WERKMASTER™
Ultra Floor Systems & Solutions

Taking it to the Wall!

OPERATOR'S MANUAL

IMPORTANT: Read before using your new machine

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LIABILITY LIMITATIONS

The remedies of the user set forth under provisions of warranty outlined at the end of this manual are the exclusive and total liability of WerkMaster Grinders & Sanders Inc. with the respect to their sale or the equipment and service furnished hereunder, in connection with the performance or breach thereof, or from the sale, delivery, installation, repair or technical direction covered by or furnished under the sale, whether based on contract, warranty, negligence, indemnity, strict liability, or otherwise shall not exceed the purchase price of the unit of equipment upon which such liability is based.

WerkMaster will not in any event be liable to the user, any successors in interest or any beneficiary or assignee relating to this sale for any consequential, incidental, indirect, special or punitive damages arising out of this sale or any breach thereof, or any defects on, or failure of, or malfunction of the equipment under this sale based upon loss of use, lost profits or revenue, interest, lost goodwill, work stoppage, impairment of other goods, loss by reason of shutdown or non-operation, increased expenses of operation of the equipment, cost of purchase or replacement power of claims of users or customers of the user for service interruption whether or not such loss or damage is based on contract, warranty, negligence, indemnity, strict liability, or otherwise.

WerkMaster reserves the right to modify, alter and improve any part or parts without incurring any obligation to replace any part or parts previously sold without such modified, altered or improved part or parts.

No person is authorized to give any other warranty or to assume any additional obligation on WerkMaster's behalf unless made in writing and signed by an officer of WerkMaster.

As a condition of these warranties, you are responsible for properly using, maintaining, and caring for your machine as outlined in this Owner's Manual. WerkMaster recommends that you maintain copies of all maintenance records and receipts for review by WerkMaster.

USE ONLY GENUINE WERKMASTER PARTS AND ACCESSORIES FOR YOUR OWN SAFETY, THE SAFETY OF OTHERS AND THE LIFE OF YOUR MACHINE. THIS WARRANTY IS NOT VALID IF YOUR MACHINE HAS BEEN MODIFIED WITHOUT WERKMASTER'S AUTHORIZATION OR REPAIRED WITH UNAUTHORIZED REPLACEMENT PARTS.

CONTENTS

INTRODUCTION

Congratulations on your purchase of a WerkMaster machine. WerkMaster machines allow professional surface prep, polishing, grinding, edging, buffing and restoration of virtually any surface material including concrete, terrazzo, stone, and hardwood. This manual is provided to assist you in the operation and maintenance of your WerkMaster.

MACHINE DESCRIPTIONS

WerkMaster machines include the SCARAB, GATOR, THE EDGE, RASP, MIROIR, RAIDER XL 5, TITAN XT, and COLOSSOS XT models. To see the complete family of WerkMaster machines visit our website at www.werkmaster.com.

RAIDER XL 5

- Aggressive and powerful surface prep and polish machine, designed to meet the needs of today's general contractors, facility maintenance contractors and equipment rentals
- 7 Machines in 1 – grinds, sands, strips, polishes, buffs, burnishes, and edges
- Use for concrete floor prep and polish, as an edger on large commercial and industrial jobs, or for retail and small commercial polishing and surface prep.
- Removes thinset, epoxy, glues, paint and mastic on concrete; works on spalled and rained out concrete
- Runs wet or dry
- Edges to within 1/8" (3 mm) of the wall
- Adjustable, foldable handle for easy transport
- Features WerkMaster Multi-Disc technology with 6 counter-rotating heads and the versatility of using our 6" (152mm) ULTRA-FLEX Plug 'N Go tooling system
- Auto-sensing dual phase variable frequency drive that runs at speeds from 450 to 1160 RPM
- 5HP engine runs on 220V 1 or 3 phase; can also be run on two 110V outlets using Werkmaster's Quick 220 kit (sold separately)
- Change the tooling and the RAIDER XL 5 can be used on hardwood, stone and terrazzo

SPECIFICATIONS

MODEL		RAIDER XL 5
Dimensions	l x w in l x w cm	30 x 17 (handle included) 76 x 73
Disc Size:	in / cm	6 / 15.2
Weight	lb / kg	362 / 164.2
Disc Speed:	RPM	400-1600
Horsepower:	HP	5
Phase:	Ph	1~ / 3~
Vacuum Req:	CFM	200
Min. Generator:	kW	6+
Frequency:	Hz	50 / 60
Breaker Size:	Amp	30
Voltage:	V	200-230 110 with Quick 220 (sold separately)

SAFETY PRECAUTIONS

⚠ WARNING

Read this manual and all the safety precautions before attempting to operate WerkMaster machines. Failure to follow the safety precautions may result in severe personal injury or death. This product is intended for commercial use.

Personal Protective Equipment

- Wear eye and ear protection at all times when operating WerkMaster machines. Use only ANSI/OSHA-approved safety glasses to help prevent eye injury.
- Wear appropriate clothing and footwear when operating WerkMaster machines. Do not wear loose clothing or jewelry that may become entangled in moving parts.
- Crystalline silica from bricks and concrete and other masonry products may cause health problems. To reduce your risk, work in a well-ventilated area, use a dust control system such as an industrial-style vacuum, and wear approved personal safety equipment, such as a dust or particle respirator designed to filter out microscopic particles.
- Exposure to wood dust may cause health problems. To reduce your risk, work industrial-style vacuum, and wear approved personal safety equipment, such as a dust or particle respirator designed to filter out microscopic particles. in a well-ventilated area, use a dust control system such as an

Physical and Mental Fitness

- **NEVER** operate WerkMaster machines under the influence of drugs or alcohol, when taking medications that impair the senses or reactions, or when excessively tired or under stress.

- Only operate and maintain WerkMaster machines if you are trained in their use and are in good physical condition and mental health. You must be physically able to handle their bulk, weight and power.

Safe Operating Distance

- WerkMaster machines are to be operated by one person at a time. Maintain a safe operating distance to other personnel. Keep bystanders a safe distance away during operation by blocking off the work area in all directions with roping, safety netting, or other material. Failure to do so may result in someone being injured by flying debris or being exposed to harmful dust and noise.
- Maintain a safe operating distance from flammable materials. Sparks from the cutting action may ignite flammable materials or vapors.

Power

- Unplug the WerkMaster's power cord when not in use and before servicing or changing tooling plates.
- Turn the WerkMaster machine **off** before disconnecting power.
- **DO NOT** disconnect power by pulling the cord. To disconnect power, grasp the plug, not the cord. To remove twist-lock plugs, turn counter-clockwise and pull apart; to engage the plugs, push in and turn clockwise.
- **DO NOT** turn on the WerkMaster while it is tilted back. Any tooling fastened to the WerkMaster may eject and become a lethal projectile.
- While in use, ground this floor-finishing machine to protect the operator from electric shock. The machine is provided with a three-conductor cord and a three-contact grounding type attachment plug to fit the proper grounding type receptacle. The green (or green and yellow) conductor in the cord is the grounding wire. **NEVER** connect this wire to other than the grounding pin of the attachment plug.

Safe Operating Conditions

- Be sure all safety decals on the machine can be clearly read and understood. Replace damaged or missing decals immediately.
- Maintain WerkMaster machines in safe operating condition with all guards in place and secure, all mechanical fasteners tight, all controls in working order, and the grinder configured for the job application whether concrete, stone, terrazzo, wood or other surfaces.
- To prevent damage to your machine or severe personal injury, avoid protruding slab inserts, nails, screws, Hilti anchors, rebar, embedded bolts or any other debris, pipe extensions, machinery bases, or any objects that transmit sudden shock to the grinding assembly.
- Inspect the tooling carefully before installing. **DO NOT** use any tooling that exhibits signs of damage, as severe personal injury or damage to the equipment could result.
- **NEVER** leave WerkMaster machines running unattended.
- Risk of Explosion: Grinding/polishing concrete surfaces and sanding/finishing wood floors can result in an explosive mixture of fine dust and air. Use this machine only in a well-ventilated area free from any flame, match or combustibles materials.

  Dust generated from sanding wood floors can spontaneously ignite or explode. Promptly dispose of any sanding dust in a metal container clear of any combustibles. Do not dispose of in a fire.

Modifications

- **DO NOT** modify WerkMaster machines. **Modifications will void the warranty** and may result in injury to persons and damage to the machine.

POWER AND CONNECTIVITY

WerkMaster machines are outfitted with a variable-frequency drive (VFD) that allows the desired grinding speed to be selected. Along with controlling the speed of the machine, the VFD features include the following:

- Undervoltage protection (damages most single-phase motors)
- +/- 10% voltage protection
- 60 Hz and 50 Hz capability (international)
- Wide voltage range (200–230V)
- Soft start (smaller generator requirements)
- Monitor pad speed display

⚠ DANGER

NEVER open the VFD panel while plugged in or immediately after unplugging the power cord. Severe injury or death may result.

General Connections

WerkMaster machines come with a variety of different plug configurations. The following table lists the plug used on the RAIDER XL5.

MODEL	RAIDER XL5
Voltage	250V
Breaker Size	30 A
Phase Configuration	3 Phase
Cord End	4 pole 3 wire twist lock

Adapter Cords

WerkMaster machines come in a variety of voltage and phase configurations. The RAIDER XL5 is typically configured to operate on 208-230V three-phase power. It is capable of operating on single-phase 208-230V power with the use of a single-phase to 3-phase adapter cord (included), as well as 110V using a Quick 220 and a 20 Amp adapter cord.

Pigtails

Pigtails are plug ends with unfinished bare wire on one end for hooking up to panels. Pigtails are used when connectivity is unknown, when connecting to the power grid of an unfinished building that has no power receptacles, or when operating certain generators. Many pigtails are available or can be made up by an electrician.

⚠ DANGER

ONLY certified electricians should make and/or install a pigtail in to a panel.

Breakout Box Draws power from either a stove/range or a dryer outlet and breaks it out into 2 x 20 Amp circuits that can be used to power both a WerkMaster machine on one side of the Breakout Box using a 20A adapter cord and either 220V or 110V equipment on the other side of the Breakout Box using the Quad Box (sold separately).

Breakout Box

Quad Box

Quick 220 Adapter When using the machines in a residential environment, source power may be hard to find. Plug two 110V cords from the Quick 220 into the 110V wall outlet on two (2) separate circuits on opposite sides of the panel. Plug the WerkMaster machine into the 20 AMP TO 30 AMP adapter cord and the cord into the Quick 220 Adapter.

Power Cord Minimum Requirements The following table lists the minimum requirements for power cords.

MODEL	DISTANCE	MINIMUM REQUIREMENT
Raider XL5	Up to 300 ft	Single-phase minimum gauge of 10/3 Three-phase minimum gauge of 10/4

Generator Minimum Requirements The minimum generator requirement for the RAIDER XL5 is 6 kW.

⚠ WARNING

Exercise extreme caution at all times when working with electrical power. WerkMaster strongly recommends that only certified electricians be permitted to work with electrical power sources within a customer's facility or on their job site.

INTRODUCTION TO THE CONTROLS

Machine Controls All machine operating controls are found on the handle NOT on the keypad of the VFD.

VFD Controls The VFD controls are locked out to avoid accidentally changing necessary parameters.

MACHINE OPERATION

⚠ WARNING

ALWAYS turn off and disconnect power from the machine when performing any operations to the bottom of the machine. The machine and the tooling may be hot after using.

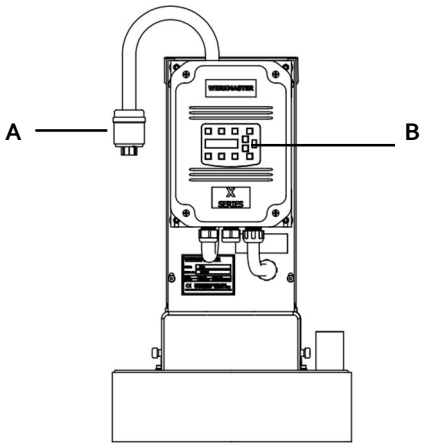


Fig. 1

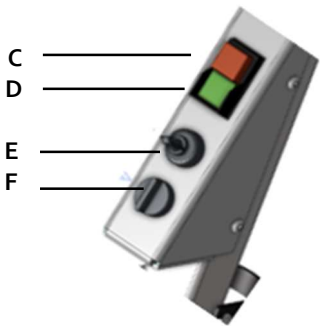


Fig. 2

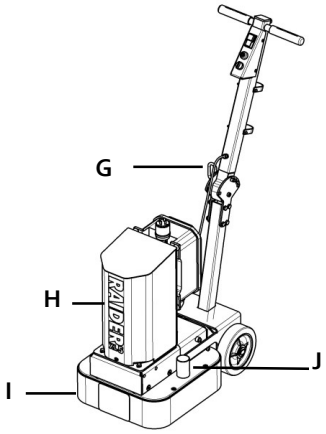


Fig. 3

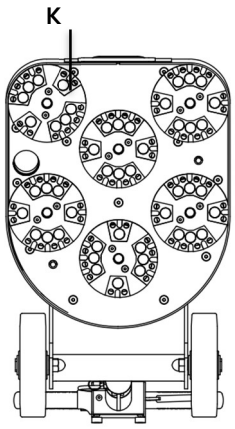


Fig. 4

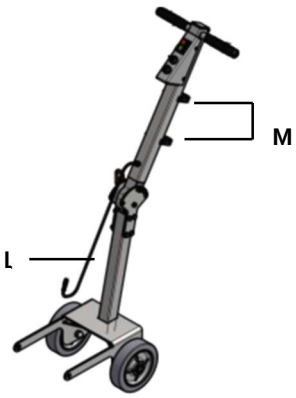


Fig. 5

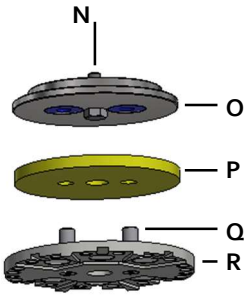
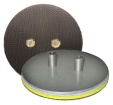


Fig. 6

ILLUSTRATED MACHINE PARTS					
	Item	Fig.		Item	Fig.
A	Twist Lock Plug	1	J	Vacuum Port	3
B	Start-up Screen	1	K	Plug 'N Go Plate	4
C	Stop Button	2	L	Control Cable, Handle	5
D	Start Button	2	M	Loop Retaining Straps	5
E	Speed Control Knob	2	N	Bolt	6
F	Forward/Reverse Switch	2	O	Pad Driver	6
G	Pull Pin	3	P	Compression Foam	6
H	Shroud	3	Q	Shear Pins	6
I	Dust Skirt	3	R	Plug 'N Go Plate	6

Changing Tools

1. Unplug the power cord from the twist lock inlet (A Fig 1).
2. Ensure the handle is in its full upright position (Fig 3). Tilt the machine back (Fig 4).
3. Choose the appropriate tooling holder attachment – magnetic Plug 'N Go plate (K Fig 4) for Metal Bond tools or Foam/Hook and Loop Adapter plate for polishing resins and sanding pads.



Foam/Hook Adapter

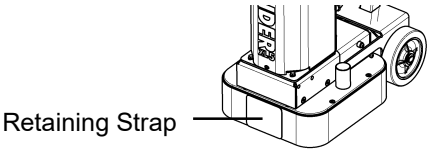
4. Insert the two shear pins (Q Fig 6) through the compression foam pad (P Fig 6) into the rubber grommets on the pad driver (O Fig 6). Attach the tooling to the plate.
5. Return the machine to the upright position (Fig 3).

Adjusting the Dust Skirt

The dust skirt (I Fig 3) serves as a seal for the bottom of the machine acting as a vacuum chamber helping the dust stay contained under the machine. If the skirt is too far from the ground, the dust containment is reduced.

To adjust the skirt:

1. Remove retaining strap.



2. Pull one end of the skirt off the machine until you reach the middle of the skirt.
3. Position the skirt until it is barely touching the ground and repeat with the other end.
4. Pull the skirt snug. The two ends of the skirt should meet at the front corner but not touch. You may have a gap of up to one inch. Replace the retaining strap.

⚠ CAUTION

Avoid positioning the skirt too low as it will drag against the ground, wearing the skirt out prematurely and possibly preventing smooth machine movement.

Adjusting the Handle

To adjust the handle, pull the pin (G Fig 3). Adjust the handle to a comfortable operating position. Re-insert the pull pin.

⚠ WARNING

Failure to check the pull pin is fully reinserted could result in damage to the machine or personal injury as the handle could release unexpectedly when the machine is being operated or tilted back.

Initial Start Sequence

When the machine is first plugged in, a start-up screen (B Fig 1) will appear showing the VFD model and the software version that it has been released with.

After the machine runs through its initial start-up sequence, the screen (B Fig 1) will show the VFD status and pad driver speed in revolutions per minute (RPM).

Starting the Machine

To start the machine:

1. Press and release the GREEN START button (E Fig 2). If doing heavy prep/coating removal, apply a slight downward pressure on the handle to alleviate some weight off the tooling when starting the machine ensuring the machine does not lift off the ground.
2. Once the machine starts, gently release the downward pressure and begin grinding.

⚠ WARNING

DO NOT lift the machine off the ground while starting it. Doing so could cause the tooling to release from the machine, resulting in damage to the floor or personal injury.

Adjusting the Speed

The speed of the machine can be adjusted when it is running or when it is stopped. To adjust the speed, rotate the Speed Control Knob (E Fig 2) on the handle clockwise to speed it up, or counterclockwise to slow it down. Always start the machine at the lowest speed and adjust as necessary.

Once the machine reaches the desired speed, the speed will remain constant as long as the load applied remains below 100%. If the machine is running at speed and the load begins to exceed 100%, the machine will reduce its speed as a protective measure to try and alleviate the outstanding load. The current running speed will be displayed. This happens under demanding conditions and is normal.

If the machine is not able to maintain the minimum speed for more than 30 seconds the machine will turn off. This is a normal protective measure. To prevent this from reoccurring alleviate some of the load and then resume operation.

Forward / Reverse

DO NOT change from Forward to Reverse or Reverse to Forward while the machine is in motion. Press STOP, wait until the machines comes to a full stop, and then change direction.

Stopping the Machine

1. Press the RED STOP button (C Fig 2).

When you unplug the machine, the screen will stay lit for a few seconds as the VFD drains the power from its internal capacitors. This is normal.

⚠ DANGER

NEVER open the VFD panel while plugged in or immediately after unplugging the power cord. Severe injury or death may result.

Viewing the Total Run Time

To view these screens:

1. Access the programming menu by pressing and holding the SHIFT key and pressing the program (PROG) key once.

Program Key **Shift Key**

2. Press ENTER to bypass the access code screen and enter the programming menu.

Enter Key

3. Using the up and down arrow keys, scroll down until you reach parameter V109. This parameter displays the total time the machine has been in plugged in.

4. Using the arrow key, scroll to parameter V108. This parameter displays the total time that the machine has actually been running.

5. To exit the programming menu, simply press the program (PROG) button. This should bring you back to the main operation screen.

Program Key

12nstalling and Removing the Pad Driver

To install and remove the pad driver on the bottom of the machine, you will need a 17 mm socket wrench, a soft face mallet, and some medium-strength threadlocker (blue Loctite 243 or equivalent).

To remove the pad driver:

1. Slip the 17 mm socket wrench over the pad driver bolt and strike the wrench with the soft face mallet in a counter-clockwise direction to loosen, then remove the bolt (N Fig 6).
2. When installing a new pad driver or re-installing an existing one, apply a generous amount of threadlocker compound to the bolt and threaded drive shaft. Insert bolt through the hole in the pad driver.

   NOTE: Reapply threadlocking compound every time a pad driver is removed.
3. Line up the bolt to the threaded end of the shaft and start the first couple of threads.
4. Once the bolt is engaged, make sure the drive shaft is properly seated within the pad driver slot before tightening the bolt all the way.

⚠ CAUTION

Failure to seat the pad driver could result in the pad driver slot being stripped out, the threads in the shaft being stripped, the machine leaving heavy tool marks, and the tooling overheating.

Rotation Pattern of Tooling Plates

Bottom of WerkMaster with tooling plates and clockwise and counterclockwise labeling.

Replacing the Shear Pins

To replace a broken shear pin:

1. Remove the Plug 'N Go plate (R Fig 6) from the pad driver (O Fig 6). Before replacing the shear pin apply a generous amount of permanent red threadlocker (Loctite 266) on the screw and into the hole.
2. Hold the shear pin securely and firmly tighten the screw until the shear pin cannot spin. Replace the Plug 'N Go plate.

To replace a bent shear pin:

1. Remove the Plug 'N Go plate (R Fig 6). Remove the bent shear pin by hitting with a hammer. Before replacing the shear pin apply a generous amount of permanent red threadlocker (Loctite 266) on the screw and into the hole; tighten.
2. Hold the shear pin securely and firmly tighten the screw until the shear pin cannot spin. Replace the Plug 'N Go plate.

SEE: How To Series: Replacing a Shear Pin
at http://www.werkmaster.com/replacing-a-shear-pin/

Changing the Primary Belt

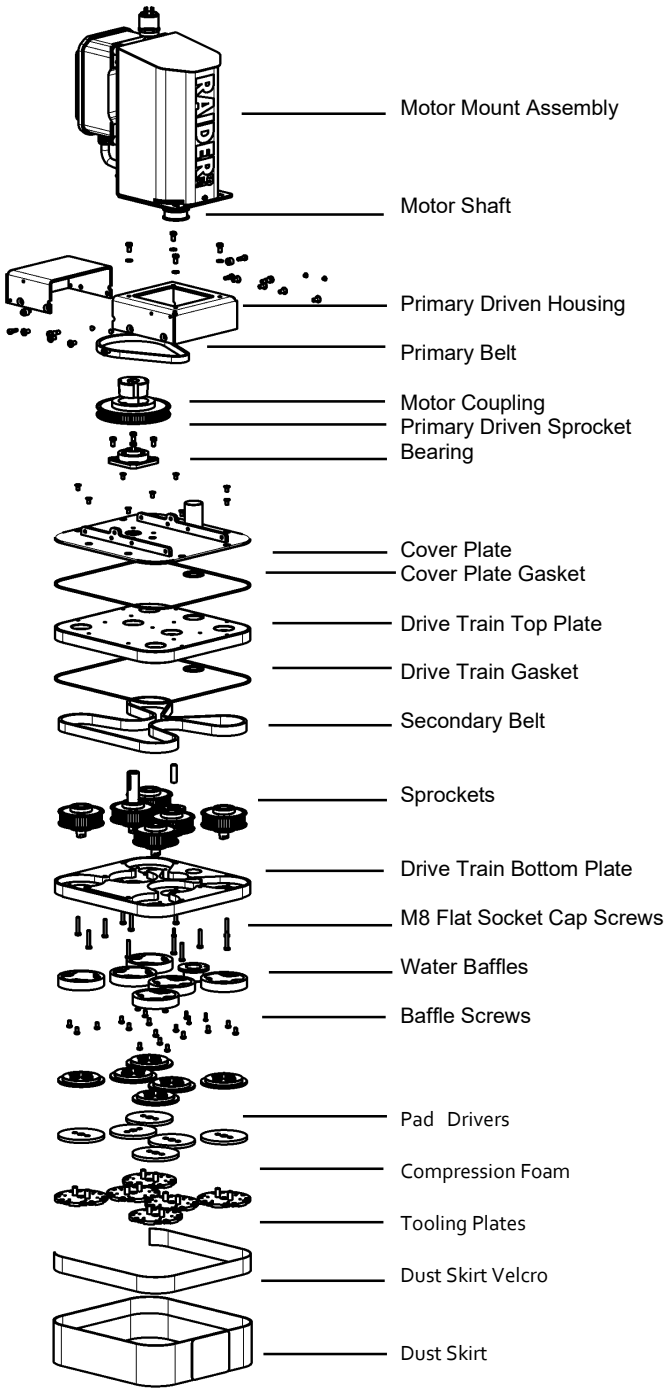


Fig. 7

1. Disconnect the power and ensure the handle is in the upright position.
2. Unscrew the handle control cable (L Fig 5) from the VFD.
3. Remove the five button cap screws holding the Shroud (H Fig 3) in place.
4. Remove the Shroud.
5. Remove the four M10 hex head bolts holding the Motor Mount Assembly (Fig 7) onto the Lower Assembly.
6. Lift the Motor Mount Assembly straight up until the Motor Sprocket is completely clear of the base.
7. Remove four M10 flat socket cap screws from the Primary Driven Housing and remove the Housing.
8. Remove and replace the belt.
9. Replace the Primary Driven Housing, apply blue thread locker (Loctite 243) and insert the four M10 flat socket cap screws.
10. Lower the Motor Mount Assembly onto the Primary Driven Housing cover, tilt the Motor Mount Assembly back and loop the belt around both the Primary Driven Sprocket and the Motor Shaft Sprocket.
11. Maintain tension on the belt and pull the Motor Mount Assembly forward and into place.
12. Apply blue thread locker (Loctite 243) to the M10 hex head bolts and insert, thread in half way.
13. Tilt the machine 45 degrees forward for steps 14 and 15.
14. Rotate a pad driver two full rotations to seat the belt completely.
15. Complete tightening the M10 hex head bolts.
16. Return machine to level.
17. Replace the Shroud.
18. Apply blue thread locker (Loctite 243) to the button cap screws and replace.
19. Reconnect the handle control cable (L Fig 5) in the VFD.

Changing the Secondary Belt

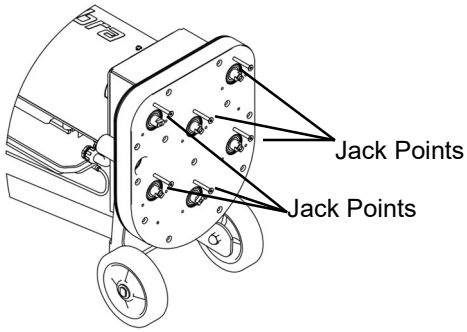
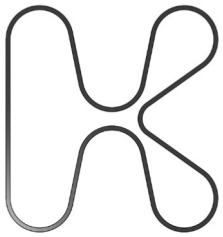


Fig. 8



Secondary Belt Path

Fig. 9

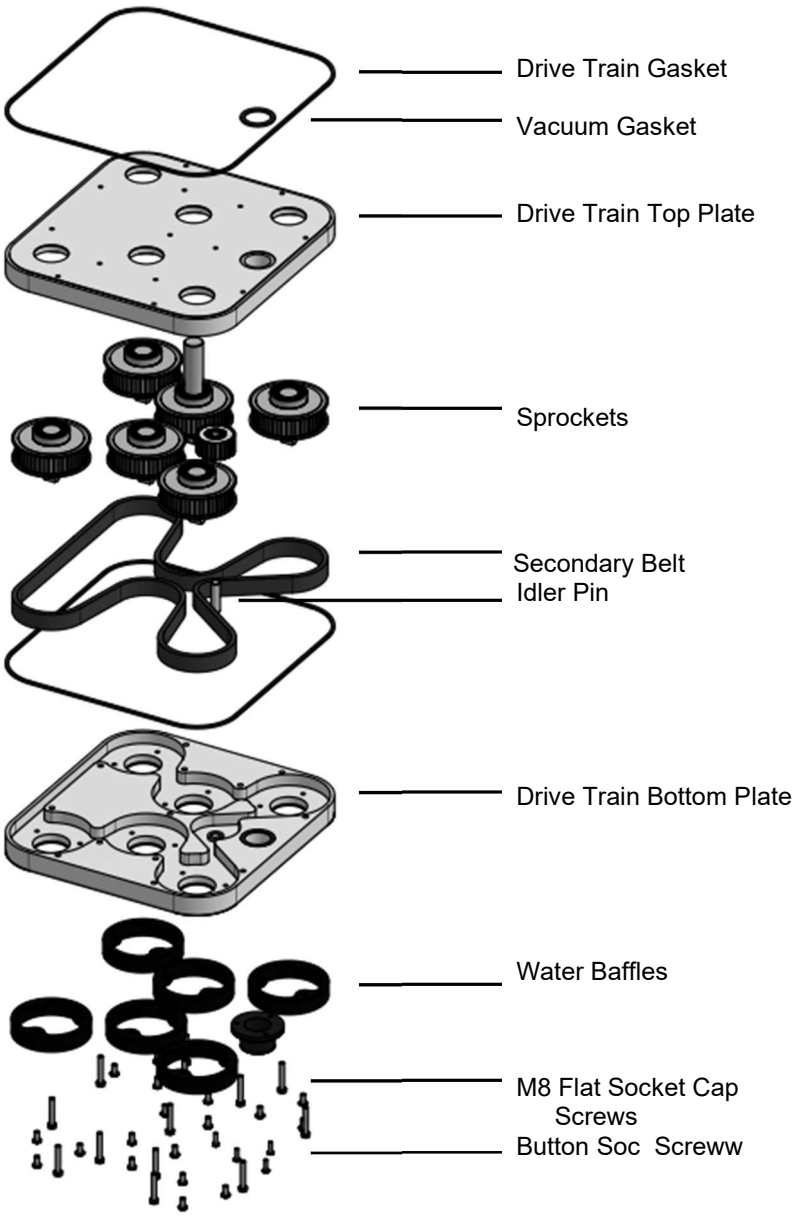


Fig. 10

To change the secondary belt:

1. Disconnect power and ensure the handle is secure in the upright position.
2. Tilt the machine back.
3. Remove the Plug 'N Go plates and pad drivers.
4. Remove the water baffles.
5. Remove the two hex head idler bolts and the sealing washers from the drive train bottom.
6. Remove the twelve M8 flat socket cap screws from the drive train bottom.

7. Insert six long M8 screws into the Water Baffle threaded hole that is used as a jack point (Fig 8) until snug.
8. Make a half turn of each screw clockwise until the drive train plates start to separate.
9. Completely separate the drive train top plate from the drive train bottom plate exposing the sprockets and belts. Remove the jack point screws (Fig 8).
10. Remove the gasket.
11. Remove the broken/damaged belt.
12. Replace the belt (Fig 9).
    NOTE: Removing one sprocket and the shaft assembly may make the belt installation easier,
13. Replace the gasket with a new gasket.
    NOTE: If a factory gasket is not available use 1/4" w x 3/8"h closed cell, adhesive-backed weather stripping.
14. Carefully line up the bottom plate with the shafts.
15. Apply Anti-Seize on the long M8 screws.
16. Thread five of the long M8 screws through the bottom plate at the four corners and one near the center.
17. Slowly and evenly make a half turn of each screw in a clockwise direction until all the shafts are lined up with the bottom plate.
18. Thread in all the remaining M8 screws and in a crisscross pattern, slowly clamp the drive train plates together.
19. Apply blue thread locker (Loctite 243) to the two hex head idler bolts and with the sealing washer, replace.
20. Tighten each M8 screw to 150 in/lbs.
21. Replace the water baffles and apply blue thread locker (Loctite 243) to all water baffle fasteners.

    NOTE: DO NOT reuse gaskets. Replace all gaskets with new ones every time the gaskets are removed or the Drive Train is opened.

VACUUM PORT

The vacuum port (J Fig 3) is located on the upper part of the base of the machine.

The vacuum recommended for the Raider XL5 has a minimum CFM of 200.

1. **ALWAYS** run the vacuum when sanding or dry grinding.
2. The vacuum port accepts a standard 2" vacuum hose cuff.
3. Always refer to vacuum manual.

MAINTENANCE

⚠ WARNING

Disconnect power before performing any maintenance, cleaning, or repair to your machine.

⚠ CAUTION

After wet operation, wash bottom of the machine thoroughly, failure to do so may result in damaged bearing seals.

Do not use any sharp object or abrasive pad to clean the bearing seals. This can compromise the bearing seals.

Daily

- Wipe down the machine after every job.
- Gently remove dirt and debris from the pad driver.
- Check grommets and replace if necessary.
- Vacuum, wash and thoroughly dry the underside of the machine.
- Inspect the plug ends for signs of carbon deposits and arcing.
- Check all fasteners and tighten if necessary.

Weekly

- Inspect the handle wires for damage.
- Blow off the VFD heat sink with compressed air.
- Using a soft scrub pad, remove any excess dirt build-up from the bottom plate and back side of the pad drivers.
- Inspect bearing seals around shaft for any wear or damage.
- Remove the pad drivers and inspect the threads to make sure there are no signs of cross-threading or stripping. Remove excess threadlocking compound from bolts using a wire brush or by washing the bolts in a solvent. Reapply blue threadlocking compound (Loctite 243) and reinstall pad drivers. Make sure bolts are tight.

⚠ CAUTION

After wet operation, wash bottom of the machine thoroughly, failure to do so may result in damaged shaft seals.

Do not use any sharp object or abrasive pad to clean the shaft seals. This can compromise the shaft seals.

Monthly

- Check all strain reliefs and make sure they are tight. (Strain reliefs are the plastic nuts that secure the wires that come out of the handle and VFD.)
- Clean and lubricate wheels.
- Using an extremely light abrasive pad, remove any topical rust from the shafts.

TROUBLESHOOTING

ISSUE	TEST	SOLUTIONS
Machine will not turn on.	Check all power connections. Make sure the source power meets the machine's minimum power requirements (see *Power Cord Minimum Requirements p. 5*).	• Plug in the machine. • Check to see if any breakers or fuses are tripped or blown. • Check to see the handle activation lever is not depressed. • Have a qualified electrician test the source power to see if it meets the machine's minimum power requirements. • Press START button while activation lever is depressed.
VFD turns on but machine will not start.	Check the VFD display for error codes (*see Appendix p.20*).	• If no error code is displayed, check if the handle wire is plugged into the machine. • If the VFD error code is "low voltage" have a qualified electrician test the source power and make the necessary adjustments to the wiring to supply the machine with its required input power.
Machine runs for a short time and then shuts down.	Check the circuit breaker to see if it is tripped or the fuse if it is blown.	• Check to make sure that the power source has the appropriately sized breaker or fuse to meet the machine's minimum power requirements. • Make sure the generator meets the machine's minimum power requirements. • Have an electrician perform a voltage test while the machine is under load to see if the voltage drops below the machine's minimum power requirements.
Pad drivers are not turning or only one pad driver is turning.	Disconnect the power and tilt the machine back. Spin one pad by hand.	• If the pad turns independently, replace the secondary belt. Go to www.werkmaster.com/support. • If all pad drivers turn but the motor fan does not turn, replace the primary belt. Contact technical support: 866.373.9375.
Not all discs are grinding the floor.	Disconnect the power and tilt the machine back. Visually inspect each pad driver height against the adjacent pad driver.	• Make sure all pad drivers are seated properly on the shafts. • Make sure grinding / polishing / sanding media is seated properly on the pad drivers. • Make sure grinding / polishing / sanding media is worn evenly and change out any media if uneven.
Excessive noise or vibration is felt or heard while running the machine.	Disconnect the power and tilt the machine back. Spin one pad by hand. Listen for a clicking sound or grit-like feeling.	• Check that all tooling is in the correct pin holes on the pad drivers. • Replace the bearings. Contact technical support: 866-373-9375 for instructions.
Tooling becomes dislodged from the machine while operating.	Disconnect the power and tilt the machine back. Remove and inspect all tooling. This includes the pins, tooling plates, and pad drivers.	• If the pin holes are excessively damaged, replace the pad drivers. • If the grommets/bumpers on the pad drivers are damaged, replace the damaged parts. • If the pins on the diamonds or tooling plates are damaged or missing, replace the pins.

ISSUE	TEST	SOLUTIONS
The machine handle malfunctions.	Check the handle plug to see if it has come loose.	• Secure the handle plug. If the handle controls are still malfunctioning, contact customer service for instructions.
VFD makes popping noise and starts to smoke. *****Disconnect power immediately!*****	Wait for 1–2 hours, then remove the VFD cover and check electronic components for discoloration, scorching, or swelling.	• Contact a dealer or technical support: 866.373.9375.
VFD screen displays error message or unusual screen display.	Look up the message in the Appendix.	• Contact technical support: 866.373.9375.

APPENDIX – VFD TROUBLESHOOTING AND DIAGNOSTICS

VFD Error Codes

The following table shows the fault codes that may be displayed during X4 AC drive operation, along with suggestions for recovering from the fault condition.

NOTE

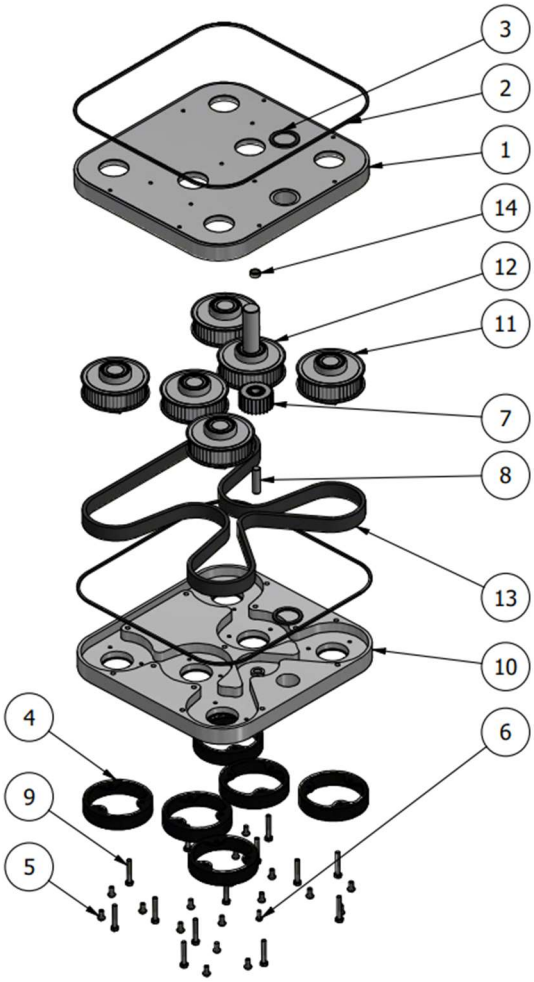
Shaded faults are auto-resettable, except where noted.

CODE	FAULT DISPLAY	DESCRIPTION	ADV. FAULT CODE	EXPLANATION	SUGGESTIONS FOR RECOVERY
1	System	System fault	0,1,2	Internal microprocessor problem.	Consult the factory for repair or replacement.
			3	Thermistor profile is incorrect.	Consult the factory for repair or replacement.
			0	Memory problem when reflashing the drive's memory.	Reset the drive to factory settings. Consult the factory.
			1,2,3	Conflict in the drive's memory.	Reset the drive to factory settings. Consult the factory.
2	EE Checksum	Checksum error	4	Unable to write an EE parameter after a parameter has been changed through the keypad or SIO.	Reset the drive to factory settings. Consult the factory.
			5	The drive is receiving EE write requests faster than they can be processed. This would typically be caused by writing parameters too frequently through Modbus.	Slow down the frequency of the Modbus writes.
3	Curr Calibr	Current calibration fault	0	Current calibration fault on phase T1/U.	Check the motor connections to the terminal strip of the drive and at the motor. Have motor checked. Consult the factory for repair or replacement of drive.
			1	Current calibration fault on phase T2/V.	
			2	Current calibration fault on phase T3/W.	
4	Power Supp	Power supply fault	0	5 V supply is below 4 VDC for more than 100 ms.	Increase resistance between REF and analog inputs. Check the wiring to REF terminals. Consult the factory.
6	IOC Trip	Instantaneous overcurrent trip	0	Short circuit was detected on power-up.	Remove the short from the power wiring Check for a shorted motor. Consult the factory.
			1	Short circuit was detected during operation.	
7	MOL	MOL contact fault	0	MOL digital input was activated, depending on pull-up or pull-down logic configuration.	Reset the MOL contact or remove the condition causing the MOL contact activation.
8	Model ID	ID # out of range	0,1,2	Control board is not reading the drive ID properly.	Consult the factory for repair or replacement.
10	Res Lockout	Restart lockout	0	The number of fault restarts is greater than the limit defined in the customer parameter.	Check the actual fault in the fault log and use the appropriate remedy.
11	Ground	Ground fault	0	The drive detected a current imbalance between output phases. Imbalance determined to be current flow to ground.	Check for unbalanced currents. Check for grounded motor leads or motor. Consult the factory.
12	Vac Imblnce	Input voltage imbalance	0	The drive detected a single-phase condition or a voltage imbalance outside the drive's rating while running a load that could be damaging to the drive.	Check input voltage and current for imbalance, and correct.

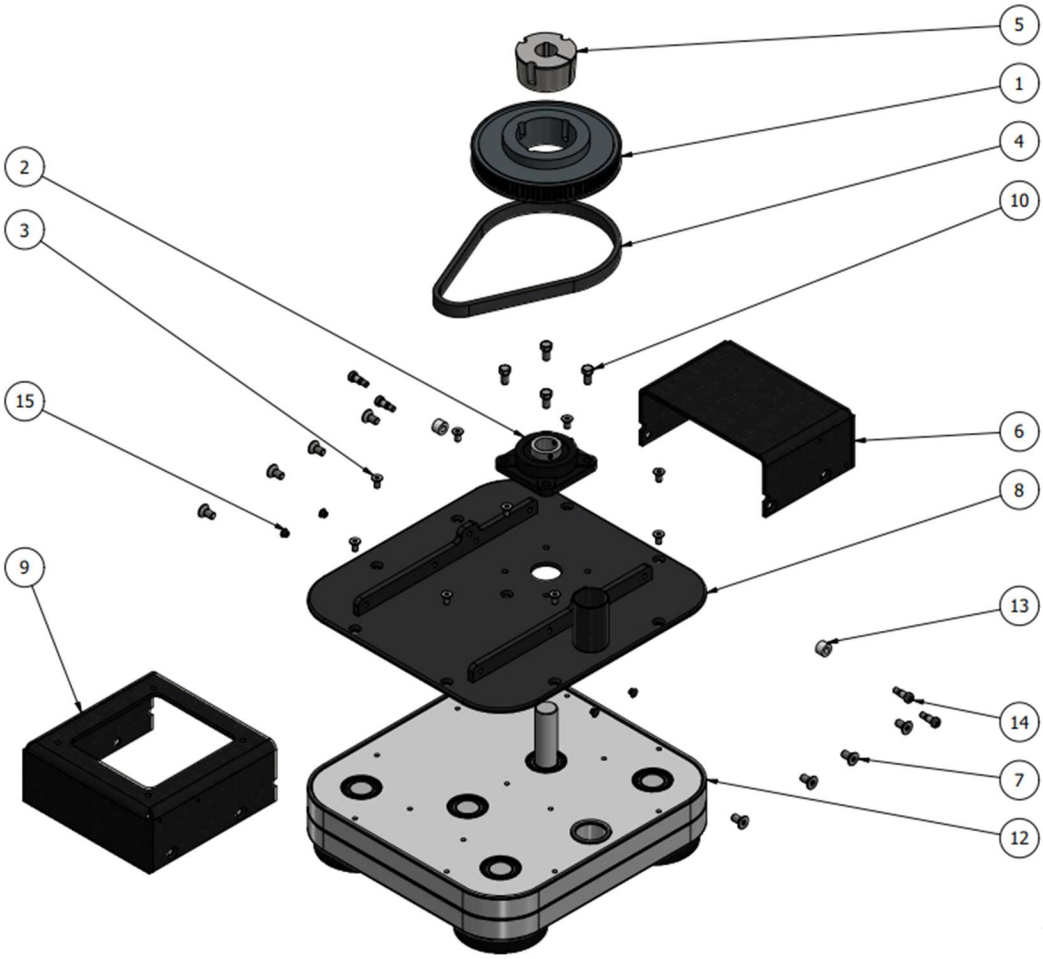
13	OverVoltage	Overvoltage condition	0	The drive detected an overvoltage condition during power-up *(not auto-resettable)*.	Verify that incoming line power is within the drive's specifications. Add a reactor or transformer to correct.
			1,3	The drive detected an overvoltage condition during a running condition.	Verify incoming line power and check for regenerative load. Reduce Regen load or add dynamic braking resistors. Regen Current Limit may help; consult the factory.
			2	The drive detected an overvoltage condition on power-up on the load side.	Verify that incoming line power is within the drive's specifications. Add a reactor or transformer to correct.
15	Dyn Brake	Dynamic brake overload	0	DB circuit is active on power-up *(not auto-resettable)*	Check for a failed braking transistor. Consult the factory.
			1	DB circuit is being activated for too long, possibly causing the resistor to overheat or fail.	Reduce the braking cycle or increase capacity. Activate the current limit; consult the factory.
			2	DB circuit is overloaded because of too large a regenerative load.	Reduce the braking cycle or increase capacity. Activate the current limit; consult the factory.
			3,4,5	DB circuit is faulty on power-up *(not auto-resettable)*.	
18	OverCurrent	Overcurrent condition	0	The drive detected an overcurrent condition on power-up *(not auto-resettable)*.	Check for a failed output power device or shorted motor.
			1	The drive detected an overcurrent condition during operation. The current has exceeded the safe operation point of power devices.	Reduce the load on the motor. Verify that Motor FLA is programmed correctly. Check for mechanical binding and shock loading.
19	Over Temp	Over-temperature condition	0	The temperature of the heat sink exceeded a temperature limit.	Check that ambient temperature does not exceed the drive's rating. Check fan operation (if the drive has fans installed).
			1	The temperature of the control board exceeded a temperature limit.	Check that ambient temperature does not exceed the drive's rating. Check fan operation (if the drive has fans installed).
			2	The drive detected that the heat sink thermistor sensor is faulty or not connected properly.	Check the thermistor connections or replace. Consult the factory.
			3	The drive detected that the control board thermistor sensor is faulty or not connected properly.	Check the thermistor connections or replace. Consult the factory.
20	Motor TOL	Motor timed overload trip	0	The drive detected an overload that exceeds the customer's defined overload setting.	Check load current demand. Verify that Motor FLA is programmed to the correct value. Verify that TOL characteristic is correct for the application.
21	Low Temp	Low temperature	0	The temperature of the heat sink fell below -10° C.	Verify that ambient temperature is within the drive's specifications; increase the ambient temperature if necessary.
22	Ref Loss	Speed reference loss	0	The drive detected that the analog input was configured to fault if the input current went below the level specified by customer parameters.	Check the physical connections for a reference signal. Check that the programming for a 4–20 mA signal is correct. Verify that the signal to the drive is correct.
23	Brk Wire	Broken wire detection	0	The drive detected that the potentiometer circuit wiring opened and generated a fault.	Check the wiring for loss of connection to control terminals. Check that a potentiometer of the proper value is installed.

24	Keypad Loss	Keypad loss	0	Problem with the keypad or a keypad connection. The drive detected that it could not read any key presses.	Check the connection from the keypad to the control board. Note that the keypad is not designed for remote mounting.
			1	Problem with the keypad or a keypad connection, or wrong keypad was used. Keypad ID for an X4 could not be read.	
			2	Problem with the keypad or a keypad connection. The drive detected that it could not write to the LCD.	
25	Comm Loss	Communication loss	0	The drive is in a serial link control path and the amount of time since the last Modbus comm. exceeded the time set in parameter 903 (SIO Timer).	Check the connections to the Modbus port. Adjust the value of parameter 903 (SIO Timer) as needed.
26	Regen Time	Regen timeout	0	The drive took more time to decelerate to a stop than is allowed. The timeout is determined by the longest deceleration ramp time (Decel1 or Decel2) plus the Regen timeout parameter.	Reduce the amount of regenerative energy or increase the Regen timeout parameter.
27	Pwr Bridge	Power bridge fault	0,1,2	The drive detected a failure in the output power devices.	Check for a failed input power device.
28	Drive TOL	Drive timed overload	0	The drive detected an overload that exceeded the drive rating.	Check that load conditions do not exceed the drive's rating (120% for 60 seconds from nameplate current rating for normal duty and 150% or rated current for 60 seconds heavy duty).
29	Stuck Key	Stuck key error	0	Key press was detected upon power-up. This would occur because of a defective keypad or because someone was holding down a key when powering up the drive.	Check for a stuck keypad and repair or replace. Consult the factory.
30	Param Range	Parameter out of range	0	One of the customer parameters is out of range.	Check for a parameter value saved out of the standard range. Reset parameters to the factory default. Consult the factory.
31	Pwr Wiring	Power wiring error	0	Problem with the drive wiring.	Check that input power wiring is not connected to load power terminals. Consult the factory.
			1	IOC fault was detected during the power wiring test.	
32	Low Voltage	Low voltage trip	0	Power dip occurred when the drive was operating, and the drive was not able to ride through the power dip before shutting off outputs.	Verify that input line power is within the drive's specifications. Add a transformer or reduce demands to the power feed. Consult the factory.
33	1Ph Overload	1Ph overload	0	Bus voltage ripple was outside the limit of the drive (when parameter 517 Single-Phase is configured for single-phase operation).	Check that input power demand does not exceed the drive's capacity for single-phase operation. Consult the factory.
34	RS Meas. Fail	Stator resistance measurement failed	0	The drive could not measure the stator resistance properly.	Try the routine again and if the fault occurs twice, consult the factory.
35	Fan Loss	Loss of fan control or operation	0	Problem with the heat sink fan.	Consult the factory.
			1	Problem with the internal fan. Occurs only on Size 4 and 5 models. All other models display a fan error warning. Note this is lack of fan control; the fan can be spinning and this fault will still occur. This happens if the fan is on and should not be, or if the fan feedback signals are obstructed from getting to the control board.	

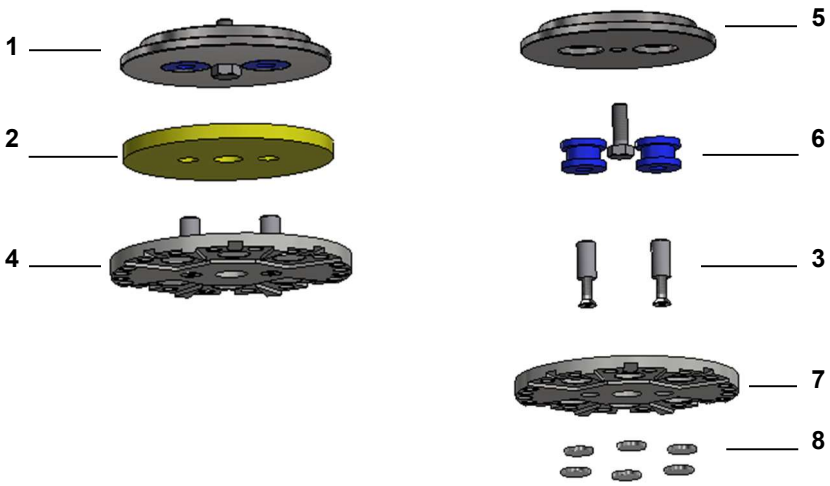
EXPLODED VIEWS AND PARTS LIST



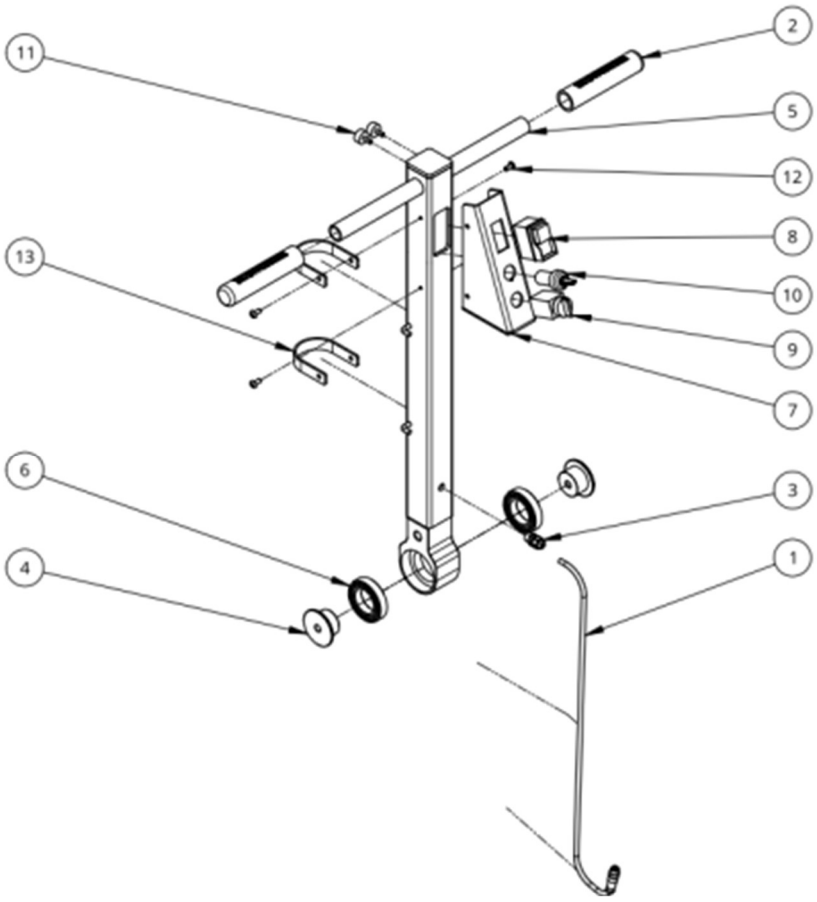
DRIVE TRAIN ASSEMBLY PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	100-1717-00	Top Plate
2	2	580-0538-00	Perimeter Gasket
3	2	580-0536-00	Vacuum Gasket
4	6	100-1459-00	Water Baffle
5	18	590-0379-00	Fastener
6	1	590-0246-00	Fastener
7	1	110-0259-00	Sprocket, Idler Assembly
8	1	580-0357-01	Pin
9	13	590-0377-00	Fastener
10	1	100-1718-00	Bottom Plate
11	5	110-0317-00	Sprocket Assembly
12	1	110-0316-00	Long Shaft Assembly
13	1	520-0006-00	Belt
14	1	100-1716-00	Idler Spacer



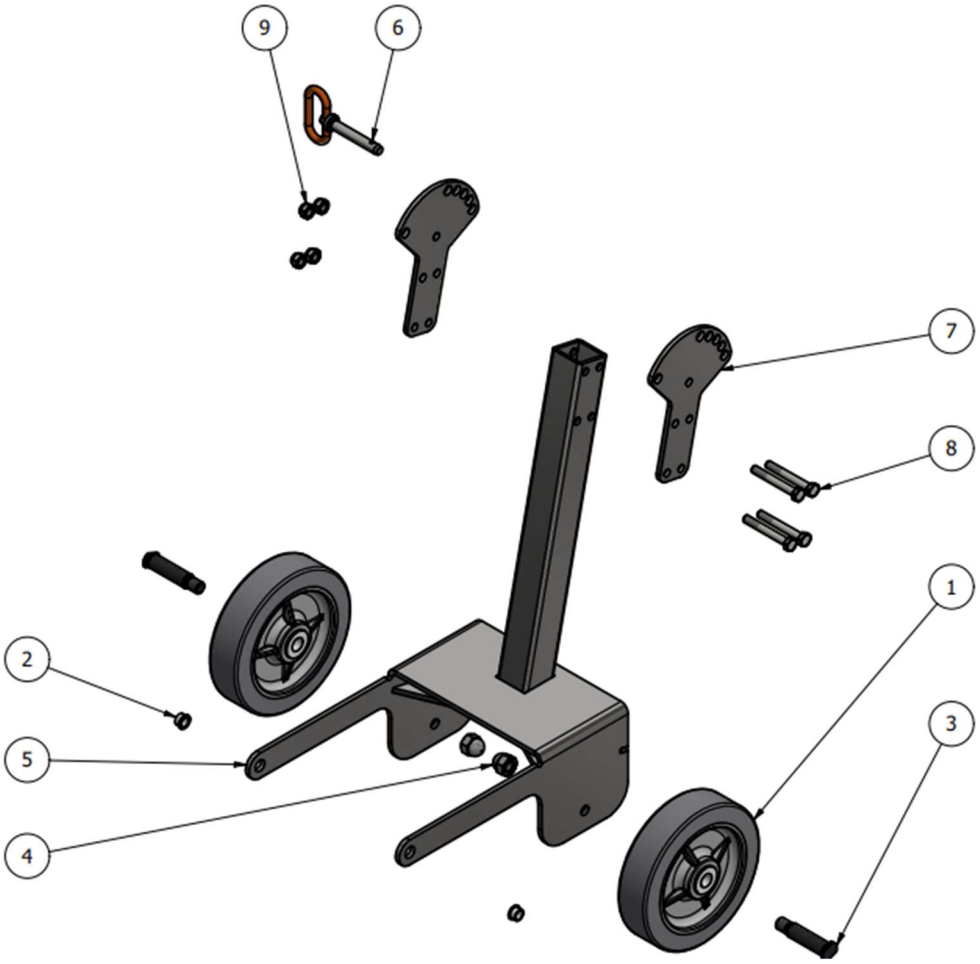
BASE ASSEMBLY PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	500-0332-00	Sprocket
2	1	500-0308-00	Flange, Four Bolt
3	9	590-0359-00	Fastener
4	1	520-0074-00	Belt
5	1	500-0244-00	Bushing
6	1	100-1714-00	Primary Cover, Rear
7	8	590-0329-00	Fastener
8	1	110-0314-00	Cover Plate Assembly
9	1	100-1713-00	Primary Cover, Front
10	4	590-0124-00	Fastener
12	1	110-0315-01	Drive Train Assembly
13	2	580-0475-00	Spacer
14	4	590-0381-00	Screw
15	4	580-0539-00	HolePlug



PLUG 'N GO PLATE ASSEMBLY AND PAD DRIVER ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	008-0553-00	Pad Driver Assembly
2	1	008-0576-00 **or** 008-0577-00	Hard Foam Soft Foam
3	2	008-0418-00	Shear Pin w Screw
4	1	008-0580-00	Plug 'N Go Plate w Recess Assembly
5	1	008-0559-00	Pad Driver
6	2	008-0551-00	Grommet
7	1	008-0558-00	Plug 'N Go Plate w Recess
8	8	580-0241-00	Magnet



UPPER HANDLE ASSEMBLY PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	540-0003-00	Brad Harrison Straight Cord
2	2	580-0259-00	Handle Grip, Foam
3	1	540-0175-00	Strain Relief
4	2	100-1708-00	Handle Pivot Axle Stub
5	1	130-0306-01	Upper Handle Welded Assembly
6	2	500-0261-00	Bearing
7	1	100-1723-00	Vertical Control Panel
8	1	540-0447-00	Switch, Pushbutton
9	1	540-0446-00	Switch, Rotary
10	1	540-0445-00	Potentiometer
11	2	540-0179-00	Bumper, Threaded
12	4	590-0114-00	Fastener
13	2	580-0542-00	Strap, Hose



LOWER HANDLE ASSEMBLY PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	280-0067-01	Wheel
2	2	580-0254-00	Flange Bushing
3	2	590-0378-00	Shoulder Socket Screw
4	2	590-0349-00	Fastener
5	1	130-0310-00	Lower Handle Assembly
6	1	580-0258-00	Quick-release Pin
7	2	100-1710-00	Handle Locating Plate
8	4	590-0131-00	Fastener
9	4	590-0261-00	Lock Nut

GLOSSARY

Line Voltage This is the voltage of a power source when it has no load applied to it. It can also be called “nominal voltage” as the voltage expressed is usually a guideline voltage.

Load Voltage This is the voltage of a power source when a load has been applied to it. As a load is applied to the power source, the resistance of the line is easier to examine. When a voltage-measuring device such as a multimeter is used during operation of the machine, you can clearly see that the voltage drops as soon as a load is applied and rises back when the load is taken off.

Pigtail Pigtails are plug ends with unfinished bare wire on one end used for hooking up to panels. Pigtails are used when the source power is unknown, when connecting to the power grid of an unfinished building that has no power receptacles, and when running certain generators. Many pigtails are available or can be made up by an electrician.

RPA Rear pivoting assembly.

VCT Vinyl composition tile.

VFD A variable-frequency drive (VFD) is a system for controlling the rotational speed of an alternating current electric motor by controlling the frequency of the electrical power supplied to the motor. A variable frequency drive is a specific type of adjustable-speed drive. Variable-frequency drives are also known as adjustable-frequency drives (AFD), variable-speed drives (VSD), AC drives, microdrives, or inverter drives. Because the voltage is varied along with frequency, these are sometimes also called variable voltage variable frequency (VVVF) drives.

WARRANTY INFORMATION

WerkMaster Grinders & Sanders Inc., herein referred to as WerkMaster, warrants that each new machine, manufactured by WerkMaster to be free from defects in material and workmanship in normal use and service for a period of three years (3) from date of shipment to the original Purchaser or Distributor.

Terms & Conditions

WerkMaster will, at its option, repair or replace, at the WerkMaster factory or at a point designated by WerkMaster, any part which shall appear to the satisfaction of WerkMaster inspection to have been defective in material or workmanship. WerkMaster reserves the right to modify, alter and improve any part or parts without incurring any obligation to replace any part or parts previously sold without such modified, altered or improved part or parts.

This warranty is in lieu of and excludes all other warranties, expressed, implied, statutory, or otherwise created under applicable law including, but not limited to the warranty of merchantability and the warranty of fitness for a particular purpose. In no event shall the Seller or the Manufacturer of the product be liable for special, incidental, or consequential damages, including loss of profits, whether or not caused by or resulting from the negligence of Seller and/or the Manufacturer of the product unless specifically provided herein.

In addition, this warranty shall not apply to any products or portions thereof which, at WerkMaster's discretion, have been subjected to abuse, misuse, improper installation, maintenance, or operation, electrical failure or abnormal conditions, and to products which have been tampered with, altered, modified, repaired, reworked by anyone not approved by the Seller, or used in any manner inconsistent with the provisions of the above or any instructions or specifications provided with or for the product.

Except for conditions or warranties which may not be excluded by law, the Seller makes no warranty of its own on any item warranted by WerkMaster, and makes no warranty on other items unless it delivers to the Purchaser a separate written warranty document specifically warranting the item. The Seller has no authority to make any representation or promise on behalf of WerkMaster or to modify the terms or limitations of this warranty in any way.

Delivery, Damages, Shortages

Seller shall use reasonable efforts to attempt to cause the Products to be delivered as provided for in these Terms & Conditions. Delivery to the initial common carrier shall constitute the delivery to the Purchaser. Seller's responsibility, in so far as transportation risks are concerned, ceases upon the delivery of the Products in good condition to such carrier at the F.O.B. point and all the Products shall be shipped at the Purchaser's risk. Seller shall not be responsible or liable for any loss of income and/or profits, or incidental, special, consequential damages resulting from Seller's delayed performance in shipment and delivery.

Return of Defective Products

Defective or failed material shall be held at the Purchaser's premises until authorization has been granted by Seller to return or dispose of Products. Products that are to be returned for final inspection must be returned Freight Prepaid in the most economical way. Credit will be issued for material found to be defective upon Seller's inspection based on prices at time of purchase.

FORCE MAJEURE

Seller's obligation hereunder are subject to, and Seller shall not be held responsible for, any delay or failure to make delivery of all or any part of the Product due to labor difficulties, fires, casualties, accidents, acts of the elements, acts of God, transportation difficulties, delays by a common carrier, inability to obtain Product, materials or components or qualified labor sufficient to timely perform part of or all of the obligations contained in these terms and conditions, governmental regulations or actions, strikes, damage to or destruction in whole or part of manufacturing plant, riots, terrorist attacks or incidents, civil commotions, warlike conditions, flood, tidal waves, typhoon, hurricane, earthquake, lightning, explosion or any other causes, contingencies or circumstances within CANADA not subject to the Seller's control which prevent or hinder the manufacture or delivery of the Products or make the fulfillment of these terms and conditions impracticable. In the event of the occurrence of any of the foregoing, at the option of Seller, Seller shall be excused from the performance under these Terms and Conditions, or the performance of the Seller shall be correspondingly extended. This document sets forth the terms and conditions pursuant to which the purchaser("Purchaser") will purchase and WerkMaster ("Seller") will sell the products, accessories, attachments (collectively "the Products") ordered by the Purchaser. These terms and conditions shall govern and apply to the sale of Seller's Products to Purchaser, regardless of any terms and conditions appearing on any purchase order or other forms submitted by Purchaser to Seller, or the inconsistency of any terms therein and herein.

SWM 10/2021

To get the best protection from your WerkMaster Warranty be sure to register your product(s) online at www.werkmaster.com/warranty.

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