



OWNER'S MANUAL

MD-12B FleetPlow™ FOR Buses



For your records, please record your serial number, found on the left hand, outside panel:

MD-12B FleetPlow Serial Number:

WARNING: Failure to read and comply with the contents of this manual can result in serious bodily injury or death, and/or property damage.

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North American Warranty

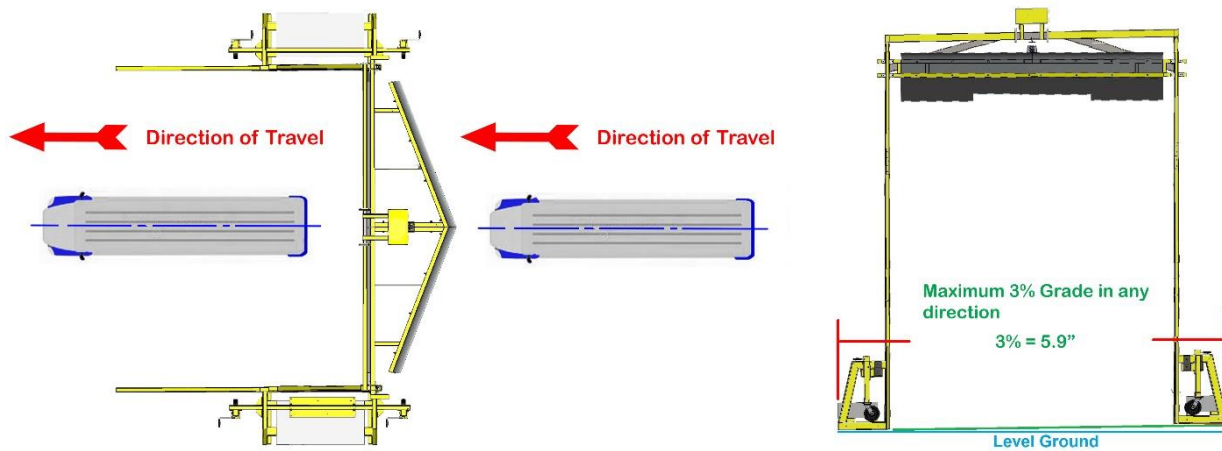
Scraper Systems Medium-Duty FleetPlows™ are warranted, from the date of shipment, to be free from defects in material and workmanship for a period of one (1) year on all mechanical and electrical parts. Further, Scraper Systems warrants one (1) year for labor, based on approved travel and labor repair times, only in the event that the Medium-Duty FleetPlow was installed by certified dealer installers or by factory installers, with training on the safe and proper operation provided by same. Medium-Duty FleetPlows must be used in accordance with manufacturer's recommendations and must not have been subject to abuse, lack of maintenance, misuse, negligence, or unauthorized repairs or alterations.

WARNING: FleetPlows are designed for safe and effective snow clearing in controlled commercial applications. Care must be taken by all personnel in the vicinity to uphold common sense safety practices and operate the machine only as described and instructed in this Owner's Manual. Failure to do so may result in damage to this or other equipment and/or personal injury or death.

Key Tips for Optimal FleetPlow™ Performance

1. **CENTER THE VEHICLE** by aligning vehicle with the V-point of the plow.
2. **LOWER PLOW** so the shorter brushes are lightly contacting the vehicle's roof.
3. **MINIMIZE WIRE CABLE SLACK** when positioning plow on the roof.
4. **STEADILY ACCELERATE** while exiting the FleetPlow, clearing snow from the roof.
5. **REMOVE GROUND SNOW**, as necessary. Avoid snow build-up beneath the FleetPlow.

Positioning the MD-12B FleetPLOW for Operation and Other Important Information



Entry and Exit Distances: Be sure your FleetPLOW is positioned at a yard location that allows your vehicles to enter and exit while maintaining a straight direction of travel, no turning until clear of the FleetPLOW.

Slope of FleetPLOW Areas: Do not operate, roll, or store the FleetPLOW on slopes greater than 3%, (*6" over the width of the FleetPLOW*).

Areas of Operation: The area of operation should be cleared of packed snow and ice prior to positioning your FleetPLOW for operation.

Full Up Position: The MD-12B plow is in the full up position when the top of the plow frame is just against the underside of the plow guide tracks. (See Image #1 below)

Excessive Slack: Can occur if the operator holds the down button too long after setting the plow on the vehicle roof. This can loosen the wire rope to a point where it may bird-nest on the spool of the hoist and tangle, causing the hoist to malfunction. Proper MD-12B slack is achieved once the first three rows of shorter 10" brushes are lightly contacting the vehicle's roof.

Water Resistant Pendant: Supplied pendant is water resistant but should be disconnected and store indoors when not in use.

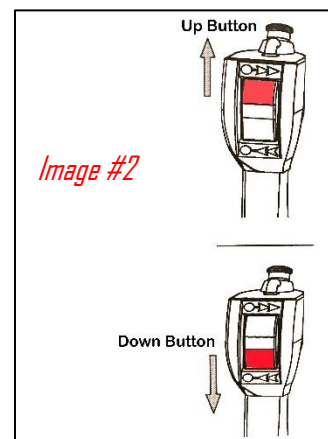
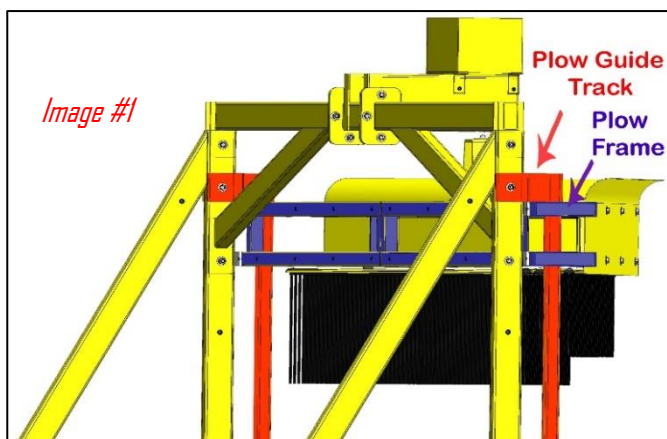
2-Button Pendant Operation: The pendant's button is a toggle type switch and requires the button to be release when raising or lowering the plow to stop the movement, (See Image #2 below)

Hoist Capacity: 800 lbs. **Power Source:** Group 27, 12 Volt Deep Cycle Battery; Lead Acid Type, Wet

Snow Depth Capacity: Up to 12" of snow; deeper amounts may require a second pass.

Storage When Not In Use: Store the unit out of the way of your normal traffic patterns, plow in the full up position, tow bars attached, and jacks completely raised off the ground.

Accu-Track System: Our Patented Accu-Track System is designed to self-level the plow on top of your vehicle's roof allowing for complete clearing of snow and ice across the entire width and length of your vehicle's roof even with variable ground conditions.



Operating Information (continued)

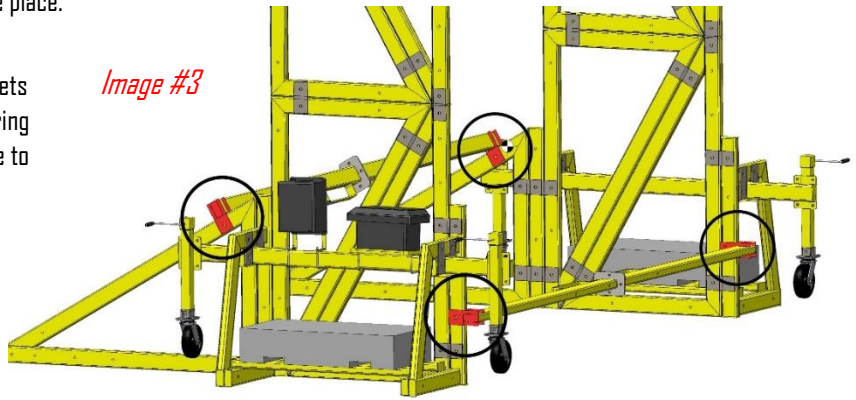
- **⚠ WARNING** Always ensure no people are underneath the plow or anywhere in the drive-thru area during operation.
- **⚠ WARNING** People must stay clear of areas where discharging snow and ice occurs.
- **⚠ WARNING** Do not use the FleetPlow for anything other than removing snow and ice from vehicle roof tops. The machine is not designed for and must not be used for lifting, supporting, transporting people or for lifting or supporting loads over people.
- **CAUTION** Plow assembly must always be in the full up position before entering the FleetPlow.
- Always use a properly charged and well maintained battery and assure that battery connections are tight.
- Always enter your FleetPlow at a slow, safe speed (5 MPH maximum).
- Always align the vehicle center with the V-point of the plow and stop the vehicle once the point of plow and shorter brushes are extending over the leading edge of the vehicle.
- Operator must always remain attentive while lowering plow to avoid excessive slack in the wire rope.
- **CAUTION** Before driving forward, always ensure that the plow assembly is position on the vehicle's roof correctly and not hanging in front of the leading edge of the roof. Only the longer brushes should be allowed below the roof line.
- **CAUTION** Never back the vehicle up while the plow assembly is on the roof.
- Steadily accelerate while clearing snow from the roof.
- Never allow a mound of snow to build up in the drive-thru. Remove built up snow as necessary and only when the plow assembly is in the full up position.
- Always turn off power to unit when not in use.

Conversion Between Operating and Rolling Modes

- 1) **To prepare for rolling**, fasten the tow bars to the front and back of the unit using clevis pins in the holes provided (*See image #3 below*).
- 2) Lower Plow Assembly to bottom of guide tracks.
- 3) Using the screw jacks, lower each wheel set so the FleetPLOW frame is raised approximately 2 inches off the ground.
- 4) Depending on equipment available you may move your FleetPLOW by various methods. (See Below)
- 5) Tow slowly to the desired location on your lot and position.
- 6) **To prepare for operation**, use jacks to raise each wheel set so the frame is lowered onto the ground.
- 7) Remove the tow bars and store them in a suitable place.

- Scraper Systems recommends that wheel sets are retracted sufficiently off the ground during operation to prevent damaging the jacks due to incidental bumping of the unit.

Image #3



Towing with a Vehicle

CAUTION: The FleetPLOW is not equipped with brakes on the caster wheels. If it is necessary to tow your FleetPLOW on a decline, you must provide a second vehicle on the back side to which the FleetPLOW is strapped to keep the FleetPLOW from rolling forward into the towing vehicle.

- Attach straps to plow side towbar of FleetPLOW, as shown.
- Pull slowly. Scraper Systems recommends having a spotter to help guide the driver while towing.
- Caution must be taken to allow appropriate stopping distance between the tow vehicle and FleetPLOW.
- Tow your FleetPLOW to your operating or storage location.



Moving with a Forklift

- Put forks through fork slots on the towbar, of the exit side of the FleetPLOW, as shown.
- Lift and tilt forks back till wheels closest to forklift are slightly off the ground.
- Push or pull as need to move the FleetPLOW to your operating or storage location.



Step-By-Step Operating Instructions

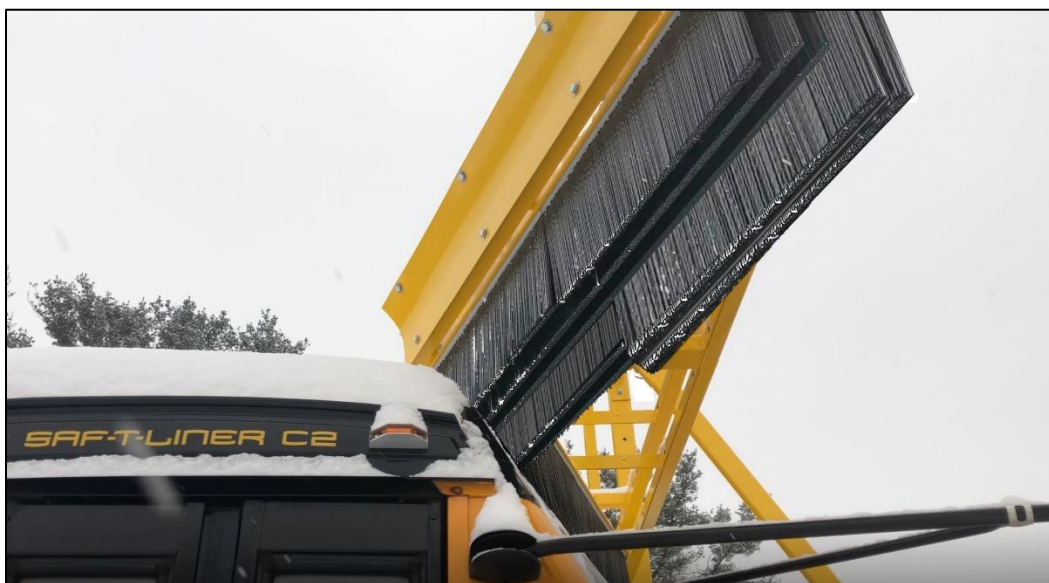
- 1) Remove dust cap from the receptacle on bottom of the control box. Plug in the pendant control by lining up the 3 pins of the male plug with the corresponding hole pattern in the receptacle. Turn locking collar counterclockwise until its seated. Then twist the locking collar to tighten.
- 2) Turn key on control box to "ON" position.
- 3) If necessary, raise plow to full up position using the 2-button pendant.
- 4) Operator signals driver to slowly (5 MPH maximum) enter FleetPlow drive-thru.
- 5) Center vehicle to line-up with V-point of the plow.
- 6) Stop when the leading edge of vehicle's roof is under the first three (3) rows of shorter 10" brushes.
- 7) With pendant control, lower the plow to the surface of the vehicle roof with the shorter 10" brushes lightly touching the roof and longer 14" and 16" brushes against the front face of vehicle. Release down button to stop the lowering process. *(see image below).*

CAUTION: DO NOT ALLOW EXCESSIVE SLACK. This can occur if the operator holds the down button too long after setting the plow on the vehicle roof. This can loosen the wire rope to a point where it may bird-nest on the spool of the hoist and tangle, causing the hoist to malfunction. Proper MD-12B slack is achieved once the shorter brushes are lightly touching the vehicle's roof.

- 8) Drive vehicle forward, steadily accelerating to clear snow off the roof. Proceed to destination.
- 9) With pendant control, raise plow to full up position for next vehicle.
- 10) With a ground plow or snow blower, regularly remove cleared snow from the drive-thru.

CAUTION: Do not allow build-up of cleared snow to form in the drive-thru area.

- 11) When the vehicle snow clearing session is complete, turn key on the control box to "OFF".
- 12) Disconnect handheld pendant by turning plug's locking collar clockwise, until keyways line up. Remove pendant control and store inside.



Maintenance

Please contact one of our North American network of dealers to provide an efficient preventative maintenance program for your FleetFlow™.

MD-12B	Criteria	Action
Test the operation of the unit using a fully charged battery	Verify 12V-DC system is functioning properly.	Test run unit several times in the fall before the first snow.
Plow Frame Slider Pads P/N 71184	Wear Pads should be free of cracks or breaks and should not have excessive wear that exposes the head of the bolt.	Replace as neccessary.
Jacks P/N 71482	Jacks should crank up and down easily.	Grease once a year or replace as neccessary.
Swivel Caster with Wheel P/N 72091	Swivel Caster should freely turn 360°. Wheels should turn freely on axles.	Grease once a year or replace as necessary.
Rigid Caster with Wheel P/N 72091-1	Wheels should be free of cracks and breaks. Wheels should turn freely on axles.	Grease once a year or replace as neccessary.
Brushes 10" - P/N 82091-1 14" - P/N 82095-1 16" - P/N 82098	Visually check for worn or deformed bristles.	Replace as neccessary.
Electrical components	Visually inspect electrical boxes, cordsets, cables and connectors for loose connections or damage.	Tighten or replace as neccessary.
Bolts, nuts, and other fasteners	Bolts, nuts, and other fasteners should not be loose.	Tighten or replace as neccessary. ½" Bolts should be torqued to 57 ft/lbs.
Lifting Hook	Visually check that hoist's lifting hook is securely hooked to the eyelet of the Damper Spring Assembly.	Secure if neccessary.
	Visually check that the the crimped eyelet is not damaged and is secure.	Replace wire rope immediately if damaged.
Wire Rope	Spool out wire rope and visually check for cuts, kinks, or frayed areas.	Replace rope immediately if damaged.
	Check for corrosion on wire rope. (The appearance of a white residue, oxidation, over time is normal and is not corrosion)	Spray with a corrosion inhibitor if desired.
Pendant – Wiring - Plug	Wire connections to contacts in pendant should not be loose or damaged.	Tighen or repair.

12V-DC Wire Rope Hoist	Criteria	Action
Fasteners	Check all mounting bolts after first use and semi-annually or after 25 hours of operation.	Tighten or replace any damaged bolts. Mounting Bolt Torque: 11 – 13 ft/lbs.
Electrical connections	Check all electrical connections after first use and semi-annually or after 25 hours of operation.	Tighten any loose connections and be sure they are free of corrosion.
Hoist Brake	Visually check for brake slippage regularly or after 25 hours of operation. <i>Plow drifts down after releasing the pendant down button when under load.</i>	Replace brake assembly or hoist.

ALWAYS WEAR EYE PROTECTION WHEN WORKING AROUND BATTERIES

12V Battery, Lead Acid, Wet	Criteria	Action
Clean battery	Keep battery and terminals clean and dry.	Wipe off moisture on terminals and battery case to minimize corrosion.
Charge battery	Do not discharge below 50%.	Charge using a quality battery charger with overcharge protection.
Check levels of electrolyte	Periodically check level of electrolyte in each cell before and after charging.	Fill as necessary with distilled water.
Check connections	Check that wing nuts are tight.	Tighten if necessary.

Battery Information for MD-12B FleetPlows

We provide a 12V, 90 AH, group 27, deep cycle, marine battery:

COLD TEMPERATURES AND BATTERY PERFORMANCE

Although batteries hold a charge better in cold weather when not being used, the capacity in use (number of buses) is adversely affected by winter temperatures. Like all FleetPlow™ brand components, the robust battery we provide is specified to exceed the usage requirements in these extreme conditions (-20° F, -29° C).

CAPACITY

Temperature affects capacity. When new, total capacity at room temperature is 356 cycles (vehicles). To get the longest battery service life, it is best to only discharge 50% before recharging.

- @ 32° F, (0° C), capacity is 85% or 302 vehicles. (151 vehicles to 50% discharge)
- @ 0° F, (-20° C), capacity is 50% or 178 vehicles. (89 vehicles @ 50% discharge)
- @ -20° F, (-29° C), capacity is 35%, or 124 vehicles. (62 vehicles at 50% discharge)
- ✓ Our battery case will hold up to a type 31 battery size, making it possible to increase the number of vehicles up to 40%.
- ✓ If you have a larger fleet or frequent snowfalls, we recommend purchasing additional batteries. Spare batteries are not currently sold by Scraper Systems.
- ✓ The 12V batteries you use for your vehicles can also be used in an emergency. However, performance will vary, and those batteries are not deep-cycle and are designed to be constantly recharged by an alternator.

ALWAYS WEAR EYE PROTECTION WHEN WORKING AROUND BATTERIES

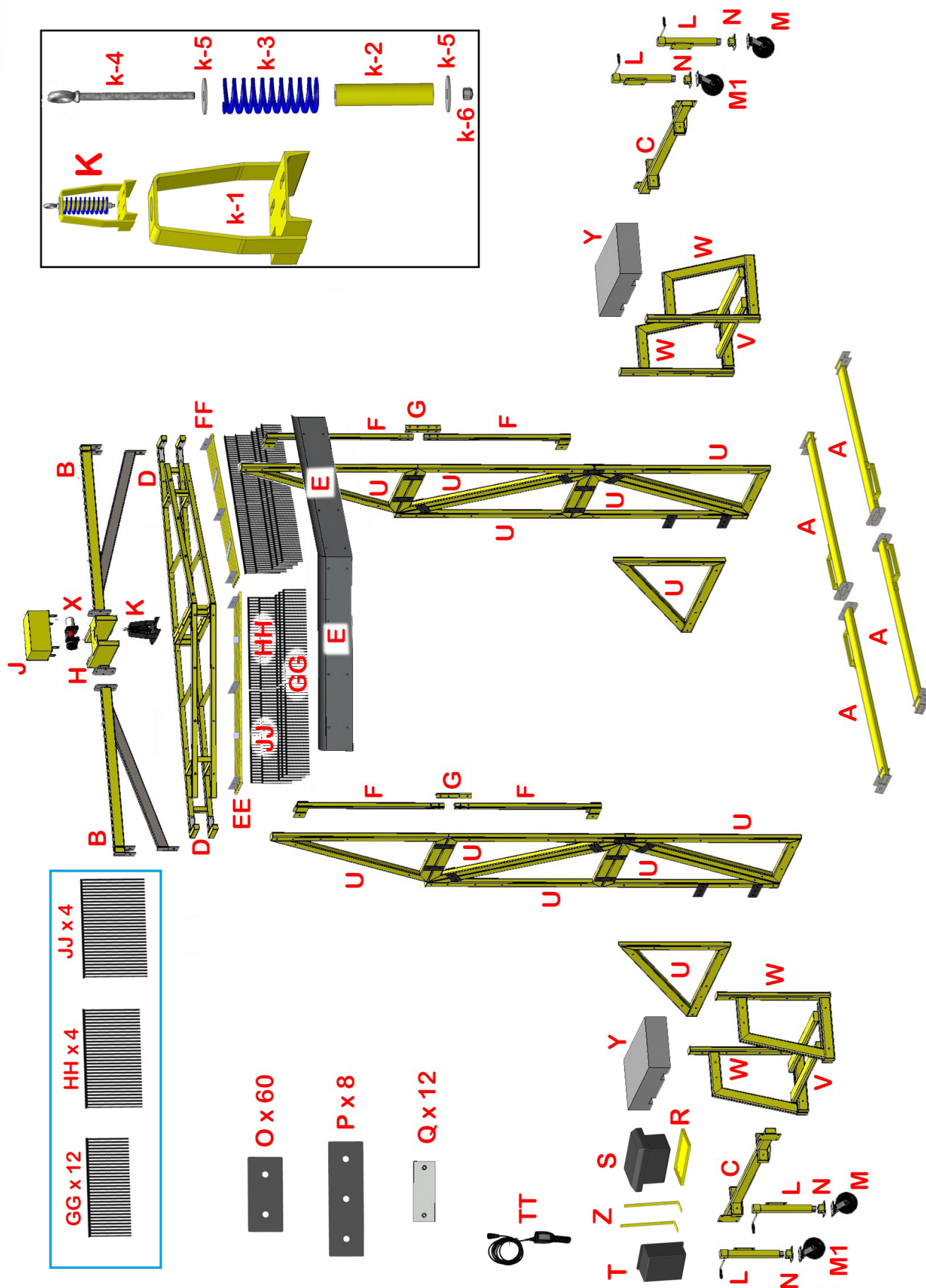
CHARGING

- ✓ The batteries do not have a “memory”, so it is best to recharge them to full after each use.
- ✓ A charged battery can be left outside on the FleetPlow, but it will need to be recharged every month to make sure that the battery will be ready to perform when you need it.
- ✓ **It is best to charge the battery inside on a quality battery charger with overcharge protection, then bring it outside and attach it to the FleetPlow for each storm.**
- ✓ Batteries will not freeze if they are charged. However, they can freeze if they are discharged and left outside in cold weather. Do not allow a discharged battery to remain outside and become frozen.
- ✓ To avoid a battery explosion, never attempt to charge a frozen battery. Allow it to warm up to room temperature before placing on charge.
- ✓ Do not overcharge your battery. Utilize a quality charger with overcharge protection.
- ✓ Check electrolytes. Verify that plates are covered before beginning to charge. At the end of the charge, add distilled water as needed to bring levels to the proper height. If water is added in cold weather, charge for an additional 30 minutes to mix. Otherwise, freezing might occur and the battery may crack or explode.

Troubleshooting

Always check that cables and connectors are properly connected and tightened at the battery, hoist, and control box.

Situation	Possible Cause	Action(s)
No power	Power is not connected; Circuit breaker is tripped or disconnect switch not in "ON" position.	Check that battery disconnect on main control panel is turned to the "ON" position.
		Check that battery is connected and connections are tight.
		Check that battery is charged.
		Check that manual reset button on circuit breaker inside main control box is reset.
	Power to remote pendant has been interrupted.	Check wiring connections. Check for 12V at positive (+) terminal on controller. Check for voltage at F1, F2 terminals with remote switch in either direction. <i>See hoist manual</i>
Hoist will power down but not power up.	Failure in remote control pendant switch or wiring.	Check for 12V at center pin of remote pendant socket on control box. Check continuity of pendant lead connector from center pin to either side pin with pendant on/off switch in both positions. Replace pendant if there is no continuity.
	Failure of components or wiring inside control box.	
Hoist operates in both directions but will not lift rated load.	Low Voltage at hoist.	Check condition of battery. Check all power wiring and connections for corrosion. Clean and tighten connections.
Hoist tries to power down, slows down and stalls or locks up.	Load brake failure or service required.	Service or replace load brake.
Hoist vibrates badly or is noisy during the lifting or lowering of load.	Load brake needs servicing.	Service or replace load brake.
	Tie rods are bent.	Replace tie rod if necessary. Check for bent or cracked housing.
Plow does not clear snow towards back of the vehicle. Plow not in contact with roof's entire length.	Uneveled vehicle.	Operator must adjust height of plow assembly to account for levelness of vehicle while clearing snow.
	Built up snow in entrance way.	Remove built up snow from entrance way.
	Plow not lowered correctly on roof.	Lower plow with correct amount of slack.
Plow drops hard off back of vehicle.	Uneveled vehicle.	Operator must adjust height of plow assembly to account for levelness of vehicle while clearing snow.
	Too much slack in wire rope.	Reduce slack in wire rope.



For Parts. Please contact dealer for pricing.

MODEL MD-12B

Letter	Part Number	Description	Quantity
A	71681	Tow Bar Segments	4
B	71581	Top Beam Outside Segments	2
C	71481	Jack Bars	2
D	71181	Plow Frames	2
E	71182-1	Plow Blade, Left Hand	1
E	71182-2	Plow Blade, Right Hand	1
F	71281	Plow Guide Track Segments	4
G	71283	Plow Track Splice Brackets	2
H	71582	Top Beam Center Segment	1
J	71780	Hoist Cover – labeled with Logo	1
K	71185	Damper Spring Assembly	1
k-1	71185-1	Damper Spring Assembly Frame	1
k-2	71185-5	Damper Spring Assembly Stop	1
k-3	71185-2	Damper Spring Assembly Spring	1
k-4	71185-3	Damper Spring Assembly Eye Bolt	1
k-5	71185-4	Damper Spring Assembly Flat Washer	2
k-6	71185-6	Damper Spring Assembly Nylon Hex Nut	1
L	71482	Jack Assembly	4
M	72091	Swivel Caster w/8" Phenolic Wheel	2
MI	72091-1	Rigid Caster w/8" Phenolic Wheel	2
N	71483	Caster Mounting Plates	4
O	71081	2-Hole Segment Plates	60
P	71082	3-Hole Segment Plates	8
Q	71184	UHMW Plow Slider Pads	12
R	71880	Battery Tray	1
T	72105	Control Box	1
U	71080	Triangle Segments	12
V	71381	Ballast Bases	2
W	71382	Ballast Side Frames	4
X	72092	12V-DC Hoist with Wire Rope	1
Y	72099	Concrete Ballast	2
Z	71890	Control Box Mounting Brackets	2
EE	71981	Brush Channel Frame LH	1
FF	71981-1	Brush Channel Frame RH	1
GG	82091-1	All-Pro Strip 10" Brush	12
HH	82095-1	All-Pro Strip 14" Brush	4
JJ	82098	All-Pro Strip 16" Brush	4
TT	72093	2-Button Pendant	1
	72092-1	12V-DC Hoist (wire rope not included)	1
	72098	Wire Rope with Hook 3/16" x 20'	1
	72094	12V Contactor	1
	72109	Owner's Manual	1

	72108	Touch Up Paint	1
	72111	Scraper Systems Logo Label	1
	72105-1	Battery Disconnect	1
	72105-2	Circuit Breaker	1
	72105-3	Battery Disconnect Key	1
	72104	Group 27 Battery Box	1
	72100	Battery Cable Set #1 (includes 72100-1 - 72100-6)	1
	72101	Battery Cable Set #2 (includes 72100-1 & 72100-2)	1
	72102	Battery Cable Set #3 (includes 72100-3 & 72100-4)	1
	72100-1	29' x 2 ga. 3311 Cable (black) with insulating boots	1
	72100-2	29' x 2 ga. 3311 Cable (red) with insulating boots	1
	72100-3	60" x 2 ga. 3311 Cable (black) with insulating boots	1
	72100-4	72" x 2 ga. 3311 Cable (red) with insulating boots	1
	72100-5	18" x 2 ga. 3311 Cable (red) with insulating boots	1
	72100-6	8" x 2 ga. 3311 Cable (red) with insulating boots	1
	75090	Hardware Set (includes 75091 - 75098)	1
	75091	Hardware, Frame Bag	1
	75092	Hardware, Jack/Caster Bar	1
	75093	Hardware, Top Beam Bag	1
	75094	Hardware, Tow Bar Bag	1
	75095	Hardware, Plow Track Bag	1
	75096	Hardware, Battery Tray Bag	1
	75097	Hardware, Plow Bag	1
	75098	Hardware, Hoist/Electrical Bag	1

For maintenance and service, contact your authorized dealer:

Dealer Contact Info:



www.scrapersystems.com

This product is covered by one or more of the following U.S. Patents: 8,584,295; 9,168,898; 9,321,432; 9,834,181; 10,351,108; and U.S. and International Patents Pending.

Scraper Systems by Rite-Hite™

Lancaster, PA USA

Toll Free: 888-340-4344

info@scrapersystems.com

P/N 72109 RevD

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