

# Syil X5 Combo: Startup



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## **Overview**

The purpose of this document is to provide the novice assistance in receiving and initially setting up the Syil X5 Combo milling machine. Experienced users may find some parts of this useful, but it's primarily intended for new users to the fun world of machining.

This was prepared by a novice user and is based on his experience in receiving and initially setting up his X5 Combo. It captures the information that was useful to him in the process.

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## Syil X5 Combo Specifications

Item	Specification
X5 Combo (3-Axis vertical milling machine) key features	<ol style="list-style-type: none"><li>1. 3-axis Servos</li><li>2. 10,000 RPM Spindle</li><li>3. Forced air-cooled spindle motor with variable frequency drive (VFD)</li><li>4. BT30 Toolholder with power drawbar</li><li>5. LNC 5800 Controller</li><li>6. Input air filter, regulator, &amp; lubricator</li><li>7. Programmable guide way oiler</li><li>8. Four-corner casters and levelers</li></ol>
Combo enclosure dimensions	52" W x 49" D x 77" H
Combo weight	1280 lb
Shipping container dimensions	55" W x 58" D x 80" H
Shipping weight	1545 lb
Shipping container material	Plywood
Input power	220 VAC, single phase, 25 amps
Input compressed air	95-100 psi
Fluids: Way oil	Mobil Vactra #2 (ISO 68 viscosity)
Fluids: Compressed air	Air tool oil



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## Delivery

The X5s are often delivered to a residence. Delivery is performed using a truck with a power lift gate and placed in a garage or small shop using a pallet jack.

The goal of the delivery is to place the box in the location where you can unbox the machine and place in the desired location. Things to consider include ensuring that the box, using either a pallet jack or a forklift, can fit through the opening to the garage or shop, then how to move the machine from the pallet to the floor, and finally how is it moved into the desired location. Things to consider: what additional equipment might be needed, will a forklift be needed (or other equipment) to get the machine off the pallet? Once the machine is on the floor, especially a concrete floor, it moves easily on the casters ... two people can easily move it in place on a flat concrete floor.

A forklift can simplify getting the machine off the pallet and onto its casters, and moving it into place. Without a forklift, one can fabricate a ramp, say out of plywood, to roll the machine off the pallet onto the floor. This approach is a more involved solution in time and preparation, but it has been applied successfully, however, it may need three people to push it off the pallet because there is additional rolling



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resistance on the plywood pallet base than on concrete.

Unboxing entails removing the top and the sides, which are held together with nails. The machine is bolted to the pallet's base using the same holes into which the levelers are installed. You'll need to remove the bolts.

If you plan to make a ramp to push the machine to the floor, you'll need to remove the 4x4 supports under the edges of the machine in order to transfer the weight of the machine to the casters. Then it can be rolled off the pallet, down the ramp, to the floor. To lift the machine up in order to remove the 4x4s, a piece of wood (such as a 4x4 post) or metal I-beam can be placed under the machine and using two floor jacks, lift each side, one at a time, to provide space to remove the 4x4 supports so as to place weight on the casters.

The machine inside the shipping box is wrapped in plastic to protect it during shipment. It's suggested to leave the machine wrapped until it is in-place, then remove the wrap. This way the outer surfaces are protected as it is moved into place.

Secured to top of the pallet base are several **black strips of metal**. These are skirts that can be fastened to the bottom perimeter of the X5 after it is in place and



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leveled. The skirts, while enhancing the appearance of the machine, are also functional in the sense of preventing debris from collecting under the machine.



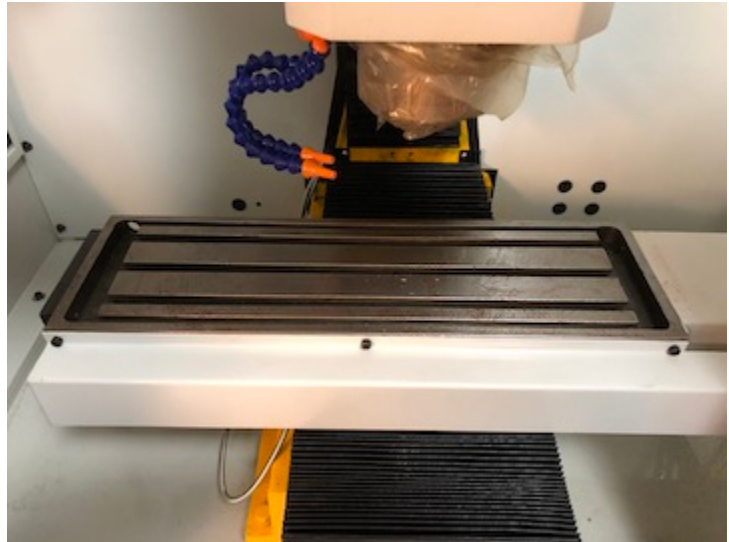


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## Unpacking

The first thing to do is remove the wrap. Use a razor blade or a knife to cut through the wrap as it is removed.

Open the worktable door and inspect the area. The bottom of the spindle is wrapped, as is the table, and the spindle is supported during transit with a block of wood placed between the top of the table and the bottom of the spindle. Remove the wrap and the block of wood. Wipe down the worktable area.

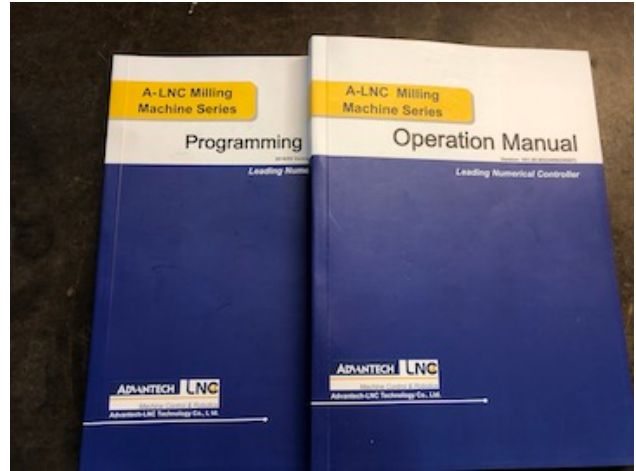


On the left bottom side of the Syil X5 is a door, behind which is the coolant reservoir, pump, and strainer. For shipping purposes the strainer is placed in the coolant reservoir. Pull out the reservoir and remove the strainer. Push the reservoir back into the enclosure and place the strainer in the guides above the reservoir.



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On the right bottom side of the X5 there is another door. Behind this door is the documentation that comes with the machine, an MPG, a single toolholder, some tools, and the levelers. This area is useful for storage.





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Behind the mill on the rear left side is the air inlet filter, regulator and lubricator. The right-hand container is the lubricator. Select a method to connect air to the regulator (left side). Here a 1/4" NPT air hose connector was installed.



Behind the mill on the rear right side is the way lubrication reservoir and pump. Instructions for the pump are included in the documentation. From the factory, the unit is programmed to pump 10 seconds every three hours (180 minutes). The running time DIP (dual inline package) switch is set to OFF-ON. The intervals switch is set to 180 minutes, ON-OFF-OFF-ON-OFF-OFF. (ON is up, OFF is down.) The manual for the motorized gear pump is included in the documentation provided with the X5. Each time the X5 is turned on, oil is pumped, then pumped again after the interval time.



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## Setup

Setup consists of adding fluids, installing the correct AC power plug, and inspecting the electronics.

Add way oil, Mobil Vactra #2 oil to the way oiler reservoir.



Add air tool oil to the right-hand container (lubricator) of the air unit.



On the left side to the rear of the machine is the AC power switch. Ensure that it is in the OFF position.

AC power is supplied by a black power cord located at the rear of the machine. The power cord may or may not have a plug attached to it. If it does have a plug attached, cut it off and attach the plug that is compatible with the AC outlet installed for the X5. For

the US market, this could be a 30A twist connector, a 50A dryer-style connector, or another style suited for 220VAC, 25A.



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At the back of the machine, is the electronics enclosure. It houses the servo motor controllers, the LNC input/output interface board, the VFD inverter that controls the spindle motor, and various transformers and relays. As part of unpacking, inspect the items in the electronics enclosure for loose wires and loose connectors. If something appears to be an issue, you can contact Syil support at [support@syil.com.cn](mailto:support@syil.com.cn).





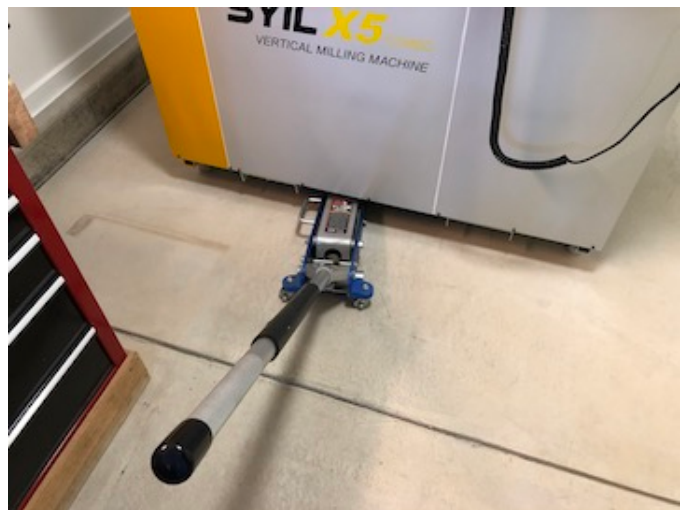
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## Leveling

There are various techniques to employ in leveling a milling machine. The procedure that follows is one that should be sufficient for the hobbyist. However, there are techniques that result in more precise leveling that you may want to use.

Before installing the levelers, ensure that the machine is positioned where you want it, while the casters are still on the floor. Installing the levelers will lift the machine such that the casters no longer bear the weight of the X5.

Using a floor jack, lift the corners and install the levelers. Screw each all the way into the same holes used to secure the machine to the transportation pallet. Then unscrew each leveler three full turns. Ensure that each is touching the floor. The floor may be sufficiently uneven such that at least one of the levelers is not touching the floor. Use a spanner wrench or channel lock pliers to snug it to the floor. You could also use the floor jack to lift that corner up slightly to snug it to the floor. (If you want to use a spanner



you can purchase a 2" spanner, but if your X5 has an ER32 collet wrench (with a single "ear"), that will work as well.

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With all levelers touching the floor, open the front of the machine to access the worktable. In this process it is assumed that the mill was precisely assembled and aligned at the factory, and that the alignment survived an ocean crossing, maybe a train ride, and certainly a truck trip.



One can start with a small carpenter level, but leveling should only be completed using a machinist level, such as a Starrett No. 98 level. Perform leveling front-to-back first (along the Y axis) then side-to-side (along the X axis). Place the level along the Y axis, in the center of the table

and determine if the front is too high or too low. (**Note:** the position of the table as it was shipped should be sufficient for this leveling. There should be no need to power the machine and move the table. If there is such a need, then perform leveling after the machine is powered.)

Place the jack at the front of the machine, in the center such that both levelers are off the floor. (Start with the front since it is lighter than the back.) Adjust the levelers up or down as needed based on the level reading and do so a quarter of a turn using the holes in the levelers as a quarter-turn guide. Lower the jack and check the level. Repeat the process until the machine is level front-to-rear.

Next change the orientation of the level so it is along the X axis, again in the center of the table. Jack up the left or right side from the middle such that both levelers (front and rear) are off the floor. Adjust the rear leveler as needed a quarter turn, leaving the front leveler alone. Lower the jack and check the level. Also check that all four levelers are touching the floor. If not, snug it to the floor. Repeat the process until the mill is level side-to-side.

After each full cycle (front-to-rear and side-to-side) recheck the level in both the X and Y axes, and repeat the leveling cycle as needed. Once you think it's level, you can place the level on the table at 45 degrees and check the level. This will show the combined level (both axes) of the machine. Ensure that all four levelers are at least snug to the floor and do not rotate by hand.

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## **Applying Power**

As a final step ... plug the mill into AC power, connect compressed air, and turn on the power switch. Keeping fingers crossed, in a short time it should power up.

Use the MPG to test moving the machine in all three axes, and use the controller to turn the spindle at a slow rate, such as 2,000 RPMs.

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## **Next Steps**

The next steps include measuring the table and spindle for correct alignment, selecting and installing a work holding device, such as a vise, setting up toolholders, and in general learning how to operate safely the Syil X5.

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## **References**

There are a wealth of YouTube videos for setting up and using mills, even ones specifically about Syil mills. Below are links to some of these videos.

[Syil X5 - Delivered, Unpacked and Powered Up](#)

[SyilCNC X7 Combo Unboxing Video](#)

[Syil X5 - Spindle Runout Test](#)

[CNC Vise Tips for Newbs](#)

[Budget Tooling & Haas Spindle Run-out](#)

[How to CNC Pt.1 - The Basics](#)

[How to CNC Pt.2 - Tool Offsets](#)

[How to CNC Pt.3 - Work Offsets](#)

[How to CNC Pt.4 - Install & Tram your Vise](#)