



Flexshaft Scaler Operations & Maintenance

MFS110 - 110V Flexshaft Scaler
MFS220 - 220V Flexshaft Scaler
MFS300 - Air Motor Flexshaft Scaler



www.Novatekco.com

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OPERATION AND MAINTENANCE MANUAL FOR

FLEX SHAFT SCALER
(MFS110 – MFS220 – MFS300)

NOTICE

FOR PROFESSIONAL USE ONLY



WARNING



**IMPORTANT SAFETY INFORMATION ENCLOSED.
READ AND UNDERSTAND THIS MANUAL BEFORE OPERATING THIS PRODUCT.**

**IT IS YOUR RESPONSIBILITY TO MAKE THIS SAFETY INFORMATION
AVAILABLE TO OTHERS THAT WILL OPERATE THIS PRODUCT.**

FAILURE TO OBSERVE THE FOLLOWING WARNING COULD RESULT IN INJURY.



PLACING TOOL IN SERVICE

- Always install, operate, inspect and maintain this product in accordance with all applicable standards and regulations (local, state, country, federal, etc.).
- Compressed air models always use clean, dry air at 90 psi (6.2bar/620kPa) maximum air pressure at the inlet. Higher pressure may result in hazardous situations including excessive speed, rupture, or incorrect output torque or force.
- Electric models must always utilize proper gauge, and rated electrical cords with correct connections.
- Be sure all hoses and fittings are the correctly sized and secured.
- Ensure an accessible emergency shut off has been installed in the air or electrical supply line. Make others aware of its location.
- Do not use damaged, frayed, or deteriorated air hoses and fittings.
- Always use proper gauge electrical cords with correct connections. (When applicable.)
- Electric models must not use damaged, frayed, or deteriorated electrical cords and connections.
- Keep clear of whipping air hoses. Shut off the compressed air before approaching a whipping hose.
- Always turn off and disconnect the tool from its power supply before installing, removing or adjusting any accessory, or before performing any maintenance on the tool.
- Do not lubricate tools with flammable or volatile liquids such as kerosene, diesel or jet fuel. Use only recommended lubricants.
- Keep work area clean, uncluttered, ventilated and illuminated.
- Keep all electrical connections clear of water or other liquids. (When applicable.)
- Do not operate the machine while flammable or volatile liquids such as gasoline, diesel or jet fuel are present. Failure to do so can result in explosion. (When applicable.)
- Do not remove any labels. Replace any damaged label.

USING THE TOOL

- Always wear protection when operating or performing maintenance on this tool.
- Always wear hearing protection when operating this tool.
- Always use Personal Protective Equipment appropriate to the tool used and material worked. This may include dust mask or other breathing apparatus, safety glasses, ear plugs, gloves, apron, safety shoes, hard hat and other equipment.
- Prevent exposure and breathing of harmful dust and particles created by power tool use:
 - Some dust created by power sanding, sawing, and grinding, drilling, and other construction activities contains chemicals known to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:
 - Lead from lead based paints,
 - Crystalline silica from bricks and cement and other masonry products, and
 - Arsenic and chromium from chemically treated lumber
- Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: work in a well ventilated area, and work with approved safety equipment, such as those dust masks that are specially designed to filter out microscopic particles.
- Keep others a safe distance from your work area, or ensure they use appropriate Personal Protective Equipment.
- This tool is not designed for working in explosive environments, including those caused by fumes and dust, or near flammable materials.

- Electrically powered tools are not insulated against electric shock.
- Be aware of buried, hidden or other hazards in your work environment. Do not contact or damage cords, conduits, pipes, or hoses that may contain electrical wires, explosive gases or harmful liquids.
- Keep hands, loose clothing, long hair and jewelry away from working end of tool.
- Power tools can vibrate in use. Vibration, repetitive motions or uncomfortable positions may be harmful to your hands and arms. Stop using any tool if discomfort, tingling feeling or pain occurs. Seek medical advices before resuming use.
- Keep body stance balanced and firm. Do not overreach when operating this tool. Anticipate and be alert for sudden changes in motion, reaction torques, or forces during startup and operation.
- Tool and/or accessories may briefly continue their motion after throttle is released,
- To avoid accidental starting – ensure tool in “off” position before applying air pressure or connecting to electricity. Avoid throttle when carrying, and release throttle with loss of air or electricity.
- Ensure work pieces are secure. Use clamps or vises to hold work piece whenever possible.
- Do not carry or drag the tool by the hose or power cord.
- Do not use power tools when tired, or under the influence of medication, drugs, or alcohol.
- Never us a damaged or malfunctioning tool or accessory,
- Do not modify the tool, safety devices, or accessories.
- Do not use this tool for purposed other than those recommended.
- Use accessories recommended by Novatek Corp.
- Never operate a tool with an accessory unless it is properly installed and the tool is held firmly against the work,
- Always use a retainer, when furnished, in addition to proper barriers to protect persons in surrounding or lower areas from possible ejected accessories.
- When wearing gloves and operating models with inside trigger, always be sure that the gloves will not prevent the trigger from being released.
- Wear safety shoes, hard hat, safety goggles, gloves, dust mask and any other appropriate protective clothing while operating the tool.
- Do no indulge in horseplay. Distraction can cause accidents.
- Keep hands and fingers away from the throttle lever until it is time to operate the tool.
- Never rest the tool on your foot.
- Never point the tool at anyone.
- Compressed air is dangerous. Never point an air hose at yourself or others.
- Never blow clothes free of dust with compressed air.
- Be sure all hose connections are tight. A loose hose not only leaks but can come completely off the tool and while whipping under pressure, can injure the operator and other in the area. Attach safety cables to all hoses to prevent injury in case a hose is accidentally broken.
- Never disconnect a pressurized air hose. Always turn off the air supply and bleed the tool before disconnecting a hose.
- When applicable, the operator must keep limbs and body clear of the chisel. If a chisel breaks, the tool with the broken chisel projecting from the tool will suddenly surge forward.
- Do not ride the tool with one leg over the handle. Injury can result if the chisel breaks while riding the tool.
- Know what is underneath the material being worked. Be alert for hidden water, gas, sewer, telephone or electric lines.
- Use only proper cleaning solvents to clean parts. Use only cleaning solvents which meet current safety and health standards. Use cleaning solvents in a well ventilated area.
- Do not flush the tool or clean any parts with diesel fuel. Diesel fuel residue will ignite in the tool when the tool is operated, causing damage to internal parts. When using models with outside triggers or throttle levers, take care when setting the tool down to prevent accidental operation.
- Do not operate the tool with broken or damaged parts.
- Never start the tool when it is lying on the ground.
- This tool is not designed for working in explosive atmospheres.

Refer All Communications to the Nearest
Novatek Corporation Office or Distributor.

Printed in the U.S.A.



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SECTION I

GENERAL

This operation and maintenance manual is furnished with each Flex Shaft Scaler purchased. It outlines the general operation and maintenance items critical to insure satisfactory, safe and long life of the Flex Shaft Scaler and accessories.

READ ALL INSTRUCTIONS AND DATA IN THIS OPERATION AND MAINTENANCE MANUAL PRIOR TO OPERATION OF THIS EQUIPMENT.

These instructions are for your protection and convenience. Please read them carefully since failure to follow the precautions could result in injury. Whenever using electric powered equipment, basic safety precautions should be followed.

If after reading this manual anything seems unclear, contact a **NOVATEK** authorized distributor or **NOVATEK** directly by dialing 1-866-563-7800.

SECTION II

SAFETY AT WORK

The following safety precautions should be practiced when operating the Shrouded Grinder tools.

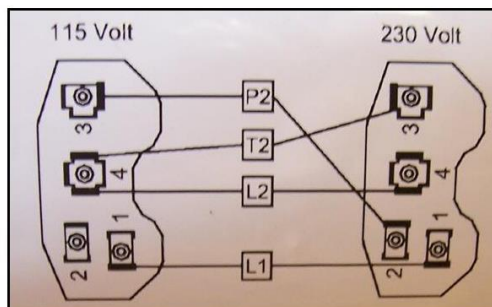
- Read all instructions first
- Follow safety instructions
- Face mask, ear defenders, shatterproof glasses, gloves, helmet, wear safety boots, and any other personal protective equipment should be worn during use.
- Avoid loose clothing; this may become trapped in moving parts and cause serious injury.
- Ensure that the work place is well ventilated.
- Avoid operating engine-powered generators or air compressors used to power the Flex Shaft Scaler in an enclosed area, since engine exhaust gases are extremely poisonous.
- Ensure that all electrical cables and connections are in good condition.
- 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 filtered.
- Do not modify the Flex Shaft 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 electricals are not exposed to excessive moisture.

Thermal Protection: If the motor overheats the thermal protector will open the motor circuit, stopping rotation of the tool. If this happens it is important that the **motors power switch is turned OFF** wait until the motor has cooled sufficiently. After the motor has cooled, push thermal protector to reset. Retry again after 15 minutes. If it trips out again, look into the cause before continuing. (Cause maybe a bearing failing, too much force being used on flexshaft, etc.)

BEFORE USE

Fit a suitable electric plug for outdoor use to the cable. Ensure that the motor is set to the correct voltage (115v or 230v). If there is a need to change the setting of the voltage, remove the back plate and cover from the rear of the motor and re-connect the leads.

For Low Voltage 115v & High Voltage 230v Setup



110v Motor

- The motor requires the minimum of a 15Amp, 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 2.5mm² cross-sections.

220v Motor

- Take particular care when using the 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.

Air Models

- The correct air pressure for this machine is 6.2bar (90psi).
- Do not let the operating pressure fall below 5.5bar (80psi) or rise above 6.9 bar (100psi) absolute maximum.
- Ensure that no moisture is present in the air hose.
- Check that there is sufficient air tool oil in the inline lubricator's reservoir.
- The air motor requires a minimum of 70cfm.

Assembly of Flexible Drive

- Align D shaped connector on the flexible drive with that on the motor unit and push in.
- Secure the flexible drive with the brass locking collar, tighten by hand.
- Select the appropriate scaling head for the application and screw into the flexible drive, initially by hand and then fasten securely using the supplied 24mm spanners.
- Fit the hand guards onto the end of the dumbbell handle and secure with the two nuts and bolts and finally tighten using the two supplied spanners.

STARTING-UP

Electric Powered Machines

- Inspect the supply cable: Check that no damage has been caused to the outer casing and that there are no exposed or loose wires.
- Do not use the machine until all faults have been rectified.
- Check that the cable is not running across sharp or jagged edges and that it is not in contact with any liquid.

Air Powered Machines

- Check the security of all hose clamps and fittings, and that the supplied air pressure is correct at 6.2bar (90psi).
- Check that there is sufficient air tool oil in the lubricator's reservoir.

SECTION III

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 the 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 providing a surface for painting.
- There are various types available, please speak with your sales representative for more information.

LUBRICATION

- Unscrew the cap to expose front ball race using special tool provided. Please note that this is fitted with a left-hand thread. Apply a liberal amount of grease to the front bearing.
- Unscrew the dumbbell body from hexagon nut (left-handed thread) and draw apart. Inner coupling is now exposed and may be unscrewed from spindle (right hand thread).

- The flexible inner shaft may now be withdrawn from the motor end of the rubber casing. Apply a liberal amount of grease to the rear bearing and inner shaft.

NOTE: It is recommended to use one of the following lubricants;

BP	Energrease LC
Castrol	LMX
Esso	Beacon EP2
Ramonol	White Grease

DISMANTLING

Changing Scaling Head

- Using spanners provided to unlock the existing head from the dumbbell handle spindle 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.
- Remove the clamp from the dumbbell handle and remove the hand guards.

Removing Brush Arbor from Wire Brush

- Secure the center bolt head in vice grips and remove the hexagonal nut and washer.
- Remove the wire brush and the bottom washer.

Removing Chipping Leaves

- Secure center bolt head in vice grips and remove the hexagonal nut and washer.
- Remove the side plate and withdraw the washers and chipping leaves.
- Check for signs of wear on the leaf pin.
- Remove the other side plate from the center bolt and check both side plates for signs of wear.

Removing Cutter Wheels

- Secure the bolt head in vice grips and remove hexagonal nut, washer and side plate.
- Remove cutter wheels and check for signs of wear on cutter wheel pins.
- Remove the bottom side plate from center bolt and check both side plates for signs of wear.

Removing Dumbbell Handle

- Secure dumbbell handles in vice grip and unscrew front cap with the special tool provided. (left hand thread)
- Unscrew the dumbbell handle body from the threaded hexagonal adaptor and pull apart. (left hand thread)

Ball Race Removal

- Unscrew front cap with tool provided to expose front ball race.
- Unscrew dumbbell body from large threaded hexagonal adaptor and pull apart.
- The inner shaft with its spanner flats are now exposed and can be unscrewed from spindle.
- Remove the spindle from the dumbbell housing.
- Both ball races are now exposed and can be removed.

Removing Inner Shaft from Outer Casing

- Disconnect inner shaft from the motor unit.
- Remove the dumbbell handles and hand guard as previously instructed.
- The inner shaft can now be withdrawn from the motor end of outer drive casing.

Removing Nose Piece

- Remove flexible drive from the motor unit as previously instructed.
- Remove dome headed screws from the motor casing and remove the nose piece.

ASSEMBLY

Fitting the Nose Piece

- Align the holes in the nose piece with those on the motor unit.
- Fit and fasten the three dome head screws.

Inner Shaft/Outer Casing Assembly

- Insert the inner shaft into the motor end of the rubber casing after ensuring that the ball race has been packed with an adequate amount of grease.

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 an adequate amount of grease.
- Fit the dumbbell handle onto the large threaded hexagonal adaptor on the outer drive casing and secure.
- Fit locking cap to front of dumbbell handle ensuring that the recessed holes are on the exposed side to enable locking with the tool provided.

Assembly of Scaling Heads Wire Brush

- Secure the center bolt head in vice grips vertically and fit with the washer, wire brush and top washer.
- Screw hexagonal nut down by hand before fastening securely with the spanners provided.

Cutter Wheels

- Secure the center bolt head in vice grips vertically and fit the bottom side plate.
- Insert the cutter wheels with pins into holes in the plate.
- Align the top plate holes with the six exposed pins.
- Fit washer and hexagonal nut to the center bolt thread.
- Screw nut down by hand before fastening securely with the spanners provided.

Chipping Leaves

- Secure the center bolt head in vice grips vertically and fit one of the side plates. It is important that the chipping leaves are orientated in the correct manners so that the tip of the leaf is first to contact the surface.
- Fit a pin into the side plate and place a chipping leaf, washer alternating with chipping leaf and washer for the length of the pin.
- The 3 pins must be equally spaced about the 6 holes.
- Align the top plate holes with 3 exposed pins.
- Fit washer and hexagonal nut to center bolt thread.
- Screw nut 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 center bolt into the dumbbell handle spindle, and fastening securely using the spanners provided.

Fitting of Hand Guard

- Place rubber guard onto the front of the dumbbell handle.
- Align holes with metal clamp and fasten securely with bolts, nuts and washers.

SPECIFICATIONS

Flexible Shaft Length	2.7 meters	9ft
Flexible Inner Shaft Diameter	16mm	5/8"
Total Weight	Approximately 34kg	75lbs
Life Expectancy of Cutter heads	50 hours	50 hours
Cutting Width	Chipping Leaves – 30mm	Cutter Wheels – 17mm

Electric Motor	110v/220v	50Hz/60Hz
Amp	110v = 12.5Amp / 115v = 12Amp	220v = 6.1Amp / 230v = 5.8Amp
Power	1 Hp	
Revolutions per minute	2860rpm at 50Hz / 3480rpm at 60Hz	
Time to stop rotation	11 seconds	

Air Motor	6.2bar (90psi) – 32.1lps (68cfm)	1.1kw (1.5Hp)
Revolutions per minute	3000rpm	
Noise	73.1dB (A)**	
Vibration at Dumbbell Handle (Leaf Cutters)	8.7m/s ² (AEQ) (k= -0% +40% **)	
(Cutter Wheels)	5.4m/s ² (AEQ) (k= -0% +40% **)	
(Wire Brush)	10.1m/s ² (AEQ) (k= -0% +40% **)	

**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.

SECTION IV

PARTS BREAKDOWN & SERVICE LAYOUT

Flex Shaft Scaler

Skid Mounted

Description	110v 50/60Hz		220v 50/60Hz		Air	
	Part No.		Part No.		Part No.	
Flex Shaft Scalers including 9' Flexible Shaft, Scaling Heads and Wire Brush	MFS110		MFS220		MFS300	

Flex Shaft Scaler Spares

Item No.	Description	110v 50/60Hz		220v 50/60Hz		Air	
		Part No.		Part No.		Part No.	
1	Dumbbell Handle Spindle	MFS4542		MFS4542		MFS4542	
2	Front Cap	MFS4536		MFS4536		MFS4536	
3	Ball Race - Large	MFS4251		MFS4251		MFS4251	
4	Ball Race - Small	MFS4252		MFS4252		MFS4252	
5	Dumbbell Body	Sold as part of Flexible Shaft Complete MFS4285					
6	Drive Casing	Sold as part of Flexible Shaft Complete MFS4285					
7	Bolt Set	Sold as part of Handguard MFS4633					
8	Handguard Clamp	Sold as part of Handguard MFS4633					
9	Handguard	MFS4633		MFS4633		MFS4633	
11	Ball Race	Sold as part of Handguard MFS4633					
12	Dome Screw	Sold as part of Handguard MFS4633					
13	Nose Piece	MFS4664		MFS4664		MFS4664	
14	Power Unit	MFSMS110		MFSMS220		-	-
15	Power Unit	-	-	-	-	MFS4490	
16	Inner Shaft	Sold as part of Flexible Shaft Complete MFS4285					
18	Centre Bolt for 6 Cutter Scaling Head	MFS4582		MFS4582		MFS4582	
21	Side Plate for 6 Cutter Scaling Head (Pack of 2)	MFS4575		MFS4575		MFS4575	
22	Washer for Leaf Scaling Heads (Pack of 50)	MFS4584		MFS4584		MFS4584	
23	Leave 547/550/554 (24/Pack)	MFS4347		MFS4347		MFS4347	
24	Leaf Pins for Scaling Heads (Pack of 12)	MFS4553		MFS4553		MFS4553	
25	Cutter Wheel for 340.581 (Pack of 12)	MFS4332		MFS4332		MFS4332	
26	Cutter Wheel Pin - 6 Cutter Scaler Head (12Pk)	MFS4583		MFS4583		MFS4583	
27	Centre Bolt - Chipping Leaves	MFS4552		MFS4552		MFS4552	
28	Side Plate - All Leaf Scaling Heads	MFS4551		MFS4551		MFS4551	
29a	Centre Bolt for 6" Power Brush	MFS4558		MFS4558		MFS4558	
29b	Centre Bolt for 6" Twisted Knot Brush	MFS4559		MFS4559		MFS4559	
29c	Centre Bolt for Crimped Wire Cup Brush	MFS4557		MFS4557		MFS4557	
-	Dumbbell Handle Complete (Item	MFS4540		MFS4540		MFS4540	
-	D Spindle	MFS4662		MFS4662		MFS4662	
-	Detachable Right Angle Handle	MFS4737		MFS4737		MFS4737	
-	Cap Spanner	MFS4754		MFS4754		MFS4754	
-	Spanner Set	MFS4755		MFS4755		MFS4755	
-	9FT Flex Shaft Complete(Includes items:1,2,3,4,5,6,10,11,16)	MFS4285		MFS4285		MFS4285	

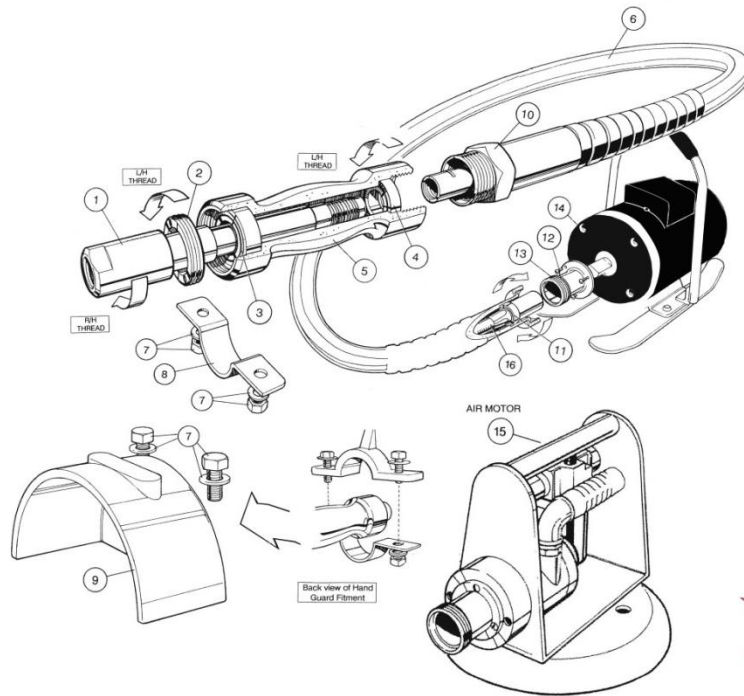
Flex Shaft Scaler Consumables

Item No.	Description	Part No.	
23	Chipping Leaf (Pk of 24)	MFS4347	
25	Cutter Wheel (Pk of 12)	MFS4332	
30a	6" Power Brush	MFS4160	
30b	6" Twisted Knot Brush	MFS4163	
30c	Crimped Wire Cup Brush	MFS4166	
30d	Twisted Knot Cup Brush	MFS4167	

Complete Heads

Description	Part No.	
Scaling Head 6 Cutter Wheel	MFS4581	
Leaf Heavy Duty Scaling Head	MFS4550	

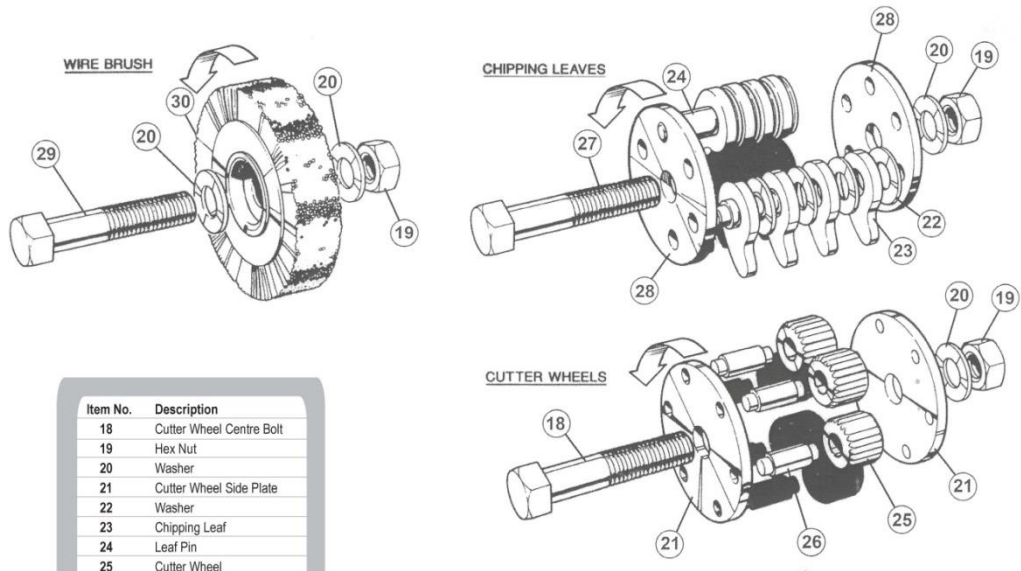
Flex Shaft Scaler Power Unit



Item No.	Description
1	Dumbbell Handle Spindle
2	Front Cap
3	Ball Race
4	Ball Race
5	Dumbbell Body
6	Drive Casing
7	Nut/Bolt/Washer Set
8	Handguard Clamp
9	Handguard
10	Threaded Hex Adaptor
11	Ball Race
12	Dome Screw
13	Thread Nose Piece
14	Electric Power Unit
15	Air Power Unit
16	Inner Shaft



Flex Shaft Scaler Heads



Item No.	Description
18	Cutter Wheel Centre Bolt
19	Hex Nut
20	Washer
21	Cutter Wheel Side Plate
22	Washer
23	Chipping Leaf
24	Leaf Pin
25	Cutter Wheel
26	Cutter Wheel Pin
27	Chipping Leaf Centre Bolt
28	Chipping Leaf Side Plate
29	Wire Brush Centre Bolt
30	Wire Brush



NOVATEK CORPORATION LIMITED WARRANTY

The **TOOLS** manufactured by **NOVATEK CORPORATION** are warranted to be free from defects in material and workmanship for a period of **180 DAYS** from the date of purchase. This warranty does not apply to accessories. All electrical components of the tool are also warranted to be free from defects in material and workmanship for a period of **180 DAYS**.

This warranty applies only to **TOOLS** purchased new from **NOVATEK CORPORATION** or one of its authorized distributors. This warranty does not apply to any **TOOL** which has been abused, misused, modified or repaired by someone other than **NOVATEK CORPORATION** or its authorized repair center.

If a **TOOL** proves defective in material or workmanship within one year of purchase from **NOVATEK CORPORATION**, it should be returned to **NOVATEK CORPORATION**, transportation pre-paid. The return must be authorized by a **RETURN MERCHANDISE AUTHORIZATION NUMBER (R.M.A. #)** obtained from **NOVATEK CORPORATION** prior to returning the **UNIT**. All packages must show clearly on the outside the return merchandise authorization number. All packages received without any R.M.A. # on the outside will be refused by **NOVATEK CORPORATION** receiving department.

Warranty claims will only be considered upon adequate proof of date of purchase. **NOVATEK CORPORATION** will, at its option, **REPAIR or REPLACE DEFECTIVE PARTS**. Repairs or replacements are warranted as above for the remainder of the original warranty period. The sole liability of **NOVATEK CORPORATION** and the user's exclusive remedy under this warranty is limited to the repair or replacement of the defective product.

THERE ARE NO OTHER WARRANTIES EXPRESSED OR IMPLIED AND **NOVATEK CORPORATION** SHALL NOT BE LIABLE FOR INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES OR ANY OTHER EXPENSES OR REPAIR OR REPLACEMENT AS DESCRIBED ABOVE.

All warranty claims should be forwarded to:

NOVATEK CORPORATION
700 Schell Lane
Phoenixville, PA 19460

ATTENTION: CLAIM AND SERVICE DEPARTMENT
R.M.A. # _____

CALL Toll Free at 1-866-563-7800 for your RMA number prior to shipping.

Also include a brief description of the problem as well as a phone number, contact name and return address in case **NOVATEK CORPORATION** service personnel has to get in contact with you.