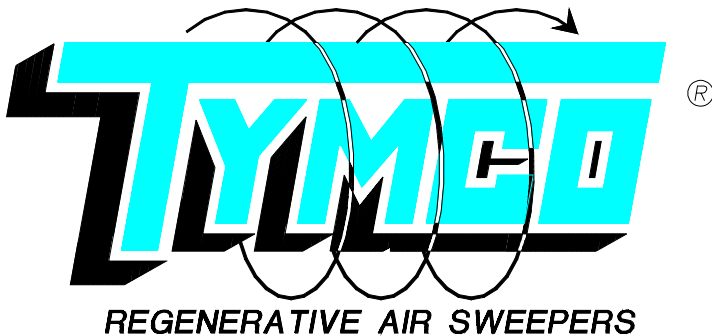
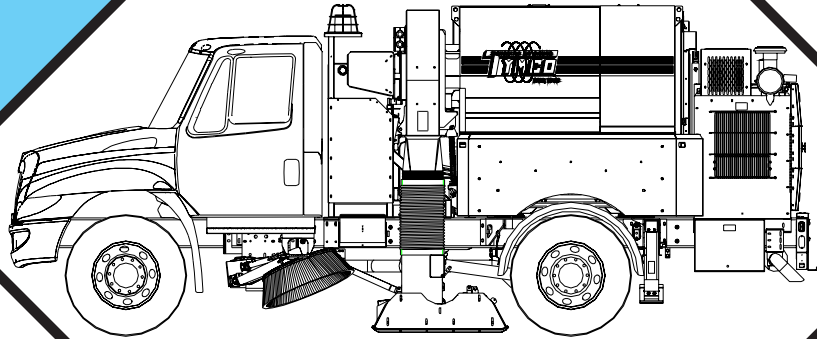


MODEL 500X



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OPERATOR'S MANUAL

2008



CONGRATULATIONS

You have just purchased the finest AIR SWEEPER produced. Yet, for all of its advanced engineering, in spite of all the skills that have gone into it — your sweeper is only as good as its operator.

TYMCO REGENERATIVE AIR SWEEPER
MODEL NO. 500X

SOLD & SERVICED BY:

NOTE: Do not destroy any part of this manual. It contains pertinent information on parts, operation and maintenance of your TYMCO REGENERATIVE AIR SWEEPER and truck chassis.

An informed operator will do a better job. Make sure he/she has an opportunity to study this manual.

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2008 EDITION

INTRODUCTION

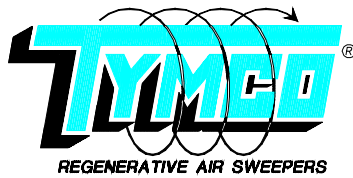
To insure proper understanding of operation, cleaning and maintenance of your TYMCO REGENERATIVE AIR SWEEPER, it is necessary that this Operator's Manual and the Service & Parts Manual be read and studied from cover to cover by the Operator. A full understanding of this equipment will help the operator achieve the results expected of this machine.

Though, seemingly, a very simple machine, the TYMCO REGENERATIVE AIR SWEEPER utilizes air instead of conventional rotary brushes, brooms and conveyers. Aerodynamic problems that arise in the REGENERATIVE AIR SWEEPER are not as easily identified and, therefore, necessitates a complete understanding of the machine.

The TYMCO REGENERATIVE AIR SWEEPER is designed to maintain cleaner surfaces at higher speeds and at lower cost. The performance capability of this truly modern machine is only limited by the initiative of those responsible for its operation. There are many different conditions found in sweeping, and we believe it impossible to answer all of the problems here. Most important in the operation and maintenance of this machine, is that it should be KEPT CLEAN.

The Operator's Manual includes the necessary checks, operating and adjustment procedures needed by the operator from day to day. For any specific adjustment, problem, or maintenance checks not explained in this manual, please refer to the Service & Parts Manual.

KEEP OUR STREAMS AND RIVERS CLEAN — PICK IT UP WITH YOUR TYMCO



Operating Procedure Guidelines

Complete Sweeper Inspection

- Check Auxiliary Engine Oil and Coolant
- Check for Seal leaks
- Check Warning and Work Lights
- Inspect Pick-Up Head
- Check Gutter Broom
- Adjust Mirrors
- Fill Fuel Tank
- Fill Water System

Sweeper Start-Up Procedures

1. Start Rear Engine (Must be in idle)
2. Turn on Warning Lights
3. Turn on Water System
4. Lower Pick-Up Head
5. Pull Sweeper forward to tuck Pick-Up Head Curtains
6. Throttle up Auxiliary Engine RPM to desired levels
7. Lower Gutter Broom(s)
8. Begin sweeping
9. DO NOT BACK UP WITH PICK-UP HEAD DOWN. Throttle down, raise head then back up. (Optional Reverse Pick-Up Head Chains allow you to back up with the head down.)

CNG Option Start-Up

1. Slowly open fuel service valve on each CNG fuel tank, if not already open.
 2. Slowly open fuel shutoff valves 1/4 turn.
 3. Start engine and idle for five minutes to allow time for warm-up before engaging transmission.
 4. Start auxiliary engine and idle for five minutes to allow time for warm-up before raising RPM.
- NOTE: This procedure supplements the sweeper Start-Up Procedure above. Read and comply with both.**

Leaf Pressure Bleeder Procedures

- Closed for heavy debris such as Sand, Gravel, Dirt; Etc. (Use BAH when necessary)
- Open 100% when sweeping light debris such as Leaves, Paper Cups, Etc.
- Adjust opening 25% to 75% for mixed debris

Sweeper Shutdown Procedures

1. Lower Auxiliary Engine RPM to idle speed (1000 RPM)
2. Raise Gutter Brooms - (Must hold switch in the up position to fully retract gutter broom)
3. Raise Pick-Up Head - (Must hold switch to retract to the travel position)
4. Turn off Water System
5. Turn off Warning Lights
6. Turn off Auxiliary Engine

CNG Option Shutdown

1. Bring all sweeper components to their stowed position.
 2. Lower engine RPM to idle on both engines for a minimum of 3 minutes to allow engine to cool down.
 3. Ignition switches may now be turned off.
- NOTE: If sweeper is to be parked in an enclosed area, close both 1/4 turn fuel shutoff valves and allow engines to run until both shut down due to fuel starvation, then close the service valve on each CNG tank. This procedure supplements the sweeper Shutdown Procedure above. Read and comply with both.**

Wash Out Procedures (DAILY)

- Clean Hopper Screens
- Clean out Hopper
- Clean out Dust Separator
- Clean under Pick-Up Head
- Wash exterior of Sweeper and Chassis
- Wash off Radiators

Parking Procedures

- Raise Hopper and lower on 2x4 Wood Blocks - Do not close rear door (Model 210 - 435)
- Leave Hopper Door and Inspection Door(s) open (All Model 600s)

TYMCO REGENERATIVE AIR SWEEPER INSPECTION AND REPETITIVE TASK SCHEDULE

| INSPECT | MODEL | | | |
|--|---------|---------|---------|---------|
| | 600 | 500X | 435 | 210 |
| GUTTER BROOM(S) FOR IMPACT DAMAGE/WEAR | D | D | D | D |
| PICK-UP HEAD BLAST ORIFICE FOR LODGED FOREIGN MAT'L/ADJUSTMENT | D | D | D | D |
| PICK-UP HEAD TURNING VANES FOR WEAR/FOREIGN MATERIAL | 100 HRS | 100 HRS | 100 HRS | 100 HRS |
| PICK-UP HEAD SKID PLATES FOR WEAR AND IMPACT DAMAGE | D | D | D | D |
| PICK-UP HEAD CURTAINS FOR WEAR/DAMAGE | D | D | D | D |
| PRESSURE AND SUCTION HOSES FOR WEAR | 100 HRS | 100 HRS | 100 HRS | 100 HRS |
| HYDRAULIC SYSTEM FOR PLUMBING OR COMPONENT LEAKAGE | D | D | D | D |
| WATER PUMP OIL LEVEL (IF APPLICABLE) | D | D | D | D |
| WATER FILLER HOSE FILTER SCREEN | D | D | N/A | N/A |
| WATER PUMP SUCTION HOSE PRE-FILTER | D | D | D | D |
| ALL HOPPER AND TRANSITION SEALS FOR WEAR/DAMAGE | D | D | D | D |
| HOPPER SCREEN FOR DAMAGE | D | D | D | D |
| DUST SEPARATOR LINER FOR WEAR/DAMAGE | D | D | N/A | N/A |
| DUST SEPARATOR DOOR CLOSED BEFORE OPERATING | D | D | N/A | N/A |
| BLOWER WHEEL FOR WEAR/DAMAGE | 100 HRS | 100 HRS | 100 HRS | 100 HRS |
| ACCESSIBLE AREAS OF BLOWER HOUSING LINER FOR WEAR/DAMAGE | 100 HRS | 100 HRS | 100 HRS | 100 HRS |
| BLOWER LIP FOR WEAR/DAMAGE | 100 HRS | 100 HRS | 100 HRS | 100 HRS |
| ENGINE AIR INTAKE FILTER RESTRICTION INDICATORS | D | D | D | D |
| MOUNT TRUCK TIRES | D | D | D | D |

| PERFORM | MODEL | | | |
|---|----------|----------|----------|----------|
| | 600 | 500X | 435 | 210 |
| ADJUSTMENT OF GUTTER BROOM(S) | A/R | A/R | A/R | A/R |
| CLEANING OF GUTTER BROOM TORQUE MOTOR SHAFT AREA | D | D | D | D |
| ROTATE PRESSURE AND SUCTION HOSES 1/4 TURN | 75 HRS | 75 HRS | 75 HRS | 75 HRS |
| CHECK OF HYDRAULIC TANK FLUID LEVEL | D | D | D | D |
| CHANGE OF HYDRAULIC SYSTEM FILTER | 100 HRS | 100 HRS | 100 HRS | 100 HRS |
| TANK BREATHER FILTER | N/A | 100 HRS | N/A | N/A |
| RETURN LINE FILTER - RESTRICTION INDICATOR | N/A | 100 HRS | N/A | N/A |
| CHARGE LOOP FILTER - RESTRICTION INDICATOR | N/A | 100 HRS | N/A | N/A |
| HYDRAULIC SYSTEM OIL CHANGE NOTE: INITIAL CHANGE AT 100 HRS | 1000 HRS | 1000 HRS | 1000 HRS | 1000 HRS |
| CHANGE OF WATER PUMP OIL (IF APPLICABLE) | 150 HRS | 150 HRS | 150 HRS | 150 HRS |
| CLEANING OF SPRAY NOZZLE TIPS AND SCREENS | A/R | A/R | A/R | A/R |
| DRAIN WATER TANK | D | D | D | D |
| CLEANING OF HOPPER AND DUST SEPARATOR CHAMBER | D | D | D | D |
| AUXILIARY ENGINE FLUID LEVEL CK. | D | D | D | D |
| WASHDOWN OF ENGINE RADIATOR(S) | D | D | D | D |
| FUNCTIONAL TEST SWEEPER LIGHTS | D | D | D | D |
| FUNCTIONAL TEST OF TRUCK BRAKES | D | D | D | D |
| FUNCTIONAL TEST OF TRUCK LIGHTS | D | D | D | D |
| MOUNT TRUCK FLUID LEVEL CHECK | D | D | D | D |

D = DAILY
HRS = HOURLY INTERVALS
A/R = AS REQUIRED



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THE TYMCO REGENERATIVE AIR SYSTEM

DESCRIPTION

The blower generates a constant blast of high velocity air that is directed down the pressure side of the machine and into the pick-up head. Blast air travels across the pick-up head, picking up normal debris and refuse in its path and sending it up the suction side of the machine.

At the same time that the blower is directing pressure down the pressure side, it is taking air from inside the hopper, creating a suction; and consequently, it pulls debris up into the hopper. The debris is deposited into the hopper while dusty air passes through the screen to a multipass, centrifugal dust separator. The fines are then deposited back into the hopper through the skimmer slot. Air, containing very fine dust, then moves into the blower and repeats its cycle.

The unique REGENERATIVE AIR SWEEPER uses no restricting filters, resulting in more energy to do your work. Since the blower is used to push and pull, restriction due to clogging or modification to any of the air passages will greatly affect the sweeper's performance. In other words, PRESSURE FOR THE BLAST depends on ample volume of air through the suction; SUCTION depends on the discharge of air from the blast orifice.

Another point to consider is the fact that a very small air leak at the dump door, suction tube seal, blower housing suction seal or suction hose will often cause a dusty condition. If the leak is severe enough, air will have a slower velocity and performance will be lowered.

**DO NOT ALLOW ANY AIR LEAKS.
CLEAN FRESH AIR DRAWN IN WILL BE DISCHARGED AS DUST.**

TYMCO REGENERATIVE AIR SWEEPER CAPABILITIES

We at TYMCO honestly believe that government officials, contractors and all personnel directly responsible for the performance and maintenance of equipment in their charge are concerned with all phases of their operation.

Sweepers are one of the most controversial pieces of equipment with reference to operating cost, performance, and maintenance. The general public does not realize the problems and depends on people knowledgeable in this area. You, therefore, the person responsible for the performance and maintenance of the sweeper should use your knowledge and experience to achieve the results expected.

The TYMCO REGENERATIVE AIR SWEEPER can achieve your anticipated results while keeping cost at a minimum. However, to realize the full potential of the TYMCO REGENERATIVE AIR SWEEPER, *YOU MUST UNDERSTAND ITS CAPABILITIES AND ADHERE CLOSELY TO OPERATING AND JOB FUNCTIONS FOR WHICH IT WAS DESIGNED.*

It is a fact that a licensed driver can operate this equipment; however, we strongly recommend that the same driver operate it daily. It is proven that ability on the equipment is increased with experience. We suggest that every operator thoroughly read and study the manual to make sure that he/she understands its operation before ever attempting to operate the sweeper. It is very important that every new operator be given this opportunity and that he does not rely solely on methods of previous operators.

A TYMCO REGENERATIVE AIR SWEEPER can be expected to clean normal debris that may accumulate on streets, parking lots, and other flat paved surfaces. Using the machine for more than it was originally designed will cause excessive wear and failure to achieve the desired results.

This sweeper is not a Vacuum Cleaner. Cleaning is actually done by a stream of high velocity air the full width of the pick-up head. A blower furnishes both pressure and suction. Air pressure from the blower passes over the surface being swept within the pick-up head, blows up debris in its path, and the suction pulls it into the hopper, where it is separated. Air continues on into the blower and the cycle is repeated.

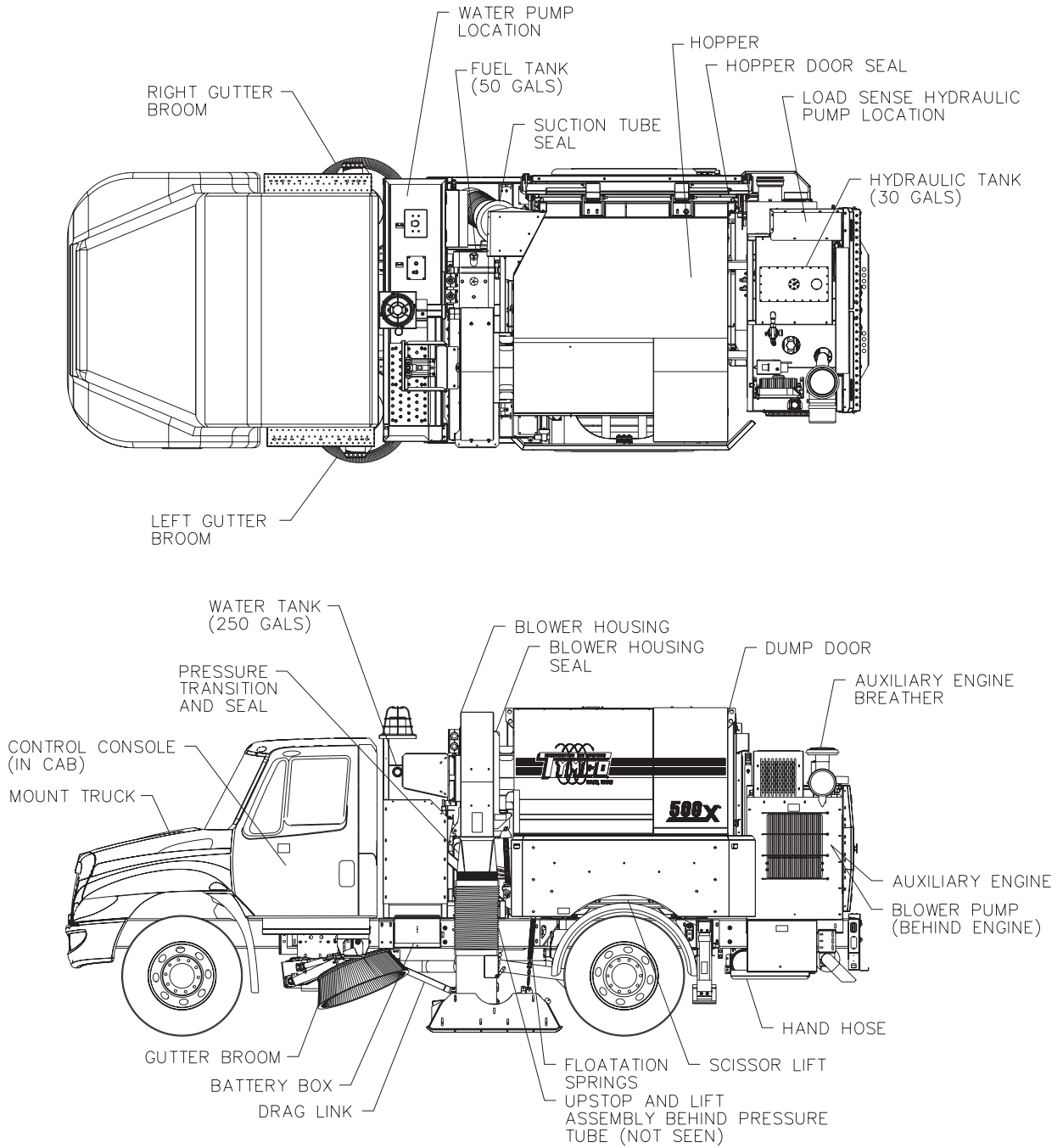
The TYMCO REGENERATIVE AIR SWEEPER is not intended nor is it expected to replace a shovel crew or a front end loader. An inspection at the dump site, however, may reveal that there are rocks and large objects in the hopper. This is due to air currents in the TYMCO REGENERATIVE AIR SYSTEM having the potential to pick up various large objects and retain them. The mixture of light debris will sometimes boost the large objects into the air stream and carry them into the hopper. Objects such as cans, bottles, glass, paper, leaves and light stringy refuse or normal daily accumulation of debris are easily picked up by the sweeper's unique REGENERATIVE AIR SYSTEM.

We can not say what blower RPM or truck speed at which you can achieve your sweeper's full capabilities because of the various types of sweeping encountered. However, blower RPM should not exceed 2750. For parking lot sweeping consisting of paper, broken glass, cans, leaves, etc., engine RPM can be reduced as desired. The sweeper can be operated at truck speeds up to 10 MPH without changing blower RPM. The above limits are intended for smooth wide open spaces that are sparsely scattered with debris. Slower truck speeds are advisable for curb and gutter work or where there are many obstacles. This prevents damage and wear to pick-up head and gutter broom. Faster speeds may be necessary under your particular conditions. However, you may expect considerably more wear, not only by the hour as a result of more coverage, but also by the mile. The heat generated at higher speeds will result in softening of the materials in contact with the surface. We would advise consideration of these facts before allowing high speed operation, overloading and machine neglect.

**SAVE FUEL, REDUCE NOISE, WEAR AND DUST.
OPERATE AT THE LOWEST POSSIBLE R.P.M. TO ADEQUATELY DO THE JOB.**



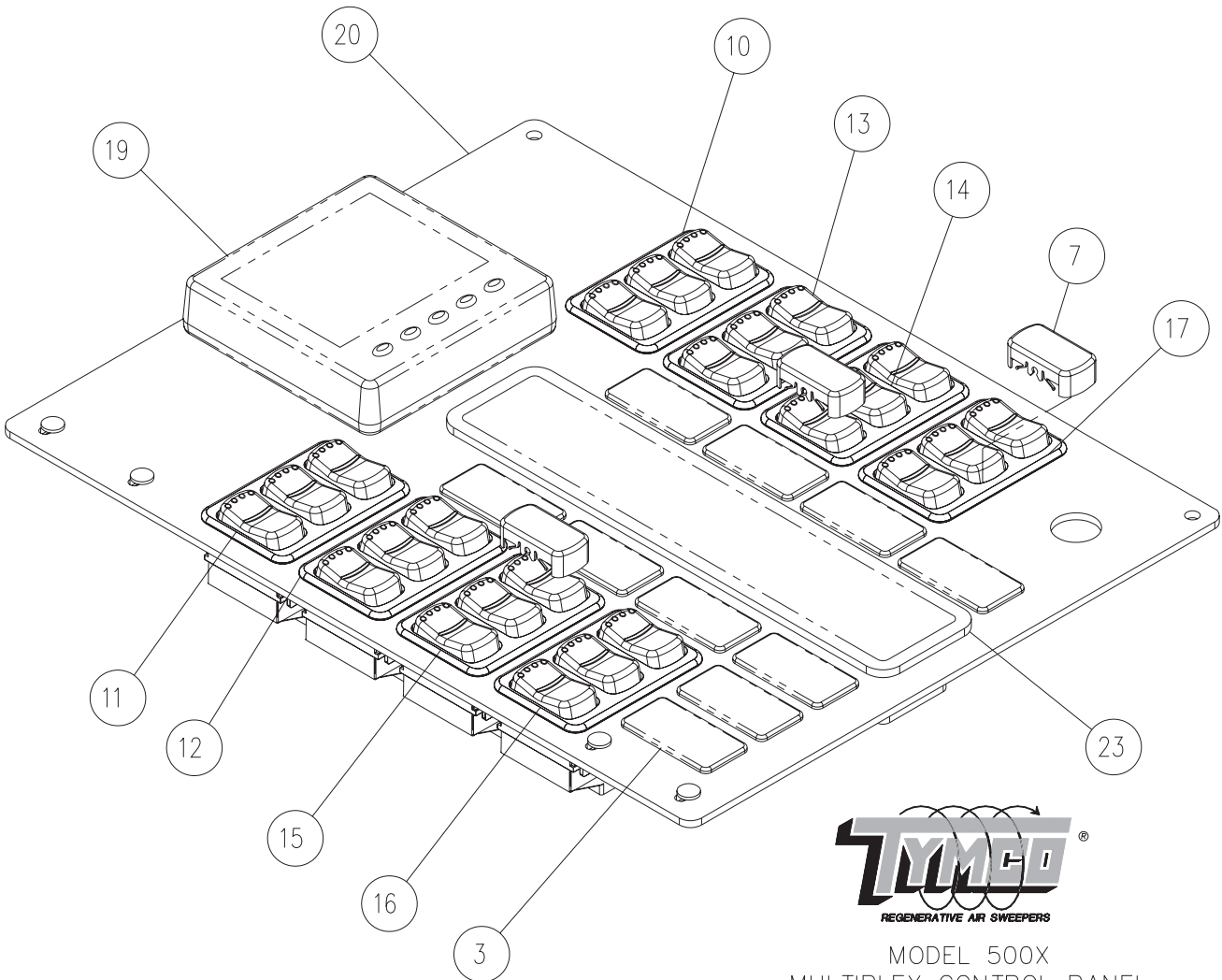
MODEL 500X QUICK REFERENCE CHART



(M01756)

CONTROL CONSOLE MODEL 500X

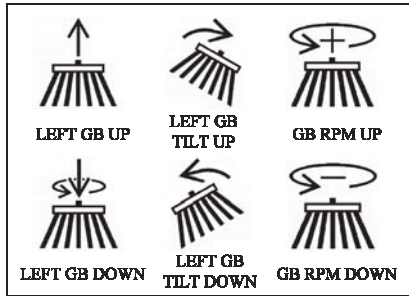
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|--|---|
| <ol style="list-style-type: none"> 1. #10-24 Self Tap Screw (Not Shown) 2. Nut - 10/24 KEPT (Not Shown) 3. Switch Blank Cover 4. Key Switch (Not Shown) 5. Retainer - #12 (Not Shown) 6. Receptacle - #12 "J" Clip (Not Shown) 7. Switch Position Cover 8. Screw - Quick Opening - #12 (Not Shown) 9. Screw - M4-0.7 x 8 PH Pan Head (Not Shown) 10. Switch Pack - PUH, Tilt, RH GB 11. Switch Pack - LH GB, Tilt RPM | <ol style="list-style-type: none"> 12. Switch Pack - Lift, Tilt, Light 13. Switch Pack - Water, Aux, BAH 14. Switch Pack - HO, PUH, GB 15. Switch Pack - GB, Hopper, HO 16. Switch Pack - GB, Warn, WkLts 17. Switch Pack - RPM, LPB, GB Lt 18. Wiring Harness (Not Sown) 19. Multiplex Display 20. Control Panel 21. Jumper Harness, Short (Not Shown) 22. Jumper Harness, Long (Not Shown) 23. Light Indicator Module |
|--|---|



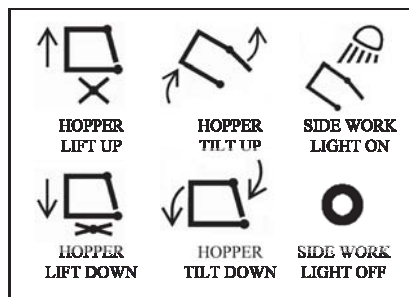
MODEL 500X
MULTIPLEX CONTROL PANEL
(M01784)

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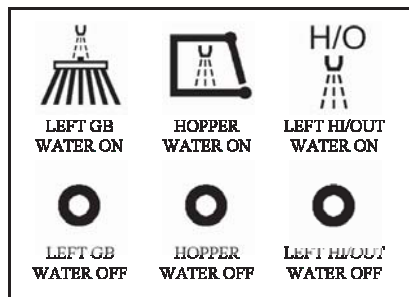
Post 2007 Light Indicator Module



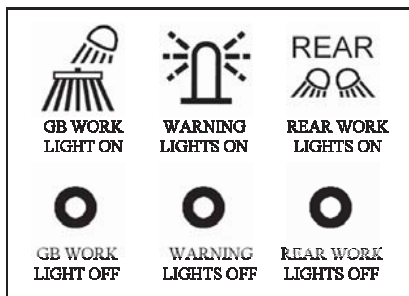
Switch Pack 1



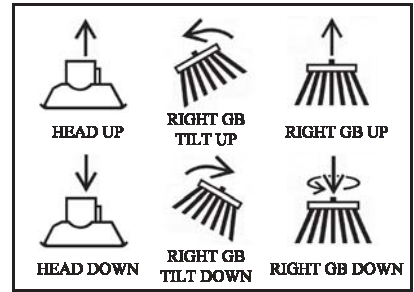
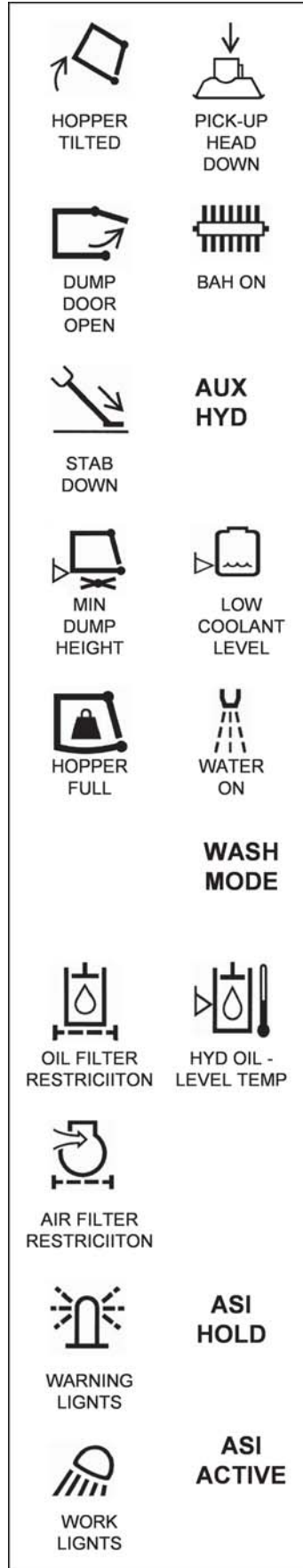
Switch Pack 3



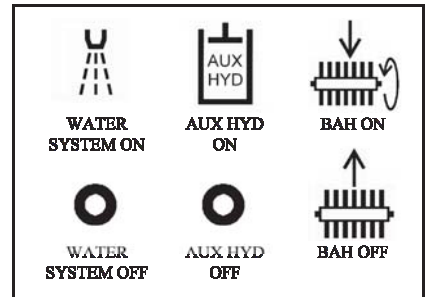
Switch Pack 5



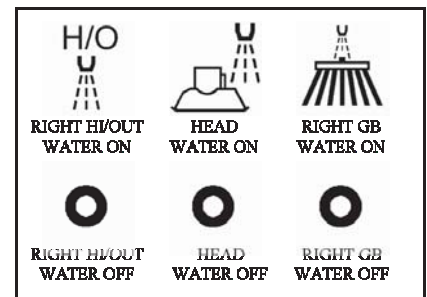
Switch Pack 7



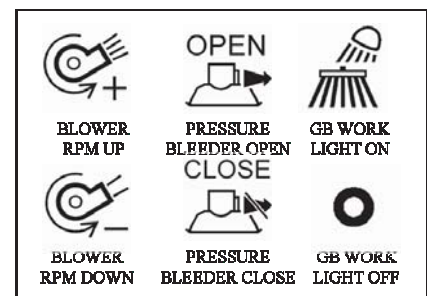
Switch Pack 2



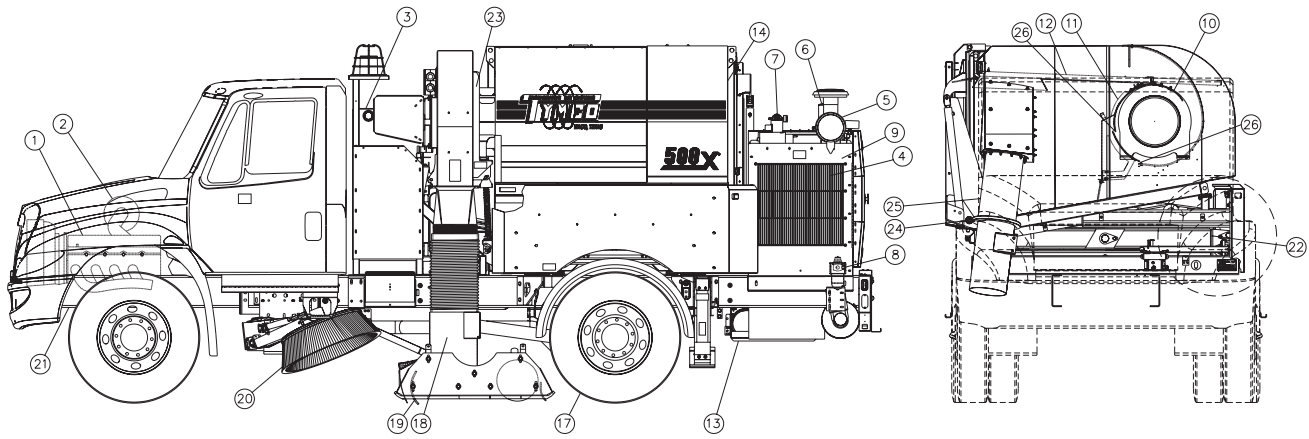
Switch Pack 4



Switch Pack 6



Switch Pack 8



**MODEL 500X
QUICK REFERENCE SERVICE CHART
(M01752)**

| ITEM | DESCRIPTION | RECOMMENDED SERVICE |
|-------------|------------------------------|--|
| 1. | Truck Engine | Check oil level DAILY! Change oil and filter every 100 hours or every 3000 miles. |
| 2. | Truck Air Cleaner | Inspect restriction indicator DAILY! |
| 3. | Water Tank | Drain tank DAILY! |
| 4. | Industrial Engine | Change oil and oil filter every 100 hours. Check oil level DAILY! |
| 5. | Auxiliary Engine Air Cleaner | Check restriction indicator DAILY! |
| 6. | Hyd. Tank Breather Filter | Change every 500 hours. |
| 7. | Return Filter | Check restriction indicator DAILY! Replace filter when indicator reaches the yellow/red region. |
| 8. | Charger Loop Filter | Check restriction indicator DAILY! Replace filter when indicator reaches the yellow/red region. |
| 9. | Hydraulic Oil | Check DAILY - Change out after first 100 hours; then every 1000 hours. (30 gallon tank) Use 10W hydraulic oil. Refer to Sweeper Parts and Service Manual for list. |
| 10. | Separate Inlet Scroll | Remove hopper screen and clean inlet every 500 hours. |
| 11. | Separator Door | Open separator door and wash out chamber DAILY! |
| 12. | Hopper Screen | Thoroughly wash screen DAILY! Never use sweeper with large tears in screen. |
| 13. | Optional Hand Hose | Check DAILY for holes and wear. |
| 14. | Sweeper Door Seals | Inspect door seals DAILY! Hopper must be air tight. Replace leaking or damaged seals. |
| 15. | Electric Water Pump | Protect from freezing. No daily service necessary. |
| 16. | Truck Differential | Follow manufacturers recommended service program. |
| 17. | Truck Tires | Inspect each tire DAILY for flats. |
| 18. | Turning Vanes/Pick-up Head | Inspect DAILY! Remove any material collected on vanes. Replace as needed. |
| 19. | Pick-up Head Curtains | Inspect DAILY! Replace as required. |
| 20. | Gutter Broom | Check for bristle wear. |
| 21. | Truck Chassis | Grease every 100 hours or every 3000 miles. |
| 22. | Scissor Lift | Check track of any loose debris. |
| 23. | Blower Housing Seal | Check DAILY for any tears. |
| 24. | Suction Transition Seal | Check DAILY! |
| 25. | Suction Tube | Check DAILY! |
| 26. | Dust Separator/Skimmer Slots | Clean DAILY! Inspect skimmer slots weekly. |

NEVER REACH INTO BLOWER HOUSING FOR ANY REASON !

HOPPER ASSEMBLY

The TYMCO Model 500X hopper is one of the most important parts of the sweeper. Its function is to separate and contain the heavy debris and fine particles from the air stream created by the blower. In order for it to remain functioning, it must be cleaned DAILY! The Model 500X is a regenerative air machine so the hopper must also remain air tight. The hopper also takes a lot of abuse due to heavy, abrasive debris being shot into it at high speeds. It is important to read this section thoroughly to understand all the hopper component functions.

Hopper and Lift Operation/Safety Interlocks



WARNING: ALWAYS CHECK FOR PEOPLE OR ANY OBSTRUCTIONS BEFORE OPENING HOPPER CHUTE AND DUMP DOOR.

Dump Door and Chute Operation

1. To open dump door and chute, engage the Hopper Tilt switch on the control panel to the UP position. The chute will open first and then the dump door.
2. To close dump door and chute, engage the Hopper Tilt switch on the control panel to the DOWN position. The dump door will close first and then chute.

WARNING: IF THE HOPPER IS LOADED, DON'T OPEN THE CHUTE AND DUMP DOOR UNLESS YOU ARE READY TO COMPLETE THE DUMP CYCLE. NEVER CLOSE THE DUMP DOOR AND CHUTE WHEN DEBRIS STILL REMAINS ON CHUTE AND HOPPER FLOOR. THE DUMP DOOR AND CHUTE COULD BE DAMAGED IF DEBRIS PREVENTS THE DUMP DOOR FROM FULLY CLOSING.



WARNING: IF SWEEPING IN EXTREMELY WET AREAS, REMEMBER THAT THE HOPPER COULD BE FULL OF WATER WHEN OPENING THE DUMP DOOR. IN THIS SITUATION YOU SHOULD CRACK THE DUMP DOOR OPEN INSTEAD OF FULLY OPENING IT. THIS ALLOWS THE WATER TO FLOW OUT OF THE HOPPER AND DOWN THE CHUTE IN A CONTROLLED MANNER.



WARNING: Before working in this area, raise hopper and install the lift assembly safety props. If unsure how to install safety props, SEE SAFETY PROPS INSTALLATION PROCEDURE in the Lift Assembly Section of this Operators Manual. Then remove ignition switch key from sweeper control console and/or remove negative battery lead terminal from battery. Serious and/or possible fatal injury can result if these rules are not followed!




Hopper Lift and Tilt Operating Procedures

Sweeper Positioning

1. Position the chute side of the sweeper as close to the dump truck or container as possible.

2. Check where your stabilizers will be deploying. Make sure the area is clear of personnel and obstructions such as a dump truck tire or a large rock where stabilizer foot contacts the ground.
3. Pull up far enough so your chute will be positioned inside the perimeter of the dump truck bed or container when tilted.
4. Folding the dump truck mirrors in can allow the sweeper to be positioned closer to the dump truck

 **WARNING:** Always check for people or any obstructions above you and beside you before lifting and tilting the hopper. Be extra careful not to raise the hopper into power lines. Doing so could cause serious injury or even death.

 **WARNING:** Always check your inclinometer on the dash before lifting or tilting the hopper. Never lift or tilt the hopper if the sweeper is inclined more than 5 degrees.

Hopper Lift Operation

1. Engage the Hopper Lift switch on the control panel to the UP position.

NOTE: The stabilizers will deploy first, and the STAB DOWN indicator light will turn ON. The hopper will begin to lift after the stabilizers are fully extended.

2. Continue holding the Hopper Lift switch in the UP position.

NOTE: Once the MIN DUMP light illuminates the hopper is ready to tilt or it can be taken to the maximum lift height.


3. Engage the Hopper Lift switch on the control panel to the DOWN position to lower the hopper.


NOTE: The hopper will travel down below minimum dump height, the MIN DUMP light will turn OFF, and the hopper will continue traveling down until it reaches the bottom.

4. Continue holding the Hopper Lift switch in the DOWN position.

NOTE: The stabilizers will automatically retract.

5. Hold the Hopper Lift switch in the Down position until the STAB DOWN indicator light turns OFF.

 **WARNING:** If the hopper is loaded, don't open the chute and dump door unless you are ready to complete the dump cycle. Never close the dump door and chute when debris still remains on chute and hopper floor. The hydraulic cylinders could damage the dump door and chute if debris prevents the dump door from fully closing.

 **WARNING:** If sweeping in extremely wet areas, remember that the hopper could be full of water when opening the dump door. In this situation you should crack the dump door open instead of fully opening it. This allows the water to flow out of the hopper and down the chute in a controlled manner.

Hopper Tilt Operation

1. Follow steps 1 through 3 of the hopper lift operation.

2. Engage the Hopper Tilt Switch in the UP position.

NOTE: The chute will lower, and then the dump door will begin to open.

3. Continue holding the Hopper Tilt switch in the UP position.

NOTE: The CHUTE DOWN indicator light will turn ON. The hopper will begin to tilt and the HOPPER TILTED indicator light will turn ON.

4. Continue holding the Hopper Tilt switch in the UP position until it is fully tilted.

NOTE: The hopper load will be distributed uniformly into the container from the far side to the sweeper side as the hopper tilts.

NOTE: If the chute comes into contact with the dump truck or container, either lift the hopper up or tilt it away from the obstruction.

5. Allow all of the debris in the hopper to fully unload.

6. Shake the hopper by lifting the hopper up and down in a fast, rhythmic motion.

NOTE: This will facilitate removing the debris that is still clinging to the inside of the hopper.

7. Engage the Hopper Tilt Switch in the DOWN position.

NOTE: The hopper will tilt down, the dump door will close, and the chute will close.

8. Follow steps 3 through 5 of the hopper lift operation.

Safety Interlocks

1. The hopper will not lift or tilt when the blower is engaged (not in neutral).

2. The hopper will not lift or tilt when the truck transmission is not in neutral and the park brake is not set.

3. If the stabilizers are down and/or the hopper is tilted, the warning buzzer and the corresponding indicator light in the cab will alert the operator if:

a. The blower rpm switch is engaged.

b. The truck transmission is shifted out of neutral.

c. The park brake is released.

4. The hopper will not tilt below minimum dump height.

NOTE: If the hopper is tilted when lowering the lift, it will stop at minimum dump height. The hopper can't travel below minimum dump height until the hopper is tilted down onto the lift (hopper tilted indicator light is OFF).

Clean Out

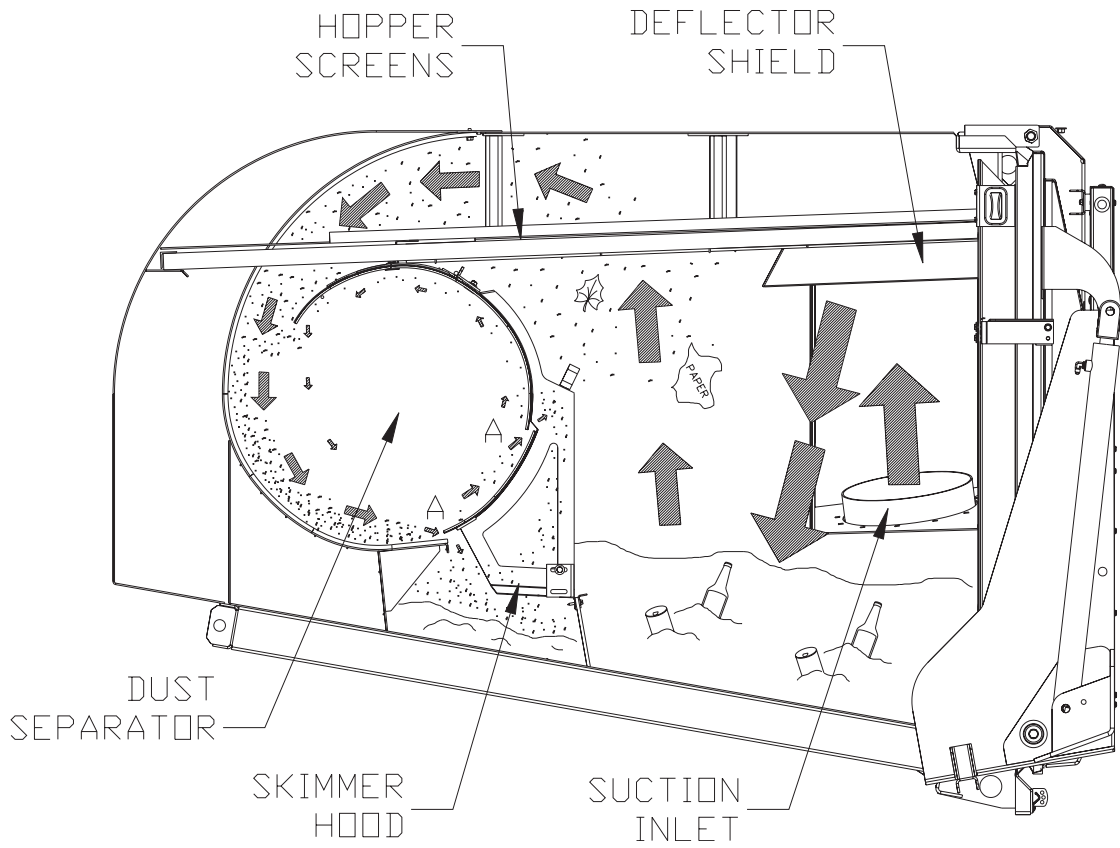
At the end of the shift, drive the sweeper to a wash area. Wash out the hopper and make sure to clean hopper screens, separator, hopper suction inlet, suction tube, and underneath the pick-up head. An optional sweeper deluge is available to facilitate cleaning the hopper and underneath the pick-up head.

Service

Aside from routinely washing out the hopper, the hopper assembly requires very little service.

1. Separator Assembly – The separator is a drum-like area found inside the blower side of the hopper. Its function is to rid the air stream of dust particles through use of centrifugal force rather than filters. Service the separator daily by fully tilting the hopper to open separator door. Wash the interior of separator chamber.
2. Skimmer Slots – The skimmer slots allow the dust particles to escape the air stream before it enters the blower housing. If they are clogged, then the separator **WILL NOT FUNCTION CORRECTLY**. The dust particles in the air stream will continue through the blower housing resulting in dust being blown out of the pick-up head. **This is why it is important to clean the separator DAILY.**
3. Skimmer Hood – Inside the Model 500X hopper is a shielded area attached to the separator door. This shielded area is formed by what is called the Skimmer Hood and is designed to create a void into which the fine dust removed by the separator skimmer slots can accumulate. The skimmer hood protects the separator skimmer slots from being choked off by debris being deposited in the hopper during operation.
4. Separator Liner – The separator liner protects the separator wall from abrasion. This is an item that is meant to be replaced over time and should be checked regularly.
5. Inlet Scroll and Separator Door Scrolls – The separator scrolls are wear items and are meant to be replaced over time. They are lined with rubber and should be checked regularly.
6. Sweeper Seals – The sweeper must maintain an air tight seal to perform adequately. Inspect the dump door seal, blower housing seal, suction tube seal, and pressure transition seal **DAILY!** If any of the seal material is missing, replace the seal. Refer to the 500X Quick Reference Chart for seal locations.
7. Hopper Screens – The large screens found inside the hopper are very important for preventing large debris from entering the separator and blower assembly. Inspect the screens **DAILY!** If any large holes are found, do not operate the sweeper until screen has been repaired or replaced. Refer to M01787 for hopper screen location. Once every 500 hours the hopper screen should be removed and the inlet area above the separator should be cleaned thoroughly. If allowed to become stopped up, the sweeper efficiency would be drastically reduced. Refer to M01787 for the separator inlet location.
8. Wear Liners – The suction inlet is one of the hoppers hot spots. It receives a lot of debris impact because it is the first thing that the debris hits when entering the hopper. This is why the suction inlet is provided with two wear liners for protection. These liners are meant to be replaced over time and should be checked **DAILY** for wear. When a hole has been worn through them, it is time to replace them.

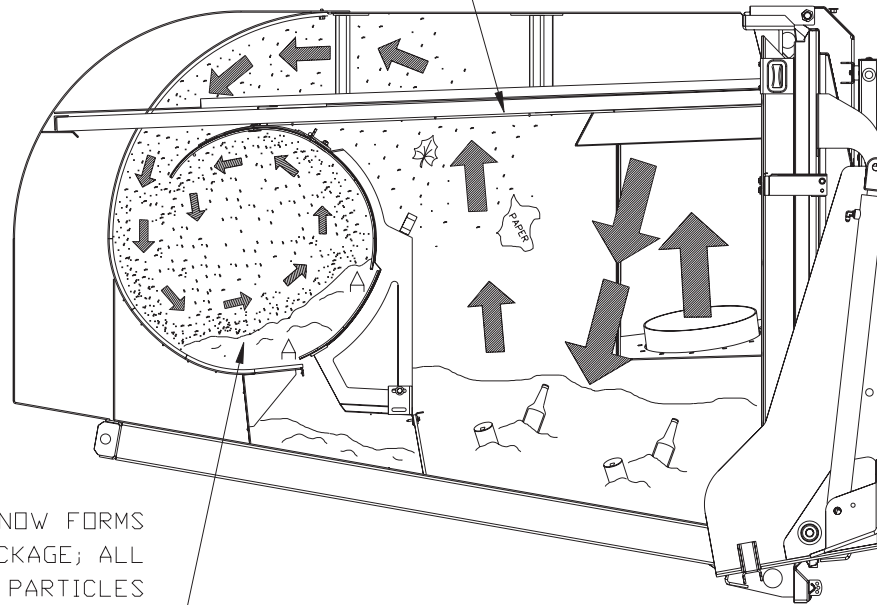
CLEAN SEPARATOR
(M01785)



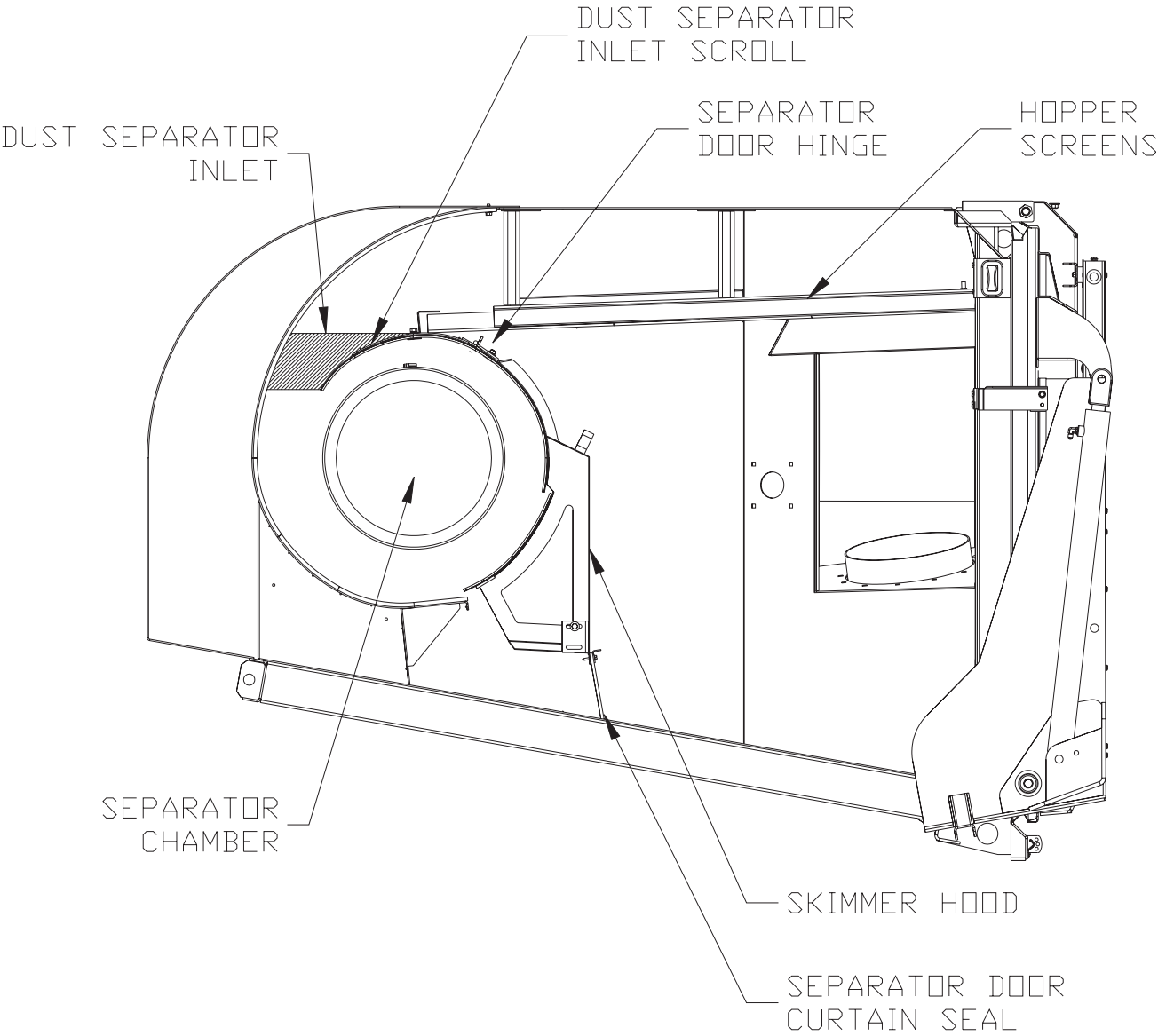
SCREEN STILL BLOCKS
PAPER, LEAVES, GRASS,
ETC.

DEBRIS NOW FORMS
BLOCKAGE; ALL
SMALL PARTICLES
AND DUST WILL
NOW ENTER
BLOWER HOUSING
AND PICK-UP HEAD

DIRTY SEPARATOR
(M01786)



MODEL 500X HOPPER
(M01787)



BLOWER ASSEMBLY

A large turbine type blower is used in the TYMCO Model 500X to generate both the vacuum and pressure air stream with which to sweep. The blower assembly is found on the left side of the sweeper in the blower housing. Refer to the 500X Quick Reference Chart for blower housing location. The blower is driven hydraulically.

WARNING: NEVER REMOVE THE PRESSURE TRANSITION AND PLACE HANDS INTO THE BLOWER HOUSING WHEN THE BLOWER WHEEL IS TURNING!



Blower Operation

The blower wheel does not begin to rotate when the auxiliary engine is turned ON. The blower rpm switch must be engaged manually before the blower wheel will start to turn. There are several safety interlocks that will prevent the blower from being turned on as well.

Operation

1. Start the auxiliary engine.
NOTE: The auxiliary engine will idle at 1100 rpm when started.
2. Lower the pick-up head and pull the sweeper forward to seal it to the ground.
3. Engage the Blower RPM switch in the UP position until desired blower rpm is reached.
NOTE: The engine will automatically increase engine speed from idle to 1800 rpm when the blower begins to be engaged.
4. The blower rpm can be varied from zero to a maximum of approximately 2750 rpm.
5. To turn off the blower, engage the Blower RPM switch in the DOWN position until auxiliary engine speed decreases to idle (1100 rpm).

Safety Interlocks

1. The blower will not turn on if the stabilizers are down, the hopper is lifted up, the hopper is tilted, or the dump door is open. Also, the blower will not turn on if the Water Wash Mode is engaged. Refer to the Water System.
2. The hopper will not lift or tilt if the blower is ON.
3. The water pump will not turn on unless the blower is ON. This is to conserve water. Refer to the Water System.

Blower RPM & Sweeping Speeds Setting

The current blower rpm can be viewed on the electronic display screen on the control panel. As a rule, the higher the blower rpm, the heavier debris which can be picked up providing the sweeper is in good operating condition. However, higher blower rpm results in faster component wear so engine rpm should be set according to the debris load on the street. The best sweeping speeds are between 1 and 10 mph depending upon how heavy the street curb is loaded. The lighter the curb debris, the faster the sweeper can sweep. However, faster speeds will cause faster wear of the pick-up head skid plates and curtains. The following rpm settings and sweeping speeds are recommended:

| Debris Type | Sweeping MPH | Blower RPM |
|--|-----------------|----------------------|
| Paper, Leaves, Light Trash | 5 mph to 10 mph | 1800 rpm to 2100 rpm |
| Normal Accumulation of Dirt, Sand and Gravel | 3 mph to 5 mph | 2300 rpm to 2500 rpm |
| Heavy Accumulation of Dirt, Sand and Gravel | 1 mph to 3 mph | 2500 rpm to 2750 rpm |



WARNING: DO NOT EXCEED 2750 RPM WITHOUT FIRST CONSULTING THE FACTORY.

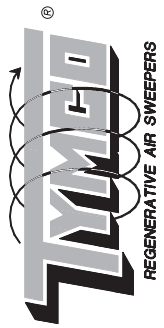
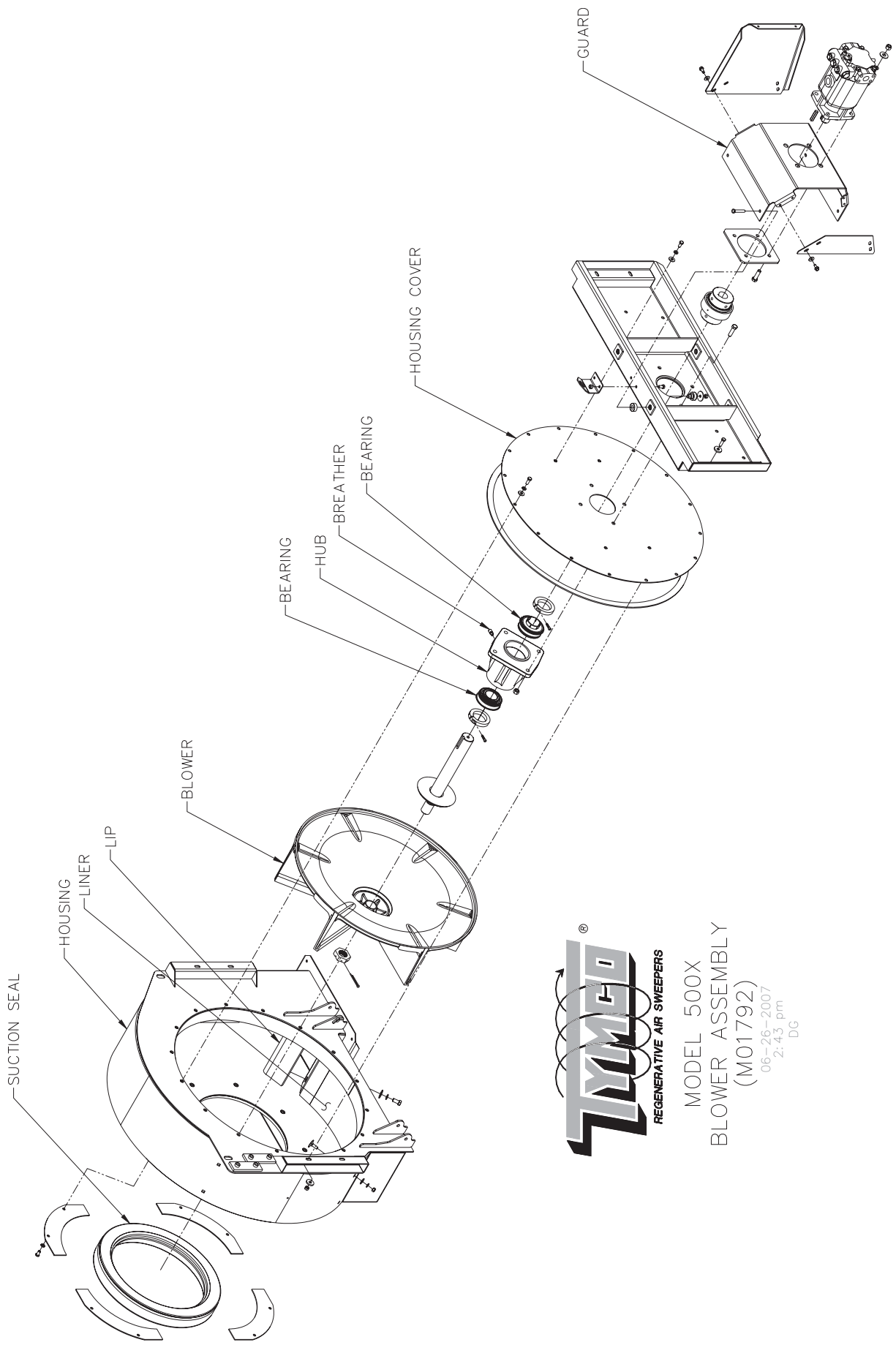
CAUTION: Street sweeping requires a great deal of concentration by the operator to avoid road hazards such as parked cars, pedestrians, chuckholes, etc. Judge the street conditions and operate sweeper at a safe speed regardless of how heavy or light the curb debris is.

Service

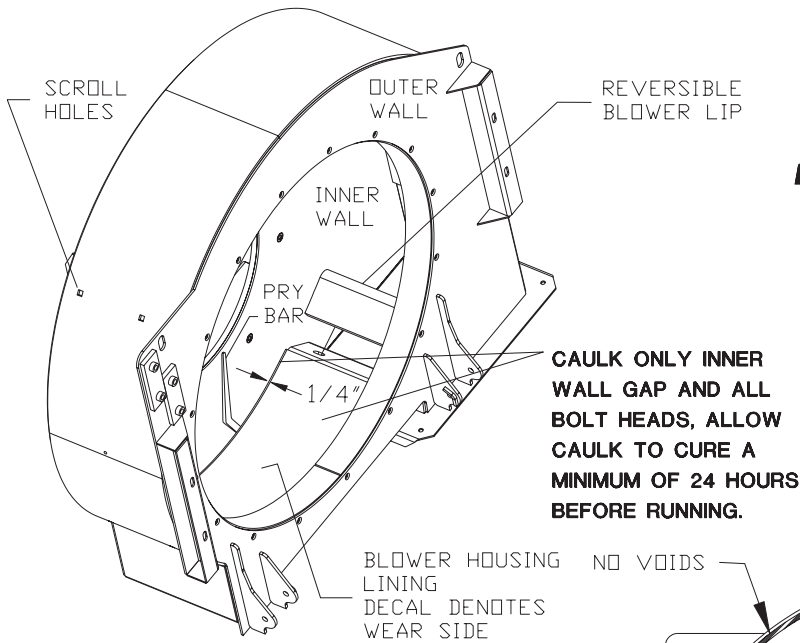
Periodic servicing of the blower should be performed on the following items:

1. **Blower Service** – For longer blower life, clean the dust separator daily. (Refer to the Hopper Section of this manual)
2. **Blower Bearings** – The bearings are pressed into an aluminum hub which is bolted to the blower housing cover. These bearings are sealed and no greasing is required. The operator should be made aware of their location and should listen for any unusual noise coming from the blower housing indicating a bearing problem. The sweeper should be serviced IMMEDIATELY when a bearing problem is detected.
3. **Blower** – Wear on the blower is normal; however, the blower should be replaced when sweeping performance is noticeably reduced. An out-of-balance blower due to caked-on debris or wear can destroy the bearings over time as well. If the blower housing is severely vibrating when the blower is on, the blower is not balanced and should be removed IMMEDIATELY.
4. **Blower Housing Liner / Blower Lip** – A rubber bolt-in wear liner is used to protect the metal scroll in the blower housing. The liner should be inspected every 500 hours of sweeper operation and replaced if expanded metal is evident. The blower lip should be inspected along with the blower housing liner. If worn, it has two usable sides and can be reversed. If both sides have been worn, then replace it.

NOTE: A thorough, periodic inspection of the blower and blower housing should be performed by a qualified mechanic at maximum intervals of 500 operating hours. This inspection requires removal of the blower assembly.



MODEL 500X
 BLOWER ASSEMBLY
 (M01792)
 06-26-2007
 2:43 pm
 DG

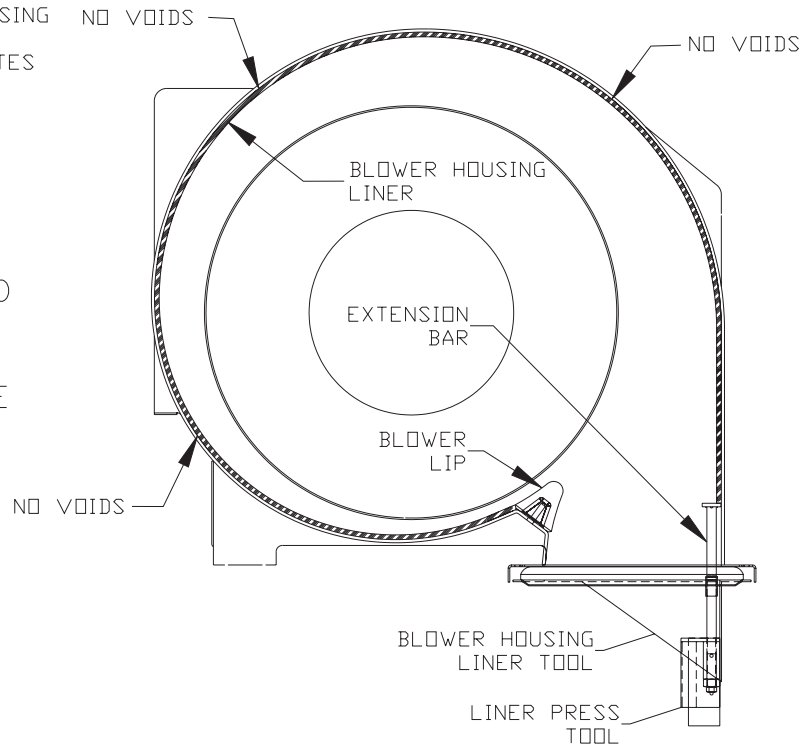


MODEL 500X
BLOWER HOUSING
(M01689)

05-11-2007
11:39 am
DG

BLOWER HOUSING LINER
INSTALLATION TOOLS

LINER MUST BE PRESSED
INTO HOUSING SCROLL TO
ELIMINATE ALL VOID
SPACES BEHIND LINER.
VOIDS CAUSE PREMATURE
WEAR OF LINER.



BLOWER HOUSING LINER INSTALLATION INSTRUCTIONS

1. Butt housing liner against blower lip.
2. Pry liner against outside blower housing wall. No Gap!
3. Install first pair of bolts.
4. Using liner press tool, press liner firmly against inner circumference of blower housing and install remaining bolts. Back drill through scroll holes.
5. Caulk 1/4" inner wall gap, bolt heads and along blower lip only.

HYDRAULIC SYSTEM

Proper sweeper operation is dependent upon a properly functioning hydraulic system. Components such as the gutter brooms, pick-up head lift assembly, hopper lift, hopper tilt, and the blower all depend on a properly functioning hydraulic system. The operator should always check for hydraulic leaks and report them immediately.

WARNING: Operators should NEVER check for hydraulic leaks using their bare hands. High pressure used in the system could result in oil being injected into hand causing serious injury. Always turn sweeper off before servicing.



The main hydraulic system components to be familiar with are:

- A. Hydraulic Tank and Cooler
- B. Hydraulic Pumps
- C. Hydraulic Motors

A. HYDRAULIC TANK AND OIL COOLER

The hydraulic tank is located at the top of the engine compartment at the rear of the sweeper. The tank has an oil capacity of 30 gallons, and the operator must check the oil level daily! The sight gauge and oil thermometer is located on the side of the tank for easy checking. If the oil level is at the thick black line at the top of the sight gauge or below, refill the reservoir before operating the sweeper. Use only 10W hydraulic Oil. Check indicator with at least one gutter broom turning.

Located on the hydraulic reservoir are two oil filters. The filter on the filler cap should be changed every 500 hours (TYMCO P/N 5010080). The return line filter should be changed at or before the restriction indicator points to the red region of the indicator (TYMCO P/N 5018628).

The hydraulic oil cooler cools all the returning oil before it re-enters the tank. It has an electric fan that turns on when the hydraulic temperature is above 116° Fahrenheit. Check the oil cooler DAILY for dirt or any debris that has been caught in the fins. A clogged oil cooler will not function correctly. Clean the oil cooler accordingly.

B. HYDRAULIC PUMPS

The sweeper is equipped with 3 pumps: the blower pump, load sense pump, and auxiliary electric pump. The auxiliary engine directly powers both the blower pump and the load sense pump. The blower pump powers the hydraulic, blower motor only. The load sense pump powers all other hydraulic, sweeper functions. The auxiliary electric pump is intended to be used as a back-up to the load sense pump. It can do every thing the load sense pump can do except lift hopper up. All three pumps are located in the engine compartment area.

A third hydraulic filter prefilters the oil before it enters the hydraulic blower circuit. It should be changed at or before the restriction indicator points to the red region of the indicator. (TYMCO P/N 22203) Check indicator when engine is running.

C. HYDRAULIC MOTORS

The sweeper is equipped with two hydraulic motors that power the gutter brooms. It is also equipped with a hydraulic motor that turns the BAH broom (if BAH pick-up head is equipped). The sweeper has another hydraulic motor that turns the blower.

Auxiliary Hydraulics

The electric hydraulic pump is a back up for the load sense pump if the auxiliary engine can not be started. The auxiliary hydraulics pump relief valve is set at 2400 psi (165 bar). It can operate all hydraulic components that the load sense pump can except for raising the lift assembly. The Multiplex electrical system will not allow the electric pump to raise the lift. The auxiliary hydraulics should always be used when installing any of the safety props.

NOTE: The auxiliary hydraulics pump requires a large amount of power to operate. It is recommended that you always start the truck engine when using the auxiliary hydraulics to prevent running the battery down.

Auxiliary Hydraulics Operation

1. Turn off auxiliary engine.

NOTE: If the auxiliary engine is running, it will automatically shutdown if the auxiliary hydraulics are turned ON. If the engine start key is engaged when the auxiliary hydraulics are ON, the Aux Hyd indicator light will flash.

2. Turn the auxiliary hydraulics toggle switch to the ON position.

NOTE: The Aux Hyd indicator light will turn on.

3. Operate any of the hydraulically controlled components except the hopper lift UP.

NOTE: If the gutter brooms are turned on, they will come down and spin for a couple of seconds then stop.

4. When finished with the auxiliary hydraulics, turn the toggle switch OFF.

GUTTER BROOM

The Model 500X utilizes a vertical digger design enabling the gutter broom to remove heavy debris from the gutter and transfer it in front of the pick-up head. The gutter broom is also designed such that it will fold under the cab if run into the curb or any other stationary object.

The gutter brooms are controlled from inside the cab by the Right Hand/Left Hand gutter broom toggle switch(es) located on the control panel. The sweeper auxiliary engine must be running in order for the gutter broom(s) to work. When the Right Hand/Left Hand toggle switch(es) are in the DOWN position, the gutter broom rotational speed can also be varied by using the gutter broom rpm switch located on the control panel. The gutter broom has 6 speeds in which it can be varied between 100 rpm and 50 rpm. It can be controlled by bumping the switch once for an incremental speed change, or it can be changed by holding the switch for approximately 1 second for a minimum/maximum gutter broom speed change.

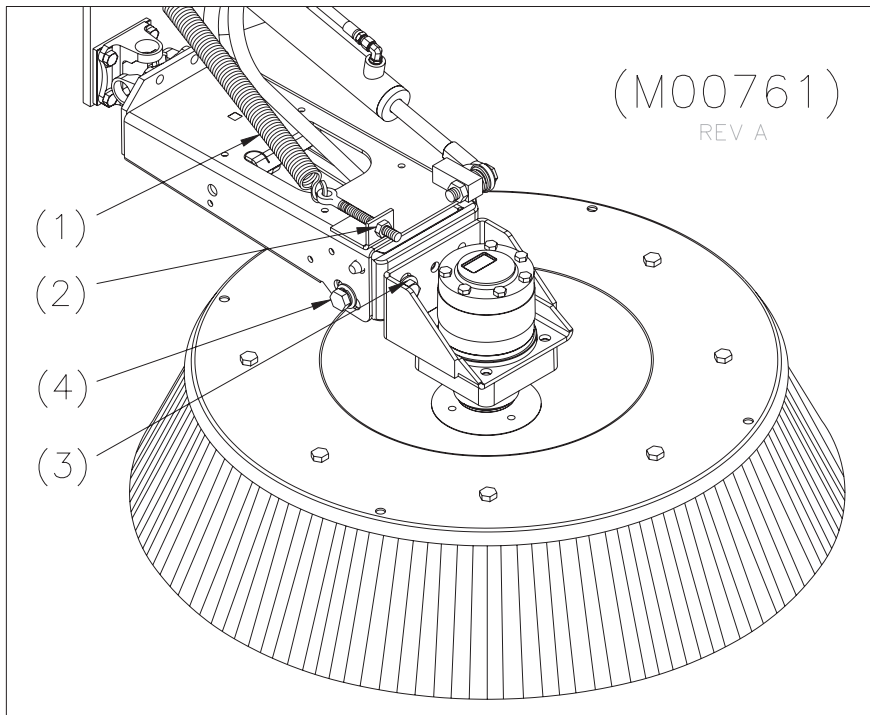
Always use care when the gutter broom is down. Never back up with the broom down or it could hang on a stationary object resulting in severe damage.



WARNING: Never work on or near rotating gutter brooms or exit the cab when a gutter broom is down and rotating.

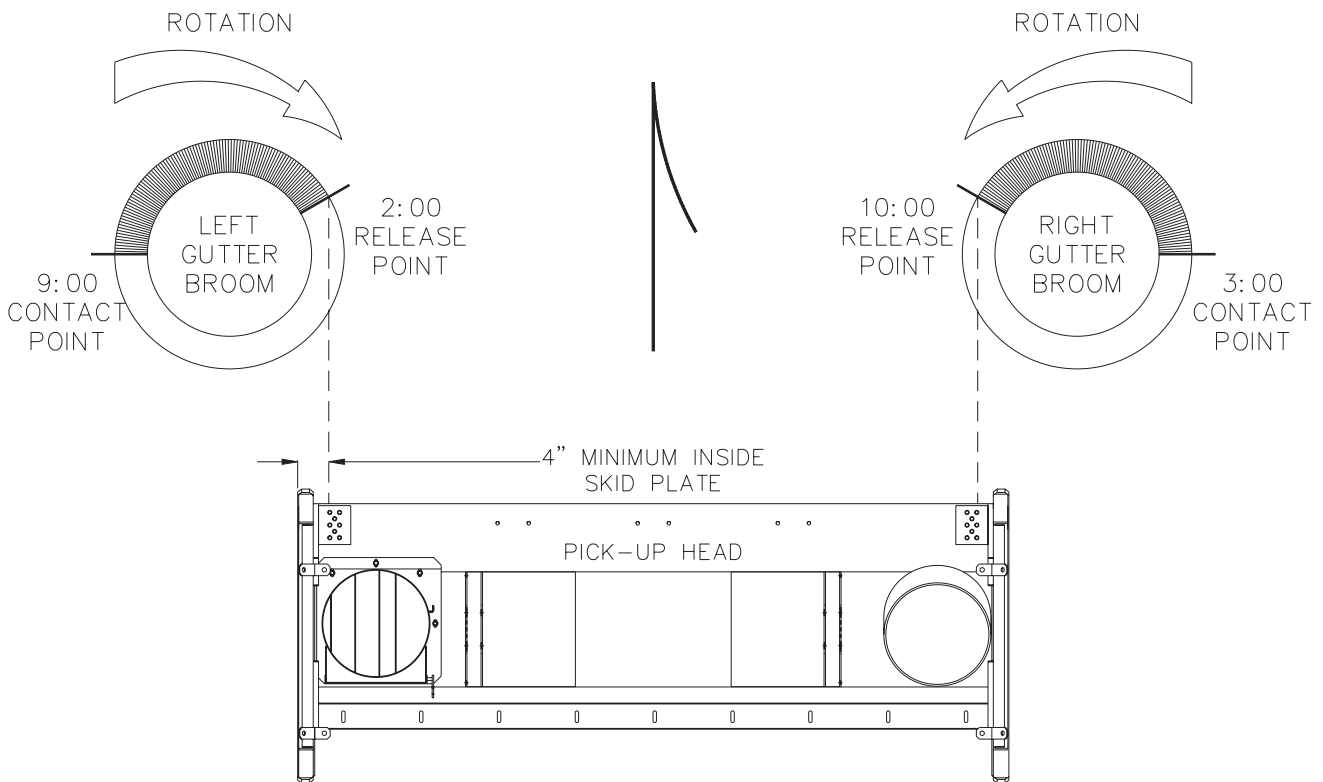
A. ADJUSTMENTS

- 1. Spring** – A long spring (1) is used to counter-balance the gutter broom assembly. As the gutter broom bristles wear out, this spring tension must be reduced by backing off the eye bolt nut (2) used to attach the spring to the boom arm. This allows the gutter broom to lower itself to the ground to compensate for the shortened bristles. However, when new gutter broom segments are installed onto the gutter broom, the spring must be re-tensioned to counter the increased weight of the new gutter broom segments. Failure to reset the spring eye bolt nut will result in premature wear of the new gutter broom bristles. Proper position of the eye bolt nut for new segments is approximately one-half way up the eye bolt.
- 2. Wrist Tilt** – Wrist Tilt allows the gutter broom to tilt from left to right. The gutter boom wrist tilt angle can be adjusted from inside the cab by a toggle switch located on the control panel. The sweeper auxiliary engine must be running in order for the gutter broom(s) to work. When the Right Hand/Left Hand Tilt toggle switch is engaged UP or Down, the broom will change tilt angles up or down. The wrist tilt is supported by a pin 2 bolts that remain loose (4). When setting the gutter broom tilt, adjust them so that they approximate drawing (M00672).
- 3. Hand Tilt** – Hand Tilt allows the gutter broom to tilt from the front to the back. The hand tilt is adjusted by two bolts that are found behind the torque motor (3). When setting the gutter broom tilt, adjust them so that they approximate drawing (M00672).



**STANDARD ROTATING POSITION
(Not Drop Down Position)**

NEW BRISTLE CONTACT PATTERN



(M00762)

B. BRISTLE REPLACEMENT

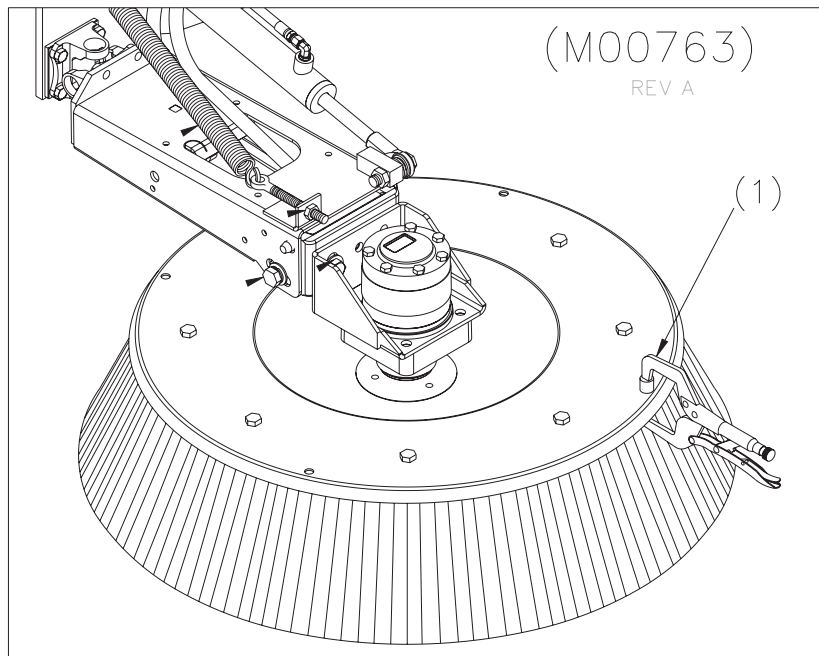
Currently, two types of vertical digger bristles are available from TYMCO:

1. Polypropylene
2. Steel

These two types are not interchangeable without replacing the gutter broom spring. Polypropylene bristles (Part No. 500393) require Spring No. 5010232; whereas steel bristles (Part No. 500392) require Spring No. 5010960.

To replace bristles, use the following procedure:

1. Lower gutter broom; turn sweeper engine off.
2. Remove bolts from bristle segments one segment at a time. TYMCO segments use two course threaded 5/8" bolts to lock segment to disc. No nut is used on the bottom side. Also, a small 3/8" bolt is used to give support to center of each segment. There is a nut used for this center support bolt. Remove and insert it into the new segment.
3. Available for the sweeper is a set of segment installation clamps (1) (see Section TK - Parts & Service Manual) which look similar to vice clamps but the ends have round dowel pins welded on. The pin on the lower jaw of the clamp inserts into the center support hole on the new bristle segment. The pin on the upper jaw inserts into the center support hole on the gutter broom disc. Lock the clamp in place to hold segment which now allows the segment holes to be aligned with the disc holes and the bolts to be installed with ease.

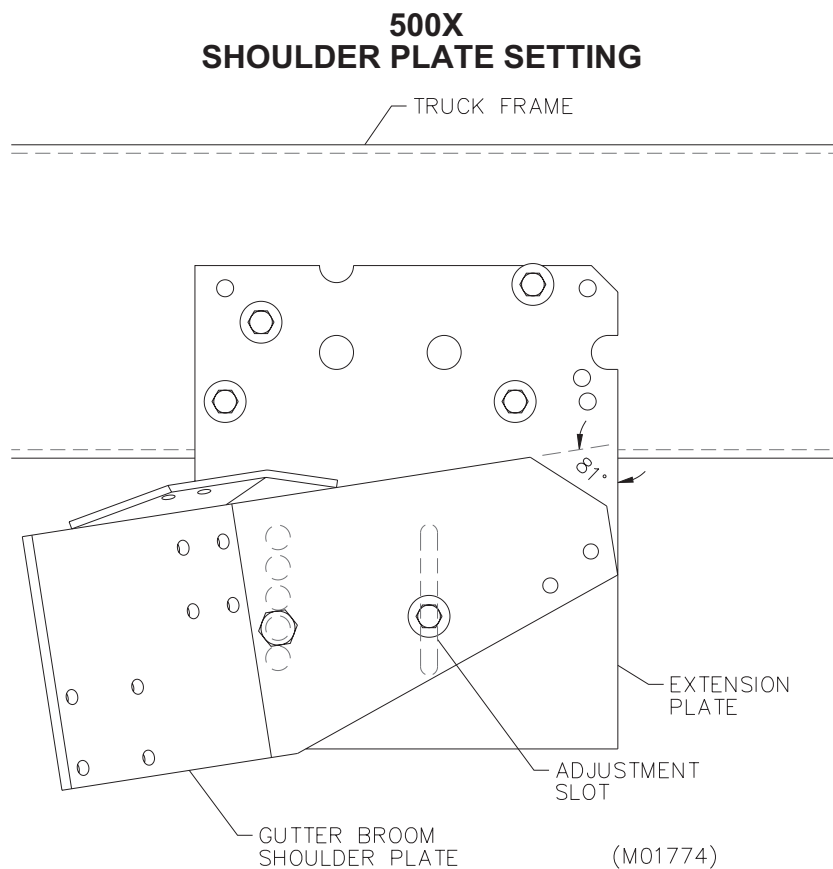


4. Remove segment clamp and install 3/8" center support bolt.
5. Once all four segments have been installed, check spring tension and tilt setting.

C. SERVICE

1. **Torque Motor Shaft** - routine service of the gutter broom requires DAILY inspection of the torque motor output shaft. Remove any build-up of grass, string, cassette tape, etc. that has wound around the shaft. Failure to do so will cause rapid failure of the high pressure shaft seal and possible damage to output shaft. If oil is observed to collect in disc, check torque motor hose fittings; if OK, then torque motor high pressure seal must be serviced. Refer to Service & Parts Manual for rebuild procedure.
2. **Shoulder Plate Setting** - the gutter broom mount plate is bolted to the truck chassis extension plate. The gutter broom mount plate referred to as the shoulder plate is adjusted so that when the hydraulic cylinder retracts the gutter broom it also causes the broom to raise. Should this plate get out of adjustment, the broom may retract but not raise. Two bolts hold this plate in position; one 3/4" bolt requiring a 1-1/8" wrench, and one 1/2" bolt requiring a 3/4" wrench and socket. With the gutter broom in the DOWN position and off, set the shoulder plate as shown in the drawing.

NOTE: If shoulder plate is set with too much forward slope, the gutter broom will strike the bottom of the cab or step when raised.



PICK-UP HEAD

The pick-up head is the most important component of the TYMCO MODEL 500X REGENERATIVE AIR SWEEPER. But, because the pick-up head must be dragged on the pavement, it can be seriously damaged by careless operation. Even when the pick-up head is fully raised, it is still close to the pavement and care must be taken not to damage it in transit.

DO NOT:

1. **Back up with pick-up head lowered.**
2. **Raise pick-up head before lowering blower RPM.**
3. **Increase blower RPM before lowering pick-up head.**
4. **Forget to raise pick-up for transit.**
5. **Cut corners while in transit.**
6. **Drive over speed bumps or divider turtles higher than two inches.**

To lift debris from the ground, a 12" diameter suction nozzle is located on the right side of the pick-up head. The sweeper blower draws air from the hopper creating a vacuum. A flexible hose is then used to connect the hopper vacuum to the pick-up head suction nozzle whereby debris is lifted from the ground and deposited into the hopper. However, because the pick-up head is 87" wide, some means must be used to move debris across to the suction nozzle. Just as debris is lifted into the hopper by the vacuum generated by the blower, the exhaust air of the blower is used to blow debris over to the suction nozzle. This is done by forcing the blower exhaust air through an elongated pressure nozzle called the Blast Orifice. The blast orifice opening is 87" long with a 1/2" to 1" tapered opening. The blower exhaust air is squeezed through this narrow opening which compresses the air into a powerful jet that is then used to blast debris from the ground, forcing it over to the suction nozzle.

OPERATION

1. Before sweeping the operator must check that the sweeper is properly prepared. The operator should read the Model 500X Operator's Manual to become familiar with all aspects of his duties regarding this sweeper. **Read the manual first!!!**
2. Start the auxiliary engine, and turn on the warning lights.
3. Hold the toggle switch labeled "Pick-Up Head" in the DOWN position until the pick-up head cylinders are fully extended. When released, the switch will return to the neutral position.
4. With the pick-up head fully lowered, pull the truck forward a few feet to fold the pick-up head curtains under into the sweep position. Turn the required gutter broom(s) on by engaging the gutter broom switch in the DOWN position.
5. Turn the water system switch to the ON position and turn on the desired water nozzles.

NOTE: The water will not turn on until after the blower is on.

6. Engage the blower rpm switch to the UP position to turn the blower on and increase the blower rpm.

NOTE: The blower rpm is dependent upon the debris being swept. Lighter debris does not require as high of a blower rpm as heavier debris. Lower blower rpm results in less wear on the sweeper.

7. The sweeper is now ready for normal operation. Keep the truck transmission shift lever in first gear to provide better throttle response. Best sweeping speeds are from 3 to 5 miles (5 to 8 km) per hour; however, curb conditions and street congestion greatly determine at what speed to sweep.
8. The design of the pick-up head allows it to handle most debris normally encountered in the curb without special consideration; however, the operator must remember that items larger than the 12.0" diameter suction tube must either be manually picked up or maneuvered around to prevent plugging of the suction tube.
9. Light debris such as leaves and paper may have a hard time getting under the front seal curtain, especially when encountered in large quantities, producing a bulldozed effect in front of the pick-up head. When encountering such debris, the operator must open the "pressure bleeder" door by moving the manual "pressure bleeder" handle back to one of the notched positions. This will increase the vacuum from the suction side of the pick-up head and lift the front seal curtain up away from the ground. The pressure bleeder should only be opened when needed and should be left closed when not needed in order to assure maximum performance in normal debris.
10. Sweepers with the broom assisted head (BAH) give the operator an additional advantage when sweeping roads with heavy caked on debris. To use the pick-up head broom, locate the toggle switch labeled "broom assist" and shift it to the down position. This automatically lowers and turns on the broom. No additional cab controls are necessary for the broom assist as the broom functions automatically once lowered. Rotational speed of the broom is constant and non-adjustable.

NOTE: The pick-up head should always be down before turning on the broom assist, and the broom assist should always be turned off before raising the pick-up head!!! For maximum longevity of the pick-up head broom, the operator should use it only when necessary. When not in use, the operator should always remember to raise the broom assist to prevent it from dragging against the pavement.

11. When the sweeping operation is nearing completion, raise the gutter broom(s) first and continue sweeping before turning off the blower. This makes sure all debris thrown into the street by the gutter broom is picked up before the sweeper is shutdown.
12. Turn off the blower and then raise the pick-up head. Turn off the warning lights. The operator should change to the left hand or legal driving seat at the first safe opportunity for the safest transit in the sweeper.

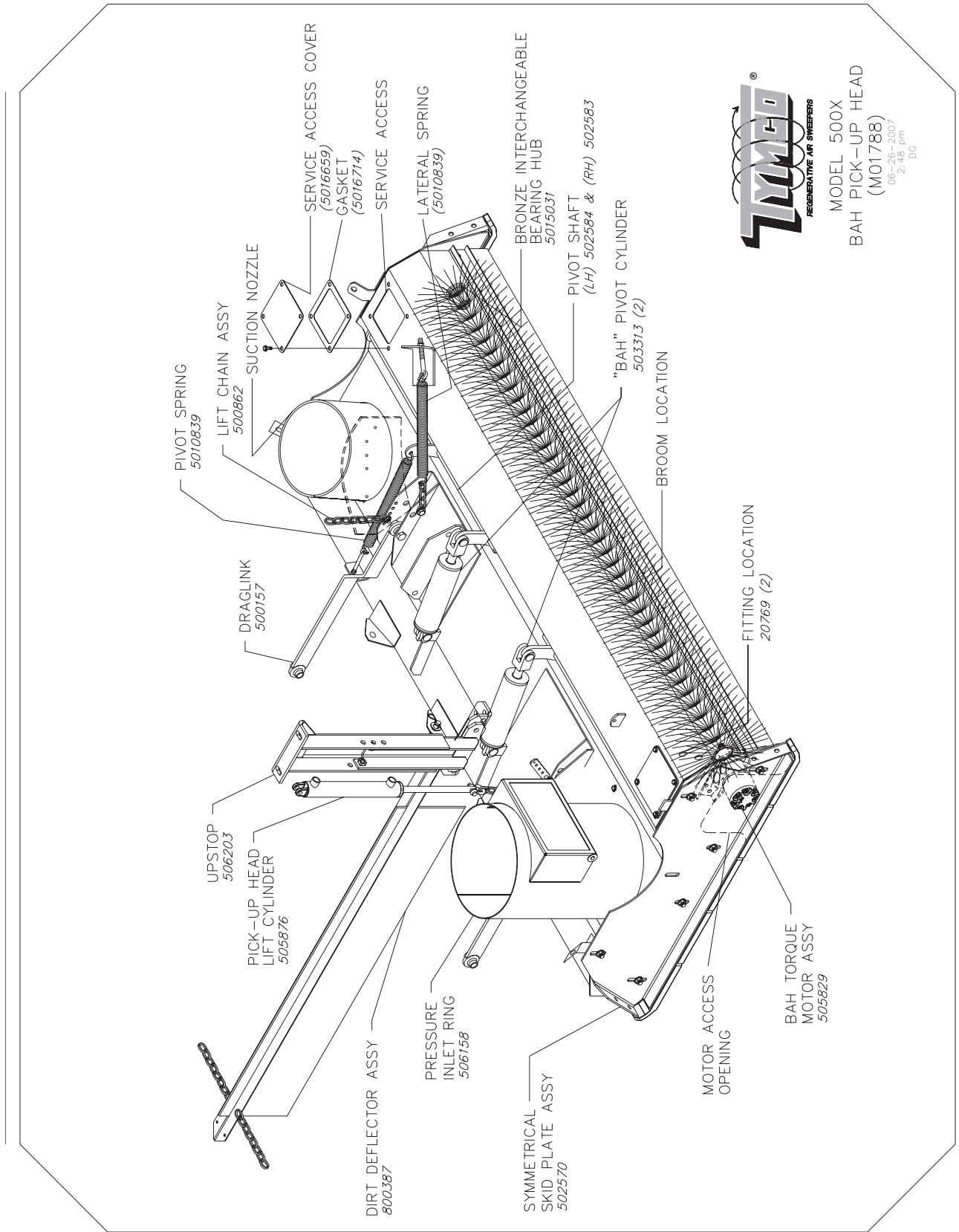
**PICK-UP HEAD MUST BE RAISED FOR TRANSIT!
NEVER BACK SWEEPER WITH PICK-UP HEAD LOWERED UNLESS
EQUIPPED WITH OPTIONAL REVERSE PICK-UP HEAD CHAINS!**

PICK-UP HEAD CURTAINS

Because high velocity air is used by the pick-up head to remove debris from the pavement, the pick-up head must be sealed by rubber curtains to the pavement. These rubber curtains will incur wear as the pick-up head is dragged along the pavement and

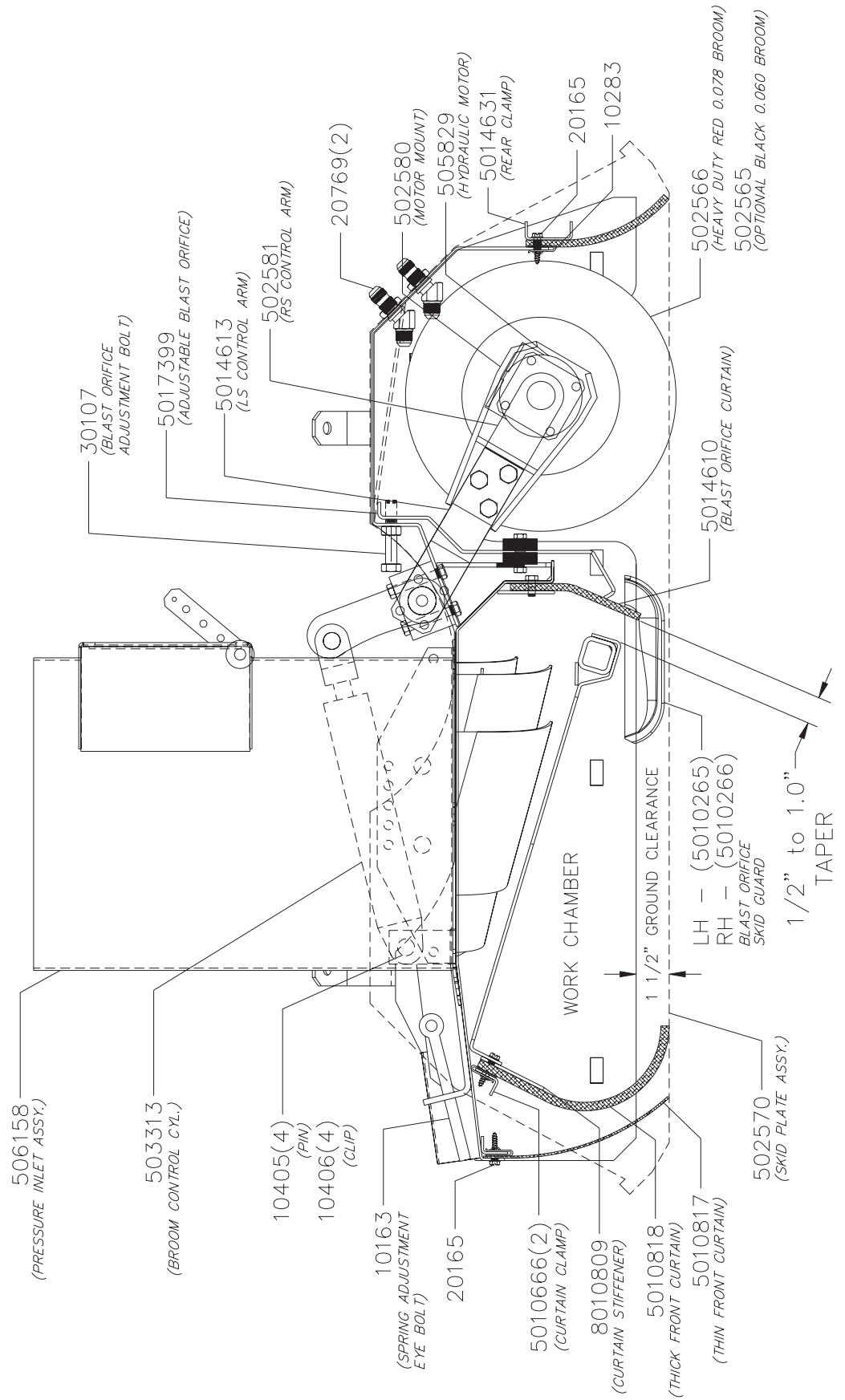
will require periodic replacement. Failure to replace worn out pick-up head curtains will result in poor sweeper performance and excessively dusty conditions. Seal curtain life will depend on pavement texture and sweeping speeds. Fast sweeping speeds increase curtain friction and accelerate curtain wear.

NOTE: Rubber curtain seal material is critical for proper wear life and sweeper performance. Use only TYMCO replacement curtains in order to guarantee sweeper performance. To replace curtains, refer to Service & Parts Manual.



MODEL 500X
 BAH PICK-UP HEAD
 (M01788)
 06-26-2007
 2:48 pm
 DG

BROOM ASSISTED HEAD PICK-UP HEAD CROSS-SECTION (M01789)



SERVICE AND MAINTENANCE



WARNING! Before servicing, stop auxiliary engine and remove ignition key or disconnect negative battery cable.

PICK-UP HEAD SETTING AND ADJUSTMENT

Skid plates - the skid plate setting for the TYMCO REGENERATIVE AIR pick-up head is critical for proper sweeper performance because it determines the relationship of the blast orifice to the pavement. Skid setting becomes even more critical with the broom assist pick-up head. If the skid plates are lowered, this raises the blast orifice further from the road surface making the air blast weaker against the pavement resulting in poor sweeping performance. Also the lower the skid setting, the less reach the BAH broom has beyond the bottom of the skid plates. Therefore, the recommended skid plate setting for the BAH pick-up head is that the rear of the skid be no lower than 2" below the side plate of the pick-up head. (See drawing M01790, Page 31).

With the skid plate is set in the normal debris setting, maximum reach of the broom beyond the bottom edge of the skid plates is 1-1/2 inches. This should be more than enough reach to clean most sweepable road surfaces.

A. Skid Plate Alignment

1. Install skid plates onto pick-up head according to the dimensions given in drawing M01790, Page 31. Tighten only the front and rear bolts. This is not the final step!!
2. With the pick-up head in the UP position, mark the link attached and disconnect the four flotation springs from their chains.
3. Lower the pick-up head onto an even floor surface and pull the sweeper forward to fold under the seal curtains on bottom of the head.
4. Try to rock the head to see if it is setting evenly on the skid plate carbide runners. Go to opposite side and check again. If little or no rocking (less than 3/16"), raise pick-up head, re-attach springs and go to spring adjustment section.
5. If the head rocks (most do), then go to the left hand skid and adjust out the uneven pick-up head by lowering the front or rear of the skid. Do not lower skid more than 1/2" from the normal setting.
6. Once the skid plates are aligned so that the pick-up head rides evenly on the skid plate runners, tighten all skid plate bolts securely. Next, the head flotation springs must be properly adjusted to prevent uneven wear on the runners.

B. Spring Adjustment - Refer to Drawing M01791, Page 32

1. Springs are adjusted each time new curtains are installed or uneven wear of the skid plates is noticed. Improper spring tension will result in premature wear of the skid plate runners and cause everything from poor performance to excessively dusty conditions. Should the skids be observed to wear unevenly, the BAH head incorporates symmetrically designed skid plates which can be rotated from one side to the other; however, this does not correct the cause of the uneven wear. Only the proper spring adjustment will result in proper wear of the skid plate runners.

2. Before beginning to adjust the pick-up head springs, check the four flotation springs (2 per side). Correct spring placement and sizing is critical for proper skid plate runner life. On older units it may be necessary to replace the springs(s) if they have lost their set. Check them by removing all tension, and see if the coils close back completely. If not, then the spring has lost tension and should be replaced. Always refer to your Parts and Service Manual to order the correct spring, making certain to order the correct spring for its location on the head.
3. Spring adjustment is done on a level surface with an empty sweeper. The spring tension is adjusted two ways, by repositioning the spring clevis in various links of the spring chain and by an eye bolt used to attach the spring assembly to the sweeper frame.
4. Each side of the pick-up head has a different spring setting due to the different direction of airflow into and out of the pick-up head. On the left side, air is being exhausted downwards towards the pick-up head driving it against the pavement. So, not only does the spring tension have to counter the weight of the pick-up head but also the downward pressure generated by the air blast from the blower. This also means that the pick-up head spring tension is checked with the pick-up head in the down position and at full blower RPM; however, the spring setting is done with the pick-up head down and blower off. Use the sketches on Page 31 to approximate spring tension on each side of the sweeper.
5. Once the pick-up head has been set to approximate the sketches, lower it and have an assistant throttle blower to sweeping RPM. Observe the head to draw itself down to the pavement. Have the assistant drive forward slowly and observe front of skid runners. If they barely touch the ground and appear to float rather than scrape against the pavement, then the spring tension is good. Same with the rear of the skid. If, however, the skids leave white skid marks on the pavement, then more spring tension is required. If the skids do not seal against the surface, then reduce the spring tension slightly. With the sweeper empty, the pick-up head should feel very light against the pavement and should be easily shifted from side to side as the sweeper is driven slowly forward. This is the proper spring setting because as the sweeper becomes loaded during operation, the load causes the truck chassis to settle lower towards the pick-up head, resulting in a decrease in overall spring tension. The springs are therefore over tensioned slightly to counter for the settling effect of the hopper load.

PICK-UP HEAD DAILY SERVICE

1. Daily Inspections

The pick-up head should be inspected daily or before each shift. The operator should check the following:

- A. Inspect the skid plates for misalignment, unequal wear or any other obvious damage.
- B. Inspect the seal curtains on the bottom of the pick-up head for excessive wear or damage. Because the seal curtains must contain the high velocity air used for sweeping, excessive seal curtain wear or damage can create extremely dusty sweeping conditions.

- C. Look under the pick-up head and inspect the blast orifice curtain for excessive wear or damage. Also, check for any debris jammed in the orifice opening such as rocks, cans or sticks.
- D. Inspect the pressure and suction hoses on either side of the sweeper for wear holes or damage. A temporary field fix can be made using duct tape to patch holes until a new tube is installed. Failure to repair or replace worn hoses will result in excessively dusty sweeping conditions.
- E. At least once a week the pick-up head pressure inlet turning vanes should be inspected for blockage and wear.
- F. Check the pick-up head drag links to make sure they are not bent or damaged, repair or replace before using sweeper.
- G. Inspect the pick-up head upstops for damage and repair or replace immediately. A damaged upstop can cause sever damage to the truck drive shaft by allowing the pick-up head to contact the drive shaft when raised.

2. Broom Assist Daily Service

- A. The broom assist contact pattern must be checked by the operator before each shift especially if it has been used extensively. The sweeper should be on a level surface such as a parking lot or shop floor. Lower the pick-up head and pull the sweeper forward slightly to fold under the curtains. Throttle up blower. Turn broom assist on and allow the broom to run for approximately one minute to bur-nish a pattern onto the pavement. Idle the auxiliary engine RPM, raise the broom and then the pick-up head and drive sweeper forward so that the pattern can be checked. The pattern mark should be 1-1/2 to 2 inches wide and fairly even the full width of the broom.

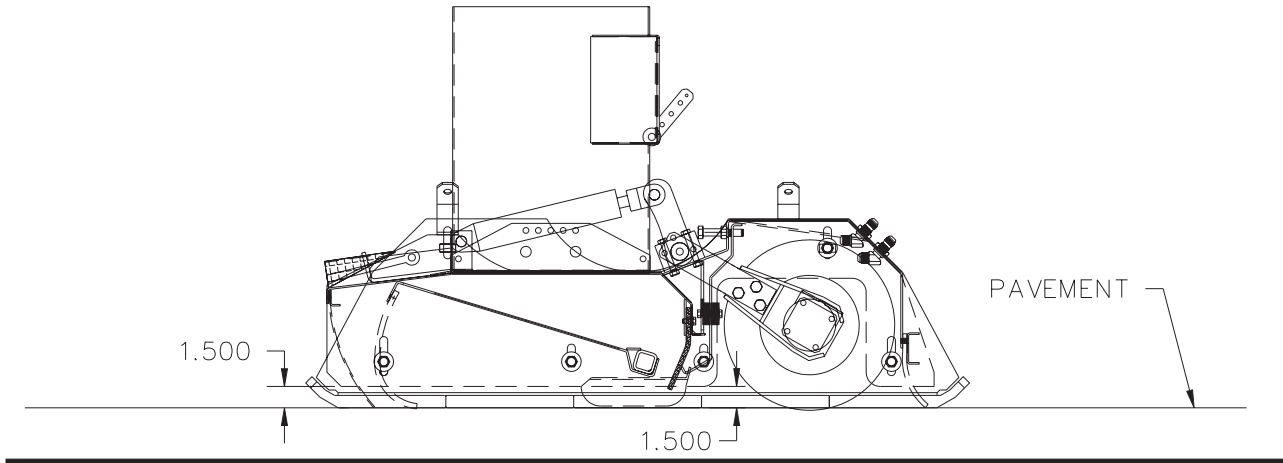
NOTE: Do not mistake the blast orifice pattern for the broom pattern.

- B. Should the broom pattern be lighter on one end or the other, locate the two pivot arm springs on top of the broom assist pick-up head (one on each side), back off the eye bolt of the spring on the light pattern side a few turns but no more than 1/2 inch at a time. Recheck and adjust until pattern is set correctly.

NOTE: BROOM SHOULD BE ROTATED WEEKLY FOR MAXIMUM BROOM SERVICE LIFE.

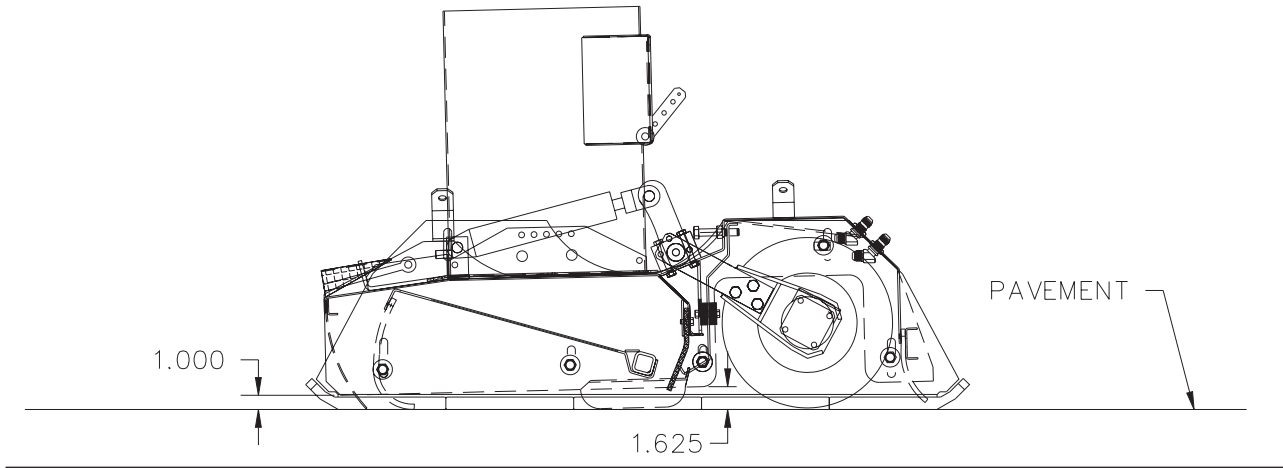
- C. Pick-up heads with the broom assist should have the broom inspected daily for debris wedged between the front of the broom and the blast orifice flange. The broom should also be inspected for severe coning on either end so that the broom may be rotated before excessive wear is incurred.
- D. At the end of each shift, the operator should clean and wash underneath the pick-up head and remove any mud build-up. Particular care should be given to the area around the broom. Thoroughly clean the area between the broom and back of the blast orifice daily! A build-up of debris and mud in this area can greatly diminish the effectiveness of the broom assist pick-up head.

MODEL 500X
NORMAL DEBRIS SETTING



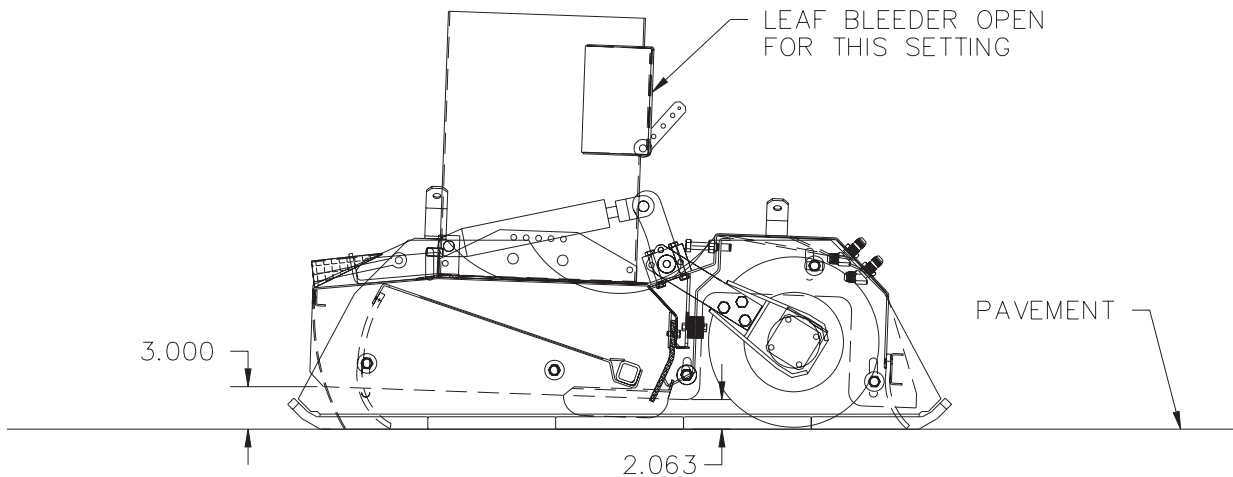
MODEL 500X

HEAVY DEBRIS SETTING



MODEL 500X

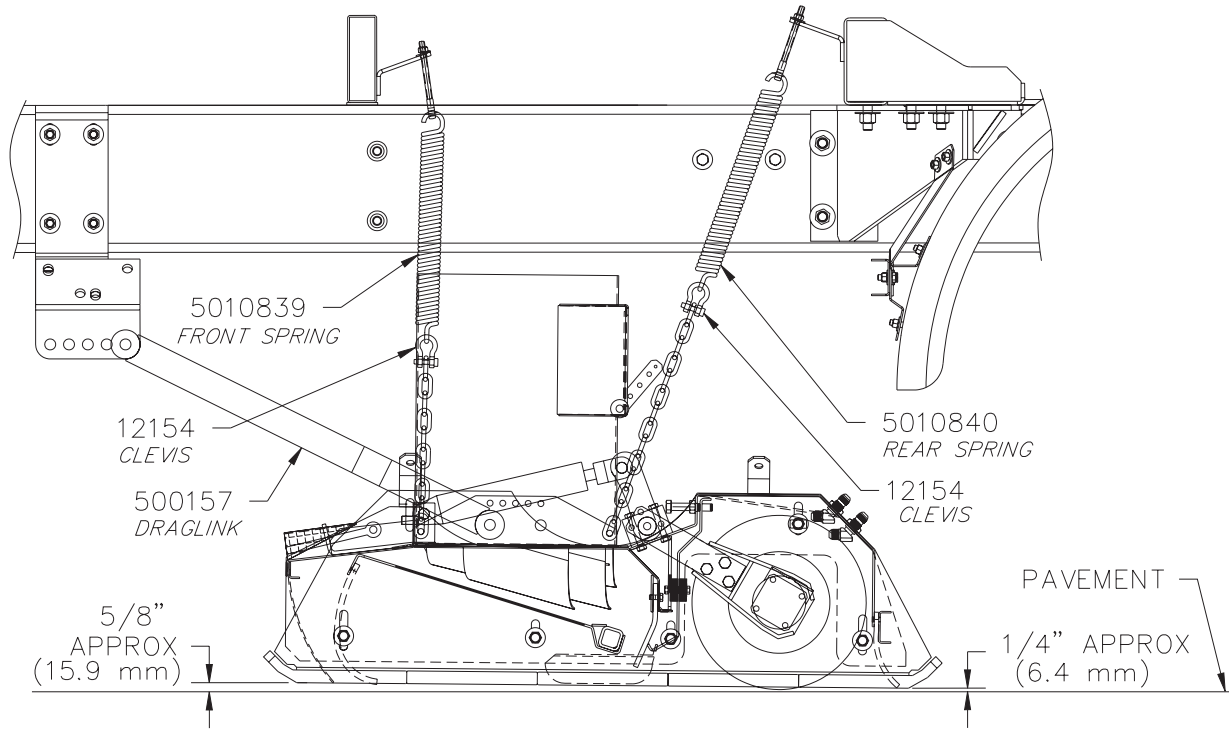
LEAF SWEEPING SETTING



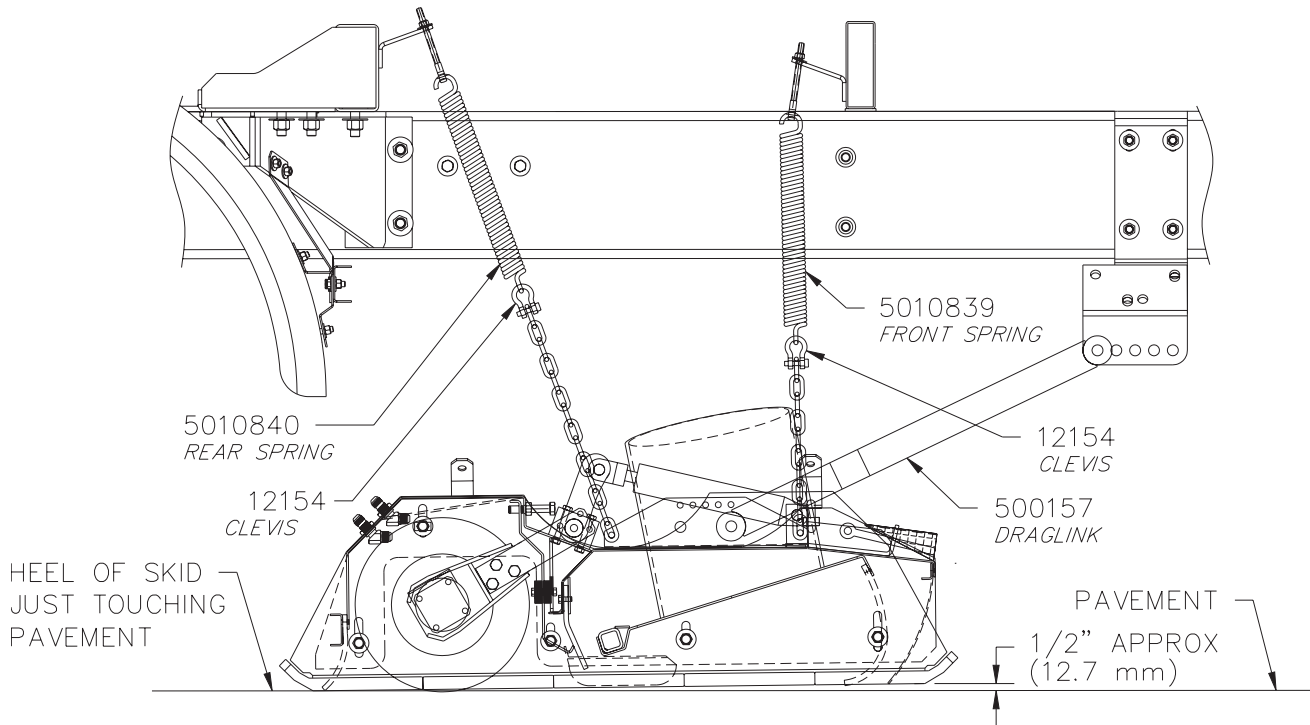
(M01790)

MODEL 500X

SPRING SETTING BLOWER SIDE



SPRING SETTING SUCTION SIDE

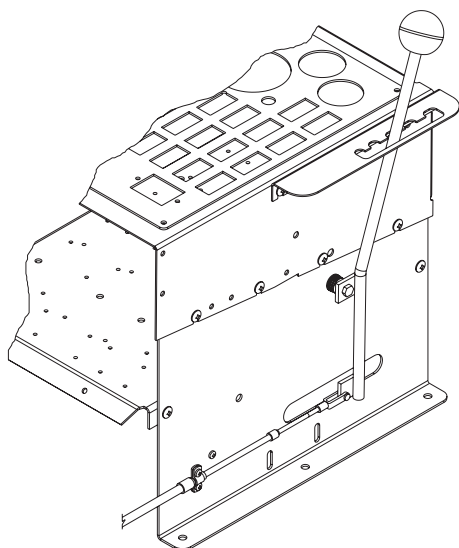


(M01791)

PRESSURE BLEEDER

The pressure bleeder is a small door located on the pick-up head pressure ring just below the pressure hose. When the pressure bleeder door is opened by controls within the cab, part of the pressure air stream is diverted to the atmosphere. This causes the vacuum beneath the pick-up head to be intensified; thus, lifting the front curtain. This allows light debris to be drawn under the pick-up head. This operation should be done only when necessary to pick up light debris and the pressure bleeder kept closed at all other times.

**OPEN PRESSURE BLEEDER DOOR ONLY WHEN SWEEPING LIGHT DEBRIS;
OTHERWISE, PRESSURE BLEEDER SHOULD BE KEPT CLOSED.**

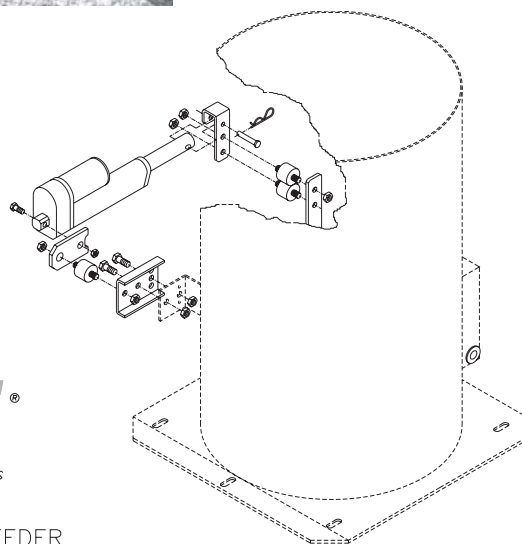


CABLE
CONTROLLED



MODEL 500X
LEAF PRESSURE BLEEDER
ACTUATOR ASSEMBLY
(M01793)

06-26-2007
2:54 pm
DC



ELECTRICALLY
CONTROLLED
(SWITCH IN CAB)

DUST CONTROL (WATER) SYSTEM

The dust control system is designed to control the dust created by the operation of the sweeper under normal sweeping conditions. The dust control system (often referred to as the water system) is only effective when the sweeper is operation properly. Problems such as damaged or worn door seals, worn pick-up head curtains, holes in the suction/pressure hoses can cause extremely dusty conditions that cannot be controlled by a properly functioning dust control system.

Water Tank Liquid Level Sensor

The liquid level sensor provides water pump protection when the water level in the tank becomes depleted. The sensor will cause the water pump clutch to turn OFF if the tank level is low. The low water indicator light on the light indicator module will turn ON when the water tank level is low.

Spray Nozzles

One high volume nozzle is located in the suction inlet of the hopper. There are spray mist nozzles located just in front of each gutter broom and on each side of the pick-up head to minimize airborne dust.

Operation

1. Fill the 250 gallon water tanks using the 2-1/2" fire hose provided with the sweeper. The filler port is located on the right (curb) side of the sweeper. Located inside of the fire hose on the hydrant side is a cone shaped water strainer. Do not loose this.
2. Always purge the fire hydrant before attaching the fire hose to fill the tank. The tank is full when water is observed spilling over the side of the tank. The TYMCO tank filling system is an anti-siphon system as water is put into the tank from the filler neck on top of the tank. At the end of the shift, open drain valve to flush the tank.
3. Start the auxiliary engine, lower pick-up head and pull forward.
4. Turn the water system toggle switch ON.
5. Increase the blower rpm. (Water conservation – blower must be ON for water system to turn on)
6. Turn on the desired water switches.

Recommended Service

There are essentially four service areas for the water system:

1. Water Tank
2. Pre-Filter
3. Water Pump
4. Spray Nozzles

Service these areas routinely according to the following directions:

1. **Water Tank** – The water tank should be flushed at the end of each shift to remove contaminants. Fill tank and then allow it to drain.

2. **Pre-Filter** – A pre-filter is located between the tank and water pump to remove any contaminants before they reach the pump. The pre-filter has a removable cleanout bowl which should be removed and cleaned once a day. **USE CARE NOT TO LOSE THE BOWL GASKET WHEN CLEANING OR WATER SYSTEM WILL NOT WORK CORRECTLY DUE TO AIR LEAK.**
3. **Water Pump** – see Winterization
4. **Spray Nozzles** – The operator is responsible for keeping the spray nozzle tips clean and spraying.

ATTENTION: It is important to use only the correct flow rated spray tips in order to realize proper water system spray time and pressure.

- a. If a spray nozzle is clogged, the entire tip assembly must be removed for cleaning. To clean tip, use the edge of a knife or razor to clear tip spray slot. Then grasp the tip between the index finger and thumb with slotted side facing up and strike the tip sharply against a clean, hard surface to dislodge blockage.

DO NOT USE A DRILL TO MAKE THE ORIFICE LARGER!!!

- b. To re-install tip, insert tip into cap and hand tighten cap to nozzle assembly. Hold tip in desired position with the use of pliers in one hand. With the other hand, use a wrench to tighten the cap which locks tip position.

Note: All nozzles should be checked daily for clogging. To check the hopper water nozzle, follow procedure below.

Water Test Mode Procedure

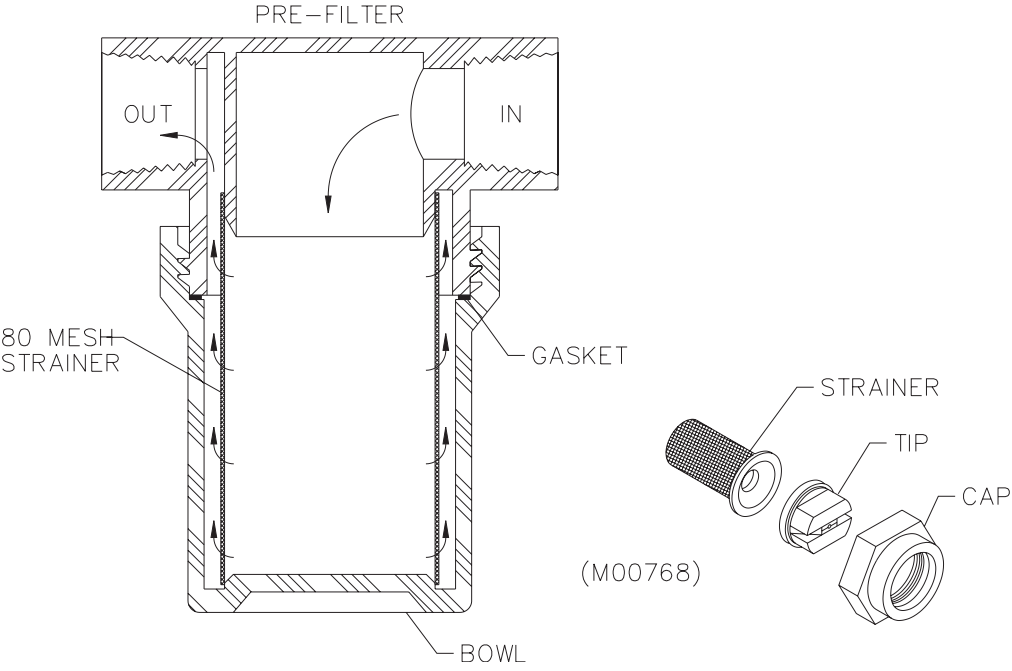
1. Start auxiliary engine.
2. Open the chute and dump door.
3. Turn the water system toggle switch ON, and all water nozzle switches.
4. Engage the blower rpm switch in the UP position for a minimum of 2 seconds.
NOTE: The engine speed will increase to 1800 rpm, and the hopper water will begin to flow.
5. To end Water Test Mode, close the dump door and chute, or turn off the water system switch.

Winterization

To winterize the Model 500X water system, the system should be filled with solution of propylene glycol. Follow procedure outlined below:

1. Turn OFF water supply ball valve next to water pre-filter.
2. Disconnect the suction side hose of the water strainer.
3. Submerge end of hose into container of propylene glycol.
4. Start auxiliary engine.
5. Perform the steps of the Water Test Mode procedure.
6. Let the water pump run until propylene glycol is observed to spray from nozzles.
7. Turn water system off and drain water tank.
8. System is now winterized.

WATER SYSTEM SERVICE AREAS



HAND HOSE OPERATION (OPTIONAL)

The optional auxiliary hand hose is designed to clean areas inaccessible to the sweeper during normal operation, such as shallow catch basins, highway medians, railing, etc. The standard hand hose is a flexible, light duty hose with an aluminum 52" extension. A shutter plate is placed between the hopper suction tube and suction transition so that suction created by the blower will be diverted to the hand hose.

Hand Hose Operation

1. Turn ON the Auxiliary Engine (Don't turn the Blower ON yet!).
2. Lift the hopper UP approximately 1 ft. and place the shutter plate (normally stored in tool box or cab) between the suction transition and the suction tube weldment.
3. Lower the hopper DOWN until the stabilizers are raised.

NOTE: This is done to divert total suction to the hand hose. The hand hose suction will be very weak if the shutter plate is not installed properly.

4. Lower the Pick-Up Head, and pull the Sweeper forward to fold the Pick-Up Head curtains.
5. Remove the 8" quick coupler that locks the cap & plug assembly to the suction tube weldment.
6. Remove the hand hose cap & plug assembly from the suction tube weldment and store it in the tool box or cab.
7. Remove the hand hose and aluminum hose extension from the storage tray under the engine compartment.
8. Attach the hand hose to the suction tube weldment using the 8" quick coupler that was removed in step 4.
9. Attach the aluminum hose extension to the hand hose using the second 8" quick coupler already attached to the hand hose.

WARNING: Hand hose suction is very powerful; do NOT test with hand or place nozzle against or near personnel as serious injury can result.



10. Increase the Blower RPM to desired speed and turn on the hopper water.

- a. Paper, leaves, cans and bottles - 1500-2000 RPM
- b. Heavy dirt and gravel - 2000-2400 RPM
- c. Water, mud, shallow catch basins - 2400-2750 RPM

NOTE: Do not submerge nozzle in liquids or mud; hold slightly above for best results.

11. Once hand hose operation is complete, turn off hopper water, turn off blower, and raise the Pick-Up Head.
12. Remove the 8" quick coupler and hand hose from the suction tube weldment.


13. Insert the hand hose cap & plug assembly into the suction tube weldment and attach the 8" quick coupler to it and the suction tube weldment.
14. Remove the aluminum hose extension from the hand hose and store both of them in the storage tray under the engine compartment.
15. Raise the hopper high enough to remove the shutter plate and store it in the tool box or cab.
16. Lower the hopper until the stabilizers are fully retracted.
17. The sweeper is ready for sweeping operation now.

Sweeper Cleaning with Hand Hose Option

Before cleaning the hopper after sweeping operation, the hand hose cap and plug assembly should be removed from the suction tube weldment. If the hand hose cap is removed after the hopper has been cleaned, it will tend to hold water and spill out when removed. The hand hose cap and plug assembly needs to be cleaned of any dirt build up under cap daily. This will facilitate future removal of the hand hose cap and plug assembly from the suction tube weldment. See the Hopper Section for more details.

AUTO SWEEP INTERRUPT (OPTIONAL)

DESCRIPTION OF OPERATION

 **WARNING!** The ASI System does not automatically inhibit the sweeper from backing up. The ASI System signals the operator when all the sweeper systems are safe to back up. Backing the sweeper is still in the control of the sweeper operator and care must be taken to avoid accident or injury from backing sweeper.

Manual/Auto switch must be in Auto position for ASI to work. Upon placing the transmission gear selector in the reverse position, the blower will automatically be turned off and the sequence of the raising operations will begin. Also, to notify the operator that the sequence of operations is in progress, a red warning light located on the console will start flashing. As soon as the pick-up head is fully raised, the green light will turn on to notify the operator that the sweeper is ready to back up. To resume sweeping, the transmission must be taken out of reverse (turning the red light off) and the INTERRUPT/RESET switch can then be pressed (turning the green light off) which will automatically lower the gutter broom(s), if previously ON, and lower the pick-up head. Operator must manually increase the blower RPM!

FUNCTION

The pick-up head is designed to operate (or be pulled) in only the forward sweeping direction. Therefore, to prevent damage to the pick-up head assembly, the sweeper should never be “backed-up” with the pick-up head in the DOWN position. Before backing the sweeper, the operator should ALWAYS turn the blower off, and raise the pick-up head and gutter brooms. The Auto Sweep Interrupt (ASI) circuit was designed to automatically accomplish this sequence of operations in an elapsed time of approximately 9.5 seconds.

When the ASI System is enabled, to interrupt sweeping for backing, the auto-sequence of operations begins immediately when the sweeper chassis is shifted into reverse or by pressing a INTERRUPT/RESET switch mounted at the sweeper control console. The auto-sequence of operations is in the following order:

1. The blower is turned off and the gutter broom(s) and the BAH (Broom Assist Head) broom, if equipped, are stopped.
2. The water system is turned OFF.
3. The left gutter broom is raised.
4. The right gutter broom is raised.
5. The pick-up head is raised (Including the BAH broom.)

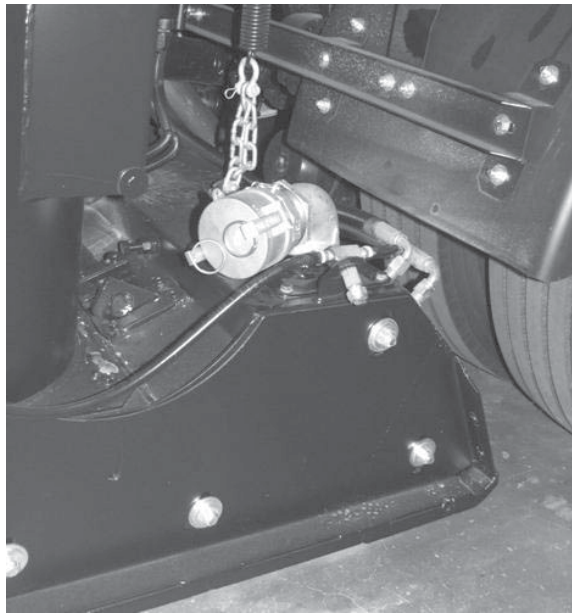
To reset the sweeper in order to resume sweeping, the transmission must be taken out of reverse and the INTERRUPT/RESET switch pressed. All systems, *except the throttle*, will return to their previous mode. The gutter broom(s) will automatically lower, the water system will resume, the pick-up head will lower and the BAH broom will rotate if each were previously ON. After an approximate 4 second time delay to insure that the pick-up head is on the sweeping surface, *the operator may pull forward and manually raise the auxiliary engine speed and resume sweeping.*

SWEeper DELUGE (OPTIONAL)

FUNCTION:

The sweeper deluge option consists of a hopper deluge and a pick-up head deluge. The hopper deluge will clean most of the internal hopper (screens, walls, dump door, floor). The pick-up head deluge works when the pick-up head is down and the blower is turned on. It cleans the BAH broom, the suction tube, the suction inlet of the hopper, and the deflector shield inside the hopper. The sweeper deluge option is intended to speed up sweeper clean up at the end of the day. Both deluge systems utilize the hydrant water fill hose supplied with the sweeper.

NOTE: The pick-up head deluge should be run first before the hopper deluge for best results.



Pick-Up Head Deluge Procedure

- 1) Lower the pick up head and pull forward to seal the pick-up head curtains.
- 2) Detach the fill hose from the sweeper and attach it to the pick-up head deluge quick-disconnect located on the pressure side of the pick-up head.
- 3) Attach the other end of the fill hose to a hydrant.
- 4) Increase Blower rpm to maximum speed.
- 5) Fully open hydrant for approximately 2 – 3 minutes then turn OFF the blower.

NOTE: It is extremely important to not allow water to be sucked into the blower housing. This can cause premature blower wheel failure. One indication of water being sucked into blower wheel housing is bent blower wheel fins. Blower damage due to water ingestion will not be covered under warranty!!!

- 6) Close hydrant and open hopper door to empty hopper.

- 7) Check hopper screen and suction inlet and determine if the pick-up head deluge procedure should be repeated. Repeat procedure if necessary.
- 8) Close hopper and remove water fill hose from pick-up head deluge quick-disconnect.
- 9) Reattach the water fill hose to the water tank filler quick-disconnect and store hose in hose tray.



Hopper Deluge Procedure

- 1) Detach the fill hose from the sweeper and attach it to the hopper deluge manifold located at the rear, curbside of the hopper.
- 2) Connect the fill hose to a hydrant. Close hopper before opening hydrant.
- 3) Open hydrant to wash hopper.

NOTE: Water will begin to drain down suction tube when hopper is full of water.

- 4) The hopper can be opened to empty water out of hopper while the deluge is still on. Beware that as soon as the hopper door opens, the water will drain out of the hopper very rapidly.

NOTE: **Be extremely careful when lifting/tilting. The hopper deluge manifold is attached to the hopper!!! It will rise with the hopper so it is extremely important to be aware of how much slack you have in your water fill hose between the manifold and the hydrant!!!**

- 5) When finished with the hopper deluge, shut off the hydrant.
- 6) Remove the water fill hose from the hydrant and hopper deluge manifold.
- 7) Reattach the water fill hose to the water tank filler quick-disconnect and store hose in hose tray.

HYDRAULIC FRONT CURTAIN LIFTER (OPTIONAL)

FUNCTION

The Front Curtain Lift (FCL) Option supplements the existing Sweeper Pressure Bleeder in order to enhance sweeper performance in light debris removal such as found in curbs with heavy leaf accumulations or litter-filled parking lots. A single hydraulic cylinder rotates the curtain lift mechanism raising the front curtain. Once the curtain is raised, light debris can easily pass under the pickup head and is quickly delivered up into the hopper.

The FCL is controlled by a toggle switch inside of the cab. The FCL should be used to raise the front curtain only after the Pressure Bleeder has been opened. The minimum pressure bleeder opening is approximately $\frac{1}{4}$ to $\frac{1}{2}$ open. Failure to open the pressure bleeder first will cause light debris to be blown away from the Pick-Up Head by the powerful blast orifice air jet. Once the light debris has been swept, the FCL is easily retracted to the stowed position releasing the front curtain for normal operation.

—NOTES—

—NOTES—



REGENERATIVE AIR SWEEPER WARRANTY

TYMCO REGENERATIVE AIR SWEEPERS are warranted to be free from defective materials and workmanship for a period of 12 months or 1,000 hours from date of delivery and such period being hereinafter referred to as "warranty period". It is the sole obligation of Seller with respect to this warranty period to replace free of charge, F.O.B. Waco, Texas, any part or parts which may prove to be defective due to defective workmanship or materials within the warranty period provided no disarrangement of using unauthorized parts or changes to the machinery be made voluntarily or by incompetency, carelessness, negligence, accident, or need of attention upon the part of purchaser, agents, employees or other parties.

This warranty shall not cover normal maintenance and adjustments, and the same not include nor shall Seller be liable or responsible for material for normal wear and usage for any damages by reason of loss of production, down time or loss of profits or income arising from any reason whatsoever. Seller reserves the right to change the design and construction of said sweeper when in its sole opinion any such change represents an improvement of the sweeper. All outside purchased equipment and accessories are guaranteed only to the extent that the manufacturer's guarantee may apply and are not subject to this warranty nor to any implied warranty.

This warranty is in lieu of all other warranties, expressed or implied. No person is authorized to give any other warranties or to assume any other liability on the Company's behalf unless made in writing by the Company, and no person is authorized to give any warranties or to assume any liabilities on the Seller's behalf unless made in writing by the Seller.

