

Operator's Instruction Manual

GeoRipper Mini Trencher

Models GR16M, GR16H, GR20M, GR20H, GR20S, GR27M, GR27H, GR27S



These are the original English instructions. **IMPORTANT:** read this instruction manual carefully before operating the GeoRipper® Mini Trencher and strictly observe the safety regulations. Keep this instruction manual!

May 2019
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All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer shall perform repairs to components.

When devices are used for applications with technical safety requirements, the relevant instructions must be followed.

Failure to observe this information can result in injury or equipment damage.

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Four Ashes Machinery Ltd, Four Ashes, Ashwicke Road, Marshfield SN14 8AD, United Kingdom
Tel: +44 1225 891158, www.georipper.co.uk

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Product Modifications

Year	Type	Modifications
2016	GeoRipper	Original model

Document Revisions

Date	Version Number	Document Changes
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Approvals

This document requires following approvals:

Name	Title

Notes

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1 PREFACE

1.1 Description of the User and Intended Use

The GeoRipper® Mini Trencher is intended to cut narrow trenches in most types of soil for laying pipes, cables, drainage system, root pruning, root barrier and any other applications where the cutting of a trench in the soil is required. It is not intended for cutting into solid ground like tarmac or concrete paths, or solid objects such as stones or tree roots over 7cmm in diameter. The user must be an adult 18+ and wear the required Personal Protective Equipment (PPE) including gloves, eye protection, face shield, ear protection, steel toe-cap footwear, and in some instances, shin pads. The user is required to know about the safe operation and maintenance of the GeoRipper® and have read, understood and followed the information detailed in this manual. Persons unfamiliar with the Instruction Manual, children, persons under 18 and persons under the influence of alcohol, drugs or medication must not operate the GeoRipper®

This document is intended solely for the authorised user of the GeoRipper® and is an essential part of the machine. This document is intended to help familiarise the user with the operation and safe handling of the GeoRipper®.

1.2 Conventions Used in This Manual

This Instruction Manual has been published in accordance with 82079-1, ANSI Z535.6 or ISO 3864 and EU Directive requirements. This manual is intended to help ensure accurate and safe operations over the life of the machine and help to take the necessary precautions to prevent accidents.

The GeoRipper® is built in compliance with the applicable requirements laid out in the following documents:

- EN 474 10 2007 + A1 2009 *Earth Moving Machinery / Trenchers*
- EN ISO 3547 2004 *Earth Moving Guard Requirements*
- EN ISO 12100 2010 *Design / Risk Assessment & Risk Reduction*
- EN ISO 14121-2 2012 *Machine Safety & Risk Assessment*

This manual provides information on the following:

- Device safety and accident prevention
- Installation and related maintenance
- Troubleshooting

1.3 Explanation of Safety Warnings and Symbols

ISO 3864 and ANSI Z535 Safety Signals



Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury



Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.



Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

NOTICE

Indicates information considered important, but not hazard-related.

	Read the Instruction Manual		Foot injury risk
	Wear protective gloves		Risk of hand injury
	Wear eyes protection		Danger, risk of kickback
	Wear ear protection		Stop the engine
	Wear steel toe caps footwear		No smoking or naked flame
	Wear dust mask		Direction of chain rotation
	Particular care and caution		Fuel and oil mixture
	Electrical danger		Recycling

1.4 Retaining Instructions

Read and understand this manual and its safety instructions before using this product. Failure to do so can result in serious injury or death. Follow all the instructions. This will avoid fire, explosions, electric shocks or other hazards that may result in damage to property and/or severe or fatal injuries. The product shall only be used by persons who have fully read and understand the contents of this user manual. Employers have a responsibility to ensure that each person who uses the product has read these warnings and instructions and follows them. Keep all safety information and instructions for future reference and pass them on to subsequent users of the product. The manufacturer is not liable for cases of material damage or personal injury caused by incorrect handling or non-compliance with the safety instructions. In such cases, the warranty will be void.

1.5 Obtaining Documentation and Information

1.5.1 Internet

The latest version of the documentation is available at the following address: <http://www.georipper.co.uk/safety-instructions>

1.5.2 Ordering documentation

Documentation, user instructions and technical information can be ordered by emailing Four Ashes Machinery Ltd. at contact@four-ashes.com.

1.5.3 Other languages

This is the English user manual. Manuals in other languages are available upon request.

1.5.4 Documentation feedback

If you are reading Four Ashes Machinery Ltd. product documentation on the internet, any comments can be submitted on the support website. Comments can also be sent to contact@four-ashes.com.

We appreciate your comments.

1.5.5 Support and service

For information about special tools and materials please contact:

Four Ashes Machinery Ltd., Four Ashes, Ashwicke Road, Marshfield SN14 8AD, United Kingdom
+44 (0)1225 891158, www.georipper.co.uk

For other questions, information, technical assistance or ordering user instructions, please contact the manufacturer:

GR Manufacturing, 5 Lilburn Street, Warkworth 0910, New Zealand
www.minitrencher.com

For service related questions, contact:

Four Ashes Machinery Ltd., Four Ashes, Ashwicke Road, Marshfield SN14 8AD, United Kingdom
+44 (0)1225 891158, www.georipper.co.uk

2 Description of the GeoRipper®

2.1 Intended Use and Reasonably Foreseeable Misuse

The GeoRipper® is intended to be used as an outdoor landscaping power tool for trenching purposes in suitable ground conditions as described in this manual. The GeoRipper® can be used hand held or mounted on its EZ Kart® and must always be coupled to an approved drive unit. The user must have read and understood the instruction manual and wear the appropriate recommended Personal Protective Equipment (PPE) before operating the GeoRipper®. Failure to wear the recommended PPE is considered improper use. Failure to read and understand this manual is considered improper use

The GeoRipper® shall not be used as a forestry tool to cut or fell trees or branches. The GeoRipper® must not be used in extremely stony grounds, solid rocks, tarmac concrete or any other unsuitable ground conditions which do not allow trenching. The GeoRipper® must not be used underground, indoor or in any other enclosed areas. The GeoRipper® must only be operated by one user and the operation of the GeoRipper® by two or more users is not permitted and considered improper use.

Failure to follow the instructions provided in this manual regarding operation, maintenance and servicing is considered improper use and will void the warranty. Four Ashes Machinery Ltd. will not be liable for any accidents or damages resulting from improper use of the GeoRipper®.

The GeoRipper® shall be used with the following original and model dependents accessories and components only:

- GR16 400mm bar
- GR20 500mm bar
- GR27 700mm bar
- GR-M (Makita® EK6101, EK7650H and EK8100)
- GR-H (Husqvarna® K770 and K970)
- GR-S (Stihl® TS700)
- EZ Kart universal trolley with model variations

2.2 Product Overview

The GeoRipper® mini trencher consists of an adaptor plate supporting a trenching bar and chain, and mounted on a petrol powered cut off saw. The Georipper® is available in a combination of model variations that includes different bar lengths: 400mm, 500mm, 700mm, petrol engine types: 2-Stroke, 4-Stroke and 2-Stroke HD, and a selection of power head brands: Makita®, Husqvarna® or Stihl®. This Instruction Manual is intended to cover all available models and variations, but for individual complementary information, please refer to the power head manufacturer's instructions. The GeoRipper® can be used handheld or mounted on its universal trolley, the EZ Kart®.

Technical Data

Specifications						
Model	GR16M, GR20M	GR16M, GR20M	GR16M, GR20M, GR27M	GR16H, GR20H	GR20H, GR27H	GR20S, GR27S
Power Head Variations	GR-M Makita EK6101	GR-M Makita EK7650H	GR-M Makita EK8100	GR-H Husqvarna K770	GR-H Husqvarna K970	GR-S Stihl TS700
Type	2-Stroke	4-Stroke	2-Stroke HD	2-Stroke	2-Stroke HD	2-Stroke HD
Max. Power at Operating Speed	3.2kW 9,500rpm	3.0kW 9,000rpm	4.2kW 9,150rpm	3.7kW /9,000 rpm	4.8kW 9,000rpm	5.0kW 9,300rpm
Bore	47mm	51mm	52mm	51mm	56mm	56mm
Stroke	35mm	37mm	38mm	36mm	38mm	40mm
Displacement	60.7cc	75.6cc	81cc	74cc	93.6cc	98.5cc
Max. Torque	3.9 Nm	4.6Nm	5.0Nm	unknown	unknown	unknown
Idling Speed	2,600 rpm	2,600 rpm	2,500 rpm	2,700 rpm	2,700 rpm	2,200 rpm
Clutch Engagement Speed	3,900 rpm	unknown	3,800 rpm	unknown	unknown	unknown
Max. Engine Speed	9,850 rpm +/-150	9,100 rpm	9,350 rpm +/-145	9,300 rpm +/- 150	9,300 rpm +/- 150	unknown
Max. Spindle Speed	4,400 rpm	4,300 rpm	3,820 rpm	4,700 rpm	4,700 rpm	5,080 rpm
Fuel Type	Mix Unleaded + 2-Stroke oil	Unleaded	Mix Unleaded + 2-Stroke oil	Mix Unleaded + 2-Stroke oil	Mix Unleaded + 2-Stroke oil	Mix Unleaded + 2-Stroke oil
Mixture Ratio	50:1	N/A	50:1	50:1	50:1	50:1
Sound Pressure Level	99.6dba (Kpa=2.5)	92.7dba (Kpa=2.5)	100dba (79dba at 15m)	113.0dba	114.0dba	101.0dba
Sound Power Level	108.6dba (Kwa=2.5)	104.6dba (Kwa=2.5)	Not recorded	115.0dba	115.0dba	113.0dba
Vibration Acceleration Rear Handle Bench Tested	4.37m/s ²	≤4.37m/s ² Estimated	5.2m/ s ² +k Estimated	≤4.37m/s ² Estimated	4.2m/s ² +k	4.5m/s ² +k Estimated
Vibration Acceleration Tubular Handle Bench Tested	4.73m/s ²	≤4.73m/s ² Estimated	9.3m/ s ² +k Estimated	≤4.73m/s ² Estimated	3.8m/s ² +k	6.6m/s ² +k Estimated
Vibration Acceleration Field Tested Handheld	22.6m/s ²	≤22.6m/s ² Estimated	Pending	≤22.6m/s ² Estimated	Pending	Pending
Vibration Acceleration Field Tested EZ Kart Handle	4.65m/s ²	≤4.65m/s ² Estimated	Pending	≤4.65m/s ² Estimated	Pending	Pending
Fuel Consumption at Max. Load	1.42kg/h	unknown	1.85kg/h	unknown	unknown	unknown
Fuel Tank Capacity	0.7L	1.1L	1.1L	0.9L	1.0L	1.2L
Oil Tank Capacity	N/A	0.22L SAE10W30	N/A	N/A	N/A	N/A
V-Belt Part Number	965-300-510 (6PJ/812)	225094-6 (5PJ/800)	965-300-481 (5PJ/900)	544-9084-06	544-9763-04	9490-000-7920
Spark Plug and Gap	NGK BPMR 7A / 0.5mm	NGK CMR6H / 0.5mm	NGK BPMR 7A / 0.5mm	NGK BPMR 7A / 0.5mm	NGK BPMR 7A / 0.5mm	NGK BPMR 7A / 0.5mm
Overall Weight	GR16: 13.9kg GR20: 14.4kg	GR16: 17.8kg GR20: 18.3kg	GR16: 15.7kg GR20: 16.2kg GR27: 18.0kg	GR16: 14.3kg GR20: 14.8kg	GR20: 16.0kg GR27: 17.4kg	GR20: 16.3kg GR27: 18.0kg
Chain Speed at Max. Spindle rotation	8.8m/s	8.6m/s	7.7m/s	9.4m/s	9.4m/s	10.2m/s
Chain Break-Out Force	6.57 kN	6.57 kN	6.57 kN	6.57 kN	6.57 kN	6.57 kN

2.3 Product Compliance

This product complies with all relevant European Directives. The Declaration of Conformity can be found in the appendix. The Product is in conformity with the following relevant product safety standards:

- EN 474 10 2007 + A1 2009 *Earth Moving Machinery / Trenchers*
- EN ISO 3547 2004 *Earth Moving Guard Requirements*
- EN ISO 12100 2010 *Design / Risk Assessment & Risk Reduction*
- EN ISO 14121-2 2012 *Machine Safety & Risk Assessment*

2.4 GeoRipper® Elements

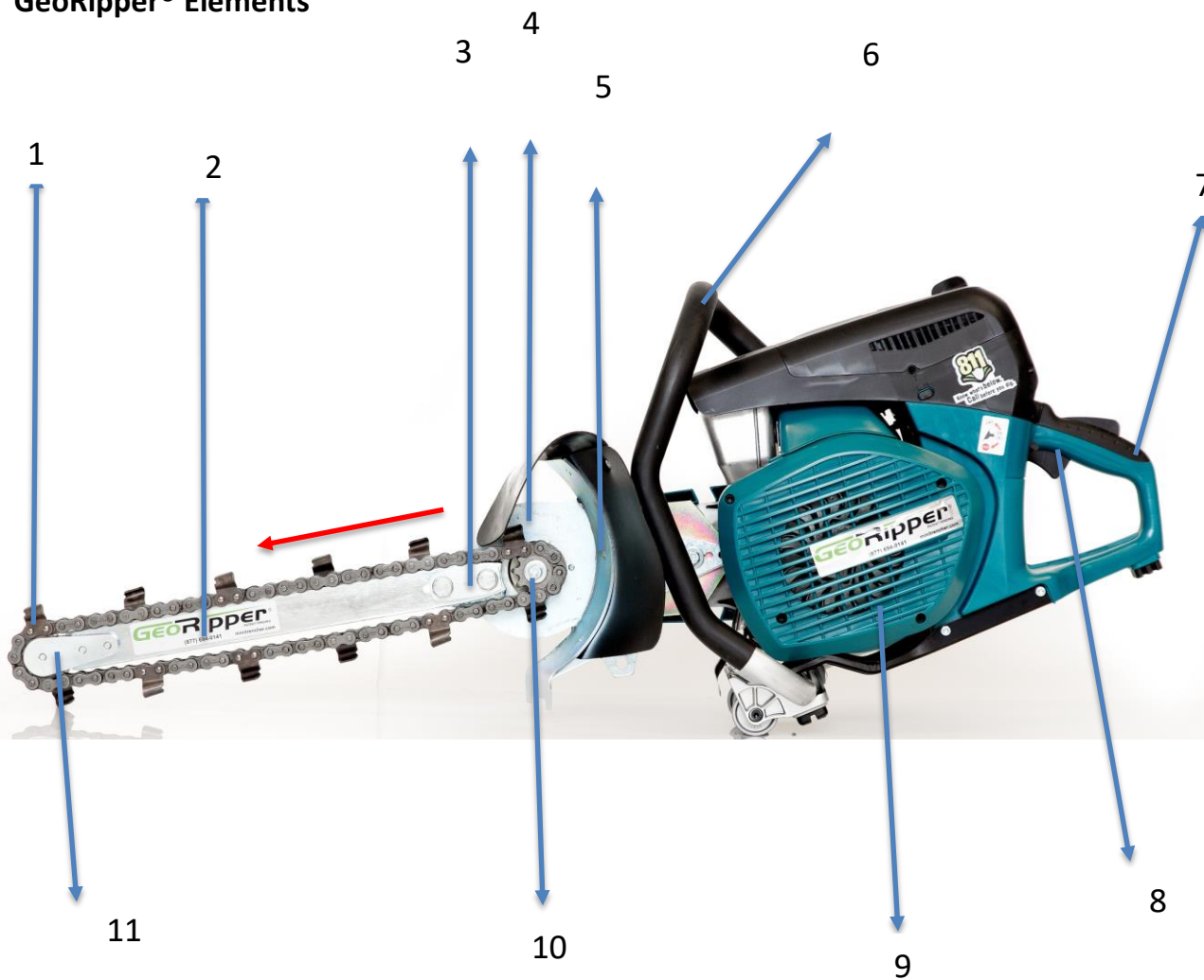


Fig.1

1. 3mm hardened steel cutting teeth
2. Heavy duty chain and bar
3. Cutting bar bolts x2 and mounting plate
4. Serial number location
5. Discharged chute and stone guard
6. Front handle
7. Rear handle
8. Throttle control
9. Engine
10. Drive sprocket
11. Nose sprocket and mounting plates

The red arrow indicates the travel direction of the chain

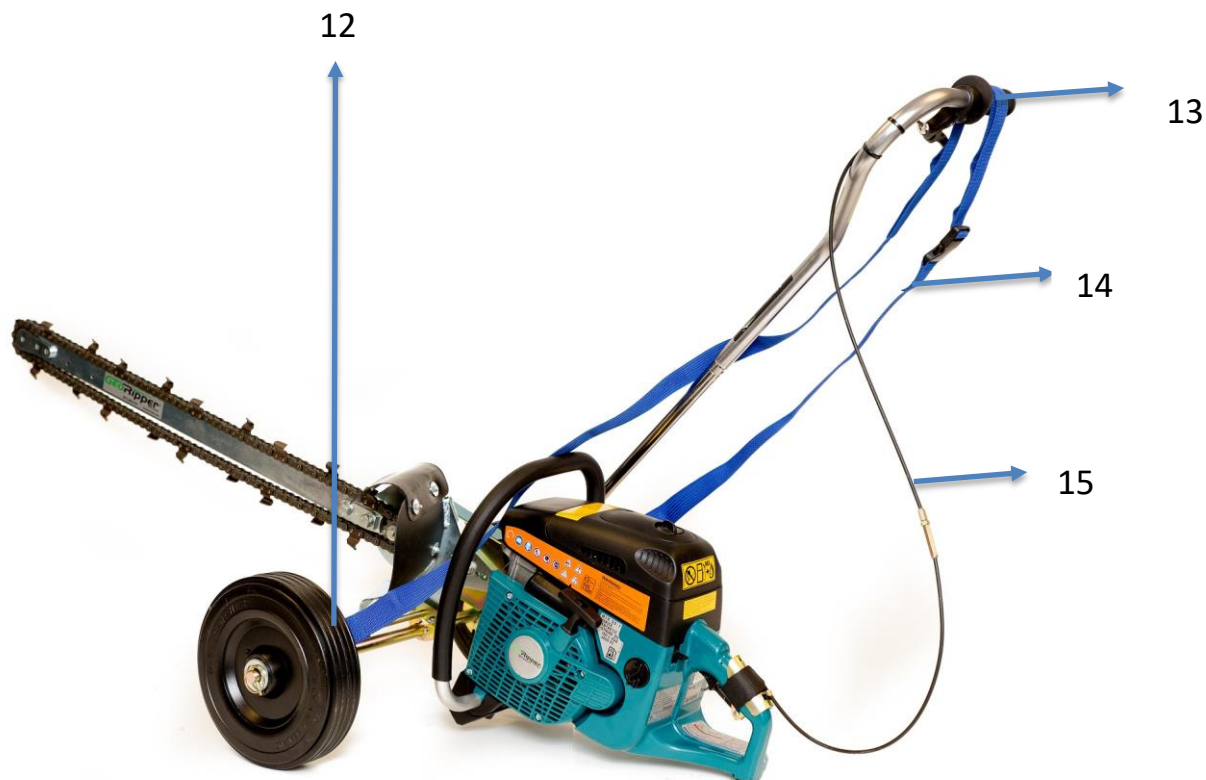


Fig.2

- 12. Axle and wheels
- 13. Rubber handle and throttle lever
- 14. Pulling strap
- 15. Throttle cable and latch

2.5 Understanding the User Interface

The GeoRipper® mini trencher is made of a cutting chain and bar (2 Fig.1) mounted on a power unit. The power unit, or engine (9 Fig.1), is an integral part of the product. The GeoRipper® can be operated hand held using the two handles (7 & 6 Fig.1) located on the power unit. The user operates the GeoRipper® with the throttle trigger (7 Fig.1) and the engine rotates the chain in the direction indicated by the red arrow. The chain stops rotating when the operator releases the throttle trigger and the engine returns to idle speed. Additional information about the power head can be found in the operation manual of the relating model and manufacturer.

The GeoRipper® can be used mounted on the optional EZ Kart® (Fig.2) which is standard with GR27-M, GR27-H and GR27-S. When mounted on the EZ Kart®, the user operates the machine using the lever throttle (13 Fig.2) on the cart handle and pulls the GeoRipper® using the straps provided (14 Fig.2)

2.6 Components Function

The chain and its cutting teeth (1 Fig.1) is a ground engaging assembly that creates a trench in the ground by rotating at speed in the direction indicated by the red arrow on Fig1, away from the operator. The chain bar (2 Fig.1), drive sprocket (10 Fig.1) and nose sprocket (11 Fig.1), provide guidance and engaged the chain to rotate. The drive sprocket is powered by the engine (9 Fig.1) which is controlled by the operator using the throttle trigger (8 Fig.1) on the power head or the throttle lever (13 Fig.2) on the cart. The wheels (12 Fig.2) on the EZ Kart® provide motion for the machine when pulled by the operator using the straps (14 Fig.2).

2.7 Explanation of Visual Signs



Fig.3

Location of the manufacturer’s serial number (4 Fig.1). The serial number is unique and identifies the model, bar size and power head manufacturer for each GeoRipper®. The serial number is stamped in the GeoRipper® mounting plate just above the bar securing bolts.

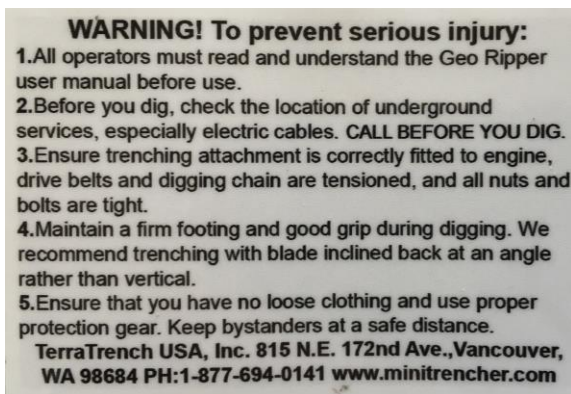


Fig.4

Manufacturer’s Warning sticker can be found on the power head.



Fig.5

CE Marking sticker can be found on the GeoRipper® mounting plate in compliance with EU Directives.

2.8 Description of Working Environment

The GeoRipper® is intended for outdoor use on flat or gently sloping ground suitable for digging trenches. The GeoRipper® is not to be used indoors or in other enclosed spaces or on any type of ground deemed unsuitable for the digging of trenches such as extreme slopes, solid ground or extremely rocky ground. The operator must make sure that the working area has been cleared of any debris or obstacles before commencing work with the GeoRipper® and that any bystanders are located outside the danger perimeter zone of 10 meters radius with particular attention to the 9-12 o'clock area. Only operate with good visibility and avoid trenching in wet or slippery ground conditions.

2.9 Lifting and Transporting

The GeoRipper® can be lifted by its tubular front handle (6 Fig.1) and always carried with the engine switch off and the trenching bar facing backwards. Ensure that the fuel cap is properly closed. Do not touch the exhaust whilst transporting as it may be hot. When used with the EZ Kart®, the mini trencher must not be lifted or carried, but only transported by pushing or pulling the EZ Kart® on its wheels. When transported inside a vehicle, the GeoRipper® must be standing upright to avoid fuel / oil spillage and be suitably strapped down inside the vehicle with the bar removed and stored securely.

3 Safety Instructions



Read and understand this manual and its safety instructions before using this product. Failure to do so can result in serious injury or death.

3.1 How to Use the Product Safely

3.1.1 Safety information for vulnerable people in the workplace

Employers have a responsibility to ensure that vulnerable people have been suitably trained to operate the GeoRipper® and that a suitable assessment process has been established.

3.1.2 Technical life span

The GeoRipper® is made of wear parts which can be replaced as many times as required. The machine will come to the end of its lifespan when it is judged no longer economically viable to repair the power unit.

3.1.3 Safety information related to the intended use and reasonably foreseeable misuse

The GeoRipper® is engineered and built following recognized safety requirements however risk may occur if not used in accordance to these instructions.



- Only use for trenching in suitably assessed ground conditions such as soil and soft ground
- Check before you start trenching for cables, pipes or other utilities buried in the ground. If in doubt do not trench
- Always start the trench with the machine on the ground with the cutting bar parallel to the ground
- Do not start the trench with the chain rotating at high speed: risk of kickbacks
- Do not start the engine with the bar and chain touching the ground
- When possible always use the EZ Kart®
- Always stand downhill of the mini trencher and behind the machine at all times
- When working parallel to a slope ensure that the discharge chute is facing downhill
- Respect a safety zone of 10 meters radius. If people or animals enter the safety zone stop work
- Do not operate alone
- Hold the trencher firmly with both hands and keep firm footing
- Switch the engine off prior to removing debris around the chain, discharge chute areas or the trench and wear gloves
- Switch the engine off as soon as stopping trenching
- Avoid wet or icy ground
- Do not operate in poor visibility
- Always wear the recommended PPE

3.1.4 Personal Protective Equipment



- Wear eye protection EN166 1B
- Wear suitably rated ear defenders EN352-1 SNR36DB
- Wear steel toe-cap footwear EN20345 SB
- Wear suitable work gloves EN420 and EN10819
- In dry ground conditions wear a face mask EN149 FFP1 NR. If particularly dusty wear breathing equipment
- In very stony ground condition the use of shin pads is recommended

3.1.5 Product limitations and restrictions



- Do not use the GeoRipper® in extremely rocky ground, tarmac or concrete
- Do not attempt to cut tree roots larger than 7cm diameter
- Do not plunge the bar into the ground
- Not suitable for cutting branches

3.1.6 Installation safety information



- Switch engine off before doing any work on the machine
- Read the instruction manual chapter 5 before assembly
- Wear gloves when handling the chain

3.1.7 Safety information regarding the use

- Do not operate for long periods of time
- Do not use if the plastic / rubber stone guard is not present (*Fig.1 item 5*)
- When possible always use the GeoRipper® mounted on the EZ Kart® to limit exposure to vibration
- Do not operate if feeling tired or if under the influence of substances

3.1.8 Maintenance safety information

- Switch engine off and wait for the chain to stop before doing any work on the machine
- Read the instruction manual chapter 5 before assembly
- Wear gloves when handling the chain
- Read the manufacturer's manual of the power head before starting maintenance on the machine
- Always check that bolts are tight before using the machine
- Keep the chain in good condition and check regularly for damage

3.1.9 Safe Disposal



- Ensure that all packaging is disposed of accordingly. The cardboard box can be recycled
- Wear parts such as chains, sprockets and bars can be recycled under the metal parts recycling facility
- At the end of its life, the power head can be disposed of in the small engine recycling facility of your local center

3.2 Machinery Failure

3.2.1 Catastrophic Failure

During a three year period and an estimated total of over 10,000 kilometers of trenches no catastrophic failure of the GeoRipper® has been reported.*

The GeoRipper® is well engineered and constructed using heavy duty components. The rotating parts of the machine are the drive sprocket, the chain and the idler nose sprocket. The drive sprocket is secured with an M8 bolt torqued at 24Nm with thread lock fluid compound. The nose idler sprocket is enclosed within two heavy gauge metal plates secured with x3 M8 high tensile screws torqued up to 33Nm with thread lock fluid. However, check every time before use that these bolts are tight. The chain is a heavy duty type chain with an average tensile strength of 36.2kN. It must be checked regularly for signs of damage and wear. The chain needs replacing regularly as the cutting teeth will wear out. As a result, a relatively new chain is always in use on the trencher making it unlikely for the chain to suffer a catastrophic failure. * *Data collated from worldwide sales of GeoRipper® chains*

3.2.2 Progressive Failure or wear parts

Check regularly and replace all wear parts including the chain, drive and idler sprockets, the bar, nose bearing and retainer plates.

3.3 Potential Health Consequences

Failing to wear the recommended PPE may cause serious injury. Hand Arm Vibration syndrome HAVs may result after long periods using the GeoRipper®. To reduce the risk of HAVs always use the mini trencher mounted on its EZ Kart® or limit the daily usage per operator. Individuals with poor circulation who are exposed to excessive vibration may experience injury to blood vessels or the nervous system. Vibration may cause the following symptoms to occur in the fingers, hands or wrists: Falling asleep (numbness), tingling, pain, stabbing sensation, alteration of skin colour or of the skin. If any of these symptoms occur, seek medical assistance.

4 Assembly Instructions

4.1 Assembly of the GeoRipper® Mini Trencher

Read the entire notice carefully before starting the assembly and make sure to have sufficient space to do so. Ensure that all the items are present and correct and if anything is missing from your box please contact Four Ashes Machinery Ltd. by emailing contact@four-ashes.com

4.1.1 Content

Inside your GeoRipper® box you will find the following:

1. GeoRipper® unit
2. Trenching bar
3. Two chains
4. Spare drive belt and idle nose bearing
5. Tools including 18mm combination spanner and machine universal tool (model dependent)

4.1.2 Assemble the GeoRipper® bar and chain



It is important to mount the chain in the correct direction. The chain is directional and will wear prematurely if mounted incorrectly!

Do not over-tension the chain and leave a minimum of 1" or 25mm slack at mid-point.

Wear gloves when handling the chain

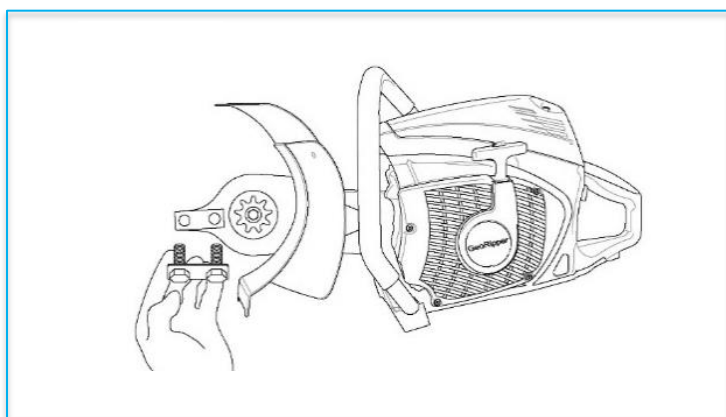


Fig.6

1. Remove the two bolts, spring washers and retaining plate (Fig.6)

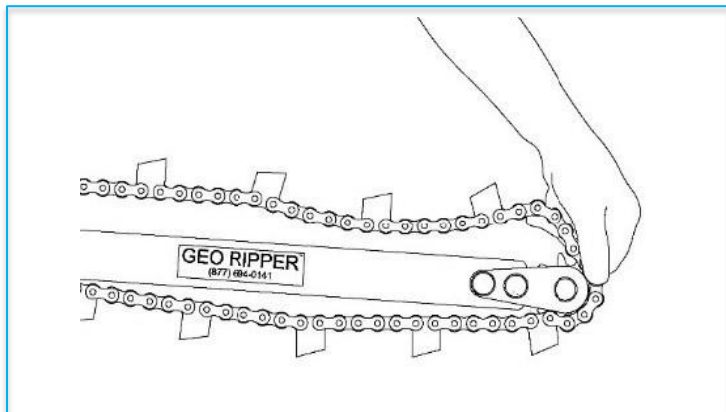


Fig.7

2. Place the chain over the bar and nose sprocket (Fig.7)

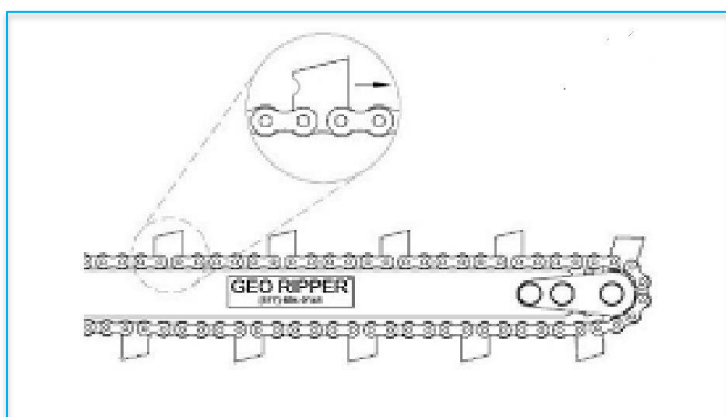


Fig.8

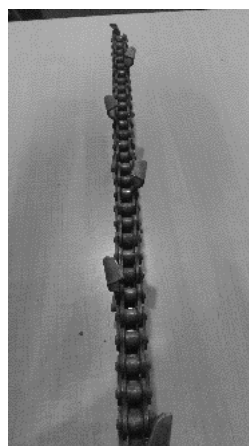


Fig.9

3. Check that the chain is facing in the right direction (Fig.8 and Fig.9) with the curved cutting edge of the teeth pointing towards the nose of the bar

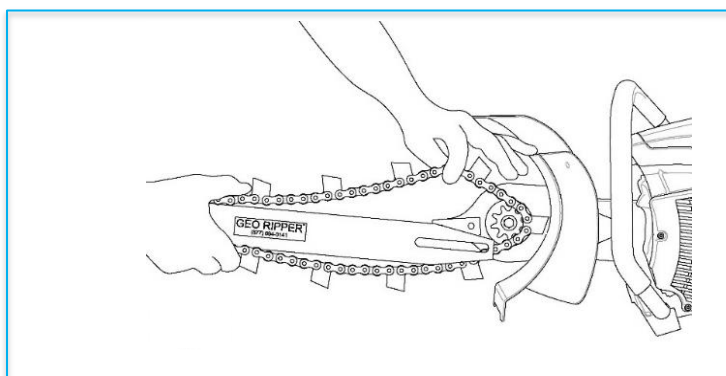


Fig.10

4. Install the chain over the bar and loop over the drive sprocket (Fig.10)
5. Double check the chain is facing in the right direction (Fig.8). A pictogram is also showing on the box for the chains

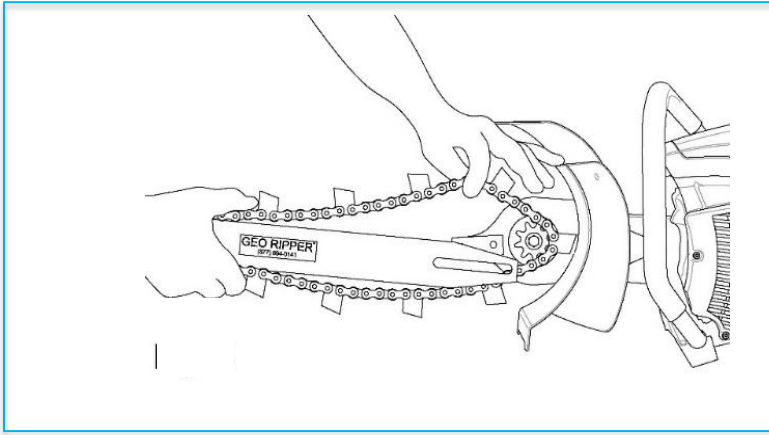


Fig.11

6. Hold the chain and bar with the chain looped over the sprocket
7. Fit the slotted section of the digging bar into the raised section of the mounting block

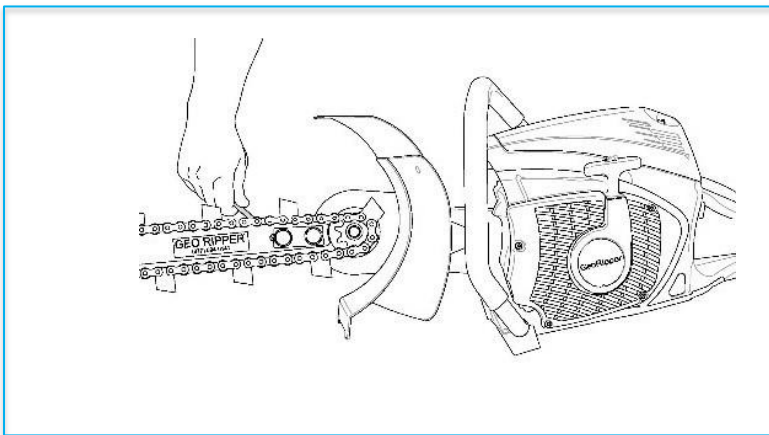


Fig.12

8. Fit the two bolts, spring washers and retaining plate removed from step 1 (Fig.1) and tighten lightly
9. From the other side of the drive sprocket, insert a flat end screw driver into the digging bar tensioning slot and use as a lever to tension the chain (Fig.12)
10. Tighten the two bolts securely with the 18mm spanner provided

Note: If a chain tensioner is installed (part number GRP-CT) on the digging bar (standard on all GR27, optional on GR16 & GR20), screw bar tensioning bolt with a 13mm spanner whilst clamping bolts are lightly secured. Once tightened to preferred tension, securely tighten clamping bolts with 18mm spanner. Tighten securing nut on bar tensioner to keep tensioning bolt in place

Chain tension guideline:

Type of Soil	Chain Tension from Middle of Bar
Clay	25mm
Hard / Compacted	25mm
Stony	38mm
Soft Top Soil	25mm
Sand	38mm

4.2 Assembly of the EZ Kart®

Read the entire notice carefully before starting the assembly and make sure to have sufficient space. Ensure that all the items are present and correct and if anything is missing from your box please contact Four Ashes Machinery Ltd. by emailing contact@four-ashes.com. The EZ Kart® is a standard item for all GR27 and optional for GR16 and GR20.

4.2.1 Content

Inside your EZ Kart® box you will find the following:

1. Axle.
2. Wheels x2
3. Wheel securing washers and clips x2
4. Handle assembly (2 parts) with cable
5. Tube
6. Belt

4.2.2 Assembly



Fig.13

1. Lay all the components on the floor



Fig.14

2. Slide the metal plates of the strap over the axle ends



Fig.15 & 16

3. Fit wheels and secure with washers and clips



Fig.17

4. Insert the bottom part of the tube into the bar of the axle and secure with lynch pin



Fig.18

5. Fit the handle assembly part onto the tube and secure with lynch pin to finish the assembly

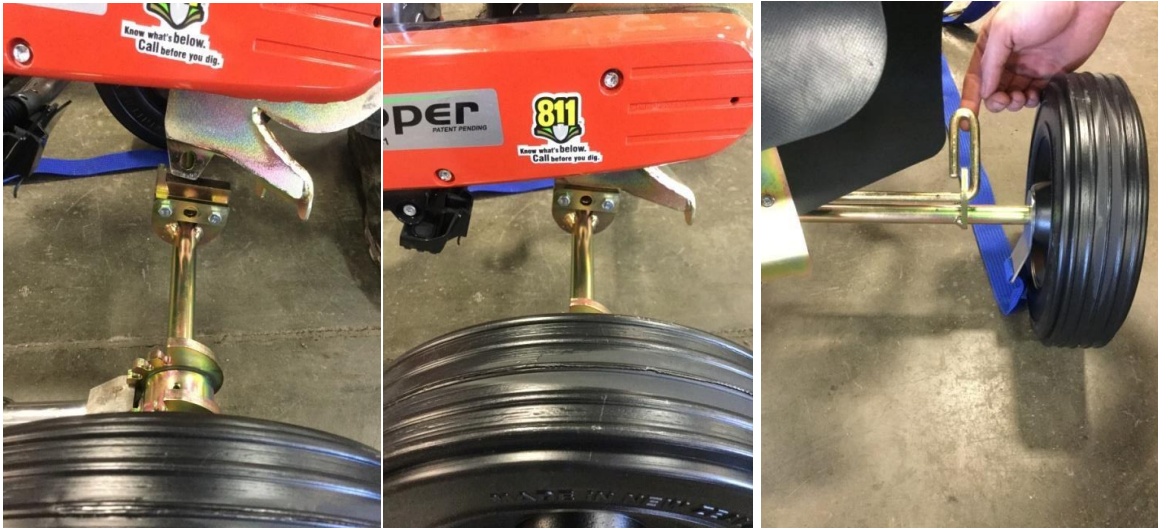


Fig.19, 20 & 21

6. Engage the GeoRipper® tab into the slot on the axle and lock into position with the bar



Fig.22 & 23

7. Fit the throttle cable latch over the throttle lock on the machine handle. Secure tightly with Velcro.



1mm gap

Fig.24 & 25

8. Adjust the cable to leave a 1mm gap between the pin of the throttle latch assembly and the throttle trigger



Fig.26

The EZ Kart® is provided as standard with all G27 models and is an optional extra for GR16 and GR20 models. The EZ Kart® fits any models of GeoRipper® and only the throttle latch assembly varies depending on the power head type: EK6101 and EK8100 Gold latch, EK7650H Silver latch, K770 and K970 Orange latch and TS700 Red latch. When ordering an EZ Kart® or latch replacement please indicate your power head model.

5 Operation

5.1 How to Transport and Store the Product



Always turn off the GeoRipper® when transporting or moving from place to place on work site. Always carry by the centre tubular handle with the bar facing backward. Never carry with the engine on or with the chain turning.

5.1.1 Lifting, handing and transporting the GeoRipper®

Carry the GeoRipper® by the centre tubular handle with the engine switched off and the bar pointing behind you (Fig.26). Never touch the exhaust. When carrying for a long distance use a wheelbarrow.

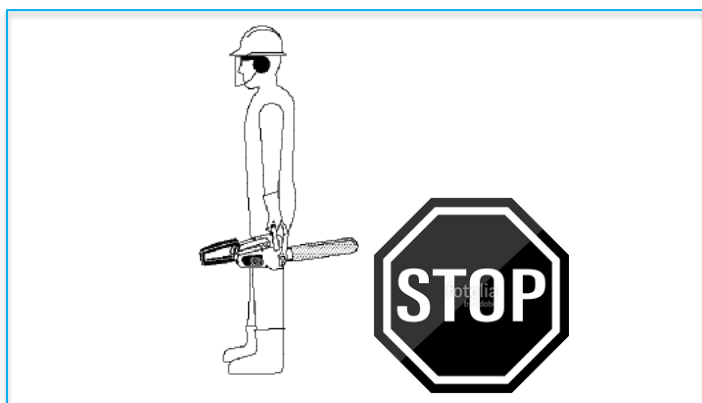


Fig.27

Do not attempt to lift the GeoRipper® when mounted on the EZ Kart®. Simply use the handle of the cart to pull or push the machine. When transporting in a vehicle ensure that the machine is upright, securely tied down and that the petrol cap is properly closed so no fuel can leak out. Secure against shocks and always remove the bar and chain when transporting in a vehicle.

5.1.2 Storing the GeoRipper®

Do not leave outside, always store the GeoRipper® in a dry place. Avoid extreme temperatures and keep away from children. Before storing, clean and dry the machine, remove all residual soil from the chain using a wire brush and spray with light oil WD40 or similar. When storing for a long period of time, empty the petrol tank and run the machine dry. Remove the chain and soak in light oil. Always check that all the components are in good condition before using again.

5.2 Commissioning and Starting the GeoRipper®

5.2.1 Commissioning

Read the instruction manual and ensure that the bar and chain have been mounted correctly as per section 4, that all bolts are tight and that there is a suitable chain slack for the ground condition.

5.2.2 Fuelling



2-STROKE FUEL & LUBRICATION INFORMATION

- Use a 50:1 fuel mixture. To ensure a correct fuel mix, use a shelf-stable pre-mixed 2-stroke fuel.
- Use high quality, air-cooled, two-stroke oil. Preferably synthetic. Husqvarna® or Makita® two-stroke engine oil is also recommended.

DO NOT USE TWO-STROKE ENGINE OIL FOR OUTBOARD MARINE OR WATER-COOLED ENGINES! IT IS NOT THE SAME!

- Use 90+ octane gasoline. Avoid bio fuels, ethanol or octane boosters, if possible.
- Use freshly-mixed fuel.
- Keep fuel container out of direct sunlight.
- Mix enough fuel only for the job at hand.
- Use a quality fuel stabilizer if using gas with ethanol.

NOTICE

FUELS WITH MORE THAN 10% ETHANOL ARE NOT APPROVED FOR USE IN GEORIPPER 2-STROKE AND 4-STROKE ENGINES! Use of alternative fuels, such as E-20 (20% ethanol), E-85 (85% ethanol) or any fuels not meeting GR MANUFACTURING, LTD requirements are not approved for use in GEORIPPER® MINITRENCHERS!

USE OF ALTERNATIVE FUELS CAN CAUSE THE FOLLOWING PROBLEMS:

Poor performance, loss of power, overheating, fuel vapour lock, improper clutch engagement, premature deterioration of fuel lines, premature deterioration of gaskets, premature deterioration of carburetors.

USING ALTERNATIVE FUELS AND/OR 2-STROKE OILS NOT ACCORDING TO JASO FC OR

ISO-L-EGD IN GEORIPPER® MINITRENCHER 2-STROKE ENGINES WILL VOID YOUR ENGINE WARRANTY!

4-STROKE FUEL & LUBRICATION INFORMATION

- Use 90+ octane gasoline. Avoid bio fuels, ethanol or octane boosters if possible.
- Use 10W30 motor oil in crankcase – high-grade, synthetic recommended.
- Change engine oil after first 20 hours of operation. After initial change, change oil every 30-40 hours.

**Refuelling
IMPORTANT:**

FOLLOW THE SAFETY PRECAUTIONS!

Fuel mixture

Be careful and cautious when handling fuels.

The engine must be turned off and cooled down!

Carefully clean the area around the fuel-tank filler neck to keep dirt from getting in the tank.

Place the Power Cut on an even surface.

Unscrew the tank cap and fill tank with fuel mixture. Take care to avoid spilling.

Screw the tank cap back on hand-tight.

Clean screw cap and tank after refuelling. Never start or operate the Power Cut in the same place as it was fuelled!

If fuel gets on your clothing, change clothes immediately.

Fig.28

For further information on fueling, consult the power head manufacturer's instruction manual specific to your GeoRipper® model

5.3 How to Use the GeoRipper®

5.3.1 Before your start trenching

1. Visually inspect the mini trencher
2. Check that bolts are tight and that the stone guard is present
3. Asses the ground conditions and remove any possible hazards
4. Carry out all safety precautions listed in chapter 2
5. Cut grass before trenching to help recover spoils
6. **Only start trenching if you are satisfied that there are NO cables, pipes or other utilities buried. If in doubt, do not trench!**



5.3.2 Starting the machine

Place the machine on solid ground with one foot on the rear handle, one hand on the tubular handle and the other hand used for pulling the starting cord (Fig.28)

For cold start, prime the fuel pump if applicable and move the combination switch to the choke position and pull the starting cord smoothly and evenly. As soon as the engine start press the throttle trigger so the engine returns to idle speed. Some models are equipped with a decompression system, refer to the power head manufacturer's instruction manual specific to your GeoRipper® model.

For warm start, the operation is as described above without the use of choke.

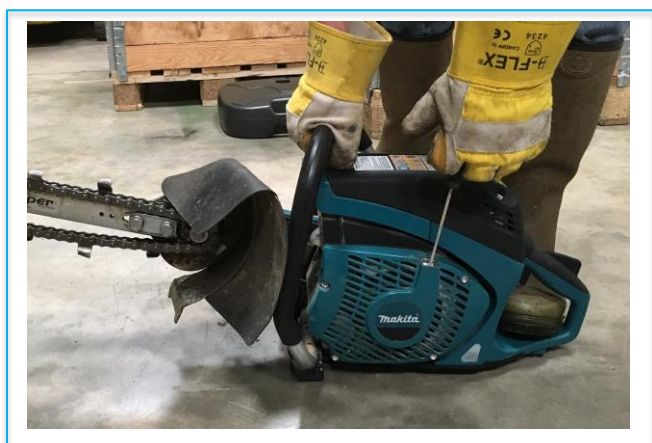


Fig.29



Always ensure that the chain is not in contact with the ground when starting your GeoRipper®

5.3.3 Using the EZ Kart®

The EZ Kart® is provided as standard with all G27 models and is an optional extra for GR16 and GR20 models. Secure the GeoRipper® on the EZ Kart® and start the machine as described in paragraphs 4.2.2 and 5.3.2. Fit the belt around the waist and adjust accordingly. Start trenching at mid-range speed and slowly push the handle until a desired

depth of trench is achieved (*Fig.29*). The tubular section of the handle is connected to the axle on a ratchet mechanism. Each position of the ratchet incline the trencher to achieve the desired depth depending on the bar length (*Fig.30*). The GeoRipper® can be used vertically only when mounted on the EZ Kart® to achieve the maximum trench depth.

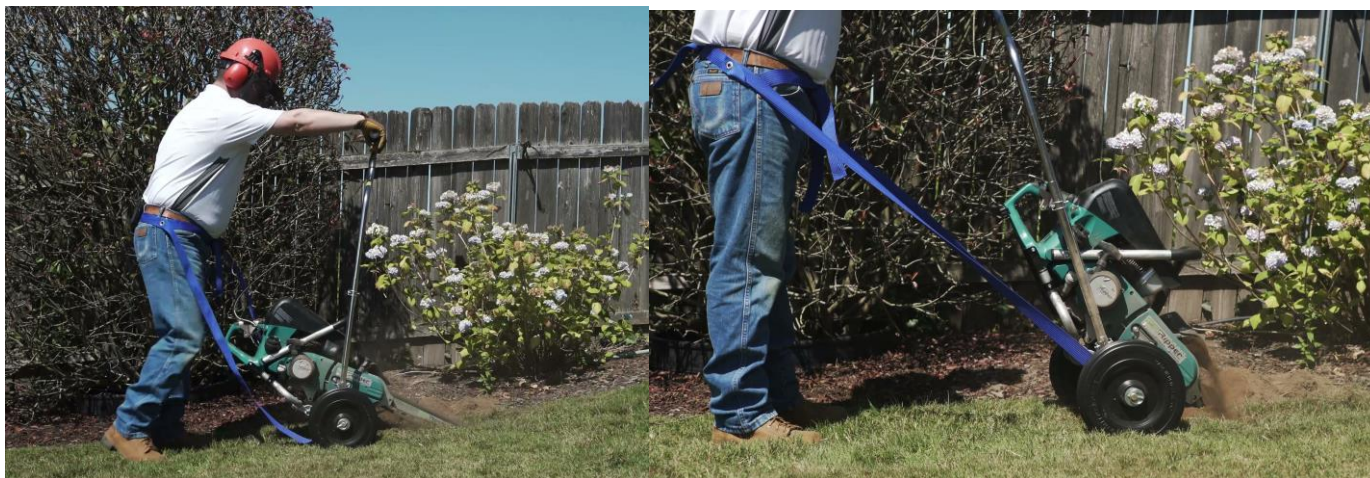


Fig.30 & 31

The EZ Kart® is recommended for longer trenches to reduce strain on the operator and give better line accuracy and depth control. The EZ Kart® has also been shown in tests to reduce vibrations. Optional side walls can be mounted on the axle of the EZ Kart® to reduce side projections and minimise back fill. (*Part number GRPEZ-28*)

5.3.4 Trenching with the GeoRipper® hand held



1. Place the GeoRipper® on the ground and slowly engage the bar into the soil as parallel as possible and using mid-range engine speed. Hold the machine firmly as some manageable kick back may be experienced. Keep the angle of the digging bar at 25-30-degree angle from vertical for comfortable operation. In lighter soils, it may be necessary to make second pass through the trench to clear out any spoils that fell back in
2. Do not use the trencher in a vertical position and do not straddle: risk of injury
3. Most powerheads are designed to operate best and develop maximum power near 3/4 throttle. Depending on soil type, best operating speeds will be from 3/4 to full throttle. For greater control at shallow depths [8 inches (200 mm) or less] a 1/2 to 3/4 throttle will improve trenching safety
4. When trenching without an EZ Kart in difficult soils, a sawing motion is recommended
5. If you strike solid obstacles (large rocks, concrete, or large roots or buried timber) remove the obstacle before continuing. The GeoRipper® mini trencher is designed to dig earth, not large stones or tree roots over 3 inches (70mm) in diameter
6. For wider trenches [2-3 inches (50 – 80mm)], rotate blade along the long axis of the blade while trenching. For anything over 3 inches (80mm), make a second trenching cut at the outside of the desired width and remove the soil between the two trenches
7. Regular checking/adjustment of digging chains will extend chain life
8. At the end of the job, and periodically during the project, brush the loose dirt off the digging chain and around the digging sprocket. Inspect the digging teeth for any damage. Always switch the engine off and wait that the chain to stop
9. To trench down an incline, always stand downhill of the trencher
10. To trench laterally across an incline, always direct the discharge chute downhill. This will keep the spoils from falling downhill back into the trench
11. In very rocky soils, use an EZ Kart® with side walls, or rock shield (*Part number GRPEZ-28*)



Fig.32

CAUTION

DO NOT ALLOW DIGGING CHAIN TO JAM OR SLOW TO A STOP WHILE HOLDING THE THROTTLE ON. TURN OFF ENGINE, DISCONTINUE OPERATION AND INVESTIGATE. RUNNING ENGINE AT MORE THAN IDLE WITH CHAIN JAMMED WILL CAUSE SEVERE CLUTCH AND/OR BELT DAMAGE.

If GeoRipper® mini trencher has an adjustment screw for the belt tension, the tension must be readjusted after the first hour of operation to prolong belt life. See power head Operator's Manual for further instruction on belt tensioning.



5.3.5 Ground condition and tips

Check along the desired trench line, clearing any obstructions, branches, large stones and other obstructions that could cause the operator to slip or loose footing. If a long continuous trench is planned, consider using the EZ Kar®.

Special situation:

1. The GeoRipper® minitrencher is not designed to trench in solid rock
2. For digging in light or sandy soils containing fine, hard stones, GeoRipper® minitrenchers should be at full speed prior to contact the ground. When trenching is complete, lift the digging bar and chain clear of the trench prior to throttling down. This will greatly reduce the occurrence of stone jamming the chain. Decreasing tension on the chain will also improve trenching in these conditions
3. When digging at full depth in difficult, wet, pliable clays, it is recommended to make two half-depth passes in opposite directions. This will reduce operator fatigue, reduce engine strain, and reduce the possibility of jamming the digging chain with mud
4. When cutting curves or radiuses, it is advisable to use several shallow passes rather than a single, full-depth cut
5. When trenching across a roadway, it is recommended to first loosen the compacted gravel/stones along the desired line. Removing larger rocks before trenching will also increase productivity and avoid damaging the digging chain

6. If digging chain is slowing or stopping because of excessive soil buildup, periodically stop the machine and clear the material for the chain, sprockets and discharge chute. Some soil will build-up on the sprocket and add tension to the chain. Loosening the chain can help. Keeping engine speed sufficiently high and constant can also help.
7. Cut the grass before starting to avoid long grass being caught around the drive sprocket. This will also facilitate back fill
8. If a large stone jams the chain – between the chain and bar – switch the machine off and hit the chain with a mallet in the opposite direction of travel to dislodge the stone (*Fig.32*) check the chain is moving freely before re-starting
9. Keep a good slack on the chain (*refer to paragraph 4.1.2*)



Fig.33

5.3.6 Vibration information for portable hand-held and hand-guided machinery



Hand Arm Vibration syndrome HAV may result after long periods using the GeoRipper®. To reduce the risk of HAV always use the mini trencher mounted on its EZ Kart® or limit the daily usage per operator. Attention: the measurement of the vibration total value to which the hand-arm system is subjected exceeds 2.5 m/s².

These measurements were taken using model GR20-M 2-stroke GeoRipper® trenching of top soil 3-6” with light sandy soil beneath. Variation in soil condition would alter this reading, and in stony soil condition, the reading is likely to be higher.

- GeoRipper® handheld: time of operation before reaching ELV of 5m/s² is 25mins
- GeoRipper® mounted on its EZ Kart®: time of operation before reaching ELV of 5m/s² is 6h16mins

6 Maintenance, Servicing and Warranty



The GeoRipper® shall only be serviced by a qualified and trained person. Only use GeoRipper® parts and OEM spare parts for the power head.

NOTICE

Always check the power head manufacturer's instructions for maintenance and service intervals. The information given in this chapter is a guideline only and specific service instructions are model dependent.

IMPORTANT! Inspect powerhead air filter daily. Clean or replace when necessary as per powerhead Operator's Manual.

Blow out and clean cooling fin on powerhead with low-pressure, compressed air every 8-10 hours of operation. Clean out any embedded or sticky debris.

Check drive belt tension and inspect drive belts for cracking or other wear daily. Replace belt as needed. A spare drive belt is included with every GeoRipper®.

Replace anti-vibration mounts and other wearable powerhead components as required to maintain the power head.

4-Cycle Engines: Change oil for the first time after 20 hours of use. After initial oil change, oil shall be changed every 30-40 hours of operation.

When storing the GeoRipper® minitrencher, drain fuel from tank, run machine dry, and oil digging chain. Follow storage instructions in power head Owner's Manual.

6.1 Regular Checks and Maintenance to be Carried Out by the Operator

Task	Frequency
Clean the machine	After use
Check and replace chain if worn or damaged	Before use
Check and replace drive sprocket if worn or damaged	Before use
Check and replace nose idler if worn or damaged	Before use
Reverse the bar if worn	Every 3 to 4 chains
Check petrol cap for tightness	Before use
Check air filter clean or replace if necessary	Before use
Check oil level	Before use – 4-Stroke only
Check the V belt tension and for damage	Before use
Check chain does not turn at idle speed	Before use
Check all bolts for tightness	Before use
Wire brush the chain and spray with light oil	After use
Check fuel suction filter and replace if needed	Once a month
Clean or replace spark plug	Once a month

6.1.1 Replacing the drive sprocket

1. Lock the pulley using tools provided
2. Undo the securing bolt and replace sprocket
3. Refit bolt using thread lock fluid and tighten fully

6.1.2 Replacing the nose idler sprocket

1. Heat screws to breakdown locking compound. An impact driver with a 5mm hex bit will help to loosen screws
2. Remove the idler sprocket and replace
3. Add a stud locking compound (Red Loctite) to screws before reinstalling. Tighten Nose bolts to 33Nm

6.1.3 Replacing the V Belt

1. Remove the side cover
2. Loosen the V belt tension. This is model dependent, please refer to power head manufacturer's instructions
3. Remove old / damaged belt and clean inside of cover
4. Adjust to the correct tension and refit cover

6.1.4 Lubricating the chain

The chain is not lubricated during use, it is self-sharpening as the teeth wear. To maintain and prolong working life clean every time after use with a wire brush and spray with light oil. For longer period of storage, remove the chain and soak in oil.

6.2 Servicing

The GeoRipper® must be serviced regularly to ensure good operation. Every 500 hours of use or once a year a full service must be carried out. Please return your GeoRipper® to your local dealer for a full service including full check and cleaning of the machine, replacement filter paper and gauze, new spark plug, replacement fuel filter and replacement V belt.

6.3 Warranty

Warranty and liability claims for personal injury and property damage are excluded if they are due to one or more of the following causes:

1. Disregard of the operating instructions
2. Improper use of the GeoRipper® in regards to the instructions in this manual
3. Repair and maintenance that do not comply with the instructions in this manual
4. Modification of the trencher or its components
5. Disasters caused by unforeseen circumstances

Use only original spare parts and wear parts from the manufacturer.
No modifications to the device without the manufacturer's approval

In the case of proper and intended use in accordance with the operating instructions, the supplier shall provide a warranty within the framework of warranty period.

Any repairs that occur during the warranty period must be performed by the supplier, the manufacturer or their authorised representative.

6.4 How to Identify and Solve Problems

6.4.1 Troubleshooting and repair by the operator



Always switch the engine off and wear gloves when investigating problems. Refer to power head manufacturer's instruction manual

Problem	Cause	Solution
Trencher does not start or with difficulties	Fuel supply	Check that there is fresh fuel in the reservoir. Check fuel filter and fuel feed to the carburetor Lift air filter assembly and spray one burst of petroleum based lubricant in carburetor
	Ignition	Check spark plug cover and spark plug. Clean and dry if necessary
	Engine failure	Take to an authorised service centre
Chain does not turn	V Belt Sprocket	Check and replace Check for obstruction like grass around sprocket
	Clutch	Take to an authorised service centre
	Chain	Check chain is turning freely
Chain runs in idle	Carburetor V Belt Clutch	Adjust idle Slack or worn, adjust tension or replace Check clutch is not blocked up
Trench with difficulty or very narrow	Chain	Replace

6.4.2 Troubleshooting by Service Centre

For any other issues with your GeoRipper® contact your local service centre.

6.5 Frequently Asked Questions

Question	Answer
How long does the chain last?	This is soil and operator dependent and could be anything from 50m to 500m, or more in very good soil condition
What about other wear parts?	Drive sprockets, idle nose sprockets, bar, drive belts will all need replacing at regular intervals
What about tree roots?	The GeoRipper® will cut through tree roots up to 7cm diameter. Roots may shorten life of the chain
How to manage kickbacks?	Relatively slow rpm and bar and chain weight help in making kickbacks more manageable. Reduce revs. Switch engine off and investigate the trench for obstacles
What size are the trenches?	Trenches can be up to 700mm and 50mm wide
What if the machine goes wrong?	Return to your point of sale for repair

6.6 Spare Parts, Wear Parts and Optional Accessories



Only use genuine GeoRipper® parts and accessories. Do NOT modify parts as this may cause serious injury to the operator or bystanders

SKU	Description
GR1	Nose plate assembly fits all models and sizes
GR2	Nose sprocket 6 tooth. Followed by 11= 11 tooth
GR3	Digging bar only. Followed by size in inches: 16, 20, 27. Letter C indicates complete bar with nose idler assembly (GR1 + GR2)
GR4	Replacement box of two chains standard 38mm width. Followed by size in inches: 16, 20, 27. Suffix W indicates wider 50mm chain sold singly (ex. GR4-20-W) wide chains are power head models dependent
GR6	Bar Clamp Plate fits all models and sizes
GR7	Clamp plate bolts and washers
GR8	Dirt Guard kit fits all models and sizes
GRCL	Chain link standard 38mm. Suffix W indicates for wider 50mm chain
GRP-CT	Chain Tensioner kit fits all models and sizes, standard with all GR27
GRP-XXX	Drive Sprocket followed by power head identification
GRPB-XX	Drive Belt followed by power head identification

GR-EZ-X	EZ Kart® complete followed by power head identification: M, H, S
GRPEZ-02	Rubber Grip handle
GRPEZ-04	Throttle Hand Lever
GRPEZ-06	Handle Bar
GRPEZ-08	Throttle Cable
GRPEZ-10-X	Throttle Latch Assembly followed by power head identification: M, H, S
GRPEZ-12	Clip
GRPEZ-14	Wheel retainer washers and linchpins
GRPEZ-16	Pair of Wheels
GRPEZ-18	Belt complete
GRPEZ-20	Belt Buckle
GRPEZ-26	Axle Extender to use in conjunction with wide chains
GRPEZ-28	Rock Shield


GeoRipper® spare parts and accessories can be purchased for your local dealer or on the online shop (www.georipper.co.uk). For any parts relating to the power head, please contact the power head manufacturer

7 Disposal



At the end of its life, take your GeoRipper® to an approved recycling centre. Wear parts such as chains, sprockets and bars can be recycled in metal section facilities.



 The symbol on the product, the accessories or packaging indicates that this device must not be treated as unsorted municipal waste, but must be collected separately! Dispose of the device via a collection point for the recycling of waste electrical and electronic equipment if you live within the EU and in other European countries that operate separate collection systems for waste electrical and electronic equipment. By disposing of the device in the proper manner, you help to avoid possible hazards for the environment and public health that could otherwise be caused by improper treatment of waste equipment. The recycling of materials contributes to the conservation of natural resources. Therefore do not dispose of your old electrical and electronic equipment with the unsorted municipal waste.

8 Related Documentation & Illustrations

#	Document Title	Version #	Location	Author
1	EK6100 / EK6101 Instruction Manual		www.makita.com	Makita Corporation
2	EK7650H / EK7651H Makita Instruction Manual		www.makita.com	Makita Corporation
3	EK7300 / EK7301 / EK8100 Instruction Manual		www.makita.com	Makita Corporation
4	K770 Operator's Manual		www.husqvarnacp.com	Husqvarna Construction Products
5	K970 III Operator's Manual		www.husqvarnacp.com	Husqvarna Construction Products
6	TS700 / 800			

Fig.	Illustration Description	Page
1	GeoRipper® Elements	12
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5	CE Marking Sticker	14
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13 to 26	EZ Kart® Assembly Procedure	22-25
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33	Dislodging Stone	31

9 Declaration of Conformity for Machinery



EU Declaration of Conformity

In accordance with EN ISO 17050-1:2010

Object of the declaration:

Product Portable Handheld Trencher
Model/type GR M(Makita) H(Husqvarna) S(Stihl) then length 400-500-800mm
Batch/serial no. GR Alphabetical Revision then numerical sequentially

GR Manufacturing
5 Lilburn Street
Warkworth 0910
New Zealand

This declaration is issued under the sole responsibility of the manufacturer.

The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:

2006/42/EC The Machinery Directive
2014/30/EU The Electromagnetic Compatibility Directive
2000/14/EC The Noise in the Environment Directive

Conformity is shown by compliance with the applicable requirements of the following documents:

Reference & Date	Title
EN 474 10 2007+A1 2009	Earth Moving Machinery/Trenchers
EN ISO 3547 2004	Earth Moving Guard Requirements
EN ISO 12100 2010	Design/Risk Assessment & Risk Reduction
EN ISO 14121-2 2012	Machine Safety & Risk Assessment

	<u>Manufacturer:</u>	<u>Imported in the UK by:</u>
Signed for and on behalf of:	GR Manufacturing	Four Ashes Machinery Ltd.
Place of issue:	Warkworth	United Kingdom
Date of issue:	20-10-2016	30-05-2019
Name:	Michael Sylvester Smith	Eric Gavras
Position:	Director	Managing Director

Signature:



The technical documentation for the machinery is available from:

Name: DOC-EUPOINT
Address: www.doceupoint.com



Imported in the UK by:
Four Ashes Machinery Ltd.
Company Registered in England and Wales no. 9811885
www.georipper.co.uk