TECHNICAL MANUAL

OPERATOR'S, ORGANIZATIONAL AND DIRECT SUPPORT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)

TRUCK, FIRE FIGHTING, 4x4,

MODEL 1350 PKP/200 AFFF

NSN 4210-00-484-5729

ANSUL FIRE PROTECTION

HEADQUARTERS, DEPARTMENT OF THE ARMY

8 JANUARY 1987

TECHNICAL MANUAL

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ANSUL FIRE PROTECTION

MARINETTE, WI 54143

CONTRACT DAAK01-78-C-1667

SERIAL NO.	IDENTIFICATION NO.	REGISTRATION NO.
001	AR185JHA31567	CH9906
002	AR185KHA17091	CH9907
003	AR185KHA17162	CH9908
004	AR185KHA18569	CH9909
005	AR185KHA18637	CH9910

Part No. S-63086

ANSUL ANSUL FIRE PROTECTION
MARINETTE, WI 54143

CONTENTS

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistake or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommend Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, U.S. Army Troop Support Command, ATTN: AMSTR-MCTS, 4300 Goodfellow Boulevard, St. Louis, MO 63120-1798. A reply will be furnished directly to you.

REPORTING EQUIPMENT IMPROVEMENTS (EIR's)

If the Fire Fighting Truck needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you do not like about your equipment. Let us know why you do not like the design or performance. Put it on an SF 368 (Quality Deficiency Report). Mail it to us at: U.S. Army Troop Support Command, ATTN: AMSTR-QX, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798. We will send you a reply.

SECTION 1 INTRODUCTION

MANUAL SCOPE

This manual is intended for use with the Ansul Twin-Agent Fire Fighting Truck. Those who operate, recharge, inspect, or maintain this fire suppressing/securing vehicle should read this entire manual. Specific sections will be of particular interest depending upon one's responsibilities.

The purpose of this manual is to familiarize personnel with the operation and maintenance of the twin-agent fire fighting truck. The operator of the fire fighting truck is responsible for all minor maintenance and adjustments necessary to keep the fire suppressing/securing systems and emergency vehicle equipment in ready condition. Higher maintenance is responsible for the major maintenance, service, and repair as necessary to bring the vehicle back into the operating condition.

The information contained in this manual is limited to the fire suppressing/securing system, serial numbers 001 thru 005 and emergency equipment mounted on the International Truck Model 1854-4x4. This manual contains the necessary information needed to prepare for use, operate, recharge, inspect, maintain, service, and repair the fire suppressing/securing system.

The contractor warrants for a period of one year all supplies furnished under Contract DAAK01-78-C-1667 to be free from defects of design, material, and workmanship; and conforms with specifications and all other requirements of this contract.

Applicable publications include:

Federal Sign and Signal Corporation: Siracom II Siren/Control System-Model PA2100 with FN 900 Microphone and TS-100 Speaker designed to be installed in the Model 24 Light Bar Assembly.

> Publications include: Dome Assembly Installation Instructions-No. 256A358; FN 900 Adaptor for PA override operation Installation Instructions-No. 256A99B; Model PA 2100 Installation and Service Instructions-No. 255A150G; Service and Parts Index-No. 256A359.

Unity Manufacturing Company: Model AG 6-inch rear decklight; No. 225 spotlight (right and left).

> Publications include: Parts Sheet-No. 105-6.

H.K. Porter Incorporated: Model PK4 Hydraulic Rescue Kit (10 ton capacity).

> Publications include: Instruction Book-No. 10119; Instruction Envelope-No. ISM 200; Instruction Sheet-No. 1PF10; and Service Station Listing-No. 10120.

Hurst Performance Incorporated: Model 3620025 Rescue Tool.

> Publications include: Instruction Manual-No. 159 0082.

INTRODUCTION

Sierra Company: Model CRK5 Sierra Rescue Crash Tool Kit.

Publications: None, contents listed in vendor's publication section.

International Harvester Company-Truck Division: Model 1854 Truck (4x4).

Publications include: Service Manual (3 volumes)-No. CTS-231 1; Parts Catalog - No. MT-140.

Paratech Incorporated, Formerly Partner Industries: Model K-1200 Rescue Saw.

Publications included: Instruction Book-No. 701042; Parts List-No. 711142.

SYSTEM DESCRIPTION

The Ansul Twin-Agent Fire Fighting Truck is designed for combating fire via roof-mounted turrets or rear-mounted hand-lines which can be used together or independently.

The truck is the basic International Model 1854, 4x4 chassis with a service body attached, and an Ansul 1350 PKP/200 AFFF fire suppressing/securing system mounted on the truck bed.

The fire fighting truck also includes: a roof-mounted warning light bar with built-in speakers controlled by an indicator switch; an electric siren, public address, and radio amplifier system with foot control switch; two rear-mounted decklights; two forward-mounted spotlights; and rescue equipment package.

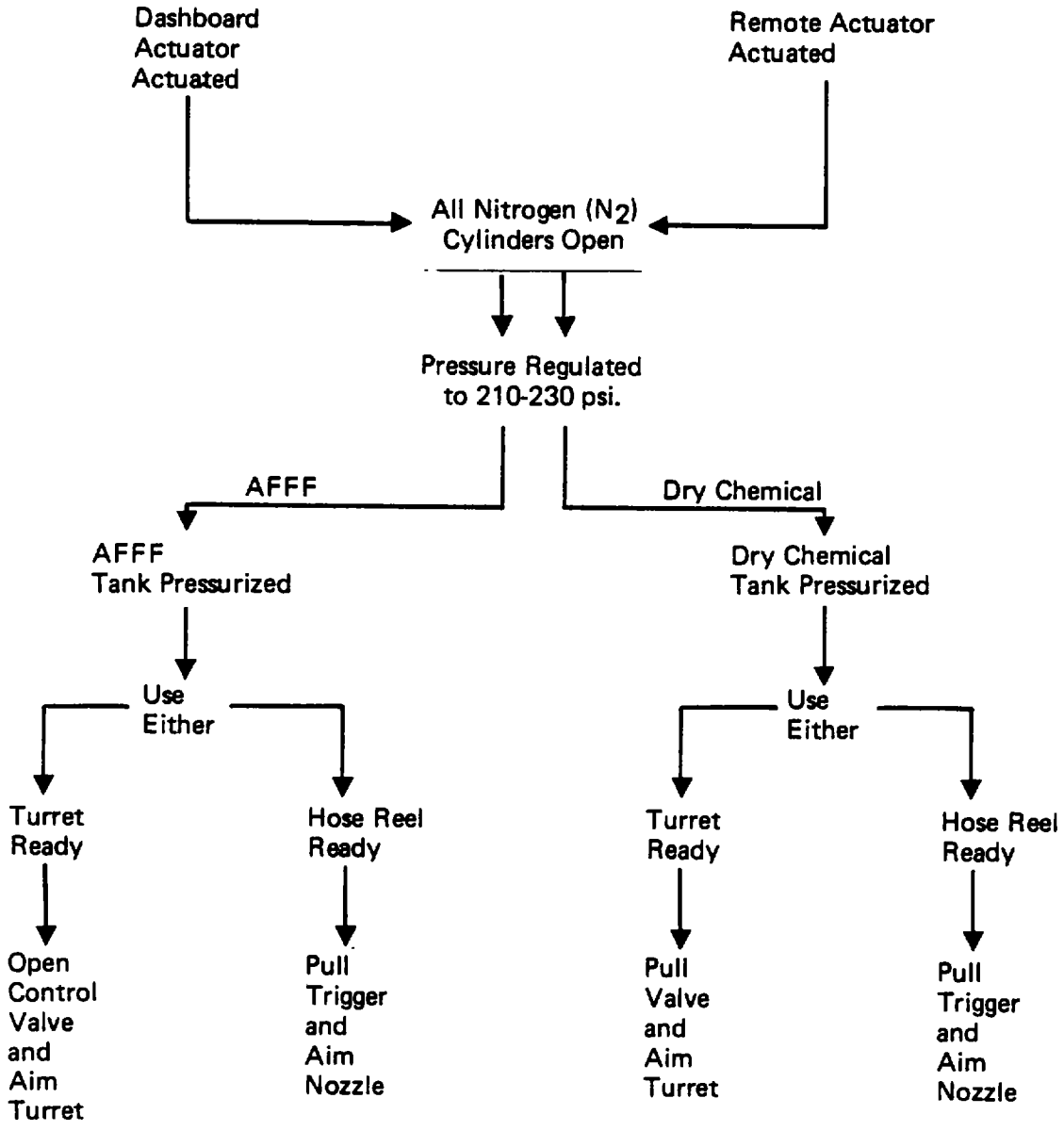
The truck is a completely self-contained fire fighting vehicle. The dry chemical fire suppression system uses 'Purple-K' as the fire extinguishing agent and nitrogen and the expellant gas. The AFFF system uses AFFF (aqueous film-forming foam) as the extinguishing agent and nitrogen as the expellant gas. Both systems can be actuated simultaneously by using either the remote actuator (located at the hose reel) or the dashboard actuator (located in the truck cab). The twin-nozzles and twin-turrets can be used either independently or simultaneously.

The dry chemical system can be used on Class B and Class C fires only. It provides rapid knockdown of Class A fires, but must be used in combination with the AFFF agent.

The AFFF (aqueous film-forming foam) system is designed for use on Class A and B fires only. It must not be used on Class C fires which involve energized electrical equipment.

CAUTION: The AFFF solution is a mixture of Ansulite AFFF Concentrate and water. It will freeze at 32°F.

The following chart illustrates the sequence of operating events and the options available with this system:



INTRODUCTION

TRUCK EQUIPMENT AND ACCESSORIES

Warning Light: The light bar is mounted on the roof of the cab and includes a built-in public address speaker. The light can be operated by means of a separate switch on the dashboard instrument panel. The switch contains a red indicator light which is activated when the warning light is in use.

Electronic Siren, Public Address, and Radio Amplifier System: The system contains selector controls for siren, public address, or radio amplification through an external speaker mounted in the warning light bar assembly. The amplifier, its controls, and the microphone are mounted in the cab in a location accessible to the driver or passenger. The siren can be operated 'by either the floor-mounted switch or the standard horn actuator.

Spotlights: Two decklights are mounted at the rear of the truck on top of the service body. Two spotlights are mounted on the side of the truck cab, The rear lights are operated by a switch located at the bottom of each light. The cab-mounted lights can be operated from switch/handle assemblies inside the truck cab.

Rescue Equipment: A hydraulic rescue kit, aircraft rescue crash tool kit, and rescue saw are located in the service body compartments for easy access during rescue operations To use, follow manufacturer's instructions provided with equipment.

FIRE SUPPRESSING/SECURING SYSTEM

Dry Chemical Fire Suppression System: The dry chemical system can be used on Class B and Class C fires and is very effective for exterior running and flowing Class B fires. It provides rapid knockdown of Class A fires, but must be used in combination with the AFFF agent to avoid fire reignition. The dry chemical system is mounted on the center of the truck bed behind the AFFF system.

The components of the dry chemical system include: a 1350 lb. dry chemical tank with control valves and associated piping, three 400 cu. ft. nitrogen cylinders with pressure regulators, a twin-agent hose reel serving both the dry chemical and AFFF system, a dry chemical discharge nozzle, and a dry chemical turret with pneumatic control valve.

AFFF Fire Suppressing/Securing System: The AFFF (aqueous film-forming foam) system is designed for use on Class A and B fires only. It must not be used on Class C fires which involve energized electrical equipment.

CAUTION: The AFFF solution is a mixture of Ansulite AFFF Concentrate and water. It will freeze at 32°F.

The AFFF system is mounted behind the truck cab in front of the dry chemical system.

The components of the AFFF system include: a 200 gal. solution tank with control valves and associated piping, two 400 cu. ft. nitrogen cylinders with pressure regulators, a twin-agent hose reel serving both the dry chemical and AFFF system, a AFFF discharge nozzle, and an AFFF turret with pneumatic control valve.

Nitrogen System: Five nitrogen cylinders provide the expellant gas for both the dry chemical and AFFF systems. Each cylinder contains a Quick-Opening valve with a pneumatic valve actuator for either local actuation (by pulling the Quick-Opening Lever), or remote actuation (from the dashboard or the hose reel). The cylinder valve also contains a gauge for accurate pressure readings. When the cylinders are opened, the compressed nitrogen flows from the cylinder through high pressure hose into the regulators where the pressure is reduced to 210 to 230 psi and then flows through low pressure hose into the agent tanks. This pressure forces the-extinguishing agents through the discharge piping to both the handline nozzles and turrets. The agent flow is then controlled by the operator by opening the nozzles or turrets. Part of the nitrogen also runs through separate lines and is regulated to 125 psi to enable turret control valve operation. A safety relief valve is located on the regulators and on each extinguishing agent tank to vent excess pressure in the event of regulator malfunction.

Control Valves: The flow of nitrogen and extinguishing agent through each system is regulated by control valves. Each valve is color-coded to correspond to instructions given on the system nameplates and manual.

Hose Reel and Hoses: A rotating drum-type hose reel is mounted on a frame behind the dry chemical tank at the rear of the vehicle. The twin-agent nozzle is secured on a holder through the tie-bar, and a ring pin holds the assembly in place when not in use. A hand crank is provided for rewinding the hose after operation should the electric motor malfunction. The hose reel holds 100 ft. of twin-agent hose (two 1 in. hoses combined, one for dry chemical, one for AFFF). Piping from the agent tanks is connected to both sides of the hose reel supplying one hose reel with both dry chemical and AFFF through the twin nozzles. The operator can use either or both of the agents to fight a fire. Both the dry chemical and AFFF nozzles are mounted on single bar to enable the operator to move easily without getting tangled in the hose.

Twin Turrets: Each turret can be controlled from the cab by means of a pneumatic control valve with open-close positions. The turrets can be maneuvered either vertically or horizontally by using the turret handles located in the ceiling of the cab adjacent to the control valve.

Remote and Dashboard Actuators: The Quick-Opening cylinder valves can be opened either at the cylinders or from a remote location. Actuation from a remote location is accomplished by using either the dashboard actuator located in the truck cab, or by a remote actuator located on the hose reel frame. The dashboard actuator allows the operator to open the nitrogen cylinder valve without having to leave the cab. The remote actuator allows the operator to open the nitrogen cylinders from the hose reel area. The actuators are operated simply by pulling the ring pin and pushing a lever (remote actuator) or button (dashboard actuator). The expellant gas from a small nitrogen cartridge flows through 1/4 inch tubing to the pneumatic valve actuators which open all five of the nitrogen cylinders.

Extinguishing Agents: This system combines the effects of two agents 'Purple-K' dry chemical and ANSULITE AFFF (aqueous film-forming foam) to suppress and secure a fire. The dry chemical provides rapid knockdown of flames to gain initial control over the fire. The AFFF creates a film-forming foam to prevent fire reflash. As the foam-supported film spreads over the fire, it prevents the escape of flammable vapors, excludes oxygen from the fuel surface, and helps cool the hazard area.

INTRODUCTION

TABLE OF SPECIFICATIONS

1. Vehicle	
Type	Truck, Twin-Agent Fire Fighting, 24,200 GVW, Model 1854 4x4 Diesel Driven, Commercial
General Dimensions	
Length (Overall)	243.0 In.
Width (Overall)	94.0 In.
Height (Maximum)	127.0 In.
Wheelbase	162.0 In.
Gross Vehicle Weight (Rated)	24,200 Lb.
Gross Vehicle Weight (Actual)	20,200 Lb.
Chassis Manufacturer	International Harvester Company (Truck Division)
Model	1854
Type	4x4 Chassis and Cab, Diesel Driven, Commercial
2 1350 PKP/200 AFFF Suppressing/Securing System	Ansul Fire Protection, Wormald U.S., Inc.
Dry Chemical System	
Model	1350 PKP
Type Agent	Ansul PKP (Purple "K") (Mil.-F-22287)
Expellant	Nitrogen
Capacity (Nitrogen Cylinder)	400 Cu. Ft.
Pressure Charged (Nitrogen Cylinder)	2640 PSI at 70°F
Tank Capacity	1350 Lb. (PKP)
Operating Pressure	210-230 PSI
AFFF System	
Model	200 AFFF
Type Agent	Ansul AFFF 6 Per Cent Concentrate (Mil.-F-24385C)
Expellant	Nitrogen
Capacity (Nitrogen Cylinder)	400 Cu. Ft.
Pressure Charged (Nitrogen Cylinder)	2640 PSI at 70°F
Tank Capacity	200 Gal.
Operating Pressure	210-230 PSI

TABLE OF SPECIFICATIONS (CONT)

3. Hose Reel

Manufacturer	Aero-Motive Mfg. Company
Model	EAD 29-14-19 With Electric Rewind
Dimensions	
Height	31.75 In.
Width	31.75 In.
Length	29.00 In.
Twin-Agent Hose	
Hose Diameter Dry Chemical (Inside)	1.0 In.
Hose Diameter AFFF Agent (Inside)	1.0 In.
Hose Length	100 Ft.

4. Dry Chemical Nozzle

Manufacturer	Ansul Fire Protection, Wormald U.S., Inc.
Part No.	S-27762
Hose Connection	1-1/2" Male NPTF x 1-1/2" Female NPSM Swivel Union
Rate	7.8 Lbs./Sec.
Effective Range	77.0 Ft.

5. AFFF Nozzle

Manufacturer	Elkhart Brass Manufacturing Corporation
Part No.	25501
Hose Connection	1-1/2" Male NPTF x 1-1/2" Female NPSM Swivel Union
Rate	58.3 GPM
Effective Range	60.0 Ft.

6. Dry Chemical Turret

Manufacturer	Ansul Fire Protection, Wormald U.S., Inc.
Part No.	14035
Hose Connection	2" Male NPTF x 2" Female NPSM Swivel Union
Rate	18.1 Lbs/Sec.
Effective Range	11 5 Ft.
Pattern Width	17 Ft.

TABLE OF SPECIFICATIONS (CONT)

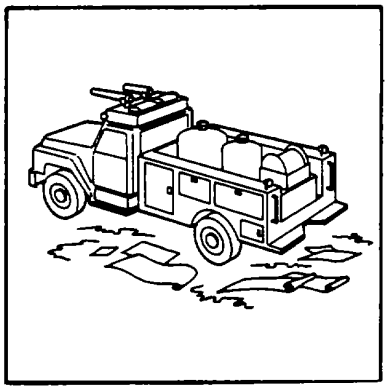
7. AFFF Agent Turret	
Manufacturer	Ansul Fire Protection, Wormald U.S., Inc.
Part No.	19444
Hose Connection	2" Male NPTF x 25' Female NPSM Swivel Union
Rate 167 GPM	
Effective Range	105 Ft.
Pattern Width	15 Ft.
8. Siren/PA Control System	
Manufacturer	Federal Sign and Signal Corporation
Model	PA-2100 With Microphone (FN-900) Speaker (TS-100) and ASI Switch
9. Warning Light	
Manufacturer	Federal Sign and Signal Corporation
Model	Aero-Dynic 24A
10. Rear Decklights	
Manufacturer	Unity Manufacturing Company
Model	AG-6
11. Front Spotlight	
Manufacturer	Unity Manufacturing Company
Model	225
12. Rescue Saw	
Manufacturer	Paratech Incorporated
Model	K-1200
13. Hydraulic Rescue Kit	
Manufacturer	H.K. Porter Inc.
Model	PK4
Capacity	10 Ton

TABLE OF SPECIFICATIONS (CONT)

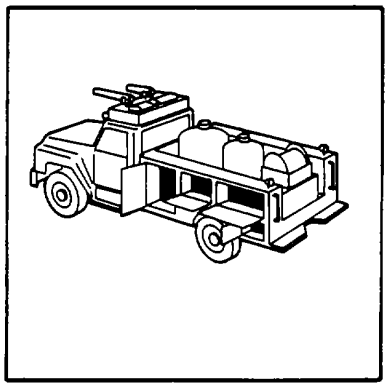
14. Crash Rescue Kit	
Manufacturer	Sierra Company
Model	CRK5 SIERRA Crash Rescue Kit
15. Rescue Tool	
Manufacturer	Hurst Performance Inc. (Safety Products Division)
Model	3620025 (Gasoline Engine, Hydraulic Powered)
16. Floor Mounted Switch	
Manufacturer	C.E. Niehoff Company
Part No.	DR-139

To prepare the Ansul suppressing/securing system for placement in service:

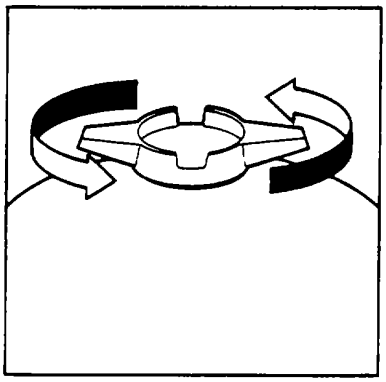
1. Remove all cord, wrapping and banding ties from system and component parts (except on hose reels).



2. Examine entire system and component parts for concealed shipping damage.



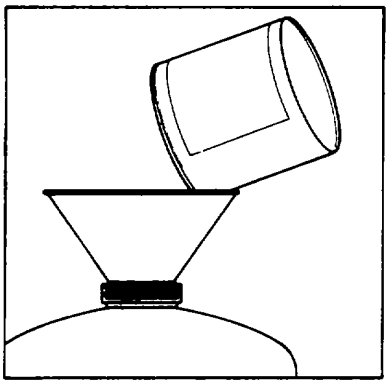
3. Remove fill cap from dry chemical tank and place funnel in opening.

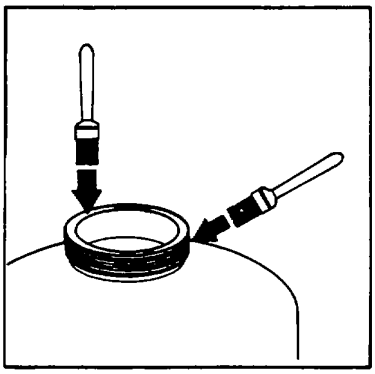


4. Fill tank to rated capacity with Ansul dry chemical specified on nameplates) only.

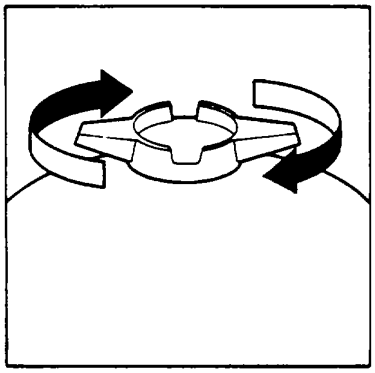
   NOTE: Certain dry chemical systems are filled before shipment.

   NOTE: Do not overfill.

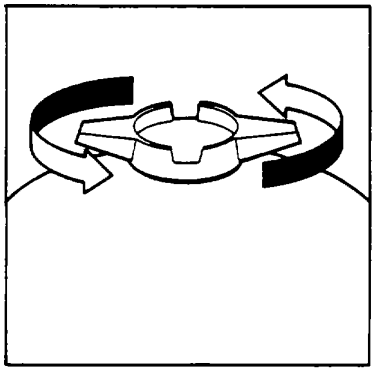




5. Clean fill opening threads and gasket seating surface.

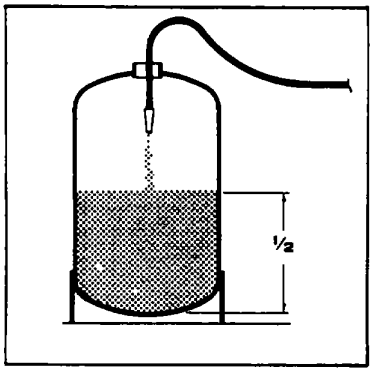


6. Secure fill cap, hand tighten.



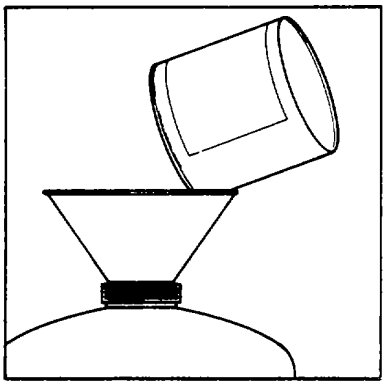
7. Remove fill cap from AFFF solution tank.

8. Fill tank one-half full with fresh tap water.



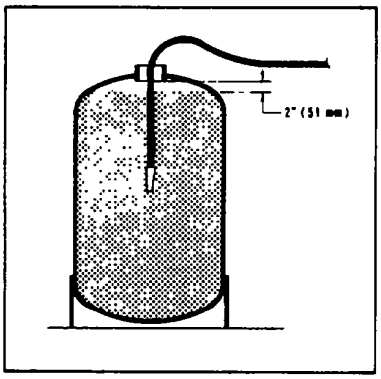
NOTE: Ansul recommends that the quality of the tap water is to be examined each time the system is charged as described on Page 1 of the Field Inspection Manual, Ansul Part No. 31274, in the back of this manual. The quality of water should be noted on the Field Inspection Record, Form No. F-7880.

9. Place funnel in fill opening and pour 13.7 gallons (51.9 l) of ANSULITE AFFF (Aqueous Film-Forming Foam) 6% Concentrate into tank.

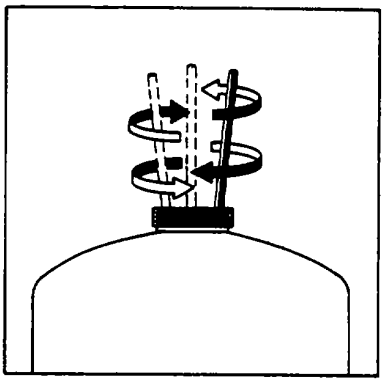


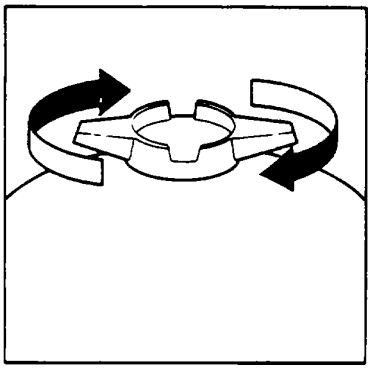
NOTE: Prior to adding the concentrate to the tank, its refractive index should be measured and recorded on the Field Inspection Record, Ansul Form No. F-7880, along with a refractive index vs. concentration curve. The procedures for these operations are covered on Page 1 of the Field Inspection Manual, Ansul Part No. 31274, at the back of this manual. It is also a good idea to record the batch number(s) from the Ansul AFFF pails on the Field Inspection Record, Ansul Form No. F-7880 (Appendix A2), for future use.

10. Submerge hose and fill remainder of tank with water to within 2 inches (51 mm) from bottom of the fill opening, reducing rate of water flow as tank becomes full.

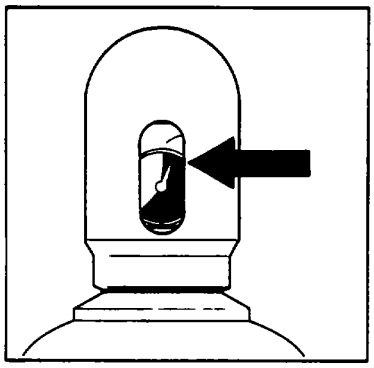


11. Stir solution for 30 seconds-use a non-metallic rod, then clean fill opening threads and gasket seating surface.

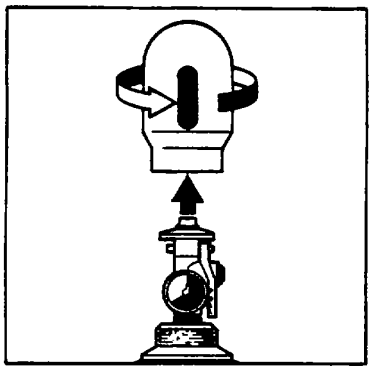




12. Secure fill cap, hand tighten.

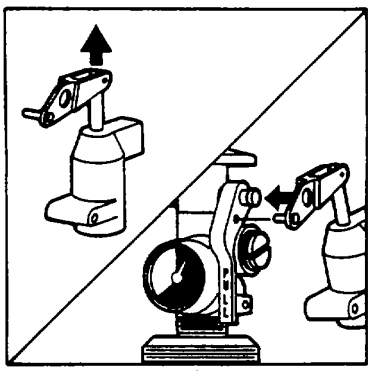


13. Read cylinder gauge(s)-pointer should be in BLACK operating range.



14. Remove safety shipping cap(s) from cylinder(s)-retain cap(s) for future use.

    WARNING: MAKE CERTAIN SAFETY PLUG IS IN PLACE IN CYLINDER VALVE OUTLET BEFORE COMPLETING THE FOLLOWING STEPS.

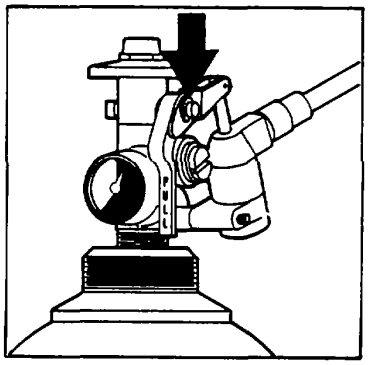


15. Install pneumatic valve actuator(s) ...

    a. Extend pneumatic valve actuator rod fully and slide actuator arm on cross shaft, engaging pin in hole on Quick Opening lever.

       NOTE: Refer to Appendix A4 for additional details.

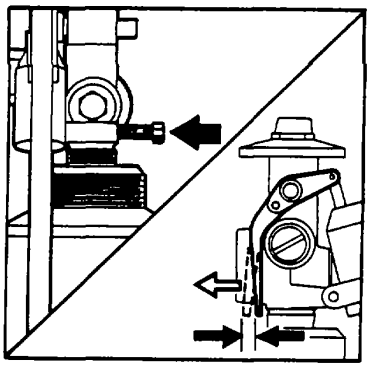
b. Insert crescent ring into groove on cross shaft.



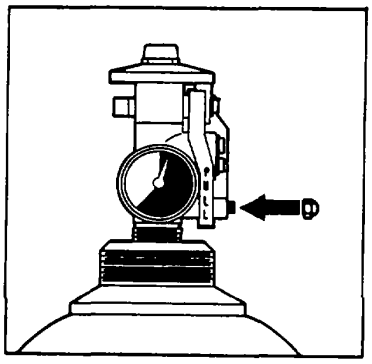
c. Insert anchor stud through valve body and actuator pivot member.

CAUTION: The Quick-Opening lever may be moved slightly forward approximately 1/4 inch (6.4 mm) to permit installation of the anchor stud.

WARNING: FORWARD MOVEMENT IN EXCESS OF 1/4 INCH (6.4 mm) MAY RESULT IN ACTUATION OF THE VALVE.

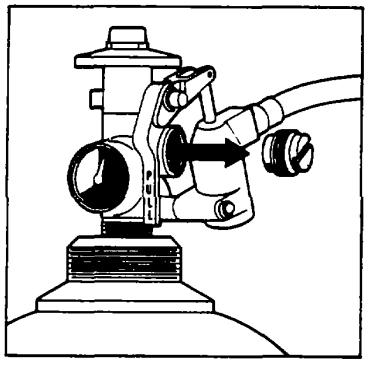


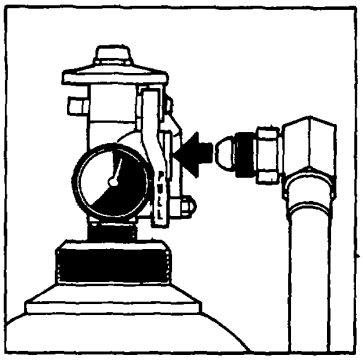
d. Engage and secure cap nut to anchor stud.



16. Remove safety plug from cylinder valve(s)-retain plug(s) for future use.

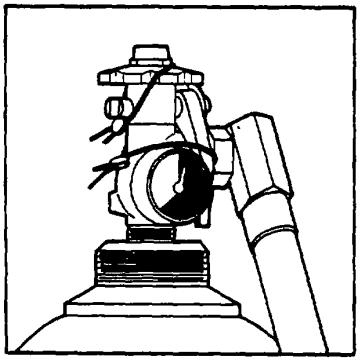
CAUTION: Do not place your body or head in front of cylinder valve outlet. If valve is accidentally operated, velocity of unrestricted escaping gas is forceful enough to cause injury, especially about the face and head.



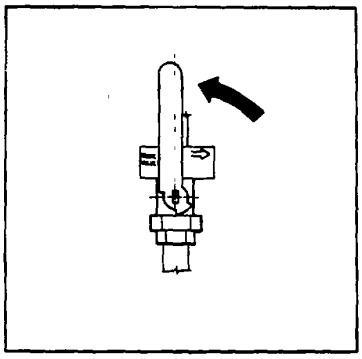


17. Connect high pressure hose to cylinder valve(s), wrench tighten.

    CAUTION: Do not strike "Pull" lever when connecting hose to cylinder valve.

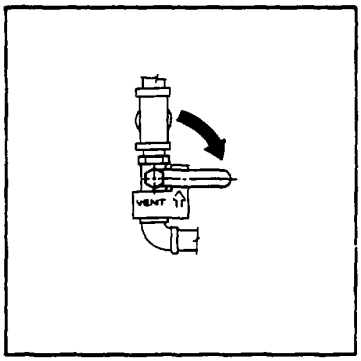


18. Make certain visual inspection seal(s) at cylinder valve(s) are still intact. Replace any broken or missing visual inspection seal(s), Ansul Part No. 15999.



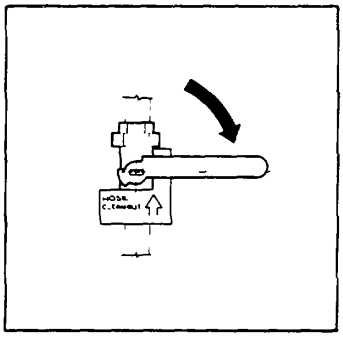
19. Make certain dry chemical tank valve handles are ring pinned and sealed in the operating position ...

    a. RED Tank Valve OPEN

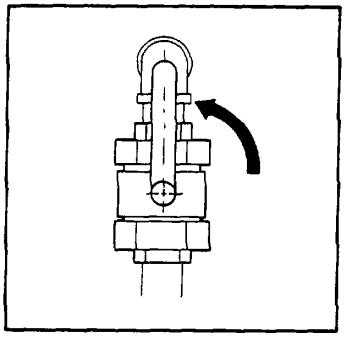


    b. GREEN Vent Valve CLOSED

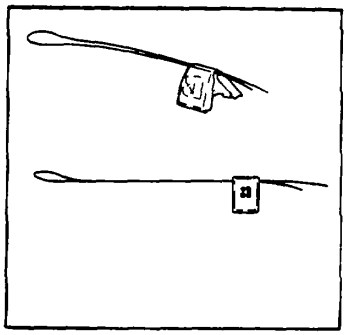
c. BLUE Hose Clean-Out Valve CLOSED



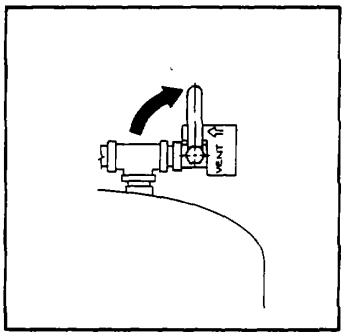
d. BLACK Dry Chemical Valve OPEN



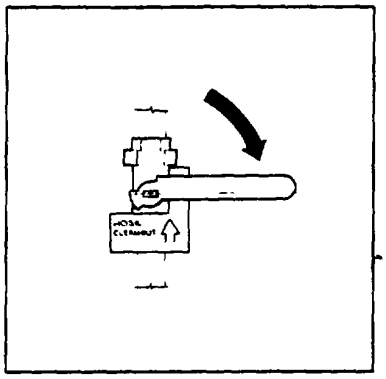
20. Replace any broken or missing visual inspection seal(s), Ansul Part No. 15999.



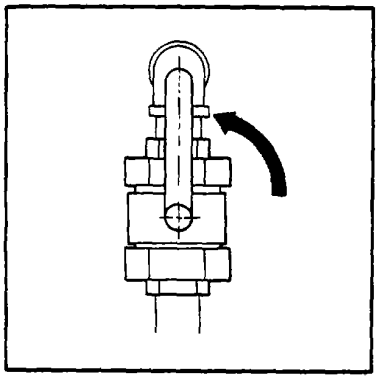
21. Make certain AFFF solution tank valve handles are ring pinned and sealed in the operating position



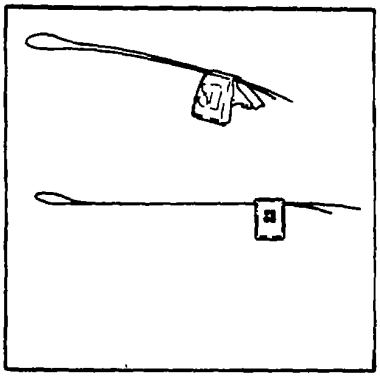
a. GREEN Vent Valve CLOSED



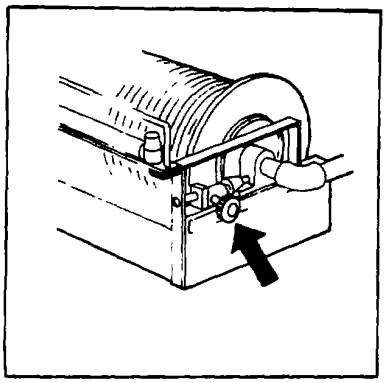
b. BLUE Hose Clean-Out Valve CLOSED



c. BLACK AFFF Valve OPEN

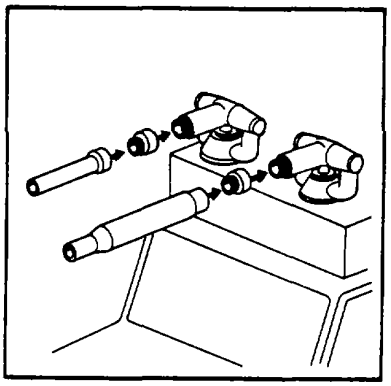


22. Repose any broken or missing visual inspection seal(s), Ansul Part No. 15999.

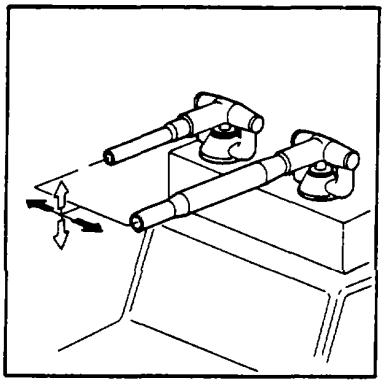


23. Unlock hose reel.

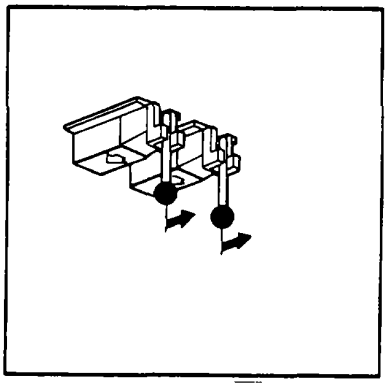
24. Install turret nozzles.



25. Swing turret vertically and horizontally to check freedom of movement.

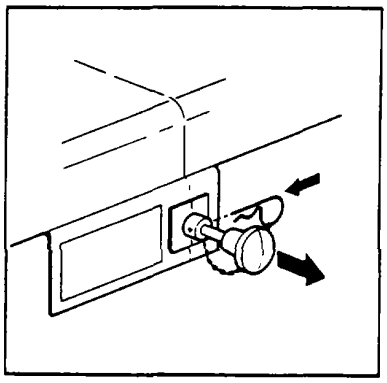


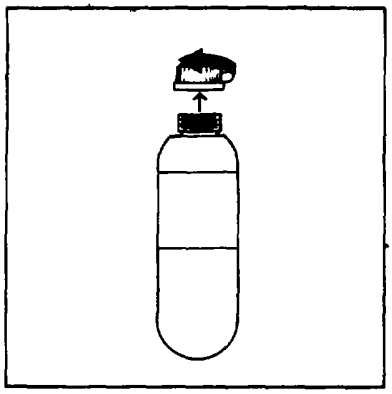
26. Make certain both turret valves operating controls are in the closed position.



27. Install cartridge in dashboard actuator .

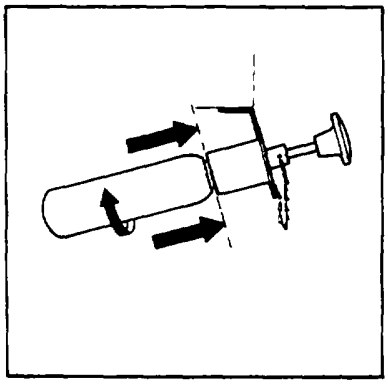
    a. Pull out actuator button and insert ring pin, to assure safe cartridge installation.



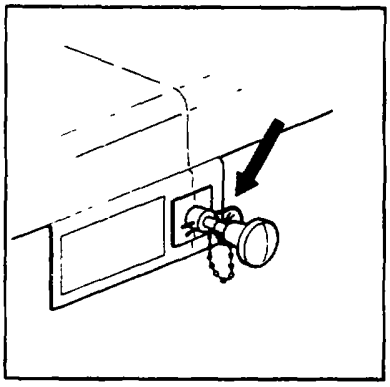


b. Remove safety shipping cap from cartridge. Weigh cartridge. Replace if weight is 1/4 ounce (7.1 9.) or more below weight stamped on cartridge.

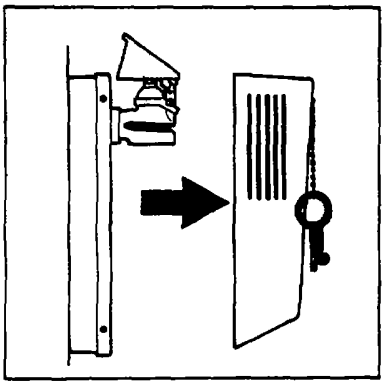
NOTE: Use cartridge, Ansul Part No. 24380, only.



c. Screw cartridge into actuator, hand tighten.



d. Seal the ring pin to actuator stem with visual inspection seal, Ansul Part No. 15999.

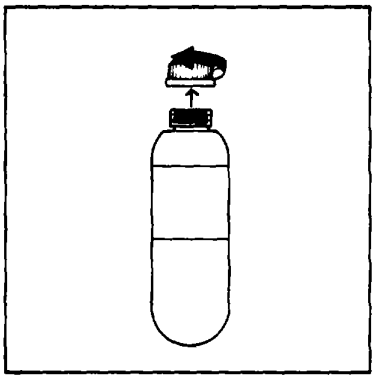


28. Install cartridge in remote actuator .

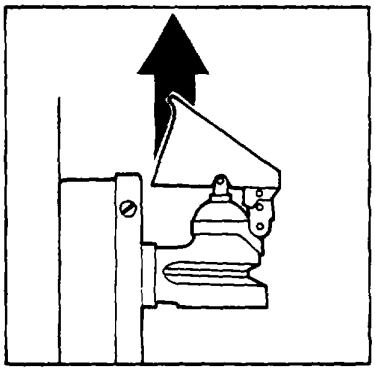
    a. Pull ring pin and remove guard.

b. Remove safety shipping cap from cartridge. Weigh cartridge. Replace if weight is 1/4 ounce (7.1 g) or more below weight stamped on cartridge.

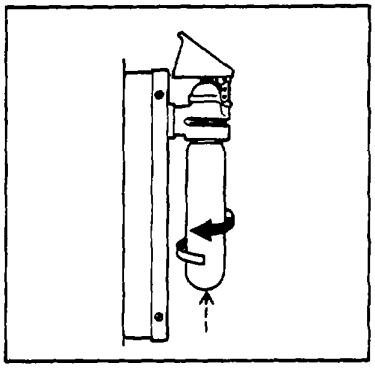
NOTE: Use cartridge, Ansul Part No. 24380, only.



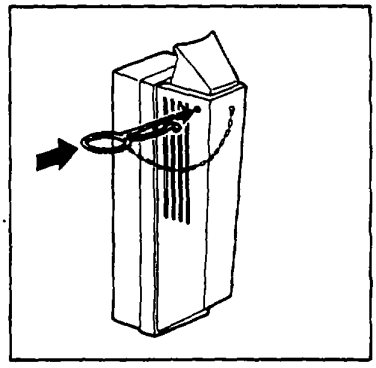
c. Raise puncture lever to assure safe cartridge installation.

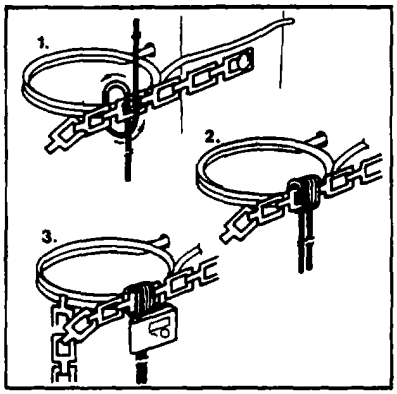


d. Screw cartridge into actuator, hand tighten.

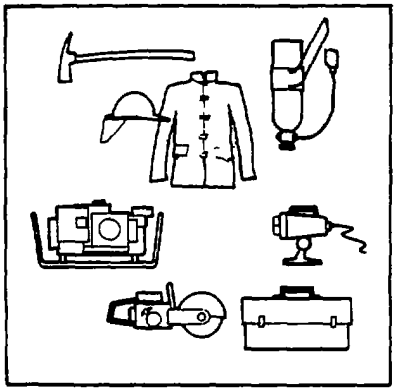


e. Replace cartridge guard and insert ring pin through guard into puncture lever link.

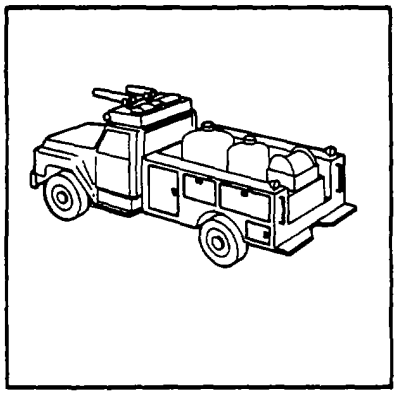




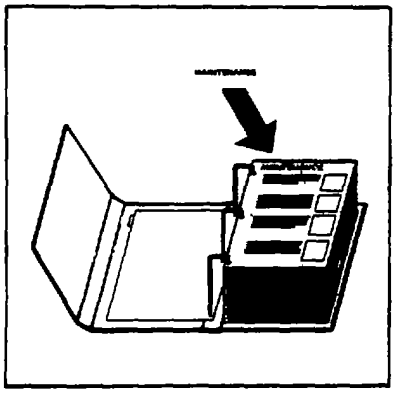
f.. Seal with visual inspection seal, Ansul Part No. 15999.



29. Make certain all rescue equipment is properly secured.

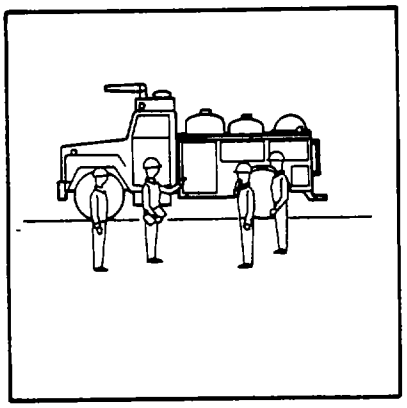


30. Check that all doors are tightly latched.

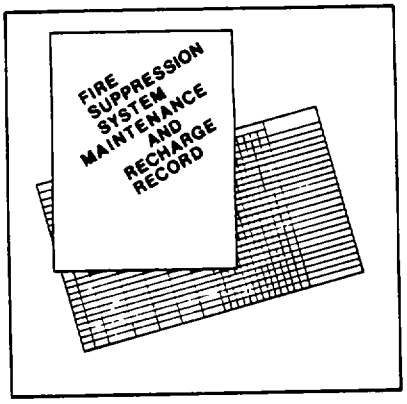


31. To give maximum assurance that the fire suppressing/securing system will operate effectively and safely, a maintenance examination could be effected at this time.

32. Instruct personnel in operation of the fire suppressing/securing system.

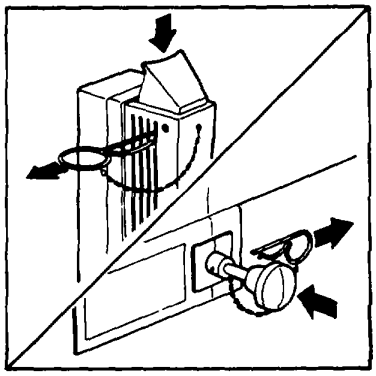


33. Record date of placement in service.



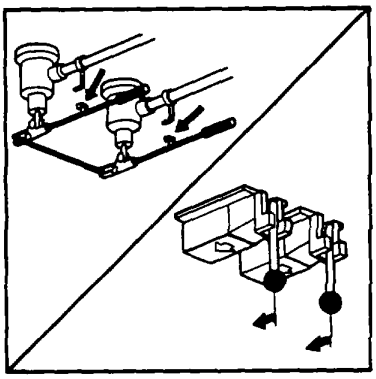
To operate the fire suppressing/securing system:

1. Pull ring pin, push red button on dashboard actuator or lever on actuator in the rear of the vehicle.

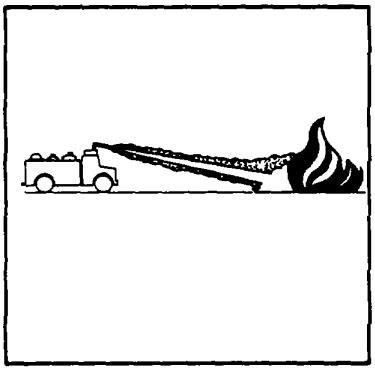


2. For turret operation:

   a. Unlock control handles and open hand valve lever(s) to operate turret(s).

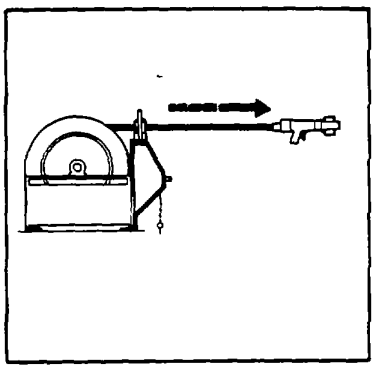


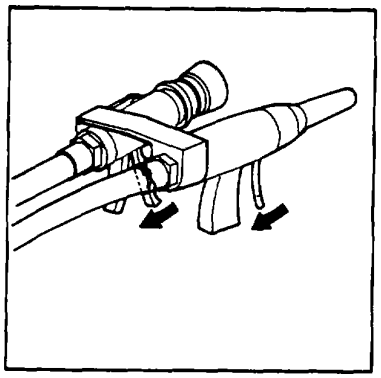
   b. For FLAMMABLE LIQUID SPILL FIRE, direct turret stream(s) at base of flames with side to side motion.



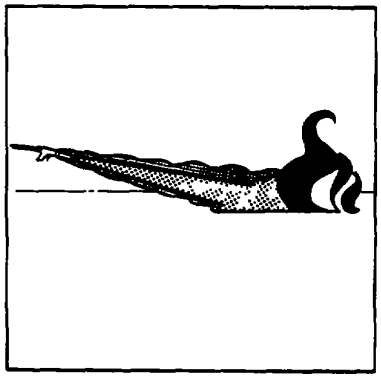
3. For operation of hand line:

   a. Pull out ring pin on nozzle assembly holder and pull all hose from reel.

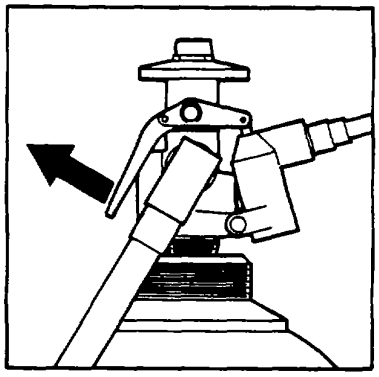




b. Open nozzle(s) fully. (Pull trigger.)



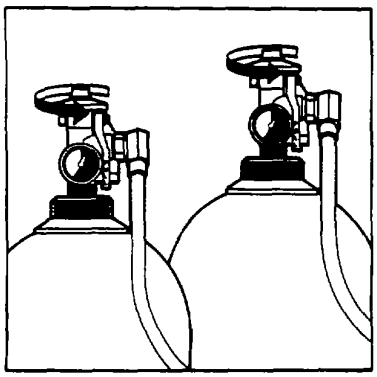
c. For FLAMMABLE LIQUID SPILL FIRE, direct stream(s) at base of flames with side to side motion.



4. **IMPORTANT:**

If the systems cannot be actuated by use of the cartridge operated actuator(s):

a. Pull the Quick-Opening operating levers on all cylinders.



OR

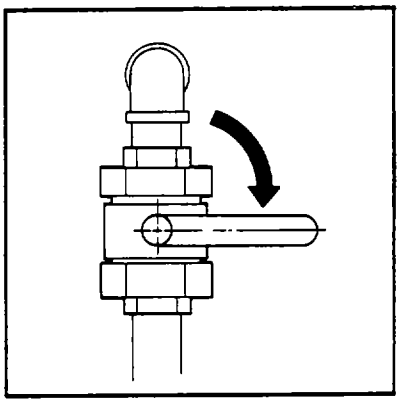
b. Turn handwheels on all nitrogen cylinders counterclockwise to full OPEN position.

SECTION 4

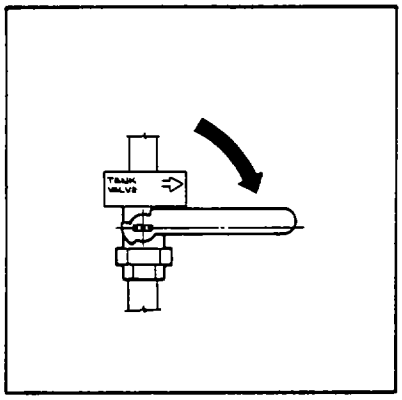
To prepare the fire suppressing/securing system for service after use. (For continued protection, the system must be recharged immediately after use.)

DRY CHEMICAL TANK

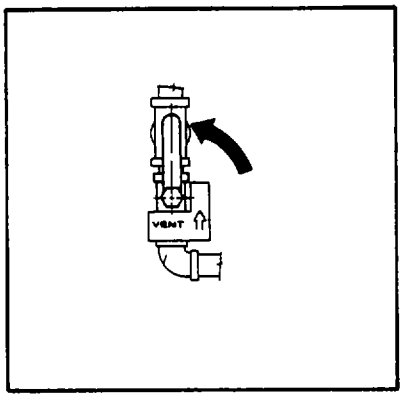
1. Pull ring pin and close BLACK Dry Chemical Valve.



2. Pull ring pin and close RED Tank Valve.

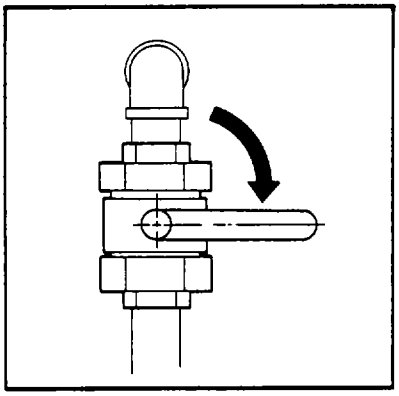


3. Pull ring pin and open GREEN Vent Valve.

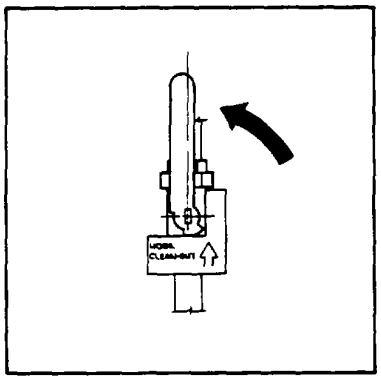


AFFF SOLUTION TANK

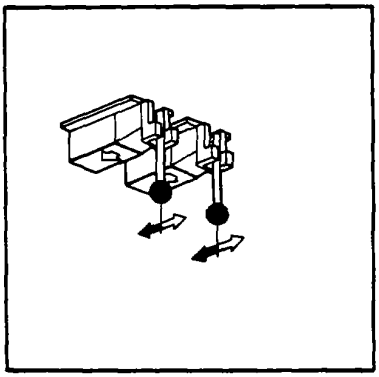
4. Pull ring pin and close BLACK AFFF valve.



SECTION 4

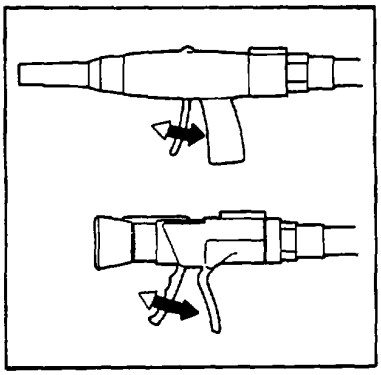


5. Pull ring pin and open BLUE Hose Clean-Out Valve.



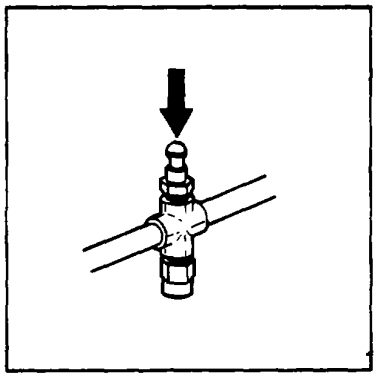
6. Open dry chemical and AFFF turret nozzles individually until streams are clear, then close.

NOTE: Do not relieve all pressure through turret



7. Open dry chemical handline nozzle to clear hose line and to relieve all pressure from dry chemical tank. Open AFFF handline nozzle until stream is clear, then close.

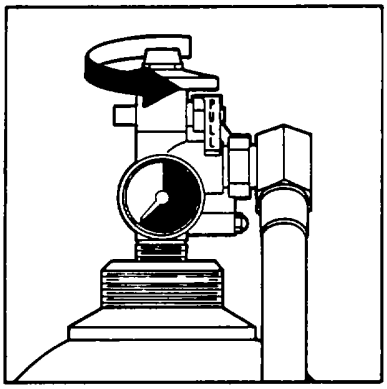
NOTE: Make sure all hose is off hose reel.



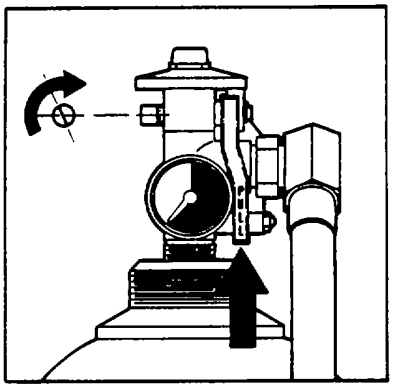
8. Close cylinder valves...

    a. Push GREEN Pressure Relief Valve Button to relieve pressure in cylinder actuation manifold.

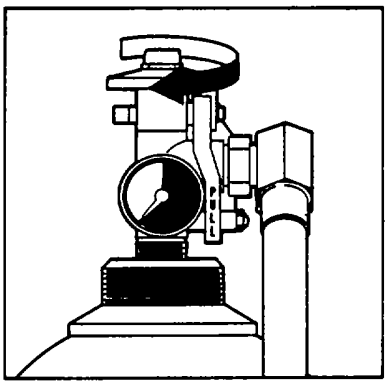
b. Turn handwheel on cylinder counterclockwise to full OPEN position.



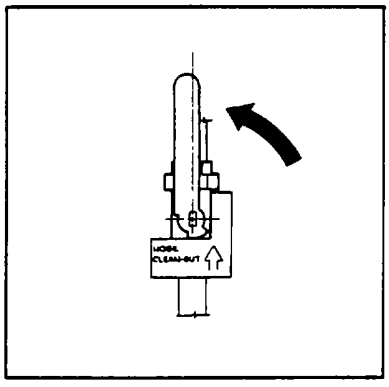
c. Push Quick-Opening lever toward valve body, while rotating cross shaft flat clockwise (when facing cross shaft from the end with flat) to STOP position.

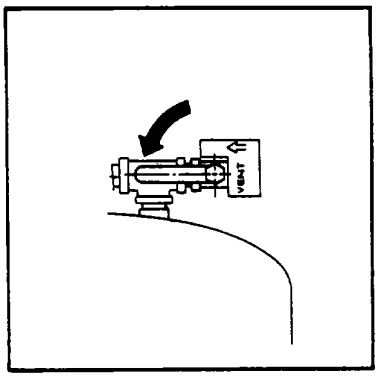


d. Close valve by turning handwheel on cylinder clockwise, hand tighten.

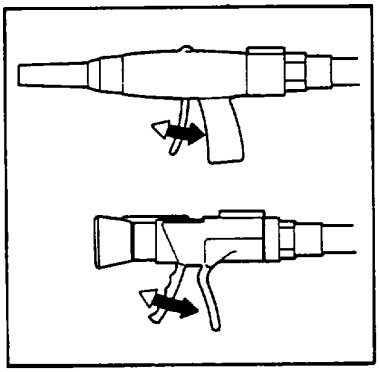


9. Pull ring pin and open BLUE hose clean-out valve on dry chemical tank piping.



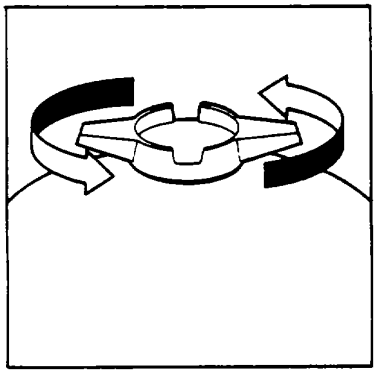


10. Pull ring pin and open GREEN Vent Valve on AFFF tank piping to relieve all remaining pressure.

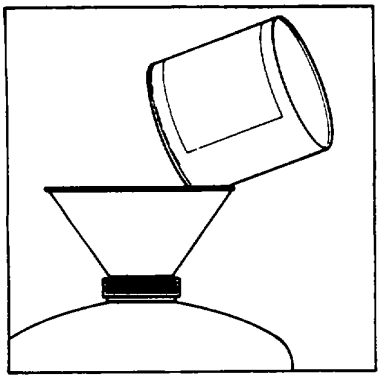


11. Open dry chemical and AFFF handline nozzle(s) individually to relieve all remaining pressure.

NOTE: DO NOT ATTEMPT TO RELIEVE PRESSURE THROUGH TURRETS.

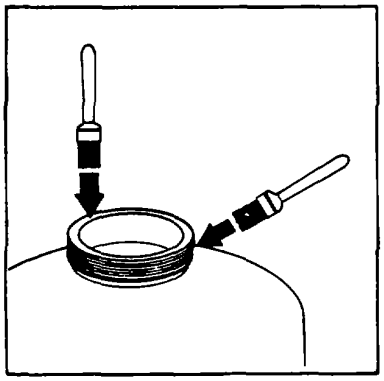


12. Remove fill cap from dry chemical tank and place funnel in opening.

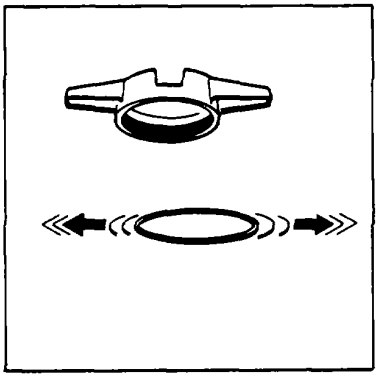


13. Fill tank to rated capacity with Ansul dry chemical specified on nameplate(s) only.

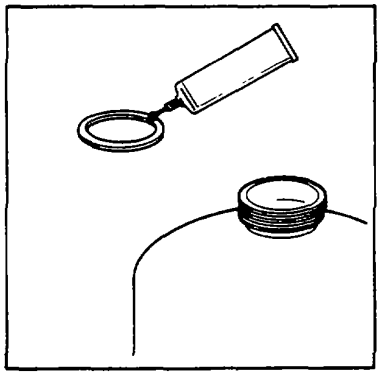
14. Clean fill opening threads and gasket seating surface.



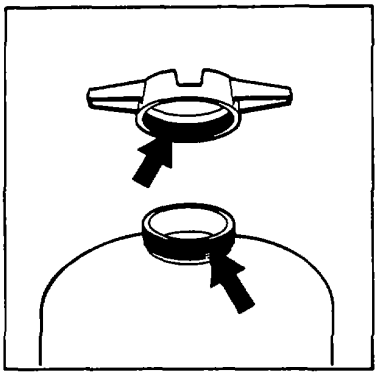
15. Examine fill cap gasket for elasticity or cuts.

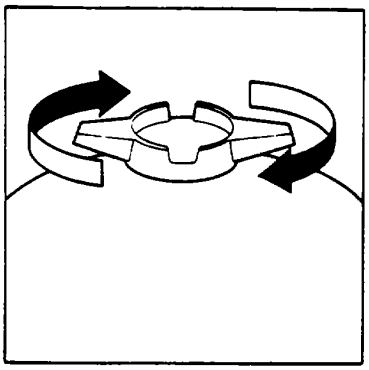


16. Clean and coat gasket lightly with a good grade of high heat resistant grease.

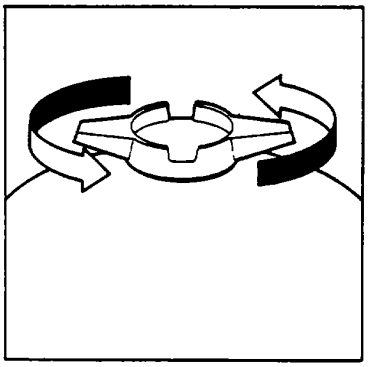


17. Inspect threads in fill cap and on fill opening for nicks, burrs, cross-threading, rough or feathered edges clean and coat fill cap threads lightly with a good grade of high heat resistant grease.

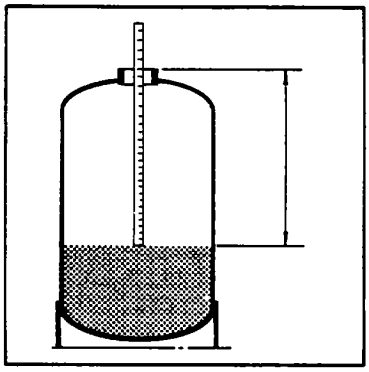




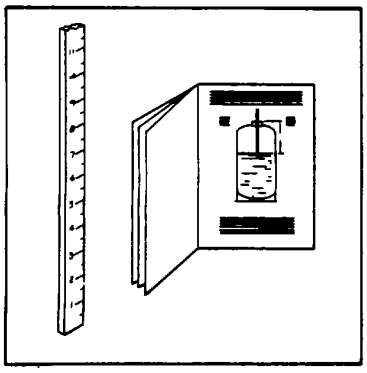
18. Secure fill cap, hand tighten.



19. Remove fill cap from Ansul AFFF solution tank.

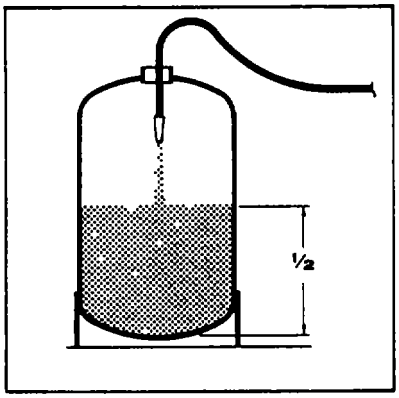


20. Insert depth measuring rod into tank, pushing it gently against bottom center to open intake valve.



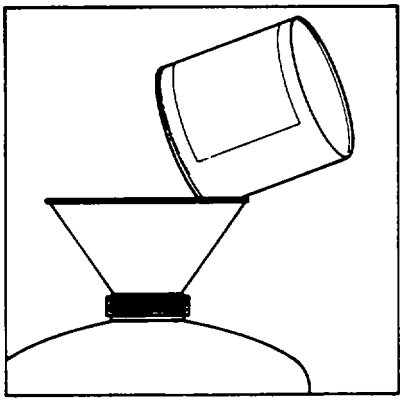
21. Determine AFFF solution depth and refer to Nameplate or Recharge Guide in Appendix A5.

22. Raise level with fresh tap water to about one-half the free space.

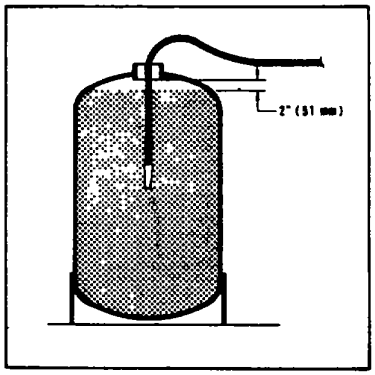


NOTE: Ansul recommends that the quality of the tap water be examined each time the system is charged as described on Page 1 of the Field Inspection Manual, Ansul Part No. 31274, in the back of this manual. The quality of water should be noted on the Field Inspection Record, Form No. F-7880 (Appendix A2).

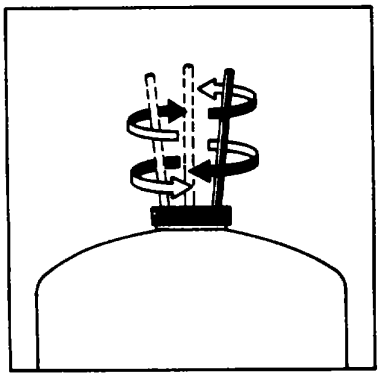
23. Place funnel in fill opening and pour measured amount of ANSULITE AFFF (Aqueous Film-Forming Foam) 6% Concentrate only, determined from Recharge Guide in Appendix A5.



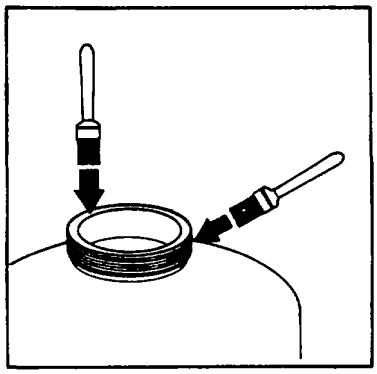
NOTE: Prior to adding the concentrate to the tank, its refractive index should be measured and recorded on the Field Inspection Record, Form No. F-7880, along with a refractive index vs. concentrate curve. The procedures for these operations are covered on Page 1 of the Field Inspection Manual, Part No. 31274, at the back of this manual. It is also a good idea to record the batch number(s) from the Ansul AFFF pails on the Field Inspection Record, Form No. F-7880, for future use. If only a portion of the solution is being added, the quality of water should be checked, the refractive index should be measured and recorded and the batch number should be recorded.



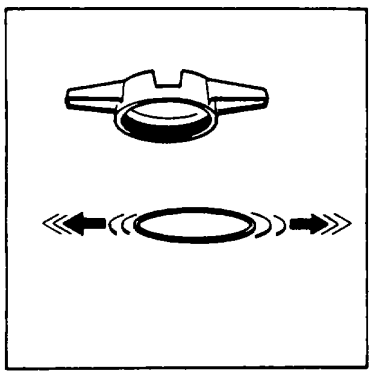
24. Submerge hose and fill remainder of tank with water to within 2 inches (51 mm) from the bottom of the fill opening, reducing rate of water flow as tank becomes full.



25. Stir solution for 30 seconds use a non-metallic rod.

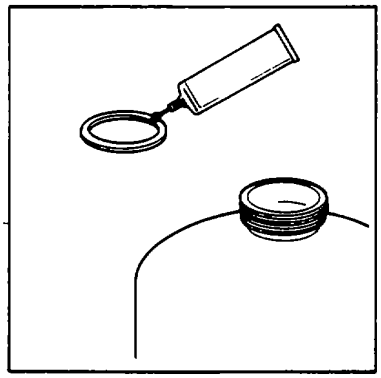


26. Clean fill opening threads and gasket seating surface.

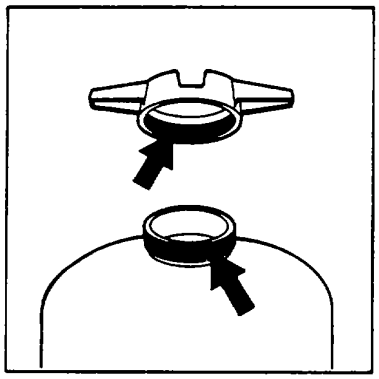


27. Examine fill cap gasket for elasticity, cuts or cracking.

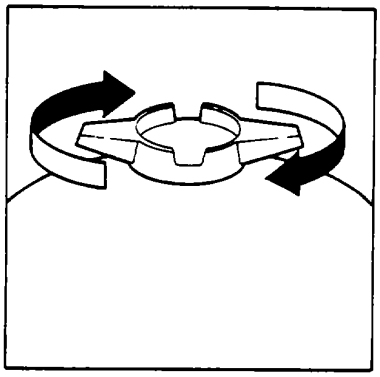
28. Clean and coat gasket lightly with a good grade of high heat resistant grease.



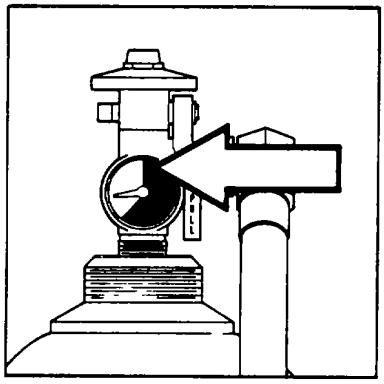
29. Inspect threads in fill cap and on fill opening for nicks, burrs, cross-threading, rough or feathered edges clean and coat fill cap threads lightly with a good grade of high heat resistant grease.

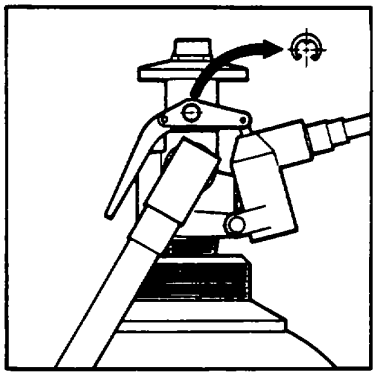


30. Secure fill cap, hand tighten.



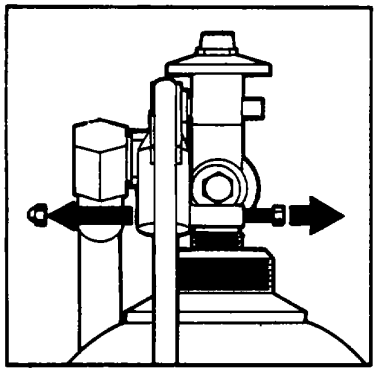
31. Read cylinder gauge(s). Note pressure, check ambient temperature and refer to Temperature Correction Chart in Appendix A3. Replace cylinder(s) if below minimum pressure.



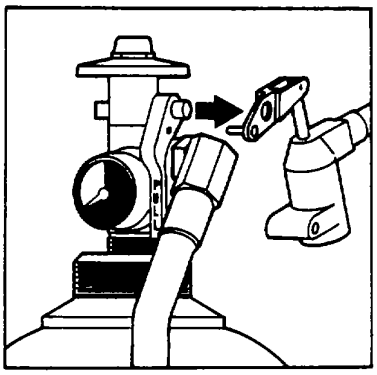


32. To replace nitrogen cylinder(s)

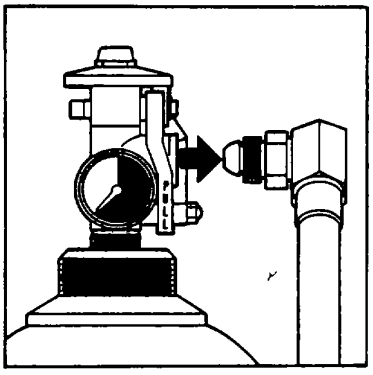
    a. Remove crescent ring from cross shaft.



    b. Remove cap nut and anchor stud.



    c. Slide actuator arm off cross shaft.

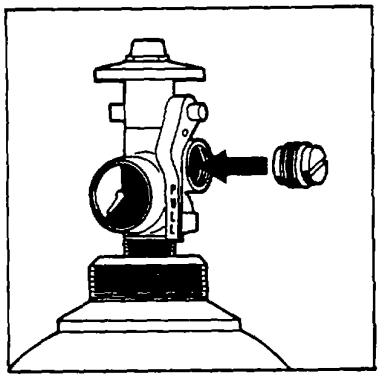


    d. Remove high pressure hose from cylinder valve.

CAUTION: Do not place your body or head in front of cylinder valve outlet. If valve is accidentally operated, velocity of unrestricted escaping gas is forceful enough to cause injury, especially about the face and head.

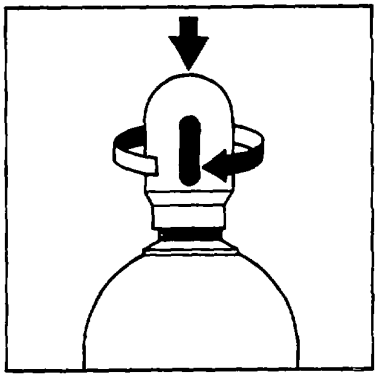
e. Thread safety plug fully into cylinder valve outlet.

CAUTION: Use of plug is vital to your safety. If valve is accidentally operated, velocity of unrestricted escaping gas is forceful enough to cause injury, especially about the face and head.

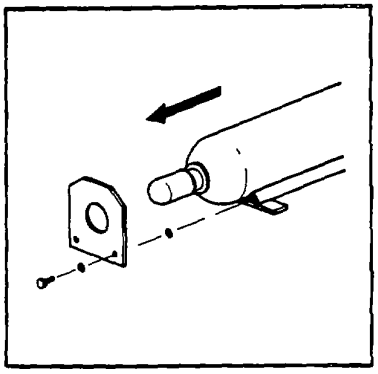


f. Secure cylinder shipping cap.

NOTE: Safety shipping cap must always be in place when removing or installing cylinder.

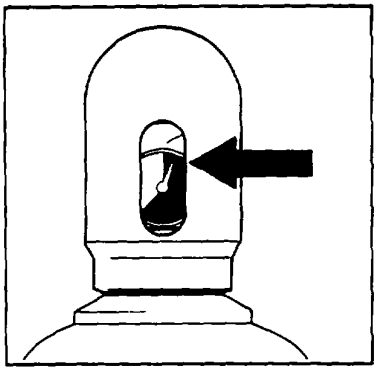


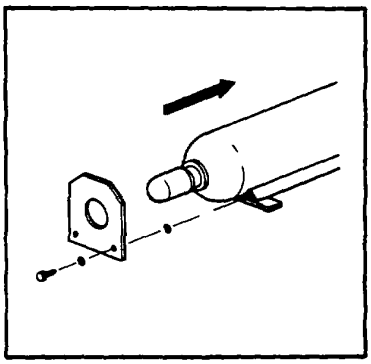
g. Remove cylinder retaining bracket and slide cylinder out.



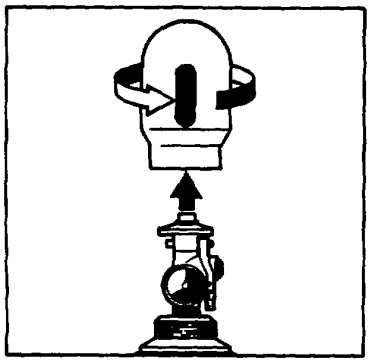
33. Install fully charged cylinder(s).

NOTE: Read cylinder gauge before installation - pointer should be in BLACK operating range.





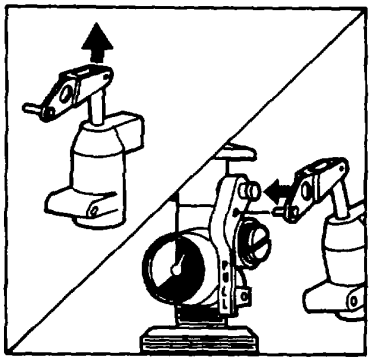
34. Secure cylinder retaining bracket(s).



35. Remove safety shipping cap(s) from cylinder(s). Retain cap(s) for future use.

WARNING: MAKE CERTAIN SAFETY PLUG IS IN PLACE IN CYLINDER VALVE OUTLET BEFORE COMPLETING THE FOLLOWING STEPS.

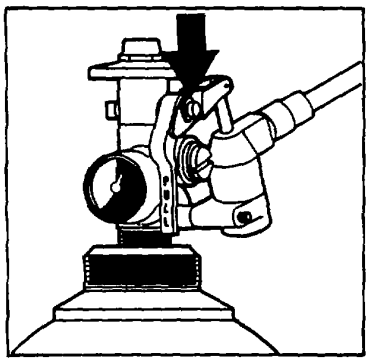
36. Install pneumatic valve actuator(s).



a. Extend pneumatic valve actuator rod fully and slide actuator arm on cross shaft, engaging pin in hole on Quick-Opening lever.

NOTE: Refer to Appendix A4 for additional detail;

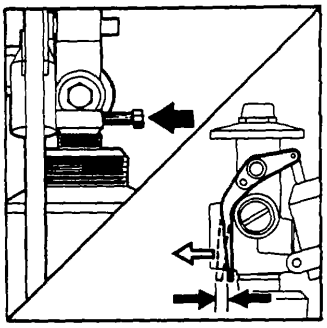
b. Insert crescent ring into groove on cross shaft.



c. Insert anchor stud through valve body and actuator pivot member.

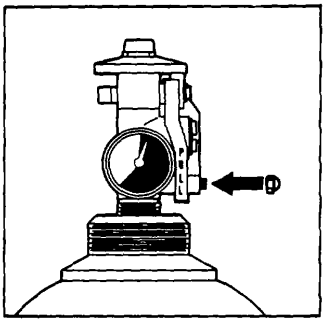
CAUTION: The Quick-Opening lever may be moved slightly forward approximately 1/4 inch (6.4 mm) to permit installation of the anchor stud.

FORWARD-MOVEMENT IN EXCESS OF 1/4 INCH (6.4 mm) MAY RESULT IN ACTUATION OF THE VALVE.



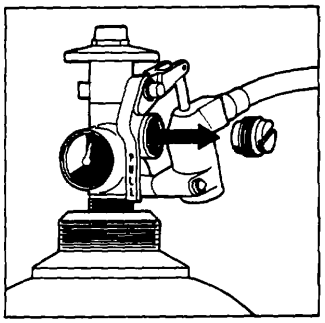
d. Engage and secure cap nut to anchor stud.

37. Remove safety plug from cylinder valve(s) - retain plug(s) for future use.

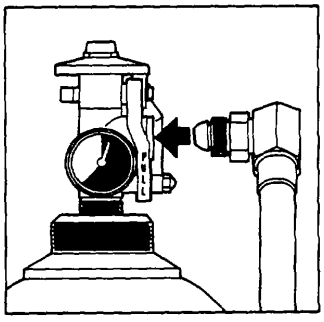


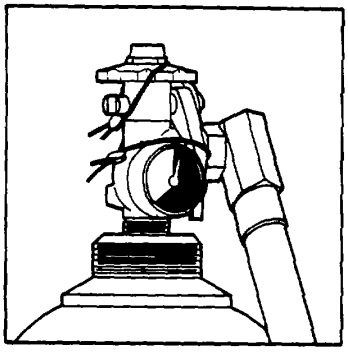
CAUTION: Do not place your body or head in front of cylinder valve outlet. If valve is accidentally operated, velocity of unrestricted escaping gas is forceful enough to cause injury, especially about the face and head.

38. Connect high pressure hose to cylinder valve(s) - wrench tighten.

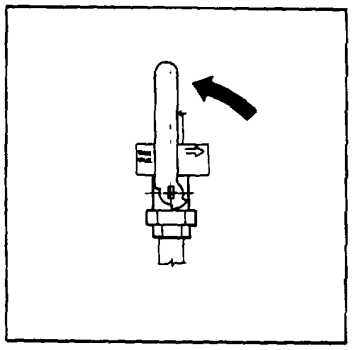


CAUTION: Do not strike "Pull" lever when connecting hose to cylinder valve.

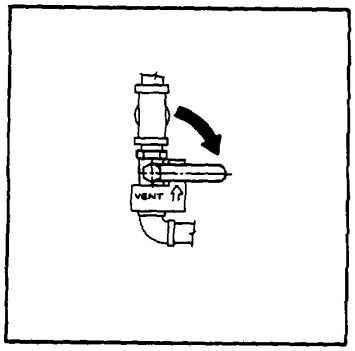




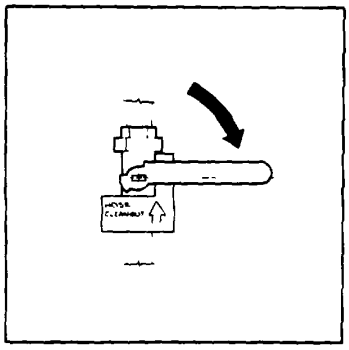
39. Make certain visual inspection seal(s) at cylinder valve(s) are still intact. Replace any broken or missing visual inspection seal(s), Ansul Part No. 197.



40. Return dry chemical tank valve handles to operating position.
    a. RED Tank Valve **OPEN**

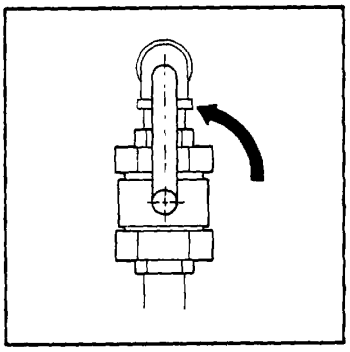


    b. GREEN Vent Valve **CLOSED**

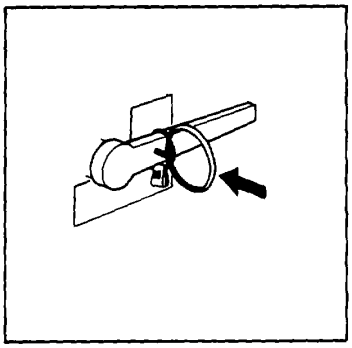


    c. BLUE Hose Clean-Out Valve **CLOSED**

d. BLACK Dry Chemical Valve **OPEN**

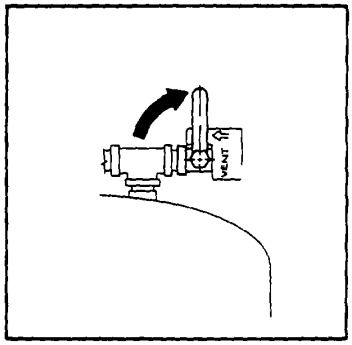


41. Insert ring pin(s) through valve handle(s) into bracket(s) and seal with visual inspection seal(s), Ansul Part No. 15999.

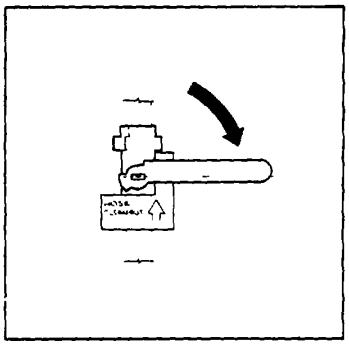


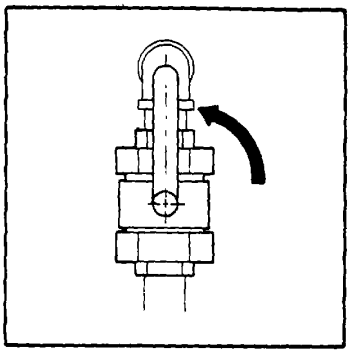
42. Return Ansul AFFF solution tank valve handles to operating position

    a. GREEN Vent Valve CLOSED

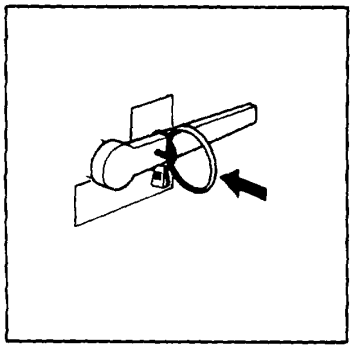


    b. BLUE Hose Clean-Out Valve CLOSED

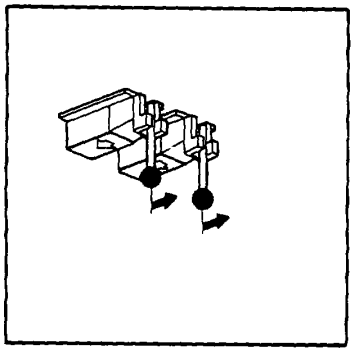




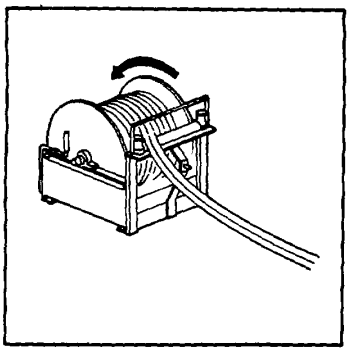
c. BLACK AFFF Valve OPEN



43. Insert ring pin(s) through valve handle(s) into bracket(s) and seal with visual inspection seal(s), Ansul Part No.15999.



44. Make certain both turret valve operating controls are in the closed position.

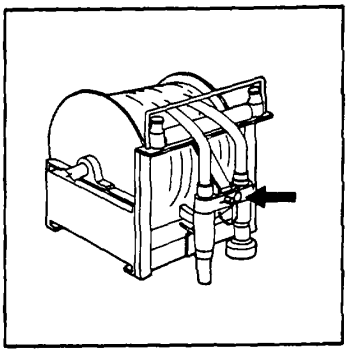


45. Rewind hose on reel.

NOTE: Do not lock hose reel.

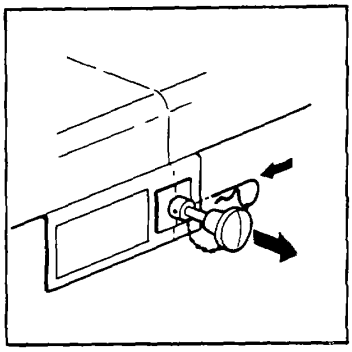
46. Secure nozzle assembly on holder and insert ring pin.

NOTE: Make certain nozzle trigger(s) are forward in the CLOSED position.

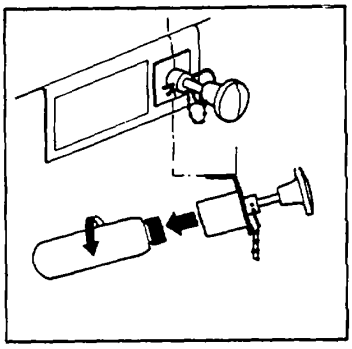


47. Replace cartridge in dashboard actuator if used.

a. Pull out dashboard actuator button and insert ring pin to assure safe cartridge installation.

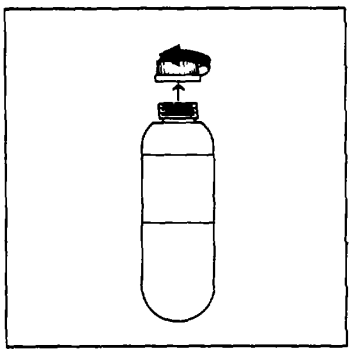


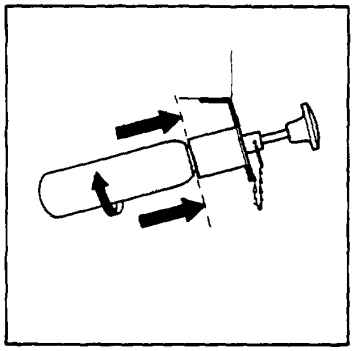
b. Remove spent cartridge.



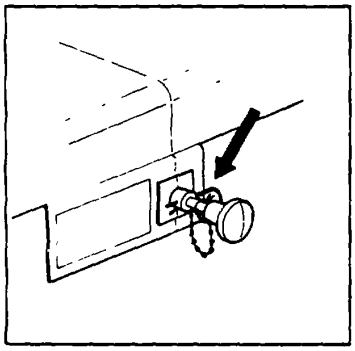
c. Remove safety shipping cap from replacement cartridge. Weigh cartridge. Replace if weight is 1/4 ounce (7.1 g.) or more below weight stamped on cartridge.

NOTE: Use cartridge, Ansul Part No. 24380 only. Order cartridge shipping assembly, Ansul Part No. 7013, to assure receiving correct replacement cartridge.

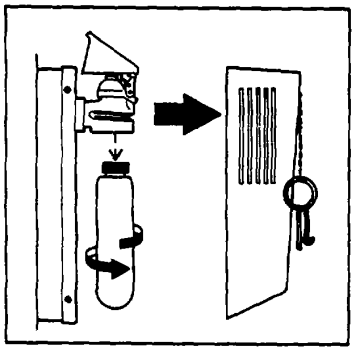




d. Screw cartridge into actuator, hand tighten.

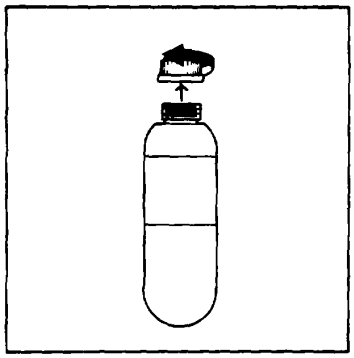


e. Seal ring pin to actuator stem with visual inspection seal, Ansul Part No. 15999.



48. Replace cartridge in remote actuator. If used.

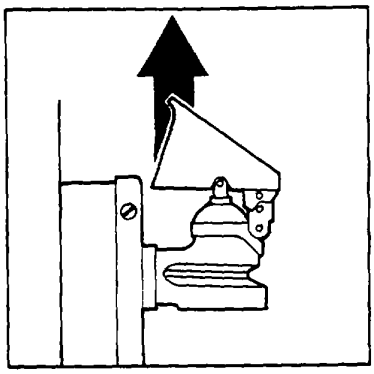
a. Remove guard and spent cartridge.



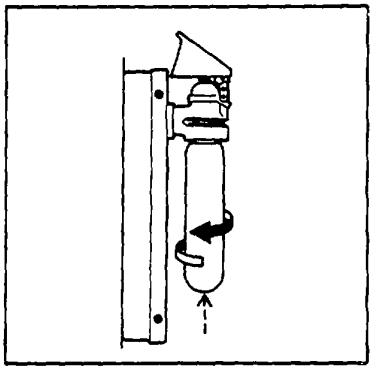
b. Remove safety shipping cap from replacement cartridge. Weigh cartridge. Replace if weight is 1/4 ounce (7.1 g.) or more below weight stamped on cartridge.

NOTE: Use cartridge, Ansul Part No. 24380, only. Order cartridge shipping assembly, Ansul Part No.7013, to assure receiving correct replacement cartridge.

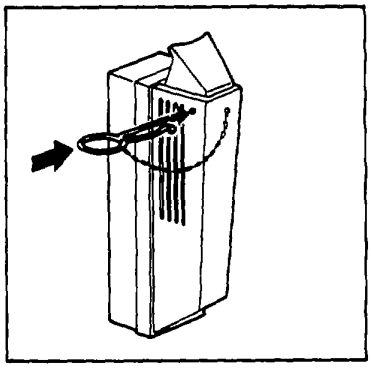
c. Raise puncture lever to assure safe cartridge installation.



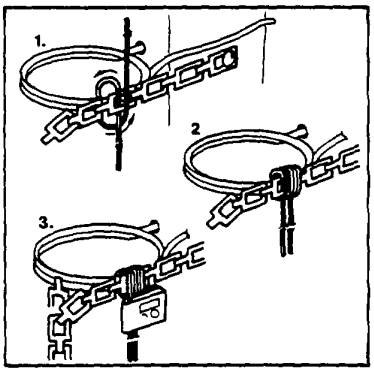
d. Screw cartridge into actuator, hand tighten.

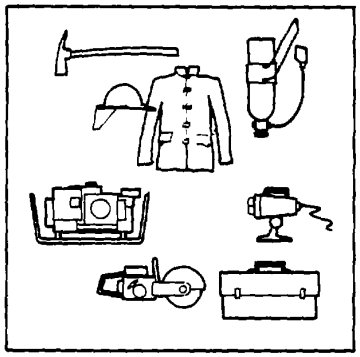


e. Replace cartridge guard and insert ring pin through guard into puncture lever link.

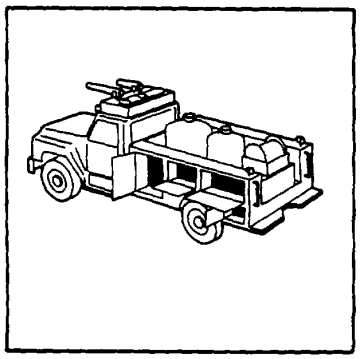


f. Seal with visual inspection seal, Ansul Part No. 15999.

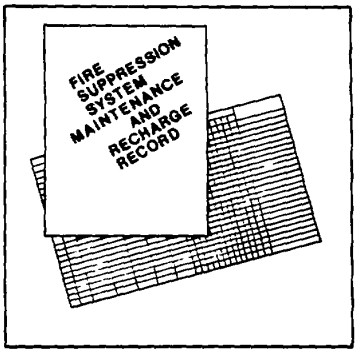




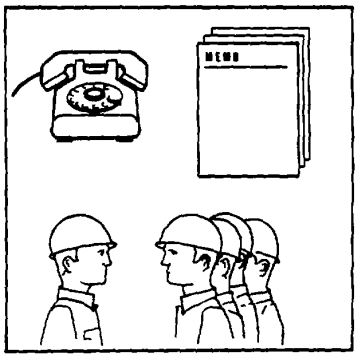
49. Return all rescue equipment and properly secure.



50. Make certain all doors are tightly latched.



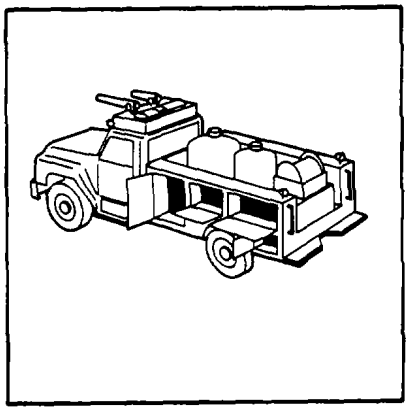
51. Record date of recharge



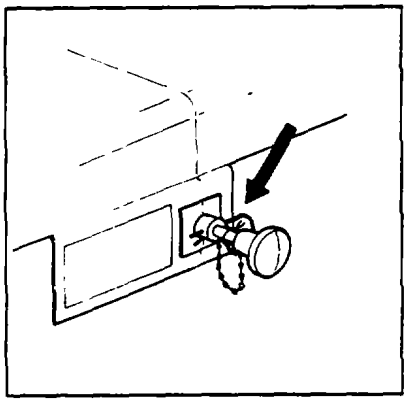
52. Notify operating personnel that the fire suppressing/securing system is back in service.

To provide reasonable assurance that the fire suppressing/securing system is fully charged and operable. The inspection frequency will vary from hourly to weekly, but shall not exceed one month, based on the needs of the situation. Inspections should always be conducted at regular intervals.

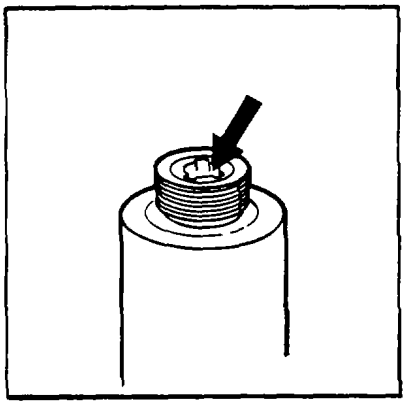
1. Check general appearance of the fire suppressing/securing system and components for mechanical damage or corrosion. Check actuation and agent hose lines for wear, especially at points where it passes through bulkheads. (Consult your truck owner's manual for chassis inspection.).



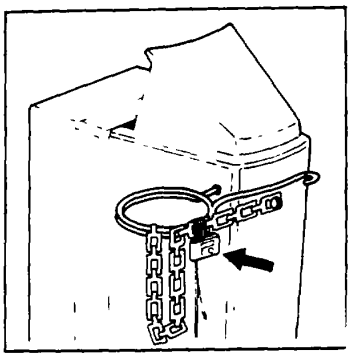
2. Make certain dashboard actuator ring pin is properly inserted and visual inspection seal is intact.



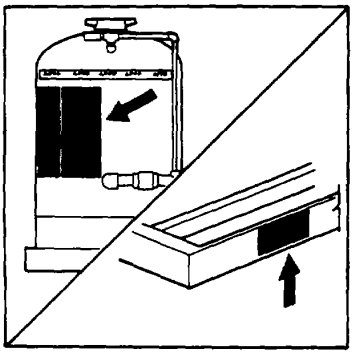
3. Remove cartridge from dashboard actuator and examine disc - seal should be un-ruptured. Return cartridge to actuator, hand tighten.



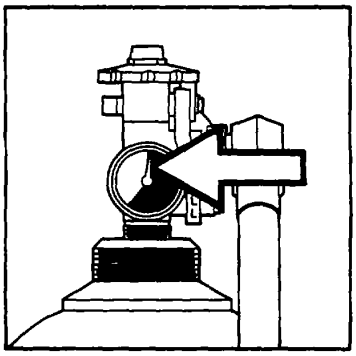
4. Check that remote actuator ring pin is properly inserted and that visual inspection seal is intact.



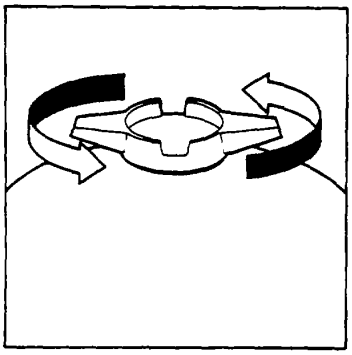
5. Check nameplates for readability.



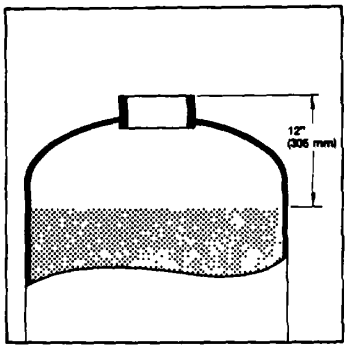
6. Read cylinder gauge(s) - pointer should be in BLACK operating range and visual inspection seal(s) on valve(s) should be intact.



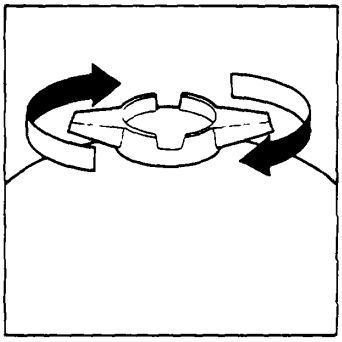
7. Remove fill cap from dry chemical tank.



8. Make certain tank is filled with free-flowing Ansul dry chemical to a level of not more than 12 inches (305 mm) from bottom of fill opening.

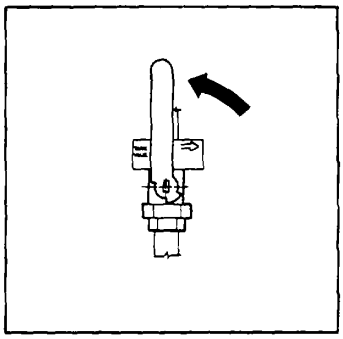


9. Secure fill cap, hand tighten.

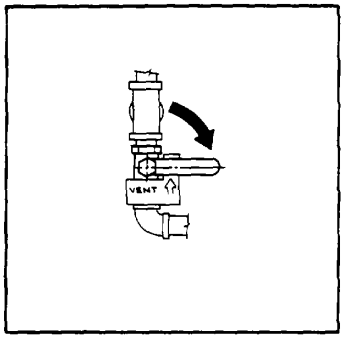


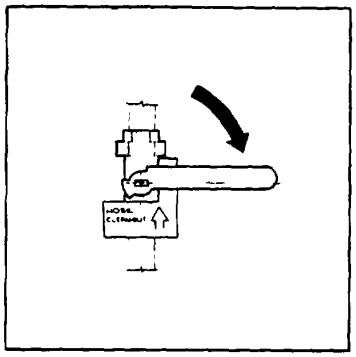
10. Make certain dry chemical tank valve handles are ring pinned and sealed in the operating position.

    a. RED Tank Valve OPEN

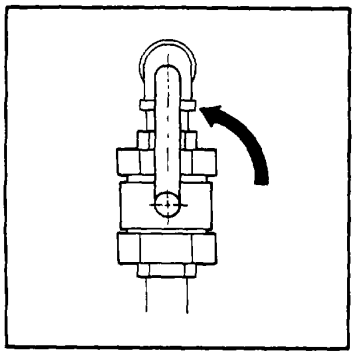


    b. GREEN Vent Valve CLOSED

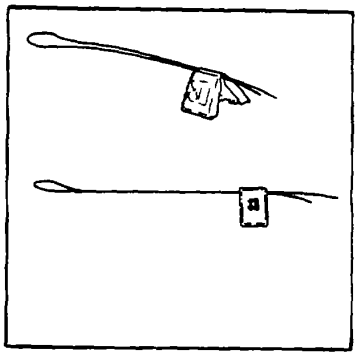




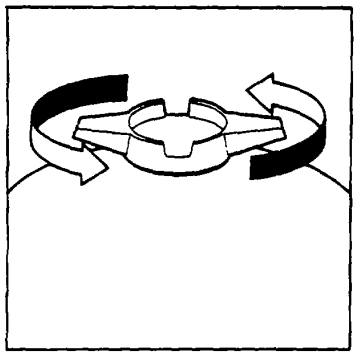
c. BLUE Hose CleanOut Valve CLOSED



d. BLACK Dry Chemical Valve OPEN

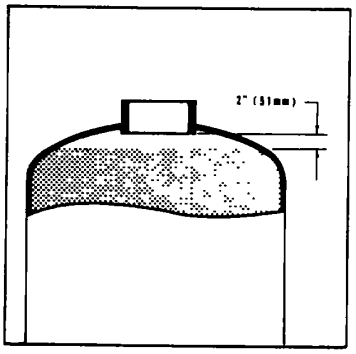


11. Replace any broken or missing visual inspection seal(s), Ansul Part No. 15999.

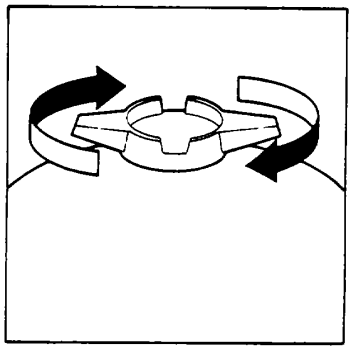


12. Remove fill cap from AFFF solution tank.

13. Make certain AFFF solution level is about 2 inches (51 mm) from bottom of the fill opening.

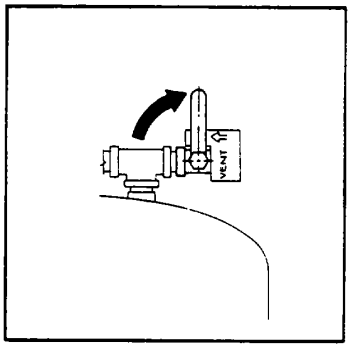


14. Secure fill cap, hand tighten.

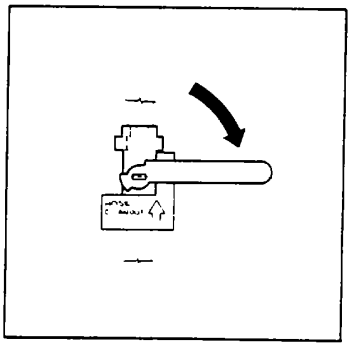


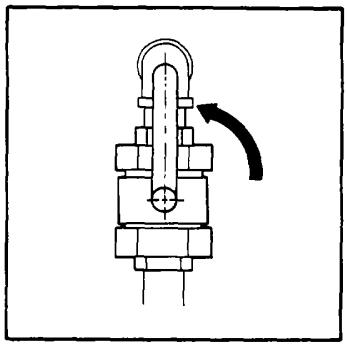
15. Make certain AFFF solution tank valve handles are ring pinned and sealed in the operating position.

    a. GREEN Vent Valve CLOSED

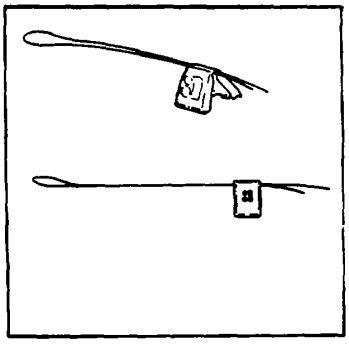


    b. BLUE Hose Clean-Out Valve CLOSED

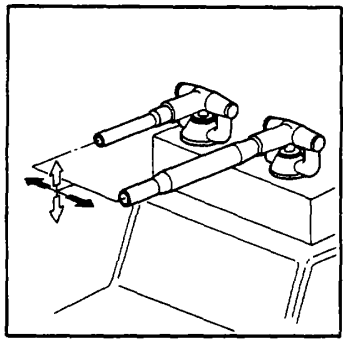




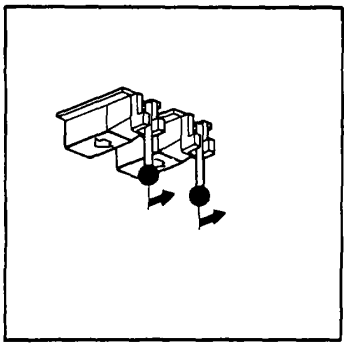
c. BLACK AFFF Valve OPEN



16. Replace any broken or missing visual inspection seal(s), Ansul Part No. 15999.

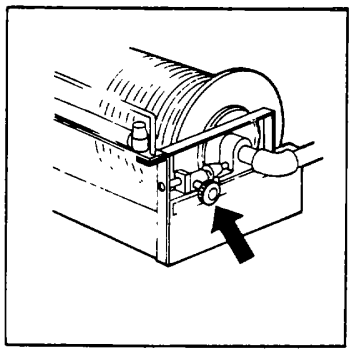


17. Swing turrets horizontally and vertically to check for free movement

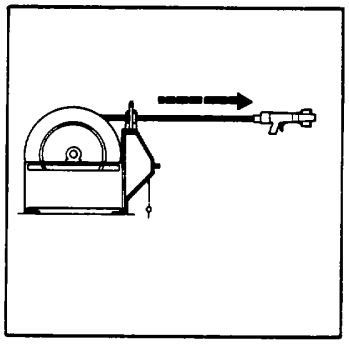


18. Make certain both turret valve operating controls are in the closed position.

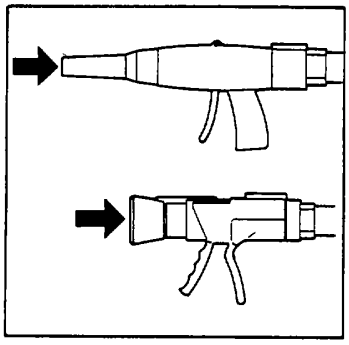
19. Make certain hose reel is unlocked.



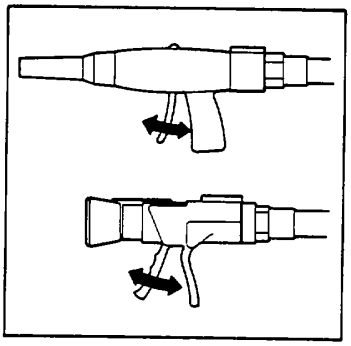
20. Pull ring pin on nozzle assembly holder and pull out several feet of hose to check for free movement.

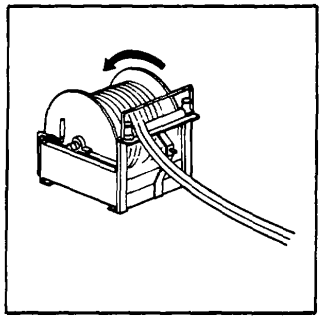


21. Examine nozzle openings for obstruction.



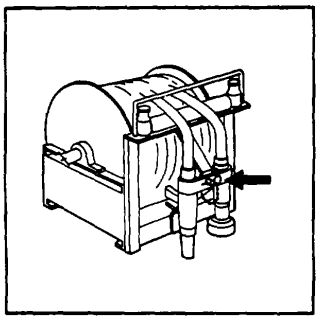
22. Squeeze nozzle triggers to check for free movement.





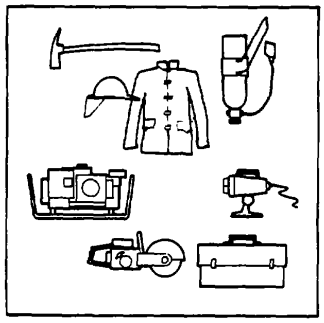
23. Rewind hose on reel.

    NOTE: Do not lock hose reel.

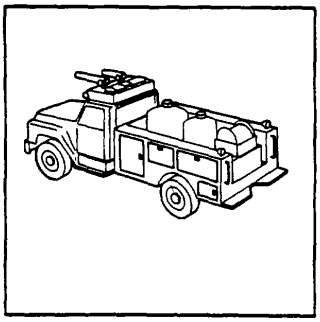


24. Secure nozzle assembly on holder and insert ring pin.

    NOTE: Make certain nozzle triggers are forward in the CLOSED position.

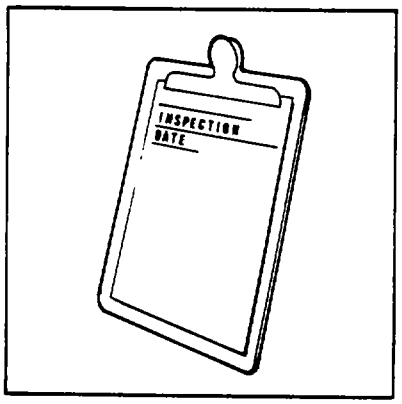


25. Make certain all rescue equipment is properly secured.



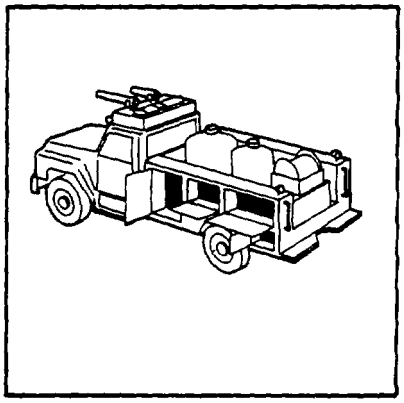
26. Check that all doors are tightly latched.

27. Record date of inspection check, if required.

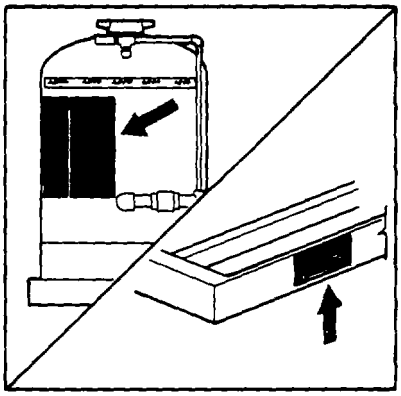


To provide maximum assurance that your Ansul fire suppressing/securing system will operate effectively and safely, fire suppressing/securing systems must be maintained at six-month intervals, or when specifically indicated by an inspection.

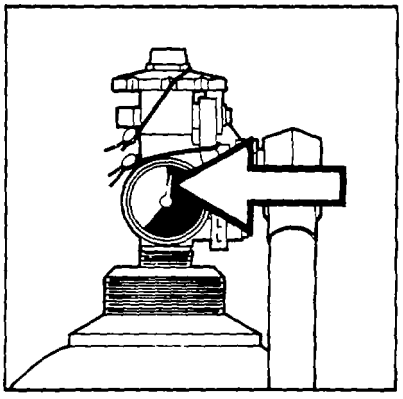
1. Check general appearance of the fire suppressing/securing system and components for mechanical damage or corrosion. Check actuation and agent hose lines for wear, especially at points where it passes through bulkheads. Consult your truck owner's manual for chassis inspection.



2. Check nameplates for readability, corrosion or looseness.

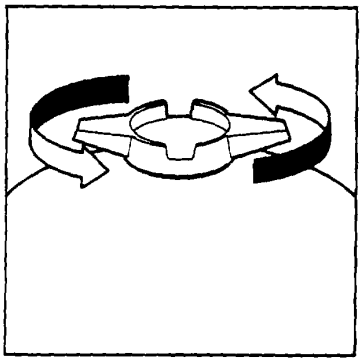


3. Read cylinder gauge(s). Note pressure, check ambient temperature and refer to Temperature Correction Chart in Appendix A3. Replace cylinder(s) if below minimum pressure.



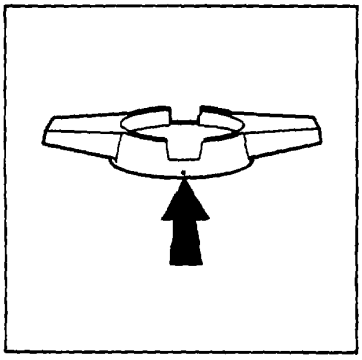
NOTE

Should cylinder replacement be required, refer to Recharge Section, Pages 410 through 4-14, Steps 32 through 39 for correct procedures.

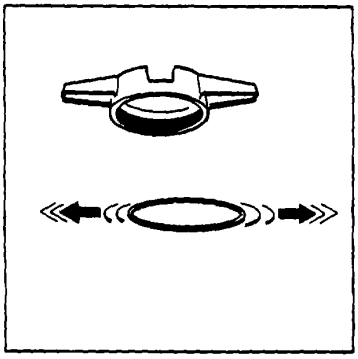


DRY CHEMICAL TANK

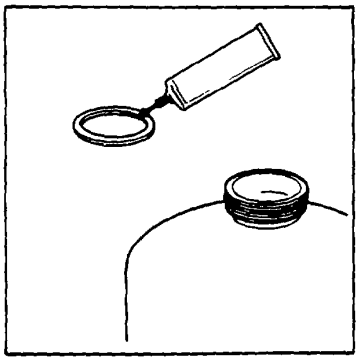
4. Remove fill cap from dry chemical tank.



5. Check pressure relief vent in fill cap for obstruction.

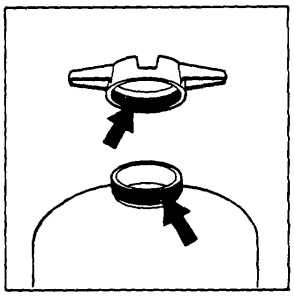


6. Examine fill cap gasket for elasticity, cuts or cracking.



7. Clean and coat gasket lightly with a good grade of high heat resistant grease.

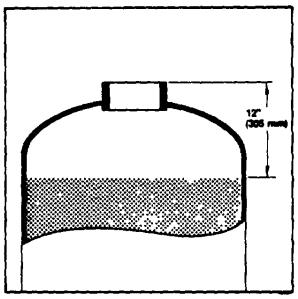
8. Inspect threads In fill cap and on fill opening for nicks, burrs, cross-threading, rough or feathered edges clean and coat fill cap threads lightly with a good grade of high heat resistant grease.



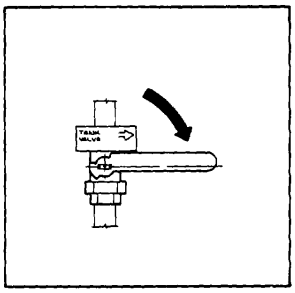
9. Make certain tank is filled with free-flowing Ansul dry chemical to a level of not more than 12 inches (305 mm) from bottom of fill opening.

NOTE

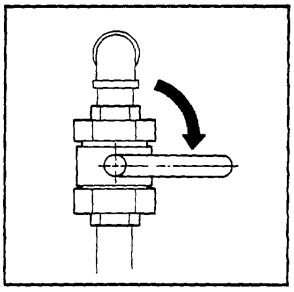
DO NOT REPLACE FILL CAP AT THIS TIME.

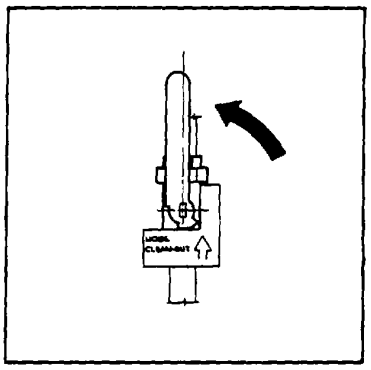


10. Pull ring pin and close RED Tank Valve.

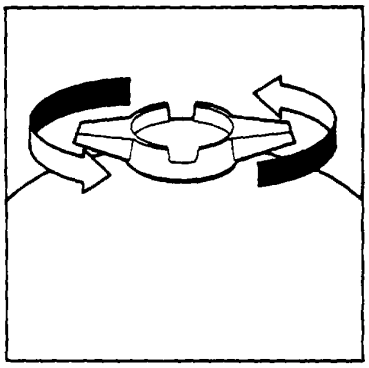


11. Pull ring pin and close BLACK Dry Chemical Valve.



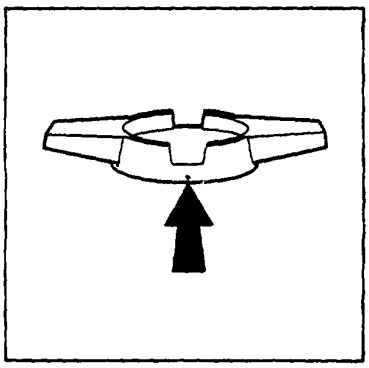


12. Pull ring pin and open BLUE hose clean-out valve.

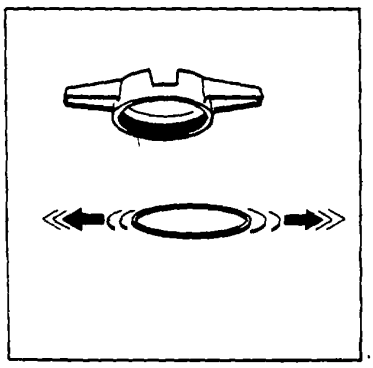


AFFF SOLUTION TANK

13. Remove fill cap from AFFF solution tank.

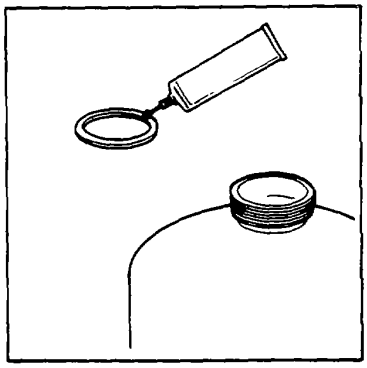


14. Check pressure relief vent in fill cap for obstruction.

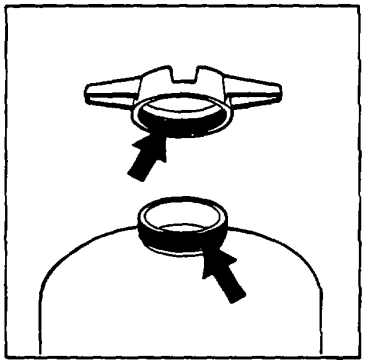


15. Examine fill cap gasket for elasticity, cuts or cracking.

16. Clean and coat gasket lightly with a good grade of high heat resistant grease.



17. Inspect threads in fill cap and on fill opening for nicks, burrs, cross-threading, rough or feathered edges clean and coat fill cap threads lightly with a good grade of high heat resistant grease.



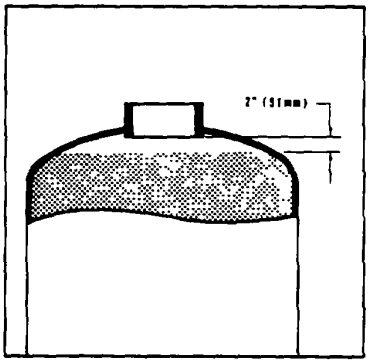
18. Make certain AFFF solution level is about 2 inches (51 mm) from bottom of the fill opening.

NOTE

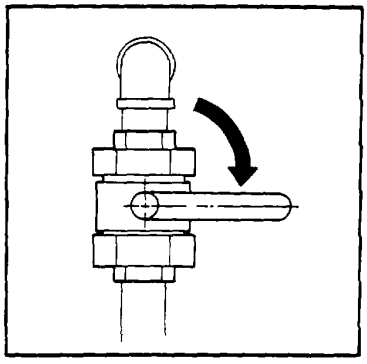
DO NOT REPLACE FILL CAP AT THIS TIME.

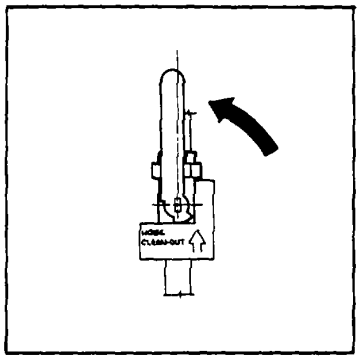
NOTE

If annual maintenance examination is being conducted, perform the steps as outlined in the Field Inspection Manual, Ansul Part No. 31274, in the back of this manual.

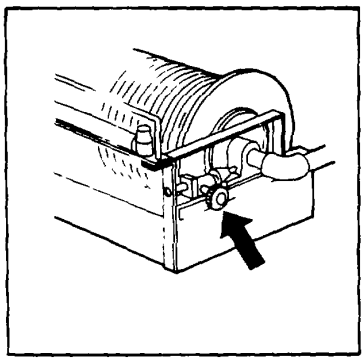


19. Pull ring pin and close BLACK AFFF Valve.

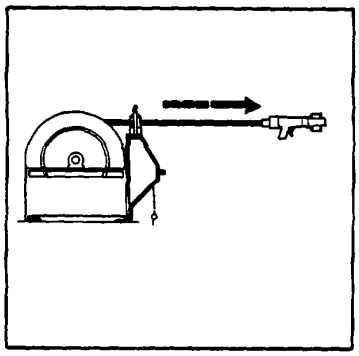




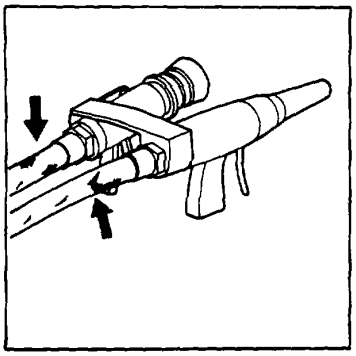
20. Pull ring pin and open BLUE clean-out valve.



21. Make certain hose reel is unlocked.

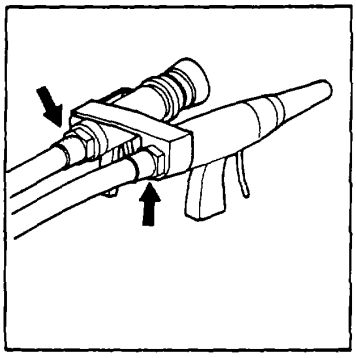


22. Pull ring pin on nozzle assembly holder and pull all hose from reel.

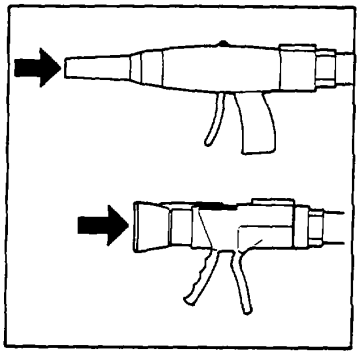


23. Examine hose for abrasion, cracks, or cuts.

24. Make certain nose couplings are tight and inspect for corrosion or mechanical damage.



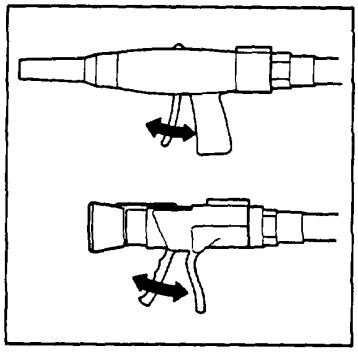
25. Examine nozzle opening(s) for obstruction.



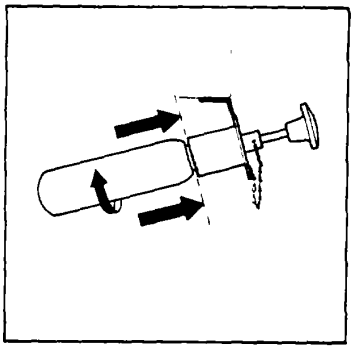
26. Squeeze nozzle triggers to check for free movement.

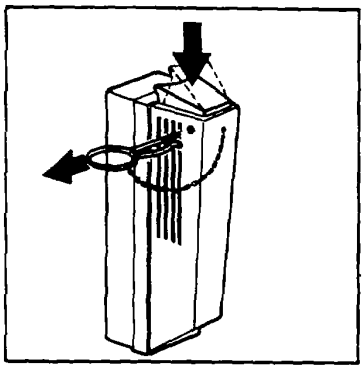
NOTE

Make certain nozzle triggers are forward in the CLOSED position.



27. Make certain cartridge is fully threaded into dashboard actuator.

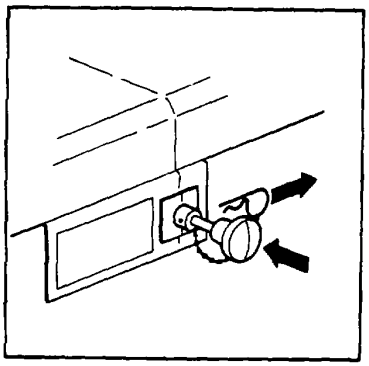




28. Pull ring pin, push button or lever on actuator. (serves as functional test of valve actuators and cylinder valves.)

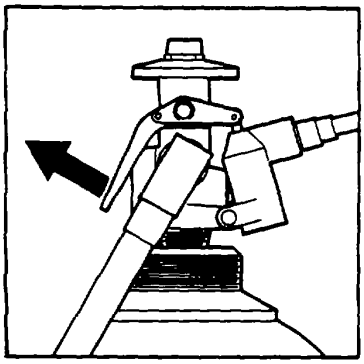
IMPORTANT

The actuator must be operated at every maintenance examination to verify system operation. Completion of all maintenance steps is vital to assure that the system will operate effectively and safely.

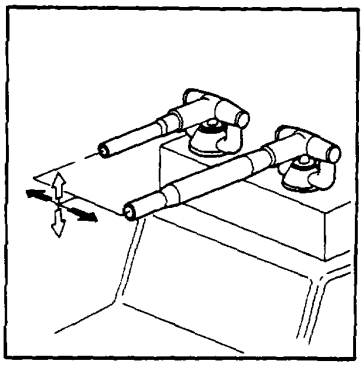


NOTE

Alternate use of the remote and dashboard actuators is recommended.



29. Check nitrogen cylinders, all valves should be open.

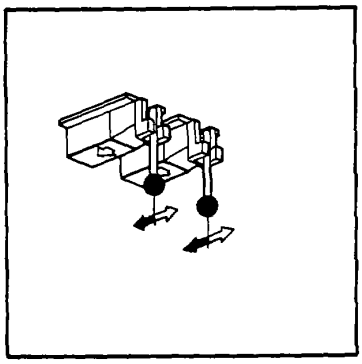


30. Swing turret horizontally and vertically to check for free movement.

31. Quickly open and close each turret individually to check valve operation.

NOTE

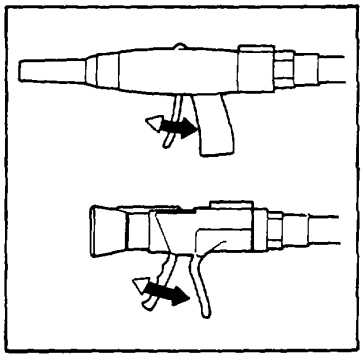
Escaping gas serves to confirm line is unobstructed and that valve and valve controls are operable.



32. Quickly open and close each hand line nozzle individually to check valve operation.

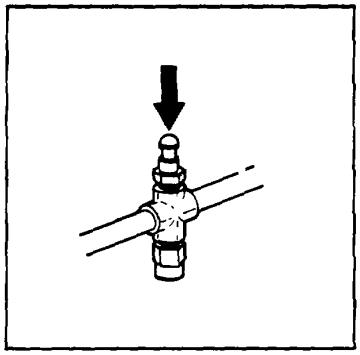
NOTE

Escaping gas serves to confirm lines are unobstructed and valves are operable.

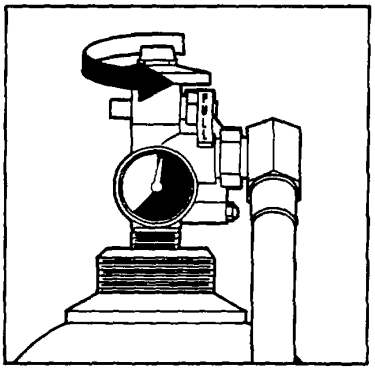


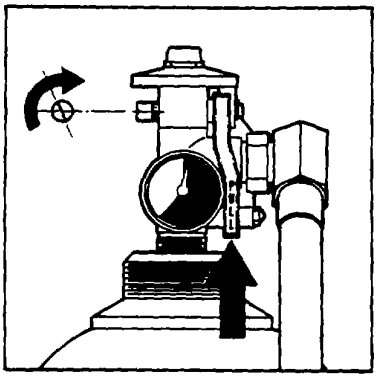
33. Close nitrogen cylinder valves.

a. Push GREEN Pressure Relief Valve Button to relieve pressure in cylinder actuation system manifold.

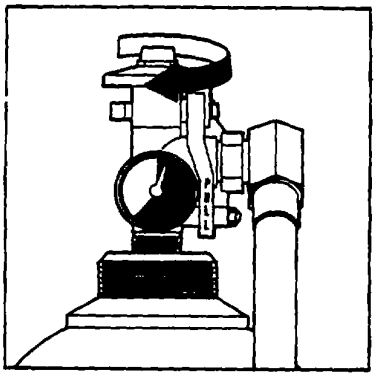


b. Turn handwheel counterclockwise to OPEN position.

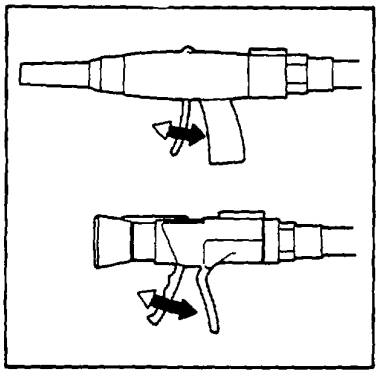




c. Push Quick-Opening lever toward valve body while rotating cross shaft flat clockwise (when facing cross shaft from end with flat) to STOP position.



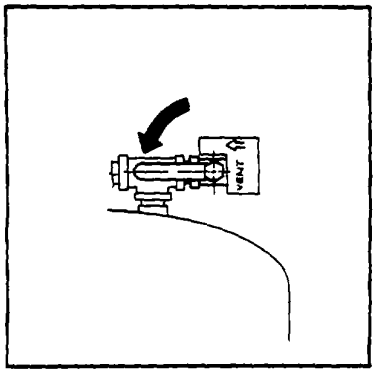
d. Close valve by turning handwheel clockwise, hand tighten.



34. Open dry chemical and AFFF nozzles to relieve pressure remaining in piping and hose lines.

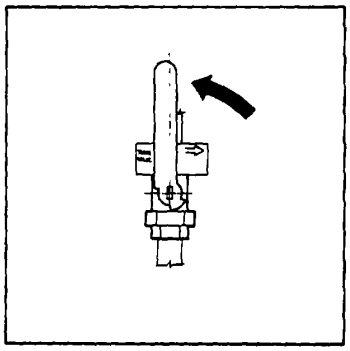
NOTE

DO NOT ATTEMPT TO RELIEVE PRESSURE THROUGH TURRET.

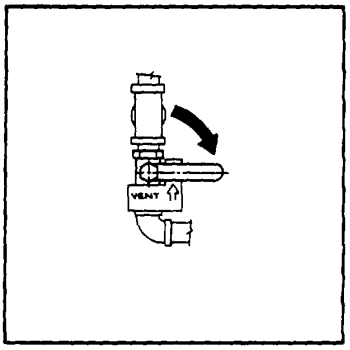


35. Open GREEN vent valve on AFFF tank to relieve residual pressure due to check valve in AFFF product line.

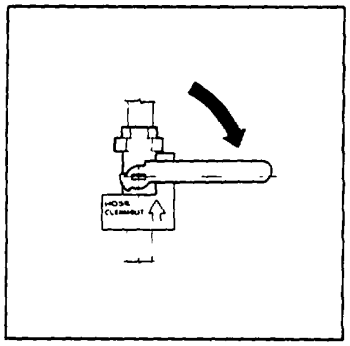
a. RED Tank Valve OPEN



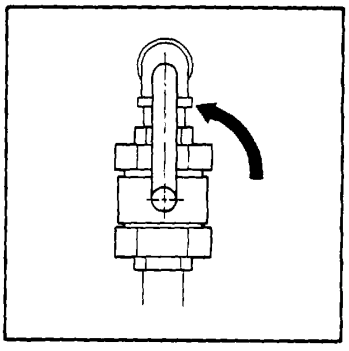
b. GREEN Vent Valve CLOSED

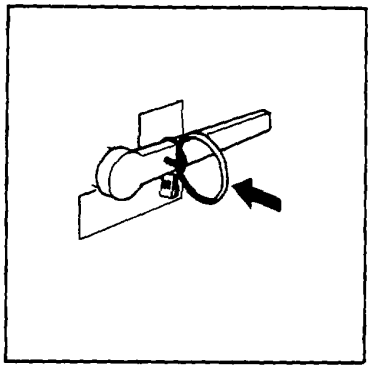


c. BLUE Hose Clean-Out Valve CLOSED

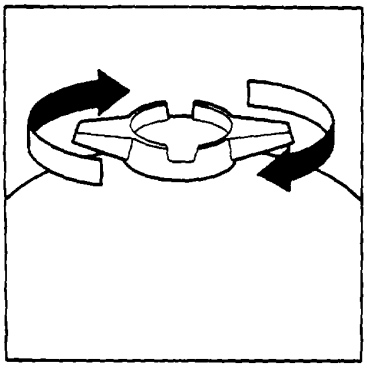


d. BLACK Dry Chemical Valve OPEN

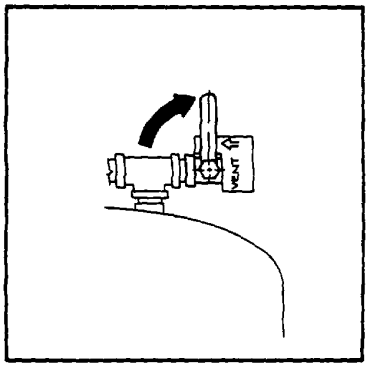




37. Insert ring pin(s) through handle(s) in bracket(s) and seal with visual inspection seal(s), Ansul Part No. 15999.

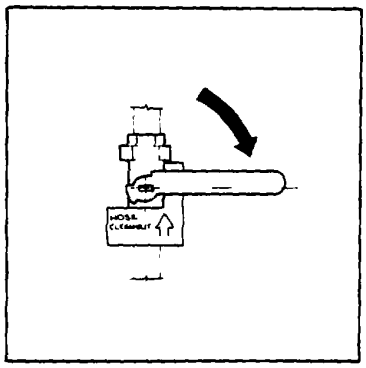


38. Secure dry chemical tank fill cap, hand tighten.



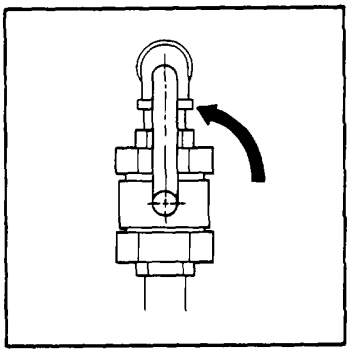
39. Return all AFFF solution tank valve handles to operating position

    a. GREEN Vent Valve CLOSED

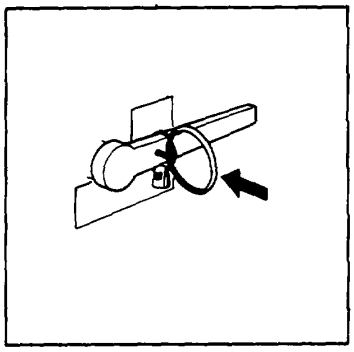


    b. BLUE Hose Clean-Out Valve CLOSED

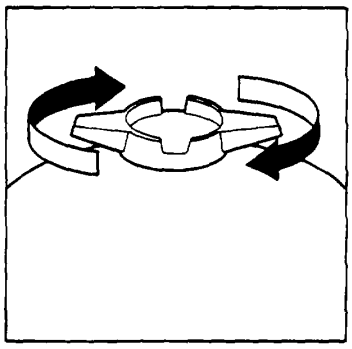
c. BLACK AFFF Valve OPEN



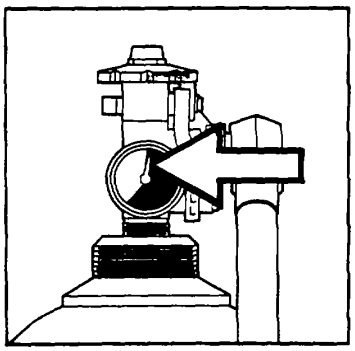
40. Insert ring pin(s) through handle(s) in bracket(s) and seal with visual inspection seal(s), Ansul Part No. 15999.

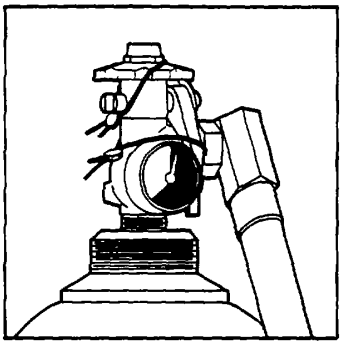


41. Secure AFFF solution tank fill cap, hand tighten.



42. Re-read cylinder gauge(s). Note pressure, rechecking ambient temperature and refer to Temperature Correction Chart in Appendix A-3. Replace cylinder(s) if below minimum pressure.

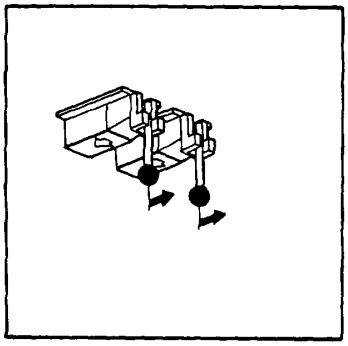




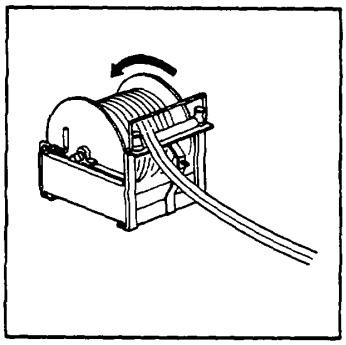
43. Seal handwheel(s) and operating lever(s) with visual inspection seals, Ansul Part No. 197.

NOTE

Should cylinder replacement be required, refer to Recharge Section, Pages 41 0 through 414, Steps 32 through 39 for correct procedures.



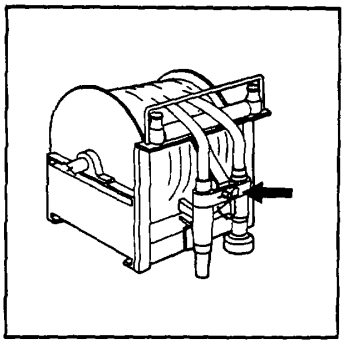
44. Make certain both turret valve operating controls are in the closed position.



45. Rewind hose on reel.

NOTE

Do not lock hose reel.

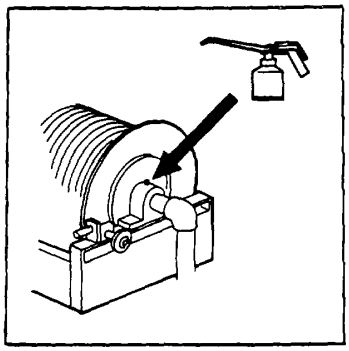


46. Secure nozzle assembly on holder and insert ring pin.

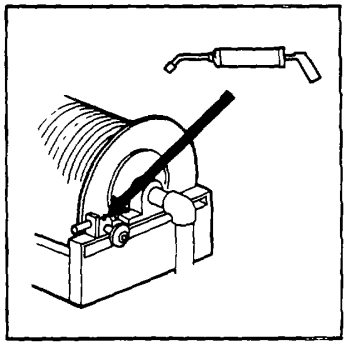
NOTE

Make certain nozzle trigger(s) are forward in the CLOSED position.

47. Oil hose reel inlet body bearing(s).

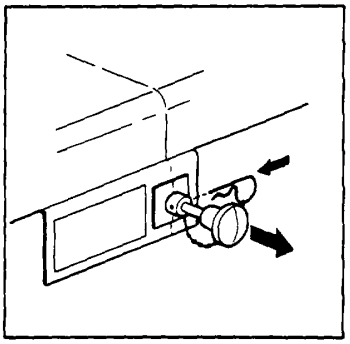


48. Grease hose reel pinion bearing(s).

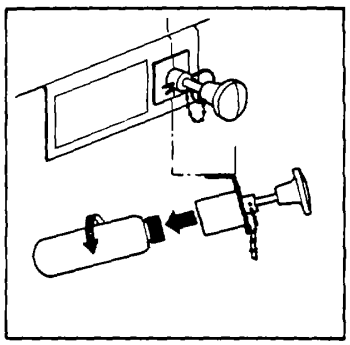


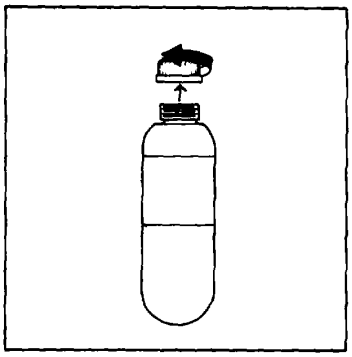
49. Replace cartridge in dashboard actuator ... if used.

    a. Pull out dashboard actuator button and insert ring pin to assure safe cartridge installation.



    b. Remove spent cartridge.

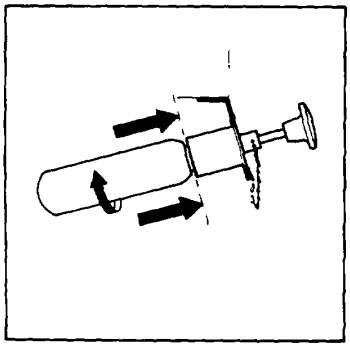




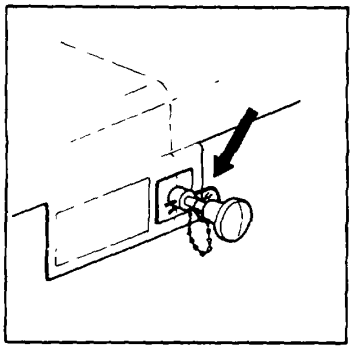
c. Remove safety shipping cap from replacement cartridge. Weigh cartridge. Replace if weight is 1/4 ounce (7.1 g.) or more below weight stamped on cartridge.

NOTE

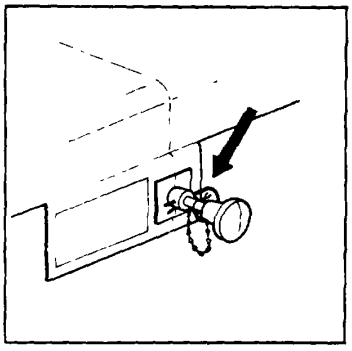
Use cartridge, Ansul Part No. 24380 only. Order cartridge shipping assembly, Ansul Part No. 7013, to assure receiving correct replacement cartridge.



d. Screw cartridge into actuator, hand tighten.



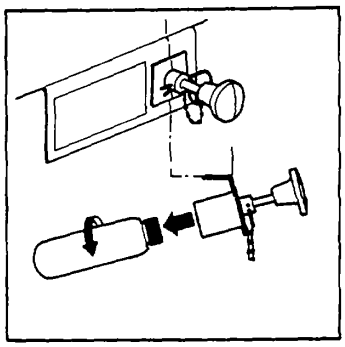
e. Seal ring pin to actuator stem with visual inspection seal, Ansul Part No. 15999.



50. Check cartridge in dashboard actuator ... if unused.

    a. Check that actuator ring pin is properly inserted and that visual inspection seal(s) is intact.

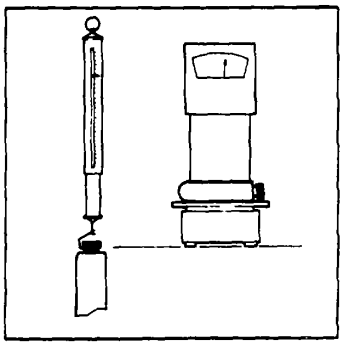
b. Remove cartridge from actuator.



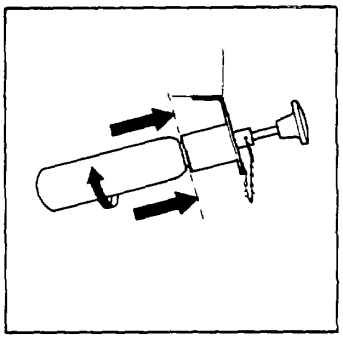
c. Weigh cartridge. Replace if weight is 1/4 ounce (7.1 g.) or more below weight stamped on cartridge.

NOTE

Use cartridge, Ansul Part No. 24380, only. Order cartridge shipping assembly, Ansul Part No. 7013, to assure receiving correct replacement cartridge.

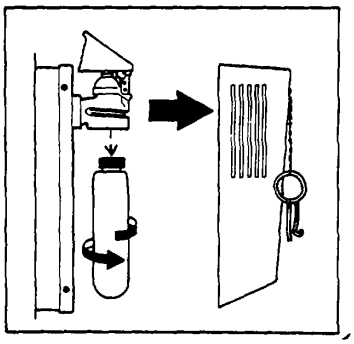


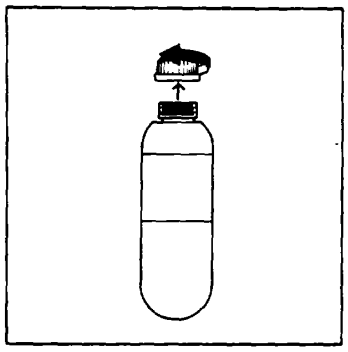
d. Screw cartridge into actuator, hand-tighten.



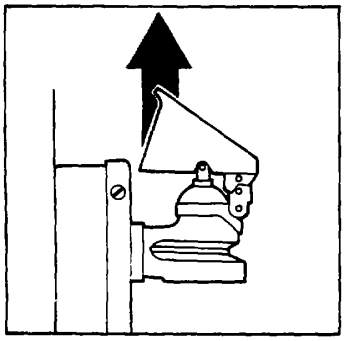
51. Replace cartridge in remote actuator ... if used.

    a. Remove guard and spent cartridge.

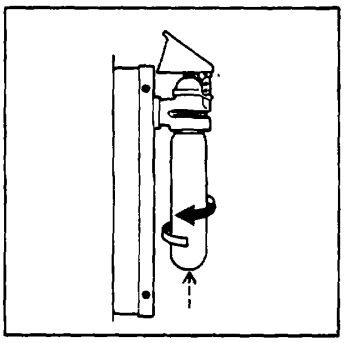




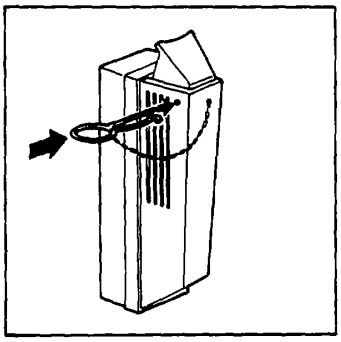
b. Remove safety shipping cap from replacement cartridge. Weigh cartridge. Replace if weight is 1/4 ounce (7.1 or more below weight stamped on cartridge. NOTE: Use cartridge, Ansul Part No. 24380, only. Order cartridge shipping assembly, Ansul Part No. 7013, to assure receiving correct replacement cartridge.



c. Raise puncture lever to assure safe cartridge installation.

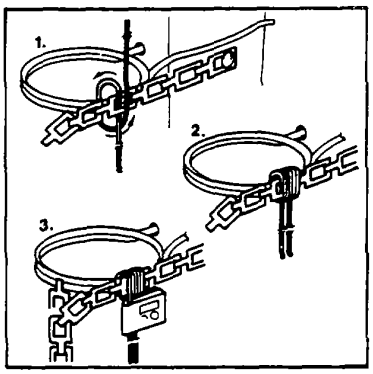


d. Screw cartridge into actuator, hand-tighten.



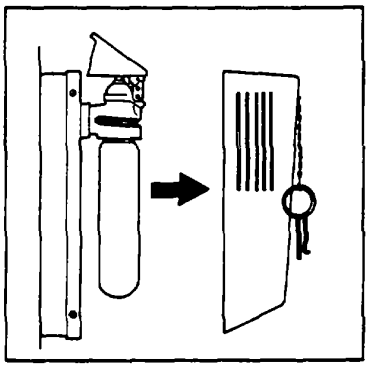
e. Replace cartridge guard and insert ring pin through guard into puncture lever link.

f. Seal with visual inspection seal, Ansul Part No. 15999.

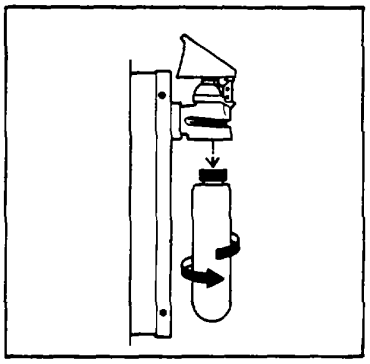


52. Check cartridge in remote actuator. . if unused.

a. Pull ring pin and remove guard.



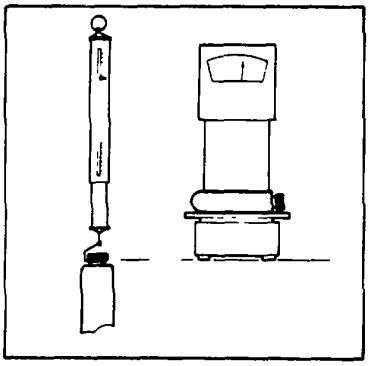
b. Remove cartridge from actuator.

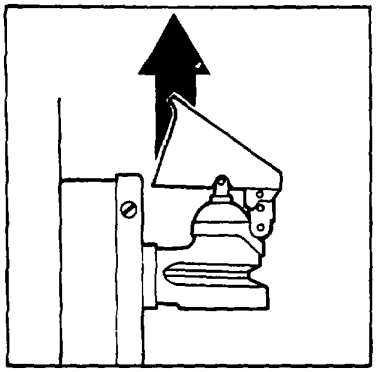


c. Weigh cartridge. Replace if weight is 1/4 ounce (7.1 g.) or more below weight stamped on cartridge.

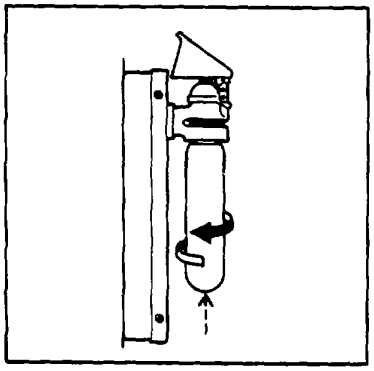
NOTE

Use cartridge, Ansul Part No. 24380 only. Order cartridge shipping assembly, Ansul Part No. 7013, to assure receiving correct replacement cartridge.

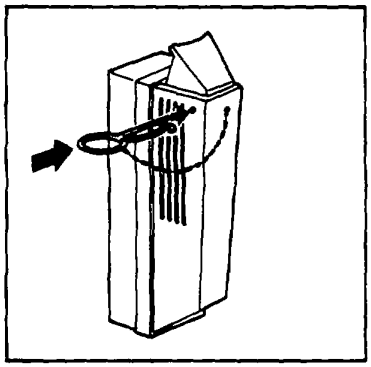




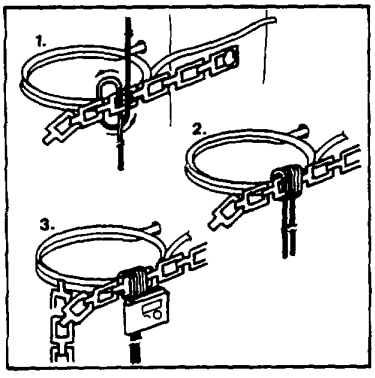
d. Raise puncture lever to assure safe cartridge installation.



e. Screw cartridge into actuator, hand-tighten.

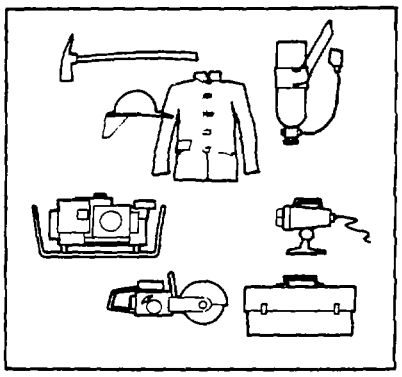


f. Replace cartridge guard and insert ring pin through guard into puncture lever link.

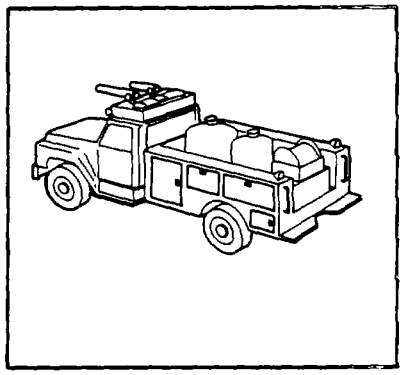


g. Seal with visual inspection seal, Ansul Part No. 15999.

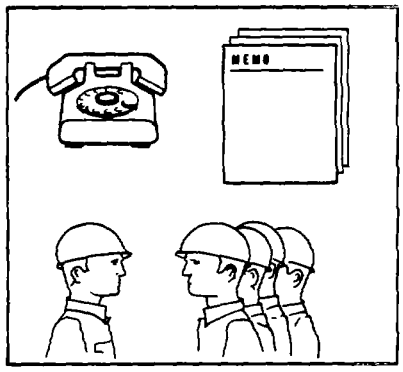
53. Make certain all rescue equipment is properly secured.



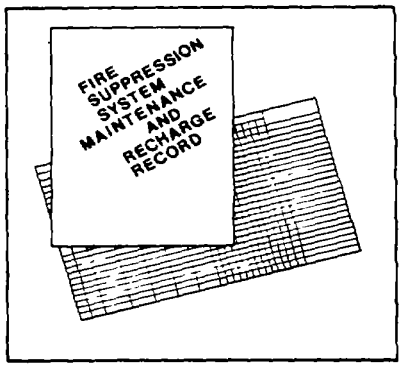
54. Make certain all doors are tightly latched



55. Notify operating personnel that fire suppressing/securing system is back in service.



56. Record date of maintenance examination.



The best assurance against fire suppressing/securing system malfunction is proper operation, recharge, inspection and maintenance. To remedy as quickly as possible any disorder that may come, the following table lists some of the probable irregularities that may develop and gives suggestions for corrective action.

Service and Repair. . . to remedy any disorder detected through periodic inspection or maintenance examinations:

COMPONENT	DISORDER	CORRECTIVE ACTION
Extinguishing Agent Tank(s)	Dents* or abrasions	Hydrostatically test (see ASME plate affixed to tank) and refinish (clean damaged area and repaint, using a primer and finish coat); or replace tank.
	Rust spots, pits and corrosion deposits	Clean corroded areas with a wire brush, replacing tank if there is any corrosion penetration; or repaint, using a primer and finish coat.
	Paint peeling	Remove loose paint with a wire brush and repaint using a primer and finish coat.
	Fill opening threads nicked, cross-threaded, corroded or worn	Clean threads with a stiff BRISTLE brush. Small nicks, burrs, rough or feathered edges may be eliminated by careful retapping or filing. If damaged or worn extensively, the tank should be replaced.
	Fill opening gasket seating surface nicked, gouged, corroded or bearing dirt deposits	Clean seating surface with a mild abrasive and lubricate cleaned surface lightly with a good grade of high heat resistant grease. If surface is sharply nicked or deeply gouged, replace tank.
	Seam welds evidencing discoloration or pin holes	Replace tank or consult Product Services, Ansul Fire Protection, Marinette, Wisconsin 54143.
Fill Cap(s)	Abraded, cracked, corroded or otherwise damaged fill cap.	Replace, destroying affected cap to prevent reuse.
	Obstructed fill cap pressure vent hole	Clear vent hole with a stiff, unbreakable wire probe of lesser diameter than vent hole.
	Threads corroded, nicked, cross-threaded or worn	Replace, destroying affected cap to prevent reuse.
	Cut, checked, deformed, stiff, brittle or worn gasket	Replace, coating clean, new gasket lightly with a good grade of high heat resistant grease.

*Record dents for reference in future servicing, replacing shell if dents are other than shallow.

COMPONENT	DISORDER	CORRECTIVE ACTION
Extinguishing Agent(s)	Improper fill level	Fill tank to rated capacity with extinguishing agent specified on nameplate-s) only.
	Caked* dry chemical	Discard agent and refill tank to rated capacity with extinguishing agent specified on name-plate(s) only.
	Low AFFF (Aqueous Film-Forming Foam) Premix Solution Concentration	6% - Actual % / 100 x Tank Capacity = Gallons of ANSULITE AFFF concentrate Example 6 - 2 / 100 x 100 = Gallons of concentrate 6 - 2 / 100 x 100 = 2 gallons Replace 2 gallons of solution with 2 gallons of ANSULITE AFFF concentrate and stir solution for 30 seconds using a non-metallic rod.
	Poor AFFF solution film formation and sealability	Replace entire AFFF solution charge
	Low AFFF solution expansion ratio	Replace entire AFFF solution charge.
Gas Tube	Bent, cracked, broken	Replace, using factory built and pressure or obstructed tested assembly only.
	Loose, leaking, damaged, or missing check valve	Replace, using factory built and pressure tested assembly only.

*The term caked, as applied to dry chemical describes a condition. It is best identified as dry chemical containing hard lumps. These lumps will render a dry chemical extinguisher inoperative. The condition usually follows the absorption and later the evaporation of an unusual amount of moisture. It is often confused with packing a condition produced by normal settling, by vibration or by impact. There is no known case on which there is evidence that an Ansul extinguisher was made inoperative as a result of packing. A simple procedure to determine which condition exists is the Underwriters Laboratories four inch drop to a clean hard surface test. If the lumps do not break up into individual particles, caking is present.

COMPONENT	DISORDER	CORRECTIVE ACTION
Dry Chemical Pick-Up Tube	Obstructed	Disconnect pipe and fittings at dry chemical tank outlet and use plumbers drain auger to clear tube.
Nameplate(s)	Unreadable wording	Use a mild abrasive (scouring powder) to clean plate. If readability cannot be improved, replace nameplate.
	Loose	Remove nameplate and inspect area under plate. If corroded, see "Extinguishing Agent Tank(s) - Rust Spots, Pits and Corrosion Deposits" and take appropriate corrective action as surface condition would indicate or clean area (repaint using a primer and finish coat if necessary) and reaffix nameplate using a good grade of heatless adhesive.
	Missing	Replace with correct nameplate (see applicable parts list).
Nitrogen Cylinder(s)	Rust spots, pits and corrosion deposits	Clean corroded areas with wire brush, replacing cylinder if there is any corrosion penetration; or repaint using a primer and finish coat.
	Dents or abrasions	Depressurize, remove valve and destroy both internal and external threads on the cylinder to render the vessel unusable.
	Paint peeling	Remove loose paint with a wire brush and repaint using a primer and finish coat.
	Safety shipping cap threads on cylinder nicked, cross-threaded, corroded or worn	Clean threads with a stiff bristle brush, small nicks, burrs, rough or feathered edges may be eliminated by careful filing. If damaged, worn or corroded severely, the cylinder should be scrapped and replaced.
	Valve leakage suspected	Apply soap solution over valve opening, around valve, to cylinder joint and all other joints, including the valve stem. If soap solution bubbles at any point, depressurize cylinder and replace valve assembly,
	Corroded, damaged or jammed valve handwheel or pull lever	Depressurize cylinder, check freedom of movement, clean and repair or replace affected part(s); or replace valve assembly.
	Immovable, jammed, loose (tap lightly to check) or missing gauge pointer	Depressurize cylinder and replace valve assembly or consult Product Services, Ansul Fire Protection, Marinette, Wisconsin 54143.

COMPONENT	DISORDER	CORRECTIVE ACTION
Nitrogen Cylinder(s) (Continued)	Missing, deformed or broken gauge crystal or bezel	Replace crystal and bezel assembly (see applicable parts list).
	Wrong gauge	Depressurize cylinder and replace valve assembly or consult Product Services, Ansul Fire Protection, Marinette, Wisconsin 54143.
	Unreadable, faded or corroded dial	Depressurize cylinder and replace valve assembly or consult Product Services, Ansul Fire Protection, Marinette, Wisconsin 54143.
	Gauge pointer below acceptable operating range	Check pressure with test gauge, Ansul Part No. 2737, tapping valve gauge lightly to check for mechanical disorder (gauge pointer loose or immovable). If test gauge pressure reading confirms valve gauge pressure reading, perform leakage test as outlined in "Valve Leakage Suspected", taking the appropriate corrective action indicated. If valve leak test result is negative, test cylinder for pinhole leak(s), discard cylinder after rendering it unusable by depressurization, removal of valve and destruction of internal and external threads if leak(s) is detectable or consult Product Services, Ansul Fire Protection, Marinette, Wisconsin 54143.
	Gauge pointer above acceptable operating range	Check pressure with test gauge, Ansul Part 2737, tapping valve gauge lightly to check for mechanical disorder (gauge pointer loose or immovable) and then bleed off excess pressure or depressurize and replace valve assembly.
	Corroded, bent or worn cylinder retaining clamp(s)	Clean and refinish; repair and refinish; or replace.
	Loose or binding cylinder retaining clamp(s)	Adjust fit by tightening or loosening clamp; adjust screw or replace clamp(s).
	Worn or missing protective cylinder clamp webbing or grommet	Replace webbing, Ansul Part No. 3360 or grommet, Ansul Part No. 8688.
	Wrong cylinder retaining clamp(s)	Replace clamp(s) with type specified by Ansul only.
Pressure Regulator(s)	Corroded, dented or otherwise damaged	Replace regulator(s).
	Regulator safety relief valve is corroded, plugged, dented, broken or missing	Replace valve.

COMPONENT	DISORDER	CORRECTIVE ACTION
Expellant Gas and Agent Control Valve(s)	Broken or missing visual inspection seal(s)	Replace seal(s).
	Bent, corroded or binding ring pin(s)	Replace ring pin(s).
	Bent, broken or missing valve handle	Remove, repair and reassemble or replace.
	Valve immovable, stiff, inoperable or leaking	Disconnect, disassemble and clean, replacing parts as required.
Pressure Relief Valve(s)	Corroded, plugged, dented, broken or missing	Clean, repair and test before reinstalling or replace valve(s).
Hose (Expellant Gas and Agent)	Cut, cracked, abraded, or deformed exterior	Replace entire hose assembly or hose only if coupling(s) are reusable type.
	Corroded, or cracked coupling(s), swivel joint or ferrule	Replace entire hose assembly or coupling(s) only if reusable type.
	Corroded, cross-threaded or worn coupling threads	Replace entire hose assembly or coupling(s) only if reusable type.
	Internal blockage	Clear by blowing dry air or nitrogen at 220 PSI through hose. CAUTION: Do not leave open end of hose unattended unless adequately restrained to prevent whipping, endangering life/safety.
	Coupling gasket(s) brittle, compression set, cut, cracked or missing	Replace, lubricating clean, new gasket(s) lightly with a good grade of high heat resistant grease before insertion.
Nozzle(s)	Wrong nozzle	Replace with type nozzle recommended by the manufacturer (Ansul).
	Valve body or barrel abraded, corroded, cracked or dented	Replace valve or barrel if in any way damaged or deformed.
	Operating handle broken or deformed	Replace handle.

COMPONENT	DISORDER	CORRECTIVE ACTION
Nozzle(s) (Continued)	Operating handle loose	Adjust securement screw by tightening.
	Operating handle binding or immovable	See "Leaking Nozzle" below.
	Leaking nozzle, plugged tip and/or discharge passage	Disassemble and clean deposits from internal passages and parts with small, stiff bristle brush; examine gaskets and 0-rings and replace if cut, checked, deformed, stiff, brittle or worn. Reassemble nozzle and pressure test at 220 PSI.
	Threads nicked, worn or cross-threaded	Replace thread bearing component (barrel, valve body or adaptor).
	Gasket(s) or 0-ring(s) brittle, compression set, cracked, cut or missing	Replace, lubricating gasket(s) or 0-ring(s) lightly with a good grade of high heat resistant grease before insertion.
Hose Reel(s)	Dents or abrasions	Repair affected area of item, clean and repaint, using a primer and finish coat; replace individual item if damage interferes with operation.
	Rust spots, pits, corrosion deposits or peeling paint	Clean corroded areas with a wire brush (replace any item seriously weakened by corrosion penetration) and repaint, using a primer and finish coat.
	Reel binding or stiff operating	Oil inlet body bearing(s) and grease pinion gear.
	Reel immovable	Disassemble inlet swing joint assembly(ies), clean deposits from internal passages with a stiff brass or bristle brush, replace gasket(s) or 0-ring(s) if cut, checked, deformed, brittle or worn and reassemble, oiling inlet body bearing and greasing pinion gear.
	Pressure leakage	See "Reel Immovable" above if leakage is discovered at a fitting other than the hose to reel connection.

COMPONENT	DISORDER	CORRECTIVE ACTION
Pneumatic Actuation System	Corroded, jammed or broken puncture lever	Clean, repair to free movement, or replace.
	Dull, bent or damaged puncture pin	Replace pin, making certain safety retaining ring is secure in groove near tip.
	Corroded, nicked, cross-threaded or worn cartridge receiver threads	Remove receiver, destroy threads, discard and replace
	Obstructed cartridge receiver pressure vent hole	Clear vent with stiff unbreakable probe of lesser diameter than vent hole.
	Wrong cartridge	Replace cartridge with type specified by Ansul only (refer to applicable parts list).
	Gas cartridge corroded, dented or abraded; or gas cartridge cross-threaded or worn	Depressurize (disconnect high pressure line to cylinder(s) and push remote actuator lever to safely vent pressure) and discard after destroying internal and external threads to prevent reuse.
	Scored, cut or corroded gas cartridge seal disc; or illegible identification or weight markings	Depressurize (disconnect high pressure line to cylinder and push lever to safely vent pressure) and replace with factory filled and sealed cartridge. Install safety shipping cap on empty cartridge and return to supplier for refill.
	Wrong cartridge seal used in previous recharge to supplier.	Remove and replace with factory filled and sealed cartridge, returning replaced cartridge
	Corroded, jammed, cracked, broken or leaking nitrogen cylinder valve actuator	Disassemble, clean, replace affected parts and conduct operation test (see Maintenance Section or replace).
	Obstructed pneumatic valve actuator piston downstroke pressure relief vent	Clear vent with stiff, unbreakable probe of lesser diameter than vent hole.
Turret		See Nozzle Section

CONTENTS

ANSUL TWIN-AGENT FIRE FIGHTING TRUCK

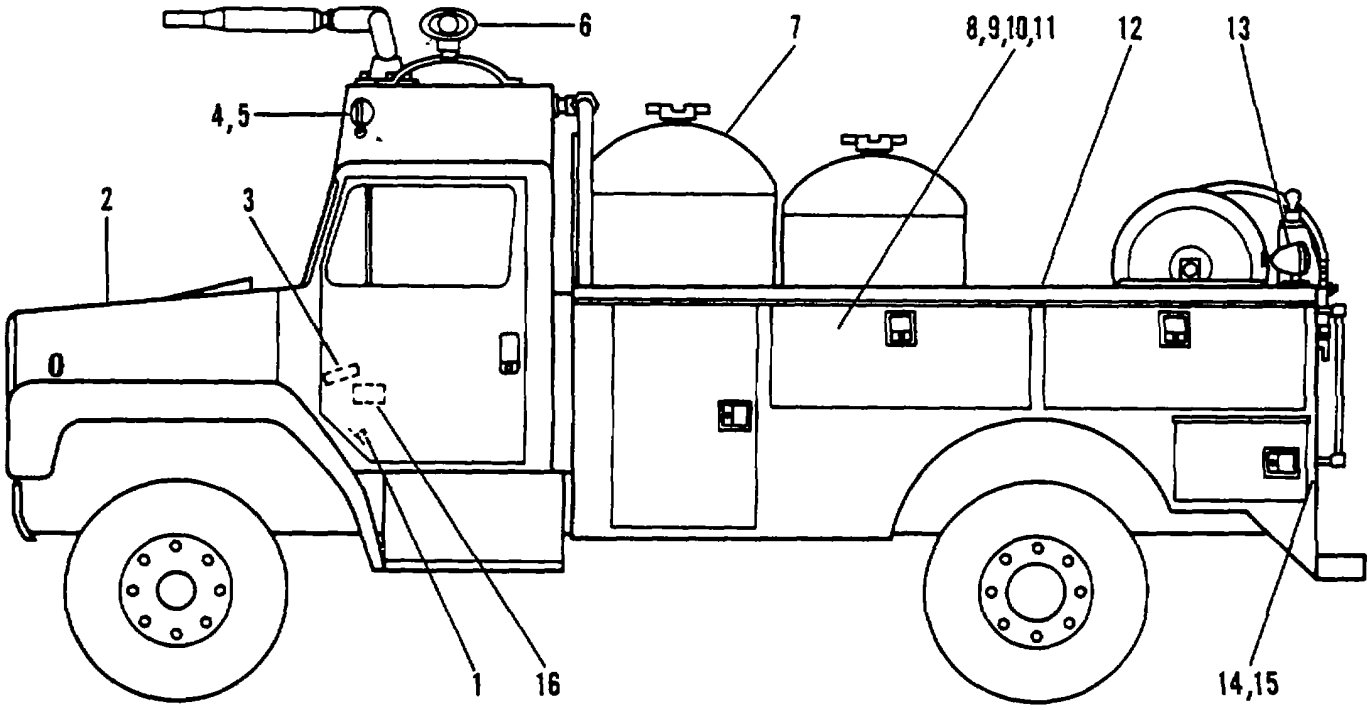
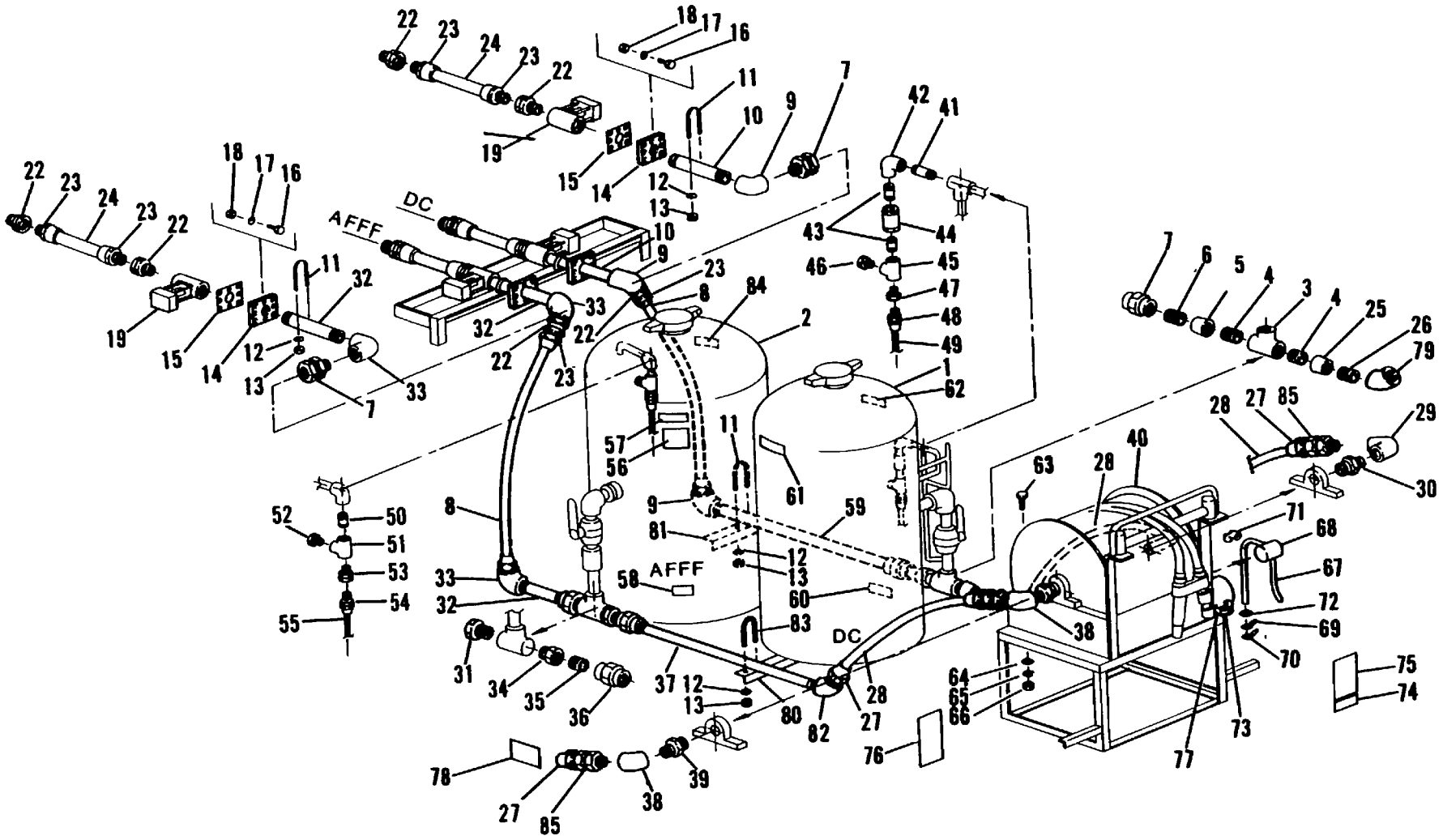


FIGURE NO.	DESCRIPTION	PART NO.
-	Twin Agent (1350 PKP/200 AFFF) Fire Fighting Truck	S-52530
1	Floor Mounted Switch	S-52920
2	International Chassis Specification 4x4	S-52528
3	Siren/PA Control System	S-52917
4	Spotlight - Left Side	S-52540
5	Spotlight - Right Side	S-52541
6	Warning Light	S-52531
7	1350 PKP/200 AFFF Suppressing/Securing System	S-52527
8	Rescue Saw	S-27770
9	Hydraulic Rescue Kit	S-52536
10	Aircraft Rescue Tool Kit	S-52537
11	Rescue Tool	S-52534
12	International Service Body	S-52529
13	Deck Light (2)	S-28259
14	Actuation Piping (Not Shown)	S-52539
15	Cylinder Piping Assembly (Not Shown)	S-52535
16	Identification Nameplate	S-52274

ANSUL TANK AND PIPING LAYOUT



ANSUL TANK AND PIPING LAYOUT

FIGURE NO.	DESCRIPTION	QUANTITY	PART NO.
-	Tank and Piping Layout	1	S-52527
1	DC Tank Assembly, 1500 Lb.	1	S-63087
2	AFFF Tank Assembly, 200 Gal.	1	S-52538
3	Tee 3"	1	12744
4	Nipple 3" x 3"	2	8284
5	Coupling, Reducing 3" x 2"	1	19956
6	Nipple, Close 2"	1	16396
7	Union 2"	1	30393
8	Hose 2" x 60"	2	19578
9	Elbow 2" x 900	2	14232
10	Pipe 2" x 11"	1	2918
11	U-Bolt	3	14626
12	Lockwasher 1/4"	8	968
13	Hex Nut, 20 UNC-1/4"	8	545
14	Backup Plate	2	16795
15	Gasket	2	16794
16	Machine Screw, Rd. Hd.,#10-32 NF x 11/16 (S.S.)	16	3855
17	Lockwasher#10 (S.S.)	16	14235
18	Hex Nut, #10-32 NF (S.S.)	16	14732
19	Ball Valve 2" and Actuator Assembly	2	29345
20	Valve, Ball 2" (Brass) (Not Shown)	2	4281
21	Actuator, Ball Valve (Not Shown)	2	29347
22	Union, Swivel Adapter 2" (Brass)	6	16153
23	Coupling, Reusable 2" (Brass)	8	16154
24	Hose 2" x 9"	2	19578
25	Coupling, Reducing 3" x 1-1/2"	1	1689
26	Nipple, Close 1-1/2"	1	16282
27	Coupling, Reusable 1-1/2" (Brass)	4	16158
28	Hose 1-1/2" x 48"	2	14617
29	Elbow 1-1/2" x 900	1	4275
30	Nipple 1-1/2" x 2-1/2"	1	2039
31	Bushing, Reducing 3" x 2" (Brass)	1	19950
32	Pipe 2" x 11" (Brass)	2	19864
33	Elbow 2" x 900 (Brass)	2	19849
34	Bushing, Reducing 3" x 1-1/2" (Brass)	1	19857
35	Nipple, Close 1-1/2" (Brass)	1	19843
36	Union, 1-1/2" (Brass)	1	19980
37	Pipe 1-1/2" x 39" (Brass)	1	19854
38	Elbow 1-1/2" x 900 (Brass)	1	19829
39	Nipple 1-1/2" x 2-1/2" (Brass)	1	19830
40	Hose Reel Assembly	1	S-52806

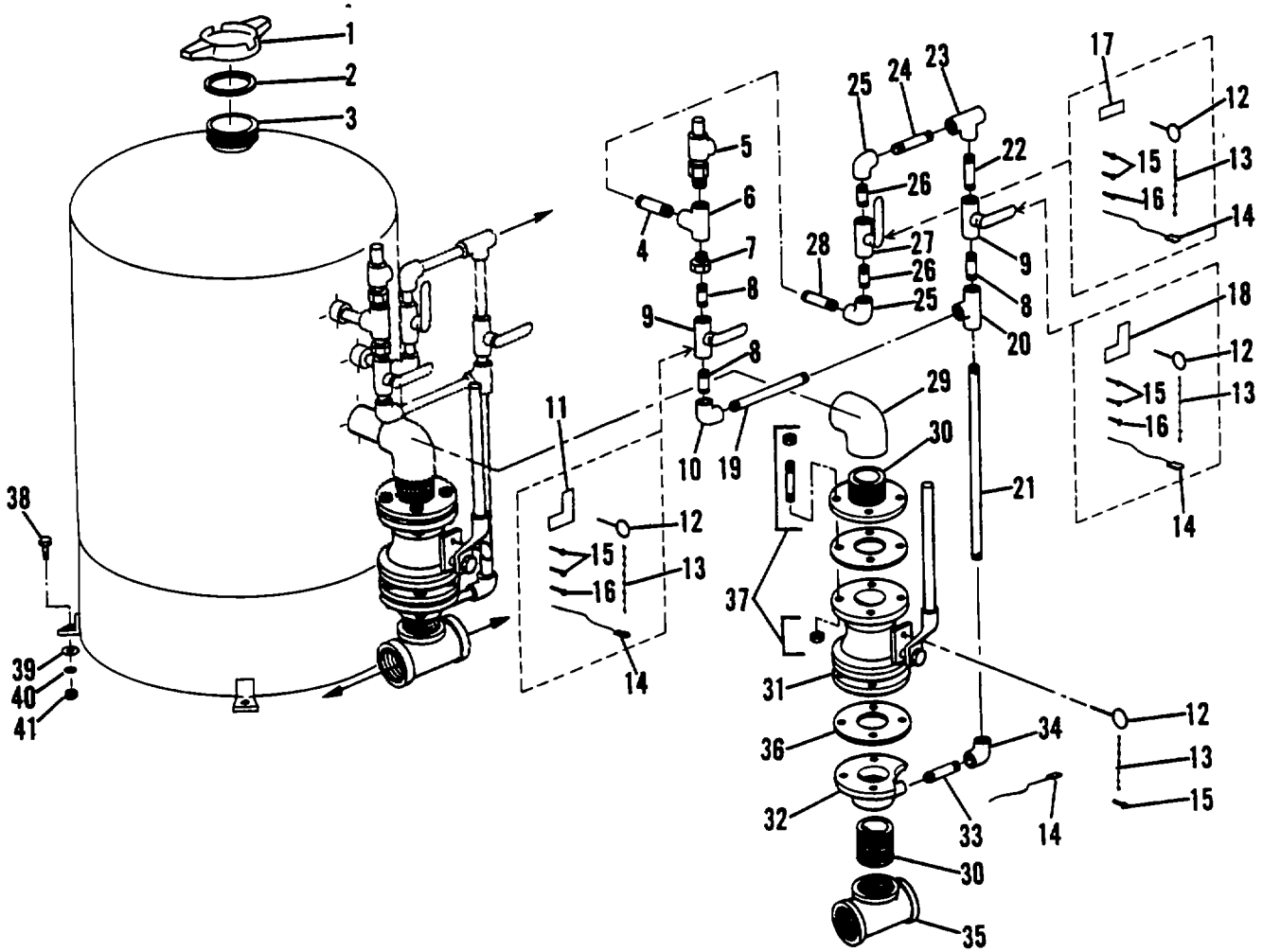
ANSUL TANK AND PIPING LAYOUT (Cont.)

FIGURE NO.	DESCRIPTION	QUANTITY	PART NO.
41	Nipple, Close 1-1/4"	1	16278
42	Elbow 1-1/4" x 900	1	4274
43	Nipple 1-1/4" x 2-i/2"	2	2069
44	Valve, Check 1-1/4"	1	12549
45	Tee 1-1/4"	1	12819
46	Bushing, Reducing 1-1/4" x 1/4"	1	13057
47	Union, Swivel Adapter 1-1/4"	1	19609
48	Coupling, Reusable 1-1/4"	2	19608
49	Hose 1-1/2" x 106"	1	19606
50	Nipple 3/4" x 2"	1	1765
51	Tee 3/4"	1	2078
52	Bushing, Reducing 3/4 x 1/4"	1	1770
53	Union, Swivel Adapter 3/4"	1	16159
54	Coupling, Reusable 3/4"	2	19611
55	Hose 3/4" x 148"	1	19610
56	Plate, AFFF Refill Chart	1	S-52316
57	Plate, AFFF Tank I.D.	2	14206
58	Plate, Name 'AFFF Product Valve"	1	S-52262
59	Pipe 2" x 42"	1	25604
60	Plate, Name "D.C. Product Valve"	1	S-52263
61	Plate, D.C. Tank 1.D.	2	19149
62	Plate, Name "D.C. Relief Valve"	1	S-52265
63	Bolt, Hex Hd 3/8"-16NC x 1-1/2" (SS)	4	16512
64	Washer, Flat 3/8" (SS)	4	16618
65	Lockwasher 3/8" (SS)	4	14929
66	Nut, Hex 3/8"-16NC (SS)	4	14928
67	Hose, Sealtite Metal 12" Lg.	1	19922
68	Hose, Sealtite Metal 36"	1	19922
69	Terminal, Solderless	1	19930
70	Terminal, Solderless	1	19931
71	Elbow, Pulling 900	1	19070
72	Grommet	1	16592
73	Guard	1	19410
74	Plate, Patent	1	4070
75	Plate, Name "To Operate"	1	16150
76	Plate, Name "Recharge"	1	19147
77	Plate, Name "Hose Reel Rewind Switch"	1	S-52268
78	Plate, Name "Identification"	2	19563
79	Elbow 1-1/2" x 450	1	4277
80	Angle 2" x 2" x 1/4" x 8"	1	2987
81	Angle 2" x 2" x 1/4" x 7"	1	2987
82	Elbow 1-1/2" x 450 (Brass)	1	19181

ANSUL TANK AND PIPING LAYOUT (Cont.)

FIGURE NO.	DESCRIPTION	QUANTITY	PART NO.
83	Bolt, U	1	30858
84	Plate, Name SrAFFF Relief Valve"	1	S-52264
85	Union, Swivel Adapter 1-1/2" (Brass)	2	16157
-	Twin Turret Handle and Tie Rod Assembly (Not Shown)	1	S-52797
-	Hand Valve and Pneumatic Actuator Assembly (Not Shown)	1	S-52798
-	Grommet, For Actuation Line Through Firewall (Not Shown)	1	15989
-	Funnel, AFFF (Not Shown)	1	14315
-	Tube, AFFF Measuring (Not Shown)	1	16707
-	Funnel, Dry Chemical (Not Shown)	1	1196
-	Wire, #16-2 (24" Lg.) (Not Shown)	1	19920
-	Cable, Battery #4 (288" Lg.) (Not Shown)	1	19921

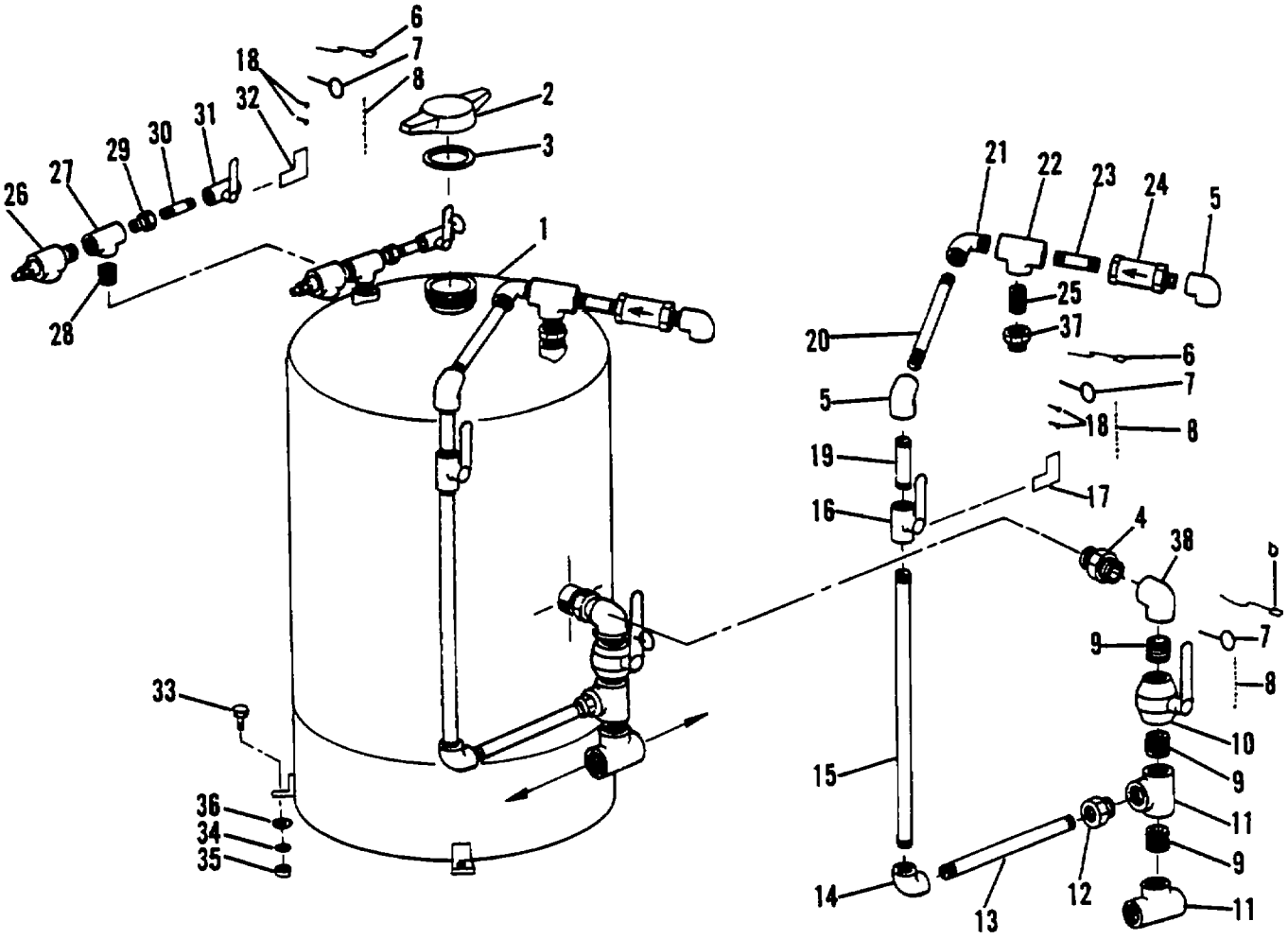
ANSUL DRY CHEMICAL TANK ASSEMBLY



ANSUL DRY CHEMICAL TANK ASSEMBLY

FIGURE NO.	DESCRIPTION	QUANTITY	PART NO.
-	Dry Chemical Tank-Assembly	Ref	S-63087
1	Cap, Fill Assembly	1	3460
2	Gasket	1	3461
3	Tank assembly	1	4545
4	Nipple 1-1/4" x 41/2" ,,	1	16279
5	Valve, Safety	1	2018
6	Tee 1"	1	2146
7	Bushing, Reducing 1" x 1/2"	1	1845
8	Nipple, Close 1/2"	3	1626
9	Valve, Ball	2	26001
10	Elbow 1/2 x 900	1	1965
11	Bracket, Nameplate	1	19993
12	Pin, Ring	4	598
13	Chain 7" Lg.	4	2367
14	Seal, Visual Inspection	4	15999
15	Rivet, Pop 3/16"	7	25540
16	Rivet, Pop	4	15053
17	Bracket, Nameplate	1	19995
18	Bracket, Nameplate	1	19992
19	Pipe 1/2" x 10-1/4" Lg.	1	2462
20	Tee 1/2"	1	10935
21	Pipe 1/2" x 18" Lg.	1	2462
22	Pipe 1/2" x 7-1/4" Lg.	1	2462
23	Tee, Reducing 1-1/4 x 1-1/4 x 1/2"	1	13336
24	Nipple 1-1/4" x 4"	1	4273
25	Elbow 1-1/4" x 900	2	4274
26	Nipple, Short 1-1/4"	2	4276
27	Valve, Ball	1	25856
28	Nipple 1" x 5"	1	2284
29	Elbow 3" x 900	1	12747
30	Pipe 3" x 3-1/2" Lg.	2	12743
31	Valve, Flanged Ball 3"	1	50571
32	Flange, Side Outlet 3" - 150*	1	51187
33	Nipple 1/2" x 2-1/2"	1	16267
34	Elbow, Union 1/2" x 900	1	16322
35	Tee 3"	1	12744
36	Gasket	2	54404
37	Stud Bolt 3/8" w/2 Nuts	8	19183
38	Screw, Hex Hd. 3/4"-1ONC x 2" (S.S.)	4	16554
39	Washer, Flat 3/4" (S.S.)	4	17227
40	Lockwasher 3/4" (S.S.)	4	16059
41	Nut, Hex 3/4"-10NC (S.S.)	4	16067
-	Gasket, Manhole (Not Shown)	1	17188
-	Tube Assembly, Gas (Not Shown)	4	13363

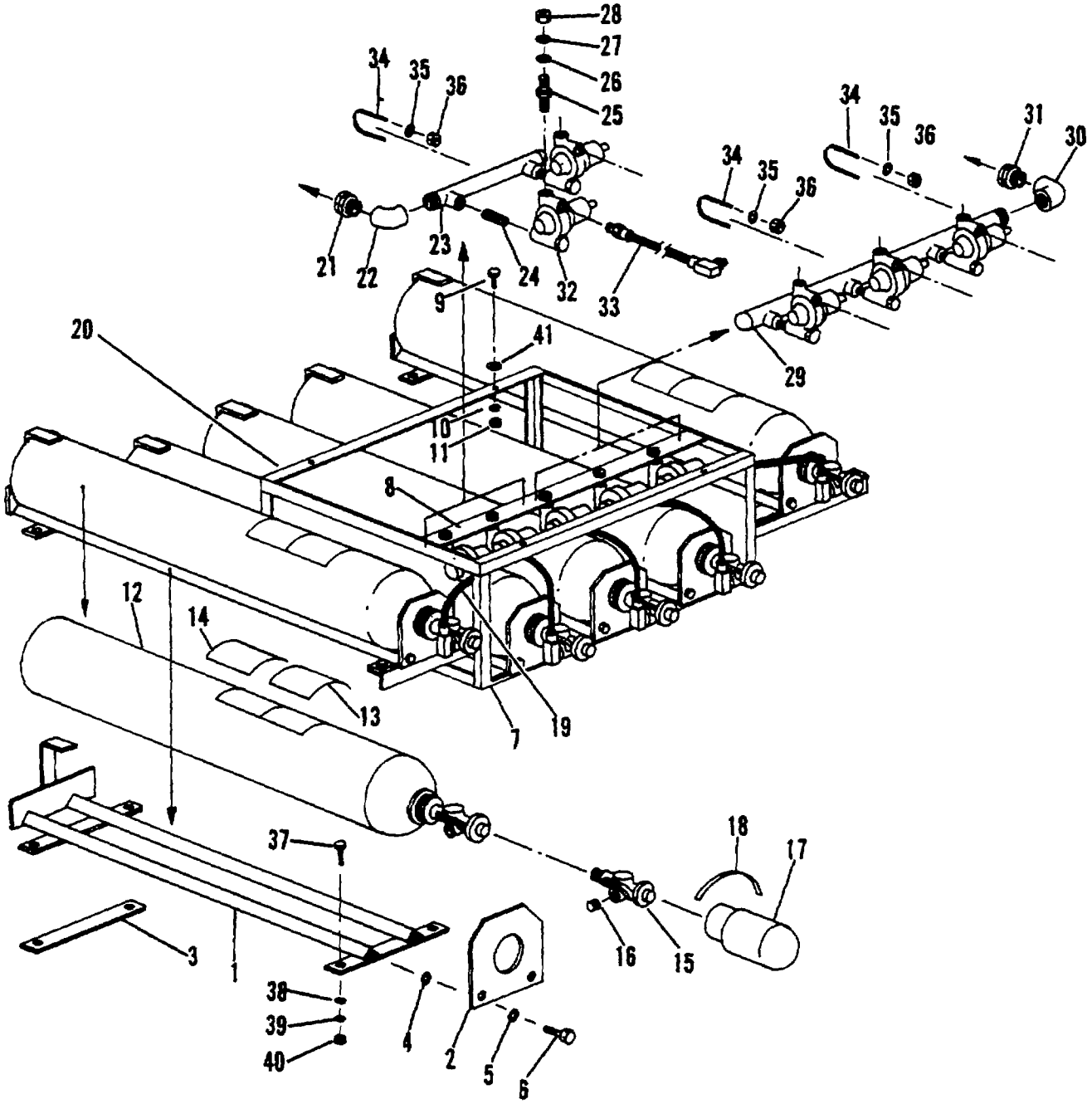
ANSUL AFFF TANK ASSEMBLY



ANSUL AFFF TANK ASSEMBLY

FIGURE NO.	DESCRIPTION	QUANTITY	PART NO.
-	AFFF-200 Tank Assembly	Ref	S-52538
1	Tank Assembly	1	S-50553
2	Fill Cap Assembly (Brass)	1	5829
3	Gasket	1	3461
4	Valve, Connector 3"	1	S-52139
5	Elbow 3/4" x 900 (Brass)	2	19833
6	Seal, Visual Inspection	3	15999
7	Ring Pin	3	598
8	Chain, Ring Pin	3	2367
9	Nipple 3" x 3" Lg.	3	19825
10	Valve, Ball 3" (Bronze)	1	12772
11	Tee 3" (Brass)	2	19974
12	Bushing, Reducing 3" x 3/4" (Brass)	1	19858
13	Pipe 3/4"x 10" Lg.	1	19853
14	Elbow, Union 3/4" x 900 (Brass)	1	32091
15	Pipe 3/4" x 35"	1	19853
16	Valve, Ball 3/4"	1	10558
17	Bracket, Nameplate	1	19992
18	Screw	4	1901
19	Pipe 3/4" x 9" Lg.	1	19853
20	Pipe 3/4" x 141/2" Lg.	1	19853
21	Elbow, Street 3/4" x 900 (Brass)	1	19852
22	Tee 3/4" (Brass)	1	19839
23	Nipple 3/4" x 6" Lg.	1	19169
24	Valve, Check	1	19105
25	Nipple, Close 3/4"	1	19116
26	Valve, Safety 1"	1	2018
27	Tee 1" (Brass)	1	19872
28	Nipple, Close 1"	1	19841
29	Bushing, Reducing 1" x 1/2" (Brass)	1	19873
30	Nipple 1/2" x 1-1/2" Lg. (Brass)	1	19836
31	Valve, Ball 1/2"	1	5816
32	Bracket, Nameplate	1	16554
33	Screw, Hex Hd Cap 3/4"-1 ONC x 2" (S.S.)	4	16059
34	Lockwasher 3/4" (S.S.)	4	16067
35	Nut, Hex 3/4"-1ONC (S.S.)	4	16067
36	Washer, Flat 3/4" (S.S.)	4	17227
37	Bushing, Reducing 1" x 3/4" (Brass)	1	19874
38	Elbow 3" x 900 (Brass)	1	19826

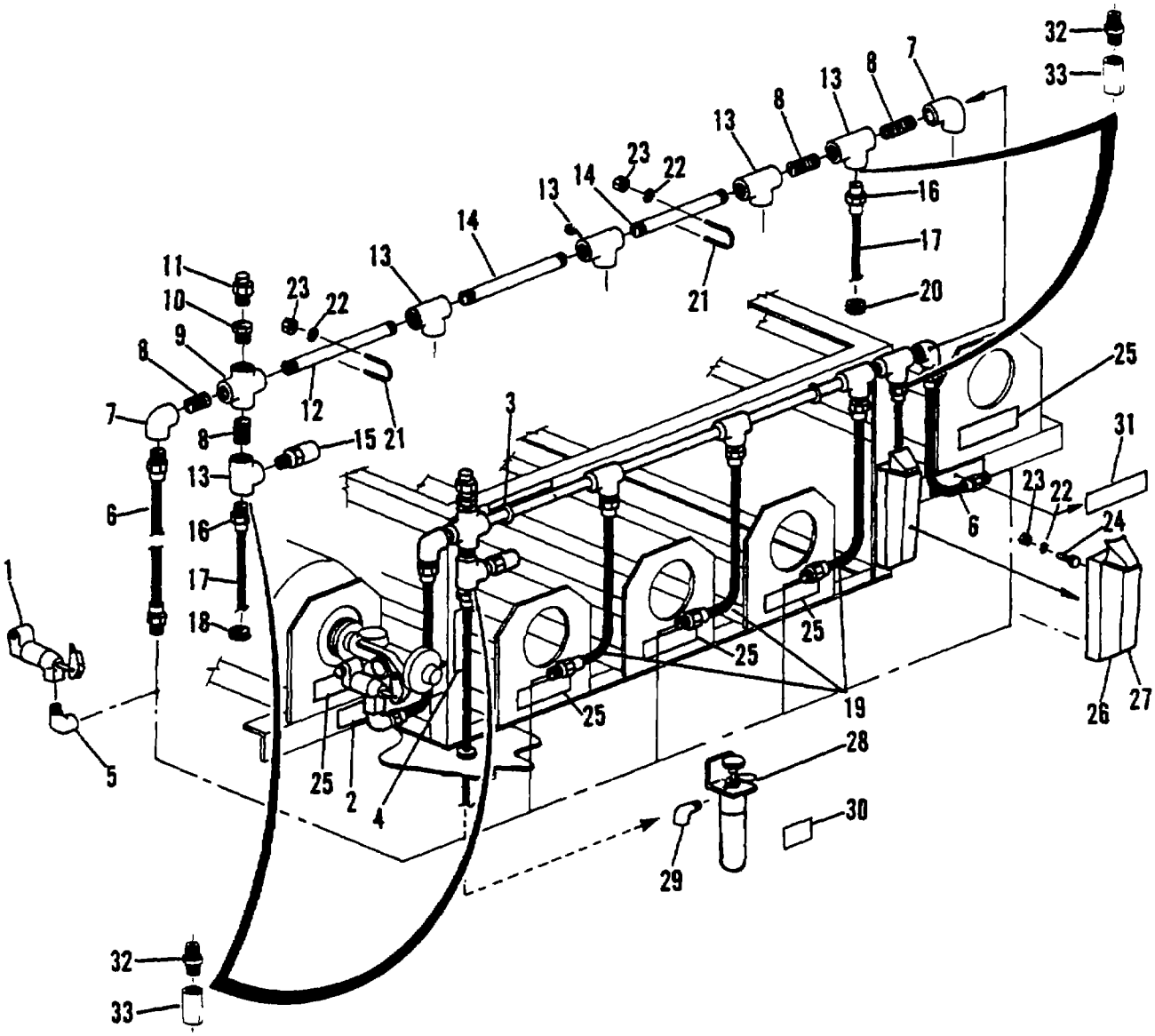
ANSUL CYLINDER PIPING ASSEMLY



ANSUL CYLINDER PIPING ASSEMBLY

FIGURE NO.	DESCRIPTION	QUANTITY	PART NO.
-	Cylinder Piping Assembly	1	S-52535
1	Nitrogen Cylinder Rack	5	26295
2	End Plate-	5	25324
3	Spacer (on 3 center cylinder racks)	3	S-52790
4	Washer, Flat - 3/8" (S.S.)	10	16618
5	Lockwasher - 3/8" (S.S.)	10	14929
6	Screw, Cap. Hex Hd. 3/8"-16NC (S.S.)	10	19124
7	Hose Reel Base	1	S-52789
8	Angle, 2 x 3 x 1/4" (39 LG)	1	8987
9	Bolt, Hex Hd. 3/8"-16NC x 1-1/4" (S.S.)	2	19124
10	Lockwasher, 3/8" (S.S.)	2	14929
11	Nut, Hex - 3/8"-16NC (S.S.)	2	14928
12	Nitrogen Cylinder -400 FT3	5	11200
13	Label	5	10994
14	Label	5	2102
15	Valve, Quick Opening	5	12824
16	Plug, Safety Shipping	5	11453
17	Cap, Shipping	5	11392
18	Label	5	11391
19	Hose and Adapter Assembly	1	7787
20	Angle 2" x 2" x 1/4" (39-1/2" LG)	2	2987
21	Union, Swivel Adapter 3/4"	1	16156
22	Elbow 3/4" x 900 (Brass)	1	19833
23	Manifold, Nitrogen (call Ansul for replacement)	1	
24	Nipple, 3/8" x 1-1/2" (S.S.)	5	19479
25	Stud (S.S.)	5	25590
26	Washer, Flat 1/2" (S.S.)	5	17486
27	Lockwasher 1/2" (S.S.)	5	16121
28	Nut, Hex 1/2"-13NC (S.S.)	5	16119
29	Manifold, Nitrogen (call Ansul for replacement)	1	
30	Elbow, 1-1/4" x 900 (Brass)	1	16091
31	Union, Swivel Adapter 1-1/4"	1	19609
32	Regulator (Hi-Flow)	5	14798
33	Hose and Adapter Assembly	4	15476
34	U-Bolt 1/4"-20 x 2-1/4" x 1-3/4" (zinc plated)	3	19109
35	Lockwasher 1/4"	6	968
36	Nut, Hex 1/4"	6	545
37	Bolt, Hex Hd, 3/8"-16NC x 2" (S.S.)	20	16515
38	Washer, Flat - 3/8" (S.S.)	20	16118
39	Lockwasher - 3/8" (S.S.)	20	14929
40	Nut, Hex - 3/8"-16NC (S.S.)	20	14928
41	Washer, Flat -3/8" (S.S.)	2	16118

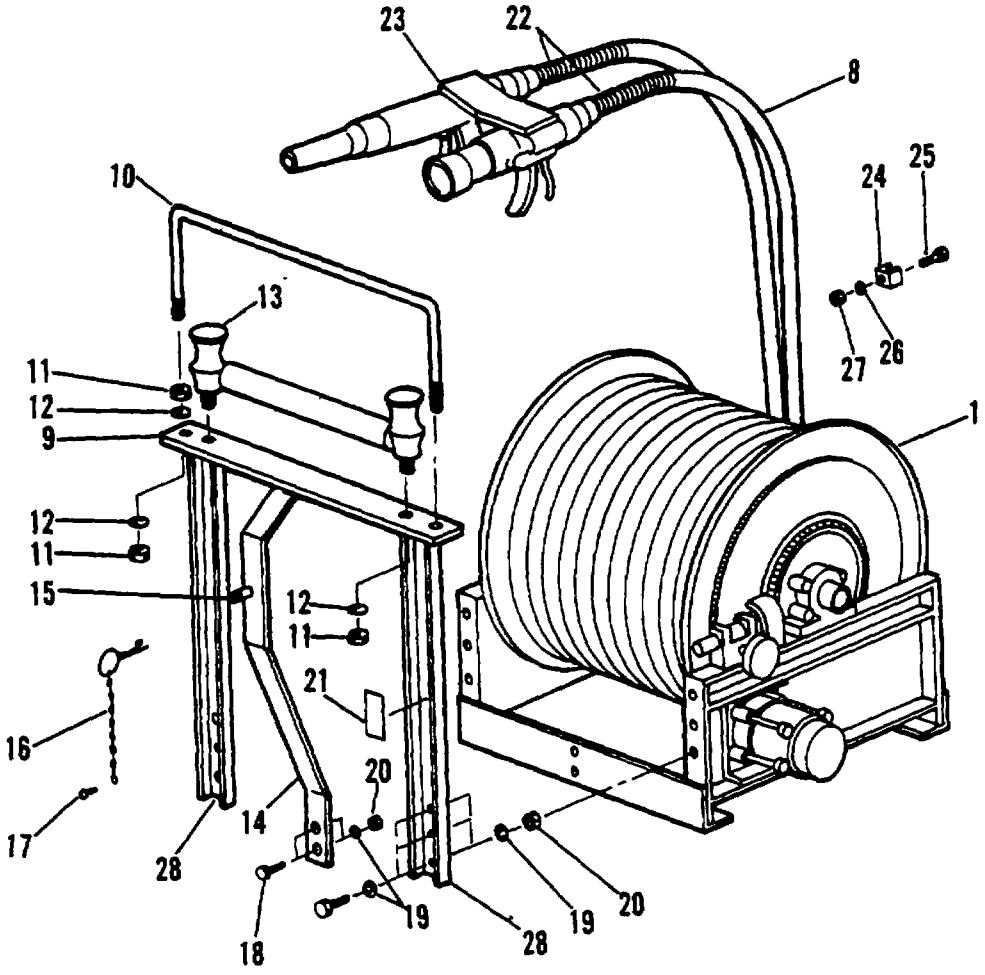
ANSUL ACTUATION PIPING ASSEMBLY

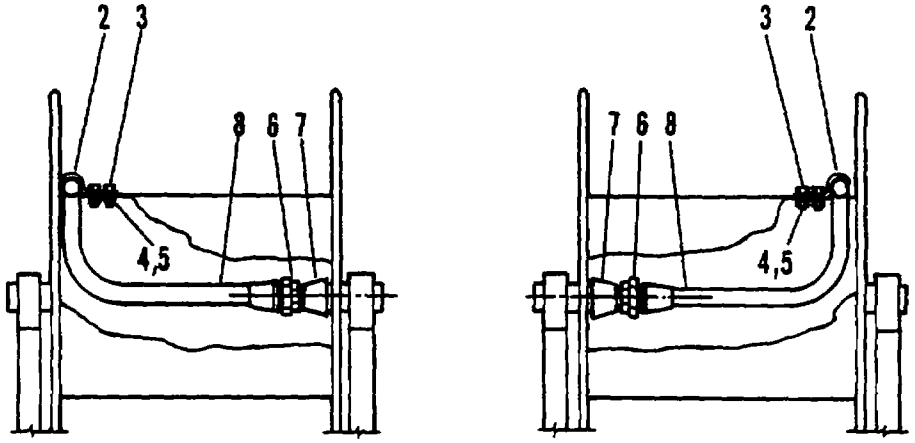


ANSUL ACTUATION PIPING ASSEMBLY

FIGURE NO.	DESCRIPTION	QUANTITY	PART NO.
-	Actuation Piping Assembly	1	S-52539
1	Actuator, Pneumatic Valve	5	11160
2	Nameplate	1	S-52270
3	Nameplate	1	S-52266
4	Nameplate	1	S -52267
5	Elbow, Street 1/8" x 900	5	30786
6	Hose (15-1/2" Long)	2	S-52854
7	Elbow, 1/4" x 900	2	13331
8	Nipple, 1/4" x 7/8"	4	30784
9	Cross, 1/4"	1	19516
10	Bushing, Reducing 1/4" x 1/8"	1	12793
11	Valve, Poppet 1/8"	1	1732
12	Pipe, 1/4" x 12-1/4" Long	1	2437
13	Tee, 1/4"	5	8292
14	Pipe, 1/4" x 10-1/2" Long	2	2437
15	Valve, Safety Relief, 1/4" (275 PSI)	1	13797
16	Connection, 1/4" Tube x 1/4" NPT	2	16477
17	Tube, Copper, PVC Covered 1/4" x 25'	1	19112
18	Grommet	1	15990
19	Hose (21" Long)	3	S-52856
20	Grommet	1	15989
21	U-Bolt, 1/4"-20 (S.S.)	2	16513
22	Lockwasher 1/4" (S.S.)	6	1133
23	Nut, Hex 1/4"-20 (S.S.)	6	18107
24	Screw, Hex Head 1/4"-20 x 1/2" Lg	2	18105
25	Nameplate	5	S-52269
26	Actuating Device Assembly (L.H.)	1	16186
27	Cartridge Shipping Assembly LT-5-L	2	7013
28	Dashboard Actuator Assembly	1	53195
29	Fitting, 1/4" Tube x 1/8" NPT x 900	1	19407
30	Nameplate	1	16151
31	Nameplate, Operating	1	19150
32	Valve, Check, 1/4" (Brass)	2	22522
33	Coupling, 1/4" (Brass)	2	24765

ANSUL HOSE REEL ASSEMBLY





ANSUL HOSE REEL ASSEMBLY

FIGURE NO.	DESCRIPTION	QUANTITY	PART NO.
-	Hose Reel Assembly	1	S-52806
1	Hose Reel Sub-Assembly	1	S-52808
-	Hose Reel Assembly	1	19253
2	Clamp, Hose	2	19686
3	Screw, Phillips Head 1/4-20NC x 3/4" Lg.	4	1132
4	Lockwasher 1/4"	4	968
5	Nut, Hex 1/4"-20NC	4	545
6	Union, Swivel Adaptor	2	16159
7	Coupling, Reducing 1-1/2" x 1"	2	19861
8	Twin Hose Assembly	1	S-29551
9	Bar, Flat Steel 3/8" x 3" x 29" Lg.	1	2396
10	Rod, Aluminum 1/2" x 40-1/2" Lg.	1	19939
11	Nut, Hex 1/2"-13 (S.S.)	6	16119
12	Lockwasher 1/2" (S.S.)	6	16121
13	Hose Roller Assembly	1	17586
14	Bar, Flat Steel 1-1/2" x 1/4" x 33" Lg.	1	2534
15	Rod, Steel 1/2" x 2" Lg.	1	2537
16	Pin, Ring Assembly	1	17753
17	Screw, Drive No. 4 x 1/2" Lg.	1	27857
18	Screw, Hex Head 1/4-20 x 1" Lg.	8	16336
19	Lockwasher 1/420	8	1133
20	Nut, Hex 1/420	8	18107
21	Nameplate	1	19780
22	Protector, Spring Hose	2	17473
23	Twinned Nozzle Assembly	1	S-27763
24	Clip, Crank Handle (2)	1	19428
25	Screw No. 10-24 (2)	1	4135
26	Lockwasher, No. 10 (2)	1	4141
27	Nut, Hex No. 10-24 (2)	1	2666
28	Channel, Steel 2" x 1" x 1/8" x 23" Lg.	2	8940

ANSUL TWINNED NOZZLE ASSEMBLY

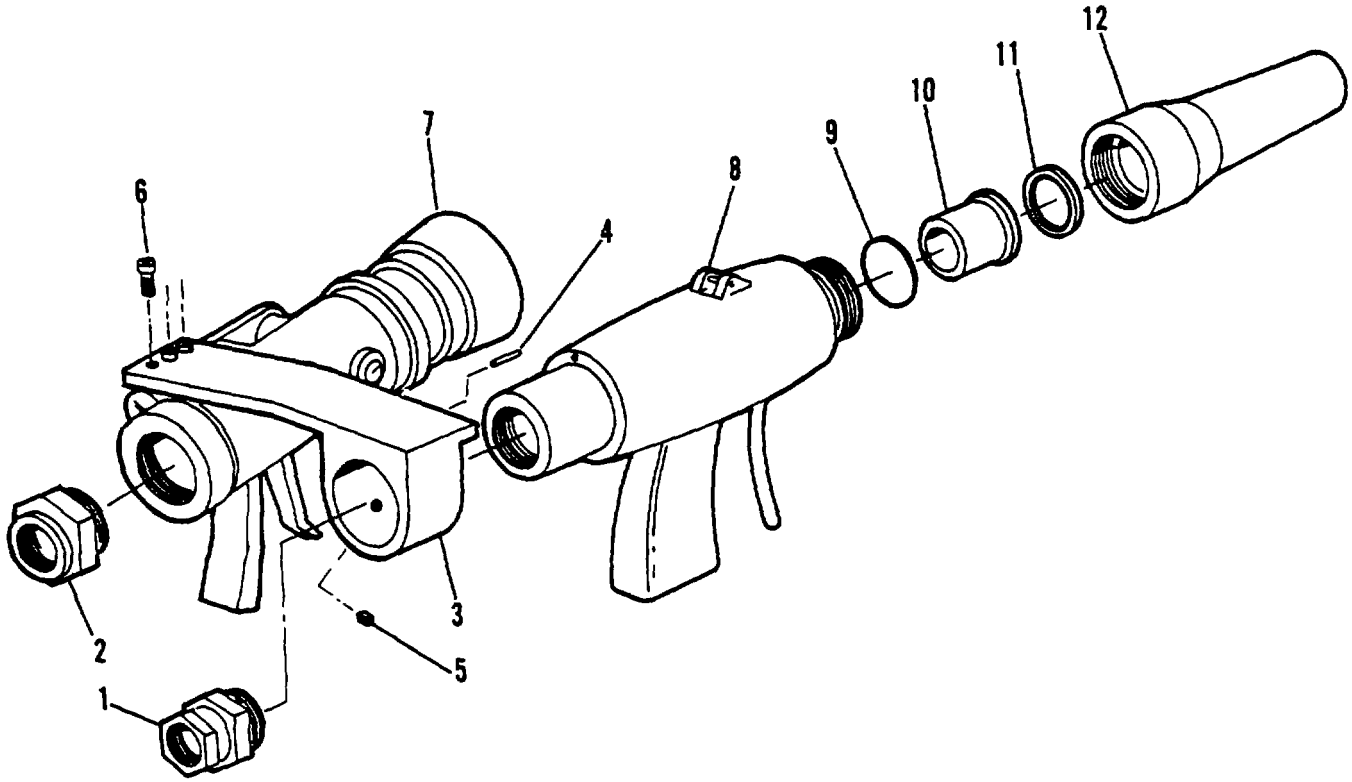


FIGURE NO.	DESCRIPTION	PART NO.
-	Twinned Nozzle AssemblyS-76	
1	Union, Swivel Adaptor 1" Male NPTF X 1" FEMALE NPSM	12531
2	Adaptor 1-1/2" NPSH x 1" NPT	S-27783
3	Bar, Tie	5-27782
4	Pin	5112
5	Screw, Set No. 10-32 NF 2A x 3/16" Lg.	4607
6	Screw 1/4"-20 x 3/4" Lg. (3)	25146
7	AFFF Nozzle Assembly	25501
	Dry Chemical Nozzle Assembly	S-27762
8	Nozzle Assembly	13770
9	"0" Ring	13903
10	Insert	13901
11	Gasket	8105
12	Nozzle Body, LR44	25907

ANSUL REMOTE ACTUATING DEVICE ASSEMBLY

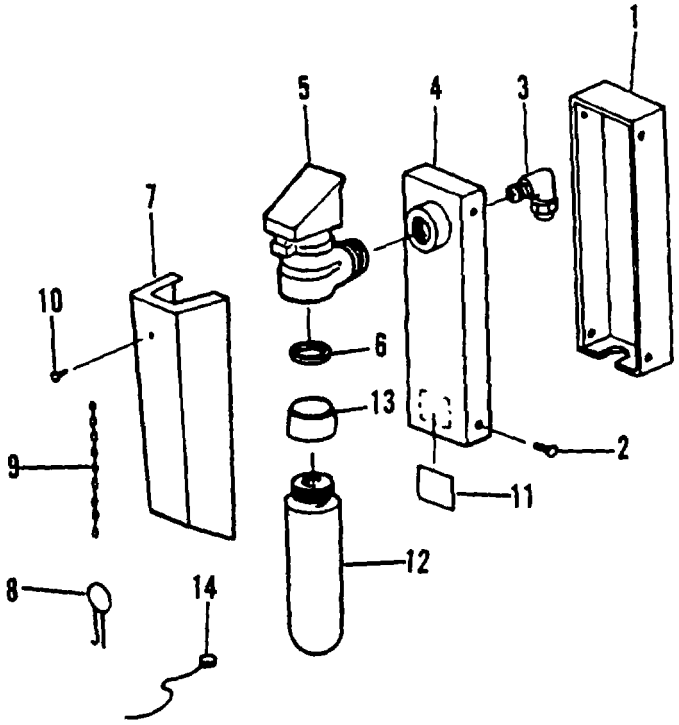


FIGURE NO.	DESCRIPTION	PART NO.
-	Actuator, Remote, Shipping Assembly	322747
-	Device, Actuating, Assembly	16186
1	Box, Mounting	32750
2	Screw, Sheet Metal (4)	19364
3	Fitting, Tube	19407
4	Cover	32749
5	Receiver, Cartridge, Assembly	32763
6	Gasket	181
-	Guard, Cartridge, Assembly	32748
7	Guard, Cartridge	19406
-	Ring Pin & Chain Assembly	7095*
8	Pin, Ring	7066*
9	Chain, Ring Pin	507*
10	Rivet	6579*
11	Label	32759
-	Cartridge, Nitrogen, Shipping Assembly	7013
12	Cartridge, Nitrogen	24380
13	Cap, Safety Shipping	1188
14	Seal, Visual Inspection	15999

*Not included with Cartridge Guard Assembly; included with Actuating Device Assembly or Separately.

ANSUL QUICK-OPENING NITROGEN CYLINDER VALVE WITH PNEUMATIC VALVE ACTUATOR

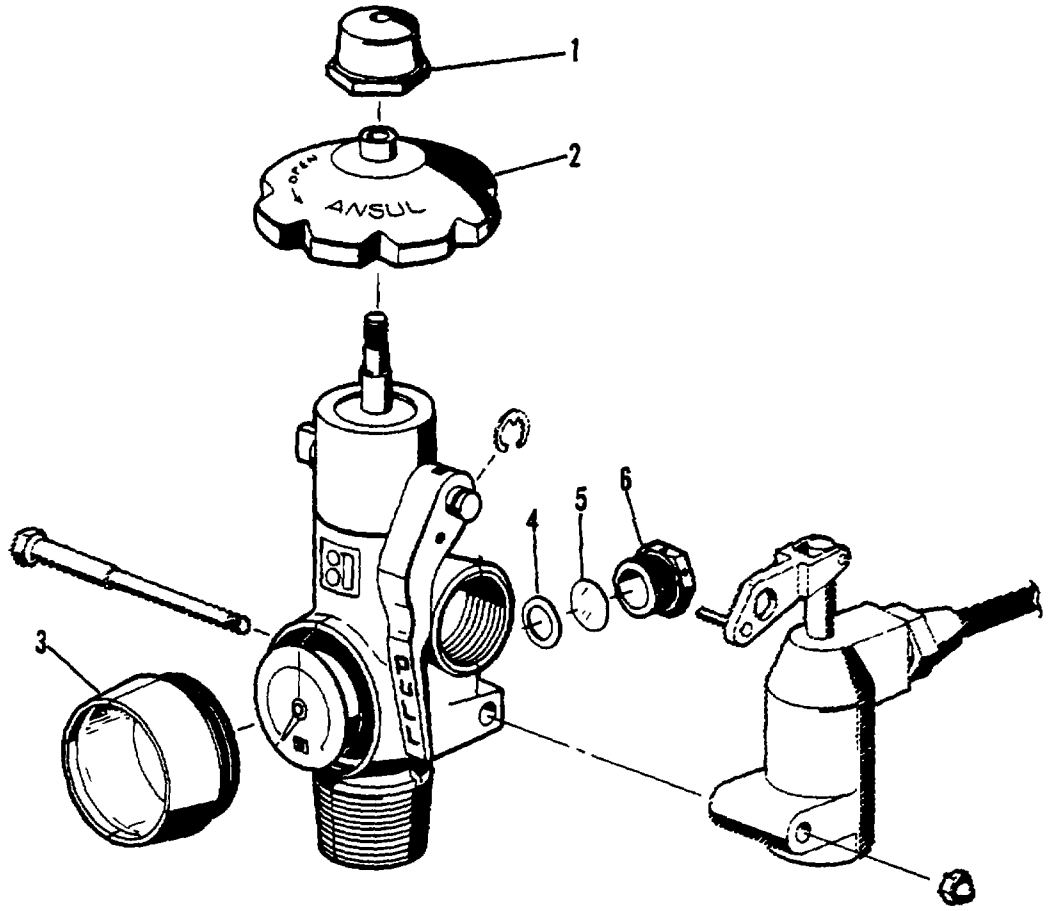


FIGURE NO.	DESCRIPTION	PART NO.
-	Valve Assembly	12824
1	Nut, Handwheel	3394
2	Handwheel	12829
3	Bezel and Crystal Assembly	3459
4	Washer	*
5	Disc*	7486
6	Plug	**
7	Plug, Safety Shipping (Not Shown)	11453
8	Inspection Seal, Lead and Wire (Not Shown)	197

*New washer, Part No. 4297, is required when replacing disc, Part No. 7486.
**Available on request, specify cylinder model.

ANSUL PNEUMATIC VALVE ACTUATOR

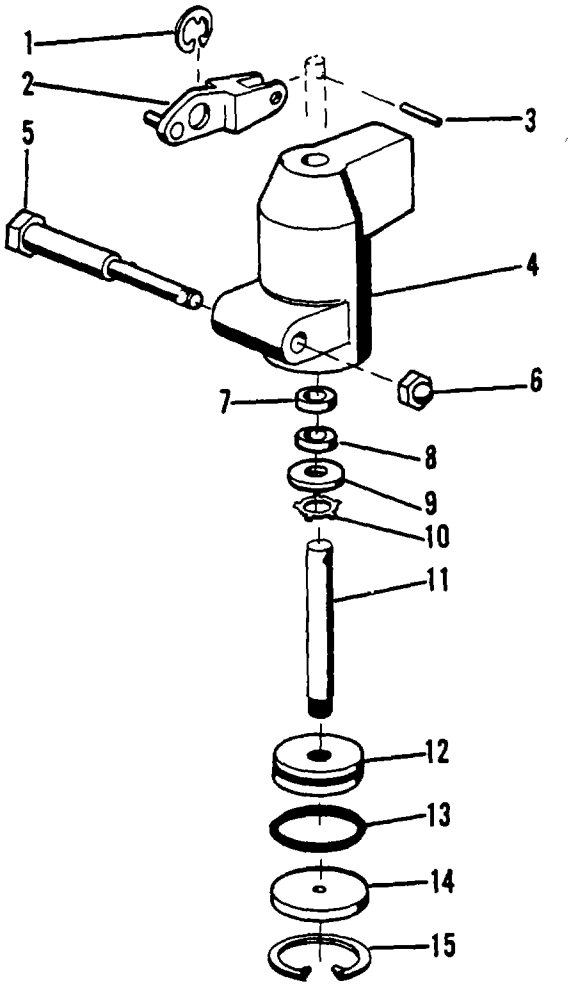
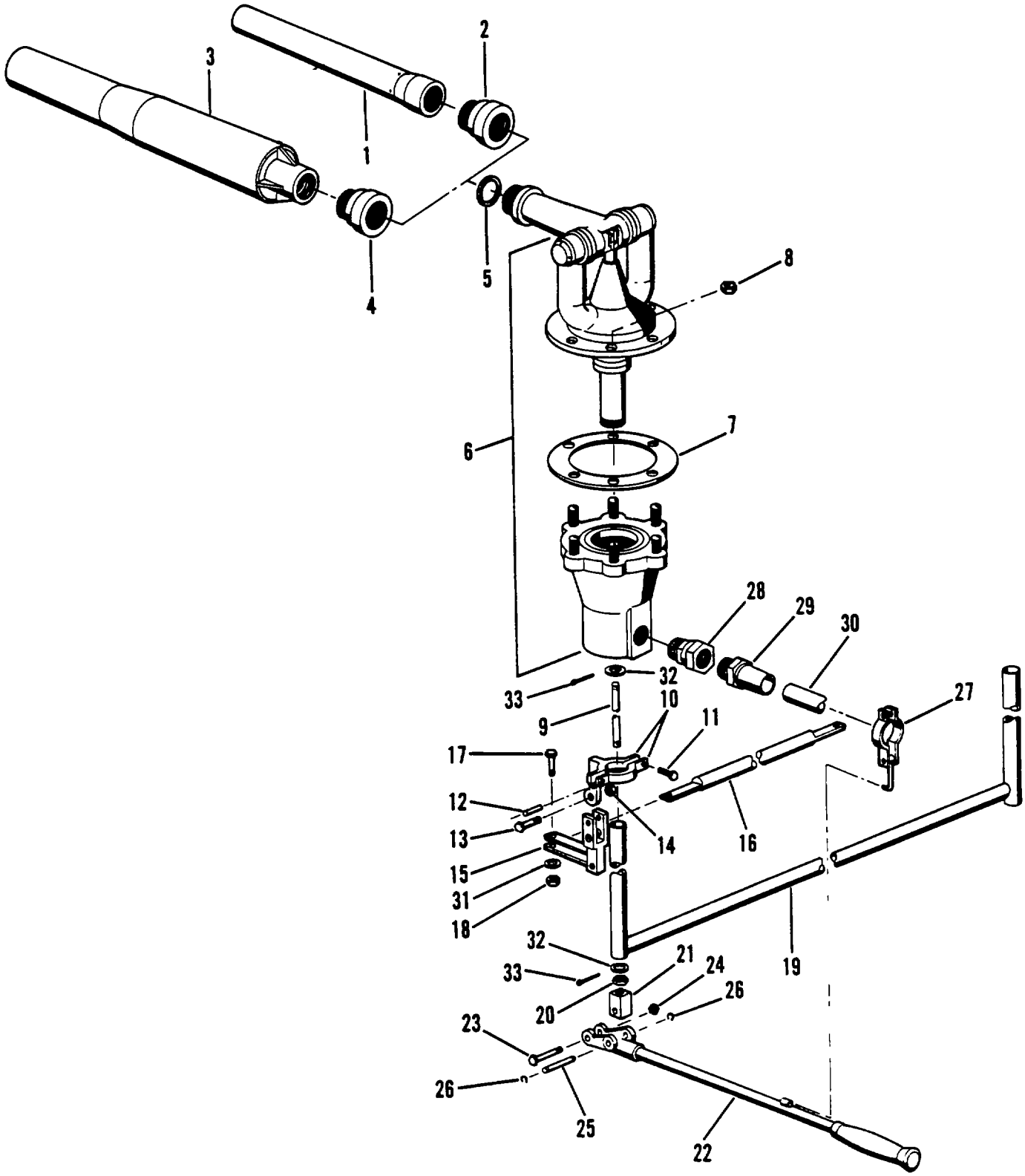


FIGURE NO.	DESCRIPTION	PART NO.
-	Q.0. Valve Actuator Assembly	11160
1	Crescent Ring	11322
2	Actuator Arm	11389
3	Roll Pin	11172
4	Actuator Body	11161
5	Anchor Stud	11171
6	Cap Nut	11173
7	Bushing	6354
8	Quad Ring	5361
9	Bushing	1238
10	Retaining Ring	6355
11	Piston Rod	11301
12	Piston	11300
13	O-Ring	5151
14	End Plug	11163
15	Retaining Ring	11302

ANSUL TWIN TURRET ASSEMBLY

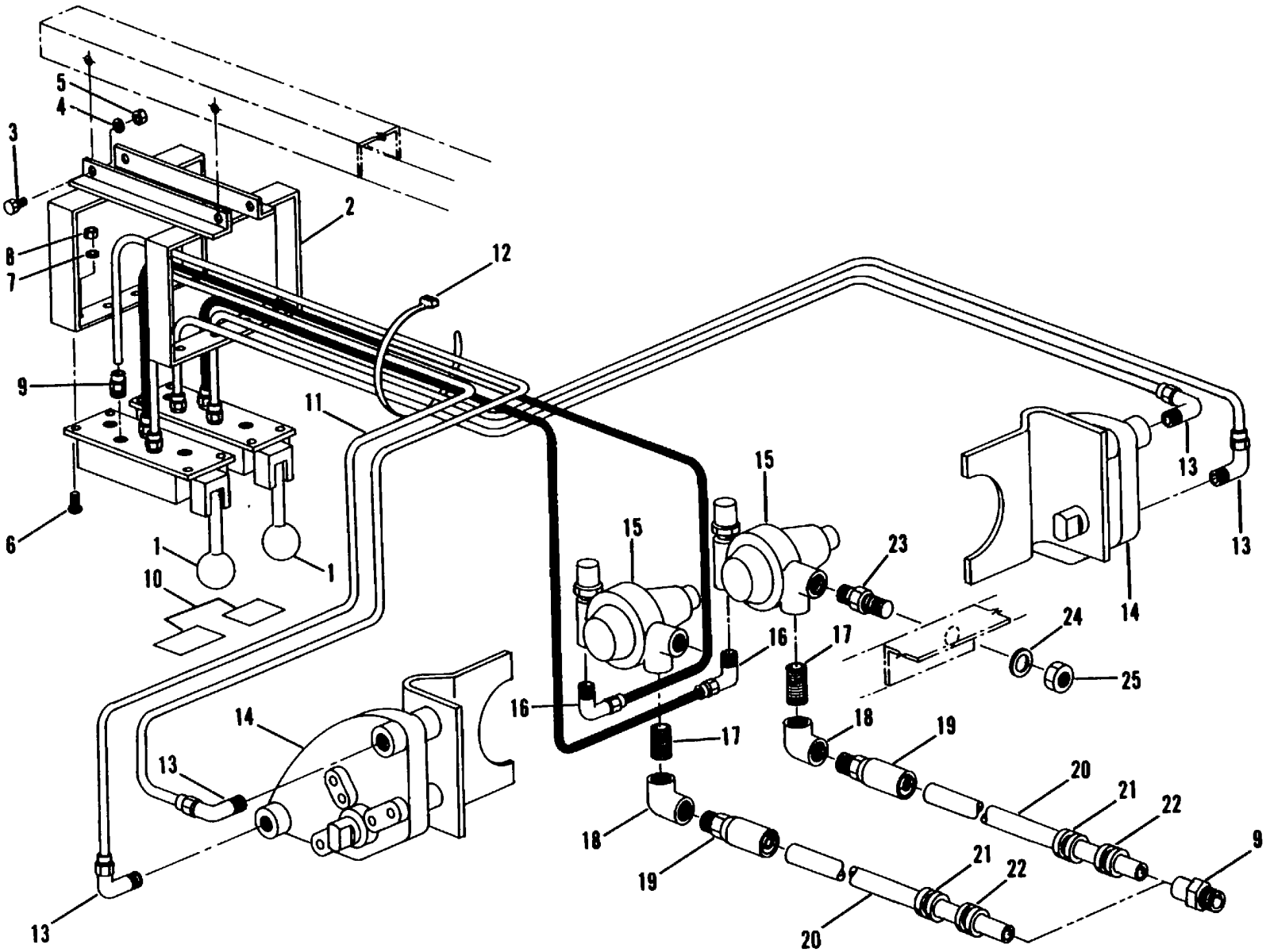


ANSUL TWIN TURRET ASSEMBLY

FIGURE NO.	DESCRIPTION	PART NO.
-	Twin Turret Assembly	S-52797
1	Dry Chemical Barrel	14035
2	Adapter	19559
3	AFFF Barrel	19444
4	Adapter	19558
5	0-Ring (2)	19557
6	Turret Assembly w/o Barrel (2)	19621*
7	Gasket (2)	10-02975*
8	Nut (2)	161-10009*
9	Elevation, Rod (2)	19664
10	Clevis Hanger Assembly (2)	10-04555*
11	Cap Screw (4)	1-52-05018*
12	Roll Pin (2)	4108
13	Cap Screw, 5/16" (2)	12364
14	Nut, 5/16" (2)	4514
15	Adapter Yoke (2)	19661
16	Horizontal Tie Bar	19662
17	Shoulder Screw (2)	19765
18	Nut, 1/4" (2)	545
19	Vertical Tie Rod	19663
20	Nut, 1/2", S.S.(2)	16119
21	Elevation Rod Connector (2)	10-04543*
22	Lower Handle (2)	10-04542*
23	Cap Screw (2)	1-52-05041*
24	Stop Nut (2)	1-61-05005*
25	Connector Pin (2)	10-04545*
26	E-Ring (4)	1-85-03140*
27	Handle Latch Assembly (2)	10-04547*
28	Union, Swivel Adapter (2)	19576
29	Hose Coupling, 2" Male NPTF (2)	19577
30	Hose, 1-13/16" ID (Specify Length) (2)	19579
31	Lockwasher 1/4" (2)	968
32	Flatwasher 1/2" (4)	160
33	Cotter Pin 1/8" x 1-1/4" (4)	19620

*Parts supplied by FSCM 52659.

ANSUL HAND VALVE AND PNEUMATIC ACTUATOR



ANSUL HAND VALVE AND PNEUMATIC ACTUATOR

FIGURE NO.	DESCRIPTION	QUANTITY	PART NO.
-	Hand Valve and Pneumatic Actuator Assembly	Ref	S-52798
1	Valve, Hand Lever	2	25054
2	Frame, Hand Valve	1	19729
3	Bolt, Hex Hd 1/4"-20NC x 3/4"	4	4065
4	Lockwasher, 1/4"	4	968
5	Nut, Hex 1/4"-20NC	4	545
6	Screw, No. 10-24x 1"	8	4135
7	Lockwasher, No. 10	8	4141
8	Nut, Hex No. 1024	8	2666
9	Connector, 1/4" x 1/4"	8	19982
10	Nameplate, Hand Valve	2	16460
11	Tube, Black Nylon 1/4" O.D. (Lg. as required)	6	19985
12	Tie, Cable Sta-Strap	4	19897
13	Elbow, Male 1/4" O.D. Tube x 1/4" NPT Ex. Lg.	4	19185
14	Actuator, Ball Valve	2	29347
15	Regulator, Pressure	2	19599
16	Elbow, 1/4" NPTx 1/4" 0.D Tube	2	16145
17	Nipple, Close	2	30784
18	Elbow, 1/4"	2	13331
19	Coupling, Quick 1/4"	2	27519
20	Hose, High Pressure 1/4" (Lg. as required)	2	27517
21	Grommet	2	15990
22	Grommet	2	15989
23	Stud	2	8762
24	Lockwasher, 1/2"	2	957
25	Nut, Hex 1/2"-13NC	2	2124

ANSUL DASHBOARD ACTUATOR ASSEMBLY

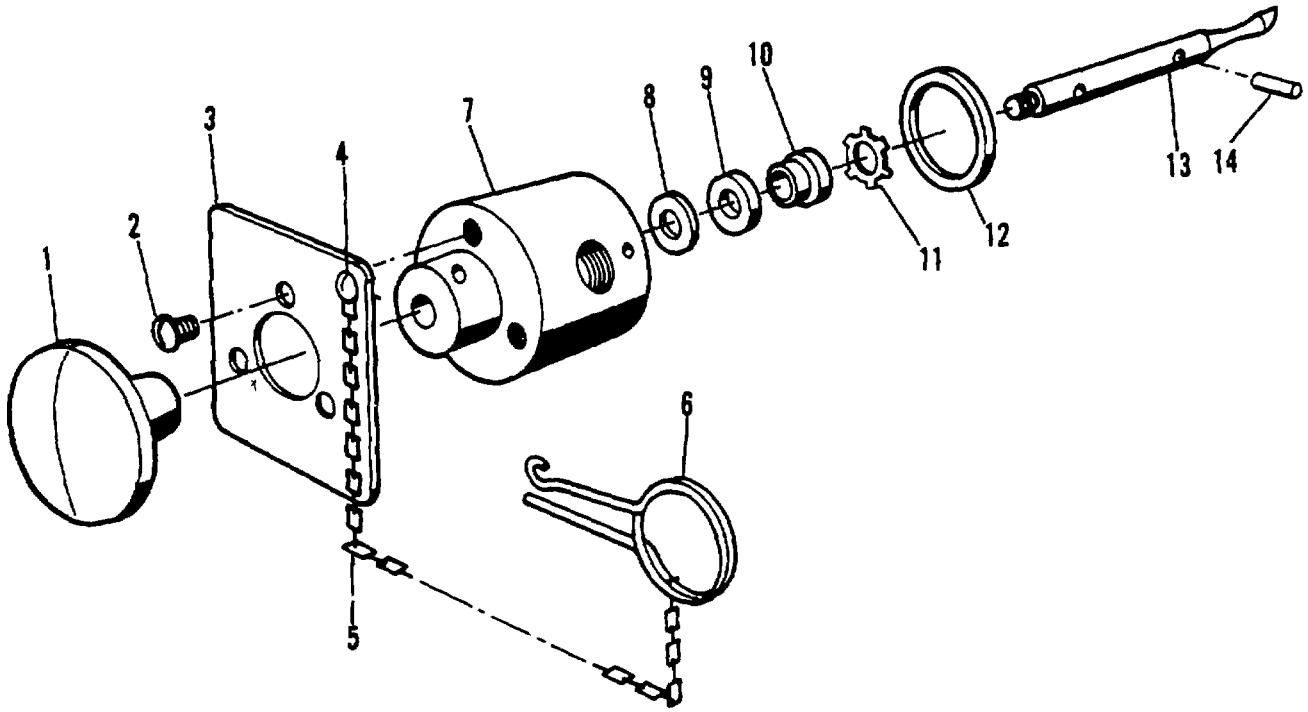


FIGURE NO.	DESCRIPTION	QUANTITY	PART NO.
-	Actuator, Dashboard Assembly	1	53195
1	Knob, Push	1	16470
2	Screw, Machine	3	17556
-	Plate, Face Assembly	1	17252
3	Plate, Face	1	17245
4	Rivet	1	6579
5	Chain, Ring Pin	1	507
6	Pin, Ring	1	32342
-	Actuator, Remote Assembly	1	17242
7	Body, Actuator	1	17243
8	Bushing	1	1238
9	U-Cup	1	17229
10	Guide, Pin	1	25465
11	Ring, Retaining	1	1239
12	Gasket	1	181
-	Pin, Puncture Assembly	1	53032
13	Pin, Puncture	1	19415
14	Pin, Spring	1	22440
-	Cartridge, Nitrogen, Shipping Assembly*	1	7013
-	Cartridge, LT-5-L*	1	24380
-	Cap, Safety Shipping*	1	1188
-	Seal, Visual Inspection (Not Shown)	1	15999

*Not included with actuator assembly; order separately.

SECTION 9

NUMERICAL INDEX

ANSUL PART NO.	PAGE NO.	FIG NO.	FSCM	VENDOR PART NO.
S-27762	8-18			
S-27763	8-17	23		
S-27763	8-18			
S-27770	8-3	8		
S-27782	8-18	3		
S-27783	8-18	2		
S-28259	8-3	13		
S-29551	8-17	8		
S-50553	8-11	1		
S-52139	8-11	4		
S-52262	8-6	58		
S-52263	8-6	60		
S-52264	8-7	84		
S-52265	8-6	62		
S-52266	8-15	3		
S-52267	8-15	4		
S-52268	8-6	77		
S-52269	8-15	25		
S-52270	8-15	2		
S-52316	8-6	56		
S-52527	8-3	7		
S-52527	8-5			
S-52528	8-3	2		
S-52529	8-3	12		
S-52530	8-3			
S-52531	8-3	6		
S-52534	8-3	11		
S-52535	8-3	15		
S-52535	8-13			
S-52536	8-3	9		
S-52537	8-3	10		
S-52538	8-5	2		
S-52538	8-11			
S-52539	8-3	14		
S-52539	8-15			
S-52540	8-3	4		
S-52541	8-3	5		
S-52789	8-13	6		
S-52790	8-13	3		
S-52797	8-7			
S-52797	8-23			
S-52798	8-7			
S-52798	8-25			
S-52806	8-5	40		
S-52808	8-17	1		
S-52854	8-15	6		
S-52856	8-15	19		
S-52917	8-3	3		
S-52920	8-3	1		
S-63087	8-5	1		
S-63087	8-9			

NUMERICAL INDEX

ANSUL PART NO.	PAGE NO.	FIG NO.	FSCM	VENDOR PART NO.
S52806	8-17			
1-52-05018	8-23	11		
1-52-P5041	8-23	23		
1-61-05005	8-23	24		
1-61-10009	8-23	8		
1-85-0314f0	8-23	26		
10-02975	8-23	7		
10-04542	8-23	22		
10-04543	8-23	21		
10-04545	8-23	25		
10-04547	8-23	27		
10-04555	8-23	10		
10558	8-11	16	01029	TYPE 3/4-A-MOD-BIITT
10935	8-9	20		
10994	8-13	13		
11160	8-15	1		
11160	8-21			
11161	8-21	4		
11163	8-21	14		
11171	8-21	5		
11177	8-21	3		
11173	8-21	6		
11200	8-13	12		
11300	8-21	12		
11301	8-21	11		
11302	8-21	15		
1132	8-17	3		
11322	8-21	1		
1133	8-15	22		
1133	8-17	19		
11389	8-21	2		
11391	8-13	18		
11392	8-13	17		
11453	8-13	16		
11453	8-20	7		
1188	8-19	13		
1188	8-26			
1196	8-7			
12364	8-23	13		
1238	8-21	9		
1238	8-26	8		
1239	8-26	11		
12531	8-18	1		
12549	8-6	44		
12743	8-9	30		
12744	8-5	3		
12744	8-9	35		
12747	8-9	29		
12772	8-11	10	01029	TYPE D14-TT
12793	8-15	10		
12819	8-6	45		

NUMERICAL INDEX

ANSUL PART NO.	PAGE NO.	FIG NO.	FSCM	VENDOR PART NO.	
12824	8-13	15			
12824	8-20				
12829	8-20	2			
13057	8-6	46			
13331	8-15	7			
133331	8-25	18			
13336	8-9	23			
13363	8-9				
13770	8-18	8			
13797	8-15	15	06023	3127	TYPE H
13901	8-18	10			
13903	8-18	9			
14035	8-23	1			
14206	8-6	57			
14232	8-5	9			
14235	8-5	17			
14316	8-7				
14617	8-5	28			
14626	8-5	11			
14732	8-5	18			
14798	8-13	32			
14928	8-6	66			
14928	8-13	11			
14928	8-13	40			
14929	8-6	65			
14929	8-13	5			
14929	8-13	10			
14929	8-13	39			
15053	8-9	16			
15476	8-13	33			
15989	8-7				
15989	8-15	20			
15989	8-25	22			
15990	8-15	18			
15990	8-25	21			
15999	8-9	14			
15999	8-11	6			
15999	8-19	14			
160	8-23	32			
16059	8-9	40			
16059	8-11	34			
16067	8-9	41			
16067	8-11	35			
16091	8-13	30			
16118	8-13	38			
16119	8-13	28			
16119	8-17	11			
16119	8-23	20			
16121	8-13	27			
16121	8-17	12			
16145	8-25	16			

NUMERICAL INDEX

ANSUL PART NO.	PAGE NO.	FIG NO.	FSCM	VENDOR PARTNO.
16150	8-6	75		
16151	8-15	30		
16153	8-5	22		
16154	8-5	23		
16156	8-13	21		
16157	8-7	85		
16158	8-5	27		
16159	8-6	53		
16159	8-17	6		
16186	8-15	26		
16186	8-19			
1626	8-9	8		
16267	8-9	33		
16278	8-6	41		
16279	8-9	4		
16282	8-5	26		
16322	8-9	34		
16336	8-17	18		
16396	8-5	6		
16460	8-25	10		
16470	8-26	1		
16477	8-15	16		
16512	8-6	63		
16513	8-15	21		
16515	8-13	37		
16554	8-9	38		
16554	8-11	33		
16592	8-6	72		
16618	8-6	64		
16618	8-13	4		
16707	8-7			
16794	8-5	15		
16795	8-5	14		
1689	8-5	25		
17188	8-9			
17227	8-9	39		
17227	8-11	36		
17229	8-26	9		
17242	8-26			
17243	8-26	7		
17245	8-26	3		
17252	8-26			
1732	8-15	11	90526	MAV-2P
17473	8-17	22		
17486	8-13	26		
17556	8-26	2		
17586	8-17	13		
1765	8-6	50		
1770	8-6	52		
17753	8-17	16		
181	8-19	6		

ANSUL PART NO.	PAGE NO.	FIG NO.	FSCM	VENDOR PART NO.
181	8-26	12		
18105	8-15	24		
18107	8-15	23		
18107	8-17	20		
1845	8-9	7		
1901	8-11	18		
19070	8-6	1		
19105	8-11	24		
19109	8-13	34		
19112	8-15	17		
19116	8-11	25		
19124	8-13	6		
19124	8-13	9		
19147	8-6	76		
19149	8-6	61		
19150	8-15	31		
19169	8-11	23		
19181	8-6	82		
19183	8-9	37		
19185	8-25	13		
19253	8-17		97542	EAD-29-14-19
19364	8-19	2		
19406	8-19	7		
19407	8-15	29		
19407	8-19	3		
19410	8-6	73		
19415	8-26	13		
19428	8-17	24		
19444	8-23	3		
19479	8-13	24		
19516	8-15	9		
19557	8-23	5		
19558	8-23	4		
19559	8-23	2		
19563	8- 6	78		
19576	8-23	28		
19577	8-23	29		
19578	8-5	8		
19578	8-5	24		
19578	8-23	30		
19599	8-25	15		
19606	8-6	49		
19608	8-6	48		
19609	8-6	47		
19609	8-13	31		
19610	8-6	55		
19611	8-6	54		
19620	8-23	33		
19651	8-23	6	96463	S-4525
19661	8-23	15		

ANSUL PART NO.	PAGE NO.	FIG NO.	FSCM	VENDOR PART NO.
19662	8-23	16		
19663	8-23	19		
19664	8-23	9		
19686	8-17	2		
197	8-20	8		
19729	8-25	2		
19765	8-23	17		
19780	8-17	21		
19825	8-11	9		
19826	8-11	38		
19829	8- 5	38		
19830	8-5	39		
19833	8-11	5		
19833	8-13	22		
19836	8-11	30		
19839	8-11	22		
19841	8-11	28		
19843	8-5	35		
19849	8-5	33		
19852	8-11	21		
19853	8-11	13		
19853	8-11	15		
19853	8-11	19		
19853	8-11	20		
19854	8-5	37		
19857	8-5	34		
19858	8-11	12		
19861	8-17	7		
19864	8-5	32		
19872	8-11	27		
19873	8-11	29		
19874	8-11	37		
19897	8-25	12		
19920	8-7			
19921	8-7			
19922	8-6	67		
19922	8-6	68		
19930	8-6	69		
19931	8-6	70		
19939	8-17	10		
19950	8-5	31		
19956	8-5	5		
19974	8-11	11		
19980	8-5	36		
19982	8-25	9		
19985	8-25	11		
19992	8-9	18		
19992	8-11	17		
19993	8-9	11		
19993	8-11	32		
19995	8-9	17		

ANSUL PART NO.	PAGE NO.	FIG NO.	FSCM	VENDOR PART NO.
2018	8-9	5		
2018	8-11	26		
2039	8-5	30		
2069	8-6	43		
2078	8-6	51		
2102	8-13	14		
2124	8-25	25		
2146	8-9	6		
22440	8-26	14		
22522	8-15	32	92029	CMMQ 20 8
2284	8-9	28		
2367	8-9	13		
2367	8-11	8		
2396	8-17	9		
2437	8-15	12		
2437	8-15	14		
24380	8-19	12		
24380	8-26			
2462	8-9	19		
2462	8-9	21		
2462	8-9	22		
24765	8-15	33		
25054	8-25	1		
25146	8-18	6		
25324	8-13	2		
2534	8-17	14		
2537	8-17	15		
2546	8-26	10		
2550	8-18	7		
2554	8-9	15		
2559	8-13	25		
2560	8-6	59		
2585	8-9	27	81865	BRB790-TTBX
2590	8-18	12		
2600	8-9	9	81865	BR-B790-TTeX
2629	8-13	1		
2666	8-17	27		
2666	8-25	8		
27517	8-25	20		
27519	8-25	19		
27857	8-17	17		
2918	8-5	10		
29345	8-5	19		
29347	8-5	21		
29347	8-25	14	86185	200
2987	8-6	80		
2987	8-6	81		
2987	8-13	20		
30393	8-5	7		
30784	8-15	8		
30784	8-25	17		

ANSUL PART NO.	PAGE NO.	FIG NO.	FSCM	VENDOR PART NO.
30786	8-15	5		
30858	8-7	83		
32n91	8-11	14		
32342	8-26	6		
32747	8-19			
32748	8-19			
32749	8-19	4		
32750	8-19	1		
32759	8-19	11		
32763	8-19	5		
3394	8-20	1		
3459	8-20	3		
3460	8-9	1		
3461	8-9	2		
3461	8-11	3		
3855	8-5	16		
4065	8-25	3		
4070	8-6	74		
4108	8-23	12		
4135	8-17	25		
4135	8-25	6		
4141	8-17	26		
4141	8-25	7		
4273	8-9	24		
4274	8-6	42		
4274	8-9	25		
4275	8-5	29		
4276	8-9	26		
4277	8-6	79		
4281	8-5	20	96463	M802
4514	8-23	14		
4545	8-9	3		
4607	8-18	5		
50571	8-9	31	81865	CS8410-TTX
507	8-19	9		
507	8-26	5		
5112	8-18	4		
51187	8-9	32		
5151	8-21	13		
53032	8-26			
53195	8-15	28		
53195	8-26			
5361	8-21	8		
54404	8-9	36		
545	8-5	13		
545	8-13	36		
545	8-17	5		
545	8-23	18		
545	8-25	5		
5816	8-11	31	01029	AIITT
5829	8-11	2		

ANSUL PART NO.	PAGE NO.	FIG NO.	FSCM	VENDOR PART NO.
598	8-9	12		
598	8-11	7		
6354	8-21	7		
6355	8-21	10		
6579	8-19	10		
6579	8-26	4		
7013	8-15	27		
7013	8-19			
7013	8-26			
7066	8-19	8		
7095	8-19			
7486	8-20	5		
7787	8-13	19		
8105	8-18	11		
8284	8-5	4		
8292	8-15	13		
8762	8-25	23		
8940	8-17	28		
8987	8-13	8		
957	8-25	24		
968	8-5	12		
968	8-13	35		
968	8-17	4		
968	8-23	31		
968	8-25	4		

APPENDIX

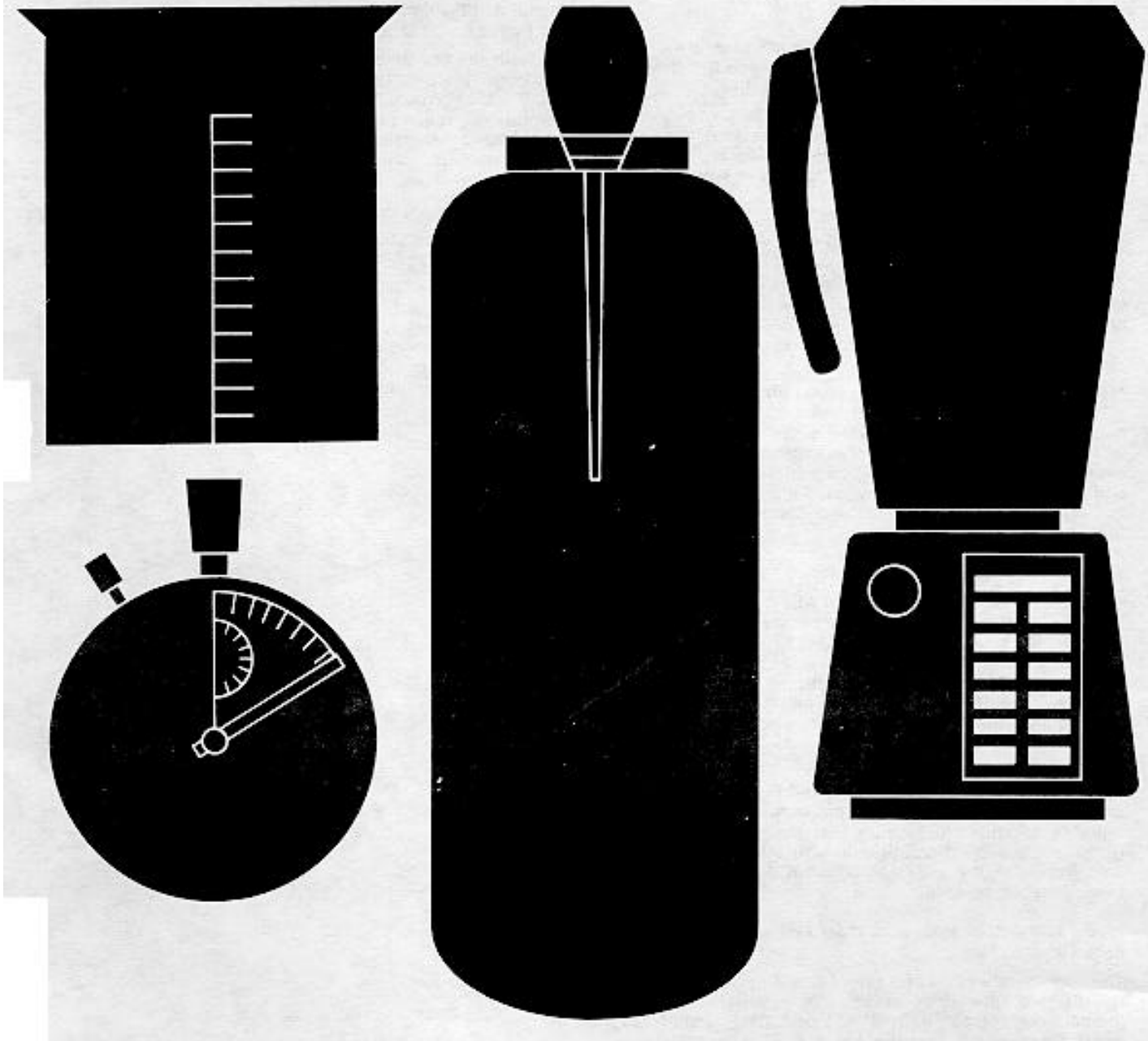
The appendix contains the following:

Vehicle Accessory Manuals

ANSUL AFFF FIELD INSPECTION MANUAL

FIELD INSPECTION MANUAL

ANSUL AFFF (AQUEOUS FILM-FORMING FOAM)



This manual is designed t(; serve as a guide to inspection procedures for Ansul AFFF 3% and Ansul AFFF 6% in both the concentrate and premix forms. The procedures are those recommended by the producer of the concentrates.

The designated inspector should be a responsible and experienced person with a sound, basic knowledge of fire equipment hardware and extinguishing agents. A thorough briefing on the procedures to be followed should include the need for precise execution of each step in each test.

Any deviation from the indicated results of a given test may mean that the solution must be replaced If there is any doubt, contact your Ansul representative.

A sample form is included within this booklet for use in recording Ansul AFFF test results. Note that the form calls for initial test data. **This Information Is Important and required as a reference point for future tests.**

Frequency And Accuracy Of Tests

Separate tests are required for the concentrate and premix solution of Ansul AFFF. Ansul recommends that premix solutions be inspected annually and that the concentrates be inspected once every five years. If you should question the quality of your Ansul AFFF due to
improper mixing, storage, etc., the tests should be
performed more frequently

Most of the tests require that certain properties, such as refractive indes, expansion ratio, etc., be measured and compared with acceptable values. To minimize small variations in the results, it is recommended that all tests, except for Ouality of Sample, be performed in triplicate and that the results be averaged. This average value is then compared with the recommended values contained in this manual.

Storage Conditions

Ansul recommends that its Ansul AFFF concentrate and premix solutions be stored at temperatures between 350 F. (1.70 C.) and 1200 F. (48.90 C.). Tests have been conducted with the concentrate and premix solutions stored at 1500 F. (65.50 C.) with no adverse effect. However, the Underwriters Laboratories Standard No. 162 requires that the maximum storage temperature be listed at 1200 F. (48.90 C.).

Storage of the concentrate below 350 F. (1.70 C.) could result in freezing of the agent. Should the agent freeze, it should be thawed at or near room temperature and then agitated or stirred to ensure that the concentrate Is a homogeneous solution. Should you suspect the agent was frozen in the past, agitation will again ensure a homogeneous solution.

Ansul AFFF Concentrate - [Test Procedures Found on Pages 2 - 6]

The concentrate as received from Ansul may be stored in the original container or in a concentrate tank, at temperatures of 350 F. (1.70 C.) or 120- F. (48.90 C.). Ansul recommends that the Ansul AFFF concentrate be tested once every five years or more frequently if adverse storage conditions exist The testing as described in this manual consists of verifying that the concentrate is a clear colorless liquid (Ansul AFFF 6%) or a clear pale yellow liquid (AnSul AFFF 3%) and that It has a refractive index of 1 .3560 to 1 .3620 for 6% concentrate, or 1.3590 to 1.3650 for the 3% concentrate. If the concentrate successfully passes these two tests, it is acceptable. Should the sample fail either of these two test, Ansul then recommends that the film formation, sealability and expansion ratio be measured to ensure he concentrate is acceptable. Observe all instructions carefully when performing inspections.

Ansul AFFF Premix Solution - [Test Procedures Found In Pages 6 - 10]

As with the concentrate, the premix solution should be stored at temperatures of 350 F. (1.7' C .) or 120* F. (48.9° C.) when the premix solution is originally formulated, a sample of the water should be taken and observed for residue. Let the water stand in its container for 5 minutes and then record the amount and appearance of any residue on the inspection sheet to avoid unnecessary concern during future premix inspections. You should also measure and record the initial refractive index of the premix solution as described on Page 8 of this manual.

Ansul recommends that the Ansul AFFF premix be tested annually or more frequently if adverse storage conditions exist. These tests consist of observing the appearance and measuring the concentration, seal ability and expansion ratio of the premix. Observe all instructions carefully when performing the tests.

Ansul recommends that Ansul AFFF concentrate be inspected every five years Should the quality of the Ansul AFFF concentrate be questioned for any reason (improper mixing, sediment, improper storage, temperatures, etc.) it is recommended that the tests be performed immediately. An Inspection Sheet (Ansul Form No. F-7880) is available for recording all test data.

Initial Inspection

When first putting the Ansul AFFF concentrate into service, it is recommended that the following be recorded:

1. Concentrate Refractive Index
2. Quality of Concentrate Sample

Initially the refractive index of the concentrate should be measured. The procedure is described on Page 3 of this manual. By submitting the concentrate's batch number to The Ansul Company, the initial refractive index can be obtained. Determination of the Quality of Concentrate Sample is described on Page 2. Both of the above test results should be recorded on the inspection sheet.

Periodic Inspection

As described on Pages 2 - 4, the periodic inspections will involve the following tests:

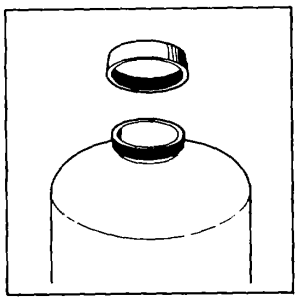
1. Quality of Sample
2. Measurement of Refractive Index

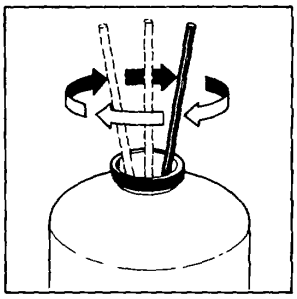
If the concentrate successfully passes these two tests, it is acceptable. Should the sample fail either of these two ests, Ansul then recommends that the following tests be performed to ensure the sample is acceptable (Pages - 6).

1. Measurement of Film Formation and Sealability
2. Measurement of Expansion

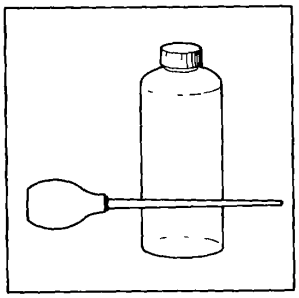
Ansul AFFF 3% or 6% Concentrate
Quality of Sample

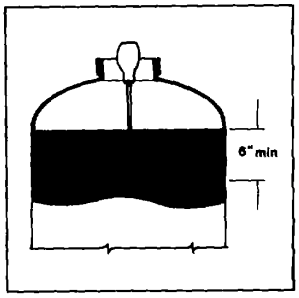
1. Remove lid from Ansul AFFF concentrate container.
2. Stir solution vigorously for 30 seconds using a non-metallic rod, or shake container





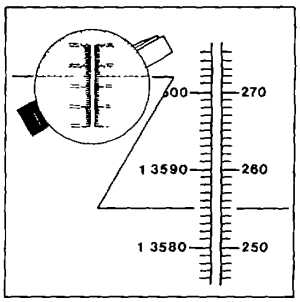
3. Use only clean, dry apparatus to extract and contain solution sample. If doubtful, clean apparatus with detergent (Alconox), rinse well and dry.
4. Extract a small amount of liquid from a depth of at least 6 inches below liquid level and replace container lid.

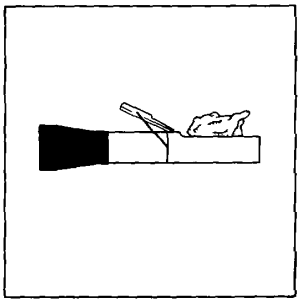




Quality of Sample [Continued]

5. Let the sample sit for about five minutes, then examine for stratification, sediment, or sludge. If more than 1 % by volume of sediment or sludge is found, it may be necessary to replace the concentrate.
6. If the sample evidences unacceptable levels of sludge or sediment in Step 5, return to the concentrate container and repeat Steps 2 through 5 to verify your findings. Continue with the Test Procedures which follow.

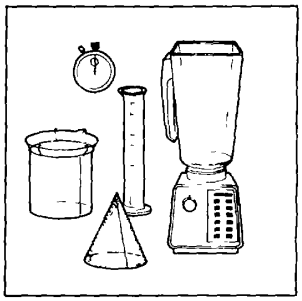


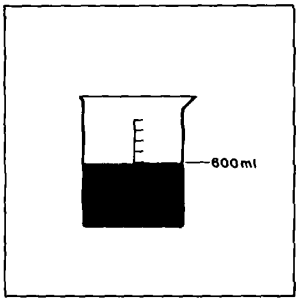


Measurement of Refractive Index*

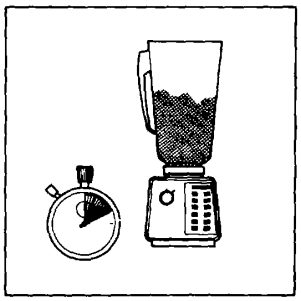
This test should be performed three times, with the result averaged to obtain the figure for the Field Inspection Record entry.

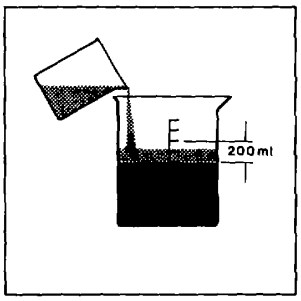
1. Hold your TS Meter** in a horizontal position, swing the cover plate over the body of the instrument to expose both the prism and the cover plate surface (clean if required) and place a small concentrate sample on the measuring prism. **NOTE:** Use a plastic pipette to minimize the possibility of scratching the prism surface by the contact with the pipette tip.
2. Swing (close) the cover plate over the measuring prism without delay to assure minimum evaporation. **CAUTION:** Take care to avoid lifting the cover plate before the reading is made. Care must be taken to avoid air bubbles when placing sample on the refractometer prism.





3. To hold the instrument for reading, place middle finger on nameplate and press the plastic cover gently but firmly to spread a minimal volume of sample In a thin, even layer over the prism. Expose it to an illuminating source such as a fluorescent or incandescent lamp or full sunlight. **NOTE:** To obtain the optimum contrast between light and dark boundary, the instrument may have to be properly tilted with respect to the lamp.
4. Bring the scale seen in the eyepiece into best focus by rotation of the eyepiece. **NOTE:** This setting need not be changed as long as the same individual continues to use the Instrument. Make the reading on the appropriate scale at the point where the dividing line between bright and dark fields crosses the scale. The average value obtained from three tests must be within ± 0.15% of the initial refractive index.

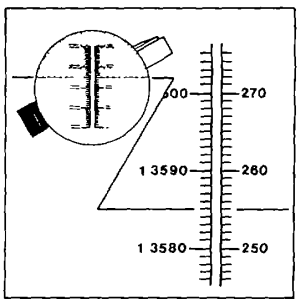


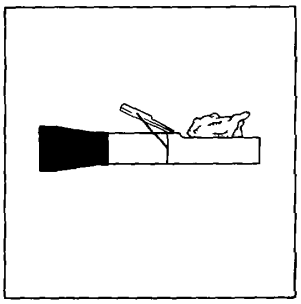


*This procedure is essentially Identical to that given In "Instructions for Use and Care of the AO TS Meter and Concentrimeter" by the American Optical Corporation, Scientific Instrument Division, Buffalo, New York, 14215 The TS meter Is available from scientific supply companies such as Rascher-Betzold or Curtin Scientific at a cost of about $500.

"The TS meter is compensated to give correct readings directly on aqueous solutions at all temperatures ranging from 60° F to 100° F.

5. Use a soft cloth or soft tissue (moisten one end with lukewarm water) for wiping the prism clean and dry If the prism surface or cover plate is not well cleaned before the next sample is loaded, an erroneous or fuzzy reading may result **CAUTION:** Do not immerse the eyepiece of the black focusing ring in water. Never use gritty cleaning compounds to clean the prism and never expose the instrument to temperatures above 150° F.

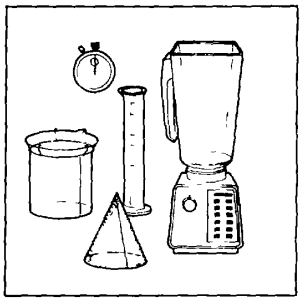




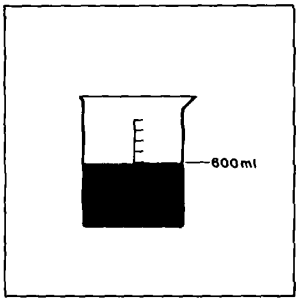
6. If the Quality of Sample and the Refractive Index Tests are okay, no further tests are needed. However, questionable results on either test indicate that the concentrate may not be acceptable. If the concentrate fails either of the above two tests, it is necessary to measure the film formation, sealability and expansion ratio as described in the following sections. If the concentrate passes these additional tests, it is acceptable and need not be replaced.

Measurement of Film Formation and Sealablity Quality*

It is not necessary to perform this test unless irregularities are encountered in the Quality of Sample or Measurement of % Concentration Tests.

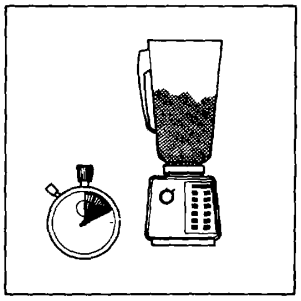


1. You will need an automatic blender for use as a test foam maker (at 70° ± 50 F), an 80-mesh concial screen of corrosion-resisting steel (5 inches in height by 43/4 inches in diameter), a corrosion-resisting 1000 ml graduated measure (41/2 inches in diameter, 5 inches deep) with small metal clips fitted at the top edge to restrain the screen from floating out of the container during the test, a corrosion-resisting 100 ml graduated measure, a stopwatch, and a flame source (see Step No 6) In lieu of the blender to generate a foam sample, a small sample of foam can be discharged through the system's foam nozzle.

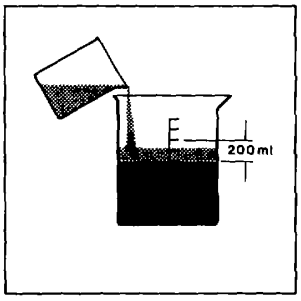


2. Pour a carefully measured 600 ml of 98 per cent cyclohexane into the 1000 ml capacity graduated measure.

3. Prepare a premix solution' from the concentrate and place a 100 ml sample in the blender. Run the blender at low speed for about 10 seconds to generate foam or generate the foam sample by discharging a small amount of solution from the system's nozzle.



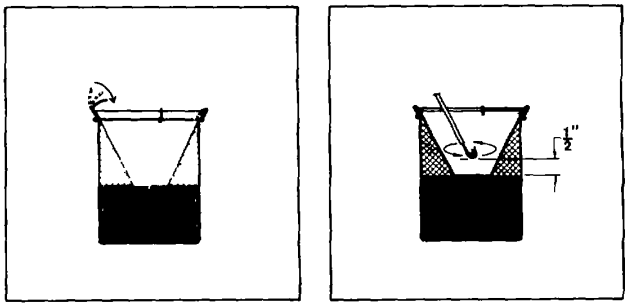
4. Pour 200 ml of this foam onto the fuel surface.



*To prepare a premix solution, first extract a sample of the concentrate using the method employed in the Ouality of Sample Section. Carefully measure 10 ml of the concentrate and combine with either 157 ml of water (for the 6% concentrate) or 323 ml of water (for the 3% concentrate) Stir gently.

Measurement of Film Formation and Sealability Quality [Continued]

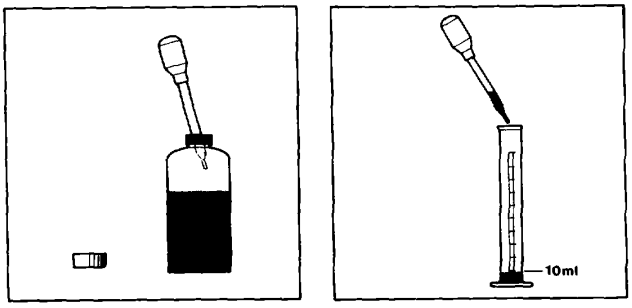
5. Insert the screen into the measure, clip firmly into place and start your stopwatch.
6 After 1 minute of elapsed time, pass a small 1-inch long flame several times around the fuel surface at a height of 1/2 inch (± 118 inch). A small flash may occur but no sustained ignition shall result if an effective vapor-seal is present. Sustained ignition means the solution should be replaced. **NOTE:** A hand-held propane tank with a capillary tubing outlet and adjustment valve will readily provide a 1-inch long pilot flame.



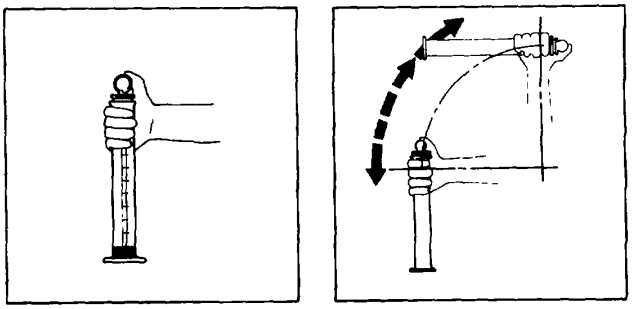
Measurement of Expansion

It is not necessary to perform this test unless irregularities are encountered in the Quality of Sample or Measurement of % Concentration Tests.

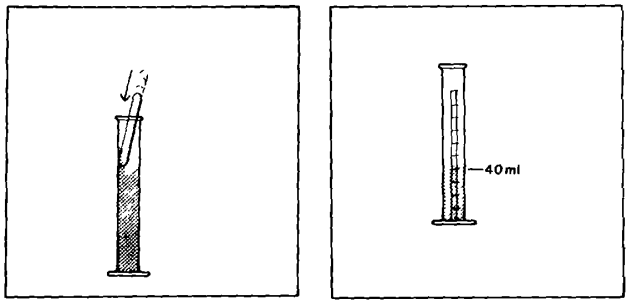
1. Extract at least 10 ml of solution from the premix solution prepared earlier.
2. Place precisely 10 ml in the clean 100 ml graduated cylinder.



3. Place stopper in graduate, placing thumb over top of stopper.
4. Shake graduate in 90o arc, hard and rapidly at least 25 times If any liquid is in evidence below foam bulk, reshake.



5. Push foam clinging to sides of graduate down into foam bulk with a spatula and read volume at top level of foam.
6 Total volume of less than 40 ml corresponds to a foam expansion of less than 4, meaning solution must be replaced.



TEST PROCEDURES - PREMIXED ANSUL AFFF

Ansul recommends that premixed solutions be inspected annually. Should the quality of the Ansul AFFF solution be questioned for any reason (improper mixing, sediment, improper storage temperatures, etc.) it is recommended that the tests be performed immediately.

An Inspection Sheet (Ansul Form No. F-7880) is available for recording all test data.

Initial Inspection

When first putting an Ansul AFFF premix system into service, it is recommended that the following measurements be taken:

1. Measurement of concentrate refractive index
2. Generation of the refractive index versus per cent concentration curve
3. Determination of quality of water

The procedure for determining concentrate refractive index is described on Pages 3 - 4. By submitting the concentrate's batch number to The Ansul Company, the initial refractive index can be obtained. The generation of the refractive index versus per cent concentration curve is illustrated on Page 11.

Ansul AFFF 3% or 6% Premix Solution

Quality of Sample

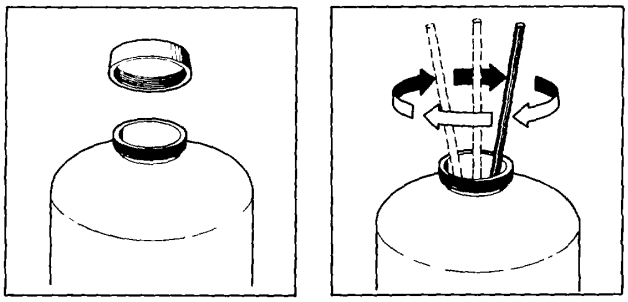
1. Remove fill cap from Ansul AFFF solution tank.
2. Stir solution vigorously for 30 seconds using a non-metallic rod.

Determining water quality consists of examining a sample of the water for residue and/or sediment. Let the water stand in its container for 5 minutes and then record the appearance and amount of any residue. This would help you avoid unnecessary concern with the me residue during future premix inspections three of the above test results should of course, be recorded on the inspection sheet.

Periodic Inspection

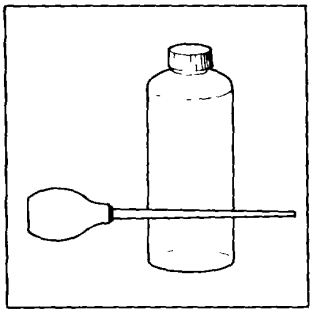
described on Pages 7 - 10, the periodic inspections Involve the following tests:

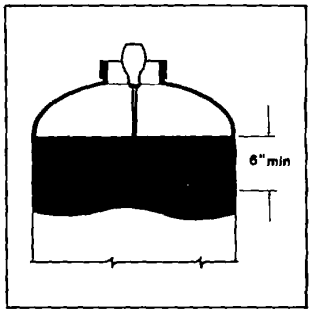
1. Quality of Sample
2. Measurement of Per Cent Concentration
3. Measurement of Film Formation and Sealability
4. Measurement of Expansion



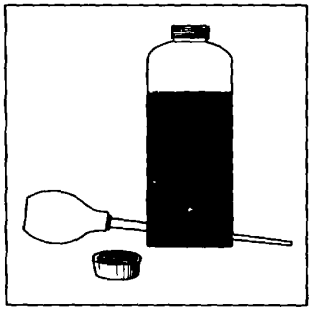
Quality of Sample [Continued]

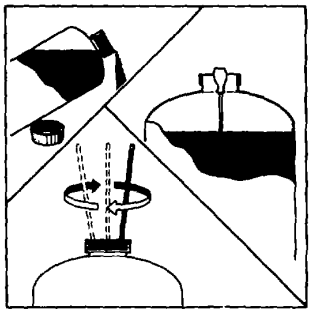
3. Use only clean, dry apparatus to extract and contain solution sample If doubtful, clean apparatus with detergent (Alconox), rinse well and dry.
4. Extract 1 quart of solution from a depth of at least 6 inches below liquid level and replace fill cap.





5. Let the sample sit for about five minutes, then look for stratification, sediment or sludge. If more than 1 % by volume of sediment or sludge is found, you should replace the premix solution. However, any sludge or sediment that was introduced **with the water,** in the premixing process, may be disregarded. Refer to your records for information about the sludge or sediment content of the water originally used.
6. If the sludge or sediment content of the sample is found to be unacceptable, clean all the sampling equipment carefully and repeat Steps 2 through 5 to verify your findings.'

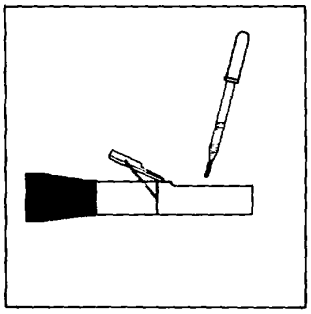


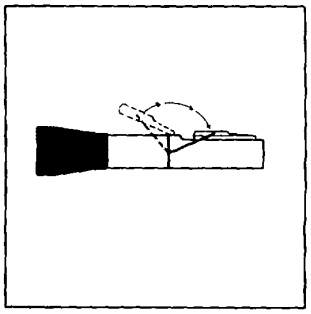


Measurement of % Concentration

This test should be performed three times, with the result averaged to obtain the figure for the Field Inspection Record entry.

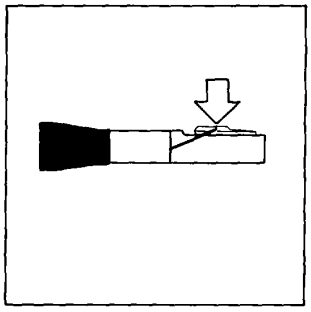
1. Hold your TS Meter** in a horizontal position, swing the cover plate over the body of the instrument to expose both the prism and the cover plate surface (clean if required) and place a small sample of the premix solution on the measuring prism. **NOTE:** Use a plastic pipette to minimize the possibility of scratching the prism surface by the contact with the pipette tip.
2. Swing (close) the cover plate over the measuring prism without delay to assure minimum evaporation **CAUTION:** Take care to avoid lifting the cover plate before the reading is made. Care must be taken to avoid air bubbles when placing sample on the refractometer prism.

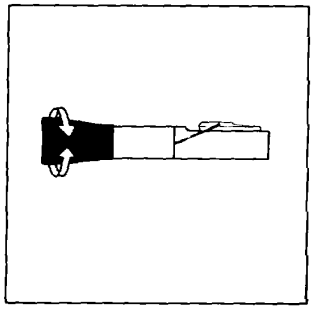




*Document the condition of the samples regardless of the test results 'This procedure is essentially identical to that given in "Instructions for Use and Care of the AO TS Meter and Concentrimeter" by the American Optical Corporation, Scientific Instrument Division, Buffalo, New York, 14215 The TS Meter Is available from scientific supply companies, such as Rascher-Betzold or Curtin Scientific at a cost of about $500

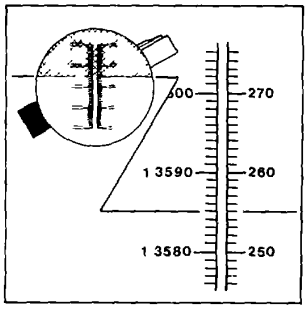
3. To hold the instrument for reading, place middle finger on nameplate and press the plastic cover gently but firmly to spread a minimal volume of sample in a thin, even layer over the prism Expose it to an illuminating source such as a fluorescent or incandescent lamp or full sunlight. **NOTE:** To obtain the optimum contrast between light and dark boundary, the instrument may have to be properly tilted with respect to the lamp.

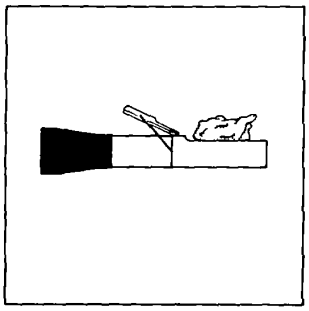




4. Bring the scale seen in the eyepiece into best focus by rotation of the eyepiece **NOTE:** This setting need not be changed as long as the same individual continues to use the instrument.

5. Make the reading on the appropriate scale at the point where the dividing line between bright and dark fields crosses the scale and use the appropriate concentration graph to convert readings to per cent concentration This graph was generated when the initial inspection was performed. (The procedure is described on Page 11. If the average of the three refractive index readings is not within + 1 % of refractive index anticipated (from the appropriate graph and the initial inspection figures of the Field Inspection Record) additional tests will be required to verify the acceptability of the Ansul AFFF premix solution.



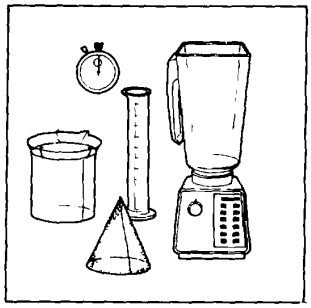


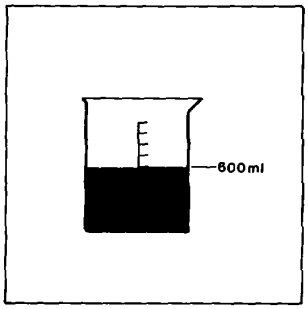
6. Use a soft cloth or soft tissue (moisten one end with lukewarm water) for wiping the prism clean and dry If the prism surface or cover plate is not well cleaned before the next sample is loaded, an erroneous or fuzzy reading may result **CAUTION:** Do not immerse the eyepiece or the black focusing ring in water Never use gritty cleaning compounds to clean the prism and never expose the instrument to temperatures above 1500 F.

Measurement of Film Formation and Sealability Quality'*

This test should be performed three times, with the result averaged to obtain the figure for the Field Inspection Record entry.

1. Equipment required to conduct the test includes an automatic blender for use as a test foam maker (at 700 ± 50 F), an 80-mesh conical screen of corrosion-resisting steel (5 inches in height by 43/4 inches in diameter), a 1000 ml corrosion-resisting graduated measure (41/2 inches in diameter, 5 inches deep) with small metal clips fitted at the top edge to restrain the screen from floating out of the container during the test, a corrosion-resisting 100 ml graduated measure, a stopwatch, and a flame source (see Step No. 6). In lieu of the blender to generate a foam sample, a small sample of foam can be discharged through the system's foam nozzle.





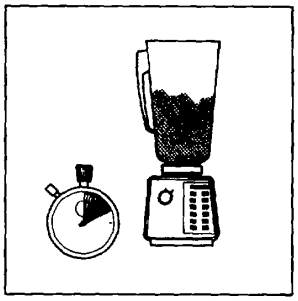
2. Pour a carefully measured 600 ml of 98 per cent cyclohexane into the 1000 ml capacity graduated measure.

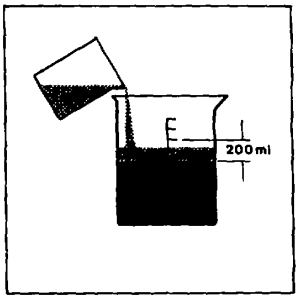
*This procedure is essentially identical to TEST FOR FILM FORMATION AND SEALABILITY OF AFFF SOLUTIONS ACCORDING TO SPECIFICATION MIL-F-24385 TEST PROCEDURE 4 7 6.

Measurement of Film Formation and Sealability Quality [Continued]

3. Place a 100 ml sample of the premix solution to be tested in the blender and foam for 10 seconds at low speed or generate the foam sample by discharging a small amount of solution from the system's nozzle.

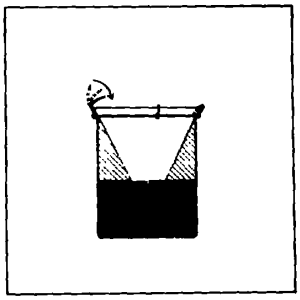
4. Pour 200 ml of this foam onto the fuel surface.

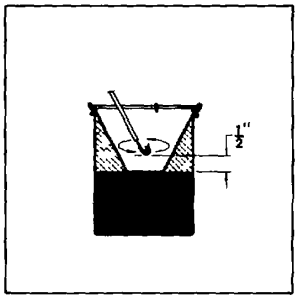




5. Insert the screen into the measure, clip firmly into place and start your stopwatch.

6. After 1 minute of elapsed time, pass a small 1-inch long flame six times around the fuel surface at a height of 1/2 inch (+118 inch). A small flash may occur but no sustained ignition shall result if an effective vapor-seal is present Sustained ignition means the solution should be replaced. **NOTE:** A hand-held propane tank with a capillary tubing outlet and adjustment valve will readily provide a 1 inch long pilot flame.

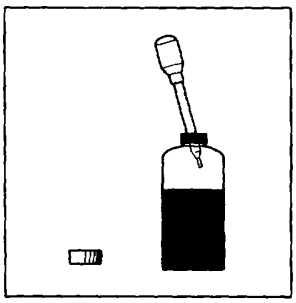


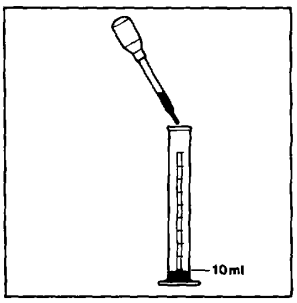


Measurement of Expansion

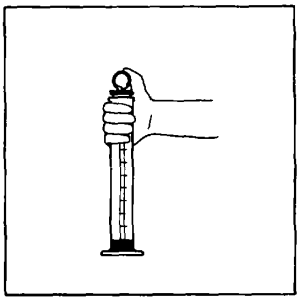
This test should be performed three times, with the result averaged to obtain the figure for the Field Inspection Record entry.

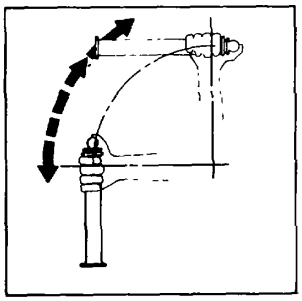
1. Extract at least 10 ml of the premix solution from one quart sample previously removed from tank.
2. Place precisely 10 ml in the 100 ml graduated cylinder



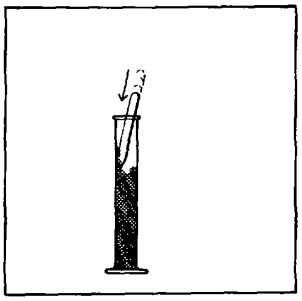


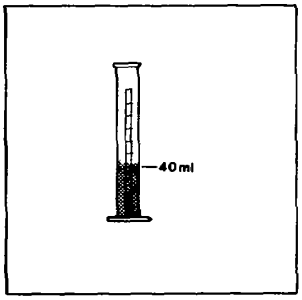
3. Place stopper in graduate, placing thumb over top of stopper.
4. Shake graduate in 90' arc hard and rapidly at least 25 times. If any liquid is in evidence below foam bulk, reshake





5. Push foam clinging to sides of graduate down into foam bulk with a spatula and read volume at top level of foam.
6. Total volume of less than 40 ml corresponds to a foam expansion of less than 4, meaning solution must be replaced.





USING THE REFRACTIVE INDEX CURVE TO DETERMINE PREMIX CONCENTRATION AND TO CHECK PROPORTIONING ACCURACY

Developing the Refractive Index Versus Concentration Curve

The refractive index of an Ansul AFFF solution can be used to determine premix concentrations or to check the accuracy of proportioning equipment. Measurement of the refractive index allows you to determine the per cent Ansul AFFF concentrate in solution with either fresh or salt water The higher the concentrate level, the higher the refractive index. In fact, a straight line relationship exists between refractive index and per cent Ansul AFFF concentration.

The refractive index is measured with the use of a refractometer, such as the hand-held AO TS Meter and Concentrimeter, manufactured by the American Optical Corporation, Scientific Instrument Division, Buffalo, NY 14215. This TS meter is available from many scientific supply companies at a cost of about $500. In lieu of purchasing the instrument, many local laboratories will have bench models for determining refractive index. Prior to mixing the premix solution or checking proportioner accuracy, it will be necessary to plot a refractive index versus concentration curve. Since the refractive index will vary somewhat with water type, it is important that this curve be based on water taken from the same source used for your premix solution or your proportioner.

Plotting the Refractive Index Versus Concentration Curve

1. The following equipment will be required:
   AO TS meter
   100 ml graduated cylinder
   Medicine dropper
   Soft cloth or soft tissue
   15 – 25 ml of your Ansul AFFF concentrate
   Sample of water used for premix or proportioning
   Grid for plotting the curve such as the one given on the back of the "Field Inspection Record" at the end of this manual
   Stirring rod
2. To plot the curve you will formulate Ansul AFFF and water solutions at 0%, 5% andl0% concentration by volume of Ansul AFFF concentrate to water The refractive index for each of these solutions will be determined and plotted on the refractive index versus concentration graph. The straight line connecting these points is the curve which will be used to check your premix concentration or proportioner accuracy
3. Refractive Index - 0% concentration - Water Only Use your TS meter to measure the refractive index of the fresh or salt water that will be mixed or proportioned with the Ansul AFFF concentrate. The use of the meter and method of reading the refractive index is described in detail on Pages 7 - 8, of this manual Measure the refractive index three times and average the values.

   Plot the resulting value on the graph at the point where the refractive index value (horizontal line from vertical axis) intersects the 0% concentration line (the far left vertical line).
4. Refractive Index – 5% concentration Formulate a 5% Ansul AFFF solution by mixing 5 ml of Ansul AFFF concentrate with 95 ml of your water sample Stir the solution to ensure that a homogeneous solution is obtained.

   Measure the refractive index three times and average the result as before. Plot the resulting point where the horizontal line from the vertical refractive index axis crosses the 5% concentration line.

Refractive Index - 10% concentration Formulate a 10% Ansul AFFF solution by mixing 10 ml of Ansul AFFF concentrate with 90 ml of your water sample. Stir the solution to ensure a homogeneous solution is obtained.

Measure the refractive index three times and average the results as before Plot the resulting point where the horizontal line from the vertical refractive index axis crosses the 10% concentration line.

5. Connecting the three points with a straight line results in the refractive index versus concentration curve This curve should be kept on file with the "Field Inspection Record."

Proportioning Accuracy and Calibration

Once the refractive index versus concentration curve is developed, it is a simple matter to calibrate or check the accuracy of your proportioner.

With the proportioner operating, withdraw a sample of am solution downstream of the proportioner. Measure e refractive index of this solution with the refractoeter as described on Pages 7 - 8. As before, it is a good idea to make three measurements and average the results. Using your refractive index versus concentration curve, draw a horizontal line through the measured refractive index value on the vertical axis to the point 'here it crosses your curve. Then draw a vertical line own from this point so it intersects the horizontal axis. The concentration read at this intercept is the per cent concentration of Ansul AFFF concentrate to water proportioned by your system.

Determining Premix Concentration.

The procedures for determining premix concentration are described on Pages 7 – 8. Note that the refractive index versus concentration curve should be constructed when he premix solution is originally formulated.

FIELD INSPECTION RECORD

Ansul AFFF Lot No(s). _____ ☐ 3% or ☐ 6% Concentrate

Date Received _____

Location _____ ☐ Storage ☐ Installation

Amount of Agent _____

Is concentrate to be premixed, either now or later? ☐ Yes ☐ No.

INITIAL INSPECTION [CONCENTRATE ONLY]

DATE	QUALITY OF SAMPLE	REFRACTIVE INDEX

INITIAL INSPECTION [PREMIX SOLUTION ONLY]

DATE	QUALITY OF WATER	AMOUNT OF WATER	AMOUNT OF CONCENTRATE	REFRACTIVE INDEX*

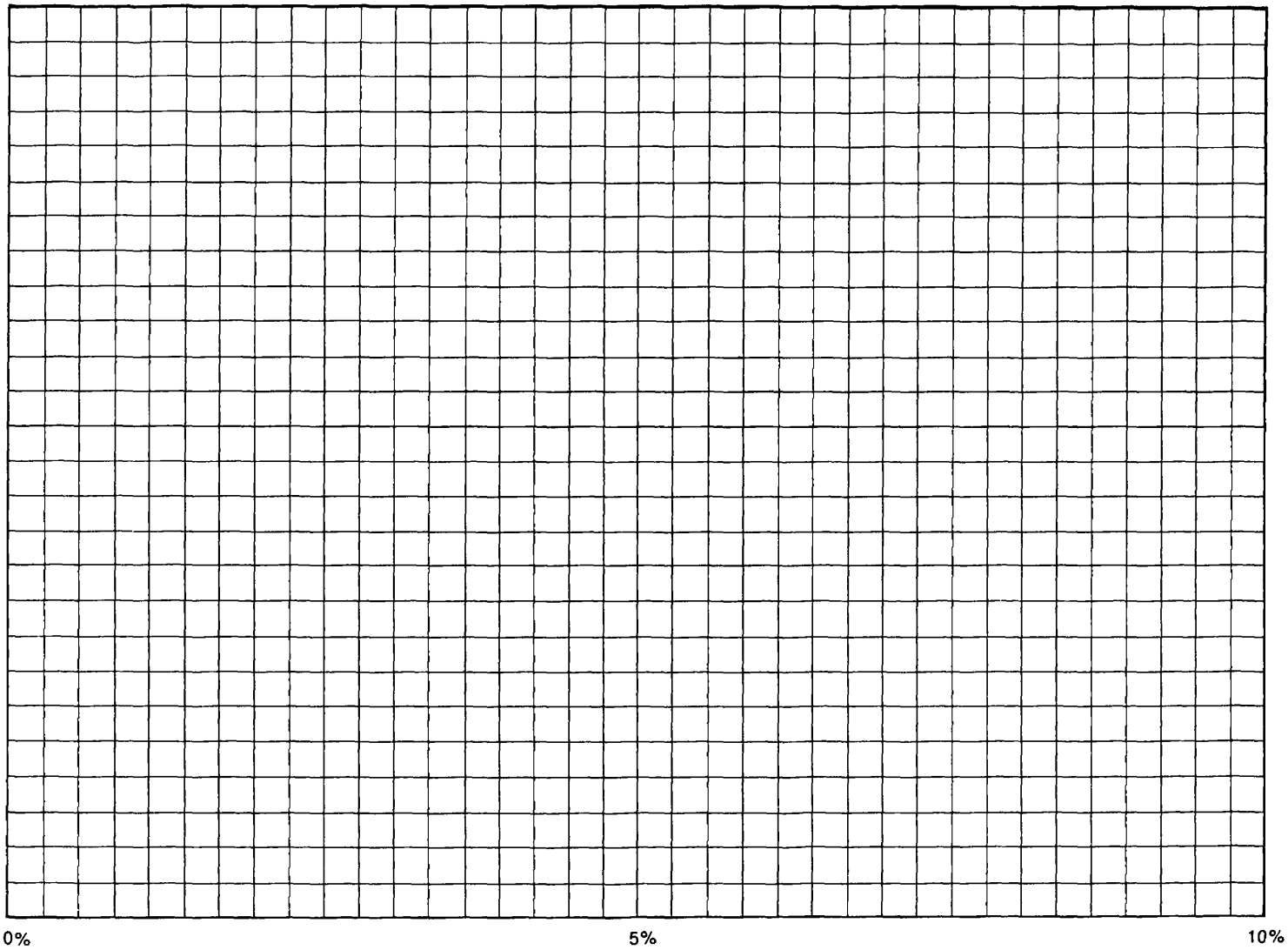
PERIODIC INSPECTION**

DATE	QUALITY OF SAMPLE	REFRACTIVE INDEX*	% CONCENTRATION FROM GRAPH (PREMIX ONLY)	FILM FORMATION AND SEALABILITY	EXPANSION RATIO	INSPECTION PERFORMED BY

* Refractive index versus concentrate curve for premix solution to be constructed on reverse.

** Inspect premix solutions annually. Inspect concentrate every 5 years. Refer to the manual for proper procedure.

REFRACTIVE INDEX



THE ANSUL COMPANY
INTERNATIONAL HEADQUARTERS: MARINETTE WISCONSIN 54143
MANUFACTURING PLANTS AND SALES OFFICES THROUGHOUT THE WORLD

Part No. 31274 ©1978 The Ansul Company Litho in U.S.A.

FIELD INSPECTION RECORD

Ansul Form F7880

THE ANSUL COMPANY, MARINETTE, WISCONSIN 54143

ANSUL AFFF FIELD INSPECTION RECORD

Ansul AFFF Lot No(s) _____ ☐ 3% or ☐ 6% Concentrate

Date Received _____

Location _____ ☐ Storage ☐ Installation

Amount of Agent _____

Is concentrate to be premixed, either now or later? ☐ Yes ☐ No.

INITIAL INSPECTION [CONCENTRATE ONLY]

DATE	QUALITY OF SAMPLE	REFRACTIVE INDEX

INITIAL INSPECTION [PREMIX SOLUTION ONLY]

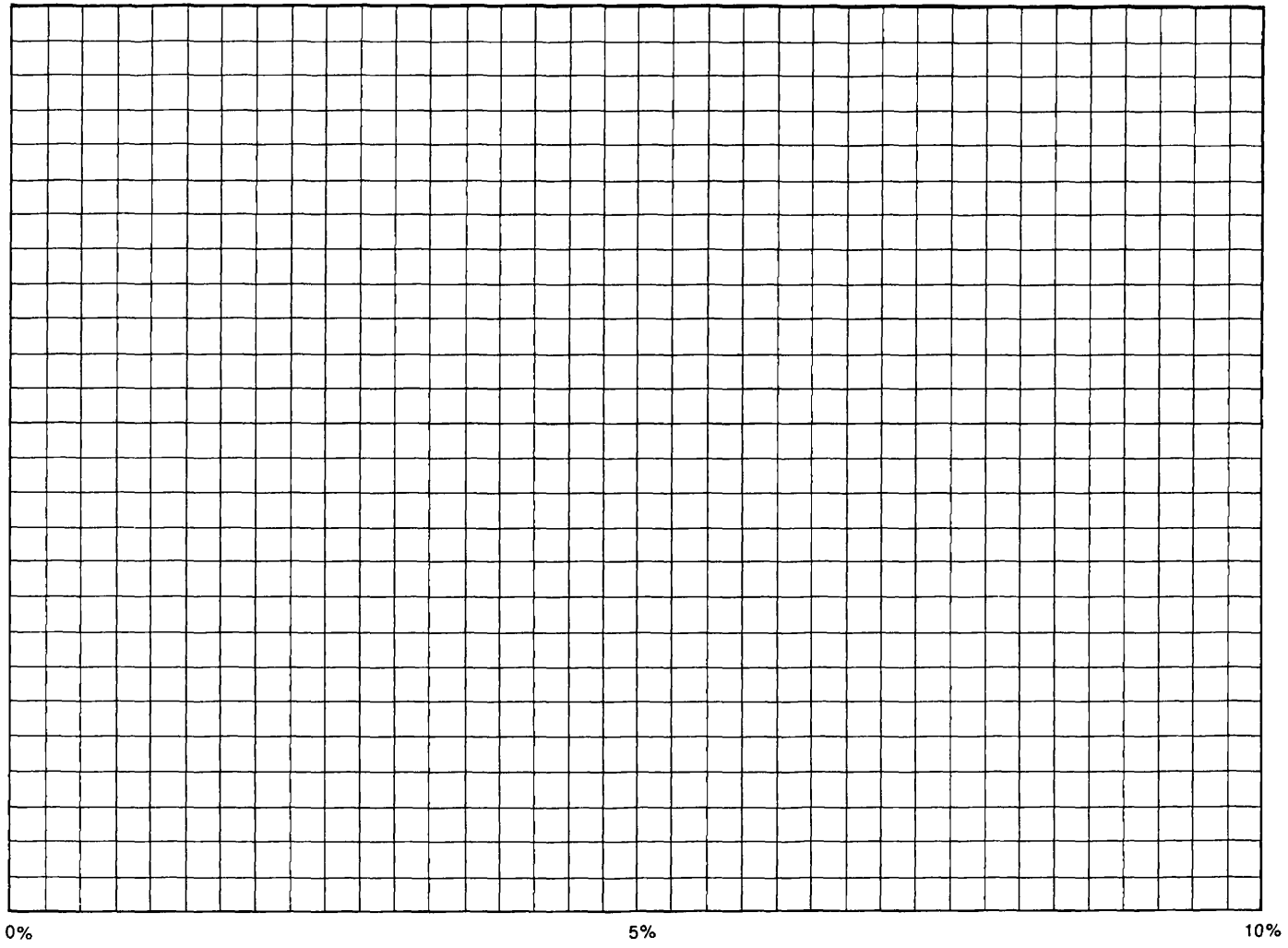
DATE	QUALITY OF WATER	AMOUNT OF WATER	AMOUNT OF CONCENTRATE	REFRACTIVE INDEX*

PERIODIC INSPECTION**

DATE	QUALITY OF SAMPLE	REFRACTIVE INDEX*	% CONCENTRATION FROM GRAPH (PREMIX ONLY)	FILM FORMATION AND SEALABILITY	EXPANSION RATIO	INSPECTION PERFORMED BY

*Refractive index versus concentrate curve for premix solution to be constructed on reverse.
**Inspect premix solutions annually. Inspect concentrate every 5 years. Refer to the manual for proper procedure.

REFRACTIVE INDEX



% CONCENTRATION

TEMPERATURE CORRECTION CHART

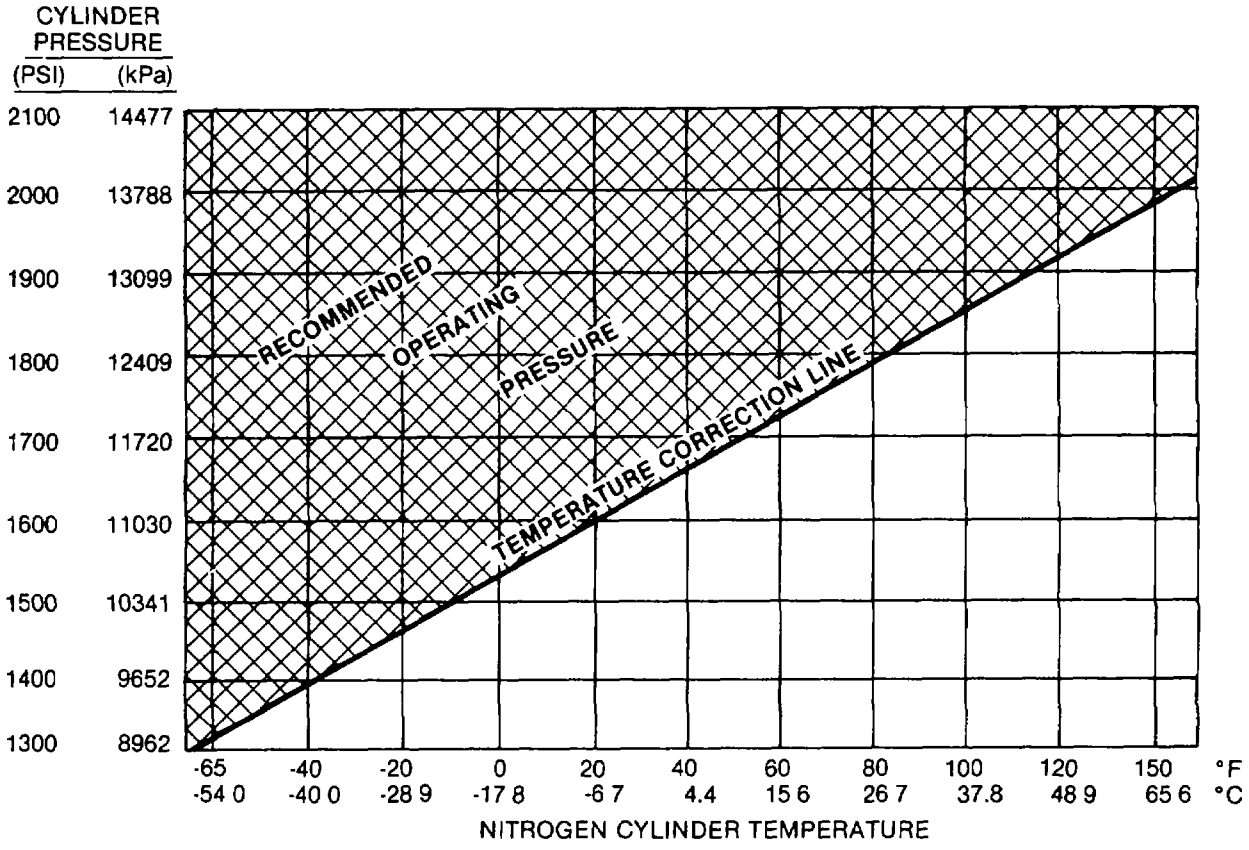
Ansul

TEMPERATURE CORRECTION CHART

For Checking Pressure of 400 Cu. Ft. (11.32 m3) Nitrogen Cylinder

Ansul fire suppressing/securing systems use compressed nitrogen as the expellant for the extinguishing agents The instructions covering proper inspection and maintenance of this equipment state that the 400 cu ft. (11.32 m^3) nitrogen cylinders should be replaced with fully charged cylinders if the pressure is less than 1750 PSI (12064 kPa) at 70°F (21° C) However, the pressure in the nitrogen cylinder varies with changes in temperature.

Accordingly, the chart below has been prepared to assist users of Ansul equipment in determining that the cylinder being checked contains enough nitrogen to furnish a recommended operating pressure



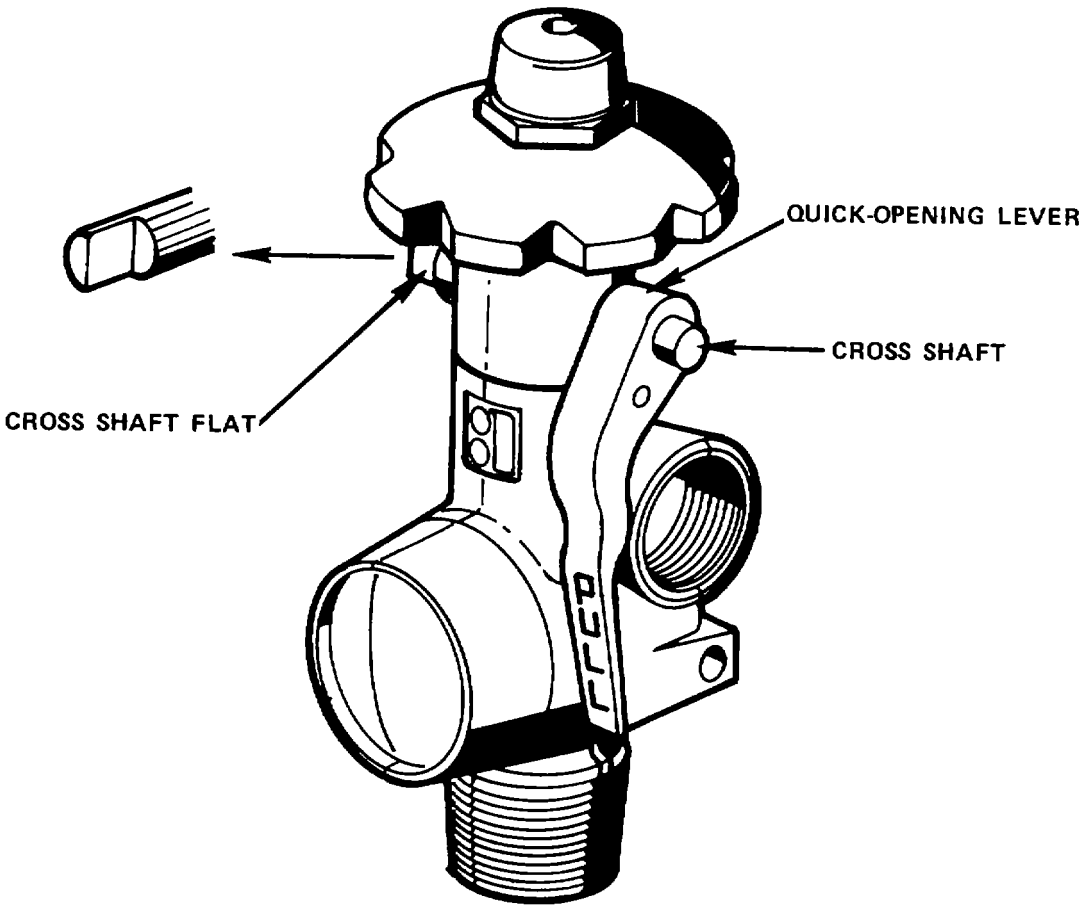
Examples:

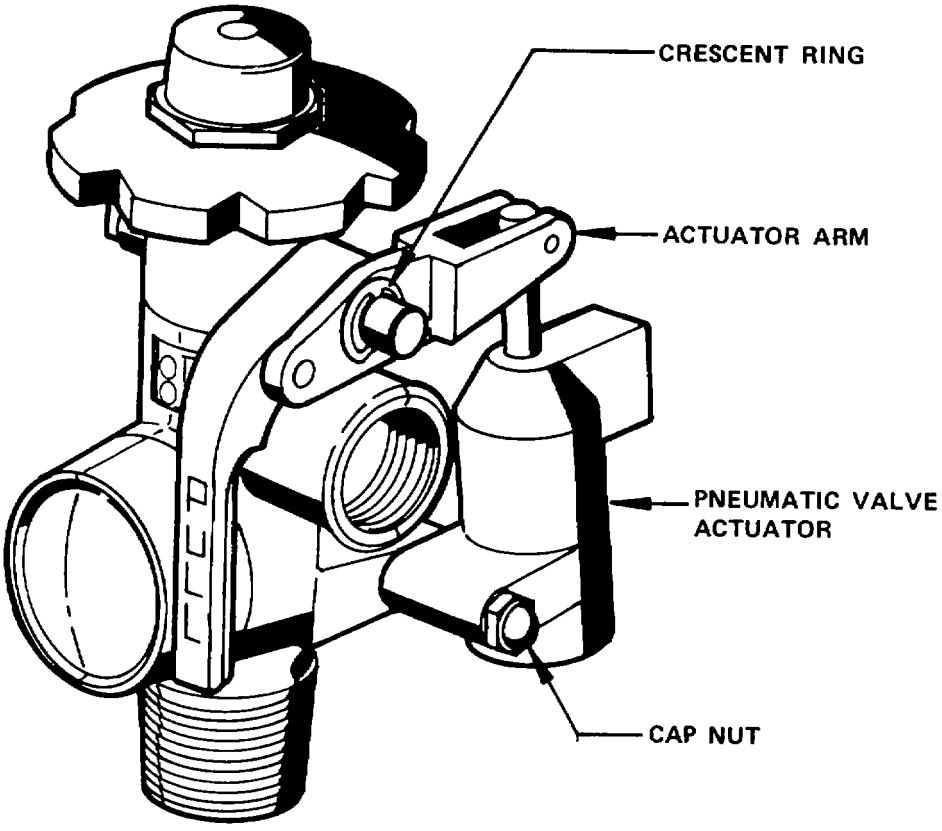
1. The nitrogen cylinder on an Ansul fire suppressing/securing system indicates a pressure of 1800 PSI (12064 kPa) on the pressure gauge. The temperature of the cylinder is 800 F (26 70 C). Reference to the chart shows that this is above the "temperature correction line" and the cylinder does not need to be replaced.

2. One of the nitrogen cylinders of an Ansul fire suppressing/securing system indicates a pressure of 1600 PSI (11030 kPa) on the pressure gauge. The temperature of the cylinder is 800 F (2670 C). Reference to the chart shows that this is below the minimum recommended pressure for this temperature. The cylinder should be replaced by a fully charged nitrogen cylinder.

QUICK-OPENING VALVE

Ansul

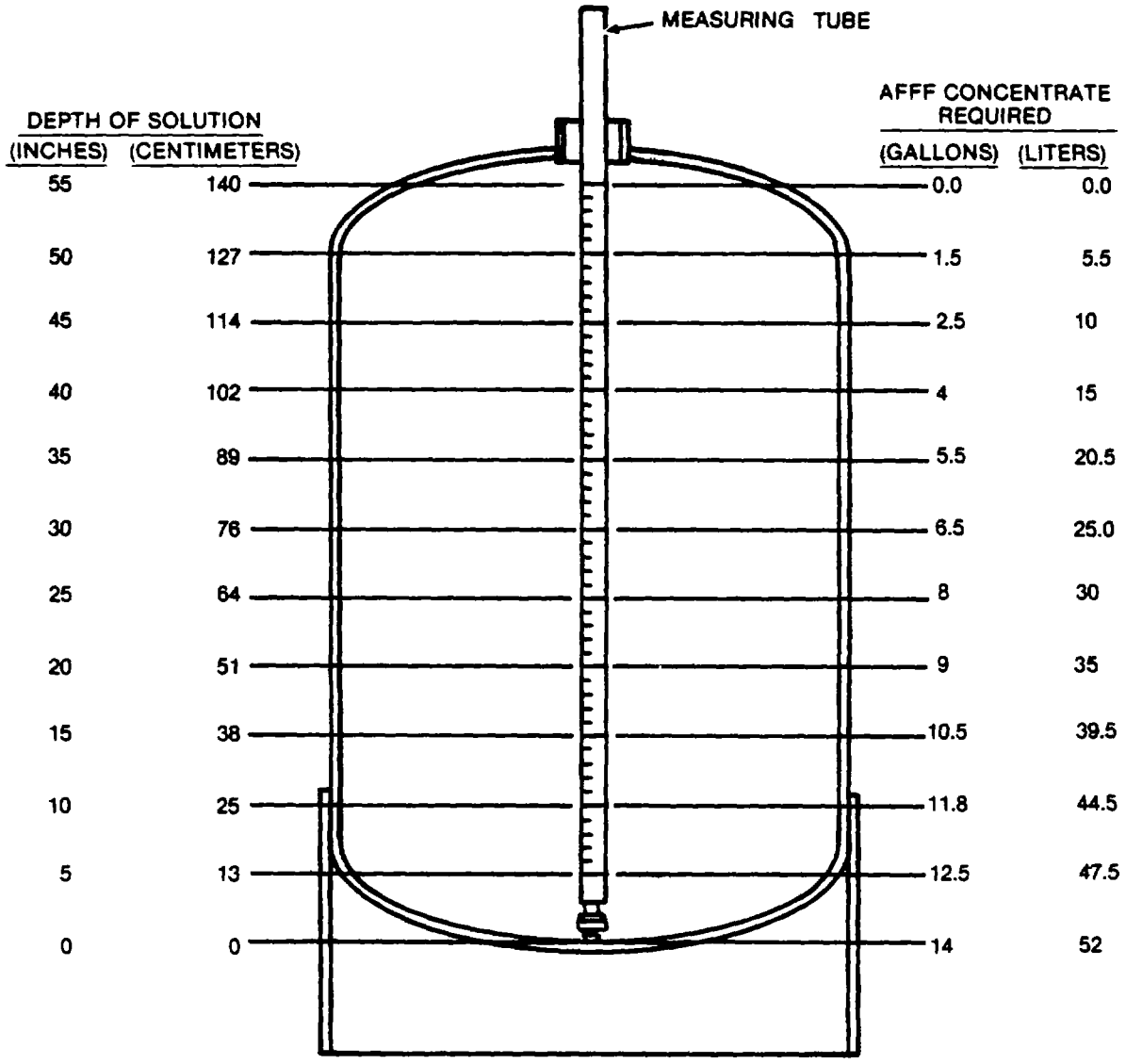

QUICK-OPENING LEVER
CROSS SHAFT
CROSS SHAFT FLAT


CRESCENT RING
ACTUATOR ARM
PNEUMATIC VALVE ACTUATOR
CAP NUT

AFFF 6% RECHARGE GUIDE

Ansul

The amount of AFFF (aqueous film-forming foam) concentrate necessary to complete a partial charge can be computed by measuring the depth of the solution remaining In the tank and referring to the chart below.



**200 GALLON (757 LITERS NOMINAL CAPACITY AFFF SOLUTION TANK
FILL TO 2 INCHES (5 CENTIMETERS) BELOW BOTTOM OF FILL OPENING**

**IGNITION SWITCH
AND IGNITION SWITCH INDICATOR LIGHT**

Ansul Part Number S-27776

Ignition Switch

6 - 32 volts

3 position, off-ignition-ignition/start

Spring return to ignition position

Silver inlaid contacts

3 screw terminals

Mounting bushing 3/8" dia. x 23/64" long

Cole-Hersee Part Number 95610

Ignition Switch Indicator Light

12 volt

Water-proof, explosion-proof heavy duty

Single wire lead, 16 gauge, 8" long

Accommodates type G-6, S.C. bayonet bulb,

No. 67 or No 89, 12 volt

Gasketed, red faceted 15/16" dia. lens

Mounts through 7/8" dia. hole

Cole-Hersee Part Number PL-39

Manufacturer

Cole- Hersee
20 Old Colony Avenue
Boston, Massachusetts 02127

SIERRA COMPANY

Crash Rescue Kit (CRK5 SIERRA) Ansul Part No. S-52537

SIERRA AIRCRAFT RESCUE CRASH TOOL KIT

Sierra Company
Los Angeles, CA 90037

Aircraft Cable Cutters, 14 inch, capacity to 1/4 inch

Lineman's Pliers, heavy duty, 8 inches long

Grappling Hook and Rope Sling, 40 inches long

Hack Saw Frame, adjustable, 8 to 12 inches

6 Fuel Line Plugs, 3 hardwood, 3 neoprene

Heavy Canvas Roll, treated, stencil outlined with tool pockets or straps

Rescue Knife, with "V" blade, will cut 10000 lb. webbing or seat belts

Serrated-Edge Axe, heat-treated blade for metal piercing

Vise Grip Wrench, 10 inches long

3 Hack Saw Blades, 10 inch steel

Metal Cutting Saw, 20 inch blade

2 Slot Screwdrivers, 4 inch and 6 inch

2 Phillips Screwdrivers, 4 inch and 6 inch

H.K. PORTER INC.

Hydraulic Rescue Kit (PK-4) Ansul Part No. S-52536

THERE'S A P-F® SERVICE STATION NEAR YOU FOR YOUR CONVENIENCE

Authorized P-F® Service Stations, specializing in the repair and service of P-F® Hydraulic Jacks are located in principal cities in every section of the country. These stations are staffed with expert workmen, trained in all phases of jack maintenance and repairs. Contact the station nearest you – they will be glad to help you quickly and reasonably. Please do not send jacks to our factory but to the P-F® SERVICE STATION NEAREST YOU.

ALABAMA
Hydraulic Service Company
3000 4th Ave., S. Birmingham

Southern Jack Company
615 North 9th Ave., Birmingham

ARIZONA
Jacks Inc.
1909 E. Washington St., Phoenix

CALIFORNIA
Valley Hydraulics
520 Van Ness, Fresno

L & G Specialities
524 Houston St., Sacramento

Hydraulic Services
5227 University Ave., San Diego

California Service Tool & Supply
436 Peralta Ave., San Leanoro

A-1 Hydraulics
666D Stockton Ave., San Jose

Jack-X-Change
1556 W. Embassy, Anaheim

COLORADO
Merrill Hydraulic Specialists
12th and Acoma, Denver

Hilliker Hydraulics
734 Santa Fe, Denver

CONNECTICUT
J & S Hydraulic Jack Repairing
45 Old Gate Lane, Milford

A & L Eastern Hydraulic, Inc.
51 Farren Ave., New Haven

DISTRICT OF COLUMBIA
Matto's
1811 14th St., N.W., Washington

FLORIDA
Broward Hydraulic Jack ServiceCo.
3811 Davie Blvd., Fort Lauderdale

Jack Carter & Son
333 Norton Ave., Orlando

Central Hydraulic Service
3423 LaSalle St., Tampa

Dade Equipment Service
960 W. 22nd, Hialeah

Hydraulic Services
200 East Main St., Pensacola

Auto Body Supply, Inc.
616 N. 13th St., Tampa

GEORGIA
Turner & Cole
353 W. Peachtree St.,N.E.,Atlanta

R & R Jack Repair
1548 Tenth Ave., Columbus

B & R Hydraulic Service, Inc.
511 Roosevelt Ave., Albany

HAWAII
Air Hydraulic Service
842 Ilaniwai St., Honolulu

ILLINOIS
Servall Engineering Co.
3937 N. Kedzie Ave., Chicago

INDIANA
Servall Engineering Co.
744 Sibley St., Hammond

A B C Specialty Co.
1075 Kenwood Ave., Ft. Wayne

Arrow Supply Company, Inc.
924 N. Illinois St., Indianapolis

Scotty's Hyd. Jack Service
1204 N. Center, Plymouth

IOWA
Turner's Hyd. Service
3011 6th Ave., DesMoines

KANSAS
Wichita Hydraulic Service Co.
1311 So. McLean, Wichita

KENTUCKY
Queen Hydraulic
1226 Rowan St., Louisville

LOUISIANA
Beerman Precision Works
2021 Thalia St., New Orleans

MAINE
Winne's Jack Service
Lubec

MARYLAND
Holdridge Engineering Company
2406-10 Aisquith St., Baltimore

MASSACHUSETTS
Alted Hydraulic Service
96 Hampshire Street, Cambridge

New England Hydraulic Service Co.
12 Hurley St., Cambridge

Block Hydraulic
2570 Main St., Springfield

MICHIGAN
Hydraulic Service
21251 Ryan Rd., Warren

Hydraulic Equipment Co.
1401 Alpine Ave. N.W., Grand Rapids

MINNESOTA
Hydraulic Jack & Equip. Serv. Co.
2601 Aldrich Ave. So., Minnesota

Jensen Small Engine Service
1332 1st Ave. North, Moorehead

MISSISSIPPI
Dixie Hydraulic Service
1640 So. Gallatin St., Jackson

MISSOURI
Central Hydraulic Service Co.
3101 Washington St., St. Louis

Harry L. Nolte Co.
1221 Clay Ave.,North Kansas City

Equipment Service & Supply
1909 McGee St., Kansas City

MONTANA
Falls Hydraulic Jack Service
307 3rd Ave., South, Great Falls

NEBRASKA
Midwest Hyd. Tool & Gun Co.
4401 So. 87th St., Omaha

NEW HAMPSHIRE
J & S Hydraulic Jack Repair
Rt. 3, Daniel Webster Highway, Merrimac

NEW JERSEY
Metro Hydraulic Jack Company
52 Elm Street, Newark

NEW YORK
Ace Hydraulic
1201 Burnet Ave., Syracuse

Albany Hyd. and Lube Service
Columbia Turnpike, Rensselaer

Buffalo Hydraulic Jack Service
488 Walden Ave., Buffalo

Metro Hydraulic Jack Company
5200 Foster Ave., Brooklyn

Atlas Hydraulic Co., Inc.
41 Hicks St., No. Lindenhurst

Gemco Garage Equip. Co.
153-75 Rockaway Blvd., Jamaica

Buffalo Hydraulic Jack Service
629 Ramona, Rochester

J & S Hydraulics
60 Broadway, Albany

NORTH CAROLINA
Charlotte Hydraulic Service
2131 South Tryon, Charlotte

Power Tool Service, Inc.
807 Huffman St., Greensboro

OHIO
A & I Hydraulic-Pneumatic Service
1401 West Delaware, Toledo

Eureka Tool & Hydraulic Service, Inc.
3818 North Bend Rd., Cincinnati

Ohio Hydraulic Service Co.
24 North Grubb St., Columbus

Knox Equipment Service Co.
Rear 344 So. Main, Dayton

Ohio Hydraulic Jack Service Company
3826 Payne Ave., Cleveland

OKLAHOMA
Hydraulic Equipment Company
515 So. Broadway, Oklahoma City

Mac's Hydraulic Jack Service
2108 E. 11th Street, Tulsa

OREGON
W. R. Karn Repair Service
1215 S.W. 16th Ave., Portland

PENNSYLVANIA
Equipment Service Company
1921 Callowhill Street, Philadelphia

Mac's Hydraulic Jack & Equip. Service
121 Putnam Street, Pittsburgh

ITS Company
North & Paxson Ave., Wyncote

SOUTH CAROLINA
General Jack & Grease Gun Service, Inc.
1013 Whaley St., Columbia

Baldwin Brothers
2132 Spruill Ave., Charleston Heights

SOUTH DAKOTA
Midwest Jack Service
910 W. 10th, Sioux Falls

TENNESSEE
Alcott Lubrications Sales & Service
682-684 Walnut at Crump St., Memphis

Hydraulic Jack Service
1710 Market Street, Chattanooga

Jack Flint & Sons
244 Jefferson Ave., Memphis

Lubrication Equip. Service, Inc.
315 Dale Ave., N.W., Knoxville

TEXAS
Austin Lacquer Co.
1400 E. Fifth St., Austin

Bond Tool Repair Company
414 Ohio Ave., Wichita Falls

Hydraulic Equipment Service Co.
1021 N. San Jacinto, Houston

Hydraulic Equip. Serv. Company
328 Avenue H., Lubbock

Hydraulic Systems Inc.
1825 Levee Street, Dallas

Schelb Equipment Service Company
1702 Rogers, San Antonio

Stephenson Hyd. Jack Company
2421 Texas Avenue, Lubbock

Wesbrooks Hyd. Equip. Service
2012 Sheppard Access Road, Wichita Falls

Young's Equip. Service Company
515 S. Hackberry at E. Houston St., San Antonio

King's Hyd. Service
3501 New Boston Rd., Texarkana

UTAH
Gustin Hydraulics
151 W. Commonwealth, Salt Lake City

VIRGINIA
Petroleum Engineering Company
5520 Virginia Beach Blvd., Norfolk

Hydraulic Service Co.
3104 Victory Blvd., Portsmouth

Moore's Jack & Equip. Service
2406 N. Lombardy, Richmond

D & S Repair Service, Inc.
20 Dove St., Alexandria

WEST VIRGINIA
CCC Hydraulic Service
4325 Washington St. W., Charleston

WASHINGTON
The Jack Shop
409 Cedar Street, Seattle

Olson's Parts & Supplies Co.
2128 E. Sprague Ave., Spokane

WISCONSIN
Hader Industries
2100 So. Calhoun Rd., New Berlin

Mac's Hydraulic Parts & Service
525 S. Broadway, Green Bay

CANADA

Alberta
Northland Air-Hydraulics
6210 88th St., Edmonton

British Columbia
Hyd. Service & Equip.
102 E. 2nd Avenue, Vancouver

Ontario
Equipment Rebuilders Ltd.
64 Colville Road, Toronto

Quebec
Anjou Warehouse Ltd.
8551 Parkway Blvd., Montreal

Uptown Auto Jack Repair
464 St. Hubert St., PontViau (Laval)

Prichard Eng. Co. Ltd.
111 Bannister
Winnipeg, Manitoba

P-F®

BODY REPAIR TOOLS and EQUIPMENT

Automotive Division of

H. K. PORTER, INC. Somerville, Mass, 02143

Also makers of Metal Cutters & Pruning Tools

HKP. Printed in U.S.A. - 1974
Form No. 10120

Caution

READ INSTRUCTIONS BEFORE USING THIS

P-F®

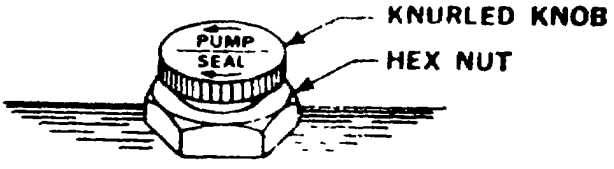
HYDRAULIC UNIT

AIR RELEASE AND OIL FILLER VALVE INSTRUCTIONS

TO OPERATE PUMP—Turn T valve to right until closed. Turn Knurled Knob one full turn to left.

TO RELEASE PUMP—Turn T valve one turn to left.

WHEN NOT USING PUMP—Turn Knurled Knob to right until closed to prevent unit from getting air-bound.



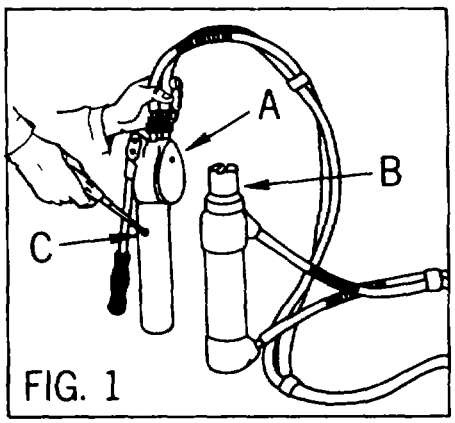
CAUTION

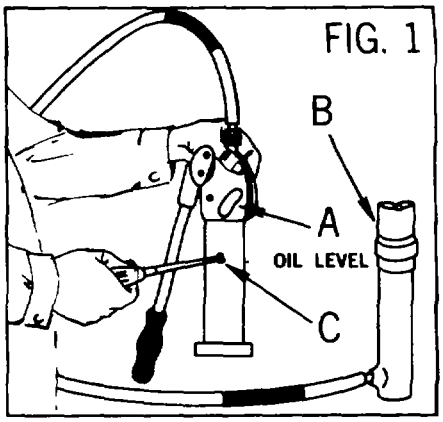
Before using, make sure BU600 Coupler is tight. (Connects Hose to Ram).

H. K. PORTER, INC.

SOMERVILLE, MASSACHUSETTS, 02143

INSTRUCTIONS FOR OIL INSPECTION, FILLING AND BLEEDING ALL P-F JACKS EXCEPT BU0300





OIL INSPECTION

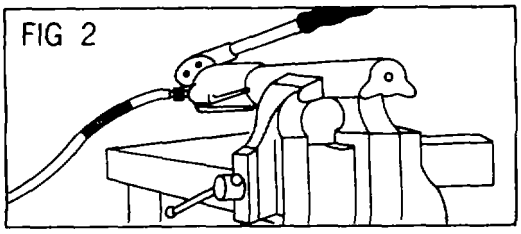
1. Open release valve A and fully retract ram B (Fig. 1). 2. Stand pump on tank end (Fig. 1), remove hex filler screw assembly C. If oil flows out of filler hole, no additional oil is needed. CAUTION: Do not fill unit when pump is in horizontal position.

FILLING INSTRUCTIONS

1. Place pump on bench, tank end down (Fig. 1). Remove hex filler screw assembly C. 2. Fill pump with P-F® Hydraulic Fluid using oil can, until oil will flow out filler hole while pump is standing on tank end. 3. Replace filler screw C and tighten securely.

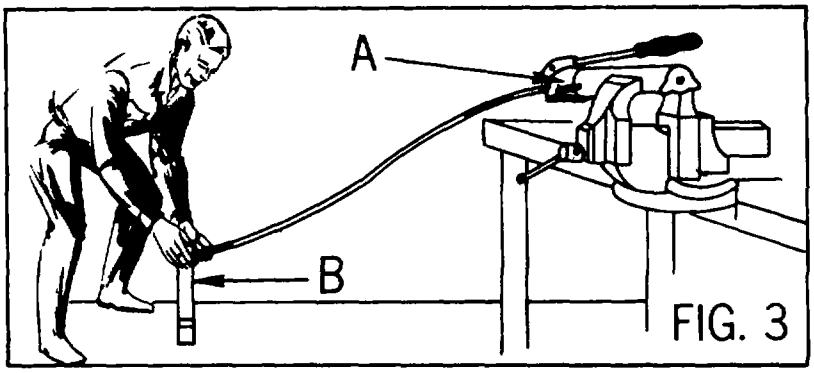
BLEEDING INSTRUCTIONS

1. Place pump in vise at slight angle (Fig. 2) so that jaws of vise grip tank, not pump housing. Exert only enough vise pressure to hold pump in position.



2. With ram B in lowest position (Fig. 3), close release valve A (Fig. 1), turn knurled knob one full turn to left and fully extend ram. Hold ram in this position for 1y minutes.

3. Open release valve A (Fig. 3) and force ram to fully retract by exerting strong, steady pressure on cylinder. Be sure to hold hose straight (Fig. 3). THIS IS VERY IMPORTANT as it allows oil pressure to force any air trapped in ram or hose back through pumping system, eliminating air pockets.



4. Remove pump from vise and stand pump on tank end (Fig. 1). Remove hex filler screw assembly C allowing excess oil to expel through filler hole. If oil will flow out filler hole, unit is properly filled. If oil does not flow out, repeat step No. 2 under filling instructions.

5. Replace hex filler screw assembly securely with vent valve in pump position. Turn release valve A, to close position. Operate pump with full stroke. Ram should extend approximately A8" on first stroke. If ram will not extend, pump is air bound and it is necessary to repeat bleeding instructions. Turn vent valve to full clockwise seal position when not in use.

BU0300 DIRECT ACTION JACK-
OIL INSPECTION, FILLING AND
BLEEDING INSTRUCTIONS

1. Place unit in vise after making certain that ram is fully retracted. Clamp the jack in vise at the angle illustrated (Fig. 4) so that filler screw A is at highest level. Be sure protector ring is threaded completely onto jack housing before securing jack in vise. Engage jaws of vise on protector ring only and then exert only enough vise pressure to keep jack in upright position.

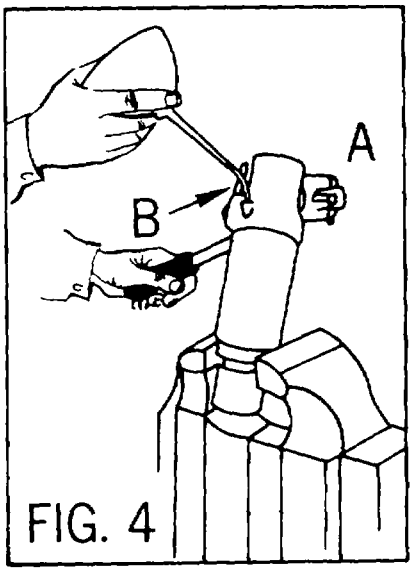


FIG. 4

2. Remove filler screw A with an Allen wrench. With release valve B open, fill jack with P-F® Hydraulic Fluid using clean oil can (Fig. 5) until Hydraulic Fluid flows out of filler hole.

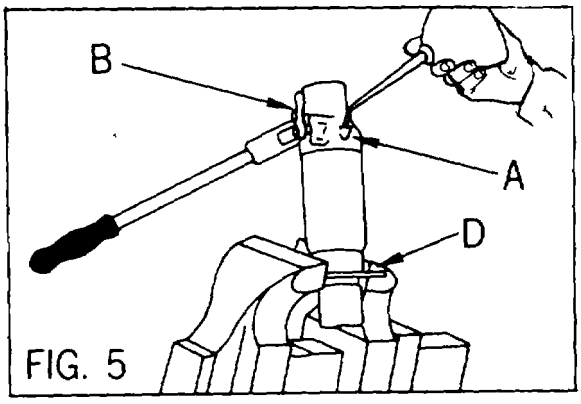


FIG. 5

3. Tighten filler screw A and close release valve B. Jack ram out to full length.

4. Open release valve B, retract ram and place a spacer D approximately 1/8" thick between ram coupling and ram housing (Fig. 5). Leave the release valve B open, remove filler screw A and refill until oil flows out of filler hole and all air is expelled

5. Replace filler screw A and turn screw in approximately 1 1/2 turns. Remove spacer D and with release valve B in open position allow excess oil and air to expel through the filler screw threads. After the oil has finished flowing, remove filler screw. Replace filler screw and tighten securely. Close release valve B and operate pump with full strokes. Unit should extend ram approximately A/" in upside-down position on the first stroke. If am will not extend on first stroke, unit is air bound and bleeding instructions must be repeated.

Caution: READ INSTRUCTIONS BEFORE USING THIS P-F® HYDRAULIC UNIT

The superior quality P-F® Hydraulic Unit has been thoroughly inspected and tested before leaving our factory. If for any reason you find the unit does not operate perfectly—**DO NOT ATTEMPT TO MAKE REPAIRS . . . RETURN THE COMPLETE UNIT TO THE P-F® DISTRIBUTOR FROM WHOM PURCHASED OR SEND THE COMPLETE UNIT TO THE NEAREST P-F® AUTHORIZED SERVICE STATION.**

IMPORTANT!

Warranty of this P-F® Hydraulic Unit will be voided unless the following instructions are strictly adhered to:

1. Do not take unit apart.
2. Use nothing but P-F® Hydraulic Fluid in this unit. Under no circumstances should brake fluid, anti-freeze or crank-case oil be used. This could cause irreparable damage to internal mechanism.
3. Be sure to use clean oil can when filling unit with Hydraulic Fluid.
4. Do not allow abrasives or other foreign matter to get into Hydraulic Fluid.
5. Do not fill unit beyond its oil level. See filling instructions inside this folder.

With careful attention to the above requirements, your P-F® Hydraulic Unit should remain in excellent working condition and give long trouble-free performance.

Service Service on P-F® Hydraulic Units is available nationwide. Keep the enclosed list of P-F® Service Stations so you can contact the one nearest you for expert maintenance or repairs if necessary.

A Product of:

H. K. PORTER, INC.

SOMERVILLE, MASSACHUSETTS, 02143

Form No. 10119

Printed in U.S.A.

Service

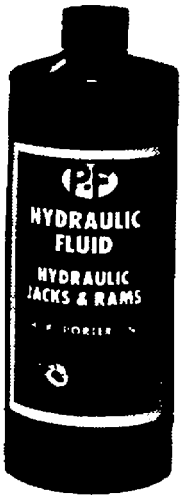
Whenever service is required return P-F® unit to the jobber from whom you purchased it or to your nearest P-F® Authorized Service Station.

Always use

P-F® Hydraulic Fluid

for economy and smooth efficient operation of quality hydraulic jacks and rams. Special detergents prevent rust.

HQ0001



HG0004

Available in quarts and gallons.

Hydraulic Unit Warranty

Every NEW P-F® Hydraulic Unit is guaranteed free from defects in workmanship and material, and is guaranteed to give satisfactory service under normal use and maintenance for a period of ninety days from date of delivery to the original purchaser.

We will, at our option, replace or repair without charge, any defective unit, provided said unit is sent transportation charges prepaid, to the nearest Authorized P-F® Service Station.

This warranty does not apply to units or component parts broken by accident, overload or abuse, nor does it apply to units or parts that have failed DUE TO THE USE OF ANY FLUID OTHER THAN HYDRAULIC JACK FLUID.

Any alterations which affect the operation or condition of the hydraulic unit or any damage from repairs made by other than an Authorized P-F® Service Station will void this warranty. This warranty will also be voided by the failure of the original purchaser to return to the company within 7 days from date of purchase, the registration card enclosed herewith.

H. K. PORTER, INC.

SOMERVILLE, MASSACHUSETTS, 02143

If yours is a P-F®

RK-0001

RESCUE KIT

WITH 4-TON JACK

read this folder first

before reading

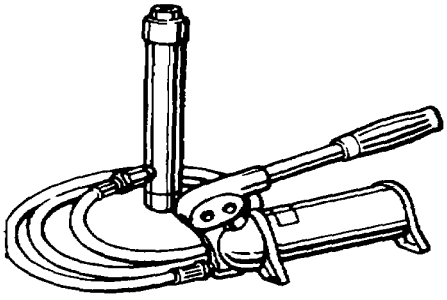
the RK-4 instruction book

Allowing for the difference in Power, your RK-1 Rescue Kit will perform practically all the operations that can be done with the more powerful RK-4 Kit, although it uses different attachments. So . . . when making hook-ups outlined in the RK-4 Manual, simply substitute similar attachments listed in this folder for those listed on pages 4, 5 and 6 of instruction book.

AUTOMOTIVE DIVISION OF

H.K. PORTER, INC.

Somerville, Mass., U.S.A. 02143

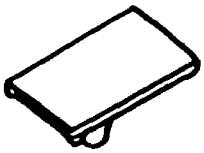


SM-200

THE 4-TON POWER SOURCE

The P-F RK-1 Rescue Kit is powered by the fast-action PF 4-Ton Remote Control Hydraulic Jack. This fast operating power source gives 1" of ram travel for every 61/2 pump strokes, so important when the saving of life may be a matter of seconds. Power from the pump is transmitted to the P-F self-retracting ram which operates in all positions. For pump operations to extend and retract ram, see page 3 of RK4 book.

ATTACHMENTS

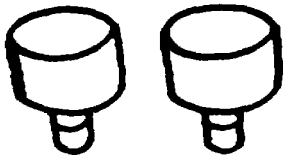


SM-41

SM-41 RAM BASE
Attaches to either end of ram to provide a solid base. Can be used as a flat-surfaced push plate when attached to end of ram piston whenever a wide, flat pushing surface is needed.

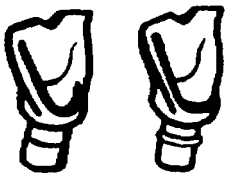
SM-49

SM-49 RAM CAPS
Attach to ram piston. Grooved to set against flanges and serrated to prevent slipping when working against surfaces where traction is needed.



SM-43

SM-43 RUBBER HEADS
Flat-topped rubber anchors that can be used on either end of the ram to provide maximum slip resistance when jacking against smooth, slick, wet or glassy surfaces.



SM-44

SM-44 OFFSET SPREADING TOES
Use on either end of ram to direct power to the sides for offset pushing. Useful in narrow openings. Offset permits positive alignment when pushing at a 900 angle. Notched edge can be used for slip-resistant anchoring.

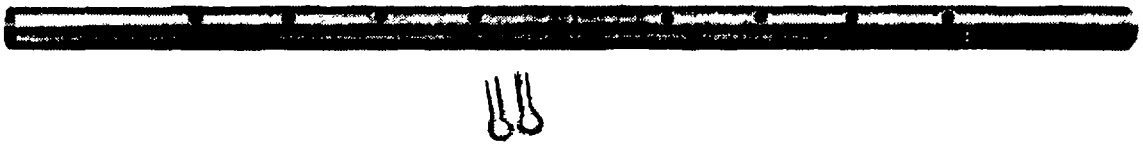
SM-39

SM-39 JACK BODY TOE
Attaches to outside of ram cylinder. Combines with Ram Extension Toe for use in spreading and lifting operations.

SM-40

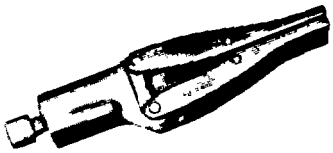
SM-40 RAM EXTENSION TOE
Attaches to ram piston for lifting or pushing and can be combined with SM-39 above, for spreading.

ATTACHMENTS



SM0062

This 36" 2 piece extension tube with 2 pins saves time when making long hook-ups and helps prevent "bowing" of tubing. Use with SM52 and SM58 tubing and lock pins to get proper span. Center plug gives increased support. Store as one long piece or two pieces to fit tool box.

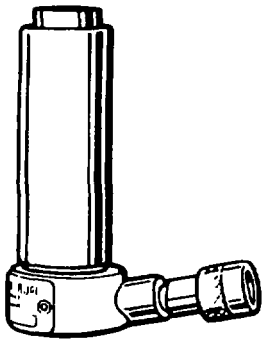


SM-100

SM-100 SPREADER
The famous P-F "duck-bill" spreader that opens up many difficult and hard-to-get-at places. Use similarly to spreader BUR-750, illustrated on page 8 of RK4 manual.

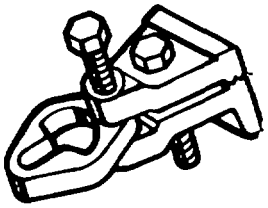
SM-42

SM-42 V-NOTCH CAP
Attaches to ram piston or extensions for holding or pushing. Also used on ram piston as Chain Pull Cap when using Chain Pull Kit. See page 10 for hook-up attachments, substituting SM-42 for BUR-288.



SM-24

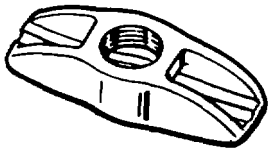
SM-24 SHORT RAM
A specially designed short ram only 4 7/8" high (retracted) which can be substituted for regular ram when working in cramped quarters. Takes all extensions and attachments of regular ram. Fourton capacity. Ram travel of 3/4". Connector is offset for space saving and ease of attaching when ram is on flat surface. (*Note:* RAM SHOULD NEVER BE DISCONNECTED WHILE UNDER LOAD).



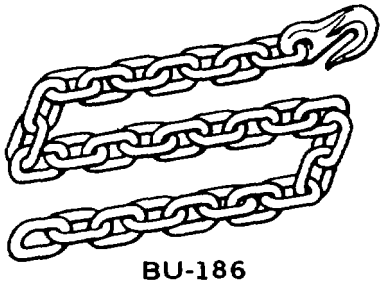
BU-190

BU-190 BITE-TITE CLAMPS
For use with Pull Chain in pulling operations. Serrated jaws grip even the thinnest metal without slipping and will not pull off during operations. Use 34" wrench for tightening bolts for positive holding of clamps. See page 9 for detailed hook-up instructions.

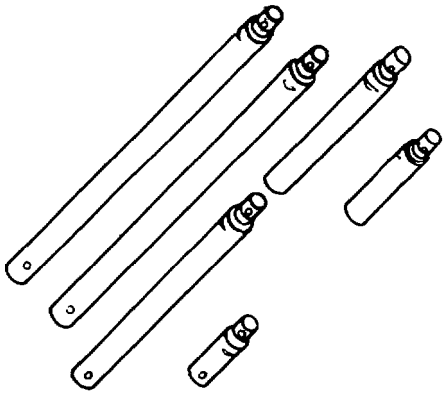
ATTACHMENTS



BU-187



BU-186



BU-187 CHAIN PULL COLLAR
Screws on ram cylinder for use with chain in pulling operations. See pages 10 and 11 for hookup attachments, substituting BU-1 87 for BUR-287.

BU-186 CHAIN
For use with Chain Pull Kit. Two 6' long chains enable operator to make any hook-up required in pulling operations. Faster and more flexible tha tubing hook-ups. See pages 10 and 11 for hook-up attachments, substituting BU-186 Chains for BU911 Chains.

TUBE EXTENSIONS
P-F EZ-E-ON Tubing and Attachments enables operator to make lightning-fast assemblies. Just snap pieces and attachments together to get correct length. Set contains:
2 SM-50 20" Tubes 1 SM-58 8" Tube
1 SM-52 12" Tube 1 SM-55 5" Tube
2 SM-53 3" Tubes
See pages 6 and 7 for hook-up attachments.

With the RK-1 Kit, you can make practically all of the pushing and lifting hook-up attachments shown on pages 12, 13, 14 and 15 and with the Chain Pull Kit, you will be able to accomplish the pulling operation described on page 16.

UNCONDITIONALLY GUARANTEED

All component parts of the P-F RK-1 Hydraulic Rescue Kit except Hose and Chain are guaranteed against defects in materials and workmanship. H. K. PORTER, INC.

#902 PRINTED IN U.S.A 3/75

AUTOMOTIVE DIVISION OF
H. K.. PORTER, INC
Somerville, Mass., U. S. A. 02143

RK0004

Hydraulic RESCUE KIT

OPERATION and MAINTENANCE Manual

No. A128

H. K. PORTER, INC.
SOMERVILLE, MASSACHUSETTS 02143

A Message from—

Edward S. "Sparky" Leonard
(Retired)

"Believe me! You can free trapped victims *FASTER* with this P-F Hydraulic Rescue Kit."

. . . and, when Mr. Leonard says "Faster," he speaks with authority. His 32 years experience with the Boston Fire Department Rescue Squad puts him in a position to know that speed is the prime necessity in any phase of rescue work.

The P-F Hydraulic Rescue Kit contains attachments that will take care of just about EVERY emergency. More than three years of actual at-the-scene use proves this fact. It is a practical, working Kit, simple and easy to operate compact yet complete. It can be taken anywhere a man can go as it is easily portable. It operates independently of outside power sources. The 10 ton Hydraulic Jack produces all the power necessary to meet every rescue emergency.

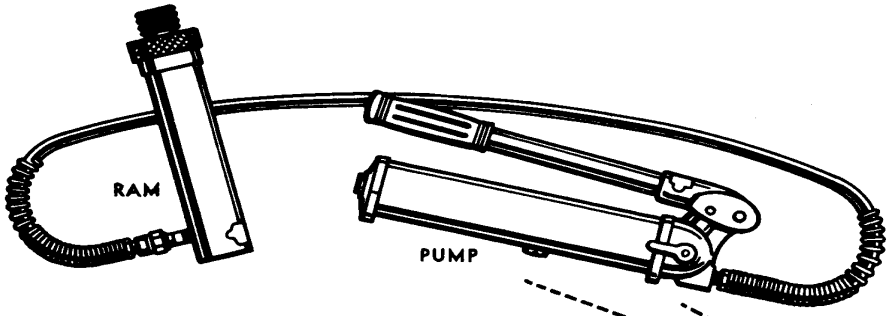
When seconds count when they nay mean the difference between life and death when they can alleviate human suffering, you can DEPEND on he P-F Hydraulic Rescue Kit to do its work and do it well.

INDEX

THE *POWER* SOURCE...

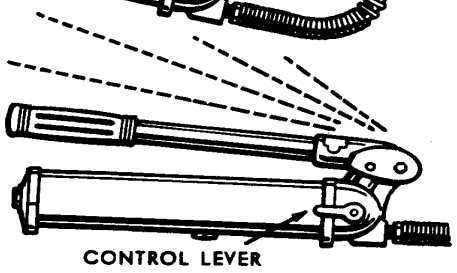
ALL THE POWER YOU *NEED* TO MEET EVERY EMERGENCY

The P-F Rescue Kit is powered by the fast-action P-F 10 Ton, Remote Control Hydraulic Jack. This fast operating power source delivers ALL the power that is necessary for ANY rescue operation. In situations where every second counts, the fewer pump strokes required for full extension of the ram can well mean the difference between life and death.



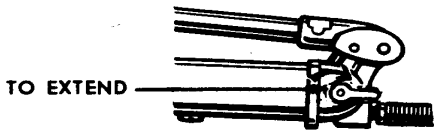
HOW TO OPERATE THE PUMP

Pump can be operated in horizontal, vertical (hose-end down) or any angle position. Remote control, plus extra long hose, permits pump to be used at a safe distance from the rescue operation when protection of the operator is involved, or close up to victim when necessary.



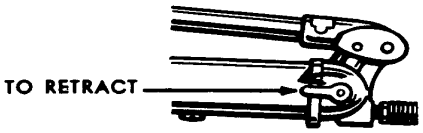
TO EXTEND RAM

Turn Control Lever on Pump one-half turn clockwise or toward the hose end. Operate Pump Handle to extend Ram to desired length.



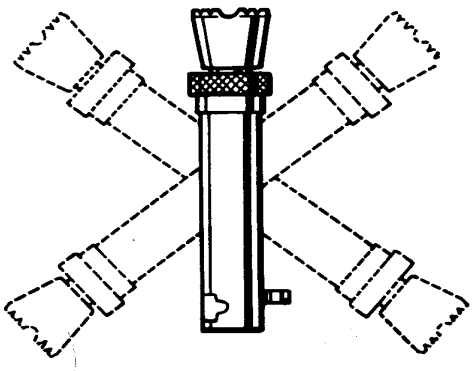
TO RETRACT RAM

No pumping is necessary to retract Ram — another time saving feature which allows quick changes of hook-ups. Merely turn the Control Lever one-half turn counter clockwise or away from hose end, and ram retracts itself. The Control Lever gives you micro-control of the Ram at all times and enables you to stop it at any desired point and hold it there.



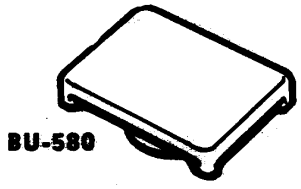
ALL POSITION RAM

The P-F Hydraulic Ram works in ALL POSITIONS through 360° — always ready, in any position, to pinpoint ten tons of pressure wherever needed. It will even work upside down.



3

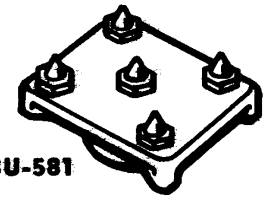
ATTACHMENTS . . .



BU-580

BU-580 FLAT PUSH PLATE

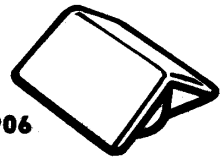
A flat-surfaced Push Plate that can be used either as a Ram Base or on end of Ram Piston, whenever a wide, flat, secure pushing surface is required.



BU-581

BU-581 CLEATED PUSH PLATE

Five pointed cleats give a positive anchor in wood, dirt, asphalt or any other soft material. Eliminates the necessity for notching trees or timbers with axe or saw to provide a flat anchoring surface. Use on either end of ram as needed.



BU-906

BU-906 V PUSHING CAP

The 90° angle provides positive anchorage in (rs or angles where flat plate would not fit. Also ves concentration of power for specific operations, such as diagonal pushing. Use on either end of ram as needed.

BU-913

BU-913 HEAVY DUTY V NOTCH CAP

Use as a base for holding jack in position when pushing front or rear cross members into alignment.

BU-586

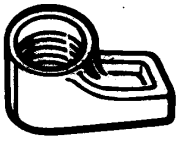
BU-586 CLEATED RAM BASE

Steel cleat in center anchors ram securely in soft materials. When anchoring in trees, poles, timbers, or brick walls, no time is wasted in notching to provide flat anchoring surface because cleat holds securely. Use on bottom end of ram. When used with BU-581, the base acts as a pivot to insure full bearing surface.

BU-904

BU-904 JACK SPREADING TOE

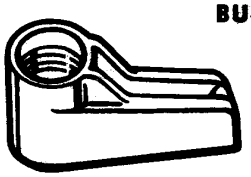
Screws on Ram Cylinder. Toe Plate can be used in any position to combine with BU-905 Jack Piston Spreading Toe (below) for use in spreading or lifting operations.



BU-905

BU-905 JACK PISTON SPREADING TOE

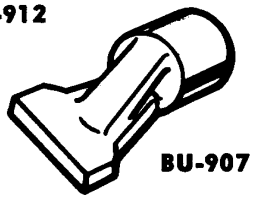
Screws on Ram Piston. Toe Plate can be used in any position to combine with BU-904 Jack Spreading Toe (above) for use in spreading or lifting operations.



BU-912

BU-912 LONG SPREADING TOE

Screws on Ram Piston. Toe Plate can be used in any position to combine with BU-905 Jack Spreading Toe (above) for use in spreading operations.



BU-907

BU-907 OFFSET SPREADING TOE

Directs power to the side for offset pushing. Particu. ly useful in narrow openings. Offset permits positive alignment when pushing at a 90° angle. Use on either end of Ram.

ATTACHMENTS

BU-190 BITE-TITE CLAMPS (2 in kit)

An exclusive feature of the P-F Hydraulic Rescue Kit. Bite-Tite Clamps have serrated jaws for positive gripping of metal and will not slip off during the pull operation. They are easily and quickly attached by only finger pressure on two bolts and will hold the thinnest metal without slipping. Reversible jaws enable clamps to be used over raised edges when necessary. Used with BU-287 and BU-288. Use ¾" wrench on bolts for positive holding of clamps.

BU-238 PULL ARM ASSEMBLY

For use with Pull Guide (BU-775) in all pulling and clamping operations. Attach SL-1 plus tubing to get ·rect span. See pages 16 and 18.

BU-775 PULL ARM GUIDE

Attaches to Ram Cylinder for use with Pull Arm Assembly (BU-238) in all pulling and clamping operations. See pages 16 and 18.

BU-705 AND BU-700 RUBBER ANCHORS

A flat-topped rubber anchor that can be used either on Ram Bottom or on Ram Piston to provide maximum slip resistance when jacking against smooth, slick, wet or glassy surfaces.

BU-910 SMALL CHAIN ATTACHMENT

Used in conjuction with Chain Pull Collar (BU-287). Chain and Clamps — Attaches to Ram Piston to guide Chain in all pulling operations.

BU-287 CHAIN PULL COLLAR

Screws on Ram Cylinder for use with Chain and clamps in all pulling operations.

BU-931 SHORT CHAIN WITH 2 HOOKS

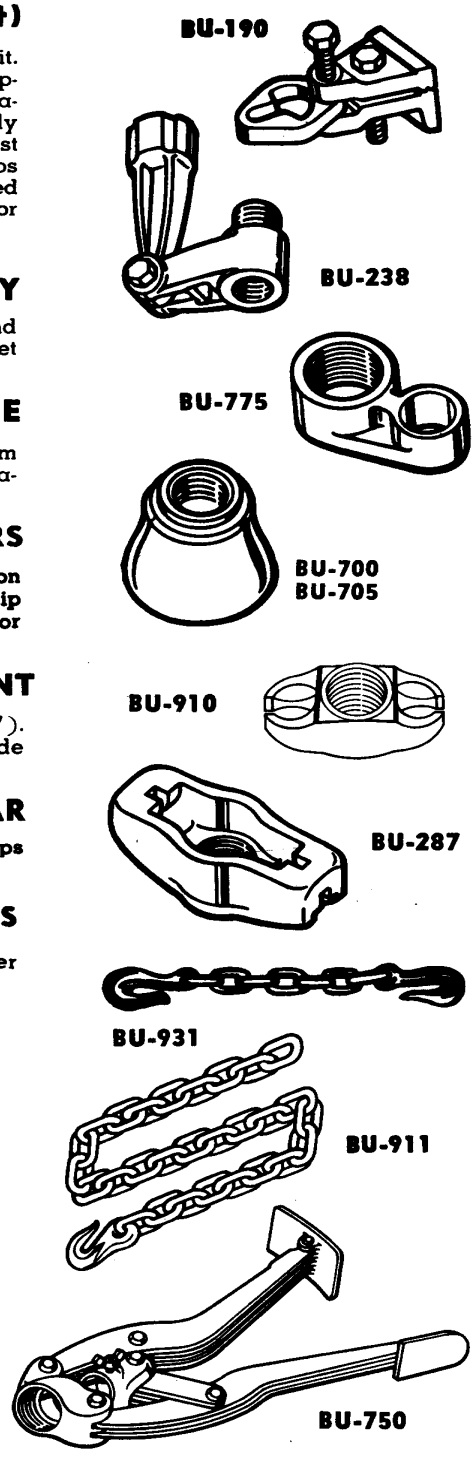
For quickly connecting two lengths of chain together for additional length when needed.

BU-911 CHAIN (2 in kit)

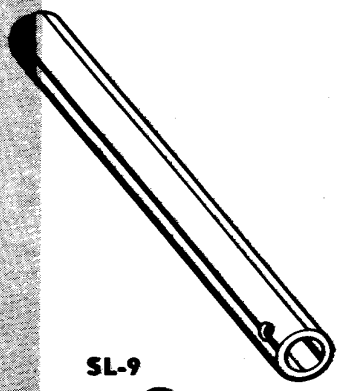
For use with Chain Pull Kit. Two 6' long — ⅜" diameter chains enable operator to make any hook-up required. In heavy duty pulling operation, the Chain Pull Kit is twice as fast and more flexible than tubing hook-ups. Chain hook-ups are self-aligning to right span. With tubing, time is wasted in adjusting pieces to get right length of span.

BU-750 SPREADER

Not an "extra" but a standard with the P-F Hy·ulic Rescue Kit. Probably the most versatile ıchment in the kit, the spreader closes to 1½" to allow entrance into narrow areas, yet has a powerful 16" spread. Attaches to ram in seconds and gets into places where a jack and other attachments cannot be used.



ATTACHMENTS . . .



SPEEDLOK® TUBING — A P-F Exclusive

P-F Speedlok Tubing enables the operator to make lightning fast assemblies. Precision machined from cold rolled, high carbon steel. Faster and easier to assemble than threaded tubing. No threads to become worn or damaged — no time lost in aligning tubing for screwing together. Pieces snap together for PUSHING — pins snap in for PULLING. 3 times as fast and twice as strong as threaded pipe. Use these pieces of tubing in any combination — at either end or both ends of ram to get desired length of hook-up. It is possible to hook up for a 7 foot span when all tubing extensions are used with the Ram and an attachment on each end of span.

Equipment consists of:

1 SL-20	20" extension	1 SL-8	8" extension
1 SL-16	16" extension	1 SL-6	6" extension
1 SL-12	12" extension	1 SL-4	4" extension

SL-9

SL-9 TUBING CONNECTORS (5 to a kit)

These connectors enable you to use all of the tubing extensions at one time, if needed for an extremely long span. All connectors have holes for inserting pins when tubing is used in pulling operations. Use one connector between each two pieces of tubing.

BU-731

BU-731 HEAVY DUTY COUPLING

For use in making threaded connections.

Note — BU-725 and BU-731 can be used to adapt to 1¼" Standard Pipe in emergencies.

SL-1

SL-1 MALE ADAPTERS (3 to a kit)

Screws into Ram bottom and BU-238 for using Speedlok Tubing and Attachments.

SL-2

SL-2 FEMALE ADAPTER

Screws onto Ram Piston thus adapting it to Speedlok Tubing and Attachments.

BU-725

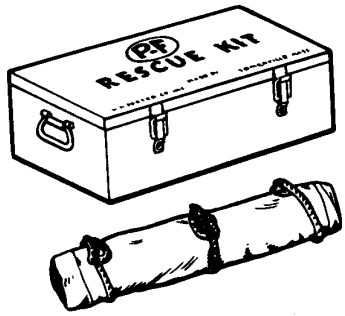
BU-725 SHORT NIPPLE

Screws into ram base for using threaded attachments.

SL-7

SL-7 CONNECTING PINS (12 to a kit)

To be used in all *pulling* operations using tubing. Simply snap connectors into holes in tubing. It is not necessary to use these pins in pushing or lifting hook-ups.



RK-98 METAL BOX

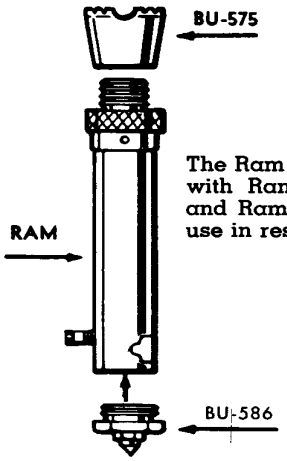
This durable all metal box is designed to conveniently hold the RK-4 Rescue Kit. On Rescue Trucks, Apparatus, Cruisers etc. Gray enamel finish. Size 22¾"x12¼"x8½".

RK-99 CANVAS CARRYING CASE

Heavy canvas with three tie ropes. Exceptionally useful for carrying necessary pieces over ladders, underground etc.

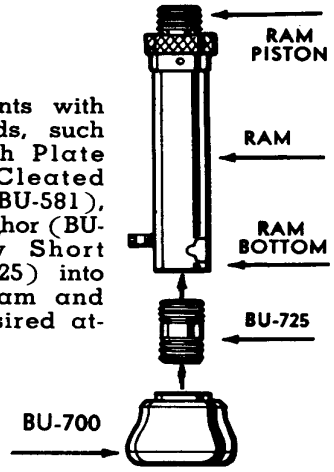
HOW TO HOOK-UP ATTACHMENTS

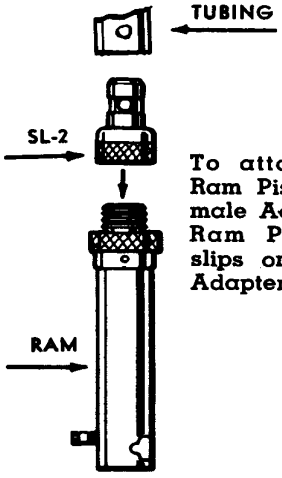
The 10 Ton Hydraulic Jack is the Power Source of the P-F Hydraulic Rescue Kit which enables an operator to work anywhere, independent of all other power sources. The Ram — the working end of the Power Unit — transmits the 10 tons of hydraulic pressure through hundreds of different and varied hook-ups for pulling, pushing, lifting, spreading and pressing operations.



The Ram in its basic form with Ram Cap (BU-575) and Ram Base BU-586 for use in restricted spaces.

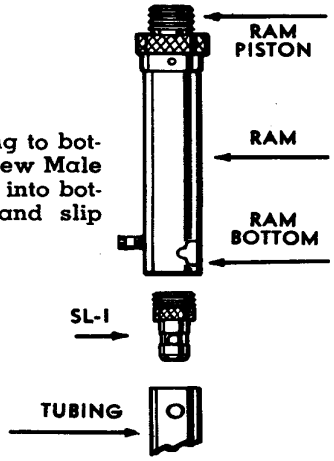
For attachments with female threads, such as Flat Push Plate (BU-580), Cleated Push Plate (BU-581), of Rubber Anchor (BU-700), screw Short Nipple (BU-725) into bottom of Ram and then use desired attachment.

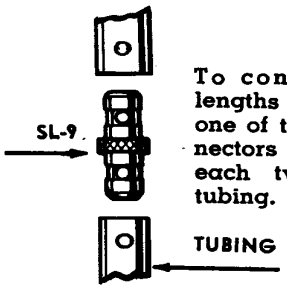




To attach tubing to Ram Piston, screw Female Adapter (SL-2) to Ram Piston. Tubing slips on male end of Adapter.

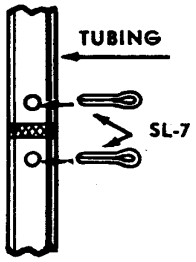
To attach tubing to bottom of Ram screw Male Adapter (SL-1) into bottom of Ram and slip on Tubing.





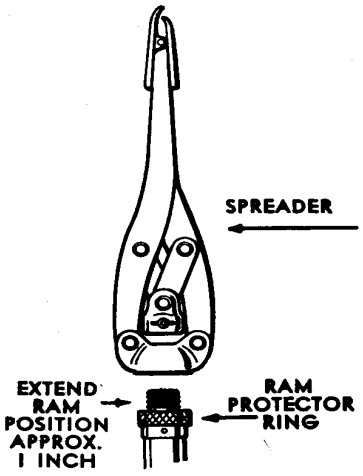
To connect various lengths of Tubing, use one of the Tubing Connectors (SL-9) between each two lengths of tubing.

When Tubing is hooked up for *pulling* operations, align holes in Tubing with Adapters and insert Connecting Pins (SL-7).



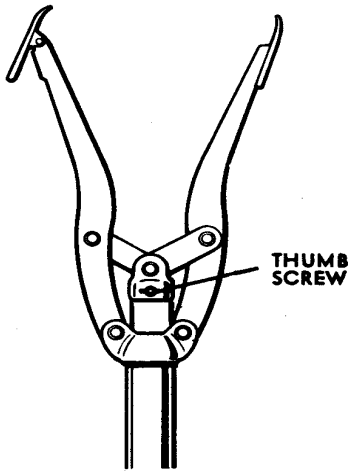
HOW TO HOOK-UP ATTACHMENTS

ASSEMBLING SPREADER TO RAM

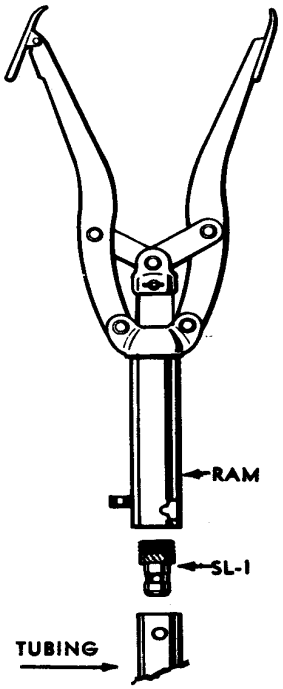


Remove Ram Protector Ring from top of ram. Extend ram piston approximately 1" and screw Spreader (BU-750) on to Ram Cylinder.

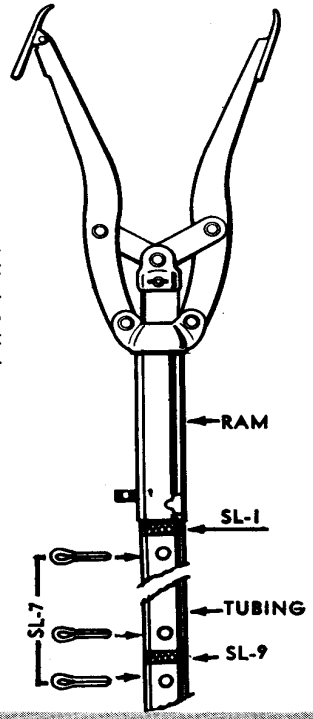
After Spreader is screwed on to Ram Cylinder, *loosen Thumb Screw on Spreader* and jack out Ram Piston until it seats in socket of Spreader.



Tighten Thumb Screw on Spreader so that Spreader will retract when pressure is released. Be sure to loosen thumb screw before removing Spreader from Ram.

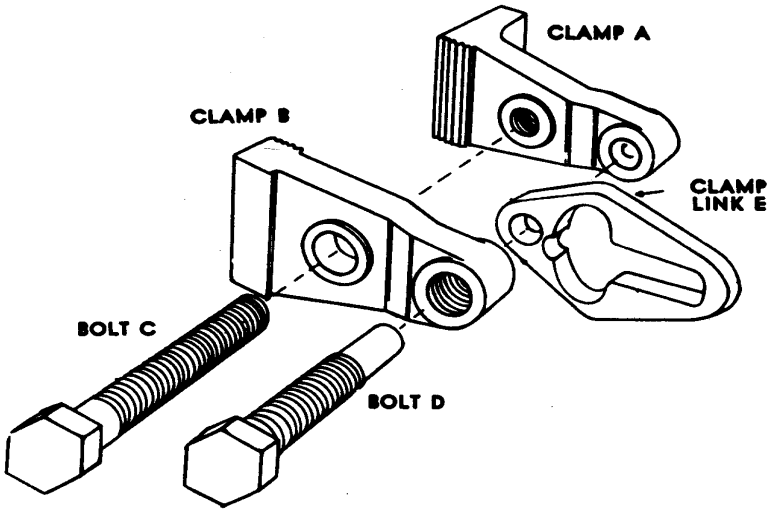


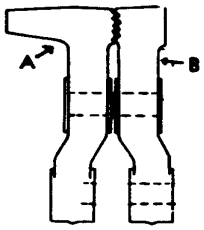
When it is necessary to use spreader beyond arm's length or in a limited working area, screw SL-1 into bottom of Ram and attach lengths of Speedlok Tubing to get desired "reach." Insert SL-7 Pins in Tubing holes to prevent unit from becoming disconnected while in use.



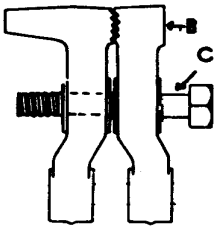
HOW TO HOOK-UP ATTACHMENTS

ASSEMBLING BITE-TITE CLAMPS

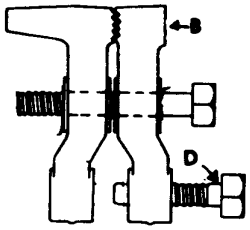




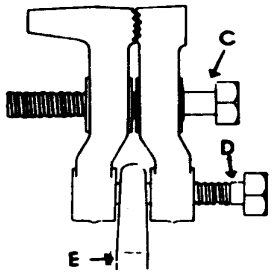
Put jaws A and B of Bite-Tite Clamps (BU-190) together as shown above.



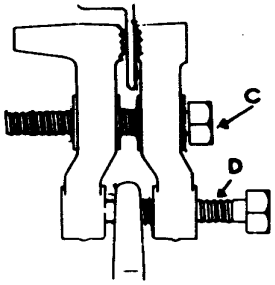
Insert Bolt C (Longest Bolt) in top hole and screw into jaws until Bolt is in position shown above.



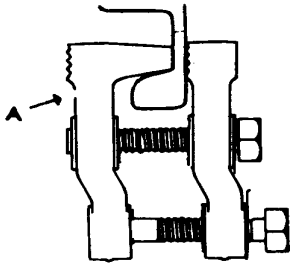
Insert Bolt D in lower hole in Clamp B and turn five times.



Insert Clamp Link E on Bolt D and then, holding jaws together, ·aw up Bolt C first ıd then Bolt D.



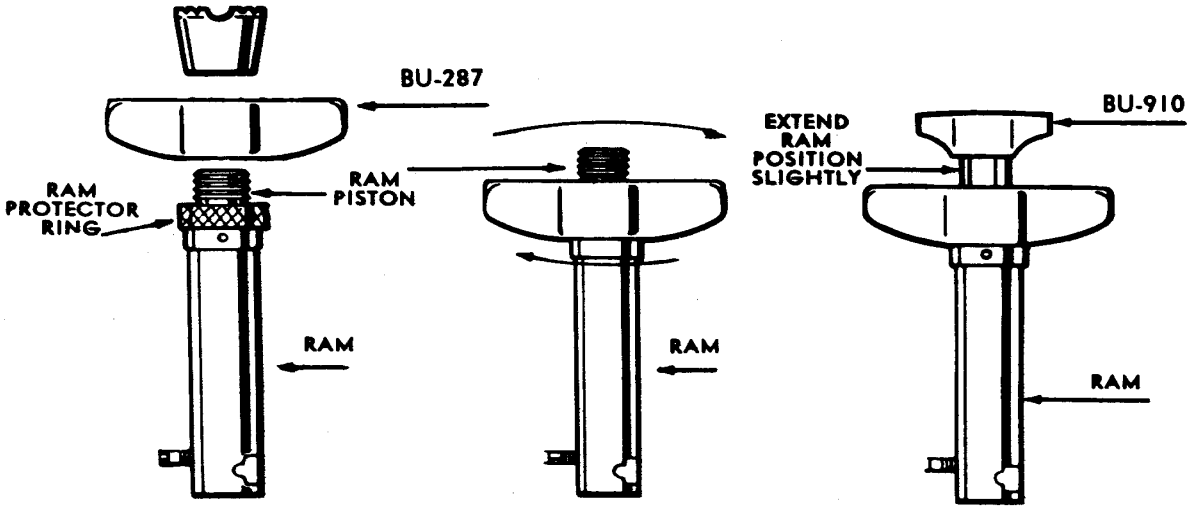
To attach Clamp to work, loosen Bolt C to provide sufficient opening for work to fit between jaws. Screw in Bolt C until Clamp is tight. CAUTION: Bolt D must remain loose. After Bolt C is tight, then screw in Bolt D to lock clamp on work. Jaws of clamps should be parallel for best holding power.



For working around channels or raised edges reverse Jaw A as shown above and proceed as above.

HOW TO HOOK-UP ATTACHMENTS

ASSEMBLING CHAIN PULL KIT



Remove Ram Cap and Ram Protector Ring from Ram Cylinder.

Screw Chain Pull Collar (BU-287) on to Ram Cylinder. Be sure threaded section of center hole is next to Ram Piston.

Extend Ram Piston slightly and screw Small Chain Attach. (BU-910) on to head of Ram Piston.

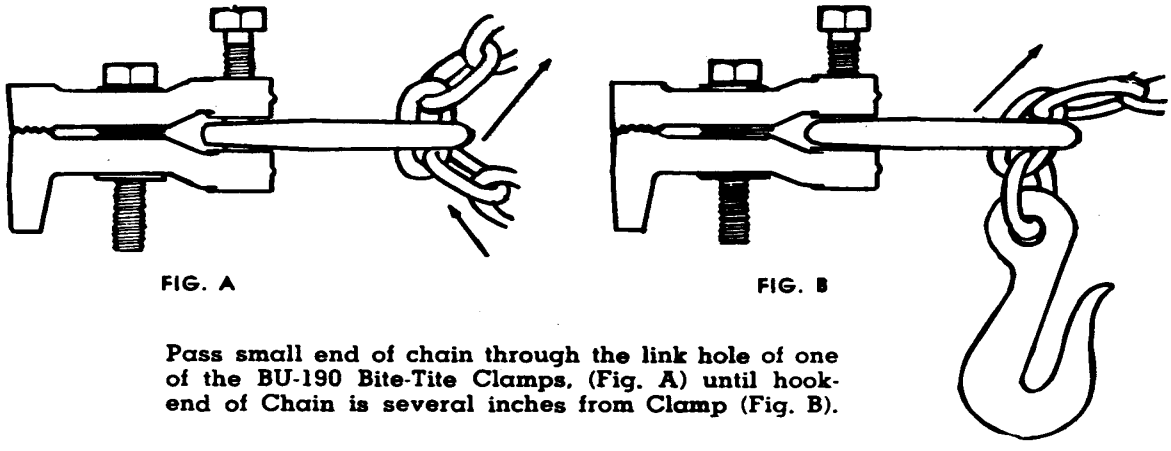


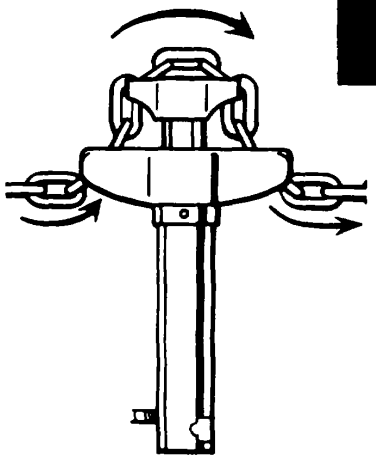
FIG. A

FIG. B

Pass small end of chain through the link hole of one of the BU-190 Bite-Tite Clamps, (Fig. A) until hook-end of Chain is several inches from Clamp (Fig. B).

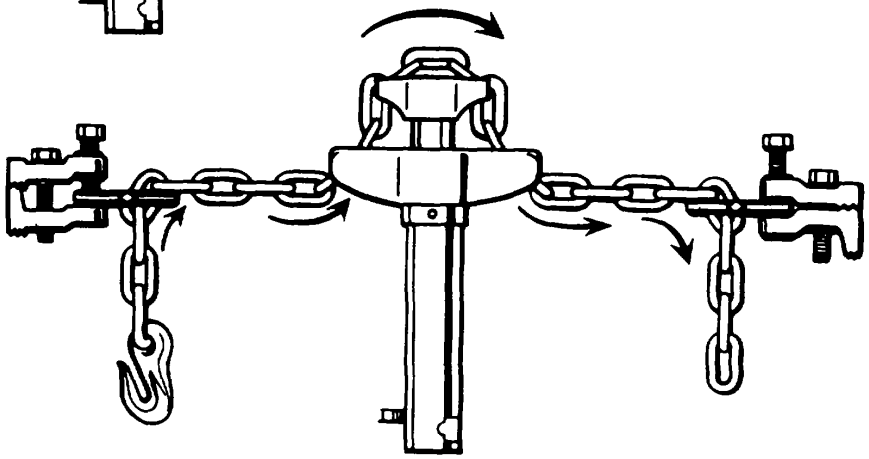
(CONTINUED ON NEXT PAGE)

HOW TO HOOK-UP ATTACHMENTS



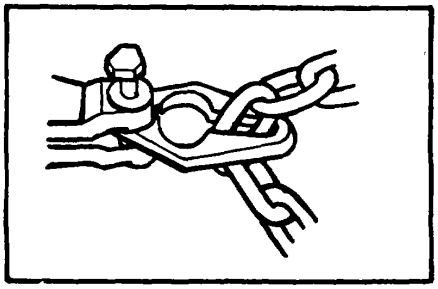
ASSEMBLING CHAIN PULL KIT — CONT.

Next thread open end of Chain *UP* through Chain Pull Collar (BU-287) over Small Chain Attachment (BU-910) and down through other side of Chain Pull Collar. Position Ram as closely as possible midway between Clamps for normal use.



Next thread open end of Chain (BU-911) into other Bite-Tite Clamp (BU-190). Retract Ram Piston and take up slack. Lock Chain in Bite Tite Clamp Links. Close Pump Lever and start jacking operation.

When Ram Piston is fully extended and further pull is required, retract Piston to same position as at start of pull, take up slack in Chain and repeat operation.



Be sure to *LOCK* links of Chain (BU-911) in slots of Clamp Links as shown above before starting pulling operations.

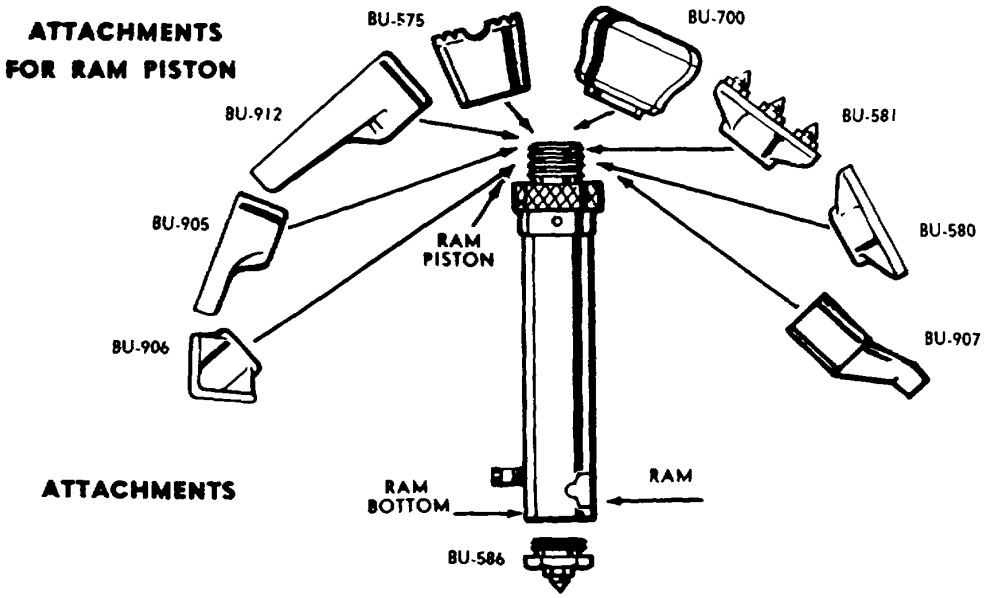
For each inch of Ram travel the Chain travels TWO inches which gives longer pull without having to change the hook-up, total pull travel of 11½" without changing hook-up.

Bite-Tite Clamps will not slip off during pulling operations as the more pull that is exerted, the lighter they hold. They attach and detach in a matter of seconds.

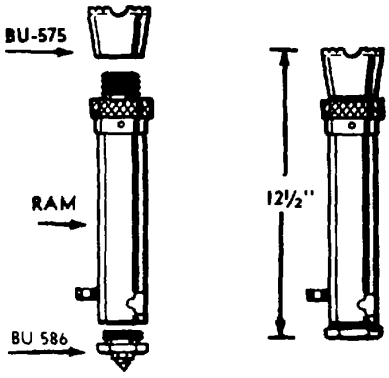
P-F Pull Kits give positive pulling operations in quicker time. Ram may be located in any desired place on chain so that Ram is always in open area away from interference.

PUSHING and LIFTING CONFINED AREAS

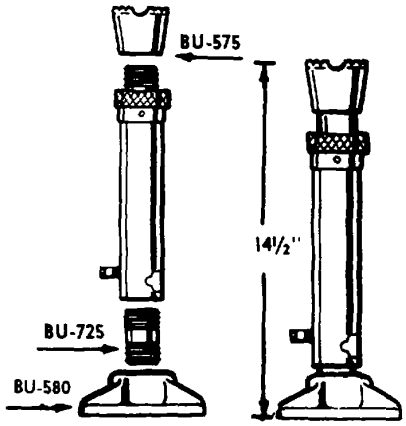
The P-F Hydraulic Rescue Kit offers many different combinations of attachments to do every kind of pushing or lifting operation efficiently and quickly. The illustrations below show the attachments that can be screwed directly on the Ram Piston to quickly release victims of automobile accidents — pushing up panels, tops, doors, seats, steering posts and motors; in collapsed buildings — lifting beams and debris; in moving material in excavations and cave-ins, in street car, train, plane and industrial accidents. Shown below are attachments for working in confined areas.



All of the above attachments may also be used on the bottom of the ram by screwing the BU-725 Short Nipple into the ram bottom.

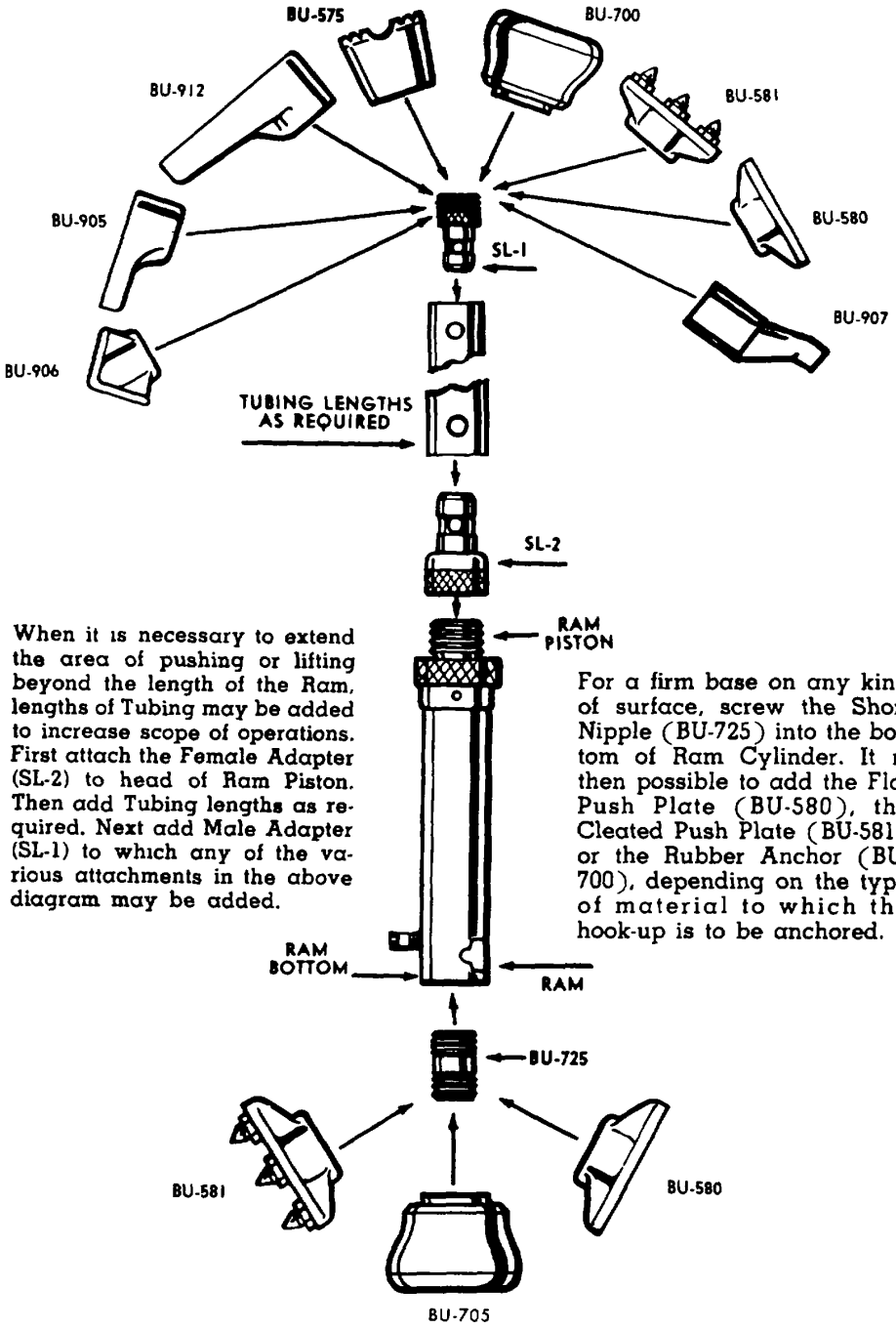


Ram can be used "as is" with Ram Cap (BU-575) attached to Piston and Ram Base BU-586 for use in restricted areas. Retracted height 12½". Extended height 18".



When it is necessary to operate with a broader base, add either the Flat Push Plate (BU-580) or the Cleated Push Plate (BU-581). These are connected to bottom of Ram by using the Short Nipple (BU-725).

PUSHING and LIFTING

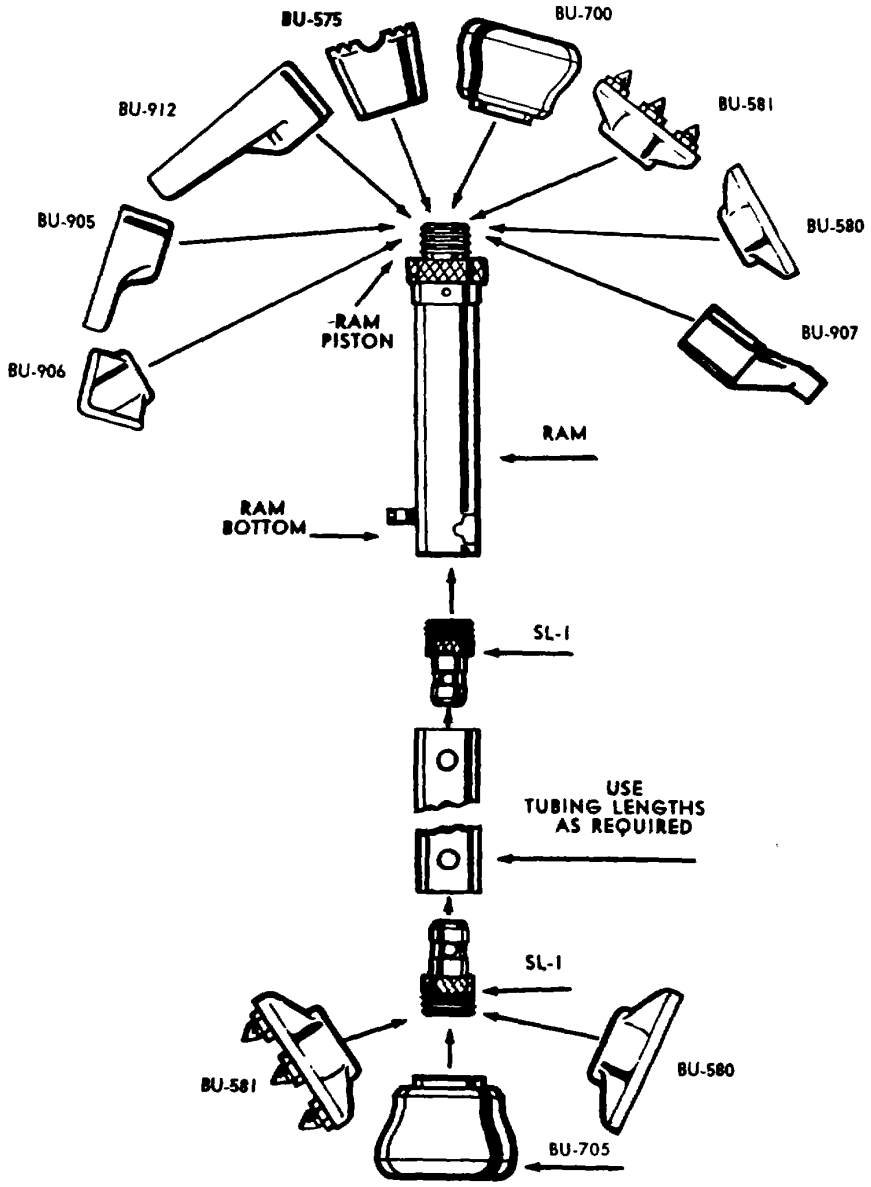


When it is necessary to extend the area of pushing or lifting beyond the length of the Ram, lengths of Tubing may be added to increase scope of operations. First attach the Female Adapter (SL-2) to head of Ram Piston. Then add Tubing lengths as required. Next add Male Adapter (SL-1) to which any of the various attachments in the above diagram may be added.

For a firm base on any kind of surface, screw the Short Nipple (BU-725) into the bottom of Ram Cylinder. It is then possible to add the Flat Push Plate (BU-580), the Cleated Push Plate (BU-581) or the Rubber Anchor (BU-700), depending on the type of material to which the hook-up is to be anchored.

Any of the working heads shown at top of illustration may be attached to Ram bottom by first inserting the BU-725 Short Nipple. Working heads at bottom of illustration may also be attached to top of Ram Piston.

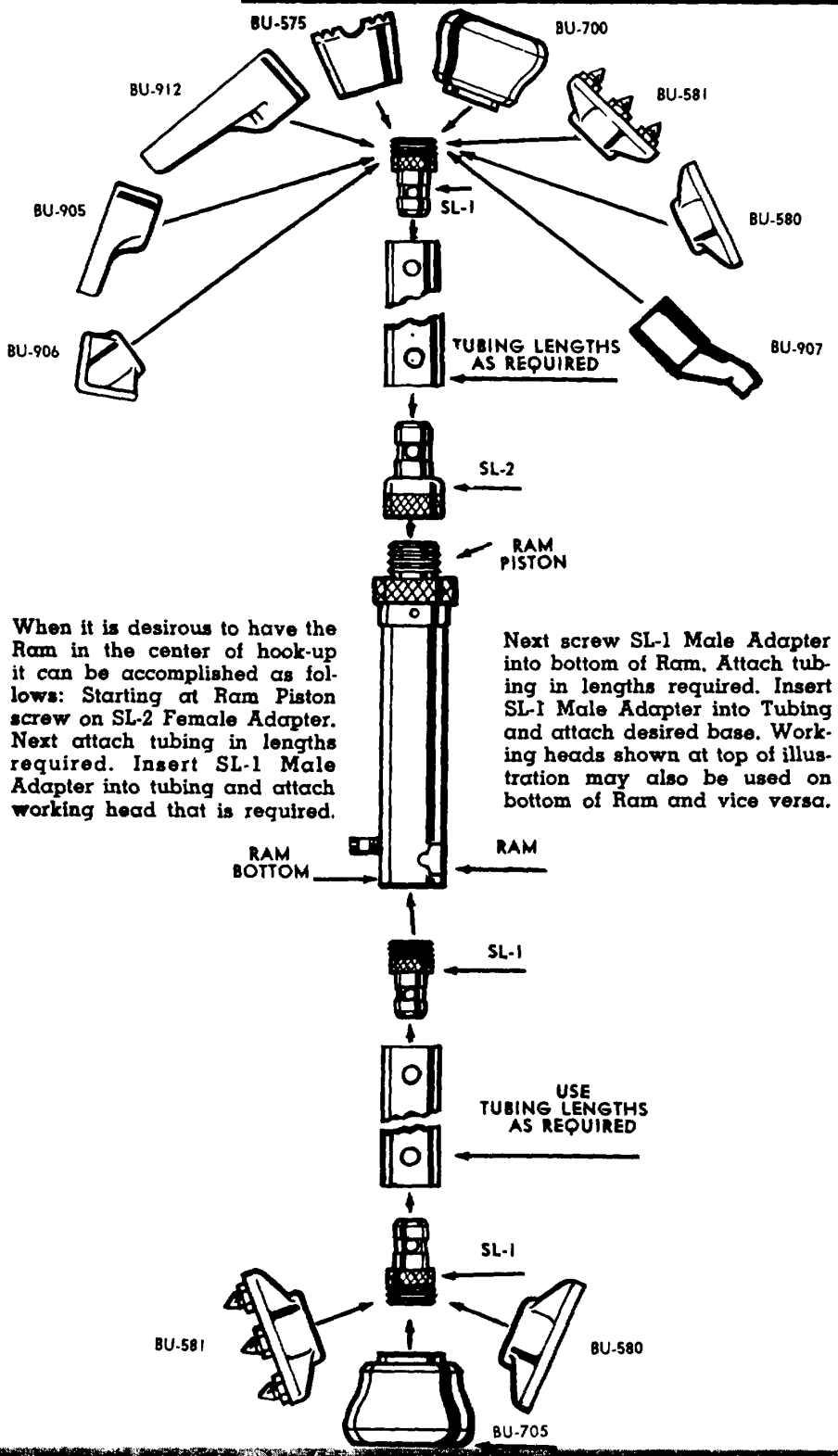
PUSHING and LIFTING



In some pushing or lifting operations it may be necessary to have the Ram at the head of the Tubing hook-up instead of at the base. This is accomplished by screwing a Male Adapter (SL-1) into Ram bottom, then adding Tubing as required with the Male Adapter (SL-1) at end of Tubing, and then attaching any of the working heads as shown in the diagram above.

Attachments shown at top of illustration may also be used at bottom and vice versa. When it is necessary to have Ram in the middle of hook-up, attach SL-2 to Ram Piston and SL-1 to Ram bottom. Add tubing to each end to get desired length. Then insert SL-1 Pins in Tubing at both ends of hook-up. Use desired working heads at each end.

PUSHING and LIFTING



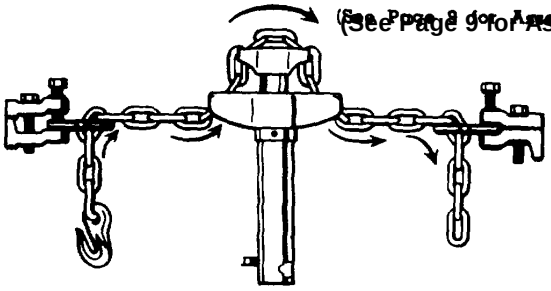
PULLING OPERATIONS

The P-F Hydraulic Rescue Kit offers a choice of two entirely different methods of pulling operations, depending on the type of rescue work to be done and the working space available. Both methods accomplish quick results through easily assembled hook-ups.

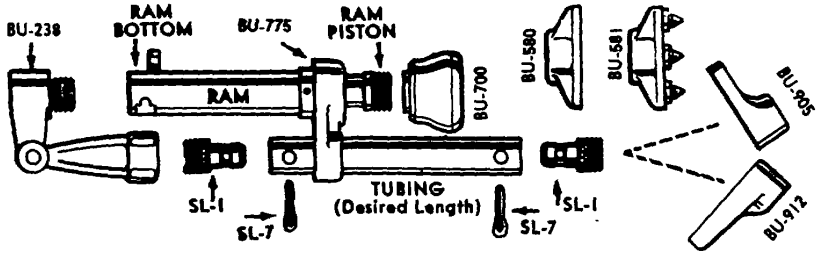
The Pull Kit with Chain, shown in sketches below is indicated for most types of accidents, but when it is necessary to work in a very small area — such as pulling together pickets on an iron fence or pressing objects together, there is the additional choice of the Outboard Pull, shown below.

HOOK-UP FOR USING THE CHAIN PULL KIT

(See Page 9 for Assembly)

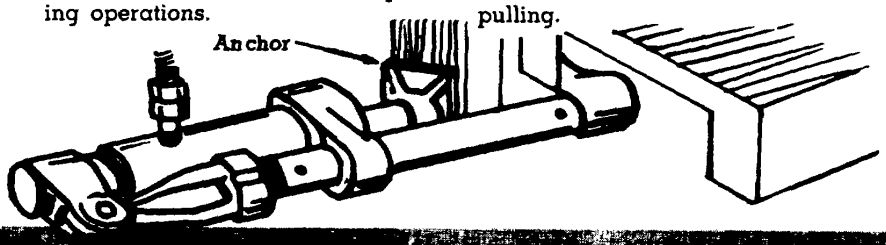


HOOK-UP FOR AN OUTBOARD PULL

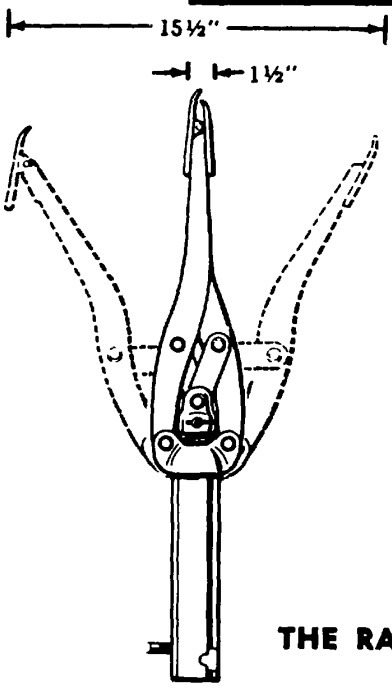


Remove Ram Protector Ring and then screw Pull Guide (BU-775) to Ram Cylinder. Next, attach choice of Flat Push Plate (BU-580), Cleated Push Plate (BU-581), or Rubber Anchor (BU-700) to Ram Piston. Next screw Pull Arm Assembly (BU-238) into bottom of Ram. Screw a Male Adapter (SL-1) into Pull Arm Assembly. Tubing of desired length passes through Pull Guide to connect with Pull Arm Assembly. Insert Connecting Pins (SL-7). CAUTION: Connecting Pins must ALWAYS be used in all pulling operations.

Additional lengths of Tubing may be added to reach any desired length but pins MUST be inserted between each two lengths of Tubing and between Tubing and SL-1 Connectors. Finish off end of Tubing with Male Adapter (SL-1) and attach either Long Spreading Toe (BU-912) or Jack Piston Spreading Toe (BU-905). This set-up, as shown in diagram below REVERSES power application from pushing to pulling.



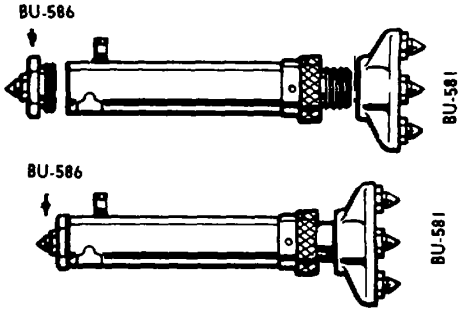
SPREADING OPERATIONS



THE P-F SPREADER (BU-750)

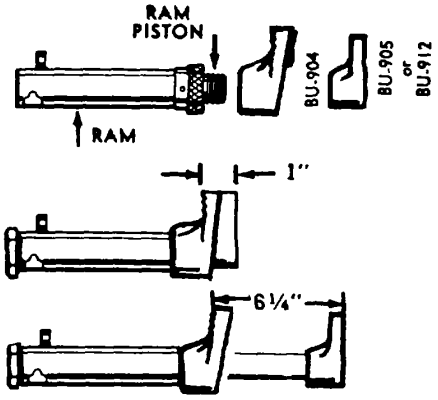
This powerful attachment is one of the most versatile and useful attachments in the P-F Hydraulic Rescue Kit. (See method of attaching on Page 8. Its use is indicated whenever there is a space problem, as the jaws close to only 1½" giving entry in very narrow spaces, yet open to a full 15½" spread. It has many uses, such as opening doors in buildings, cars and planes and is particularly recommended for freeing victims who are pinned in automobiles where it would be impossible to use the Ram and Attachments. Tubing may be added to bottom of Ram when it is necessary to use Spreader beyond arm's length or in limited working area. (See page 8.)

THE RAM SPREADING OPERATION



For Persons Caught In Trees Etc.

When used against trees, timbers or poles and it is necessary to push against another soft material, a firmly anchored non-slip operation may be obtained by using the Cleated Push Plate (BU-581) on Ram Piston and the Cleated Ram Base (BU-586) on bottom of Ram. This hook-up eliminates the necessity of notching trees or poles to give a flat surface to jack against. See illustration Page 20

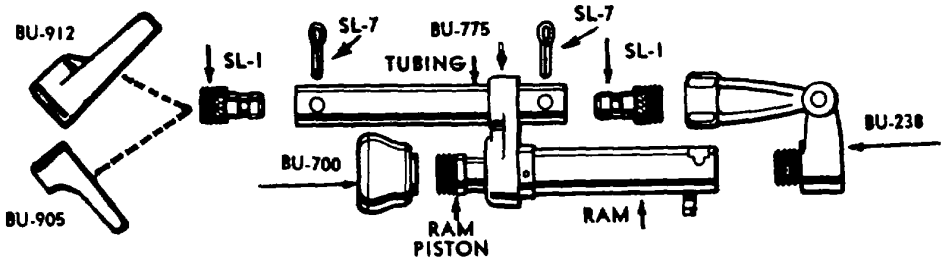


For Elevator Accidents

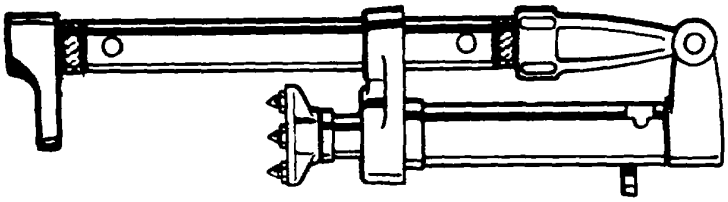
If work is restricted to very cramped quarters, spreading operations are easily accomplished by first removing the Ram Protector Ring from the Ram and then screwing the Jack Spreader Toe (BU-904) to the Ram Cylinder. Next extend Ram Piston two or three pump strokes and screw on the Jack Piston Spreading Toe (BU-905), or Long Spreading Toe (BU-912). This allows an entering wedge of only 1" which can be expanded to 6¼". In this operation the elevator car is not lifted but is pushed back into elevator well. See illustration Page 19

PRESSING OPERATIONS

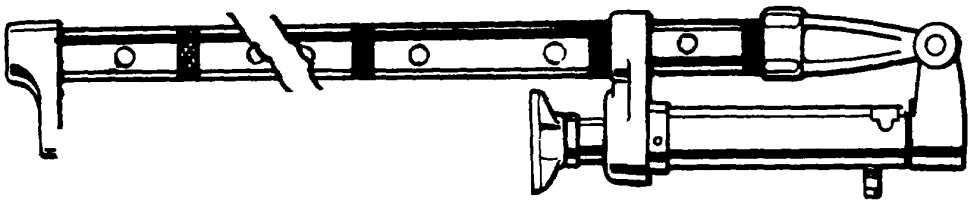
Pressing operations are similar to pulling operations and are used whenever it is necessary to press any two objects together, such as the pickets of an iron fence.



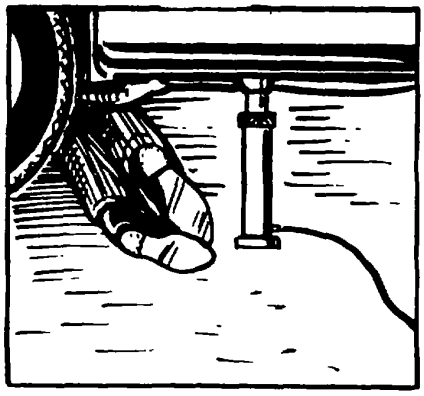
Remove Ram Protector Ring and screw Pull Guide (BU-775) to Ram Cylinder. Screw Pull Arm Assembly (BU-238) into bottom of Ram and add Male Adapter (SL-1) to Pull Arm Assembly. Desired working head should be attached to Ram Piston *BEFORE* tubing of desired length is passed through Pull Guide (BU-775) to connect with Pull Arm Assembly (BU-238). Attach choice of Flat Push Plate (BU-580), Cleated Push Plate (BU-581) or Rubber Anchor (BU-700) to head of Ram Piston. Additional Tubing may be added to extend pressing operation to a distance of 5'2". Insert Connecting Pins (SL-7). Caution: *Connecting Pins must always be used in pressing operations.*



Any additional required lengths of tubing may be added to tubing in Pull Arm Guide (BU-775) or to Ram Piston but pins must be inserted in holes between each two lengths of Tubing and SL-1 Adapters. Finish off with the Male Adapter (SL-1) and attach either Long Spreading Toe (BU-912) or Jack Piston Spreading Toe (BU-905).



P-F RESCUE KITS OFFER QUICK and EASY HOOK-UPS to TAKE CARE OF EVERY ACCIDENT.



LIFTING

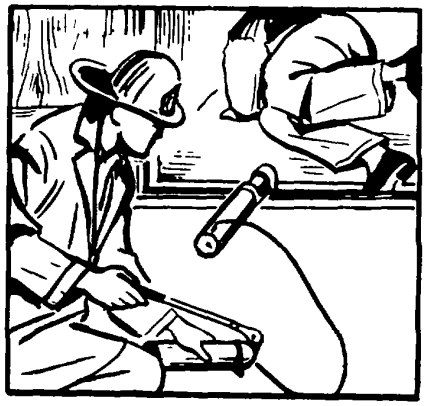
Victim trapped under truck. Necessary to lift vehicle in order to free legs. (See hook-up on Page 12.)

HOLDING

Victim buried under debris of fallen building. Heavy wall has been lifted and is now being held in place to permit rescue workers to recover victim. (See hook-up on Pages 13, 14, 15)

PUSHING

Victim wedged between fallen tree and building. Tree is being pushed away. (See hook-up on Pages 12, 13, 14, 15)

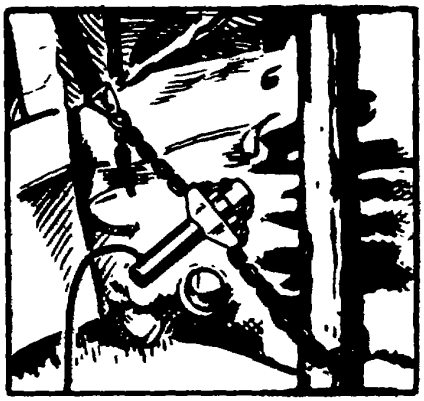


SPREADING

Victim caught in elevator is released by moving elevator back in well. See Page 17.

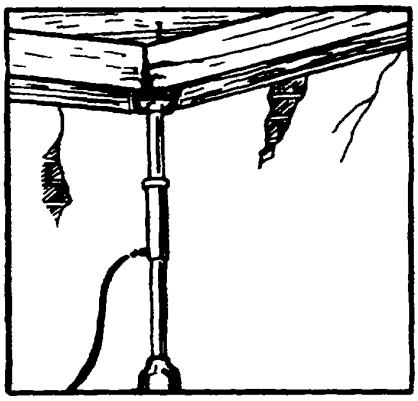
DEPARTMENT NOTES

ONE MAN CAN TRANSPORT, HOOK-UP and USE A P-F RESCUE KIT TO SAVE LIVES.



PULLING

Here the Chain Pull Kit is being used to pull back panel of car to free victims in rear seat. (See hook-up on Page 16.)

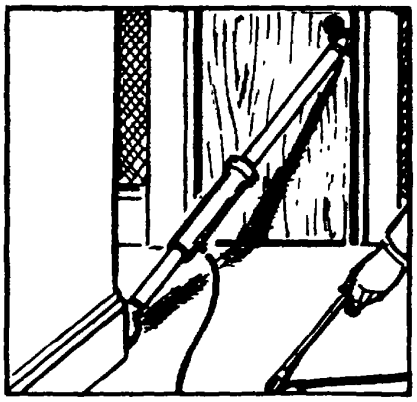


SHORING

P-F Ram with Tubing Extensions being used to keep weak wall from collapsing. (For hook-up see Pages 12, 13, 14, 15.)

SPREADING

Spreading crotch of tree to release victim's foot. Cleated Push Plate and Ram Base eliminate notching tree for anchorage. (See hook-up on Page 17.)

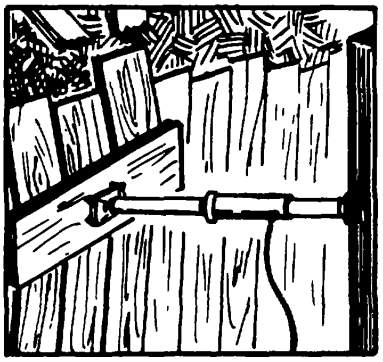


OPENING

Forcing open locked door. (See hook-up on Pages 13, 14, 15.)

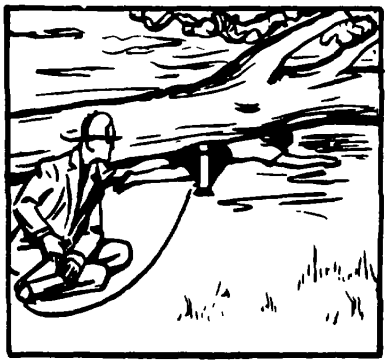
DEPARTMENT NOTES

THERE'S A P-F HOOK-UP POSSIBLE to SOLVE any RESCUE PROBLEM!



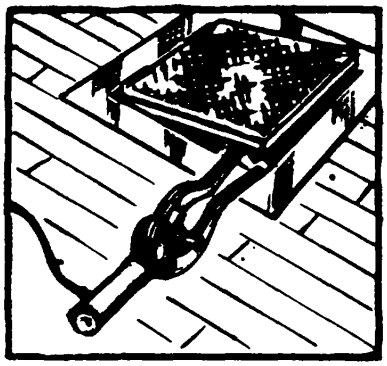
BRACING

Fallen tunnel shaft being braced to allow rescue workers to speed up cave-in rescue. (For hook-up see Pages 12, 13, 14.)



LIFTING

Cyclone-felled trees being raised away from accident victim. (For hook-up see Pages 12, 13, 14.)



OPENING

Spreader is being used to open metal trap door leading to basement. (For hook-up see Page 17.)

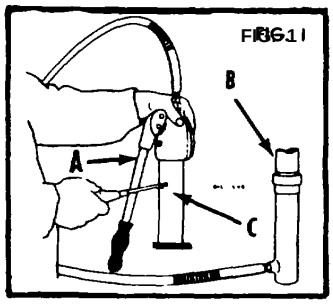
TRANSPORTING

P-F Rescue Kits can go anywhere a man can go. They are independent of outside power sources and can be used safely near inflammables where torches cannot be employed. Canvas carrying case permits man to take only essential parts over ladders or into difficult or hazardous locations.

DEPARTMENT NOTES

MAINTENANCE AND CARE OF THE P-F 10 TON HYDRAULIC REMOTE CONTROL JACK.

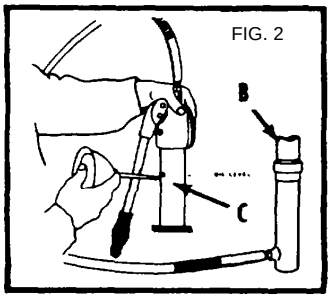
OIL INSPECTION



1. Open Control Lever (A) and fully retract Ram (B) (Fig. 1).
2. Stand Pump on tank end (See Fig. 1), remove Filler Screw (C). If oil flows out of the filler hole (C), no additional oil is needed. CAUTION: DO NOT FILL UNIT WHEN PUMP IS IN HORIZONTAL POSITION.

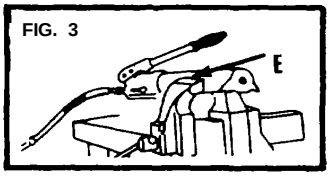
FILLING INSTRUCTIONS

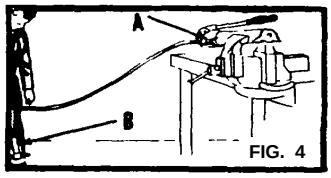
1. Fully retract ram (B).
2. Stand pump on tank end (Fig 2) and remove filler screw (C) Fill pump with P-F Hydraulic Fluid, using oil can, until oil flows out of filler hole. Replace filler screw (C).

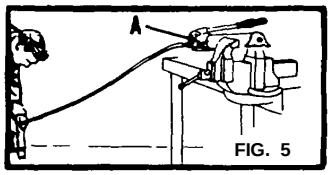


BLEEDING INSTRUCTIONS

1. Place pump in vise at slight angle (Fig. 3), so that jaws of vise grip tank, *NOT PUMP HOUSING*. Exert only enough "squeeze" to hold pump in position.
2. With ram (B) in lowest position (Fig. 4), CLOSE Control Lever (A) and fully extend Ram. Hold Ram in this position for 1½ minutes.
3. Turn control level (A) counterclockwise or away from hose end (Fig. 5) and with Ram Piston resting on floor, exert strong, steady pressure on Ram Cylinder so that it is quickly retracted. Be sure that hose is held out straight — THIS IS VERY IMPORTANT — as it allows oil pressure to force any air trapped in Ram or hose back through the pumping system, thus eliminating air pockets.
4. Remove pump from vise and stand pump on tank end (Fig. 1). Remove filler screw (C), allowing excess oil to expel through filler hole. If oil will flow out of filler hole, unit is properly filled. If oil does not flow out, repeat No. 2 under FILLING INSTRUCTIONS.
5. Replace filler screw (C) securely and turn Control Lever clockwise or toward hose end. (A) Operate Pump with full stroke. Ram should extend ⅛" on first stroke. If the Ram will not extend, Pump is air bound and it will be necessary to repeat bleeding instructions.







CAUTION: **For the protection of your P-F Ram, use only Genuine**

P-F HYDRAULIC FLUID

CARE AND PROTECTION OF THE P-F HYDRAULIC RESCUE KIT.

The P-F Hydraulic Rescue Kit has been carefully engineered and manufactured to give trouble-free service and to last for years. It has been thoroughly examined and tested before leaving the factory.

It requires a minimum of care and stands up under a maximum of hard usage Here are a few simple *do's* and *dont's* which will keep it functioning and in good condition

DO

... Protect the threads on Ram Cylinder. A Protector Ring (BU-576) is furnished and should always be screwed on Ram unless other attachments are being used. Also protect Piston by keeping Ram Cap (BU-575) screwed on when not using other attachments.

... Keep Oil Lines clean. Use every precaution to guard unit against entrance of dirt or other foreign matter which might cause pump failure.

... Use only P-F Hydraulic Fluid. Never use brake fluid or ordinary cylinder oil.

... Provide sufficient clearance. See that hose is clear when ram extends. Avoid wear on hose by keeping it free from obstructions.

... Keep unit away from fire and excessive heat as this will tend to melt sizing in cups and cause leakage. Heat also weakens the hose structure.

... Treat the P-F Hydraulic Rescue Kit as you would any other piece of fine machinery.

... Send unit to nearest P-F Authorized Jack Service Station for service.

DON'T

... Attempt to disassemble the pump and ram units yourself.

... Use a dirty oil can or one that previously contained any other fluid when filling the ram.

... Fill Pump beyond oil level or neglect to do a complete bleeding operation.

... Overload the ram. Never try to lift a load which exceeds the ram capacity as it will cause cracked cylinders, blown cups and bent piston.

... Over-extend ram. There is a tremendous force in hydraulic power and it is possible to push piston out of top of ram.

... Pump rapidly when load is off center such as when you are using pressing, pulling and spreading operations or lifting with Spreading Toes. Excessive off-center loads produce strain on ram piston and tubes.

... Drop heavy objects on hose. It will weaken hose and cause it to leak or burst.

... Carry unit by hose, this puts undue strain on hose.

HYDRAULIC RESCUE KITS

Guarantee

All P-F Body Repair Tools and Equipment except Hose and Chain are guaranteed against defects in materials and workmanship. Hydraulic Jacks have a warranty period of ninety days. (See Warranty Card Enclosed with each Jack). Tools and Equipment that have been used beyond capacity, abused, or used for other than their intended purpose are not covered by this Guarantee.

H. K. PORTER, INC.
SOMERVILLE, MASSACHUSETTS 02143

No. A128 Printed in U.S.A. Revised 6-74

Ansul Part Number S-27771

Contents

Quantity	Part No.	Description
1	BU0480	10 ton remote control jack, 6" ram travel, 3/8" NPTF
2	BU0190	Bite-tite clamp
1	BU0238	Pull arm assembly
1	BU0287	Chain pull collar
1	BU0580	Flat push plate
1	BU0581	Cleated push plate
1	BU0586	Cleated ram base
1	BU070	Rubber anchor
1	BU0705	Small rubber base
1	BU0725	Short Nipple
1	BU0731	Heavy Duty Coupling
1	BU0750	Spreader
1	BU0775	Pull Guide
1	BU0904	Jack spreading toe
1	BU0905	Jack piston spreading toe
1	BU0906	V pushing cap
1	BU0907	Offset spreading toe
1	BU0910	Small chain attachment
2	BU0911	6' chain, 3/8" dia. links
1	BU0912	Long spreading toe
1	BU0913	V notch cap
1	BU0931	Short chain with 2 hooks
3	SL0001	Male adaptors
1	SL0002	Female adaptor
1	SL0004	4" extension tube
1	SL0006	6" extension tube
12	SL0007	Connecting pins
1	SL0008	8" extension tube
5	SL0009	Tubing connectors
1	SL0012	12" extension tube
1	SL0016	16" extension tube
1	SL0020	20" extension tube
1	RK0098	Steel carrying case
1	RK0099	Canvas carrying case

Manufacturer:

H. K. Porter, Inc.
Somerville, Massachusetts 02143

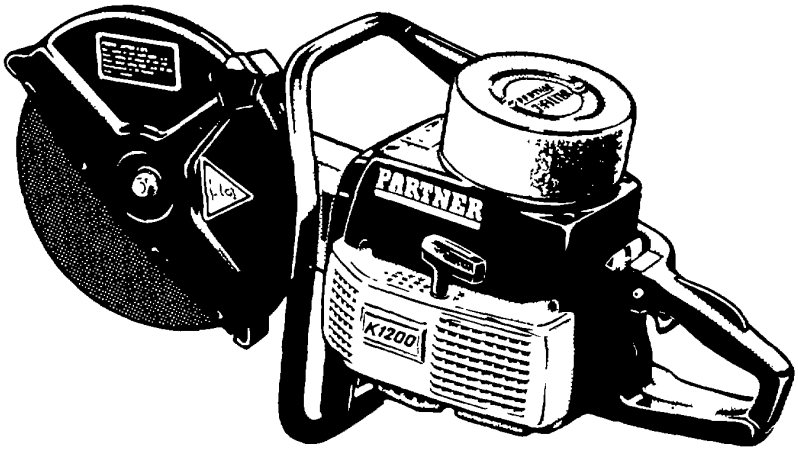
PARATECH INCORPORATED

Rescue Saw (K-1 200) Ansul Part No. S27770

PARTNER®

K1200 • K65

INSTRUKTIONSBOK
INSTRUCTION BOOK
BETRIEBSANLEITUNG
MANUEL D'ENTRETIEN



Förord

För att Din kapmaskin skall bli den goda PARTNER Du med all ratt vantar Dig, råder vi Dig att agna några minuter åt att lasa igenom denna bok, som ar avsedd att underlatta en riktig skotsel av maskinen samt visa hur man utfor nodvandiga kontroller och underhållsarbeten.
Kapmaskinen ar ett arbetsverktyg med hög skarkapacitet, som ar forsedd med sakerhetsdetaljer for att gora arbetet så sakert som mojligt Med dessa ur funktion eller vid vårdslos eller felaktig anvandning kan maskinen orsaka skador på foraren eller på personer i omedelbar narhet av skarande maskin Las darfor noga igenom sakerhetsforeskrifterna på sidan 6
En kapmaskin får under inga omständigheter ändras från sin ursprungliga konstruktion annat än med fabrikens skriftliga medgivande. Icke auktoriserade andringar kan medföra att säkerheten äventyras.
Fabriken forbehåller sig ratten att foretaga andringar utan foregående meddelande darom

AB PARTNER

Vorwort

Damit die neue Motortrennsage Ihren mit Recht gestellten Erwartungen entsprechen kann, mochten wir die Bedeutung davon hervorheben, daß die Trennsage eine regelmassige und richtige Wartung erhalt
Die Trennsage besitzt eine hohe Schneidkapazitat Eine Reihe von Sicherheitseinrichtungen gewahrleistet großmogliche Sicherheit beim Arbeiten mit dieser Maschine Falls diese Sicherheitsdetails jedoch außer Funktion sind oder die Maschine falsch benutzt wird, besteht die Gefahr von Verletzungen fur Personen, die mit der Trennsage arbeiten oder sich in unmittelbarer Nahe davon aufhalten Machen Sie sich daher mit den Sicherheitsvorschriften auf Seite 8 vertraut
Eine Trennsäge darf unter keinen Umständen in ihrer ursprünglichen Konstruktion abgeändert werden, es sei denn mit ausdrücklicher, schriftlicher Erlaubnis des Werkes. Nicht autorisierte Änderungen können die Sicherheit gefährden.
Das Werk behalt sich das Recht vor, anderungen ohne vorherige Mitteilung vorzunehmen

AB PARTNER

Foreword

If your new cutting machine is to be the good PARTNER you have every right to expect we should like to underline the importance of certain inspections and maintenance being carried out at regular intervals.
The power cutter is a machine with a high cutting capacity and it is fitted with safety features to make the work carried out as safe as possible If the safety features are out of operation or if the machine is used carelessly or wrongly, the result can be injuries suffered by the operator or people in the immediate vicinity For this reason you should read through the safety regulations on page 7 very carefully
Under no conditions may a power cutter be modified from its original design except with the permission of the manufacturer in writing. Non-authorized modifications can imply considerable safety risks.
The manufacturers reserve the right to carry out modifications without previous notice.

AB PARTNER

Avant-propos

Afin que votre nouvelle découpeuse devienne, à juste titre, la bonne PARTNER sur laquelle vous pourrez compter, nous tenons à souligner qu'il est important que soient effectués régulièrement certains contrôles et travaux d'entretien.
La découpeuse est un outil de travail à haute capacité de découpage Elle est équipée de systèmes de sécurité qui rendent le travail aussi sûr que possible Si ces systèmes de sécurité sont hors fonction ou si la découpeuse est employée négligemment ou de façon incorrecte, elle peut risquer d'occasionner des blessures à son utilisateur et aux personnes se trouvant dans son entourage immédiat Il faut donc lire attentivement les prescriptions se référant à la sécurité, page 9
Il ne faut jamais modifier la conception originale d'une découpeuse sans avoir l'autorisation écrite de l'usine. Les modifications qui n'ont pas été autorisées, peuvent risquer la sécurité.
Nous nous réservons le droit de faire, sans avis préalable, toutes les modifications que nous pourrions juger nécessaires

AB PARTNER

Innehållsförteckning:

Contents:

Inhaltsverzeichnis:

Table des matieres:

Tekniska data

Motor	K65	K1200
luftkyld, 2-takts		
cylindervolym	65 cm³	100 cm³
Tändsystem		
transistortandsystem	PARTNER IGNITRON	PARTNER IGNITRON
tandstift	Bosch WKA 225 T3	Bosch WKA 225 T6
elektrodavstånd	0,5 mm	0,8 mm
Forgasare		
varvtalsreglerad	Tillotson HS-175 A	Tillotson HS-175 A
regleromräde	9 600±400	9 600±400
Bränsle		
oljeinblandning	4 % (1 25)	4 % (1 25)
med PARTNER-olja	2 % (1 50)	2 % (1 50)
tankvolym	0,75 l	1,0 l

KAPUTRUSTNING

Kapskiva	**Utväxling**	**Max. periferihastighet**
12" (K65)	1 1,97	80 m/s
12" (K1200)	1 2,0	80 m/s
12" (K1200)	1 1,7	100 m/s
14" (K1200)	1 2,0	100 m/s

Technical data

Engine	**K65**	**K1200**
air-cooled, two-stroke		
capacity	65 c c	100 c c
Ignition system		
transistor ignition system	PARTNER IGNITRON	PARTNER IGNITRON
spark plug	Bosch WKA 225 T3	Bosch WKA 225 T6
electrode spark gap	0 5 mm (020")	0 8 mm (031")
Carburetor		
speed governor	Tillotson HS-175 A	Tillitson HS-175 A
range of regulations	9.600±400	9 600±400
Fuel		
oil mixture ratio	4 % (1 25)	4 % (1·25)
with PARTNER oil	2 % (1 50)	2 % (1 50)
tank capacity	0 75 l (1 32 Imp pints – 1 59 US pints)	1 0 l (1 76 Imp pints – 2 12 US pints)

CUTTING EQUIPMENT

Cutter disc	**Gear ratio**	**Max. peripherical speed**
12" (K65)	1 1 97	80 m/s
12" (K1200)	1 2 0	80 m/s
12" (K1200)	1 1 7	100 m/s
14" (K1200)	1 2 0	100 m/s

Technische Daten

Motor	**K65**	**K1200**
Zweitaktmotor mit Luftkuhlung		
Hubraum	65 cm³	100 cm³
Zündanlage		
Transistorzundanlage	PARTNER IGNITRON	PARTNER IGNITRON
Zundkerze	Bosch WKA 225 T3	Bosch WKA 225 T6
Elektrodenabstand	0,5 mm	0,8 mm
Vergaser		
Drehzahlregulierung	Tillotson HS-175 A	Tillotson HS-175 A
Regulierbereich	9 600±400	9 600±400
Kraftstoff		
Ölgemisch	4 % (1 25)	4 % (1 25)
mit PARTNER-Öl	2 % (1 50)	2 % (1 50)
Tankfullmenge	0,75 l	1,0 l

TRENNZUSATZ

Trennscheibe	**Übersetzung**	**Max. Umfangsgeschwindigkeit**
12" (K65)	1 1,97	80 m/s
12" (K1200)	1 2,0	80 m/s
12" (K1200)	1 1,7	100 m/s
14" (K1200)	1 2,0	100 m/s

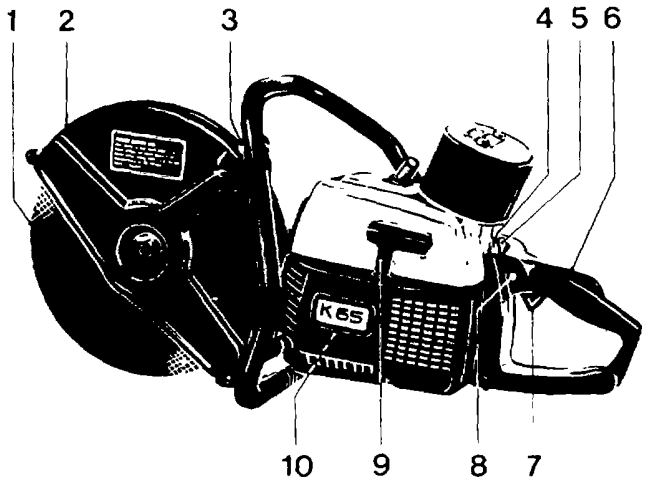
Données techniques

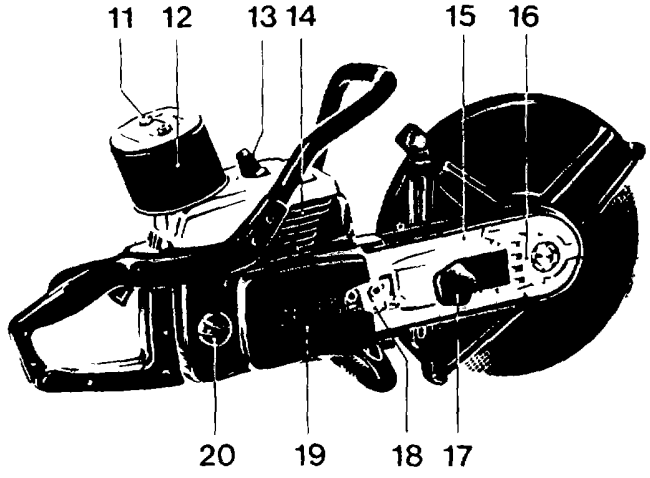
Moteur	**K65**	**K1200**
refroidi par air, à 2 temps		
cylindrée	65 cm³	100 cm³
Allumage		
système d'allumage Transistor	PARTNER IGNITRON	PARTNER IGNITRON
bougie	Bosch WKA 225 T3	Bosch WKA 225 T6
écartement des électrodes	0,5 mm	0,8 mm
Carburateur		
protection d'emballement	Tillotson HS-175 A	Tillotson HS-175 A
étendue de réglage	9 600±400	9.600±400
Carburant		
mélange de lubrifiant	4 % (1 25)	4 % (1 25)
avec huile PARTNER	2 % (1 50)	2 % (1·50)
volume de réservoir	0,75 litres	1,0 litres

OUTILLAGE D'ABATTAGE

disque	**démultiplication**	**vitesse périphérique maxi. du disque**
12" (K65)	1 1,97	80 m/s
12" (K1200)	1 2,0	80 m/s
12" (K1200)	1 1,7	100 m/s
14" (K1200)	1 2,0	100 m/s

K65

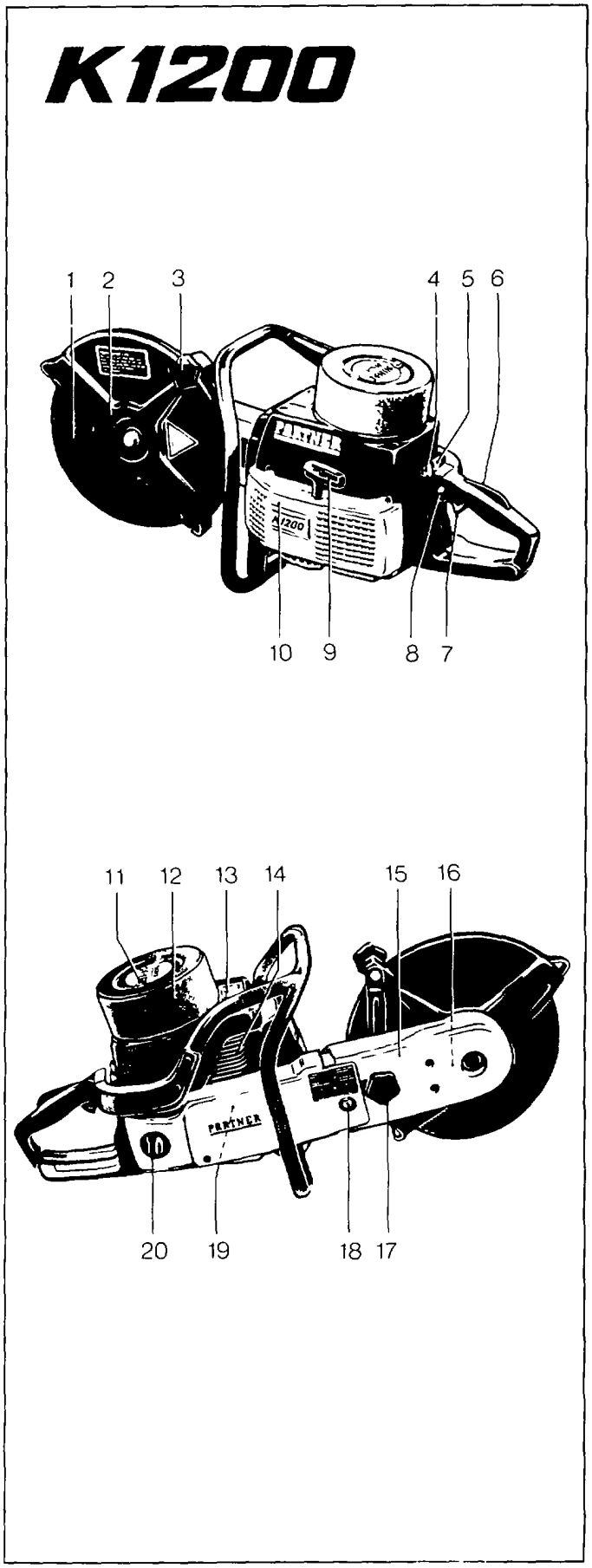




Pos Benamning
1 Kapskiva
2 Sprangskydd
3 Ratt for sprangskydd
4 Stoppknapp
5 Chokeknapp
6 Tomgångssparr
7 Gasreglage
8 Startgassparr
9 Starthandtag
10 Startapparat
11 Låsmutter for luftfilter
12 Luftfilter
13 Tandstift
14 Cylinder
15 Drivrem
16 Kaparm
17 Ratt for sprangskydd
18 Remspannare
19 Drivhjul, koppling
20 Bransletank

Pos Description
1 Cutter disc
2 Guard
3 Knob for guard
4 Stop control
5 Choke
6 Idling catch
7 Throttle control
8 Starter throttle control
9 Starting handle
10 Starter unit
11 Lock nut for air filter
12 Air filter
13 Spark plug
14 Cylinder
15 Vee-belt
16 Cutting arm
17 Knob for guard
18 Belt tensioner
19 Drive wheel, clutch
20 Fuel tank

Pos Bezeichnung
1 Trennscheibe
2 Splitterschutz
3 Splitterschutzknopf
4 Abstellknopf
5 Choke
6 Leerlaufsperre
7 Gashebel
8 Anwerfgassperre
9 Anwerfgriff
10 Anwerfvorrichtung
11 Sicherungsmutter fur Luftfilter
12 Luftfilter
13 Zundkerze
14 Zylinder
15 Antriebsriemen
16 Trennarm
17 Splitterschutzknopf
18 Riemenspannung
19 Kettenrad, Kupplung
20 Kraftstofftank



Pos Désignation
1 Disque découpeur
2 Protecteur
3 Volant du protecteur
4 Bouton d'arrêt
5 Bouton de starter
6 Blocage de ralenti
7 Commande d'accélération
8 Blocage de démarrage
9 Poignée de démarrage
10 Dispositif de mise en route
11 Ecrou pour filtre à air
12 Filtre à air
13 Bougie
14 Cylindre
15 Courroie d'entraînement
16 Bras de découpage
17 Volant du protecteur
18 Tendeur de courroie
19 Accouplement
20 Réservoir de carburant

Säkerhetsåtgärder för kapmaskinsförare

1 Anvand aldrig maskinen nar Du ar trott

2 Anvand skor som ger säkert grepp, tatt åtsittande klader, skyddsglasogon, horsel- och huvudskydd och skyddshandskar

3 Var alltid forsiktig vid påfyllning av bränsle Forflytta kapmaskinen minst tre meter från påfyllningsstallet, innan den startas

4 Kontrollera alltid att ingen befinner sig i narheten då maskinen startas eller under kapning Åskådare och djur måste hållas utanfor arbetsområdet

5 Borja aldrig kapa innan arbetsområdet ar fritt och fotfastet sakert

6 Håll alltid maskinen i ett fast grepp med båda handerna nar motorn är igång Håll ett fast grepp med tummar och fingrar som sluter sig kring handtagen

7 Håll Dig på avstånd från kapskivan nar motorn ar igång

8 Sprangskyddet skall alltid vara på

9 Håll inte skivan snett i spåret, kila heller inte in eller klam fast skivan i spåret.

10 Kontrollera att skivan inte ar i kontakt med någonting innan motorn startas

11 Nar man bar maskinen skall motorn alltid vara avstangd och ljuddamparen riktad bort från ens kropp

12 Arbeta aldrig med en kapmaskin som ar skadad eller felinstalld, eller med en kapmaskin, dar någon del saknas eller dar monteringen inte har gjorts på ett betryggande satt Kontrollera att skivan slutar rotera nar gasreglaget frigores

13 Stäng alltid av motorn innan maskinen sätts ner

14 Håll handtagen torra, rena och fria från olja och bränsle

15 Anvand maskinen endast i utrymmen med god ventilation Forsummelse kan leda till allvarlig skada eller dod

16 Kapskivan skall tagas av kapmaskinen under transport eller vid forvaring

17 All service utover de punkter som uppraknas i tillverkarens underhållsinstruktioner skall utforas av kompetent servicepersonal

18 Arbeta inte med kapmaskinen utan att forst ha genomgått specialutbildning i dess handhavande

Operator Safety Precautions

1 Never operate the machine when you are fatigued.

2 Use safety footwear, snug-fitting clothing, safety goggles, and hearing- and head-protection devices and gloves

3 Always use caution when handling fuel Move the cutting machine at least 10 feet from the fueling point before starting engine

4 Do not allow other persons to be near the machine when starting or cutting Keep bystanders and animals out of the work area

5 Never start cutting until you have a clear work area and secure footing

6 Always hold the unit firmly with both hands when the engine is running Use a firm grip with thumbs and fingers encircling the handles

7 Keep all parts of your body away from the cutter disc when the engine is running

8 Never operate without the disc guard

9 Do not cock, wedge or jam the disc in the cut

10 Before starting the engine, make sure that the disc is not contacting anything

11 Always carry the machine with the engine stopped and the muffler away from your body

12 Never operate a cutting machine that is damaged, improperly adjusted, or not completely and securely assembled Be sure that the disc stops moving when the throttle-control trigger is released

13 Always shut off the engine before setting the machine down

14 Keep the handles dry, clean, and free of oil or fuel

15. Operate the machine only in well-ventilated areas Failure to use the power cutter in a well-ventilated area can lead to serious injury or death

16 The cutter disc should be removed from the cutting machine when it is transported or stored

17 All service other than items listed in the machinebuilder's maintenance instructions should be performed by competent service personnel

18 Do not operate a cutting machine unless specifically trained to do so

Sicherheitsmaßnahmen für den Benutzer von Trennsägen

1 Die Trennsage nie benutzen, wenn man mude ist

2 Benutzen Sie Schuhe, die einen sicheren Halt geben, dicht anliegende Kleidung, eine Schutzbrille, Ohren- und Kopfschutz und Schutzhandschuhe.

3 Seien Sie immer beim Auffüllen des Kraftstoffes vorsichtig. Tragen Sie die Maschine zu einem Platz, der wenigstens 3 m von der Auftankstelle entfernt ist, bevor Sie sie starten

4 Erlauben Sie niemandem, sich in der Nahe aufzuhalten, wenn Sie die Maschine starten oder während des Schneidens Zuschauer und Tiere aus dem Arbeitsbereich fernhalten

5 Nie mit dem Trennen beginnen, bevor der Arbeitsbereich frei ist und Sie stabil und sicher stehen

6 Halten Sie die Maschine immer mit beiden Händen in einem festen Griff, wenn der Motor lauft. Halten Sie einen festen Griff mit Daumen und Fingern, die sich um den Handgriff schließen

7 Kommen Sie der Trennscheibe nicht zu nahe, wenn der Motor lauft

8 Der Splitterschutz muß immer aufmontiert sein

9 Halten Sie die Trennscheibe nicht schrag im Schlitz und verkeilen oder klemmen Sie sie nicht ein

10 Kontrollieren, daß die Trennscheibe frei rotieren kann, bevor Sie den Motor anwerfen

11 Beim Tragen der Maschine soll der Motor stets abgestellt und der Schalldampfer von Ihrem Korper weggedreht sein

12 Arbeiten Sie nie mit einer beschadigten oder falsch eingestellten Trennsage oder mit einer Maschine, an der ein Teil fehlt oder wo die Montage nicht unter zufriedenstellenden Bedingungen ausgeführt wurde Kontrollieren, daß sich die Scheibe nicht mehr dreht, wenn der Gashebel gelöst wird

13. Stellen Sie immer den Motor ab, bevor Sie die Maschine niedersetzen

14. Halten Sie die Handgriffe trocken, sauber und frei von Öl und Kraftstoff

15 Benutzen Sie die Maschine nur in Raumen mit guter Luftung Ein Versaumnis kann ernsthafte Schaden oder den Tod zur Folge haben

16 Die Trennscheibe soll von der Maschine wahrend des Transports oder der Verwahrung abmontiert sein

17 Alle Wartung, die uber die vom Hersteller im Wartungsplan genannten Punkte hinausgeht, soll von zustandigem Wartungspersonal ausgefuhrt werden.

18 Arbeiten Sie nicht mit einer Trennsage, bevor Sie eine Spezialausbildung in ihrer Handhabung durchgemacht haben

Mesures de sécurité concernant l'utilisateur de la découpeuse

1 Il ne faut jamais employer la découpeuse lorsqu'on est fatigué

2 Il faut employer des chaussures garantissant une bonne prise, des vêtements qui s'appliquent bien au corps, des lunettes protectrices, un casque protecteur et une protection de l'organe auditif et des gants

3 Il faut être prudent lors du remplissage de carburant La découpeuse doit être déplacée au moins à trois mètres du lieu de remplissage avant d'être mise en route

4 Contrôler toujours qu'il n'y a personne à proximité lorsque la machine est mise en route ou utilisée au découpage Les curieux et les animaux doivent être maintenus en dehors du secteur de travail

5 Il ne faut jamais commencer à effectuer un découpage avant de s'assurer que le secteur est bien dégagé et que l'on a, avec ses pieds, une bonne prise au sol

6 Il faut toujours bien maintenir fermement la machine avec ses deux mains lorsque le moteur est en marche Il faut bien maintenir la poignée avec ses pouces et ses doigts

7 Il faut se maintenir à bonne distance du disque découpeur lorsque le moteur est en marche

8 Le protecteur doit toujours être en place

9 Le disque découpeur ne doit pas être maintenu en biais ou être bloqué dans la gorge

10 Contrôler que le disque n'est pas en contact avec un objet quelconque avant que le moteur soit mis en route

11 Lorsqu'on porte la machine, le moteur doit toujours être arrêté et le silencieux doit être orienté dans le sens inverse à celui du corps de l'utilisateur

12 Il ne faut jamais travailler avec une découpeuse endommagée ou mal réglée ou bien encore avec une découpeuse où il manque une pièce quelconque ou bien encore là où le montage des pièces n'a pas été exécuté de façon conforme Contrôler que le disque cesse de tourner lorsque la commande d'accélération est lâchée

13 Le moteur doit toujours être arrêté avant que la machine soit déposée sur une surface quelconque

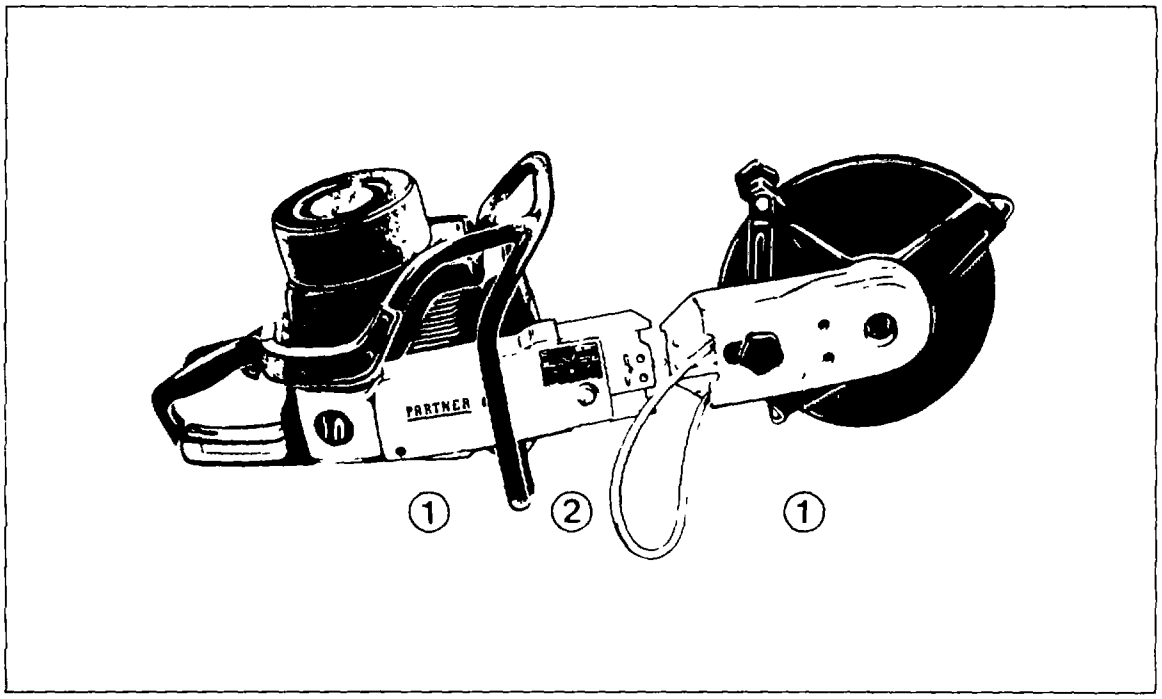
14 Les poignées doivent être bien sèches, propres et bien débarrassées de toute trace d'huile et de carburant

15 Il ne faut employer la machine que dans les endroits où la ventilation est satisfaisante Non-observation peut occasionner des blessures ou la mort

16 Le disque découpeur doit être enlevé de la découpeuse lors de transport ou lors de dépôt

17 Toutes mesures de service d'entretien, en plus des points mentionnés dans les instructions d'entretien du fabricant, doivent être exécutées par un personnel de service compétent

18 Il ne faut pas utiliser la découpeuse avant d'avoir préalablement suivi une formation spéciale sur la façon de l'employer



Montering av kaparm 1200

Demontera de bàda remskyddskaporna (Fyra skruvar ratt och bussning) (1)
Demontera fastskruven for kaparmen (2)

Passa in skruven, pa vilken ratten satt, i armens ovre hàl och drag fast fastskruven (2) for hand

---

Fitting the cutter arm K1200

Remove both the drive belt protecting casings (4 screws knob and bushing) (1)
Remove the attaching bolt (2) for the cutter arm

Fit the bolt on which the knob was placed in the upper hole in the arm and tighten the attaching bolt (2) by hand

---

Einbau des Trennarms K1200

Die beiden Riemenschutzkappen ausbauen (4 Schrauben Knopf und Buchse) (1)
Die Befestigungsschraube (2) fur den Trennarm herausschrauben

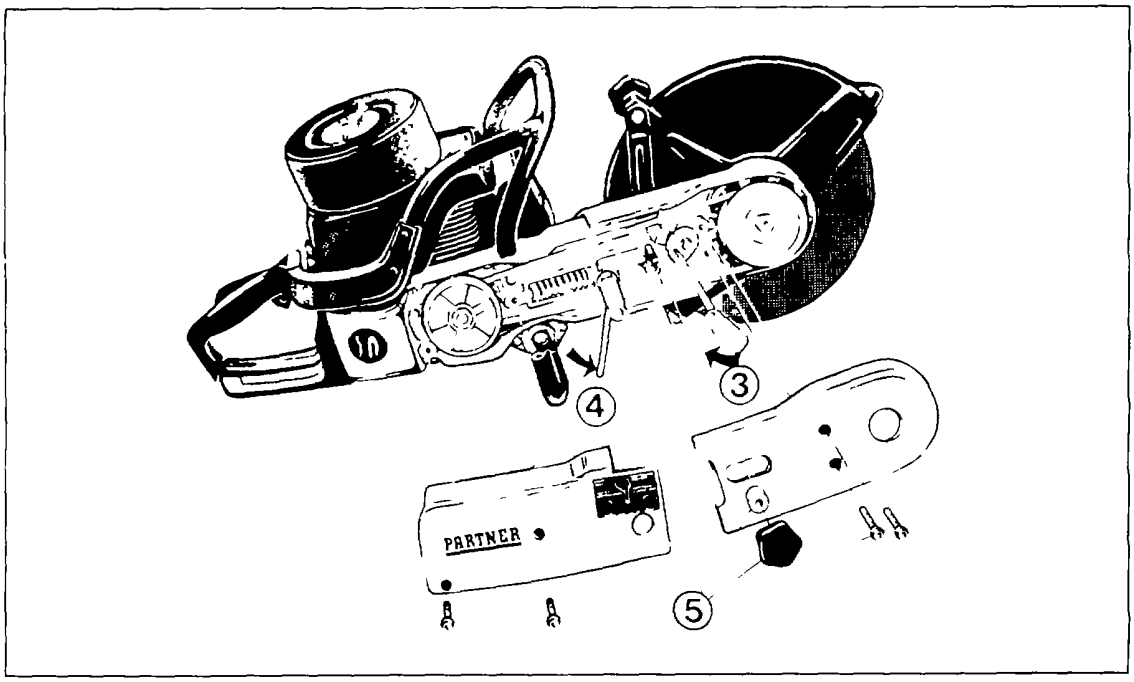
Die Schraube, an der der Knopf befestigt war in das obere Loch des Arms einpassen und die Befestigungsschraube (2) mit der Hand fest anziehen

---

Montage du bras de disque découpeur K1200

Démonter les deux couvercles protecteurs de courroie (4 vis volant et douille) (1)
Demonter la vis de fixation (2) de bras de disque découpeur

Introduire la vis dans le trou superieur de bras et serrer la vis de fixation (2) à la main



Lagg på kilremmen och spann den genom att vrida excentern (3) i bottenlage (medurs) med hylsnyckel 381306
Drag fast fastskruven (4) (moturs) med hylsnyckel 381317

Montera remskyddskåporna, bussningen och ratten (5)
Spann kilremmen efter 1 – 2 tankars korning och kontrollera darefter spanningen dagligen Betraffande vandning av kaparm se sid 31

Fit the vee-belt and tension it by turning the eccentric (3) to its bottom position (clockwise) using socket wrench 381306
Tighten the attaching bolt (4) (anti-clockwise) using socket wrench 381317

Fit the drive belt protective casings, the bushing and the knob (5)
Tension the vee-belt after 1 – 2 tank refills and thereafter every day
See page 31 concerning turning the arm

Den Keilriemen auflegen und durch Drehen des Exzenters (3) im Uhrzeigersinn mit dem Schlussel 381306 bis zum Anschlag spannen
Die Befestigungsschraube (4) entgegen dem Uhrzeigersinn mit dem Schlussel 381317 fest anziehen

Riemenschutzkappen, Buchse und Knopf wieder montieren (5)
Den Keilriemen nach 1 – 2 Tankfullungen nachspannen und anschließend die Spannung taglich kontrollieren
Umdrehung des Trennarms, siehe Seite 31

Placer la courroie et la tendre en tournant l'excentrique (3) à fond (dans le sens des aiguilles d'une montre) à l'aide de la clé à douille 381306
Serrer la vis de fixation (4) à fond (dans le sens inverse des aiguilles d'une montre) à l'aide de la clé à douille 381317
Monter les couvercles protecteurs de courroie, la douille et le volant (5)

Tendre la courroie après un emploie ayant nécessité 1 ou 2 remplissages de réservoir et contrôler ensuite quotidiennement la tension
En ce qui concerne l'inversion du bras découpeur, voir page 31

Skötsel av kapskivor

Iakttag forsiktighet vid hantering och forvaring av kapskivor, så att de inte skadas
Genast efter uppackning av skivorna skall man undersoka dem noga for att forvissa sig om att de inte blivit skadade vid hantering, under transport eller av andra orsaker
Kapskivor skall forvaras liggande på plan yta och på betryggande avstånd från stark varme och fukt Skivorna får inte under lagringen utsattas for hog luftfuktighet vatten och andra vatskor, eller temperaturer under noll grader
Vid transport av kapmaskinen skall kapskivan tagas av och forvaras enligt har givna anvisningar for att forhindra att den skadas

Care of cutter discs

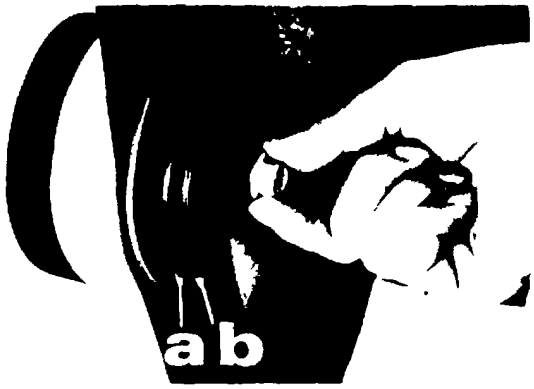
All cutter discs are breakable and, therefore, care shall be exercised in their handling and storage to prevent damage Immediately after unpacking, all discs shall be closely inspected to make certain that they have not been damaged from handling shipping or other causes
Cutter discs should be laid flat on a flat surface away from excessive heat or moisture Discs should not be stored subject to exposure to high humidity, water, other liquids, or freezing temperatures Discs used on machines on emergency vehicles should be dismounted after use and discared or carefully stored as described in this section

Pflege der Trennscheiben

Vorsicht bei der Hantierung und Verwahrung von Trennscheiben, damit sie nicht beschadigt werden
Nach dem Auspacken sofort die Trennscheiben genau auf Schaden untersuchen die wahrend der Hantierung des Transportes oder aus anderen Grunden enstanden sein konnen
Die Trennscheiben sollen liegend auf ebene Flache in ausreichendem Abstand von starker Warme und Feuchtigkeit verwahrt werden Sie durfen wahrend der Lagerung nicht hoher Luftfeuchtigkeit Wasser und anderen Flussigkeiten oder Temperaturen under 0 C ausgesetzt werden
Beim Transport von Trennsagen soll die Trennscheibe abmontiert sein und gemaß den hier gegebenen Anweisungen verwahrt werden um Schaden zu vermeiden

Entretien des disques découpeurs

Il faut observer des precautions lors de la manutention et de la garde des disques découpeurs de sorte qu ils ne soient pas endommages
Immediatement après le deballage des disques decoupeurs il faut les examiner afin de s'assurer qu ils n ont pas eté endommages en cours de manutention transport etc
Les disques decoupeurs doivent être conserves horizontalement sur une surface plane et à bonne distance de toute source de chaleur elevée ou d'umidite Les disques ne doivent pas être soumis à l action d une humidite d air trop elevee à celle de l eau ou autres liquides ou bien encore à des temperatures situees au-dessous de zéro
Lors de transport de la decoupeuse le disque decoupeur doit être enleve et conserve selon les indications fournies afin qu'il ne soit pas endommage



Kapskiva

Partner-kapskivan ar specialtillverkad och godkánd for frihandskapning Pappetiketterna på vardera sidan av kapskivan ar till for att fordela trycket från flansbrickan och forhindra att skivan slirar

Cutter disc

PARTNER cutter disc is specially manufactured for free-hand cutting The cardboard labels on each side of the disc are intended for use as a spacer to distribute the pressure from the flange washer

Trennscheibe

Die PARTNER-Trennscheibe ist speziell zum Freihandsagen angefertigt und zugelassen Die zwei Pappscheiben auf jeder Seite der Trennscheibe sind angebracht um den Druck von der Flanschscheibe zu verteilen und zu verhindern daß, die Scheibe gleitet

Disque découpeur

Le disque découpeur Partner est spécialement fabriqué et agréé pour le découpage à la main Sur chaque côté du disque découpeur vous trouverez des étiquettes mince en papier pour que la pression des brides se répartisse sur toute la surface d'appui

K65

Skivan placeras mellan flansnavet (a) och flansbrickan (b) Flansbrickan vrids runt så att den passar in i flansnavet Kapskivan dras fast med hylsnyckel 381317, som ingår i verktygssatsen Axeln låses med pinne 202934, som skjutes in så långt som möjligt Skivan dras fast medurs

The disc is located between the flange hub (a) and the flange washer (b) Turn the flange washer round so that it fits into the flange hub The cutter disc should be tightened by using the fixed wrench 381317 that is included in the tool kit The spindle is secured by means of pin 202934 which is pushed in as far as possible The disc is tightened clockwise

Die Trennscheibe wird zwischen der Flanschnabe (a) und der Flanschscheibe (b) angebracht Die Flanschscheibe ist so zu drehen, daß sie in die Flanschnabe paßt Die Scheibe soll mit dem festen Schlussel 381317, der zum Werkzeugsatz gehort, angezogen werden Die Welle wird mit dem Stift 202934 verriegelt, der so weit wie moglich eingeschoben werden muß Die Scheibe wird im Uhrzeigersinn fest angezogen

Le disque est placé entre le moyeu de bride (a) et l'appui de bride (b) L'appui de bride est tourné de sorte qu'il s'adapte dans le moyeu de bride
Le disque découpeur est serré à l'aide de la clef à tube 381317 qui fait partie du jeu d'outils L'axe est bloqué à l'aide de la goupille 202934 qui est enfoncée aussi loin que possible Le disque est serré dans le sens des aiguilles d'une montre

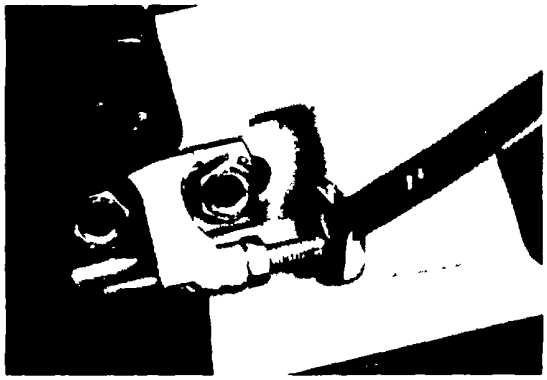
K1200

Skivan placeras mellan flansnavet (a) och flansbrickan (b) Flansbrickan vrids runt så att den passar in i flansnavet Kapskivan dras fast med hylsnyckel 381317, som ingår i verktygssatsen Håll emot axeln med tandstiftsnyckeln Skivan dras fast medurs men om kaparmen ar vand 180° drages den fast moturs (Se aven sidan 31)

The disc is located between the flange hub (a) and the flange washer (b) Turn the flange washer round so that it fits into the flange hub The cutter disc should be tightened by using the fixed wrench 381317 that is included in the tool kit Support the shaft with the spark plug wrench The disc is to be tightened clockwise but if the cutter arm is turned 180° it must be tightened in counter clockwise direction (See also page 31)

Die Trennscheibe wird zwischen der Flanschnabe (a) und der Flanschscheibe (b) angebracht Die Flanschscheibe ist so zu drehen, daß sie in die Flanschnabe paßt Die Scheibe soll mit dem festen Schlussel 381317, der zum Werkzeugsatz gehort, angezogen werden Stemmen Sie die Welle mit dem Zundkerzenschlussel Die Scheibe ist im Uhrzeigersinn zu ziehen, wenn aber der Trennarm 180° gedreht ist, ist er entgegengesetzt dem Uhrzeigersinn zu ziehen (Siehe auch Seite 31)

Le disque est placé entre le moyeu de bride (a) et l'appui de bride (b) L'appui de bride est tourné de sorte qu'il s'adapte dans le moyeu de bride
Le disque découpeur est serré à l'aide de la clef à tube 381317 qui fait partie du jeu d'outils Maintenir l'axe à l'aide de la clef à bougie Le disque est serré dans le sens des aiguilles d'une montre amis si le bras de disque est tourné de 180° le serrage doit être effectué dans le sens inverse à celui des aiguilles d'une montre (Voir également page 31)



Drivrem K65

Drivremmen ar helt inkapslad och val skyddad mot damm och smuts såval som mot åverkan vid kapning

Vid strackning av drivremmen lossas muttrarna, som håller kaparmen med verktyg 381306
Lossa ratten (17) som låser sprangskyddet och remskyddet Drag av remskyddet framåt så remmen blir frilagd Lossa låsmuttern på spannskruven och justera ut skruven med nyckel 381158 Drivremmen skall vara så hårt spand att den knappt kan tryckas ned mot botten i kaparmen med normal tumkraft (Det skall kravas en kraft av 4 kp att trycka ned remmen 5 mm)
Drag åt låsmuttern och darefter de båda muttrarna, som håller kaparmen
Skjut på remskyddet och drag åt ratten

Vee-belt K65

The belt is completely enclosed and well protected from dust and dirt as well as from mechanical damage during cutting work
To stretch the vee-belt, loosen the nuts retaining the cutter arm Use tool 381306
Loosen the knob (17) securing the safety casing and the belt protector Pull off the belt protector forward to expose the belt Loosen the locknut on the tensioning screw and adjust the screw using wrench 381158 The vee-belt must be tensioned so much that it cannot quite be pushed down against the bottom of the cutter arm with normal thumb force (A force of 4 kgf=8 8 lbf should be needed to press down the drive belt 5 mm= 0 2")
Tighten the lock nut and then the two nuts retaining the cutter arm Slide on the belt protector and tighten the knob

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Antriebsriemen K65

Der Antriebsriemen ist völlig eingekapselt und wird gut gegen Staub und Schmutz, sowie gegen mechanische Beschadigung bei Schneid- und Trennarbeiten geschutzt
Zum Spannen des Antriebsriemens mit dem Werkzeug 381306 die Muttern losen, mit denen der Trennarm befestigt ist
Den Drehgriff (17) losen, der den Sprengschutz und den Riemenschutz fixiert Den Riemenschutz nach vorn abziehen, so daß der Riemen frei liegt Die Sicherungsmutter an der Spannschraube losen und die Schraube mit dem Schlussel 381158 verstellen Der Antriebsriemen soll so hart gespannt sein, daß er mit normaler Daumenkraft kaum nach unten gegen den Trennarm eingedruckt werden kann (Um den Riemen 5 mm einzudrucken, soll eine Kraft von 4 kp erforderlich sein)
Die Sicherungsmutter und anschließend die beiden Muttern, die den Trennarm halten anziehen Den Riemenschutz aufschieben und den Drehgriff anziehen

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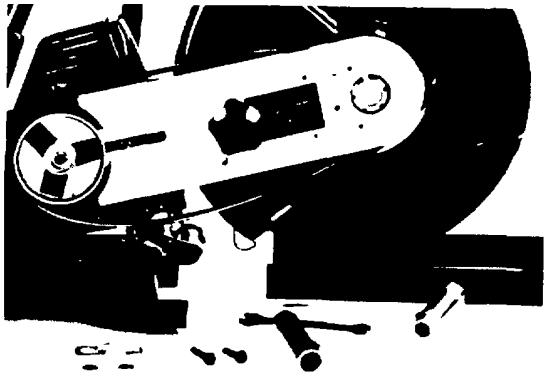
Courroie d'entraînement K65

La courroie d'entraînement est entièrement incorporée et bien protégée contre la poussière et contre tout dommage pouvant survenir pendant le sciage
Lors de tension de la courroie d'entraînement, dévisser les écrous qui maintiennent le bras découpeur à l'aide de l'outil 381306
Enlever le volant (17) qui bloque le capot protecteur et la protection de courroie Enlever la protection de courroie vers l'avant de sorte que la courroie soit dégagée Enlever l'écrou de blocage de la vis de tension et ajuster la vis à l'aide de la clé 381158 La courroie d'entraînement doit être tendue au point que l'on ne puisse à peine l'enfoncer dans le fond du bras découpeur à l'aide du pouce (Il faut une force d'environ 4 kp pour enfoncer la courroie de 5 mm)
Serrer l'écrou de blocage et ensuite les deux écrous qui maintiennent le bras de découpeur Pousser le capot protecteur et serrer le volant



Byte av drivrem K65

Vid byte av drivrem demonteras kopplingskåpan Tre skruvar håller kåpan, varav en ar inskruvad uppifrån (bakom handtagskonsolen) Skruven for remspanningen skruvas tillbaka helt
Remmen laggs ned vid sidan om remskivan på kaparmen och i spåret på skivan, som sitter på motoraxeln Då remmen ligger i ratt lage fores den på remskivan på kaparmen
Ny drivrem skall efterspannas då en eller två bransletankar korts och darefter en gång i veckan
Observera att ratten, som låser sprangskyddet, inte drages åt innan remskyddet skjutits på vid återmonteringen

Replacing the vee-belt K65

To replace the vee-belt, remove the clutch casing Three screws hold this casing in position, one of which is inserted from the top (behind the handle bracket) Unscrew the belt tensioning screw completely
Lay the belt beside the pulley on the cutter arm and in the slot of the pulley fitted to the engine shaft When the belt is in its correct position, fit it in the cutter arm pulley slot
A new vee-belt must be re-tightened now and them, preferably after two full tanks of fuel have been used up and then every week
Note that the knob securing the safety casing is not tightened until the belt protector has been slid into position during re-assembly

Austausch des Antriebsriemens K65

Zum Austausch des Antriebsriemens muß das Kupplungsgehause ausgebaut werden Dieses ist mit drei Schrauben befestigt, von denen eine von oben eingeschraubt ist (hinter der Handgriffkonsole) Die Schraube fur die Riemenspannung muß ganz zuruckgeschraubt werden
Den Riemen neben der Riemenscheibe auf den Trennarm und in die Nut an der Scheibe legen, die auf der Motorwelle sitzt Nun kann der Riemen auf die Riemenscheibe am Trennarm gefuhrt werden
Ein neuer Antriebsriemen muß nach etwa zwei Tankfullungen und anschließend einmal pro Woche nachgespannt werden
Der Drehgriff, der den Sprengschutz fixiert, darf erst angezogen werden, wenn der Riemenschutz beim Wiedereinbau aufgeschoben ist

Remplacement de la courroie K65

Lors du remplacement de la courroie d'entraînement, le couvercle d'accouplement doit être démonté Trois vis maintiennent le couvercle dont une est vissée à la partie supérieure (derrière le support de poignée)
La vis de tension de courroie est dévissée entièrement
La courroie est placée le long de la poulie sur le bras découpeur et dans la gorge, sur le disque qui se trouve sur l'axe moteur Lorsque la courroie est en position correcte, elle est placée sur la poulie du bras découpeur
Une nouvelle courroie doit être tendue lorsque deux réservoirs de carburant ont été utilisés ou bien une fois par semaine
Il faut observer que le volant qui bloque le capot protecteur ne doit pas être serré avant que la protection de courroie a été remise en place lors du rémontage

Drivrem K1200

Vid strackning av drivremmen lossas skruven som haller kaparmen genom att vrida medurs med hylsnyckeln som ingar i verktygssatsen och dra runt kapskivan nagra varv for hand Nar skruven lossats nagot stracks drivremmen genom den automatiska remspannaren

Vee-belt K1200

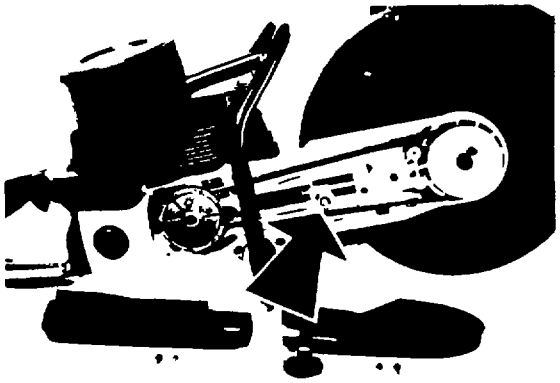
To stretch the belt loosen the screw retaining the cutting arm by turning clockwise using the socket wrench included in the tool set and rotate the cutter disc a few turns by hand When the screw has loosened slightly stretch the belt by using the automatic belt tensioner

Antriebsriemen K1200

Zum Spannen des Antriebsriemens die Schraube durch die der Trennarm gehalten wird mit dem im Werkzeugsatz enthaltenen Schraubenschlussel im Uhrzeigersinn losen Gleichzeitig die Trennscheibe einige Umdrehungen mit der Hand drehen Wenn die Schraube etwas gelost ist wird der Riemen durch den automatischen Riemenspanner gespannt

Courroie d'entraînement K1200

Lors de tension de la courroie déviser la vis qui maintient le bras de decoupage en tournant dans le sens des aiguilles d'une montre a l aide de la clef à douille qui fait partie du jeu d outils et faire tourner le disque découpeur de quelques tours à la main
Lorsque la vis est déserrée quelque peu la courroie est tendue par l intermediaire du tendeur automatique de courroie



Byte av drivrem K1200

Vid byte av drivremmen demonteras de bada kaporna pà kaparmen Lossa skruven (vid pilen) som haller kaparmen

Replacing the vee-belt K1200

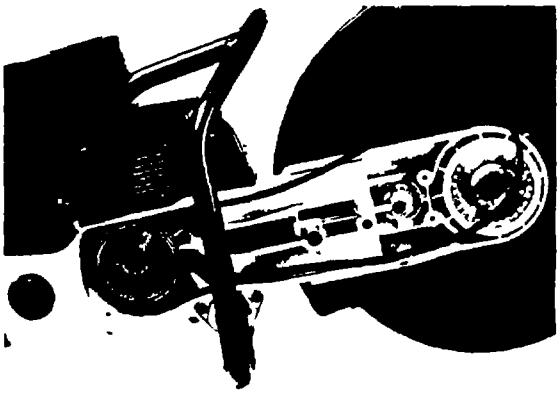
To replace the belt remove both the casings on the cutting arm Loosen the screw (at the arrow) holding the cutting arm

Austausch des Antriebsriemens K1200

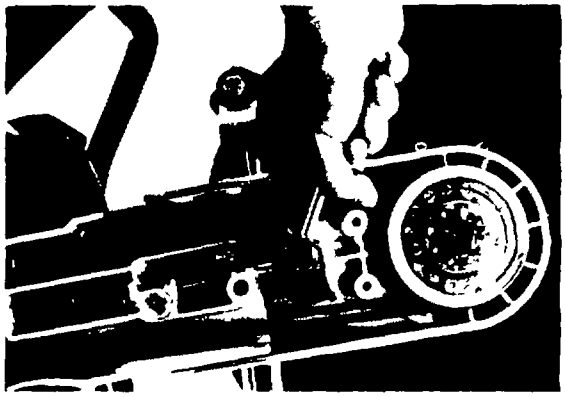
Bei einem Austausch des Antriebsriemens sind die beiden Gehause am Trennarm abzunehmen Die Schraube (am Pfeil) die den Trennarm halt losen

Remplacement de la courroie K1200

Lors du remplacement de la courroie il faut démonter les deux couvercles qui se trouvent sur le bras de decoupage Deviser la vis (à la fléche) qui maintient le bras decoupage



Vrid excentern moturs med tandstiftsnyckeln så att fjaderbelastningen slapps Darefter kan kaparmen tryckas tillbaka så att drivremmen kan tagas av



Remspannaren består av en kraftig fjader, som spanns genom att excentern på bilden vrids medurs så långt det går Drivremmen spanns då av fjaderkraften exakt så mycket som erfordras
När remmen är ny, skall den spannas efter 1 – 2 tankars körning Spänningen kontrolleras därefter dagligen

Turn the eccentric counter-clockwise by using the spark plug wrench so that the tension on the spring is released The cutting arm can then be pressed back and the belt removed

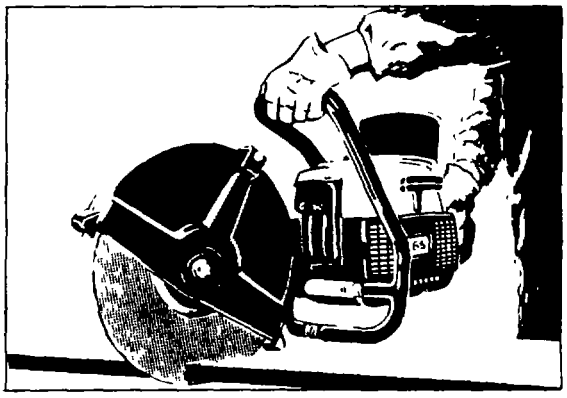
The belt tensioner consists of a powerful spring tensioned by turning the eccentric (fig) clockwise as much as possible The belt will then be tensioned by the spring power exactly as much as necessary
A new belt should be tensioned after 1 – 2 refillings of the fuel tank Thereafter check the tension daily

Den Exzenter mit dem Zündkerzenschlüssel entgegen dem Uhrzeigerzinn drehen, so daß die Federbelastung nachläßt Danach den Trennarm zurückdrücken und den Antriebsriemen abnehmen

Der Riemenspanner besteht aus einer kraftigen Feder, die mit Hilfe eines Exzenters gespannt ist Der Exzenter soll im Uhrzeigersinn soweit wie möglich gedreht werden Der Antriebsriemen wird da durch die Federkraft genau soviel wie erforderlich gespannt
Neuer Antriebsriemen soll nach 1 – 2 Einfüllungen des Kraftstofftanks gespannt werden Danach die Spannung täglich kontrollieren

Tourner l'excentrique à l'aide de la clef à bougie dans le sens inverse à celui des aiguilles d'une montre pour que le ressort n excerce plus de tension Après quoi le bras de decoupage peut être presse pour que la courroie d'entraînement puisse être enlevee

Le tendeur de courroie est constitué par un puissant ressort comprimé à l'aide d'un excentrique L'excentrique (fig) doit être tourné dans le sens des aiguilles d'une montre A ce moment le courroie est suffisamment tendu par la force du ressort
Une nouvelle courroie doit être tendue après 1 – 2 remplissages de carburant – d'après chaque jour



Sprängskydd

Sprangskyddet skall stallas in så att bakre delen ligger nara arbetsstycket Slippartiklar och gnistor samlas då upp av skyddet och avleds från foraren Med hjalp av ratten (nr 17 sidan 4) lossas skyddet och kan stallas in i onskat lage

Guard

The guard should be adjusted so that its rear section is close to the workpiece Particles dust or sparks from cutting are then collected by the guard and directed away from the operator By using the knob (no 17 page 4) the guard can be loosened and adjusted to the desired position

Splitterschutz

Der Schutz muß so eingestellt werden, daß das untere Teil des Schutzes in nachster Nahe des Werkstuckes liegt und somit den Funkenstrahl auffangt, um ihn vom Bediener abzuleiten Durch Drehen des Knopfes (Nr 17 Seite 4) wird der Schutz gelost und kann in die gewunschte Lage eingestellt werden

Protecteur

Le protecteur doit être placé de sorte que sa partie arrière se trouve près de la machine Les particules de decoupage et les étincelles s'y rassemblent alors pour être évacuées tout en protégeant l utilisateur A l'aide du volant (17 page 4) le protecteur est déserré pour être reglé dans la position désirée

Bränsletank

God renlighet skall iakttagas vid branslepafyllningen Detta minskar risken for driftsstopp orsakade av att bransletankens filter blivit igensatt Filterpatronen kan inte rengoras utan maste bytas ut, om den ar igensatt Filterpatronen bor dock bytas minst en gang per ar

Fuel tank

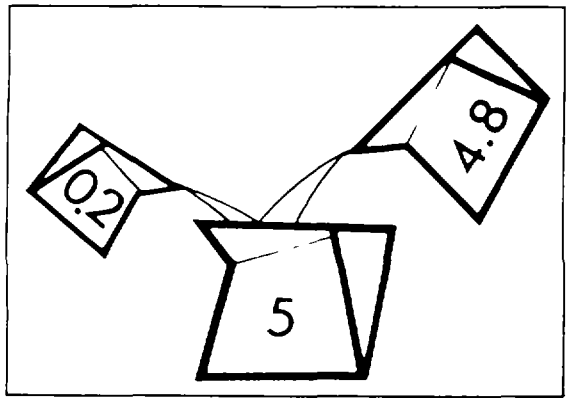
The fuel tank must be protected from impurities when filling up with fuel This decreases the risk of running interruptions caused by blockage of the fuel tank filter The filter cartridge cannot be cleaned but must be replaced if it becomes blocked This replacement should be done once a year

Kraftstofftank

Der Kraftstofftank muß vor Verunreinigungen beim Tanken geschutzt werden Dadurch werden auch Betriebsstorungen aufgrund eines verstopften Kraftstoffilters im Tank vermieden Die Filterpatrone kann nicht gereinigt werden falls sie verstopft ist Ein derartiger Austausch ist in der Regel einmal pro Jahr erforderlich

Reservoir de carburant

Une grande propreté doit être observee lors du remplissage de carburant et cela afin de reduire les risques d arrêt pouvant être occasionnes par un filtre à carburant colmate L elément filtrant ne peut être nettoye et doit donc être remplace lorsqu il est colmate Ce remplacement doit être effectue normalement une fois par an



Bränsleblandning

Endast oljeblandad bensin får anvandas

Bensin

1 Anvand regular-bensin Premiumbensin ar ej nodvandig

Olja

1 For basta resultat anvand PARTNER-olja Blandningsforhållande 1 50 (2 %)
2 Om PARTNER-olja ej finns tillfanglig kan annan tvåtaktsolja av hog kvalitet anvandas Blandningsforhållande 1 25 (4 %)
3 Anvand aldrig Multigrade olja 10W-30 eller en olja avsedd for 4-taktsmotorer

Blanda alltid bensinen och oljan omsorgsfullt innan den påfylles bransletanken
Tanka aldrig maskinen med motorn igång!

Fuel mixture

The engine is lubricated by the oil in the fuel mixture

Petrol (gasoline)

1 Use "regular" petrol (gasoline) Premium grade is not necessary

Oil

1 For best performance use Partner-oil Mixture ration 1 50 02 %)
2 If no Partner oil is available, other two-stroke oil of good quality can be used Mixture ratio 1 25 (4 %)
3 Never use multi-grade oil (10W-30) or any oils formulated for 4-cycles engines

The petrol (gasoline) and the oil must be thoroughly mixed before being put into the fuel tank **Always shut the engine off before filling the tank.**

Kraftstoffgemisch

Es darf nur ein Öl/Benzingemisch verwendet werden

Benzin

1 Normalbenzin verwenden, da Super-Kraftstoff nicht erforderlich ist

Öl

1 Wir empfehlen Partner-Öl Mischungsverhaltnis 1 50 (2 %)
2 Falls kein Partner-Öl zur Verfugung steht, darf auch ein anderes Zweitaktol von hoher Qualitat verwendet werden Das Mischungsverhaltnis betragt 1 25 (4 %)
3 Niemals Mehrbereichsol (10W-30) oder Öl fur Viertaktmotoren verwenden

Vor dem Einfullen mussen Benzin und Öl sorgfaltig miteinander vermischt werden **Zum Tanken stets den Motor abstellen.**

Mélange de carburant

Seule de l'essence mélangée à de l'huile doit être employée!

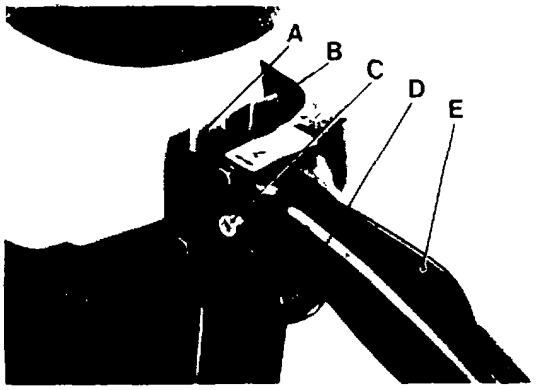
Essence

1 Employer de l'essence dite "regular" De l'essence dite "premium" n'est pas necessaire

Huile

1 Afin d'obtenir le meilleur rendement possible, il faut employer de l'huile Partner Le rapport de mélange est de 1 50 (2 %)
2 S'il ne se trouve pas d'huile Partner disponible, on peut utiliser une autre huile de haute qualité pour moteurs à deux temps Le rapport de mélange est de 1 25 (4 %)
3 Il ne faut jamais employer de l'huile dite "multigrade" (10 W-30) ou une huile destinée à des moteurs à 4 temps

L'essence et l'huile doivent être minutieusement mélangées avant que le remplissage soit effectué **Le moteur doit toujours être arreté lorsqu'on effectue le remplissage.**



Reglage

A **Stoppknapp.** Nar knappen trycks bakåt, stoppas motorn Knappen stannar i detta lage och måste återforas fore nasta start

B **Chokeknapp.** Kall motor startas med stangd choke (knappen tryckt bakåt) Varm motor startas i regel utan choke

C **Startgasspärr.** Tryck in gasreglaget och darefter startgassparren Slapp ut gasreglaget och gasen ar sparrad i halvgaslage Sparren frigors, nar gasreglaget trycks in helt

D **Gasreglage.** Med gasreglaget regleras motorns varvtal o kapskivans hastighet

E **Tomgångsspärr.** Sparren hindrar ofrivilligt gaspådrag, nar motorn går på tomgång Vid arbete med maskinen, frigors sparren av handen, som man håller på bakre handtaget

Controls

A **Stop control.** When the button is pressed backwards, the engine stops The button remains in this position and must be returned to its initial position before the engine is started the next time

B **Choke button.** A cold engine is to be started with the choke flap closed (the button pressed backwards) A warm engine is as a rule to be started without choke

C **Starter throttle catch.** Press in the throttle control and thereafter the starter throttle catch Release the throttle control and the throttle is blocked in half throttle position The catch is released when the throttle control is pressed in all the way

D **Throttle control.** The throttle control is used to regulate engine speed and the speed of the cutter disc

E **Idling catch.** This catch will prevent the throttle from opening accidentally when the engine is at idling speed When working with the machine the catch is released by the hand holding the rear handle

Regler

A **Abstellknopf.** Der Knopf ist herauszudrucken, wenn der Motor abgestellt werden soll Der Knopf bleibt in dieser Lage und muß vor dem nachsten Anwerfen zuruckgefuhrt werden

B **Choke.** Wenn der Motor beim Anlassen kalt ist, muß der Choke geschlossen sein (der Knopf wird nach hinten gedruckt) Wenn der Motor warm ist, ist eine Chokebetatigung in der Regel nicht erforderlich

C **Anwerfgassperre.** Gashebel und danach Anwerfgassperre eindrucken Wenn man den Gashebel loslaßt, ist die Gaszufuhr in Halbgaslage gesperrt Zum Losen der Sperre muß der Gashebel ganz eingedruckt werden

D **Gashebel.** Mit dem Gashebel konnen die Drehzahl des Motors und die Geschwindigkeit der Kette reguliert werden

E **Leerlaufsperre.** Die Sperre verhindert unfreiwilliges Gasgeben, wenn der Motor im Leerlauf lauft Bei Arbeiten mit der Sage wird die Sperre mit der Hand gelost, die den hinteren Handgriff halt

Réglage

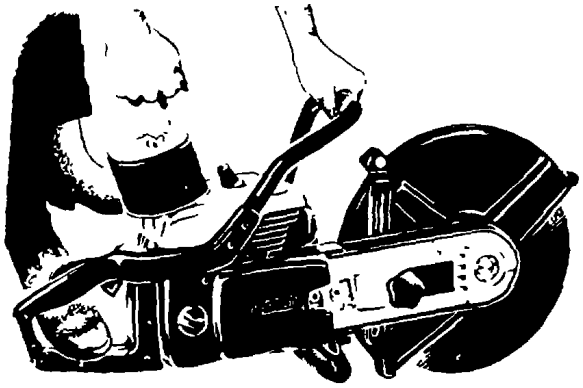
A **Bouton d'arrêt.** Lorsque le bouton est enfoncé vers l'arrière, le moteur s'arrête Le bouton reste dans cette position et doit être remis en place pour que le prochain démarrage puisse être effectué

B **Bouton de starter.** Un moteur froid est mis en route avec un starter fermé (le bouton est enfoncé vers l'arrière) Un moteur chaud est généralement mis en route sans starter

C **Blocage de démarrage.** Enfoncer la commande d'accélération et ensuite le blocage de démarrage Lâcher la commande d'accélération et l'accélération est bloquée en position de semi-accélération Le blocage est dégagé quand la commande d'accélération est entièrement enfoncée

D **Commande d'accélération.** La commande d'accélération règle le régime du moteur et la vitesse du disque découpeur

E **Blocage de ralenti.** Ce blocage empêche toute accélération involontaire lorsque le moteur tourne au ralenti Lors de travaux avec la machine, le blocage est libéré à l'aide de la main qui maintient la poignée arrière

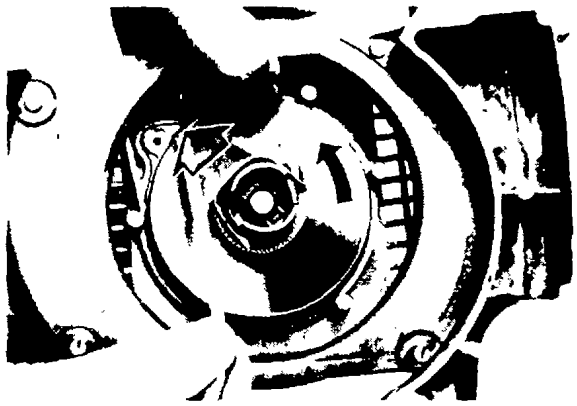


Ratt startstallning och start av maskinen
Reglagen skall vara installda for start Då maskinen startar borjar kapskivan att rotera Det ar darfor viktigt att stå stadigt samt att se till att kapskivan kan rotera fritt Drag ut startlinan med ett ryck tills dess att motorn startar

Correct starting position and starting of the machine
Due to the setting of the throttle, the disc will start to rotate as soon as the engine fires so be sure that you and the machine are firmly positioned when starting Pull the starter cord out smartly a few times until the engine starts

Vorschriftsmaßige Anwerfstellung und Anwerfen der Maschine
Zum Anwerfen der Sage mussen alle Regler entsprechend eingestellt sein Außerdem ist es wichtig, daß Sie stabil und sicher stehen Das Anwerfseil mit einem kraftigen Ruck ein paarmal herausziehen, bis der Motor angesprungen ist

Position correcte de démarrage et démarrage de la machine:
Lorsque les commandes sont en place pour le démarrage il est important de se tenir d'une façon bien stable lorsque le moteur doit être mis en route car le disque va se mettre à tourner en raison de la position de la commande de démarrage Tirer le cordon de démarrage d'un ou de plusieurs coups secs jusqu'à ce que le moteur démarre



Startapparat

Byte av startlina
Lossa flaktkåpan Drag ut startlinan en bit och hindra linskivan från att snurra tillbaka Lagg startlinan i urtaget och låt linskivan snurra tillbaka

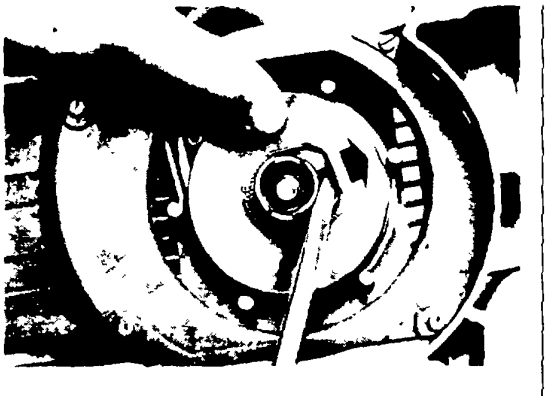
Starter unit
Replacing the starter cord
Loosen the fan casing Pull out the starter cord a little and prevent the cord drum from rotating back Place the starter cord in the recess and let the cord drum rotate back.

Anwerfvorrichtung

Anwerfseil auswechseln
Das Geblasegehause losen Das Anwerfseil ein Stuck herausziehen und darauf achten, daß die Seilscheibe nicht zuruckspringt Das Anwerfseil in die Aussparung der Seilscheibe legen und die Seilscheibe zuruckspulen lassen

Appareil de démarrage

Remplacement du cordon de démarrage
Enlever le capot de ventilateur Sortir quelque peu le cordon de démarrage et empêcher le tambour d'enroulement de se renbobiner Placer le cordon de démarrage dans l'encoche et laisser le tambour d'enroulement se renbobiner

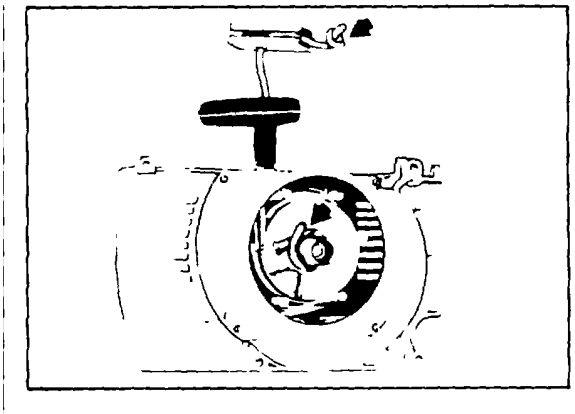


Lossa låsfjadern och lyft upp linskivan For den nya startlinan genom hålet i linskivan och vidare genom flaktkåpan till starthandtaget, dar linan stoppas med en knut

Loosen the lock spring and lift up the cord drum Pull the new starter cord through the hole in the cord drum and further through the fan casing to the starter handle, where the cord is secured by a knot

Die Sicherungsfeder losen und die Seilscheibe hochheben Das neue Anwerfseil durch das Loch in der Seilscheibe und durch das Geblasegehause zum Anwerfgriff fuhren und dort mit einem Knoten befestigen

Dégager le ressort de blocage et enlever le tambour d'enroulement Passer le nouveau cordon de démarrage dans le trou du tambour d'enroulement et ensuite dans le capot de ventilateur jusqu'à la poignée où le cordon est arrêté en y faisant un nœud

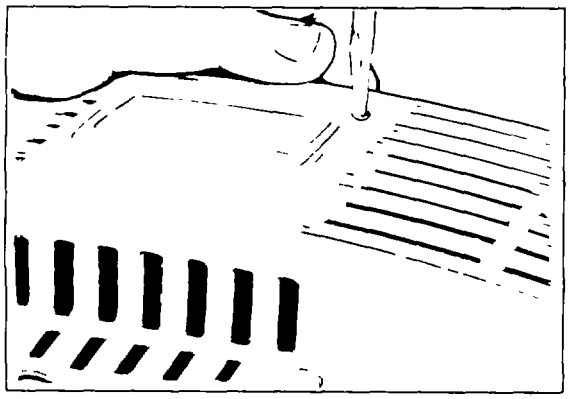


Gor fast andra anden vid linskivan Lagg på några varv av linan och montera linskivan Spann startfjadern genom att med linan i urtaget vrida linskivan medurs ett eller två varv Dra i startlinan så att starten griper in i svanghjulet, innan flaktkåpan skruvas fast på maskinen

Attach the other end to the cord drum Take a few turns of the cord and fit the cord drum Tension the starter spring by giving the cord drum one or two turns clockwise. Pull the starter cord to make sure that the starter unit functions before screwing the fan casing into position

Das andere Ende an der Seilscheibe befestigen Das Seil einige Umdrehungen aufwickeln und die Seilscheibe montieren Die Anwerffeder durch Drehen der Seilscheibe im Uhrzeigersinn (eine oder zwei Umdrehungen) mit dem Seil in der Aussparung spannen Durch Herausziehen des Anwerfseiles kontrollieren, ob die Anwerfvorrichtung ordnungsgemaß funktioniert Danach kann das Geblasegehause an der Trennsage angeschraubt werden

Arrêter l'autre extrémité au tambour d'enroulement Enrouler le cordon de quelques tours et monter le tambour d'enroulement Tendre le cordon de démarrage en tournant le tambour d'enroulement d'un ou deux tours dans le sens des aiguilles d'une montre, le cordon étant dans l'enchoche Tirer le cordon de démarrage de sorte à obtenir une bonne prise au volant avant que le capot de ventilateur soit revissé sur la découpeuse

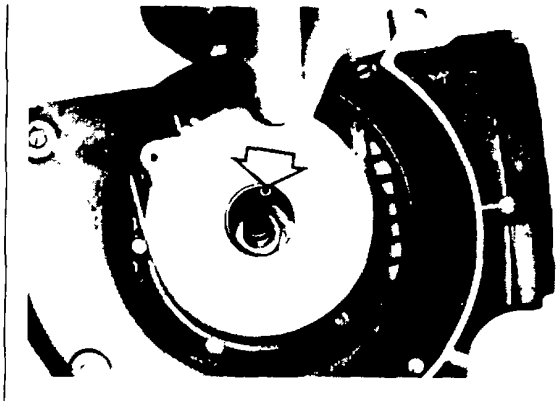


Byte av startfjader
Demontera linskivan på samma satt som beskrives ovan Lossa darefter spårskruven, som håller fast fjaderkassetten vid flaktkåpan

Replacing the starter spring
Follow the same procedure as described above for replacement of the starter cord. Then loosen the screw holding the spring cassette to the fan casing.

Anwerffeder auswechseln
Die Seilscheibe, wie oben beschrieben, ausbauen Danach die Schlitzschraube losen, mit der die Federkassette am Gebläsegehause befestigt ist

Remplacement du ressort de démarrage
Démonter le tambour d'enroulement de la même façon que celle qui est décrite ci-dessus Enlever ensuite la vis qui maintient la cassette de ressort au capot de ventilateur

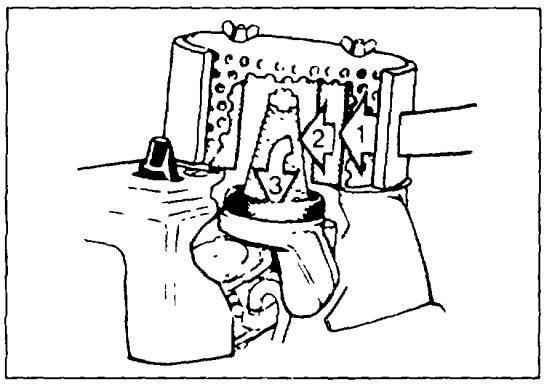


Passa in oglan på fjadern i linskivan fore montering Startanordningens funktion sakerstalls om startfjadern, linskivans bussning och starthakarna rengors och smorjs med siliconolja eller liknande minst en gång i månaden

Place the eyelet of the spring into the cord before the fitting In order to guarantee dependable functioning of the starter unit, the cord drum bushing and the starting hooks should be lubricated with silicon oil or similar lubricant at least once a month.

Vor Einbau die Öse der Feder in die Seilscheibe einpassen Die Anwerfvorrichtung funktioniert sicherer, wenn die beweglichen Teile, wie die Buchse der Seilscheibe sowie die Anwerfhaken, mindestens einmal im Monat mit etwas Silikonol versehen werden

Faire passer l'œillet du ressort dans le tambour d'enroulement avant le montage Le fonctionnement du système de démarrage est assuré si le ressort de démarrage, l'axe de tambour d'enroulement et les taquets de démarrage sont bien nettoyés et huilés à l'aide d'huile silicone ou similaire au moins une fois par mois



Luftfilter K65

Filtersystemet består av forfilter (1), huvudfilter (2) och spillfilter (3) Spillfiltret skall endast bytas på behörig verkstad
Forfiltret kan bytas utan verktyg och är lätt att göra rent Det skyddar huvudfiltret från att sätta igen sig alltför snabbt

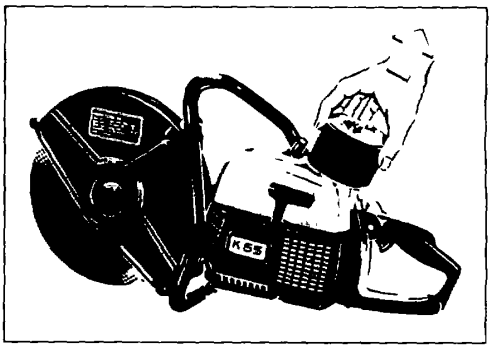
Air filter K65
The air filter systems consists of a pre-filter(1) a main filter (2) and a spill filter (3) The spill filter may only be replaced by an authorized workshop.
The pre-filter can be changed without using any tools and is easy to clean It protects the main filter from becoming blocked too quickly.

Luftfilter K65

Das Filtersystem besteht aus Vorfilter (1), Hauptfilter (2) und Leckfilter (3) Das Leckfilter sollte nur in einer Vertragswerkstatt ausgewechselt werden
Das Vorfilter kann ohne Werkzeug ausgewechselt werden und läßt sich leicht reinigen Es schutzt das Hauptfilter vor zu schneller Verstopfung

Filtre à air K65

Le système de filtrage se compose d'un préfiltre (1), d'un filtre principal (2) et d'un filtre de trop-plein (3) Le filtre de trop-plein ne doit être remplacé que dans un atelier autorisé
Le préfiltre peut être remplacé sans outils Il est facile à nettoyer Il empêche le filtre principal de se colmater trop rapidement

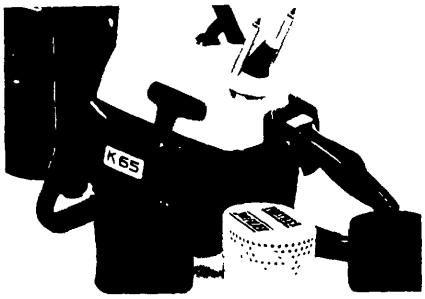


Forfiltret skall dragas av och skakas rent vid varje tankning Det bör bytas ut eller tvättas ordentligt efter ca 25 körtimmar i stålmaterial och efter ca 10 timmars körning i betong eller liknande material som framkallar kraftig dammbildning
Huvudfiltret demonteras genom att lossa muttrarna och lyfta av filterhuset Filtret är tvättbart Byt filter efter fem tvättningar

The pre-filter must be pulled off and shaken ocean in connection with every tanking operation The prefilter should be replaced thoroughly washed after every 25 hours of operation in steel material or after every ten hours of operation in concrete or similar material which gives rise to intensive dust The main filter is removed by loosening the nuts and lifting off the filter housing. The filter can be washed It is to be replaced by a new unit after it has been washed five times.

Bei jedem Tanken sollte das Vorfilter abgezogen und saubergeschuttelt werden Das Vorfilter ist nach ca 25 Betriebsstunden in Stahlmaterial und nach ca 10 Betriebsstunden in Beton oder ahnlichem Material, das kraftige Staubbildung verursacht, auszuwechseln oder grundlich zu waschen
Zum Ausbau des Hauptfilters die Muttern losen und das Filtergehause abheben Das Filter ist waschbar Nach 5 Waschen sollte das Filter jedoch ausgewechselt werden

Le préfiltre doit être enlevé et nettoyé lors de chaque remplissage Le préfiltre doit être remplacé ou complètement nettoyé après environ 25 heures de travail effectuées sur du métal ou après environ 10 heures lors de travail effectué sur du béton ou autre matière qui donne lieu à un fort dégagement de poussières
On demonte le filtre principal en devissant les écrous et en soulevant le boitier de filtre
Le filtre est lavable Il doit être remplacé par un filtre neuf après cinq lavages

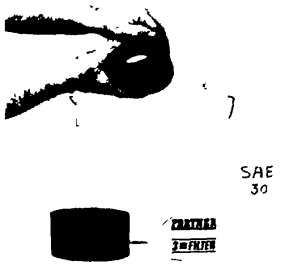


Vid varje tillfalle huvudfiltret tages ur från filterhuset skall filterhuset torkas rent Byte till nytt eller tvattat och återinoljat filter skall goras med samma tidsintervaller som angivits ovan eller vid behov Om forfiltret ej skotes eller anvandes reduceras namnda tider kraftigt
Spillfiltret bytes endast vid verkstadsbesok Filtret skall forhindra att damm och smuts faller ned i forgasaren, då ovriga filter demonteras

Each time the main filter is taken out of the filter housing, this housing is to be cleaned . The fitting of a new or washed and re-oiled filter is to be carried out at the same time intervals as those stated above or when required. If the pre-filter is not properly looked after or not used at all the times mentioned are reduced to a great extent.
The spill filter may only be changed by an authorized workshop The function of this filter IS to prevent dust and dirt from falling down into the carburetor when the other filters are removed.

Jedesmal, wenn das Hauptfilter aus dem Filtergehause genommen wird, muß das Filtergehause abgetrocknet werden Fur den Filterwechsel oder die Filterwasche und -einolung gelten die gleichen Zeitintervalle wie oben oder bei Bedarf Wenn das Vorfilter nicht gewartet oder verwendet wird verkurzen sich die Intervalle fur den Hauptfilterwechsel erheblich
Das Leckfilter ist nur bei Werkstattbesuchen auszutauschen Es soll verhindern daß Staub und Schmutz in den Vergaser fallen, wenn ubrige Filter ausgebaut werden

Chaque fois que le filtre principal est sorti du carter de filtre, le carter de filtre doit être nettoye et séche Les remplacements ou lavages et huilage de filtre doivent être faits aux mêmes intervalles mentionnés ci-dessus ou bien encore au besoin Si le préfiltre n est pas entretenu ou employé les temps doivent être fortement réduits
Le filtre de trop-plein d'est remplacé que lors de visite en atelier Ce filtre empêche les impuretes de tomber dans le carburateur lorsque les autres filtres sont demontés

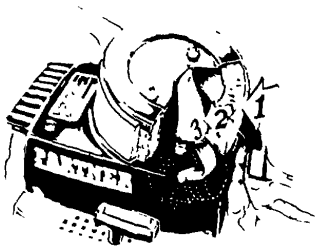


Huvudfiltret rengores i fotogen eller bensin Doppa filtret upprepade gånger och krama ur det hart efter varje gång Då filtret ar val rengjort skall det oljas in Fyll ett karl med SAE 30 olja och doppa ned filtret helt och krama ur det några gånger Tag darefter upp filtret och krama ur overflodig olja Ett filter skall ej tvattas mer an 5 gånger
Obs! Felaktig skotsel eller vårdslos tvattning av filtret kan resultera i motorhaveri.

Cleaning of the main filter can be done in either paraffin or petrol Dip the filter in the fluid repeatedly and squeeze it out hard after each dip. When all the impurities have been removed from the filter, it must be oiled as follows Fill a vessel with SAE30 oil, dip the filter completely in the oil and squeeze it out a few times. Then lift up the filter and squeeze out any superfluous oil. Never wash the same filter more than five time.
Poor servicing or careless washing of the filter can result in an engine breakdown.

Reinigung des Hauptfilters kann in Petroleum oder Benzin ausgefuhrt werden Das Filter mehrere Male eintauchen und es nach jedem Mal hart auswringen Wenn das Filter grundlich gereinigt ist, muß es eingeolt werden Ein Gefaß mit SAE 30-Ol fullen, das Filter ganz in das Ol eintauchen und mehrere Male auswringen Danach das Filter herausnehmen und von uberflussigem Ol befreien Ein Hauptfilter darf nicht mehr als 5 Mal gewaschen werden
WICHTIG! Falsche Pflege oder mangelhafte Wasche des Filters kann zu ernsthaften Motorschaden fuhren!

Nettoyage du filtre principal peut être effectue au pétrole ou à l'essence Le filtre est plongé plusieurs fois dans un tel bain pour être ensuite presse afin de faire sortir les impurités Lorsque le filtre est bien propre, il faut l'huiler comme suit Remplir un récipient d'huile SAE30 et plonger entièrement le filtre pour ensuite le presser plusieurs fois Le filtre doit ensuite être sorti du bain et l'huile superflue doit être évacuée Un filtre ne doit pas être lavé plus de 5 fois
Remarque· Un mauvais entretien du filtre ou un lavage défectueux peut donner lieu à de graves perturbations dans le moteur



K1200

Luftfilter K1200

Filtersystemet består av forfilter (1) huvudfilter (2) och spillfilter (3) Spillfiltret skall endast bytas på behorig verkstad
Forfiltret kan bytas utan verktyg och ar latt att gora rent Det skyddar huvudfiltret från att satta igen sig alltfor snabbt

Air filter K1200
The air filter systems consists of a pre-filter (1) a main filter (2) and a spill filter (3) The spill filter may only be replaced by an authorized workshop The pre-filter can be changed without using any tools and is easy to clean It protects the main filter from becoming blocked too quickly.

Luftfilter K1200

Das Filtersystem besteht aus Vorfilter (1) Hauptfilter (2) und Leckfilter (3) Das Leckfilter sollte nur in einer Vertragswerkstatt ausgewechselt werden
Das Vorfilter kann ohne Werkzeug ausgewechselt werden und laßt sich leicht reinigen Es schutzt das Hauptfilter vor zu schneller Verstopfung

Filtre à air K1200

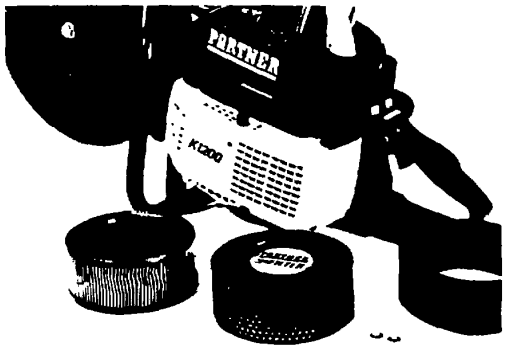
Le système de filtrage se compose d'un préfiltre (1) d'un filtre principal (2) et d'un filtre de trop-plein (3) Le filtre de trop-plein ne doit être remplacé que dans un atelier autorise
Le prefiltre peut être remplacé sans outils Il est facile à nettoyer Il empêche le filtre principal de se colmater trop rapidement

Forfiltret skall dragas av och skakas rent vid varje tankning Det skall tvattas ordentligt eller bytas efter ca 30 kortimmar i stalmaterial och efter ca 20 kortimmar i betong eller liknande material som framkallar kraftig dammbildning

The pre-filter must be pulled off and shaken clean in connection with every tankning operation. The pre-filter should be thoroughly washed or replaced after 30 hours of operation in steel material or after 20 hours of operation in concrete or similar material which gives rise to intensive dust

Bei jedem Tanken sollte das Vorfilter abgezogen und saubergeschuttelt werden Das Vorfilter ist nach ca 30 Betriebsstunden in Stahlmaterial und nach ca 20 Betriebsstunden in Beton oder ahnlichem Material das kraftige Staubbildung verursacht auszuwechsel oder grundlich zu washen

Le prefiltre doit être enlevé et il faut faire tomber les impuretés qui peuvent s y trouver en le secouant lors de chaque remplissage Il doit être lave minutieusement ou être remplacé après environ 30 heures d utilisation de la machine lors de decoupage dans le metal ou après environ 20 heures de marche lors de découpage dans le béton ou autres matieres similaires donnant lieu à un grand degagement de poussiere

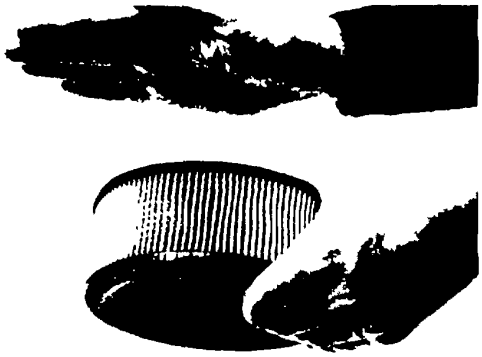


Huvudfiltret demonteras genom att lossa muttrarna, som håller filterhuset och lyfta av detta Huvudfiltret ar ett pappersfilter av speciell kvalitet, som inte får tvattas eller blåsas rent **Filtret far endast skakas rent.** Om man tvattar blåser eller rengor med verktyg skadas filtret och blir oanvandbart

Remove the main filter by loosening the nuts retaining the filter housing and lifting off the housing. The main filter is a paper unit of a special quality grade which must not be washed or blown clean. The filter may only be shaken clean. Washing, blowing clean or attempts to clean the filter by using tools damage it to such an extent that it is ruined.

Zum Ausbau des Hauptfilters die Muttern losen, mit denen das Filtergehause befestigt ist Anschließend das Filtergehause abheben Das Hauptfilter ist ein Papierfilter mit besonderer Qualitat, es darf weder gewaschen noch saubergeblasen werden **Nur Ausschutteln des Filters ist zulassig.** Wenn man das Filter wascht, sauberblast oder mit mit Werkzeugen reinigt, wird es beschadigt und damit unanwendbar

Le filtre principal est démonté en dévissant les écrous qui maintiennent le boîtier de filtre et en dégageant ce boîtier Le filtre principal est un filtre en papier de qualité spéciale qui ne doit pas être lavé et qu'il ne faut pas soumettre à l'air comprimé **Ce filtre ne peut être que secoué lors de nettoyage.** Si on le lave ou si on le soumet à l'action de l'air comprimé ou à celle d'un outil quelconque, cela l'endommage et il devient alors inemployable



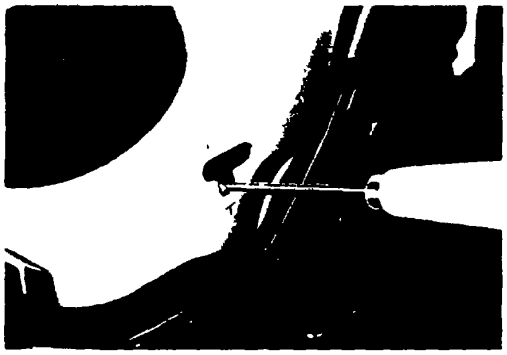
Vid kapning i stål bytes huvudfiltret efter 60 kortimmar och i betong efter 40 kortimmar Under svårare forhållanden kommer bytesintervallerna tatare
OBS! Felaktig skotsel eller forsummelse att byta forfilter och huvudfilter enligt angivna tidsintervaller kan resultera i motorhaveri.

When cutting steel, change the filter after bout 60 hours of operation and when cutting concrete after about 40 hours of operation More frequent changing should be carried out when working under more severe conditions

NOTE! Incorrect servicing or neglect to change the pre-filter and main filter at the specified intervals can result in engine break-down.

Bei Trenn- und Schneidarbeiten in Stahl muß das Hauptfilter nach ca 60 Betriebsstunden und in Beton nach ca 40 Betriebsstunden ausgewechselt werden Bei besonders schwierigen Arbeitsverhaltnissen mussen die Austauschintervalle kurzer sein
Zur Beachtung! **Fehlerhafte Wartung oder Nichtbeachtung der vorgeschriebenen Austauschintervalle für Vorfilter und Hauptfilter konnen zu ernsthaften Motorschaden führen.**

Lors de découpage de métal, le filtre principal doit être remplacé après environ 60 heures de marche et lors de découpage de béton après environ 40 heures de marche Lors de conditions d'emploi particulièrement difficiles de la découpeuse, les intervalles de remplacement doivent être plus courts
Remarque: Un mauvais entretien ou un oubli de remplacer le préfiltre et le filtre principal conformément aux intervalles mentionnés peut donner lieu à une destruction du moteur.



Förgasare

På fabriken grundinstalls forgasaren Detta innebar ca 3/4 varv oppet på både hogvarvsnålen (H) och lågvarvsnålen (L) Tomgångsskruven (t) skruvas in ca 1/2 varv efter beroring med gasarmen Efter varmkorning kan forgasaren finjusteras Lágvarvsskruven (L) stalls in så att motorn ej stannar på tomgáng Hogvarvsskruven (H) skruvas in så att motorn ej accelererar från tomgáng vid hastigt gaspádrag Darefter oppnas skruven 1/4 varv Forgasaren ar forsedd med en automatisk varvtalsbegransare, som forhindrar for hog periferihastighet pá kapskivan Vid fullgas och obelastad kapskiva hors tydliga variationer i motorvarvtalet Detta ar normalt och bara ett tecken pá att varvtalsregleringen fungerar
Tomgángsskruven (t) stalls in sá att motorn gár pá tomgáng utan att skivan roterar

Carburetor

When delivered from the factory the carburetor is basically set This means about 3/4 turns open on both the high-speed screw (H) and the low-speed screw (L) The idling screw (t) is to be screwed in 112 turns after contact with the throttle shaft lever After the saw has the been run warm the carburetor is ready for fine adjustment The low-speed screw (L) Is to be set so that the engine does not stop at idling speed. The high-speed screw (H) is to be set so that the engine runs well at full speed. Then open the screw 1/4 turns. The carburetor is fitted with an excess speed governor to prevent excessively high engine speed, which would result in the cutter disc turning too fast. At full speed and with unloaded disc you can hear clear variations of the engine speed. This is normal and only a sign of the fact that the speed governor is working. The idling screw (t) is set so that the engine runs at idling speed without the disc rotating.

Vergaser

Die Grundeinstellung des Vergasers wird im Werk vorgenommen Die Hochtourenschraube (H) und die Niedertourenschraube (L) sind je ca 3/4 Umdrehung geoffnet Die Leerlaufschraube ist ca 1/2 Umdrehung nach Beruhrung mit dem Gasarm einzuschrauben Wenn der Motor warmgelaufen ist kann der Vergaser nachgestellt werden Die Niedertourenschraube (L) ist so einzustellen, daß der Motor im Leerlauf nicht stehenbleibt Die Hochtourenschraube (H) ist so einzustellen, daß der Motor bei voller Gaszufuhr gut durchdreht Danach ist die Schraube 1/4 Umdrehung zu offnen Der Vergaser ist mit einem Uberdrehschutz versehen der zu hohe Motordrehzahlen verhindert die zu einer zu hohen Geschwindigkeit der Trennscheibe fuhren konnten Bei Vollgas und unbelasteter Trennscheibe sind deutliche Veranderungen der Drehzahl zu horen Dies ist normal und bedeutet nur, daß der Uberdrehschutz in Funktion tritt Die Leerlaufschraube (t) ist so einzustellen, daß der Motor im Leerlauf lauft ohne daß sich die Scheibe dreht

Carburateur

L'ajustage de base du carburateur est effectué en usine Cela signifie environ 3/4 de tour d'ouverture sur l'aiguille de haut régime (H) et l'aiguille de bas regime (L) La vis de ralenti (t) est vissée d'environ 1/2 tour après réglage du bras d'accélération Lorsque le moteur est chaud, le carburateur peut faire l'objet d'un ajustage d'appoint La vis de bas régime (L) est reglée de sorte que le moteur ne s'arrête pas lorsqu'il tourne au ralenti La vis de haut régime (H) est réglée afin que le moteur tourne de façon réguliière et lors de pleine accélération lorsque le moteur est en plein effort D'après la vis doit être devissee un quart de tour Le carburateur est equipé d'une protection d'emballement qui empêche un régime trop élevé du moteur ce qui pourrait occasionner une trop grande rotation du disque découpeur Quand le moteur est emballé et le disque est à nulle charge on peut entendre des variations distinctes du régime du moteur Cela est normal et montre seulement que le protection d'emballement entre en fonction La vis de ralenti (t) est ajustée de sorte que le moteur puisse tourner au ralenti sans que le disque tourne

Tändstift

Tandstiftet måste hållas i god kondition och ha ratt varmetal for att motorn skall fungera utan driftsstorningar Kontrollera och vid behov justera elektrodavståndet I regel bor man byta tandstift varannan månad

Demontering K65· Lyft av tandstiftsskyddet och lossa tandstiftet med hylsnyckeln, som ingår i verktygssatsen

Spark plug

If the engine shall work without running interruptions the spark plug must be kept in good condition and have the correct heat range. Check and if necessary adjust the electrode spark gap As a rule the spark plug should be changed every second month.

Removing the spark plug, K65: Lift off the spark plug protector and then loosen the spark plug by using the socket wrench in the tool kit.

Zündkerze

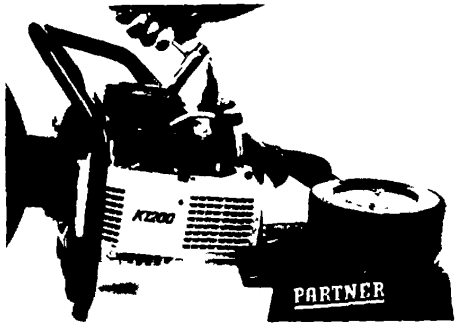
Damit die Zundkerze einwandfrei funktionieren kann, muß sie in gutem Zustand erhalten werden und den vorschriftsmassigen Warmewert haben Der Elektrodenabstand muß kontrolliert und eingestellt werden Meistens muß die Zundkerze alle zwei Monate ausgewechselt werden

Ausbau K65: Zundkerzenschutz abheben und Zundkerze mit dem im Werkzeugsatz enthaltenen Steckschlussel losen

Bougie

La bougie doit être maintenue en bonne condition et avoir le degré de chaleur requis pour que le moteur puisse fonctionner sans perturbations Contrôler et éventuellement ajuster l'écartement des électrodes En règle générale, il faut remplacer la bougie tous les deux mois

Démontage K65: Enlever la protection de bougie et démonter la bougie à l'aide de la clé à tube qui fait partie du jeu d'outils

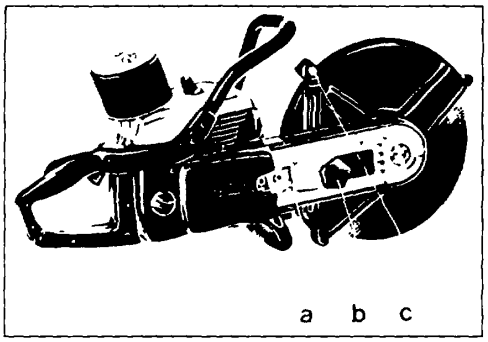


Demontering K1200: Lossa de tre skruvarna, som håller cylinderkåpan Lyft darefter av cylinderkåpan tillsammans med luftfiltret Lossa tandstiftet med hylsnyckeln, som ingår i verktygssatsen

Removing the spark plug, K1200: Loosen three screws retaining the cylinder casing then lift off the cylinder casing together with he air filter Loosen the spark plug by using the socket wrench in the tool kit.

Ausbau K1200: Die drei Schrauben losen, mit denen die Zylinderkopfhaube befestigt ist Anschließend die Zylinderkopfhaube zusammen mit dem Luftfilter abheben Zundkerze mit dem im Werkzeugsatz enthaltenen Steckschlussel losen

Démontage K1200: Dévisser les trois vis qui maintiennent le couvercle de cylindre Enlever ensuite le couvercle de cylindre ainsi que le filtre à air Démonter la bougie à l'aide de la clé à tube qui fait partie du jeu d'outils.



Kaparm K65

Det finns mojlighet att vanda kaparmen 180 sa att kapskivan kommer pa armens motsatta sida Detta underlattar kapning nara vertikala hinder sasom vaggar och liknande
Kaparmen, sprangskyddet och drivremmen lossas pa samma satt som vid drivremsbyte *se sid* 15

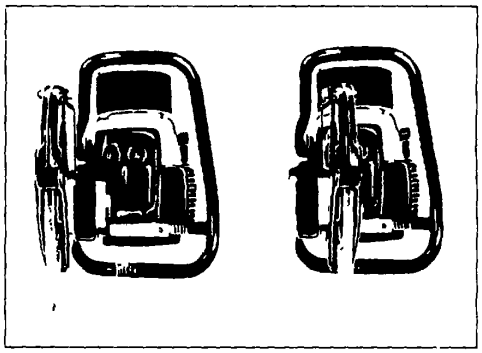
Cutting arm K65
It is possible to turn the cutting arm 180 so that the cutter disc is positioned on the opposite side of the arm This facilitates cutting close to vertical obstacles such as walls, etc. The cutting arm, the safety casing and the drive belt are loosened in the same way as when changing the drive belt see page 15.

Trennarm K65

Man kann den Trennarm um 180° drehen, so daß die Trennscheibe an der entgegengesetzten Seite des Arms zu liegen kommt Dadurch werden Trenn- und Schneidarbeiten an senkrechten Hindernissen, z B an Wanden, erleichtert
Trennarm, Sprengschutz und Antriebsriemen werden auf die gleiche Art gelost wie *beim Riemenwechsel* Siehe Seite 15

Bras de découpage K65

Il est possible de tourner le bras de découpage de 180° de sorte que le disque découpeur se trouve sur le côté opposé du bras
Cela facilite le découpage d'obstacles verticaux tels que des parois ou autres objets similaires
Le bras découpeur, le capot protecteur et la courroie d'entraînement sont dégagés de la même façon que lors du remplacement de courroie d'entraînement voir page 15

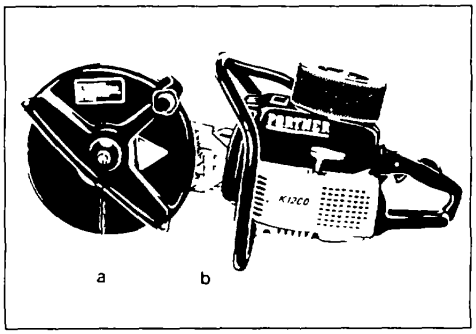


Skruven (c), som haller lasstaget pa sprangskyddet tages bort och skyddet vrides ett halvt varv Vand armen 180 och satt tillbaka respektive detaljer och skruva fast pa samma satt som tidigare
Observera att flansbrickan, som haller kapskivan har en specialasning, som inte lossnar da skivan andrar rotationsriktning

The screw (c) retaining the locking stay at the safety casing is removed and the safety casing is turned through half a revolution. Turn the arm 180 and then refit parts and screw into position as earlier Note that the flange washers retaining the cutter disc have special locking device which does not loosen when the cutter disc changes its direction of rotation

Die Schraube (c), mit der die Sicherungsstrebe am Sprengschutz befestigt ist, herausschrauben und den Schutz eine halbe Umdrehung drehen Den Arm um 180° wenden und die jeweiligen Teile wieder in ihre ursprungliche Lage zurucksetzen und auf die gleiche Art wie fruher festschrauben Die Flanschscheibe fur die Trennscheibe hat eine Spezialsicherung, die sich nicht lost, wenn die Scheibe ihre Drehrichtung andert

La vis (c) qui maintient le blocage sur le capot protecteur est enlevée et le capot est tourné d'un demi tour Tourner le bras de 180° et replacer les pièces pour ensuite effectuer un vissage identique au vissage précédent Il faut observer que la rondelle à bride qui maintient le disque découpeur a un blocage spécial qui ne se dégage pas lorsque le disque change de sens de rotation



Kaparm K1200

Med kaparmen i normallage hålls kapskivan fast av en hogergangad skruv (a) medan kaparmens fastskruv (b) ar vanstergangad Det finns mojlighet att vanda kaparmen 180 sa att kapskivan kommer på armens motsatta sida Detta underlattar kapning nara vertikala hinder såsom vaggar och liknande

Cutting arm K1200

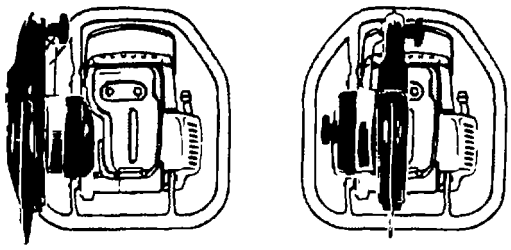
When the cutting arm is in its normal position the cutter disc is held in position by means of a screw with a right-hand thread (a) while the cutter arm attaching screw (b) has a left-hand thread This facilitates cutting close to vertical obstacles such as walls, etc.

Trennarm K1200

Wenn sich der Trennarm in Normallage befindet, wird die Trennscheibe durch eine Scheibe (a) mit Rechtsgewinde festgehalten Die Befestigungsschraube des Trennarms (b) hat Linksgewinde Man kann den Trennarm um 180" drehen, so daß die Trennscheibe an der entgegengesetzten Seite des Arms zu liegen kommt Dadurch werden Trenn- und Schneidarbeiten an senkrechten Hindernissen, z B an Wanden, erleichtert

Bras de découpage K1200

Lorsque le bras de découpage est en position normale, le disque de découpage est maintenu en place par une vis à pas orientée vers la droite (a) alors que la vis de fixation du bras de découpage (b) possède un pas qui est orienté vers la gauche Il est possible de tourner le bras de découpage de 180° de sorte que le disque découpeur se trouve sur le côté opposé du bras Cela facilite le découpage d'obstacles verticaux tels que des parois ou autres objets similaires



Kaparmen lossas på liknande satt som vid drivremsbyte, se sid 16 Lossa aven ratten och skruven som håller staget
Vrid sprangskyddet 180° Montera drivremmen på motorn och darefter kaparmen så att skruven for staget passar in i nedre hålet i vevhuset Skifta skruvarna a och b Lagg på remmen på framre remhjulet och spann excentern Drag fast kaparmen och montera kåporna

The cutter arm is loosened in the same way when changing the drive belt, see page 16. Loosen also the knurled knob and the screw taming the stay Turn the protective casing rough 180°. Fit the drive belt on the engine d then on the cutter arm so that the screw the stay fits into the lower hole in the crankcase Interchange screws a and b Fit the belt on the front pulley and then tension e eccentric. Tighten the cutter arm and fit the casings.

Der Trennarm wird ahnlich wie beim Wechsel des Keilriemens gelost, siehe Seite 16 Außerdem mussen Drehgriff und Schraube, mit der die Strebe befestigt ist, gelost werden Den Sprengschutz um 180° drehen Keilriemen am Motor und danach Trennarm montieren, so daß die Schraube fur die Strebe in das untere Loch des Kurbelgehauses paßt Die Schrauben A und B untereinander austauschen Riemen auf das vordere Riemenrad auflegen und excenter spannen Trennarm fest anziehen und die Gehause montieren

Le bras découpeur est demonté de la même façon que lors de l'échange de la courroie d'entraînement, voir page 16 Enlever également le volant et la vis qui maintiennent l'étai Tourner le protecteur à 180° Monter la courroie d'entraînement sur le moteur et ensuite le bras découpeur d'une facon telle que la vis d'etai s'adapte au trou inférieur du carter de manivelle Interchanger les vis a et b Placer la courroie sur la roue de courroie avant et tendre le tendeur Serrer le bras découpeur et monter les couvercles

Underhallsschema

Detta underhallsschema ar en sammanstallning over de olika atgarder, som namns i boken och som ar nodvandiga for ratt skotsel av kapmaskinen De angivna tidsintervallerna bor tillampas om kapmaskinen anvands minst 4 timmar om dagen Anvands kapmaskinen kortare tid per dag kan de kortaste intervallerna forlangas utan olagenhet

Enhet pa sagen	Atgard	Utfores
Sprangskydd	Kontroll av funktion	alltid
Reglage	Kontroll av funktion	alltid
Startapparat	Rengoring och smorjning av rorliga delar	varje manad
Luftfilter		
Forfilter	Skakas rent	vid varje tankning
Huvudfilter	Rengores - bytes	se sid 25 och 27
Spillfilter	Rengores – bytes	av aukt verkstad
Forgasare	Rengoring justering	vid behov
Tandstift	Kontroll och justering av elektrodavstand	vid behov
	Byte	varannan manad
Motor	Rengoring av kylflansar	varannan vecka
Drivrem	Ny rem strackes efter	1 – 2 tankars korning
	Darefter kontrollera spanningen	varje dag
Bransletank	Byte av branslefilter	minst en gang/ar
Skruvar och muttrar	Kontroll av atdragning	varje vecka

Maintenance scheme

The following is a summary of various measures mentioned in the book and which is essential for the correct servicing of the cutting machine The time intervals mentioned should be applied if the cutting machine is used for at least 4 hours every day If the machine is used for a shorter time each day the shortest intervals can be extended without any ill effects

Unit on cutter	Operation	Frequency
Guard	Check function	always
Controls	Check function	always
Starter unit	Clean and lubricate moving parts	every month
Air filter		
Pre-filter	Shake clean	at every tanking operation
Main filter	Clean - replace	see page 25 and 27
Spill filter	Clean - replace	by authorized workshop
Carburetor	Check.	adjust when necessary
Spark plug	Check and adjust electrode gap	when necessary
	Replace	every other month
Engine	Clean cooling vanes	every other week
Vee-belt	New belt to be tensioned after	1 -2 refillings
	thereafter check belt tension	daily
Fuel tank	Replace filter cartridge	at least once a year
Screws bolts and nuts	Check tightening	every week

Wartungsplan

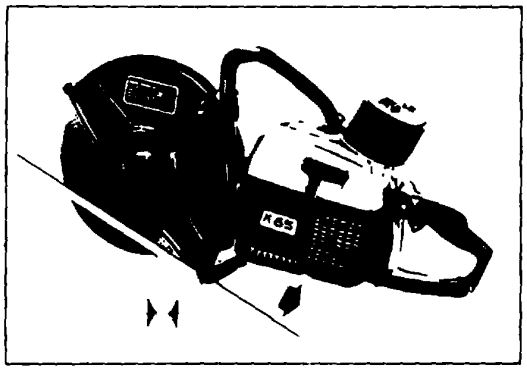
Vorbeugende Wartungsarbeiten an der Trennsage sind in diesem Heft angegeben worden Nachstehend geben wir Ihnen eine Zusammenstellung dieser Arbeiten Die Zeitabstande im Wartungsplan sind maßgebend, wenn die Trennsage mindestens 4 Stunden taglich verwendet wird Wird die Trennsage taglich kurzere Zeit verwendet, konnen die kurzesten Zeitabstande ohne weiteres verlangert werden

Einheit der Trennsage	Maßnahme	Ausfuhrung
Splitterschutz	Funktionskontrolle	immer
Regler	Funktionskontrolle	immer
Anwerfvorrichtung	Reinigung und Schmierung von beweglichen Teilen	monatlich
Luftfilter		
Vorfilter	Sauberschutteln	bei jedem Tanken
Hauptfilter	Reinigen – auswechseln	siehe Seite 25 und 27
Leckfilter	Reinigen – auswechseln	bei Werkstattbesuch
Vergaser	Reinigen einstellen	bei Bedarf
Zundkerze	Kontrolle und Einstellen des Elektrodenabstands	bei Bedarf
	Auswechseln	alle 2 Monate
Motor	Kuhlflanschen reinigen	alle 2 Wochen
Antriebsriemen	Neuer Antriebsriemen spannen	nach 1 – 2 Einfullungen des Kraftstofftanks
	Danach Spannung kontrollieren	taglich
Kraftstofftank	Filterpatrone kontrollieren	mindestens einmal pro Jahr
Schrauben u Muttern	Nachziehen	wochentlich

Schema d'entretien

Dans la presentation ci-dessus se retrouvent differentes mesures necessaires d'entretien correct de la decoupeuse Les intervalles de temps qui figurent dans le présentation constituent des donnees auxquelles il faut se referer si la découpeuse est employée au moins quatre heures par jour Si par contre la decoupeuse est employee pendant une moins longue periode par jour les plus courts intervalles peuvent être prolongé sans risque

Partie de la decoupeuse	Mesures à prendre	A exécuter
Protecteur	Contrôle de fonctionnement	toujours
Reglage	Contrôle de fonctionnement	toujours
Dispositif de mise en route	Nettoyage et graissage des parties mobiles	chaque mois
Filtre a air		
Prefiltre	Le secouer	à chaque remplissage
Filtre principal	Nettoyage – remplacement	voir page 25 et 27
Filtre de trop plein	Nettoyage – remplacement	dans un atelier autorisé
Carburateur	Nettoyage ajustage	au besoin
Bougie	Contrôle et ajustage de la distance entre les electrodes	au besoin
	Remplacement	toutes les deux mois
Moteur	Nettoyage des ailettes de refroidissement	toutes les deux semaines
Courroie d entrainement	Nouvelle courroie à tendre apres d'après contrôle de la tension	1 – 2 remplissage de carburant chaque jour
Reservoir de carburant	Remplacement de la cartouche filtrante	une fois par an au moins
Vis et ecrous	Contrôle du serrage	chaque semaine



Arbetsteknik

Vid kapning i stål och andra metaller bor man alltid strava efter hogt sliptryck och hog periferihastighet på skivan Forsok att få så liten kontaktyta som mojligt Kapa alltid med fullt gaspådrag och reglera varvtalet genom att oka eller minska matningstrycket

Working technique

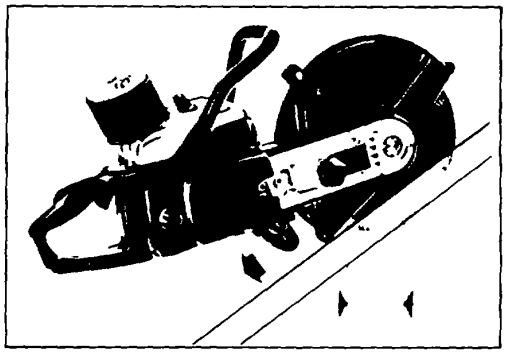
When cutting steel and other metals, always try to maintain high cutting pressure and with disc speed. Try to get smallest possible contact point. Always open the throttle fully when you apply the cutter disc to the material and regulate the speed of the machine by increasing or decreasing the feed pressure.

Arbeitstechnik

Beim Schneiden in Stahl und anderen Metallen muß man stets danach streben, hohen Schleifdruck und hohe Scheibengeschwindigkeit zu halten Versuchen eine so kleine Kontaktstelle wie moglich zu erhalten Beim Anbringen der Trennscheibe am Material ist immer Vollgas zu geben Dann ist die Drehzahl durch Steigern oder Verringern des Zufuhrdruckes zu regeln

Technique de travail

Lors de découpage de tôle ou autres métaux il faut toujours s'efforcer d'obtenir une haute pression d'affûtage et une vitesse élevée du disque On obtient la plus grande rapidité de coupe si l'on pénètre dans la matière à découper par un mouvement avançant et reculant Accélérer toujours à fond lors de la mise en contact du disque de découpage avec la matière à découper Régler ensuite le régime en augmentant ou diminuant la pression sur l'objet à découper



Vid kapning i sten betong eller liknande material bor skivan foras fram och tillbaka i spåret så att man får god varmeavledning och låg temperatur i slippunkten Finns det mojlighet att kyla skivan med vatten uppnås mycket god skivekonomi

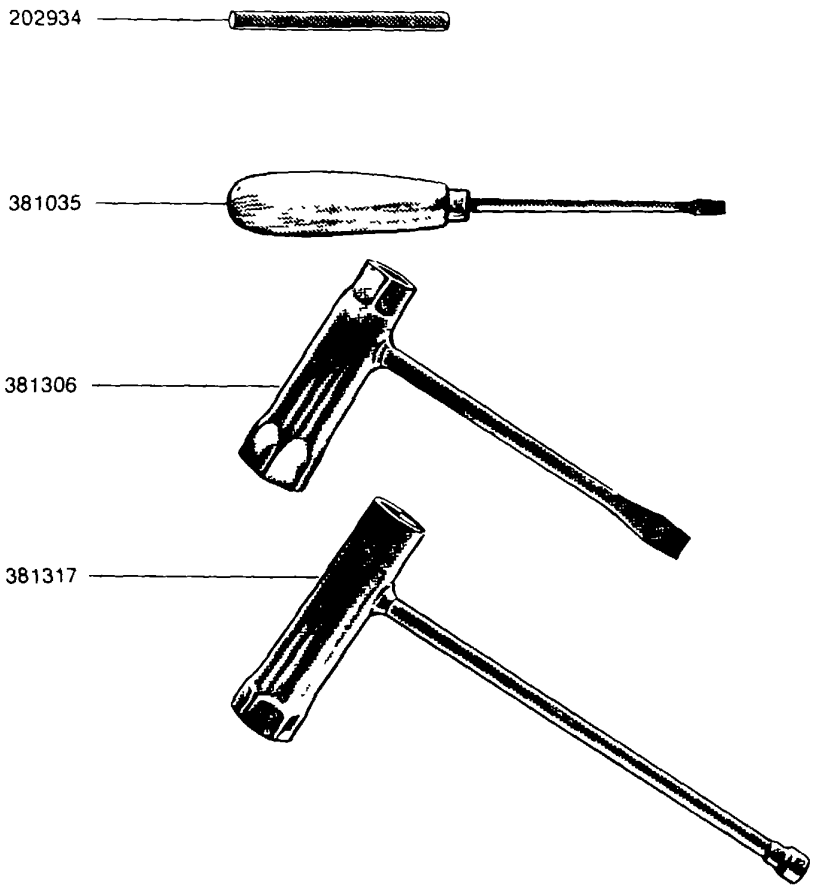
When cutting stone, concrete and similar material the disc should be moved forwards and backwards in the cut to obtain good conduction of heat away from the disc and a low temperature at the cutting point. If there is a possibility to cool the cutter disc with water, this results in very good cutter disc economy.

Beim Schneiden von Stein, Beton o a soll die Scheibe im Schlitz hin und her gefuhrt werden, so daß man eine gute Warmeableitung und niedrige Temperatur am Schleifpunkt erhalt Wenn die Moglichkeit besteht, die Scheibe durch Wasser abzukuhlen wird eine sehr gute Scheibenwirtschaftlichkeit erreicht

Lors de découpage de pierre, beton et matériaux similaires on obtient la plus grande rapidité de coupe si l'on pénètre dans la matière à découper par un mouvement avançant et reculant de sorte à obtenir une bonne dissipation de la chaleur du disque et une basse température au point de découpage Si l'on a la possibilité de refroidir le disque avec de l'eau, cela permet d'obtenir une amélioration de la rentabilité du disque

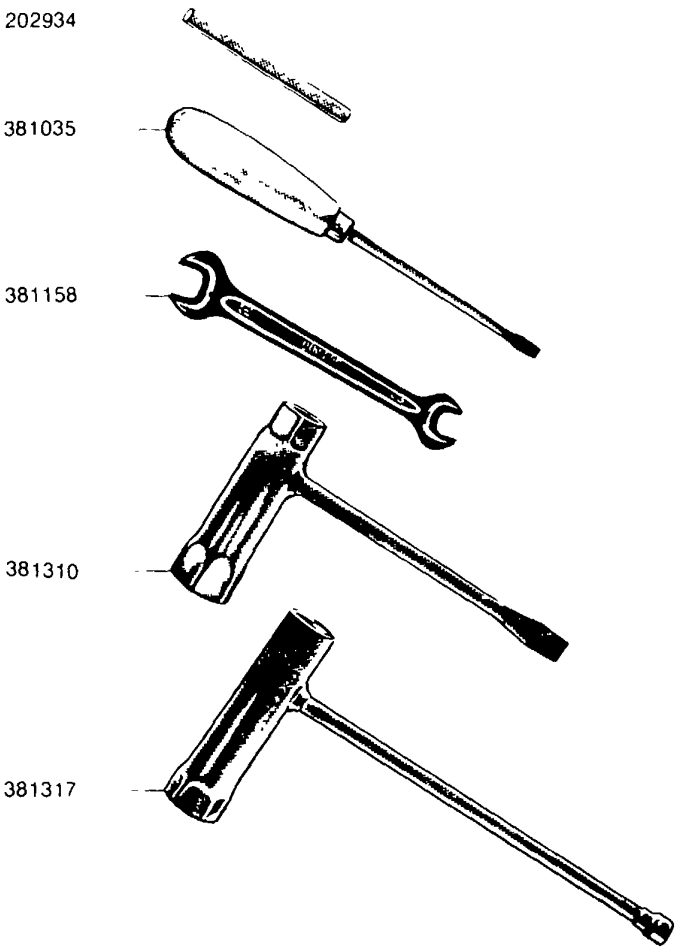
Verktyg
Tools
Werkzeuge
Outils

K1200



Verktyg
Tools
Werkzeuge
Outils

K65

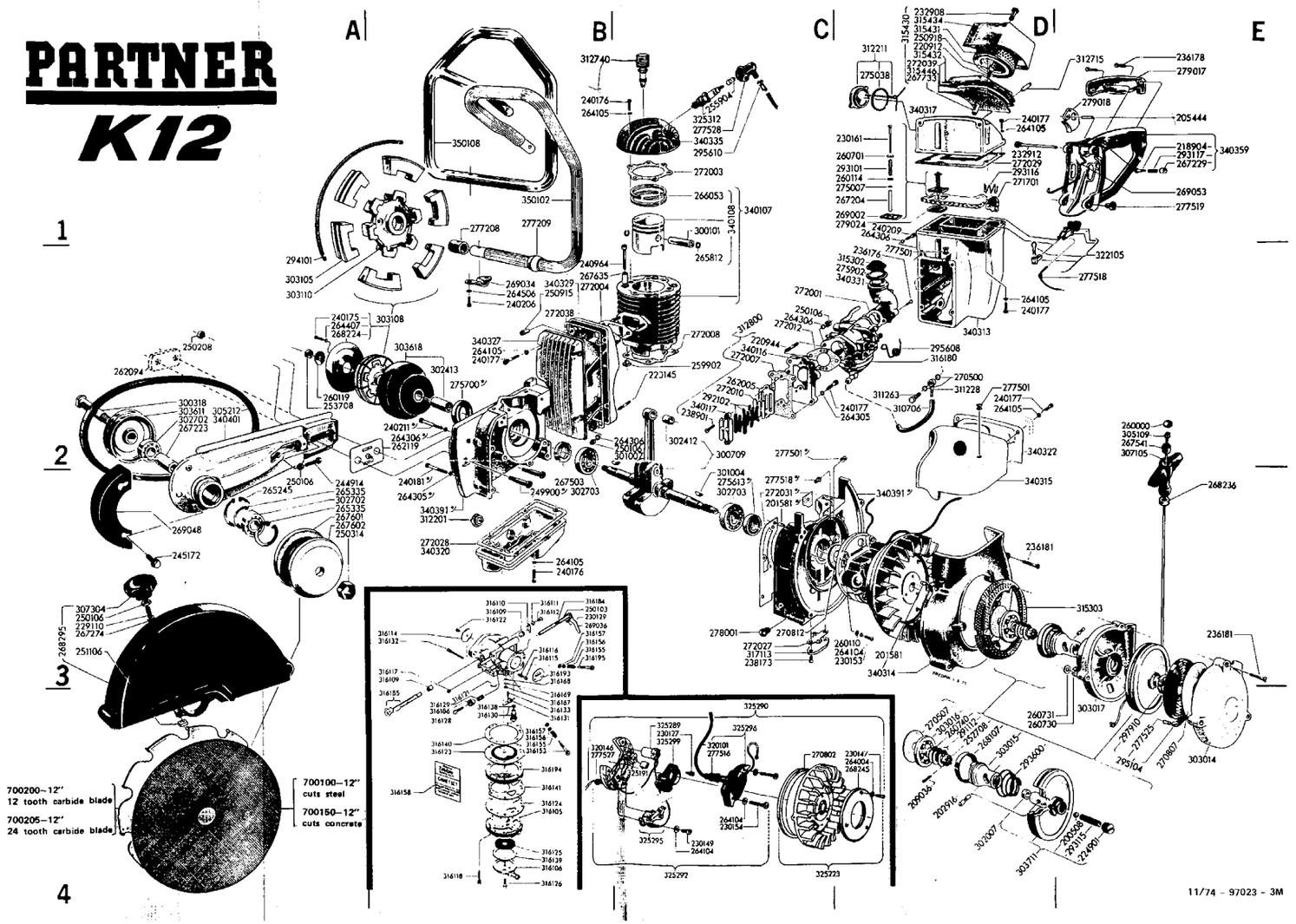


AB PARTNER
Fack, S-431 20 Molndal 1, Sweden

701042 10 000 10 78

8730 Skandia-Tryckeriet Goteborg

PARTNER K12



For further information, call or write:
PARTNER INDUSTRIES OF AMERICA, INC.
2727 WEST FULTON STREET / CHICAGO, ILLINOIS 60612
PHONE: 312 · 826-1424 TELEX: 910 221-4438

SIGNAL DIVISION
Federal Signal Corporation

256A358
479
Printed in U.S.A.

INSTRUCTIONS

FOR

INSTALLING AeroDynic™ DOME ASSEMBLY

1. Remove two screws located at identification plate. Slide dome assembly out.
2. To install dome assembly, line-up the curved hook ends of the dome assembly with the slots in the extrusion.
IMPORTANT: You may have to slightly bow the dome assembly out to allow it to line-up with the extrusion slots.
3. Slide-on dome assembly and secure with two screws removed in step 1.

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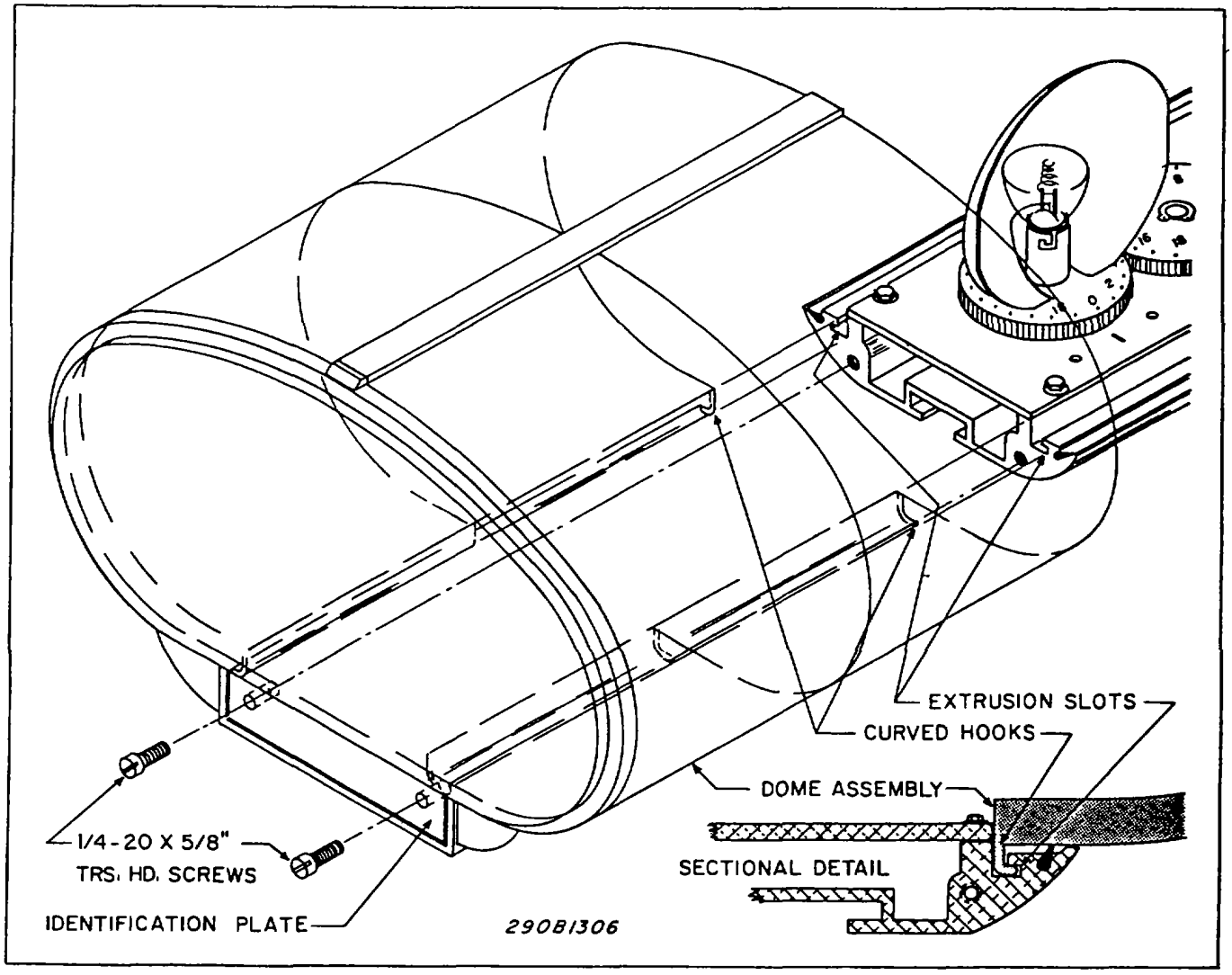


UNITY MANUFACTURING COMPANY

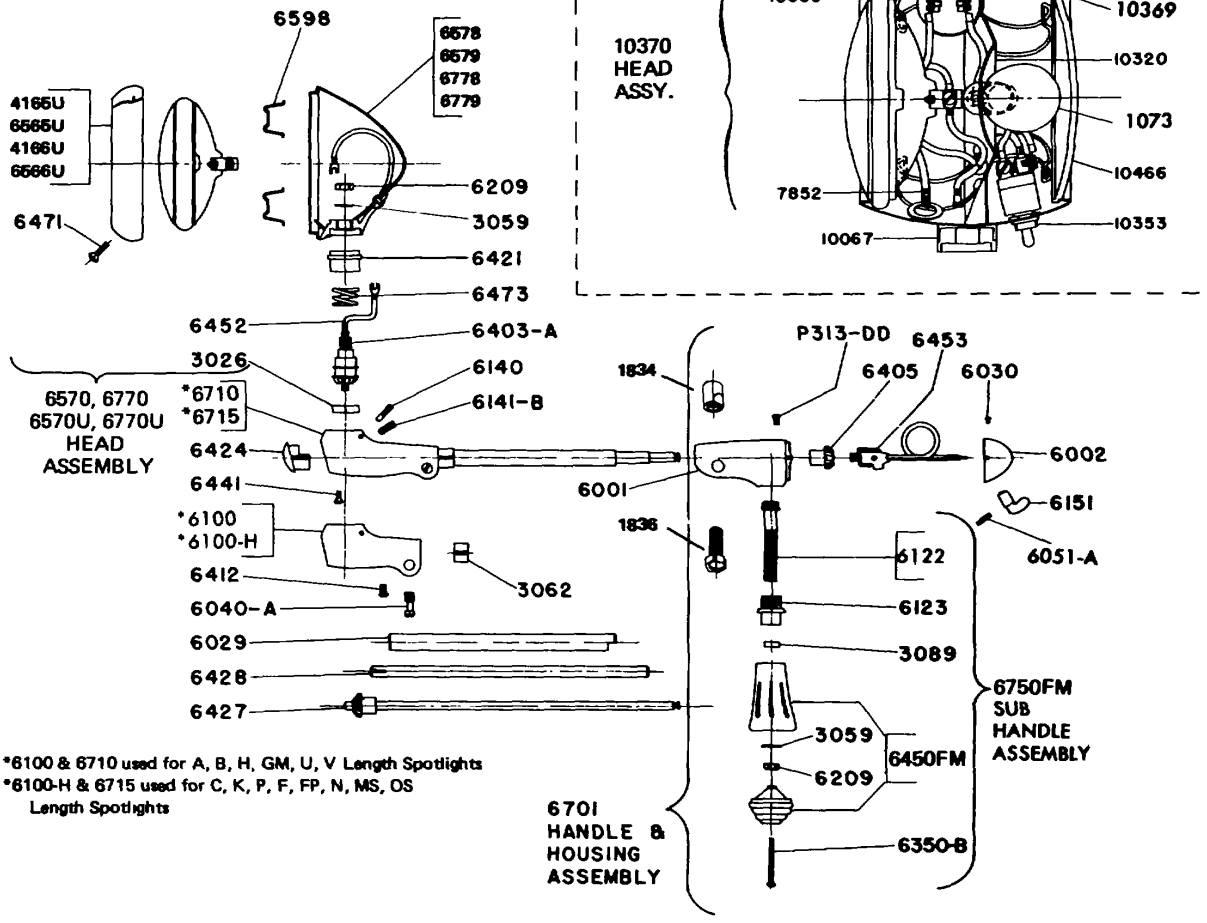
Rear Decklights (AG-6) Ansul Part No. S-28259
Front Spotlights (Model-225) Ansul Part No. S52540
Ansul Part No. S-52541

UNITY MANUFACTURING CO • 1260 N CLYBOURN AVE • CHICAGO, IL 60610 • PHONE 312-943-5200

PARTS SHEET

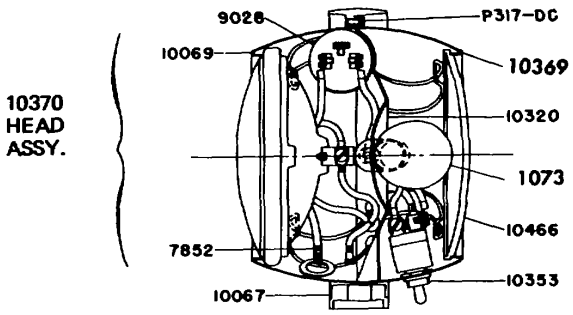
Form No. 105-6 10-80

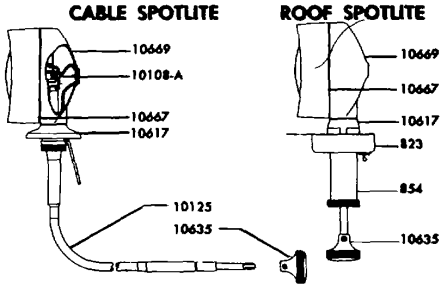
	SPOTLIGHT	ROOFLIGHT
MODEL S-6	225	275
MODEL H-1	250	U250



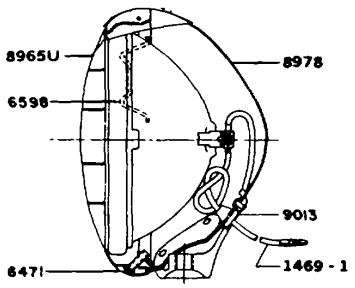
*6100 & 6710 used for A, B, H, GM, U, V Length Spotlights
*6100-H & 6715 used for C, K, P, F, FP, N, MS, OS Length Spotlights

DOUBLE HEADER
MODEL 10300

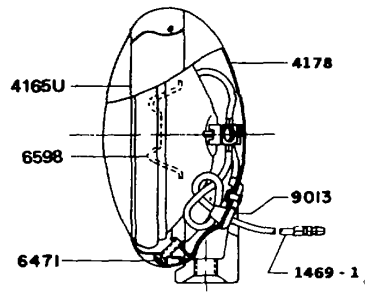




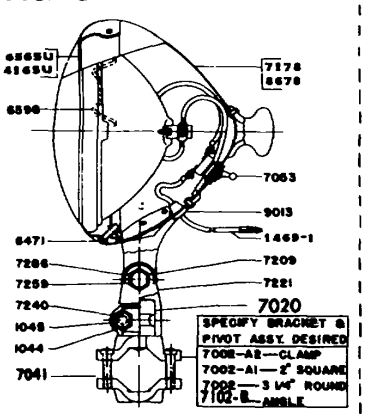
F1
300 SERIES



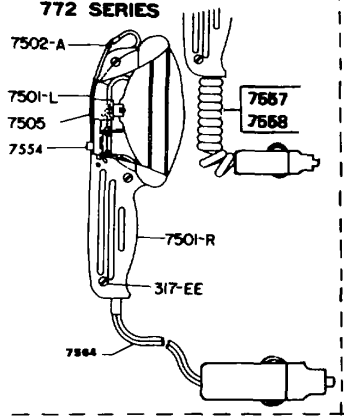
H1
520 SERIES



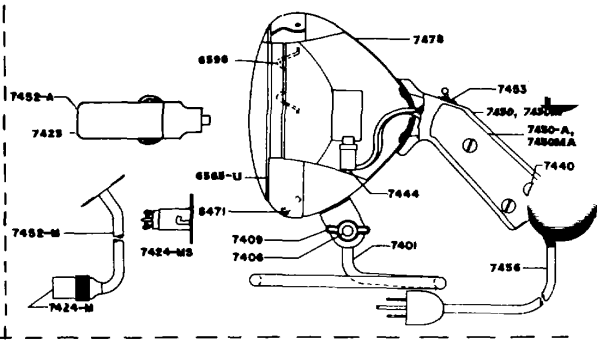
S6 & H1
AG & 5AG SERIES



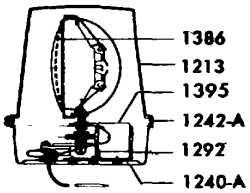
UNILITE
772 SERIES



SEARCHLIGHT
740, 742, 744

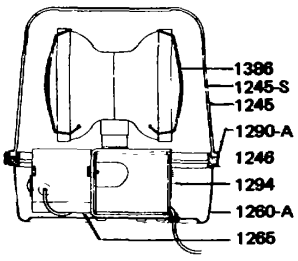


RV-15
UNIBEACON



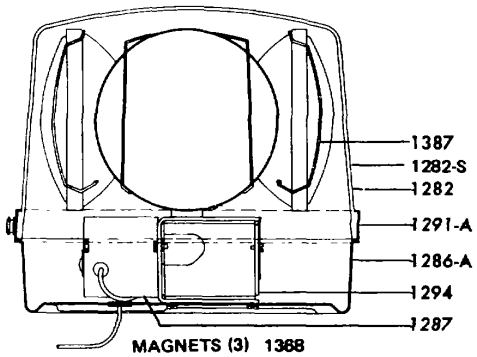
MAGNETS (3) 1270

RV-25
UNIBEACON



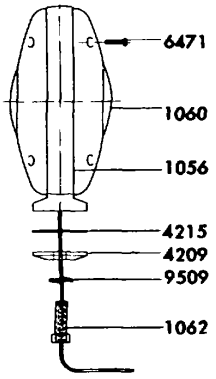
MAGNETS (3) 1347

RV-46
UNIBEACON

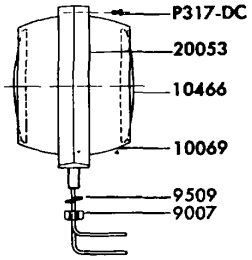


MAGNETS (3) 1388

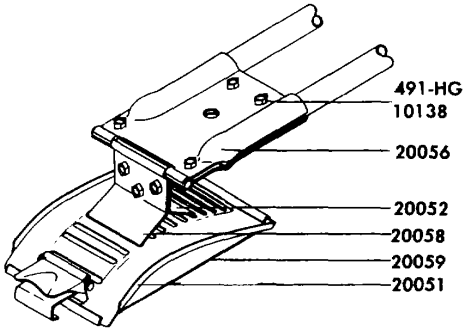
20110-7" WARNING LIGHT



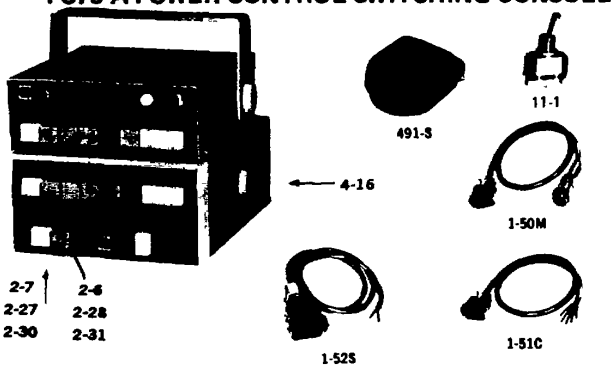
20040-5" WARNING LIGHT



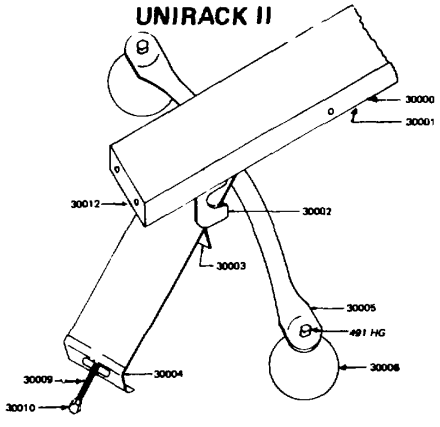
UNIRACK I END BRACKET



SPR-70A, 73A, 73B, 75A SI-TRON AMPLIFIER
PC75-A POWER CONTROL SWITCHING CONSOLE

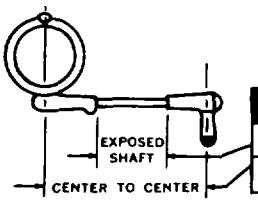


UNIRACK II



PART NUMBER	DESCRIPTION	Suggested LIST PRICE
1-52S	Radio Audio Cable	37.97
1-50M	Radio Control Cable Kit	94.90
1-51C	Radio Control Cable Kit	56.93
2-6	Black Button SPR 70A	4.67
2-7	White Button SPR 70A	4.67
2-27	White Button SPR 73A, 73B	4.67
2-28	Blue Button SPR 73A, 73B	4.67
2-30	White Button PC75A, SPR-75A	4.67
2-31	Blue Button PC75A, SPR-75A	4.67
4-16	Mounting Bracket	56.93
11-1	Horn Ring Control Selector Switch	15.67
P-313DD	Screw	.13
P-317DC	Screw	.17
317EE	Screw	.13
491HG	Bolt	.43
491-S	Foot Switch	61.70
823	Escutcheon	2.37
854	Sleeve	2.70
1003A	Drill Bushing	.37
1044	Nut	.13
1045	Washer	.07
1056	Body	12.97
1060	Lens 7" -201 10 Amber, Blue, Red	8.50
1062	Bolt	2.70
1213	Dome for RV 15-Amber, Blue, Clear, Red	15.73
1240A	Base for RV15	7.13
1242-A	Ring Assy. RV1 5	5.40
1245	Dome for RV25-Amber, Blue, Clear, Red	21.43
1245-S	Spitfire Dome (Blue or Red) RV25	39.13
1246	Gasket-RV25	1.30
1260-A	Base for RV25	40.07
1265	Motor for RV5 V6	50.00
1270	Magnet-RV15	3 90 ea.
1282	Dome- RV26, 45 & 46 Amber, Blue, Clear, Red	28.57
1282-S	Spitfire Dome (Blue or Red) RV26,45 &46	46.27
1286-A	Base-RV26, 45 &46	51.17
1287	Motor-RV45 & 46	60.00
1290-A	Ring Assy.-RV25	7.20
1291 -A	Ring Assy.-RV26, 45 &46	13.10
1292	Gear Train-RV1 5	30.77
1294	Gear Train- RV25, 26, 45 & 4643.20	
1347	Magnet-RV25	13.30ea.
1368	Magnet-RV26, 45 & 46.	16.13 ea
1386	Spring for RV15, 25 & 45	80
1387	Spring for RV26 & 46	1.27
1395	Motor for RV15	47.50
1469-1	Wire Assy	2.17

PART NUMBER	DESCRIPTION	Suggested LIST PRICE
1834	Wedge	.87
1836	Wedge Screw	.20
3026	Felt Washer	.43
3059	Washer	.13
3062	Bushing	1.00
3089	Felt Washer	.20
4165U	Ring Assy. 520, 250	6.30
4166U	Ring Assy U250	6.30
4178	Shell Assy.520	10.00
4209	Washer	.87
4215	Gasket	.17
6001	Handle Housing	6.83
6002	SW. Cap	3.20
6029	Tube *See Note	5.03
6030	Screw	.17
6040-A	Screw	.50
6051-A	Screw	.20
6100	Housing-Long	6.83
6100-H	Housing-Short	6.83
6122	Pinion	4.97
6123	Bushing	1.80
6140	Pin	.13
6141-B	Screw	.20
6151	Toggle Assy.	1.80
6209	Nut	.17
6350-B	Screw	.30
6403-A	Headpost Assy	5.77
6405	Gear	1.73
6412	Screw	.13
6421	Bushing	1.97
6424	Plug	1.27
6427	Rod & Gear, *See Note	8.10
6428	Tube, 'See Note	3.23
6441	Screw	.17
6450FM	Upper & Lower Handle (Black)	2.87
6452	Wire	.63
6453	SW. & Wire	4.67
6471	Screw	.30
6473	Spring	.17
6565U	Ring Assy. 225	6.30
6566U	Ring Assy 275	6.30
6570	Head Assy. 225	37.50
6570U	Head Assy. 275	37.50
6578	Shell Assy. 225	18.43
6579	Shell Assy. 275	18.43
6598	Spring	.13
6701	Handle & Housing Assy	19.63
6710	Housing & Tube Assy. *See Note	20.70
6715	Housing & Tube Assy. *See Note	20.70
6750FM	Sub Handle Assy	9.00
6770	Head Assy. 250	35.40
6770U	Head Assy. U250	35.40
6778	Shell Assy. 250	18.43



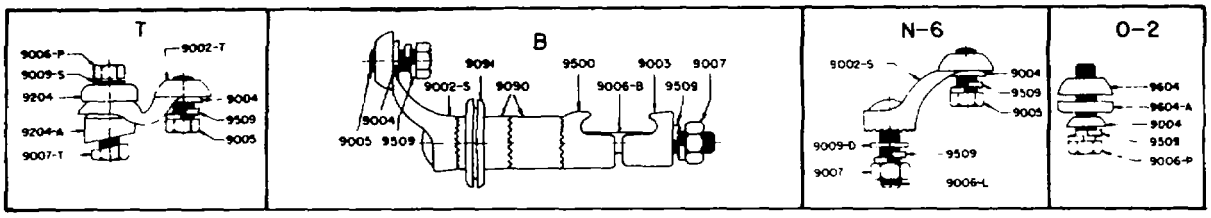
SPOTLIGHT LENGTHS

N	B	H	A	K	V	GM	C	P	G	F	FP	MS	DS
4¼"	4¾"	5⅞"	6½"	7⅜"	7½"	9"	10⅜"	12⅝"	14"	15⅝"	17⅝"	18⅞"	21⅛"
9⅛"	10¼"	11⅜"	12"	12½"	13"	14½"	15½"	17½"	19½"	20½"	22½"	23¾"	26"

NOTE - *When Ordering include Spotlight Length from this Chart

PART NUMBER	DESCRIPTION	Suggested LIST PRICE
6779	Shell Assy U250	18.43
7015	Gasket-Rooflight	.73
7020	Pivot	3.33
7041	Screw	.17
7053	Switch	5.17
7178	AG Shell Assy	30.73
7209	Nut	.30
7221	Pivot Housing	17.27
7240	Screw	.43
7259	Washer	.13
7286	Screw	.47
7401	Stand	8.63
7406	Carriage Bolt	.90
7409	Wing Nut	.90
7424-AR	Auto Socket	5.40
7424-M	Marine Plug	6.13
7424-MS	Marine Socket	8.80
7425	Auto Plug	2.70
7440	Screw	.30
7444	Socket	1.97
7450	Handle	7.20
7450-A	Handle Plate	3.60
7450-M	Marine Handle.	7.20
7450-MA	Marine Handle Plate	3.60
7452-A	Auto Wire & Plug	10.80
7452-M	Marine Wire & Plug	13.50
7453	Switch	3.23
7456	Wire & Plug	9.00
7478	Shell Assy. 740	18.43
7501-L	Body Left	7.57
7501-R	Body Right	7.57
7502-A	Spring Assy	1.63
7505	Spacer-Rubber	.47
7554	Switch	2.27
7557	8 1/3' Koiled Kord & Plug Assy	15.10
7558	12 1/2' Koiled Kord & Plug Assy	21.30
7564	Cord Set	7.93
7852	Ground Wire	1.50
8678	SAG Shell Assy	30.73
8965U	Ring Assy -300	6.30
8978	Shell Assy -300	10.00
9002-S	Bracket Arm	4.00
9002-T	Bracket Arm	2.93
9003	Bracket Clamp	1.63
9004	Cup Washer	.63
9005	Cap Screw	.37
9006-B	Carriage Bolt-6"	1.73
9006-L	Carriage Bolt-1 3/4"	.70
9006-P	Cap Screw	.73

PART NUMBER	DESCRIPTION	Suggested LIST PRICE
9007	Nut	.30
9007-T	Nut	.53
9009-D	Washer	.13
9009-S	Washer	.13
9013	Grommet	.17
9028	Flasher-12V (Unison)	.72
9030	Flasher-12V (Alternately)	9.40
9052-15	Wire Assy	1.03
9052-15A	Wire Assy	1.03
9090	Bushing	1.27
9091	Grommet	.80
9204	Washer	1.20
9204-A	Bushing	1.07
9500	Bracket Clamp	1.63
9509	Lock Washer	.13
9604	Washer	1.60
9604-A	Washer	1.80
10067	Ring.	9.90
10069	Shell Assy.-20040	18.43
10108-A	Yoke Assy	1.07
10125	Cable Assy -37 1/2"	26.80
10125	Cable Assy.-33 1,2"	26.80
10138	Nut & Lock Washer	.30
10320	Reflector Assy	9.00
10353	Switch	5.47
10369	Shell-10,300	18.43
10370	Head Assy.-10,300	70.00
10465	Lens-Clear	3.33
10466	Lens-Red	3.33
10467	Lens-Amber	3.33
10468	Lens-Blue	3.33
10617	Base Assy	4.50
10635	Knob	4.50
10667	Ring	7.00
10669	Body	11.40
20051	Bracket Assy	10.43
20052	Clamp	1.97
20053	Ring Assy	9.90
20056	Clamp Bracket	2.70
20058	Clamp & Pin	3.60
20059	Bracket Pad	2.37
30000	Upper Cover	46.80
30001	Lower Bar	30.23
30002	Bracket Clamp	3.97
30003	Support Strap	8.20
30004	Body Strap	8.70
30005	Support Arm	10.97
30006	Suction Cup	3.77
30009	Threaded Rod	2.70
30010	Acorn Nut	3.03
30012	Sheet Metal Screw	.37



ALL PRICES AND SPECIFICATIONS WITHOUT NOTICE.

A SERVICE CHARGE OF $1.50 WILL BE APPLIED TO ALL ORDERS LESS THAN $15.00.

FOR REPLACEMENT SEALED BEAM LAMPS SEE FORM 128.

FEDERAL SIGN AND SIGNAL CORPORATION

Siren/PA Control System (PA-2100) with Michphone (FN-900) and
Speaker (TS-100) Ansul Part No. S-52917
Warning Light (Aero-Dynic 24A) Ansul Part No. S-52531

A6

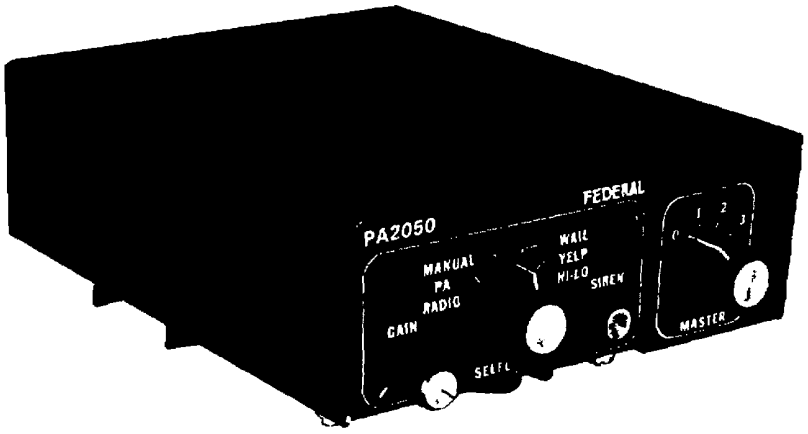
TM 5-4210-228-14&P-1
PRICE $2.00

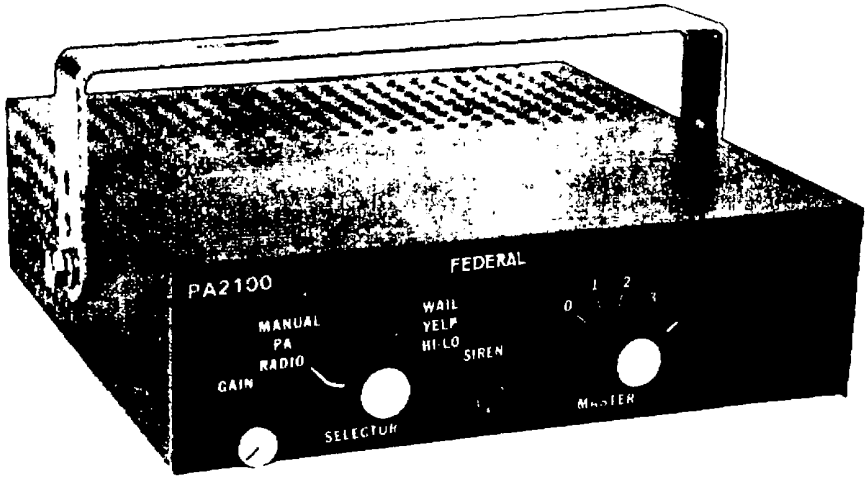
SIGNAL DIVISION
Federal Signal Corporation

MODELS PA2050 & PA2100

SIRACOM II®

SIREN/CONTROL SYSTEM





INSTALLATION AND SERVICE INSTRUCTIONS

NOTE

This service manual describes the PA2100. However, the PA2050 and PA2100 are identical except the PA2050 does not have provision for accommodating the optional lighted pushbutton switches. Therefore, all descriptions, specifications, and service data apply equally to both models.

Warranty

The Federal Signal Corporation warrants each of its new electronic sirens to be free from defective material and workmanship for a period of one year from date of purchase. Federal Signal Corporation will remedy any defect which under normal installation and operation discloses such defect; provided the unit is delivered, transportation prepaid by owner, to our factory for examination and such examination reveals that in our judgment a defect in material and/or workmanship exists. In all cases, Federal Signal Corporation will be sole judge of what constitutes defective material and workmanship.

Defects of workmanship and material under this warranty will be corrected at no cost to you for labor and material.

This warranty does not extend to any electronic siren which has been subjected to abuse, misuse; improper installation or violation of any instructions supplied by us, nor extended to units which have been serviced or modified at any facility other than our factory.

This warranty takes precedence over all other warranties expressed or implied and no representative or other person is authorized to assume for Federal Signal Corporation any other liability in connection with the sale of our electronic sirens.

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FEDERAL SIGNAL CORPORATION

SECTION I

GENERAL DESCRIPTION

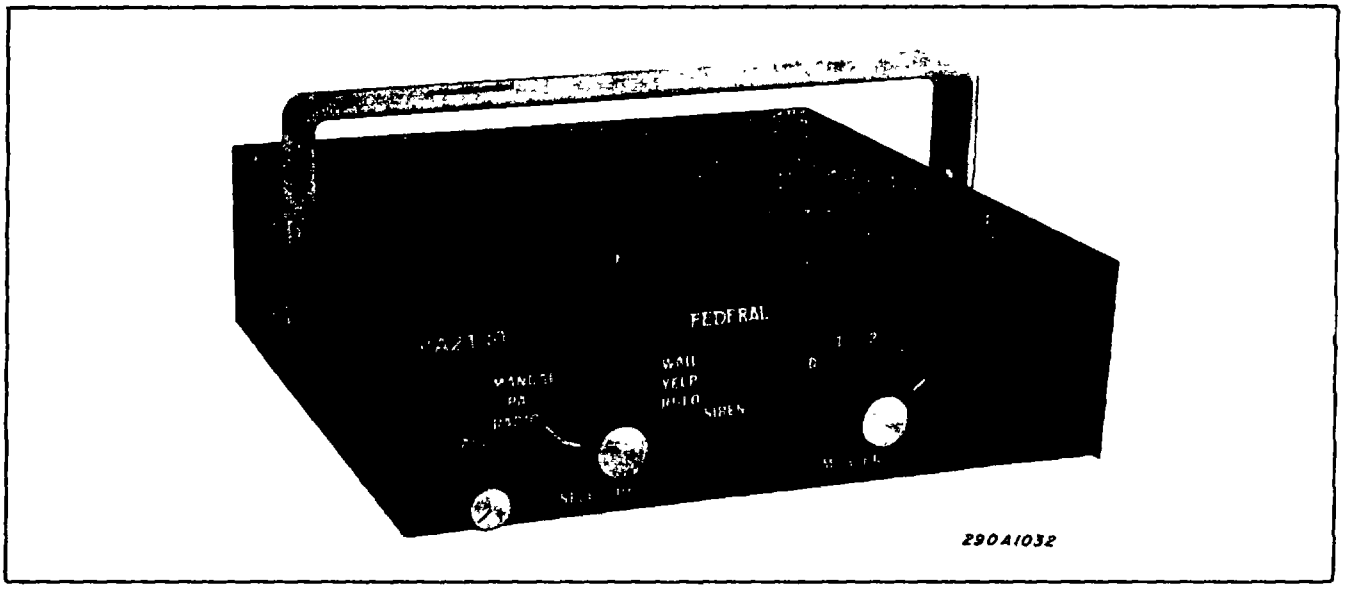


Figure 1-1. Model PA2100 Siren/Control System.

1-1. GENERAL

The Federal Model PA 2100 SIRACOM II (figure 1-1) is a precision-built, compact Siren/Control System of advanced design. It consists of a Siren Module and a Control Module.

The PA 2100 is designed to operate from a nominal 12 volt DC, negative ground electrical system. The speaker terminals, on the rear panel of the unit, in conjunction with a slide switch on the rear of the siren module inside of the housing, allow the use of either 100 watt or 58 watt speakers.

The Siren Module produces three distinct sounds. This module also has provisions for public address (PA), amplification of radio messages (radio rebroadcast), and manual siren operation.

If it is desired to make use of the provisions for PA and radio rebroadcast, a Federal Model MNCT Microphone or the vehicle's two-way radio microphone and the appropriate adapter module are required. The Model MNCT Microphone and a line of adapter modules to fit most popular makes of two-way radio microphones are available as options from Federal. The adapter modules include the wiring required to interconnect the PA 2100 with the micro-phone and the two-way radio.

The Siren Module can be easily removed from the vehicle without disturbing he wiring to the control switches and without disabling the vehicle accessories (horn, lights, radio, gunlock, etc.).

The Control Module contains all of e circuitry and devices necessary to control the entire vehicle warning light system ad accessories. The Control Module also routes power to the Siren Module.

An external 50 ampere, automatic reset circuit breaker is supplied to protect the vehicle warning light system.

A panel light and a pilot light are illuminated whenever the vehicle ignition switch is

1-2. SIREN MODULE.

Most of the solid state electronic circuitry in the Siren Module is mounted on printed circuit boards. This circuitry provides a high level of performance and reliability over a wide range of environmental conditions. The circuitry incorporates feed-back that maintains high audio quality for PA and radio rebroadcast functions. The 2tronic circuitry in the Siren Module is protected by a 20 ampere fuse.

The Siren Module produces three distinct siren sounds; WAIL, YELP, and HI-LO. In addition, it also has provisions for public address (PA) and radio rebroadcast. A LED indicator illuminates when the SELECTOR is set to RADIO (radio rebroadcast). A manual SIREN pushbutton switch is included for control of the Manual Wail signal.

The siren can also be operated by an auxiliary switch such as the vehicle horn switch or a foot switch. The unit can still be operated manually by depressing the SIREN button if an auxiliary switch is installed.

The TAP II Instant Yelp feature provides "push-on", "push-off" operation when the auxiliary switch is operated while the MASTER switch is in position 3 and the SELECTOR switch is in the WAIL, YELP or HI-LO positions.

The PA 2100 can be used with a Model MNCT microphone or in common with the microphone included with the two-way radio installed in the vehicle. The Model MNCT microphone is a transistorized, noise canceling microphone that has the characteristics necessary to drive the audio amplifier in the PA 2100. A Model FN900 Adapter Module is required when the MNCT Microphone is used with the PA 2100.

In common microphone operation, an optional adapter module connects the siren directly to the two-way radio. The common microphone is electrically connected to the two-way radio in all SELECTOR switch positions except PA. When the SELECTOR switch is set to PA, the microphone is connected to the siren amplifier so that messages can be announced over the siren speaker system.

1-3. CONTROL MODULE.

A. General

The Control Module is designed to be used as a central connection and control location for all vehicle emergency warning devices along with the distribution of power and control of other emergency and safety devices normally found in an emergency vehicle.

B. MASTER Switch

The four position MASTER rotary itch is used to control the emergency warning light system and the siren. Any combination of lights can be controlled by the ASTER switch. For example, position 1 n be used to operate the vehicle's flashing lights; position 2 can control the rotating lights and the siren is controlled by position 3. (Position 3 also transfers the horn ring circuit from the horn to the siren). Position 0 is the "off" position.

A maximum of three switched circuits can be controlled by any given position of the MASTER switch. The actual deices controlled by a given position of the MASTER switch can be programmed by means of a nine section miniature rocker witch inside of the Control Module. The switched circuits can be reprogrammed requirements change.

C. Accessory Control Switches (PA 2100 Only)

A maximum of four optional lighted, pushbutton type switches can be provided by Federal for installation on the front panel of he Control Module. These switches can be used for controlling vehicle accessories such as the spotlight, gunlock, brake lights, trunk lid, etc. These switches are available in two types. The switch types and their typical applications are shown in Chart 1-1.

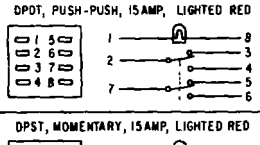
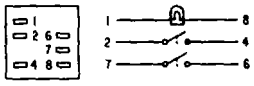
MODEL	TYPE / CONTACT ARRANGEMENT	TYPICAL APPLICATION
AS1	DPDT, PUSH-PUSH, 15AMP, LIGHTED RED 	AUXILIARY LIGHTS ALLEY LIGHTS BRAKE LIGHT OR BACK-UP LIGHT CUT-OFF
AS2	DPST, MOMENTARY, 15AMP, LIGHTED RED 	GUN LOCKS TRUNK LOCK DOOR LOCKS MECHANICAL SIREN BRAKE
NOTE	THE MODEL CLK ACCESSORY KIT IS ALSO AVAILABLE. THIS LENS KIT CONTAINS ONE EACH OF THE FOLLOWING: RED, YELLOW, GREEN, AND BLUE LENSES. THE STANDARD RED LENS PROVIDED WITH EACH SWITCH IS FACETED, WHEREAS ALL LENSES IN THE KIT ARE TRANSLUCENT	

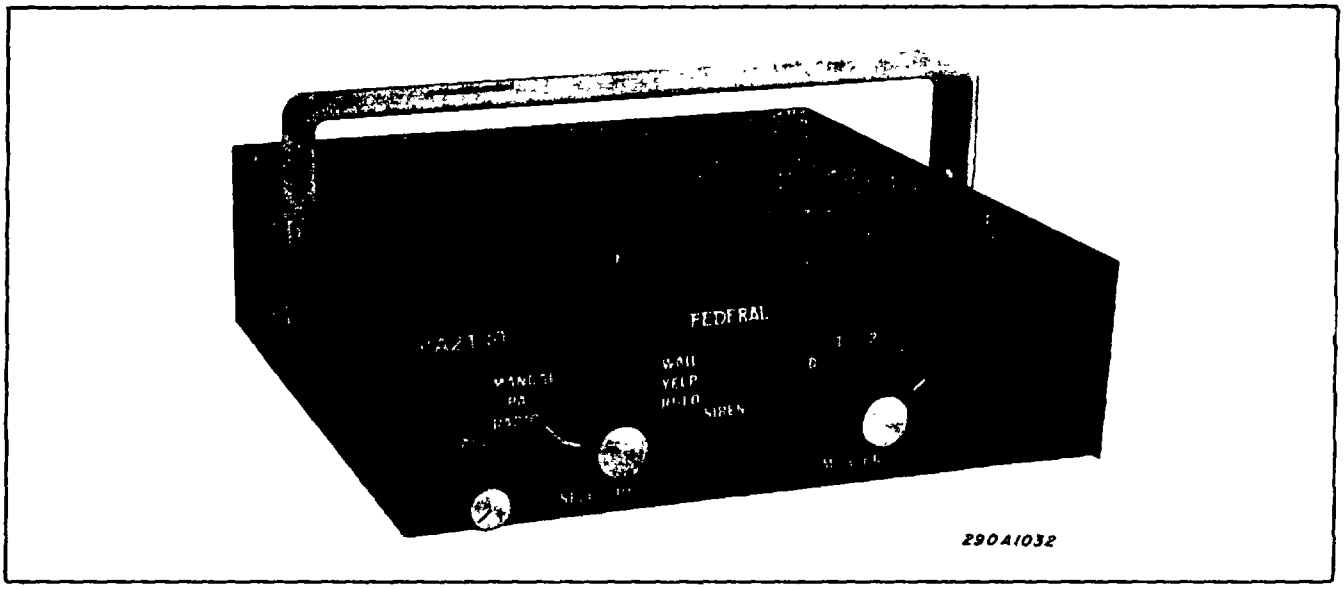
Chart 1-2.

D. Terminal Positions

Most of the electrical connections to the PA 2100 are made by means of 16 screw terminals. As indicated in figure 2, all terminal positions on the rear panel of the Control Module are clearly labeled on a legend plate. The function and current capacity of each terminal are listed Chart 1-2.

E. Flasher Option

An optional internal alternating flasher is available for use with the PA 2100. This flasher is capable of switching a maximum of 12 amperes. The flasher can also be used as a single light flasher. The flash or alternating rate is approximately 90 flashes or alternations per minute. The flash or alternating rate is independent of the voltage, load, and temperature.



Terminal	Function	Current Capacity
FLA IN	Flasher input	12A
FLA OUT (2)	Flasher output	12A
RING	Vehicle horn ring	2A
HORN	Vehicle horn	2A
A	Flasher Off override2A	-
B	Flasher On override	-
C	Not connected	-
1	MASTER Circuit 1	30A
2	MASTER Circuit 2	30A
3	MASTER Circuit 3	30A
4	Not connected	-
IGN	Ignition switch connection	10.5A
RC	Radio Control (for radio rebroadcast)	10A
SPKR	Speaker Terminals	-

Chart 1-2.

SECTION II

SPECIFICATIONS

2-1. GENERAL.

Input Voltage	10VDC to 16VDC (16VDC operation limited to 15 min.)
Polarity	Negative ground only
Standby Current (MASTER switch set to position 0)	0 mA. (not including panel lamp)
Operating Temperature Range	-30°C to +65°C
Dimensions (HWD-excluding heat sink, knob and rear trim)	2-3/8" x 7-7/8" x 8" (6cm x 20cm x 20.3cm)
Weight (approx.)	10 lb. (4. 5kg.)

2-2. SIREN.

Operating Current (14.	OVDC-WAIL)
1 Low Power Speaker	5 amperes
2 Low Power Speakers or 1 High Power Speaker	10 amperes
2 High Power Speakers	15 amperes
Frequency Range	550 to 1500Hz
Cycle Rate	WAIL-10 cycles/min.
	YELP-180 cycles/min.
	HI-LO- 50 cycles/min.

Voltage Output (approx.)

1 Low Power Speaker	45VP-P
2 Low Power Speakers	40V P-P
1 High Power Speaker	64V P-P
2 High Power Speakers	60V P-P

2-3. AUDIO.

NOTE

14. OVDC supply voltage. Radio potentiometer and GAIN control at maximum

Frequency Range	300 to 10,OOOHZ
Harmonic Distortion	10% max. at all power levels from . 5 to 70 watts (frequency response ±3dB)
Input Impedance	Radio-3.6K ohms
	Carbon Mic. -3.6K ohms
	Magnetic Mic. -10K ohms
Signal input voltage required to obtain 20 Vrms across a 5.5 ohm load	Radio-0.45 Vrms
	Carbon Mic.-0.165 Vrms
	Magnetic Mic.-0.025 Vrms

2-4. ACCESSORIES (OPTIONAL).

Model MNCT	Transistorized Noise Canceling Microphone
Model FN900	Federal Model MNCT Microphone Adapter Module
Model FN901	Federal Model MNC or MR Microphone Adapter Module
Model FN902	Federal Model VPII Microphone Adapter Module
Model FN903	Motorola Microphone Adapter Module
Model FN904	Motorola Micor Microphone Adapter Module
Model FN905	RCA Microphone Adapter Module
Model FN906	RCA 500 Microphone Adapter Module
Model FN907	GE Microphone Adapter Module
Model FN908	GE Master It Microphone Adapter Module
Model FN909	GE TPL Microphone Adapter Module
Model FN910	Federal Duty Patrol Microphone Adapter Module
Model FN911	Aerotron MPAC 6,7 or 8. Adapter Module
Model FN912	RF Communications Model RF-498 Adapter Module
Model FN913	Motorola "Converta-Com" Microphone Adapter Module

SECTION III

INSTALLATION

3-1. UNPACKING.

After unpacking the Model PA 2100, examine it for damage that may have occurred in transit. If the equipment has been damaged, file a claim immediately with the carrier stating the extent of the damage. carefully check all envelopes, shipping labels and tags before removing or destroying them. If an adapter module was ordered, is packed in a separate carton.

3-2. GENERAL.

Before connecting any wires to the A 2100 install all revolving and flashing lights, gunlocks trunk locks and other devices that will be controlled by the PA 2100. Route all wiring to the mounting location of e PA 2100, allowing 8 to 12 inches of extra wire at the siren location. Install the vehicle speakers and route the speaker ads (AWG 18 wire) to the siren location. Run leads to the vehicle's horn ring circuit. Install the 50 ampere circuit breaker provided between the battery and the firewall, as close to the battery as practical. Install leads between the battery and the circuit breaker and the siren location using re no smaller than AWG 10. Install the ring between the ignition switch and the 'en installation site. If desired, all Ids at the PA 2100 may be terminated crimp-on spade connectors.

3-3. CONTROL MODULE ACCESSORY SWITCHES. (PA 2100 Only)

A. General.

The PA 2100 Control Module is designed to accommodate up to four optional customer installed pushbutton switches. These switches are used to control various vehicle mounted devices. There are two types of switches available. Switches that meet the customer's requirements are selected at the placement of the order. Switch types, their descriptions, and typical applications are listed in Chart 1-1.

B. Installation.

If no accessory switches are to be installed in the front panel of the Control Module, disregard the procedure that follows:

CAUTION

Do not change any factory wiring in the PA 2100 when the optional accessory switches are being installed. Any change in the existing wiring may overload the circuitry and damage the unit.

1. In order to wire the accessory witches, it is necessary to remove the top over from the chassis. To remove the over, loosen the two hex head captive crews on the bottom of the unit and slide e cover off.

2. Remove one hole plug a switch to be installed on the front panel of the Control Module. Push the plugs out from the inside of the unit.

3. Install the switches by inserting them into the desired holes in the front panel in accordance with the instructions provided with the switches. Press the switches into the front panel until they snap in place.

4. Pass all wiring to the accessory switches through the 1" hole in the rear panel of the Control Module. Refer to Chart 1-1 for information concerning the wiring of the switches. The wiring to each switch is determined by the device that the switch controls. Follow the installation instructions included with the devices and ensure that the device is properly fused.

3-4. BRACKET MOUNTING.

The siren is shipped with a swinging mounting bracket that makes it possible to mount the unit in a variety of positions. Positioning the bracket above the unit allows mounting on the underside of the dash. Positioning the bracket below the unit permits mounting on any horizontal surface or, in conjunction with Federal's TU70 Tunnel Mount, on the vehicle's transmission hump.

Mount the siren in a location that is convenient and comfortable to the operator and where it will not interfere with the safe operation of the vehicle. Keep visibility and accessibility of controls in mind when choosing a mounting location. To install the racket under the dash, determine the mounting location and proceed as follows See figure 3-1):

CAUTION

The unit must be installed in an adequately ventilated area. Never install the siren near heater ducts.

A. Use the mounting bracket as a template and scribe two drill positioning marks at the selected mounting location under the dash.

B. Drill two 1/4-inch diameter holes at the position marks.

C. Secure the mounting bracket to the dash using two each of the following: 1/4-20 x 3/4 hex head screws, 1/411 split lockwashers and 1/4-20 nuts as shown in figure 3-1.

D. Set the siren on the floor of the vehicle as close as possible to its final mounting location. DO NOT secure the PA 2100 to the mounting bracket at this time.

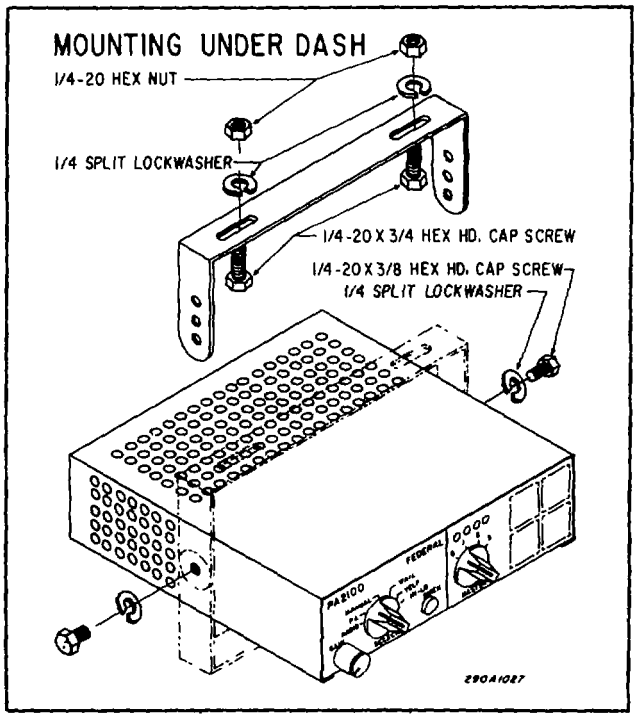


Figure 3-1. Installation of Siren Under the Dash

When installing the PA 2100 on the transmission hump, a Federal Model TU70 Tunnel Mount is recommended. The TU70 is drilled and tapped to accept the PA 2100 mounting bracket. Follow the installation instructions packed with each unit.

3-5. POWER CONNECTIONS.

NOTE

The PA 2100 can be installed only in vehicles that have a negative ground electrical system.

A. Install the 50 ampere circuit breaker provided in the vehicle engine compartment. Mount the circuit breaker as close as practical to the battery.

B. Connect the red power lead of the PA 2100 to one side of the circuit breaker. If necessary, splice additional AWG 8, or heavier, wire to the heavy red lead using the splice connector supplied.

C. Use AWG 8, or heavier, wire to connect the other side of the circuit-breaker to the vehicle battery.

D. Connect the black wire directly to the vehicle frame as close as possible to the siren.

3-6. SPEAKER CONNECTIONS.

Either 58 watt or 100 watt speakers may be used with the PA 2100. The PA 2100 is also capable of driving a single 200 watt speaker such as the Federal TS200.

If one or two 58 watt speakers such as Federal's CP 25 or TS 24 are being installed, set the speaker HI/LOW switch, SW302, to LOW. See figure 3-2 for the location of SW302. Connect the speaker leads to the SPKR terminals with AWG 18 wire, as shown in figure 3-3.

CAUTION

When using 58 watt speakers, ALWAYS be sure that the Speaker switch is set to LO. If the speaker switch is set to HI, the 58 watt speakers will probably be damaged or destroyed.

When 100 watt speakers such as Federal's CP100 or TS100 are being installed, set SW302 to HI before connecting the speakers to the siren. Use AWG 18 wire as indicated in figure 3-3.

When two speakers are used, it is necessary to connect the speakers in parallel and in phase for optimum performance. This can be accomplished by connecting the speaker leads marked "1" to the same SPKR terminal on the siren and the two leads marked "2 " to the other SPKR terminal (see figure 3-3).

The PA 2100 is capable of driving only one TS200 speaker. Therefore, if a TS200 is to be used with the siren, DO NOT connect any other speaker to the siren. Follow the instructions packed with the TS200 and set the speaker switch to HI before connecting the speaker to the siren with AWG 18 wire (see figure 3-4).

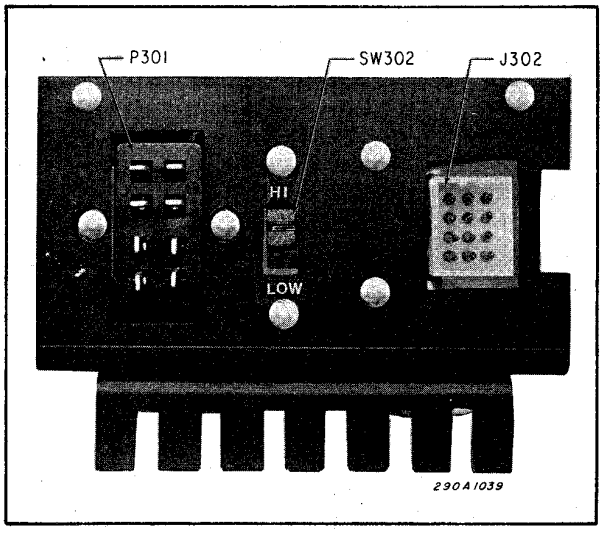


Figure 3-2. Siren Module Rear View.

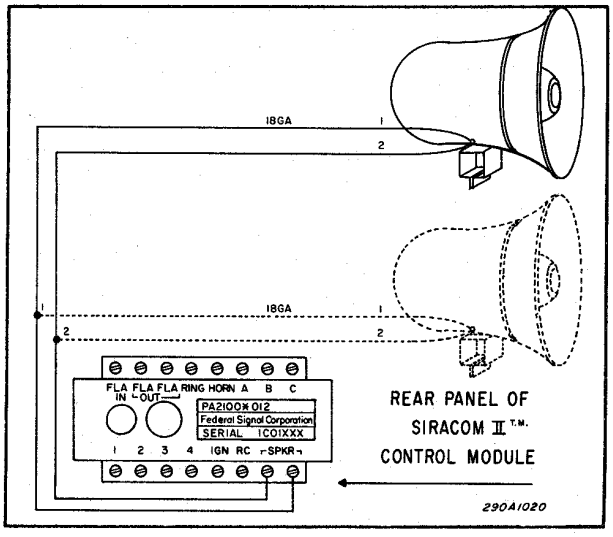


Figure 3-3. 58 Watt and 100 Watt Speaker Connections

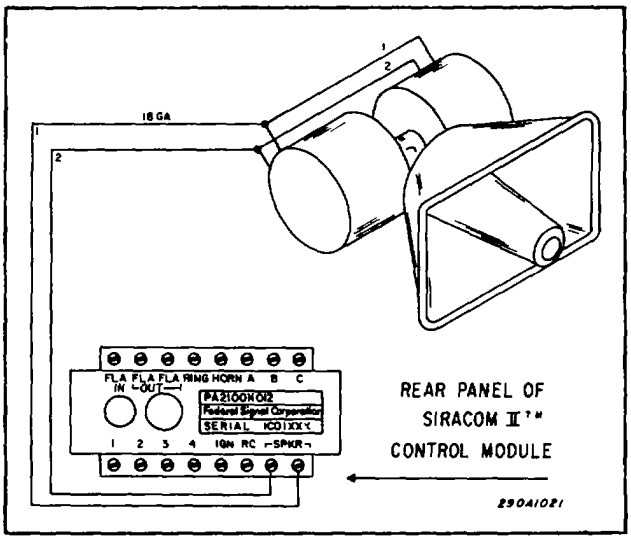


Figure 3-4. TS200

NOTE

Refer to Section IV for a description of the operation of the PA override and common microphone features. The PA 2100 can be easily set for operation in either of these modes. If required, the mode of operation can be changed at a future date.

A. PA Override Connections.

In order to take advantage of the PA override feature, separate microphones are required for the two-way radio and the siren PA function. If PA override operation with rebroadcast of radio messages is desired, proceed as follows (see figure 3-5):

1. Slide the Siren Module from the PA 2100 chassis.

2. Slide the optional FN900 Adapter Module into the Adapter Module Channel.

3. Start the sheet metal screw provided through the hole in the channel and into the hole in the bottom of the Adapter Module.

4. Replace the Siren Module in the PA 2100 chassis. Make sure that the connector on the Siren Module mates properly with the connector on the Adapter Module. Tighten the sheet metal screw that was inserted in step 3.

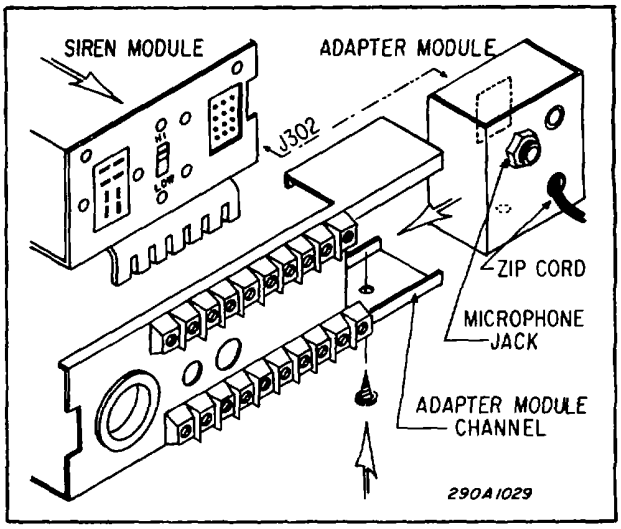


Figure 3-5. Adapter Module Installation.

5. Connect the brown zip cord across ire two-way radio's speaker voice coil terminals.

6. Plug the Model MNCT Microphone into the Adapter Module. The PA 2100 is now set for PA override operation.

B. Common Microphone Connections.

1. Obtain the Adapter Module that is appropriate for the make of two-way radio in the vehicle. Install the Adapter Module in accordance with the instructions supplied with the module.

2. Plug the two-way radio microphone into the receptacle on the Adapter Module. The PA 2100 is now set for common microphone operation.

C. Modification of Siren Amplifier for Positive PTT Circuits.

Perform the following modification only if the radio on your vehicle has a positive PTT circuit (refer to the instructions provided with the adapter module).

1. Slide the Siren Module out of the housing.

2. Remove the Main Circuit Board from the module by removing the mounting screws and unplugging the Main Circuit Board from the Front Circuit Board. Disconnect the rear connector (J303) from the Main Board and lift the board away from the Chassis.

3. Solder a length of AWG 22 bare wire between P201 and P202 on the foil side of the Front Circuit Board in the Siren Module. See figure 3-6 for the location of P201 and P202.

4. Replace the Main Circuit Board in the Siren Module chassis. When reconnecting J303, make sure that the color dot on the connector is next to the color dot on the board.

5. Replace the Siren Module in the housing.

3-8. IGNITION CIRCUIT.

Connect the terminal labeled IGN to the vehicle ignition or accessory circuit using AWG 16 wire. This terminal supplies power to the panel light and pilot light as well as the radio control circuit when the ignition switch is turned on.

3-9. HORN RING CIRCUIT.

To connect the vehicle's horn ring circuit so that the horn ring controls the siren's Manual Wail operation in MANUAL and TAP II operation in WAIL, YELP, and HI-LO, proceed as follows (see figure 3-7):

A. Locate the wire that connects the horn ring to the horn relay or the horns. Cut this wire and, if necessary, splice additional wire to each end so that these wires can be terminated on the rear of the PA 2100.

B. Connect the wire that is connected to the horn ring switch to the PA 2100 terminal labeled RING.

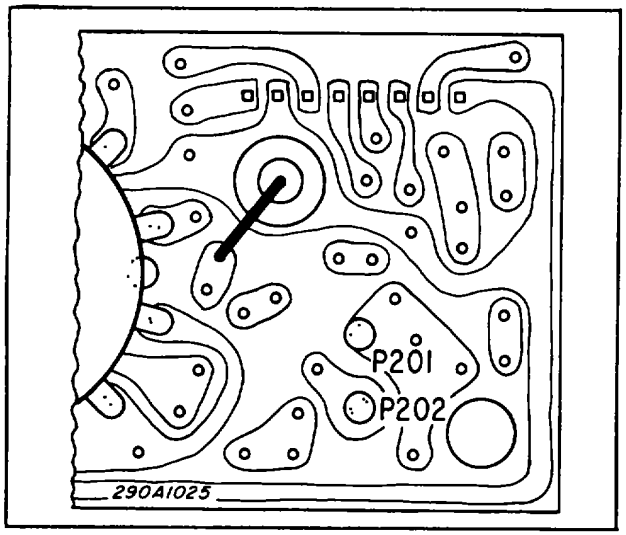


Figure 3-6. P201 and P202 Location

C. Connect the wire from the horn relay or horn(s) to the HORN terminal on the rear of the PA 2100. The siren automatically compensates for both positive and negative horn ring circuits without any adjustments.

3-10. RADIO CONTROL CIRCUIT.

NOTE

Before performing the procedure in this paragraph, ensure that the instructions in paragraph 3-8 have been performed.

Proper connection of the radio control circuitry allows power to be supplied to the two-way radio whenever the vehicle's ignition is on or when the SELECTOR switch is set to RADIO (radio rebroadcast). To perform this connection, proceed as follows (see figure 3-8).

A. Connect a wire from the vehicle's two-way radio relay control circuit to the RC terminal on the rear of the PA 2100. If necessary, refer to the two-way radio service manual to locate this wire in the radio.

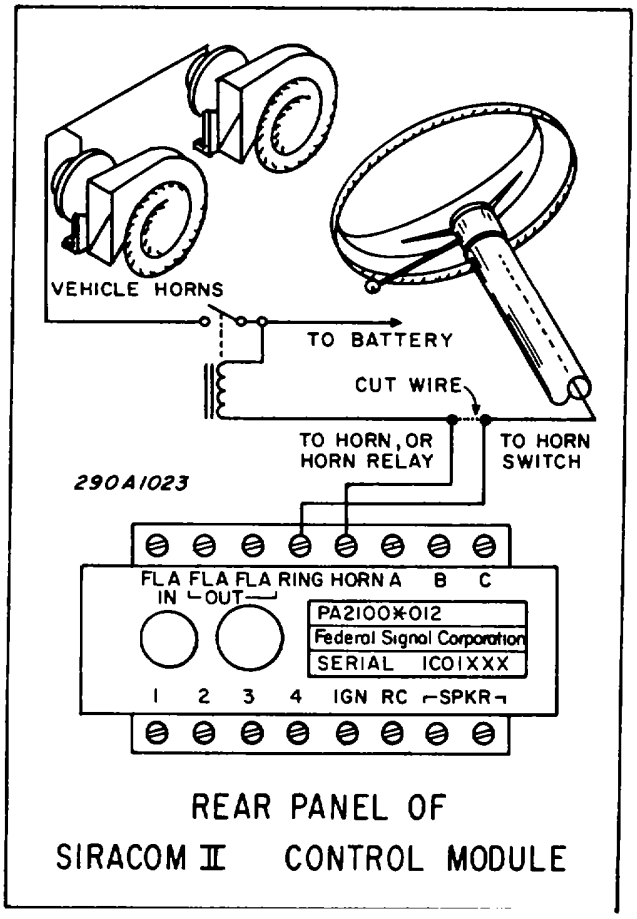


Figure 3-7. Horn Ring Connections.

B. If the two-way radio draws more than 10 amperes of current, install a 12V DC relay in the circuit. Connect one end of the relay coil to the RC terminal on the rear of the siren module. Ground the other end of the relay coil. Use the relay contacts to control power to the radio. See figure 3-8.

NOTE

FCC Rules and Regulations require the use of a key-lock switch to control the power to a mobile transmitter. Therefore, wire the PA 2100 RC terminal to control power to the receiver only. Wiring to accomplish this type of control varies with the type of two-way radio. Refer to the radio manufacturer's service manual.

3-11. MASTER SWITCH.

Terminals 1,2, and 3, on the rear panel of the PA 2100 are controlled by the MASTER switch. Any combination of terminals can be controlled by a given position of the MASTER switch. The actual terminals controlled by a given position of the MASTER switch are programmed by means of the nine section miniature rocker switch inside of the Control Module. To make use of this capability, proceed as follows:

A. Connect the devices to be controlled by the MASTER switch, SW 401, to terminals 1,2, or 3 on the rear of the unit (terminal 4 is not connected to SW 401). For example, flashing lights may be connected to terminal 1; rotating lights to terminal 2; and the optional flasher to terminal 3. If desired, several devices may be connected to a given terminal, provided that the 30 ampere current capacity of the terminal is not exceeded.

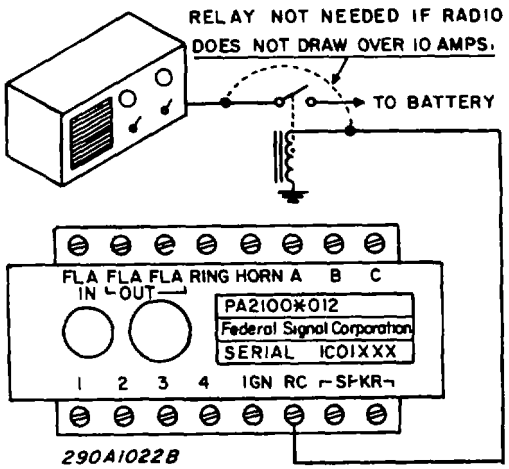


Figure 3-8. Radio Control Connections.

NOTE

The MASTER switch is programmed by means of the nine section miniature rocker switch, SW501. As shown in figure 3-9, each section of the switch is labeled to indicate the terminal and the MASTER position that it programs. ONE, TWO, and THREE indicate the terminal programmed by each group of three switch sections. The numerals "1", "2", and "3" denote the MASTER position controlled by the individual rocker switch sections. For example, the closed contact of ONE-1 programs terminal 1 for MASTER Position 1, the ONE-2 contact programs terminal 1 for MASTER position 2; etc. Therefore, when ONE-1 is depressed, the device(s) connected to terminal 1 is (are) energized when the MASTER switch is set to position 1; when ONE-2 is depressed, the device(s) connected to terminal 2 is(are) energized in MASTER position 2; etc.

B. Determine which device(s) is(are) to be controlled by each MASTER switch position. Using the example in step A, it may be desired to activate the flashing lights in MASTER switch position 1, rotating lights in position 2, and all three devices in position 3.

To program the example described in steps A and B of this paragraph, close switches ONE-1 and ONE-3 to program terminal 1 (flashing lights) for MASTER positions 1 and 3, respectively. Close TWO-2 and TWO-3 to program terminal 2 (rotating lights) for positions 2 and 3 respectively. Close THREE-3 to program terminal 3 (optional flasher) for MASTER position 3 (see figure 3-9).

C. Remove the top cover of the chassis by loosening the hex head captive screws and sliding off the cover.

D. Program the MASTER switch by depressing the appropriate sections of 3W501 with a pencil point or similar pointed tool. As indicated in figure 3-9, the switch contacts are closed when the upper half of the rocker is pressed. Any combination of terminals can be controlled by any given MASTER switch position.

E. Replace the top cover on the chassis.

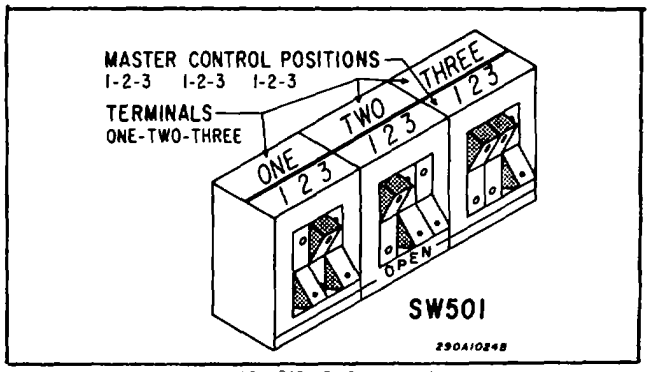


Figure 3-9. MASTER Switch Programming.

3-12. FLASHER OPTION.

Those sirens designated PA 2100*012F on the rear legend plate include the factory installed Flasher option. If your siren is NOT designated PA 2100*012F, disregard the procedure in this paragraph.

The flasher circuitry has an On Override and an Off Override feature. When a positive voltage is applied to terminal B, on the rear panel of the PA2100, the lamp(s) connected to the FLA OUT terminals are illuminated continuously, regardless of the voltage present at FLA IN. Conversely, a positive voltage at terminal A, on the rear panel, causes the lamp(s) connected to FLA OUT to be off continuously, regardless of the voltage present at FLA OUT or terminal B.

Figure 3-10 shows the wiring diagram of a typical headlight flashing circuit. This circuit is configured so that the flasher circuitry in the siren is defeated when the headlight switch is turned on.

A. Single Flasher Operation.

1. Connect a flasher control switch that is capable of controlling 12VDC such as a Control Module Accessory Switch or a MASTER CONTROL switch terminal, to the FLA IN terminal on the rear of the Control Module.

2. Connect the circuit to be flashed to the FLA OUT terminal closest to the FLA IN terminal.

B. Alternating Flasher Operation.

1. Connect a flasher control switch that is capable of controlling 12VDC, such as a Control Module Accessory Switch or a MASTER switch terminal, to the FLA IN terminal on the rear of the Control Module.

2. Connect the circuits to be alternated to the FLA OUT terminals, one circuit to each of the terminals.

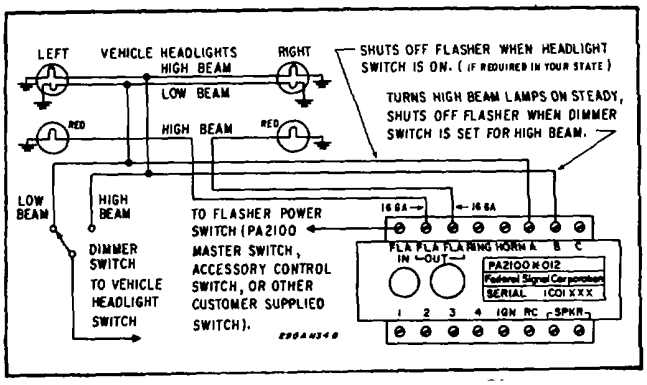


Figure 3-10. Typical Headlight Flashing circuit.

3-13. RELATIVE PA LOUDNESS ADJUSTMENT.

After all of the electrical wiring to the PA2100 is complete, set the SELECTOR switch to PA. Depress the microphone push-to-talk switch, speak in a normal voice, and adjust the front panel GAIN control for the desired sound level outside the vehicle. Turn on the two-way radio and adjust the volume for a comfortable listening level inside the vehicle. Set the siren SELECTOR switch to RADIO. Stand outside of the vehicle and note the radio rebroadcast loudness. If it is too loud, or too soft, adjust R142, accessible through a hole in the top of the unit (see figure 3-11), for the desired level.

Clockwise rotation of R142 decreases the sound level. Counterclockwise rotation increases the sound level.

When this adjustment is completed, the loudness of the radio rebroadcast and public address may be controlled with the front panel GAIN control.

Secure the PA2100 to the mounting bracket with 1/4-20 x 3/4" hex head screws and 1/4" split lockwashers. Tilt the PA 2100 to the desired position and tighten the 1/4-20 x 3/4" hex head screws.

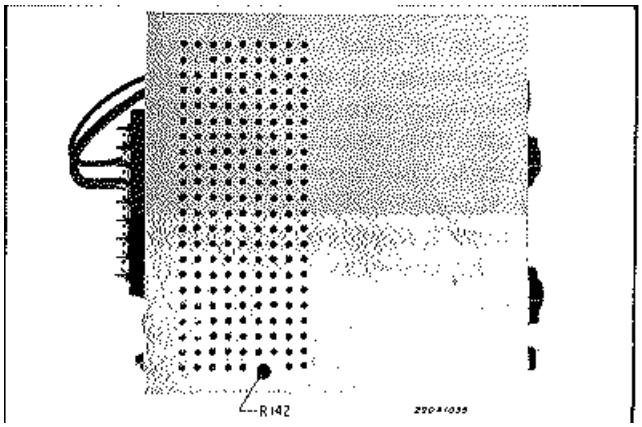


Figure 3-11. PA 2100 Top View.

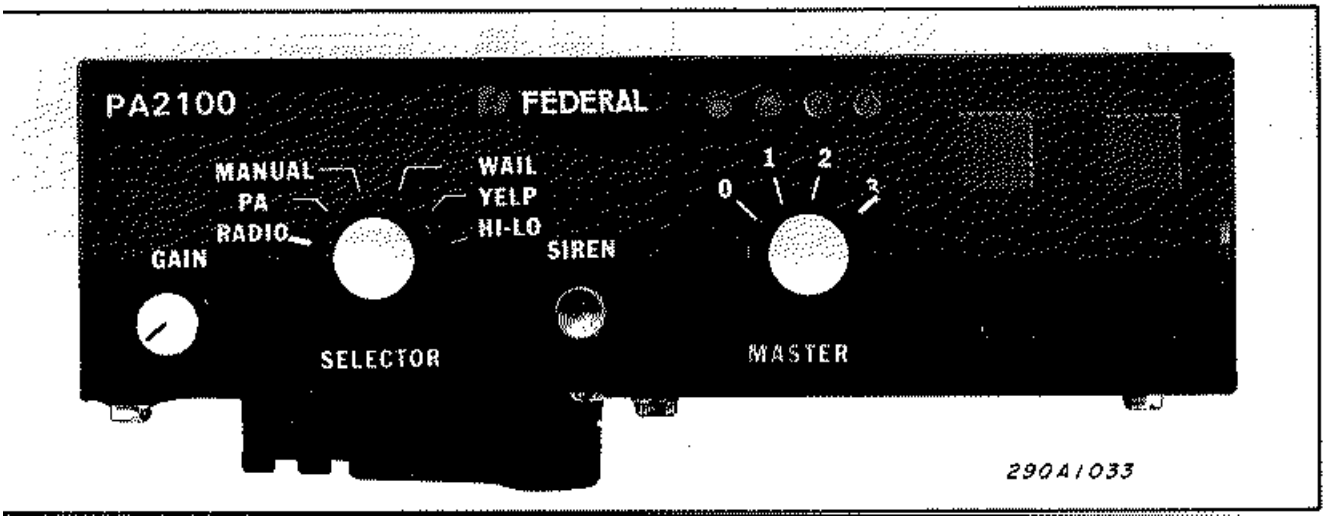


Figure 4-1. PA2100 Front View

4-1. GENERAL.

As shown in figure 4-1, all PA 2100 operating controls are located on the front panels of both the Siren Module and the Control Module.

A line of optional adapter modules allows the user the option of using either the siren's own microphone (PA override) or the two-way radio microphone (common microphone).

The optional Model MNCT Microphone and Model FN900 Adapter Module are required when PA override operation is used. When the siren is connected for PA override operation, the two-way radio and the siren each have their own separate microphones. In addition the public address is available in any SELECTOR switch position, E except RADIO, when the microphone push-to-talk switch is depressed.

In common microphone operation, the radio microphone is used for both the siren and the two-way radio in the vehicle. A Federal adapter module, that is designed to accommodate the two-way radio microphone connects the siren directly to the radio. The common microphone is electrically connected to the two-way radio in all SELECTOR switch positions except PA. When the SELECTOR switch is set to PA, the two-way radio microphone is connected to the siren amplifier so that announcements can be made over the siren speaker system.

4-2. MASTER SWITCH.

The MASTER switch is a four position rotary switch that is used to control the vehicle's emergency warning light system d the electronic siren. The equipment controlled by a given MASTER switch potion depends upon the configuration of individual installation.

In a typical installation, secondary warning lights (flashing lights) are energized when the MASTER switch is set to position 1. Revolving lights are ordinarily stalled so that they function in position In position 3, the siren can be activated hen the siren's SELECTOR switch is set one of the siren positions. In addition, any combination of warning lights that are activated in positions 1 or 2 or additional warning lights can be energized when the MASTER CONTROL is in position 3.

The MASTER switch position is indicated by three red LED'S (light emitting diodes) on the front panel of the Control module. The "0" position of the switch is the "off" position and all of the LED'S are extinguished. When the MASTER switch is in position 1, one of the LED'S illuminate; in position 2, two LED'S are illuminated, and in position 3, all three LED'S illuminate.

If your installation was wired as described in paragraph 3-9 of this manual, he horn ring activates the vehicle's horn when the MASTER switch is set to position 0,

1, or 2. However, when the MASTER switch is set to position 3, the horn ring or other auxiliary switch operates the TAP II feature if the SELECTOR switch is set to WAIL, YELP or HI-LO. The TAP II feature is operated by actuating the auxiliary switch, causing the siren to "Yelp" until the auxiliary switch is operated again.

The Manual Wail signal is operational in all four MASTER switch positions provided that the SELECTOR switch is in the MANUAL position. When the MASTER switch is in positions 1 or 2, and the SIREN switch, SW201, is depressed, the siren sounds until SW201 is released. When SW201 is released, the siren signal ceases immediately. The operation of the Manual Wail signal when the MASTER switch is in position 3 is similar except that when SW201 is released, the frequency of the siren signal "coasts down" to approximately 550Hz before it ceases.

If your installation has been wired as described in paragraph 3-8, power is applied to the two-way radio whenever the vehicle ignition switch is on. In addition, the front panel of the PA 2100 is illuminated and the green LED above the MASTER switch is lit, indicating that power is applied to the siren.

4-3. GAIN CONTROL.

The GAIN control controls the loudness of the sound output from the siren speaker(s) when the siren is being used as a public address or radio rebroadcast amplifier. Clockwise rotation of the GAIN control increases the sound level from the speaker. The GAIN control does not control the volume of the siren.

The maximum usable setting of the GAIN control is determined by the setting of the control where feedback or "squeal" occurs. The sound level at which "squeal" occurs depends upon microphone gain, speaker placement, the proximity of reflective surfaces, etc. Adjust the GAIN control to the position just below the point at which feedback occurs, or as desired.

4-4. SELECTOR SWITCH.

The SELECTOR switch is a six-position rotary switch that selects the siren function. The following describes the six positions of the SELECTOR switch:

A. RADIO

When the SELECTOR is in this position, incoming radio messages are amplified by the siren amplifier and rebroadcast over the siren speaker system. Volume is controlled by the GAIN control. An LED indicator illuminates to indicate that the SELECTOR switch is set to RADIO.

If the system is wired as described in paragraph 3-8, power is always supplied to the two-way radio, even if the ignition switch is off.

B. PA

When the SELECTOR is set to the PA position, the siren amplifier may be used as a public address amplifier. In those installations where the siren and the two way radio share the same microphone, the PA position is the only SELECTOR switch position that connects the microphone to he siren amplifier.

C. MANUAL

This position of the SELECTOR switch allows operation of the siren with he front panel SIREN push-button switch. the siren can also be activated by means if an auxiliary switch, such as a foot witch or horn ring switch.

D. WAIL

In this position the siren produces continuous "wailing" sound, up and down in frequency.

E. YELP

This position of the SELECTOR witch causes the siren to produce a rapid warbled" tone.

F. HI-LO

In this switch position the siren produces a two-tone signal. This distinctive signal may be reserved for any special indication or situation.

4-5. SIREN BUTTON.

The SIREN button activates the siren then the SELECTOR switch is set to the MANUAL position.

SECTION V
SIREN MODULE CIRCUIT DESCRIPTION

5-1. General

Refer to the Siren Module Functional Block Diagram, figure 5-1, and the Siren Module Schematic Diagram, figure 6-6, while reading the following paragraphs.

5-2. TONE CONTROL OSCILLATOR.

A. General

When the SELECTOR switch, SW301, is set to the WAIL, YELP, or HILO position, IC101 and IC102 control the siren tone output. The control voltage generated by IC102 controls the output frequency of the VCO (voltage controlled oscillator).

B. WAIL

When SW301 is set to WAIL, the Wail tone control voltage is initiated by IC102. IC102 is basically a timing circuit whose output voltage levels are used to control the charge and discharge of timing capacitor, C106. C106 charges through CRI04 and R106 until it reaches IC102's threshold voltage (approximately 6.9 volts). When the voltage on C106 and IC102-6 reaches approximately 6.9 volts, IC102 changes states and C106 discharges through R126, R127 and R128. When the voltage on C106 reaches the trigger voltage of IC102 (approximately 3.5V), IC102 again changes states and the cycle repeats. The WAIL control voltage at IC102-6 is then applied to Emitter Follower, Q101 and to the Scaling Amplifier, IC103B.

The Scaling Amplifier expands (scales) and inverts the control voltage waveform at the emitter of Q101 to the level necessary to control the Voltage Controlled Oscillator (VCO) without significantly affecting the shape of waveform. The gain of IC103B is determined by R113 and R116. The scaled control voltage waveform at IC103B-1 is coupled through CR108 to the VCO Control Point, IC104-5.

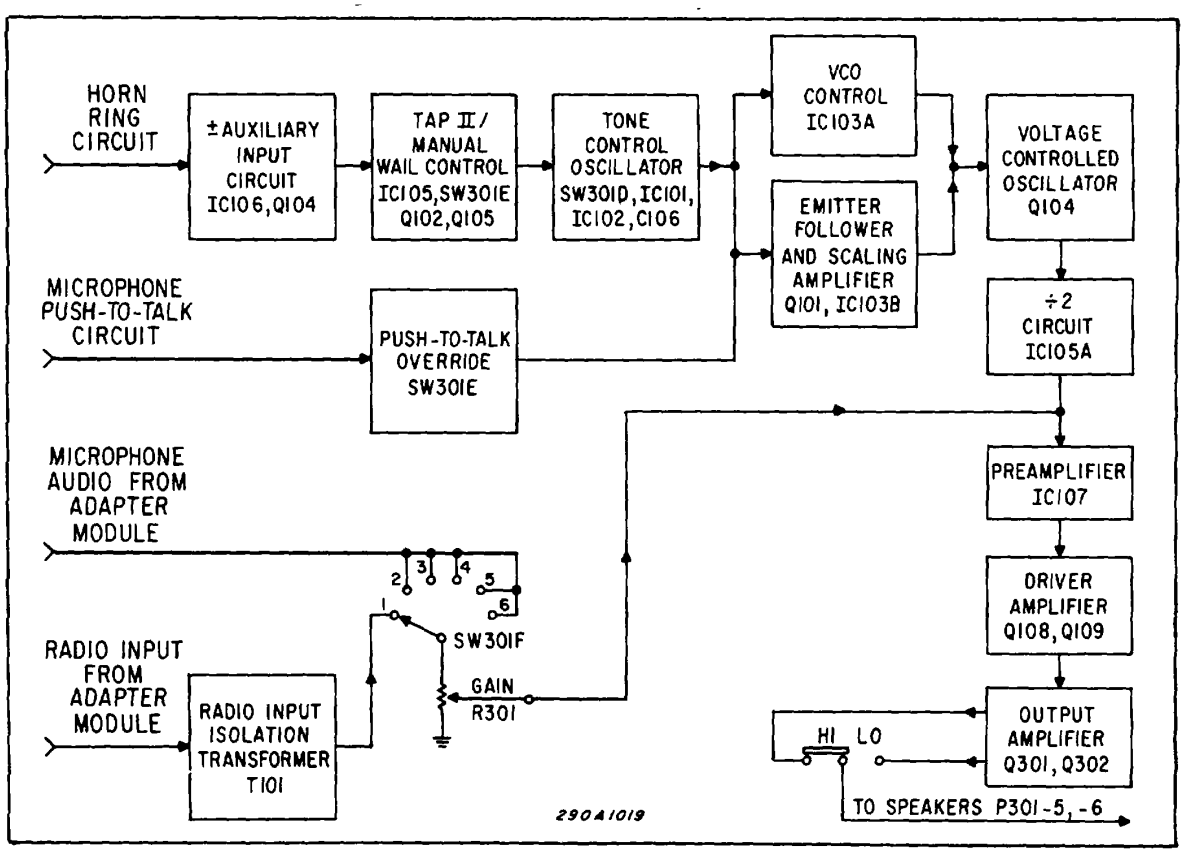


Figure 5-1. Siren Module Functional Block Diagram.

The output signal from the Voltage Controlled Oscillator, IC104, is a series of pulses whose frequency is determined by R119, R120, C105 and the control voltage at the VCO control point, IC104-5. As the control voltage at IC104-5 increases, the frequency of the output of IC104 decreases. Conversely as the control voltage decreases the output frequency increases. The output signal from IC1043 is applied to the .÷2 Circuit at IC105A-13.

The ÷2 Circuit, IC105A, is a toggle flip-flop that divides the pulse frequency by 2. The symmetrical output from this circuit is present at IC105A-15.

When the siren operator turns off the WAIL tone, the timing capacitor, C106 begins discharging toward zero volts. However, C106 is connected through CR105 and R109 to the regulated supply of Q101. As a result, C106 does not completely discharge to zero volts. Consequently, the residual charge on C106 is applied to Q101 and IC103B, applying a constant level control voltage to IC104-5. Simultaneously, Q101 also applies a sample of the voltage on C106 to the VCO Control Point, IC103A-5. When the voltage at IC103A-5 becomes less positive than the fixed voltage at IC103A-6, IC1O3A-7 goes low. This low resets the ÷2 Circuit, preventing the constant level control voltage at IC 104-5 from allowing the VCO to generate an annoying and false constant frequency tone.

C. YELP.

When SW301 is set to YELP, the operation of the circuitry is similar to WAIL, except that C106 charges through CR106 and R104 and discharges through R126 and IC101C. The charge and discharge rate of C106 is more rapid in YELP than in WAIL. Consequently, the control voltage variations and the resultant tone frequency variations are more rapid in YELP than in WAIL.

D. HI-LO.

In HI-LO, C106 charges through CR104 and R105 and discharges through R126, R127 and Icl01D, producing a symmetrical it square wave at IC102-3. When the voltage is at IC102-3 is high, the VCO control voltage developed by R102 and R118 and is applied directly to the VCO control point, IC104-5. When IC102-3 is low the voltage at IC104-5 is determined by R102, R103, and R118.

5-3. ± AUXILIARY INPUT.

The ± Auxiliary Input circuit consists of CR110, CR111, Q104, IC106, and associated components. This circuit allows the Manual Wail and TAP II circuits to respond to the vehicle's horn ring or other auxiliary switch without regard to polarity when the MASTER switch is set to position 3.

In the off state, Q104 is biased off, causing a low to be present at IC106-3. If negative horn ring circuit is used to trigger the ± Auxiliary Input Circuit, depressing the horn ring applies a negative (ground) potential to the cathode of CR111, allowing R111 to conduct. The conduction of R111 brings Q104 into conduction, causing IC106 to turn on and produce a high at C106-3. This high remains at IC106-3 or the entire time that the horn ring is depressed, plus approximately 200 millisecond after the horn ring is released. The high at IC1O1-3 is applied to IC102, allowing the Tone Control Oscillator to operate s previously described.

If a positive horn ring circuit is used activate the ± Auxiliary Circuit, the operation of the circuit is similar. When the horn ring is depressed, the positive voltage (+14VDC) causes CR110 to conduct so that positive voltage is applied to the base of 104, bringing Q104 into conduction. Q104 en activates IC106 and the circuitry operates as previously described.

5-4 MANUAL WAIL AND TAP II

The SIREN switch, SW201, can operate the Manual Wail signal whenever the SELECTOR switch is set to MANUAL. The Manual Wail signal can also be activated the horn ring or other auxiliary switch when the MASTER switch is set to position 3.

When SW201 is depressed, the base of 07 is grounded through R157 and CR207,turning on Q107. The conduction of Q107 simultaneously turns on Q106, Q103, and Preamplifier IC107. The conduction of Q103

allows the Tone Control Oscillator to begin generating a Wail signal. The conduction of Q106 turns on the Driver Amplifier, Q108 and Q109.

As described in paragraph 5-3, if the MASTER switch on the Control Module is set to position 3, the ±Auxiliary Input circuit can activate the Manual Wail signal.

TAP II operation is accomplished by the ±Auxiliary Input circuit in conjunction with IC105 and IC106. When an input is applied to the ±Auxiliary Input, IC106 applies a positive pulse to IC105-3 causing IC105-1 to be grounded. This ground is applied through R122 to Q102, bringing Q102 into conduction. The conduction of Q102 applies positive voltage to CR103 and R104 to start the Yelp signal. The positive voltage from Q102 also turns on IC101C. IC101C, acts as part of the discharge path for C106.

The Yelp signal continues until the ±Auxiliary Input circuit causes IC106 to produce another positive pulse at IC105-3. As a result, the voltage at IC105-1 returns to its high level, turning off Q102, and normal siren operation resumes.

IC105-7 is held at ground potential for TAP II operation. However, when the SELECTOR switch, SW301, is set to RADIO, PA, or MANUAL, TAP II operation is not required. Therefore, to prevent the operation of the TAP II circuitry when SW301 is set to RADIO, PA, or MANUAL, IC105 is held reset by the application of the positive supply voltage to IC105-7. IC105-7 is also held positive between switch positions so that IC105 is held reset as the position of SW301 is changed.

5-5. PREAMPLIFIER AND AMPLIFIER STAGES.

All siren and audio signals are applied to the Preamplifier, IC107. Siren signals are applied through C114 and R147 to I07-6. Audio signals from the microphone or radio are coupled through C115 id Rl45 to IC107-2. The amplified output IC107-8 is coupled through C118 to the primary of T102. The secondary of T102 plies a push-pull input to the Driver Amplifier Q108 and Q109.The collectors of is stage are coupled to the output Amplifier, Q301 and Q302. The output of p301 and Q302 is coupled through T301 and P301-5 and 6 to the siren speaker(s). The HI/LO switch, SW302, is set to HI when a 200 watt speaker or 100 watt speakers are connected to the siren. SW302 is set to LO when 58 watt speakers are used.

5-6. PUSH-TO-TALK OVERRIDE.

When the siren and the two-way radio each have separate microphones, the siren is set for PA override operation. The PA override feature allows the siren operator to use the siren as a public address amplifier when the SELECTOR switch is set to any position except RADIO.

When the operator depresses the microphone push-to-talk switch, the Push-To Talk Line is grounded. This ground potential is applied through SW301 to IC301A and through Q101 to IC103B. In addition, the ground potential is also applied to the Timing Capacitor, C106, preventing it from alternately charging and discharging. As a result, siren tone generation ceases, allowing microphone audio to be amplified by the Preamplifier and Amplifier stages.

5-7. ALTERNATING FLASHER.

The optional Alternating Flasher is located on a printed circuit board in the Control Module. The schematic diagram of this circuit is shown in figure 6-12.

The Alternating Flasher is basically an unstable multivibrator that operates at a nominal rate of 90 cycles per minute.

SECTION VI

SERVICE AND MAINTENANCE

6-1. GENERAL.

Most of the electronic component parts used in the PA2100 are standard items that are available from almost any radio or electronics supply outlet.

The factory can and will service your equipment or provide technical assistance with problems that cannot be handled satisfactorily and promptly locally.

Address all communications and shipments to:

Service Department
Signal Division
Federal Signal Corporation
136th and Western Avenue
Blue Island, Illinois 60406

If any unit is returned for adjustment or repair, it can be accepted only if we are notified by mail or phone in advance of its arrival. Such notice should clearly indicate the service requested and give all pertinent information regarding the nature of the malfunction and, if possible, its cause.

The following diagrams are provided to assist repair personnel when service to the equipment is required.

Fig.	Diagram
6-1	SELECTOR Switch Diagram
6-2	Siren Module Printed Circuit Board Removal
6-3	Siren Module Internal View
6-4	Siren Module Schematic Diagram
6-5	Siren Module Main Circuit Board Parts Location Diagram
6-6	Siren Module Front Circuit Board Parts Location Diagram
6-7	PA2100 Bottom View
6-8	Control Module Internal View
6-9	Control Module Schematic Diagram
6-10	Control Module Relay Circuit Board Parts Location Diagram
6-11	Control Module LED Circuit Board Parts Location Diagram
6-12	Control Module Optional Flasher Board Schematic Diagram
6-13	Control Module Optional Flasher Circuit Board Parts Location Diagram

6-2. SIREN MODULE.

A. General

Any competent electronic technician should have little difficulty in tracing and correcting a malfunction. When troubleshooting the PA2100 Table 6-1 may be useful for isolating a malfunction.

When replacing small components, use care when soldering. Heat easily damages integrated circuits, transistors, capacitors and circuit boards. Therefore, it is advisable to use long-nose pliers or similar heat sink on the component lead being soldered.

When replacing the Driver Amplifier transistors, Q108 and Q109, or the Output Amplifier transistors, Q301 and Q302, insure that a matched pair is used. In addition, always replace the mica insulators. Use heat sink compound on both sides of the mica insulators and ensure that they are properly installed. Improper installation of the insulator could cause a short circuit.

Always adjust the symmetry of the output waveform when Q108 and Q109 or R301 and Q302 are replaced. To perform his adjustment, disconnect the speaker(s) and connect a 5.5 ohm 200 watt dummy load across the speaker terminals. Connect an oscilloscope across the dummy load and activate the Yelp signal. Adjust R158 for he best possible square wave. See figure -2 for the location of R158.

B. Removal for Servicing.

The Siren Module is easily removed from the PA2100 chassis. To remove the Siren Module, loosen two of the hex head crews on the bottom of the unit, and slide the Siren Module out (see figure 6-7).

C. Circuit Board Removal.

1. To remove the Main Circuit Board move the three screws that hold the board the Siren (see figure 6-2). Disconnect the socket at the rear of the board and lift the board out of the module. When replacing the Main Circuit Board, align the socket at the rear so that the color dot

on the socket is adjacent to the color dot on the circuit board. Also be sure that the two plugs on the front of the circuit board mate properly with sockets on the Front Circuit Board.

2.To remove the Front Circuit Board, remove the Main Circuit Board as described in subparagraph 6-2.C.1. Loosen all control knob set screws and slide the knobs from their control shafts. Remove the spanner nuts that hold the SELECTOR and the GAIN control to the front panel of the module. Remove the screw that holds the siren button bracket in place (see figure 6-7) and lift out the Front Circuit Board.

6-3. CONTROL MODULE.

To gain access to the interior of the Control Module, loosen two hex head screws on the bottom of the PA2100 (see figure 6-7). Slide cover off the unit.

Most of the circuitry in the Control Module is used to control power to vehicle accessories. Therefore, if a malfunction occurs in a given circuit the problem is probably external to the Control Module. However, before troubleshooting he external circuitry always be sure that rear panel of the Control Module is properly wired.

If a malfunctioning device is controlled by the MASTER switch, SW401, make sure that SW401 is properly programmed by the nine section miniature rocker switch, SW 501 (refer to paragraph 3-11).

To remove the Control Module from the PA2100 housing, it is only necessary to loosen one hex head screw (see figure 6-7).

If optional accessory switches are installed to control other vehicle accessories always check the switches for proper operation before troubleshooting the external devices.

The optional Alternating Flasher operates by use of electronic circuitry. If this circuitry fails, see the schematic diagram figure 6-12 and the parts location diagram figure 6-13.

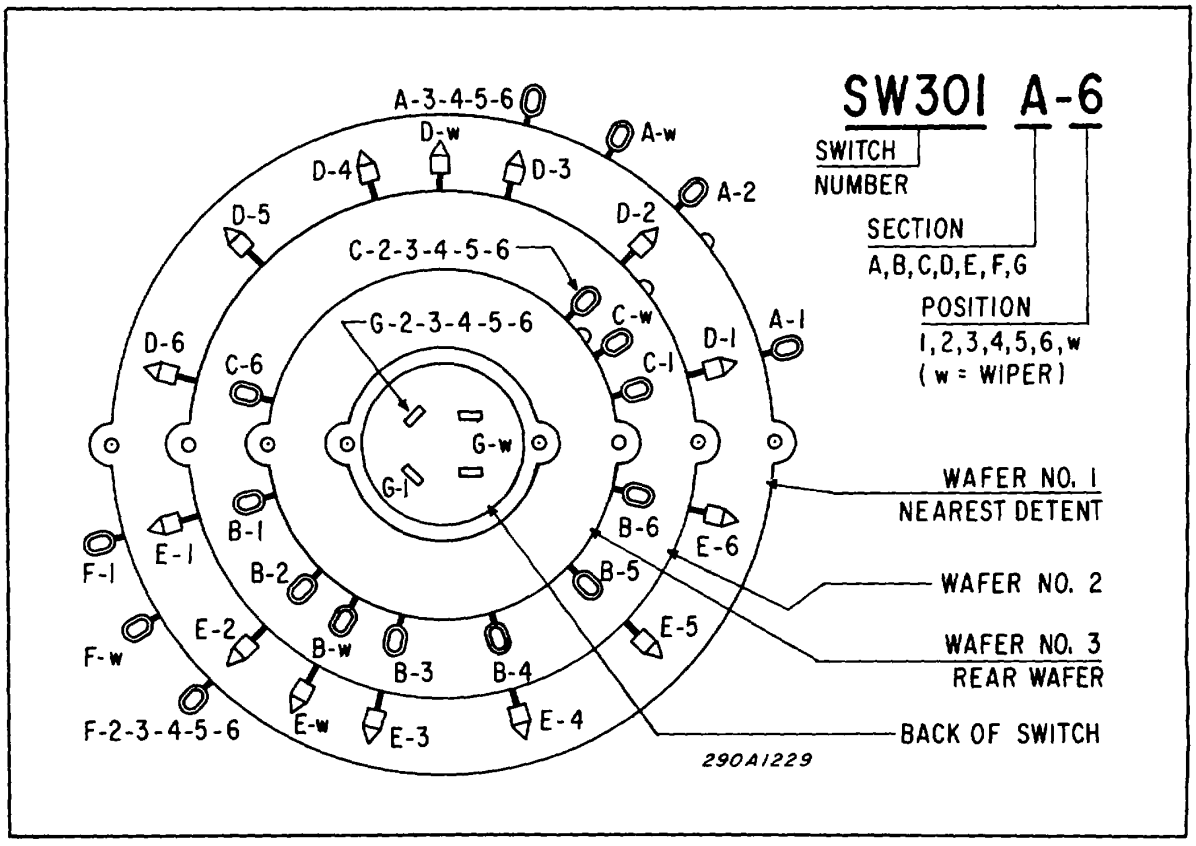


Figure 6-1. MASTER Switch Diagram

Table 6-1 lists voltages and waveforms, that appear on the integrated circuits and transistors in the PA2100 when the SELECTOR switch is set to its various positions. Abbreviations are used to describe the SELECTOR position. These abbreviations and their meanings are as follows:

R	=	RADIO	W	=	WAIL
P	=	PA	Y	=	YELP
M	=	MANUAL	H	=	HILO

Table 6-1. PA2100 Voltages and Waveforms.

When a waveform is present at a given point, the waveform is listed by a capital letter, its cycle rate and its peak-to-peak voltage. For example, the waveform at IC101-3 is listed as A/45-55,1. Therefore, when an oscilloscope is connected to IC101-3, waveform A having a cycle rate of 45-55 cycles per minute (or Hz, if specified) and a nominal amplitude of 1 volt peak-to-peak (Var. = varying) should be observed. All waveforms are illustrated at the end of this table.

IC101

Pin	SELECTOR Position	Voltage or Waveform
1	All	10.5VDC
2	H	10.5VDC
3,4	H	A/45-55,1
5	H	10VDC
6	H	10VDC
8	H	OV
11	Y	OV
12	Y	10.5VDC
13	H	10.5VDC
14	All	10.5VDC

IC102

Pin	SELECTOR Position	Voltage or Waveform
2,6	W	B/10,3
2,6	Y	B/160-190,3
2,6	H	B/45-55,3
3	W	A/109.8
3	Y	A/160-190,9.8
3	H	A/45-55,9.8
4	All	10.5VDC
5	All	7VDC
7	W	C/10,7
7	Y	C/160-190,7
7	H	C/45-55,7
8	All	10.5VDC
2	M	1.9VDC
6	M	1.9VDC
7	M	OV

IC103

1	W,Y	B/10,2.8
2	H	10.5VDC
3	All	5.25VDC
5	W	B/10,3
5	Y	B/160-190,3
5	H	B/45-55,3
6	All	2.7VDC
7	W,Y,H	9.0VDC, min.
7	M,P,R	0.5VDC
8	All	10.5VDC

IC104

2,6	W,Y,H	C/1000-3000Hz, Var.
3	W,Y,H	D/1000-3000Hz,9.8
4	All	10.5VDC
5	W	B/10,3
5	Y	B/160-190,3
5	H	A/45-55, 0.9
7	W,Y,H	E/1000,3000Hz. Var.
8	All	10.5VDC

IC105

Pin	SELECTOR Position	Voltage or Waveform
1	All	10.5VDC
3	All	OV
5	All	10.5VDC
6	All	10.5VDC
7	W,Y,H	OV
7	M,P,R	10.5VDC
10	W,Y,H	9.0VDC
10	M,P,R	0.5VDC
11	W,Y,H	9.0VDC
11	M,P,R	0.5VDC
12	All	1.0VDC max.
13	W,Y,H	D/1000-3000Hz,10
15	W,Y,H	A/500-1500Hz,10.5
16	All	10.5VDC

IC106

Pin	SELECTOR Position	Voltage or Waveform
2	All	10.0VDC
3	All	OV
4	All	10.5VDC
5	All	7.0VDC
6	All	OV
7	All	OV
8	All	10.5VDC
IC107		
1	All	6.3VDC
8	W,Y,H	F/500-1500Hz,10
8	P,R	G/1000Hz, 1.8
14	All	13.6VDC

Q101

B,E	W	B/10,3
B,E	Y	B/160-190,3
B,E	H	B/45-55,3
B,E	P,R	1.5VDC
B,E	M	1.9VDC
C	All	10.5VDC

Q103

B	All	11.0VDC
E	All	10.5VDC
C	All	13.6VDC

Q106

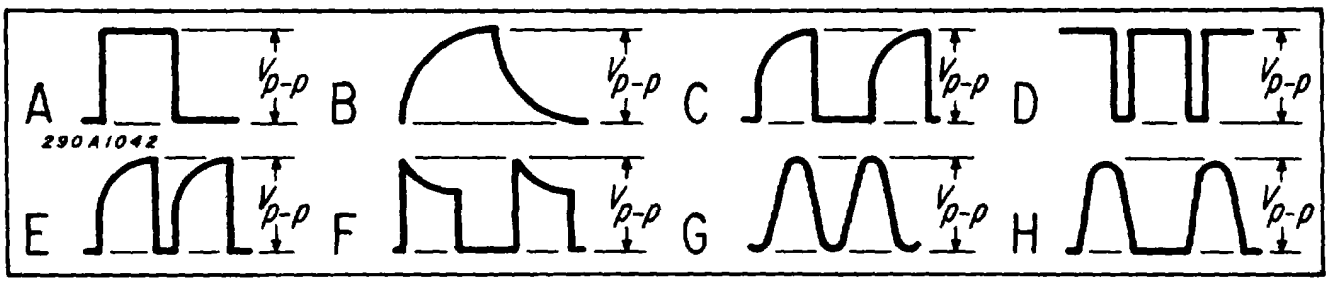
B	All	0.7VDC
E	All	OV
C	All	0.3VDC

Q107

B	All	12.9VDC
E	All	13.6VDC
C	All	13.5VDC

Q108,109

B	W,Y,H	A/500-1500Hz,30
B	P,R	G/1000Hz,5
E	W,Y,H	A/500-1500Hz,23
E	P,R	G/1000Hz,5
C	W,Y,H	A/500-1500Hz,1.5
C	P,R	H/1000Hz,0.8



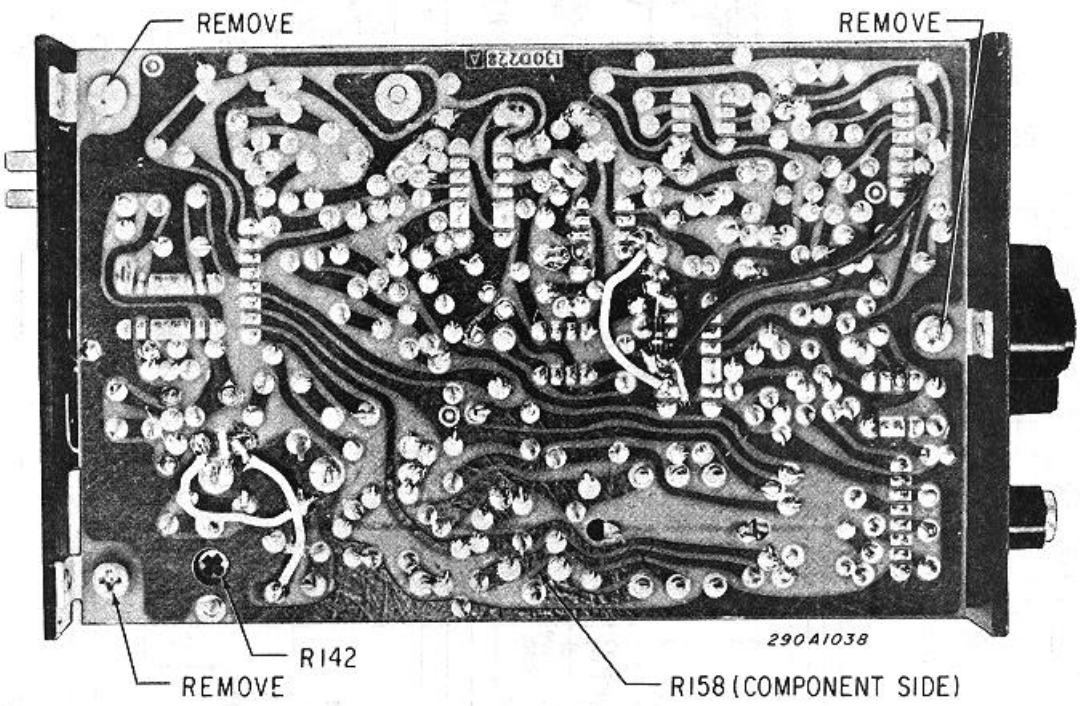


Figure 6-2. Siren Module Printed Circuit Board Removal

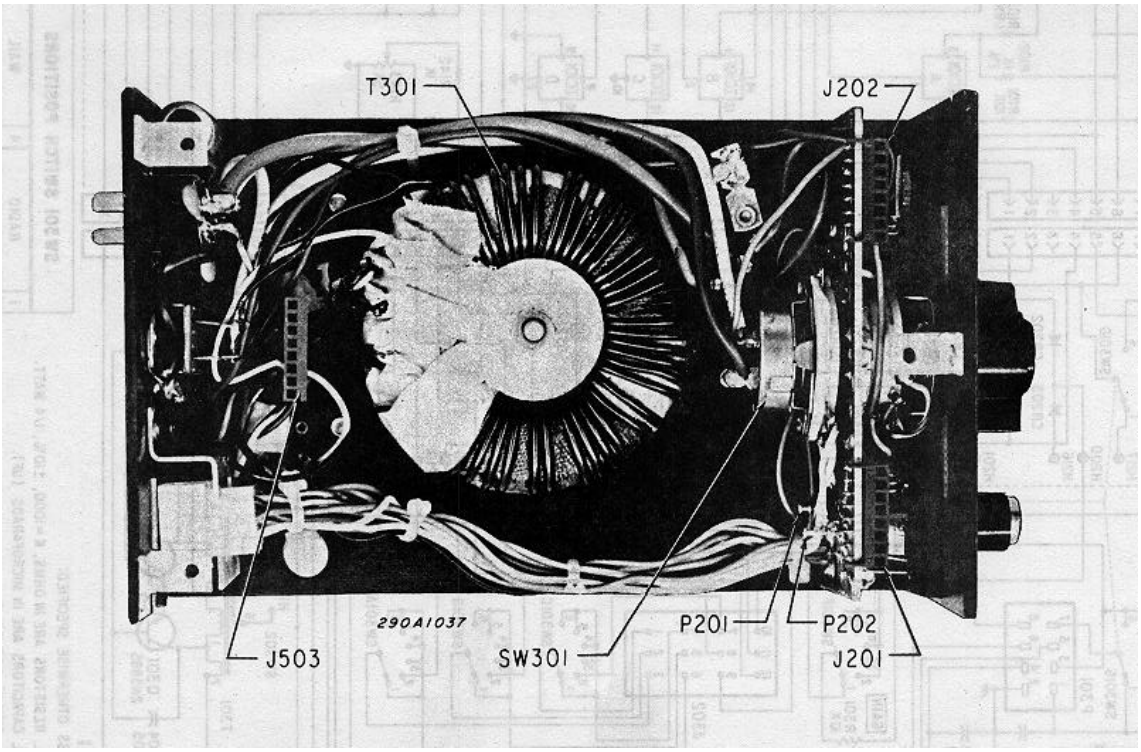
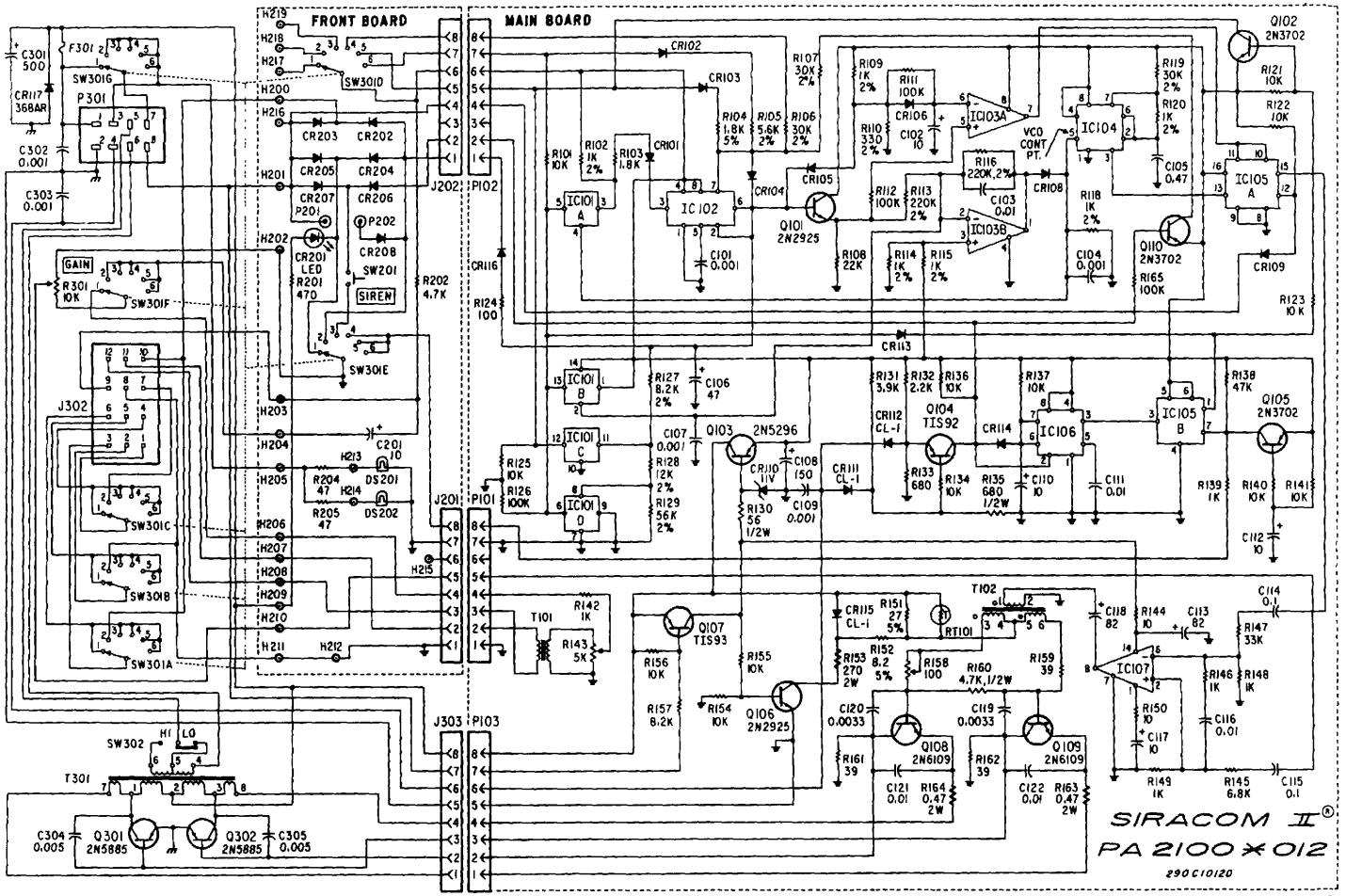


Figure 6-3. Siren Module Internal View

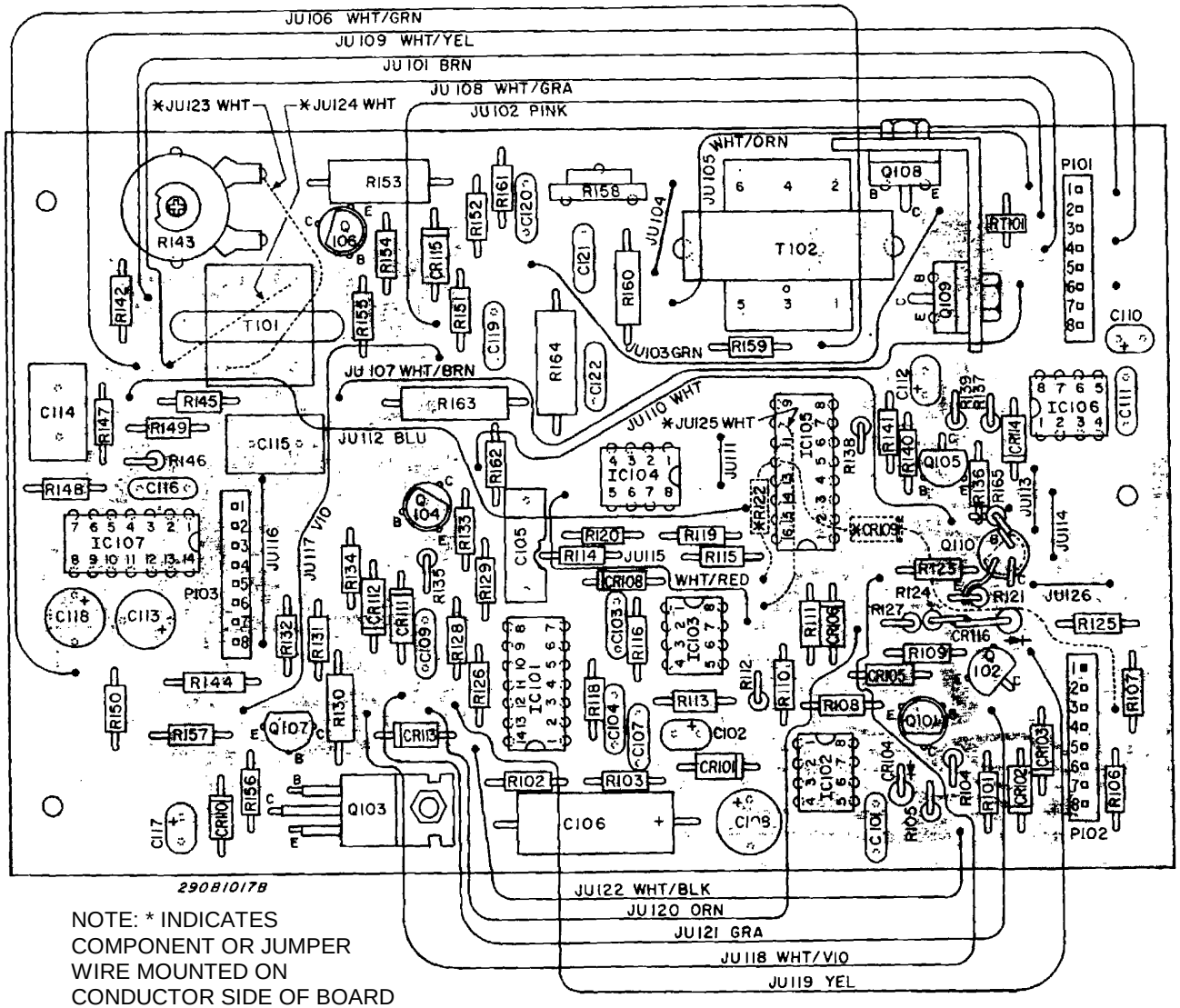


SW301 SWITCH POSITIONS			
1	RADIO	4	WAIL
2	PA	5	YELP
3	MANUAL	6	HI-LO

P301			
PIN	FUNCTION	PIN	FUNCTION
1	B+ INPUT	5	SPEAKER OUTPUT
2	B- INPUT	6	SPEAKER OUTPUT
3	LAMP	7	RADIO CONTROL
4	+/- AUXILIARY	8	MASTER CONTROL

J302			
PIN	FUNCTION	PIN	FUNCTION
1	MIKE HI INPUT	5	MIKE LOW OUTPUT
2	MIKE LO INPUT	6	MIKE P.T.T OUTPUT
3	MIKE P.T.T INPUT	7	PA OUTPUT
4	MIKE HI OUTPUT	8	GROUND
9	MIKE AUDIO (TO AMP)		
10	P.T.T INPUT		
11	RADIO INPUT		
12	RADIO INPUT		

Figure 6-4. Siren Module Schematic Diagram.



NOTE: * INDICATES COMPONENT OR JUMPER WIRE MOUNTED ON CONDUCTOR SIDE OF BOARD

Figure 6-5. Siren module Main Circuit Board Parts Location Diagram

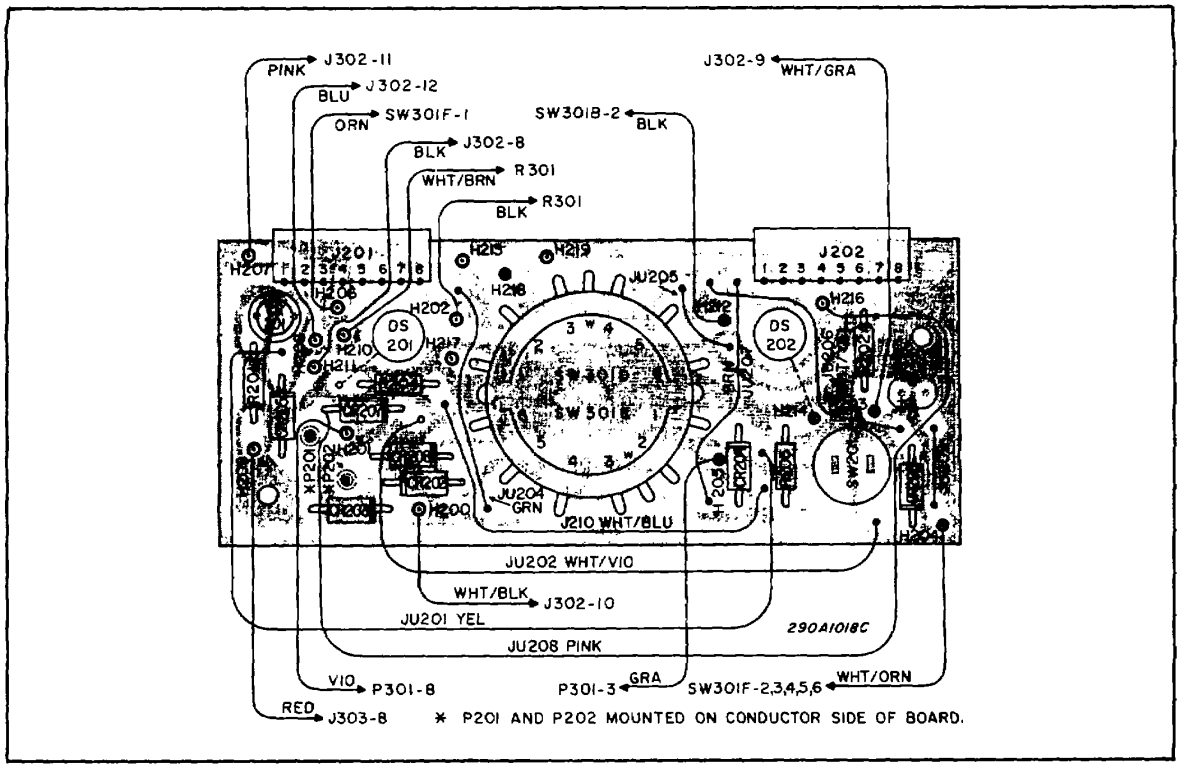


Figure 6-6. Siren Module Front Circuit Board Parts Location Diagram.

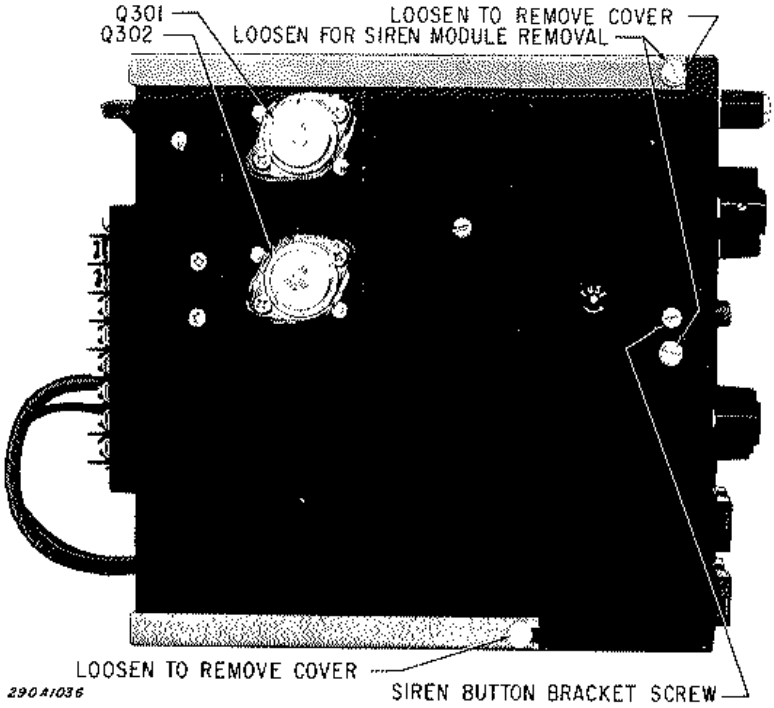


Figure 6-7. PA2100 Bottom View.

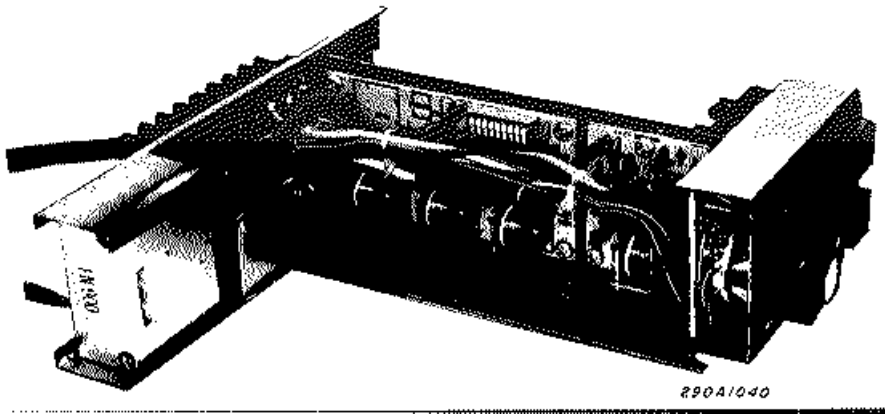


Figure 6-8. Control Module Internal View.

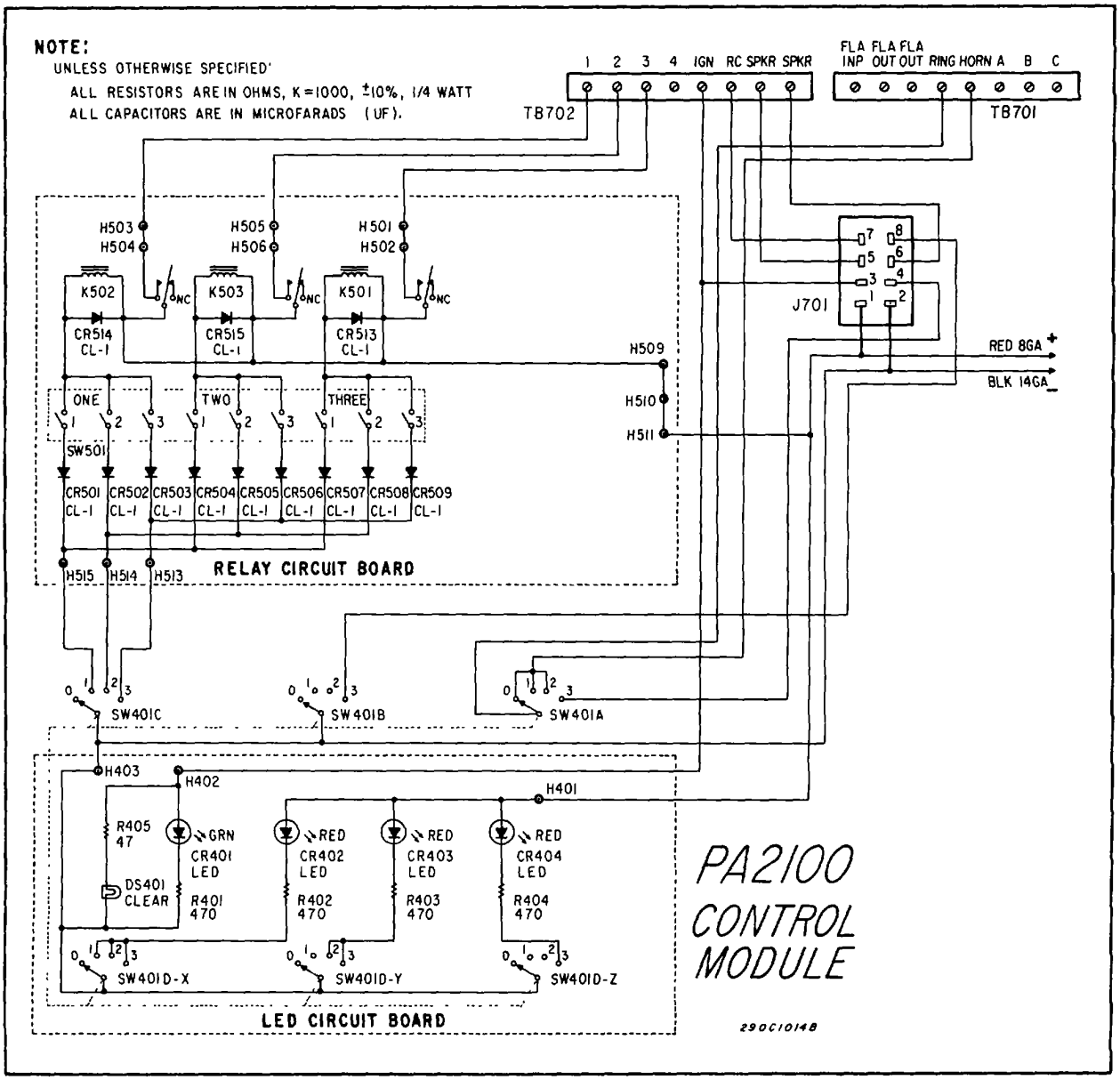


Figure 6-9. Control Module Schematic Diagram.

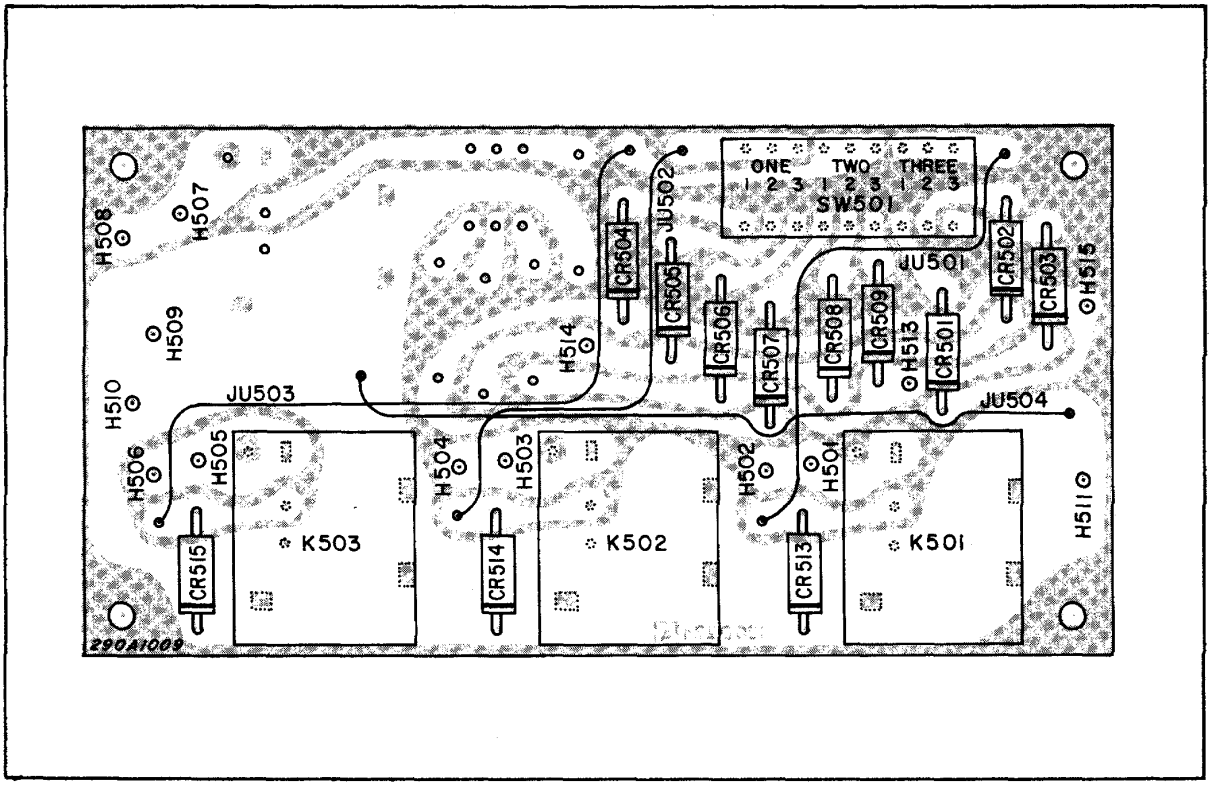


Figure 6-10. Control Module Relay Circuit Board Parts Location Diagram

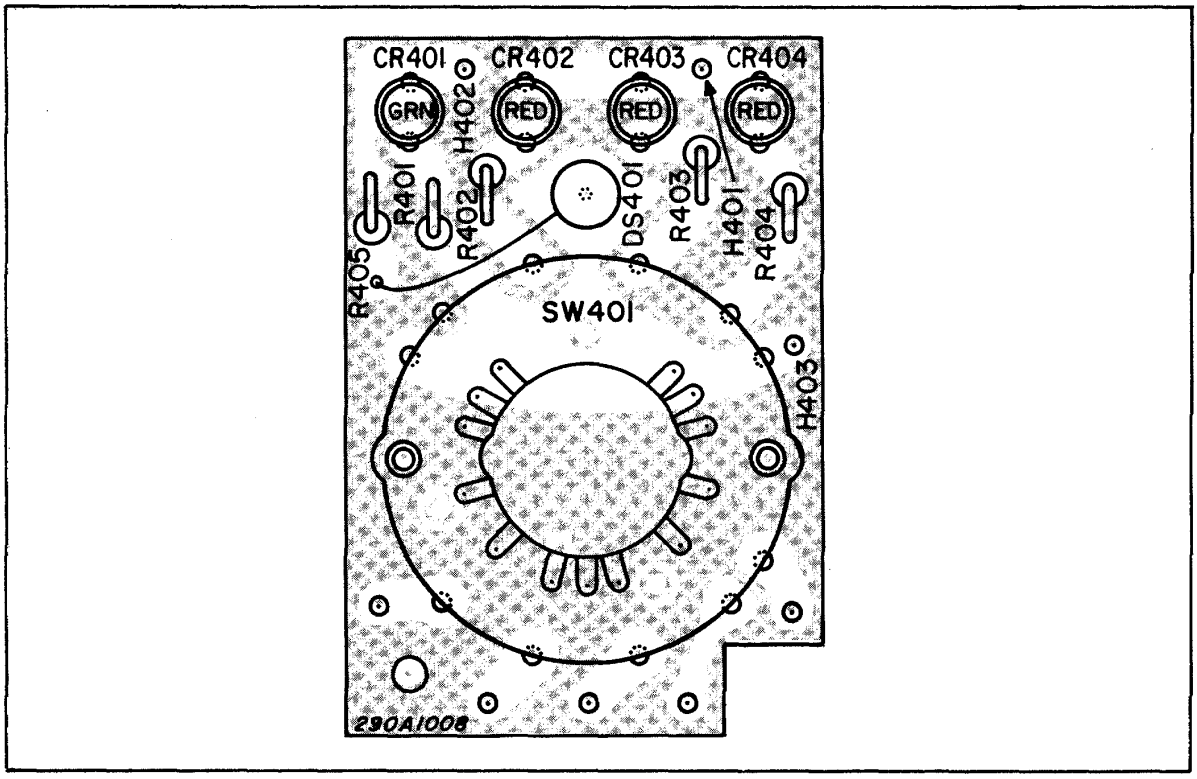


Figure 6-11. Control Module LED Circuit Board Parts Location Diagram

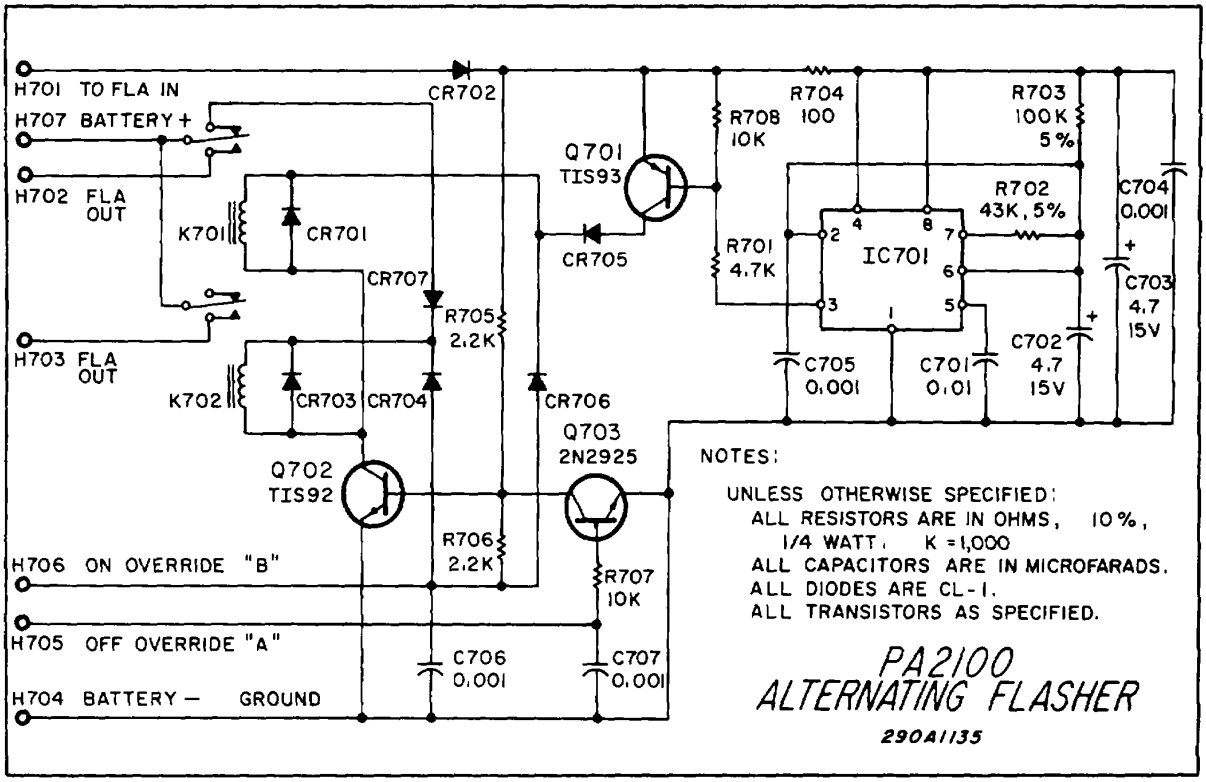


Figure 6-12. Control Module Optional Flasher Circuit Board Schematic Diagram.

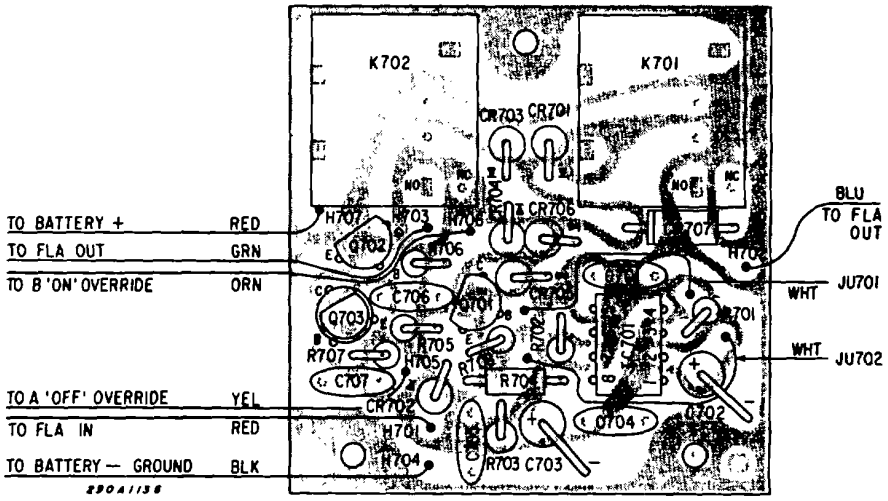


Figure 6-13. Control Module Optional Flasher Circuit Board Parts Location Diagram

MAIN CIRCUIT BOARD
PARTS LIST

Schematic Symbol	Description	Part No.
	RESISTORS	
R101,121,122,123, 125,134,136,137, 140,141,154,155, 156	10K Ohm	100A207
R102,109,114 115,118,120	1K Ohm,2%	100A712
R103		
R104	1.8K Ohm	100A205
R105	1.8K Ohm, 5%	100A705
R106,107,119	5.6K Ohm, 2%	100A714
R108	30K Ohm, 2%	100A717
R110	22K Ohm	100A208
R111,112,126	330 Ohm	100A201
R113,116	100K Ohm	100A222
R124	220K Ohm, 2%	100A719
R127	100 Ohm	100A236
R128	8.2K Ohm, 2%	100A715
R129	12K Ohm, 2%	100A716
R130	56K Ohm, 2%	100A718
R131	56 Ohm, ½ Watt	100A414
R132	3.9K Ohm	100A273
R133	2.2K Ohm	100A221
R135	680 Ohm	100A231
R138	680 Ohm, ½ Watt	100A313
R139,142,146 148,149	47K Ohm 1K Ohm	100A228 100A233
R143		
R144,150	Potentiometer 5K Ohm	105B204
R145	10 Ohm	100A251
R147	6.8 Ohm	100A210
R151	33K Ohm	100A211
R152	27 Ohm, 5%	100A290
R153	8.2 Ohm, 5%	100A724
R157	270 OhM, 2 Watt, WW	103A128
R158	8.2K Ohm	100A268
R159,161,162	Potentiometer, 100Ohm	105A244
R160	39 Ohm	100A266
R163,164	4.7K Ohm, ½ Watt	100A320
R165	.47 Ohm, 2 Watt, WW	103A130
RT101	100K Ohm Thermistor, 200 Ohm	100A222 104A111

Unless otherwise specified, all risistors are carbon composition, 10%, ¼ watt.

	CAPACITORS	
C101,104,107,109	.001UF,500V,disc	107A263
C102,110,112,117	10UF, 10V, tantalum	107A6345
C103,111,116 121,122	.01 UF, 25V, disc	107A226

Schematic Symbol	Description	Part No.
	CAPACITORS (Continued)	
C105	.047UF, 50V, Mylar	107A418
C106	.47UF, 15V tantalum	107A621
C108	150UF, 15V, tantalum	107A680
C113,118	82UF, 15V, tantalum	107A650
C114,115	.1UF, 100V, Mylar	107A406
C119,120	.0033UF, 100V, disc	107A271
	SEMICONDUCTORS	
IC101	Circuit Integrated, RAC, CD4066 AE	128A047
IC102,104,106	Circuit Integrated, National, LM555C	128A043-02
IC103	Circuit Integrated, National, LM358	128A045
IC105	Circuit Integrated, RCA CD4027AE	108A044
IC107	Circuit Integrated, National, LM380N	128A046
Q101,106	Transistor, NPN, Silicon 2N2925	125A119
Q102,105,110	Transistor, NPN, Silicon 2N3702	125A113
Q103	Transistor, NPN, Silicon 2N5296	125A415
Q104	Transistor, NPN, Silicon TIS92	125B132
Q107	Transistor, NPN, Silicon TIS93	125A133
Q108,109	Transistor, NPN, Silicon 2N6109	1254B431
CR101,102,103 104,105,106, 108,109,113 114,116	Diode, T0151	115B101
CR110	Diode, Zener, 11V, 1 Watt	115A245
CR111,112,115	Diod ED 3002S (CL-1)	115B301
	MISCELLANEOUS	
T101	Transformer, Audio	120B123
T102	Transformer, Driver	120B145
P101,102,103	Connector, Wafer	140A170
	Main Circuit Board (without parts	130D228
	Main Circuit Board (with parts installed)	200D703

FRONT CIRCUIT BOARD
PARTS LIST

Schematic Symbol	Description	Part
R201	Resistor,470 Ohm,FC,10%,1/4 Watt	100A255
R202	Resistor, 4.7K Ohm, FC, 10%,1/4 Watt	100A224
R204, 205	Resistor, 47 Ohm, FC, 10%,1/4 Watt	100A237
C201	Capacitor, 10UF,10V,tantalum	107A634
CR201	Pilot Light, LED, Red	147A113A-01
CR202,203,204 205,206,207,208	Diode, TI51	115B101
DS201,202	Lamp, 14V,CM382	8469A665
SW201	Switch, Pushbutton	122A167
SW301D,E	Switch, Rotary	122B164
J201,202	Connector, Right Angle	139A161
P201,202	Terminal, USECO 1280BI	233A103
	Front Circuit Board (without parts)	130D229
	Front Circuit Board (with parts installed)	200D702

RELAY CIRCUIT BOARD
PARTS LIST

CR501-509, 513—515	Diode, ED3002S (CL-1)	115B301
K501,502,503	Relay, SPDT, 12V	8536401
SW501	Switch, Rocker, 9 Section, Miniature	122A165A-02
	Relay Circuit Board (without parts)	130D224
	Relay Circuit Board (with parts installed)	200D699

CHASSIS MOUNTED COMPONENTS
PARTS LIST

Schematic Symbol	Description	Part No.
R301	Potentiometer, 10K Ohm	106A121
C301	Capacitor, 500 UF, 15V, electrolytic	108A122
C302,303	Capaciter, .001UF, 100V, disc	107A207
C304,305	Capaciter, 005, 100V, disc	107A211
CR117	Diode, 368AR	115A311
Q301,302	Transistor, NPN, Silicon 2N5885	125B432
T301	Transformer, Output	120C146
SW302	Switch, Slide, DPDT	122A144
F301	Fuse, 20 Ampere, 3AG	143A127
P301	Connector, 8-contact (Cinch-Jones) P308-AB	140A114
J302	Connector, 12 contact (Molex 03-06-212)	140A163
	Fuseholder, 342002	143A106
	Knob, Control	141A117
	Knob, GAIN	141A118
	Connector, PC Board	233A126

ACCESSORY KIT

Qty.	Description	Part No.
1	Straight Connector, Two Collar N-35	8536A440
2	1/4" - 20 x 3/8 Hex, Head Screw	7002A000-06
2	1/4" - 20 x 1/2" Hex, Had Screw	7003A307-08
2	1/4" - 20" Hex, Nut	7069A018
4	Split Lockwasher, 1/4"	7074A015
2	8A x 1/2" Phillips, Pan Head, Thread Forming Screw	7011A012-08
1	Circuit Breaker, 12V. 50 Amp	8474A138
1	Item sheet	8536A418
	Accessory Kit, Complete	8536A405

MISCELLANEOUS PARTS

	Assembly, Housing	8536C408
	Bracket, Mounting	8536A420

LED CIRCUIT BOARD
PARTS LIST

Schematic Symbol	Description	Part No.
R401,402,403. 404	Resistor, 470 Ohm, FC, 10%, 1/4 Watt	100A255
R405	Resistor, 47 Ohm, FC, 10%. 1/4 Watt	1006237
CR401	Pilot Light LED, Green	147A113A-02
CR402,403,404	Pilot Light, LED, Red	147A113A-01
DS401	Lamp, Clear, 14V, CM 382	8469A665
SW401	Switch, Rotary	122B166
	LED Circuit Board (without parts)	130C226
	LED Circuit Board (with parts installed)	200C701

OPTION F (ALTERNATING FLASHER)
PARTS LIST

R701	Resistor, 4.7K Ohm, FC, 10%. 1/4 Watt	100A224
R702	Resistor, 43K Ohm, FC, 5%, 1/4 Watt	100A710
R703	Resistor, 100K Ohm, FC, 5%, 1/4 Watt	100A262
R704	Resistor, 100 Ohm, FC, 10%, 1/4 Watt	100A236
R705,706	Resistor, 2.2K Ohm, FC, 10%, 1/4 Watt	100A221
R707,708	Resistor, 10K Ohm, FC, 10%. 1/4 Watt	100A207
C701	Capacitor, 0.01 UF, 25V, Disc	107A226
C702,703	Capacitor. 4.7 UF, 15V, Tantalum	107A676
C704,705,706, 707	Capacitor. 0.001UF, 500V, Disc	107A263
IC701	Integrated Circuit, LM555C	128A043-02
Q701	Translator, PNP, T1S93	125B133
Q702	Transistor, NPN, T1S92	125B132
Q703	Transistor, NPN, 2N2925	125A119
CR701,702,703, 704,705,106,707	Diode, ED 3002S	115B301
K701,702	Relay, SPST, Bosch	131A126
	Printed Circuit Board (without parts)	130C239
	Printed Circuit Bard (with parts installed)	200C722

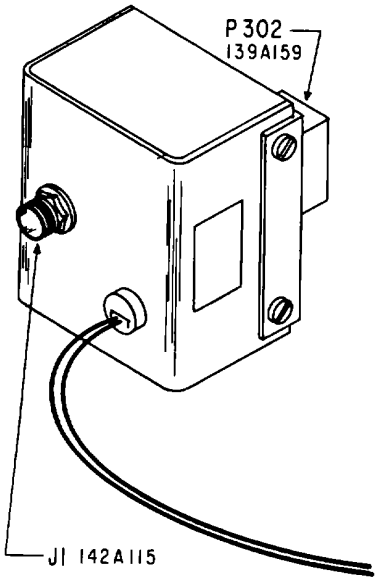
26A299B
579
Printed in the U.S.A.

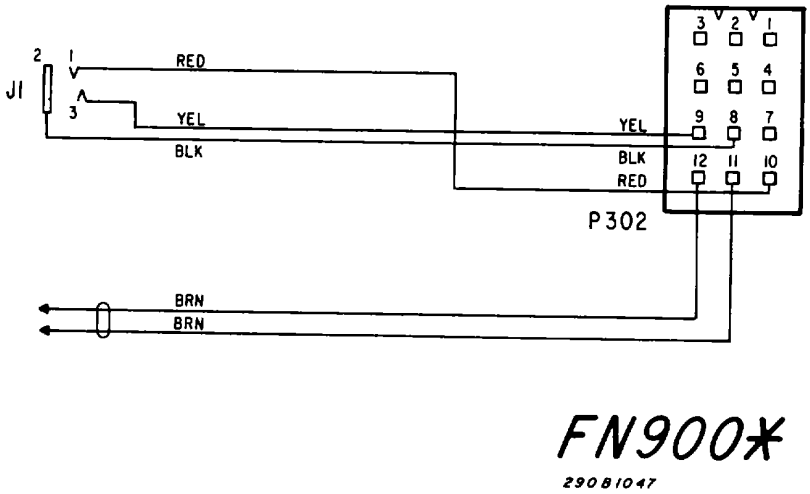
INSTALLATION INSTRUCTIONS
FOR
MODEL FN 900 ADAPTOR MODULE
FOR PA OVERRIDE OPERATION

1. Install the adapter module following the instructions in the siren service manual.

2. Connect the brown zip cord across the radio speaker voice terminals.

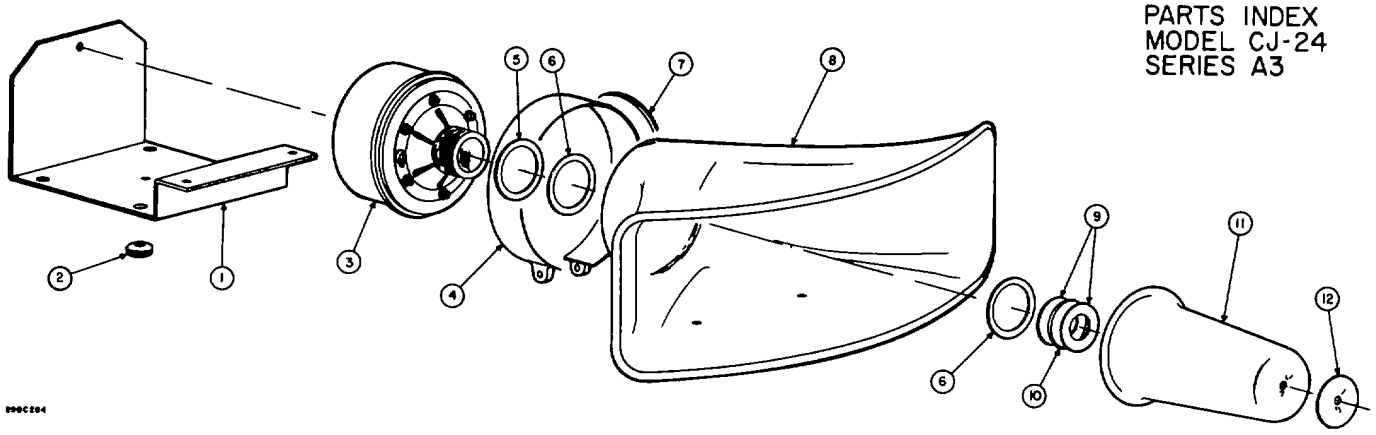
3. Plug the Model MNCT Microphone into J! On the adapter module. The siren is now set PA Override operation.





FEDERAL SIGN & SIGNAL CORPORATION

PARTS INDEX
MODEL CJ-24
SERIES A3



PPL0043
PARTS PRICE LIST MODEL CJ-24 SPEAKER ASSY. EFFECTIVE JUNE 1974

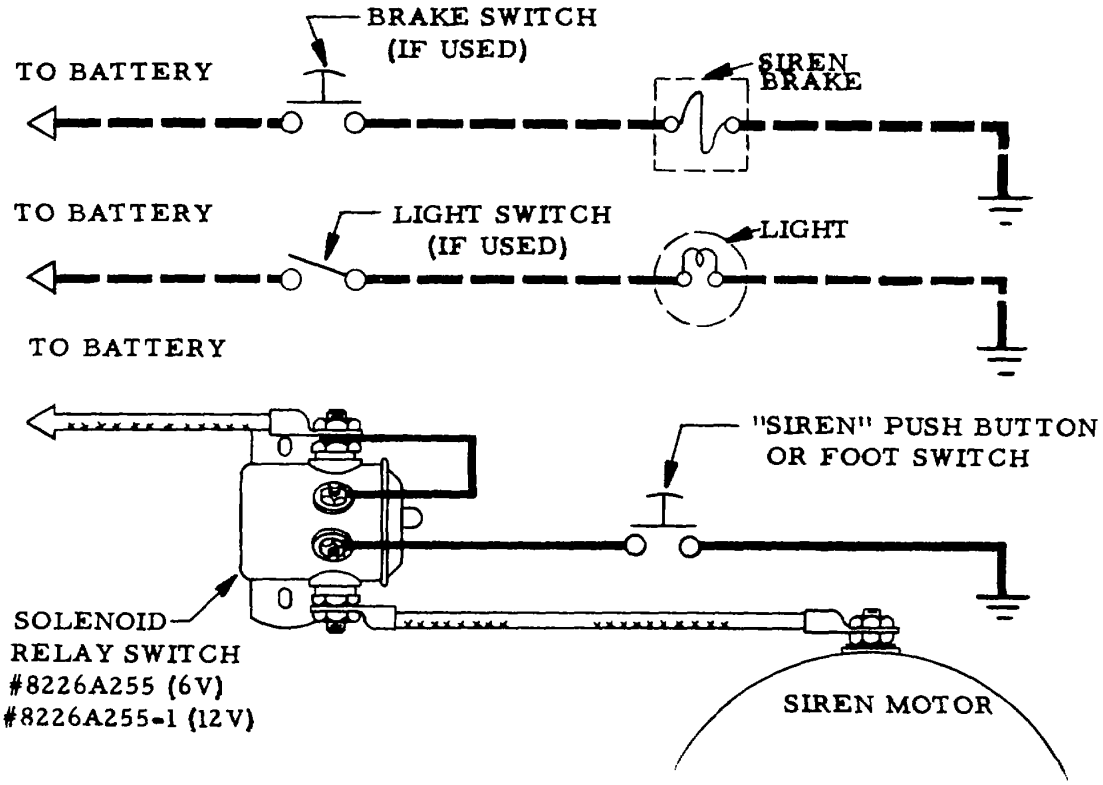
Index No.	Description	Part No.	Qty.	User's Net Each
1	Bracket	8283C292	1	$ 1.85
2	Grommet	8108A14	6	0.10
3	Driver	8283B433	1	33.00
4	Band Cover, Painted	8283A448	1	0.75
5	Washer, Steel	8283A450	1	0.15
6	Washer, Vellutex	8283A451	2	0.10
7	Gasket	8283A449	1	0.25
8	Projector	8283C432	1	15.00
9	Washer, Vellutex	8283A453	2	0.10
10	Washer, Rubber	8283A452	1	0.10
11	Cone	8283B430-1	1	4.29
12	Nameplate	8146A507-3	1	0.35
Not	Voice Coil (part of item 3)	8287A164	1	10.80
Shown	Visibar Conversion Kit	8422A152	1AR	3.95

DO NOT ORDER PARTS BY INDEX NUMBER. Give model, voltage, description and part number.

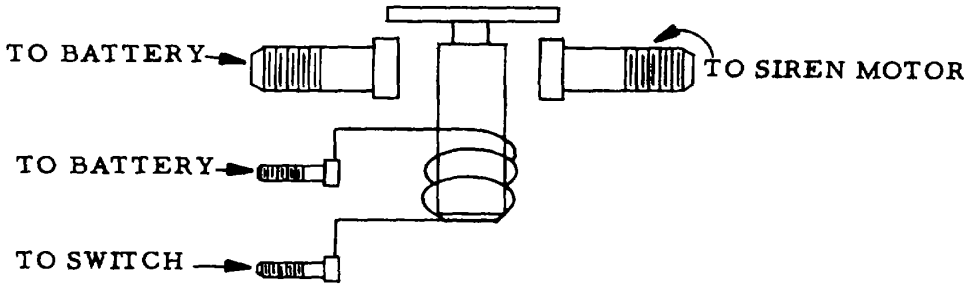
All prices F. 0. B. Factory - Blue Island, Illinois.
All prices subject to change without notice.

Federal Sign and Signal Corporation
Signal Division
136th and Western Avenue
Blue Island, Illinois 60406.

FEDERAL SIGN & SIGNAL CORP.
SIGNAL DIVISION
IMPORTANT INSTRUCTIONS



WIRING OF SIREN RELAY WITH DASH OR FOOT SWITCH



INTERNAL WIRING OF SOLENOID WIRING

FEDERAL
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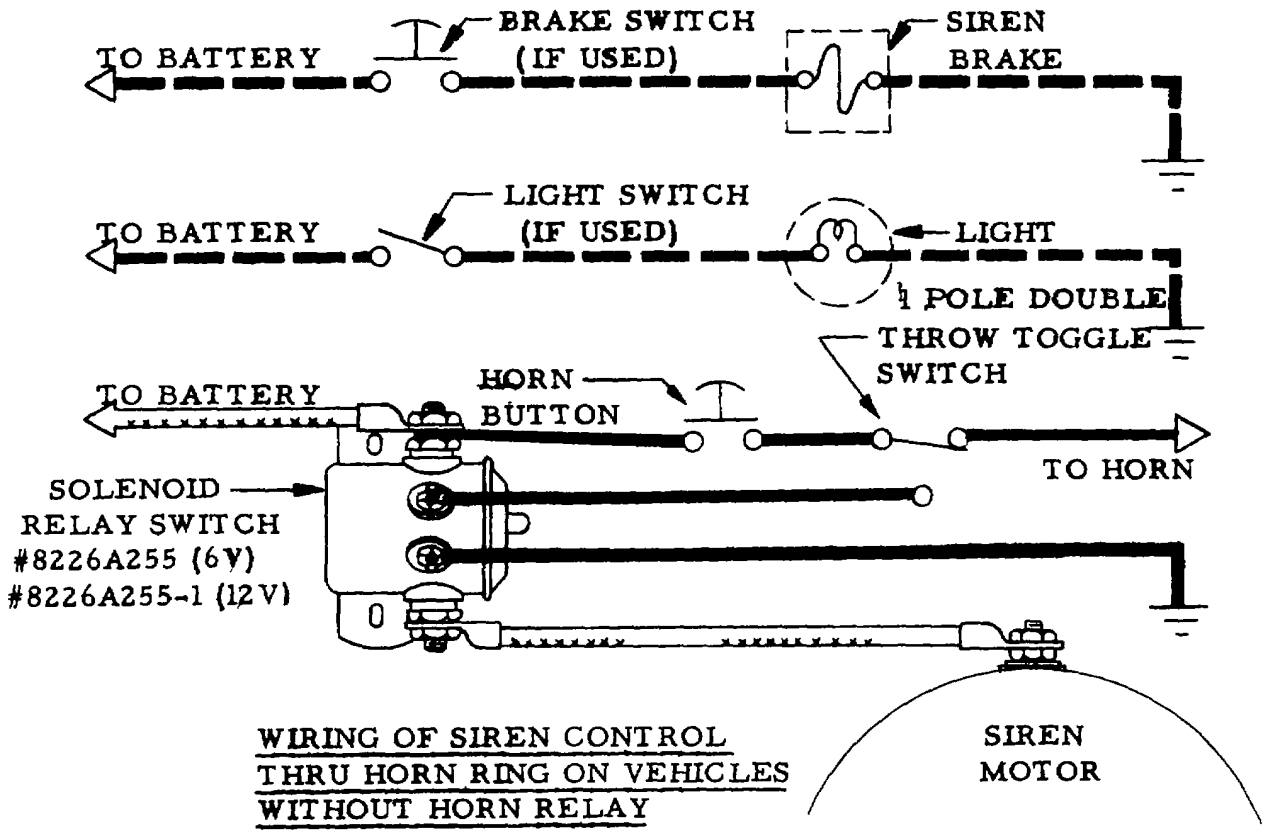
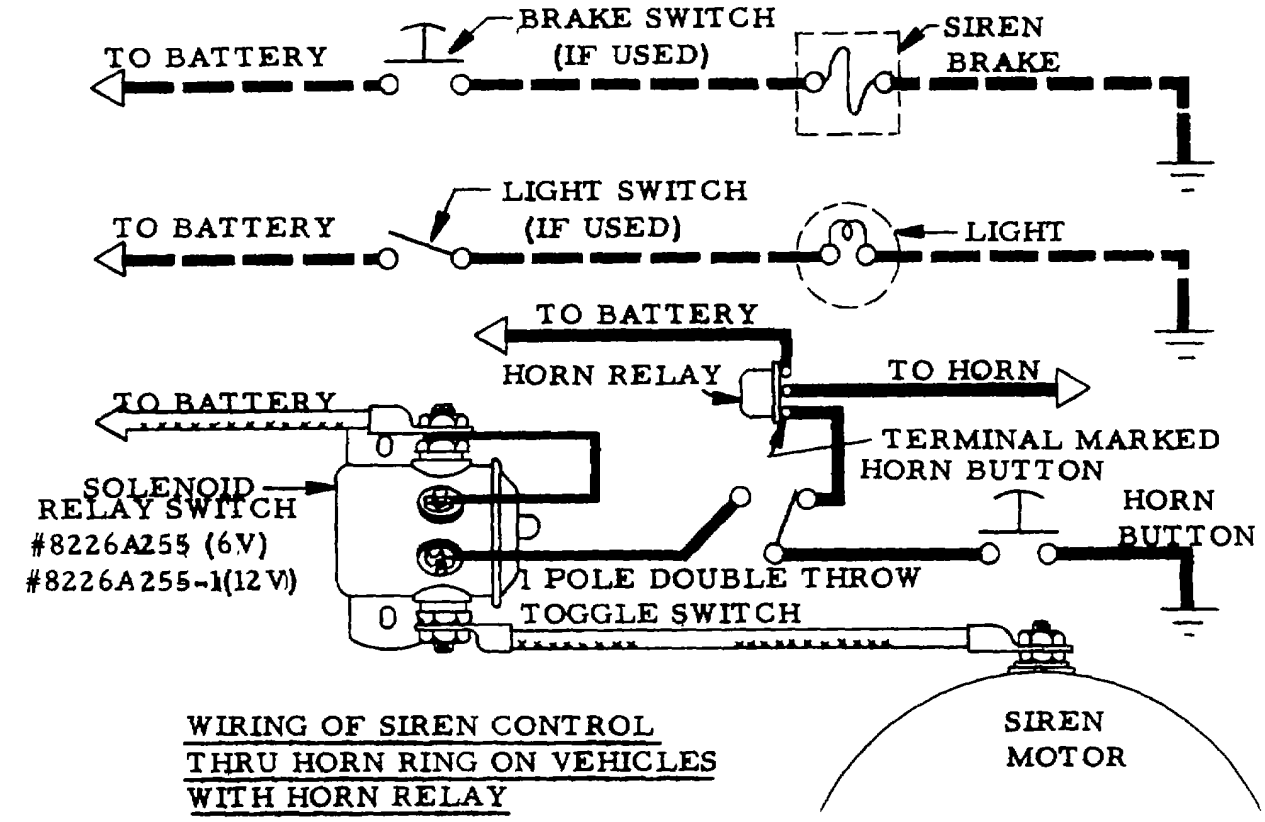
CORPORATION



WIRING OF SIREN CONTROL THRU HORN RING ON VEHICLES WITHOUT HORN RELAY



WIRING OF SIREN CONTROL THRU HORN RING ON VEHICLES WITH HORN RELAY

The enclosed cable is designed to inter-connect the Interceptor with a two-way radio. It is designed to work with a variety of makes and models and may be used when separate microphones are used for the Interceptor and the two-way radio or when a common microphone is used for the Interceptor and the two-way radio.

1. If separate microphones are used for the Interceptor and the two-way radio and it is desired to monitor in-coming radio calls thru the Interceptor, connect the Red and Green leads of the cable to the speaker leads of the two-way radio. Tape the ends of the other four leads of the cable. Plug the six-pin connector on the other end of the cable into the connector on the rear of the Interceptor. Turn the knob marked SELECTOR to the RADIO position to monitor radio calls.

2. If a common microphone is to be used for the Interceptor and the two-way radio, remove the microphone from the two-way radio. This microphone must be plugged into the receptacle in the bottom of the Interceptor. If the microphone does not have a plug, it must be equipped with an Amphenol Type 91-MC4M male plug, preferably with the #1 pin in line with the polarizing key. Wire as shown in the diagram on this sheet. Connect the Red and Green leads of the radio adapter cable to the speaker leads of the two-way radio. Connect the bare lead to the low side of the microphone circuit in the control head and the Black lead to the high side of the microphone circuit. Connect the Blue lead to a ground point on the control head and the Yellow lead to the push-to-talk circuit of the radio. Refer to your radio circuit diagram and to the diagram of the Interceptor. Plug the six-pin connector of the cable into the six-pin connector on the rear of the Interceptor. The microphone will be connected to the RADIO in all positions of the Selector Switch except PA.

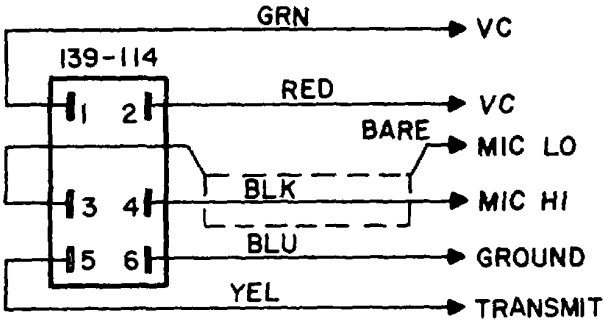
KIT NO. 146B203

INSTALLATION INSTRUCTIONS FOR

FN-203

WIRED-IN ADAPTER CABLE FOR RADIO

FEDERAL



WIRING DIAGRAM

Use with 146-203 Cable.

TM 5-4210-228-14&P-1

PRICE $0.50

FEDERAL
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CORPORATION

INSTALLATION AND SERVICE INSTRUCTIONS

MODEL PA-20A
INTERCEPTOR
ELECTRONIC SIREN
SERIES 2E

Warranty

The Federal Sign and Signal Corporation warrants each of its new electronic sirens to be free from defective material and workmanship for a period of one year from date of purchase. Federal Sign and Signal Corporation will remedy any defect which under normal installation and operation discloses such defect; provided the unit is delivered, transportation prepaid by owner, to our factory for examination and such examination reveals that in our judgment a defect in material and/or workmanship exists. In all cases, Federal Sign and Signal Corporation will be sole judge of what constitutes defective material and workmanship.

Defects of workmanship and material under this warranty will be corrected at no cost to you for labor and material.

This warranty does not extend to any electronic siren which has been subjected to abuse, misuse, improper installation or violation of any instructions supplied by us, nor extended to units which have been serviced or modified at any facility other than our factory.

This warranty takes precedence over all other warranties expressed or implied and no representative or other person is authorized to assume for Federal Sign and Signal Corporation any other liability in connection with the sale of our electronic sirens.

FEDERAL
SIGN & SIGNAL
CORPORATION

290A589

SECTION I
GENERAL DESCRIPTION

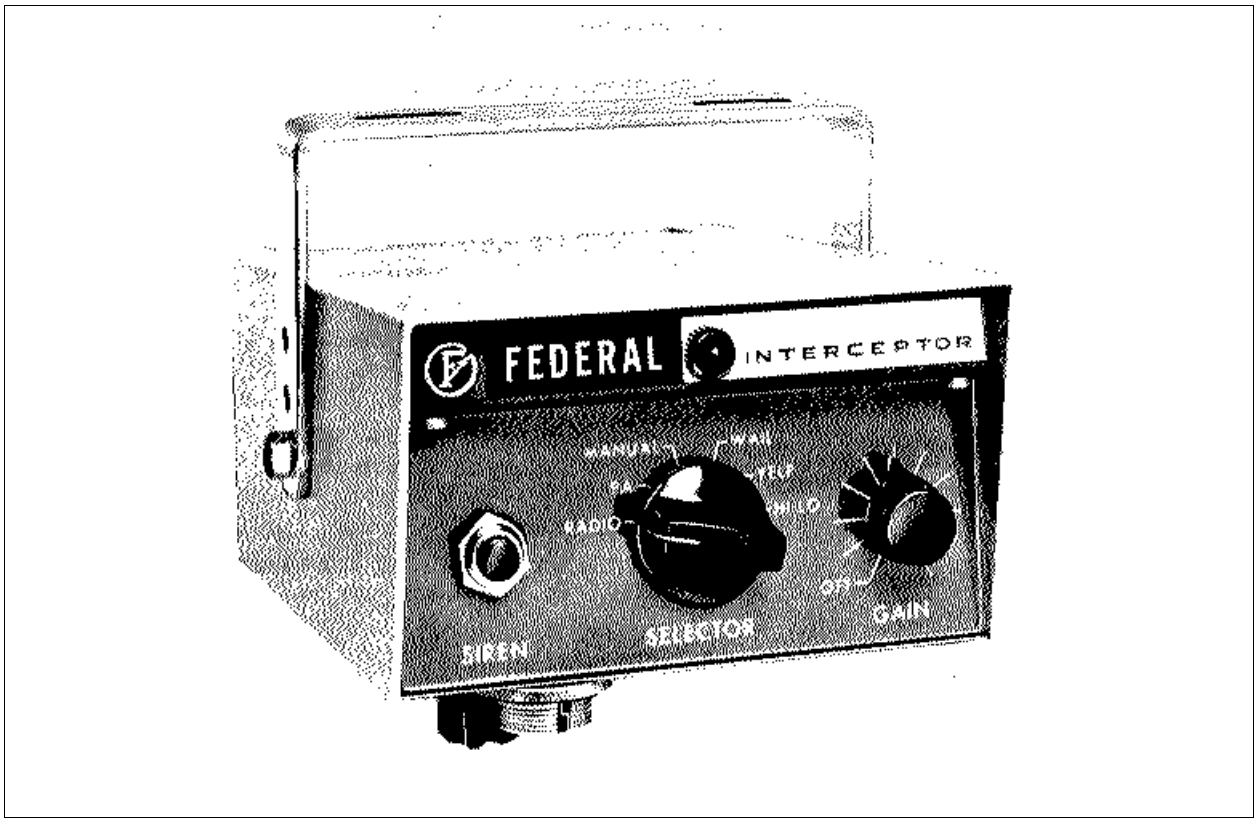


Figure 1. Model PA-20A (Interceptor) Electronic Siren

The FEDERAL Model PA-20A (Interceptor) Electronic Siren is a precision built, compact, solid-state unit of advanced design. The unit provides three distinct siren sounds plus provisions for public address, manual siren operation and the amplification of radio messages. The Interceptor ordinarily comes equipped for use with a 12 VDC power source (positive or negative grounded system). Any 75 watt commercial speaker (11-ohm impedance) may be used with the PA-20A. Your FEDERAL dealer has a full line of speakers that can be used with the PA-20A. By use of an auxiliary switch, such as a horn ring or foot switch, the unit can be operated manually. The unit can still be operated manually by depressing the SIREN button, after the auxiliary switch 3 installed. The microphone plug-in convenience of the PA-20A allows the user to utilize the vehicle's two way radio microphone, or an independent microphone. Other features of the PA-20A include:

- Output isolation transformer to reduce the hazard of shorting the output transistors caused by instantaneous short-circuits across the load, i.e. rubbing of speaker coil.
- Blocking transistor to increase thermal stability.
- Blocking diode to prevent damage to the unit if the power leads are reversed.
- Silicon transistors for maximum reliability.
- Constructed to facilitate servicing.

SECTION II
SPECIFICATIONS

Input Voltage	10 VDC to 14.6 VDC (6 VDC unit optional)
Standby Current	500 MA maximum (MANUAL position)
Operating Current	6 amperes (WAIL position, 1 speaker) 10 amperes (WAIL position, 2 speakers)
Operating Temperature	-30°C to + 65°C
Frequency Range	500 Hz to 1400 Hz
Cycle Rate	Wail -10 cycles/ minute Yelp - 240 cycles/minute Hi- Lo- 45 cycles/ minute
Voltage Output (13.6 VDC input)	40 Vpp (11-ohm resistive load) 38 Vpp (5.5 ohm resistive load)
Audio Distortion	Less than 10% from 300 Hz to 3000 Hz at output power levels of 1/10 watt to 25 watts
Auxiliary switch leakage resistance	10K ohms, minimum
Size	2-3/4 (H) x 5-E (W) x 7-1 (D) inches
Net Weight	4 pounds, 2 ounces
Shipping Weight	6 pounds

NOTE: The following parameters were obtained with the radio input potentiometer (R30) and GAIN control set at maximum. The voltages shown are needed to obtain the maximum sine wave output of 17 volts RMS.

Radio Input	Impedance, 1800 ohms Voltage, 0. 55V RMS
Carbon Microphone Input	Impedance, 3500 ohms Voltage, 0. 15V RMS
Magnetic Microphone Input	Impedance, 20K ohms Voltage, 0. 03V RMS

SECTION III
INSTALLATION

3-1. UNPACKING

After unpacking the Model PA-20A, examine it for damage that may have occurred in transit. If the equipment has been damaged, file a claim immediately with the carrier stating the extent of the damage. Carefully check all envelopes, shipping labels and tags before removing or destroying them. The radio interconnecting cable, if ordered, is packed in a separate carton. The packing carton in which the electronic siren is packed contains:

A. Model PA-20A Electronic Siren.

B. Mounting bracket.

C. Envelope containing mounting hardware.

D. Warranty Card.

E. Power Cable.

3-2. MOUNTING BRACKET.

The electronic siren comes equipped with a swinging bracket which enables it to be mounted in a variety of positions (see figure 2). Positioning the bracket above the unit allows mounting to the underside of the dash. Positioning the bracket below the unit will permit mounting above the dash or on any horizontal surface. The unit should be mounted in a position that is both comfortable and convenient to the operator. After determining the mounting position, proceed as follows:
CAUTION: The unit must be installed in an adequately ventilated area. Never install near heater ducts.

A. Use the mounting bracket as a template and mark two positioning holes.

B. Drill two 1/4 inch mounting holes.

C. Mount the bracket with the 1/4-20 x 3/4 hexagon head machine screws, 1/4-20 hexagon nuts and 1/4 inch split lock washers as shown in figure 3.

3-3. ELECTRONIC SIREN TO MOUNTING BRACKET.

The height of the unit above or below a surface may be adjusted by selecting a set of mounting holes in the bracket. Mount the unit to the bracket with the two 1/4 20 x 5/16 hexagon head machine screws as shown i figure 3. The unit may be tilted to any convenient position.

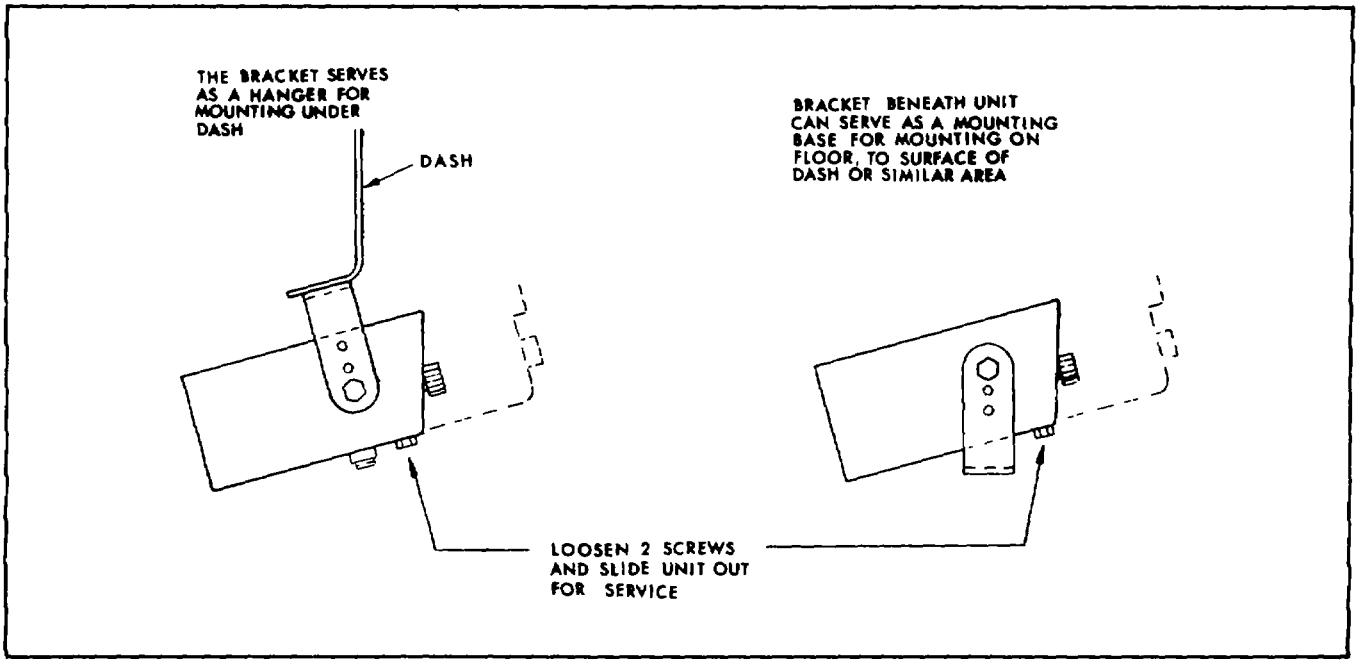


Figure 2. Positioning Unit in Mounting Bracket.

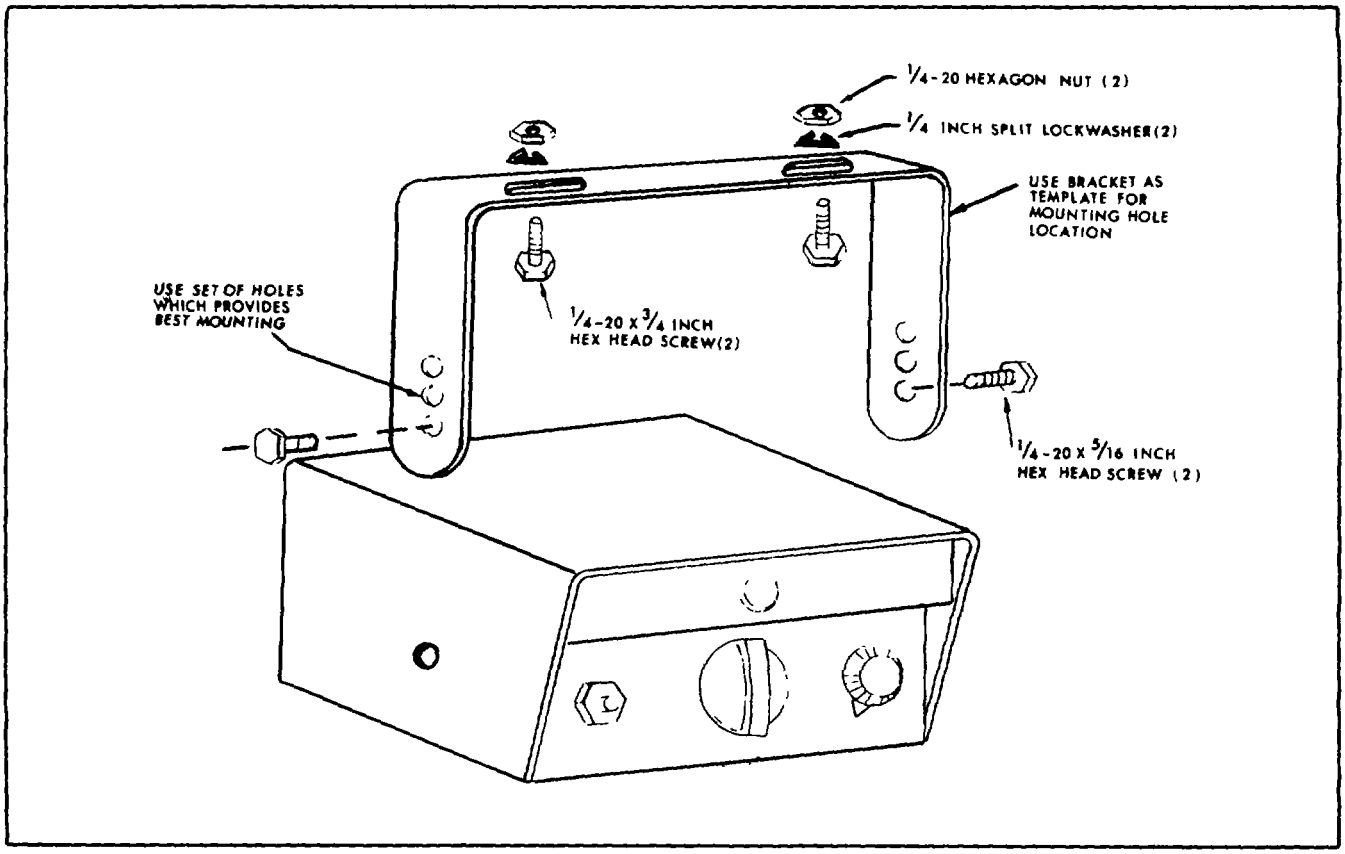


Figure 3. Installation of Mounting Bracket

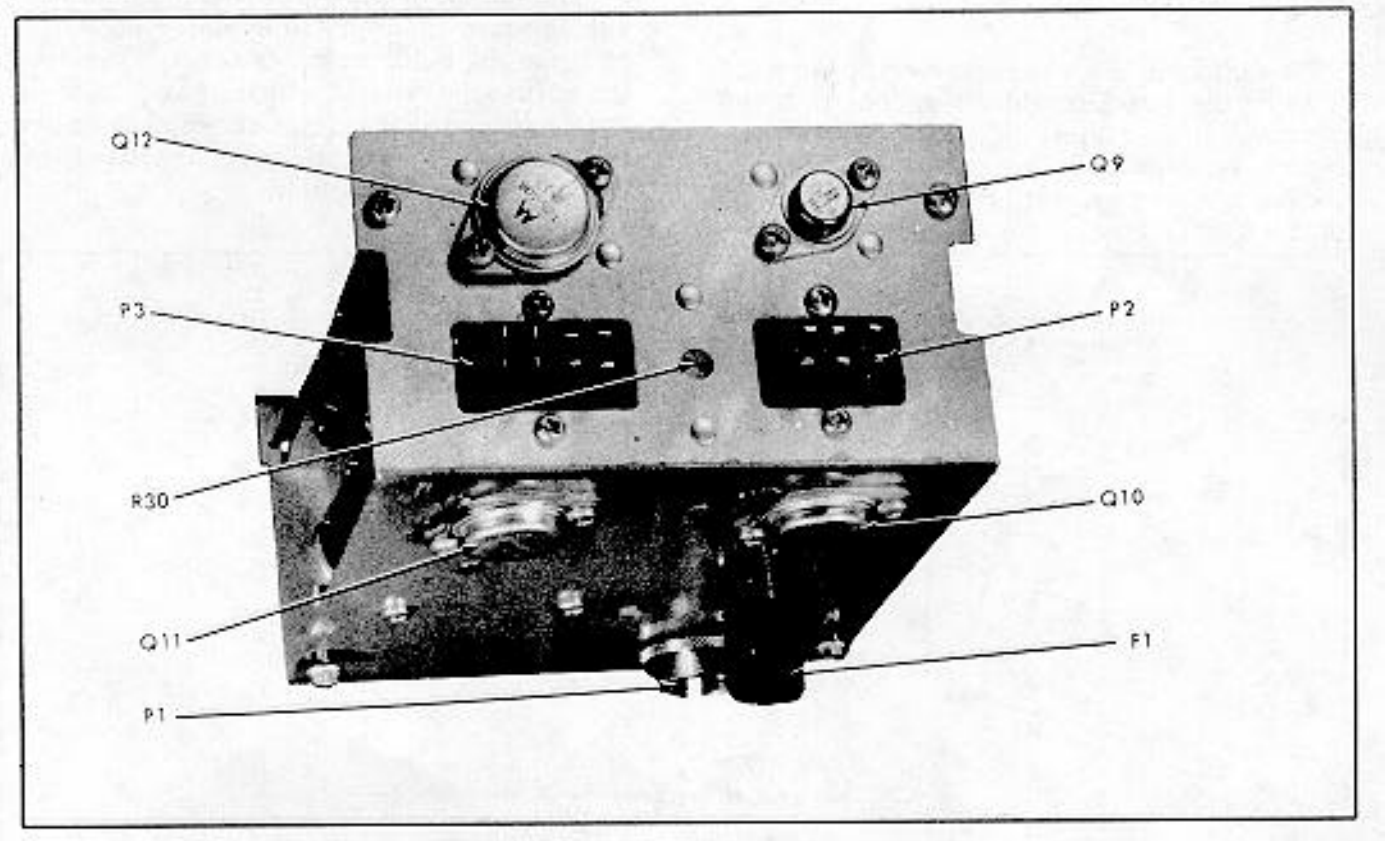


Figure 4. Rear View of Electronic Siren

3-4. POWER CABLE INSTALLATION.

The power cable included in the amplifier carton is equipped with an eight prong plug that mates with the connector (P3) on the rear of the electronic siren (see figure 4). The various wires on the connector must be connected as described below.

A. Speaker.

The unit is designed to operate with one 11-ohm impedance speaker, or two 11-ohm impedance speakers connected in parallel.

Speakers are not included as part of the electronic siren. FEDERAL speakers are weatherproof and may be installed in any convenient location; on the roof, fender, behind the grille, etc. Any special mounting instructions applicable to the model of speaker you have selected will be found in the speaker carton. The 12-inch two conductor zip cord (P3, pins 5 and 6) should be connected to the speaker leads. Either wire may be connected to either speaker lead, since polarity is not a factor when using a single speaker. It is recommended that the wire splices be soldered and insulated with tape. If soldering equipment is not available, use the two nuts furnished with the speaker.

When two speakers are used, it is necessary to connect the speakers in parallel and in-phase for optimum performance. This can be accomplished by connecting the two speaker leads marked "1" to the same power cable lead, and the two speaker leads marked 1121" to the other power cable lead (see figure 5).

B. Connection to Power Source.

The electronic siren will operate in vehicles having either a negative or positive grounded system. Take care to insure battery charging voltage does not exceed 14.6 VDC at any time. Operating power can be obtained by making connections directly at the battery terminal, or to the hot side of the ignition switch. Determine the type of vehicle ground system, and perform the applicable procedure described below. When the negative terminal of the battery is connected to the vehicle frame, the vehicle has a negative grounded system. When the positive battery terminal is connected to the vehicle frame, the vehicle has a positive grounded system.

1. Negative Ground Installation. Connect the red lead (P3, pin 1) to the positive (hot) side of the battery terminal or ignition switch. Connect the black lead (P3, pin 2) to the vehicle frame (see figure 6). When making connections directly to the battery terminal, proceed as follows:

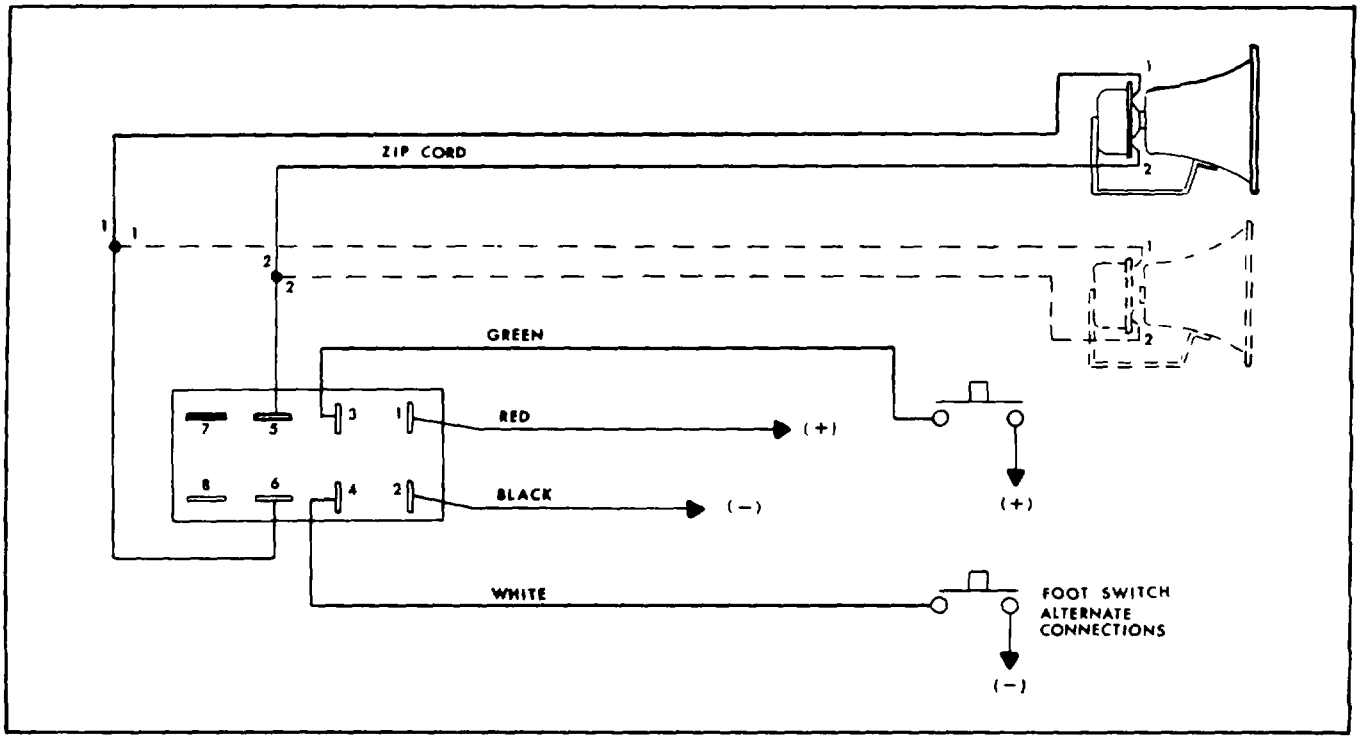


Figure 5. Power Cable Connections - Foot Switch Control

a. Drill a 1/2-inch hole through the firewall on the battery side of the vehicle.

b. Place a grommet in the newly drilled hole.

c. Feed the black and red leads through the grommet and connect as previously described.

2. Positive Ground Installation.
Connect the black lead to the negative (hot) side of the battery terminal or ignition switch. Connect the red lead to the vehicle frame.

C. Foot Switch.

A foot switch is provided to allow foot control of the siren in addition to the control provided by the front panel SIREN button. Find a convenient mounting position on the vehicle floorboard and proceed as follows:

1. Use the foot switch as a template and mark two positioning holes on the floorboard.

2. Drill two 0.128 diameter (#30) holes into the floorboard at the positioning marks.

3. Connect one terminal of the foot switch to the green lead (P3, pin 3), and the other terminal to the positive (hot) side of the battery terminal (negative grounded systems). As an alternate method, connect one terminal of the foot switch to the white lead (P3, pin 4) and the other terminal to the vehicle frame or other good ground point (see figure 5).

4. Mount the foot switch to the floorboard with the two #8 x 3/4 round head screws (supplied).

D. Horn Switch.

Included with the electronic siren is a SPDT switch (toggle switch) which when properly installed, allows the user to activate the siren by depressing the horn button. When installing the horn switch in a vehicle with a negative ground system with a grounded horn ring, connect as shown in figure 6. See figure 7 when installing the horn switch in a positive ground vehicle with a grounded horn ring, or in a negative ground vehicle with an ungrounded horn ring. Locate a convenient mounting position for the toggle switch (supplied) and proceed as follows:

1 Drill a 1/2-inch diameter hole into the dash at the selected mounting location. Take care not to damage wires located behind the dash when drilling.

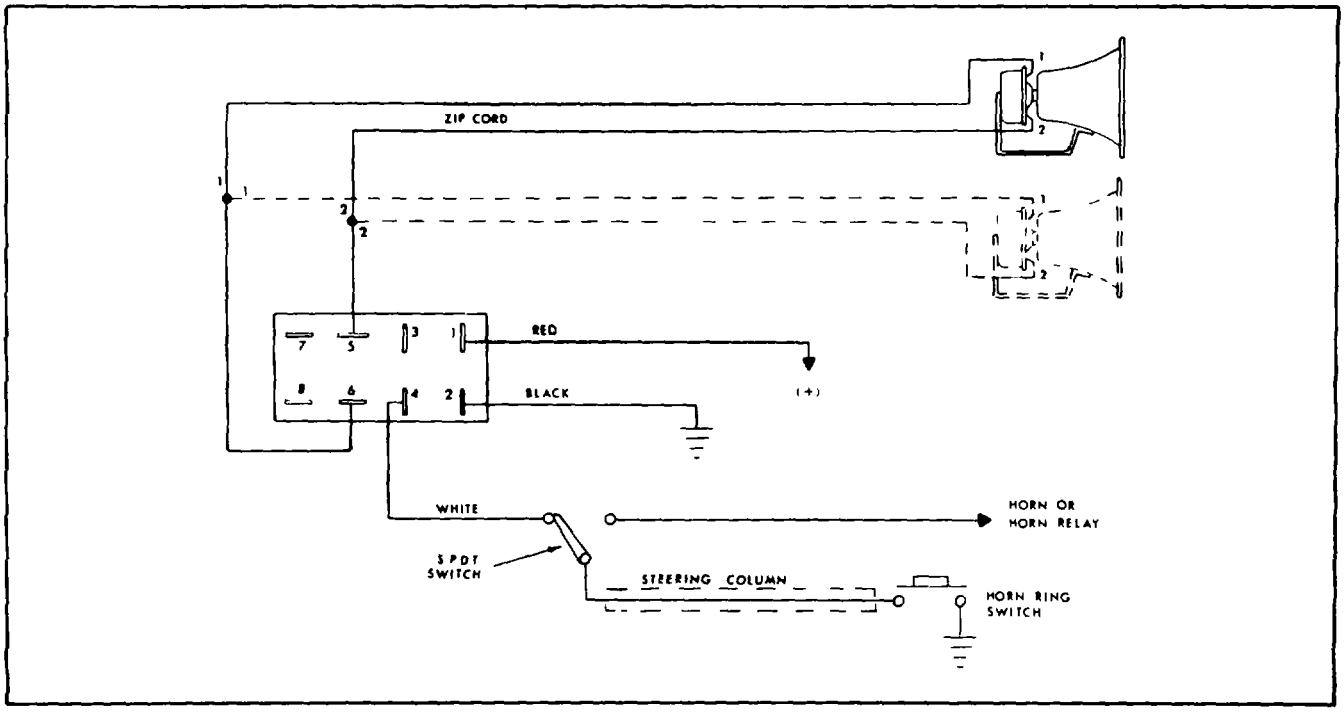


Figure 6. Power Cable Connections - Horn Ring Control (negative ground vehicles with grounded horn ring)

2 Connect a length of wire from one terminal of the toggle switch to the horn or horn relay. A screw terminal is usually provided on the horn relay. If a screw terminal is not provided, connect the wire to the lead that connects to the horn relay.

3. Connect the other terminal of the toggle switch to the white lead (P3, pin 4), if the vehicle has a negative ground system with a grounded horn ring (see figure 6). When the vehicle has a positive ground system with a grounded horn ring or a negative ground system with an ungrounded horn ring, connect this terminal of the toggle switch to the green lead (P3, pin 3) (see figure 7).

4. Connect the center terminal of the toggle switch to the horn ring switch as shown in figure 6 or 7.

5. Place the hexagon nut on the threaded portion of the toggle switch. Insert the threaded portion of the toggle switch through the hole in the dash and secure with the knurled nut.

3-5. RADIO INTERCONNECTING CABLE.

The radio interconnecting cable has a Six prong connector that plugs into P2 at the rear of the electronic siren. After installation of the cable, the electronic siren has the provision to broadcast two-way radio messages over the loudspeaker. Also, the two-way radio microphone can be used to take advantage of the electronic siren's public address feature. Refer to the instruction sheet furnished with the radio interconnecting cable for proper connection.

3-6. MICROPHONE CONNECTION

The electronic siren's public address feature can be utilized after the connection of microphone. The two-way radio microphone can be used after the connections described in paragraph 3-5 have been made. The electronic siren has a receptacle at the bottom of the unit which is used to interconnect a separate microphone.

The unit will operate with a magnetic, controlled magnetic (noise canceling), carbon or transistorized magnetic microphone. A slide switch (S3) located just inside the chassis, in the front and to the left of the pilot lamp (see figure 10), must be set according to the type of microphone used. When a controlled magnetic microphone is used, set the switch to the position marked "M". If a carbon or transistorized microphone is used, set the switch to the position marked "C".

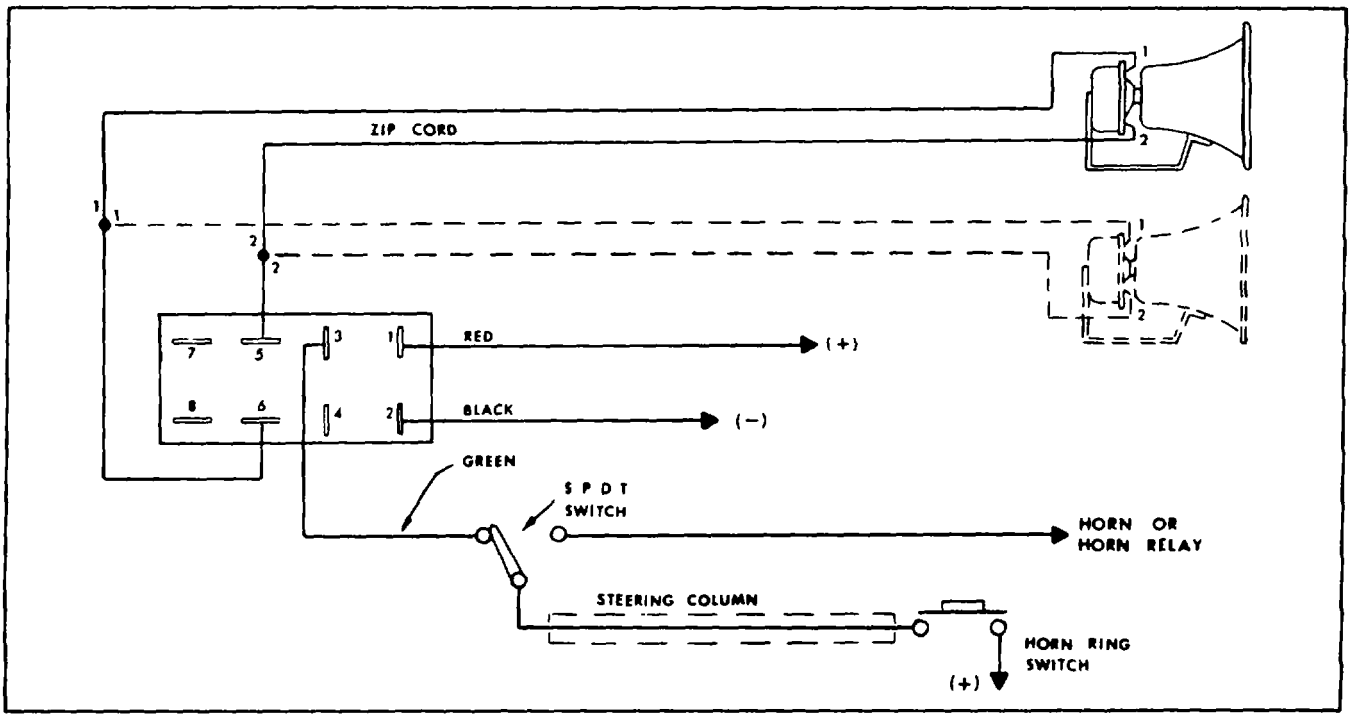


Figure 6. Power Cable Connections - Horn Ring Control (positive ground vehicles with grounded horn ring or negative ground vehicles with grounded horn ring)

SECTION IV
CONTROLS

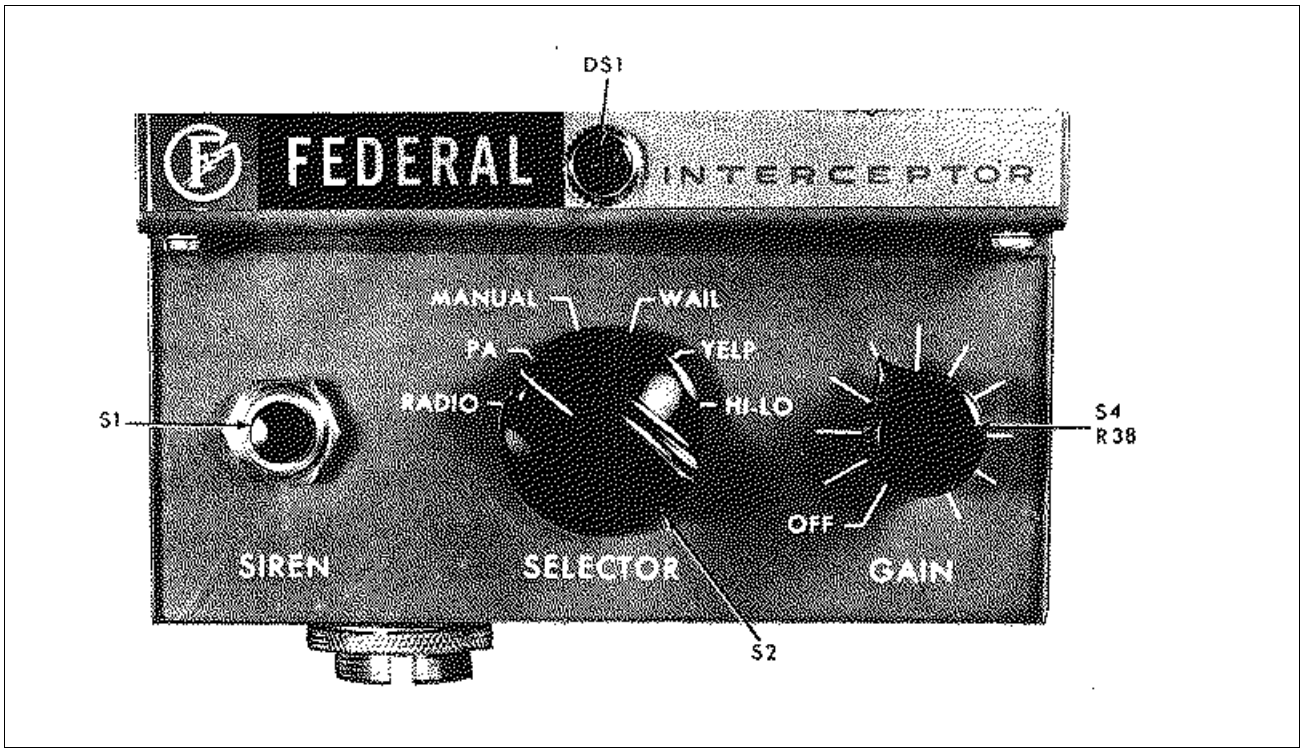


Figure 8. Front Panel View

All controls utilized during normal operation of the electronic siren are located on the front panel (see figure 8).

4-1. GAIN CONTROL.

The GAIN control is used to turn the electronic siren on and off. Also, it is used to control the volume when the electronic siren is used for public address or radio amplification. Clockwise rotation of this knob turns the unit on. Further rotation increases voice volume in the public address or radio amplification mode. The GAIN control does not control the volume of the siren.

Radial lines around the knob can be used for setting the volume to a predetermined level. The maximum clockwise setting of the control will be determined, in most cases, by the point at which feedback or "squeal" occurs. This will depend upon the microphone gain, open windows, speaker placement, proximity of reflecting surfaces (buildings or other vehicles), etc. Adjust the GAIN control to a position just low the point at which feedback occurs.

4-2. SIREN BUTTON

The SIREN button, located on the left-hand side of the front panel, is used to activate the siren when the SELECTOR witch is in the MANUAL position.

4-3. SELECTOR SWITCH

The SELECTOR switch is a six position rotary switch used to select the mode of operation. If a common microphone is used or the electronic siren and two-way radio, he switch will disconnect the microphone from the radio's transmitter section only when the switch is set to P.A. The following are positions on the SELECTOR switch:

A. RADIO.

In this position, incoming radio messages are amplified by the electronic siren. Volume can be controlled by the GAIN control. The radio volume may be adjusted to match the P. A. volume by means of the resistor control located on the rear panel of the electronic siren (see figure 4).

B. P.A.

In this position the electronic siren may be used as a public address system. Volume is controlled by the GAIN control. This is the only position in which the microphone is disconnected from the two-way radio's transmitter, if a common microphone is used for both the electronic siren and two-way radio.

C MANUAL.

In this position it is possible to operate the siren by depressing the front panel SIREN button. The siren can also be activated by means of an auxiliary switch, such as a foot switch or horn ring button. Operation will be similar to that of a conventional electro-mechanical siren.

D. WAIL.

In this position the siren will produce a continuous "wailing" sound, up or down in frequency.

E. YELP.

In this position a continuous rapid "warbled" tone is generated.

F HI-LO.

In this position a two-tone sound will be heard. This distinctive tone may be reserved for any special indication or situation.

SECTION V

OPERATION

5-1. TURNING THE UNIT ON OR OFF.

To turn the unit on, rotate the GAIN control clockwise until a click is heard. The pilot lamp will illuminate. To turn the unit off, rotate the GAIN control fully counterclockwise.

5-2. RADIO OR PA OPERATION.

Set the SELECTOR switch to RADIO or PA. Adjust the GAIN control to a position just below the point at which feedback occurs. When maximum volume in the P. A. position is required, hold the microphone close to your lips and speak in a loud voice. he radial lines around the GAIN control m be used for pre-setting the level.

5-3. WAIL, YELP OR HI-LO OPERATION

Set the SELECTOR switch to the desired siren position.

5-4. MANUAL SIREN OPERATION

Set the SELECTOR switch to the MANUAL 3ition. Depress the SIREN button or, connected, activate the auxiliary switch. activate the siren from the horn ring itch, the toggle switch must be in the position.

SECTION VI

THEORY OF OPERATION

6-1. GENERAL

The major circuitry consists of a wail yelp timing oscillator, hi-lo timing oscillator, sweep oscillator, microphone pre-amplifier, emitter follower, driver amplifier, and output amplifier. See figure 11.

6-2. WAIL YELP TIMING OSCILLATOR.

In the WAIL or YELP position, Q1 and Q2 function as a timing oscillator. The output of the timing oscillator determines the frequency of operation of the sweep oscillator (Q5 and Q6). Initially, assume SELECTOR switch set to WAIL and Q1 on, C3 charges through R4 and the emitter-collector junction of Q1. When C3 is sufficiently charged, Q1 cuts off which turns on Q2. C3 discharges through R10. The charge and discharge of C3 determines the repetition rate (10 cycles/minute)in the WAIL mode. In the YELP mode, C4 has a similar function as C3. The repetition rate in the YELP mode in approximately 180 cycles/minute. An RC network (C6, R12 in WAIL and C5, R11 in YELP) develops a slowly rising and falling voltage having a triangular shape. This rising and falling voltage is applied to the sweep oscillator and determines the frequency of operation.

With the SELECTOR switch set to MANUAL, Q1 and Q2 no longer function as a timing oscillator. When a positive source is connected through an auxiliary switch to P3, pin 3 or when S1 is depressed, Q2 turns on and allows C6 to charge. While C6 charges, the sweep oscillator frequency increases. After releasing S1 or the auxiliary switch, Q2 turns off and C6 discharges through R12 causing the sweep oscillator frequency to decrease. The circuit will function in a similar manner when a negative source is connected through an auxiliary switch to P3 pin 4.

6-3. HI-LO TIMING OSCILLATOR.

The HI-LO timing oscillator functions only when the SELECTOR switch is set to the HI-LO position. When the switch is set to HI-LO, C7 charges through the base emitter junction of Q3. When the C7 charge voltage reaches the trip point of Q4, it immediately discharges through the anode-cathode junction of Q4. The charge and discharge of C7 causes a rising and falling voltage, with a repetition rate of approximately 45 cycles/minute, which turns Q3 n and off. A square wave at the Q3 collector turns CR2 on and off. When CR2 is not conducting the low tone is generated, nd when CR2 conducts (R15 in parallel with 13) the high frequency tone is generated. ,he square wave at the junction of R13 and .14 is applied to the sweep oscillator.

6-4. SWEEP OSCILLATOR.

The rising and falling voltages from the timing oscillators is applied to the junction of R24 and R25. The voltage at this point determines the bias voltage at Q5 and Q6, which function as an astable multivibrator. R4 and CR5 are used to set the DC bias of the transistors. The output of the sweep oscillator is a series of square waves, frequency determined (500 Hz to 1400 Hz) by the bias voltage. This frequency increases when the bias voltage increases and decreases when the bias voltage decreases.

6-5. MICROPHONE PRE-AMP.

The microphone pre-amplifier is used only when S3 is set to the "TM" position (magnetic microphone) and the SELECTOR switch is set to PA. The signal from a magnetic microphone is applied through S3 to the base of Q7. The low level signal is amplified by Q7, flows through S3, S2G and the GAIN control to the base of Q8.

6-6. EMITTER FOLLOWER AND DRIVER.

An output from the sweep oscillator, microphone pre-amplifier, carbon or transistorized microphone, or two-way radio is applied to the base of Q8. Transistor Q8 functions as an emitter follower,

providing a high input and low output impedance. The output of Q8 is applied to the driver (Q9) amplified and transformer coupled to the output stage.

6-7. OUTPUT AMPLIFIER.

Transistors Q10 and Q11 operate as a Class B, push-pull amplifier. The output of the amplifier is transformer coupled to the speaker. Transistor Q12 and diode CR6 provide protection should the power leads be reversed. Q12, along with resistors R46 through R49 help in preventing thermal runaway.

SECTION VII

SERVICE AND MAINTENANCE

7-1. SERVICE AND REPAIR.

Most of the component electronic parts used in the Interceptor are standard items that can be obtained from any radio or electronics supply shop.

To aid the repairman in isolating a malfunction and locating components, a top chassis view (figure 9), rear chassis view (figure 4), component location diagram (figure 10), and schematic diagram (figure 11) are provided. Any competent radio repairman or electronic technician should have no difficulty in tracing and correcting a malfunction, should any occur. When servicing the Interceptor, the voltage chart (table 1) and troubleshooting chart (table 2) can be useful in isolating a malfunction. For emergency replacement of any of the small components, care must be used when soldering. Heat easily impairs transistors, capacitors and circuit boards. It is therefore advisable to use longnose pliers or a similar heat sink on the lead being soldered.

When replacing output transistors, insure that a matched pair is used. Replace only with Federal part number 125B403 or Motorola 2N1560. Other transistors will burn-out after a very short time. Also use heat sink compound on both sides of the mica. Insure that the mica is installed properly. Improper Installation of mica could cause a short-circuit. Securely tighten transistor mounting screws.

NOTE

Most cases of defective output transistors are caused by a defective speaker (short-circuited voice coil). Make certain that the speaker is not defective prior to installing the repaired Interceptor.

The factory can and will service your equipment or assist you with technical problems, should any arise, that cannot be handled satisfactorily and promptly locally.

Communications and shipments should be addressed to:

Service Dept., Signal Division
Federal Sign and Signal Corporation
136th and Western Avenue
Blue Island, Illinois 60406

If any unit is returned for adjustment or repair, it can be accepted only if we are notified by letter or phone in advance of its arrival. Such notice should clearly indicate the service requested and give all pertinent information regarding nature of malfunction and, if possible, its cause.

7-2. MAINTENANCE.

A. Removal from Mounting Bracket.

When removing the Interceptor from the counting bracket, loosen the two hexagon head screws on the underside of the unit, ear the front edge (see figure 2). It is not necessary to remove the mounting bracket from location or the siren case from the racket. Disconnect all plug-in connectors. Slide the entire chassis and control panel at of the case.

B. Removal of Circuit Board.

The board is attached to the chassis by four Phillips-head screws. Removing these crews permits the board to be pivoted out

of the chassis without breaking any of the electrical connections, and allowing ample access to all components.

C. Symmetry Adjustment.

The symmetry of the output waveform has been preadjusted at the factory and will not ordinarily require readjustment unless Q5 or Q6 have been replaced. To perform the symmetry adjustment, proceed as follows:

1. Remove the speaker leads connected between P3, pins 5 and 6. Connect an 11-ohm load across pins 5 and 6.

2. Connect an oscilloscope across pins 5 and 6.

3. Set the SELECTOR switch to WAIL, YELP or HI-LO. Adjust R21 for a perfect square wave on the oscilloscope.

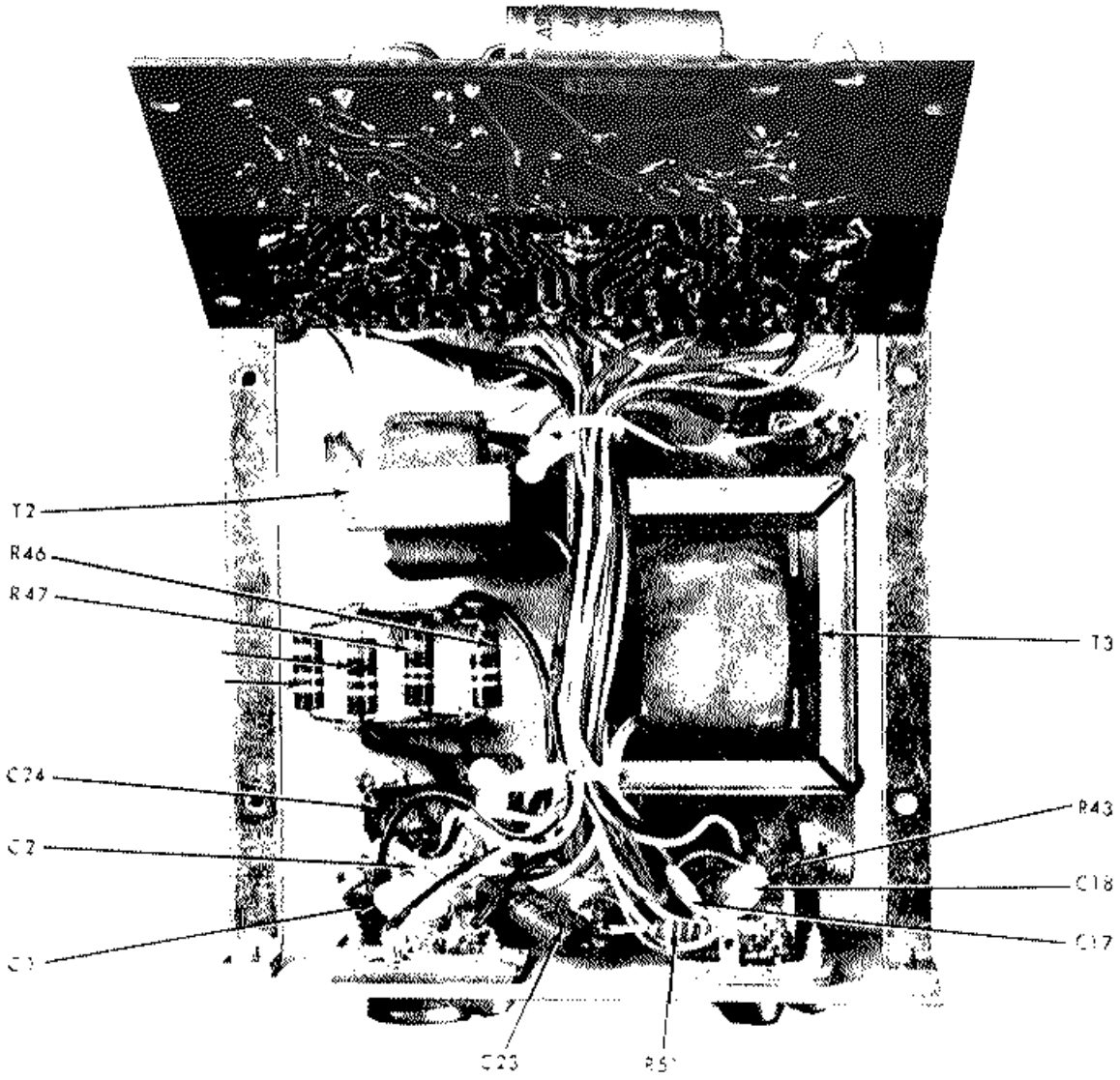
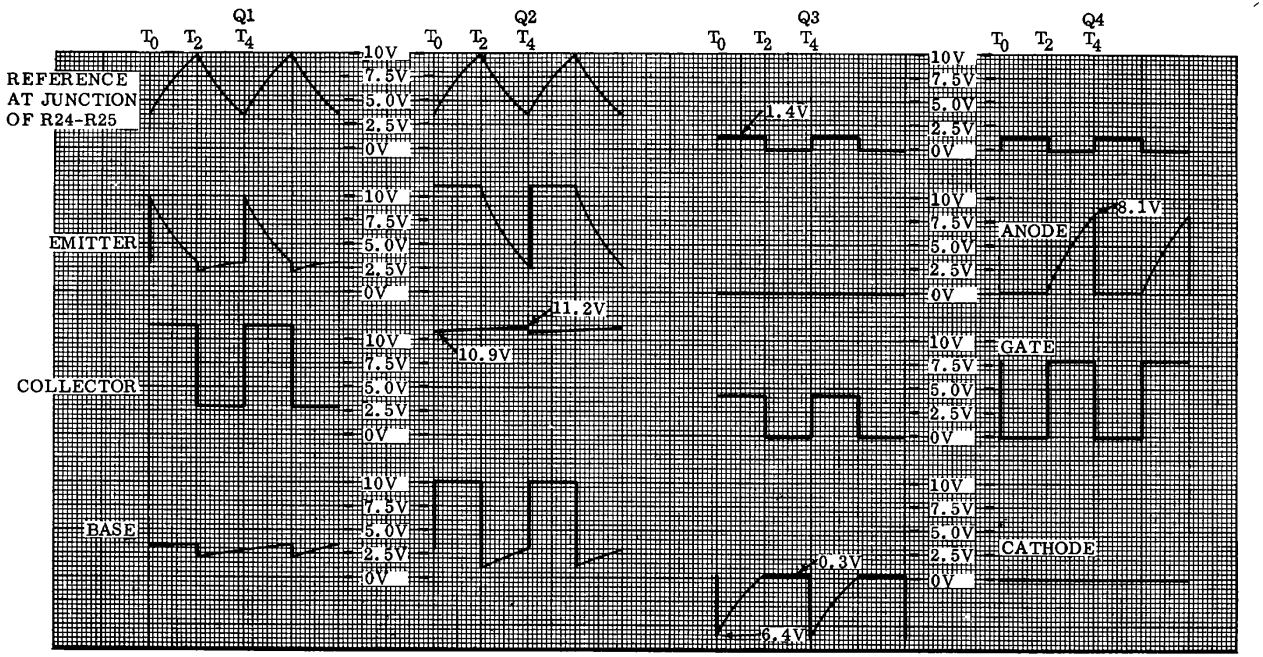


Figure 9. Top Chassis View

Table 1. Voltage Chart



Q5	1.7 VDC	3.7 VDC	1.6 VDC
Q6	1.6 VDC	3.7 VDC	1.5 VDC
Q7	0.48 VDC	9.3 VDC	1.09 VDC
Q8	1.28 VDC 0.05 VAC	12.6 VDC 0.0 VAC	1.8 VDC 0.5 VAC
Q9	1.28 VDC 0.05 VAC	12.3 VDC 2.9 VAC	0.65 VDC 0.5 VAC
Q10	13.2 VDC 0.14 VAC	0.0 VDC 7.4 VAC	13.0 VDC 0.32 VAC
Q11	13.2 VDC 0.18 VAC	0.0 VDC 7.4 VAC	13.0 VDC 0.4 VAC
Q12	13.6 VDC 0.0 VAC	13.6 VDC 0.0 VAC	13.2 VDC 0.0 VAC

1. GROUND CHASSIS TO B-BEFORE ATTEMPTING TO TAKE ANY MEASUREMENTS.
2. ALL MEASUREDMENTS MAKE WITH NEGATIVE LEAD OF OSCILLOSCOPE OR VTVM CONNECTED TO NEGATIVE POWER LEAD.
3. Q1, 2, 5, AND 6 MEASUREMENT TAKEN WITH SELECTOR SWITCH SET TO WAIL.
4. Q3 AND q4 MEASUREMENT TAKEN WITH SELECTOR SWITCH SET TO HI-LO.
5. Q7 THROUGH Q12 DC MEASUREMENTS TAKEN WITH SELECTOR SWITCH SET TO RADIO AND NO SIGNAL INPUT.
6. Q8 THROUGH Q12 AC MEASUREMENTS TAKEN WITH SELECTOR SWITCH SET TO RADIO WITH AN INPUT SIGNAL OF 1 VRMS AT 1 KHz- GAIN CONTROL SET AT APPROXIMATEL MID-POINT.

Table 2. Troubleshooting Chart

TROUBLE	PROBABLE CAUSE
Fuse blows.	One or more output transistors (Q10, Q11) defective and/or defective blocking transistor Q12.
No siren in any position. Radio and P. A. function normally.	Open capacitor C15.
No siren. Unit "chirps" in YELP position.	Open capacitor C6 or C7.
Little or no volume in all positions.	Defective loudspeaker.
Low output in all positions.	Defective transistor Q10, Q11, or Q12.
Little or no volume in RADIO position. P.A. is OK.	Improper adjustment of R30.
Little or no output when magnetic microphone is used.	Microphone transfer switch in "C" position. Open capacitor C11. Defective microphone.
No output from carbon or transistorized microphone.	Microphone transfer switch in "M" position.
No HI-LO. All other tones OK.	Defective transistor Q3 or Q4.
No radio or P. A. Siren tones OK.	Open capacitor C13 or C14.
Steady tone in all siren positions except MANUAL and HI-LO.	Defective resistor R3 or R5.
WAIL tone falls only. Manual tone only when SIREN button is held (does not coast down, but stops immediately when SIREN button is released).	Open capacitor C6.
WAIL tone rises to steady tone and holds. All other tones OK.	Open capacitor C3.
YELP tone falls only. All other tones OK.	Open capacitor C5.
Steady tone in YELP position. All other tones OK.	Open capacitor C4.
In MANUAL position, siren emits a steady or intermittent tone even though auxiliary switch (horn ring or foot) is not operated.	Defective transistor Q5 or Q6. Electrical leakage at auxiliary switch due to dirt or moisture. (Switch resistance should not be less than 10K ohms.)
Excessive noise in P.A. position only.	Short-circuit in microphone. There should be an open circuit between pin 2 and shell of microphone plug.
Buzz in loudspeaker when engine or radio is operated.	Open capacitor C20.
Short siren blast in MANUAL position. Sometimes heard when vehicle is being started.	Defective capacitor C8 and/or defective diode CR3.
Frequency of siren affected by flashing lights.	Voltage drop in power lead. Connect amplifier directly to battery terminal .

PARTS LIST

SCHEMATIC SYMBOL	DESCRIPTION	PART NUMBER
	*** RESISTORS**	
R1,28	1.5K ohm	100A220
R2,11,12	27K ohm, 5%	100A244
R3	10K ohm, 5%	100A257
R4	39K ohm, 5%	100A260
R5	18K ohm, 5%	100A258
R6	470 ohm	100A255
R7,18,29	1K ohm	100A202
R8,35	150 ohm	100A238
R9	8.2K, 5%	100A233
R10	100K ohm, 5%	100A262
R13,16	100K ohm	100A222
R14	10K ohm	100A207
R15,33	27K ohm	100A254
R17	47K ohm	100A228
R19	2.7K ohm	100A206
R20,22	2.7K ohm, 5%	100A256
R21	5K ohm, potentiometer	105A204
R23,31,34	4.7K ohm	100A224
R24,25	68K ohm, 5%	100A261
R26,27	22K ohm, 5%	100A259
R30	500 ohm, potentiometer	105A212
R32, 37	270K ohm	100A227
R36	22K ohm	100A208
R38	50K ohm, potentiometer	106A105
R41	3.3K ohm	100A209
R42	10 ohm	10OA251
R43	1.8K ohm, 2 watt	100A339
R44	120 ohm, 5%,2 watt	103A105
R45	1.0 ohm, 1 watt	103A101
R46,47	0.05 ohm, 5watt	103A208
R50	220 ohm	100A219
R51	3.3K ohm, 2 watt	100A340
	* Unless otherwise specified, all RESISTORS are in ohms, ± 10%, 1/4 watt.	
	TRANSISTORS	
Q1,2,3,5,6, 7,8	2N2925	125C119
Q4	D131TI, PUT	125C310
Q9	RCA 40316,Driver	125B410
Q10,11	2N1560,(Motorola only)	125B403
Q12	Blocking	125B406

SCHEMATIC SYMBOL	DESCRIPTION	PART NUMBER
	CAPACITORS	
C1,2,21	0.01 UF Ceramic Disc	107A223
C3,6	82 UF, 10V Tantalum	107A624
C4,5	3.9 UF, 15V Tantalum	107A625
C7,13,14	10 UF, 10V Tantalum	107A634
C8,19,20	250 UF, 15V Electrolytic	108A107
C9,10	0.0068 UF, Mylar	107A413
C11,22	0.47 UF, Mylar	107B405
C12,17	0.005 UF, Ceramic Disc	107A211
C15	0.1 UF, Mylar	107A406
C18	0.05 UF, Ceramic Disc	107A214
C23	0.22 UF, Mylar	107A414
C24	0.47 UF, Mylar	107A405-1
	DIODES	
CR1, 2,3,4,5	TI51	115B101
CR6	1 Amp. Rectifier	115B301
	TRANSFORMERS	
T1	Transformer	120B123
T2	Driver Transf.	120B125
T3	Output Transf.	120B124
	SWITCHES	
S1	Push button, SIREN	122A117
S2	Rotary, SELECTOR	122Bl40
S3	Slide	122B119
S4	ON-OFF, Part of R38	106Al05
	MISCELLANEOUS	
P1	Microphone connector	139B134
P2	6-Pin Jones Plug	140B113
P3	8-Pin Jones Plug	140B114
F1	Fuse, 15 ampere, 3AG	148A107
DS1	Pilot lamp, #53	149B101
Fuseholder	143A106	
Knob, Volume Control		141A102
Knob, Function Switch		141A103
Pilot lamp holder and jewel		147A104
Terminal strip		229A115

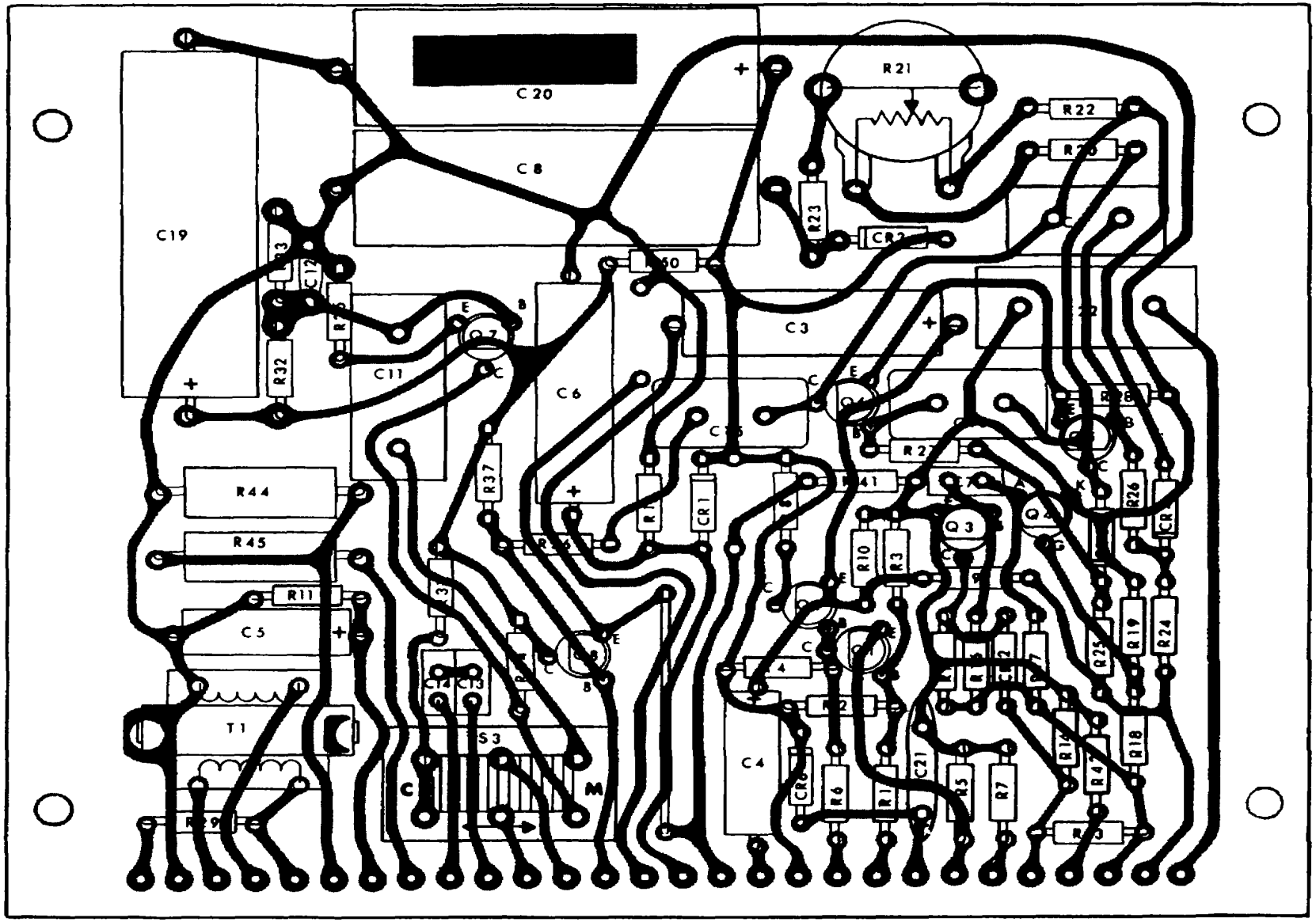
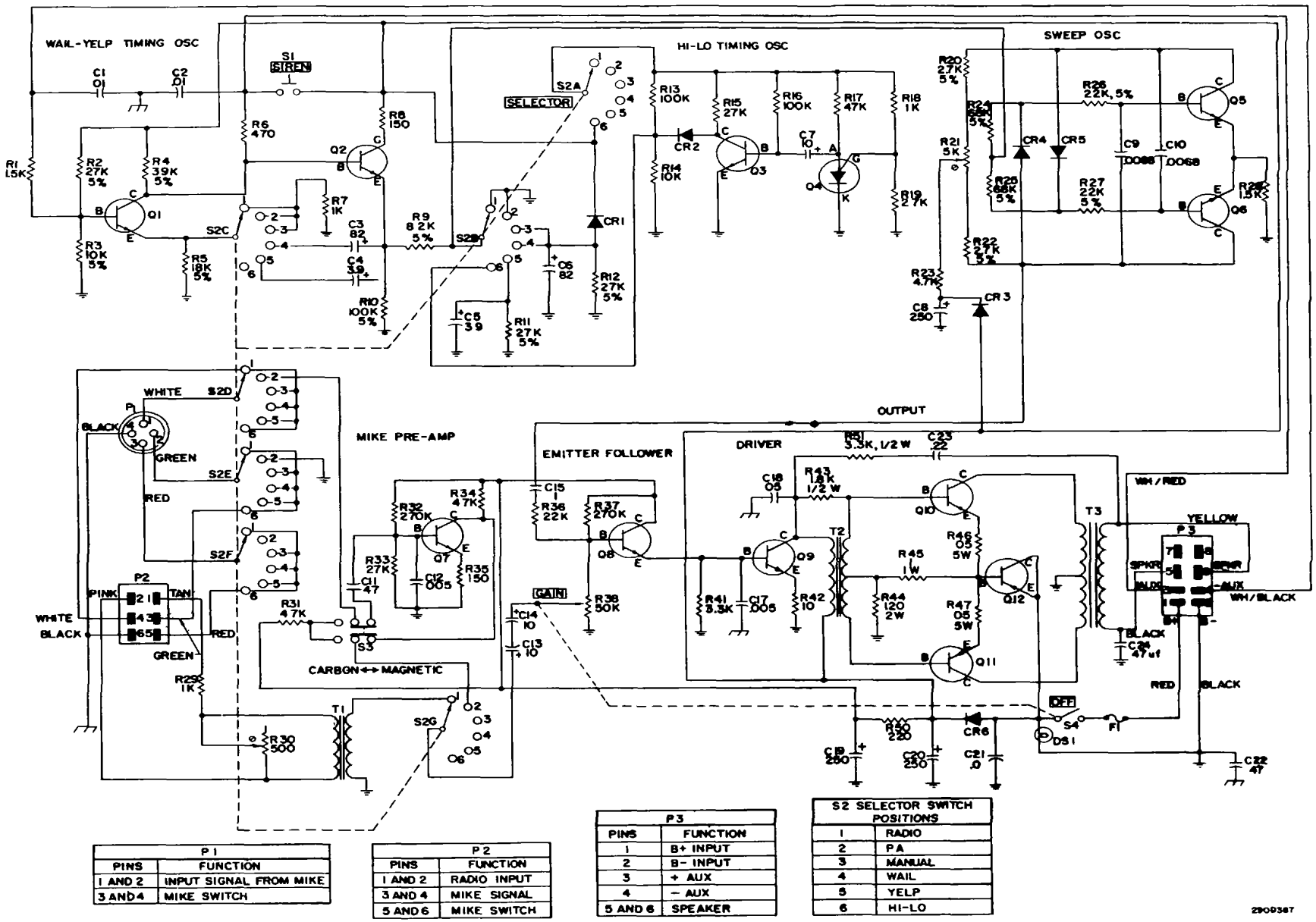


Figure 10. Component Location Diagram.



P1	
PINS	FUNCTION
1 AND 2	INPUT SIGNAL FROM MIKE
3 AND 4	MIKE SWITCH

P2	
PINS	FUNCTION
1 AND 2	RADIO INPUT
3 AND 4	MIKE SIGNAL
5 AND 6	MIKE SWITCH

P3	
PINS	FUNCTION
1	B+ INPUT
2	B- INPUT
3	+ AUX
4	- AUX
5 AND 6	SPEAKER

S2 SELECTOR SWITCH POSITIONS	
1	RADIO
2	PA
3	MANUAL
4	WAIL
5	YELP
6	HI-LO

2909387

Figure 11. Schematic Diagram

C. E. NIEHOFF COMPANY

Floor Mounted Switch (Part No. DR-139) Ansul Part No. S-52920

HURST PERFORMANCE INC. - SAFETY PRODUCTS DIVISION

Rescue Tool (Model 3620025) Ansul Part No. S-52534

By Order of the Secretary of the Army:

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

Official:

R. L. DILWORTH
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 = 3,280.8 feet

Weights

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

Liquid Measure

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

Square Measure

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

Cubic Measure

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

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	Newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29,573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	Newton-meters	1.356	metric tons	short tons	1.102
pound-inches	Newton-meters	.11296			

Temperature (Exact)

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

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