Electronic Service Manuals

This electronic document is provided as a service to our customers. We do not create the contents of the information contained in this document. Should you have detailed questions pertaining to the information contained in this document, you may contact Michco, or the manufacturer which provided the original information in this electronic deliverable. Michco's only part in this electronic deliverable was the electronic assembly process. By providing this manual on line we are not guaranteeing parts availability.

You may contact Michco through the following methods:
Phone (517) 484-9312 or (800) 331-3339
2011 N. High St. -- Lansing, Michigan -- 48906
Fax: (517) 484-9836
Email: CustServe@Michco.com
Web site: www.Michco.Com
Parts Web site: www.FloorMachineParts.Com

Order Parts on Line at:
www.FloorMachineParts.Com

Directly to Parts & Service:
By Email: **Shop@Michco.com**
By Fax: (517) 702-2041
By Voice: Use numbers above.

Serving the Cleaning Industry Since 1922

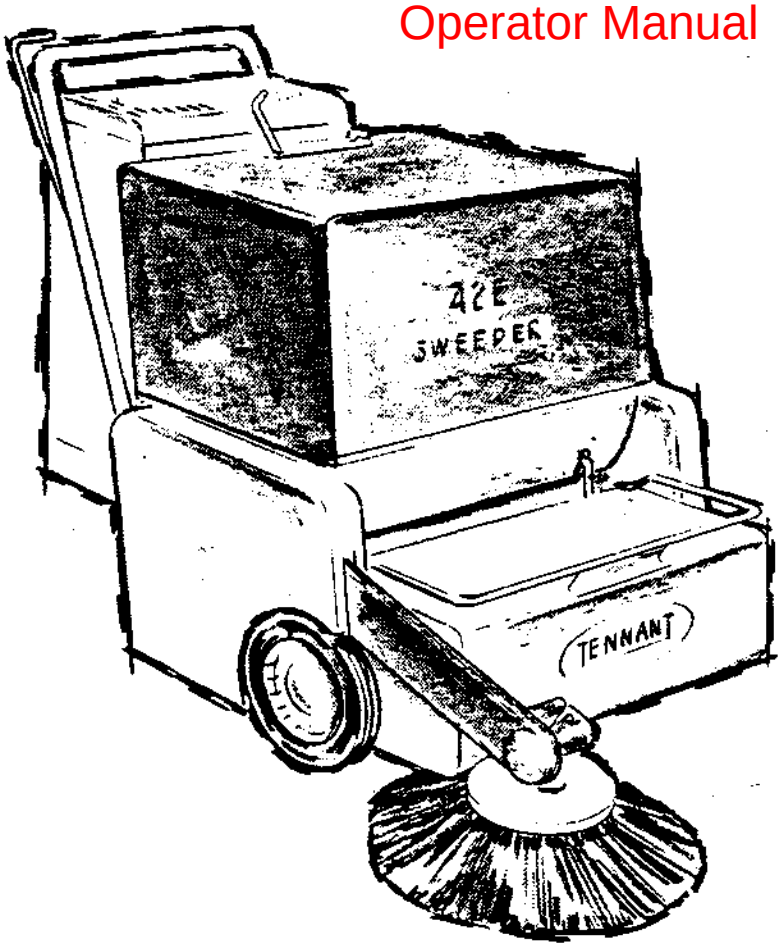
MM028

3-84

42E/EHD
POWER SWEEPER

Operation, Maintenance, and Parts Manual

Operator Manual



SPECIALIZED MAINTENANCE EQUIPMENT

SWEEPERS • SCRUBBERS • SCARIFIERS • FLOOR COATINGS

42E/EHD
POWER SWEEPER

This manual is furnished with each new TENNANT® Model 42E. The machine operators will easily learn how to operate the machine and understand its mechanical functions by following the directions and absorbing the information in the Operation section.

This machine will give excellent service and sweeping results, and save maintenance expenses. However, as with all specially engineered mechanical equipment, best results are obtained at minimum costs if:

- The machine is operated with reasonable care and
- The machine is maintained regularly — per the maintenance instructions provided.
- Components used in this machine have been carefully selected for performance and safety. Use only Tennant Company supplied or equivalent parts.

Parts and supplies may be ordered by phone or mail from any Tennant Company parts and service center, distributor, or from any of the Tennant Company subsidiaries.

The telephone, telex, mailing addresses, and locations are listed on the last page of the manual.

MANUAL NO. MM028
Published: 3-84

02334

TENNANT COMPANY WARRANTY POLICY

Tennant Company warrants to the original purchaser, for the period of one (1) year from the date of delivery, that goods manufactured by it will be free from defects of workmanship and material, provided such goods are installed, operated, and maintained in accordance with Tennant Company written manuals or other instructions.

Tennant Company's sole obligation, and Purchaser's sole remedy under this warranty for all claims arising out of the purchase and use of the goods, shall be limited to the repair or replacement, at Tennant Company's option, of parts that do not conform to this Warranty.

For thirty (30) days from date of installation, Tennant Company will, at its option, provide labor for repair, pay for outside repair service, or pay the customer straight time in accordance with Tennant Company's flat rate schedule for particular warranty repairs. Thereafter, Tennant Company's sole obligation shall be limited to the repair or replacement, at Tennant Company's option, of parts that do not conform to this Warranty.

Repair parts supplied by Tennant Company are warranted for the period of thirty (30) days following installation. Tennant Company's obligation is limited to the replacement of the warranted part, and Tennant Company shall not be obligated to provide labor in installing such part.

Battery and tires will be replaced if failure occurs due to defective material or workmanship within 90 days from date of purchase. Thereafter, a pro rata adjustment from date of purchase to 12 months will be made. The pro rata adjustment price of the new battery and/or the new tire will be the Tennant Company current price as of the adjustment request less 1/12th of that price for each month remaining in the 12-month period. All warranty applies only to batteries and tires purchased from Tennant Company and installed in vehicles used in normal service.

Brushes that fail due to defective material or workmanship will be replaced on a pro rata basis within the first 12 months of purchase. The replacement price will be calculated by multiplying the current Tennant Company price by the percentage of usable bristle remaining at the time of adjustment.

No Warranty is made with respect to items made by others when such items are warranted by their respective makers or when they are supplied by Tennant Company on special order.

This Warranty shall not cover:

A. Floor materials or application, and models 140 and 140E.

B. Maintenance items, adjustments, or installation of machines.

C. Repairs required as a result of failure due to normal wear, accidents, misuse, abuse, negligence, or improperly installed repair parts.

D. Products altered or modified in a manner not authorized by Tennant Company in writing.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER EXPRESSED OR IMPLIED WARRANTIES INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS AND OF ALL OTHER OBLIGATIONS AND LIABILITIES ON THE PART OF TENNANT COMPANY, INCLUDING LIABILITIES FOR DIRECT, IMMEDIATE, SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE FAILURE OF ANY MACHINE OR PART OF IT TO OPERATE PROPERLY, INCLUDING THE COST OR EXPENSE OF PROVIDING SUBSTITUTE EQUIPMENT OR SERVICE DURING PERIODS OF MALFUNCTION OR NON-USE.

This Warranty cannot be extended, changed, or modified by any representative of Tennant Company.

Dear Customer,

Keeping you as a satisfied customer is our primary concern. If for any reason you are not satisfied, please contact anyone of the persons listed below.

One of the addresses is your local engine dealer. We will handle replacements on all parts of our equipment but this dealer probably carries a more complete stock of engine parts than we do and should be able to give you faster service in this area. Try him first for engine parts. Also, your engine dealer should be contacted first for warranty claims pertaining to the engine.

If you find that you need an experienced mechanic, please contact anyone listed below and he will be happy to recommend a mechanic to you.

To get maximum trouble free service from your machine, you must perform maintenance checks as specified in the machine manual and arrange for maintenance on a regular basis. Remember that breakdowns are directly related to maintenance.

TENNANT COMPANY	TENNANT COMPANY REPRESENTATIVE	ENGINE DEALER	
Tennant Company			
P. O. Box 1452			
Minneapolis, MN 55440			
(612) 540-1200			

POWER SWEEPER - 42E/42EHD MM028 (3-84) LITHO IN U.S.A.

SAFETY PRECAUTIONS

The following symbols are used throughout this manual as indicated in their descriptions:

DANGER: To warn of immediate hazards which will result in severe personal injury or death.

WARNING: To warn of hazards or unsafe practices which could result in severe personal injury or death.

CAUTION: To warn of hazards or unsafe practices which could result in minor personal injury.

ATTENTION! To warn of unsafe practices which could result in extensive equipment damage.

NOTE: To give important information or to warn of unsafe practices which could result in equipment damage.

The following information signals potentially dangerous conditions to the operator or equipment. Read this manual carefully. Know when these conditions can exist. Locate all safety devices on the machine. Then, take necessary steps to train the machine operating personnel. Report machine damage or faulty operation immediately.

WARNING: Batteries emit a highly explosive hydrogen gas that can be ignited by smoking or electrical arcing.

CAUTION: Always disconnect batteries-to-machine connector before working on machine.

WARNING: Avoid moving parts of the unit. Loose jackets, shirts or sleeves should not be permitted when working on machine because of the danger of becoming caught in moving parts. Make sure all nuts and bolts are secure. Keep shields and guards in position. If adjustments must be made while the unit is running, use extreme caution around moving parts.

WARNING: Do not operate the machine until you have read and understood the operating instructions and are properly trained. Failure to do so could result in severe personal injury.

WARNING: Do not operate the machine in flammable or explosive environment. Machine is not designed for such an environment. It could cause ignition of flammable or explosive materials.

WARNING: Always follow safety and traffic rules of the area in which the machine is being operated to prevent serious injury.

WARNING: Do not use flammable or combustible cleaning agents when scrubbing to prevent fire or explosion and serious injury.

WARNING: Keep the machine cover open when charging batteries to prevent the buildup of explosive hydrogen gas.

WARNING: Avoid contact with battery acid. Battery acid can cause severe burns. Wash immediately and get medical attention if contact with battery acid occurs.

CAUTION: Always place the master power switch in the "off" position before leaving the machine unattended.

POWER SWEEPER - 42E/42EHD MM028 (3-84) LITHO IN U.S.A.

GENERAL INFORMATION

CONTENTS

CONTENTS

SECTION 1
SPECIFICATIONS

CONTENTS

MACHINE SPECIFICATIONS

POWER TYPE
Electric propelling motor -
nominal voltage 24 VDC
1 hp (0.7 kw) @ 2000 rpm, 40 A

Dust filter shaker motor -
nominal voltage 12 VDC
0.075 hp (0.06 kw) @ 1375 rpm, 8.4 A

Batteries (2) -
12V, 125 A/hr

POWER TRAIN
Propelling - limited slip, belt driven differential, chain driven drive wheels by differential
Main brush - belt driven
Side brush - belt driven through gear reducer
Vacuum fan - belt driven

SUSPENSION SYSTEM
Front (2) - 10 x 2.00 solid tires
Rear - 5 x 1.25 solid caster

GENERAL MACHINE DIMENSIONS - CAPACITIES
Length - 65.6 in (1665 mm)
Width - 34.25 in (870 mm)
Height - 38.5 in (980 mm)
Track, front - 31.5 in (800 mm)
Wheel base - 23.7 in (600 mm)

Main brush, sweeping, length - 26 in (660 mm)
diameter - 10 in (255 mm)
Side brush, sweeping, diameter - 17 in (430 mm)
Sweeping path width - 34 in (865 mm)
Main brush, scrubbing, length - 26 in (660 mm) with scrub attachment
diameter - 8 in (200 mm) with scrub attachment
Side Brush, scrubbing, diameter - 11.25 in (285 mm) with scrub attachment
Scrubbing path width - 30 in (760 mm) with scrub attachment
Hopper capacity - 3.2 cu ft (0.09 m^3)
150 lb (68 kg)
Dust filter area - 34.7 sq ft (3.2 m^2)
Solution tank capacity - 14.5 gal (55 L) with scrub attachment
Recovery tank capacity - 17.5 gal (66 L) with scrub attachment

MACHINE WEIGHTS
Machine net weight, less batteries, brushes - 402 lb (182 kg)
Machine net weight, with batteries, brushes - 598 lb (271 kg)
Scrubber attachment net weight, dry - 183 lb (83 kg)

GENERAL MACHINE PERFORMANCE
Maximum travel speed - 2.6 mph (4.2 k/hr)

POWER SWEEPER - 42E/42EHD MM028 (3-84) LITHO IN U.S.A.

SECTION 2
OPERATION

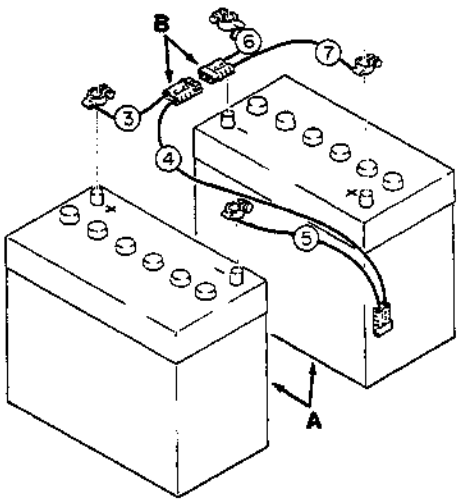
CONTENTS

PREPARATION FOR OPERATION

1. Uncrate the machine.
2. Check the machine for shipping damage. Report any damage to the carrier at once.
3. Read and understand this manual before operating the machine.

⚠ WARNING: Do not operate the machine until you have read and understood the operating instructions and are properly trained. Failure to do so could result in severe personal injury.

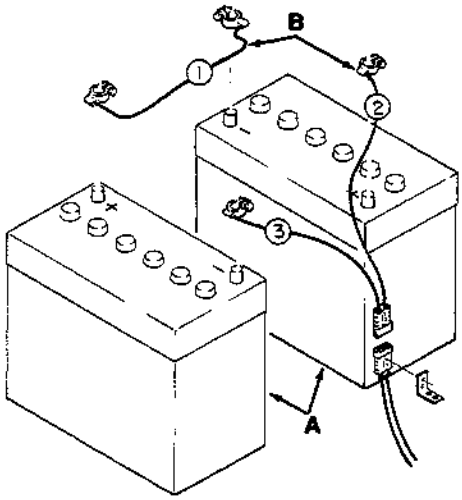
4. Open the battery cover.
5. Check the batteries. If they are of the wet-type, check the electrolyte level as described in Batteries. If they are of the dry-type, activate them as described in Activating Dry-Type Batteries.
6. Check the battery specific gravity to determine the state of charge as described in Batteries. Charge the batteries if necessary.
7. Connect the battery cables to the batteries as shown in the appropriate illustration below.



01002

BATTERY CABLE CONNECTIONS - OLD STYLE

A. Battery
B. Battery Cable

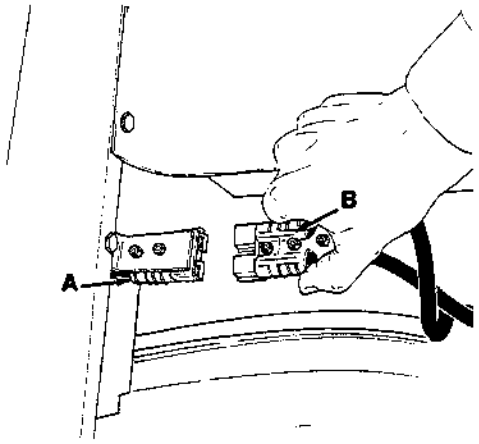


01002

BATTERY CABLE CONNECTIONS - NEW STYLE

A. Battery
B. Battery Cable

8. Install the main brush as described in Brushes.
9. Install the side brush with the hardware provided in the cloth bag attached to the machine handle.
10. Connect the batteries-to-machine connector.

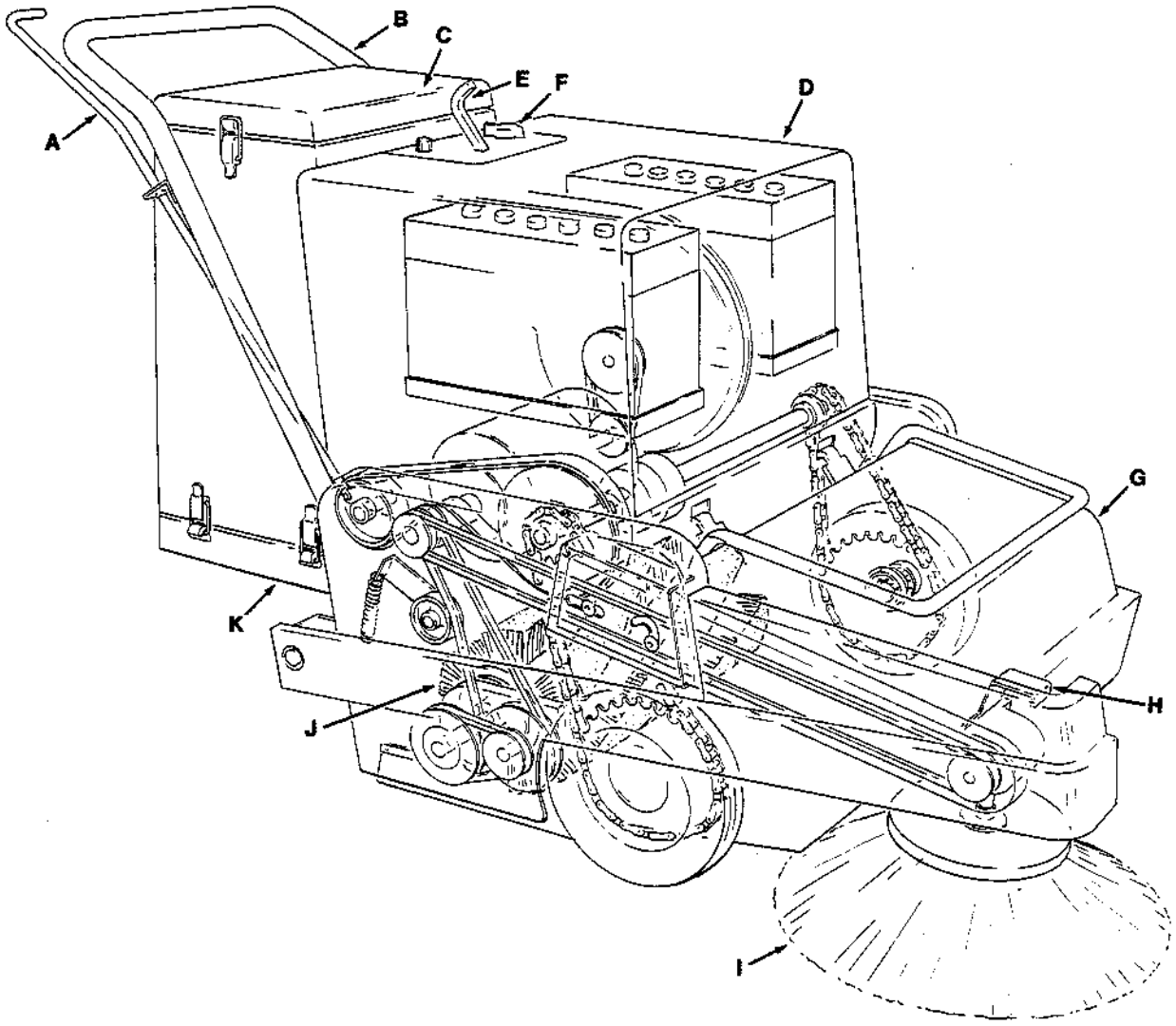


02332

CONNECTING BATTERIES-TO-MACHINE BATTERY CONNECTOR

A. Machine Connector
B. Batteries Connector

11. Close and latch the battery cover.
12. Operate the machine as described in Machine Operation.



MACHINE COMPONENTS 02333

A. Clutch Control Handle
B. Stationary Handle
C. Filter Box
D. Battery Cover
E. Main Brush Lift Handle
F. Master Power Switch
G. Hopper
H. Side Brush Arm
I. Side Brush
J. Main Brush
K. Dust Tray

CLUTCH CONTROL HANDLE

The clutch control handle operates a cable which controls the drive belt idler. Pushing the control handle in propels the machine forward. Releasing the control handle disengages the drive belt, stopping the machine.

STATIONARY HANDLE

The stationary handle is used to steer the machine. It also serves as an aid in controlling the clutch control handle.

BATTERY COVER

The battery cover encloses the machine batteries and other electrical components. To gain access to the machine batteries, unlatch the battery cover latches and lift the battery cover off the machine. A chain connects the battery cover to the machine frame.

MAIN BRUSH LIFT HANDLE

The main brush lift handle operates a linkage which controls the height of the main brush.

To lower the main brush, pull the handle back, lower the handle, and move it forward into the "restricted down" position so the upper groove in the handle engages the left slot; or move it to the right and then forward into the "free-float" position so the handle engages the right slot. To raise the main brush, pull the handle back and to the left, lift, and move the handle forward so the lower groove in the handle engages the left slot.

The "restricted down" position is used for normal sweeping. The "free-float" position should only be used on extremely uneven surfaces.

To adjust the main brush pattern, pull the handle back and turn it.

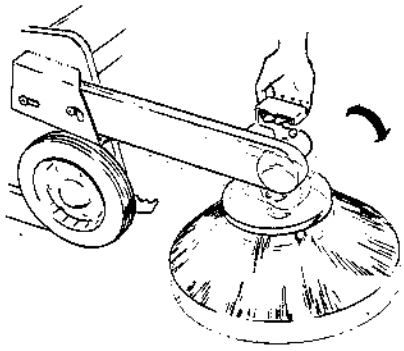
MASTER POWER SWITCH

The master power switch controls the machine motor. Flipping the switch toggle forward to the "on" position starts the machine motor. Flipping the switch toggle to the "off" position stops the machine motor. Do not leave the machine unattended while the machine motor is operating.

⚠ CAUTION: Always place the master power switch in the "off" position before leaving the machine unattended.

SIDE BRUSH ARM

The side brush arm controls the height and rotation of the side brush. Pulling up and back on the side brush arm to the "raised" position raises and stops the side brush. Pulling up, forward, and down to the "operating" position lowers and starts side brush rotation.



RAISING SIDE BRUSH 02335

DUST FILTER SHAKER HANDLE

The dust filter shaker handle, when in the "operating" position, is connected to a dust filter shaker. Cranking the handle shakes the dust filter clean of dust. Sixty to seventy complete revolutions of the handle are enough to shake the dust filter clean. The shaker handle is stored in a storage clip on the back of the filter box.

DUST FILTER SHAKER PUSH BUTTON

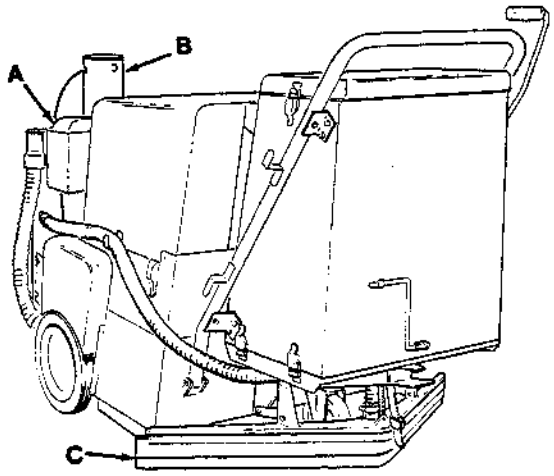
The dust filter shaker push button is present on all 42EHD machines. It controls an electric motor which is connected to a dust filter shaker. Pushing the push button operates the motor and shakes the dust filter free of dust. Holding the push button in for ten seconds is usually sufficient to clean the dust filters.

FUSES

Fuses are a one-time circuit protection device designed to stop the flow of current in the event of a circuit overload. Never substitute higher value fuses than those specified in this manual. Refer to Parts Section for fuse sizes and part numbers.

SCRUB ATTACHMENT

The scrub attachment gives the machine the added ability to scrub floors. The scrub attachment includes a 14.5 gal (55 L) solution tank, a 17.5 gal (66 L) recovery tank, a special side brush speed reducer, a side and rear squeegee, a debris tray, and an installation and storage cart.



02336

MACHINE EQUIPPED WITH SCRUB ATTACHMENT

A. Solution and Recovery Tanks
B. Vacuum Fan Motor
C. Rear Squeegee

The solution control valve handle operates a cable which controls a solution control valve. Pushing the handle forward into the "on" position opens the valve; pulling the handle backward into the "off" position closes the valve, stopping the solution flow.

MACHINE OPERATION

NORMAL SWEEPING OPERATION

1. Place the master power switch in the "on" position.
2. Drive the machine to the area to be cleaned.
3. Pick up oversize debris.
4. Place the main brush lift handle into the "restricted down" or "free-float" position, depending on the floor conditions, and the side brush arm into the "operating" position.
5. Sweep the area as required.

   Press the clutch handle to place the machine in motion. Release the clutch handle for easier turning. Try to arrange sweeping long, straight runs with a minimum of turning or stopping.

   Empty the debris hopper when it becomes full.
6. When finished sweeping, place the main brush lift handle and the side brush arm in the "raise" position and the master power switch in the "off" position.
7. Empty the debris hopper.
8. Check the brushes for tangled string or wire. Remove if found.
9. Check the batteries' state of charge. Charge if needed.

NORMAL SCRUBBING OPERATION

1. Perform the following pre-operation checks:
   - Solution control lever in "off" position.
   - Squeegee position control lever in "raise" position.
   - Recovery tank drain hose in elevated storage position.
2. Fill the solution tank with water and detergent.
3. Place the master power switch in the "on" position.
4. Drive the machine to the area to be cleaned.
5. Place the vacuum fan switch in the "on" position.
6. Place the rear squeegee lever in the "down" position.
7. Place the main brush lift handle in the "restricted down" or "free-float" position.
8. Place the side brush arm in the "operating" position.
9. Place the solution control level in the "on" position.
10. Scrub the area as needed.

    Adjust the machine speed and solution flow. Empty the debris tray and recovery tank and fill the solution tank as required.
11. When finished scrubbing, place the solution control lever in the "off" position, the rear squeegee lever in the "raise" position, and the vacuum fan switch in the "off" position. Place the main brush lift handle and side brush arm in the "raise" position and the master power switch in the "off" position.
12. At the end of the day, clean the squeegee, debris tray, hoses, and recovery tank.
13. Check the brushes for tangled string or wire, rear squeegees for wear or damage, and batteries for charging requirements.

MOUNTING SCRUB ATTACHMENT

1. Place the master power switch in the "off" position and disconnect the batteries-to-machine connector.

⚠ CAUTION: Always disconnect the batteries-to-machine connector before working on the machine to prevent creeping or shock.

2. Remove the debris hopper.
3. Swing the side brush arm out of the way.
4. Use the scrub attachment cart to roll the scrub tank assembly into place on the machine.
5. Flip the retainers over the studs on the sides of the scrub tank assembly. Adjust if necessary.
6. Connect the vacuum hose to the top of the tank.
7. Remove the hopper dust tray. Attach the rear squeegee assembly in its place.
8. Remove the sweeper side brush and gear box. Install the scrubbing side brush and gear box in their places.
9. Slide the side brush squeegee onto its mounting pins.
10. Using the thumbscrew provided, adjust the side brush squeegee so it deflects 0.25 to 0.50 in (5 to 15 mm) when in contact with the floor.
11. Replace the sweeping main brush with a scrubbing main brush.

12. Remove the filter box cover. Position the solution control lever bracket over the edge of the filter box. Reinstall the filter box cover to secure the control lever bracket.

13. Position the sweeper vacuum fan belt idler handle, located on the side of the vacuum fan intake housing, into the "disengaged" position. The sweeper vacuum fan should not operate when the scrub attachment is installed.

DEBRIS HOPPER

The machine debris hopper collects debris picked up by the main brush. The debris hopper should be emptied whenever it becomes full and after every work shift.

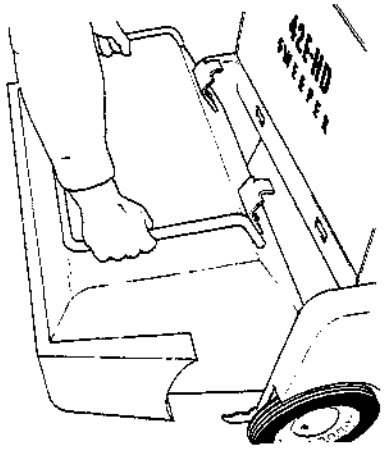
TO DUMP HOPPER

1. Place the master power switch in the "off" position.

⚠ CAUTION: Always place the master power switch in the "off" position before working on the machine to prevent creeping.

2. Grasp the hopper handles with both hands.
3. Swing the hopper up to dump the debris out of the hopper; then push the machine back away from the debris pile.

   Or, push down the front edge of the hopper to disengage the hopper hangers, lift the hopper out, and dump the debris into a dumpster.
4. Swing the hopper back into the "operating" position or replace the hopper in its hangers.



REMOVING DEBRIS HOPPER 02337

DUST FILTER

The dust filter filters the air drawn in by the vacuum fan. The dust filter should be shaken after every work shift. Dust shaken from the dust filters falls into a dust tray under the dust filter.

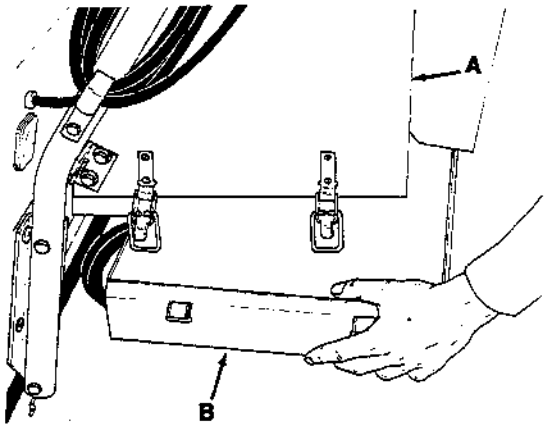
Empty the dust tray after every 20 hours of operation.

TO EMPTY DUST TRAY

1. Place the master power switch in the "off" position.

⚠ CAUTION: Always place the master power switch in the "off" position before working on the machine to prevent creeping.

2. Unlatch the four dust tray latches.
3. Lower and empty the dust tray.



REMOVING DUST TRAY 02338

A. Filter Box
B. Dust Tray

4. Inspect the dust tray seals on the filter box for damage. Replace seals if necessary.
5. Position the dust tray on the filter box.
6. Latch the four dust tray latches.

MACHINE STORAGE

STORING MACHINE

When storing the machine for extended periods of time, the following procedures must be followed to lessen the chance of rust, sludge, and other undesirable deposits from forming:

1. Place the main brush and side brush in the "raise" position.
2. Empty and clean the debris hopper.
3. Fully charge the batteries.
4. Disconnect the batteries-to-machine connector.
5. Empty and clean the solution supply system. Flush the supply hoses and control valve.
6. Empty and clean the solution recovery system. Flush the pickup hose.
7. Place the squeegee assembly in the "raised" position.

POWER SWEEPER - 42E/42EHD MM028 (3-84) LITHO IN U.S.A.

SECTION 3
MAINTENANCE

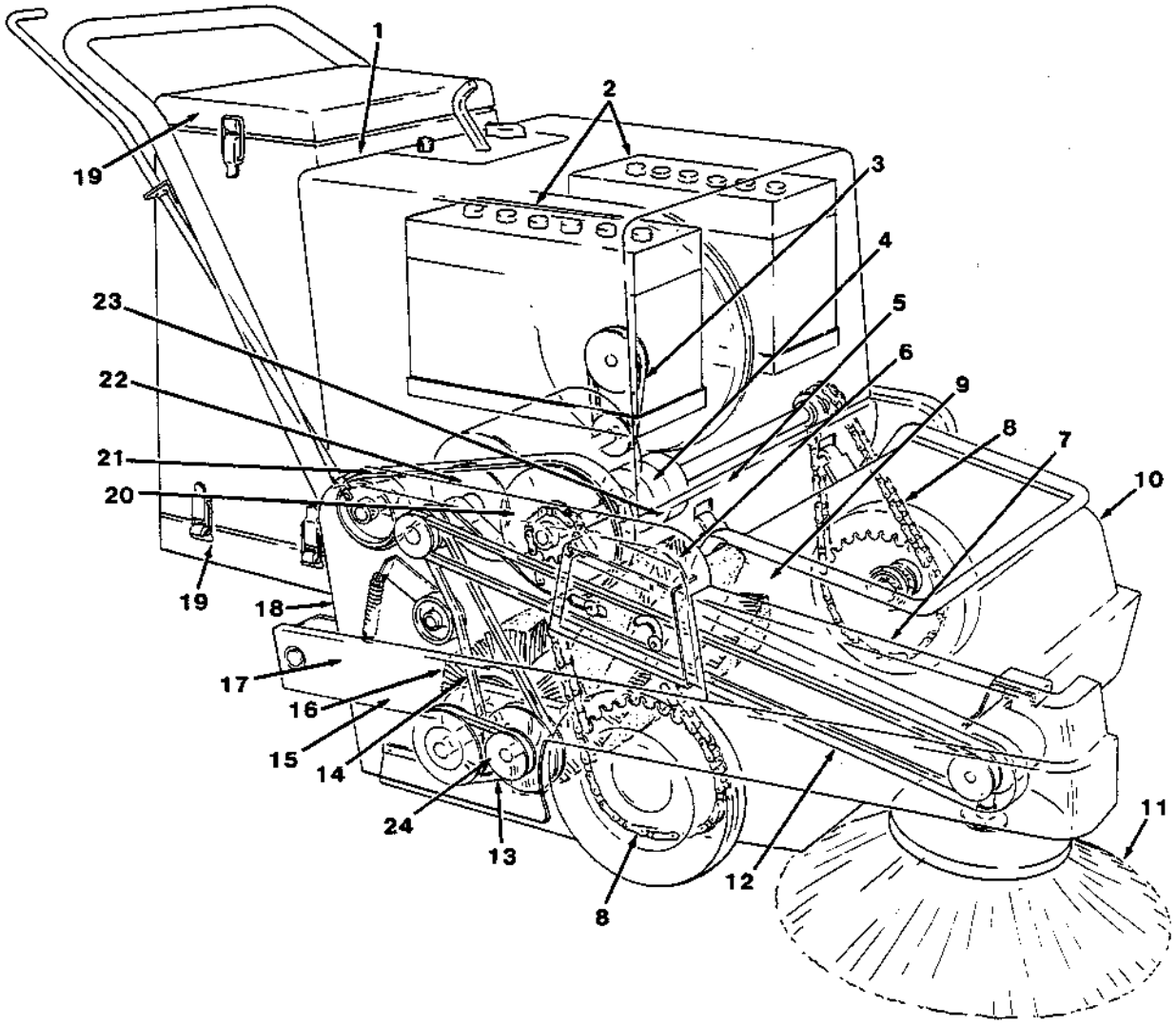
CONTENTS

RECOMMENDED FIRST 20-HOUR MACHINE INSPECTION

After the first 20 hours of operation, perform the following procedures:

1. Check the specific gravity of the batteries.
2. Check the battery cable connections.
3. Perform all other regularly scheduled maintenance.

MAINTENANCE CHART



MAINTENANCE LOCATIONS 02333

MAINTENANCE CHART

Interval	Key	Description	Procedure	Material/ Lubricant	No. of Service Points
Daily	2	Batteries	Check electrolyte level	-	2
	16	Main brush	Check for wear or damage	-	1
	11	Side brush	Check for wear or damage	-	1
	6	Filter intake screen	Inspect	-	1
	-	Scrub attachment solution recovery system	Clean and inspect	-	1
	18	Rear caster	Lubricate	MPGM	1
	2	Batteries	Check specific granity	-	2
	16	Main brush	Rotate end-for-end	-	1
	16	Main brush	Check adjustment	-	1
	11	Side brush	Check adjustment	-	1
	7	Hopper lip skirt	Check for wear or damage	-	1
	17	Rear brush skirt	Check for wear or damage	-	1
20 hours or weekly	23	Hopper top seal	Check for wear or damage	-	1
	9	Main brush compartment seals and skirts	Check for wear or damage	-	4
	19	Filter box seals	Inspect	-	2
	20	Flat belt pulley	Lubricate	MPGM	1
	24	Brush arm pivots	Lubricate	MPGM	2
	4	Differential	Lubricate	MPGM	1
80 hours or 4 weeks	2	Batteries	Clean battery tops	-	2
	21	Flat propelling belt	Check for wear or damage	-	1
	12	Side brush drive belt	Check for wear or damage	-	1
	13	Short main brush drive belt	Check for wear or damage	-	1
	14	Long main brush drive belt	Check for wear or damage	-	1
	3	Vacuum fan drive belt	Check for wear or damage	-	1
	1	Dust filter	Clean and inspect	-	1
	10	Debris hopper	Adjust floor clearance	-	1
	-	Scrub attachment solution supply system	Flush	-	1
160 hours or 8 weeks	5	Brush lift shaft	Lubricate	MPGM	3
	22	Clutch plate	Lubricate	EO	1
	8	Wheel drive chains	Lubricate	EO	2
	21	Flat propelling belt	Check tension	-	1
	12	Side brush drive belt	Check tension	-	1
	3	Vacuum fan drive belt	Check tension	-	1
	15	Static drag chain	Inspect	-	1
	8	Wheel drive chains	Check tension	-	2

MPGM - Multi-purpose, water-resistant, lithium base, moly-disulphide EP grease.
EO - Engine oil.

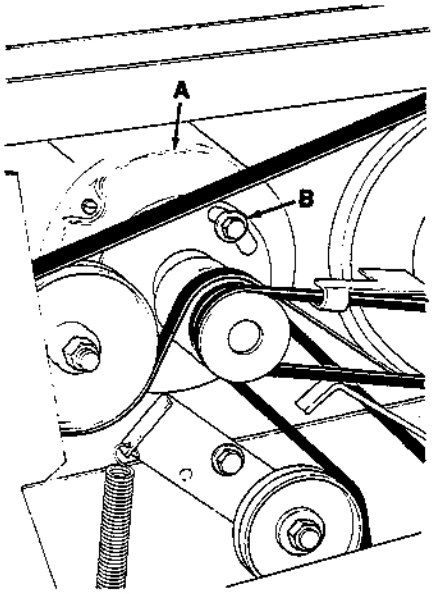
Note: More frequent intervals may be required in extremely dusty conditions.

BRUSH LIFT SHAFT

The brush lift shaft pivots on top of the machine frame. Three shaft pivot clamps keep the brush lift shaft in place. Lightly oil each of the shaft pivot clamps after every 160 hours of operation.

CLUTCH PLATE

The clutch plate pivots on the face of the electric motor. The contact surface between the motor and the clutch plate should be lightly oiled after every 160 hours of operation.



02339

CLUTCH PLATE

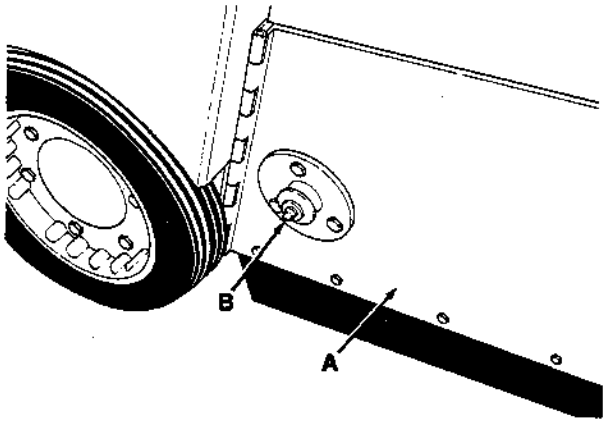
A. Electric Motor
B. Clutch Plate

FLAT BELT PULLEY

The flat belt pulley drives the machine differential. Apply a lithium base moly-disulphide EP grease to the grease fitting after every 80 hours of operation.

BRUSH ARM PIVOTS

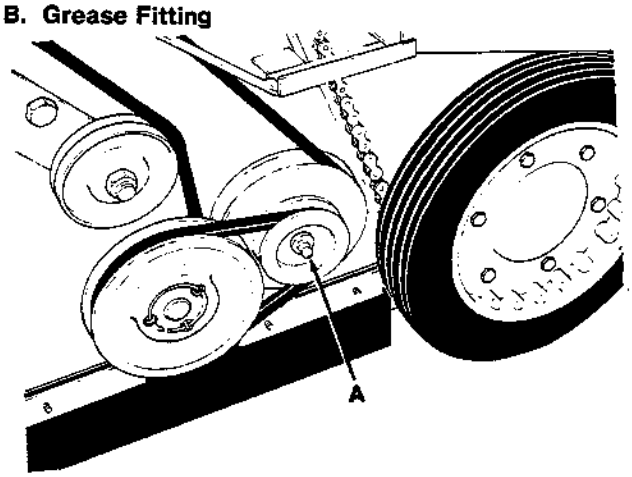
The brush arm pivots on a stub shaft on each side of the machine. Each of the stub shafts are fitted with a grease fitting. Apply a lithium base moly-disulphide EP grease to the grease fittings after every 80 hours of operation.



02340

RIGHT SIDE BRUSH ARM PIVOT GREASE FITTING

A. Main Brush Access Door
B. Grease Fitting



02341

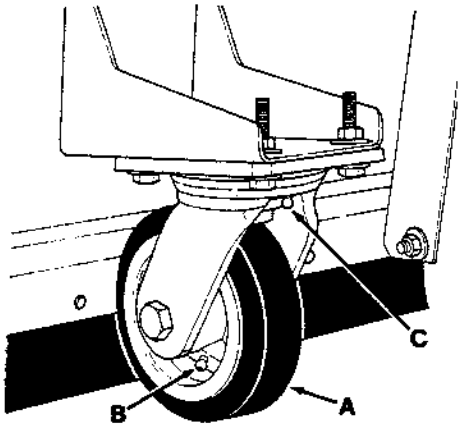
LEFT SIDE BRUSH ARM PIVOT GREASE FITTING

A. Grease Fitting

REAR CASTER

There is one rear caster which supports the weight of the rear of the machine. There are two grease fittings on the caster for lubrication purposes. One grease fitting is located on the swivel position of the caster. The other grease fitting, located on the hub portion of the caster, is for lubricating the caster axle.

Apply a lithium base moly-disulphide EP grease to each of the grease fittings after every 20 hours of operation. The caster axle is full when grease appears between the caster hub and the caster fork. The caster swivel is full when grease appears through the swivel o-ring.



REAR CASTER 02342

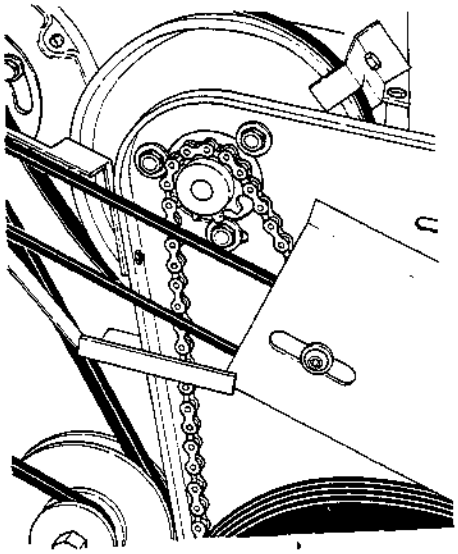
A. Rear Caster
B. Axle Grease Fitting
C. Swivel Grease Fitting

DIFFERENTIAL

The differential transfers power to both drive wheels. There is a grease fitting provided to lubricate the differential. Apply a lithium base moly-disulphide EP grease to the differential grease fitting after every 80 hours of operation.

WHEEL DRIVE CHAINS

There are two wheel drive chains, one on each side of the machine. Lubricate each of the chains with engine oil after every 160 hours of operation.



RIGHT SIDE WHEEL DRIVE CHAIN 02343

BATTERIES

The machine batteries provide all of the energy used by the machine. They require regular maintenance to keep them operating their best.

Do not allow batteries to remain in discharged condition for any length of time.

Do not operate machine if batteries are in poor condition or discharged beyond 80%, specific gravity below 1.120.

Check the battery cables daily for loose connections on the battery terminals. Inspect the cables for corrosion or damage.

Clean the top surface and the terminals of the batteries after every 80 hours of operation. Use a strong solution of baking soda and water. Brush the solution sparingly over the battery top, terminals, and cable clamps. Do not allow any baking soda solution to enter the battery. Use a wire brush to clean the terminal posts and the cable connectors. After cleaning, apply a coating of clear petroleum jelly to the terminals and the cable connectors. Keep the tops of the batteries clean and dry.

Keep all metallic objects off the top of the batteries, as they may cause a short circuit. Replace worn or damaged wires.

Check the electrolyte level daily in each battery cell. The electrolyte level must always be above the battery plates. Add distilled water to maintain solution at the correct level above the plates, but do not overfill. Never add acid to batteries, only water. Keep vent plugs firmly in place at all times, except when adding water or taking hydrometer readings.

⚠ WARNING: Avoid contact with battery acid. Battery acid can cause severe burns. Wash immediately and get medical attention if contact with battery acid occurs.

Use a hydrometer to check the electrolyte specific gravity after every 20 hours of operation.

If one or more battery cells tests lower than the other battery cells (0.050 or more), the cell is damaged, shorted, or is about to fail.

NOTE: Do not take readings immediately after adding water - if the water and acid are not thoroughly mixed, the readings may not be accurate. Check the hydrometer readings against this chart:

SPECIFIC GRAVITY AT 80°F (26.6°C)	BATTERY CONDITION
1.260 - 1.280	100% charged
1.230 - 1.250	75% charged
1.200 - 1.220	50% charged
1.170 - 1.190	25% charged
1.110 - 1.130	Discharged

NOTE: If the readings are taken when the battery electrolyte is any temperature other than 80°F (26.6°C), the reading must be temperature corrected.

To determine the corrected specific gravity reading when the temperature of the battery electrolyte is other than 80°F (26.6°C):

Add to the specific gravity reading 0.004, 4 points, for each 10°F (5.5°C) above 80°F (26.6°C).

Subtract from the specific gravity reading 0.004, 4 points, for each 10°F (5.5°C) below 80°F (26.6°C).

BATTERY CHARGING

The machine batteries are specially made for this machine application. They are unique in that they hold their power for long periods of time, but they can only be recharged a certain number of times. To get the most life from the batteries, charge them when 80% of the battery power has been used, so the battery specific gravity is between 1.190 and 1.170. A battery's life cycle is counted in total number of charge-discharge cycles. A partial discharge cycle counts almost as much as a full discharge cycle.

Do not expose the battery charger to water. Do not touch uninsulated battery terminals or unnecessarily expose any portion of your body to the batteries when making electrical connections.

TO CHARGE BATTERIES

1. Stop the machine on a flat, dry surface next to an electrical outlet and the battery charger, if it is not built-in.
2. Turn off the master power switch.

⚠ CAUTION: Always place the master power switch in the "off" position before working on the machine to prevent creeping.

3. Lift the battery cover into the "open" position.
4. Check the water level in the batteries. Before charging, add just enough distilled water to cover the plates. Then, after charging is completed, add enough water to bring the electrolyte up to the indicator mark. If the water level is topped off before charging, normal expansion of the electrolyte may cause an overflow, resulting in loss of acid balance and acid damage to the machine area around the batteries.

⚠ CAUTION: Do not attempt to charge defective or frozen batteries.

5. Plug the battery charger into its power source.

6. Turn the battery charger to the "start" position if required. The ammeter will indicate the charger is operating.
7. The batteries will be fully charged when the timer reads "off" or the battery specific gravity is 1.28 to 1.26.

NOTE: Some battery chargers may remain connected to the batteries for extended periods of time without harm to the charger or batteries. The charging rate should gradually taper down as the batteries are charged.

8. Disconnect the battery charger from its power source.
9. Check the electrolyte level of the batteries; it should be up to the indicator mark.

ACTIVATING DRY-TYPE BATTERIES

Some new batteries are supplied in a dry-type form. These batteries need to be activated by filling them with battery acid before they can be put into service.

TO ACTIVATE DRY-TYPE BATTERIES

1. Extinguish all cigarettes, fire, and spark producing equipment in the area.

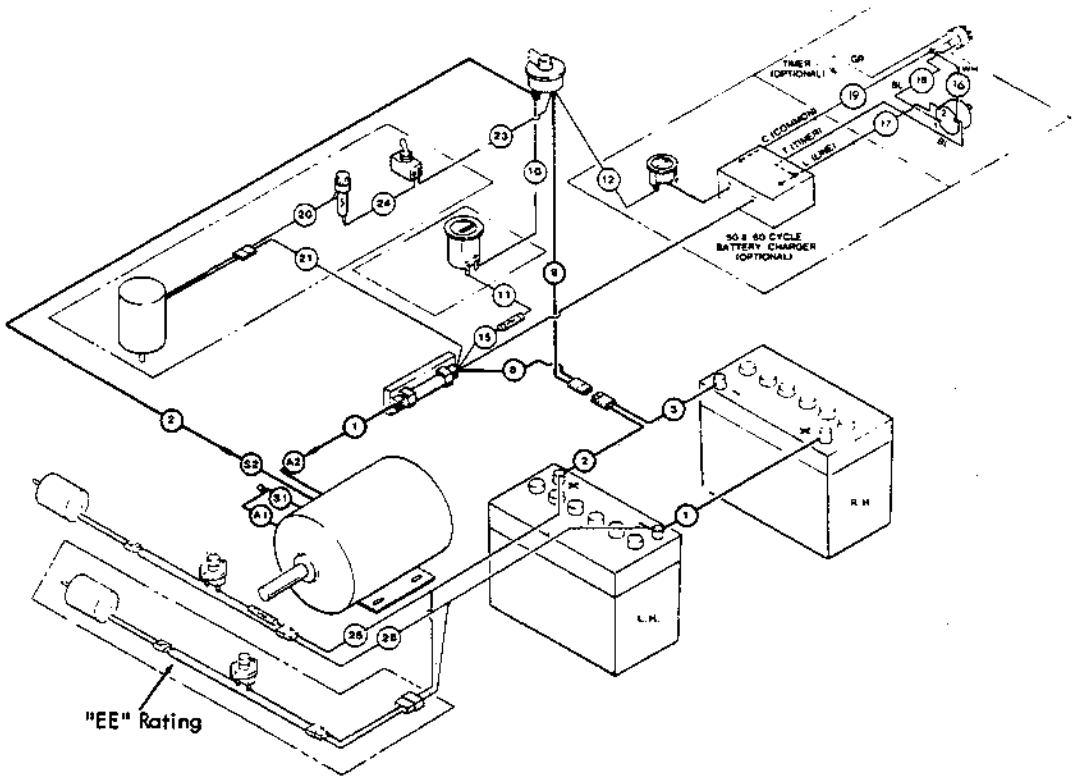
⚠ WARNING: Batteries emit a highly explosive gas that may be ignited by cigarettes, fire, or spark producing equipment.

2. Remove the batteries from the shipping crate or the machine and place on a level surface.
3. Remove and save the battery vent caps; or if they are equipped with ventless plugs, remove and discard the vent plugs.
4. Carefully fill each battery cell with battery grade sulfuric acid to 0.38 in (10 mm) above the battery plates.
5. Check the specific gravity of the batteries. Charge the batteries until the specific gravity is 1.28 to 1.26 temperature corrected.
6. Add battery acid if necessary to 0.38 in (10 mm) above the battery plates.
7. Insert battery vent caps in the vent holes.
8. Clean the battery posts and cables.
9. Install the batteries in machine.
10. Connect the battery cables to the battery posts.
11. Fill the batteries with water, if necessary, up to the electrolyte indicator rings. Do not add battery acid to the batteries after inserting the vent caps.

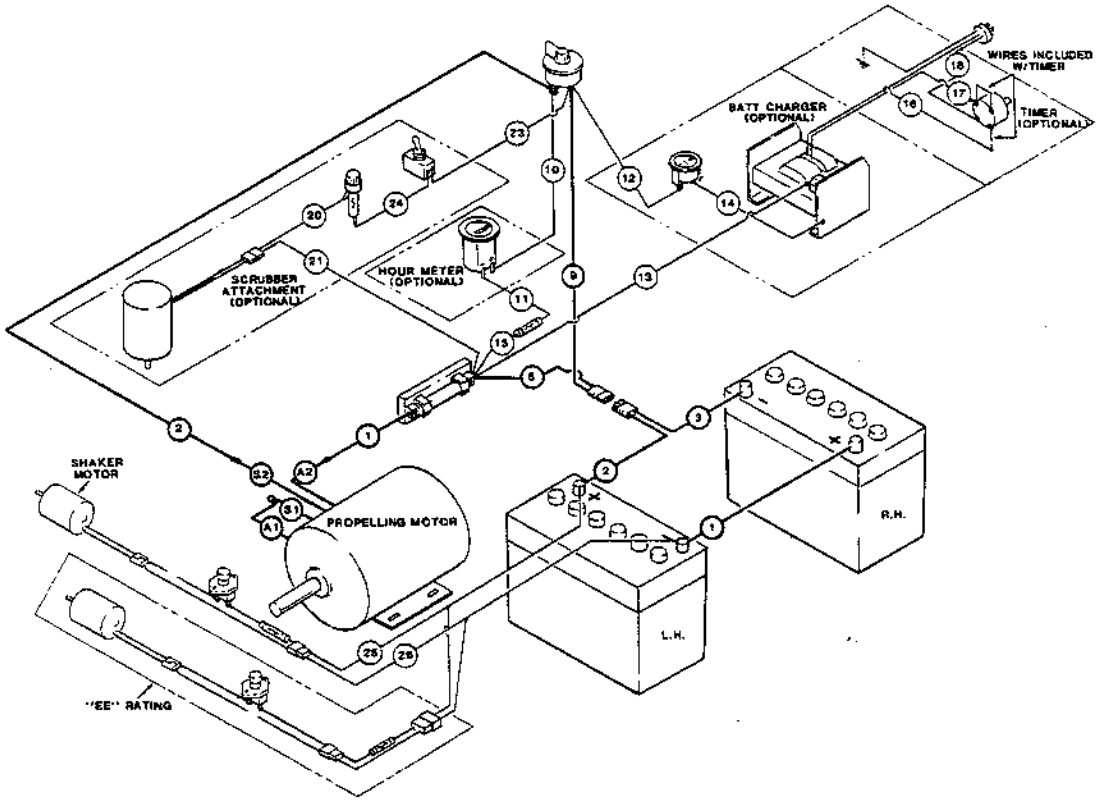
ELECTRIC MOTOR

The electric motor brushes should be inspected and the brush dust should be blown out of the motor after every 250 hours of operation. If the brushes have been worn to less than 0.38 in (10 mm) in length, they should be replaced.

If the commutator is worn or rough, the armature should be removed. The commutator should be turned in a lathe, the mica recut, and commutator polished. Reassemble, and seat the new brushes, using a brush seating stone. Be sure the rocker arm is set on the neutral mark.

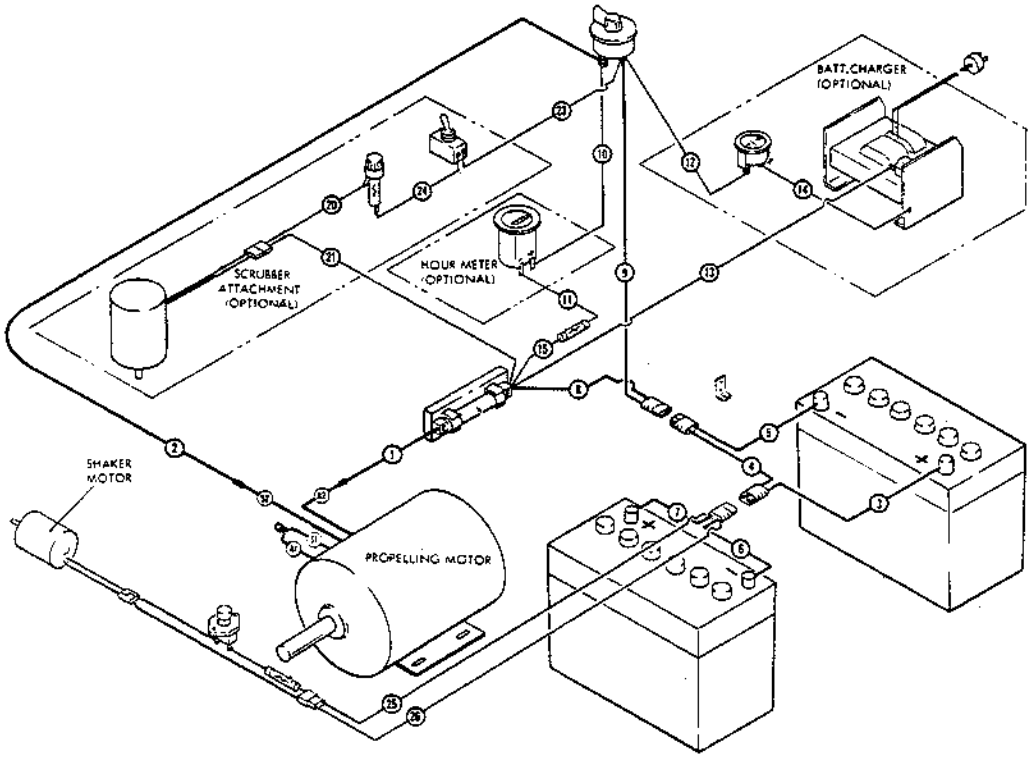


ELECTRICAL SYSTEM WITH MAC CHARGER



ELECTRICAL SYSTEM WITH ADC CHARGER

02344



ELECTRICAL SYSTEM WITH ADC CHARGER
(EARLY BATTERY CABLE DESIGN)

02344

FLAT PROPELLING BELT

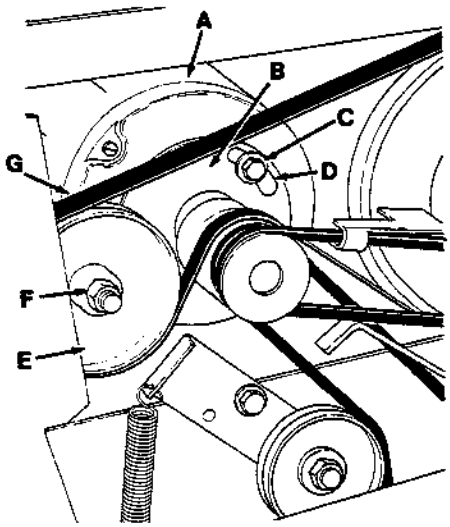
The flat propelling belt transfers power from the electric motor to the machine differential. Check the belt for wear or damage after every 80 hours of operation. Check the belt tension after every 160 hours of operation.

TO CHECK AND ADJUST FLAT PROPELLING BELT TENSION

1. Place the master power switch in the "off" position and disconnect the batteries-to-machine connector.

⚠ CAUTION: Always disconnect the batteries-to-machine connector before working on the machine to prevent creeping or shock.

2. Remove the battery cover.
3. Press the clutch handle to tighten the flat propelling belt.
4. Observe the position of the three clutch plate bolts. They should be approximately in the center of the slots. If the bolts are in the proper position, replace the battery cover; if not, continue with step 5 to readjust the belt tension.



CLUTCH PLATE BOLTS 02339

A. Electric Motor
B. Clutch Plate
C. Clutch Plate Bolt
D. Bolt Slot
E. Idler Sheave
F. Idler Sheave Bolt and Nut
G. Flat Propelling Belt

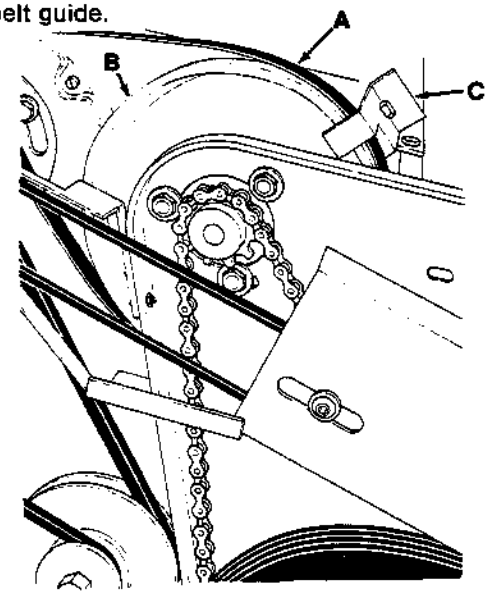
5. Remove the debris hopper and right side panel.
6. Loosen the idler sheave nut and slide the idler sheave to the rear to tighten the flat propelling belt; slide the sheave forward to loosen the flat propelling belt.
7. Tighten the idler sheave nut.
8. Press the clutch handle to tighten the flat propelling belt and recheck the position of the clutch plate bolts. Repeat as necessary to adjust belt tension.
9. Replace the right side panel, debris hopper, and battery cover.

TO REPLACE FLAT PROPELLING BELT

1. Place the master power switch in the "off" position and disconnect the batteries-to-machine connector.

⚠ CAUTION: Always disconnect the batteries-to-machine connector before working on the machine to prevent creeping or shock.

2. Remove the debris hopper and battery cover.
3. Remove the right side panel and flat propelling belt guide.



FLAT PROPELLING BELT GUIDE 02343

A. Flat Propelling Belt
B. Flat Belt Pulley
C. Belt Guide

4. Slip the flat propelling belt off the idler sheave.
5. Remove the differential coupling.

6. Slide the old belt out through the coupling opening.
7. Slide the new flat propelling belt through the coupling opening.
8. Reconnect the coupling to the differential shafts.
9. Slip the flat propelling belt over the idler sheave and motor sheave.
10. Adjust flat propelling belt as described in To Check and Adjust Flat Propelling Belt Tension.
11. Replace the flat propelling belt guide and the right side panel.
12. Replace the debris hopper and battery cover.

SIDE BRUSH DRIVE BELT

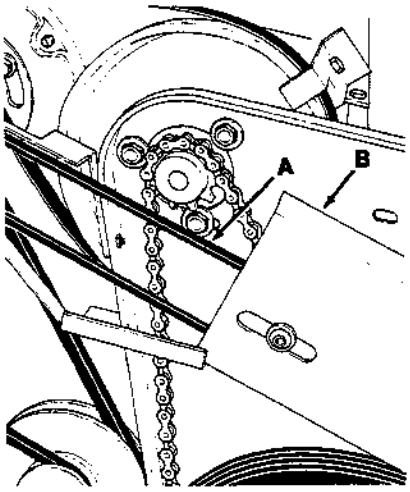
The side brush drive belt transfers power from the electric motor to the side brush gear reducer. Check the belt for wear or damage after every 80 hours of operation. Check the belt tension after every 160 hours of operation.

TO CHECK AND ADJUST SIDE BRUSH DRIVE BELT TENSION

1. Place the master power switch in the "off" position and disconnect the batteries-to-machine connector.

⚠ CAUTION: Always disconnect the batteries-to-machine connector before working on the machine to prevent creeping or shock.

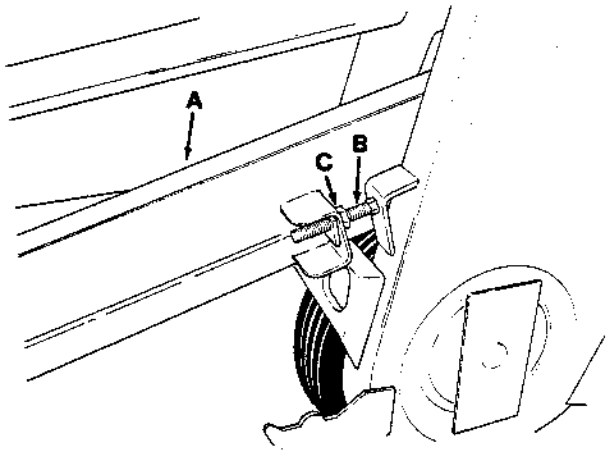
2. Remove the debris hopper and battery cover.
3. Remove the right side panel.
4. Place the side brush arm in the "operating" position.
5. Check the side brush belt tension at a point 9 in (229 mm) from the electric motor shaft. The belt should deflect 0.75 ± 0.06 in (20 ± 2 mm) from a force of 6 lb (3 kg).



SIDE BRUSH DRIVE BELT 02343

A. Side Brush Drive Belt
B. Belt Guard
C. Belt Adjusting Screw

6. To adjust belt tension, loosen the belt adjusting screw located on the side brush arm and the bolt lock nut located ahead of the right tire.



SIDE BRUSH BELT ADJUSTING BOLT 02345

A. Side Brush Arm
B. Adjusting Bolt
C. Lock Nut

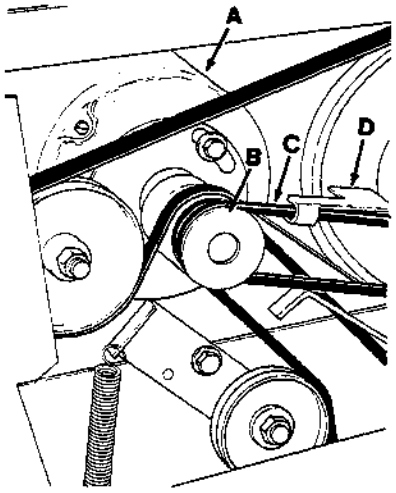
7. Tighten the adjusting bolt to tighten the belt tension. Loosen the adjusting bolt to loosen belt tension.
8. Tighten the adjusting bolt lock nut after the belt is tensioned properly.
9. Replace the right side panel.
10. Replace the debris hopper and battery cover.

TO REPLACE SIDE BRUSH DRIVE BELT

1. Place the master power switch in the "off" position and disconnect the batteries-to-machine connector.

⚠ CAUTION: Always disconnect the batteries-to-machine connector before working on the machine to prevent creeping or shock.

2. Remove the debris hopper and battery cover.
3. Remove the right side panel.
4. Place the side brush arm in the "raised" position.
5. Remove the four side brush speed reducer mounting bolts and the speed reducer from the side brush arm.
6. Slide the drive belt off the electric motor sheave and out of the machine.



SIDE BRUSH DRIVE BELT 02343

A. Electric Motor
B. Motor Sheave
C. Side Brush Drive Belt
D. Belt Guide

7. Position the new drive belt over the electric motor sheave, under the belt guide, and through the side brush arm.
8. Loop the side brush drive belt over the speed reducer sheave and bolt the speed reducer back onto the side brush arm.
9. Adjust the belt tension as described in "To Check and Adjust Side Brush Drive Belt Tension."
10. Replace the right side panel.
11. Replace the debris hopper and battery cover.

SHORT MAIN BRUSH DRIVE BELT

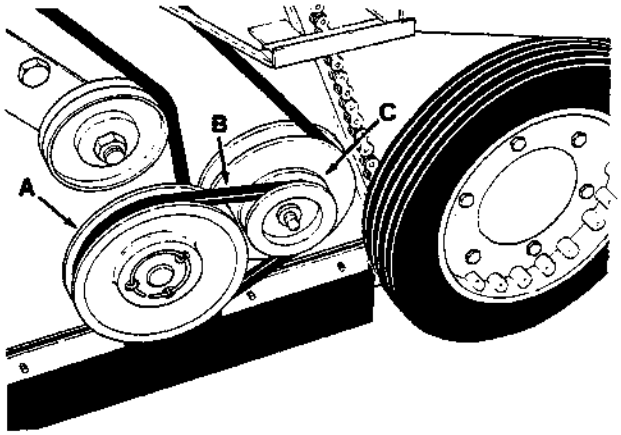
The short main brush drive belt transfers power from the main brush two-step sheave to the main brush. Check the belt for wear after every 80 hours of operation. A self-adjusting sheave is provided to control belt tension; it is not adjustable.

TO REPLACE SHORT MAIN BRUSH DRIVE BELT

1. Place the master power switch in the "off" position and disconnect the batteries-to-machine connector.

⚠ CAUTION: Always disconnect the batteries-to-machine connector before working on the machine to prevent creeping or shock.

2. Remove the debris hopper and battery cover.
3. Remove the right side panel.
4. Thread two 10-24 screws into the two threaded holes in the face of the self-adjusting sheave.



SHORT MAIN BRUSH DRIVE BELT 02340

A. Self-Adjusting Sheave
B. Short Main Brush Drive Belt
C. Two-Step Sheave

5. Evenly tighten the two screws to expand the self-adjusting sheave.
6. Slip the drive belt off the sheaves.
7. Slide the new drive belt over the sheaves.
8. Unthread the two screws.
9. Replace the right side panel.
10. Replace the battery cover and debris hopper.

LONG MAIN BRUSH DRIVE BELT

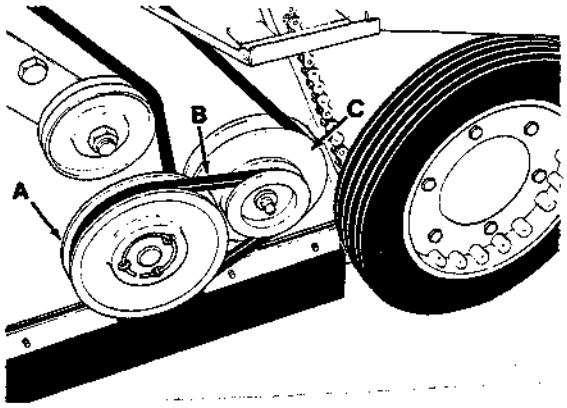
The long main brush drive belt transfers power from the electric motor to the main brush two-step sheave. Check the belt for wear after every 80 hours of operation. A belt idler is provided to control belt tension and is not adjustable.

TO REPLACE LONG MAIN BRUSH DRIVE BELT

1. Place the master power switch in the "off" position and disconnect the batteries-to-machine connector.

⚠ CAUTION: Always disconnect the batteries-to-machine connector before working on the machine to prevent creeping or shock.

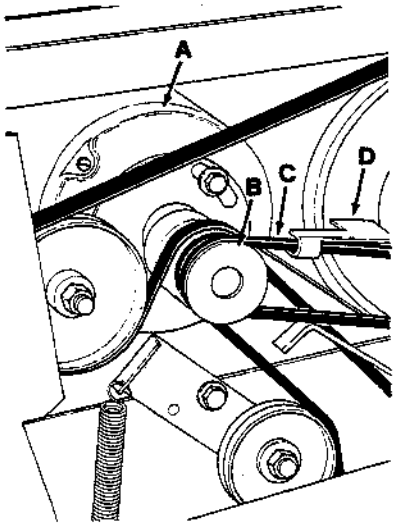
2. Remove the debris hopper and battery cover.
3. Remove the right side panel.
4. Thread two 10-24 screws into the two threaded holes in the face of the self-adjusting sheave.



SELF-ADJUSTING SHEAVE 02340

A. Self-Adjusting Sheave
B. Short Main Brush Drive Belt
C. Two-Step Sheave

5. Evenly tighten the two screws to expand the self-adjusting sheave.
6. Slip the short main brush drive belt off the sheaves.
7. Place the side brush arm in the "raised" position.
8. Remove the four side brush speed reducer mounting bolts and the speed reducer from the side brush arm.
9. Slide the side brush drive belt off the electric motor sheave.



SIDE BRUSH DRIVE BELT 02339

A. Electric Motor
B. Motor Sheave
C. Side Brush Drive Belt
D. Belt Guide

10. Disconnect the idler sheave spring.
11. Slide the long main brush drive belt out of the machine.
12. Position the new long main brush drive belt in the machine.
13. Reconnect the idler sheave spring.
14. Position the side brush drive belt over the electric motor sheave and under the belt guide.
15. Loop the side brush drive belt over the speed reducer sheave and bolt the speed reducer back onto the side brush arm.
16. Slide the short main brush drive belt over the self-adjusting sheave and the two-step sheave.
17. Unthread the two screws separating the self-adjusting sheave.
18. Adjust the belt tension as described in "To Check and Adjust Side Brush Drive Belt Tension."
19. Replace the right side panel.
20. Replace the debris hopper and battery cover.

VACUUM FAN DRIVE BELT

The vacuum fan drive belt transfers power from the electric motor to the vacuum fan impeller. Check the belt for wear after every 80 hours of operation. Check the belt tension after every 160 hours of operation. Machines prepped for scrubbing have a self-tensioning idler sheave.

TO CHECK AND ADJUST VACUUM FAN DRIVE BELT TENSION

1. Place the master power switch in the "off" position and disconnect the batteries-to-machine connector.

⚠ CAUTION: Always disconnect the batteries-to-machine connector before working on the machine to prevent creeping or shock.

2. Remove the debris hopper and battery cover.
3. Check belt deflection by applying a force of 6 lb (3 kg) to the midpoint of the belt span. The belt should deflect 0.06 ± 0.03 in (2 ± 1 mm).
4. To adjust belt tension, loosen the two fan outlet clamp bolts and the three fan support bolts. Slide the vacuum fan housing upward to tighten the drive belt. Push the housing downward to loosen the belt. Tighten all bolts loosened and recheck the drive belt tension.
5. Replace the battery cover and debris hopper.

TO REPLACE VACUUM FAN DRIVE BELT

1. Place the master power switch in the "off" position and disconnect the batteries-to-machine connector.

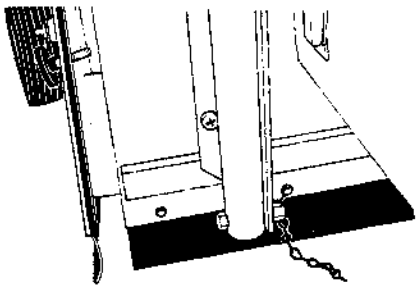
⚠ CAUTION: Always disconnect the batteries-to-machine connector before working on the machine to prevent creeping or shock.

2. Remove the debris hopper and battery cover.
3. Loosen the two fan outlet clamp bolts and three fan support bolts.
4. Push the fan housing downward to loosen the belt tension.
5. Slide the drive belt off the sheaves.
6. Position the new drive belt on the electric motor sheave and the vacuum fan sheave.
7. Slide the vacuum fan housing upward to snug the drive belt into place.
8. Adjust drive belt tension as described in "To Check and Adjust Vacuum Fan Drive Belt Tension."
9. Replace the battery cover and debris hopper.

STATIC DRAG CHAIN

A static drag chain is provided to prevent the buildup of static electricity in the machine. The chain is attached to the machine by a rear brush skirt mounting bolt.

Check the chain for wear after every 160 hours of operation. Make sure it is making contact with the floor at all times.

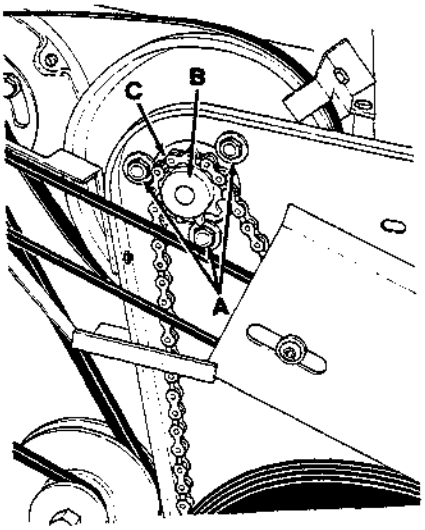


STATIC DRAG CHAIN 02346

WHEEL DRIVE CHAINS

The two wheel drive chains transfer power from the differential to the drive wheels. Lubricate the chains with engine oil after every 160 hours of operation.

Check the chains for wear or damage and tension after every 160 hours of operation. The wheel drive chains should have 1 in (25 mm) slack measured midway between the sprockets.



WHEEL DRIVE CHAIN 02343

A. Adjustment Nut
B. Sprocket
C. Chain

BRUSHES

MAIN BRUSH

The main brush is the basic cleaning tool. It projects debris into the debris hopper. Inspect the main brush daily for wear or damage. Remove any string or wire found tangled on the main brush, the main brush drive hub, or the main brush idler hub.

Rotate the main brush end-for-end after every 20 hours of operation to obtain maximum brush life.

The main brush should be replaced when the remaining bristle measures 0.5 in (15 mm).

TO REMOVE MAIN BRUSH

1. Place the master power switch in the "off" position and disconnect the batteries-to-machine connector.

⚠ CAUTION: Always disconnect the batteries-to-machine connector before working on the machine to prevent creeping or shock.

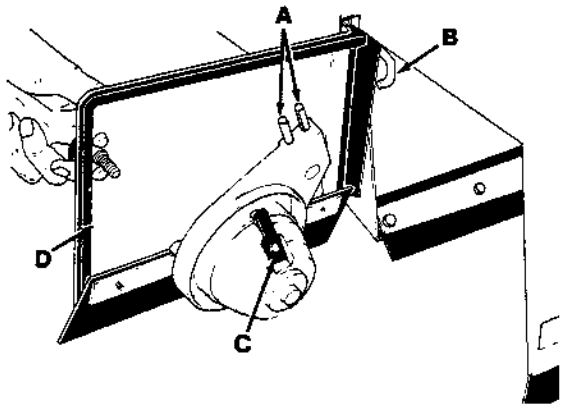
2. Remove the debris hopper.
3. Place the main brush lift handle in the "free float" position.
4. Open the main brush access door.
5. Pull the main brush out of the brush compartment.

TO INSTALL MAIN BRUSH

1. Slide the main brush through the main brush access door into the brush compartment.
2. Rotate the main brush until the slots in the main brush core engage the keys on the main brush drive hub.

NOTE: Do not force the main brush onto the drive hub. When the main brush slots and drive hub keys are properly aligned, the main brush will easily engage the drive hub.

3. Close and secure the main brush access door, making sure the lift arm engages the idler arm lift pins.



CLOSING MAIN BRUSH ACCESS DOOR 02347

A. Lift Arm Pin
B. Lift Arm
C. Idler Key
D. Access Door

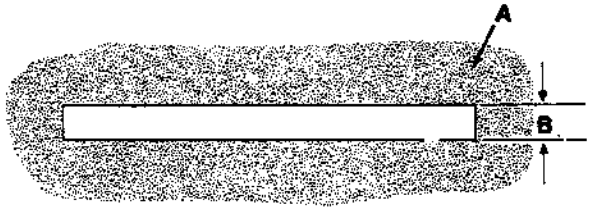
4. Check and adjust main brush pattern as described in "Main Brush Pattern Adjustment."

MAIN BRUSH PATTERN ADJUSTMENT

The main brush pattern should be checked after every 20 hours of operation. The main brush pattern should be 1.5 in (38 mm) wide. Main brush pattern adjustments are made by turning the main brush lift handle.

TO CHECK AND ADJUST MAIN BRUSH PATTERN

1. Place the master power switch in the "on" position.
2. Place the main brush lift handle in the "restricted down" position to lower the main brush to the floor for one minute, while holding the machine in place.
3. Place the main brush lift handle in the "raise" position.
4. Move the machine from the main brush polish mark.
5. Place the master power switch in the "off" position.
6. Observe the width of the polish mark. The proper polish width is 1.5 in (40 mm).



MAIN BRUSH PATTERN 00582

A. Main Brush Pattern
B. Polish Width

If the polish width is too narrow, turn the main brush lift handle counterclockwise.

If the polish width is too wide, turn the main brush lift handle clockwise.

If any adjustments are made, recheck the main brush pattern before continuing sweeping with the machine.

SIDE BRUSH

The side brush deflects debris into the path of the main brush. The side brush should be inspected daily for wear or damage.

Remove any string or wire found tangled on the side brush, side brush drive hub, or shaft.

The side brush should be replaced when the remaining bristle length measures 1 in (25 mm) in length.

TO REMOVE SIDE BRUSH

1. Place the master power switch in the "off" position and disconnect the batteries-to-machine connector.

⚠ CAUTION: Always disconnect the batteries-to-machine connector before working on the machine to prevent creeping or shock.

2. Pull the side brush arm up and back to raise the side brush.
3. Remove the side brush retaining bolt.
4. Slide the side brush off the side brush drive shaft.

TO INSTALL SIDE BRUSH

1. Slide the side brush onto the side brush drive shaft.
2. Thread the side brush retaining bolt through the side brush and the side brush drive shaft.
3. Tighten the retaining bolt.
4. Check the side brush adjustment as described in Side Brush Pattern Adjustment.

SIDE BRUSH PATTERN ADJUSTMENT

The side brush adjustment should be checked after every 20 hours of operation. The side brush is properly adjusted when, with the side brush arm in the "raised" position, there is approximately 1 in (25 mm) of space between the floor and the side brush bristles.

Side brush adjustments are made by mounting the side brush in a different one of the five mounting holes in the side brush drive shaft.

TO ADJUST SIDE BRUSH

1. Place the master power switch in the "off" position and disconnect the batteries-to-machine connector.

⚠ CAUTION: Always disconnect the batteries-to-machine connector before working on the machine to prevent creeping or shock.

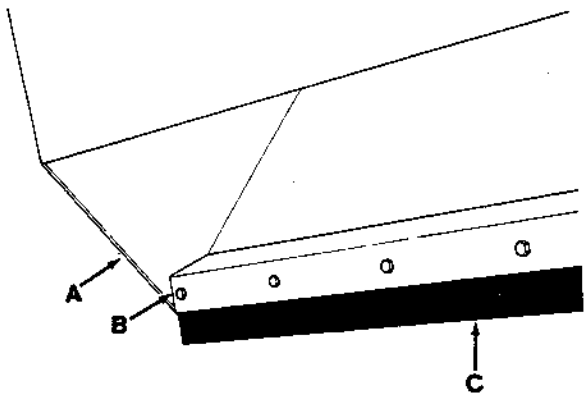
2. Pull the side brush arm up and back to place the side brush in the "raised" position.
3. Remove the side brush retaining bolt.
4. Slide the side brush up or down on the shaft until there is approximately 1 in (25 mm) of space between the floor and the side bristles.
5. Line up the side brush and drive shaft holes to allow the side brush to be nearest to the specified dimension.
6. Secure the side brush to the drive shaft with the retaining bolt.

NOTE: It may be necessary to readjust the side brush drive belt tension after adjusting the side brush height.

SKIRTS AND SEALS

HOPPER LIP SKIRT

The hopper lip skirt is located on the lower rear of the hopper. It floats over debris and helps deflect that debris into the hopper. The hopper lip skirt should be inspected for wear or damage after every 20 hours of operation.

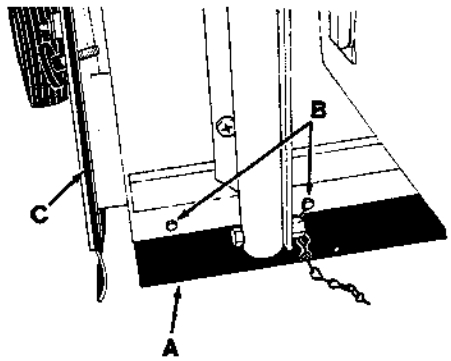


HOPPER LIP SKIRT 02348

A. Hopper
B. Retaining Strip
C. Hopper Lip Skirt

REAR BRUSH SKIRT

The rear brush skirt is located on the bottom rear of the brush compartment. This skirt seals the rear of the brush compartment . The rear brush skirt has slotted mounting holes and should be adjusted to clear the floor by 0.06 in (2 mm). Inspect the skirt for wear or damage and proper floor clearance after every 20 hours of operation.

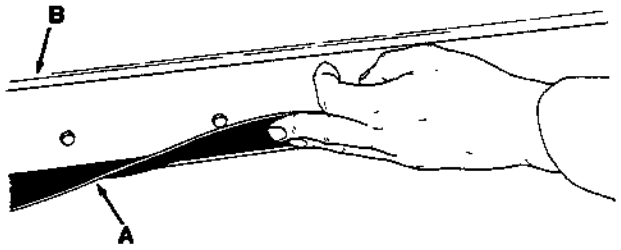


REAR BRUSH SKIRT 02346

A. Rear Brush Skirt
B. Retaining Bolt
C. Main Brush Access Door

HOPPER TOP SEAL

The hopper top seal is located on the front edge of the machine frame. The seal seals the area between the top of the hopper and the brush compartment. Inspect the seal for wear or damage after every 20 hours of operation.

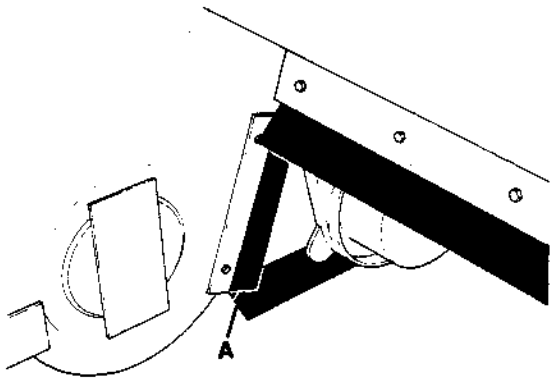


HOPPER TOP SEAL 02349

A. Seal
B. Frame

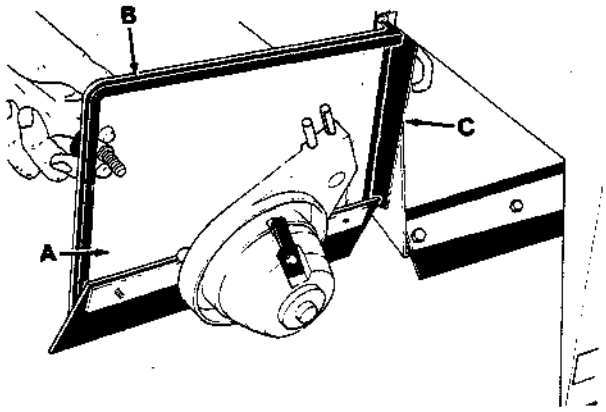
MAIN BRUSH COMPARTMENT SEALS

There are three main brush compartment seals which seal the sides of the hopper and the main brush access door. Inspect the seals for wear or damage after every 20 hours of operation.



RIGHT SIDE HOPPER SEAL 02350

A. Hopper Seal



LEFT SIDE HOPPER SEAL AND MAIN BRUSH ACCESS DOOR SEAL 02347

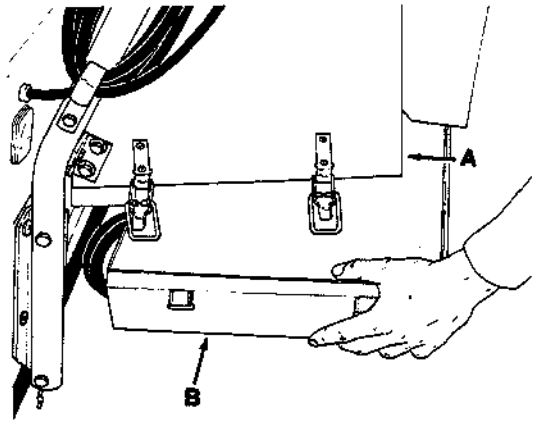
A. Access Door
B. Access Door Seal
C. Left Side Hopper Seal

MAIN BRUSH COMPARTMENT SKIRTS

There are two main brush compartment skirts which seal the lower sides of the brush compartment. The right side seal is mounted to the machine frame. The left side seal is mounted to the main brush access door. The skirts have slotted mounting holes and should be adjusted to clear the floor by 0.06 in (2 mm). Inspect the skirts for wear or damage after every 20 hours of operation.

FILTER BOX SEALS

There are two sets of seals on the filter box; the dust filter cover seals and the dust tray seals. The dust filter cover seals seal the filter and filter cover to the filter box. The dust tray seals seal the dust tray to the filter box. Inspect the seals after every 20 hours of operation.



REMOVING DUST TRAY 02338

A. Filter Box
B. Dust Tray

DUST FILTER SYSTEM

DUST FILTER

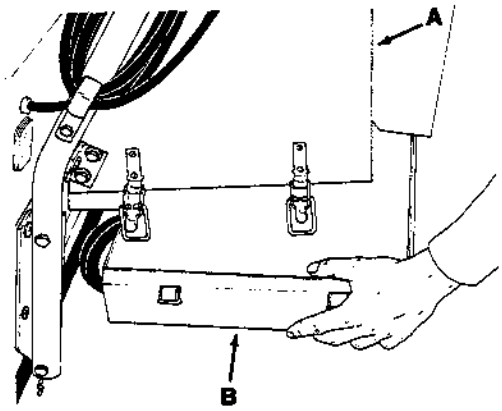
The dust filter filters the air drawn in by the vacuum fan. The dust filter should be shaken after every work shift. Clean and inspect the dust filter after every 80 hours of operation. Clean and inspect the dust filter more often if operating in extremely dusty conditions.

TO CLEAN AND INSPECT DUST FILTER

1. Place the master power switch in the "off" position and disconnect the batteries-to-machine connector.

⚠ CAUTION: Always disconnect the batteries-to-machine connector before working on the machine to prevent creeping or shock.

2. Shake the filter bag.
3. Unlatch and remove the dust tray from the filter box.



REMOVING DUST TRAY 02338

A. Filter Box
B. Dust Tray

4. Empty and clean the dust tray.
5. Inspect the dust tray seals for damage.
6. Unlatch and remove the filter cover.
7. Lift the filter bag out of the machine.
8. Thoroughly clean the filter bag with compressed air.
9. Inspect the filter bag for holes or other damage. Replace if required.
10. Carefully lower the filter bag into the filter box, making sure a weight rod is in the bottom of each filter envelope, that there are filter bag separators separating the filter envelopes, and that the filter bag rack is properly in place on the filter box.
11. Replace and latch the filter cover and dust tray onto the filter box.

FILTER INTAKE SCREEN

The filter intake screen helps prevent light litter from being drawn into the vacuum fan. Inspect the filter intake screen for jammed debris after every work shift.

DEBRIS HOPPER

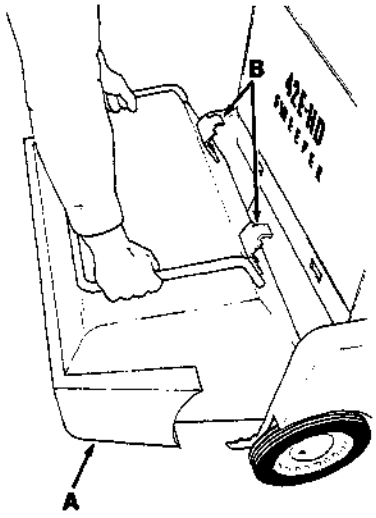
The debris hopper should be emptied after every work shift. The debris hopper floor clearance should be checked after every 80 hours of operation.

TO CHECK AND ADJUST HOPPER FLOOR CLEARANCE

1. Place the master power switch in the "off" position and disconnect the batteries-to-machine connector.

⚠ CAUTION: Always disconnect the batteries-to-machine connector before working on the machine to prevent creeping or shock.

2. Park the machine on a smooth, level surface.
3. Empty the debris hopper and replace it on the machine.
4. The bottom rear metal edge of the hopper should clear the floor by 0.38 to 0.5 in (10 to 15 mm). Also, be sure the hopper is level side to side.
5. To adjust the hopper on Model 42E machines, thread the hopper hanger hook in to raise the hopper or out to lower the hopper. To adjust the hopper on Model 42EHD machines, loosen the hanger bracket bolts, reposition the hanger bracket, and retighten the hanger bracket bolts.



HOPPER HANGER BRACKET 02337

A. Hopper
B. Hanger Bracket

SCRUB ATTACHMENT

SOLUTION SUPPLY SYSTEM

The solution supply system consists of the solution tank, the solution supply hoses, and the control valve. Under normal operating conditions, the solution tank, supply hoses, and control valve should be flushed clean after every 80 hours of operation.

TO CLEAN SOLUTION SUPPLY SYSTEM

1. Stop the machine next to a floor drain.
2. Place the master power switch in the "off" position and disconnect the batteries-to-machine connector.

⚠ CAUTION: Always disconnect the batteries-to-machine connector before working on the machine to prevent creeping or shock.

3. Place the solution control valve handle in the "open" position.
4. Open the solution tank cover and flush the solution tank with clean water. The clean water from the tank will then flush the control valve and solution supply hoses.
5. Check the solution distribution tube holes for obstruction.
6. Place the solution control valve handle in the "closed" position.
8. Close the solution tank cover.

SOLUTION RECOVERY SYSTEM

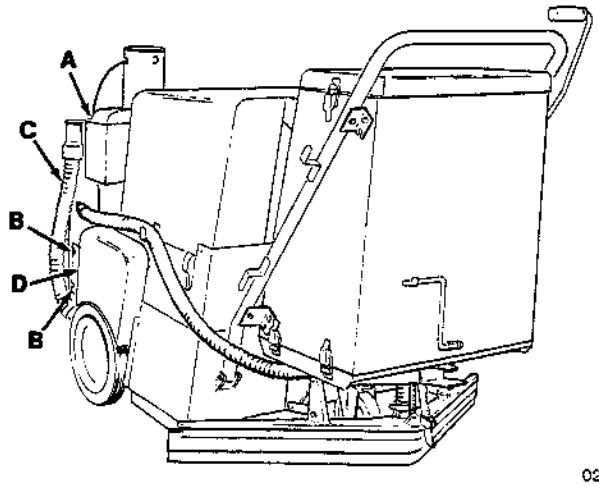
The solution recovery system consists of the recovery tank, the vacuum fan, debris tray, the hose, and the side and rear squeegee assembly. Under normal operating conditions, the solution recovery system should be cleaned after every work shift.

TO CLEAN SOLUTION RECOVERY SYSTEM

1. Stop the machine near a floor drain.
2. Place the master power switch in the "off" position and disconnect the batteries-to-machine connector.

⚠ CAUTION: Always disconnect the batteries-to-machine connector before working on the machine to prevent creeping or shock.

3. Remove the recovery tank drain hose from its retaining tab. Slowly lower the drain hose to the floor drain to drain the recovery tank.



02336

RECOVERY TANK DRAIN HOSE AND CLEAN-OUT DOOR
A. Recovery Tank
B. Wing Nut
C. Drain Hose
D. Clean-Out Door

4. Unthread the two cleanout door wing nuts and remove the clean-out door.
5. Hose out the interior of the recovery tank.
6. Replace the clean-out door and drain hose. Tighten the clean-out door wing nuts.
7. Pull the rear squeegee suction hose off the recovery tank coupling and backflush it with a stream of water from a garden hose.
8. Reconnect the rear squeegee suction hose to the recovery tank coupling.
9. Empty and clean the debris tray.

SIDE SQUEEGEE

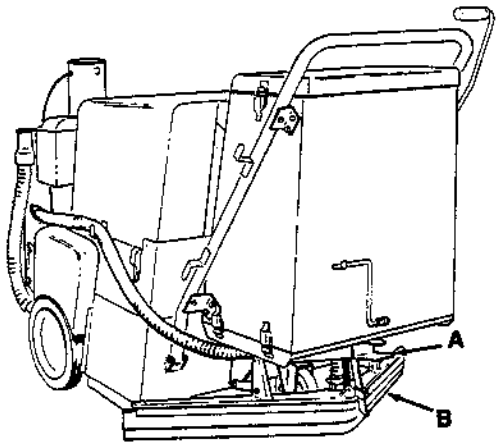
The side squeegee channels water from the side scrub brush into the path of the main brush. Check the side squeegee for wear or damage daily.

The side squeegee may be adjusted higher or lower with the thumb screw provided.

REAR SQUEEGEE

The rear squeegee channels water into the center of the squeegee frame so the water may be picked up by the machine vacuum. The rear squeegee does not require up or down adjustment. It relies on its own weight and a spring to exert correct down pressure on the blade. However, there are provisions for leveling the squeegee from front to rear.

To adjust rear squeegee, park the machine on a smooth, level surface. Loosen the two lift pedal-to-frame bolts. Lower the rear squeegee and propel the machine forward 24 in (610 mm) to allow the squeegee to level itself. Then tighten the bolts loosened earlier.



REAR SQUEEGEE 02336

A. Lift Pedal
B. Squeegee

SECTION 4
APPENDIX

CONTENTS

HARDWARE INFORMATION

The following charts state standard plated hardware tightening ranges for normal assembly applications. Decrease the specified torque by 20% when using a thread lubricant. Do not substitute lower grade hardware for higher grade hardware. If higher grade hardware than specified is substituted, tighten only to the specified hardware torque value to avoid damaging the threads of the part being threaded into, as when threading into speed nuts or weldments.

STANDARD BOLT TORQUE CHART

Thread Size	SAE Grade 2 Torque ft lb (Nm)	SAE Grade 5 Torque ft lb (Nm)	SAE Grade 8 Torque ft lb (Nm)
0.25 in	5-6 (7-8)	7-10 (9-14)	10-13 (14-18)
0.31 in	9-12 (12-16)	15-20 (20-27)	20-26 (27-35)
0.38 in	16-21 (22-28)	27-35 (37-47)	36-47 (49-64)
0.44 in	26-34 (35-46)	43-56 (58-76)	53-75 (72-103)
0.50 in	39-51 (53-69)	65-85 (88-115)	89-116 (121-157)
0.62 in	80-104 (108-141)	130-170 (176-231)	117-265 (159-359)
0.75 in	129-168 (175-228)	215-280 (291-380)	313-407 (424-552)
1.00 in	258-335 (350-454)	500-650 (678-881)	757-984 (1026-1334)

NOTE: Decrease torque by 20% when using a thread lubricant.

METRIC BOLT TORQUE CHART

Thread Size	Class 8.8 Torque ft lb (Nm)	Class 10.9 Torque ft lb (Nm)	Class 12.9 Torque ft lb (Nm)
M4	2 (3)	3 (5)	4 (6)
M5	4 (7)	6 (9)	7 (11)
M6	7 (11)	10 (16)	11 (19)
M8	18 (27)	25 (36)	29 (45)
M10	32 (53)	47 (74)	58 (87)
M12	58 (91)	83 (128)	100 (154)
M14	94 (145)	133 (204)	159 (244)
M16	144 (222)	196 (313)	235 (375)
M20	260 (434)	336 (610)	440 (732)
M24	470 (750)	664 (1050)	794 (1270)

NOTE: Decrease torque by 20% when using a thread lubricant.

BOLT IDENTIFICATION

Identification Grade Marking	Specification and Grade
	SAE-Grade 5
	SAE-Grade 8
	ISO-Grade 8.8
	ISO-Grade 12.9

01395

POWER SWEEPER - 42E/42EHD MM028 (3-84) LITHO IN U.S.A.