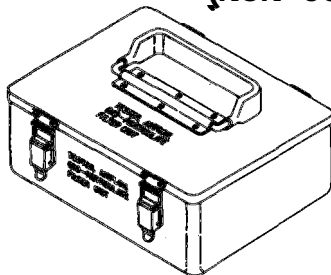


TM 3-6680-316-10

**OPERATOR'S MANUAL**  
**TESTER, AIRFLOW, GAS-PARTICULATE**  
**FILTER UNIT: M39**  
**(NSN 6680-00-436-4212)**



HEADQUARTERS,  
DEPARTMENT OF THE ARMY  
15 November 1983

## WARNING

Hold spring clip firmly when removing it. Spring clip can snap off air purifier or pre-cleaned and injure you.

Be careful not to let air purifier or pre-cleaned fall from mounting bracket. You could injure yourself or damage equipment.

For First Aid, refer to FM 21-11.

\*TM 3-6680-316-10

TECHNICAL MANUAL

NO. 3-6680-316-10

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
Washington, DC, 15 November 1983

OPERATOR'S MANUAL  
TESTER, AIR FLOW, GAS-PARTICULATE  
FILTER UNIT: M39  
(NSN 668000436-4212)

REPORTING OF ERRORS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter or DA Form 2028( Recommended Changes to Publications and Blank Forms) direct to: Commander, US Army Armament Materiel Readiness Command, ATTN: DRSAR-MAS-C, Aberdeen Proving Ground, MD 21010. A reply will be furnished to you.

\* This manual supersedes so much of TM 3-4240-201-13, 15 November 1972, and TM 9-2350-256-341, 28 January 1977, as pertains to the M39 Gas-Particulate Filter Unit Airflow Tester.

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## CHAPTER 1 INTRODUCTION

### Section I. GENERAL INFORMATION

#### 1-1. Scope

a. *Type of Manual:* Operator's.

b. *Model Number and Equipment Name:*  
Tester, Airflow, Gas-Particulate Filter Unit: M39

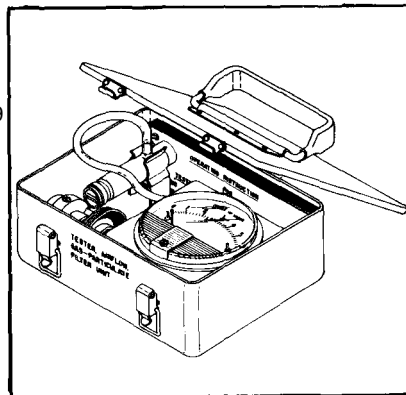
c. *Purpose of Equipment:*

(1) To measure airflow at each chemical and biological protective mask station in installations and vehicles using these gas-particulate filter units:

- M7A1      ● M13 series
- M8 series    ● M14

(2) To bench test for airflow:

- M2A1 and M2A2 air Purifiers
- M1A1-19 precleaned and particulate filter assembly.



**1-2. Maintenance Forms and Records.**

**Department of the Army forms and procedures used for equipment maintenance will be those prescribed by TM 38-750, The Army Maintenance Management System (TAMMS).**

**1-3. Reporting Equipment Improvement Recommendations (EIR's).**

**If your tester needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Tell us why a procedure is hard to perform. Put it on an SF 368 (Quality Deficiency Report). Mail it to us at: Commander, US Army Armament Materiel Readiness Command, ATTN: DRSAR-MAY-MA, Aberdeen Proving Ground, MD 21010. We'll send you a reply.**

**1-4. Nomenclature Cross-Reference List***Common Name**Official Nomenclature*

Adapter . . . . .	Adapter connector
Orifice assembly . . . . .	Calibrated orifice assembly
Precleaned. . . . .	Precleaned and Particulate Filter Assembly, M1A1-19
Pressure gage. . . . .	Gage, Differential, Dial Indicating
Tester . . . . .	Tester, Airflow, Gas-Particulate Filter Unit: M39

**1-5. List of Abbreviations.***Abbreviation**Explanation*

cfm . . . . .	cubic feet per minute
GPFU . . . . .	gas-particulate filter unit

## Section II. EQUIPMENT DESCRIPTION

### 1-6. Equipment Purpose, Capabilities, and Features.

*a. Purpose.* To check airflow of M7A1, M8 series, M13 series, and M14 GPFUs. To check airflow of M2A1 and M2A2 air purifiers and M1A1-19 precleaned.

*b. Capabilities and Features.* A one-man portable unit mounted in a carrying case. Measures air pressure within the range of 0 to 6 in. of water (0 to 5 cfm airflow).



## 1-7. Equipment Data

### *Weights and Dimensions*

Weight . . . . .	approx 3.5 lb
Height . . . . .	approx 3 in.
Width . . . . .	approx 9 in.
Length . . . . .	approx 7 in.

### *Performance*

Measurement capability . . . . .	0 to 6 in. of water
Gage graduation . . . . .	0.2 in. increments
Maximum pressure . . . . .	15 psi
Maximum operating temperature . . . . .	140°F (60°C)

## CHAPTER 2 OPERATING INSTRUCTIONS

### Section I. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS

#### 2-1. Controls and Indicators.

● ***Pressure Gage.*** Indicates amount of air pressure being supplied by each GPFU. Is graduated in 0.2 in. increments from 0 to 6 in. of water. Airflow values are found by converting pressure readings (in. of water) to cfm.

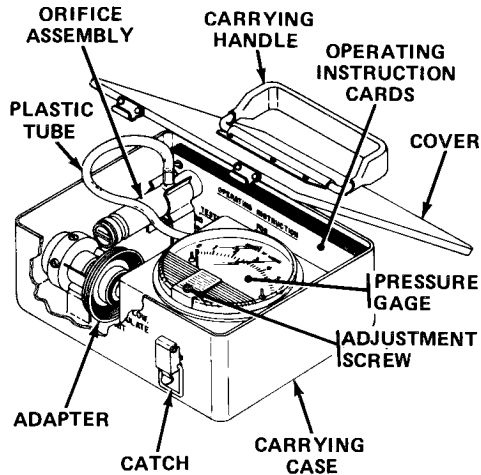
● ***Adjustment Screw.*** Used to zero pressure gage.

● ***Plastic Tube.*** Connects orifice assembly to pressure gage.

● **Orifice Assembly.** Connects tester to GPFU. Controls flow of air to gage.

● **Adapter.** Permits connection of orifice assembly to M7A1 and M14 GPFU headpieces.

● **Operating Instruction Cards.** Give operating instructions for using M39 tester.



**Section II. OPERATION UNDER USUAL CONDITIONS**

**2-2. General.**

The procedures in this manual are more detailed than those provided on the operating instruction cards. If you have both the instruction cards and the technical manual, use the technical manual to run the M39 airflow tests.

**2-3. Preoperational Checks and Adjustment.**

Do the checks and adjustment below before using the tester. If you find damaged or missing parts, or if you cannot zero the pressure gage, turn in the tester for a new one.

**a. Airflow Tester.**

**NOTE**

Calibration label should be located on cover (3).

● Make sure that CALBR VOID date has not passed. If CALBR VOID date has passed or calibration label is missing turn tester in for calibration.

US ARMY CALIBRATED INSTRUMENT (TM 38-750)	
1. DATE CALBR	1E. CALBR BY
3. CALBR VOID	4. NAME/REPORT NO.
5. IDENTIFICATION NO.	1E. OWNER
DA LABEL NO. 1 DEC 77	
REPLACES EDITION OF 1 JAN 76 WHICH IS OBSOLETE	

## 2-3. Preoperational Checks and Adjustment. (cont)

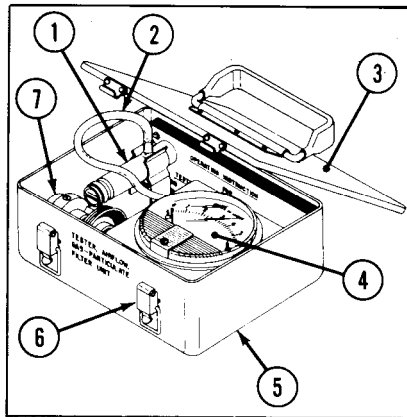
### a. Airflow Tester (cont)

- Release four catches (6) and remove cover (3) from carrying case (5). Lay cover aside.

- Make sure that adapter (7), orifice assembly (1), plastic tube (2), and pressure gage (4) are present.

- Make sure that plastic tube (2) is connected to orifice assembly (1) and pressure gage (4). If disconnected, attach tube to orifice assembly or pressure gage.

- Inspect plastic tube (2) for splits and cracks.

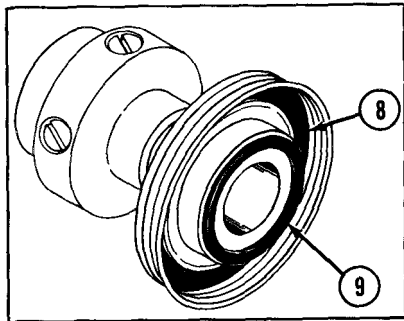


***b. Adapter.***

**NOTE**

Adapter design may vary.

- Make sure that gasket (8) and preformed packing (9) are present and not split or cracked.



## 2-3. Preoperational Checks and Adjustment. (cont)

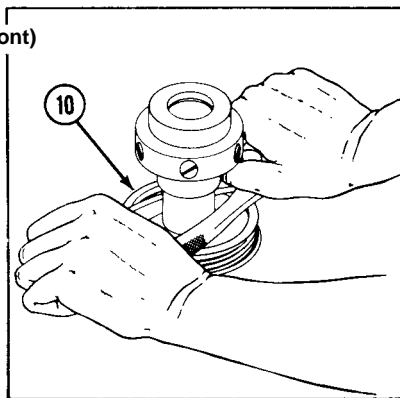
### b. Adapter (cont)

#### NOTE

When checking out M17A1 or M14 series GPFUs, you may find that adapter will not thread onto air hose inlet adapter.

● If adapter will not thread onto air hose inlet adapter, bend cap (10) slightly as follows:

- (1) Set adapter on a flat surface with preformed packing facing down.
- (2) Place pliers or similar tool across top of threaded cap.
- (3) Press down firmly on pliers.
- (4) Repeat steps (1) thru (3) as needed until adapter will thread onto air hose inlet adapter.



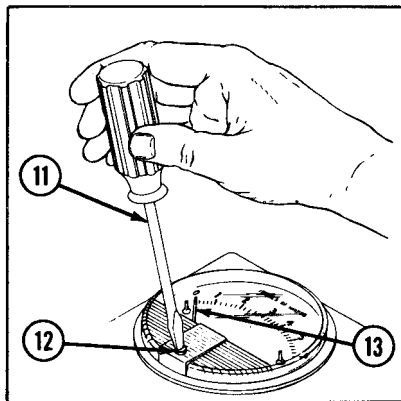


**c. Pressure Gage.**

**NOTE**

Have tester lying flat when zeroing pressure gage.

Using a screw driver (11), turn adjustment screw (12) until pointer (13) is in line with zero line.



## 2-4. Airflow Test Procedures.

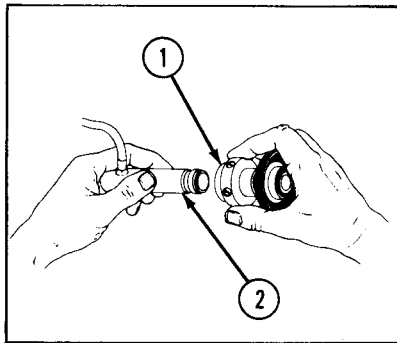
Proceed to the following paragraphs for the GPFU (s) to be tested:

M7A1 GPFU Airflow Test . . . . .	Para 2-5
M8 Series GPFU Airflow Test.....	Para 2-6
M13 Series GPFU Airflow Test . . . . .	Para 2-7
M14 GPFU Airflow Test . . . . .	Para 2-8
M2A1, M2A2 Air Purifier and M1A1-19 Precleaned Airflow Bench Tests..	Para 2-9

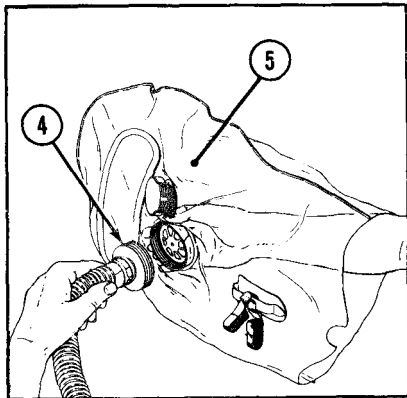


**2-5. M7A1 GPFU Airflow Test. (cont)**

- c. Insert grooved end of orifice assembly (2) into quick-disconnect end of adapter (1).**

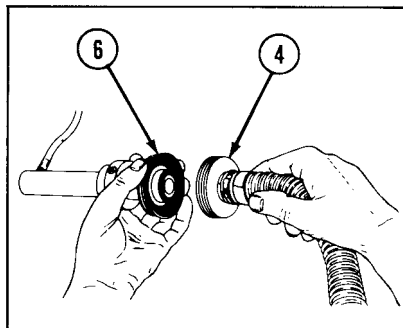


*d.* Unscrew hose inlet adapter (4) from a headpiece (5).



2-5. M7A1 GPFU Airflow Test. (cont)

e. Screw cap (6) onto hose inlet adapter (4).  
Hand tighten.



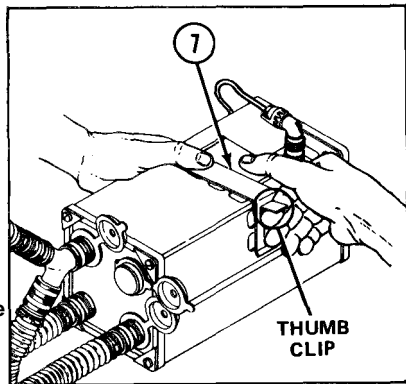
# **WARNING**

Hold spring clip (7) firmly when removing it. Spring clip can snap off air purifier and injure you.

## **NOTE**

Use thumb dip, if present, to lift spring clip (7) from air purifier.

f. Hold down one side of spring clip (7) while carefully lifting other side.



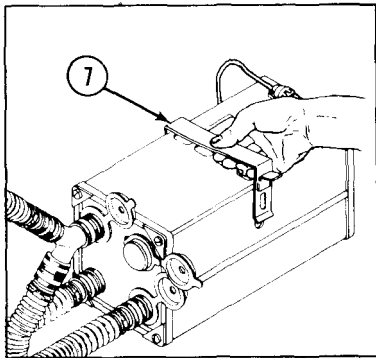
2-5. M7A1 GPFU Airflow Test.(cont)

g. Remove spring clip (7).

**NOTE**

Not all air purifiers have adjustable airflow regulators.

h. Look in right center slot (10) of air purifier for an airflow regulator. If you see an airflow regulator, go to step i. If there is no airflow regulator, go to step k.



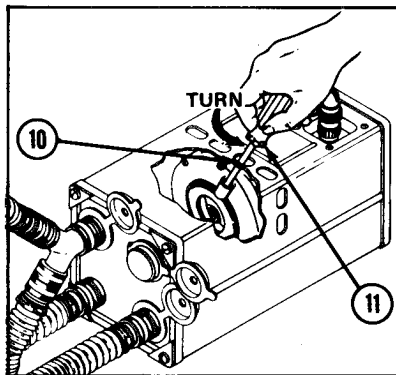


*i.* Insert narrow, flat-tip screwdriver (11) through slot (10) and into adjustment mechanism.

*j.* To fully open airflow regulator, turn screwdriver counterclockwise until you feel resistance or hear clicks.

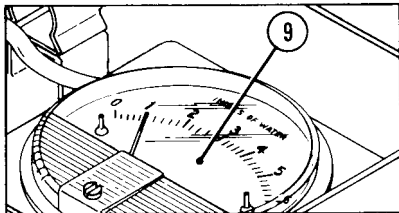
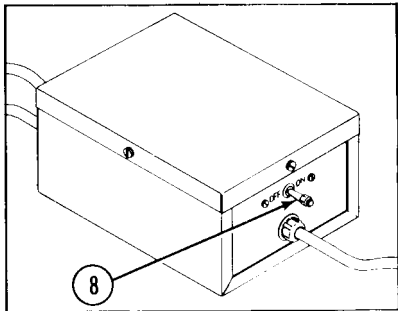
#### NOTE

if you don't feel resistance or hear clicks after two full turns, airflow regulator is bad. Notify maintenance personnel after test



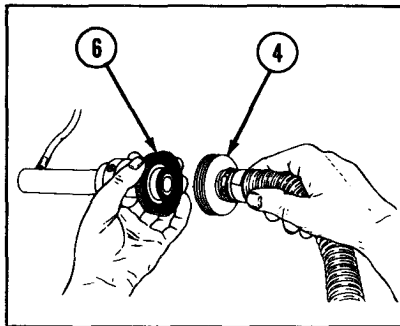
2-5. M7A1 GPFU Airflow Test. (cont)

k. Turn M7A1 GPFU transformer unit OFF/ON switch (8) to ON.



l. Read pressure gage (9). Reading must be at least 0.7 in. of water (1.75 cfm). If pressure is less, note reading.

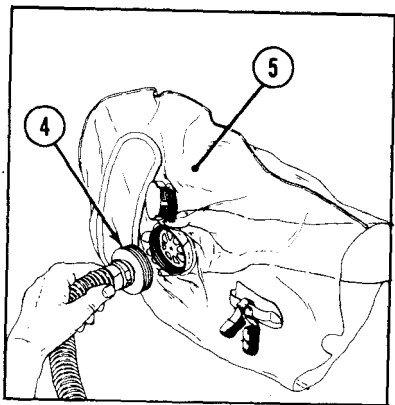
*m.* Unscrew cap (6) from hose inlet adapter (4).



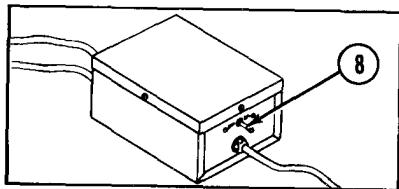
**2-5. M7A1 GPFU Airflow Test. (cont)**

*n.* Reconnect hose inlet adapter (4) to head-piece (5).

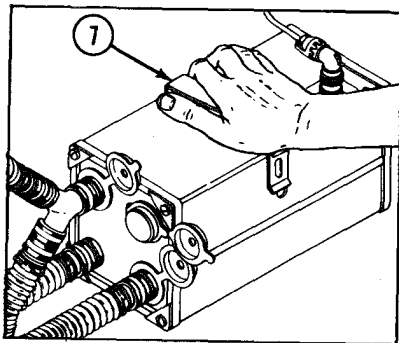
*o.* Repeat steps *d*, *e*, *l*, *m*, and *n* for remaining untested hoses.



*p.* Turn transformer OFF/ON switch (8) to OFF.

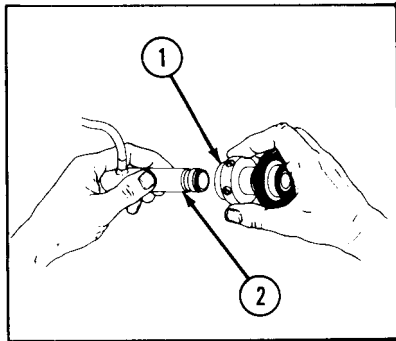


*q.* Spread spring clip (7) over slots on air purifier and press down.



2-5. M7A1 GPFU Airflow Test. (cont)

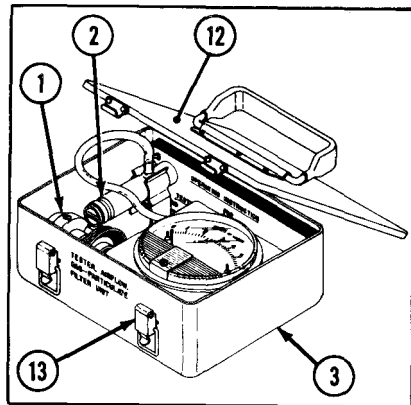
Disconnect orifice assembly (2) from adapter (1).



s. Replace adapter (1) and orifice assembly (2) carrying case (3).

t. Replace cover (12) and fasten four catches (13).

u. If any readings you took were below 0.7 in. of water, notify maintenance personnel of a bad GPFU.

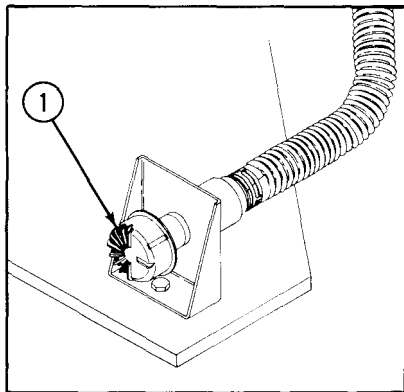


## 2-6. M8 Series GPFU Airflow Test

### NOTES

Refer to vehicle operator's manual for location of crew stations, switches, and GPFU.

●  
Use M13 series test procedures for GPFUs equipped with orifice connectors (1). Refer to para 2-7.





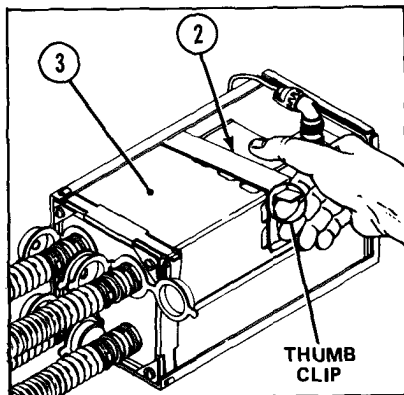
a. Perform preoperational checks and adjustment, para 2-3.

**NOTE**

Use thumb clip, if present, to lift spring clip (2) from air purifier (3).

b. Lift spring clip (2).

c. Turn vehicle MASTER switch and GAS-PARTICULATE switch ON.



2-6. M8 Series GPFU Airflow Test. (cont)

NOTES

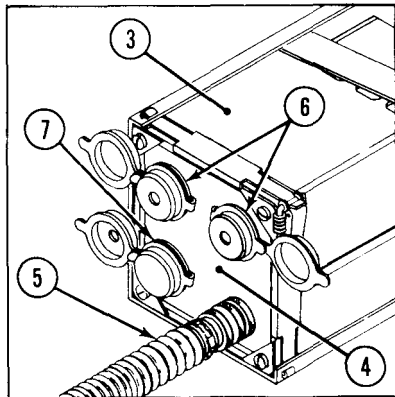
Air purifier (3) will have a three- or four-socket manifold assembly (4).

Hoses have quick-disconnect couplings. Pull collar straight back to disconnect.

d. Disconnect hoses from air purifier (3). Leave one hose (5) attached.

e. Cover two sockets with airflow control caps (6) having center hole.

f. Cover fourth socket, if present, with a solid airflow control cap (7).



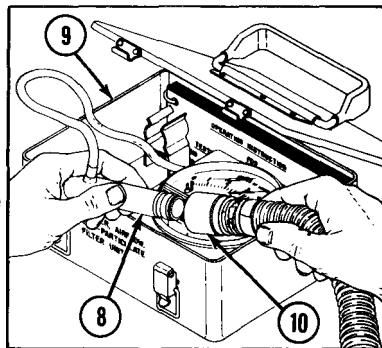
**g. Remove orifice assembly (8) from carrying case (9).**

**NOTE**

**Test will be made at crew members' stations.**

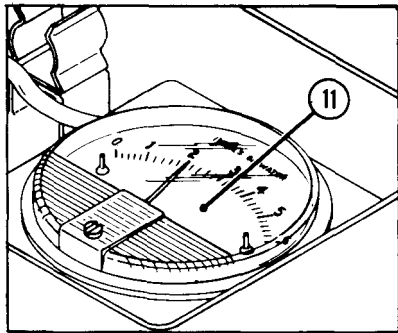
**h. Remove quick-disconnect coupling (10) of hose connected to air purifier from mounting clamp.**

**i. Insert grooved end of orifice assembly (8) into quick-disconnect coupling (10).**



2-6. M8 Series GPFU Airflow Test. (cont)

j. Read pressure gage (1 1). Reading must be at least 2.0 in. of water (3.0 cfm). If pressure is met, go to step r. *If* pressure is less, note reading and go to step k.

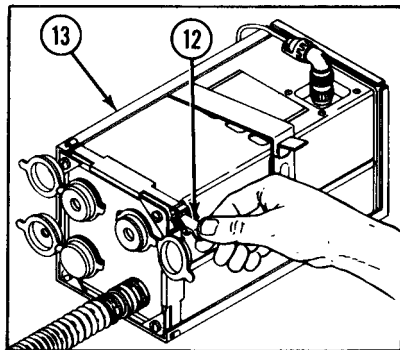


### NOTES

If you have already done steps *k* thru *p*, go to step *r*.

●  
If mounting bracket does not look like the one shown, refer to vehicle technical manual to open mounting bracket.

*k.* Release catch (12) on air purifier mounting bracket (13).

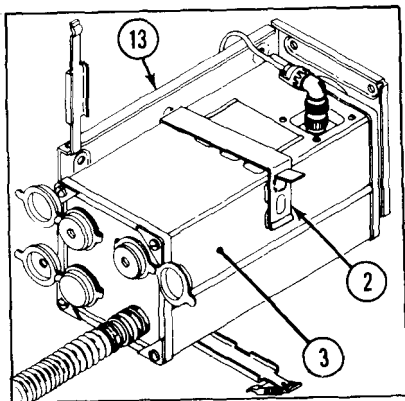


2-6. M8 Series GPFU Airflow Test. (cont)

**WARNING**

Be careful not to let air purifier fall from mounting bracket. You could injure yourself or damage equipment.

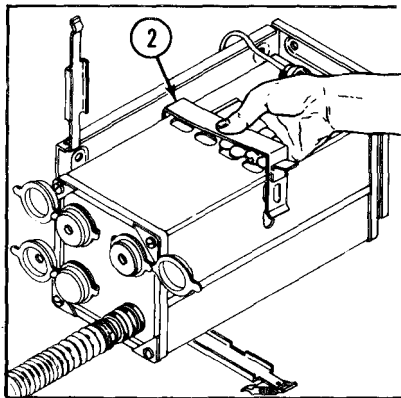
1. Move air purifier (3) far enough out of mounting bracket (13) to take off spring clip (2).



## WARNING

Hold spring clip (2) firmly when removing it. Spring clip can snap off air purifier and injure you.

*m.* Remove spring clip (2).



2-6. M8 Series GPFU Airflow Test. (cont)

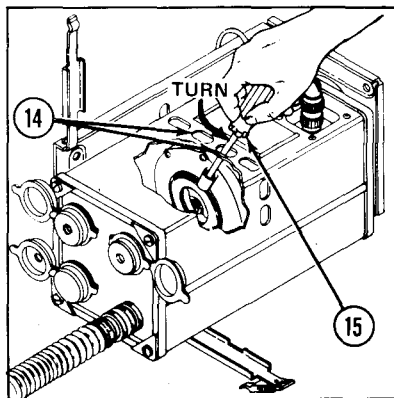
**NOTE**

Not all air purifiers have adjustable airflow regulators.

*n.* Look in center slots (14) of air purifier for an airflow regulator. If you see an airflow regulator, go to step *o*. If there is no airflow regulator go to step *r*.

*o.* Insert narrow, flat-tip screwdriver (15) through slot (14) and into adjustment mechanism.

*p.* To fully open airflow regulator, turn screwdriver counterclockwise until you feel resistance or hear clicks.

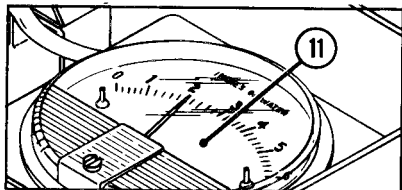


**NOTE**

If you don't feel resistance or hear clicks after two full turns, airflow regulator is bad. Notify maintenance personnel after test.

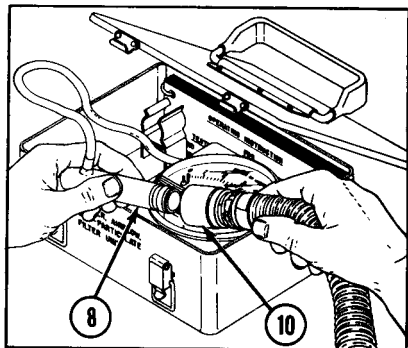


*q.* Read pressure gage (11). Reading must be at least 2.0 in. of water (3.0 cfm). If pressure is less, note reading.



*r.* Disconnect orifice assembly (8) from quick-disconnect coupling (10).

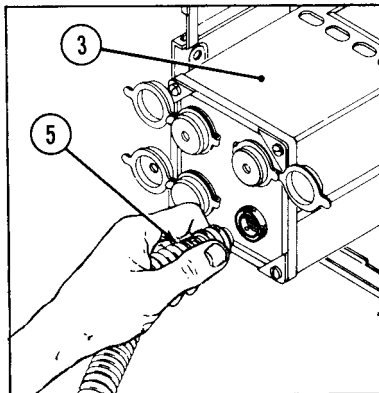
*s.* Replace quick-disconnect coupling (10) in mounting clamp.



2-6. M8 Series GPFU Airflow Test. (cont)

*t.* Disconnect hose (5) from air purifier (3).

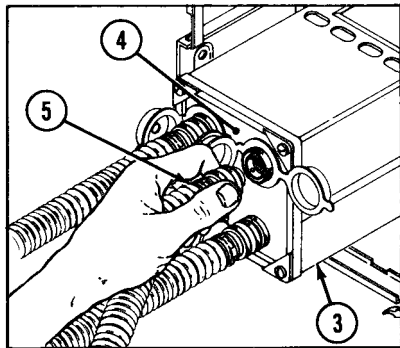
*u.* Connect another untested hose to air purifier. Repeat steps *h*, *i*, and *j* for each remaining untested hose.



## NOTE

Four-socket manifold assembly (4) is shown.

- v. Reconnect all hoses (5) to air purifier  
(3) Put a solid airflow control cap on any remaining open socket.

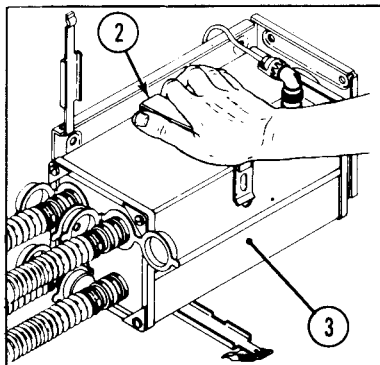


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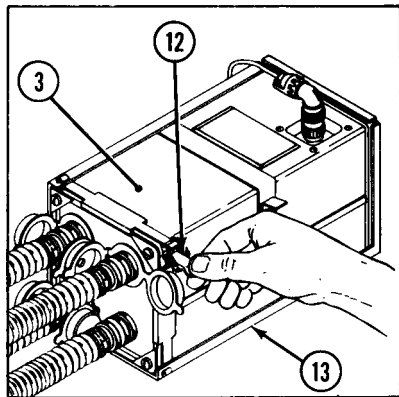
2-6. M8 Series GPFU Airflow Test. (cont)

w. Turn vehicle MASTER switch and GAS-PARTICULATE switch OFF.

x. Slide spring clip (2) over slotted openings of air purifier (3).



y. If air purifier (3) was pulled out, put air purifier back into mounting bracket (13) and fasten catch (12).

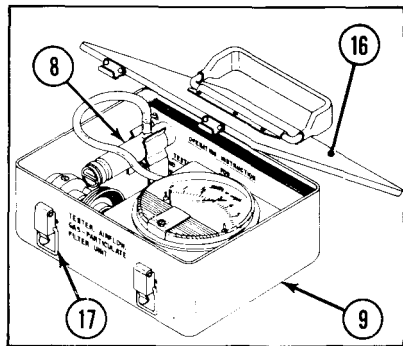


2-6. M8 Series GPFU Airflow Test. (cont)

z. Replace orifice assembly (8) in carrying case (9).

aa. Replace cover (16) on carrying case (9) and fasten four catches (17).

ab. If any readings you took were below 2.0 in. of water, notify maintenance personnel of a bad GPFU.



## 2-7. M13 Series GPFU Airflow Test.

### NOTE

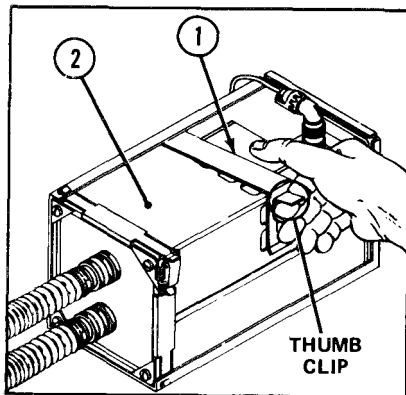
Refer to vehicle operator's manual for location of crew stations, switches, and GPFU.

- a. Perform preoperational checks and adjustment, para 2-3.

### NOTE

Use thumb clip, if present, to lift spring clip (1) from precleaned (2).

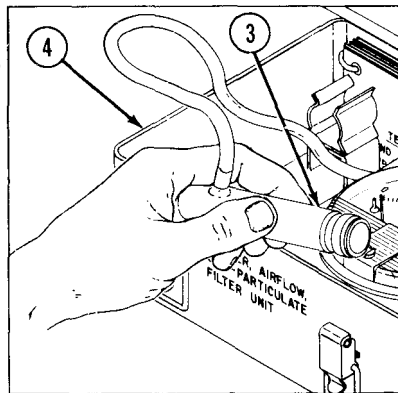
- b. Lift spring clip (1).



2-7. M13 Series GPFU Airflow Test. (cont)

Turn vehicle MASTER switch and GAS-PARTICULATE switch ON.

d. Remove orifice assembly (3) from carrying case (4).

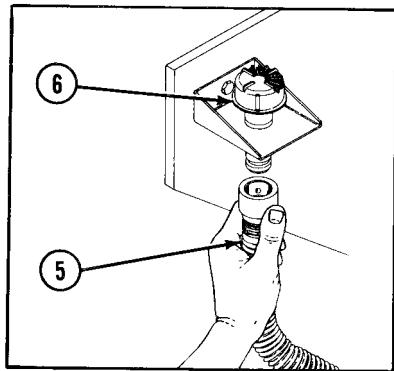




**NOTE**

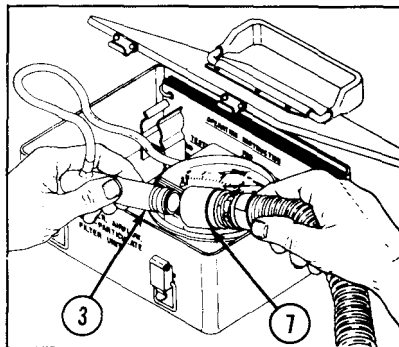
Test will be made at crew members' stations.

Full one crew member's hose (5) from orifice connector (6).

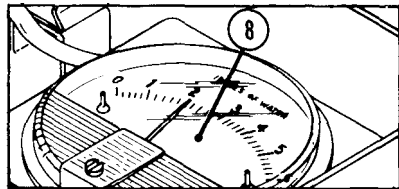


## 2-7. M13 Series GPFU Airflow Test (cont)

*f.* Insert grooved end of orifice assembly (3) into quick-disconnect coupling (7) of hose.



*g.* Read pressure gage (8). Reading must be at least 2.0 in. of water (3.0 cfm). If pressure is met, go to step *o*. If pressure is less, note reading and go to step *h*.

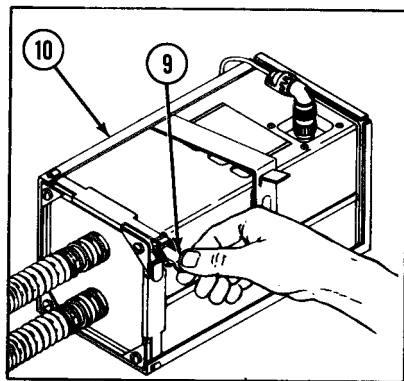


# NOTES

If you have already done steps *h* thru *n*, go to step *o*.

If mounting bracket does not look like the one shown, refer to vehicle technical manual to open bracket.

*h.* Release catch (9) on precleaned mounting bracket (10).

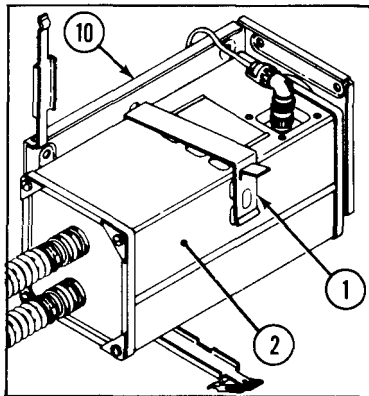


2-7. M13 Series GPFU Airflow Test. (cont)

**WARNING**

Be careful not to let precleaner fall from mounting bracket. You could injure yourself or damage equipment

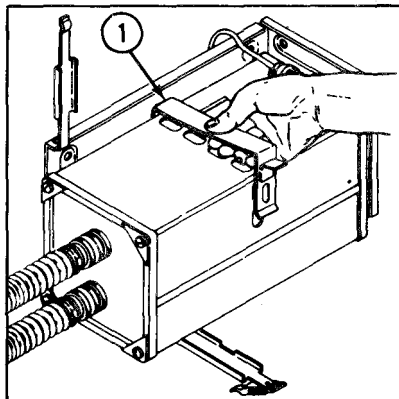
*i.* Move precleaner (2) far enough out of mounting bracket (10) to take off spring clip (1).



# **WARNING**

Hold spring clip (1) firmly when removing it. Spring clip can snap off air purifier and injure you.

- j. Remove spring clip (1).



2-7 M13 Series GPFU Airflow Test. (cont)

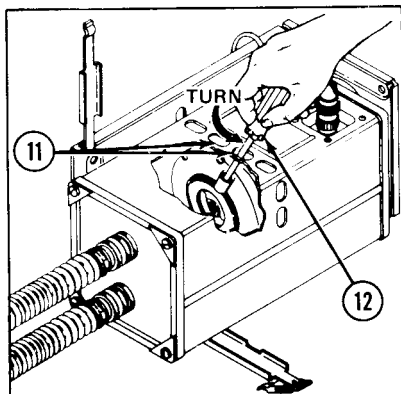
**NOTE**

Not all precleaners have adjustable airflow regulators.

*k.* Look in center slots (11) of precleaner for an airflow regulator. If you see an airflow regulator, go to step *l*. If there is no airflow regulator, go to step *o*.

*l.* Insert narrow, flat-tip screwdriver (12) through slot (11) and into adjustment mechanism.

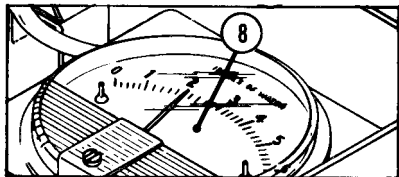
*m.* To fully open airflow regulator, turn screwdriver counterclockwise until you feel resistance or hear clicks.



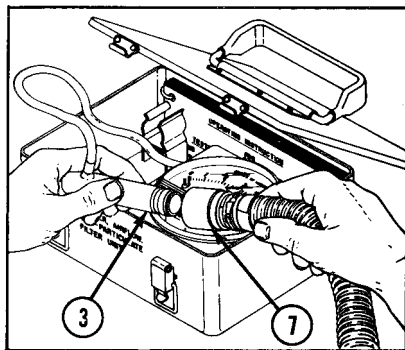
**NOTE**

If you don't feel resistance or hear clicks after two full turns, airflow regulator is bad. Notify maintenance personnel after test.

**n.** Read pressure gage (8). Reading must be at least 2.0 in. of water (3.0 cfm). If pressure is less, note reading.



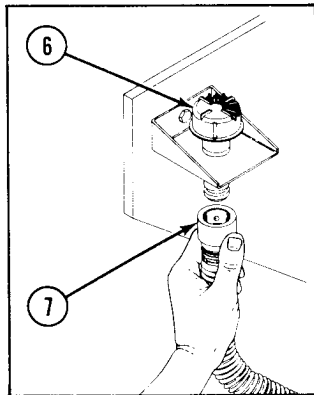
**o.** Disconnect orifice assembly (3) from quick-disconnect coupling (7).



2-7. M13 Series GPFU Airflow Test. (cont)

*p.* Reconnect hose quick-disconnect coupling (7) to orifice connector (6).

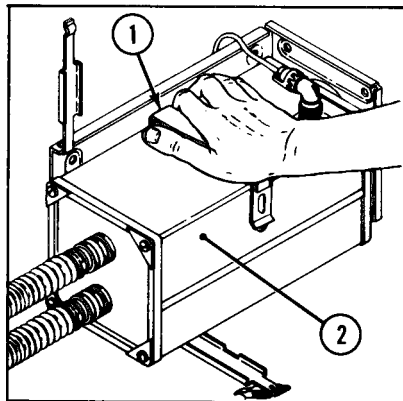
*q.* Repeat steps *e*, *f*, and *g* for remaining untested crew members' hoses.





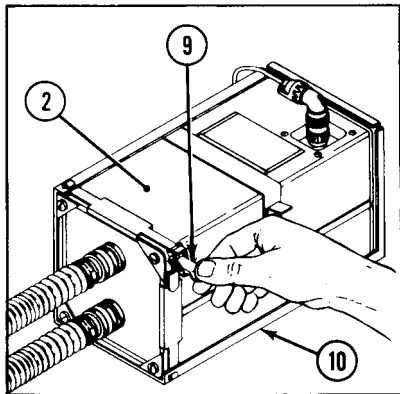
r. Turn vehicle MASTER switch and GAS-PARTICULATE switch OFF.

s. Slide spring clip (1) over slotted openings of precleaner (2).



2-7. M13 Series GPFU Airflow Test. (cont)

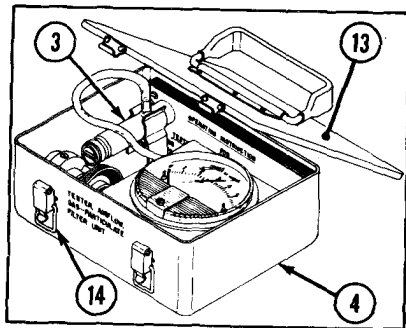
t. If precleaner (2) was pulled out, put precleaner back into mounting bracket (10) and fasten catch (9).



u. Replace orifice assembly (3) in carrying case (4).

v. Replace cover (13) on carrying case (4) and fasten four catches (14).

w. If any readings you took were below 2.0 in. of water (3.0 cfm), notify maintenance personnel of a bad GPFU.



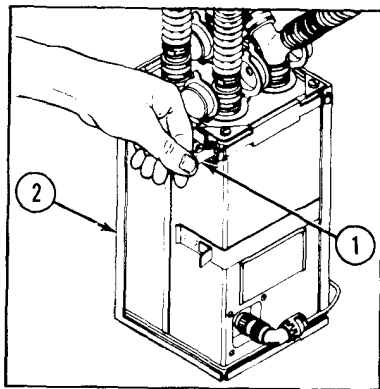
2-8. M14 GPFU Airflow Test.

**NOTE**

Refer to vehicle operator's manual for location of crew stations, switches, and GPFU.

a. Perform preoperational check and adjustment, para 2-3.

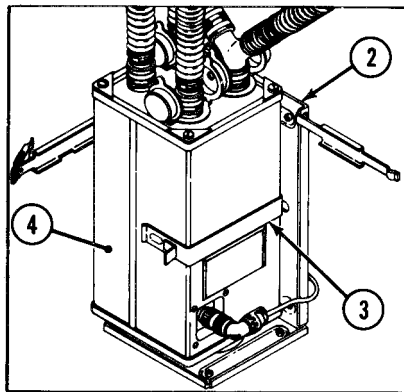
b. Release catch (1) on air purifier mounting bracket (2).



**WARNING**

Be careful not to let air purifier fall from mounting bracket. You could injure yourself or damage equipment.

c. Remove spring clip (3) by moving air purifier (4) far enough out of mounting bracket (2).



2-8. M14 GPFU Airflow Test. (cont)

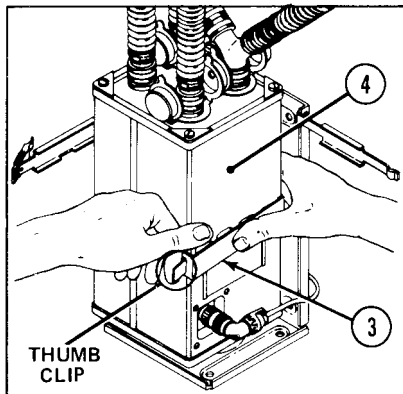
**WARNING**

Hold spring clip (3) firmly when removing it. Spring clip can snap off air purifier and injure you.

**NOTE**

Use thumb clip, if present, to lift spring clip (3) from air purifier (4).

*d.* Remove spring clip (3).

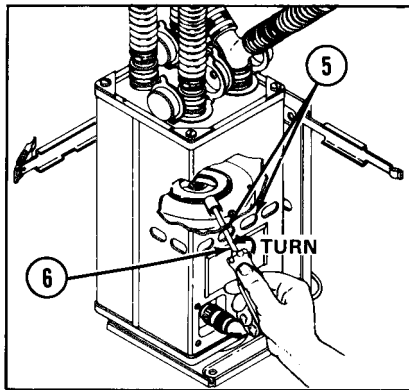


**NOTE**

Not all air purifiers have adjustable airflow regulators.

e. Look in center slots (5) of air purifier for an airflow regulator. If you see an airflow regulator, go to step *f*. If there is no airflow regulator, go to step *h*.

*f.* Insert narrow, flat-tip screwdriver (6) through slot (5) and into adjustment mechanism.



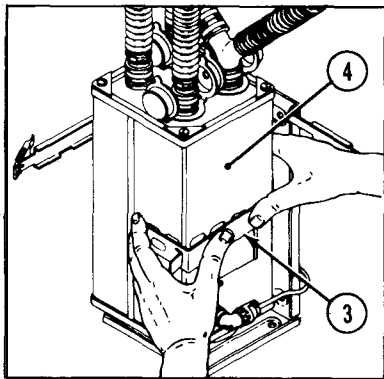
2-8. M14 GPFU Airflow Test. (cont)

*g.* To fully open airflow regulator, turn screwdriver counterclockwise until you feel resistance or hear clicks.

**NOTE**

If you don't feel resistance or hear clicks after two full turns, airflow regulator is bad. Notify maintenance personnel after test.

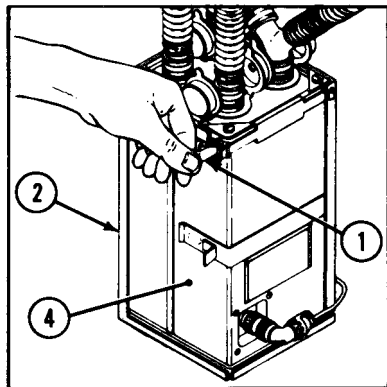
*h.* Press spring clip (3) over slotted openings of air purifier (4).





*i.* Put air purifier (4) back into mounting bracket (2).

*j.* Fasten catch (1) on mounting bracket (2).

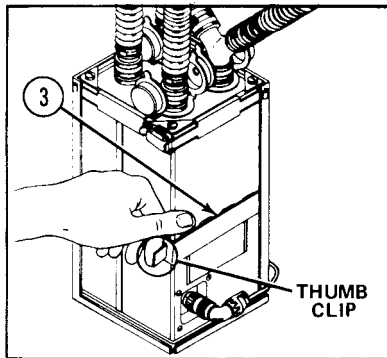


2-8. M14 GPFU Airflow Test. (cont)

NOTE

Use thumb clip, if present, to lift spring clip (3) on air purifier.

k. Lift spring clip (3).

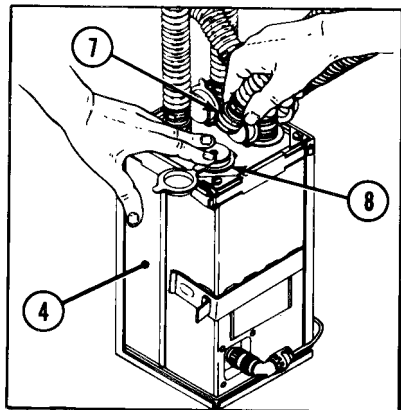


# NOTE

Hoses have quick-disconnect couplings.  
Full collar straight back to disconnect.

*l.* Disconnect driver's hose (7) from air purifier (4).

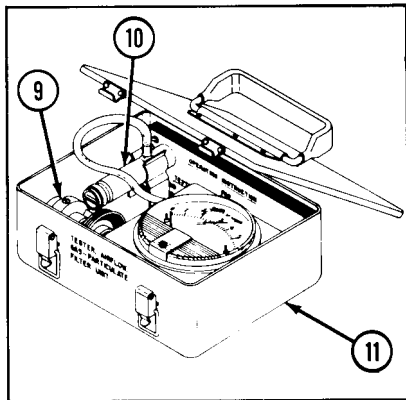
*m.* Cover driver's hose socket with airflow control cap (8) having canter hole.



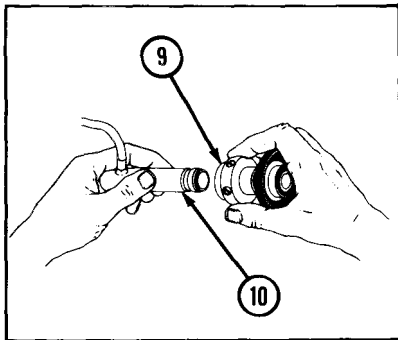
2-8. M14 GPFU Airflow Test. (cont)

n. Turn vehicle MASTER switch and AIR PURRIFIER switch ON.

o. Remove adapter (9) and orifice assembly (10) from carrying case (11).



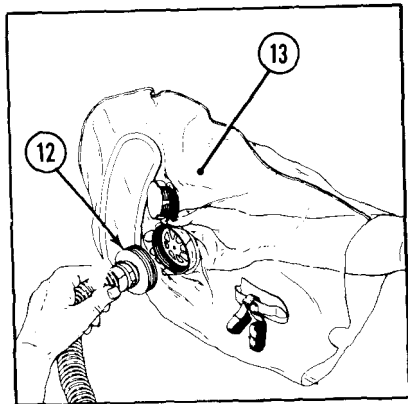
*p.* Insert grooved end of orifice assembly (10) into quick-disconnect end of adapter (9).



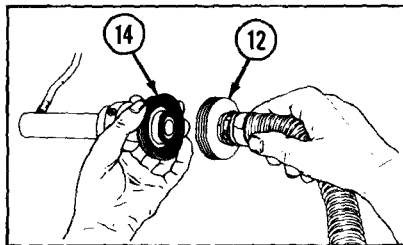
TM 3-6680-316-10

2-8. M14 GPFU Airflow Test. (cont)

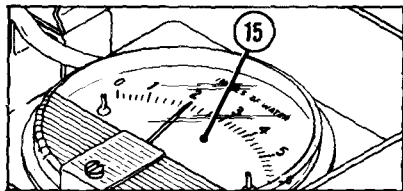
a. Unscrew hose inlet adapter (12) from a headpiece (13).



r. Screw cap (14) onto hose inlet adapter (12). Hand tighten.

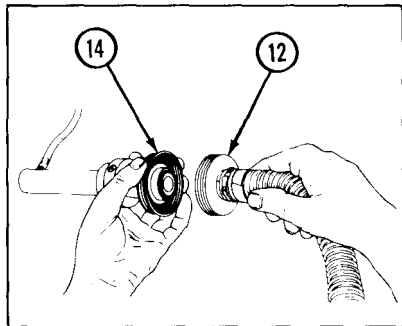


s. Read pressure gage (15). Reading must be at least 0.7 in. of water (1.75 cfm). If pressure is less, note reading.



2-8. M14 GPFU Airflow Test. (cont)

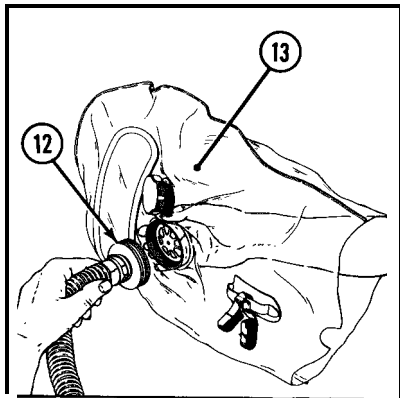
f. Unscrew cap (14) from hose inlet adapter (12).





*u.* Reconnect hose inlet adapter (12) to headpiece (13).

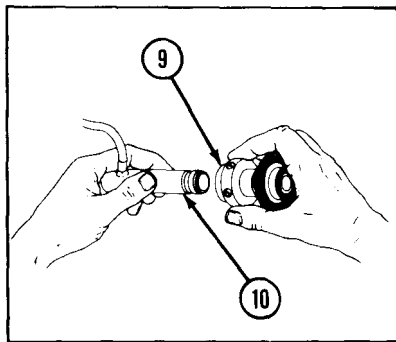
*v.* Repeat steps *q* thru *u* for remaining hoses connected to headpieces.



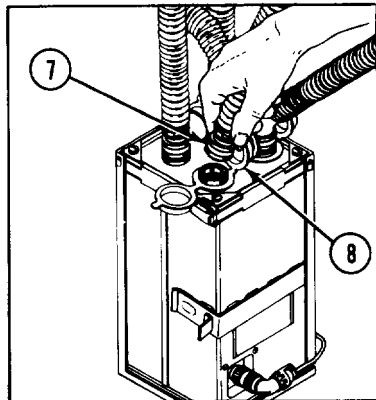
TM 3-6680-316-10

2-8. M14 GPFU Airflow Test. (cent)

w. Disconnect adapter (9) from orifice assembly (10) and lay adapter to one side.

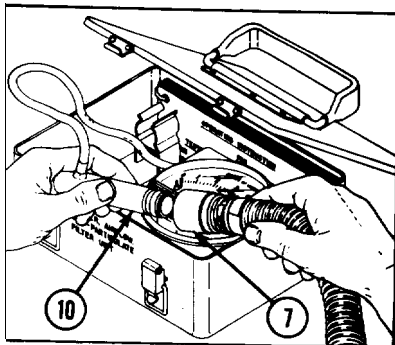


x. Remove airflow control cap (8) from socket in air purifier and reconnect driver's hose (7).

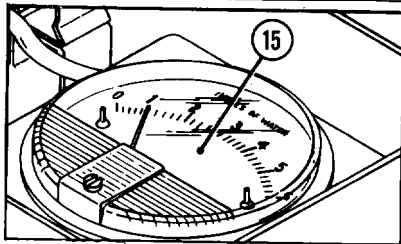


## 2.8. M14 GPFU Airflow Test. (cont)

y. Connect other end of driver's hose (7) to orifice assembly (10).

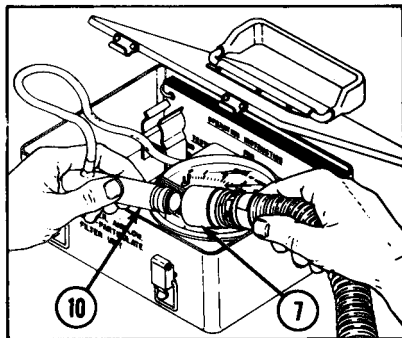


z. Read pressure gage (15). Reading must be at least 2.0 in. of water (3.0 cfm). If pressure is less, note reading.



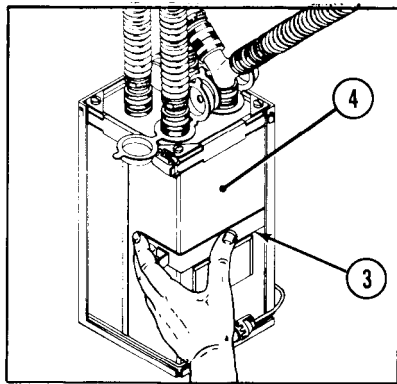
**aa. Disconnect orifice assembly (10) from driver's hose (7).**

**ab. Turn AIR PURIFIER switch and vehicle MASTER switch OFF.**



2-8. M14 GPFU Airflow Test. (cont)

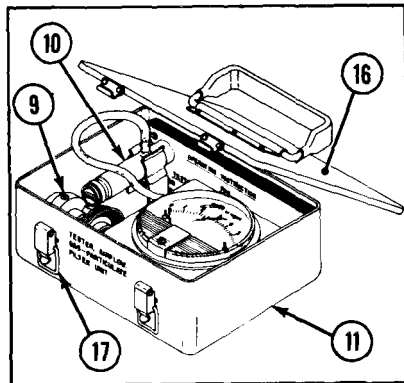
ac. Slide spring clip (3) over slotted openings in air purifier (4).



*ad.* Replace orifice assembly (10) and adapter (9) in carrying case (11).

*ae.* Replace cover (16) on carrying case (11) and fasten four catches (17).

*af.* If any readings you took were too low, notify maintenance personnel of a bad GPFU.



## 2-9. M2A1, M2A2 Air Purifier and M1A1-19 Precleaned Airflow Bench Tests.

To perform airflow bench tests on M2A1 and M2A2 air purifiers and M1A1-19 pre-cleaner, refer to TM 3-4240-276-30&P.

**APPENDIX A  
REFERENCES**

**A-1. Scope.**

This appendix lists all forms, field manuals, and technical manuals referenced in this manual.

**A-2. Forms.**

Quality Deficiency Report . . . . . SF 368  
Recommended Changes to Publications and Blank Forms . . . . . DA Form 2028

**A-3. Field Manuals (FM).**

First Aid for Soldiers . . . . . FM 21-11

**A-4. Technical Manuals (TM).**

Direct Support Maintenance Manual Including Repair Parts and Special Tools List  
for Purifier, Air: M2A1; Purifier, Air: M2A2; and Precleaned and Particulate Filter  
Assembly: M1A1-19 . . . . . TM 3-4240-276-30&P  
The Army Maintenance Management System (TAMMS) . . . . . TM 38-750



**TM 3-6680-316-10 - TESTER, AIRFLOW, GAS-PARTICULATE FILTER UNIT: M39**

By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.  
*General, United States Army*  
*Chief of Staff*

Official:


ROBERT M. JOYCE  
*Major General, United States Army*  
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## THE METRIC SYSTEM AND EQUIVALENTS

### LENGTH MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches  
 1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches  
 1 Kilometer = 1000 Meters = 0.621 Miles

### WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces  
 1 Kilogram = 1000 Grams = 2.2 lb.  
 1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

### LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces  
 1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

### SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches  
 1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet  
 1 Sq. Kilometer = 1,000,000 Sq. Meters = 0.386 Sq. Miles

### CUBIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches  
 1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

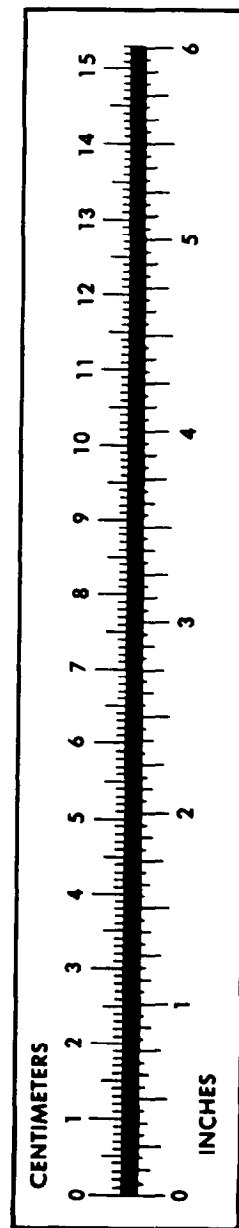
### TEMPERATURE

$5/9(^{\circ}\text{F} - 32) = ^{\circ}\text{C}$   
 212° Fahrenheit is equivalent to 100° Celsius  
 90° Fahrenheit is equivalent to 32.2° Celsius  
 32° Fahrenheit is equivalent to 0° Celsius  
 $9/5^{\circ}\text{C} + 32 = ^{\circ}\text{F}$

### APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
Quarts	Liters	0.473
Gallons	Liters	0.946
Ounces	Liters	3.785
Pounds	Grams	28.349
Short Tons	Kilograms	0.454
Pound-Feet	Metric Tons	0.907
Pounds per Square Inch	Newton-Meters	1.356
Miles per Gallon	Kilopascals	6.895
Miles per Hour	Kilometers per Liter	0.425
	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Milligrams	Ounces	0.035
Grams	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pounds-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
Kilometers per Liter	Miles per Gallon	2.354
Kilometers per Hour	Miles per Hour	0.621



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