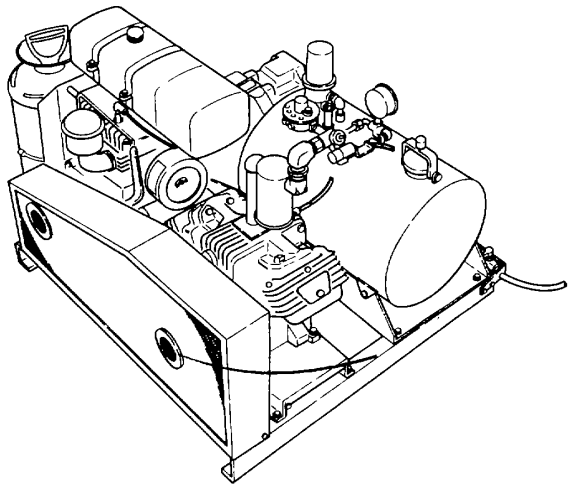
TECHNICAL MANUAL

OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE MANUAL

AEROSOL GENERATOR, NON-THERMAL, INSECTICIDE, ULTRA-LOW VOLUME

MODEL XKA

(NSN 3740-01-076-1341)



HEADQUARTERS, DEPARTMENT OF THE ARMY
1 DECEMBER 1981

CHANGE

NO. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 22 October 1990

Operator's, Organizational, Direct Support, and General Support
Maintenance Manual

AEROSOL GENERATOR, NON-THERMAL,
INSECTICIDE, ULTRA-LOW VOLUME
MODEL XKA
(NSN 3740-01-076-1341)

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TM 5-3740-214-14, 1 December 1981, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
2-17 and 2-18	2-17 and 2-18
4-29 and 4-30	4-29 and 4-30
4-49 and 4-50	4-49 and 4-50
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5-57 and 5-58	5-57 and 5-58
5-121 and 5-122	5-121 and 5-122
5-259 and 5-260	5-259 and 5-260

2. Retain this sheet in front of manual for reference purposes.

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

THOMAS F. SIKORA
Brigadier General, United States Army
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WARNING

CARBON MONOXIDE (EXHAUST GAS) WILL KILL YOU

Carbon monoxide does not have any color and it does not have a smell. If it is breathed in it will cause headaches, dizziness, sleepiness and you may lose control of your arms and legs. Carbon monoxide is present in the exhaust fumes of gasoline driven engines.

- DO NOT operate the ULV Aerosol Generator engine in a closed place.

- BE ALERT at all times during operation of the aerosol generator for exhaust odors or exposure symptoms. If symptoms are evident in any personnel, remove them to fresh air and keep them warm. DO NOT PERMIT PHYSICAL EXERCISE. Give artificial respiration if necessary.

WARNING

INSECTICIDES CAN BE HAZARDOUS TO YOUR HEALTH

The insecticides used in the aerosol generator can be fatal if swallowed, breathed into the lungs, or absorbed through the skin.

- DO NOT generate an insecticide aerosol inside a closed place. If insecticide fog is breathed, follow the treatment instructions outlined on the insecticide label.

- BE ALERT at all times when handling the insecticides. If the insecticide comes in contact with the skin, follow the treatment instructions outlined on the insecticide label.

- DO NOT breathe the insecticide aerosol. If it is breathed go to a well ventilated area and follow instructions outlined on the insecticide label.

- Wash hands after contacting insecticide or parts covered with insecticide.

WARNING

FLUSHING SOLVENTS AND GASOLINE CAN BE EXPLOSIVE AND HAZARDOUS TO YOUR HEALTH.

Gasoline and the flushing solvents recommended for use in the aerosol generator are flammable. Under the proper conditions they can be explosive. If their vapors are breathed for a long period of time they will cause dizziness and faintness.

· DO NOT smoke or have an open flame near the gasoline containers.

· DO NOT smoke or have an open flame near the aerosol generator, when adding gasoline or flushing solvent to their tanks.

· DO NOT store gasoline or flushing solvent containers in the cab of the truck.

· DO NOT breathe gasoline or flushing solvent vapors for long periods of time. If exposed to the vapors for a long period of time go to a well ventilated area.

WARNING

DRY CLEANING SOLVENT, P-D-680 IS POTENTIALLY DANGEROUS. AVOID REPEATED AND PROLONGED BREATHING OF VAPORS AND SKIN CONTACT WITH THELIQUID. DO NOT USE NEAR OPEN FLAME OR EXCESSIVE HEAT. USE IN A WELLVENTILATED AREA. THE FLASH POINT OF THIS SOLVENT IS 100°F - 138°F (38°C - 59°C).

WARNING

CARELESS WORKING HABITS WILL CAUSE SEVERE INJURIES SOMETIMES DEATH.

Careless working habits are one of the greatest causes of injuries, accidents and accidental deaths.

· BE SURE to follow all instructions before operating the aerosol generator.

· BE SURE the Aerosol Generator is ready for operation before starting it.

DO NOT rush through or skip any of the instructions.

Hazard signs, if required, will be furnished and attached to the aerosol generator and shall state the following:

WARNING

HEARING PROTECTION REQUIRED.

TECHNICAL MANUAL

No. 5-3740-214-14

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 1 December 1981

Operator, Organizational, Direct Support and General Support Maintenance Manual

ULV AEROSOL GENERATOR, XKA

REPORTING OF ERRORS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended change to Publications and Blank Forms) or DA Form 2028-2 located in the back of this manual directly to: Commander, U.S. Army Troop Support & Aviation Materiel Readiness Command, ATTN: DRSTS-MTT, 4300 Goodfellow Boulevard, St. Louis, MO 63120. A reply will be furnished you.

Table of Contents

Table of Contents (Continued)

LIST OF TABLES

CHAPTER 1
INTRODUCTION

Section I. GENERAL INFORMATION

SCOPE

Type of Manual. Operator, Organizational, Direct Support and General Support Maintenance Manual.

Model Number and Equipment Name: Model XKA, ULV Aerosol Generator.

Purpose of Equipment. The ULV Aerosol Generator is designed to produce an insecticide aerosol that will effectively kill mosquitoes and other flying insects.

Special Limitations

a. Use of the ULV Aerosol Generator is limited to those insecticides specifically manufactured for (ULV) Ultra Low Volume ground equipment. No other insecticide should be used in the ULV aerosol generator.

b. Use of the ULV Aerosol Generator is limited by wind velocity. If the wind velocity is greater than 10 mph, it will carry the aerosol away and decrease its effectiveness in the spraying area.

c. Use of the aerosol generator is limited by outside temperature and time of day. On hot or warm days the heat rising from the ground will carry the aerosol away from the spraying area. The best time to spray is when the outside temperature is cool such as in the late evening, at night, or in the early morning.

MAINTENANCE FORMS RECORDS AND REPORTS

Department of the Army forms and procedures used for equipment maintenance will be prescribed by TM 38-750, The Army Maintenance Management System. Hand receipts for the End Item/Components of End Item (COEI), Basic Issue Items (BII), and Additional Authorization List (AAL) items are published in a Hand Receipt Manual. The Hand Receipt Manual numerical designation is the same as the related technical manual with the letters HR added to the number. These manuals are published to aid in property accountability and are available through: Commander, U.S. Army Adjutant General, Publication Center, 2800 Eastern Boulevard, Baltimore, MD 21220.

DESTRUCTION OF ARMY MATERIAL TO PREVENT ENEMY USE

Command decision, according to the tactical situation, will determine when the destruction of the ULV Aerosol Generator will be accomplished. A destruction plan will be prepared by the using organization, unless one has been prepared by a higher authority. For general destruction procedures for this equipment, refer to TM 750-244-3, Procedures for Destruction of Equipment, to prevent Enemy Use (Mobility Equipment Command).

PREPARATION FOR STORAGE OR SHIPMENTI

See Chapter 5, Section VI for storage and shipment information.

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)
EIR can and must be submitted by anyone who is aware of an unsatisfactory condition with the equipment design or use. It is not necessary to show a new design or list a better way to perform a procedure, just simply tell why the design is unfavorable or why a procedure is difficult. EIR may be submitted on SF 368, Quality Deficiency Report. Mail directly to Commander, US Army Troop Support and Aviation Materiel Readiness Command, ATTN: DRSTS-MEM, 4300 Goodfellow Blvd., St. Louis, MO 63120. A reply will be furnished to you.

Section II. EQUIPMENT DESCRIPTION DATA

PURPOSE, CAPABILITIES and FEATURESI

Purpose

The ULV Aerosol Generator is designed to provide an effective method for controlling mosquitoes and other flying insects.

Capabilities and Features

a. Produces a low volume low temperature insecticide aerosol.

b. The aerosol is long lasting, is widely dispersed by prevailing air currents, and remains close to the ground to ensure a high kill rate per gallon of insecticide.

c. An eight horsepower engine drives the aerosol generator.

d. The engine speed is controlled by a governor system.

e. The insecticide flow from the formulation tank to the discharge nozzle is carried by a reduced air pressure from the compressor.

f. The insecticide solution flows through a control panel. The control panel is mounted in the vehicle within reach of the driver.

g. The compressor provides 90-100 psi air pressure to a special nozzle assembly. The air blast through the nozzle assembly breaks up the insecticide solution into tiny aerosol size droplets.

h. A flush tank is provided for flushing the generator system after operation.

LOCATION and DESCRIPTION of MAJOR COMPONENTS

The aerosol generator is designed to be mounted on the back of a pickup truck or other suitable vehicle and operated from the driver's position. It is made up of seven major parts.

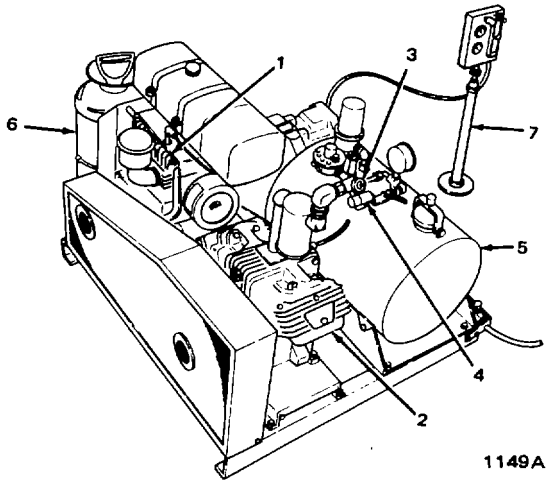


Figure 1-1. ULV Aerosol Generator

ULV AEROSOL GENERATOR

ENGINE ASSEMBLY (1). Provides the power to drive the compressor.

COMPRESSOR (2). Provides low pressure air to pressurize the formulation tank and air pressure at 90-100 psi to discharge nozzle assembly to generate the insecticide aerosol.

NOZZLE ASSEMBLY (3). The air blast through the discharge nozzle breaks up the insecticide solution into tiny aerosol droplets.

SOLENOID VALVE (4). Turns on and off the insecticide flow to the nozzle assembly.

FORMULATION TANK (5). Acts as a holding tank for the insecticide. Tank allows the operator to carry a supply of insecticide. The tank is maintained at a pressure less than 15 psi.

FLUSH TANK (6). Allows the operator to flush out the aerosol generator system without draining the formulation tank.

REMOTE CONTROL PANEL (7). Allows the operator to run the unit from the driver's position.

NOZZLE ASSEMBLY

FLUID NOZZLE (1). Supplies an insecticide solution and high pressure air to the air cap.

AIR CAP (2). Directs a compressed air blast around and across the insecticide stream. This action breaks up the insecticide stream into tiny aerosol droplets.

KNURLED RING (3). Holds the air cap securely in place against the fluid nozzle.

TEFLON GASKET (4). Provides a seal between the fluid nozzle and the nozzle body.

NOZZLE BODY (5). Acts as connecting point for the rest of the nozzle assembly, the air line, and the solenoid valve.

SOLENOID VALVE (6). Turns on and off the flow of insecticide to the nozzle assembly.

ADJUSTING NUTS (7). Allows the operator to aim the nozzle assembly in a horizontal and/or a vertical direction.

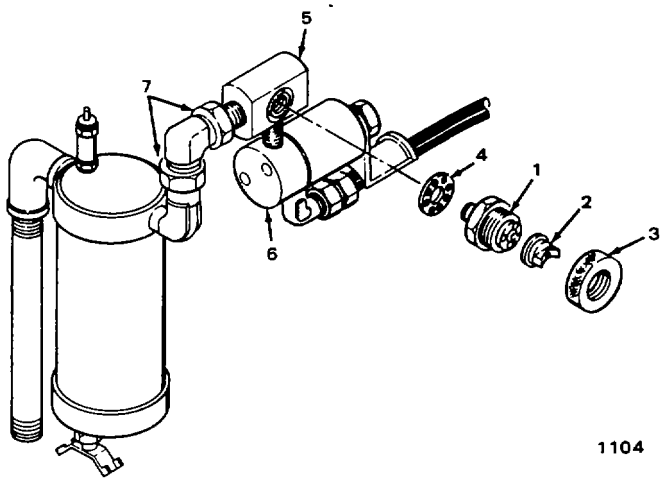


Figure 1-2. Nozzle Assembly

CONTROL PANEL

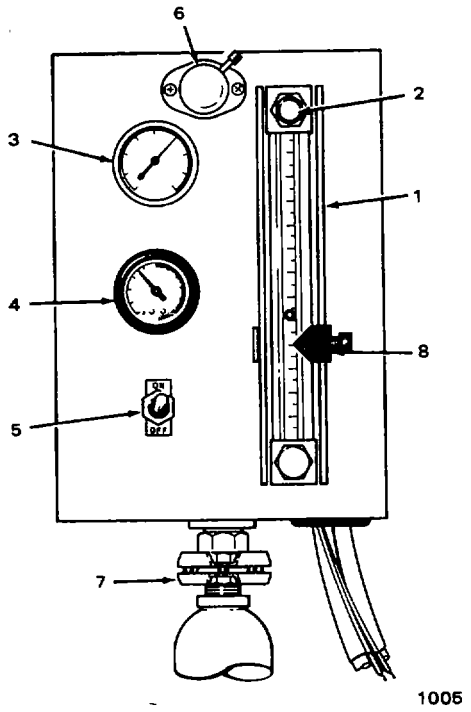


Figure 1-3. Controls and Indicators

The control panel is made up of eight major parts.

FLOW METER (1). Allows the operator to monitor the insecticide flow rate.

CONTROL NEEDLE VALVE (2). Allows the operator to regulate the insecticide flow rate.

TEMPERATURE GAGE (3). Allows the operator to monitor the insecticide temperature.

PRESSURE GAGE (4). Allows the operator to monitor the air pressure produced at the nozzle assembly.

SOLENOID VALVE SWITCH (5). Allows the operator to turn the insecticide flow on and off from the drivers position.

CONTROL PANEL LIGHT (6). Lights up the control panel for night-time operations.

UNIVERSAL JOINT (7). Allows the operator to adjust the control panel to a perpendicular position. If the flow meter is not pointing straight up and down, the flow rate reading during operation will be incorrect.

FLOW POINTER INDICATOR (8). Indicates the correct point for the float ball to reach during operations. The pointer shows the correct flow rate for the insecticide being sprayed.

Section III. TECHNICAL PRINCIPLES OF OPERATION AND MAINTENANCE SPECIFICATIONS

MAJOR COMPONENTS

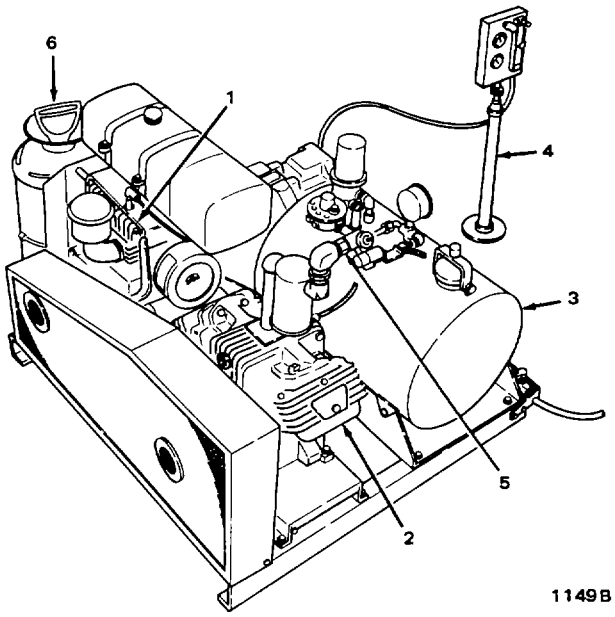


Figure 1-4. ULV Aerosol Generator

The aerosol generator is mounted on the back of a pick-up or other suitable vehicle. The vehicle is driven at right angles to the prevailing wind current. Each pass of the vehicle will cover a 300 foot width swath.

ENGINE (1). Drives the compressor.

COMPRESSOR (2). Pressurizes the formulation tank to less than 15 psi and blasts air through the nozzle assembly to produce the insecticide aerosol.

FORMULATION TANK (3). Contains up to 15 gallons of insecticide mixture.

CONTROL PANEL (4). Controls insecticide flow rate.

DISCHARGE NOZZLE (5). Air blasts through the discharge nozzle and breaks up the insecticide solution into fine aerosol droplets.

FLUSH TANK (6). Allows operator to rinse out the discharge hoses, flow meter, solenoid valve, and nozzle assembly without draining formulation tank. It is used when aerosol generator will be operated again within 3-day period.

MAINTENANCE SPECIFICATIONS

Aerosol Generator

Length ..... 44 in. (111.76 cm)
Width..... 34.75 in. (88.27 cm)
Height..... 28.50 in. (72.39 cm)
Dry Weight (with oil in crankcases) ..... 338 lbs (153.45 kg)

Control Panel

Length ..... 6 in. (15.24 cm)
Width..... 1 in. (17.78 cm)
Height..... 31 in. (78.74 cm)
Weight (with harness) ..... 10 lbs (4.54 kg)

Shipping Weight and Dimensions

Shipping Box ..... 44.9 cu ft (1.3 cu M)
Length ..... 54 in. (137.7 cm)
Width..... 41 in. (104.1 cm)
Height..... 35 in. (88.9 cm)
Weight..... 670 lbs (304.2 kg)

Recommended Air Nozzle Pressures and Engine and Compressor rpm's for the Aerosol Generator

Do not operate at less than 90 psi or more than 105 psi nozzle air pressure. Median nozzle air pressure is 97-98 psi.

At 90 psi, normal compressor rpm is 950 ± 10%, at 70°F (21.1°C) and 800 ft. (243.8M) altitude. At 90 psi, normal engine rpm is 2540 ± 10%, at 70°F (21.1°C) and 800 ft. (243.8M) altitude.

At 97-98 psi, normal compressor rpm is 1025 ± 10%, at 70°F (21.1°C) and 800 ft. (243.8M) altitude. At 97-98 psi, normal engine rpm is 2750 ±10%, at 70°F (21.1°C) and 800 ft. (243.8M) altitude.

At 105 psi, normal compressor rpm is 1100, ± 10%, at 70°F (21.1°C) and 800 ft. (243.8M) altitude. At 105 psi, normal engine rpm is 2950 ± 10%, at 70°F (21.1°C) and 800 ft. (243.8M) altitude.

Engine Oil

Initially the engine oil should be changed after the first 5 hrs of operation, then every 25 hrs thereafter.

LUBRICANT		**REFILL CAPACITY (APP)**	**EXPECTED TEMPERATURE**		
			Above 30°F	**30- 0°F**	**Below 30°F**
OE/HDO (MIL-L-2104C)	Lubricating oil Internal combustion engine, heavy duty	1 qt	**OE/HDO** 30	**OE/HDO** 10-30	**OE/HDO** 5-20

Compressor Oil

Use 1.5 pts of Anderol 500 (FSN 9150-01-0052-7562) or Amsoil Synthetic Reciprocating Compressor Oils, or equivalent. Drain the crankcase and change the oil after 200 hrs of operation or sooner if dirty.

MAINTENANCE SPECIFICATIONS (Continued)

Compressor Air Filter

Do not attempt to clean the compressor air filters. Replace them after 75 hrs of operation or sooner as necessary.

Nozzle Separator Filter

Clean the separator filter as necessary and replace it after 200 hrs of operation.

Formulation Tank Filter

Clean the formulation tank filter after 200 hrs of operation and replace it as necessary.

Flush Tank Filter

Replace the flush tank filter as necessary.

Fan Belt Deflection

The fan belt deflection should be 5/16" (6.35 mm), when a pressure of 5 to 8 lbs (2.27 to 3.63 kg) is applied midway between the belts.

Battery Specific Gravity Specifications

Specific Gravity	Battery Condition
1.250 to 1.280	Good
1.225 to 1.250	Fair
1.150 to 1.225	Poor
below 1.150	Replace

NOTE

If the specific gravity in one cell is more than 0.050 less than the other cells and charging does not return the cell to 50% of a normal charge replace the battery.

ENGINE SPECIFICATIONS AND WEAR TOLERANCES

Specification

Engine Kohler Model; K181S, Specification No. PA-30662D
Displacement
- Cubic In ..... 18.6 $in.^3$
- Cubic Centimeters ..... 304.8 (cm^3)

Horsepower (Max rpm) ..... 8.0 hp
Cylinder Bore
- New Diameter ..... 2.9375 in. (74.65 mm)
- Max Wear Diameter ..... 2.9405 in. (74.72 mm)
- Max Taper ..... 0.0025 in. (0.064 mm)
- Max Out of Round ..... 0.005 in. (0.13 mm)

Crankshaft
- End Play (Free) ..... 0.002/0.023 in. (0.051/0.58 mm)

ENGINE SPECIFICATIONS AND WEAR TOLERANCES (Continued)

Crankpin	
New Diameter	1.186 in. (30.14 mm)
Max Out of Round	0.0005 in. (0.013 mm)
Max Taper	0.001 in. (0.025 mm)
Camshaft	
Run Clear. on Pin	0.0005/0.003 in. (0.013/0.076 mm)
End Play	0.005/0.010 in. (0.13/0.25 mm)
Connecting Rod	
Big End Max Diameter	1.1885 in. (30.20 mm)
Rod-Crankpin Max Clear	0.0035 in. (0.089 mm)
Small (Pin) End-View Diameter	0.62565 in. (15.90 mm)
Rod to Pin Clear	0.0006/0.0011 in. (0.015/0.028 mm)
Piston	
Thrust Face-Max Wear Diameter	2.9305 in. (74.47 mm)
Thrust Face-Bore Clear	0.006/0.008 in. (0.15/0.20 mm)
Ring-Max Side Clear	0.006 in. (0.15 mm)
Ring-End Gap in New Bore	0.007/0.017 in. (0.18/0.43 mm)
Ring-End Gap in Used Bore	0.027 in. (0.69 mm)
Valve-Intake	
Valve-Tappet Cold Clear	0.006/0.008 in. (0.15/20 mm)
Valve Lift (Zero Lash)	0.2778 in. (7.06 mm)
Stem to Guide Max Wear Clear	0.0045 in. (0.114 mm)

Specification

Valve-Exhaust	
Valve-Tappet Cold Clear	0.015/0.017 in. (0.38/0.43 mm)
Valve Lift (Zero Lash)	0.2542 in. (6.46 mm)
Stem to Guide Max Wear Clear	0.006 in. (0.15 mm)
Tappet	
Clear. in Guide	0.005/0.002 in. (0.013/0.51 mm)
Ignition	
Spark Plug Gap-Gasoline	0.025 in. (0.64 mm)
Spark Plug Gap-Gas	0.018 in. (0.46 mm)
Spark Plug Gap (Shielded)	0.020 in. (0.51 mm)
Breaker Point Gap	0.020 in. (0.51 mm)
Trigger Air Gap (Breakerless)	0.005/0.010 in. (0.13/0.25 mm)
Spark Run BTDC	20°
Spark Retard	3° BTDC (Acr-None)
Torque Values	
Spark Plug (ft-lbs)	18-22 (2.49/3.04 kg m)
Cylinder Head	15-20 ft-lbs (2.07/2.77 kg m)
Connecting Rod	200 in-lbs (2.30 kg m)
Flywheel Nut	50-60 ft-lbs (6.92/8.30 kg m)
Fuel Systems	
Fuel Tank	2.7 gal (10.22 L)
Carburetor Idle Jet Setting	Back the idle needle out 1-1/4 turns from full closed position
Carburetor Operational Jet Setting	Back the main fuel needle out 2 full turns from full closed position
Carburetor Float Setting	11/64 in. + 1/32 in. (0.044 mm ± 0.008 mm)

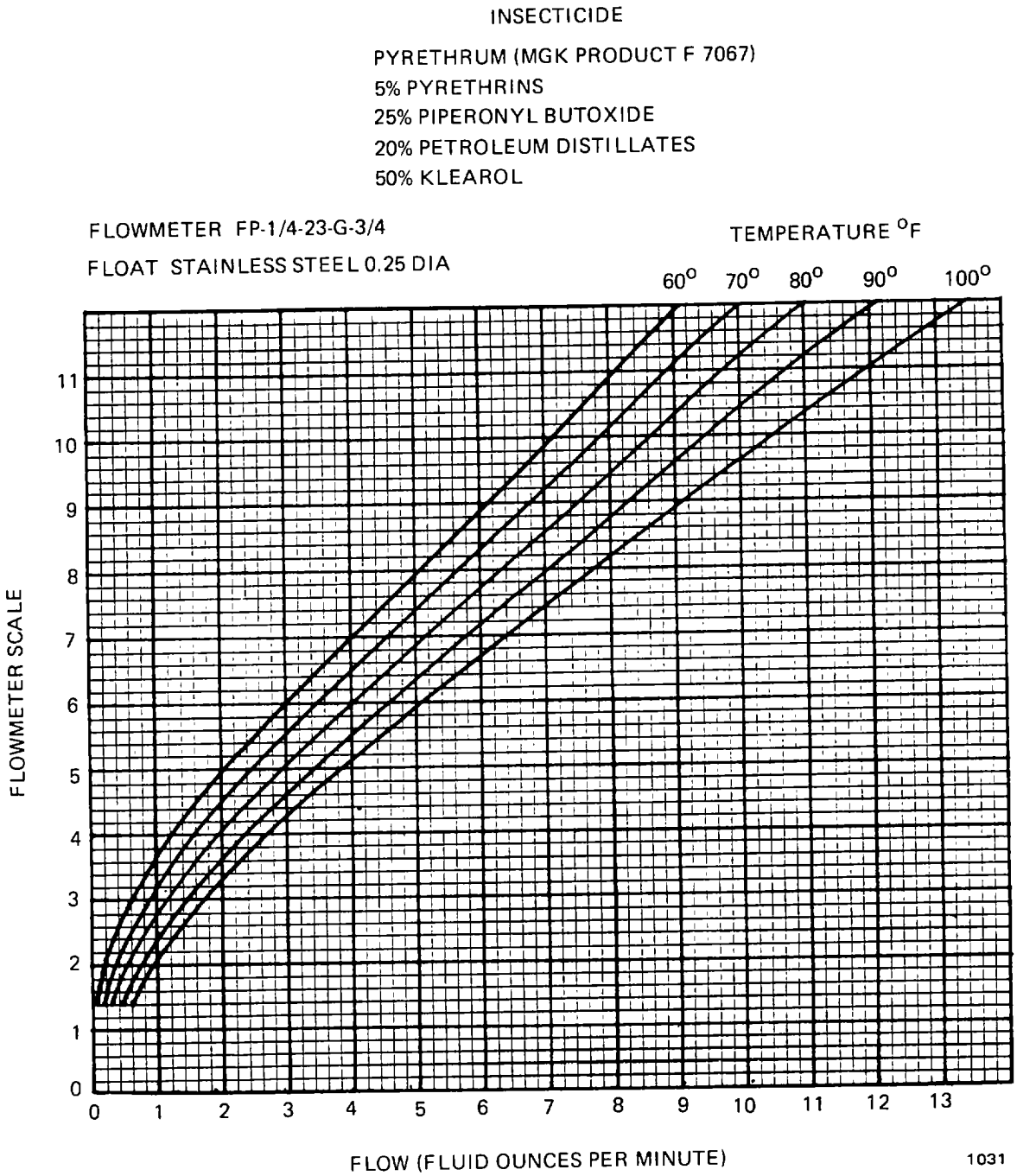


Figure 1-5. Pyrethrum Temperature Correction Curve

INSECTICIDE

FENTHION (BAYTEX® 29493, FORMULA 011061)
9.67 LB/GAL

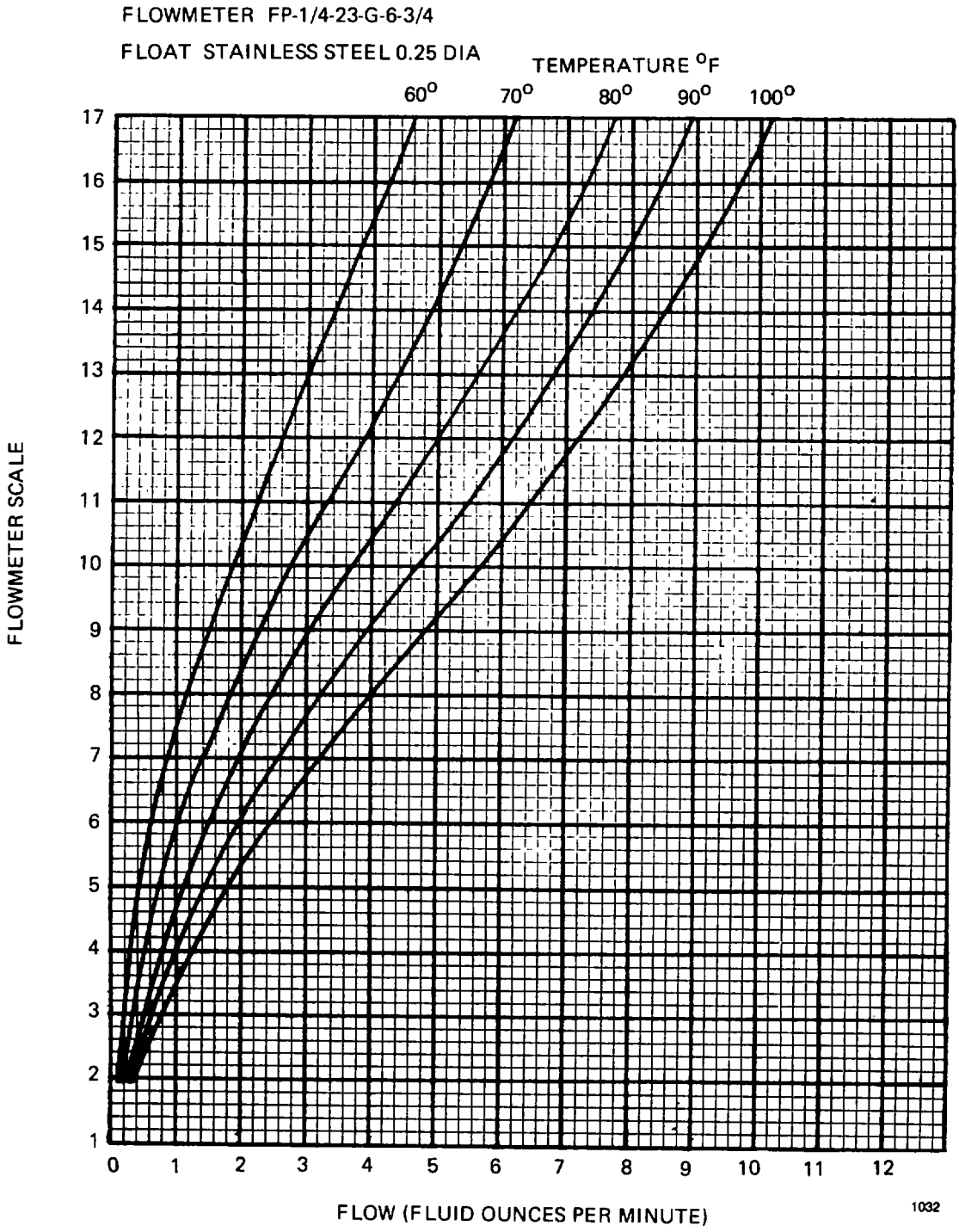


Figure 1-6. Fenthlon Temperature Correction Curve

INSECTICIDE

MALATHION (CYTHION ULV 24600-05 D48)
95% MALATHION
5% INERT
9.7 LB/GAL

FLOWMETER FP-1/4-23-G-6-3/4

FLOAT STAINLESS STEEL 0.25 DIA

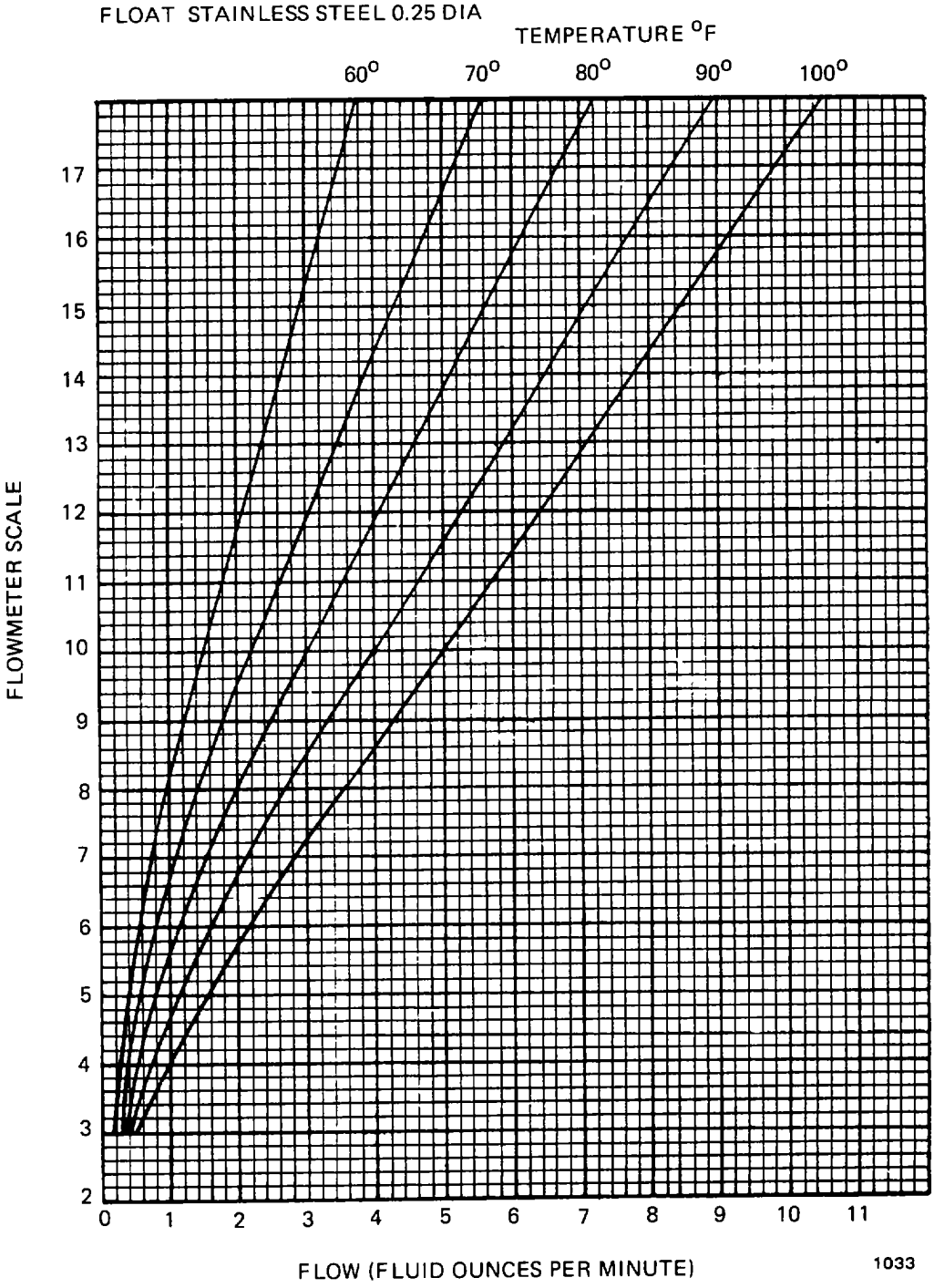


Figure 1-7. Malathion Temperature Correction Curve

INSECTICIDE

CHLORPYRIFOS (DOW MOSQUITO FOGGING CONC)
(FORMULA MN 03017)
61.5% CHLPYRIFOS
34.5% XYLENE
4.0% INERT
6 LB/GAL

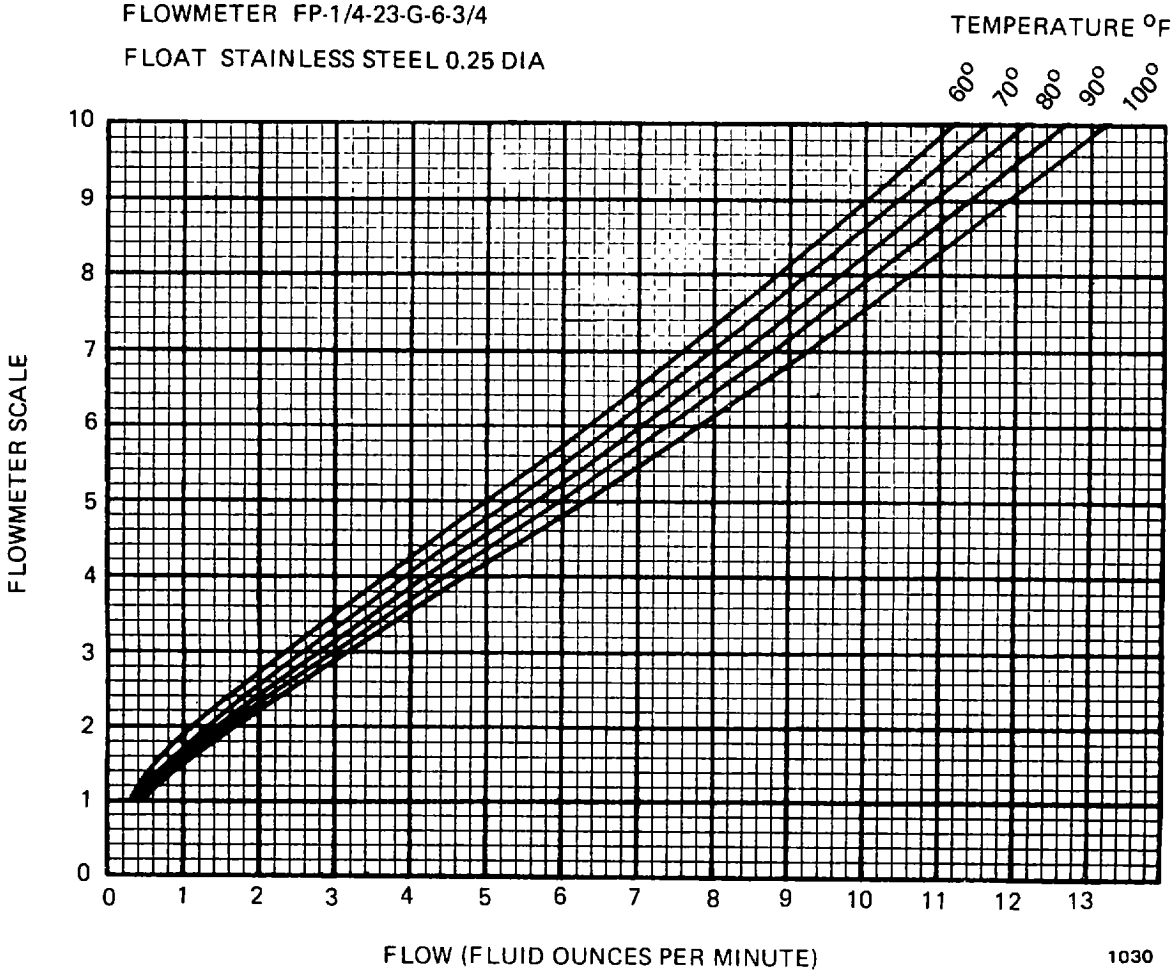


Figure 1-8. Chlorpyrifos Temperature Correction Curve

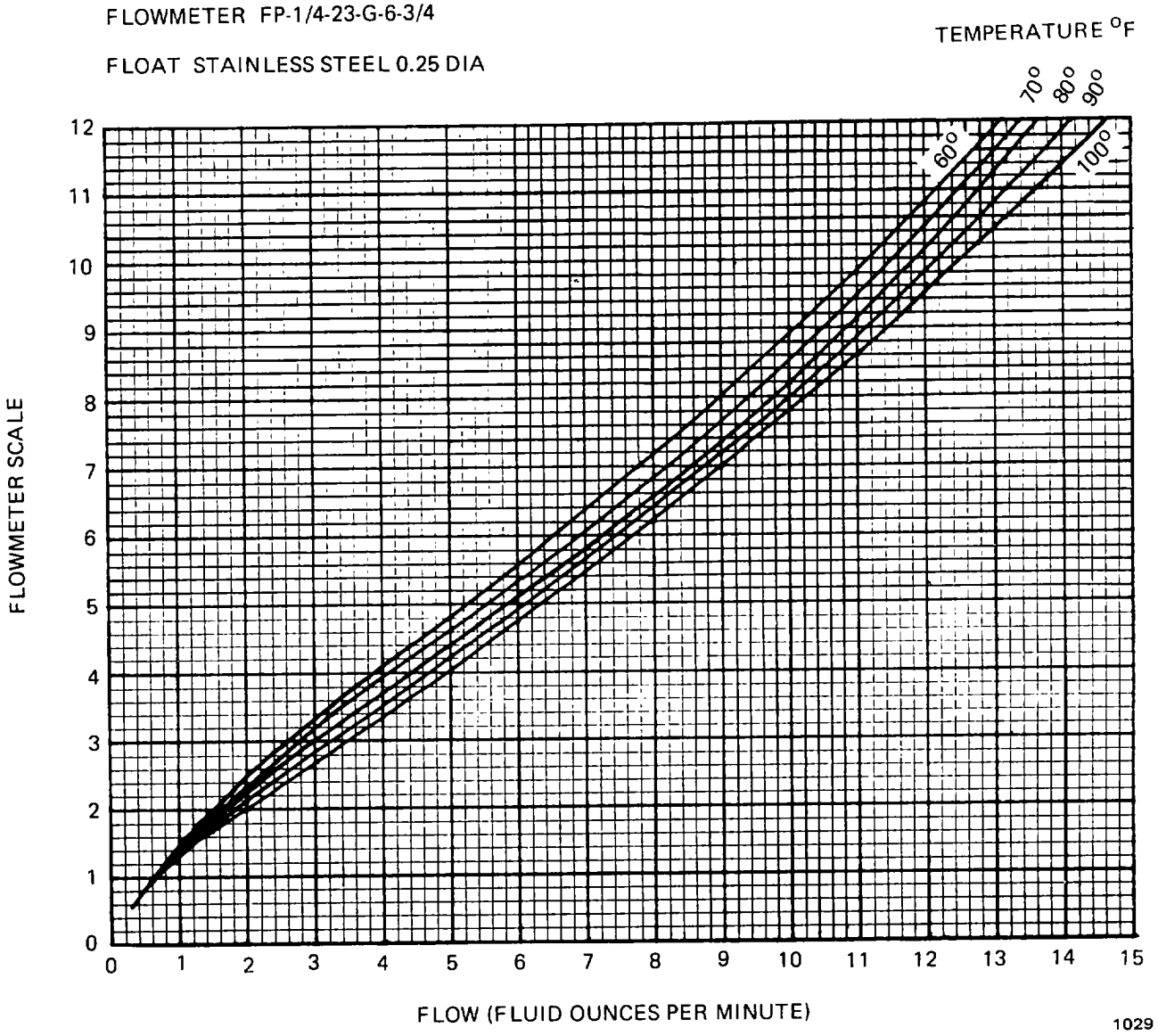


Figure 1-9. Naled Temperature Correction Curve

CHAPTER 2
OPERATING INSTRUCTIONS

Section I. GENERAL INFORMATION

CAB CONTROL PANEL

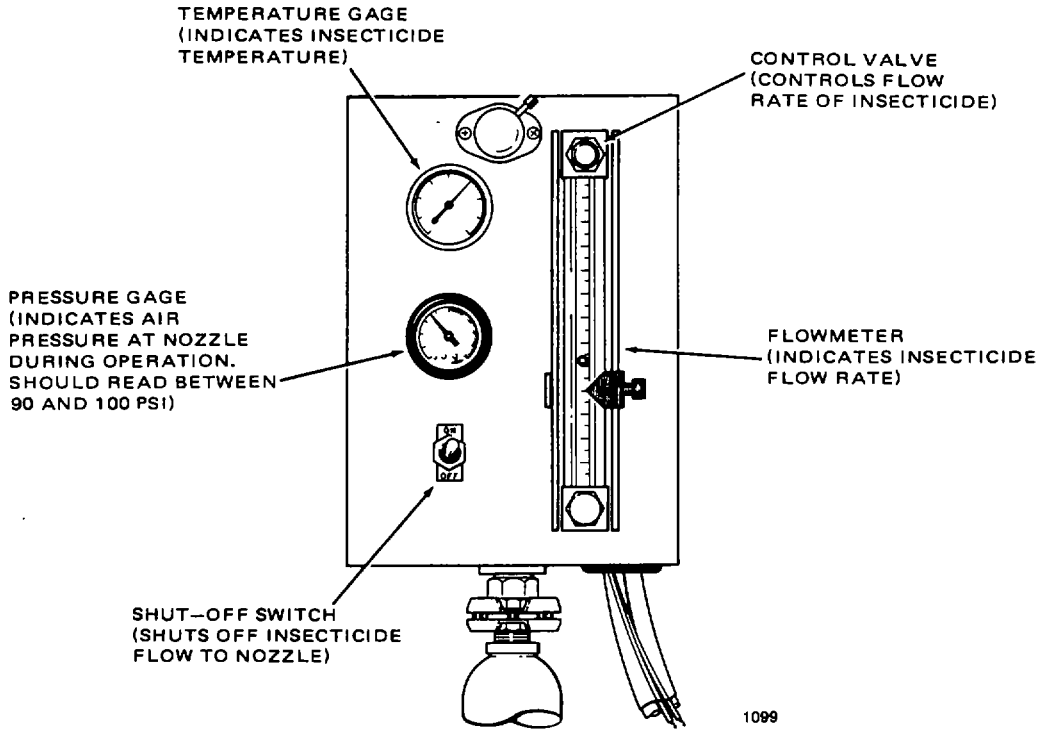


Figure 2-1. Cab Control Panel

TANK PRESSURE GAGE

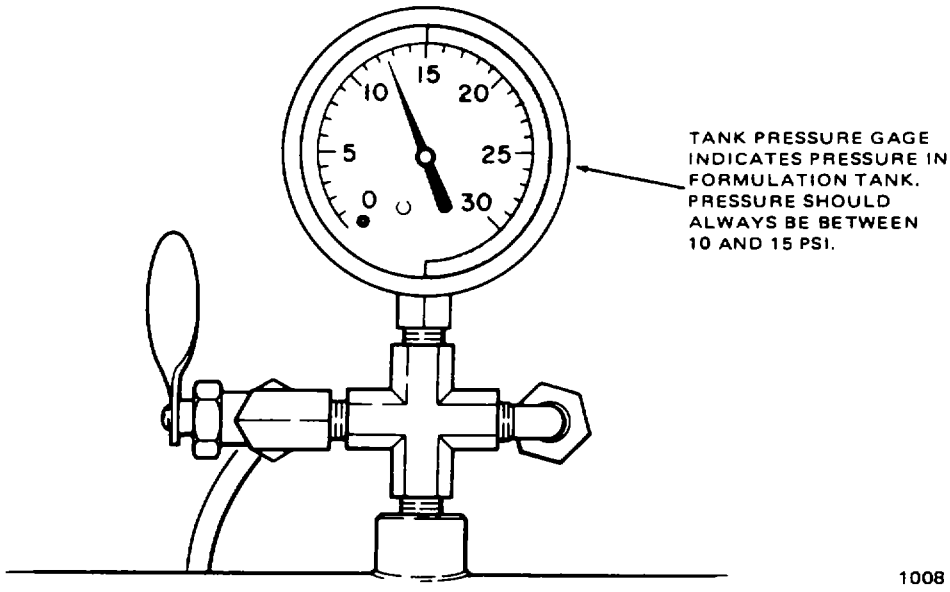


Figure 2-2. Formulation Tank Pressure Gage

ENGINE CONTROL PANEL

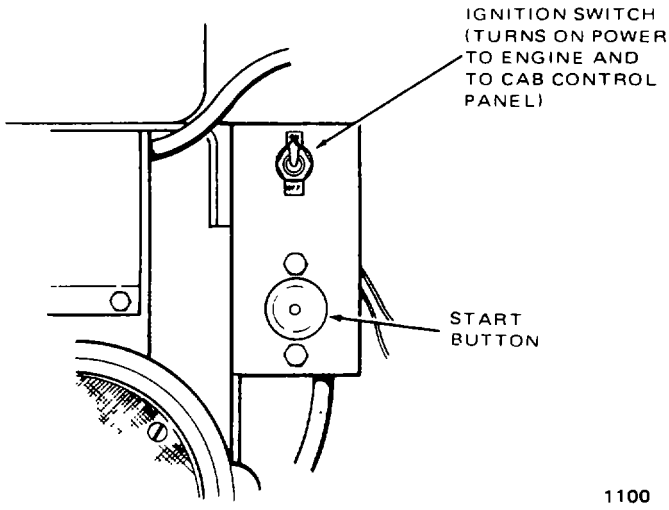


Figure 2-3. Ignition Switch

Section II. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES

GENERAL

The preventive maintenance checks and services (PMCS) are performed daily. This makes sure that defects are discovered and corrected before they cause serious damage. The proper checks and services are listed in Table 2-1.

The preventive maintenance table is divided into three intervals of maintenance.

a. Before Operation (B). These checks should be limited to those required for consecutive application by an assigned operator/crew. A statement as follows will be included in the heading of all PMCS tables to obtain increased inspections when items are first assigned to an operator/crew or operation is resumed after a period of nonuse:

(1) You are the assigned operator and have not operated the item since the last weekly check.

(2) You are operating the item for the first time.

b. During Operation (D). These are checks and services needed to be performed while the engine is running. Make sure to keep all Warnings and Cautions in mind while performing the checks and services.

c. After Operation (A). These are checks and services performed after shutting down the aerosol generator. They make sure that the machine will be ready for operation the next time it is used.

If the aerosol generator fails to operate properly, turn to the troubleshooting sections. Use TM 38-750 to report any mechanical defects.

PREVENTIVE MAINTENANCE CHECKS AND SERVICE

Table 2-1 lists all the preventive maintenance procedures that the operator must perform. Columns indicate the interval, the items to be inspected, and procedures to be used by the operator. An equipment readiness column will indicate when the aerosol generator is not ready for operation.

NOTE

Read the preventive maintenance checks and services through one time before performing the procedures.

Table 2-1. Operator Preventive Maintenance Checks and Services

B - Before D - During A - After

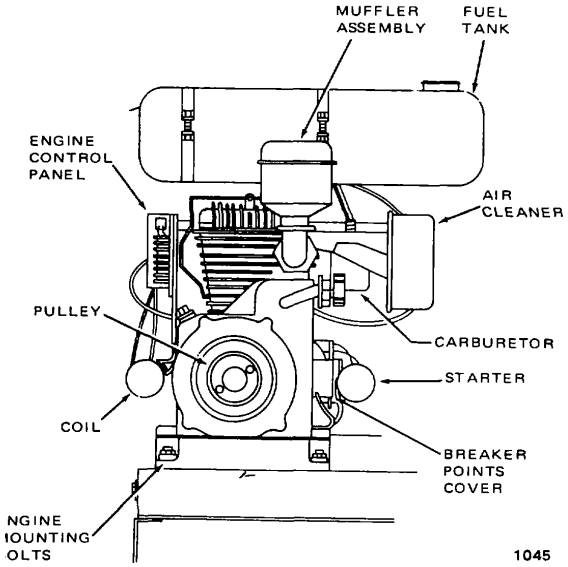
ITEM NO.	INTERVAL B	INTERVAL D	INTERVAL A	ITEM TO BE INSPECTED. PROCEDURE	FOR READINESS REPORTING, EQUIPMENT IS NOT READY/AVAILABLE IF:
1				GENERAL	
					
				Figure 2-4. Engine Installation	
	•		•	a. Make sure all component mounting screws, nuts, and bolts are tightened securely. b. Make sure all attached engine compressor and formulation tank parts are securely fastened.	Subassemblies are not tightened securely
2				ENGINE ASSEMBLY	
	•		•	Check crankcase oil level. a. Remove plug dipstick (figure 2-5). b. Wipe off dipstick and return it to crankcase. Do not screw it back into crankcase. c. Remove dipstick again and check oil level. The level must be kept near the full (F) mark on dipstick.	The oil level is slightly above or below the low (L) mark on the dipstick

Table 2-1. Operator Preventive Maintenance Check and Services (Continued)
B - Before D - During A - After

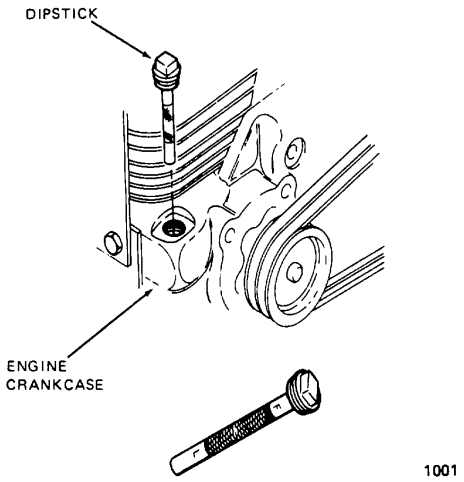
ITEM NO.	INTERVAL B	D	A	ITEM TO BE INSPECTED. PROCEDURE	FOR READINESS REPORTING, EQUIPMENT IS NOT READY/AVAILABLE IF:
				ENGINE ASSEMBLY (Continued)	
				 **Figure 2-5. Engine Crankcase and Dipstick**	
				ENGINE ASSEMBLY (Continued) **CAUTION** **DO NOT overfill. The oil level must not be higher than the full (F) mark**. d. If oil level is at or below low (L) mark, add oil MIL-L-2104C through dipstick hole. e. Make sure oil level is at or below full (F) mark. f. Return plug dipstick to engine and tighten it.	
3				ELECTRICAL PARTS a. Make sure all wires are securely fastened to terminals.	Any electrical wires or terminals are damaged or loose
				b. Check all wire and cable insulation for cracks, burns, fraying, or chafing. Notify your supervisor of any damaged wires.	

Table 2-1. Operator Preventive Maintenance Check and Services (Continued)

B - Before **D - During** **A - After**

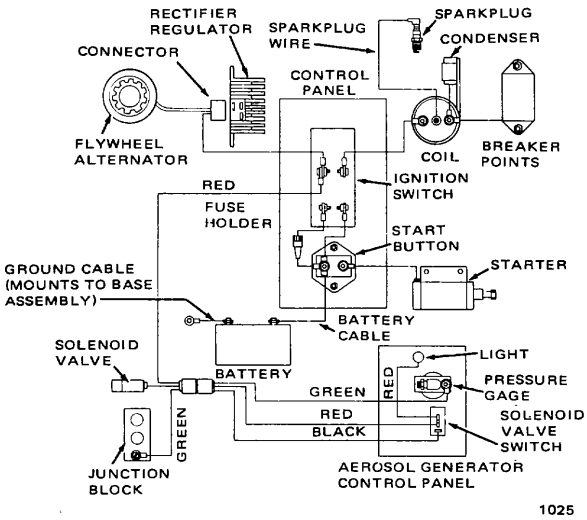
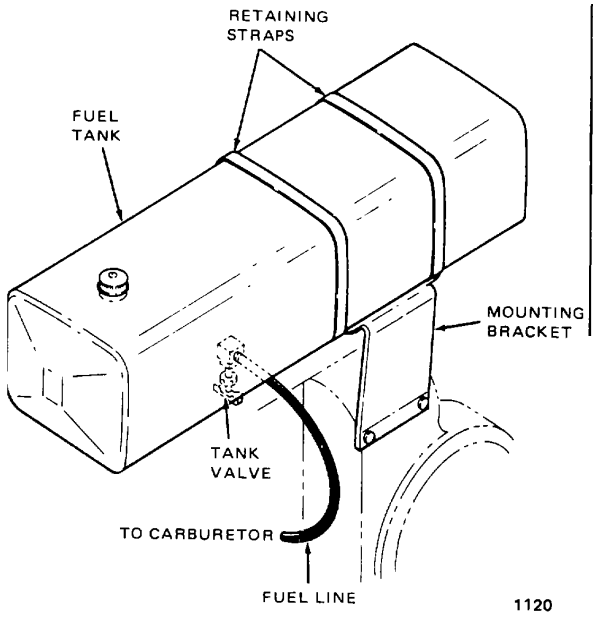
ITEM NO.	INTERVAL B	INTERVAL D	INTERVAL A	ITEM TO BE INSPECTED. PROCEDURE	FOR READINESS REPORTING, EQUIPMENT IS NOT READY/AVAILABLE IF:
				 **Figure 2-6. Aerosol Generator Wiring Diagram**	
4				FUEL TANK  **Figure 2-7. Fuel Tank Assembly**	

Table 2-1. Operator Preventive Maintenance Check and Services (Continued)
B - Before D - During A - After

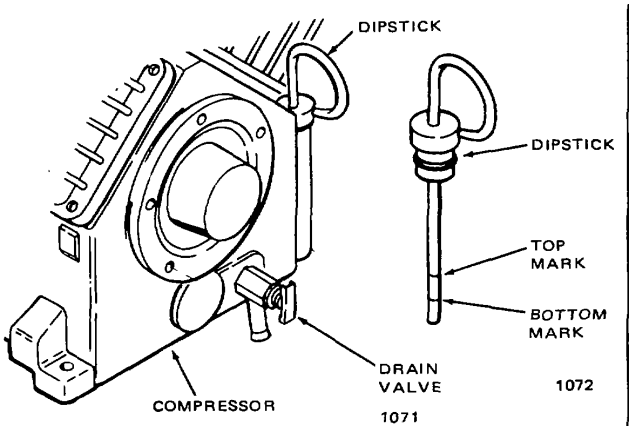
ITEM NO.	INTERVAL B	D	A	ITEM TO BE INSPECTED. PROCEDURE	FOR READINESS REPORTING, EQUIPMENT IS NOT READY/AVAILABLE IF:
	•			Inspect fuel line for cracks, wear or leaks.	
5				COMPRESSOR ASSEMBLY	
					
				Figure 2-8. Compressor Dipstick	
	•			Check crankcase oil level. a. Remove dipstick. b. Wipe off dipstick and place it back in crankcase. c. Remove dipstick again and check oil level. The oil level must be kept near the top mark on the dipstick. **CAUTION** **DO NOT overfill. The oil level must never be higher than the top mark on the dipstick**. d. If oil level is slightly above or below bottom dipstick mark, add synthetic reciprocating compressor oil (refer to page 1-6 for correct oil). Add oil through dipstick hole. e. sure oil level is at or below top dipstick mark. f. Return dipstick to compressor.	The oil level is slightly above or below the bottom mark on the dipstick

Table 2-1. Operator Preventive Maintenance Check and Services (Continued)
B - Before D - During A - After

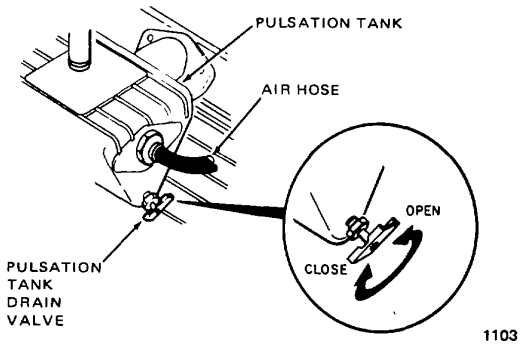
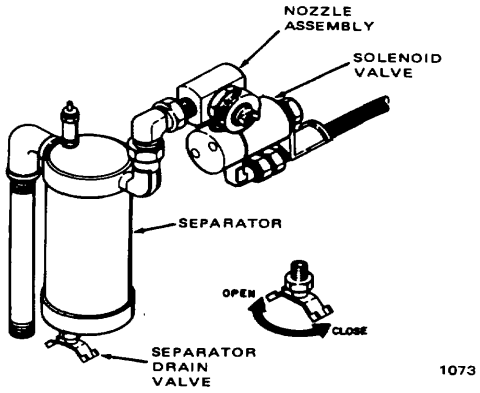
ITEM NO.	INTERVAL B	D	A	ITEM TO BE INSPECTED. PROCEDURE	FOR READINESS REPORTING, EQUIPMENT IS NOT READY/AVAILABLE IF:
6				BELTS AND PULLEYS	
		•	•	Make sure belts do not slip or sag.	The belts are loose or damaged
				 **Figure 2-9. Pulsation Tank Drain Valve**	
7				PULSATION TANK	
	•			a. Open pulsation tank drain valve and drain oil from pulsation tank. Be sure to close valve after oil is drained. b. Make sure there are no air leaks around pulsation tank manifold or separator pipe.	There are air leaks around the pulsation tank
8				SEPARATOR ASSEMBLY	
				 **Figure 2-10. Separator Drain Valve**	

Table 2-1. Operator Preventive Maintenance Check and Services (Continued)
B - Before D - During A - After

ITEM NO.	INTERVAL B	INTERVAL D	INTERVAL A	ITEM TO BE INSPECTED. PROCEDURE	FOR READINESS REPORTING, EQUIPMENT IS NOT READY/AVAILABLE IF:
				SEPARATOR ASSEMBLY (Continued)	
	•			a. Open separator drain valve and drain oil from separator. Be sure to close valve after oil is drained.	There are air leaks around the separator or its plumbing
		•		b. Check all separator fittings for air leaks.	
9				NOZZLE ASSEMBLY	

CAUTION

DO NOT use hard metal objects or probes to clear out air cap holes. They will damage the air cap.

DO NOT use too much force to tighten knurled ring.Tighten knurled ring by hand. Too much force will damage nozzle assembly.

DO NOT use force to tighten fluid nozzle. Too much force will damage teflon gasket.

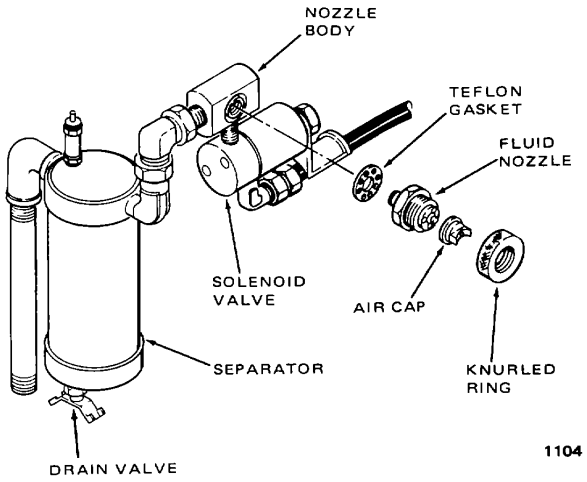


Figure 2-11. Nozzle Assembly

Table 2-1. Operator Preventive Maintenance Checks and Services (Continued)
B - Before D - During A - After

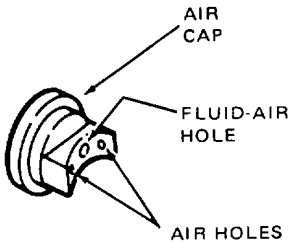
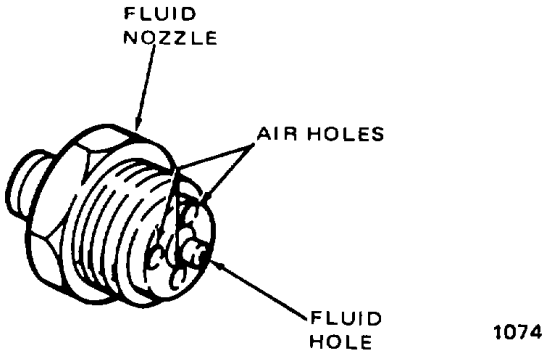
ITEM NO.	INTERVAL B	D	A	ITEM TO BE INSPECTED. PROCEDURE	FOR READINESS REPORTING, EQUIPMENT IS NOT READY/AVAILABLE IF:
				NOZZLE ASSEMBLY (Continued)	
					
				Figure 2-12. Air Cap	
	•			a. Make sure air cap holes are not coated with oil residue, partially blocked, or plugged. (1) Remove knurled ring and air cap. (2) Soak the air cap in acetone (0-A-51F) to dissolve the gunk and varnish. (3) Carefully clean out the air cap holes with a toothpick or other soft non-metallic object. (4) Wipe the air cap, the exposed fluid nozzle surfaces, and the fluid hole projection with a clean rag.	The nozzle assembly is blocked or leaks
					
				Figure 2-13. Fluid Nozzle	
				b. Make sure fluid nozzle is not blocked or plugged.	The fluid nozzle leaks air
				(1) Remove fluid nozzle and teflon gasket.	
				NOTE **Be sure to check the air groove in the back of the fluid nozzle and clean it as necessary**.	

Table 2-1. Operator Preventative Maintenance Checks and Services (Continued)

B - Before **D - During** **A - After**

ITEM NO.	INTERVAL B	D	A	ITEM TO BE INSPECTED. PROCEDURE	FOR READINESS REPORTING, EQUIPMENT IS NOT READY/AVAILABLE IF:
				NOZZLE ASSEMBLY (Continued) (2) Soak the fluid nozzle in acetone (0-A-51 F)to dissolve the gunk and varnish. (3) Carefully clean out the fluid nozzle holes with a toothpick or other soft non-metallic object. (4) Wipe the fluid nozzle surfaces with a clean rag. (5) If teflon gasket is stretched out of shape, replace it.	

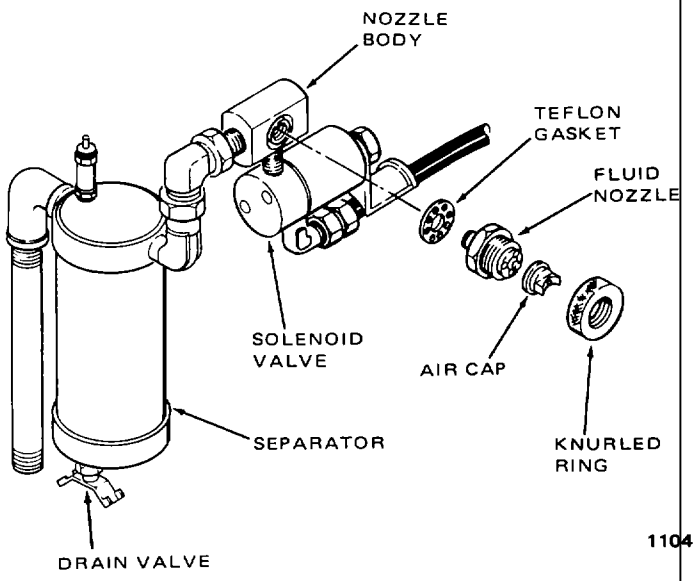


Figure 2-14. Nozzle Assembly

•			c. Reassemble nozzle assembly. **CAUTION** **Do not over tighten the fluid nozzle. This would damage the teflon gasket and cause air leaks.**	
	•		(1) Thread fluid nozzle and teflon gasket into nozzle body. (2) Install air cap and knurled ring. Tighten knurled ring by hand. d. Check nozzle assembly for air leaks.	

Table 2-1. Operator Preventative Maintenance Checks and Services (Continued)

B - Before **D - During** **A - After**

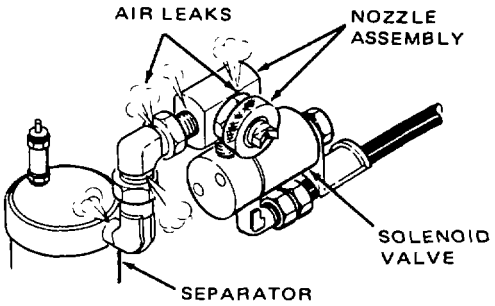
ITEM NO.	INTERVAL B	D	A	ITEM TO BE INSPECTED. PROCEDURE	FOR READINESS REPORTING, EQUIPMENT IS NOT READY/AVAILABLE IF:
				 **Figure 2-15. Nozzle Air Leaks** **WARNING** **MAKE SURE solenoid valve switch is turned OFF before checking nozzle assembly for air leaks.** **DO NOT walk in front of nozzle assembly while engine is operating.** (1) Turn solenoid valve OFF. (2) Start engine according to engine startup procedures in Section III. (3) Check fittings listed below for air leaks: 1. Air cap and knurled ring 2. Fluid nozzle 3. Nozzle body 4. Adjusting nuts and nipples 5. Swivel elbow 6. Pipe joint at pulsation tank	

Table 2-1. Operator Preventative Maintenance Checks and Services (Continued)

B - Before **D - During** **A - After**

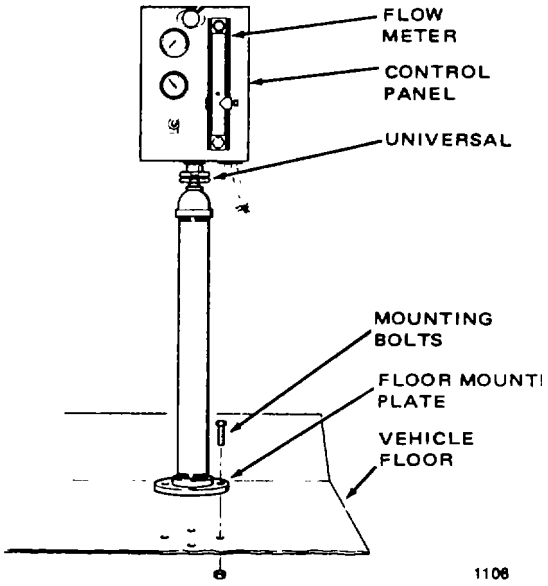
ITEM NO.	INTERVAL B	D	A	ITEM TO BE INSPECTED. PROCEDURE	FOR READINESS REPORTING, EQUIPMENT IS NOT READY/AVAILABLE IF:
				 **Figure 2-16. Control Panel Installation**	
10				CONTROL PANEL	
	•			a. Make sure control panel is securely fastened to vehicle floor.	The control panel is damaged
	•			b. Inspect control panel components for broken or cracked glass.	
	•			c. Make sure control panel is set vertically in the vehicle. at an angle	The control panel is tilted
				(1) Loosen universal screws.	
				(2) Adjust control panel to a vertical position.	
				(3) Tighten universal screws.	
	•			d. Check panel light.	
				(1) Turn aerosol generator ignition switch ON.	
				(2) Turn light ON. If it does not operate, replace light bulb. If it still does not operate, notify your supervisor.	

Table 2-1. Operator Preventative Maintenance Checks and Services (Continued)

B - Before **D - During** **A - After**

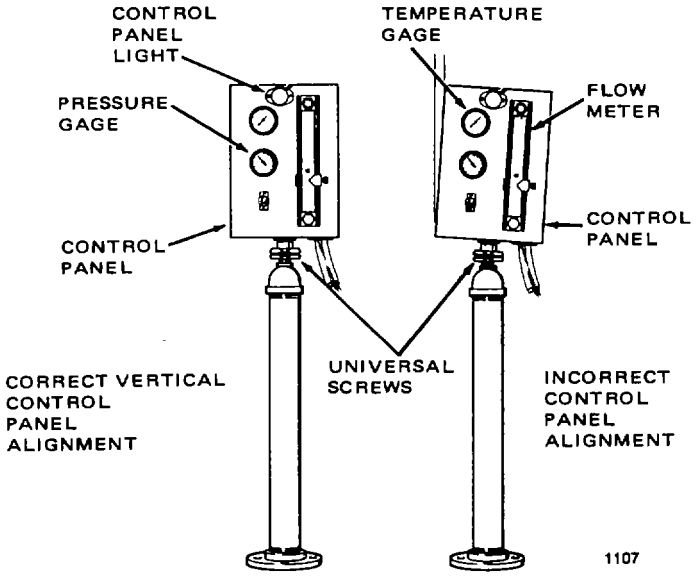
ITEM NO.	INTERVAL B	D	A	ITEM TO BE INSPECTED. PROCEDURE	FOR READINESS REPORTING, EQUIPMENT IS NOT READY/AVAILABLE IF:
				CONTROL PANEL (Continued)	
				 **Figure 2-17. Control Panel Alignment**	
	•			e. Check control panel gages. (1) Turn solenoid valve switch OFF. (2) Start engine according to engine startup procedures in Chapter 2, Section III. (3) Pressure gage should read between 90 and 100 psi. If it does not, turn to operator troubleshooting in Chapter 3, Section II. (4) Temperature gage should read the same as the outside temperature.	If the gages do not operate correctly or are damaged
11				FLOWMETER **WARNING** **DO NOT operate the aerosol generator if the flowmeter is damaged. Insecticide can leak into vehicle and be hazardous to health.**	

Table 2-1. Operator Preventative Maintenance Checks and Services (Continued)

B - Before **D - During** **A - After**

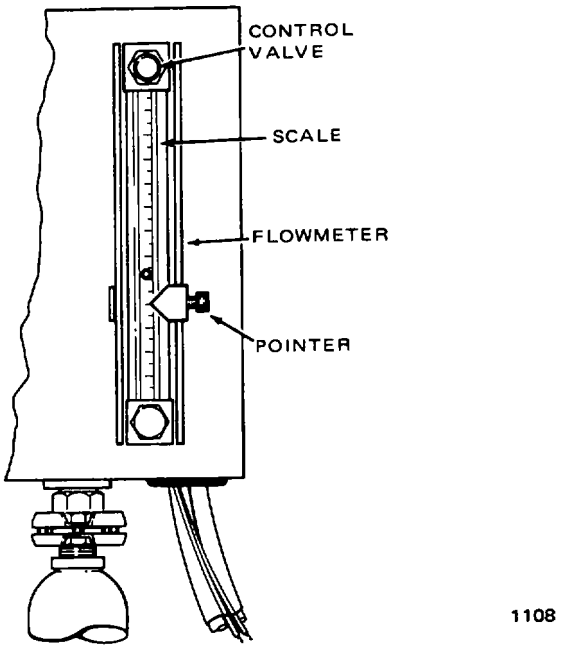
ITEM NO.	INTERVAL B	INTERVAL D	INTERVAL A	ITEM TO BE INSPECTED. PROCEDURE	FOR READINESS REPORTING, EQUIPMENT IS NOT READY/AVAILABLE IF:
				FLOWMETER (Continued)	
				 **Figure 2-18. Insecticide Flowmeter**	
	•			a. Make sure meter tube is not cracked, nicked, or leaking.	The flowmeter is damaged
	•			b. Make sure control needle valve operates smoothly and does not leak.	
		•		c. Make sure insecticide flows well through meter tube. Watch float ball for flow indications.	
	•			d. Make sure hose fittings are securely tightened. Tighten them by hand when necessary.	

Table 2-1. Operator Preventative Maintenance Checks and Services (Continued)

B - Before **D - During** **A - After**

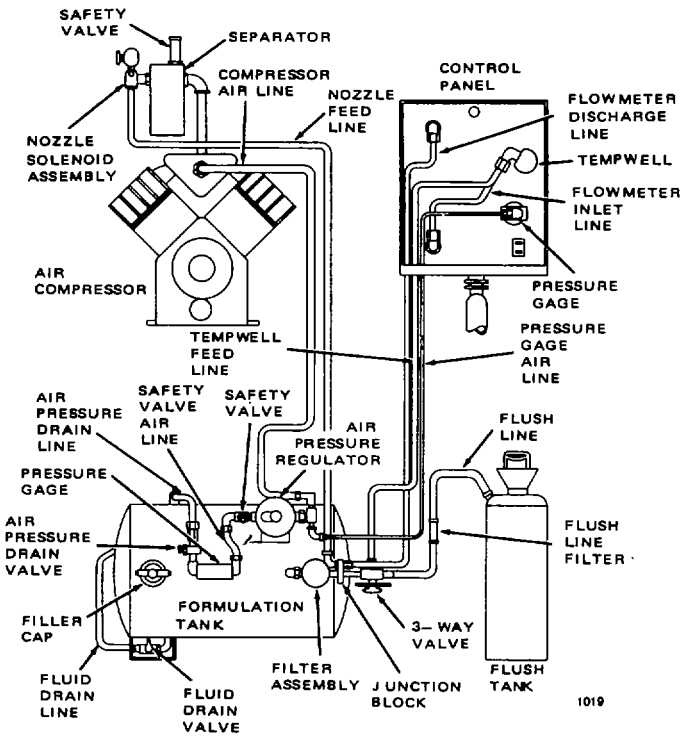
ITEM NO.	INTERVAL B	D	A	ITEM TO BE INSPECTED. PROCEDURE	FOR READINESS REPORTING, EQUIPMENT IS NOT READY/AVAILABLE IF:
					
				Figure 2-19. Hoses, Lines, and Fittings	
12				HOSES, LINES, AND FITTINGS	
	•		•	Check all hoses, lines, and fittings for leaks, cracks, or chafing. Notify your supervisor of any damaged hoses or fittings.	The hose lines or fittings leak
13				FORMULATION TANK	
	•			a. Make sure valves turn smoothly.	The formulation tank leaks air or fluid
		•		b. Check valves and fittings for leaks.	
				(1) Turn solenoid valve switch OFF.	
				(2) Start engine according to engine startup procedures in Chapter 2, Section III.	

Table 2-1. Operator Preventative Maintenance Checks and Services (Continued)

B - Before **D - During** **A - After**

ITEM NO.	INTERVAL B	INTERVAL D	INTERVAL A	ITEM TO BE INSPECTED. PROCEDURE	FOR READINESS REPORTING, EQUIPMENT IS NOT READY/AVAILABLE IF:
				FORMULATION TANK (Continued)	

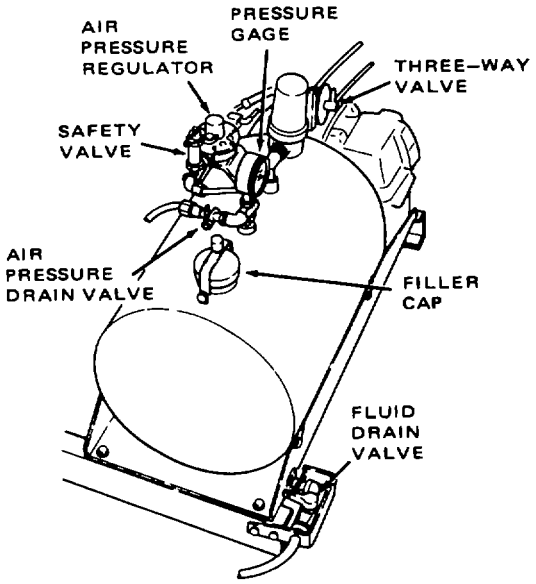


Figure 2-20. Formulation Tank

(3) Check around valves and fittings for air or fluid leaks. Notify your supervisor of any leaks or damaged components.

• c. Check tank pressure gage.

(1) Check gage for physical damage. Notify your supervisor of any damage.

(2) When tank is pressurized, pressure gage should read 10 to 15 psi.

Table 2-1. Operator Preventative Maintenance Checks and Services (Continued)

B - Before **D - During** **A - After**

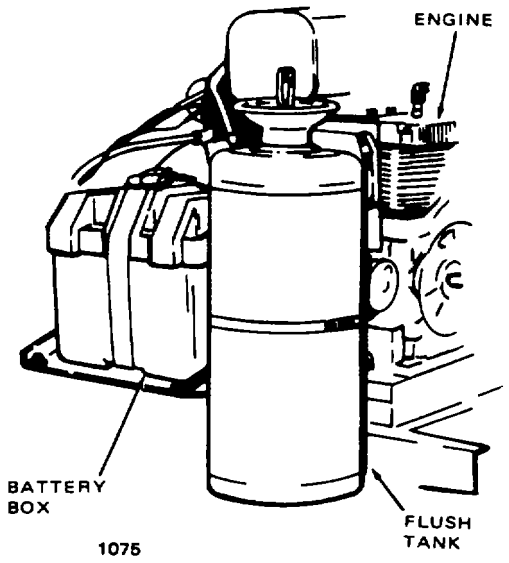
ITEM NO.	INTERVAL B	D	A	ITEM TO BE INSPECTED. PROCEDURE	FOR READINESS REPORTING, EQUIPMENT IS NOT READY/AVAILABLE IF:
				 **Figure 2-21. Flush Tank**	
14				FLUSH TANK	
	•		•	Make sure flush tank is securely fastened to engine assembly.	The flush tank is not secured
15				BATTERY ASSEMBLY	
	•		•	a. Make sure battery box is securely fastened to base assembly.	Electrolyte is low
				NOTE **Use distilled water or a good grade drinking water (excluding mineral water).**	
	•		•	b. Check electrolyte level. (1) Undo retainer strap and remove battery box cover. (2) Remove cell caps. (3) Electrolyte level should be sufficient to cover above battery plates. Add distilled water as necessary. (4) Install cell caps. (5) Secure battery box cover in place.	

Table 2-1. Operator Preventative Maintenance Checks and Services (Continued)

B - Before **D - During** **A - After**

ITEM NO.	INTERVAL B	INTERVAL D	INTERVAL A	ITEM TO BE INSPECTED. PROCEDURE	FOR READINESS REPORTING, EQUIPMENT IS NOT READY/AVAILABLE IF:
				BATTERY ASSEMBLY (Continued)	

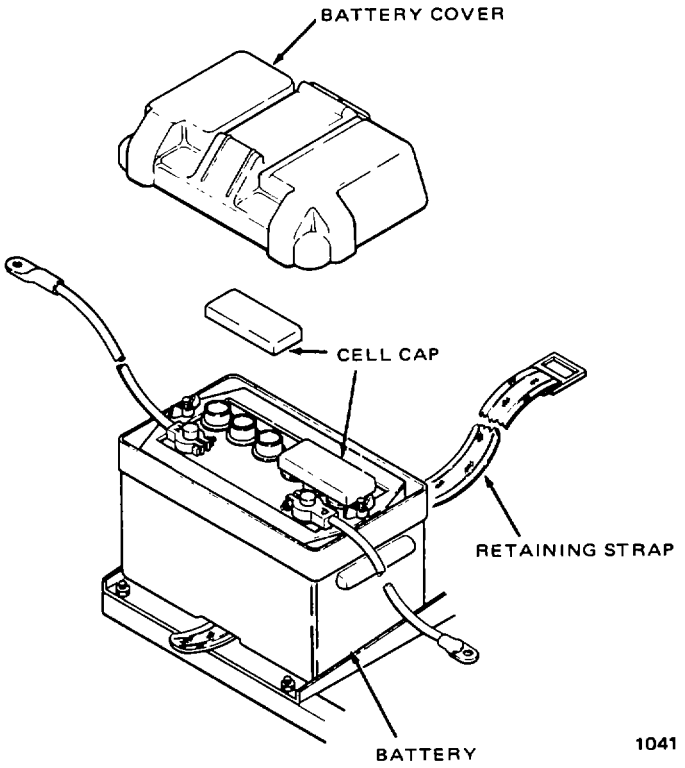
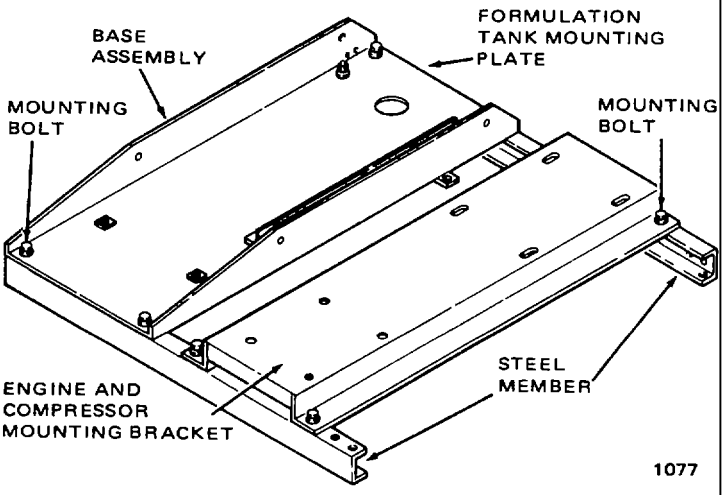


Figure 2-22. Battery Assembly

Table 2-1. Operator Preventative Maintenance Checks and Services (Continued)

B - Before **D - During** **A - After**

ITEM NO.	INTERVAL B	D	A	ITEM TO BE INSPECTED. PROCEDURE	FOR READINESS REPORTING, EQUIPMENT IS NOT READY/AVAILABLE IF:
				 **Figure 2-23. Base Assembly**	
16				BASE ASSEMBLY	
	•		•	Make sure attaching nuts and bolts are securely tightened.	The base assembly is not securely installed

Section III. OPERATION UNDER NORMAL CONDITIONS

WARNING

Read all the following procedures through one time before starting the aerosol generator.

INSECTICIDE PREPARATION

Follow the insecticide label information for the correct insecticide mixing instruction if mixing is required.

FORMULATION TANK AND NOZZLE PREPARATION

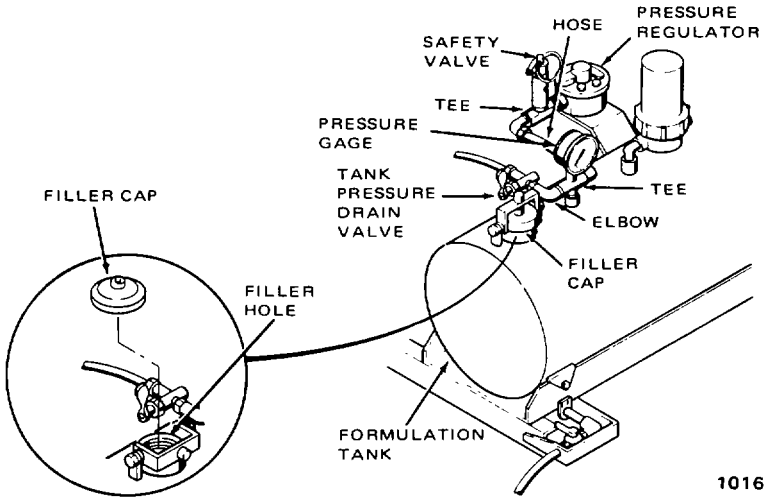


Figure 2-24. Formulation Tank Filler Cap

a. Add insecticide to formulation tank.

(1) Open pressure drain valve and relieve tank pressure.

(2) Loosen filler cap retaining screw and turn down cap bracket.

(3) Remove filler cap.

FORMULATION TANK AND NOZZLE PREPARATION (Continued)

WARNING

BE ALERT to wear adequate respirator, rubber gloves, and coveralls when filling or working with the insecticide tank. The insecticide chemicals can be harmful.

BE ALERT to read and follow the insecticide safety instructions on the container label.

BE ALERT at all times not to spill or splash insecticide on yourself. If insecticide comes in contact with your skin or eyes, follow the medical treatment instructions on the insecticide label.

DO NOT breathe the fumes from the insecticide. If you begin to feel the effects of the fumes, remove yourself to a well-ventilated area and follow the medical treatment instructions on the insecticide label.

(4) Add the correct insecticide to the formulation tank. Do not fill the tank to the top. Leave at least two inches of air space.

CAUTION

DO NOT use tools to tighten filler cap retaining screw. Tighten the knob by hand only. If excessive force is used it will damage the cap and the knob.

(5) Place filler cap back on the tank.

(a) Make sure cap is seated correctly.

(b) Turn cap bracket up to the correct position.

(c) Tighten filler cap retaining screw by hand.

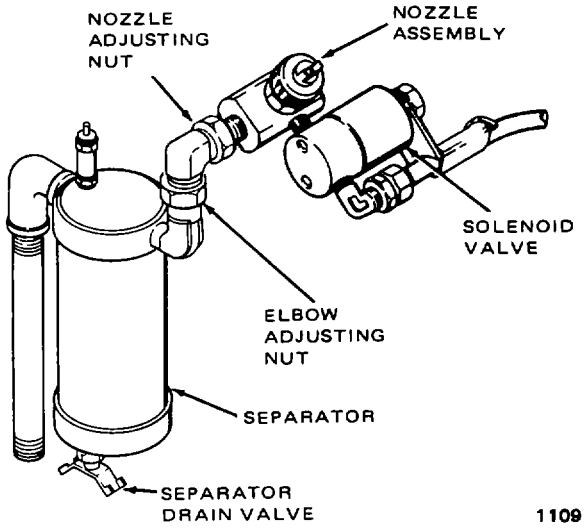


Figure 2-25. Nozzle Adjustment Nuts

FORMULATION TANK AND NOZZLE PREPARATION (Continued)

b. Aim nozzle in the required direction.

NOTE

The nozzle assembly is normally aimed up at a 45° angle and to the rear of the vehicle.

(1) Loosen nozzle adjusting nut and turn nozzle body up or down to the required position. The nozzle assembly is normally aimed up at a 45° angle.

(2) Tighten nozzle adjusting nut.

(3) Loosen elbow adjusting nut and twist elbow right or left to the required position to discharge to the rear of the vehicle.

(4) Tighten elbow adjusting nut.

PRE-START CHECKS

a. Perform all of the preventive maintenance checks and services outlined in Section II above.

b. Make sure all valves and switches are in the correct position before starting the engine.

(1) Shut the solenoid valve switch OFF.

(2) Close the pulsation tank drain valve.

(3) Close the separator drain valve.

(4) Make sure the three-way valve is in the ULV position.

(5) Close the air pressure drain valve.

c. Check and fill the fuel tank as necessary.

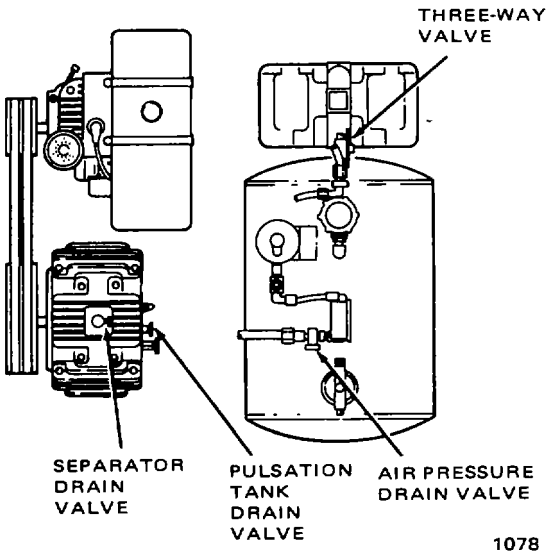


Figure 2-26. Valve Locations

WARNING

Before starting the engine, ensure that personnel are clear of the nozzle.

ENGINE START-UP PROCEDURES

a. Open the fuel tank valve.

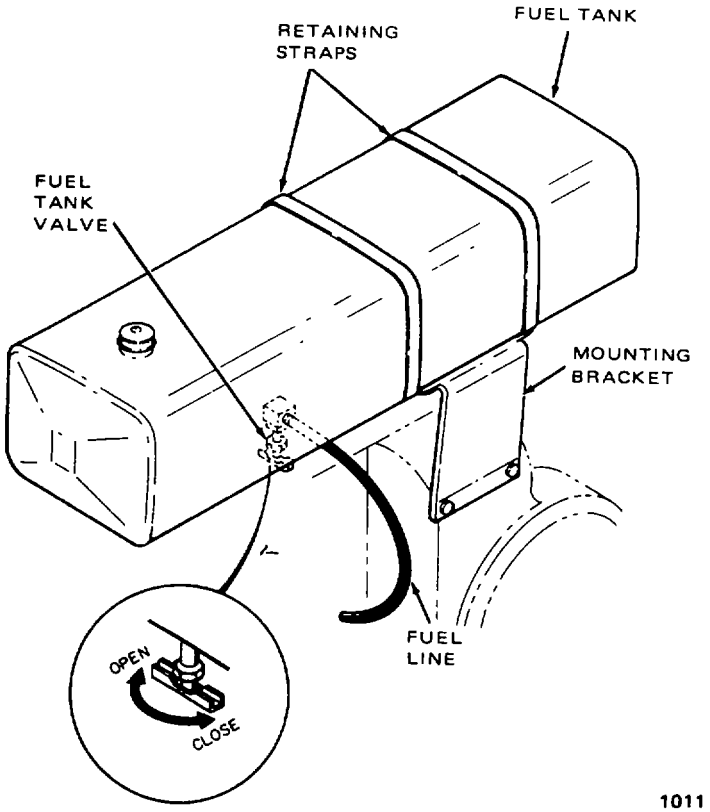


Figure 2-27. Fuel Tank Valve

b. Close the choke.

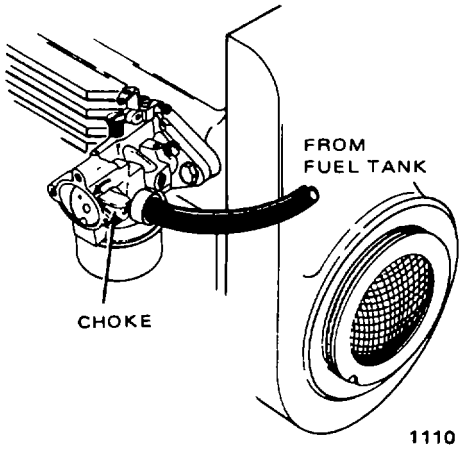


Figure 2-28. Choke Position

ENGINE START-UP PROCEDURES (Continued)

c. Make sure the solenoid valve switch is turned OFF.

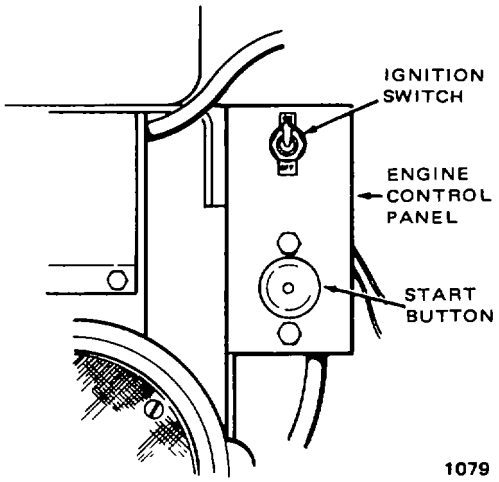


Figure 2-29. Ignition Switch

d. Turn the ignition switch ON.

e. Push the start button and hold it in until the engine starts.

NOTE

If the engine is difficult to start, open the compressor pulsation tank drain valve to decrease the engine load.

f. If the engine does not start, refer to the troubleshooting instructions in Chapter 3, Section II.

g. As the engine warms up, gradually open the choke.

h. Perform the pre-operation checks and services.

OPERATION PRE-CHECK

WARNING

BE ALERT not to touch the compressor, separator or nozzle assembly while performing operation pre-checks. These parts get hot when the compressor is running.

BE ALERT not to walk in front of the nozzle when the compressor is running.

a. Allow the engine to run for five minutes before performing the operation pre-checks.

b. Check the formulation tank pressure gage.

(1) The pressure gage should read 10 to 15 psi.

(2) If the pressure gage reads greater than 15 psi, shut the engine ignition switch OFF, and turn to the troubleshooting procedures in Chapter 3, Section II.

OPERATION PRE-CHECK (Continued)

(3) If the pressure gage reads less than 10 psi, shut the engine ignition switch OFF, and turn to the troubleshooting procedures in Chapter 3.

NOTE

If the tank pressure becomes greater than 15 psi, the pressure relief valve will operate, and reduce the pressure.

(4) If the tank pressure becomes greater than 15 pounds but the pressure relief valve does not go off, turn the ignition switch OFF and notify your supervisor.

c. Check the nozzle air pressure gage on the cab control panel.

(1) The pressure gage should read between 90 and 100 pounds.

(2) If the nozzle pressure is greater than 100 pounds, shut the ignition switch OFF and turn to the troubleshooting procedures in Chapter 3, Section II.

(3) If the nozzle pressure is less than 90 pounds, shut the ignition switch OFF and turn to the troubleshooting procedures in Chapter 3, Section II.

d. Check the flow meter calibration and calibrate it if necessary.

(1) Aim nozzle assembly into a bucket.

(a) Loosen nozzle adjusting nut.

(b) Aim nozzle down into bucket and tighten adjusting nut.

(2) Turn solenoid valve switch OFF.

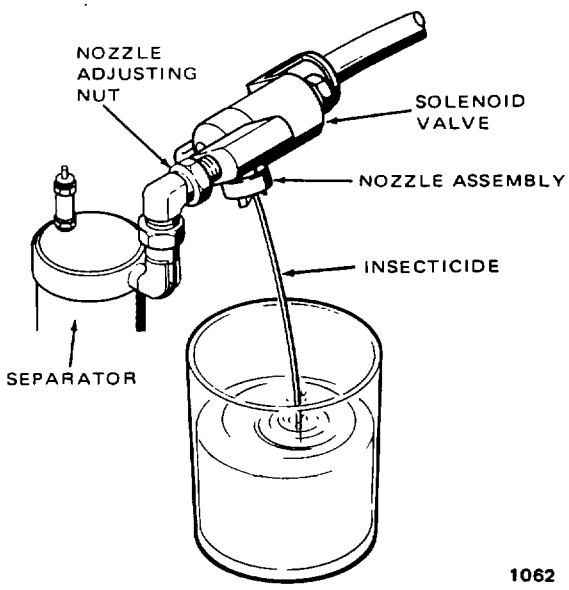


Figure 2-30. Flowmeter Calibration

OPERATION PRE-CHECK (Continued)

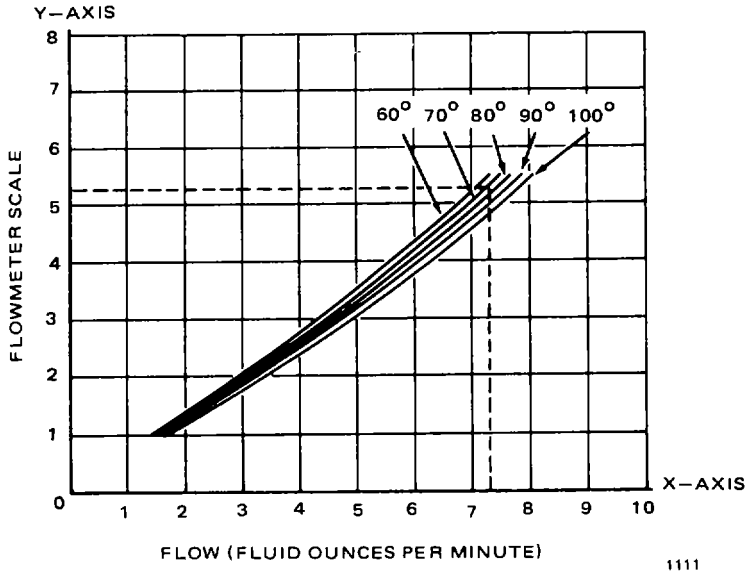


Figure 2-31. Temperature Correction Curve

(3) Start engine according to engine start procedures on page 2-25.

(4) When formulation tank pressure levels off, shut engine OFF.

(5) Turn the ignition switch and the solenoid valve switch ON and let the insecticide flow into a bucket. Let the insecticide flow for five minutes.

(6) Check the temperature.

(7) Check the flowmeter scale reading.

(8) Hold a beaker under the insecticide stream for one timed minute.

(9) Turn OFF the ignition switch and the solenoid valve switch.

(10) Pour the insecticide from the beaker into a graduated cylinder and measure the volume of insecticide that flowed in one minute.

(11) Find the flow rate in oz/min on the graph (pages 1-9 thru 1-13) that matches the flowmeter scale reading. Use the graph provided for the insecticide being sprayed. Figure 2-31 illustrates how to use the temperature correction curves.

(a) If the flow rate from the graph is the same as the measured flow rate, the flowmeter is ok.

(b) If the flow rate from the graph is not the same as the measured flow rate, notify your supervisor.

OPERATION PROCEDURES

a. Adjust the flowmeter to the proper flow rate.

b. Check the insecticide label for the recommended driving speed.

c. Each pass with the vehicle will cover a 300 ft. width swath.

OPERATION PROCEDURES (Continued)

d. Watch the temperature gage. As the temperature increases or decreases, readjust the flowmeter to the correct flow meter setting. Find the new flow setting in the performance data graph.

e. Watch the nozzle pressure gage. If the nozzle air pressure gradually increases, the air holes may be plugged with oil or partially coated with oil residue. Remove the nozzle air cap and rinse it with acetone.

f. Turn the solenoid valve switch OFF when driving near automobiles and buildings. The insecticide can cause spotting to paint finishes. The commercially acceptable operating distance from automobiles and buildings is 100 feet.

g. Turn the solenoid valve switch OFF when the vehicle is stopped.

h. Only spray insecticide aerosol when wind conditions are less than 10 mph.

i. Do not spray insecticide aerosol during the hot periods of the day. The heat rising from the ground will carry the aerosol away. The best time to spray is early morning or late evening when the temperatures are cooler.

SHUTDOWN PROCEDURES

a. Shut the solenoid valve switch OFF and stop the truck.

b. Shut the aerosol generator ignition switch OFF.

c. Close the fuel tank valve.

d. Park the vehicle on a flat area or facing uphill.

e. If the aerosol generator is going to be stored for less than three days, flush the fluid lines only.

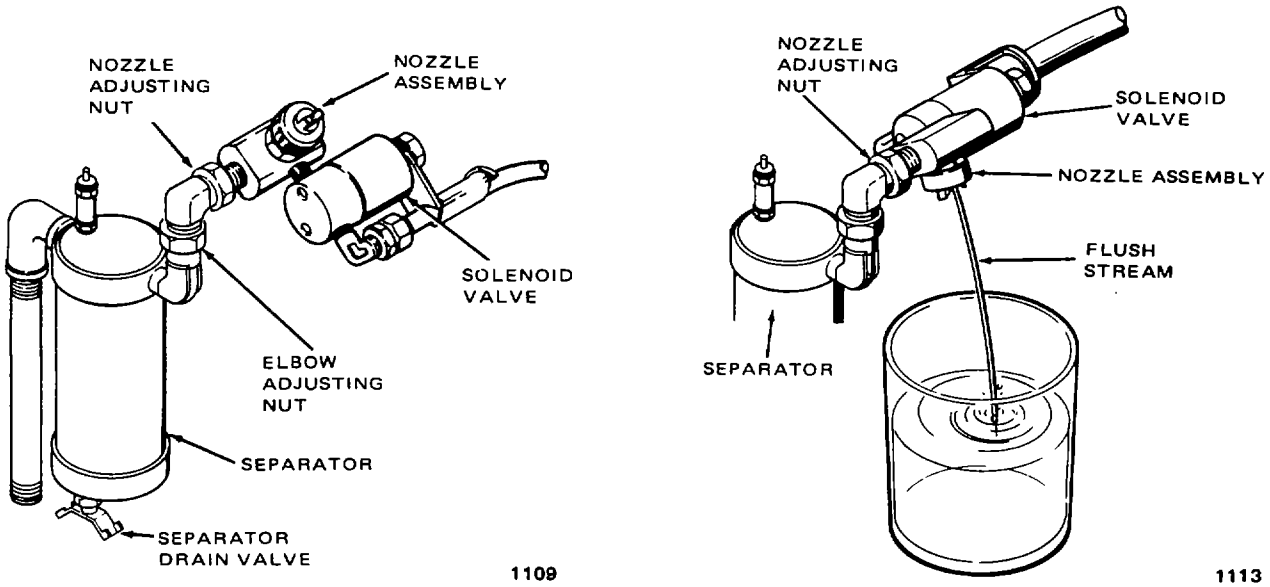


Figure 2-32. Nozzle Adjustment Procedure

SHUTDOWN PROCEDURES (Continued)

(1) Turn the nozzle down and aim it into a bucket.

(a) Loosen the elbow adjusting nut and turn the elbow to the desired position.

(b) Tighten the elbow adjusting nut.

(c) Loosen the nozzle adjusting nut and turn the nozzle down to aim it into the bucket.

(d) Tighten the nozzle adjusting nut.

(2) Make sure the three-way valve is still in the ULV position.

(3) Add flushing solvent to the flush tank. Do not fill the tank more than 3/4 full.

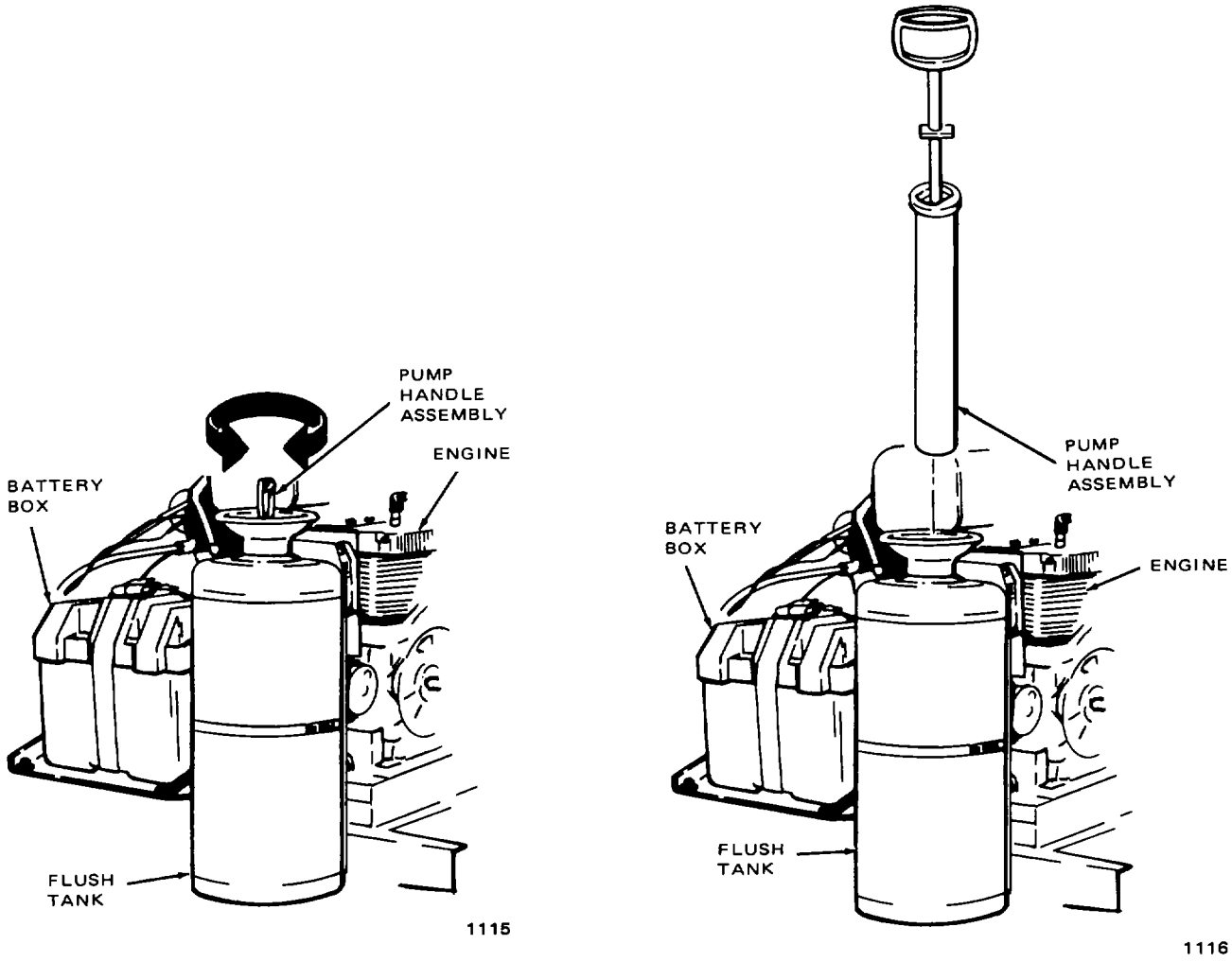


Figure 2-33. Flush Tank Disassembly

SHUTDOWN PROCEDURES (Continued)

(a) Turn the pump handle assembly all the way to the left and lift it out of the tank.

(b) Fill the flush tank three fourths of the way full with flushing solvent. Use soap and water.

(c) Place the pump handle assembly back into the flush tank. Fit it into the proper slots and turn it all the way to the right.

WARNING

DO NOT stand with head or body directly over the flush tank when pumping the handle.

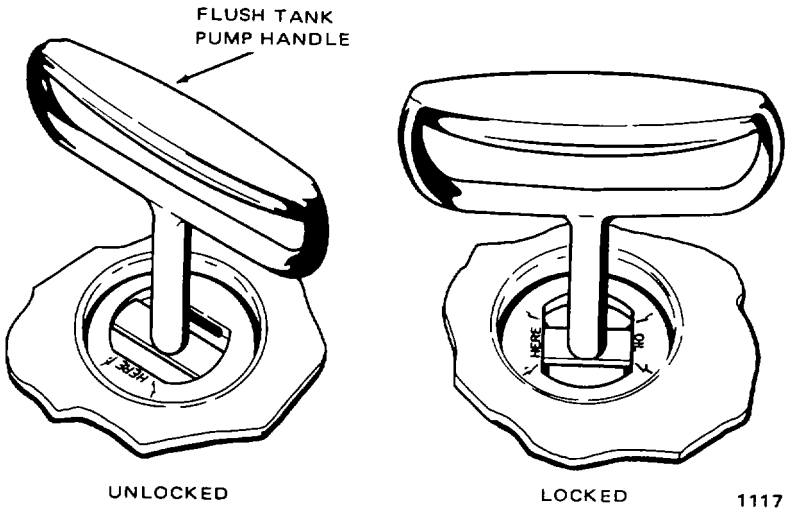


Figure 2-34. Locking of Pump Handle

(4) Pressurize the flush tank.

WARNING

DO NOT leave the flush tank under pressure if it will be in the hot sun for long periods of time. This could cause an increased pressure in the tank which could be harmful.

(a) Push the pump handle all the way down and twist it to the left to unlock it.

(b) Pump the handle up and down until it pumps hard.

(c) Push the handle all the way down and twist it to the right to lock it.

(5) Flush the fluid lines.

(a) Turn the three-way valve to the flush position.

(b) Turn the engine switch ON.

(c) Turn the solenoid valve switch ON.

NOTE

It may be necessary to repressurize the flush tank before the flush tank is emptied.

SHUTDOWN PROCEDURES (Continued)

(6) Shut the solenoid valve switch OFF.

(7) Shut the engine ignition switch OFF.

(8) Aim assembly up at a 45° angle and to the rear of the vehicle.

f. If the aerosol generator is going to be stored for more than three days, flush the formulation tank and the fluid lines.

(1) Pressurize the formulation tank.

(2) Drain the formulation tank.

WARNING

BE ALERT to hold the drain hose in the bucket. The pressure on the tank may cause the hose to jump around and splash insecticide.

(a) Hold the drain hose in a bucket.

(b) Open the tank drain valve and drain the tank.

(c) Make sure the drain valve closes.

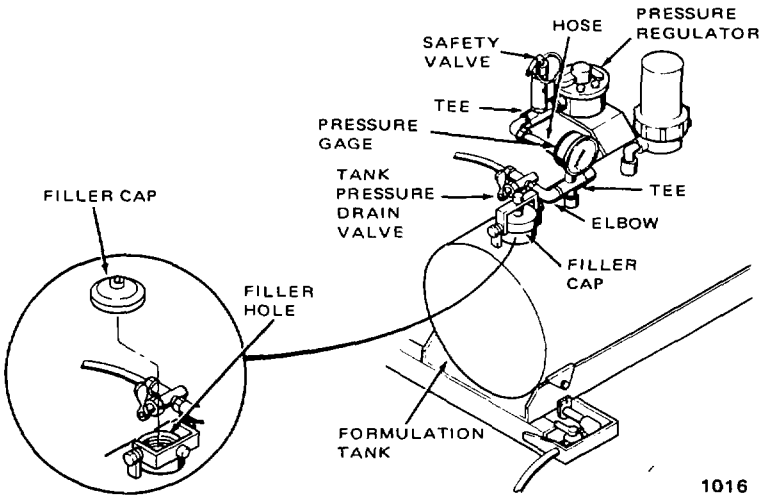


Figure 2-35. Formulation Tank Filler Cap

(3) Service the formulation tank with one to two gallons of soap and water.

(a) Open tank pressure drain valve.

(b) Loosen the filler cap retaining screw and turn the cap bracket down.

(c) Remove the filler cap.

(d) Partially fill the tank with one to two gallons of soap and water.

(e) Place the filler cap back on the tank. Make sure it seats correctly.

SHUTDOWN PROCEDURES (Continued)

(f) Turn the cap bracket back up and tighten the cap knob.

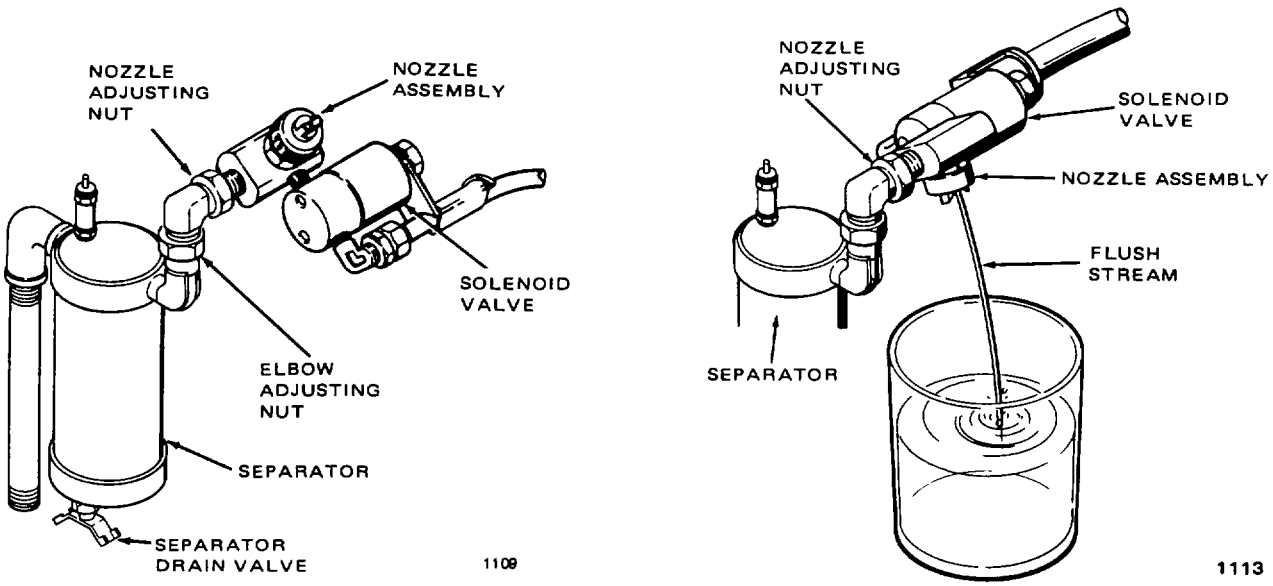


Figure 2-36. Nozzle Adjustment Procedure

(4) Turn the nozzle down and aim it into a bucket.

(a) Loosen the elbow adjusting nut and turn the elbow to the desired position.

(b) Tighten the elbow adjusting nut.

(c) Loosen the nozzle adjusting nut and turn the nozzle down and aim it into a bucket.

(d) Tighten the nozzle adjusting nut.

(5) Pressurize the formulation tank.

(a) Make sure the solenoid valve switch is turned OFF.

(b) Turn the three-way valve to the flush position.

WARNING

MAKE SURE there are no personnel in front of the nozzle before starting the engine.

(c) Turn the engine ignition switch ON and push the start button until the engine starts.

(d) When the tank pressure levels off shut the ignition switch OFF.

(e) Open the flow meter control needle valve.

(f) Turn the solenoid valve switch ON.

(g) Turn the three-way valve to the ULV position.

SHUTDOWN PROCEDURES (Continued)

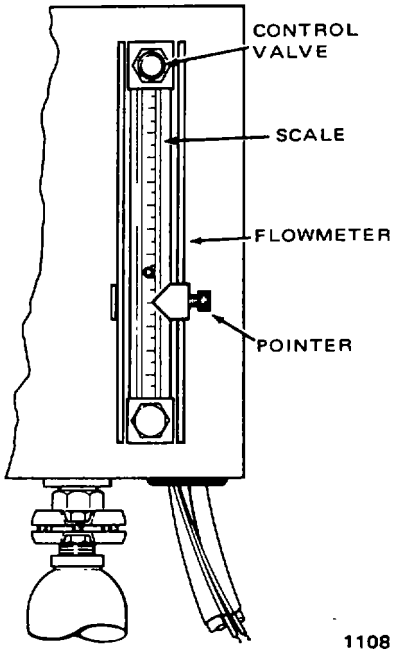


Figure 2-37. Insecticide Flowmeter

WARNING

MAKE SURE there are no personnel in front of the nozzle before flushing the fluid lines.

(6) Turn the ignition switch ON and flush the system until the flush tank is emptied.

NOTE

Finished insecticidal spray solutions and flushing rinseate must be disposed of in a manner consistent with current federal and local regulations.

(7) Shut down the aerosol generator.

(a) Turn the solenoid valve switch OFF.

(b) Turn the ignition switch OFF.

(c) Return the nozzle to the operating position.

(d) Drain any extra soap and water from the formulation tank.

(e) Open the air pressure drain valve.

STARTUP AND OPERATION SUMMARY

The following information outlines the startup and operation instructions in Chapter 2 of this manual.

a. Preventive Maintenance Checks and Services. Refer to table 2-1 for the preventive maintenance checks and services.

STARTUP AND OPERATION SUMMARY (Continued)

b. Pre-start Checks.

c. Engine Startup Procedures.

d. Operation Checks.

(1) Formulation tank operating pressure should be 10 to 15 psi.

(2) Nozzle operating pressure should be 90 - 100 psi.

(3) If the pressures registering on the gages are outside these limits, turn the aerosol generator OFF and notify your supervisor.

e. Calibration Check.

(1) Turn the engine OFF.

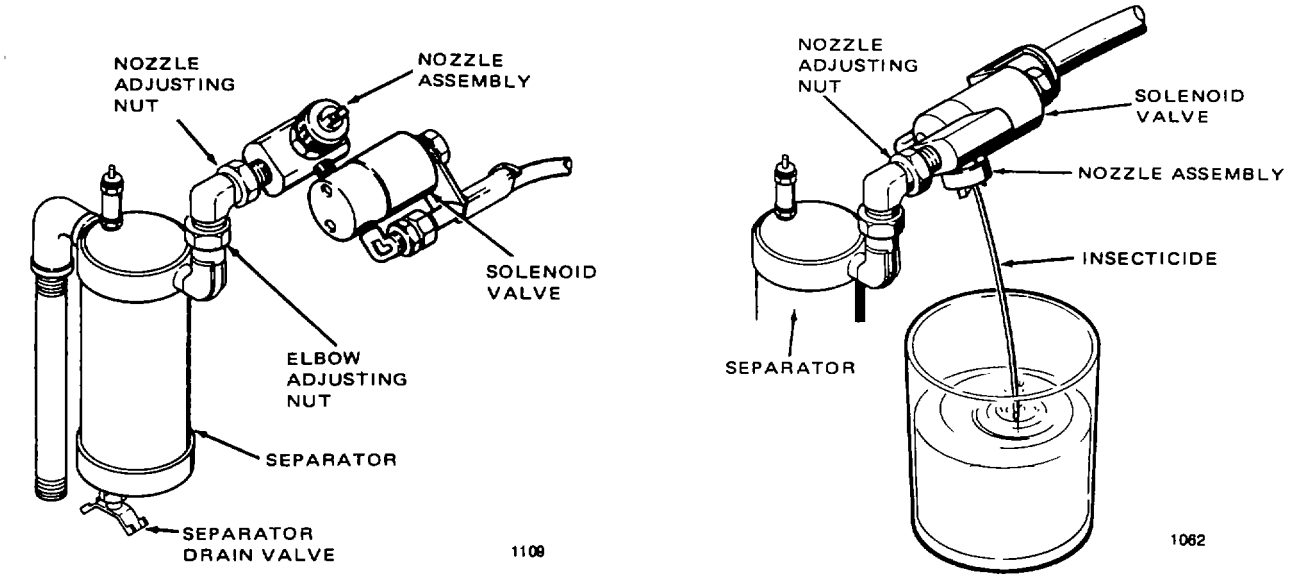


Figure 2-38. Aiming of Nozzle

(2) Aim the nozzle into a bucket.

(3) Turn the ignition switch and the solenoid switch ON.

(4) Allow the insecticide to flow for about five minutes.

(5) Record the flowmeter scale reading and the insecticide temperature.

STARTUP AND OPERATION SUMMARY (Continued)

(6) Using the recorded flow rate and temperature, determine the insecticide flow rate in ounces per minute from the appropriate graph. Figure 2-39 illustrates how to use the temperature correction curves.

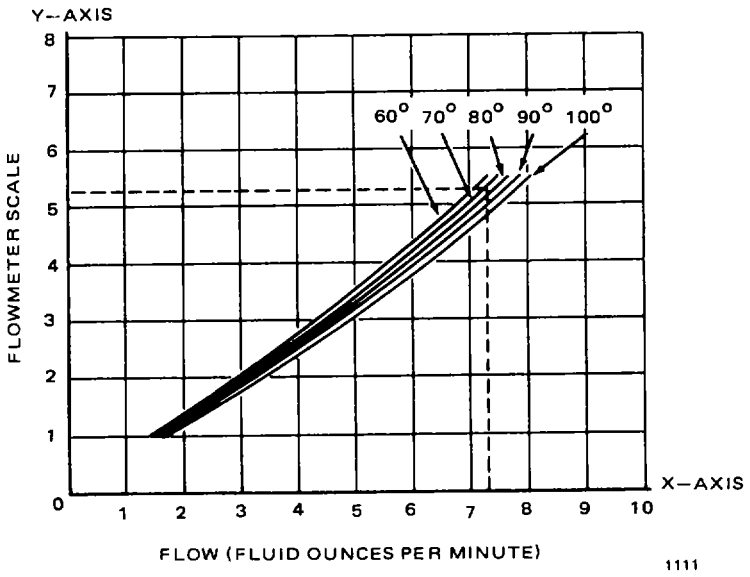


Figure 2-39. Temperature Correction Curve

NOTE

Temperature correction curves are listed on pages 1-9 through 1-13 for EPA approved insecticides. Refer to these curves for the appropriate insecticide flow rates.

(7) Allow insecticide to flow into a beaker for a timed minute.

(8) Turn OFF the ignition switch.

(9) Transfer the insecticide from the beaker into a graduated cylinder.

(10) Compare the reading determined from the temperature correction curve to the number of ounces per minute collected in the beaker.

(11) If the flow rates are not equal, notify your supervisor.

f. Operation Procedures

(1) Adjust the flowmeter to the proper flow rate.

(2) Check the insecticide label for the recommended driving speed.

(3) Drive over the course to be sprayed.

(4) Monitor the operation temperature and the operating nozzle temperature.

NOTE

A gradual increase in the nozzle operating pressure may be due to a build up of oil residue in the nozzle. If corrective action outlined in the operator troubleshooting table does not correct the problem, notify your supervisor.

STARTUP AND OPERATION SUMMARY (Continued)

g. Shutdown Procedures.

(1) Turn the solenoid valve switch OFF.

(2) Turn the ULV aerosol generator switch OFF.

(3) Open the tank pressure drain valve.

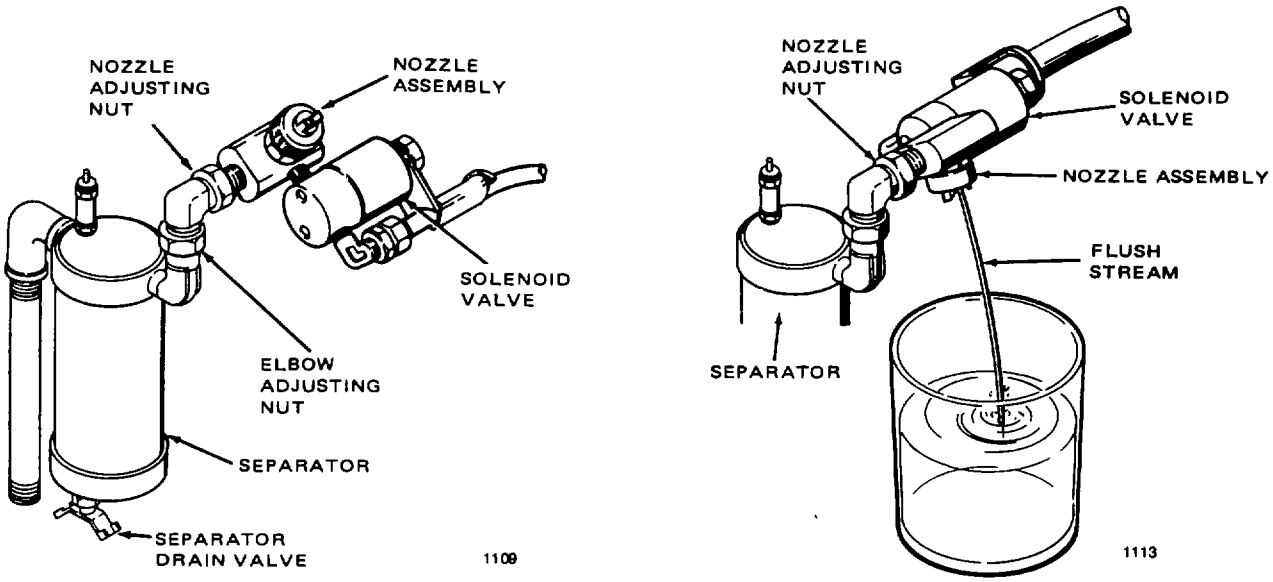


Figure 2-40. Flushing Procedures

(4) Aim the nozzle into a bucket.

(5) Fill the flush tank with soapy water.

(6) Pressurize the flush tank.

(7) Turn the solenoid valve switch ON.

(8) Turn the ULV aerosol generator ignition switch ON.

(9) Turn the three-way valve to flush and flush for about five to ten minutes.

CHAPTER 3

MAINTENANCE INSTRUCTIONS

Section I. LUBRICATION INSTRUCTIONS

ENGINE CRANKCASE

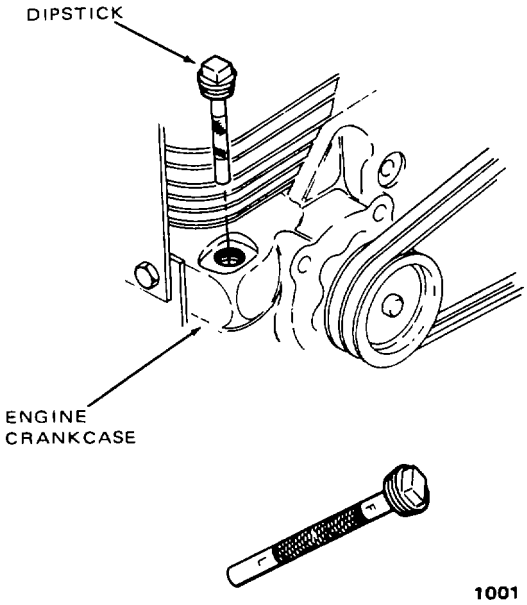


Figure 3-1. Engine Crankcase and Dipstick

Check the crankcase oil level daily.

a. Unscrew the plug dipstick and remove it from the crankcase.

b. Wipe off the dipstick and return it to the crankcase. DO NOT screw it back into the crankcase.

c. Remove the dipstick again and check the oil level. The level must be kept near the full (F) mark on the dipstick.

CAUTION

DO NOT overfill. The oil level must never be higher than the full (F) mark on the dipstick.

d. If the oil level is slightly above or below the low (L) mark, add oil to the crankcase through the dipstick hole. Use OE/HDO 30 detergent oil MIL-L-2104C.

e. Return the plug-dipstick to the hole and screw it down securely.

COMPRESSOR CRANKCASE

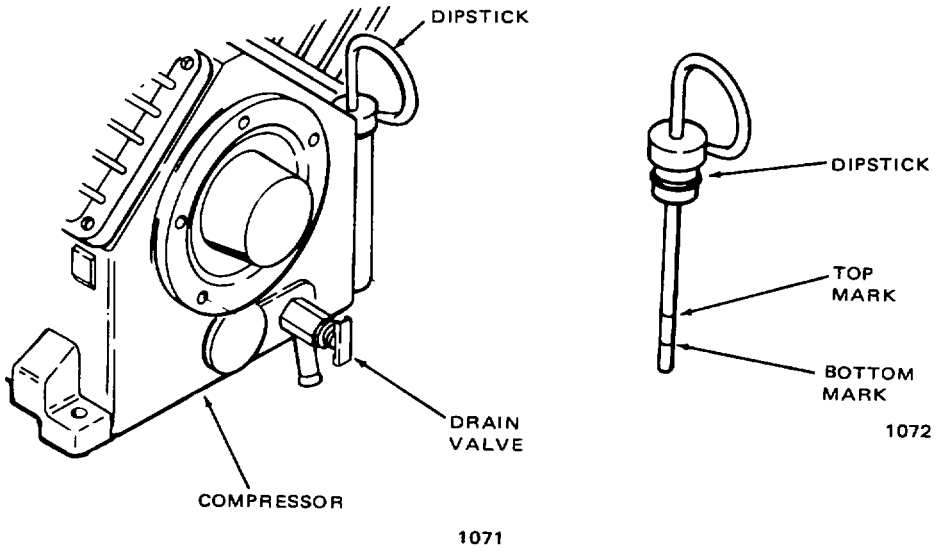


Figure 3-2. Compressor Dipstick

Check the crankcase oil level daily.

a. Pull the dipstick out of the crankcase.

b. Wipe off the dipstick and return it to the crankcase.

c. Remove the dipstick again and check the oil level.The oil level must be kept near the top mark on the dipstick.

CAUTION

DO NOT overfill. The oil level must never be higher than the top mark on the dipstick.

d. If the oil level is slightly above or below the bottom mark add oil through the dipstick hole. Use synthetic reciprocating compressor oil. Refer to page 1-6 for the correct compressor oil.

e. Install the dipstick in the hole.

Section II. OPERATOR TROUBLESHOOTING PROCEDURES

GENERAL

This section contains the troubleshooting procedures assigned to the aerosol generator operator according to the maintenance allocation chart. Each possible aerosol generator malfunction is listed in the symptom index (table 3-1). The probable cause and corrective actions are listed in the troubleshooting table (table 3-1). This manual cannot list all possible malfunctions, nor all tests, inspections or corrective actions. If a malfunction is not listed or is not corrected by the listed corrective actions, notify your supervisor.

Table 3-1. Symptom Index

Table 3-2. Operator Troubleshooting

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

1. NOZZLE PRESSURE GREATER THAN 100 PSI

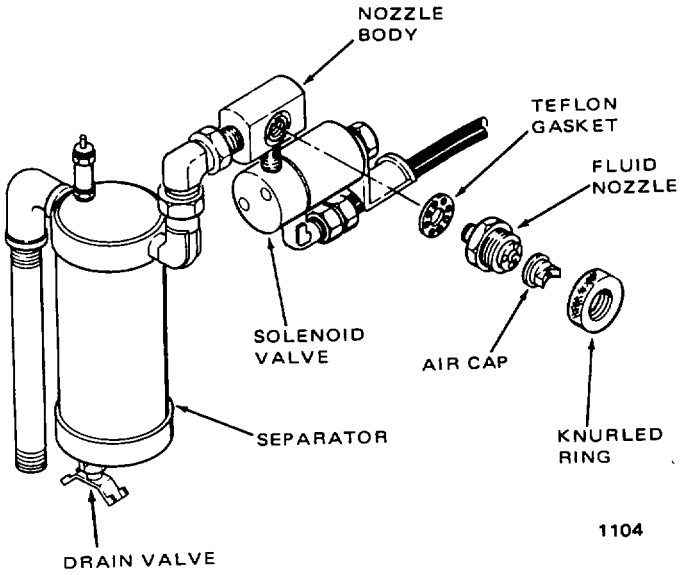


Figure 3-3. Nozzle Assembly

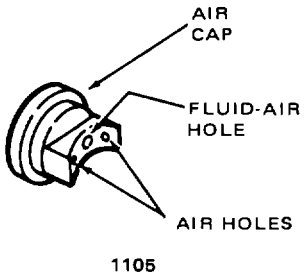


Figure 3-4. Air Cap

Step 1. Check nozzle assembly for blocking or plugging.

CAUTION

Do not use hard metal objects or probes to unplug air cap holes. Use a soft material like a toothpick.

a. Unscrew the knurled ring and remove the air cap.

(1) If the air cap holes are partially or completely plugged or coated with oil residue, soak the fluid nozzle in acetone (O-A-51F) to clean it.
(2) Carefully dean out the air cap holes with a toothpick or other non-metallic object.
(3) Wipe the air cap, the exposed fluid nozzle surfaces and the fluid hole projection with a clean rag. Go to step 1b.
(4) If the air cap is not plugged, go to step 1b.

b. Remove the fluid nozzle and check the air holes.

(1) If the air holes are plugged, or coated with oil residue, soak the fluid nozzle in acetone (O-A-51F) to dissolve the gunk and varnish.

Table 3-2. Operator Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

NOZZLE PRESSURE GREATER THAN 100 PSI (Continued)

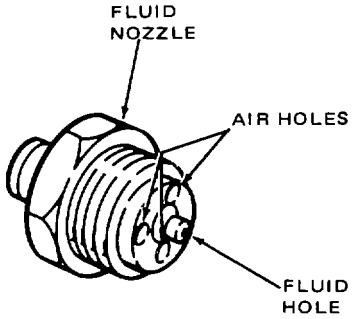


Figure 3-5. Fluid Nozzle

NOTE

Be sure to check the air groove in the back of the fluid nozzle and clean it as necessary.

(2) Carefully clean out the fluid nozzle holes with a toothpick or other soft non-metallic object.
(3) Wipe the fluid nozzle surface with a clean rag. Go to step 1c.
(4) If the air holes are not plugged, or coated with oil residue, go to step 1c.

CAUTION

DO NOT use tools to tighten the knurled ring. Tighten it by hand. Too much force will damage the nozzle assembly.

DO NOT over tighten the fluid nozzle: this could damage the teflon gasket and cause air leaks.

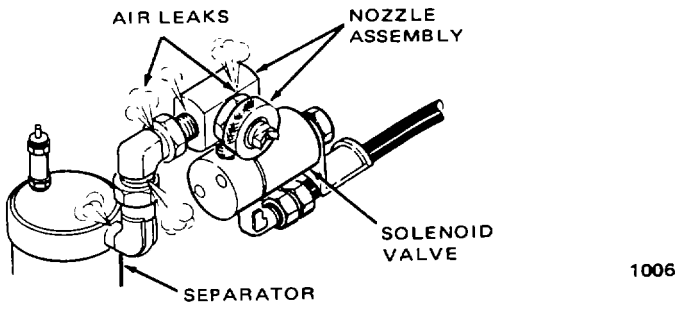


Figure 3-6. Nozzle Air Leaks

Table 3-2. Operator Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

NOZZLE PRESSURE GREATER THAN 100 PSI (Continued)

c. Reassemble the nozzle assembly and turn the engine ON. Check the pressure gage.

(1) If the pressure is 90-100 psi, the problem is solved.
(2) If the pressure is still greater than 100 psi, notify your supervisor of the problem.

2. NOZZLE PRESSURE BELOW 90 PSI

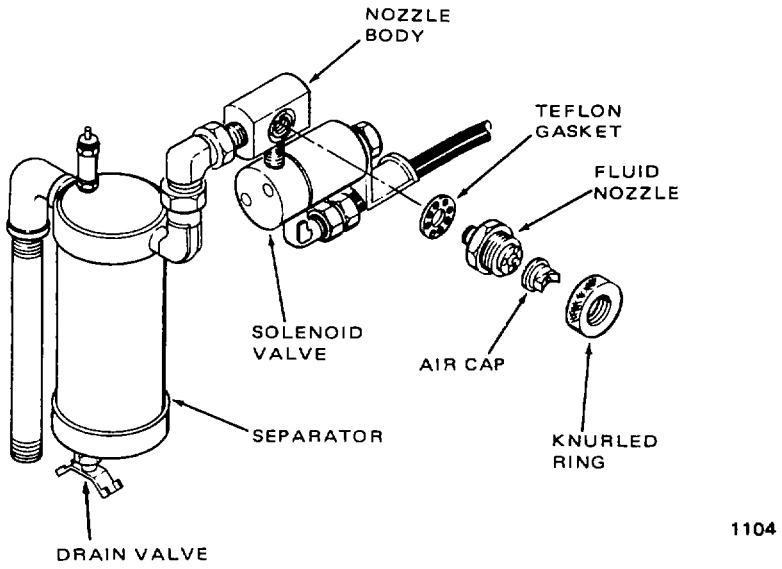


Figure 3-7. Nozzle Assembly

Step 1. Turn the engine ON and listen to the compressor.

a. If it runs smoothly, it is ok.
b. If the compressor makes grinding, rubbing or rattling noises, stop the engine and notify your supervisor.

Step 2. Check the nozzle assembly parts listed below for air leaks:

1. Knurled ring
2. Fluid nozzle
3. Teflon gasket
4. Nozzle body
5. Adjusting nuts and nipples
6. O-rings

Table 3-2. Operator Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

NOZZLE PRESSURE BELOW 90 PSI (Continued)

WARNING

DO NOT turn the solenoid valve switch ON while checking the nozzle assembly for air leaks.

CAUTION

DO NOT use tools to tighten the knurled ring. Tighten it by hand. Too much force will damage the nozzle assembly.

DO NOT use too much force to tighten the fluid nozzle. Too much force will damage the teflon gasket.

NOTE

The engine must be running to check for leaks around the nozzle assembly.

a. If the nozzle assembly parts listed above do not leak, notify your supervisor of problem.

b. If any of the nozzle assembly parts listed above are loose, tighten them. If they still leak, go to step 2d.

c. Shut the engine OFF before replacing any nozzle assembly parts.

d. If any of the nozzle assembly parts listed above still leak, remove them and inspect them.

(1) If any of the machined surfaces are nicked or scratched, replace that part and go to step 2e.

(2) If the teflon gasket is broken or squeezed out of shape, replace it and go to step 2e.

(3) If the O-rings are cut or cracked, replace them and go to step 2e.

e. After replacing any parts above, start the engine and check pressure again.

(1) If the pressure is 90-100 psi, the problem is solved.

(2) If the pressure is still less than 90 psi, notify your supervisor.

Section III. MAINTENANCE PROCEDURES

Operator maintenance procedures are limited to Preventive Maintenance Checks and Services on page 2-3 and Troubleshooting on page 3-3.

CHAPTER 4

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. REPAIR PARTS, SPECIAL TOOLS, TMDE AND SUPPORT EQUIPMENT

REPAIR PARTS

Repair parts are listed and illustrated in the repair parts and special tools list (TM5-3740-214-24P) covering organizational maintenance for this equipment.

COMMON TOOLS and EQUIPMENT

For authorized common tools and equipment refer to the Modified Table of Organization and Equipment (MTOE) used by your unit.

SPECIAL TOOLS, TMDE, and SUPPORT EQUIPMENT

a. Special Tools. There are no special tools listed in the repair parts and special tools list for this equipment.

b. TMDE and Support Equipment. No test measurement diagnostic equipment or support equipment is used by organizational maintenance.

Section II. SERVICE UPON RECEIPT

Service upon receipt by the organizational maintenance technician is limited to the following:

- Servicing aerosol generator with oil and gasoline.
- Checking and adding electrolyte in battery.
- Checking belt tension.
- Securing any loose nuts, bolts or screws.

Section III. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES

GENERAL

This section describes the preventive maintenance checks and services performed by organizational maintenance personnel. These checks and services ensure that any defects are discovered and corrected before they cause any serious damage. The proper checks and services are listed in Table 4-1. This table is divided into four main columns.

a. Item number. Each item to be inspected is numbered in order of performance. These item numbers will be listed in TM number column on the Equipment Inspection and Maintenance Work Sheet, DA Form 2404.

b. Interval. This column indicates when a certain part of the aerosol generator should be inspected.

c. Item to be Inspected. The items listed in this column are divided into groups showing the part of the aerosol generator being inspected.

d. Procedures. This column describes and illustrates the parts being inspected and the steps followed. If the aerosol generator fails to operate properly, turn to the troubleshooting section. Use TM 38-750 to report any mechanical defects.

Table 4-1. Organizational Preventive Maintenance Checks and Services

M = Monthly A/R = As Required Q = Quarterly H = Hourly

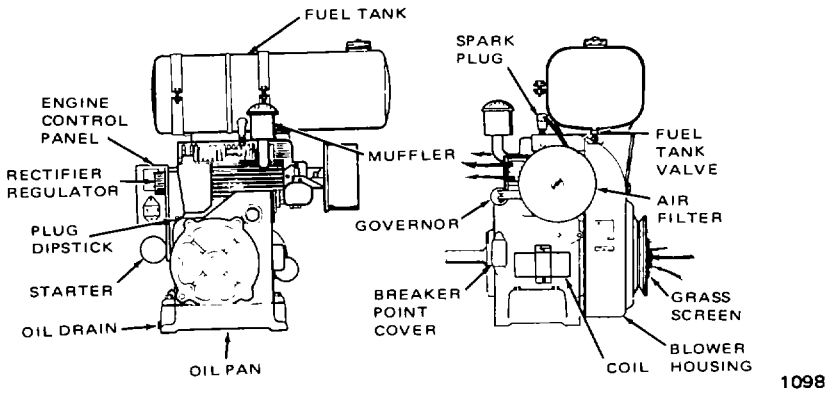
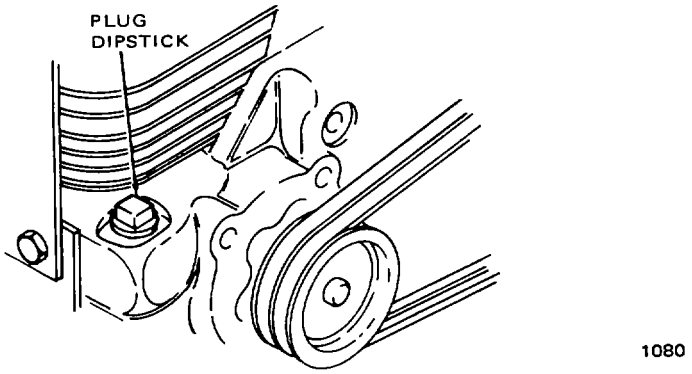
ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
1					**ENGINE ASSEMBLY**
					
					Figure 4-1. Engine Front and Rear Views
	●				a. Make sure all attached parts are securely fastened to engine assembly. Tighten loose components. Make sure mounting bolts are tight.
				25	b. Change engine crankcase oil.
					NOTE **The oil must be changed after the first five hours of operation then after every twenty-five hours of operation. Change the oil while it is warm. It will drain better when it is warm.** **WARNING** **BE ALERT not to touch the engine or crankcase while the engine is hot. It can cause severe burns.**
					
					Figure 4-2. Engine Dipstick Location

Table 4-1. Organizational Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
					ENGINE ASSEMBLY (Continued)

(1) Unscrew plug dipstick and allow it to rest in the dipstick hole.

(2) Place a pan under engine oil drain.

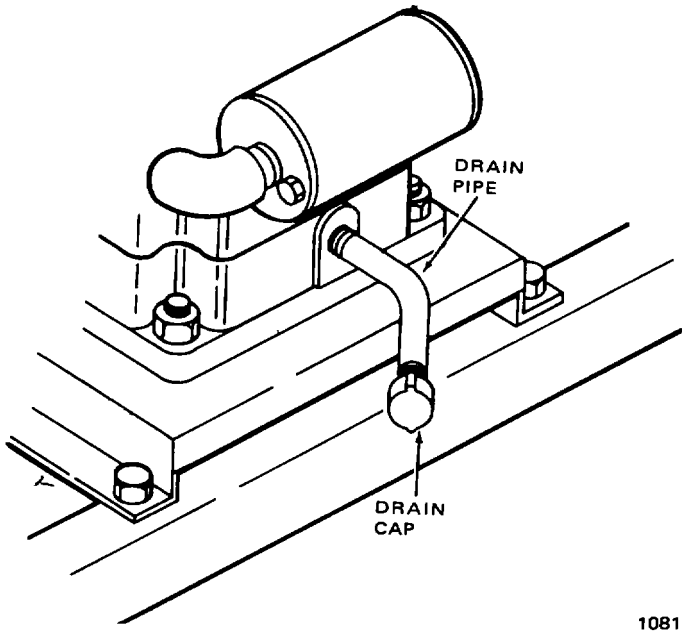


Figure 4-3. Engine Crankcase Drain

(3) Remove drain cap and drain oil into pan.

NOTE

Drain oil when it is warm. It will drain faster when it is warm.

(4) Return cap to drain pipe after oil is drained.

(5) Remove dipstick and add one quart of OE/HD 30 detergent oil MIL-L-2104C.

CAUTION

DO NO overfill. The oil level must never be higher than the (F)mark. If it is, drain oil until reaching the correct level.

(6) Install plug-dipstick.

Table 4-1. Organizational Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
2					**ENGINE ASSEMBLY (Continued)**

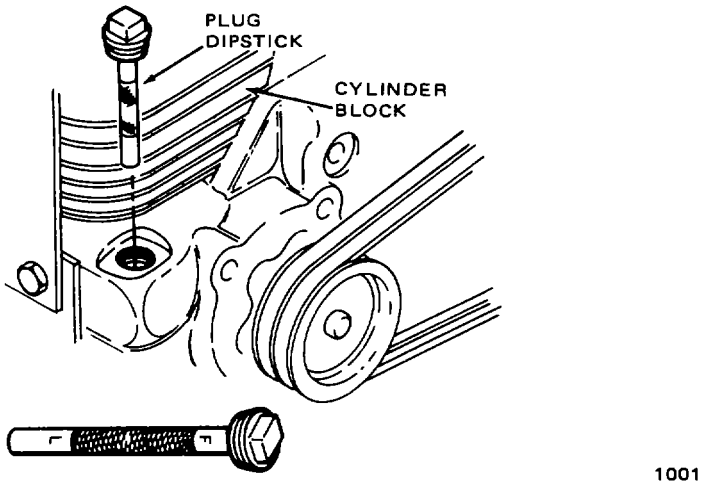


Figure 4-4. Engine Crankcase and Dipstick

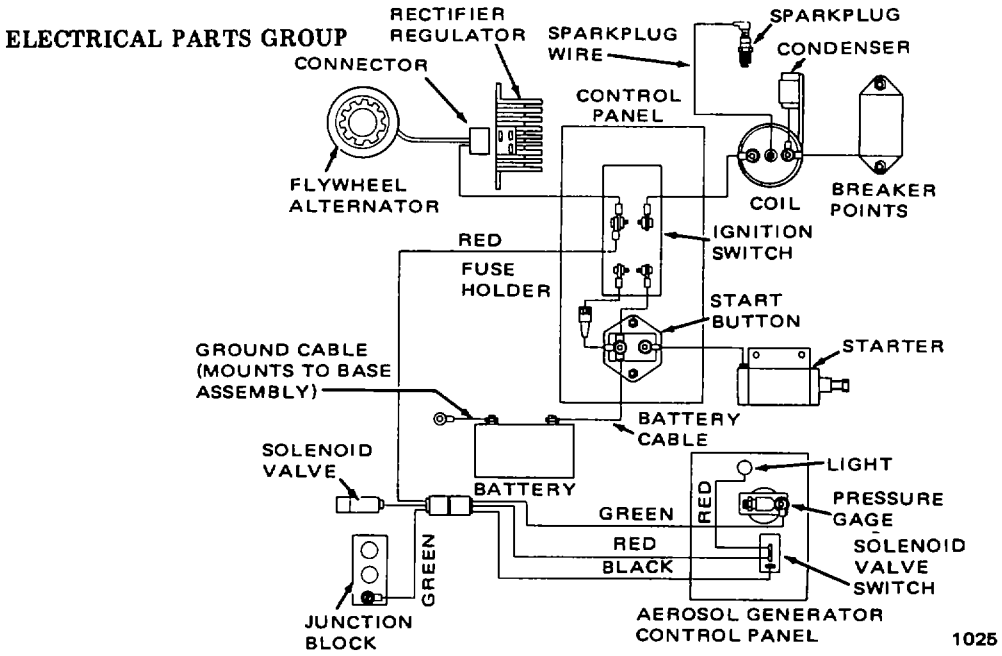


Figure 4-5. Aerosol Generator Wiring Diagram

Table 4-1. Organizational Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
					ELECTRICAL PARTS GROUP (Continued)
	●				a. Check electrical fittings listed below for looseness, rust, corrosion or damage. 1. Engine Control Panel wires 2. Spark plug 3. Coil wires 4. Breaker point lead 5. Rectifier-regulator 6. Control panel 7. Starter 8. Solenoid valve 9. Harness connectors 10. Ground wires 11. Battery cables
					b. Replace wires when insulation is frayed, chafed, cut or cracked.
					c. Check fuse. Replace it as necessary.
				100	d. Replace spark plug.
3	●				**FUEL TANK**

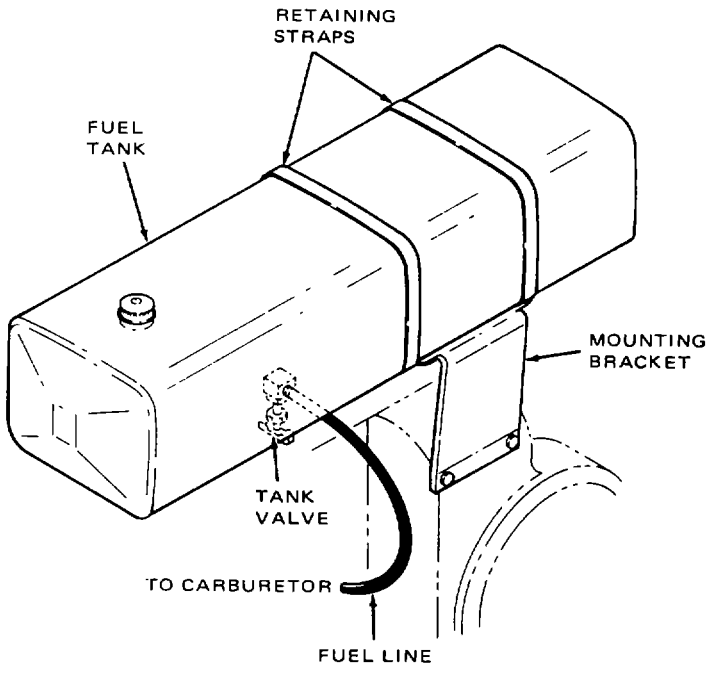


Figure 4-6. Fuel Tank Assembly

Table 4-1. Organizational Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
					FUEL TANK (Continued) a. Make sure fuel tank is securely mounted to engine assembly. Tighten mounting screws, nuts and bolts as necessary. b. Make sure fuel line is not chafed, cut or leaking. c. Make sure fuel tank valve opens and closes smoothly.
4					**MUFFLER ASSEMBLY**
	●				a. Make sure muffler is securely fastened to engine. b. Replace muffler if it is leaking.

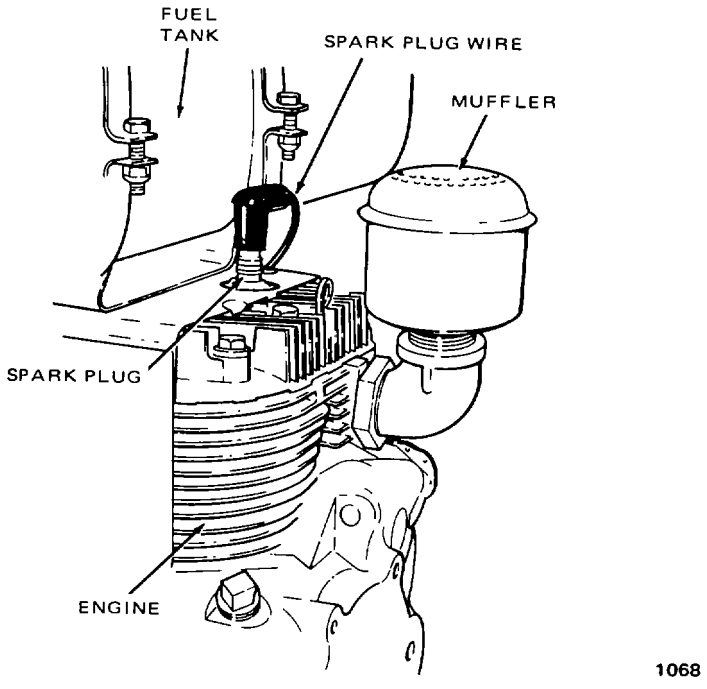


Figure 4-7. Muffler Location

Table 4-1. Organizational Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
5					**AIR CLEANER**

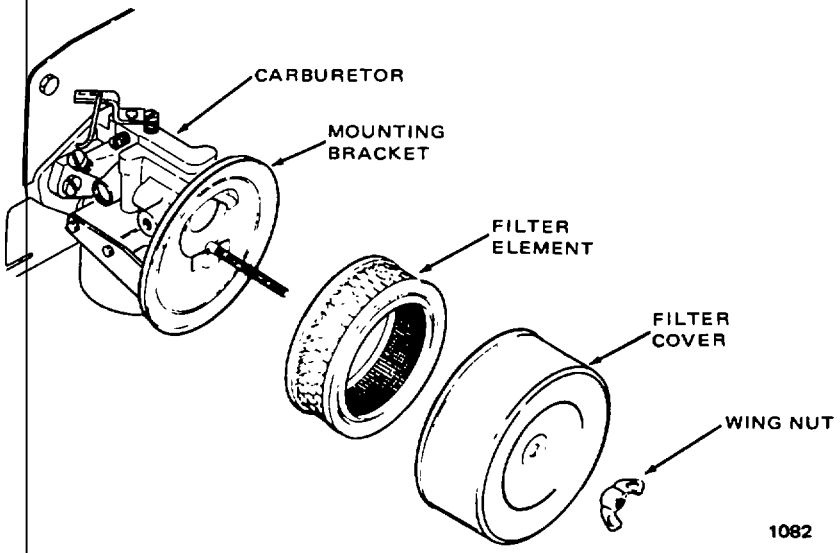


Figure 4-8. Air Cleaner

				50	a. Remove filter cover and check filter element.

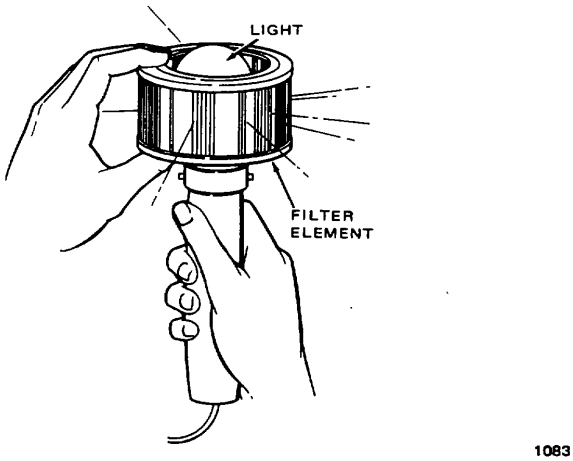


Figure 4-9. Air Filter Test

b. Hold a light in the center of filter element.

Table 4-1. Organizational Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

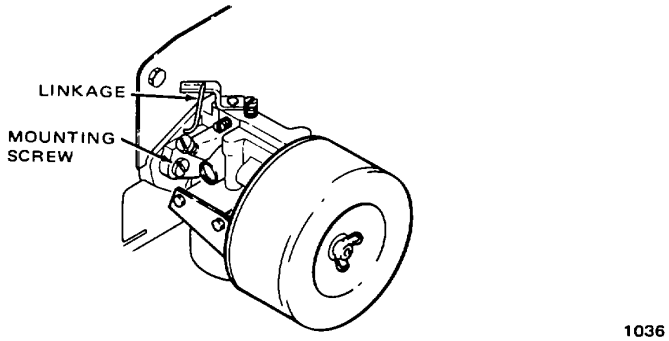
ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
					AIR CLEANER (Continued)
					(1) If light passes through filter element, it is ok.
					NOTE
					Before installing the air filter element, bang it on a flat surface to remove loose dirt.
					The air filter element must be replaced after 100 hours of operation.
					(2) If light does not pass through filter element, replace it.
					c. Make sure air cleaner mounting bracket is securely fastened to carburetor and reassemble air cleaner.
6					**CARBURETOR**
					
					Figure 4-10. Carburetor
	●				a. Make sure carburetor is securely fastened to engine.
	●				b. Make sure carburetor linkage is correctly attached.
7					**COMPRESSOR ASSEMBLY**
	●				a. Make sure compressor is securely fastened to base assembly.
	●				b. Check belt condition.
					(1) Remove belt guard.
					(2) If belts are cracked, frayed or worn, replace them.

Table 4-1. Organizational Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
					COMPRESSOR ASSEMBLY (Continued)

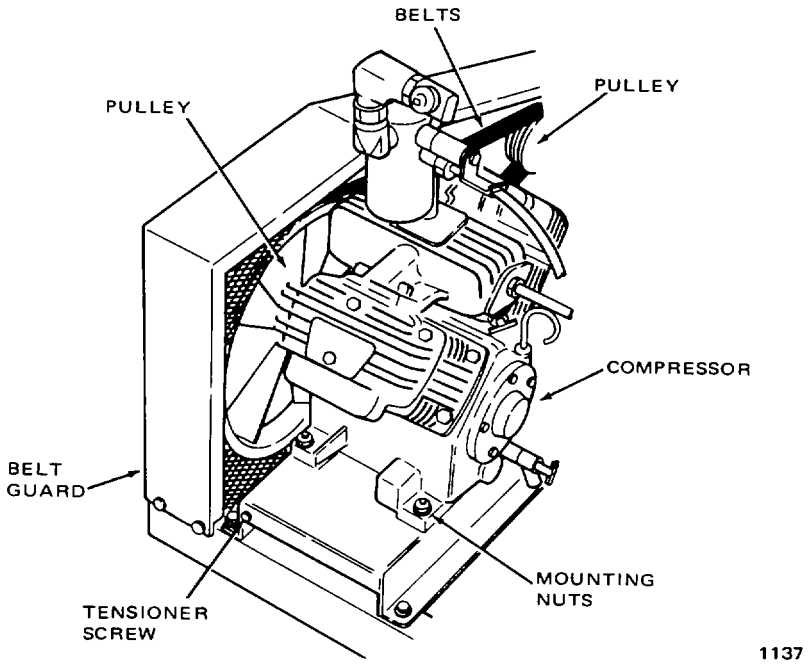


Figure 4-11. Compressor Assembly

		●			c. Replace belts. (1) Loosen mounting nuts. Do not remove them. (2) Turn tensioner nut counterclockwise (left) to loosen belts. (3) Replace belts. **NOTE** **Replace belts as a set. DO NOT replace only one belt at a time.** d. Line up pulleys. **NOTE** **Compressor mounting nuts should be loose and belt guard removed. An alignment gage can be made from a piece of scrap metal or wood and be used to line up the pulleys.**

Table 4-1. Organizational Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
					COMPRESSOR ASSEMBLY (Continued)

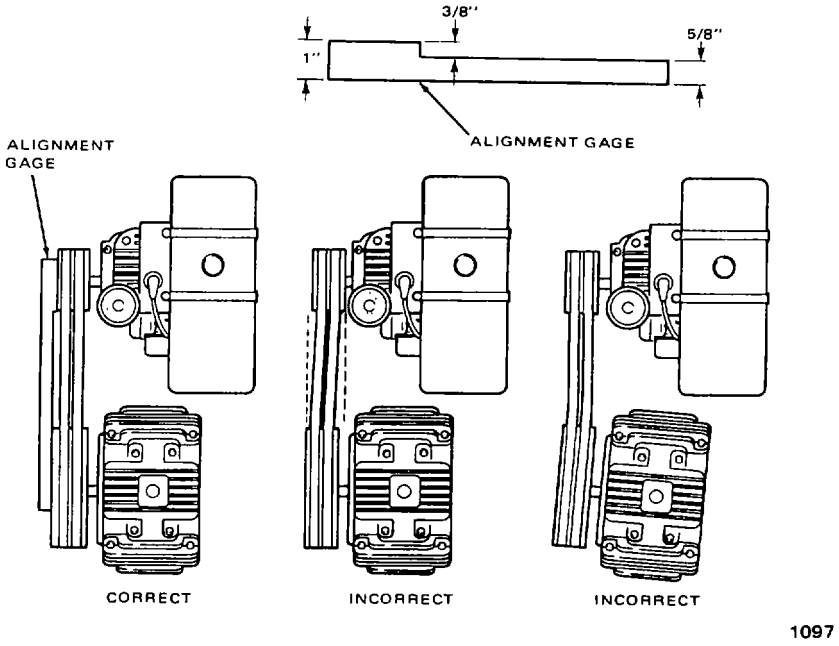


Figure 4-12. Compressor Alignment

(1) Line up compressor pulley with engine pulley.

(2) Turn tensioner screw clockwise (right) to tighten belts. Keep pulleys lined up while tightening screw.

(3) Check the belt tension. The belts should only move 5/16 inch (6. 35 mm) when a 5 8 lb (2. 27 to 3. 63 Kg) pressure is applied to a point on the belts midway between the pulleys.

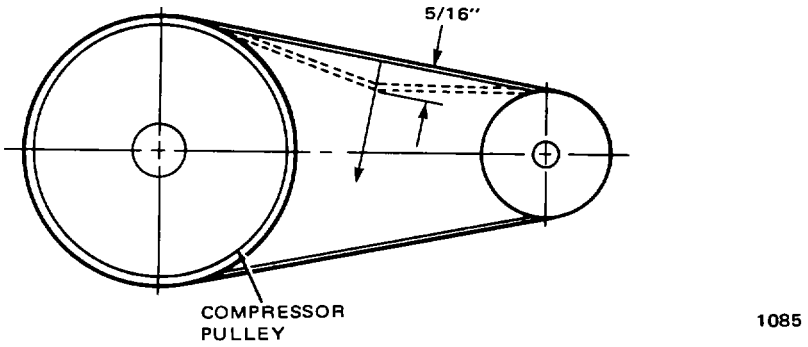


Figure 4-13. Belt Deflection

Table 4-1. Organizational Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
					COMPRESSOR ASSEMBLY (Continued)
					(4) When the belt tension is correct, tighten the compressor mounting nuts.
					(5) Replace the belt guard.
				100	e. Change compressor crankcase oil.
					(1) Remove dipstick.
					(2) Place pan under crankcase drain valve.
					(3) Drain oil and close valve.
					NOTE
					Drain oil when it is warm. It will drain faster when it is warm.
					(4) Add 1.5 pints of synthetic reciprocating compressor oil through dipstick hole. Refer to page 1-6 for correct compressor oil.
					CAUTION
					DO NOT overfill. The oil level must never be higher than the top mark on the dipstick. If it is, drain oil until reaching the correct level.
					(5) Install dipstick.
				75	f. Change compressor air filters. The compressor air filter elements must be replaced after each 75 hours of operation or sooner, as necessary.

Table 4-1. Organizational Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

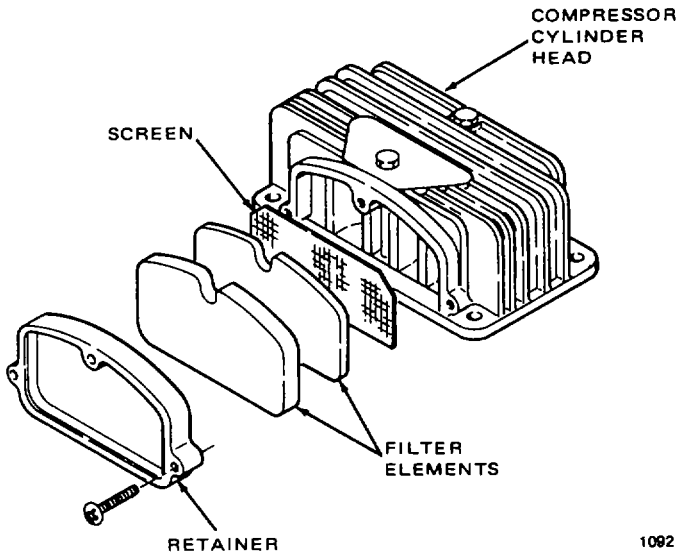
ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
					COMPRESSOR ASSEMBLY (Continued)
					
					Figure 4-13.1. Compressor Air Filter Assembly
					(1) Remove the filter retainer screws and the filter retainer.
					(2) Remove the filter elements and screen.
					(3) Replace the filter elements; do not attempt to clean them. Cleaning solvents will dissolve the filter elements.
					(4) Clean the screen with acetone (O-A-51F).
					(5) Install the screen and new filters and secure them with the filter retainer and screws.
8					**SEPARATOR ASSEMBLY**
				200	a. Drain oil from separator.
					b. Disassemble separator.
					(1) Remove separator retaining nut.
					(2) Disassemble separator parts.
				100	c. Check filter element and clean it in acetone as necessary.

Table 4-1. Organizational Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
					SEPARATOR ASSEMBLY (Continued)

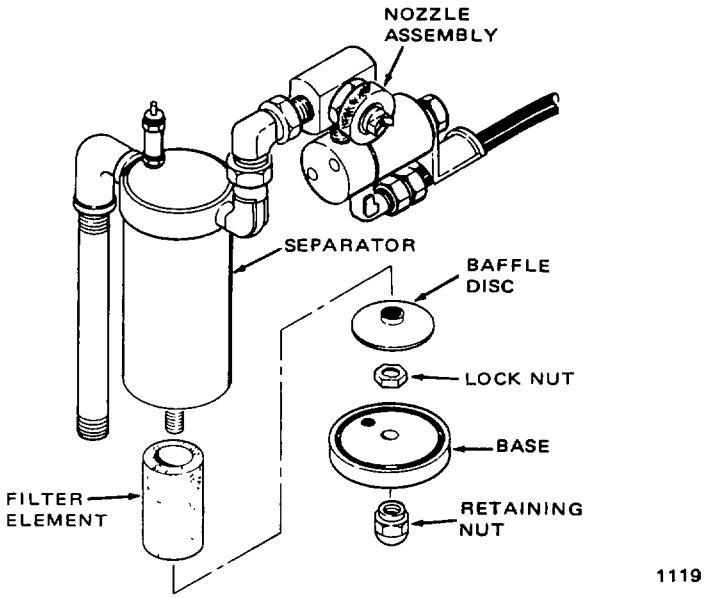


Figure 4-14. Separator Assembly

	9				**NOZZLE ASSEMBLY**

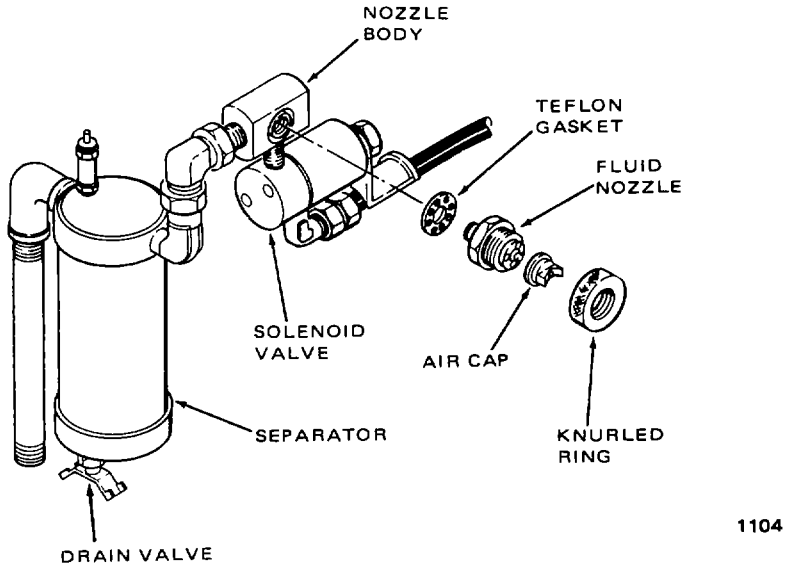


Figure 4-15. Nozzle Assembly

Table 4-1. Organizational Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

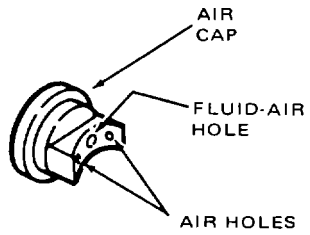
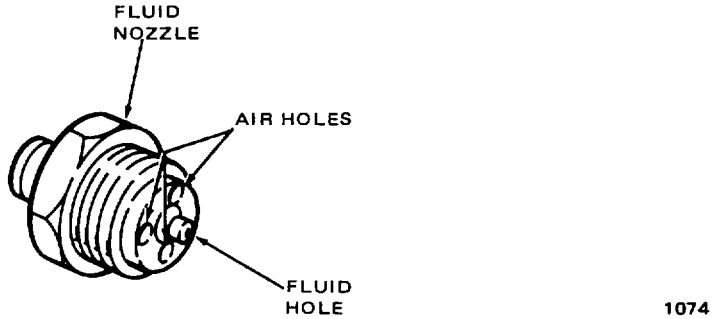
ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
					NOZZLE ASSEMBLY (Continued)
					CAUTION **DO NOT use hard metal objects or probes to clean air cap holes or fluid nozzle.** **DO NOT use tools to tighten knurled ring. Tighten it by hand. Too much force will damage the air cap and knurled ring.** **DO NOT use too much force to tighten fluid nozzle. Too much force will damage the Teflon gasket.**
					
					Figure 4-16. Air Cap
	●			100	a. Make sure air cap is not plugged or blocked. (1) Remove knurled ring and air cap. (2) Soak the air cap in acetone (0-A-51F) to dissolve the gunk and varnish. (3) Unplug the air cap holes with a toothpick. (4) Wipe all exposed air cap surfaces with a clean rag.
					
					Figure 4-17. Fluid Nozzle

Table 4-1. Organizational Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
					NOZZLE ASSEMBLY (Continued)
	●			100	b. Make sure fluid nozzle air holes are not plugged or blocked. (1) Remove fluid nozzle-and gasket. **NOTE** **Be sure to check the air groove in the back of the fluid nozzle and clean it as necessary.** (2) Soak the fluid nozzle in acetone (0-A-51F) to dissolve the gunk and varnish. (3) Unplug the fluid nozzle holes with a toothpick. (4) Wipe the fluid nozzle with a clean rag. (5) Replace Teflon gasket. (6) Install fluid nozzle, gasket, air cap, and knurled ring.
10					**CONTROL PANEL**

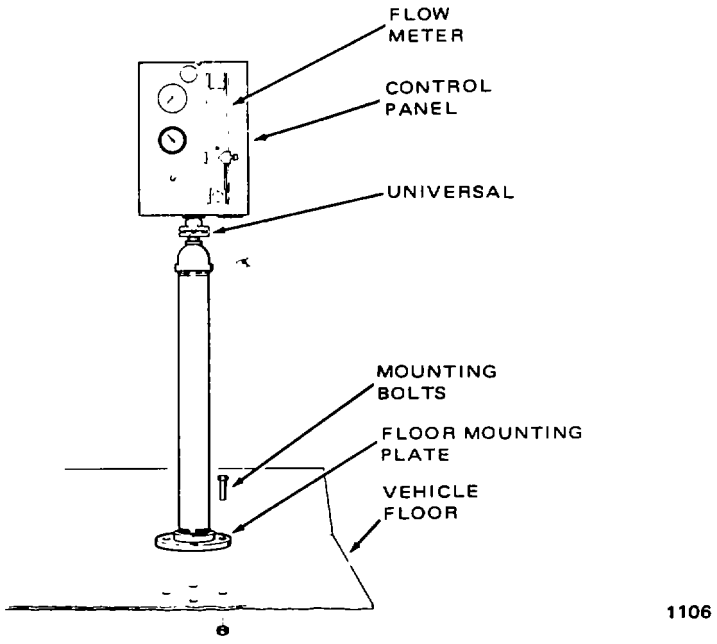


Figure 4-18. Control Panel Installation

Table 4-1. Organizational Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
	●				**CONTROL PANEL (Continued)** a. Make sure control panel base is securely fastened to vehicle floor.

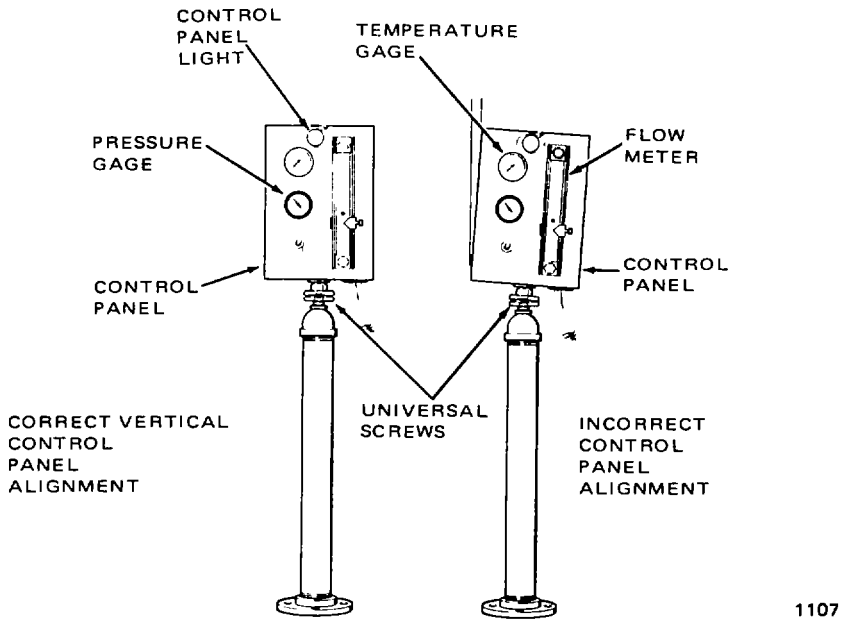


Figure 4-19. Control Panel Alignment

b. Make sure control panel is in a straight up and down position and not tilted at an angle.

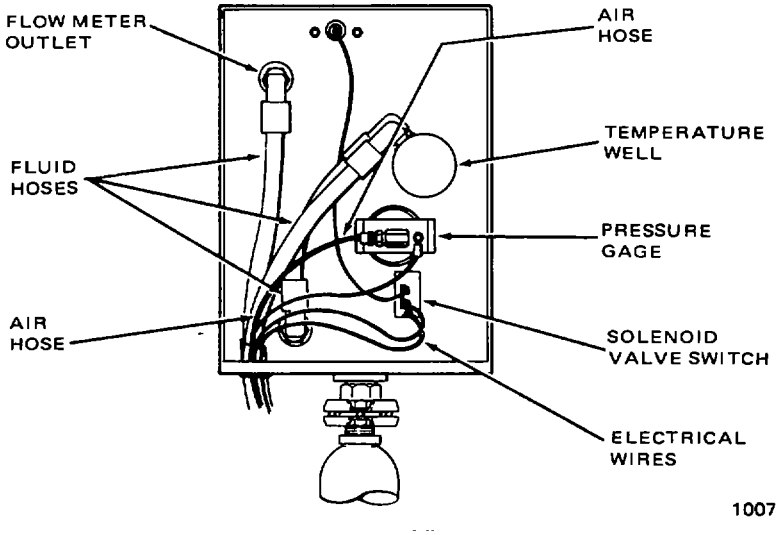


Figure 4-20. Control Panel Rear View

Table 4-1. Organizational Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
					CONTROL PANEL (Continued) c. Make sure all control panel components are securely fastened to control panel. Check all hoses and fittings for leaks and replace them as necessary. Make sure electrical wires are securely fastened to solenoid valve switch and ground. d. Make sure control panel light operates.
11					**FLOWMETER**
	●				a. Make sure flowmeter control valve operates smoothly. b. Check meter tube for nicks or cracks. c. Make sure pointer operates smoothly.

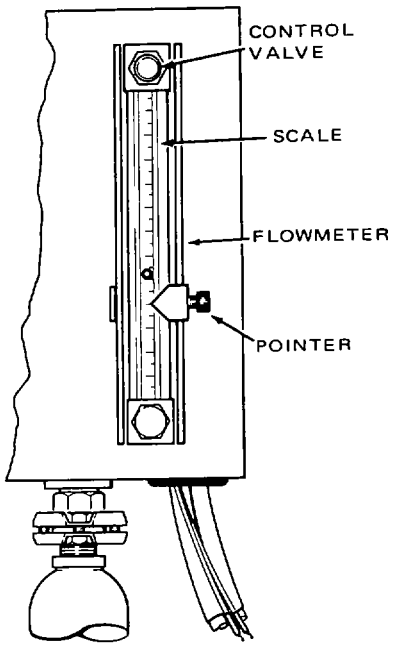


Figure 4-21. Insecticide Flowmeter

CAUTION

DO NOT force control valve all the way open or closed. Too much force will damage the valve.

Table 4-1. Organizational Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

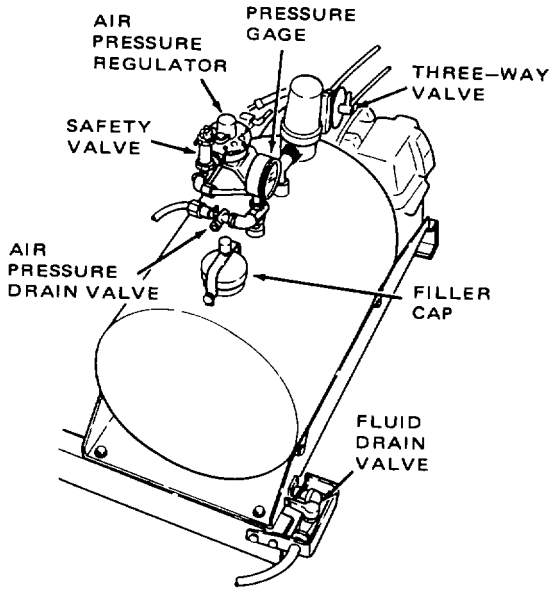
ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
12					**FORMULATION TANK**
					 **1140**
					Figure 4-22. Formulation Tank
	●				a. Pressurize formulation tank. (1) Make sure tank is empty. If not drain it. (2) Turn three-way valve to flush. (3) Start engine according to start procedures in Chapter 2, Section III. (4) When tank pressure evens out, shutoff engine. (5) Allow tank to stand under pressure for five minutes. (a) If pressure remains constant the tank is ok. (b) If pressure drops or tank leaks, notify your supervisor.

Table 4-1. Organizational Preventive Maintenance Checks and Services (Continued)

M = Monthly **A/R = As Required** **Q = Quarterly** **H = Hourly**

ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
					FORMULATION TANK (Continued)

b. Check all hoses and fittings for damage.

(1) If hoses are cracked, chafed, burned or leaking replace them.

(2) If fittings are damaged or leaking, replace them.

NOTE

If hose or fitting damage is too great to repair, replace the entire harness and not the damaged hose or fitting.

c. Make sure all valves operate smoothly and do not leak.

d. Make sure filter cap seals correctly and does not leak.

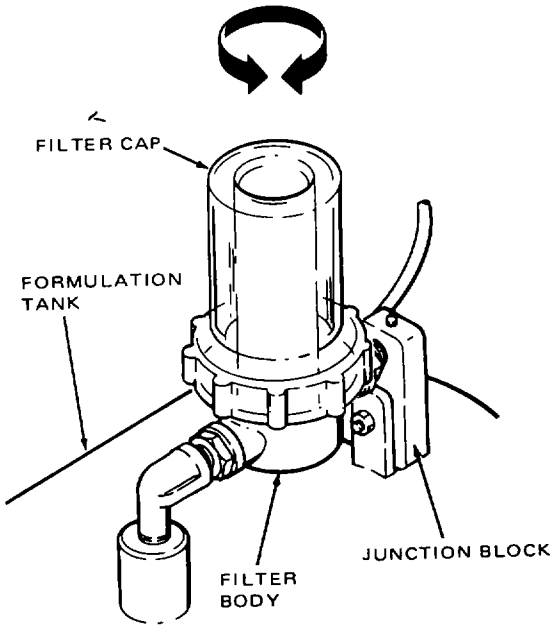


Figure 4-23. Formulation Tank Filter

e. Check formulation tank filter.

(1) Unscrew filter cap and remove filter screen. If it is clogged or dirty, clean it with soap and water such as P-S-579.

Table 4-1. Organizational Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
					FORMULATION TANK (Continued)

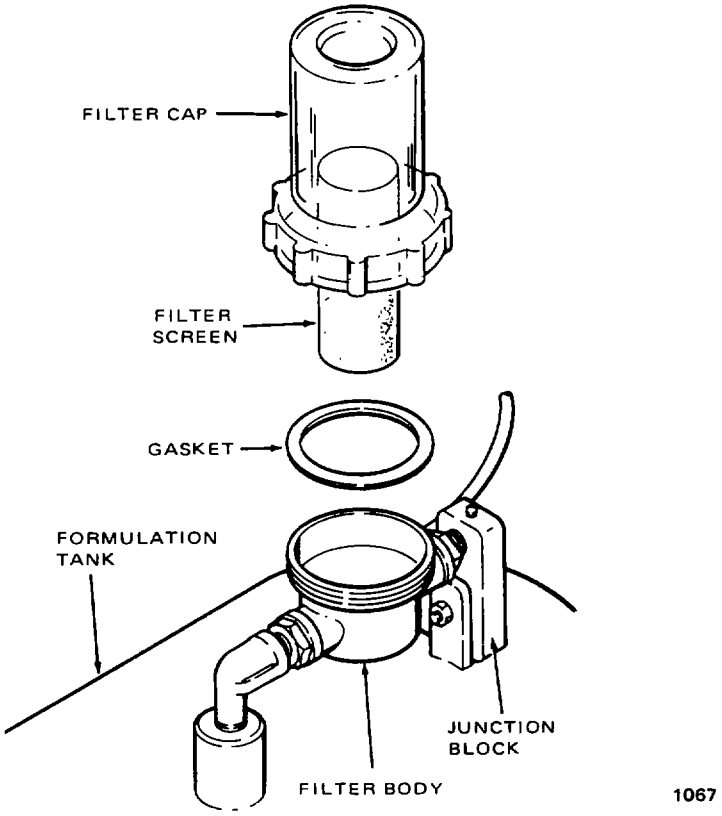


Figure 4-24. Filter Assembly

(2) Reassemble filter. Make sure gasket seats correctly and does not bend, twist or become pinched in the threads.

13					**FLUSH TANK**
	●				a. Make sure flush tank is securely fastened to base assembly and engine.
					b. Make sure flush tank operates correctly.
					(1) Turn three-way valve to flush position.
					(2) Unlock flush tank pump handle.
					(3) Pump handle up and down twelve times and lock handle. If a pressure does not build up while pumping notify your supervisor.

Table 4-1. Organizational Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
					FLUSH TANK (Continued

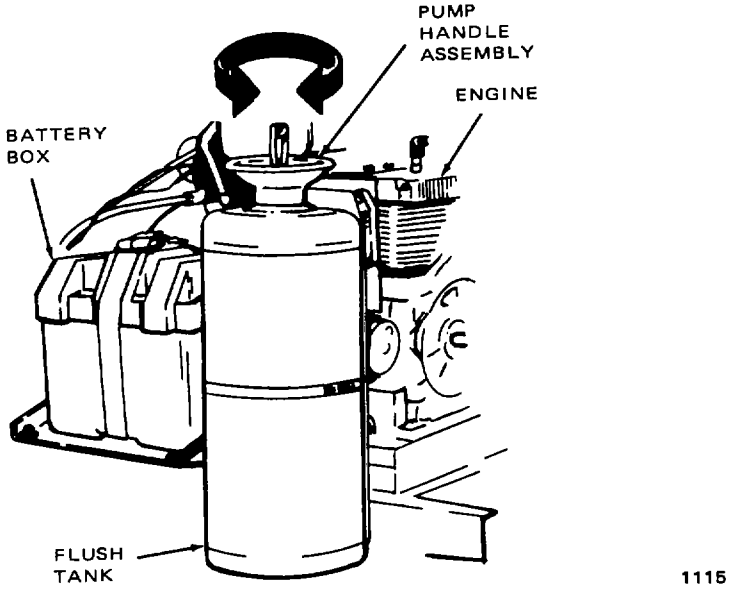


Figure 4-25. Flush Tank

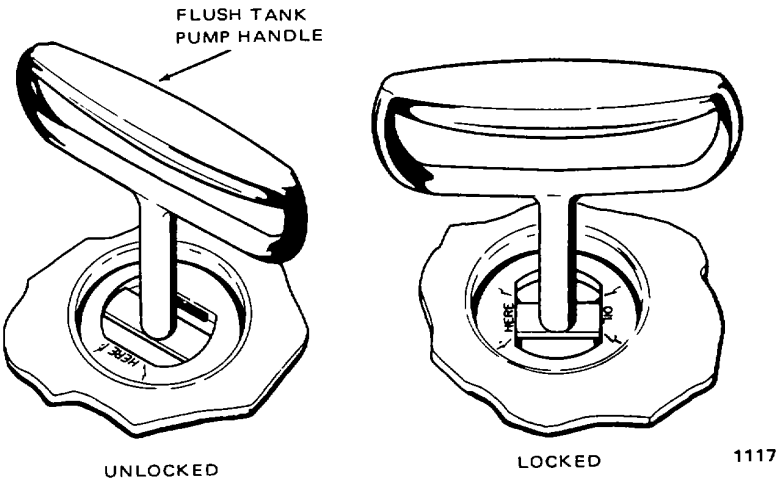


Figure 4-26. Locking of Pump Handle

(4) Turn aerosol generator ignition switch ON.

(5) Turn solenoid valve switch ON and watch float ball. If there is pressure on flush tank when solenoid valve is opened, the ball will jump. If the ball does not jump, notify your supervisor the flush tank will not pressurize.

Table 4-1. Organizational Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
					FLUSH TANK (Continued)

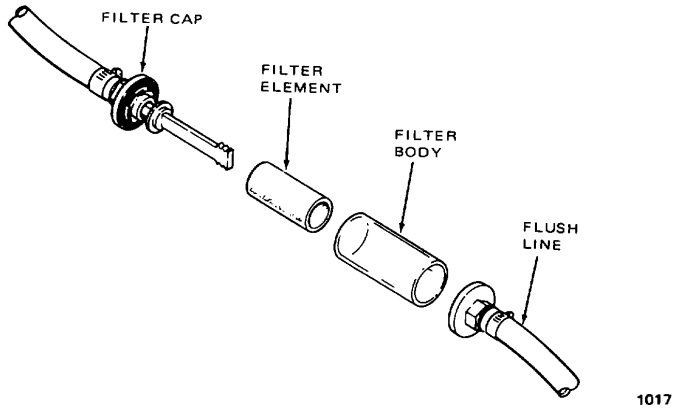


Figure 4-27. Flush Line Filter Assembly

(6) Turn solenoid valve switch OFF.

(7) Turn engine ignition switch OFF.

c. Check flush line filter. If it is dirty, replace it.

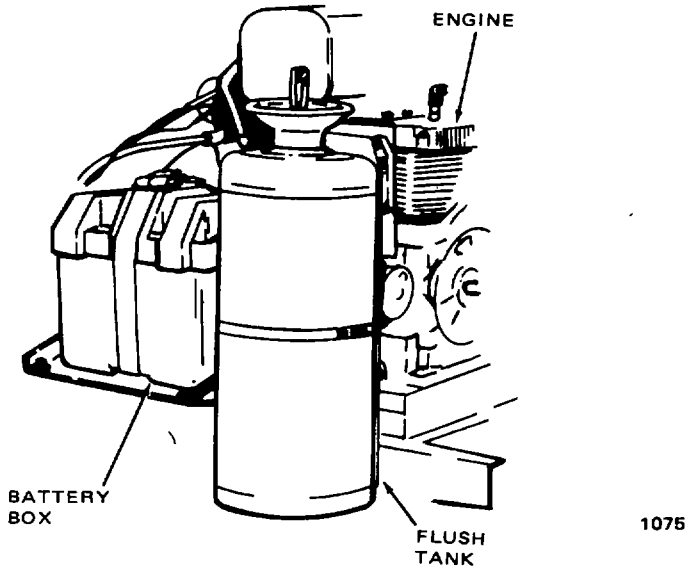


Figure 4-28. Flush Tank

Table 4-1. Organizational Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

ITEM NO.	INTERVAL M	Q/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
14					**BATTERY ASSEMBLY**
	●				a. Make sure battery and battery box are securely fastened to base assembly.
					b. Inspect battery visually.
					(1) Undo retainer strap and remove battery box cover.
					(2) Make sure the battery cables are tight on the terminals. They should not be able to be moved by hand.
					(3) Make sure the battery ground connection is securely fastened.
					(4) If there is any corrosion on the battery or around the terminals, rinse it off with a baking soda and water solution.
					(5) If there is dirt on the top of the battery, brush it off.
					(6) If the cable insulation is frayed or broken, replace the cable.
					(7) If there are cracks in the sides or the cover of the battery, replace it.
	●			50	c. Check the electrolyte in the battery. Use a hydrometer to check the specific gravity.

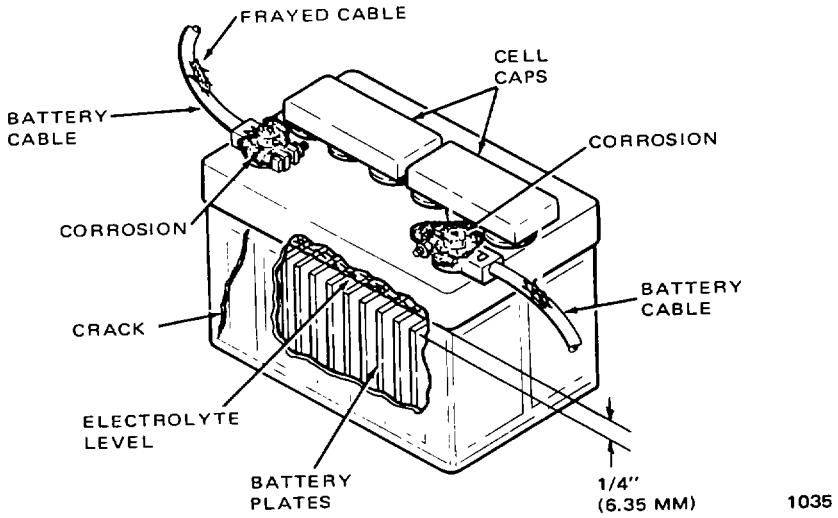


Figure 4-29. Battery Inspection

Table 4-1. Organizational Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
					BATTERY ASSEMBLY (Continued)

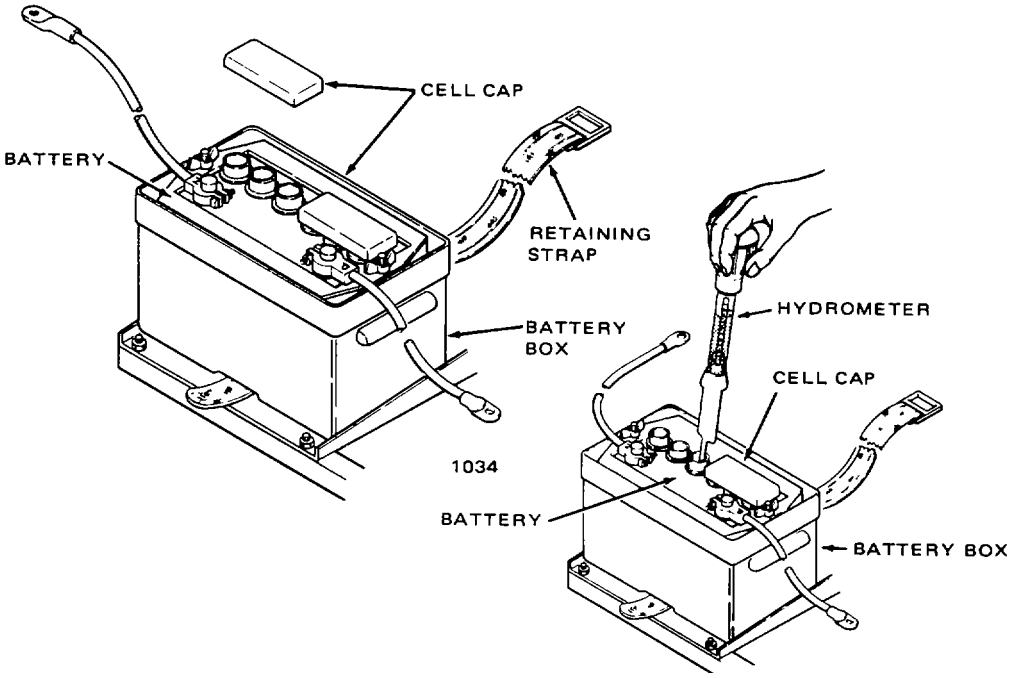


Figure 4-30. Specific Gravity Test

CAUTION

The electrolyte level must be kept above the plates in the battery.

DO NOT overfill the battery. The electrolyte should not overflow onto the battery cover when the cell covers are placed over the cells.

(1) Remove the cell covers and check the electrolyte level. Add distilled water if the level is below the top of the plates.

(2) Check the specific gravity.

(3) If the specific gravity is between 1.250 and 1.280, the cells are ok.

(4) If the specific gravity is between 1.225 and 1.250, the cells are still in fair condition .

(5) If the specific gravity is below 1.150 in any one cell, replace the battery.

(6) If the specific gravity in one cell is more than 0.050 less than the other cells and will not charge to more than a 50% charge, replace the battery.

Table 4-1. Organizational Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
15					**BASE ASSEMBLY**

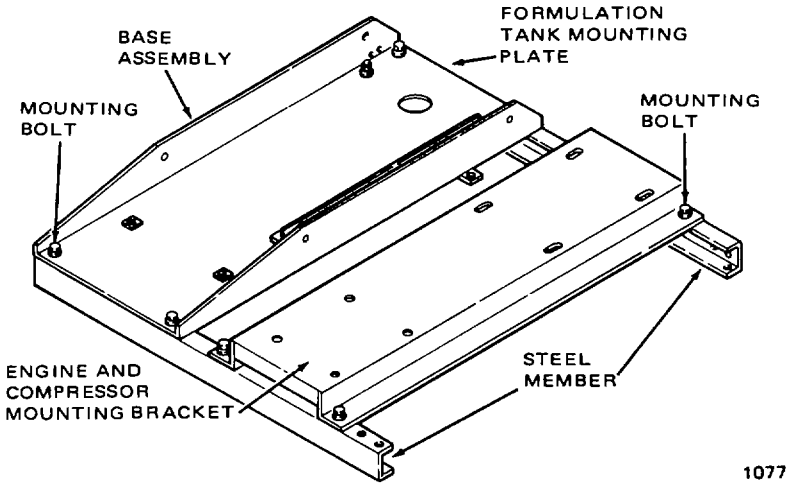


Figure 4-31. Base Assembly

Make sure base plates and steel members are securely fastened together. Tighten nuts and bolts as necessary.

Section IV. ORGANIZATIONAL MAINTENANCE TROUBLESHOOTING PROCEDURES

GENERAL

This section contains the troubleshooting procedures assigned to the organizational maintenance technician according to the maintenance allocation chart. Each probable aerosol general malfunction is listed in the symptom index (table 4-2). The probable cause and corrective actions are listed in the troubleshooting table (table 4-2). This manual cannot list all possible malfunctions, nor all tests, inspections or corrective actions. If a malfunction is not listed or is not corrected by the listed corrective actions, notify your supervisor.

Table 4-2. Symptom Index

Table 4-3. Troubleshooting Chart

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

1. ENGINE DOES NOT START BUT IT TURNS OVER

Step 1. Check fuel tank.

a. If there is fuel in tank go to step 2.

b. If there is no fuel in tank, fill it with gasoline and go to step 1c.

c. Start engine.

(1) If engine starts, the problem is solved.

(2) If engine does not start, go to step 2.

Step 2. Check for gasoline in carburetor throat.

WARNING

Open the pressure drain valve on the formulation tank and turn the solenoid valve switch OFF. Cranking the engine over could pressurize the formulation tank and accidentally spray insecticide.

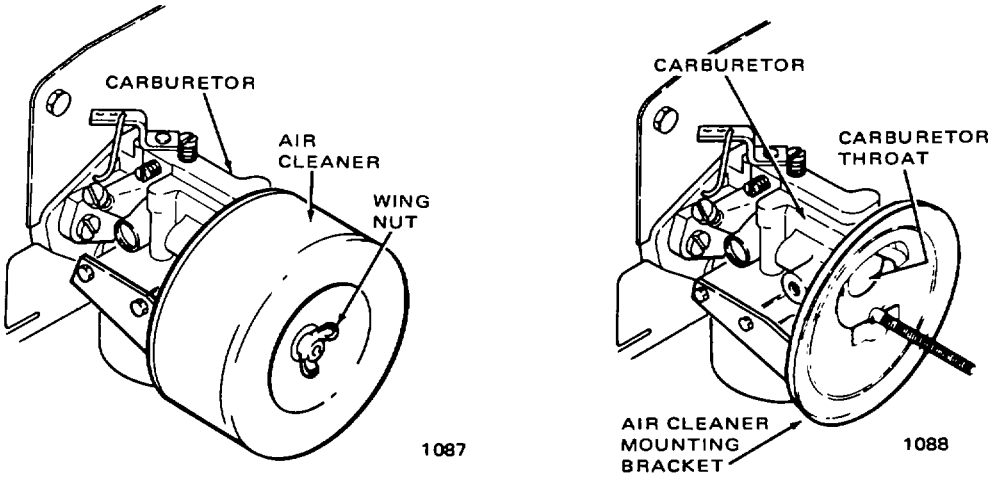


Figure 4-32. Air Cleaner Removal

a. Remove air cleaner wing nut and air cleaner.

b. Turn ignition switch OFF.

c. Push the start button and crank engine over a few times.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE DOES NOT START BUT IT TURNS OVER (Continued)

d. Smell for gasoline in carburetor throat.

(1) If there is gasoline in the carburetor throat, go to step 3.

(2) If there is no gasoline in carburetor throat, notify your supervisor.

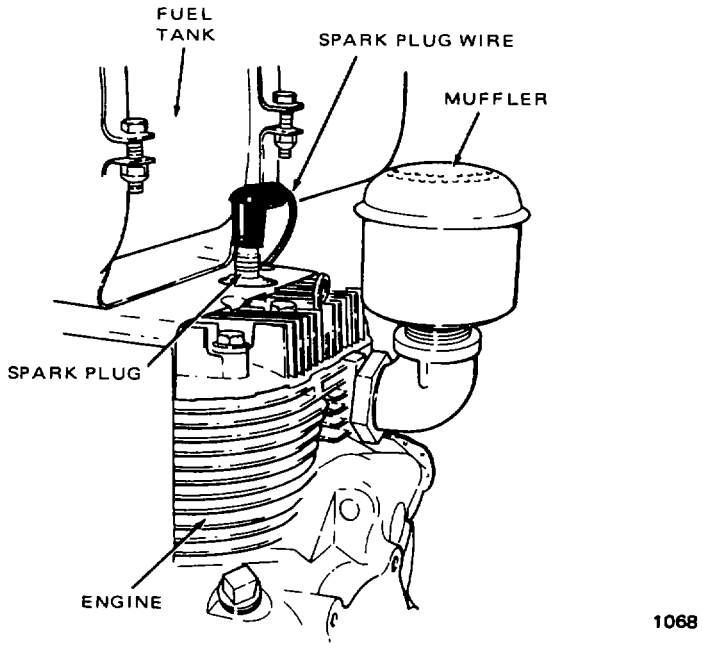


Figure 4-33. Spark Plug Location

Step 3. Make sure there is spark to spark plug.

a. Turn ignition switch OFF.

b. Remove spark plug wire from spark plug.

c. Turn ignition switch ON.

WARNING

DO NOT hold the spark plug wire in your bare hands while testing for spark. You can be severely shocked.

d. Hold spark plug wire about 3/16 inch (4.76 mm) from a grounded engine part.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE DOES NOT START BUT IT TURNS OVER (Continued)

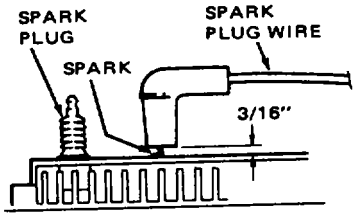


Figure 4-34. Spark Test

e. Remove belt guard and crank the engine over. As breaker points open and close, a spark should jump between spark plug wire and engine.

(1) If there is a bright blue spark, go to step 4.

(2) If there is no spark, or the spark is weak and yellow, notify your supervisor of the problem.

Step 4. Check battery.

NOTE

If the engine is sluggish or slow when cranking, the battery may be weak.

If the engine turns over fast when starting, the battery is ok. Go to step 5.

a. Check battery visually.

(1) Undo retainer strap and remove battery box cover.

(2) Make sure battery cables are securely fastened to battery. They should not twist on terminals.

(3) Make sure the battery cables are securely fastened to base assembly and start button.

(4) If there is any corrosion on battery or around terminals, rinse it off with a baking soda and water solution.

(5) Clean any dirt or dust from the top of battery.

(6) If the cable insulation is frayed or cracked, replace the cable and go to step 4c.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE DOES NOT START BUT IT TURNS OVER (Continued)

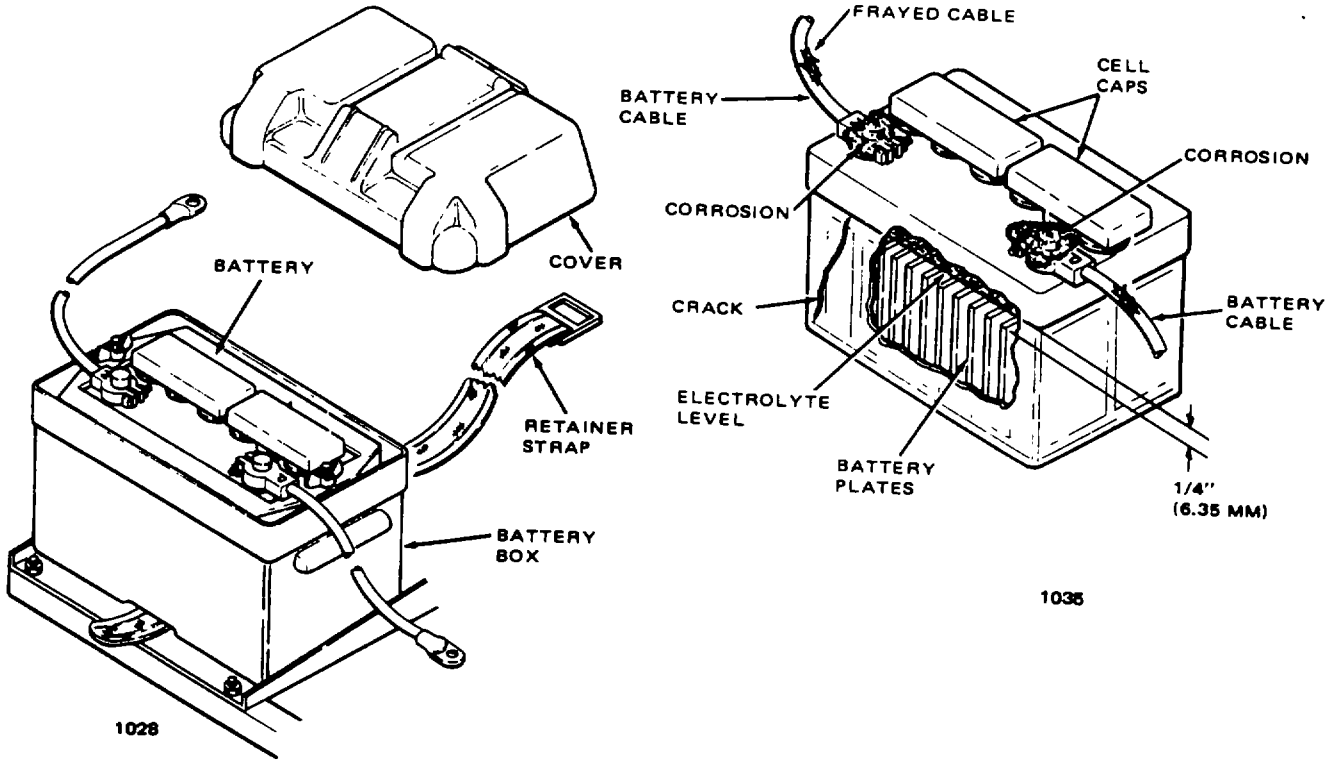


Figure 4-35. Battery Visual Checks

(7) Go to step 4b after completing the visual check.

(8) If there are cracks in battery body, replace the battery.

b. Check the specific gravity of the electrolyte in the battery. Use a hydrometer.

CAUTION

The electrolyte level must be kept 1/4 of an inch (6.35mm) above the top of battery plates.

DO NOT overfill the battery. The electrolyte should not overflow onto the battery when the cell caps are set in the battery.

NOTE

Use distilled water or a good grade drinking water (excluding mineral water).

(1) Remove cell caps and check the electrolyte level. Add distilled water if necessary.

(2) Check the specific gravity.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE DOES NOT START BUT IT TURNS OVER (Continued)

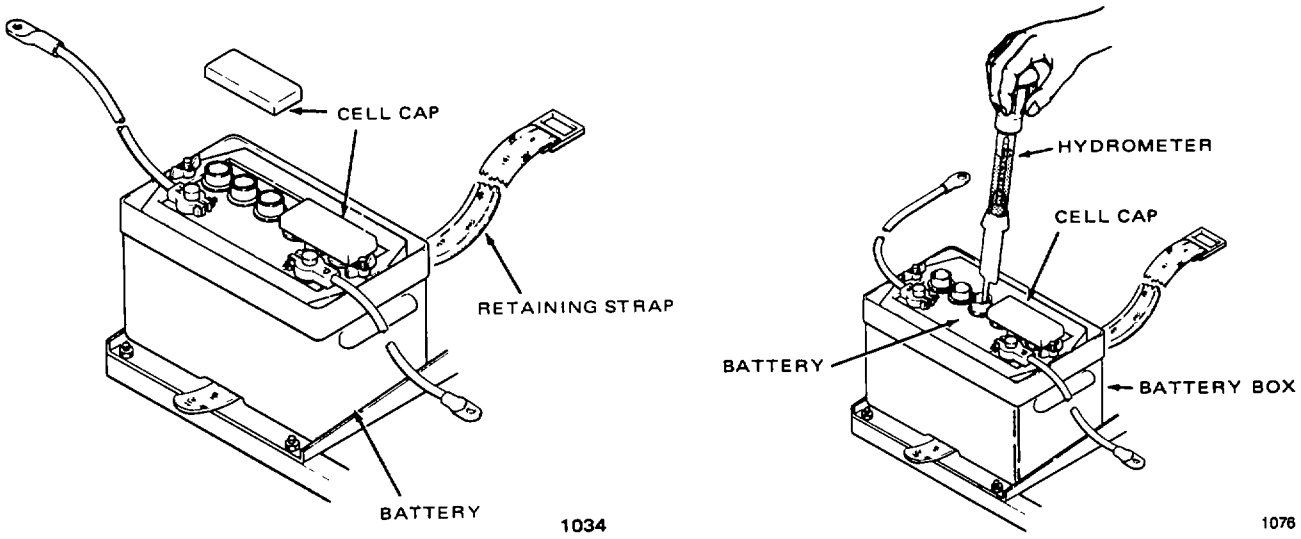


Figure 4-36. Specific Gravity Test

(3) If the specific gravity is between 1.250 and 1.280, the battery cell being tested is ok. Go to step 5.

(4) If the specific gravity is between 1.225 and 1.250, the cell being tested is still in fair condition. Go to step 5.

(5) If the specific gravity is below 1.150 in any one cell, replace the battery and go to step 4c.

(6) If the specific gravity in one cell is 0.050 more or less than the other cells and charging does not bring the charge to a 50% charge, replace the battery and go to step 4c.

c. Start the engine.

(1) If the engine starts, the problem is solved.

(2) If the engine does not start, go to step 5.

Step 5. Check fuel tank valve and fuel line.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE DOES NOT START BUT IT TURNS OVER (Continued)

WARNING

BE ALERT to disconnect the ground cable from the battery before performing maintenance on the fuel tank assembly. Spilled gasoline will be ignited by a spark.

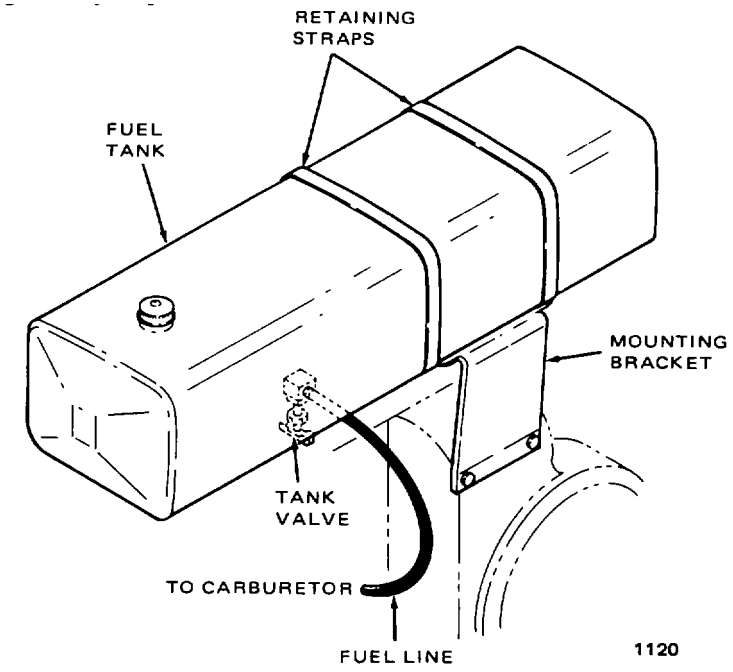


Figure 4-37. Fuel Tank Assembly

a. Drain fuel tank.

(1) Close fuel tank valve if possible.

(2) Pinch fuel line with the forefinger and thumb and disconnect it from carburetor.

(3) Open valve and drain the gasoline into a container.

(4) If gasoline drains thru tank valve, go to step 6.

(5) If gasoline does not drain thru valve, notify your supervisor of the problem.

b. Check fuel line.

(1) If fuel line is ok, return it to valve and carburetor. Go to step 6.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE DOES NOT START BUT IT TURNS OVER (Continued)

(2) If the fuel line is plugged, unplug it and return it to the valve and carburetor. Go to step 5c

(3) If the fuel line is cut or cracked or damaged, replace it and go to step 5c.

c. Start the engine.

(1) If the engine starts, the problem is solved.

(2) If the engine does not start, go to step 6.

Step 6. Check the carburetor.

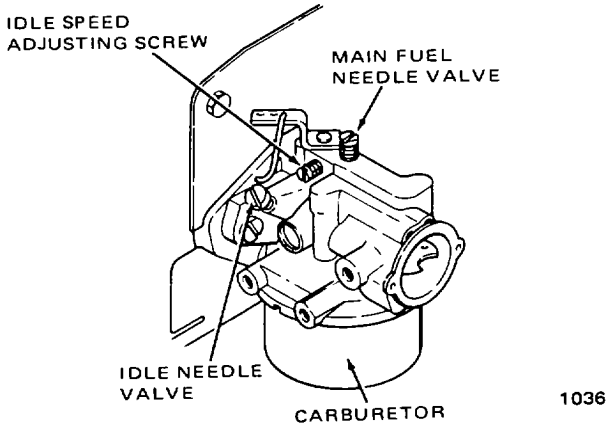


Figure 4-38. Carburetor

CAUTION

BE CAREFUL not to use force when turning the needle valve in and out. Too much force will damage the needle valves and valve seats.

a. Adjust the needle valves.

(1) Turn both needle valves all the way to the right (clockwise) until they gently touch bottom.

(2) Turn the main fuel needle valve to the left (counterclockwise) two full turns.

(3) Turn the idle needle valve to the left (counterclockwise) 1-1/4 turns.

(4) Go to step 6b.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE DOES NOT START BUT IT TURNS OVER (Continued)

b. Start the engine.

(1) If the engine starts, the problem is solved. Go to step 6c.

(2) If the engine does not start, notify your supervisor of the problem.

c. Adjust the carburetor while the engine is running.

(1) Turn the main fuel needle valve to the right (clockwise) until the engine slows down.

(2) Turn the needle valve back to the left (counterclockwise) until the engine slows down.

(3) Turn the needle valve back to the right to a position halfway between the slow down points.

2. ENGINE DOES NOT TURN OVER

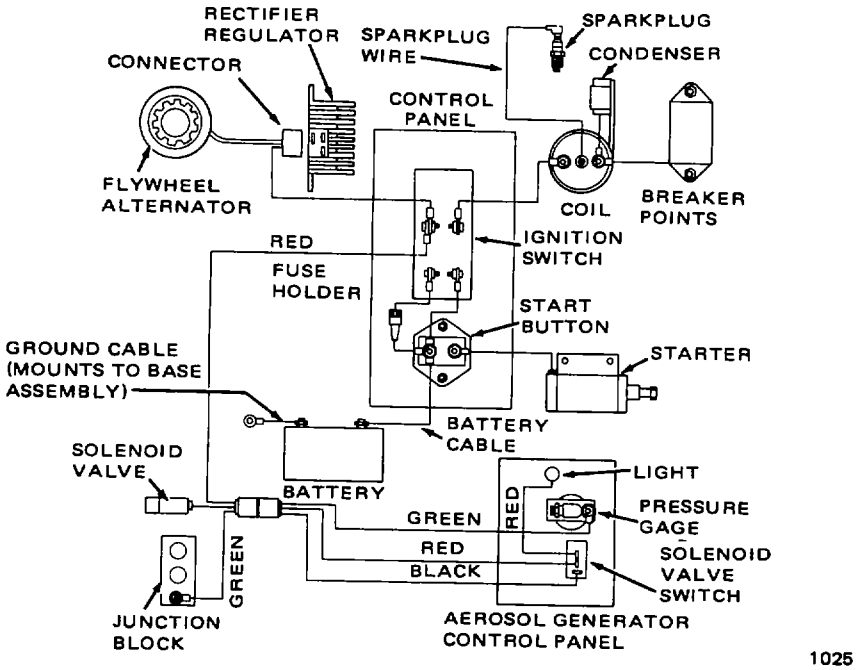


Figure 4-39. Aerosol Generator Wiring Diagram

Step 1. Be sure electrical wires listed below are securely fastened.

a. The battery cables at battery terminals, and at the ground and start button connections.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE DOES NOT TURN OVER (Continued)

b. The wire between the starter and the start button

(1) If wire is ok, go to step 2.

(2) If wire is loose, tighten it and go to step 1c.

(3) If wire and/or insulation are cracked, broken or frayed, replace it and go to step 1c.

c. Start engine.

(1) If the engine starts, the problem is solved.

(2) If the engine does not start, go to step 2.

Step 2. Check battery.

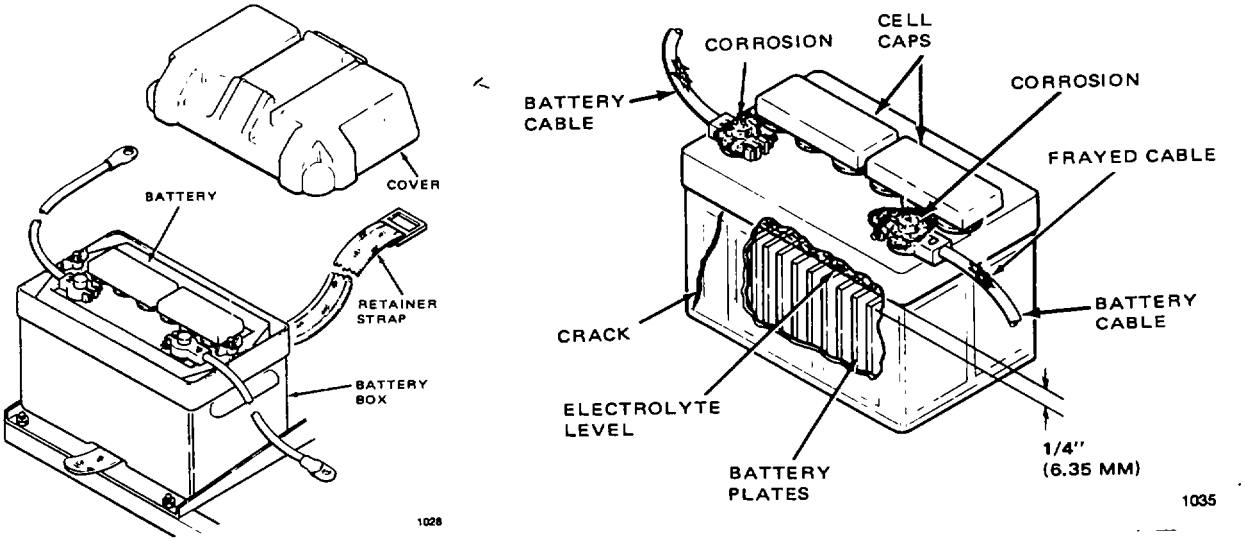


Figure 4-40. Battery Visual Checks

a. Check the battery visually.

(1) Undo retainer strap and remove battery box cover.

(2) Make sure battery cables are tight on terminals. They should not be able to be moved by hand.

(3) Make sure battery ground connection is securely fastened.

(4) If there is any corrosion on battery or around terminals, rinse it off with a baking soda and water solution.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE DOES NOT TURN OVER (Continued)

(5) If there is dirt on the top of battery, brush it off.

(6) If cable insulation is frayed or broken, replace the cable and go to step 2c.

(7) If there are cracks in battery sides or cover, replace it and go to step 2c.

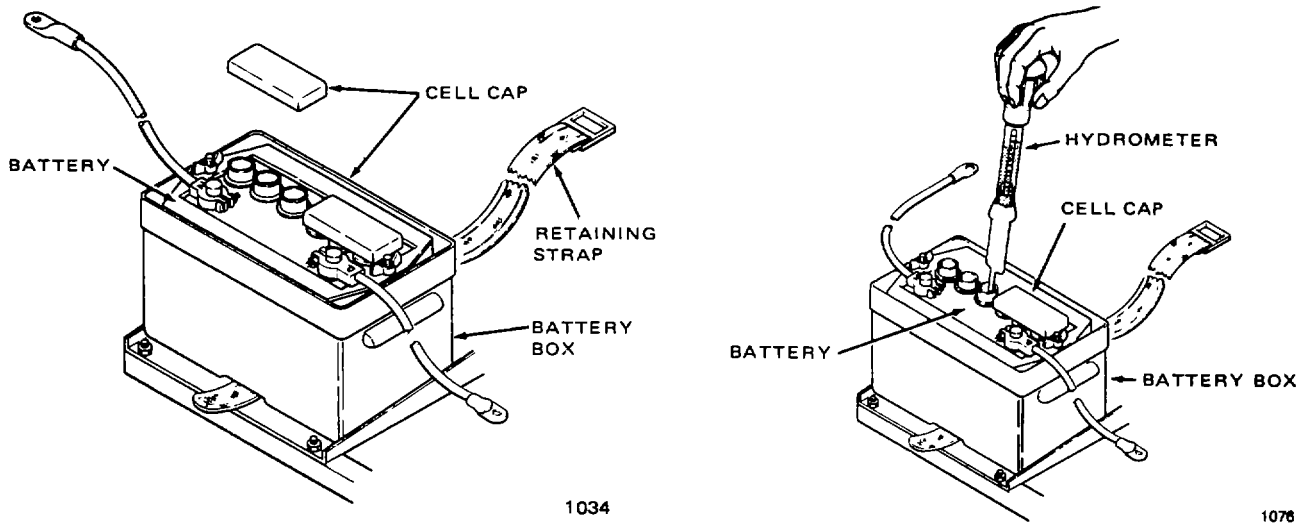


Figure 4-41. Specific Gravity Test

b. Check the electrolyte in battery. Use a hydrometer to check the specific gravity.

CAUTION

The electrolyte level must be kept 1/4 inch (6.35 mm) above the plates in the battery.

DO NOT overfill the battery. The electrolyte should not overflow onto the battery cover when the cell covers are placed over the cells.

(1) Remove cell covers and check electrolyte level. Add distilled water if the level is below the top of plates.

(2) Check the specific gravity.

(3) If the specific gravity is between 1.250 and 1.280, the cells are ok. Notify your supervisor of the problem.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE DOES NOT TURN OVER (Continued)

(4) If the specific gravity is between 1.225 and 1.250, the cells are still in fair condition. Notify your supervisor of the problem.

(5) If the specific gravity is below 1.150 in any one cell, replace the battery and go to step 2c.

(6) If the specific gravity in one cell is more than 0.050 less than the other cells and will not charge to more than a 50% charge, replace the battery and go to step 2c.

c. Start engine.

(1) If engine starts, the problem is solved.

(2) If engine does not start, notify your supervisor.

3. ENGINE IS HARD TO START

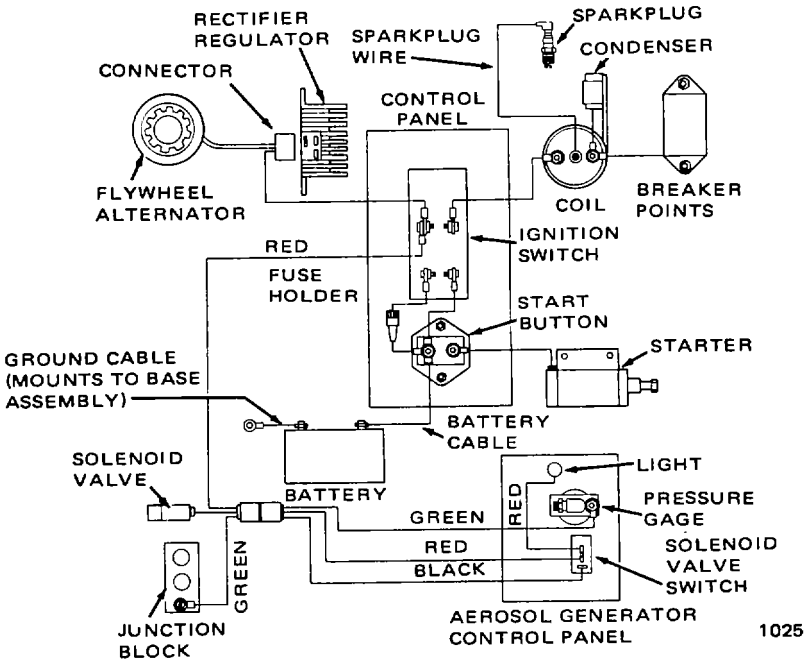


Figure 4-42. Aerosol Generator Wiring Diagram

Step 1. Make sure all the wires listed below are securely fastened to their terminals.

Battery cables
Spark plug wire
Wires between ignition switch and coil, points and coil, and condenser and coil
Between starter and start button
Between ignition switch and start button

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE IS HARD TO START (Continued)

a. If any wires are loose, tighten them and go to step 1c.

b. If wire insulation is frayed, cracked or broken, replace the wire and go to step 1c.

c. Start engine.

(1) If engine starts without trouble, the problem is solved.

(2) If engine does not start or if it is hard to start, go to step 2.

Step 2. Check the carburetor.

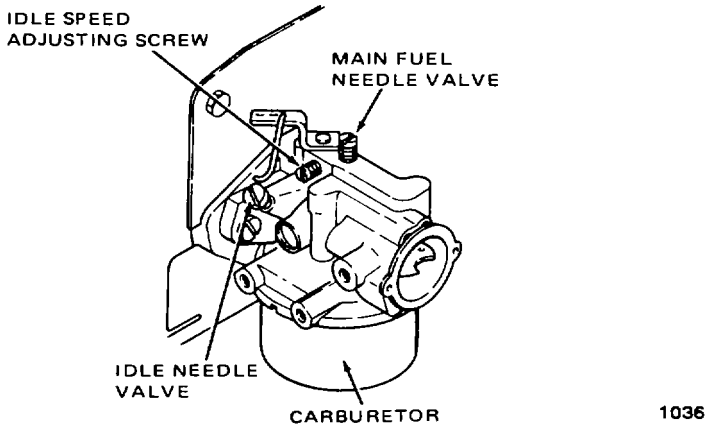


Figure 4-43. Carburetor

a. Adjust needle valves.

(1) Turn both needle valves all the way to the right (clockwise) until they gently touch bottom.

(2) Turn main fuel needle valve to the left (counterclockwise) two full turns.

(3) Turn idle needle valve to the left (counterclockwise) 1-1/4 turns.

(4) Go to step 2b.

b. Start the engine.

(1) If engine starts without trouble, the problem is solved. Go to step 2c.

(2) If engine is hard to start, go to step 2c.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE IS HARD TO START (Continued)

c. Adjust carburetor while it is running.

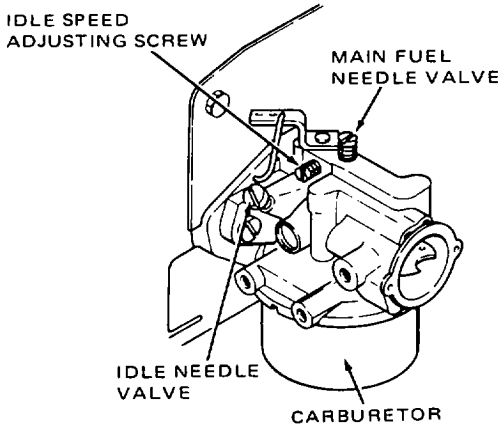


Figure 4-44. Carburetor

(1) Turn main fuel needle valve to the right (clockwise) until engine slows down.

(2) Turn main fuel needle valve back to the left (counterclockwise) until engine slows down.

(3) Turn main fuel needle valve back to a point halfway between slowdown points.

d. Start engine.

(1) If engine starts without trouble, the problem is solved.

(2) If engine is still hard to start, go to step 3.

Step 3. Check fuel line.

WARNING

BE ALERT to disconnect the ground cable from the battery before performing maintenance on the fuel tank assembly. Spilled gasoline will be ignited by a spark.

a. Close fuel tank valve.

b. Remove fuel line and check it for clogging.

(1) If fuel line is clogged, replace it and go to step 3c.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE IS HARD TO START (Continued)

(2) If fuel line is not clogged, return it to fuel tank and carburetor. Notify your supervisor.

c. Start the engine.

(1) If engine starts with no trouble, the problem is solved.

(2) If engine does not start, or if it is hard to start, notify your supervisor.

Step 4. Check engine air cleaner.

a. Remove the air cleaner cover and filter element.

b. Place a light in the center of the filter element.

(1) If the light passes through the filter element, the filter element is ok.

(2) If the light will not pass through the filter element, bang the filter on a flat surface to loosen the dirt then test it again.

(3) If the light still cannot be seen through the filter element, replace it.

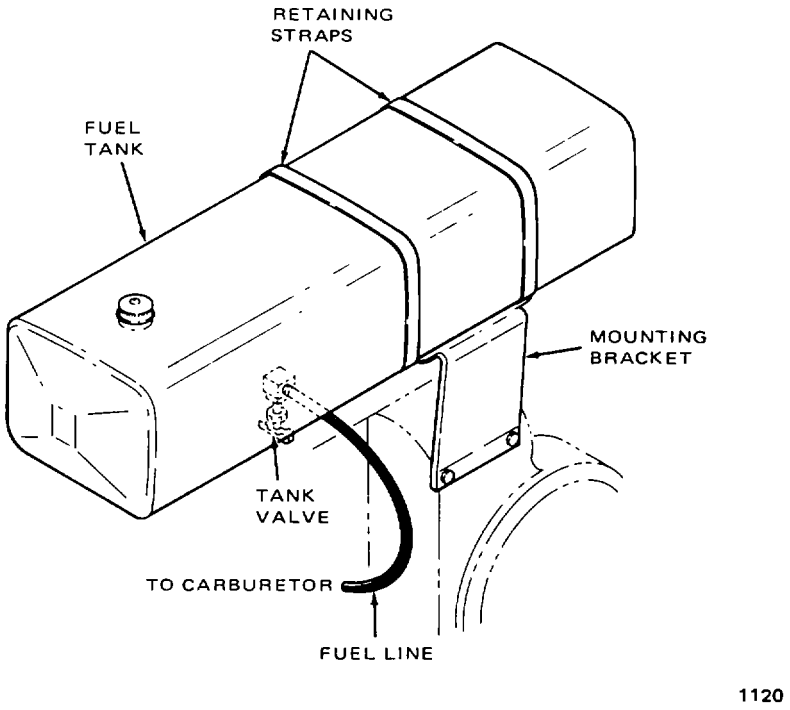


Figure 4-45. Fuel Tank Assembly

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

4. ENGINE STOPS SUDDENLY

Step 1. Check fuel tank.

a. If there is fuel in tank, go to step 2.

WARNING

DO NOT add fuel to the fuel tank when the engine is hot. Allow it to cool first.

b. If there is no fuel in tank, fill it and go to step 1c.

c. Start engine.

(1) If engine starts, problem is solved.

(2) If engine does not start, go to step 2.

Step 2. Check engine crankshaft. Push start button.

a. If engine turns over freely, go to step 3.

b. If engine struggles to turn over and sounds sluggish, go to step 3.

c. If engine makes a lot of noise like rubbing or rattling metal, replace it.

d. If engine will not turn over and is frozen, replace it.

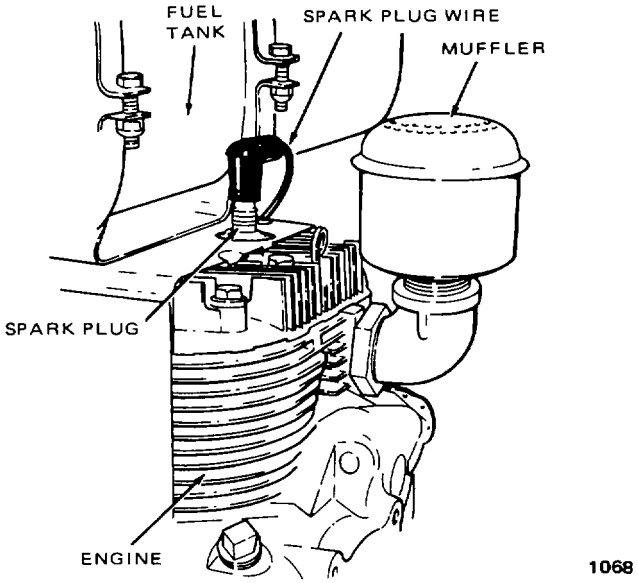


Figure 4-46. Spark Plug Location

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE STOPS SUDDENLY (Continued)

Step 3. Make sure there is spark to spark plug.

a. Make sure ignition switch is turned OFF.

b. Remove spark plug wire from spark plug.

c. Turn ignition switch ON.

WARNING

DO NOT hold the spark plug wire in your bare hands while testing for spark. You can be severely shocked.

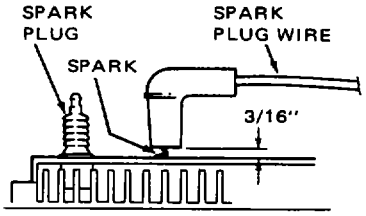


Figure 4-47. Spark Test

d. Hold spark plug wire about 3/16 inch (4.76 mm) from a grounded engine part.

e. Remove belt guard and crank the engine over. As the points open and close, a spark should jump between spark plug wire and engine.

(1) If there is a bright blue spark, go to step 4.

(2) If there is no spark or the spark is weak and yellow, notify your supervisor.

Step 4. Check fuel line.

WARNING

BE SURE to disconnect the ground cable from the battery before performing maintenance on the fuel tank assembly. Spilled gasoline will be ignited by a spark.

a. Check fuel line.

(1) If fuel line is ok, return it to valve and carburetor. Go to step 5.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE STOPS SUDDENLY (Continued)

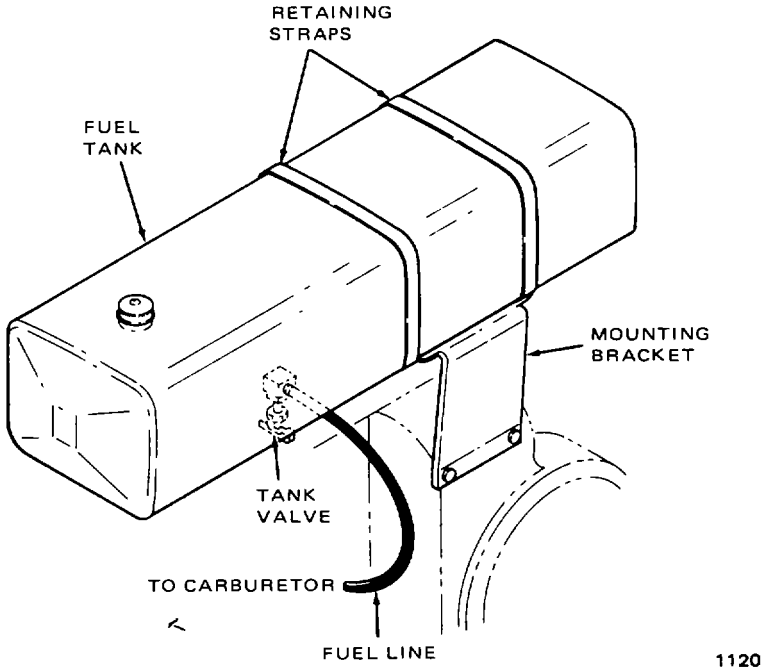


Figure 4-48. Fuel Tank Assembly

(2) If fuel line is plugged, unplug it and return it to valve and carburetor. Go to step 4b.

(3 If fuel line is cut or cracked, replace it and go to step 4b.

b. Start engine.

(1) If engine starts, the problem is solved.

(2) If engine does not start, go to step 5.

Step 5. Check carburetor.

CAUTION

BE CAREFUL not to use force when turning the needle valves in and out. Force can damage the valve seats.

a. Adjust needle valves.

(1) Turn both needle valves all the way to the right (clockwise) until they gently touch bottom.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE STOPS SUDDENLY (Continued)

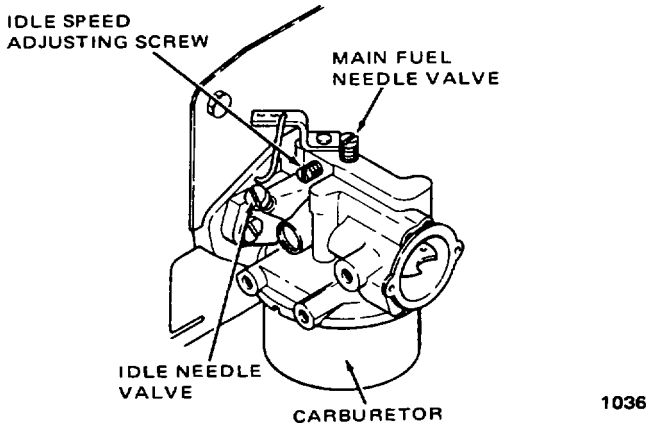


Figure 4-49. Carburetor

(2) Turn main fuel needle valve to the left (counterclockwise) two full turns.

(3) Turn idle needle valve to the left (counterclockwise) 1-1/4 turns.

(4) Go to step 5c.

b. Start engine.

(1) If engine starts, the problem is solved. Go to step 5c.

(2) If engine does not start, notify your supervisor.

c. Adjust the carburetor while the engine is running.

(1) Turn main fuel needle valve to the right (clockwise) until engine slows down.

(2) Turn main fuel needle valve back to the left (counterclockwise) until engine slows down.

(3) Turn main fuel needle valve back to the right to a position halfway between the slow down points.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

5. ENGINE LACKS POWER

Step 1. Adjust carburetor needle valves.

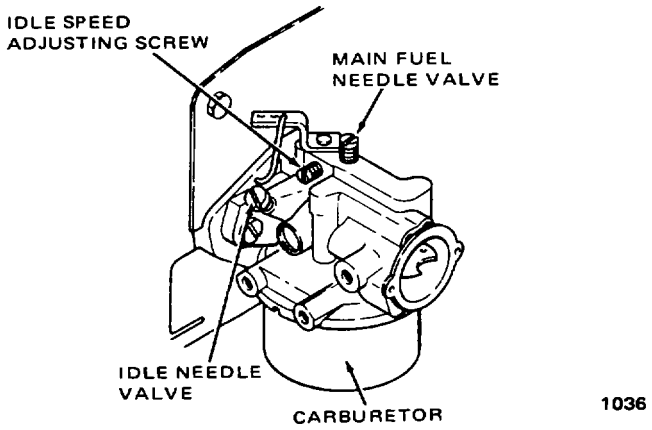


Figure 4-50. Carburetor

a. Turn both needle valves all the way. to the right (clockwise) until they gently touch bottom.

b. Turn main fuel needle valve to the left (counterclockwise) two full turns.

c. Turn idle needle valve to the left (counterclockwise) 1-1/4 turns.

d. Start the engine.

(1) If engine runs correctly, the problem is solved.

(2) If engine still lacks power, go to step 2.

(3) If engine does not start, go to step 2.

e. Adjust carburetor while the engine is running.

(1) Turn main fuel needle valve to the right (clockwise) until the engine slows down.

(2) Turn main fuel needle valve back to the left (counterclockwise) until the engine slows down.

(3) Turn main fuel needle valve back to the right to a position halfway between the slow down points.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE LACKS POWER (Continued)

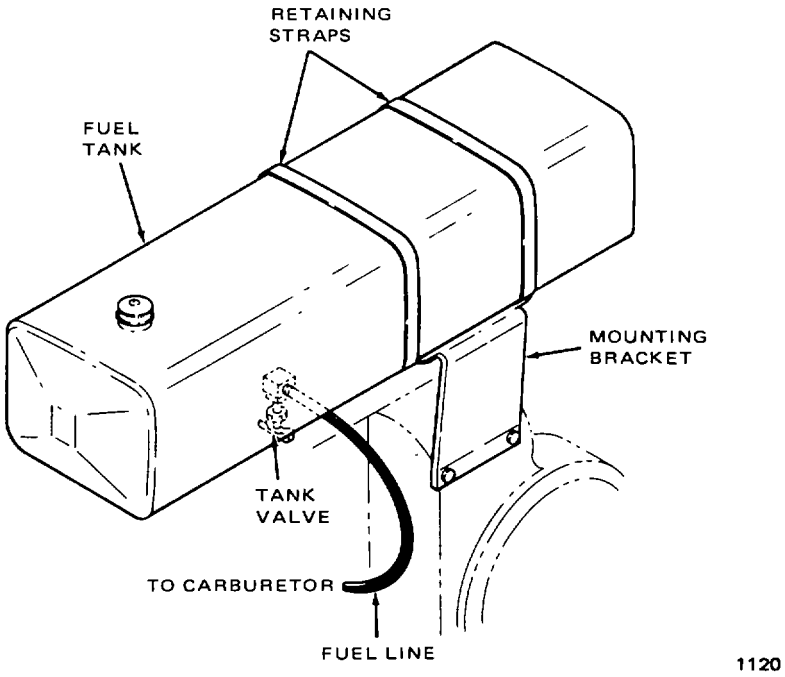


Figure 4-51. Fuel Tank Assembly

Step 2. Check fuel line.

WARNING

BE ALERT to disconnect the ground cable from the battery before performing maintenance on the fuel tank assembly. Spilled gasoline will be ignited by a spark.

a. Close fuel tank valve.

b. Remove fuel line and check it for clogging.

(1) If fuel line is clogged, replace it and go to step 2c.

(2) If fuel line is not clogged, return it to fuel tank and carburetor. Go to step 3.

c. Start the engine.

(1) If engine starts with no trouble, the problem is solved.

(2) If engine does not start, or if it is hard to start, go to step 3.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE LACKS POWER (Continued)

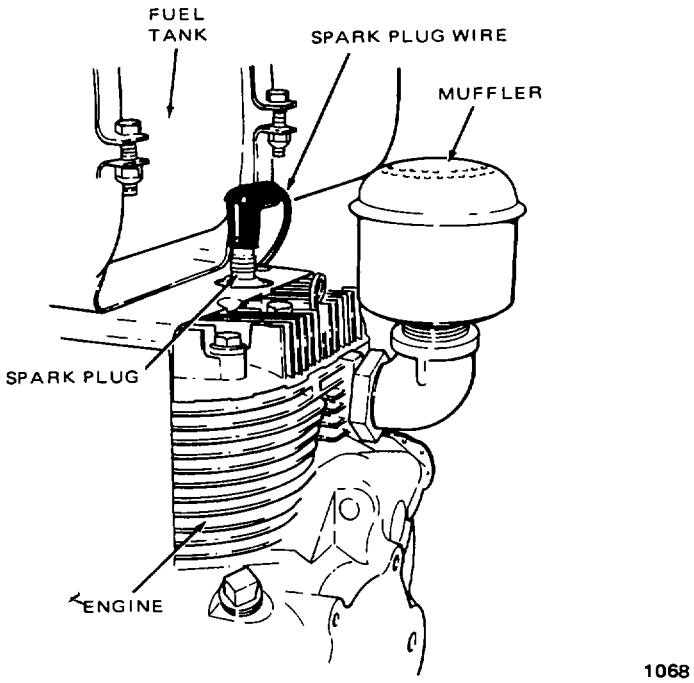


Figure 4-52. Spark Plug Location

Step 3. Make sure there is spark to spark plug.

a. Turn ignition switch OFF.

b. Remove spark plug wire from spark plug.

c. Turn ignition switch ON.

WARNING

DO NOT hold the spark plug wire in your bare hands while testing for spark. You can be severely shocked.

d. Hold spark plug wire about 3/16 inch (4.76 mm) from a grounded engine part.

e. Remove belt guard and crank the engine over. As breaker points open and close, a spark should jump between spark plug wire and engine.

(1) If there is a bright blue spark, go to step 4.

(2) If there is no spark, or the spark is weak and yellow, notify your supervisor of the problem.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE LACKS POWER (Continued)

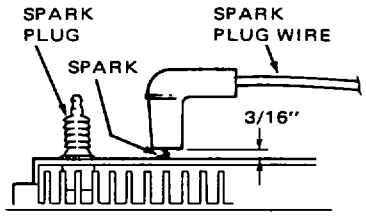


Figure 4-53. Spark Test

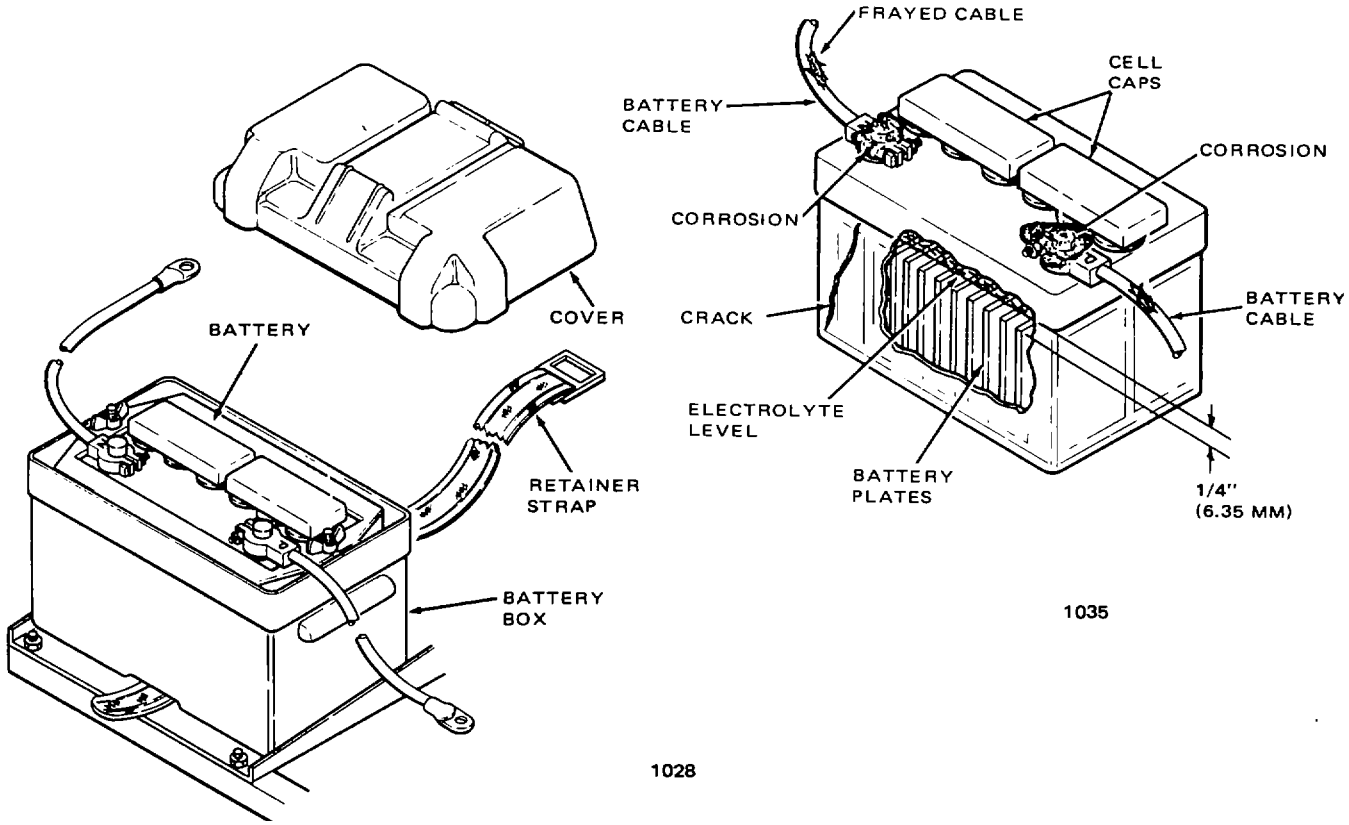


Figure 4-54. Battery Visual Checks

Step 4. Check battery.

a. Check battery visually.

(1) Undo retainer strap and remove battery box cover.

(2) Make sure battery cables are tight on terminals. They should not be able to be moved by hand.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

ENGINE LACKS POWER (Continued)

(3) Make sure battery ground connection is securely fastened.

(4) If there is any corrosion on battery or around terminals, rinse it off with a baking soda and water solution.

(5) If there is dirt on top of battery, brush it off.

(6) If cable insulation is frayed or broken, replace cable and go to step 4b.

(7) If there are cracks in sides or cover of battery, replace it

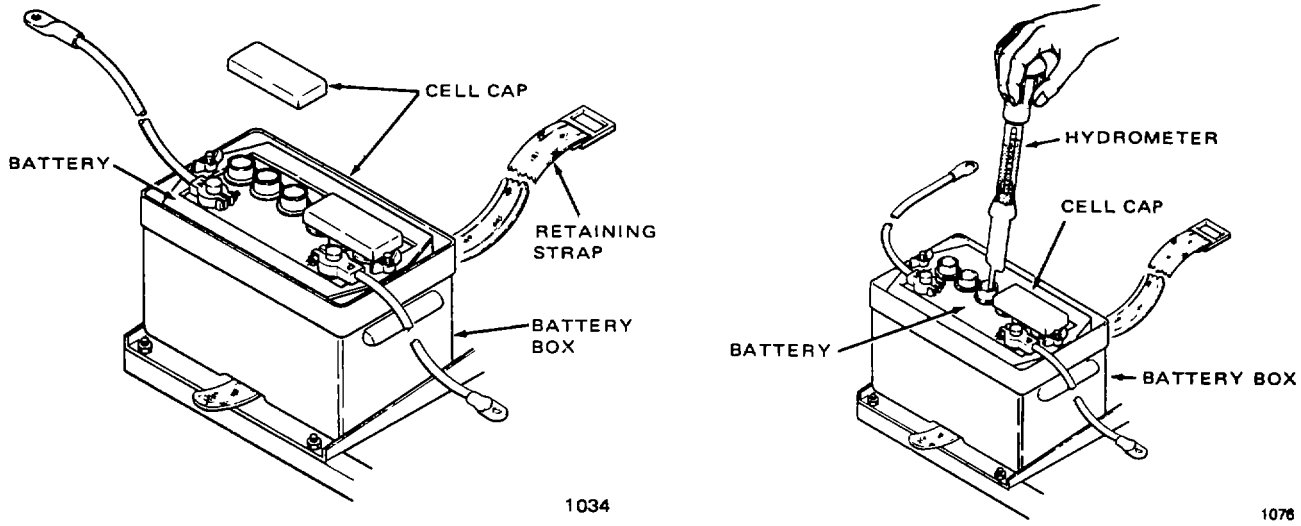


Figure 4-55. Specific Gravity Test

b. Check electrolyte in battery. Use a hydrometer to check the specific gravity.

CAUTION

The electrolyte level must be kept above the plates in the battery.

DO NOT overfill the battery. The electrolyte should not overflow onto the battery cover when the cell covers are placed over the cells.

NOTE

Use distilled water or a good grade drinking water (excluding mineral water).

(1) Remove cell covers and check electrolyte level. Add distilled water if the level is below the top of the plates. The level should be 1/4 of an inch (6.35 mm) above battery plates.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE LACKS POWER (Continued)

(2) Check specific gravity.

(3) If the specific gravity is between 1.250 and 1.280, the cells are ok. Notify your supervisor of the problem.

(4) If the specific gravity is between 1.225 and 1.250, the cells are still in fair condition. Go to step 10.

(5) If the specific gravity is below 1.150 in any one cell, replace the battery and go to step 4c.

(6) If the specific gravity in one cell is 0.050 more or less than the other cells and charging does not bring the charge to a 50% charge, replace the battery and go to step 4c.

c. Start the engine.

(1) If the engine starts operating correctly, the problem is solved.

(2) If the engine still lacks power, notify your supervisor of the problem.

6. ENGINE OPERATES ERRATICALLY

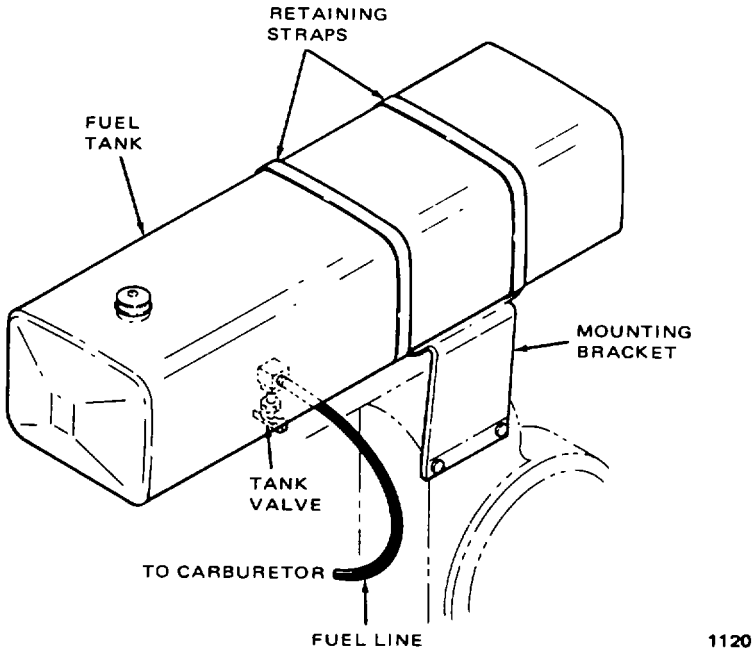


Figure 4-56. Fuel Tank Assembly

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE OPERATES ERRATICALLY (Continued)

Step 1. Check fuel line and fuel.

WARNING

BE ALERT to disconnect the ground cable from the battery before performing maintenance on the fuel tank assembly. Spilled gasoline will catch fire from electrical sparks.

a. Remove fuel line from carburetor.

(1) Close fuel tank valve.

(2) Remove hose clamp from carburetor end of the fuel line. Pinch fuel line together and remove it from carburetor.

(3) Place the end of fuel line in a clear glass container. Go to step lb.

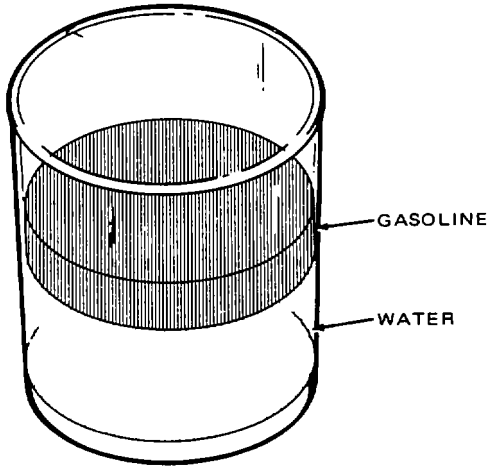


Figure 4-57. Water and Gasoline Test

b. Drain gasoline from the tank into the glass container and check the gasoline for water.

(1) If the gasoline will not drain or drains slowly from fuel tank, go to step id.

(2) If gasoline drains well and there is no water in it, fuel is ok.

(3) If there is water in the gasoline, go to step 1c.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE OPERATES ERRATICALLY (Continued)

c. Replace gasoline in fuel tank.

(1) Drain all fuel into a container and throw it away.

(2) Flush tank with some clean gasoline.

NOTE

Contaminated fuel must be disposed of in a manner consistent with current federal and local regulations.

Check the gasoline bulk supply for water before using it.

(3) Close fuel tank valve and fill tank with clean gasoline and go to Step 1d.

d. Disconnect fuel line from carburetor and fuel tank and check it for damage or plugging.

(1) If fuel line is ok, go to Step 2.

(2) If fuel line is plugged, blow it out and return it to fuel tank and carburetor. Go to Step 1e.

(3) If fuel line is cut, cracked, or leaking, replace it and go to Step 1e.

(4) If gasoline still does not drain through fuel line after returning or replacing it, go to Step 2.

e. Start engine.

(1) If engine runs smoothly, the problem is solved.

(2) If engine still operates erratically, go to Step 2.

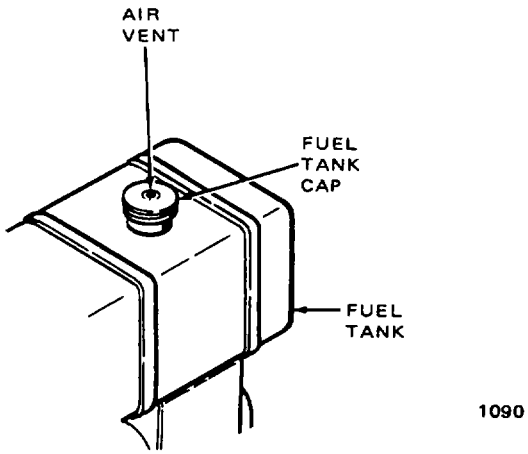


Figure 4-58. Fuel Tank Cap

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE OPERATES ERRATICALLY (Continued)

Step 2. Check fuel tank cap.

a. Remove cap and check the air vent.

(1) If cap vent is plugged, clean it out and return it to the tank. Go to Step 2b.

(2) If cap is ok, go to Step 3.

b. Start engine.

(1) If engine runs smoothly, the problem is solved.

(2) If engine still operates erratically, go to Step 3.

Step 3. Check carburetor.

CAUTION

BE CAREFUL not to use force when turning the needle valves in and out. Force will damage the valve seats.

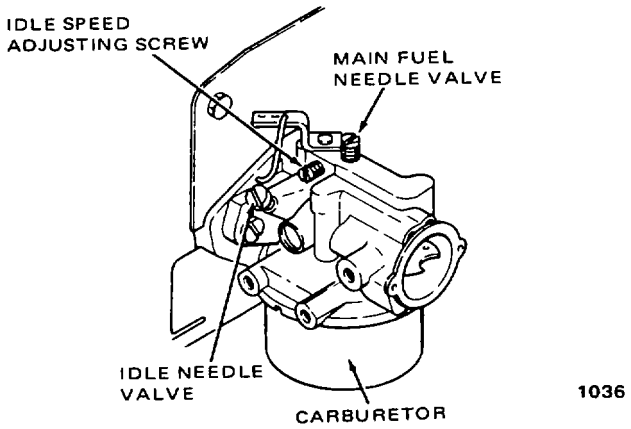


Figure 4-59. Carburetor

a. Adjust needle valves.

(1) Turn main fuel needle valve to the right (clockwise) until the engine slows down.

(2) Turn main fuel needle valve back to the left (counterclockwise) until engine slows down.

(3) Turn main fuel needle valve back to the right to a position halfway between the slow down points.

(4) Go to Step 3b.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE OPERATES ERRATICALLY (Continued)

b. Start engine.

(1) If engine starts, the problem is solved. Go to Step 3c.

(2) If engine does not start, notify your supervisor of the problem.

c. Adjust carburetor while engine is running.

(1) Turn needle valves to the right (clockwise) until the engine slows down.

(2) Turn needle valves back to the left (counterclockwise) until engine slows down.

(3) Turn needle valves back to the right to a position halfway between the slow down points.

7. ENGINE OVERHEATS

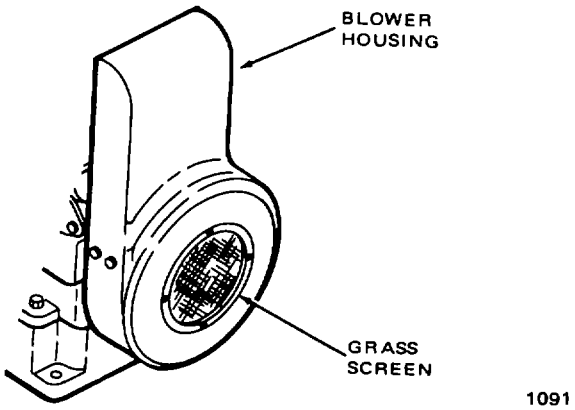


Figure 4-60. Blower Housing

Step 1. Check grass screen.

a. If screen is clogged, clean it out and go to Step 2.

b. If screen is clear, go to Step 2.

Step 2. Check cooling fins for clogging.

a. If cooling fins are clear, go to Step 3.

b. Clean cooling fins if possible. Notify your supervisor of the problem.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE OVERHEATS (Continued)

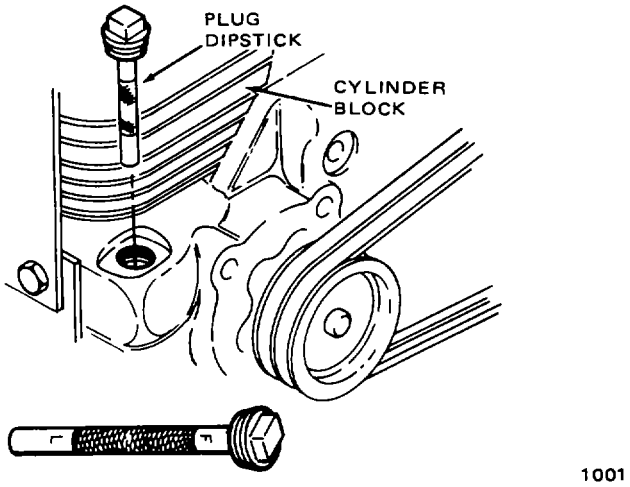


Figure 4-61. Engine Crankcase and Dipstick

Step 3. Check oil level.

a. If oil level is higher than the full mark (F) on dipstick, remove drain pipe cap and drain oil. The level must be kept between the low (L) and full (F) marks (near the full mark). Go to Step 4.

b. If the oil level is near the full (F) mark, go to Step 4.

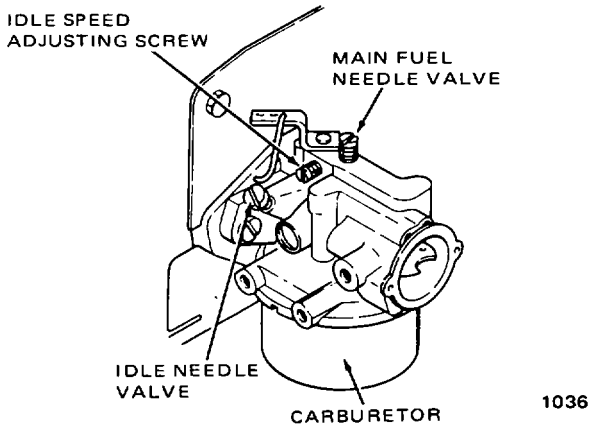


Figure 4-62. Carburetor

Step 4. Adjust main fuel needle valve on carburetor.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE OVERHEATS (Continued)

CAUTION

DO NOT use force to turn the needle valve in.

a. Turn main fuel needle valve all the way in to gently touch the bottom.

b. Turn main fuel needle valve to the left (counterclockwise) two full turns.

c. Go to Step 5.

Step 5. Start engine and adjust main fuel needle valve.

a. Turn main fuel needle valve to the right (counterclockwise) until the engine slows down.

b. Turn main fuel needle valve to the left (clockwise) until it slows down.

c. Turn main fuel needle valve back to a point halfway between the slow down points.

d. Allow engine to run for 15 minutes.

(1) If engine dows not overheat, the problem is solved.

(2) If engine still overheats, replace it. The problem is internal, notify your supervisor.

8. ENGINE BACKFIRES

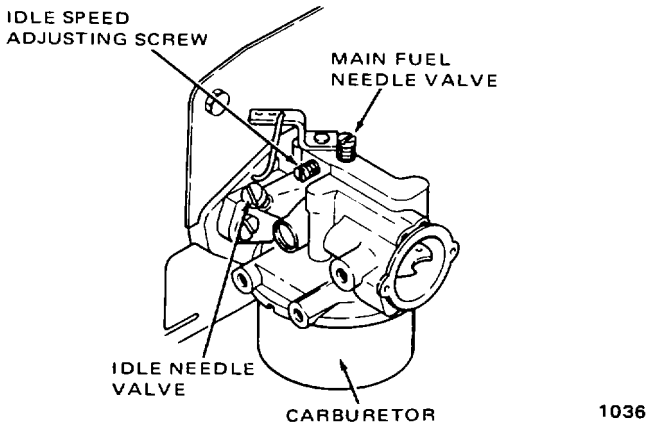


Figure 4-63. Carburetor

Step 1. Readjust main fuel needle valve on carburetor while engine is running.

a. Turn main fuel needle valve to the right (clockwise) until the engine slows down.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE BACKFIRES (Continued)

b. Turn main fuel needle valve back to the left (counterclockwise) until the engine slows down.

c. Turn the needle valve back to a point halfway between the slow down points.

(1) If engine stops backfiring the problem is solved.

(2) If engine continues to backfire, notify your supervisor.

9. NOZZLE PRESSURE BELOW 90 PSI

Step 1. Turn engine ON and listen to compressor.

a. If compressor runs smoothly, go to Step 2.

b. If compressor makes grinding, rubbing or rattling noises, go to Step 1c.

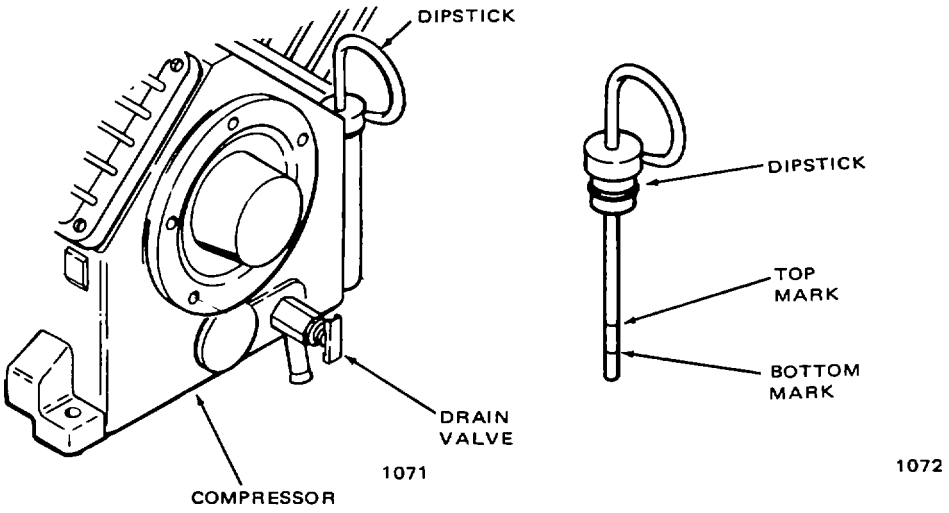


Figure 4-64. Compressor Dipstick

c. Check oil level.

(1) If oil level is near the full (F) mark, go to Step 2.

CAUTION

DO NOT overfill the crankcase. The oil level must be kept between the full (F) and low (L) marks on the dipstick.

(2) If oil level is below the low (L) mark, add oil. Use synthetic compressor oil: refer to page 1-6 for correct oil. Go to Step 2.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

NOZZLE PRESSURE BELOW 90 PSI (Continued)

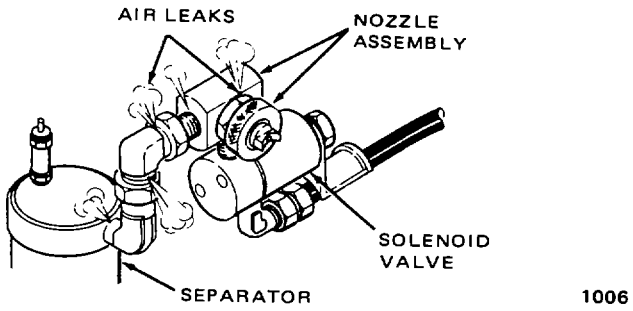


Figure 4-65. Nozzle Air Leaks

Step 2. Check nozzle assembly parts listed below for air leaks.

- Knurled ring
- Fluid nozzle
- Teflon gasket
- Nozzle body
- Adjusting nuts and nipples
- O-rings
- Pipe joint at the pulsation tank

NOTE

The engine must be running to check for leaks around the nozzle assembly.

WARNING

DO NOT turn the solenoid valve switch ON while checking the nozzle assembly for air leaks.

CAUTION

DO NOT use tools to tighten the knurled ring. Tighten it by hand. Too much force will damage the nozzle assembly.

DO NOT use too much force to tighten the fluid nozzle. Too much force will damage the Teflon gasket.

a. Disconnect black power wire from solenoid valve switch to prevent insecticide flow during maintenance.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

NOZZLE PRESSURE BELOW 90 PSI (Continued)

b. If nozzle assembly parts listed above do not leak, go to Step 4.

c. If nozzle assembly parts listed above are loose, tighten them. If they still leak, go to Step 2d.

d. Shut engine OFF before replacing any nozzle assembly parts.

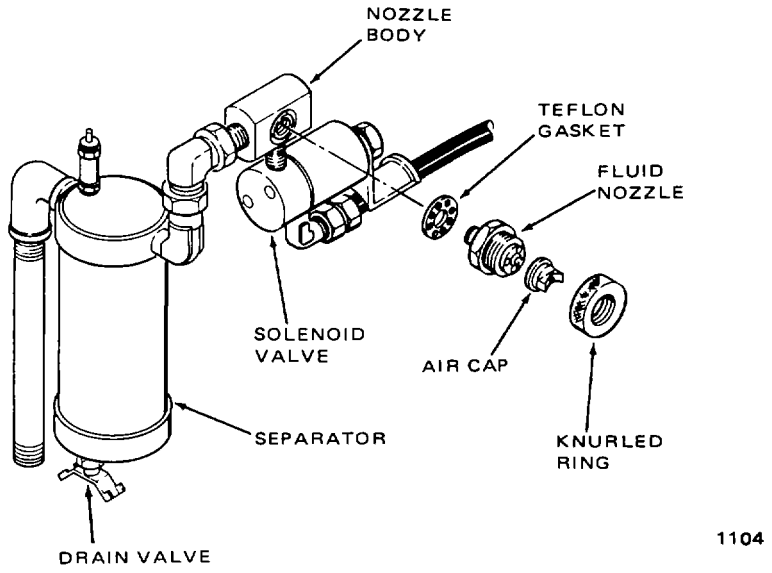


Figure 4-66. Nozzle Assembly

e. If nozzle assembly parts listed above still leak, remove them and inspect them.

(1) If machined surfaces are nicked or scratched, replace that part and go to Step 2f.

(2) If teflon gasket is broken or squeezed out of shape, replace it and go to Step 2f.

(3) If O-rings are cut or cracked, replace them and go to Step 2f.

f. After replacing any parts above, start engine and check pressure again.

(1) If pressure is 90-100 psi, the problem is solved.

(2) If pressure is still less than 90 psi, go to Step 3.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

NOZZLE PRESSURE BELOW 90 PSI (Continued)

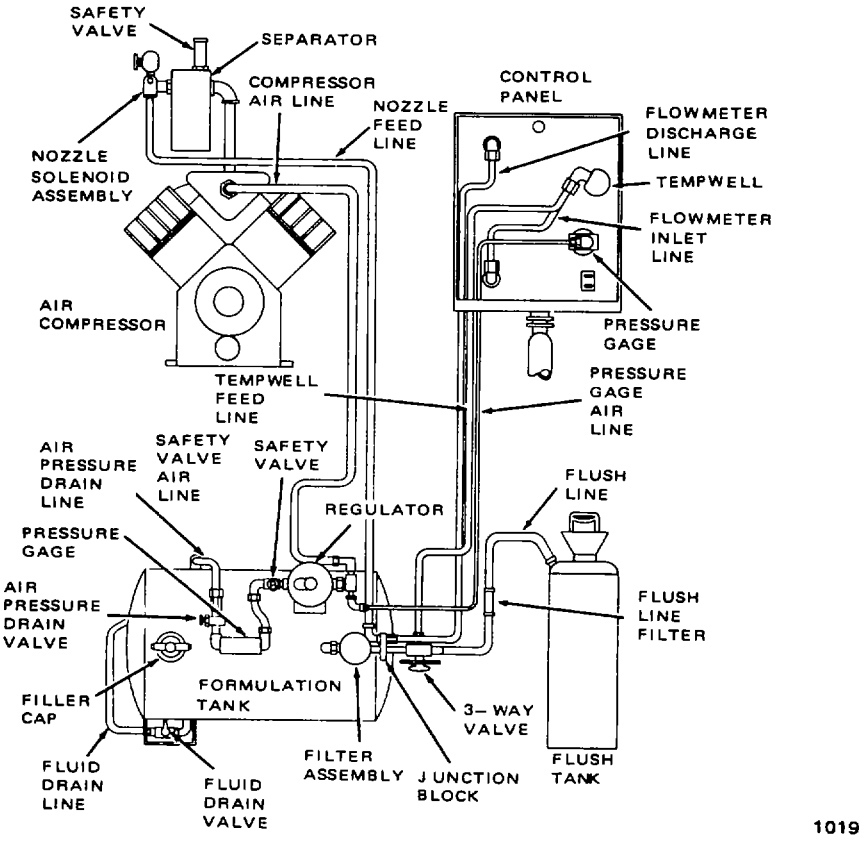


Figure 4-67. Hoses, Lines and Fittings

Step 3. Check air hose and fittings listed below for leaks.

- Hose between compressor and formulation tank.
- The 1/8 inch (3.18 mm) black hose between formulation tank and cab control panel pressure gage.

a. If hoses are frayed, cracked, or cut, replace them and go to Step 3e.

b. If fittings leak, tighten them and check the pressure gage again.

(1) If pressure is 90-100 psi, the problem is solved.

(2) If pressure is less than 90 psi, go to Step 3c.

c. If fittings are dented or bent, replace the hose and fitting and go to Step 3e.

d. If 1/8 inch (3.18 mm) hose is crimped or bent at a sharp angle, replace it and go to Step 3e.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

NOZZLE PRESSURE BELOW 90 PSI (Continued)

e. After replacing any of the parts listed above, start the engine and check the pressure again.

(1) If pressure is 90-100 psi, the problem is solved.

(2) If pressure is less than 90 psi, go to Step 4.

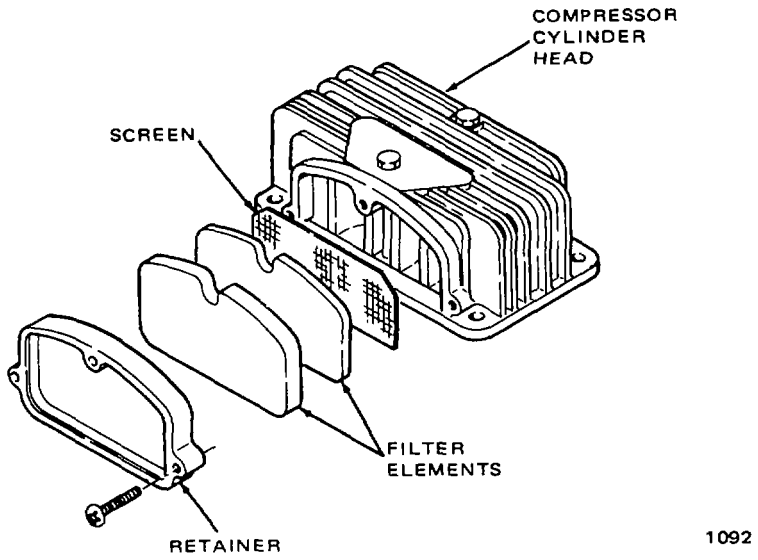


Figure 4-68. Compressor Air Filter

Step 4. Check compressor air filters.

a. If a back pressure can be felt at air filters when compressor is running, notify your supervisor.

b. Remove filter elements and inspect them.

(1) If they are plugged with dirt, replace them and go to Step 4c.

(2) If they are ok, go to Step 5.

c. After replacing filter elements, start engine and check pressure again.

(1) If pressure is 90-100 psi, the problem is solved.

(2) If pressure is still less than 90 psi, go to Step 5.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

NOZZLE PRESSURE BELOW 90 PSI (Continued)

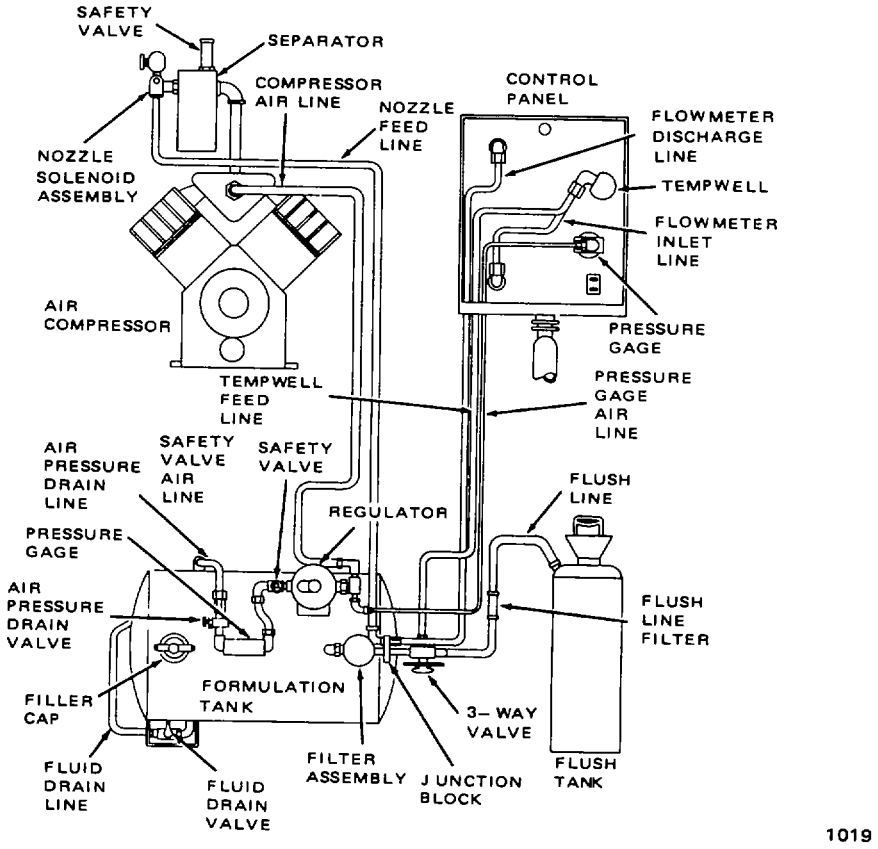


Figure 4-69. Hoses, Lines and Fittings

Step 5. Check pipe fittings listed below for air leaks.

- Pipe elbow and nipple between pulsation tank and separator.
- Street elbow at separator.
- Pulsation tank pipe plug.

a. If above fittings are loose, tighten them when they reach their normal operating temperature and go to Step 5c. Be careful not to be burned.

b. If fittings above are warped and cannot be tightened to stop air leaks, replace them and go to Step 5c.

c. After tightening or replacing any of the above parts, start the engine and check the pressure gage.

(1) If pressure is 90-100 psi, the problem is solved.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

NOZZLE PRESSURE BELOW 90 PSI (Continued)

(2) If pressure is less than 90 psi, go to Step 6.

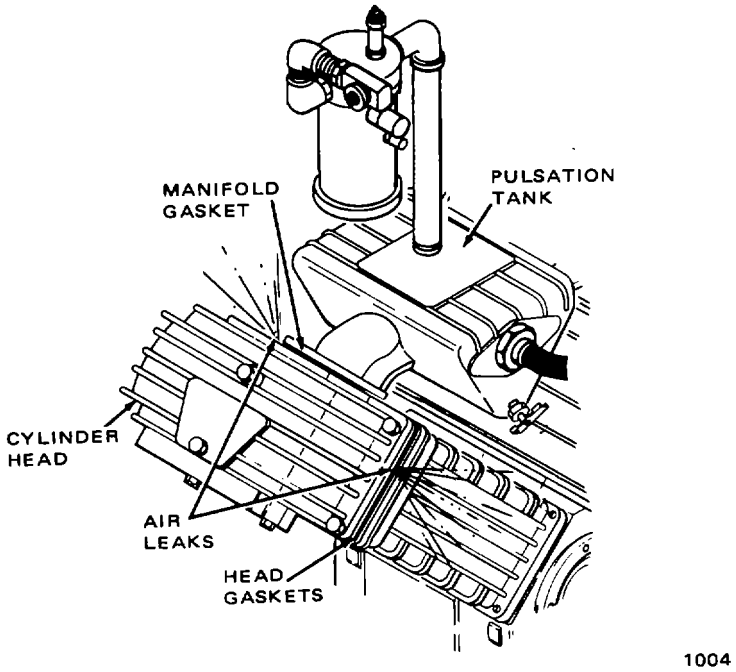


Figure 4-70. Compressor Air Leaks

Step 6. Check compressor head gaskets for air leaks while the engine is running.

a. Feel around cylinder head seams for air leaks.

b. Feel around pulsation tank for air leaks.

(1) If there are air leaks present, tighten head screw or change gaskets as necessary.

(2) If there are no air leaks present, notify your supervisor of the problem.

NOTE

Even if there are no apparent air leaks, a loss of pressure can be caused by bad or broken valves.

c. Feel around pulsation tank and head joints for air leaks.

(1) If there are no air leaks, notify your supervisor of the problem.

(2) If there are air leaks, notify your supervisor of the problem.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

NOZZLE PRESSURE BELOW 90 PSI (Continued)

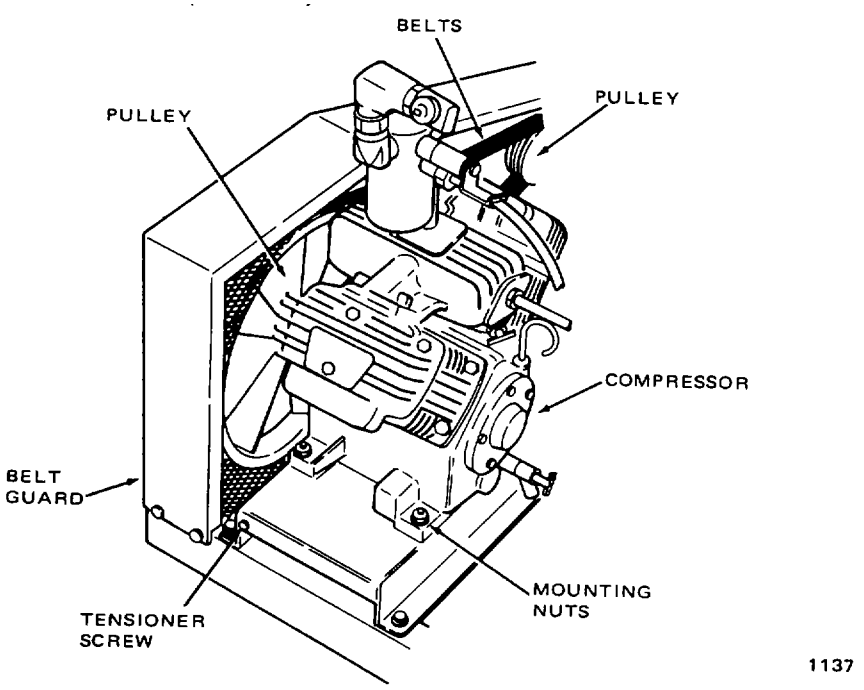


Figure 4-71. Compressor Assembly

Step 7. Check belt tension.

a. Remove belt guard.

b. Apply a 5 to 8 lb pressure (2.27 to 3.63 kg) to the belts midway between the pulleys.

(1) If the belts move more than 5/16 inch (7.94 mm) they are too loose. Go to Step 7c.

(2) If the belts only move 5/16 inch (7.94 mm), the tension is all right.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

NOZZLE PRESSURE BELOW 90 PSI (Continued)

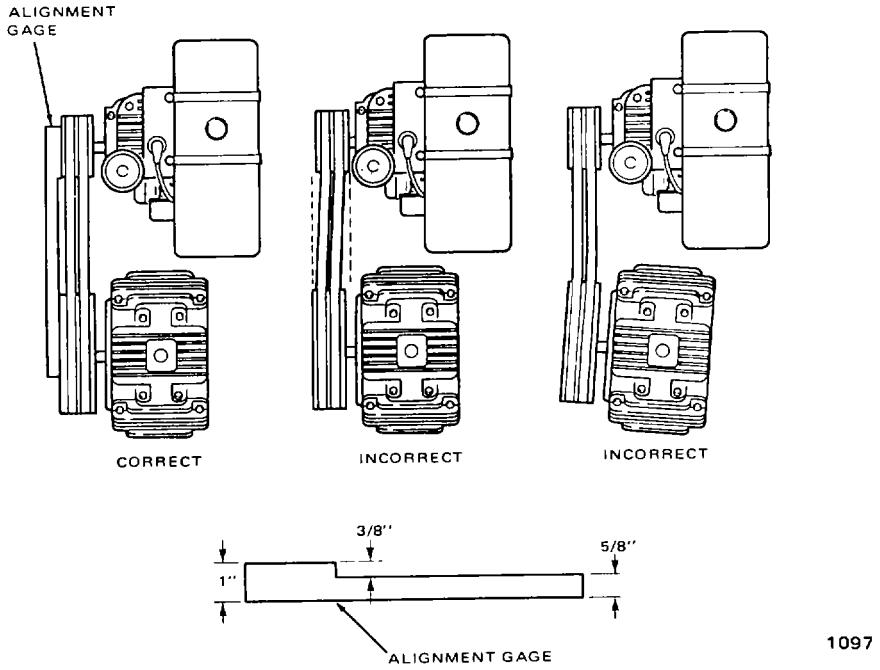


Figure 4-72. Compressor Alignment

NOTE

An alignment gage can be made from a piece of scrap metal or wood and can be used to line up the pulleys.

c. Adjust the belt tension.

(1) Loosen compressor mounting nuts. Do not remove them.

(2) Line up the pulleys.

(3) Turn tensioner screw to the right (clockwise) to tighten the belt tension.

(4) Tighten compressor mounting screws.

(5) Install belt guard.

d. Start the engine and check the nozzle pressure.

(1) If pressure is between 90 and 100 psi, the problem is solved.

(2) If pressure is less than 90 psi, notify your supervisor of the problem.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

10. NOZZLE PRESSURE GREATER THAN 100 PSI

Step 1. Check nozzle assembly for plugging.

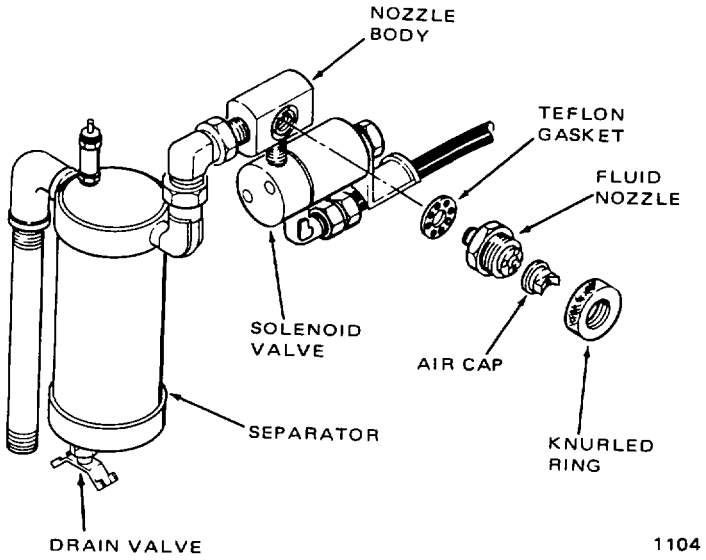


Figure 4-73. Nozzle Assembly

CAUTION

DO NOT use hard metal objects to unplug the air cap. This will damage the air cap. Use a soft material, like a toothpick.

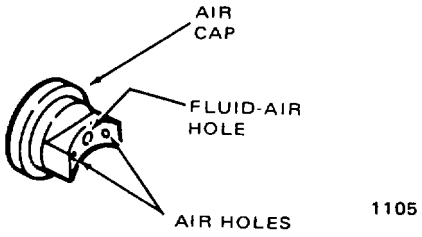


Figure 4-74. Air Cap

a. Unscrew knurled ring and remove air cap.

(1) If the air cap holes are partially plugged or coated with oil residue, soak the air cap in acetone (O-A-51F) to clean it.

(2) Carefully clean out the air cap holes with a toothpick or other soft non-metallic object.

(3) Wipe the air cap, the exposed fluid nozzle surfaces, and fluid hole projection with a clean rag.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

NOZZLE PRESSURE GREATER THAN 100 PSI (Continued)

NOTE

Be sure to check the air groove in the back of the fluid nozzle and clean it as necessary.

(4) If air cap is not plugged, or coated with oil residue; go to Step 1b.

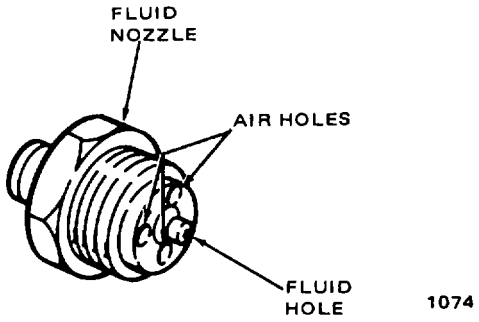


Figure 4-75. Fluid Nozzle

b. Remove fluid nozzle and check air holes.

(1) If air holes are plugged, soak the fluid nozzle in acetone (O-A-51F) to dissolve the gunk and varnish.

(2) Carefully clean out the fluid nozzle holes with a toothpick or other soft non-metallic object.

(3) Wipe the fluid nozzle surfaces with a clean rag. Go to Step 1c.

(4) If air holes are not plugged, go to Step 1c.

CAUTION

DO NOT use tools to tighten the knurled ring. Tighten it by hand. Too much force will damage the nozzle assembly.

DO NOT use too much force to tighten the fluid nozzle. Too much force will damage the teflon gasket.

c. Reassemble nozzle assembly and start engine. Check the pressure gage.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

NOZZLE PRESSURE GREATER THAN 100 PSI (Continued)

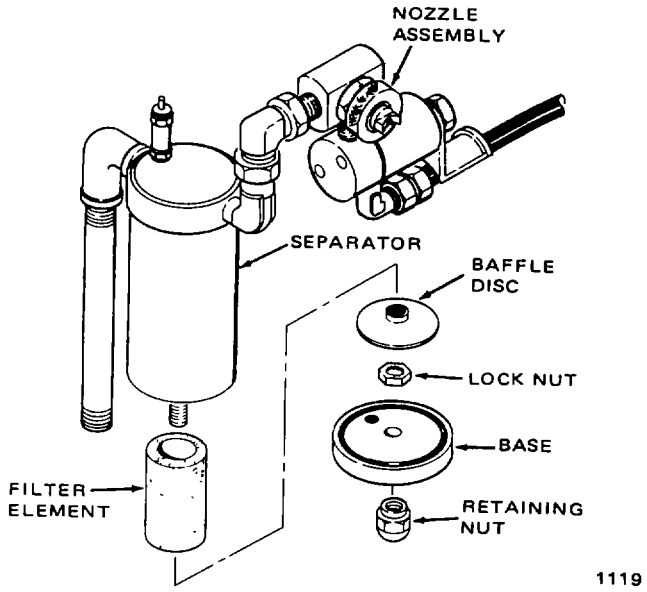


Figure 4-76. Separator Assembly

(1) If pressure is 90-100 psi, the problem is solved.

(2) If pressure is still greater than 100 psi, go to Step 2.

Step 2. Check separator filter element.

a. Disassemble separator.

(1) Remove bottom retaining nut.

(2) Remove separator body and bottom.

(3) Remove filter lock nut, baffle disc and filter element. Go to Step 2b.

b. Inspect filter element.

(1) If filter element is plugged, replace it and go to Step 2c.

(2) If filter element is ok, go to Step 2c.

c. Inspect bottom gasket. If gaskets are cracked or broken, replace them and go to Step 2d.

d. Reassemble separator and start engine. Check pressure gage.

(1) If pressure is 90-100 psi, the problem is solved.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

NOZZLE PRESSURE GREATER THAN 100 PSI (Continued)

(2) If pressure is still greater than 100 psi, notify your supervisor.

11. CONTROL PANEL LIGHT DOES NOT LIGHT

NOTE

First make sure the aerosol generator ignition switch was ON when the control panel light switch was turned ON.

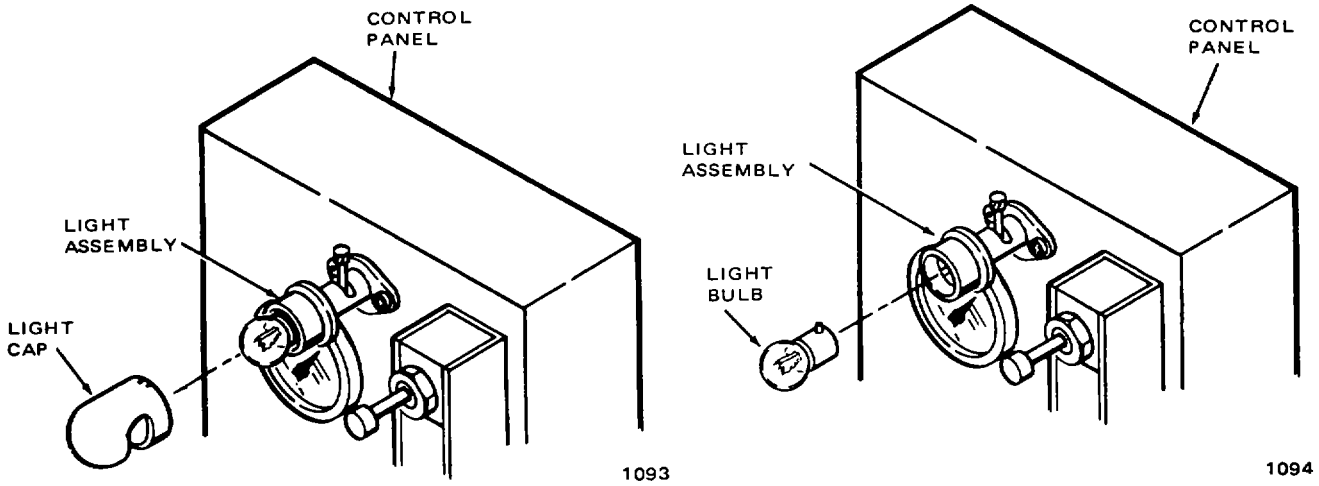


Figure 4-77. Control Panel Light Removal

Step 1. Check control panel light bulb.

a. Remove light bulb.

(1) Pull light bulb cap off the light.

(2) Push bulb in and twist it to the left to remove it. Go to Step lb.

b. Inspect light.

(1) If it appears to be ok, notify your supervisor of the problem.

(2) If it appears to be burned out, go to Step 1c.

(3) If it appears ok and the solenoid valve does not work, the solenoid valve switch could be bad. Notify your supervisor of the problem.

Table 4-3. Troubleshooting Chart (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
CONTROL PANEL LIGHT DOES NOT LIGHT (Continued)
c. Replace light bulb and turn light switch and ignition switch ON. (1) If light works, the problem is solved. (2) If light does not work, notify your supervisor.

Section V. MAINTENANCE PROCEDURES

GENERAL

This section contains general procedures for removal, minor repair, replacement and installation of aerosol generator components by the organizational maintenance technician.

a. General Removal Instructions.

(1) Be sure to disconnect the battery ground cable before removing any electrical parts or working on the fuel system.

(2) Be sure there is enough clearance to remove a component. Disassemble the aerosol generator to a point necessary to provide good working clearance.

(3) To help reassemble and install components, place identifying tags on mating ends of electrical air and fluid lines as they are disconnected.

b. General Disassembly Instructions.

(1) O-rings, gaskets, seals, and similar materials should be replaced if they are removed. Be sure all traces of old gasket or sealant material is removed.

CAUTION

DO NOT use hard metal tools to scrape old gasket or sealant materials from machined surfaces.

(2) Lockwashers, self-locking nuts, and any similar locking devices should be replaced if they are removed.

(3) To help reassemble and install components, place identifying tags on mating ends of electrical, air, and fluid lines as they are disconnected.

(4) Apply protective covers to hoses and openings to prevent foreign matter from entering open housings and lines. Wrap all parts in clean paper or dip them in preservative oil, Military Specification MIL-C-8188, or equivalent.

(5) Do not remove any parts that do not need repair or replacement. Do not disassemble a component any further than necessary to accomplish needed repairs.

c. General Cleaning Instructions.

(1) When cleaning bearings, place them in a container of dry cleaning solvent, P-D-680. If necessary use a brush to remove caked grease and chips, etc. Do not rotate the bearings before they are cleaned. When the bearings are cleaned, spin them in light lubricating oil to remove solvent.

(2) Do not expose O-rings, gasket, or other rubber parts to cleaning solvent. The solvent will damage them.

(3) Before disassembling the aerosol generator, clean all mud, grease, and grit from the unit.

(4) For cleaning exterior parts and components, use a cleaning compound such as Federal Specification P-C-435A. Dilute the cleaning compound as recommended on its container.

(5) For cleaning insecticide residue, use hot soap and water, Federal Specifications P-S-579.

GENERAL (Continued)

(6) Electrical parts, coil connectors, switches, and wiring using insulating materials should not be soaked or sprayed with cleaning solutions. Clean these parts with a lint-free cloth moistened in dry cleaning solvent, Federal Specification P-D-680.

d. General Inspection Instructions.

(1) Examine bearings for rusted or pitted balls, races, or separator. Examine balls for abrasion, serious discoloration, or misshaping. Replace bearings for the following reasons:

(a) Cuts or grooves parallel to bearing rotation.

(b) Bad pits.

(2) Check for physical distortion, wear, cracks and pitting. Clean all parts before inspection.

(3) Remove crankcase drain plugs and check the sediment that sticks to the plug. Grit and fine metal particles indicate potential equipment failure. This inspection is good for determining the condition of internal parts.

(4) Check all hoses for broken, cracked or frayed material. Check for breaks or chafing next to metal fittings. Inspect the fitting threads for damage. Replace all damaged parts. After reassembly and initial operation, check fittings for leaks.

(5) Inspect belts for cracks or fraying.

(6) Check all welded joints for cracks and/or leaks.

(7) Inspect the hose harness for chafing or burning. Inspect all terminal connectors for loose connections and/or broken parts.

e. General Repair.

(1) Exterior painted parts may be touched-up where paint is damaged. Follow instructions of TM 43-0139, Painting Instructions for Field use.

(2) Replace all broken, worn or burned electrical wiring.

(3) Replace all broken, cracked or frayed hoses. Replace fittings if threads are stripped. If a hose is damaged, replace the entire harness.

(4) Replace bolts, nuts, screws and fittings that have stripped threads.

(5) Replace worn, cracked or frayed belts.

f. General Reassembly.

(1) Remove protective grease coatings from new parts before installation.

(2) Replace all O-rings. Clean groove, then stretch O-ring into position. Coat the O-ring lightly with the fluid it will operate in.

(3) Install oil seals with seal lip facing the correct direction. Apply an even force to the outer edges of seal when installing it.

(4) Lubricate bearings before installing them.

OPERATIONAL CHECK

a. Refer to the direct and general support preventive maintenance section for the general operational check.

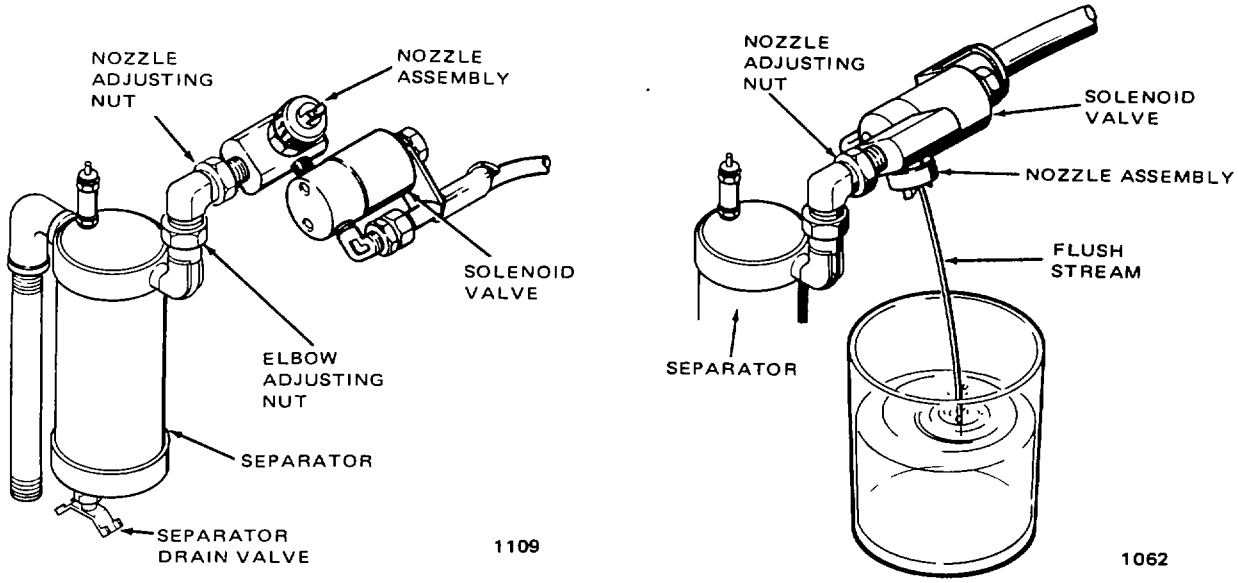


Figure 4-78. Nozzle Adjustment Procedure

b. Calibrate flowmeter.

(1) Aim nozzle assembly into a bucket.

(a) Loosen nozzle adjusting nut.

(b) Aim nozzle down into bucket and tighten adjusting nut.

(2) Turn solenoid valve switch OFF.

(3) Start engine according to engine start procedures in Chapter 2 Section III.

(4) When formulation tank pressure levels off, shut engine OFF.

(5) Turn the ignition and solenoid valve switches ON and let the insecticide flow into a bucket. Let the insecticide flow until the fluid lines are free of air bubbles.

(6) Check the temperature.

(7) Hold a beaker under the insecticide stream for a timed minute.

(8) Turn OFF the ignition and solenoid switches.

(9) Pour the insecticide from the beaker into a graduated cylinder and measure the volume of insecticide that flowed in one minute.

OPERATIONAL CHECK (Continued)

(10) Check the flowmeter scale reading.

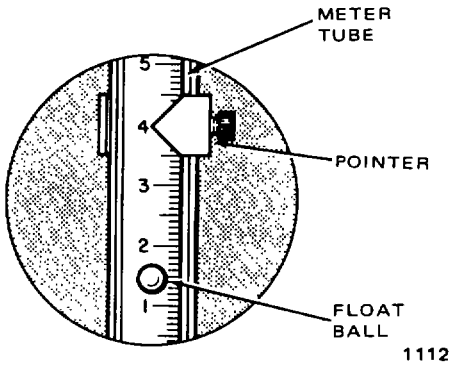


Figure 4-79. Flowmeter Scale

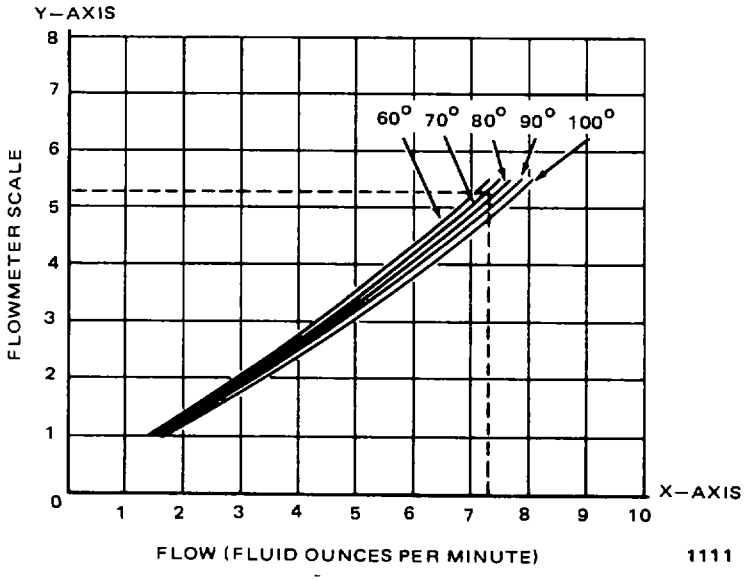


Figure 4-80. Temperature Correction Curve

(11) Find the flow rate in oz/min on the graph (Pages 1-9 thru 1-13) that matches the flowmeter reading. Use the graph provided for the insecticide being sprayed. Figure 4-80 illustrates how to use the temperature correction curves.

(a) If the flow rate from the graph is the same as the measured flow rate the flowmeter is ok.

(b) If the flow rate from the graph is not the same as the measured flow rate, check the meter tube, the flowmeter control valve, and the temperature gage for damage or plugging.

ENGINE ASSEMBLY MAINTENANCE

a. Service engine crankcase oil.

NOTE

Change the oil after first 5 hours of operation and every 25 hours thereafter.

Change the oil when it is warm. It will drain faster, if it is warm or hot.

WARNING

BE ALERT not to touch any hot engine parts. They can cause severe burns.

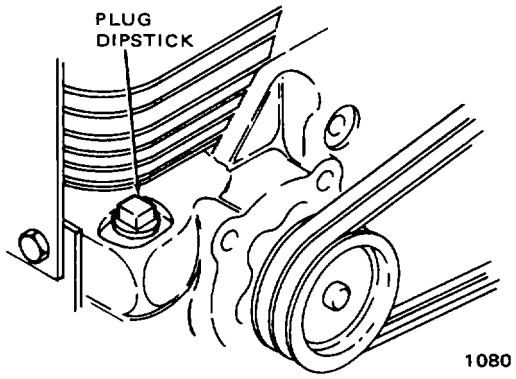


Figure 4-81. Engine Dipstick Location

(1) Unscrew plug dipstick and allow it to rest on top of dipstick hole.

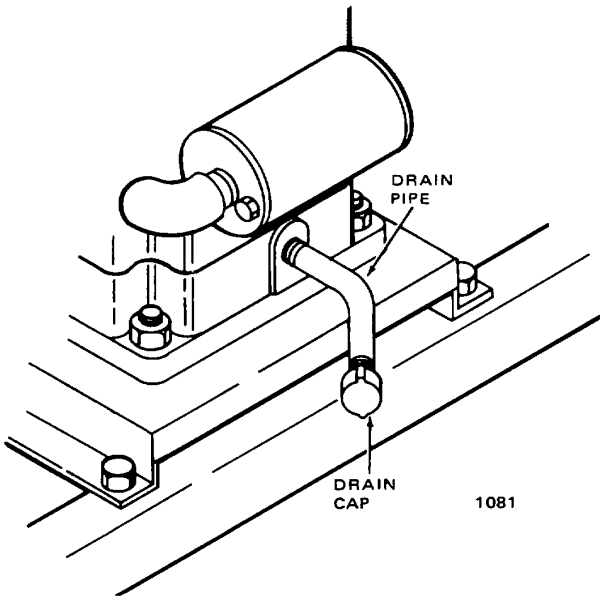


Figure 4-82. Engine Crankcase Drain

ENGINE ASSEMBLY MAINTENANCE (Continued)

(2) Place a pan under crankcase drain pipe.

(3) Remove drain pipe cap and drain oil into pan.

(4) Return pipe cap when all the oil has drained from crankcase.

CAUTION

DO NOT overfill. The oil level must never be higher than the (F) mark on the dipstick.

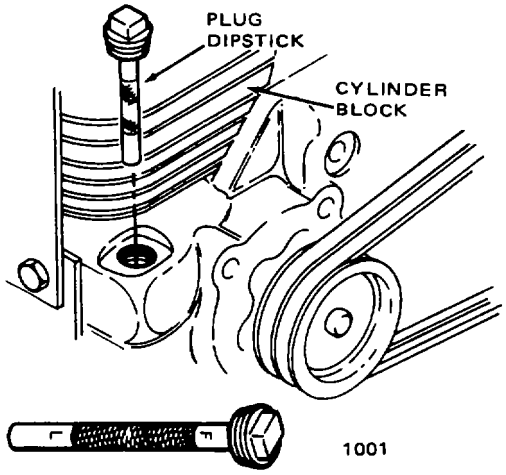


Figure 4-83. Engine Crankcase

(5) Remove plug dipstick and add one quart of OE/HD 30 detergent oil MIL-L-2104C through dipstick hole.

(6) After filling crankcase, check oil level according to instructions above.

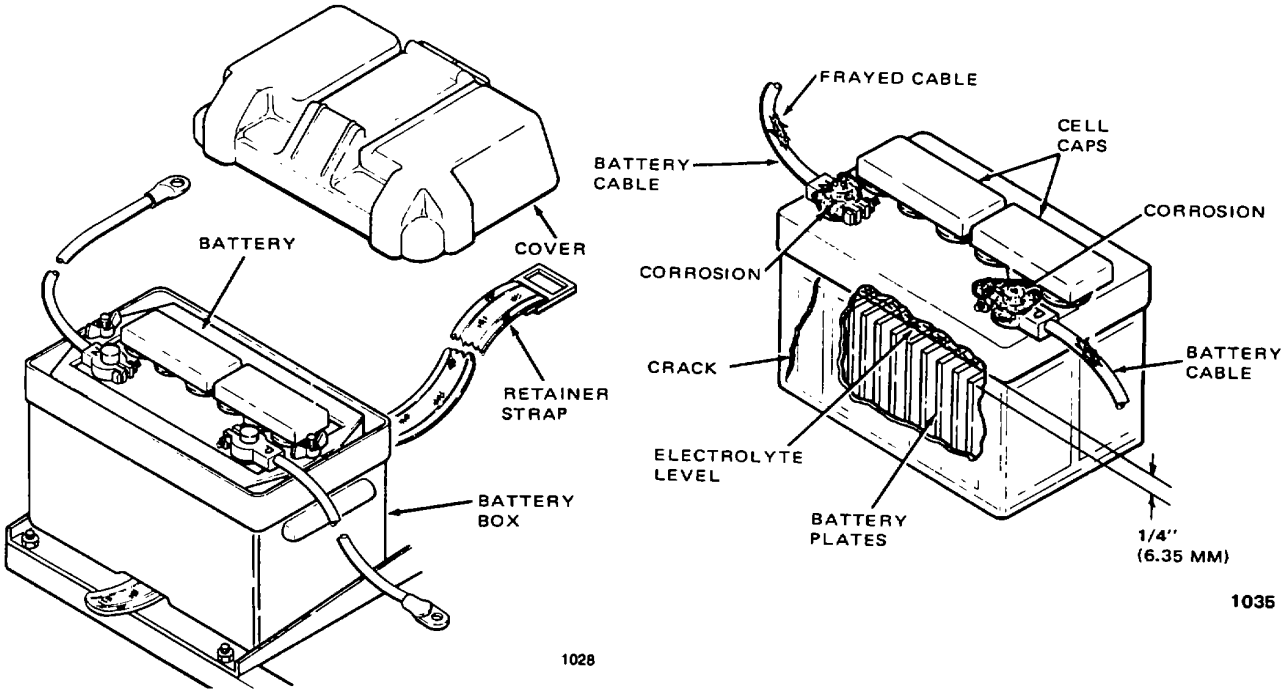


Figure 4-84. Battery Visual Checks

ENGINE ASSEMBLY MAINTENANCE (Continued)

b. Service and test battery.

(1) Check battery visually.

(a) Undo retainer strap and remove battery box cover.

(b) Make sure the battery cables are tight on terminals. They should not be able to be moved by hand.

(c) Make sure battery ground connection is securely fastened to base assembly.

(d) If there is any corrosion on the battery or around the terminals, rinse it off with a baking soda and water solution.

(e) If there is dirt on top of the battery, brush it off.

(f) If cable insulation is frayed or broken, replace the cable.

(g) If there are cracks in the sides or the cover of battery, replace it.

(2) If the meter reads less than 11.5 volts, go to Step 1c. Check electrolyte in battery. Use a hydrometer to check specific gravity.

CAUTION

The electrolyte level must be kept above the plates in the battery. DO NOT overfill the battery. The electrolyte should not overflow onto the battery cover when the cell covers are placed over the cells.

NOTE

Use distilled water or a good grade drinking water (excluding mineral water).

(a) Remove battery box cover.

(b) Remove cell covers and check electrolyte level. Add distilled water if the level is below the top of battery plates.

(c) Check specific gravity.

(d) If the specific gravity is between 1.250 and 1.280, the cells are ok.

(e) If the specific gravity is between 1.225 and 1.250, the cells are still in fair condition.

(f) If the specific gravity is below 1.150 in any one cell, replace the battery.

ENGINE ASSEMBLY MAINTENANCE (Continued)

(g) If the specific gravity in one cell is 0.050 or more less than the other cells and charging does not bring the charge to a 50% charge, replace the battery.

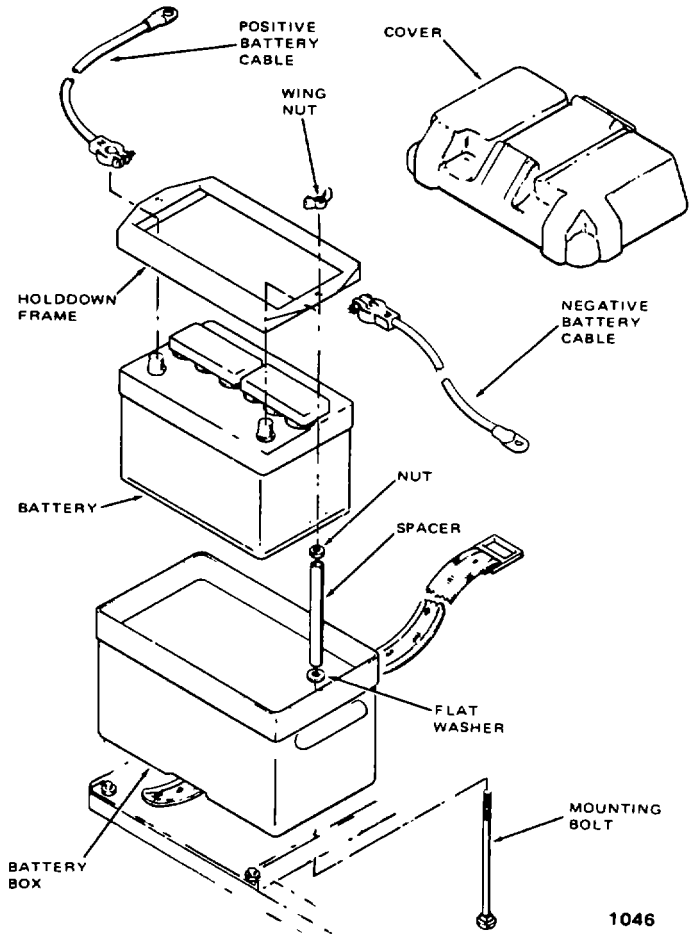


Figure 4-85. Battery Box Assembly

(3) Remove battery and disassemble battery box.

(a) Remove battery box cover.

(b) Remove wing nuts and battery hold down frame.

(c) Remove battery.

(d) Remove nuts, spacers, flat washers, and mounting bolts.

(e) Remove battery box.

ENGINE ASSEMBLY MAINTENANCE (Continued)

(4) Reassemble battery box and install battery.

(a) Insert mounting bolts in battery box holes in base assembly.

(b) Slide battery box over screws.

(c) Tighten battery box to base assembly with washers, spacers, and nuts.

(d) Install battery in battery box.

(e) Place hold down bracket on battery and attach it with washers and wing nuts.

WARNING

BE ALERT not to spill or splash electrolyte on skin. Electrolyte is sulfuric acid and will cause severe burns.

(f) Add electrolyte O-S-801B to battery. The electrolyte should be at least 0.250 inches (6.35 mm) above battery plates. The electrolyte should not be allowed to overflow on to the top of the battery.

MUFFLER ASSEMBLY MAINTENANCE

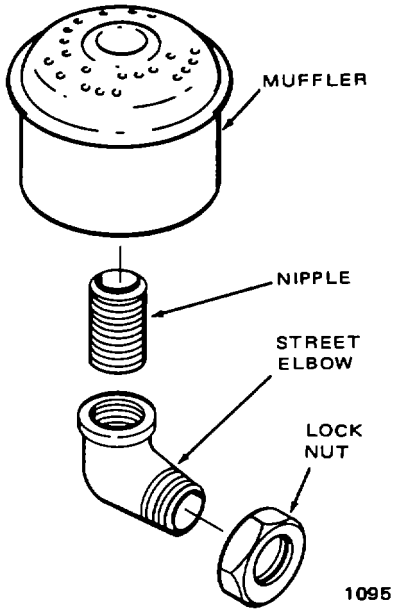


Figure 4-86. Muffler Assembly

a. Removal and disassembly.

(1) Remove muffler and nipple.

(2) Loosen locknut.

(3) Remove street elbow and locknut.

MUFFLER ASSEMBLY MAINTENANCE (Continued)

b. Reassemble and install.

(1) Install street elbow, nut, and nipple.

(2) Install muffler.

AIR FILTER ASSEMBLY MAINTENANCE

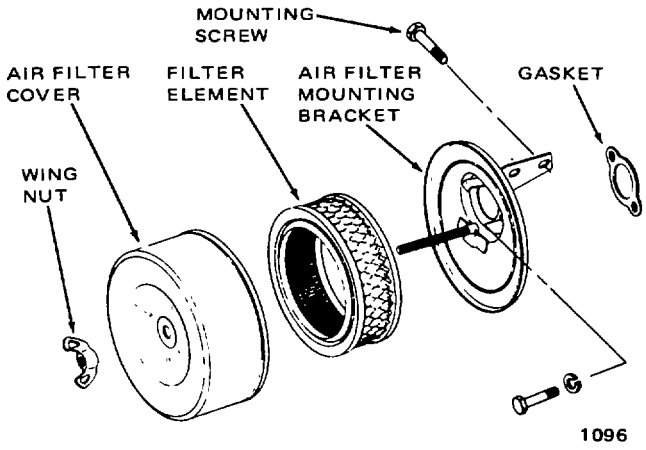


Figure 4-87. Air Cleaner Assembly

a. Disassemble and remove air filter.

(1) Remove wing nut, air filter cover and air filter element.

(2) Remove screws, lockwashers, air filter mounting bracket and gasket.

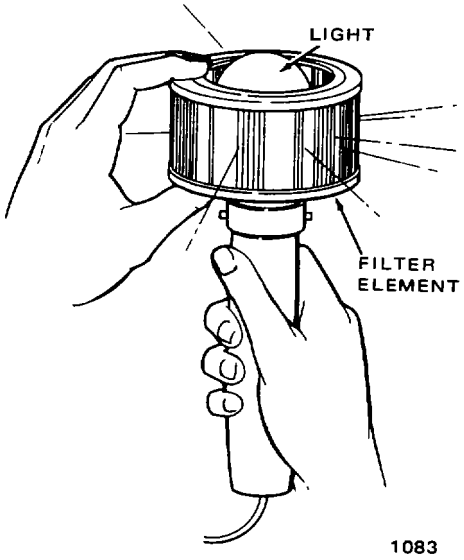


Figure 4-88. Air Filter Test

AIR FILTER ASSEMBLY MAINTENANCE (Continued)

b. Inspect filter element.

NOTE

Clean the filter element after 50 hours of operation.

Replace the filter after 100 hours of operation.

(1) Place a light in the center of filter element.

(2) If the light can be seen through the element the element is ok.

(3) If the light cannot be seen through the element, clean it or replace it as necessary.

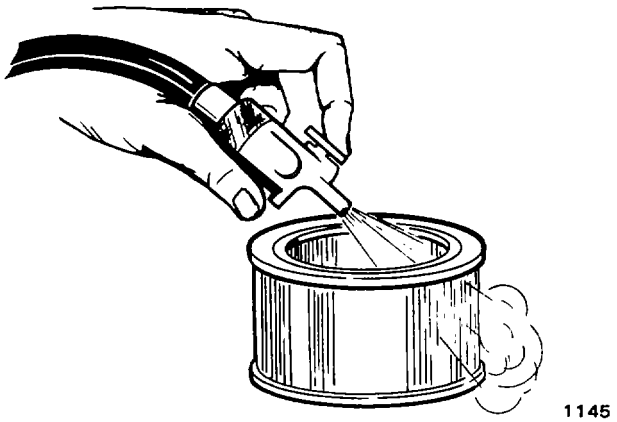


Figure 4-89. Air Filter Cleaning

c. Clean filter element. Blow air through the filter element from the inside out.

d. Install and reassemble air filter assembly.

(1) Attach air filter bracket to and gasket to carburetor.

(2) Attach air filter cover and filter element to bracket.

(3) Tighten wing nut securely.

CARBURETOR ASSEMBLY MAINTENANCE

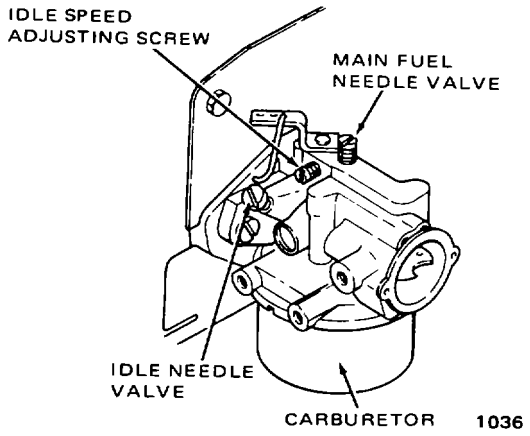


Figure 4-90. Carburetor

a. Adjust the carburetor without the engine running.

(1) Turn both needle valves all the way to the right (clockwise) until they gently touch bottom.

(2) Turn the main fuel needle valve to the left (counterclockwise) two full turns.

(3) Turn the idle needle valve to the left (counterclockwise) 1-1/4 turns.

b. Adjust the carburetor while the engine is running.

(1) Start the engine.

(2) Turn the main fuel needle valve to the right (clockwise) until the engine slows down,

(3) Turn the main fuel needle valves back to the left (counterclockwise) until the engine slows down.

(4) Turn the main fuel needle valve back to the right to a position halfway between the slow down points.

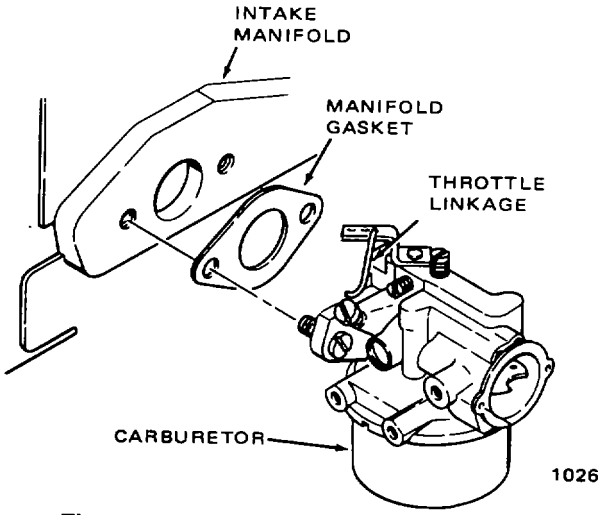


Figure 4-91. Carburetor Removal

CARBURETOR ASSEMBLY MAINTENANCE (Continued)

c. Remove the carburetor from the engine.

(1) Remove the air cleaner and air cleaner bracket.

(2) Disconnect the throttle linkage and remove the carburetor from the engine.

NOTE

To remove the carburetor from the engine, it is necessary to loosen one mounting screw, then the other. Pull the carburetor away from the engine and loosen each screw again. Repeat this procedure until the carburetor can be removed from the engine.

(3) Inspect the carburetor to manifold gasket. If it is cracked, broken, or damaged, replace it.

d. Install carburetor assembly.

(1) Secure manifold gasket and carburetor to engine.

(2) Adjust carburetor according to steps a. and b. above.

NOTE

Set mounting screws through carburetor and gasket then start them in the mounting holes. Hold the carburetor and gasket away from the engine and tighten one screw a few turns then the other. Repeat this procedure until the carburetor is securely attached to the engine.

(3) Attach the air filter bracket to the carburetor.

(4) Attach the filter element and filter cover to the bracket.

(5) Tighten the wing nut.

BELTS MAINTENANCE

a. Remove belts.

(1) Remove belt guard.

(2) Loosen compressor mounting nuts.

(3) Turn tensioner screw counterclockwise (left) until belts are loose enough to remove.

b. Inspect belts. Check belts for cuts, chafing, or fraying.

c. Install belts.

(1) Place belts on pulleys.

NOTE

An alignment gage can be made from a piece of scrap metal or wood and be used to line up the pulleys.

BELTS MAINTENANCE (Continued)

(2) Line up the pulleys.

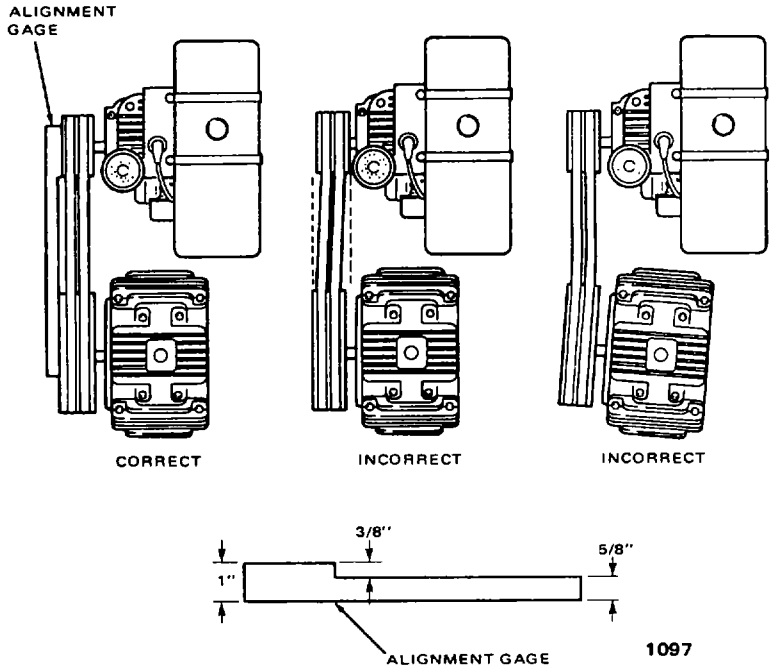


Figure 4-92. Compressor Alignment

(3) Adjust belt tension.

(a) Turn tensioner screw clockwise (right) until belts are properly taut.

NOTE

When a pressure of 5 to 8 lbs (2.27 to 3.63 kg) is applied to a point midway between pulleys they should only move 5/16 of an inch (7.94 mm). Loosen or tighten the tension as necessary.

(b) Tighten compressor mounting screws.

(c) Install the belt guard.

COMPRESSOR ASSEMBLY MAINTENANCE

NOTE

Change crankcase oil after 200 hours of operation or when it becomes dirty.

Change the oil when it is warm. It will drain faster if it is warm.

WARNING

BE ALERT not to touch hot compressor parts (separator), or nozzle parts. They can cause burns.

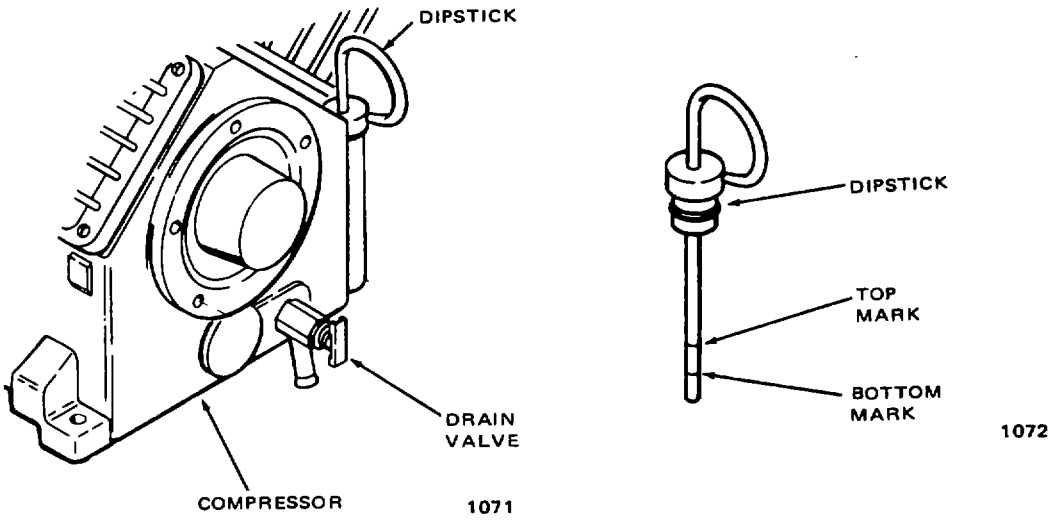


Figure 4-93. Compressor Dipstick

(a) Remove dipstick.

(b) Place a pan under crankcase drain valve.

(c) Open drain valve and drain oil.

(d) Close drain valve when all the oil is drained from crankcase.

CAUTION

DO NOT overfill. The oil level must never be higher than the top mark on the dipstick.

(e) Add 1.5 pints of synthetic reciprocating compressor oil through dipstick hole. Refer to page 1-6 for correct compressor oil.

(f) Return dipstick to crankcase.

NOZZLE ASSEMBLY MAINTENANCE

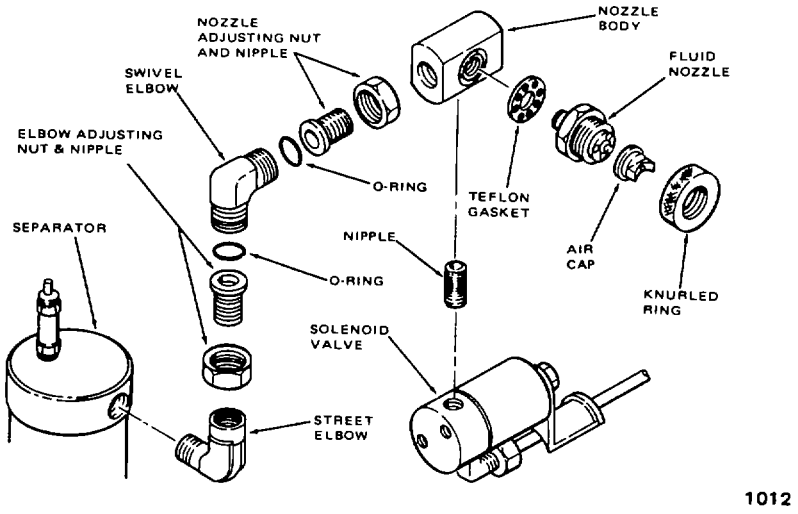


Figure 4-94. Nozzle Installation

a. Remove and disassemble nozzle assembly.

(1) Remove knurled ring and air cap.

(2) Remove fluid nozzle and Teflon gasket.

(3) Disconnect nozzle adjusting nut and nipple from the swivel elbow.

(4) Separate solenoid valve and close nipple from nozzle body.

(5) Disconnect elbow adjusting nut and O-ring.

(6) Separate swivel elbow, O-ring, nozzle adjusting nut and nipple from nozzle body.

(7) Separate elbow adjusting nut and nipple from street elbow.

b. Inspect and clean nozzle assembly.

CAUTION
DO NOT use hard metal objects or tools to unplug nozzle assembly.

NOTE
Replace Teflon gasket with each inspection.

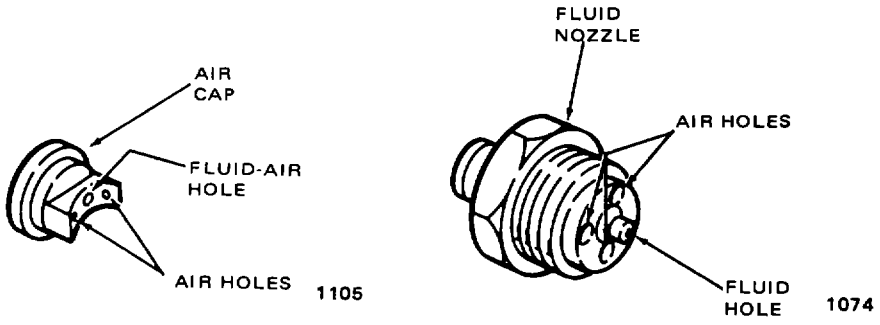


Figure 4-95. Air Cap and Fluid Nozzle

NOZZLE ASSEMBLY MAINTENANCE (Continued)

(1) If fluid nozzle is plugged, or partially obstructed, soak the fluid nozzle in acetone to dissolve the gunk and varnish.

(2) Carefully clean the air cap holes with a toothpick.

(3) Wipe the air cap with a clean rag.

(4) Unplug the fluid nozzle holes with a toothpick.

(5) Wipe the fluid nozzle with a clean rag.

(6) Clean air grooves on back of fluid nozzle.

c. Reassemble and install nozzle assembly.

(1) Attach adjusting nut, nipple, O-ring and swivel elbow to street elbow.

(2) Attach O-ring, adjusting nut, nipple, and nozzle body to swivel elbow.

(3) Attach nipple, solenoid valve, and support bracket to nozzle body.

SEPARATOR MAINTENANCE

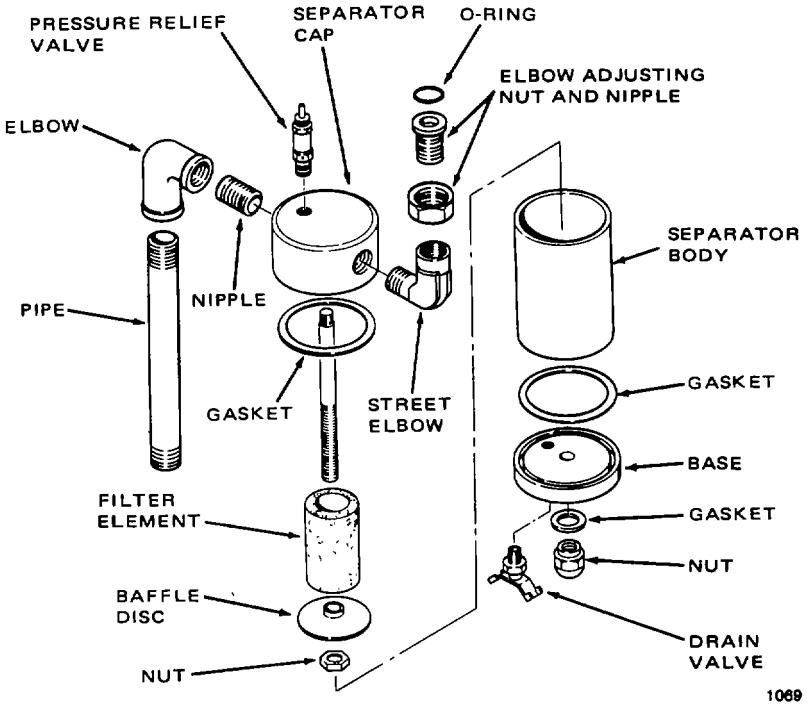


Figure 4-96. Separator Disassembly

SEPARATOR MAINTENANCE (Continued)

a. Remove and disassemble separator.

(1) Disconnect elbow, adjusting nut, nipple, and O-ring.

(2) Remove street elbow.

(3) Remove pressure safety relief valve.

(4) Remove separator drain valve.

(5) Remove nut, washer, base, gaskets, and separator body.

(6) Remove nut, baffle disc, filter element, and stud.

(7) Remove pipe and separator pipe elbow, nipple, and separator cap.

b. Inspect filter element.

(1) If filter element is dirty, replace it.

(2) If filter element is not dirty, return it to separator.

(3) Replace separator gaskets and stud gasket with each inspection.

c. Assemble separator.

(1) Attach pipe, elbow, and nipple to pulsation tank.

(2) Attach separator cap to nipple.

(3) Attach safety valve to separator cap.

(4) Attach stud, filter element, baffle disc, and retainer nut to separator cap.

(5) Attach gaskets, separator body, and separator base to separator cap with gasket and nut.

(6) Attach street elbow to separator.

(7) Attach separator drain valve to separator base.

CONTROL PANEL ASSEMBLY MAINTENANCE

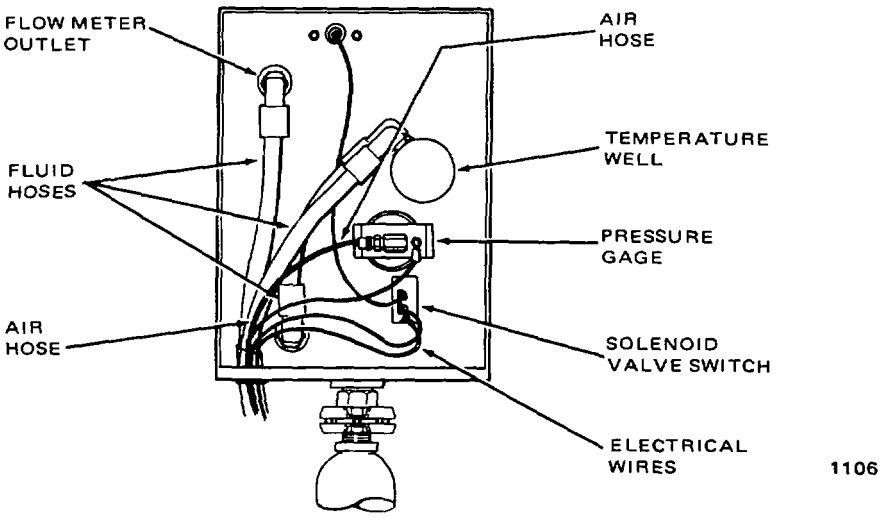


Figure 4-97. Control Panel Insecticide, Air, and Electrical Lines

a. Remove control panel assembly.

WARNING

BE SURE the aerosol generator ignition switch is turned OFF before working on control panel.

BE SURE there is no air pressure on formulation tank or flush tank.

BE SURE there is no insecticide in hoses before removing them from control panel. DO NOT spill insecticide on skin.

Release flush tank pressure before removing hoses.

(1) Turn three-way valve to flush position.

(2) Turn aerosol generator ignition switch OFF.

(3) Disconnect fluid hoses from temperature well inlet and flow meter outlet. Cover hose ends to prevent dirt from entering hoses.

(4) Disconnect wires from solenoid valve switch and ground connection.

(5) Disconnect black air hose from pressure gage.

(6) Remove control panel from vehicle floor and vehicle.

CONTROL PANEL ASSEMBLY MAINTENANCE (Continued)

b. Install control panel assembly.

WARNING

BE SURE the aerosol generator ignition switch is turned OFF before installing control panel.

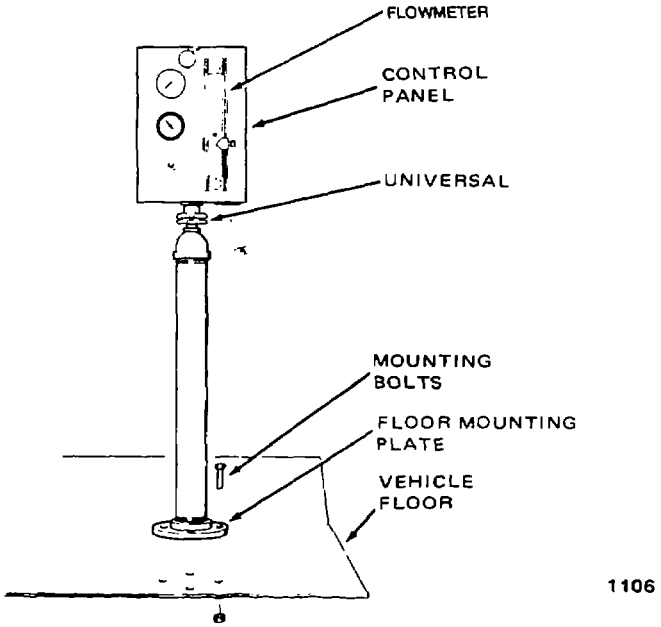


Figure 4-98. Control Panel Installation

(1) Mount control panel on vehicle floor.

(2) Connect fluid hoses to temperature well inlet and flowmeter outlet. Be sure hoses are connected to correct component.

(3) Connect black air hose to pressure gage.

(4) Connect wires to solenoid valve switch and ground.

(5) Loosen universal joint and adjust control panel to a vertical position.

FORMULATION TANK FILTER MAINTENANCE

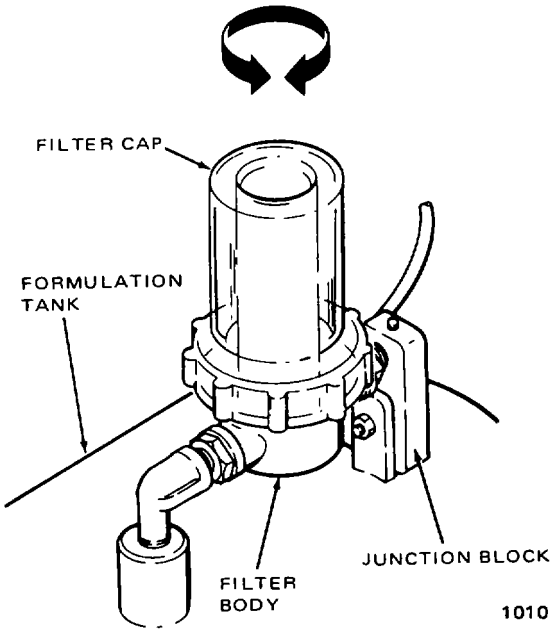


Figure 4-99. Formulation Tank Filter

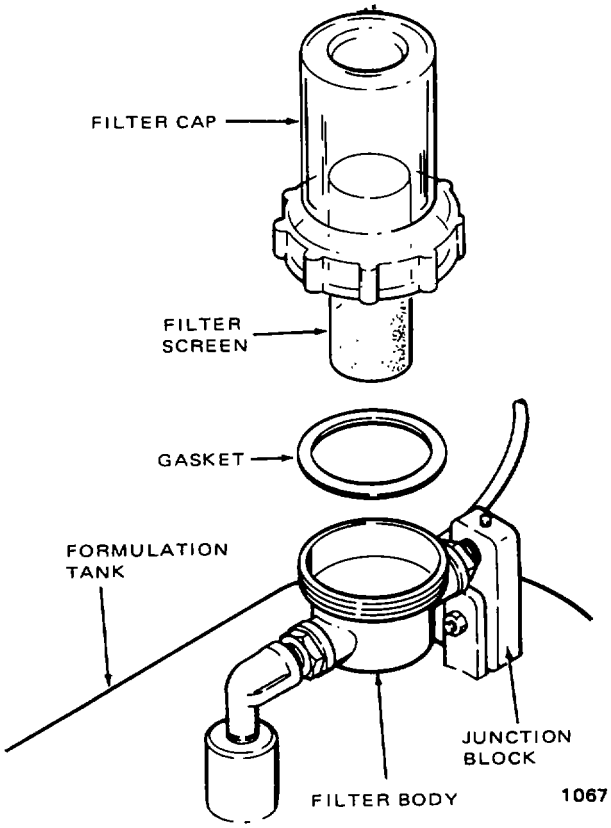


Figure 4-100. Filter Assembly

a. Disassemble filter assembly for inspection.

NOTE

Change filter screen after 100 hours or as necessary.

Clean filter screen as necessary.

Replace gasket with each inspection.

(1) Remove filter cap and gasket.

(2) Remove filter screen and inspect it.

b. Inspect filter screen.

(1) If filter screen is worn or damaged, replace it.

(2) If filter screen is dirty, clean it with soap and water.

(3) Replace gasket with each inspection.

c. Assemble filter assembly.

(1) Insert filter screen into filter body.

FORMULATION TANK FILTER MAINTENANCE (Continued)

(2) Center gasket on filter seat. Make sure the gasket does not become pinched in the threads.

(3) Tighten filter cap by hand only. Metal tools will damage the plastic filter cap. Be sure the gasket remains centered on the filter seat.

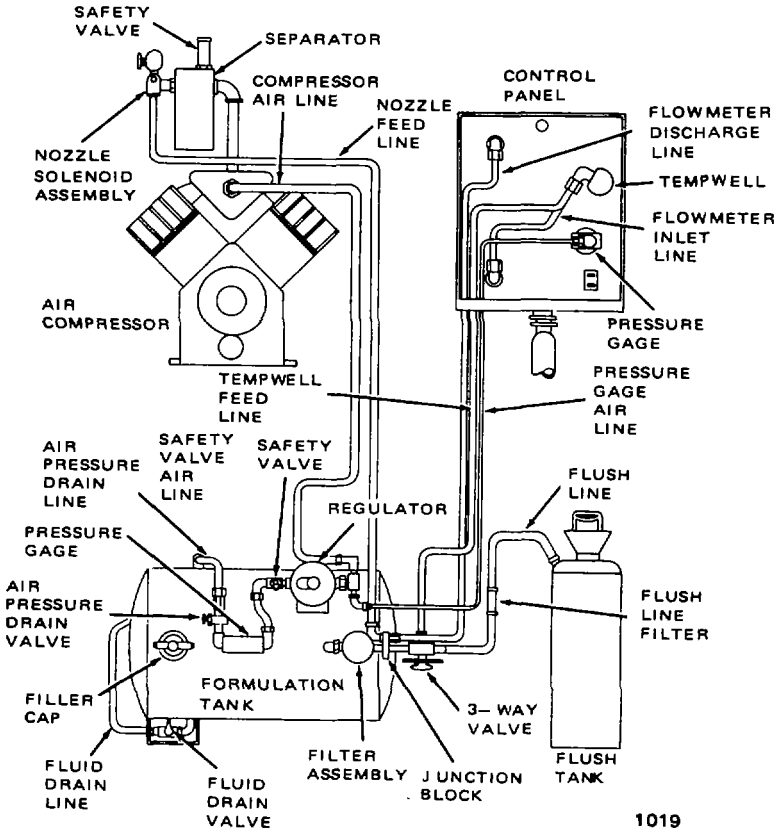


Figure 4-101. Hoses, Lines and Fittings

HOSES AND FITTINGS MAINTENANCE

a. Remove hoses.

WARNING

BE SURE to release all tank and flush tank pressure before removing any hose. Pressure may cause the insecticide to splash in the face and eyes.

(1) Disconnect fluid hoses listed below.

(a) Fluid drain hose.

(b) Flush line.

(c) Fluid hose to temperature well on control panel.

HOSES AND FITTINGS MAINTENANCE (Continued)

(d) Fluid hose between temperature well and flow meter.

(e) Fluid hose to junction block from control panel.

(f) Fluid hose to solenoid valve.

(2) Disconnect air hoses listed below:

(a) Air hose from pulsation tank to inlet side of pressure regulator.

(b) Air hose to control panel pressure gage.

(c) Air hose between safety valve and tank pressure gage.

(d) Hose from air pressure drain valve.

b. Inspect hoses and fittings.

(1) If any hoses are cut or cracked, replace them.

(2) If any hoses are chafed or burned, replace them.

(3) If any fittings are damaged and leak, replace them.

(4) If the black 1/8 (3.18 mm) inch air hose is kinked and leaks, replace it.

NOTE

If any hoses in the harnesses are damaged beyond repair, replace the entire harness.

If any fitting is damaged and cannot be replaced, replace the entire hose. If the fitting is on a harness hose, replace the entire harness.

c. Install hoses.

(1) Connect fluid hoses listed below:

(a) Fluid drain hose.

(b) Flush line.

(c) Fluid hose to temperature well on control panel.

(d) Fluid hose between temperature well and flow meter.

(e) Fluid hose to junction block from control panel.

(f) Fluid hose to solenoid valve.

HOSES AND FITTINGS MAINTENANCE (Continued)

(2) Connect air hoses listed below:

(a) Air hose from pulsation tank to inlet side of pressure regulator.

(b) Air hose to control panel pressure gage.

(c) Air hose between safety valve and tank pressure gage.

(d) Hose from air pressure drain valve.

FLUSH TANK MAINTENANCE

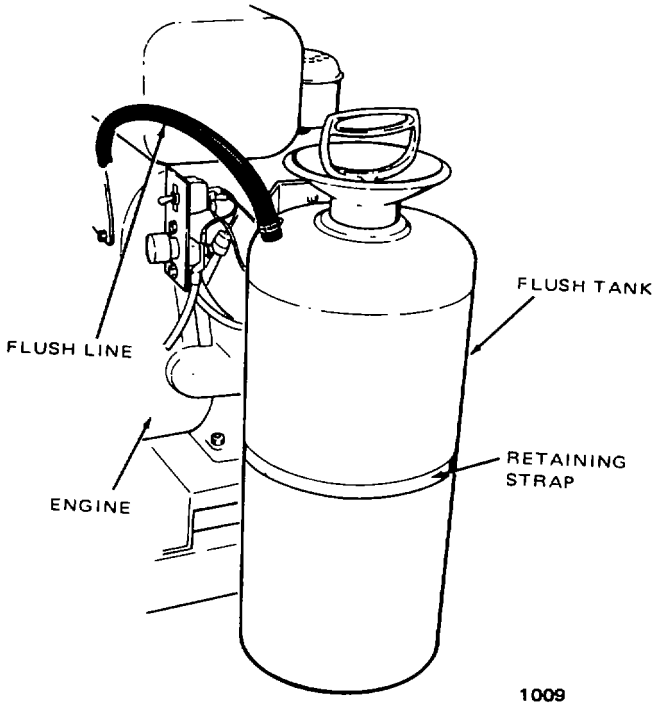


Figure 4-102. Flush Tank Installation

FLUSH TANK MAINTENANCE (Continued)

a. Remove flush tank.

WARNING

BE SURE there is no pressure on the flush tank before removing it from aerosol generator.

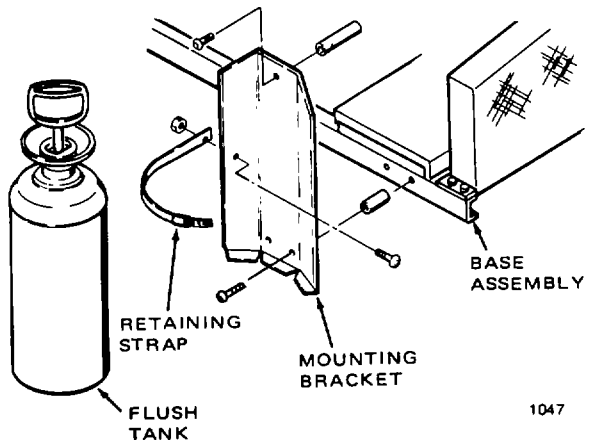


Figure 4-103. Flush Tank Assembly

(1) Disconnect flush line from three-way valve and flush tank.

(2) Disconnect retaining strap.

(3) Remove flush tank.

(4) Remove mounting bracket from base and engine assemblies.

b. Install flush tank assembly.

(1) Attach mounting bracket to base and engine assemblies.

(2) Set flush tank on mounting bracket and tighten retaining strap.

(3) Connect flush line to flush tank and three-way valve.

CHAPTER 5

DIRECT SUPPORT AND GENERAL SUPPORT

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. REPAIR PARTS, SPECIAL TOOLS, TMDE AND SUPPORT EQUIPMENT

REPAIR PARTS

Repair parts are listed and illustrated in the repair parts and special tools list (TM 5-3740-214-24P) covering organizational maintenance for this equipment.

COMMON TOOLS AND EQUIPMENT

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) used by your unit.

SPECIAL TOOLS, TMDE, and SUPPORT EQUIPMENTI

No special tools are listed in the repair parts and special tools list for this equipment.

Section II. SERVICE ON RECEIPT

GENERAL SERVICE

a. Make sure there are no damaged, dented or broken components. Check all glass parts for breakage.

b. Make sure all nuts, bolts and screws are securely fastened.

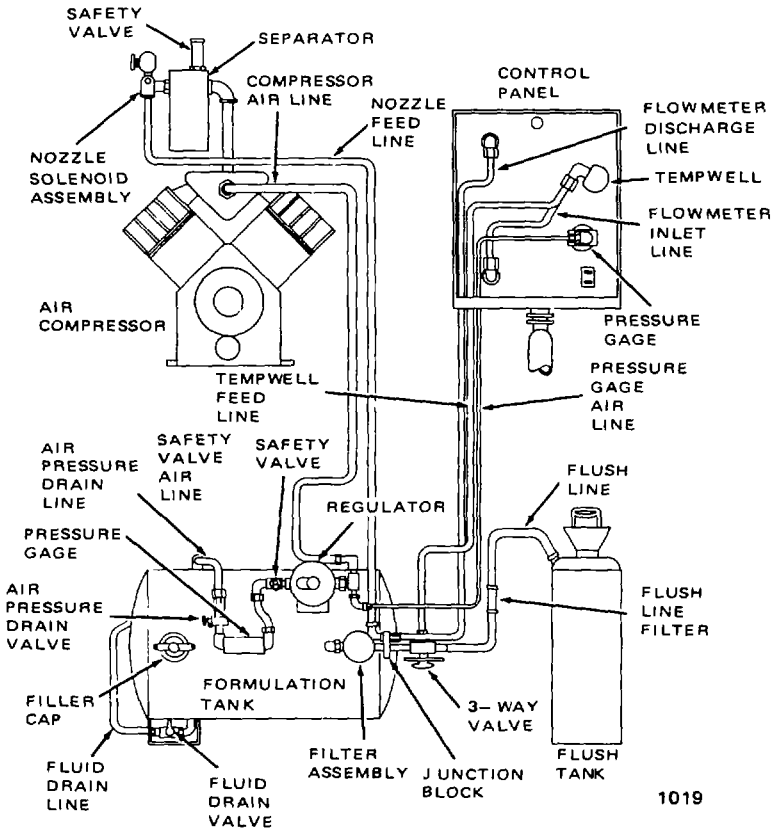


Figure 5-1. Hoses, Lines, and Fittings

c. Check all plastic hose fittings for tightness. Hand tighten them if they are loose.

d. Check all hoses for breaks, cracks or chafing.

MOUNTING AEROSOL GENERATOR

a. The aerosol generator is designed to be mounted on the back of an open vehicle. It is usually mounted on a pick-up truck, but it is not restricted to use on a pick-up truck. It can be mounted directly on the vehicle or on the wooden skid it is shipped on. The wooden skid acts as a shock absorber.

b. The aerosol generator has a remote control panel that is mounted on the cab floor of the vehicle. The hose harness can enter the truck through an open window on the passenger side. For a more permanent mounting, a hole can be drilled through the back of the vehicle cab for entry of the harness.

CONNECTIONS

When the aerosol generator is shipped, the hose harness is disconnected at the junction block. When connecting the hoses, make sure they are connected to the proper fittings. See illustration on page 5-2.

Section III. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

GENERAL

This section describes the preventive maintenance checks and services performed by the organizational maintenance personnel. These checks and services ensure that defects are discovered and corrected before they cause any serious damage. The proper checks and services are listed in table 5-1. This table is divided into four main columns.

a. Item number. Each item. Each item to be inspected is numbered in order of performance. These item numbers will be listed in TM number column on the Equipment Inspection and Maintenance Work Sheet, DA Form 2404.

b. Interval. This column shows when parts of the aerosol generator should be inspected.

c. Item to be Inspected. The items listed in this column are divided into groups showing the part of the aerosol generator being inspected.

d. Procedures. This column describes and illustrates the parts being inspected and the steps followed.

Table 5-1. Direct and General Support Preventive Maintenance Checks and Services

M = Monthly A/R = As Required Q = Quarterly H = Hourly

ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
1					ENGINE ASSEMBLY
				500	a. Check crankcase vacuum. Use vacuum gage.

NOTE

The engine must be running to check crankcase vacuum.

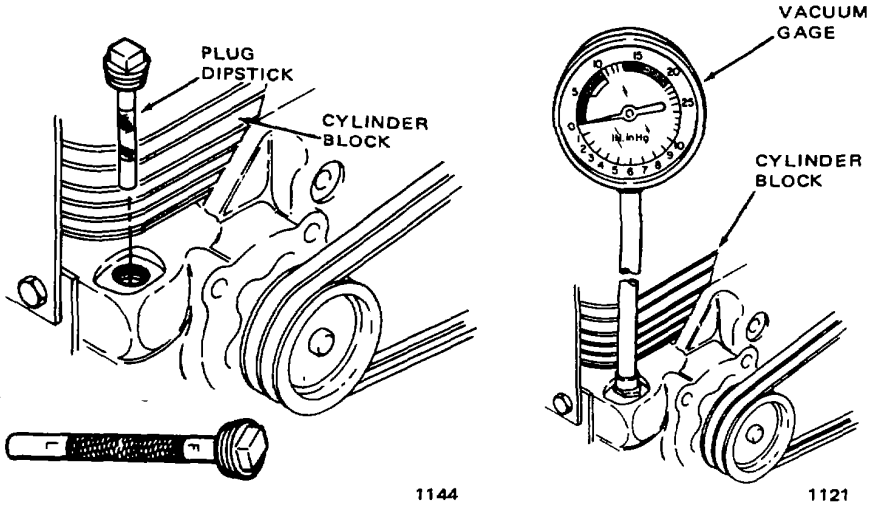


Figure 5-2. Installation of Vacuum Gage

(1) Remove plug dipstick.

(2) Insert vacuum gage into dipstick hole. Make sure it seals well.

(3) Start engine and test vacuum.

(a) If vacuum is /2 - 1 inch (12.7 - 25.4 mm) of mercury the engine is ok.

(b) If vacuum is less than 1/2 inch (12.7 mm) of mercury, check crankcase breather.

(c) If there is a positive pressure in the crankcase, check engine compression.

				500	b. Check crankcase breather assembly.

(1) Remove valve cover and gasket.

Table 5-1. Direct and General Support Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
					ENGINE ASSEMBLY (Continued)

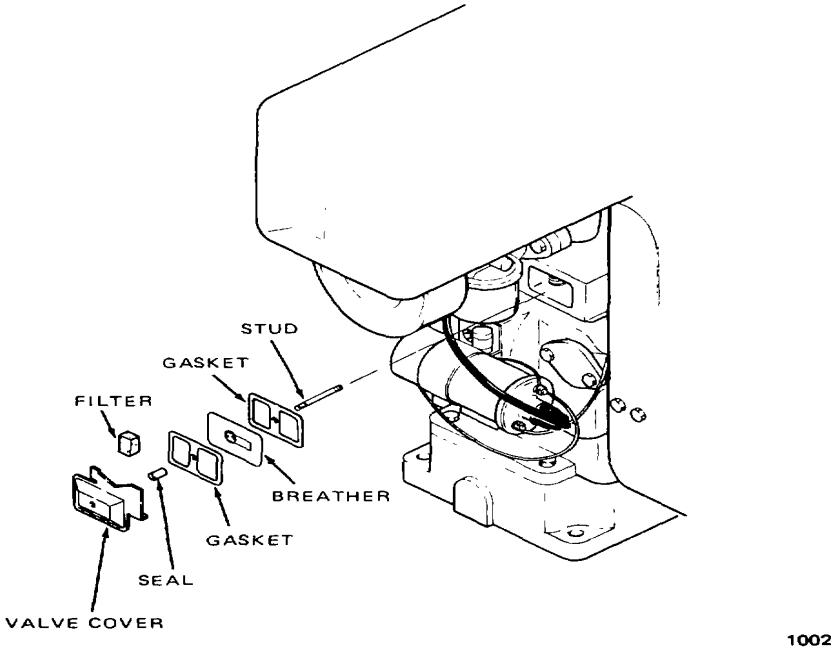


Figure 5-3. Engine Valve Cover

(2) Remove breather, seal, and filter. If the filter is dirty or plugged, replace it.

(3) Replace gaskets as necessary.

(4) Reassemble breather assembly. Make sure valve cover is sealed tightly and does not leak.

500 c. Check engine compression.

NOTE

Because the automatic compression release does not release until the engine reaches 600 rpm, there is a special compression test procedure for this engine.

(1) Start engine and run it for fifteen minutes.

Table 5-1. Direct and General Support Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
					ENGINE ASSEMBLY (Continued)

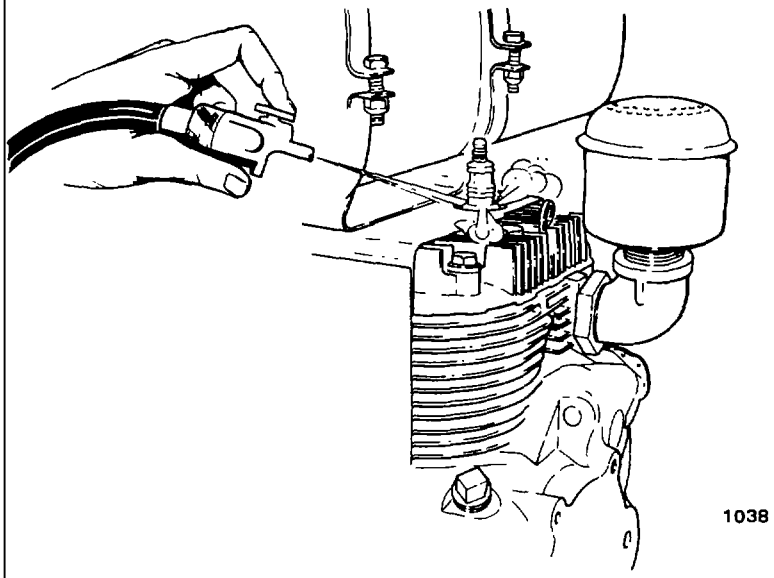


Figure 5-4. Spark Plug Cleaning

(2) Shutoff engine and remove spark plug.

CAUTION

BE CAREFUL when removing spark plug. Too much force can break spark plug insulator.

(a) Loosen spark plug a few turns.

(b) Blow dirt out of spark plug well with high pressure air.

(c) Remove spark plug by hand.

(3) Install compression gage in spark plug hole. Make sure it seals well.

(4) Set choke wide open. Remove air cleaner if necessary.

(5) Remove belt guard and crank engine by hand counterclockwise (left: opposite normal rotation). Turn engine over about eight times.

(a) With the first few turns the compression may be as low as 30 psi. After the seventh turn, the compression should be 90 psi.

Table 5-1. Direct and General Support Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
					ENGINE ASSEMBLY (Continued)

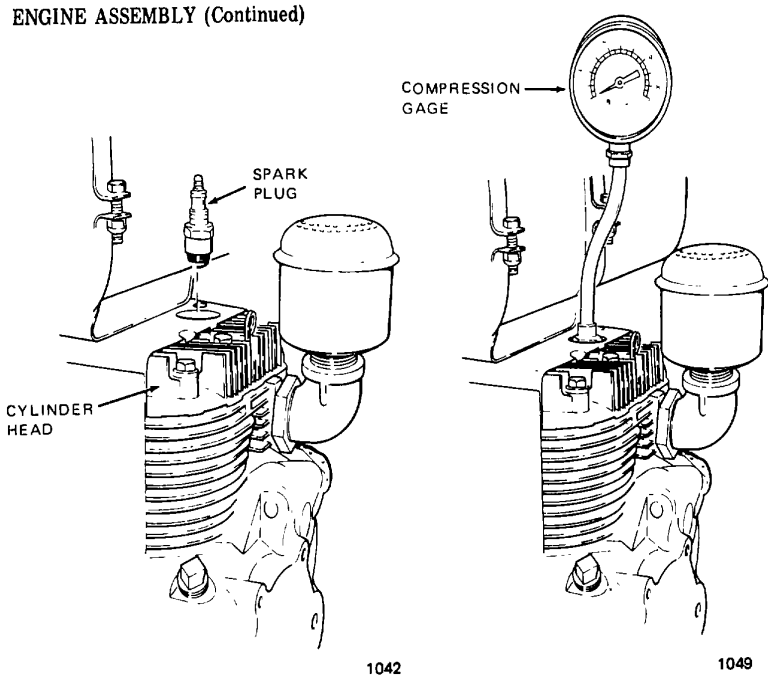


Figure 5-5. Installation of Compression Gage

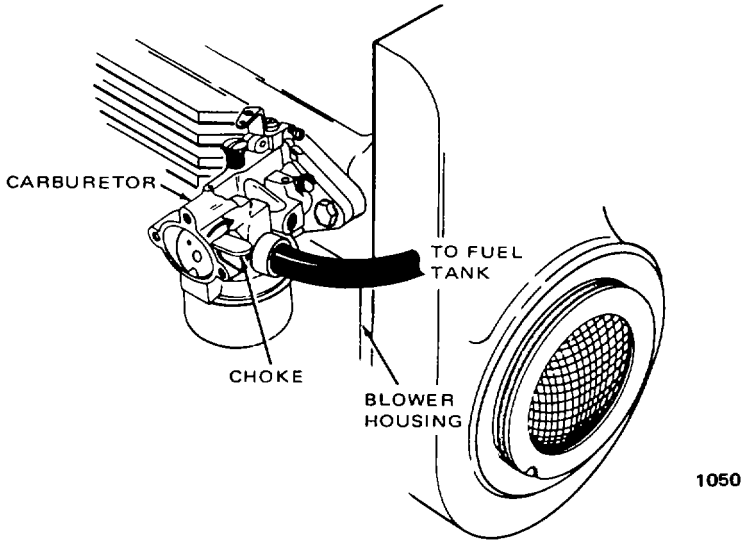


Figure 5-6. Choke Open Position

(b) If the compression is less than 90 psi, there is internal damage. Replace engine assembly.

Table 5-1. Direct and General Support Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
2					**ELECTRICAL PARTS**
				100	a. Check spark plug.

CAUTION

BE CAREFUL when removing spark plug. Too much force can break spark plug insulator.

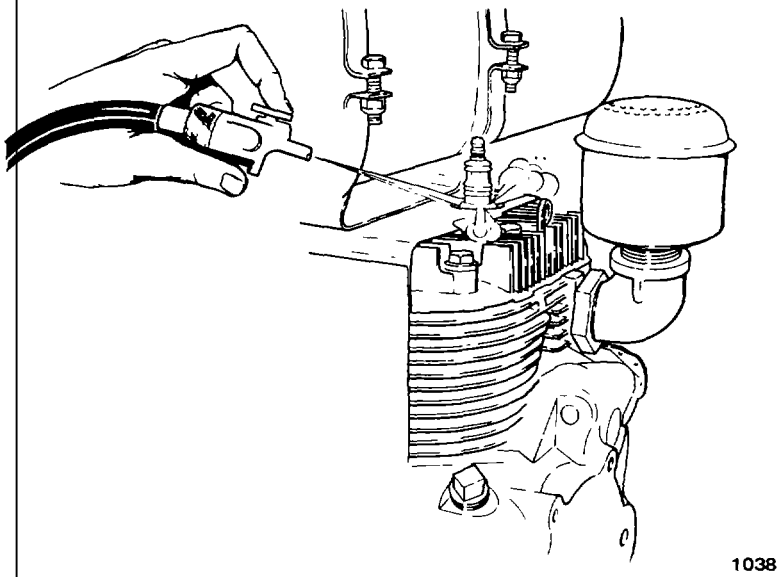


Figure 5-7. Spark Plug Cleaning

(1) Remove spark plug.

(a) Loosen spark plug a few turns.

(b) Blow dirt out of spark plug well with high pressure air.

(c) Remove spark plug by hand.

(2) Check spark plug visually. Replace it if the following conditions exist.

(a) Cracks in insulator.

(b) Electrodes worn too thin to be regapped.

(c) Oil fouling, soft, wet, oil covering insulator and plug nose.

Table 5-1. Direct and General Support Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
					ELECTRICAL PARTS (Continued)

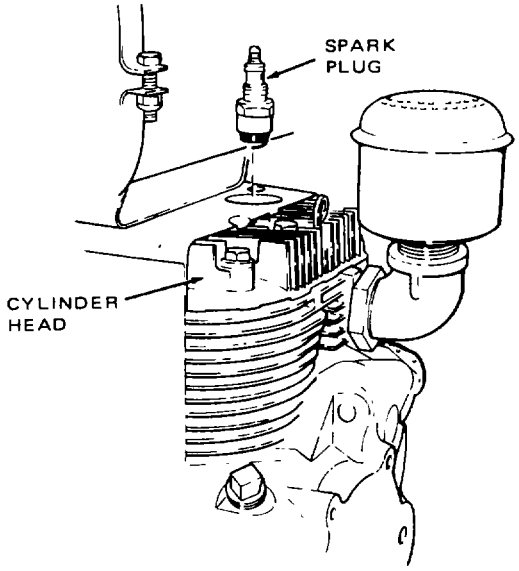


Figure 5-8. Spark Plug Removal

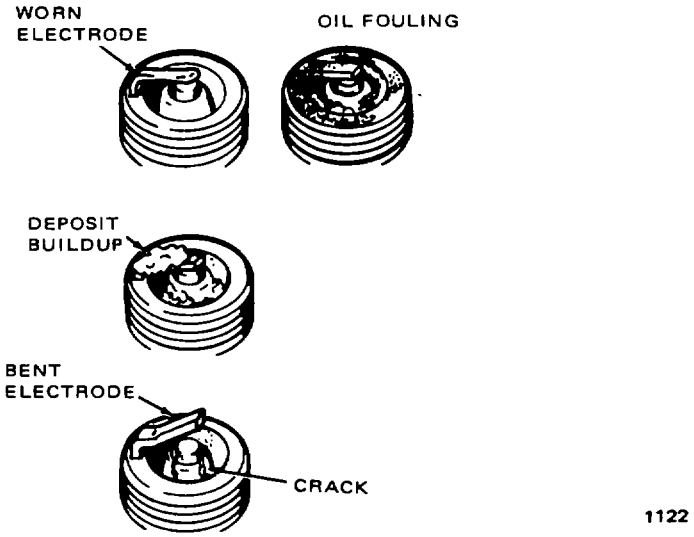


Figure 5-9. Spark Plug Defects

(d) Build up of deposits between insulator and plug shell.

(e) Badly burned electrodes.

Table 5-1. Direct and General Support Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

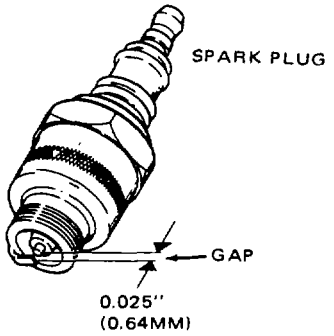
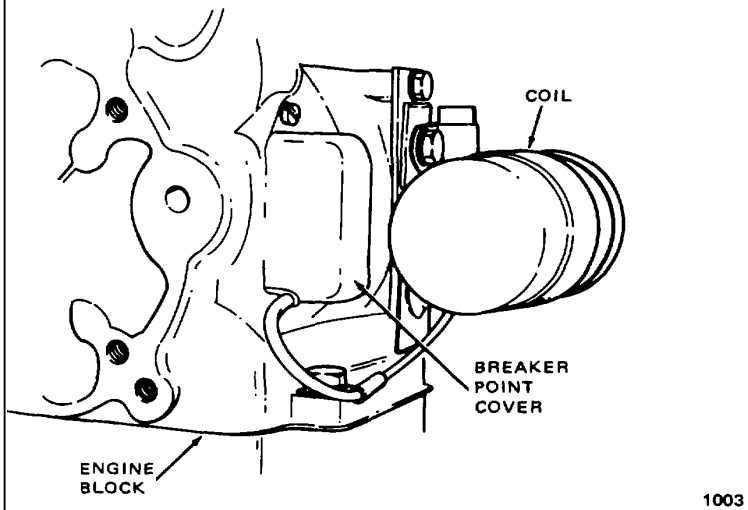
ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
					ELECTRICAL PARTS (Continued)
					
					Figure 5-10. Spark Plug Gap
					(f) Broken insulator or bent electrode.
				100	(3) Check spark plug gap. Reset gap at 0.025 inches (0.64 mm) as necessary. Use a feeler gage to reset gap.
				100	b. Check breaker point gap.
					(1) Remove breaker cover and gasket.
					(2) Crank engine by hand until points open to widest gap.
					
					Figure 5-11. Breaker Point Cover

Table 5-1. Direct and General Support Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
					ELECTRICAL PARTS (Continued)

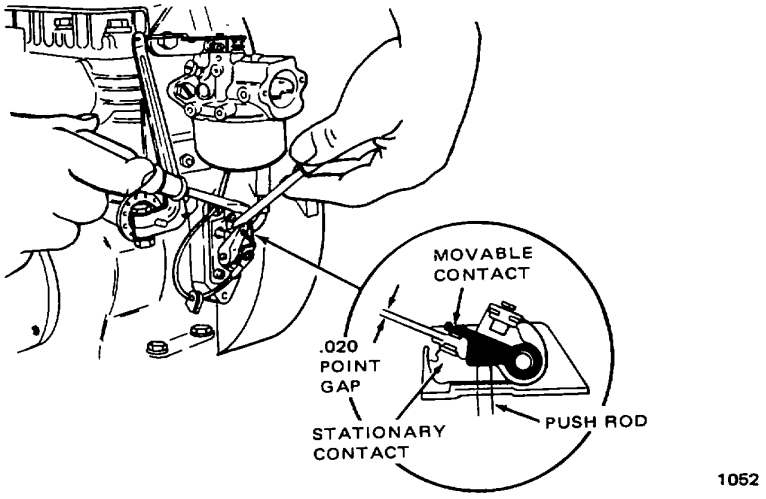


Figure 5-12. Gapping Breaker Points

(3) Measure gap with feeler gage. Set gap at 0.020 inches (0.51 mm) as necessary.

(a) Loosen adjusting screw.

(b) Insert feeler gage between points.

(c) Tighten adjusting screw and remove feeler gage.

(d) Recheck the breaker gap.

(4) Check and replace points if following conditions exist.

Burned points
Worn points
Transfer of metal
Pitted points

Table 5-1. Direct and General Support Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

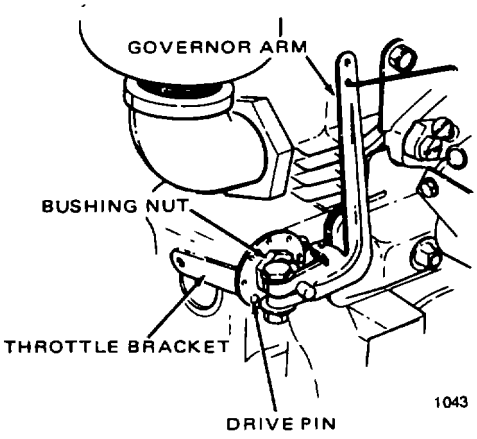
ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
3					**GOVERNOR**
				500	Check and reset engine speed. Use a tachometer. a. Start engine according to engine startup procedures in Chapter 2, Section III. **NOTE** **Belts should be installed while checking engine speed.** b. Check operating speed with tachometer. Refer to page 1-6 for correct rpm settings.  **Figure 5-13. Governor Assembly** c. Adjust engine speed as necessary. (1) Loosen bushing nut slightly. (2) Turn throttle bracket counterclockwise (left) to increase engine speed. Turn it clockwise (right) to decrease engine speed. Refer to page 1-6 for the correct rating. **CAUTION** **DO NOT FORCE bushing nut tight. This could cause binding or stripping of threads.** (3) When engine speed is adjusted to the correct rpm, tighten bushing nut to lock throttle bracket.

Table 5-1. Direct and General Support Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
4					**CONTROL PANEL**
				500	a. Test temperature gage.

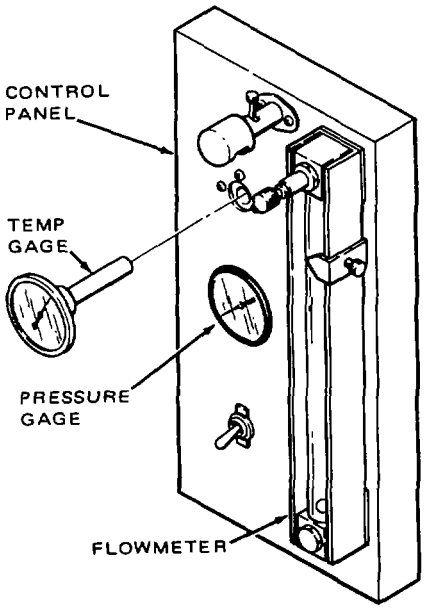


Figure 5-14. Temperature Gage Removal

(1) Unscrew temperature gage from thermometer well.

(2) Place temperature gage in a glass of cold water with a calibrated thermometer.

(3) Compare temperature gage with thermometer. If temperature varies more than three degrees, replace temperature gage.

(4) Screw temperature gage into temperature well.

b. Nozzle pressure gage.

(1) Remove belt guard.

(2) Remove air hose from pulsation tank.

(3) Adapt a calibrated pressure gage and thread it into the air hole.

(4) Turn solenoid valve switch OFF.

Table 5-1. Direct and General Support Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
					CONTROL PANEL (Continued)

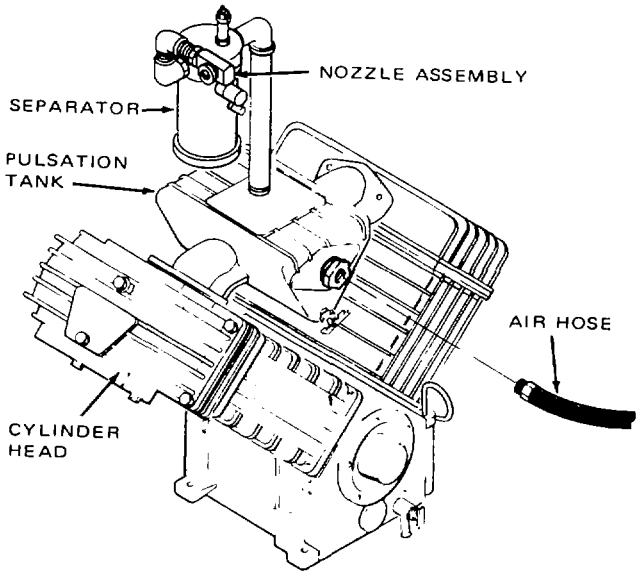


Figure 5-15. Compressor Air Line

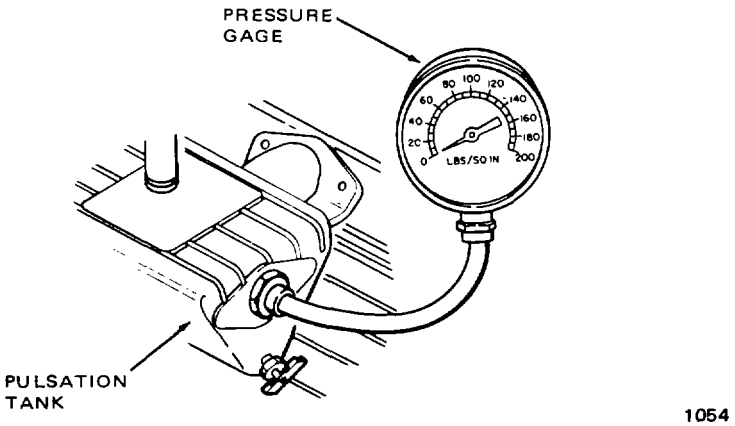


Figure 5-16. Installation of Pressure Gage

(5) Start engine. If pressure readings from two gages vary more than 5 psi, replace panel gage.

Table 5-1. Direct and General Support Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
5					**FLOWMETER**
				500	Calibrate flowmeter

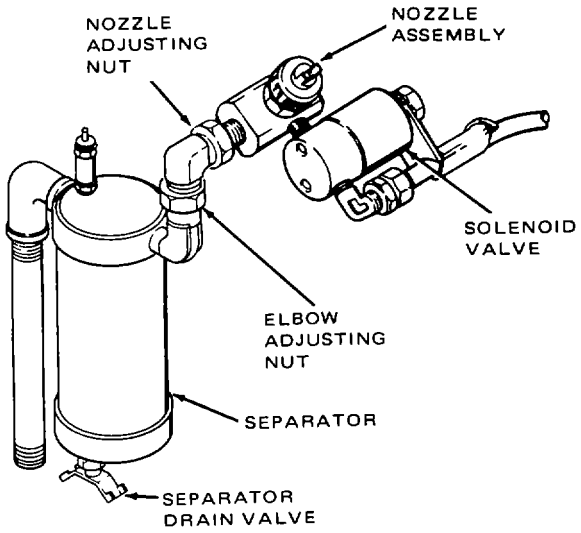


Figure 5-17. Nozzle Adjustment

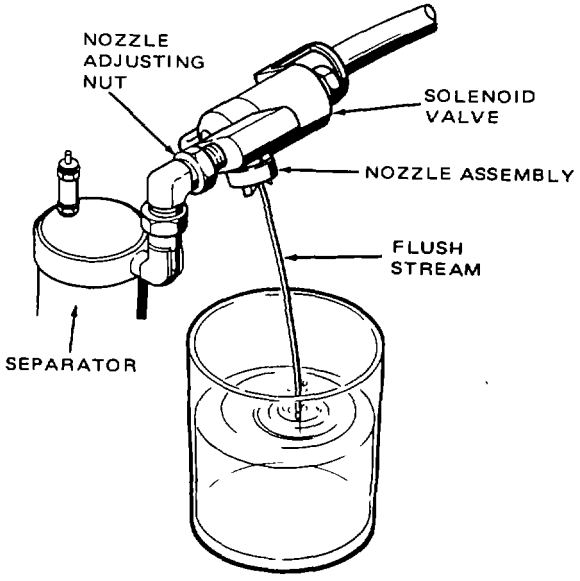


Figure 5-18. Insecticide Stream

Table 5-1. Direct and General Support Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
					FLOWMETER (Continued) a. Aim nozzle down into bucket. (1) Loosen nozzle adjusting nut. (2) Turn nozzle down and tighten adjusting nut. b. Turn solenoid valve switch OFF. c. Start engine according to engine startup procedures in Chapter 2, Section III. d. When formulation tank pressure levels off, shut engine OFF. e. Turn the ignition and solenoid valve switches ON and let insecticide flow into bucket. Let it flow for a few minutes to remove any air bubbles. f. Check temperature and flow rate on flowmeter. g. Hold a beaker under stream for one minute. h. Turn OFF ignition and solenoid valve switches.

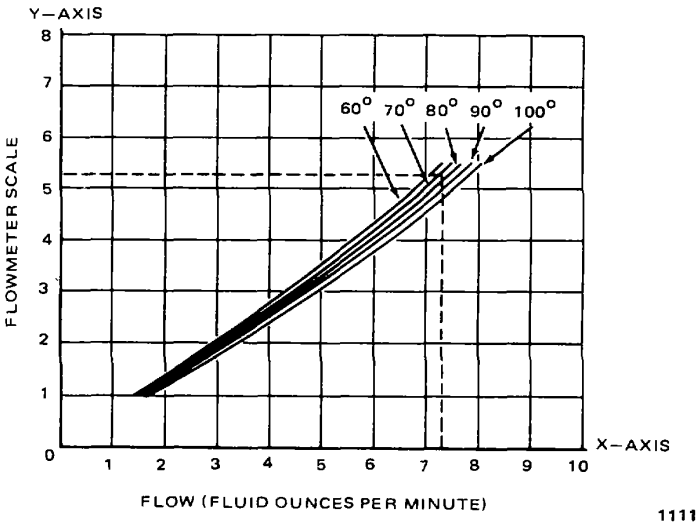


Figure 5-19. Temperature Correction Curve

Table 5-1. Direct and General Support Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
					FLOWMETER (Continued)

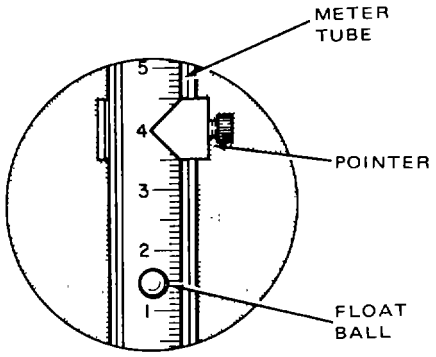


Figure 5-20. Flowmeter Scale

h. Measure insecticide into a graduated cylinder. Compare the measurement with the graph reading for the temperature and flow rate indicated. If flow rate varies ±10%, check meter tube and temperature gage. Replace each one as necessary.

6					**FORMULATION TANK**
				500	Check pressure gage and pressure regulator.

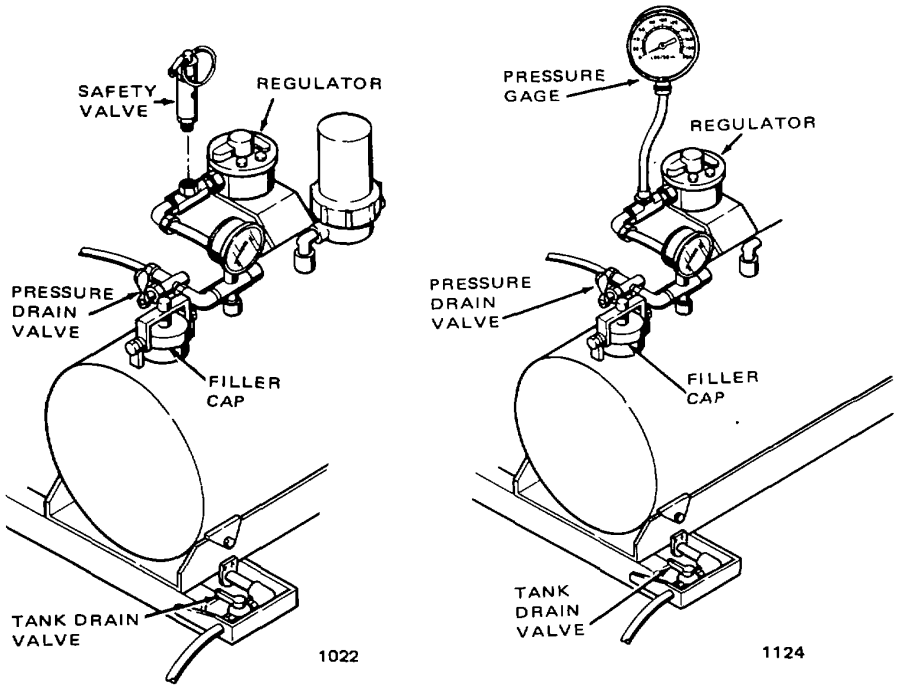


Figure 5-21. Installation of Pressure Gage

Table 5-1. Direct and General Support Preventive Maintenance Checks and Services (Continued)

M = Monthly A/R = As Required Q = Quarterly H = Hourly

ITEM NO.	INTERVAL M	A/R	Q	H	ITEM TO BE INSPECTED PROCEDURE
					FORMULATION TANK (Continued) a. Open air pressure drain valve and drain air pressure. b. Remove safety valve from tee. c. Place calibrated pressure gage in tee. d. Turn solenoid valve switch OFF. e. Start engine according to engine startup procedures in Chapter 2, Section III. f. When tank pressure levels off, shut engine OFF. g. Compare the two pressure gages. (1) If both gages are the same, tank gage is ok. (2) If pressure varies 2 psi, replace tank pressure gage. (3) If pressure is greater than 15 psi or less than 12 psi, replace regulator. (4) If pressure is slightly less than 15 psi, pressure regulator is ok. (5) If both pressure gages read greater than 15 psi, and safety valve has not been releasing, replace it.

Section IV. DIRECT AND GENERAL SUPPORT MAINTENANCE TROUBLESHOOTING PROCEDURES

GENERAL

This section contains the troubleshooting procedures assigned to the direct and general support maintenance technicians according to the maintenance allocation chart. Each probable aerosol generator malfunction is listed in the symptom index (table 5-2). The probable cause and corrective actions are listed in the troubleshooting chart (table 5-3).

This manual cannot list all possible malfunctions, nor all tests, inspections or corrective actions. If a malfunction is not listed, or is not corrected by the listed corrective actions, notify your supervisor.

Table 5-2. Symptom Index

Table 5-3. Direct and General Support Maintenance Troubleshooting

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

1. ENGINE DOES NOT START BUT TURNS OVER

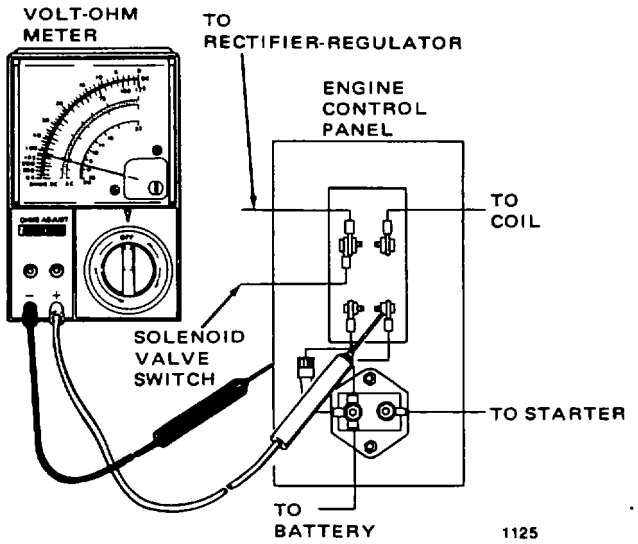


Figure 5-22. Engine Control Panel Test

Step 1. Check the ignition switch.

a. Turn the ignition switch ON.

b. Turn the cab control panel light ON.

(1) If the light comes on, the ignition switch is ok. Go to Step 2.

(2) If the light does not come on, go to Step 1c.

c. Check the ignition switch with a volt-ohmmeter.

(1) Connect the positive (+) meter lead to the battery connection on the switch.

(2) Connect the negative (-) meter lead to the coil connection on the switch.

(3) Set the meter to read volts and turn the ignition switch ON.

(4) If the meter reads 12 volts, the switch is ok. Go to Step 2.

(5) If the meter reads less than 12 volts, go to Step 4.

Step 2. Make sure there is spark to the spark plug.

a. Turn the ignition switch OFF.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued}

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE DOES NOT START BUT TURNS OVER (Continued)

b. Remove the spark plug wire from the spark plug.

c. Turn the ignition switch ON.

WARNING

DO NOT hold the spark plug wire in your bare hands while testing for spark. You can be severely shocked.

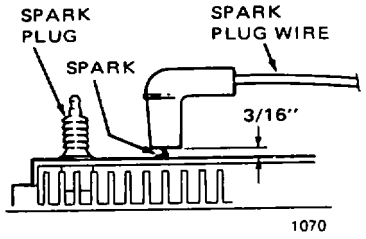


Figure 5-23. Spark Test

d. Hold the spark plug wire about 3/16 inch (4.76 mm) from a grounded engine part.

e. Crank the engine over. As the breaker points open and close, a spark should jump between spark plug wire and the engine.

(1) If there is a bright blue spark, go to Step 3.

(2) If there is no spark, or the spark is weak and yellow, go to Step 4.

Step 3. Check the spark plug.

CAUTION

BE CAREFUL when removing the spark plug from the engine. The insulator will break easily.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE DOES NOT START BUT TURNS OVER (Continued)

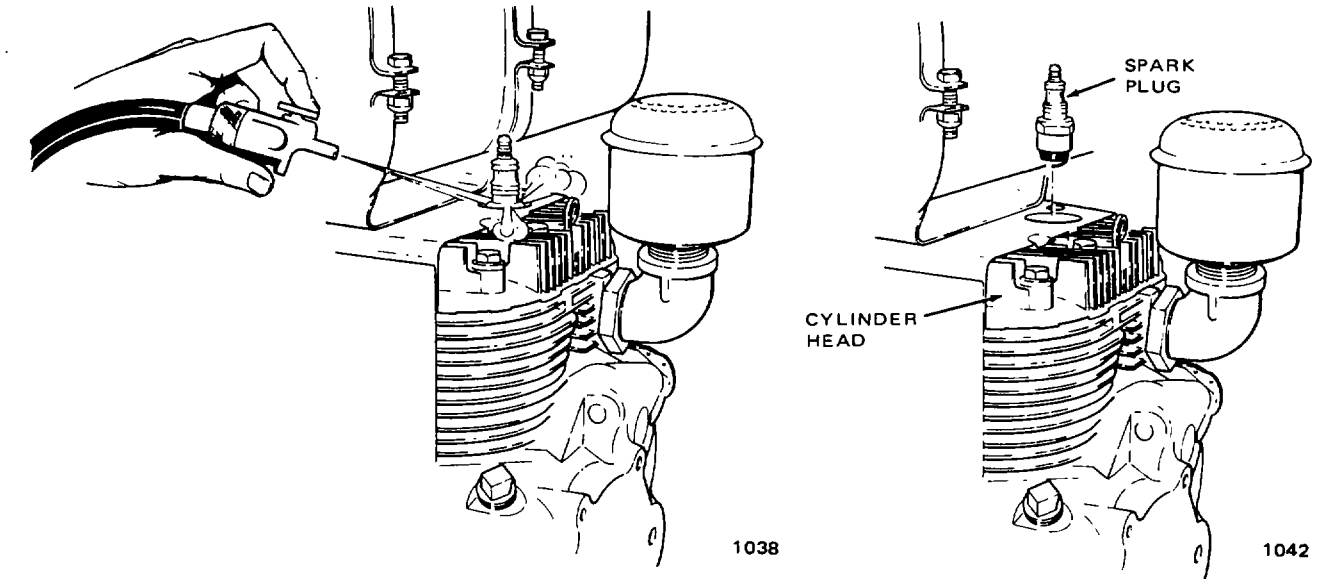


Figure 5-24. Spark Plug Cleaning and Removal

a. Remove the spark plug.

(1) Loosen the spark plug a few turns.

(2) Blow high pressure air into the spark plug well. This will clean out any dirt or debris.

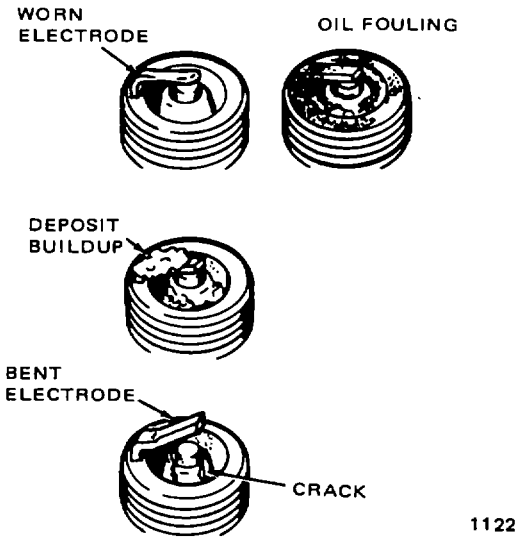


Figure 5-25. Spark Plug Defects

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE DOES NOT START BUT TURNS OVER (Continued)

b. Check the spark plug visually. Replace it and go to Step 4, if there are:

(1) Cracks in the insulator.

(2) Electrodes worn so thin they cannot be regapped.

(3) Oil fouling, soft wet oil covering the insulator and the plug nose. If there is oil fouling, go to Step 13.

(4) Build-up of deposits between insulator and the plug shell.

(5) Broken insulator and/or bent electrode.

NOTE

If the spark plug must be replaced, set the gap at 0.025 inches (0.64 mm). Oil fouling is a sign of internal engine damage.

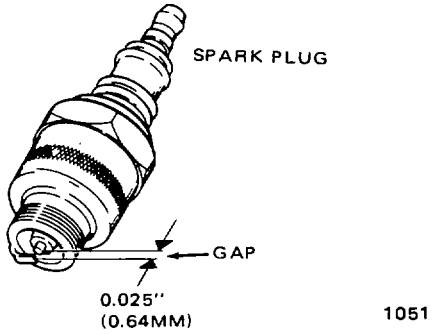


Figure 5-26. Spark Plug Gap

c. Check the spark plug gap.

(1) Reset the gap at 0.025 inches (0.64 mm), if necessary and go to Step 3.

(2) If the gap is ok, go to Step 3.

d. Check the spark plug for a spark.

(1) Connect the spark plug wire to the spark plug and set the plug on a grounded part of the engine.

(2) Turn the ignition switch ON.

(3) Crank the engine by hand. When the points open and close, a spark will jump between the spark plug electrodes.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE DOES NOT START BUT TURNS OVER (Continued)

(4) If there is a bright blue spark, go to Step 9.

(5) If there is no spark, or the spark is weak and yellow, replace the spark plug and go to Step 3.

e. Start the engine.

(1) If the engine starts, the problem is solved.

(2) If the engine does not start, go to Step 4.

Step 4. Check the battery.

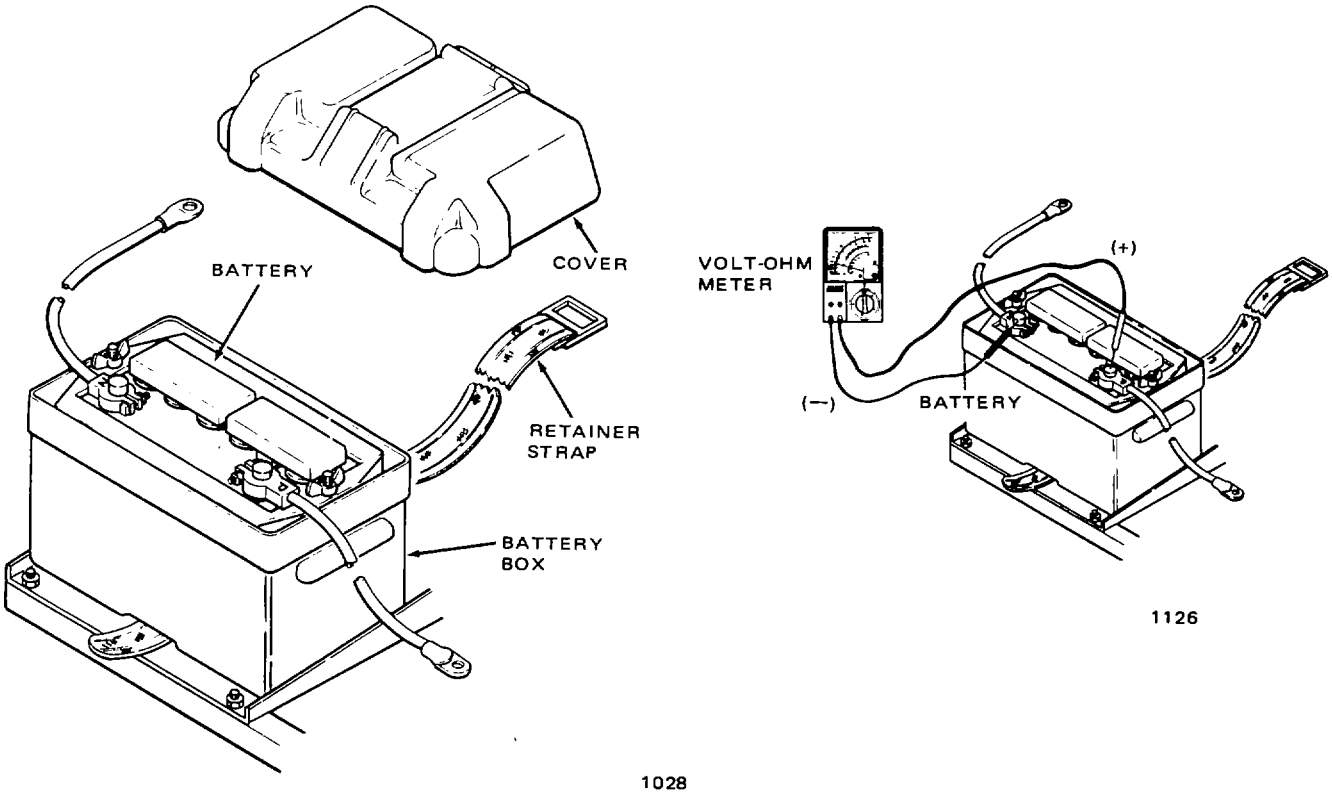


Figure 5-27. Battery Voltage Test

a. Check the battery with a volt-ohmmeter.

(1) Connect the positive (+) meter lead to the positive (+) battery pole.

(2) Connect the negative (-) meter lead to the negative (-) battery pole and set the meter on volts.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
ENGINE DOES NOT START BUT TURNS OVER (Continued)	

(3) If the meter reads 11.5 to 12 volts the battery is ok. Go to Step 5.

(4) If the meter reads less than 11.5 volts, go to Step 6e.

b. Check the specific gravity of the electrolyte in the battery. Use a hydrometer.

CAUTION

The electrolyte level must be kept above the top of the battery plates.

DO NOT overfill the battery. The electrolyte should not overflow onto the battery when the cell caps are set in the battery.

NOTE

Use distilled water or a good grade drinking water (excluding mineral water).

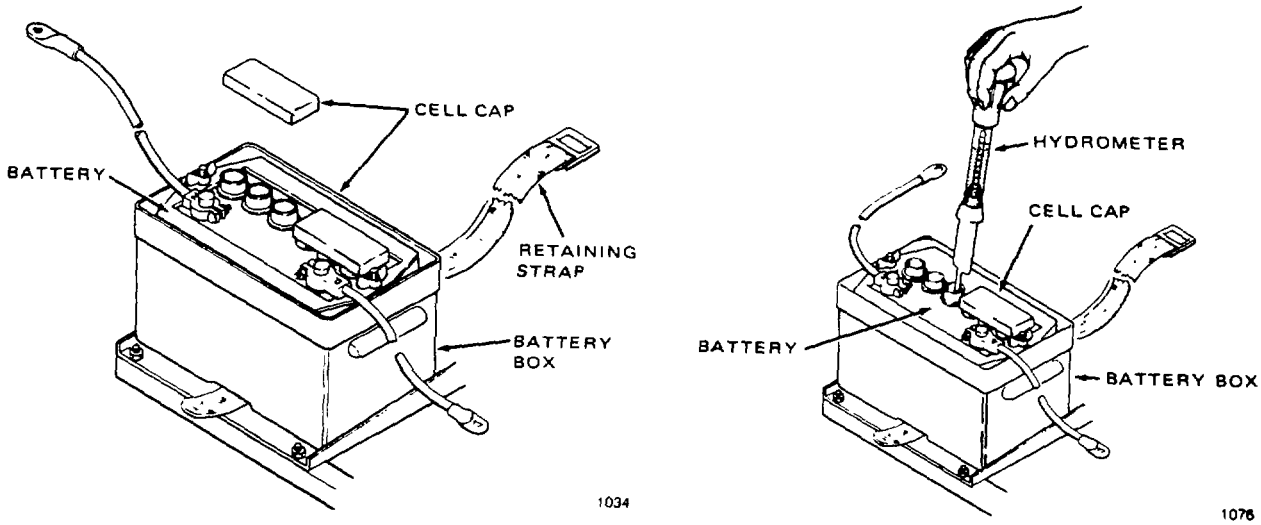


Figure 5-28. Specific Gravity Test

(1) Remove the cell caps and check the electrolyte level. Add distilled water if necessary.

(2) Check the specific gravity.

(3) If the specific gravity is between 1.250 and 1.280 the battery cell being tested is ok. Go to Step 5.

(4) If the specific gravity is between 1.225 and 1.250 the cell being tested is still in fair condition. Go to Step 5.

(5) If the specific gravity is below 1.150 in any one cell, replace the battery and go to Step 4d.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE DOES NOT START BUT TURNS OVER (Continued)

(6) If the specific gravity In one cell is 0.050 more or less than the other cells and charging does not bring the charge to a 50% charge, replace the battery and go to Step 4d.

c. Charge the battery.

(1) If the battery does not hold a charge, replace the battery and go to Step 4d.

(2) If the battery holds a charge, return the battery to the battery box and go to Step 4d.

d. Inspect and check the continuity of the wires below. Use a volt-ohmmeter.

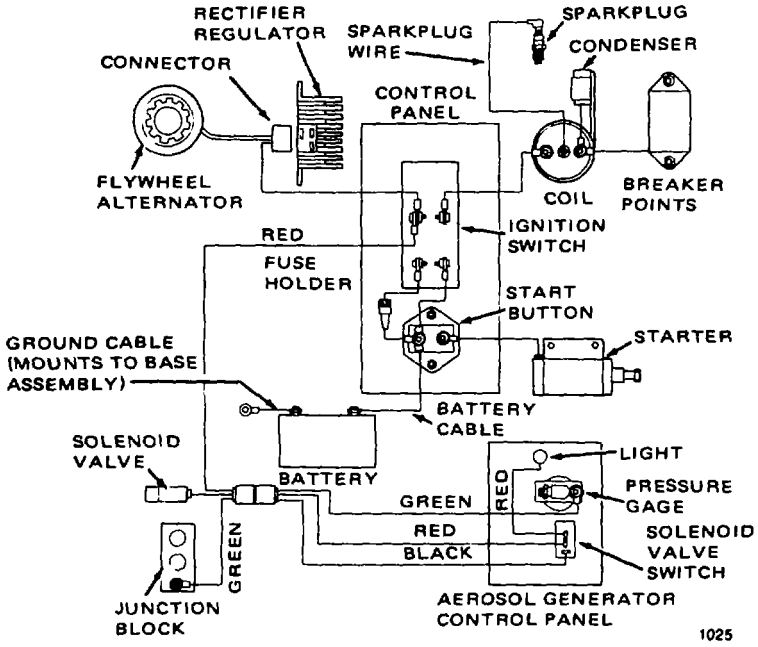


Figure 5-29. Aerosol Generator Wiring Diagram

- Battery cables.
- The wire between the battery and the start button.
- The wire between the start button and the ignition switch.
- The wire between the ignition switch and the alternator.

(1) Connect a meter lead to each end of the wire being tested.

(2) Wiggle the wire.

(3) If the wire conducts a current, go to Step 5g.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
ENGINE DOES NOT START BUT TURNS OVER (Continued)

(4) If the wire does not conduct electricity or it causes the needle to fluctuate, replace it and go to Step 4e.

(5) If any of the wires or insulation are frayed, broken, or cracked, replace them and go to Step 4e.

e. Start the engine.

(1) If the engine starts, the problem is solved.

(2) If the engine does not start, go to Step 5.

Step 5. Check the spark plug wire.

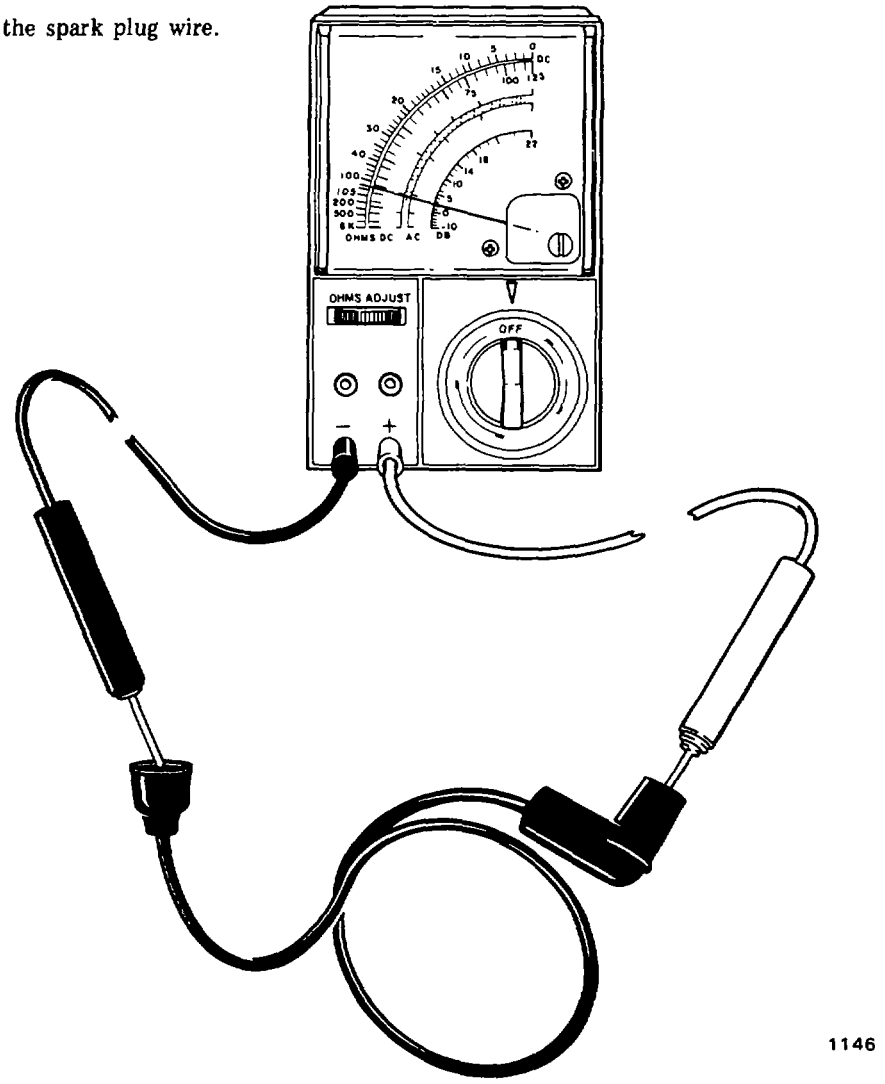


Figure 5-30. Spark Plug Wire Test

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE DOES NOT START BUT TURNS OVER (Continued)

a. Remove the spark plug wire and test it with a volt-ohmmeter.

(1) Attach a meter lead to each end of the spark plug wire.

(2) If the meter reads below 40 k ohms (40,000), go to Step 6.

(3) If the meter reads steadily above 40 k ohms, replace the wire and go to Step 5b.

(4) Wiggle the wire back and forth. If the meter fluctuates up and down, there is a break in the wire. Replace the wire and go to Step 5b.

b. Start the engine.

(1) If the engine starts, the problem is solved.

(2) If the engine does not start, go to Step 6.

Step 6. Check the coil.

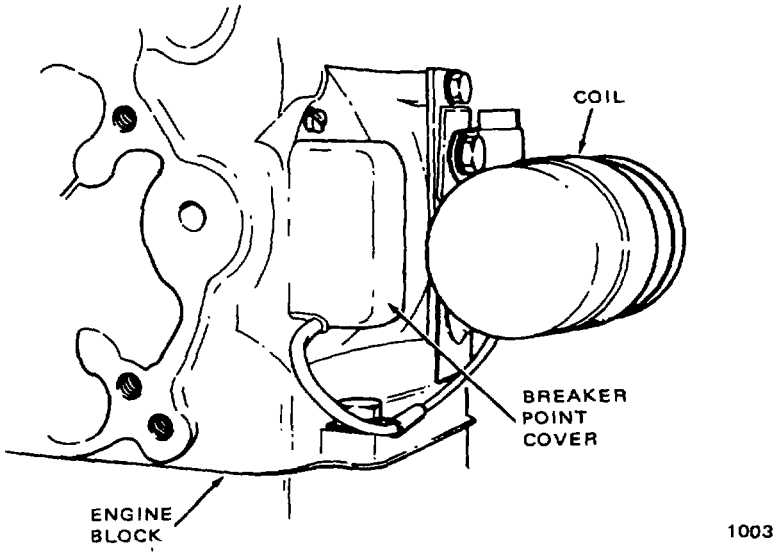


Figure 5-31. Breaker Point Cover

a. Check the coil visually.

(1) If the coil is cracked or broken, replace it and go to Step 6e.

(2) Remove the spark plug wire from the coil and check the connections for moisture. If the connections are wet, dry them and return the wire to the coil. Go to Step 6e.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE DOES NOT START BUT TURNS OVER (Continued)

(3) If the coil is ok, go to Step 6b.

WARNING

DO NOT hold any ignition wires in your bare hands. You can be electrocuted. Use well insulated tools to hold the wires.

b. Check the secondary coil winding.

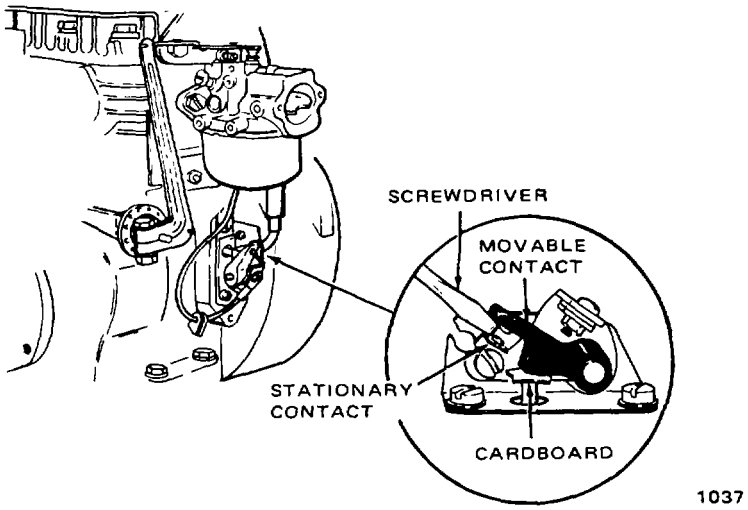


Figure 5-32. Breaker Points

(1) Remove the breaker point cover and jam the points open with a piece of cardboard.

(2) Remove the spark plug wire from the spark plug.

(3) Turn the ignition switch ON.

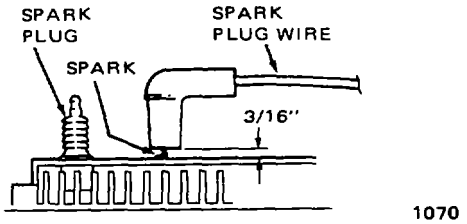


Figure 5-33. Spark Test

(4) Hold the end of the spark plug wire about 3/16 inch (4.76 mm) from a grounded part of the engine.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE DOES NOT START BUT TURNS OVER (Continued)

(5) Hold a screwdriver point across the open breaker points.

(6) Remove the screwdriver from the breaker points.

(7) If a bright blue spark jumps between the wire and the engine, the coil is ok. Go to Step 7.

(8) If there is no spark or the spark is weak and yellow, the coil is weak. Replace the coil and go to Step 6e, if the condenser and the points check ok.

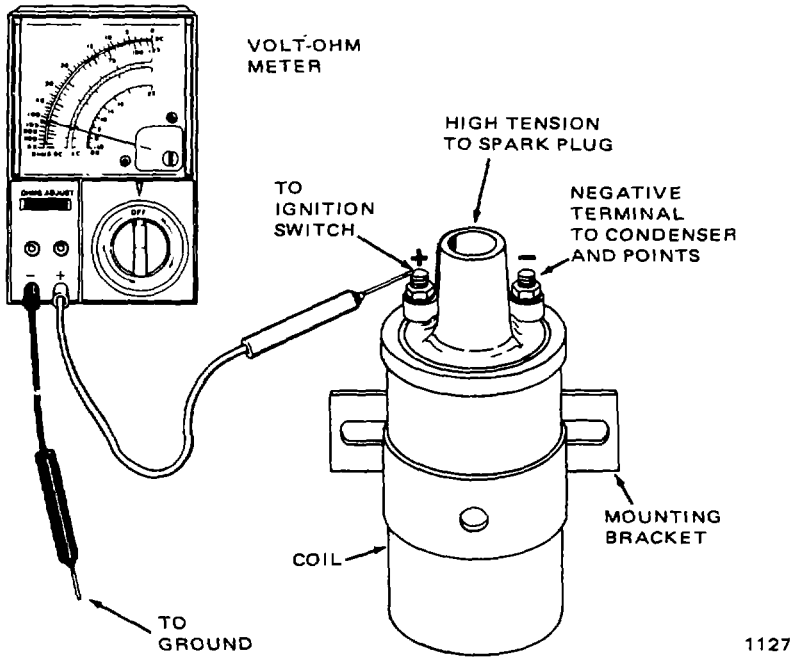


Figure 5-34. Coil Test I

c. Coil Test I. Check the primary coil winding. Use a volt-ohmmeter.

(1) Remove the breaker point cover and jam a piece of cardboard between the breaker points.

(2) Turn the ignition switch ON.

(3) Connect the negative (-) meter lead to a grounded part of the engine.

(4) Connect positive (+) meter lead to the battery (+) side of the coil. If the meter reads 11.5 to 12 volts, there is current to the coil. Go to Step 6c. (5). If the meter reads 11.5 volts or less, there is poor current to the coil. Go to Step 6d.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

ENGINE DOES NOT START BUT TURNS OVER (Continued)

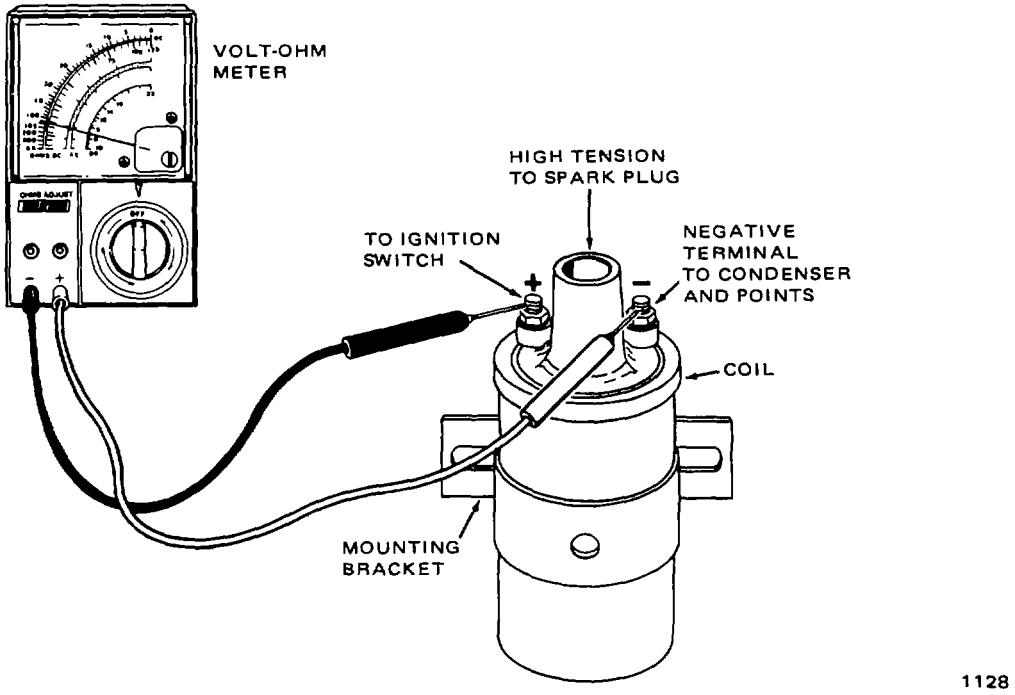


Figure 5-35. Coil Test II

d. Coil Test II. Connect the positive (+) lead to the breaker points (-) side of the coil. If the meter reads 11.5 to 12 volts, the coil is ok. Go to Step 7. If the meter reads 11.5 volts or less, the coil is bad. Replace the coil and go to Step 6e, if the points and condenser check ok.

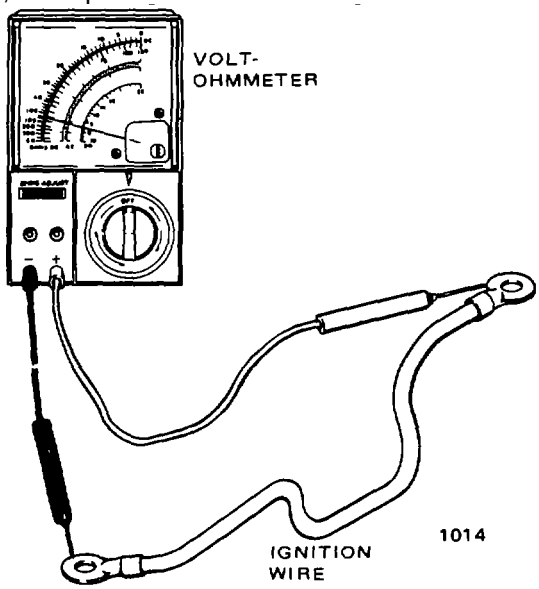


Figure 5-36. Ignition Wire Test

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE DOES NOT START BUT TURNS OVER (Continued)

e. Check the wires between the coil and the ignition switch and the coil and the points. Use a volt-ohmmeter.

(1) Remove the ignition wire from the ignition switch and the coil.

(2) Connect a meter lead to each end of the wire and check the continuity.

(3) Wiggle the wire back and forth. If the meter does not register a current, replace it and go to Step 6f. If the meter does register a current, go to Step 7.

(4) Remove the breaker point wire from the points and the coil.

(5) Connect a meter lead to each end of the wire and check for continuity.

(6) Wiggle the wire back and forth. If the meter does not register a current or the needle fluctuates, replace it and go to Step 6f. If the meter does register a current, go to Step 7.

f. Start the engine.

(1) If the engine starts, the problem is solved.

(2) If the engine does not start, go to Step 7.

Step 7. Check the breaker points.

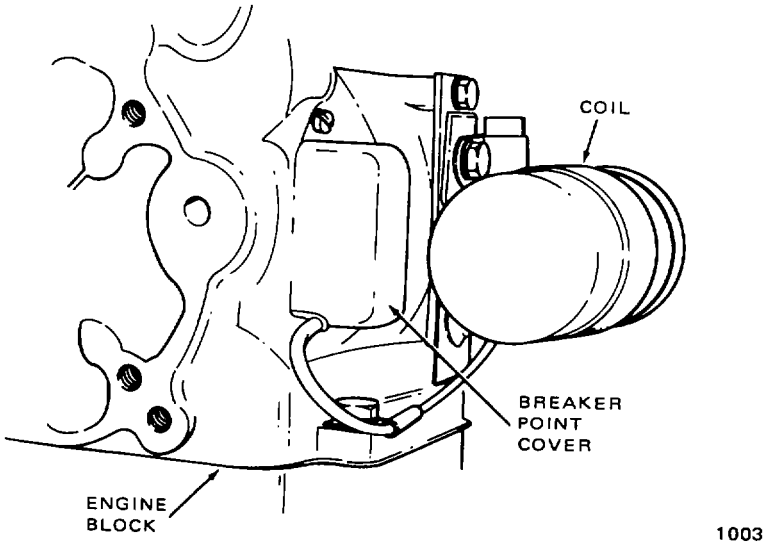


Figure 5-37. Breaker Point Cover

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

ENGINE DOES NOT START BUT TURNS OVER (Continued)

a. Remove the breaker point cover.

b. Open the points with a screwdriver and inspect them. If they are pitted, burned, or badly oxidized, replace them and go to Step 7c.

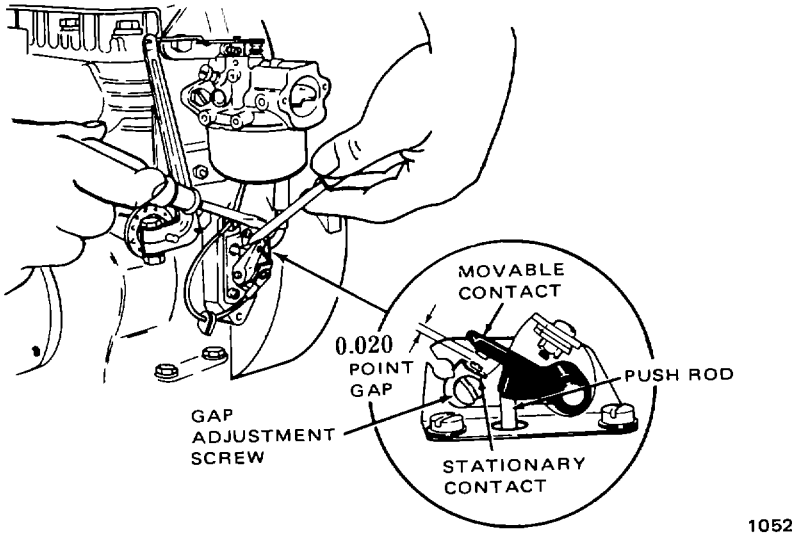


Figure 5-38. Gapping Breaker Points

c. Check the breaker point gap.

(1) Shut the ignition switch OFF.

(2) Crank the engine by hand until the points are open to their widest gap.

(3) If the gap is 0.020 inches (0.52 mm) the gap is ok. Go to Step 8.

(4) If the gap is greater than or less than 0.020 inches (0.52 mm) go to Step 7d.

d. Reset the breaker point gap.

(1) Rotate the engine by hand until the breaker points reach their greatest gap.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE DOES NOT START BUT TURNS OVER (Continued)

(2) Loosen the point gap adjustment screw and place an 0.020 inch (0. 52 mm) feeler gage between the points.

(3) Tighten the adjusting screw after setting the gap.

(4) Replace the breaker point cover and go to Step 7e.

e. Start the engine.

(1) If the engine starts, the problem is solved.

(2) If the engine does not start, go to Step 8.

Step 8. Check the condenser. Use a volt-ohmmeter.

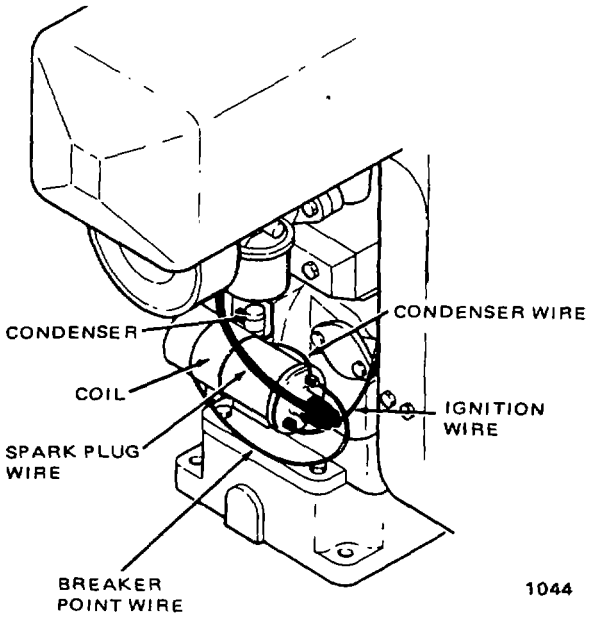


Figure 5-39. Engine Coil Location

a. Remove the condenser from the engine.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE DOES NOT START BUT TURNS OVER (Continued)

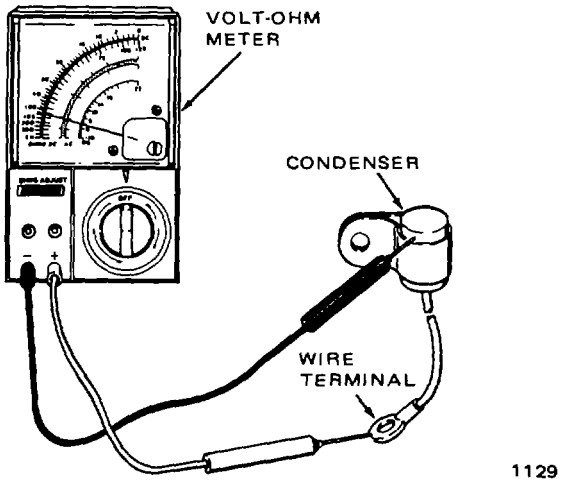


Figure 5-40. Condenser Test

b. Set the meter to read high resistance.

c. Connect the negative (-) meter lead to the side of the condenser and the positive (+) meter lead to the wire terminal.

(1) If the meter reads below infinity the condenser is ok. Go to Step 9.

(2) If the meter reads at infinity and remains there, replace the condenser. Go to Step 8e.

d. Tap the condenser lightly. If the meter fluctuates, there are loose connections inside the condenser.

(1) If there are no loose connections, go to Step 9.

(2) If there are loose connections, replace the condenser and go to Step 8e.

e. Start the engine.

(1) If the engine starts the problem is solved.

(2) If the engine does not start, go to Step 9.

Step 9. Check the fuel tank valve and fuel line.

WARNING

BE ALERT to disconnect the ground cable from the battery before performing maintenance on the fuel tank assembly. Spilled gasoline will be ignited by a spark.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE DOES NOT START BUT TURNS OVER (Continued)

a. Drain the fuel tank.

(1) Close the fuel tank valve if possible.

(2) Pinch the hose with the forefinger and thumb and disconnect the fuel line from the carburetor.

(3) Open the valve and drain the gasoline into a container.

(4) If gasoline drains thru the fuel tank valve, go to Step 10.

(5) If gasoline does not drain thru the valve, go to Step 9b.

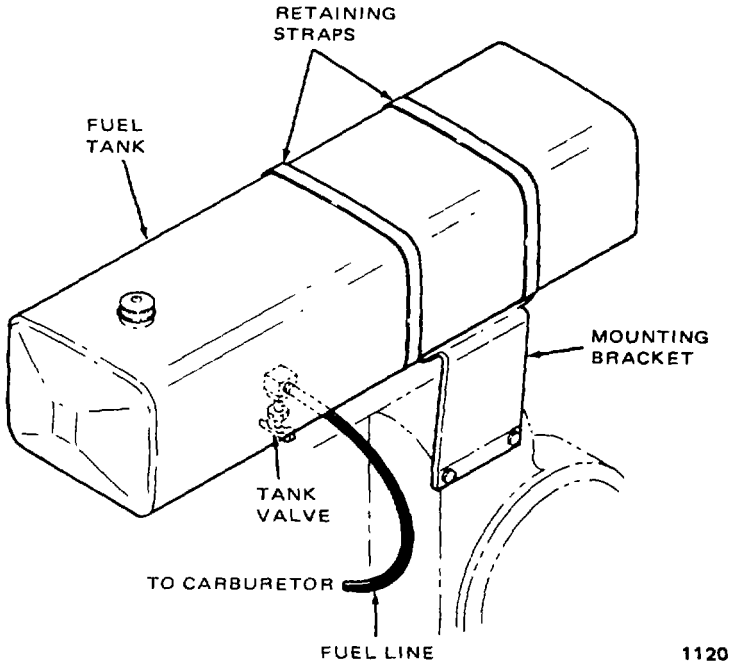


Figure 5-41. Fuel Tank Assembly

b. Remove the valve from the fuel tank and check it for plugging.

(1) Remove the fuel line from the valve.

(2) Remove the valve from the tank.

(3) Check the valve for plugging or jamming. If the valve is plugged, blow high pressure air through the valve to unplug it. If the valve is jammed, unjam it.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE DOES NOT START BUT TURNS OVER (Continued)

(4) If the valve can be repaired, repair it and return it to the tank. Go to Step 9e.

(5) If the valve cannot be repaired, replace it and go to Step 9d.

c. Check the fuel line.

(1) If the fuel line is ok, return it to the valve and carburetor. Go to Step 10.

(2) If the fuel line is plugged, unplug it and return it to the valve and carburetor. Go to Step 9d.

(3) If the fuel line is cut or cracked or damaged, replace it and go to Step 9d.

d. Start the engine.

(1) If the engine starts, the problem is solved.

(2) If the engine does not start, go to Step 10.

Step 10. Check the carburetor.

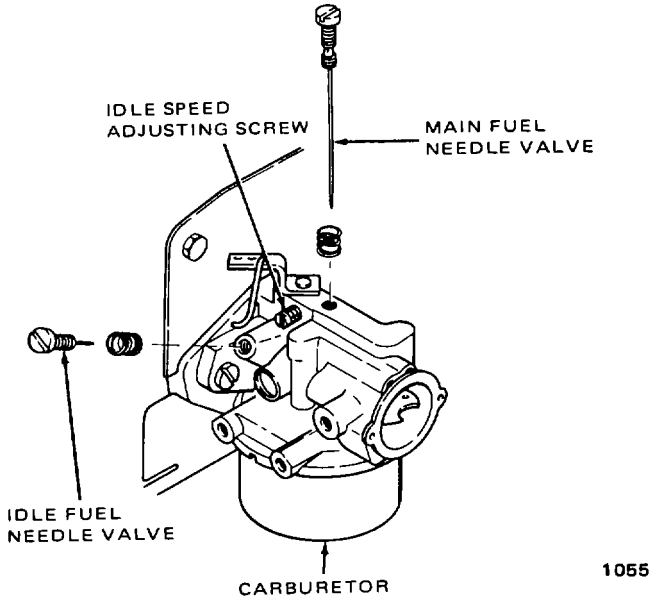


Figure 5-42. Carburetor Needle Valve Removal

CAUTION

BE CAREFUL not to use force when turning the needle valves in and out. Force can damage the valves.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

ENGINE DOES NOT START BUT TURNS OVER (Continued)

a. Remove the main fuel needle valve and idle fuel needle valve and check them for damage and/or plugging.

(1) If the needle valves are ok, go to Step 10d.

CAUTION

DO NOT use hard metal objects to unplug the needle valves. Hard metal objects will damage them.

(2) If the needles are plugged or gummed up, rinse them in alcohol or acetone and return them to the carburetor. Go to Step 10b.

(3) If the needles are damaged and cannot be repaired, replace them and go to Step 10b.

b. Adjust the needle valves.

(1) Turn both needle valves all the way to the right (clockwise) until they gently touch bottom.

(2) Turn the main fuel needle valve to the left (counterclockwise) two full turns.

(3) Turn the idle needle valve to the left (counterclockwise) 1 1/4 turns.

(4) Go to Step 10c.

c. Remove the carburetor from the engine.

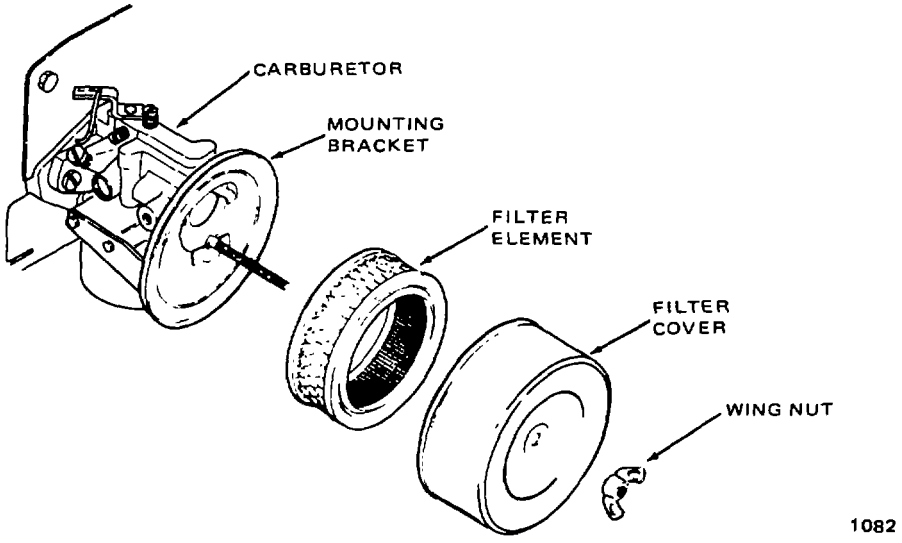


Figure 5-43. Air Cleaner

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE DOES NOT START BUT TURNS OVER (Continued)

(1) Remove the air cleaner and air cleaner bracket.

(2) Disconnect the throttle linkage and remove the carburetor from the engine.

NOTE

To remove the carburetor from the engine, it is necessary to loosen one mounting screw, then the other. Pull the carburetor away from the engine and loosen each screw again. Repeat this procedure until the carburetor can be removed from the engine.

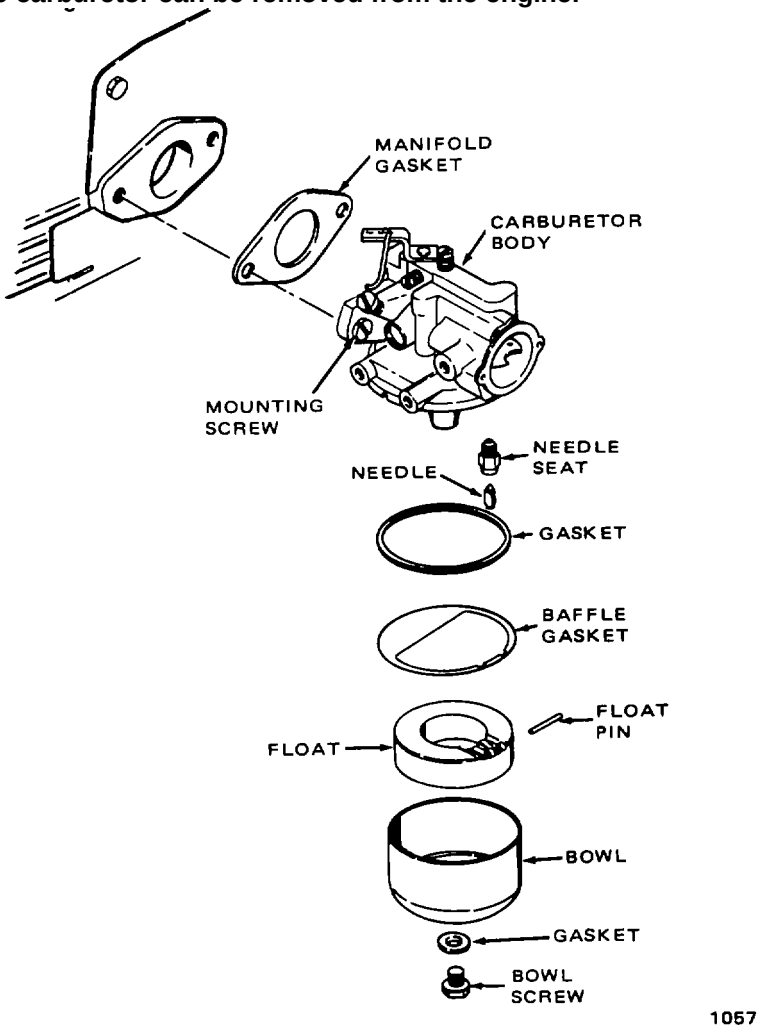


Figure 5-44. Carburetor Disassembly

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE DOES NOT START BUT TURNS OVER (Continued)

(3) Inspect the carburetor to manifold gasket. If it is cracked, broken, or damaged, replace it and go to Step 10d.

d. Disassemble the carburetor and make sure gasoline is getting to the carburetor.

(1) Remove the bowl screw, gasket and bowl, and baffle gasket.

(2) Remove the float pin, float needle and needle seat. If the float leaks or is worn, replace it.

(3) Check the needle and seat for damage. If they are cut or scratched, replace them.

CAUTION

DO NOT use hard metal objects or tools to clean the inlet port. Use something soft like a toothpick and flush the port with alcohol or acetone.

(4) Unplug the inlet port if necessary.

(5) If the choke is worn or the throttle damaged, replace the whole carburetor and go to Step 10b.

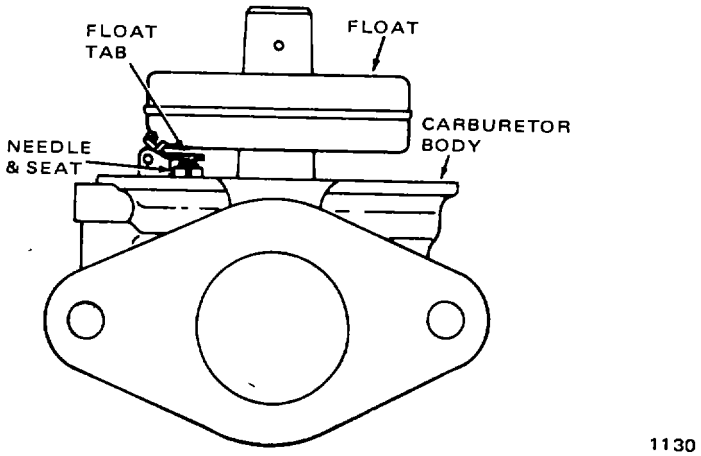


Figure 5-45. Carburetor Float Adjustment

e. Assemble the carburetor.

(1) Install the seat, needle, float and pin.

(2) Set the float level. Turn the carburetor upside down and let the float rest on the needle. The clearance between the machined surface of the carburetor and the free end of the float should be 0.17 inches ±0.03 inches (4.32 mm ±0.76 mm).

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE DOES NOT START BUT TURNS OVER (Continued)

(3) Adjust the clearance by bending the float tab with a screwdriver if necessary.

(4) Install a new baffle gasket, a new bowl gasket, the fuel bowl and a bowl screw. Make sure the bowl gasket seats well.

(5) Return the carburetor to the engine and go to Step 10f. Make sure the carburetor to manifold gasket seals well.

f. Start the engine.

(1) If the engine starts, the problem is solved. Go to Step 10g.

(2) If the engine does not start, go to Step 11.

g. Adjust the carburetor while the engine is running.

(1) Turn the main fuel needle valve to the right (clockwise) until the engine slows down.

(2) Turn the main fuel needle valve back to the left (counterclockwise) until the engine slows down.

(3) Turn the main fuel needle valve back to the right to a position halfway between the slow-down points.

Step 11. Make sure gasoline is getting to the cylinder.

a. Remove the spark plug.

b. Push the start button and crank the engine over a few times.

c. Smell for gasoline in the cylinder.

(1) If there is gasoline present in the cylinder, check the seat between the carburetor and engine. Make sure it is tight and does not leak air. Go to Step 11b.

(2) If gasoline is getting to the cylinder, but it still does not start, go to Step 12.

(3) If gasoline is not getting to the cylinder, go to Step 12.

Step 12. Check the crankcase vacuum. Use a vacuum gage.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE DOES NOT START BUT TURNS OVER (Continued)

NOTE

The engine must be turned over to check the crankcase vacuum.

a. Remove crankcase plug-dipstick.

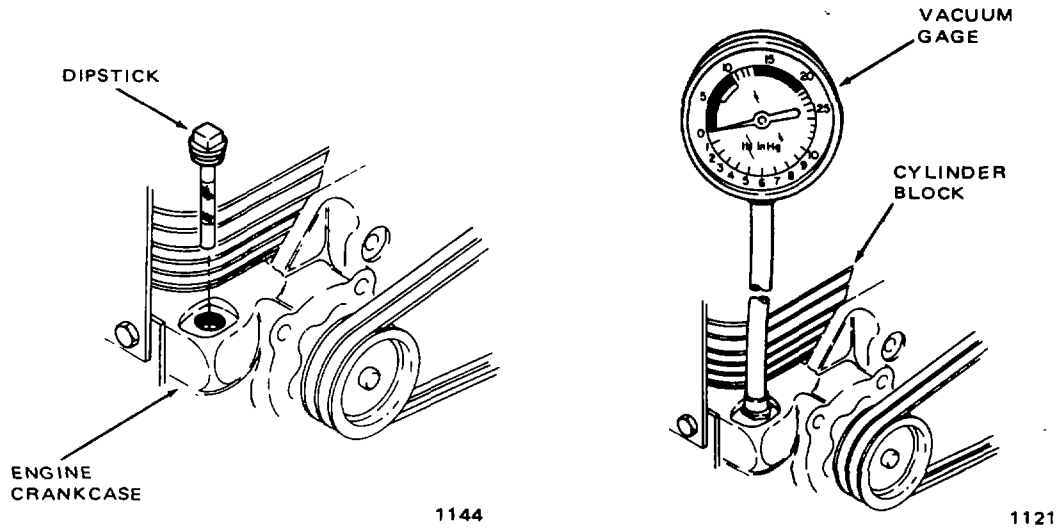


Figure 5-46. Installation of Vacuum Gage

b. Place vacuum gage in dipstick hole. Make sure it seals well.

c. Test the vacuum.

(1) If the vacuum is 1/2 inch to 1 inch (12.7 mm to 25.4 mm) of mercury, the engine is ok.

(2) If the vacuum is less than 1/2 inch (12.7 mm) of mercury, go to Step 13.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE DOES NOT START BUT TURNS OVER (Continued)

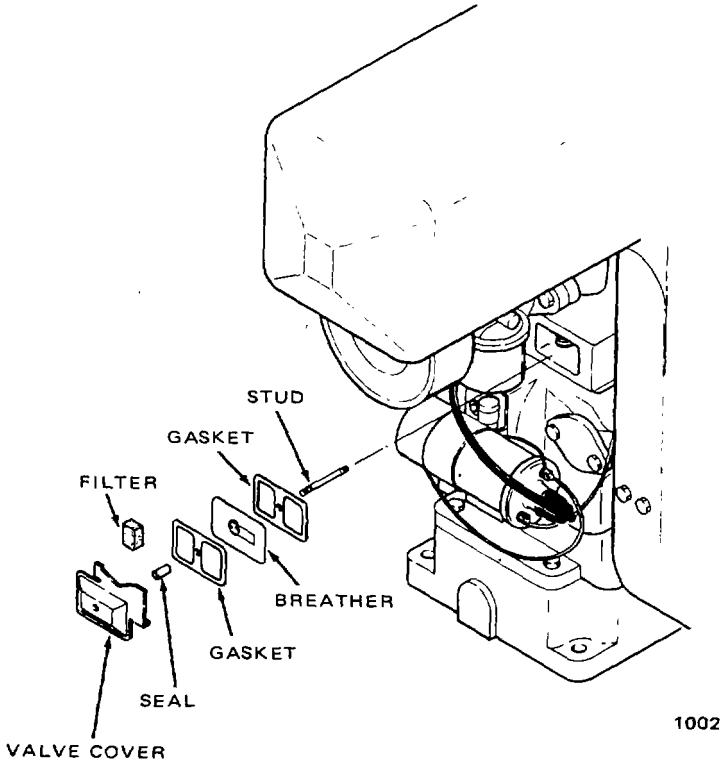


Figure 5-47. Engine Valve Cover

(3) If there is a positive pressure in the crankcase, go to Step 14.

Step 13. Check the crankcase breather assembly.

a. Remove the breather and clean it if necessary.

(1) Remove the valve cover retaining nut and the valve cover.

(2) Remove the breather seal and filter. If the filter is dirty and plugged, replace it.

(3) Remove the gaskets and breather,

(4) Replace the gaskets and clean all the other parts.

b. Reassemble the breather assembly and go to Step 12. Make sure the valve cover is securely tightened to prevent oil leaks.

Step 14. Check the engine compression.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE DOES NOT START BUT TURNS OVER (Continued)

NOTE

Because automatic compression release engines release compression at 600 rpm, there is a different compression test procedure for this engine.

a. Start the engine and run it for fifteen minutes.

b. Shut the engine OFF and remove the spark plug.

CAUTION

BE CAREFUL when removing the spark plug. Too much force can break the insulator.

(1) Loosen the spark plug a few turns.

(2) Blow out the spark plug well with high pressure air. This will clean out any dirt or debris that can fall into the cylinder.

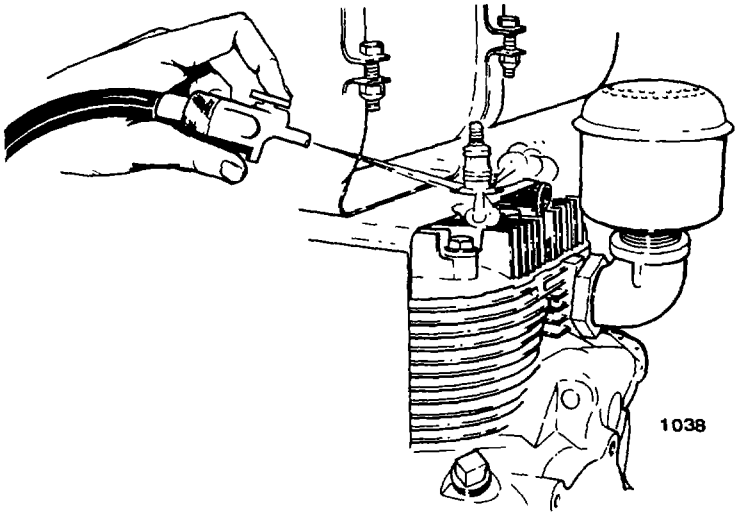


Figure 5-48. Spark Plug Cleaning

(1) Loosen the spark plug a few turns.
(2) Blow out the spark plug well with high pressure air. This will clean out any dirt or debris that can fall into the cylinder.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

ENGINE DOES NOT START BUT TURNS OVER (Continued)

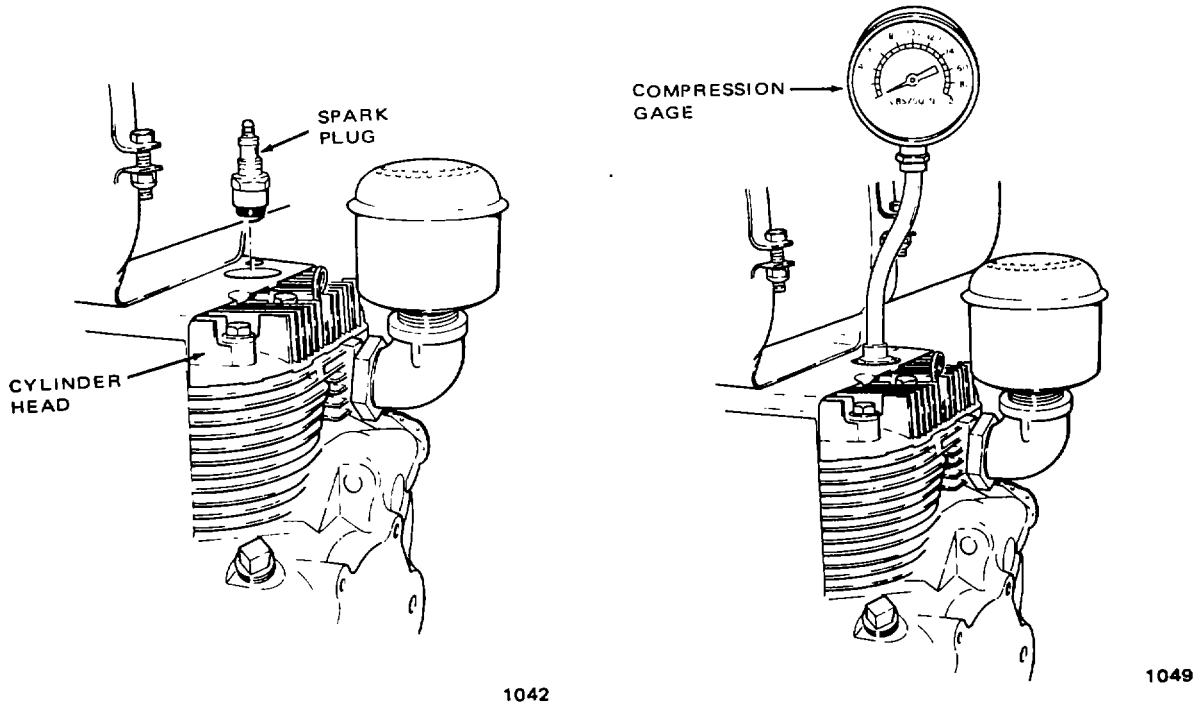


Figure 5-49. Installation of Compression Gage

(3) Remove the spark plug by hand.

c. Place a compression gage in the spark plug hole. Make sure it seals well.

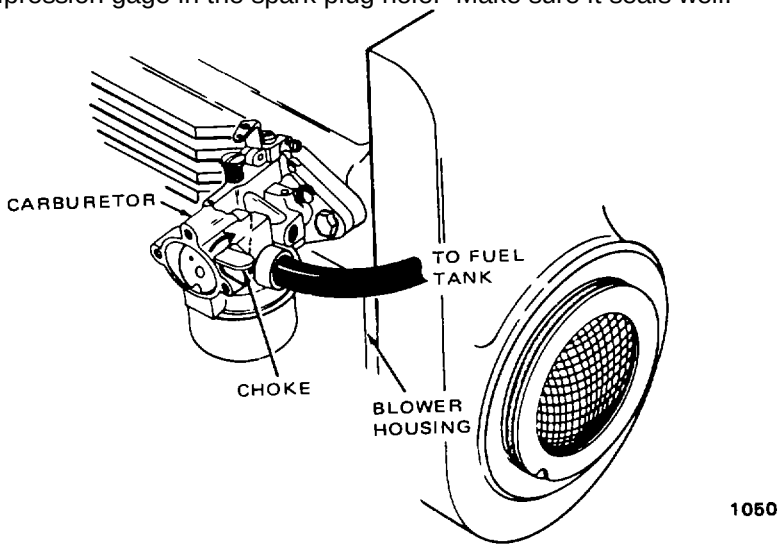


Figure 5-50. Choke Open Position

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

ENGINE DOES NOT START BUT TURNS OVER (Continued)

d. Set the choke wide open. Remove the air cleaner if necessary.

e. Crank the engine by hand counterclockwise (left: opposite normal rotation).

f. Take eight to ten compression readings.

(1) The first few turns of the engine, the compression may be as low as 30 psi. After the seventh turn, the compression should be 90 psi.

(2) If the compression is less than 90-100 psi, replace the engine.

2. ENGINE DOES NOT TURN OVER

Step 1. Check the electrical wires.

a. The battery cables at the battery terminals and the ground connection and the start button.

b. The wire between the starter and the start button.

(1) If the wires are ok, go to Step 2.

(2) If the wires are loose, tighten them and go to Step 1d.

(3) If the wires and/or insulation are cracked, broken, or frayed, replace them and go to Step 1d.

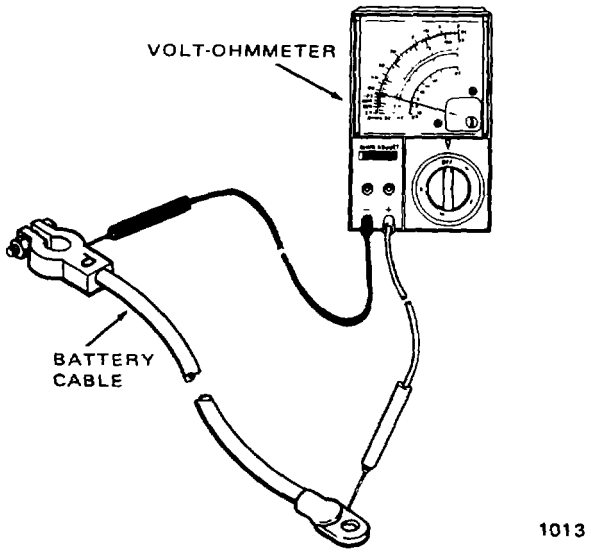


Figure 5-51. Battery Cable Test

Table 5-3. Direct and General Support Maintenance Troubleshooting Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

ENGINE DOES NOT TURN OVER (Continued)

c. Check the continuity of the wires. Use a volt-ohmmeter.

(1) Connect a meter lead to each end of the wire being tested and wiggle the wire back and forth.

(2) If the wire conducts a current, go to Step 2.

(3) If the wire does not conduct a current, or the meter needle jumps up and down, replace the wire. Go to Step 1d.

d. Start the engine.

(1) If the engine starts, the problem Is solved.

(2) If the engine does not start, go to Step 2.

Step 2. Check the battery.

a. Check the battery voltage. Use a volt-ohmmeter.

(1) Undo retainer strap and remove battery box cover.

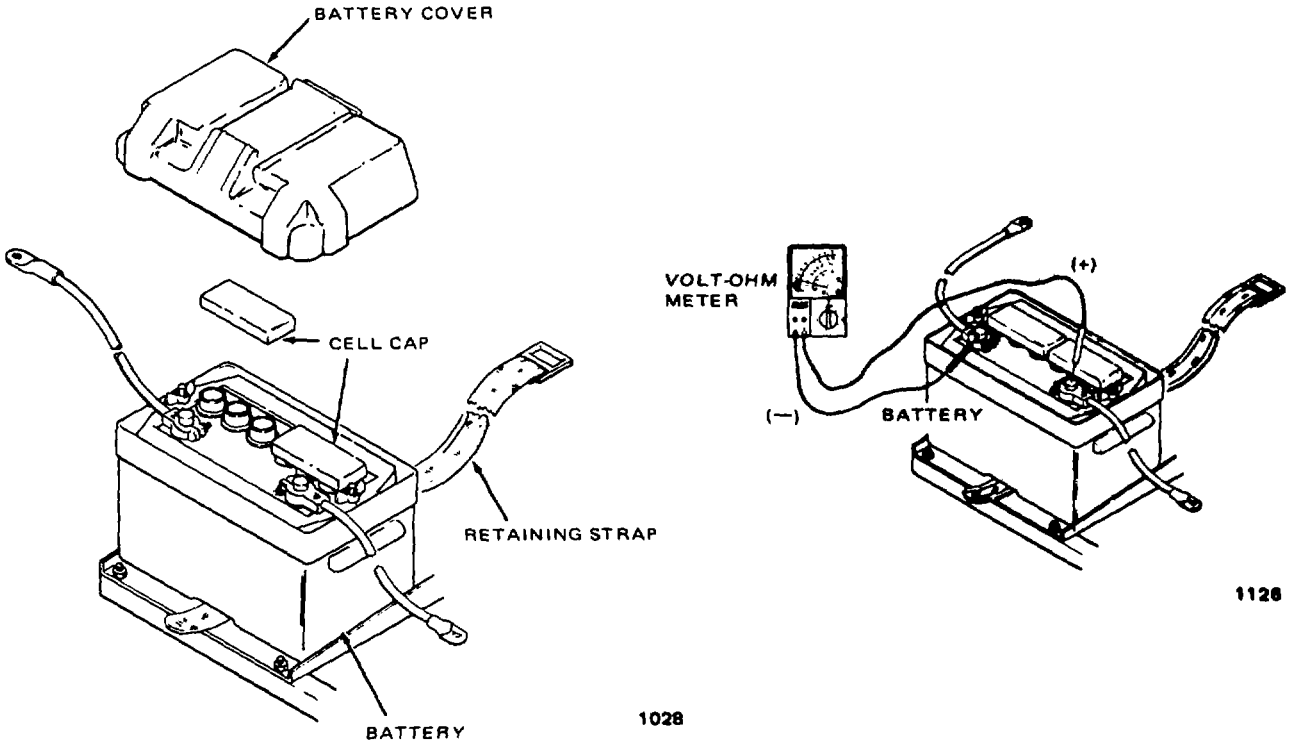


Figure 5-52. Battery Voltage Test

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

ENGINE DOES NOT TURN OVER (Continued)

(2) Connect the positive (+) meter lead to the positive (+) battery terminal and the negative (-) meter lead to the negative battery terminal.

(3) If the meter reads between 11.5 and 12 volts, the battery is ok. Go to Step 3.

(4) If the meter reads less than 11. 5 volts, go to Step 2b.

b. Check the electrolyte in the battery. Use a hydrometer to check the specific gravity.

CAUTION

The electrolyte level must be kept above the plates in the battery.

DO NOT overfill the battery. The electrolyte should not overflow onto the battery cover when the cell covers are placed over the cells.

NOTE

Use distilled water or a good grade drinking water (excluding mineral water).

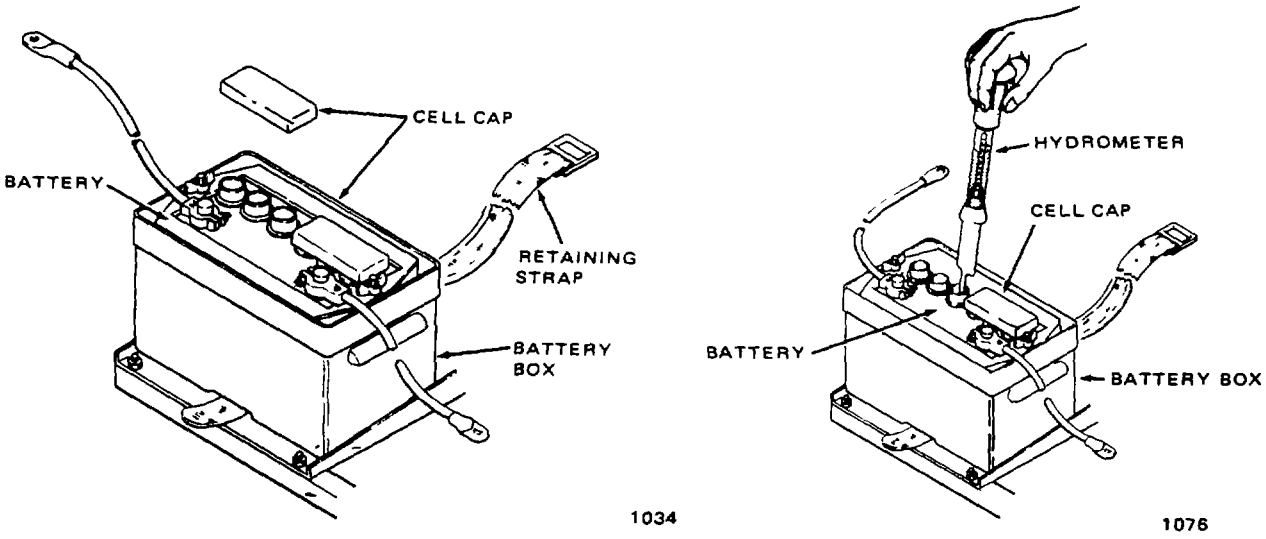


Figure 5-53. Specific Gravity Test

(1) Remove the cell covers and check the electrolyte level. Add distilled water if the level is below the top of the plates.

(2) Check the specific gravity.

(3) If the specific gravity is between 1.250 and 1.280, the cells are ok. Go to Step 3.

(4) If the specific gravity is between 1.225 and 1.250, the cells are in fair condition. Go to Step 3.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE DOES NOT TURN OVER (Continued)

(5) If the specific gravity is below 1.150 in any one cell, replace the battery and go to Step 2d.

(6) If the specific gravity in one cell is more than 0.050 less than the other cells and will not charge to more than a 50% charge, replace the battery and go to Step 2d.

c. Charge the battery.

(1) If the battery holds a charge, return it to the battery box and go to Step 2d.

(2) If the battery does not hold a charge, replace it and go to Step 2d.

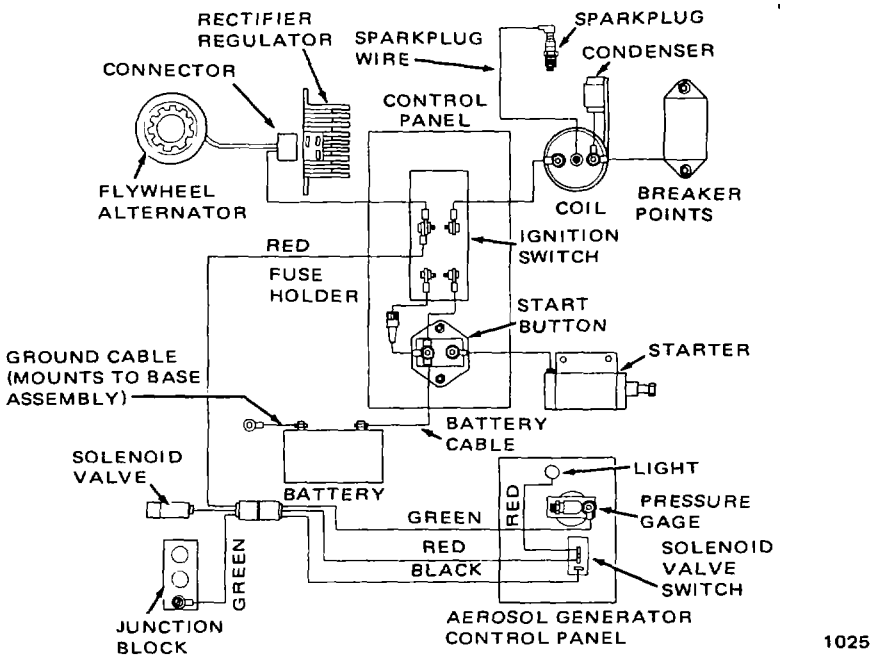


Figure 5-54. Aerosol Generator Wiring Diagram

d. Inspect and check the continuity of the wires below. Use a volt-ohmmeter.

- Battery cables.
- The wire between the battery and the start button.
- The wire between the start button and the ignition switch.
- The wire between the ignition switch and the alternator.

(1) Connect a meter lead to each end of the wire being tested.

(2) Wiggle the wire.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

ENGINE DOES NOT TURN OVER (Continued)

(3) If the wire conducts a current, go to Step 2f.

(4) If the wire does not conduct electricity or the meter fluctuates, replace it and go to Step 2f.

(5) If any of the wires or insulation are frayed, broken, or cracked, replace them and go to Step 2f.

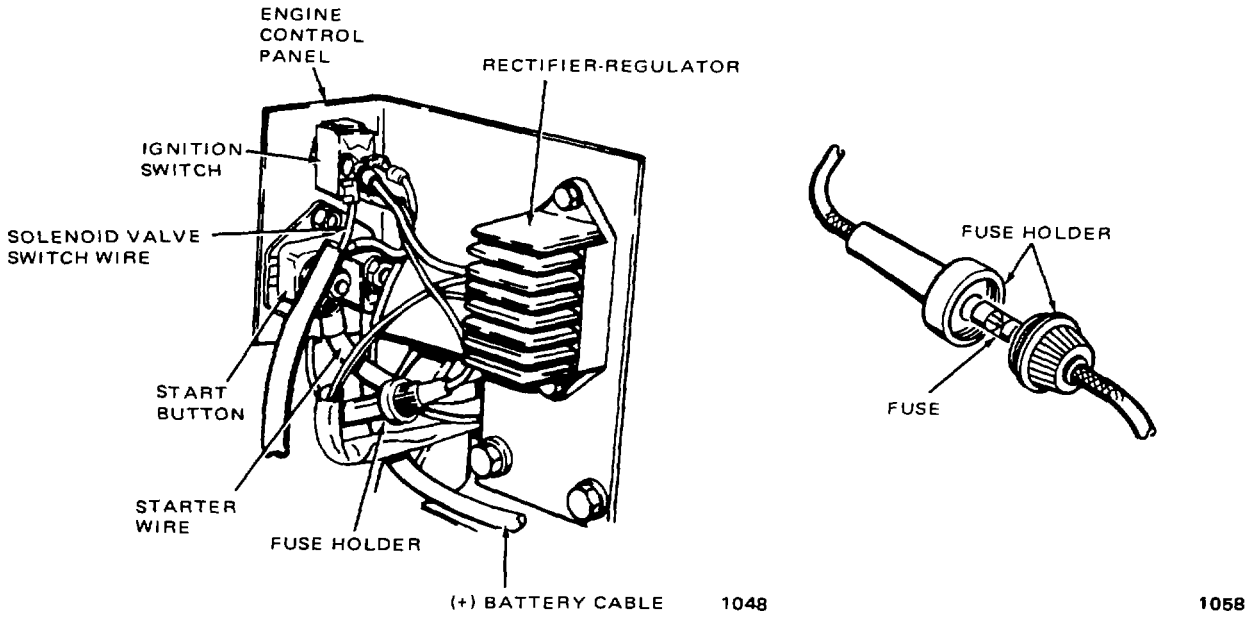


Figure 5-55. Fuse Holder Location

e. Check the fuse.

(1) Unscrew the fuse holder and check the fuse.

(2) If it is ok, screw the fuse holder back together and go to Step 3.

(3) If the fuse is blown, replace it and screw the fuse holder back together. Go to Step 2f.

f. Start the engine.

(1) If the engine starts, the problem is solved.

(2) If the engine does not start, go to Step 3.

Step 3. Check the starter.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE DOES NOT TURN OVER (Continued)

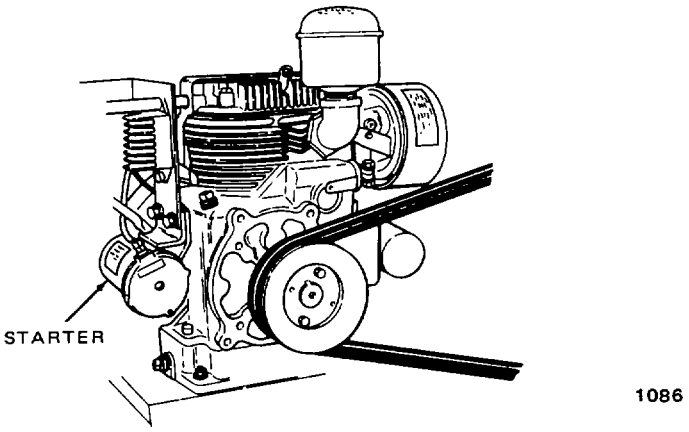


Figure 5-56. Engine Pulley

a. Remove the starter from the engine.

(1) Disconnect the positive (+) battery cable from the battery.

(2) Disconnect the starter wire.

(3) Remove the two mounting bolts and separate the starter from the engine.

b. Turn the drive pinion gear.

(1) If it turns smoothly, go to Step 3c.

(2) If it does not turn smoothly, go to Step 3c and check the armature shaft and bushing.

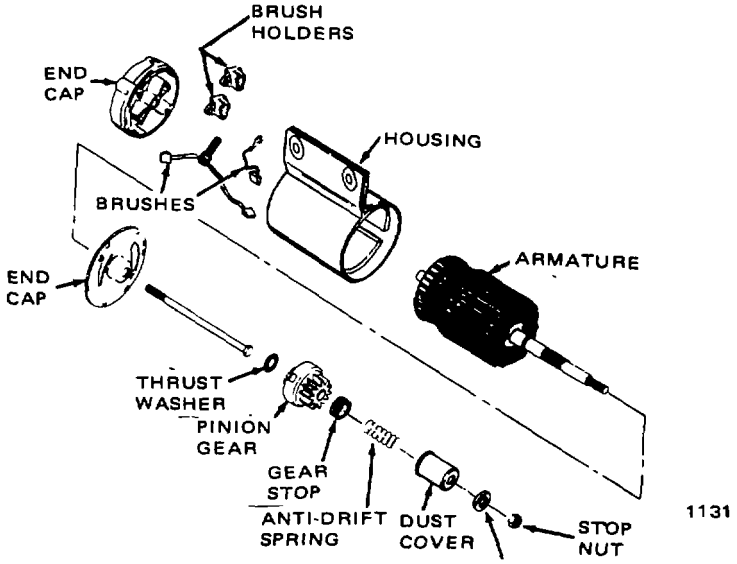


Figure 5-57. Starter Assembly SPACER

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE DOES NOT TURN OVER (Continued)

c. Disassemble the starter and go to Step 3d. Remove the following parts from the starter.

(1) Stop nut.

(2) Spacer.

(3) Dust cover.

(4) Anti-drift spring.

(5) Gear stop.

(6) Pinion gear.

(7) Thrust washer.

(8) Both end caps.

(9) Brushes and holders.

(10) Armature.

d. Check the pinion gear.

(1) If the gear teeth are chipped or cracked, or worn, replace the pinion gear and go to Step 3e.

(2) If there is no damage to the pinion gear, go to Step 3e.

e. Check the brush holders and brushes.

(1) If the brush holders do not hold the brushes in the correct position, replace them. Go to Step 3e.

(2) If the brushes jam and do not ride on the commutator correctly, reset them and go to Step 3e.

(3) If the brushes are worn unevenly or are less than half the size of new brushes, replace them. Go to Step 3f.

(4) If the brushes are ok, return them to the starter and go to Step 3f.

(5) Make sure the chamfered side of the brushes is away from the spring.

f. Check the armature shaft in the bushing.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE DOES NOT TURN OVER (Continued)

(1) After removing the armature from the starter, place the end caps back on the shaft. Check the shaft and bushing fitting.

(2) If the shaft is loose in the bushing, replace the bushing and go to Step 3g.

(3) If the end of the shaft is worn, replace the armature.

(4) If the armature shaft fits the bushing correctly, check the commutator.

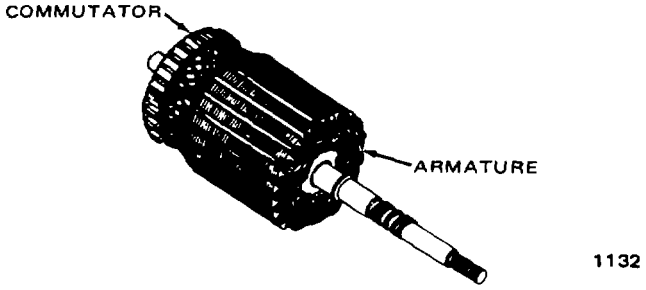


Figure 5-58. Armature

g. Check the commutator.

CAUTION

DO NOT use emery cloth to clean the commutator.

(1) Clean the commutator. Use number 00 sandpaper.

(2) If the commutator has any of the following signs, replace the entire armature and go to Step 3h.

- Wearing
- Pitting
- Burned
- Out of round
- Has high insulation between the bars

(3) If the commutator is ok, go to Step 3h.

h. Check the armature for opens.

(1) Check for loose leads between the armature conductors and the commutator bars.

(2) Resolder any loose leads and go to Step 3c. Use rosin core solder.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

ENGINE DOES NOT TURN OVER (Continued)

(3) If there are not any loose leads, go to Step i.

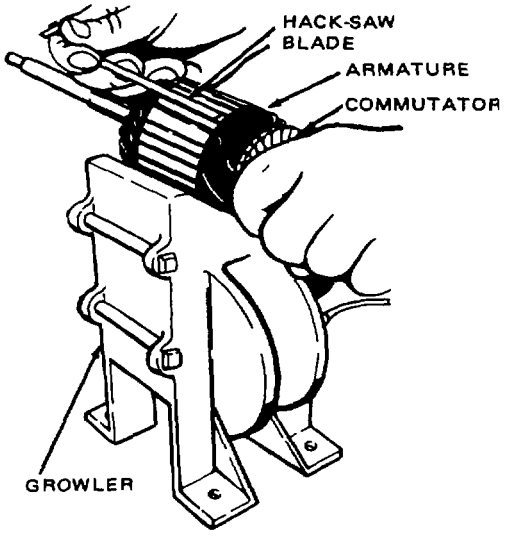


Figure 5-59. Armature Test

i. Check the armature for shorts. Use a growler (open core transformer).

(1) Rotate the armature slowly on the growler.

(2) Hold a hacksaw blade over the armature while it is turning. When a shorted winding comes under the hacksaw blade, it will vibrate.

(3) If shorts are found in the commutator, brush them from between the slots and check the commutator again. If it is all right, go to Step j. If it is still shorted, go to Step k.

j. Check for grounds in the armature. Use a 110 volt test lamp and test leads.

(1) Connect one lead to the commutator.

(2) Connect the second test lead to the armature shaft.

(3) If the light lights, there is a grounded wire.

(4) Clean the slots in the commutator for grounds again.

(5) If there are grounds, go to Step 3k.

k. If there are any opens, shorts or grounds, replace the armature and go to Step 3m.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE DOES NOT TURN OVER (Continued)

l. If there are no opens, shorts or grounds, go to Step 4.

m. Reassemble the starter and test it.

(1) Reassemble the starter.

(2) Connect the starter to a 12 volt battery. If the starter turns over, return it to the engine. If the starter does not turn over, replace it and go to Step n.

n. Start the engine.

(1) If the engine starts, the problem is solved.

(2) If the engine does not start, go to Step 4.

Step 4. Check internal parts.

a. Turn crankshaft by hand.

(1) If it will not turn or if it turns with difficulty notify your supervisor.

(2) If the engine makes a grinding or rattling noise notify your supervisor.

b. Replace the engine if the internal parts are damaged. DO NOT overhaul engine unless a new engine is not available.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

3. THE BATTERY FAILS TO CHARGE

Step 1. Check the battery.

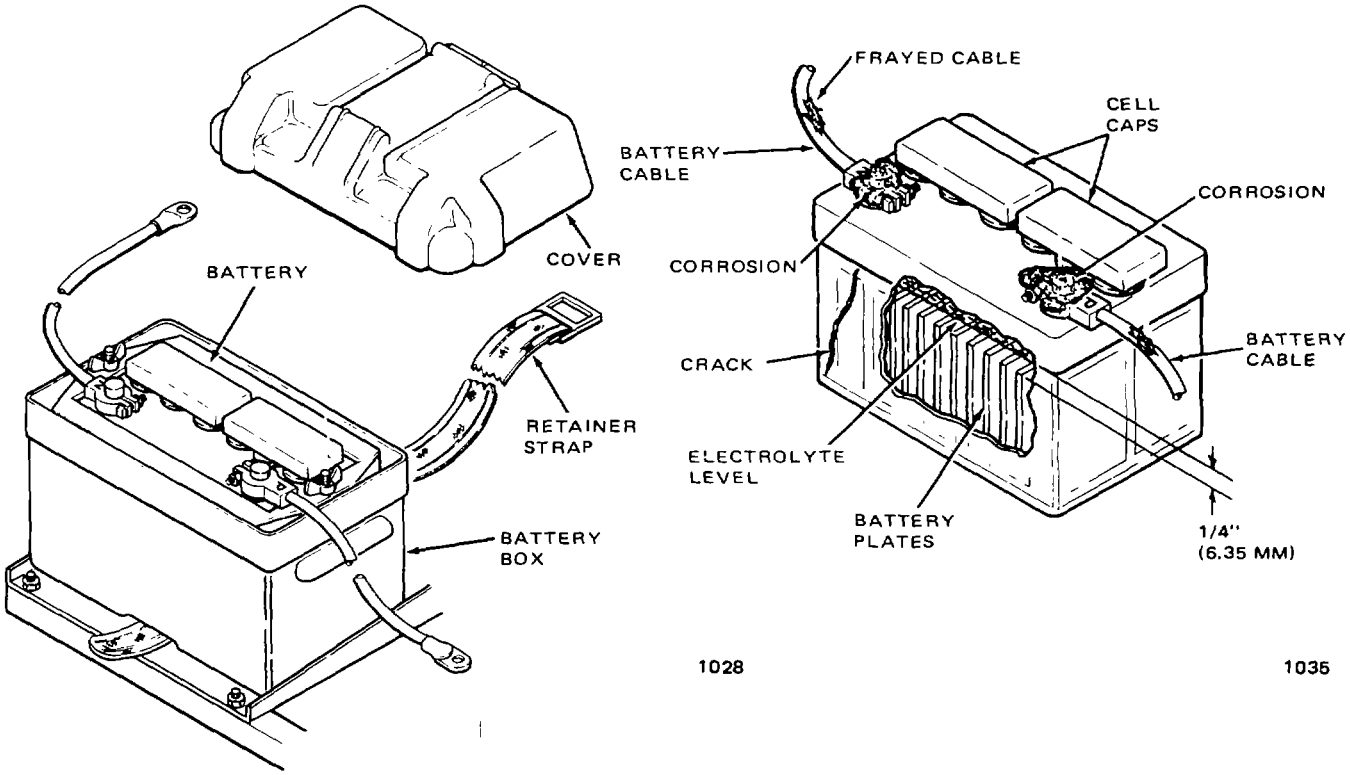


Figure 5-60. Visual Battery Checks

a. Check the battery visually.

(1) Make sure the battery cables are tight on the terminals. They should not be able to be moved by hand.

(2) Make sure the battery ground connection is securely fastened.

(3) If there is any corrosion on the battery or around the terminals, rinse it off with a baking soda and water solution.

(4) If there is dirt on the top of the battery, brush it off.

(5) If the cable insulation is frayed or broken, replace the cable and go to Step 1b if the battery still fails to charge.

(6) If there are cracks in the sides or the cover of the battery, replace it and go to Step 1b if the battery still fails to charge.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

ENGINE DOES NOT TURN OVER (Continued)

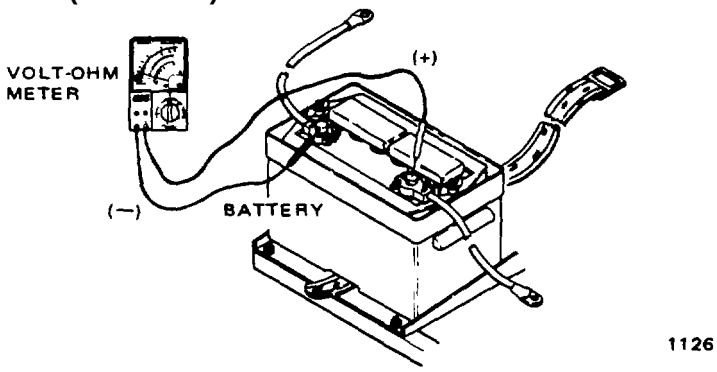


Figure 5-61. Battery Voltage Test

b. Check the electrolyte in the battery. Use a hydrometer to check the specific gravity.

CAUTION

The electrolyte level must be kept above the plates in the battery.

DO NOT overfill the battery. The electrolyte should not overflow onto the battery cover when the cell covers are placed over the cells.

NOTE

Use distilled water or a good grade drinking water (excluding drinking water).

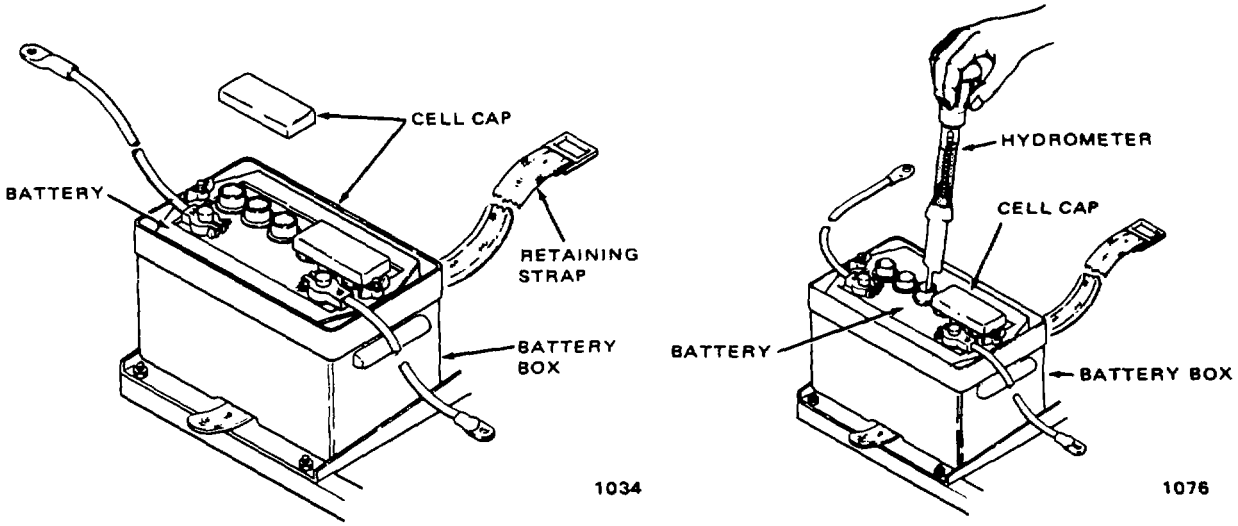


Figure 5-62. Specific Gravity Test

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

THE BATTERY FAILS TO CHARGE (Continued)

(1) Remove the cell caps and check the electrolyte level. Add distilled water it the level is below the top of the plates.

(2) Check the specific gravity.

(3) If the specific gravity is between 1.250 and 1.280, the cells are ok. Go to Step 2.

(4) If the specific gravity is between 1.225 and 1.250, the cells are still in fair condition. Go to Step 2.

(5) If the specific gravity is below 1.150 in any one cell, replace the battery and go to Step 2 if the new battery fails to charge.

(6) If the specific gravity in one cell is 0.050 more or less than the other cells, and charging does not bring the charge to a 50% charge, replace the battery and go to Step 2 if the new battery fails to charge.

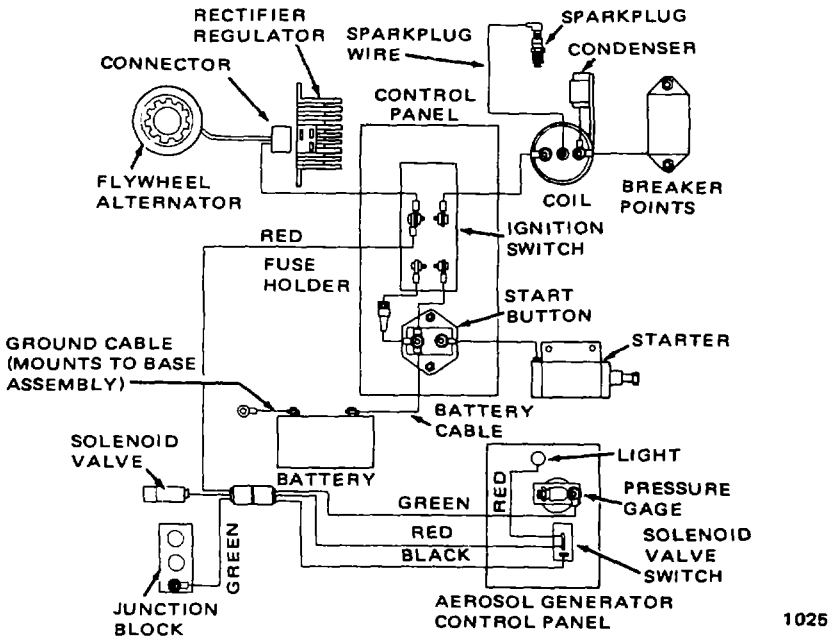


Figure 5-63. Aerosol Generator Wiring Diagram

c. Inspect and check the continuity of the wires listed below. Use a volt-ohmmeter.

- Battery cables
- The wire between the battery and the start button
- The wire between the start button and the ignition switch
- The wire between the ignition switch and the alternator

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

THE BATTERY FAILS TO CHARGE (Continued)

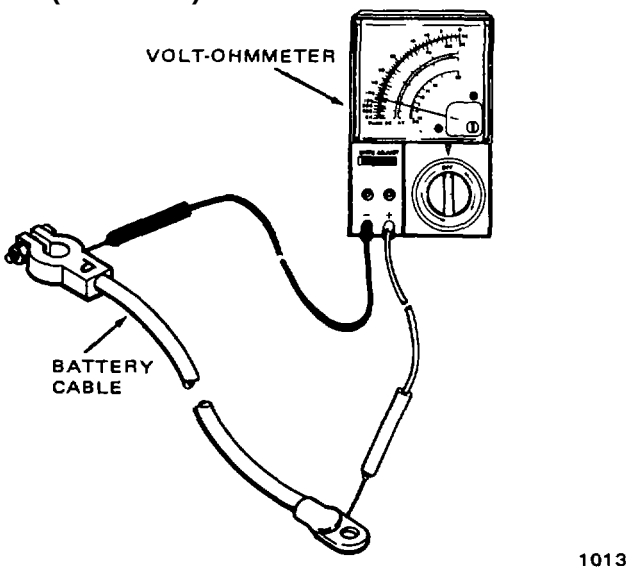


Figure 5-64. Battery Cable Test

(1) Connect a meter lead to each end of the wire being tested.

(2) Wiggle the wire.

(3) If the wire conducts a current, go to Step 2.

(4) If the wire does not conduct, replace it and go to Step 2 if the battery still does not charge.

(5) If any of the wires or insulation are frayed, broken or cracked, replace them and go to Step 2 if the battery still fails to charge.

d. Check the fuse between the ignition switch and the start button.

(1) Unscrew the fuse holder and check the fuse.

(2) If it is ok, screw the fuse holder together and go to Step 2.

(3) If the fuse is blown, replace it and screw the fuse holder together. Go to Step 2 if the battery still fails to charge.

Step 2. Check the rectifier regulator. Use a volt-ohmmeter.

Table 53. Direct and General Support Maintenance Troubleshooting (Continued)

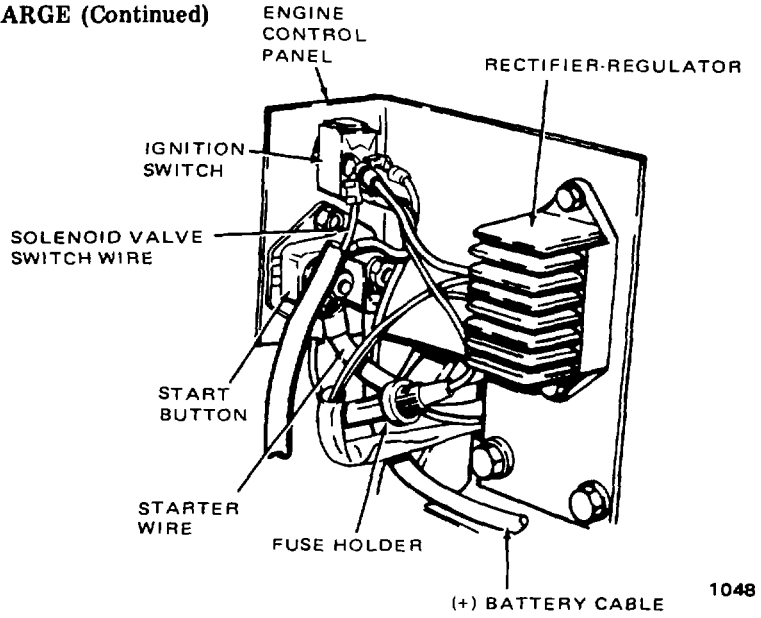
MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION	
THE BATTERY FAILS TO CHARGE (Continued)	

Figure 5-65. Engine Electrical Assembly

NOTE

The engine must be running while checking the rectifier-regulator.

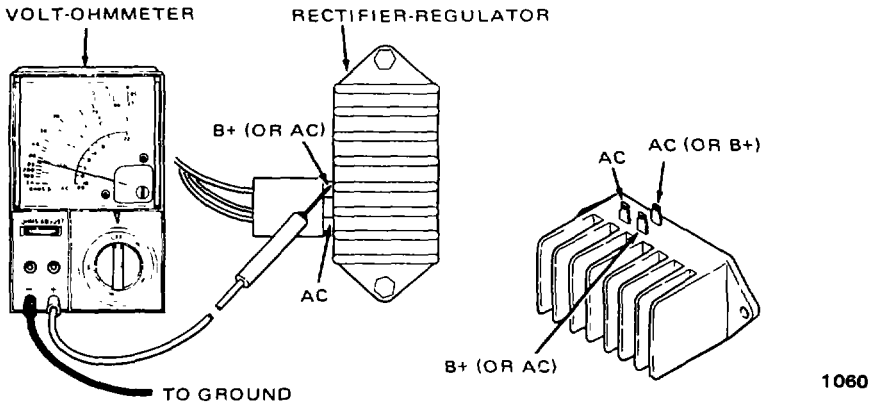


Figure 5-66. Rectifier-Regulator Test

a. Connect the negative (-) meter lead to a grounded engine part, and the positive (+) meter lead to the B+ terminal at the rectifier-regulator. Do not disconnect the rectifier-regulator wire. If the voltage is 13.8 volts or higher, place a load of 5 amps or more on the battery to reduce the voltage.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

THE BATTERY FAILS TO CHARGE (Continued)

(1) If the charge rate increases, the rectifier-regulator is ok. Go to Step 3.

(2) If the charge rate does not increase, go to Step 2b.

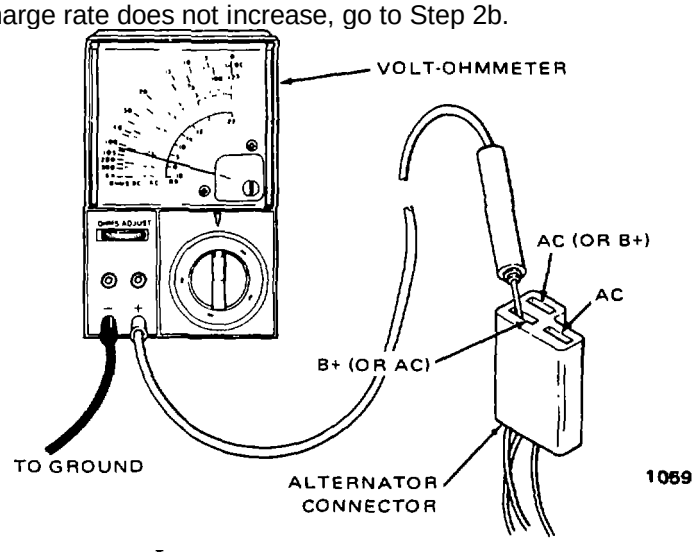


Figure 5-67. Alternator Test

b. Unplug the leads at the rectifier-regulator. Connect the positive (+) meter lead across the ac leads and the negative (-) lead to a grounded engine part.

(1) If the meter reads less than 31 volts, the stator is bad. Replace the engine. Go to Step 3.

(2) If the meter reads more than 31 volts, remove the rectifier-regulator mounting bolts and replace the rectifier-regulator. Go to Step 2a.

c. Connect the positive (+) meter lead to the B+ lead, and the negative (-) meter lead to a grounded engine part.

(1) If the meter reads more than 14.7 volts, remove the rectifier-regulator mounting bolts and replace the rectifier-regulator. Go to Step 2a.

(2) If the meter reads less than 14.7 volts, go to Step 1c.

Step 3. Check the engine speed. Use a hand-held tachometer.

a. Start the engine according to operating instructions in Chapter 2, Section III.

NOTE

The belts should be connected to the pulleys while checking the engine speed.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

THE BATTERY FAILS TO CHARGE (Continued)

b. Check the engine operating speed with a hand-held tachometer. Refer to page 1-6 for correct rpm ratings.

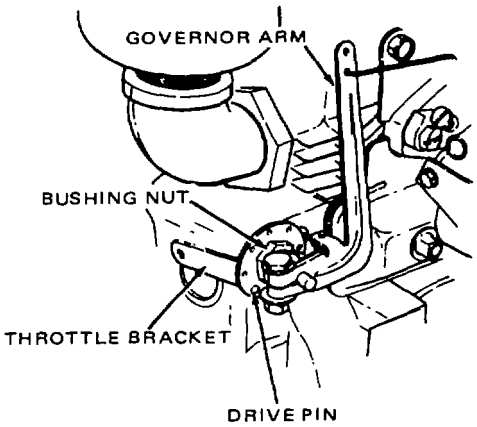


Figure 5-68. Governor Assembly

c. Adjust the engine speed to correct rpm.

(1) Loosen the bushing nut slightly.

(2) Move the throttle bracket to the left (counterclockwise) to increase the engine speed and to the right (clockwise) to decrease the engine speed. Refer to page 1-6 for correct rpm rating.

CAUTION

DO NOT force the bushing nut tight. This could cause binding or stripped threads.

(3) When the engine speed is adjusted to the correct rpm, tighten the bushing nut and lock the throttle bracket in place. Go to Step 2.

4. THE ENGINE IS HARD TO START

Step 1. Check the carburetor.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

4. THE ENGINE IS HARD TO START (Continued)

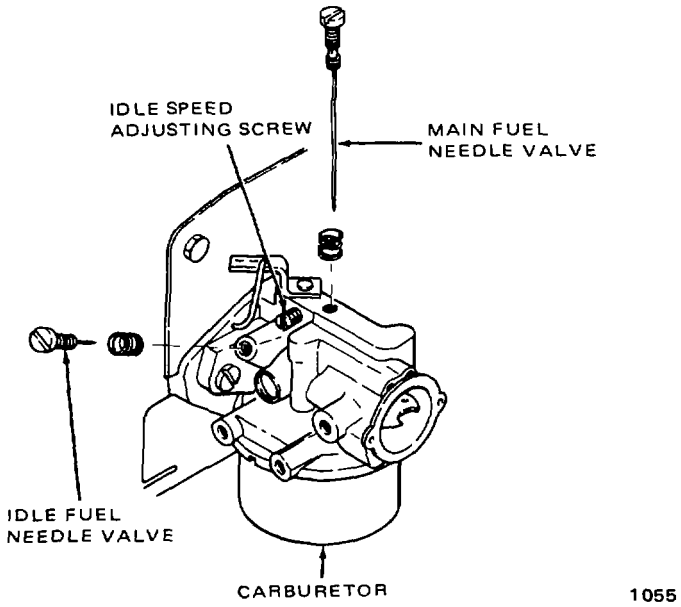


Figure 5-69. Carburetor Needle Valve Removal

CAUTION

BE CAREFUL not to use force when turning the needle valves in and out. Force can damage the valves.

a. Remove the main fuel needle valve and idle fuel needle valve and check them for damage and/or plugging.

(1) If the needle valves are ok, go to Step lb.

CAUTION

DO NOT use hard metal objects to unplug the needle valves. Hard metal objects will damage them.

(2) If the needles are plugged or gummed up, rinse them in alcohol or acetone and return them to the carburetor. Go to Step 1b.

(3) If the needles are damaged and cannot be repaired, replace them and go to Step 1b.

b. Adjust the needle valves.

(1) Turn both needle valves all the way to the right (clockwise) until they gently touch bottom.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

THE ENGINE IS HARD TO START (Continued)

(2) Turn the main fuel needle valve to the left (counterclockwise) two full turns.

(3) Turn the idle needle valve to the left (counterclockwise 1 1/4 turns).

(4) Go to Step 1c.

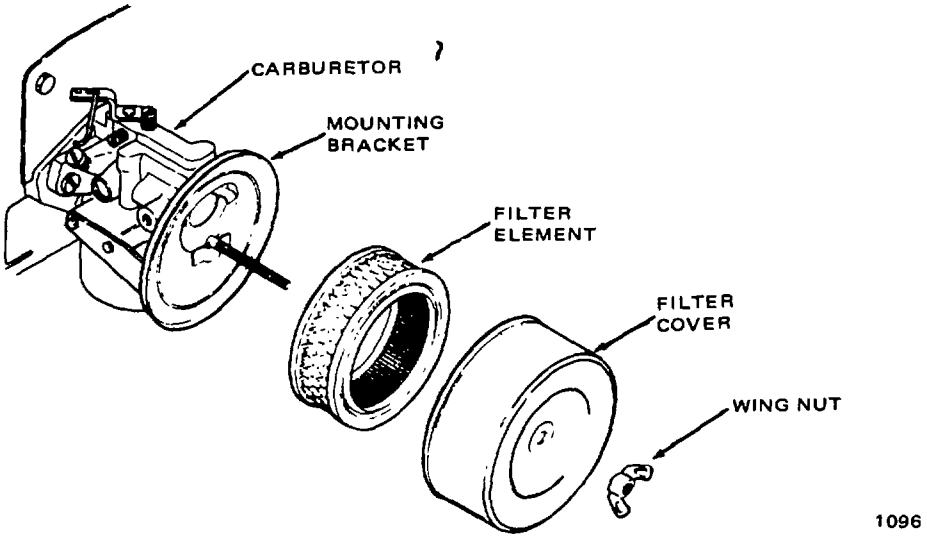


Figure 5-70. Air Cleaner Assembly

c. Remove the carburetor from the engine.

(1) Remove the air cleaner and air cleaner bracket.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

THE ENGINE IS HARD TO START (Continued)

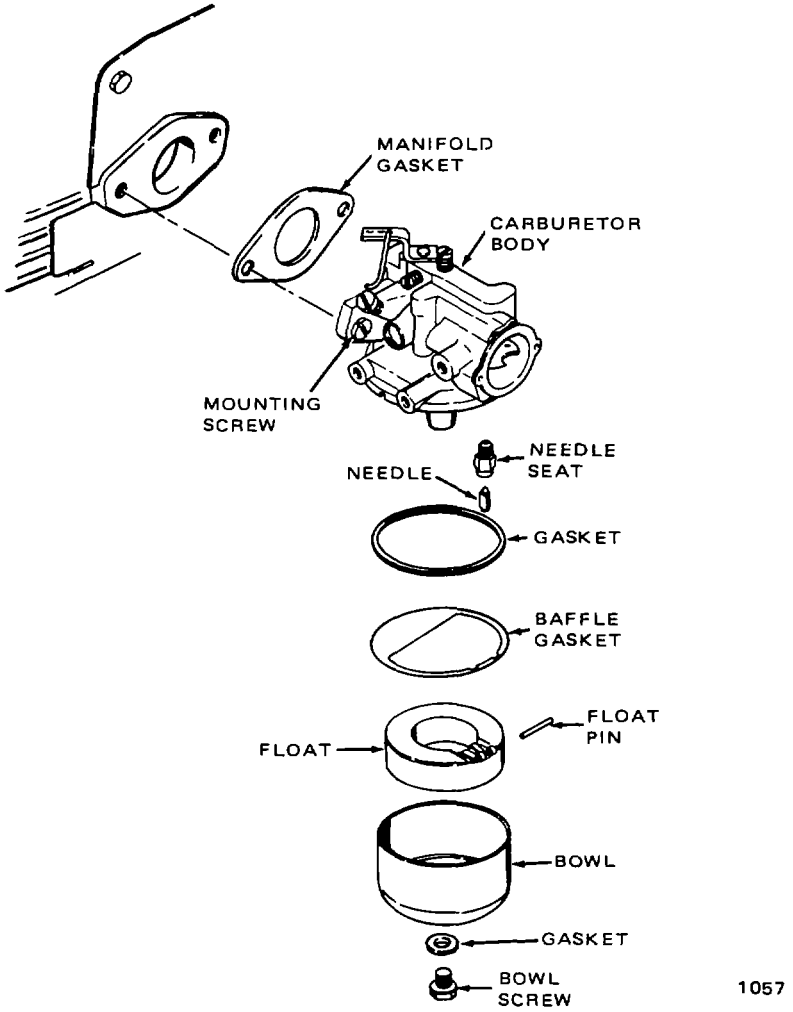


Figure 5-71. Carburetor Disassembly

(2) Disconnect the throttle linkage and remove the carburetor from the engine.

NOTE

To remove the carburetor from the engine, it is necessary to loosen one mounting screw, then the other. Pull the carburetor away from the engine and loosen each screw again. Repeat this procedure until the carburetor can be removed from the engine.

(3) Inspect the carburetor to manifold gasket. If it is cracked, broken, or damaged, replace it and go to Step 1d.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

THE ENGINE IS HARD TO START (Continued)

d. Disassemble the carburetor and make sure gasoline is getting to the carburetor.

(1) Remove the bowl screw, gasket and bowl and baffle gasket.

(2) Remove the float pin, float needle and needle seat. If the float is dented or has pin holes, replace it. If the float leaks or is worn, replace it.

(3) Check the needle and seat for damage. If they are cut or scratched, replace them and go to Step 1e.

CAUTION

DO NOT use hard metal objects or tools to clean the inlet port. Use something soft like a toothpick and flush the port with alcohol or acetone.

(4) Unplug the inlet port if necessary and go to Step 1e.

(5) If the choke is worn or damaged, replace the whole carburetor and go to Step 2.

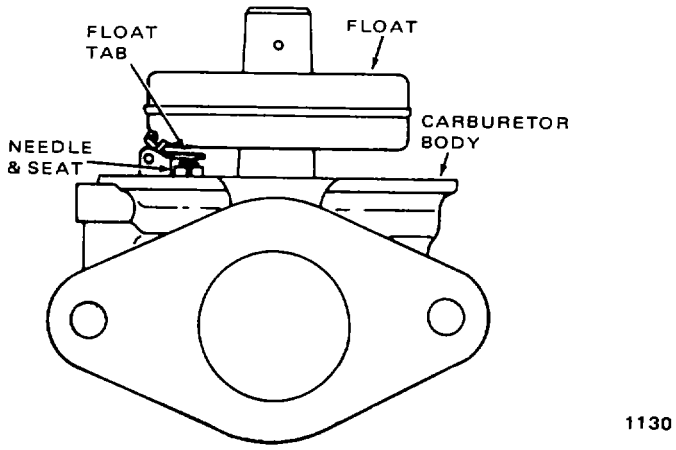


Figure 5-72. Carburetor Float Adjustment

e. Assemble the carburetor.

(1) Install the seat needle float and pin.

(2) Set the float level. Turn the carburetor upside down and let the float rest on the needle. The clearance between the machined surface of the carburetor and the free end of the float should be 0.17 inches ± 0.03 inches (4.32 mm ± 0.76 mm).

(3) Adjust the clearance by bending the float tab with a screwdriver if necessary.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

THE ENGINE IS HARD TO START (Continued)

(4) Install new baffle gasket, a new bowl gasket, the fuel bowl and the fuel bowl screw and gasket. Make sure the bowl gasket seats well.

(5) Return the carburetor to the engine and go to Step If. Make sure the carburetor to manifold gasket seals well.

f. Start the engine.

(1) If the engine starts, the problem is solved. Go to Step 1g.

(2) If the engine does not start, go to Step 3.

g. Adjust the carburetor while the engine is running.

(1) Turn the main fuel needle valve to the right (clockwise) until the engine slows down.

(2) Turn the main fuel needle valve counterclockwise (left: opposite normal rotation) until the engine slows down.

(3) Turn the main fuel needle valve back to the right to a position half-way between the slow down points.

Step 2. Check the spark plug.

CAUTION

BE CAREFUL when removing the spark plug from the engine. The insulator will break easily.

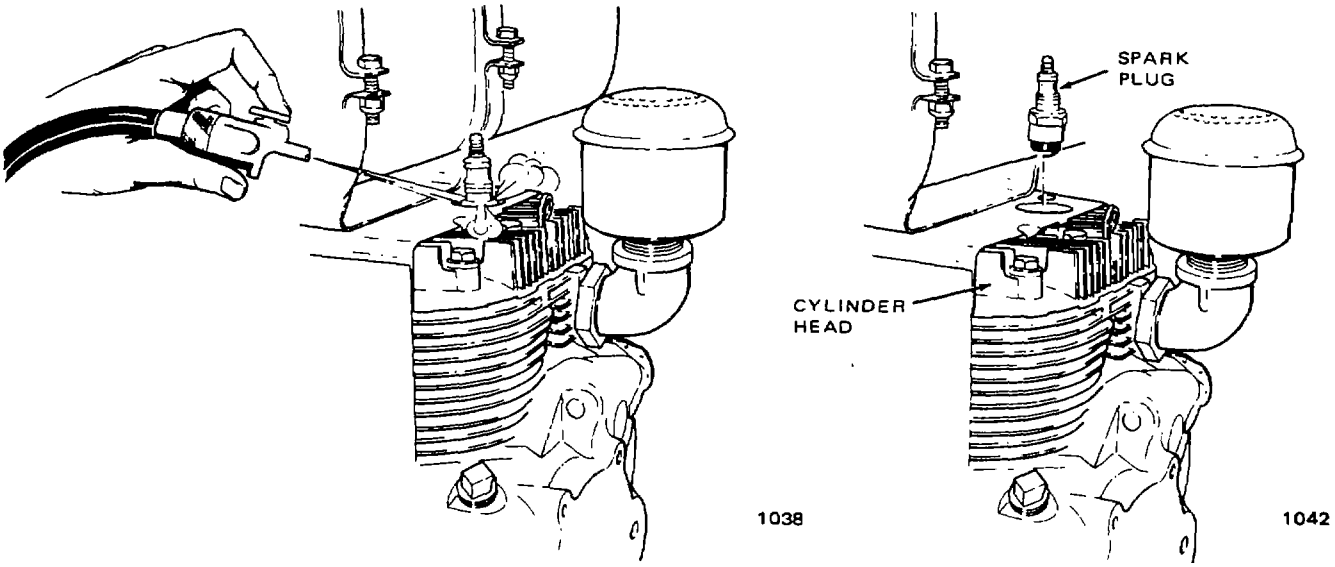


Figure 5-73. Spark Plug Cleaning and Removal.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

THE ENGINE IS HARD TO START (Continued)

a. Remove the spark plug.

(1) Loosen the spark plug a few turns.

(2) Blow high pressure air into the spark plug well. This will clean out any dirt or debris.

(3) Remove the spark plug by hand.

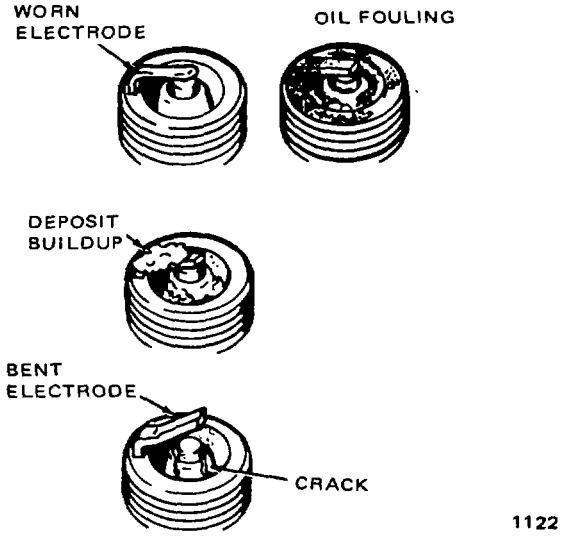


Figure 5-74. Spark Plug Defects

b. Check the spark plug visually. Replace it and go to Step 2e, if there are:

- Cracks in the insulator
- Electrodes worn so thin they cannot be regapped
- Soft, wet, oily deposits covering the insulator and the plug nose
- Build-up of deposits between insulator and the plug shell
- Broken insulator and/or bent electrode

NOTE

If the spark plug must be replaced, set the gap at 0.025 inches (0.64 mm).

Oil fouling is a sign of internal engine damage.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

THE ENGINE IS HARD TO START (Continued)

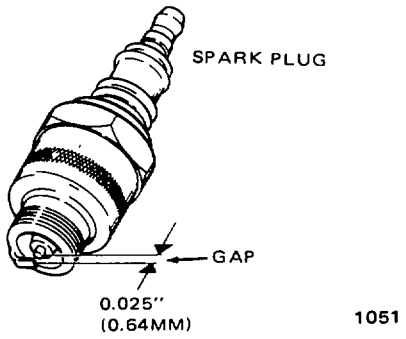


Figure 5-75. Spark Plug Gap

c. Check the spark plug gap.

(1) Reset the gap at 0.025 inches (0.64 mm) if necessary, and go to Step 2d.

(2) If the gap is okay, go to Step 2d.

d. Check the spark plug for a spark.

(1) Connect the spark plug wire to the spark plug and set the plug on a grounded part of the engine.

(2) Turn the ignition switch ON.

(3) Crank the engine by hand. When the points open and close, a spark will jump between the spark plug electrodes.

(4) If there is a bright blue spark, go to Step 2e.

(5) If there is no spark, or the spark is weak and yellow, go to Step 3.

e. Start the engine.

(1) If the engine starts without trouble, the problem is solved.

(2) If the engine does not start, or if it is hard to start, go to Step 3.

Step 3. Check the spark plug wire.

a. Remove the spark plug wire and test it with a volt-ohmmeter.

(1) Attach a meter lead to each end of the spark plug wire.

(2) If the meter reads below 40 k ohms (40,000) go to Step 4.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

THE ENGINE IS HARD TO START (Continued)

(3) If the meter reads steadily above 40 k ohms, replace the wire and go to Step 5b.

(4) Wiggle the wire back and forth. If the meter jumps up and down, there is a break in the wire. Replace the wire and go to Step 3b.

b. Start the engine.

(1) If the engine starts without trouble, the problem is solved.

(2) If the engine does not start, or if it is hard to start, go to Step 4.

Step 4. Check the coil.

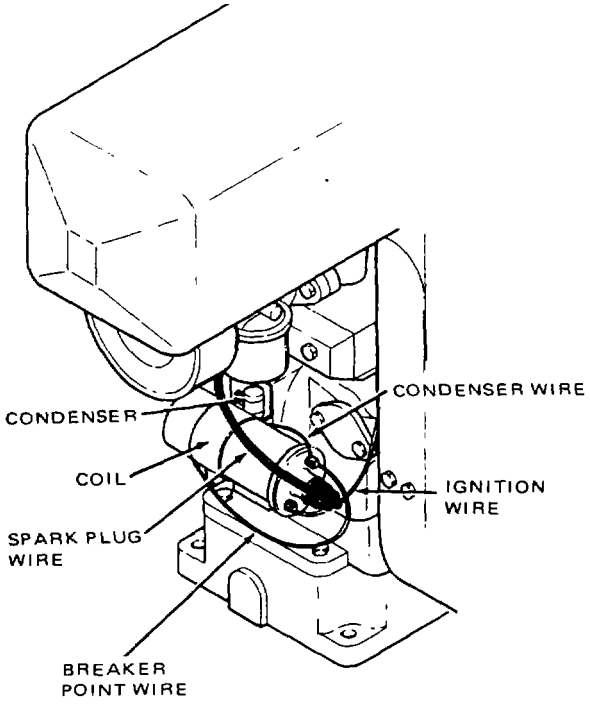


Figure 5-76. Engine Coil Location

a. Check the coil visually.

(1) If the coil is cracked or broken, replace it and go to Step 4e.

(2) Remove the spark plug wire from the coil and check the connections for moisture. If the connections are wet, dry them and return the wire to the coil. Go to Step 4b.

(3) If the coil is ok, go to Step 4e.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

THE ENGINE IS HARD TO START (Continued)

WARNING

DO NOT hold any ignition wires in your bare hands. You can be electrocuted. Use well-insulated tools to hold the wires.

b. Check the secondary coil winding.

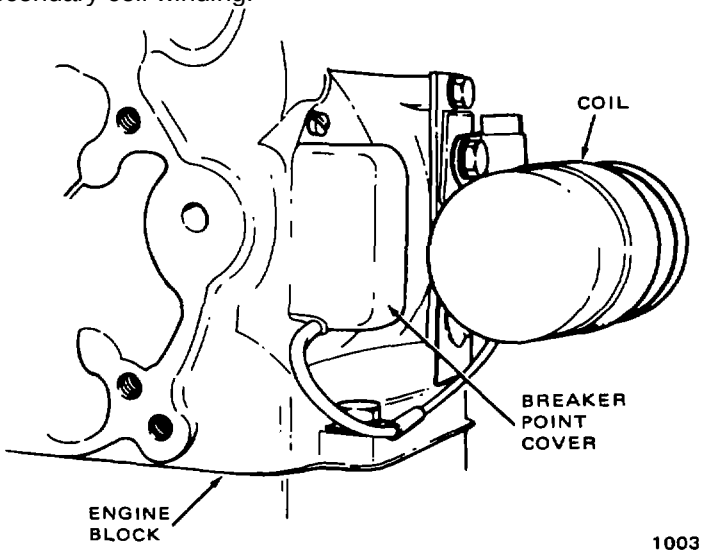


Figure 5-77. Breaker Point Cover

(1) Remove the breaker point cover and jam the points open with a piece of cardboard.

(2) Remove the spark plug wire from the spark plug.

(3) Turn the ignition switch ON.

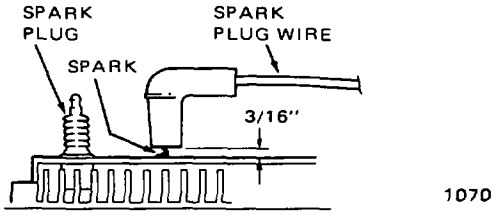


Figure 5-78. Spark Test

(4) Hold the end of the spark plug wire about 3/16 inch (4.76 mm) from a grounded part of the engine.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

THE ENGINE IS HARD TO START (Continued)

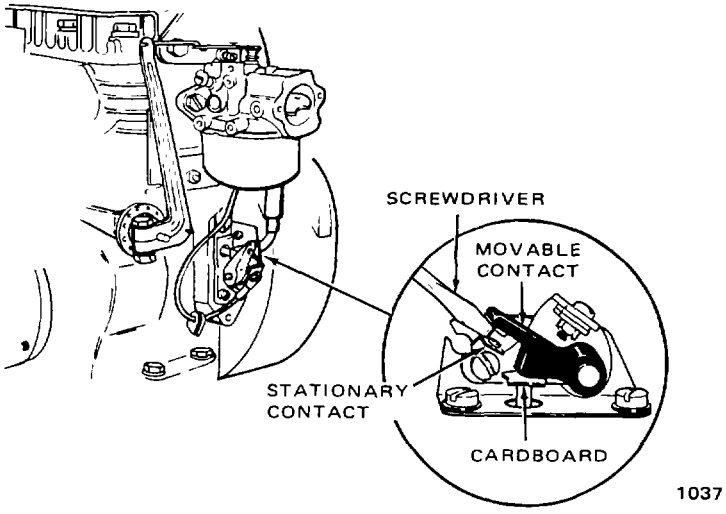


Figure 5-79. Breaker Points

(5) Hold a screwdriver point across the open breaker points.

(6) Remove the screwdriver from the breaker points.

(7) If a bright blue spark jumps between the wire and the engine, the coil is ok. Go to Step 5.

(8) If there is no spark or the spark is weak and yellow, the coil is weak. Replace it and go to Step 4e, if the condenser and the points check ok.

c. Coil Test I. Check the primary coil winding. Use a volt-ohmmeter.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

THE ENGINE IS HARD TO START (Continued)

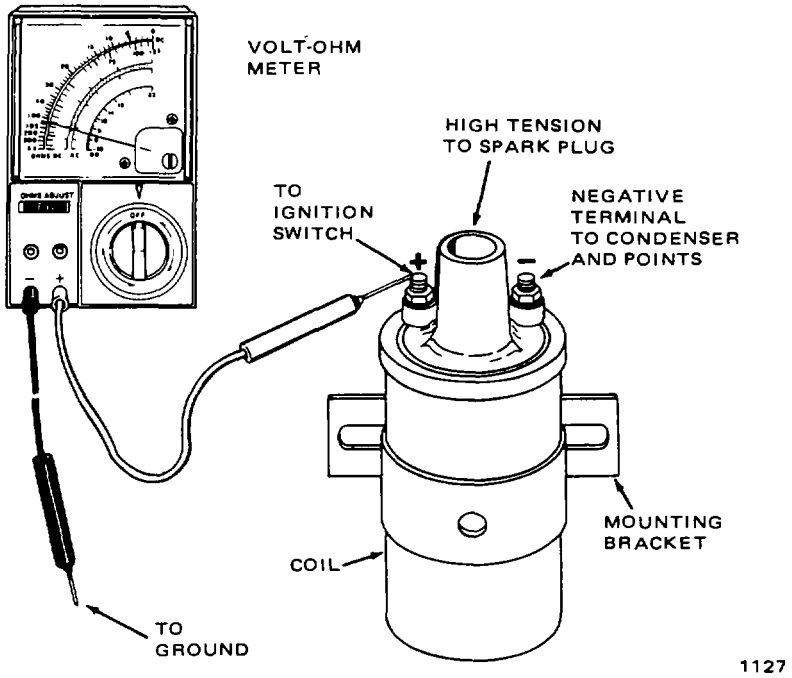


Figure 5-80. Coil Test I

(1) Remove the breaker point cover and jam a piece of cardboard between the breaker points.

(2) Turn the ignition switch ON.

(3) Connect the negative (-) meter lead to a grounded part of the engine.

(4) Connect positive (+) meter lead to the battery (+) side of the coil. If the meter reads 11.5 to 12 volts, there is current to the coil. Go to Step 3d. If the meter reads 11.5 volts or less, there is poor current to the coil. Go to Step 4d.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

THE ENGINE IS HARD TO START (Continued)

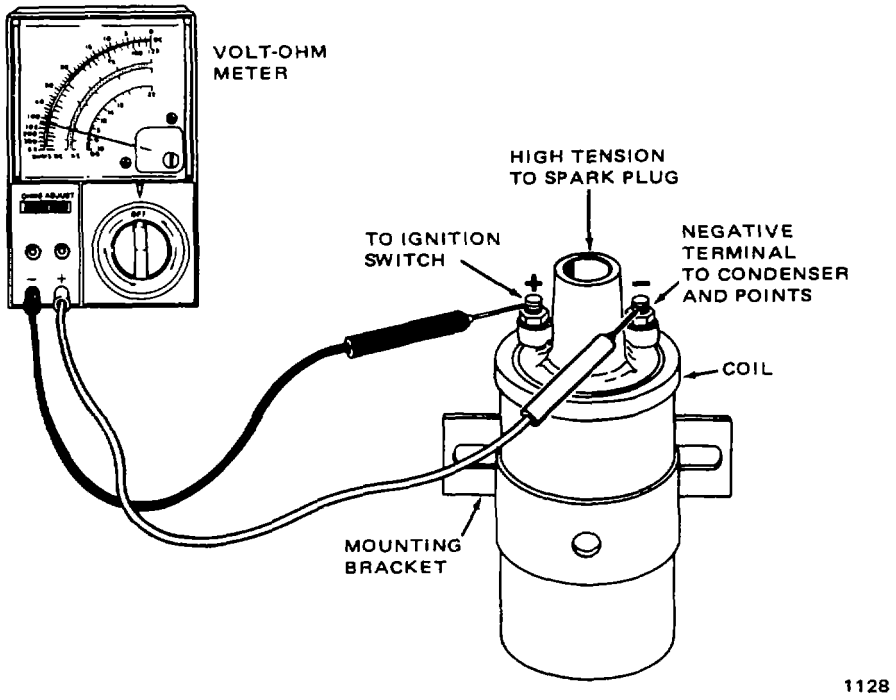


Figure 5-81. Coil Test II

d. Coil Test II. Connect the positive (+) lead to the breaker points (-) side of the coil. If the meter reads 11.5 to 12 volts, the coil is ok. Go to Step 5. If the meter reads 11.5 volts or less, the coil is bad. Replace it and go to Step 4e, it the points and condenser check ok.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

THE ENGINE IS HARD TO START (Continued)

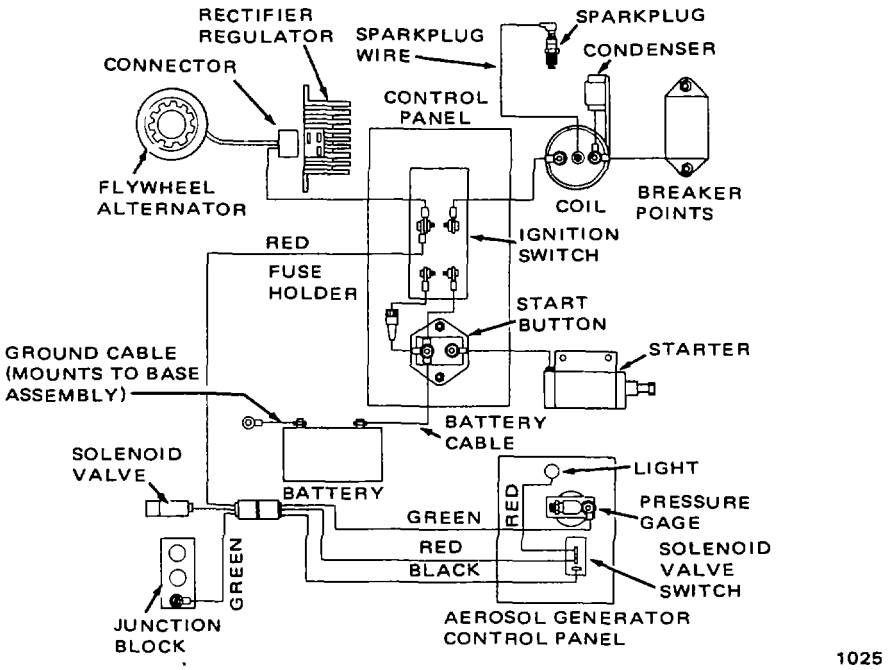


Figure 5-82. Aerosol Generator Wiring Diagram

e. Check the wires between the coil and the ignition switch and the coil and the points. Use a volt-ohmmeter.

(1) Remove the ignition wire from the ignition switch and the coil.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

THE ENGINE IS HARD TO START (Continued)

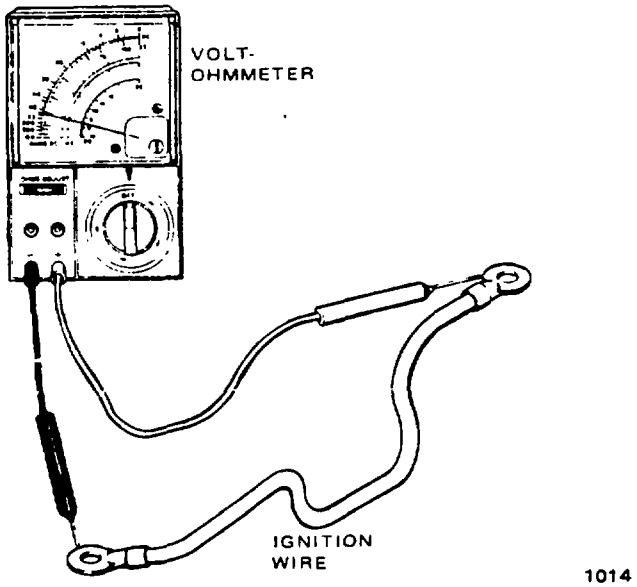


Figure 5-83. Ignition Wire Test

(2) Connect a meter lead to each end of the wire and check the continuity.

(3) Remove the breaker point wire from the points and the coil.

(4) Connect a meter lead to each end of the wire and check for continuity.

(5) Wiggle the wire back and forth. If the meter does not register a current, replace it and go to Step 4e. If the meter does register a current, go to Step 5.

f. Start the engine.

(1) If the engine starts without trouble, the problem is solved.

(2) If the engine does not start, or if it is hard to start, go to Step 5.

Step 5. Check the breaker points.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

THE ENGINE IS HARD TO START (Continued)

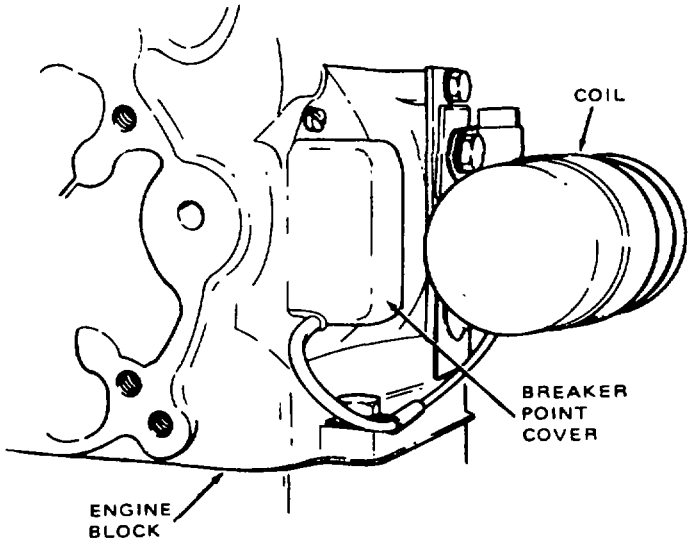


Figure 5-84. Breaker Point Cover

a. Remove the breaker point cover.

b. Open the points with a screwdriver and inspect them. If they are pitted, burned, or badly oxidized, replace them and go to Step 5c.

c. Check the breaker point gap.

(1) Shut the ignition switch OFF.

(2) Crank the engine by hand until the points are open to their widest gap.

(3) If the gap is 0.020 inches (0.52 mm), the gap is ok. Go to Step 6.

(4) If the gap is greater than or less than 0.20 inches (0.52 mm), go to Step 5d.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

THE ENGINE IS HARD TO START (Continued)

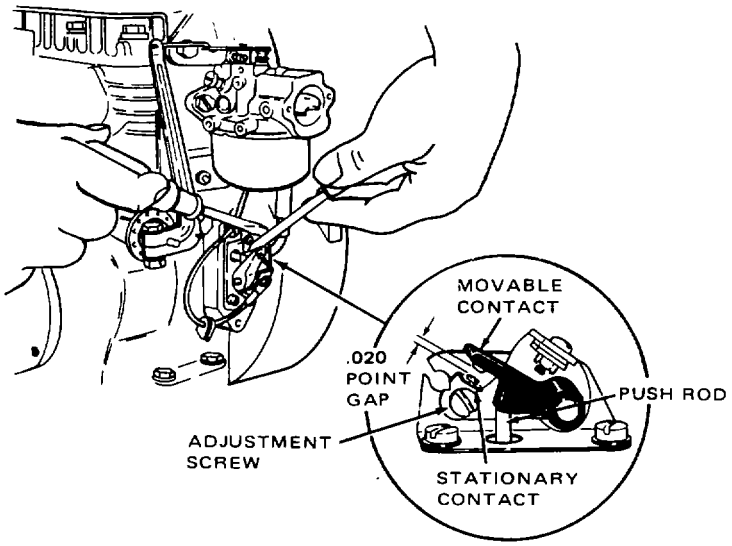


Figure 5-85. Gapping Breaker Points

d. Reset the breaker point gap.

(1) Rotate the engine by hand until the breaker points reach their greatest gap.

(2) Loosen the point gap adjustment screw and place an 0.020 inch (0.52 mm) feeler gage between the points.

(3) Tighten the adjusting screw after setting the gap.

(4) Replace the breaker points cover and go to Step 5e.

e. Start the engine.

(1) If the engine starts without trouble, the problem is solved.

(2) If the engine does not start, or if it is hard to start, go to Step 6.

Step 6. Check the condenser. Use a volt-ohmmeter.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

THE ENGINE IS HARD TO START (Continued)

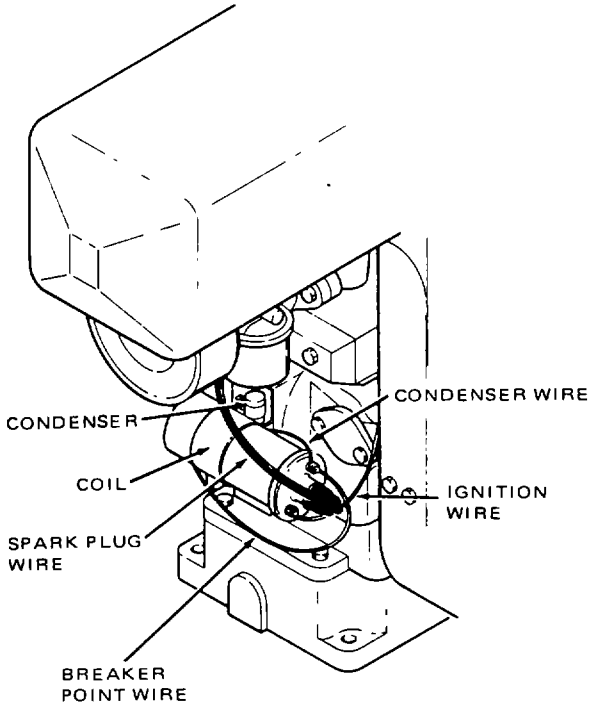


Figure 5-86. Engine Coil Location

a. Remove the condenser from the engine.

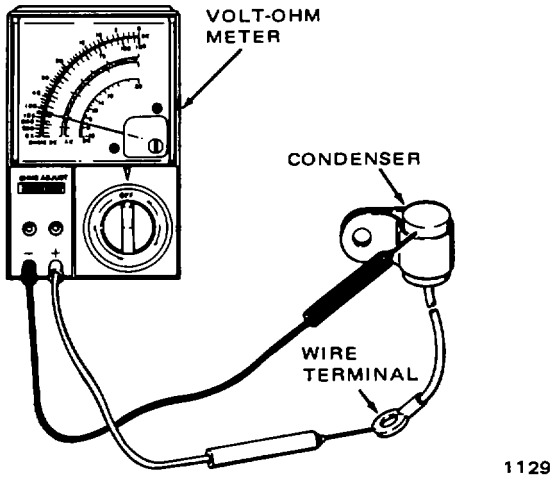


Figure 5-87. Condenser Test

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

THE ENGINE IS HARD TO START (Continued)

b. Set the meter to read high resistance.

c. Connect the negative (-) meter lead to the side of the condenser and the positive (+) meter lead to the wire terminal.

(1) If the meter reads below infinity, the condenser is ok. Go to Step 7.

(2) If the meter reads at infinity and remains there, replace the condenser. Go to Step 6e.

d. Tap the condenser lightly. If the meter fluctuates, there are loose connections inside the condenser.

(1) If there are no loose connections, go to Step 7.

(2) If there are loose connections, replace the condenser and go to Step 6e.

e. Start the engine.

(1) If the engine starts without trouble, the problem is solved.

(2) If the engine does not start, or if it is hard to start, go to Step 7.

Step 7. Check the continuity of the wires listed below. Use a volt-ohmmeter.

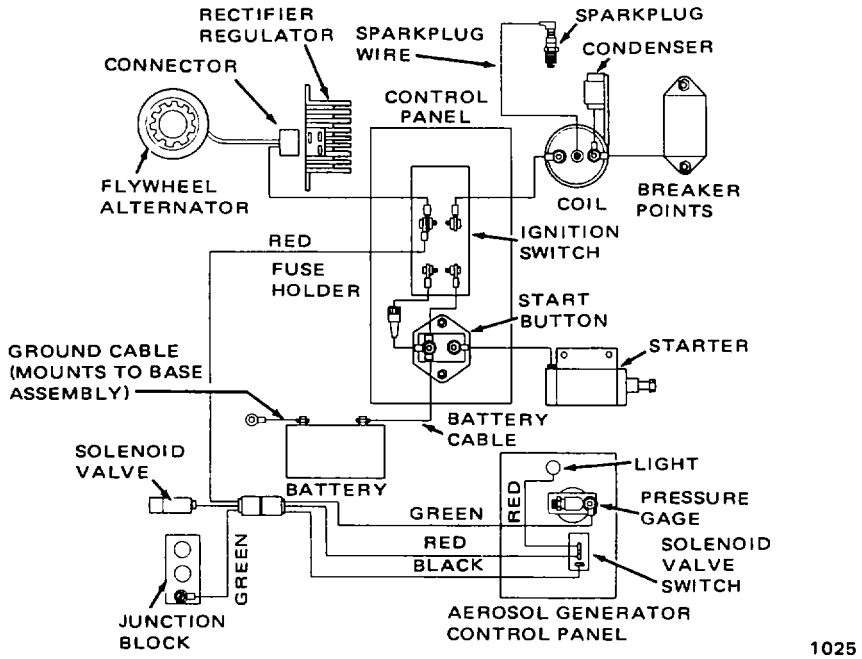


Figure 5-88. Aerosol Generator Wiring Diagram

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

THE ENGINE IS HARD TO START (Continued)

- Battery cables between the battery and the start button and the battery and the ground connection.
- Wires between the ignition switch and the coil, the points and the coil, and the condenser and the coil.
- Between the starter and the start button.
- Between the ignition switch and the start button.

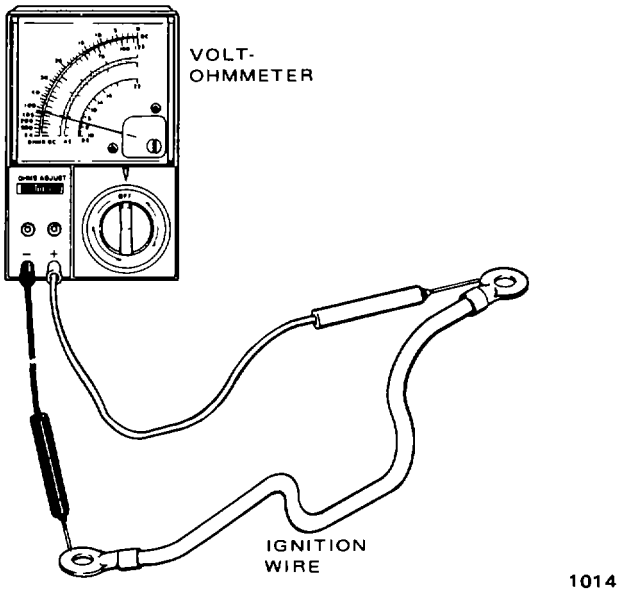


Figure 5-89. Ignition Wire Test

a. Remove the wire to be tested and connect a meter lead to each end of the wire.

(1) If the wire shows a current, it is ok. Go to Step 7a(3).

(2) If the wire does not show a current, replace it and go to Step 6b.

(3) Wiggle the wire back and forth. If the meter jumps up and down, replace the wire and go to Step 6b. If the meter stays steady, go to Step 7c.

b. Start the engine.

(1) If the engine starts without trouble, the problem is solved.

(2) If the engine does not start, or if it is hard to start, go to Step 7c.

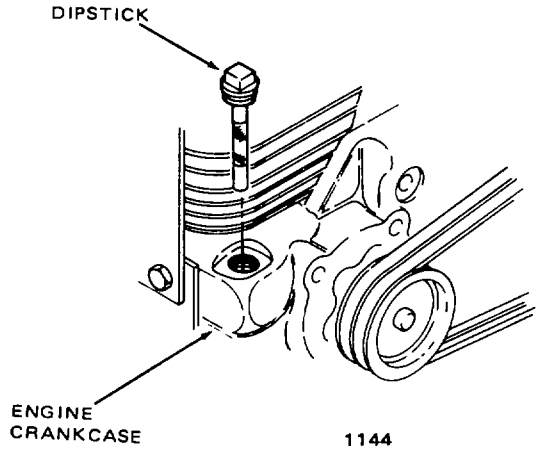
c. Check the cooling system. Symptom 10, Step 1.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

THE ENGINE IS HARD TO START (Continued)

Step 8. Check the crankcase vacuum. Use a vacuum gage.



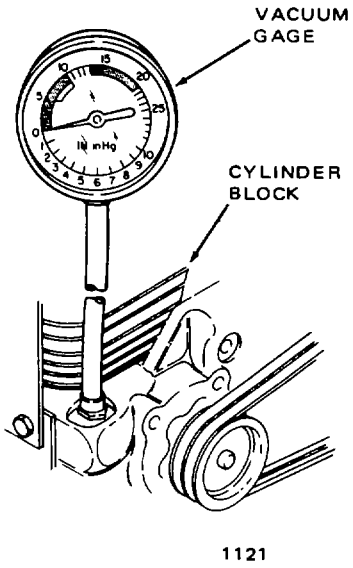


Figure 5-90. Installation of Vacuum Gage

NOTE

The engine must be running to check the crankcase vacuum.

a. Remove crankcase plug-dipstick.

b. Place vacuum gage in dipstick hole. Make sure it seals well.

c. Test the vacuum.

(1) If the vacuum is 1/2 inch to 1 inch (12.7 mm to 25.4 mm) of mercury, the engine is ok.

(2) If the vacuum is less than 1/2 inch (12.7 mm) of mercury, go to Step 9.

(3) If there is a positive pressure in the crankcase, go to Step 10.

Step 9. Check the crankcase breather assembly.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

THE ENGINE IS HARD TO START (Continued)

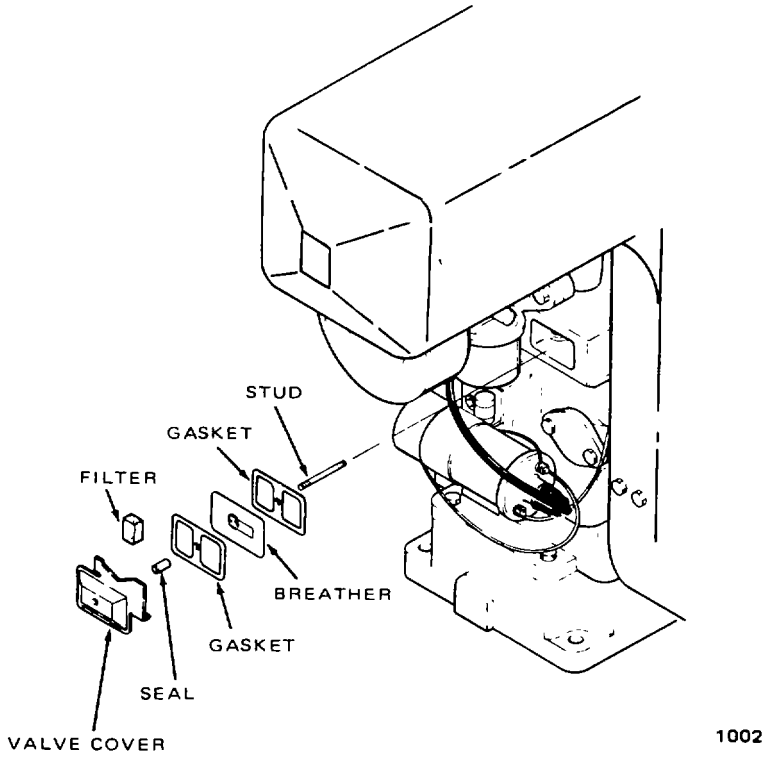


Figure 5-91. Engine Valve Cover

a. Remove the breather and clean it if necessary.

(1) Remove the valve cover retaining nut and the valve cover.

(2) Remove the breather seal and filter. If the filter is dirty and plugged, replace it.

(3) Remove the gaskets and breather.

(4) Replace the gaskets and clean all the other parts.

b. Reassemble the breather assembly and go to Step 8. Make sure the valve cover is securely tightened to prevent oil leaks.

Step 10. Check the engine compression.

NOTE

Because automatic compression release engines release compression at 600 rpm, there is a different compression test procedure for this engine.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

THE ENGINE IS HARD TO START (Continued)

a. Start the engine and run it for fifteen minutes.

b. Shut the engine OFF and remove the spark plug.

CAUTION

BE CAREFUL when removing the spark plug. Too much force can break the insulator.

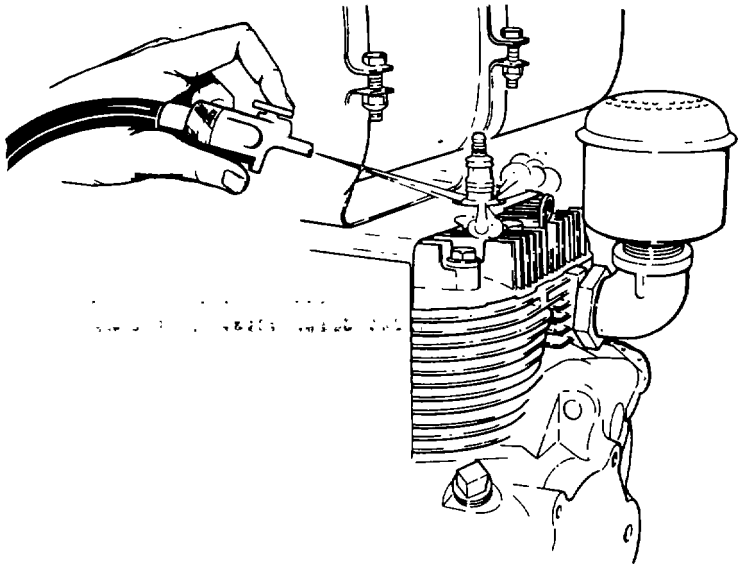


Figure 5-92. Spark Plug Cleaning

(1) Loosen the spark plug a few turns.

(2) Blow out the spark plug well with high pressure air. This will clean out any dirt or debris that can fall into the cylinder.

(3) Remove the spark plug by hand.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

THE ENGINE IS HARD TO START (Continued)

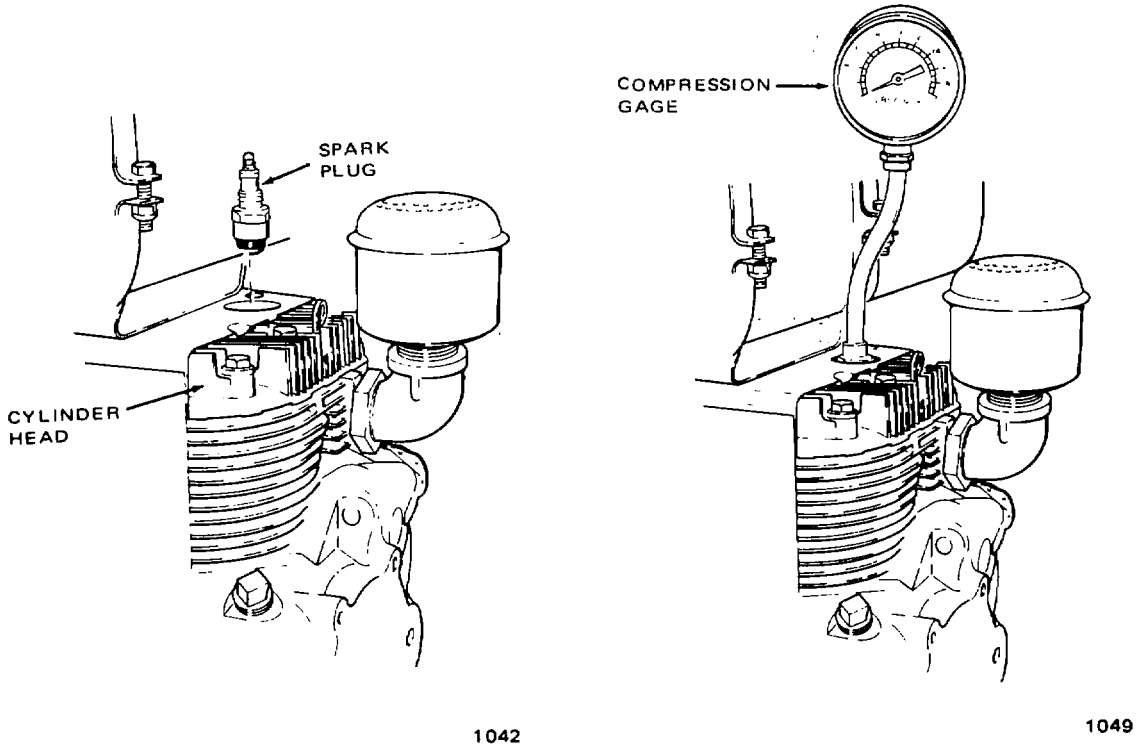


Figure 5-93. Installation of Compression Gage

c. Place a compression gage in the spark plug hole. Make sure it seals well.

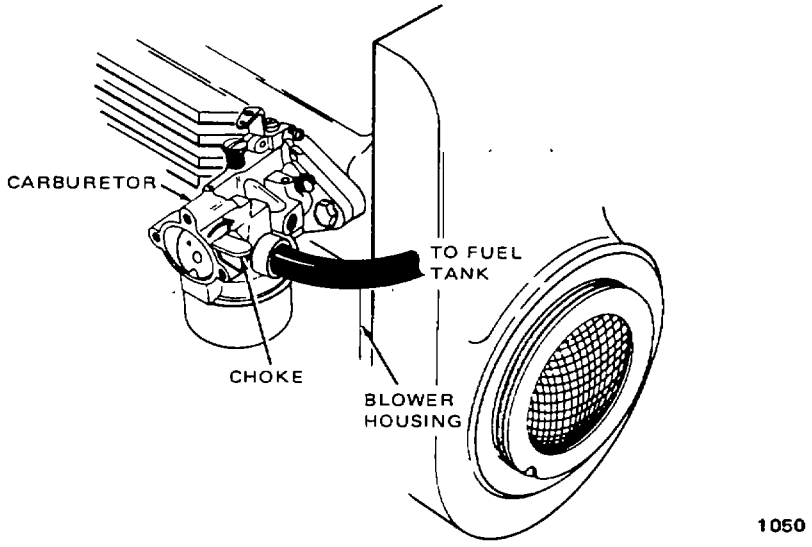


Figure 5-94. Choke Open Position

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

THE ENGINE IS HARD TO START (Continued)

d. Set the choke wide open. Remove the air cleaner if necessary.

e. Crank the engine by hand counterclockwise (left: opposite to normal rotation).

f. Take eight to ten compression readings.

(1) The first few turns of the engine, the compression may be as low as 30 psi. After the seventh turn, the compression should be 90 psi.

(2) If the compression is less than 90 psi, replace the engine.

5. ENGINE STOPS SUDDENLY

Step 1. Check the engine crankshaft. Push the start button.

a. If the engine turns over freely, go to Step 2.

b. If the engine struggles to turn over and sounds sluggish, go to Step 2.

c. If the engine makes a lot of noise like rubbing or rattling metal, replace it.

d. If the engine will not turn over and is frozen, replace the engine. Figure 5-95. Spark Test

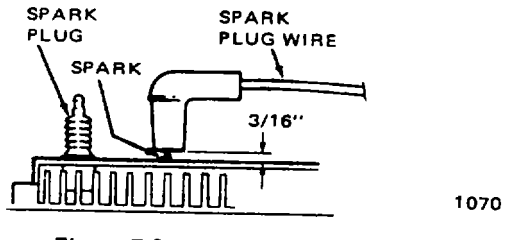


Figure 5-95. Spark Test

Step 2. Make sure there is spark to the spark plug.

a. Make sure the ignition switch is turned OFF.

b. Remove the spark plug wire from the spark plug.

c. Turn the ignition switch ON.

WARNING

DO NOT hold the spark plug wire in your bare hands while testing for spark. You can be severely shocked.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE STOPS SUDDENLY (Continued)

d. Hold the spark plug wire about 3/16 inch (4.762 mm) from a grounded engine part.

e. Crank the engine by hand. As the points open and close, a spark should jump between the spark plug wire and the engine.

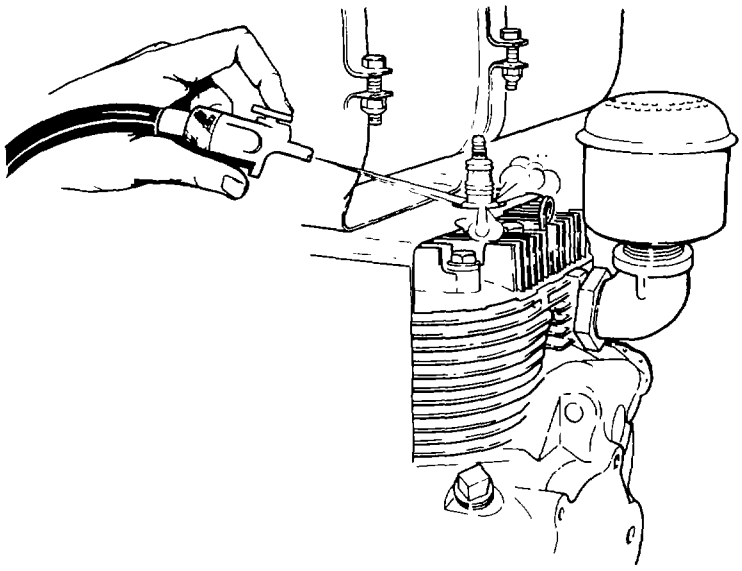
(1) If there is a bright blue spark, go to Step 4.

(2) If there is no spark or the spark is weak and yellow, go to Step 4.

Step 3. Check the spark plug.

CAUTION

BE CAREFUL when removing the spark plug from the engine. The insulator will break easily.



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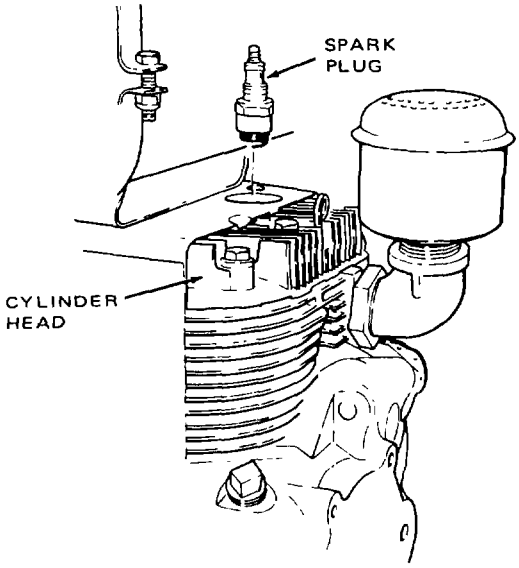

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Figure 5-96. Spark Plug Cleaning and Removal

a. Remove the spark plug.

(1) Loosen the spark plug a few turns.

(2) Blow high pressure air into the spark plug well. This will clean out any dirt or debris.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE STOPS SUDDENLY (Continued)

(3) Remove the spark plug by hand.

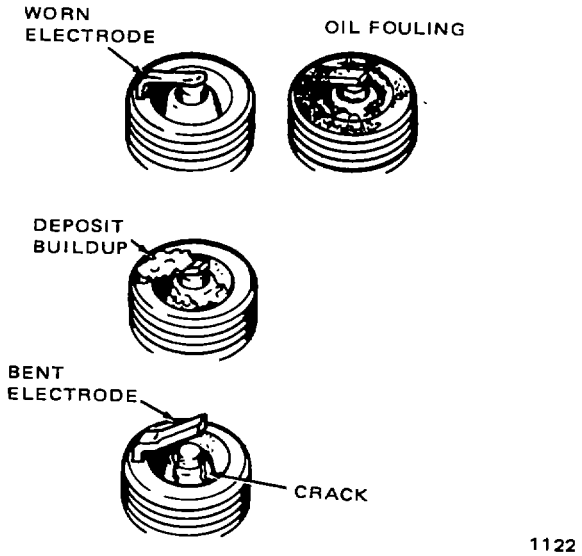


Figure 5-97. Spark Plug Defects

b. Check the spark plug visually. Replace it and go to Step 3, if there are:

(1) Cracks in the insulator.

(2) Electrodes worn so thin they cannot be regapped.

(3) Soft, wet, oily deposits covering the insulator and the plug nose.

(4) Build-up of deposits between insulator and the plug shell.

(5) Broken insulator or bent electrode.

NOTE

If the spark plug must be replaced, set the gap at 0.025 inches (0.64 mm).

Oil fouling is a sign of internal engine damage.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE STOPS SUDDENLY (Continued)

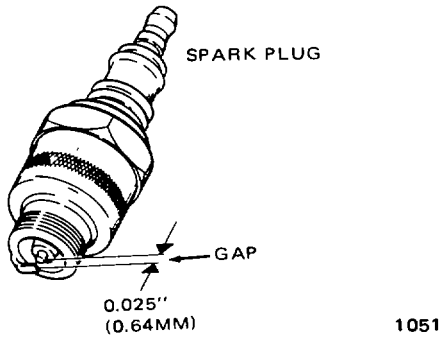


Figure 5-98. Spark Plug Gap

c. Check the spark plug gap.

(1) Reset the gap at 0.025 inches (0.64 mm) if necessary and go to Step 3d.

(2) If the gap is ok, go to Step 3d.

d. Check the spark plug for a spark.

(1) Connect the spark plug wire to the spark plug and set the plug on a grounded engine part.

(2) Turn the ignition switch ON.

(3) Crank the engine by hand. When the points open and close, a spark will jump between the spark plug electrodes.

(4) If there is a bright blue spark, go to Step 4.

(5) If there is no spark or the spark is weak and yellow, go to Step 4.

e. Crank the engine over. As the points open and close,

(1) If the engine starts, the problem is solved.

(2) If the engine does not start, go to Step 4.

Step 4. Check the spark plug wire.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE STOPS SUDDENLY (Continued)

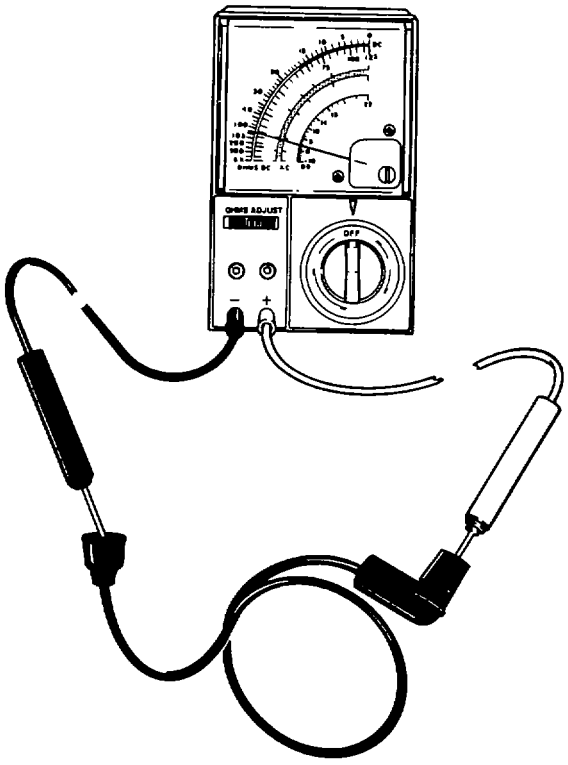


Figure 5-99. Spark Plug Wire Test

a. Remove the spark plug wire and test it with a volt-ohmmeter.

(1) Attach a meter lead to each end of the spark plug wire.

(2) If the meter reads below 40 k ohms (40,000), go to Step 5.

(3) If the meter reads steadily above 40 k ohms, replace the wire and go to Step 5b.

(4) Wiggle the wire back and forth. If the meter jumps up and down, there is a break in the wire. Replace the wire and go to Step 4b.

b. Start the engine.

(1) If the engine starts, the problem is solved.

(2) If the engine does not start, go to Step 5.

Step 5. Check the coil.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE STOPS SUDDENLY (Continued)

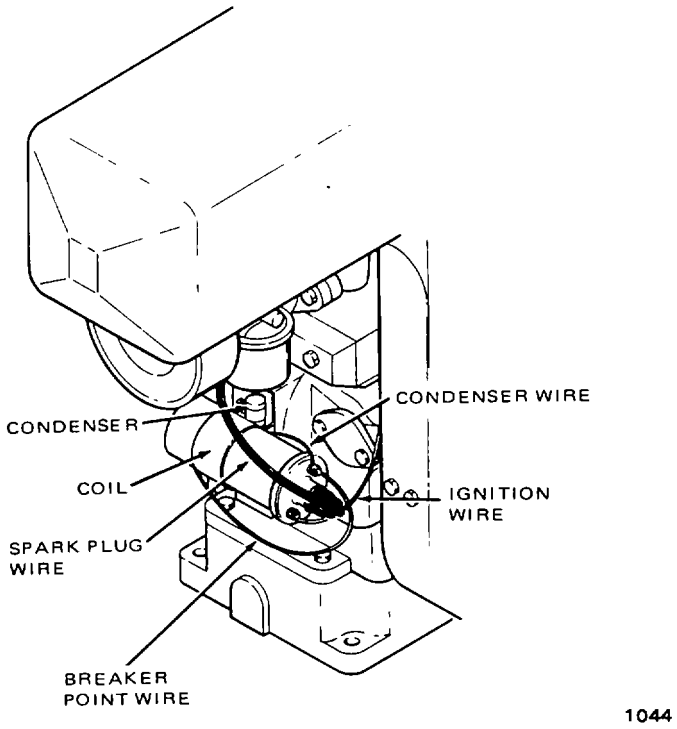


Figure 5-100. Engine Coil Location

a. Check the coil visually.

(1) If the coil is cracked or broken, replace it and go to Step 5e.

(2) Remove the spark plug wire from the coil and check the connections for moisture. If the connections are wet, dry them and return the wire to the coil. Go to Step 5e.

(3) If the coil is ok, go to Step 5b.

WARNING

DO NOT hold any ignition wires in your bare hands. You can be electrocuted. Use well insulated tools to hold the wires.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE STOPS SUDDENLY (Continued)

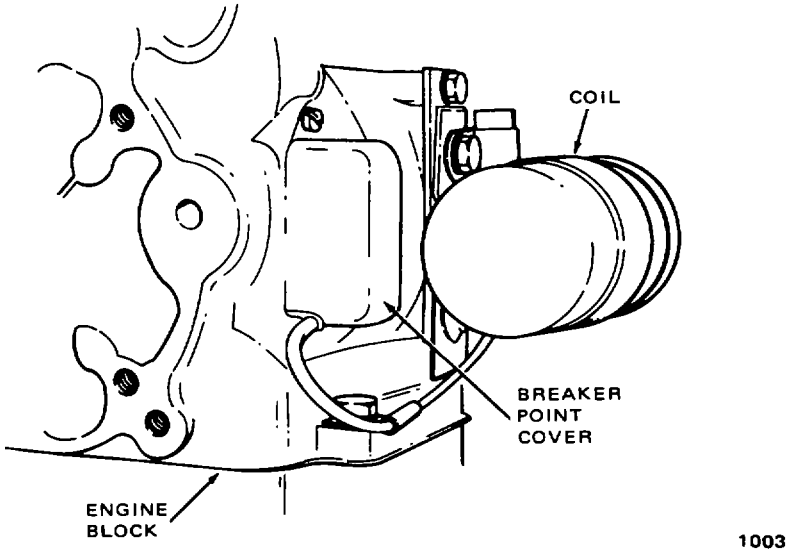


Figure 5-101. Breaker Point Cover

b. Check the secondary coil winding.

(1) Remove the breaker point cover and jam the point open with a piece of cardboard.

(2) Remove the spark plug wire from the spark plug.

(3) Turn the ignition switch ON.

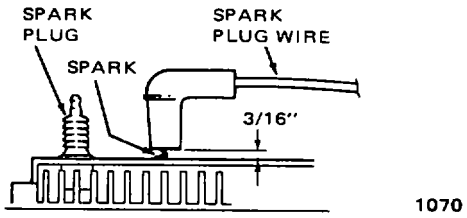


Figure 5-102. Spark Test

(4) Hold the end of the spark plug wire about 3/16 inch (4.76 mm) from a grounded part of the engine.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE STOPS SUDDENLY (Continued)

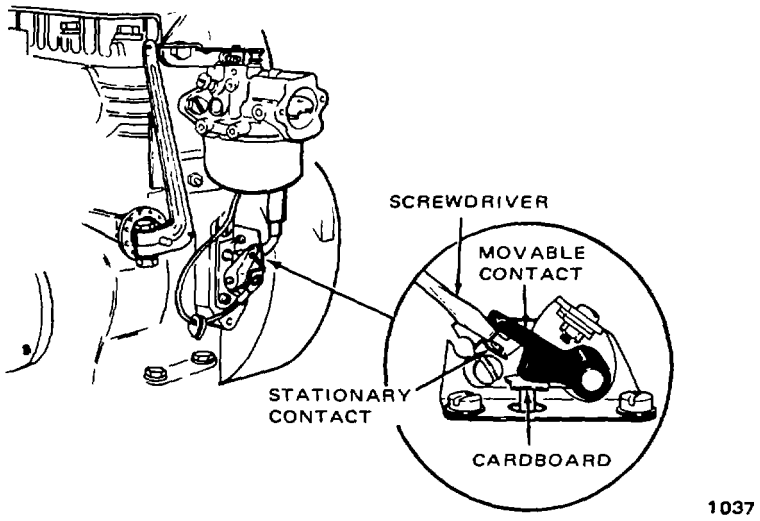


Figure 5-103. Breaker Points

(5) Hold a screwdriver point across the open breaker points.

(6) Remove the screwdriver from the breaker points.

(7) If a bright blue spark jumps between the wire and the engine, the coil is ok. Go to Step 6.

(8) If there is no spark or the spark is weak and yellow, the coil is weak. Replace it and go to Step 5e, if the condenser and the points check ok.

c. Coil Test I. Check the primary coil winding. Use a volt-ohmmeter.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE STOPS SUDDENLY (Continued)

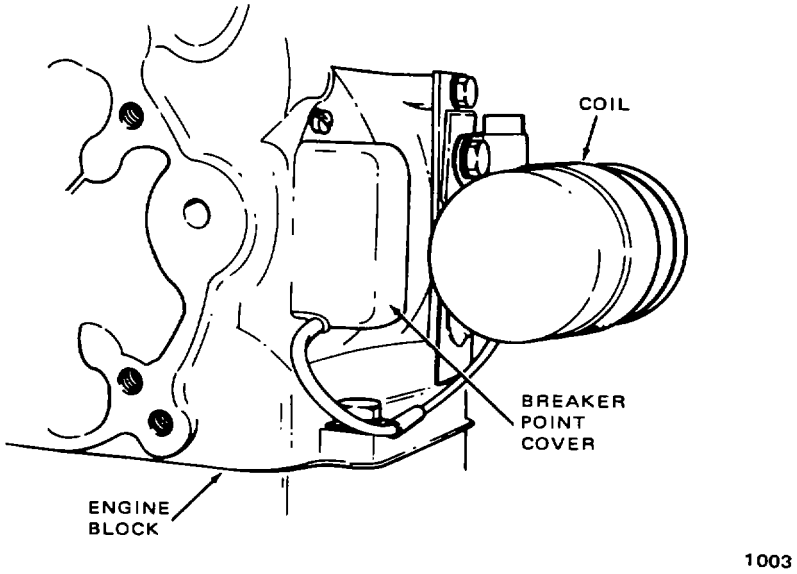


Figure 5-104. Breaker Point Cover

(1) Remove the breaker point cover and jam a piece of cardboard between the breaker points.

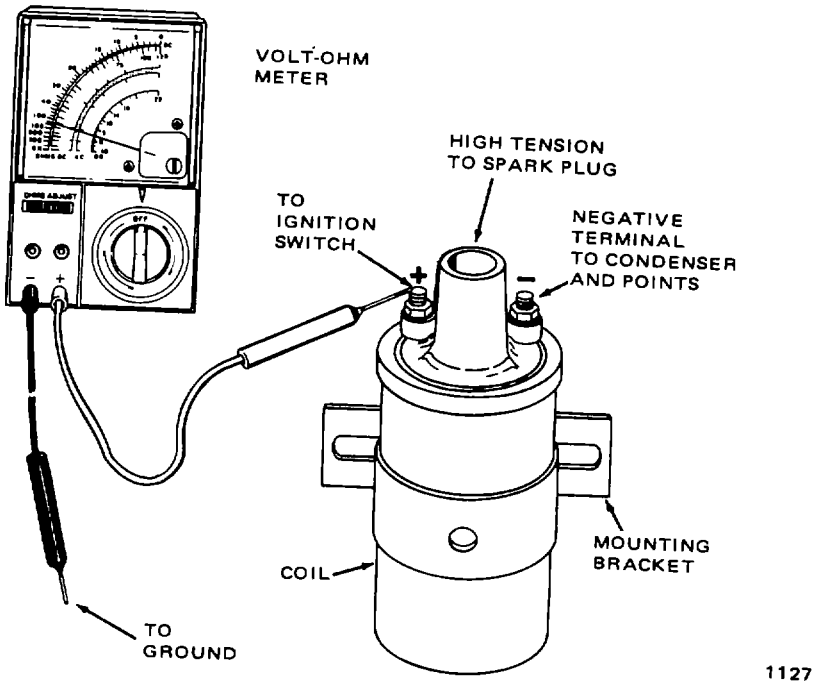


Figure 5-105. Coil Test I

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE STOPS SUDDENLY (Continued)

(2) Turn the ignition switch ON.

(3) Connect the negative (-) meter lead to a grounded part of the engine.

(4) Connect positive (+) meter lead to the battery (+) side of the coil. If the meter reads 11.5 to 12 volts, there is current to the coil. Go to Step 5c(5). If the meter reads 11.5 volts or less, there is poor current to the coil. Go to Step 5d.

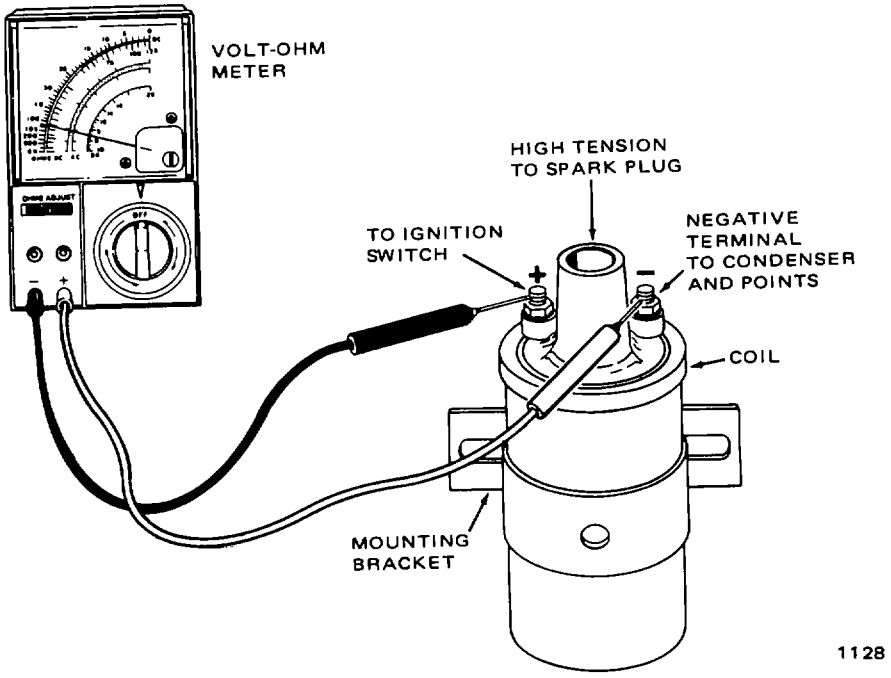


Figure 5-106. Coil Test II

(5) Coil Test II. Connect the positive (+) lead to the breaker points (-) side of the coil. If the meter reads 11.5 to 12 volts, the coil is ok. Go to Step 6. If the meter reads 11.5 volts or less, the coil is bad. Replace it and go to Step 5e, if the points and condenser check ok.

d. Check the wires between the coil and the ignition switch and the coil and the points. Use a volt-ohmmeter.

(1) Remove the ignition wire from the ignition switch and the coil.

(2) Connect a meter lead to each end of the wire and check the continuity.

(3) Wiggle the wire back and forth. If the meter does not register a current, replace it and go to Step 5e. If the meter does register a current, go to Step 6.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE STOPS SUDDENLY (Continued)

(4) Remove the breaker point wire from the points and the coil.

(5) Connect a meter lead to each end of the wire and check for continuity.

(6) Wiggle the wire back and forth. If the meter does not register a current, replace and go to Step 5e. If the meter does register a current, go to Step 6.

e. Start the engine.

(1) If the engine starts, the problem is solved.

(2) If the engine does not start, go to Step 6.

Step 6. Check the breaker points.

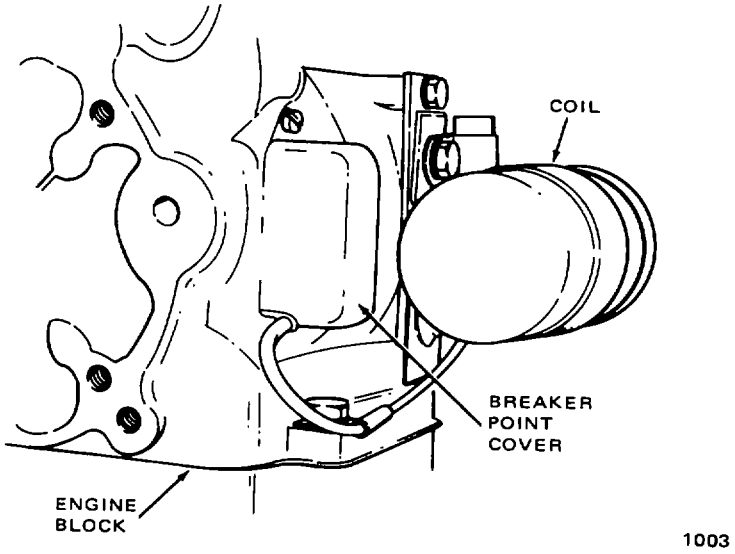


Figure 5-107. Breaker Point Cover

a. Remove the breaker point cover.

b. Open the points with a screwdriver and inspect them. If they are pitted, burned, or badly oxidized, replace them and go to Step 6c.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE STOPS SUDDENLY (Continued)

c. Check the breaker point gap.

(1) Shut the ignition switch OFF.

(2) Crank the engine by hand until the points are open to their widest gap.

(3) If the gap is 0.020 inches (0.52 mm) the gap is ok. Go to Step 7.

(4) If the gap is greater than or less than 0.020 inches (0.52 mm) go to Step 6d.

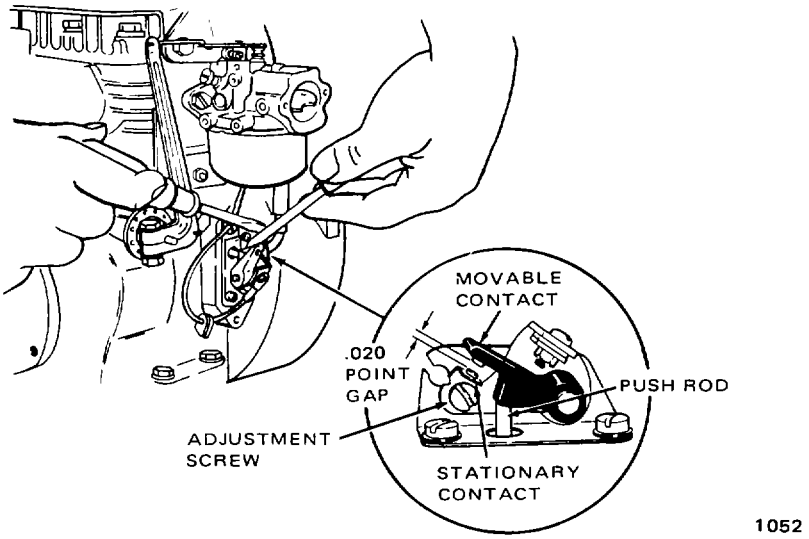


Figure 5-108. Gapping Breaker Points

d. Reset the breaker point gap.

(1) Rotate the engine by hand until the breaker points reach their greatest gap.

(2) Loosen the point gap adjustment screw and place an 0.020 inch (0.52 mm) feeler gage between the points.

(3) Tighten the adjusting screws after setting the gap.

(4) Replace the breaker point cover and go to Step 6e.

e. Start the engine.

(1) If the engine starts, the problem is solved.

(2) If the engine does not start, go to Step 7.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE STOPS SUDDENLY (Continued)

Step 7. Check the condenser. Use a volt-ohmmeter.

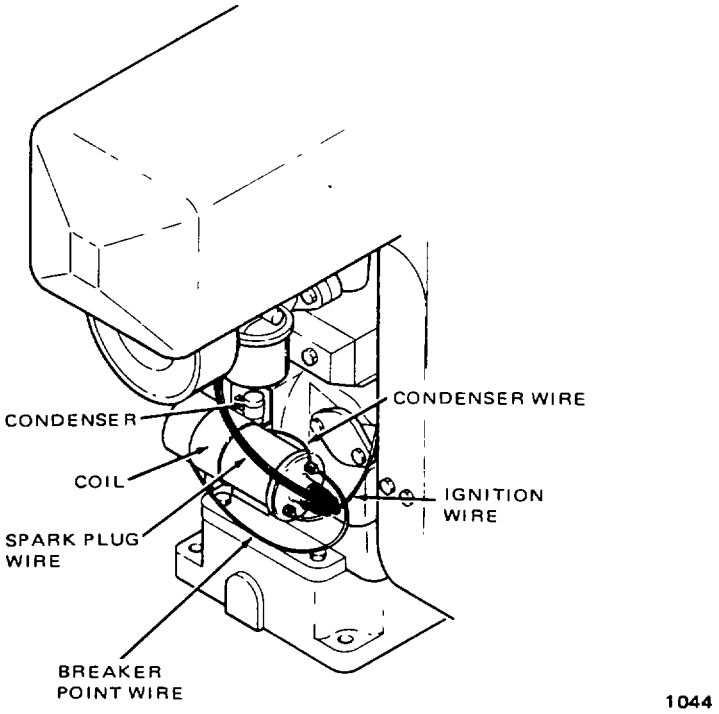


Figure 5-109. Engine Coil Position

a. Remove the condenser from the engine.

b. Set the meter to read high resistance.

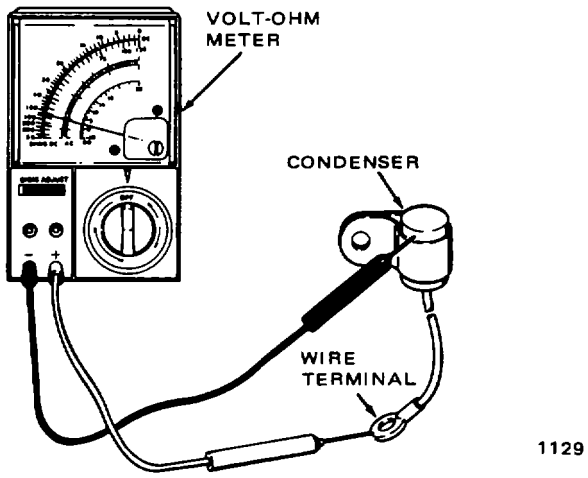


Figure 5-110. Condenser Test

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE STOPS SUDDENLY (Continued)

c. Connect the negative (-) meter lead to the side of the condenser and the positive (+) meter lead to the wire terminal.

(1) If the meter reads below infinity, the condenser is ok. Go to Step 9.

(2) If the meter reads at infinity and remains there, replace the condenser. Go to Step 8e.

d. Tap the condenser lightly. If the meter fluctuates, there are loose connections inside the condenser.

(1) If there are no loose connections, go to Step 9.

(2) If there are loose connections, replace the condenser and go to Step 8e.

e. Start the engine.

(1) If the engine starts, the problem is solved.

(2) If the engine does not start, go to Step 8.

Step 8. Check the fuel valve and fuel line.

WARNING

BE ALERT to disconnect the ground cable from the battery before performing maintenance on the fuel tank assembly. Spilled gasoline will be ignited by a spark.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE STOPS SUDDENLY (Continued)

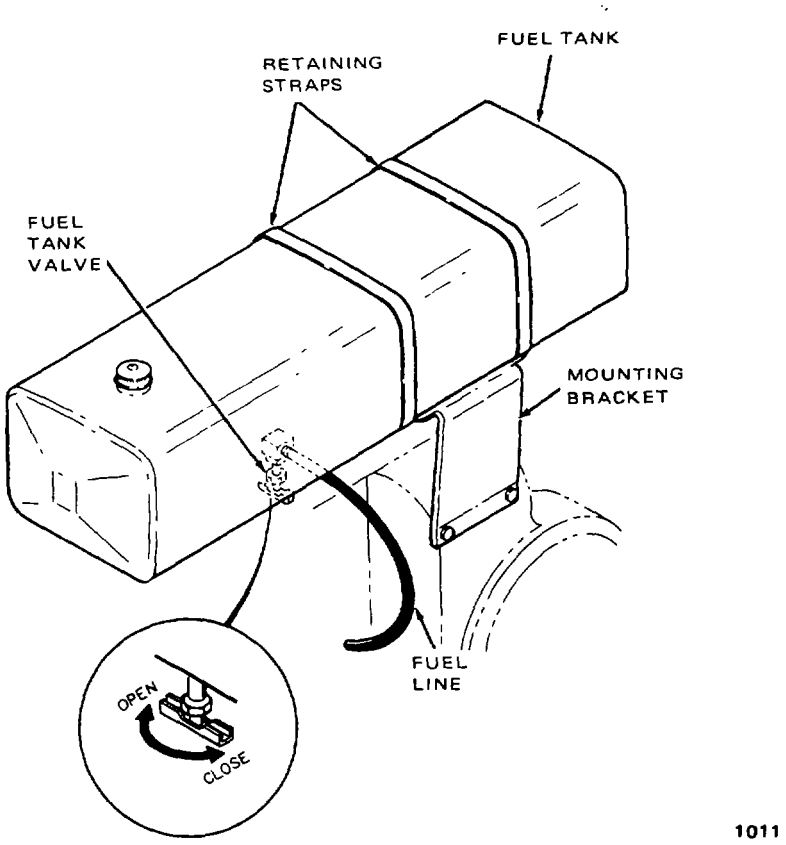


Figure 5-111. Fuel Tank Valve

a. Drain the fuel tank.

(1) Close the fuel tank valve if possible.

(2) Pinch the hose with the forefinger and thumb and disconnect the fuel line from the carburetor.

(3) Open the valve and drain the gasoline into a container.

(4) If gasoline drains thru the fuel tank valve, go to Step 9.

(5) If gasoline does not drain thru the valve, go to Step 8b.

b. Remove the valve from the fuel tank and check it for plugging.

(1) Remove the fuel line from the valve.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE STOPS SUDDENLY (Continued)

(2) Remove the valve from the tank.

(3) Check the valve for plugging or jamming. If the valve is plugged, blow high pressure air through the valve to unplug it. If the valve is jammed, unjam it.

(4) If the valve can be repaired, repair it and return it to the tank. Go to Step 8c.

(5) If the valve cannot be repaired, replace it and go to Step 8c.

c. Check the fuel line.

(1) If the fuel line is ok, return it to the valve and carburetor. Go to Step 9.

(2) If the fuel line is plugged, unplug it and return it to the valve and carburetor. Go to Step 8d.

(3) If the fuel line is cut or cracked, replace it and go to Step 8d.

d. Start the engine.

(1) If the engine starts, the problem is solved.

(2) If the engine does not start, go to Step 9.

Step 9. Check the carburetor.

CAUTION

BE CAREFUL not to use force when turning the needle valves in and out. Force can damage the valves.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE STOPS SUDDENLY (Continued)

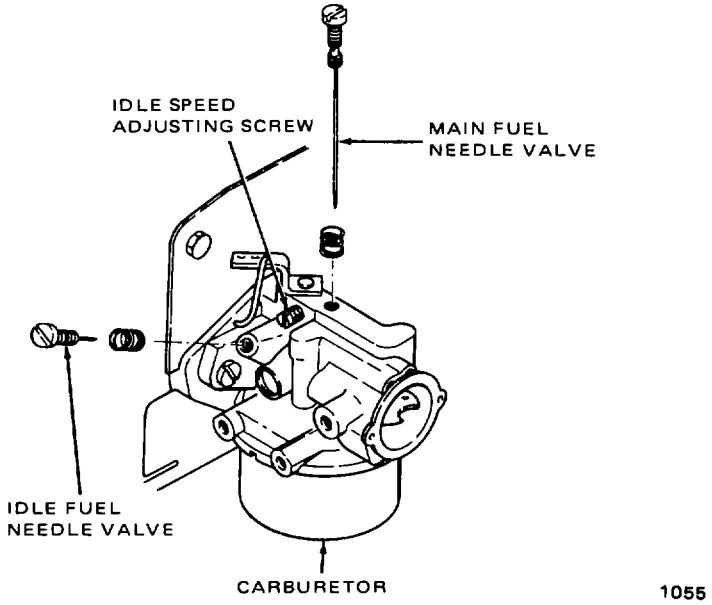


Figure 5-112. Carburetor Needle Valve Removal

a. Remove the main fuel needle valve and idle fuel needle valve and check them for damage and plugging.

(1) If the needle valves are ok, go to Step 9d.

CAUTION

DO NOT use hard metal objects to unplug the needle valves. Hard metal objects will damage them.

(2) If the needles are plugged or gummed up, rinse them in alcohol or acetone and return them to the carburetor. Go to Step 9b.

(3) If the needles are damaged and cannot be repaired, replace them and go to Step 9b.

b. Adjust the needle valves.

(1) Turn both needle valves all the way to the right (clockwise) until they gently touch bottom.

(2) Turn the main fuel needle valve to the left (counterclockwise) two full turns.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE STOPS SUDDENLY (Continued)

(3) Turn the idle needle valve to the left (counterclockwise) 1-1/4 turns.

(4) Go to Step 9c.

c. Remove the carburetor from the engine.

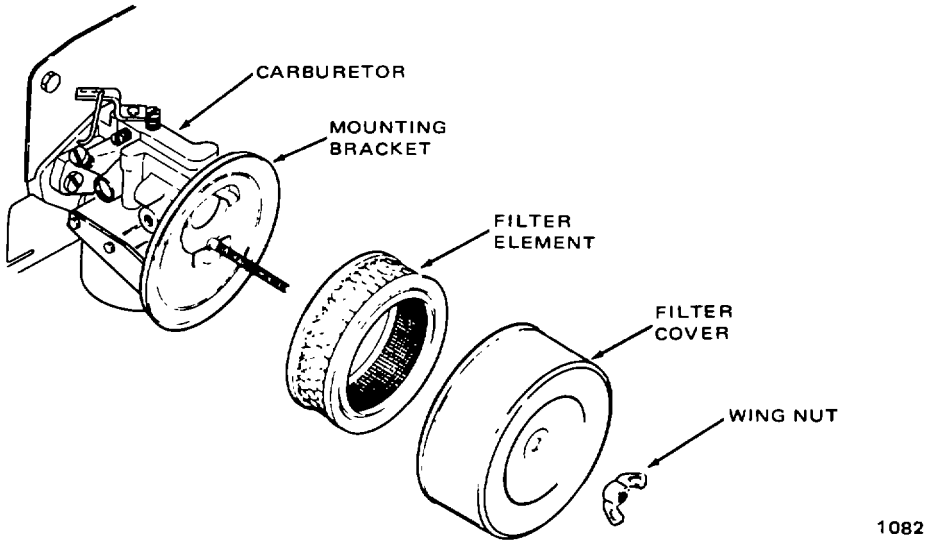


Figure 5-113. Air Cleaner

(1) Remove the air cleaner and air cleaner bracket.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE STOPS SUDDENLY (Continued)

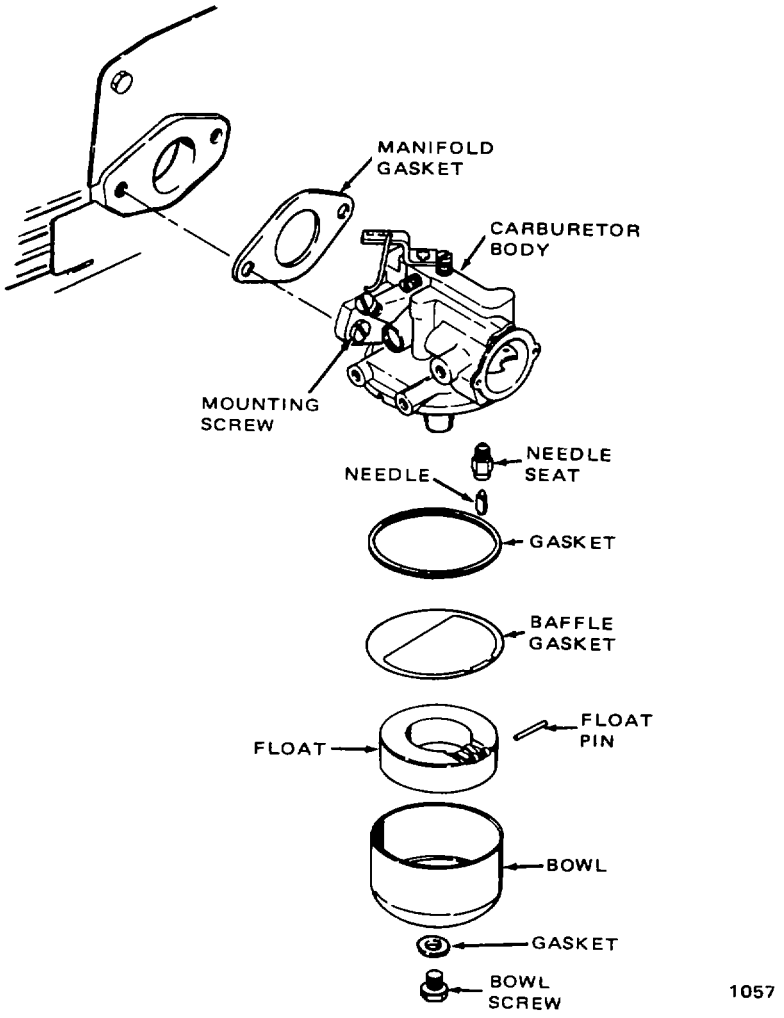


Figure 5-114. Carburetor Disassembly

(2) Disconnect the throttle linkage and remove the carburetor from the engine.

NOTE

To remove the carburetor from the engine it is necessary to loosen one mounting screw, then the other. Pull the carburetor away from the engine and loosen each screw again. Repeat this procedure until the carburetor can be removed from the engine.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE STOPS SUDDENLY (Continued)

(3) Inspect the carburetor to manifold gasket. If it is cracked, broken or damaged, replace it and go to Step lid.

d. Disassemble the carburetor and make sure gasoline is getting to the carburetor.

(1) Remove the bowl screw, gasket and bowl and baffle gasket.

(2) Remove the float pin, float needle and needle seat. If the float is dented or has pin holes, replace it. If the float leaks or is worn, replace it.

(3) Check the needle and seat for damage. If they are cut or scratched, replace them.

CAUTION

DO NOT use hard metal objects or tools to clean the inlet port. Use something soft like a toothpick and flush the port with alcohol or acetone.

(4) Unplug the inlet port if necessary.

(5) If the choke is worn or damaged, replace the whole carburetor and go to Step 9b.

(6) Unplug the inlet port if necessary and go to Step 9e.

e. Assemble the carburetor.

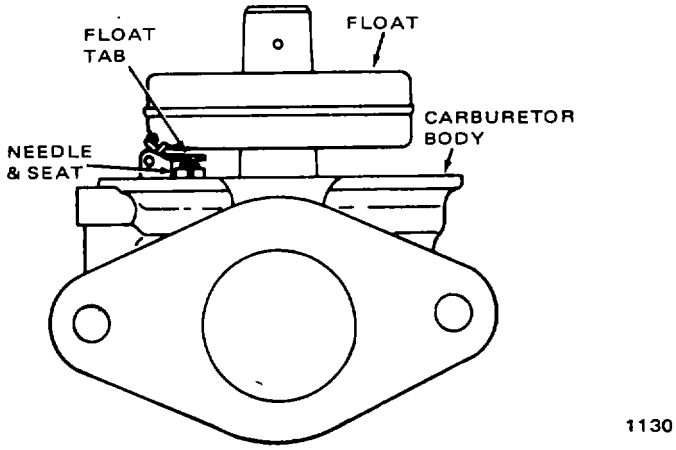


Figure 5-115. Carburetor Float Adjustment

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

ENGINE STOPS SUDDENLY (Continued)

(1) Install the seat needle float and pin.

(2) Set the float level. Turn the carburetor upside down and let the float rest on the needle. The clearance between the machined surface of the carburetor and the free end of the float should be 0.17 inches ± 0.03 inches (4.32 mm ± 0.76 mm).

(3) Adjust the clearance by bending the float tab with a screwdriver if necessary.

(4) Install a new baffle gasket, a new bowl gasket, the fuel bowl, fuel bowl screw and gasket. Make sure the bowl gasket seats well.

(5) Return the carburetor to the engine and go to Step 9f. Make sure the carburetor to manifold gasket seals well.

f. Start the engine. If the engine starts, the problem is solved. Go to Step 9g.

g. Adjust the carburetor while the engine is running.

(1) Turn the main fuel needle valve to the right (clockwise) until the engine slows down.

(2) Turn the main fuel needle valve back to the left (counterclockwise) until the engine slows down.

(3) Turn the main fuel needle valve back to the right to a position halfway between the slow-down points.

6. ENGINE LACKS POWER

Step 1. Remove the carburetor adjusting needle valves. Inspect them for dirt and damage.

CAUTION

BE CAREFUL not to use force when turning the needle valves in and out. Force can damage the valves.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE LACKS POWER (Continued)

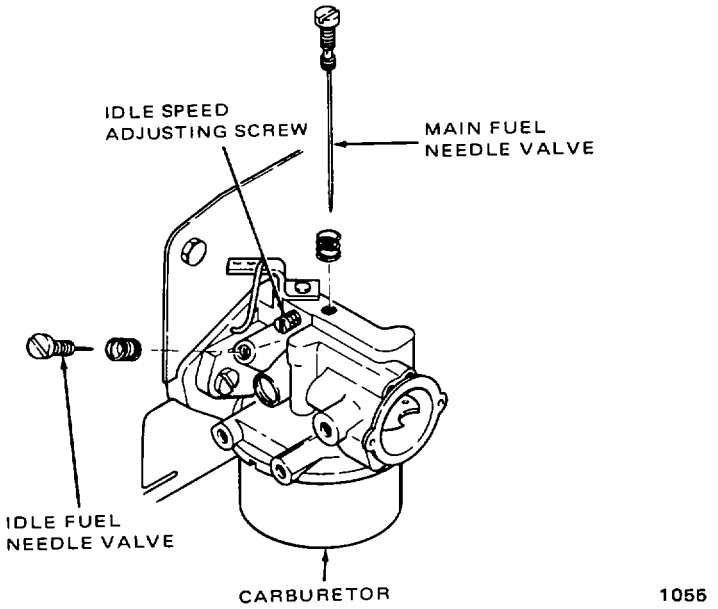


Figure 5-116. Carburetor Needle Valve Removal

a. Remove the main fuel needle valve and idle fuel needle valve and check them for damage and plugging.

(1) If the needle valves are okay, go to Step 1d.

CAUTION

DO NOT use hard metal objects to unplug the needle valves. Hard metal objects will damage them.

(2) If the needles are plugged or gummed up, rinse them in alcohol or acetone and return them to the carburetor. Go to Step 1b.

(3) If the needles are damaged and cannot be repaired, replace them and go to Step 1b.

b. Adjust the needle valves.

(1) Turn both needle valves all the way to the right (clockwise) until they gently touch bottom.

(2) Turn the main fuel needle valve to the left (counterclockwise) two full turns.

(3) Turn the idle needle valve to the left (counterclockwise) 1-1/4 turns.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE LACKS POWER (Continued)

(4) Go to Step 1c.

c. Remove the carburetor from the engine.

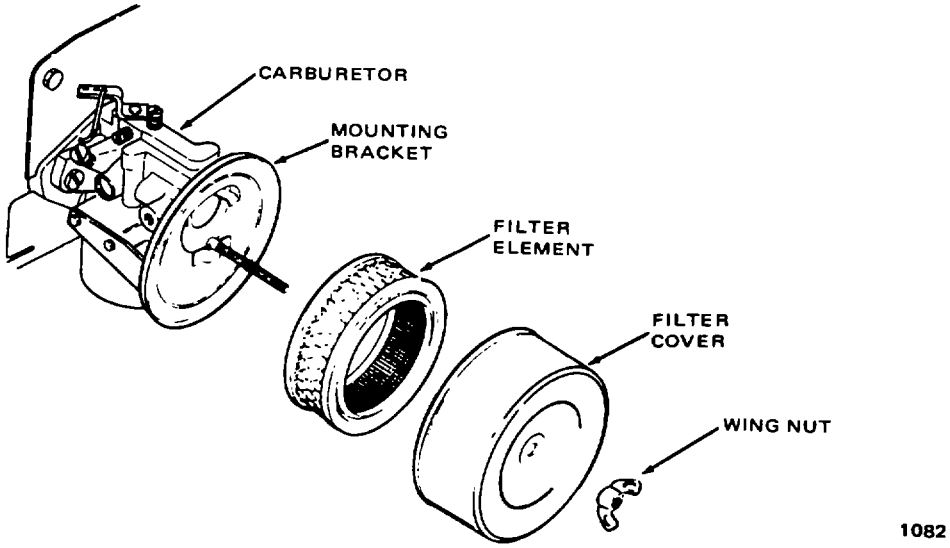


Figure 5-117. Air Filter Assembly

(1) Remove the air cleaner and air cleaner bracket.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE LACKS POWER (Continued)

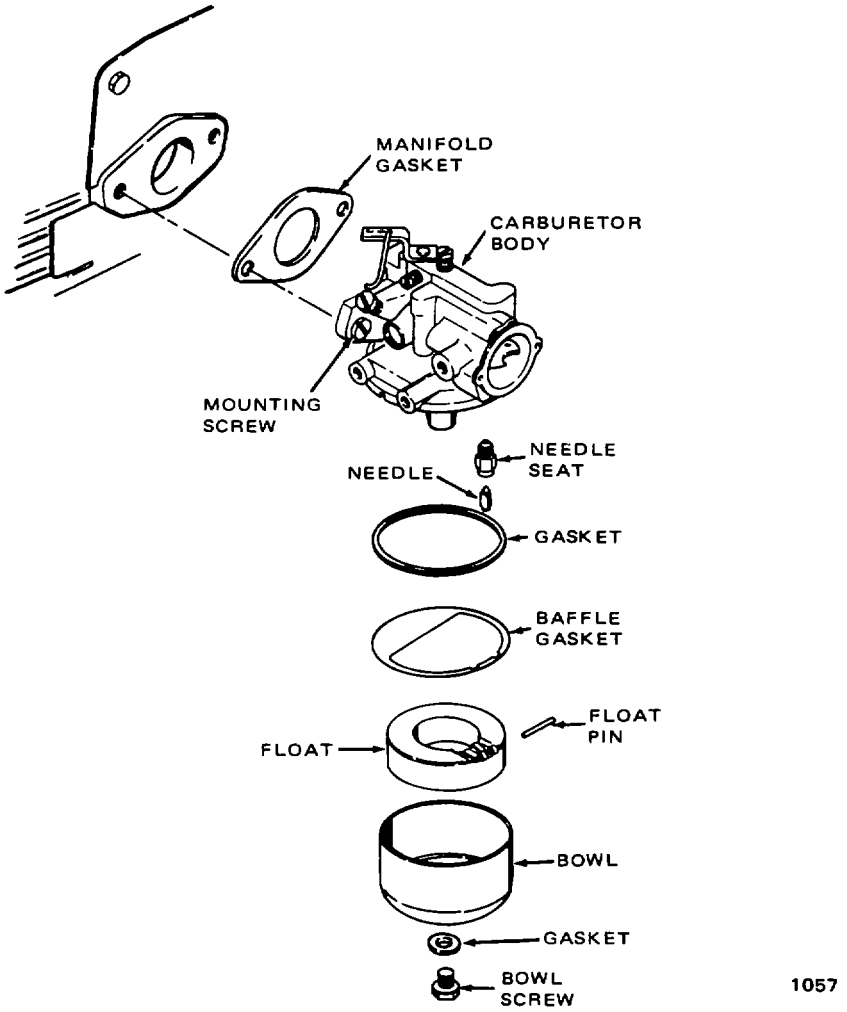


Figure 5-118. Carburetor Disassembly

(2) Disconnect the throttle linkage and remove the carburetor from the engine.

NOTE

To remove the carburetor from the engine it is necessary to loosen one mounting screw, then the other. Pull the carburetor away from the engine and loosen each screw again. Repeat this procedure until the carburetor can be removed from the engine.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

ENGINE LACKS POWER (Continued)

(3) Inspect the carburetor to manifold gasket. If it is cracked, broken, or damaged, replace it and go to Step 1d.

d. Disassemble the carburetor and make sure gasoline is getting to the carburetor.

(1) Remove the bowl screw, gasket and bowl, and baffle gasket.

(2) Remove the float pin, float needle and needle seat. If the float is dented or has pin holes, replace it. If the float leaks or is worn, replace it.

(3) Check the needle and seat for damage. If they are cut or scratched, replace them.

CAUTION

DO NOT use hard metal objects or tools to clean the inlet port. Use something soft like a toothpick and flush the port with alcohol or acetone.

(4) Unplug the inlet port if necessary.

(5) If the choke is worn or damaged, replace the whole carburetor and go to Step 1b.

(6) Unplug the inlet port if necessary and go to Step 1e.

e. Assemble the carburetor.

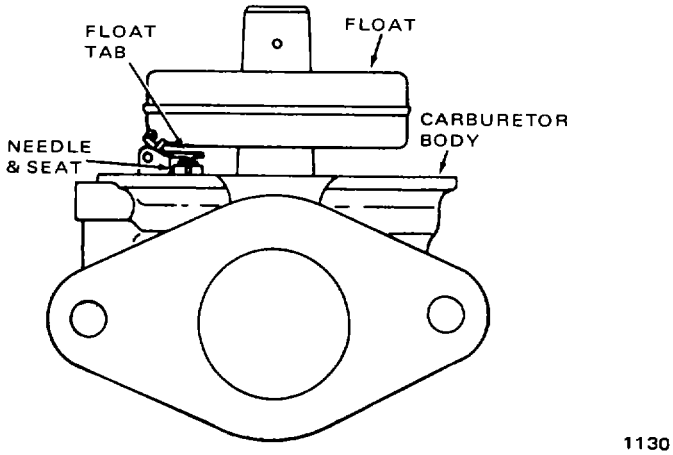


Figure 5-119. Carburetor Float Adjustment

(1) Install the seat needle float and pin.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE LACKS POWER (Continued)

(2) Set the float level. Turn the carburetor upside down and let the float rest on the needle. The clearance between the machined surface of the carburetor and the free end of the float should be 0.17 inches ± 0.03 inches (4.32 mm ± 0.76 mm).

(3) Adjust the clearance by bending the float tab with a screwdriver if necessary.

(4) Install a new baffle gasket, a new bowl gasket, the fuel bowl and fuel bowl screw and gasket. Make sure the bowl gasket seats well.

(5) Return the carburetor to the engine and go to Step 1f. Make sure the carburetor to manifold gasket seals well.

f. Start the engine.

(1) If the engine starts, the problem is solved. Go to Step 1g.

(2) If the engine does not start, go to Step 2.

g. Adjust the carburetor while the engine is running.

(1) Turn the main fuel needle valve to the right (clockwise) until the engine slows down.

(2) Turn the main fuel needle valve back to the left (counterclockwise) until the engine slows down.

(3) Turn the main fuel needle valve back to the right to a position halfway between the slow down points.

h. Readjust the carburetor adjusting needle valves.

(1) Turn the main fuel adjusting needle all the way in to gently touch bottom. Then turn it out two full turns.

i. Start the engine.

(1) If the engine runs correctly, the problem is solved.

(2) If the engine still lacks power, go to Step 2.

Step 2. Check the breaker points.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE LACKS POWER (Continued)

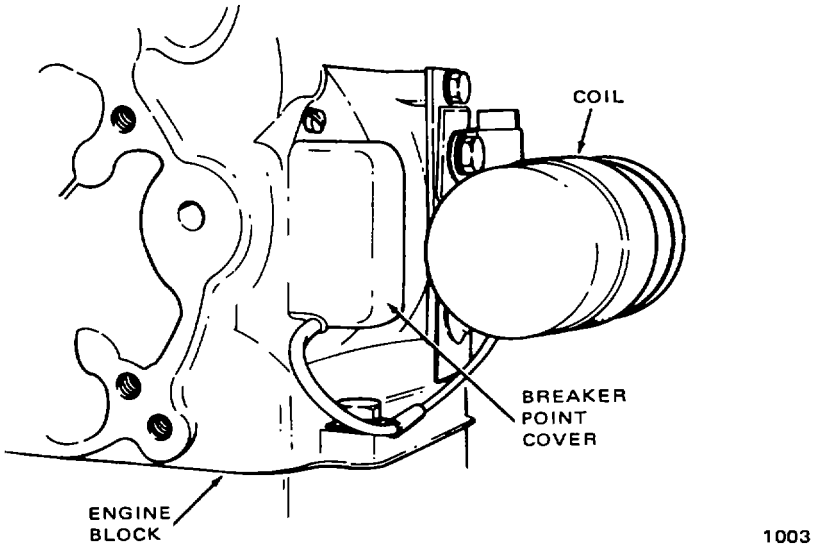


Figure 5-120. Breaker Point Cover

a. Remove the breaker point cover.

b. Open the points with a screwdriver and inspect them. If they are pitted, burned, or badly oxidized, replace them and go to Step 2c.

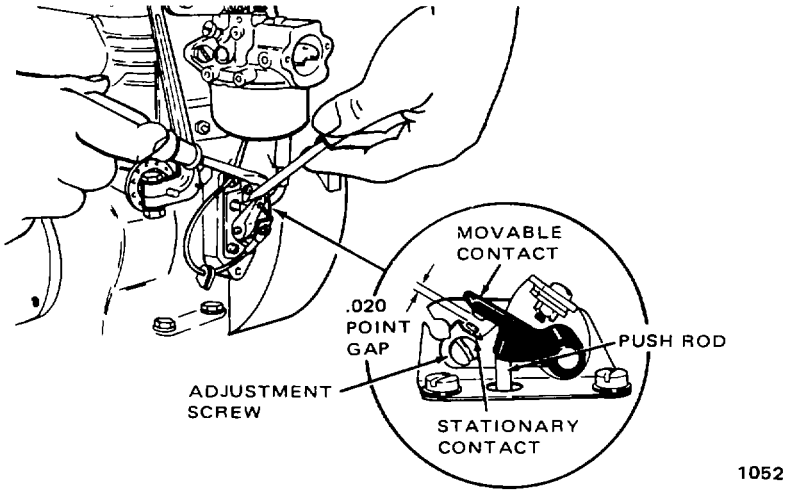


Figure 5-121. Gapping Breaker Points

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE LACKS POWER (Continued)

c. Check the breaker point gap.

(1) Shut the ignition switch OFF.

(2) Crank the engine by hand until the points are open to their widest gap.

(3) If the gap is 0.020 inches (0.52 mm) the gap is ok. Go to Step 3.

(4) If the gap is greater than or less than 0.020 inches (0.52 mm) go to Step 2d.

d. Reset the breaker point gap.

(1) Rotate the engine by hand until the breaker points reach their greatest gap.

(2) Loosen the point gap adjustment screw and place an 0.020 inch (0.52 mm) feeler gage between the points.

(3) Tighten the adjusting screw after setting the gap.

(4) Replace the breaker point cover and go to Step 2e.

e. Start the engine.

(1) If the engine starts, the problem is solved.

(2) If the engine does not start, go to Step 3.

Step 3. Check the condenser. Use a volt-ohmmeter.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

ENGINE LACKS POWER (Continued)

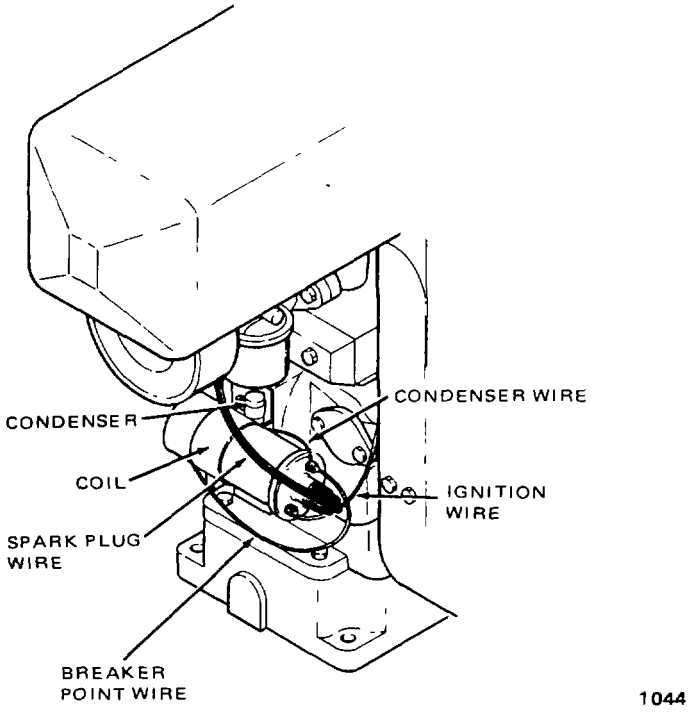


Figure 5-122. Engine Coil Location

a. Remove the condenser from the engine.

b. Set the meter to read high resistance.

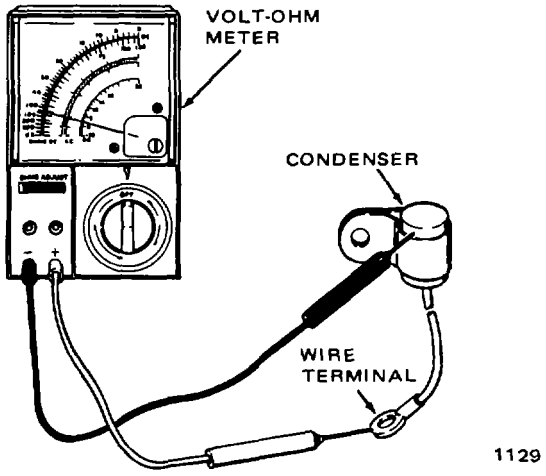


Figure 5-123. Condenser Test

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE LACKS POWER (Continued)

c. Connect the negative (-) meter lead to the side of the condenser and the positive (+) meter lead to the wire terminal.

(1) If the meter reads below infinity, the condenser is ok. Go to Step 4.

(2) If the meter reads at infinity and remains there, replace the condenser. Go to Step 3e.

d. Tap the condenser lightly. If the meter fluctuates, there are loose connections inside the condenser.

(1) If there are no loose connections, go to Step 4.

(2) If there are loose connections, replace the condenser and go to Step 3e.

e. Start the engine.

(1) If the engine starts, the problem is solved.

(2) If the engine does not start, go to Step 4.

Step 4. Check the ignition switch.

a. Turn the ignition switch ON.

b. Turn the cab control panel light ON.

(1) If the light comes on, the ignition switch is ok. Go to Step 5.

(2) If the light does not come on, go to Step 4c.

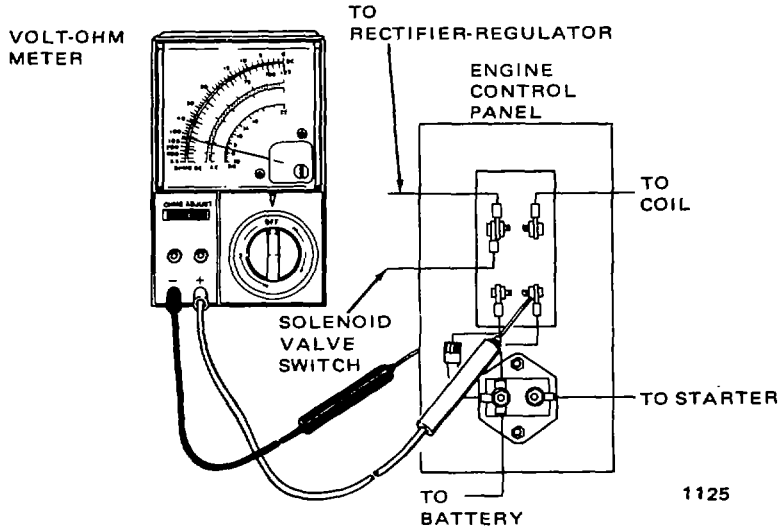


Figure 5-124. Engine Control Panel Test

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE LACKS POWER (Continued)

c. Check the switch with a volt-ohmmeter. Place the positive probe (+) on the battery side of the switch and the negative probe on the engine side of the switch.

(1) If the switch is ok, go to Step 5.

(2) If the switch is not ok, replace it and go to Step 4a.

Step 5. Make sure there is spark to the spark plug.

a. Make sure the ignition switch is turned OFF.

b. Remove the spark plug wire from the spark plug.

c. Turn the ignition switch ON.

WARNING

DO NOT hold the spark plug wire in your bare hands while testing for spark. You can be severely shocked.

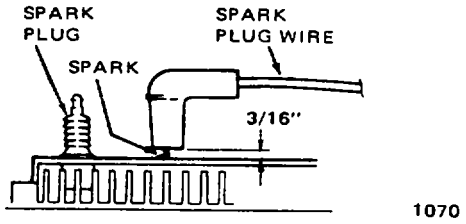


Figure 5-125. Spark Test

d. Hold the spark plug wire about 3/16 inch (4.76 mm) from a grounded engine part.

e. Crank the engine over. As the points open and close, a spark should jump between the spark plug wire and the engine.

(1) If there is a bright blue spark, go to Step 6.

(2) If there is no spark or the spark is weak and yellow, go to Step 7.

Step 6. Check the spark plug.

CAUTION

BE CAREFUL when removing the spark plug from the engine. The insulator will break easily.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE LACKS POWER (Continued)

a. Remove the spark plug.

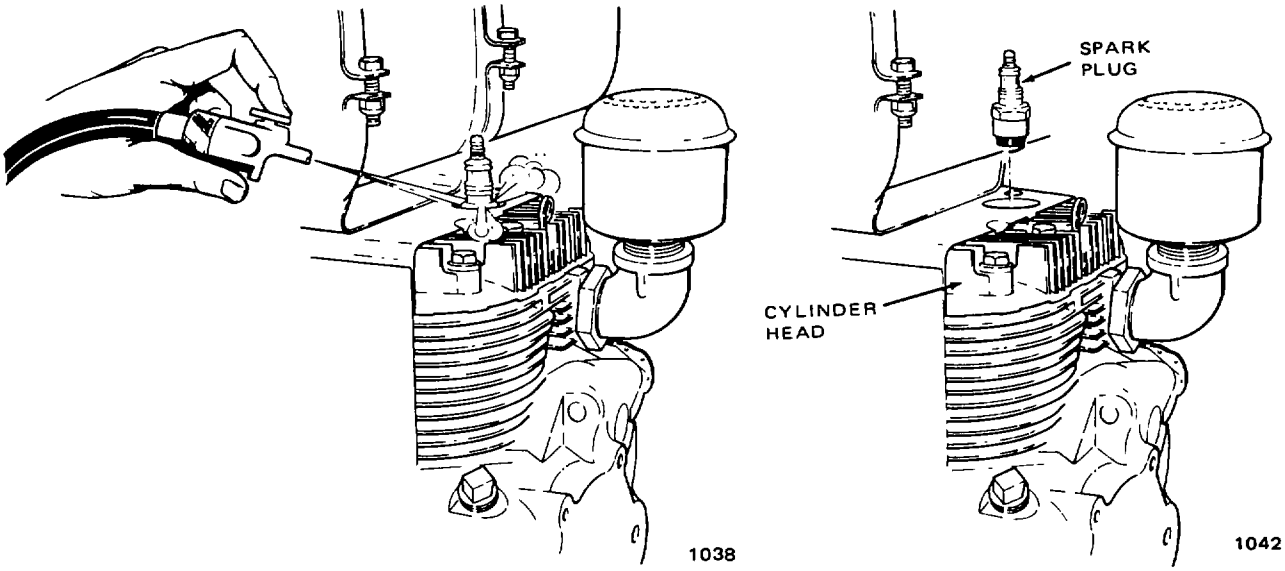


Figure 5-126. Spark Plug Cleaning and Removal

(1) Loosen the spark plug a few turns.

(2) Blow high pressure air into the spark plug well. This will clean out any dirt or debris.

(3) Remove the spark plug by hand.

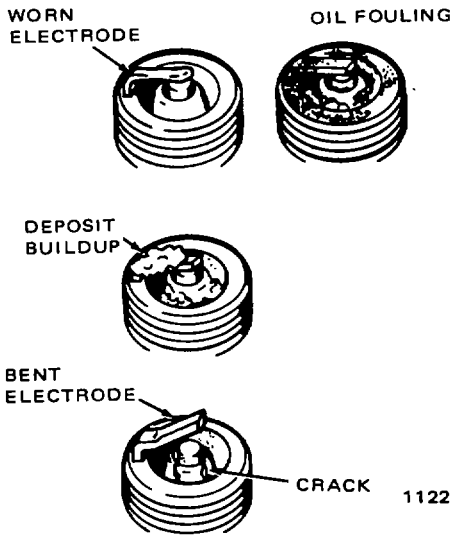


Figure 5-127. Spark Plug Defects

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE LACKS POWER (Continued)

b. Check the spark plug visually. Replace it and go to Step 5, if there are:

(1) Cracks in the insulator.

(2) Electrodes worn so thin they cannot be regapped.

(3) Oil fouling, soft, wet, oily deposits covering the insulator and the plug nose. If there is oil fouling, go to Step 10.

(4) Build-up of deposits between insulator and the plug shell.

(5) Broken insulator or bent electrode.

NOTE

If the spark plug must be replaced, set the gap at 0.025 inches (0.64 mm).

Oil fouling is a sign of internal engine damage.

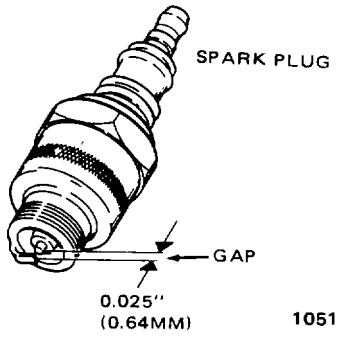


Figure 5-128. Spark Plug Gap

c. Check the spark plug gap.

(1) Reset the gap at 0.025 inches (0.64 mm) if necessary and go to Step 6d.

(2) If the gap is ok, go to Step 6d.

d. Check the spark plug for a spark.

(1) Connect the spark plug wire to the spark plug and set the plug on a grounded part of the engine.

(2) Turn the ignition switch ON.

(3) Crank the engine by hand. When the points open and close, a spark will jump between the spark plug electrodes.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE LACKS POWER (Continued)

(4) If there is a bright blue spark, go to Step 9.

(5) If there is no spark or the spark is weak and yellow, go to Step 9.

e. Start the engine.

(1) If the engine starts, the problem is solved.

(2) If the engine does not start, go to Step 7.

Step 7. Check the battery.

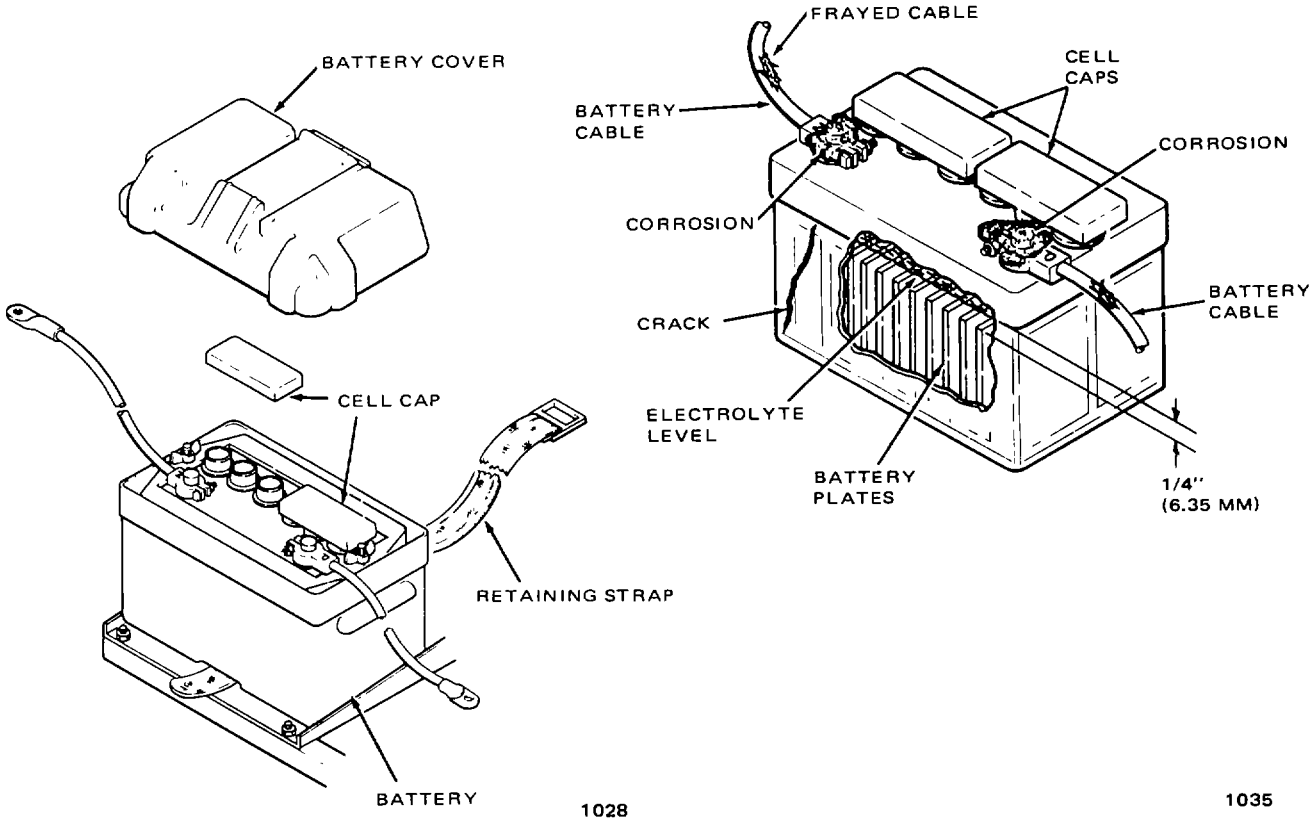


Figure 5-129. Battery Visual Checks

a. Check the battery visually.

(1) Make sure the battery cables are tight on the terminals. They should not be able to be moved by hand.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE LACKS POWER (Continued)

(2) Make sure the battery ground connection is securely fastened.

(3) If there is any corrosion on the battery or around the terminals, rinse it off with a baking soda and water solution.

(4) If there is dirt on the top of the battery, brush it off.

(5) If the cable insulation is frayed or broken, replace the cable and go to Step 6e.

(6) If there are cracks in the sides or the cover of the battery, replace it and go to Step 7e.

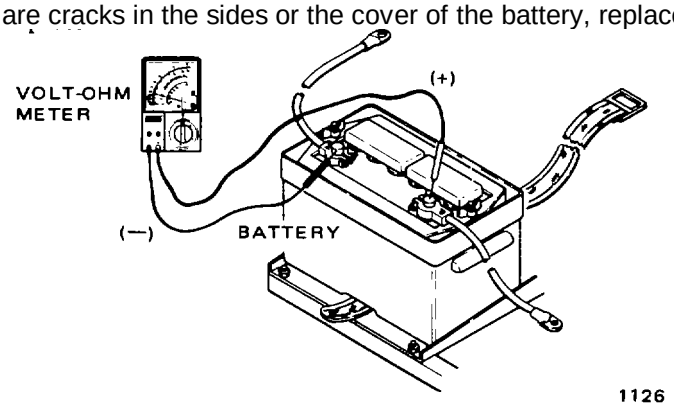


Figure 5-130. Battery Voltage Test

b. Check the battery voltage. Use a volt-ohmmeter.

(1) Undo retainer strap and remove battery box cover.

(2) Connect the positive (+) meter lead to the positive (+) battery terminal and the negative (-) meter lead to the negative (-) battery terminal.

(3) If the meter reads between 11.5 and 12 volts, the battery is ok. Go to Step 8.

(4) If the meter reads less than 11.5 volts, go to Step 9c.

c. Check the electrolyte in the battery. Use a hydrometer to check the specific gravity.

CAUTION

The electrolyte level must be kept above the plates in the battery.

DO NOT overfill the battery. The electrolyte should not overflow onto the battery cover when the cell covers are placed over the cells.

Table 5-3 Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE LACKS POWER (Continued)

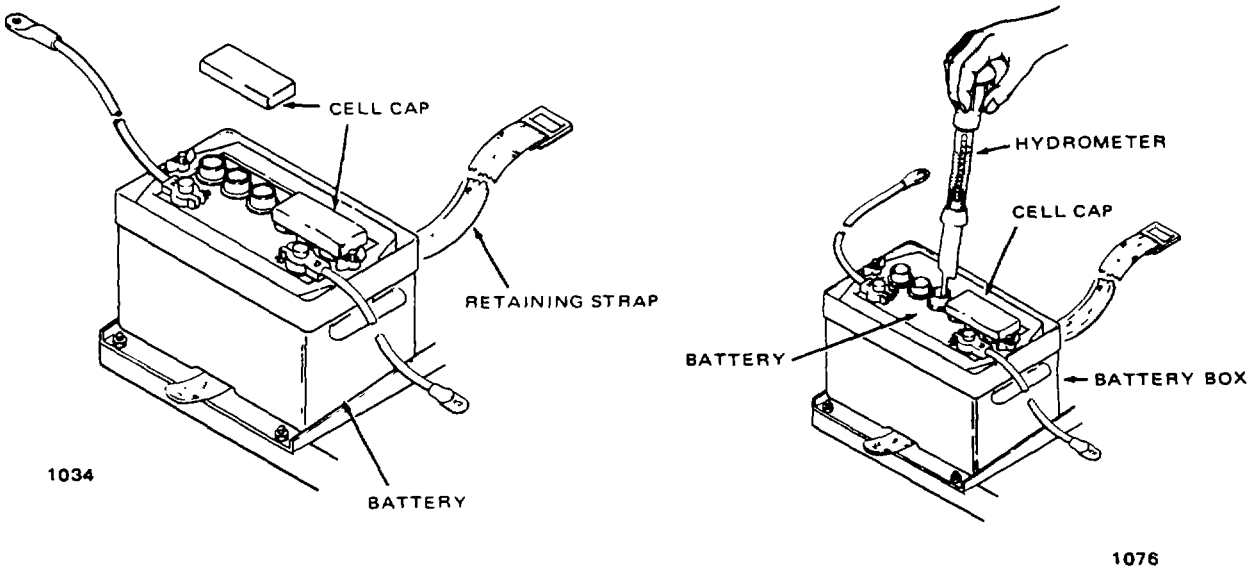


Figure 5-131. Specific Gravity Test

NOTE

Use distilled water or a good grade drinking water (excluding drinking water).

(1) Remove the cell covers and check the electrolyte level. Add distilled water if the level is below the top of the plates.

(2) Check the specific gravity.

(3) If the specific gravity is between 1.250 and 1.280, the cells are ok. Go to Step 8.

(4) If the specific gravity is between 1.225 and 1.250, the cells are still in fair condition. Go to Step 8.

(5) If the specific gravity is below 1.150 in any one cell, replace the battery and go to Step 7e.

(6) If the specific gravity in one cell is 0.050 more or less than the other cells and charging does not bring the charge 50% charge, replace the battery and go to Step 9e.

d. Charge the battery.

(1) If the battery does not hold a charge, replace the battery and go to Step 7e.

(2) If the battery holds a charge, return the battery to the battery box and go to Step 7e.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

ENGINE LACKS POWER (Continued)

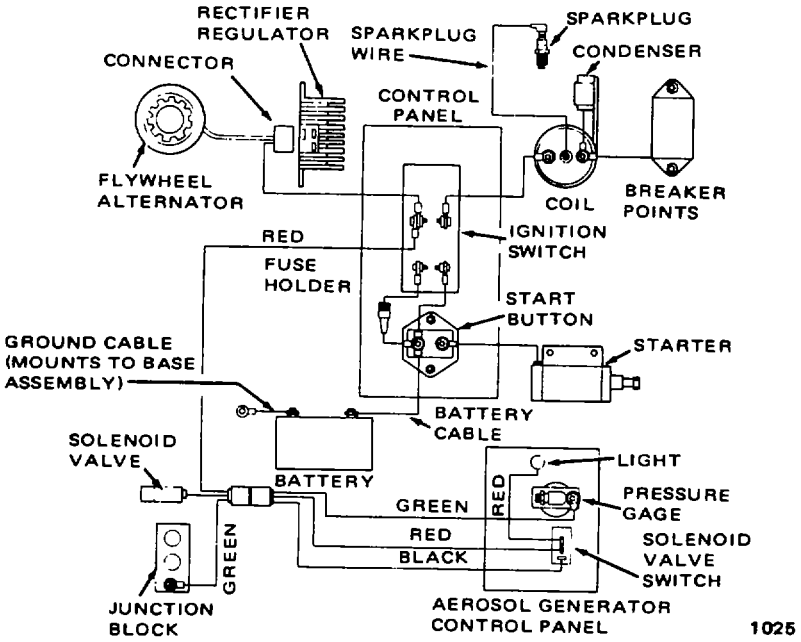


Figure 5-132. Aerosol Generator Wiring Diagram

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE LACKS POWER (Continued)

e. Inspect and check the continuity of the wires below. Use a volt-ohmmeter.

- Battery cables.
- The wire between the battery and the start button.
- The wire between the start button and the ignition switch.
- The wire between the ignition switch and the alternator.

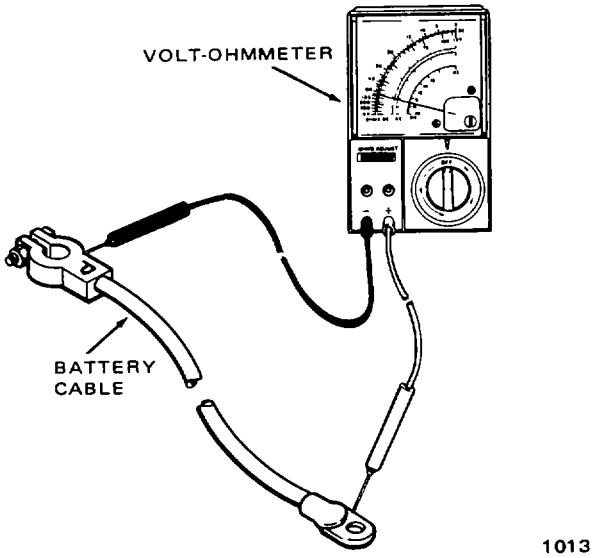


Figure 5-133. Battery Cable Test

(1) Connect a meter lead to each end of the wire being tested.

(2) Wiggle the wire.

(3) If the wire conducts a current, go to Step 10.

(4) If the wire does not conduct, replace it and go to Step 10.

(5) If any of the wires or insulation are frayed, broken or cracked, replace them and go to Step 8.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE LACKS POWER (Continued)

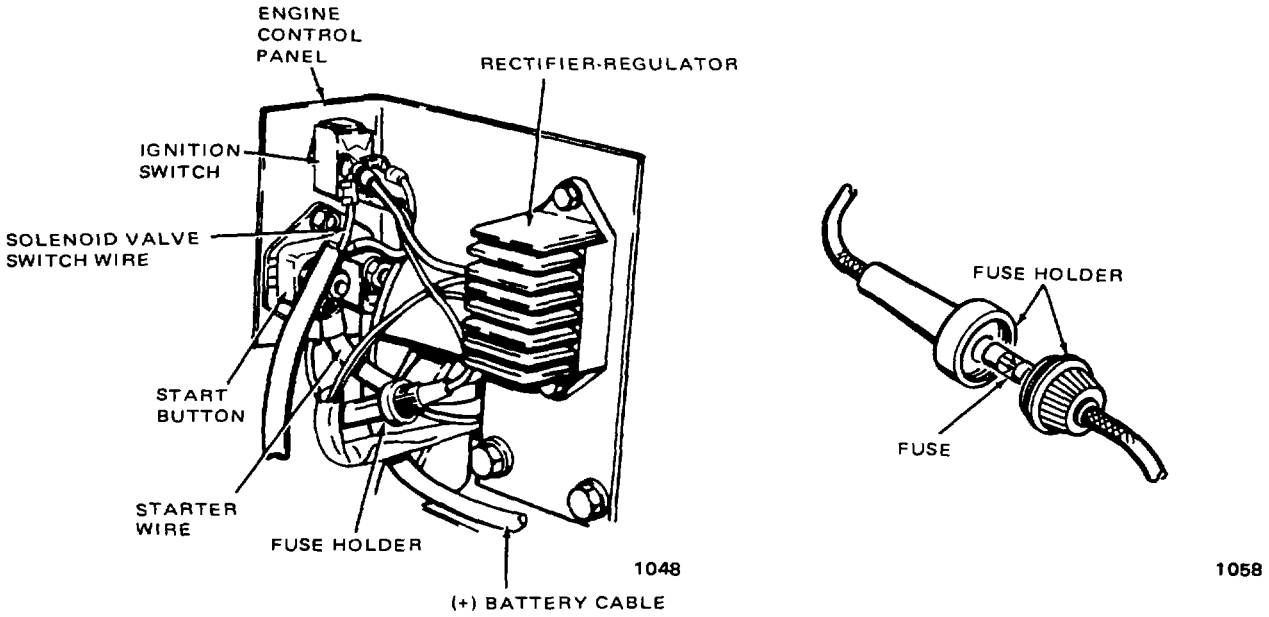


Figure 5-134. Fuse Holder Location

f. Check the fuse.

(1) Unscrew the fuse holder and check the fuse.

(2) If it is ok, screw the fuse holder back together and go to Step 8.

(3) If the fuse is blown, replace it and screw the fuse holder back together. Go to Step 7g.

g. Start the engine.

(1) If the engine starts, the problem is solved.

(2) If the engine does not start, go to Step 8.

Step 8. Check the spark plug wire.

a. Remove the spark plug wire and test it with a volt-ohmmeter.

(1) Attach a meter lead to each end of the spark plug wire.

(2) If the meter reads below 40 k ohms (40,000) go to Step 9.

(3) If the meter reads steadily above 40 k ohms, replace the wire and go to Step 8b.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE LACKS POWER (Continued)

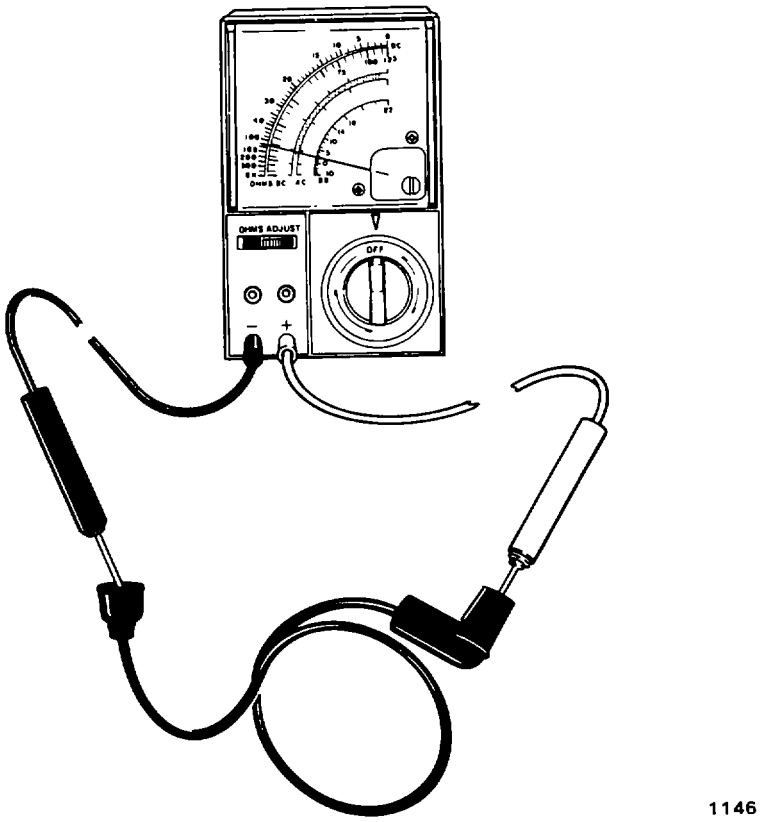


Figure 5-135. Spark Plug Wire Test

(4) Wiggle the wire back and forth. If the meter fluctuates up and down, there is a break in the wire. Replace the wire and go to Step 8b.

b. Start the engine.

(1) If the engine starts, the problem is solved.

(2) If the engine does not start, go to Step 9.

Step 9. Check the coil.

a. Check the coil visually.

(1) If the coil is cracked or broken, replace it and go to Step 8.

(2) Remove the spark plug wire from the coil and check the connections for moisture. If the connections are wet, dry them and return the wire to the coil. Go to Step 9b.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

ENGINE LACKS POWER (Continued)

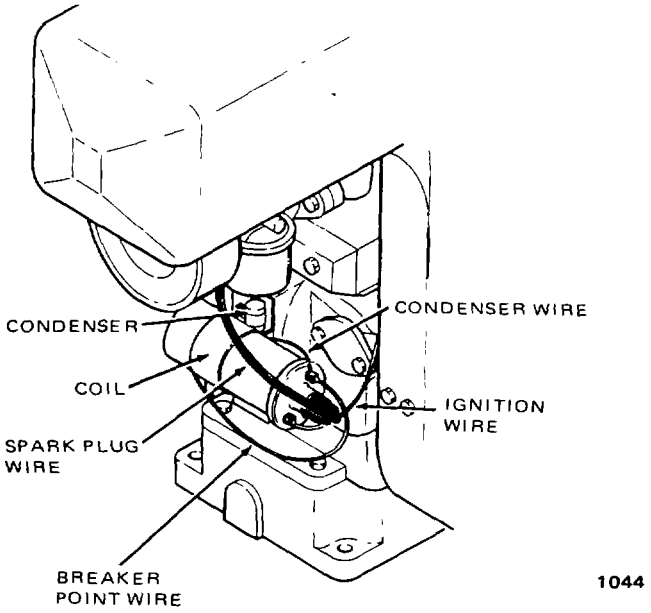


Figure 5-136. Engine Coil Location

(3) If the coil is ok, go to Step 9b.

WARNING

DO NOT hold any ignition wires in your bare hands. You can be electrocuted. Use well-insulated tools to hold the wires.

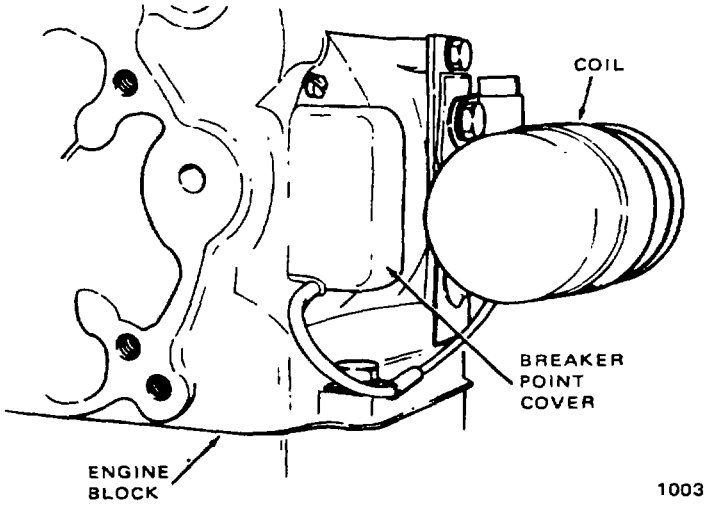


Figure 5-137. Breaker Point Cover

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE LACKS POWER (Continued)

b. Check the secondary coil winding.

(1) Remove the breaker point cover and jam the points open with a piece of cardboard.

(2) Remove the spark plug wire from the spark plug.

(3) Turn the ignition switch ON.

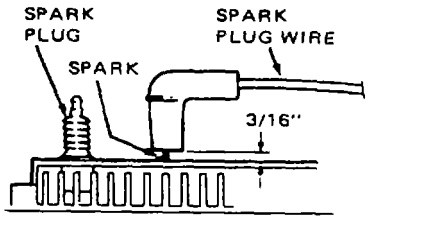


Figure 5-138. Spark Test

(4) Hold the end of the spark plug wire about 3/16 inch (4.76 mm) from a grounded part of the engine.

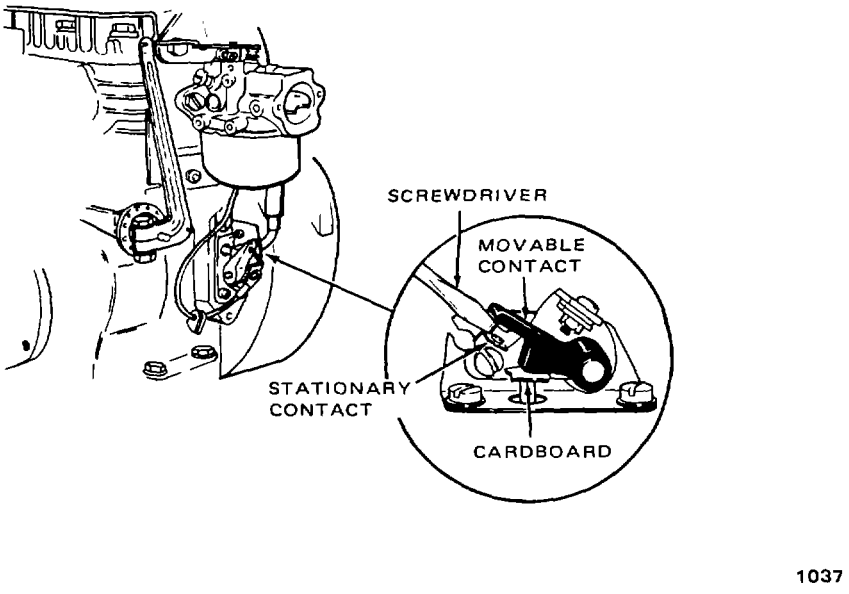


Figure 5-139. Breaker Points

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE LACKS POWER (Continued)

(5) Hold a screwdriver point across the open breaker points.

(6) Remove the screwdriver from the breaker points.

(7) If a bright blue spark jumps between the wire and the engine, the coil is ok. Go to Step 10.

(8) If there is no spark, or the spark is weak and yellow, the coil is weak. Replace it and go to Step 9e, if the condenser and the points check ok.

c. Coil Test I check the primary coil winding. Use a volt-ohmmeter.

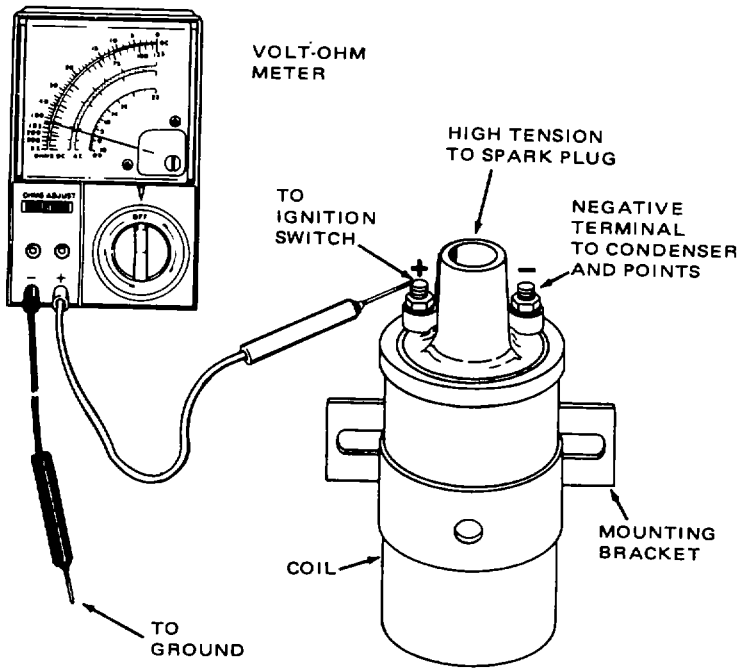


Figure 5-140. Coil Test I

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE LACKS POWER (Continued)

(1) Remove the breaker point cover and jam a piece of cardboard between the breaker points.

(2) Turn on the ignition switch.

(3) Connect the negative (-) meter lead to a grounded part of the engine.

(4) Connect positive (+) meter lead to the battery (+) side of the coil. If the meter reads 11.5 to 12 volts, there is current to the coil. Go to Step 9c(5). If the meter reads 11.5 volts or less, there is poor current to the coil. Go to Step 9d.

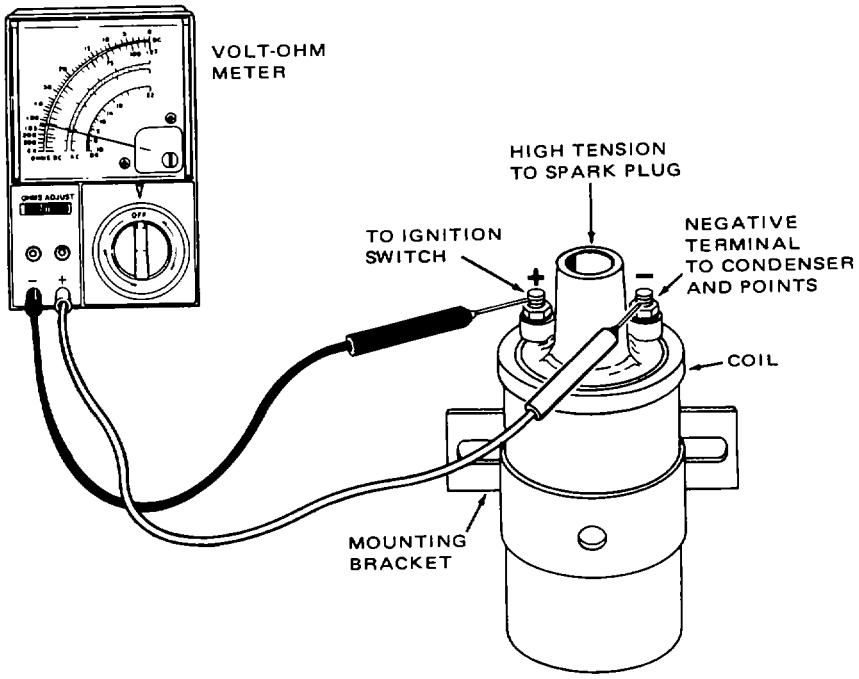


Figure 5-141. Coil Test II

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE LACKS POWER (Continued)

(5) Coil Test II. Connect the positive (+) lead to the breaker points (-) side of the coil. If the meter reads 11.5 to 12 volts, the coil is ok. Go to Step 10. If the meter reads 11.5 volts or less, the coil is bad. Replace it and go to Step 9e, if the points and condenser check ok.

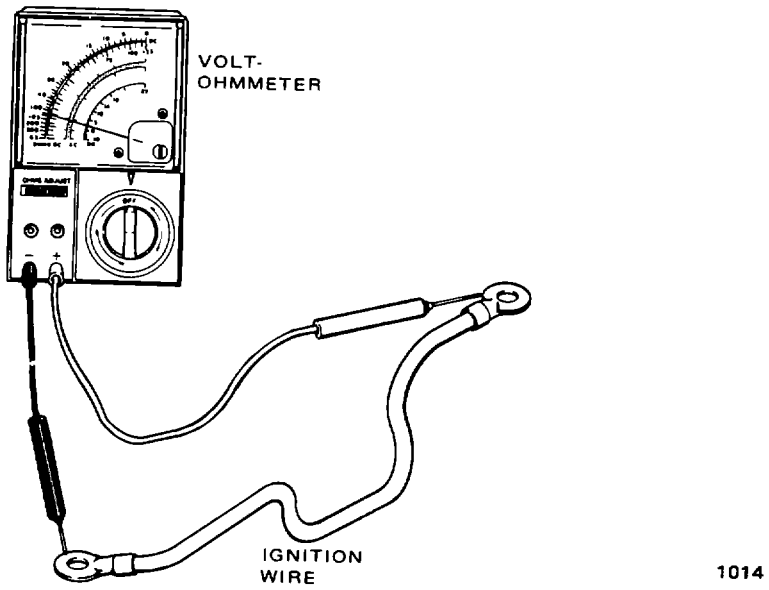


Figure 5-142. Ignition Wire Test

d. Check the wires between the coil and the ignition switch and the coil and the points. Use a volt-ohmmeter.

(1) Remove the ignition wire from the ignition switch and the coil.

(2) Connect a meter lead to each end of the wire and check the continuity.

(3) Wiggle the wire back and forth. If the meter does not register a current, replace it and go to Step 9e. If the meter does register a current, go to Step 10.

(4) Remove the breaker point wire from the points and the coil.

(5) Connect a meter lead to each end of the wire and check for continuity.

(6) Wiggle the wire back and forth. If the meter does not register a current, replace it and go to Step 9e. If the meter does register a current, go to Step 10.

e. Start the engine.

(1) If the engine starts, the problem is solved.

(2) If the engine does not start, go to Step 10.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

ENGINE LACKS POWER (Continued)

Step 10. Check the engine compression.

NOTE

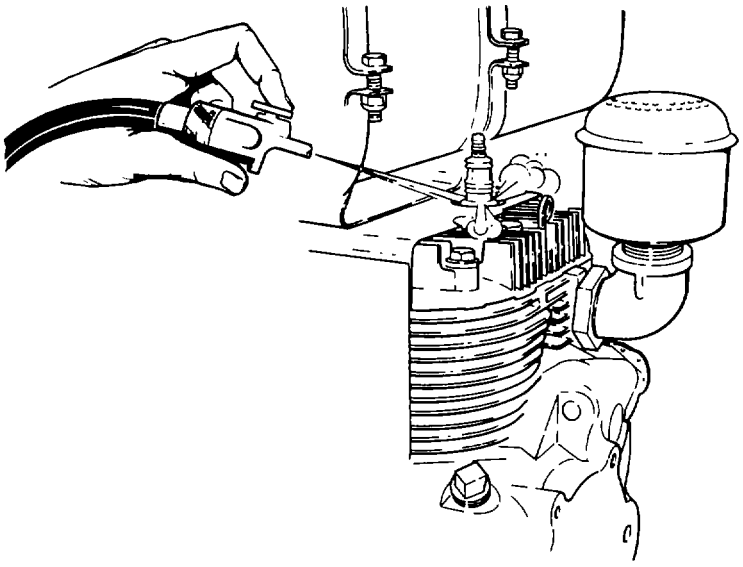
Because automatic compression release engines release compression at 600 rpm, there is a different compression test procedure for this engine.

a. Start the engine and run it for fifteen minutes.

b. Shut the engine OFF and remove the spark plug.

CAUTION

BE CAREFUL when removing the spark plug. Too much force can break the insulator.



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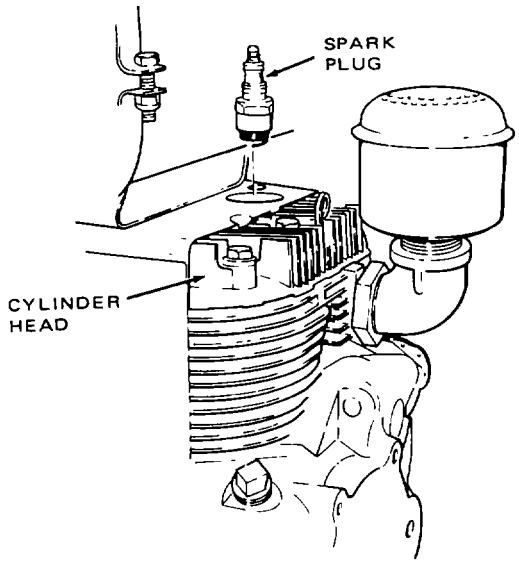

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Figure 5-143. Spark Plug Cleaning and Removal

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE LACKS POWER (Continued)

(1) Loosen the spark plug a few turns.

(2) Blow out the spark plug well with high pressure air. This will clean out any dirt or debris that can fall into the cylinder.

(3) Remove the spark plug by hand.

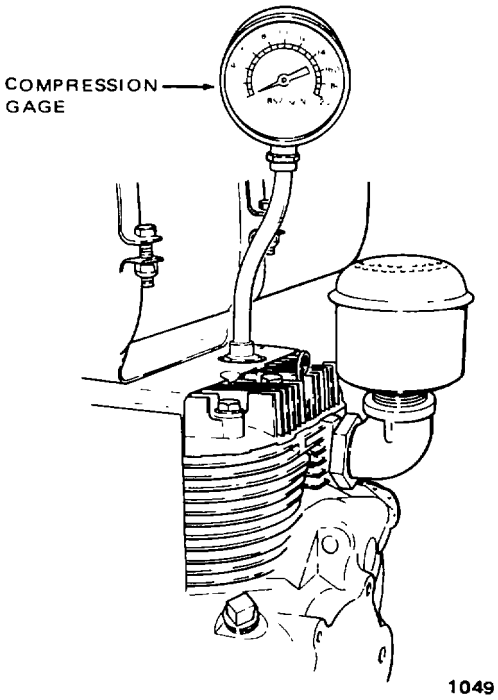


Figure 5-144. Installation of Compression Gage

c. Place a compression gage in the spark plug hole. Make sure it seals well.

d. Set the choke wide open. Remove the air cleaner if necessary.

e. Crank the engine by hand counterclockwise (left: opposite to normal rotation).

f. Take eight to ten compression readings.

(1) The first few turns of the engine, the compression may be as low as 30 psi. After the seventh turn, the compression should be 90 psi.

(2) If the compression is less than 90 psi, replace the engine.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE LACKS POWER (Continued)

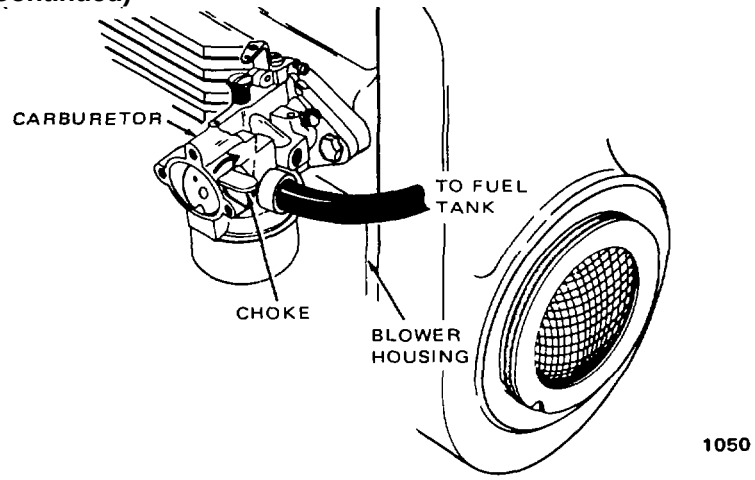


Figure 5-145. Choke Open Position

7. ENGINE OPERATES ERRATICALLY

Step 1. Check the fuel tank valve.

WARNING

BE ALERT to disconnect the ground cable from the battery before performing maintenance on the fuel tank assembly. Spilled gasoline will be ignited by a spark.

a. Remove the fuel line from the carburetor.

b. Open the fuel tank valve.

(1) If gasoline does not drain or drains slowly from the tank, go to Step 1c.

(2) If gasoline drains well from the tank, go to Step 2.

c. Remove the tank cap and blow air back through the valve. If gasoline still does not drain or drains slowly from the fuel tank, replace the valve and the fuel line. Go to Step 1d.

d. Start the engine.

(1) If the engine runs smoothly, the problem is solved.

(2) If the engine still operates erratically, go to Step 2.

Step 2. Check the spark plug.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE OPERATES ERRATICALLY (Continued)

CAUTION

BE CAREFUL when removing the spark plug from the engine. The insulator will break easily.

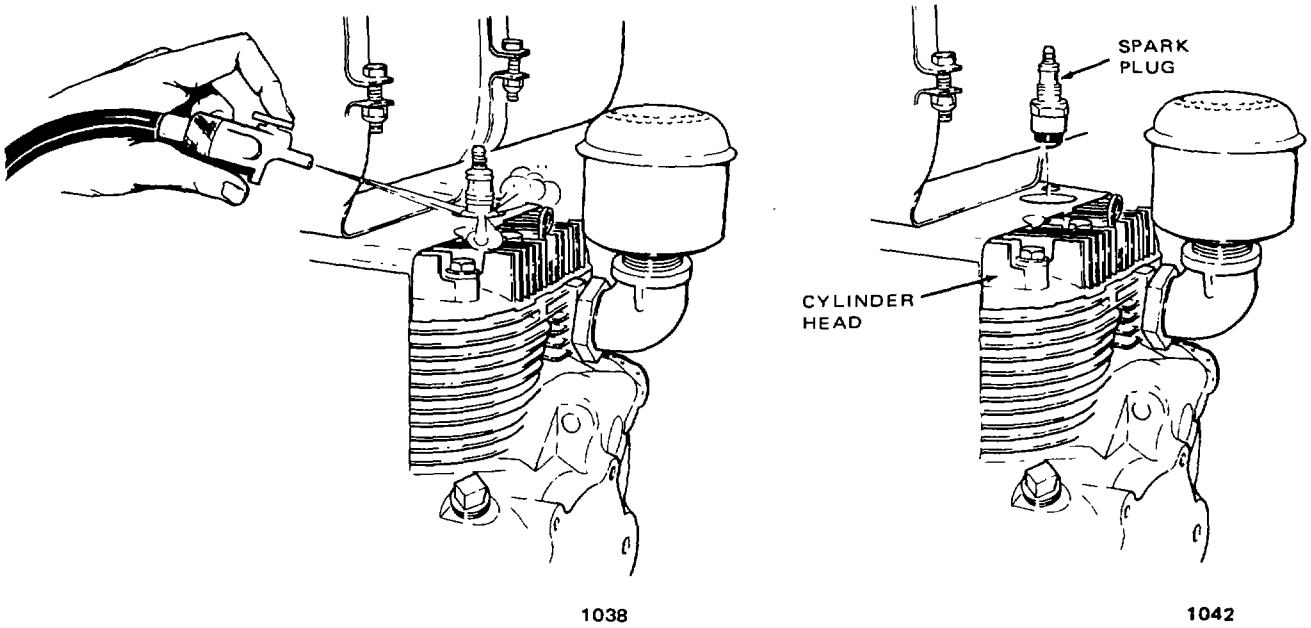


Figure 5-146. Spark Plug Cleaning and Removal

a. Remove the spark plug.

(1) Loosen the spark plug a few turns.

(2) Blow high pressure air into the spark plug well. This will clean out any dirt or debris.

(3) Remove the spark plug by hand.

b. Check the spark plug visually. Replace it and go to Step 9, if there are:

(1) Cracks in the insulator.

(2) Electrodes worn so thin they cannot be regapped.

(3) Oil fouling, soft, wet, oily deposits covering the insulator and the plug nose. If there is oil fouling, go to Step 9.

(4) Build-up of deposits between insulator and the plug shell.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE OPERATES ERRATICALLY (Continued)

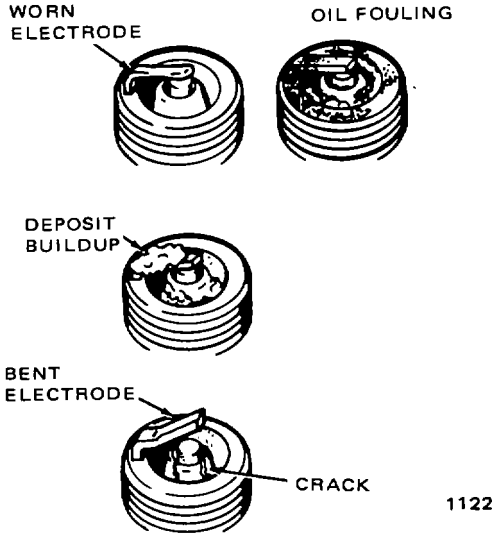


Figure 5-147. Spark Plug Defects

(5) Broken insulator and/or bent electrode.

NOTE

If the spark plug must be replaced, set the gap at 0.025 inches (0.64 mm).

Oil fouling is a sign of internal engine damage.

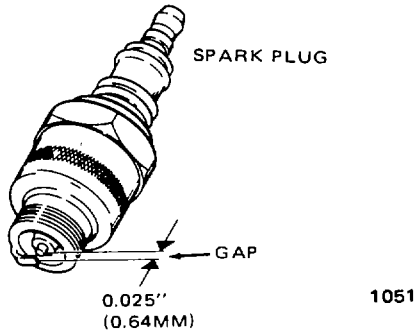


Figure 5-148. Spark Plug Gap

c. Check the spark plug gap.

(1) Reset the gap at 0.025 inches (0.64 mm) if necessary and go to Step 2d.

(2) If the gap is ok, go to Step 2d.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE OPERATES ERRATICALLY (Continued)

d. Check the spark plug for a spark.

(1) Connect the spark plug wire to the spark plug and set the plug on a grounded part of the engine.

(2) Turn the ignition switch ON.

(3) Crank the engine by hand. When the points open and close, a spark will jump between the spark plug electrodes.

(4) If there is a bright blue spark, go to Step 7.

(5) If there is no spark or the spark is weak and yellow, go to Step 3.

e. Start the engine.

(1) If the engine starts, the problem is solved.

(2) If the engine operates erratically, go to Step 3.

Step 3. Check the spark plug wire.

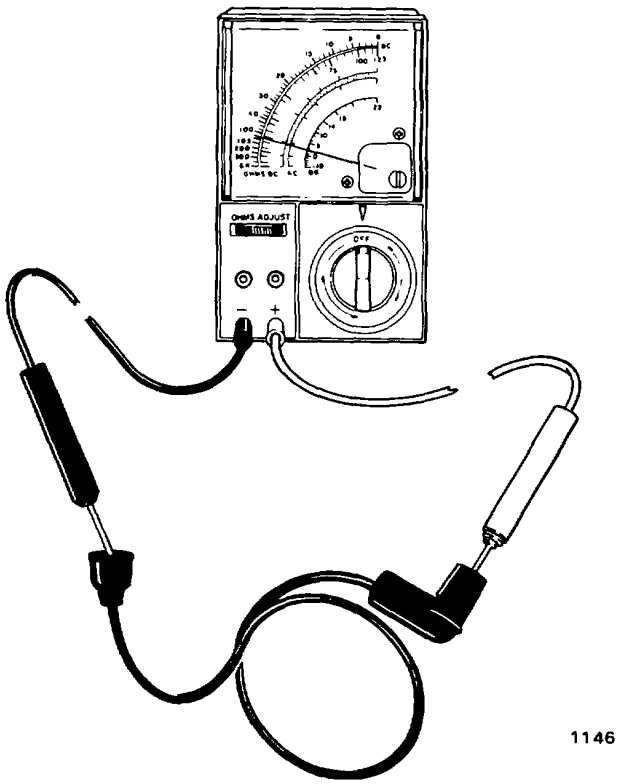


Figure 5-149. Spark Plug Wire Test

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE OPERATES ERRATICALLY (Continued)

a. Remove the spark plug wire and test it with a volt-ohmmeter.

(1) Attach a meter lead to each end of the spark plug wire.

(2) If the meter reads below 40 k ohms (40,000), go to Step 4.

(3) If the meter reads steadily above 40 k ohms, replace the wire and go to Step 3b.

(4) Wiggle the wire back and forth. If the meter fluctuates up and down, there is a break in the wire. Replace the wire and go to Step 3b.

b. Start the engine.

(1) If the engine starts, the problem is solved.

(2) If the engine does not start, go to Step 4.

Step 4. Check the coil.

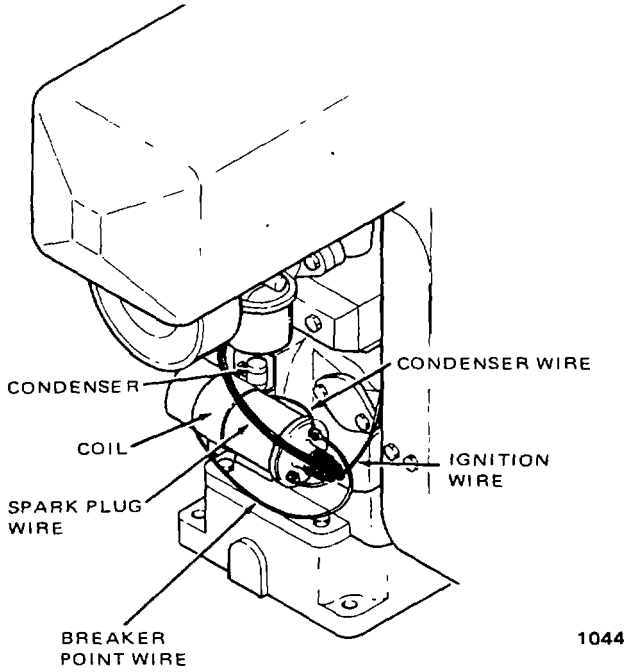


Figure 5-150. Engine Coil Location

a. Check the coil visually.

(1) If the coil is cracked or broken, replace it and go to Step 4e.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE OPERATES ERRATICALLY (Continued)

(2) Remove the spark plug wire from the coil and check the connections for moisture. If the connections are wet, dry them and return the wire to the coil. Go to Step 4e.

(3) If the coil is ok, go to Step 4b.

WARNING

DO NOT hold any ignition wires in your bare hands. You can be electrocuted. Use well-insulated tools to hold the wires.

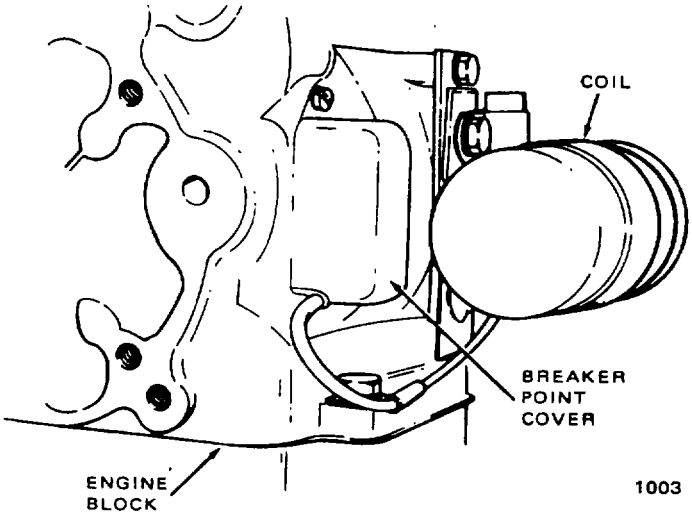


Figure 5-151. Breaker Point Cover

b. Check the secondary coil winding.

(1) Remove the breaker point cover and jam the points open with a piece of cardboard.

(2) Remove the spark plug wire from the spark plug.

(3) Turn the ignition switch ON.

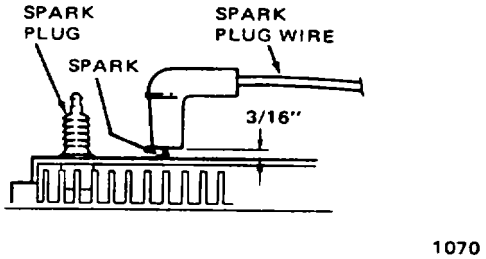


Figure 5-152. Spark Test

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE OPERATES ERRATICALLY (Continued)

(4) Hold the end of the spark plug about 3/16 inch (4.76 mm) from a grounded part of the engine.

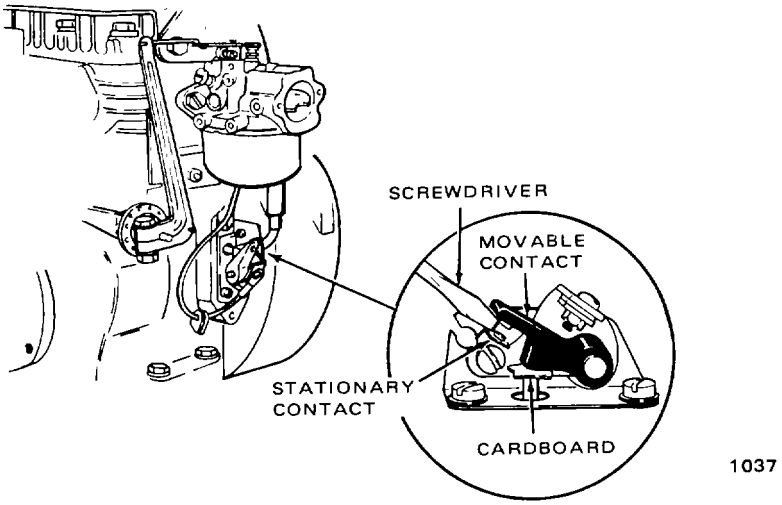


Figure 5-153. Breaker Points

(5) Hold a screwdriver point across the open breaker points.

(6) Remove the screwdriver from the breaker points.

(7) If a bright blue spark jumps between the wire and the engine, the coil is ok. Go to Step 5.

(8) If there is no spark or the spark is weak and yellow, the coil is weak. Replace it and go to Step 4e, if the condenser and the points check ok.

c. Coil Test I. Check the primary coil winding. Use a volt-ohmmeter.

(1) Remove the breaker point cover and jam a piece of cardboard between the breaker points.

(2) Turn the ignition switch ON.

(3) Connect the negative (-) meter lead to a grounded part of the engine.

(4) Connect positive (+) meter lead to the battery (+) side of the coil. If the meter reads 11.5 to 12 volts, there is current to the coil. Go to Step 4c(5). If the meter reads 11.5 volts or less, there is poor current to the coil. Go to Step 4d.

(5) Coil Test II. Connect the positive (+) lead to the breaker points (-) side of the coil. If the meter reads 11.5 to 12 volts, the coil is ok. Go to Step 8. If the meter reads 11.5 volts or less, the coil is bad. Replace it and go to Step 4e, if the points and condenser check ok.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE OPERATES ERRATICALLY (Continued)

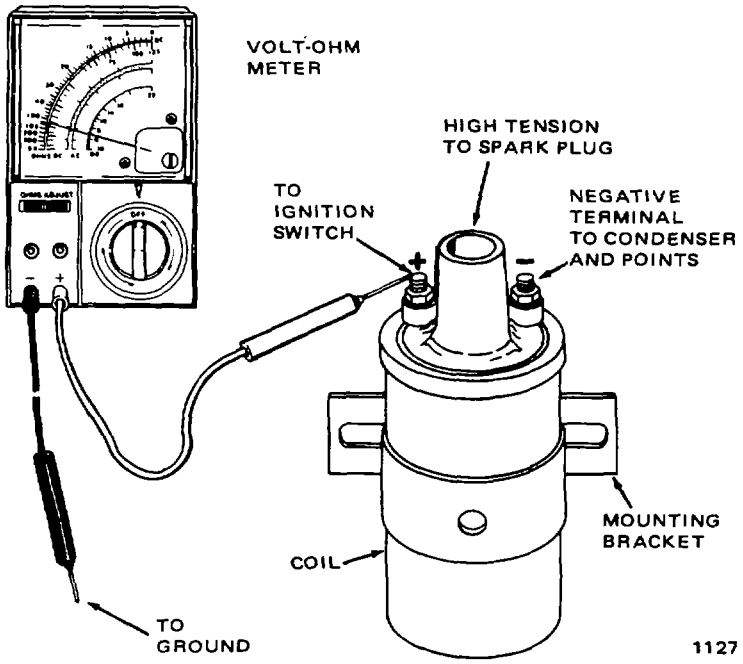


Figure 5-154. Coil Test I

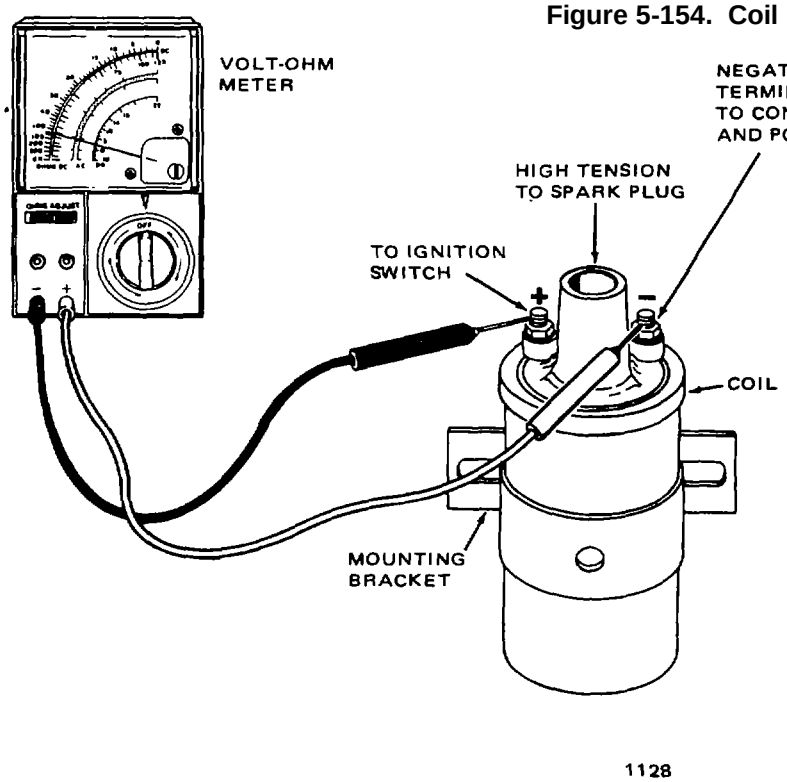


Figure 5-155. Coil Test II

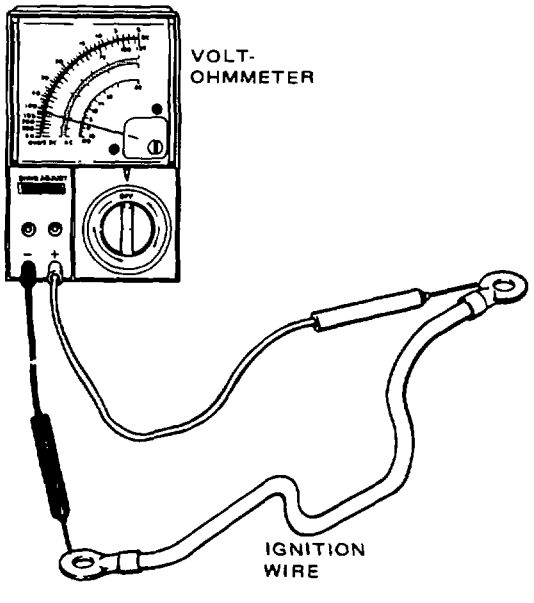


Figure 5-156. Ignition Wire Test

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE OPERATES ERRATICALLY (Continued)

d. Check the wires between the coil and the ignition switch and the coil and the points. Use a volt-ohmmeter.

(1) Remove the ignition wire from the ignition switch and the coil.

(2) Connect a meter lead to each end of the wire and check the continuity.

(3) Wiggle the wire back and forth. If the meter does not register a current, replace it and go to Step 4e. If the meter does register a current, go to Step 5.

(4) Remove the breaker point wire from the points and the coil.

(5) Connect a meter lead to each end of the wire and check for continuity. Go to Step 4d(6).

(6) Wiggle the wire back and forth. If the meter does not register a current, replace it and go to Step 5f. If the meter does register a current, go to Step 5.

e. Start the engine.

(1) If the engine starts, the problem is solved.

(2) If the engine does not start, go to Step 5.

Step 5. Check the breaker points.

a. Remove the breaker point cover.

b. Open the points with a screwdriver and inspect them. If they are pitted, burned, or badly oxidized, replace them and go to Step 5c.

c. Check the breaker point gap.

(1) Shut the ignition switch OFF.

(2) Crank the engine by hand until the points are open to their widest gap.

(3) If the gap is 0.020 inches (0.52 mm), the gap is ok. Go to Step 6.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE OPERATES ERRATICALLY (Continued)

(4) If the gap is greater than or less than 0.020 inches (0.52 mm), go to Step 5d.

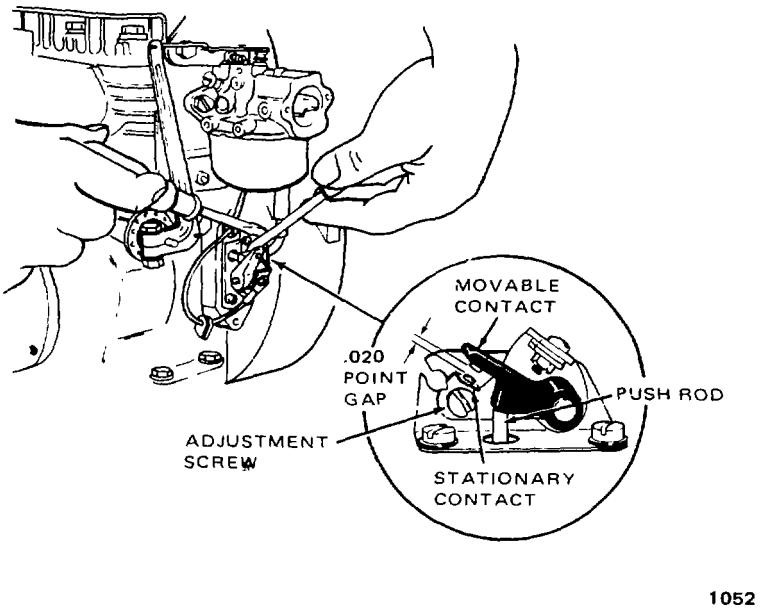


Figure 5-157. Gapping Breaker Points

d. Reset the breaker point gap.

(1) Rotate the engine by hand until the breaker points reach their greatest gap.

(2) Loosen the point gap adjustment screw and place an 0.020 inch (0.52 mm) feeler gage between the points.

(3) Tighten the adjusting screw after setting the gap.

(4) Replace the breaker point cover and go to Step 5e.

e. Start the engine.

(1) If the engine starts, the problem is solved.

(2) If the engine does not start, go to Step 6.

Step 6. Check the condenser. Use a volt-ohmmeter.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

ENGINE OPERATES ERRATICALLY (Continued)

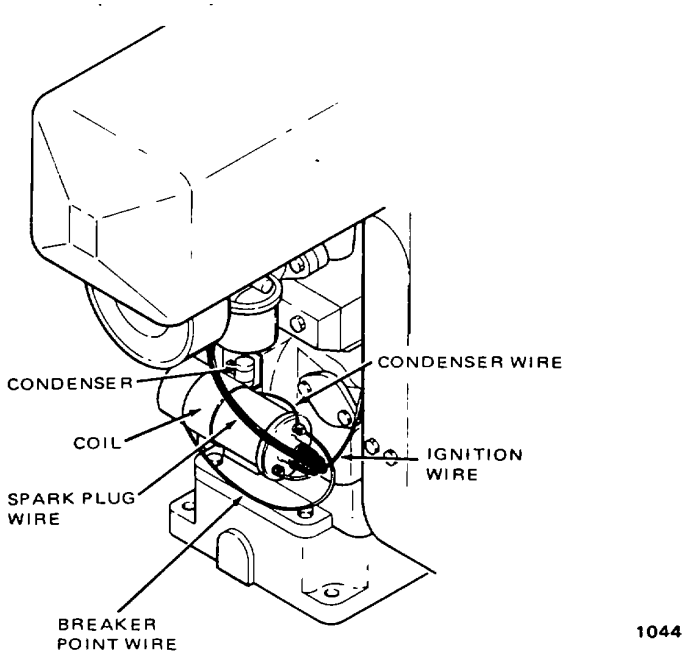


Figure 5-158. Engine Coil

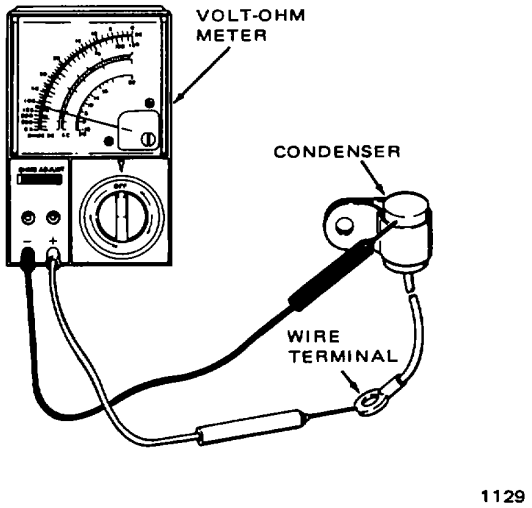


Figure 5-159. Condenser Test

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

ENGINE OPERATES ERRATICALLY (Continued)

a. Remove the condenser from the engine.

b. Set the meter to read high resistance.

c. Connect the negative (-) meter lead to the side of the condenser and the positive (+) meter lead to the wire terminal.

(1) If the meter reads below infinity, the condenser is ok. Go to Step 7.

(2) If the meter reads at infinity and remains there, replace the condenser. Go to Step 6e.

d. Tap the condenser lightly. If the meter fluctuates, there are loose connections inside the condenser.

(1) If there are no loose connections, go to Step 7.

(2) If there are loose connections, replace the condenser and go to Step 6e.

e. Start the engine.

(1) If the engine starts, the problem is solved.

(2) If the engine does not start, go to Step 7.

Step 7. Check the engine speed. Use a hand-held tachometer.

a. Start the engine according to operating instructions in Chapter 2, Section III.

NOTE

The belts should be connected to the pulleys while checking the engine speed.

b. Check the engine operating speed with a hand-held tachometer. Refer to page 1-6 for the rpm ratings. If the speed is not correct, go to Step 7c.

c. Adjust the engine speed to the correct rpm.

(1) Loosen the bushing nut slightly.

(2) Move the throttle bracket to the left (counterclockwise) to increase the engine speed and to the right (clockwise) to decrease the engine speed.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE OPERATES ERRATICALLY (Continued)

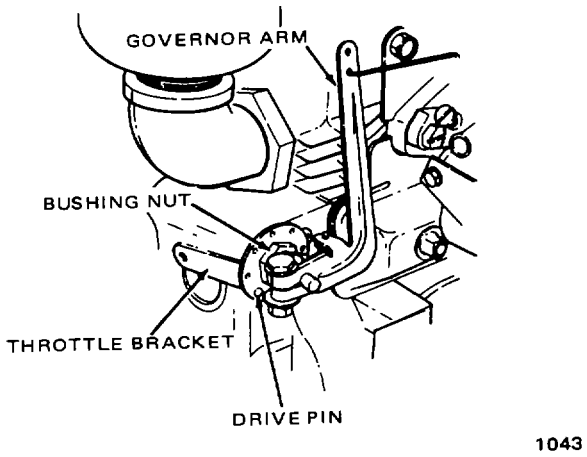


Figure 5-160. Governor Assembly

CAUTION

DO NOT force the bushing nut tight. This could cause binding or stripped threads.

(3) When the engine speed is adjusted to the correct rpm, tighten the bushing nut and lock the throttle bracket in place. Go to Step 7d.

d. Start the engine.

(1) If the engine runs smoothly, the problem is solved.

(2) If the engine still operates erratically, go to Step 8.

Step 8. Check the carburetor.

CAUTION

BE CAREFUL not to use force when turning the needle valves in and out. Force can damage the valves.

a. Remove the main fuel needle valve and idle fuel needle valve and check them for damage and/or plugging.

(1) If the needle valves are ok, go to Step 8d.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

ENGINE OPERATES ERRATICALLY (Continued)

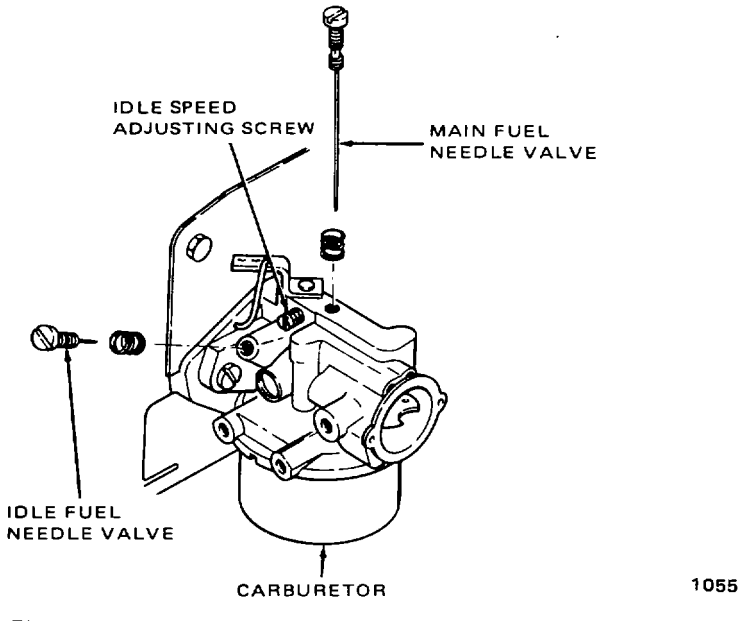


Figure 5-161. Carburetor Needle Valve Removal

CAUTION

DO NOT use hard metal objects to unplug the needle valves. Hard metal objects will damage them.

(2) If the needles are plugged or gummed up, rinse them in alcohol or acetone and return them to the carburetor. Go to Step 8b.

(3) If the needles are damaged and cannot be repaired, replace them and go to Step 8b.

b. Adjust the needle valves.

(1) Turn both needle valves all the way to the right (clockwise) until they gently touch bottom.

(2) Turn the main fuel needle valve to the left (counterclockwise) two full turns.

(3) Turn the idle needle valve to the left (counterclockwise) 1-1/4 turns.

(4) Go to Step 8c.

c. Remove the carburetor from the engine.

(1) Remove the air cleaner and air cleaner bracket.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

ENGINE OPERATES ERRATICALLY (Continued)

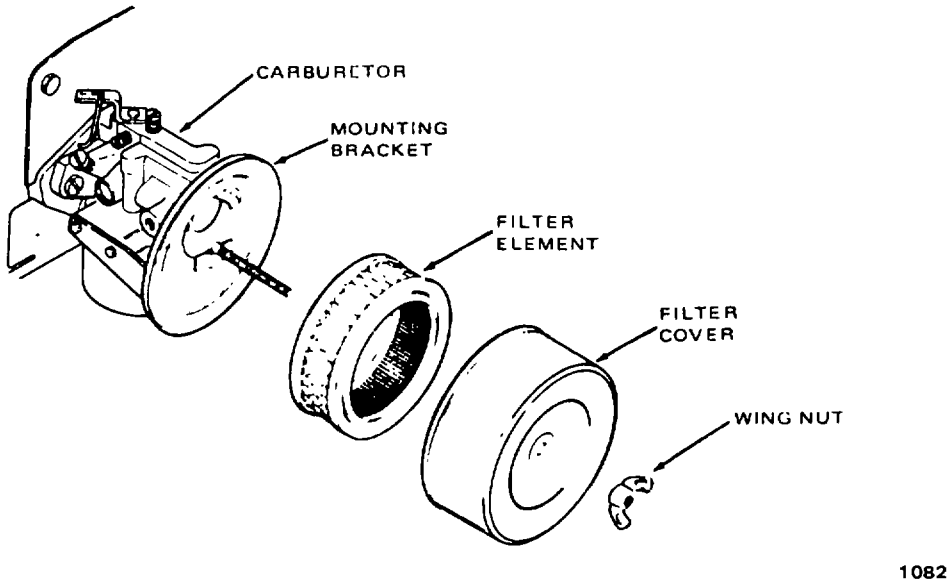


Figure 5-162. Air Filter

(2) Disconnect the throttle linkage and remove the carburetor from the engine.

NOTE

To remove the carburetor from the engine it is necessary to loosen one mounting screw, then the other. Pull the carburetor away from the engine and loosen each screw again. Repeat this procedure until the carburetor can be removed from the engine.

(3) Inspect the carburetor to manifold gasket. If it is cracked, broken, or damaged, replace it and go to Step 8d.

d. Disassemble the carburetor and make sure gasoline is getting to the carburetor.

(1) Remove the bowl screw, gasket and bowl, and baffle gasket.

(2) Remove the float pin, float needle and needle seat. If the float is dented or has pin holes, replace it. If the float leaks or is worn, replace it.

(3) Check the needle and seat for damage. If they are cut or scratched, replace them.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE OPERATES ERRATICALLY (Continued)

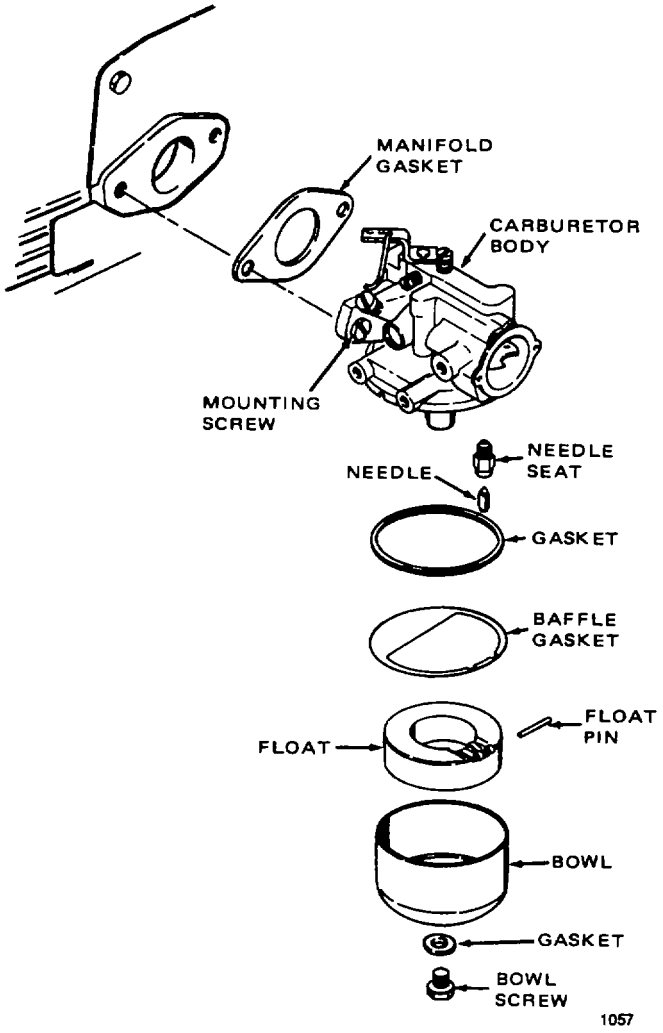


Figure 5-163. Carburetor Disassembly

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE OPERATES ERRATICALLY (Continued)

CAUTION

DO NOT use hard metal objects or tools to clean the inlet port. Use something soft like a toothpick and flush the port with alcohol or acetone.

(4) Unplug the inlet port if necessary.

(5) If the choke is worn or damaged, replace the whole carburetor and go to Step 8b.

(6) Unplug the inlet port if necessary and go to Step 8e.

e. Assemble the carburetor.

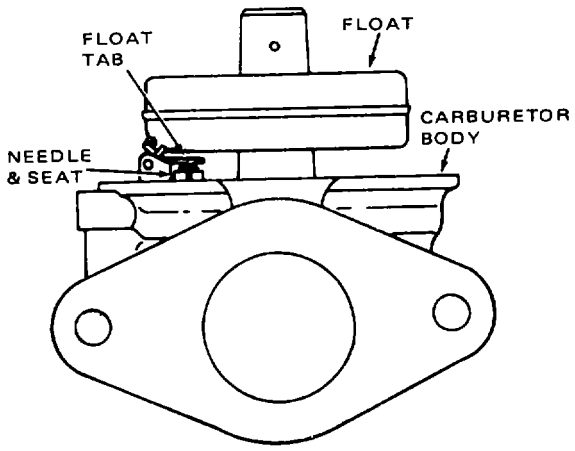


Figure 5-164. Carburetor Float Adjustment

(1) Install the seat needle float and pin.

(2) Set the float level. Turn the carburetor upside down and let the float rest on the needle. The clearance between the machined surface of the carburetor and the free end of the float should be 0.17 inches ±0.03 inches (4.37 mm ±0.76 mm).

(3) Adjust the clearance by bending the float tab with a screwdriver if necessary.

(4) Install a new baffle gasket, a new bowl gasket, the fuel bowl and a bowl screw. Make sure the bowl gasket seats well.

Table 53. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE OPERATES ERRATICALLY (Continued)

(5) Return the carburetor to the engine and go to Step llf. Make sure the carburetor to manifold gasket seals well.

f. Start the engine.

(1) If the engine starts, the problem is solved. Go to Step 8g.

(2) If the engine does not start, go to Step 9.

g. Adjust the carburetor while the engine is running.

(1) Turn the main fuel needle valve to the right (clockwise) until the engine slows down.

(2) Turn the main fuel needle valve back to the left (counterclockwise) until the engine slows down.

(3) Turn the main fuel needle valve back to the right to a position half-way between the slow down points.

Step 9. Check the engine compression.

NOTE

Because automatic compression release engines release compression at 600 rpm, there is a different compression test procedure for this engine.

a. Start the engine and run it for fifteen minutes.

b. Shut the engine OFF and remove the spark plug.

CAUTION

BE CAREFUL when removing the spark plug. Too much force can break the Insulator.

(1) Loosen the spark plug a few turns.

(2) Blow out the spark plug well with high pressure air. This will clean out any dirt or debris that can fall into the cylinder.

(3) Remove the spark plug by hand. /

c. Place a compression gage in the spark plug hole. Make sure it seals well.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

ENGINE OPERATER ERRATICALLY (Continued)

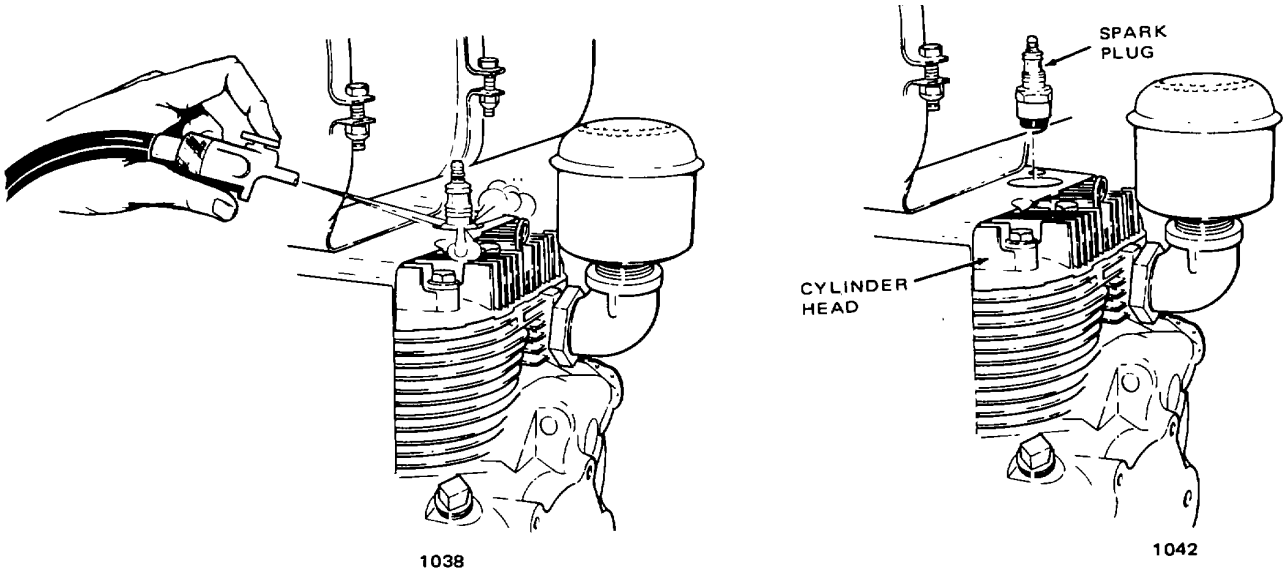


Figure 5-185. Spark Plug Cleaning and Removal

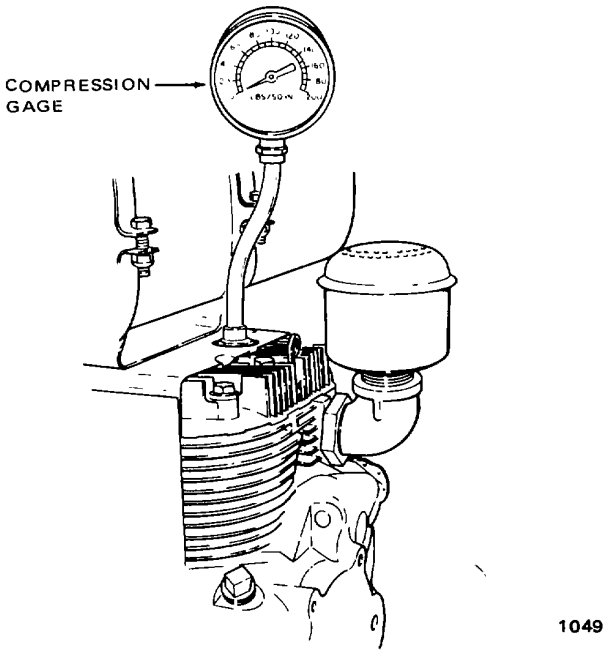


Figure 5-166. Installation of Compression Gage

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE OPERATES ERRATICALLY (Continued)

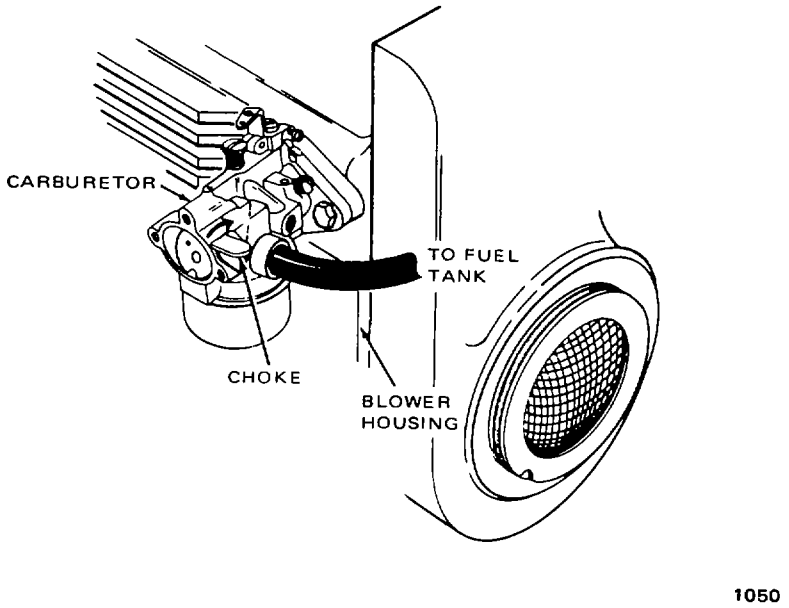


Figure 5-167. Choke Open Position

d. Set the choke wide open. Remove the air cleaner if necessary.

e. Crank the engine by hand counterclockwise (left: opposite to normal rotation).

f. Take eight to ten compression readings.

(1) The first few turns of the engine, the compression may be as low as 30 psi. After the seventh turn, the compression should be 90 psi.

(2) If the compression is less than 90 psi, replace the engine.

8. ENGINE KNOCKS

Step 1. Check the fuel octane rating.

a. If the octane rating is below 90, change the fuel supply.

b. If the octane rating is 90 or above, go to Step 2.

Step 2. Check the breaker points.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE KNOCKS (Continued)

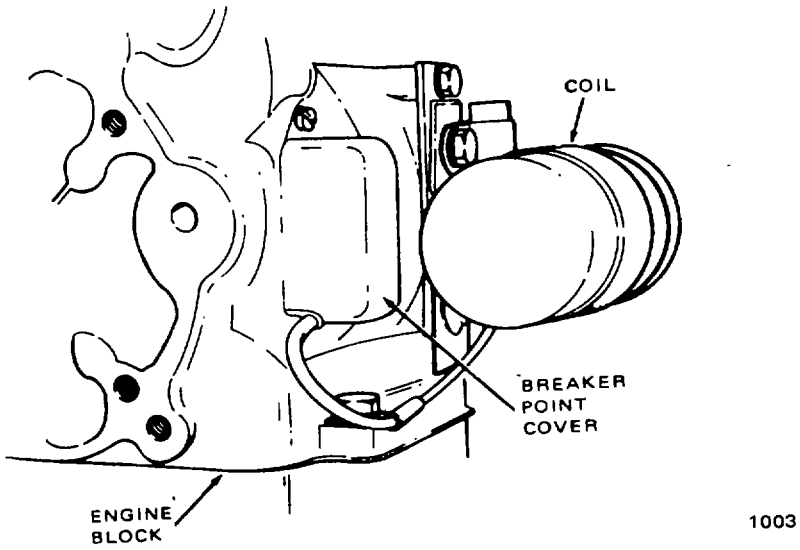


Figure 5-168. Breaker Point Cover

a. Remove the breaker point cover.

b. Open the points with a screwdriver and inspect them. If they are pitted, burned, or badly oxidized, replace them and go to Step 2c.

c. Check the breaker point gap.

(1) Shut the ignition switch OFF.

(2) Crank the engine by hand until the points are open to their widest gap.

(3) If the gap is 0.020 inches (0.52 mm) the gap is ok. Go to Step 3.

(4) If the gap is greater than or less than 0.020 inches (0.52 mm), go to Step 2d.

d. Reset the breaker point gap.

(1) Rotate the engine by hand until the breaker points reach their greatest gap.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE KNOCKS (Continued)

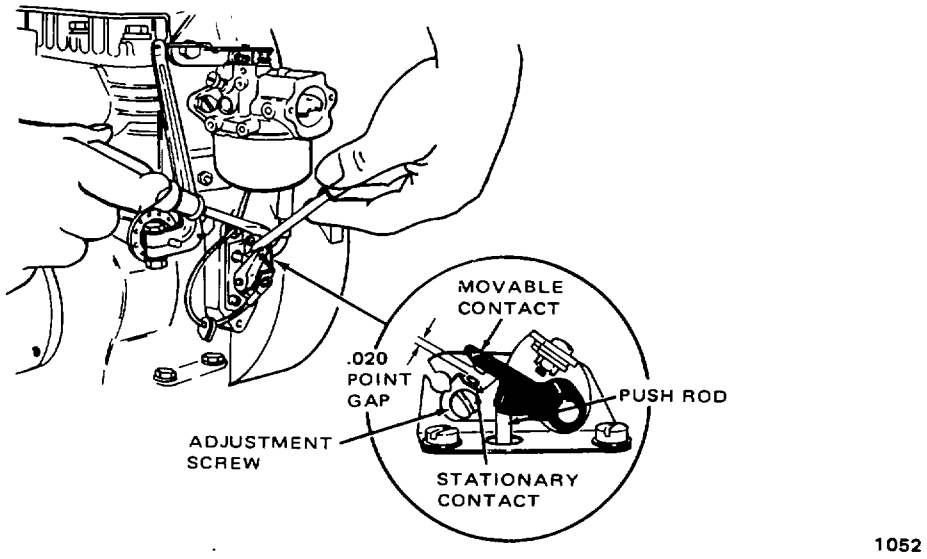


Figure 5-169. Gapping Breaker Points

(2) Loosen the point gap adjustment screw and place an 0.020 inch (0.52 mm) feeler gage between the points.

(3) Tighten the adjusting screw after setting the gap.

(4) Replace the breaker point cover and go to Step 2e.

e. Start the engine.

(1) If the engine starts, the problem is solved.

(2) If the engine does not start, go to Step 3.

Step 3. Check the engine compression.

NOTE

Because automatic compression release engines release compression at 600 rpm, there is a different compression test procedure for this engine.

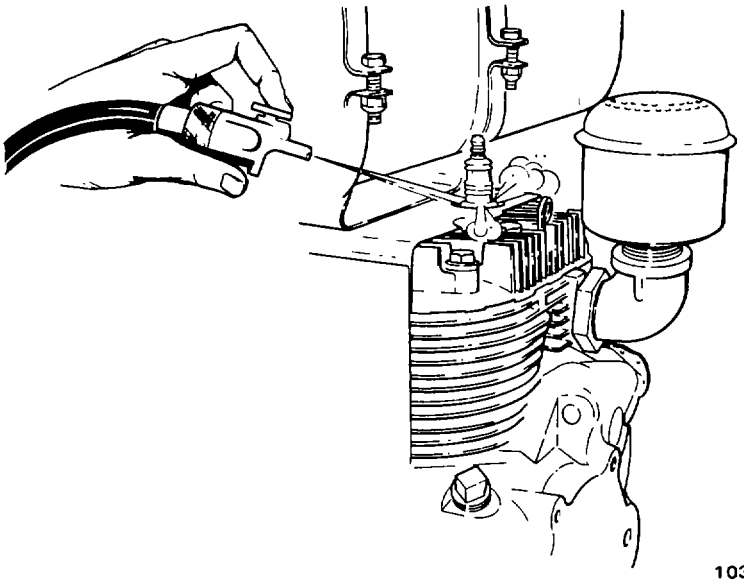
a. Start the engine and run it for fifteen minutes.

b. Shut the engine OFF and remove the spark plug.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE KNOCKS (Continued)



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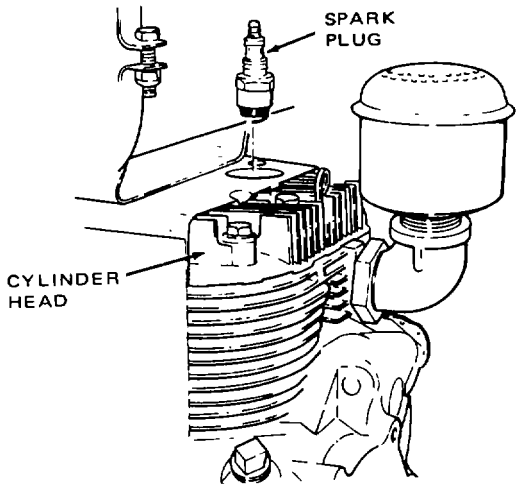

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Figure 5-170. Spark Plug Cleaning

CAUTION

BE CAREFUL when removing the spark plug. Too much force can break the insulator.

(1) Loosen the spark plug a few turns.

(2) Blow out the spark plug well with high pressure air. This will clean out any dirt or debris that can fall into the cylinder.

(3) Remove the spark plug by hand.

c. Place a compression gage in the spark plug hole. Make sure it seals well.

d. Set the choke wide open. Remove the air cleaner if necessary.

e. Crank the engine by hand counterclockwise (left: opposite to normal rotation).

f. Take eight to ten compression readings.

(1) The first few turns of the engine, the compression may be as low as 30 psi. After the seventh turn, the compression should be 90-100 psi.

(2) If the compression is less than 90 psi, replace the engine.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION	

ENGINE KNOCKS (Continued)

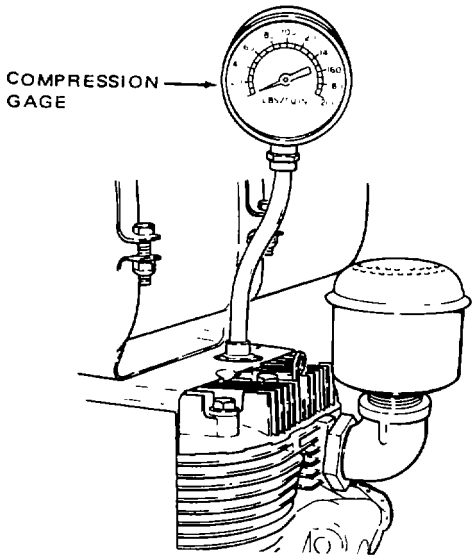

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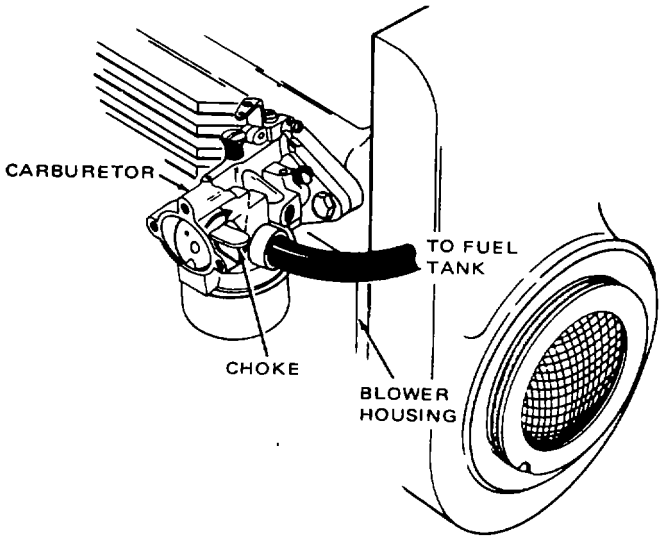
Figure 5-171. Installation of Compression



1050

Figure 5-172. Choke Open Position

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

ENGINE KNOCKS (Continued)

(3) If the compression is mutch greater than 100 psi, there may be carbon build-up in the cylinder. Remove the cylinder head and check for carbon build-up.

(4) If there is carbon build-up, replace the engine.

9. ENGINE SKIPS AT HIGH SPEED

Step 1. Check the spark plug.

CAUTION

BE CAREFUL when removing the spark plug from the engine. The insulator will break easily.

a. Remove the spark plug.

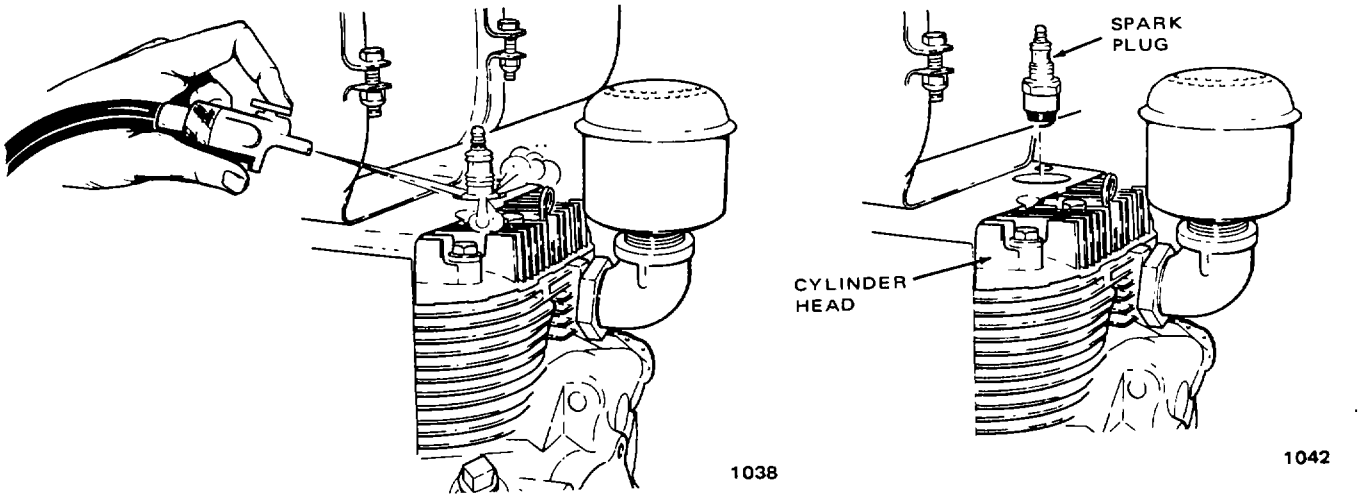


Figure 5-173. Spark Plug Cleaning and Removal

(1) Loosen the spark plug a few turns.

(2) Blow high pressure air into the spark plug well. This will clean out any dirt or debris.

(3) Remove the spark plug by hand.

b. Check the spark plug visually. Replace it and go to Step Id, if there are:

(1) Cracks in the insulator.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE SKIPS AT HIGH SPEED (Continued)

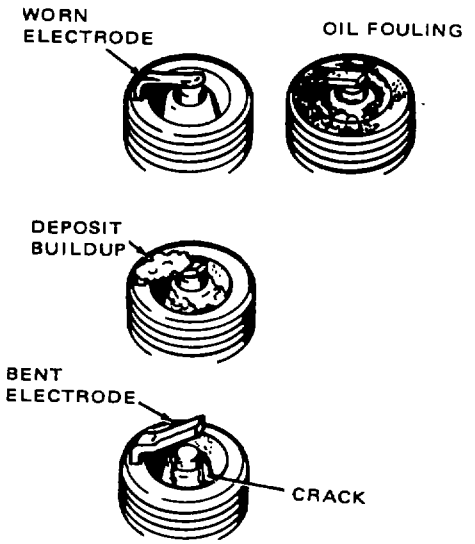


Figure 5-174. Spark Plug Defects

(2) Electrodes worn so thin they cannot be regapped.

(3) Oil fouling, soft, wet, oily covering the insulator and the plug nose. If there is oil fouling, notify your supervisor.

(4) Build-up of deposits between insulator and the plug shell.

(5) Broken insulator or bent electrode.

NOTE

If the spark plug must be replaced, set the gap at 0.025 inches (0.64 mm).

Oil fouling is a sign of internal engine damage.

c. Check the spark plug gap.

(1) Reset the gap at 0.025 inches (0.64 mm) if necessary and go to Step 1d.

(2) If the gap is ok, go to Step 1d.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE SKIPS AT HIGH SPEED (Continued)

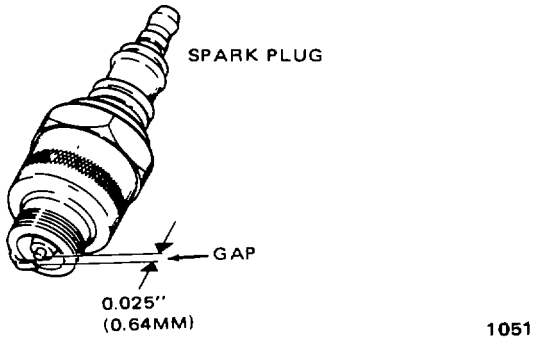


Figure 5-175. Spark Plug Gap

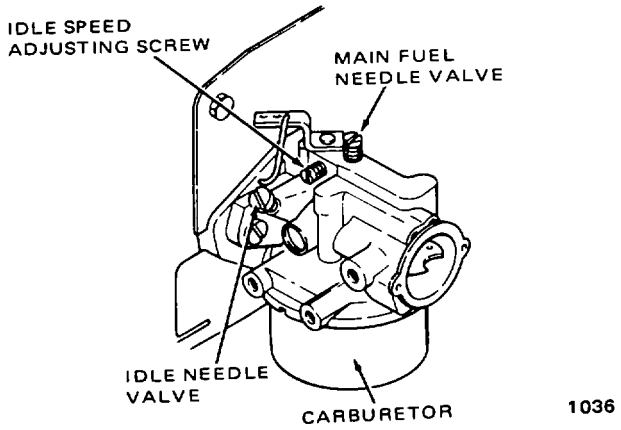


Figure 5-176. Carburetor

d. Check the spark plug for a spark.

(1) Connect the spark plug wire to the spark plug and set the plug on a grounded part of the engine.

(2) Turn the ignition switch ON.

(3) Crank the engine by hand. When the points open and close, a spark will jump between the spark plug electrodes.

(4) If there is a bright blue spark, go to Step 2.

(5) If there is no spark or the spark is weak and yellow, go to Step 2.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE SKIPS AT HIGH SPEED (Continued)

e. Start the engine.

(1) If the engine starts, the problem is solved.

(2) If the engine does not start, go to Step 2.

Step 2. Check the carburetor needle valve adjustment.

a. Adjust the carburetor while it is running.

(1) Turn the main fuel needle valve to the right (clockwise) until the engine slows down.

(2) Turn the main fuel needle valve back to the left (counterclockwise) until the engine slows down.

(3) Turn the main fuel needle valve back to a point halfway between the slow down points.

(4) If the engine stops skipping, the problem is solved.

(5) If the engine still skips, go to Step 2b.

CAUTION

BE CAREFUL not to use force when turning the needle valves in and out. Force can damage the valves.

b. Remove the main fuel needle valve and idle fuel needle valve and check them for damage and/or plugging.

(1) If the needle valves are ok, go to Step 2c.

CAUTION

DO NOT use hard metal objects to unplug the needle valves. Hard metal objects will damage them.

(2) If the needle valves are plugged, unplug them and return them to the carburetor. Go to Step 2d.

(3) If the needle valves are damaged or cannot be unplugged, replace them and go to Step 2c.

c. Adjust the needle valves.

(1) Turn both needle valves all the way to the right (clockwise) until they gently touch bottom.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE SKIPS AT HIGH SPEED (Continued)

(2) Turn the main fuel needle valve to the left (counterclockwise) two full turns.

(3) Turn the idle needle valve to the left (counterclockwise) 1-1/4 turns.

(4) Go to Step 2.

Step 3. Check the breaker points.

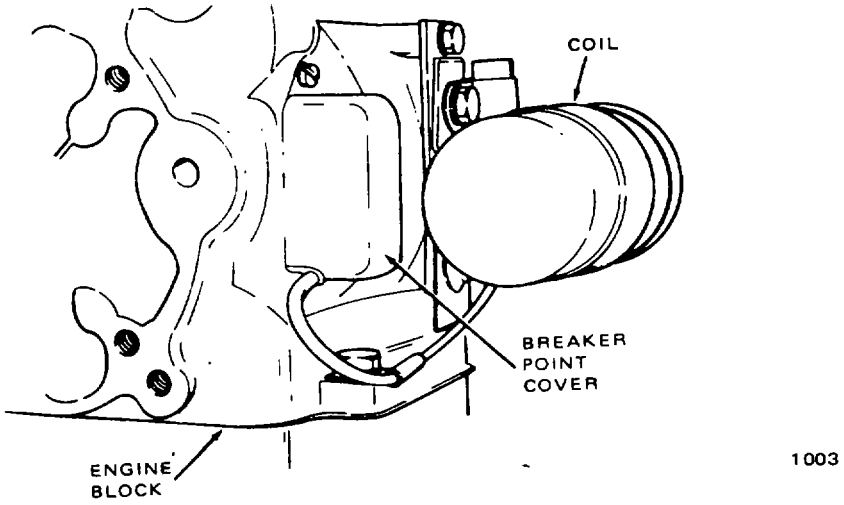


Figure 5-177. Breaker Point Cover

a. Remove the breaker point cover.

b. Open the points with a screwdriver and inspect them. If they are pitted, burned, or badly oxidized, replace them and go to Step 3c.

c. Check the breaker point gap.

(1) Shut the ignition switch OFF.

(2) Crank the engine by hand until the points are open to their widest gap.

(3) If the gap is 0.020 inches (0.52 mm) the gap is ok. Go to Step 2.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE SKIPS AT HIGH SPEED (Continued)

(4) If the gap is greater than or less than 0.020 inches (0.52 mm) go to Step 3d.

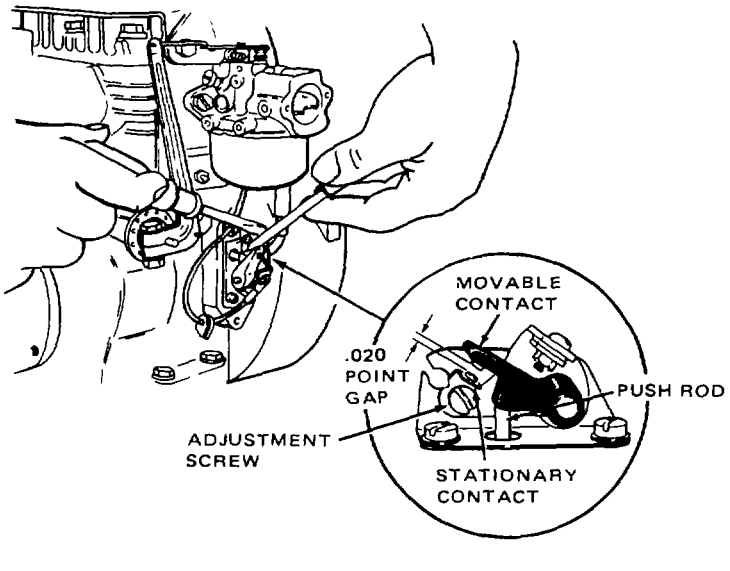


Figure 5-178. Gapping Breaker Points

d. Reset the breaker point gap.

(1) Rotate the engine by hand until the breaker points reach their greatest gap.

(2) Loosen the point gap adjustment screw and place an 0.020 inch (0.52 mm) feeler gage between the points.

(3) Tighten the adjusting screw after setting the gap.

(4) Replace the breaker point cover and go to Step 3c.

e. Start the engine.

10. ENGINE OVERHEATS

Step 1. Check the cooling fins for clogging. Remove the fuel tank.

a. Disconnect the battery power cable from the battery.

b. Close the fuel tank valve.

c. Disconnect the fuel line from the carburetor.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

ENGINE OVERHEATS (Continued)

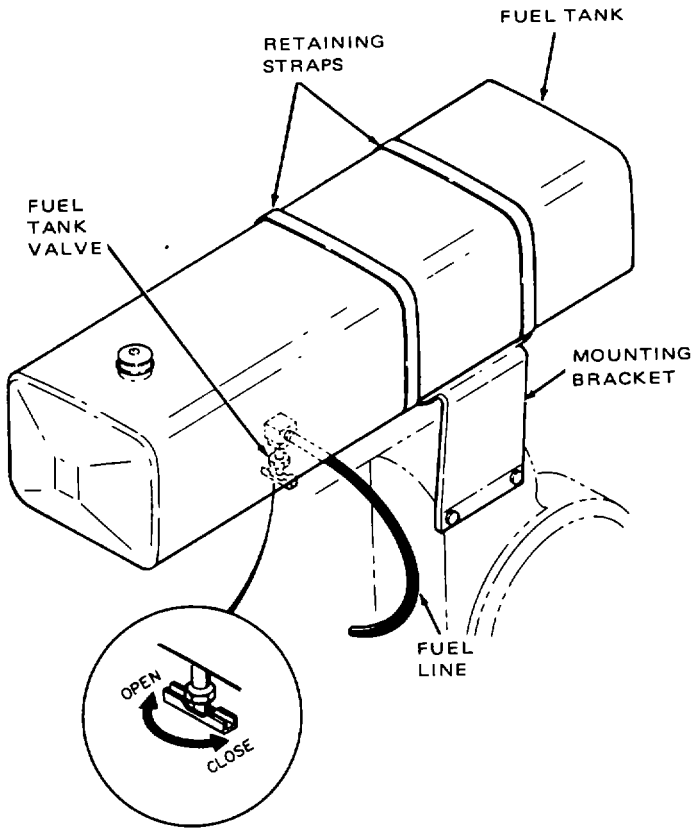


Figure 5-179. Fuel Tank Valve

d. Remove retaining strap nuts and bolts, retaining strap and fuel tank.

e. Remove the head baffle.

f. Disconnect the stator wires from the rectifier regulator.

g. Remove the blower housing.

h. Remove the cylinder baffle and the side air baffle.

i. Clean the cooling fins.

j. Reassemble the cooling system and go to Step 2.

Step 2. Check the oil level.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE OVERHEATS (Continued)

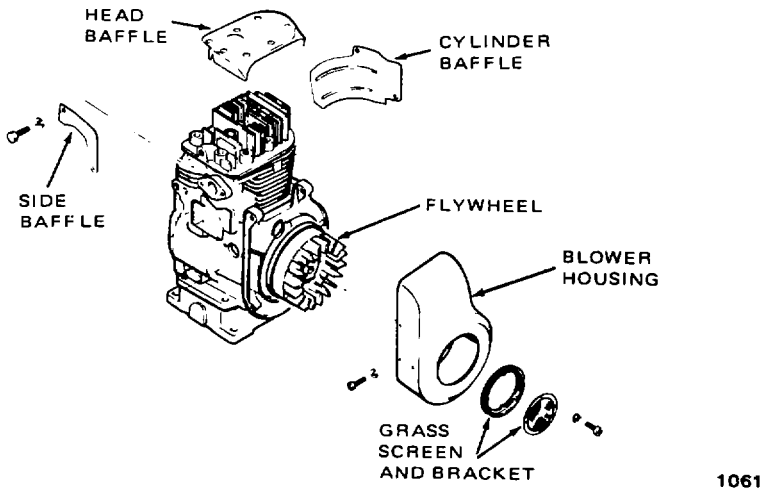


Figure 5-180. Engine Baffles

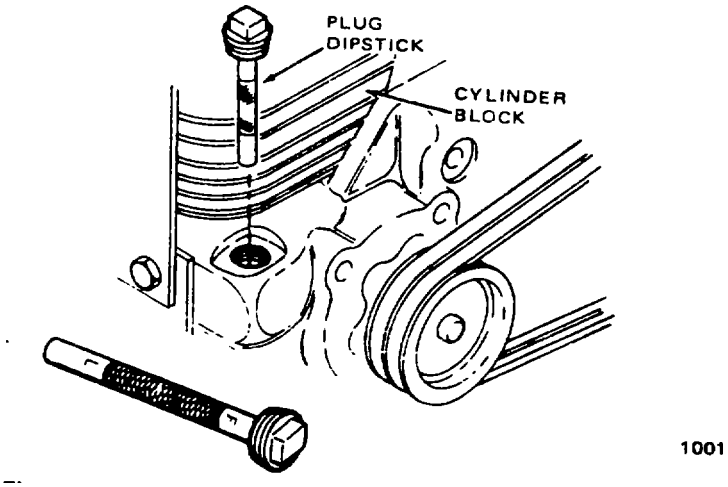


Figure 5-181. Engine Crankcase and Dipstick

a. If the oil level is higher than the full (F) mark on the dipstick, remove the drain pipe cap and drain the oil. The level must be kept between the low (L) and full (F) marks (near the full (F) mark). Go to Step 3.

b. If the oil level is near the full (F) mark, go to Step 3.

Table 5-3 Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE OVERHEATS (Continued)

Step 3. Adjust the carburetor main fuel needle valve.

CAUTION

DO NOT use force when adjusting the needle valve.

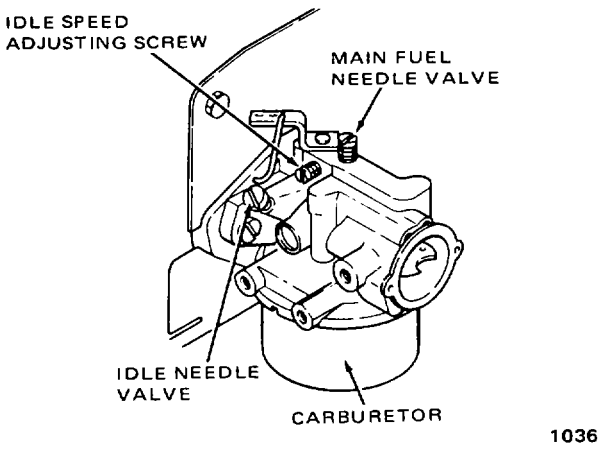


Figure 5-182. Carburetor

a. Turn the main fuel needle valve all the way in to gently touch the bottom.

b. Turn the main fuel needle valve to the left (counterclockwise) two full turns.

c. Go to Step 4.

Step 4. Check the breaker points.

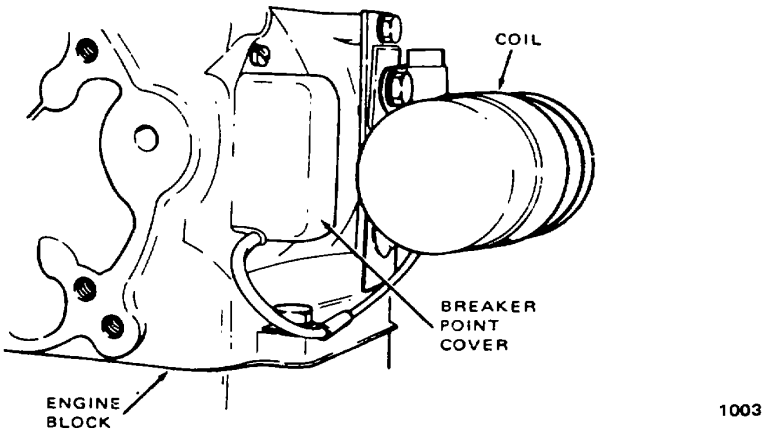


Figure 5-183. Breaker Point Cover

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE OVERHEATS (Continued)

a. Remove the breaker point cover.

b. Open the points with a screwdriver and inspect them. If they are pitted, burned, or badly oxidized, replace them and go to Step 4c.

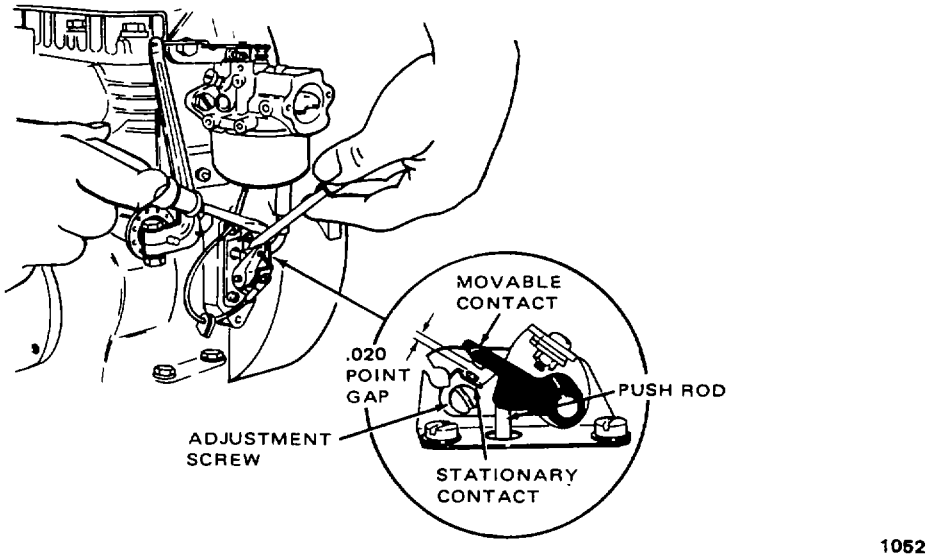


Figure 5-184. Gapping Breaker Points

c. Check the breaker point gap.

(1) Shut the ignition switch OFF.

(2) Crank the engine by hand until the points are open to their widest gap.

(3) If the gap is 0.020 inches (0.52 mm) the gap is ok. Go to Step 2.

(4) If the gap is greater than or less than 0.020 inches (0.52 mm) go to Step 4d.

d. Reset the breaker point gap.

(1) Rotate the engine by hand until the breaker points reach their greatest gap.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE OVERHEATS (Continued)

(2) Loosen the point gap adjustment screw and place an 0.020 inch (0.52 mm) feeler gage between the points.

(3) Tighten the adjusting screw after setting the gap.

(4) Replace the breaker point cover and go to Step 4e.

e. Start the engine.

11. ENGINE BACKFIRES

Step 1. Check the breaker points.

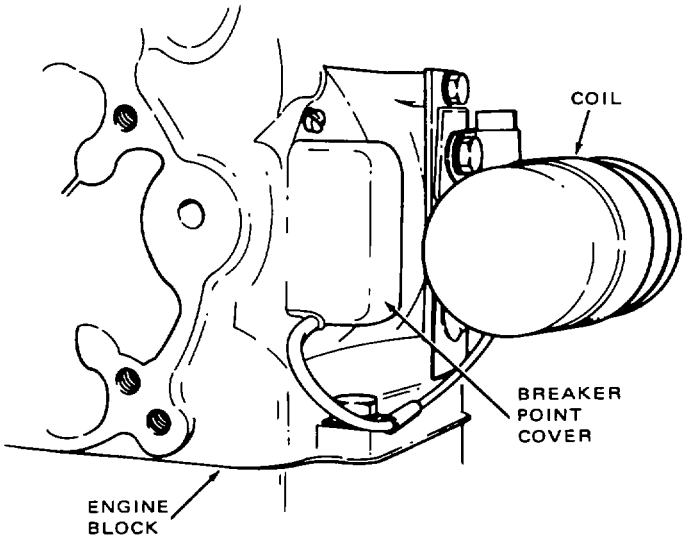


Figure 5-185. Breaker Point Cover

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE BACKFIRES (Continued)

a. Remove the breaker point cover.

b. Open the points with a screwdriver and inspect them. If they are pitted, burned, or badly oxidized, replace them and go to Step ic.

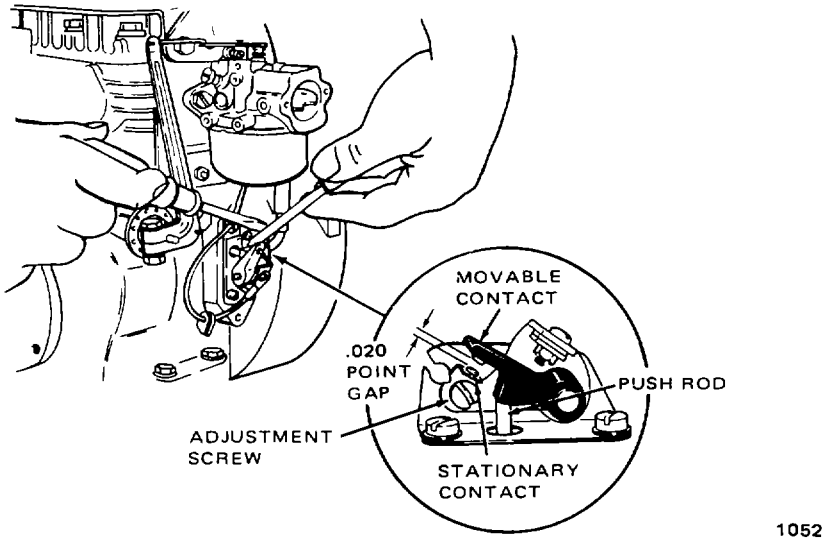


Figure 5-186. Gapping Breaker Points

c. Check the breaker point gap.

(1) Shut the ignition switch OFF.

(2) Crank the engine by hand until the points are open to their widest gap.

(3) If the gap is 0.020 inches (0.52 mm) the gap is ok. Go to Step 2.

(4) If the gap is greater than or less than 0.020 inches (0.52 mm), go to Step 1d.

d. Reset the breaker point gap.

(1) Rotate the engine by hand until the breaker points reach their greatest gap.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE BACKFIRES (Continued)

(2) Loosen the point gap adjustment screw and place an 0.020 inch (0.52 mm) feeler gage between the points.

(3) Tighten the adjusting screw after setting the gap.

(4) Replace the breaker point cover and go to Step 1e.

e. Start the engine.

(1) If the engine starts the problem is solved.

(2) If the engine does not start, go to Step 2.

Step 2. Check the engine compression.

NOTE

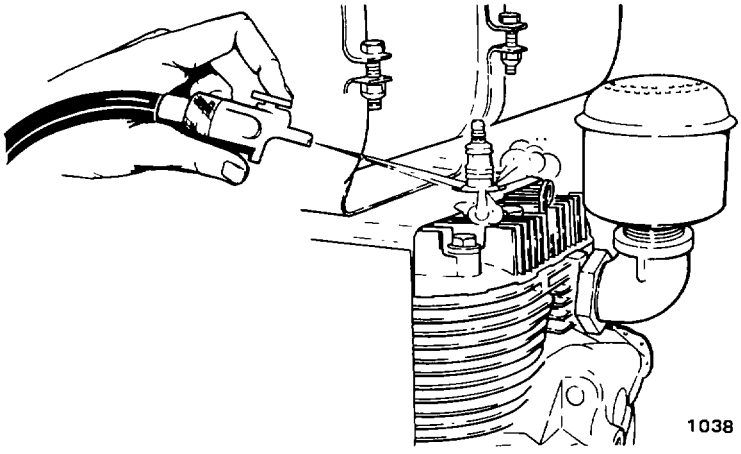
Because automatic compression release engines release compression at 600 rpm, there is a different compression test procedure for this engine.

a. Start the engine and run it for fifteen minutes.

b. Shut off the engine and remove the spark plug.

CAUTION

BE CAREFUL when removing the spark plug. Too much force can break the insulator.



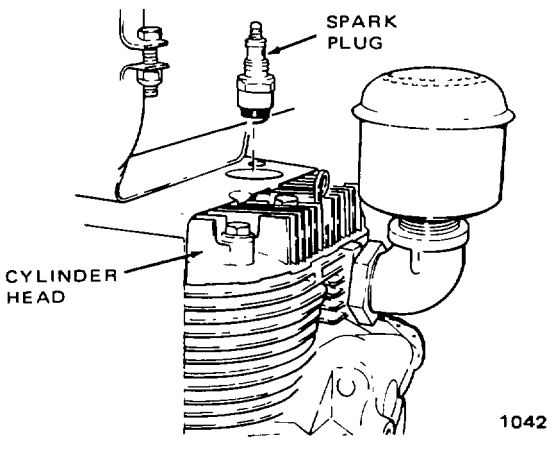


Figure 5-187. Spark Plug Cleaning and Removal

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE BACKFIRES (Continued)

(1) Loosen the spark plug a few turns.

(2) Blow out the spark plug well with high pressure air. This will clean out any dirt or debris that can fall into the cylinder.

(3) Remove the spark plug by hand.

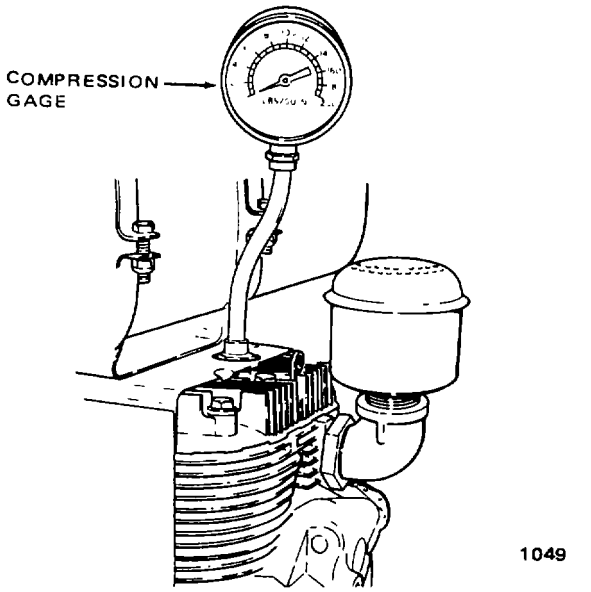


Figure 5-188. Installation of Compression Gage

c. Place a compression gage in the spark plug hole. Make sure it seals well.

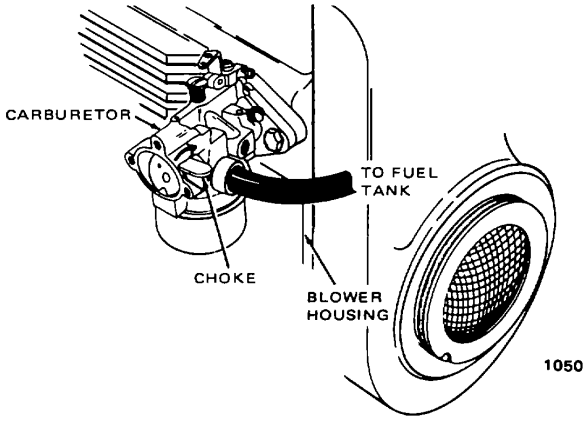


Figure 5-189. Choke Open Position

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE BACKFIRES (Continued)

d. Set the choke wide open. Remove the air cleaner if necessary.

e. Crank the engine by hand counterclockwise (left: opposite to normal rotation).

f. Take eight to ter compression readings.

(1) The first few turns of the engine, the compression may be as low as 30 psi. After the seventh turn, the compression should be 90 psi.

(2) If the compression is less than 90 psi, replace the engine.

12. NOZZLE PRESSURE BELOW 90 PSI

Step 1. Turn the engine ON and listen to the compressor.

a. If it runs smoothly, go to Step 2.

b. If the compressor makes grinding, rubbing or rattling noises, go to Step 1c.

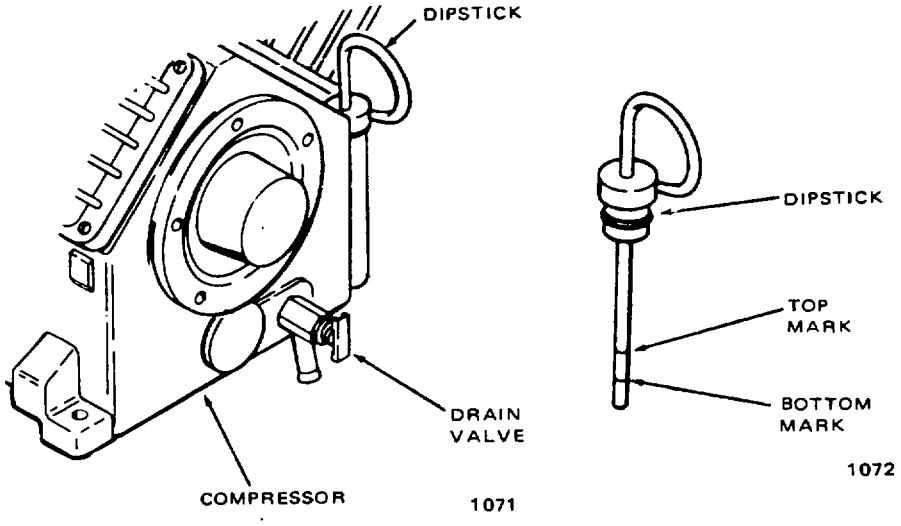


Figure 5-190. Compressor Dipstick

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

NOZZLE PRESSURE BELOW 90 PSI (Continued)

c. Check the oil level.

(1) If the oil level is near the top mark, go to Step 2.

CAUTION

DO NOT overfill the crankcase. The oil level must be kept between the top and bottom marks on the dipstick.

(2) If the oil level is slightly above or below the (L) low mark, add oil. Use a synthetic reciprocating compressor oil: refer to page 1-6 for correct compressor oil. Go to Step 2.

Step 2. Check the air hose and fittings listed below for leaks.

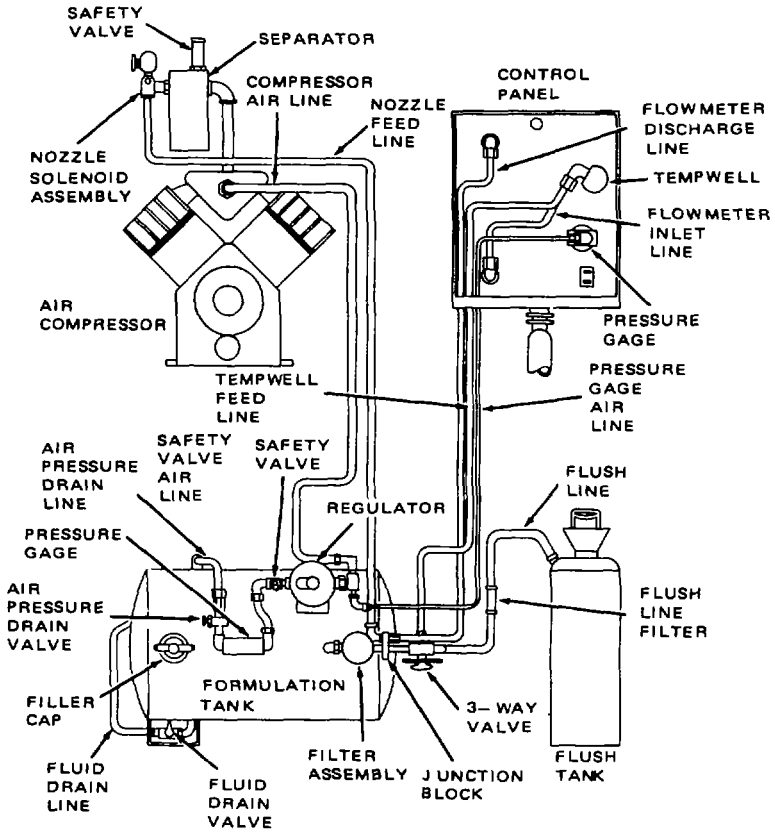


Figure 5-191. Hoses Lines and Fittings

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

NOZZLE PRESSURE BELOW 90 PSI (Continued)

- Hose between the compressor and the formulation tank.
- The 1/8 inch (3.18 mm) black nylon hose between the formulation tank and the cab control panel pressure gage.

a. If the hoses are frayed, cracked or cut, replace them and go to Step 2e.

b. If the fittings leak, tighten them and check the pressure gage again.

(1) If the pressure is 90-100 psi, the problem is solved.

(2) If the pressure is less than 90 psi, go to Step 2c.

c. If the fittings are dented or bent, replace the hose and fitting and go to Step 2e.

d. If the 1/8 inch (3.18 mm) hose is crimped or bent at a sharp angle, replace it and go to Step 2e.

e. After replacing any of the parts listed above, start the engine and check the pressure again.

(1) If the pressure is 90-100 psi, the problem is solved.

(2) If the pressure is less than 90 psi, go to Step 3.

Step 3. Check the air compressor filters.

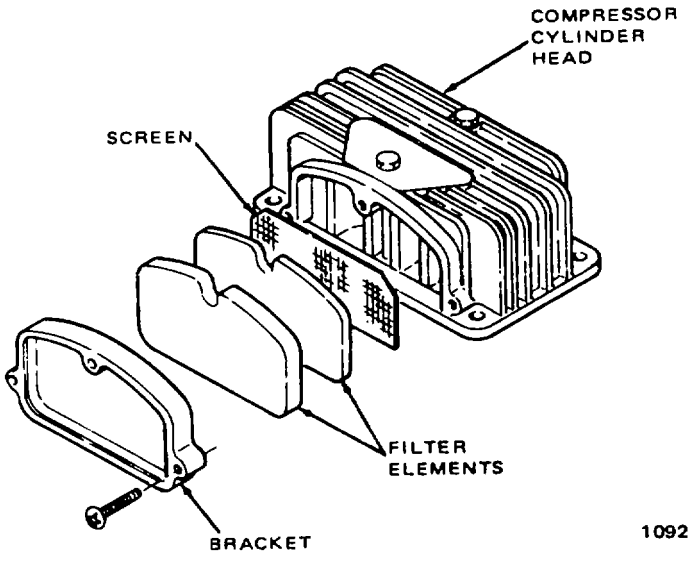


Figure 5-192. Compressor Air Filter

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

NOZZLE PRESSURE BELOW 90 PSI (Continued)

a. If a back pressure can be felt at the air filters when the compressor is running, go to Step 7.

b. Remove the filter elements and inspect them.

(1) If they are plugged with dirt, replace them and go to Step 3c.

(2) If they are ok, go to Step 4.

c. After replacing the filter elements, start the engine and check the pressure again.

(1) If the pressure is 90-100 psi, the problem is solved.

(2) If the pressure is still less than 90 psi, go to Step 4.

Step 4. Check the pipe fittings listed below for air leaks.

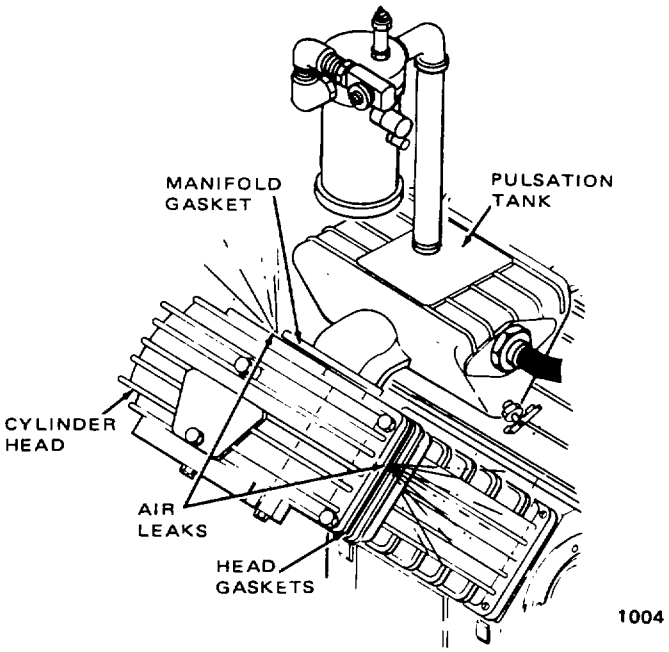


Figure 5-193. Compressor Air Leaks

- Pipe elbow and nipple between the pulsation tank and separator.
- Street elbow at the separator.
- Pulsation tank pipe plug.
- Nozzle assembly.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

NOZZLE PRESSURE BELOW 90 PSI (Continued)

a. If any of the above fittings are loose, tighten them when the nozzle reaches normal operating temperature and go to Step 4c.

b. If the fittings above are warped and cannot be tightened to stop air leaks, replace them and go to Step 4c.

c. After tightening or replacing any of the above parts, start the engine and check the pressure gage.

(1) If the pressure is 90-100 psi, the problem is solved.

(2) If the pressure is less than 90 psi, go to Step 5.

Step 5. Check gaskets for leaks while the engine is running.

a. Feel around the head seams for air leaks.

(1) If there are air leaks, go to Step 6.

(2) If there are no air leaks, go to Step 6.

NOTE

Even if there are no apparent air leaks, a loss of pressure can be caused by bad valves.

b. Feel around the pulsation tank and head connection for air leaks.

(1) If there are no air leaks, go to Step 6.

(2) If there are air leaks, go to Step 6b.

Step 6. Check the compressor cylinder head assembly for air leaks.

a. Disassemble head assembly.

(1) Disconnect the nozzle adjusting nut and separate the nozzle from the swivel elbow.

(2) Disconnect the air hose from the pulsation tank.

(3) Loosen pulsation tank screws.

(4) Remove the head mounting screws.

(5) Separate head assembly and valve plates from compressor.

(6) Separate compressor heads from pulsation tank.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

NOZZLE PRESSURE BELOW 90 PSI (Continued)

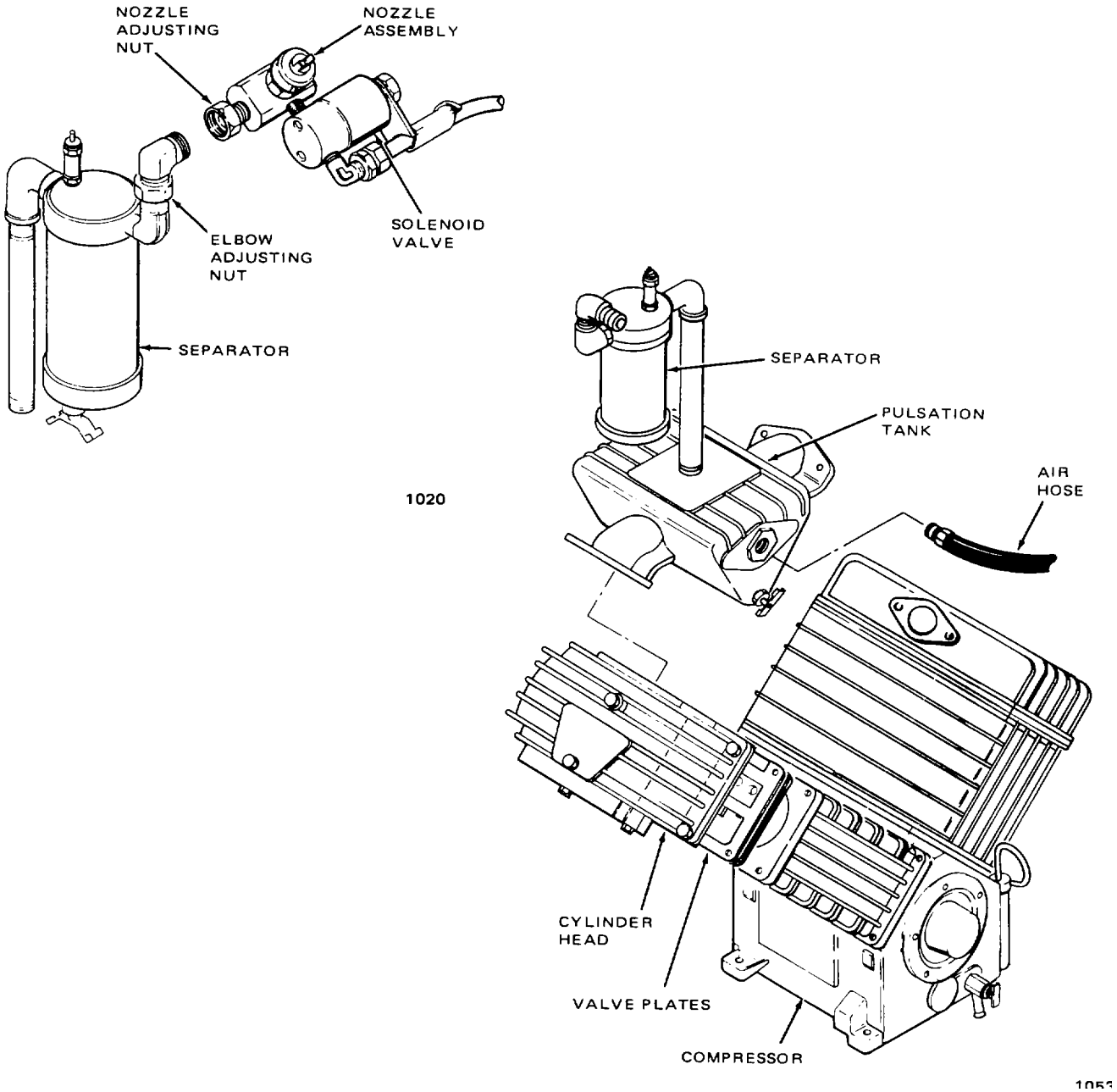


Figure 5-194. Compressor Disassembly

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

NOZZLE PRESSURE BELOW 90 PSI (Continued)

b. Inspect the pulsation tank.

(1) If the O-rings are cracked or broken, replace them and go to Step 6c.

(2) If the machined surfaces are nicked or scratched, replace the pulsation tank. Go to Step 6c.

(3) If the pulsation tank is ok, go to Step 6c.

c. Inspect the heads.

(1) If the machined surfaces are nicked or scratched, replace the heads and go to Step 6e.

(2) If the head is warped or bent, replace it and go to Step 6e.

(3) If the heads are ok, go to Step 6d.

NOTE

Whenever the heads are removed, replace the head gaskets.

d. Inspect the valve plates and valves.

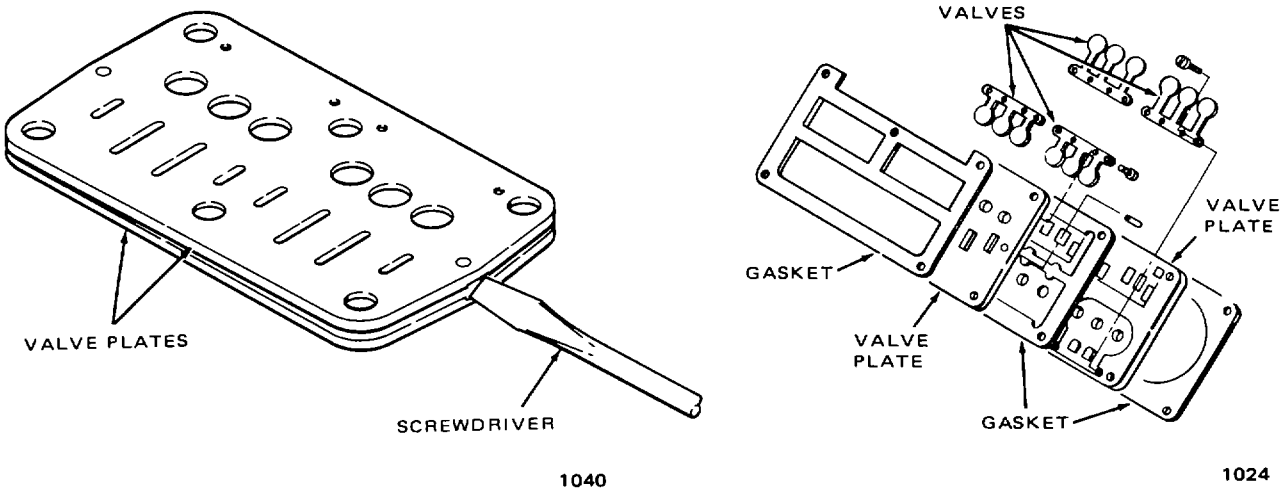


Figure 5-195. Valve Plate Disassembly

(1) Place a screwdriver in the valve plate end notches and pry the plate open.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

NOZZLE PRESSURE BELOW 90 PSI (Continued)

(2) If the valve plates are warped or bent, replace them and go to Step 6f.

(3) If the valves are bent, worn or if they stick, replace them and go to Step 6f.

e. Inspect the top of the cylinder.

(1) If the machined surfaces are nicked or scratched, replace the compressor and go to Step 6f.

(2) If the cylinder body is warped, replace the compressor and go to Step 6f.

(3) If the cylinder is ok, go to Step 7.

(4) If the valve plates and valves are ok, go to Step 6f.

f. Reassemble valve plates and head assembly.

(1) Press the valve plates together.

(2) Attach the compressor heads to the pulsation tank.

(3) Install the valve plates and compressor heads. Torque the head screws to 400 inch lbs (4.61 kgM).

(4) Install the nozzle assembly and the air hose and go to Step 6g.

g. Recheck for air leaks.

(1) If the nozzle pressure is 90 to 100 psi, the problem is solved.

(2) If the nozzle pressure is less than 90 psi, go to Step 7.

Step 7. Check the accuracy of the control panel pressure gage.

a. Disconnect the air hose from the hose fitting.

b. Remove the hose fitting from the pulsation tank.

c. Insert a test pressure gage into the pulsation tank and compare the control panel pressure gage.

(1) If both gages read the same pressure, the control panel gage is ok.

(2) If both gages read less than 90 psi, the piston rings are bad. Replace the compressor.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

NOZZLE PRESSURE BELOW 90 PSI (Continued)

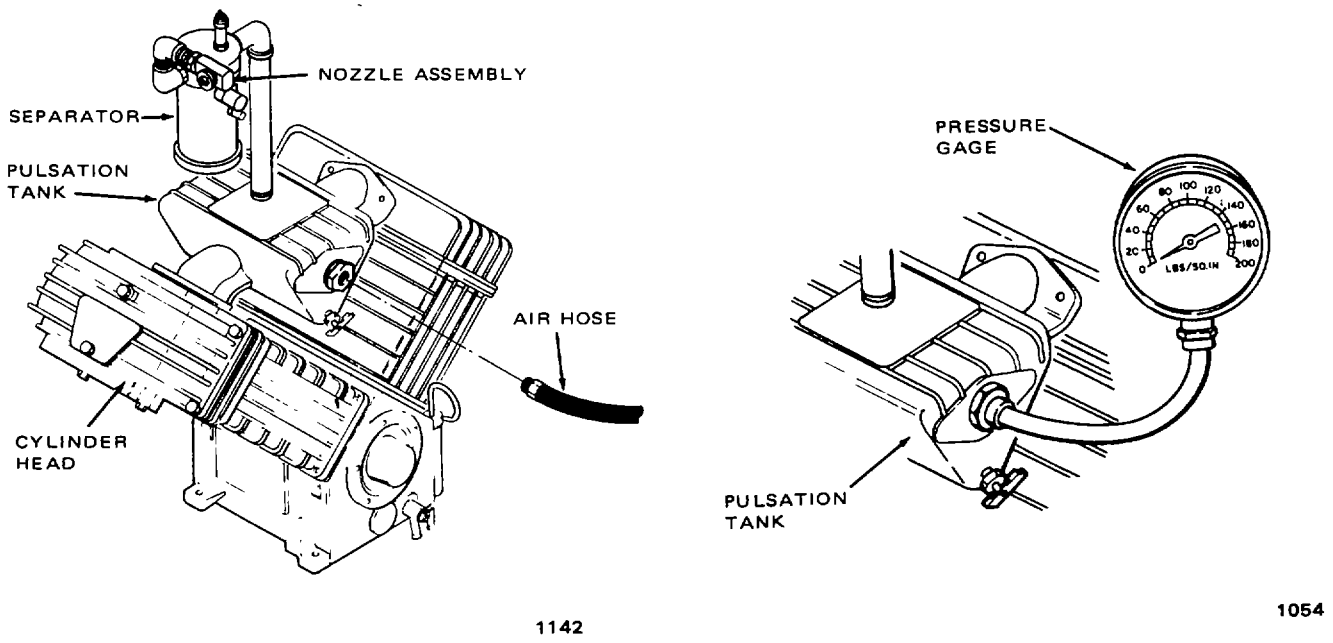


Figure 5-196. Installation of Pressure Gage

(3) If the gages do not read the same pressure, replace the control panel gage and go to Step 7d.

d. After replacing the gage, recheck the pressure.

(1) If the pressure is 90-100 psi, the problem is solved.

(2) If the pressure is less than 75 psi, go to Step 7c(2).

13. NOZZLE PRESSURE GREATER THAN 100 PSI

Step 1. Check the separator filter element.

a. Disassemble the separator.

(1) Remove the bottom retaining nut.

(2) Remove the separator body and bottom.

(3) Remove the filter retaining nut, baffle disc and filter element. Go to Step 1b.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

NOZZLE PRESSURE GREATER THAN 100 PSI (Continued)

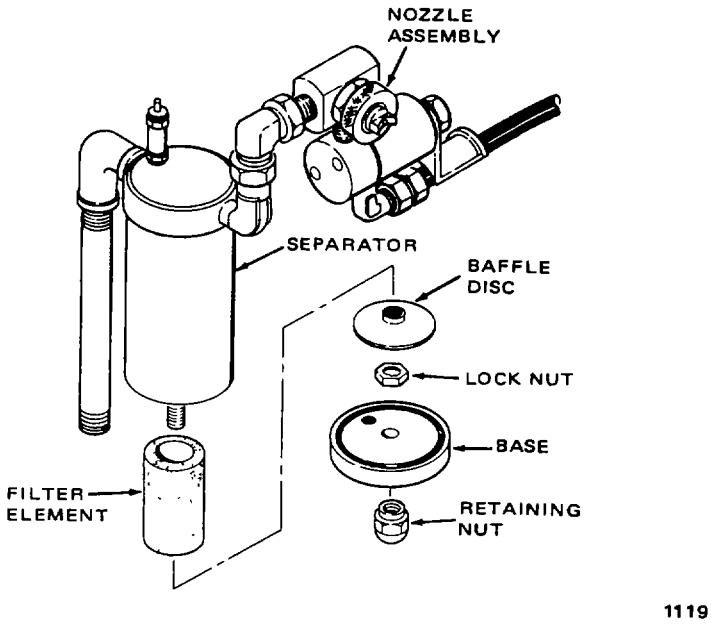


Figure 5-197. Separator Assembly

b. Inspect the filter element.

(1) If the filter element is plugged, clean it with acetone (O-A-51F), replace it and go to Step 1c.

(2) If the filter element is ok, go to Step 1c.

c. Inspect the gaskets.

(1) If the gasket is cracked or broken, replace it and go to Step 1d.

(2) If the gasket is ok, go to Step 1d.

d. Reassemble the separator and start the engine. Check the pressure gage.

(1) If the pressure is 90-100 psi, the problem is solved.

(2) If the pressure is still greater than 100 psi, go to Step 2.

Step 2. Check the engine speed. Use a hand-held tachometer.

a. Start the engine according to operating instructions in Chapter 2, Section III.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

NOZZLE PRESSURE GREATER THAN 100 PSI (Continued)

NOTE

The belts should be connected to the pulleys while checking the engine speed.

b. Check the engine operating speed with a hand-held tachometer. Refer to page 1-6 for correct rpm ratings. If the speed is not correct, go to Step 2c.

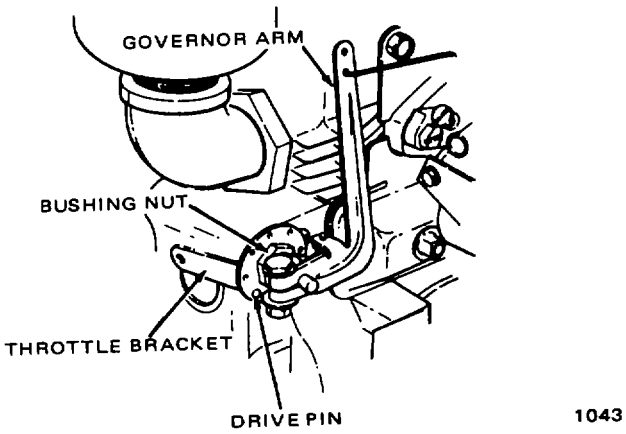


Figure 5-198. Governor Assembly

c. Adjust the engine speed to the correct rpm.

(1) Loosen the bushing nut slightly.

(2) Move the throttle bracket to the left (counterclockwise) to increase the engine speed and to the right (clockwise) to decrease the engine speed.

CAUTION

DO NOT force the bushing nut tight. This could cause binding or stripped threads.

(3) When the engine speed is adjusted to the correct rpm, tighten the bushing nut and lock the throttle bracket in place.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

14. CONTROL PANEL LIGHT DOES NOT LIGHT

NOTE

First make sure the aerosol generator ignition switch was on when the control panel light switch was turned on.

Step 1. Make sure there is power to the light. Use a volt-ohmmeter.

WARNING

BE ALERT that the ignition switch is turned OFF before checking the wires.

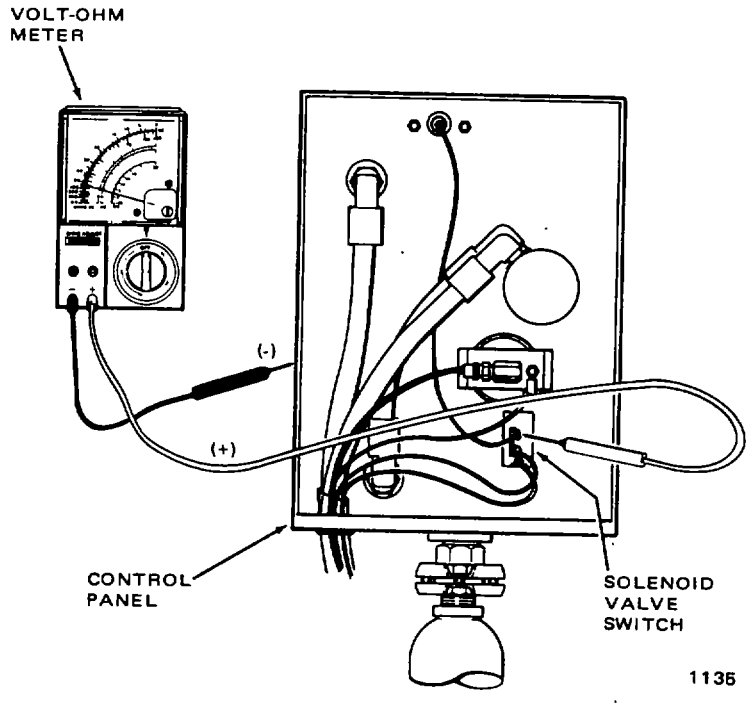


Figure 5-199. Control Panel Electrical Test

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

CONTROL PANEL LIGHT DOES NOT LIGHT (Continued)

a. Disconnect the red power wire from the back of the solenoid valve switch.

b. Connect the positive (+) meter lead to the red wire and the negative (-) meter lead to the back of the switch terminal.

c. Turn the ignition switch ON.

(1) If the volt-ohmmeter reads 12 volts, the wire is ok and the light assembly is bad. Replace the light assembly and go to Step 1d.

(2) If the volt-ohmmeter does not read 12 volts, go to Step 2.

d. Check the new light assembly. Turn on the light switch and ignition switch.

(1) If the light comes on, the problem is solved.

(2) If the light does not come on, go to Step 2.

Step 2. Check the red power line and connectors.

a. If the wire terminal at the ignition switch is loose, tighten it and turn on the light. If it does not work, go to Step 2c.

b. If the wire connectors are disconnected, connect them and turn on the light. If it does not work, go to Step 2c.

c. Disconnect the female connectors and check the engine side with a volt-ohmmeter.

(1) Connect the positive (+) meter lead to the hot side of the connector and the negative (-) meter lead to the ground side of the connector.

(2) Turn the ignition switch ON.

(3) If the meter does not read 12 volts, replace the wire and the light.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

15. FORMULATION TANK WILL NOT HOLD PRESSURE

Step 1. Determine if the problem is in the formulation tank or the compressor.

WARNING

- **BE SURE the formulation tank is empty of any liquid before testing it.**
- **BE SURE to turn the solenoid valve switch OFF before pressurizing the formulation tank.**
- **BE SURE there are no personnel in front of the nozzle before starting the engine.**
- **DO NOT walk in front of the nozzle when the engine is running.**

a. Turn the solenoid valve switch OFF and start the engine.

b. Check the control panel pressure gage.

(1) If the pressure is 90-100 psi, the compressor is ok. Go to Step 1c.

(2) If the pressure is less than 90 psi, go to Page 5-171 symptom 12.

c. When the tank pressure reaches 11-14 psi, shut the engine OFF and go to Step 2.

Step 2. Check all fittings and joints for air leaks. See figure for fitting and joint locations.

a. Listen for air leaks.

(1) If they can be located, correct them and then go to Step 2d.

(2) If there are no apparent leaks, go to Step 2b.

(3) If the safety valve opens before the tank pressure reaches 11-14 psi, go to Step 3.

b. Test the fittings and joints for air leaks.

(1) Prepare a thick lather with soap and water.

(2) Spread the lather around all the fittings and joints in figure 1.

(3) If there is a leak, it will blow bubbles through the lather. Go to Step 2c.

(4) If there are no leaks, go to Step 3.

(5) If the filler cap leaks, go to Step 4.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

FORMULATION TANK WILL NOT HOLD PRESSURE (Continued)

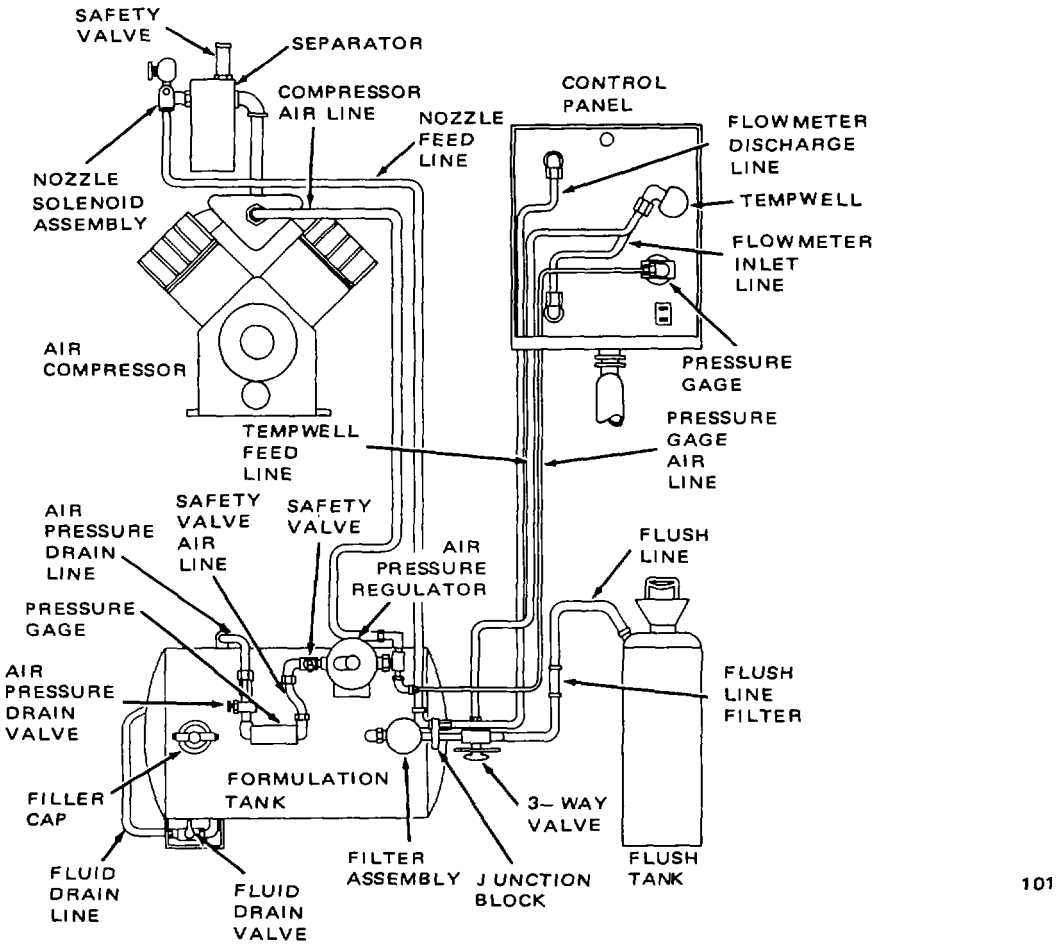


Figure 5-200. Hoses and Lines and Fittings

(6) If the formulation tank filter leaks, go to Step 7.

WARNING

BE SURE to open the pressure drain valve and release tank pressure before replacing any parts.

c. Wash away the lather and inspect the leaking fitting.

(1) If the fitting is loose, tighten it and go to Step 2d.

(2) If the fitting is damaged so it does not seal the tank, replace it and go to Step 2d.

d. After replacing the part, close the pressure drain valve and pressurize the tank again. Let the tank sit for 5-10 minutes.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

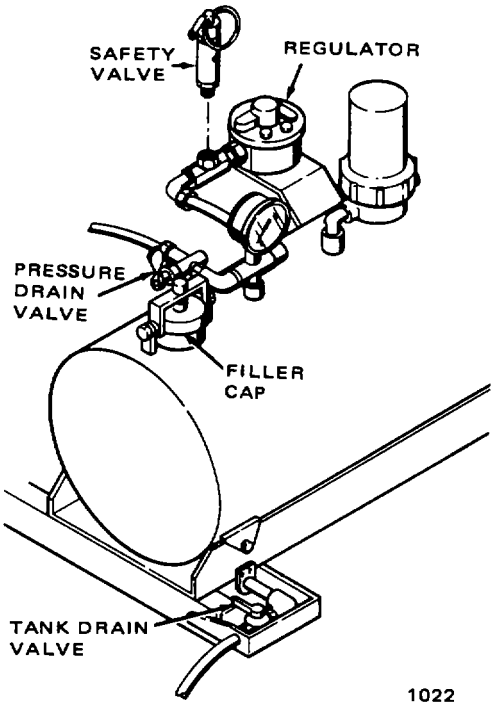
MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

FORMULATION TANK WILL NOT HOLD PRESSURE (Continued)

(1) If the tank holds the 11-14 psi pressure, the problem is solved.

(2) If the tank does not hold the 11-14 psi pressure and there are no more leaks, go to Step 3.

Step 3. Check the safety valve, the pressure regulator and the tank pressure gage. Use a test pressure gage.



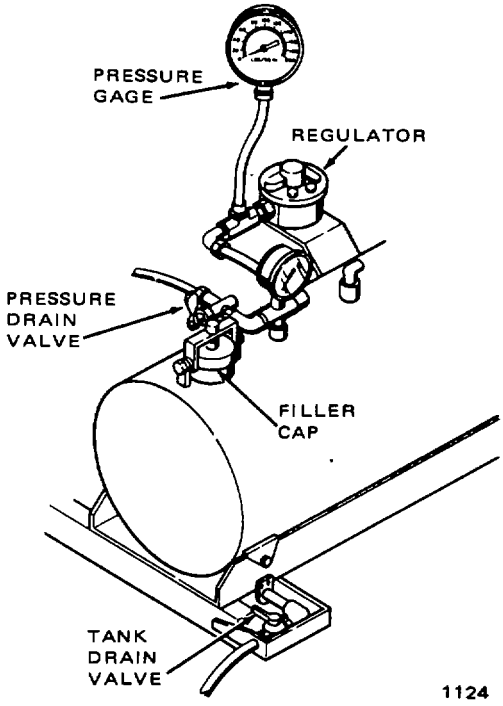


Figure 5-201. Pressure Gage Installation

a. Remove the safety valve from the tee.

b. Insert a test pressure gage into the tee.

c. Start the engine and pressurize the formulation tank.

WARNING

BE SURE to open the pressure drain valve and release the tank pressure before replacing any parts.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

FORMULATION TANK WILL NOT HOLD PRESSURE (Continued)

(1) If the test pressure gage reads 10 psi or less, replace the pressure regulator and go to Step 3d.

(2) If the test pressure gage reads more than 15 psi, replace the safety valve and the pressure regulator and go to Step 3d.

(3) If the test pressure gage is equal to the tank pressure gage, the tank pressure gage is ok. Go to 3d.

(4) If the test pressure gage and the tank pressure gage are not equal, replace the tank pressure gage. Go to Step 3d.

d. Close the pressure drain valve and pressurize the tank. Let it sit for 5-10 minutes.

(1) If the tank holds 11-14 psi pressure, the problem is solved.

(2) If the tank does not hold 11-14 psi, go to Step 4.

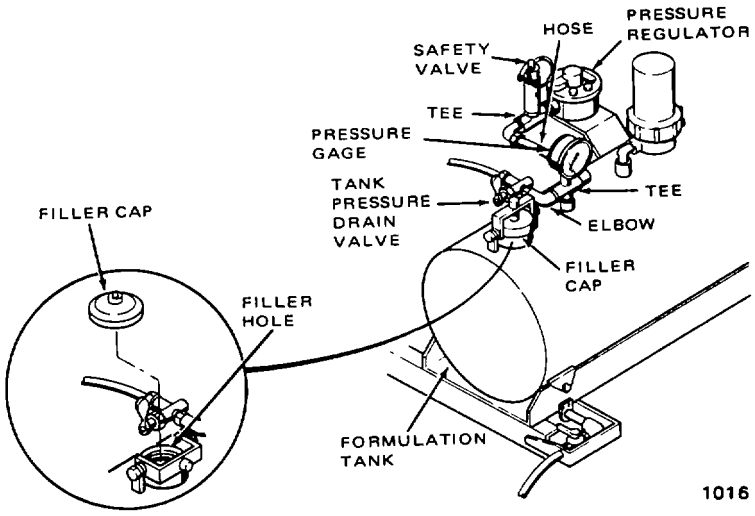


Figure 5-202. Formulation Tank Filler Cap

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

FORMULATION TANK WILL NOT HOLD PRESSURE (Continued)

Step 4. Remove the filler cap and inspect it.

WARNING

BE SURE to open the pressure drain valve and release the tank pressure before removing the filler cap.

a. If the filler cap is warped or dented so the cap will not seal correctly, replace it and go to Step 4c.

b. If the O-ring is cracked, broken or swelled, replace the cap and go to Step 4c.

c. Close the pressure drain valve and pressurize the formulation tank. Let it sit for 5-10 minutes.

(1) If the formulation tank holds 11-14 psi pressure, the problem is solved.

(2) If the formulation tank does not hold 11-14 psi pressure, go to Step 5.

Step 5. Check the pressure drain valve for air leaks.

a. Start the engine and pressurize the tank. When the tank pressure reaches 11-14 psi, shut the engine OFF.

b. Remove the pressure drain hose from the retaining clip and place it in a container of water.

WARNING

BE SURE to open the pressure drain valve and release the tank pressure before replacing it.

(1) If a steady stream of air bubbles form in the water, replace the valve.

(2) If no air bubbles form, the valve is ok. Go to Step 6.

Step 6. Check the welded seams on the tank for air leaks.

a. Start the engine and pressurize the tank.

b. Test the welded seams.

(1) Prepare a thick lather with soap and water.

(2) Spread the lather over the welded seams.

(3) If there are any leaks, they will blow bubbles through the lather. Go to Step 6c.

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

FORMULATION TANK WILL NOT HOLD PRESSURE (Continued)

(4) If there are no leaks, the tank is ok.

(5) If there are air leaks in the seams, replace the tank and go to Step c.

c. Pressurize the new tank and let it sit for 5-10 minutes.

(1) If the new tank holds 11-14 psi pressure, it is ok.

(2) If the new tank will not hold 11-14 psi pressure, go to Step 1.

Step 7. Inspect the formulation tank filter.

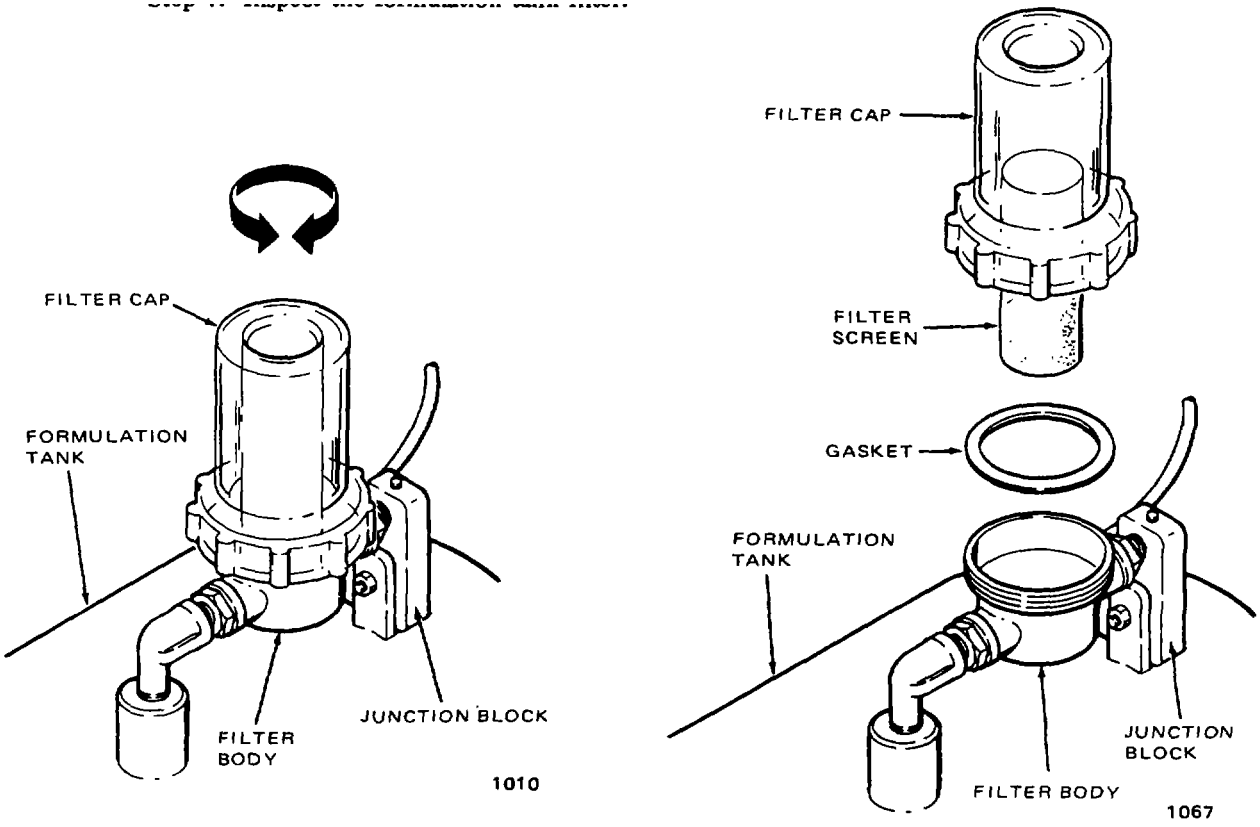


Figure 5-203. Formulation Tank Filter

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

FORMULATION TANK WILL NOT HOLD PRESSURE (Continued)

a. Open the pressure drain valve.

b. If the filter body is cross threaded and does not seal correctly, unscrew it.

c. Check the filter gasket.

(1) If the gasket is broken, cracked or swelled, replace it and go to Step 7d.

(2) If the gasket is ok, go to Step 7d.

d. Reassemble the filter and pressurize the tank. Make sure the gasket is set evenly in place before tightening the filter body.

(1) If the filter still leaks, replace it and go to Step 1.

(2) If the filter does not leak, the problem is solved. Go to Step 1.

16. FORMULATION TANK PRESSURE GREATER THAN 15 PSI

Step 1. Test the pressure regulator and tank pressure gage. Use a test pressure gage.

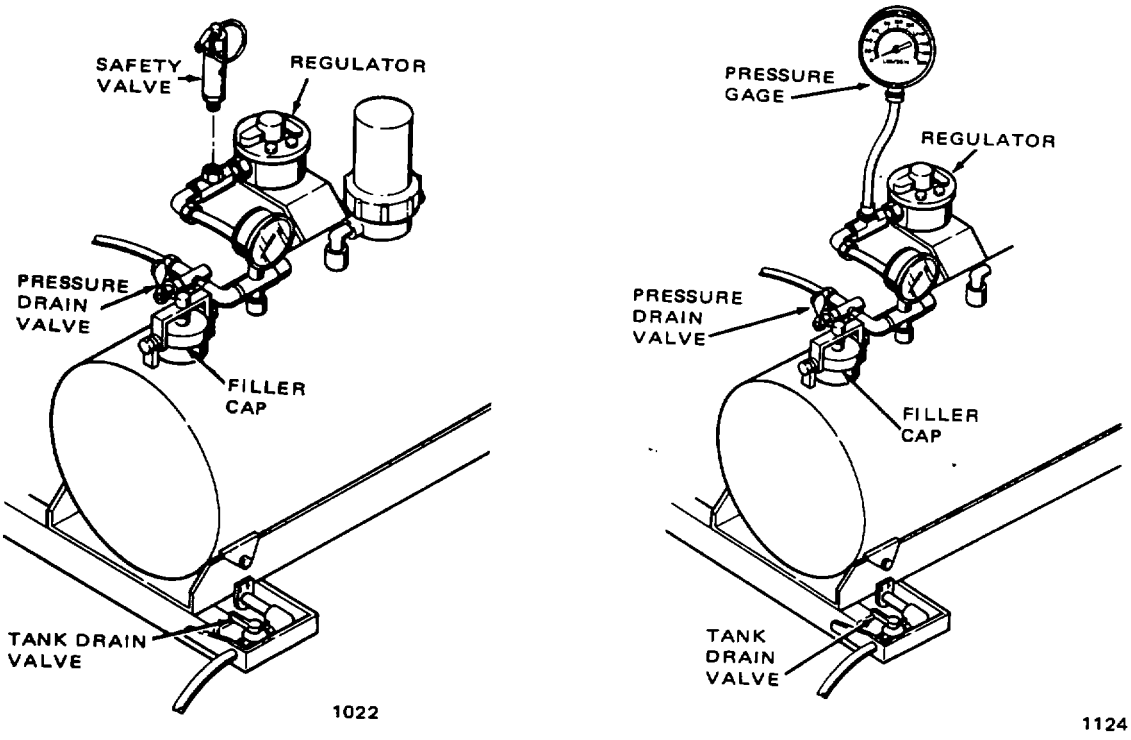


Figure 5-204. Pressure Gage Installation

Table 5-3. Direct and General Support Maintenance Troubleshooting (Continued)

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
FORMULATION TANK PRESSURE GREATER THAN 15 PSI (Continued)	
a. Remove the pressure relief valve from the tee. b. Insert the test pressure gage into the tee. c. Start the engine and pressurize the tank. **WARNING** **BE SURE to open the pressure drain valve before replacing any parts.** (1) If the test pressure gage and the tank pressure gage are equal, go to Step 1c (3). (2) If the test pressure gage and the tank pressure gage are not equal, replace the tank pressure gage and go to Step 1c. (3) If the test pressure gage reads higher than 15 psi, replace the pressure regulator. Go to Step 1.	

Section V. MAINTENANCE PROCEDURES

GENERAL

This section contains the general procedures for the removal, minor repair, replacement and installation of aerosol generator components by direct and general maintenance technicians.

a. General Removal Instructions.

(1) Be sure to disconnect the battery ground cable before removing any electrical parts or working on the fuel system.

(2) Be sure there is enough clearance to remove a component. Disassemble the aerosol generator to a point necessary to provide good working clearance.

(3) To help reassemble and install components, place identifying tags on mating ends of electrical, air and fluid lines, as they are disconnected.

b. General Disassembly Instructions.

(1) O-rings, gaskets, seals and similar materials should be replaced if they are removed. Be sure all traces of old gasket and sealant material are removed.

CAUTION

DO NOT use hard metal tools to scrape old gasket or sealant materials from machined surfaces.

(2) Lockwashers, self-locking nuts and any similar locking devices should be replaced if they are removed.

(3) To help reassemble and install component, place identifying tags on mating ends of electrical, air and fluid lines, as they are disconnected.

(4) Apply protective covers to hoses and openings to prevent foreign matter from entering open housings and lines. Wrap all parts in clean paper or dip them in preservative oil, Military Specification MIL-C-8188, or equivalent.

(5) Do not remove any parts that do not need repair or replacement. Do not disassemble a component any further than necessary to accomplish needed repairs.

c. General Cleaning Instructions.

(1) When cleaning bearings, place them in a container of dry cleaning solvent, P-D-680. If necessary use a brush to remove caked grease and chips. Do not rotate the bearings before they are cleaned. When the bearings are cleaned spin them in light lubricating oil to remove solvent.

(2) Do not expose O-rings, gasket, or other rubber parts to cleaning solvent. The solvent will damage them.

(3) Before disassembling the aerosol generator, clean all mud, grease, and grit from the unit.

(4) For cleaning exterior parts and components, use a cleaning compound such as Federal Specification P-C-435A. Dilute the cleaning compound as recommended on the container.

(5) For cleaning insecticide residue, use hot soap and water, MIL-D-16791E.

GENERAL (Continued)

(6) Electrical parts, coil connectors, switches, and wiring using insulating materials should not be soaked or sprayed with cleaning solutions. Clean these parts with a lint free cloth moistened in dry cleaning solvent, Federal Specification P-D-630.

d. General Inspection Instructions.

(1) Examine bearings for rusted or pitted balls, races or separator. Examine balls for abrasion, serious discoloration, or misshaping. Replace bearings for the following reasons:

(a) Cuts or grooves parallel to bearing rotation.

(b) Bad pits.

(2) Check for physical distortion, wear, cracks and pitting. Clean all parts before inspection.

(3) Remove crankcase, drain plugs, and check the sediment that sticks to the plug. Grit and fine metal particles indicate potential equipment failure. This inspection is good for determining the condition of internal parts.

(4) Check all hoses for broken, cracked or frayed material. Check for breaks or chafing next to metal fittings. Inspect the fitting threads for damage. Replace all damaged parts. After reassembly and initial operation, check fittings for leaks.

(5) Inspect belts for cracks or fraying.

(6) Check all welded joints for cracks and leaks.

(7) Inspect the hose harness for chafing or burning. Inspect all terminal connectors for loose connections and broken parts.

e. General Repair.

(1) Exterior painted parts may be touched-up where paint is damaged. Follow instructions of TM 43-0139, Painting Instructions for Field Use.

(2) Replace all broken, worn, or burned electrical wiring.

(3) Replace all broken, cracked, or frayed hoses. Replace fittings if threads are stripped. If a hose is damaged, replace the entire harness.

(4) Replace bolts, nuts, screws, or fittings that have stripped threads.

(5) Replace worn, cracked, or frayed belts.

f. General Reassembly.

(1) Remove protective grease coatings from new parts before installation.

(2) Replace all O-rings, clean groove, then stretch O-ring into position. Coat the O-ring lightly with the fluid it will operate in.

(3) Install oil seals with seal lip facing the correct direction. Apply an even force to the outer edges of seal when installing it.

(4) Lubricate bearings before installing them.

GENERAL (Continued)

NOTE

This manual is provided with instructions for complete assembly and disassembly of the engine and compressor. These instructions will not normally be used. When there is damage to internal parts the entire engine or compressor will be replaced. The engine and compressor will only be overhauled when a complete engine or compressor is not available.

OPERATIONAL CHECK

a. Refer to the direct and general support preventive maintenance section for the general operational check.

b. Calibrate flowmeter.

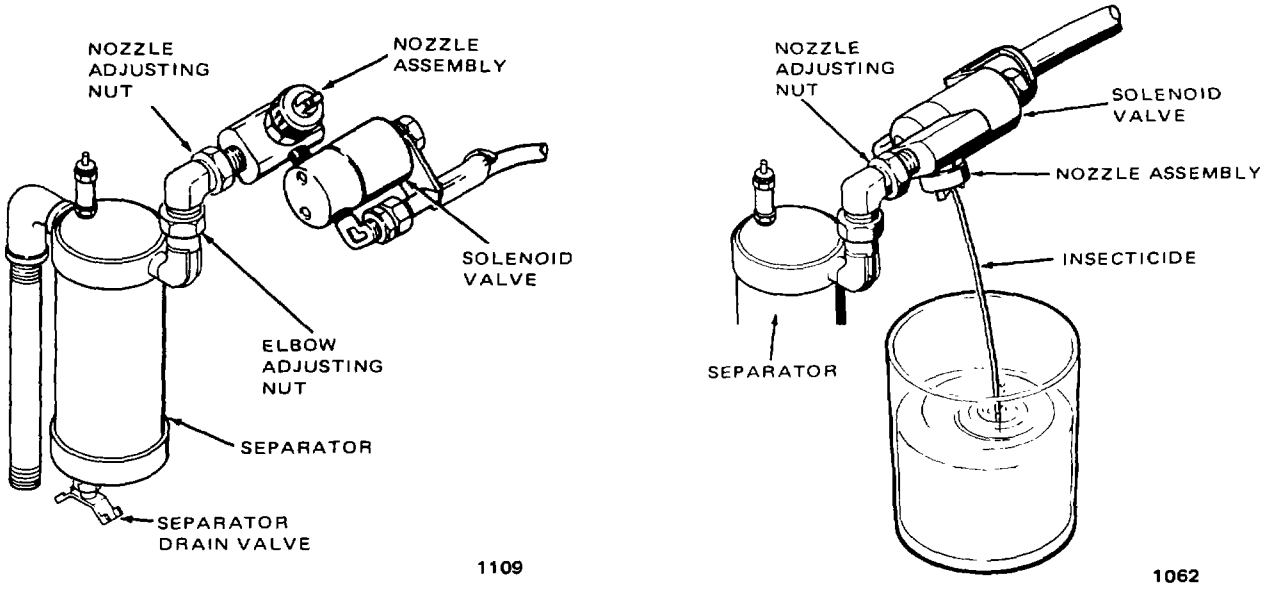


Figure 5-205. Nozzle Adjustment

(1) Aim nozzle assembly into a bucket.

(a) Loosen nozzle adjusting nut.

(b) Aim nozzle down into bucket and tighten adjusting nut.

(2) Turn solenoid valve switch OFF.

(3) Start engine according to engine start procedures in Chapter 2, Section III.

(4) When formulation tank pressure levels off, shut engine OFF.

(5) Turn the ignition and solenoid valve switches ON and let the insecticide flow into a bucket. Let the insecticide flow for 1-2 minutes.

OPERATIONAL CHECK (Continued)

(6) Check the temperature.

(7) Check the flowmeter scale reading.

(8) Hold a beaker under the insecticide stream for one minute.

(9) Turn OFF the ignition and solenoid valve switches.

(10) Pour the insecticide from the beaker into a graduated cylinder and measure the volume of insecticide that flowed in one minute.

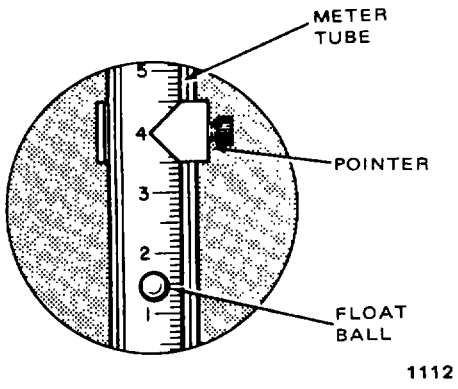


Figure 5-206. Flowmeter Scale

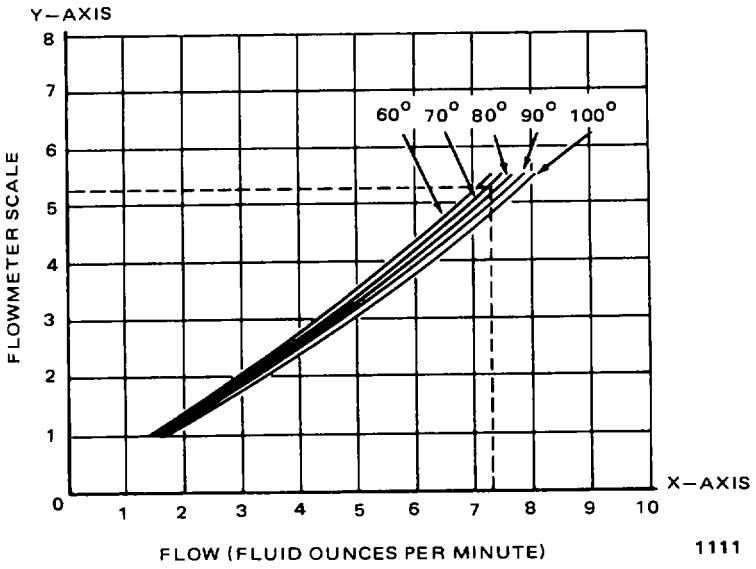


Figure 5-207. Temperature Correction Curve

(11) Find the flow rate in oz/min on the graph (pages 1-9 through 1-13) that matches the flowmeter scale reading. Use the graph provided for the insecticide being sprayed. Figure 5-207 illustrates how to use the temperature correction curves.

(a) If the flow rate from the graph is the same as the measured flow rate, the flowmeter is okay.

(b) If the flow rate from the graph is ± 10% different from the measured flow rate, check the meter tube, the flow meter control valve, and the temperature gage for damage or plugging.

c. Check the engine speed. Use a hand-held tachometer.

(1) Start the engine according to operating instructions in Chapter 2, Section III.

NOTE

The belts should be connected to the pulleys while checking the engine speed.

(2) Check the engine operating speed with a hand-held tachometer. Refer to page 1-6 for the correct rpm ratings. If the speed is not correct, adjust the governor.

OPERATIONAL CHECK (Continued)

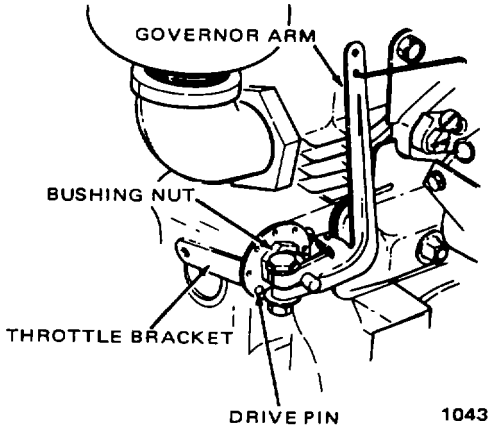


Figure 5-208. Governor Assembly

(3) Adjust the engine speed to the correct rpm.

(a) Loosen the bushing nut slightly.

(b) Move the throttle bracket to the left (counterclockwise) to increase the engine speed and to the right (clockwise) to decrease the engine speed.

CAUTION

DO NOT force the bushing nut tight. This could cause binding or stripped threads.

(c) When the engine speed is adjusted to the correct rpm, tighten the bushing nut and lock the throttle bracket in place.

SERVICE AEROSOL GENERATOR

a. Change oil in engine crankcase.

NOTE

Change the oil while it is warm. It will drain better when it is warm.

WARNING

BE ALERT not to touch the engine or crankcase while the engine is hot. It can cause burns.

SERVICE AEROSOL GENERATOR (Continued)

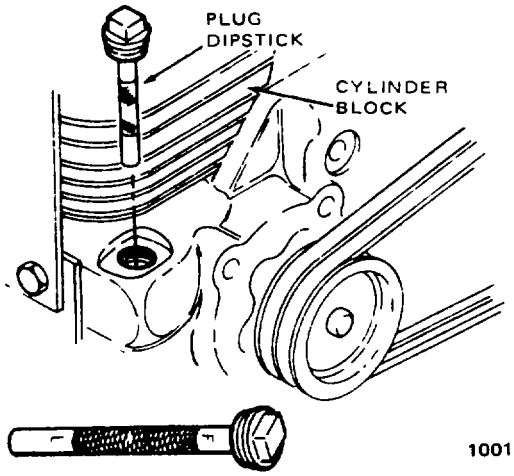


Figure 5-209. Engine Crankcase and Dipstick

(1) Unscrew plug dipstick and allow it to rest on top of the dipstick hole.

(2) Place a pan under crankcase drain pipe.

(3) Remove drainpipe cap and drain oil into pan.

(4) Return pipe cap when all the oil has drained from crankcase.

(5) Remove plug dipstick and add one quart of OE/HDO 30 detergent oil MIL-L-2104C through dipstick hole.

CAUTION

DO NOT overfill. The oil level must never be higher than the (F) mark on the dipstick.

(6) After filling the crankcase, check the oil level according to instructions above.

b. Change oil in compressor crankcase.

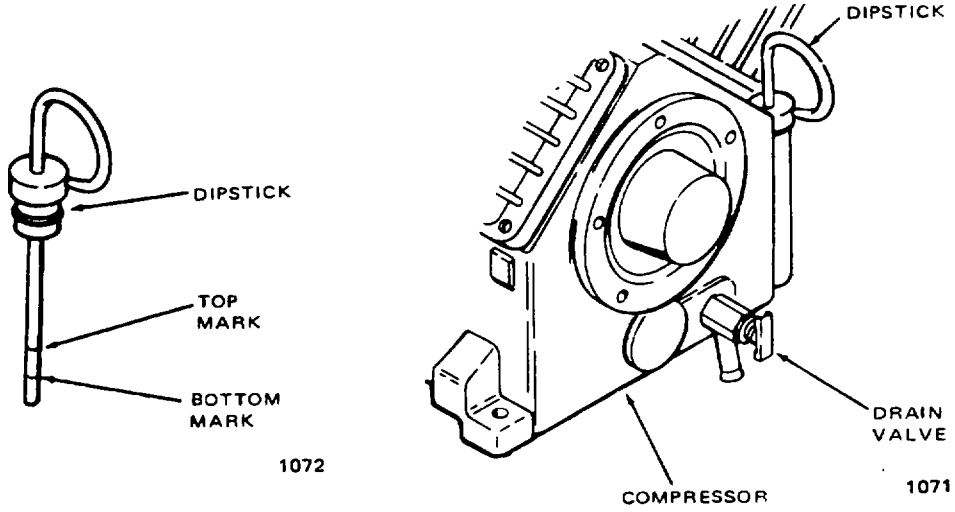


Figure 5-210. Compressor Dipstick

SERVICE AEROSOL GENERATOR (Continued)

(1) Remove dipstick.

(2) Place a pan under crankcase drain valve.

(3) Open drain valve and drain oil.

(4) Close drain valve when all the oil is drained from crankcase.

CAUTION

DO NOT overfill. The oil level must never be higher than the top mark on the dipstick.

(5) Add 1.5 pints of synthetic reciprocating compressor oil through dipstick hole. Refer to page 1-6 for correct compressor oil.

(6) Return dipstick to crankcase.

c. Add electrolyte to battery.

WARNING

BE ALERT not to spill electrolyte on clothing or skin. It is sulfuric acid and will cause bad burns.

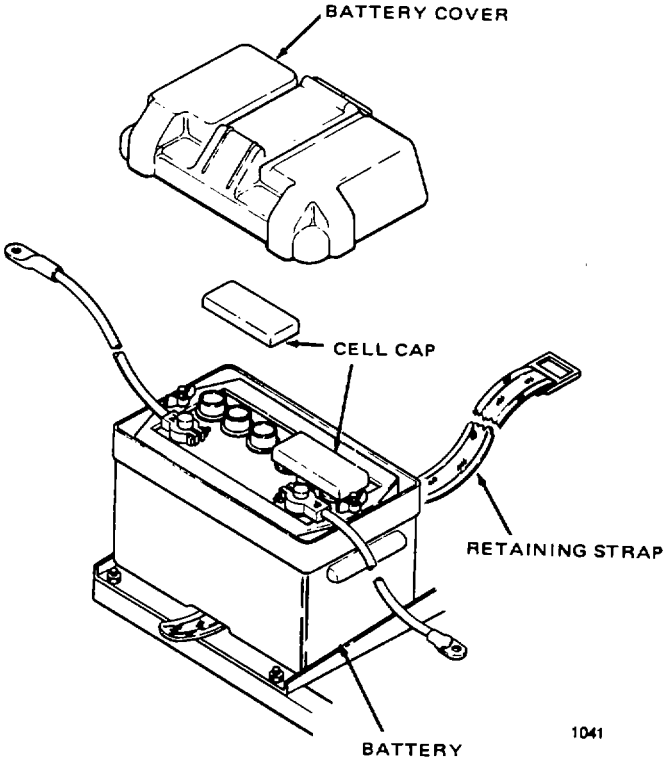


Figure 5-211. Battery Assembly

SERVICE AEROSOL GENERATOR (Continued)

(1) Undo retainer strap and remove battery box cover.

(2) Remove cell caps.

(3) Carefully add electrolyte O-S-801B to each cell until the level is about 1/4 of an inch (6.35 mm) above battery plates.

(4) Return cell caps.

(5) Place battery box cover on box and securely fasten it.

ENGINE ASSEMBLY MAINTENANCE

a. Remove engine assembly.

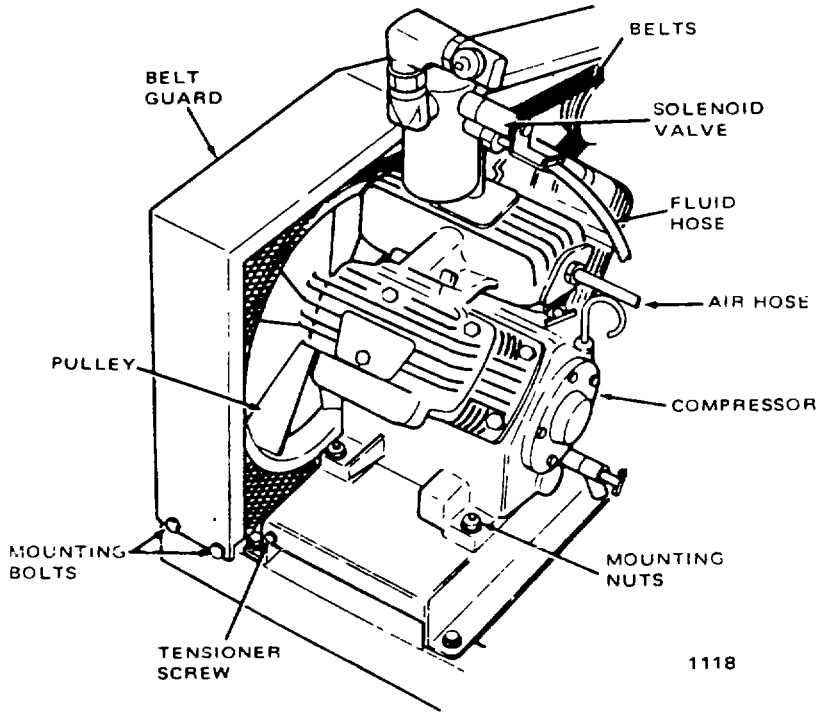


Figure 5-212. Compressor Assembly

(1) Remove four mounting bolts and belt guard.

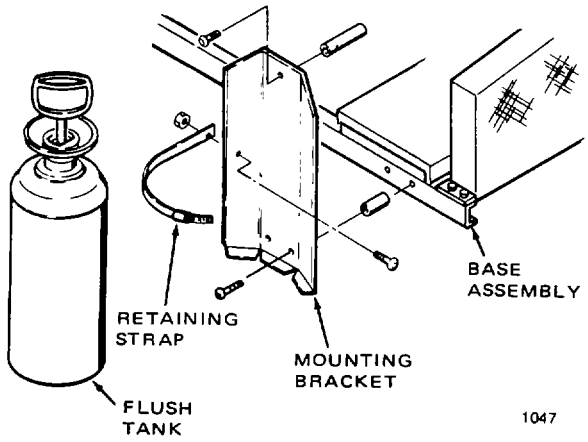
(2) Remove belts.

(a) Loosen four compressor mounting bolts.

(b) Turn belt tensioner bolt to the left (counterclockwise) until belts are loose.

(c) Remove belts.

ENGINE ASSEMBLY MAINTENANCE (Continued)



Engine 5-213. Flush Tank Assembly

(3) Remove flush tank assembly.

(a) Disconnect hose clamp and remove flush line from flush tank.

(b) Loosen flush tank retaining strap and remove flush tank from mounting bracket.

(c) Remove three mounting screws and spacers.

(d) Remove mounting bracket.

(4) Remove battery cables.

(a) Remove battery box cover.

(b) Disconnect battery cables from battery base assembly and start button.

ENGINE ASSEMBLY MAINTENANCE (Continued)

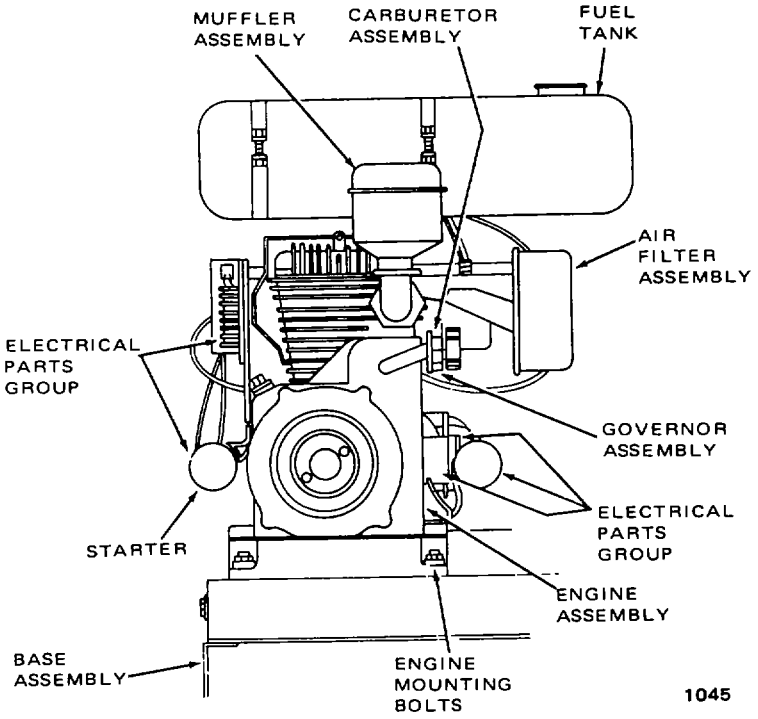


Figure 5-214. Engine Assembly

(5) Remove engine mounting bolts, nuts, lock washers, flat washers and stiffeners.

(6) Remove engine assembly from base assembly.

b. Disassemble Engine.

NOTE

The components listed below are covered under separate disassembly procedures. This sequence covers the engine after these components have been removed.

Governor
Electrical parts. group
Starter
Fuel tank assembly
Muffler assembly
Air filter assembly
Carburetor assembly
Belts

ENGINE ASSEMBLY MAINTENANCE (Continued)

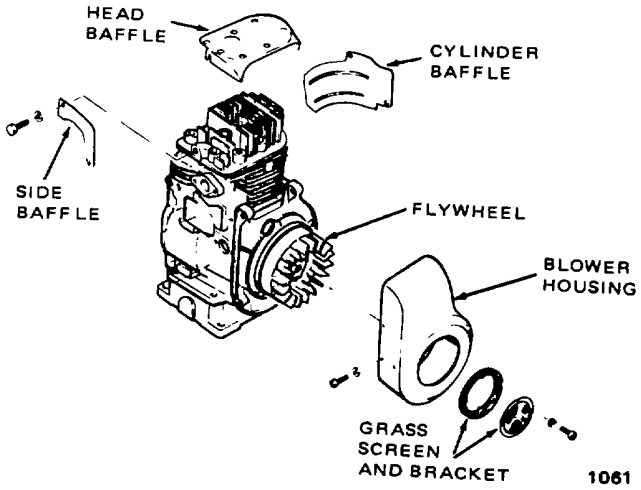


Figure 5-215. Engine Baffles

(1) Remove air cooling system.

(a) Remove grass screen and bracket.

(b) Remove blower housing.

(c) Remove cylinder baffle.

(d) Remove head baffle.

(e) Remove flywheel assembly. Use a flywheel puller.

(f) Separate flywheel and gear ring as necessary.

(g) Remove stator.

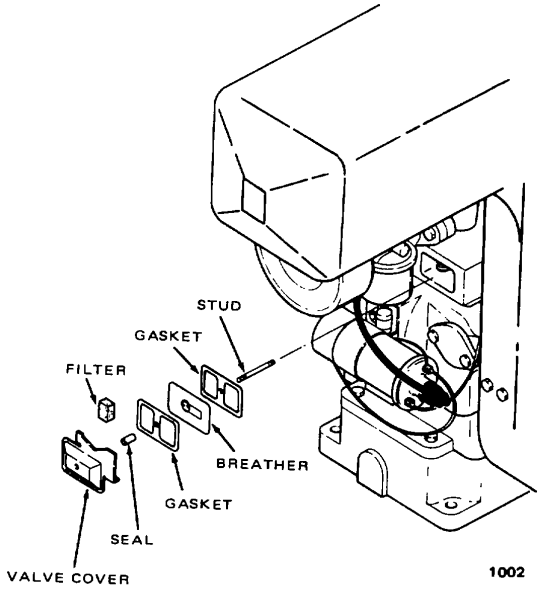


Figure 5-216. Engine Valve Cover

ENGINE ASSEMBLY MAINTENANCE (Continued)

(2) Disassemble breather assembly.

(a) Remove valve cover.

(b) Remove breather and gaskets.

(c) Separate breather, filter and seal.

(d) Remove stud.

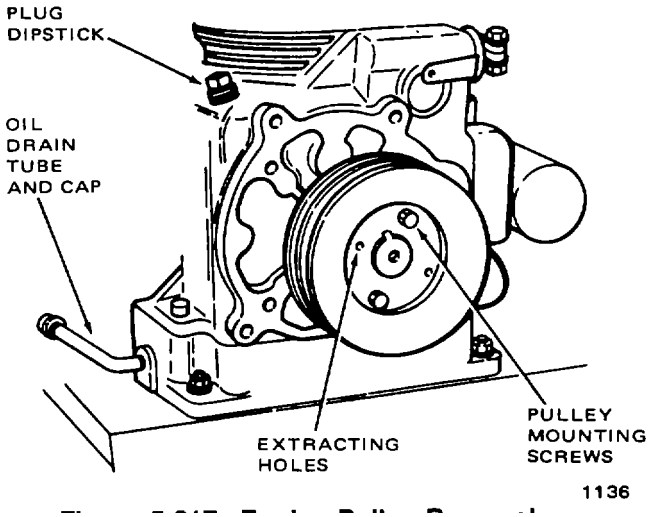


Figure 5-217. Engine Pulley Removal

(3) Remove pulley.

(a) Remove pulley mounting screws.

(b) Insert screws in extracting holes and tighten them to remove pulley.

(4) Remove oil drain tube and cap.

(5) Remove plug dipstick.

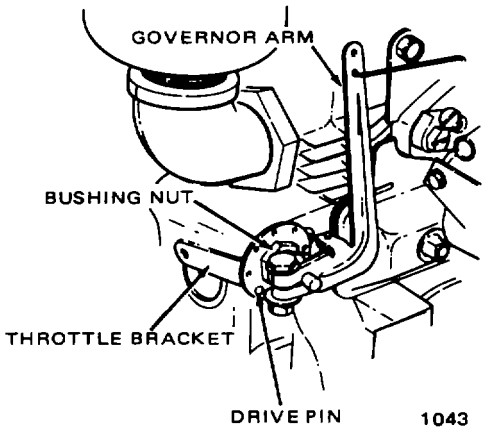


Figure 5-218. Governor Assembly

ENGINE ASSEMBLY MAINTENANCE (Continued)

(6) Remove and disassemble governor assembly.

(a) Remove governor arm and spring.

(b) Remove bushing nut, regulating nut, and speed control bracket.

c. Inspection and cleaning of parts.

(1) Cleaning. Clean all mud, grease, and dirt from outside surfaces of engine assembly before disassembly using a cleaning compound such as Federal Specification P-C-435A. Dilute the compound as recommended on its container. Thoroughly clean all internal parts with cleaning compound such as MIL-C-11090D. Clean all bearings with dry cleaning solvent, P-D-680. When bearings are clean, spin them in light lubricating oil to remove solvent.

(2) Inspection. Check all machined surfaces for nicks, cuts or scratches. Look for uneven wear on camshaft and crankshaft. Make sure bearings are not out of round or scarred. Make sure gear teeth are not chipped or cracked. Replace any parts that are damaged.

d. Assemble engine.

(1) Install and assemble governor.

(a) Place speed control disc on bushing nut.

(b) Thread bushing nut into cylinder block and clamp speed control bracket in place.

(c) Adjust the shaft end clearance by moving the needle bearing in or out. There should be a slight back and forth movement in the shaft.

(d) Place spacer washer on stud shaft and insert governor gear into place.

(2) Install breather assembly.

(a) Make sure all parts are clean and in good condition.

NOTE

Use new gaskets, reed and filter for reconditioned engine.

ENGINE ASSEMBLY MAINTENANCE (Continued)

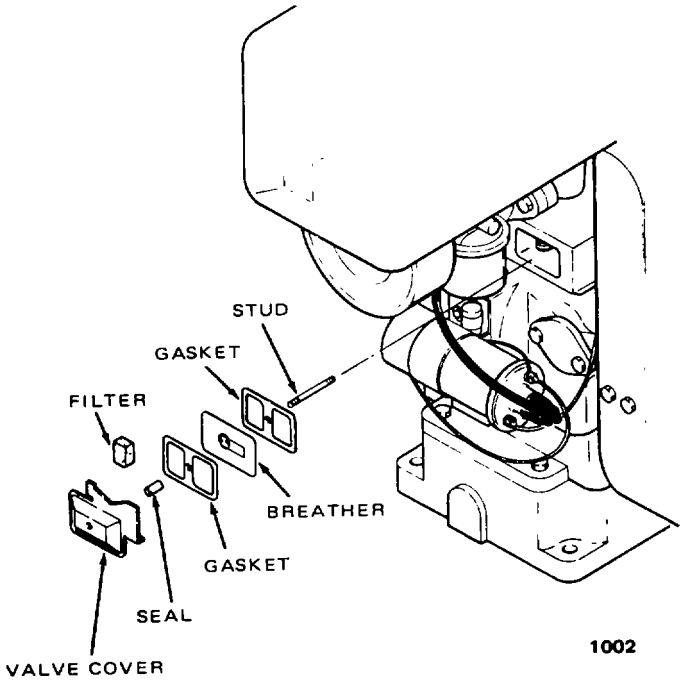


Figure 5-219. Engine Valve Cover

(b) Install stud.

(c) Install gaskets, breather, seal and filter.

CAUTION

Breather cover must be securely tightened to prevent oil leaking.

(d) Install breather cover and tighten retaining nut.

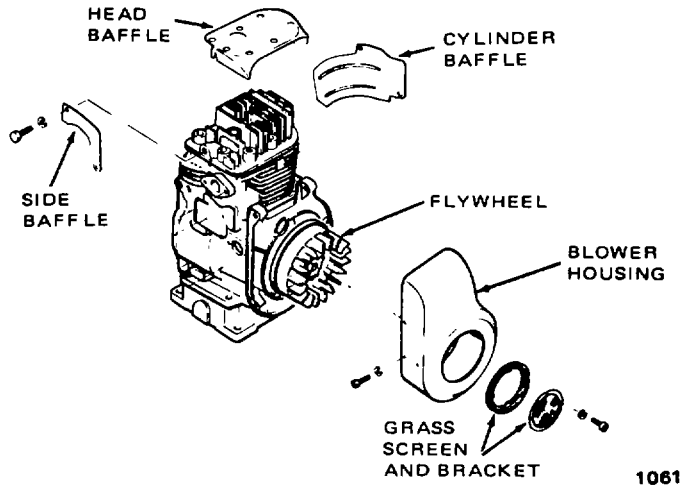


Figure 5-220. Engine Baffles

ENGINE ASSEMBLY MAINTENANCE (Continued)

(3) Install cooling system

(a) Install head baffle.

(b) Install cylinder baffle.

(c) Install side cooling baffle.

(d) Install blower housing.

(e) Install grass screen bracket and screen.

(4) Install pulley.

(a) Slide pulley over crankshaft.

(b) Install belt.

(c) Line pulley up with compressor, see belt maintenance for details.

(d) Install belt guard.

ELECTRICAL PARTS GROUP

a. Remove and disassemble electrical parts.

(1) Remove ignition switch and start button from engine control panel.

WARNING

BE SURE to disconnect battery before dissembling engine control panel.

(a) Disconnect battery cables from battery base assembly and start button.

ELECTRICAL PARTS GROUP (Continued)

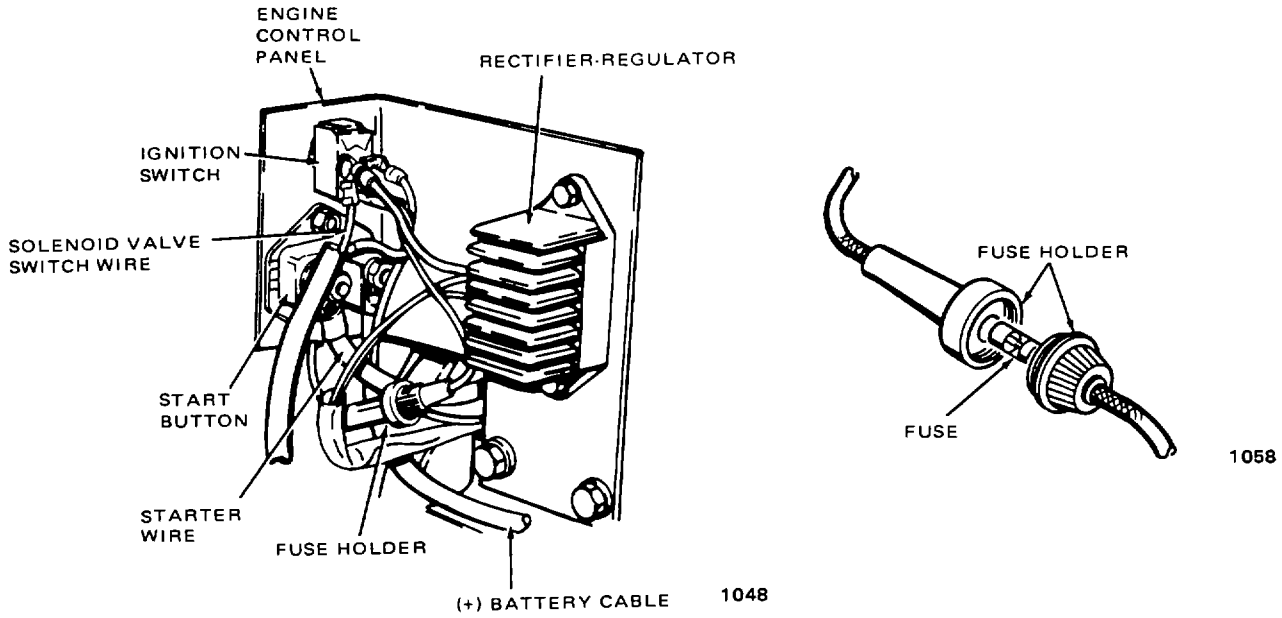


Figure 5-221. Fuse Holder Location

(b) Disconnect all wires from back of engine control panel.

(c) Twist fuse holder and remove fuse.

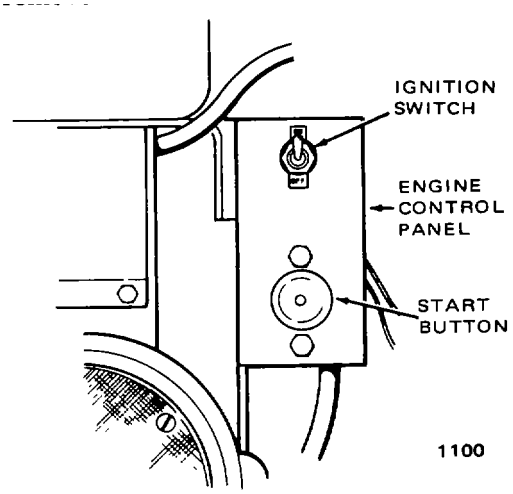


Figure 5-222. Ignition Switch

(d) Remove ignition switch.

(e) Remove start button.

ELECTRICAL PARTS GROUP (Continued)

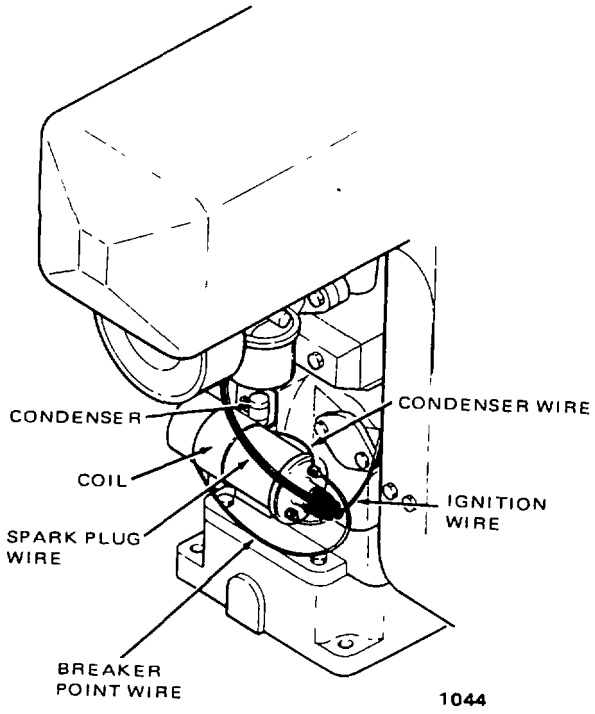


Figure 5-223. Engine Coil Location

(2) Remove coil and condenser.

(a) Disconnect spark plug wire from coil.

(b) Disconnect condenser and breaker point wire from coil.

(c) Disconnect ignition wire from coil.

(d) Remove coil and condenser.

ELECTRICAL PARTS GROUP (Continued)

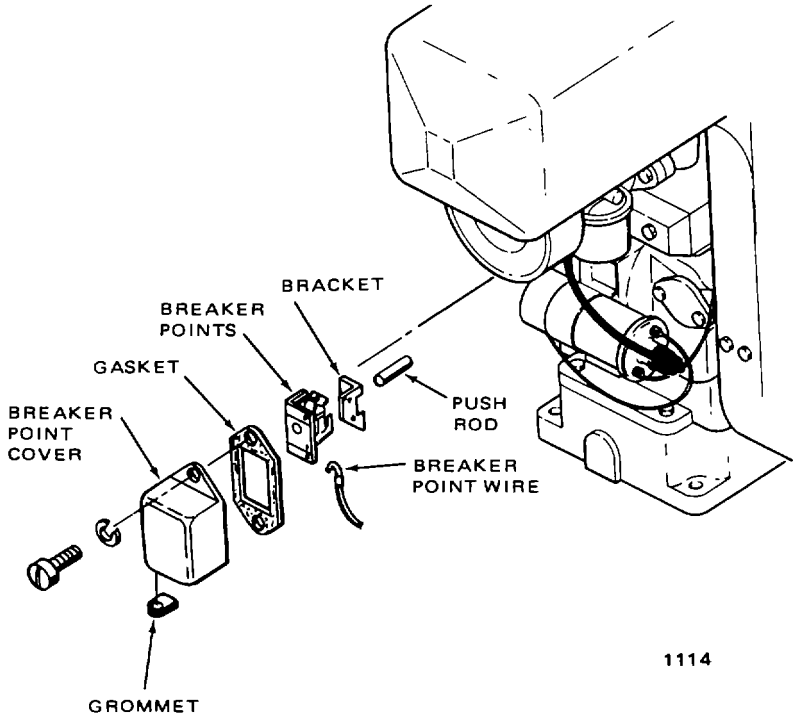


Figure 5-224. Engine Breaker Point Assembly

(3) Remove and disassemble breaker points.

(a) Remove breaker point cover and gasket.

(b) Separate grommet from breaker point cover.

(c) Disconnect breaker point wire.

(d) Remove breaker points and bracket.

(e) Remove push rod.

(f) Remove breaker point wire clip.

(4) Disconnect stator wires and remove rectifier regulator.

(5) Disconnect starter wire from starter.

(6) Remove starter, engine control panel and side cooling baffle.

ELECTRICAL PARTS GROUP (Continued)

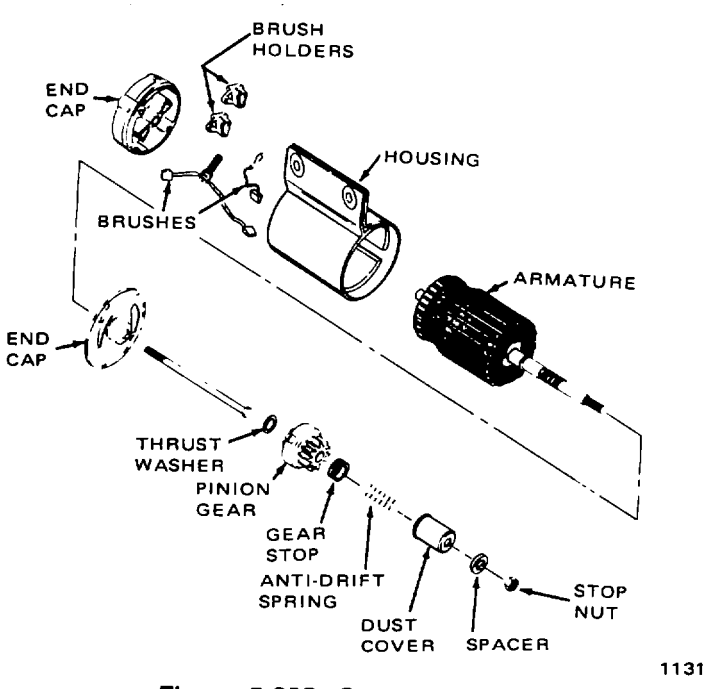


Figure 5-225. Starter Assembly

(7) Disassemble starter.

(a) Remove stop nut, spacer, dust cover, anti-drift spring, and stop gear spacer.

(b) Remove pinion gear and thrust washer.

(c) Remove bolts and end caps.

(d) Separate armature and starter body.

(e) Remove stud nut, lock washer, and insulation bushing.

(f) Separate terminal stud and input brushes from brush and cap.

(g) Remove capscrew, lock washer, brushes, and springs.

ELECTRICAL PARTS GROUP (Continued)

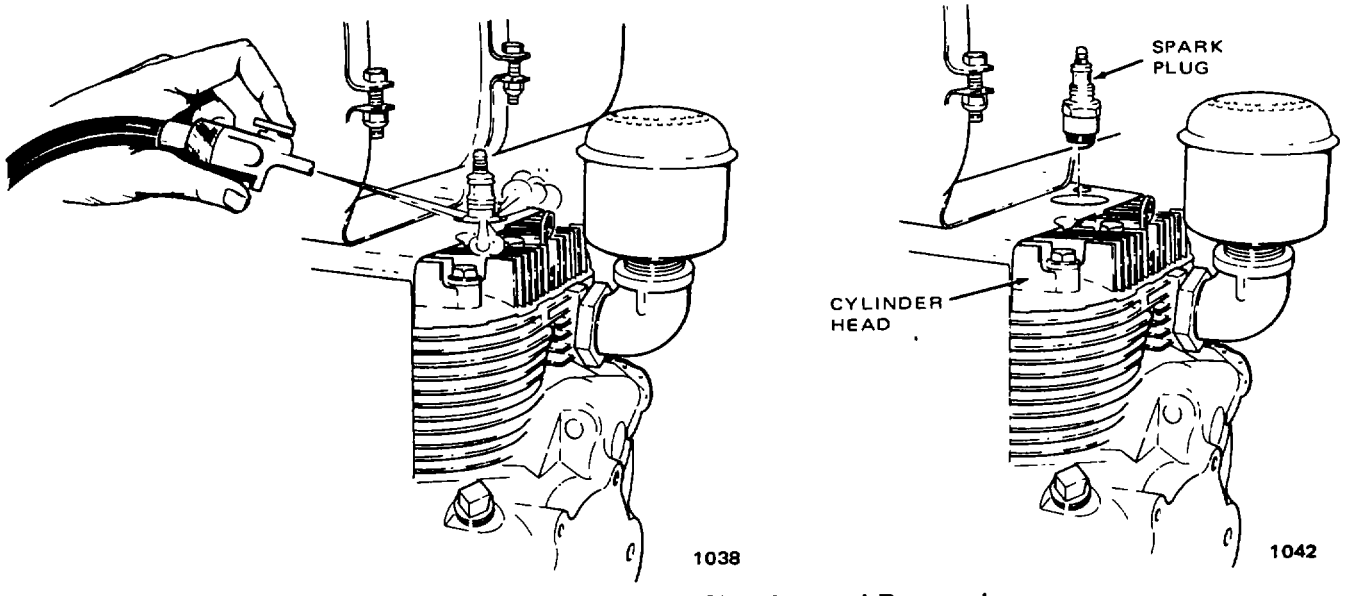


Figure 5-226. Spark Plug Cleaning and Removal

(8) Remove spark plug and wire.

(a) Disconnect spark plug wire.

(b) Loosen spark plug a few turns.

(c) Blow dirt and debris out of spark plug well.

(d) Remove spark plug the rest of the way by hand.

b. Cleaning and Inspection of electrical parts.

(1) Cleaning. Clean all terminals, wires and electrical parts in dry cleaning solvent Federal Specification P-D-680. Do not spray, rinse or soak electrical parts in any other solvents or cleaning compounds.

(2) Inspection.

(a) Check wires for fraying or breaking.

(b) Check wire insulation for cracks, wear, fraying or breaks.

(c) Check breaker points for burning, uneven wear or transfer of metal.

ELECTRICAL PARTS GROUP (Continued)

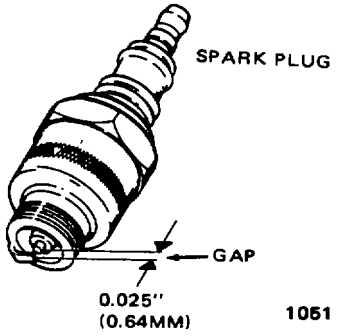


Figure 5-227. Spark Plug Gap

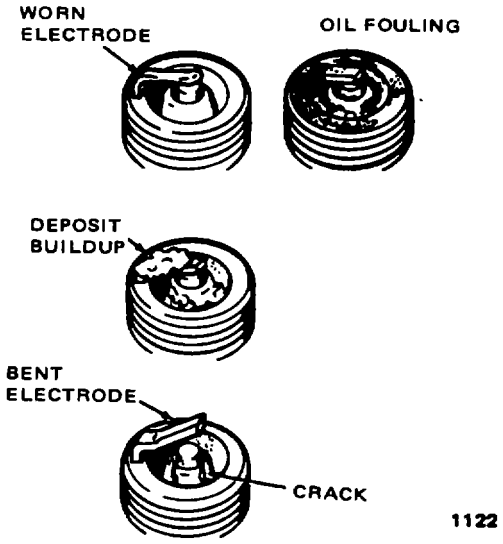


Figure 5-228. Spark Plug Defects

(d) Check spark plug for the following:

Correct gap
Worn electrodes
Cracked insulator
Build-up of deposits
Oil fouling

(e) Check coil terminals for corrosion and dirt.

(f) Replace any damaged or worn parts.

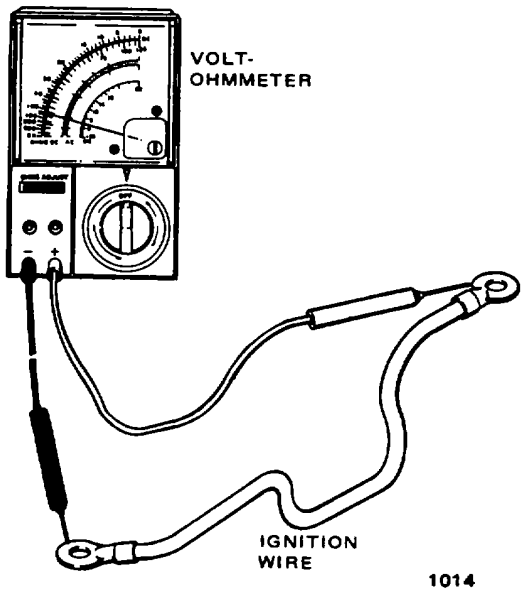


Figure 5-229. Ignition Wire Test

ELECTRICAL PARTS GROUP (Continued)

c. Testing electrical parts group.

(1) Test all electrical wires. Use a volt-ohmmeter.

(a) Attach a meter lead to each end of the wire being tested.

(b) Test the conductance of the wire.

(c) If it conducts a current it is okay.

(d) Wiggle the wire around. If the needle does not jump around, the wire is ok.

(e) Replace any damaged wire.

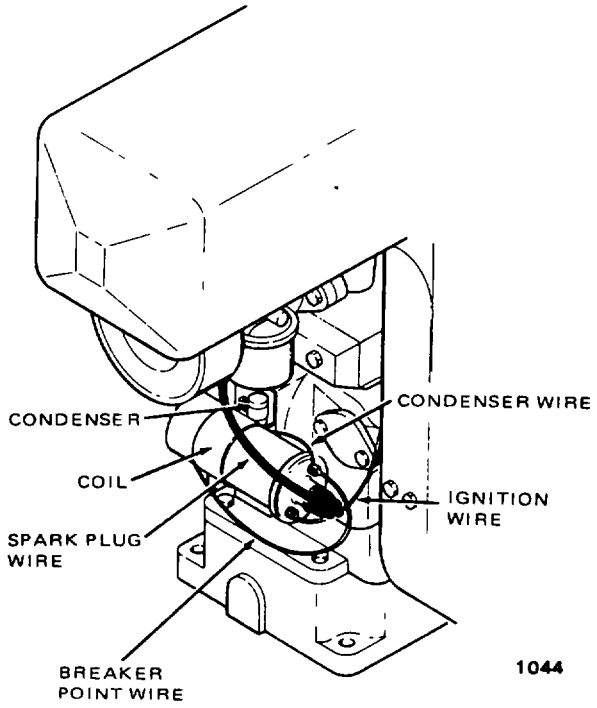


Figure 5-230. Engine Coil Location

(2) Test secondary coil winding while the coil is still hooked up to the battery.

ELECTRICAL PARTS GROUP (Continued)

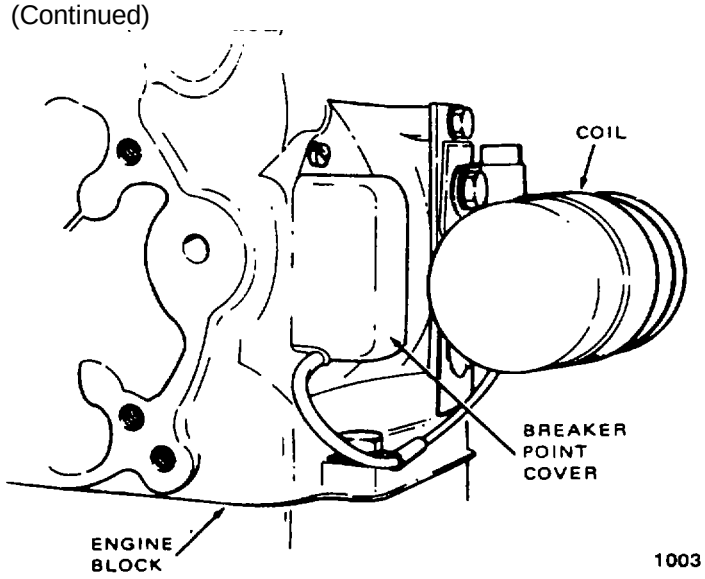


Figure 5-231. Breaker Point Cover

(a) Remove breaker point cover and jam points open with a piece of cardboard.

(b) Turn ignition switch ON.

WARNING
DO NOT hold any wires in bare hands while testing electrical parts. Use well insulated tools.

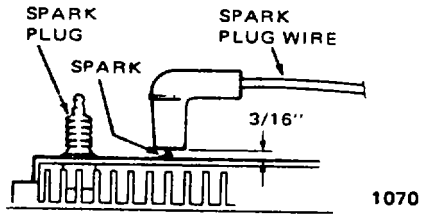


Figure 5-232. Spark Test

(c) Hold the end of the spark plug wire about 3/16 inch (4.76 mm) from a grounded part of the engine.

ELECTRICAL PARTS GROUP (Continued)

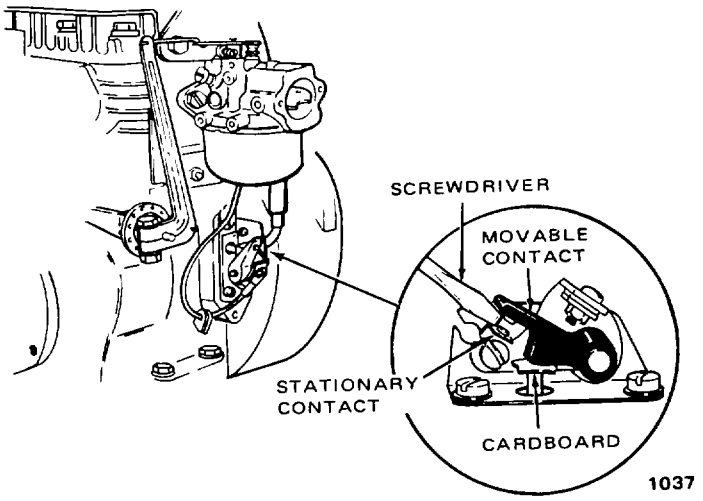


Figure 5-233. Breaker Points

(d) Hold a screwdriver point across the open breaker points then remove the screwdriver.

(e) If a bright blue spark jumps between the wire and the engine, the coil is ok.

(f) If there is no spark or the spark is weak and yellow, the coil is weak; replace it.

(3) Coil Test I. Test the primary coil winding. Use a volt-ohmmeter.

(a) Remove the breaker point cover and jam a piece of cardboard between the breaker points.

(b) Turn the ignition switch ON.

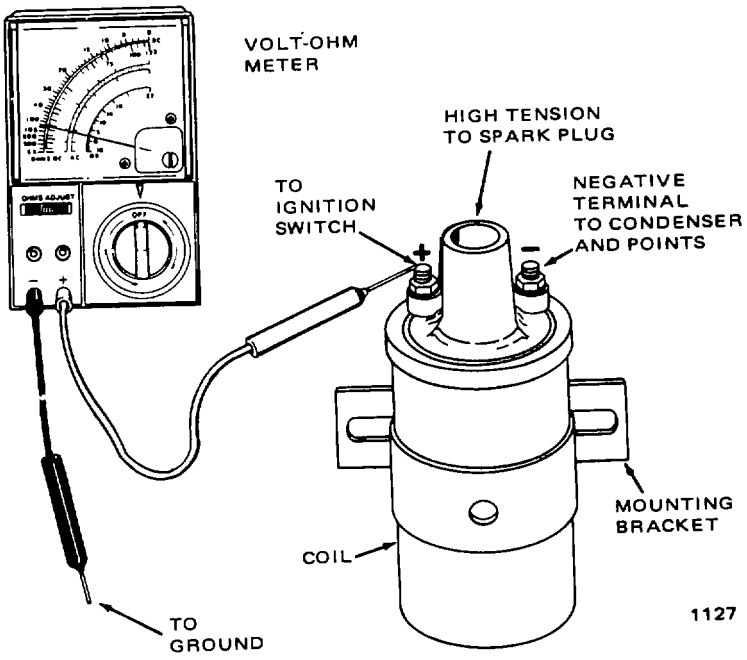


Figure 5-234. Coil Test I

ELECTRICAL PARTS GROUP (Continued)

(c) Connect the negative (-) meter lead to a grounded part of the engine.

(d) Connect positive (+) meter lead to the battery (+) side of the coil. If the meter reads 11.5 to 12 volts, there is current to the coil. If the meter reads 11.5 volts or less, there is poor current to the coil; check battery.

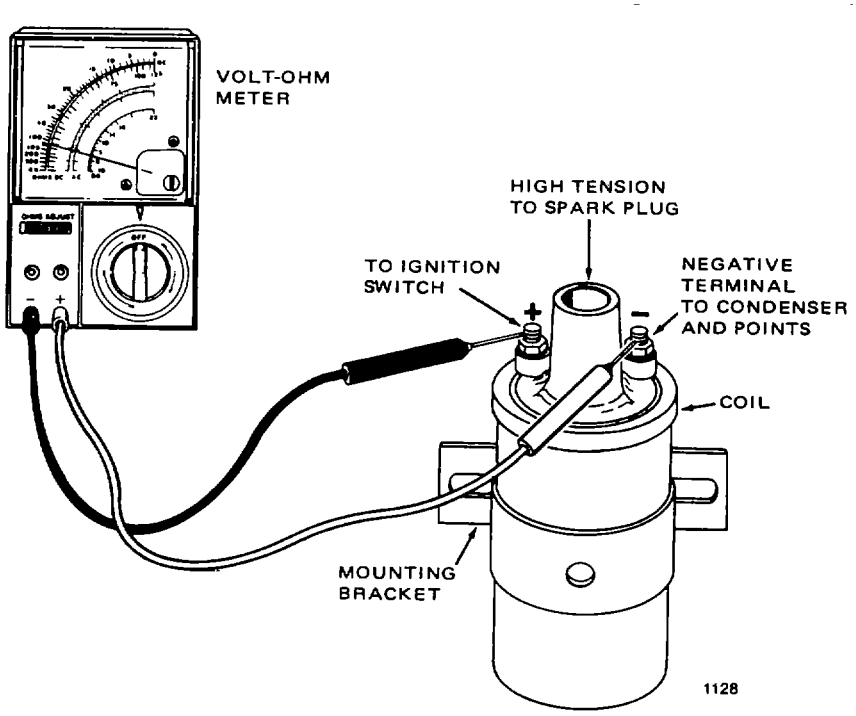


Figure 5-235. Coil Test II

(e) Coil Test II. Connect the positive (+) lead to the breaker points (-) side of the coil. If the meter reads 11.5 to 12 volts, the coil is ok. If the meter reads 11.5 volts or less, the coil is bad; replace it.

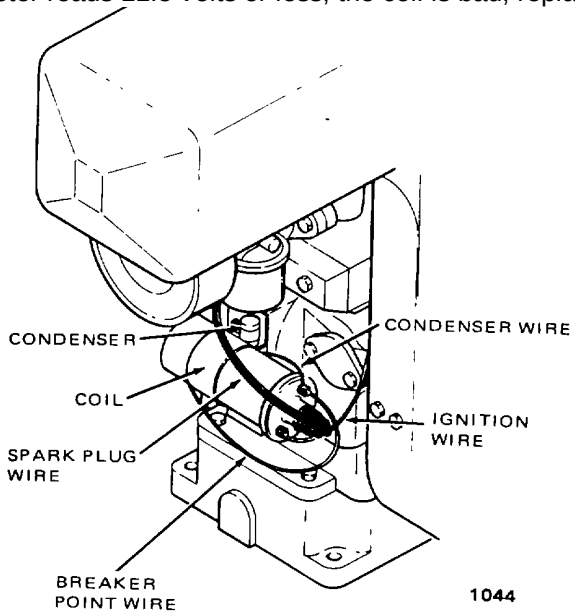


Figure 5-236. Engine Coil Location

ELECTRICAL PARTS GROUP (Continued)

(4) Test the condenser. Use a volt-ohmmeter.

(a) Remove the condenser from the engine.

(b) Set the meter to read high resistance.

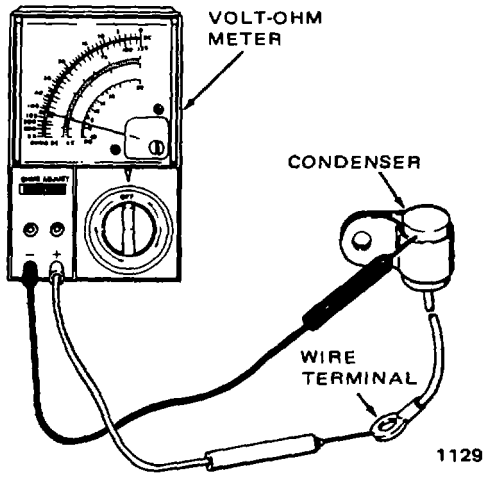


Figure 5-237. Condenser Test

(c) Connect the negative (-) meter lead to the side of the condenser and the positive (+) meter lead to the wire terminal.

- If the meter reads below infinity the condenser is ok.
- If the meter reads at infinity and remains there, replace the condenser.

(d) Tap the condenser lightly. If the meter fluctuates, there are loose connections inside the condenser.

- If there are no loose connections, the condenser is ok.
- If there are loose connections, replace the condenser.

(5) Test the rectifier regulator. Use a volt-ohmmeter.

ELECTRICAL PARTS GROUP (Continued)

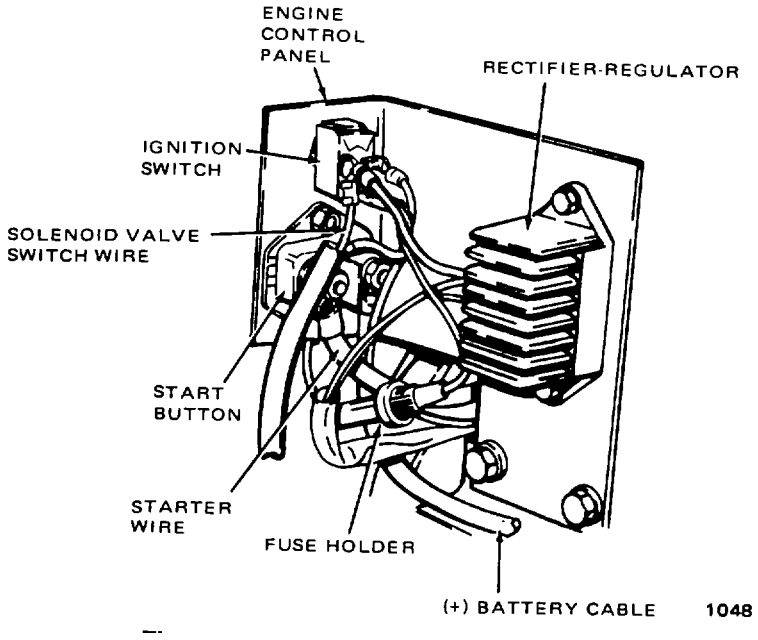


Figure 5-238. Engine Ignition Assembly

NOTE
The engine must be running while checking the rectifier-regulator.

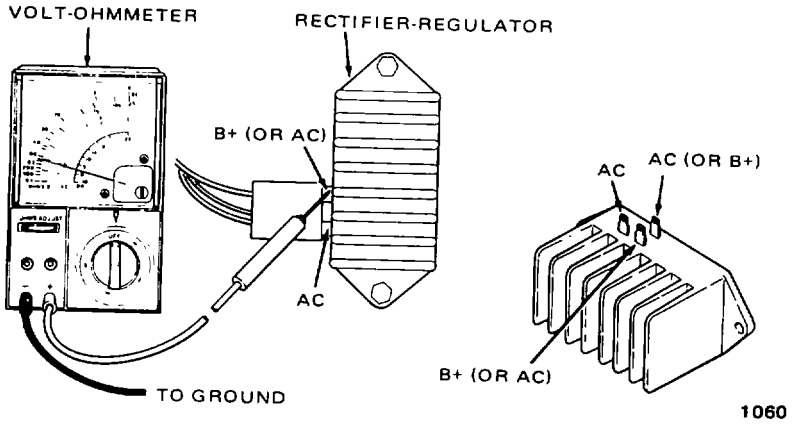


Figure 5-239. Rectifier-Regulator Test

(a) Connect the negative (-) meter lead to a grounded engine part and the positive (+) meter lead to the B + terminal at the rectifier regulator. Do not disconnect the rectifier-regulator wire. If the voltage is 13.8 volts or higher, place a load of 5 amps or more on the battery to reduce the voltage.

- If the charge rate increases, the rectifier-regulator is ok.
- If the charge rate does not increase, go to Step b, below.

ELECTRICAL PARTS GROUP (Continued)

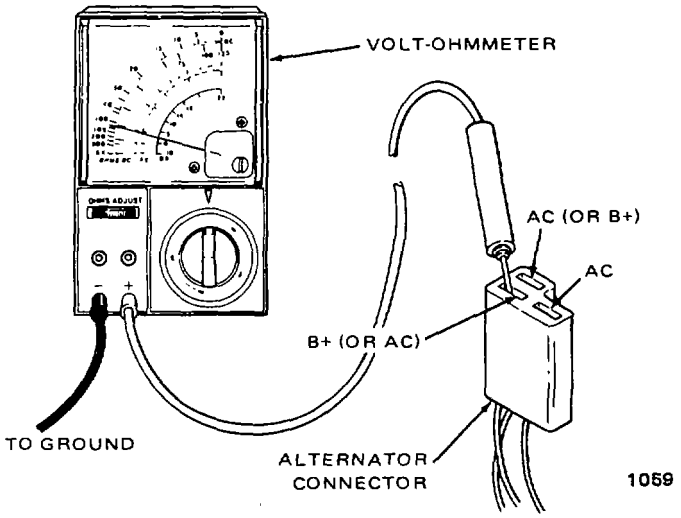


Figure 5-240. Alternator Test

(b) Unplug the leads at the rectifier-regulator. Connect the positive (+) meter lead across the ac leads and the negative (-) lead to a grounded engine part.

- If the meter reads less than 31 volts, the stator is bad. Replace the engine.
- If the meter reads more than 31 volts, remove the rectifier-regulator mounting bolts and replace the rectifier-regulator.

(c) Connect the positive (+) meter lead to the B+ lead and the negative (-) meter lead to a grounded engine part.

- If the meter reads more than 14.7 volts, remove the rectifier-regulator mounting bolts and replace the rectifier-regulator.
- If the meter reads less than 14.7 volts, check the battery.

(6) Test starter motor.

ELECTRICAL PARTS GROUP (Continued)

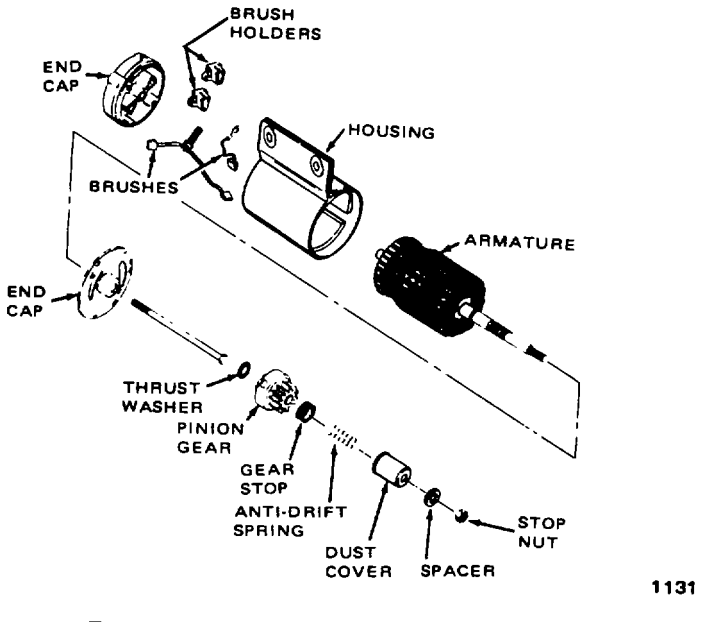


Figure 5-241. Starter Assembly

(a) Check the pinion gear.

- If the gear teeth are chipped or cracked, or worn, replace the pinion gear.
- If there is no damage to the pinion gear, check brushes.

(b) Check the brush holders and brushes.

- If the brush holders do not hold the brushes in the correct position, replace them.
- If the brushes jam and do not ride on the commutator correctly, reset them.
- If the brushes are worn unevenly or are less than half the size of new brushes, replace them.
- If the brushes are ok, return them to the starter.

CAUTION

Make sure the chamfered side of the brushes is away from the spring.

ELECTRICAL PARTS GROUP (Continued)

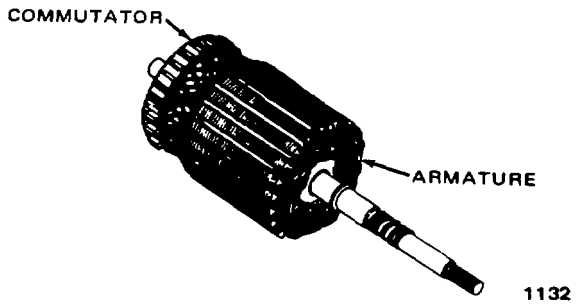


Figure 5-242. Armature

(c) Test the armature shaft in the bushing. After removing the armature from the starter, place the end caps back on the shaft. Check the shaft and bushing fitting.

- If the shaft is loose in the bushing, replace the bushing.
- If the end of the shaft is worn, replace the armature.
- If the armature shaft fits the bushing correctly, check the commutator.

(d) Check commutator.

CAUTION

DO NOT use emery cloth to clean the commutator.

NOTE

Clean the commutator. Use number 00 sandpaper. If the commutator has any of the following signs, replace the entire armature.

Wearing
Pitting
Burned
Out of round
Has high insulation between the bars

(e) Check the armature for opens.

(1) Check for loose leads between the armature conductors and the commutator bars.

(2) Resolder any loose leads. Use rosin core solder.

ELECTRICAL PARTS GROUP (Continued)

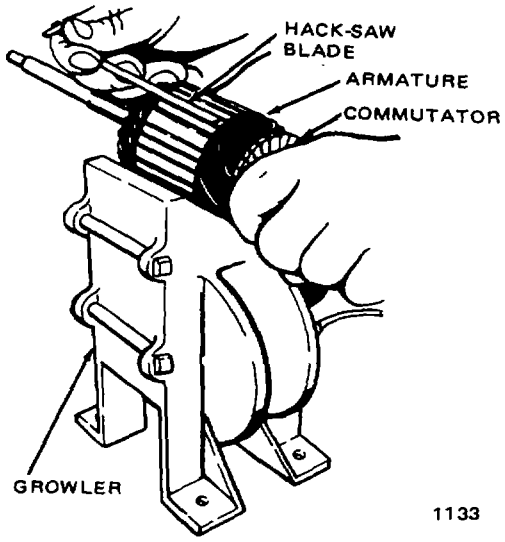


Figure 5-243. Armature Test

(f) Check the armature for shorts. Use a growler (open core transformer).

(1) Rotate the armature slowly on the growler.

(2) Hold a hacksaw blade over the armature while it is turning. When a shorted winding comes under the hacksaw blade, it will vibrate.

(3) If shorts are found in the commutator, brush the dust and grit from between the slots and check the commutator again.

(g) Check for grounds in the armature. Use a 110 volt test lamp and test leads.

(1) Connect one lead to the commutator.

(2) Connect the second test lead to the armature shaft.

(3) If the light lights, there is a grounded wire.

(4) Clean the slots in the commutator and test for grounds.

(h) If there are any opens, shorts or grounds, replace the armature.

ELECTRICAL PARTS GROUP (Continued)

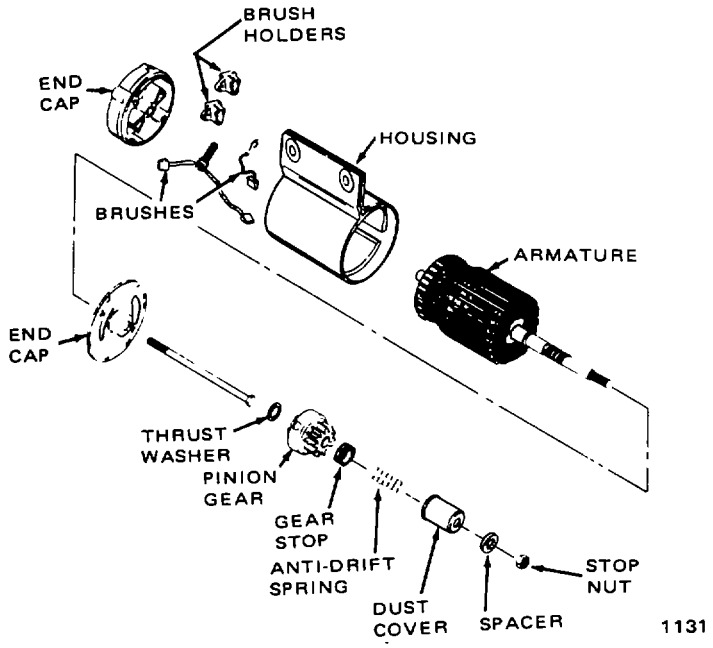


Figure 5-244. Starter Assembly

d. Assemble electrical parts group.

(1) Assemble starter.

(a) Insert stud terminal brush into end cap. Tighten nuts and bushings. Use the old bushings.

(b) Insert input brushes into rear end cap. Use new springs. Be sure the angled edge of the brushes is away from the springs.

(c) Set rear end cap and brushes in place on starter body.

(d) Insert armature into starter body. Insert rear end of shaft into rear end cap.

(e) Slide front end cap over armature shaft and tighten end caps.

(f) Attach thrust washer and pinion gear to armature shaft.

(g) Attach spacer, spring and dust cover.

(h) Secure parts to shaft with retaining nut and washer.

ELECTRICAL PARTS GROUP (Continued)

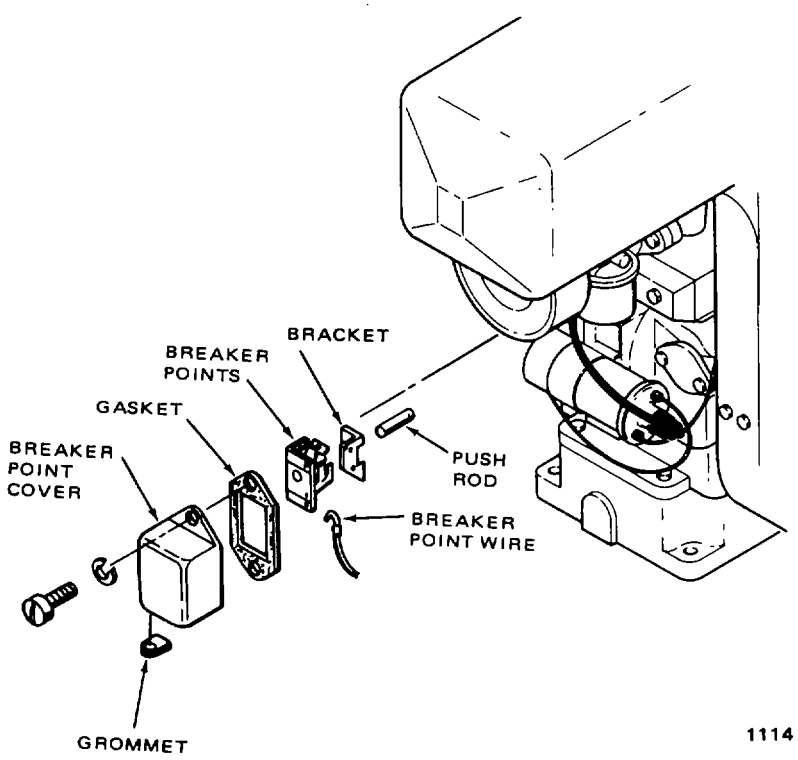


Figure 5-245. Engine Breaker Point

(2) Install starter, cylinder, cooling baffle and engine control panel.

(3) Assemble breaker points.

(a) Install breaker point lead wire and clip.

(b) Install breaker point push rod.

(c) Install breaker point bracket and points.

(d) Install breaker point lead wire and grommet into breaker point cover.

(e) Attach breaker point lead wire to points. Run it through cover gasket.

ELECTRICAL PARTS GROUP (Continued)

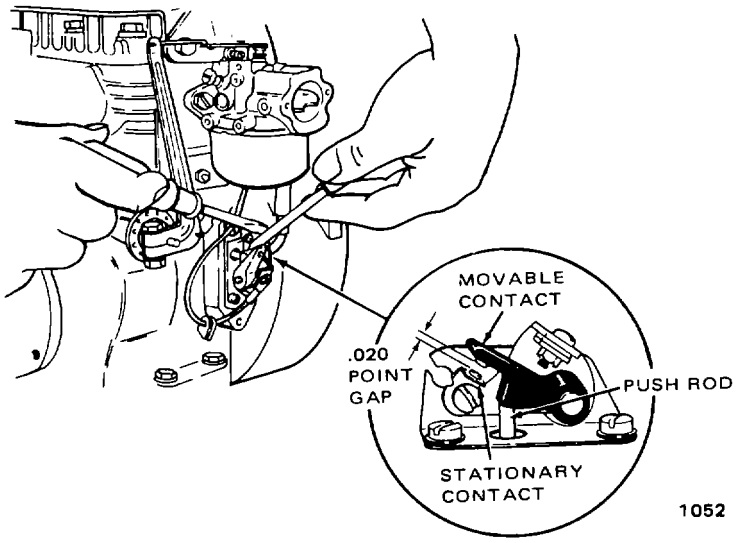


Figure 5-246. Gapping Breaker Points

(4) Set breaker points at correct gap.

(a) Turn flywheel by hand until points open to their widest gap.

(b) Insert feeler gage between points.

(c) Loosen and then tighten adjusting screw. Use 0.020 inch (0.51 mm) feeler gage.

(d) Recheck breaker gap.

(e) Install breaker point cover.

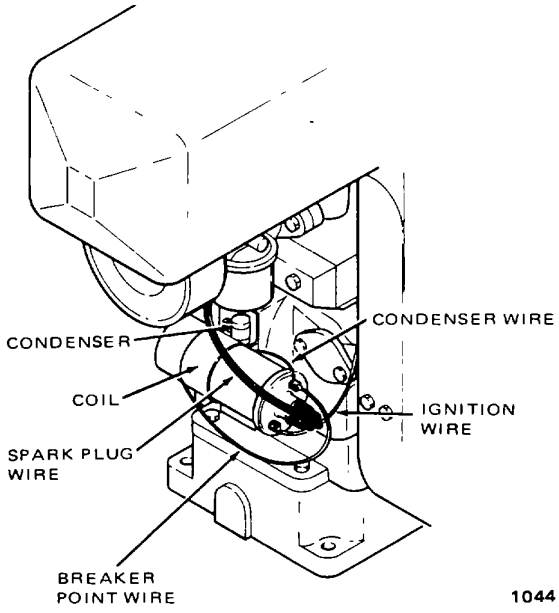


Figure 5-247. Engine Coil Location

ELECTRICAL PARTS GROUP (Continued)

(5) Install coil and condenser.

(a) Secure coil and condenser to engine.

(b) Attach condenser lead wire and breaker point lead wire to negative (-) of coil terminal.

(c) Attach ignition lead to positive (+) coil terminal. Attach spark plug wire to coil.

(6) Install spark plug.

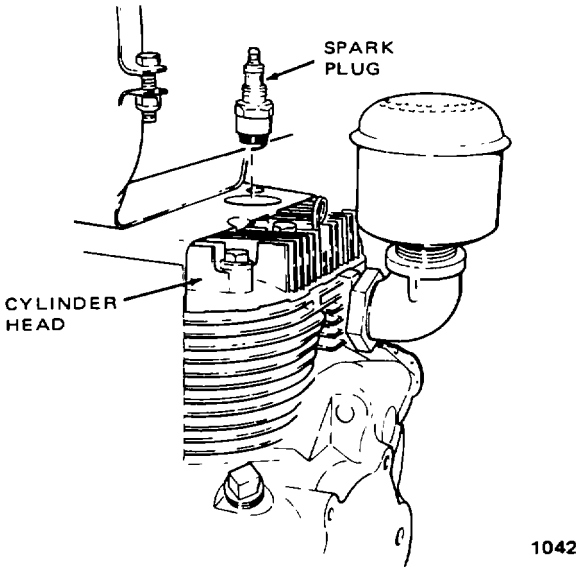


Figure 5-248. Spark Plug Installation

(a) Set spark plug gap at 0.020 inches (0.51 mm).

(b) Insert spark plug. Torque it to 18-22 ft-lbs (2.49-3.04 kg/m).

(c) Attach spark plug wire.

ELECTRICAL PARTS GROUP (Continued)

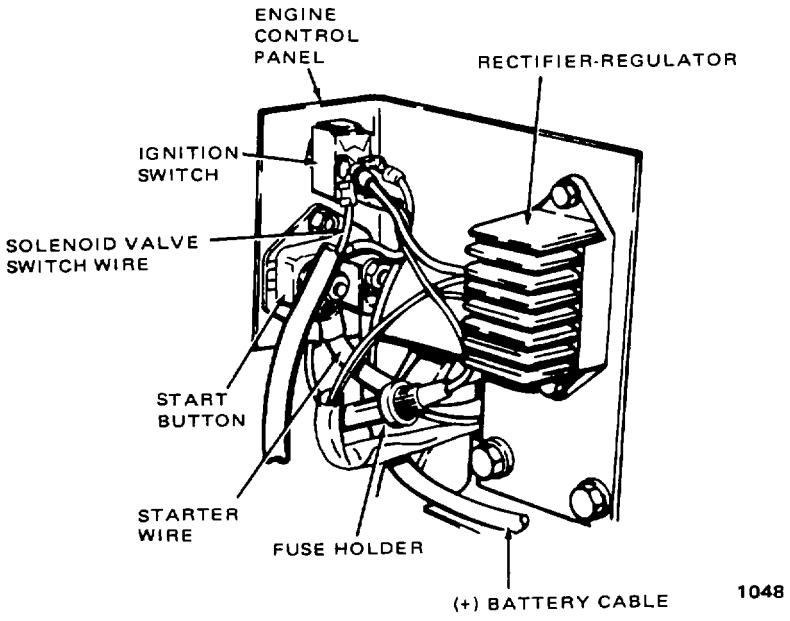


Figure 5-249. Engine Ignition Assembly

(7) Install rectifier-regulator and connect stator lead wire to it.

(8) Install ignition switch and start button to control panel.

(9) Insert fuse into fuse holder and tighten fuse holder.

(10) Connect all wires to back of engine control panel.

FUEL TANK MAINTENANCE

CAUTION
BE SURE to drain the fuel tank before removing it from the engine.

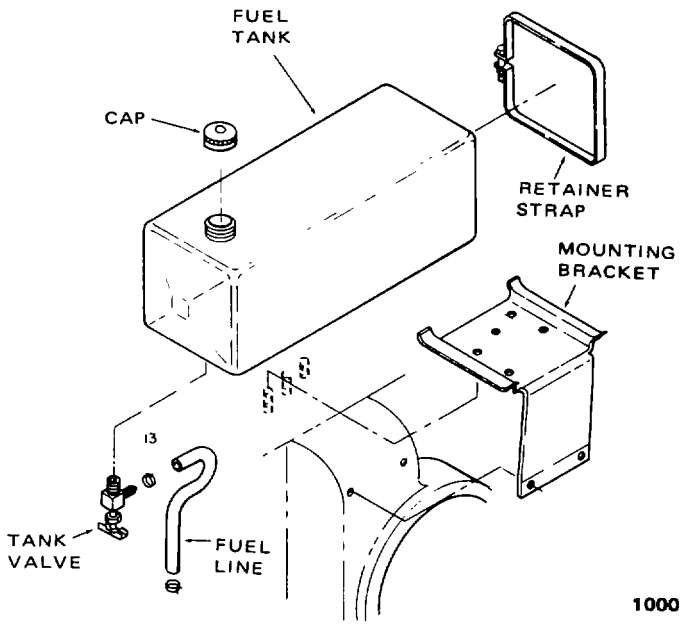


Figure 5-250. Fuel Tank Disassembly

a. Remove and disassemble fuel tank.

(1) Disconnect fuel line from carburetor.

(2) Remove tank retainer straps.

(3) Remove tank from bracket.

(4) Remove bracket from engine.

(5) Remove fuel tank cap.

(6) Remove fuel line from tank valve.

(7) Remove valve from tank.

b. Clean and inspect fuel tank.

(1) Cleaning. Clean the tank with fuel tank cleaning compound MS 36434.

(2) Inspection.

(a) Check fuel tank for leaks.

(b) Check for rust and corrosion.

FUEL TANK MAINTENANCE (Continued)

(c) Make sure tank valve operates smoothly.

(d) Check fuel line for cracks, cuts and chafing.

(e) Replace any damaged parts.

c. Assemble and install fuel tank.

(1) Install tank valve and cap.

(2) Connect fuel line to valve.

(3) Secure bracket to engine.

(4) Secure fuel tank to bracket.

(5) Connect fuel line to carburetor.

CARBURETOR MAINTENANCE

a. Remove carburetor.

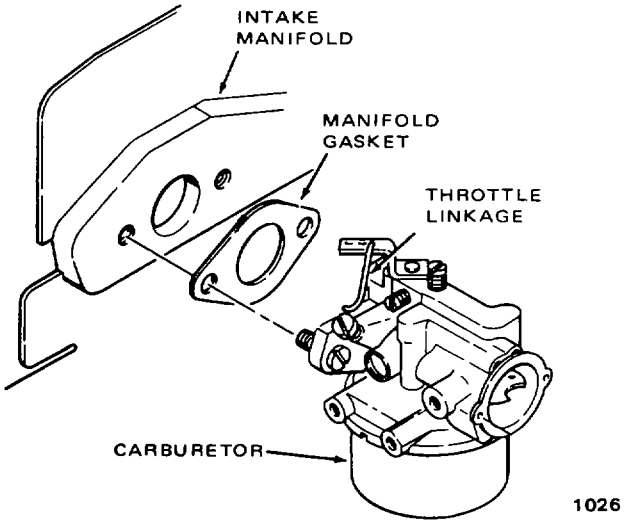


Figure 5-251. Carburetor Removal

(1) Remove air filter assembly.

(2) Disconnect fuel line from carburetor.

(3) Disconnect carburetor linkage.

NOTE

Loosen carburetor mounting screws. Pull carburetor away from engine and hold it. Loosen mounting screws again. Repeat this procedure until carburetor is removed from engine.

(4) Remove carburetor and gasket.

CARBURETOR MAINTENANCE (Continued)

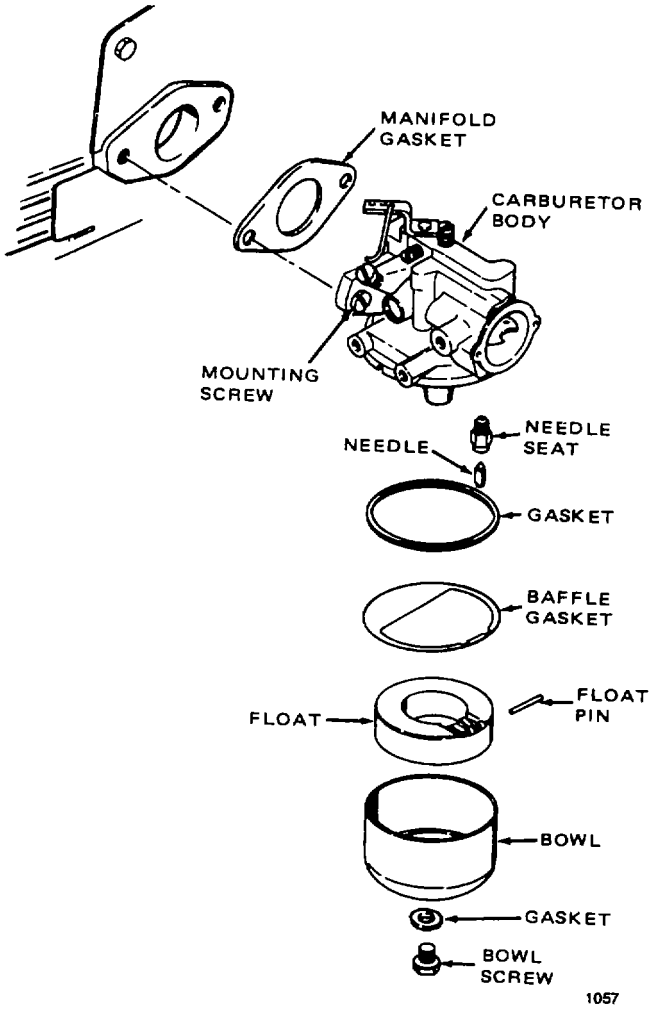


Figure 5-252. Carburetor Disassembly

b. Disassemble carburetor.

(1) Remove main fuel needle valve and spring.

(2) Remove idle needle valve and spring.

(3) Remove bowl retainer screw and washer and carburetor bowl, antisplash gasket, and bowl gasket.

(4) Remove float hinge pin and float.

(5) Remove float valve seat and float needle valve.

c. Clean and inspect carburetor.

(1) Cleaning. Clean carburetor parts in acetone O-A-51F or alcohol, MIL-A-37570.

(2) Inspection.

(a) Check adjusting needle valves for damage.

CARBURETOR MAINTENANCE (Continued)

(b) Check fuel inlet port for blocking.

(c) Check the choke, throttle plates and shafts. If these parts are worn or damaged replace the entire carburetor.

d. Assemble carburetor.

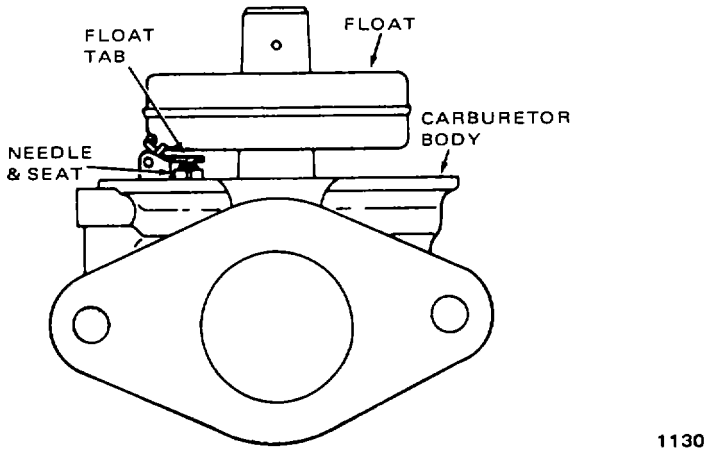


Figure 5-253. Carburetor Float Adjustment

(1) Install the seat needle float and pin.

(2) Set the float level. Turn the carburetor upside down and let the float rest on the needle. The clearance between the machined surface of the carburetor and the free end of the float should be 0.17 inches ±0.03 inches (4.32 mm ±0.76 mm).

(3) Adjust the clearance by bending the float tab with a screwdriver if necessary.

(4) Install a new baffle gasket, a new bowl gasket, the fuel bowl and fuel bowl screw and gasket. Make sure the bowl gaskets seats well.

(5) Return the carburetor to the engine. Make sure the carburetor to manifold gasket seals well.

(6) Install main fuel needle valve and idle fuel needle valve.

e. Adjust the needle valves.

(1) Turn both needle valves all the way to the right (clockwise) until they gently touch bottom.

(2) Turn the main fuel needle valve to the left (counterclockwise) two full turns.

(3) Turn the idle needle valve to the left (counterclockwise) 1-1/4 turns.

CARBURETOR MAINTENANCE (Continued)

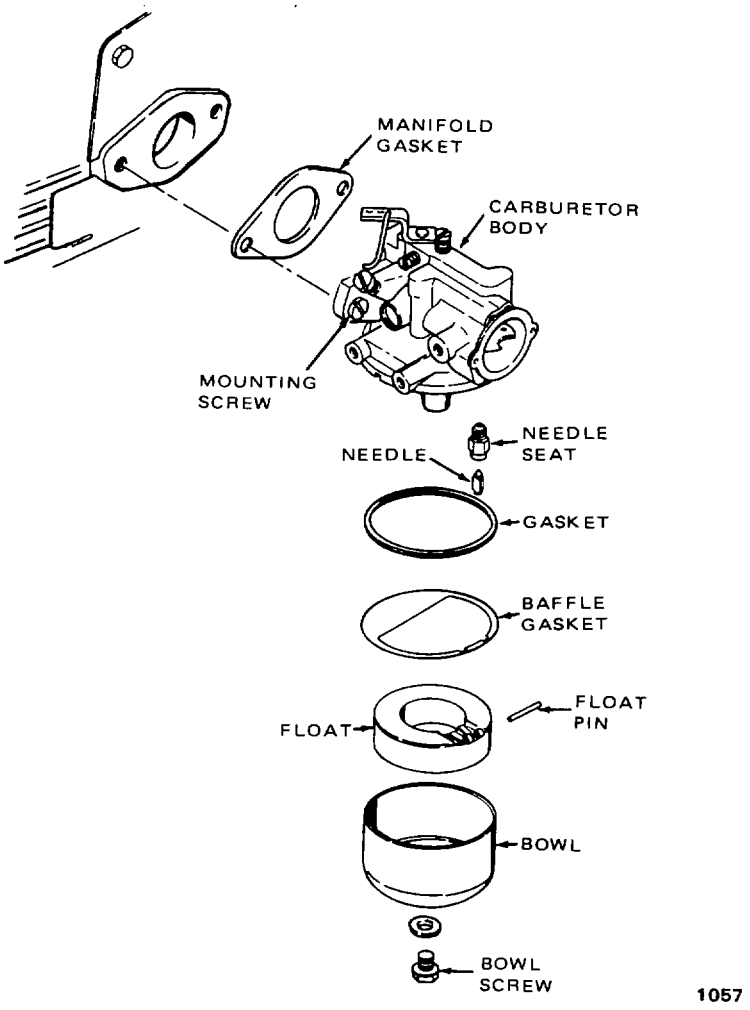


Figure 5-254. Carburetor Disassembly

COMPRESSOR MAINTENANCE

a. Remove compressor assembly.

(1) Disconnect air hose from pulsation tank.

(2) Disconnect fluid hose and wires from solenoid valve.

(3) Remove belt guard.

(4) Remove compressor mounting nuts.

(5) Turn tensioner screw counterclockwise (left) to loosen belts.

(6) Remove belts.

(7) Remove tensioner assembly and bolt plate.

(8) Remove compressor.

COMPRESSOR MAINTENANCE (Continued)

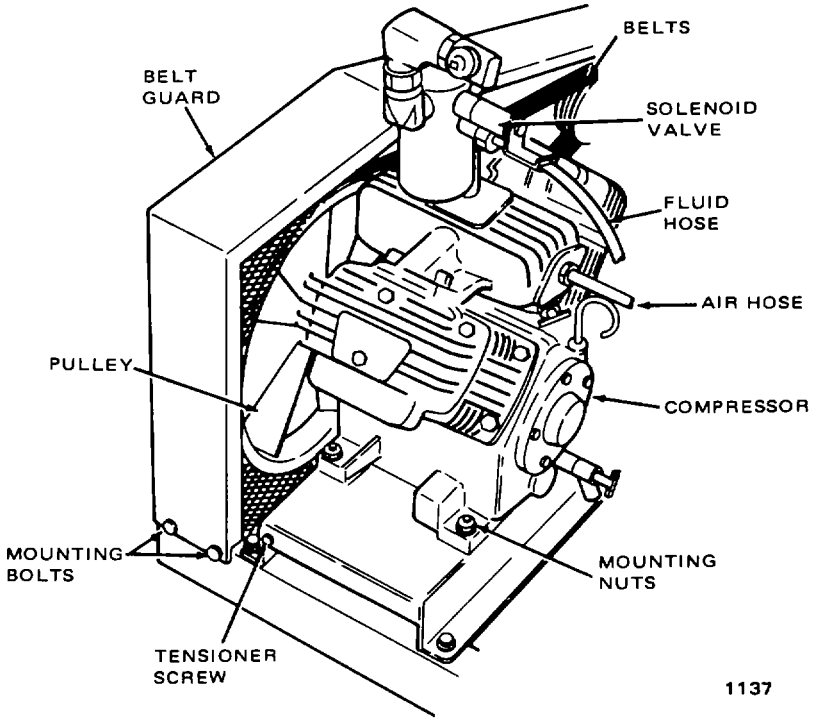


Figure 5-255. Compressor Assembly

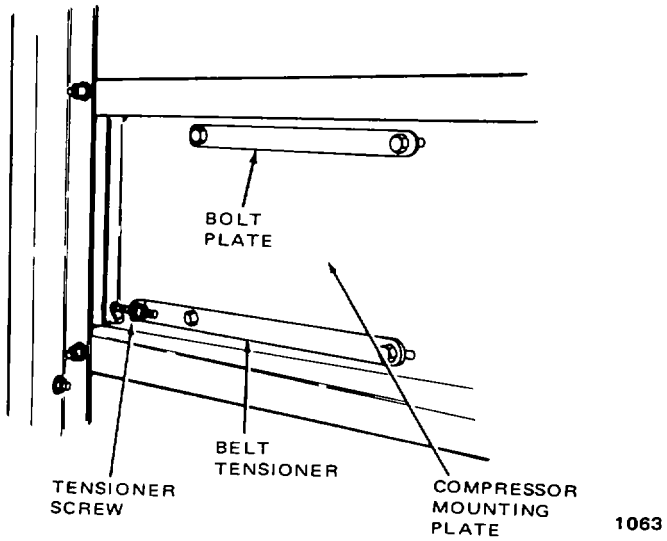


Figure 5-256. Belt Tensioner

b. Disassemble compressor assembly.

(1) Disassemble nozzle.

(a) Remove knurled ring and air cap.

(b) Remove fluid nozzle and Teflon gasket.

(c) Separate nozzle adjusting nut and nipple from the swivel elbow.

COMPRESSOR MAINTENANCE (Continued)

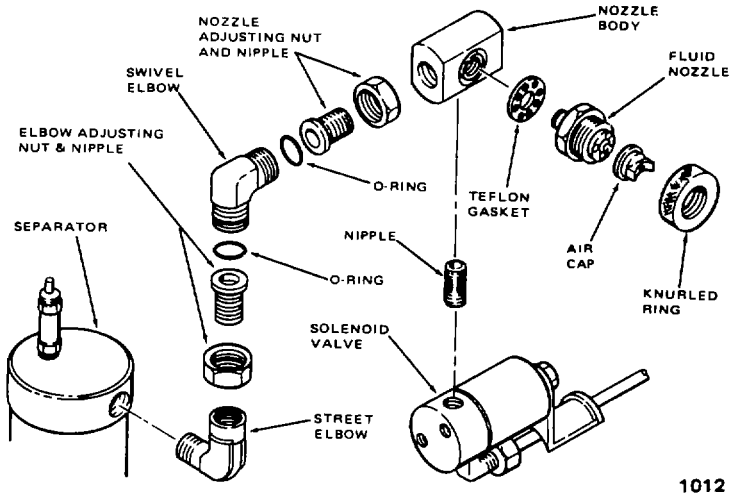


Figure 5-257. Nozzle Installation

(d) Separate the nozzle body from the solenoid valve and close nipple.

(e) Disconnect elbow adjusting nut and O-ring.

CAUTION

DO NOT make metal to metal contact when removing adjusting nipples from street elbow and nozzle body.

(f) Separate swivel elbow, O-ring, nozzle adjusting nut and nipple from nozzle body.

(g) Separate elbow adjusting nut and nipple from street elbow.

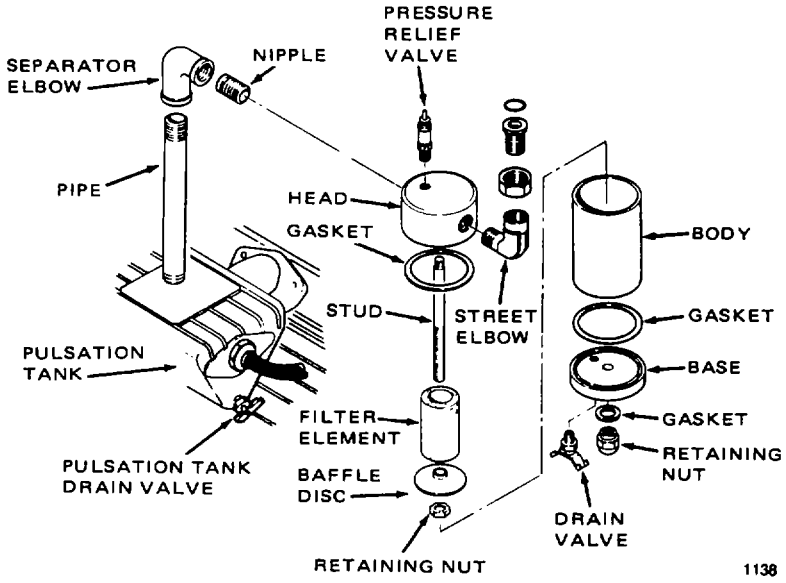


Figure 5-258. Separator Assembly

COMPRESSOR MAINTENANCE (Continued)

(2) Remove and disassemble separator assembly.

(a) Remove street elbow.

(b) Remove pressure relief valve.

(c) Remove separator drain valve.

(d) Remove nut washer base, O-rings and separator body.

(e) Remove nut, baffle disc, filter element and stud.

(f) Remove pipe, separator, elbow, nipple and separator cap.

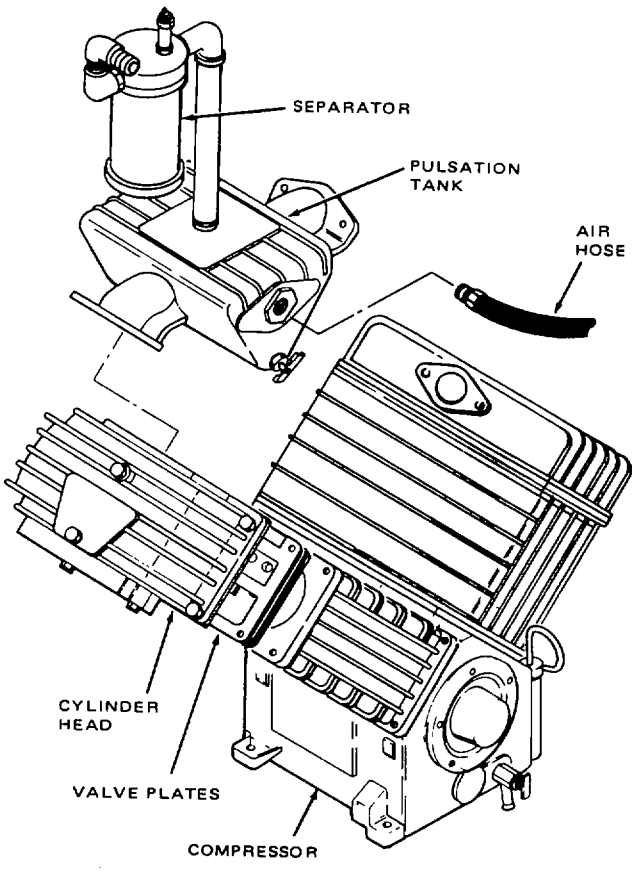


Figure 5-259. Compressor Disassembly

(3) Remove pulley from crankshaft. Do not lose key.

(4) Remove pulsation tank and pulsation tank drain valve.

(5) Remove crankcase drain valve.

(6) Remove and disassemble air filters.

(a) Remove filter retainers.

(b) Remove filter elements and retaining screen.

COMPRESSOR MAINTENANCE (Continued)

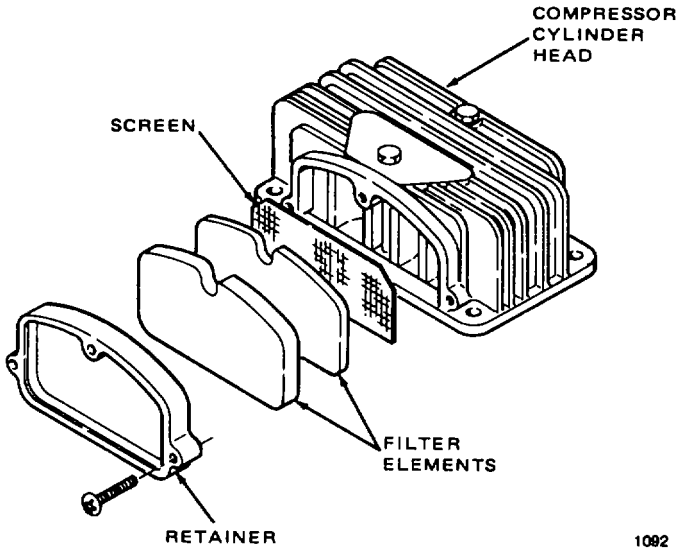


Figure 5-260. Compressor Air Filter

(7) Remove and disassemble compressor head assemblies.

(a) Remove compressor heads, gaskets and valve plates.

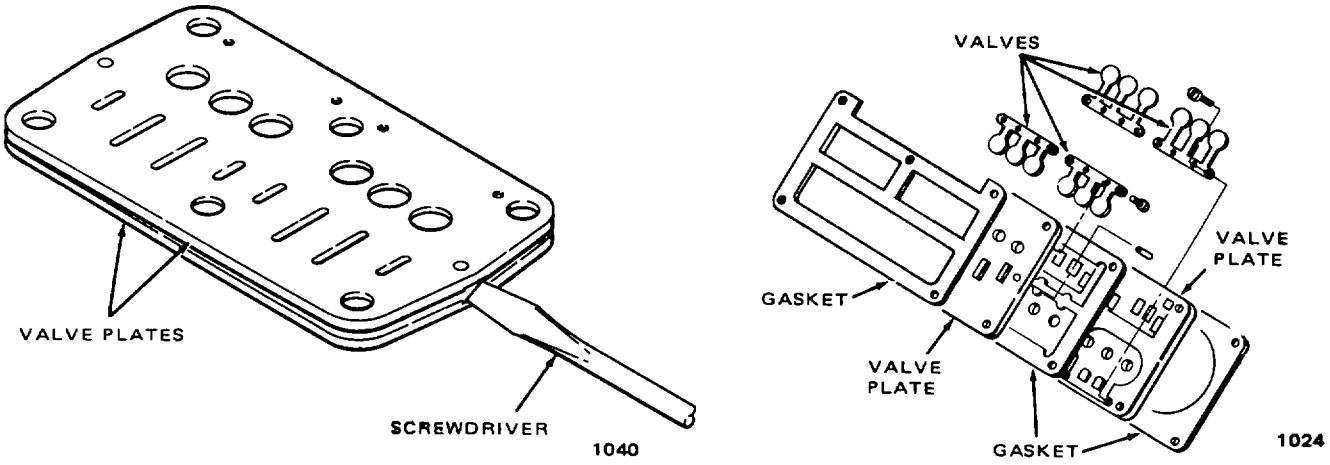


Figure 5-261. Valve Plate Disassembly

(b) Place a screw driver in the valve plate notches and pry the plates apart.

(c) Remove gaskets and valves.

(8) Remove and disassemble crankcase breathers.

(a) Remove breather caps.

(b) Remove springs, valves and valve seats.

COMPRESSOR MAINTENANCE (Continued)

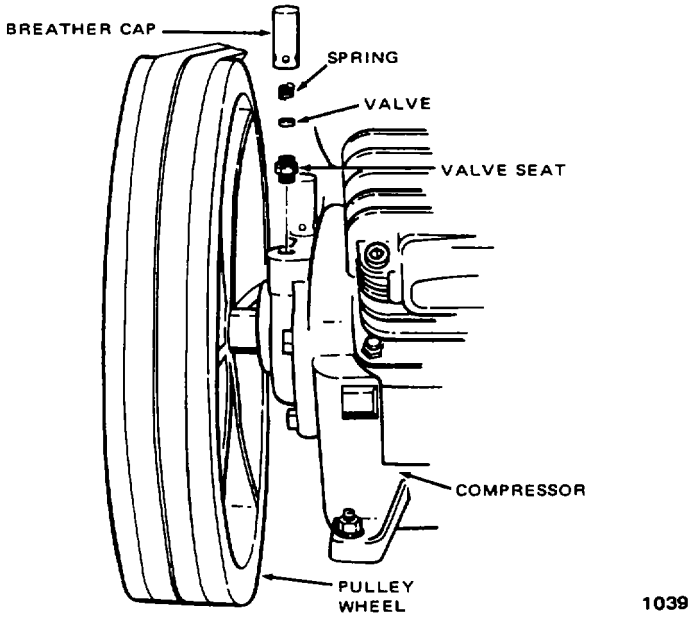


Figure 5-262. Compressor Breather Assembly

c. Clean and Inspect compressor.

(1) Cleaning. Clean all mud, grease and dirt from the outside of the compressor before disassembly using a cleaning compound such as Federal Specification P-C-435A. Dilute the compound as recommended on its container. Thoroughly clean all internal parts with cleaning compound such as MIL-C-11090D. Clean all bearings with dry cleaning solvent P-D-680. When the bearings are clean, spin them in light lubricating oil to remove solvent VV-L-820-C.

(2) Inspection. Check all machined surfaces for nicks, cuts or scratches. Look for uneven wear on the crankshaft. Make sure the bearings are not out of round or scarred. Replace any damaged parts.

d. Assemble compressor.

(1) Install breather assemblies.

(2) Install compressor head assemblies and pulsation tank.

NOTE

Install new valve plate gaskets, head gaskets, and pulsation tank gaskets when reassembling the compressor.

(a) Assemble valve plate assemblies.

(b) Install valve plate assemblies.

(c) Install valve plate and head assemblies. Do not tighten the head bolts.

COMPRESSOR MAINTENANCE (Continued)

(d) Set the pulsation tank in place between the heads and screw the mounting bolts down but not tight.

(e) Lightly torque each head bolt.

NOTE

Torque the longer center bolts first then the shorter outside bolts.

(f) Torque the head bolts to 400 in-lbs (4.61 kgM).

(g) Torque the pulsation tank bolts to 400 in-lbs (4.61 kgM).

NOTE

When new gaskets are installed, retorque the head bolts to 400 in-lbs (4.61 kgM) after 5 hours of operation.

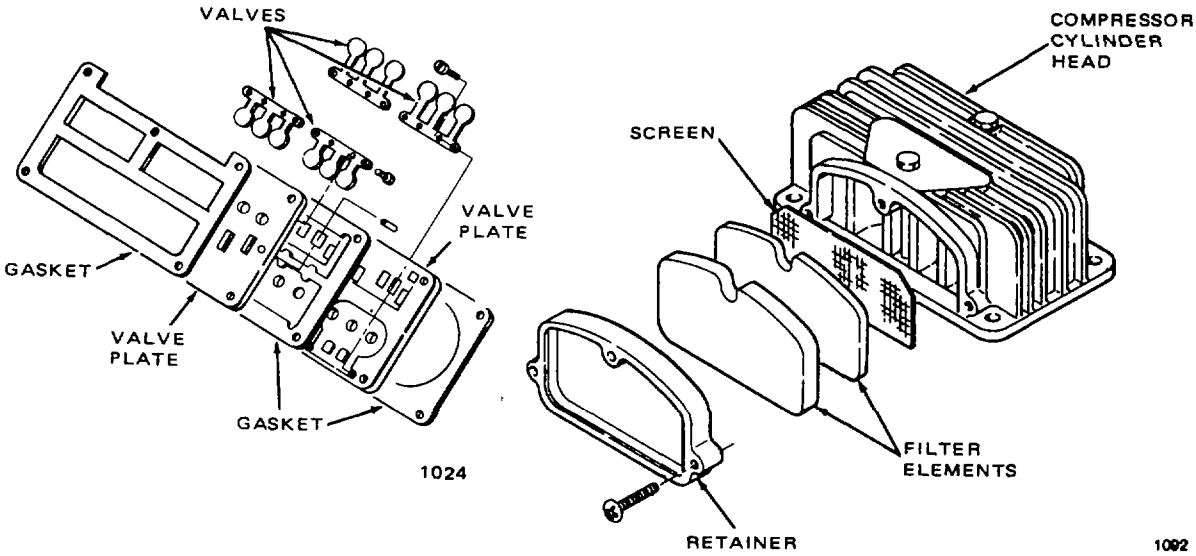


Figure 5-263. Compressor Valve Plate Assembly

(h) Install air hose fitting drain valve and separator pipe in pulsation tank.

(i) Install air filter elements screen and filter retainer in compressor heads.

(3) Assemble separator assembly.

NOTE

Retighten separator pipe pipe elbow nipple and separator assembly after the compressor reaches its normal operating temperature.

(a) Attach elbow and nipple to pulsation tank.
(b) Attach separator cap to nipple.
(c) Attach pressure relief valve to separator cap.
(d) Attach stud, filter element, baffle disc, and retainer nut to separator cap.
(e) Attach gaskets, separator body, and separator base to separator cap with washer and nut.
(f) Attach street elbow to separator. Be sure the street elbow is torqued tightly.
(g) Attach separator drain valve to separator base.

COMPRESSOR MAINTENANCE (Continued)

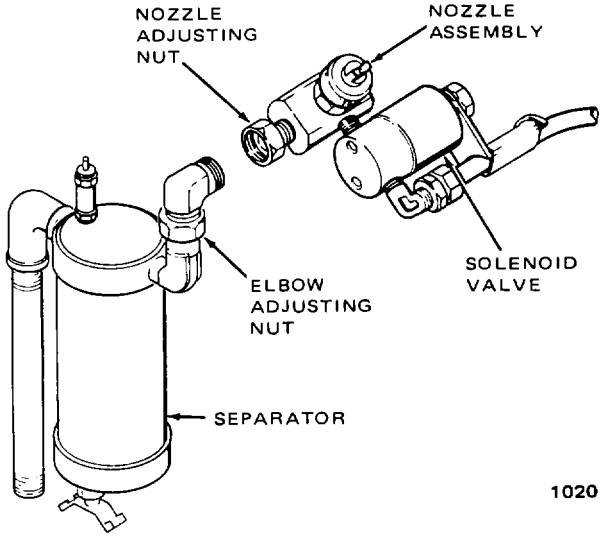


Figure 5-264. Separator Nozzle Connection

(4) Attach nozzle assembly to separator assembly.

(a) Attach adjusting nut, nipple, O-ring, and swivel elbow to street elbow.

(b) Attach O-ring, adjusting nut, nipple, and nozzle body to swivel elbow.

(c) Attach nipple and solenoid valve to nozzle body.

CAUTION

DO NOT use too much force to tighten fluid nozzle. Tighten it by hand. Too much force will damage the Teflon gasket.

DO NOT use tools to tighten knurled ring; tighten by hand.

(d) Assemble fluid nozzle, teflon gasket, air cap and knurled ring and attach them to nozzle body.

(5) Install compressor assembly.

(a) Line up compressor and mounting holes.

(b) Insert tensioner studs and bolt plate studs through mounting holes.

(c) Thread tensioner screw into belt tensioner.

(d) Tighten mounting nuts.

NOTE

An alignment gage can be made from a piece of scrap metal or wood and be used to line up the pulleys.

(6) Adjust belt tension and pulley alignment. See belt maintenance on page 4-12 for details.

(7) Install air hose between pulsation tank and inlet side of air pressure regulator.

COMPRESSOR MAINTENANCE (Continued)

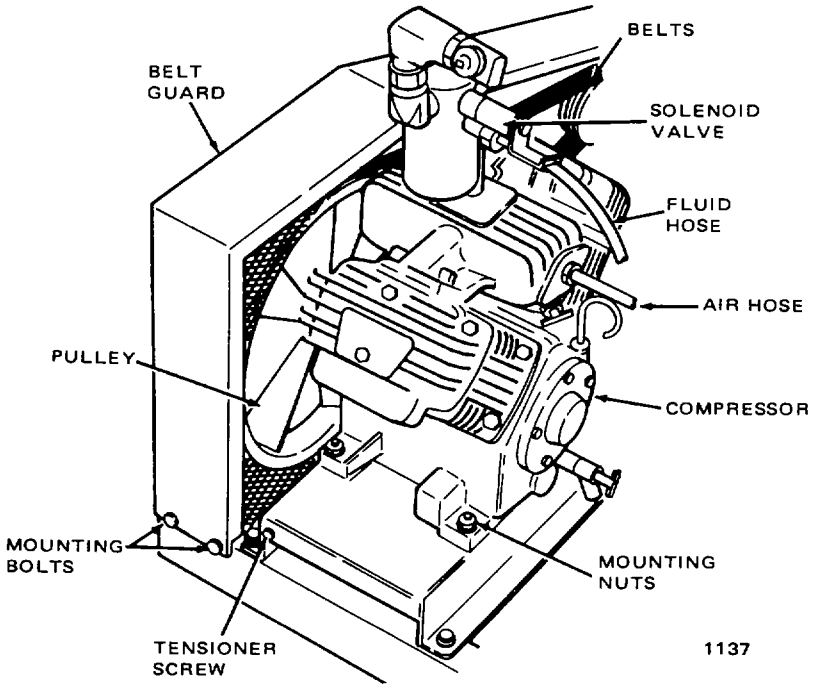


Figure 5-265. Compressor Installation

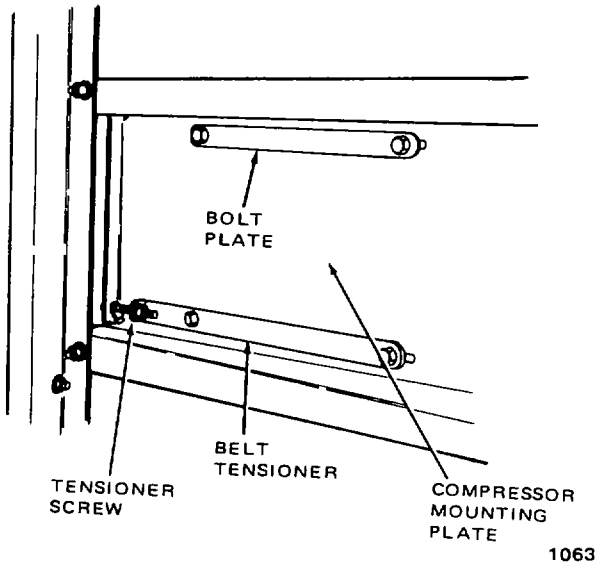


Figure 5-266. Belt Tensioner

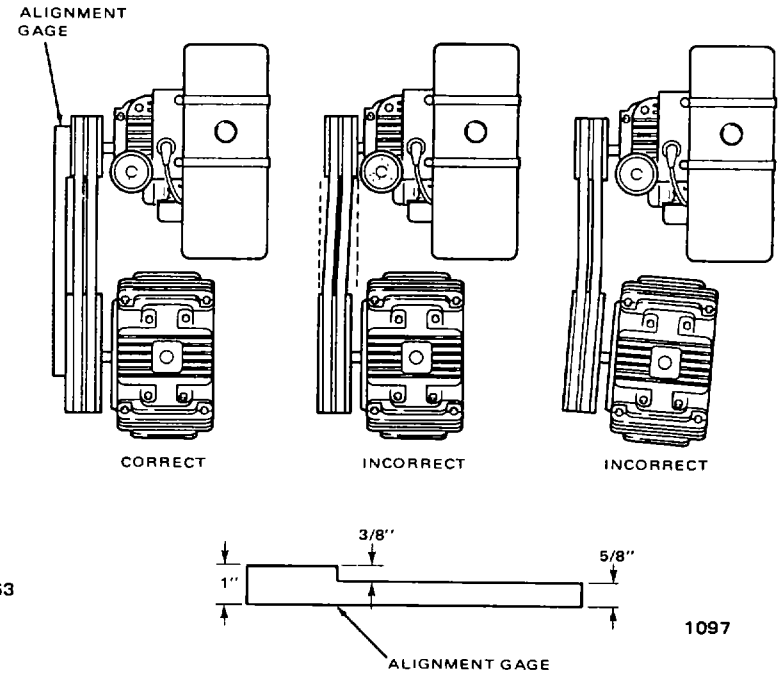


Figure 5-267. Compressor Alignment

Figure 5-267. Compressor Alignment

COMPRESSOR MAINTENANCE (Continued)

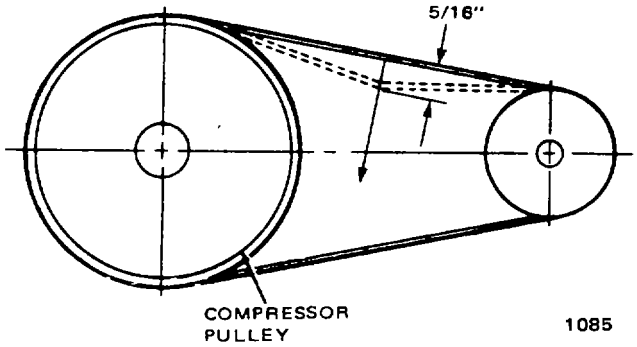


Figure 5-268. Belt Deflection

CONTROL PANEL MAINTENANCE

a. Remove control panel from vehicle.

CAUTION

BE SURE there is no pressure on formulation tank before removing control panel.

BE SURE the battery is disconnected before removing control panel.

BE CAREFUL not to spill insecticide on skin or clothing when disconnecting hoses.

(1) Disconnect battery ground cable from battery.

(2) Open formulation tank air pressure drain valve.

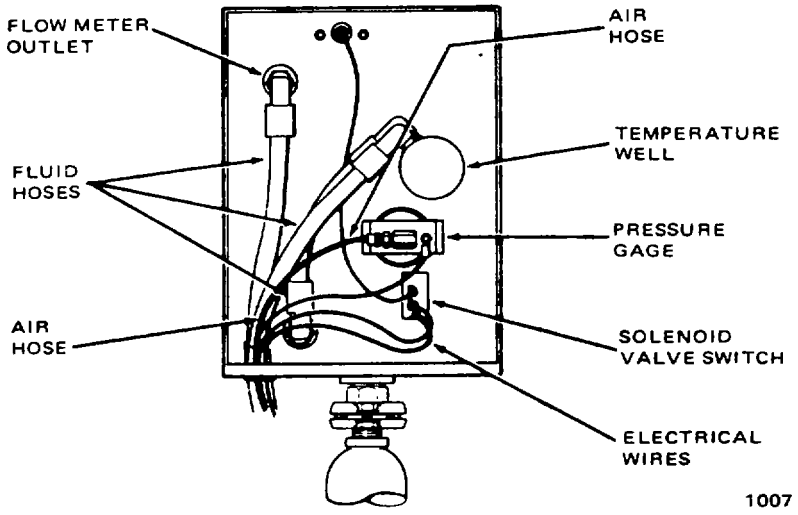


Figure 5-269. Control Panel Rear View

(3) Disconnect fluid hoses from temperature well and flowmeter outlet.

(4) Disconnect black air line from pressure gage.

(5) Disconnect wires from solenoid valve switch.

CONTROL PANEL MAINTENANCE (Continued)

b. Disassemble control panel assembly.

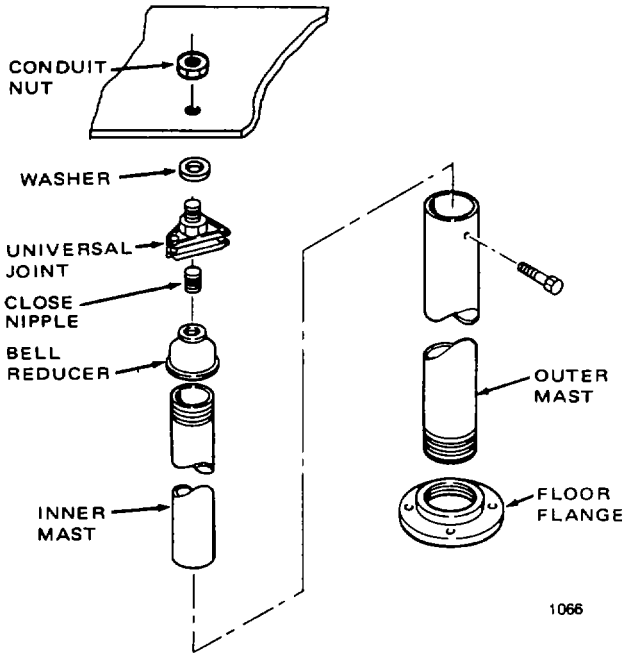


Figure 5-270. Control Panel Mast Assembly

(1) Disassemble mast assembly.

(a) Remove mast assembly from control panel.

(b) Separate inner and outer masts.

(c) Remove floor flange from outer mast.

(d) Remove conduit nut, universal joint, and close nipple from inner mast.

(e) Separate inner mast and bell reducer.

(2) Disassemble control panel.

(a) Disconnect hose between temperature well and flowmeter.

(b) Remove thermometer and temperature well.

(c) Remove pressure gage.

(d) Remove panel light assembly.

(e) Remove solenoid valve switch.

CONTROL PANEL MAINTENANCE (Continued)

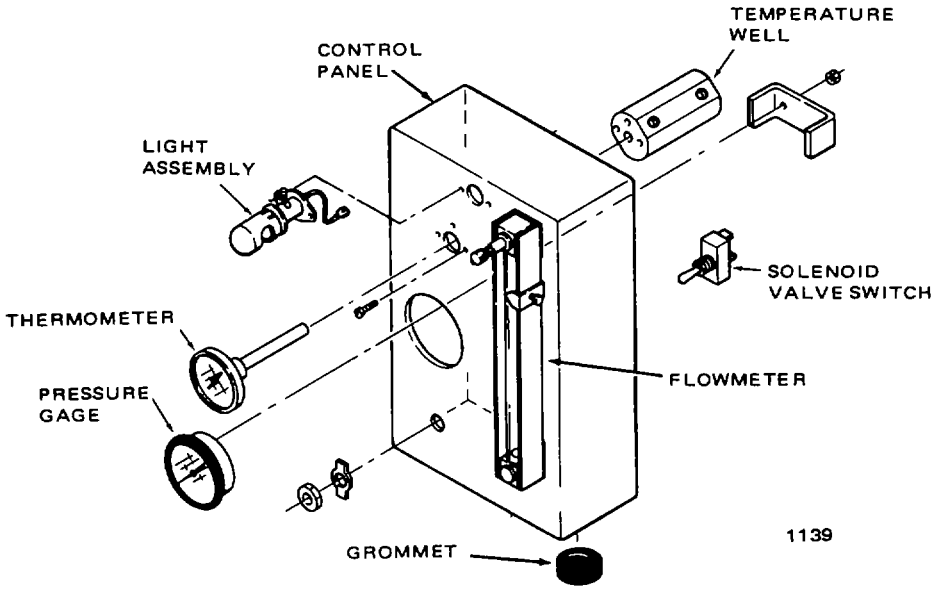


Figure 5-271. Control Panel Assembly

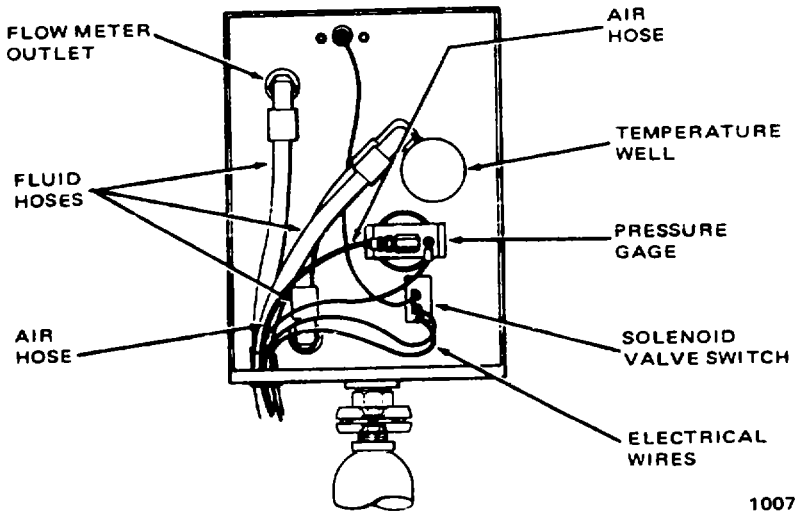


Figure 5-272. Control Panel Rear View

CONTROL PANEL MAINTENANCE (Continued)

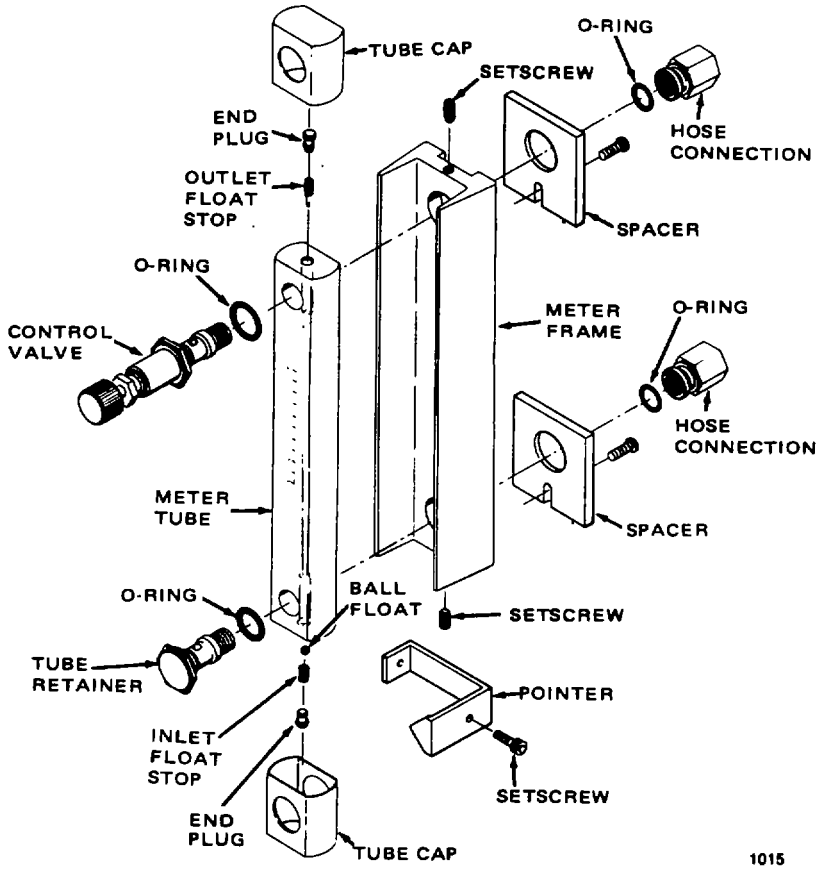


Figure 5-273. Flowmeter Assembly

(3) Disassemble and remove flowmeter.

WARNING

BE SURE the aerosol generator ignition switch is turned OFF before working on control panel.

BE SURE there is no air pressure on formulation tank or flush tank.

BE SURE there is no insecticide in hoses before removing them from control panel. DO NOT spill insecticide on skin.

(a) Turn three-way valve to flush position.

(b) Turn aerosol generator ignition switch OFF.

(c) Disconnect hoses from temperature well, and flow meter.

(d) Disconnect black air hose from pressure gage.

(e) Disconnect wires from solenoid valve switch and ground.

(f) Using a 5/8" box wrench, loosen but do not remove the tube retainers, or tube retainer and control valve (as the case may be).

CONTROL PANEL MAINTENANCE (Continued)

(g) While holding the meter tube, complete the removal of the tube retainers and/or tube retainer and control valve.

(h) Remove the meter tube from the meter frame and pull the tube caps from each end.

(i) From the outlet end of the meter tube, carefully remove the end plug from the tube. Depending upon the selection of seal materials, this end plug may be either one solid part or a plug with an "O" ring. In either case, inspect the parts for nicks or cuts that could be the possible source of a leak.

(j) With the tube in the vertical position, remove the outlet float stop. Then, with one hand over the top of the tube, invert the meter to remove the ball float. Put the float aside so that it will not be damaged.

(k) From the inlet end of the meter tube, remove the end plug (as in step i) and the inlet float stop.

c. Clean flowmeter components. Clean insecticide from flowmeter components with hot soap and water such as MIL-D-16791E. Clean electrical components with a lint free cloth dampened in dry cleaning solvent Federal Specification P-D-680.

d. Inspect and test control panel components.

(1) Inspection. Check hoses for kinking, chafing, or cracking. Check hoses and fittings for leaks. Check electrical insulation for cracks or chafing. Replace any damaged components.

(2) Testing.

(a) Thermometer. Place the thermometer in a glass of ice water with a calibrated thermometer. Check the calibrated thermometer against the panel thermometer. If the temperature varies ± 10%, replace the panel thermometer.

(b) Nozzle pressure gage. Check the panel gage against a calibrated gage. If the pressures vary more than 2 psi, replace the panel gage.

(c) Flow meter. See calibration procedures in Chapter 2, Section III. If the flow meter is incorrect, replace the meter tube.

e. Assemble and install flowmeter.

(1) Insert float ball in meter tube.

(2) Insert inlet and outlet float stops.

(3) Insert end plugs.

(4) Attach tube caps.

(5) Set meter tube in meter frame and tighten setscrews.

(6) Secure flowmeter spacer to meter frame with screw.

(7) Attach pointer to flowmeter.

CONTROL PANEL MAINTENANCE (Continued)

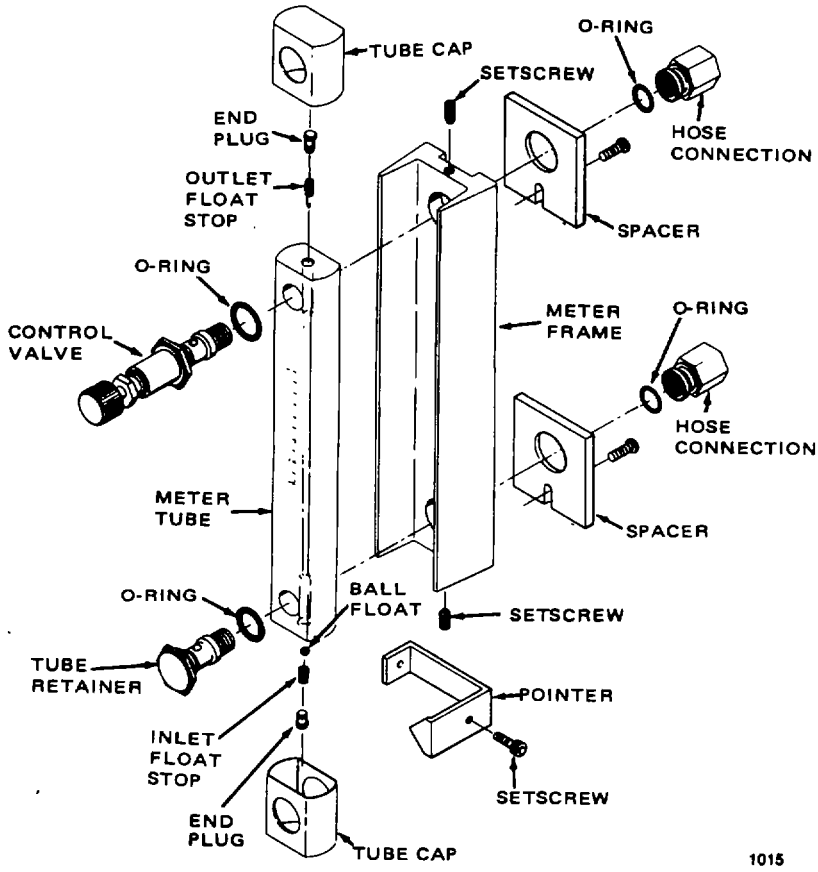


Figure 5-274. Flowmeter Assembly

NOTE

Lubricate the O-rings with silicone grease before inserting them.

(8) Attach flowmeter to control panel with fittings, new O-rings, tube retainer, and control valve.

f. Assemble and install control panel.

(1) Attach thermometer and temperature well to control panel.

(2) Attach pressure gage to control panel.

(3) Attach light assembly to control panel.

(4) Attach solenoid valve switch to control panel.

g. Assemble masts.

(1) Attach conduit nut, universal joint and close nipple to inner mast.

(2) Attach floor flange to outer mast.

(3) Slide inner mast into outer mast.

CONTROL PANEL MAINTENANCE (Continued)

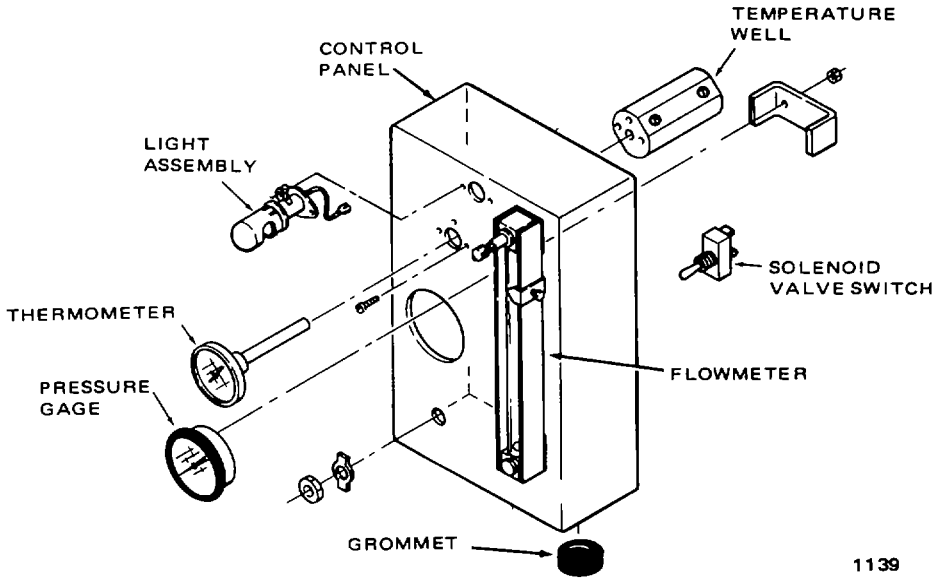


Figure 5-275. Control Panel Assembly

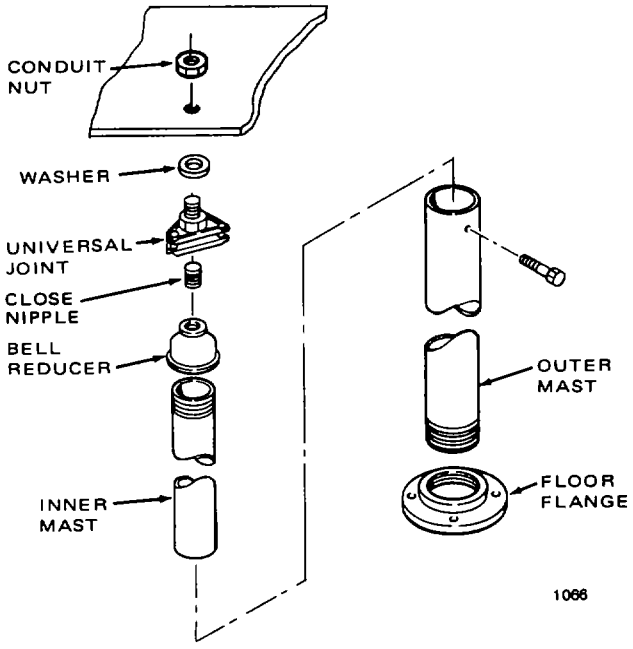


Figure 5-276. Control Panel Mast Assembly

(4) Attach control panel to universal joint.

(5) Install control panel in vehicle.

(6) Connect fluid hoses to temperature well and flowmeter.

(7) Connect black air line to pressure gage.

(8) Connect electrical wires to solenoid valve switch, ground and light assembly.

FORMULATION TANK ASSEMBLY MAINTENANCE

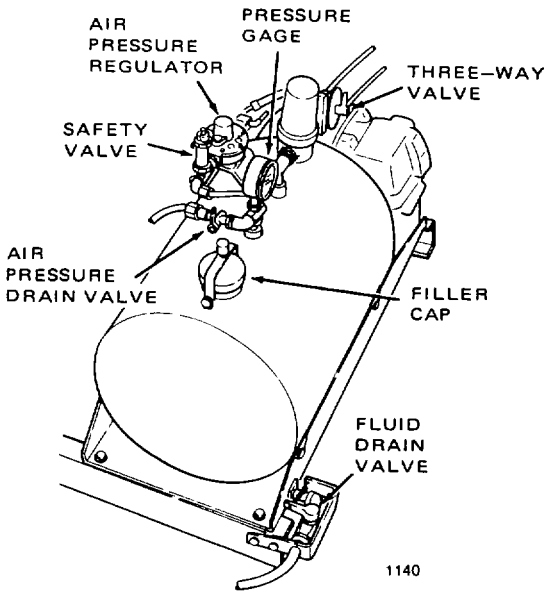


Figure 5-277. Formulation Tank

a. Remove formulation tank assembly.

WARNING

BE SURE there is no pressure on the formulation tank before removing it.

BE SURE the formulation tank is empty before removing it.

BE ALERT not to spill insecticide on skin or clothing when removing the hoses.

(1) Drain formulation tank.

(2) Open air pressure drain valve.

(3) Remove spring and valve guard bracket.

(4) Remove tank fluid drain valve assembly.

(5) Disconnect fluid hoses from three-way valve, junction block, and regulator.

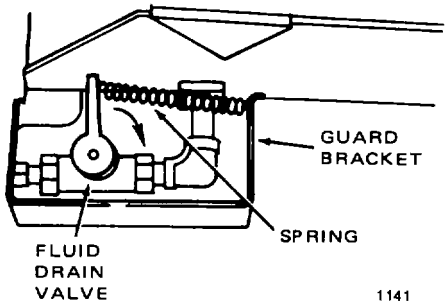


Figure 5-278. Formulation Tank Fluid Drain Valve

FORMULATION TANK ASSEMBLY MAINTENANCE (Continued)

(6) Disconnect air hoses from inlet side of tank pressure regulator.

(7) Disconnect ground wire from junction block.

(8) Remove mounting screws and formulation tank from base assembly.

b. Disassemble formulation tank.

(1) Remove air pressure drain valve assembly.

(a) Remove hose and fitting from valve.

(b) Remove valve from elbow.

(2) Disassemble pressure gage assembly.

(a) Remove hose from pressure gage.

(b) Remove fittings and elbow from cross tee.

(c) Remove pressure gage from cross tee.

(d) Remove cross tee from tank.

(3) Disassemble pressure regulator and safety valve assembly.

(a) Remove safety valve from tee.

(b) Separate elbow tee and check valve from pressure regulator.

(c) Remove fittings from pressure regulator.

(4) Disassemble three-way valve.

(a) Disconnect hoses from three-way valve and junction block.

(b) Remove valve lever, indicator plate, and couplings.

(c) Remove hose adapter from junction block.

(d) Remove valve body and coupling from pipe nipple.

(e) Remove setscrew and pipe nipple from junction block.

(f) Remove mounting screw, lockwasher, and junction block from formulation tank.

FORMULATION TANK ASSEMBLY MAINTENANCE (Continued)

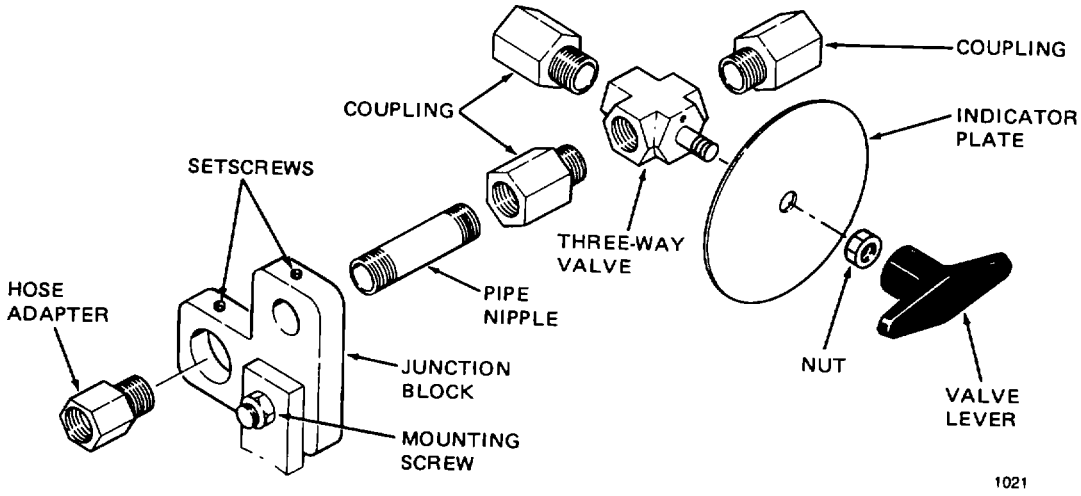


Figure 5-279. Three-Way Valve

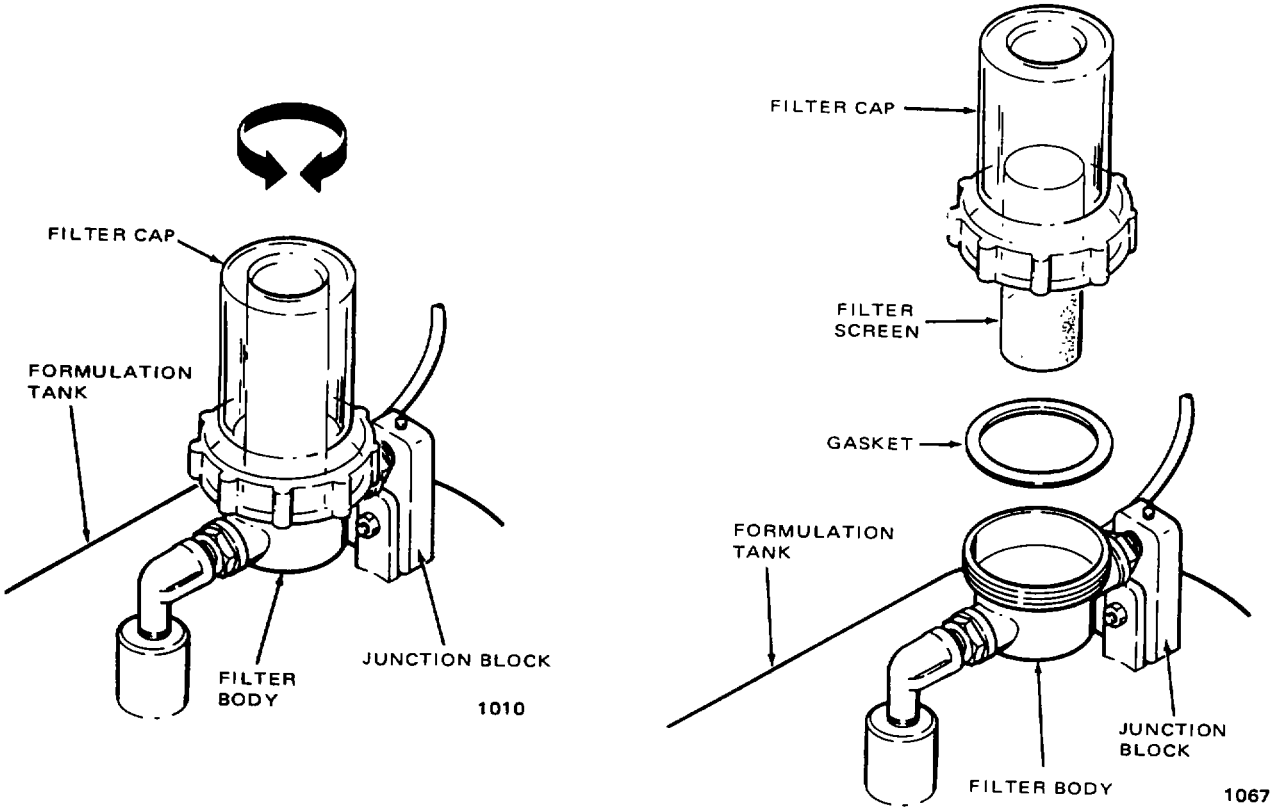


Figure 5-280. Formulation Tank Filter

(5) Disassemble formulation tank filter.

(a) Unscrew filter cap and remove filter screen and gasket.

(b) Disconnect junction block from formulation tank.

FORMULATION TANK ASSEMBLY MAINTENANCE (Continued)

(c) Remove filter body from pick up tube.

(d) Separate bushings from filter base.

(e) Remove pick-up tube from tank.

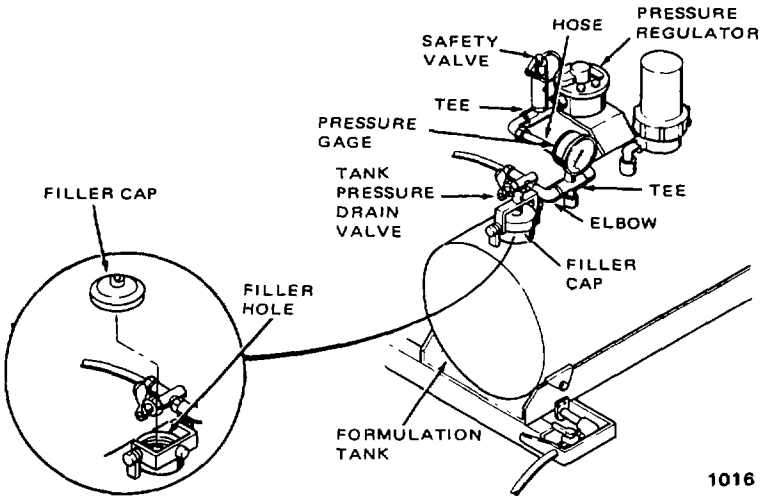


Figure 5-281. Formulation Tank Filler Cap

(6) Disassemble filler cap.

(a) Remove filler cap bracket.

(b) Remove filler cap.

c. Clean formulation tank. Clean formulation tank inside and out with hot soap and water. Use cleaning compound such as MIL-D-16791E.

d. Test formulation tank.

NOTE

Test formulation tank before it is disassembled.

(1) Test fittings and welded seams for leaks.

(a) Drain all fluid from tank.

(b) Turn solenoid valve switch OFF on control panel.

(c) Pressurize tank and shut engine OFF.

(d) Spread a soap lather over all fittings and seams. If bubbles blow through the lather, there is a leak at that spot.

(2) Test pressure gage and pressure regulator.

(a) Release pressure from tank.

(b) Remove safety valve from tee.

(c) Place a calibrated pressure gage in the tee.

FORMULATION TANK ASSEMBLY MAINTENANCE (Continued)

(d) Pressurize formulation tank.

(e) If both pressure gages read the same pressure, the tank pressure gage is ok.

(f) If the pressure is greater than 15 psi, the pressure regulator is not working properly.

e. Assemble formulation tank.

(1) Install filler cap assembly.

(a) Set filler cap evenly in place.

(b) Install bracket and tighten knurled screw.

CAUTION

DO NOT use tools to tighten knurled screw. Tighten it by hand.

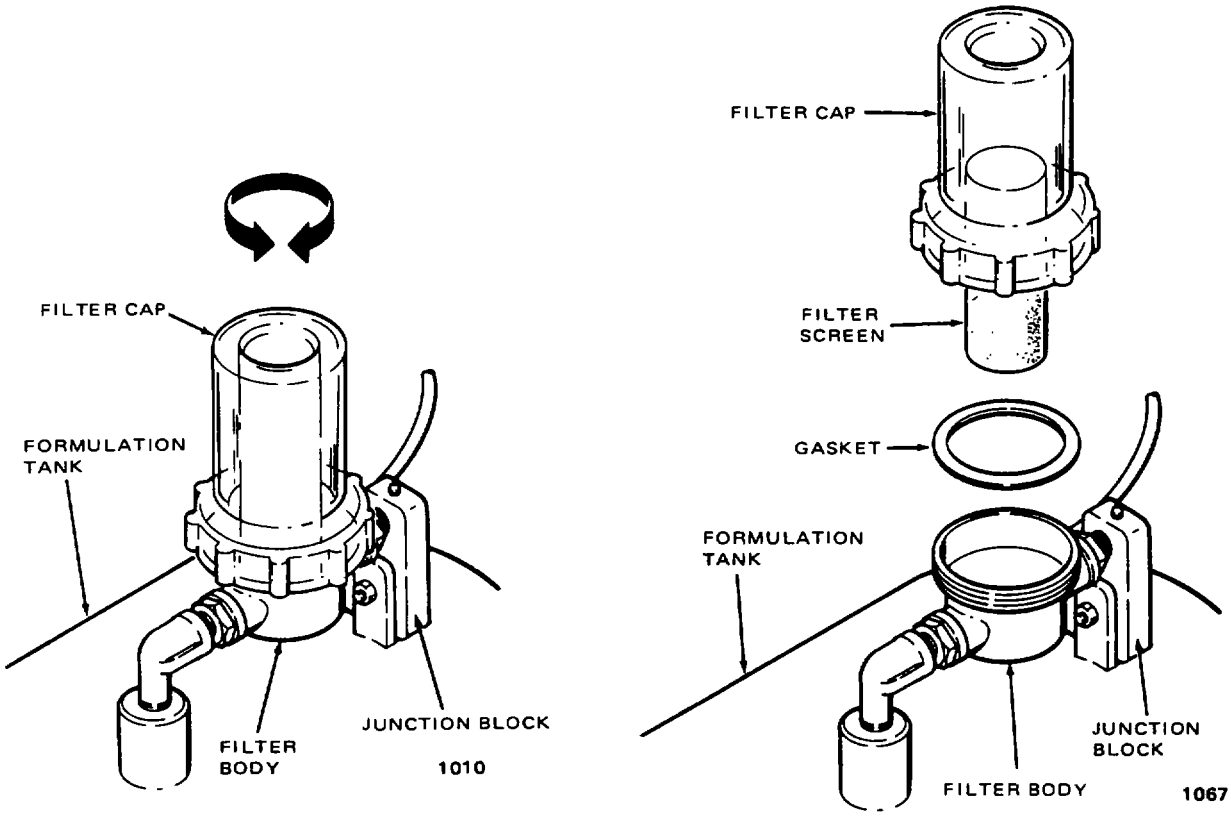


Figure 5-282. Formulation Tank Filter

(2) Install tank filter assembly.

(a) Install pick-up tube.

(b) Install filter body.

(c) Attach junction block to filter body.

(d) Install filter screen, gasket and cap. Be sure the gasket seats well and does not become pinched in the threads.

FORMULATION TANK ASSEMBLY MAINTENANCE (Continued)

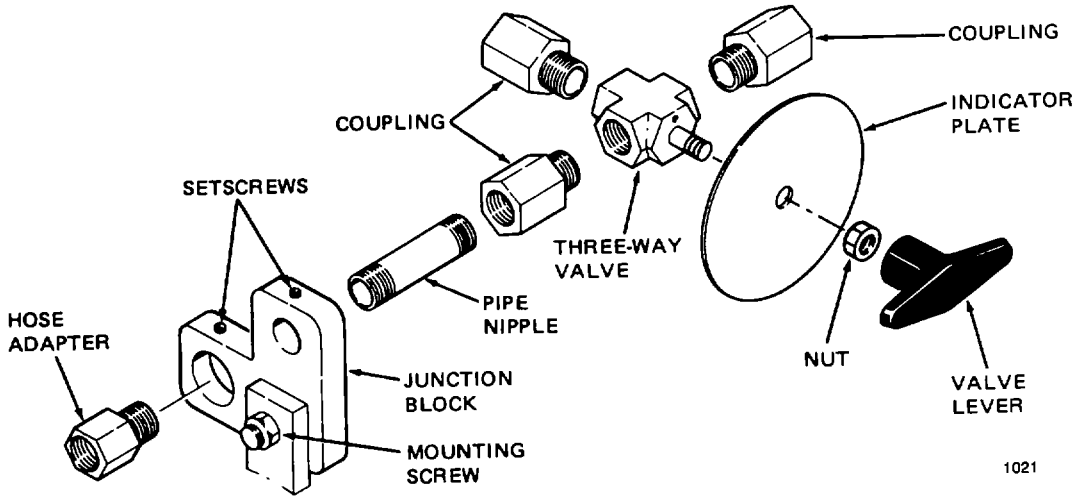


Figure 5-283. Three-Way Valve

(3) Install three-way valve.

(a) Install junction block.

(b) Install pipe nipple and hose adapter in junction block.

(c) Attach three-way valve and coupling pipe nipple.

(d) Attach indicator plate and lever to valve body.

(e) Attach couplings hose fittings to valve body.

(4) Assemble safety valve and pressure regulator.

(a) Attach fittings to inlet side of pressure regulator.

(b) Attach check valve and safety valve to outlet of pressure regulator.

(c) Attach fittings to safety valve.

(5) Install pressure gage assembly.

(a) Attach gage and tee to formulation tank.

(b) Attach elbows and fitting to tee.

(c) Install hose between tee and safety valve.

FORMULATION TANK ASSEMBLY MAINTENANCE (Continued)

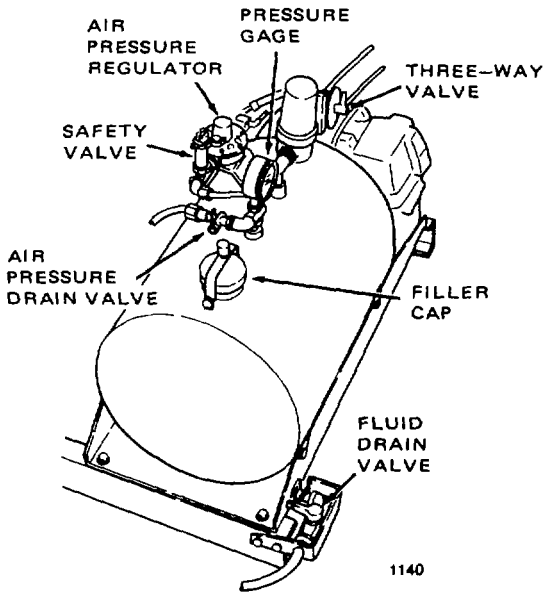


Figure 5-284. Formulation Tank

(6) Install air pressure drain valve and hose.

f. Install formulation tank assembly.

(1) Set tank on base assembly, install washers, and tighten mounting screws.

(2) Connect fluid hoses to three-way valve and junction block. Be sure to connect hoses to the correct component.

(3) Hang hose harness from tank pressure regulator.

(4) Connect air hose to inlet side of tank pressure regulator.

(5) Connect green ground wire to junction block.

(6) Install fluid drain valve assembly to formulation tank.

(7) Install valve guard bracket to base assembly.

(8) Attach spring to valve and bracket.

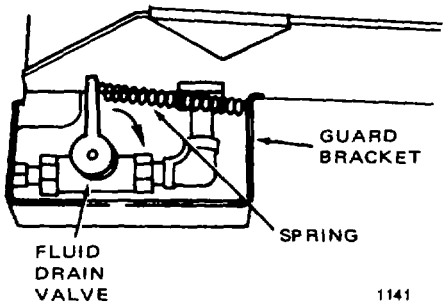


Figure 5-285. Formulation Tank Fluid Drain Valve

FLUSH TANK ASSEMBLY MAINTENANCE

a. Remove flush tank assembly.

WARNING

BE SURE there is no pressure on the flush tank before removing it from aerosol generator.

(1) Disconnect flush line from three-way valve and flush tank.

(2) Disconnect retaining strap.

(3) Remove flush tank.

(4) Remove mounting bracket from base assembly.

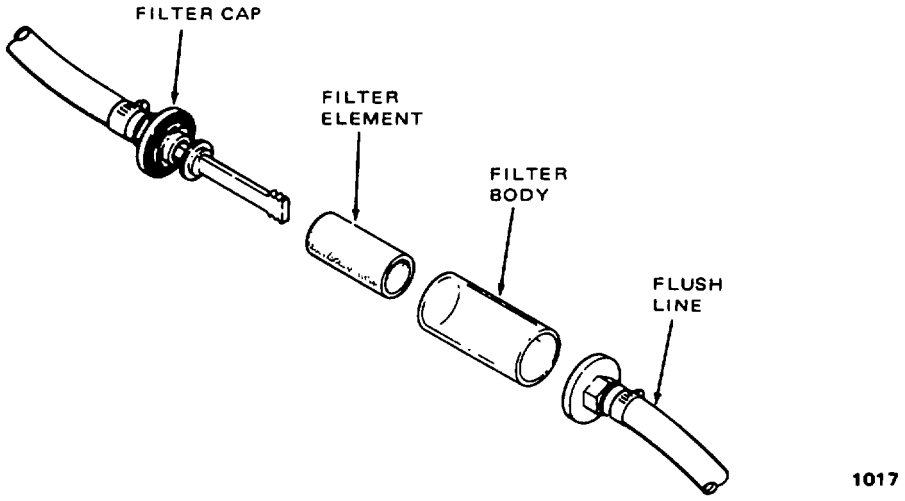


Figure 5-286. Flush Line Filter Assembly

b. Disassemble flush line filter.

(1) Disconnect hose from filter assembly.

(2) Disconnect end cap from filter body.

(3) Remove filter element.

FLUSH TANK ASSEMBLY MAINTENANCE (Continued)

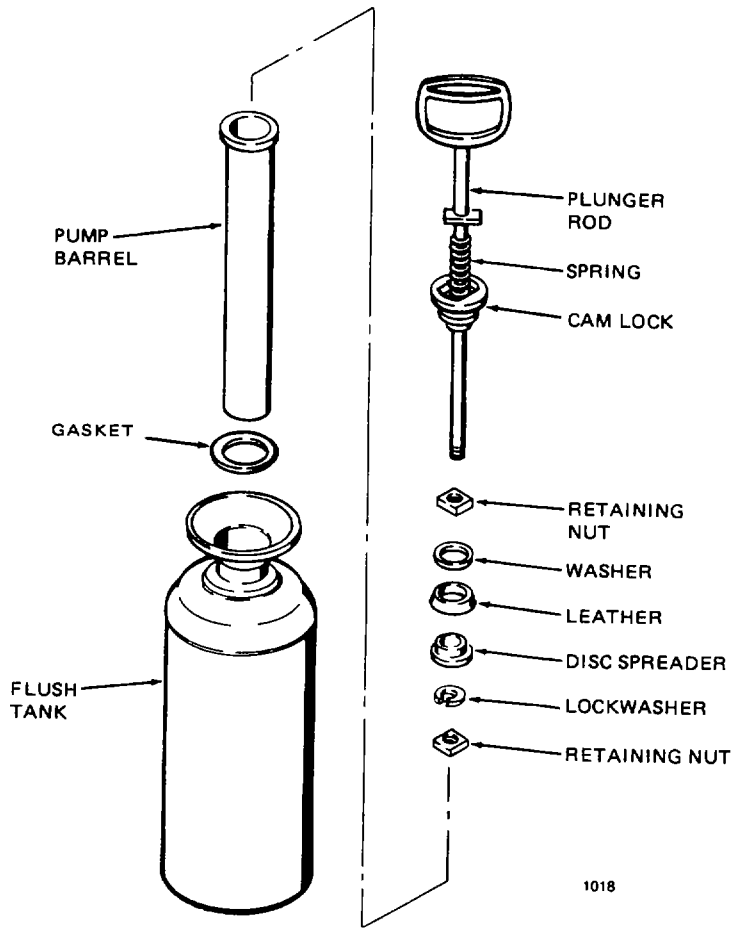


Figure 5-287. Flush Tank Assembly

c. Disassemble flush tank.

(1) Remove pump handle assembly from flush tank.

(2) Remove plunger rod assembly from pump barrel.

(3) Remove retaining nuts, washers, leather, disc spreader, cam lock, and spring from plunger rod.

d. Inspect pump leather. If it is mushy soft replace it. If it is dry and cracked replace it. The leather should be firm and pliable.

e. Assemble flush tank.

(1) Attach cam lock, leather, spring, spreader disc, washers and retaining nuts to plunger rod.

(2) Slide plunger assembly into pump barrel.

(3) Install pump handle assembly in flush tank.

FLUSH TANK ASSEMBLY MAINTENANCE (Continued)

f. Assemble flush line filter.

(1) Insert filter element into filter body.

(2) Attach end cap to filter body.

(3) Connect hoses and clamps to filter assembly.

g. Install flush tank assembly.

(1) Attach mounting bracket to base assembly.

(2) Set flush tank on mounting bracket and tighten retaining strap.

(3) Connect flush line to flush tank and three-way valve.

BATTERY ASSEMBLY MAINTENANCE

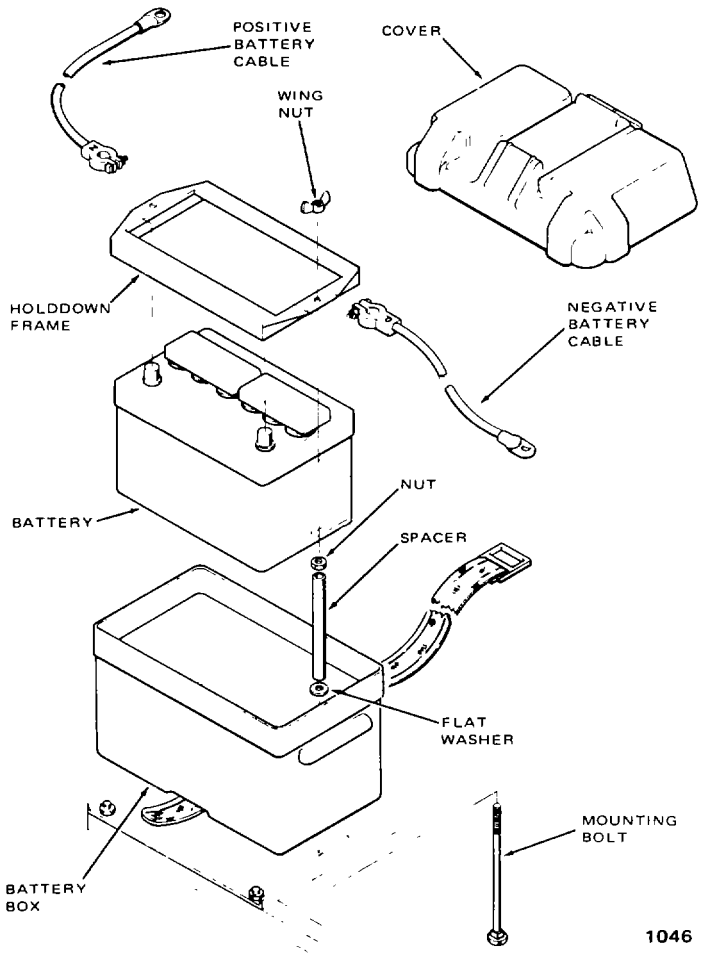


Figure 5-288. Battery Box Assembly

BATTERY ASSEMBLY MAINTENANCE (Continued)

a. Remove and disassemble.

(1) Remove battery box cover.

(2) Disconnect battery cables from battery base assembly and start button.

(3) Remove hold down frame.

(4) Remove battery from battery box.

(5) Remove battery box from base assembly.

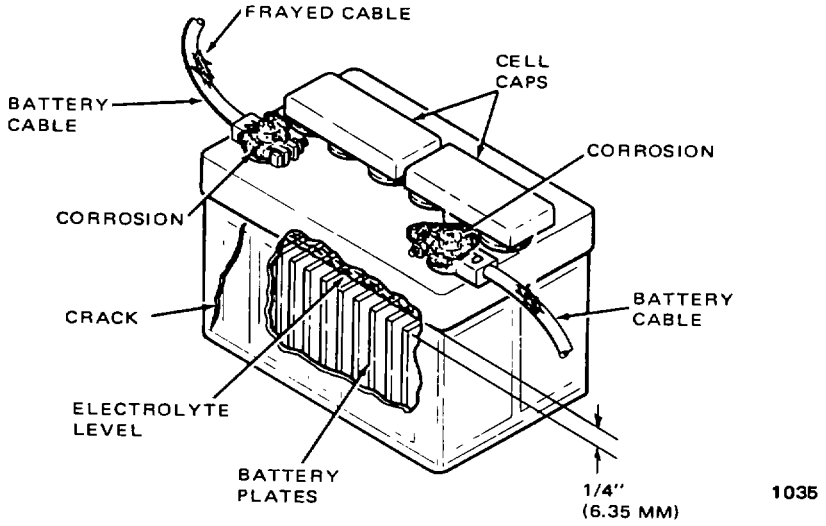


Figure 5-289. Battery Defects

b. Inspect and test battery.

(1) Check the battery visually.

(a) Make sure the battery cables are securely fastened to the battery. They should not twist on the poles.

(b) Make sure the battery cables are securely fastened to the ground connection and start switch.

(c) If there is any corrosion on the battery or around the terminals, rinse it off with a baking soda and water solution.

(d) Clean any dirt or dust from the top of the battery.

(e) If the cable insulation is frayed or cracked, replace the cable.

(f) If there are cracks in the battery body, replace the battery.

BATTERY ASSEMBLY MAINTENANCE (Continued)

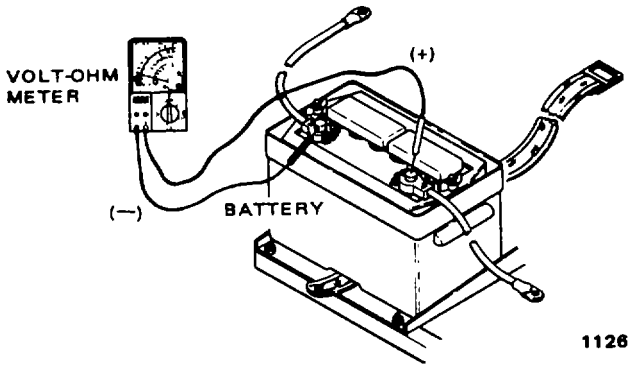


Figure 5-290. Battery Voltage Test

(2) Test the battery with a volt-ohmmeter.

(a) Connect the positive (+) meter lead to the positive (+) battery pole.

(b) Connect the negative (-) meter lead to the negative (-) battery pole and set the meter on volts.

(c) If the meter reads 11.5 to 12 volts the battery is ok.

(d) If the meter reads less than 11.5 volts, check the specific gravity of the electrolyte.

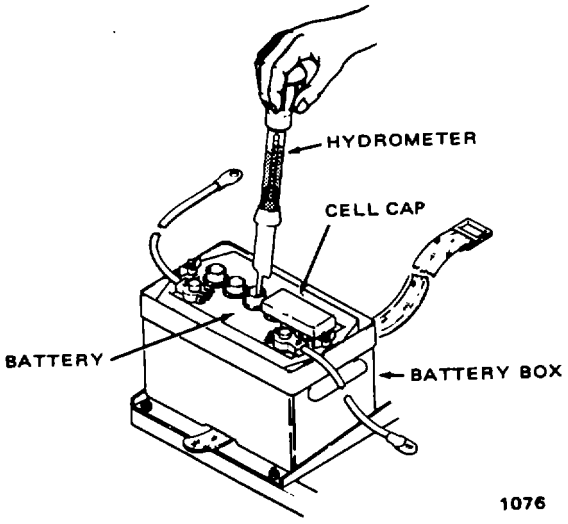


Figure 5-291. Specific Gravity Test

(3) Test the specific gravity of the electrolyte in the battery. Use a hydrometer.

CAUTION

The electrolyte level must be kept above the top of the battery plates.

DO NOT overfill the battery. The electrolyte should not overflow onto the battery when the cell caps are set in the battery.

BATTERY ASSEMBLY MAINTENANCE (Continued)

NOTE

Use distilled water or a good grade drinking water (excluding drinking water).

(a) Remove the cell caps and check the electrolyte level. Add distilled water if necessary.

(b) Check the specific gravity.

(c) If the specific gravity is between 1.250 and 1.280 the battery cell being tested is okay.

(d) If the specific gravity is between 1.225 and 1.250 the cell being tested is still in fair condition.

(e) If the specific gravity is below 1.150 in any one cell, replace the battery.

(f) If the specific gravity in one cell is 0.050 more or less than the other cells and charging does not bring the charge to a 50% charge, replace the battery.

(4) Charge the battery.

(a) If the battery does not hold a charge, replace the battery.

(b) If the battery holds a charge, return the battery to the battery box.

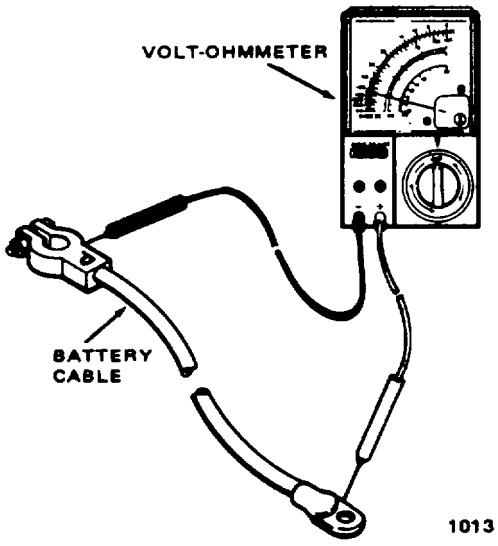


Figure 5-292. Battery Cable Test

(5) Test the continuity of the battery cables. Use a volt-ohmmeter.

(a) Connect a meter lead to each end of the wire being tested.

(b) Wiggle the wire.

(c) If the wire conducts a current, it is ok.

(d) If the wire does not conduct, replace it.

(e) If any of the wires or insulation are frayed, broken or cracked, replace them.

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BATTERY ASSEMBLY MAINTENANCE (Continued)

c. Assemble and install battery assembly.

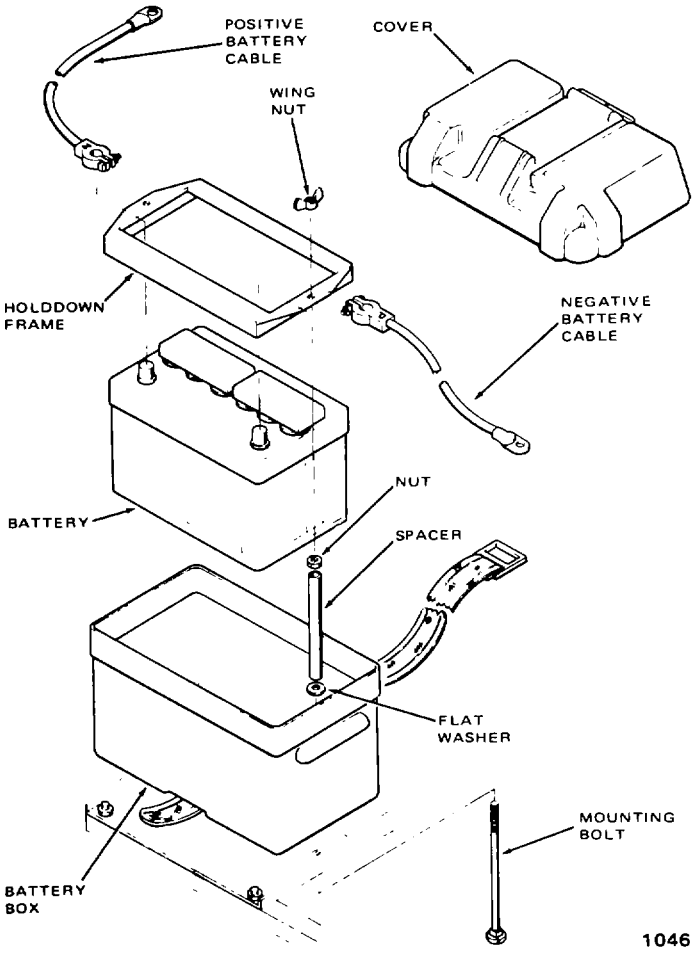

Figure 5-293. Battery Box Assembly

(1) Attach battery box to base assembly.

(2) Place battery in battery box.

(3) Install battery hold down bracket.

(4) Add electrolyte to battery. The electrolyte should be 1/4 of an inch (6.35 mm) above battery plates.

(5) Attach negative (-) battery cable to battery and base assembly.

(6) Attach positive (+) battery cable to battery and start button.

BASE ASSEMBLY MAINTENANCE

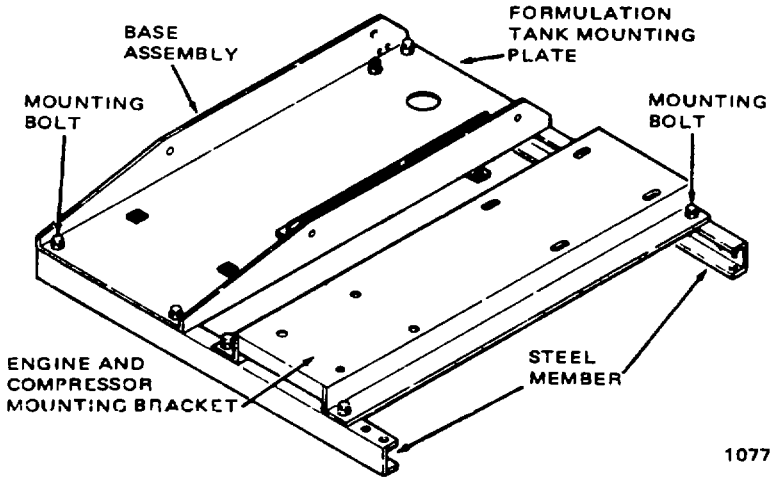

Figure 5-294. Base Assembly

a. Disassemble base assembly.

(1) Remove all attached components according to individual components disassembly procedures.

(2) Separate mounting plates and channel steel members.

b. Assemble base assembly.

(1) Assemble mounting plates and channel steel members according to illustration. Be sure to install the special 1-1/4 x 1-1/4 inch aluminum washers under the heads of the formulation tank mounting plate bolts.

(2) Install attached components according to individual component installation procedures.

Section VI. PREPARATION FOR STORAGE OR SHIPMENT

GENERAL

a. This section contains procedures for storing or shipping the aerosol generator.

b. Procedures dealing with overseas shipment are found in MIL-STD-162H.

c. Procedures dealing with administrative storage are covered in TM 740-90-1.

PREPARATION FOR STORAGE AND SHIPMENT

a. Inspections. Perform preventive maintenance checks and services in Chapter 4, Section III.

b. Repair. Repair or replace all damaged parts necessary.

BODY PREPARATION

a. Cleaning. Thoroughly wash all exterior parts of the aerosol generator. Use dry cleaning solvent P-D-680 to break up grease and oil and liquid detergent, MIL-D-16791E to clean insecticide. Thoroughly flush the formulation tank, the control panel nozzle assembly and fluid hoses. Use liquid detergent MIL-D-16791E. Drain oil from engine crankcase and compressor crankcase. Remove rust and corrosion, and scrape any peeling paint.

b. Painting and Preserving. Dry all surfaces to be painted or coated with preservative. Repaint all surfaces as necessary to protect against rust and corrosion. Refer to TM 43-0139. Cover all exposed metal surfaces with preservative oil MIL-C-8188.

APPENDIX A
REFERENCES

A-1. FIRE PROTECTION SAFETY

TB5-4200-200-10	Hand Portable Fire Extinguisher Approved for Army Users

A-2. LUBRICATION

C9100-IL	Identification List for Fuels, Lubricants, Oils, and Waxes
LO5-3740-214-14	Lubrication Order Operator, Organizational, Direct Support and General Support Maintenance Manual for

A-3. PAINTING

TM43-0139	Painting Instructions for Field Use

A-4. MAINTENANCE

TM9-6140-200-12	Operator, Organizational Maintenance Manual for Storage Batteries - Lead Acid
TM5-3740-214-14HR	Hand Receipt Manual
TM38-750	The Army Maintenance Management System (TAMMS)
TM5-3740-214-24P	Operator, Organizational

A-5. DEMOLITION

TM750-244-3	Destruction of Equipment to Prevent Enemy Use

APPENDIX B
COMPONENTS OF END ITEMS LIST

B-1. SCOPE.

This appendix lists Integral Components of and Basic Issue Items (BII) for the Aerosol Generator to help you inventory items required for safe and efficient operation.

B-2. GENERAL.

The components of end item list are divided into the following sections:

a. Section II. Integral Components of the End Item. These items, when assembled, comprise the Aerosol Generator and must accompany it whenever it is transferred or turned in.

b. Section III. Basic Issue Items. These are minimum essential items required to place the Aerosol Generator in operation, to operate it and to perform emergency repairs. Although shipped. separately packed, they must accompany the Aerosol Generator during operation and whenever it is transferred between accountable officers. The illustrations will assist you with hard-to-identify items. This manual is your authority to requisition replacement BII based on Table(s) of Organization and Equipment (TOE)/Modification Table of Organization and Equipment (MTOE) authorization of the end item.

B-3. EXPLANATION OF COLUMNS.

a. Illustration: This column is divided as follows:

(1) Figure Number. Indicates the figure number of the illustration on which the item is shown (if applicable).
(2) Item Number. The number used to identify item called out in the illustration.

b. National Stock Number (NSN): Indicates the national stock number assigned to the end item which will be used for requisitioning.

c. Part Number (P/N): Indicates the primary number used by the manufacturer which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards and inspection requirements to identify an item or range of items.

d. Description: Indicates the federal item name and, if required, a minimum description to identify the item.

e. Location: The physical location of each item listed is given in this column. The lists are designed to inventory all items in one area of the major item before moving on to an adjacent area.

f. Usable on Code: Not applicable.

g. Quantity Required (Qty Reqd): This column lists the quantity of each item required for a complete major item.

h. Quantity: This column is left blank for use during inventory. Under the received column, list the quantity you actually receive on your major item. The date columns are for use when you inventory the major item at a later date, such as for shipment to another site.

Section II.
INTERGRAL COMPONENTS OF THE END ITEM (Aerosol Generator)

(1) ILLUSTRATION		(2)	(3)	(4)	(5)	(6)	(7)	(8) QUANTITY			
(a) FIGURE NO. DATE	(b) ITEM NO.	NATIONAL STOCK NUMBER	PART NO. AND FSCM	DESCRIPTION	LOCATION	USABLE ON CODE	QTY REQD	REV'D	DATE		DATE
14	1	NA	20091 (56215)	Control Panel Assembly			1				
15	1	NA	1004 (56215) ,	Flowmeter			1				
16				Hose, Lines and Fittings (Wire and Fluid Harness)			1				

Section III.
BASIC ISSUE ITEMS (Aerosol Generator)

(1) ILLUSTRATION		(2)	(3)	(4)	(5)	(6)	(7)	(8) QUANTITY			
(a) FIGURE NO. DATE	(b) ITEM NO.	NATIONAL STOCK NUMBER	PART NO. AND FSCM	DESCRIPTION	LOCATION	USABLE ON CODE	QTY REQD	REV'D	DATE		DATE
		7520-00-559-9618		Case Manual			1				
				DATM5-3740-214-14			1				
		4210-00-555-8837		Extinguisher			1				

APPENDIX C
REPAIR PARTS, SPECIAL TOOLS LIST
TMDE, AND SUPPORT EQUIPMENT

C-1. For common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

C-2. No special tools are required to perform maintenance functions on the Aerosol Generator.

C-3. Repair parts are listed and illustrated in the Repair Parts and Special Tools List (TM-3740-214-24P) covering organizational maintenance for this equipment.

APPENDIX D
EXPENDABLE SUPPLIES AND MATERIALS LIST

D-1. SCOPE.

This appendix lists expendable supplies and materials you will need to operate and maintain the Aerosol Generator. These items are authorized to you by CTA50-970, Expendable Items (except Medical, Class V, Repair Parts, and Heraldic Items).

D-2. EXPLANATION OF COLUMNS.

a. Column 1 Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use cleaning compound, Item 5, App. D").

b. Column 2 - Level. This column identifies the lowest level of maintenance that requires the listed item.

(enter as applicable):

C - Operator/Crew	F - Direct Support Maintenance
O - Organizational Maintenance	H - General Support Maintenance

c. Column 3 National Stock Number. This is the National stock number assigned to the item; use it to request or requisition the item.

d. Column 4 Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the part number followed by the Federal Supply Code for Manufacturer (FSCM) in parenthesis, if applicable.

e. Column 5 Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e. g. , ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

EXPENDABLE SUPPLIES AND MATERIALS LIST FOR AEROSOL GENERATOR

ITEM NUMBER	LEVEL	NATIONAL STOCK NUMBER	DESCRIPTION	U/M
1	O, C	9150-00-265-9435	Oil, Eng OE 30	GL
2	O, C	9150-00-402-2372	Oil, Eng Sub Zero OES APG PD-1 OEA	GL
3	O, C	9150-01-052-7562	Oil, Reciprocating Compressor, Synthetic	GL
4	O, C	9130-00-160-1837	Gasoline, Automotive	
5	O, C		Filter, Outer Element (01605) 52128	EA
6	O, C		Filter, Inner Element (01605) 52129	EA
7	O, C		Element, Air Cleaner (52845) 231847	EA
8	O, C		Filter, Flush line (28566) VA-6	EA
9	O, C		Fuse SFE 20	BX
10	O, C		Filter, Separator 1002.1	EA
11	O, C		Gasket, Teflon 1013	

APPENDIX E
MAINTENANCE ALLOCATION CHART

E-1. GENERAL.

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels.

b. The Maintenance Allocation Chart (MAC) in paragraph E-3 designates overall responsibility for the performance of maintenance functions on the identified end item or component. The implementation of the maintenance functions upon the end item or component will be consistent with the assigned maintenance functions.

c. Paragraph E-4 lists tools and test equipment required for a particular maintenance function as referenced from paragraph E-3.

d. Paragraph E-5 contains supplemental instructions and explanatory notes for a particular maintenance function as referenced from paragraph E-3.

E-2. MAINTENANCE FUNCTIONS

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical and/or electrical characteristics with established standards through examination.

b. Test. To verify serviceability and detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

d. Adjust. To maintain, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

e. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test, measuring, and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. Install. The act of emplacing, seating, or fixing into position an item, part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. Replace. The act of substituting a serviceable like part, subassembly, or module (component or assembly) for an unserviceable counterpart.

i. Repair. The application of maintenance services or other maintenance actions to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

j. Overhaul. That maintenance effort (services/actions) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (i. e. , DMWR) in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc.) considered in classifying Army equipment/components.

E-3. EXPLANATION OF COLUMNS IN THE MAC.

a. Column 1, Group Number. Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies, and modules with the next higher assembly.

b. Column 2, Component/Assembly. Column 2 contains the names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Functions. Column 3 lists the functions to be performed on the item listed in Column 2. (For detailed explanation of these functions, see paragraph E-2.)

d. Column 4, Maintenance Level. Column 4 specifies, by the listing of a "work time" figure in the appropriate subcolumn(s), the lowest level of maintenance authorized to perform the function listed in Column 3. This figure represents the active time required to perform the maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance levels, "work time" figures will be shown for each level. The number of man-hours specified by the "work time" figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenance levels are as follows:

C..... Operator or crew.
O..... Organization maintenance.
F.....Direct support maintenance.
H ..... General support maintenance.

e. Column 5, Tools and Equipment. Column 5 specifies, by code, those individual tools required to perform the designated function. (Paragraph E-4.)

f. Column 6, Remarks. This column shall, when applicable, contain a letter code, in alphabetical order, which shall be keyed to the remarks contained in paragraph E-5.

E-4. EXPLANATION OF COLUMNS IN TOOL AND TEST EQUIPMENT REQUIREMENTS.

a. Column 1, Reference Code. The tool and TMDE reference code correlates with a code used in the MAC, paragraph E-3, Column 5.

b. Column 2, Maintenance Level. The lowest level of maintenance authorized to use the tool or test equipment.

c. Column 3, Nomenclature. Name or identification of the tool or test equipment.

d. Column 4, National Stock Number. The National stock number of the tool or TMDE.

e. Column 5, Tool Number. The manufacturer's part number.

E-5. EXPLANATION OF COLUMNS IN REMARKS.

a. Reference Code. The code recorded in Column 6, paragraph E-3.

b. Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC, paragraph E-3.

MAINTENANCE ALLOCATION CHART

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) C	O	F	H	(5) TOOLS AND EQUIPMENT	(6) REMARKS
01	Engine Assy	Inspect	.1					
		Service		.2				
		Test			.2			
		Repair			.5			
		Replace			1.3			
02	Governor	Inspect			.1			
		Test			.3			
		Repair			.5			
		Replace			.5			
03	Electrical Parts Group	Inspect	.1					
		Test			.3			
		Repair			.7			
		Replace			.7			
04	Starter	Inspect	.1					
		Test			.3			
		Repair			.1			
		Replace			.5			
05	Tank Assembly (Gasoline)	Inspect	1.0					
		Test			1.0			
		Replace			.3			
06	Muffler Assy	Inspect	.1					
		Replace		.3				
07	Air Filter Assy	Inspect	.1					
		Replace		.1				
08	Carburetor Assy	Inspect	.1					
		Adjust		.1				
		Repair			.5			
		Replace		.3				
09	Belts	Inspect	.1					
		Adjust		.5				
		Replace		.6				

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) C	O	F	H	(5) TOOLS AND EQUIPMENT	(6) REMARKS
10	Air Pump (Compressor)	Inspect	.1					
		Service		.5				
		Repair			.7			
		Replace			1.0			
11	Filter/Nozzle Assy (On Compressor)	Inspect	.2					
		Repair		.3				
		Replace		.3				
12	Control Panel Assy	Inspect	.1					
		Replace		.2				
		Repair			.7			
13	Flowmeter	Inspect	.1					
		Repair			1.0			
		Align			.2			
		Replace			.3			
14	Hoses, Lines and Fittings	Inspect	.5					
		Repair		1.3				
		Replace		1.3				
15	Tank Assembly (Insecticide)	Inspect	.2					
		Replace			1.5			
16	Tank Assembly (Flush)	Inspect	.1					
		Repair			.2			
		Replace		.1				
17	Battery Assembly	Inspect	.1					
		Test			.2			
		Service	.1					
		Replace		.2				
18	Base Assembly	Inspect	.1					

APPENDIX F
ADDITIONAL AUTHORIZATION LIST

(Not applicable.)

APPENDIX G
TORQUE LIMITS

Torque values are given in inch pounds (in-lbs) foot pounds (ft-lbs) and kilogram meters (kgM).

	Inch pounds	Foot pounds	Kilogram Meters
Engine			
Spark plug		18-22	2.43-2.97
Cylinder Head		15-20	2.03-2.70
Connecting Rod	200		2.25
Flywheel Nut		50-60	6.75-8.10
Compressor			
Cylinder Head	400		4.61
Pulsation Tank	400		4.61

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T

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T (Continued)

V

W

By Order of the Secretary of the Army:

E. C. MEYER
General, United States Army
Chief of Staff

Official:

ROBERT M. JOYCE
Brigadier General, United States Army
The Adjutant General

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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 = 3.2808.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 dekagram = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 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

Cubic Measure

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

Square measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. in.
1 sq. decimeter = 100 sq. centimeters = 15.5 inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 feet
1 sq. dekameter (are) = 100 sq. meters = 1.076.4 sq. ft.
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 hectometers = .386 sq. miles

Liquid Measure

1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons
1 liter = 10 deciliters = 33.81 fl. ounces
1 centiliter = 10 milliliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3 38 fl. ounces
1 metric ton = 10 quintals = 1.1 short tons

Approximate Conversion Factors

To change	To	Multiply by
inches	centimeters	2.540
feet	meters	.305
yards	meters	.914
miles	kilometers	1.609
sq. inches	sq. centimeters	6.451
sq. feet	sq. meters	.093
sq. yards	sq. meters	.836
sq. miles	sq. kilometers	2.590
acres	sq. hectometers	.405
cubic feet	cubic meters	.028
cubic yards	cubic meters	.765
fluid ounces	milliliters	29.573
pints	liters	.472
quarts	liters	.946
gallons	liters	3.785
ounces	grams	28.349
pounds	kilograms	.454
short tons	metric tons	.907
pound inches	newton-meters	.11296

To change	To	Multiply by
ounce inches	newton-meters	.0070062
centimeters	inches	.394
meters	feet	3.280
meters	yards	1.094
kilometers	miles	.621
sq. centimeters	sq. inches	.155
sq. meters	sq. yards	10.764
sq. kilometers	sq. miles	1.196
sq. hectometers	acres	2.471
cubic meters	cubic feet	35.315
milliliters	fluid ounces	.034
liters	pints	2.113
liters	quarts	1.057
grams	ounces	.035
kilograms	pounds	2.205
metric tons	short tons	1.102
pound-feet	newton-meters	1.356

Temperature (Exact)

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