OK basic user manual with OK safety and operation instructions, general maintenance and troubleshooting concerns, and a partial list of replacement parts. The manual could be improved greatly through the use of pictures showing operational steps and illustrating precautions, and greater detail in the operational steps and troubleshooting (which are likely so general due to the lack of operating experience.)

Soil Mixer and Dispenser

User's Manual

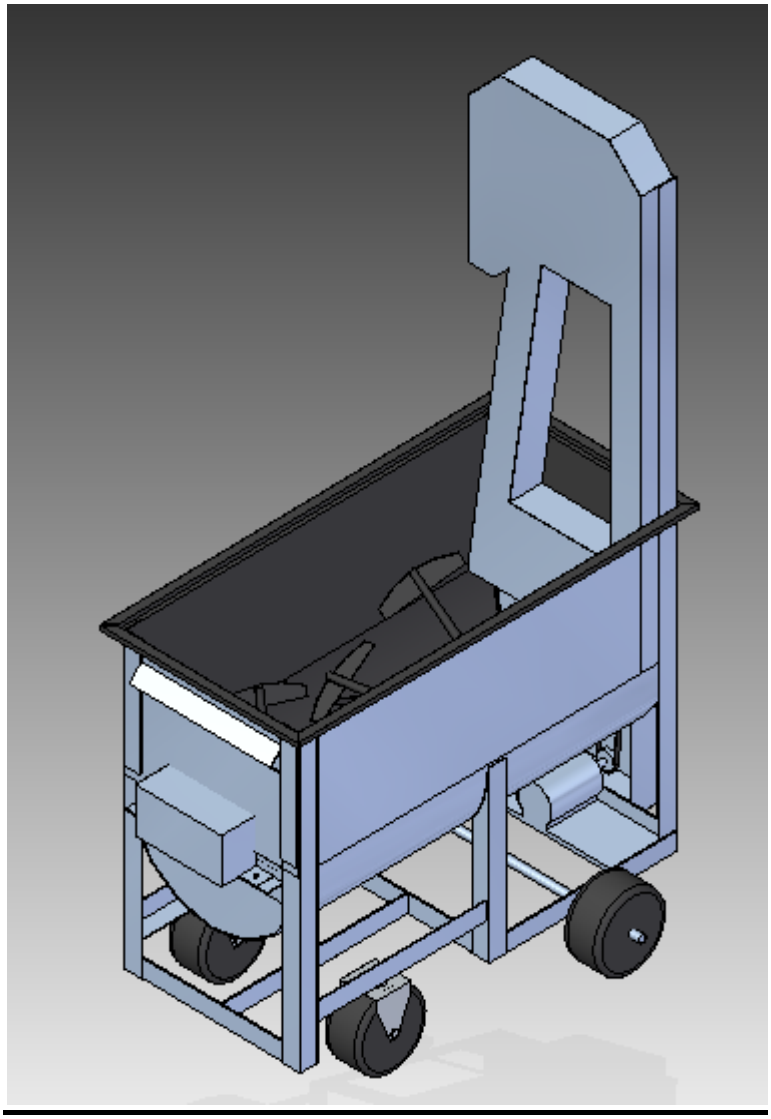
Ohio University

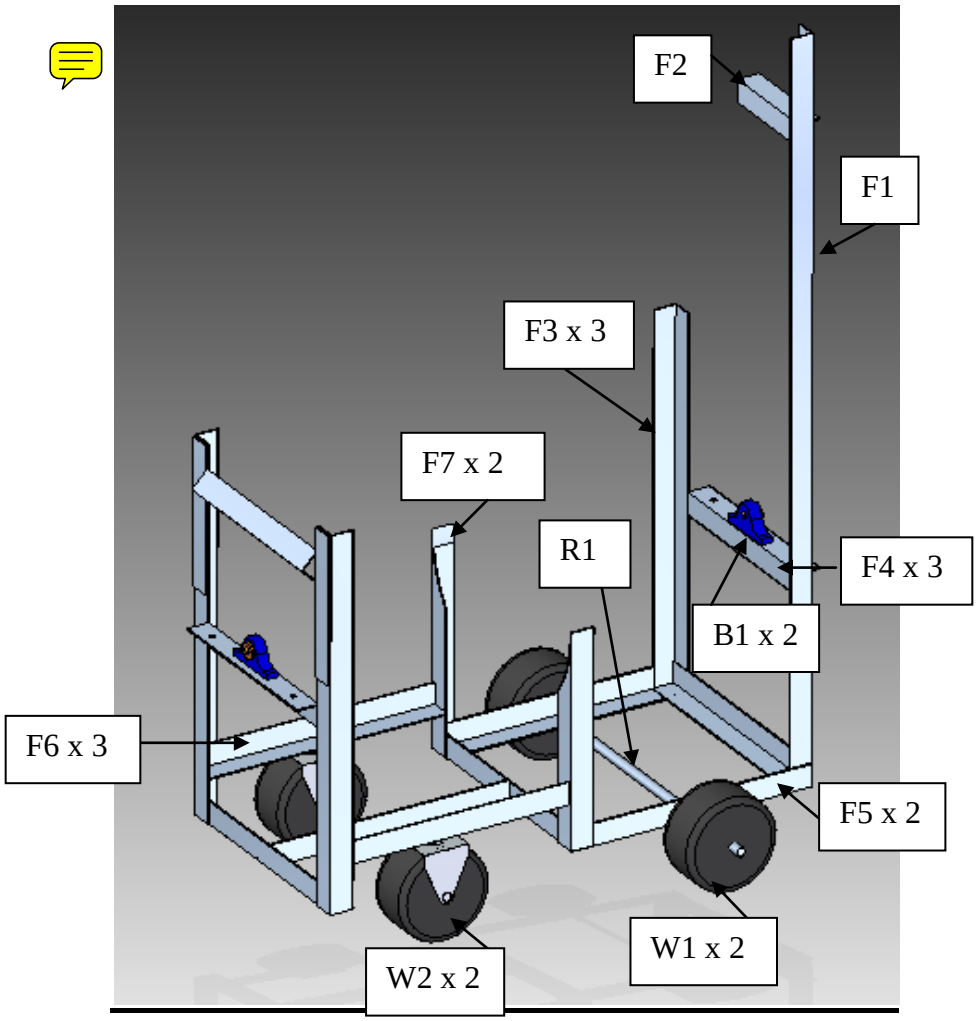
Russ College of Engineering

Mechanical Engineering Senior Design Team: Keeping M.E. Fertile

Authors: Matthew Haszto, Patrick Bonifas, Zakary Sherfy, Michael Brennan, Nicholas Randolph

Assembly and Subassemblies





F1 - Steel Angle (2x2x69 inches)

F2 - Steel Angle (2x2x10 inches)

F3 - Steel Angle (2x2x33 inches)

F4 - Steel Angle (2x2x16 inches)

F5 - Steel Angle (2x2x22 inches)

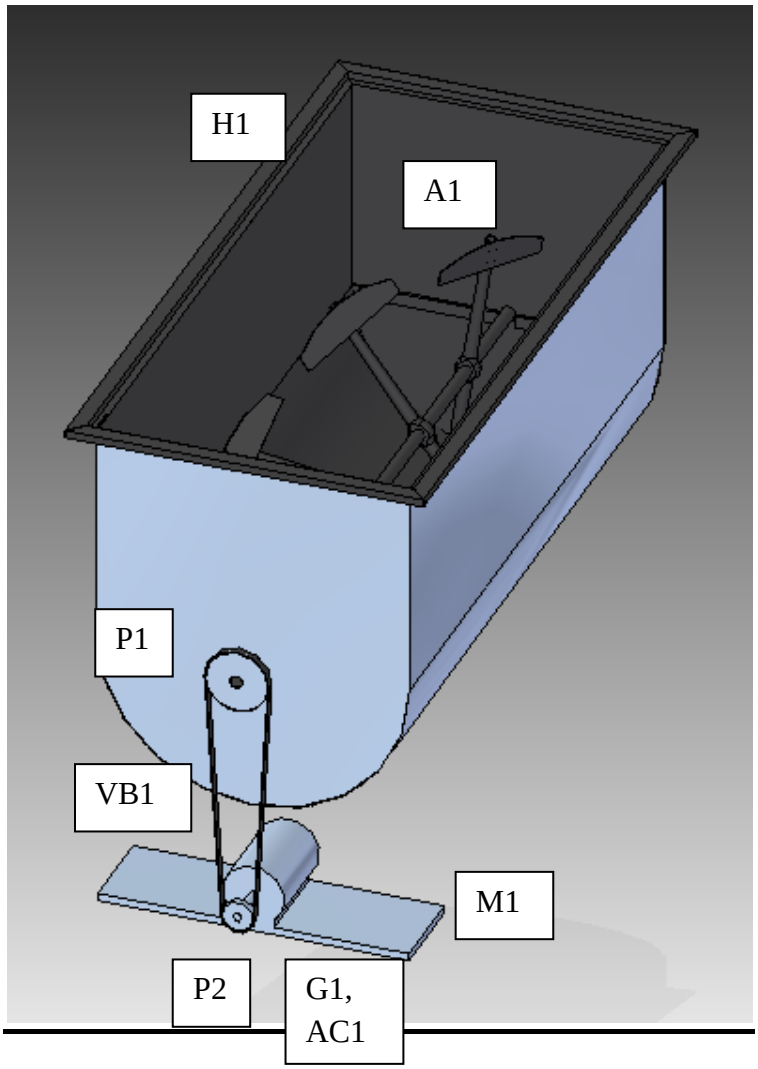
F6 - Steel Angle (2x2x21 inches)

F7 - Steel Angle (2x2x21 inches)

W1 - 8 inch pneumatic tires

W2 - 8 inch pneumatic tires with casters

R1 - Rear axel



H1 – Hopper

A1 – Auger Shaft with 8 paddles

P1 – Auger Shaft Pulley

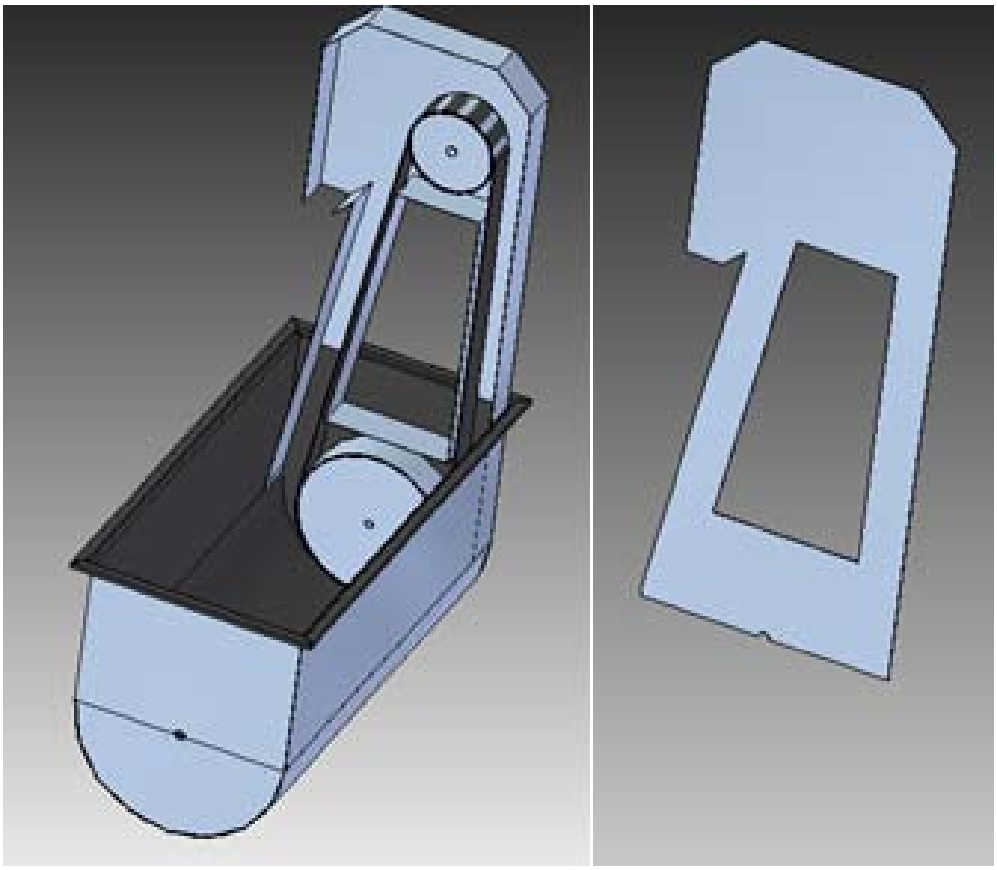
P2 – Auger Shaft Pulley (1/2 of P1)

VB1 – Linked V-Belt

G1 – Gearbox, 40 to 1 ratio

AC1 – AC motor (located behind gearbox)

M1 – Motor mount



Safety and Precautions

During Operation

- Do not reach inside the machine while it is running for any reason. Ensure that the machine comes to a full stop before placing body parts or other equipment in the machine.
- Do not wear loose clothing or let loose hair dangle near the machine while performing work. Loose objects can easily become caught.
- Ensure hopper is clear of all foreign objects or debris prior to operation.
- Ensure that all items are removed from the grate prior to opening or shutting the grate. Failure to do so could cause equipment to be caught in machine.
- Use only specified soil, using other mixtures such as gravel could form dangerous projectiles during operation.
- Ensure that weight placed on grate does not exceed tolerance specified. Exceeding the weight limit could cause grate bending and catastrophic failure.
- Ensure that wheel ~~breaks~~ are locked during operation. Failure to do so could cause machine to move in operation.
- Ensure that cord is outside the work area to avoid tripping hazard.
- It is advisable to wear safety glasses while operating the machine to prevent dust and debris from entering eyes.
- Do not lean or otherwise place large amounts of pressure against the side of the machine. Bending/Tipping over will cause catastrophic failure
- If grinding, rattling or shaking of machine occurs outside normal parameters, SHUT MACHINE DOWN IMMEDIATELY.

Storage

- Always store machine on level surface and lock wheels. Failure to do so could cause machine to move unexpectedly.
- Ensure that sharp corners are placed outside walk path to keep them from hurting people or damaging equipment that may bump into it.
- Do not place anywhere machine can be hit or knocked over by the movement of other equipment.
- Properly wind and store cord to avoid tripping hazard.
- Do not store equipment on top of grate.
- Keep small equipment capable of falling into machine clear of area. Small parts in machine can damage it.

Movement

- Make sure that you have clear line of site prior to moving machine. Machine is heavy and can cause harm to individuals hit with it.
- Do not let children or weak persons to move machine. Machine could potentially harm user if not properly controlled.
- Do not move over grade ~~with~~ at least two people to control machine. Machine could potentially roll out of control.
- Only push or pull using the specified handles, Pushing at improper places can cause machine to tip over.
- Ensure machine is unplugged prior to movement and cord is properly wound in order to remove tripping hazard.

Operation Instructions

Before operation a set of checks should be performed to ensure a safe start-up. A list of the checks is shown below.

a) Make sure there is nothing but soil in the hopper. Rocks, sticks, or other foreign objects could cause a jam and damage the auger or lift system.

b) Position the casters to reduce the chance of tripping (i.e. so they are not pointing straight out) and lock both wheels. This prevents the machine from shifting during operation.

c) Make sure the grate is properly positioned in the lip. Improper seating will cause the safety switch to cut power to the motor.

After performing the pre-operation checks the machine is then ready for use. The following is a list of steps to take for start-up and operation.

1.) Plug the cord into the nearest available outlet. Extension cords can be used but it is recommended to use heavy duty extension cords to deal with the current drawn by the motor.

2.) Fill the hopper with the desired amount of soil and water. When finished replace the top grate.

3.) Press START button.

4.) Soil should begin to come out of the lift system and the user can now fill containers.

Maintenance

Component	Required Service/Inspection	Maintenance Schedule	Possible Required Maintenance	Refer to section XX
V-belt	check tension of belt, signs of wear	monthly	tighten/replace v-belt/adjust transmission pulleys	
Lift Belt	inspect tension, alignment, check for signs of wear	bi-weekly	tighten/align lift belt	
Bolts	Check bolts for tightness	monthly	tighten bolts	
Rust/Corrosion	empty machine/ inspect machine for signs of corrosion	montly	remove rust/ apply rust preventative material	
Tires	check wear and tire pressure	monthly	inflate to correct psi/ replace tires	
Bearings	inspect, clean + regrease bearings, inspect set screws	quarterly	tighten set screws/ replace bearings	
Motor/Power Transmission	See motor manual	See Motor Manual	change motor brushes, etc	
motor housing	remove motor housing to vacuum motor, power transmission system	monthly		
buckets	check bolts for tightness/buckets for signs of wear	quarterly	tighten bolts/replace bucket	

***Caution: turn off and unplug device before performing any maintenance tasks such as cleaning**

Troubleshooting

CAUTION: When troubleshooting, turn off the power and unplug the power cord.

Problems	Solutions	
Motor Not Running	Check if power cord is plugged in	
	Check if the power cord leads are connected to motor	
	Check if the hopper cover is on the kill switch	
Auger is Not Moving, When Motor is Running	Check the power transmission belt.	It could be off the pulleys
		It could be broken
		Check the tension of the belt
	Check if the motor shaft is inserted into the gearbox correctly	
	Hopper may be overfilled. After checking the power transmission belt and gearbox, remove some soil from the hopper.	
Soil Not Dispensing When Auger is Moving	Check the lift system belt	Check the tension of the belt
		It could be off the pulleys
		It could be damaged or broken
	Check if buckets are broken	
	Hopper may be overfilled. Overfilled hopper may be causing the lift system to be running at a slower speed than required. Remove some soil from the hopper.	
Hopper Cover Kill Switch Not Working	Check if the wire leads are connected properly	
	Check if the hopper cover is on the kill switch	

Replacement Parts Chart and Details

Replacement Parts Chart and Details

PART NAME:	DESCRIPTION:	QTY.
Motor Gearbox	GEARBOX,40.50:1,56C INPUT,1.25"OUTPUT SHAFT DIA.	1
	1750 RPM INPUT=43.21 OUTPUT RPM	
Motor Base Mount	BASE MOUNT/FEET FOR ABOVE UNIT	1
	REMOVE C-FLANGE ON GEARBOX AND MOUNT NEW BASE	
Elecrtic Motor	LEESON MOTOR,1.5HP,1750 RPM,56C FRAME, MAN.O/L	1
	1/60/115-208-230 VAC,TEFC, FOOTLESS	
Belt for Motor Pulley	B POWERTWIST BELTING, 2M (6.6FT.) SLEEVE	1
Pulley for Gearbox	2 GROOVE PULLEY, 6.95" O.D. TAPER LOCK	1
	TAPER LOCK BUSHING,1-1/4", For Gearbox	1
Pulley for Auger Shaft	2 GROOVE PULLEY, 3.75" O.D. TAPER LOCK	1
	TAPER LOCK BUSHING, 3/4", For Auger	1
Buckets for Elevator Lift System	3" x 2" CC-HD Poly Blue Elevator Buckets (Standard Drilling)	TBD
Bolts for Elevator Buckets	¼" x 1-1/2" Zinc Plated Fanged Elevator Bolts	TBD
Washers for Elevator Buckets	Zinc Plated Flat Washer	TBD
Nuts for Elevator Buckets	Zinc Plated Nylock Nuts	TBD
Start/Stop Switch	A-B 100-C09D10 MCS-C CNTCTR IEC 9A 110V 50HZ/	1
Power Box for On/Off Switch	A-B 800S-2SA STATION ASSMBLD P/B 600VAC MAX 5	1
Pillow Block Bearings for Auger Shaft	Stamped Steel Base Mounted Ball Bearing, Double Sealed,	2
	3/4" Diameter Shaft and 1" Center Height	
Stationary Pneumatic Wheels	8" Pneumatic Wheel Only, Zinc Plated, with Black Inflatable Tire	2
Swivel Caster Pneumatic Wheels	8" Pneumatic Swivel Caster with TB Brake, Zinc Plated,	2
	with Black Inflatable Tire	
Kill Switch for Hopper Grate		1
Belt for Elevator Lift System		1