

# NOVA

## DVR Saturn™

### WOODLATHE



# INSTRUCTION MANUAL



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Models:

- 1) 55241 spindle thread 1 1/4" x 8 TPI 115v (USA/Canada)
- 2) 55242 spindle thread 1 1/4" x 8 TPI 220-240v (Australasia)
- 3) 55243 spindle thread M33x3.5 220-240v (Europe)

# Nova DVR SATURN Lathe Features at a glance

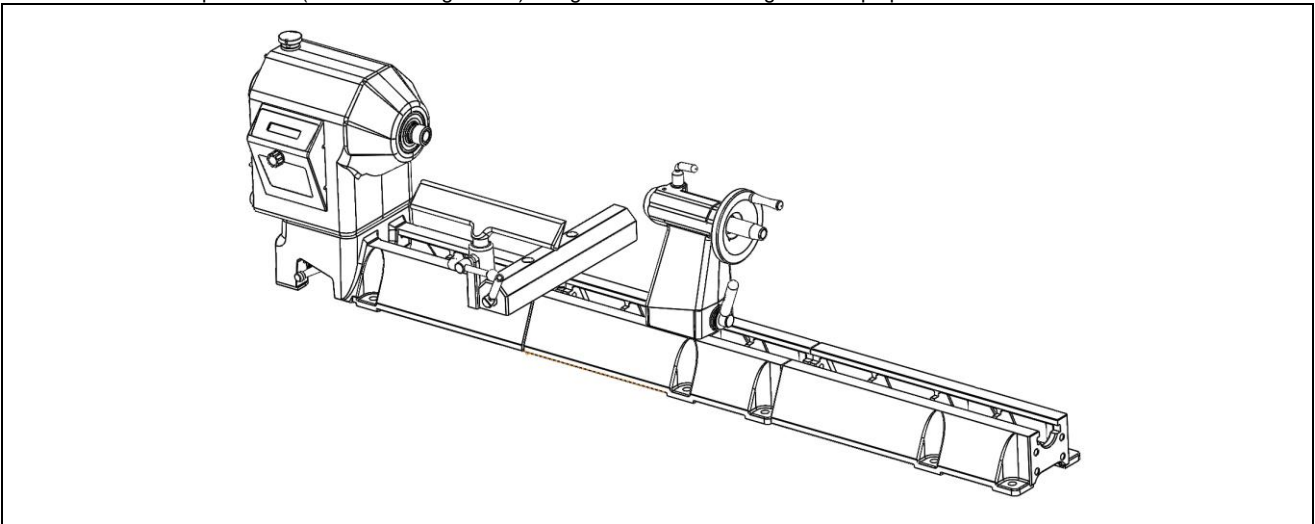
## DVR Electronic drive

The Nova DVR SATURN lathe is unique. The DVR incorporates the motor built as part of the headstock, the spindle and motor are one unit. The motor is almost maintenance free and designed with high reliability. The Digital Variable Reluctance motor uses smart motor technology to provide an incredibly smooth and powerful drive. This drive takes turning to a new level. The controller monitors the spindle position constantly and maintains spindle speed very closely. Additional power is added as it senses extra load from the tool.

## Add on Bed System

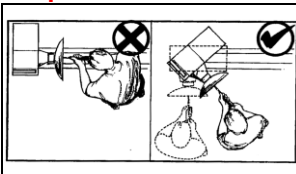
A lathe that meets your woodturning needs your workshop space, and your pocket! Each segment is 20" or 510mm in length. This feature appeals for many different reasons:

- As a compact lathe (standard configuration) it is great for small turning workshop spaces.



- As an extended lathe for those wanting to do extra-long spindles (beyond the traditional between center of most lathes) the Nova DVR SATURN delivers big turning capacity.
- As a bowl lathe for those just wanting to turn bowls.

## Sophisticated Swivel Head



Swivel head lathes have many advantages:

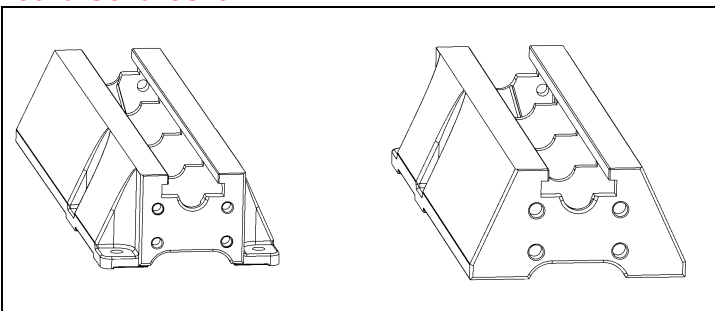
- Space saving
- Allows the turner (not the machine!) to decide the most comfortable position for your turning (saving you from back strain)
- Elimination of left-hand 'outboard' turning techniques and no extra outboard chucks and faceplates are necessary.

There are a number of swivel head lathes available, but the Nova DVR SATURN has by far the most sophisticated, accurate and easy to use swivel head on the market.

The Nova DVR SATURN lathe can be easily and quickly swiveled to any position (360 degrees). It can be solidly locked in any position plus it has the added security of a detent pin lock at 0,22.5,45,90 degrees plus 315 (for left-hand use).

The swivel head turns, locks easily and has a very accurate detent position, to lock the spindle in line with the tailstock. The combination of rigid Tailstock construction and detent pin delivers superb accuracy and is unique to the Nova DVR SATURN.

## Solid Construction



Well proven design, the Nova DVR SATURN is made from Cast Iron components for strength and rigidity. Added features like the heavy duty TRIMAX triple bearing system and special webbed bed design makes the lathe well equipped to take heavy turning stresses.

The bed has been designed with vibration dampening qualities - a solid 1/2" cross rib is positioned along the bed unit, quickly dissipating any vibration as it travels down the bed. The new powerful trapezoidal bed design delivers even more vibration damping properties. All this combined with cosmetically appealing, smooth flowing lines.

Cast iron has always been the material of choice for Woodlathe construction for its inherent mass and an excellent modulus of vibration.

Smart Tools, Powerful Solutions

# NOVA SATURN

SKU 55241; 55242; 55243

**nova**  
Smart Tools, Powerful Solutions

The Nova DVR SATURN lathe is a unique lathe which incorporates the Digital Variable Reluctance (DVR) motor as part of the headstock. The motor is almost maintenance free and designed with high reliability. The DVR motor uses smart motor technology to provide an incredibly smooth and powerful drive. This drive takes turning to a new level.



## Specifications:

- ▶ **Capacity:**  
400mm (16in) Swing Overbed  
740mm (29in) Swing Outboard  
(With optional outrigger accessory)
- ▶ **Between Centres:**  
600mm (24in); extendable in 510mm  
(20in) units with add-on bed extensions
- ▶ **Swivel Headstock:**  
0 to 360deg
- ▶ **Spindle Thread:**  
1-1/4 x 8TPI RH  
M33 x 3.5 RH
- ▶ **Spindle Taper:**  
No. 2 Morse Taper (2MT)  
Headstock and Tailstock
- ▶ **Tailstock Quill Travel:**  
85mm (3-1/4in)
- ▶ **Toolrest:**  
300mm(12in)
- ▶ **Speed Range:**  
100 – 3500 RPM is default (option in  
settings to increase to 5000 RPM)

## FEATURES/ BENEFITS:

- ▶ **10 Favourite speed function**
- ▶ **Built in recommended speed guide**
- ▶ **Dial knob for fast easy interface navigation**
- ▶ **Power assisted braking**

## Motor Specifications:

- ▶ DVR High Torque Motor, Electronic Variable Speed
- ▶ Direct Drive
- ▶ Single Phase Input Supply automatically detects voltage
- ▶ 110-120V, 15A, 1.75HP
- ▶ 220-240V, 2HP (Requires optional plug change)

- ▶ **Adaptive Control Software:** Smart adaptive computer technology actually measures the weight of the workpiece and adjusts its performance accordingly
- ▶ **Vibration Sensor:** The vibration sensor will automatically shut down the lathe when a potential unsafe working condition has been detected. Excess vibration could be caused by an unbalanced workpiece, unstable footing or incorrect speed selected.
- ▶ **Energy Efficient:** Unlike other 'dumb' electric motors, the Smart DVR Motor only inputs enough power to maintain the set speed – giving you potential for power savings over conventional motors
- ▶ **Ultra-Smooth Cutting Power:** Selected RPM is closely maintained and the DVR has no belt stretch or motor bounce which affects smooth cutting. The DVR motor runs smooth with almost no vibration.
- ▶ **Trimax Bearing System:** Unique Trimax Bearing System is a triple bearing system to provide a smooth, heavy duty load bearing support for the spindle, which can easily absorb turning stresses.
- ▶ **5 Year Warranty (limited):** On all castings, mechanical parts and components. 2 Year Warranty on all electronics and electrical components.
- ▶ **Plug and Play:** Just bolt to stand or bench, plug it in and you are turning! No complex motor set ups or adjustments.
- ▶ **Low Maintenance:** The motor is simple, brushless with no rotor windings (rotor is solid steel). The industrial grade electronics are built to last. There are no drive pulleys or belts to set up or come loose.

# Welcome

Thank you for choosing our Nova DVR SATURN Woodlathe and welcome to the NOVA product family. Your choice shows you want the best for your woodturning and you recognize the superb DVR drive technology and the host of other unique features the Nova DVR SATURN offers.

We strive to achieve the best value for your money – providing quality, innovative features, a wide range of accessories – plus comprehensive, ongoing support (latest manuals downloadable from our website, newsletters, projects etc). We are only a phone call or email away with technical advice or assistance on the operation of your lathe or your woodturning queries.

Please feel free to contact us about any aspect of our products or service – we regard our customers as our best development and improvement team – we would love to hear from you!

Once again, welcome to the “NOVA Family”. We trust that you enjoy our products and hope they enhance the pleasure you experience from the wonderful craft of woodturning!

Best Regards

Brian Latimer  
Marketing Director  
Teknatool International Ltd

# Contact Teknatool

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Or you can contact the retailer where you purchased your NOVA DVR SATURN Wood lathe, for the contact details please see our website [www.teknatool.com](http://www.teknatool.com)

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# GENERAL SAFETY RULES



**Warning!** Failure to follow these rules may result in serious personal injury

1. **FOR YOUR OWN SAFETY, READ THE MANUAL BEFORE OPERATING THE TOOL.** Learn the machine's application and limitations plus the specific hazards particular to it.
2. **ALWAYS USE A FULL-FACE SHIELD-Strongly recommended** (must comply with ANSI STANDARD Z87.1 -USA) Everyday eye-glasses usually are only impact resistant and safety glasses only protect eyes. A full-face shield will protect the eyes and face. Use face or dust mask if cutting operation is dusty.
3. **WEAR PROPER APPAREL.** Do not wear loose clothing, gloves, neckties, rings, bracelets or other jewelry which may get caught in moving parts. Non-slip footwear is recommended. Wear protective hair covering to contain long hair.
4. **USE EAR PROTECTORS.** Use ear muffs for extended period of operation. Use muffs rated to 103 DBA LEQ (8 hour).
5. **DON'T USE IN DANGEROUS ENVIRONMENT.** Don't use power tools in damp or wet locations, or expose them to rain. Keep work area well lighted. The DVR SATURN Lathe is intended for indoor use only. Failure to do so may void the warranty.
6. **KEEP WORK AREA CLEAN.** Cluttered areas and benches invite accidents. Buildup of sawdust is a fire hazard.
7. **KEEP CHILDREN AND VISITORS AWAY.** The Nova DVR SATURN is **not recommended** for children and infirm. Such personnel and onlookers should be kept a safe distance from work area.
8. **MAKE WORKSHOP CHILDPROOF** with locks, master switches, or by removing starter keys.
9. **GROUND ALL TOOLS.** If the tool is equipped with a three-prong plug, it should be plugged into a three-hole electrical receptacle. If an adapter is used to accommodate a two-prong receptacle, the adapter plug must be attached to a known ground. Never remove the third prong.
10. **MAKE SURE TOOL IS DISCONNECTED FROM POWER SUPPLY** while the motor is being mounted, connected, or reconnected.
11. **DISCONNECT TOOLS from wall socket** before servicing and when changing accessories such as blades, bits, cutters and fuses etc.
12. **AVOID ACCIDENTAL STARTING.** Make sure switch is in the Off position before plugging in power cord.
13. **NEVER LEAVE MACHINE RUNNING UNATTENDED.** Do not leave machine unless it is turned off and has come to a complete stop.
14. **KEEP GUARDS IN PLACE** and in working order.
15. **USE CORRECT TOOLS.** Do not use a tool or attachment to do a job for which it was not designed.
16. **USE RECOMMENDED ACCESSORIES.** The use of improper accessories may cause hazards.
17. **DON'T FORCE THE TOOL.** It will do the job better and be safer at the rate for which it was designed.
18. **MAINTAIN TOOLS IN TOP CONDITION.** Keep tools sharp and clean for best and safest performance. Follow instructions for lubricating and changing accessories.
19. **NEVER STAND ON TOOL.** Serious injury could occur if the tool is tipped or if the cutting tool is accidentally contacted.
20. **REMOVE ADJUSTING KEYS AND WRENCHES.** Form a habit of checking to see that keys and adjusting wrenches are removed from tool before turning it on.
21. **DON'T OVERREACH.** Keep proper footing and balance at all times.
22. **DIRECTION OF FEED.** Feed work into a blade or cutter against the direction of rotation of the blade or cutter only.
23. **ATTENTION TO WORK.** Concentrate on your work. If you become tired or frustrated, leave it for a while and rest.
24. **SECURE WORK.** Use clamps or a vice to hold work when practical. It's safer than using your hand and frees both hands to operate tool.
25. **CHECK DAMAGED PARTS.** Before further use of the tool, any part that is damaged should be carefully checked to ensure that it will operate properly and perform its intended function. Check for alignment of moving parts, binding of moving parts, mounting, and any other conditions that may affect its operation. Any damaged part should be properly repaired or replaced.
26. **DRUGS, ALCOHOL, MEDICATION.** Do not operate machine while under the influence of drugs, alcohol, or any medication.
27. **DUST WARNING.** The dust generated by certain woods and wood products can be harmful to your health. Always operate machinery in well-ventilated areas and provide means for proper dust removal. Use wood dust collection systems whenever possible.



# ADDITIONAL SAFETY RULES FOR WOODLATHES



**Warning!** Failure to follow these rules may result in serious personal injury.

**Important:** ALWAYS BEFORE SWITCHING SPINDLE ON, CHECK SCREEN FOR CORRECT SETTING

- DO NOT MODIFY OR USE LATHE FOR USES OTHER THAN FOR WHICH IT WAS DESIGNED.**
- SEEK INSTRUCTION.** If you are not thoroughly familiar with the operation of woodlathes, obtain advice from your supervisor, instructor, or other qualified person. Instruction from a qualified person is strongly recommended.
- DO NOT OPERATE LATHE** until it is completely assembled and installed. Follow instructions and recommendations.
- FOLLOW ELECTRICAL CODES.** Make sure wiring codes and recommended electrical connections are followed and that the machine is properly grounded.
- WHEN REPLACING THE FUSE** (on relevant models), completely isolate power when removing the fuse. It is imperative the plug is removed from the mains supply before the fuse is removed. Replace fuse cap before reconnecting to mains.
- DVR SATURN; Do not open the switch and rear covers.** Components can carry dangerous voltages even when isolated from mains power.
- DVR SATURN; Always ensure spindle fixtures (e.g. faceplates etc) are locked to spindle in case spindle reverse is engaged.** Otherwise they will unwind from spindle. See "Mounting a Faceplate to a chuck" section.
- WHEN SPINDLE REVERSE IS ENGAGED DO NOT USE CHISELS OR CUTTING TOOLS - USE FOR SANDING ONLY**
- KEEP WORK AREA CLEAN.** Do not turn the lathe on before clearing the lathe of all objects (tools, scraps of wood, etc.). Keep the nearby area and floor clear of debris.
- CHECK SET-UP** with spindle Off. Examine the set-up carefully and rotate the work piece by hand to check clearance and check speed is correctly selected before turning on spindle.
- DO NOT MAKE ADJUSTMENTS** when the lathe or work piece is turning. Make all adjustments with power Off.
- TIGHTEN ALL CLAMP HANDLES** on the headstock, tailstock, and tool rest before operating lathe.
- EXAMINE WORK PIECE** and glue joints before turning to make sure it has no defects that would cause it to break when turning.
- DVR SATURN; ALWAYS CHECK CORRECT SPEED IS SELECTED BEFORE SWITCHING ON SPINDLE**
- USE LOWEST SPEED** when turning a new or unbalanced work piece.
- TURN AT RECOMMENDED SPEED.** Always operate the lathe at the recommended speeds. Consult this manual for suggested speeds.
- ADJUST TOOLREST** close to the work piece. Before turning, revolve the stock by hand to make sure it clears the rest. At intervals, stop the lathe and readjust the tool rest.
- KEEP TOOL ON TOOLREST.** The lathe tool or chisel should be on the toolrest before the lathe is turned On. Tools should remain on the toolrest whenever the tool is engaged in contact with the work piece **REMOVE TOOLREST** when sanding or polishing so fingers do not get pinched.
- USE CORRECT LATHE TOOLS.** Do not use spindle turning chisels for faceplate mounted work, and vice versa. Spindle turning tools used for faceplate mounted work may grab the work piece and pull the chisel from your control.
- WHEN ROUGHING STOCK** do not jam the lathe tool or chisel into work piece or take too big a cut.
- DO NOT POUND WORK PIECE** into headstock drive (spur) center when turning between centers. Pound the drive center into the work piece with a soft mallet before installing it between centers in the lathe.
- DO NOT USE TAILSTOCK** to drive work piece into the drive (spur) center when turning between centers. Secure work between centers with light pressure from the tailstock quill action.
- FASTEN STOCK SECURELY BETWEEN CENTERS.** Make sure the tailstock is locked before turning on the power.
- NEVER LOOSEN TAILSTOCK SPINDLE** or tailstock while work piece is turning.
- CORRECT USE OF FACEPLATE.** When faceplate turning, make sure work piece is securely fastened to the faceplate and that appropriate size faceplate is used to support the work piece. Any screw fasteners must not interfere with the turning tool at the finished dimension of the work piece. Rough-cut the work piece as close as possible to finished shape before installing on faceplate.
- DO NOT OPERATE LATHE IF DAMAGED OR FAULTY.** If any part of your lathe is missing, damaged or broken, in any way, or any electrical component fails, shut off the lathe and disconnect the lathe from the power supply. Replace missing, damaged, or failed parts before resuming operation.
- ADDITIONAL SAFETY INFORMATION** regarding the safe and proper operation of this product is available from the National Safety Council, 444 N. Michigan Avenue, Chicago, IL 60611 in the Accident Prevention Manual of Industrial Operations and also in the Safety Data Sheets provided by the NSC. Refer to the American National Standards Institute ANSI 01.1 Safety Requirements for Woodworking Machines and the U.S Department of Labor OSHA 1910.213 Regulation.

Guidelines to symbols used in this manual:



Warning Symbol. Pay close attention!



Note/Information Symbol. Please read - important information for you.

# DVR SATURN Woodlathe Specifications

**Size:** 1100mm(L) x 240mm (W) x 1214mm (H)  
[412mm(H)without stand]  
43 1/3"(L) x 9 1/2" (W) x 47 5/6"(H)  
[16 1/4"(H) without stand]

**Weight:** 82kg (181 LB) without stand

**Swing Over Bed:** 400mm (16in.)

**Distance Between Centers:** 600mm (24in.);  
extendable in 510mm (20in.) units with  
add-on Bed sections.

**Swing Outboard:** 740mm (29in.) with headstock  
at 90° using outrigger tool rest.

**Headstock:**

Spindle Thread: M33 x 3.5 RH <sup>(1)</sup> or  
1-1/4 x 8 TPI RH <sup>(2)</sup>

Headstock Bore: No. 2 Morse Taper (#2 MT)  
Headstock Swivel: 0 to 360 degrees, with  
detents at 0, 22.5, 45, and 90 degrees.

Outboard End Internal Thread: M20 x 1.5 LH  
Spindle Index: 24 divisions (every 15 degrees) 15mm  
through-hole through Headstock

**Tailstock:**

Tailstock Bore: No. 2 Morse Taper (#2 MT)  
Quill Travel: 85mm (3-1/4in.)  
Hole Through Tailstock: 15mm (9/16in.)

**Tool rest:**

Length: 300mm (12in.)  
Shaft Diameter: 25.4mm (1in.)

**Speeds (rpm):**

100 – 3500 RPM is default (option in settings to  
increase to 5000 RPM)

**Favorite Speeds:**

10 presets

**Standard Equipment:**

300mm (12in.) Tool rest,  
80mm (3in.) Faceplate  
Spur Center  
Live Center  
Outboard Handwheel.

**Optional Accessories:**

Precision Midi, G3, SuperNova 2, NOVA Infinity,  
Titan Chuck  
150mm (5.9in.) Faceplate  
100mm (4in.) Tool rest  
Bowl Tool rest  
Outrigger Tool rest Unit  
Revolving Center System  
Faceplate rings  
Bed Extension

**Notes:**

- (1) Applicable to Europe
- (2) Applicable to United States, Canada, Australia,  
New Zealand & South Africa.

①\* *Note: Standard equipment varies from country to country, In some markets, the faceplate is an optional accessory. Check with your reseller if you are unsure.*



For Europe, Australasia, UK and South Africa



**Directives this equipment complies with:**

Low voltage directive (LVD) 73/23/EEC + 93/68/EEC +2006/95/EC  
Machinery directive (MD) 89/392/EEC + 91/368 EEC + 93/68/EEC +  
2006/42/EC Electromagnetic compatibility directive (EMCD)  
89/336/EEC + 92/31/EEC + 93/68/EEC + 2004/108/EC

Harmonized Standards applied in order to verify compliance with  
Directives:EN 61029-1:2009 (Low Voltage Directive and Machinery  
Directive)

EN 55014-1:2007  
EN 55014-2:2009  
EN 61000-3-2: Ed3 2006  
EN 61000-3-3:1995 A1 + A2

Signed Spencer M. Herran Dated 07/23/2015

Spencer Herran  
Research and Development Engineer

# Setting Up Your Workshop

## Workshop Requirements

<i>Consideration</i>	<i>Recommendation</i>
Lathe location	Locate the Nova DVR SATURN close to a power source in an area with good lighting. Leave enough clearance on all sides of the lathe; allow for motor clearance when the headstock is swiveled. Other machines in your shop should not interfere with the operation of the lathe.
Lighting	Your shop should have adequate lighting. The work area of the lathe should be well lit; there should not be shadows cast on your work. If possible, locate near a window. A portable spotlight may be helpful.
Electrical	The Nova DVR SATURN requires the appropriate power outlet nearby to power the motor. Wiring and outlets should adhere to local electrical codes. If in doubt, seek advice from an electrician. Minimize use of extension cords. See "Connecting to power" section for Surge Protector requirements.
Ventilation	Your shop should be adequately ventilated. The degree of ventilation will vary based on the size of the shop and the amount of work done. The use of dust collectors and filters will minimize risks to your health.

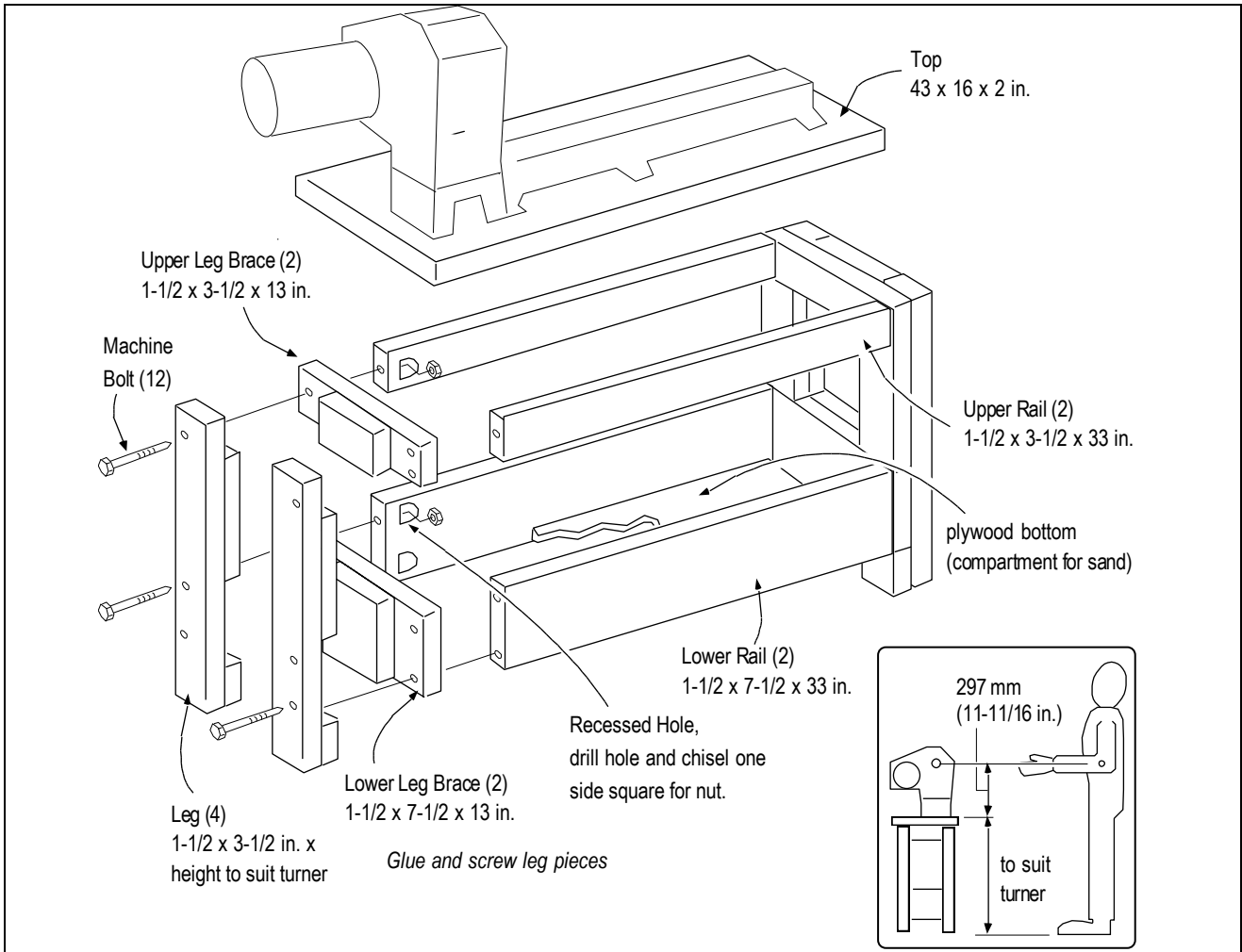
## Lathe Stand Recommendations

A sturdy and rigid stand is required so that the Nova DVR SATURN Woodlathe can deliver optimum performance. A common flaw with many woodlathe installations is an inadequate stand for the lathe. The larger the size of your turnings, the greater the importance of the lathe stand design.

<i>Consideration</i>	<i>Recommendation</i>
Lathe Height from floor	The height of the stand should locate the centerline of the lathe spindle at the elbow height of the turner. (illustration next page)
Stand Top	The stand top should be flat so the lathe does not twist when it is bolted down. Check for any gaps between lathe feet and stand top before bolting down. Shim and prepare stand as necessary.
Stand Weight	The stand should have enough weight and mass so that it doesn't move when turning large work pieces, and so that the stand can absorb vibrations. A lathe stand's stability can be improved by weighing it down with sand bags on a lower shelf.
Stand Legs	The stand should sit level on the floor and not rock.

# Example of Shop-made Lathe Stand

This has been designed with economy of space in mind. Heavier sections, wider rails and gussets on the corners are encouraged. For stability and vibration dampening, it is highly recommended that the base is filled with sand.

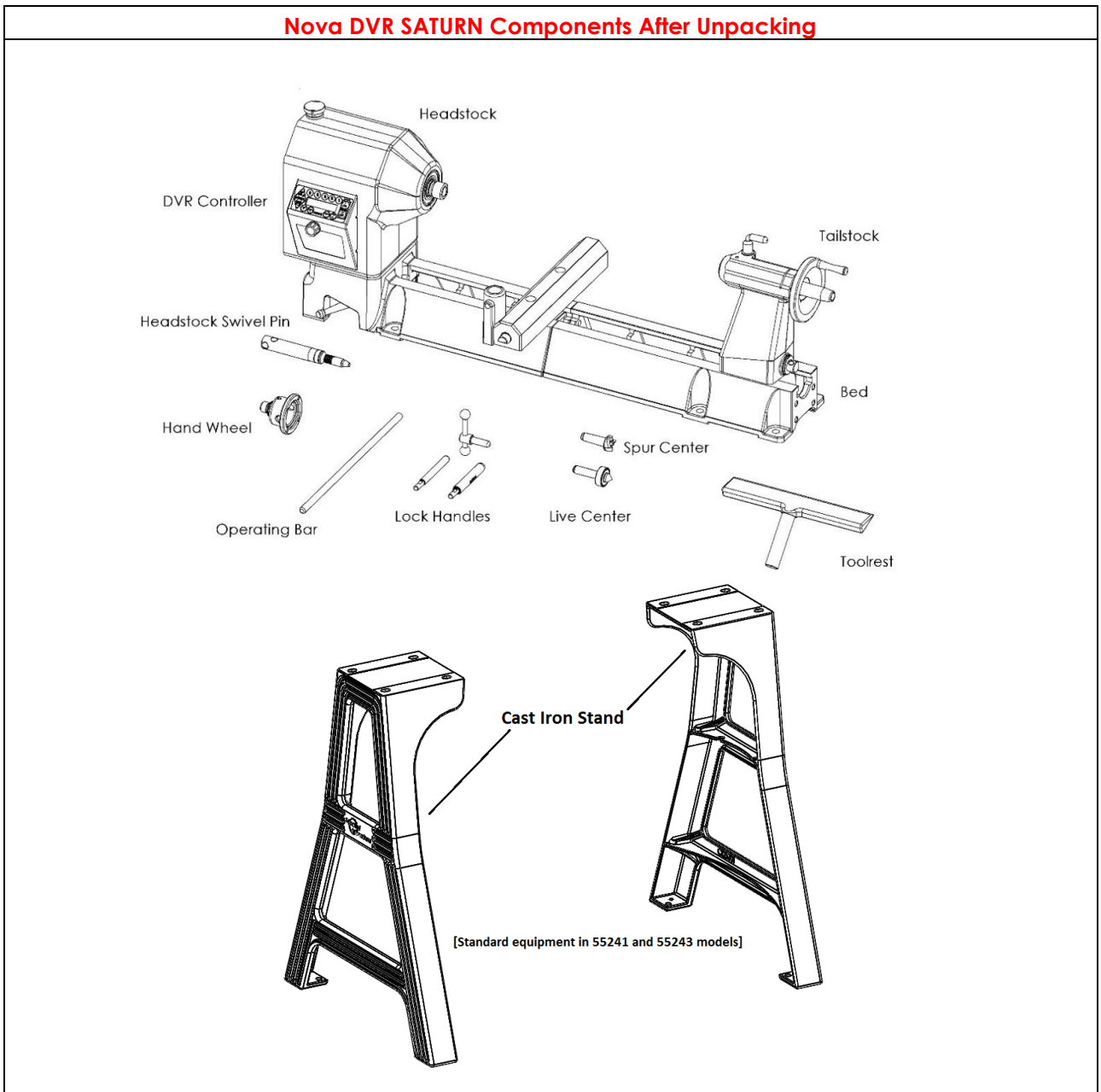


# Assembling the Nova DVR SATURN



**Warning!** Seek help when moving the NOVA DVR Saturn lathe and its heavier components to help avoid risk of injury. Read and understand the contents of this manual and recommended procedures before attempting to assemble or operate the Lathe or its parts. DO NOT CONNECT POWER ON LATHE UNTIL FULLY ASSEMBLED.

1. Unpack the lathe and components from the shipping container. This is best done by cutting down the sides of the box to expose the lathe
2. Clean any parts coated with rust preventative with a cloth moistened with a petroleum-bases solvent or cleaner, such as paint thinner. Coat the lathe bed with paste wax.



## Assembling the Bed and Legs

3. Attach legs to bed using 6 supplied bolt M12 screws & spring washers and 2 supplied bolt M10 screws and spring washers.
4. Once legs are fastened to bed, bed weight can be carefully placed on legs; screws must be fully tightened down before further assembly.

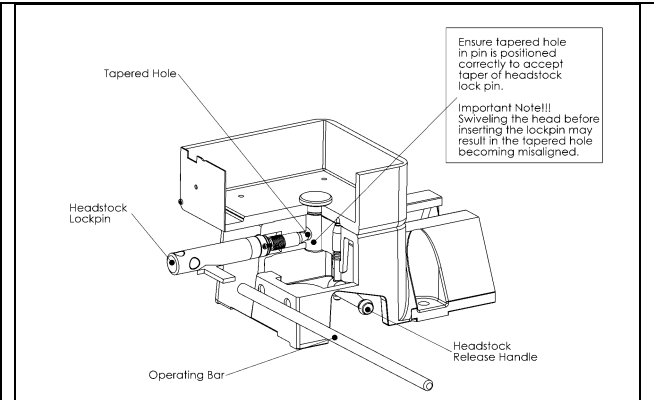
## Installing the Headstock Lock Pin and Handles

- Remove the plastic shipping tube from headstock base. Immediately screw the Headstock Lock Pin into the threaded hole at the bottom of the headstock. Insert the operating bar into the hole in the Lock Pin and firmly tighten the Lock Pin to lock the headstock in position; then remove the operating bar.

① **Note:** When the pin is fully engaged, the groove machined into the pin furthest from the thread should line up with the edge of the hole in the casting. By doing this the pin will be engaged in the hole of the swivel pin.

- Loosen the Lock Pin 1 – 2 turns. Push the Headstock Release Handle down and rotate the Headstock so the spindle points to the tailstock and lines up parallel to the lathe bed. Tighten lock pin again.

① **Note:** Do not use excessive force when tightening the Lock Pin.



### Important note:

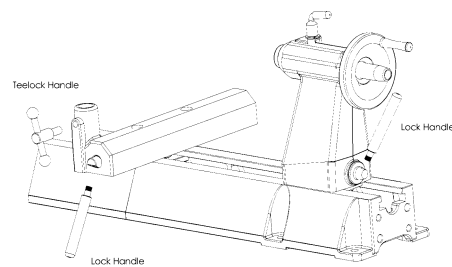
Swiveling the headstock before inserting the lock pin may result in the tapered hole on the Swivel pin becoming misaligned.

- Assemble the handles:

① **Note:** Some handles may come pre-assembled.

- **Tool Rest Clamp Handle** - Insert the rod through the handle and screw the ball knobs onto each end of the rod.
- **Tool Slide Clamp Handle** - screw the lock handle into the tool slide.
- **Tailstock Clamp Handle** - screw the lock handle into the tailstock.

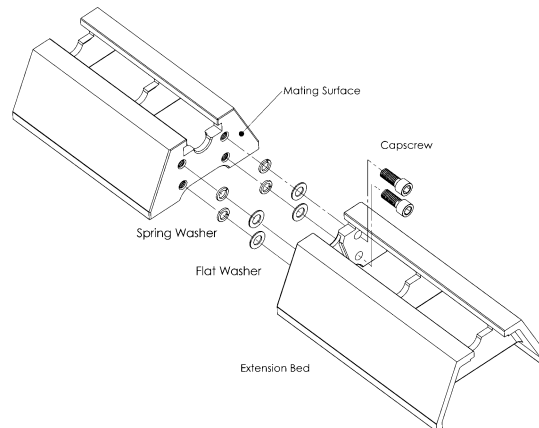
### Installing Handles



## Adding an Extension Bed

Each cast iron extension bed adds 510mm (20in.) to the lathe's capacity to turn between centers.

- Clean the joining ends of both bed sections with a petroleum-based solvent. Make sure there are no dents or burrs on either mating surface. Remove burrs and high spots with a smooth file.
- Screw in cap screws tight.
- Secure the bed sections together with four M12x30 cap screws using a 10mm Allen wrench. It may be necessary to move the lathe so the cap screws can be reached with the wrench from the bottom of the bed.

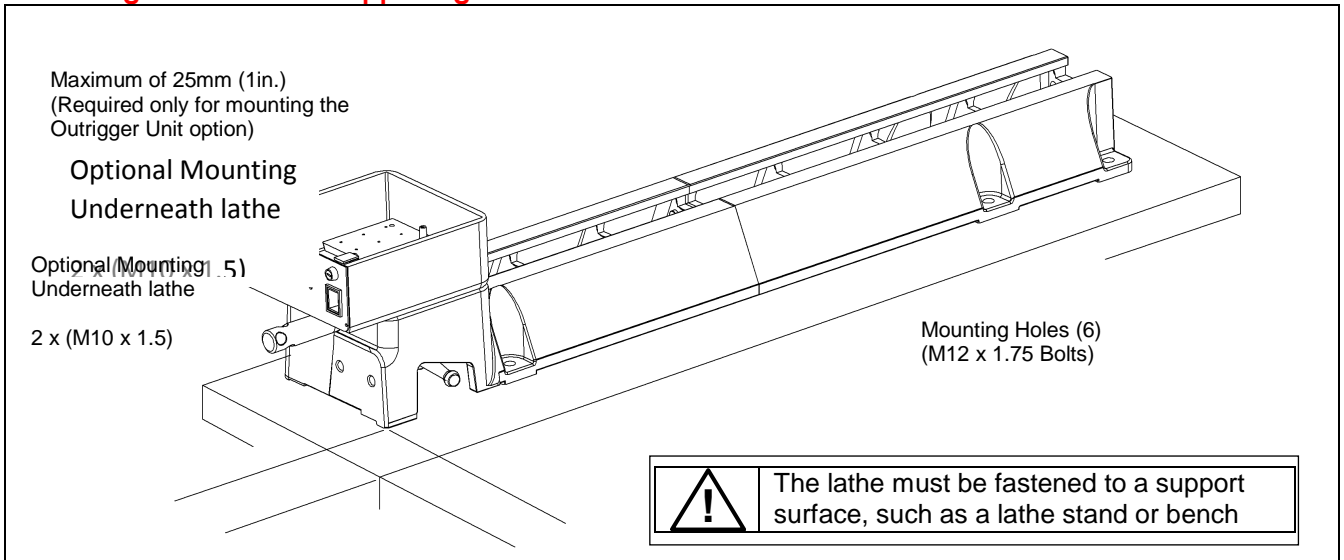


### Warning!

Do not use a metal hammer to pound on the extension bed. This may damage the bed, affect accuracy and tailstock action, and may prevent you from adding another extension bed.

- Bring the Tailstock along until it is on top of the join area where the bed extension face meets the lathe bed face. The bed extension may require manipulations up-and-down and sideways in order for the Tailstock to fit.
- Check that the tool slide and tailstock move freely over the mating joint and also over the full length of the add-on extension. If there is a ridge between the two mating surfaces then repeat steps 1 - 4 again, use a smooth file to file the surfaces flush.
- Follow the suggestions under "Mounting the Lathe to a Support Surface".

## Mounting the Lathe to a Supporting Surface



1. Place the lathe on the stand top. Locate the front and left corner of the lathe approximately 25mm (1in.) from the corner edge of the stand top. This provides a comfortable reach when turning and allows the optional outrigger unit to be easily installed.
2. If necessary, mark the six hole locations on the top and drill M12 holes.
3. Place a spirit level along the top of the lathe bed. Any movement of the bubble as the lathe is secured, indicates a twist on the bed. For the lathe to operate correctly the bed must not twist; if necessary, use shims between the bed and stand top.
4. Use bolts of suitable length (not included) to secure the lathe. Tighten the two headstock bolts first, then the two tailstock bolts, and finally tighten the last two bolts on top.
5. The two M10 threaded holes underneath the outrigger end of headstock can be optionally used (making a total of 8 bolt positions). Ensure that the bolts are metric M10 x 1.5mm pitch and correct length to ensure that the bolt does not bottom the threaded hole which could potentially damage casting.

## Connecting to Power

The power cord should be 3-wire, having a grounding conductor and a grounding plug. The plug must be plugged into a matching outlet that is properly installed and grounded in accordance with local electrical codes.

The DVR SATURN can run on either 115v or 220v ~ 240v, **but the lathe will require correct plug** for the selected voltage. If the lathe is purchased in USA, it will already be setup for 115v operation. All other countries are preset for 220v ~ 240v.



### Warning!

Improper connection of the motor can result in a risk of electrical shock.

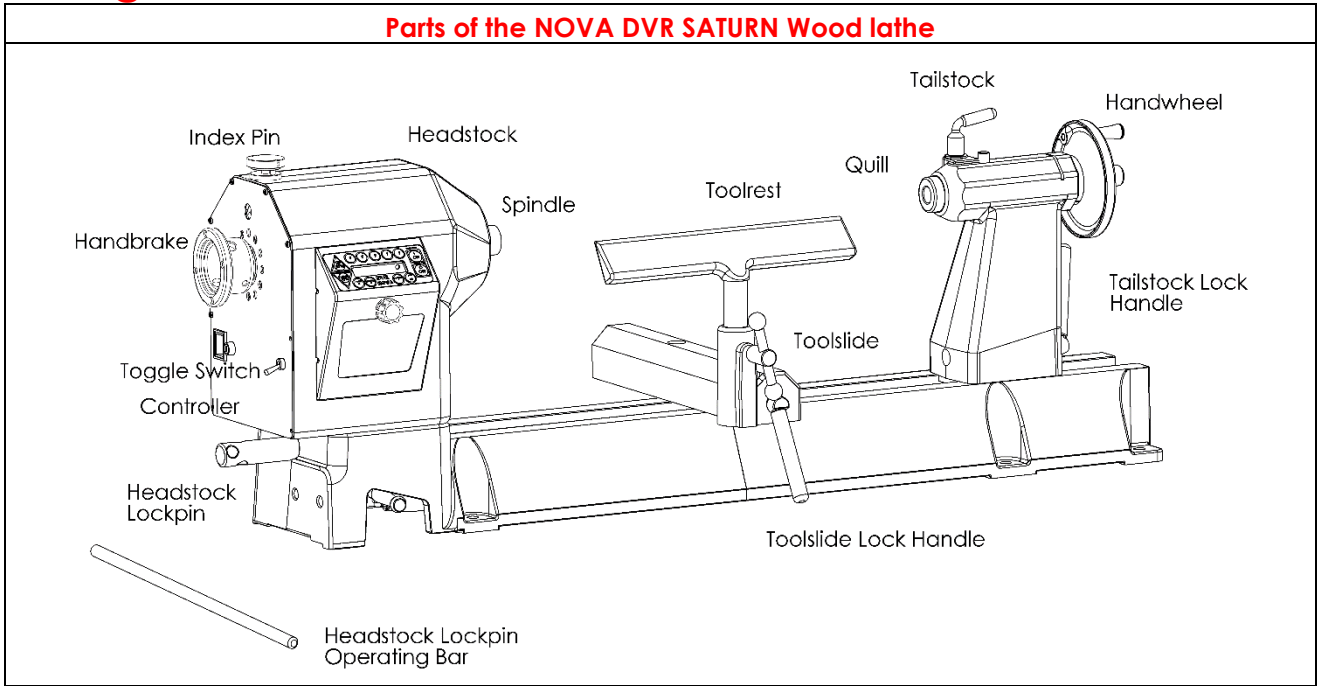
If it is necessary to use an extension cord, the cord should be grounded. Use the correct wire size for the extension cord, for a given cord length, to avoid power loss and over-heating.



### IMPORTANT:

**A Surge Protection Device rated to at least 15 amps - for USA and Canada, other countries 10 or 15 amps - must be used to protect the DVR electronics from electrical spikes or surges, similar to those used on most Home PC's. Ground Fault Interrupters (GFI's) or Residual Current Detectors (RCD's) are helpful and are a recommended protection device for any power tool. They can be used in conjunction with a DVR lathe. Note some makers of GFI may not be compatible**

# Using the Nova DVR SATURN



## DVR Variable Speed Controller

The NOVA DVR drive is a unique type of drive system where the motor and controller interact with one another. The motor provides data to the controller about its position and load condition. Controller then processes the information sent from the motor to deliver power to the motor for optimal performance and minimal losses.

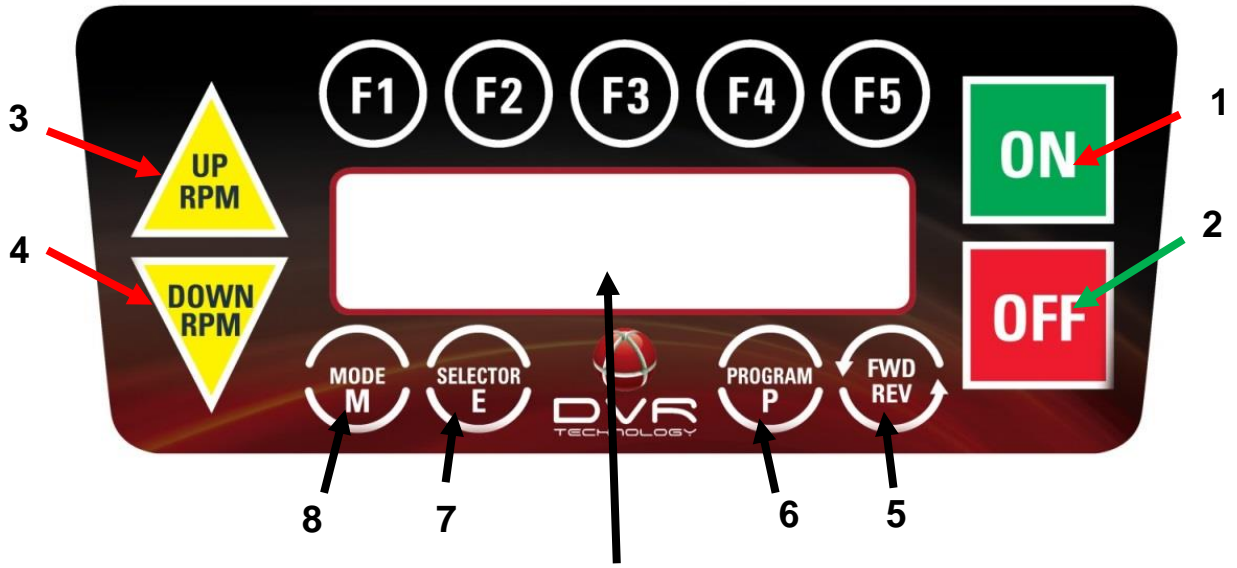
## DVR Drive Parameters

<b>Motor Type</b>	Digital Variable Reluctance	
<b>Motor Power</b>	1.75HP for 115V	2.0HP for 230V
<b>Accuracy of Speed Stabilization</b>	<2.5%	
<b>Speed Stabilization</b>	Current Level, Pulse Width	
<b>Motor Speed Range</b>	100~5000 rpm	
<b>Default Speed (When powering up)</b>	500 rpm	
<b>Reverse Function</b>	Yes	
<b>Regulator Type</b>	PID	
<b>Speed Control</b>	Button (5 rpm increment)	

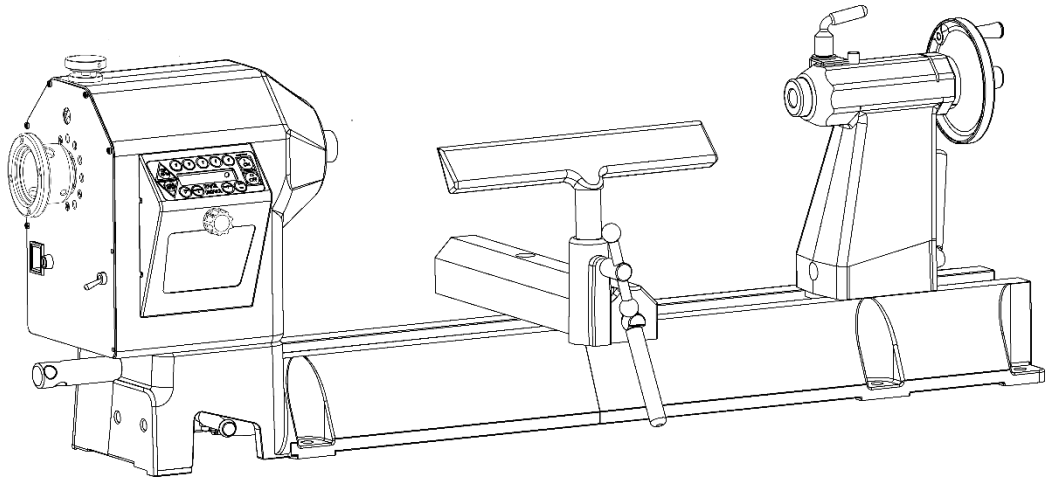


DVR Drive Functions

Control Panel Buttons




9. Two String Liquid-Crystal Display (LCD)



Number	Name of Key	Function
1.	Green ON	<p>Press to start machine at the commanded speed. Always check that the speed has been selected correctly.</p> <p>When the computer is first switched on it is set at a default speed of 500 rpm. Remember that whenever the computer is switched off at the wall or at the incoming power supply switch, the computer will restart at the default setting. The spindle will not start until this key has been pressed once.</p> <p>When the "ON" button is first pressed, the screen will display "Go Low! rpm" and then "4 retries left". These messages are normal, the computer first does a self-check.</p>
2.	Red Off	<p>Key to stop spindle rotation</p> <p>The ON/ OFF keys only switch the motor on and off. The selected speed will remain until</p>

		adjusted or computer or computer is switched off.
3.	UP RPM	One press of this key will increase speed by 5 rpm. Holding the key will increase the speed continuously in 5 rpm increments. The speed can be adjusted regardless whether the spindle is running or not. Large speed adjustments can be made quicker when the spindle is OFF.
4.	DOWN RPM	Press to lower the speed of the spindle, this key operates in the same way as the "UP RPM" key.  The UP and Down keys can also be used in program mode to change the parameters.
5.	FWD/ REV	Pressing this key will change the motor rotation from forward to reverse. Pressing again will select forward. You can verify the direction by the two arrows at the bottom left or right of the screen.  <b>Important: always verify the forward or reverse is selected correctly before switching spindle on.</b>  * Whenever reverse is selected a "Warning Reverse Selected" will flash on screen for about 1-2 seconds before spindle starts*
6.	Program	Used for special and parameter settings
7.	Selector	Used for special and parameter settings
8.	Mode	Used for special and parameter settings
9.	Two string LCD	Displays the current information of the lathe.  Example: <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px auto; width: fit-content;">Ready to start at XXXXrpm &gt;&gt;</div> <p>"XXXX" is the reference motor speed. "&gt;&gt;" Indicates forward direction of rotation.</p> <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px auto; width: fit-content;">Speed = CCCC rpm Ref -&gt; RRRR rpm</div> <p>"CCCC" = current value of the motor speed "RRRR" = reference value. (Value selected)</p>

### Special Parameters and Settings

	You may wish to change the stabilization setting from time to time depending on the type of work piece you are working on.
---	--

You have 3 options preset for you:

1. SOFT: For light work at speeds lower than 500 rpm
2. NORMAL: Suitable for most work and is the default setting
3. HARD: For heavy and/or 'out-of-balance' work at speeds lower than 500 rpm

a)	Press <OFF> if necessary
b)	Press <PROGRAM> (key #6 on diagram). The stabilization setting will be displayed. The default setting is NORMAL.
c)	Press <SELECTOR> (key #7 on diagram) to toggle between the 3 options as mentioned above  <b>NOTE:</b> Pressing <MODE> (key #8 on diagram) allows the user to change the parameter settings in more detail. This breaks it down into Proportional (Kprop) and Integration (Kint) settings which make up the PID control of the DVR. The 3 options of SOFT, NORMAL and HARD have been preprogrammed for your convenience and are balanced for optimum output. To clear special settings and return to default --- switch off computer at the master switch.
d)	Press <PROGRAM> button to return to ready state. (Ready to start mode).

While the machine is running, if you push Mode (8) the screen will display various diagnostics. Operation of the machine is not effected. Each time mode is pressed a different screen will show. This area is only used for advanced programming functions.

Auto safety-- If the power is lost to the machine, when power is restored the computer will reboot but the machine will not start until the 'ON' switch is pressed. **Remember to correctly select speed if different from Default speed.**

**Warning: Do not push several keys together as special coded combinations of keys open diagnostic and service functions. Some of these disable control and protection functions. If an unfamiliar screen is displayed, switch off the computer and leave for one minute before rebooting.**

If the DVR hasn't been used for some period (over one month) it is helpful to switch the unit on 30 – 60 minutes before use

## Function Keys

The NOVA DVR keypad interface allows instance access to the user's favorite 10 preset speeds.

Key	Name	Short description
F1	- Preset Speed 1 Key -	Set speed to "Preset speed #1"
F2	- Preset Speed 2 Key -	Set speed to "Preset speed #2"
F3	- Preset Speed 3 Key -	Set speed to "Preset speed #3"
F4	- Preset Speed 4 Key -	Set speed to "Preset speed #4"
F5	- Preset Speed 5 Key -	Set speed to "Preset speed #5"
Hold "Mode" + F1 or Double press F1	- Preset Speed 6 Key -	Set speed to "Preset speed #6"
Hold "Mode" + F2 or Double press F2	- Preset Speed 7 Key -	Set speed to "Preset speed #7"
Hold "Mode" + F3 or Double press F3	- Preset Speed 8 Key -	Set speed to "Preset speed #8"
Hold "Mode" + F4 or Double press F4	- Preset Speed 9 Key -	Set speed to "Preset speed #9"
Hold "Mode" + F5 or Double press F5	- Preset Speed 10 Key -	Set speed to "Preset speed #10"

## Speed Dial Knob

The speed dial allows the user to control the speed and navigate the menu system on the HMI.

Speed Dial Action	Description
Short Press	Menu: Confirm
Turn Clockwise	Increase Speed – Fine Adjustment (Menu: Scroll Down)
Turn Counter-Clockwise	Decrease Speed – Fine Adjustment (Menu: Scroll Up)
Press and Hold & Turn Clockwise	Increase Speed – Coarse Adjustment
Press and Hold & Turn Counter Clockwise	Decrease Speed – Coarse Adjustment

The speed dial has 2 modes when adjusting the spindle speed; fine adjustment mode and coarse adjustment mode. Fine adjustment mode increases/ decreases the desired speed value in small step sizes. Coarse adjustment mode increases/ decreases the desired speed value in greater step sizes, allowing the user to quickly adjust the speed. A small step adjustment at low speed will allow the user to accurately control the speed, while a larger step size at a higher speed will allow the user to adjust the speed quickly. The table below lists the step sizes for the fine and coarse speed adjustment for the speed ranges.

Speed Range (RPM)	Fine Adjustment	Coarse Adjustment
Less than 200	5 RPM	20 RPM
200 ~ 499	5 RPM	50 RPM
500 ~ 999	5 RPM	100 RPM
1000 ~ 2999	10 RPM	200 RPM
3000 and Over	20 RPM	500 RPM

### Changing line in the menu

The menu line can be changed by pressing the <Fwd / Rev> key.

**Note:** Previously, the user had to hold <Fwd/Rev> and press <UP RPM> or <DOWN RPM> key to change the line.

### **New functions in the control panel:**

Two new features have been implemented in the latest iteration of the DVR SATURN Lathe, these are “Recommended Turning Speeds Guide” and the “Powered Assisted Braking”

### Recommended Speed Guide

The recommended turning speed is a simple guide to advise the turner on the turning speed based on the size of wood and the type of cut the turner wishes to perform.

How to use the speed chart:

1. Press the <Program P> button until the “Speed Guide” page appears
2. Press the <Selector E> button to enter the speed chart
3. Select the type of cut (Finish/Shape Cut or Rough Cut) by using the <UP RPM> or <DOWN RPM> button and confirm by pressing the <Selector E> button
4. Select the diameter of the work piece by using the <UP RPM> or <DOWN RPM> button and confirm by pressing the <Selector E> button
5. Press the <Program P> button to set the recommended speed as the current running speed

**IMPORTANT NOTE:** The “Recommended Speed Guide” only provides a rough estimate of the speed which should be used.

The user should adjust the speed value based on:

- The shape, balance and weight of the work piece
- Type of cut which the wood turner is going to perform
- The experience of the wood turner

### Powered Assisted Braking

The powered assisted braking feature can be used to help slow large work pieces when the user has pressed the “OFF” button.

How to use the Powered Braking:

1. Press the “Program P” button until the “Assisted Braking” page appears
2. Press the “Selector E” button to ENABLE or DISABLE the power braking
3. IF the braking mode is enabled, the motor will energize the motor when the user has pressed “OFF” to help slow down the spindle

### Vibration sensor

The vibration sensor will automatically shut down the lathe when a potential unsafe working condition has been detected. Excess vibration could be caused by an unbalanced workpiece, unstable footing or incorrect speed selected. There are four settings for the vibration sensor, these are Low, Med, High and Off. The settings can be adjusted in the Lathe Settings menu.

- **HIGH** (default): this is high sensitivity setting, default setting on the machine. This default setting will shut down and apply braking to stop the spindle when excess vibration is detected from imbalance in the work piece or excess speed. This is a recommended setting.
- **MED:** this is intermediate sensitivity setting. This setting will shut down and apply braking to stop the spindle when excess vibration is detected from imbalance in the work piece or excess speed. When med sensitivity setting selected – the operator must determine that working condition are safe.
- **LOW:** this is low sensitivity setting. This setting will shut down and apply braking to stop the spindle when a mass of vibration is detected from imbalance in the work piece or excess speed. When low sensitivity setting selected – the operator must determine that working condition are safe. This is a **NOT RECOMMEND SETTING.**
- **OFF:** The vibration sensor can be turned off by the user to prevent the motor from shutting off due to vibration. When **Off** selected – the operator must determine that working condition are safe. This is a **NOT RECOMMEND SETTING.**



### **WARNING!**

It is recommended that the vibration sensor is used when turning. Please start motor with slower speed for unbalanced work.



Please pressing any key to continue when the vibration sensor warning is displayed.

## Turning Tips

The Nova DVR SATURN drive technology is not just a variable speed motor - its smart motor technology takes turning to a new level. The speed, vibration and load sensing work with the conditions and turning. The machine will reward skilled turning with exceptional finish. There is often no need for sanding. As you apply load (chisel pressure or depth of cut) the control will sense the change in spindle conditions and compensate accordingly. Get a feel of the communication between yourself and the motor turning by applying increasing force. The motor will respond by applying increased power to exactly maintain speed.

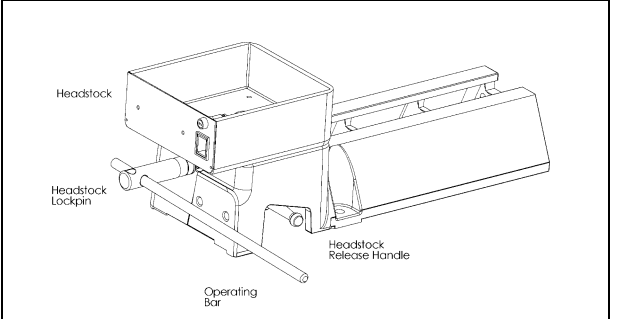

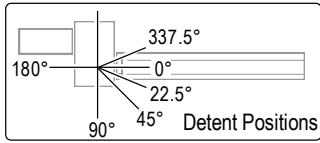
LOW SPEEDS 100-350: Select Hard Mode (see Special and Parameter settings)

Note – at low speeds 100- 350 rpm control of the chisel is important. At 250rpm the motor still has good torque (in fact the torque is more or less the same as at 400 or 1000 – but at low speeds there is a difference, the DVR is a unique type of motor in that the control only supplies enough power to maintain the spindle at the commanded speed. It needs to sense the load from the chisel and then it will apply power as needed. At very low speeds the chisel can move fast compared with the rotation of the wood. The important thing is to have good control of the chisel and maintain steady cuts (using the same woodturning practices that produce quality cuts and finishes). By using correct techniques surprisingly heavy cuts can be achieved. However, rapid or incautious use of the chisel will be immediately sensed by machine and spindle will shut down and then automatically restart.

“Will the Machine Shut Down on Interrupted Cuts?” No, as long as the cut is within the normal range of Woodturning cuts. An interrupted cut at slow rpm may cause a loss of control of the chisel and a dig in may occur.

A way to understand chisel feed rates is to consider that at 100 rpm, the work piece has only rotated about 1 and a half turns in one second and at 250 rpm, 4 turns. Considering that chisel feed or movement under normal turning can be anything between say 5 and 100mm per second at normal Woodturning turning speeds. At very low rpms it is easy to move the chisel too fast for good cutting conditions. In general, low rpm is only used for special processes or conditions. Speeds below 350 are generally not Woodturning speeds. The machine will operate down to 100 rpm but this is generally for applying finishes and other applications.

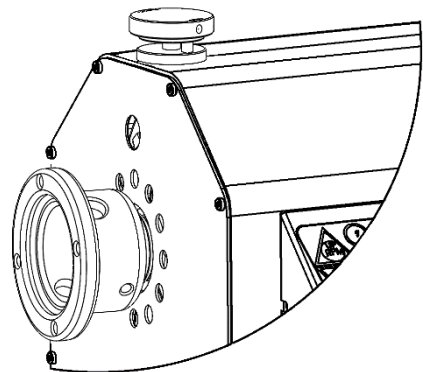
## Swiveling the Headstock


1.	Stop the lathe. Insert the operating bar into a hole in the Headstock Lock pin. Loosen the Lock pin half a turn.							
2.	Slide the Headstock Release Handle towards outboard end of lathe, and rotate the headstock to a detent position. Do not push down on the handle							
	<b>Warning!</b> Use the detent latch positions to prevent Headstock movement during turning.							
3.	Firmly tighten the Headstock Lock pin with the operating bar; but do not use excessive force. Remove the operating bar.							
		<table border="1"> <thead> <tr> <th></th> <th>Right-hand Turners</th> <th>Left hand Turners</th> </tr> </thead> <tbody> <tr> <td><b>Detent Positions</b></td> <td>0, 22.5, 45, 90 degrees</td> <td>180, 337.5 degrees</td> </tr> </tbody> </table>		Right-hand Turners	Left hand Turners	<b>Detent Positions</b>	0, 22.5, 45, 90 degrees	180, 337.5 degrees
	Right-hand Turners	Left hand Turners						
<b>Detent Positions</b>	0, 22.5, 45, 90 degrees	180, 337.5 degrees						

## Spindle Index

The spindle index pin locks the headstock spindle. It is selectable in 15 degree increments (24 divisions). There is sight hole to read index numbers (0 through 23).

1. Stop the lathe
2. Pull the index knob and turn it left until the pin drops into the hole. To lock the spindle, it must engage into a hole in the headstock pulley



	<b>Warning!</b> Make sure the index pin is out before operating the lathe. The pin should drop into the indentation in the headstock to prevent it from engaging whole the spindle is turning.	<table border="1"> <thead> <tr> <th>Divisions</th> <th>Index Number</th> <th>Degrees</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>0, 12</td> <td>180</td> </tr> <tr> <td>3</td> <td>0,8,16 (every 8<sup>th</sup>)</td> <td>120</td> </tr> <tr> <td>4</td> <td>0,6,12,18 (every 6<sup>th</sup>)</td> <td>90</td> </tr> <tr> <td>6</td> <td>0,4,8,12,16,20 (every 4<sup>th</sup>)</td> <td>60</td> </tr> <tr> <td>8</td> <td>0,3,6,9,12,15,18,21 (every 3<sup>rd</sup>)</td> <td>45</td> </tr> <tr> <td>12</td> <td>0,2,4,6,8...22 (every 2<sup>nd</sup>)</td> <td>30</td> </tr> <tr> <td>24</td> <td>Every hole</td> <td>15</td> </tr> </tbody> </table>	Divisions	Index Number	Degrees	2	0, 12	180	3	0,8,16 (every 8 <sup>th</sup> )	120	4	0,6,12,18 (every 6 <sup>th</sup> )	90	6	0,4,8,12,16,20 (every 4 <sup>th</sup> )	60	8	0,3,6,9,12,15,18,21 (every 3 <sup>rd</sup> )	45	12	0,2,4,6,8...22 (every 2 <sup>nd</sup> )	30	24	Every hole	15
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## Headstock

The headstock houses the Rotor, Stator, Electronics, bearings, and the Spindle. The headstock spindle accepts centers and accessories with no. 2 Morse taper (#2 MT), plus threaded faceplates and chucks.

<b>Spindle Thread Size</b>	
<i>Country</i>	<i>Threads</i>
United States, Canada, Australia, New Zealand, South Africa, United Kingdom.	1-1/4 x 8 TPI RH
Europe (excluding the UK)	M33 x 3.5 RH

### Mounting a Faceplate or Chuck

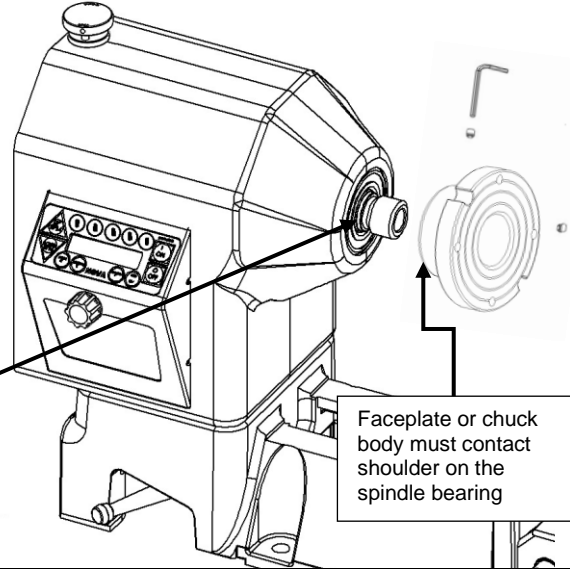
1. Use the Spindle Index Pin to lock the headstock spindle.
2. Remove the side-locking screw, then wind the faceplate or chuck onto the spindle threads. A spindle washer in between may be used to make removal easier.



#### Warning!

The faceplate or chuck body must contact the shoulder on the spindle bearing.

3. Pull and turn the Index Pin and place it in the "safe" indentation in the headstock.
4. A vee groove is provided in the spindle for a special locking grub screw that is used in conjunction with Nova chucks and accessories to prevent unwinding during reverse operations. Wind in the side-locking grub screw and lock firmly in place, without over tightening.



#### Warning!

It is important that all Chucks and Faceplates that are used on the DVR SATURN spindles have a side-locking function.

Some older Teknatool products may not have a side-locking function. If any of these products are intended to be used on the DVR SATURN spindle they will need to undergo a modification to include the side-locking function or new products purchased with a side-locking function. All spindle mounted products produced by Teknatool International for the DVR Lathe have side-locking functions\*.

The side-locking function should be used at all times while running the chuck on the spindle during operation. Without this function engaged the Chuck or Faceplate may unwind from the spindle during operation.



#### Warning!

When installing or removing the Faceplate or Chuck from the spindle, the side-locking grub screws **MUST** be completely removed.

This avoids any potential damage to the spindle that the grub screws may cause if it were not completely removed, when winding the Faceplate or Chuck on or off the spindle.

*\*Exception 1.* When an ILNS insert is used with a FP150Z faceplate on the DVR3000 or a Spindle adaptor, the insert or adaptor must be located onto the faceplate to avoid it unwinding when the spindle is run in reverse. Loctite 272 Thread locker is recommended.

*\*Exception 2.* Customers with dedicated threaded Teknatool chucks who intend using the chuck on the DVR SATURN Spindle must have a side-locking function adapted to the chuck before running it. Chucks with M33 threads may apply for Europe.

### IMPORTANT NOTE

The Index Pin is designed for indexing and not for leveraging against, when removing faceplates, inserts and chucks. For this we recommend holding the spindle using the operating bar through the 2 LHB holes (Left Hand Brake).

## Using a Spur center

Mount the spur center to the work piece as shown and then insert the spur center and work piece into the headstock spindle.



### Warning!

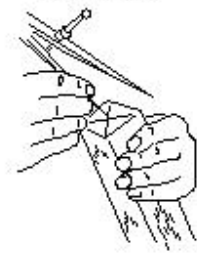
Do not pound work piece into headstock drive center when turning between centers or you may damage the headstock.

To remove the center, insert a 10mm (3/8-inch) diameter wooden dowel or steel rod through the headstock spindle hole. While holding the center so it doesn't fall, tap it out.

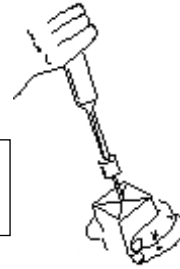
Mark stock centers



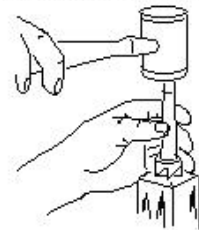
For softwoods - punch centers



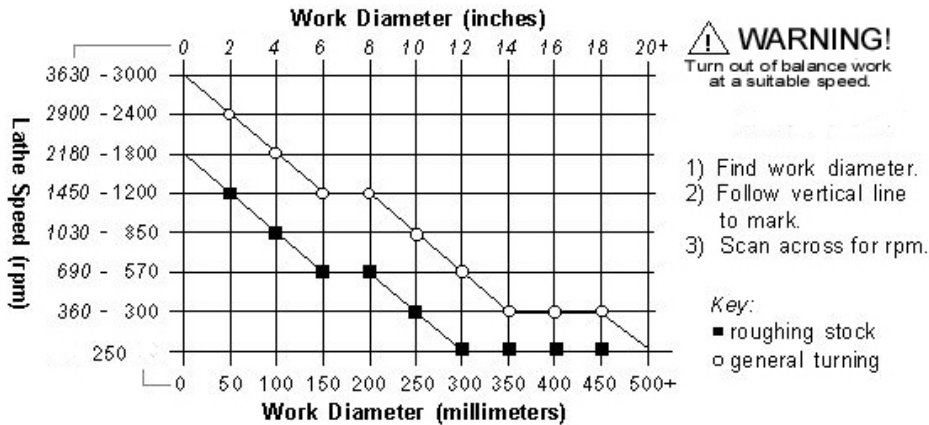
For Hardwoods – drill centres and saw diagonals for spur drive centre



Set spur center with mallet



## Lathe Turning Speeds



Correct selection of turning speeds is important for safety and finish cut quality

It is important to take the fixing of the work piece into account, it should be made as secure as possible. Various techniques are available for this consult books on the subject and seek training opportunities.

There are safety and out of balance considerations. Aim for a good balance in turning speed, ensure good fixing and try to balance timber as much as possible before installing on lathe.

In general wood likes being sliced and if too low a speed is used the timber can "hammer" against the cutting tool, tearing fibers and imposing large forces on the tool and work piece. This can often be dangerous, it is best to select a higher speed as the cuts will be smoother and less force is imposed on the work piece. It can be likened to a wood plane, if it is pushed very slowly, more force is needed to break the fibers. If the plane is pushed at a higher speed less forces are involved and a better cut results. Use 250 rpm when needed, but it is better turning at 400-600 rpm.

## Tailstock



### Warning!

Never loosen the tailstock quill or tailstock while the work piece is turning

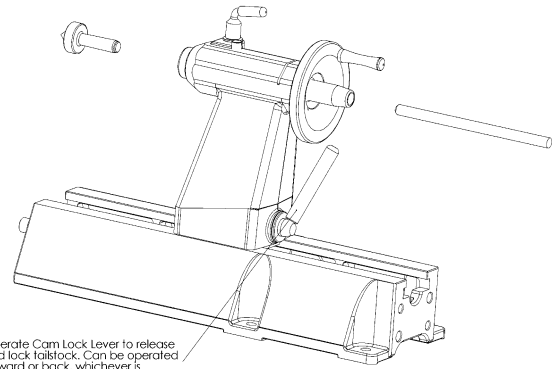
To move the tailstock along the bed, loosen the Tailstock Clamp Handle, slide the tailstock to the desired position, and tighten the clamp handle.

To move the tailstock quill in or out, loosen the Quill Lock and turn the Handwheel. Lock the quill in place with the Quill Lock.

The tailstock quill accepts centers and accessories with no. 2 Morse taper (#2 MT). To install a taper use a quick, firm action by hand. Do not pound the taper in.

To remove a taper, insert the operating bar through the tailstock quill hole. While holding the taper so it doesn't fall, tap it out.

The tailstock quill is hollow, allowing you to bore holes through turnings if a hollow center is used.



## Learning Wood Turning

The art and technique of turning is a subject beyond the scope of this instruction manual. It is recommended that you receive hands-on instruction on lathe turning and/or refer to books and videos on the subject. For reference, some woodturning books are:

*The Lathe Book*  
By Ernie Conover

*Woodturning A Foundation Course*  
by Keith Rowley

*Creative Woodturning*  
by Dale Nish

*Turning Wood With Richard Raffan*  
by Richard Raffan

*The Fundamentals of Woodturning*  
by Mike Darlow

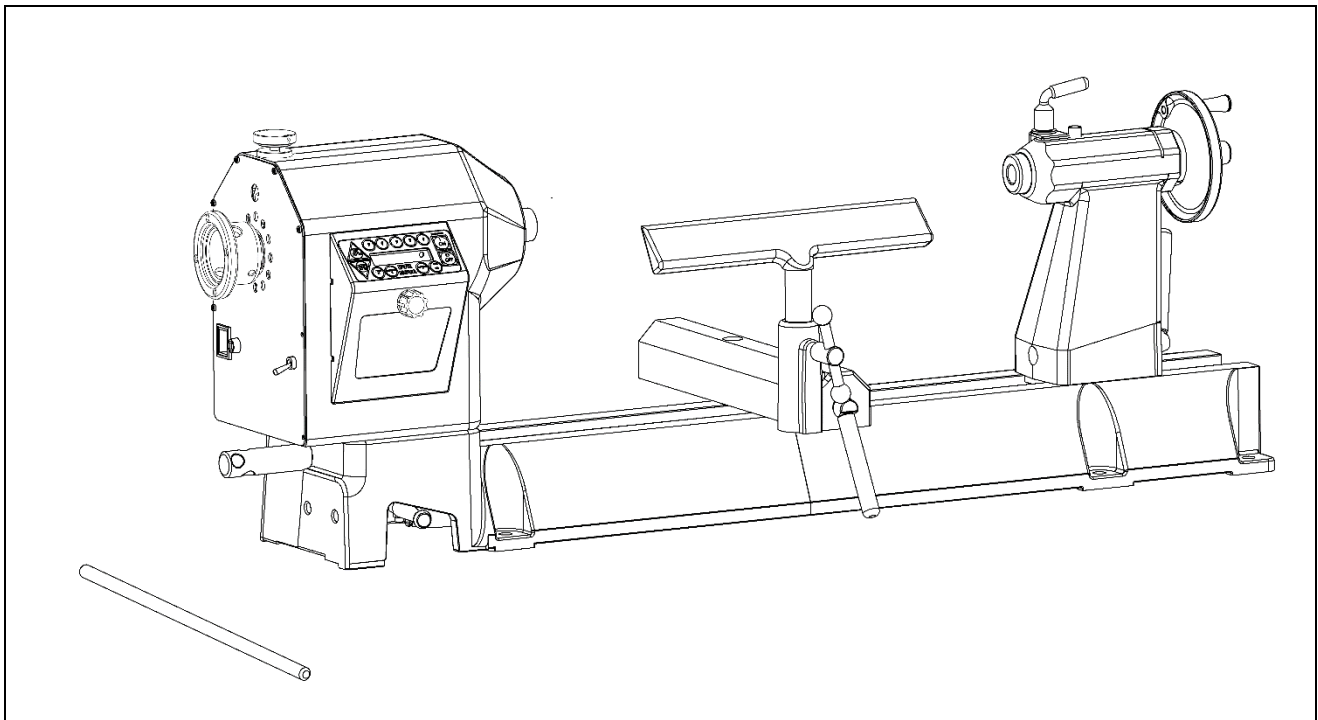


# Maintaining the NOVA DVR SATURN

## General Maintenance

**Caution:** Always isolate the lathe from the power supply (unplug) before carrying out any maintenance

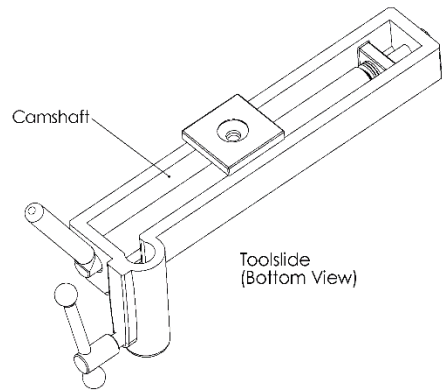
<i>Interval</i>	<i>Maintenance</i>
After each use	Clean the work area and Lathe. Vacuum shavings and dust from the Headstock, Tailstock, under the Toolside and in between the bed.
Monthly	<p>Wax exposed cast iron parts with a good quality paste wax, especially the bed rails. Buff out the wax thoroughly.</p> <p>Check tightness of nuts and bolts.</p> <p>Lubricate, with one or two drops of light-weight oil, the tailstock quill threads, index pin shaft, and the toolslide camshaft (remove plastic plugs) and toolslide front camshaft bore.</p>
6 Months	<p>Grease tailstock quill threads. Turn the handwheel so the quill threads are exposed, apply grease to the threads, crank the handwheel back and forth to work in the grease, wipe off any excess.</p> <p>Lubricate the tailstock slot with one or two drops of light-weight oil.</p> <p>With the power switched off and dis-connected, remove the upper-rear guard and remove any wood dust with a vacuum cleaner. Avoid getting the nozzle too close to the electronics. After this step dust may fall into the Headstock so suck the dust out through the vent at the front of the Headstock under the spindle. Replace guard.</p>



## Cleaning the Toolside

If the toolside becomes hard to move and adjust, cleaning and lubricating are required.

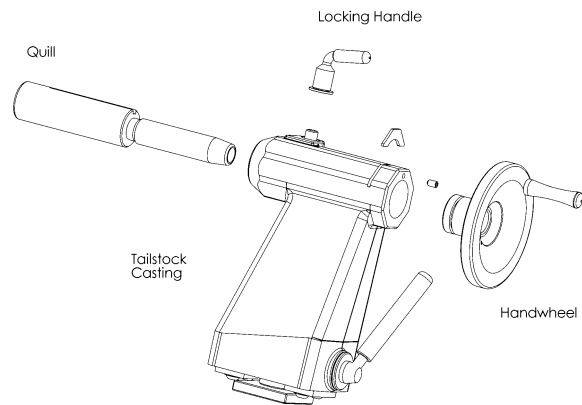
1. To make the toolside slide more freely along the bed, make sure the bed rails are clean. Apply some paste wax to the rails.
2. If the toolside is hard to move towards or away from you, remove the toolside from the lathe bed. Clean the toolside camshaft (round eccentric rod) with a petroleum-based solvent. Lubricate the rod with lightweight oil or a silicone spray.
3. Slide the base back onto the lathe bed.



## Cleaning the Tailstock

If the tailstock quill becomes hard to use or the Handwheel is hard to turn, cleaning and lubricating are required.

1. Remove the 6mm set screw from the tailstock. If necessary, turn the Handwheel to expose the set screw.
2. Using a screwdriver, remove the keeper plate from the tailstock body.
3. Remove the quill and Handwheel from the tailstock body.
4. Wipe clean all parts including the inside of the tailstock.
5. Lubricate the quill and tailstock slot with lightweight oil and apply a small amount of grease to the quill threads.
6. Reassemble.



## Aligning the lathe Headstock and Tailstock

1. Crank the Handwheel back so the quill is all the way in.
2. Place any #2 MT accessories you have that have a sharp point like a spur center, or live center in the tailstock quill and another center in the headstock spindle.

**Note:** Tailstock alignment can be made easier by using the Teknatool AcruLine Accessory Center in place of the centers.

3. Move the tailstock close to the headstock so the two centers nearly touch; check the alignment of the center points. Move the tailstock away from the headstock and extend and lock the quill. The points of the centers should align when the quill is halfway extended, fully extended, and fully retracted. If the centers are aligned at all three locations no adjustment is necessary.
4. If the tailstock does not meet the conditions in step 3, follow the steps below. This indicates that the tailstock is not parallel to the lathe bed and you will need to realign the tailstock.
5. First make sure the tailstock alignment plate is not binding inside the bed. If the tailstock doesn't move freely then remove the tailstock and look for burrs or high spots on the bed rails or the alignment plate. Using a smooth file remove any burrs or high spots. When done replace the tailstock on the bed.
6. Slightly loosen the four tailstock cap screws with a 5mm Allen wrench. Tap the tailstock with a wooden mallet in the appropriate direction to align the centers. Check and adjust the positioning of the tailstock. The centers should align when the quill is halfway extended, fully extended, and fully retracted, as previously described in step 3.
7. Lock the tailstock in place with the Tailstock Clamp Handle and fully tighten the two cap screws. The cap screws must be fully tightened in order to avoid slippage during work.
8. Check the alignment of the Tailstock by bringing it together with the Headstock, with the Live center and Spur center in each spindle. The Points on the centers should be within 0.50mm (0.020") height and width of each other.

# Voltage Selection

The DVR SATURN can be operated on both 110V input or 220V input. The conversion can be done by replacing the power connector. To convert the DVR SATURN to run on 220V input:





**Warning!**

This procedure should only be undertaken by a suitably qualified person. Electricity is a very dangerous hazard which may lead to death therefore the work needs to be inspected before the lathe is plugged back in to the wall socket.

**Equipment Required**

1 x NEMA 6-15P Plug (Or 15A rated plug)

Step No.	Description	Image
1.	<p>The original 110V plug needs to be switched to a 220V plug.</p> <p><b>Note:</b> 220V plug should be a <b>15A minimum rated</b>. An example of this type of plug is the NEMA 6-15P plug.</p>	  <p><i>Figure 1: Original 110V Plug</i></p> <p><i>Figure 2: NEMA 6-15P Plug</i></p>

# Troubleshooting Guide

<i>Problem</i>	<i>Possible Cause and Solution</i>
Excessive Vibration	<p>Out of balance, or large work piece. Reduce the lathe speed to the lowest and turn the work piece to a true circle. Adjusting the speed using the up/ down key will change the speed in 5rpm increments. If you try adjusting the speed up or down, you will find that it is easy to find speed points that will minimize vibration and is one of the biggest advantages of DVR technology</p> <p>Work piece is not held in the center. Check work piece mounting and correct.</p> <p>Work piece is not secure or held tight enough. Check work piece mounting.</p> <p>Lathe incorrectly bolted to stand or bench. Refer to this manual for lathe stand recommendations.</p> <p>Stand or bench not well constructed, too light, or not level on the floor. Make sure the stand is solidly constructed. Use sandbags to weigh down the stand.</p> <p>The metal floor stand should be Rawl bolted to the floor at the 4 hole points.</p>
Faceplate or Chuck running out of true	Dirt build-up on the rear of the faceplates or chuck. Clean off all build-up and dirt. Faceplate and chucks must mount securely against the inner bearing ring surface of the spindle.
Turning tools not sliding smoothly across Toolrest	Damaged surface on toolrest face caused by sharp edged tools. File the toolrest using a fine smooth file and polish with extra fine sandpaper. Remove the sharp edges from the corners of turning tools.
Spur drive center or live center not holding into the spindle taper or quill taper when turning	<p>Small end of Morse taper is damaged due to dropping or hitting. File or polish away any damage. Check that inside of tapers have not been scored.</p> <p>Grease or oil inside of Morse tapers. Wipe clean the inside of the tapers.</p> <p>Insufficient pressure when installing the center. Use a quick, firm action by hand to install a taper. Do not knock in using any solid object.</p>
Display screen not on	<p>Is master switch on? Toggle master switch to "ON" position.</p> <p>Check machine is plugged into wall socket and switched on.</p> <p>Check that the wall switch plug is live by plugging in another power tool if the other power tool doesn't go check your board fuse.</p> <p>Check the master fuse on the lower rear guard. Ensure machine unplugged (see Additional safety rules at the front of this manual). If blown, replace with the spare fuse that comes with the lathe. Do not replace with a higher amp fuse.</p>
LCD screen shows: <div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>Rotor Fault</b>  <b>&lt;Flashing&gt;</b> </div>	<p>Press off button; switch off computer by master switch wait one minute and switch on again.</p> <p>Check that the spindle index is not engaged or that something is preventing the spindle from turning.</p> <p>Note leaving the spindle index unit in will not harm the motor, however it will put some strain on the index unit. It is likely that the spindle index will be left in from time to time and the motor is designed for this.</p>
LCD screen shows: <div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>RP State Error</b>  <b>&lt;Flashing&gt;</b> </div>	<p>The optical sensors that gives the spindle position feedback (Rotor Position State) are obscured, damaged or have been disconnected. Dust over a long period of time may have settled on the sensors.</p> <p>Firstly, spin the spindle by hand to create a draught through the sensors. Re-try the motor. If the error remains, with the power switched off and disconnected, remove the upper-rear guard and remove any wood dust with a vacuum cleaner. Avoid getting the nozzle too close to the electronics.</p> <p>After this step, dust may fall further into the headstock so suck the dust out though the vent at the front of the headstock under the spindle. Do this sequence a few times. Try blowing if available with an air gun. Replace guard.</p>
LCD screen shows: <div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>PFC Corrector</b>  <b>&lt;Flashing&gt;</b> </div>	<p>The computer has built in voltage condition and temperature sensors. If this message appears, check the temperature of the lower section of the headstock.</p> <p>If it is very hot, switch off the master switch and leave the machine to cool down for a period. If the headstock is relatively cool the computer may have detected an under and over voltage from the mains power. Switch off and try rebooting. The DVR has a high level of protection and is intelligently checking conditions all the time.</p>

## Troubleshooting Guide (Continued)

Problem	Possible Cause and Solution
Tailstock and headstock center not lining up correctly	<p>Bed incorrectly bolted to stand causing twist. Ensure stand and lathe are correctly installed.</p> <p>Headstock not returned to detent position after it has been rotated. Ensure that the headstock is locked into a detent position.</p> <p>Headstock Lock pin not fully seated. Twist the headstock back and forth to make sure it is properly seated and then tighten the Lock pin.</p> <p>Dirt or wood dust accumulated in the headstock swivel pin hole. Remove the Headstock Lock pin and clean out hole.</p>
Tailstock Handwheel hard to turn or will not turn	<p>Quill lock is locked; unlock the quill lock. If necessary, lightly tap a block of wood against handwheel handle and tap the handle in a clockwise direction as viewed from the tailstock end.</p> <p>Build-up of dust and wood resin on the quill or inside of the handwheel thread. Remove, clean, and lubricate the quill and tailstock as described under "Cleaning the Tailstock".</p> <p>The quill has been extended too far and is locked against the handwheel. Push the quill back into the tailstock when turning the handwheel.</p>
Tailstock quill hard to move	<p>Quill lock is locked; unlock the quill lock.</p> <p>The quill is damaged; turn the handle to expose the quill and check for marks along the quill, especially on the edges of the slotted keyway. Remove the high spots with a smooth file and test the quill travel. Replace the quill if necessary.</p>
Tailstock not locking correctly onto bed, or tailstock not sliding smoothly on bed ways	<p>Tailstock adjustment plate not adjusted correctly; adjust as described under "Aligning the Tailstock".</p> <p>Dirty bed ways and underside of tailstock body. Clean bed ways and underside of tailstock body with a petroleum-based solvent.</p>
Tailstock binds	<p>The inside of the bed has a high spot. File the area with a smooth flat file until the tailstock moves freely.</p> <p>The tailstock adjustment plate has a rough spot or a burr. Remove the tailstock and file the plate with a smooth flat file.</p>
Tailstock jumps where bed sections join	<p>The machined flat surfaces are not flush. File the area with a smooth flat file until the tailstock moves freely</p>

**i** Note: Can't find the answer in this Trouble Shooting guide?

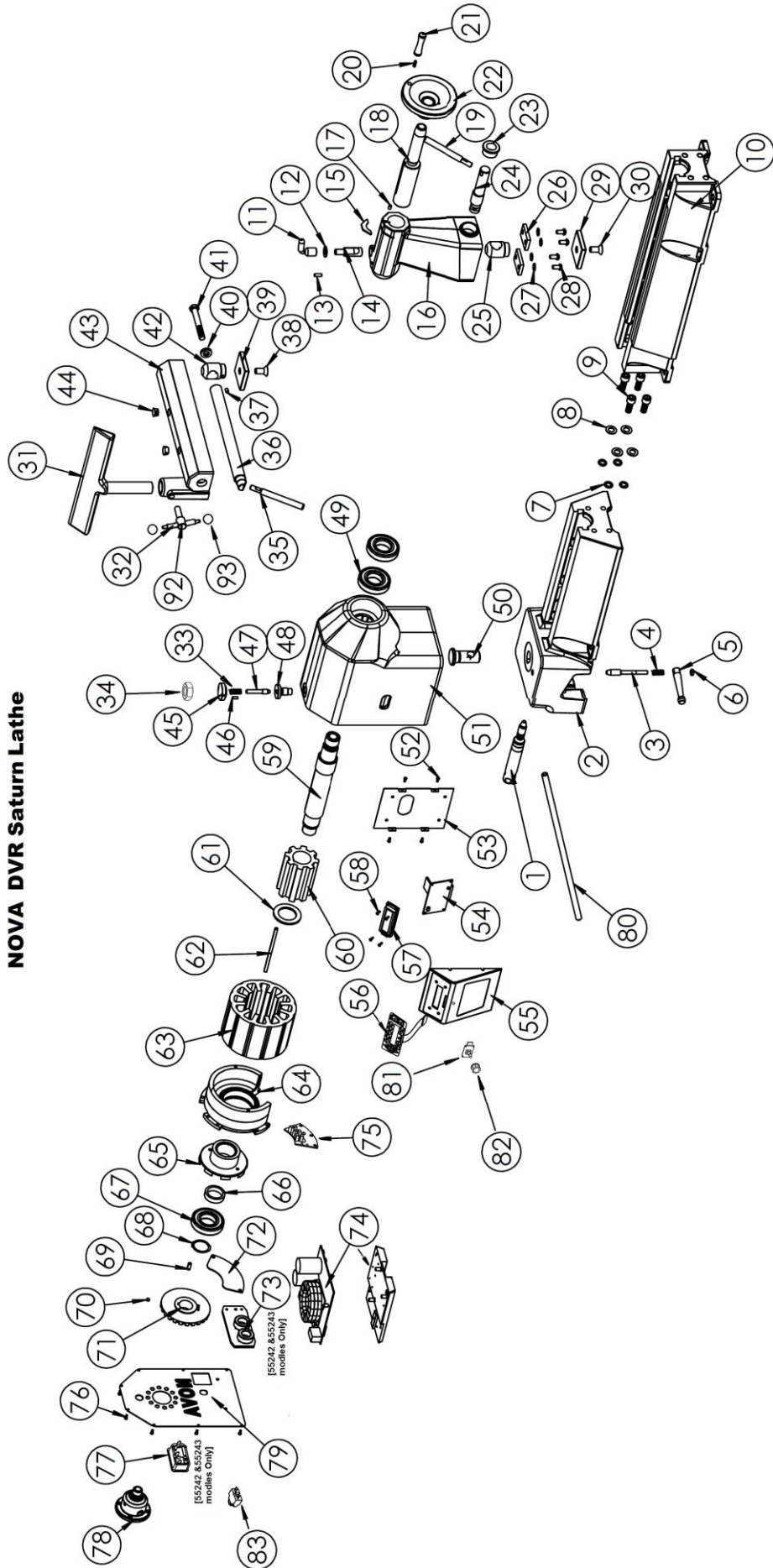
Visit the *Lathe Support Section* on our website - this is packed with *Frequently Asked Questions*.

Or

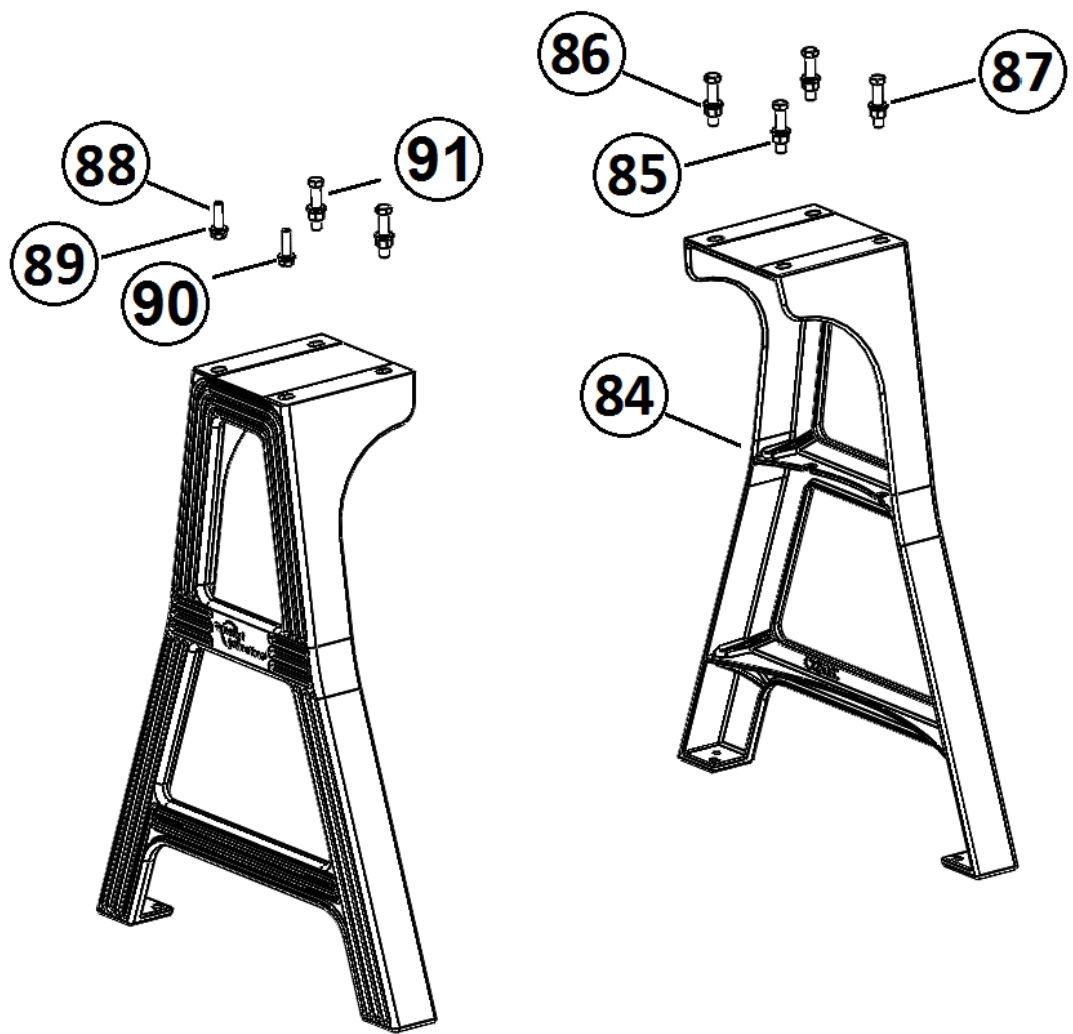
Contact Us (details are at the front of this manual)

# DVR SATURN Lathe Breakdown

## NOVA DVR Saturn Lathe



# DVR SATURN Stand Breakdown



Standard equipment in 55241 and 55243 models

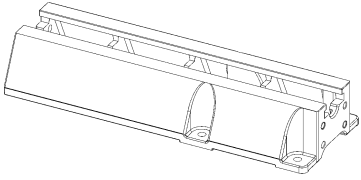
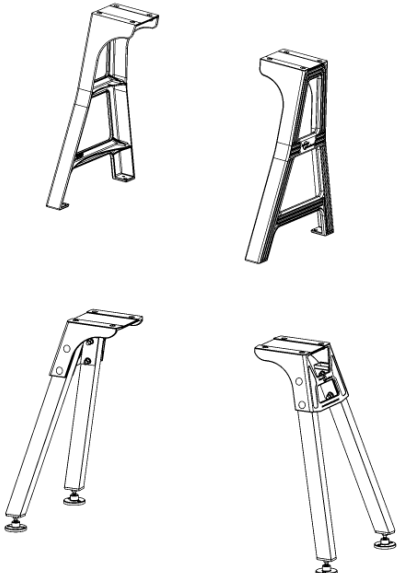
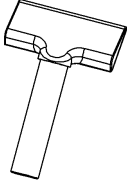
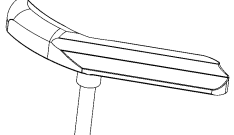
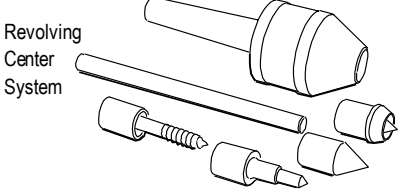
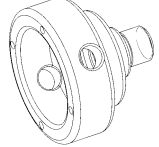
## DVR SATURN Parts List

Item #	Qty	Part #	Description
1	1	55048	Lock Pin
2	1	24118	Main bed (Machined)
3	1	24023	Detent Pin
4	1	24060	Detent Spring
5	1	55176	Detent Lever
6	1	NHZ8	M8 nut
7	4	SW12	Spring Washer M12
8	4	FW12	Flat Washer M12
9	4	24011	Cap Screw M12 X 30
10	1	24119	Bed Extension
11	1	55029	Lever-Quill Locking
12	1	FW12	Flat Washer ZP M12
13	1	24023	Dowel Pin D12
14	1	55026	Shaft-Quill Lock
15	1	24040	Keeper Plate
16	1	55017	Adjustable Tailstock
17	1	G0610	M6X10 Grub screw-Tailstock
18	1	55028	Quill-Tailstock 1.5" Dia
19	1	55153	Lock arm- Tailstock
20	1	TP0820	Tension Pin 8X20
21	1	24065	Handle-Handwheel
22	1	24043	Handwheel Casting
23	1	55027	Sleeve-camshaft
24	1	55025	Camshaft-Tailstock
25	1	24048	Camnut-Tailstock
26	2	25029	Alignment Plate
27	4	FW08	Flat Washer M08
28	4	BHC0816	Capscrew M8*16 button head
29	1	27006	Lock plate-Tailstock
30	1	K1225	M12X25 Countersunk screw-Tailstock
31	1	24120	Toolrest
32	1	25001	Tee lock arm
33	1	55056	Index Pin Spring
34	1	NHH16	M16x2 Index Nut
35	1	55153	Lock arm- Toolslide
36	1	24020	Camshft-Toolslide
37	1	G0606	M6X6 Grub screw-Tailstock
38	1	K1225	M12X25 Countersunk screw-Toolslide
39	1	27002	Lock plate-Toolslide
40	1	FW12	Flat Washer M12 ZP 1.6MM Thick
41	1	BNMZ12090	Bolt ENG M12X 90 ZP
42	1	24048	Camnut-Toolslide
43	1	24009	Tooslide
44	1	HP-16	Hole Plug
45	1	55036	Index Knob
46	1	TP131658	3/16" 5/8" Tension Pin
47	1	55033	Index Pin-Fan
48	1	55035	Index Guide Bush
49	2	6207RS1-C0	Trimax Bearings-Front



Item #	Qty	Part #	Description
50	1	55012	Swivel Pin-Headstock
51	1	55145	Headstock
52	4	MPB05010	Pan Pozi Head Screw M5x10
53	1	55040	Backing Plate
54	1	55400	Interface Board
55	1	55014	Front Control Cover
56	1	55304	Keypad Membrane
57	1	55049	LCD Interface Board
58	4	CM0310	M3x10 Countersunk Screw
59	1	55003	Headstock Spindle 1 1/4" 8 UNS RH
	1	55103	Headstock Spindle M33 X 3.5 RH
60	1	55007	Rotor Lamination Set
61	1	55005	Spacer Ring
62	1	55050	Rotor Key
63	1	55009	Stator
64	1	55146	Bearing Carrier
65	1	55004	Position Disc
66	1	55006	Encoder Ring
67	1	6207RS1-C0	Trimax Bearings-Rear
68	1	EC35	Circlip-Rear Bearing
69	1	55051	Fan Key
70	1	G0606	M6X6 Grub Screw-Fan
71	1	55011	Fan/Index Plate
72	1	55174	Sensor Guard
73	1	55170	EMI Filter (55242 &55243 models)
74	1	55018	Control Board (Version Vary)
	1	55303	Heatsink Aluminium
75	1	55020	Sensor Infrared Board DVR
76	8	MPB0408	Pan Pozi Screw M4 x 8
77	1	5689030	Switch with fuse and socket (55242 &55243 models)
	1	55414	Rocker Switch (55241 model)
	1	55404	Fuse & Holder (55241 model)
78	1	LHB	Handbrake handwheel
79	1	55172	Endcover EMI DVR
80	1	55081	Operating Bar
81	1	8339028	HMI Encoder
82	1	8339032	HMI Knob
83	1	55416	Thermal switch
84	2	25034	Cast Iron Stand legs [Standard equipment in 55241 and 55243 models]
85	6	NHZ12	M12 Nut [Standard equipment in 55241 and 55243 models]
86	6	SW12	Spring Washer M12 [Standard equipment in 55241 and 55243 models]
87	6	FW12	Washer M12 [Standard equipment in 55241 and 55243 models]
88	2	BNMZ10030	Bolt M10x30 [Standard equipment in 55241 and 55243 models]
89	2	FW10	Washer M10 [Standard equipment in 55241 and 55243 models]
90	2	SW 10	Spring Washer M10 [Standard equipment in 55241 and 55243 models]
91	6	BNMZ12035	Bolt M12x35 [Standard equipment in 55241 and 55243 models]
92	1	24026	Tee lock body
93	2	865913	Knob Ball

# Accessories

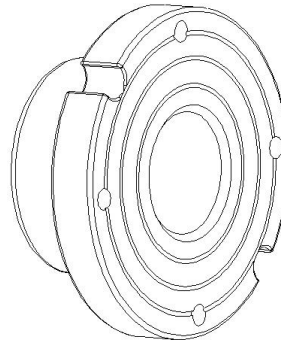
<p><b>Add On Bed Extension: 55224</b>          Extend the bed of your Nova DVR SATURN Woodlathe for greater capacity for turning between centers. Each bed unit adds 510mm (20in.)</p>	
<p><b>Lathe Stand</b>  <b>(Standard equipment in 55241 and 55243 models)</b>          The stand pieces are cast from a high grade of Cast iron with extremely good section thickness and CAD generated internal gussets at all critical points to withstand extremely high stresses with practically no distortion. Cast iron has always been the material of choice for wood lathe construction because of its inherent mass and excellent modulus of vibration dampening. The cast iron stand has been purposely designed to be heavy, solid and robust keeping this in mind.</p> <p>Hybrid Stand          The hybrid stand is a combination of cast iron and rectangular hollow section. Compared to its original predecessor, the hybrid was designed to be light weight and style.</p>	
<p><b>Small Toolrest: TR100/1</b>          A small 100mm (4in.) toolrest (not shown) for turning small work pieces or reaching into recessed areas.</p>	
<p><b>Bowl Toolrest:</b>          A curved toolrest, which gives you better chisel support on both the outside and inside of a bowl. Because of the curve, you are able to position your chisel support closer to the bowl.</p>	
<p><b>Live Centre System: 5015</b>          A multi-function live center system to expand your options when turning between centers. It includes quick change tapers: a hollow cup center point, threaded center, cone center, and an extension center. Made with three bearings and precision machined for a high-quality finish.</p>	<p>Revolving Center System</p> 
<p><b>Handwheel Unit: LHB</b>          The handwheel is mounted on the outboard end of the headstock spindle so you can manually position work or to slow it down. The vacuum coupler can also be added to this unit to make a vacuum holding option.</p>	

## Accessories (Continued)

### Faceplates:

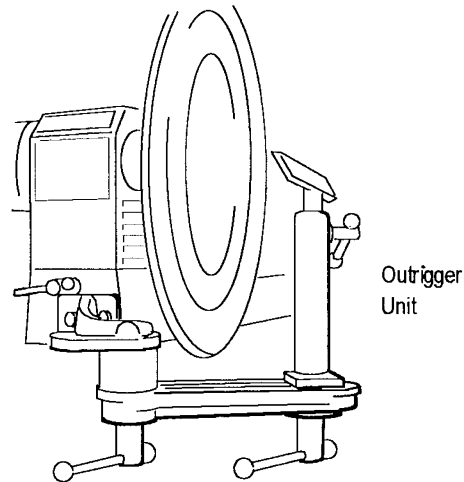
#### SFP80L (with side-locking function).

Faceplates are used to mount the work piece when faceplate turning bowls or platters. Faceplates are available in 80mm (3") diameter. A vacuum faceplate is also available. The 80mm (3") faceplate is made of solid steel. This faceplate has a small contact area to allow maximum freedom while shaping. It comes with 2 notches on the outside diameter for removing the faceplate from the spindle. This can be done with a light drift and mallet.



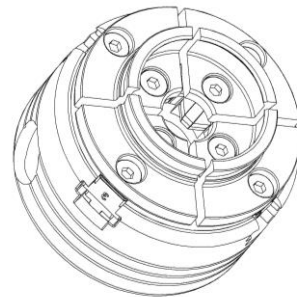
### Outrigger Unit: 55223

Extend the bowl turning capacity of the Nova DVR SATURN Woodlathe to up to 740mm (29in.) in diameter. This unit is made from cast iron, is easy to position and control, and mounts to the headstock end of the lathe.



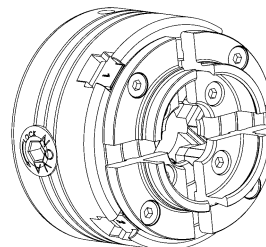
### G3 Chuck

NOVA G3 Wood Turning Chuck Insert Type is a 4 Jaw self-centering geared chuck. With unique NOVA features such as Auto Stop, Copper composite Jaw Slides, Woodworm Screw, Comfortable T Bar Handle and 2" Jaws as standard, this chuck is fully featured. Powerful Tuff Lock gearing with precise, hardened action delivers incredibly smooth strength for a solid, vibration free performance. Takes the same accessory range as other NOVA Chucks.



### Supernova 2 Chuck

Designed for the tough demands of modern woodturning. Body is precision machined from high quality K1045 machine steel. Gearing is heavy section, hardened steel to provide a powerful action. The greater holding strength, stability, and precision decreases vibration from small delicate turnings right up to large bowls and platters work (up to 29"/740mm)



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# Teknatool Warranty

## ***Teknatool Five Year Limited Warranty (2 year on electrical parts)***

This Teknatool product is backed by a warranty from the date of purchase. Teknatool International Ltd will repair or replace, at its expense and option, this Teknatool product which in normal use has proven to be defective in workmanship or material, provided that the customer returns the product prepaid to an authorized Teknatool service center with proof of purchase of the product within TWO YEARS and provides Teknatool with reasonable opportunity to verify the alleged defect by inspection. Teknatool will pay return product by most cost effective surface transport to customer. Any special freight services above this will be at customer cost. Furthermore, Teknatool International Ltd. extends this two-year period for three additional years, excluding labor costs and electrical parts, provided the aforementioned conditions are met. All electrical parts and electronics are covered by a TWO YEAR warranty from the date of purchase.

Teknatool will not be responsible for any asserted defect, which has resulted from normal wear, misuse, abuse, power surges or excess voltage fluctuation, repair or alteration made by anyone other than an authorized service facility or representative.

Under no circumstances will Teknatool International Ltd. be liable for incidental, special, indirect, and consequential damages or expenses, including loss of profits or loss of operations. This warranty is Teknatool International Ltd sole warranty. There are no other warranties, whether written or verbal, whether expressed or implied by law, trade, custom, or otherwise, whether of merchantability, fitness for purpose, or otherwise, except for remedies available to customers under the Consumer Guarantees Act or other legislation.

OVERSEAS CUSTOMERS: Our Teknatool Distributors and agents will issue their own warranty to cover this product. Terms may vary from those stated above; please check with your dealer. In North America warranty covers Continental USA only. For Alaska, Hawaii and other areas, warranty covers replacement of parts only and excludes transport costs.

*Register your warranty faster with Teknatool online.*

*Visit our website on [www.teknatool.com](http://www.teknatool.com) to register your warranty today!*



**Nova DVR SATURN Lathe Manual**

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