



**MTA-H HYDROSTATIC &
MTA ENGINE DRIVEN
STREET FLUSHERS**

ROSCO MANUAL PART NO. 37782

Revised 08/20/02

OPERATION, MAINTENANCE AND SERVICE MANUAL

NOTE: It is the responsibility of the customer or user's management to train, educate or supervise his employees in the proper operation and maintenance of this equipment.

ROSCO - A LeeBoy Company

688 North Highway 16
Denver, North Carolina
Telephone: 704-966-3300
www.LeeBoy.com

TABLE OF CONTENTS

1.	GENERAL INFORMATION	SECTION 1
	INTRODUCTION	1.2
	WARRANTY	1.3 - 1.4
	SPECIFICATIONS	1.5 - 1.8
2.	SAFETY	SECTION 2
	SYMBOLS	2.2
	GENERAL PRECAUTIONS	2.3
	OPERATING	2.4
	PTO DRIVELINE	2.4
	MAINTENANCE	2.4
	HYDRAULICS	2.5
	TRANSPORT	2.5
	STORAGE	2.5
	TIRES	2.6
	REFUELING	2.6
	BATTERY	2.6
	SAFETY DECALS	2.6
	SAFETY DECAL INSTALLATION	2.7
	SIGN-OFF FORM	2.8
	SAFETY DECAL LOCATION	2.9 - 2.11
3.	OPERATIONS	SECTION 3
	GENERAL DESCRIPTION	3.2 - 3.3
	MACHINE BREAK-IN	3.3
	PRE-OPERATION CHECKLIST	3.4 - 3.6
	OPERATION OF MTA-H UNITS	3.6 - 3.13
	OPERATION OF MTA UNITS	3.14 - 3.20
4.	MAINTENANCE	SECTION 4
	INTRODUCTION	4.2
	GENERAL MAINTENANCE	4.2 - 4.5
	PREVENTIVE MAINTENANCE CHART - MTA-H	4.6
	PREVENTIVE MAINTENANCE CHART - MTA	4.7
	HYDRAULIC FLUIDS	4.8
	HYDRAULIC FITTING TORQUE CHART	4.9
	BOLT TORQUE CHART	4.10
5.	TROUBLESHOOTING	SECTION 5
6.	PARTS CATALOG	SECTION 6

GENERAL INFORMATION

INTRODUCTION 1.2

WARRANTY 1.3 - 1.4

SPECIFICATIONS 1.5 - 1.8

 MTA 1.5

 MTA-H 1.6

 OPTIONAL EQUIPMENT AND ATTACHMENTS 1.7 - 1.8

INTRODUCTION

This manual has been compiled to assist the owner and/or operator with the correct operation and routine preventive maintenance procedures for the Model MTA or MTA-H STREET FLUSHER as manufactured by ROSCO MANUFACTURING COMPANY (ROSCO) of Madison, South Dakota, U.S.A. A parts catalog is also included in this manual to allow for the accurate ordering of repair parts from Authorized Rosco Dealers/Distributors.

THIS MANUAL HAS BEEN ORGANIZED INTO SIX (6) MAJOR SECTIONS:

- | | |
|------------------------|--------------------|
| 1. GENERAL INFORMATION | 4. MAINTENANCE |
| 2. SAFETY | 5. TROUBLESHOOTING |
| 3. OPERATION | 6. PARTS CATALOG |

A general contents page is located at the beginning of this manual as a quick reference to the these sections and their major subsections. In order to receive the performance and efficiency that has been designed into the MTA or MTA-H Street Flusher, it is very important to:

- A. Read this manual thoroughly before operating or servicing the Street Flusher.
- B. Keep this manual in a convenient place for ready reference.
- C. Not attempt repairs or adjustments you do not understand. If you require additional information or service, contact your Authorized Rosco Dealer/Distributor.

Throughout this manual references are made to the **LEFT SIDE** and **RIGHT SIDE** of the Street Flusher. These terms are as seen from the driver's seat and facing forward.

Serial Number - It is important to know the Serial Number of this equipment. The Serial Number Plate is located on the front left lower corner of the tank frame of the FLUSHER directly behind the drivers side of the truck cab, and a space has been provided below to record it. Use the Serial Number in all correspondence referring to the Street Flusher and when ordering parts.

Model _____

Serial Number _____

Production Year _____

Design Specifications - ROSCO MANUFACTURING COMPANY reserves the right to make design or specification changes without prior notification or to make any other improvements without incurring obligations to add them to any machine in existence.

Technical Information - ROSCO MANUFACTURING COMPANY is continuously improving its products. The technical information found in this manual was correct at the time it was approved for publication. However, if you find differences between your Street Flusher and the information contained in this manual, please contact your local Authorized ROSCO Dealer/Distributor.

LIMITED WARRANTY POLICY & PROCEDURES

A. WARRANTY

1. If a defect in material or workmanship is found and the authorized Dealer is notified during the warranty period, ROSCO will repair or replace any part or component of the unit or part that fails to conform to the warranty during the warranty period.
2. The warranty will begin upon the completion of the warranty form by the initial customer and will expire after twelve (12) months have passed. The Warranty Card must be filled out within ten (10) days of delivery of the unit.
3. Engines and truck chassis are warranted by their manufacturers and may have warranty coverage that differs from that of ROSCO.
4. Replacement parts furnished by ROSCO are covered for the remainder of the warranty period applicable to the unit or component in which such parts are installed.
5. ROSCO has the right to repair any component or part before replacing it with a new part.
6. All new replacement parts purchased by a ROSCO dealer will carry a six (6) month warranty. Remanufactured parts purchased by a ROSCO dealer will carry a ninety (90) day warranty.

B. LIMITATIONS

ROSCO has no obligation under this warranty for:

1. Any defects caused by misuse, misapplication, negligence, accident or failure to maintain or use in accordance with the most current operating instructions.
2. Unauthorized alterations.
3. Defects or failures caused by any replacement parts or attachments not manufactured by or approved by ROSCO.
4. Failure to conduct normal maintenance and operating service, including without limitation, providing lubricants, coolant, fuel, tune-ups, inspections or adjustments.
5. Unreasonable delay, as established by ROSCO, in making the applicable units or parts available upon notification of a service notice ordered by ROSCO.
6. The warranty responsibility on all engines and/or truck chassis rests with the respective manufacturer.
7. ROSCO may have support agreements with some engine and/or truck chassis manufacturers for warranty and parts support.

LIMITED WARRANTY POLICY & PROCEDURES

C. ITEMS NOT COVERED

ROSCO is not responsible for the following:

1. Charges for travel time, mileage or overtime.
2. Charges related to transporting the product to and from the place at which warranty work is performed.
3. Freight charges related to transporting repair parts to the place at which warranty work is performed.
4. All used units or used parts of any kind.
5. Repairs made necessary by normal wear and tear or brought about by abuse or lack of maintenance of the equipment, except for premature failures.
6. Attachments not manufactured or installed by ROSCO.
7. Liability for incidental or consequential damages of any type, including, but not limited to lost profits or expenses of acquiring replacement equipment.
8. Miscellaneous charges.

D. OTHER WARRANTIES

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESSED, STATUTORY AND IMPLIED WARRANTIES APPLICABLE TO UNITS, ENGINES OR PARTS, WITHOUT LIMITATION, AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR USE OR PURPOSE. IN NO EVENT, WHETHER AS A RESULT OF BREACH OF CONTRACT OR WARRANTY, OR ALLEGED NEGLIGENCE OR LIABILITY WITHOUT FAULT, SHALL ROSCO BE LIABLE FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, LOSS OF PROFIT OR REVENUE, COST OF CAPITAL, COST OF SUBSTITUTED EQUIPMENT, FACILITIES OR SERVICES, DOWN TIME COSTS, LABOR COSTS OR CLAIMS OF CUSTOMERS, PURCHASERS OR LESSEES FOR SUCH DAMAGES.

MTA SPECIFICATIONS

CAPACITY

1,550 to 4,000 rated U.S. gallons.

TANK TYPE & MATERIAL

Steel, elliptical cross section with flat, flanged and reinforced 7 gauge heads, lower section of tank is 7 gauge, minimum 7 gauge surge plates, upper section of tank is 10 gauge. 8 inch sump, 4 inch non-corrosive drain plug.

INDICATOR

Equipped with an 80% full indicator.

AUXILIARY ENGINE WITH MANUAL PRESSURE SELECTION

Cummins 4B3.9, 239 cu.in., 76 HP engine.

WATER PUMP

750 GPM single stage high pressure water pump with 4 inch intake and 4 inch discharge.

PUMP DRIVE

Engine driven (direct connected to the auxiliary engine).

TOP OPENING

22 inch diameter with cover.

NOZZLES

Three (3) adjustable flushing nozzles located as follows: one (1) mid-ship left hand; one (1) mid-ship right hand; one (1) mounted at front right side. Nozzles are 2 piece horizontally split, slot type nozzles.

PIPING

Standard carbon steel in combination with high pressure rubber hose for increased flexibility.

LOAD LINE

2.5 inch anti-syphon, 6 inch air gap with hose.

TANK MOUNTING

Tank is welded to formed steel sills and spring mounted to truck frame with steel angles and bolts on hardwood cushion strips.

FINISH

Exterior of tank primed and painted in customer's choice of color. Interior is sandblasted and coated with epoxy coating.

MISCELLANEOUS

I.C.C. clearance lights and reflectors, full width fenders with mud flaps, hose hooks, rear bumper, and back-up alarm.

MTA-H SPECIFICATIONS

CAPACITY

1,550 to 4,000 rated U.S. gallons.

TANKTYPE & MATERIAL

Steel, elliptical cross section with flat, flanged and reinforced 7 gauge heads, lower section of tank is 7 gauge, minimum 7 gauge surge plates, upper section of tank is 10 gauge. 8 inch sump, 4 inch non-corrosive drain plug.

INDICATOR

Equipped with an 80% full indicator.

PUMP DRIVE

Variable displacement hydrostatic pump, driven by chassis engine crankshaft (front live power) with fixed displacement piston motor and EDC control. 20 gallon pressurized hydraulic reservoir and replaceable 7 micron filter. (Truck chassis must be suitable for front live power.)

AUTO PRESSURE CONTROL

Pressure set with a dial on control panel (water pressure gauge on panel). Maintains constant water pressure regardless of speed between 3 - 25 mph. (Speed range depends on drive train specifications.)

WATER PUMP

750 GPM single stage high pressure water pump with 4 inch intake and 4 inch discharge.

POWER TAKEOFF

Hydrostatic transmission of flusher can be driven by a suitable heavy-duty power takeoff, installed on the truck transmission, with shifting control in truck cab if transmission PTO provides for live power.

TOP OPENING

22 inch diameter with cover.

NOZZLES

Three (3) adjustable flushing nozzles located as follows: one (1) mid-ship left hand; one (1) mid-ship right hand; one (1) mounted at front right side. Nozzles are 2 piece horizontally split, slot type nozzles.

PIPING

Standard carbon steel in combination with high pressure rubber hose for increased flexibility.

LOAD LINE

2.5 inch anti-syphon, 6 inch air gap with hose.

TANK MOUNTING

Tank is welded to formed steel sills and spring mounted to truck frame with steel angles and bolts on hardwood cushion strips.

FINISH

Exterior of tank primed and painted in customer's choice of color. Interior is sandblasted and coated with epoxy coating.

MISCELLANEOUS

I.C.C. clearance lights and reflectors, full width fenders with mud flaps, hose hooks, rear bumper, and back-up alarm.

SPECIFICATIONS - Optional Equipment and Attachments

THE FOLLOWING ITEMS MAY BE USED ON MTA AND MTA-H FLUSHERS UNLESS NOTED

PTO DRIVEN HYDROSTATIC PUMP

Driven from truck transmission. (MTA-H only)

FULL STREAMLINE SKIRTING

Includes skirting with catwalks, engine compartment, other compartments when required.

FOURTH FLUSHING NOZZLE

Complete with solenoid controlled valve and cab control.

SPRINKLER ATTACHMENT For Use on Unpaved Streets

Two (2) cylindrical brass heads mounted vertically, with cab control and mounted at rear of truck.

FIRE FIGHTING ATTACHMENT

2 1/2 inch valve.

SUCTION FILLING ATTACHMENT

For filling flusher tank from other than hydrant. For transferring water, pumping out basements, cisterns etc.

PRIMER PUMP, FOOT VALVE AND STRAINER

For use with suction filling attachment.

SUCTION HOSE

Two (2) lengths of 3 inch X 10 foot rubber suction hose for use with suction filling attachment.

EIGHT FOOT SPRAYBAR

With nozzles, mounted at rear including ON/OFF controls in the cab.

HOSE REEL

Mounted at the rear or side with manual or electric rewind, including 100 feet of 2 1/2 inch hose.

REMOTE WATER CANNON

For controlled high pressure spraying. Cab controlled water turret mounted on top front of tank.

TOOL BOX

Lockable, mounted on fender for storing wrenches or couplings.

TANK SIGHT GAUGE

Clear water sight gauge mounted on front of tank.

REMOTE RH MIRROR

Controlled from inside the cab, 4-way.

SPECIFICATIONS - Optional Equipment and Attachments

DUMP VALVE

Full opening, with ON/OFF control in the cab, for fast unloading for sewer flushing, ice rink flooding etc. Air operated from the truck air brake system.

WATER RECIRCULATING FOR COLD WEATHER OPERATION

Prevents freezing of piping and valves.

PUMP WATER SUCTION STRAINER

Strains water before entering pump. Prevents pump damage and nozzle clogging.

ELECTRIC WORK LIGHTS

One (1) located mid-tank curb side. One (1) located on rear tank head.

LOADING HOSE

Single jacket cotton hose, 2 1/2 inch X 15 foot with IPT 2 1/2 coupling on one end.

SAFETY

SYMBOLS	2.2
GENERAL PRECAUTIONS	2.3
OPERATING	2.4
PTO DRIVELINE	2.4
MAINTENANCE	2.4
HYDRAULICS	2.5
TRANSPORT	2.5
STORAGE	2.5
TIRES	2.6
REFUELING	2.6
BATTERY	2.6
SAFETY DECALS	2.6
SAFETY DECAL INSTALLATION.....	2.7
SIGN-OFF FORM	2.8
SAFETY DECAL LOCATION	2.9 - 2.11

SAFETY

SAFETY ALERT SYMBOLS

This Safety Alert symbol means
ATTENTION! BECOME ALERT!
YOUR SAFETY IS INVOLVED!



The Safety Alert symbol identifies important safety messages on the ROSCO STREET FLUSHER and in its manual. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

Why is SAFETY important to you?

3 Big Reasons:

- ***Accidents Disable and Kill**
- ***Accidents Cost**
- ***Accidents Can be Avoided**

Signal Words

Note the use of the signal words **DANGER**, **WARNING** and **CAUTION** with the safety message. The appropriate signal word for each message has been selected using the following guidelines:

DANGER

An immediate and specific hazard which **WILL** result in severe personal injury or death if the proper precautions are not taken.

WARNING

A specific hazard or unsafe practice which **COULD** result in severe personal injury or death if proper precautions are not taken.

CAUTION

Unsafe practices which **COULD** result in personal injury if proper practices are not taken, or as a reminder of good safety practices.

Equipment Safety Symbol

Throughout this manual, whenever you see this "Broken Bolt" symbol, it means:



ATTENTION

Equipment on the machine could be damaged through improper performance of an operation, maintenance or repair procedure.

SAFETY

You are responsible for the safe operation and maintenance of your Rosco Street Flusher. You must ensure that you and anyone else who is going to operate, maintain or work around the machine is familiar with the operating and maintenance procedures. Special attention should be given to learning and understanding the safety information contained in this manual.

In accordance with OSHA regulations 1928.51 and 1928.52, operating instructions must be provided initially to operators or employees before allowing them to operate the Street Flusher, and at least annually thereafter.

The most important safety device on this equipment is a well trained and safe operator. It is his/her responsibility to read and understand all safety and operating instructions in this manual. A person who has not read and understood all operating and safety instructions is not qualified to operate the Street Flusher. An untrained operator exposes himself/herself and bystanders to possible serious injury or death. All accidents can be avoided!

Do not modify the Street Flusher in any way. Unauthorized modification may impair function and/or safety and affect the working life of the equipment.

ROSCO Manufacturing Company assumes **NO LIABILITY** for accident or injury incurred through the improper use of this equipment.

SAFETY PRECAUTIONS

GENERAL

1. Always read and fully understand the Operator's manual and the safety decals on the machine before trying to operate or service the equipment.



2. It is wise to have a first aid kit available and be familiar with its contents.



3. Keep a charged extinguisher within reach whenever you work in an area where fire may occur. Also be sure you have the correct type of extinguisher for your situation:

Type A: Wood, paper, textile and rubbish.

Type B: Flammable liquid

Type C: Electrical equipment



4. Be sure to wear safe work clothing. It should be well fitted and in good repair. Do not wear rings, wrist watches or loose fitting clothing when working on machinery.

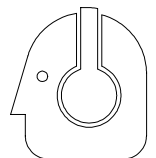


They could catch on moving parts causing serious injury. Wear sturdy, rough-soled work shoes, safety glasses and any other protective gear that is warranted by the work environment.

5. Keep work area organized and clean. Wipe up oil spills of any kind. Keep tools and parts off floor. Eliminate the possibility of a fall which could result in injury.

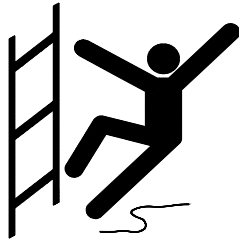


6. Wear appropriate ear protection for prolonged exposure to excessive noise.



SAFETY

7. DO NOT hurry! Use recommended hand holds and steps with at least three points of support when getting on and off the Street Flusher. Keep steps, floor, hand holds and controls clean and free from grease. Face the machine when climbing up and down and never jump off or dismount while the machine is in motion.



OPERATING

1. DO NOT allow riders on the Street Flusher when transporting.

2. Clean reflectors and lights before transporting.

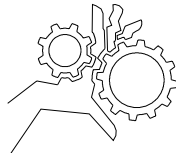
3. Clear the area of people before starting or operating the unit.

4. Place all controls in neutral, stop engine, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.

5. Reinstall safety devices, guards or shields after adjusting and/or servicing the machine.

6. After servicing, be sure that all tools, parts or servicing equipment are removed from the vehicle or engine.

7. Keep hands, feet, hair and clothing away from moving parts.



8. DO NOT go into the tank. Entry into a confined space requires special equipment and training. Serious injury or death can result due to poisonous gasses or lack of oxygen. Keep others out.

9. When using the chemical injection system, be sure to follow safe practices. Wear safety glasses and other appropriate gear. Follow local,

state and federal regulations when disposing of chemicals.

10. Keep all hydraulic lines, fittings and couplers tight and free of leaks before using.

11. DO NOT go under the vehicle when the engine is running.

PTO DRIVELINE

1. Stay away from rotating drive line. Hands, feet, hair and clothing can get caught on rotating parts and cause serious injury or death.



2. DO NOT go under vehicle when the engine is running.

3. DO NOT work on the PTO driveline when the engine is running.

4. DO NOT engage or disengage PTO by hand from under the vehicle when the engine is running.

5. Shut off engine and remove ignition key before working on or near the system.

MAINTENANCE

1. Follow ALL operating, maintenance and safety information in the manual.

2. Support the machine with blocks or safety stands when changing tires or working beneath it.

3. Place all controls in neutral, stop engine, remove ignition key and wait for all moving parts to stop before servicing, adjusting or repairing.

4. Follow good shop practices. Keep service area clean and dry. Be sure electrical outlets and tools are properly grounded. Use adequate light for the job at hand.



SAFETY

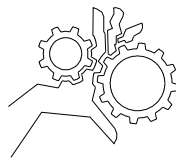
5. Make sure all guards are in place and properly secured when maintenance work is completed.

6. Never wear ill-fitting, baggy or frayed clothing when working around or on any of the drive system components.

7. Before applying pressure to a hydraulic system, make sure all lines, fittings and couplers are tight and in good condition.

8. DO NOT go into the tank. Entry into a confined space requires special equipment and training. Serious injury or death can result due to poisonous gasses or lack of oxygen. Keep others out.

9. Keep hands, feet, hair and clothing away from moving parts.



10. Clear the area of bystanders when performing any maintenance, repairs or adjustments.

HYDRAULICS

1. Make sure that all components in the hydraulic system are kept in good condition and are clean.

2. Replace any worn, cut, abraded, flattened or crimped hoses and metal lines.

3. DO NOT attempt makeshift repairs using tape, clamps or cements. The hydraulic system operates under extremely high pressures and such repairs could cause serious injury.



4. Wear proper hand and eye protection when searching for a high pressure leak. Use a piece of wood or cardboard as a back stop instead of hands to isolate



and identify leaks. Insure all pressure is relieved before disconnecting lines, hoses and/or valves.

5. If injured by a concentrated high pressure stream of hydraulic fluid, seek medical attention immediately. Serious infection or toxic reaction can develop from hydraulic fluid piercing the skin surface.

TRANSPORT

1. Make sure you are in compliance with all local regulations regarding transporting equipment on public roads and highways.

2. Make sure the lights and reflectors that are required by local highway and transport authorities are in place, are clean, are in good repair and can be seen clearly by all overtaking and oncoming traffic.

3. If your machine is equipped with a spraybar, raise and secure spraybar wings before transporting.

4. DO NOT exceed 55 m.p.h. (90 km/h) when transporting the machine. Reduce speed on rough roads and surfaces and when making turns.

5. DO NOT drink and drive. Use seat belts.

STORAGE

1. Store the Street Flusher in an area away from human activity.

2. DO NOT permit children to play on or around the stored machine.

3. Make sure the unit is stored in an area that is firm, level and free of debris.

SAFETY

TIRES

1. Failure to follow proper procedures when mounting a tire on a wheel or rim can produce an explosion which may result in serious injury or death.
2. DO NOT attempt to mount a tire unless you have the proper equipment and experience to do the job.
3. Have a qualified tire dealer or repair service perform required tire maintenance.
4. Support the machine with blocks or safety stands when changing tires or working beneath it.
5. DO NOT inflate tires beyond the maximum recommended inflation pressure. NEVER run a vehicle on one tire of a dual assembly. The carrying capacity of the single tire and rim is dangerously exceeded and operating a vehicle in this manner can result in damage to the rim and tire.

REFUELING

1. Handle fuel with care. It is highly flammable. DO NOT over fill fuel tank as over fill creates a fire hazard.
2. Clean up spilled fuel before restarting engine.
3. DO NOT refuel the machine while smoking or when near open flame or sparks. DO NOT refuel with engine running.
4. Fill fuel tank outdoors. Keep the hose nozzle or the funnel and container in contact with the metal of the fuel tank to avoid the possibility of an electrical spark igniting the fuel.
5. Prevent fires by keeping machine clean of accumulated trash, grease and debris.



BATTERY

1. Keep all sparks and flames away from batteries, as gas given off by electrolyte is explosive.
2. Wear safety glasses when working near batteries. If you come in contact with battery electrolyte solution wash off immediately.
3. DO NOT tip batteries more than 45 degrees to avoid electrolyte loss.
4. To avoid injury from spark or short circuit, disconnect battery ground cable before servicing any part of the electrical system.
5. Use jumper cables ONLY in recommended manner. Improper use can result in battery explosion or unexpected Street Flusher motion.

SAFETY DECALS

1. Keep safety decals and signs clean and legible at all times.
2. Become familiar with the content and the position of each safety decal. Important information is written on decals.
3. Replace safety decals and signs that are missing or have become illegible.
4. When replacing parts, be sure to check that any safety decals that were on the original part are also on the new part.
5. Obtain safety decals or signs from your Authorized ROSCO Dealer/Distributor.

SAFETY

DECAL INSTALLATION

1. Be sure that the installation area is clean and dry. Use hot soapy water and dry the area thoroughly before installing decals.

2. Decide on the exact position by taking measurements and test fitting before you remove any of the backing paper.

3. For decals with no top protection paper, decide on the location for the decal and remove the smallest adhesive backing of the split backing paper.

4. Align the decal over the specified area and carefully press the small portion with the exposed adhesive backing in place.

5. Slowly peel back the remaining paper and carefully smooth the remaining portion of the decal in place.

6. Small air pockets can be pierced with a pin and smoothed out using a piece of decal backing paper.

7. If the decal has a protective top paper, use hot soapy water on the surface to which the decal is being applied. Leave wet. After deciding on the location, remove the backing paper and soak the decal in clean soapy water before application. This will help to alleviate air bubbles in the finished decal.

7a. Smooth the decal into place with a squeegee and check for air bubbles.

7b. Small air pockets may be pierced with a pin and smoothed out. When the decal is completely smoothed out, carefully remove the top paper.

SIGN-OFF FORM

ROSCO Manufacturing Company follows the general Safety Standard specified by the Society of Automotive Engineers (SAE) and the Occupational Safety and Health Administration (OSHA). Anyone who will be operating and/or servicing the Street Flusher must read and clearly understand all safety, operating and maintenance information presented in this manual. DO NOT operate or allow anyone to operate this equipment until such information has been reviewed. Annually review this information before the season start-up. Make these periodic reviews of Safety and Operation a standard practice for all your equipment. An untrained employee is unqualified to operate this machine.

This sign-off form is provided for your record keeping to show that all personnel who will be working with the Street Flusher have read and understand the information in the Operator's Manual and have been instructed in the operation of this equipment.

DATE	EMPLOYEES SIGNATURE	EMPLOYERS SIGNATURE

SAFETY DECAL LOCATION

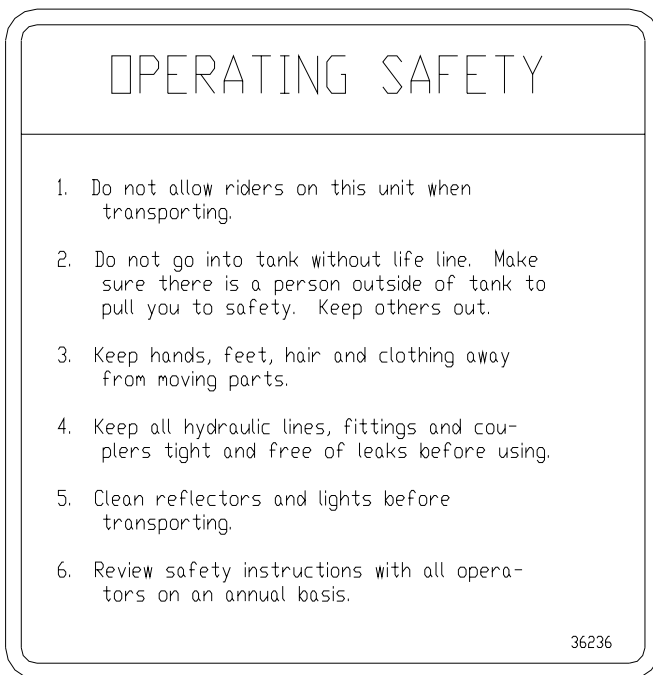
Good safety requires that you familiarize yourself with the various safety decals, the type of warning and the area, or the particular function related to that area, which requires your safety awareness.

Refer to the **Parts Section** of this manual for a complete list of decals affixed to your Flusher.

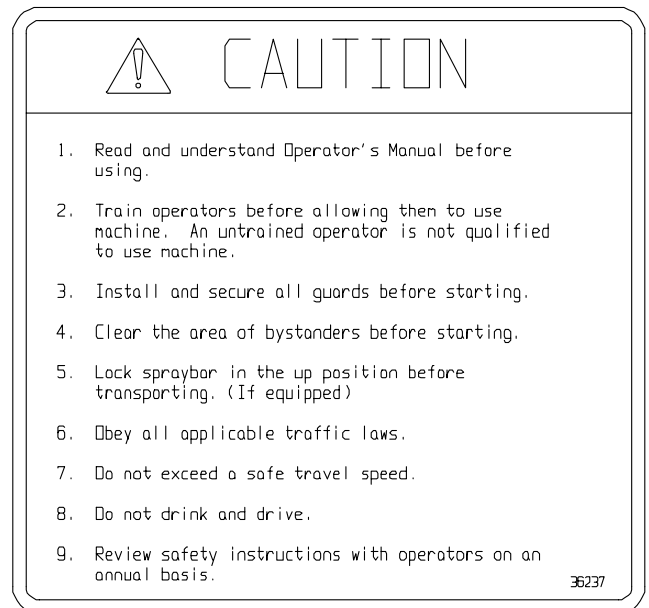
THINK SAFETY!

WORK SAFELY!

THE FOLLOWING DECALS APPEAR ON MTA and MTA-H UNITS:



Part #36236
Located on rear window of cab.



Part #36237
Located on rear window of cab.



Part #37000
Located on top of tank at ladder.

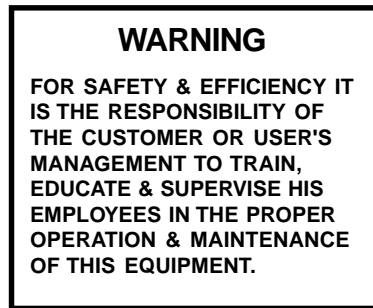


Part #37763
Located inside cab on dash.

SAFETY DECAL LOCATION

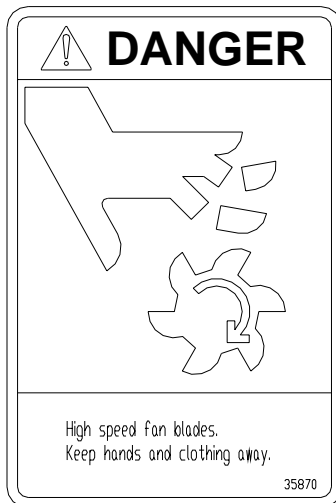


Part #38480
Located on top of tank lid.

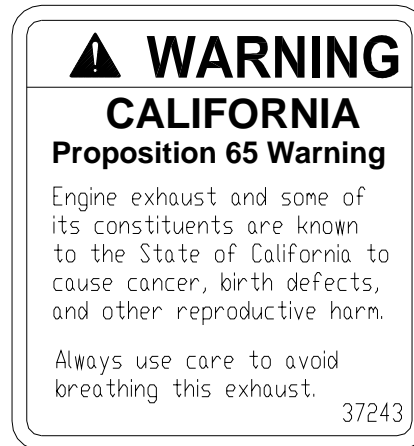


Part #53495
Located on rear window of cab.

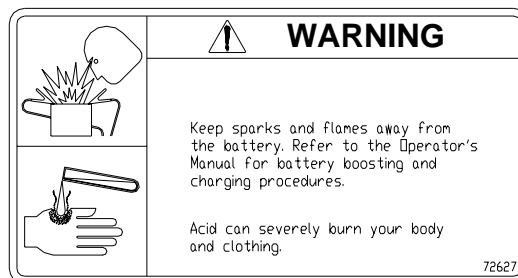
THE FOLLOWING DECALS APPEAR ON MTA UNITS ONLY:



Part #35870
Located at rear of unit on radiator bracket.



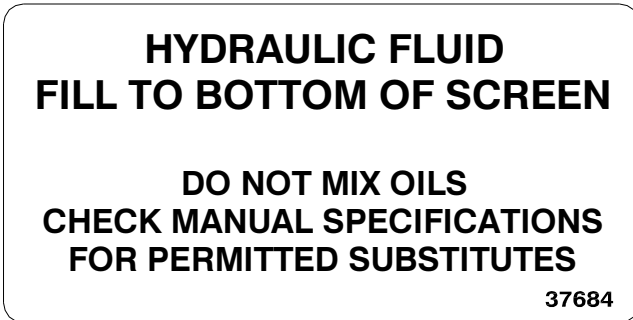
Part #37243
Located on driver's side of front windshield.



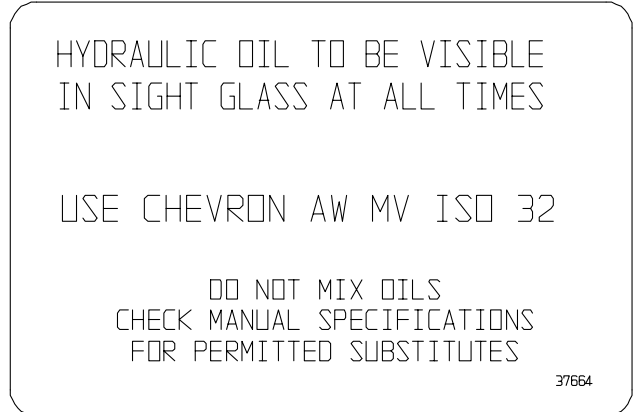
Part #72627
Located at rear of unit near battery.

SAFETY DECAL LOCATION

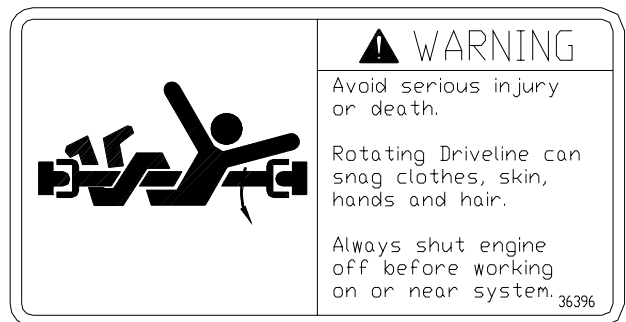
THE FOLLOWING DECALS APPEAR ON MTA-H UNITS ONLY AND MAY VARY, DEPENDING ON OPTIONS or MODEL SELECTED:



Part #37684
Located on hydraulic reservoir.



Part #37664
Located on hydraulic reservoir.



Part #36396
Located on driver's side front truck frame behind the cab.

OPERATION

GENERAL DESCRIPTION	3.2 - 3.3
MACHINE COMPONENTS	3.2 - 3.3
MACHINE BREAK-IN	3.3
 PRE-OPERATION CHECKLIST	 3.4 - 3.6
 OPERATION OF MTA-H UNITS	 3.6 - 3.13
CONTROLS	3.6 - 3.8
LOADING	3.9 - 3.10
TRANSPORTING	3.10
FLUSHER SHOES	3.10
SPRAYING	3.10 - 3.11
OPERATING HINTS	3.11
UNLOADING	3.12
STORAGE	3.12
STARTING THE NEW SEASON	3.12 - 3.13
 OPERATION OF MTA UNITS	 3.14 - 3.20
CONTROLS	3.14 - 3.15
LOADING	3.16 - 3.17
TRANSPORTING	3.17
FLUSHER SHOES	3.17
STARTING AUXILIARY ENGINE	3.18
COLD WEATHER STARTING	3.18
SPRAYING	3.18 - 3.19
STOPPING	3.19
OPERATING HINTS	3.19
UNLOADING	3.19
STORAGE	3.20
STARTING THE NEW SEASON	3.20

OPERATION

It is very important that the Street Flusher owners and operators fully realize the overall operating procedures of the equipment furnished. Complete understanding of the enclosed procedures will insure safe operation and maximum efficiency.

The ROSCO Street Flushers are designed to transport and apply water to road surfaces.

The Street Flusher contains an elliptical Stainless steel tank which holds water to apply to road surfaces or for other uses. It can be loaded through the manhole cover on top or the fill system. A large water pump provides the high pressure to spray the water and is powered by a hydrostatic system on the MTA-H, or a separate auxiliary engine on the MTA. The hydrostatic system may be powered off the front of the truck engine crankshaft (front live power) or by the truck engine transmission via the PTO.

A control panel for the Street Flusher and for PTO engagement is mounted in the truck cab. Brass nozzles are mounted at front, midship or rear of the unit. Optional spray bar and sprinkler head systems may be included on your unit.

GENERAL DESCRIPTION

MACHINE COMPONENTS (All Units Unless Otherwise Noted)

Tank: A steel tank for holding water.

Top Opening: Provides an opening to fill the tank and is located at the top of the tank.

Ladder: Provides a method for the operator to get to the top opening cover.

Overload Indicator: A mechanical float and rod, located at the front top of the tank, that contacts the material when the tank is 80% full.

Control Panel: Mounted in a convenient location in the cab. It is used to measure, monitor and control operation of the Street Flusher.

Flusher Shoes: Are located at the front, midship and/or rear. They direct a flat spray of water onto the street.

Drain Valve: The drain valve (petcock) is located on the lowest part of the piping system to make sure all water is drained out of the system.

Dump Valve Control: The control connects to the dump valve under the tank to unload any remaining water in the tank.

Anti-Siphon Fill System: To load tank.

Hose Reel: The electric or manual rewind hose reel is used to store the hose and nozzle.

Circuit Valve: (Only provided with suction fill option). The manually controlled valve is located between the pump and tank. Opening valve allows circulation of water from the pump back into the tank.

Hydrostatic Pump: (MTA-H) The variable displacement pump, mounted on the front of the truck or to the truck frame behind the cab, is driven by the truck engine and provides power to operate the water pump.

Hydraulic Tank: MTA-H) The tank contains hydraulic fluid for the hydrostatic system and is located at the front or side of the truck depending on pump mounting.

OPERATION

Hydrostatic Motor and Water Pump: (MTA-H)

The fixed displacement motor operates the water pump and maintains water to flusher shoes.

Auxiliary Engine and Water Pump: (MTA)

The rear mounted auxiliary engine is directly connected to the water pump. The speed of the pump is controlled by the engine rpm.

Optional Spraybar: The rear mounted 8 foot (2.44 m) spray bar has nozzles for spraying water on road and other surfaces for dust control.

MACHINE BREAK-IN (All Units)

Although there are no operational restrictions on the machine when used for the first time, it is recommended that the following mechanical items be checked:

Before Starting:

1. Read the Street Flusher Operator's Manual and all safety decals before starting.
2. Read the truck manual and engine manual before starting.
3. Tighten the tank tie-down hardware.
4. Review and follow truck and engine break-in instructions.

After 2 operating hours:

1. Tighten all wheel bolts to their specified torque.
2. Tighten all fasteners and tank tie-down hardware to their specified torque.
3. Lubricate pump bearing with multi-purpose grease.
4. Check all fluid levels.
5. Perform truck break-in checks.
6. Check that no hydraulic lines are being pinched or crimped.

After 8 to 16 operating hours:

1. Repeat all checks described in part B.
2. Then go to regular maintenance schedule as defined in this manual.

OPERATION

THE PRE-OPERATION CHECKLIST (All Units Unless Otherwise Noted)

Efficient and safe operation of the Rosco Street Flusher requires that each operator reads and understands the operating procedures and safety precautions outlined in this section. A pre-operation check list is provided for the operator. It is important for both personal safety and maintaining good mechanical condition of the machine that this checklist is followed.

Included in this section is a functional check. It is recommended that a functional check be done on each system and major component to insure that it functions properly before starting work. Use 2 people when performing the functional checks, one in the truck cab to run the engine and controls, and one at the appropriate check point.

Check the following areas before operating the Street Flusher and each time thereafter:

PRE-OPERATION CHECKLIST

VISUAL INSPECTION

1. Check the tightness of the tank tie-down hardware. Tighten as required.
2. Check for loose fasteners and hardware on the machine and nozzles. Tighten as required to their specified torque. (See torque requirements)
3. Check for any loose components. Adjust, tighten or secure as required.
- 4a. (MTA-H) Check the condition of all hydraulic lines, couplers, fittings and connections. Reroute, adjust tighten, repair or replace any that are damaged or loose.
- 4b. (MTA) Check all fluid levels on the auxiliary engine.

SERVICE AND MAINTENANCE

1. Perform all truck and engine service checks specified in the truck manual.
2. Lubricate the water pump bearing using ROSCO multipurpose grease.
3. Check all fluid levels: engine oil, hydraulic reservoir, battery, coolant and gearbox. Fill or add as required.

4. Check for leaks. Repair all leaks before starting.

FLUSHER SHOE INSPECTION

1. Check for loose or missing hardware or fasteners. Tighten or replace.
2. Check the air, hydraulic and water lines and connections. Be sure there are no leaks or damaged components. Tighten fittings or replace components as required.
3. Check the angle of each flusher shoe. Be sure they are all set at the same angle.

FUNCTIONAL CHECK (MTA-H)

Truck Engine:

1. Start the truck engine and run at low idle.

CAUTION: *Be sure shoes, sprinklers and spraybar are in the OFF position.*



2. Turn the Control Panel (system power) in the cab ON to activate the system.
3. Apply the parking brake.
- 4a. If PTO driven, engage the PTO:

OPERATION

Manual Transmission: Depress the clutch pedal, place transmission in neutral, engage PTO and release clutch pedal. The hydraulic and hydrostatic systems should now be functioning.

Automatic Transmission: Apply the vehicle brakes, disengage parking brake, place transmission in DRIVE, engage PTO, place transmission in PARK, reapply the parking brake and release the vehicle brakes.

NOTE: It may be necessary to let the truck creep forward slightly to allow the PTO to engage. Be sure everyone is clear of the vehicle.

4b. Check that the PTO driveline is turning.

NOTE: Front live models have PTO turning constantly to supply fluid to the hydrostatic system.

Automatic System

The Automatic System maintains a constant pre-set pressure at all operating conditions. It is monitored and controlled by an EDC circuit that sets the hydrostatic pump to maintain the pressure. To check the system:

1. Set the system to produce a circuit pressure of 30 psi.
2. Push all the Flusher Shoe switches in to turn them OFF.
3. Move the Master switch to the ON position.
4. Briefly activate the individual switches one at a time. This will allow water to flow to each shoe.
5. Watch the pressure gauge. It should drop momentarily until the system adjusts to the new operating condition. If it does not, determine the source of the problem and correct before starting work.

Manual System

The operator must manually set the pressure using the control potentiometer on the Control Panel. The pressure will go up or down with the engine rpm. To check the system:

1. Set the system to produce a circuit pressure of 30 psi.
2. Push all the Flusher Shoe switches in to turn them OFF.
3. Move the Master switch to the ON position.
4. Briefly activate the individual switches one at a time. This will allow water to flow to each shoe.
5. Watch the pressure gauge. It should drop momentarily until the system adjusts to the new operating condition. If it does not, determine the source of the problem and correct before starting work.

VISUAL CHECK (MTA-H)

1. Do a final visual check of all hoses, lines connectors and couplers for leaks and pinching. Be sure there are no leaks before starting to use the machine. Reroute any damaged components.
2. Check for loose parts. Be sure all are tight before starting.

FUNCTIONAL CHECK (MTA) Engine Driven

1. Start the remote engine and run at low idle until warmed up.

CAUTION: *Be sure flusher shoes are in the OFF position.*



2. Bring engine up to 1000 to 1500 rpm range.
3. Activate nozzle switches for flusher shoes.
4. Engage the Spray Master switch on the Control Panel to activate nozzles. Adjust engine rpm.
5. If any functional problems occur, identify the cause and correct before starting.

OPERATION

VISUAL CHECK (MTA)

1. Do a final visual check of all hoses, lines connectors and couplers for leaks and pinching. Be sure there are no leaks before starting to use the machine. Reroute any damaged components.
2. Check for loose parts. Be sure all are tight before starting.

CONTROLS FOR MTA-H UNITS

It is recommended that all operators review this section of the manual to familiarize themselves with the location and function of all controls before starting. Controls are located in the cab and at the rear of the machine for operator convenience. Use this section of the manual as a guide to control operation when training operators. Your unit may have slightly different switches or controls depending on the options ordered with your unit. Refer to detail on page 8.

GENERAL DESCRIPTION

IN-CAB CONTROL PANEL

Work Lights: Turn switch to ON to turn Work Lights on. Place in OFF to turn Work Lights off.

Beacon Light Switch: Place switch in the ON position to turn Beacon Light on. Place in OFF to turn Beacon Light off.

Tank Level Indicator-EMPTY: A light comes on when the water tank is near empty. When the indicator light comes on, the hydraulic system automatically shuts down, shutting off power to the water pump when operating in AUTO mode.

Water Pressure Gauge: Shows water pressure range from 0 to 200 psi. Maintain pressure below 100 psi for safe operation.

Water Pressure Selector Control: Rotate knob to obtain operating pressure level. Pressure level will vary slightly when more than two nozzles are used.

Water Pressure Auto/Manual Switch: Place switch in the AUTO position to hold pressure set on the Water Pressure Selector Control. When in this position the truck engine speed will not affect

the pressure if it varies slightly. When the switch is in the MANUAL position, the Water Pressure Selector Control sets the speed of the water pump and allows the pressure to vary with the speed of the engine.

System Power: Turn switch ON to engage pumping system and allow Flusher to spray. The panel must be turned ON before machine can be operated.

Nozzle Switches: Switches operate flusher shoes for the front, midship or rear positions. Selection is provided for LH (left-hand) or RH (right hand) sides. Turn switch ON to operate flusher shoes, and OFF to stop water flow.

Spray Master Switch: Controls power to nozzle switches. This switch allows you to control power to all engaged nozzles at one time.

Dump Valve: Turn this switch ON to open the dump valve and empty the tank. Turn switch OFF to close the valve.

OPERATION

Spray Bar ON/OFF: (Optional) Place the switch in the ON position to turn spray bar on and OFF to turn the spray bar off.

Sprinklers ON/OFF: (Optional) Turn the switch ON to operate sprinkler for the front or rear. Selection is provided for left hand or right hand. Turn switch OFF to stop the water flow.

Hydraulic Oil Temperature: (Optional) The red light indicates when temperature of hydraulic fluid is too high (210°F or 99°C). Check oil level. Check to see if oil cooler is blocked. Failure to correct the problem will cause serious component damage.

HOSE REEL CONTROL

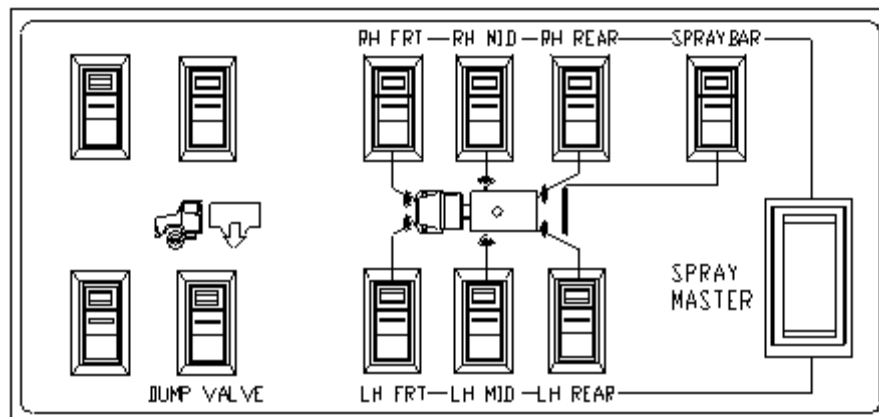
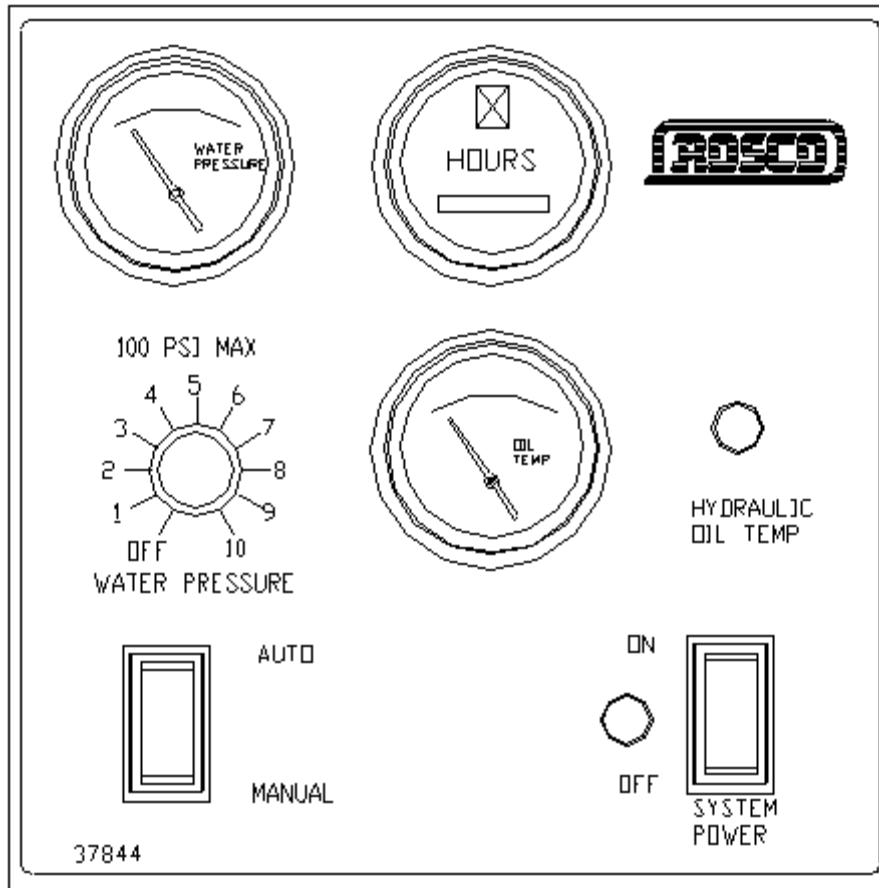
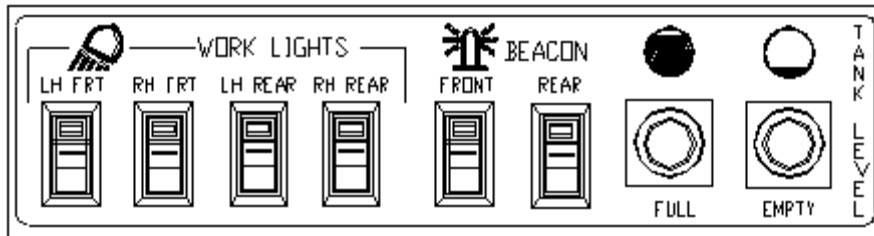
The electric or manual hose reel control is located on the back of the unit.

Manual: Remove crank from storage location and install to shaft and turn hose reel.

Electric: Push the button located on the right side of the reel to rewind the hose.

OPERATION

MTA-H Control Panel



OPERATION

OPERATING THE MTA-H

The machine is designed to perform all required loading, unloading, circulating and spraying functions without the need for axillary equipment. Each operator should review the appropriate section referring to that operation prior to starting.

- WARNING:**
- Read manual before starting.
 - Train all operators before they work with this machine.
 - Do not smoke around the unit.
 - Wear protective gear and clothing.
 - All operators must meet all state and local licensing requirements.



OPERATION INSTRUCTIONS

LOADING

This section explains the procedure to be followed when loading the tank and the function of the controls and components. Review these instructions and follow them to insure the safety of the operator and to maintain a safe working environment. The tank can be loaded by either the top opening or the tank load line. Optional suction fill is available and allows loading by use of the water pump on the Flusher.

Top Opening and Load Line Loading:

1. Review and follow the Pre-Operation Checklist before starting. Be sure all systems are functional and in good repair.
2. Be sure tank dump valves, drain valves and petcocks are closed.
3. Move the unit to the hydrant, storage tank or transfer vehicle.
4. Carry the loading hose to the top of the tank and open the top opening cover or connect the hose to the load line located at the upper rear of the tank.
5. Lay the end of the hose in the tank or check that joints between the load line and hose are tight.
6. Open the hydrant or start the pump on the storage tank or transfer vehicle to load the tank. If loading into the top opening, be sure that the hose stays in the opening. It may be necessary to secure the hose in place.

7. Fill until the tank is 80% to 90% full. Observe tell-tale gauge on tank if so equipped.

8. Stop hydrant. Remove hose from top opening and close cover or disconnect hose from load line coupling.

9. Operate Flusher when at location.

Suction Fill Loading: (Optional)

1. Check that all drain valves, petcocks and the dump valve are closed.
2. Attach suction hose to pump inlet. Check that all joints are air tight.
3. Place screen at hose end. Do not exceed 15 feet (4.6m) of suction lift on hose.
4. Close valve between pump inlet and tank.
5. Open the valve between the primer and the water pump.
6. Using the primer handle, pump until water has completely filled the water pump case.
7. Open larger valve between water pump discharge and the water tank.
8. Start the flusher and run the water pump. Once the water pump is loading, close the small valve between the primer and the water pump.

OPERATION

9. Fill until the tank is 80% to 90% full. Observe the tell-tale gauge on tank if so equipped.

10. Stop the water pump and close the large valve between the water pump and water tank.

11. Open the outlet valve between the pump inlet and the tank.

12. Disconnect suction hose and store in appropriate holder.

TRANSPORTING

The ROSCO Street Flusher is designed to be easily and conveniently moved from the storage area to the work site or between sites. Every driver should be trained and follow defensive driving practices. Obey all traffic laws.

Vehicle:

1. Review and follow operating instructions in the truck Operator's manual.

2. Comply with all road and traffic regulations. Check with local transport authorities to be sure.

3. Maintain the truck in good operating condition.

4. Clean all lights and reflectors before driving on a public road. Be sure all bulbs are working.

5. Make sure the vehicle can be seen clearly by oncoming and overtaking traffic.

6. DO NOT drink and drive.

7. A loaded truck will require more stopping distance than an unloaded vehicle. Allow extra stopping space between the truck and the vehicle in front.

Street Flusher:

1. Check the tank tie-down hardware on a daily basis. Tighten as required.

2. Do not allow riders on the machine.

3. When the tank is loaded, do not operate the pump system until the location is reached.

4. Remove Flusher shoes if Street Flusher is to be transported long distances. (Prevents damage from gravel and rock impacting the nozzle spray surface.)

5. Plug open piping with pipe caps to prevent contamination and damage to threads.

6. Raise spraybar wings if your unit is equipped with the 12 ft (3.66m) spraybar. Secure with anchor chains before transporting.

FLUSHER SHOES

Standard shoe settings vary according to the particular situation found on each street such as construction, crown profile widths, type of sewage system and water availability. Review the job specifications to determine the Flusher shoe application rate required.

1. Set Flusher shoes to obtain maximum coverage possible.

2. Ensure stream barely overlaps at point of pavement contact.

3. Ensure water strikes pavement 8 to 12 feet (2.4 to 3.7 m) in front of shoe to provide normal coverage and pressure for cleaning.

4. Set shoes so water strikes pavement 4 to 6 feet (1.2 to 1.8m) from shoe if dirt is heavy or refuse is to be cleaned from street.

SPRAYING

This section explains the procedure to be followed when flushing or spraying. It also covers the position and function of applicable controls. Review these instructions and follow them to insure the safety of the operator and to maintain a safe working environment.

OPERATION

1. Move the System Power switch to the ON position.
2. Be sure the Spray Master switch is in the OFF position.
3. Before spraying, be sure the following items have been performed:
 - a. Check that Flusher shoes are in the operating position.
 - b. Place spraybar and wings in their operating configuration, if so equipped.
 - c. Clear the area of bystanders.
 - d. Select the desired Flusher shoe(s) by activating the corresponding individual nozzle switch.
4. If any sections of the Flusher shoes will not be operating, be sure that switch is OFF.
5. Align the truck with the area to be sprayed. Allow sufficient space for the truck to come to the required speed before it gets to the spraying start point.
6. Place the truck in the desired gear, axle ratio and engine rpm.
7. Proceed toward the start point.
8. Activate the Spray Master switch to start spraying at the desired start point. The valves for each selected nozzle will be opened and the spraying will start.
9. Watch the Water Pressure gauge on the Control Panel. Be sure the ground speed stays constant. Adjust the Water Pressure Selector Control to give the desired spray pattern and spray force.
10. When the flushing or spraying is complete or when the tank is empty, turn the Spray Master switch OFF. If the tank runs empty, the Low Level indicator light on the Control Panel will come on and the hydraulics will automatically shut off power to the pumps.



ATTENTION: *Do not let the pump run dry. Running the pump without liquid will destroy the seal assembly.*

OPERATING HINTS

To achieve the most efficient use of this unit, follow the hints below:

1. Adjust Flusher shoes to obtain maximum street cleaning and coverage.
2. Operate the truck at 4 to 8 m.p.h. (6 to 13 k.p.h.) to obtain the best operating conditions. Keep the speed down to maintain a safe working environment.



CAUTION: *Set the parking brake whenever it is necessary to leave the cab. Block the tires to prevent the truck from moving or creeping away when working at the rear of the machine.*



WARNING: *Clear everyone from the working area before moving the vehicle.*

3. Maintain the machine in good condition at all times. Damaged or worn components can fail during operation and create hazardous conditions. Good maintenance can prevent personal injury and expensive down time.
4. Drain water tank when the ROSCO Flusher will not be used for more than several days. Open all valves to ensure water is drained from lines and hoses.



ATTENTION: *Water remaining in piping can freeze and damage unit.*

OPERATION

UNLOADING

Review these instructions and follow them to ensure the safety of the operator and to maintain a safe working environment. When unloading the tank, follow this procedure:

1. Move the truck to the unloading site or over sewer hole opening where the remaining water can be dropped.
2. Open the valve at the bottom of the sump. Open petcock in the pump piping. Empty the tank.
3. Close petcock and valve at bottom of sump.
4. If your unit is equipped with a dump valve, engage Dump Valve switch on Control Panel. Wait until the tank is empty. Close the dump valve.

STORAGE

At the end of the season, the machine should be thoroughly inspected and prepared for storage. Repair or replace worn or damaged components to prevent unnecessary down time at the beginning of the next season. Follow this procedure:

1. Thoroughly wash the machine.
2. If the machine is heavily caked with dirt, it may be necessary to use a high-pressure washer to clean it.
3. Drain the water from the tank and lines by opening valves under the tank and on lines throughout the system. The standard drains are petcocks located on the lowest points of the piping.
4. Open drain valve at bottom of pump housing. Drain water from water pump. Close drain valve.
5. Lubricate all grease points. Make sure all grease cavities have been filled with grease. See truck manual for lubrication points on the truck and chassis.

6. Top up all fluid levels to minimize condensation during the storage period.

7. Inspect all air and hydraulic hoses, couplers, fittings and cylinders. Tighten any loose fittings. Replace any hose that is badly cut, nicked, abraded or is separating from the crimped end of a fitting.

8. Inspect all water hoses and fittings. Replace any hose that is badly cut, nicked or separating from a fitting.

9. Check the condition of all safety decals. If any are missing, damaged or illegible, order replacements immediately. Install the replacement decals according to instructions at end of Safety Section..



CAUTION: *Store the machine in an area that is level and dry with a firm base.*

10. Repaint the skirting if water action has worn away the paint.

11. Every month during storage, start the truck and run for 30 minutes to charge the battery. An alternative would be to remove the battery from the battery compartment during the storage time.



WARNING: *Store the Street Flusher away from human activity. Do not allow children to play around the stored machine.*

STARTING THE NEW SEASON

When removing the Flusher from storage and preparing for use, follow this procedure:

1. Use the truck manual as a guide to service the truck before starting. Replace battery if it was removed for the storage time.

OPERATION

2. Check tank hold down hardware and all other hardware and fasteners. Tighten as required.
3. Check tire pressure.
4. Check all lines and fittings. Repair, replace or tighten as required.
5. Lubricate all grease fittings on water pump.
6. Check that drain valve is closed on water pump.
7. Repair or replace any worn, broken or defective parts before starting.
8. Review and follow the Pre-Operation Checklist before starting.
9. Calibrate and set the machine before starting.

OPERATION

CONTROLS FOR MTA UNITS

It is recommended that all operators review this section of the manual to familiarize themselves with the location and function of all controls before starting. Controls are located in the cab for operator convenience. Use this section of the manual as a guide to control operation when training operators. Your unit may have slightly different switches or controls depending on the options ordered with your unit. Refer to detail on page 15.

GENERAL DESCRIPTION

IN-CAB CONTROL PANEL

Work Lights: Turn switch to ON to turn Work Lights on. Place in OFF to turn Work Lights off.

Beacon Light Switch: Place switch in the ON position to turn Beacon Light on. Place in OFF to turn Beacon Light off.

Tank Level Indicator-EMPTY: A light comes on when the water tank is near empty.

Oil Pressure Gauge: Shows the oil pressure throughout the operating system and the auxiliary engine. If oil pressure is too low, the automatic shutdown system will engage.

Water Pressure Gauge: Shows water pressure range from 0 to 200 psi. Maintain pressure below 100 psi for safe operation.

Water Temperature Gauge: Shows coolant temperature throughout operating system and will indicate if the auxiliary engine is overheating.

Tachometer: Indicates engine speed in rpm and guides the operator to select the most desirable operating range of the auxiliary engine.

Voltmeter: Shows the voltage for the auxiliary engine system.

Throttle: Increase throttle speed by pressing up on throttle switch to obtain desired engine rpm. Release switch when engine speed is set. Decrease engine rpm by pushing switch down.

Ignition: Insert key and turn to start the auxiliary engine.

Engine Warning Light: The light will come on to indicate low oil pressure, high water temperature or alternator not charging on auxiliary engine.

Nozzle Switches: Switches operate flusher shoes for the front, midship or rear positions. Selection is provided for LH (left-hand) or RH (right hand) sides. Turn switch ON to operate flusher switches and OFF to stop water flow.

Spray Master Switch: Controls power to nozzle switches. This switch allows you to control power to all engaged nozzles at one time.

Dump Valve: Turn switch ON to engage the dump valve and empty the tank. Turn switch OFF to close the valve.

Tank Level Indicator-FULL: (Optional) A light comes on when the water tank is near full.

Sprinklers ON/OFF: (Optional) Turn the switch ON to operate sprinkler for the front or rear. Selection is provided for left hand or right hand. Turn switch OFF to stop the water flow.

HOSE REEL CONTROL

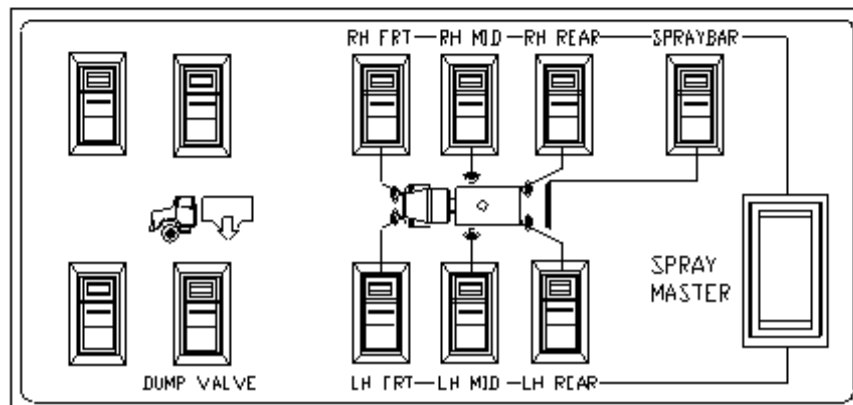
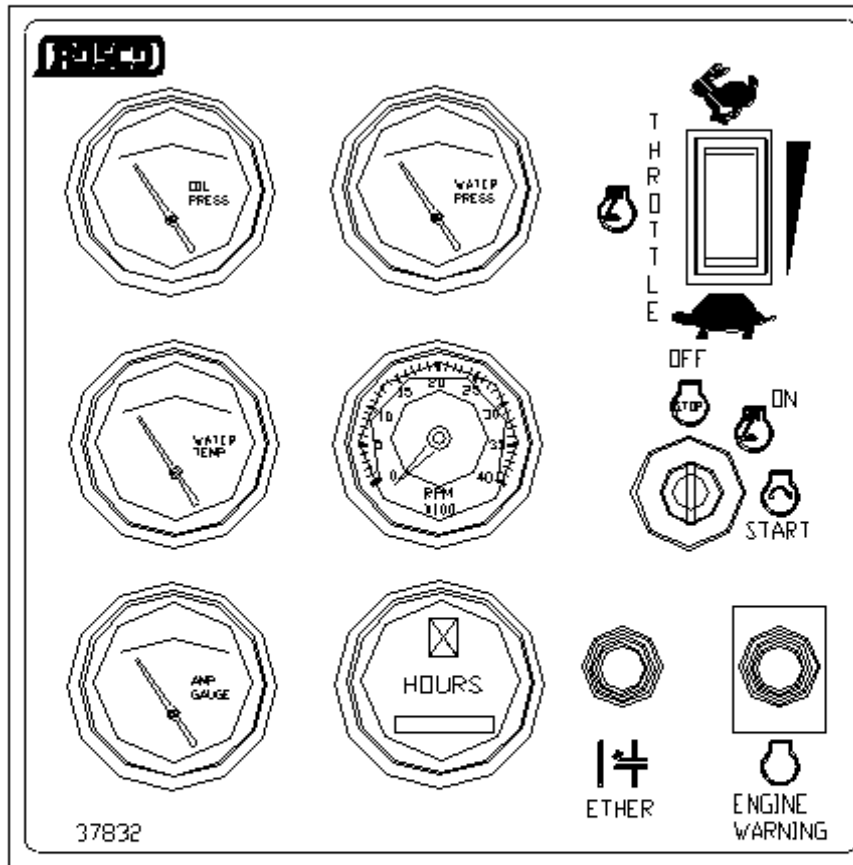
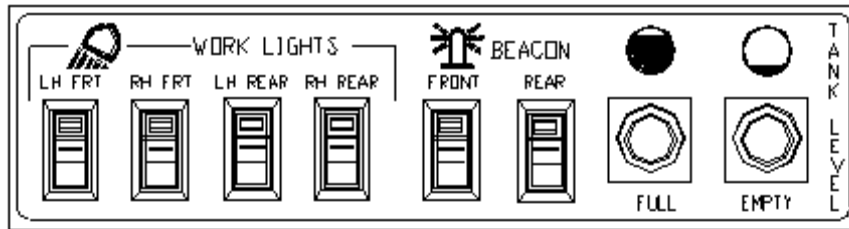
The electric or manual hose reel control is located on the back of the unit.

Manual: Remove crank from storage location and install to shaft and turn hose reel.

Electric: Push the button located on the right side of the reel to rewind the hose.

OPERATION

MTA Control Panel



OPERATION

OPERATING THE MTA

The machine is designed to perform all required loading, unloading, circulating and spraying functions without the need for axillary equipment. Each operator should review the appropriate section referring to that operation prior to starting.

- WARNING:** Read manual before starting.
 Train all operators before they work with this machine.
 Do not smoke around the unit.
 Wear protective gear and clothing.
 All operators should meet all state and local licensing requirements.



OPERATION INSTRUCTIONS

LOADING

This section explains the procedure to be followed when loading the tank and the function of the controls and components. Review these instructions and follow them to insure the safety of the operator and to maintain a safe working environment. The tank can be loaded by either the top opening or the tank load line. Optional suction fill is available and allows loading by use of the water pump on the Flusher.

Top Opening and Load Line Loading:

1. Review and follow the Pre-Operation Checklist before starting. Be sure all systems are functional and in good repair.
2. Be sure tank dump valves, drain valves and petcocks are closed.
3. Move the unit to the hydrant, storage tank or transfer vehicle.
4. Carry the loading hose to the top of the tank and open the top opening cover or connect the hose to the load line located at the upper rear of the tank.
5. Lay the end of the hose in the tank or check that joints between the load line and hose are tight.
6. Open the hydrant or start the pump on the storage tank or transfer vehicle to load the tank. If loading into the top opening, be sure that the hose

stays in the opening. It may be necessary to secure the hose in place.

7. Fill until the tank is 80% to 90% full. Observe tell-tale gauge on tank if so equipped.
8. Stop hydrant. Remove hose from top opening and close cover or disconnect hose from load line coupling.
9. Operate Flusher when at location.

Suction Fill Loading: (Optional)

1. Check that all drain valves, petcocks and the dump valve are closed.
2. Attach suction hose to pump inlet. Check that all joints are air tight.
3. Place screen at hose end. Do not exceed 15 feet (4.6m) of suction lift on hose.
4. Close valve between pump inlet and tank.
5. Open the valve between the primer and the water pump.
6. Using the primer handle, pump until water has completely filled the water pump case.
7. Open larger valve between water pump discharge and the water tank.

OPERATION

8. Start the flusher and run the water pump. Once the water pump is loading, close the small valve between the primer and the water pump.

9. Fill until the tank is 80% to 90% full. Observe the tell-tale gauge on tank if so equipped.

10. Stop the water pump and close the large valve between the water pump and water tank.

11. Open the outlet valve between the pump inlet and the tank.

12. Disconnect suction hose and store in appropriate holder.

TRANSPORTING

The ROSCO Street Flusher is designed to be easily and conveniently moved from the storage area to the work site or between sites. Every driver should be trained and follow defensive driving practices. Obey all traffic laws.

Vehicle:

1. Review and follow operating instructions in the truck Operator's manual.

2. Comply with all road and traffic regulations. Check with local transport authorities to be sure.

3. Maintain the truck in good operating condition.

4. Clean all lights and reflectors before driving on a public road. Be sure all bulbs are working.

5. Make sure the vehicle can be seen clearly by oncoming and overtaking traffic.

6. DO NOT drink and drive.

7. A loaded truck will require more stopping distance than an unloaded vehicle. Allow extra stopping space between the truck and the vehicle in front.

Street Flusher:

1. Check the tank tie-down hardware on a daily basis. Tighten as required.

2. Do not allow riders on the machine.

3. When the tank is loaded, do not operate the pump system until the location is reached.

4. Remove Flusher shoes if Street Flusher is to be transported long distances. (Prevents damage from gravel and rock impacting the nozzle spray surface.)

5. Plug open piping with pipe caps to prevent contamination and damage to threads.

6. Raise spraybar wings if your unit is equipped with the 12 ft (3.66m) spraybar. Secure with anchor chains before transporting.

FLUSHER SHOES

Standard shoe settings vary according to the particular situation found on each street such as construction, crown profile widths, type of sewage system and water availability. Review the job specifications to determine the Flusher shoe application rate required.

1. Set Flusher shoes to obtain maximum coverage possible.

2. Ensure stream barely overlaps at point of pavement contact.

3. Ensure water strikes pavement 8 to 12 feet (2.4 to 3.7 m) in front of shoe to provide normal coverage and pressure for cleaning.

4. Set shoes so water strikes pavement 4 to 6 feet (1.2 to 1.8m) from shoe if dirt is heavy or refuse is to be cleaned from street.

OPERATION

STARTING AUXILIARY ENGINE

The auxiliary engine is started from the truck cab, using a key. Insert the key into the ignition and turn to start the engine.

COLD WEATHER STARTING

The direct-injected Cummins diesel engine starts well in cold weather. If it is necessary to use ether as a starting aid, do it promptly. Read and follow the steps below, and those of the ether manufacturer, for safe and effective use.

1. Place unit in neutral and set parking brake.
2. Set throttle to idle.
3. Have another person crank the engine while you spray starting fluid into the air cleaner for no more than two (2) seconds at a time. NEVER remove the air filter element and spray ether directly into the air inlet piping or the intake manifold.
4. Be sure that engine oil pressure is indicated on the gauge within 30 seconds after starting.



DANGER: *Never use ether near open flames or with pre-heater or glo-plugs. The combination can cause an explosion.*



WARNING: *Do not breath in ether starting fluid fumes. They are harmful.*



ATTENTION: *Do not use excessive amounts of ether starting fluid when starting the engine. (No more than 2 seconds per time.) Using too much ether starting fluid will cause engine damage.*

If your unit is equipped with an Automatic Ether Injection System, follow the steps below for cold weather starting:

1. Put the unit in neutral and set the parking brake.

2. Set throttle to idle.
3. While cranking the engine, inject a metered amount of ether starting fluid by pushing the Ether Injection button.
4. Be sure the engine oil pressure is indicated on the gauge within 30 seconds after starting.
5. Never inject ether for more than two (2) seconds at a time.

SPRAYING

This section explains the procedure to be followed when flushing or spraying. It also covers the position and function of applicable controls. Review these instructions and follow them to insure the safety of the operator and to maintain a safe working environment.

1. Be sure the Spray Master switch is in the OFF position.
2. Before spraying, be sure the following items have been performed:
 - a. Check that Flusher shoes are in the operating position.
 - b. Place spraybar and wings in their operating configuration, if so equipped.
 - c. Clear the area of bystanders.
 - d. Select the desired Flusher shoe(s) by activating the corresponding individual nozzle switch.
3. If any sections of the Flusher shoes will not be operating, be sure that switch is OFF.
4. Start the auxiliary engine and bring rpm up until desired operating water pressure is reached (100 psi maximum). Set engine speed to maintain constant operating water pressure.
5. Align the truck with the area to be sprayed. Allow sufficient space for the truck to come to the required speed before it gets to the spraying start point.

OPERATION

6. Place the truck in the desired gear, axle ratio and engine rpm.

7. Proceed toward the start point.

8. Activate the Spray Master switch to start spraying at the desired start point. The valves for each selected nozzle will be opened and the spraying will start.

9. Watch the Water Pressure gauge on the Control Panel. Be sure the ground speed stays constant. Adjust the auxiliary engine speed to give the desired spray pattern and spray force.

10. When the flushing or spraying is complete or when the tank is empty, turn the Spray Master switch OFF. If the tank runs empty, the Low Level indicator light on the Control Panel will come on. Immediately stop the auxiliary engine. Shut off water to all nozzles and refill the tank. Do not let the pump run dry.



ATTENTION: Do not let the pump run dry. Running the pump without liquid will destroy the seal assembly.

STOPPING

To stop spraying, lower the auxiliary engine speed to idle. Shut down all nozzles on the Control Panel by pushing switches DOWN. Turn off engine.

OPERATING HINTS

To achieve the most efficient use of this unit, follow the hints below:

1. Adjust Flusher shoes to obtain maximum street cleaning and coverage.
2. Operate the truck at 4 to 8 m.p.h. (6 to 13 k.p.h.) to obtain the best operating conditions. Keep the speed down to maintain a safe working environment.



CAUTION: Set the parking brake whenever it is necessary to leave the cab. Block the tires to prevent the truck from moving or creeping away when working at the rear of the machine.



WARNING: Clear everyone from the working area before moving the vehicle.

3. Maintain the machine in good condition at all times. Damaged or worn components can fail during operation and create hazardous conditions. Good maintenance can prevent personal injury and expensive down time.

4. Drain water tank when the ROSCO Flusher will not be used for more than several days. Open all valves to ensure water is drained from lines and hoses.



ATTENTION: Water remaining in piping can freeze and damage unit.

UNLOADING

Review these instructions and follow them to ensure the safety of the operator and to maintain a safe working environment. When unloading the tank, follow this procedure:

1. Move the truck to the unloading site or over sewer hole opening where the remaining water can be dropped.
2. Open the valve at the bottom of the sump. Open petcock in the pump piping. Empty the tank.
3. Close petcock and valve at bottom of sump.
4. If your unit is equipped with a dump valve, engage Dump Valve switch on Control Panel. Wait until the tank is empty. Close the dump valve.

OPERATION

STORAGE

At the end of the season, the machine should be thoroughly inspected and prepared for storage. Repair or replace worn or damaged components to prevent unnecessary down time at the beginning of the next season. Follow this procedure:

1. Thoroughly wash the machine.
2. If the machine is heavily caked with dirt, it may be necessary to use a high-pressure washer to clean it.
3. Drain the water from the tank and lines by opening valves under the tank and on lines throughout the system. The standard drains are petcocks located on the lowest points of the piping.
4. Close drain valve at bottom of pump housing. Drain water from water pump. Close drain plug.
5. Lubricate all grease points. Make sure all grease cavities have been filled with grease. See truck manual for lubrication points on the truck and chassis.
6. Top up all fluid levels to minimize condensation during the storage period.
7. Inspect all air and hydraulic hoses, couplers, fittings and cylinders. Tighten any loose fittings. Replace any hose that is badly cut, nicked, abraded or is separating from the crimped end of a fitting.
8. Inspect all water hoses and fittings. Replace any hose that is badly cut, nicked or separating from a fitting.
9. Check the condition of all safety decals. If any are missing, damaged or illegible, order replacements immediately. Install the replacement decals according to instructions at end of Safety Section..



CAUTION: *Store the machine in an area that is level and dry with a firm base.*

10. Repaint the skirting if water action has worn away the paint.

11. Every month during storage, start the truck and run for 30 minutes to charge the battery. An alternative would be to remove the battery from the battery compartment during the storage time.



WARNING: *Store the Street Flusher away from human activity. Do not allow children to play around the stored machine.*

STARTING THE NEW SEASON

When removing the Flusher from storage and preparing for use, follow this procedure:

1. Use the truck manual as a guide to service the truck before starting. Replace battery if it was removed for the storage time.
2. Check tank hold down hardware and all other hardware and fasteners. Tighten as required.
3. Check tire pressure.
4. Check all lines and fittings. Repair, replace or tighten as required.
5. Lubricate all grease fittings on water pump.
6. Check that drain valve is closed on water pump.
7. Repair or replace any worn, broken or defective parts before starting.
8. Review and follow the Pre-Operation Checklist before starting.
9. Calibrate and set the machine before starting.

MAINTENANCE

INTRODUCTION-----	4.2
GENERAL MAINTENANCE -----	4.2 - 4.5
TRUCK -----	4.2
TANK -----	4.2
DRAINING -----	4.2
TANK COMPONENTS -----	4.2 - 4.3
FLUSHER SHOES -----	4.3
HYDRAULIC RESERVOIR -----	4.3
HYDRAULIC OIL FILTER -----	4.3
HOSES -----	4.3 - 4.4
SOLENOIDS -----	4.4
WATER PUMP -----	4.4
SKIRTING -----	4.4
AIR LINES -----	4.4
ELECTRICAL ITEMS -----	4.4
AUXILIARY ENGINE -----	4.4
SPRAYBAR AND COMPONENTS -----	4.4 - 4.5
FLUIDS AND LUBRICANTS -----	4.5
GREASING -----	4.5
PREVENTIVE MAINTENANCE CHART - MTA-H -----	4.6
PREVENTIVE MAINTENANCE CHART - MTA -----	4.7
HYDRAULIC FLUIDS-----	4.8
HYDRAULIC FITTING TORQUE CHART -----	4.9
BOLT TORQUE CHART-----	4.10

MAINTENANCE

The suggestions and recommendations contained in this manual for maintenance should be followed to obtain long life and best performance from your ROSCO Street Flusher.

PROPERLY MAINTAINED EQUIPMENT IS SAFE EQUIPMENT. The operator of the Street Flusher should inspect the machine daily. The operator is responsible for seeing that worn or damaged parts are replaced or repaired to prevent damage to other areas of the machine. Daily inspections should include observation for loose bolts, fluid leaks, worn or damaged hoses, debris or dirt accumulations which could cause a potential service or safety problem.

A CLEAN MACHINE. The first and most important requirement for satisfactory Street Flusher performance is a clean machine. Many equipment failures are due to accumulations of excess dirt and neglected adjustments and lubrication.

USE THE PREVENTIVE MAINTENANCE CHART AT THE END OF THIS SECTION TO SET UP AND RECORD ALL SCHEDULED MAINTENANCE.

General Maintenance

TRUCK

Perform all service functions on the vehicle as defined in the truck Operator's Manual. This will include but is not limited to the following:

1. Check fuel level. Add as required.
2. Check engine oil level. Add as required.
3. Check coolant level. Add as required.
4. Check transmission fluid and brake fluid levels. Add as required.
5. Check all belts and hoses. Replace as needed.
6. Check the tire inflation pressure.

TANK

If tank requires internal maintenance, hire trained professionals to perform the operation required.



DANGER: *DO NOT go into the tank. Entry into a confined space requires special equipment and training. You can be seriously injured or killed due to poisonous gases or lack of oxygen.*

DRAINING

When the Street Flusher will not be used for several days or at the end of the season, be sure to drain the tank. Follow the unloading procedure in the **Operation Section** of this manual to completely empty the tank.

TANK COMPONENTS

1. Every 40 hours or weekly, check the overflow tube on the top of the tank. Clean if necessary.
2. A sight gauge is located on the front tank head to indicate the amount of water in the tank. Be sure the gauge is kept clean and all connections are tight.
3. The tank is attached to the truck frame with clamps. Wooden blocks are mounted between the tank and the truck frame to absorb shock loads and act as wear surfaces. During use, the blocks wear and the mounting hardware will need to be tightened. Keep the hardware tight at all times to prevent the tank from shifting on the frame. The best time to check the hardware is at the start of the day. To tighten:

MAINTENANCE

- a. Stop the engine and place all controls in neutral. Set parking brake and remove ignition key.
- b. Tighten the anchor bolts. Measure spring length and maintain at 2.5 inches (63.5 mm) visible between spring coils.
- c. If mounting bolts can no longer be adjusted for proper spring compression, the wooden blocks should be replaced.

FLUSHER SHOES

There is little or no maintenance required for the flusher shoes. Replace shoes when broken.

1. Ensure the two-piece assembly of flusher shoe is secured together.
2. Check the locking nuts and piping to ensure they are properly tightened.

HYDRAULIC RESERVOIR

1. The hydraulic reservoir may be located on the side or front of the Street Flusher. If it is located on the side of the truck, it is accessible through the side doors. Operators should check the level on the tank sight gauge.
2. Add oil through the filler cap on top of the tank. Clean the cap and filler neck before filling so no dirt or contaminants enter the tank. Hydrostatic systems will fail in a short time if the oil is not clean.
3. Change the oil in the reservoir annually. The drain plug is located in the bottom of the tank. It is recommended that the oil be drained when the system is warm, to remove the most contaminants. Use a large pail or container to collect the used oil. Dispose of used oil in an approved manner. Reinstall drain plug. See chart on page 4-8 for recommended hydraulic oils. **Do not overfill.** Fill to lower level of filter screen in the filler neck.



WARNING: Always wear protective clothing, gloves and a face shield. Contact with hot oil can cause severe burns. NEVER smoke around hot oil.

HYDRAULIC OIL FILTER

The hydraulic system is equipped with an oil filter to remove dirt and other contaminants. It is located on the right front side of the truck just ahead of the oil reservoir. To check the condition of the filter or change it, follow this procedure:

1. Start the engine. Run the engine at 1200 RPM.
2. Engage the PTO (if necessary) to operate the hydraulic system.
3. Run the hydraulics until a minimum temperature of 140° F (60° C) is achieved. Cold oil can cause the indicator to show a restriction.
4. Visually check the pointer on the gauge at the top of the filter. If the pointer is not in the red area, the filter does not need to be changed.
5. Change filter only at regular maintenance times or if the pointer is in the red area of the gauge.

HOSES

Each day before starting work, check all hydraulic hoses, fittings, couplers and all air lines and connections. Be sure there are no leaks or cracks and that all fittings and connections are tight. Repair or replace damaged parts.



WARNING: Refer to the Hydraulics information in the **Safety Section** of this manual before repairing or checking for hydraulic leaks.

MAINTENANCE



DANGER: *Serious infection or toxic reaction can develop from hydraulic fluid piercing the skin. If injured by high pressure hydraulic fluid, seek medical attention immediately.*

SOLENOIDS

Each day inspect the solenoids to be sure they are free of dirt and debris.

WATER PUMP

Every three months, lubricate the water pump (1 location) using multi-purpose grease until grease escapes from bearing retainers.

SKIRTING

If water action has worn away the paint, repaint the skirting at the end of each season. Wash the machine and perform steps to get the unit ready for storage. (See **Operation Section** of manual.)

AIR LINES

At the start of each day inspect the air lines to ensure there are no cracks in the lines or loose connections. Tighten or repair lines as necessary.

ELECTRICAL ITEMS

1. Each day, before starting the job, clean the lights or lenses to ensure they can be seen by oncoming vehicles.

2. Check the fuses. Make sure they make a proper connection to contact. Replace when cracked or blown.

AUXILIARY ENGINE

Follow the recommended service intervals in the auxiliary engine manual that was supplied with the unit. Be sure to regularly change oil and filters for the air intake and oil.

SPRAY BAR AND COMPONENTS

The spray bar (if equipped) is mounted on the back of the Street Flusher and its purpose is to distribute water over the road surface. Circuits to distribute water to the nozzles, hydraulic lines for movement and an air system for valve actuation are included with the spray bar. Maintain the system components with the following daily procedures:

Cleaning:

1. **Internal:** Keep the internal components clean to prevent clogging of any component.
2. **External:** It is important to clean the outside of the machine at the end of each working day, or more frequently if required. Clean all joints and pivots of the hydraulic and air systems to prevent caked dirt or other debris from interfering with their function.
3. Clean the platform, steps, railings, ladder and catwalk to prevent slipping or tripping during operation.
4. Clean the decals, gauges and other information plaques so they can be seen and read by the operator at all times.

Inspecting:

1. After cleaning, visually check all hoses, fillings and clamps for leaks or loose components. Do not operate the unit with leaking or damaged components. Leaks can create a hazardous condition and affect performance and function of the machine.

MAINTENANCE

2. Check that all pivots, hinges and joints are tight and can move freely. Free up all points that are binding.

3. Check that all fasteners are tight. Do not operate with loose components. Review bolt specifications and maintain them at their specified torque.

4. Check the alignment of the spray bar nozzles. Adjust as required.

FLUIDS AND LUBRICANTS

1. **Grease** - Use a multi-purpose high-temperature grease with extreme-pressure (EP) performance. Also acceptable is an SAE multi-purpose lithium base grease.

2. **Truck systems** - Refer to the the truck Operator's Manual for fuel, lubricating oils, coolants and lubricating greases. Consult with truck manual for system capacities and servicing frequencies.

GREASING

1. Use only hand-held grease guns for all greasing.

2. Wipe grease fitting with a clean cloth before greasing to avoid injecting dirt and grit.

3. Replace broken fittings immediately.

4. If a fitting will not take grease, remove and clean thoroughly. Also clean lubricant passageway. Replace fitting if necessary.

Use the Preventive Maintenance Chart provided to keep a record of all scheduled maintenance.

PREVENTIVE MAINTENANCE CHART - MTA-H

Action Codes: I = Inspect/check L = Lubricate CL = Clean
 A = Adjust R = Replace

Hours

MAINTENANCE	CAPACITIES	PART NUMBER	TYPE OF SUPPLIES REQUIRED	/	/	/	/	/	/	/	/	/	/
EVERY 6 HOURS or DAILY													
I Fuel level	See truck Operator's Manual for information												
I Engine oil level	See truck Operator's Manual for information												
I Coolant level	See truck Operator's Manual for information												
I Transmission fluid level	See truck Operator's Manual for information												
I Overflow tube on tank													
I Air lines for cracks													
I Solenoids are clean													
I Fuses			See parts book										
CL Lights or lenses													
I Hydraulic hoses			See parts book										
I Hydraulic fluid level	9 gallons		See chart										
3 MONTHS													
L Water pump bearing			SAE multi-purpose high-temperature grease (EP)										
I/A Tie-down hardware													
I Air systems			See parts book										
I Hydraulic filter		34464	Element										
ANNUALLY													
R Coolant													
CL Machine													
P Skirting													
R Hydraulic oil and filter	See above	See above	See above										

PREVENTIVE MAINTENANCE CHART - MTA

Action Codes: I = Inspect/check L = Lubricate CL = Clean
 A = Adjust R = Replace

Hours

MAINTENANCE	CAPACITIES	PART NUMBER	TYPE OF SUPPLIES REQUIRED										
EVERY 6 HOURS or DAILY													
I Fuel level	See truck	Operator's Manual	for information										
I Engine oil level	See truck	Operator's Manual	for information										
I Coolant level	See truck	Operator's Manual	for information										
I Transmission fluid level	See truck	Operator's Manual	for information										
I Overflow tube on tank													
I Air lines for cracks			See parts book										
I Solenoids are clean													
I Fuses			See parts book										
CL Lights or lenses													
I Auxillary Engine Fluids	See truck	Operator's Manual	for information										
3 MONTHS													
L Water pump bearing			SAE multi-purpose high-temperature grease (EP)										
I/A Tie-down hardware													
I Air systems			See parts book										
ANNUALLY													
R Coolant													
CL Machine													
P Skirting													

MAINTENANCE

HYDRAULIC FLUIDS

The below recommended hydraulic oils have been reviewed by Rosco and are recommended as replacements. It is best to use the heaviest weight oil that can be safely used for the temperature range of machine operation. If your machine will never be used at below 0°F temperatures, we recommend that you use a heavier weight oil.

If you are considering using an oil that is not listed, contact the Rosco factory to obtain the specifications that the hydraulic oil must meet to provide the needed lubrication and cooling for the units' hydraulic components.

HYDRAULIC OIL REQUIREMENTS AND APPROVED BRANDS FOR FIELD FILL:



DO NOT MIX manufacturers or grade weights when adding hydraulic oil.

Be sure hydraulic oil selection is compatible with your hydraulic system.

Be sure to use mineral base hydraulic oil.

Be sure hydraulic oil selection assistance is from a reputable supplier.

Be sure the hydraulic specifications meet or exceed the following specifications.

Hydraulic oil must provide anti-wear properties that meet or exceed those found in the API (American Petroleum Institute) classification SD, SE or CC crank case oil.

Hydraulic oil viscosity must not fall below 70 SUS (13 cs) in the reservoir under the most adverse conditions. The best viscosity being 80-300 SUS (17 cs to 65 cs). The viscosity rating at the lowest expected start-up temperature should not exceed 10,000 SUS (2158 cs).

Hydraulic oil must have rust and oxidation inhibitors that will maintain chemical stability. When changing the hydraulic oil with oil other than the factory fill oil, the hydraulic system must be completely drained. Be sure to purge or drain all hoses, cylinders, valves, motors and pumps of hydraulic oil. All hydraulic oil filters must also be changed at this time.

AMBIENT TEMP. -25° F TO 80° F (-32° TO 27° C)	AMBIENT TEMP. -10° F TO 95° F (-23° TO 35° C)	AMBIENT TEMP. 0° F TO 105° F (-18° TO 41° C)
AMOCO RYKON 32	AMOCO RYKON 46	AMOCO RYKON 68
EXXON UNIVIS N32	EXXON UNIVIS N46	EXXON UNIVIS N68
GULF HARMONY 32 AW MOBIL DTE 13M	GULF HARMONY 46 AW MOBIL DTE 15M	GULF HARMONY 68 AW MOBIL DTE 16M
PHILLIPS 66 MAGNUS A32 SHELL TELLUS 32	PHILLIPS 66 MAGNUS A46 SHELL TELLUS 46	PHILLIPS 66 MAGNUS A68 SHELL TELLUS 68
TEXACO 32	TEXACO 48	TEXACO 68
CHEVRON MV ISO 32	MOBILFLUID NO. 424	CONOCO 68

MAINTENANCE

HYDRAULIC FITTING TORQUE

TIGHTENING FLARE TYPE TUBE FITTINGS

1. Check the flare and flare seat for defects that might cause leakage.
2. Align tube with fitting before tightening.
3. Lubricate connection and hand tighten swivel nut until snug.
4. To prevent twisting the tube(s), use two wrenches. Place one wrench on the connector body and with the second tighten the swivel nut to the torque shown.

Note: The torque values shown are based on lubricated connections as in assembly.

Tube Size OD	Nut Size Across Flats	Torque Value (see note)		Recommended Turns to Tighten (After Finger Tightening)	
		(N.m)	(lb-ft)	(Flats)	(Turns)
(in)	(in)				
3/16	7/16	8	6	1	1/6
1/4	9/16	12	9	1	1/6
5/16	5/8	16	12	1	1/6
3/8	11/16	24	18	1	1/6
1/2	7/8	46	34	1	1/6
5/8	1	62	46	1	1/6
3/4	1-1/4	102	75	3/4	1/8
7/8	1-3/8	122	90	3/4	1/8

TIGHTENING O-RING FITTINGS

1. Inspect O-ring and seat for dirt or obvious defects.
2. On angle fittings, back the lock nut off until washer bottoms out at top of groove.
3. Hand tighten fitting until back-up washer or washer face (if straight fitting) bottoms on face and O-ring is seated.
4. Position angle fittings by unscrewing no more than one turn.
5. Tighten straight fittings to torque shown.
6. Tighten while holding body of fitting with a wrench.

Note: The torque values shown are based on lubricated connections as in reassembly.

Tube Size OD	Nut Size Across Flats	Torque Value (see note)		Recommended Turns to Tighten (After Finger Tightening)	
		(N.m)	(lb-ft)	(Flats)	(Turns)
(in)	(in)				
3/8	1/2	8	6	2	1/3
7/16	9/16	12	9	2	1/3
1/2	5/8	16	12	2	1/3
9/16	11/16	24	18	2	1/3
3/4	7/8	46	34	2	1/3
7/8	1	62	46	1-1/2	1/4
1-1/16	1-1/4	102	75	1	1/6
1-3/16	1-3/8	122	90	1	1/6
1-5/16	1-1/2	142	105	3/4	1/8
1-5/8	1-7/8	190	140	3/4	1/8
1-7/8	2-1/8	217	160	1/2	1/12

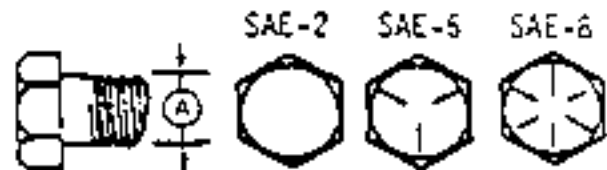
BOLT TORQUE

CHECKING BOLT TORQUE

The tables shown below give correct torque values for various bolts and capscrews. Tighten all bolts to the torques specified in chart unless otherwise noted. Check tightness of bolts periodically, using bolt torque chart as a guide. Replace hardware with the same strength bolt.

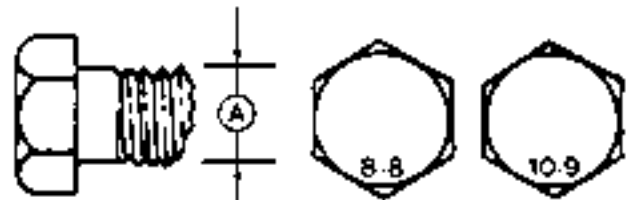
ENGLISH TORQUE SPECIFICATIONS

Bolt Diameter "A"	Bolt Torque *					
	SAE 2		SAE 5		SAE 8	
	N.m	(lb-ft)	N.m	(lb-ft)	N.m	(lb-ft)
1/4"	8	{6}	12	{9}	17	{12}
5/16"	13	{10}	25	{19}	36	{27}
3/8"	27	{20}	45	{33}	63	{45}
7/16"	41	{30}	72	{53}	100	{75}
1/2"	61	{45}	110	{80}	155	{115}
9/16"	95	{70}	155	{115}	220	{165}
5/8"	128	{95}	215	{160}	305	{220}
3/4"	225	{165}	390	{290}	540	{400}
7/8"	230	{170}	570	{420}	880	{650}
1"	345	{225}	850	{630}	1320	{970}



METRIC TORQUE SPECIFICATIONS

Bolt Diameter "A"	Bolt Torque *			
	8.8		10.9	
	N.m	(lb-ft)	N.m	(lb-ft)
M3	5	{.4}	1.8	{1.3}
M4	3	{2.2}	4.5	{3.3}
M5	6	{4}	9	{7}
M6	10	{7}	15	{11}
M8	25	{18}	35	{26}
M10	50	{37}	70	{52}
M12	90	{66}	125	{92}
M14	140	{103}	200	{148}
M16	225	{166}	310	{229}
M20	435	{321}	610	{450}
M24	750	{553}	1050	{774}
M30	1495	{1103}	2100	{1550}
M36	2600	{1917}	3675	{2710}



Torque figures indicated above are valid for non-greased or non-oiled threads and heads unless otherwise specified. Therefore, do not grease or oil bolts or capscrews unless otherwise specified in this manual. When using locking elements, increase torque values by 5%.

* Grade designations of bolts and capscrews are identified by their head markings.

TROUBLE SHOOTING

The ROSCO Street Flusher is a large tank that transports and sprays water on roads. It is a simple and reliable system that requires regular maintenance.

In the following section, we have listed common problems, causes and possible solutions to those problems.

If you experience a problem not covered here, please call your local dealer. Before you call, please have this Operator's Manual and the serial number from your Street Flusher ready.

PROBLEM	CAUSE	SOLUTION
Entire machine vibrates.	Hydraulic pump mounting bolts or bracket bolts are loose.	Tighten bolts.
	Hydraulic pump cavitating and running too fast.	Troubleshoot cause of pump cavitation - slow pump speed down.
	Engine or driveline problems with truck.	Have truck inspected and repaired by qualified dealer mechanic.
"Chatter" heard during hydraulic system operation.	Air in the hydraulic system (oil is foaming) from:	Purge air from system.
	-clogged filter.	Change filter.
	-low oil level.	Add fluid to the proper fill level. See Maintenance Section .
	-leaks in the system.	Check for leaks.
	-hydraulic pump cavitation.	Check for restrictions to inlet flow on hydrostatic and hydraulic pumps.
	Pressure setting of hydraulic or hydrostatic pump relief valve.	Check hydrostatic pump relief pressure. See pump manual.
	Hydraulic tank valve closed causing hydraulic pump to cavitate.	Open hydraulic tank valve. Tank valve may be stuck closed and may require additional force to open.

TROUBLE SHOOTING

Hydraulic oil gets too hot.	Low hydraulic fluid level.	Add fluid to proper level. See Maintenance Section .
	Reservoir and/or hoses covered with dirt, oil or other debris.	Clean with solvent.
	Hydraulic filter plugged.	Replace filter. See chart in Maintenance Section .
	Air trapped in hydraulic system.	Check for leaks and/or restriction in the hydraulic lines.
	Relief valve setting too low on hydrostatic pump.	Check hydrostatic pump relief pressure. See pump manual.
Water pump does not turn.	Hydrostatic pump not turning.	Check hydrostatic pump and lines.
	Hydrostatic pump failure.	Check charge pressure with engine at a low idle.
	Clogged charge filter causing low charge pressure.	Replace filter. See chart in Maintenance Section .
	Faulty water pump.	Replace water pump or faulty components.
Water pump turns but won't pick up water.	Air leak on suction side of pump.	Check coupling between tank and pump strainer assembly. Check for hole in piping on the suction side of the water pump.
	Pump not primed.	See priming procedure in pump manual.
	Water tank is empty.	Fill water tank.
	Valve on external water source closed.	Open valve.
	Inlet screen plugged.	Clean inlet screen in pump strainer box assembly.

TROUBLE SHOOTING

Water pump won't turn fast enough.	Speed of hydrostatic pump not matched to the needs of the water pump. Truck engine speed too slow.	Increase truck engine rpms.
	Air trapped in hydraulic system.	Purge air from system.
	High temperature in hydraulic system.	See page 2.
	Malfunction of the hydraulic system components.	Check for leaks in hydraulic system components, hoses and hose fittings. See Maintenance Section .
Water application is too light.	Ground speed is too fast.	Slow truck down.
	Engine rpm's not sufficient to keep pump speed up.	Gear down and/or idle up.
	Plugged or restricted inlet to water pump.	Clean water tank screens.
	Plugged or restricted outlet from water pump.	Check valves and flusher shoes. Clean and replace as needed.
Individual flusher shoes spraying light.	Shoe clogged.	Clean shoe.