



6 - Chip Auger

Chip Removal and Coolant - Service Manual

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Coolant -

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Coolant

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Coolant

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ndenser

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Conveyor

18 - Coolant VFD

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20 - Chip
Separator

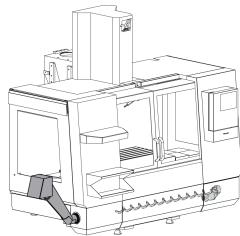
21 - Chip Tray
Strainer

6.1 CHIP AUGER - INSTALLATION

VMC - Chip Auger - Installation - NGC

AD0483

Introduction - DT/DM and VF/VM



This procedure explains how to install a single chip auger on the following machines:

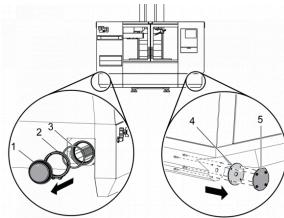
- ✓ VF-1 to 14 made with **NGC**.
- ✓ DT-1/2 made after **April 2018**.
- ✓ DM-1/2 made after **April 2018**.

NOTE: The procedure showing the installation process for the VF-3. The installation process is the same for all of the machines that are listed above.

This document applies to the following service kits.

- VF-1/2: Chip Auger Kit PN is **93-1000204**
- VF-3/5: Chip Auger Kit PN is **93-1000201**
- DT-1/DM-1: Chip Auger Kit PN is **93-1000515**
- DT-2/DM-2: Chip Auger Kit PN is **93-1000516**

Single Chip Auger - Installation



1

Press POWER OFF.

Set the main circuit breaker to the OFF position.

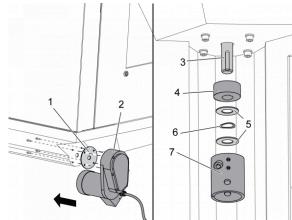
Lock the main circuit breaker. Use an approved lock with an approved safety tag.

Remove these parts from the left end of the enclosure:

- [1] discharge cover
- [2] v-flange clamp
- [3] o-ring

Remove these parts from the right end of the enclosure:

- [5] cover plate for the conveyor motor
- [4] gasket

2

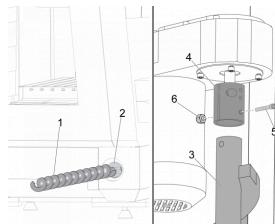
Clean coolant and chips out of the auger trough.

Attach the gasket [1] and the auger motor [2] to the enclosure pan.

Find the motor shaft. The motor shaft is inside the machine. Put these parts onto the motor shaft [3]:

- [4] Spacer
- [5] 5/8" flat washer
- [6] 5/8" wave washer
- [5] Another 5/8" flat washer

Connect the motor coupling [7] to the motor shaft.

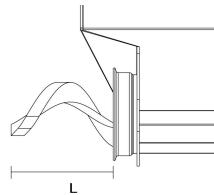
3

Insert the auger [1] through the discharge port [2].

Insert the auger [3] into the motor coupling [4].

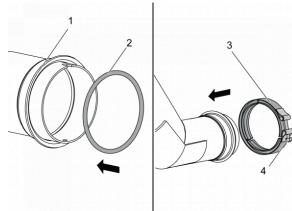
Insert the bolt [5] into the coupling, and through the auger [3].

Attach the retainer bolt [5] into the coupling with a nylock nut [6].

4

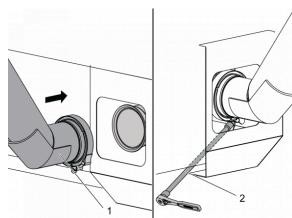
Measure the stick-out of the auger. Contact with the chip chute will occur at 6.25", which will wear a hole in the chute.

The length [L] of the auger from the chute flange should be 6" MIN - 6.25" MAX.

5

Put the o-ring [2] onto the chip chute [1].

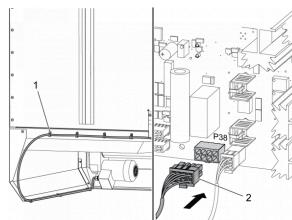
Put the V-flange clamp [3] onto the chip chute. Make sure the nut on the clamp [4] points to the chip chute as shown.

6

Put the chip chute [1] onto the outlet tube on the enclosure pan.

Turn the clamp to put the nut at the bottom of the chip chute. Make sure the nut points to your left.

Use a ratchet extension [2] to tighten the nut.

7

Install the cable [1] for the auger motor. Put the cable along the rear of the machine. Use the (7) 7/16" (11 mm) cable clamps.

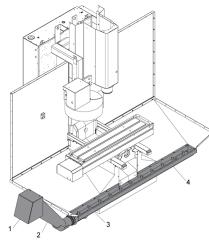
Put the cable into the bottom of the control cabinet.

Danger: If the vector drive voltage indicator light is on, do not touch the electrical components. The high voltage in the control cabinet can kill you. Wait for the voltage indicator LED on the vector drive to go off completely.

- For the machine with the NGC connect the cable [2] to P24 on the SIO PCB.

To enable the auger skip to the end of the procedure page.

Introduction - TM 1P/2P/3P



This procedure explains how to install a single chip auger on the following machines:

- ✓ TM-1P
- ✓ TM-2P
- ✓ TM-3P

Understand the following components to complete this procedure:

1. Safety skirt
2. Chip chute
3. Chip auger
4. Chip auger trough

This document applies to the following service kits:

IMPORTANT: There are two types of TM machines: TM Non-Reboot and TM Reboot. Please refer to the [TM IDENTIFICATION](#) reference document for more information.

Non-Reboot:

- TM-1P: Chip Auger P/N **93-1000205**
- TM-2P and TM-3P: Chip Auger P/N **93-1000206**

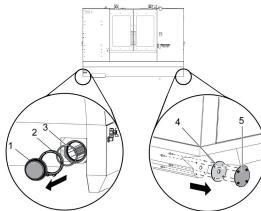
Reboot:

- TM-OP Reboot: Chip Auger P/N **93-1000956**
- TM-1P Reboot: Chip Auger P/N **93-1000957**
- TM-2P Reboot: Chip Auger P/N **93-1000958**

NOTE: The Reboot Chip Auger service kits will be available for sale soon.

For machines made prior November 2012 refer to [CHIP AUGER - INSTALLATION CHC](#)

Single Chip Auger - Installation

**1**

If a tool is in the spindle , remove tool and jog the Y axis to the rear of the machine.

Clean the grease, coolant and chips off.

Press **POWER OFF**.

Set the main circuit breaker to the **OFF** position.

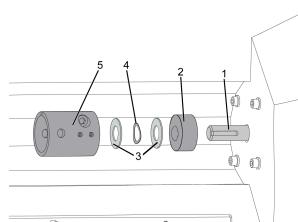
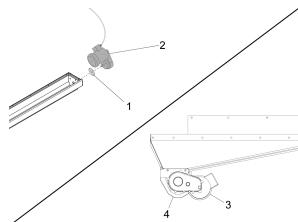
Lock the main circuit breaker. Use an approved lock with an approved safety tag.

Remove these parts from the left end of the enclosure:

- [1] discharge cover
- [2] v-flange clamp
- [3] o-ring

Remove these parts from the right end of the enclosure:

- [5] cover plate for the conveyor motor
- [4] gasket

**2**

For all machines, put the motor gasket [1] on the motor [2].

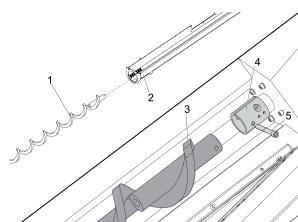
Install the motor [3] to the trough [4].

3

Find the motor shaft. The motor shaft is inside the machine. Put these parts onto the motor shaft [1]:

- [2] Spacer
- [3] 5/8" flat washer
- [4] 5/8" wave washer
- [3] Another 5/8" flat washer

Connect the motor coupling [5] to the motor shaft.

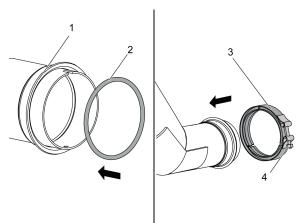
**4**

Insert the auger [1] through the discharge port [2].

Insert the auger [3] into the motor coupling [4].

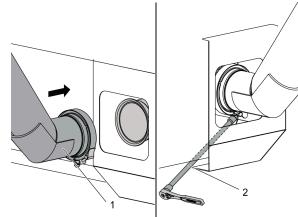
Insert the bolt [5] into the coupling, and through the auger [3].

Attach the retainer bolt [5] into the coupling with a nylock nut.

**5**

Put the o-ring [2] onto the chip chute [1].

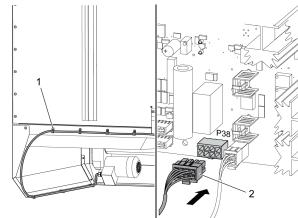
Put the V-flange clamp [3] onto the chip chute. Make sure the nut on the clamp [4] points to the chip chute as shown.

**6**

Put the chip chute [1] onto the outlet tube on the enclosure pan.

Turn the clamp to put the nut at the bottom of the chip chute. Make sure the nut points to your left.

Use a ratchet extension [2] to tighten the nut.

**7**

Install the cable [1] for the auger motor. Put the cable along the rear of the machine. Use the (7) 7/16" (11 mm) cable clamps.

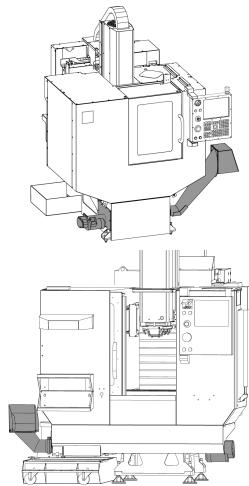
Put the cable into the bottom of the control cabinet.

Danger: If the vector drive voltage indicator light is on, do not touch the electrical components. The high voltage in the control cabinet can kill you. Wait for the voltage indicator LED on the vector drive to go off completely.

- For the machine with the NGC connect the cable [2] to P24 on the SIO PCB.

To enable the auger skip to the end of the procedure page.

Introduction - Mini Mill and Super Mini Mill



This procedure explains how to install a single chip auger on the following machines:

- ✓ Mini Mill Series
- ✓ Super Mini Mill Series

NOTE: The procedure showing the installation process for the above machines built from after **February, 2000**

This procedure applies to the following kits:

Note: There are two different styles of MiniMill series machines. There are reboot machines and non-reboot machines. Refer to the [MINIMILL SERIES - IDENTIFICATION](#) document for more information.

Non-Reboot machines:

- **93-1000202** - MiniMill and Super MiniMill
- **93-1000203** - Super MiniMill2 and MiniMill 2

Reboot machines (machines built from 12/2023 and later):

- **93-1001068** - MiniMill and Super
Minimill Reboot

For machines with CHC please refer to
[CHIP AUGER - INSTALLATION CHC](#)

Single Chip Auger - Installation

1

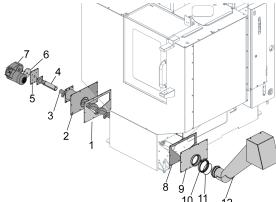
If a tool is in the spindle , remove tool and jog the Y axis to the rear of the machine.

Clean the grease, coolant and chips off the mill table

Press **[POWER OFF]**.

Set the main circuit breaker to the **OFF** position.

Lock the main circuit breaker. Use an approved lock with an approved safety tag.

**2**

For machines built before December 2023:

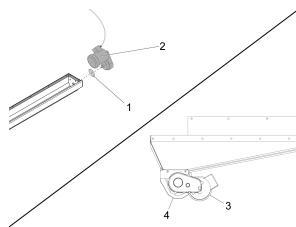
Remove the (2) covers for the auger ports.

Attach the auger. Install these parts:

- Gasket [1]
- Motor Mount [2]
- Auger [3]
- Coupling [4]
- Plate to mount the motor [5]
- Motor gasket [6]
- Auger motor [7]

Attach the chip chute. Install these parts:

- Gasket [8]
- Plate [9] to mount the chip chute
- V-flange clamp [10]
- O-ring [11]
- Chip chute [12]

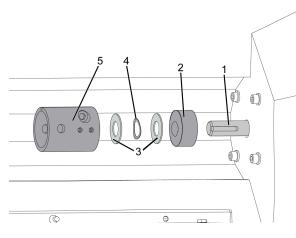
**3**

Note: Steps 3 thru 7 are for minimill/super minimill machines built after December 2023.

Continue to step 8 to see instructions for all MM/SMM machines.

Put the motor gasket [1] on the motor [2].

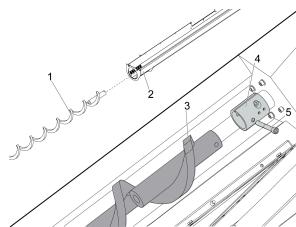
Install the motor [3] to the trough [4].

**4**

Find the motor shaft. The motor shaft is inside the machine. Put these parts onto the motor shaft [1]:

- [2] Spacer
- [3] 5/8" flat washer
- [4] 5/8" wave washer
- [3] Another 5/8" flat washer

Connect the motor coupling [5] to the motor shaft.

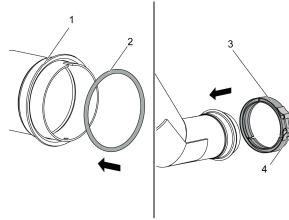
**5**

Insert the auger [1] through the discharge port [2].

Insert the auger [3] into the motor coupling [4].

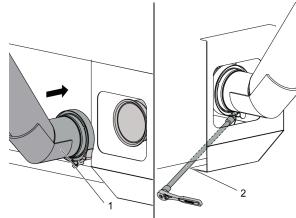
Insert the bolt [5] into the coupling, and through the auger [3].

Attach the retainer bolt [5] into the coupling with a nylock nut.

**6**

Put the o-ring [2] onto the chip chute [1].

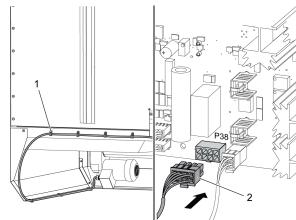
Put the V-flange clamp [3] onto the chip chute. Make sure the nut on the clamp [4] points to the chip chute as shown.

**7**

Put the chip chute [1] onto the outlet tube on the enclosure pan.

Turn the clamp to put the nut at the bottom of the chip chute. Make sure the nut points to your left.

Use a ratchet extension [2] to tighten the nut.

**8**

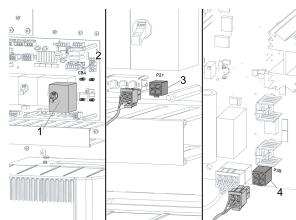
Install the cable [1] for the auger motor. Put the cable along the rear of the machine. Use the (7) 7/16" (11 mm) cable clamps.

Put the cable into the bottom of the control cabinet.

Danger: If the vector drive voltage indicator light is on, do not touch the electrical components. The high voltage in the control cabinet can kill you. Wait for the voltage indicator LED on the vector drive to go off completely.

- For the machine with the NGC connect the cable [2] to P24 on the SIO PCB.

To enable the auger skip to the end of the procedure page.

**9**

If the machine has a 3A circuit breaker [1] at position CB4 [2], remove it.

Install a 5A circuit breaker at position CB4.

Connect one end of cable 160 to P21 [3] on the PSUP PCB.

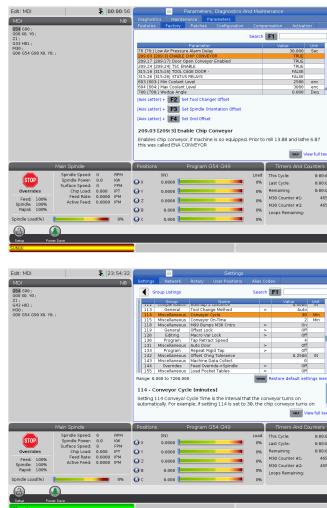
Connect the other end to P39 [4] on the I/O PCB.

Press **[POWER ON]** on the machine.

Make sure the auger operates correctly. Push **[CHIP FWD]** or **[CHIP REV]**.

To enable the auger skip to the end of the procedure page.

Single Chip Auger - Enable the Auger

**1**

Change Parameter 209:3, ENABLE CHIP CONVEYER, to TRUE .

2

Change Settings 114, Conveyor Cycle (minutes) and 115, Conveyor On-time (minutes), to set chip auger run times. For example, set Setting 114 to 30 and set Setting 115 to 2. You get these results:

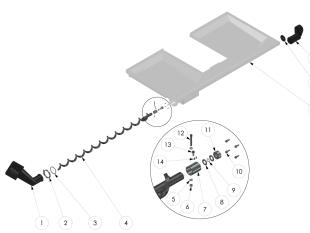
1. The Auger starts at intervals of 30 minutes.
2. The auger operates for 2 minutes.

Operate the chip auger by pressing CHIP FWD on the pendant. Make sure the auger operates correctly.

6.2 CHIP AUGER SYSTEM - TROUBLESHOOTING GUIDE

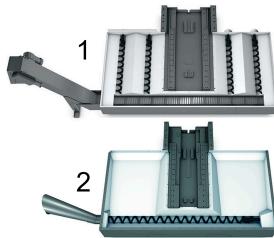
Chip Auger System - Troubleshooting Guide

Exploded View Single Auger



1. AUGER DISCHARGE CHUTE
2. V-FLANGE CLAMP
3. O-RING 2-425 BUNA
4. AUGER
5. WASHER 5/16 SPLIT LOCK PLTMED
6. NUT 5/16-18 HEX
7. MOTOR COUPLING
8. WASHER 5/8 STEEL .048THK X 1 1/4
9. WAVE WASHER .734 O.D. .531 I.D. 4/7
10. SHCS 1/4-20 X 3/4 LOCTITE
11. SPACER
12. SHCS 5/16-18 X 2 1/4
13. SHCS 5/16-18 X 3/4
14. SSS 1/4-20 X 3/8 CUP PT
15. ENCLOSURE PANEL PAN SINGLE AUGER
16. GASKET CONVEYOR MOTOR
17. AUGER MOTOR 1PH

Introduction



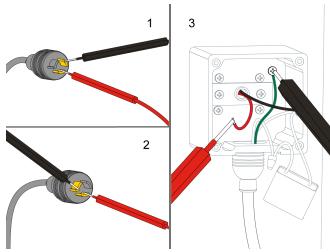
1. Multi Auger
2. Single Auger

Symptom Table

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
Alarm 9819 CHIP CONVEYOR SHORT CIRCUIT	The auger motor start capacitor is at fault.	Inspect the auger motor start capacitor for damage.
Alarm 9848 CHIP CONVEYOR MOTOR DISCONNECTED	There is no power from the I/O PCB to the motor.	Verify the voltage at the I/O PCB and the motor.
The auger does not start.	The circuit breaker is tripped.	Check for a short in the motor or the cable.
	There is no power from the I/O PCB to the motor.	Verify the voltage at the I/O PCB and the motor.
	The fuses are blown (I/O-version R or earlier).	Check the fuses on the I/O PCB.
	The auger motor start capacitor is at fault.	Inspect the auger motor start capacitor for damage.
	Parameters are not set correctly.	In service mode, check that Parameter 209.03 is enabled. If the machine is Classic Haas Control or an NGC machine that has not been updated after October 10th, 2018, check that Parameter 209.17 is enabled. This parameter will have no effect if the machine has been updated after that date.
The auger is noisy or oscillates between forward and reverse. Then, Alarm 9906 CHIP CONVEYOR MALFUNCTION is generated.	There is an excessive chip build-up or an obstruction.	Clear all chips and obstructions from the auger trough and chip chute.
There is no chip build-up or obstruction, and the machine generates Alarm 9906 CHIP CONVEYOR MALFUNCTION	The auger motor is bound up.	The machine is detecting an overcurrent condition. Check the discrete input CHIP_CONVEYOR_OVERCURRENT cycles from 0 - 1 or 1 - 0 (0 means overload condition. Check the motor for burnout or binding.
The auger does not remove chips.	The auger drive assembly has a mechanical issue.	Inspect the auger motor and coupling for damage.
	The auger is worn.	Inspect the end of the auger for wear.
	The auger is bent.	Remove the auger from the machine. Roll the auger on the floor and visually inspect for a bend.
Chip Auger, Conveyor, may start without operator action, even with doors open.	The machine has software 100.17.000.1016	Update software to 100.17.000.2030 or greater. This problem has been corrected such that the conveyor never restarts automatically. With a Classic Haas Control, the operator can restart the conveyor with the door open. NGC machines updated after October 10th, 2018, will have strict door rules that make this impossible.

M31 is restarting conveyor timers if the conveyor is already on.	The machine has software earlier than 100.17.000.2030, and the conveyor cycle restarts every time an M31 is encountered.	Update software to 100.17.000.2030 or greater. In the new software, if a conveyor cycle is already running but in the off state, a M31 will NOT restart the conveyor. The conveyor will follow the cycle it is currently in.
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Motor Cable Inspection



Corrective Action:

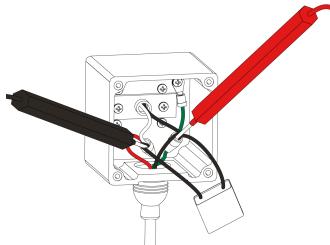
Inspect the motor cable for any sign of damage. Check for burn marks at the plug. This could be caused by coolant contamination.

Measure the Ohms across the motor power cable leads [1] at the plug. There should be resistance leg to leg. An open reading suggests a bad motor or cable.

Measure the Ohms on the motor power cable from each power leg to the plug's ground leg [2]. This reading should be open.

If the cable shows a short leg to ground at the plug, disconnect the power cable at the motor and check each motor power lead to the motor chassis [3]. If the reading is open, the cable is at fault. If any lead tests short, the motor is shorted.

Voltage



Corrective Action:

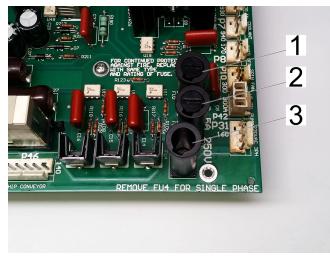
Find the chip conveyor motor cable 140 at the I/O PCB. Press **[CHIP FWD]**. Use a multimeter with needle tip probes to measure the voltage between the black and red wires on the cable.

Have someone press and hold **[CHIP REV]**. Measure the voltage between the black and white wires. When the I/O PCB operates correctly, each voltage reading is 240 VAC.

If the voltage at the I/O PCB is correct, open the conveyor motor junction box. Use a multimeter with needle tip probes to check for voltage on the power leads at the motor.

If there is no voltage, check the motor and the cable. If there is voltage, check the capacitor. If you verify the voltage and capacitor are correct, inspect the motor drive shaft and keyway.

Fuses

**Corrective Action:**

Check these fuses at the bottom right corner of the I/O PCB (Fuse type: AGC Samp):

- Single phase motors: FU2 [1] /FU3 [2]. There should be no fuse in FU4 [3].
- 3 phase motors: FU2 [1] /FU3 [2] /FU4 [3]

A short in the motor or the cable could have blown the fuse.

Capacitor

**Corrective Action:**

Inspect the conveyor motor capacitor for damage. A damaged capacitor usually has signs of deformation or bubbling on the casing. This could be caused by a short in the motor or in the cable.

Open the motor junction box. Check the capacitor. Look for burn marks on the case.

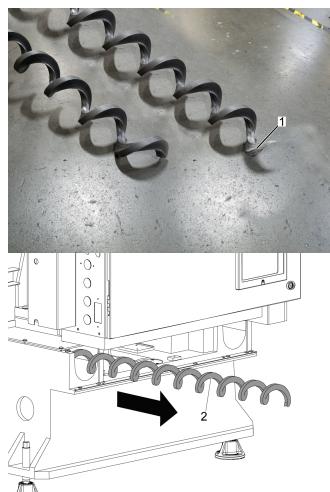
Measure the capacitor. Most multimeters can measure capacitance upon manual activation (turn to the correct units of measurement and push the yellow button). It should be 6 or 9 microfarads, as noted on the capacitor's case.

Chips

Corrective Action:

Clear chips and obstructions. Make sure the conveyor settings are optimized for the chips that are produced.

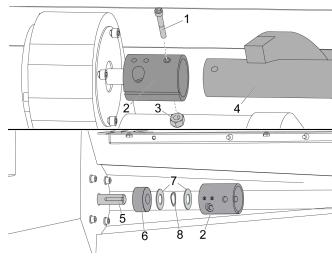
Auger Inspection

**Corrective Action:**

Cutting material that is harder than the auger [2] will wear down [1] the auger and chip chute faster than normal wear. For the auger to work correctly, it must extend far enough into the chute to force the chips up and out.

Remove the chip chute. Check the end of the auger for wear.

Measure the length the auger extends from where the chip chute connects to the machine. Measure the length of the bottom of the chute, from where it attaches to the machine to where the chute angles up. Compare the length of the auger and the bottom of the chute. The auger should be within 1/2" to 1" from where the chute angles up.



Inspect the drive coupler [2] on the auger for damage. Make sure all of the screws are tight. The illustration shows the hardware for installing an auger on a VF-1/2/3/4/5.

1. Bolt
2. Drive coupler
3. Nylock nut
4. Auger
5. Motor shaft/keyway
6. Spacer
7. 5/8" flat washer
8. 5/8" wave washer

Electrical Diagram

