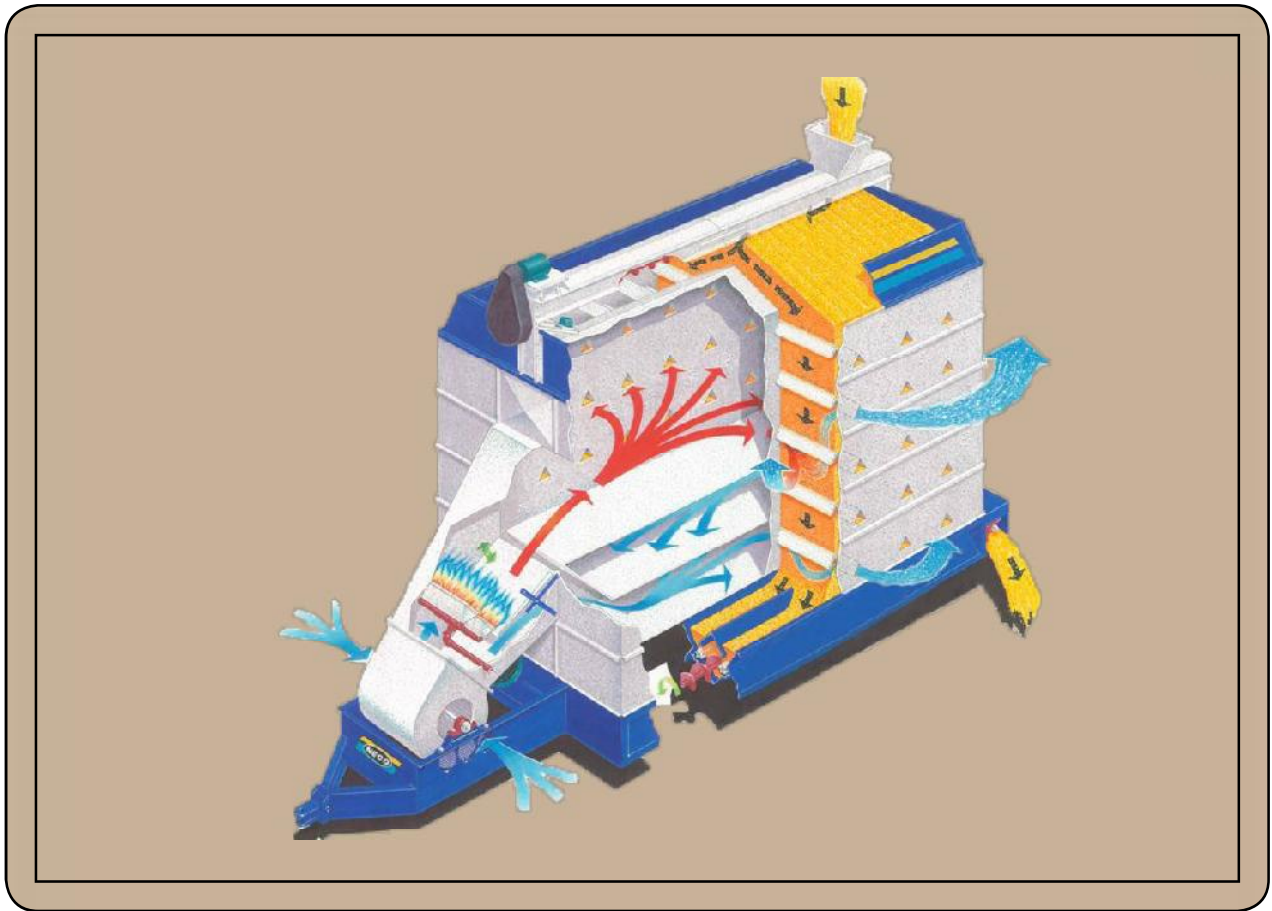




# Continuous-Flow Grain Dryer

— Standard Controls —

## *Owner's & Operator's Manual*



Effective Date: August 2012



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Rev:

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## ***Welcome to the growing number of satisfied NECO customers***

Since 1959, NECO equipment has been proudly designed, manufactured, and supported for customers in the USA and around the world. Occupational safety is one of NECO's primary concerns. With proper operation and maintenance, the equipment will provide years of safe and dependable service. NECO is continually testing and improving our products in order to provide you with the safest, most efficient, and most economical grain handling & grain conditioning equipment available. We welcome your questions or comments and look forward to a long-standing relationship, ultimately saving you valuable time and reducing your workload.

### **IMPORTANT ---**

- This Owner's & Operator's Manual is provided to help ensure the safety of the operator, as well as others who come into contact with the equipment. It contains necessary information concerning personal safety, assembly, installation, operation, and maintenance.
- It is your responsibility as an owner, operator, or supervisor to know what hazards exist and to make these known to all persons working with the equipment or who are in the area so that they may take any needed safety precautions.
- Failure to read this Owner's & Operator's Manual or to understand and heed the instructions contained herein constitutes a misuse of the equipment.
- A copy of this manual should be available at all times and be kept in a safe place to be available for future reference. For additional copies, contact NECO's Sales Department. Provide them with the equipment description and the Publication Number, located at the lower right corner of the front cover page.
- Although NECO language translations of this manual are made as accurately as possible, if there is a conflict or difference between the English and the other translations of this manual, the English text will prevail.
- NECO reserves the right to make changes or improvements to its products without incurring any obligation with respect to previously manufactured products.
- Please contact NECO or your dealer if you have any questions concerning this manual.

## **ATTENTION -- Become Alert !!**

The symbol shown below is used to call your attention to instructions concerning your personal safety. It means "ATTENTION - Become Alert !!"

**Be ALERT !**



**Be SAFE !**

Personal Safety is involved - be alert to the possibility of personal injury or death.

**\*\*\*\*\* LIMITED WARRANTY \*\*\*\*\***

For a period of one (1) year after shipment of goods by Buyer to the Buyer's customer, NECO will supply, free of charge, EXW\*\* NECO's factory, Omaha, Nebraska, replacement parts for any parts that prove to be defective due to workmanship or material.\* Defective parts must be returned, freight-prepaid, to the NECO Factory in Omaha, Nebraska. You must obtain a "Return Authority" form from NECO prior to returning goods.

- GOODS NOT MANUFACTURED BY NECO CARRY ONLY THE MANUFACTURER'S WARRANTY.
- THIS UNDERTAKING IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
- NECO RESERVES THE RIGHT TO MAKE CHANGES OR IMPROVEMENTS TO ITS PRODUCTS WITHOUT INCURRING ANY OBLIGATION WITH RESPECT TO PREVIOUSLY MANUFACTURED PRODUCTS.
- FAILURE TO FOLLOW THE INSTRUCTIONS CONTAINED IN THIS MANUAL, AS WELL AS THE EXISTENCE OF ANY OF THE CONDITIONS LISTED BELOW, WILL CAUSE THIS LIMITED WARRANTY TO BE VOIDED.

1. Improper assembly
2. Improper installation (including power and wiring)
3. Unauthorized alteration of goods
4. Operation of the unit when repairs are needed
5. Use of unauthorized parts
6. Operation by children or uninstructed personnel
7. Processing of materials that are abrasive, that do not flow freely, or that are otherwise unsuited for processing in farm equipment.
8. Abuse or misuse of the unit or of any of its components
9. Accidents

**LIMITATION OF LIABILITY**

BUYER AGREES THAT IN NO EVENT SHALL NECO HAVE LIABILITY FOR DIRECT DAMAGES IN EXCESS OF THE CONTRACT PRICE OF THE GOODS FOR WHICH THE CLAIM IS MADE. Buyer further agrees that in no event shall NECO have liability for loss of use, loss of profits, or for any indirect, incidental, or consequential damages on any claim of any kind.

\*This limited warranty does not extend to parts designed to wear in normal operation and be replaced periodically or to damage caused by negligence, accident, abuse, or improper installation or operation.  
\*\*Ex Works (or EXW) is the correct Incoterm term for what North Americans traditionally call FOB. (See "Incoterm" on wikipedia.org for clarification.)

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**\*\*\*\*\* HAVE QUESTIONS or NEED HELP ?? \*\*\*\*\***

See the back cover of this manual for complete NECO contact information.

## Before you call .....

For effective communication, calls for any dryer system will require the customer to provide important information, such as the dryer model #, part #, serial #, and the wiring diagram drawing number and revision level. These numbers, along with other important information, are found at the dryer Control Panel.

Record the following information from the dryer rating label for future reference:

**Model Number is** \_\_\_\_\_ **Install Date** \_\_\_\_\_

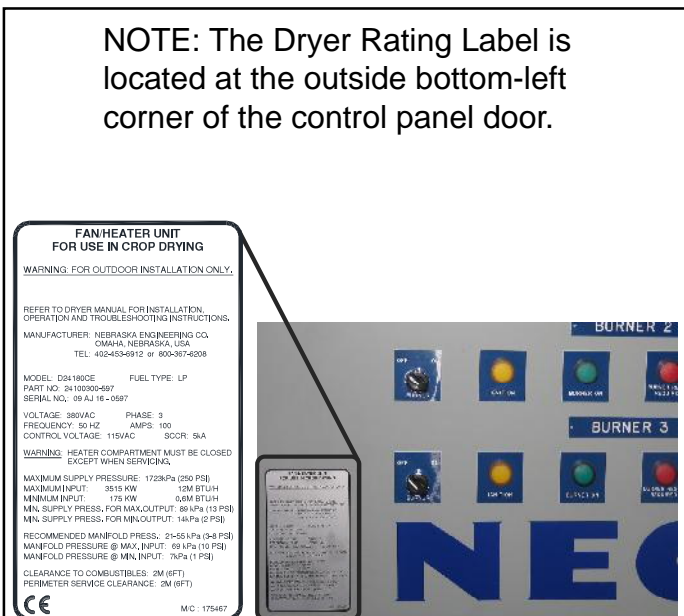
**Part Number is** \_\_\_\_\_ **Fuel Type** \_\_\_\_\_

**Serial Number is** \_\_\_\_\_ **# of Blowers** \_\_\_\_\_

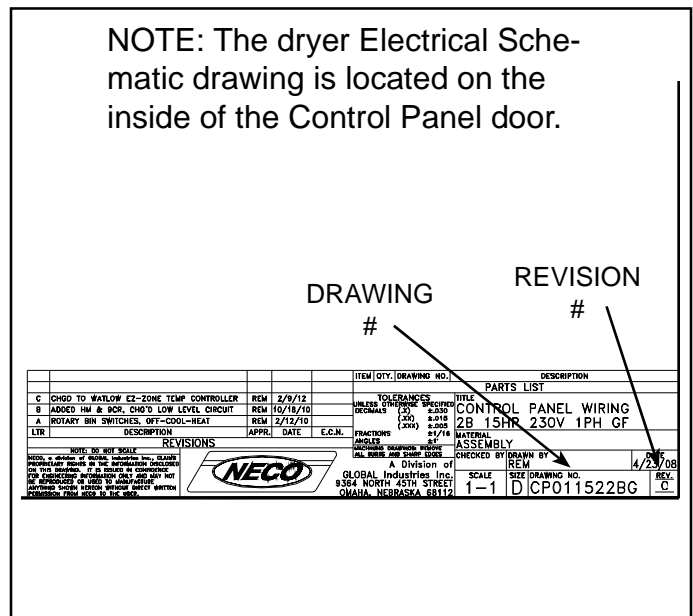
**Volts** \_\_\_\_\_ **Phase** \_\_\_\_\_ **Frequency** \_\_\_\_\_ **Amps** \_\_\_\_\_

Record the following information from the Wiring Diagram for future reference:

**Wiring Diagram Dwg # is** \_\_\_\_\_ **Rev Level** \_\_\_\_\_



Dryer Rating Label



Electrical Schematic - Title Block View

# 1. SAFETY

- Read and Understand this manual.
- Heed all warnings.
- Make sure all warning decals are in place and legible.
- Call NECO for free decal replacements.



## WORK AREA SAFETY

Under no circumstances should persons not involved in the operation be allowed into the work area.

Operators must ensure that no children or other unauthorized persons enter the work area. The operator on duty must immediately shut down the equipment if anyone not involved in the actual operation enters the work area.

Prior to start-up and during operation, operators must ensure that the work area is clean and free of any and all tools and debris that might cause tripping or falling.



## WEAR PROTECTIVE CLOTHING

Wear personal protective clothing at all times.

- Wear safety glasses to protect vision!
- Wear leather gloves—edges are sharp!
- Use fall protection when climbing!



## ANSI and NFPA STANDARDS

Install all equipment in compliance with ANSI and NFPA Standards.



## OPERATOR QUALIFICATIONS

Only competent and experienced persons should operate farm equipment. Anyone operating or working around power equipment must understand and meet all legal and contractual requirements.

It is your responsibility to know the regulations in your own area. For example, some regulations specify that no one under the age of 16 may operate power machinery including farmstead equipment.

Current OSHA regulations state in part, “At the time of initial assignment and at least annually thereafter, the employer shall instruct every employee in the safe operation and servicing of all equipment with which the employee is, or will be involved.” \*\*

Unqualified persons must stay out of the work area—which is defined as the area surrounding grain handling equipment. Anyone who hasn’t read and who doesn’t understand all operating and safety instructions is not qualified to operate the machinery.



## OPERATING PROCEDURES

Either you or another qualified person must monitor NECO equipment while it’s running. Inspect the equipment periodically. Be alert for unusual noises, vibrations, and loose fasteners.

- Observe work area restrictions.
- Keep all safety shields and devices in place.
- Make sure everyone is out of harm’s way before operating or moving farmstead equipment.
- Keep hands, feet, and clothing away from moving parts.

• **SHUT OFF, LOCK OUT, and TAG OUT POWER** before adjusting, cleaning, or servicing equipment!

---

\*\* Federal Occupational Safety & Health Standards for Agriculture Subpart D, Section 1928.57 (a)(6).



## EQUIPMENT INSPECTION

Inspect the equipment after assembly and before each use.



## DRIVES AND LOCKOUTS

Inspect the drive before adding power. Know how to shut down the equipment in case of an emergency.

Whenever you service or adjust the equipment, make sure you SHUT OFF power and LOCK OUT your power source.

Electric motors and controls must be installed by a qualified electrician. They must meet the standards set by the NFPA Std. 70 of the National Electrical Code and all local and state codes.

Disconnect power before resetting the motor.

The reset controls and motor-starting controls must be located where the operator has a full view of the entire operation.

Make sure all guards and shields are kept in place.

Make sure the power disconnect switch can be locked in the OFF position. This disconnect switch must be locked whenever work is being performed on the equipment.



## SAFE SHUTDOWN

### Normal Shutdown

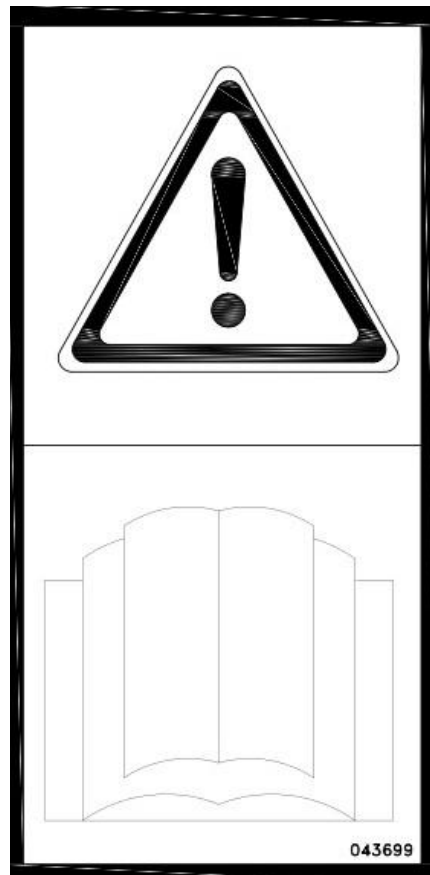
LOCK OUT the power source before leaving the work area.

### Emergency Shutdown

Disconnect and lock out the power source if the equipment suddenly or unexpectedly shuts down while under load. Determine the cause of the shutdown. Then repair and reconnect the power source to continue operating.



**FAILURE TO HEED THESE INSTRUCTIONS  
CAN RESULT IN PERSONAL INJURY**



**READ & UNDERSTAND THIS MANUAL**



# 2. WARNING LABELS

## Warning Label Overview

- Grain dryers present significant safety hazards. Decals must be displayed in appropriate locations to provide adequate warning regarding these hazards. NECO supplies all the necessary decals with your Dryer and will provide free replacements if needed.



- BE ALERT - Make sure all warning labels are present and can be easily read.
- If the warning labels become unreadable in any way, use the following information to determine the required part number and contact NECO Customer Service at 402-453-6912 or toll free at 800-367-6208.

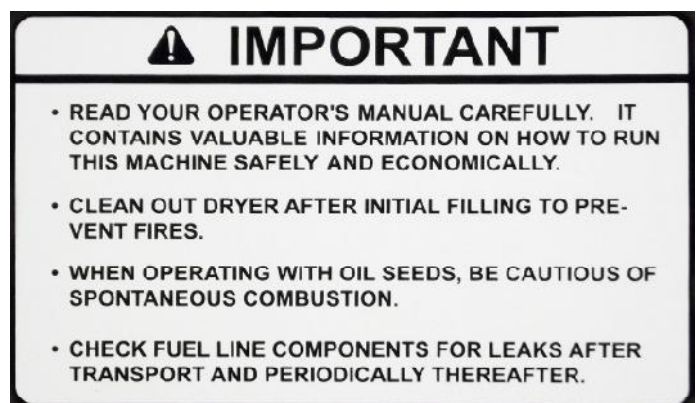
## Warning Label Identification

PART #	QTY	HAZARD DESCRIPTION	LOCATION
1002301	1	CAUTION - GENERAL WARNINGS	FUEL SIDE OF TRANSITION
036781	1	IMPORTANT - INFORMATION	FUEL SIDE OF TRANSITION
1025080	2	CAUTION - ROTATING AUGER	1X - CROSS AUGER HOUSING 1X - ROOFTOP LEVEL AUGER (IF PRESENT)
036726	5	DANGER - ROTATING PARTS	1X - ON FUEL INLET SIDE OF TRANSITION 2X - CROSS-AUGER DRIVES (DRIVE END) 2X - CROSS-AUGER DRIVES (IDLER END)
035690	3	DANGER - ROTATING PULLEY	1X - MAIN DRIVE MOTOR BRACKET 2X - BOTH OUTSIDE / INSIDE OF TRANSITION BELT GUARD (OPPOSITE FUEL SIDE TRANS)
043696	1	WARNING - INSPECTION DOOR	FUEL SIDE OF TRANSITION (SIGHT GLASS)
040220	1	DANGER - POWER LINES	DRIVERS SIDE AT FRONT (IF TOWED)
043695	2	WARNING - HIGH VOLTAGE	1X - OUTSIDE OF ELEC BOX FUEL SIDE OF TRAN 1X - OUTSIDE OF MAIN CONTROL PANEL
036725	2	DANGER - HIGH VOLTAGE	INSIDE OF SAME ELEC BOXES
043697	1	WARNING - DO NOT TOUCH	ENTRANCE DOOR

**NOTE:** The following pictorial examples of warning labels are NOT shown full size.



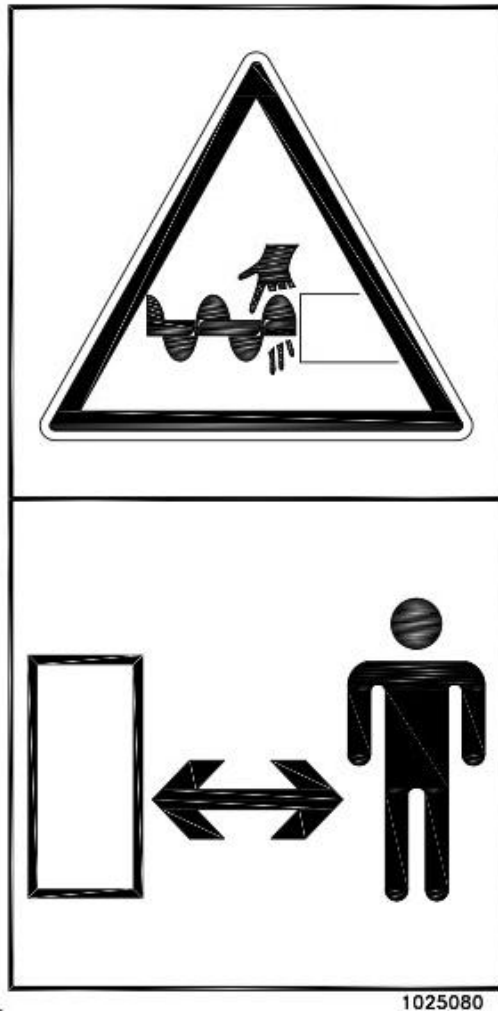
#1002301 - CAUTION\_General Warnings



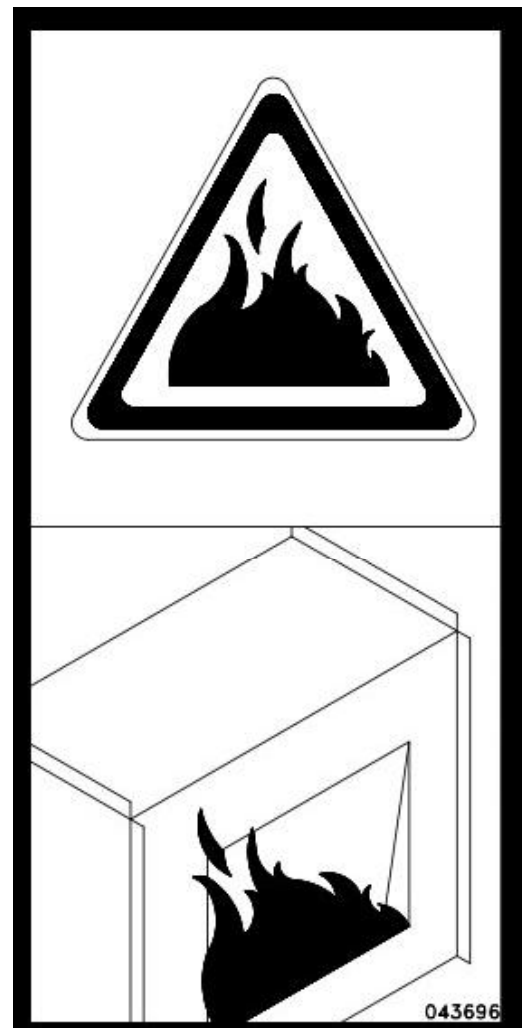
#036731 - Important Information

# Warning Label Graphics (NOT shown actual size)

(CONTINUED)



#1025080 - CAUTION\_Rotating Auger



#043696 - WARNING\_Inspection Door



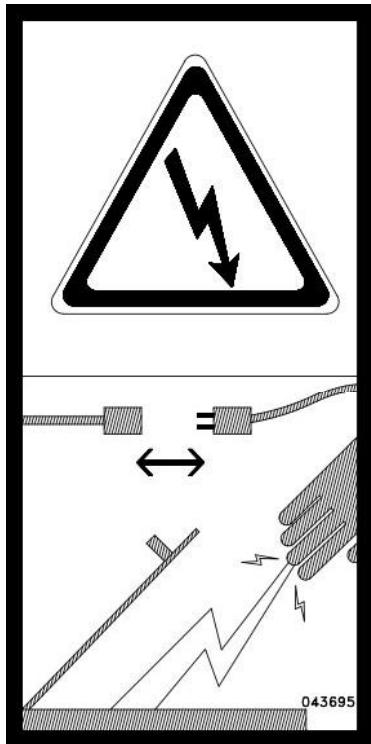
#035690 - DANGER\_Rotating Pulley



036726 - DANGER\_Rotating Parts

# Warning Label Graphics (NOT shown actual size)

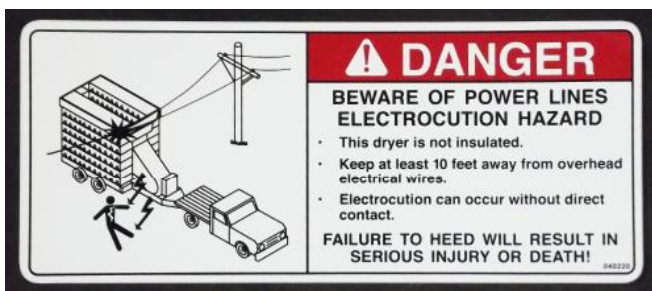
(CONTINUED)



#043695 - WARNING\_High Voltage



#036725 - DANGER\_High Voltage



#040220 - DANGER\_Power Lines



#043697 - CAUTION\_Do Not Touch

# 3. EQUIPMENT OVERVIEW

## Where to Find Additional Information

### Operation Decal

- The large decal on the front of the Control Panel provides basic operating instructions.

<b>OPERATING INSTRUCTIONS</b>		<b>DETERMINE &amp; FIX CAUSE OF DRYER SHUT-DOWN PRIOR TO RESTARTING.</b>	
<b>READ AND UNDERSTAND OPERATING PROCEDURE IN OWNER'S MANUAL BEFORE OPERATING DRYER.</b>		<b>PERIODICALLY CHECK CONTROLS, IGNITION SYSTEMS AND VALVES FOR PROPER FUNCTION AND OPERATION.</b>	
<b>FILL DRYER</b>		<b>NORMAL DRYER START/RESTART</b>	
1. BRIEFLY EMPTY DRYER TO VERIFY THE METERING ROLLS TURN FREELY.		1. LOW DRYER LIGHT MUST BE OFF.	
2. FUNCTION SWITCH TO FILL/EMPTY.		2. FUNCTION SWITCH TO START.	
3. FILLING SWITCH TO AUTO.		3. FILLING SWITCH TO AUTO.	
4. ALL OTHER SWITCHES TO OFF.		4. BLOWER SWITCH TO START, THEN ON.	
5. FILL 2 TIERS, DISCHARGE SWITCH TO AUTO. ALLOW METERING ROLLS TO ROTATE 1/2 TURN, DISCHARGE SWITCH OFF. CONTINUE FILLING UNTIL FULL.		5. DISCHARGE SWITCH TO AUTO.	
<b>EMPTY DRYER</b>		6. FUEL SYSTEM SWITCH TO AUTO.	
1. FUNCTION SWITCH TO FILL/EMPTY.		7. FUNCTION SWITCH TO INTERLOCK AS SOON AS ALL BURNER ON LAMP(S) ARE ILLUMINATED.	
2. DISCHARGE SWITCH TO AUTO.		<b>NORMAL DRYER SHUT-DOWN</b>	
3. ALL OTHER SWITCHES TO OFF.		1. FILLING, DISCHARGE & FUEL SWITCHES TO OFF (REFER TO OPERATOR'S MANUAL FOR FUEL SHUTDOWN).	
<b>BATCH DRYER START/RESTART</b>		2. FUNCTION SWITCH TO START.	
1. FUNCTION SWITCH TO START.		3. ALLOW BLOWER TO OPERATE FOR SUFFICIENT TIME TO COOL GRAN (15 - 20 MINUTES).	
2. BLOWER SWITCH TO START, THEN ON.		4. BLOWER SWITCH TO OFF.	
3. FUEL SYSTEM SWITCH TO BATCH.			
4. ALL OTHER SWITCHES TO OFF.			

### NECO Dryer (Standard Control) DVD

- The DVD entitled *Continuous-Flow Grain Dryer* (#7713391) will help you understand how to start and operate the dryer.



Refer to Figures 3.1, 3.2, 3.3, and 3.4:

- Understanding the terms used to identify the various components of a dryer system will make the instructions in this manual clearer and easier to follow.
- The dryer example shown is a model #D24150 with a gravity fill system.

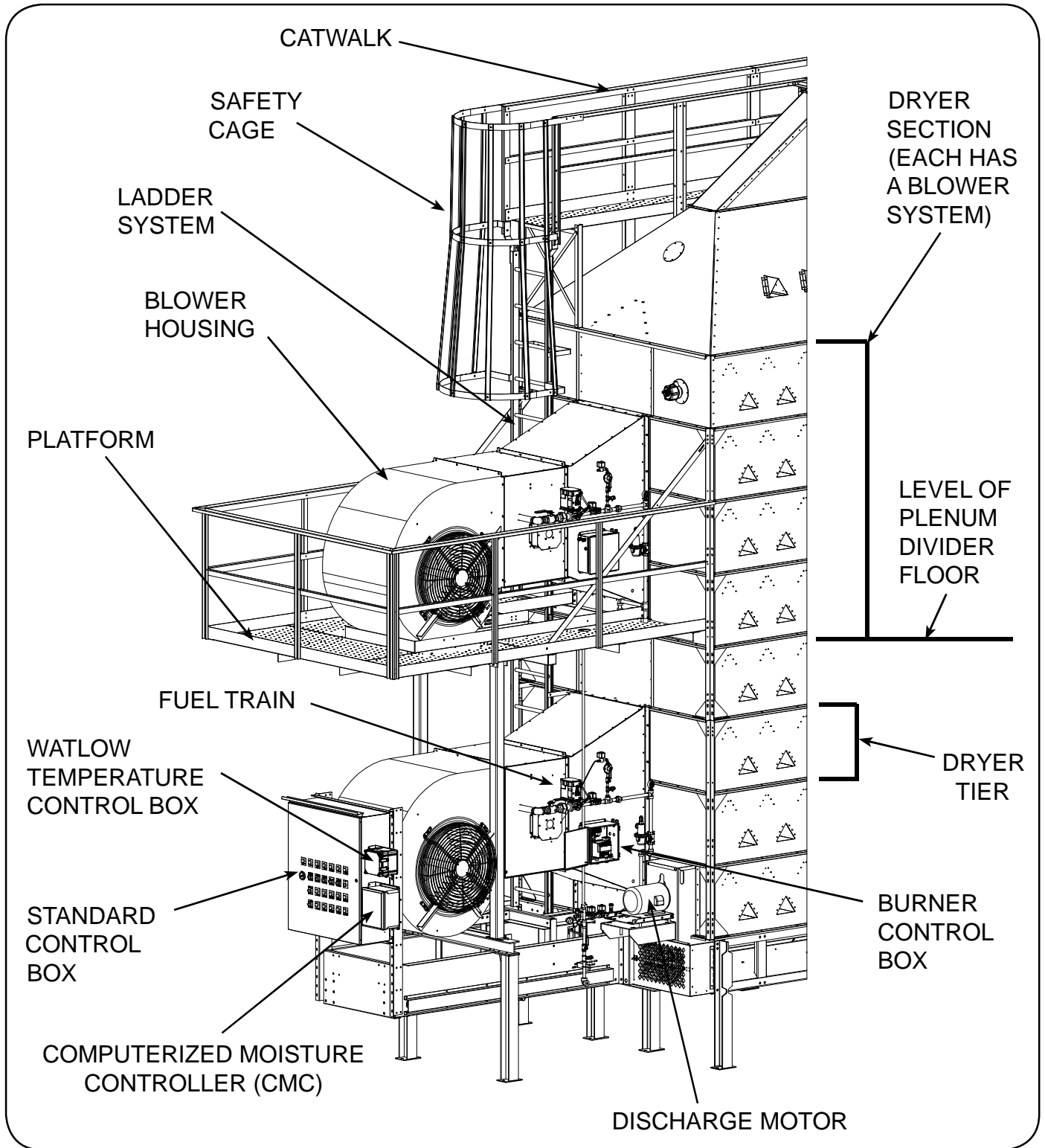


Figure 3.1 - Front of Dryer (From Fuel Train Side)

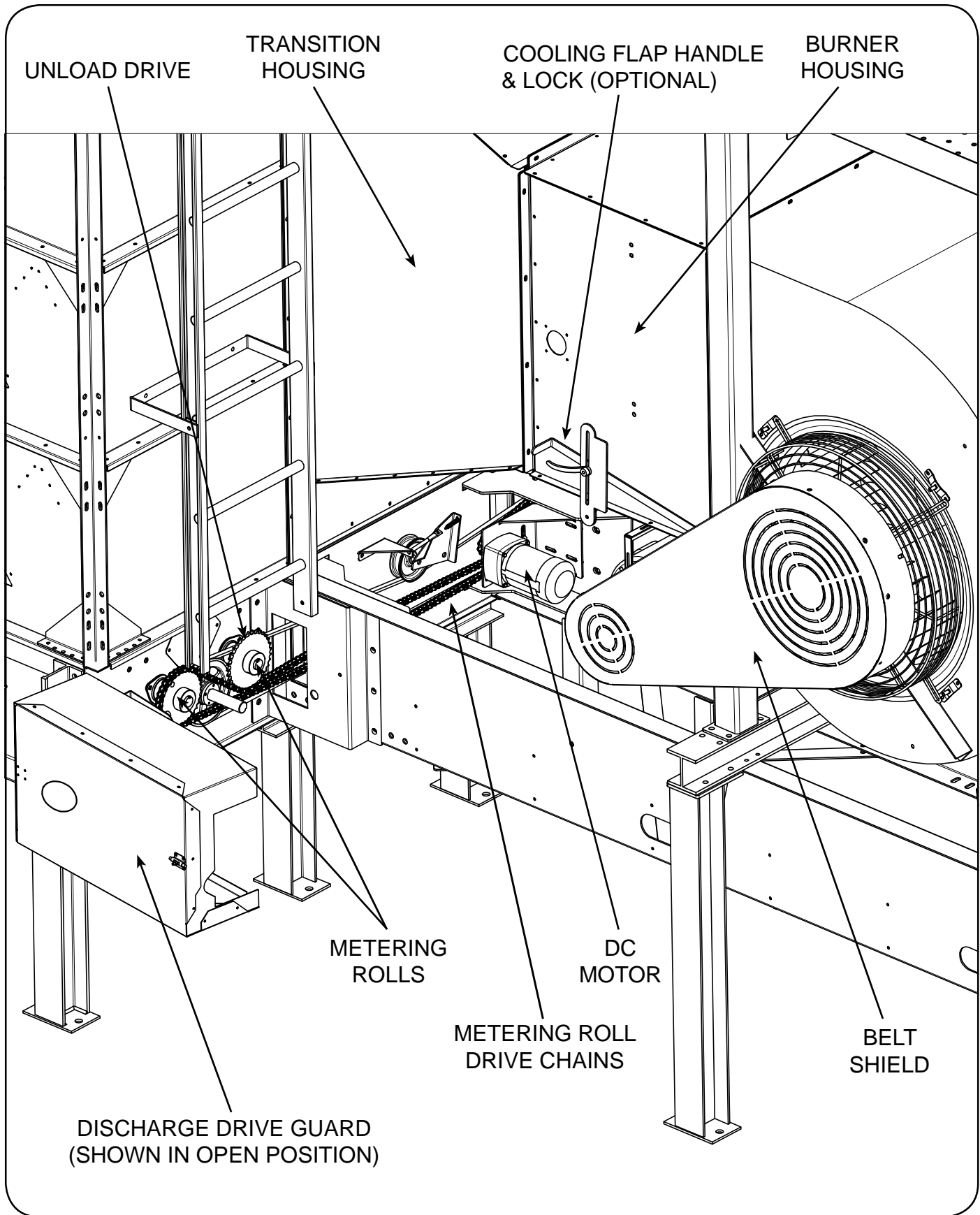


Figure 3.2 - Front of Dryer (From Blower Belt Shield Side)

NOTE: The Plenum Door is at the rear of dryer and allows access into the center plenum area. Each dryer section ABOVE THE PLENUM DOOR is separated by a Divider Floor with one Divider Door for plenum access. Divider Doors should always be closed during operation. Optional Cooling Floor(s) & Doors serve a totally different purpose - See Grain Cooling System.

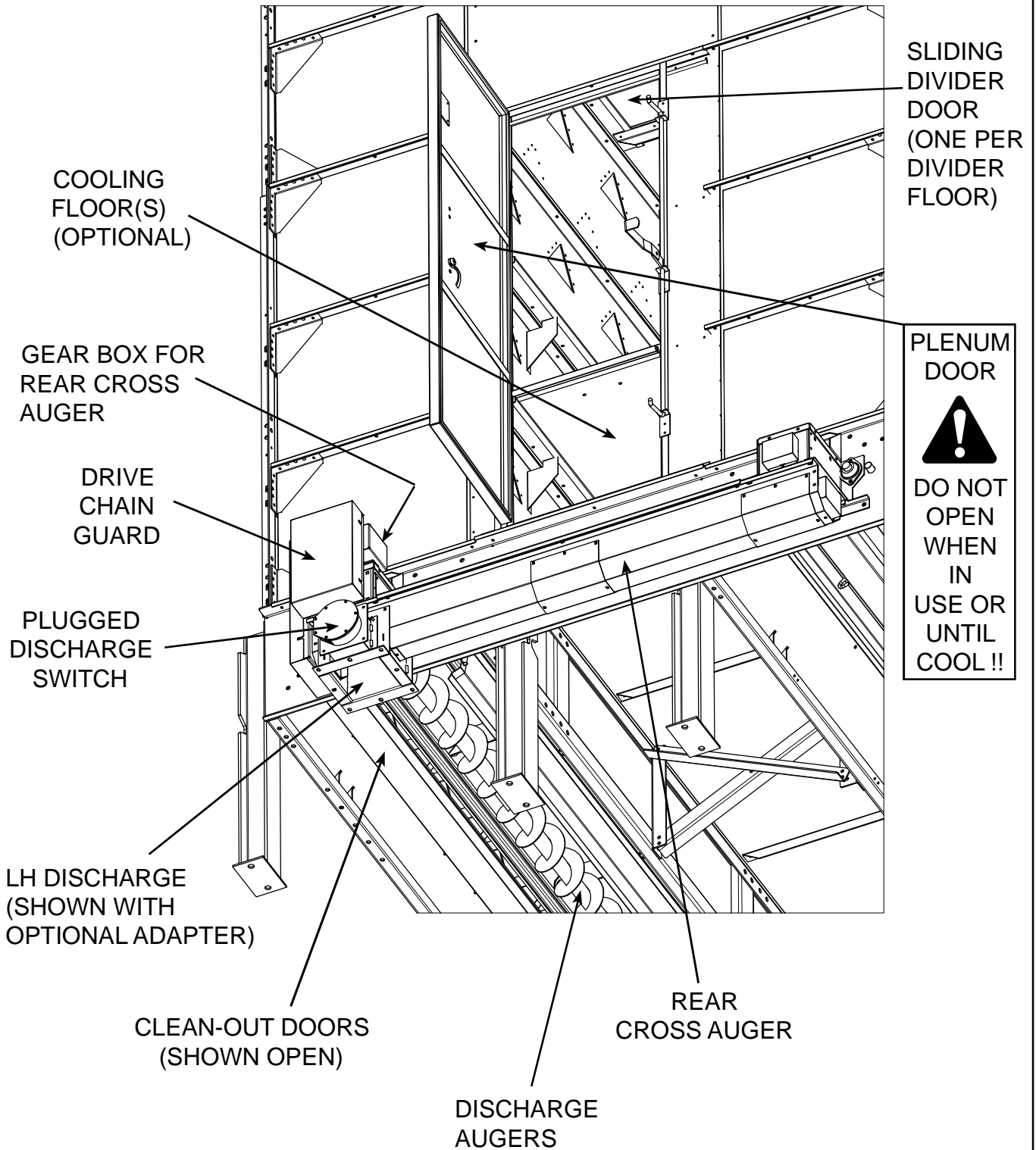
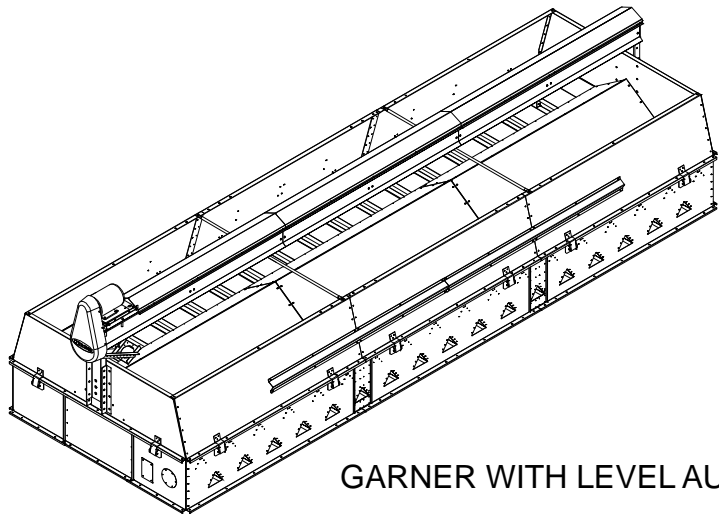
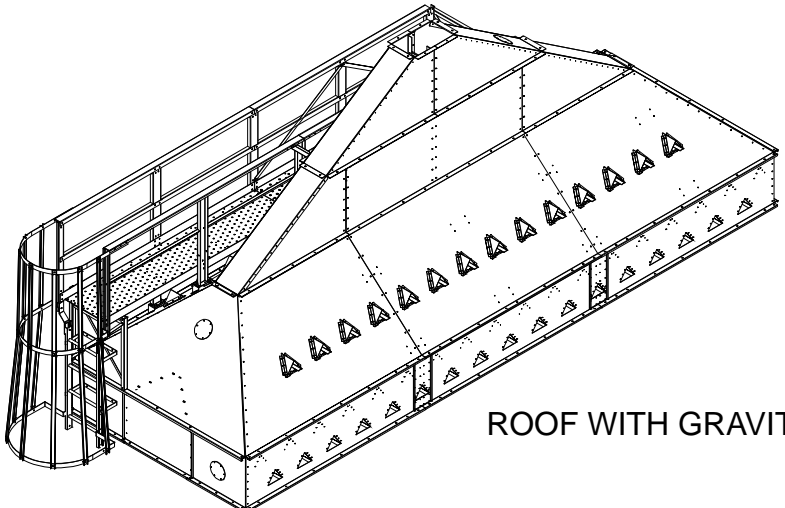


Figure 3.3 - Rear of Dryer (From Below)



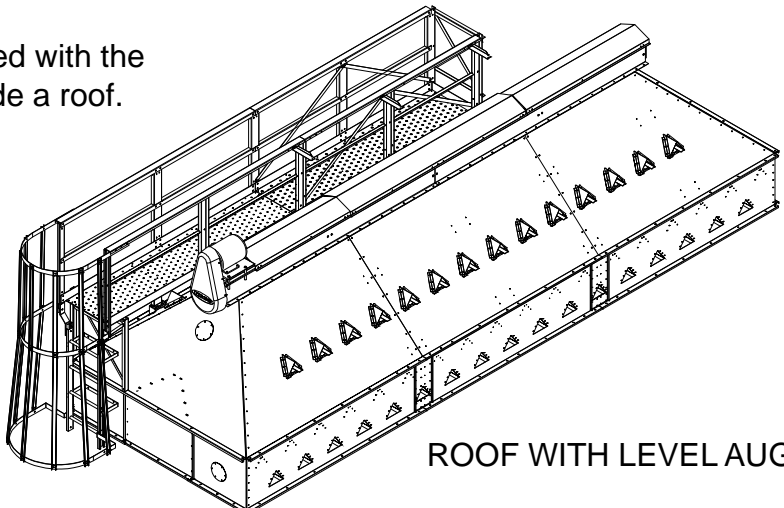
GARNER WITH LEVEL AUGER



ROOF WITH GRAVITY FILL

**NOTE**

Catwalks are only used with the styles of fill that include a roof.



ROOF WITH LEVEL AUGER

Figure 3.4 - Topside Filling Options



# Fuel Supply

NOTE: The dryer fuel train was set up at the factory for either propane (LP) or natural gas (NG). The fuel supply system must include an emergency shut-off valve. NECO suggests hiring a professional to plan, setup, and connect the dryer fuel supply so that all aspects conform to applicable code requirements.

## Liquid Propane (LP) Fuel Source

Refer to Figure 3.5:

- The tank should be equipped with both a **vapor tap** and a **liquid tap**.
- The liquid tap should have a rapid flow shut-off valve, which will stop the flow of propane if a fuel line breaks
- Help prevent oil sediment from entering the fuel system by propping one end of the propane tank higher than the other end.

Tanks that contained ANHYDROUS AMMONIA:

- Fuel train components can be damaged by anhydrous ammonia - make sure that the tank is completely purged.



Oil entering the dryer fuel system will void the warranty on fuel train components.



Fuel train components damaged by anhydrous ammonia ARE NOT covered under NECO warranty.

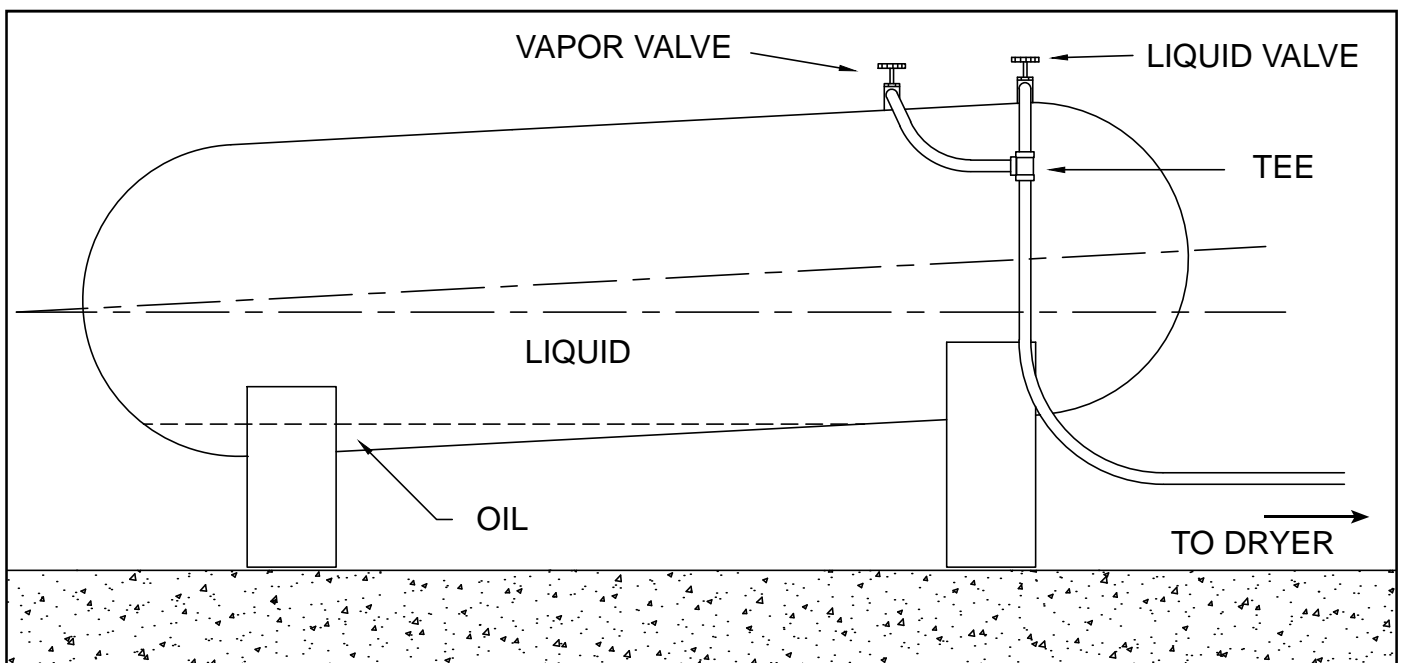


Figure 3.5 - LP Fuel System Setup

## Sizing the LP Supply Line

NOTE: Size the line for maximum capacity of your dryer system, while taking into consideration any future plans to upgrade. Refer to APPENDIX Table 7.1 for maximum heat capacity for the dryer model.

Refer to Table 3.6 for the line size needed to allow a pressure drop of 1 psi when running **LP** between the storage tank and the dryer:

Table 3.6 - LINE SIZING FOR LP FUEL (INLET LINE)										
FLOW RATE		LINE LENGTH IN FEET								
		COPPER TUBING TYPE K			SCHEDULE 80 PIPE					
BTU per hour (000)	GPH	3/8" OD	1/2" OD	5/8" OD	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"
5,490	60	9'	36'	157'	20'	92'	331'			
7,320	80		20'	83'	11'	51'	187'	735'		
9,150	100		13'	56'	7'	33'	119'	470'		
12,810	140			29'		15'	61'	240'	813'	
16,470	180			17'			37'	145'	491'	
18,300	200			14'			30'	118'	399'	
25,620	280						15'	60'	205'	
27,450	300						13'	52'	180'	785'
31,110	340							40'	150'	700'
34,770	380							30'	125'	600'
38,430	420							25'	95'	500'
42,090	460							20'	80'	400'
45,750	500							15'	70'	300'

## Natural Gas (NG) Fuel Source

The natural gas inlet line fitting for all NECO Dryers is 2".

Refer to maximum output of Table 11A in the APPENDIX section and ensure that the pressure supplied to the fuel train inlet is 15 to 20 psi. The regulator should be located near the dryer to reduce the supply line length.

**For both types of fuel supply, LP & NG:**



**Upon completion of fuel system, from source to inlet supply and all accessible connections, verify that all joints are tight and that ALL shutoff valves work correctly.**  
**EXPLOSION HAZARD**

# Fuel Supply Components

## LP Fuel Inlet System & Fuel Control Manifold

Refer to Figures 3.7 for LP Fuel Inlet System Component Descriptions:

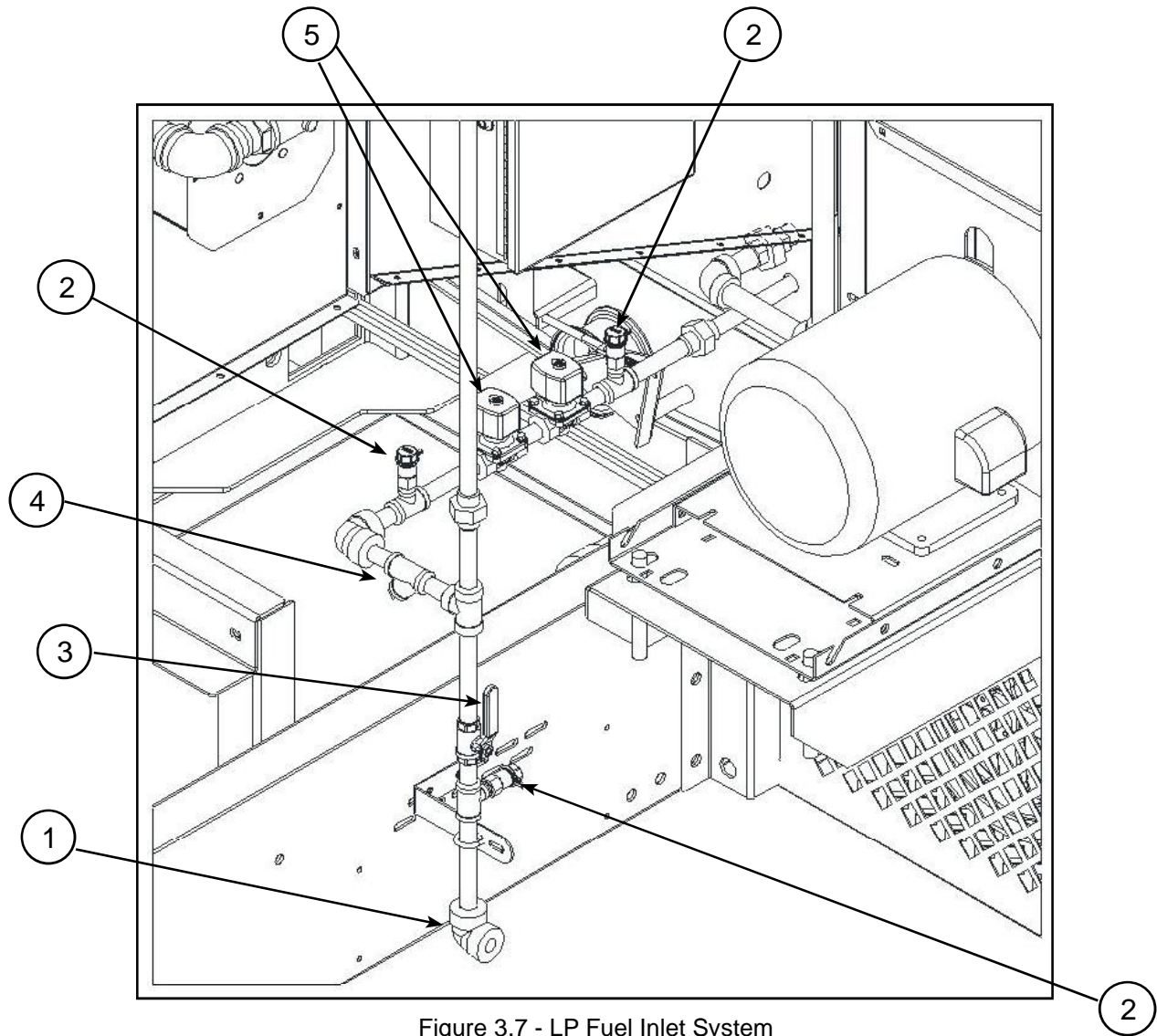


Figure 3.7 - LP Fuel Inlet System

1. **FUEL SUPPLY INLET ELBOW:** The main fuel supply connects at this location.

2. **HYDROSTATIC RELIEF VALVE:** Relieves the hydrostatic pressure that might develop in sections of liquid piping between closed shutoff valves.

3. **MANUAL SHUTOFF VALVE:** Manually prevents entry of fuel into the fuel system.

4. **FUEL STRAINER:** Traps foreign debris that may be in the fuel line.

5. **SOLENOID VALVES:** Electrically actuated valves which turn fuel on and off.

Refer to Figures 3.8 for LP Fuel Control Manifold Component Descriptions:

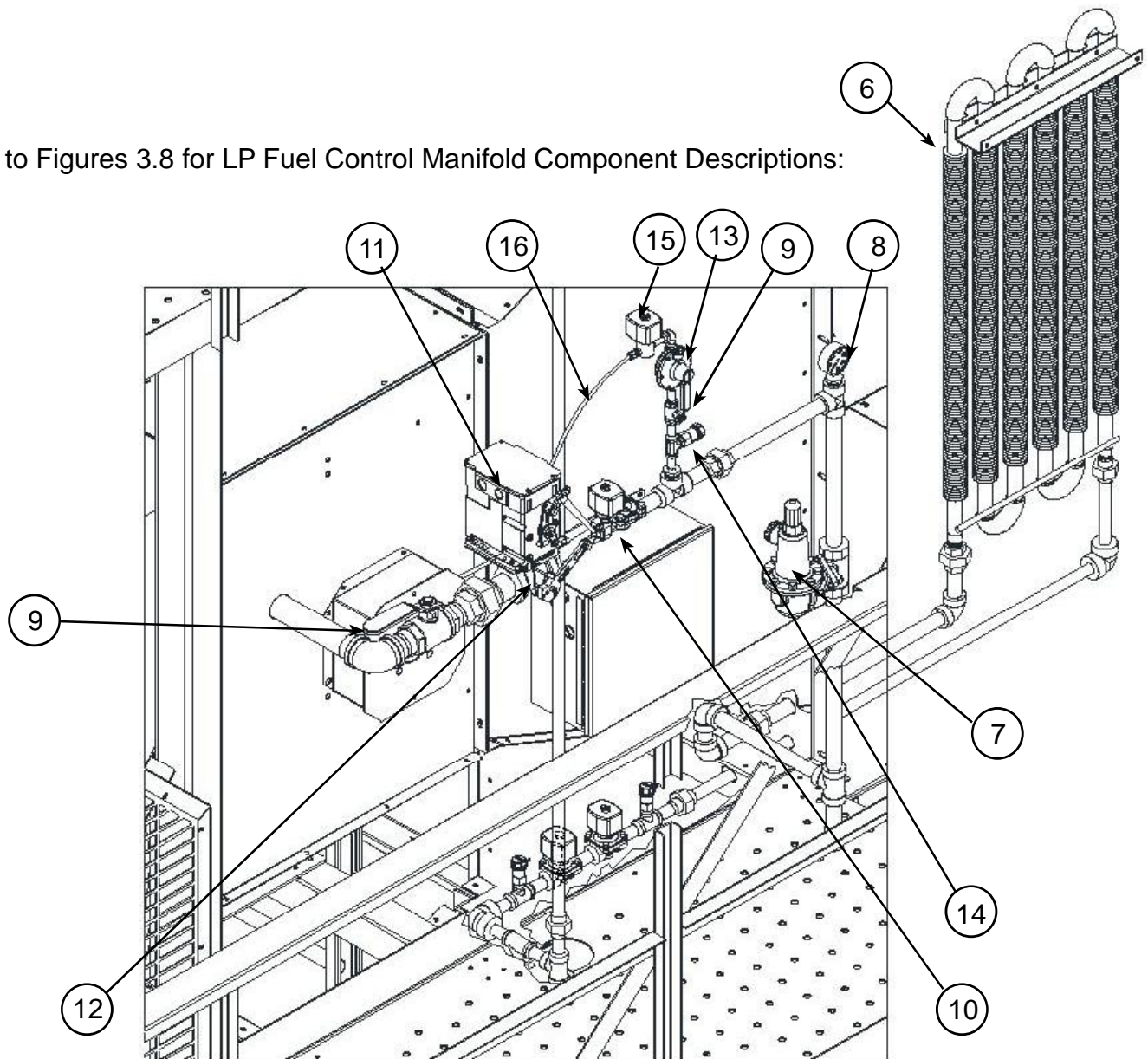


Figure 3.8 - LP Fuel Control Manifold

6. **VAPORIZER:** Finned tube which vaporizes the liquid propane. Located in the dryer plenum.

7. **PRESSURE REGULATOR:** Reduces LP fuel pressure to the control system.

8. **PRESSURE GAUGE:** Indicates LP fuel pressure setting at regulator.

9. **MANUAL SHUTOFF VALVE:** Used to manually shut off LP fuel.

10. **VAPOR SOLENOID VALVES:** Electrically actuated valves to turn LP fuel on and off.

11. **ELECTRONIC MODULATING MOTOR:** Receives signal from temperature controller

and moves linkage attached to butterfly valve to control fuel to the burner & regulate the drying temperature.

12. **BUTTERFLY VALVE:** Controls flow of fuel to the burner to maintain the desired temperature.

13. **PILOT PRESSURE REGULATOR:** Further reduces fuel pressure to pilot solenoid valve.

14. **PILOT HYDROSTATIC RELIEF VALVE:** Relieves excess fuel pressure in the pilot line.

15. **PILOT SOLENOID VALVE:** Electrically actuated valve turns LP fuel on and off to the pilot.

16. **PILOT LINE:** Supplies LP fuel to the pilot.

## NG Fuel Inlet & Fuel Control Manifold



**EXPLOSION HAZARD** Observe all safety rules when working with natural gas.

Refer to Figures 3.9 for NG Fuel Control Manifold Component Descriptions:

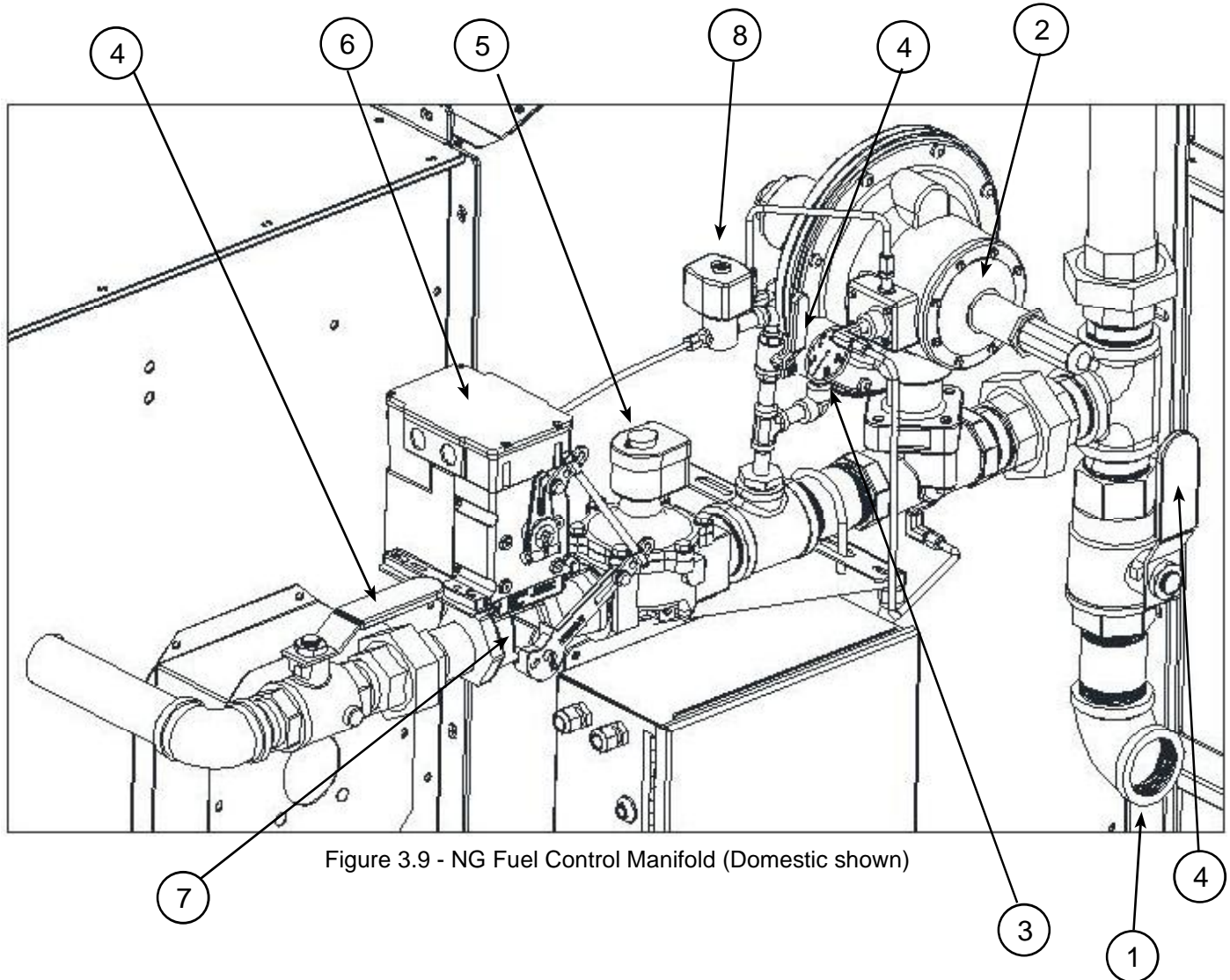


Figure 3.9 - NG Fuel Control Manifold (Domestic shown)

**1. FUEL SUPPLY INLET ELBOW:** The main fuel supply connects at this location.

**2. PRESSURE REGULATOR:** Reduces fuel pressure to a value which can be controlled by the remaining fuel control valves.

**3. PRESSURE GAUGE:** Indicates fuel pressure setting at regulator.

**4. MANUAL SHUTOFF VALVE:** Used to manually shut off NG fuel.

**5. SOLENOID VALVE:** Electrically actuated safety valves which turn fuel on and off.

**6. ELECTRONIC MODULATING MOTOR:** Receives signal from temperature controller and moves linkage attached to butterfly valve.

**7. BUTTERFLY VALVE:** Controls flow of fuel to the burner to maintain the desired temperature.

**8. PILOT SOLENOID VALVE:** Electrically actuated safety valve turns fuel on and off to burner pilot.

## NG Fuel Manifold - CE Requirements

Refer to Figure 3.10:

- Dryers that require CE certification and are fueled by natural gas (NG) are supplied with an additional solenoid in the control manifold.
- This second solenoid is identical to the first and acts as an additional safety backup.

ADDITIONAL SOLENOID



Figure 3.10 - NG Fuel Control Manifold - Dual Solenoid for CE requirements.

# Burner Control and Temperature Control

## Burner Control Box Components

Refer to Figure 3.11:

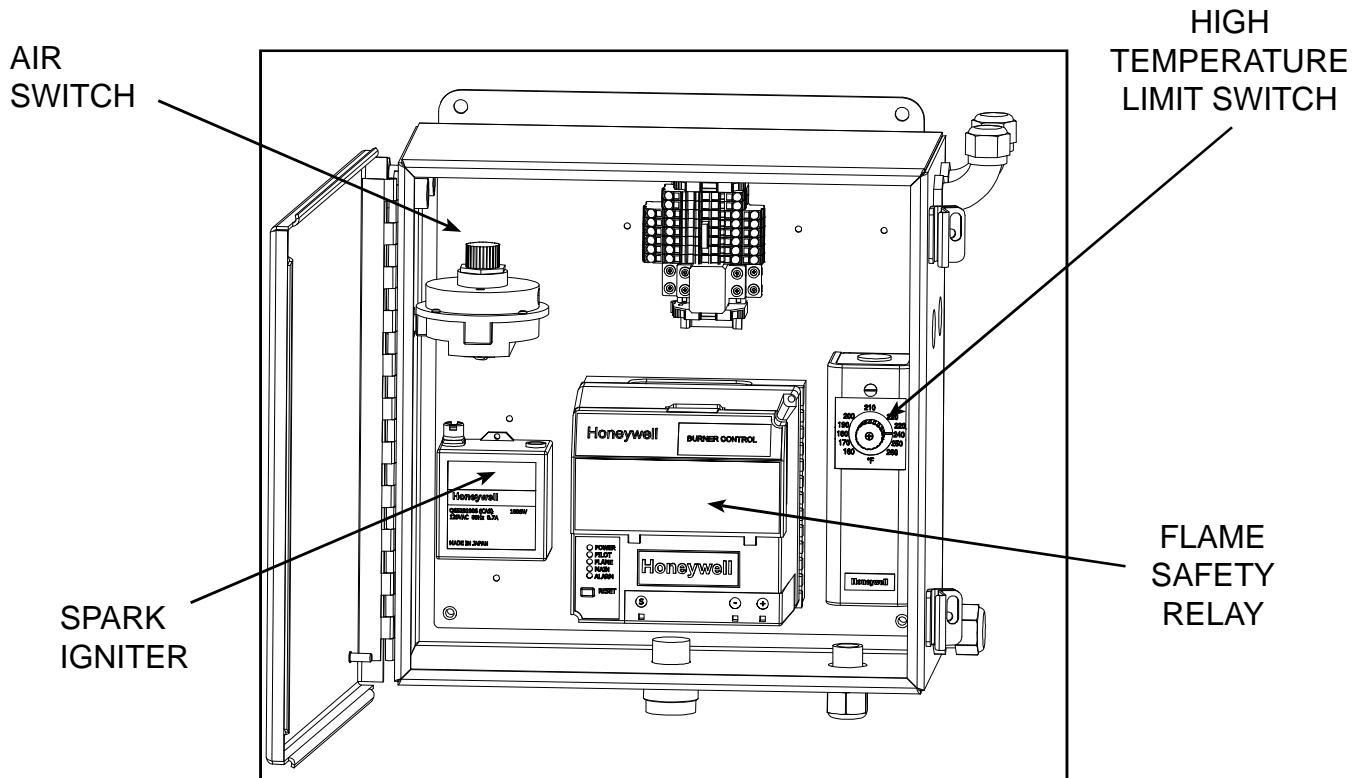


Figure 3.11 - Inside of the Burner Control Box

The Burner Box contains four primary components, which work together to control the combustion inside the dryer. They are:

- The **Air Switch** checks for airflow across the burner.
- The **Spark Igniter** sends voltage to the spark plug to light the pilot.
- The **High Temperature Limit Switch** allows manual control of the high temperature setting by adjustment of the knob. If the high temperature limit is exceeded, the dryer shuts down immediately with NO cool-down period.
- The Honeywell **Flame Safety Relay** checks functions related to combustion:
  1. Absence of pilot flame
  2. Adequate air flow
  3. Presence of burner flame
  4. High Temperature Limit
  5. Controls outputs for ignition, inlet valves, pilot valve, main valve, and burner reset lamp.



**HIGH VOLTAGE WARNING**—Turn OFF power to the system and Lock-out and tag-out power before opening the Burner Control Box or dryer interior for any reason.

## Components Located at Burner

Refer to Figure 3.12:

- The **Spark Plug** lights the pilot upon signal from the **Spark Igniter**.
- The **UV Sensor** checks for two separate conditions relating to the absence or presence of flame.
- The **Pilot Fuel Line** supplies the fuel for the pilot. This line comes from the main fuel train and has its own manual shut-off, pressure regulator, and solenoid valve.
- The **Air Switch Line** is connected to the **Air Switch**.

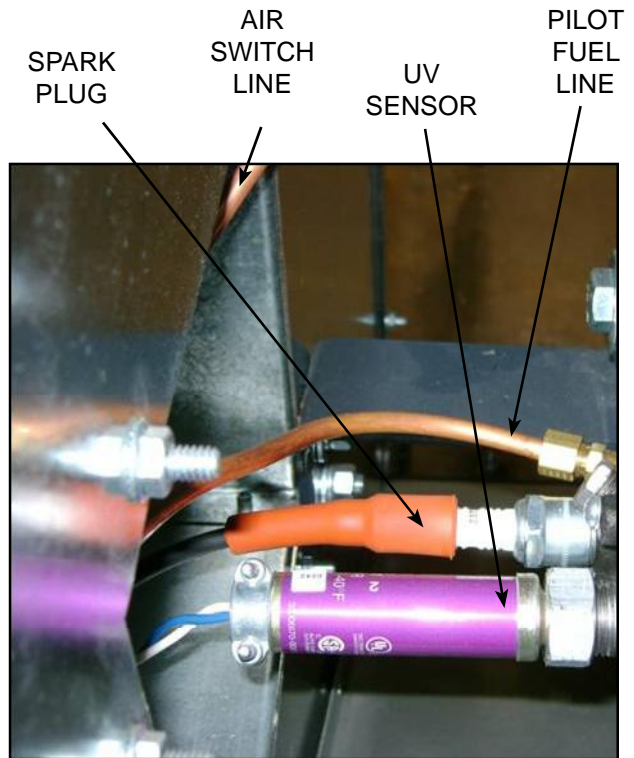


Figure 3.12 - Burner Components

## Components Located within Plenum

Refer to Figure 3.13:

- The **High Limit Temperature Bulb** registers the current temperature data for the **High Temperature Limit Switch**.
- The black twisted **Thermocouple Wire** is held in place with a clip and sends current temperature data to the **Watlow Temperature Control**.

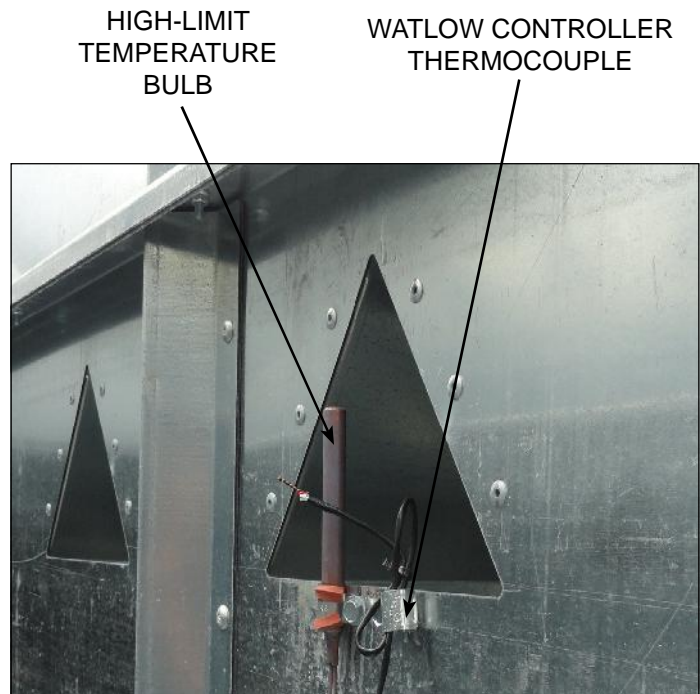


Figure 3.13 - High Temp Bulb & Watlow Controller Thermocouple (See clip - black twisted wire)



## Watlow Temperature Control Box

Refer to Figure 3.14:

- Each burner on the dryer system is coupled with a Watlow Temperature Control Unit.
- The burner ID # is stamped to the right of each temperature control unit.
- The current plenum temperature value is received by thermocouple wire. (See Figure 3.13)

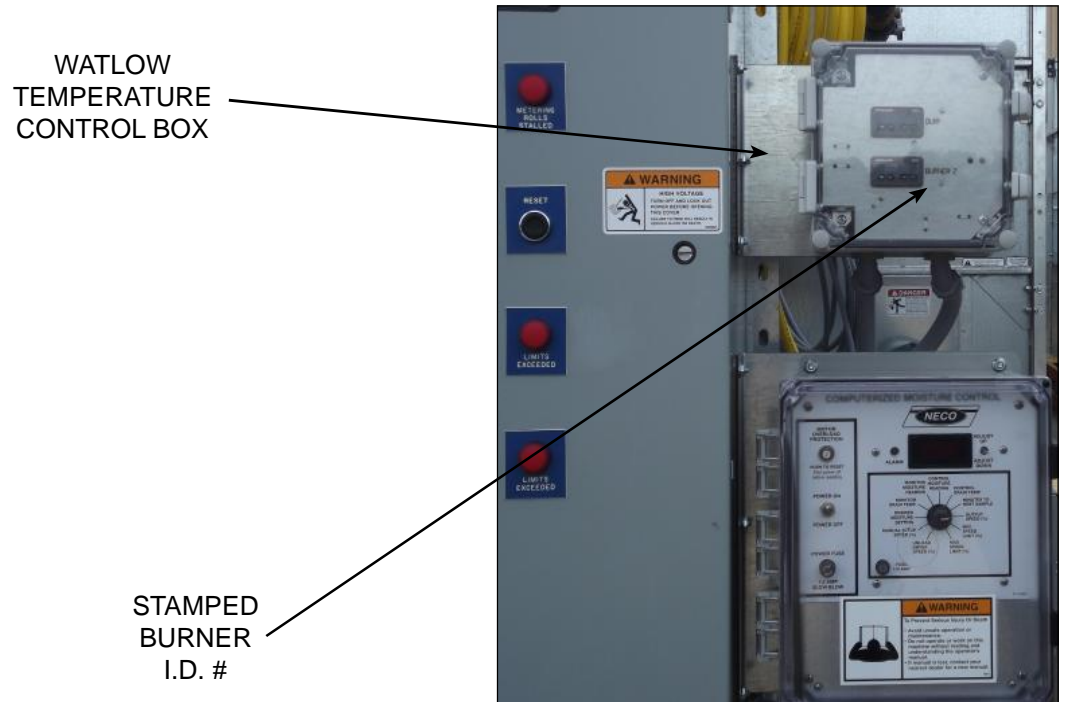


Figure 3.14 - Watlow Temperature Control Box

Refer to Figure 3.15:

- Set the desired air temperature for that burner by pressing the up or down arrows.
- Based on the temperature data, signals are sent to the fuel train modulating motor which will adjust the butterfly valve in order to vary the amount of fuel going to the burner.

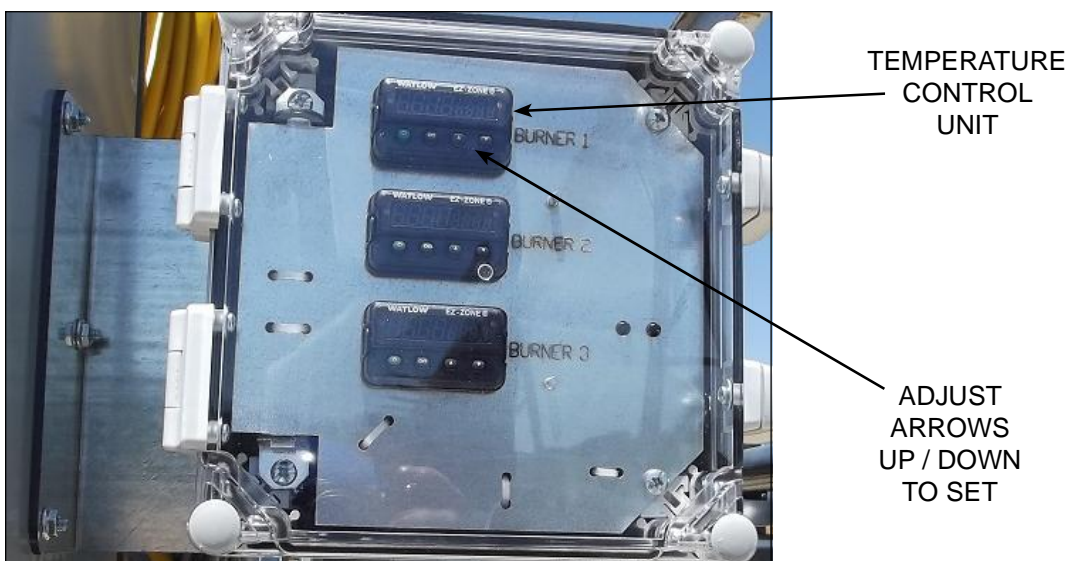


Figure 3.15 - Each burner has a temperature control

# Grain Level Switches

Refer to Figure:3.16:

In Continuous Mode the system is capable of monitoring 5 grain level switches. The following 3 grain monitors are included with the system:

- **Fill Dryer Switch** (NECO supplied, but installed on location during final assembly)
- **Low Dryer Switch** (NECO supplied and factory installed)
- **Plugged Discharge Switch** (NECO supplied, but installed by the customer)

Two optional grain monitors (customer supplied and installed) can be wired into the dryer control:

- **Wet Empty Switch**
- **Dry Full Switch**

## Fill Dryer & Low Dryer Switches

NOTE: The Fill Dryer Switch has three possible mounting options, depending upon the type of dryer fill system. See the Assembly & Installation Manual for all three mounting examples. The example shown below is of a roof with level auger fill system.

- The **Fill Dryer Switch** senses the presence of grain, it signals to shut off the filling auger and starts timer #5TR. The filling equipment will resume operation when the set timer runs out.
- The **Low Dryer Switch** is located in the very top tier of the dryer. It is designed to shut off the dryer just before any ducts are empty so that fuel will not be wasted. Once the switch has been triggered, if operating in continuous mode grain must be added or if at the end of a drying period the remaining grain will need to be dried in batch mode.

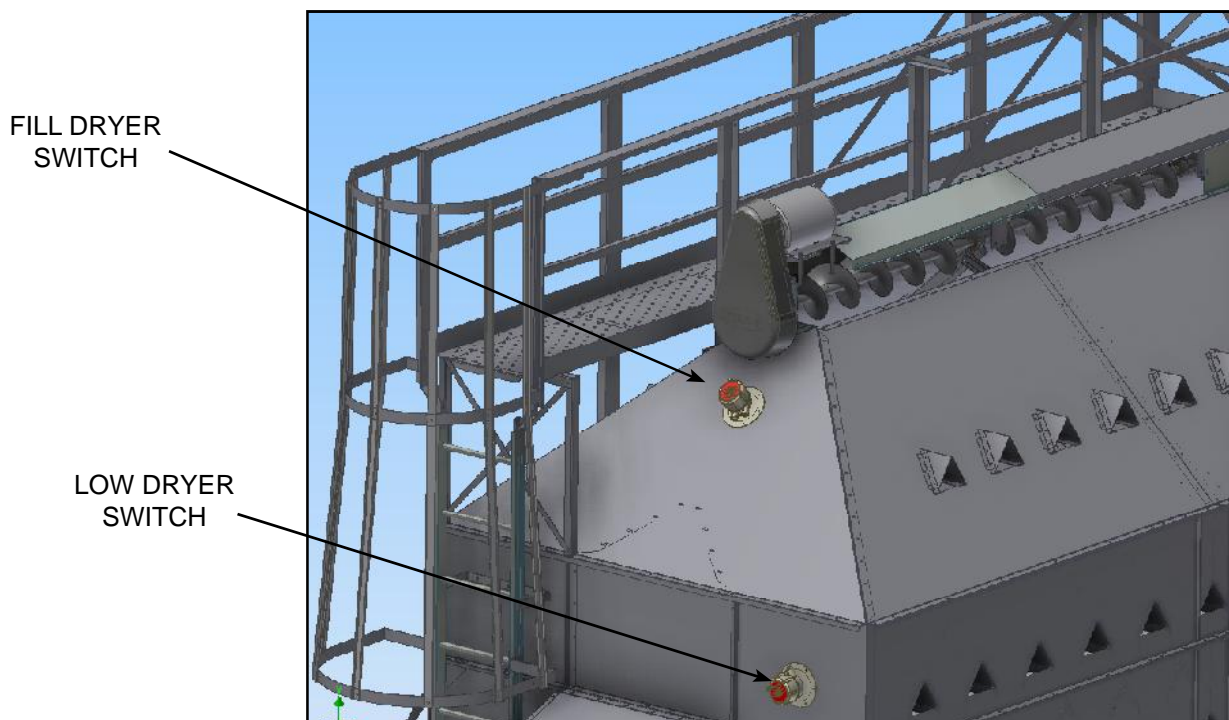


Figure 3.16 - Fill Dryer Switch & Low Dryer Switch

## Plugged Discharge Switch

Refer to Figure 3.17:

- The **Plugged Discharge Switch** is positioned by the owner. The ideal location is at the back of the dryer between the cross-auger and the take-away equipment. If a blockage occurs, grain will back up and put pressure against the diaphragm switch. The dryer will then shut down and the Discharge Plugged lamp on the control panel will turn on.

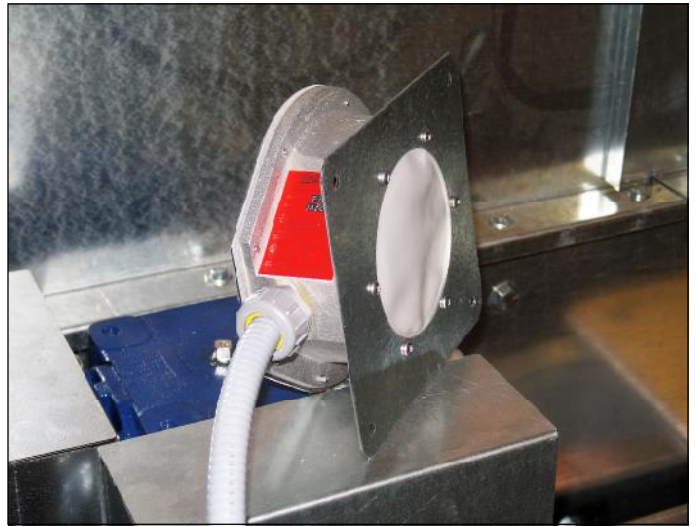


Figure 3.17 - Diaphragm Switch

## Wet Empty & Dry Full (Optional)

NOTE: The following two sensors can be wired into the NECO dryer control system. The customer supplies the switch, proper installation, and hookup. See the Dryer Assembly & Installation Manual - CE Version (#7713392) for mounting instructions and wiring information. Wiring information is also located inside the front door of the Control Panel on the wiring diagram. These two switches are the same as the Plugged Dryer Switch shown above and can be ordered from your dealer - ask for NECO part #040440 (Auger Switch Control #BM65-FHT).

- The **Wet Empty Switch** should be mounted at the bottom of the wet surge bin and detects when the wet grain supply is exhausted.
- The **Dry Full Switch** should be mounted at the top of the dry bin and detects when the dry bin is full.

# Blower System

Refer to Figure 3.18:

The blower motor, pulley, and blower housing are located at the lowest level of each dryer section. The primary purpose for the blower system is to provide airflow through the burner unit and heat the plenum area for each dryer section. The blower system in the lowest dryer section can also include an optional system that will cool grain - See Grain Cooling System.

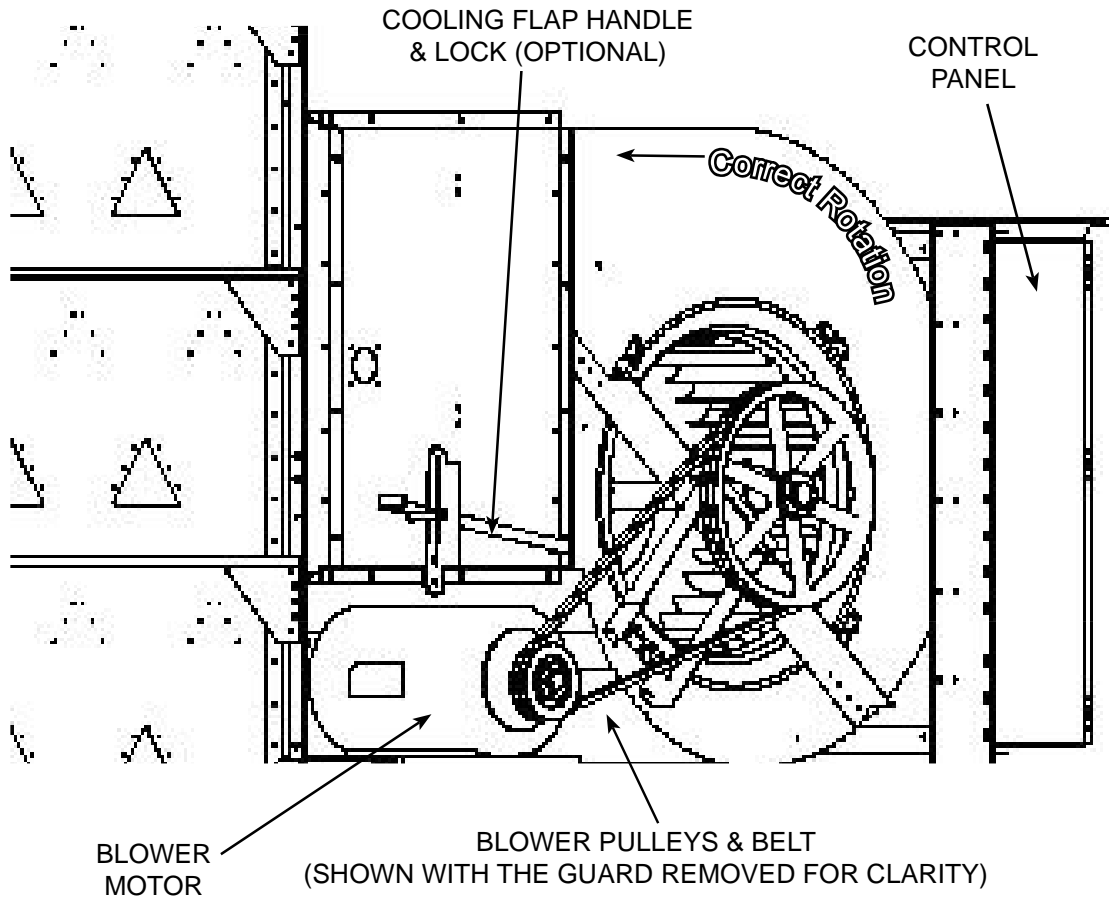


Figure 3.18 - Blower System - lowest dryer section shown (with optional cooling system).

Standard provision provides airflow through the burner system and into each plenum area:

- The blower motor size is provided per dryer configuration and customer requirements. Standard motors can be 15 HP to 30 HP. See APPENDIX - Standard Model Specifications for additional information.

# Grain Cooling System (Optional)

## General Overview

Refer to Figure 3.19A:

- An optional grain cooling system with either one or two cooling floors can be supplied with the dryer. Each of the cooling floors has door openings spaced evenly along the length of the dryer. The operator has the choice of several cooling choices for the grain.
- The cooling floor(s) work in combination with a manually positioned cooling flap that can direct a portion of the blower system airflow. The cooling flap is in-line with the position of the exterior handle so that the operator can tell at a glance where the cooling flap is positioned. (See Figure 3.18).
- The cooling flap position determines the amount of cooling air that reaches the grain. Moving the handle down will lower the cooling flap and increase the cooling. To lessen the cooling move the handle up and to shut off the cooling move the handle all the way up.
- The handle position should be secured with the locking system.

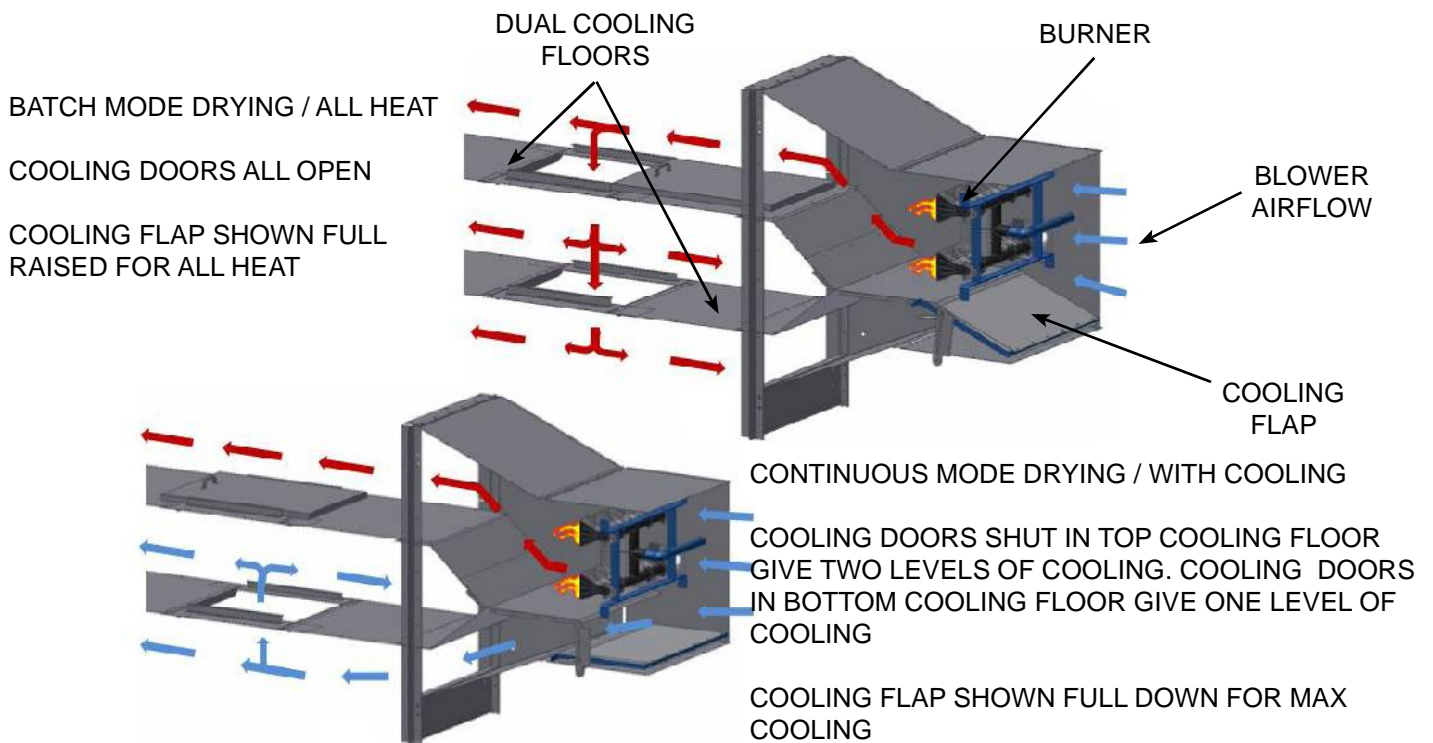


Figure 3.19A - Cooling System Overview - Showing Blower Airflow

## Cooling System - Batch Mode (All Heat)

Refer to Figure 3.19B:

- In Batch Mode drying, the cooling flap is in the FULL RAISED position, which directs all of the blower system airflow through the burner. The cooling floor doors are FULL OPEN, which provides for ALL HEAT to the cooling areas.

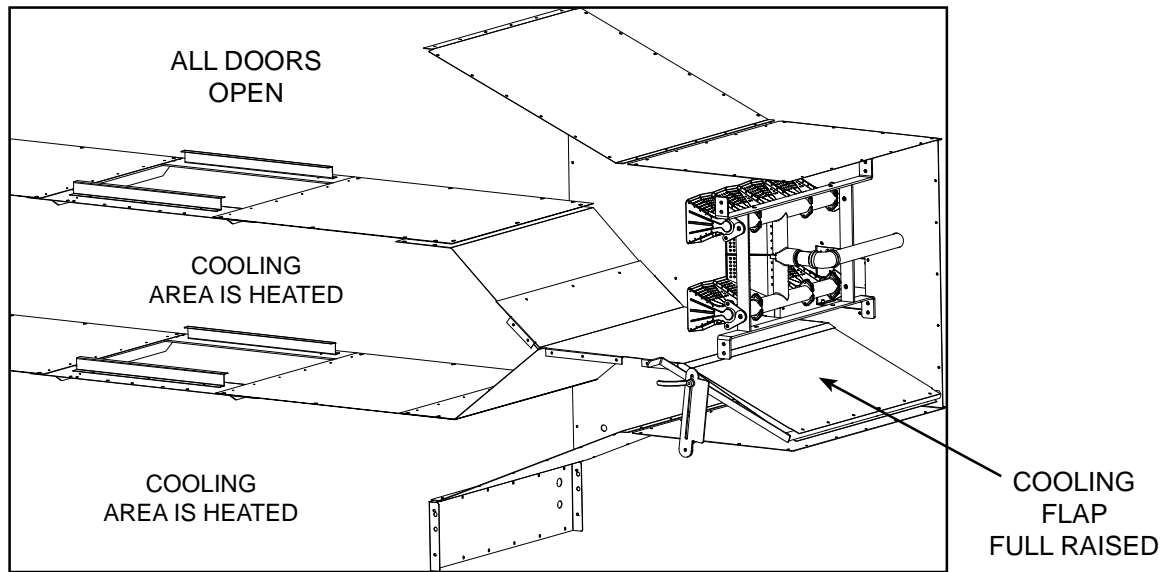


Figure 3.19B - Cooling System for Batch Mode (ALL heat)

## Cooling System - Continuous Mode

Refer to Figure 3.19C:

- In Continuous Mode, the operator can choose how much cooling and the amount of cool air. If the dryer has two cooling floors, the cooling doors can be CLOSED and positioned in the top cooling floor which would produce two levels of cooling. If the dryer has one cooling floor, the doors can be CLOSED which would produce one level of cooling. Adjust the cooling flap as needed - as the cooling flap lowers, more cooling air is supplied to the cooling area.

NOTE: Use the cooling doors and cooling floors to define what areas are designated to be for cooling the grain. Use the cooling flap position to determine how much cooling reaches the grain.

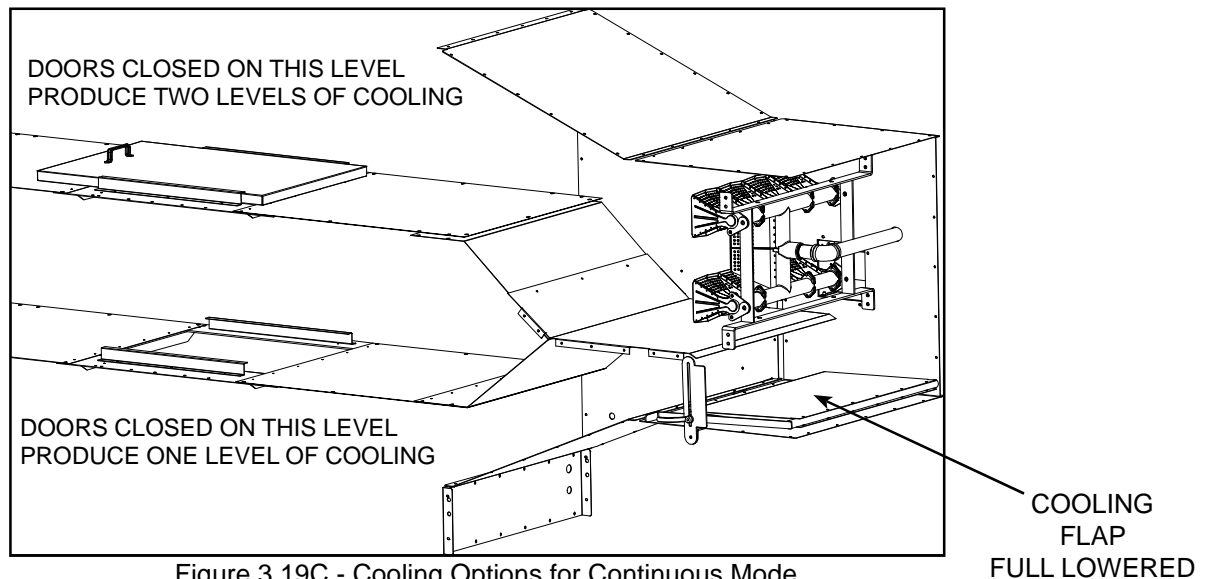


Figure 3.19C - Cooling Options for Continuous Mode

# Control Panel - Standard (CE)

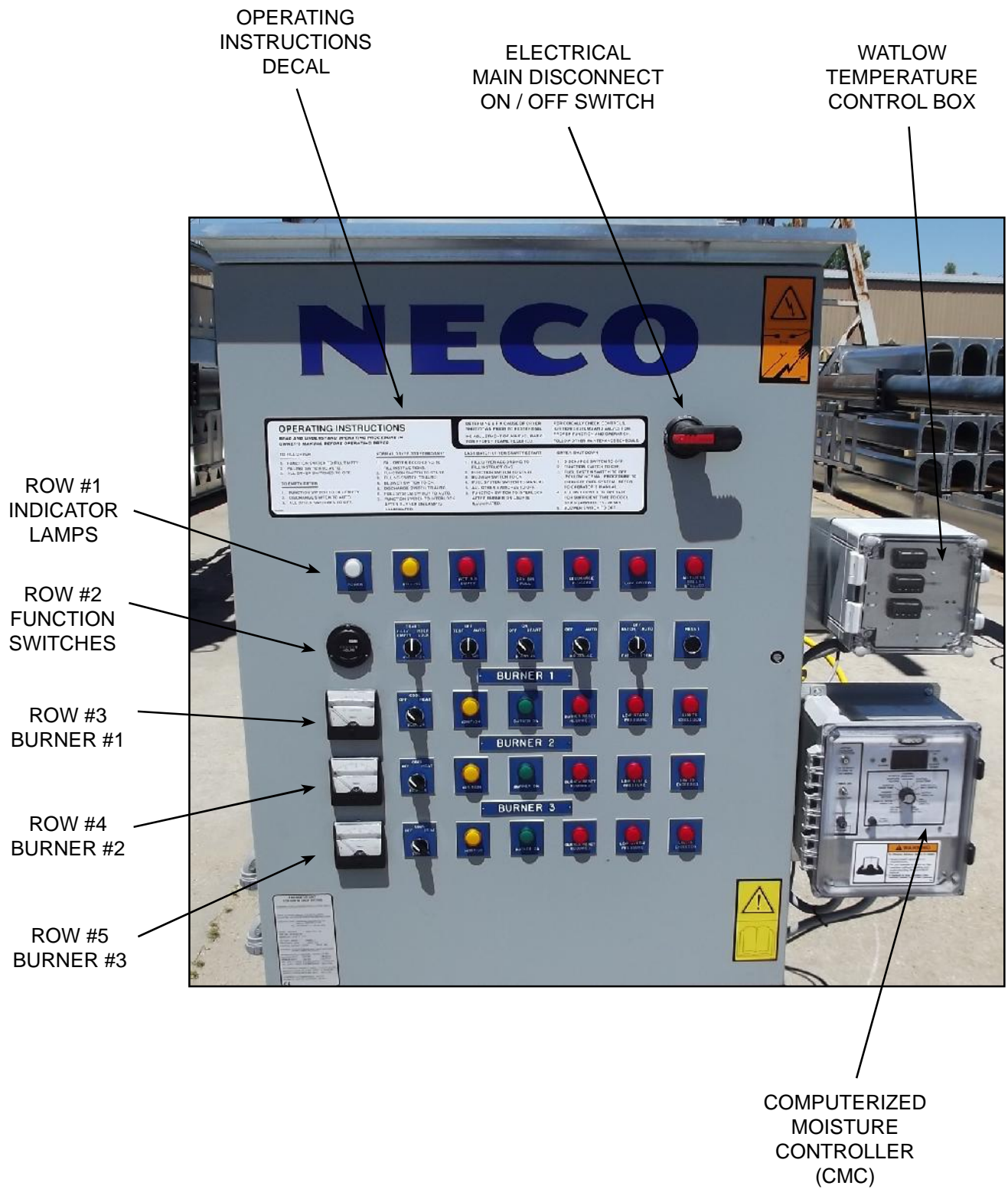


Figure 3.20 - Standard Control (CE) - View of Front

Refer to Figure 3.20A Standard (CE) Control Panel:

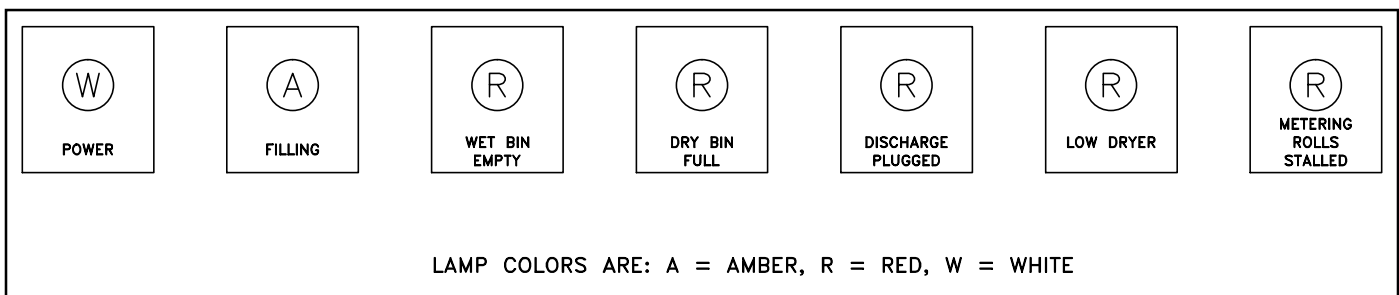
## Operating Instructions Decal

- To Fill Dryer
- To Empty Dryer
- Normal Dryer Start / Restart
- Last Batch Dryer Start / Restart
- Dryer Shut-Down

## Electrical Main Disconnect

- CE rated dryers have the Electrical Main Disconnect located within the Control Panel.
- It is NECO supplied and factory installed and has the ON and OFF positions labeled.

## Row #1 - Indicator Lamps



(Described as shown above - from left to right)

### POWER Lamp

- Indicates the dryer control is energized because the Main Disconnect is turned to ON.

### FILLING Lamp

- Indicates that the dryer is currently in the filling mode.

### WET BIN EMPTY Lamp

- Indicates when the wet bin is empty. The sensor for this lamp is optional and customer supplied. When activated, the dryer will shut down using standard Cool-Down procedures.

### DRY BIN FULL Lamp

- Indicates when the dry bin is full. The sensor for this lamp is optional and customer supplied. When activated, the dryer will shut down using standard Cool-Down procedures.

### DISCHARGE PLUGGED Lamp

- Indicates the discharge is plugged and stops the customers discharge system. Also, if the fuel system was set to "AUTO" position, it will also stop. Quick shut down - NO Cool-Down.

### LOW DRYER Lamp

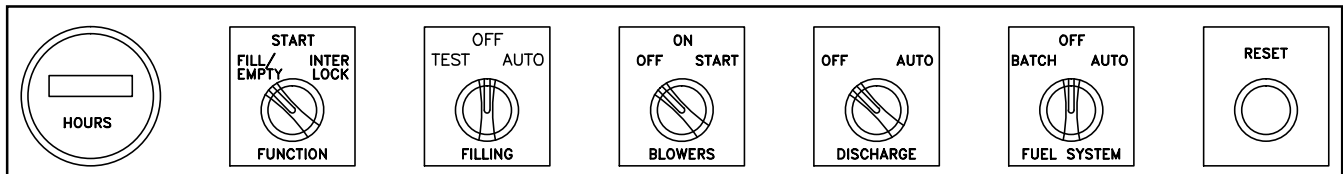
- Indicates the grain level is low. If the fuel system switch and the discharge were set to "AUTO" position, the dryer will also stop when the timer setting is reached. When activated, the dryer will shut down using standard Cool-Down procedures.

### METERING ROLLS STALLED Lamp

- Indicates the metering rolls have stopped turning. Quick shut down - NO Cool-Down.



## Row #2 - Hour Meter & Selector Switches



(Described as shown above - from left to right)

### HOURLY METER

- This meter collects the total hours of blower run time - single and multiple included together.

### FUNCTION Switch

- 3 Position switch that controls the following, upon 30 sec delay per timer #1TR:
  1. The **FILL / EMPTY** position is used when filling or emptying the dryer
  2. The **START** position is used to fill the dryer for both batch mode and continuous mode.
  3. The **INTERLOCK** position locks the discharge mechanism and the fuel system to the operation of the burners and blowers. The burners and blowers can operate in continuous mode only when in Interlock mode. While the Dryer is in the Interlock mode, any disruption to the discharge or fuel system will shut down the Dryer.

### FILLING Switch

- 3 Position switch that controls the following:
  1. The **TEST** position takes the Low Dryer and Fill Dryer sensors out of the circuit. Use this position when you want to test the filling equipment.
  2. The **OFF** position should be selected whenever the dryer is running in batch mode.
  3. The **AUTO** position is used when drying grain in continuous mode. When the grain level reaches the filling bin level switch, the leveling auger and the fill auger will stop.

NOTE - Overload relays for these auger motors are interlocked in such a way that if one motor overloads, the other will also stop.

### BLOWERS Switch

- Spring loaded 3 position switch controls the following:
  1. The **OFF** position turns ALL blowers off.
  2. Turn the switch to the **START** position and hold until the blower starts, then let it “spring” back to the ON position.

NOTE - The timer (#4TR) is used to keep the blowers operating after the burners shut down. The time can be set by the operator so that when no more wet grain is available, the blower will continue to cool grain left in the dryer.

## Row #2 (CONTINUED)

### **DISCHARGE Switch**

- 2 Position switch that controls the following:
  1. The **OFF** position turns the unloading system OFF
  2. The **AUTO** position is used when drying grain in continuous mode. If a burner stops for any reason, the auto discharge will stop. If the Discharge Plugged switch or the Dry Full switch detect grain, the unloading system will stop.

NOTE - Overload relays for these auger motors are interlocked in such a way that if one motor overloads, the other will also stop.

### **FUEL SYSTEM Switch**

- 3 Position switch that controls the following:
  1. The **BATCH** position is used only when running the dryer in batch mode.
  2. The **OFF** position turns the fuel supply OFF.
  2. The **AUTO** position is used when drying grain in continuous mode.

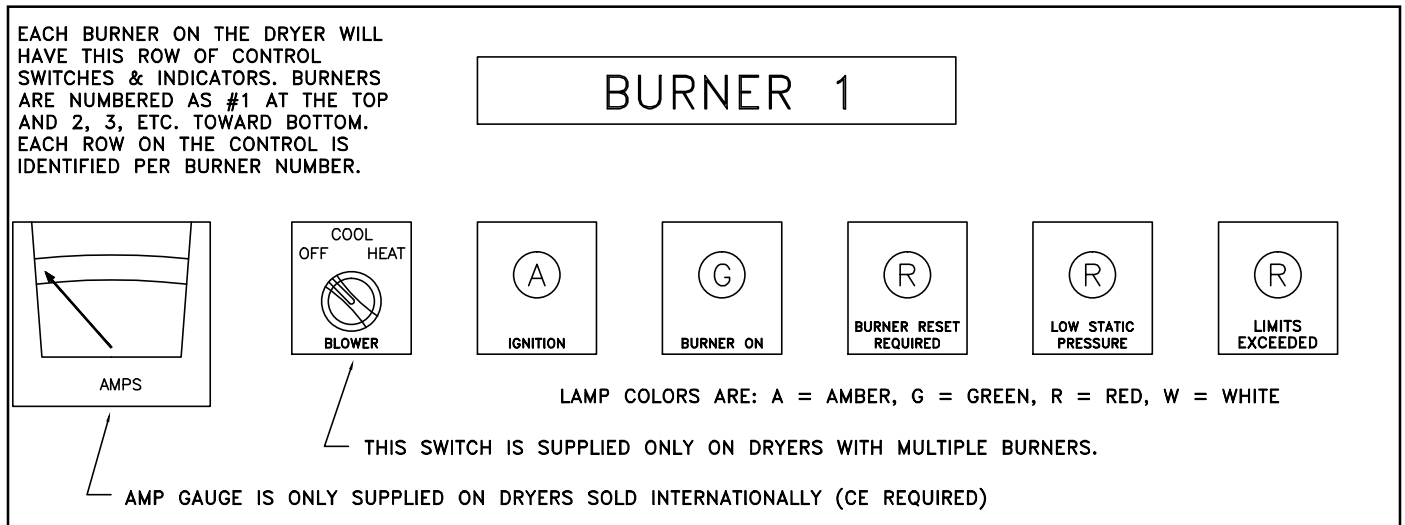
NOTE - In the AUTO position, fuel control is tied into all the safety control devices. Auger failure, depletion of grain supply, high limit, static pressure, etc. situations will stop the fuel and burners.

### **RESET Button**

- Push to reset any alarms that have been triggered.

## Row #3 - Burner #1

NOTE: On dryers with multiple burners, each burner will have this row. Identified as #1, #2, etc.



(Described as shown above - from left to right)

### AMP METER (ONLY on International dryers requiring CE ratings)

- This meter measures the amount of current flowing to that particular blower motor.

### BLOWER Switch - ONLY on dryers with multiple burners.

- 3 Position switch that controls the following:
  1. The **OFF** position is used to keep the blower turned OFF.
  2. The **COOL** position will run this burner's dryer section in the cooling mode (Burner OFF)
  3. The **HEAT** position is used to dry the grain in continuous mode and batch mode.

### IGNITION Lamp

- Indicates when the Honeywell controller is attempting to light the pilot. An ignition attempt will be made for 10 seconds maximum.

### BURNER ON Lamp

- Indicates when the pilot flame has been sensed and the main gas valve opens to the burner.

### BURNER RESET REQUIRED Lamp

- Indicates there is a problem somewhere in the flame safety process - such as loss of flame signal, high temperature, low airflow, etc. **MUST** be reset before you can restart.

### LOW STATIC PRESSURE Lamp

- Indicates there is a lack of airflow present for good burner operation.

### LIMITS EXCEEDED Lamp

- Indicates that the setting for High Temperature Limit has been exceeded.

# Computerized Moisture Control (CMC)

Refer to Figure 3.21 & 3.22::



Figure 3.21 - CMC Control Box



Figure 3.22 - CMC Moisture Sensor

## Overview

- The CMC works only when power is being supplied to discharge equipment and does not work when running the dryer in batch mode. The CMC unit is for operating in continuous grain drying mode only.
- The CMC moisture sensor is ideally located in one of the bottom three ducts - based on customer requirements. It measures the moisture content of the grain. See Figure 3N2.
- The CMC uses values from those moisture readings to compute how fast grain must flow through the dryer to achieve the targeted moisture content.
- An optional second moisture / temperature sensor is available to be added into the system. It is usually installed at the top where it will provide real-time moisture and temperature readings to readout on CMC, but does not control or provide any input to the CMC program.
- The CMC sends signals to the DC motor that controls the metering roll speed and maintains, increases, or decreases that speed so that grain will reach the targeted moisture content.

# Control Box Component Identification

Refer to Figure 3.23:

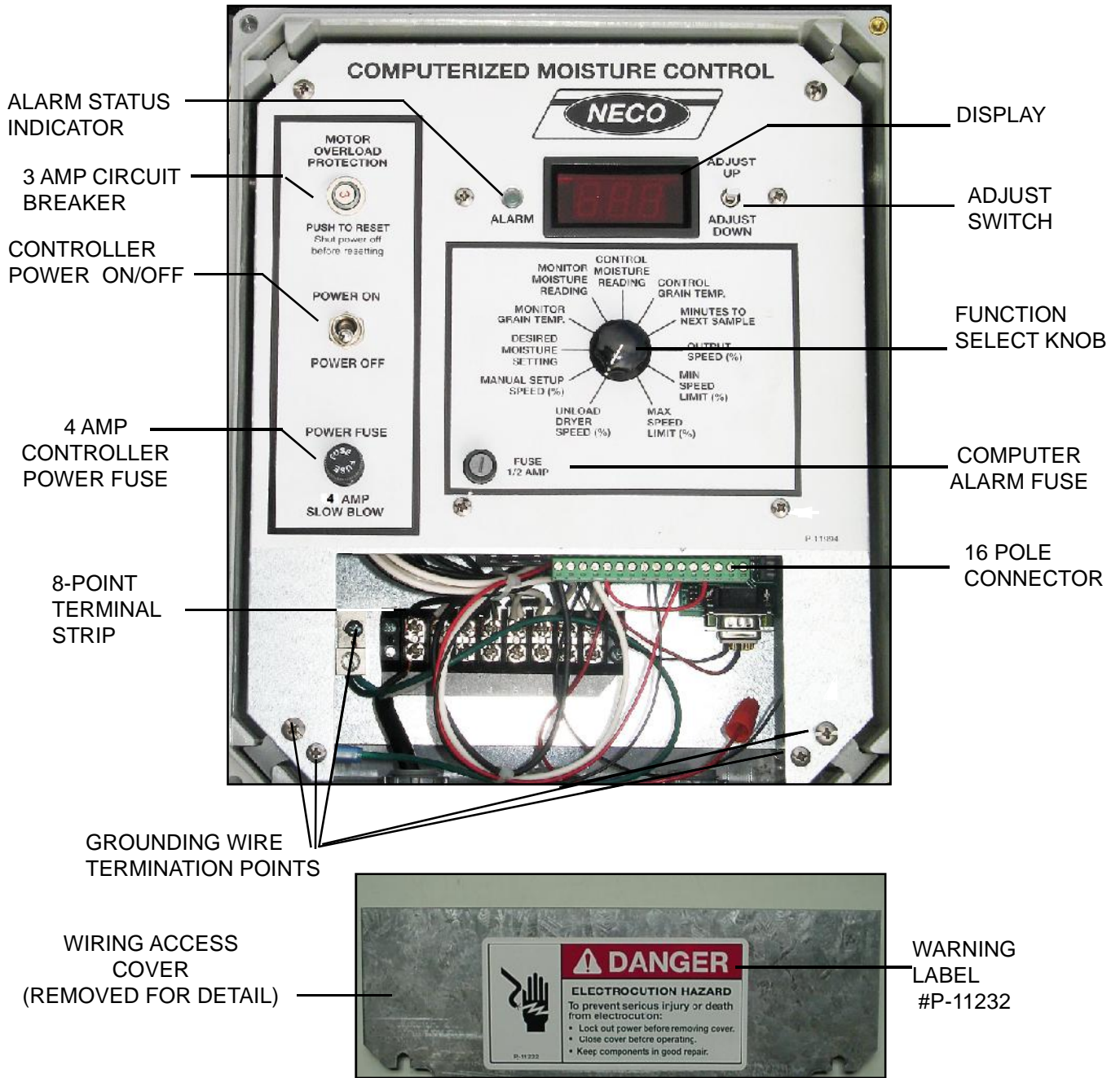


Figure 3.23 - CMC Control Box - Component Identification

## Alarm Status Indicator

- Indicator showing an error has occurred.

## 3-AMP Circuit Breaker

- Overload or short protection for the unit. Push to reset.

## Controller Power ON/OFF

- Turns power to the entire unit ON or OFF.

### **Computer Alarm Fuse**

- Replaceable ½-amp fuse.

### **Controller Power Fuse**

- Replaceable 4 amp, slow-blow fuse.

### **8-Point Terminal Strip**

- Power connections to the controller.

### **Ground Wire Termination**

- Uses these termination points to make grounded connections.

### **Wiring Access Cover**

- This cover should be in place at all times and has the DANGER - Electrocutation label.

### **Display**

- Displays current reading or status.

### **Adjust Switch**

- Adjust setting values up or down.

### **Function Select Knob**

- See the section titled *Function Select Knob Settings* below for descriptions of each selection.

### **16-Pole Connector**

- Optional control moisture sensor and monitor moisture sensor would be wired here.

### **Warning Label**

- Make sure a clean, legible warning label is in place on the front cover at all times.

## **Function Select Knob Settings**

### **MINUTES TO NEXT SAMPLE**

- How many minutes will elapse before the next sample is to be taken.
- The first sample is taken two minutes after the drying program starts and it takes about one minute to read the sensor.
- Default time is set to 3 minutes - adjusting downward to zero will start the sample process immediately or upward to a maximum of 60 minutes.

### **OUTPUT SPEED (%)**

- Displays the desired DC meter roll speed setting.
- It can be adjusted by the operator from the minimum speed limit to the maximum speed limit.
- The output speed setting will change based on the moisture data received from the control sensor as compared to the desired moisture setting.
- If the output speed setting is manually changed while the controller is reading the sensor, it will take about a minute to register.
- The default speed setting is 50%.

## Function Select Knob Settings (Continued)

### MIN SPEED LIMIT (%)

- Setting for minimum possible output speed (without an error).
- It can be adjusted from 1 to the maximum speed limit and must be within 10% of max speed.
- Use caution not to set this limit too high or wet grain may be transferred.
- The default setting is 25%.

### MAX SPEED LIMIT (%)

- Setting for maximum possible output speed.
- It can be adjusted from the minimum speed limit to 99 and must be within 10% of min speed.
- Use caution not to set this limit higher than the transfer system can handle or, if not set high enough grain may be overdried.
- The default setting is 75%

### UNLOAD DRYER SPEED (%)

- Setting for Manual Unload speed used only when unloading the dryer.

### MANUAL SETUP SPEED (%)

- Setting for current manual output speed used to set up the system prior to automatic control.

### DESIRED MOISTURE SETTING

- Setting required for the desired output moisture in the grain.

### MONITOR GRAIN TEMP (Optional)

- Displays the *temperature reading* from an optional monitor sensor (See NOTE).

### MONITOR MOISTURE READING (Optional)

- Displays the *moisture reading* from an optional monitor sensor (See NOTE).

### CONTROL MOISTURE READING

- Displays the *calibrated moisture reading* from the control sensor.

### CONTROL GRAIN TEMP

- Displays the temperature reading from the control sensor.

NOTE: Typically, the optional temperature & moisture sensors are mounted at the top of the dryer to inform the operator of incoming grain condition. These optional sensors are informational only. They provide data, but do not figure into the CMC program or are they used for any calculations.

# Discharge Equipment

The Discharge Equipment includes the following components:

- DC Drive Motor
- Stall Timer & Proximity Switch
- Metering Rolls
- Discharge Augers and Drive Motor
- Clean-out Doors

Refer to Figure 3.24:

## Overview of Discharge Equipment Operation

- As shown in Figure 3.3, the dryer incorporates a discharge system that runs along both sides from front to rear. Both discharge augers are powered by the discharge drive motor.
- The grain is fed to each discharge auger by a pair of metering rolls that are powered by the DC drive motor and controlled by the CMC unit. A safety switch checks the metering rolls for stalling.
- Each pair of cleanout doors close together to form a trough system around each discharge auger. The grain is moved toward the rear mounted cross auger, which combines the grain for discharge.

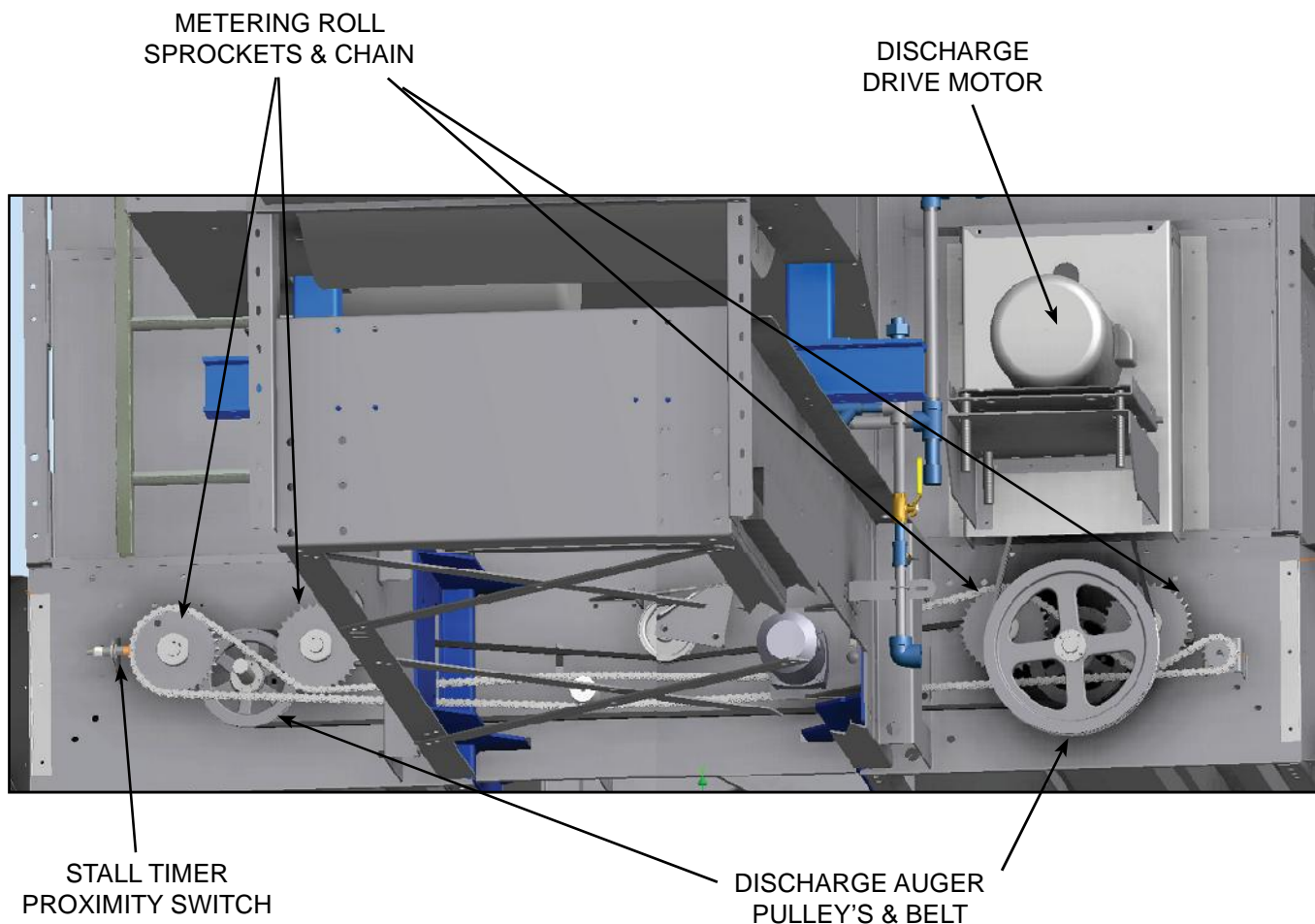


Figure 3.24 - Discharge Drive System view (NOTE: Guards are hinged open to show detail)



## DC Drive Motor

Refer to Figure 3.25:

- The DC motor is located under the front frame of the dryer.
- Chains run from the DC motor to drive sprockets on the ends of the metering rolls.
- The motor receives RPM input from the CMC unit based on the target moisture content.
- The motor will be one of the following sizes depending on the dryer model. See APPENDIX - Dryer Speed Recommendations Table 7.3 to determine initial starting RPM values. If the equipment was ordered Heavy Duty or Extra Heavy Duty for future expansion, there would be a larger motor installed than the ID plate model number indicates. Check the motor rating plate to be sure:

¼ hp 27 rpm	¼ hp 42 rpm
¼ hp 63 rpm	¼ hp 82 rpm
½ hp 93 rpm	

DC  
DRIVE  
MOTOR



Figure 3.25 - DC Drive Motor with Meter Roll Drive Chain

## Stall Timer Proximity Switch

Refer to Figure 3.26:

- The proximity switch to activate the stall timer (#8TR) is located to the left of the metering roll drive sprockets and senses the rotation of the sprocket.
- If the metering rolls jam or stall, the dryer will shut down normally with a cool-down period.'



Figure 3.26 - Stall Timer Proximity Switch

## Metering Rolls

Refer to Figure 3.27:

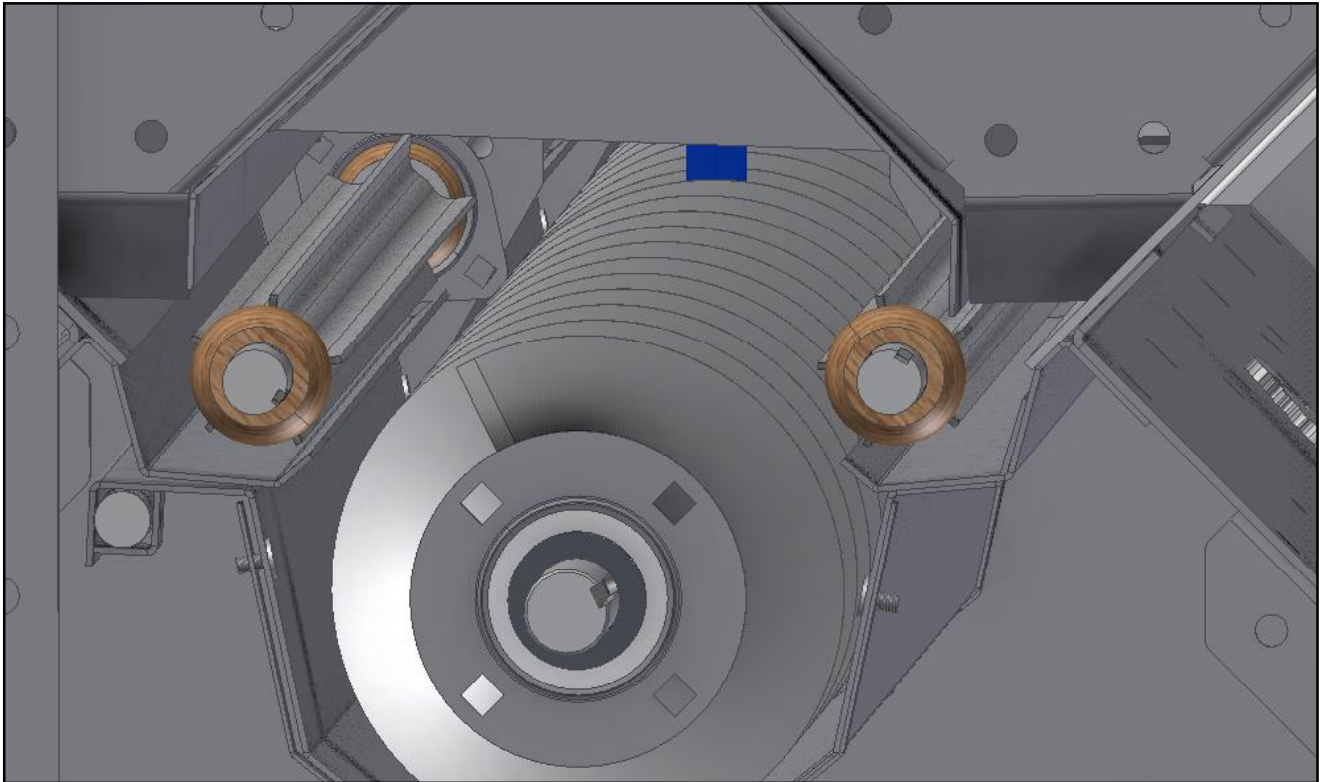


Figure 3.27 - Cut-away view showing metering rolls & discharge auger with closed cleanout doors.

- The metering rolls direct the grain to the discharge auger.
- Each pair of closed and sealed cleanout doors act as a trough for each discharge auger.

## Discharge Auger

Refer to Figures 3.27 and 3.28:

- The discharge motor turns the discharge augers counterclockwise, as seen from the front of the dryer. Grain moves to the rear.
- Each set of cleanout doors open for access to the discharge augers and provide ease of cleanout duties.



Figure 3.28 - Looking past open cleanout doors at the discharge auger.

## Rear Cross-Auger System

Refer to Figure 3.3 of EQUIPMENT OVERVIEW Section:

- The cross auger system combines the dried grain from the two main discharge augers and transfers it to a single discharge output. Customer discharge equipment takes over from there.
- The rear cross auger system can be supplied with a left-hand discharge, a right-hand discharge, or a center discharge.
- You can change the type of discharge if needed. Contact your NECO dealer.

## Cleanout Doors

NOTE: If the Clean-out doors are not closed and overlapped properly, grain damage can occur or grain can leak out.

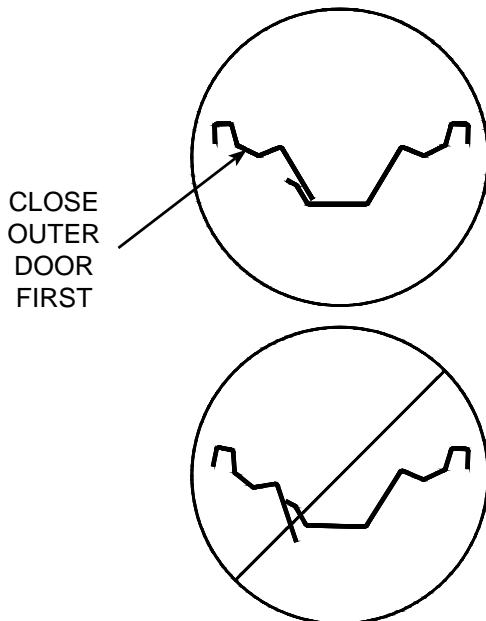


Figure 3.29 - Showing the outer door closed FIRST, then while holding in place, close the inner door.

Refer to Figure 3.29

- Close the outer clean-out door first.
- Then, while holding the outer door in place, close the inner door until it overlaps snugly.

Refer to Figure 3.30:

- While holding both clean-out doors in place, rotate the handle into the closed position.
- Use the steel cable to secure the handle.



Figure 3.30 - Showing the cleanout doors closed, with the outside handle in LOCKED position. Secure with the steel cable.

# 4. EQUIPMENT PRE-CHECK

This section provides hands-on information regarding primary tasks that must be completed before grain drying begins:

## Turn OFF Power

Refer to Figure 4.1:

- Make SURE all control panel switches are in the OFF position.
- Turn power OFF at the main disconnect and LOCK OUT all power.



Figure 4.1 - CE rated Standard Control Panel

## Check for Obstructions

- Make sure no one is in or around the equipment.
- Open the dryer and check the inside
- Look behind all guards for obstructions / debris / etc.
- Make sure that nothing will hinder the flow of grain through the dryer.

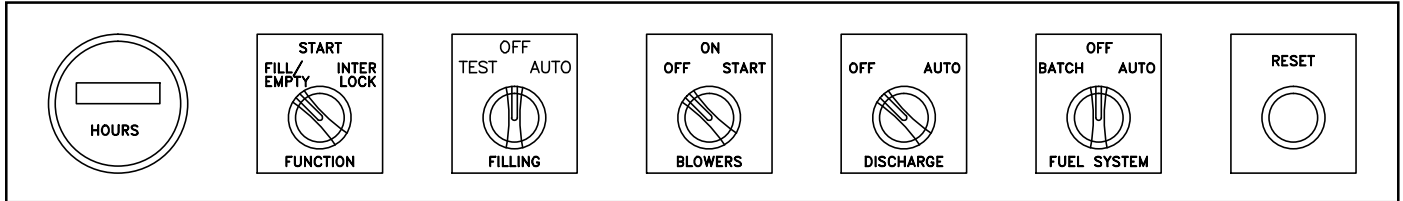
## Turn ON the Power

- Make SURE all control panel switches are in the OFF position.
- Turn power ON at disconnect.

## ATTENTION

**DO NOT fill the dryer until the discharge system has been checked.**

### Check the Discharge System



To start the discharge auger:

- Set the FUNCTION switch to FILL / EMPTY position.
- Set the DISCHARGE switch to the AUTO position.



**CAUTION - Use caution when removing guards for pre-checks, etc.**

Refer to Figure 4.2 and FOR BOTH LEFT & RIGHT sides of the dryer:

- Make sure the belt driven discharge auger is rotating counter-clockwise, as viewed from the front of dryer.
- Make sure that the chain driven metering rolls are rotating “over the top” toward the center, or toward the discharge auger.

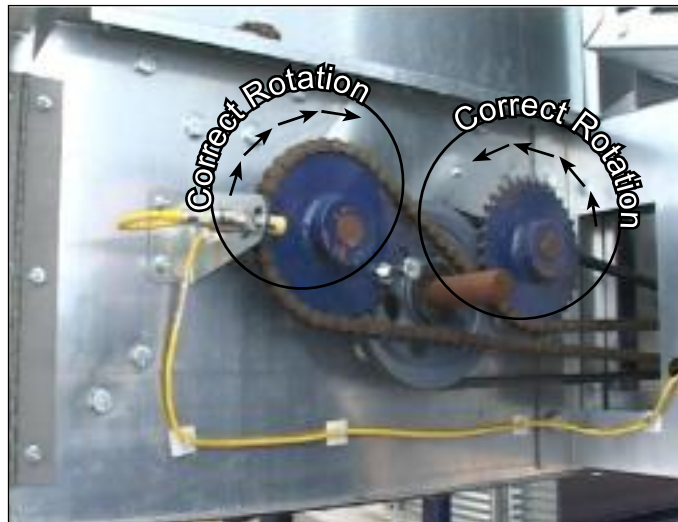


Figure 4.2 - One pair of metering rolls showing direction of rotation. The pulley and belt of discharge auger is between them.  
(Guard was removed to take this photo)



**CAUTION - Make sure all guards are in place after pre-checks, etc.**

# Check the Blower System

NOTE: Perform this check seasonally or if a blower motor is replaced, etc.

Check for proper blower rotation - shown in Figure 4.3:

- The blower should be counter-clockwise, as viewed from the blower drive side.



Figure 4.3 - Check rotation of blower

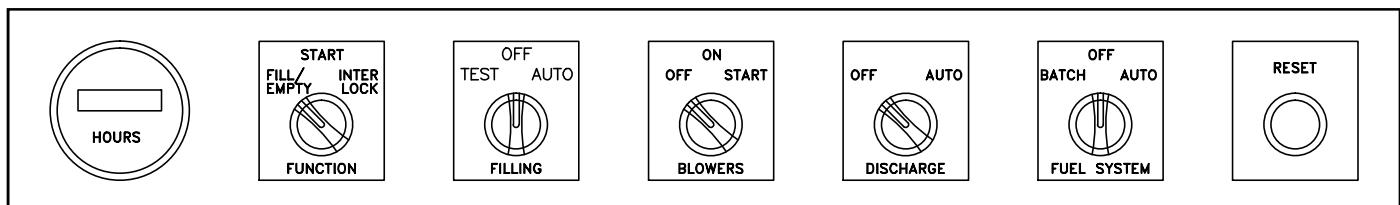
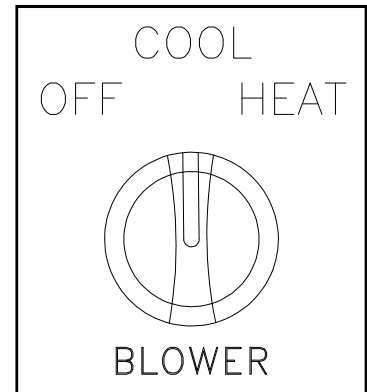
## IF THE ROTATION IS INCORRECT:

- Lock out / Tag out the power
- Check the blower motor wiring
- Reverse the leads, if needed.
- Restore power to the system
- Verify correct rotation

Due to staggered or timed blower startup, start with Burner #1 and Check EACH blower:

NOTE: The BLOWER switch is only on dryers with multiple blowers. Proceed with BLOWERS switch step if this is a single blower dryer.

- Move the BLOWER switch to COOL.
- Move the BLOWERS switch to START and then to ON. There is a delay between each of the blowers starting, so wait for the blower being checked to come on.
- Turn the BLOWERS switch to OFF.



- While the blower is still spinning, make sure it is turning counterclockwise, as viewed from the blower drive side. The forced air should be directed toward the rear of dryer section.
- Verify the proper operation of each blower.

## Verify CLOSED Position of Cleanout Doors

### ATTENTION

**DO NOT fill the dryer until the cleanout doors have been closed properly and secured.**

See EQUIPMENT OVERVIEW - Cleanout Doors for detailed examples.

## Verify CLOSED Position of Divider Doors

Divider doors should be closed during dryer operation. If they are not closed during dryer operation, each dryer sections blower system will not be separated for accurate temperatures, etc.



**DO NOT** open the plenum entrance door or enter the dryer plenum until the unit has been Locked Out & Tagged Out.

## Cooling Doors / Cooling Flap Adjustment (If Equipped with Cooling Option)

NOTE: See EQUIPMENT OVERVIEW - Grain Cooling System for detailed examples.

The position of the cooling doors and cooling flap depend on what mode of drying is being used:

- Batch (all heat) drying mode requires cooling doors to be open and the cooling flap to be fully raised, which directs all blower system air force through the burner.
- Continuous drying mode may require cooling dependant upon various conditions, so the cooling doors may need to be open, partially opened, or closed. The cooling flap may need to be partially raised or fully lowered.

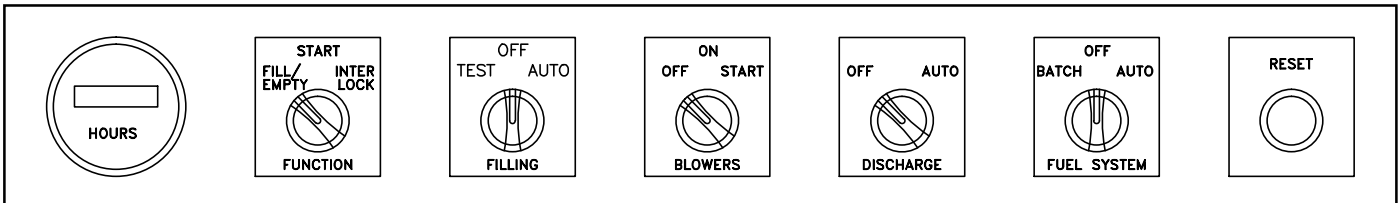
## Check System for Fuel Leaks

Using a qualified method for leak detection, check all possible areas for fuel leaks from the supply source to the dryer hookup and all accessible connections within the fuel train.

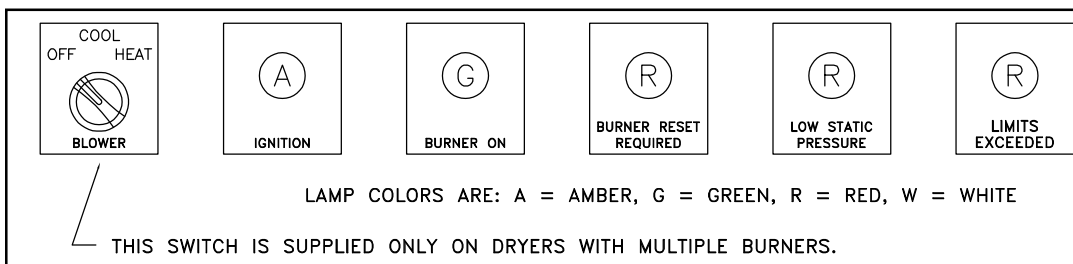
## Test Fire the Burners

- On LP fueled dryers, open the vapor valve on propane tank. If the tank is not equipped with a vapor relief valve, open the inlet liquid valve on the dryer approximately 1/8 turn.
- On NG fueled dryers, open all manual gas valves.

Set the following switches:



- All switches should start out in the OFF position.
- Set the FUNCTION switch to START.
- Set the FILL switch to AUTO.
- Turn the BLOWERS switch to START then to ON.
- Set the DISCHARGE switch to AUTO.
- After the blowers are running, set the FUEL SYSTEM switch to AUTO.



- After a 30 second delay, the illumination of the IGNITION lamps will signal the start of an ignition attempt. Burners get the signal to ignite on 10 sec intervals. When the UV sensor has verified flame presence, the green BURNER ON lamp will be lit.
- Turn the FUNCTION switch to INTERLOCK (within 30 sec or dryer will auto shutdown) to continue with Blower Motor amp check. Otherwise, leave the switch in AUTO to shut down.

NOTE: After shutdown, look at the fuel pressure gauge for any drops. If a pressure drop is encountered, shut down the dryer and check all fittings in that area for leaks.



## Check the Amperage of the Blower Motors (SEASONAL)



If you don't clearly understand the electrical aspects of these procedures, hire a licensed electrician.

Refer to Figure 4.4:

- The amperage of each blower motor should be checked.

**NOTE: The amperage should be checked when the dryer is FULL of grain. A full dryer will result in the highest static pressure for a true “full-load amperage” reading.**

- The blower motor(s) should be operating at about 90% of the “full-load amperage”.
- Check the blower motor(s) rating plate to determine what the full load amp rating is.
- Note that when no grain is present the fans can push more air, so the blower motors will pull significantly more amperage.
- Motor life can be reduced with regular or sever over loading.



Figure 4.4 - Blower Motor Rating Plate

Check the amperage for EACH blower motor by.

- All BLOWER switches in the OFF position (For multiple burner dryer systems only)
- Turn the selected BLOWER switch to COOL.
- Turn the BLOWERS switch to START and then to ON.
- Check to ensure the motor is operating within the 90% range.

After checking all blower motors:

- The system will automatically shut down (timer #1TR), when the FUNCTION switch is not moved to the INTERLOCK position.
- After shutdown, look at the fuel pressure gauges for any pressure drops. If a pressure drop is encountered, check all fittings in that area for leaks.

# 5. OPERATION

There are a many factors to consider when drying grain:

- The type of grain. Some varieties of grain are moisture-resistant compared to others.
- The end usage of the grain. Will it be used for seed, feed, commercial, or some other usage.
- The outside weather conditions including temperature, humidity, and even wind.
- The moisture content of the incoming grain.
- The cleanliness of the grain.

Initial startup needs to be done in a Batch Mode or “all heat” configuration. This is done to get one complete cycle of dried grain out the bottom. The operator may choose to cycle this first batch back through the dryer a second time, after the CMC program takes over for automated drying.

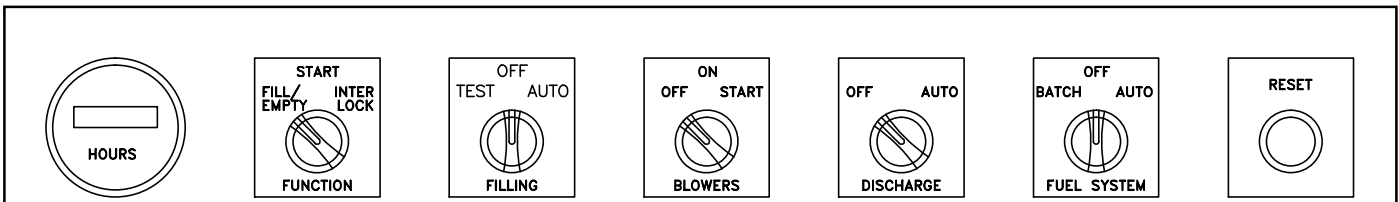
## Filling the Dryer



Be sure that the cleanout doors are completely closed prior to filling the dryer and that all guards are properly closed and secured.

- If your dryer is equipped with cooling floors, open the cooling floor doors fully and put the cooling flap in the all-heat position.
- On LP fueled dryers, open the vapor valve on propane tank. If the tank is not equipped with a vapor relief valve, open the main dryer liquid valve approximately 1/8 turn.
- On NG fueled dryers, open all manual gas valves on dryer.

Set the following switches to fill the dryer:



NOTE: Do not attempt to fill the dryer with FILLING switch in the TEST position because the grain level switches are excluded from the circuit. The augers will not stop, even when dryer is full.

- Power should be ON. Both the POWER lamp and the LOW DRYER lamp should be lit.
- Set the FUNCTION switch to FILL / EMPTY.
- Set the FILLING switch to AUTO.

NOTE: Fill the dryer about two tiers full and then check the operation of the discharge augers. (See Emptying the Dryer later in this section)

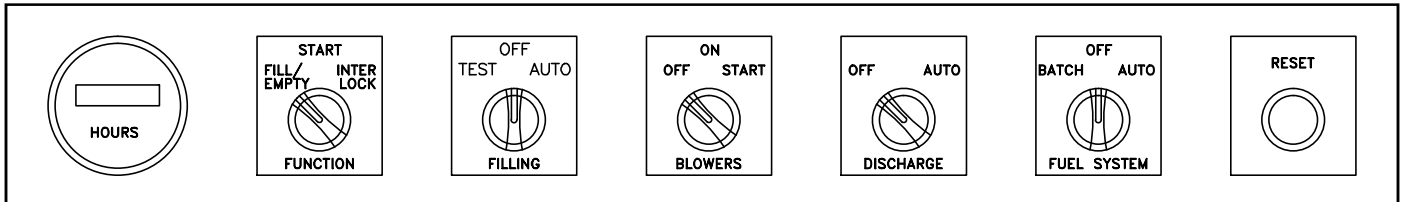
- Continue filling the dryer until the grain reaches the top. In AUTO mode, the LOW DRYER lamp will go OFF and the filling equipment will stop.

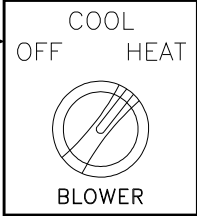
# Batch Mode Drying (ALL Heat)

NOTE: For proper moisture content testing, obtain a calibrated moisture analyzer. This will provide accurate results and is needed in batch mode to know when to transition to continuous mode and also in continuous mode to correctly calibrate the CMC moisture level setting.

Set the HI-Temp Limit in the Burner Control Box to 240F / 115C degrees.

Set the following switches to run the first cycle of grain in Batch Mode:



- Set the FUNCTION switch to START and set the FILLING switch to OFF.
- Set all BLOWER switches to HEAT (Multiple burners only). 
  - The diagram shows a circular switch with 'COOL' at the top, 'OFF' on the left, and 'HEAT' on the right. The switch is currently positioned towards the 'HEAT' position. The label 'BLOWER' is at the bottom.
- The DISCHARGE switch set to OFF
- Set the FUEL switch to BATCH.
- Turn the BLOWERS switch to Start and then to ON.
- After a 30 second delay, the illumination of the IGNITION lamps will signal the start of an ignition attempt. Burners get the signal to ignite on 10 sec intervals. When the UV sensor has verified flame presence, the green BURNER ON lamp will turn on.

**BURNER RESET:** During the process of burner ignition the Flame Safety Relay is checking for potential problems. If a Burner Reset light comes on, the first step is to push the Burner Reset button. This will start the ignition process for that burner over again. If the problem persists see APPENDIX - Troubleshooting Guide.

- Once the burners are ON, set the Watlow Controllers. In batch mode, the temperature is usually set highest at the bottom and is reduced somewhat for each burner toward the top. For example ONLY: On a 4 burner system, the setting at the bottom may be about 210F / 98C, the next burner up may be 200F / 93C, the next may be 190F / 87C, and 180F / 82C at the top. This is an example ONLY. The variable factors discussed at the very beginning of the OPERATION section will have the ultimate impact on what settings are chosen.
- Before opening the fuel line completely, make sure that the plenum is heating up correctly. For LP units, make sure that all vaporizer coils are working correctly. The 3/4" return line coming back from the vaporizer MUST be warm to the touch.
- Open the fuel line completely and verify the pressure settings on each of the systems regulators. For LP systems, set the regulator pressure 4-6 psi. For NG systems, set the regulator pressure 3-5 psi (See Overview Section for setting the regulators).

- Manually open the fuel lines all the way.

Refer to Figure 5.1:

- As the desired temperature is reached in each of the sections, check the modulating motor and butterfly valve to make sure the linkage arm is moving slightly as it adjusts the fuel flow to each of the burners.

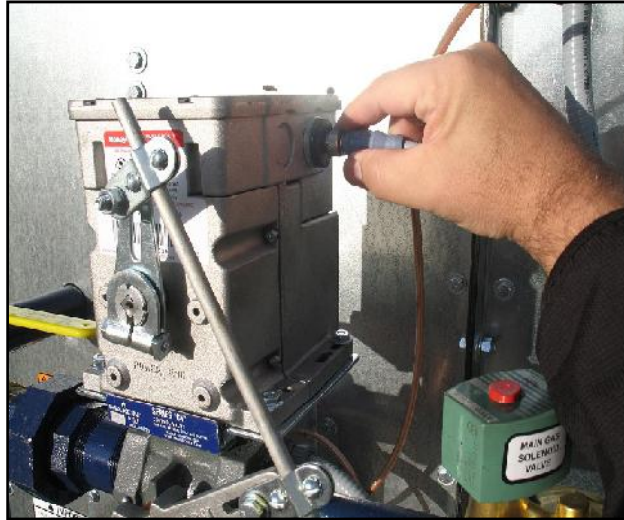


Figure 5.1 - Modulating Motor & Linkage Arm

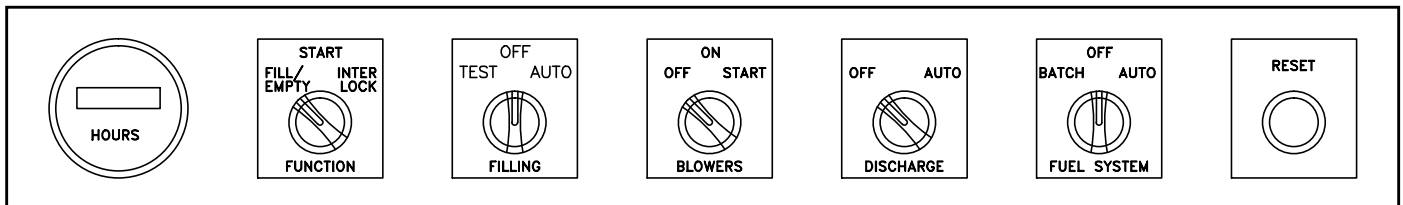
- Test the moisture content every 15 minutes. Remain in batch mode until the exit grain reaches the desired moisture content. Typically, the removal of 5% (corn) would take approximately one hour. Very wet grain can take several hours.
- When the dryer has completed the first batch to the desired moisture content the starting Batch Mode is complete.

NOTE: If grain is really wet or the target moisture was not quite met, but the decision to proceed to Continuous Mode processing is made, some operators will choose to circulate the first cycle back through the dryer after starting Continuous Mode.

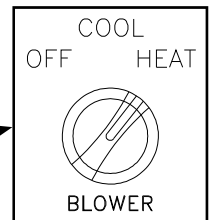
# Continuous Mode Drying

- If the dryer has optional cooling floors, the system can use a cooling mode. Refer to the EQUIPMENT OVERVIEW - Cooling System section for information on operating a dryer with cooling floor(s). If the dryer is not equipped with the cooling option, some operators run an entire dryer section in a cooling mode. To do this, turn the Blower switch to COOL for that dryer section while leaving the other Blower switches set to HEAT. If neither of these cooling modes is used, the dryer is considered to be in an 'ALL HEAT' mode.
- The best procedure is to pick a good starting speed of operation, accurately measure the exit grain for moisture content, and then adjust accordingly until the CMC unit can take over and produce automated operation.
- Continuous Mode generally has the Watlow Controller temperatures set hotter at the top of dryer and then progressively less as grain descends. For example, on a 4 burner system, the bottom temp setting may be about 180F / 82C, the next burner up may be 190F / 87C, the next may be 200F / 93C, and the initial top burner may be 210F / 98C. This is an example ONLY.

To proceed with full-time Continuous Mode:



- Leave the FUNCTION switch set to START position.
- Set the FILLING switch to AUTO.
- Leave the BLOWER switches set to HEAT (Multiple burners only).



NOTE: Based on the choice of cooling modes, if any, the bottom burner may be set to COOL or adjustment of optional cooling floors may be needed.

- Set the DISCHARGE switch to AUTO and turn the FUEL SYSTEM switch to AUTO.
- Verify that all Burner lamps are ON - note that burners start at approximate 30 sec intervals. If a dryer section is chosen for cooling and that blower switch was set to cool, this burner would shut off and the burner lamp would be off.
- Turn the FUNCTION switch to INTERLOCK within 30 seconds of the burner lamps coming ON. This setting ties the discharge to the flame safety relay control. If there is a problem that the safety system encounters, an automatic shut-down will occur. Depending on the conditions, the shut-down will either be immediate or will allow for a cool-down period.
- Set the temperature on the Watlow Controllers to the required burner temperature for each dryer section that is heated.

## Calibrating the CMC

Calibrate the CMC to read the target moisture content:

Refer to Figure 5.2:

- Refer to APPENDIX - Dryer Speed Recommendations Table 7.3 and choose an initial Discharge Speed for the metering rolls. Turn the function knob to MANUAL SETUP SPEED and set the desired speed percentage value using the ADJUST UP or ADJUST DOWN toggle.
- Discharge grain for about 15 minutes. Use the moisture analyzer to take a current moisture reading and compare it to the desired target moisture value. If the moisture content is too high, slow the dryer down. If the moisture content is too low, speed the dryer up. Repeat this process until the tested value matches the target value.



Figure 5.2 - Set the Manual Setup Speed (%)

Refer to Figure 5.3:

- Turn the function knob to DESIRED MOISTURE SETTING and set the value to match the measured moisture target reading by using the toggle adjust.
- During the drying process, if the grain moisture content needs to be changed, the DESIRED MOISTURE SETTING value can be adjusted at any time.



Figure 5.3 - Set the Desired Moisture Setting

Refer to Figure 5.4:

- To complete the CMC calibration, turn the function knob to CONTROL MOISTURE READING and adjust the percentage to match the tested value.
- With the control knob set in the CONTROL MOISTURE READING position the CMC will sample the grain's moisture content at regular intervals, starting within three minutes.
- The flashing light shows that a moisture reading is being taken. Based on that reading, the CMC will evaluate the set values between the DESIRED MOISTURE SETTING and the CONTROL MOISTURE READING. If a speed change is needed, it will direct a change to the output speed of the metering rolls.



Figure 5.4 - Set the Control Moisture Reading

## CMC Usage During Production

The dryer is now set to run for Continuous Mode drying.

NOTE: Keep taking moisture readings once every two hours to make sure the machine is operating safely and within the target moisture requirements.

- Since the moisture sensor is located at the bottom of the dryer, any change in the moisture content of incoming grain will not be detected until it reaches the sensor. It can take from one hour to several hours for the new grain to reach the sensor.
- If high moisture grain is added to a dryer that has been processing low moisture grain let the dryer make the correction.
- Immediate moisture samples can be obtained by turning the function knob to MINUTES TO NEXT SAMPLE and adjusting the value to 000. This will reset back to a 3 minute value automatically.

- Set the MAX SPEED LIMIT, while being careful not to exceed the transfer system's capacity. Set the MIN SPEED LIMIT to the desired level. The alarm indicator will come on if the MAX and MIN speed settings are more than 10 percentage points apart.

### NOTES:

- Changing the CONTROL MOISTURE READING calibration will change the moisture content of grain being discharged from the dryer.
- Changing the CONTROL GRAIN TEMP calibration will effect the CONTROL MOISTURE READING.
- Calibration cannot be performed when the controller is reading sensor information.

- Calibration should be checked periodically throughout the season—especially if temperatures, grain varieties, or test weights change significantly.
- Calibration and dryer settings will stay in memory even when power is lost. It is still a good idea to record the settings in case they are needed.

## Moisture Rebound

- Moisture Rebound can be defined as the equalization of moisture within a grain kernel after being rapidly dried. Since moisture is removed from the outer part of the grain kernel first, the inside is at a higher moisture content and that internal moisture will equalize outward.
- The amount of moisture rebound will vary depending upon the amount of moisture removed, and how fast that moisture is removed.
- Normal drying operations should include and account for basic moisture rebound. Use the following procedure to determine the compensation amount:
  1. Verify moisture content of exit grain and place in a tightly sealed container overnight.
  2. Check the moisture content in the morning.
  3. The difference between the two moisture values will be the moisture rebound amount.
  4. To compensate, “overdry” the grain by adding the rebound moisture value to the DESIRED MOISTURE SETTING.

## CMC Error Codes

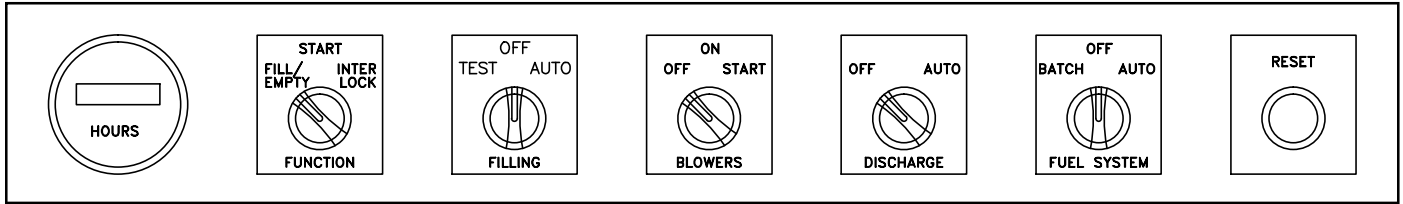
If a warning lamp is encountered:

- Px.x Program version number. Power was off.
- E02 Watchdog timer reset. A computer malfunction shut off the system.
- E03 Speed is at the maximum or minimum limit for too long.
- E04 Reading is out-of-range, or grain is too wet or too dry or not making contact with the sensor.
- E05 Moisture Sensor or cable has a problem.
- E06 Bad grain temperature. The temperature is below 1° or above 160° F.
- E07 Drying Parameter read error. Defaults are set, check settings.
- E08 No rotary switch input. Stops sampling. To clear, shut power off.
- E64 (Both and error 06 and an error 04) This is usually a cable connection problem.
- Stops sampling. Press adjust up or down to start drying program. Output speed goes to zero (6 volts to gear motor).



# Emptying the Dryer

To empty the dryer:



- Set the FUNCTION switch to the FILL / EMPTY position.
- Set the DISCHARGE switch to the AUTO position.
- Set all other switches to the OFF position.

The dryer will now empty out completely. The DISCHARGE PLUGGED sensor is included in the circuit when the DISCHARGE switch is in the EMPTY position and will stop the dryer emptying process if activated.

When the dryer has been emptied completely, proceed with the manual shut-down procedure.

## Manual Shut-Down Procedure (With Cool-Down)

To Shut-Down the Dryer from normal operation:

- Set the DISCHARGE switch to the OFF position.
- Set the FUNCTION switch to the START position
- Set the FUEL switch to the OFF
- Turn off the fuel supply at its source. (Propane tank or gas valve furthest away from dryer).
- Allow the burner(s) to operate until all fuel in the closed lines has been consumed.
- Close the main shut-off valves on the dryer.
- Turn off all switches except the blower switch(es).
- Allow blower(s) to operate for sufficient time to cool grain. Usually 15 - 20 minutes is adequate.
- Turn off blower(s).

# Emergency Shut-Down (Without Cool-Down)

NOTE: This procedure would only be used in an emergency situation where it was important to stop the equipment immediately.

To Shut-Down the dryer and supply utilities:

- The operator should instruct someone to go to the main fuel supply and turn OFF the supply of fuel to the dryer.
- Turn OFF electrical power at the main electrical disconnect.
- If the grain needs to be removed quickly from the dryer, open the cleanout doors and let the grain to flow freely.

## Clean Out & Storage

- Open the cleanout doors on both sides and let any grain fall thru. If needed, the discharge augers can be run briefly to ensure no grain is left on the topside of a stationary auger system.
- Clean out the Rear Cross Auger.
- For storage, the cleanout doors should be left open so that rain may fall through. Extra Heavy Duty dryer systems will need the cleanout doors bolted to the lower frame removed for rain to pass.
- The belts should be loosened and removed, then stored in a dark place.
- The chains should be removed and lubricated, then stored in an air tight container.

# 6. MAINTENANCE

NECO takes pride in choosing quality vendors and products in association with the design and manufacture of our products. Vendor supplied goods consist of motors, gear reducers, valves, switches, etc. OEM products have a service life related to operating conditions and usage. This information is to assist you in keeping your equipment in operating condition and to help obtain correct OEM data for proper maintenance.



**CAUTION:** Always use proper LOCK-OUT / TAG-OUT procedures during any maintenance task. DO NOT go near shafts or any augers or any moving part if the machine is running. Wear personal protective equipment (PPE) when necessary and follow all safety procedures as outlined in the SAFETY section of this manual.

Prior to each season or usage:

- Check fasteners & bolted connections. Tighten any loose connections and fittings.
- Check wiring connections. Tighten any loose connections.
- Complete the EQUIPMENT PRE-CHECK section and verify proper operation for each step.

During regular usage:

- Clean the plenum frequently during regular usage.
- Check the burner ports for blockage.

End-of-season equipment shutdown:

- Always leave the cleanout doors open when dryer is not in use to allow rain, etc. to pass through.

## Lubrication

Refer to Table 6.1 for lubrication requirements:

NOTE: On greaseable sealed bearings, DO NOT OVER GREASE. Over greasing will force out the seals causing contamination and rapid bearing wear from dust.

TABLE 6.1	
PART	TIME PERIOD or (HOURS of USAGE)
Gearbox, Cross Auger - 80/90 Gear Oil 1/2 Full	Check Weekly (100 hrs.)
Fan Shaft Bearings	Weekly (100 hrs.)
Rear Cross Auger Bearings	Weekly (100 hrs.)
Sealed Meter and Auger Bearings	Oil (Seasonally)
Roller Chains for Metering Rolls and Discharge Augers	Oil Weekly (100 hrs.)

## **Burner Gas Ports**

Conduct initial inspection within the first month after commissioning. Visually check the gas ports of new burner assemblies for any piping scale or debris. Use a pin vise and a #47 drill bit to remove any blockages. **DO NOT USE AN ELECTRIC DRILL**

Annual inspections are normally adequate once the initial piping debris are removed. Heavy usage of the burner may require checking and cleaning monthly or more.

## **Solenoid Valves**

All solenoid valves should be cleaned annually. The time between cleanings will vary depending on the service conditions. In general, if the voltage to the coil is correct, sluggish valve operation, excessive noise, or leakage will indicate that cleaning is required. In the extreme case, faulty valve operation will occur and the valve may fail to open or close.

Cleaning instructions and rebuild kits for valves can be obtained online from vendors such as ASCO, etc.

## **Motors**

The OEM drive motors can vary in size and manufacturer, depending on the dryer size and usage requirements. In order to properly maintain the various drive motors within your system, record the manufacturer, model number, etc. from the motors ID tag. Print off the manufacturers information pertaining to proper maintenance through their online resources.

# 7. APPENDIX

## Standard Model Specifications (CE)

Refer to Table 7.1 for some specifications of several common-size NECO Dryers. If the model number of your particular dryer is not shown below, contact your NECO representative.

<b>Table 7.1 - NECO Grain Dryer Specifications</b>						
<b>Model #</b>	<b># of Tiers</b>	<b>Holding Capacity (* Metric Tons)</b>	<b># of Burners &amp; Blowers</b>	<b>Total Blower CMM</b>	<b>Maximum Output (MJ / hr)</b>	<b>Minimum Output (MJ/hr)</b>
<b>12'</b>						
D1240	4	11	1	424	6	0.3
D1250	5	12	1	495	6	0.3
D1260	6	14	1	582	6	0.3
<b>16'</b>						
D1670	5	17	1	665	6	0.3
D1680	6	19	1	778	6	0.3
D1690	7	22	1	905	6	0.3
D16106	8	24	2	1035	12	0.6
D16120	10	29	2	1330	12	0.6
D16140	12	34	2	1556	12	0.6
D16160	14	39	3	1847	18	0.9
D16180	16	44	3	2221	18	0.9
<b>24'</b>						
D24108	6	29	2	1165	12	0.6
D24150	8	36	2	1556	12	0.6
D24180	10	44	2	1754	15	0.8
D24210	12	51	3	2334	18	0.9
D24240	14	58	3	2532	21	1.1
D24260	16	66	4	3113	24	1.2
D24300	18	73	4	3311	27	1.4
D24330	20	80	5	3891	30	1.5
D24360	22	88	5	4089	33	1.7
D24380	24	95	6	4669	36	1.8
<b>32'</b>						
D32260	12	68	3	3056	23	1.1
D32340	16	88	4	4075	30	1.5
D32440	20	107	5	5150	38	1.9
D32500	24	127	6	6112	45	2.3

\* These values represent corn @ 15.5 % - note that other grain and other moisture contents will result in different holding capacity amounts in metric tons.

# Specific Crops



**CAUTION:** For all crops, machine cleanliness is important and the accumulation of debris can be a combustion hazard. Some types of grain create more cleaning issues than others. Keep the equipment and work area clean.

## **Corn, Barley, Wheat and Oats:**

- These crops dry relatively trouble free.
- If incoming grain moisture is above 28% (especially wheat) consider two drying passes.

## **Rapeseed:**

- Due to the screenless design, rapeseed is as trouble-free as any other crop to dry.
- With rapeseed containing pods, it is advisable to clean out the machine at the end of each days' operation to prevent trash from building up.
- Watch the drying temperature carefully. Combustion is known to have occurred in rapeseed when seed temperatures reached about 155°F (68°C).

## **Flaxseed:**

- Similar conditions exist with flaxseed as with rapeseed, but flax is one of the most difficult crops to force air through.
- By keeping it moving, it will stay loose and more air will pass through. It will also tend to stick together and to the walls of the machine if it is not kept moving at all times. The blower speed may have to be lowered or the intakes partially covered in order to prevent it from being lifted out of the ducts.

## **Specialty Crops:**

- Sunflower seed will lift easily with too much blower speed and the equipment typically needs to be cleaned often.

# Dryer Temperature Recommendations

## High-Limit Temperature Consideration

To avoid tripping the “High Temperature Limit” switch, limit the drying temperature to 240° F (110° C). When a High Temperature Limit alarm is activated, the equipment will shut down with NO Cool-Down period (blowers OFF).

Table 7.2							
RECOMMENDED MAXIMUM TEMPERATURES IN THE NECO DRYER							
		FEED		COMMERCIAL		SEED	
		°F	°C	°F	°C	°F	°C
Barley, Oats, Wheat, Corn	Continuous-Flow	200+	93+	180-200	82-93	160	71
	Batch	160	71	140-160	60-71	130	71
Rapeseed, Flaxseed	Continuous-Flow	—	—	150-170	66-77	130-140	54-60
	Batch	—	—	130-140	54-60	110	43

In cases where the grain has a lot of trash, or when drying high moisture grain that is immature or frozen, drying at these temperatures may not be possible. In cases where there is blocking in the machine due to trash, it is possible for this material to become subject to spontaneous combustion. In this case and in any case where a person may see smoke coming from the machine, the blower(s) should be stopped immediately.

## Method to Measure Actual Seed Temperatures

When the machine is operating in the initial batch mode, there is a simple check to see what the maximum operating temperature can be. To determine correct kernel temperature, take a sample from a duct at the lower part of the heating section. Put into an insulated (covered) container, with a thermometer directly in the grain. After 10 minutes record temperature reading. NOTE: Putting a thermometer directly in the dryer only gives the temperature of the air between the kernels and not the correct temperature of the actual kernels

## Cool-Down

When stopping the machine the grain should be cooled down:

- **MANUAL COOL-DOWN** Turn off the burners, but leave the blowers running for a period of 5 - 15 minutes.
- **AUTOMATIC COOL-DOWN** The system has five possible grain level monitors. Certain conditions can result in the equipment automatically shutting down. Most of these conditions include a cool-down period. A few conditions, such as High Limit Temperature (Timer #4TR), that are reached provide a shut-down with NO cool-down period.

## Dryer Speed Recommendations (Corn)

Refer to Table 7.3:

These speeds are recommended as a STARTING POINT only. Use them for the start of Continuous Drying Mode - until the CMC enters the automated phase.

:

CMC SPEED (DC MOTOR %) PER MOISTURE POINTS TO REMOVE							
MODEL - RPM	3	5	7	9	11	13	15
D1240 - 27 RPM	42%	25%	18%	14%	12%	10%	9%
D1250 - 27 RPM	52%	32%	23%	18%	15%	13%	11%
D1260 - 27 RPM	63%	38%	27%	21%	18%	15%	13%
D1670 - 27 RPM	52%	32%	23%	18%	15%	12%	11%
D1680 - 27 RPM	62%	38%	27%	21%	17%	15%	13%
D1690 - 27 RPM	73%	44%	32%	25%	20%	17%	15%
D16106 - 42 RPM	53%	32%	23%	18%	15%	13%	11%
D16120 - 42 RPM	67%	40%	29%	22%	18%	16%	14%
D16140 - 42 RPM	80%	48%	34%	27%	22%	19%	16%
D16160 - 62 RPM	63%	38%	27%	21%	17%	15%	13%
D24108 - 27 RPM	62%	38%	27%	21%	17%	15%	13%
D24150 - 42 RPM	53%	32%	23%	18%	15%	12%	11%
D24180 - 42 RPM	67%	40%	29%	22%	18%	16%	14%
D24210 - 42 RPM	80%	48%	34%	27%	22%	19%	16%
D24240 - 62 RPM	63%	38%	27%	21%	17%	15%	13%
D24260 - 62 RPM	72%	43%	31%	24%	20%	17%	15%
D24300 - 83 RPM	61%	37%	26%	20%	17%	14%	12%
D24330 - 83 RPM	68%	41%	29%	23%	19%	16%	14%
D24360 - 83 RPM	74%	45%	32%	25%	20%	17%	15%
D24380 - 83 RPM	81%	49%	35%	27%	22%	19%	16%
D32260 - 62 RPM	54%	32%	23%	18%	15%	13%	11%
D32340 - 62 RPM	72%	43%	31%	24%	20%	17%	15%
D32440 - 92 RPM	61%	36%	26%	20%	17%	14%	12%
D32500 - 92 RPM	73%	44%	31%	24%	20%	17%	15%

Table 7.3 - Dryer Speed for % of Moisture Removal (Corn)



# Troubleshooting Guide

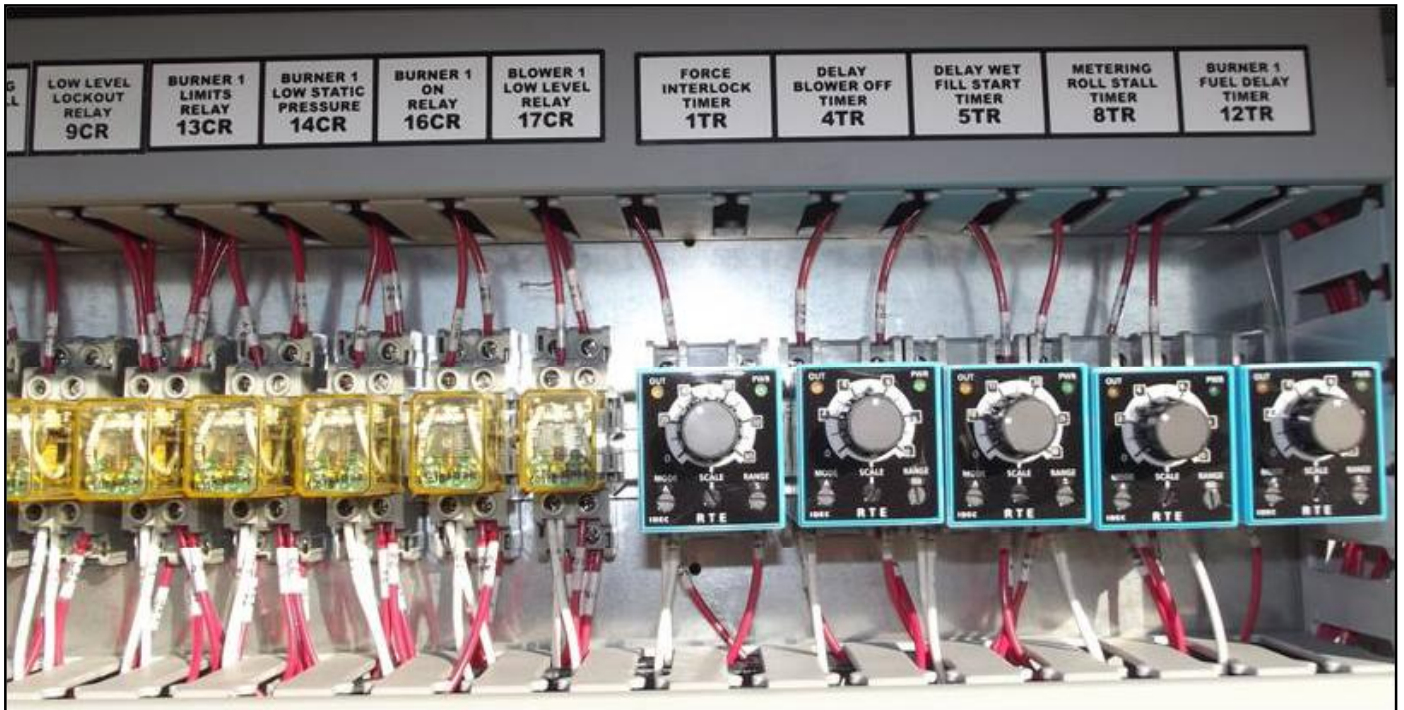


Figure 7.4 - Relays & Timers (Inside Control Box)



Figure 7.5 - Lamps & Switches

**TROUBLESHOOTING GUIDE - REFER TO FIGURES 7.4 & 7.5**

<b>Problem</b>	<b>Check...</b>	<b>Possible Cause</b>	<b>Possible Solution</b>
<p>The Dryer won't fill in AUTO mode.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>NOTE: A lit up lower lamp shows the timer is timing out. If both lamps are lit up, the timer has timed out.</p> </div>	If POWER lamp isn't lit...	No power is getting to the Dryer.	Turn ON power to the Dryer.
	If POWER lamp is lit...	Make sure you wait long enough for delay on time (5TR) to energize.	Wait for the on-delay timer to time out. The 5tr timer delays the start of the fill auger contactor. This is normally set for 10 seconds.
	Neither lamp is lit. 5TR timer is not timing...	The Rotary switch may be faulty.	Contact NECO dealer for replacement or repair.
	Both lamps on the timer are lit up—but the motor won't start...	Motor overload may have been tripped.	Reset the Wet Auger (2M) and the Level Auger (4M) overload relays. Ensure the motor protector is set to FLA (Full-Load Amps).
	The wet bin empty lamp is ON—while a Low Bin Level Switch installed...	The grain in Wet Holding Bin is low.	Fill the bin with grain.  Check & re-install.
	The (optional) wet bin empty lamp is ON—while a Low Bin Level Switch NOT installed...	There's a loose or missing jumper wire from terminal 7 to terminal 9.	Verify jumper wire from terminal 7 to terminal 9 is properly installed.
<p>The blower won't start.</p> <p align="right">(Continued... )</p>	The POWER lamp is not lit up...	No power is getting to the Dryer.	Turn ON power to the dryer.
	The circuit breaker 1CB in the panel has been tripped	Someone turned the breaker OFF or something caused it to be tripped.	Turn the breaker back ON. If the circuit breaker continues to trip, determine why (shorted wire, etc.)
	The overload on the blower motor contactor has been tripped...	The blower motor is overloaded.	Reset the overload relay. Check the amperage of the blower motor leads. The blower motor will pull the most amps when the dryer cooling flap is open. If the motor is pulling more amps than the nameplate rating specifies, check for loose connections. If connections are tight, then a smaller motor pulley needs to be installed.
	The Discharge Plugged lamp is ON...	Grain is pressing against the Discharge Plugged Switch.	Remove grain from the switch and/or reset the Discharged Plugged lamp.
	The Low Static Pressure lamp is ON...	The fuel switch is in the auto or manual position.	Turn the fuel switch OFF and reset the Low Static pressure on the panel. DON'T TURN the fuel ON until the blower has pressurized the plenum.

## TROUBLESHOOTING GUIDE

Problem	Check...	Possible Cause	Possible Solution
The blower won't start. (...continued from the previous page)	The Limits Exceeded lamp is ON...	A high temperature limit condition has shut down the Dryer.	Check the Dryer to determine the reason for the high temperature limit condition. Check the setting of the switch. Reset the high temperature limit on the panel.
	While the Power Lamp is OFF—improper or inadequate voltage may exist between the H1-H4 (line voltage) and/or between X1-X2 (120 volt)...	Fuses may have blown (Control Transformer Primary fuses 2FU & 3FU)	If no voltage reading between high volt transformer terminals H1-H4 (line voltage) then the 2FU and/or 3FU fuse has blown. Replace the blown fuse.  If there's no voltage between X1-X2 (120 volt) then the transformer may be bad. Replace the transformer.
The blower starts to go ON but stalls and stops when the switch is released.	The Low Dryer lamp is lit up...	Grain has dropped below the Low Dryer switch on the side of the Dryer.	Grain must be above this switch for the blower to run.  You may try starting the blower as this action may cause grain to shift and settle against the Low Dryer switch—which would remedy the situation.
	Grain is above the switch but the Low Dryer lamp is ON...	The Low Dryer switch is stuck.	After accessing the switch, tap on the diaphragm to unstick the switch.
	The auxilliary switch (5OL) on the blower contactor is not allowing current to pass...	There's a loose wire on the auxiliary switch. Dirt or grain particles are interfering with contacts.	Tighten wires.  Inspect and clean contacts or replace the switch.
	4TR timer is not plugged in...	The timer has become loose.	Make sure the timer is securely inserted into the base.
The blower starts and then shuts down.	The Low Static pressure lamp comes on when the fuel switch is turned to Auto.	The Air switch is not adjusted correctly.	Loosen the large nut on top of the Air switch and back the threaded collar out of the switch $\frac{3}{4}$ turn.

## TROUBLESHOOTING GUIDE

Problem	Check...	Possible Cause	Possible Solution
The blower runs and then shuts down.	The blower motor is pulling too many amps...	The overload relay may be getting tripped.	<p>Check the amperage of the blower motor leads. The blower motor will pull the most amps when the cooling flap is open.</p> <p>If the motor is pulling more than the nameplate rating, check for loose connections. If the connections are tight, then a smaller motor pulley needs to be installed.</p>
The Dryer does not try for ignition.	The switches are in the wrong positions...	The Fuel switch is not turned to Auto/ Batch.	Turn the Fuel switch to the Auto/Batch position.
	Relays are loose...	The "F" relay is not plugged in...	Make sure the "F" relay is securely inserted into the base.
	The power LED on the Honeywell Flame Safeguard IS NOT LIT...	The Honeywell Flame Safeguard may need to be reset.	Push the reset button on the cover of the Honeywell Flame Safeguard.
	The power LED on the Honeywell Flame Safeguard IS LIT...	The timer card in the Honeywell Flame Safeguard is bad or missing.	Replace or secure the time card.
<p>The blower is running and the ignition light comes ON, but the pilot does not light.</p> <p style="text-align: right;">(continued...)</p>	There's a lack of fuel...	<p>Fuel may not be turned ON at the supply.</p> <p>The manual shutoff valves may be open on the Dryer.</p> <p>There may be air in the fuel line.</p> <p>The liquid solenoid valves aren't opening.</p>	<p>Turn ON fuel at the supply.</p> <p>Open the manual shutoff ball valves on the dryer fuel line.</p> <p>Let the Dryer cycle several times to purge air from the system.</p> <p>When the fuel switch is moved to the Auto position, the liquid solenoid valves should click (on LP units). Place your hand on</p>

## TROUBLESHOOTING GUIDE

Problem	Check...	Possible Cause	Possible Solution
<p>The blower is running and the ignition light comes ON, but the pilot does not light. (Continued from the previous page)</p>		<p>The pilot solenoid valve is not opening.</p> <p>There is either too little or not enough fuel pressure.</p>	<p>on the solenoids to check for the click. You should be able to read pressure on the fuel gauge above the solenoids at this time. If not, check to see that there is power to the liquid solenoid terminals in the panel. If there is and if all the connections are good, replace the solenoid(s).</p> <p>30 seconds after the fuel switch is moved to the Auto position, the pilot solenoid valve should open. Check for this by placing your hand on the solenoid to see if it clicks. If it doesn't click, check to see that there is power to the liquid solenoid terminals in the panel. If there is power and if all the connections are good, replace the solenoid.</p> <p>Adjust the regulator.</p>
	<p>Lack of ignition.</p>	<p>The ignitor plug is dirty or wet.</p>	<p>Look through the view window on the rear of the Dryer and check to see if there is a spark. Clean the plug and adjust the gap to 3/16". Check to see that there is power to the transformer terminals in the panel. If there is power and if all connections are good, replace the transformer.</p>
<p>The blower is running and the pilot is burning, but the burner doesn't light.</p>	<p>The burner indicator light isn't coming ON.</p>	<p>The mini-peeper (UV sensor) isn't seeing a flame.</p> <p>The main fuel solenoid isn't energizing.</p>	<p>Clean or replace the mini-peeper as needed.</p> <p>Test for voltage at the solenoids. Check the wire connections at the Honeywell. If the connections are good, check that the solenoid clicks—if it doesn't click determine that power is getting to the solenoid. If so, replace the solenoid.</p>

## TROUBLESHOOTING GUIDE

Problem	Check...	Possible Cause	Possible Solution
The blower is running and the burner is ON, but the burner goes out when the Function switch is turned from START to INTER-LOCK.	The panel switches may not be set at the proper settings...	The Discharge switch may not be set to AUTO.	Set the Discharge switch to AUTO or the DRyer will time out and shut down.
	If the switches are set properly but the burner still shuts down...	The Discharge contactor(s) overload may have been tripped (1M & 3M).  The Contactor 1M auxilliary switch isn't closing.	•Reset the overload. Ensure that 1M & 3M motor protector is set to the motor FLA.  Test and replace the switch as needed.
The Dryer is running fine for a while but then the suddenly loses flame.	If the blower is still running...	The mini-peeper is losing sight of the flame.	Clean the mini-peeper and check for obstructions into the burner.
	If the blower is still running and the Low Dryer lamp is ON...	The Low Dryer switch shows that the Dryer has run out of grain to dry and is timing out to shut down.	Add more grain to the Dryer to continue drying.  Check the Low Dryer switch for possible obstructions and damage. Replace the switch if needed.
The Dryer is running fine for a while but then loses flame—for Dryers equipped with a Dry Bin Full switch.	The blower is still running and the Dry Bin Full lamp is ON...	The grain bin is full and the Dryer is timing out to shut down.	More storage is needed for the Dryer.
	The Low Dryer lamp is ON...	The Dryer ran out of grain and has gone through automatic shutdown.  The setting on the 5TR timer is too high and the Dryer is running out of grain before it can be replenished with wet grain.	The Dryer needs a new supply of grain. Then restart the Dryer.  Adjust the 5TR timer to a lower setting so that the level auger is turning ON and OFF more than needed.
(Continued...)			

## TROUBLESHOOTING GUIDE

Problem	Check...	Possible Cause	Possible Solution
The Dryer is running fine for a while but then loses flame—for Dryers equipped with a Dry Bin Full switch.  (...Continued from previous page)	The Low static pressure reset button is lit up...	The Air switch has detected low static pressure in the plenum.	Check that nothing is blocking the air tube inside the plenum and that the air tube is facing the blower. Push the reset button and restart the Dryer. If the problem persists the air switch may need adjustment.
	The High Limit reset button is lit up...	The plenum temperature has reached the High Limit setting	Check the High Limit setting with the Temperature setting at which the Dryer is operating. The high limit controller is not very precise and the set temperature may be off by as much as 10 degrees Fahrenheit. Adjust the high limit if necessary. Push the reset button and restart the Dryer. Watch the Dryer run for a while and determine that everything is running smoothly and safely.
	The High Limit reset button is lit up shortly after the burner comes ON...	The fuel pressure may be set too high—or there may be a very large temperature differential between the set temperature and the ambient temperature.	Lower the fuel pressure or lower the temperature setting until the burner comes on. Then gradually ramp back up to the desired temperature.
The Dryer is operating fine for a while, but then shuts down.	The Plugged Discharge reset button is lit up	The Plugged Discharge switch has been tripped at the rear cross auger.	Check the drive belts for proper tension. Check the chains to the rear cross auger to make sure they are in place and properly adjusted. Make sure power is OFF. Unplug the auger. Push the reset button and restart the Dryer.
The Dryer is running, all function switches are in their proper positions—but grain is not being metered out.  (continued...)	The Moisture Controller may not be getting power...	Is 3M aux contact switch not closing?	Clean and adjust or replace the auxiliary switch if necessary.
	Red lights may be lit up inside the Moisture Controller box	Is the Power switch ON inside the Moisture Controller Box?	Turn ON the switch
		Blown fuse	Replace with a 4 amp fuse.

## TROUBLESHOOTING GUIDE

Problem	Check...	Possible Cause	Possible Solution
The Dryer is running, all function switches are in their proper positions—but grain is not being  (...continued from the previous page)	There's power to the Moisture Controller but the motor is not turning the metering rolls...	If the moisture controller is in the manual mode with speed dial set at the lowest setting....	Use the speed dial to briefly increase the speed to the point where the metering rolls turn a couple revolutions, then return the speed dial to the previous setting.
		The DC voltage output module could be defective—it may not be sending power to the gear motor that powers the metering rolls.	Contact your NECO dealer for replacement parts and/or repair.
The Dryer is not maintaining the set temperature.	The thermocouple wire inside the plenum is still intact.	The wire may be broken or the wire insulation may be gone.	Contact your NECO dealer for replacement parts and/or repair.
		The wire could be touching and grounding to the metal wall of the dryer.	Bend the wire away from the wall of the dryer so it isn't grounding to it.
		Lamps are lit up in the Watlow panel.	Contact your NECO dealer for replacement parts and/or repair.
There is power to the Watlow; temperature is ok; linkage is set—but temperature is still not being controlled.	The linkage between the modulating motor and the butterfly valve is not secure.	The linkage could have been shaken loose during shipping.	Contact your NECO dealer for instructions regarding the proper setting of the linkage.
	The modulating motor may not be modulating...	The transformer in the modulating motor might be defective.	Contact your NECO dealer for replacement parts and/or repair.
		The programming in the Watlow panel could have been erased.	Contact your NECO dealer for reprogramming of the Watlow panel.



# Replacement Parts

## Standard Control Panel

PART #	DESCRIPTION
044485	TIMER RTE-P1AF20 100-240V IDEC
044262	TIMER BASE 8PIN SR2P-05C IDEC
044495	RELAY RH2B-UL AC110-120V IDEC
044496	RELAY BASE SH2B-05C IDEC
044929	INCANDESCENT LIGHT BULB -120V
044927	RED LED
044926	GREEN LED
045096	YELLOW LED
044928	WHITE LED
044924	N.O. CONTACT BLOCK
044925	N.C. CONTACT BLOCK
040452	2 POSITION SWITCH
044604	3 POSITION SWITCH
044605	3 POSITION SWITCH - LEFT
044625	3 POSITION SWITCH - RIGHT
044923	MOUNT COLLAR FOR SWITCH

## Computerized Moisture Controller (CMC)

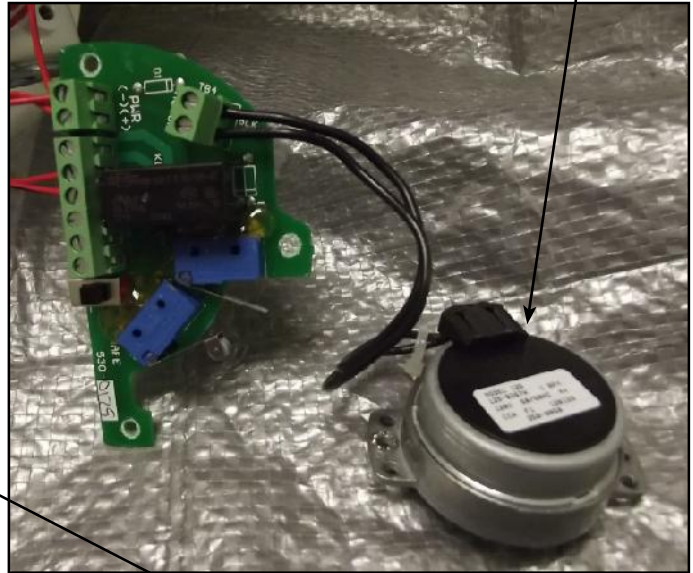
PART #	DESCRIPTION
045090	90V CONTROLLER UNIT (WITHOUT SENSOR)
059289	CONTROLLER POWER FUSE AGC - 4 BUSS 250V
045091	MOISTURE SENSOR (WITH CABLE)
E-6355	PLUG-IN RESISTOR FOR METERING ROLLS
597-691A	ANALOG OUTPUT MODULE FOR METERING ROLLS
E-6354	VARIABLE SPEED DRIVE FOR METERING ROLLS

## Watlow Temperature Controller

PART #	DESCRIPTION
045794	WATLOW EZ ZONE TEMPERATURE MODULE
059136	CABLE - 10M LG, 5 PIN, MOD
059137	CABLE - 20M LG, 5 PIN, MOD
7712521	TYPE J THERMOCOUPLE WIRE - PER FOOT

## Switches

Rotary Bin Switch (Used for Fill / Low Dryer Sensors)



3

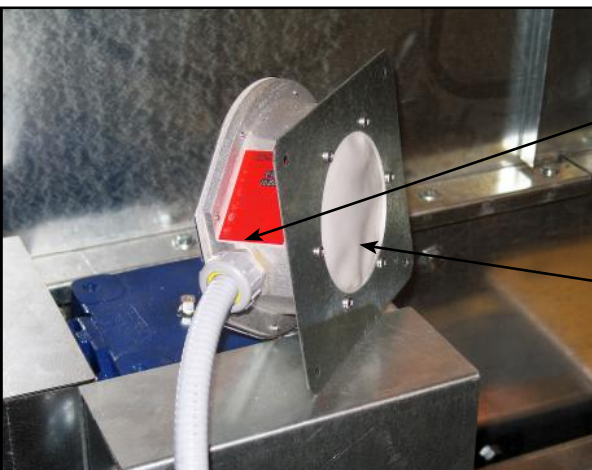
Proximity Switch (Used for Metering Roll Stall Sensor)

1&2



4

Pancake Switch (Used for Discharge Plugged, Wet Empty, & Dry Full Sensors)



5

6

## Switches

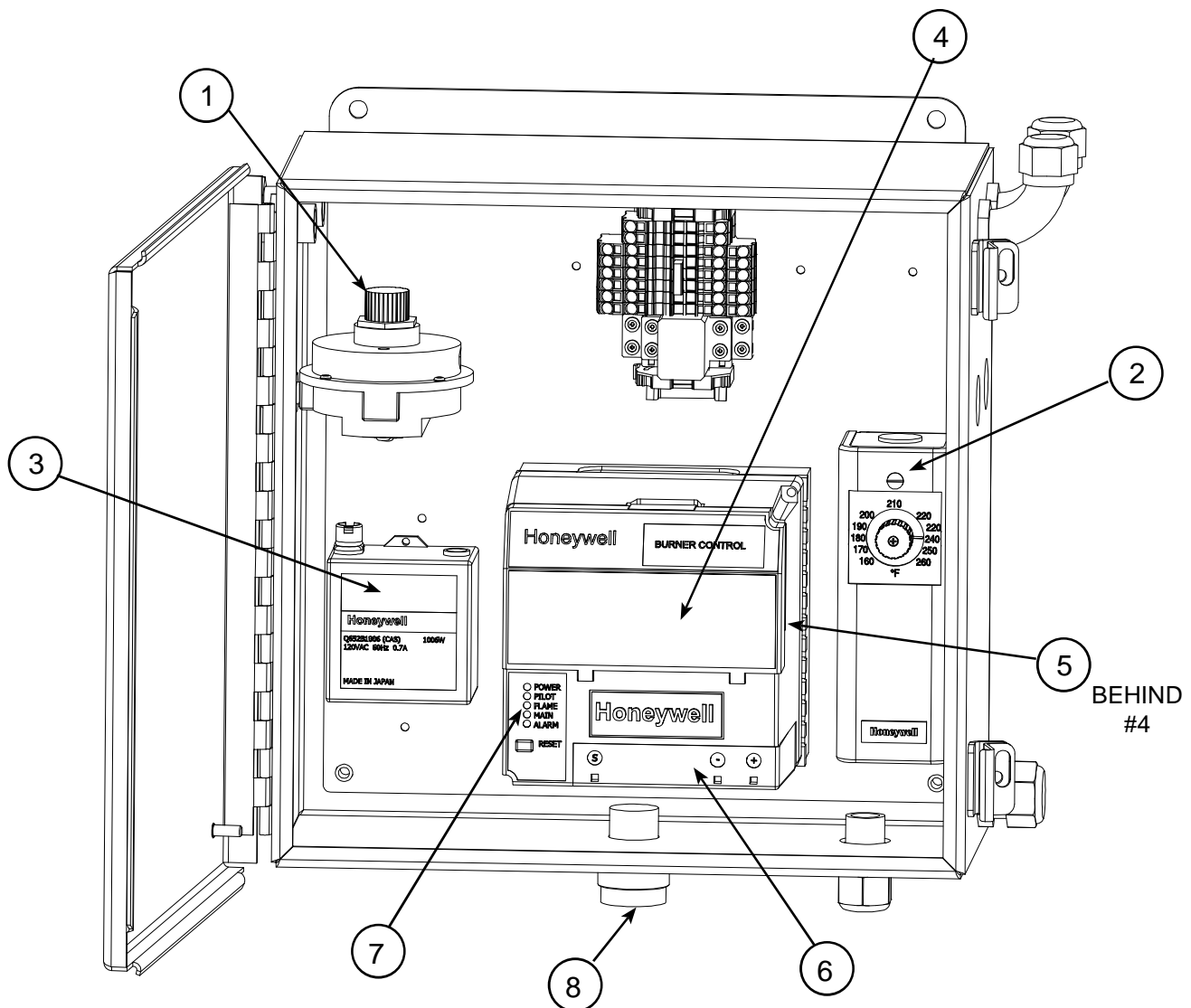
ITEM #	PART #	DESCRIPTION
1	059167	ROTARY BIN SWITCH - TOTAL ASSEMBLY WITH PADDLE
2	059167R	ROTARY BIN SWITCH - WITH CONNECTOR, NO PADDLE
3	040493-1	ROTARY BIN SWITCH - MOTOR ONLY
--	059203	3 VANE PADDLE
--	059162	ROTARY SWITCH CABLE - 6M LG x 4 PIN FEM PIGTAIL
--	059163	ROTARY SWITCH CABLE - 5M LG x 4 PIN (EXTENSION)
--	059164	ROTARY SWITCH CABLE - 8M LG x 4 PIN (EXTENSION)
--	059165	ROTARY SWITCH CABLE - 10M LG x 4 PIN (EXTENSION)
4	059118	PROXIMITY SENSOR (METERING ROLLS)
--	059130	PROXIMITY SENSOR CABLE - 6M LG x 3 PIN FEM
5	040440	AUGER CONTROL / DISCHARGE PLUGGED SWITCH
6	045039	PANCAKE SWITCH DIAPHRAGM (#225-0005 SILICONE)

## Fuel Train Components

ITEM #	PART #	DESCRIPTION
1	044444W	MODULATING MOTOR
1	044446	MODULATING MOTOR TRANSFORMER
2	040877	ASCO SOLENOID VALVE - 1/4 "
3	040881	ASCO SOLENOID VALVE - 1/2"
4	040879	ASCO SOLENOID VALVE - 3/4"
5	040218	ASCO SOLENOID VALVE - 2"
6	040972	ASCO COIL - P/N 040879
7	059066	ASCO COIL - P/N 040881
8	040889	PRESSURE GAUGE 0 - 15 PSI

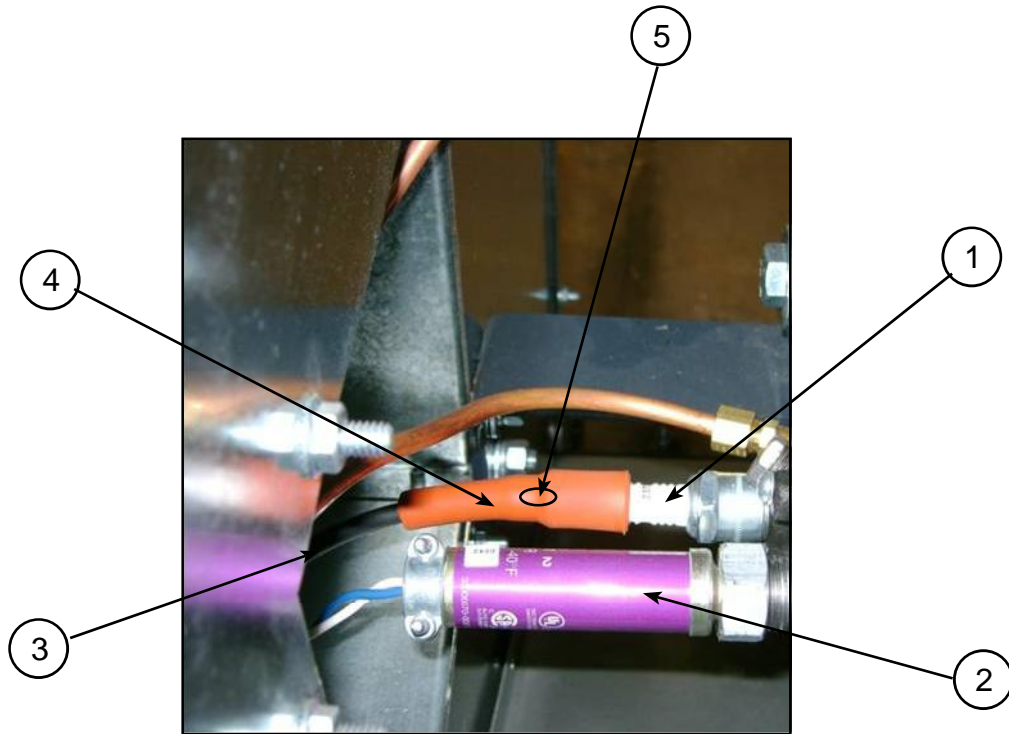
NOTE: Both types of fuel (LP & NG) components are common - piping size is different.

## Burner Box Components



ITEM #	PART #	DESCRIPTION
1	F148003	AIR SWITCH
1	F148004	AIR SWITCH - 3200 SERIES DRYER
2	7712555	HIGH LIMIT SWITCH
3	040365	SPARK GENERATOR Q652B1006 TRANSFORMER
4	045955	REMOTE RESET
5	044781	PURGE TIMER CARD
6	044780	FLAME SIGNAL AMPLIFIER
7	045611	HONEYWELL RELAY MODULE
8	059123	CABLE - 4M LG, 12 PIN, FEM
8	059124	CABLE - 7M LG, 12 PIN, FEM
8	059125	CABLE - 10M LG, 12 PIN, FEM
8	059126	CABLE - 17M LG, 12 PIN, FEM

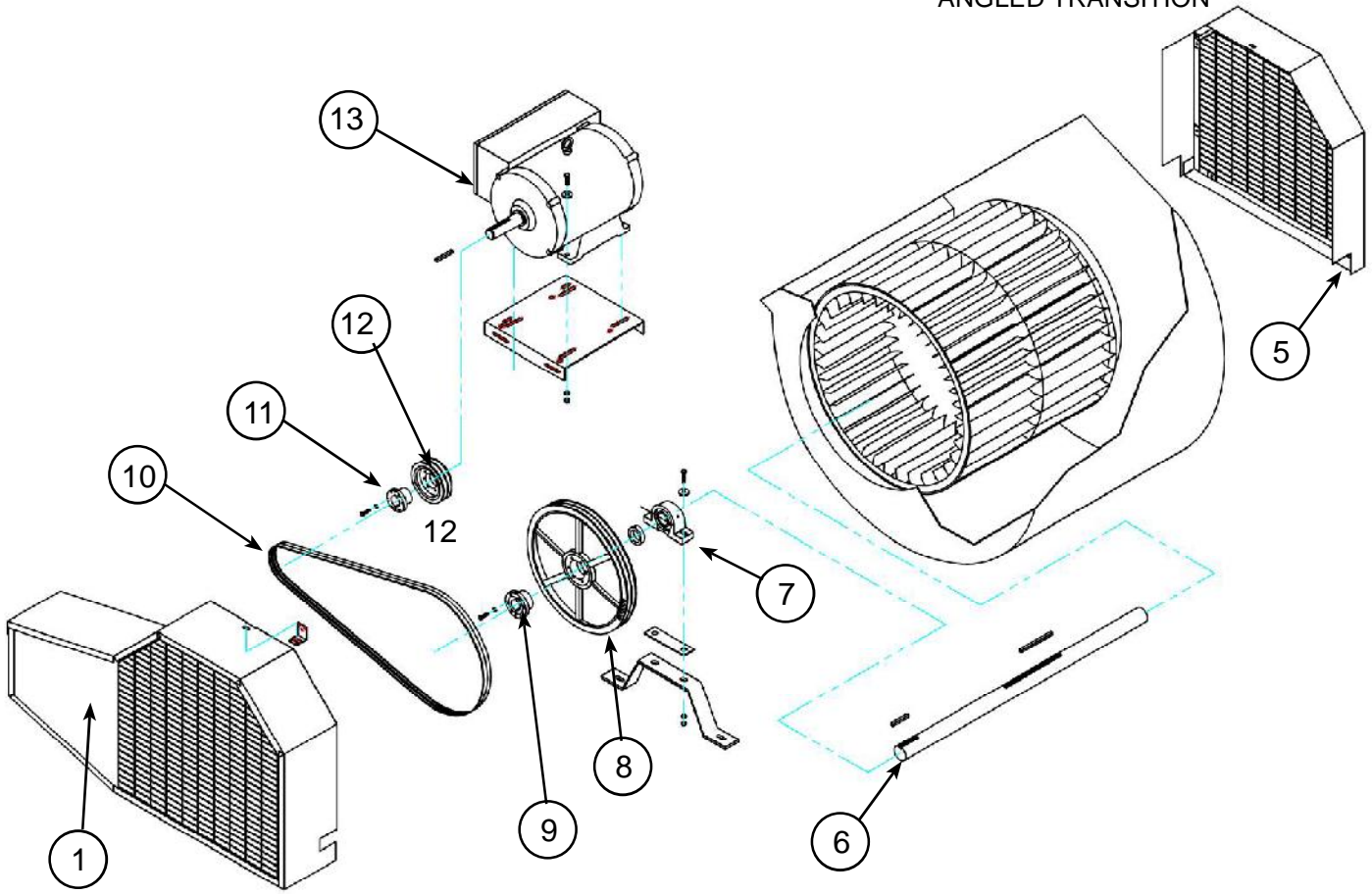
# Ignition Components



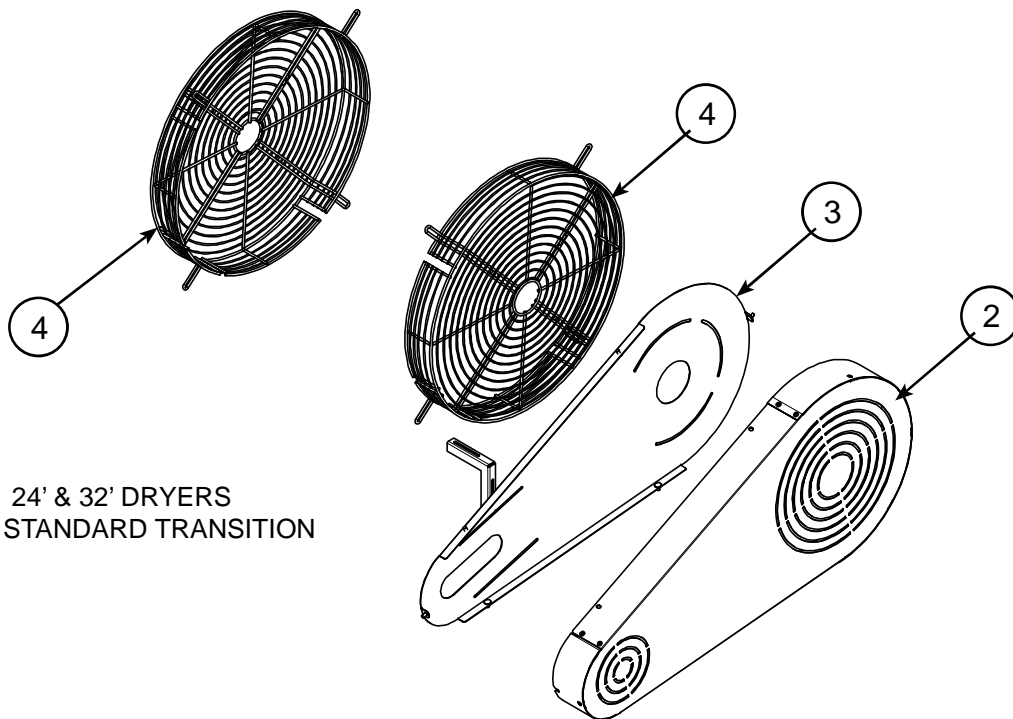
ITEM #	PART #	DESCRIPTION
1	040155	IGNITER PLUG - AUBURN E5-I-31-1
2	7712552	UV SENSOR MINI PEEPER - C7027A1031
3	F912000	IGNITION WIRE - PER FOOT
4	045893	SPARK PLUG BOOT
5	F048017	METAL CAP (INSIDE SPARK PLUG BOOT)

# Blower System Components

12' & 16' DRYERS WITH ANGLED TRANSITION



12' & 16' DRYERS WITH ANGLED TRANSITION

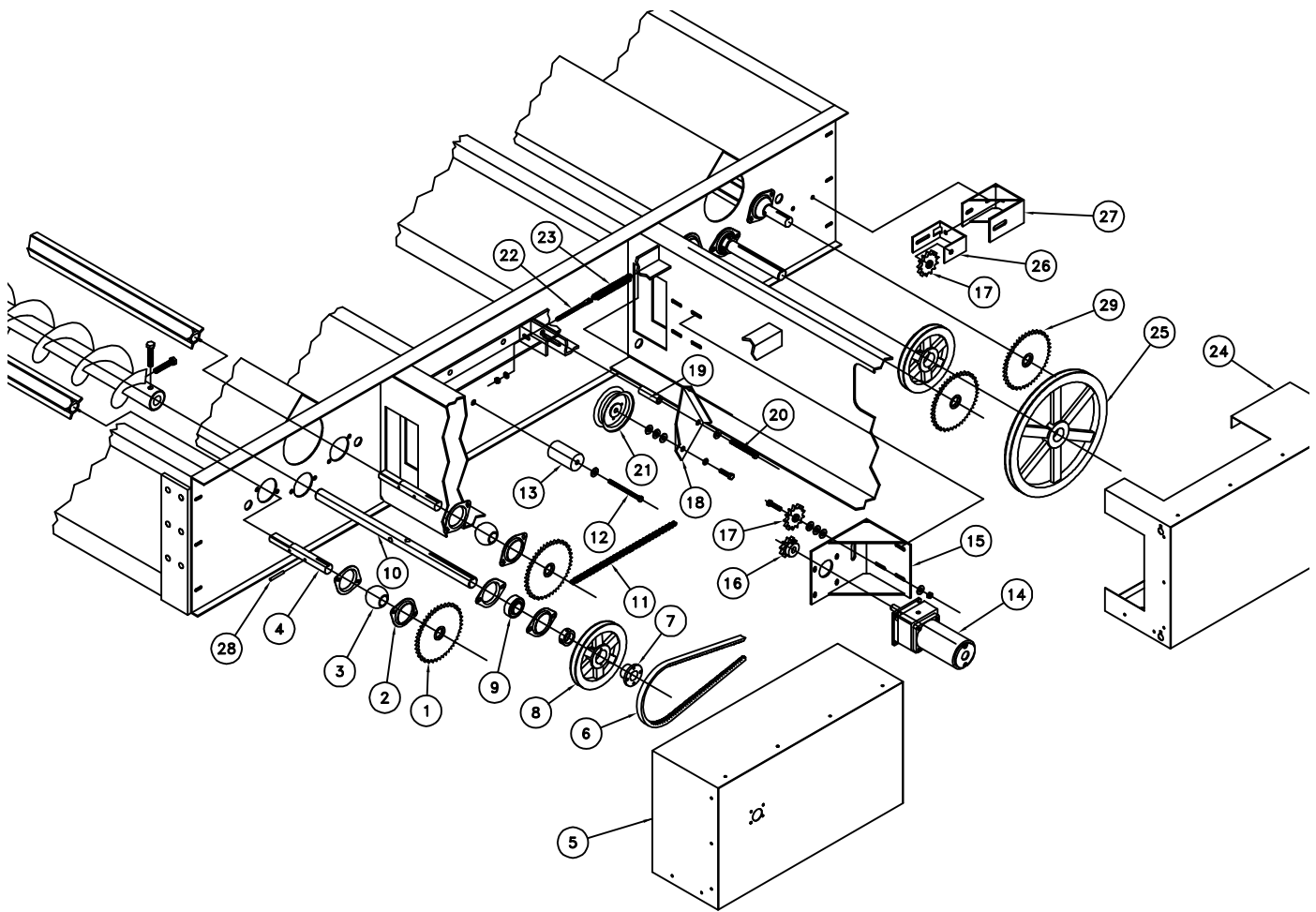


24' & 32' DRYERS WITH STANDARD TRANSITION

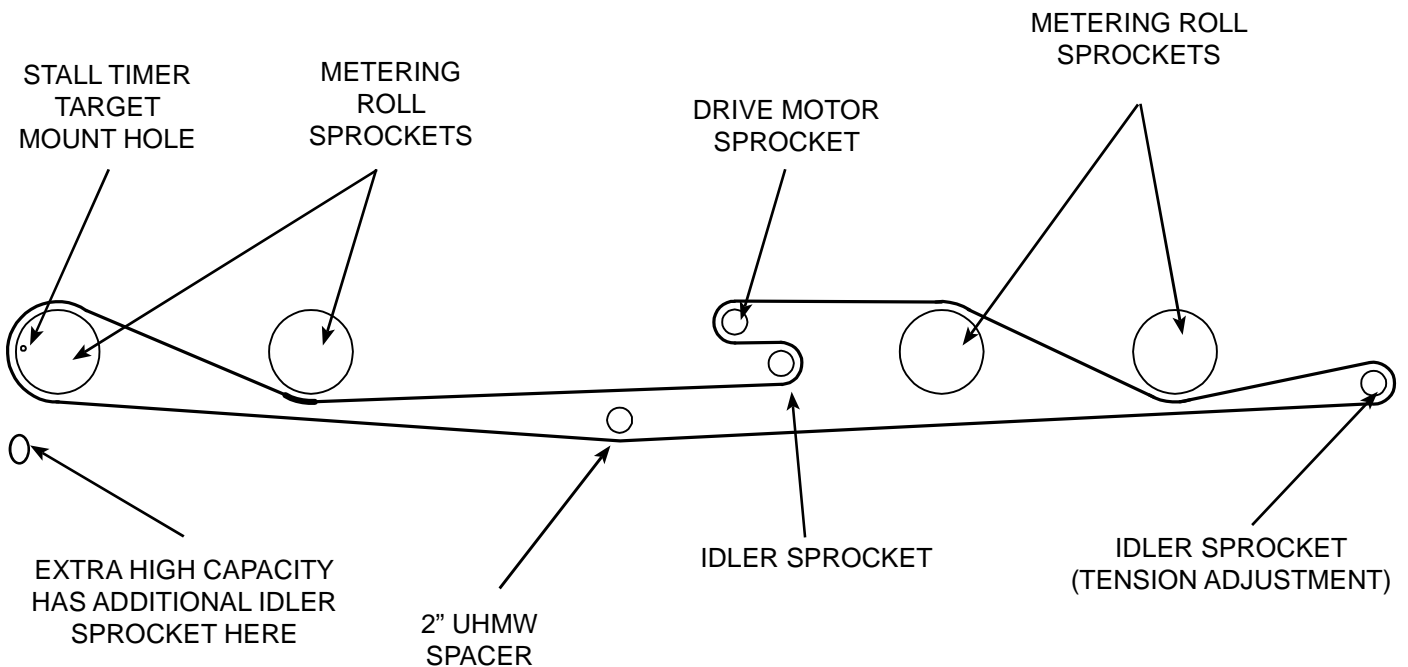
## Blower System Components

ITEM #	PART #	DESCRIPTION
1	078940	BELT SHIELD (FOR 12' & 16' DRYERS / ANGLED TRANS)
2	7612668	ROUND BELT SHIELD ASSY (FOR 24' & 32' DRYERS)
3	7612652	ROUND BELT SHIELD BK PLT (FOR 24' & 32' DRYERS)
4	044036	29" SCREEN GUARD, PLATED (FOR 24' & 32' DRYERS)
5	044092	RH SHIELD WLD (FOR 12' & 16' DRYERS / ANGLED TRANS)
6	7714895	2-3/16" BLOWER SHAFT
7	044772	2-3/16" PILLOW BLOCK BEARING
8	035765	FAN PULLEY - 18.4 x 2GR #2B18.4QD
8	035766	FAN PULLEY - 18.4 x 3GR SK 3B
9	036457	PULLEY BUSHING - 1 7/8" SK
10	044602	BELT B97 NOTCHED
10	044676	BELT BX103 NOTCHED
11	036202	MOTOR PULLEY BUSHING - 1-7/8 SD
12	036494	MOTOR PULLEY - 6.8 x 3GR
13	005369	MOTOR 15HP 1PH 230V
13	005374	MOTOR 15HP 3PH 230/460V
13	7710280	MOTOR 20HP 1PH 230V
13	005375	MOTOR 20HP 3PH 230 /460V
13	F048237	MOTOR 25HP 3PH 230/460V
13	040580	MOTOR 30HP 3PH 230/460V

# Discharge Drive System



How to position metering roll drive chain properly:

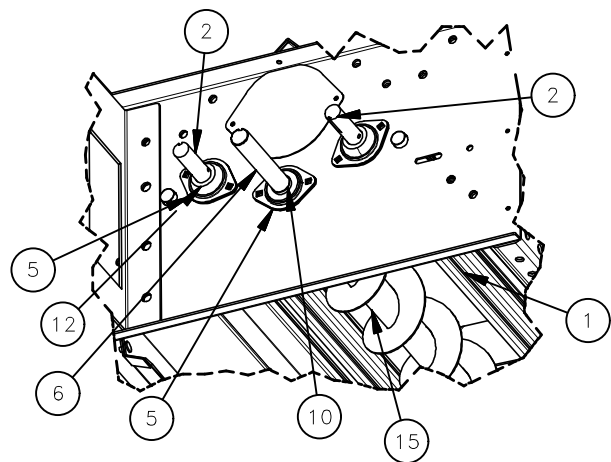
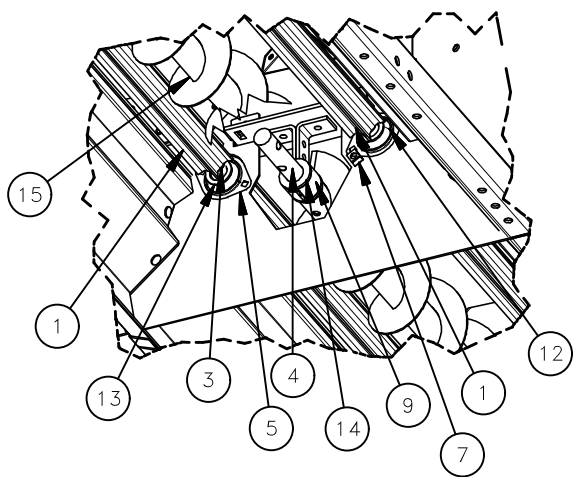
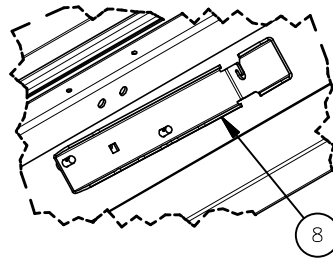
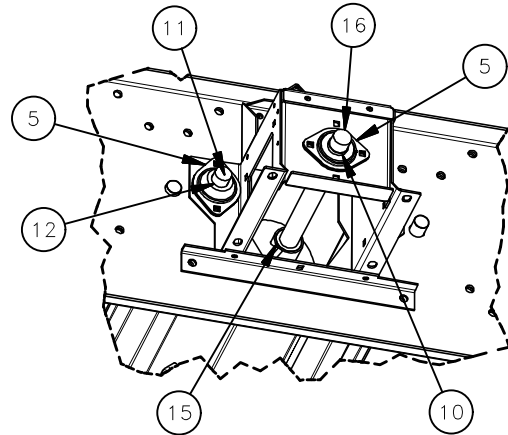
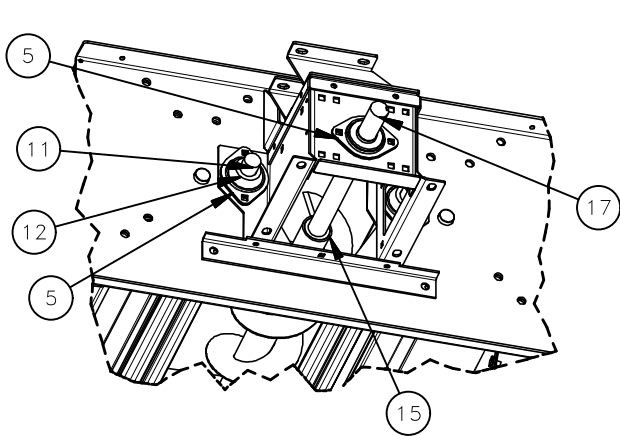




## Discharge Drive System

ITEM #	PART #	DESCRIPTION
1	044622	SPROCKET RC5033 1 1/8" BORE WITH HOLE
2	035118	BEARING HOLDER FLANGETTE
3	036784	1-1/8" WOOD BEARING
4	044644	FRONT METERING ROLL DRIVE SHAFT
5	044309	RH DISCHARGE DRIVE SHIELD (CE)
6	7714730	BX136 NOTCHED BELT (12/16' DRYER)
	045696	BX133 NOTCHED BELT
	040438	BX150 NOTCHED BELT
7	036190	1-1/4" PULLEY BUSHING
8	035992	PULLEY - 2B64SDS
	040436	PULLEY - BK80-H BROWNING
9	040436	RK8.0 BROWNING PULLEY
10	044758	1-1/4" BEARING INSERT / FAFNIR
11	044624	#50 ROLLER CHAIN - 17 FT
	002116	#50 ROLLER CHAIN - BULK
12	1596700	1/2" x 5" BOLT - ZINC
13	040102	UHMW CHAIN IDLER 2" RD
14	044598	90V 1/4 HP 27RPM GEAR MOTOR (12/16' DRYER)
	044201	90V 1/8 HP 42RPM GEAR MOTOR
	045259	90V 1/4 HP 62RPM GEAR MOTOR (24' DRYER)
	7715298	90V 1/2 HP 92RPM GEAR MOTOR (EXTRA HIGH CAPACITY)
15	044576	90V MOTOR MOUNT BRACKET WELDMENT
	7715304	90V MOTOR MOUNT WELDMENT - 1/2HP EXTRA HIGH CAP
16	044623	SPROCKET 50B10 5/8" BORE
17	036714	SPROCKET IDLER 5013 1/2" BORE
18	040425	BELT TENSIONER PIVOT PLATE
19	040428	BELT TENSIONER PIVOT SPACER
20	003078	1/2" x 3-1/2" BOLT - ZINC
21	036482	PULLEY 5" FLAT IDLER 1/2" BORE
22	025259	BELT TENSIONER THREADED ROD
23	025064	BELT TENSIONER EXPANSION SPRING
24	044310	LH DISCHARGE DRIVE SHIELD (CE)
25	2102082	PULLEY BK150 1 GR, BROWNING
26	044751	INSIDE SPROCKET ADJUSTMENT BRACKET
27	044654	OUTSIDE SPROCKET ADJUSTMENT BRACKET
28	003218	1/4" x 2" ROLL PIN
29	044622	SPROCKET RC5033 1 1/8" BORE

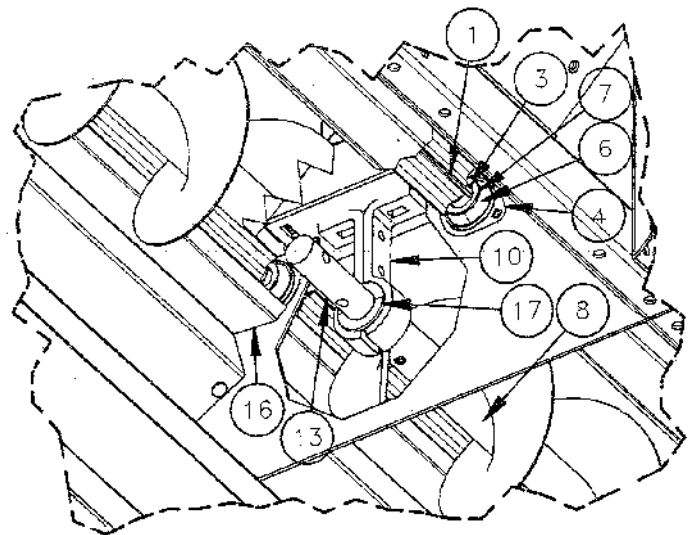
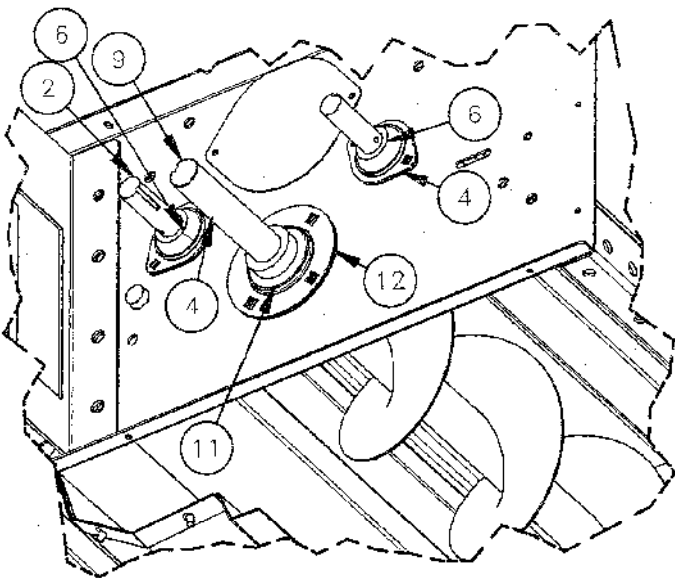
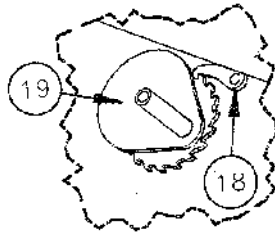
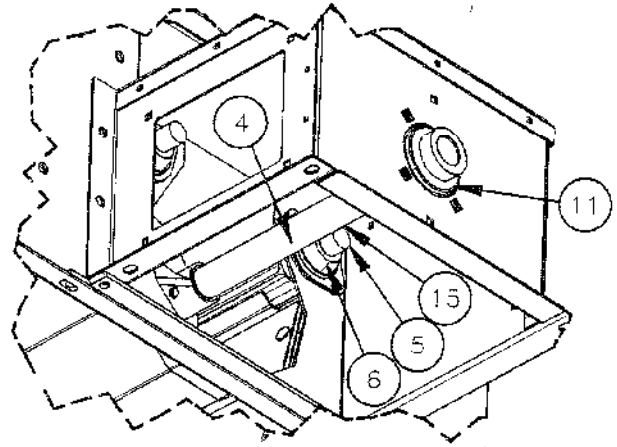
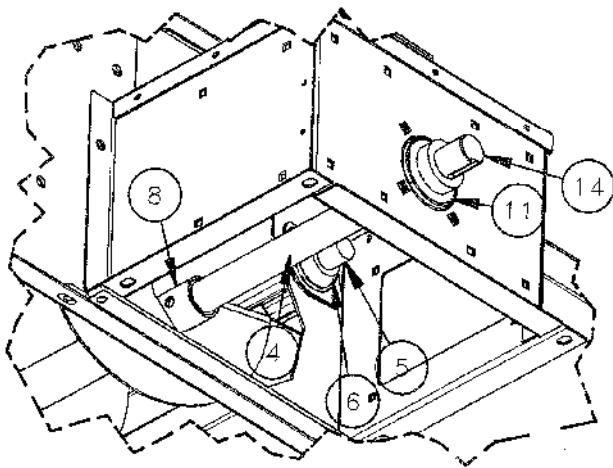
# Standard & High Capacity Unload System



## Standard & High Capacity Unload System

ITEM #	PART #	DESCRIPTION
1	044641	ALUM METERING EXTRUSION, 93 3/8"
	045705	ALUM METERING EXTRUSION, 69 3/8"
2	044644	METERING SHAFT, FRONT DRIVE
3	044642	METERING SHAFT, CENTER
4	044171	SHAFT CONNECTION DRYER UNLOAD AUGER
5	035116	B0053 1 1/4" FLANGETTE 2-HOLE ZINC
6	044953	DRIVE SHAFT - 12/24' CLEANOUT AUGER
7	045251	FRAME DOORSTOP ANGLE
8	7712705	CLEAN-OUT DOOR HANDLE RIGHT
9	044647	HANGER BEARING HOLDER HALF DRYER
10	044756	BEARING 1 1/4" INSERT RA103RRB2AG
11	044643	REAR METERING ROLL SHAFT
12	036784	BEARING WOOD SPHERE 1-1/8 62 MM
13	036751	MACH BUSH 1.25 1.78 10 GA. ZINC
14	035297	B0164 BEARING 1-1/4" WOOD HANGER PAIR
15	044979	UNLOAD AUGER 6" x 8'
	045704	UNLOAD AUGER 6" x 6"
	044822	UNLOAD AUGER 8" x 8'
16	7714231	REAR IDLER SHAFT - STANDARD CAPACITY
	7714273	REAR IDLER SHAFT - HIGH CAPACITY
17	7714230	REAR DRIVE SHAFT - STANDARD CAPACITY
	7714272	REAR DRIVE SHAFT - HIGH CAPACITY

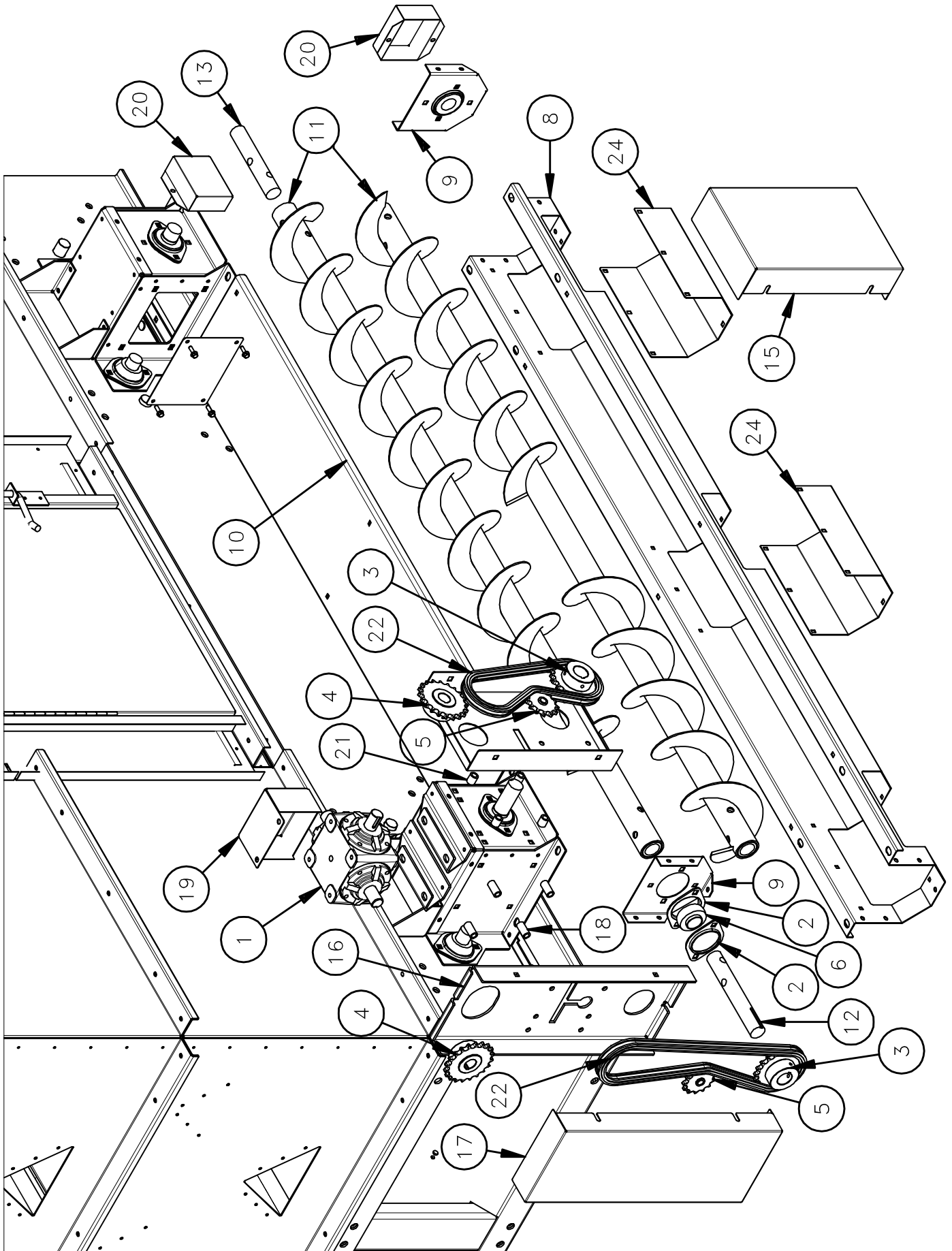
# Extra High Capacity Unload System



## Extra High Capacity Unload System

ITEM #	PART #	DESCRIPTION
1	044641	EXTRUSION, METERING ALUM, 93 3/8"
2	044644	Front Drive Metering Shaft
3	044642	SHAFT, METERING, CENTER
4	035116	B0053 1 1/4" FLANGETTE 2-HOLE ZINC
5	044643	REAR METERING ROLL SHAFT
6	036784	BEARING WOOD SPHERE 1-1/8 62 MM
7	036751	MACH BUSH 1.25 1.78 10 GA. Zinc
8	045385	AUGER, 9" RH 8' EHC DRYER
9	040058	ECH DRYER UNLOAD FRONT DRIVE SHAFT
10	045398	HANGER BEARING HOLDER 1 1/2" EHC DRYER
11	035265	Bearing 1 1/2" Insert with Locking Collar B0135
12	035264	B0134 1 1/2" FLANGETTE 4-HOLE ZINC
13	035288	B0154 SHAFT, 1 1/2" X 12" CONNECTION
14	7714325	DRYER EHC REAR DRIVE SHAFT
15	7714326	DRYER EHC REAR IDLE SHAFT
16	045504	FRAME EXTENSION METERING ROLL CUP
17	035298	B0165 BEARING 1 1/2" WOOD HANGER PAIR
18	039588	WHEEL STOP STIR III PAWL
19	045816	CLEANOUT DOOR CABLE WINCH WELDMENT

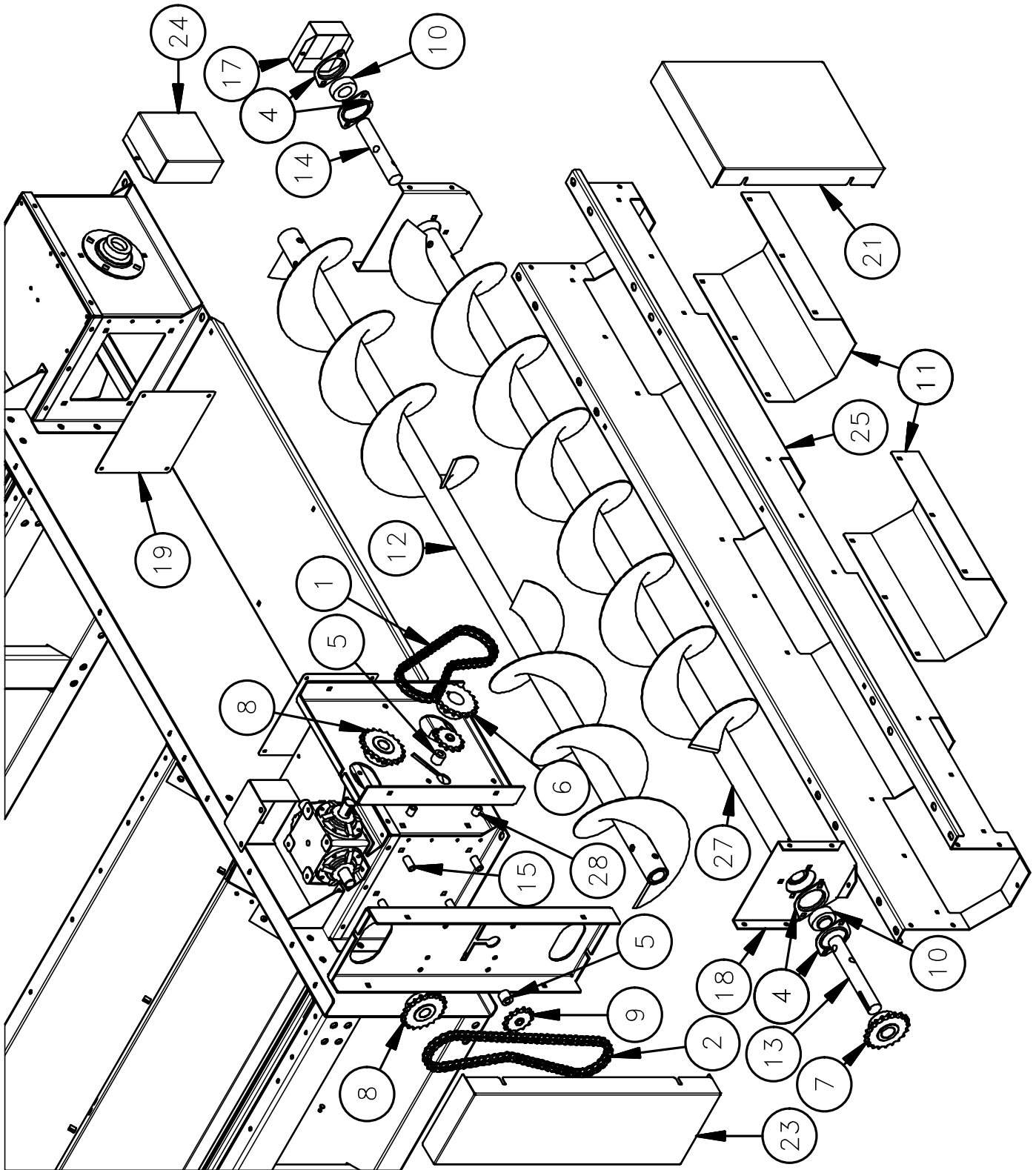
# Standard & High Capacity Rear Cross Auger



## Standard & High Capacity Rear Cross Auger

ITEM #	PART #	DESCRIPTION
1	010078	GEARBOX ASSEMBLY
2	035116	B0053 1 1/4" FLANGETTE 2-HOLE ZINC
3	036495	SPROCKET RC5020 x 1 1/4" BORE
4	036707	SPROCKET RC5020 x 1" BORE
5	036714	IDLER SPROCKET 5013 1/2" BORE
6	044756	BEARING 1 1/4" INSERT RA103RRB2AG
7	7714222	DRYER SPOUT ACCESS COVER
8	7714551	CROSS AUGER TROUGH - STD
	7714539	CROSS AUGER TROUGH - HIGH CAPACITY
9	7714224	TROUGH END PLATE - STD
	7714286	TROUGH END PLATE - HIGH CAPACITY
10	7714550	TROUGH LID - STD
	7714540	TROUGH LID - HIGH CAPACITY
11	7714646	STANDARD DISCHARGE
	7714289	HIGH CAPACITY DISCHARGE
	7714549	STANDARD CENTER DISCHARGE
	7714725	HIGH CAPACITY CENTER DISCHARGE
12	7714228	SHAFT DRIVE, CROSS AUG U-TR
13	7714229	SHAFT IDLE, CROSS AUG U-TR
14	7714234	REAR CHAIN GUARD BACK PLATE
15	7714236	REAR CHAIN GUARD COVER
16	7714237	SIDE CHAIN GUARD BACK PLATE
17	7714239	SIDE CHAIN GUARD COVER
18	7714241	SIDE CHAIN GUARD SPACER - 1.25"
19	7714242	GEARBOX SHAFT SHIELD - REAR
20	7714243	UNLOAD SHAFT SHIELD - REAR
21	7714724	REAR CHAIN GUARD SPACER - 0.75"
22	002116	ROLLER CHAIN - #50
	036131	ROLLER CHAIN CONNECTION LINK - #50
24	7612741	TROUGH DISCHARGE COVER - STD
	7612743	TROUGH DISCHARGE COVER - HIGH CAPACITY

# Extra High Capacity Rear Cross Auger

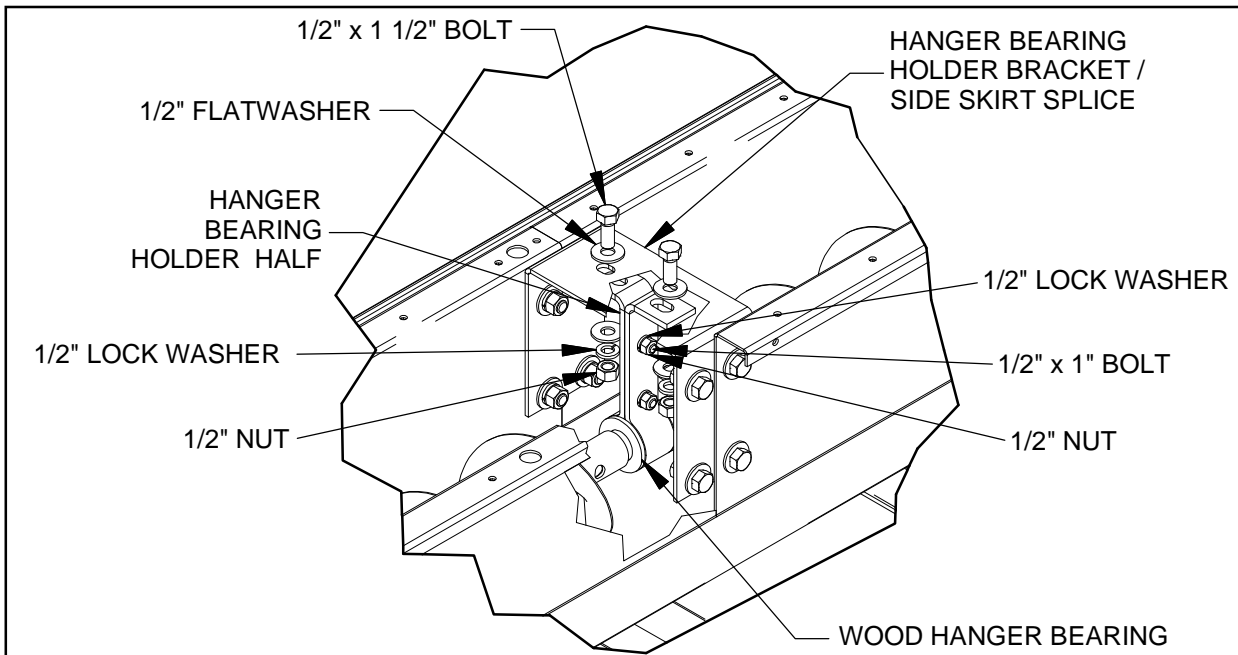
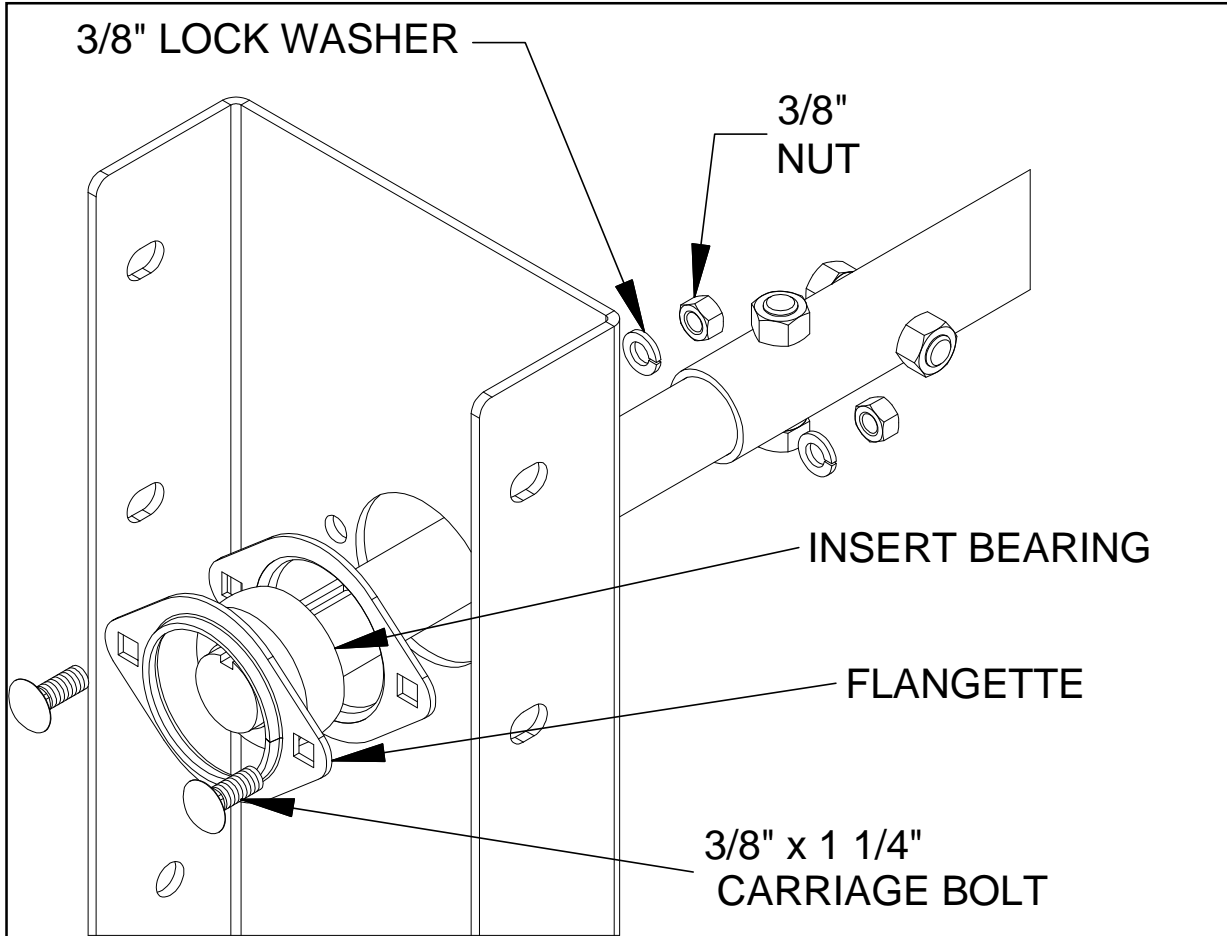




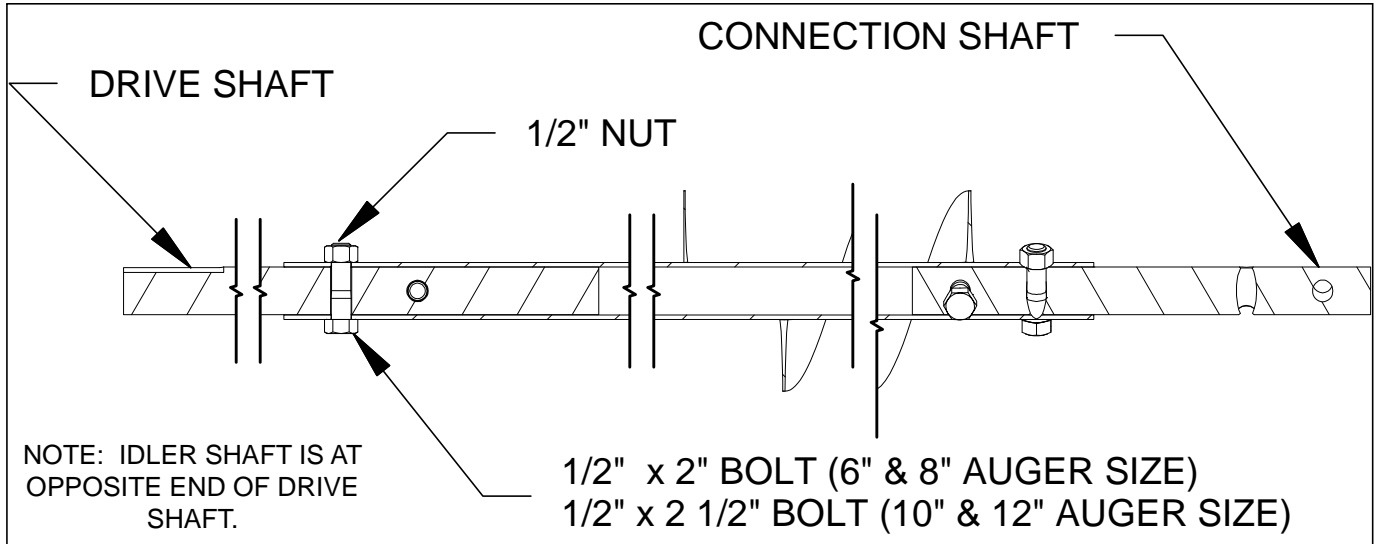
## Extra High Capacity Rear Cross Auger

ITEM #	PART #	DESCRIPTION
1	002116	ROLLER CHAIN #50 BULK
2	036131	ROLLER CHAIN #50 CONN LINK N0511
3	010078	GEARBOX ASSEMBLY, GRAIN DRYER
4	035116	B0053 1 1/4" FLANGETTE 2-HOLE ZINC
5	035332	SPACER, 1/2" I.D. X 1" O.D. X 7/8" LONG B0197
6	035544	SPROCKET RC5020 X 1 1/2" BORE
7	036495	SPROCKET RC5020 X 1 1/4" BORE
8	036707	SPROCKET RC5020 X 1" BORE
9	036714	SPROCKET IDLER 5013 1/2" BORE
10	044756	BEARING 1 1/4" INSERT RA103RRB2AG
11	7612745	DISCH COVER CROSS AUGER THROUGH EHC CHUTE
12	N/A	EHC REAR CROSS AUGER CENTER DISCHARGE
13	7714228	SHAFT DRIVE, CROSS AUG U-TR
14	7714229	SHAFT IDLE, CROSS AUG U-TR
15	7714241	SPACER CHAIN GUARD SIDE 1.25"
16	7714242	SHAFT SHIELD GEARBOX REAR DRYER
17	7714243	SHAFT SHIELD DRYER UNLOAD CROSS
18	7714298	EHC CROSS AUGER END PLATE
19	7714331	EHC DRYER SPOUT ACCESS COVER
20	7714332	EHC REAR CHAIN GUARD BACK PLATE
21	7714334	EHC REAR CHAIN GUARD COVER
22	7714335	EHC SIDE CHAIN GUARD BACK PLATE
23	7714337	EHC SIDE CHAIN GUARD COVER
24	7714338	EHC UNLOAD SHAFT SHIELD
25	7714628	EHC CROSS AUGER TROUGH (NRW)
26	7714629	EHC CROSS AUGER LID (NRW)
27	7714630	EHC REAR CROSS AUGER LFT / RGT DISCHARGE (NRW)
28	7714724	SPACER CHAIN GUARD REAR 0.75"

# Level Auger Misc. Parts (Garner & Roof Style)

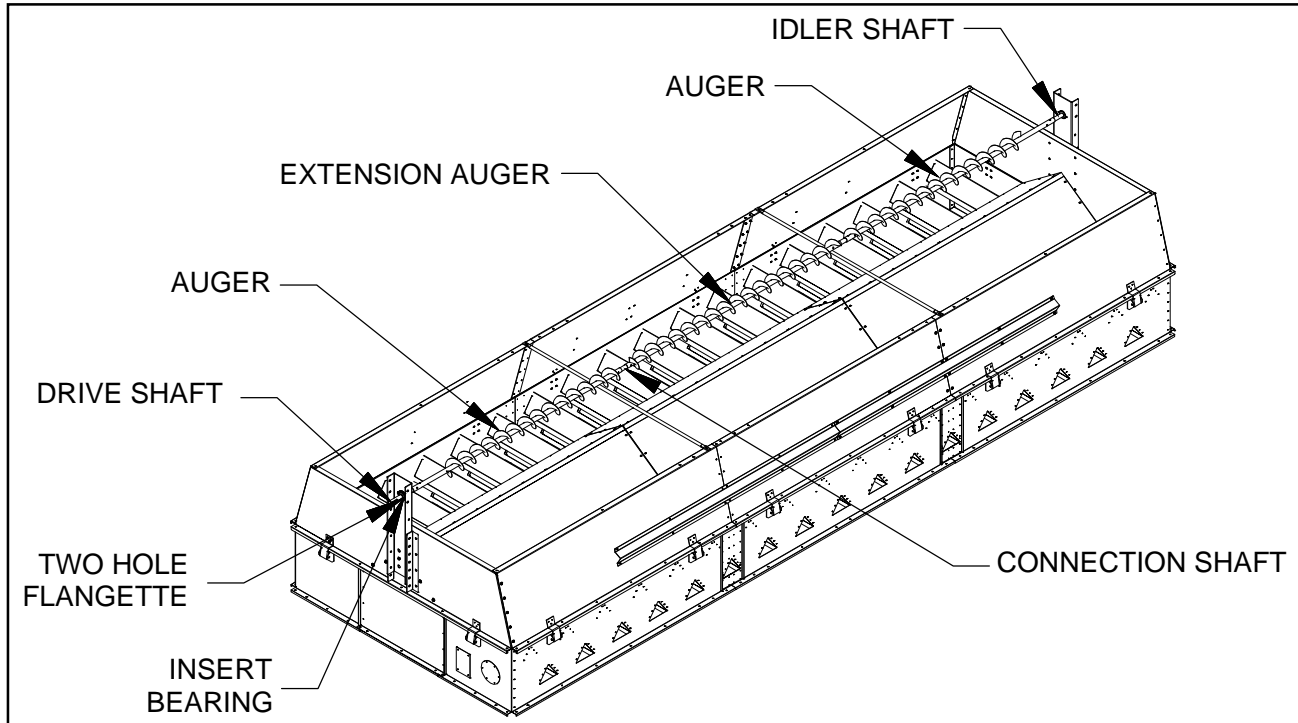


## Level Auger Misc. Parts (Garner & Roof Style)



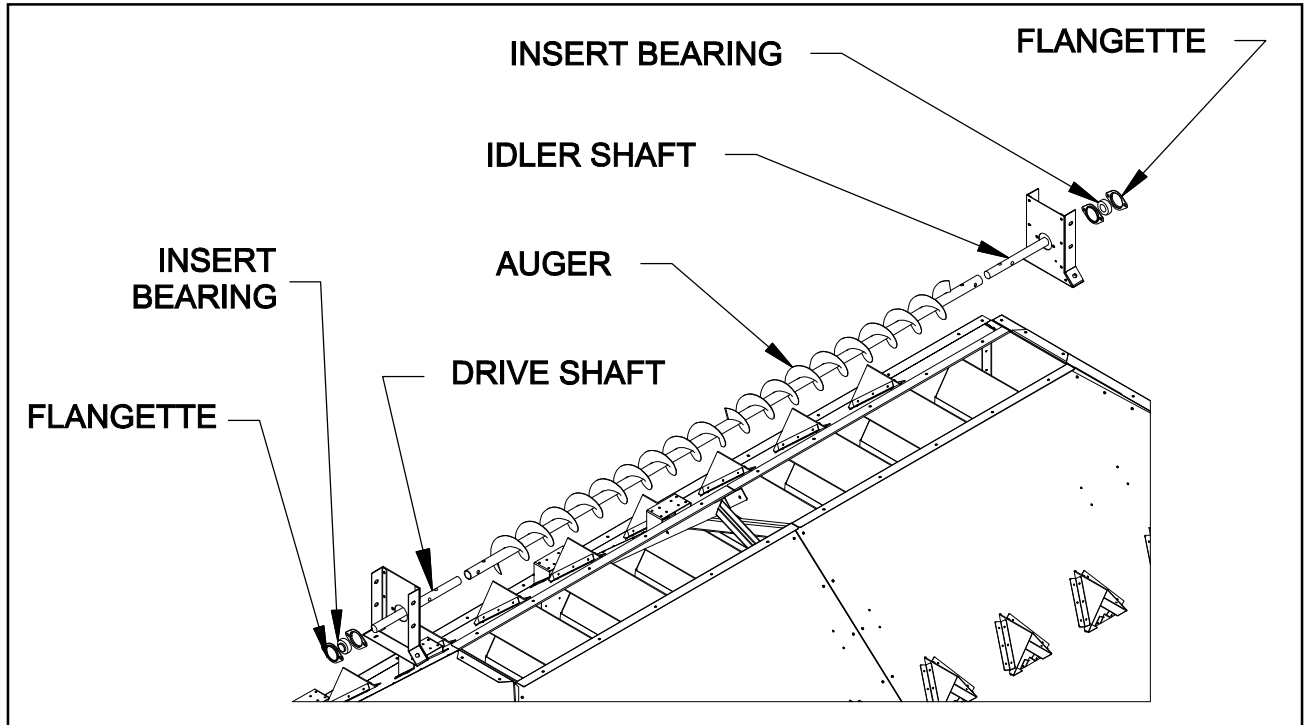
LEVEL AUGER MISC. PARTS (GARNER & ROOF STYLE)		
DRYER SIZE	PART #	DESCRIPTION
N/A	035116	B0053 1 1/4" FLANGETTE 2-HOLE ZINC
N/A	044756	BEARING 1 1/4" INSERT RA103RRB2AG
N/A	035297	1 1/4" WOOD HANGAR BEARING
N/A	035298	1 1/2" WOOD HANGAR BEARING
N/A	035299	2" WOOD HANGAR BEARING
12' & 16'	040419	DRIVE SHAFT (6" AUGER)
24'	040420	DRIVE SHAFT (8" AUGER)
24' & 32'	045005	DRIVE SHAFT (10" & 12" AUGER)
24'	044171	CONNECTION SHAFT (6" & 8" AUGER)
24' & 32'	044912	CONNECTION SHAFT (10" AUGER)
12' & 16'	040420	IDLER SHAFT (6" AUGER)
24'	040419	IDLER SHAFT (8" AUGER)
24' & 32'	045004	IDLER SHAFT (10" AUGER)
24' & 32'	023204	IDLER SHAFT (12" AUGER)

## Garner Style Level Auger



DRYER SIZE	PART #	DESCRIPTION
12' & 16'	044431	6" AUGER
16'	040418	6" AUGER
16'	045204	8" AUGER
16'	045002	10" AUGER
24'	7714587	6" AUGER
24'	045204	8" AUGER
24' & 32'	045002	10" AUGER
32'	045002	10" AUGER
24'	7714588	6" EXTENSION AUGER
24'	045206	8" EXTENSION AUGER
24'	045003	10" EXTENSION AUGER
32'	7714711	10" EXTENSION AUGER

## Roof Style Level Auger



DRYER SIZE	PART #	DESCRIPTION
12'	7714932	6" AUGER
16'	7714207	6" AUGER
16'	7715174	8" AUGER
24'	7714719	8" AUGER
24'	7715097	10" AUGER
24'	045462	12" AUGER
24'	7601513	12" AUGER
32'	045002	10" AUGER
32'	7714709	10" AUGER
32'	045462	12" AUGER
32'	7601513	12" AUGER

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If you have any questions regarding information  
in this manual, please contact NECO.

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