



**Operators Guide and  
Installation Manual**



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## **Operators Manual**

## Part List


### Main Items

Quantity	Item	Image
One	Battery Cable – fuse located in battery box for safety purposes	
One	Charging Lead	
One	Battery Compartment See table below for contents.	
One	Velocity Drive	
One	Split pin Insert Tool	






### Brace Bag Contents

Quantity	Item	Image
One	Torque Bar / Brace (according to leg specified)	
Two	Torque Bar Spacers (according to leg specified)	
One	Circlip (supplied with the bracket)	

### Attached To The Battery

Quantity	Item	Contents
Two	Battery Terminal Bolts Split Washer x1 Flat Washer x2	

## Battery Box Contents

Quantity	Item	Contents
One	Battery (see the "Attached To The Battery" )	
One	Manual Hand Crank	
One	Large Vibration Dampener	
One	Fuse (in bag). <b>Do not insert until the Velocity Drive is fully installed.</b>	
Two	Bolts M16 x 65 (in bag)	

One	Split Pin (in bag)	
One	Rubber Bung (in bag)	
One	Small Vibration Dampener	
Two	Nylock Nuts M16 (in bag)	
Four each	Battery Box Washers (in bag)  Battery Box Split Washers (in bag)  Battery Box Bolts (in bag)	





## **2. Safety Information**

The Velocity Drive is designed to take the physical effort out of raising and lowering trailer landing legs. Use of the Velocity Drive does not remove or reduce any of the hazards or risks associated with positioning tow vehicles or trailers for hitching or unhitching.

Raising or lowering trailer landing legs should only be carried out by trained, qualified and experienced personnel.

Safety information in this manual refers only to the operation of the Velocity Drive.

### **Warning**

**Rotating machinery – stay clear of output crank shaft during operation.**

**When using manual mode, disconnect the battery (remove fuse) before inserting hand crank.**

**Remove hand crank upon completion of manual operation. Failure to do so may cause injury.**

**Ensure hand crank is stored in original location before resuming powered operation.**

**Stand clear of vehicle and landing legs when raising or lowering.**

**Do not attempt to open velocity drive whilst in use.**

**Weight limits – do not attempt to exceed lifting capacity of landing leg.**

**Ensure legs are fully extended and the direction functions are correctly set before installation commences.**

**Caution**

**The telescopic landing legs must be in the correct gear before raising or lowering the landing leg.**

**Do not use the Velocity Drive or battery compartment as an anchor for securing loads.**

**To lift / lower a laden trailer, ensure low gear is engaged.**

### 3. Operating Information - Selecting High and Low Gear

The Velocity Drive uses the high and low gear functions of the landing leg for the following operating modes:

High gear - Used for raising or lowering the landing legs to and from ground level.

Low gear - Used for raising or lowering any load, including an empty trailer.

#### 3.1 Selecting High Gear

3.1.1 Firmly hold the Velocity Drive unit and pull outwards (towards yourself) until you feel it engage. You may hear a click (depending on the manufacturer).



3.1.2 If the unit will not engage the high gear, press the up button .



3.1.3 After 1 second, press the stop button.



This will release any tension in the leg gear box.


3.1.4 Repeat step 3.1.1


3.1.5 The unit is now ready to use.

## 3.2 Selecting Low Gear

3.2.1 To select low gear, firmly hold the Velocity Drive unit and push inwards (away from yourself) until you feel it engage. You may hear a click (depending on the manufacturer).



3.2.2 If the unit will not engage the low gear, press the up button. 

3.2.3 After 1 second, press the stop button.  This will release any tension in the leg gear box.

3.2.4 Repeat step 3.2.1.

3.2.5 The unit is now ready to use.

## 4. Powered Operations

The Velocity Drive is operated from the control panel /decal shown below.




The Velocity Drive has five modes of operation:

- Lower leg to ground
- Lifting trailer
- Lowering trailer
- Raising leg from ground
- Standby mode

### 4.1 Activate the Velocity Drive

4.1.1 Press and hold for 5 seconds the stop button.



4.1.2 The LED associated with the spanner icon  will light and the Velocity Drive is now operational.

If this LED is not lit, see the trouble shooting section for further guidance.

## 4.2 Standby Mode

4.2.1 After 40 seconds of inactivity, the Velocity Drive will automatically enter standby mode. All LED's will be off.

4.2.2 To reactivate the Velocity Drive, press and hold the stop button for five seconds.



4.2.3 The LED associated with the spanner icon will light and the Velocity Drive is now operational.



If this LED is not lit, see the trouble shooting section for further guidance.

## 4.3 Stop Functions

4.3.1 Press the stop button. The stop button may be used any time.





For example, press the stop button to stop the legs lowering, stop the timer, or to stop landing legs in an emergency.



4.3.2 After 40 seconds of inactivity, the Velocity Drive will automatically enter standby mode.

## 4.4 Lower Landing Legs

### Warning



**Rotating machinery – stand clear of output crank shaft during operation.**

4.4.1 Activate the Velocity Drive by pressing the stop button  for five seconds.  
LED associated with the spanner icon will light. 


4.4.2 Press the down button.   
The LED associated with the indicator icon will illuminate,  and the legs will automatically lower to the ground.

If this LED is not lit, see the trouble shooting section for further guidance.


In many cases, this is all that is required prior to decoupling. However, if needed complete the following steps.

4.4.3 Press the up button.   
Then one second later, press the stop button.  This will remove any load from the leg gear.

4.4.4 Ensure the legs are in low gear - grip the Velocity Drive unit and push inwards (away from yourself) until you feel it engage. You may hear a click (depending on the manufacturer).

4.4.5 Press the lift button once.   
The LED's associated with all three icons will light, and the Velocity Drive will operate for 30 seconds. If these LED's are not lit, see the trouble shooting section for further guidance.

4.4.6 The height required may vary from trailer to trailer, therefore repeat steps 4.4.3 to 4.4.5 until required trailer height is reached.

The legs can be stopped at any time by pressing the stop button. 




## 4.5 Lowering Trailer


### Warning


**Rotating machinery – stand clear of output crank shaft during operation.**


4.5.1 If the legs are not clear of the ground, the legs will need to be in low gear. To do this, grip the Velocity Drive unit and push inwards (away from yourself) until you feel the low gear engage. You may hear a click (depending on the leg manufacturer).

If you have difficulty engaging low gear, please repeat step 4.4.3. Otherwise continue on to step 4.5.2.

4.5.2 Switch the Velocity Drive on by pressing the stop button  for five seconds.


4.5.3 The LED associated with the spanner icon  will light, and the legs will lower. If this LED is not lit, see the trouble shooting section for further guidance.


4.5.4 Press the up button. 


The LED associated with the indicator icon  will light and the legs will rise slowly.

If this LED is not lit, see the trouble shooting section for further guidance.

Once clear of the ground the leg gearing should be changed to high gear to bring the legs up quickly.

4.5.5 Press the stop button  and change to high gear by firmly holding the Velocity Drive and pull outwards (towards yourself) until you feel it engage. You may hear a click (depending on the manufacturer).

4.5.6 Press the up button. 

4.5.7 The LED associated with the indicator icon  will light and the legs will rise slowly.

If this LED is not lit, see the trouble shooting section for further guidance.

4.5.8 Cranking will cease automatically.

## 4.6 Raising Legs From Ground


### Warning


**Rotating machinery – stand clear of output crank shaft during operation.**

### Caution


**When there is no weight bearing on the landing leg, place the Velocity Drive into high gear (see 3.1 ).**


4.6.1. Ensure the legs are in high gear - firmly hold the Velocity Drive unit and pull outwards (towards yourself) until you feel it engage. You may hear a click (depending on the manufacturer). If you have difficulty engaging high gear, please repeat steps 4.4.3. Otherwise continue on to step 4.6.2.

4.6.2. Activate the Velocity Drive on by pressing the stop button  for five seconds.

4.6.3 The LED associated with the spanner icon  will light.

If this LED is not lit, see the trouble shooting section for further guidance.

4.6.4 Press the up button. 

4.6.5 The LED associated with the indicator icon  will light and the legs will rise slowly.

If this LED is not lit, see the trouble shooting section for further guidance.

4.6.6 Cranking will cease automatically.

## 5. Manual Operation

### Warning.

When using manual mode, **REMOVE BATTERY FUSE** before inserting the hand crank. Failure to do so may cause injury.

In the event of a fault or a power failure, the Velocity Drive may be operated manually using a hand-crank, located in the battery box (see image below).



Remove hand crank, and replace screw cap upon completion .



Store crank handle in original location before resuming powered operation.

## 5.1 Lowering / Raising Leg Using Hand-Crank

### Warning.

When using manual mode, **REMOVE BATTERY FUSE** before inserting the hand crank. Failure to do so may cause injury.

5.1.1. Remove the Velocity Drive fuse located inside battery compartment.

5.1.2. Slide the hand-crank out from battery compartment.

5.1.3. Use a flat blade screwdriver to carefully unscrew and remove screw cap



to reveal the hex socket.



5.1.4. Place the leg into the required gear (see 3.1 or 3.2).

5.1.5. Using the hex-key on the hand crank:

A) rotate crank clockwise to raise the legs and lower trailer.

B) rotate counter-clockwise to lower the legs and raise trailer.

5.1.6 When completed remove hand crank.

5.1.7 Replace screw cap and return hand-crank into the battery compartment see image on page 20).

5.1.8 Replace fuse.

## **6. Maintenance**

The Velocity Drive has been carefully designed to require very little maintenance by the end user.

If the Velocity Drive decal comes into contact with harmful chemicals, wipe off immediately. Prolonged exposure to chemicals will damage the decal, possibly eroding the adhesive, or damaging the symbols.

A visual check of cables should be carried out before each use to ensure the safe working operation of the Velocity Drive.

**UNDER NO CIRCUMSTANSE SHOULD THE UNIT BE  
OPENED.**

## 7. Troubleshooting

Symptom	Cause	Solution	Alternative Solution
No power LED's are not lit	Blown fuse	Replace fuse	Manually crank and book into local depot
Slow operation, LED's are lit	Low voltage	Ensure charging cable is connected and is not damaged	Book into depot
	Gear ratio	Ensure unit is in correct leg gear (See Page 3.1 or 3.2)	Book into depot
Output crank shaft rotates but leg not moving	Leg gear is in neutral	Ensure unit is firmly in gear. (See Page 3.1 or 3.2)	Book into depot
Unit begins to lift then immediately stops	Over-current cut-off	Unit will not lift weight in high gear. Ensure unit is in correct leg gear (See Page 3.1 or 3.2)	Manually crank & book into local depot
Leg will not engage correct gear	Gearing not meshing correctly	Press the up button and after one second, press the stop button	Manually crank & book into local depot

Symptom	Cause	Solution	Alternative Solution
Red LED flash	Battery voltage outside expected limits	Voltage is >15v Use different battery  Voltage is <8v Charge battery	Book into depot
Yellow LED flash	Temperature is too high	Allow the unit to cool	Book into depot

## 8. Technical Specifications

### 8.1 Mechanical Specifications

Crank Torque	Up to 120nM, 33-48 RPM using smart technology  Equivalent to 16,000 Kg lift above landing legs.
Mechanical Drive	230:1 gear reduction ratio.  At least 30rpm output shaft speed at rated torque (equivalent to one manual turn of the crank handle per second).  Manual crank option included (with device still fitted).
Operation Times	Lower legs to ground (30cm / 12") - 27 seconds typical Timed trailer lift (3cm / 1.2" typical lift) - 30 seconds.  Raising legs - 60 seconds typical
Compatible Landing Legs	All industry standard landing legs are supported (includes Jost, K-Hitch, Fontaine, SAF Holland, etc).  A wide variety of adaptor plates are available. Contact your local supplier for more details.

### 8.2 Material Specifications

LM6 Aluminium Casting Alloy	
This alloy conforms to BS 1490:1988 LM6	
Corrosion Resistance	LM6 exhibits resistance to corrosion under both ordinary atmospheric and marine conditions.

### 8.3 Environmental Specifications

Temperature	Operational: -25°C to +60°C / -13°F to +140°F  Storage: -40°C to +60°C / -40°F to +140°F  Case rise @ full load: < 3°C
Humidity	• 0%to95%RH
Water Resistance	• IP66 (protected against hose-down)



## 8.4 Electrical Specification

Motor Power	600W @ rated torque, 50A / 12V @ rated torque. 11,000rpm @ rated torque
Battery Specification	12V sealed lead-acid. Low maintenance 20Ah capacity, 60A peak current 15A typical for leg raise or lower Operation 30A to 60A typical for trailer raise operation (user configurable trip point depends on trailer weight) 2mA @ standby
Cranking Cycles	2-14 hitch / unhitch cycles between local battery recharge cycles Unlimited hitch / unhitch cycles with trailer lighting circuit active (recharging local battery between cycles)
External Supply From Vehicle	Connection to trailer side-lights circuit 10V to 28V (suitable for 12V and 24V systems) Automatic charging of local battery whenever trailer lighting circuit is active
Automatic Charging of Local Battery	Ambient temperature compensated 2-stage automatic charging Float voltage of 13.7V @ 25°C / 77°F Charge current of 1A to 2A typical
Recharge Time	1 hour, after typical trailer un-hitch operation 15 mins, after typical trailer hitch operation
Standby Time	Up to 5000 hours standby between re-charge cycles of local battery

## 8.5 Standards and Regulatory Compliance

Electro-magnetic compliance (EMC)	Emissions: CISPR 25, FCC part 15 Immunity: ISO 7637-2, IEC 61000
Safety	Electrical: TBA Physical: ADR 63, UL 1112
Shock and Vibration	EN 60068
Markings	CE, C-tick, UL, FCC

## 8.6 Leg Drive Performance

Leg lower 48 RPM = 72cm per minute
Leg lift 34 RPM = 51cm per minute
Lift 16 Tonnes – 33 RPM = 30mm per minute in low gear.

## 8.7 Operational Configuration and Safety Cut-Off

Over-Current Cut-off	Cranking action will cease automatically if preconfigured motor currents are exceeded.  Current trip point can be configured by user between 30A and 60A in 5A steps (7 levels)
Over-Temperature Cut-off	Automatic shut down if enclosure reaches 80°C / 176°F  Yellow indicator will flash, showing over-temperature  Automatic re-start when enclosure cools to safe level
Over / Under-Voltage Cut-off	Auto-shutdown if local battery voltage outside safe levels.  Auto-shutdown if trailer lighting circuit voltage outside safe levels.
Orientation of Controls	Cranking direction can be reversed for the 'up' and 'down' buttons. This allows installation on either side of a trailer.



## **Installation Guide**

## 9. How To Install The Velocity Drive

### 9.1 Fitting the Torque Bar

#### You will need:

Torque Wrench  
Socket wrench 15/16" or 24mm  
Pair of nuts supplied (see battery box)  
Pair of bolts supplied (see battery box)  
Bracket  
Spacers (dependant on bracket supplied)

#### Instructions:

**Note: The Velocity Drive should be installed by qualified persons only. These instructions are for guidance only.**

9.1.1 Remove the manual crank handle from the drive shaft.

9.1.2 Bolt on the leg mounting bracket, using the spacers supplied, (dependant on bracket supplied).



9.1.3 Check the Velocity Drive will align with the drive shaft and the mounted bracket.

9.1.4 Adjust as required.

9.1.5 Torque up the mounted bracket bolts to the leg manufactures recommendations (check with your leg manufactures for more details).

## 9.2 Fitting the Velocity Drive

### You will need:

Manual Hand Crank  
Split Pin  
Hammer  
Punch

### Instructions:

9.2.1 If required, clean or lubricate the drive shaft.

9.2.2 Attach the velocity drive to the leg drive shaft.



9.2.3 Remove the screw cap



to expose the hex socket.



9.2.4 Insert the manual hand crank and rotate to align the Velocity Drive output hole with the drive shaft hole.



9.2.5 Insert the supplied split pin using a hammer and supplied inserting tool.

9.2.6 Replace screw cap.

9.2.7 Replace manual hand crank into the battery box, ensuring the lid is replaced firmly.

## **9.3 Preparing the Battery Box**

### **Warnings:**

**Before using conductive tools on a battery, remove metallic personal adornments from the hands and wrists, e.g watches and rings.**

### **You will need:**

8 mm Spanner  
Cross head screwdriver

### **Instructions:**

9.3.1 Remove the front cover of the battery box and lay out the contents.

9.3.2 Remove the battery bracket and battery.

9.3.3 Attach the battery cable.

9.3.4 To attach the battery cable, first, using the 8mm spanner, connect the black lead on the battery cable wire to the black negative terminal.

9.3.5 Connect the red positive lead on the battery cable to the red positive terminal.

9.3.6 Ensure both connections are secure.

9.3.6 Ensure the large vibration dampener is in the battery box before replacing the battery.

9.3.7 Replace the battery in the battery box.

9.3.8 Place the smaller vibration dampener on top of the battery.

9.3.9 Attach the battery bracket, taking care not to cover the punched hole in the small vibration dampener.



9.3.10 Adjust the grommet and route the battery cable around and out of the box.

9.3.11 Remove the black bung from the battery box bag, and insert into the empty cable entry hole.

9.3.12 Insert the manual crank handle to the punched hole on the small vibration dampener. Take care not to make contact with the battery terminals.

9.3.13 Replace the lid.

9.3.14 The battery box is ready to be installed.

## **9.4 Fitting The Battery Compartment To The Trailer**

### **You will need:**

Drill bit 9mm or 11/32"

Socket Head 13mm or 1/2"

### **Instructions:**

9.4.1 Select a suitable location on the trailer.

9.4.2 Using the template supplied as part of the fitting kit, create four holes to secure the battery box.

9.4.3 Attach the battery box using the screws, bolts and washers supplied.

9.4.4 As the final steps, insert the fuse supplied in the battery box bag.

9.4.5 Replace the battery box cover.

## 9.5 Connecting Battery Charging Lead To A Trailer Lighting Circuit.

9.5.1 To connect the charging lead to the lighting circuit, a qualified auto-electrician will be required to modify the lighting circuit.

9.5.2 The following connections are required:

The brown 12v supply cable to the red charging lead.  
The white ground cable to the black charging lead.



9.5.3 For most trailers, this is the correct wiring configuration.

If uncertain, check with your leg manufacturer.

The battery charger works automatically. If the red LED flashes, there may be a possible issue with the trickle supply which tops up the battery.

## 10. Configure The Velocity Drive

The lifter provides two simple configuration options. The first is to invert or swap the direction of up and down buttons, the second is to configure the force limit at which the lifter will turn off.

### 10.1 Re-Program The Direction Buttons

If the Velocity Drive is trying to lift the leg when you want it to lower the leg, you will need to swap the direction.

#### **Instructions:**

10.1.1 Ensure the Velocity Drive is in standby mode, this means it is connected to its battery but all indicators are turned off.

10.1.2 To do this, leave the Velocity Drive inactive for 40 seconds, or until all the LED's are off.

10.1.3 Press and hold both the up and down button until you see all three indicators turn on.



10.1.4 Release the buttons and wait till the LED's switch off.

10.1.5 To reverse the direction to original settings, repeat the previous steps.

**Note:**

Swapping the direction affects the timed mode button which is configured to lift for 30 seconds.

## 10.2 Adjust The Force Limit

The lifter will always stop when the force limit has been exceeded.

### Instructions:

10.2.1 Press and hold the timer button for 5 seconds.



10.2.2 The LED's will light to show the current configured force (see table below).

10.2.3 Consult the table below to determine the current setting.

Current	Indicators	Description
5	Green	This is the lowest setting
10	Yellow	
15	Green and Yellow	
20	Red	
25	Green, Red	
30	Yellow , Red	
35	Green, Yellow , Red	This is the highest setting

10.2.4 To increase the force by one step, press and hold both the timer button and the down button until the LED's illuminate (see table on previous page).

10.2.5 Repeat as required.

10.2.6 To decrease the force by one step, press and hold both the timer button and the down button until the LED's illuminate (see table on previous page).

10.2.7 Repeat as required.





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