

MasterMover®

Worldwide Electric Tug Solutions



OPERATOR'S MANUAL

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MasterMover Part No. 011-46900 Standard Operator's Manual (English)

General Sales and Service Contact Information:

MasterMover Ltd.
Airfield Industrial Estate,
Moor Farm Road,
Ashbourne,
Derbyshire.
DE6 1HD
UK

T +44 (0) 1335 347700
W www.mastermover.com

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About this Operator Manual



This manual provides general machine instructions and guidance for our machines. Please also refer to your machine Bolt-On manual supplied.

In the interests of Safety, please make sure that you read and understand both manuals before using your MasterMover machine.



Maintenance

This manual does not cover maintenance other than basic cleaning and checking for signs of a problem. In the event of a fault, please contact your supplier or MasterMover Ltd – see page 22.

Disclaimer

The purpose of this manual is to provide general, non-machine specific instructions and guidance for our machines.



Nothing contained in this manual constitutes a warranty of any kind in respect of the machine or of the results to be achieved by its use. The only warranties given by MasterMover in respect of any machine are those expressly given by MasterMover or your supplier in the contract under which it sells the machine to its purchaser.

The information contained in this manual is believed to be accurate at the date of publication.

Health & Safety

Warning Labels

Some of the following symbols may be used on your machine. Please study them and learn their meaning.

	Refer to instruction manual/booklet		Wear eye protection
	Wear safety footwear		Disconnect mains plug from electrical outlet
	General warning sign		Warning; Battery charging
	Warning; Explosive material		Warning; Crushing of feet or limbs
	Warning; Flammable material		Warning; Corrosive substance
	Warning; Electricity		Warning; Toxic materials
	Warning; Crushing of hands or limbs		No children allowed
	No open flame; Fire, open ignition source and smoking prohibited		Recycle the batteries – they contain Lead (Pb)
	Battery power-disconnect		Waste Electronic and Electrical Equipment (WEEE) symbol. Recycle in the correct manner
	Company ISO 9001 quality assurance in production, installation and servicing		Manufacturer's declaration that the product meets the requirements of the applicable EC directives

Health & Safety

Safety Warnings in this Manual



In this manual, we indicate potential safety issues by the Warning/Caution symbol. Please read the safety information before you do any task preceded by this symbol.

There are two levels of safety message: WARNINGS and CAUTIONS:

- **WARNING:** Failure to observe a WARNING could result in death or serious injury.
- **CAUTION:** Failure to observe a CAUTION may cause minor injury or damage to equipment.

If you Suspect a Fault

If you notice a fault, or if the machine does not operate as described:

1. STOP the machine and turn the key switch to OFF.
2. Disconnect the battery.
3. REPORT the problem immediately to your supervisor/manager, or directly to MasterMover.



CAUTION: SERVICING SAFETY

In the interests of safety only authorised, trained personnel may service or repair MasterMover machines.

Safety Precautions

Please follow these precautions when using the machine:

- Do not switch the machine on until you are ready.
- Make sure the working area is safe and clear of obstacles.
- Wear suitable non-slip, safety footwear with protective toecaps.
- Be very careful how you move the machine, how you drive it from its packing crate, etc.
- If necessary, ask someone to help you or use lifting equipment.
- Always follow your company's Health and Safety Regulations.

Health & Safety



WARNING: MACHINE WEIGHT

Our machines are very heavy and could easily injure someone if incorrectly used.

Preparation

The machine is supplied ready for use, although in some cases you may need to fit the coupling you have chosen (fitting the coupling is simple and requires only a few basic hand tools).

At the MasterMover factory:

- We set the acceleration and speed. Note, this can be altered.
- We provide and attach the chosen machine Options (some simple assembly may be required in the case of certain options).
- We send the unit with a fully-charged battery pack.

Unpacking

Check that you have received all the parts shown on the itemised delivery note. If anything is missing, please contact your supplier immediately.



IMPORTANT:

FAILURE TO COMPLY WITH THE FOLLOWING POINTS COULD RESULT IN SERIOUS DAMAGE TO EQUIPMENT AND POTENTIALLY CAUSE SEVERE INJURY OR DEATH OF THE OPERATOR OR THOSE AROUND

Lighting in the Work Area

The working area must be sufficiently well lit so that the operator and all other pedestrians in the area can clearly see:

- The load and your immediate surroundings.
- The route ahead that the load will be travelling through.
- The condition of the ground/surface where the machine and load will move.
- All possible obstructions.

Health & Safety

Safety Do's

- ✓ When pulling a load, DO walk beside the machine when possible, for safety. If you need to walk backwards when pulling a load, DO make sure that you are not walking into an obstruction.
- ✓ DO use the warning horn to make people aware of your movements.
- ✓ DO take care to avoid people, objects, equipment, cables on the floor etc.
- ✓ DO check the coupling for wear or damage (including cracks/deformation).
- ✓ DO remove the key when machine is not in use - store in a secure place.
- ✓ DO keep the machine clean and free of dirt and grease.
- ✓ DO take extra care on slopes and loose surfaces.
- ✓ DO keep your feet clear of the machine when moving the machine.

Safety Don'ts

- ✗ DON'T use the machine if the battery state meter shows a low or uncharged state. Recharge immediately.
- ✗ DON'T use the machine unless properly trained.
- ✗ DON'T use the machine for anything other than its intended use.
- ✗ DON'T try to ride on the machine.
- ✗ DON'T attempt to turn the castor wheel using feet/hands.
- ✗ DON'T use pressure washers to clean the machine, water can easily get into the battery compartment through the ventilation slots.
- ✗ DON'T detach the machine from the load if on a slope. The load could easily roll away and injure someone.
- ✗ DON'T try to modify the machine yourself. This includes changes affecting for example, stability, capacity, braking, steering, visibility and the addition of any removable attachments.

General Information

Storing the Machine

It is important to have a designated storage and charging area, in a dry place indoors. Store in a suitable place away from aisles and passageways as to avoid it being an obstacle and trip hazard.

Model Names

The first two or three letters of the machine model indicate which family it is part of. If it has a plus '+' symbol at the end, this denotes it has hydraulic functionality.

Abbreviated family name	Full family name
SM	SmartMover
MT	MasterTug
AT	All Terrain
AT TOW	All Terrain Tow
MH	MasterHandler
MP	MasterPusher
GBM	Gas Bottle Mover
TMS	Trailer Moving System
CEM	Cummins Engine Mover
RCM	Roll Cage Mover

Noise Levels

This is a quiet, electrically-operated machine. These are the typical noise levels at the operator's position:

Noise level	Decibels (dBA)
Motor operation in high speed mode, at maximum speed	$\leq 80^{*1}$
Flashing safety light and motion bleeper	80
Horn output	95

*1 Tested on concrete floor

IP rating

The IP rating varies from machine to machine – please refer to page 1 of your machine Bolt-On manual for more information.

Cleaning

When cleaning your MasterMover (including Stainless Steel machines), do not use solvents or pressurised water*² as this can damage the machine and the internal components invalidating your warranty. Instead we recommend to use a damp, non-abrasive cloth or sponge with a mild detergent or soap. Avoid cleaning pastes and detergents containing chloride.

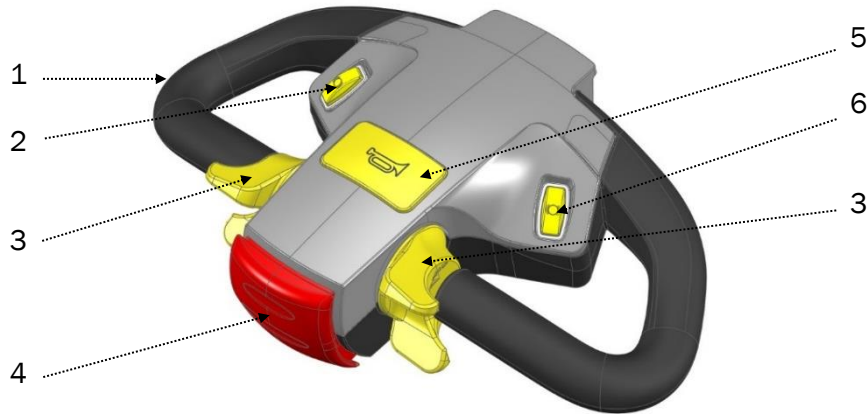
*² Only the MT5/400+SS IP55 can be subjected to pressurised water.

Controls & Indications

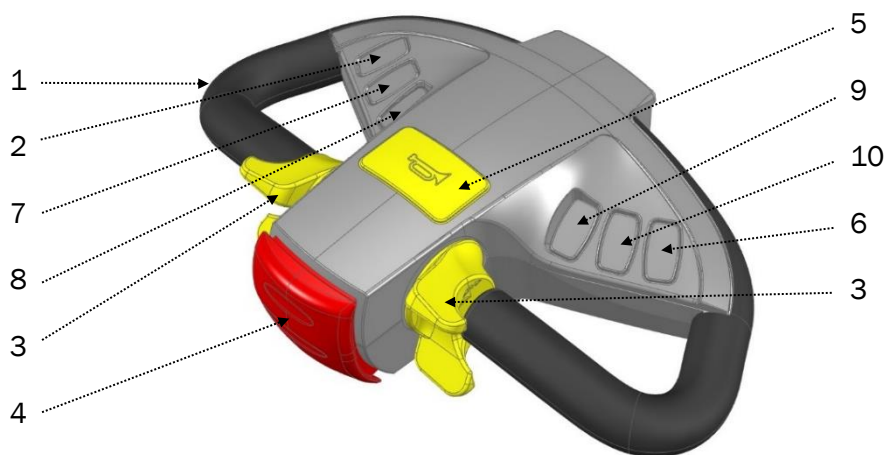
Control Head

The Control Head is the steering wheel of the MasterMover machine. There are two variants:

Two button configuration



Six button configuration



1. Steering handles
2. Two speed selector switch (Option): See page 12
3. Forward/reverse throttle and brake lever (referred to as throttle lever)
4. Anti-crush button
5. Warning horn
6. Hydraulic coupling switch: See page 9
7. Dependant on application
8. Dependant on application
9. Dependant on application
10. Dependant on application

Controls & Indications

Key Switch

The key switch is located on the front or top of the machine. When you insert the key and turn it ON, the battery discharge indicator will display the charge level - this confirms that the machine is now "live".

We supply two keys with the machine. Extra keys are available to order, please contact your dealer or MasterMover Technical Support.

Note: You can only remove the key in the OFF position.



Emergency Stop

The Emergency Stop is a red button usually located on the tiller arm. When the emergency stop button is pressed, it activates a cut-out for the machine and all controls are disabled. To release the button, turn the button 90° clockwise and this will activate the machine again.



Automatic Parking Brake

The machines are equipped with an automatic parking brake - there is no separate manual brake control. The brake is automatic and releases when you move the throttle lever. A constant electric current holds the parking brake OFF while the machine is moving. When it comes to a complete stop, the brake applies automatically.

Note: If you turn the key switch **OFF**, or if the battery becomes fully discharged, the motor stops and the parking brake applies automatically.



Controls & Indications

Anti-Crush Button

At the front centre of the control head is a red Anti-Crush button which overrides the throttle levers when pressed.

In the unfortunate event of being trapped while the machine is reversing, this button will activate an emergency stop and move forward slowly. If pressed while moving forwards, the machine will perform an emergency stop and will not move until the throttle lever has returned to its neutral position first.



Hydraulic Coupling Switch

This activates the hydraulic pump on the machine to either raise/lower the coupling mast or to clamp/unclamp the coupling, allowing you to connect to the load. See 'Coupling to the Load' in your machine Bolt-On manual.



Lower/Clamp



Raise/Unclamp

Warning Horn

Use the horn to give audible warning when you approach corners or to let other people know that a moving load is coming.



Controls & Indications

Forward/Reverse Throttle and Brake Lever

Forward, reverse and brakes are controlled by the throttle levers. This is a variable speed control: you can accelerate and decelerate gently.



Using the Throttle:

To **push** the load away from you, **push either lever UP** away from you.

To **pull** the load towards you, **press either lever DOWN** towards you.

These levers are mechanically linked so you can use either side.

How to Stop:

Release the throttle levers and they spring to a central, neutral position. The motor slows the load to a stop. When stationary, the parking brake applies automatically.

Battery Discharge Indicator (BDI)

The Battery Discharge Indicator (BDI) shows you the charge level of the battery pack as a percentage. It will also display any fault code the machine might have (model dependant).



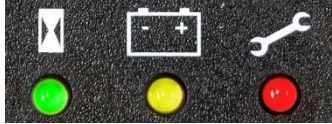

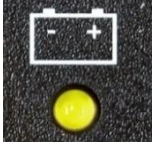

100% charged.



31 - 40% charged.

Controls & Indications

For those machines with the circular BDI, the following indications are to be observed when switching on and during use of the machine:

<p>1. When you first switch the machine ON, all 3 LEDs illuminate briefly (green, yellow and red) to indicate that they are all working, then they switch off.</p>	
<p>2. Next, the green light shows. The meter displays "Traction Hours" for a moment, then a number. This number displayed is the total number of hours that the machine has been moving.</p>	
<p>3. Next, the yellow light shows and after a few moments switches off. The display shows the battery charge level and will continue to show this during use.</p> <p>The yellow light will also show the following Low Battery Indications:</p> <ul style="list-style-type: none"> • Yellow light ON - battery $\leq 35\%$. • Yellow light FLASHING - battery $\leq 25\%$. • Yellow light FLASHING and text reading "Low BDI" - battery $\leq 20\%$. Recharge the battery pack immediately, or the battery may fail. 	
<p>4. If the red light is FLASHING then there is a fault and the display will show a fault code number. If this happens, report the fault and code to your supervisor.</p> <p>Additional information:</p> <ul style="list-style-type: none"> • Check that the battery pack is well charged before use. 	

Machine Options

Option – flashing safety light and motion bleeper



Option – two speed selector switch



Option – wireless control handset



Option – lifting and anchoring points



Option – wheel protectors



Option – forward facing LED



Option – headlights



Option – no horn



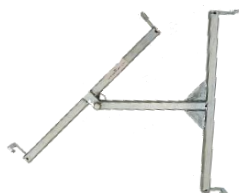
Option – drive wheel



Option – mast steering lock



Option – roll cage pivot link bar - sunlight



Option – roll cage pivot link bar - universal



Option – XrissXcross roll cage connection straps



Option – air compressor



Machine Options

Option Contents

MasterMover Model	Option - flashing safety light and motion bleeper	Option - two speed selector switch	Option - lifting and anchoring points	Option - wireless control handset	Option - wheel protectors	Option - forward facing LED	Option - headlights	Option - no horn	Option - Drive Wheel			Option - mast steering lock	Option - roll cage pivot link bar - sunlight	Option - roll cage pivot link bar - universal	Option - XrissXcross roll cage connection straps	Option - air compressor
									Extra grip	316 stainless steel	316 stainless steel extra driv					
SmartMover																
SM60+	●					●		●					●	●	●	
SM100+	●					●		●					●	●	●	
SM100	●					●		●					●	●	●	
SM100 TOW	●					●		●					●	●	●	
MasterTug																
MT200	●	●	●													
MT300+	●	●	●													
MT400+	●	●	●	●												
MT600+	●	●	●	●												
MT800+	●	●	●	●												
MT1000+	●	●	●	●												
MT1200+	●	●	●	●												
MT1500+	●	●	●	●												
MT2000+	●	●	●	●												
All Terrain																
ATP400	●	●	●	●	●											
ATT400	●	●	●	●	●							●				
ATT400+	●	●	●	●	●							●				
AT200 TOW	●															
AT300 TOW	●															
Stainless Steel Machines																
SM60+ SS																
SM100+ SS																
MT5/400+ SS IP44 & IP55	●	●									●					
MH400+ SS IP44		●									●					
MT20 SS IP44	●	●							●	●	●					
MasterPusher																
MP400	●	●	●													
Trailer Moving System																
TMS	●	●	●													●
MasterHandler																
GBM16	●	●	●													
GBM20	●	●	●													
MH400+	●	●	●													
MH TOW	●	●	●													
MasterTug (pre 2014)																
MT20/1500 extended body	●	●	●						●							
MT30/2000+ PAS	●	●	●													

Batteries

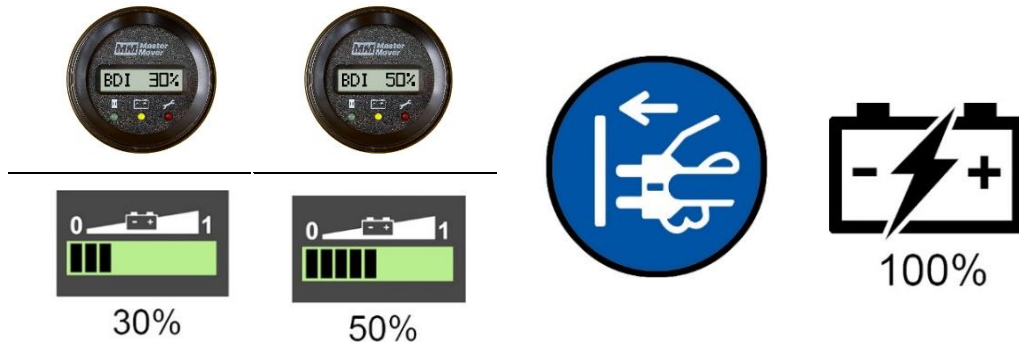
Battery Care & Life

Lead Acid - Sealed and Vented

To prolong battery life of your machine, read this carefully:

- For the first 15 charges, discharge the battery until the meter shows the remaining charge as BDI = 30%, but not lower.

Note: It is very important that you follow this procedure for the first charge cycles on the battery; otherwise the battery life can be severely affected. After these initial charges, we recommend you charge when the BDI shows 30-50%.



- Always recharge the battery to 100% regardless of the current battery charge level.

Lithium

To prolong battery life of your machine, read this carefully:

- Unlike Lead-Acid, Lithium batteries are designed to be regularly charged for short periods of time, a charge pattern often referred to as 'opportunity charging'.
- It does not need to be fully recharged every time. There is no minimum charge time required.
- 30% capacity can be returned to the battery in 30mins. Full charge in 1.5 hours.
- The battery does not give off gas when on charge, therefore the charger can be mounted wherever is convenient.
- The battery must receive a full charge every three months. This is true whether the machine has been used during this time or not. Failure to do this may lead to irreparable damage to the battery.



IMPORTANT: BATTERY LEVELS

Lead Acid and Lithium batteries: If the battery indicator shows 30% or less stop using the machine and recharge as soon as possible, otherwise the machine may stall while connected to a load. Do not leave a battery fully discharged. This can damage the battery, impair performance and shorten its life.

Additional Information:

- Machine batteries are consumable items and have a certain life. They will need replacing from time to time.
- You must only fit a new battery pack that is approved by MasterMover or by your local service partner. Warranty restrictions apply.

Batteries

Battery Do's

- ✓ Wear suitable hand and eye protection when you change batteries. Battery acid is poisonous and corrosive should it accidentally leak.
- ✓ Keep the top of the battery clean and dry.
- ✓ Switch off the charger before connecting or disconnecting the battery.
- ✓ Check that the battery terminal connections are tight, using insulated tools. Keep terminals clean and greased with petroleum jelly or light/medium grease.
- ✓ When changing batteries, take proper care and use correct safety procedures. Batteries are very heavy and can be dangerous to handle.
- ✓ Charge the battery when the BDI shows between 30-50% charge.
- ✓ Only use the charger supplied by MasterMover. An incorrect charger can damage the batteries and invalidate the warranty.
- ✓ Always store the machine at full charge to avoid degradation of the battery.
- ✓ When charging always recharge to 100%.

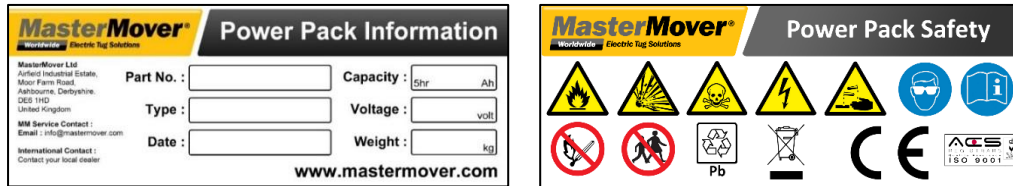
Battery Don'ts

- ✗ Do not discharge the battery below 30%, or battery life will deteriorate and it may fail completely. This is not covered by warranty. Recharge immediately.
- ✗ Do not put metal objects on top of the battery. Beware of metal tools and jewellery.
- ✗ Do not allow corrosion around terminals. Clean and re-grease.
- ✗ Do not store the battery below 0°C.

Batteries

Battery Safety Labels

On the machine, regardless of battery option, the power pack information and safety labels will either be mounted on top of the battery cover or on the battery itself.



Interchangeable Battery Pack

The interchangeable battery pack means you can have any number spare for your machine, some on charge whilst one is in use. As the recharge time is typically 6-7 hours, by changing the battery pack you can maintain high productivity.

Fixed battery setups and internal chargers are also available.

Disposing of Used Batteries or Packs

If a MasterMover representative replaces the batteries, they will remove the old batteries and dispose of them correctly.

If you replace batteries, then please ensure that you dispose of them correctly according to local rules and regulations.

Charging

Charging with the External Charger

1. Take the machine to the recharging bay. Switch the machine **OFF** and remove the key.
2. Make sure the charger is switched **OFF**.
3. Locate the battery and pull out the machine plug from the battery pack connector (some models may have the plug in a separate compartment on the outside of the machine).
4. Push the charger plug firmly into the battery pack connector.
5. Switch the charger **ON**.
6. Check that the charger indicator light shows that it is **ON**.
7. Leave it on charge until the charger indicator shows "Full" - this could take several hours. The length of time depends on the model of your machine, the type of charger, the battery pack capacity and the level of discharge when you start charging.



Note: Following the above procedure will prolong the battery life.

8. Switch the charger **OFF** and unplug the charger connector from the battery pack.
9. Make sure the machine is switched off and then plug the machine connector into the battery pack.
10. Close the compartment (where applicable). You can now resume normal use.



CAUTION: CHARGER INSTRUCTIONS

Failure to follow the above instructions will result in the charger not resetting – this can create problems with future battery charging.

Charging with the Internal Charger

1. Take the machine to where there is a convenient mains socket. Switch the machine **OFF** before charging and remove the key.
2. Locate the mains plug and extend the mains lead, connect it to a mains supply and switch **ON**.
3. Check that the charger indicator light(s) show that it is **ON**. Leave it on charge until the charger indicator shows "Full" - this could take several hours. The length of time depends on the model of your machine, the type of charger, the battery pack capacity and the level of discharge when you start charging.

Note: Following the above procedure will prolong the battery life. Always charge with the battery lid open.








4. Switch the mains supply **OFF**, unplug the mains lead and reverse the process given in point 2, making sure the machine is switched **OFF**.
5. Put the cables carefully inside the machine, so that they will not be trapped.
6. You can now resume normal use.






Charging

Charger Indicator Lights

- Charger – internal – 3A 24V – 110V-240V
- Charger – external – 5A 24V – 85V-265V
- Charger – external – 5A 48V – 115V
- Charger – external – 5A 48V – 230V
- Charger – internal – 10A 24V – 110V-240V
- Charger – external – 10A 24V – 110V-240V
- Charger – external – 15A 24V 85V-265V
- Charger – internal – 20A 24V – 110V-240V
- Charger – external – 20A 24V – 110V-240V
- Charger – external – 30A 24V – 110V-240V

The charger has red, yellow and green indicator lights, which show you the charging situation as follows:

INDICATOR LIGHTS		CHARGE SITUATION
Red LED Flashing	 x2	Battery charger set to charge vented batteries (twice flashing)
Green LED Flashing	 x2	Battery charger set to charge GEL and/or AGM batteries (twice flashing)
Red LED on		Charging – charge level low
Yellow LED on		Charging – charge level high
Green LED on		Fully charged - ready to use
Yellow LED flashing		Battery not connected/Unsuitable battery/Output short circuit
Red LED flashing		Safety timer exceeded / Internal short circuit

<p>Charger – internal – 3A 24V – 110V-240V</p> 	<p>Charger – external – 5A 24V – 85V-265V</p> 	<p>Charger – external – 10A 24V – 110V-240V</p> 
<p>Charger – external – 15A 24V – 85V-265V</p> 	<p>Charger – internal – 20A 24V – 110V-240V</p> 	<p>Charger – external – 30A 24V – 110V-240V</p> 

Charging

- *Charger – internal - 12.5A 24V – 110V-240V*
- *Charger – external -12.5A 24V – 110V-240V*

The charger has red, yellow and green indicator lights next to the words, 'Mains, Bulk, Full and Charge', which show you the charging situation as follows:



INDICATOR LIGHTS		CHARGE SITUATION
Yellow 'Bulk' and Red 'Charge' LED Alternate Flashing		Soft Start – battery voltage is between 15V and 21V. The charger uses small current to charge battery in order to extend battery lifetime
Red 'Charge' LED on		Battery being charged to 80% capacity
Red 'Charge' LED quick blinking		Battery being charged to maximum capacity
Green LED on		Fully charged. The charger can now be disconnected from the battery or the battery remains at float-charge mode
Red 'Charge' LED blinking		Dead battery or battery has been deeply discharged (one steady flash)
		Battery voltage is too high, or wrong battery is connected (twice flashing)
		Charger temperature is too high to charge (five recurrent flashes)

Machine Checks



WARNING: CHECKING THE MACHINE

Ensure the machine is situated in a safe place before you carry out the following checks.

Pre-Shift Checks

- Check the battery display indicator (BDI) for sufficient charge level.
- Check for leaks.
- Check that the machine is fully intact and that there is no visible damage to the:
 - Control head or controls
 - Bodywork
 - Coupling
 - Drive or castor wheels

Weekly Checks

- Clean dirt or grease off the machine.
- Check that the coupling fixing bolts and nuts are tight.
- Check the coupling surfaces for unusual wear, cracks or damage.
- Check coupling clamps move freely and clamp firmly on the load.
- Check that the anti-crush and emergency stop buttons work correctly.
- Check that the key switch isolates the machine. Make sure none of the controls work when switched off.
- Check the battery cables, connectors, charger and protective outer wrapping for damage or wear. If they are damaged do not use your machine.

Monthly Checks

Check that the terminals of the battery pack connectors are free from corrosion. If necessary, clean the terminals and apply a small amount of light grease or petroleum jelly.

Note: Identification of any of the above should be reported to your line manager.

Training & Servicing

Training

In the interests of safety, we strongly recommend that all operators of MasterMover machines are trained by MasterMover approved trainers.

The section “Operating the Machine” in your machine Bolt-On manual gives an overview of the training and is included for reference to make sure that users are following correct operational procedures.

Typically we train up to six people at a time, normally when we deliver and commission the machine.

Training includes:

- An overview of the machines key safety and operational features.
- How to operate the machine safely, with or without a load attached.
- How to couple/uncouple the machine to the load.
- The limitations of the machine.
- A brief guide to keeping your machine operational and what to do in the case of a machine breakdown.

If learners cannot perform any of the required tasks safely and correctly, the MasterMover trainer will give feedback and re-train as required.

Training is usually provided to small groups and can be provided to new staff members upon request.

To maintain safe practices we recommend that training is refreshed every 2 years by a MasterMover trainer. For further details of training and availability, please contact MasterMover or your supplier.

Regular Service

The machine needs to be serviced regularly; as a minimum we recommend this needs to be done every 6 months. Different levels of service contract are available depending on your needs. Extended warranty and consumable packs are available on request.

Planned preventative maintenance needs to be done by a MasterMover service engineer or an approved service partner. For details contact your supplier or MasterMover Customer Service (details on page 22).

Training & Servicing

Sales & Service Contacts

For **Technical Support**, please contact your **supplier** in the first instance. Details of this can be found on the machine or on the front of your machine pack. If you still require further help, please contact:

<u>Service:</u>	 +44 (0)1335 301869	 customerservice@mastermover.com
<u>Sales:</u>	 +44 (0)1335 301030	 sales@mastermover.com

Find the model number/type and serial number

In order to assist you, we will ask for the model type and serial number – this can be found on the **CE Identification plate**. The ID plate shows you:

- CE mark.
- Manufacturer's name, address, telephone and fax numbers.
- Model and serial number.
- Build year of manufacture.
- Patent Number.
- Weight of the machine with battery pack.
- Max Push/Pull: the maximum pushing or pulling force in Newtons. (1000 Newtons \approx 100kg force).
- Power: the input power of the motor in kW.
- Voltage of the battery pack.

For more information on where to locate the CE ID plate please see the Appendix in your machine Bolt-On manual.

Warranty

All MasterMover machines carry a full 12-month manufacturer's warranty. This excludes the following:

- Failure caused by non-compliance with manufacturer's instructions.
- Damage caused by misuse, accidents or collision with other objects.
- Fitting or use of non-MasterMover parts.
- Tampering with the machine.

For all warranty information, please refer to section 9.2(b) of your 'Terms and Conditions of Sale' booklet.

Note: We strongly recommend that the machine be serviced by MasterMover or an approved service partner. However if it is serviced by someone suitably qualified and using approved components, then the warranty remains.

Evidence of any work carried out on the machine will need to be provided when making a warranty claim. When making a claim, please ensure you have the serial number of the machine.

FAQs and Troubleshooting

How do I charge the machine?

Please see page 17 of this manual for further details.

How do I know when the machine is fully charged?

This will depend on your charger – please see the Charging section of this manual for more information (page 17).

How long will charging take?

This is highly dependent on the type and size of the battery, as well as how discharged it is. An average recharge will take roughly 6-7 hours. With the exception of lithium batteries, we always recommend to recharge the battery to 100% regardless of the current battery charge level.

How long does a fully charged battery last?

This is highly dependent on a number of factors, including the type and size of the battery, weight and duration of the load being moved, slopes, number of stop/starts and floor condition. During the initial evaluation and discussions with you, we will discuss the working environment and a suitable battery will be chosen accordingly.

How do I remove the interchangeable battery?

The batteries are very heavy and with the exception of the SmartMover, will need an overhead crane to lift them out of the machine. Detach any connected charger and machine plugs. Remove the batteries with the lifting hooks.

How often should the machine be serviced?

We recommend the machine should be serviced every 6 months – please see page 21 for more information.

What should I do if I am not using the machine for a long period of time?

- Store the machine at full charge and disconnect the battery.
- Clean the machine beforehand to avoid excessive corrosion (see page 6).
- Ensure the key is stored in a secure location.

The machine is losing traction and the drive wheel is spinning

- Ensure the floor is clean, tidy and dry, free from oils and other lubricants.
- If using the machine over uneven floors and you have a hydraulic mast, ensure it is adjusted accordingly to maintain maximum traction.
- Check for excessive wear and damage to the drive wheel/s.

How fast does the machine move?

This is set in the factory to 3kph (5kph for the SmartMover) but can be altered by your approved service provider or dealer. Speed is also dependent on whether your machine has the two speed selector switch option and whether it is set to hare (fast) or tortoise (slow) speed setting. If you do have this option, the speeds given above are for the hare setting.

FAQs and Troubleshooting

What is the maximum load weight I can move?

This is given on page 1 in your machine Bolt-On manual however it will be limited by environmental factors such as slopes, floor conditions, rolling resistance etc. This is discussed during your initial evaluation and the correct machine will be chosen for your load.

What is the maximum coupling height?

Please refer to the 'Machine Dimensions, Layout and Weight' section in your machine Bolt-On manual.

Who do I contact for spare parts / technical details / breakdowns / further problems?

Please contact your approved service provider or dealer.