

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

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**OPERATOR'S MANUAL  
TRACTOR, WHEELED, WAREHOUSE  
GASOLINE, PNEUMATIC-TIRED WHEELS  
4000-POUND DRAWBAR PULL  
ARMY MODEL MHE-189  
UNITED TRACTOR MODEL G40  
FSN 3930-724-8146**

**This copy is a reprint which includes current  
pages from Changes 4 thru 6.**

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**HEADQUARTERS, DEPARTMENT OF THE ARMY  
DECEMBER 1964**



## **SAFETY PRECAUTIONS**

### **Before Operation**

Check the operating area to be sure it is clear of personnel and obstructions.

Do not allow smoking or the use of an open flame in the immediate vicinity while servicing the batteries. Batteries generate hydrogen, a highly explosive gas.

When filling the fuel tank, always provide a metal-to-metal contact between the container and the fuel tank. This will prevent a static spark from being generated as fuel flows over metallic surfaces.

Exercise care at all times while handling electrolyte. When necessary to dilute electrolyte, always pour acid into water. Avoid breathing fumes and do not permit electrolyte to come in contact with skin. If electrolyte comes in contact with skin, wash affected area immediately with baking soda solution or with liberal quantity of water. If electrolyte splashes into eyes, wash immediately with liberal quantity of clean water and obtain medical aid as soon as possible.

### **During Operation**

Be alert for other workers to be sure they are not in the way of the moving tractor or towed load.

Do not fill fuel tank while the engine is running. Fuel spilled on a hot engine may explode and cause injury to personnel.

If the tractor is operated in an enclosed area, be sure adequate ventilation is provided. Exhaust gases contain carbon monoxide. Continued breathing of exhaust fumes is dangerous and can be fatal.

### **After Operation**

Do not allow smoking or the use of an open flame in the immediate vicinity while servicing the batteries. Batteries generate hydrogen, a highly explosive gas.

Use only approved cleaning solvents to- prevent the possibility of fire or poisoning.

If the tractor is parked on an incline, block at least two wheels in the event of handbrake failure.

Exercise care at all times while handling electrolyte. When necessary to dilute electrolyte, always pour acid into water. Avoid breathing fumes and do not permit electrolyte to come in contact with skin. If electrolyte comes in contact with skin, wash affected area immediately with baking soda solution or with liberal quantity of water. If electrolyte splashes into eyes, wash immediately with liberal quantity of clean water and obtain medical aid as soon as possible.

When filling the fuel tank, always provide a metal-to-metal contact between the container and the fuel tank. This will prevent a static spark from being generated as fuel flows over metallic surfaces.

GPO 820-461-1



CHANGE

NO. 6

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
WASHINGTON, DC 21 January 1985

**Operator's Manual**  
**TRACTOR, WHEELED, WAREHOUSE; GASOLINE;**  
**PNEUMATIC-TIRED WHEELS, 4,000 lb. DRAWBAR PULL**  
**(ARMY MODEL MHE-189, UNITED TRACTOR MODEL G40)**  
**(ARMY MODEL MHE-189A, UNITED TRACTOR MODEL G40A)**  
**(ARMY MODEL MHE-189B, UNITED TRACTOR MODEL G40B)**  
**(NSN 3930-00-724-8146)**

TM 10-3930-409-10, 2 December 1964 is changed as follows:

*Title:* Title appearing on front cover and page 1 changed as shown above.

*Page 3,* paragraph 1.a., line 6, "Federal Stock Number" change to read "National Stock Number".

*Page 3,* paragraph 4 is superseded as follows:

#### **4. REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS**

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, DA Form 2028 (Recommended Changes to Publications and Blank Forms) direct to: Commander, US Army Tank-Automotive Command, Warren, MI 48090, Attn: AMSTA-MB. A reply will be furnished to you.

*Page 10,* paragraph 25, line 5, change "Refer to figure 5 for the daily. preventive maintenance services" to read "Refer to page 12 for Operator/Crew Preventive Maintenance Checks and Services".

*Page 12,* "Preventive Maintenance Services Daily" is superseded by the following:

#### **OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES**

a. Do your before (B) PREVENTIVE MAINTENANCE just before you operate the vehicle. Pay attention to the CAUTIONS and WARNINGS.

b. Do your (D) PREVENTIVE MAINTENANCE during operation. (During operation means to monitor the forklift and its components/systems while they are actually being operated.)

c. Do your after (A) PREVENTIVE MAINTENANCE right after operating the vehicle. Pay attention to the CAUTIONS and WARNINGS.

d. Do your weekly (W) PREVENTIVE MAINTENANCE weekly.

e. Do your monthly (M) PREVENTIVE MAINTENANCE once a month.

f. If something doesn't work, troubleshoot it with the instructions in your TM 10-3930-409-10, or notify your supervisor.

g. Always do your PREVENTIVE MAINTENANCE in the same order so it gets to be a habit. Once you've had some practice, you'll spot anything wrong in a hurry.



**OPERATOR/CREW  
PREVENTIVE MAINTENANCE CHECKS  
AND SERVICES - CONTINUED**

h. If anything looks wrong and you can't fix it, write it on your DA Form 2404. If you find something seriously wrong, report it to ORGANIZATIONAL MAINTENANCE RIGHT NOW.

i. When you do your PREVENTIVE MAINTENANCE, take along the tools you will need to make all the checks. Take along a rag; you'll always need at least one.

**WARNING**

**Dry cleaning solvent P-D-680 is toxic and flammable. Wear protective goggles and gloves and use only in a well ventilated area. Avoid contact with skin, eyes and clothes and don't breathe vapors. Do not use near open flame or excessive heat. If you become dizzy while using cleaning solvent, get fresh air immediately and get medical aid. If contact with skin or clothing is made, flush with water. If contact with eyes is made, wash your eyes with water and get medical aid immediately.**

A - Keep it clean: Dirt, grease, oil and debris only get in the way and may cover up a serious problem. Clean as you work and as needed. Use dry cleaning solvent (SD-2) on all metal surfaces. Use soap and water when you clean rubber or plastic material.

B - Bolts, nuts and screws: Check them all for obvious looseness, missing, bent or broken condition. You can't try them all with a tool, but look for chipped paint, bare metal, or rust around bolt heads. If you find one you think is loose, tighten it, or report it to ORGANIZATIONAL MAINTENANCE if you cannot tighten it.

C - Welds: Look for loose or chipped paint, rust or gaps where parts are welded together. If you find a bad weld, report it to Organizational Maintenance.

D - Electric wires and connectors: Look for cracked or broken insulation, bare wires, and loose or broken

connectors. Tighten loose connectors and make sure the wires are in good shape.

E - Hoses and fluid lines: Look for wear, damage and leaks and make sure clamps and fittings are tight. Wet spots show leaks, but a stain around a fitting or connector can mean a leak. If a leak comes from a loose fitting or connector, tighten it. If something is broken or worn out, report it to Organizational Maintenance.

j. It is necessary for you to know how fluid leakage affects the status of your vehicle. The following are definitions of the types/classes of leakage you need to know to be able to determine the status of your vehicle. Learn, then be familiar with them and REMEMBER - WHEN IN DOUBT, NOTIFY YOUR SUPERVISOR!

**Leakage Definitions for Operator/Crew PMCS**

Class I Seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops.

Class II Leakage of fluid great enough to form drops but not enough to cause drops to drip from item being checked/inspected.

Class III Leakage of fluid great enough to form drops that fall from the item being checked/inspected.

**CAUTION**

**Equipment operation is allowable with minor leakages (Class I or II). Of course consideration must be given to the fluid capacity in the item/system being checked/inspected. When in doubt, notify your supervisor. Exceptions are fuel and brake system, where no leakage is allowable.**

**When operating with Class I or II leaks, continue to check fluid levels as required in your PMCS.**

**Class III or fuel and brake system leaks should be reported to your supervisor or organizational maintenance.**



# Operator/Crew Preventive Maintenance Checks and Services

## NOTE

Within designated interval, these checks are to be performed in the order listed.

**B - Before**

**D - During**

**A - After**

**W - Weekly**

**M - Monthly**

ITEM NO.	INTERVAL					Item to be Inspected Procedures: Check for and have repaired filled or adjusted as necessary.	For Readiness Reporting, Equipment Is Not Ready/Available If:
	B	D	A	W	M		
1	•					<p>IMPORTANT: Perform Weekly (W) As Well As Before (B) Operation PMCS If:</p> <p>1. You are the assigned operator and have not operated the vehicle since last weekly check.</p> <p>2. You are operating the vehicle for the first time.</p> <p><u>EXTERIOR OF VEHICLE</u> Check for leaks or appearance of leaks.</p>	Class III or any fuel.
2	•					<p><u>FIRE EXTINGUISHER</u> Check that seal is not broken; check that gage indicates proper charge (if applicable).</p>	Seal is broken, improper charge reading on gage.
3	•					<p><u>ENGINE OIL LEVEL</u> Check oil dipstick; add oil if needed to raise level between ADD and FULL mark on dipstick.</p>	
4		•				<p><u>BRAKES</u> Check for chatter, rubbing, uneven stopping and/or unusual noise. operation.</p>	Brakes will not stop the travel of tractor during
5		•				<p><u>LIGHTS</u> Check that lights are operative.</p>	
6		•				<p><u>STEERING</u> Check that tractor steers without binding sticking.</p>	Steering sticks or tractor or is hard to steer.
7		•				<p><u>ACCELERATOR</u> Check that tractor accelerator operates smoothly.</p>	Pedal sticks.
8						<p><u>INSTRUMENTS</u> Observe the following instrument readings after achieving normal operating temperatures.</p>	



Operator/Crew Preventive Maintenance Checks and Services - Continued

**NOTE**

Within designated interval, these checks are to be performed in the order listed.

**B - Before**

**D - During**

**A - After**

**W - Weekly**

**M - Monthly**

ITEM NO.	INTERVAL					Item to be Inspected Procedures: Check for and have repaired filled or adjusted as necessary.	For Readiness Reporting, Equipment Is Not Ready/Available If:
	B	D	A	W	M		
8		•				<u>INSTRUMENTS - CONTINUED</u> a. Ammeter indicates slightly to the "+" side of "O".  b. Oil pressure gage - 45 to 50 PSI. specified range.  c. Torque Converter oil temperature indicator - 250° F maximum.  d. Engine temperature indicator - 180° F maximum.	Erratic or continuous high rate of charge or discharge.  Reading is not within  Indicated temperature exceeds 250° F.  Indicated temperature exceeds 180° F.
9		•				<u>HORN</u> Check horn by depressing horn button.	
10				•		<u>RADIATOR</u> Check that coolant level is "1" inch below filler neck.	
11				•		<u>TRANSMISSION</u> Check that the fluid level is between ADD and FULL mark; add oil if necessary.	
12						<u>BATTERY</u>  <u>WARNING</u> Do not smoke, or allow any flame or spark in the vicinity while checking or filling the battery. The battery generates hydrogen, a highly explosive gas.	
				•		a. Check electrolyte level. If level of electrolyte is below the top of battery plates, add distilled water.	
				•		b. Check battery and battery box for corrosion and obvious damage.	Battery missing engine will not crank.
13				•		<u>FAN BELT</u> Check belt for loose, worn, cracked or frayed condition.	Belt is missing, broken or damaged.



**Operator/Crew Preventive Maintenance Checks and Services - Continued**

**NOTE**

Within designated interval, these checks are to be performed in the order listed.

**B - Before**

**D - During**

**A - After**

**W - Weekly**

**M - Monthly**

ITEM NO.	INTERVAL					Item to be Inspected Procedures: Check for and have repaired filled or adjusted as necessary.	For Readiness Reporting, Equipment Is Not Ready/Available If:
	B	D	A	W	M		
14				•		<u>AIR CLEANER</u> Check that oil in air cleaner reservoir is at level mark. If necessary, add oil. (Ref. LO 10-3930-409-12)	
15				•		<u>TIRES</u> Check for excessive wear, cuts, cracks, abrasions, low or flat tires (correct tire pressure - rear 40 PSI; front 50 PSI).  Tires missing, flat or unserviceable.	Tires worn, cut or damaged which would result in failure during operation.

Page 14, paragraph 33, after last sentence add the following: "See TM 750-244-6".

Page 15, Appendix I is superseded as follows:

**APPENDIX I**

**REFERENCES**

AR 310-25	Dictionary of United States Army Terms.
AR 310-50	Authorized Abbreviations and Brevity Codes.
C-9100IL	Petroleum, Petroleum-Base Products and Related Material.
DA Pam 310-1	Military Publications: Index of Administrative Publications.
DA Pam 310-2	Military Publications: Index of Blank Forms.
DA Pam 310-3	Military Publications: Index of Doctrinal Training and Organizational Publications.
DA Pam 310-4	Military Publications: Index of Technical Manuals, Technical Bulletins, Supply Manuals (Type 7, 8, and 9), Supply Bulletins, Lubrication Orders.
DA Pam 310-5	Index of Graphic Training Aids and Devices.
DA Pam 738-750	The Army Maintenance Management System (TAMMS).
FM 5-25	Explosives and Demolitions.
FM 21-5	Military Training.



# APPENDIX I - CONTINUED

FM 21-30	Military Symbols.
FM 25-3	Techniques of Military Instruction.
FM 55-30	Army Motor Transport Units and Operations.
TB 43-0210	Nonaeronautical Equipment Army Oil Analysis Program (AOAP).
TM 21-300	Driver Selection and Training (Wheeled Vehicles).

Page 17, paragraph 2.b., change both words "Federal" to "National".

Page 17, paragraph 3d., line 1, change both words "Federal" to "National".

Page 17, paragraph 2.c. (2) line 6, change "Federal Stock Number" to "National Stock Number".

Page 18, Section II. "BASIC ISSUE ITEMS LIST" is superseded as follows:

## Section II. BASIC ISSUE ITEMS LIST

Source codes				Federal Stock No.	Description	Unit of issue	Quantity authorized	Quantity issued with equipment	Illustrations	
Materiel	Source	Maintenance	Recoverability						Fig.	Item
11	P1	0	-	6140-00-643-0495	BATTERY, storage, 12-volt, charged and dry.	ea	*			
9	P1	0	-	6810-00-249-9354	ACID, sulfuric, electrolyte, dilute specific gravity 1.280, 1-gallon container.	ea	*			
5	P1	0	-	4210-00-893-1092	EXTINGUISHER, fire (GE)	ea	*	1		
10	P1	0	-	7520-00-559-9618	CASE, maintenance and operation manuals.	ea	*	1		
12	-	-	-		PUBLICATIONS TM 10-3930-409-10 (Operator's Manual ).	ea	*	1		
					REPAIR PARTS None authorized for operator/crew maintenance.					
					SPECIAL TOOLS None authorized for operator/crew maintenance.					
					RECORDS EQUIPMENT LOG BOOK Consisting of the following DA Forms: 2408, 2408-1, 2408-2, 2408-3, 2408-5, 2408-6, 2408-7, 2408-8, 2408-10, 2408-11 and Log Book Binder.	ea	*	1		



Page 19, Section III, Maintenance and Operating Supplies is superseded as follows:

### Section III. MAINTENANCE AND OPERATING SUPPLIES

Item	Component Application	Source of supply	National Stock No.	Description	Quantity required for initial operation	Quantity required for 8 hours operation	Notes
1	CRANKCASE (1)			OIL, LUBRICATING: 5 gal. Drum as follows:			(1) Includes quantity of oil to fill engine oil systems as follows:
		10	9150-00-188-9858	OE-30	-	-	5 qt-Crankcase 1 qt-Oil Filter
		10	9150-00-186-6668	OE-10	-		
2	AIR CLEANER (2)	10	9150-00-402-2372	OES	6 1/2 qt		1/2 qt-Air Cleaner
3	TRANSMISSION (2)	-	9150-00-188-9858	OIL, LUBRICATING (2)			
		10	9150-00-186-6668	OE-10 (2)	8 qt		(2) Use oil as prescribed in item 1.
4	BRAKE SYSTEM	10	9150-00-402-2372	OES (2)			
		-	-	BRAKE FLUID SILICONE, AUTOMOTIVE			
		10	9150-01-059-2586	1 gal. (Metal Container)	3/4 pt-(3)	-	(3) Represents quantity of oil to fill reservoir to proper level.
5	RADIATOR	10	9150-01-102-9455	1 gal. (Plastic Container)			
		-	-	WATER	14 1/2 qt		
		9	6850-00-181-7929	ANTIFREEZE: Inhibited glycol, 1 gal. Can			(4) Tank Capacity
		9	6850-00-174-1806	ANTIFREEZE: Compound Arctic, 55 gal. Drum			
6	DIFFERENTIAL	-		OIL, LUBRICATING, GEAR: 5 gal. Pail as follows:			
		10	9150-01-035-5393	80 W/90	9 1/2 pt		
		10	9150-01-035-5391	75 W			
7	DROP GEAR	10	9150-01-035-5393	80 W/90	1 1/2 pt CASE		
		10	9150-01-035-5391	75W			



By Order of the Secretary of the Army:

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

Official:

DONALD J. DELANDRO  
*Brigadier General, United States Army*  
*The Adjutant General*

Distribution:

To be distributed in accordance with DA Form 12-25A, Operator's Maintenance requirements for Warehouse Equipment.



CHANGE

No. 5

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
WASHINGTON, DC, 29 April 1974

**Operator's Manual  
TRACTOR, WHEELED, WAREHOUSE; GASOLINE;  
PNEUMATIC-TIRED WHEELS, 4,000 lb. DRAWBAR PULL  
(ARMY MODEL MHE-189, UNITED TRACTOR MODEL G40)  
(ARMY MODEL MHE-189A, UNITED TRACTOR MODEL G40A)  
(ARMY MODEL MHE-189B, UNITED TRACTOR MODEL G40B)  
FSN 3930-724-8146**

TM 10-393409-10, 2 December 1964, is changed as follows:

*Inside Front Cover.* Add the following warning to the list of safety precautions:

**WARNING**

**Operation of this equipment presents a noise hazard to personnel in the area. The noise level exceeds the allowable limits for unprotected personnel. Wear ear muffs or ear plugs which were fitted by a trained professional.**

*Page 3.* Paragraph 4 is superseded as follows:

**4. Recommendation for Maintenance Publications Improvements.** You can help to improve this manual by calling attention to errors and by recommending improvements. Your letter or DA Form 2028 (Recommended Changes to Publications and BLANK Forms) should be mailed direct to: Commander, US Army Troop Support Command, ATTN: AMSTS-MPP, 4300 Goodfellow Blvd., St. Louis, MO 63120. A reply will be furnished direct to you.

*Page 8.* Immediately after Section III title, add the following warning:

**WARNING**

**Operation of this equipment presents a noise hazard to personnel in the area. The noise level exceeds the allowable limits for unprotected personnel. Wear ear muffs or ear plugs which were fitted by a trained professional.**

*Page 15.* Appendix I, References, add the following. "TB MED 251, Noise and Conservation of Hearing".



By Order of the Secretary of the Army:

CREIGHTON W. ABRAMS  
*General, United States Army*  
*Chief of Staff*

VERNE L. BOWERS  
*Major General, United States Army*  
*The Adjutant General*

Distribution:

To be distributed in accordance with DA Form 12-25A (qty rqr block No. 893) Operator's Maintenance requirements for Warehouse Equipment.



CHANGE

No. 4

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
WASHINGTON, D.C., 17 May 1972

**Operator's Manual**

**TRACTOR, WHEELED, WAREHOUSE; GASOLINE;  
PNEUMATIC-TIRED WHEELS, 4,000 lb. DRAWBAR PULL  
(ARMY MODEL MHE-189, UNITED TRACTOR MODEL G40)  
(ARMY MODEL MHE-189A, UNITED TRACTOR MODEL G40A)  
(ARMY MODEL MHE-189B, UNITED TRACTOR MODEL G40B)  
FSN 3930-714 8146**

TM 10-930-409-10, 2 December 1964, is changed as follows:

The cover and title page is changed as shown above.

*Page 1.* "Recommended Changes" in the table of contents is changed to read

"Reporting of Equipment Publication Improvements."

*Page 2.* "Basic Issue Items List and Maintenance and Operating Supplies" in the table of contents is changed to read "Basic Issue Items List and Items Troop Installed or Authorized."

*Page 3.* Paragraph 1 is superseded as follows:

**1. Scope**

This manual is for your use in operating and maintaining the warehouse tractor.

*Page 3.* Paragraph 4 is superseded as follows:

**4. Reporting of Equipment Publication Improvements**

The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes DA Publications) and

forwarded direct to: Commanding General, US Army Mobility Equipment Command, ATTN: AMSME-MPP, 4300 Goodfellow Boulevard, St. Louis, MO 63120.

*Page 3.* Paragraph 3 is superseded as follows:

**6. Description**

Army Model MHE-189 (United Tractor Model G40) (fig. 1 and 2) Army Model MHE-189A (United Tractor Model G40A) (fig. 1 and 2.1) and Army Model MHE-189B (United Tractor Model G40B) (fig. 1.1 and 2.2) are gasoline powered, front-wheel steered, rear-wheel driven, materials handling tractors. The tractors are powered by a six-cylinder, four-stroke cycle, L-head, in-line liquid-cooled, gasoline engine. The tractor is equipped with a three-speed automatic transmission.

*Page 4.* Figure 1, add to figure caption (Army Models MHE-189 and MHE-189A).

*Page 4.* Figure 1.1 is added as follows:

\* This change supersedes C2, 7 May 1961 and C3, 21 January 1971.

TAGO 3469



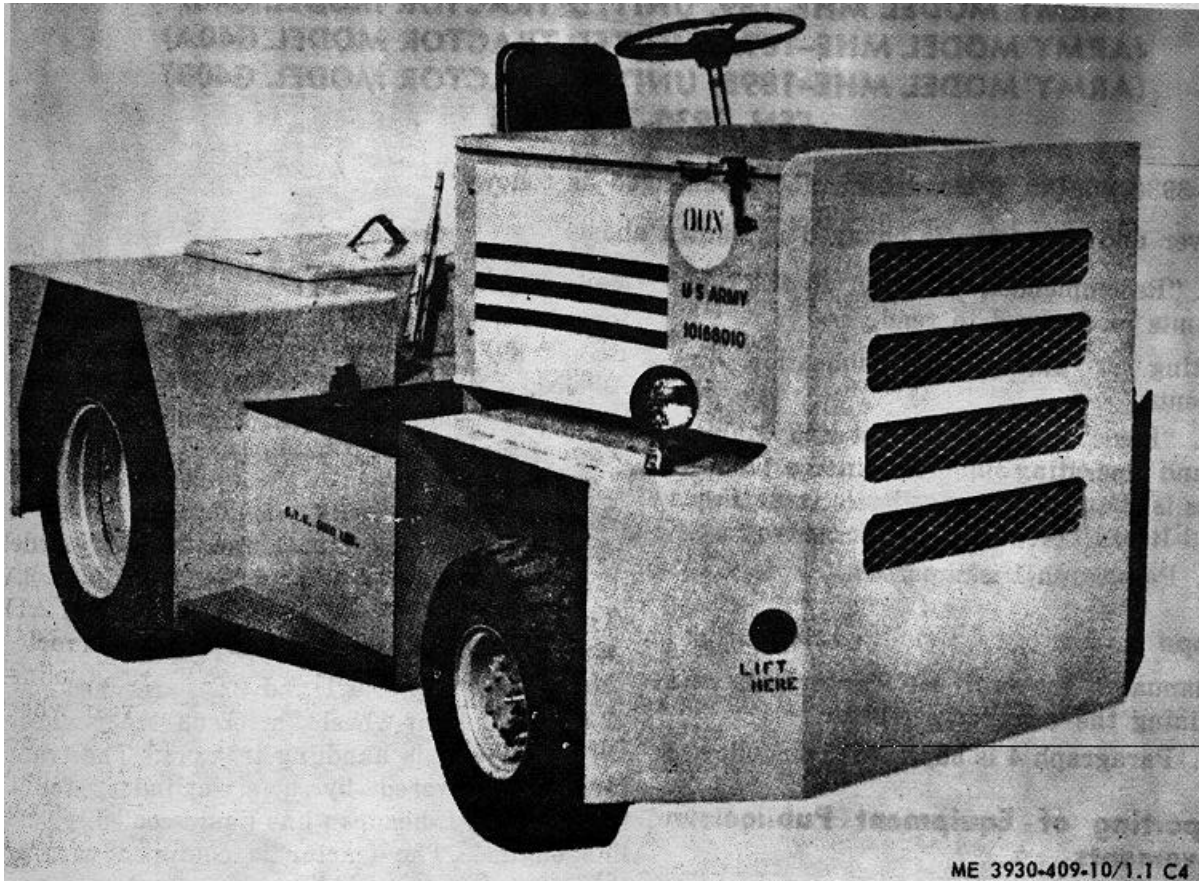
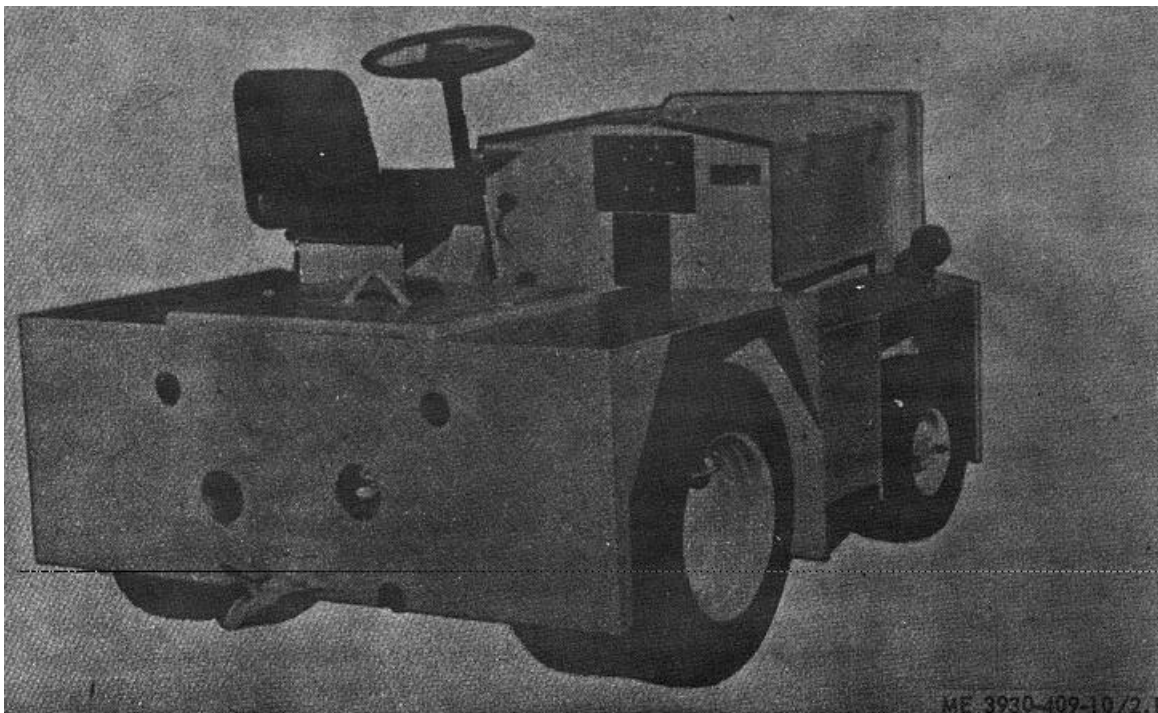


Figure 1.1 Tractor, three - quarter front view (Army Model MHE-189B).





Page 5. Figure 2, add to figure caption (Army Model 189).

Page 5. Figure 2.1 and 2.2 are added as follows:

**Figure 2.1 Tractor, three quarter rear-view (Army Model MHE-189A).**



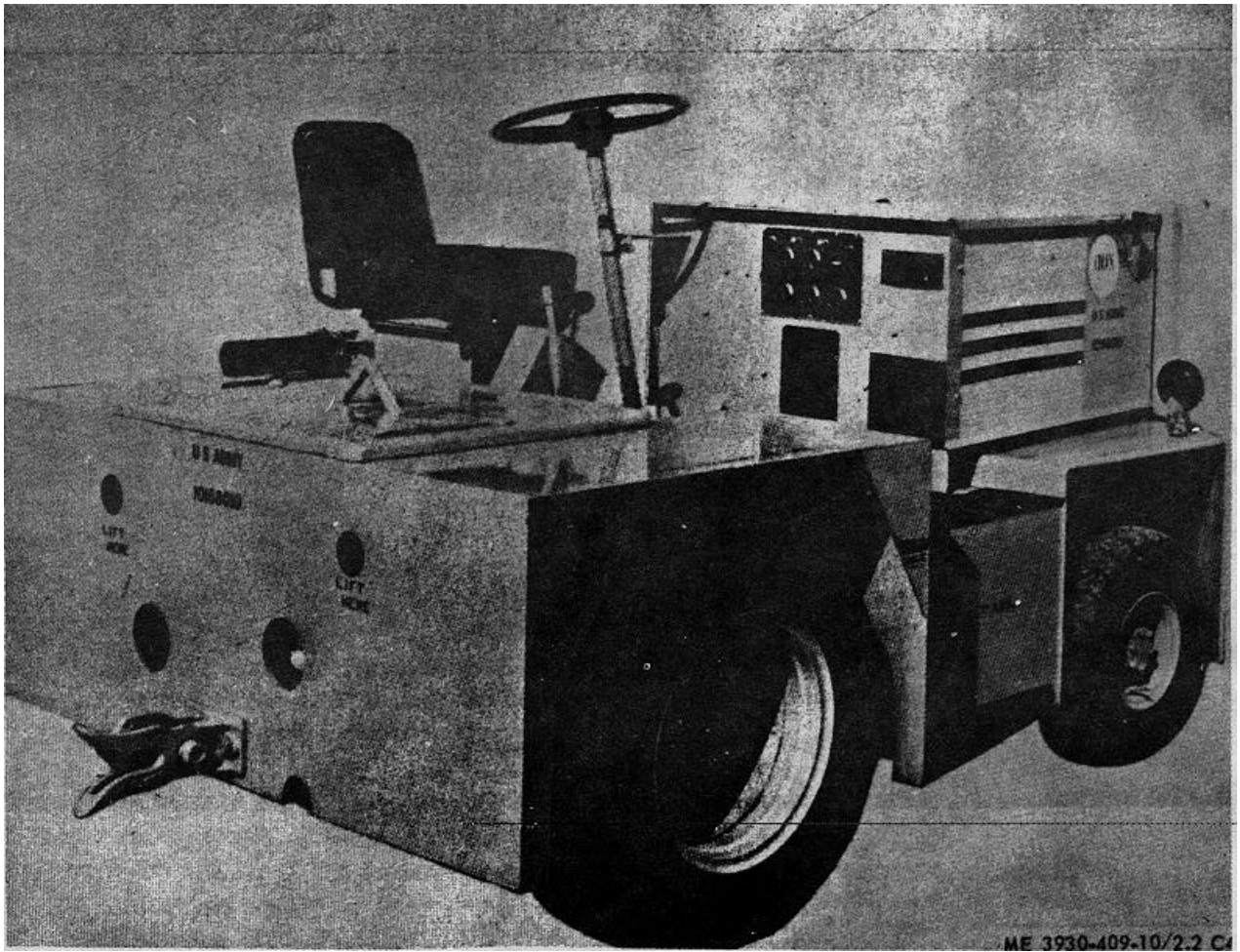


Figure 2.2 Tractor, three - quarter rear view (Army Model MHE-180B).



Pages 6, 7, and 8. In paragraphs 11d, e, g, h, i, j, and 12a through e, wherever reference is made to figure 3, it is changed to figures 3, 3.1, and 3.2.

Page 6. Paragraph 11a is superseded as follows

**NOTE**

**Throughout this paragraph all references are made to figures 3, 3.1 and 3.2 unless otherwise indicated.**

a. *Starter Switch.* The starter switch (5) is located at the upper left of the instrument panel. Pushing the starter switch will activate the starter solenoid, which in turn causes the starter motor to crank the engine. On Model MHE-189, the directional push button N (neutral) must be fully depressed. On models MHE-189A and MHE-189B, the transmission shift control lever must be in the N (neutral) position. Release the starter push button when the engine starts.

*Paragraph 11b* is superseded as follows:

b. *Ignition Switch.* The ignition switch (7) is located to the right of the starter pushbutton on the instrument panel. On Model MHE189 pull out on the ignition switch knob to activate the ignition system. On Models MHE189A and MHE-189B, turn the ignition switch lever clockwise to activate the ignition system. On Model MHE-189, push the switch knob in to shut off the ignition system. On Models MHE-189A and MHE-189B, turn ignition switch lever counterclockwise to shut off the ignition system.

*Paragraph 11c* is superseded as follows:

c. *Headlight Switch.* The headlight switch (9) is located on the instrument panel to the right of the ignition switch. On Army Model MHE-189, pull out on the headlight switch knob to turn on the headlights and taillight. On Models MHE-189A and MHE-189B, turn the headlight switch lever clockwise to turn on the headlights

and taillights. On Model MHE189 push in the headlight switch knob to turn the lights off. On Models MHE-189A and MHE-189B, turn the headlight switch lever counterclockwise to turn off the lights.

*Paragraph 11c.1* is added as follows:

c.1 *Rear Light Switch.* The rear light switch (9A, fig. 3.2) is located on the instrument panel to the right of the headlight switch on Model MHE-189B. Pull out on the switch knob to turn on the rear light. Push in the switch knob to turn off the light.

*Paragraph 11f* is superseded as follows:

f. *Transmission Controls.* On Model MHE189 the transmission pushbutton control (3, fig. 3) is located to the left of the instrument panel. Depress pushbuttons (1, first) (2, second) or (D, third) to put the tractor in forward motion. Depress pushbutton "R" to put the tractor in reverse motion. Depress pushbutton N to disengage the transmission. On Models MHE-189A and MHE-189B the transmission shift control lever (3, fig. 3.1 and 3.2) is located to the right of the operator's seat. Move the lever to (1, first) (2, second) or (D, drive) to put the tractor in forward motion. Move the lever to R to put the tractor in reverse motion. Move the lever to N to disengage the transmission. Always put the transmission in N (neutral) when the tractor is parked.

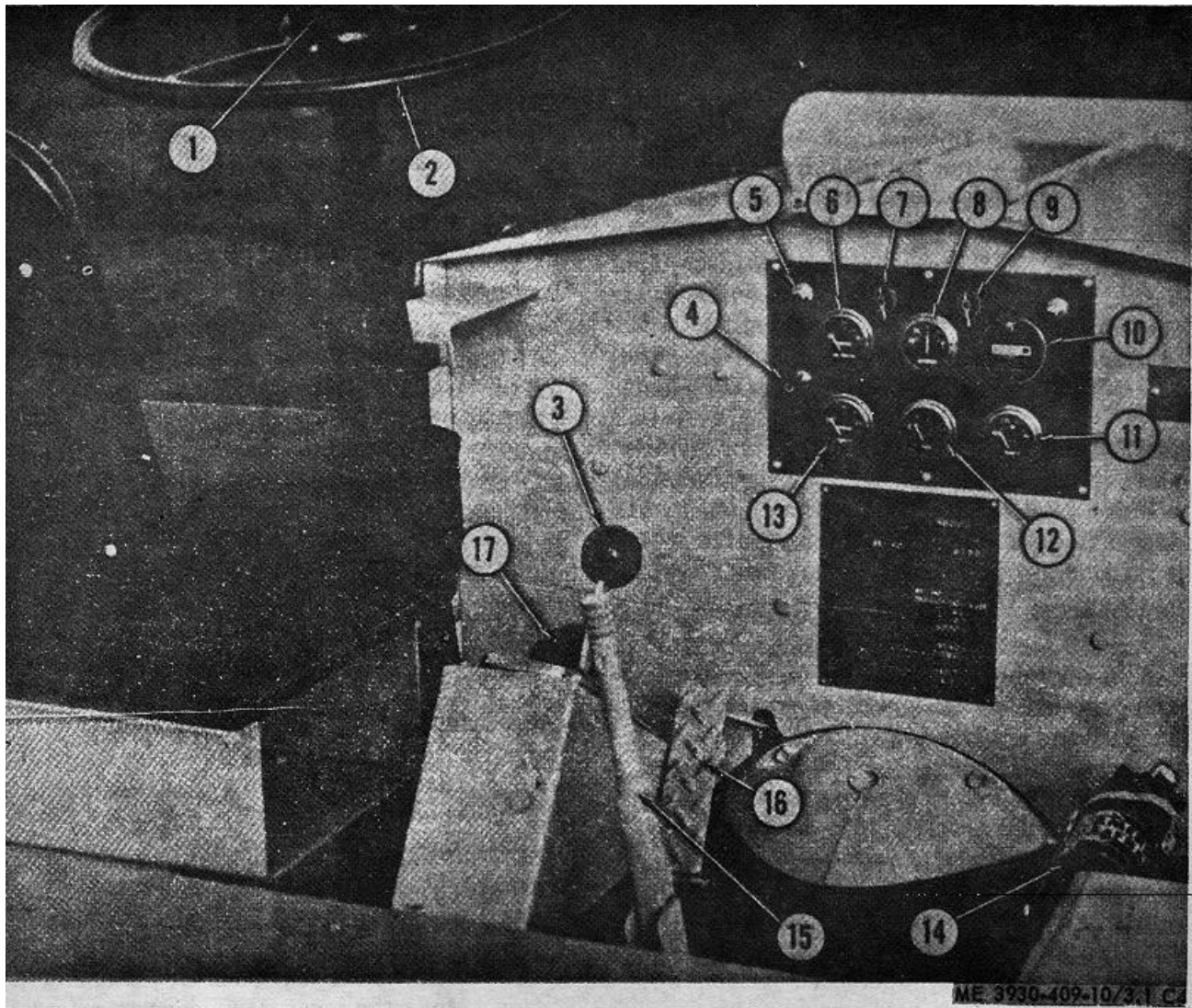
*Paragraph 11q.* Add the following:

On Models MHE-189A and MHE-189B, pull up on the lever (15, fig. 3.1 and 3.2) to apply the brake to hold the truck in stationary position. Move the lever downward to release the brake.

*Page 7.* Figure 3, add to figure caption (Army Model MHE-189).

*Page 7.* Figures 3.1 and 3.2 are added as follows:

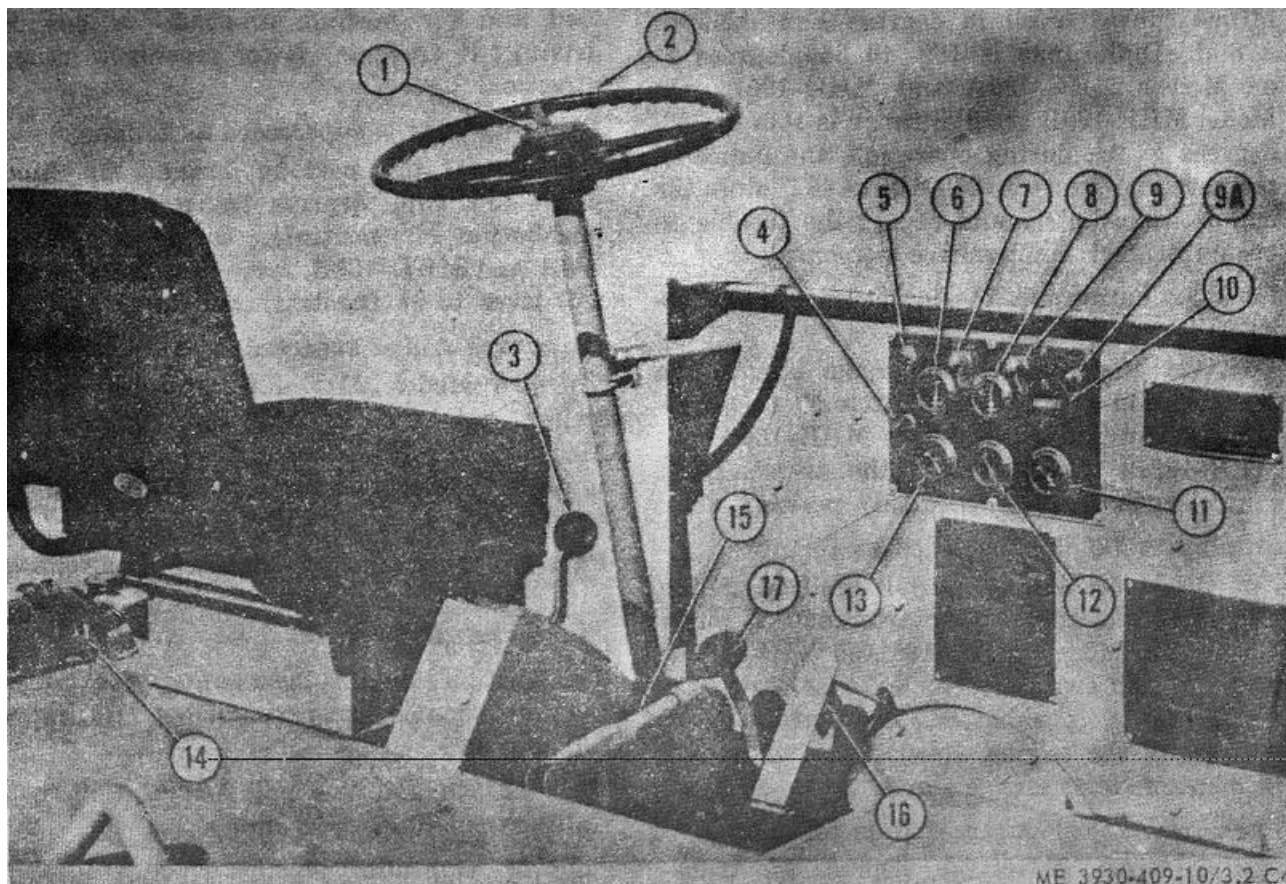




- |                                 |  |
|---------------------------------|--|
| 1 Horn button                   | 10 Engine hourmeter                            |
| 2 Steering Handwheel            | 11 Torque converter oil temperature indicator. |
| 3 Transmission shift control    | 12 Fuel lever indicator                        |
| 4 Choke control                 | 13 Engine coolout temperature indicator        |
| 5 Starter switch                | 14 Fire extinguisher                           |
| 6 Engine oil pressure indicator | 15 Parking brake lever                         |
| 7 Ignition switch               | 16 Accelerator pedal                           |
| 8 Ammeter                       | 17 Brake pedal                                 |
| 9 Light switch                  |  |

**Figure 3.1 Location of operating controls (Army Model MHE-189A).**





- |                                 |  |
|---------------------------------|--|
| 1 Horn button                   | 9A Rear light switch                           |
| 2 Steering handwheel            | 10 Engine hourmeter                            |
| 3 Transmission shift control    | 11 Torque converter oil temperature indicator. |
| 4 Choke control                 | 12 Fuel level indicator                        |
| 5 Starter switch                | 13 Engine coolant temperature indicator        |
| 6 Engine oil pressure indicator | 14 Fire extinguisher                           |
| 7 Ignition switch               | 15 Parking brake lever                         |
| 8 Ammeter                       | 16 Accelerator pedal                           |
| 9 Headlights switch             | 17 Brake pedal                                 |

**Figure 3.2 Location of operating controls (Army Model MHE-189B).**



Page 8. Paragraph 12f is superseded as follows:

f. *Torque Converter Oil Temperature Indicator.* The torque converter oil temperature indicator (11, fig. 3, 3.1, 3.2) is located below the engine hourmeter on the instrument panel. The indicator registers the temperature of the torque converter oil in degrees Fahrenheit on a dial. Dial range is 100- to 350-degrees F. on Models MHE-189A and MHE-189B. On Model MHE 189B the dial range is 100- to 360degrees F. If, during operation, the indicated temperature exceeds 250-degree F., stop the engine immediately and report the trouble to organizational maintenance personnel.

Page 9. Paragraph 14c is superseded as follows:

c. On Model MHE-189, make certain the transmission control pushbutton N (neutral) is fully depressed. On Models MHE-189A and MHE-189B, make certain the transmission control lever is in N (neutral) position.

Paragraph 14f is superseded as follows:

f. On Model MHE-189 pull ignition switch pull knob out and press starter switch pushbutton. On Models MHE-189 and MHE-189B, turn ignition switch lever clockwise and press starter switch pushbutton. The starter motor will crank the engine. Release starter switch pushbutton when engine starts.

Paragraph 15a is superseded as follows:

a. On Model MHE-189, depress the trans

Page 15. Appendix I is superseded as follows:

mission pushbutton for desired mode of travel. On Models MHE-189A and MHE-189B, move transmission selector lever for desired mode of travel. D (drive) is for normal forward driving and light towing; 1 (first) is for pulling a heavy load and for steep upgrade or downhill driving; 2 (second) is for pulling a medium load and for medium upgrade or downhill driving; R (reverse) is for moving in reverse direction.

Paragraph 16c is superseded as follows:

c. Apply the parking brake. On Model MHE-189, fully depress transmission control pushbutton N (neutral). On Models MHE 189A and MHE-189B, move transmission control lever to N (neutral) position.

Paragraph 16d is superseded as follows:

d. On Model MHE-189, push in ignition switch pull-knob to stop the engine. On Models MHE-189A and MHE-189B, turn the ignition lever counterclockwise to stop the engine.

Page 9. Paragraph 18 is superseded as follows:

## **18. General**

This section contains instructions for operating the portable fire extinguisher (14, fig. 8, 3.1, and 8.2).

Page 12. On figure 5 add Models G40A and G40B to existing model numbers.

Page 15. Appendix I is superseded as follows:

## **APPENDIX I**

### **REFERENCES**

1. Fire Protection  
TB 54200-200-10.
2. Maintenance  
TM 38-750.

Page 16. Appendix II is superseded as follows:

Hand Portable Fire Extinguisher. Approved for Army Users. The Army Maintenance Management System (TAMMS).



## APPENDIX II

### BASIC ISSUE ITEMS LIST AND ITEMS TROOP INSTALLED OR AUTHORIZED

#### Section I. INTRODUCTION

##### B-1. Scope

This appendix lists items required by the operator for operation of the tractor.

##### B-2. General

This list is divided into the following sections:

- a. *Basic Issue Items List-Section II.* Not applicable.
- b. *Items Troop Installed or Authorized List - Section III.* A list of items in alphabetical sequence which, at the discretion of the unit commander, may accompany the tractor. These items are not subject to turn-in with the tractor when evacuated.

##### B-3. Explanation of Columns.

The following provides an explanation of columns in the tabular list of Items Troop Installed or Authorized, Section III.

- a. *Source, Maintenance, and Recoverability Code(s) (SMR).*

(1) *Source Code*, indicates the source for the listed item. Source codes are:

Code	Explanation
P	Repair parts, special tools, and test equipment supplied from GSA/DSA or Army supply system and authorized for use at indicated maintenance levels.
P2	Repair parts, special tools, and test equipment which are procured and stocked for insurance purposes because the combat or military essentiality of the end item dictates that a minimum quantity be available in the supply system.

(2) *Maintenance code*, indicates the lowest level of maintenance authorized to install the listed item. The maintenance level code is:

Code	Explanation
C	Crew/Operator

(3) *Recoverability code*, indicates whether unserviceable items should be returned for recovery or salvage. Items not coded are nonrecoverable. Recoverability codes are:

Code	Explanation
R	Applied to repair parts (assemblies and components), special tools, and test equipment which are considered economically reparable at direct support and general support maintenance levels.
S	Repair parts, special tools, test equipment, and assemblies which are economically reparable at DSU and GSU activities and which normally are furnished by supply on an exchange basis.

b. *Federal Stock Number.* This column indicates the Federal stock number assigned to the item and will be used for requisitioning purposes.

c. *Description.* This column indicates the Federal item name and any additional description of the item required.

d. *Unit of Measure (U/M).* A 2-character alphabetic abbreviation indicating the amount or quantity of the item upon which the allowances are based; e.g., ft, ea, pr; etc.

e. *Quantity Authorized.* This column indicates the quantity of the item authorized to be used with the equipment.

#### Section III. ITEMS TROOP INSTALLED OR AUTHORIZED LIST

(1) SMR Code	(2) Federal stock number	(3) Description  Ref No. Code  Usable on Code	(4) Unit of Meas	(5) Qty Auth
PC	7520-559-9618	CASE, Maintenance and Operation Manuals	EA	1
PC	4210-889-2221	EXTINGUISHER, Fire	EA	1



By Order of the Secretary of the Army:

*Official:*

VERNE L. BOWERS,  
*Mayor General, United States Army,  
The Adjutant General.*

W. C. WESTMORELAND,  
*General, United States Army,  
Chief of Staff.*

Distribution:

To be distributed in accordance with DA Form 1225A (qty rqr block No. 893), Operator Requirements for Warehouse Equipment.



TECHNICAL MANUAL

No. 10-3930-409-10

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
WASHINGTON, D. C., 2 December 1964

**Operator's Manual**  
**TRACTOR, WHEELED, WAREHOUSE**  
**GASOLINE, PNEUMATIC-TIRED WHEELS**  
**4,000-POUND DRAWBAR PULL**  
**ARMY MODEL MHE-189**  
**UNITED TRACTOR MODEL G40**  
**FSN 3930-724-8146**

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# CHAPTER 1

## INTRODUCTION

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### Section I. GENERAL

#### 1. Scope

a. This manual is for the use of personnel responsible for the operator/crew maintenance of the Tractor, Wheeled, Warehouse, Gasoline, Pneumatic-Tired Wheels, 4,000 Pound Drawbar Pull, United Tractor Model G40, Army Model MHE-189, Federal Stock Number 3930-724-8146, procured under Contract Number DSA-4-015203.

b. It provides the operator with the necessary instructions to operate the tractor and to perform his required maintenance services. These maintenance services have been assigned to the operator within the limits of the daily preventive maintenance services (paras. 24 and 25).

#### 2. Appendixes

Appendix I contains a list of publications applicable to this manual. The maintenance allocation chart is contained in TM 10-3930-409-20. Appendix II contains the list of basic issue items and maintenance and operating supplies authorized the operator of the equipment.

#### 3. Forms, Records, and Reports

The forms, records, and reports applicable to the operation and operator/crew maintenance of this tractor are listed and described in TM 38-750.

#### 4. Recommended Changes

The direct reporting by the individual user of errors, omissions, and recommendations for improving this manual is authorized and encouraged. DA Form 2028 (Recommended Changes to DA Publications) will be used for reporting these improvements. This form will be completed in triplicate using pencil, pen or typewriter. The original and one copy will be forwarded direct to the Commanding Officer, U.S. Army Mobility Equipment Center, ATTN: SMOME-MMP, P.O. Drawer 58, St. Louis, Mo. 63166. One information copy will be provided to the individual's immediate supervisor (officer, noncommissioned officer, supervisor, etc.).

#### 5. Orientation

Throughout this manual, the use of the terms right, left, front, and rear with respect to engine and tractor indicates directions from the viewpoint of the operator sitting in the seat of the tractor.

### Section II. DESCRIPTION AND DATA

#### 6. Description

Army Model MHE-189 (figs. 1 and 2) (United Tractor Model G40) is a gasoline powered front-wheel-steer, rear-wheel-drive materials handling tractor. The tractor is powered by a six cylinder, in-line, four-stroke cycle, L-head, liquid cooled, gasoline engine and is equipped with three-speed, automatic transmission.

Cooling system.....	14 1/2 qt.
Crankcase (with filter) .....	6 qt.
Differential .....	9 1/2 pt.
Fuel tank .....	13 gal.
Hydraulic system .....	3/4 pt.
Reduction gearcase .....	1 1/2 pt.
Steering gear.....	1 1/2 pt.
Transmission.....	8 qt.

#### 7. Tabulated Data

##### a. Capacities.

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*b. Performance.*

Towing capacity:

Level surface ..... 160,000 lb.

On-grade:

2 percent ..... 83,800 lb.

6 percent ..... 41,800 lb.

8 percent ..... 32,800 lb.

10 percent ..... 26,800 lb.

12 percent ..... 22,400 lb.

14 percent ..... 18,200 lb.

Speed (maximum):

4 percent ..... 56,200 lb.

Forward ..... 13 mph

Reverse ..... 6 ½ mph

Turning radius:

Inside ..... 46 in.

Outside ..... 130 in.

*c. Tires.*

Type ..... Pneumatic

Number ..... 6

Size:

Drive ..... 650X16-6 ply

Steer ..... 600X9-6 ply

Air pressure:

Drive ..... 40 psi

Steer ..... 50 psi

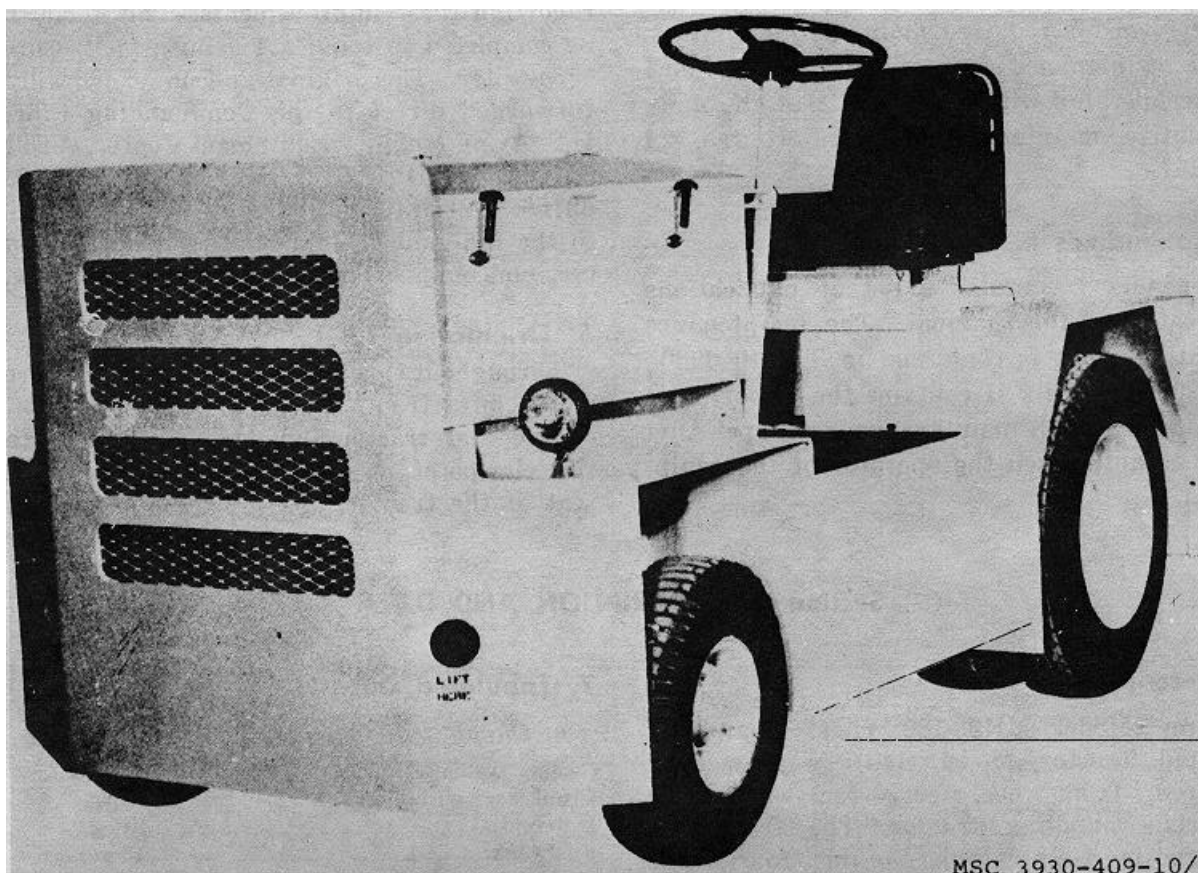
*d. Dimensions and Weight.*

Length ..... 99 in.

Width ..... 65½ in.

Height ..... 58½ in.

Weight ..... 5000 lb.



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**Figure 1. Tractor, three-quarter front view.**

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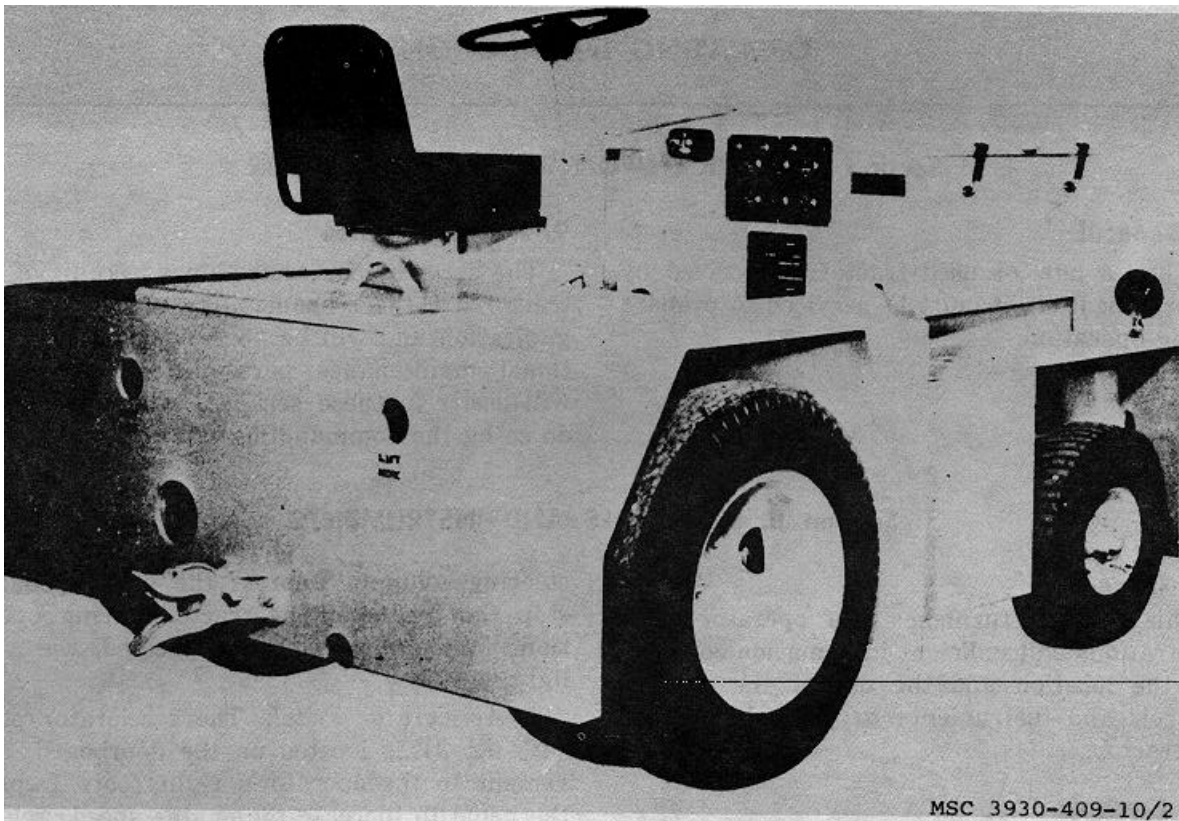


Figure 2. Tractor, three-quarter rear view.



## CHAPTER 2

### OPERATING INSTRUCTIONS

---

#### Section I. SERVICE UPON RECEIPT OF TRACTOR

##### 8. General

When a new or used tractor is received by an organization, it must be serviced to prepare it for operation.

The services performed upon receipt of the tractor are the responsibility of the using organization and will be performed by organizational maintenance personnel. The operator will assist in these services when directed to do so by the commanding officer.

##### 9. Responsibilities

#### Section II. CONTROLS AND INSTRUMENTS

##### 10. General

This section furnishes the operator with illustrations and sufficient information concerning the location and the use of the various controls and instruments to properly operate the tractor.

##### 11. Controls

*a. Starter Switch.* The starter switch (5, fig. 3) is located at the upper left of the instrument panel. Depressing the starter switch knob will activate the starter solenoid which in turn causes the starter motor to crank the engine. (The directional pushbutton N (neutral) must be fully depressed). Release the starter switch knob when the engine commences to operate.

*b. Ignition Switch.* The ignition switch (7, fig. 3) is located to the right of the starter switch on the instrument panel. Pull out the ignition switch knob to activate the electrical system. Push in the ignition switch knob to shut off the supply of electric current to the ignition system and electrically operated instruments.

*c. Light Switch.* The light switch (9, fig. 3) is located on the instrument panel to the right of the ignition switch. Pull out the light switch knob to turn on the headlights and taillight. Push in the light switch knob to turn off the headlights and taillight.

*d. Brake Pedal.* The brake pedal (17, fig. 3) is located on the floor to the right of the steering column. Depress the brake pedal to stop the travel of the tractor during operation. When the pedal is depressed, the stoplight will glow.

*e. Accelerator Pedal.* The accelerator pedal (16, fig. 3) is located on the floorboard, convenient to the operator's right foot. Depress the pedal to increase the engine speed; release the pressure on the pedal to decrease the engine speed.

*f. Transmission Pushbutton Control.* The transmission pushbutton control (3, fig. 3) is located to the left of the instrument panel. Depress pushbuttons 1 (first), 2 (second) or D (drive) to allow the tractor to move forward. Depress pushbutton R (reverse) to allow the tractor to move backward. Depress pushbutton N (neutral) when the tractor is parked.

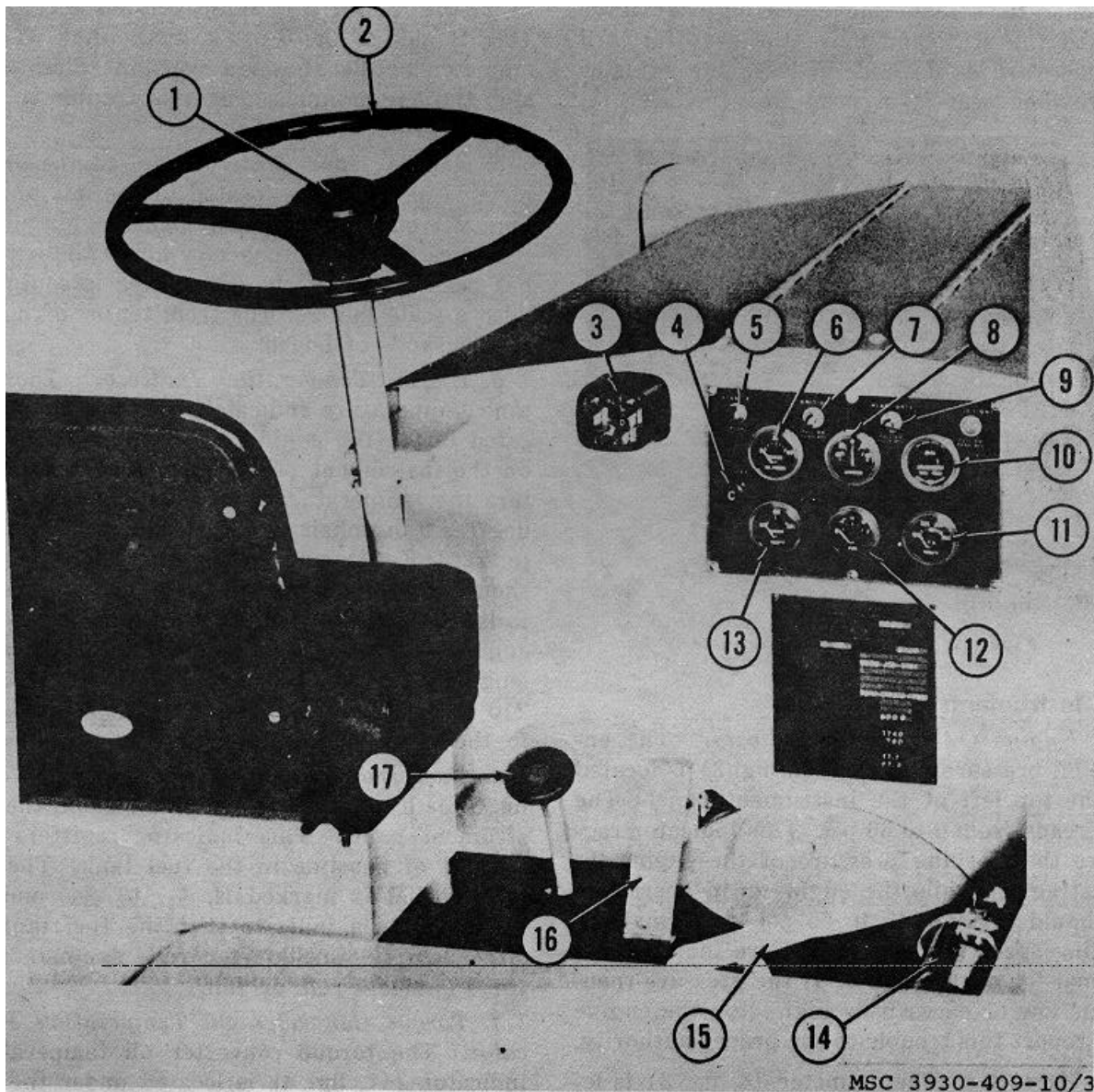
*g. Parking Brake Lever.* The parking brake lever (15, fig. 3) is located to the right of the operator's seat, convenient to the operator's right hand. Pull up and toward the left on the lever to apply the brake and hold the tractor in a stationary position. Move the lever downward and toward the right to release the brake.

*h. Steering Handwheel.* The steering handwheel (2, fig. 3) controls the direction of travel of the tractor. Turn the handwheel to the right (clockwise) to move the tractor to the right; turn the handwheel to the left (counterclockwise) to move the tractor to the left.

*i. Horn Button.* The horn button (1, fig. 3)

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- |                                   |   |
|-----------------------------------|---|
| 1 Horn button                     | 10 Engine hour meter                          |
| 2 Steering handwheel              | 11 Torque converter oil temperature indicator |
| 3 Transmission pushbutton control | 12 Fuel indicator                             |
| 4 Choke control                   | 13 Engine temperature indicator               |
| 5 Starter switch                  | 14 Fire extinguisher                          |
| 6 Engine oil pressure indicator   | 15 Parking, brake lever                       |
| 7 Ignition switch                 | 16 Accelerator pedal                          |
| 8 Ammeter                         | 17 Brake pedal                                |
| 9 Light switch                    |   |

**Figure 3. Location of operating controls.**

is located in the center of the steering handwheel. Depress the button to sound the horn.

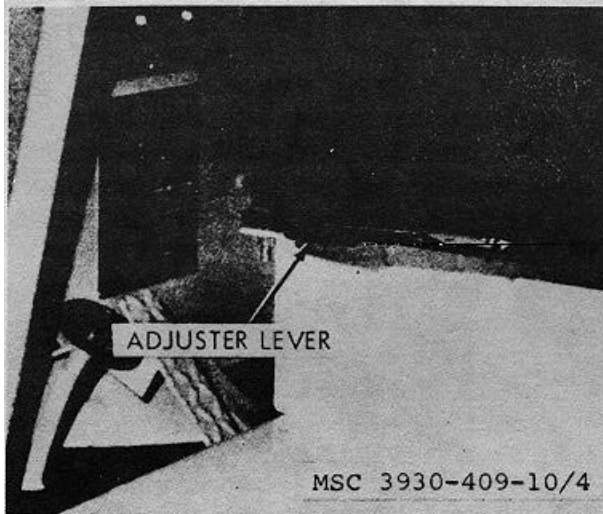
*j. Choke Control.* The choke control (4, fig. 3) is located on the left side of the instrument panel. The normal operating position for the choke control is pushed

in as far as it will go. Pull out on the choke control to close the choke valve in the carburetor when starting a cold engine. As the engine warms, push in on the choke control as required to insure smooth engine operation.

*k. Seat Adjuster Assembly.* An adjuster assembly



(see fig. 4) is located on the left of the operator's seat. Move the adjuster lever toward the seat, and move the seat forward or backward as desired. Release the adjuster lever when seat is in position.



**Figure 4. Location of seat adjuster.**

## **12. Instruments**

*a. Engine Oil Pressure Indicator.* The engine oil pressure indicator (6, fig. 3) is located at the top left of the instrument panel. The dial reads from 0 to 60 psi. This indicator registers the working pressure of the engine lubricating oil while the engine is in operation. It should register 45 to 55 psi at normal operating speed. A higher pressure indication is normal for a cold engine. If the pressure reading is low or excessively high, stop the engine and report this trouble to the proper authority.

*b. Ammeter.* The ammeter (8, fig. 3) is located to the right of the engine oil pressure indicator on the instrument panel. The ammeter indicates the amount of current flowing to or being withdrawn from the battery. The dial reads from -40 amperes to +40 amperes. When the engine is started, the ammeter needle should move far to

the left side of the dial and should fall back gradually to a position near the center or slightly to the charge (right) side of the 0 mark on the dial. If the ammeter needle shows a constant discharge, stop the engine and report this trouble to the proper authority.

*c. Engine Hour Meter.* The engine hour meter (10, fig. 3) is located to the left of the ammeter on the instrument panel. This meter indicates the total number of hours the engine has been in operation. The meter is equipped with a scale that records from tenths of hours to thousands of hours.

*d. Engine Temperature Indicator.* The engine temperature indicator (13, fig. 3) is located under the engine oil pressure indicator on the instrument panel. The indicator registers the temperature of the engine coolant in degrees Fahrenheit on a dial reading from 100° to 220° F. During operation, the indicator should register 160° to 180° F. If the indicator fails to show any temperature gain after the engine has been operated for a reasonable length of time, or if the needle registers above 210° F., stop the engine and report the trouble to the proper authority.

*e. Fuel Indicator.* The fuel indicator (12, fig. 3) is located under the ammeter on the instrument panel. This indicator registers the amount of gasoline in the fuel tank. The indicator dial is marked E, 1/4, 1/2, 3/4, and F. These symbols indicate that the fuel tank is either empty, one-quarter full, one-half full, three quarters full, or full.

*f. Torque Converter Oil Temperature Indicator.* The torque converter oil temperature indicator (11, fig. 3) is located under the engine hour meter on the instrument panel. The indicator registers the temperature of the torque converter in degrees Fahrenheit on a dial reading from 100° to 350° F. If during operation, the indicated temperature exceeds 250° F., stop the engine immediately and report the trouble to the proper authority.

## **Section III. OPERATION UNDER USUAL CONDITIONS**

### **13. General**

A person selected to operate this tractor must be an experienced operator of materials handling equipment. In addition, each operator must undergo a thorough training

program to acquaint him with the specific operating characteristics of this tractor.

### **14. Starting Tractor**

*a.* Perform the daily preventive maintenance services required by paragraph 25.

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b. Pull up on the parking brake lever (para. 11g) to make certain tractor will remain in a stationary position while it is being started.

c. Make certain the transmission pushbutton (para. 11f) N (neutral) is fully depressed.

d. At initial starting or if engine is cold, pull choke control (para. 11j) all the way out.

e. Press down on the accelerator pedal (para. 11e) approximately one-third the distance from its normal raised position.

f. Pull ignition switch (para. 11b) knob out and depress starter switch (para. 11a) knob. The starter motor will crank the engine. When engine starts, release starter switch knob.

**Caution. Do not operate the starter motor continuously for more than 30 seconds. If the engine fails to start after 30 seconds, allow the starter motor to cool for at least 2 minutes before attempting to start the engine again.**

g. Hold accelerator pedal steady to allow engine to warm up at a fast idling speed. Immediately observe engine oil pressure indicator (para. 12a) and ammeter (para. 12b) for normal readings. As engine begins to warm up, gradually push in choke control; as soon as engine is warm, push choke control all the way in.

h. Warm engine until it will idle smoothly with the choke control pushed all the way in. Check for proper readings on ammeter (para. 12b), engine oil pressure indicator (para. 12a), engine temperature indicator (para. 12d), torque converter oil temperature indicator (para. 12f), and fuel indicator (para. 12e). Be sure engine hour meter (para. 12c) is operating properly.

i. Remove foot pressure from accelerator pedal. Report any malfunctions to the proper authority.

## 15. Driving Tractor

a. Depress one of the transmission pushbuttons (para. 11f) to desired position of travel: D (drive) for normal forward driving and light towing, 1 (first) for pulling a heavy load and for steep upgrade or downhill driving, 2 (second) for pulling a medium load and for medium upgrade or downhill driving, and R (reverse) for backing.

b. Place foot on the accelerator pedal, and release the parking brake lever. Gradually depress the accelerator pedal until the tractor begins to travel. Continue to depress the accelerator pedal until safe operating speed is attained. If the tractor fails to move, shut off the engine immediately and. report this to the proper authority.

## 16. Stopping Tractor

a. Remove foot from the accelerator pedal.

b. Apply gradual pressure on the brake pedal to bring the truck to a safe smooth stop. Avoid sudden stops.

c. Apply the parking brake. Fully depress transmission pushbutton N (neutral).

d. Push in the ignition switch knob to stop the engine.

## 17. Safety Precautions

a. Be alert, for other workers to be sure they are not in the way of the moving tractor or towed load.

b. Avoid sudden starting and stopping of the tractor. Reduce speed when making a turn.

c. Know the rated capacity of the tractor and do not overload it.

d. Report any evidence of faulty tractor performance.

## Section IV. OPERATION OF EQUIPMENT USED IN CONJUNCTION WITH TRACTOR

### 18. General

This section contains instructions for operating the portable fire extinguisher (14, fig. 3) that is supplied with the tractor.

### 19. Operating Extinguisher

a. Disconnect the clamp that secures the extinguisher to its mounting bracket, swing the clamp open, and remove the extinguisher.

b. Hold the extinguisher upright and raise the large locking handle to break the seal.

c. Aim the nozzle at the base of the fire and depress the small operating lever with the thumb.

d. Direct the discharge at the base of the fire with a side to side sweeping motion.

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## CHAPTER 3 MAINTENANCE INSTRUCTIONS

---

### Section I. SPECIAL TOOLS AND EQUIPMENT

#### 20. Special Tools

There are no special tools necessary for the operation or operator/crew maintenance of this tractor.

#### 21. Equipment

The items of equipment supplied with this tractor are listed in the basic issue items list (app. II).

### Section II. LUBRICATION

#### 22. General

The lubrication of this tractor is the responsibility of the using organization and will be performed by organizational personnel.

#### 23. Operator Responsibilities

The operator will be alert to detect signs of tractor malfunctioning from lack of lubrication. He will report these conditions immediately to the proper authority.

### Section III. PREVENTIVE MAINTENANCE SERVICES UNDER USUAL CONDITIONS

#### 24. General

To insure that the tractor is ready for operation at all times, it must be inspected systematically, so that defects may be discovered and corrected before they result in serious damage or failure. The necessary preventive maintenance services to be performed are listed and described in paragraph 25. The item numbers indicate the sequence of minimum inspection requirements. Defects discovered during operation of the tractor will be noted for future correction, to be made as soon as operation has ceased. Stop operation immediately if a deficiency is noted during operation which would damage the

equipment if operation were continued. All deficiencies and shortcomings will be recorded with the corrective action taken on DA Form 2404 at the earliest possible opportunity.

#### 25. Daily Preventive Maintenance Services

This paragraph contains an illustrated tabulated listing of preventive maintenance services which must be performed by the operator. Refer to figure 5 for the daily preventive maintenance services.

### Section IV. PREVENTIVE MAINTENANCE SERVICES UNDER UNUSUAL CONDITIONS

#### 26. General

When the tractor is operated under unusual conditions, extra care must be taken to maintain the tractor in good operating condition. Certain additional services must be performed, and some of the regular preventive maintenance services must be performed more often.

#### 27. Operation in Extreme Heat

##### *a. Cooling System,*

- (1) Check the fan belt more often to be sure it deflects properly. The belt should deflect 1 inch when finger pressure is applied midway between the pulleys.
- (2) Check the coolant level more often, maintaining the level at the bottom of the filler cap neck. Be sure the radiator cap is secure.
- (3) Keep external parts of the radiator clean and free of foreign matter to insure good air circulation.

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- (4) Have the cooling system flushed and cleaned frequently.

*b. Electrical System.* Check the battery electrolyte level more often, maintaining the level 1/8 inch above the plates. Have the specific gravity of the electrolyte checked more often.

## **28. Operation in Extreme Cold**

*a. Shelter.* Store the tractor in a heated building or in a shelter, if possible. If a shelter is not available, park the tractor with the rear end facing into the wind and cover the tractor with a tarpaulin.

*b. Cooling System.* If the tractor is to be at rest an appreciable length of time and antifreeze is not available, have the cooling system drained when the temperature is likely to be 30° F. or lower. Attach a tag to the steering handwheel to warn personnel that the cooling system has been drained.

*c. Electrical System.*

- (1) Have the specific gravity of the battery electrolyte checked more often.

- (2) Do not add water to the battery unless the engine is to be operated immediately.
- (3) Have the battery removed and stored in a warm place if the tractor is not parked in a shelter.

## **29. Operation in Sandy Terrain**

*a.* Take precautions to prevent sand and dust from entering the fuel system. Have a bag made of single-layer cloth and loosely tie it over the entire air cleaner during sandstorms. Have the air cleaner and fuel filter bowl cleaned daily.

*b.* Be sure to remove sand from axles, wheels, steering spindles, radiator, and brake assemblies.

## **30. Operation in Tropical Areas**

In tropical areas, corrosive action will take place almost immediately where paint is chipped or scratched from the tractor. Inspect the tractor often for signs of defective paint, and report this condition to the proper authority.

# **Section V. TROUBLESHOOTING**

## **31. Definition**

Troubleshooting is the process of locating and correcting malfunctions that may occur under normal operating conditions, and it is the responsibility of the using organization.

## **32. Operator Responsibilities**

The operator will report to the proper authority any deficiencies noted before, during, or after operation. Report any strange noises or subnormal operation immediately and as accurately as possible.



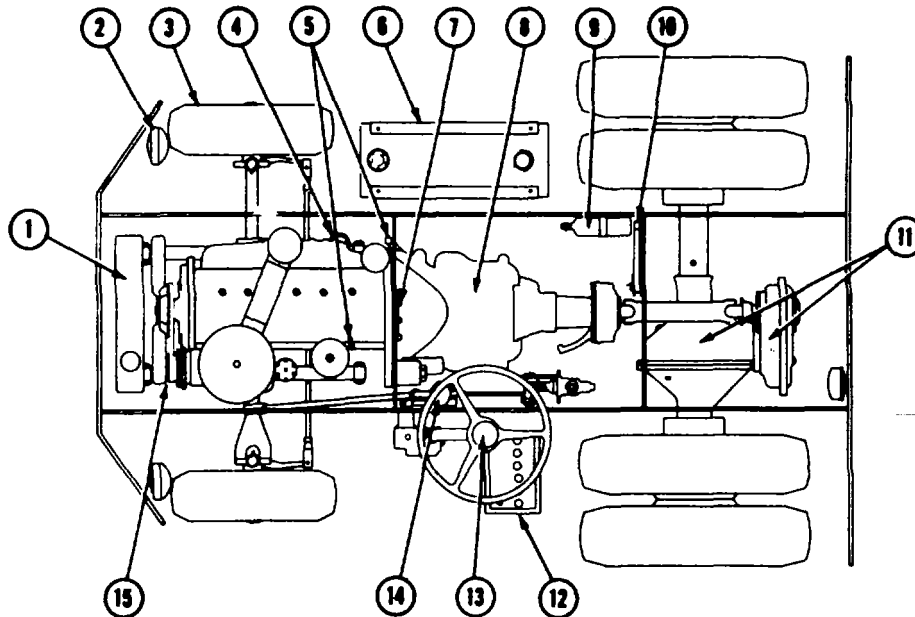
## PREVENTIVE MAINTENANCE SERVICES

### DAILY

TM 10-3930-409-10

UNITED TRACTOR  
MODEL G40

TRACTOR, WAREHOUSE



ITEM	LUBRICATE IN ACCORDANCE WITH CURRENT LUBRICATION ORDER	PAR REF
1	RADIATOR. Proper coolant level is 1 inch below filler neck.	
2	LIGHTS. Check for defective lamps or lamp units.	
3	TIRES. Check for cuts. Remove foreign material from tires. (Weekly)	
4	FUEL PUMP BOWL. Tighten nut at bottom o bowl retainer if gasket is leaking.	
5	OIL LEVEL GAGE. Add oil as Indicated by level gage. Reference current L.O.	
6	FUEL TANK. Add fuel as required.	
7	CONTROLS AND INSTRUMENTS. Inspect for damage and loose mounting. With unit operating, check for proper operation. Normal operating readings for instruments are as follows:  Engine oil pressure indicator 45 to 55 psi Engine temperature indicator 160° to 180° F Ammeter Slight positive charge Torque converter oil temperature indicator Below 250° F	11 13

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**Figure 5. Daily preventive maintenance services.**

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## CHAPTER 4

### DEMOLITION OF TRACTOR

---

#### 33. Authority

The tractor will be destroyed only if there is danger of capture and use by the aggressor, and only after the order is given by the unit commander. Destroy the same parts on all similar equipment to prevent salvage by the aggressor.

#### 34. Methods

**Warning: Observe adequate safety precautions.**

*a. Destruction by Hand.*

- (1) Smash the items listed below with a sledge, a hammer, or an ax.
  - (a) controls
  - (b) carburetor
  - (c) manifold
  - (d) generator
  - (e) distributor
  - (f) ignition coil
  - (g) spark plugs
  - (h) battery
- (2) Smash the items listed below by using a heavy hammer to drive a pointed steel bar into the parts.
  - (a) engine

(b) drive axle and differential

(c) transmission

(d) steering gear housing

(e) radiator

(f) fuel tanks

- (3) Destroy the items listed below by cutting them or ripping them out.

(a) wires

(b) cables

(c) lines

*b. Destruction by Misuse.*

- (1) Drain the crankcase, transmission and radiator, disconnect the radiator fan, and run the engine at full throttle.
- (2) Place sand, gravel, nuts, bolts, screws, or broken glass in the fuel tank.
- (3) Pack clothes saturated with gasoline around the engine and inside the tractor, and set the clothes afire.
- (4) Remove the carburetor, the generator, and the distributor and bury them in the ground or throw them into a body of water.

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## **APPENDIX I**

### **REFERENCES**

AR 320-5	Dictionary of United States Army Terms.
AR 320-50	Authorized Abbreviations and Brevity Codes.
AR 600-55	Motor Vehicle Driver Selection, Testing, and Licensing.
AR 750-5	Organization, Policies, and Responsibilities for Maintenance Operations
C-9100SL	Petroleum, Petroleum-Base Products and Related Material.
DA Pam 108-1	Index of Army Motion Pictures, Film Strips, Slides, and Phono-Recording
DA Pam 310-1	Military Publications: Index of Administrative Publications.
DA Pam 310-2	Military Publications: Index of Blank Forms.
DA Pam 310-3	Military Publications: Index of Doctrinal Training and Organizations Publications.
DA Pam 310-4	Military Publications: Index of Technical Manuals, Technical Bulletin Supply Manuals (Type 4, 6, 7, 8, and 9), Supply Bulletins, Lubrication Orders, and Modification Work Orders.
DA Pam 310-	Index of Graphic Training Aids and Devices.
FM 5-25	Explosives and Demolitions.
FM 21-5	Military Training.
FM 21-6	Techniques of Military Instruction.
FM 21-30	Military Symbols.
TM 21300	Driver Selection and Training (Wheeled Vehicles).
TM 38-750	Army Equipment Record Procedures.



## APPENDIX II

### BASIC ISSUE ITEMS LIST AND MAINTENANCE AND OPERATING SUPPLIES

---

#### Section I. INTRODUCTION

##### 1. General

Section II lists the accessories, tools, and publications required for maintenance and operation by the operator, initially issued with, or authorized for the (insert end item nomenclature). Section III lists the maintenance and operating supplies required for initial operation.

##### 2. Explanation of Columns Contained in Section II

a. *Source Codes.* The information provided in each column is as follows:

- (1) *Materiel.* This column lists the basic materiel code number of the supply service assigned responsibility for the part. Blank spaces denote supply responsibility of the preparing agency. General Engineer Supply parts are identified by the letters GE in parentheses, following the nomenclature in the description column. Other basic materiel code numbers are:

- 3-Chemical Materiel
- 5-Engineer Materiel
- 8-Medical Materiel
- 9-Ordnance Materiel
- 10-Quartermaster Materiel
- 11-Signal Materiel
- 12-Adjutant General Materiel
- 55-Transportation Materiel

*Note.* Include only the applicable materiel codes.

- (2) *Source.* The selection status and source of supply for each part are indicated by one of the following code symbols:

- (a) P-applied to high-mortality repair parts which are stocked in or supplied from the supply service depot system, and authorized for use at indicated maintenance level.
- (b) P1-applied to repair parts which are low-mortality parts, stocked in or supplied from supply service depots,

and authorized for installation at indicated maintenance level.

- (c) M-applied to repair parts which are not procured or stocked but are to be manufactured at indicated maintenance level.

- (d) X2-applied to repair parts which are not stocked. The indicated maintenance echelon requiring such repair parts will attempt to obtain them through cannibalization; if not obtainable through cannibalization, such repair parts will be requisitioned with supporting justification through normal supply channels.

- (3) *Maintenance.* The lowest maintenance level authorized to use, stock, install, or manufacture the part is indicated by the following code symbol:

O-Organizational Maintenance

- (4) *Recoverability.* Repair parts and/or equipment items that are recoverable are indicated by one of the following code symbols:

- (a) A-applied to repair parts and assemblies which are economically repairable at direct and general support maintenance activities and normally are furnished by supply on an exchange basis.
- (b) T-applied to high-dollar value recoverable repair parts which are subject to special handling and are issued on an exchange basis. Such repair parts normally are repaired or overhauled at depot maintenance facilities.

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- (c) U-applied to repair parts specifically selected for salvage by reclamation units because of precious metal content, critical materials, high-dollar value reusable casings, castings, and the like.

*Note.* When no code is shown in the recoverability column the part is considered expendable.

*b. Federal Stock Number.* When a Federal stock number is available for a part, it will be shown in this column, and will be used for requisitioning purposes.

*c. Description.*

- (1) The item name and a brief description of the part are shown.
- (2) A five-digit Federal supply code for manufacturers and/or other supply services is shown in parentheses followed by the manufacturer's part number. This number will be used for requisitioning purposes when no Federal stock number is indicated.

*Example:* (08645) 86543

- (3) The letters GE, shown in parentheses immediately following the description, indicates General Engineer supply responsibility for the part.

*d. Unit of Issue.* If no abbreviation is shown in this column, the unit of issue is "each."

*e. Quantity Authorized.* This column lists the quantities of repair parts, accessories, tools, or publications authorized for issue to the equipment operator or crew as required.

*f. Quantity Issued With Equipment.* This column lists the quantities of repair parts, accessories, tools, or publications that are initially issued with each item of equipment. Those indicated by an asterisk are to be requisitioned through normal supply channels as required.

*g. Illustrations.* This column is subdivided into two columns which provide the following information:

- (1) *Figure number.* Provides the identifying number of the illustration.

- (2) *Item number.* Provides the referenced number for the parts shown in the illustration.

### 3. Explanation of Columns Contained in Section III

*a. Item.* This column contains numerical sequenced item numbers, assigned to each component application, to facilitate reference.

*b. Component Application.* This column identifies the component application of each maintenance or operating supply items.

*c. Source of Supply.* This column lists the basic materiel code number of the supply service assigned responsibility for the item. Blank spaces denote supply responsibility of the preparing agency. Other basic materiel code numbers are-

- 3-Chemical Materiel.
- 5-Engineer Materiel.
- 8-Medical Materiel.
- 9-Ordnance Materiel.
- 10-Quartermaster Materiel.
- 11-Signal Materiel.
- 12-Adjutant General Materiel.
- 55-Transportation Materiel.

*Note.* Include only the applicable materiel codes.

*d. Federal Stock Number.* The Federal stock number will be shown in this column and will be used for requisitioning purposes.

*e. Description.* The item and a brief description are shown.

*f. Quantity Required for Initial Operation.* This column lists the quantity of each maintenance or operating supply item required for initial operation of the equipment.

*g. Quantity Required for 8 Hours Operation.* Quantities listed represent the estimated requirements for an average 8 hours of operation.

*h. Notes.* This column contains informative notes keyed to data appearing in the preceding column.



## Section II. BASIC ISSUE ITEMS LIST

Source codes				Federal stock No.	Description	Unit of Issue	Expend-ability	Qty authorized	Qty issued with equip-ment	Illustration	
Technical Service	Source	Maintenance	Recover-ability							Fig.	Item.
11	P1	O	---	6140-635-5208	BATTERY, storage, 12-volt, charged and dry.	ea	*	1			
9	P1	O	---	6810-249-9354	ACID, sulfuric, electrolyte, dilute specific gravity 1.280, 1-gallon container.	ea	*	1			
5	P1	O	---	4210-893-1092	EXTINGUISHER, fire (GE)	ea	*	1			
10	P1	O	---	7520-559-9618	CASE, maintenance and operation manuals.	ea	*	1			
12	---	---	---	-----	<p>PUBLICATIONS</p> <p>TM 10-3930-409-10 (Operator's Manual).</p> <p>REPAIR PARTS</p> <p>None authorized for operator/crew maintenance.</p> <p>SPECIAL TOOLS</p> <p>None authorized for operator/crew maintenance.</p> <p>RECORDS</p> <p>EQUIPMENT LOG BOOK</p> <p>Consisting of the following DA Forms: 2408, 2408-1, 2408-2, 2408-3, 2408-5, 2408-6, 2408-7, 2408-8, 2408-10, 2408-11 and Log Book Binder.</p>	ea	*	1			



### Section III. MAINTENANCE AND OPERATING SUPPLIES

Item	Component Application	Source of Supply	Federal Stock No.	Description	Quantity required for initial operation	Quantity required for 8 hours operation	Notes
1	CRANKCASE (1)	---	-----	OIL, LUBRICATING: 5 gal. Drum as follows:			(1) Includes quantity of oil to fill engine oil systems as follows:
		10	9150-231-6653	Grade 9250	6 ½ qt		
		10	9150-265-9435	OE-30	-----	-----	5 qt-Crankcase
		10	9150-231-9037	Grade 9110	6 1/2 qt	-----	1 qt-Oil Filter
		10	9150-265-9428	OE-10			
		10	9150-242-7603	OES	6 1/2 qt		1/2 qt-Air Cleaner
2	AIR CLEANER (2)	---	-----	OIL, LUBRICATING (2)			
3	TRANSMISSION (2)	10	-----	OE-10 (2)	8 qt		(2) Use oil as prescribed in item 1.
		10	-----	OES (2)			
4	HYDRAULIC BRAKE SYSTEM.	---	-----	OIL, HYDRAULIC			
		10	9150-231-9071	1 gal. Can as follows: HB-Nonpetroleum Base, Automotive	3/4 pt-(3)		(3) Represents quantity of oil to fill reservoir to proper level.
		10	9150-252-6375	HBA Nonpetroleum Base Automotive Arctic-Type			
5	FUEL TANK	10	9130-264-6218	GASOLINE, AUTOMOTIVE Bulk.			
6	RADIATOR	---	-----	WATER	13 gal (4)	6 gal.	
		9	6850-243-1992	ANTIFREEZE: Inhibited glycol, 1 gal. can	14 1/2 qt		(4) Tank Capacity
		9	6850-174-1806	ANTIFREEZE: Compound Arctic, 55 gal. drum			
7	DIFFERENTIAL	---	-----	OIL, LUBRICATING, GEAR:			
		10	9150-577-5844	5 gal. Pail as follows: GO-90	9 1/2 pt		
		10	9150-257-5440	GOS			
8	DROP GEAR CASE	10	9150-577-5844	GO-90	1 1/2 pt		
		10	9150-257-5440	GOS			



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NG: State Ag (3).

USAR: None.

For explanation of abbreviations used, see AR 320-50.



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## The Metric System and Equivalents

### Linear Measure

1 centimeter = 10 millimeters = .39 inch  
 1 decimeter = 10 centimeters = 3.94 inches  
 1 meter = 10 decimeters = 39.37 inches  
 1 dekameter = 10 meters = 32.8 feet  
 1 hectometer = 10 dekameters = 328.08 feet  
 1 kilometer = 10 hectometers = 3,280.8 feet

### Weights

1 centigram = 10 milligrams = .15 grain  
 1 decigram = 10 centigrams = 1.54 grains  
 1 gram = 10 decigrams = .035 ounce  
 1 decagram = 10 grams = .35 ounce  
 1 hectogram = 10 decagrams = 3.52 ounces  
 1 kilogram = 10 hectograms = 2.2 pounds  
 1 quintal = 100 kilograms = 220.46 pounds  
 1 metric ton = 10 quintals = 1.1 short tons

### Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce  
 1 deciliter = 10 centiliters = 3.38 fl. ounces  
 1 liter = 10 deciliters = 33.81 fl. ounces  
 1 dekaliter = 10 liters = 2.64 gallons  
 1 hectoliter = 10 dekaliters = 26.42 gallons  
 1 kiloliter = 10 hectoliters = 264.18 gallons

### Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch  
 1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches  
 1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet  
 1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet  
 1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres  
 1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

### Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch  
 1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches  
 1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

## Approximate Conversion Factors

<i>To change</i>	<i>To</i>	<i>Multiply by</i>	<i>To change</i>	<i>To</i>	<i>Multiply by</i>
inches	centimeters	2.540	ounce-inches	Newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29.573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	Newton-meters	1.356	metric tons	short tons	1.102
pound-inches	Newton-meters	.11296			

## Temperature (Exact)

°F	Fahrenheit	5/9 (after	Celsius	°C
	temperature	subtracting 32)	temperature	







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