

LS14 Lawn Scarifier

Operating Instructions

Before commissioning the machine, read operating instructions and observe warning and safety instructions.



Manufacturer Details

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Machine Details

Model:	CAMON LS14 Scarifier
Serial Number:	
Engine Serial No:	
Date of Purchase:	
Supplier:	

Table of Contents

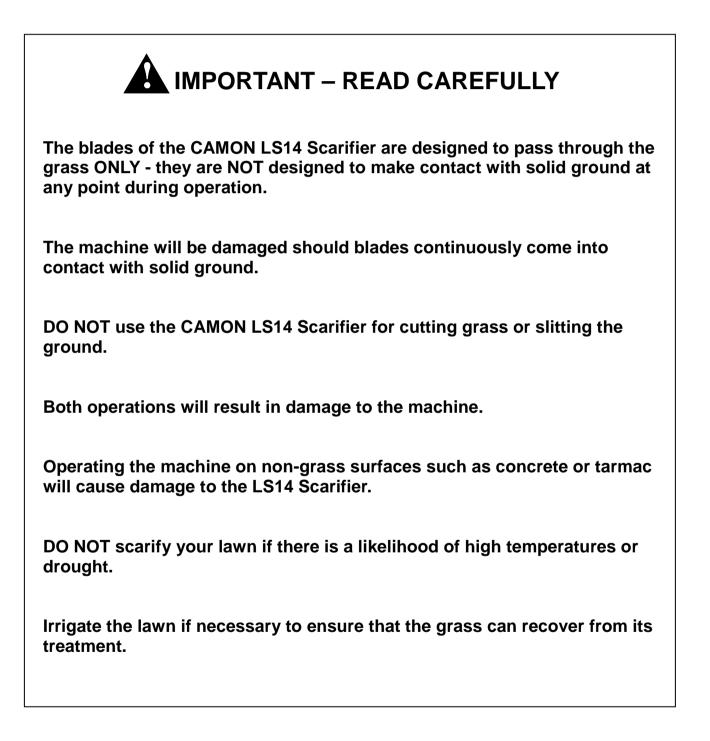
1.0	What the Machine is Designed For 2 1.1 Applications 2			
2.0	.0 Specifications			
3.0	Unpacking and Assembly 3.1 Major Components Diagram 3.2 Unpacking Instructions	. 4		
4.0	 Safety Instructions – Pre-Operation	555566666		
5.0	Safety Instructions Starting and Operating.5.1To Start the Engine.5.2To Stop the Engine .5.3Safety Equipment .5.4Operation.5.5Procedure for Unexpected Shut Down .5.6How to Clear Unwanted Debris from the Underside of the Machine .5.7Residual Risks of the LS14 Scarifier .	. 8 . 9 . 9 . 9 10 10		
6.0	Maintenance 6.1 Schedule 6.2 Basic Maintenance 6.3 Advanced Maintenance 6.3 6.3 Advanced Maintenance 6.3.1 Belt 6.3.3 6.4 Engine 6.4.2 Change Engine Oil 6.4.3 Air Filter 6.4.4 Spark Plug 6.5 Cleaning 6.6.1 Machine 6.6.1 Machine 6.6.2 Engine 6.6.3 Lubricants	11 11 11 12 13 14 14 15 15 15		
7.0 8.0	Transportation, Storage and Handling 7.1 7.1 Transportation 7.2 Storage 7.3 Handling Service Record 7	16 16 16		
Warranty Registration				
	EC Declaration of Conformity			

1.0 What the Machine is Designed For

1.1 Applications

The CAMON LS14 Lawn Scarifier has been designed by Tracmaster for removing the dead thatch and moss from lawns and other grassed areas.

The benefit of scarifying a lawn is that it allows air, water and nutrients to reach the roots of the grass whilst removing unwanted dead and foreign material.



2.0 Specifications

ENGINE	
Engine Manufacturer	Honda
Engine Model	GP160
Engine Type	4-stroke OHV, single cylinder
Net Engine Power	3.6kW (4.8hp) @ 3600rpm
Engine Shaft Size	¾" straight
Spark Plug	BPR6ES (NGK) / W20EPR-U (DENSO)
Spark Plug Gap	0.70 - 0.80mm
Engine Ignition Type	Recoil
Cold Start System	Choke
Fuel Tank Capacity	3.1 litres
Fuel Type	Unleaded
Fuel Consumption	1.4 litres per hour @ 3600rpm
Air Filter	Paper
Rated Engine Speed	3600rpm
Engine Oil	10w/30 API SJ or later
Engine Oil Capacity	0.6 litres
Dry Weight	15.1kg

The power rating of the engine indicated in this table is the net power output tested on a production engine for the engine model and measured in accordance with SAE J1349 at a specified rpm.

MACHINE	
Model	LS14
Working Width	42cm
No of Blades	15
Direction of Rotor	The rotor rotates in the same direction as travel
Clutch Type	Centrifugal
Height Adjustment	From 0mm above the ground to 20mm
Discharge	Onto the ground or into collection bag if fitted
Wheel Types	Solid rubber
Handlebar	Foldable
Noise Level	86db(A)
Vibration Acceleration Value	6.2ms ²
Max Gradient for Operation on Slope	20 degrees
Weight	40kg
Dimensions (I x w x h)	95 x 60 x 102cm

3.0 Unpacking and Assembly

3.1 Major Components Diagram



- 1 Operating Lever
- 2 Engine
- 3 Belt Guard
- 4 Handlebar Locking Knob
- 5 Rotor Cover
- 6 Wheels
- 7 Front Axle
- 8 Height Adjustment Knob

3.2 Unpacking Instructions

Open the top of cardboard box.

Cut the box open by using a sharp knife to cut down through the four corners of the box.

Swivel the folded top part of the handle bar upwards until it locates into position extending from the lower handle bar arms.

Tighten the top handlebar into position using the locking knobs provided.

Push the machine forward safely and gently out of the box.

Dispose of the cardboard box and other padding material.

4.0 Safety Instructions – Pre-Operation

4.1 Basic Safety Instructions

Before starting the machine, read and understand these operating instructions.

4.2 Main Components and Operating Elements

Below is a description of the main components of the LS14 and how they operate.

4.3 Engine and Drive



The Honda GP160 is a four stroke engine that runs on standard unleaded fuel.

The Honda GP160 is fitted with a red on/off lever that is the main operating control for this engine. Rotating the switch to the 'l' position allows the engine to be started. Rotating the switch to the 'O' position will turn off the engine.

The engine is air cooled and therefore it is important that the grille covering the recoil rope is kept clear from debris.

The engine drive shaft is fitted with a centrifugal clutch that engages at a set engine speed and drives a fixed drive belt that is also connected to a pulley on the rotor shaft.

The engine air filter cleans the air drawn in by the engine. A clogged air filter will reduce performance.

The engine is fitted with a fuel on/off lever and a choke lever. Read the engine operating instructions to understand the operation of these levers.

4.4 Operating Lever

The LS14 Scarifier is operated by squeezing the black lever located at the top of the handlebar. NB: IT IS A TWO STAGE PROCESS TO PULL THE BLACK LEVER. THE GREY LEVER LOCKING CATCH MUST BE DEPRESSED BEFORE THE BLACK OPERATING LEVER CAN BE SQUEEZED BY THE OPERATOR.

This lever increases the engine speed to a level that will engage the centrifugal clutch fitted to the engine drive shaft. Once the clutch has been engaged it will transfer the engine power to the rotor shaft that will rotate at high speeds within the chassis of the Scarifier.

4.5 Height Adjustment

The height of the blades of LS14 Scarifier is altered using the two large knobs at the front of the machine.

The top knob is connected to the centre of the front axle via a threaded rod. Rotating the knob in each direction will raise or lower the front axle in relation to the main chassis of the machine and in turn alter the height of the blades with the chassis.

The second knob located below the top knob on the threaded rod is used to fix the position of the threaded rod and consequently the height of the blades relative to the front axle.

4.6 Optional Collection Bag

Use the central lifting handle when connecting or disconnecting the bag from the machine.

Always stop the engine and wait for the blades to stop rotating before removing or replacing the collection bag.

To attach the collection bag onto the machine, first lift the safety back flap on the rear of the machine chassis with one hand. Then whilst holding the bag with your other hand guide the two small metal rods protruding from either side of the collection bag frame into the two channels that have been formed to hold the bag.

4.7 Rotor Shaft

The main rotor shaft holds 15 steel blades and 14 separating spacers.

4.8 Commissioning

Prior to operation it is necessary to check the engine oil level and add engine oil level to the levels indicated in the table in section 5.1.

The engine fuel tank will not contain fuel so will need filling to the recommended level before use.

4.9 General Safety Instructions

Be aware of all the safety requirements for the machine.

Visually check the machine for operational safety, complete componentry and fixed guarding prior to each use.

Read and be aware of the warning and instruction signs located on the machinery.

Cordon off the work area to prevent access from the general public.

Before starting work clear the area of any objects that may cause damage to the machine.

Do not operate the machine if you are under the influence of alcohol or drugs. This equipment must only be operated by persons who are medically fit both physically and mentally.

Only work in good light and visibility.

Wear the correct personal protection equipment as instructed by this manual.

Operator clothing should not be loose and footwear should offer good grip.

Know how to stop the machine in an emergency.

4.10 Engine Specific Safety Instructions

Always ensure the engine is turned off and fuel tap is turned off when transporting the machinery, cleaning the machinery and making adjustments.

Always start the engine in open air. Starting an engine within a confined space can lead to the inhalation of toxic substances.

Do not smoke or use a naked flame when refueling.

Only use unleaded petrol from fuel containers designed for this purpose. Refuel outdoors only and replace the fuel tank cap securely.

Do not mix oil with the fuel.

Leave one inch of space in the fuel tank during refilling.

Clear up any petrol spillages immediately.

Avoid contact with the engine, especially the exhaust during operation as it will become hot. Leave the engine to cool prior to contact.

Never interfere with the control settings of the engine.

NEVER TILT THE MACHINE BACKWARDS WHEN CLEANING.

5.0 Safety Instructions Starting and Operating

5.1 To Start the Engine

Using the dipstick provided, check the engine oil level. Top up with 10w/30 oil if the dipstick is clear of oil.	OIL FILLER CAP/DIPSTICK UPPER LIMIT
Check the fuel level. Refill as necessary and as determined by the fuel tank type – see diagram.	MAXIMUM FUEL LEVEL (strainer type) FUEL TANK TOP 25 mm (1 inch) 25 mm (1 inch) Ptore by Herds
Switch the engine ignition switch to the ON position.	ENGINE SWITCH Horda Picture
Turn the fuel tap located on the engine carburetor to the ON position. If the engine is cold or has not been operated recently set the choke lever on the carburetor to the ON position.	FUEL VALVE LEVER CHOKE LEVER THROTTLE LEVER Fuer by Hods

Pull the engine recoil handle slowly until it engages then pull hard and fast to start the engine.

After the start, guide the cord back into its position. Do not let it snap back.

Once the engine has started, if the choke lever has been used, return this to its OFF position after the engine has run for a few seconds.

5.2 To Stop the Engine

Release the operating lever.

Switch the engine ON/OFF switch to the 'O' off position.

Turn the fuel tap lever to the OFF position.

Ensure the blades have stopped rotating prior to moving the machine.

WARNING: THE EXHAUST COVER MAY BE HOT - DO NOT TOUCH.

5.3 Safety Equipment

The LS14 operator must be wearing:

- Ear Defenders
- Gloves
- Protective Footwear
- Safety Glasses

5.4 Operation

Before scarifying can be carried out the grass **must** be cut short and be cleared of any objects such as stones or sticks that would damage the Scarifier or be picked up and thrown by the rotating blades.

WARNING: SCARIFYING LONG GRASS WILL QUICKLY CAUSE DAMAGE TO COMPONENTS OF THE MACHINE. WE RECOMMEND GRASS IS CUT PRIOR TO SCARIFIYING.

Do not operate the Scarifier on wet lawns or in rainy weather.

Set the operating height by screwing the top adjuster knob either up or down and locking the desired height with the locking handle.

WARNING: THE BLADES MUST NOT BE ALLOWED TO TOUCH THE GROUND AT ANY POINT DURING OPERATION.

If using the collection bag, ensure that it is mounted correctly and is secure.

Lift the operating lever to engage the rotor shaft and walk at a slow steady pace pushing the machine ahead of you.

To turn the LS14 Scarifier 180 degrees, release the operating lever, put light downwards pressure on the handlebars and rotate the machine on its rear wheels.

Do not work the Scarifier on slopes of more than 20 degrees and always work across the slope, not up and down it.

Once the collection bag has become full, release the operating lever, turn off the engine and ensure the rotor shaft has stopped turning. Remove the collection bag and empty. Reattach the bag securely and re-start the engine to continue scarifying.

5.5 Procedure for Unexpected Shut Down

Release the operating lever

Turn the engine operating switch located on the engine to the OFF position.

Ensure the rotor shaft and blades have stopped rotating prior to moving the machine.

5.6 How to Clear Unwanted Debris from the Underside of the Machine

Ensure that the engine has been turned off and the rotor shaft has stopped turning.

Turn the engine fuel tap to the off position.

Remove the spark plug to ensure the engine cannot be started accidentally.

Attach a lifting hoist to the top handlebar and lift the machine so that it tilts forward onto its front wheels. As the underneath of the chassis becomes exposed it is possible to see and remove any unwanted debris.

WARNING: ALWAYS TILT THE LS14 SCARIFIER FORWARDS TO AVOID OIL IN THE ENGINE FLOODING INTO AREAS WHERE IT WILL CAUSE DAMAGE.

5.7 Residual Risks of the LS14 Scarifier

The rotor shaft will continue to rotate for a couple of seconds once the operating lever has been released. Ensure that the blades have stopped rotating prior to moving or tilting the machine.

The LS14 Scarifier is designed to be pushed by the operator both during transportation and operation. It has no brake system and therefore the operator must hold firmly onto the machine on sloped areas.

6.0 Maintenance

6.1 Schedule

	Operation	Daily	Every Week	Every Month
Engine	Check engine oil level 10W/30	Х	Х	
	See separate engine manual			
Machine	Check condition of blades		Х	
	Check condition of blade rods		Х	
	Check belt condition			Х
	Check operating lever and cable		Х	
	Check grassbag condition		Х	
	Check rotor shaft bearings			Х
	Lubricate wheel bearings			Х
	Tighten all nuts and bolts			Х

6.2 Basic Maintenance

Check that all guards are fitted securely.

Ensure the cable connecting the operating lever to the engine is securely fastened at both ends and shows no sign of wear.

Ensure that the solid tyres do not show any indentations or significant wear and tear.

Ensure the wheels are held securely and the bolts that hold the wheels onto the axles are in place.

Check the wheels rotate smoothly and without hindrance.

6.3 Advanced Maintenance

We strongly recommend that an Authorised Representative is consulted prior to any major machine maintenance projects.

6.3.1 Belt

Inspection Check:

Check every 25 hours that the drive belt is not frayed or cracked. If it appears frayed or cracked then it is time to replace the belt.

Changing the Belt:

Remove the three capscrews used to attach the belt guard to the chassis and remove the belt guard.

Loosen the four M8 nuts that secure the engine to the chassis.

Gently push the engine to reduce the belt tension.

The drive belt has now become slack.

Grab the right hand side of the belt close to the bottom pulley and pull as if you are trying to pull the belt off the bottom pulley.

With your other hand slowly and carefully rotate the pulley in an anticlockwise direction and ease the belt off the pulley.

The belt is now free from the machine.

To fit the new belt, start by locating the new belt in the groove of the centrifugal clutch.

Stretch the new belt tight by pulling it downwards to the bottom pulley.

Locate one side of the belt in position on the bottom pulley.

Slowly rotate the bottom pulley so that the belt is slowly eased into its place sitting in the groove of the bottom pulley.

Gently pull the engine to tension the drive belt.

Re-attach the belt guard using the original cap screw bolts.

6.3.2 Removing Rotor Assembly

To access the underneath of the chassis you must use a lifting hoist to lift the handlebars of the machine so that it tilts forward over its front axle.

Remove both the belt guard and rotor shaft guard by undoing the fastening nuts and bolts.

Remove the belt as instructed above in section 6.3.1.

Remove the two grub screws from the bottom pulley. Using one the removed grub screws insert this into the "spare hole" on the pulley. It may require some force using an allen key to continue turning the grub screw into the spare hole until the two parts of the pulley separate.

NEVER USE A PULLEY TO REMOVE THE PULLEY FROM THE ROTOR SHAFT AS IT MAY RESULT IN DAMAGE TO THE MACHINE AND/OR PERSONAL INJURY.

WARNING: Do not lose the woodruff key at this stage.

Loosen the grub screws in the bearings.

Remove the fasteners of the bearing carriers. The two chassis protection plates will become detached from the chassis at this stage.

Pull the loose bearings away from the chassis approximately 30mm. A tool for pulling bearings may be required at this stage should the bearings be difficult to move. Once the bearings have been pulled away from the chassis the blade rotor will be able to be removed from the chassis.

6.3.3 Blades

Inspection Check:

Blades that have been worn so that they have become rounded must be changed for the LS14 Scarifier to function properly.

Changing the Blades:

Safety glasses and gloves must be worn.

Remove the rotor as described in section 6.3.2.

Undo the grub screw located in one of the clamps that holds the blades and spacers onto the hexagonal section of the rotor shaft.

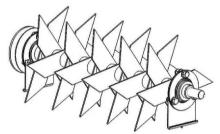
Slide all the blades and spacers off the hexagonal shaft and carefully dispose of the worn blades.

Slide on the first blade until it is touching the shaft clamp and then slide on a spacer.

The hexagonal shaft allows the blades to be fitted in three orientations. Rotate the next blade to be fitted by 120 degrees so that it sits on a separate face of the hexagonal shaft. Once the second blade is fitted add a second spacer.

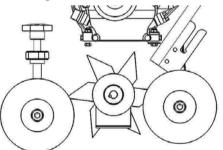
The third blade to be fitted is again rotated by 120 degrees and the above process is repeated until all blades and spacers are fitted onto the shaft.

NB: When fitting the blades check that the points of the blades are all facing in the same direction. See diagram below.



Reattach rotor to the chassis as described in section 6.3.2.

NB: When reattaching, the rotor the blades must be reinserted so that the straight edge is the leading edge. See diagram below.



6.4 Engine

6.4.1 Check Engine Oil Level

This must be checked prior to each use and every 8 hours during operation.

Check only when the engine is off and in a horizontal position.

Clean the oil filler plug and its surrounding parts.

Remove the oil filler plug. Clean the dipstick with a clean cloth and put the oil filler plug all the way back into the engine. Remove the oil filler plug and check the oil level.

Re-fill the oil if indicator shows more is required. For the Honda GP160 the recommended oil is SAE 10w/30.

6.4.2 Change Engine Oil

Refer to the engine manufacturer's manual for location of components and more detailed assistance.

Do not change the oil if the engine is hot.

The first oil change is after 50 hours of work.

Subsequent oil changes should be made after each 100 hours of work.

At extreme temperatures or conditions change the oil after every 50 hours.

Open the drain plug on the engine and the filling plug and drain the oil into a suitable container or use a suction pump to remove oil through filler neck.

Ensure the waste oil is disposed of properly.

Re-fit the drain plug and tighten.

Fill fresh engine oil through the oil filling opening. Use a funnel or similar device for ease of filling.

Replace the oil filler plug and tighten.

6.4.3 Air Filter

Inspection Check:

Remove the air cleaner cover and inspect the filter elements.

Cleaning:

See diagram below containing information provided by Honda.

Cleaning

Dual-Filter-Element Types

- 1. Remove the wing nut from the air cleaner cover, and remove the cover.
- 2. Remove the wing nut from the air filter, and remove the filter.
- 3. Remove the foam filter from the paper filter.
- 4. Inspect both air filter elements, and replace them if they are damaged.

Picture by Honda

ELEMENT TYPE	
WING NUT	
PAPER FILTER ELEMENT	O
FOAM FILTER ELEMENT	e
GASKET	
	9-

STANDARD DUAL-FILTER-

6.4.4 Spark Plug

Clean and replace.

6.5 Cleaning

After cleaning, particularly if a pressure washer has been used, ensure any lubrication points are re-lubricated. Additionally Tracmaster recommends that a water dispersant product such as WD40 or GT85 is used on the rotor assembly and the underside of the chassis after cleaning.

Clean the engine with a cloth only. Avoid spraying the engine with jets of water as this may leak into the fuel and ignition systems.

6.6 Troubleshooting

6.6.1 Machine

Have all serious malfunctions on the machine and engine repaired by an authorised Tracmaster or Honda agent.

Problem	Possible Cause	Remedy
No drive to	Broken belt	Replace belt
blades	Damaged centrifugal clutch	Replace clutch
Poor collection	Blades have become rounded on bottom edge	Replace blades
and performance	Blades are worn out	Replace blades

6.6.2 Engine

Problem	Possible Cause	Remedy
	Spark plug connector not connected	Connect spark plug connector
	Choke lever is not actuated	Actuate choke lever
Engine	Fuel tank empty	Fill fuel tank
does not start	Fuel line clogged	Clean fuel line
	Defective spark plug	Clean or replace spark plug
	Engine has too much fuel	Dry and adjust spark plug and start engine
Engine overheats	Low engine oil	Refill immediately
overneats	Impaired cooling	Clean cooling fan grille
	Air filter clogged	Clean air filter

6.6.3 Lubricants

Use the specified 10w/30 oil specified by Honda for the engine oil.

To lubricate the roller bearings in the wheels we recommend bio-lubricating grease.

7.0 Transportation, Storage and Handling

7.1 Transportation

Use ramps where possible to manoeuver the Scarifier into a transportation vehicle.

The LS14 must be fixed securely using straps and by placing chocks behind the wheels.

Always transport the LS14 horizontally and not at an angle.

Ensure that the fuel control lever on the engine is moved into the OFF position so fuel does not leak into the carburetor during transportation.

7.2 Storage

Always clean the machine and dry thoroughly prior to storage and ensure all lubrication points have been re-greased. Additionally Tracmaster recommends that the blades and under side of the chassis are treated with a water dispersant product such as WD40 or GT85.

For periods of long storage, change the engine oil.

Either drain the fuel completely, or fill the fuel tank and add fuel stabilizer.

Do not store the Scarifier in wet rooms, where fertiliser is stored, or in stables as heavy corrosion may occur.

Always store the machine in a horizontal position.

7.3 Handling

Do not attempt to lift the machine alone. At least two people is the minimum required.

Gloves must be worn when lifting the LS14 Scarifier.

Do not tilt the machine so that fuel can leak into the air filter of the engine.

When performing maintenance on the Scarifier when it is situated on a work bench, ensure that the machine is firmly held in position at all times.

Do not lift the machine solely by the engine at any point.

8.0 Service Record

To ensure your machine is kept in peak condition we recommend that your CAMON LS14 Lawn Scarifier is serviced regularly.

Contact Tracmaster on 01444 247689 to find out who your local Authorised Agent is.

Company: Date:	Company: Date:
Company: Date:	Company: Date:
Company: Date:	Company: Date:

Visit our website for more information on the CAMON LS14 Lawn Scarifier.

www.camon.co.uk or www.tracmaster.co.uk

Videos, parts diagrams, technical bulletins, FAQ's and more.

Warranty Registration

To validate your warranty please complete the form below and return it to:

Tracmaster Ltd, Sovereign Centre, Victoria Road, Burgess Hill, RH15 9LR

Alternatively visit <u>www.tracmaster.co.uk</u> and complete the online form.

CUSTOMER DETAILS

Name:	
Company (if applicable):	
Address:	
	Postcode:
Email:	
Phone:	
MACHINE DETAILS	
Machine:	CAMON Lawn Scarifier
Model:	LS14
Serial Number:	
Engine Serial Number:	
Purchase Date:	
SUPPLIER DETAILS (if r	not supplied directly by Tracmaster)
Dealer Name:	
Dealer Address:	
	Postcode:

We will never pass your details to any third party, however, we may occasionally send you emails with offers and promotions, if you do not want us to do this, please tick this box.

EC Declaration of Conformity



Tracmaster Ltd declares that the machinery stipulated below complies with all the relevant provisions of:

Machinery Directive 2006/42/EC

EMC Directive 2004/108/EC

and the National Laws and Regulations adopting these directives and other relevant directive.

- Manufacturer: Tracmaster Ltd Sovereign Centre Victoria Road Burgess Hill RH15 9LR UNITED KINGDOM
- Machine Description: CAMON LS14 Scarifier

Serial No:

Harmonised Standards applied: (including parts of):

EN 294:1992	Safety of machinery: Safety distance to prevent danger zones being reached by the upper limbs.	
EN 954-1:1996	Safety of machinery: Safety related parts of control systems. Part 1 – general principles for design.	
EN 20643:2008+A1:20	Hand arm vibration: Laboratory measurement of vibration at the grip surface of hand guided machinery – general.	
EN 12100-1:2003 & EN12100-2:2003	Safety of machinery: Basic concepts, general principles for design parts 1 & 2.	
EN 13684:2004+A2:2009 Garden equipment. Pedestrian controlled lawn aerators and		
ISO 11684:1995	Tractors, machinery for agriculture and forestry, powered lawn and garden equipment: Safety signs and hazard pictorials – general principles.	
Responsible Person:	Jody Symons	
Position in Company:	Technical Director	
Address:	Tracmaster Ltd, Sovereign Centre, Victoria Road, Burgess Hill, RH15 9LR	
Date:	January 2015	
Signature:	J Symons	



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