D E P A R T M E N T O F T H E A R M Y T E C H N I C A L M A N U A L

OPERATOR AND ORGANIZATIONAL MAINTENANCE MANUAL

KIT, SPARK PLUG CLEANING
AC SPARK PLUG DIVISION
OF GENERAL MOTORS

NO. 5612478, TYPE TK-2

FSN 4910-786-9271

This publication includes all changes in effect at the time of publication - Change 1.

H E A D Q U A R T E R S , D E P A R T M E N T O F T H E A R M Y

JUNE 1964

Changes In force: C1

TM 9-4910-422-12
C1

Change No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, *25 June 1973*

Operator and Organizational Maintenance Manual
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TM 9-4910-422-12, 11 June 1964, is changed as follows:

Page 2. Add the following paragraphs:

Recommendations for Maintenance Publications Improvements.

You can improve this manual by calling attention to errors and by recommending improvements using DA Form 2028 (Recommended Changes to Publications) or by a letter and mailing direct to Commander, US Army Weapons Command, ATTN:

AMSWE-MAS-SP, Rock Island IL 61201. A reply will be furnished direct to you.

Components of the End Item.

Parts included with the end item and considered as components of the end item configuration are listed in the following table:

Table 1. Components of the End Item

Components	Part No.	(FSCM)	Qty
ADAPTER, CONNECTOR:	5273L	(74545)	1
ADAPTER, INDICATOR, SPARK PLUG CLEANER:	CL79	(70040)	1
ADAPTER, INDICATOR, SPARK PLUG CLEANER:	CL95	(70040)	1
ADAPTER, SLEEVE CLEANER:	AV17-1	(70040)	1
ADAPTER, SPARK PLUG CLEANER:	CL82	(70040)	1
ADAPTER, SPARK PLUG CLEANER:	CL98	(70049)	1
CHEST, METAL:	5610523	(70040)	1
CLEANER, VIBRATOR, SPARK PLUG:	AV19-3	(70040)	1
CLEANING COMPOUND, SPARK PLUG:	MILG9954	(81349)	6
CLEANING COMPOUND, INSULATOR SLEEVE:	AV7-1	(70040)	1
CLEANING TOOL:	CL251	(70040)	1
CLEANING TOOL:	CL273	(70040)	1
CLEANING TOOL:	CL274	(70040)	1
GAGE, GAP SETTING:	AV14-1	(70040)	1
GAGE, SPACER, FIXED:	CL258	(70040)	4
GAP SPACER:	CL277	(70040)	1
GAP SPACER:	CL250	(70040)	1
HOLDER, SPARK PLUG:	CL248	(70040)	4
MAGNIFIER:	M7AE	(47241)	1
TERMINAL CONTACTOR, SPARK PLUG:	CL235	(70040)	1
TERMINAL CONTACTOR, SPARK PLUG:	CL238	(70040)	1
TOOL HOLDER:	CL272	(70040)	1
TOOL, SLEEVE CLEANER, SPARK PLUG:	CL241	(70040)	1
TOOL, SPARK PLUG GAPPING:	AV20-3	(70040)	1
TRAY, SPARK PLUG:	CL237	(70040)	1

Page 27. Appendix I is superseded as follows:

APPENDIX I
BASIC ISSUE ITEMS LIST
AND
ITEMS TROOP INSTALLED OR AUTHORIZED LIST

The basic issue items and items troop installed or authorized lists are not applicable.

By Order of the Secretary of the Army:

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

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

Distribution:
To be distributed in accordance with DA Form 12-31 (qty rqr block No. 94), Organizational maintenance requirements for all fixed and rotor wing aircraft.

TECHNICAL MANUAL
NO. 9-4910-422-12

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *11 June 1964*

OPERATOR AND ORGANIZATIONAL MAINTENANCE MANUAL
(INCLUDING REPAIR PARTS AND SPECIAL TOOL LISTS)

KIT, SPARK PLUG CLEANING
AC SPARK PLUG DIVISION OF GENERAL MOTORS NO. 5612478
TYPE TK-2 FSN 4910-786-9271

Page

ACS-15143
February 22, 1961

OPERATING INSTRUCTIONS

TYPE TK-2 AC FINE WIRE AIRCRAFT SPARK PLUG
SERVICING KIT. ASSEMBLY PT. NO. 5610532

Kit Components

Quantity		Name		Pt. No.
		Model AV11-1 S.P. Cleaner & Indicator Components		
One	(1)	Spark Plug Cleaner and Indicator Unit		5610533
One	(1)	Miscellaneous Service Parts	Pkg.	5569672
One	(1)	Hood		5562179
One	(1)	Type CL-237 Spark Plug Tray		5564312
One	(1)	Type CL-107 Water Trap		5571883
One	(1)	Type CL-82 Cleaning Adapter (14 MM)		5562174
Two	(2)	Type CL-98 Cleaning Adapter (18 MM)		5562175
Two	(2)	Type CL-235 Terminal Contactor (Low Alt.)	Pkg.	5569953
Two	(2)	Type CL-238 Terminal Contactor (High Alt.)	Pkg.	5569980
Two	(2)	Type CL-95 Indicator Adapter (18 MM)	Pkg.	5569716
Two	(2)	Type CL-73 Nozzles (Service Part)	Pkg.	5569674
One	(1)	Type AV19-3 Vibrator Cleaning Unit		5612500
One	(1)	Conversion Plug (Extension Cord)		5565429
Four	(4)	Type CL-248 Vib. Cleaning Tools (2 blade-4 pcs.)	Pkg.	5612124
One	(1)	Type AV20-3 Fine Wire Gapping Tool Assembly		5612269
Five	(5)	Type CL-250 Gap Spacers (.016 Nom. - 5 pcs.)	Pkg.	5612132
Two	(2)	Type AV14-1 Gap Gauge	Pkg.	5569937
One	(1)	Type AV17-1 Ins. Sleeve Cleaning Tool Assembly	Pkg.	5612077
Six	(6)	Type CL-241 Ins. Sleeve Cleaning Tools (6 pcs.)	Pkg.	5612078
One	(1)	Type AV7-1 Ins. Sleeve Cleaning Compound		5569928
Six	(6)	Type CL-3 Airc. S.P. Cleaning Compound (6 cans)	Pkg.	5569957
One	(1)	Type AV24-1 Inspection Light	Pkg.	5562256
One	(1)	Type CL-73 Nozzle Package (18 Nozzles)	Pkg.	5569763
One	(1)	Instruction Book	ACS - 15143	

UTILITY REQUIREMENTS

1. Two (2) suitable work benches or tables - approximate size 3 ft. x 5 ft.
2. Filtered, compressed air supply - 120 to 150 psig.
3. Two (2) positively grounded (three wire) single phase 110-120 volt, 60 cycle, power supply double outlet receptacles. Locate one double outlet at each bench.
4. Auxiliary Equipment:
   a. About 8 to 10 metal or wood spark plug holding trays, 50 to 100 spark plug capacity per tray (depending on quantity of plugs being processed.)
   b. Degreasing Equipment, Solvent Washing or Vapor Degreasing. (See Section II)
   c. One (1) 1/2 H.P., 1750 to 3400 RPM, electric motor-driven fine wire wheel brush (.005 Dia. wire bristles) 6" dia. x 1/2" or 3/4" wide. Electrical features to match Para. No. 3 power supply.
   d. One (1) 1/8 H.P., 1000 to 1750 RPM, electric motor-driven 3/8" Jacobs Chuck or adapter sleeve to drive AV17-1 Insulator Sleeve Cleaning Tool Assembly. Electrical features to match Para. No. 3 power supply.

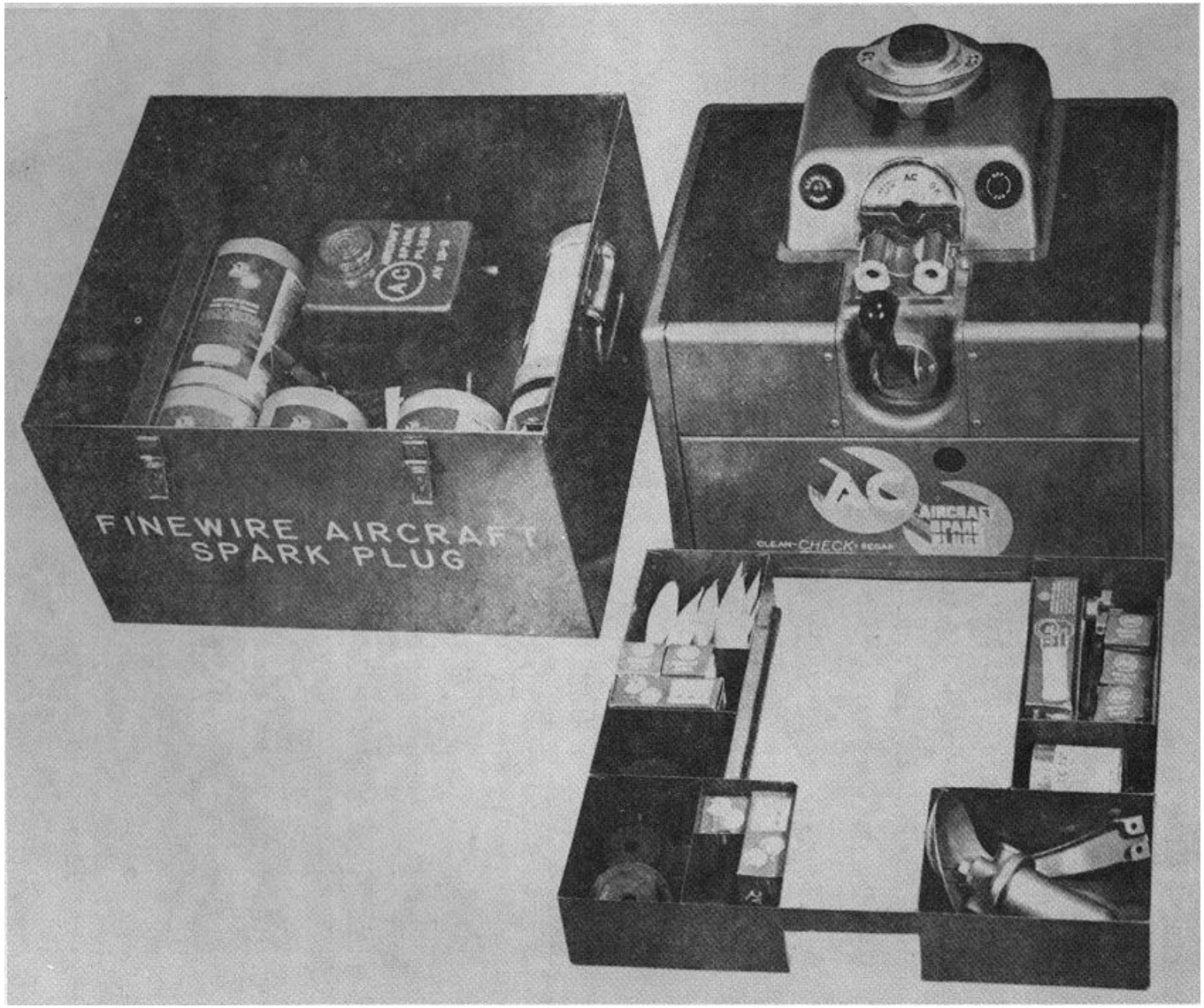
INSTALLATION AND LOCATION OF EQUIPMENT

Layout and position each piece of servicing equipment onto bench top so as to con form with recommended reconditioning sequence outlined under "How to Service AC Spark Plugs."

1. Make 120-150 psig compressed air line connections to Model AV11-1 Cleaner and Indicator Unit.
2. Plug extension cord, from AV19-3 Vibrator Unit, 1/2 H.P. Wire Brush Motor and 1/8 H.P. Sleeve Cleaning Motor into the 110-120 volt 60 cycle power supply outlet receptacles.

How To Service AC Aircraft Spark Plugs.

All AC type aircraft spark plugs are ruggedly constructed and engineered so as to withstand the severest types of engine operations. However, careful handling is necessary at all times to minimize possible damage to the threads, electrodes and ceramic insulator.


FINEWIRE AIRCRAFT
SPARK PLUG
AC
CLEAN-CHECK

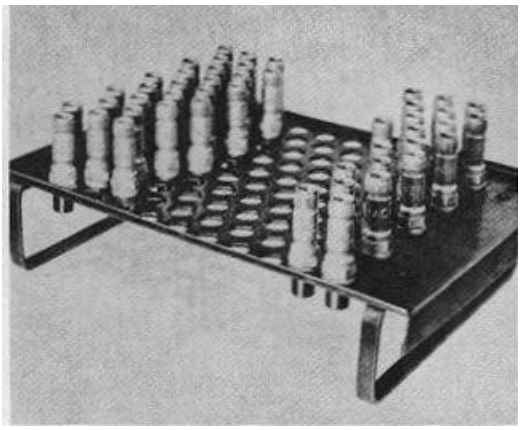

TK-2
SERVICING KIT
AC
FINEWIRE AIRCRAFT
SPARK PLUG
FINEWIRE AIRCRAFT
SPARK PLUG

Preliminary to Reconditioning

Method of Handling:

To facilitate spark plug handling with minimum possible damages (to and from the engines and during reconditioning process,) a sheet metal or wooden holding tray of suitable size to accommodate from two to four sets of sparks should be used.

If a spark plug should accidentally be dropped at any time, it should be identified with a tag for special inspection and electric testing regardless of the fact that no damage is apparent by visual inspection.



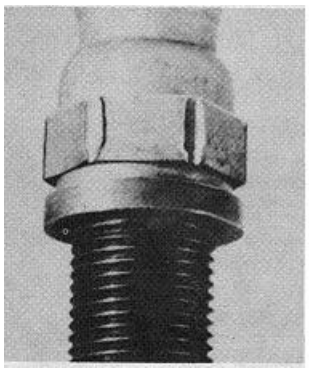
Typical metal handling tray. Plugs can be identified by spacing or upending,. Wooden trays can be made locally using 8" x 8 x 2" wooden blocks. Drill 3/4" dia. holes.

RECONDITIONING SEQUENCE AND EQUIPMENT OPERATIONS

I. Visual Inspection

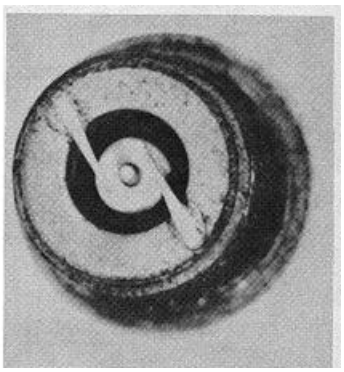
Prior to any spark plug reconditioning processes:

a. Remove engine seat gaskets from each spark plug.
b. Visually inspect each spark plug for the following obvious non-reparable defects, to eliminate unnecessary reconditioning time and expense.
    1. Severely damaged shell or shield threads nicked up, stripped or cross-threaded.
    2. Badly battered or rounded shell hexagons.
    3. Out-of-round or damaged shielding barrel.
    4. Chipped, cracked or broken ceramic insulator portions; tip end or shielding barrel sleeve.
    5. Badly eroded electrodes worn to approximately 50% of original size.



Damaged Hex

Broken Insulator
Shielding Barrel

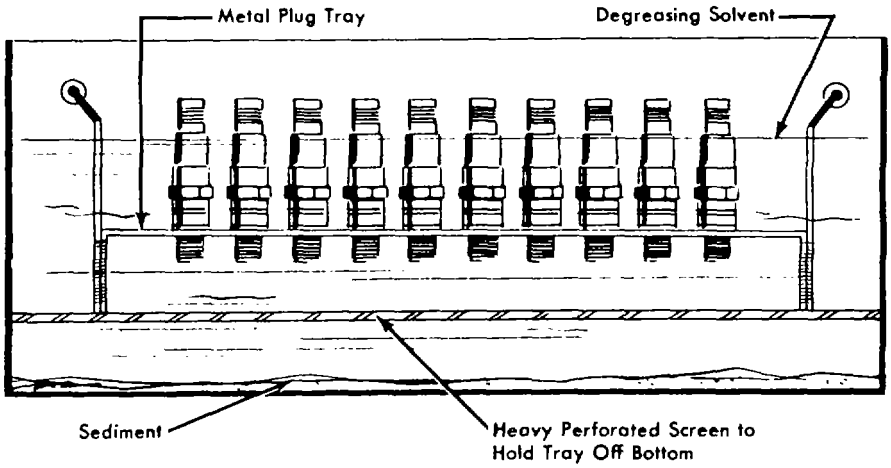


Excessively
Worn Electrodes

II. Degreasing

Spark plugs to be reconditioned should be thoroughly cleaned of all grease and soluble combustion deposits by either of the following methods:

A. Solvent Method



Solvent Cleaning Chamber-This can be made locally using either 1/32" or 1/16" sheet metal steel stock. Vary the area and depth to handle available trays. Hold the solvent level to a point at least 1/2" below top of spark plug shield.

1. Place the spark plugs in an appropriate type metal holding tray. Electrode Ends Down.
2. Immerse tray full of spark plugs (shielded types 2/3 overall length only; nonshielded types completely) into a suitable container of degreasing solvent.
3. Let tray of plugs soak for 20 to 30 minutes, after which, remove and allow to drain for one minute.
4. Thoroughly dry each spark plug by air blasting. A moist or damp firing end cavity will result in the accumulation of cleaning compound between the shell and ceramic insulator during the abrasive blast operation (see section III).

Any one of the following commercial solvents are suitable for the above degreasing operation:

Varsol

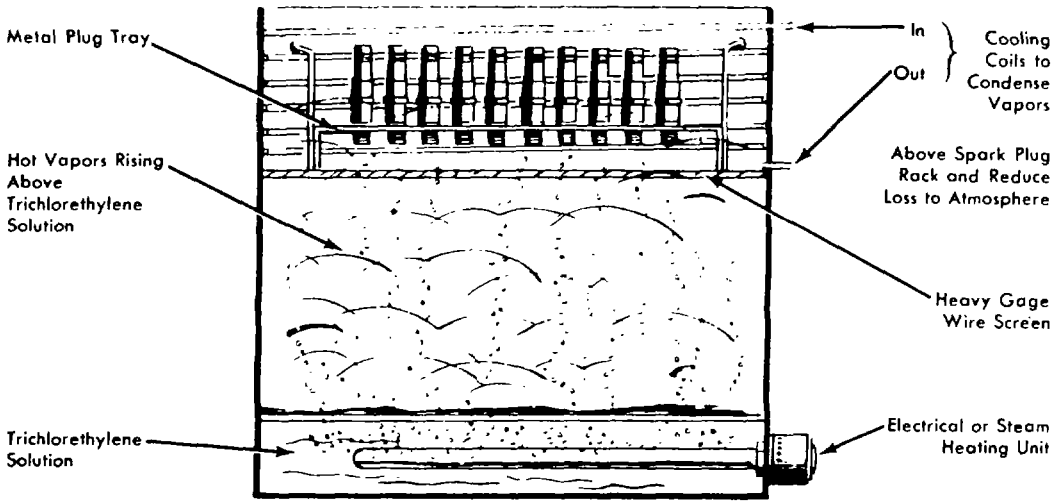
Stoddard Solvent

White (unleaded) Gasoline

Dry Cleaners Naphtha

DO NOT USE CARBON TETRACHLORIDE

B. Vapor Method:



Vapor Cleaning Chamber-Construct chamber from 1/16" metal steel stock. Paint outside to reduce metal oxidation. Place cover over top when not in use to reduce solution evaporation.

1. Place the spark plugs into an appropriate type metal tray. Electrode Ends Down.
2. Lower the tray full of spark plugs onto the heavy gage wire screen in the vapor cleaning tank for about 15 minutes. During this time oil and grease deposits will be dissolved by the hot rising trichloroethylene fumes.
3. Remove tray of plugs and allow them to drain for one minute. Invert each plug in the tray to minimize condensation in the shielding barrels while cooling sufficiently to handle.

4. If retreatment is necessary, the plugs should be allowed to cool for 20 minutes before returning to the vapor cleaning tank (electrode ends down). Exceptionally dirty spark plugs should be lowered directly into the trichloroethylene for one minute, then removed and allowed to cool before returning to the vapor cleaning position in tank.

Trichloroethylene vapors are toxic and should be vented by an air conditioning hood to atmosphere. Other equally good commercial solvents can be used if handled with equal care.

III. Firing End Cavity - Cleaning

One of the most effective and economical ways of removing non-soluble combustion deposits from the spark plug firing end cavity is by the use of an abrasive blast unit. This unit operates with available shop compressed air and is commercially obtainable with universal adapting features for all standard type aircraft spark plugs.

AC FINE WIRE AIRCRAFT SPARK PLUG CLEANER INSTRUCTIONS
MODEL AV11-1 AIRCRAFT SPARK PLUG CLEANER AND INDICATOR

Installation:

1. Bench position unit so as to b e conveniently located for spark plug cleaning and testing operations.
2. Attach (CL-107) water trap with opening marked "Outlet" to air inlet at rear of unit with furnished 1/4" pipe nipple or street elbow.
3. Attach hood to rear portion of top casting with the two prepositioned screws.
4. Attach compressed air line to the water trap opening marked "Inlet".

   Air pressure at the water trap must be at least 120 psig (150 psig more preferable). A "Globe" or "Gate" wheel type shut off valve should be installed into the air line servicing the unit so air supply can be shut off when unit is not in use.
5. Attach a ground wire (No. 16 or 18 size) to indicated transformer retaining

lug (red tagged) located in rear of unit if three-wire grounded type 110-120 volt power supply is not available. Attach other end of ground wire to convenient water pipe or suitable ground.

6. Plug extension cord from the unit into 110-120 volt, 60 cycle power supply receptacle.
7. Cleaning Compound - Use only AC type CL-3 Aircraft Spark Plug Cleaning Compound. Open and lift door off hinges for best accessibility. Loosen thumb nut on bail assembly, swing bail aside and remove compound container. Pour 1/2 the contents of type CL-3 package- into compound container (This is approximately 2-1/2# of CL-3 Compound). Replace compound container and retain with bail by finger-tightening thumb nut.
8. Install Nozzle Assembly by - removing cleaning adapter retaining ring and cleaning adapter. Remove cleaner nozzle assembly (consists of rubber nozzle and steel bushing) from miscellaneous parts envelope.

   Place in recess of casting at plug cleaning position. Replace cleaning adapter and lock in position with cleaning adapter retaining ring. Install new Type CL-73 rubber nozzles each time cleaning compound is replaced.

Operation:

NOTE

For best firing end cavity cleaning results the spark plugs should be thoroughly dry and free of any oil, grease, or soluble deposits.

1. Select rubber cleaning adapter that corresponds to the thread size of spark plugs to be processed; 14MM or 18MM. Install adapter into unit and retain in position with lock ring.
2. Insert firing end of spark plug into adapter. 14MM or short reach 18MM type plugs full length of threads to gasket seat. Long reach 18MM type plugs should be inserted only about 1/2 of thread length.
3. Cleaning Sequence:
   A. Wobble the terminal end of plug on about a one inch diameter circle with one hand.

B. Depress "Compound Blast" lever for about five seconds with other hand.

C. Release "Compound Blast' lever and depress "Air Blast" lever for about five seconds to blow off loose compound particles which may cling to the plug.

D. Inspect the firing end cavity of plug with AV24-1 Inspection Light.

E. If heavy combustion or lead deposits are noted, set plug aside for cleaning per AV19-3 Vibrator Unit Operating Instructions (see page No. 21).

F. If no deposits are noted and plug is not satisfactorily clean, a second or even a third cleaning cycle "A" through "C" can be applied. Three five second cycles or total of fifteen seconds.

Due to the fast cleaning action of unit, lengthy random cleaning is not recommended because spark plug electrode or insulator tip damage could result from excessive cleaning.

4. Maintenance:

A. Use only AC Aircraft Compound type CL-3. Purchase separately type CL-73 rubber nozzle and install a new one each time the cleaner is refilled.

B. One half package (2-1/2 pounds) of compound will clean about 300 spark plugs. Examine compound weekly and replace when it looks like fine dust. A more accurate test would be to push the end of a pencil into the compound, remove pencil and notice if compound flows back into hole. If it compacts, replace. Shake clinging dust from inside cloth filter sleeve before removing compound container. Discard worn compound. Add new compound type CL-3. Replace rubber nozzle type CL-73.

C. Open water trap daily to avoid water accumulation. Damp compound will reduce efficiency of cleaning action.

SERVICE HINTS

TROUBLE	PROBABLE CAUSE	REMEDY
Excessive cleaning time required or will not deliver compound.	Insufficient air pressure	Air pressure at cleaner must be 150 psig.
		Is air line attached to cleaner?
		Is wheel valve open in air line?
	Damp Compound	Dry compound or replace
		Drain water trap
		Clean accumulated compound from mix chamber and pickup tube.
	Worn out Compound	Shake or pat cloth bag to remove clinging dust and discard use compound from container.
		Add new compound Type CL-3
	Cleaning valve stuck to valve seat	See valve replacement instructions
	Plug not precleaned with solvent to remove oily or wet deposit	Degrease oily or wet plugs; oven or air dry. Replace oily compound with new compound Type CL-3
	Worn rubber nozzle	Replace rubber nozzle Type CL-73 if hole is excessively enlarged.
	Nozzle or nozzle assembly missing	Replace nozzle assembly Type CL-71 in recess at plug cleaning position.
	Clogged air line	Be sure air is being delivered to cleaner costing.
Compound packs in spark plug.	Oily or wet plugs not pre-cleaned in solvent	Degrease oily or wet plugs with solvent and dry in heated cabinet.
		Replace compound Type CL-3
	Damp compound	Dry compound or replace.
		Drain water trap
		Clean accumulated compound from mix chamber and pick-up tube.
Extreme wear on spark plug insulator and electrode	Nozzle hole worn excessively	Replace nozzle Type CL-73
	Failure to wobble plug in adapter	Wobble plug so upper end moves through 1" circle without rotating plug in adapter.
	Over exposure of plug to cleaning blast	Replace plug if it cannot be cleaned in 3 cleaning blast cycles of 5 seconds each.
	Cleaner has been disassembled and air restriction washer lost from elbow which connects air line to cleaner casting	Remove air line and install restriction washer Type CL-116. Replace air line.

SERVICE HINTS (Continued)

Rubber nozzle hole wears quickly or on only one side	Air jet (below nozzle) is loose	Tighten air jet until fully seated
Dust emission or loss of compound	Compound worn out. Interior surface of filter sleeve clogged with fine compound dust (air pressure must exhaust thru pores of cloth filter sleeve)	Snake or pat exterior of cloth filter sleeve to drop clinging dust into compound container.
		Discord used compound
		Add new compound
	Compound container gasket worn out or defective.	Remove worn gasket.
		Install new gasket Type CL-75 and cement in place. Remove excess cement to prevent difficult removal of compound container.
	Holes worn in filter sleeve.	Replace filter sleeve Type CL-88. See filter sleeve replacement.
	Top casting gasket loose or defective.	Tighten screws or replace gasket Type CL-102
	Valve cover gasket loose or defective.	Tighten screws or replace gasket Type CL-93
Air flow thru either nozzle with valve lever in shut off position	Broken Valve spring	Replace valve spring Type 17
	Worn rubber valve	Replace valve Type CL-92
	Valve packing gland too fight.	Loosen packing gland in 1/4 turn increments until valve shuts off easily. See "valve replacement."

VALVE REPLACEMENT

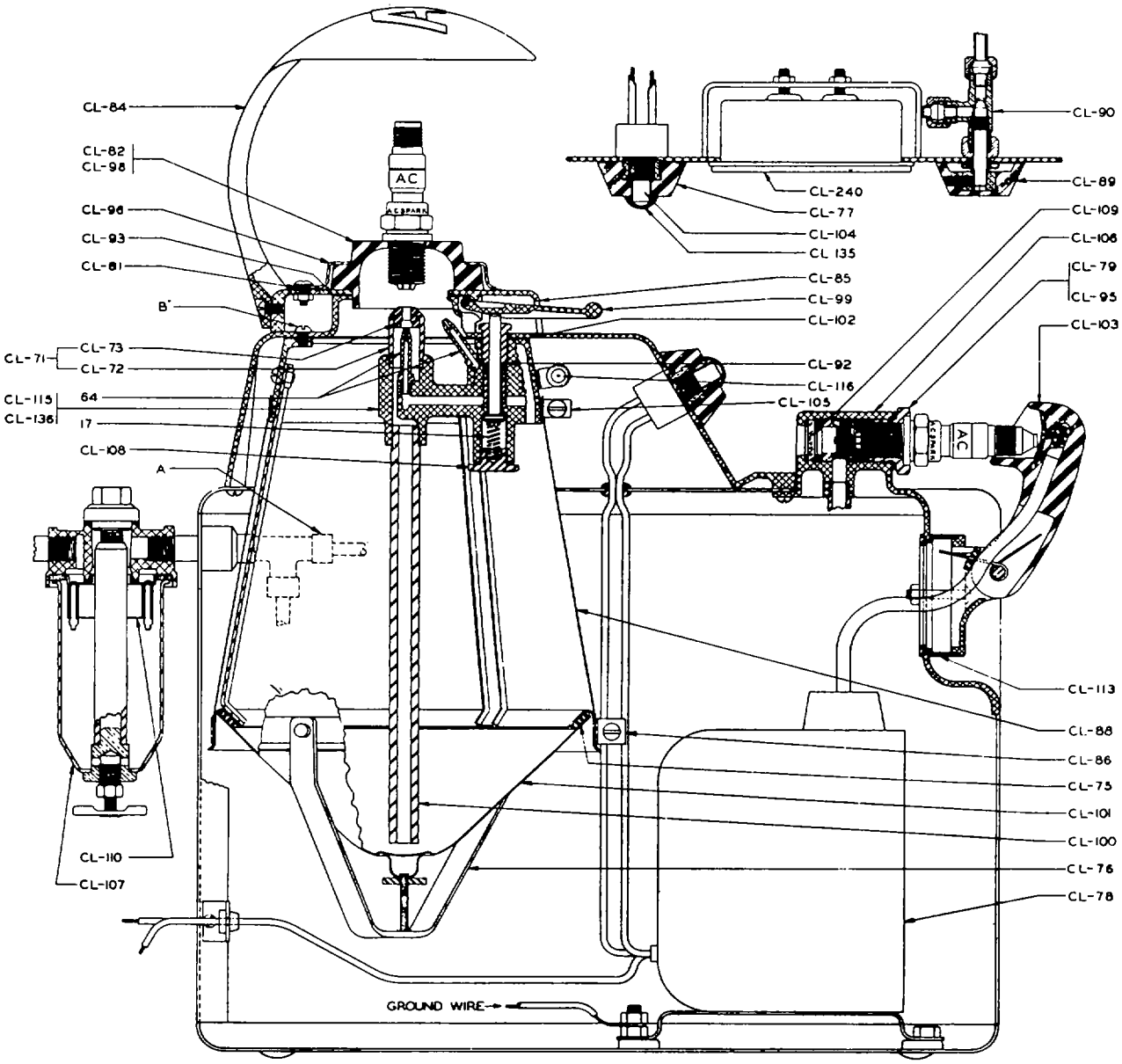
1. Remove hood (CL-84) by removing two retaining screws.
2. Shake filter sleeve (CL-88) to deposit any clinging compound dust in container (CL-101). Loosen thumb nut on bail assembly (CL-76). Swing bail to one side and remove compound container (CL-101).
3. Remove rubber adapter and metal retainer by turning retainer (CL-96) part turn.
4. Disconnect air line to compound casting at coupling marked "A" on drawing.
5. Remove only 3 counter sunk screws from valve cover (CL-85). Lift off valve cover (CL-85), two levers (CL-99), two springs (CL-80) and gasket (CL-93).
6. Remove four round head screws marked "B" on drawing.
7. Remove assembly of valves, casting and filter sleeve.
8. Loosen gland nuts on each valve stem.

9. From inside filter sleeve remove two hex head plugs. Valve springs will drop out when plugs are removed. Tap valve stems (CL-92) on rounded end to remove from hex plug end of valve hole.
10. Assemble new valve assembly (CL-92) in casting and reassemble other cleaner components. Use supplied packing gland material when required.
11. Be sure to tighten packing glands at rounded end of valve stems until valve returns slowly when depressed. Then back off gland 1/4 turn.

FILTER SLEEVE REPLACEMENT

1. Follow procedure under Valve Replacement, Item 1 through 7.
2. Remove copper air line and elbow from casting.
3. Loosen and remove upper (CL-105) and lower clamp (CL-86) assemblies and slide filter sleeve (CL-88) up and off.
4. Slide new filter sleeve into position, tighten clamps. Reassemble other cleaner components.

1 3/4” to top trim



LIST OF SERVICE PARTS

Type	Description	Quantity Used
CL- 3	Package of compound (5 pounds)	1
17	Valve Spring	2
64	Air Blast Jet Nozzle	1
CL-71	Nozzle Assembly	1
CL-72	Steel Bushing	1
CL-73	Rubber Nozzle	1
CL-75	Compound Container Gasket	1
CL-76	Container Ball Assembly	1
CL-77	Knob Assembly (Switch)	1
CL-78	Transformer	1
CL-79	14 MM Indicator Adapter	2
CL-81	Spacer Washer	2
CL-82	14 MM Cleaner Adapter	1
CL-84	Hood	1
CL-85	Valve Cover	1
CL-86	Lower Filter Sleeve Clamp and Bail Retainer Assembly	1
CL-88	Filter Sleeve	1
CL-89	Knob Assembly (Needle Valve)	1
CL-90	Needle Valve Assembly	1
CL-92	Valve Assembly Kit Consists of: 1-Valve stem assembly 1-Gland Nut 1-Packing 1-Washer	2
CL-93	Valve Cover Gasket	1
CL-95	18 MM Indicator Adapter	2
CL-96	Adapter Retaining Ring	1
CL-98	18 MM Cleaning Adapter	1

LIST OF SERVICE PARTS (Continued)

Type	Description	Quantity Used
CL-99	Lever	2
CL-100	Compound Tube	1
CL-101	Compound Container	1
CL-102	Gasket	1
CL-103	Connector Arm Assembly	1
CL-104	Switch (110 v.)	1
CL-105	Upper Filter Sleeve Clamp Assembly	1
CL-106	Bomb and Connector Housing	1
CL-107	Water Trap Assembly	1
CL-108	Valve Plug	2
CL-109	Bomb Window Kit Consists of: 4-Rubber Gaskets 2-Window 2-Gasket	1
CL-110	Water Trap Element	1
CL-113	Connector Extension	1
CL-115	Casting Only	1
CL-116	Air Restriction Washer	1
CL-135	Sealing Grommet	
CL-136	Mixing Chamber & Valve Assembly	1
CL-235	Terminal Contactor	1
CL-237	Spark Plug Tray	1
CL-238	Terminal Contactor	I
CL-240	Pressure Gauge Assembly	1

OPERATING INSTRUCTIONS
Type AV 19-3

Vibrator Cleaning Tool Assembly:

Introduction

The primary use of this unit is intended for the salvaging of fine wire electrode type aircraft spark plugs, which have previously been cleaned and found to be unsatisfactory for further use because of heavy lead compound deposits remaining in the firing end cavity.

Unit Installation:

1. Securely mount unit onto a conveniently located work bench, with available 110-120 volt, 60 cycle, AC power supply outlet.
2. Provide an exhaust duct or dust collector means under vibrator tool adapter head, in such a manner, so as when salvaging operations are being performed, all lead compound deposit particles and dusting are positively carried away from operation. (Continued exposure to lead compound dust should be avoided because of toxic effects).
3. Install two-pronged bayonet type cleaning tool into vibrator tool adapter head and secure with retaining flat head screw.
    A. Type CL-248 tool for AC-185, 285, SR-83P, HSR-83P and SR-47P type aircraft spark plugs.
    B. Type CL-251 tool for AC-181 and 281 aircraft spark plugs.
    C. For AC 3 electrode type plugs, install type CL-272 Dual Vibrator Cleaning Tool Holder onto unit tool holder shaft. Install one type CL-273 and one type CL-274 3 blade tools, (one is left hand and other is right hand) into dual tool holder with retaining flathead screws.
4. Insert extension cord 3 pronged plug into properly grounded 110-120 volt, 60 cycle, AC power supply outlet. (Round pin of plug, or green colored wire attached to conversion plug provides positive grounding of unit).

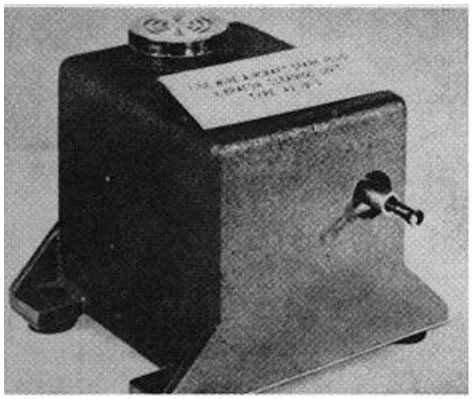
Salvage Operations:

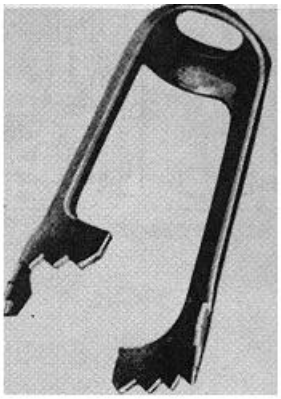
Prior to the use of this unit, all spark plugs should first be degreased and then processed through a conventional type spark plug cleaning operation.

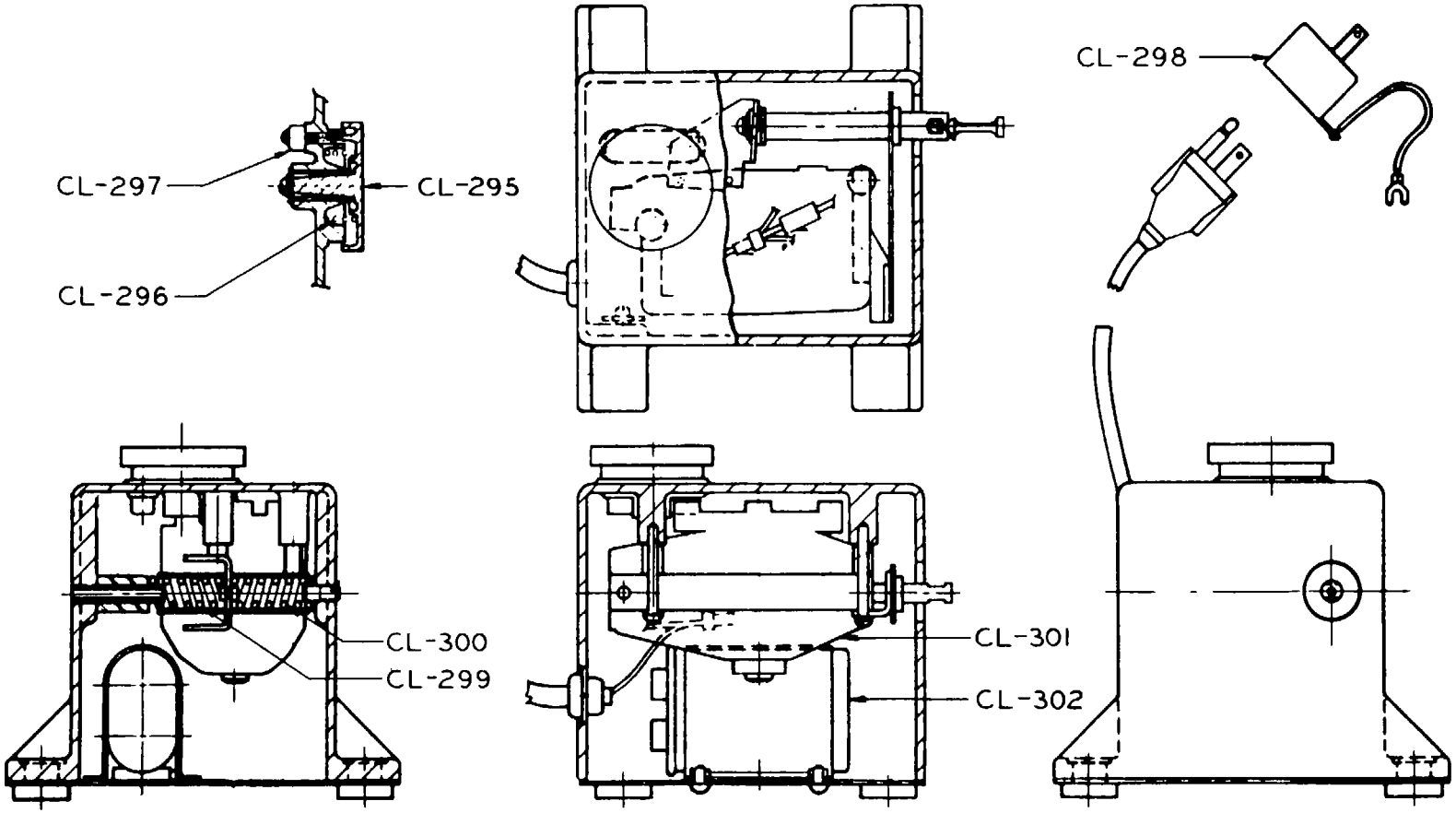
Spark plugs with lead compound deposits can then be readily detected and set aside

for salvaging operations.

1. Position firing end of spark plug so that ground electrodes will permit both bayonet points of cleaning tool to enter the cavity of firing end.
2. With one hand moderately hold the plug against the tool. With other hand depress unit control palm switch.
3. Gently work the plug against the vibrating tool with a semi-rotating motion. The vibrating action of the tool will break up and loosen the lead compound deposits.
4. After the above operations, each spark plug should be re-run through the conventional spark plug cleaning procedures.







AV-19-3 VIBRATOR

Replacement Service Parts

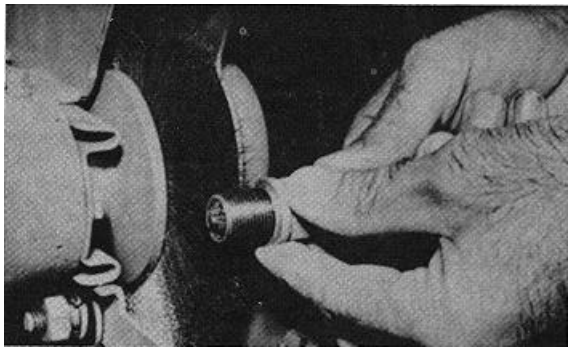
Type No.	Name	Pkg. No.	Type No.	Name	Pkg. No.
CL-295	Switch Button Components	5612840	CL-299	Rear Spring	5612844
CL-296	Switch Button Ret. Spring	5612841	CL-300	Front Spring	5612845
CL-297	Switch Assembly	5612842	CL-301	Motor Assembly Complete	5612846
CL-298	Conv. Adapter-Ext. Cord	5612843	CL-302	Capacitor Assembly Complete	5612847

IV. Shell and Shield Thread - Cleaning.

Spark plug shell and shield threads should be wire brushed so they are free and clean from old thread lubricating compounds, anti-seize and foreign deposits. This operation can be accomplished with the use of a commercially obtainable Fine Wire Scratch Brush, or a Power-Driven Fine Wire (.005 diameter) Wheel Brush.

NEVER BRUSH ELECTRODES OR INSULATOR PORTIONS

After cleaning, examine thread forms for cleanliness and nicks which can be smoothed out or touched up at this time with a small three-cornered needle file. Discard spark plugs with badly nicked, deformed or stripped threads to avoid damaging the engine cylinder head bushings.



V. Ceramic Shielding Barrel - Cleaning

The cleaning of spark plug ceramic shielding barrel inner surfaces is an important operation which requires careful handling with appropriate type equipment for removing oily films and other deposits that could become conductive seepage paths for applied ignition voltages. To accomplish this operation on high altitude 3/4" diameter, or low altitude, 5/8" diameter, shielding barrels, chuck an AV17-1 Sleeve Cleaning Tool Assembly into a drill press chuck, or attach to the protruding shaft of a small electric motor. Recommended operating speeds are around 1000 to 1725 RPM.

1. Apply a small quantity of water soluable AV7-1 Sleeve Cleaning Compound into the spark plug shielding barrel (CL-241).

2. Insert the rotating cleaning tool (CL-241) into the plug barrel until end bottoms against contact cap. Work plug back and forth (3/8" stroke) five or six times.
3. Examine ceramic sleeve internal surfaces. If satisfactorily clean, rinse out with a fountain type jet of warm water (120^{o} to 150^{o} F). If the ceramic sleeve is chipped or cracked, scrap the spark plug.
4. Air-blast sleeve end of each plug and place into a holding tray, shield end down. Generally, the heat from the hot water is sufficient for thorough drying out, but for positive drying, the plugs should be placed into a 225^{o} F oven for 30 minutes.

Replaceable rubber cleaning tools, Type CL-241, are available as service parts for the AV17-1 assembly.

VI. Gap Setting

The resetting of spark plug electrode gaps must always be accomplished by the adjustment of the side or ground electrodes only. Never attempt to bend or move the center electrode because ceramic tip fracture will result.

FINE WIRE AIRCRAFT SPARK PLUG GAP SETTING TOOL TYPE AV20-3
OPERATING INSTRUCTIONS

1. Fasten gap setting tool onto a conveniently located work bench or table top so the handle position is freely accessible.
2. Insert firing end of spark plug into the tool adapter bushing, so that protruding tool jaws will enter the firing end cavity.

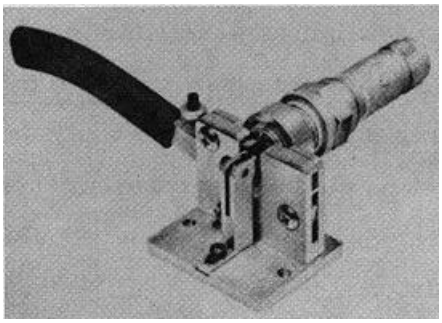
3. Loosen gauge holding clamp detail "Retaining Screw' in base. Then slide detail out of position.
4. Insert desired gap size spacer into the top portion of gauge holding detail.

   Type CL-249 (.001-.014 Gap Size) .012 Nominal

   Type CL-258 (.013-.016 Gap Size) .014 Nominal

   Type CL-250 (.015-.018 Gap Size) .016 Nominal

   Type CL-277 (.017-.021 Gap Size) .018 Nominal
5. Slide gauge holding detail up to the spark plug. Adjust gauge retaining clamp screw so spacer gauge leaves will freely enter the spark plug gap openings with minimum center electrode clearance. Locate clamp holding detail so that spacer gauge engagement extends full length of the center electrode without touching the ceramic insulator tip.
6. Depress the tool handle so both side electrodes are moderately squeezing the spacer gauge leaves against the center electrode.
7. Spark plug is now gapped; remove from tool adapter and install next plug repeat above operation. Paragraph No. 6.



TYPE AV20-3
FINE WIRE SPARK PLUG
GAPPING TOOL

Replacement Service Parts

Type No.	Name	Page No.
CL-303	Stationary Jaw	5612848
CL-304	Movable Jaw	5612849

VII. Electric Testing

The primary reason for electric testing any spark plug is to determine if the ceramic insulator is dielectrically sound, i.e., there are no hidden fractures or pin holes through which the applied high tension ignition voltages could be diverted to ground instead of firing the plug.

The above electric testing of spark plugs can be accomplished by using the indicator portion of the Model AV11-1 Spark Plug Cleaner and Indicator Unit as follows: See Section III, Page No. 10 for Unit Installation and Cleaner Operation.

Operation

NOTE

The indicator will provide a quick and accurate dielectric soundness check of aircraft plug insulator with exception of firing end and approximately 1/8" of sleeve end. These areas should be carefully inspected for chips and cracks with an AV24-1 Magnifying Inspection Light.

1. Select a pair of Indicator Adapters corresponding to the thread size of spark plugs to be tested - 14 MM to 18 MM. Use a 7/8" spark plug gasket under each adapter and moderately tighten into test chambers.
2. Screw aircraft spark plugs, one into each chamber, without any seat gaskets, full length of threads, finger tight only. Slight air leakage is necessary to maintain best sparking ability of plugs.

NOTE

Plugs must be clean and properly gapped to engine manufacturer's specifications. Spark plug. gap sizes should not exceed .025 for satisfactory test results.

3. When checking shielded type aircraft spark plugs, insert correct type terminal contactor into the ceramic shielding barrel of each plug.
   A. Type CL-235 Short Contactors are for low altitude type spark plugs with 5/8 - 24 threaded shields.
   B. Type CL-238 Long Contactors are for high altitude type spark plugs with 3/4 - 20 threaded shields.
4. Place H.T. voltage contact arm onto the exposed end of terminal contactor in one plug.

5. Press H.T. voltage button located on left side of indicator gauge and with other hand slowly open air control needle valve located on right side of gauge.
6. Observe the gap sparking characteristics of the plug in mirror finish of gauge, while increasing the air pressure in test chambers.
   A. If electrode gap sparking characteristics are bright and continuous throughout gauge pointer rise from Red Zone to Green Zone, the spark plug insulator is dielectrically sound.
   B. If audible or visible Flashover is noted in the spark plug shielding barrel while the gauge pointer is in the Green Zone and plug gap sparking characteristics are bright and continuous, the spark insulator is dielectrically sound.

      Flashover in barrel is due to the presence of excessive high tension voltage which can build up sufficiently to seek out any insulator defects (see note under operations) or discharge up insulator sleeve to grounded shield.
   C. If electrode gap sparking stops while gauge pointer is in Red Zone and flashing over in barrel is noted, inspect insulator shielding barrel for defect or cleanliness. If found defective, scrap plug; otherwise, clean barrel, recheck electrode gaps, and retest plug.
   D. If electrode gap sparking stops while gauge pointer is in Red Zone and <u>no</u> flashing over is noted in barrel, inspect electrode gaps for possible bridged gap, firing end cavity for cleanliness and possible cracked insulator tip. If insulator tip is cracked or broken, <u>scrap plug</u>; otherwise correct possible cause for failure and re-test. If plug fails to check out, insulator has internal defect. Scrap plug.
7. Switch contact arm to next plug in test chamber, Paragraph 4, and repeat test procedures Paragraph 5 and 6.
8. Release H.T. Voltage switch button, close air pressure needle valve, remove terminal contactors and plugs from unit.

9. Install next two plugs for test and repeat above outlined procedures. Occasionally open air control needle valve to the test chambers (without any plugs in place). The air flow will blow out any loose metallic thread particles which could accumulate and possibly cause erratic test results by shorting or bridging the spark plug electrodes.

10. For Best Results:

    Do not electric test any spark plugs until they have been degreased, firing end cavity cleaned, shielding barrel cleaned, threads cleaned, and electrodes regapped to engine manufacturer's specifications.

    If engine manufacturer's recommendations for spark plug gap sizes exceed .025, the electrode gaps should be reset after electric testing.

SERVICE HINTS

TROUBLE	PROBABLE CAUSE	REMEDY
Fogged viewing window	Excessive Moisture in compressed air	Drain water trap.
		If necessary, re-locate cleaner away from sump end of compressed air line.
		Use air hose to dry condensation of window.
Broken viewing window	Accidental blow	See replacement instructions.
No high tension spark	Electrical circuit failure	Replace fuse or repair building wiring.
	High tension lead disconnected from transformer	Pull service cord from outlet and replace H.T. lead in transformer tower.
	Defective H.T. voltage switch.	Replace switch type CL-104. Unsolder wire leads and, looking at rear of switch, un-screw switch from knob in counter-clockwise direction.
	Wrong terminal contactor or none used. Air not turned an.	Use long contactor for 3/4" barrels, short contactor for 5/8" barrels. Turn on air.
Air gouge does not show pressure	Gouge broken	Replace gauge assembly Type CL-240
	Airline clogged	Clear Air Line.

See pages 13, 14 and 15 for Service Part Listings.

VIEWING WINDOW REPLACEMENT

1. Window replacement requires use of locally made wrench to fit gland slot 1/8" thick and 25/32" wide x 4" long. Gland and window components (CL-109) are removed and replaced through spark plug test positions.

H.T. VOLTAGE SWITCH

1. Replace switch Type CL-104. To remove, rotate switch unit inside cleaner 2-1/2 turns counter-clockwise. Push switch outward and turn knob from front of cleaner. Solder leads to new switch and insulate with tape. Reassemble new unit in reverse manner.

VIII. Final Inspection

After all reconditioning and testing operations, each spark plug should be individually inspected for the following defects which could have been overlooked or undetected in processing:

A. Nicked or damaged shell and shield threads. Use suitable thread gauges.

B. Carefully examine the ceramic insulator sleeve and firing end tip for cleanliness, possible hairline cracks or chipped conditions. Use suitable magnifying glass with good lighting source.

C. Recheck gap sizes and electrode conditions. Use suitable round wire "GO" and "NO-GO" gauges.

D. Check general condition of spark plug shielding barrel and hexagon. Use suitable tools and gauges.

IX. Rust - Proofing

If Aircraft Spark Plugs are to be stored for an indefinite period, rust-proof the shell and shielding barrel threads with an oxidation inhibitor that will meet specification MIL-C-6529-A, Type III. Local Oil Company representatives can make a suitable recommendation.

Brush on a light coating without allowing excess to spill over into the shielding barrel or on the electrodes. Mica-lube is equally satisfactory for application on the shell threads only, in place of regular oxidation inhibitor. If mica-lube is used, the spark plug needs no additional anti-seize application before installation.

X. Storage

Plugs that are stored after rust-proofing can be placed back in empty new plug cartons and properly identified. Rack storage is also practical if the shell and electrode ends are covered with paper caps. In damp, humid and sea coast areas, place the rust-proofed plugs in a closed cabinet, heated by a low wattage light bulb.

APPENDIX I

BASIC ISSUE ITEMS LIST

Section I. INTRODUCTION

1. General

This appendix is a list of basic issue items. It is composed of those items which make up the major end item of equipment and the operator's tools and equipment that are issued with the equipment and are required for stockage. For a list of repair parts for the equipment see appendix III.

2. Requisition Notes

a. Repair Part Identified by Federal Stock Number.

(1) If the exact item requisitioned is not furnished, or if other action is necessary, the exact nature of the action taken by the commodity command will be indicated by standard symbols on prescribed forms.

(2) When requisitioning an item, the requesting agency will order the listed item. However, the commodity command will take necessary action to issue the exhaust stock item until stock is exhausted, whether it be an individual item, kit, set, or assembly.

(3) Requisition for replacement of items that are the responsibility of commodity commands will be submitted to the commodity command indicated in materiel code number, column 1a.

b. Part to which Federal Stock Number has not been assigned. When requisitioning a C source (local procurement) item identified only by a manufacturer's part number, it is mandatory that the following information be furnished the supply officer:

(1) Manufacturer's code number (5 digit number preceding the colon in the descriptive column).

(2) Manufacturer's part number (the number, and sometimes letters, following the colon, (1) above). Dashes, commas, or other marks must be included exactly as listed.

(3) Noun name and dimensions, if necessary.

(4) Name of manufacturer of end item (from cover of TM or manufacturer's nameplate).

(5) Federal stock number of end item (from TM).

(6) Manufacturer's model number (from TM or name/data plate, preferably name/data plate).

(7) Manufacturer's serial number (from name/data plate).

(8) Any other information such as type, frame number, and electrical characteristics, if applicable.

(9) If DD Form 1348 is used, fill in all blocks except 4, 5, 6, and Remarks field, in accordance with AR 725-50. Complete form as follows:

(a) In blocks 4, 5, and 6, list manufacturer's code, and manufacturer's part number (as listed in description column).

(b) In Remarks field, list noun name (repair part), end item application (FSN of end item), manufacturer, model number (end item), serial number (end item), and any other pertinent information such as frame number, type, etc.

3. Explanation of Columns

a. Source, Maintenance, and Recoverability Code (col. 1).

(1) *Materiel numerical codes* (col. 1*a*). This column indicates the responsible commodity command for the materiel. The commodity commands responsible

for supply of items in this list are-

Code	*Type Materiel*
9	Ordnance materiel
11	Signal materiel

(2) *Source* (col. 1*b*). This column indicates the selection status and source for the listed item. Source code used in this list is-

Code	*Explanation*
C	Obtain through local procurement. If not available from local procurement, requisition through normal supply channels with a supporting statement of nonavailability from local procurement.

(3) *Maintenance level* (col. 1*c*). This column indicates the category of maintenance authorized to install the listed item. Maintenance level code used in this list is-

Code	*Explanation*
O	Organizational maintenance

(4) *Recoverability* (col. 1*d*). This column indicates whether unserviceable items should be returned for recovery of salvage. When no code is indicated, the item will be considered expendable. Recoverability code used in this list is-

Code	*Explanation*
R	Items which are economically repairable at direct and general support maintenance activities and are normally furnished by supply on an exchange basis.

b. Federal Stock Number (col. 2). This column indicates the Federal stock number which has been assigned by the Cataloging Division, Defense Logistics Services Center.

c. Description (col. 3). This column indicates the Federal item name (shown in capital letters) and any additional description required for supply operations. The manufacturer's code and part number are also included for reference.

Code	*Explanation*
70040	AC Spark Plug Division of General Motors Corp, Flint, Mich.
74545	Hubbell Harvey, Inc., Bridgeport, Conn.

d. Unit of Issue (col. 4). This column indicates the quantity to be requisitioned.

e. Quantity Authorized (col. 5). This column indicates the quantity of the listed item authorized for stockage to constitute the pre scribed load.

4. Abbreviations

cir	circular
dia	diameter
etc	et cetera (and so forth)
h	height
in	inch(es)
lg	length (long)
mm	millimeter(s)
mtl	metal
stght	straight

5. Suggestions and Recommendations

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 Technical Manual Parts Lists or Supply Manual 7, 8, or 9) 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 Commanding General, Headquarters, U. S. Army Weapons Command, ATTN: AMSWE-SMM-P, Rock Island Arsenal, Rock Island, Ill. 61202. One information copy will be provided to the individual's immediate supervisor (e.g., officer, noncommissioned officer, supervisor, etc.).

Section II. BASIC ISSUE ITEMS

(1) Source maintenance and recoverability code				(2)	(3)	(4)	(5)
(a) Material code	(b) Source	(c) Maintenance level	(d) Recover-ability	Federal stock number	Description	Unit of issue	Quantity authorized
					MAJOR COMBINATION The following item is to be requisitioned for initial issue only.		
9	--	--	--	4910-786-9271	KIT, SPARK PLUG CLEANING: (70040:5612478, type TK-2)	ea	--
					COMPONENTS OF MAJOR COMBINATION None authorized REPAIR PARTS None authorized.		
					TOOLS AND EQUIPMENT FOR: KIT, SPARK PLUG CLEANING: (70040:5612478, type TK-2)		
11	C	O	--	5935-552-4372	ADAPTER, CONNECTOR: 2 connector mating ends, stght shape, 5 contacts, 1 female, U-hollow, 2 female, flat at one end, 2 male, flat at other end, nonlocking, 1.078 lg x 1.438 dia in. (74545:5273L).	ea	1
9	C	O	--	4910-069-9348	ADAPTER, INDICATOR, SPARK PLUG CLEANER: 14-mm (70040: CL-79).	ea	1
9	C	O	--	4910-069-9351	ADAPTER, INDICATOR, SPARK PLUG CLEANER: 18-mm (70040: CL-95).	ea	1
9	C	O	--	4910-787-4329	ADAPTER, SLEEVE CLEANER: (70040: AV17-1)	ea	1
9	C	O	--	4910-356-8768	ADAPTER, SPARK PLUG CLEANER: rubber, 14 mm size spark plug accommodated, 2-13/16 in dia of shoulder, 2.00 in. dia of body, 1/2 in. h of body (70040: CL-82).	ea	1
9	C	O	--	4910-356-8769	ADAPTER, SPARK PLUG CLEANER: rubber, 18 mm size spark plug accommodated, 2-13/16 in. dia of shoulder, 2.00 in. dia of body, 1/2 in. h of body (70040: CL-98).	ea	1
9	C	O	--	4910-787-4332	CHEST METAL: (70040:5610523)	ea	1
9	C	O	--	4910-787-4334	CLEANER, VIBRATOR, SPARK PLUG: (70040: AV19-3).	ea	1
9	C	O	--	4910-787-4333	CLEANING COMPOUND, INSULATOR SLEEVE: (70040: AV7-1).	ea	1
9	C	O	--	4910-787-4330	CLEANING COMPOUND, SPARK PLUG: (70040: CL-3)	ea	6

(1) Source maintenance and recoverability code				(2)	(3)	(4)	(5)
(a) Material code	(b) Source	(c) Maintenance level	(d) Recover-ability	Federal stock number	Description	Unit of issue	Quantity authorized
					TOOLS AND EQUIPMENT FOR-Continued		
					KIT, SPARK PLUG CLEANING-Continued		
9	C	O	--	4910-787-4328	GAGE, GAP SETTING: (70040: AV14-1)	ea	1
9	C	O	--	4910-787-4325	GAGE, SPACER, FIXED: (70040: CL-258)	ea	4
9	C	O	--	4910-787-4326	HOLDER, SPARK PLUG: (cleaning tool, 2 blade) (70040: CL-248).	ea	4
9	C	O	--	6650-256-9058	MAGNIFIER: monocular, two cir lens, selfillumi-nated, 2 in. dia, 5 power, plastic frame, plastic or mtl.	ea	1
9	C	O	--	4910-018-5301	TERMINAL CONTACTOR, SPARK PLUG CLEAN-ER: (70040: CL-235).	ea	1
9	C	O	--	4910-018-5302	TERMINAL CONTACTOR, SPARK PLUG CLEAN-ER: (70040: CL-238).	ea	1
9	C	O	--	4910-789-0930	TOOL, SLEEVE CLEANER, SPARK PLUG: (70040: CL-241).	ea	1
9	C	O	--	4910-787-4327	TOOL, SPARK PLUG GAPPING: (70040: AV20-3)	ea	1
9	C	O	--	----------	TRAY, SPARK PLUG: (70040: CL-237) The following equipment used In conjunction with the spark plug cleaning kit is to be requisitioned on an "as required" basis.	ea	1
9	C	O	--	4910-056-7251	CLEANING TOOL: 2 blade (70040: CL-251)	ea	1
9	C	O	--	4910-056-7253	CLEANING TOOL: lh (70040: CL-273)	ea	1
9	C	O	--	4910-078-4963	CLEANING TOOL: rh (70040: CL-274)	ea	1
9	C	O	--	4910-056-7249	GAP SPACER: (70040: CL-277)	ea	1
9	C	O	--	4910-056-7250	GAP SPACER: (70040: CL-250)	ea	1
9	C	O	--	4910-056-7252	TOOL HOLDER: (70040: CL-272)	ea	1

Section II. MAINTENANCE ALLOCATION CHART

(1) Group No.	(2) Components and related operations	(3) Category of maintenance				
		(a) O/C	(b) O	(c) DS	(d) GS	(e) D
1	Kit, Spark Plug Cleaning					
	Service	x				
	Adjust	x				
	Inspect	x				
	Replace		x			

APPENDIX II

MAINTENANCE ALLOCATION

Section I. INTRODUCTION

1. Purpose

The maintenance allocation chart allocates specific maintenance operations to the proper category of maintenance.

2. Basis

Allocation of maintenance operations is made on the basis of time, tools, and skills normally available to the various categories of maintenance in a combat situation and influenced by maintenance policy and sound maintenance practices, as outlined in AR 750-5.

3. Explanation and Definitions

The maintenance allocation chart designates overall responsibility for the maintenance function on an end item or assembly. Repair and/or rebuild of major assemblies is designated by authority of the Army commander representative, except for the specific subfunctions listed in the maintenance allocation chart. Deviation from maintenance operations allocated in the maintenance allocation chart is authorized only upon approval of the Army commander representative.

Service-To clean, to preserve, and to replenish fuel and lubricants.

Adjust-To prevent or correct malfunction by maintaining prescribed limits or by bringing into proper or exact position.

Inspect-To verify serviceability and to detect incipient electrical or mechanical failure by scrutiny.

Replace-To substitute serviceable assemblies, subassemblies, and parts for unserviceable components.

Symbol X-The symbol X placed in the appropriate column indicates the maintenance category responsible for performing that particular. maintenance operation, but does not necessarily indicate that repair parts will be stocked at that level. Maintenance categories higher than the maintenance category marked by X are authorized to perform the indicated operation.

APPENDIX III

REPAIR PARTS AND SPECIAL TOOL LISTS

Section I. INTRODUCTION

1. General

a. This appendix is a list of repair parts which may be required by the using organization for performing organizational maintenance but are not authorized to be stocked. These items are to be requisitioned as required for immediate use only.

b. For prices of items listed herein, see the appropriate supply manual of the 9-2 series. Prices of items that are the responsibility of other commodity commands may be obtained from the appropriate type 2 supply manuals for those commands.

c. Additional applications of items in this manual are listed in the supply manuals of the 9-3 series.

2. Requisition Notes

See appendix I, paragraph 2a.

3. Explanation of Columns

a. Source, Maintenance, and Recoverability Code (col. 1).

(1) *Materiel Numerical Codes* (col. 1*a*). This column indicates the responsibility commodity command for the materiel. The commodity command responsible for supply of items in this list is-

Code	*Type Materiel*
9	Ordnance

(2) Source (col. 1b). This column indicates the selection status and source for the listed item. Source code used in this list is-

Code	*Explanation*
C	Obtain through local procurement. If not obtainable from local procurement, requisition through normal supply channels with a supporting statement of nonavailability from local procurement.

(3) *Maintenance level* (col. 1*c*). This column indicates the category of maintenance authorized to install the listed item. Maintenance level code used in this list is-

Code	*Explanation*
O	Organizational maintenance

(4) *Recoverability* (col. 1d). This column indicates whether unserviceable-items should be returned for recovery or salvage. When no code is indicated, the item will be considered expendable.

b. Federal Stock Number (col. 2). This column indicates the Federal stock number which has been assigned by the Cataloging Division, Defense Logistics Services Center.

c. Description (col. 3). This column indicates the Federal item name (shown in capital letters) and any additional description required for supply operations. The manufacturer's code and part number is also included for reference,

Code	*Explanation*
70040	AC Spark Plug Division of General Motors Corp, Flint, Michigan

d. Unit of Issue (col. 4). This column indicates the quantity to be requisitioned.

e. Quantity Incorporated in Unit (Col. 5). This column indicates the total number of times the listed item is used in the end item (major item) or major combination. Where no quantity is shown, reference should be made to the first appearance of the item as indicated in the description column.

f. 15-Day Maintenance Allowance (col. 6). This column indicates the quantitative allowance for the organization maintenance category of the listed items. These allowance represent one prescribed load, for a 15-day period, for the number of major items supported. They must be on hand or on order at all times. Major commanders will determine the number of prescribed loads organizational units

will carry. Units and organizations authorized additional prescribed loads will multiply the number of equipments supported by the number of prescribed loads. Additional repair parts which may be required for performing authorized maintenance, but are not authorized for stockage in the prescribed load, are indicated by an asterisk (*). These items are to be requisitioned, as required, for immediate use only. Where no quantity is shown, reference should be made to the first appearance of the item as indicated in the description column.

4. Special Information

Basic issue items are listed in appendix II of this manual.

5. Abbreviations and Symbols

a. Abbreviations.

cntr ..... container
deg ..... degree(s)
dr ..... drum
ea ..... each
F ..... Fahrenheit
Fed ..... Federal
fl ..... flat
ga ..... gage
gal ..... gallon(s)
hr ..... our(s)
in. ..... inch (es)
lb ..... pound
lg ..... length (long)
lt ..... light (weight)
max ..... maximum
MIL ..... military
min ..... minute
mtl ..... metal
No. ..... number
oz ..... ounce (s)
pt ..... point
qt ..... quart(s)
S ..... steel
sq ..... square
thk ..... thick (ness)
w. ..... wide, width
w/ ..... with
yd ..... yard (s)

b. Symbols.

‡ ..... as required
* ..... see para. 3*f*

6. Suggestions and Recommendations

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 Technical Manual Parts Lists or Supply Manual 7, 8, or 9) 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 Commanding General, Headquarters, U. S. Army Weapons Command, ATTN: AMSWE-SMM-P, Rock Island Arsenal, Rock Island, Ill. 61202. One information copy will be provided to the individual's immediate supervisor (e.g., officer, noncommissioned officer, supervisor, etc.).

Section II. REPAIR PARTS AND SPECIAL TOOLS

(1) Source maintenance and recoverability code				(2)	(3)	(4)	(5)	(6)
(a) Material code	(b) Source	(c) Maintenance level	(d) Recover-ability	Federal stock number	Description	Unit of issue	Quantity incorporated in unit	15-day maint. allowance per 1-6 Equipments
					REPAIR PARTS FOR SPARK PLUG CLEANER AND INDICATOR			
9	C	O	--	4910-069-9347	BAIL ASSEMBLY, CONTAINER, SPARK PLUG CLEANER: (70040: CL-76)	ea	1	*
9	C	O	--	4910-069-9346	BUSHING, SPARK PLUG CLEANER: S ru nozzle (70040: CL-72)	ea	1	*
9	C	O	--	4910-069-9354	FILTER ELEMENT, WATER TRAP, SPARK PLUG CLEANER: (70040: CL-110)	ea	1	*
9	C	O	--	4910-072-0743	GASKET, COMPOUND CONTAINER: Spark plug cleaning kit, type TK-2 (70040: CL-75)	ea	1	*

(1) Source maintenance and recoverability code				(2)	(3)	(4)	(5)	(6)
(a) Material code	(b) Source	(c) Maintenance level	(d) Recover-ability	Federal stock number	Description	Unit of issue	Quantity incorporated in unit	15-day maint. allowance per 1-6 Equipments
9	C	O	--	4910-787-4331	NOZZLE, ABRASIVE: (70040: CL-73)	ea	1	*
9	C	O	--	4910-069-9345	NOZZLE ASSEMBLY, SPARK PLUG CLEANER: (70040: CL-71)	ea	1	*
9	C	O	--	4910-357-1778	PARTS KIT, SPARK PLUG CLEANER AND TESTER: compression chamber glass (70040: CL-109)	ea	1	*
9	C	O	--	4910-069-9350	SLEEVE, FILTER, SPARK PLUG CLEANER: (70040: CL-88)	ea	1	*
9	C	O	--	4910-069-9355	WASHER, RESTRICTION, SPARK PLUG CLEANER: (70040: CL-116) The following parts are not authorized for replacement by organizational maintenance Casting, mixing chamber (70040: CL-115). Clamp, lower filter sleeve (70040: CL-86). Clamp, upper, filter sleeve (70040: CL-105). Connector extension (70040: CL-113). Contactor arm assembly (70040: CL-103). Container, compound (70040: CL-101). Cover, valve (70040: CL-85). Gage, indicator, assembly Cover, valve (70040: CL-85). (70040: CL-240) Gasket, housing, mixing chamber (70040: CL-102). Gasket, valve cover (70040: CL-93). Grommet, sealing, push button switch (70040: CL-135). Hood, abrasive deflector (70040: CL-84). Housing, compression chamber (70040: CL-106). Kit, valve assembly (70040: CL-92). Knob assembly, needle valve (70040: CL-89).	ea	1	*

(1) Source maintenance and recoverability code				(2)	(3)	(4)	(5)	(6)
(a) Material code	(b) Source	(c) Maintenance level	(d) Recover-ability	Federal stock number	Description	Unit of issue	Quantity incorporated in unit	15-day maint. allowance per 1-6 Equipments
					Knob assembly, push button switch (70040: CL-77) . Lever, air or compound blast (70040: CL-99). Needle valve assembly (70040: CL-90). Nozzle, air jet (70040:64). Plug, valve (70040: CL-108). Retaining ring, adapter. Screw, retaining (70040: CL-96) Spring, valve (70040:17). Switch, push button (70040: CL-104). Transformer (70040: CL-78). Tube, compound (70040: CL-100). Washer, spacer, retaining screw (70040: CL-81). Water trap assembly (70040: CL-107). SPECIAL TOOLS None authorized TOOLS AND EQUIPMENT None authorized			

By Order of the Secretary of the Army:

EARLE G. WHEELER,
General, United States Army,
Chief of Staff.

Official:

J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

Distribution:

Active Army:

Distribution:

To be distributed in accordance with DA Form 12-31 requirements for Organizational Maintenance instructions for all fixed and rotor wing aircraft.

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RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

THEN...JOT DOWN THE DOPE ABOUT IT ON THIS FORM. CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL.

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BE EXACT PIN-POINT WHERE IT IS

PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.

IN THIS SPACE, TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT.

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DA FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ARE OBSOLETE.

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

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 decigram = .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 milliters = .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

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
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 temperature	5/9 (after subtracting 32)	Celsius temperature	°C

PIN: 006028-000