps (LH and RH)
(10) EGON Mount
(11) SATCOM Antenna (a.k.a. 'Egg Beater Ant')
(12) Inner Fender Liner from Left Front Wheel Well
(13) Turret Hatch Locking Handle Knobs (left and right)

M-ATV variants with UIK only: the following items must be removed to reduce weight:

(1) Driver Doors with Side Mirror
(2) Passenger Door with Side Mirror
(3) Rear Doors
(4) Hood
(5) Bar Below Front Bumper
(6) CROWS Hatch
(7) Rear Small Antenna

CAUTION: Vehicles equipped with UIK will not be transported aboard C-130 aircraft unless in compliance with Table 3 and paragraph 2 limitations. Transport may require removal of equipment or components in excess of those items listed in paragraph 2.c and 2.d

e. Shipper is responsible for providing all shoring materials. See paragraph 5 for specifications.

f. Automatic Fire Extinguisher System (AFES) must be de-activated. Undercarriage AFES cylinders equipped with manual valves shall have the valves placed in the "off" position (perpendicular to the valve assembly) and safety-wired in that position.

g. All hazardous materials (to include fuel level, batteries, etc.) must be prepared and certified for airlift in accordance with TM 38-250/AFMAN 24-204(I). Do not consider this air transport certification as approval for hazardous materials. Authorization for airlifting hazardous material is the responsibility of AFMC/A4RT (DSN 787-4503 or COM (937) 257-4503).

3. Loading Instructions:

a. Item can be loaded using general vehicle loading procedures as listed in the respective aircraft cargo loading manual.

b. C-17/C-5: Sleeper shoring may be required, see paragraph 5 for specifications.

4. Restraint Requirements: The M-ATV and all accompanying cargo must be restrained to meet air transport requirements of 3G forward, 1.5G aft and lateral, and 2G up. In addition, stored or installed equipment must meet these requirements and be capable of withstanding a 4.5G down load. Tiedown provision locations and rated capacities are provided in Table 4. Additional restraint may be obtained from the vehicle axles up to their rated capacities listed in Table 2. Do not apply more than 50% of required restraint to vehicle axles for longitudinal and lateral directions. Note that spring mounted axles provide zero vertical restraint.

Table 4: Provision Location and Rated Capacities

Provision Location	Rated Capacity (lbs.)		
	Longitudinal	Lateral	Vertical
Front – Right and Left	74,463	23,420	15,705
Rear – Right and Left	74,463	32,080	21,520
Auxiliary (2-each side)	16,000	25,000	25,000

Figure 7: Front Tiedown Provisions

Figure 8: Rear Tiedown Provisions

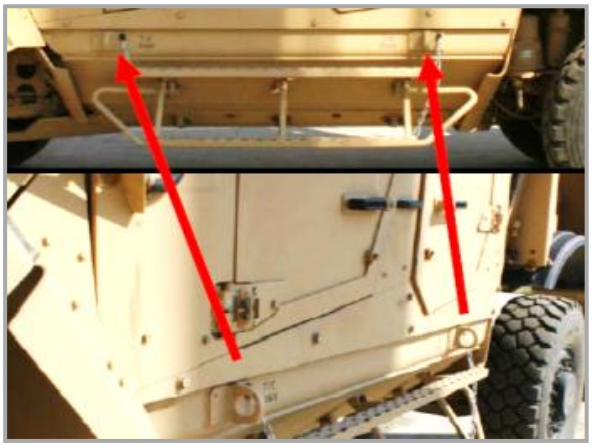

Figure 9: Auxiliary Tiedown Provisions

5. Required Shoring Dimensions:

a. Sleeper Shoring (applicable only to C-17/C-5):

(1) Front Axle: Two stacks are required when axle weight is greater than 14,420 lbs. Minimum base dimensions of each shoring stack shall be 15" L x 15" W.

(2) Rear Axle: Two stacks are required when axle weight is greater than 19,980 lbs. Minimum base dimensions shall be 17" L x 17" W.

(3) Position two shoring stacks, one on each side, adjacent to each axle as required. Sleeper shoring must be stacked to within ½" of chassis/frame and will be secured with cargo straps.

NOTE: Sleeper shoring height must be at least ½ the largest base dimension.

Required Distribution:

1. Shipper shall give a copy of this certification to the ATOC representative when the item is presented for airlift. This memo will be part of the official cargo manifest documentation package and shall be briefed to the aircraft loadmaster prior to loading this item.

2. AMC/A3V & AMC/A4T

3. SDDC TEA

Point of Contact: Peggy Miedlar, at peggy.miedlar@us.af.mil or ATTLA@us.af.mil, DSN 986-9856 or Commercial (937) 656-9856. Refer to file number 2009.08.32 Rev 10 to reference this item.

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Figure 7: Auxiliary Tiedown Provisions