Miniature Railway Workshop Limited.

www.miniaturerailwayworkshop.com

Email. miniaturerailwayworkshop@gmail.com
Tel. 07591 006642

Operating Instructions for Hurricane Steam Raising Blower

Version 1 (01/02/2022)

Registered office; Unit 1A & 1B, New Line Road
Kirkby-in-Ashfield, Nottingham, NG17 8JQ

Preface

Miniature railways are not a toy, the power of a miniature locomotive is significant and the momentum of a moving train is equivalent to that of a car. They should be treated with the respect and caution that they deserve. The heat created when a miniature steam locomotive is in steam is well in excess of 100 degrees celsius and therefore poses a significant burn risk to the operator and anyone who is in close proximity. We have outlined as much guidance as we are able, but it is down to you to implement your own risk assessments and put in place safe working practices when operating miniature railway locomotives, rolling stock, products and equipment. Please also remember to use a good amount of common sense and most of all enjoy operating your locomotive.

Content table

Introduction

Steam raising blowers for miniature steam engines have been in use for decades. The intended purpose of a blower is to create an improved draw through the firebox of a steam locomotive. This in turn significantly reduces the time required to bring the fire to a stage where it is generating the heat necessary for steam to be created which will in turn allow the loco's steam blower to function.

Hurricane Blower in use raising steam on the 9 ½" gauge Lakeshore Railroad

At MRW, through attempting to get hold of a good blower ourselves, we arrived at the conclusion that the hobby needed a powerful, reliable and supported blower that would take the hassle out of a day's steaming. With years of experience operating miniature steam locomotives and a 12 month testing period of the fundamental design, we are confident that the Hurricane, designed and manufactured by us right here in Nottingham, UK, will serve you well for many years.

Hurricane Steam Raising Blower

Hurricane Blower in use raising steam on a 7 ¼" gauge LNER K2.

The Hurricane steam raising blower is composed primarily of aluminium with some steel components and a 12V fused electrical system. The product weighs approximately 2.5kg (2.2kg in later versions) and has a swing handle for more compact storage. With a bypass flap on the base, the Hurricane has the ability for the draw through the locomotive to be varied.

On newer models feature a rubber o-ring to reduce vibration on the chimney and noise (this can be retrofitted to earlier versions, please contact us).

Suitability of the Hurricane is defined as large 5 inch gauge locomotives up to small 10¼ inch gauge locomotives. It is also compatible with many miniature traction engines and is well suited to 3" scale. Prior to dispatch, the Hurricane Blower is put through a series of electrical and functional quality checks to ensure it is performing correctly.

Operating Instructions

Place the blower on top of the chimney before lighting the fire with a suitable power supply at the ready but importantly do not have the power connected. Light the fire in the conventional manner, close the fire hole door and connect the power supply at this point. *It might prove helpful to have a friend assist this process.*

Charcoal soaked in Paraffin being placed in the firebox.

The Hurricane is designed to work with 12V leisure and automotive batteries. IMPORTANT: Ensure the red crocodile clip is attached to the positive (+) terminal of the battery, and the black crocodile clip to the negative (-) terminal. Failure to connect the product to the battery in the correct orientation should not cause damage (the fan unit will spin in the opposite direction). In this instance, the fire will not be drawn correctly, possibly leading to blow back and posing a burn risk to the operator. Be sure to connect the terminals correctly.

With the Hurricane on the chimney of the locomotive, the operator must pay close attention to the draw it is creating. If the draw is too powerful for the size of the locomotive, the bypass flap should be opened to reduce it accordingly. It may prove wise to adjust the damper as the fire builds with the minimum draft as the fire is first light.

If the locomotive is particularly small then it may prove wise to run the blower on 6 Volts.

Hurricane blower bypass flap.

When the fire is strong and boiler pressure is beginning to build, the conventional steam blower should be used. The Hurricane should be removed with the foldout handle to prevent the chance of burns to the operator. Removal of the product in a timely manner will also reduce excess soot build up inside the body and fan unit. Leave the product away from people/members of the public to cool in its own time. The product should be cool enough to handle and pack away after 45 minutes of rest.

If using coal that deposits particularly thick soot, we recommend leaving the Hurricane running during cooldown as this will reduce the chances of the fan binding in future steamings. Importantly do not allow the blower to suck up any debris during this cool down period.

Hurricane blower in use with a Station Road Steam Stafford.

Bringing a locomotive to steam with a forced draw always increases the risk of thermal shock to the boiler and therefore damage. The use of any blower by the operator is the acceptance of the increase of this possibility and Miniature Railway Workshop have made this clear through the webshop product listing and this user guide. Miniature Railway Workshop Ltd accepts no liability for damage to boilers and operators of blowers must be mindful and accepting of the risks involved with using the product for forcing a draft. We recommend using the least possible draw enhancement offered by the product in conjunction with the bypass flap to reduce the risk of damage to boilers as much as reasonably achievable.

Maintenance, Wear and Tear

The Hurricane blower is designed to receive relatively little maintenance and it's aluminium bodied construction means that corrosion is not a significant issue. Corrosion can occur on the base (early steel base models) and the chimney pipe, however these are thick gauge metals and should cause no bother for many years of use.

It is possible that soot build up can cause a reduction in performance and potentially cause drag on the fan unit. Should you observe excessive build up of soot on the exhaust vents on the product, hear any dragging noises during operation or experience a noticeable drop in performance, the product should be disconnected from the power supply immediately for maintenance. Failure to do so can cause such issues as motor burn out and excessive internal temperatures, eventualities which are not covered by our 1 year warranty.

To clean the product, we offer a cleaning service at MRW to ensure your blower remains in good serviceable condition. We will also inspect the product for wear and tear and guarantee it for a further 6 months, (or until expiration of the warranty period, whichever comes first).

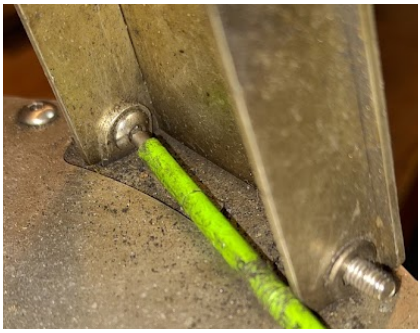
Alternatively, you can clean the product yourself. We recommend placing the body into a paraffin bath and to submerge the fan assembly. The bath should not submerge the motor in any way as this can lead to failure. Scrubbing may be effective to remove large deposits. For this we recommend a hard plastic bristled brush or non metallic scrubbing pad as to not scratch the surfaces of the blower.

The blower should be inspected prior to every use. Failed or loose bolts, broken welds on the base assembly (earlier models) or cuts in the electrical cable can cause instability, poor performance or electrocution respectively. Openings on the casework are not intended and pose a risk of injury to the user due to the high speed rotating fan assembly.

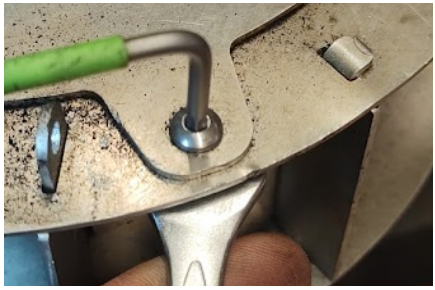
Cleaning the Hurricane

Clogged vents will significantly decrease the effectiveness of the blower. When working on the blower, always ensure it is disconnected from the power source.

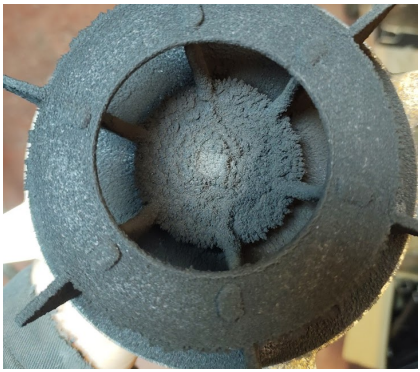
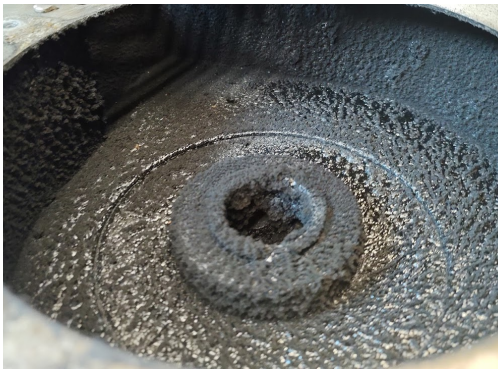
Only two tools are required for disassembly - a 7mm spanner and a ball ended 2.5mm allen key. A ball end is very important for accessing the bolts for the hoop assembly.




First we will remove the hoop. Place the ball ended allen key into the bolt head to secure it and back off the nut with the 7mm spanner.

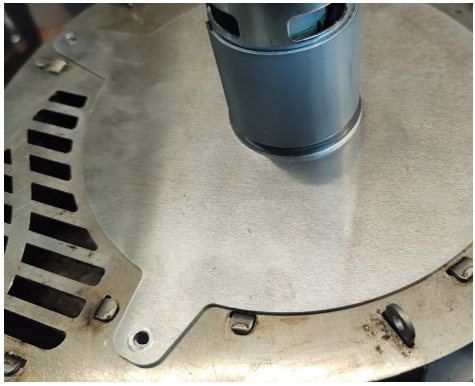



With a flat headed screwdriver, pry the terminal cables off of the motor. You can then remove the hoop and handle assembly. With the 2.5mm allen key and the 7mm spanner, remove the 4 bolts to hold the motor assembly to the body.

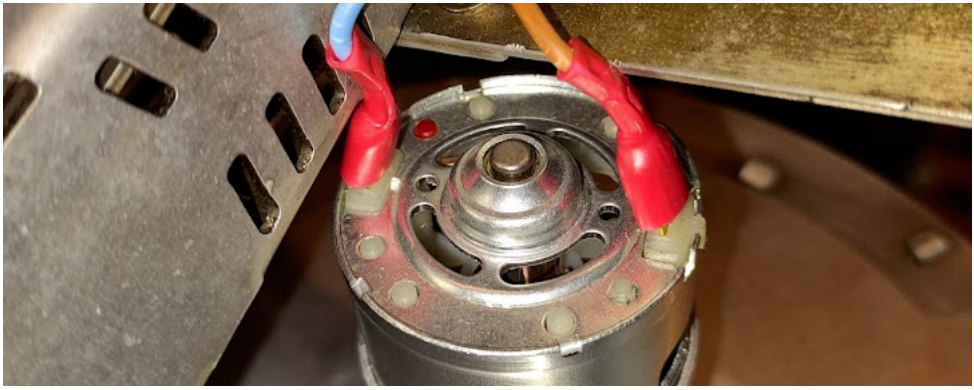



Remove the motor assembly by simply lifting it upwards, with the bolt holes aligned. Internally, the product can still continue to function with significant soot deposits, but performance will gradually reduce.


Using a suitable aluminium-safe solvent, soak the blower and leave it to sit for a while. We use acetone, but paraffin is also suitable and white spirit can work if you don't mind using a bit of elbow grease. Ensure you are following the usage instructions of any solvent you use, alway ensuring to use in a well ventilated area. Clean away deposits as best possible.



Using a pointed implement, clean any soot deposits from the chimney pipe so that the holes for the bypass flap are open. Clean the body of any soot marks and bolt the motor assembly back down.



IMPORTANT: When bolting the hoop back on, pay very close attention to the motor connectors. They are wired to spin the **anti-clockwise**. Ensure the blue wire (black on very early models) is connected to the terminal closest to the red dot on the motor housing. The brown (red on early models) should be furthest away from the red dot. **Remember to attach the motor terminals before bolting the hoop down, it is very easy to forget and almost impossible to do afterwards.**

WARRANTY: Defective items will be repaired/replaced free of charge within one year from the date of sale, provided there is no misuse of the product to cause the defect. We take component failure incredibly seriously as it undermines the pillar of quality we aim to provide with every product manufactured here at MRW. Should component failure occur, it will be thoroughly investigated and retested to establish whether product recall is necessary. In this eventually, we may take the option to refund the product with no replacement to be offered. We do not offer refunds for products/components damaged during disassembly - a service to clean your product is available at a reasonable price. Please do get in touch with us for this service.

Periodic checks

The Hurricane requires continuous monitoring to ensure it is safe for use. The cable should be checked for cuts and damage, the body should be checked for structural integrity and soot build up should be monitored.

By ensuring these aspects of the product are in serviceable condition, it will be safe and fit to use.

Storage

The Hurricane is constructed largely of non-ferrous metals however there are still aspects of the design, including the base on early models, the chimney pipe and internal components of the motor that are susceptible to corrosion. It is therefore recommended to store the Hurricane in a dry environment whilst not in use to ensure its condition is preserved for the long term.

After using the Hurricane for steaming, it should be placed in an area that cannot be accessed by people who are not going to be operating the product to allow it to cool. It should be left to cool for a minimum of 45 minutes before attempting to pick it up, however always exercise caution. Failure to check the product's temperature can lead to burns, or even fire if stored àway hot. As always, the folding handle should be the point of contact for the hand and this will minimise the risk of injury through burns.

Transportation

The product has a rigid body and is relatively robust, however some aspects of the design are stronger than others and to reduce avoidable damage, we recommend heavy objects are not placed on or around the product during transportation. Do not attempt to move the Hurricane around whilst it is being left to cool as this can lead to burns and potential injury.

PPE

Personal Protective Equipment (PPE) should be used when handling the Hurricane.
We recommend wearing the following:

- General purpose fabric work gloves.
- Steel toed boots or shoes - the product has enough weight to cause injury if dropped from height onto the operator's foot. The thick, protective nature of steel toed shoes should also help prevent burns should the product be dropped into a foot whilst it is being removed from the loco for cooling.
- Overalls - these should help reduce the chances of accidental burns to the skin.

Please note: this is not an exhaustive list of PPE, please consider any possible risks whilst operating, moving, and allowing the product to cool. It should be clear that a product designed to bring a locomotive into steam

will in turn become exceptionally hot, however this may not be the case for other operators, volunteers and bystanders. It is the responsibility of the user to take appropriate action to reduce the risks involved with operating a steam locomotive and this product.

End of life

The product is designed to last many years and we aim to continue to support it with spares and components indefinitely. Should you need to enquire about a replacement part, please contact us directly and we will be happy to help. In the unfortunate eventuality that the product becomes damaged beyond repair, it can be separated into its sub-assemblies and recycled at your local metal recycling center.

Some models contain steel bases, and these especially must be separated from the non-ferrous aluminium body and handle. You will need a 2.5mm Allen key and a 7mm spanner. Bolts used are stainless steel so should be in good condition when the product is ready to be recycle

Hurricane Blower Risk Assessment

NO.	Hazards anticipated	Risk level		Person at risk	Control measures	Residual Risk
1	Burns from handling product.	**20**	**High**	Operators, bystanders	Correct use of handle, advised PPE in can reduce severity of burn, placing the product in a hard to reach place when cooling, use of signs, cooling boxes.	**15**
2	Electrocut- ion	**10**	**Moderate**	Operators, bystanders	A safety check of the wire before use for cuts, damage and fraying wires will significantly reduce this risk. Keep bystanders away from power supply.	**6**
3	Particles in eyes	**10**	**Moderate**	Operators, bystanders	Use in a well ventilated space/outdoors, wearing of eye protection, ensure user does not lean over the product from above. Keep bystanders away.	**3**
4	Smoke/ particle inhalation	**10**	**Moderate**	Operators, bystanders	Use in a well ventilated space/outdoors, burn smokeless coal, ensure user does not lean over product from above. Do not use product if you experience breathing difficulties. Keep bystanders away.	**3**
5	Finger traps	**9**	**Moderate**	Operators	Product is designed to mitigate this risk, but damage or poor reassembly after maintenance can introduce traps. Inspect product before use to ensure no gaps in casework.	**3**
6	Carcinogen-ic exposure from steel coated in oil	**3**	**Low**	People within close proximity, during transportati on.	Steel components are coated in oil from the steel mill as an anti-corrosion agent. Wear general purpose workshop or rigger gloves.	**1**

Summary
Risk is mostly low when used products are used in accordance with correct operating procedures laid out in manual and following the guidance of the Passenger Carrying Miniature Railway Safety Group (PCMRSG). The product always gets incredibly hot during use just like the steam locomotives it is used with and operators should always be mindful of the dangers of burns for both themselves and any other person the product may come into contact with. If in doubt, use in an environment away from any other people.
Recommendations/Further actions
Follow the user guide, use appropriate PPE and follow (PCMRSG) guidelines.
References
User guide, (PCMRSG), https://www.miniaturerailwayworkshop.com/

Likelihood	Consequences				
Risk Assessment Matrix	**Insignificant (1)**	**Minor (2)**	**Moderate (3)**	**Major (4)**	**Catastrophic (5)**
	No injuries	First aid treatment	Medical treatment	Hospital	Death
Almost Certain (5)	5	10	15	20	25
Often occurs / once a week					
Likely (4)	4	8	12	16	20
Could easily happen / once a month					
Possible (3)	3	6	9	12	15
Could happen or known it to happen / once a year					
Unlikely (2)	2	4	6	8	10
Hasn't happened yet but could / once every 10 years					
Rare (1)	1	2	3	4	5
Conceivable but only on extreme circumstances / once in 100 years					
	Residual Risk				
	Low	Moderate	High	Catastrophic	
	1 -3	4 - 9	15 - 25	15 - 25	

Some of the MRW team at a exhibition.

Everything is made in Britain and built to last.

Where possible we source our materials, such as steel for rails and plastic wood for sleepers, from the UK and all of our manufacturing is solely based in Nottingham. Furthermore, we aim to make as much as possible in-house with the cutting, finishing, welding, assembly, quality check and dispatch all undertaken by ourselves at the workshop.

Hurricane blower in use with a Tinkerbell Class Locomotive.