OPERATION

Foreword
Thank you for your purchase of the TRELAWNY TRIDENT NEPTUNE DE-SCALING MACHINE.

This manual contains the necessary maintenance information for you to ensure proper operation and care for this machine.

See also the manual that is supplied by the motor manufacturer.

It is essential for you to read through these manuals thoroughly.

In the unlikely event that you experience problems with your Trident Neptune please do not hesitate to contact your local Trelawny dealer or agent. We always welcome feedback and comments from our valued customers.

General Information
Before operating, performing maintenance or repairing the Trident Neptune this manual must be read and understood by the operator, if in any doubt, ask your supervisor before using this equipment.

Local safety regulations must be followed at all times. Failure to follow these instructions could result in damage to the machine and/or personal injury.

Trelawny SPT Limited disclaims all responsibility for damage to persons or objects arising as a consequence of incorrect handling of the machine, failure to inspect the machine for damage or other faults that may influence the operation prior to starting work, or failure to follow the safety regulations listed or applicable to the job site.

This machine is primarily designed for the removal of heavy rust or paint from steel surfaces. Typically used on ships decks and superstructures. It can be used both indoors and out.

This machine must not be used in a fixture.

The electric motor used has dual 50 or 60 hertz compatibility, no modification is required, it can be converted easily for use on a 110v or 220v electricity supply. See motor plate for further information.

Safety
FACE MASK, EAR DEFENDERS, SHATTERPROOF GLASSES, GLOVES, HELMET, WEAR SAFETY BOOTS, and any other personal protective equipment required for the working conditions.

Avoid loose clothing; this may become trapped in moving parts and cause serious injury.

ENSURE THAT THE WORK PLACE IS WELL VENTILATED.

Avoid operating engine-powered generators or air compressors used to power the Trident Neptune in an enclosed area, since engine exhaust gases are extremely poisonous.

Ensure that all electrical cables and connections are in good condition and that a good earth connection is established.

Do not use the machine if any electrical insulation appears to be damaged.

The tool guard is supplied to protect the operator from flying particles. Always ensure that it is fitted.

Do not modify the Trident Neptune De-Scaler in any way.

Do not apply excessive pressure – let the Scaler do the work.

The electric motor is rated as splash proof, ensure that the electrics are not exposed to excessive moisture.

IMPORTANT
Thermal protection:
If the motor overheats the thermal protector will open the motor circuit, stopping rotation of the tool.

If this has occurred it is imperative that the motors power switch is switched off, wait until the motor has cooled sufficiently.

After the motor has cooled, the thermal protector will reset automatically. Retry again after 15mins. If it trips out again investigate the cause before continuing.

(It maybe caused by a bearing failing or incorrect grease used in the flexible shaft, to much force being used etc.)

Risk of Hand-arm Vibration injury
These tools may cause Hand-arm Vibration Syndrome injury if their use is not adequately managed.

We advise you to carry out a risk assessment and to implement measures such as; limiting exposure time [i.e. actual trigger time, not total time at work], job rotation, ensuring the tools are used correctly, ensuring the tools are maintained according to our recommendations, and ensuring that the operators wear personal protective equipment [PPE] particularly gloves and clothing to keep them warm and dry.

Employers should consider setting up a programme of health surveillance to establish a benchmark for each operator and to detect early symptoms of vibration injury.

We are not aware of any PPE that provides protection against vibration injury by attenuating vibration emissions.

See ‘Specifications’ section for vibration emission data.

Further advice is available from our Technical Department.

We strongly advise you to visit the U/K Health & Safety Executive website http://www.hse.gov.uk/vibration. This site provides excellent advice and information on Hand-arm Vibration Exposure Calculator that is easy to use to work out the daily vibration exposure for each of your operators.

Cutter Types & Applications
Cutter Wheels
These the most aggressive, they are designed for the rapid removal of very heavy rust and scale and are also suitable for the rapid removal of two part epoxy paint coatings.

Chipping Leaves
These are fitted as standard, they are designed for the rapid removal of very heavy rust and scale, they are less aggressive than cutter wheels, and should provide a surface finish suitable for coating with most modern paint systems.

Wire Brush
These are the least aggressive of all, and are generally used for the removal of light rust and paint, or for final finishing to provide a surface suitable for painting. There are various types available, see parts list for further information.

DO NOT OPERATE ELECTRIC VERSIONS IN WET CONDITIONS.
**Before Use**

Fit a suitable electric plug for outdoor use to the cable.

Colour code as follows: -

<table>
<thead>
<tr>
<th>Colour</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue</td>
<td>neutral</td>
</tr>
<tr>
<td>Brown</td>
<td>live</td>
</tr>
<tr>
<td>Green</td>
<td>earth</td>
</tr>
</tbody>
</table>

**Important:** Please ensure the motor is set to the correct voltage (110v or 120v)

If there is a need to change the setting of the voltage, remove back plate and cover from the rear of the motor and reconnect the leads as illustrated: -

For Low Voltage 110v Setup:
Disconnect the wire labelled “2” from the terminal numbered (4) and connect it to terminal numbered (L2).

Disconnect the wire labelled “J” from terminal numbered (3) and connect it to terminal numbered (4).

For High Voltage 220v Setup:
Disconnect the wire labelled “J” from terminal numbered (4) and connect it to terminal numbered (3).

Disconnect the wire labelled “2” from the terminal numbered (L2) and connect it to terminal numbered (4).

110v Motor
The motor requires the minimum of a 16amp, 110v power supply. Always use the shortest possible length of extension cable. To avoid voltage drop the cable must be a minimum core wire size of 2.5mm cross-section.

Maximum length of cable is 30 meters.

Use a centre tap transformer with a continuous rated output of at least 1.5va. In practice this means that a 3.0kva transformer will be required. Be aware that manufacturers have different methods of rating their equipment. All transformers and extension cables should be fitted with 16amp plugs and sockets. The 240v supply to the 110v transformers ideally should be rated to at least 13amp if supply problems are to be avoided.

220v Motors
Take particular care when using 220v machines, ensure that the electrical supply is earthed and that breakers and fuses are correct for the loading. The 220v motor requires the minimum of a 13amp, 220v power supply. Always use the shortest possible length of extension cable. It is recommended that if a residual current device (RCD) or (RBC) tripping at 30mA is fitted in the supply.

Air Models;
The correct air pressure for this machine is to 6.2bar (90psi). Do not let the operating pressure fall below 5.5bar (80p.s.i.) or rise above 6.9bar (100 psi) absolute maximum. Ensure that there is no moisture (condensation) is present in the air hose.

**Cleaning**
If the operation of the Trident Neptune Scaler becomes sluggish or if the electric motor thermal overload protection continually has to reset, it is recommended that the tool be lubricated as indicated in the previous paragraph.

**Servicing**
Always disconnect power supply from the tool before performing any servicing work.

**Lubrication**
Unscrew cap (2) to expose front ball race (3) using special tool provided. Please note this is fitted with a left-hand thread. Apply a liberal amount of grease to the front bearing.

Unscrew Dumbbell body (5) from the external nut (10) (left-hand thread) and the coupling nut is now exposed, and can be unscrewed from spindle (1) (right-hand thread). The flexible inner shaft (16) may now be withdrawn from motor end of the rubber casing. Apply liberal amount of grease to the rear bearing and inner shaft.

**NOTE:** It is recommended to use one of the following lubricants, or an equivalent.

- BP ENERGREASE LC
- CASTROL LMX
- ESSO BEACON EP2
- RAMONOL WHITE GREASE

**Dismantling**

**Changing Scaling Head.**
Using spacers provided unlock the existing head from the dumbbell handle spindle (1) and unscrew until free. Fit the alternative scaling head or wire brush to the spindle and fasten until hand tight.

**Hand Guard Removal**
Unlock and remove both sets of nuts, bolts and washers (7); Withdraw the clamp (8) from the dumbbell handle (5) and remove the hand guard (9).

**Removing Brush Arbor from Wire Brush**
Secure the centre bolt head (29) in vice and remove the hexagonal nut (19) and washer (20). Withdraw the wire brush (30) and the bottom washer (20).

**Removing Chipping Leaves**
Secure centre bolt head (27) in vice and remove hexagonal nut (19) and washer (20). Remove side plate (28) withdraw the washers (22) and chipping leaves (23) and check for any sign of wear on the leaf pins (24).

Remove the other side plate (28) from the centre bolt and check both side plates for signs of wear.

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**Operational Diagrams**

![Diagram](https://via.placeholder.com/150)

**For Low Voltage 110v Setup:**
Disconnect the wire labelled “2” from the terminal numbered (4) and connect it to terminal numbered (L2).

**For High Voltage 220v Setup:**
Disconnect the wire labelled “J” from terminal numbered (3) and connect it to terminal numbered (4).

110v Motor
The motor requires the minimum of a 16amp, 110v power supply. Always use the shortest possible length of extension cable. To avoid voltage drop the cable must be a minimum core wire size of 2.5mm cross-section.

Maximum length of cable is 30 meters.

Use a centre tap transformer with a continuous rated output of at least 1.5va. In practice this means that a 3.0kva transformer will be required. Be aware that manufacturers have different methods of rating their equipment. All transformers and extension cables should be fitted with 16amp plugs and sockets. The 240v supply to the 110v transformers ideally should be rated to at least 13amp if supply problems are to be avoided.
Removing Cutter Wheels
Secure bolt head (18) in vice and remove hexagonal nut, (19) washer, (20) and side plate (21). Withdraw cutter wheels (25) and check for signs of wear on cutter wheel pins (26). Remove bottom side plate from centre bolt and check both side plates for signs of wear.

Removing Dumbbell Handle
Secure dumbbell handle (5) in a soft jawed vice and unscrew front cap (2) with the special tool provided (left-hand thread). Unscrew the dumbbell body (5) from the threaded hexagonal adaptor (10) (left-hand thread) and draw apart.

Ball Race Removal
Unscrew front cap (2) with special tool provided (left-hand thread) to expose front ball race (3). Unscrew dumbbell body (5) (left-hand thread) from large threaded hexagonal adaptor (10) (left hand thread) and draw apart.

The inner shaft with its spanner flats are now exposed and can be unscrewed from spindle (1) (right-hand thread). Remove the spindle from the dumbbell housing. Both ball races (3) and (4) are now exposed and can be removed.

Removing Inner Shaft from Outer Casing
Disconnect inner shaft (16) from motor unit (14/15). Remove dumbbell handle and hand guard as previously instructed. The inner shaft (16) can now be withdrawn from the motor end of outer drive casing.

Removing Nose Piece
Remove flexible drive from motor unit as previously instructed. Remove dome headed screws (12) from the motor casing and withdraw nose piece (13).

Assembly
Ensure all parts are clean. If the Scaler is being fully serviced, replace all ball races.

Fitting the Nose Piece
Align the holes in the nose piece (13) with those on the motor unit (14/15). Fit and fasten the three dome head screws (12).

Inner Shaft/Outer Casing Assembly
Insert inner (16) into the motor end of rubber casing after ensuring that the ball race (11) has been packed with grease.

The inner shaft needs to be pre-tensioned. Screw the threaded dumbbell spindle screw onto the inner shaft and pull the end out of the outer shaft until the spanner flats on the inner shaft are visible.

Insert the supplied spanner into the flats and tighten the spindle onto the inner shaft.

Fitting of Dumbbell Handle
Fit both ball race bearings into the corresponding bores of the dumbbell handle. Ensure that the ball races are fitted correctly and have been packed with the recommended grease.

Fit the dumbbell handle onto the large threaded hexagonal adaptor (10) on the outer drive casing (6) and secure (left-hand thread).

Fit locking cap (2) to front of dumbbell handle ensuring that the recessed holes are on the exposed side to enable locking with special tool provided.

Assembly of Scaling Heads

Wire Brush
Secure centre bolt (29) head in vice vertically and fit washer, (20) wire brush (30) and top washer (20).

Screw hexagonal nut (19) down by hand before fastening securely with the spanners provided.

Fitting Assembled Scaling Head to Dumbbell Handle
All scaling heads are fitted to the dumbbell handle by screwing the centre bolt (18), (27) or (29) into the dumbbell handle spindle, (1) and fastening securely using the spanners provided.

Fitting of Hand Guard
Place rubber guard (9) onto front of dumbbell handle (5), align holes with metal clamp (8) and fasten securely with bolts, nuts and washers (7).

Machine Storage

Short period storage: up to 3months
Clean the outside of the machine and inspect the cutters and pins for wear, replace any worn parts as required.

Liberally spray the cutterhead assembly with a rust preventative solution which is also safe to use on the rubber components, if accidentally applied.

See also motor manufactures operation and maintenance instruction book.

Cover the machine to protect it.
Store the machine in a dry place.
Be sure to check the security of all fastenings after any lay up period.

Long period storage: over 3months
Clean the outside of the machine and strip down the flexible shaft and dumbbell handle, grease all bearings and the flexible inner shaft. Inspect the cutters and pins for wear, replace any worn parts as required.

Liberally spray the cutterhead assembly with a rust preventative solution which is also safe to use on the rubber components, if accidentally applied.

See also motor manufactures operation and maintenance instruction book.

Cover the machine to protect it. Store the machine in a dry place.
Be sure to check the security of all fastenings after any lay up period.
<table>
<thead>
<tr>
<th>Item</th>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>340.542</td>
<td>Dumbbell Handle Spindle</td>
</tr>
<tr>
<td>2</td>
<td>340.536</td>
<td>Front Cap</td>
</tr>
<tr>
<td>3</td>
<td>340.252</td>
<td>Ball Race (Large)</td>
</tr>
<tr>
<td>4</td>
<td>340.252</td>
<td>Ball Race (Small)</td>
</tr>
<tr>
<td>5</td>
<td>340.541</td>
<td>Dumbbell Body</td>
</tr>
<tr>
<td>5a</td>
<td>340.540</td>
<td>Dumbbell Handle Assembly</td>
</tr>
<tr>
<td>6</td>
<td>340.290</td>
<td>Outer Drive Casing Assembly</td>
</tr>
<tr>
<td>6a</td>
<td>340.285</td>
<td>Flexible Drive Assembly</td>
</tr>
<tr>
<td>7</td>
<td>340.633</td>
<td>Nut / Bolt &amp; Washer Set (Part of item 9)</td>
</tr>
<tr>
<td>8</td>
<td>340.252</td>
<td>Ball Race</td>
</tr>
<tr>
<td>9</td>
<td>340.633</td>
<td>Hand guard Assembly</td>
</tr>
<tr>
<td>10</td>
<td>340.548</td>
<td>Centre Bolt for Single Leaf Cutting Head</td>
</tr>
<tr>
<td>11</td>
<td>340.548</td>
<td>Centre Bolt for Crimped Wire Cup Brush</td>
</tr>
<tr>
<td>12</td>
<td>340.644</td>
<td>Hexagon Nut</td>
</tr>
<tr>
<td>13</td>
<td>340.288</td>
<td>Centre Bolt for 6 x Cutter Scaling Head (Part of 2)</td>
</tr>
<tr>
<td>14</td>
<td>340.594</td>
<td>Washer</td>
</tr>
<tr>
<td>15</td>
<td>340.594</td>
<td>Washer for 6 x Cutter Scaling Head (Part of 50)</td>
</tr>
<tr>
<td>16</td>
<td>340.594</td>
<td>Chipping Leaf (Part of 24)</td>
</tr>
<tr>
<td>17</td>
<td>340.594</td>
<td>Chipping Leaf (Part of 24)</td>
</tr>
<tr>
<td>18</td>
<td>340.594</td>
<td>Chipping Leaf (Part of 24)</td>
</tr>
<tr>
<td>19</td>
<td>340.594</td>
<td>Chipping Leaf (Part of 24)</td>
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<tr>
<td>20</td>
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<td>21</td>
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<tr>
<td>22</td>
<td>340.594</td>
<td>Chipping Leaf (Part of 24)</td>
</tr>
<tr>
<td>23</td>
<td>340.594</td>
<td>Chipping Leaf (Part of 24)</td>
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</tbody>
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### TECHNICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexible Shaft Length (approximately)</td>
<td>2.7 metres</td>
</tr>
<tr>
<td>Flexible Inner Shaft Diameter</td>
<td>16mm</td>
</tr>
<tr>
<td>Total Weight</td>
<td>Approximately 34 kg</td>
</tr>
<tr>
<td>Life expectancy of the cutterheads</td>
<td>50 hrs</td>
</tr>
<tr>
<td>Cutting Width</td>
<td>Chipping Leaves - 30mm</td>
</tr>
<tr>
<td>Electric Motor</td>
<td>110v / 220v</td>
</tr>
<tr>
<td>Amperage</td>
<td>110v = 11.4amp / 115v = 9.8amp / 220v = 5.7amp / 230v = 4.9amp</td>
</tr>
<tr>
<td>Power</td>
<td>0.75hp</td>
</tr>
<tr>
<td>Revolutions per minute</td>
<td>2850rpm at 50Hz / 3450rpm at 60Hz</td>
</tr>
<tr>
<td>Time to stop rotation</td>
<td>9 sec</td>
</tr>
<tr>
<td>Air Motor - (Air inlet J-Mac Claw Coupling)</td>
<td>6.2bar (90psi) - 32.1 lps (68cfm) / 1.1kw (1.5hp)</td>
</tr>
<tr>
<td>Revolutions per minute</td>
<td>3000rpm</td>
</tr>
<tr>
<td>Noise (process noise not inc)</td>
<td>(LwA, SWL) 73.1dB (A)</td>
</tr>
<tr>
<td>Vibration at Dumbbell Handle (Leaf Cutters)</td>
<td>8.7m/s² (AEQ) (k = -0% +40% **)</td>
</tr>
<tr>
<td>(Cutter Wheels)</td>
<td>5.4m/s² (AEQ) (k = -0% +40% **)</td>
</tr>
<tr>
<td>(Wire Brush)</td>
<td>10.1m/s² (AEQ) (k = -0% +40% **)</td>
</tr>
</tbody>
</table>

(k) ** Equals the factor of uncertainty, which allows for variations in measurement and production. Vibration Data figures are tri-axial, which gives the total vibration emission. Because of various factors, the range of vibration from these tools may vary 5.4m/s² & 14.1m/s².

The vibration is dependent on the task, the operators grip and power source etc.

NOTE: The above vibration levels were obtained from tri-axial measurements to comply with the requirements of “The Control of Vibration at Work Regulations 2005” and the revisions to the (8662) now EN ISO 28927 and EN ISO 20643 series of standards. These values are at least 1.4 times larger than the values obtained from single axis measurements.

This tool has been designed and produced in accordance with the following directives:
2006/42/EC Machinery Directive
73/23/EC Low Voltage Directive

If your company has any problem with our products or would like to discuss the possibility of an improvement being made to them, then please do not hesitate to contact us. Your comments are both important and appreciated.

All rights reserved. Any unauthorised use or copying of the contents or part thereof is prohibited.
This applies to trademarks, model denominations, part numbers and drawings.
Use only genuine Trelawny spares.
The use of non-Trelawny spare parts invalidates the warranty.

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