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MODEL CPO-315-HFA-NF-CNC COLD SAW

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MODEL
CPO-315-HFA-NF-CNC
COLD SAW

FEBRUARY 2024

SCOTCHMAN INDS. - 180 E US HWY 14 - PO BOX 850 - PHILIP, SD 57567 Call: 1-800-843-8844

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1.0 INTRODUCTION

The CPO-315 HFA-NF-CNC Fully Automatic Cold Saw is a high speed saw designed to cut solids, tubes, flats and other profiles in grades of nonferrous material that range from aluminum, brass, copper, synthetics and extrusions.

Cold sawing is a process similar to a milling process. In most cases, this gives a finished cut that does not require any secondary machining or de-burring.

The high spindle speeds of this saw make it ideal for extrusions with varying cross section thicknesses.

To achieve the best results from this machine, choose the proper spindle speed. Proper material clamping and a good quality coolant are also important.

Cold sawing has several advantages over band saws and abrasive saws. Besides the mill quality cut, cold saws have the ability to generate faster cutoff times than band saws. There are no sparks and excessive noises that are associated with abrasive cutoff saws. There is no work hardening of the workpiece.

The vise allows for easy change over to special clamping jaws for profiles and extrusions. Having two spindle speeds enables the user to cut a wide range of materials.

2.0 SAFETY PRECAUTIONS

1. **The operators of this machine must be qualified and well trained in the operation of this machine. The operators must be aware of the capacities and the proper use of this machine.**

2. **This manual is not intended to teach untrained personnel how to operate equipment.**

3. **NEVER OPERATE THIS MACHINE WITH ANY OF THE PROTECTIVE GUARDS OR HOODS OPEN OR REMOVED!**

4. **Wear the appropriate personal protective equipment. Safety glasses are required at all times when operating or observing this machine in operation.**

5. **Never place any part of your body into the path of the saw blade, material vises or shuttle cylinder.**

6. **Do not wear loose fitting clothing, gloves or jewelry when operating this machine.**

7. **All electrical connections shall be made by a qualified electrician. This machine must be grounded in accordance with the National Electric Code.**

8. **Disconnect the machine from the power source before performing maintenance or changing blades.**

9. **Strictly comply with all of the warning labels and decals on the machine. Never remove any of the labels. Promptly replace worn or damaged labels.**

10. **Practice good housekeeping. Keep the area around the machine clean and dry. Do not obstruct the operator's position by placing anything around the machine that would impede the operator's access to any of the machine's functions.**

11. **When sawing, always support long pieces and make sure that the material is properly clamped.**

12. **Keep the guards, as well as all other parts of the saw, in good working condition. Replace worn parts promptly.**

13. **Do not alter or modify this machine in any way without written permission from the manufacturer.**

14. **Set up a program of routine inspections and maintenance for this machine. Make all repairs and adjustments in accordance with the manufacturer's recommendations.**

3.0 WARRANTY

Scotchman Industries, Inc. will, within 2 years of date of purchase, replace F.O.B. the factory or refund the purchase price for any goods which are defective in materials or workmanship and, at the seller's option, returns the defective goods, freight and delivery prepaid, to the seller, which shall be the buyer's sole and exclusive remedy for defective goods.

Hydraulic and electrical components are subject to their respective manufacturer's warranties.

This warranty does not apply to machines or components which have been altered, changed or modified in any way or subjected to abusive or abnormal use, inadequate maintenance or lubrication or subjected to use beyond the seller's recommended capacities and specifications.

In no event shall seller be liable for labor costs expended on such goods or consequential damages.

Seller shall not be liable to purchaser or any other person for loss or damage directly or indirectly arising from the use of the goods or from any other cause.

No officer, employee or agent of the seller is authorized to make any oral representations or warranty of fitness or to waive any of the foregoing terms of sale and none shall be binding on the seller.

Any electrical changes made to the standard machine to comply with local electrical codes must be paid by the purchaser.

As we constantly strive to improve our products, we reserve the right to make changes without notification.

4.0 INSTALLATION AND SET-UP

⌦ **CAUTION: THIS SECTION DISCUSSES INSTALLATION AND SET-UP PROCEDURES. PLEASE READ ALL SECTIONS OF THIS MANUAL THOROUGHLY BEFORE OPERATING THIS MACHINE.**

4.1 PHYSICAL DIMENSIONS

SEE FIGURE 1 ON THE FOLLOWING PAGE.

	DIMENSIONS	INCHES	CM
A	HEIGHT	65	165
B	FLOOR TO VISE	38.5	98
C	BASE HEIGHT	35	89
D	VISE OPENING	3-5/8	9.2
E	VISE DEPTH	2-1/4	5.7
F	BASE WIDTH	61	155
G	BASE DEPTH	25	64
H	WIDTH	100	254
I	DEPTH	44	112
	WEIGHT	1,750 LB.	795 KG.

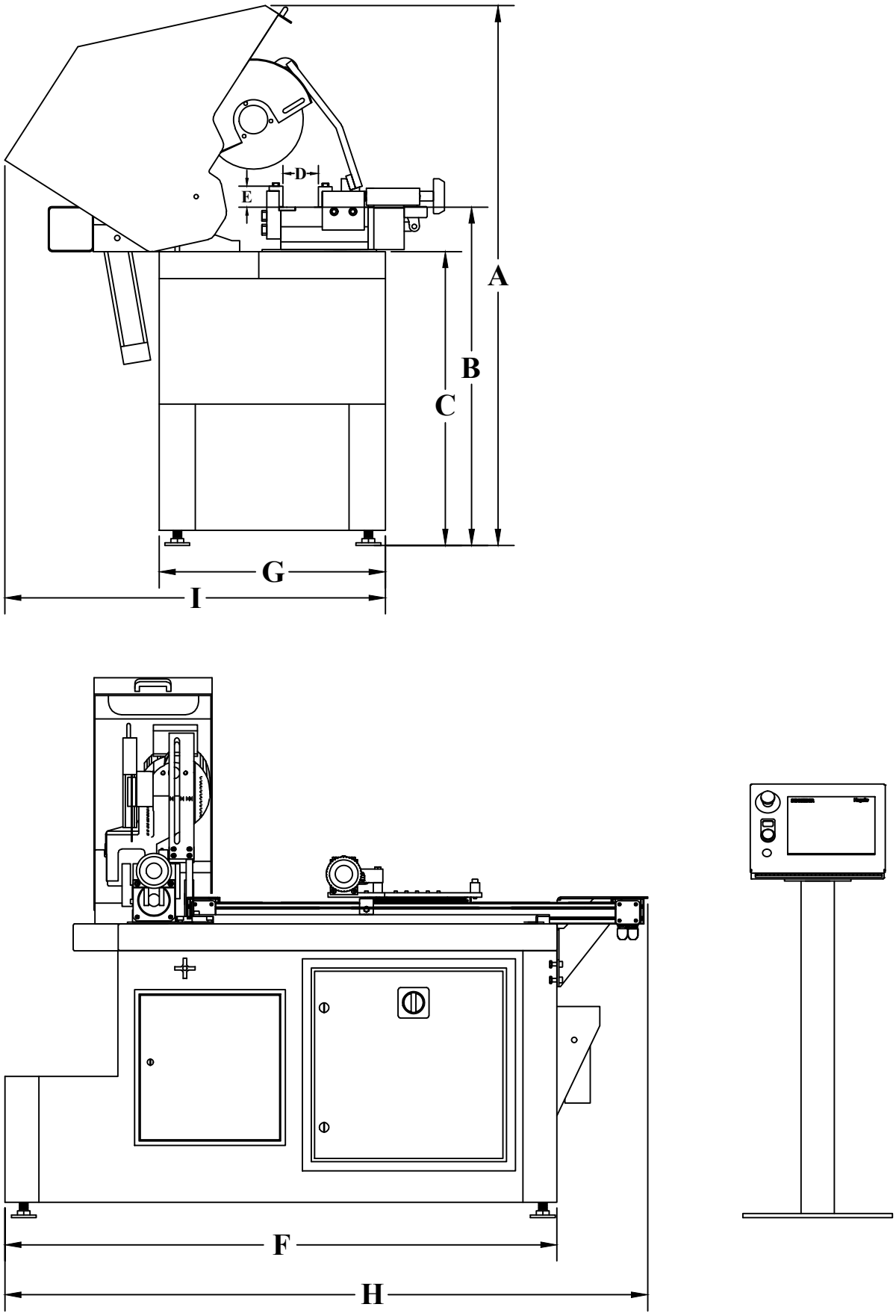


FIGURE 1

4.2 MACHINE INSTALLATION

SEE FIGURE 2 ON THE FOLLOWING PAGE.

This machine is shipped on a pallet and can be moved to the installation location by means of a fork lift.

⌦ **CAUTION: THIS MACHINE IS TOP HEAVY AND MUST BE MOVED WITH CARE, ON HARD FLAT SURFACES, ONLY.**

USE THE FOLLOWING STEPS TO INSTALL THE MACHINE:

1. **Select a location for the machine that allows adequate room for any length of material that you may want to cut. Leave adequate space behind the machine and on either end, for set-up and maintenance.**

2. **Lift the machine off of the shipping pallet, using a fork lift.**

3. **Place the machine in its final location and level it, using the leveling pads. For this machine to function properly, it is very important that it is level. Any supply tracks used with this machine must also be level and aligned with the vises on the machine.**

4. **We strongly recommend that you anchor the machine and supply tracks to the floor, with the anchor plates provided with the machine.**

5. **Connect the main air and electrical supply lines to the machine. To connect the air, slide the shuttle valve down to the closed position and connect the incoming supply line. (DO NOT TURN THE AIR ON YET.) This machine requires a minimum of 90 PSI and may require up to 130 PSI, depending on your application. The electrical supply lines must be connected by a qualified electrician. The supply lines connect to the top of the main disconnect switch, located in the lower base cabinet. Make sure that your plant phase and voltage correspond to the phase and voltage of the machine before connecting the electrical supply.**

⌦ **CAUTION: DO NOT POWER THE MACHINE UNTIL THE MACHINE INSTALLATION IS COMPLETE AND YOU HAVE READ ALL OF THE SECTIONS OF THIS MANUAL!**

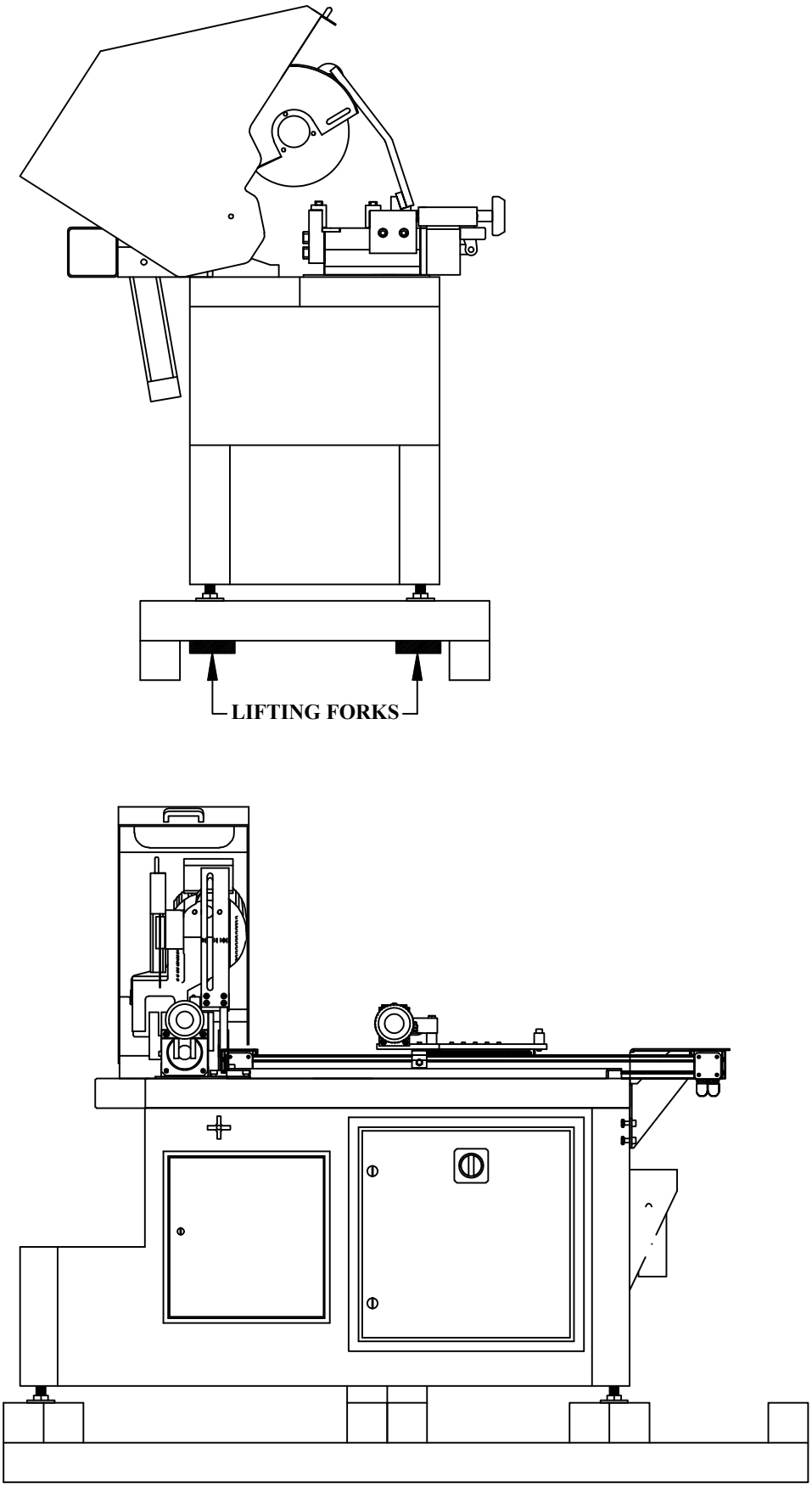


FIGURE 2

4.3 ELECTRICAL REQUIREMENTS

⌦ **CAUTION: TO PREVENT DAMAGE TO THE MACHINE AND DANGER TO THE OPERATOR, ALL ELECTRICAL CONNECTIONS MUST BE MADE BY A QUALIFIED ELECTRICIAN. THIS MACHINE OPERATES WITH LIQUID COOLANT AND MUST BE GROUNDED IN ACCORDANCE WITH NATIONAL ELECTRIC CODES.**

All machines are wired for three phase power. If the machine is not the same voltage as your plant voltage, you will have to purchase a transformer to either step up or down to the correct voltage for the machine as the linear drive components are voltage specific. Check the motor data tag for full load current requirements. Single phase motors are not available.

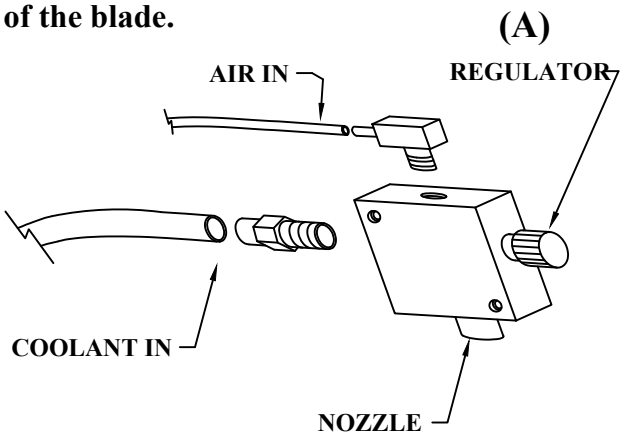
THE ELECTRICAL DIAGRAM FOR THIS MACHINE IS IN SECTION 14.0.

For supply lines ten feet (304 cm) or shorter, we recommend 12 gauge wire. For lines longer than ten feet (304 cm), we recommend 10 gauge wire. We do not recommend supply lines over twenty feet (609 cm) in length.

CPO-315-HFA-NF-CNC (3000 RPM)		
MOTOR VOLTAGE	**FULL LOAD CURRENT**	**HORSEPOWER**
208	**16.4**	**5**
230	**15**	**5**
460	**7.5**	**5**

4.4 MIST COOLANT SYSTEM

The coolant system on this machine is a pneumatic mist type. We recommend using only our P/N 075760, SYNCON-2 coolant in this saw. One gallon of coolant is shipped with the saw. For the best results, we recommend that it is used straight and not diluted. The NF coolant reservoir has a capacity of (5) quarts (4.7 liters). The pressure regulator for the mister should be set at 15PSI (1 BAR). The amount of air is regulated by the adjustment knob (A) on the end of the mister unit. The mist spray should be evenly distributed on both sides of the blade.



MISTER UNIT

FIGURE 3

5.0 MACHINE START-UP

Before starting this machine, take the time to review the operator's manual thoroughly, to familiarize yourself with all of the functions of the machine.

We strongly urge you to follow OSHA directive CFR-1910.147 (effective 09-09-90) regarding lock-out, tag-out procedures. Keep in mind that the directive refers to all hazardous energy sources, not just electrical. The air supply must also be disconnected and locked or tagged.

Do not install a blade on the saw until after it has been powered and cycled several times.

Once the machine has been powered, check the rotation of the spindle. There is an arrow on the guard showing the proper rotation. If the rotation is not correct, the electrician will have to switch two of the three line wires

5.1 CONTROL PANEL FUNCTIONS

HOME SCREEN: This is the home screen for this model. This screen will come up when the saw is powered. You can navigate all of the other screens from this screen. On the initial setup of the saw, move to the Recipe Setup screen next.

SEE FIGURE 4 BELOW.

FIGURE 4

5.1A RECIPE SETUP SCREEN

On this screen, you can set up your cut jobs. To set a job:

1. **Press the recipes field and enter the name for the job you are setting up. Enter the length of the part and the number of parts that you want to cut in the appropriate fields.**

2. **Enter the blade RPM in the proper field. This saw has an RPM range from 1800-3600.**

> **CAUTION: NEVER EXCEED THE RATED RPM OF THE BLADE!!**
> **NEVER USE A HSS BLADE ON THIS NON-FERROUS SAW**

NOTE: SCOTCHMAN INDUSTRIES BLADES ARE RATED FOR A MAXIMUM OF 3000 RPM.

3. **By touching the recipe field, you can name this cut job by the part number or the part name. The machine will store up to 50 cut jobs. Once you have saved a cut job, you can select it anytime by touching the down arrow and selection the job that you want. Once you have set up the cut job, go to the manual screen.**

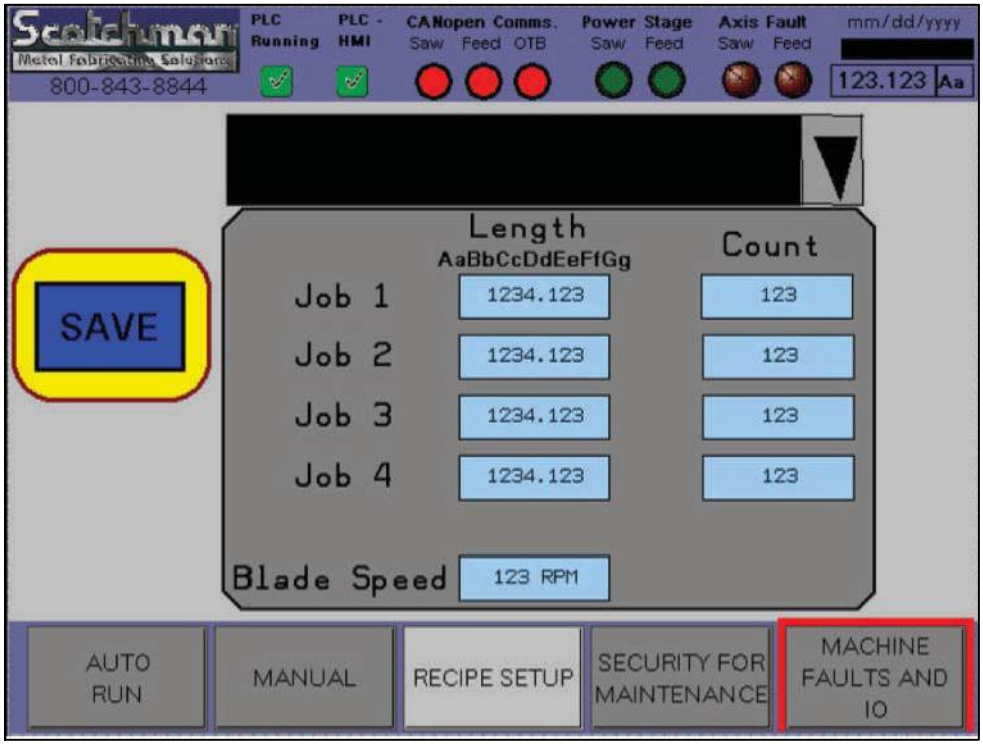


FIGURE 4

5.1B MANUAL SCREEN 1

There are two screens in the manual screen. This is the first screen. From this screen, you set the main vise and the shuttle vise to the size of the material that you are cutting. Open both the material vise and the shuttle vises and place a piece of your material in the vises. Manually adjust both vises to within 1/8 of an inch of the material. On the manual screen, close the vises one at a time and verify that the material is firmly clamped.

You can also set the stroke of the blade from this screen. See Section 6.8 on setting the stroke.

You can make manual cuts from this screen. To make a manual cut, place the material in the vise and clamp the material. Press the blade button and press the head down button. The saw will make one cut. Set the stroke of the machine before making manual cuts.

You also use this screen to start the coolant pump if your saw is equipped with the optional flood coolant. All of the functions on the manual screen can be performed with the hood open, except for the blade start. If you press the blade start with the hood open, the machine will automatically go to the E-stop. This feature allows you to do many of the set-up functions with the hood open.

FIGURE 6

5.1C MANUAL SCREEN 2

This is the second screen on the manual screens. To reach this screen, just toggle the arrow on the right hand side of the manual screen. On this screen, you can manually jog the shuttle vise forward and reverse. You can also home the shuttle vise. To jog or home the shuttle, the shuttle vise has to open. If the shuttle won't move, go back to the manual screen 1 and open the shuttle vise.

You can also set the feed rates of the shuttle vise from this screen. The feed rates are preset at the factory and should not need to be changed for most applications. The feed velocity is set at 12 in/s. If you are cutting solid or heavy wall pipe or tubing, you may have to slow the in-feed rate down to prevent the velocity and mass of the material affecting the cut length. The maximum speed velocity is 15 in/s.

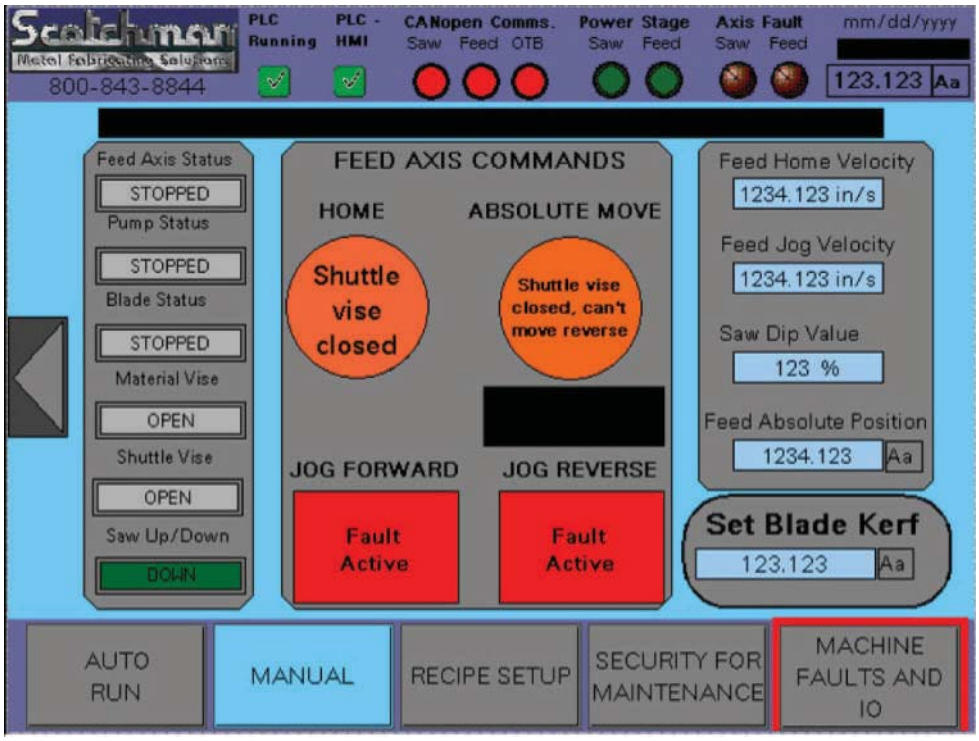


FIGURE 7

5.1D AUTO RUN SCREEN

Before starting an auto operation, make sure that you have all of your setup done. Make sure that the vises are adjusted to your material size, the machine's stroke is set for your material and that you have the correct cut job selected.

Place a piece of material in the machine, with at least 1/2 inch of material extended past the blade.

Press the trim start button. The machine will make the trim cut and start the auto operation.
The operation will continue until the preset amount on the counter is reached, the machine runs out of material or you stop the operation by pressing either the E-Stop or the cycle stop buttons.

Unless there is an emergency, press the cycle stop button. When you press the cycle stop button, the machine will complete the cut it is making and stop at the end of the cycle. You can then press the cycle start button and continue the operation.

If you press the E-Stop, you will have to start the operation over after you have powered the machine back up.

The cut reset button on this machine will reset the cut quantity. If you had the quantity set at 100 and you have cut 50 pieces, push the cut count reset and it will reset the count back to 100 pieces.

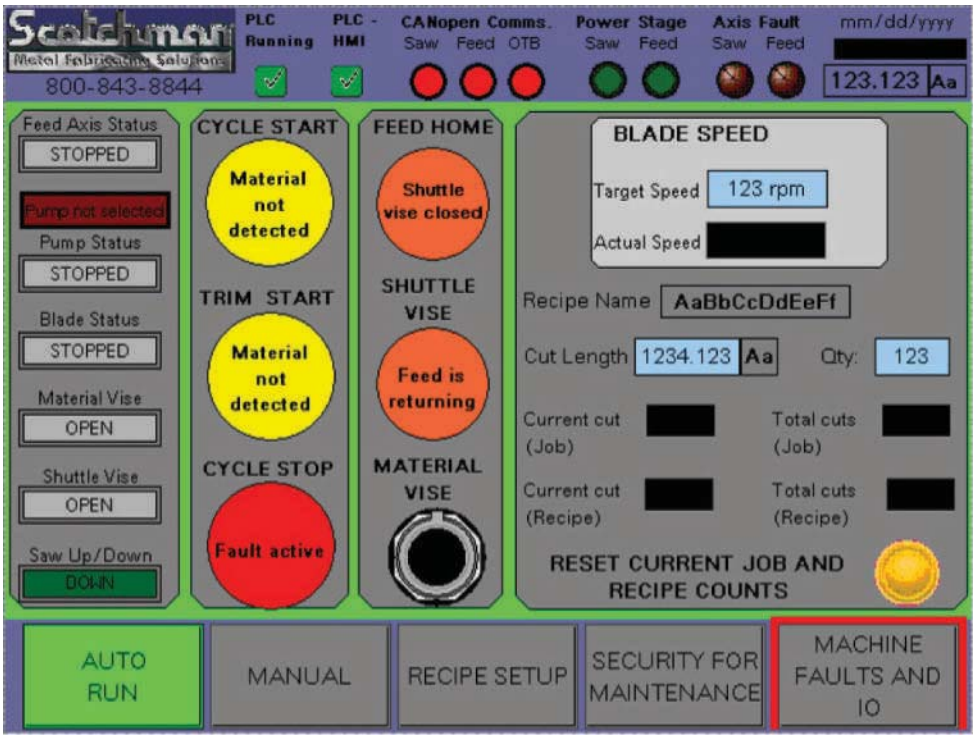


FIGURE 8

5.1E E-STOP SCREEN

This screen appears anytime that the E-Stop is pressed or the saw hood is opened when the machine is powered. If the hood has been opened, you have to press the E-Stop after the hood has been closed or the faults will not reset.

FIGURE 9

5.1F SECURITY FOR MAINTENANCE

On this screen, a username and password are required to access the machine setup and controller menus. To add a username and password, type in the master password "wade" and press the users setup button. Follow the prompts to create a profile for a user.

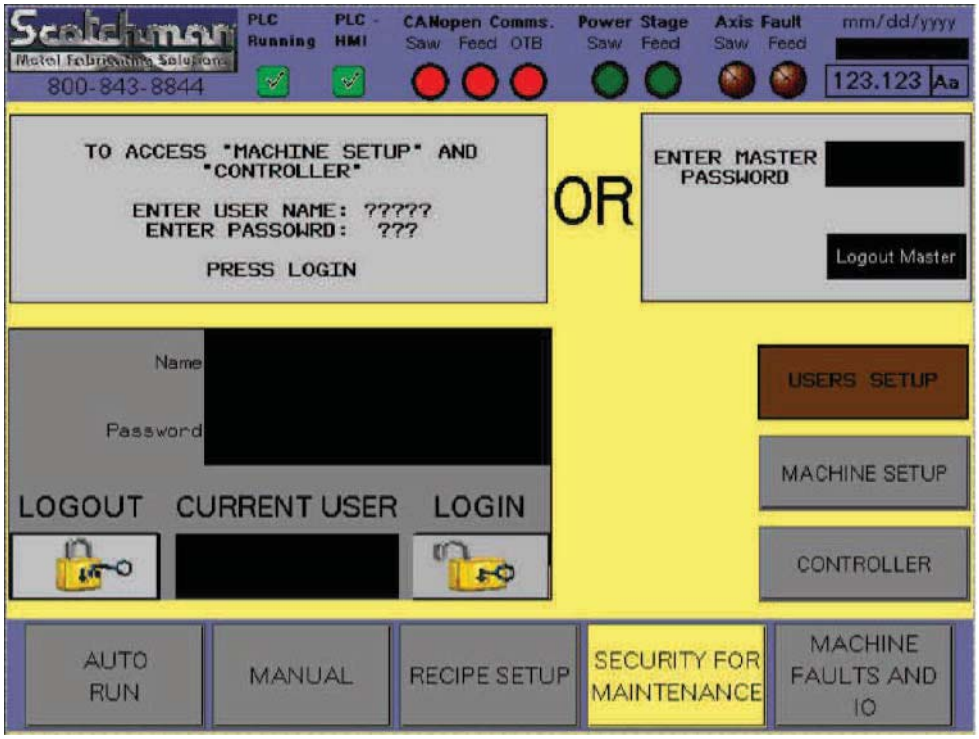


FIGURE 10

5.1G MACHINE SETUP

On this screen, you can set the shuttle vise feed rates and see the current position of the shuttle vise in reference to the full out hard stop.

These parameters are again set at the factory and should not need to be changed for most applications.

The same applies to the in-feed velocity as for manual screen 2. The return velocity for the shuttle is set at 15 in/s. This is the highest setting you can use. If the return velocity is set any higher, the shuttle vise may not stop quick enough on the return, which will affect the cut lengths of your part.

The cut adjust feature on this screen allows you to make fine adjustments to your cut length without re-setting the whole cut program. The maximum adjustment you can make here is plus or minus .100.

As an example, if you are cutting a part 62.5 inches and it is coming out 62.475 inches, go to the 60-90 inch field and insert .025. This will add .025 to 62.475 and bring your cut length back to 62.500.

You can also add a negative value if your part is too long.

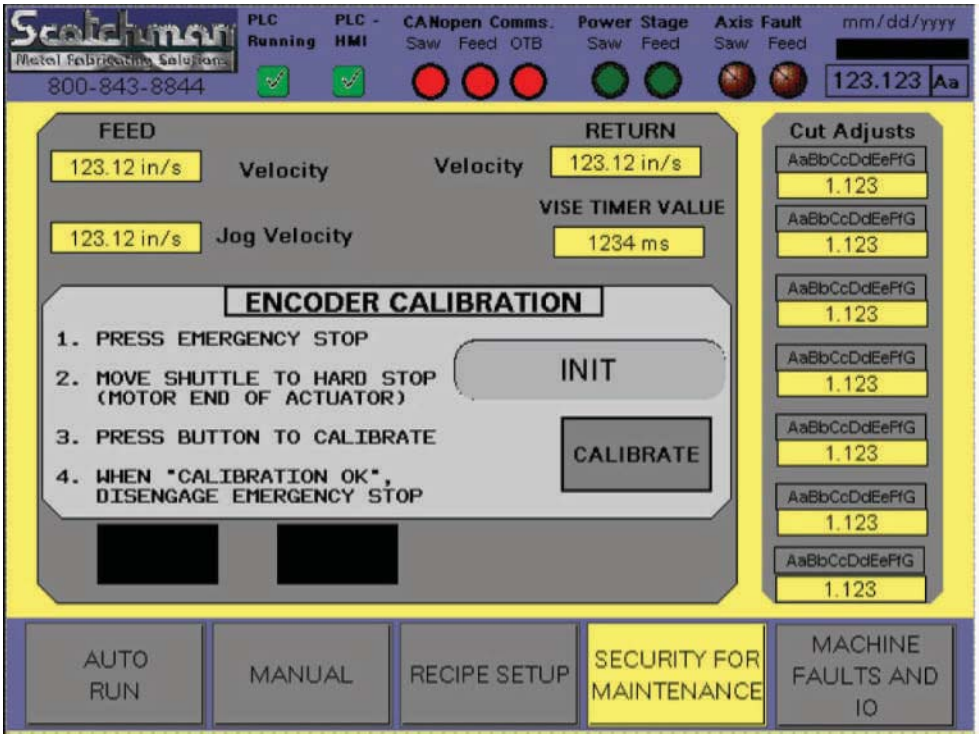


FIGURE 11

5.1H CONTROLLER

On this screen, you can change the brightness of the display screen. You can also empty the event log.

FIGURE 12

5.1I MACHINE FAULTS & IO

The machine faults section shows if the variable speed drive or the linear drive are faulted and their error code. Press the clear button to re-set. The inputs/outputs section shows all the inputs and outputs of the PLC. This screen is generally used for troubleshooting.

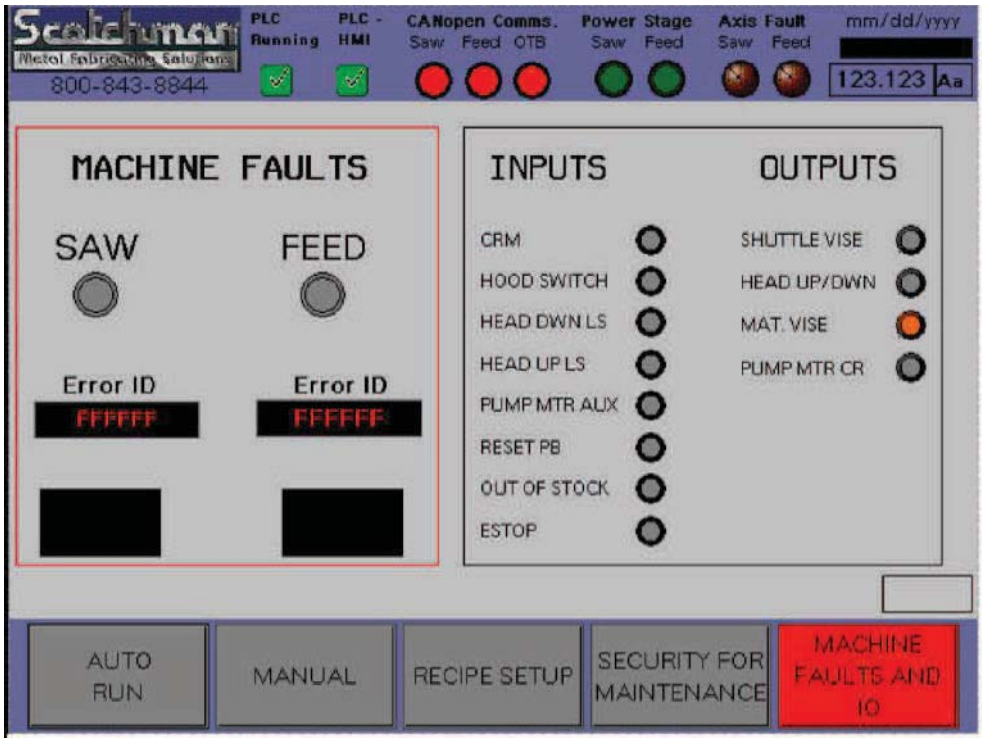


FIGURE 13

6.0 MACHINE OPERATION

6.1 BLADE INSTALLATION

SEE FIGURE 4A BELOW.

⌦ **CAUTION: THIS MACHINE IS DESIGNED TO USE CARBIDE TIPPED BLADES, ONLY. USE ONLY BLADES DESIGNED FOR THIS MACHINE. DO NOT USE BLADES DESIGNED FOR THIS MACHINE ON ANY OTHER EQUIPMENT.**

NEVER EXCEED THE MAXIMUM RPM OF THE BLADE.

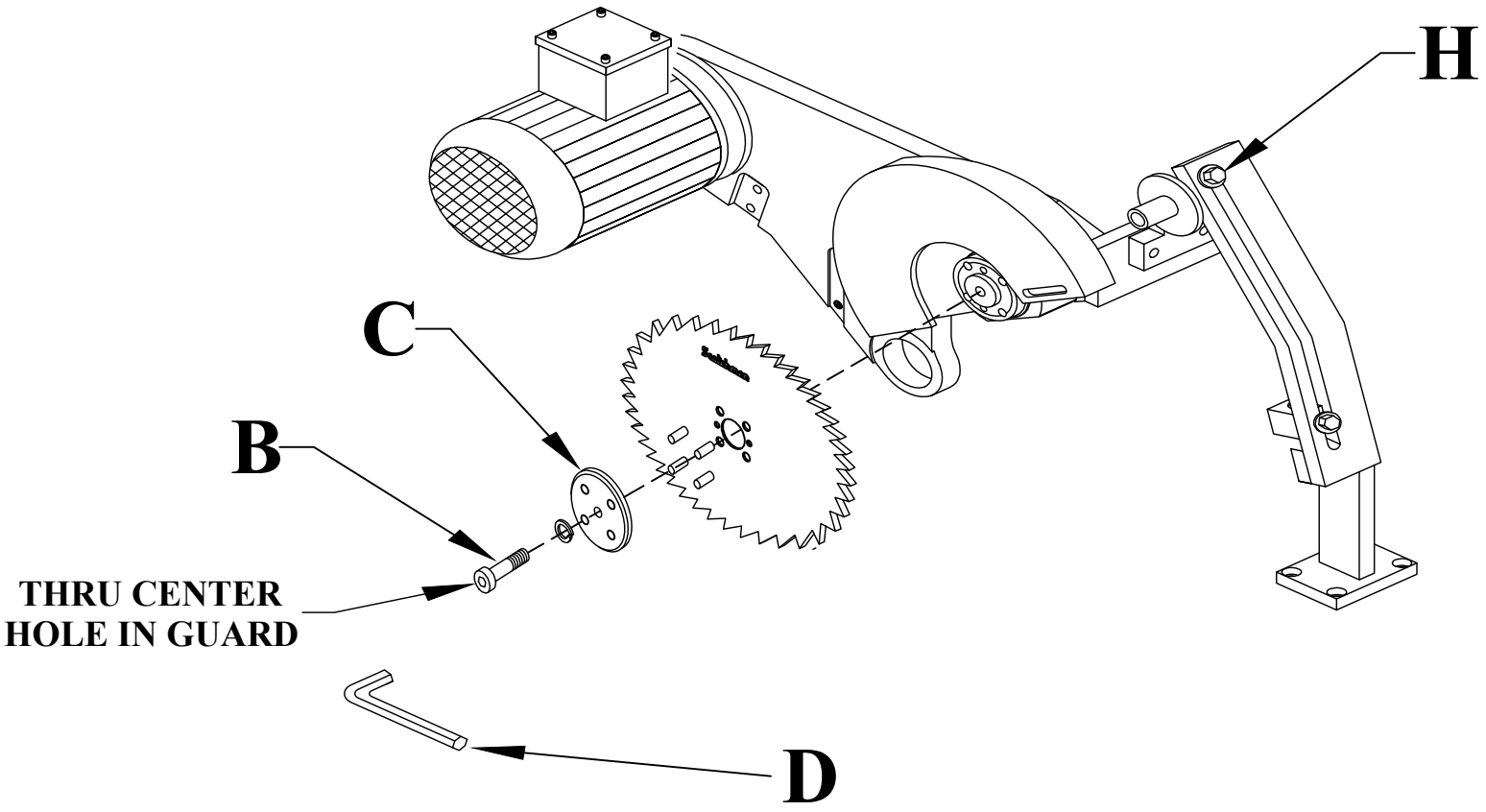


FIGURE 14

The CPO-315-HFA-CNC-NF saw is designed to use a maximum 12 inch (300mm) diameter blade.

The arbor size is 40mm with four 10mm pins and uses a blade with 4/12/64 pin spacing.

BEFORE INSTALLING THE BLADE, make sure that the power to the machine is disconnected and the air supply is turned OFF.

USE THE FOLLOWING STEPS TO INSTALL A BLADE:

An 8mm hex key wrench (D), shipped with each machine, is required to change blades.

1. **Raise the movable hood guard to the open position.**
2. **Release the upper stroke control stop (H) and allow the head to travel to its full up position.**
3. **Remove the blade bolt (B) and the blade flange (C).**

► **NOTE: The blade bolt is left hand threaded and must be turned clockwise to remove it.**

4. **Check the blade flange, the blade and the saw spindle for any chips or nicks that will affect the way the blade seats. Flange, spindle and blade hub MUST be clean before installing blade!!**
5. **Install the blade. Make sure that the pin holes in the blade line up to the holes in the spindle.**
6. **Replace the blade flange (C) and start the bolt (B) into the spindle.**
7. **Before locking the blade in position, the back lash must be taken up. To take up the back lash, rotate the bottom of the blade toward you until it seats against the drive pins.**

⌦ **CAUTION: THE BLADES ARE VERY SHARP AND CARE MUST BE TAKEN WHEN REMOVING THE BACK LASH. DO NOT GRIP THE CUTTING EDGE OF THE BLADE BARE HANDED. THE BACK LASH MUST BE TAKEN UP EVERY TIME A BLADE IS CHANGED.**

8. **After taking up the back lash, tighten the blade bolt (B).**
9. **Reset the upper stroke control and return the movable hood guard to the down position.**
10. **Break in the saw blade. The teeth on new or re-sharpened blades have a very sharp edge and should be fed through the first three or four cuts, very slowly, before starting normal cutting.**

Besides taking up the back lash and breaking in the blade, it is very important to keep the blade flange, the spindle and the blade clean and free from nicks. Failure to do these things will result in poor saw performance or possibly broken or damaged blades.

6.2 SELECTING THE PROPER BLADE & CUTTING SPEED

BLADE RPM - 1800-3600 is the RPM range of this non-ferrous saw.

> ⌦ **CAUTION: NEVER EXCEED THE RATED RPM OF THE BLADE!!**
> **NEVER USE A HSS BLADE ON THIS NON-FERROUS SAW**

Scotchman Industries offer three different 300mm (12") carbide tipped blades for this saw. They are all rated for a maximum of 3000 RPM. They have three different numbers of teeth and have two thicknesses. They are:

P/N 074334
This blade has 120 teeth and is also the thinner (.091) of the blades. It is recommended for thin walled tubing (square or round) and extrusions that have a thinner profile.

P/N 074329
This blade has 84 teeth and and is thicker (.134) and it is recommended for thicker wall materials and smaller to mid sized solids.

P/N 074327
This blade has 72 teeth and is also thicker (.134). It is recommended for heavy walled tube, thick extrusions, and larger solids.

With a non-ferrous saw it is possible to use a coarser blade (fewer teeth) to cut thinner material. But for best results, the feed rate should be reduced. It is not advised to use a finer blade (more teeth) to cut thick solids as the teeth will load up with material and material can bond itself to the blade. This is called "pick-up" and it is very difficult to remove. A blade with pick-up will cause vibrations during the cut as the blade is "pinched" when it passes thru the material and will leave a very rough finish on the cut. It can also cause the material to move in the vise.

Coolant is also very important factor. Not using enough coolant or the wrong kind of coolant can cause a blade to get pick-up and will shorten blade life. We highly recommend using our SYNCON 2 coolant (P/N 075760) straight and not diluted. Make sure to use the proper coolant and make sure the mister is adjusted correctly so it applies enough coolant to the blade to keep it lubricated.

The feed rate is adjusted with a knob on the front upper left of the saw just above the left cabinet door. screw it in to slow the feed rate and screw it out to increase the feed rate. Always start with a slower feed rate and work up to a faster feed rate. With the right blade, good coolant and correct feed rate you can expect long blade life and high performance from this saw.

6.3 SAW CAPACITIES

SEE FIGURE 15 BELOW.

Figure 15 is a chart showing the maximum capacities of this machine in various materials.

CAPACITIES WITH MAXIMUM DIAMETER BLADES 315 MM		HFA 90° ONLY	RFA/ST 90° ONLY	RFA/ST BUNDLE FEED
	INCHES MM	Ø3-1/2 Ø89	Ø3 Ø76	Ø3 Ø76
	INCHES MM	3-1/8 X 3-1/8 79 X 79	2-1/2 X 2-1/2 63 X 63	2-1/2 X 2-1/2 63 X 63
	INCHES MM	3-1/8 X 3-1/8 79 X 79	2-1/2 X 2-1/2 63 X 63	N/A
	INCHES MM	3-1/8 X 3-1/8 79 X 79	2-1/2 X 2-1/2 63 X 63	N/A
	INCHES MM	3-1/2 X 2-3/4 89 X 70	3 X 2-1/2 76 X 63	3 X 2-1/2 76 X 63
FERROUS	INCHES MM	Ø1-3/4 Ø44	Ø1-3/4 Ø44	Ø1-3/4 Ø44
FERROUS	INCHES MM	1-1/2 X 1-1/2 38 X 38	1-1/2 X 1-1/2 38 X 38	1-1/2 X 1-1/2 38 X 38
NF	INCHES MM	Ø3-1/2 Ø89	Ø3 Ø76	Ø3 Ø76
NF	INCHES MM	3-1/8 X 3-1/8 79 X 79	2-1/2 X 2-1/2 63 X 63	2-1/2 X 2-1/2 63 X 63

03/21 #047200

FIGURE 15

6.4 MATERIAL MAIN VISE

SEE FIGURE 16 BELOW.

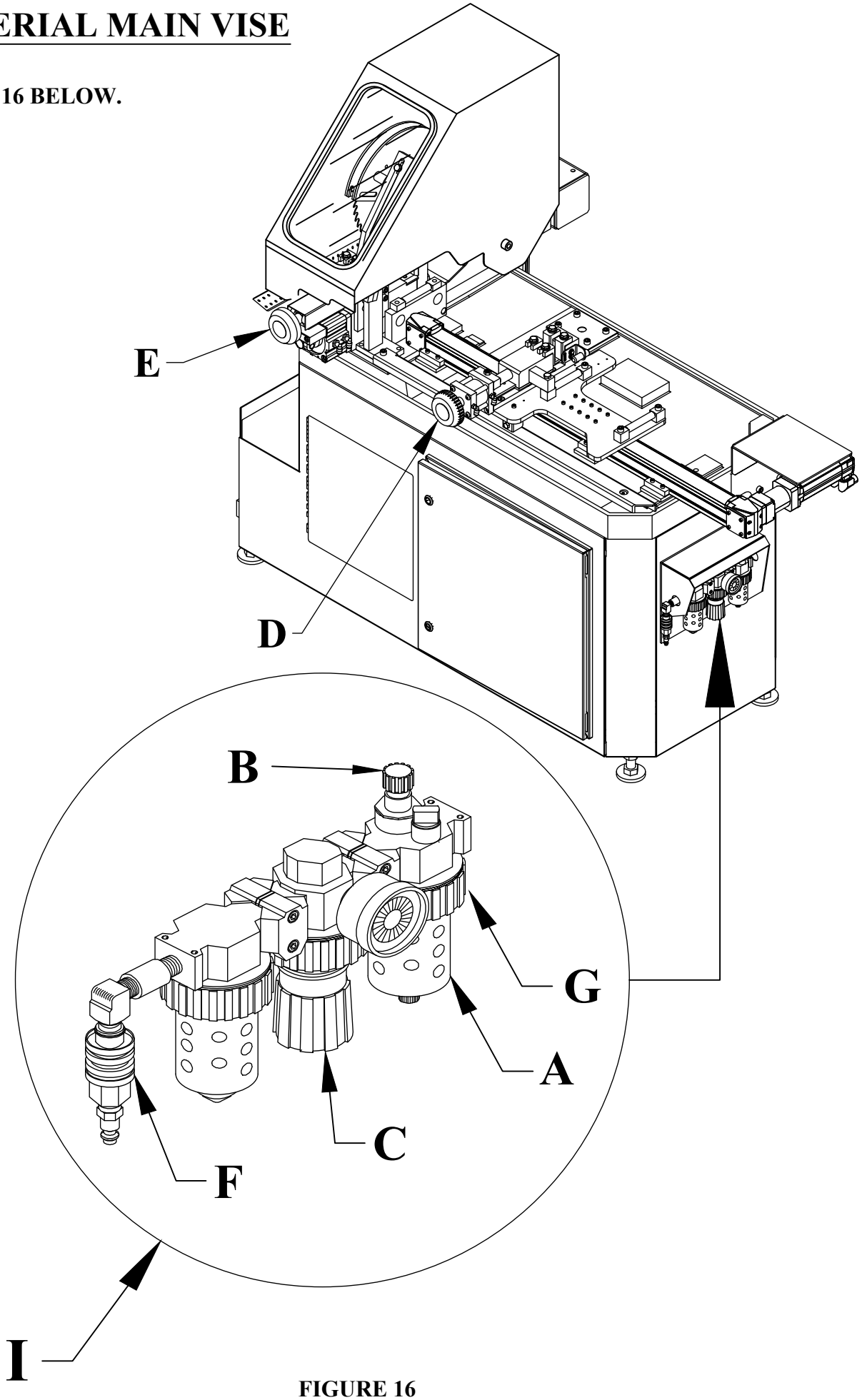


FIGURE 16

The following are set-up and maintenance instructions for the material main vise.

1. **Make sure that the filter/lubricating device (A) is full of oil.**

⌦ **NOTE: Use a quality (ISO 22) air line lubricant designed for automatic oilers.**

2. **Slide the shuttle valve (F) on the filter/lubricator device down to the closed position.**
3. **Connect the air supply to the shuttle valve. Make sure that the vise is clear and that the head is in the UP position.**
4. **Slide the shuttle valve up to open the valve. Whenever the shuttle valve is closed, it bleeds the air pressure out of the system automatically.**
5. **Adjust the air pressure regulator (C). 90 PSI (6.2 BAR) is the minimum operating pressure. 130 PSI (9 BAR) is the maximum.**
6. **The vise is activated by the top proximity switch on the saw head.**
7. **The lubricating device (A) should release one drop of oil every 5 to 10 cycles. On top of the lubricating device is a clear plastic dome with a small tube inside. The oil should drop out of the tube. The lubricating device is adjusted by turning the knob (B) on the top of the lubricator.**
8. **To add oil to the lubricating device, disconnect the air supply and remove the plastic bowl. The bowl is threaded and is removed by turning the threaded collar (G). Fill the bowl approximately 3/4 full of oil designed for air lubricators and screw it back onto the lubricator.**

TO ADJUST THE VISE TO THE SIZE OF MATERIAL BEING CUT:

1. **Open the vise, using the positioning handle (E), and place the material in the vise.**
2. **Crank the vise closed to within approximately 1/8 of an inch (3mm) from the material. The power vise has approximately 1/4 of an inch (6mm) of stroke. Proper clamping is very important and special jaws may be required for some materials.**

FOR MORE INFORMATION CONTACT YOUR LOCAL DEALER OR THE FACTORY.

6.5 SHUTTLE VISE & CYLINDER

REFER TO FIGURE 16 ON PAGE 26.

The following are set-up and maintenance instructions for the shuttle assembly.

1. Steps 1 through 8 are the same for the shuttle vise as they are for the material vise.

TO ADJUST THE VISE TO THE SIZE OF MATERIAL BEING CUT:

2. Open the vise, using the positioning handle (D), and place the material in the vise.

3. Crank the vise closed to within approximately 1/8 of an inch (3mm) from the material.

The shuttle vise has approximately 1/4 of an inch (6mm) of stroke. Proper clamping is very important and special jaws may be required for some materials.

FOR MORE INFORMATION ABOUT SPECIAL JAWS PLEASE CONTACT YOUR LOCAL DEALER OR THE FACTORY.

MODEL
CPO-315-HFA-CNC

- FULLY AUTOMATIC CYCLE (available In ferrous or non-ferrous)
- TOUCH SCREEN CONTROLS
- PRECISION CNC CONTROLLED
- INTERLOCKING SAFETY HOOD
- EMERGENCY STOP BUTTON
- CLAMPING BOTH SIDES OF BLADE FOR HIGHEST QUALITY, BURR-FREE CUTS
- BLADE GUIDES FOR ACCURATE TOLERANCES (FERROUS MODEL ONLY)
- MIST COOLANT LUBRICATION SYSTEM
- ADJUSTABLE STROKE CONTROL ON THE SAW HEAD
- ADJUSTABLE INDEXING FEED SPEEDS
- ADJUSTABLE DOWN FEED CONTROL ON THE SAW HEAD FOR FEED RATE
- PROGRAM UP TO FOUR SEPARATE CUT LENGTHS IN EACH JOB
- 100 PROGRAM JOB STORAGE
- 30" SINGLE SHUTTLE LENGTH (UNLIMITED SHUTTLES)
- PIECE COUNTER
- ONE SAW BLADE
- ONE GALLON COOLANT
- COMPLIES WITH ANSI B11.10 SAFETY STANDARDS
- WARRANTY: TWO YEARS ON PARTS
- MADE IN USA

FIGURE 17

6.6 POWER DOWN FEED

REFER TO FIGURE 18 BELOW.

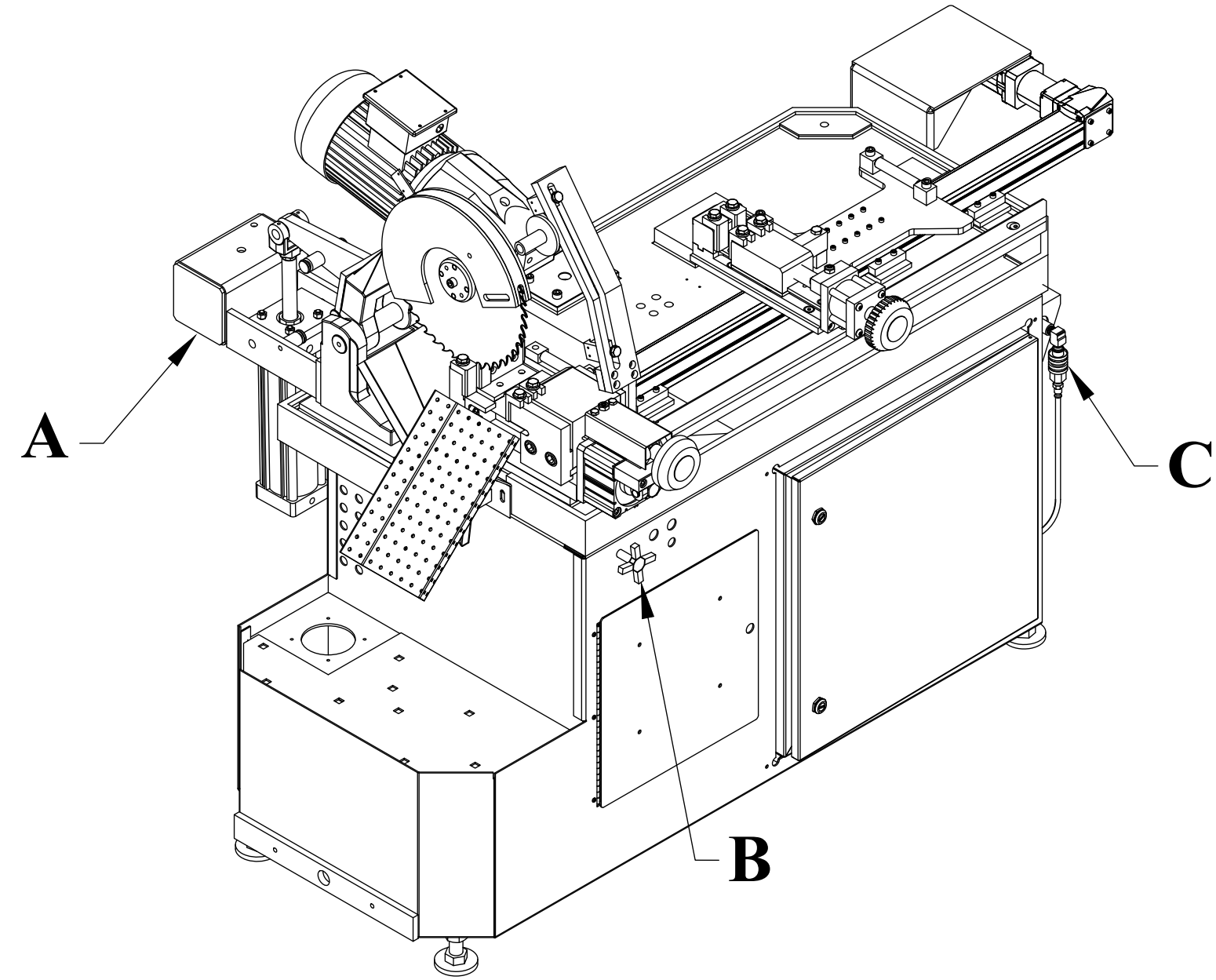


FIGURE 18

⌦ **CAUTION: ALWAYS DISCONNECT THE AIR SUPPLY BEFORE REMOVING THE FILLER PLUG FROM THE RESERVOIR. IF THE FILLER PLUG IS REMOVED WHILE THE MACHINE IS CONNECTED TO AIR PRESSURE, THE FLUID IN THE TANK WILL BE PURGED THROUGH THE OPENING UNDER PRESSURE.**

Before powering the saw, check the oil level in the reservoir (A). There is a sight glass in the back of the reservoir. The head must be in the full UP position. Use our P/N 060520 or a SAE 10W (ISO 32) non-foaming hydraulic oil, such as Mobil DTE 10 or equivalent.

1. **Slide the shuttle valve (C) to its CLOSED position and connect the air supply.**

2. **Slide the shuttle valve to its OPEN position and shut the flow control valve off. Then open it one turn.**

3. **The down feed rate is adjusted using the flow control valve (B). The down feed rate should be set during the setup of an operation while the AUTOMATIC/MANUAL switch is in the MANUAL position. Slowly adjust the rate up as the saw makes a cut. Thin walled tube and extrusions can generally be cut fairly fast. Thick solids should be cut at a slower feed rate. Listen to the saw. Too fast of a feed rate (especially with thick solids) will overload the saw and can possibly slow blade RPM excessively. It could also cause the material to load up in the teeth of the saw blade as overly fast feed rates don't allow time for chip clearance.**

   Many things, including the type of material being cut, the blade RPM and the condition of the blade, will affect the down feed rate.

6.7 MATERIAL CLAMPING

All work pieces must be clamped securely in the vise. Any slippage of the material can result in broken or damaged blades. The material should be clamped so that the contact surface between the material and the blade is as small as possible. For this reason, when cutting flat stock material, we recommend standing it up and cutting it through the thinnest section, whenever possible. We also recommend cutting square tubing through the diagonal section and angle with the web up. Some thin walled round sections and profiles will require special jaws to hold them.

6.8 STROKE CONTROL ADJUSTMENT

SEE FIGURE 19 ON THE FOLLOWING PAGE.

TO ADJUST THE UP AND DOWN STROKE OF THE SAW HEAD, USE THE FOLLOWING STEPS:

1. **With the machine's power off, raise the hood of the saw.**
2. **Using a 17mm wrench, loosen the bolt (A) on the lower stroke control (B) and let the stroke control rest at the bottom of the slot.**
3. **Place a piece of the material you are going to cut in the saw vise and manually clamp it in a position so that it is off to one side of the blade, so that the saw blade will not contact the material when the head comes down.**
4. **Close the hood. The saw will not run with the hood open. Go to the manual screen and press head down button**
5. **When the blade has gone passed the material in the vise by approximately 1/8 of an inch (3mm), stop the head movement by turning off the flow control valve (F) and turn off the air pressure by sliding the shuttle valve (G) down.**
6. **Turn the power off. Raise the hood and bring the lower stroke control (B) up to the head stop and lock it in place.**
7. **Bring the upper stroke control (C) down to the head stop and lock it in place.**
8. **Turn the air back on by moving the shuttle valve (G) up and open the flow control valve (F) one turn.**
9. **Loosen the bolt (A) on the upper stroke control (C) and allow the head to move slowly up until the blade is approximately 1/8 of an inch (3mm) above the material in the vise. Tighten the bolt in the upper stroke control.**

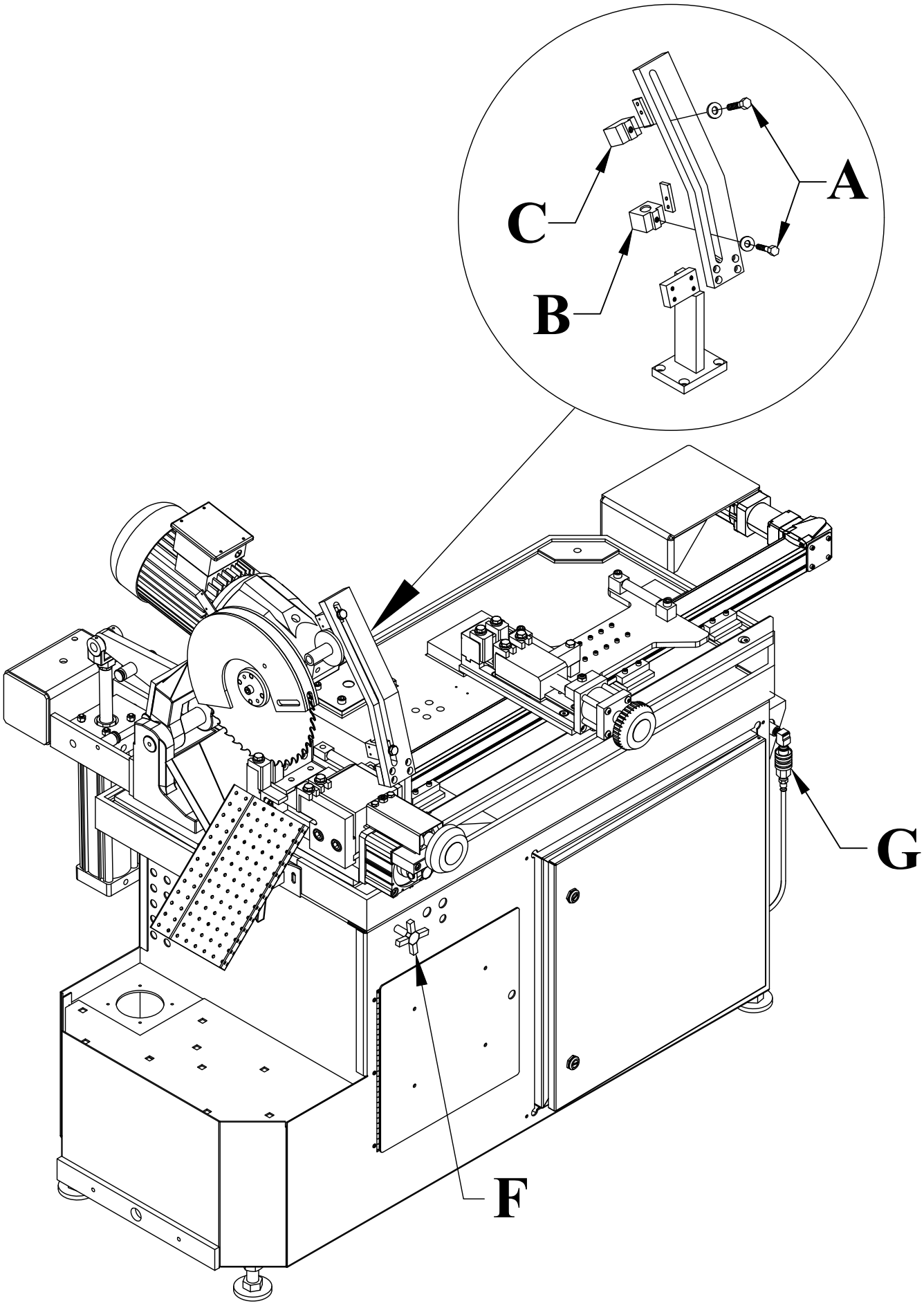


FIGURE 19

7.0 MAINTENANCE

7.1 LUBRICATION

SEE FIGURE 20 BELOW.

Grease the head pivot pin (C) and the spindle shaft with a high pressure, high temperature, bearing grease daily. Apply oil to the shuttle vise guide shafts daily.

Clean the chips out of the vise at least once a day, more often if needed. Apply penetrating oil to the spindle and guide pins. Clear the chips with a brush or similar device. DO NOT use compressed air.

Check the oil level in the air lubricator device daily. (Section 6.4 - Number 7 and 8)

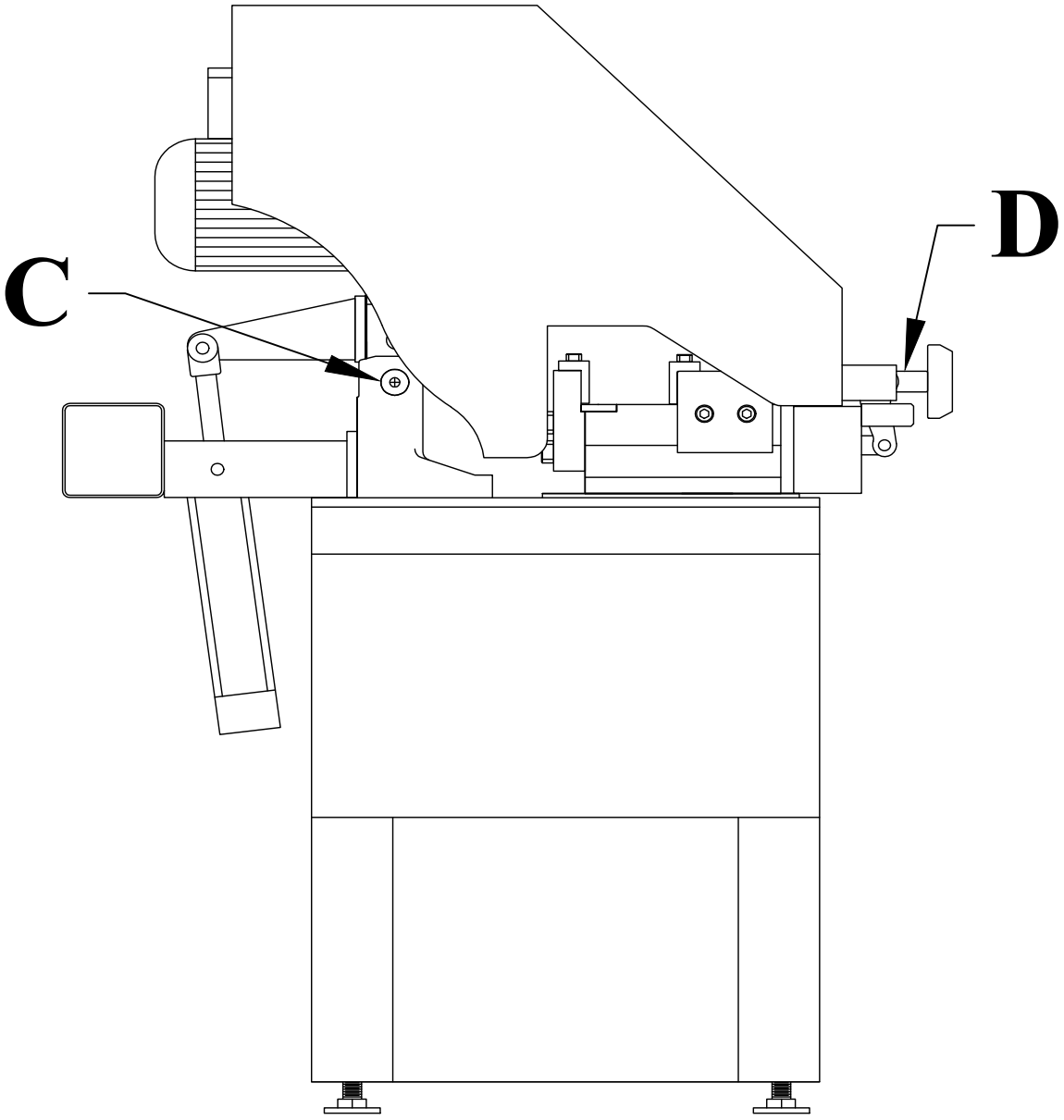


FIGURE 20

7.2 CUTTING OILS AND LUBRICANTS

SECTION 12.0 lists Scotchman's part numbers for cutting oils and lubricants. Using high quality lubricants and oils will greatly increase the life of this equipment.

For the mister, we recommend using only our P/N 075760 - SYNCON-2 straight - not diluted.

For the power down feed, we recommend using our P/N 060520 - POWER DOWN HYDRAULIC OIL or use a SAE 10W (ISO 32) non-foaming hydraulic oil, such as Mobil DTE 10 or equivalent in the reservoir.

For the air lubricators, we recommend using our P/N 075753 - AIRLINE LUBRICATION or use a quality (ISO 22) air line lubricant designed for automatic oilers.

7.3 SCHEDULED MAINTENANCE

A program of scheduled maintenance should be set up and documented according to your application and the frequency you use this machine. The following is a list of some important things that should be included in a scheduled maintenance program.

1. **EVERY 250 HOURS OR 3 MONTHS:**
   If your saw is equipped with the optional flood coolant system, drain the coolant reservoir and flush it Refill the coolant reservoir with new coolant. The coolant reservoir has a capacity of eight (8) gallons (37.3 liters). This will extend the life of the coolant pump considerably. Check the level of the hydraulic fluid in the power down feed reservoir.

⌦ **CAUTION: ALWAYS DISCONNECT THE AIR SUPPLY BEFORE REMOVING THE FILLER PLUG FROM THE RESERVOIR. IF THE FILLER PLUG IS REMOVED WHILE THE MACHINE IS CONNECTED TO AIR PRESSURE, THE FLUID IN THE TANK WILL BE PURGED THROUGH THE OPENING UNDER PRESSURE.**

2. **EVERY 750 HOURS OR 6 MONTHS:**
   Check the condition of the pivot pins on the head and on the guard. Check the complete saw for loose connections in the electrical and air systems. Since every application is different, each user must design and implement a scheduled maintenance program that fits his applications.

7.4 SPINDLE SHAFT REPLACEMENT

REFER TO FIGURE 13 BELOW.

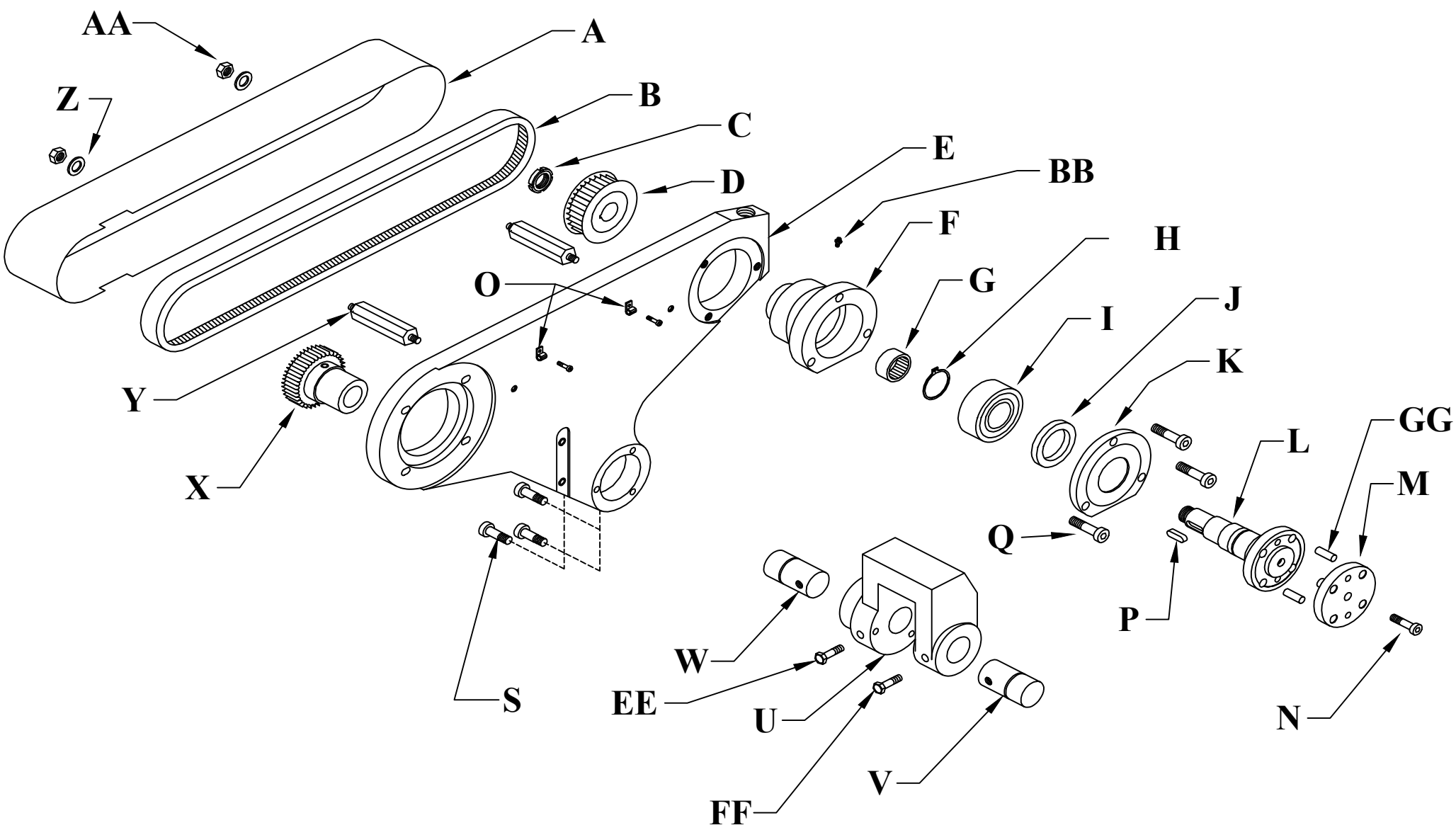


FIGURE 21

Replacing the spindle or spindle bearings on this machine is not an easy task. You should consider ordering the spindle shaft assembly (P/N 077929) which includes parts E, F, G, H, I, J, K, L and P.

TO REMOVE THE SPINDLE, USE THE FOLLOWING STEPS:

1. **Remove the lock nut (C) and pull the belt sprocket (D) off the end of the shaft.**

2. **Remove the three bolts (Q) and remove the blade guard. Remove the spindle shaft assembly from the saw. The housing (F) fits snugly in the frame (E) and may have to be tapped out with a hammer.**

3. **Gently tap two steel wedges, opposite of each other, between the housing (F) and the bearing retainer (K).**

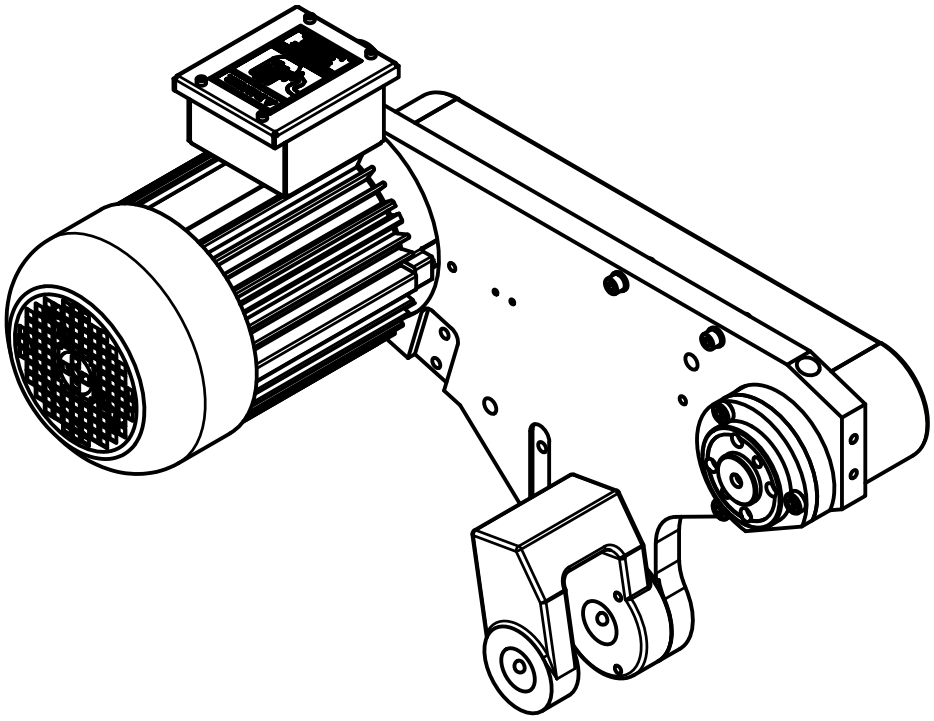
4. **Place the assembly in a press, resting on the steel wedges, and press the spindle and bearing out of the housing (F).**

5. **Remove the snap ring (H) and press the bearing (I) off of the spindle shaft (L).**

6. **Press the needle bearing (G) out of the spindle housing (F).**

7. **Reassemble the spindle assembly, reversing the above steps.**

8. **Be sure to grease the assembly with a high temperature bearing grease before operating the machine.**



7.5 SPINDLE REPLACEMENT (MAIN VISE)

SEE FIGURE 22 BELOW.

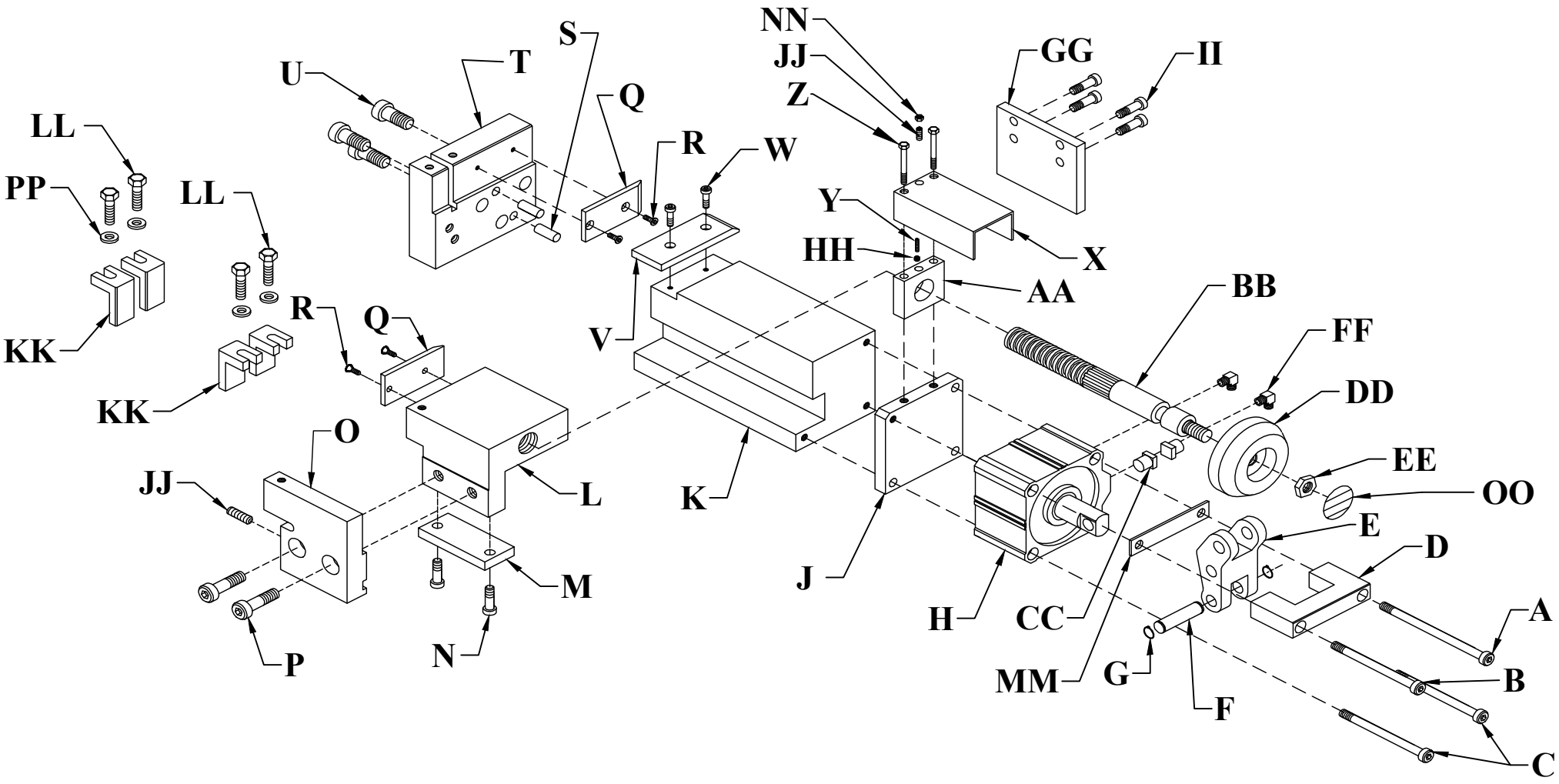


FIGURE 22

1. **Disconnect the machines power and the air supply.**

2. **Remove the vise guard (X) and the spring (Y) and ball (HH).**

3. **Remove the bolts (A & B) and the retainer (D).**

4. **Remove the clevis pin (F) and remove the clevis (E) and the forks (CC).**

5. **The spindle can now be removed from the machine.**

6. **If the spindle is locked up in the machine, remove the bolts (II) and the side plate (GG).**

7. **The vise block (L) and the spindle can now be removed as one piece.**

8. **Install the new spindle and reassemble the vise, reversing the above steps.**

7.6 SEAL REPLACEMENT (MAIN VISE)

SEE FIGURE 22 ON THE PRECEDING PAGE.

SEAL KIT IS P/N 045631

1. **Make sure that the power and air supply to the machine are both off.**

2. **Remove the bolts (A & B) and the retainer (D).**

3. **Remove the clevis pin (F) and the cylinder clevis (E) and the forks (CC).**

4. **Remove the two lower bolts (C) and remove the cylinder (H) from the machine.**

5. **Place the cylinder in a vise and remove the snap ring from the front of the cylinder.**

6. **Pull the cylinder apart and remove all of the old seals. Check the end casting, cylinder tube and piston for nicks or scratches.**

7. **Install the new seals and reassemble the vise, reversing the above procedures.**

7.7 SHUTTLE VISE MAINTENANCE

SEE FIGURE 23 BELOW.

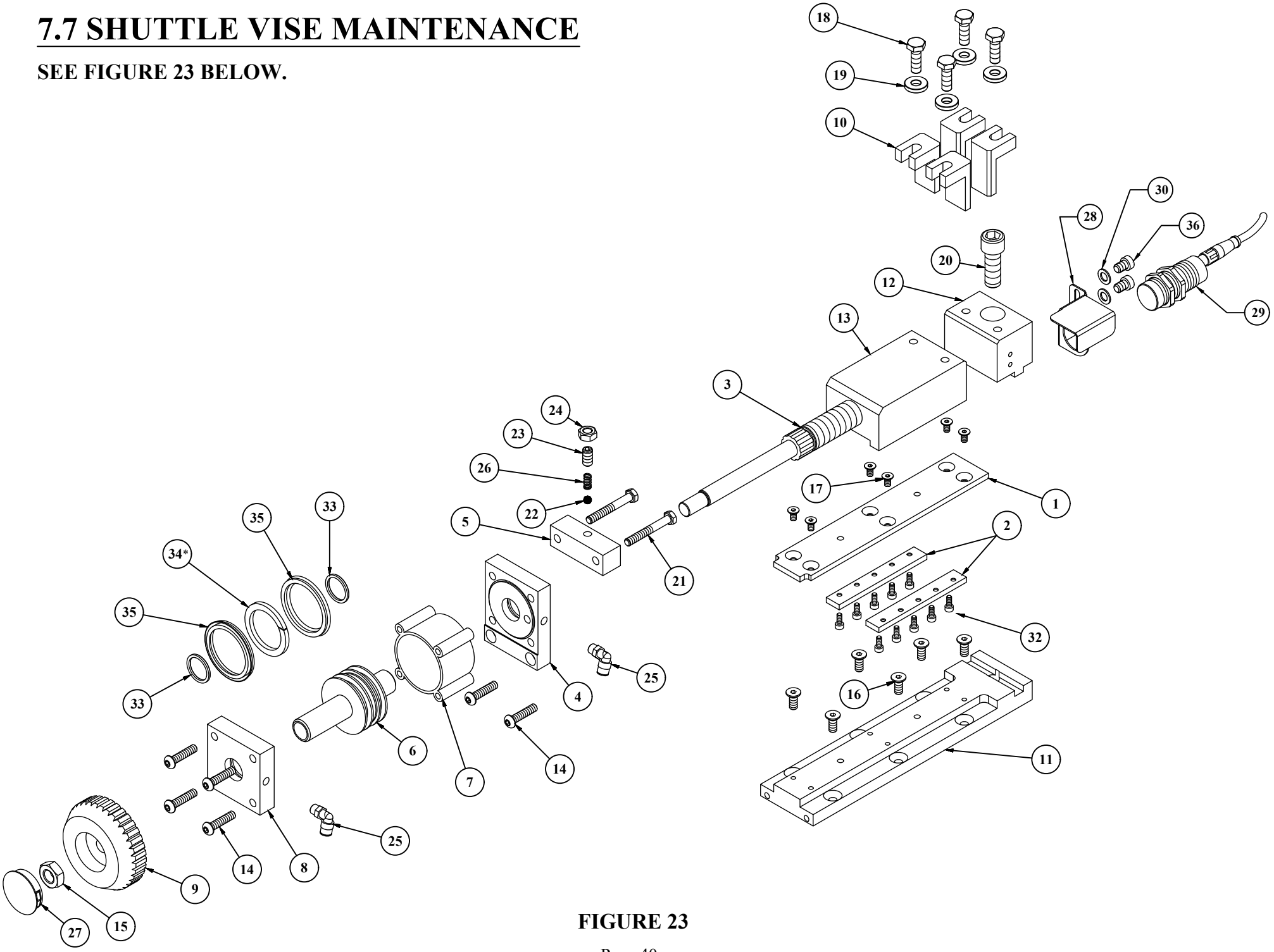


FIGURE 23

TO REPLACE THE VISE SPINDLE OR SEALS - FOR SEALS SEE BOTTOM OF PAGE:

⌦ **CAUTION: DISCONNECT THE AIR SUPPLY TO THE SAW**

1. **Remove the jam nut (24), the set screw (23), the spring (26) and the ball (22)**

2. **Remove cover (27) and jam nut (15) and the boss (9), from the end of the spindle.**

3. **Disconnect the air lines. The air connections on the cylinder are snap connectors. To release the air connections, push the collar around the hose into the fitting and pull the hose out. To reconnect the lines, simply push the air line into the fitting as far as it will easily go.**

4. **Remove the two bolts (14) from the cylinder mount plate (4) and remove the cylinder assembly from the machine.**

5. **Slide the vise spindle (3) and vise block (13) off of the machine and replace either part, as needed.**

6. **Reassemble the vise, reversing the above steps.**

IF YOU NEED TO REPLACE THE SEALS IN THE AIR CYLINDER:

SEAL KIT IS P/N 045654

1. **After step number 4 above, clamp the mount plate (4) in a vise and remove the four bolts (14).**

2. **Slide the end plate (8) off and remove the piston (6) and the cylinder tube (7).**

► **NOTE: Make sure everything is clean and the inside of the cylinder tube is smooth.**

3. **Replace the seals and reassemble, reversing the above steps.**

NOTE: (34*) may or may not be included in the piston assembly.
It is not needed for the CPO-315-HFA-NF-CNC machine.

7.8 OPTIONAL COOLANT PUMP MAINTENANCE

(OPTINAL FLOOD COOLANT)

SEE FIGURE 24 BELOW.

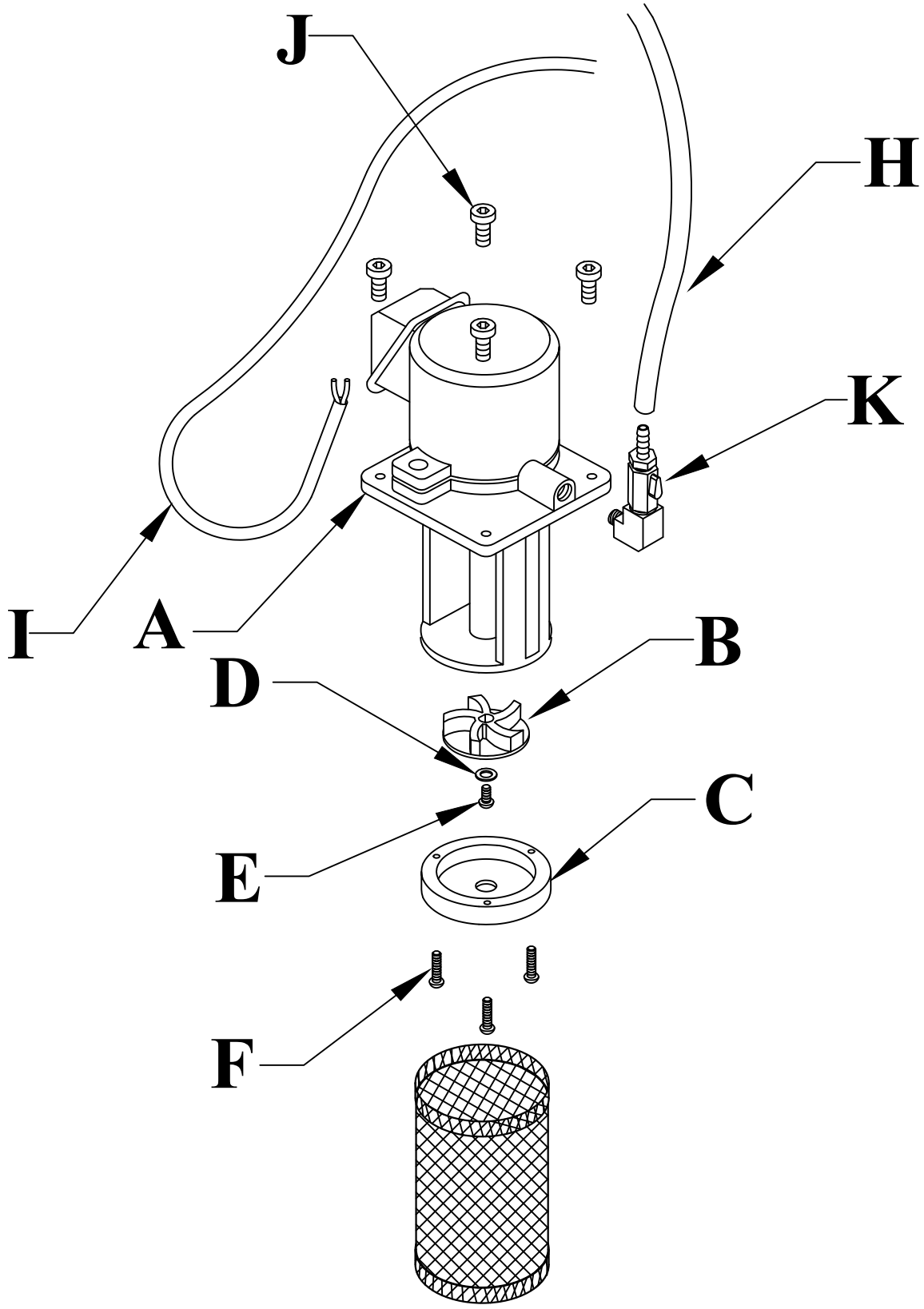


FIGURE 24

IF YOUR COOLANT PUMP IS LEAKING OR LACKS POWER, USE THE FOLLOWING STEPS:

NOTE: WE RECOMMEND REPLACING THE PUMP SEAL (D) P/N 060151 ANYTIME THE PUMP IS DISMANTLED.

FOR PART IDENTIFICATION, SEE THE FOLLOWING PAGE

1. **Make sure that the power to the machine is off.**
2. **Remove the four bolts (J) and remove the pump from the machine.**
3. **Remove the coolant line (H) and the fittings (K). Clean any sludge out of the line and fittings.**
4. **Remove the three bolts (F) and remove the end plate (C).**
5. **Remove the screw (E), seal (D) and the impeller (B) from the pump.**
6. **Clean the sludge out of the impeller, end cap and passage way from the bottom of the pump to the outlet port.**
7. **Reassemble the pump, reversing the above steps.**
8. **Clean out the reservoir and fill with new coolant. We recommend our P/N 075751 saw coolant mixed in a ratio of one part coolant to seven parts water. The capacity is 8 gallons.**

8.0 OPTIONAL EQUIPMENT

8.1 SPECIAL VISE JAWS

Special vise jaws for holding thin wall round tubes, profiles and bundles are available on a made to order basis. For prices and delivery on special jaws, contact your local dealer or the factory.

FOR MORE INFORMATION CONTACT YOUR LOCAL DEALER OR THE FACTORY.

8.2 OPTIONAL IN FEED SUPPLY TRACKS

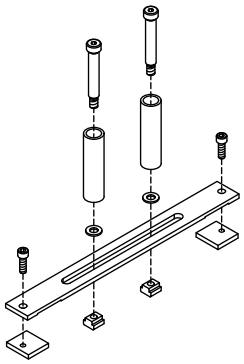
A ten foot roller supply track, that can be installed on the input side of the saw to support longer pieces of material, is an available option for this saw.

The supply tracks can also be bolted end to end, to supply longer tracks, if needed.

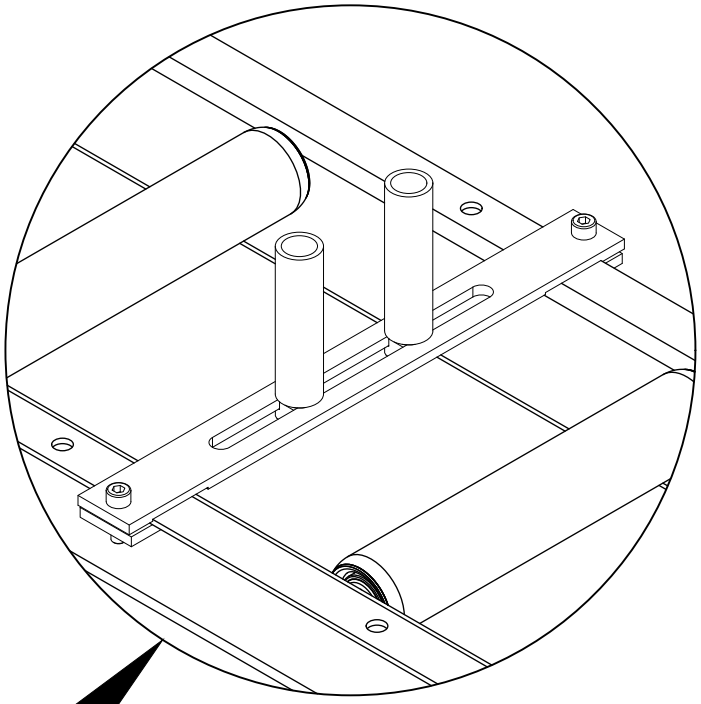
SEE FIGURE 25 ON THE FOLLOWING PAGE.

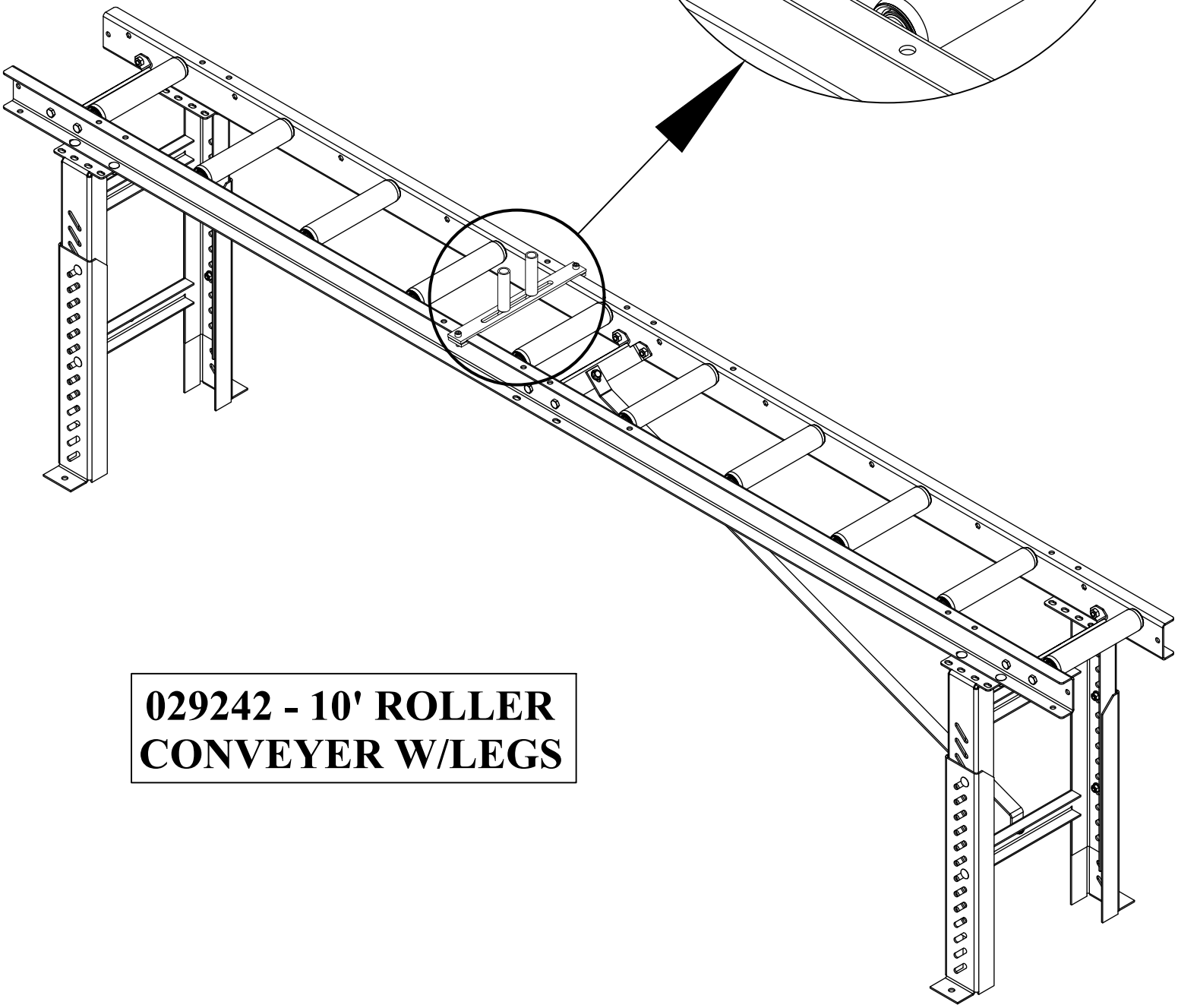
1. **What is shown is our P/N 029242 - 10' ROLLER CONVEYER W/LEGS that is fully assembled with our optional P/N 076938 - 13" GUIDE ASSEMBLY mounted to it.**
2. **The conveyors can be bolted together to make longer lengths if needed.**
3. **Adjust the conveyor so that the rollers are at the same level as the bed of the material vise on the saw. The conveyor height is adjusted via the slots in the legs.**
4. **For additional stability, we strongly recommend anchoring the conveyor to the floor.**
5. **The vertical rollers on the Guide Assembly are adjustable for width and can be adjusted to keep the material toward the front or back of the conveyor.**
6. **Several Guide Assemblies can be mounted to the conveyor if needed.**

EXPLODED VIEW **DETAIL VIEW**



076938
13" GUIDE
ASSEMBLY





029242 - 10' ROLLER
CONVEYER W/LEGS

FIGURE 25

9.0 TROUBLE SHOOTING GUIDE

9.1 ELECTRICAL TROUBLE SHOOTING

1. THE SAW MOTOR RUNS BUT DOES NOT HAVE ADEQUATE POWER.

A. Make sure that the supply voltage and phase correspond to the saw motors voltage and phase.
B. Disconnect the machine from the power source and check for any loose or disconnected wires.
C. The supply lines to the machine must be of adequate size to handle the load.
FOR RECOMMENDED SIZES AND LENGTHS, SEE SECTION 4.3.
D. The bearings in the blade spindle may be damaged. With the power to the machine disconnected, check the blade spindle for any free play. If free play is present, the bearings should be replaced.

FOR SPINDLE REPAIR OR REPLACEMENT INSTRUCTIONS - SEE SECTION 7.4.

2. THE MACHINE WILL NOT RUN IN THE AUTOMATIC MODE.

A. The counter must have a pre-set quantity displayed. If the counter reads zero, the machine will not run in the automatic mode.
B. There must be material in the shuttle vise and the vise must be adjusted to the material.
C. If the machine has reached the end of a bar, you need to reset the machine before starting the automatic operation again. REFER TO SECTION 5.1D.

9.2 BREAKAGE OR EXCESSIVE DULLING OF BLADES

1. Select the proper blade and spindle speed for the material being cut.
FOR RECOMMENDATIONS, REFER TO SECTION 6.2.
2. Always break in the blade before you start normal cutting.
3. Do not apply excessive down pressure on the workpiece. Excessive down pressure will cause the teeth to remove too large of a chip, resulting in premature dulling or breakage or cause pick-up.
4. We recommend using only our P/N 075760 SYNCON-2 coolant in this saw that it be used straight and not diluted. See SECTION 4.4 for more information on the coolant system.
5. Have your blades re-sharpened by someone who has the right equipment for circular cold saw blades. Improper re-sharpening is one of the most common problems encountered in cold sawing.
6. Keep the blade flange, the face of the blade spindle and the blade clean and free from nicks. Any contamination or nicks on the flange, spindle or the blade will cause the blade to run out of alignment.

7. **Always remove the back lash when installing a blade. For instructions: REFER TO SECTION 6.1. Also, check the condition of the drive pins when replacing the blade. If the drive pins are broken or worn, replace them.**
8. **Any of the above problems may cause a condition known as pick-up. Pick-up is caused when the material being cut adheres itself to the blade and makes that spot on the blade wider. When pick-up is present, you will notice the sound is different during the cut due to a vibration caused by the pickup passing thru the material. This is caused by the blade being pinched as it goes through the material where the pickup is present. This can cause the material to move in the vise and the cut will have a very rough finish. It can also damage the blade if not removed. After the pick-up has been removed, review the above items to determine what caused the problem.**

9.3 PART LENGTH NOT CONSISTENT

1. **Check your air pressure. This machine requires a minimum of 90 pounds of pressure to function properly. When cutting solid materials, the pressure may have to be set as high as 130 PSI to prevent the material from slipping in the jaws.**
2. **The bolts in the adjustable stop may not be tight enough, allowing the stop to move.**
3. **The main vise or shuttle vise may be adjusted too tight, causing the material to drag or bind before the vise is seated against the stop.**
4. **Check for chip build-up between the main vise and the shuttle vise.**

9.4 COOLANT SYSTEM

1. **IF THE MISTER IS NOT APPLYING COOLANT TO THE BLADE:**

A. **Check the level of the coolant in the reservoir.**
B. **Check the nozzle on the end of the mister and make sure that it is turned on.**
C. **Make sure the regulator knob on the mister is adjusted correctly.**
D. **Check the suction line between the reservoir and the mister unit. Make sure it isn't plugged, cracked, or has poor connections. If it does it will not siphon the coolant out of the reservoir.**
E. **Check the reservoir for contamination that may be blocking the inlet.**
F. **Check the air line to the mister for air flow. Make sure it is not pinched, kinked, or leaking. Make sure the air pressure to the mister is adjusted correctly.**
G. **The mister may be plugged. It may be necessary to remove it and disassemble it and clean it.**

9.5 PNEUMATIC SYSTEM

REFER TO FIGURE 26 BELOW.

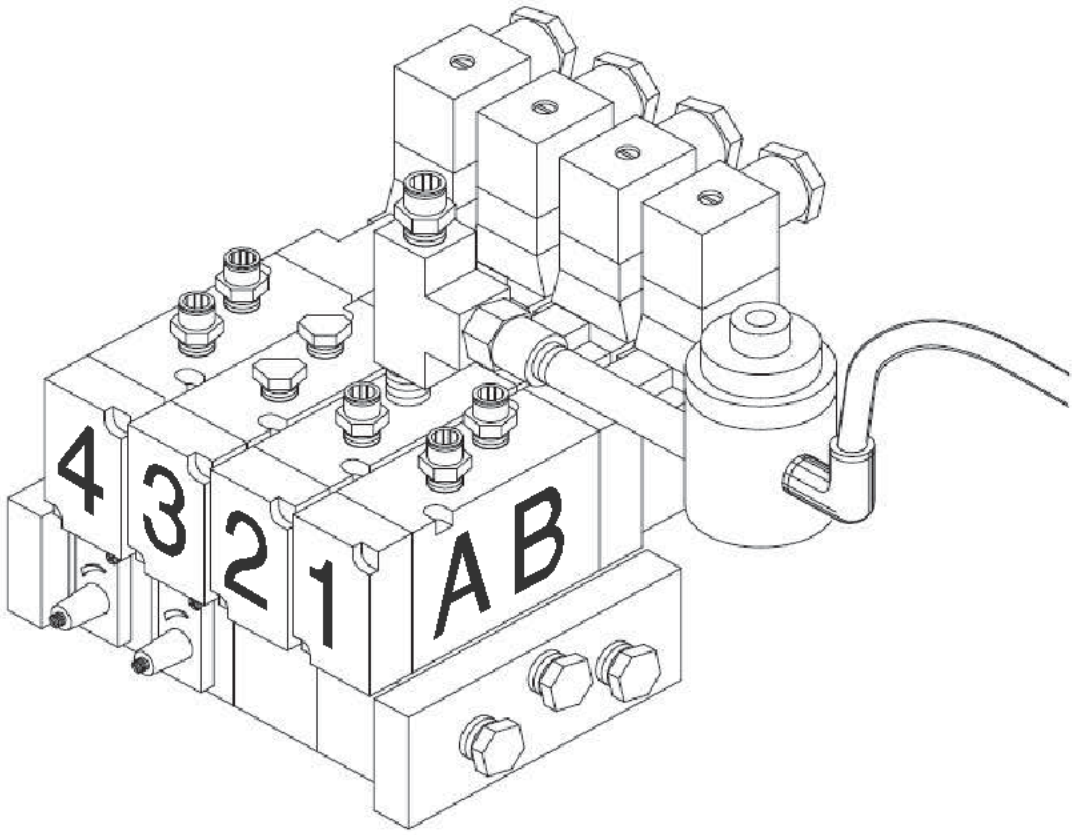


FIGURE 26

1A - 5/16" BLACK TO SAW VISE BACK
1B - 5/16" BLACK TO SAW VISE FRONT
2A - 1/4" RED TO TOP OF POWER DOWN HYD. TANK
2B - 1/4" GREEN TO BOTTOM OF POWER DOWN CYL.
3A - 1/4" BLUE TO RIGHT END OF SHUTTLE CYLINDER
3B - 5/16" BLACK TO TOP OF SHUTTLE HYD. TANK
4A - 1/4" BLACK TO BACK OF SHUTTLE VISE
4B - 1/4" YELLOW TO FRONT OF SHUTTLE VISE

FLOW CONTROL VALVE - POWER DOWN - SAW VISE
RIGHT SIDE - 3/8" BLACK TO TEE UNDER POWER DOWN HYD. TANK
LEFT SIDE - 3/8" BLACK TO STRAIGHT FITTING UNDER POWER DOWN HYD. TANK
3/8" BLACK FROM TEE UNDER POWER DOWN HYD. TANK TO CYL. TOP

FLOW CONTROL VALVE - SHUTTLE
1/2" BLACK FROM VALVE TO LEFT END SHUTTLE CYLINDER
(AS VIEWED FROM FRONT OF MACHINE.)

THE MOST COMMON PNEUMATIC/HYDRAULIC PROBLEMS ARE:

A. LOW LEVEL OF FLUID IN THE RESERVOIR:

A sight glass is located on the back of the reservoir behind the machine. Saw head must be in the full up position to check the fluid level. Use our P/N 060520 or a SAE 10W (ISO 32) non-foaming hydraulic oil, such as Mobil DTE 10 or equivalent.

⌦ **CAUTION: THE AIR SUPPLY TO THE MACHINE MUST BE DISCONNECTED BEFORE YOU REMOVE THE FILLER PLUG FROM THE RESERVOIR. FAILURE TO DISCONNECT THE AIR WILL CAUSE THE FLUID TO BE PURGED OUT THROUGH THE OPENING UNDER PRESSURE!**

B. Worn seals in the vise cylinder: For seal kit installation instructions:

REFER TO SECTION 7.5 & SECTION 7.6.

C. Loose connections in the air lines: All of the air lines on this machine are the snap in connector type. To remove the hose, push in on the slide connector while pulling out on the hose. To reconnect the hose, simply push the hose into the connector as far as it will go. If there are any questions about where the hoses connect:

REFER TO FIGURE 26 ON THE PRECEDING PAGE.

► **NOTE: AIR SUPPLY MUST BE SHUT OFF TO REMOVE AND REINSTALL AIR LINES**

10.0 PARTS LISTS

THE FOLLOWING SECTIONS CONTAIN THE SAW AND OPTIONAL EQUIPMENT PARTS LISTS AND DRAWINGS.

FOR YOUR CONVENIENCE, ALWAYS GIVE YOUR COMPLETE SERIAL NUMBER WHEN ORDERING PARTS!

10.1 DRIVE ASSEMBLY

ITEM	PART #	DESCRIPTION	Q	677901	M-10 SHCS
A	677912	Belt Guard	R	077864	M-5 x 12 SHCS
B	077915	Belt	S	221120	M-8 HHCS
C	077189	Lock Nut	T		Not used
D	077898	Belt Sprocket	U	077912	Pivot Shaft Housing
E	047913	Pivot Frame	V	077329	Pivot Pin (Short)
F	077900	Bearing Housing	W	077341	Pivot Pin (Long)
G	077909	Needle Bearing	X	077906	Motor Sprocket
H	077897	Snap Ring (33mm)	Y	677904	Guard Mount Studs
I	075077	Bearing	Z	077160	M-8 Plastic Washer
J	075075	Seal	AA	677936	M-8 Dome Nut
K	077896	Seal Flange	BB	243102	Grease Nipple
L	077894	Spindle Shaft	EE	073328	M-8 x 40 HHCS
M	077626	Saw Flange	FF	073326	M-8 x 25 HHCS
N	077908	M-10 Bolt (Left Hand)	GG	073920	M10 Dowel Pin (Included in M)
O	046094	Wire Clip	HH	077929	Spindle Assembly (Includes C, D, F, G, H, I, J, K, L, N, P & BB)
P	077902	Key 8 x 25			

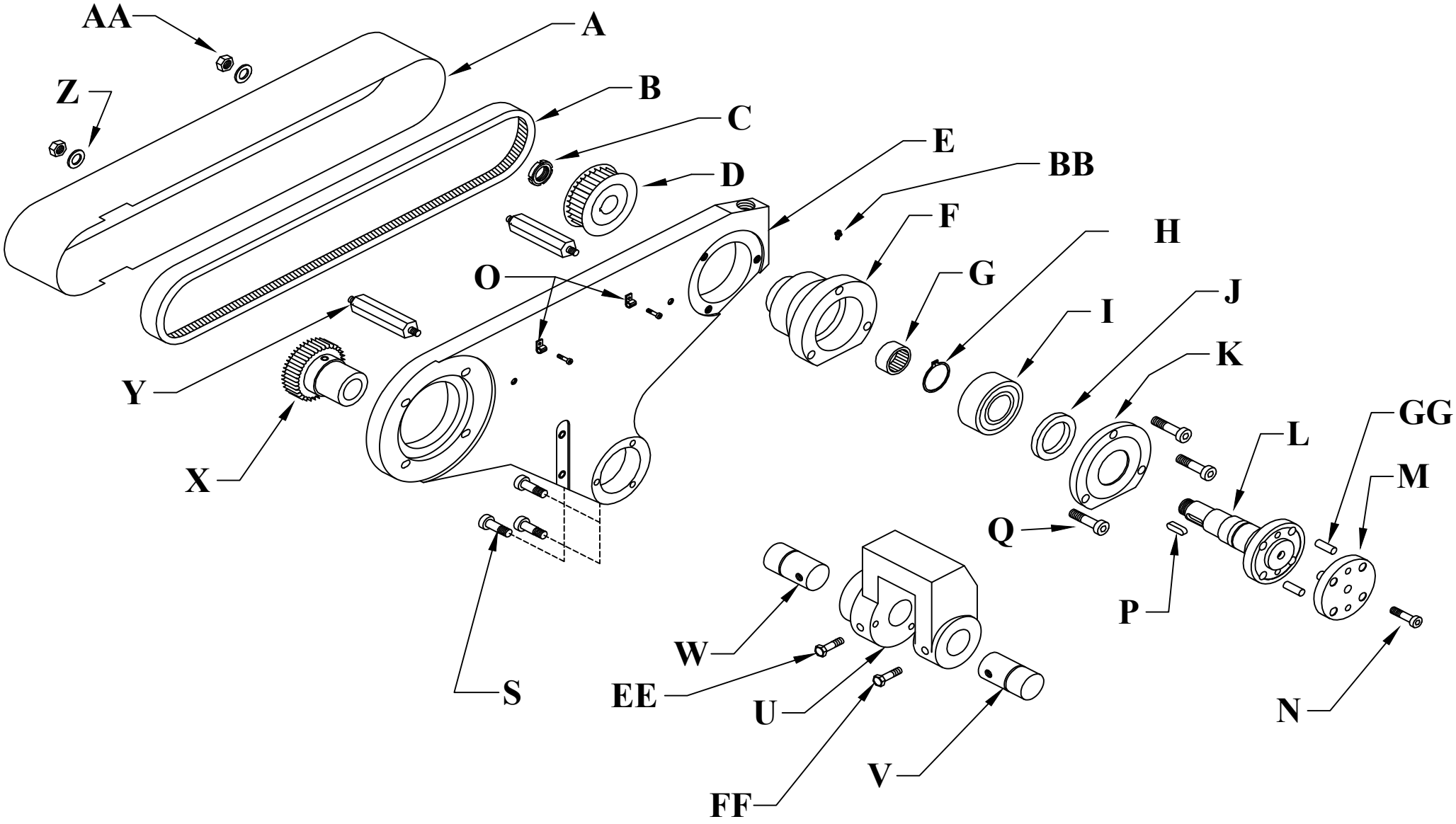
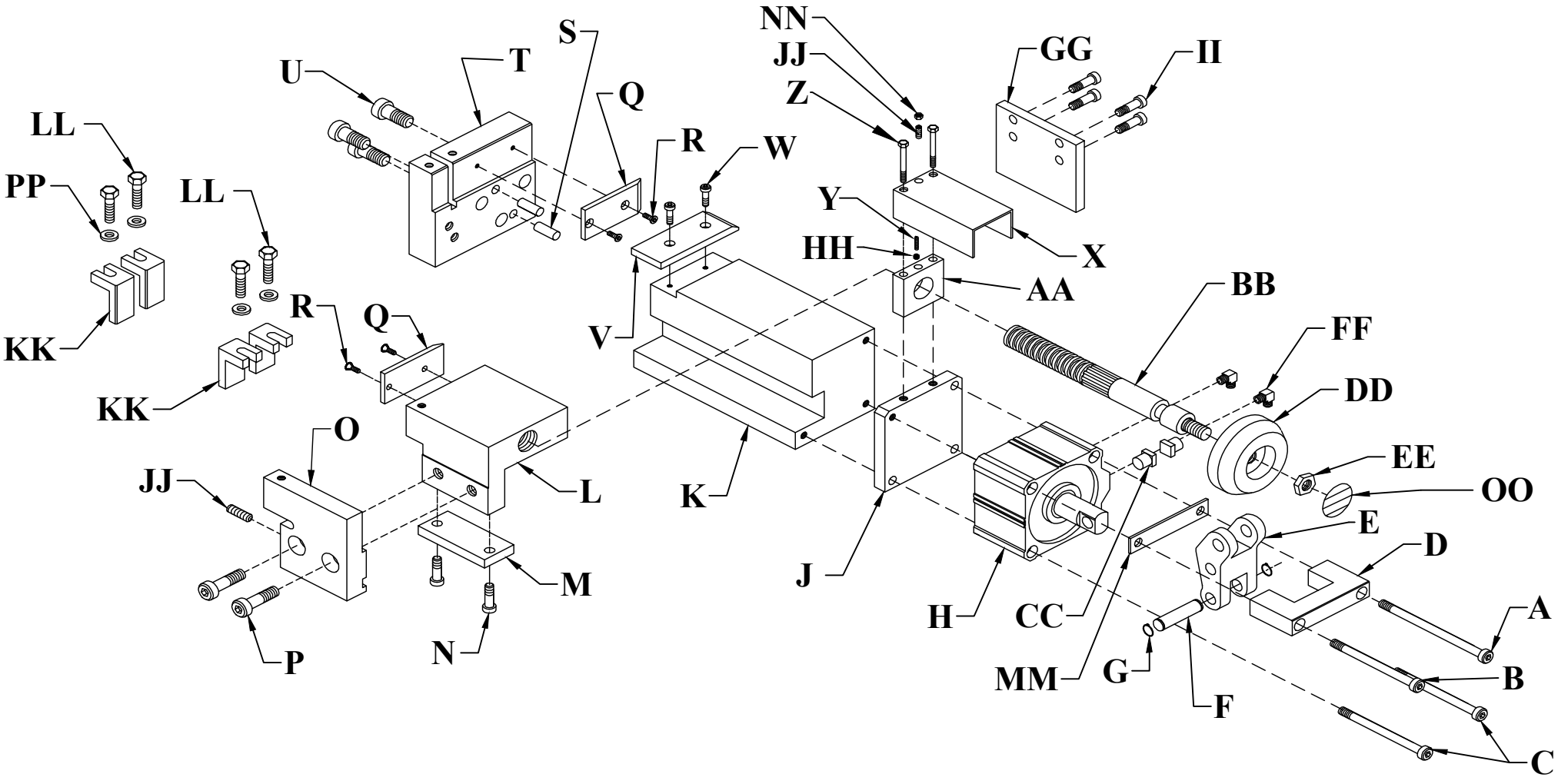


FIGURE 27

10.2 MAIN VISE ASSEMBLY

ITEM	PART #	DESCRIPTION	V	045308	Lower Wear Plate
A	221245	10 x 160mm SHCS	W	073458	M-6 x 10 SHCS
B	221240	10 x 140mm SHCS	X	045325	Lead Screw Cover
C	221235	10 x 100mm SHCS	Y	045602	Spring
D	045311	Clevis Guide	Z	201160	M-8 x 60 HHCS
E	045312	Clevis	AA	045314	Detent Block
F	045317	Clevis Pin	BB	045309	Lead Screw
G	046655	Snap Ring	CC	045198	Drive Forks
H	045630	Cylinder	DD	045310	Boss
I	045631	Cylinder Seal Kit	EE	077121	M-20 Jam Nut
J	045313	Cylinder Mount	FF	045030	1169 x 5 x 65 90 Degree Elbow
K	045301	Vise Body	GG	045305	Guide Plate
L	045302	Push Block	HH	046652	Detent Ball
M	045306	Hold down Plate	II	221210	M-10 x 25 SHCS
N	221210	M-10 x 25 SHCS	JJ	219047	M-10 x 12 Set Screw
O	045304	Vise Side Plate	KK	077798	Vise Jaws
P	221412	M-16 x 35 SHCS	LL	203212	M-10 x 30 HHCS
Q	045307	Upper Wear Plate	MM	045224	Clevis Wear Plate
R	230005	M-6 x 12 FSHCS	NN	210012	M-10 Jam Nut
S	077100	M-10 Dowel Pin	OO	060270	End Cap
T	045303	End Plate	PP	114020	M-10 Washer
U	201620	M-16 x 55 HHCS	QQ	045300	Complete Vise Assembly


NN
JJ
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PP
LL
Y
HH
X
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BB
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OO
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D
A
B
C
F
G
MM
CC
H
J
K
V
R
Q
KK
KK
O
JJ
L
M
N
P

FIGURE 28

10.3 SHUTTLE VISE ASSEMBLY

ITEM	QTY	PART #	DESCRIPTION	ITEM	QTY	PART #	DESCRIPTION
1	1	045214	Slide Plate	16	6	230110	M-8 x 20 DIN 7991 FSHCS
2	2	045211	Keeper Plate	17	6	230005	M-6 x 12 FSHCS
3	1	045212	Lead Screw	18	4	203212	M-10 x 30 DIN 933 HHCS
4	1	045668	Cyl. Mounting Plat	19	4	114020	3/8 Hard Washer
5	1	045221	Ball Detente Block	20	1	221417	M-16 x 45 DIN 912 SHCS
6	1	045199	Piston	21	2	201160	M-8 x 60 DIN 931 HHCS
7	1	045659	Cylinder Body	22	1	046652	M-8 Plain Ball DIN 5401
8	1	045222	End Plate	23	1	218048	M-10 x 20 DIN 916 Set Screw
9	1	045219	Boss	24	1	210012	M-10 DIN 439 Jamb Nut
10	4	077799	Grip Cheek	25	3	077743	1/8 NPT x 1/4 90 ELL
11	1	045672	Vise Body	26	1	045602	Detente Spring - Short
12	1	045213	End Block	27	1	060270	1 3-4 Hole Plug 2773-01
13	1	045210	Push Block	28	1	045679	Sensor Bracket
14	6	220027	M-8 x 35 BSHCS	29	1	045486	Hyde Pard Prox Sens - VM18PNCQ
15	1	111015	5/8 - 11 Hex Jamb Nut	30	2	201120	M-6 x 12 DIN 933 HHCS

32	**10**	**077864**	**M5 x 12 DIN 912 SHCS**
33	**2**	**046667**	**1/8" 214 O-RING**
34*	**1**	**045660**	**Magnet**
35	**2**	**045654**	**PISTON SEAL KIT (44578)**

34* **May or may not be included in the piston assembly.**
It is not needed for the CPO-315-HFA-NF-CNC machine.

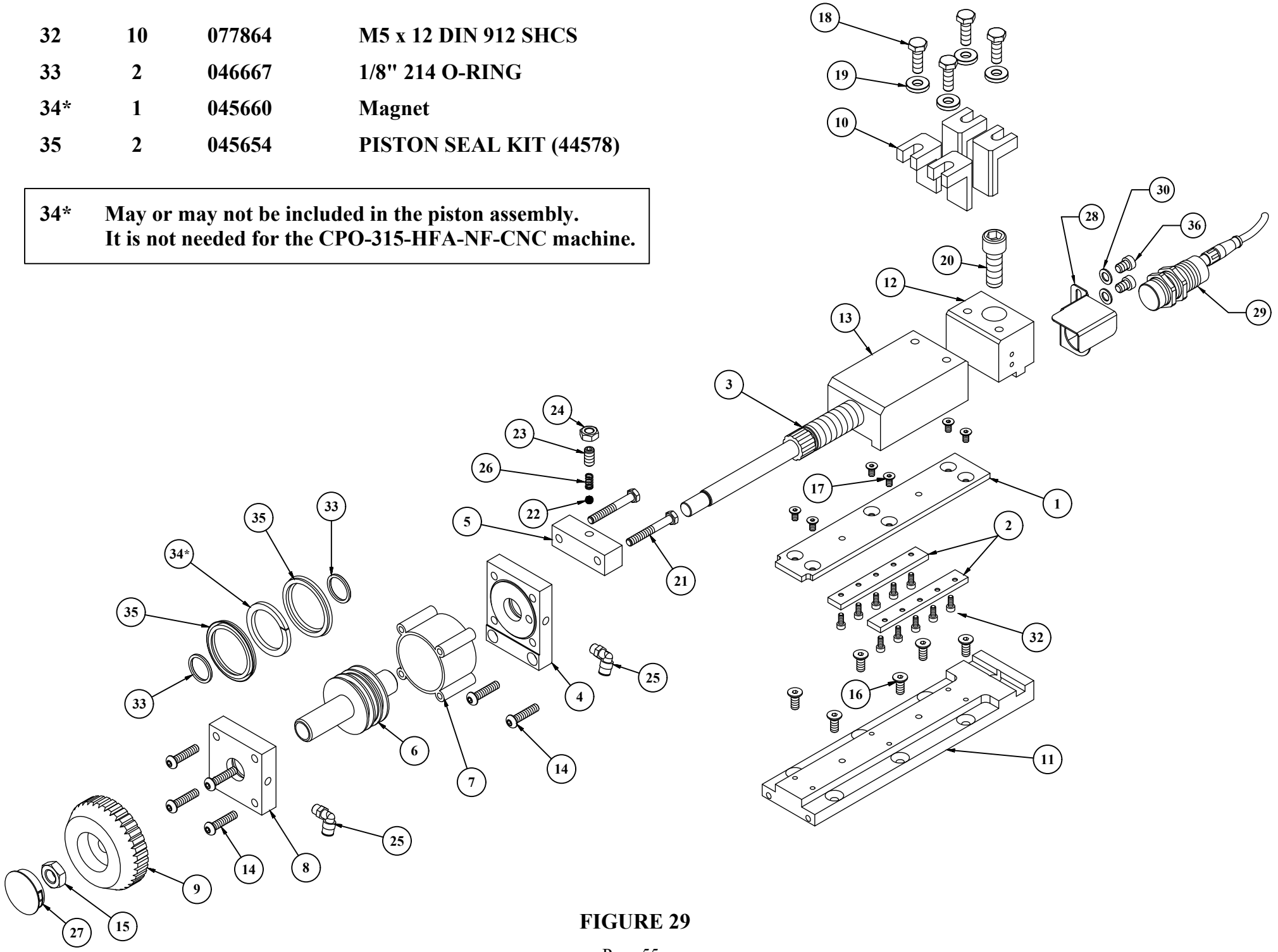
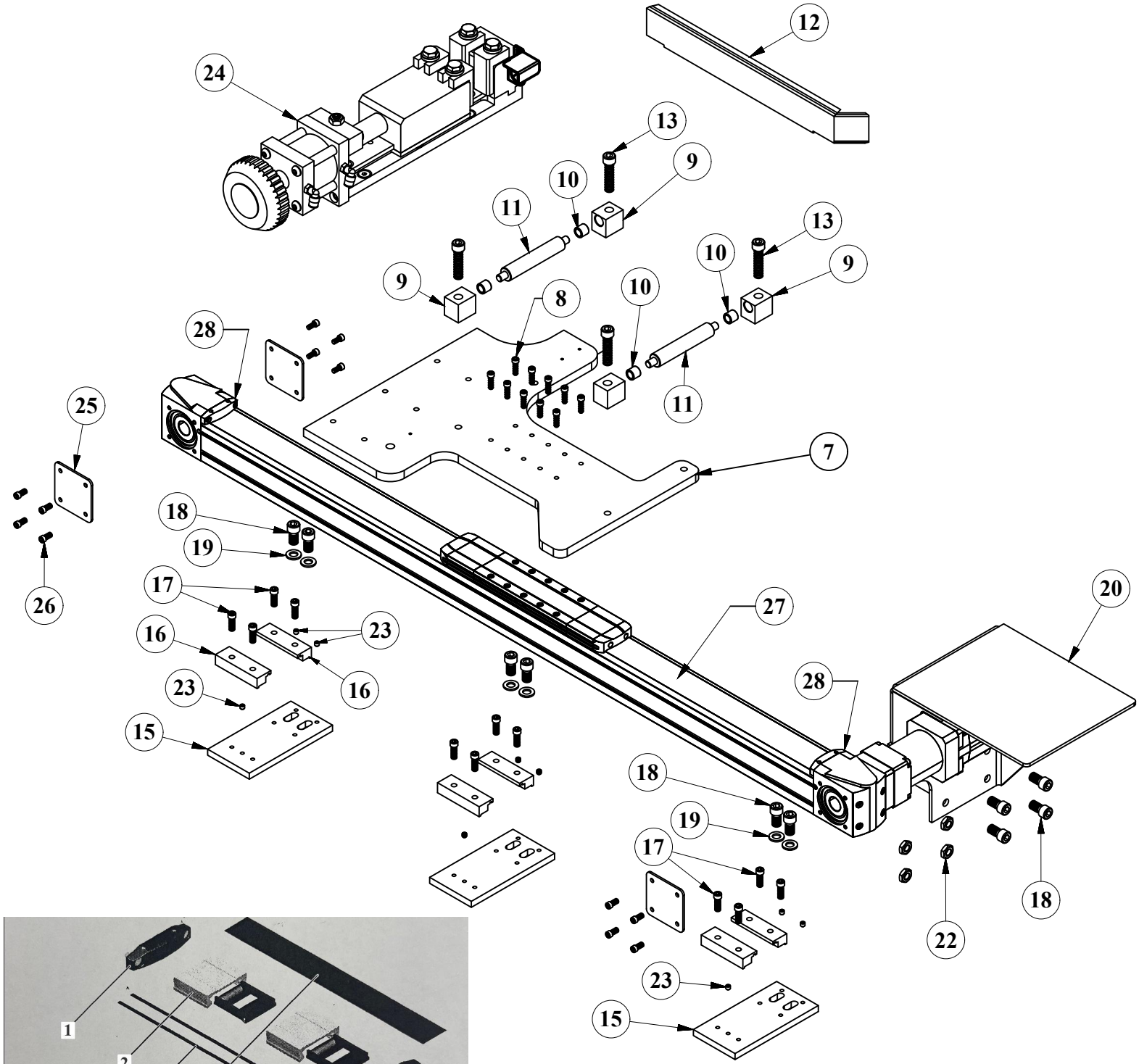


FIGURE 29

10.4 SHUTTLE ASSEMBLY

ITEM	QTY	PART #	DESCRIPTION
7	1	045670	T-Plate Alum
8	10	073455	M-5 x 20 DIN 912 SHCS
9	4	045669	Roller Block - Tall
10	4	045233	Bearing INA #SCE68
11	2	047254	HFA Roller
12	1	045680	Sensor Target
13	3	221220	M-10 x 40 DIN 912 SHCS
15	3	045673	Spacer - Linear Drive
16	6	045671	Hold Down - Linear Rail
17	12	073619	M-6 x 20 DIN 912 SHCS
18	10	073626	M-10 x 20 DIN 912 SHCS
19	6	214012	M-10 DIN 125 Flat Washer
20	1	045676	Actuator Motor Cover
22	4	208012	M-10 DIN 934 Hex Nut
23	9	218022	M-6 x 20 DIN 916 Set Screw
24	1	045209	Shuttle Vise
25	3	045261	Linear Drive End Cover
26	12	077864	M-5 x 12 DIN 912 SHCS
27	1	044790	Actuator Cover Strip 6 Meter (strip is made of metal)
28	2	044795	Actuator Bumper Cap


12
24
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8
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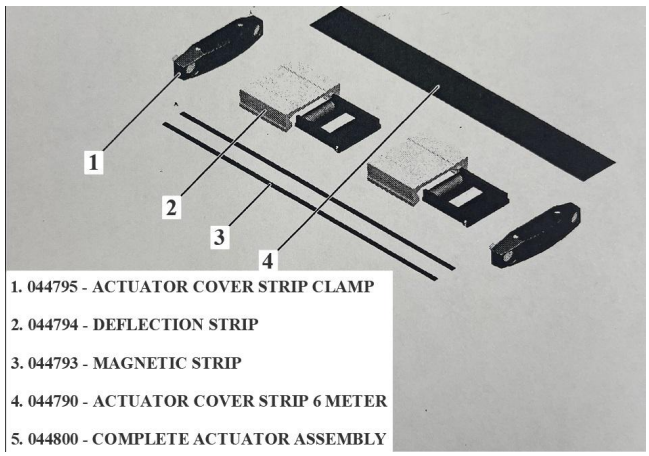

1
2
3
4
1. 044795 - ACTUATOR COVER STRIP CLAMP
2. 044794 - DEFLECTION STRIP
3. 044793 - MAGNETIC STRIP
4. 044790 - ACTUATOR COVER STRIP 6 METER
5. 044800 - COMPLETE ACTUATOR ASSEMBLY

FIGURE 30

10.5 POWER DOWN FEED ASSEMBLY

ITEM	PART #	DESCRIPTION
A	077671	Sales Cylinder Festo NF Metric Includes A, E, J, K, K1, L, N, O, P & Q
B	045425	Reservoir
C	077715	Pivot Bolt - Package of (2)
D	045232	Cylinder Bracket
E	077512	TPC Cyl. Nut-Machined
F	041015	Right Angle Flow Control
G	221212	M10 x 30 SHCS
H	047100	Upper Bracket Assembly
I	221210	M10 x 25 SHCS
J	077663	1/2" Elbow 90°
K	077664	3/8 MBSPP TO 1/8 FNPT Adapter
K1	077665	3/8 BSPP Bonded Seal
L	077578	M16 x 1.5 Cylinder Clevis (Includes R)
M	078455	Sight Glass
N	077700	Bellow
O	077505	Bellow Clamp
P	660505	Black Zip Tie
Q	210017	M16 X 1.5 Jam Nut
R		Included with L

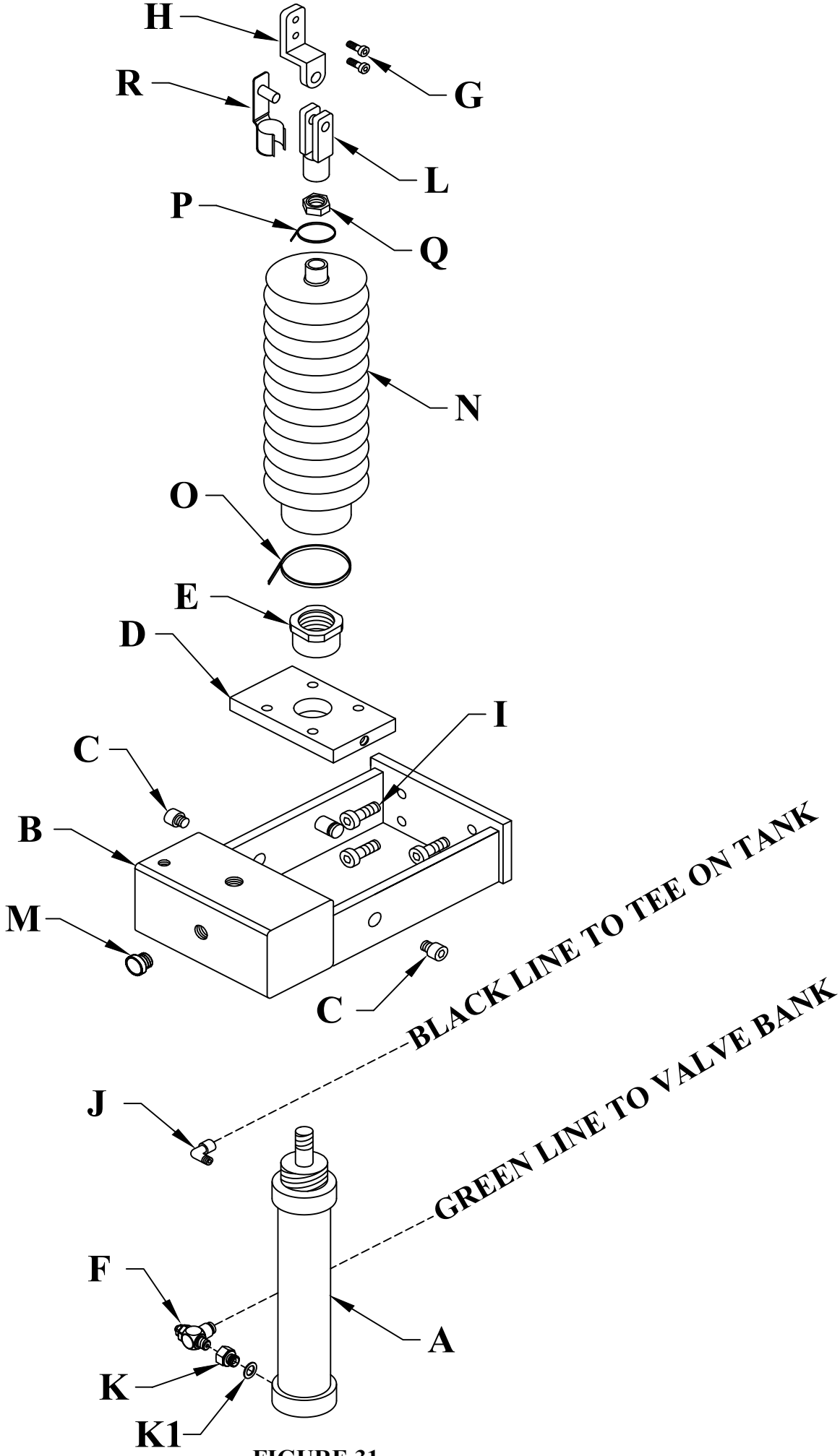

H
G
R
L
P
Q
N
O
E
D
I
C
B
M
C
BLACK LINE TO TEE ON TANK
GREEN LINE TO VALVE BANK
J
F
A
K
K1

FIGURE 31

10.5A POWER DOWN FEED VALVES

ITEM	PART #	DESCRIPTION
A	077746	1/4" NPT x 169 PL
B	077701	Baffle
C	077777	3/8" NPT Plug
D	045054	Ninety Degree Swivel
E	077536	Check Valve
F	045042	Return Line Fitting
G-H-I		MVK6 Mounting Kit
J	047535	Flow Control Valve
K	045054	1/4 NPT x 1/2 PL Ninety Degree Swivel
L	045041	Brass 3-Way
M	077779	1/4 NPT Nipple
N	077771	Reducer
O	078455	Sight Glass

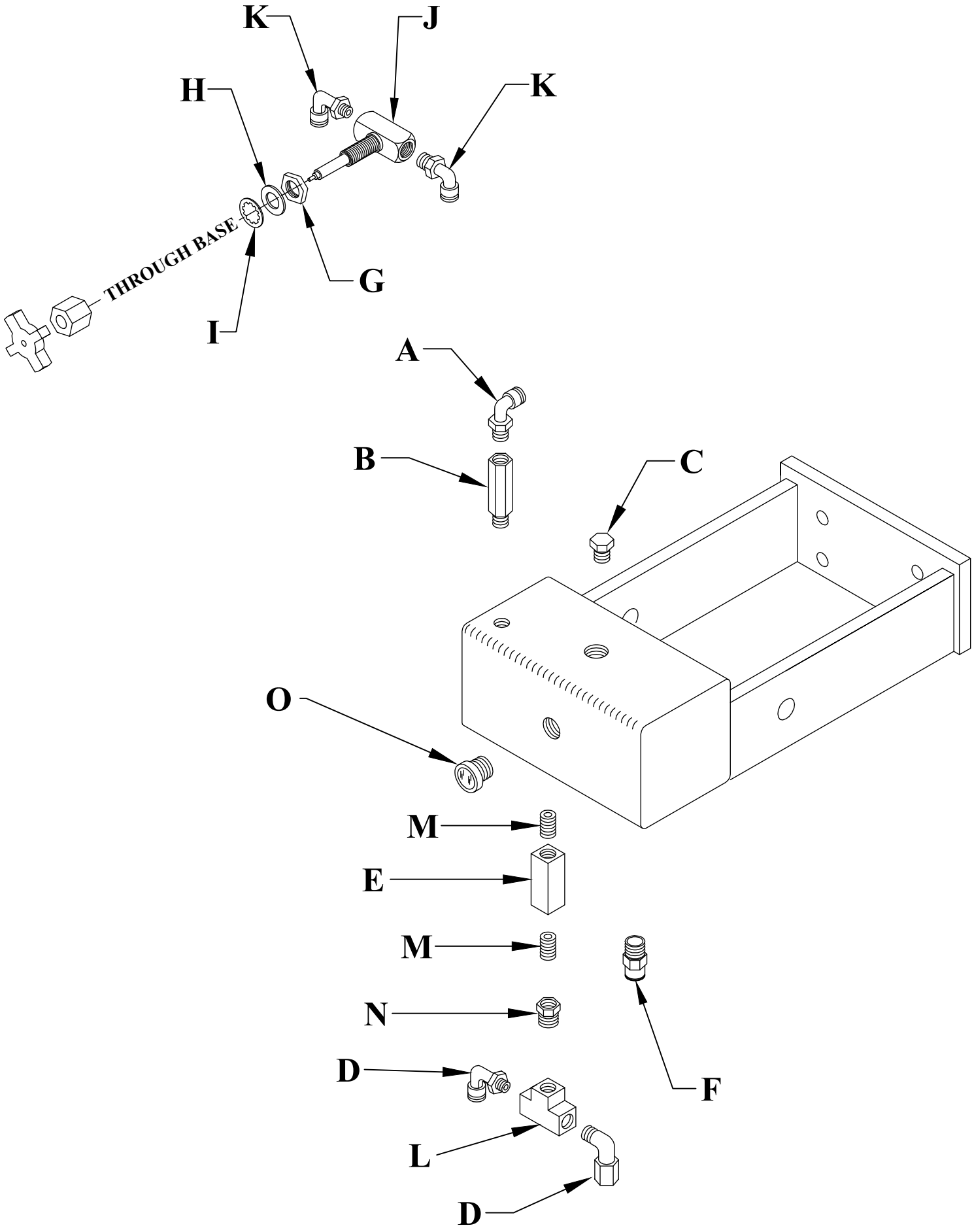


FIGURE 32

10.5B AIR CONTROLS

ITEM	PART #	DESCRIPTION
A	N/A	Provided by Customer
B	077719	Shuttle Valve
C	077737	1/4 NPT Brass Street Elbow
D	077780	Brass NPT Coupler
E	077779	1/4" NPT Nipple
F	045604	Complete Filter/Regulator/Lubricator
G	045605	Mounting Brackets
H	077738	90 Degree Fitting
I	045609	Replacement Bowls
J	045610	Filter Seal Kit
K	045612	Regulator Seal Kit
L	045613	Lubricator Seal Kit
M	045176	Valve Mount
N	045606	Gauge

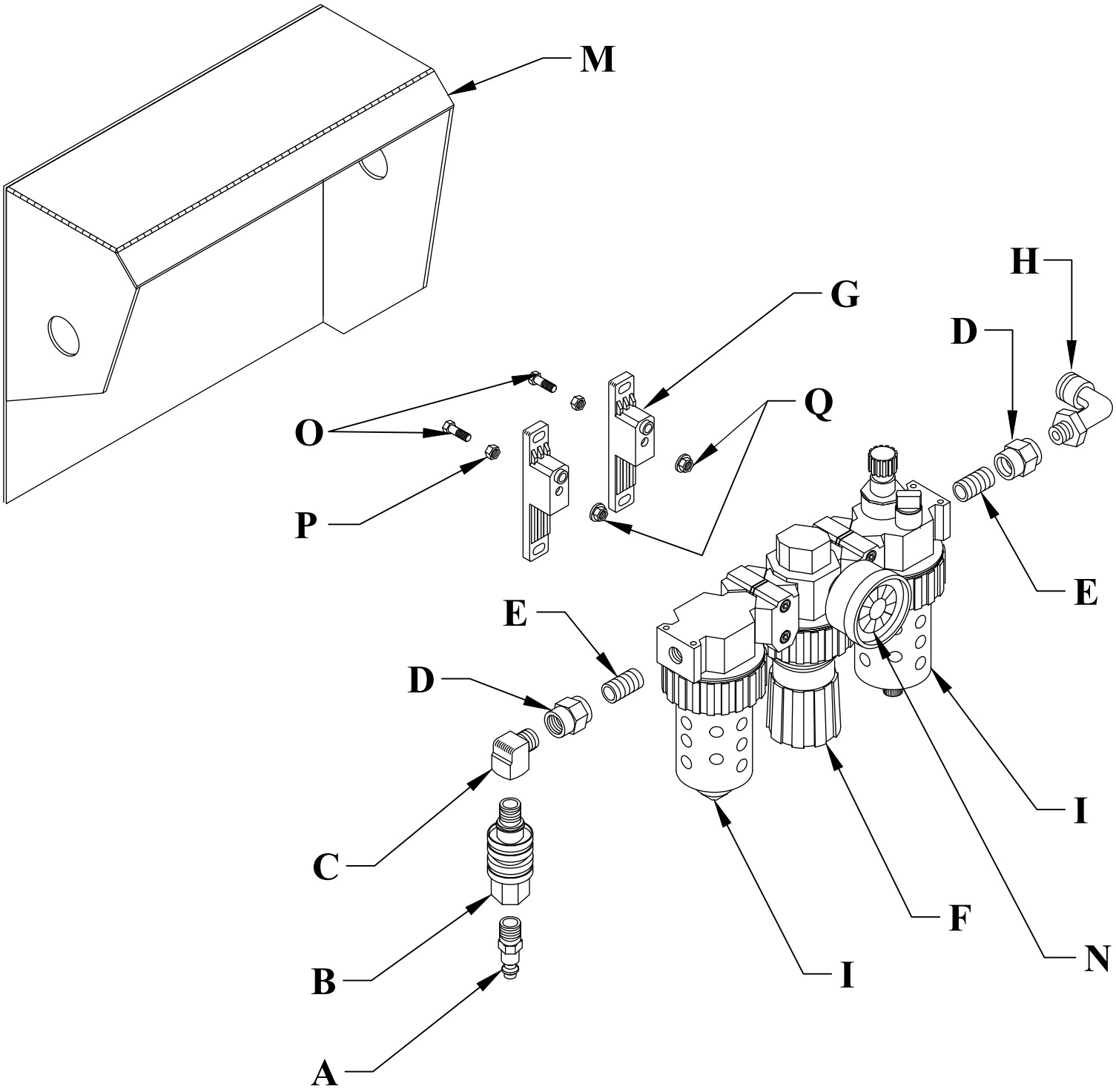


FIGURE 33

10.6 AIR VALVE ASSEMBLY

ITEM	PART #	DESCRIPTION
A	046047	DIN Connector for 060040
B	077744	Fitting (5/16 PL to 1/4 NPT)
C	077777	Plug (3/8 NPT)
D	045045	ASP-3BV Breather)
E	077740	3/8" 90 DEG Male Swivel
F	045650	Solenoid 24VDC
G	045655	Valve (Includes F)
H	677728	Fitting (1/4 NPT to 1/4 Hose)
I	077779	1/4" X Close Brass Nipple
J	077741	1/8" Male SW x 169 PL
K	077750	1/8" NPT X 2-1/2" Nipple
L	077721	1/8" X 1/4" Brass Bushing
M	677745	1/4" Brass Tee
N	045653	4 Station Valve Assembly All Except: H, I, J, K, L, M, & O
O	077930	Mister Regulator

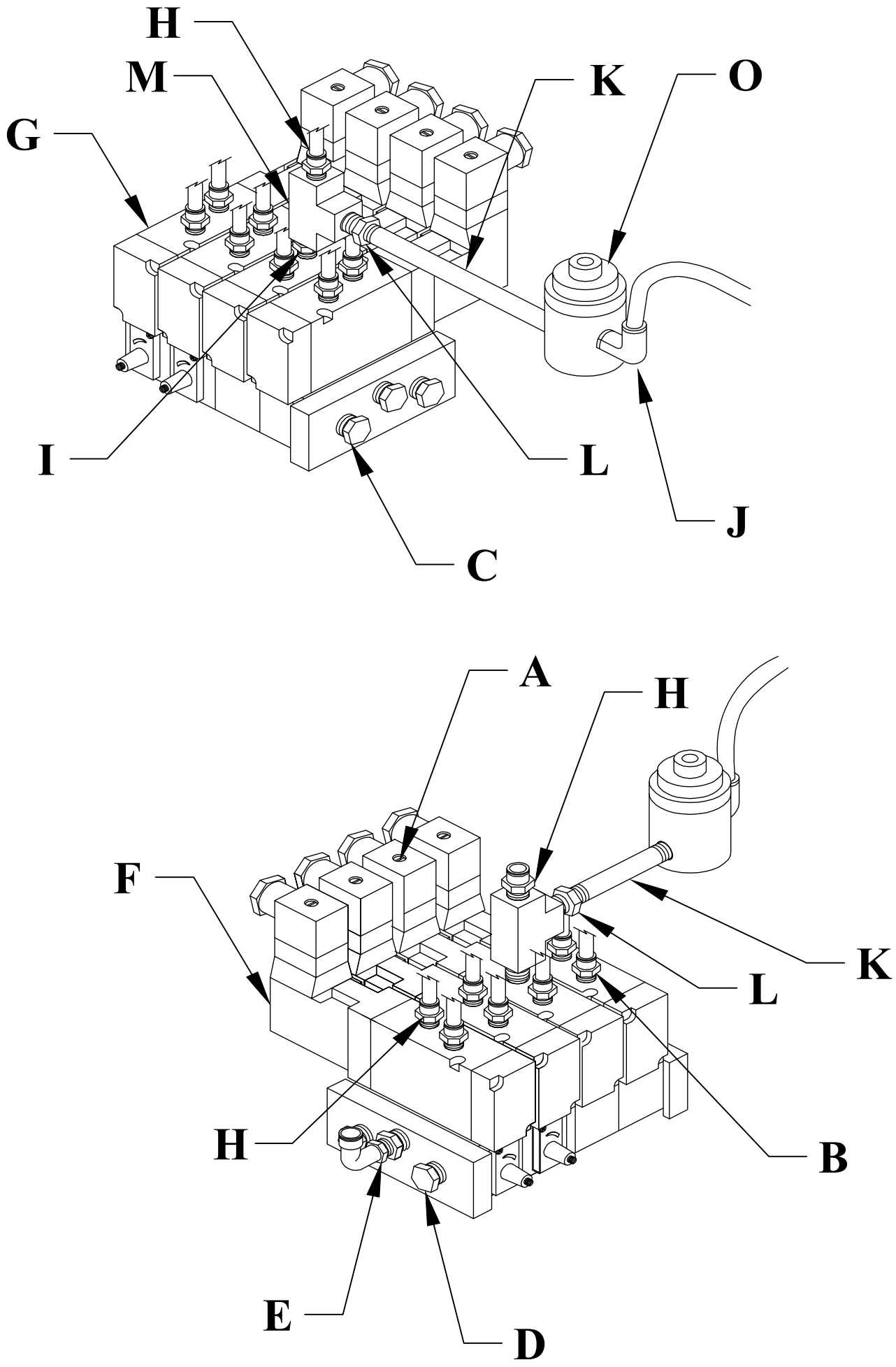


FIGURE 34

10.7 BLADE GUARD ASSEMBLY

ITEM	PART #	DESCRIPTION
A	045267	Guard Shell
B	073641	M-10 SHCS
C	040087	M-10 Brass HHCS
D	208012	M-10 Jam Nut
E	026621	M-10 Tee Nut
F	073766	Coolant Line
G	046269	Hose Barb
H	073450	M-4 x 16 SHCS
*I	076839	Mister Unit (Standard)
J	676842	Hose Barb
K	077926	Coolant Line
L	060501	5/16 Air Line
M	676844	Fitting
N	073095	M-4 Washer
O	073415	M-4 SHCS
P	046267	Elbows
Q	073766	Coolant Line
R	046268	T Mount
S	026619	M-10 Tee Nut

*** Mister is standard equipment - Flood Coolant is optional**

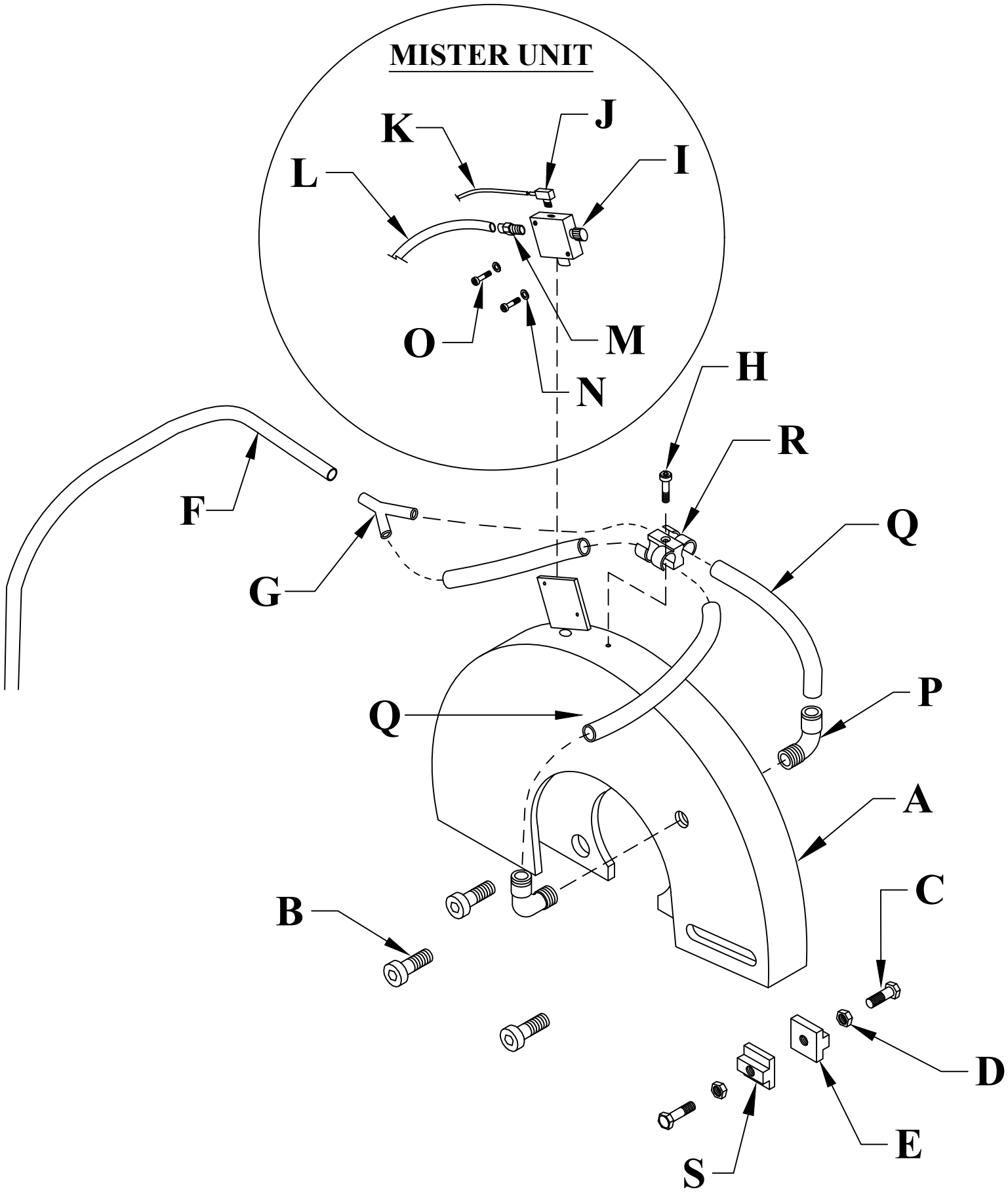


FIGURE 35

10.8 MOTOR ASSEMBLY

ITEM	PART #	DESCRIPTION
A	076883	Fan Cover EMOD
B	073407	M5 X 6 Slot Head
C	076884	Fan (30mm Bore) EMOD
D	077381	Rear Motor Casting 30MM
E	077325	6206 C3 Bearing
F	077191	Retaining Ring
G	077370	KEY 6 x 4 x 30mm
H	073326	M8 X 30 HHCS
I	077370	Key 6 x 4 x 30mm
J	077376	Seal 30 X 47 X 7
K	075050	Retaining Ring
L	076556	Snap Ring (30mm Only)
M	077378	Front Casting (EMOD)

COMPLETE MOTORS

A	076987	350NF 230V 5HP Motor Painted
B	076989	350NF 460V 5HP Motor Painted
C	N/A	575V Motor is Not Available

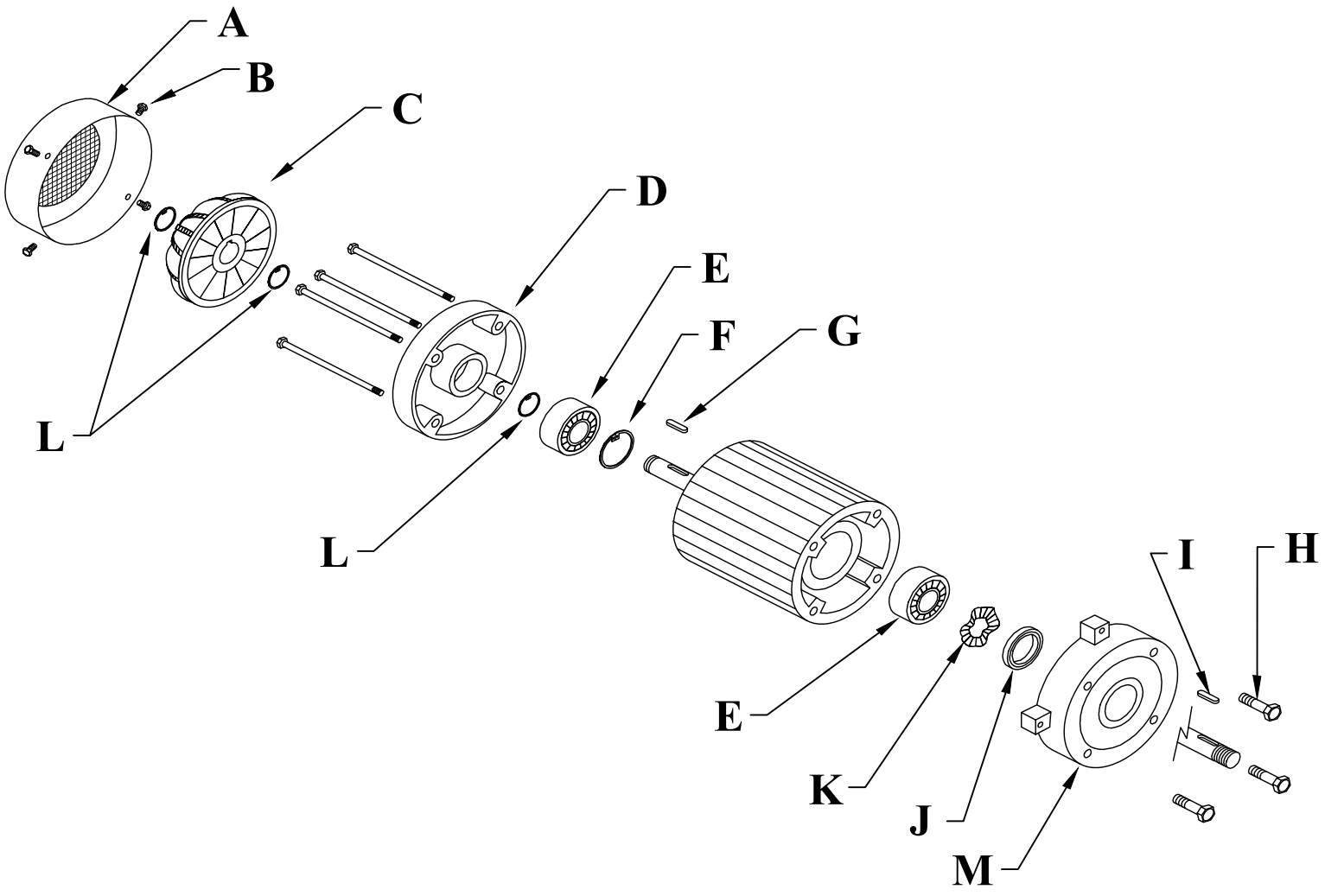


FIGURE 36

10.9 MIST COOLANT SYSTEM

ITEM	PART #	DESCRIPTION
A	677728	1/4 NPT x 1/4 Hose
B	677745	1/4 Brass Tee
C	077721	1/4 To 1/8 NPT Reducer
D	077750	1/8 x 2-1/2 Pipe Nipple
E	077930	Mister Regulator
F	677933	Mister Reservoir
G	077779	1/4 Brass Nipple
H	077741	5/16 Swivel Fitting
I	045740	Check Valve
J	077926	Line

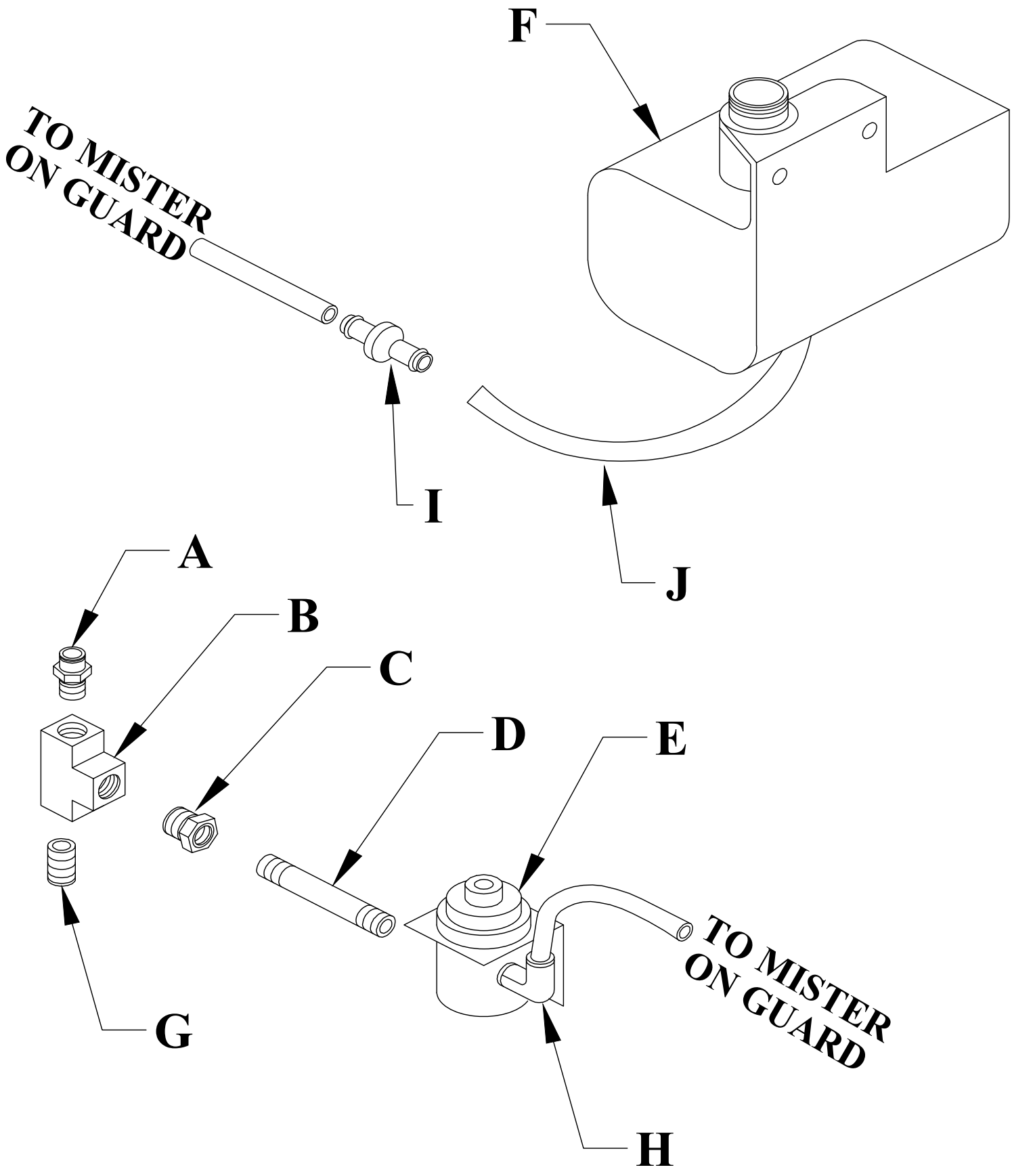


FIGURE 37

10.10 ELECTRICAL UNIT - LINE CIRCUIT

ITEM	PART #	DESCRIPTION
A	045483	230 Volt Power Supply
B	045485	Mini Circuit Breaker
C	045491	Manual Starter
D	045508	9 Amp Contactor
E	045512	24 Volt DC Relay
F	045490	Manual Starter 17-25 Amp
G	045481	Manual Starter 4-6.3 Amp
H	045537	Can Open Bus Master Module
I	045487	Safety Relay
J	048212	PLC
J1	075209	DIN Rail
K	078285	5HP 230V VFD-PROGRAMMED
K1	078286	5HP 460V VFD-PROGRAMMED
L	045546	Linear Motor Drive

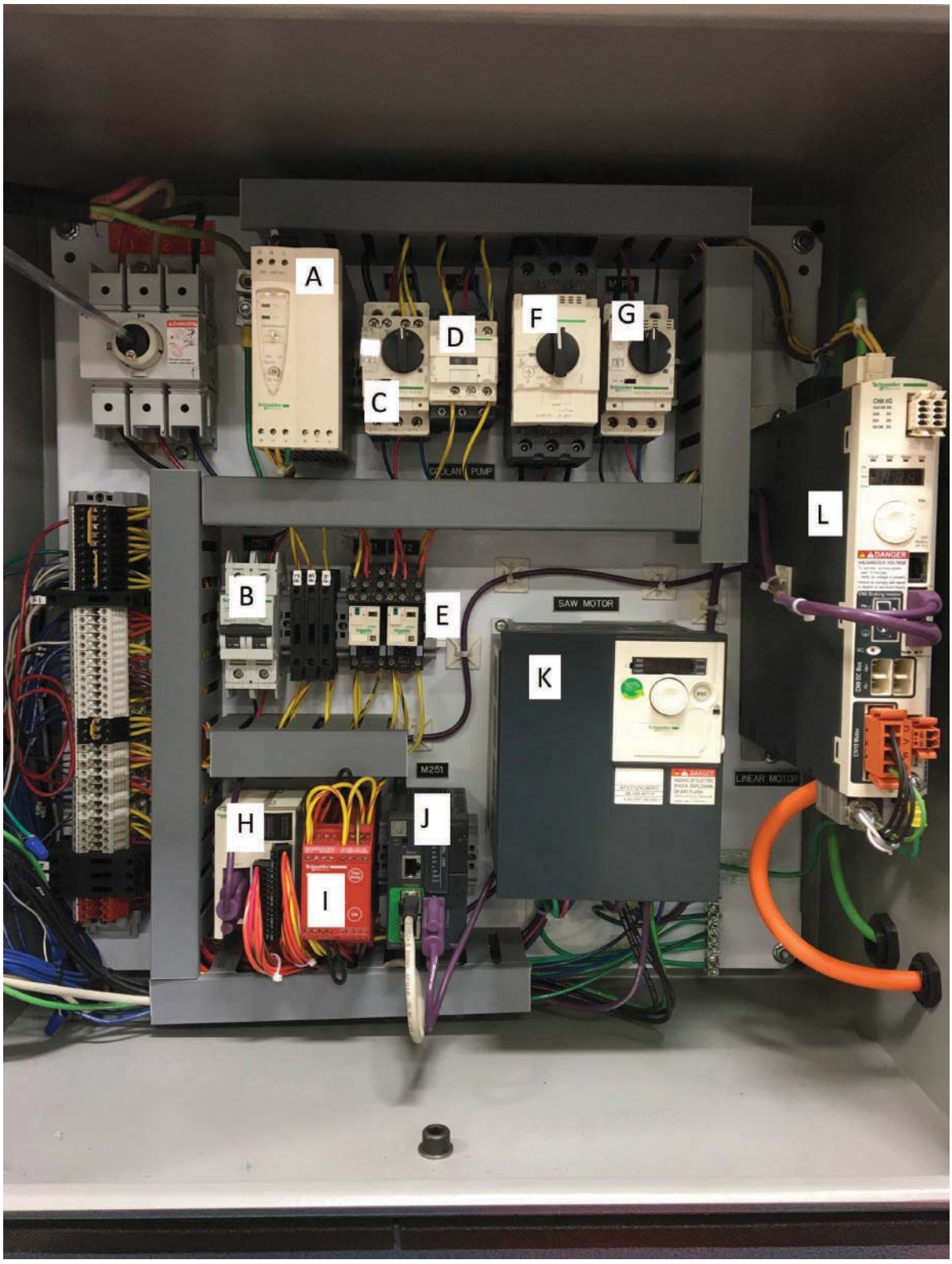


FIGURE 38

10.11 BASE ASSEMBLY

ITEM	PART #	DESCRIPTION
A	045171	Base Cabinet Painted HFA/RFA
B	045415	Base Plate Casting HFA-CNC Painted
C	045476	Painted Lower Enclosure
D	045172	Front Door Painted
E	045257	Coolant Reservoir Screen
F	060150	Optional 230V Pump
F1	060158	Optional 460V Pump
F2	060160	Optional 575V Pump
G	049217	Foot Assembly (Leveling Pads)
H	073350	M10 X 100 HHCS
I	221005	M6 X 12MM SHCS
J	N/A	
K	221002	M4 X 12MM SHCS
L	045470	NF Chip Chute Assembly
M	221120	M8 X 25 SHCS
N	045052	Chip Box Assembly
O	060149	Pump Screen
P	046018	Handle
Q	049330	Foot Clamp

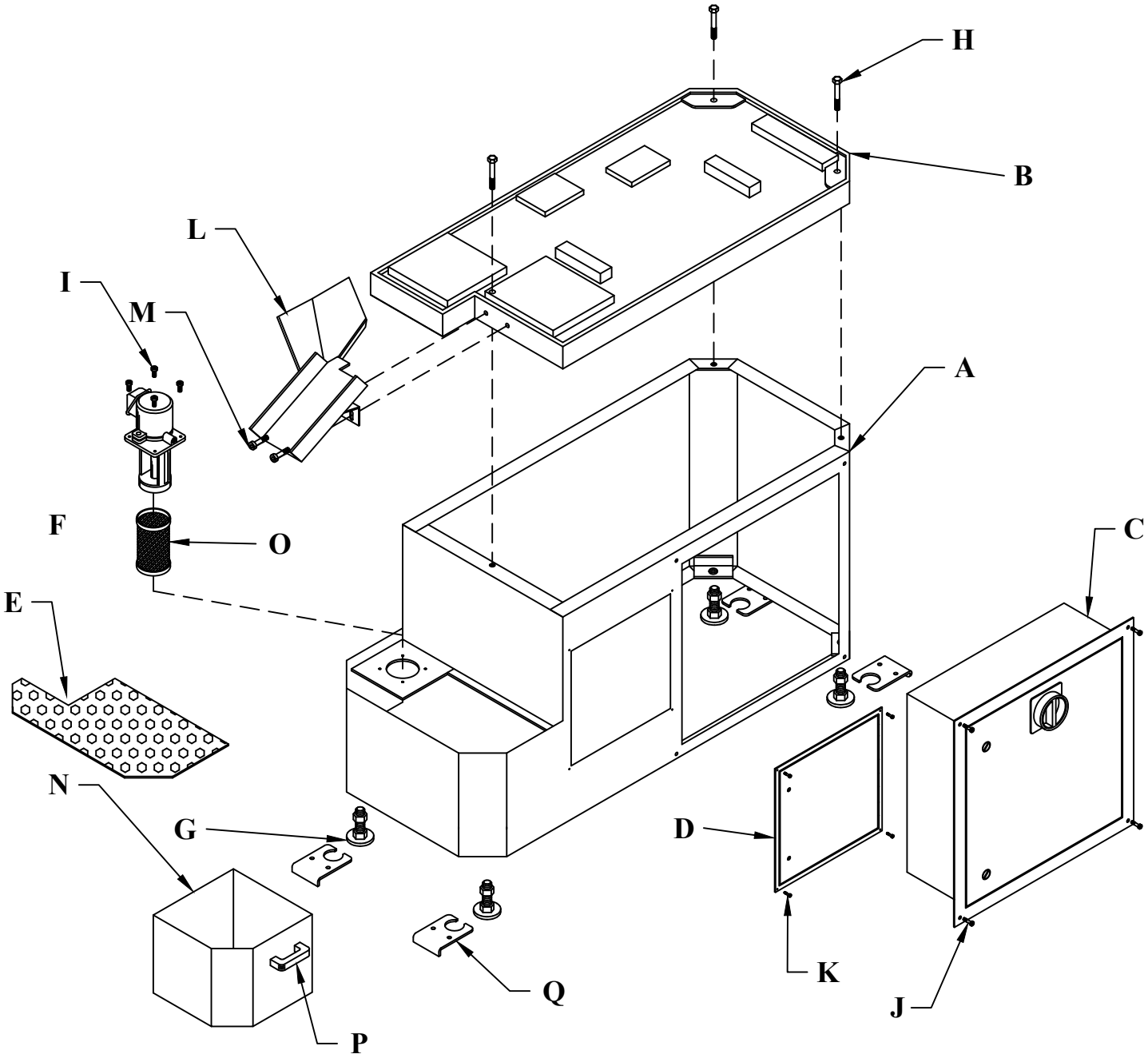


FIGURE 39

10.12 OPTIONAL COOLANT PUMP

(OPTIONAL FLOOD COOLANT)

ITEM	PART #	DESCRIPTION
A	060150	230 Volt Coolant Pump
A1	060158	460 Volt Coolant Pump
A2	060160	575 Volt Coolant Pump
B	060152	Impeller (obsolete)
C		N/A
D	060151	Pump Oil Seal
E	N/A	Bolt
F	N/A	Bolt
G	060080	90 Degree Elbow (Not Shown)
H	060140	Coolant Line
I	060095	Pump Cable
J	221005	M-6 x 12 SHCS
K1	072354	3/8 NPT Hose Barb
K2	072322	3/8" Ball Valve
K3	077774	3/8 NPT Close Nipple
K4	046271	Elbow
L	046300	Hose Clamp (Not Shown)
M	060149	Pump Screen

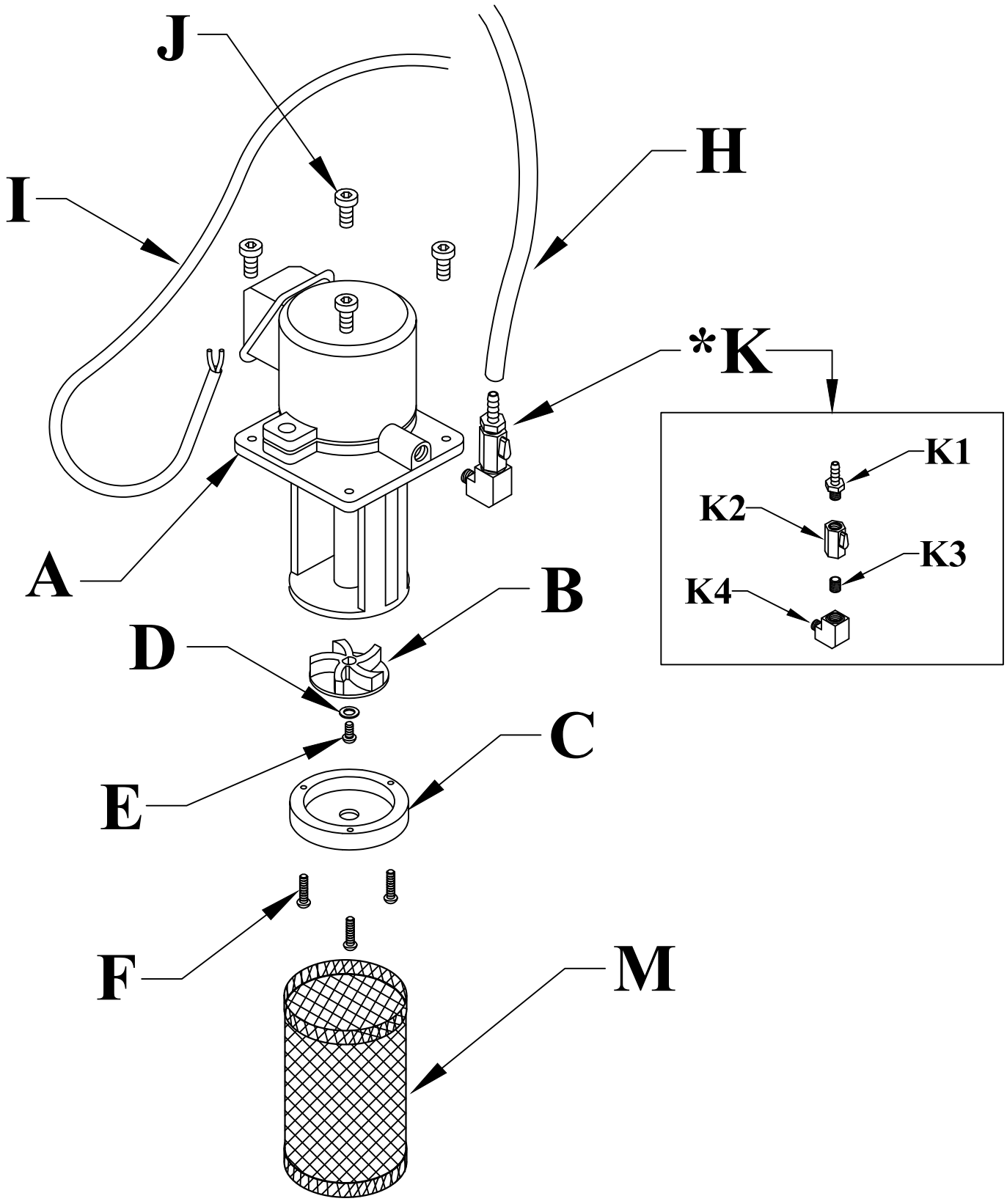


FIGURE 40

10.13 STROKE CONTROL ASSEMBLY

ITEM	PART #	DESCRIPTION
A	045253	Stroke Adjustment Plate
B	045249	Stroke Control Stand
C	045299	Stop Block
D	045320	Stroke Sensor Mount
E	045330	Stop Guide
F	220010	M4 X 10MM BHCS
G	203212	M-10 x 30 HHCS
H	114020	3/8" Hard Washer
I 1	077796	Proximity Sensor (OLD M18 - One Used)
I 2	077795	Inductive Prox. Sensor (NEW M12 - Two Used) NOTE: Verify Size Before Ordering!!
J	221212	M-10 x 30 SHCS
K	221210	M-10 x 25 SHCS
L	221120	M-8 x 25 SHCS
M	158202	Bumper
N	073095	M-4 Washer

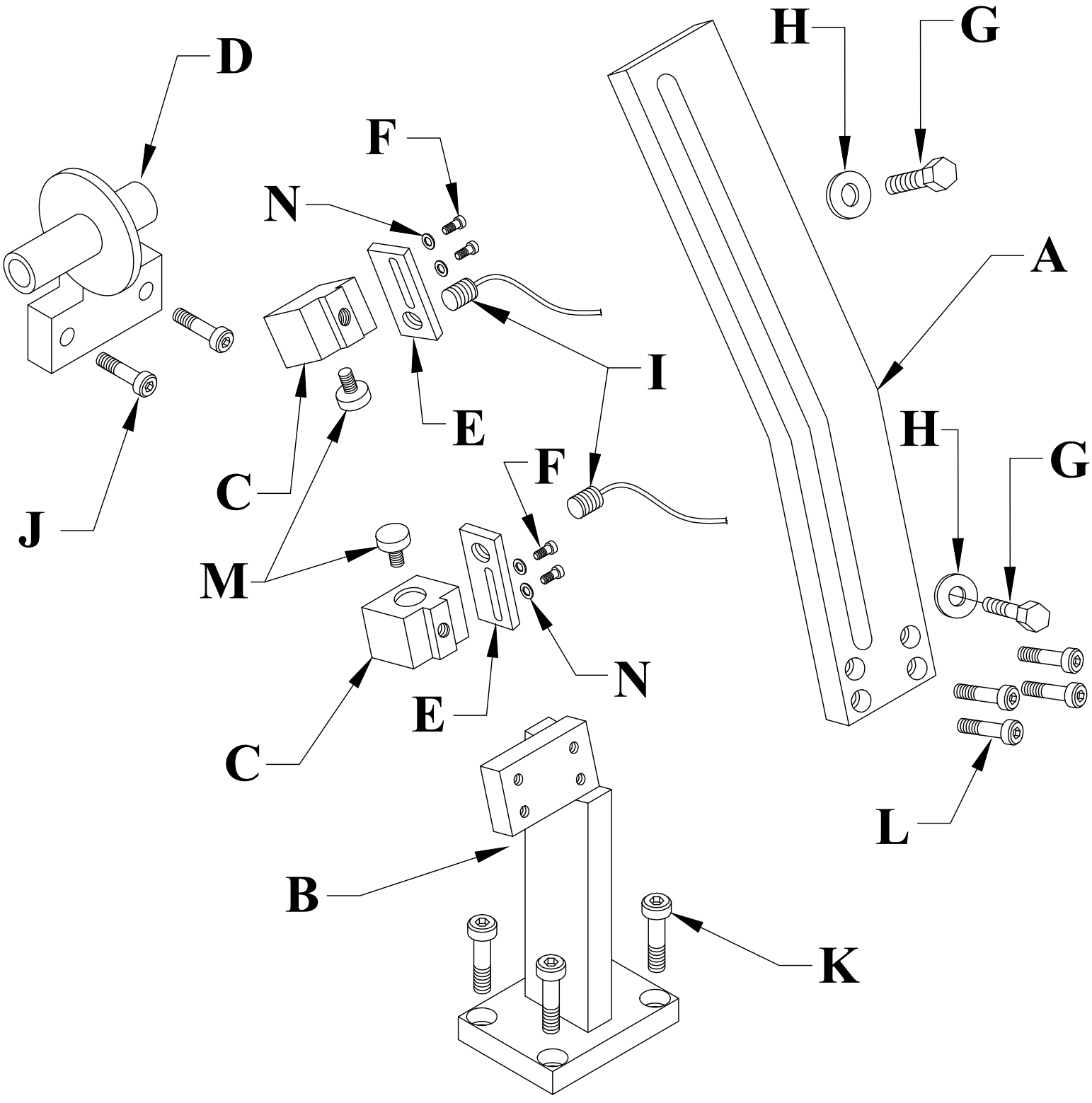


FIGURE 41

10.14 HOOD ASSEMBLY

ITEM	PART #	DESCRIPTION
A	203217	M-10 x 45 HHCS
B	045196	Pedestal
C	045285	Pivot Pin
D	046018	Hood Handle
E	045464	Extension
F	045322	Sight Glass
G	046645	Sight Glass Seal
H	201120	M-6 x 20 HHCS
I	077157	M-6 Nylon Loc Nut
J	229415	M-10 x 12 x 16 Shoulder Bolt
K	045255	Hood
L	077142	Grease Nipple
M	077100	M-10 Dowel Pin
N	073617	M-6 x 12 BHCS
O	040012	Bumpers
P	047110	Interlock Switch
P1	047115	Switch Mount
P2	220010	M-4 x 12 BHCS
P3	21500	M-4 Nylon Loc Nut
Q	047160	Hood Assembly (Includes D, E, F, G, H, I, K, N, O, P, R)
R	215013	M-8 Nylon Loc Nut
S	077907	Shroud Edge

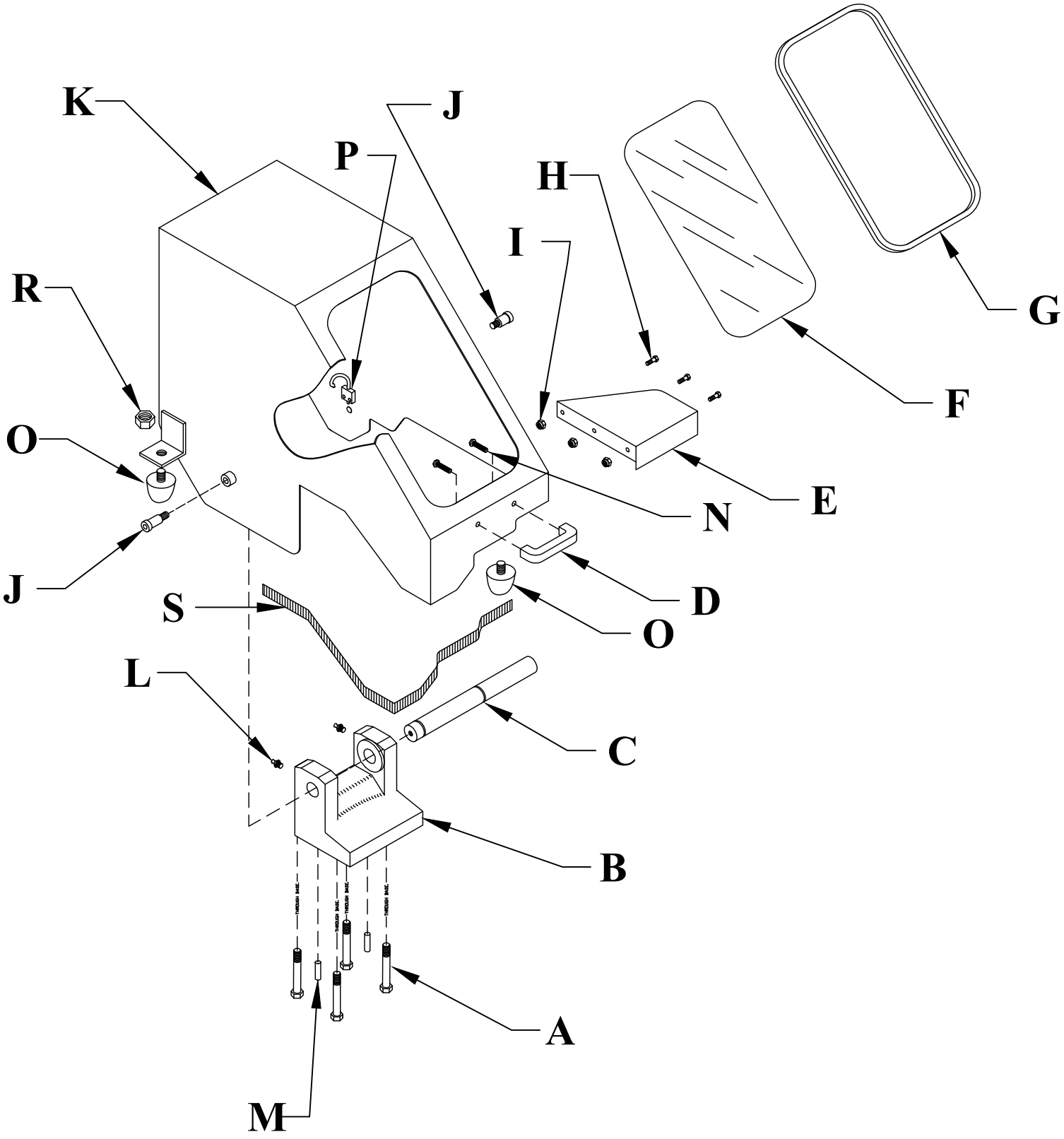


FIGURE 42

11.0 OPTIONAL EQUIPMENT PARTS LISTS

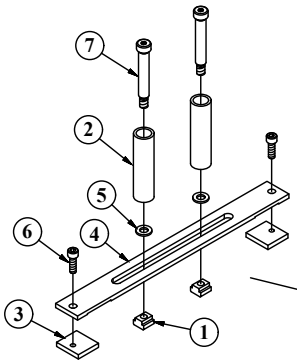
11.1 TEN FOOT SUPPLY TRACK

ITEM	QTY	PART #	DESCRIPTION
1	1	029242	10' Roller Conveyer W/Legs (Complete Assy.)
2	2	029243.1	10' Roller Conveyor Side
3	2	029244	Leg Roller Conveyor
4	10	029245	Replacement Rollers For #29243
5	1	029300	Conveyor Brace
6	3	029621	Conveyor Support Bracket
7	12	201205	M10 X 16MM DIN933 HHCS
8	12	208012	M10 DIN 934 Hex Nut
9	2	216015	M10 BN190 Flange Nut
10	2	224205	M10 X 16MM DIN-BN73 WLCS

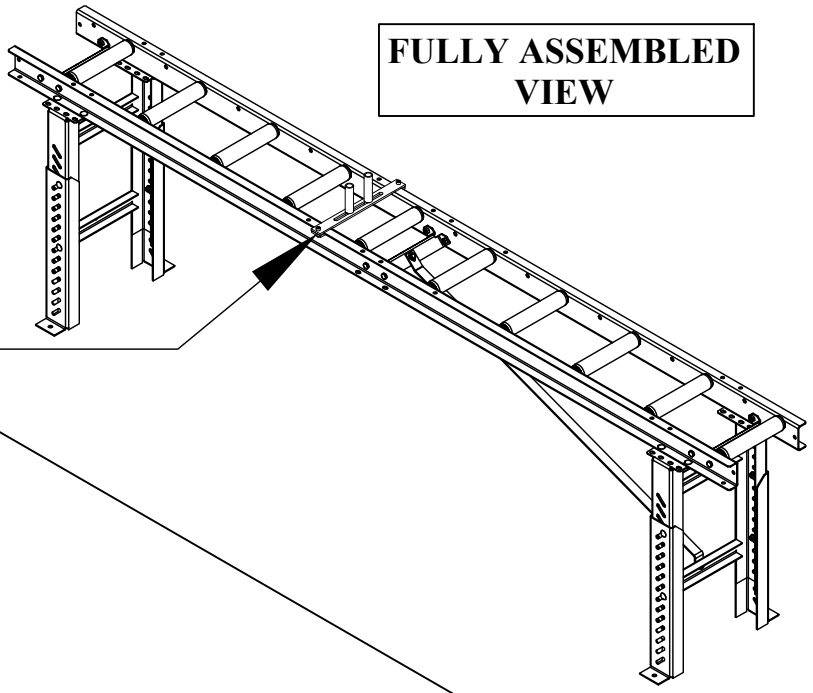
*076938 - 13" GUIDE ASSEMBLY (Optional)

ITEM	QTY	PART #	DESCRIPTION
1	2	026619	SMALL TEE NUT (M10)
2	2	043003	NYLON ROLLER 3.25
3	2	076941	BASE CLIP
4	1	076943	BASE MATERIAL GUIDE 13" PAINT
5	2	214012	M10 DIN125 REGULAR WASHER
6	2	221120	M8 X 25 DIN9121580 12.9 SHCS
7	2	229225	M10 X 12 X 70 SB912

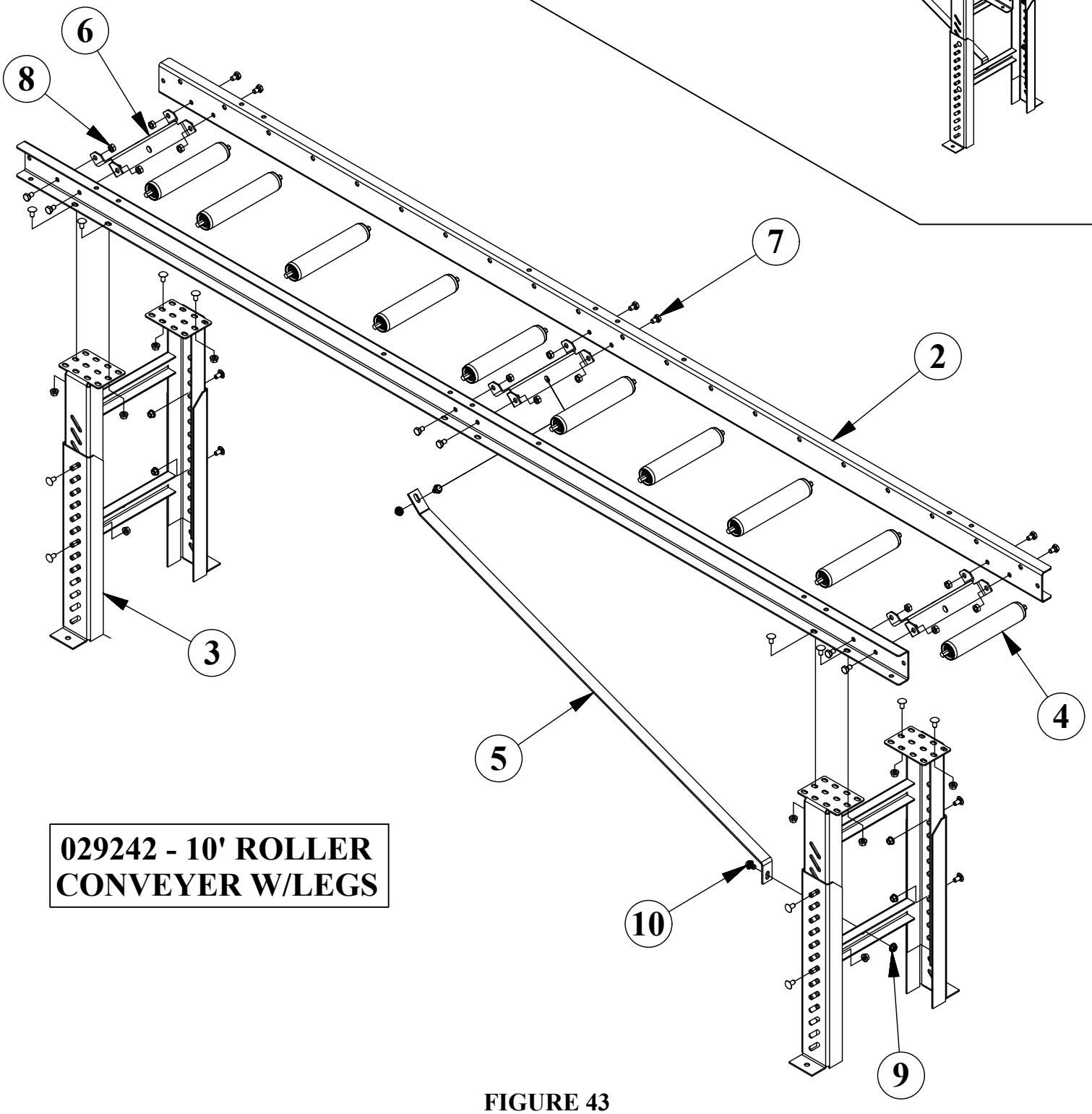
*** 076935 - Optional Guide Assembly for older conveyors**



076938
13" GUIDE ASSEMBLY



FULLY ASSEMBLED VIEW



029242 - 10' ROLLER CONVEYER W/LEGS

FIGURE 43

11.2 STATIONARY VISE REGULATOR (Option)

ITEM	PART #	DESCRIPTION
A	078190	Regulator W/Gauge
B	677934	NF-FRL Wall Mount Bracket
C	077864	M5 X 12 DIN912 SHCS
D	077742	1/4" MALE SW X169PL
E	077744	1/4-5/16 NPT Straight Fitting
F	060501	5/16" Black Air Tube
G	047250	Complete Air Regulator Vise

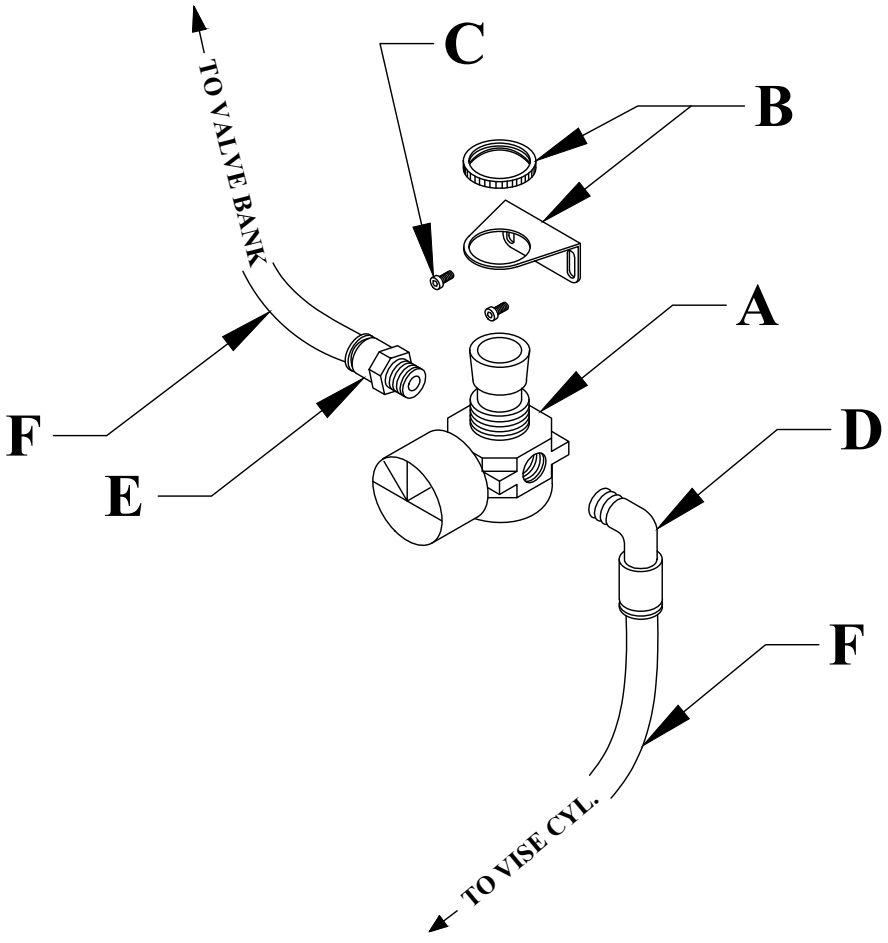


FIGURE 44

11.3 SHUTTLE VISE REGULATOR (Option)

ITEM	PART #	DESCRIPTION
A	078190	Regulator W/Gauge
B	677934	NF-FRL Wall Mount Bracket
C	077864	M5 X 12 DIN912 SHCS
D	077746	1/4 x 90 Swivel Fittings
E	077744	1/4-5/16 NPT Straight Fitting
F	060501	5/16" Black Air Tube
G	077721	1/8" x 1/4" Bushing (not shown)
H	077750	1/8" x 2-1/2" Nipple (not shown)
I	047252	HFA Vise Regulator Factory Installed

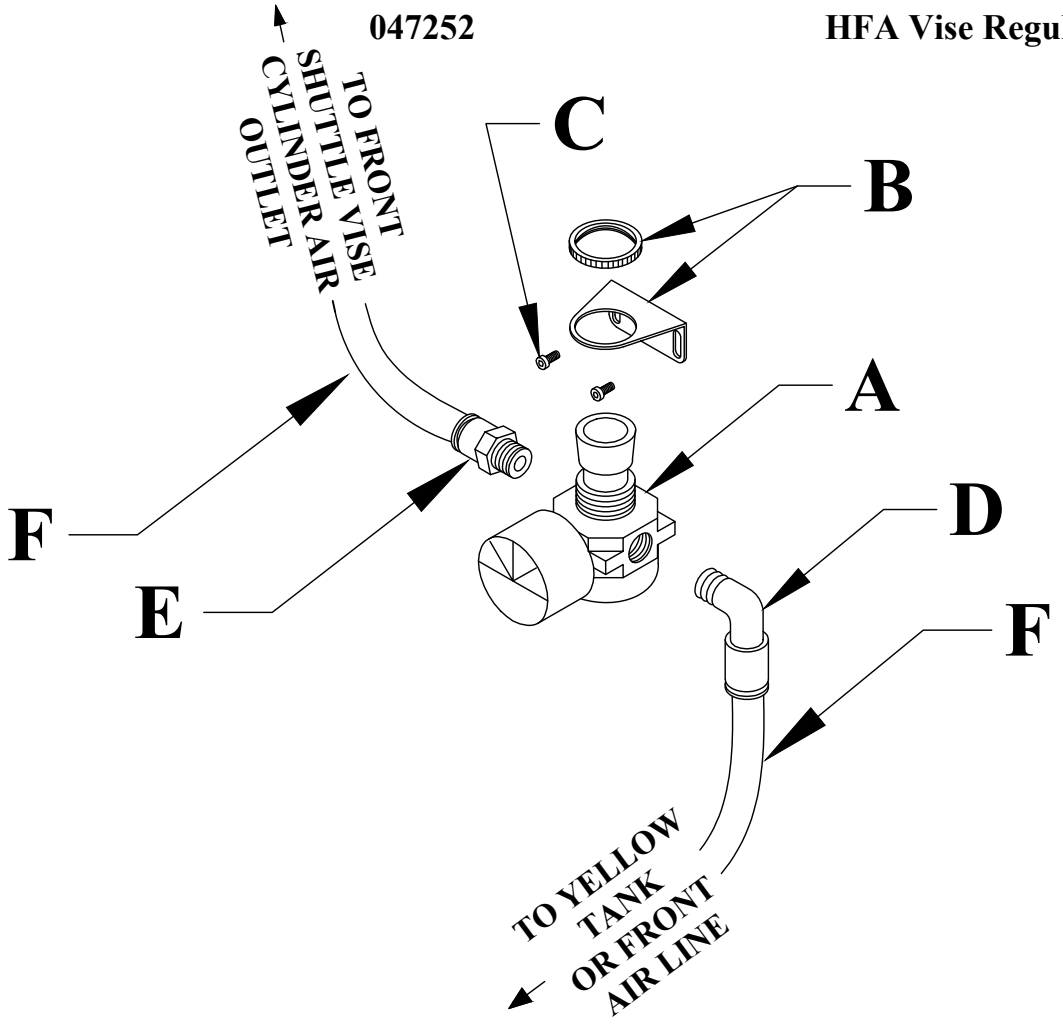


FIGURE 45

12.0 COOLANTS AND LUBRICANTS

UNIT	PART	DESCRIPTION
1 Gal.	075760	1 GAL. SYNCON-2 (do not dilute)
55 Gal.	075761	55 GAL. SYNCON-2 (do not dilute)
1 Qt.	075753	Air Line Lubricant
1 Gal.	075759	Air Line Lubricant
1 Qt.	060520	Hydraulic Oil - Power Down

13.0 STOCK BLADES

300 MM-12" - CARBIDE TIPPED - 40 MM BORE - 2/8/55 & 4/12/64 PIN SPACING

MINIMUM RPM IS 1500 - MAXIMUM RPM IS 3000 RPM

Part No.	Thickness	Teeth
074334	.091	120
074329	.134	84
074327	.134	72

14.0 WIRING DIAGRAMS

The wiring diagrams (FIGURES 46 - 53) for the CPO-315-HFA-NF-CNC saw are on the following pages.

FIGURES 46-49 ARE FOR THE 230V SAWS

FIGURES 50-53 ARE FOR THE 480V SAWS.

If further assistance is needed, please call Scotchman Industries at 1-800-843-8844.

Or you can go to our website at Scotchman.com for more information.

Scotchman

MADE IN USA

Metal Fabricating Solutions

SCOTCHMAN HFA 230V

POWER DIAGRAM

PAGE 1

Drawing 3757A

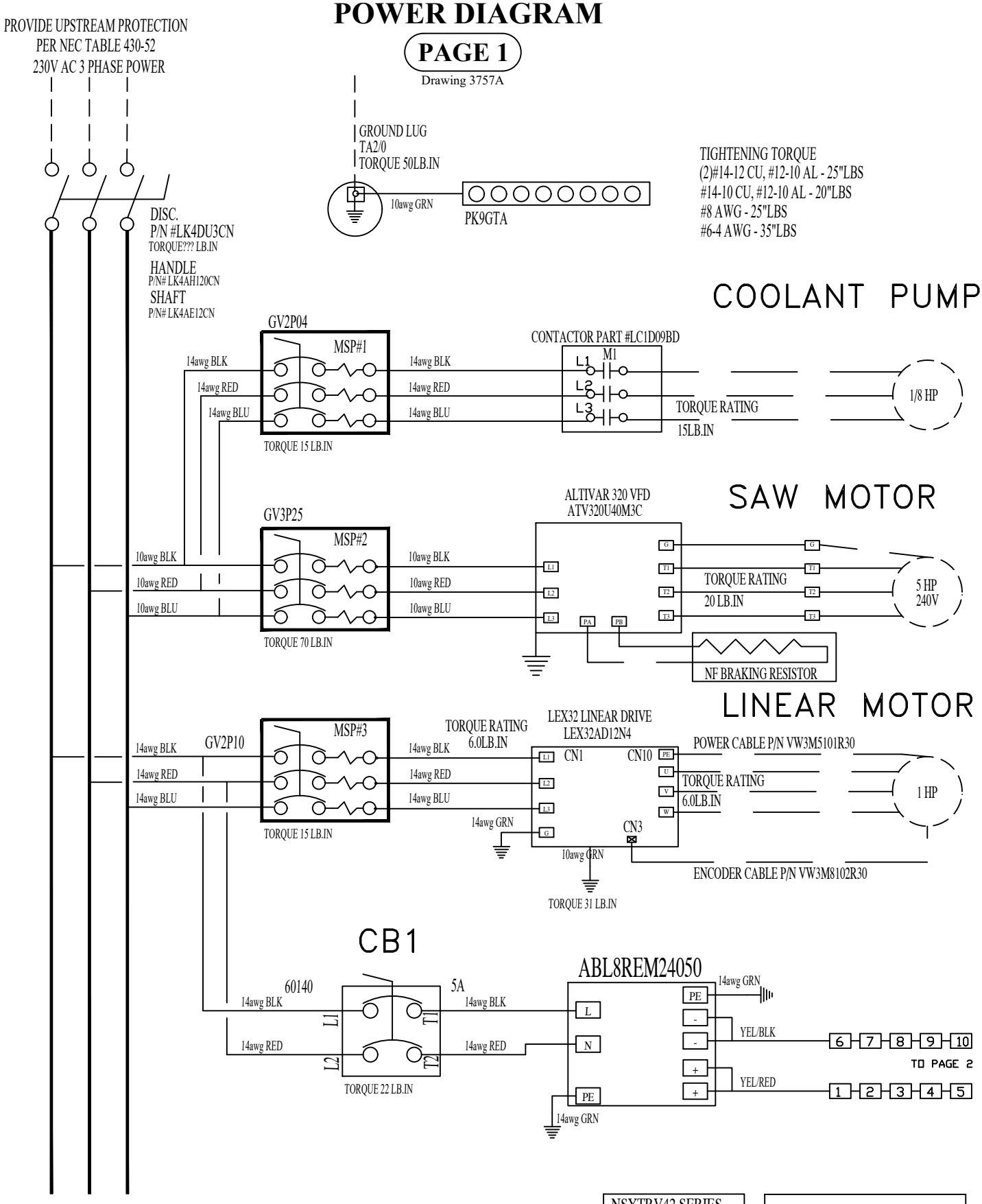


FIGURE 46

SCOTCHMAN HFA 230V

CONTROL WIRING

PAGE 2

Drawing 3757A

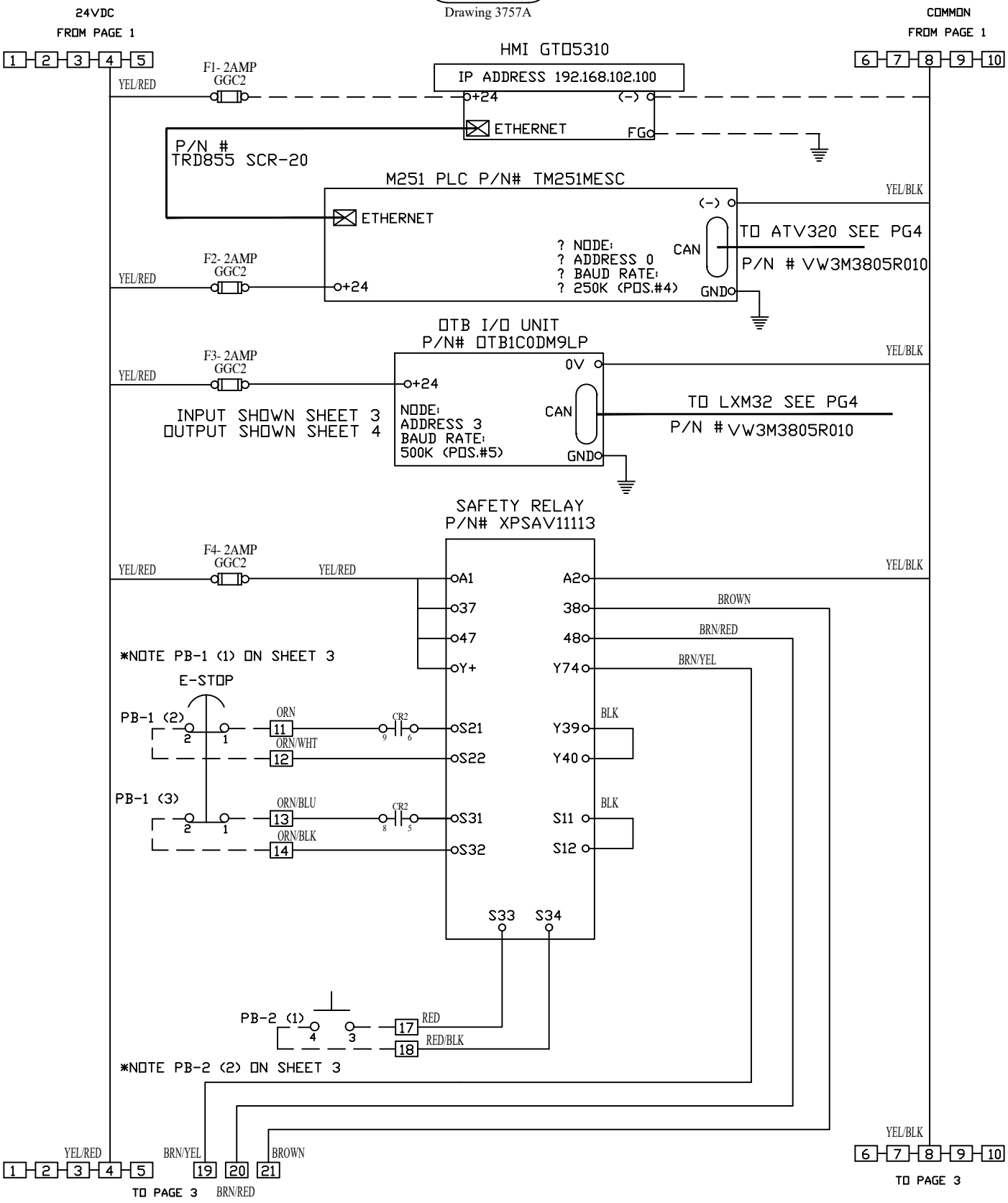


FIGURE 47

NSYTRV42 SERIES
TERMINAL SPECS.
600V 30A MAX.
22-10 AWG. WIRE
TORQUE 5.3 TO 7.08 LB.IN

TERMINAL
CONNECTED ITEMS
FIELD WIRING

SCOTCHMAN HFA 230V

CONTROL WIRING

PAGE 3

Drawing 3757A

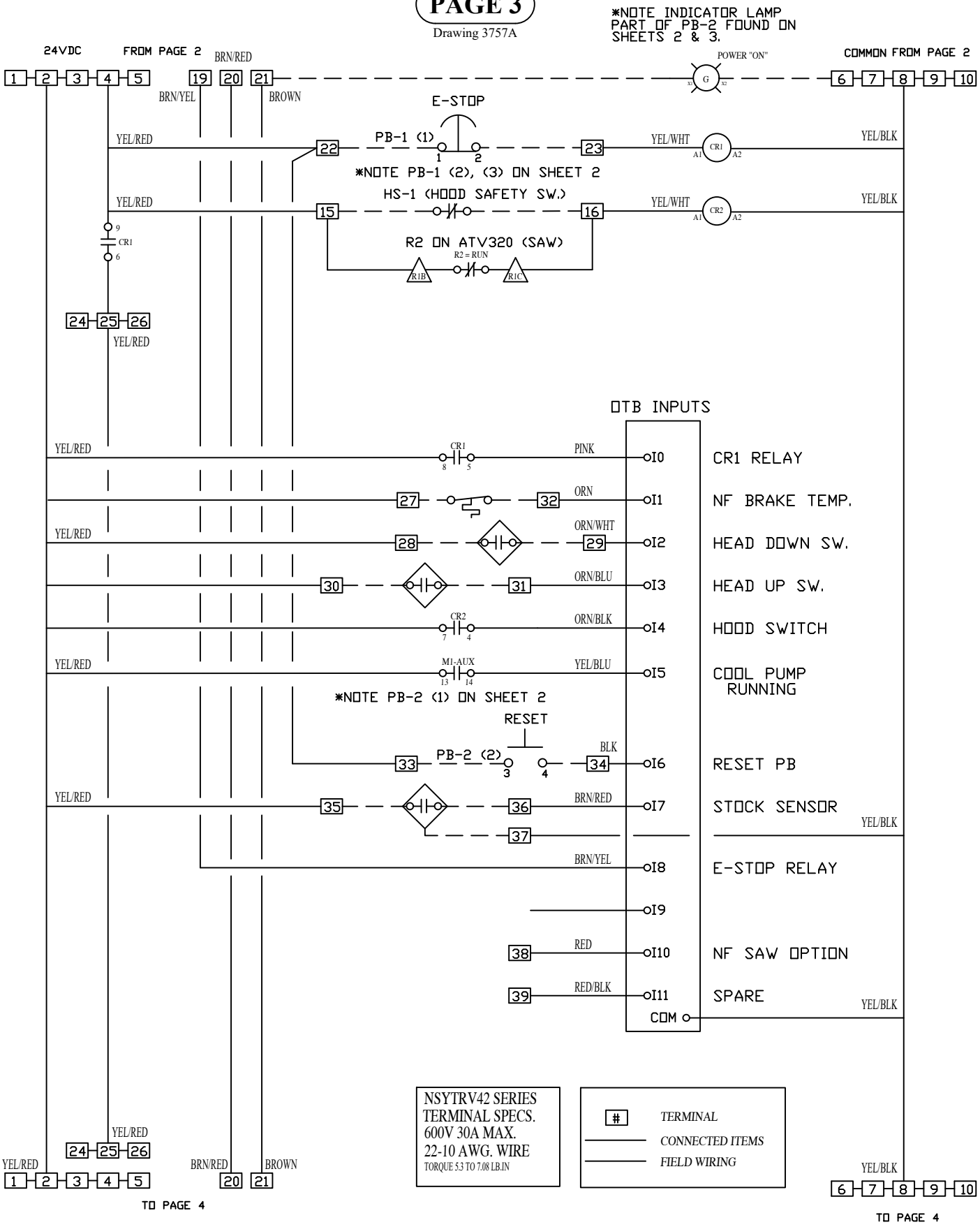


FIGURE 48

SCOTCHMAN HFA 230V

CONTROL WIRING

PAGE 4

Drawing 3757A

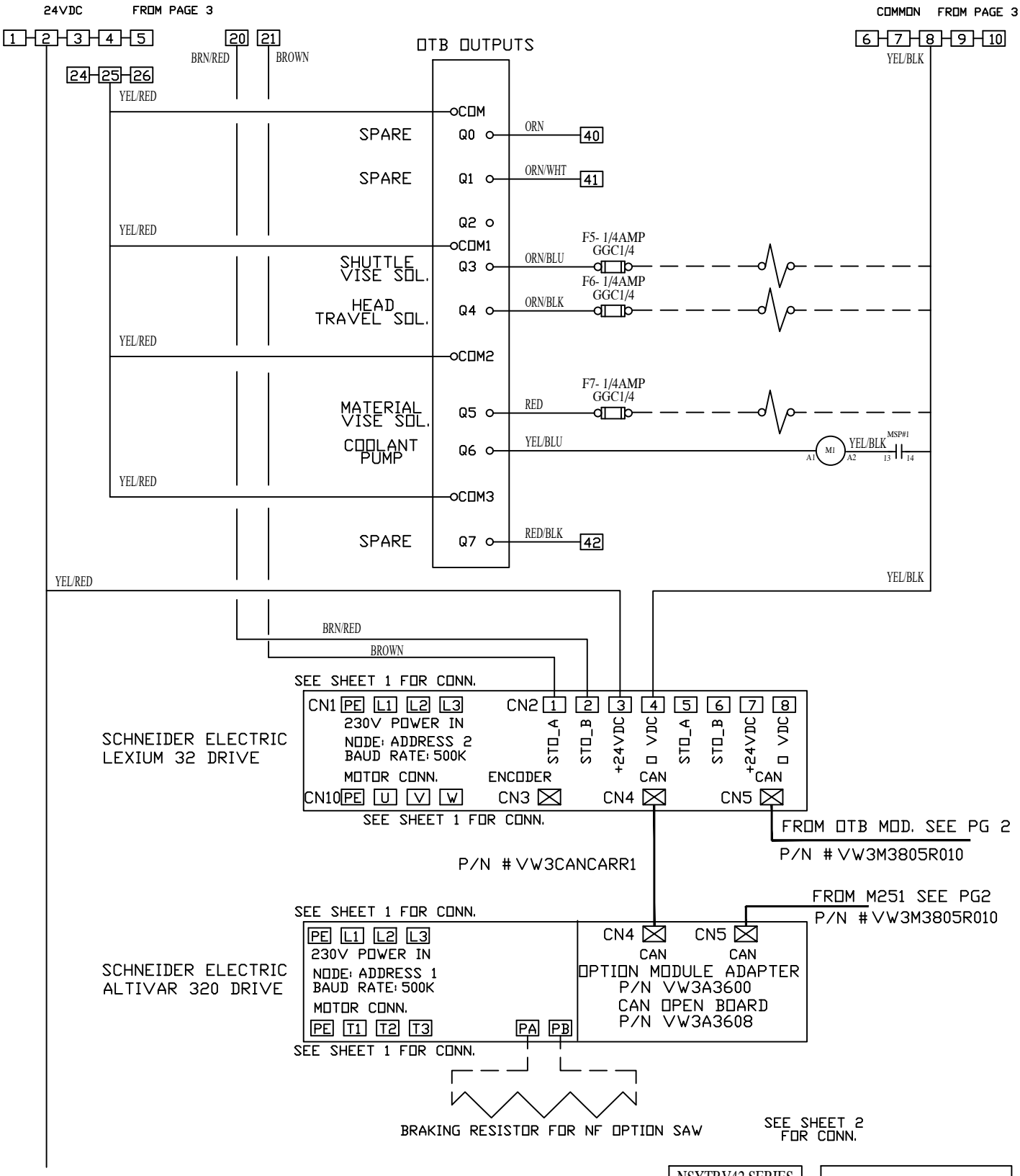


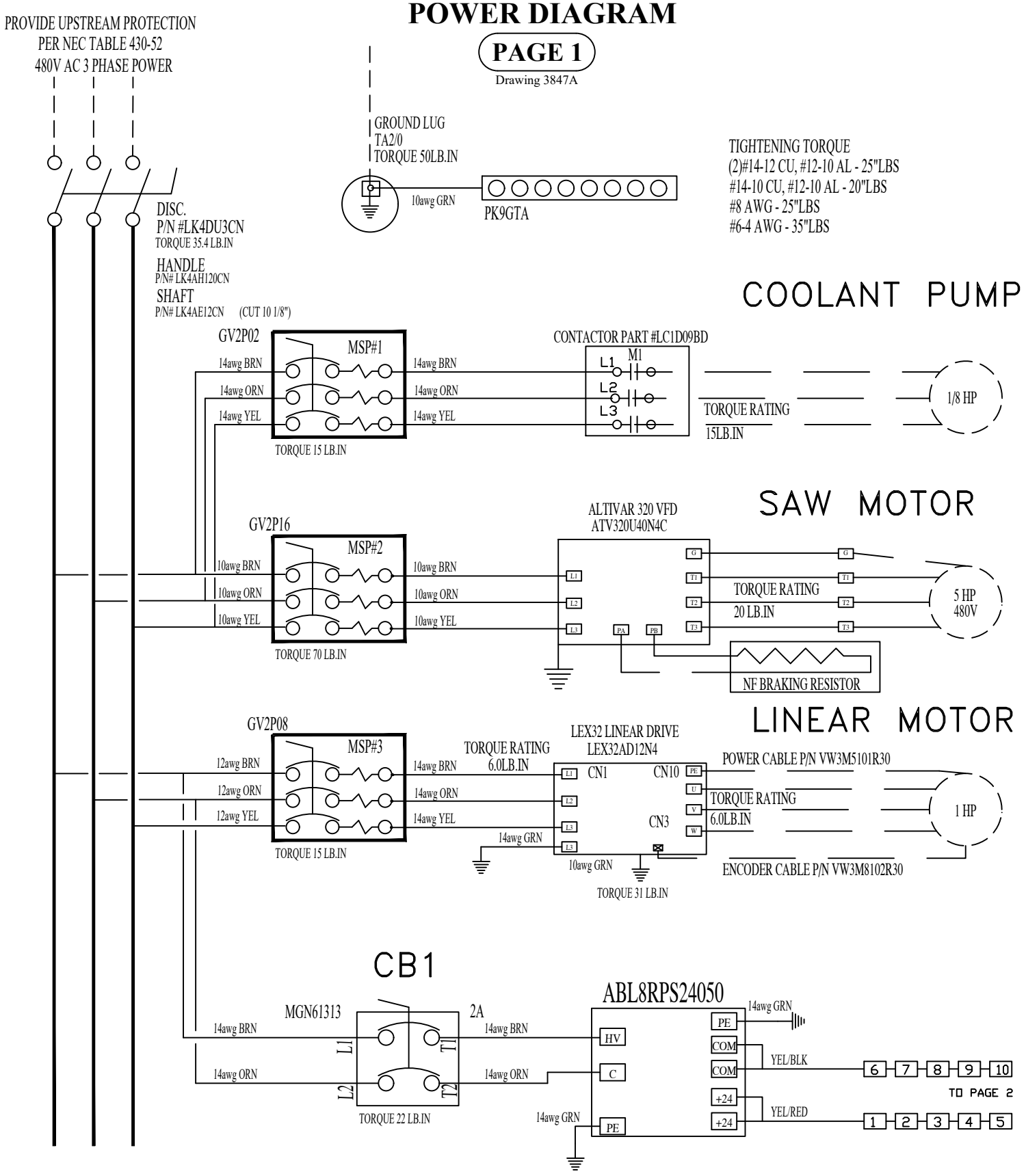
FIGURE 49

SCOTCHMAN HFA 480V

POWER DIAGRAM

PAGE 1

Drawing 3847A



NSYTRV42 SERIES
TERMINAL SPECS.
600V 30A MAX.
22-10 AWG. WIRE
TORQUE 5.3 TO 7.08 LB.IN

= TERMINAL
CONNECTED ITEMS
FIELD WIRING

FIGURE 50

SCOTCHMAN HFA 480V

CONTROL WIRING

PAGE 2

Drawing 3847A

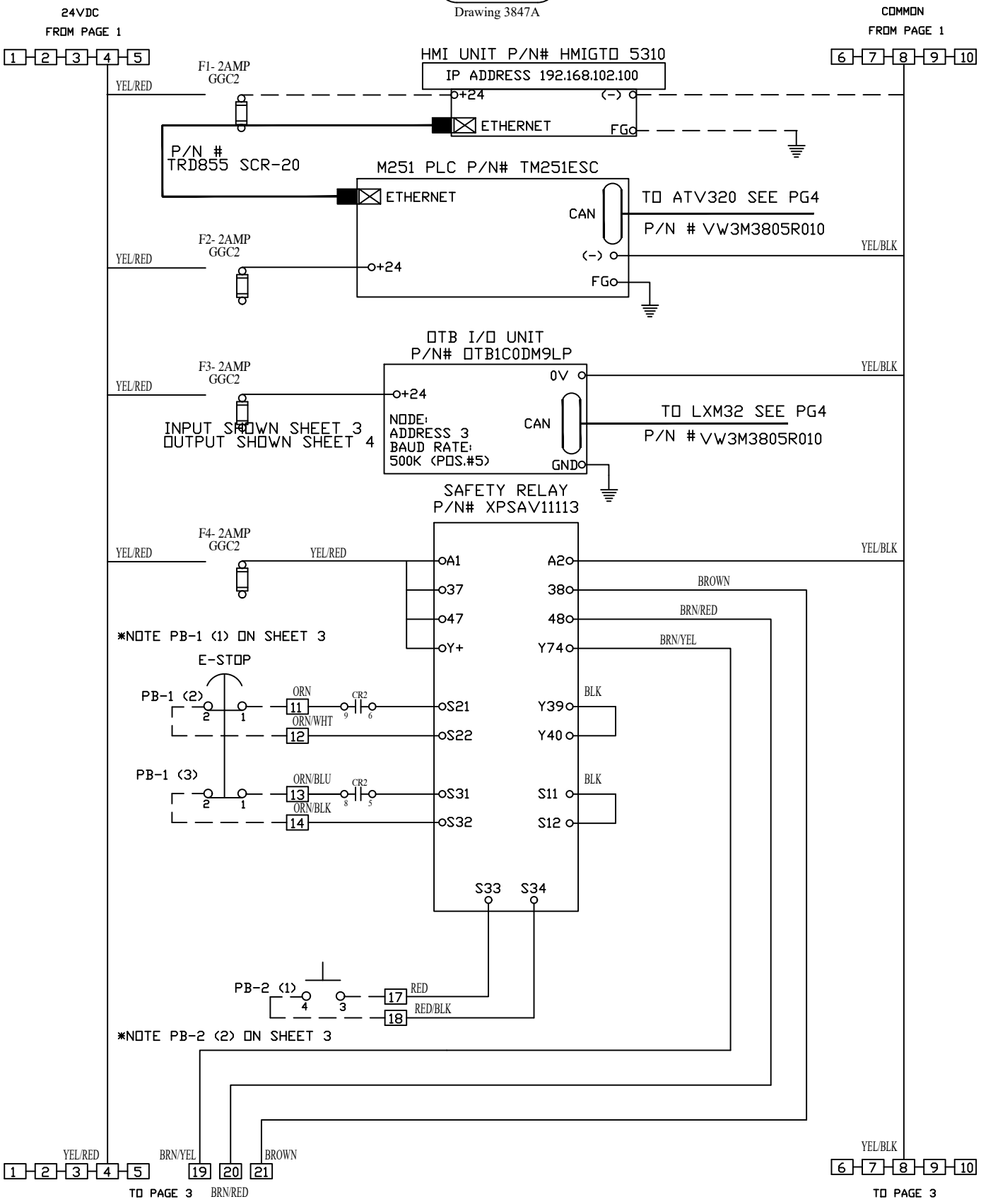


FIGURE 51

NSYTRV42 SERIES
TERMINAL SPECS.
600V 30A MAX.
22-10 AWG. WIRE
TORQUE 5.3 TO 7.08 LB.IN

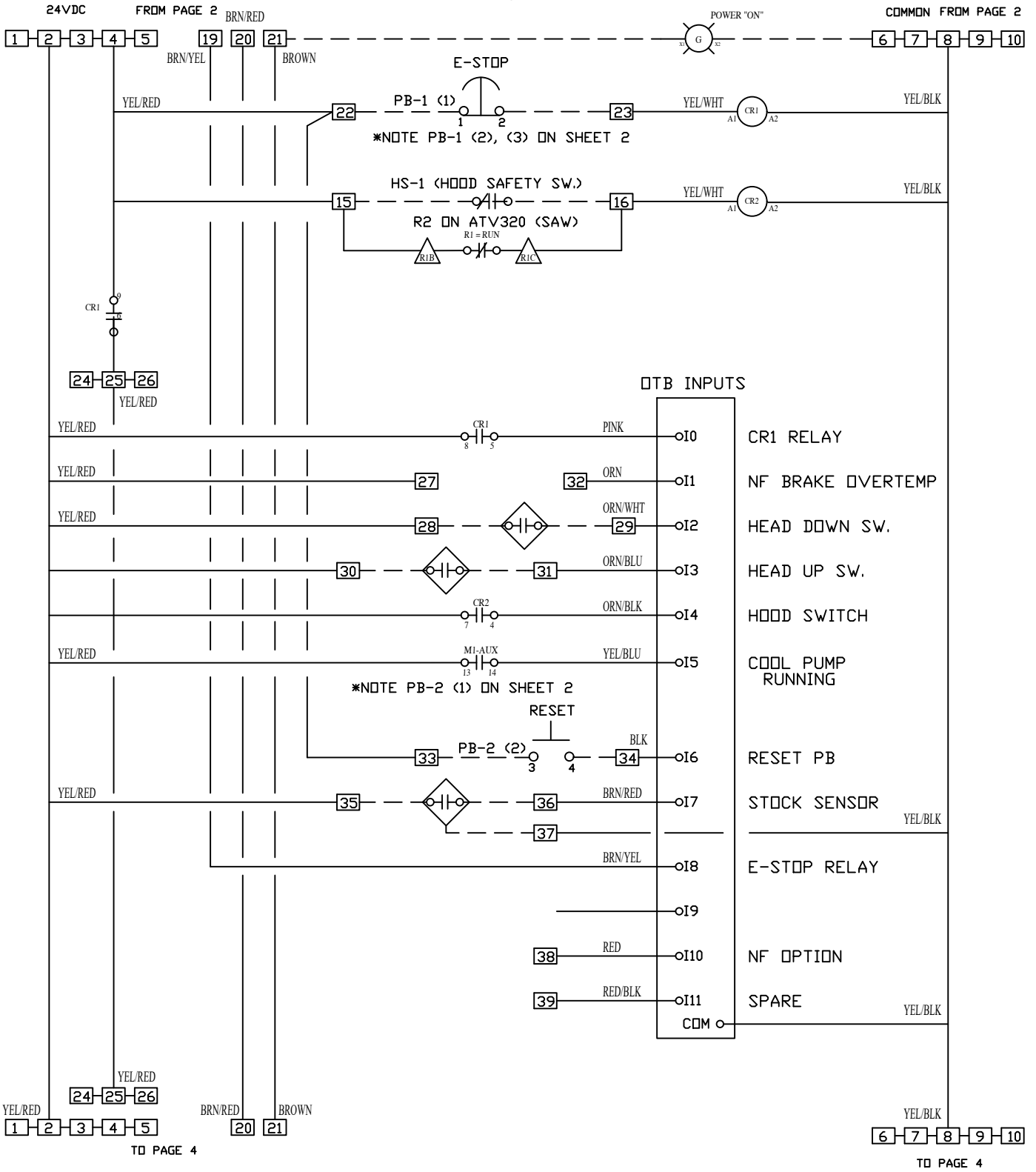
TERMINAL
CONNECTED ITEMS
FIELD WIRING

SCOTCHMAN HFA 480V

CONTROL WIRING

PAGE 3

Drawing 3847A



NSYTRV42 SERIES TERMINAL SPECS. 600V 30A MAX. 22-10 AWG. WIRE TORQUE 5.3 TO 7.08 LB.IN	# TERMINAL CONNECTED ITEMS FIELD WIRING

FIGURE 52

SCOTCHMAN HFA 480V

CONTROL WIRING

PAGE 4

Drawing 3847A

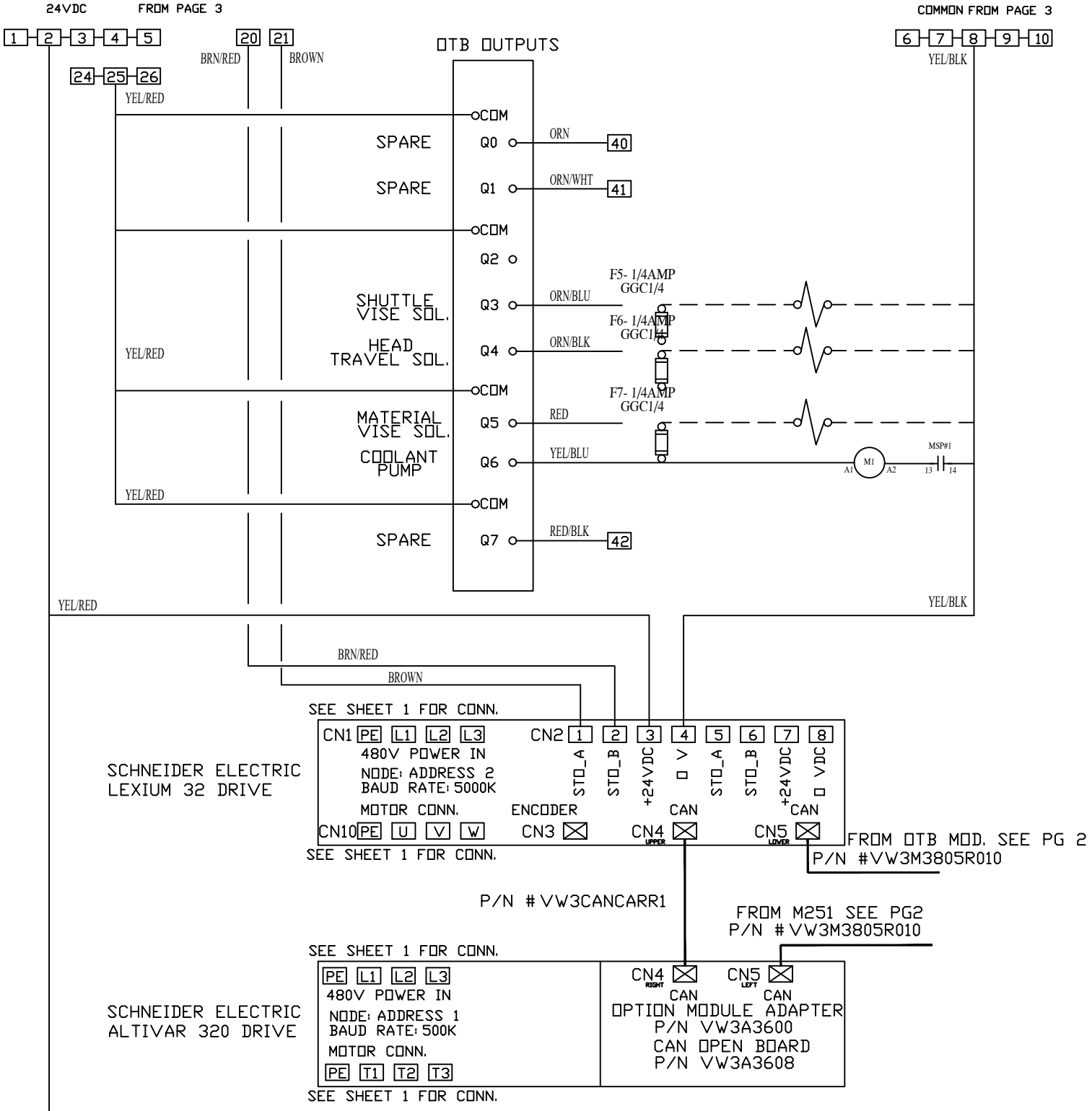


FIGURE 53