AUTOMATIC OILER INSTALLATION – 115 VAC

Product Identification: Automatic Oiler – 115 VAC (PN 31373)

Purpose: This document details the installation and use of the automatic oiler system on a PCNC 770 mill.

Qty.	Automatic Oiler – 115 VAC	PN
1	2 Liter Automatic Oiler	38254
1	Cord Grip	31376
1	Cord Grip Nut	31867
2	M6 x 16 mm Screw	31378
2	M6 Lock Washer	31379
2	M6 Nut	31381
10’	3-conductor Wire	31377
2	Spade Connector	31128
1	Ring Connector	31093
4	Steel One-Hole Clamp	32702

NOTE: *If any of these items are missing, contact Tormach Customer Service at (608)849-8381 for a replacement.*

Required Tools

- 0.25” drill bit
- Electric drill
- Wire stripper/crimper
- Phillips screwdriver
- Flat-head screwdriver
- Adjustable wrench

Automatic Oiler Connections

1. Remove automatic oiler cover plate; feed 3-conductor Wire through pre-installed cord grip assembly as shown in **Figure 1**.
2. Strip 2” of 3-conductor Wire insulation; strip wires back 1/4” and connect as shown in **Figure 1**.
3. Remove slack on 3-conductor Wire by gently pulling out of oiler until snug; tighten nut.
4. Reinstall cover plate set aside earlier.

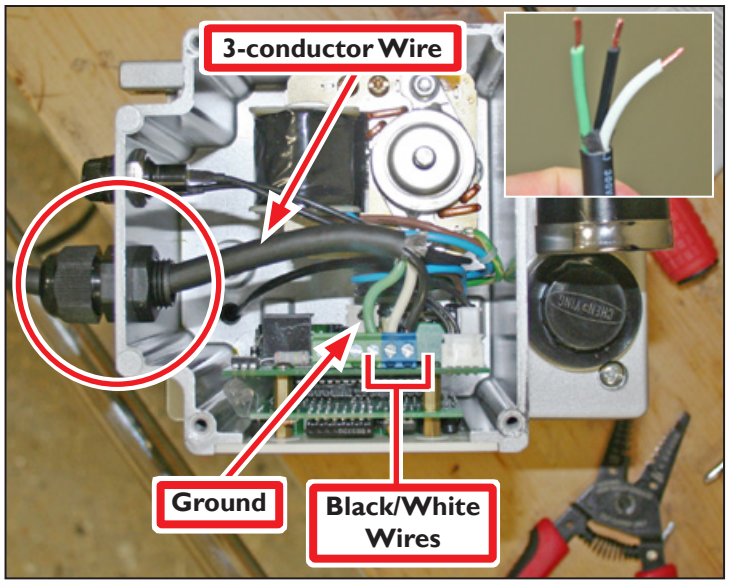

Figure 1

5. Using Upper Fitting and Ferrule from automatic oiler’s Brass Fitting, attach oil line to Automatic Oiler as shown in **Figure 2**. Tighten using an 8 mm wrench.

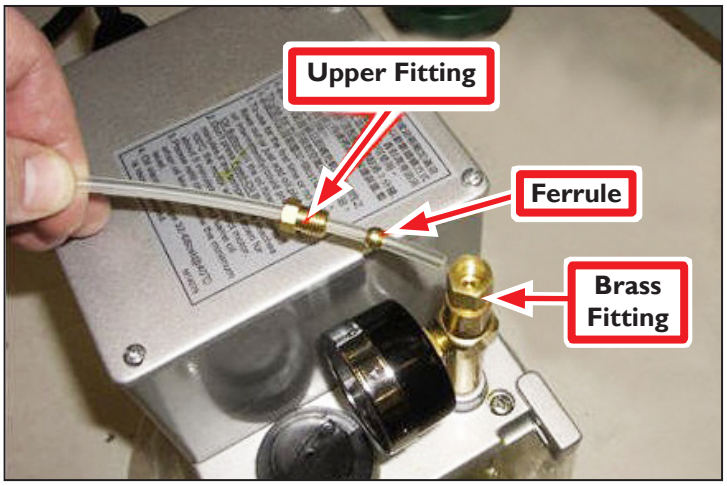

Figure 2

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PCNC 770 Installation

1. Power off mill according to *Power Off/On Procedure* detailed in this section.

WARNING! Electrical Shock Hazard: *Be sure to power off machine before making any electrical modifications. Failure to do so may result in serious injury or death.*

Power Off/On Procedure

Power Off	1. Push red *E-stop* button in	
	2. Click *Exit* on screen; when prompted click *OK* to power off	
	3. Turn Main Disconnect *Off* (see image at right)	
Power On	1. Turn Main Disconnect *On* (see image at right)	
	2. After software loads, turn red E-stop clockwise to release	
	3. Press green *Start* button	
	4. Click *Reset* on screen	

2. Identify Pilot Holes for mounting automatic oiler, located on the left-hand side of stand under chip pan (see **Figure 3**).
3. Using two M6 x 16 mm Screws, two M6 Lock Washers, and two M6 Nuts, attach automatic oiler to stand.
4. Using four Steel One-hole Clamps, route oil line around back of mill under chip pan (see **Figure 4**); this routing ensures that oil line does not come in contact with any moving parts.
5. Using cable ties (or similar), route 3-conductor Wire from automatic oiler around back of mill together with oil line (see **Figure 4**).

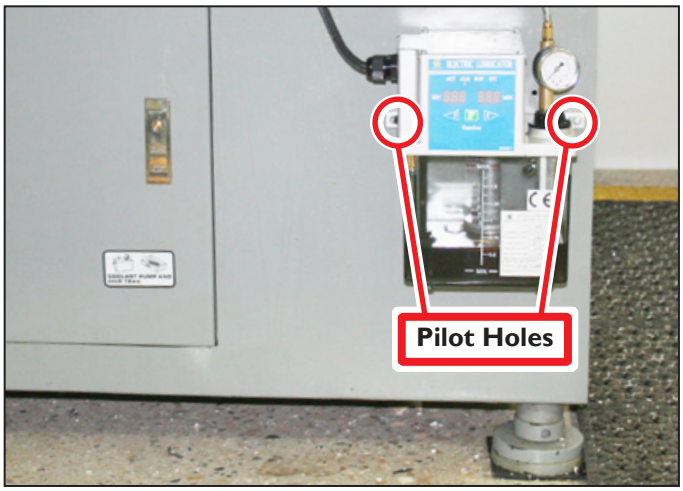

Figure 3

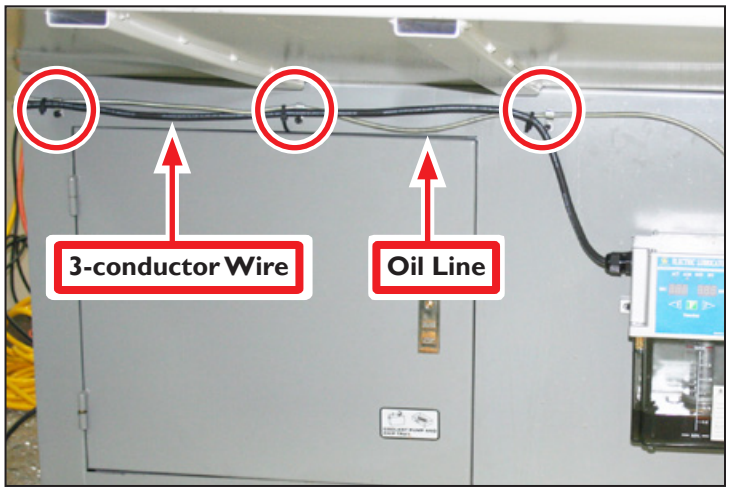

Figure 4

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6. Using Cord Grip, run 3-conductor Wire through bottom of electrical cabinet via knockout hole (see **Figure 5**); tighten with Cord Grip Nut.

NOTE: *If Cord Grip does not fit in knockout hole, drill out hole with 7/8" drill.*

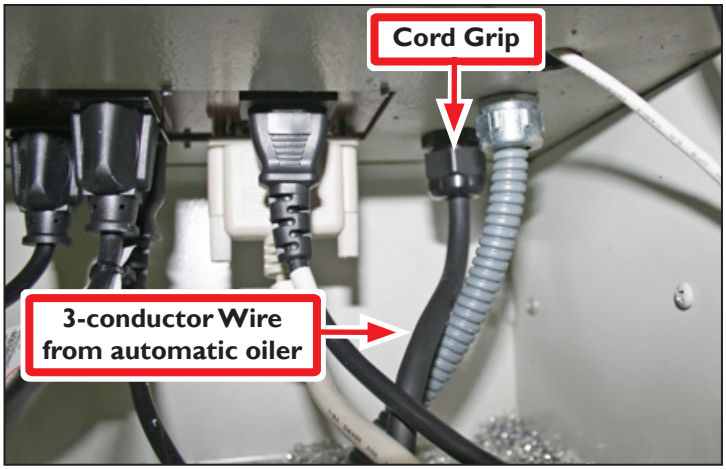

Figure 5

7. Older machines have a Ground Bar (see **Figure 6**); newer machines have a green Ground Terminal Block (see **Figure 7**). Identify the ground connection specific to your machine.

Ground Bar

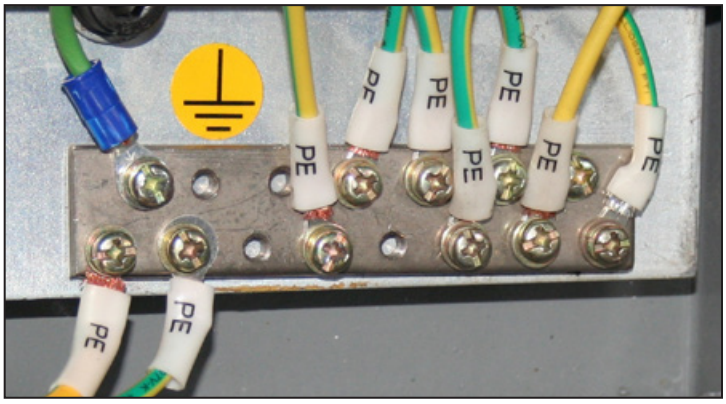

Figure 6

Ground Terminal Block

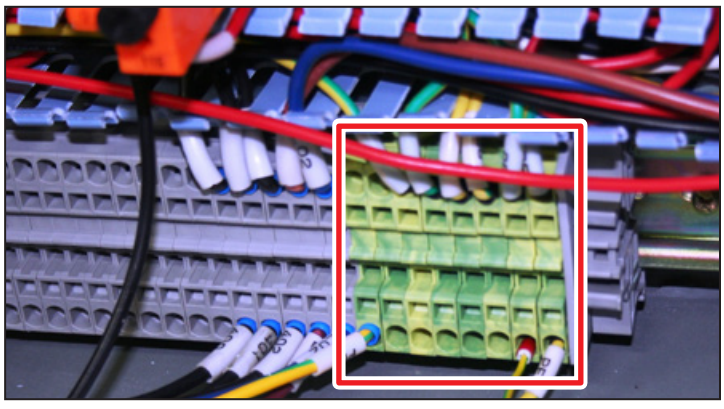

Figure 7

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Ground Bar Connection

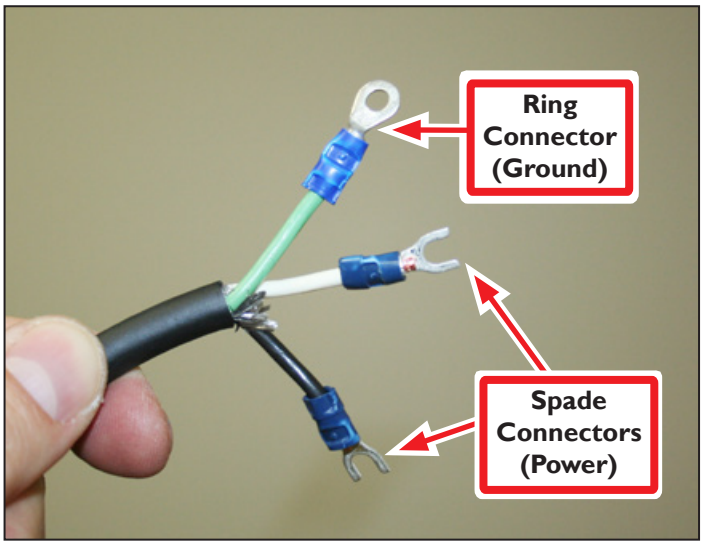

Figure 8

Ground Terminal Block Connection

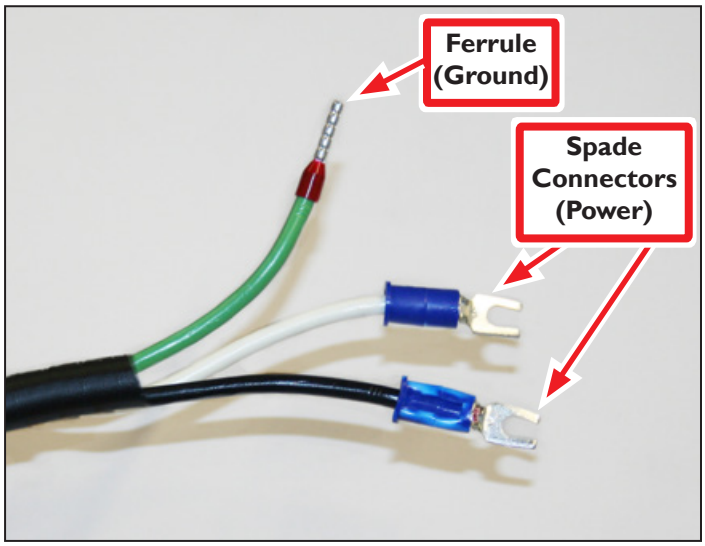

Figure 9

8. Using a wire stripper, strip off 1/4” of insulation on black and white power wires, exposing bare metal.
9. Crimp Spade Connectors to black and white power wires (see **Figure 8** and **Figure 9**).
10. Based on ground connection identified in step 7, either use pre-mounted Ferrule for Ground Terminal Block connection (see **Figure 7** and **Figure 9**) or clip off Ferrule, strip wire back 1/4” and crimp on Ring Connector for Ground Bar connection (see **Figure 6** and **Figure 8**).
11. Inside electrical cabinet, remove Lower Wire Trough cover and set aside (see **Figure 10**).

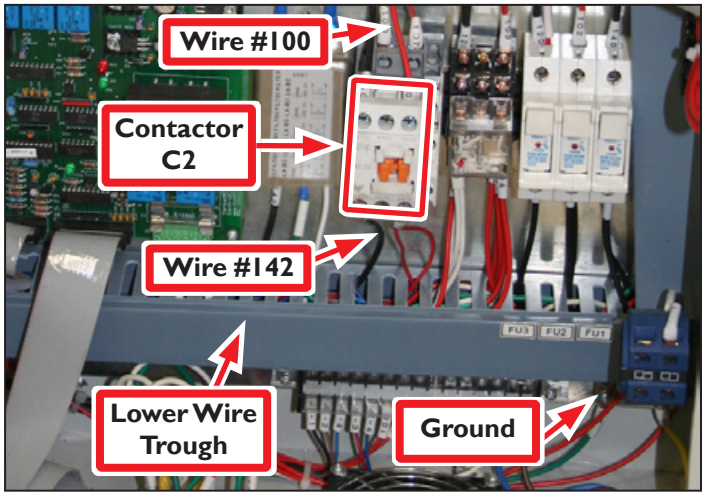

Figure 10

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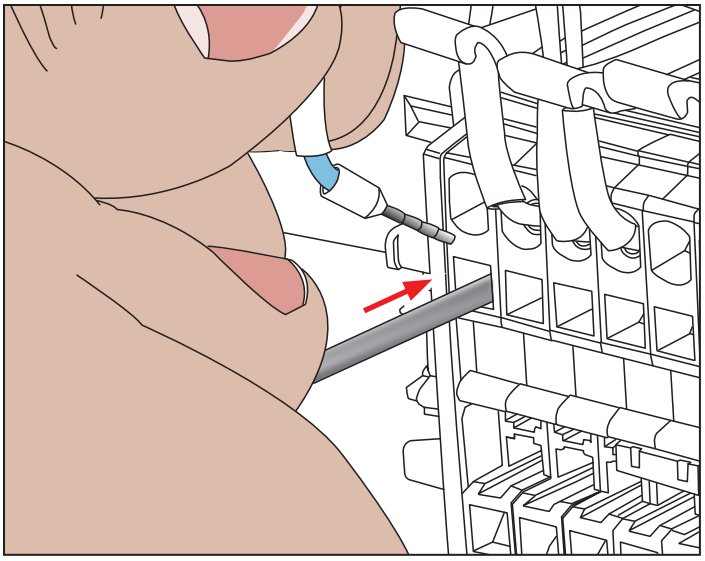

Figure 11

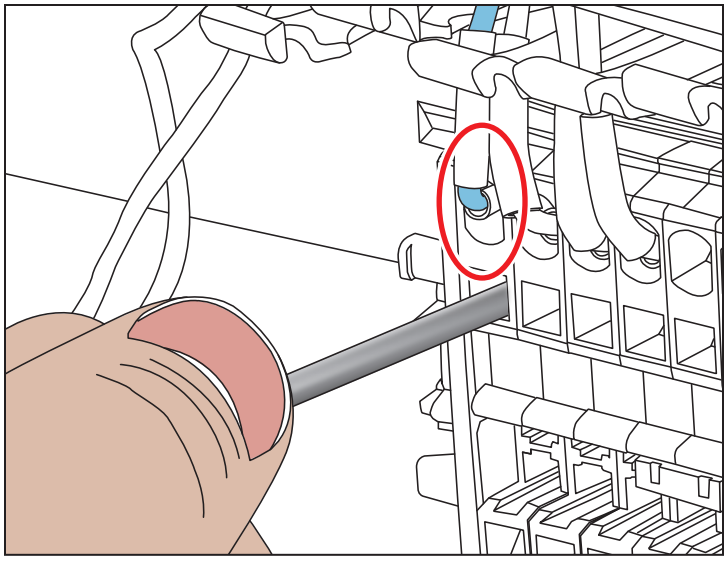

Figure 12

12. Based on ground connection identified in step 7 (either Ground Bar or Ground Terminal Block), make green ground wire connection as detailed in the table below.

Ground Bar	a) Route green wire via lower Wire Trough and connect to any Ground Bar terminal screw (see **Figure 6** and **Figure 10**).
Ground Terminal Block	a) Route green wire via lower Wire Trough (see **Figure 10**).
	b) Slowly insert end of a small, flat-head screwdriver straight into any slot in green end of Ground Terminal Block (see **Figure 7** and **Figure 11**).
	c) Once resistance is felt, insert wire into terminal block (see **Figure 12**); slowly remove screwdriver. ***IMPORTANT!*** *Do not move screwdriver up or down inside terminal block. Failure to do so could damage terminal block.*

13. Route black and white wire to Contactor C2 via Lower Wire Trough (see **Figure 10**). Loosen screws above wires #142 and #100; connect black wire to #142 and white wire to #100 (see **Figure 10**).
14. Tighten all screws and reattach Lower Wire Trough cover set aside earlier.

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Setup

1. Remove Fill Cap and fill reservoir with way oil up to the Max Fill Line (see **Figure 13**). Use only recommended way oils detailed in the table below. For more information on way oils, refer to machine operator manual.

Brand	Recommended Way Oils
Shell	Tonna 68
Mobile	Vactra No. 2
Sunoco	Way-lube
Texaco	Waylube 68
Esso	Febis 68
Perkins	Perlube WL-68

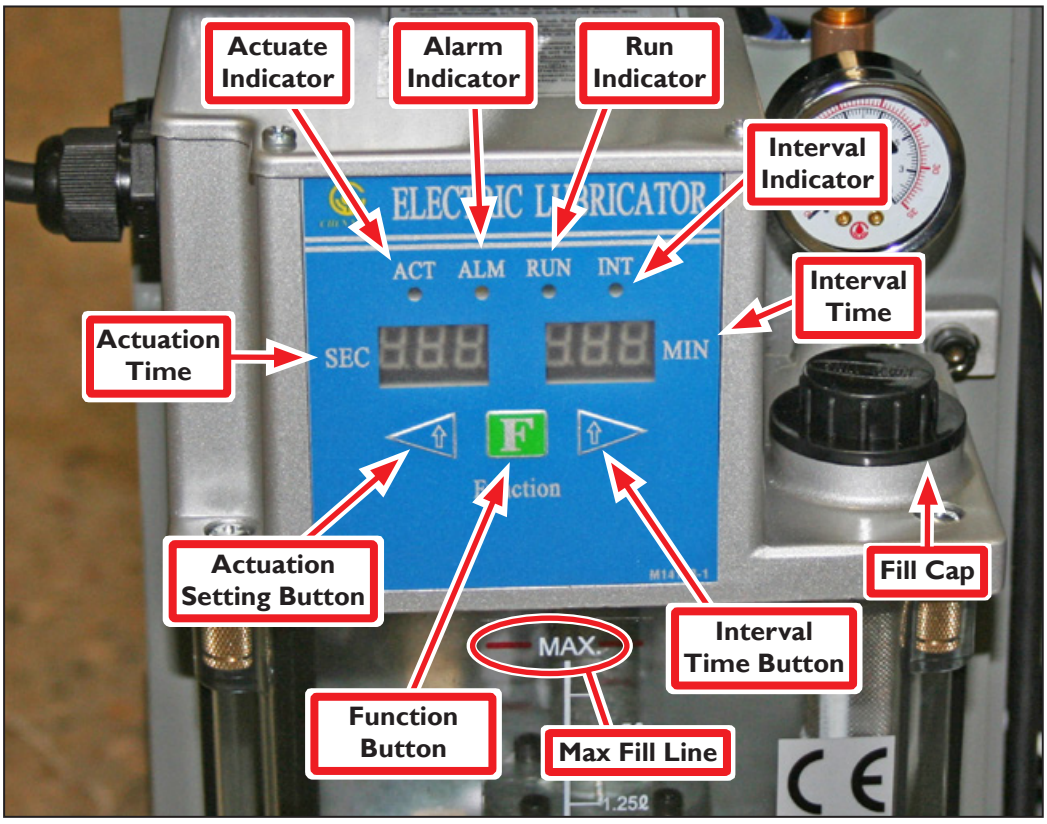

Figure 13

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2. Power on oiler; automatic oiler is powered through spindle drive contactor C2. When spindle variable frequency drive (VFD) is on, oiler is on.

NOTE: *Oiler is not active when cutting air or running high-speed spindle without VFD powered on.*

3. Push Function Button (manual override button) to pull oil through tube (see **Figure 13**); check for leaks.
4. After first connecting oiler, or if oiler has run out of oil, purge air from lines. Push and hold the Function Button (see **Figure 13**) in four second increments; repeat four times.
5. Set the interval time to define the time between applications. Push and release Interval Time Button (see **Figure 13**) to activate the interval time setting (indicated by a flashing Interval Indicator LED). In this mode, Interval Time Button increases interval setting and Function Button decreases interval setting. The setting is displayed in the Interval Time window (see **Figure 13**). This should be set to 240 minutes (four hours).
6. Set the actuation time to define the time of oil application, or length of oil application pulse. Push and release Actuation Setting Button (see **Figure 13**) to activate actuation time setting (indicated by a flashing Actuation Indicator LED). In this mode, Actuation Setting Button increases actuation setting and Function Button decreases actuation setting. The setting is displayed in the Actuation Time window (see **Figure 13**). This should be set to 5 seconds.
7. After actuation time and/or interval time is changed, the system pauses for five seconds. It then reverts to run mode, as indicated by an actuation of oil application for a duration equal to the actuation time (indicated by an illuminated Actuation Indicator LED) followed by the start of the interval time (indicated by an illuminated Interval Indicator LED).

NOTE: *Interval or actuation time may need to be tweaked per individual circumstances.*

CAUTION! Pressure Hazard: *Excessive pressure may damage hose or crack manifold. Do not set the actuation time too high. If more lubrication is needed, shorten the interval time. Failure to do so could result in serious injury and/or machine damage.*

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Operation

Automatic oiler powers on whenever spindle VFD is powered on. If machine is left powered on for long periods of time – overnight, for example – oil is wasted. Power off the mill when not in use. Power off the VFD by turning the spindle lockout key to the *Off* position to prevent oil waste.

Automatic oiler has two alarms relating to routine operation:

- The first sounds when the level in the reservoir drops below the required minimum, indicated by an illuminated Alarm Indicator LED and the Actuation Time window display flashing (see **Figure 13**)
- The second sounds when low pressure is detected, indicated by an audible beep, an illuminated Alarm Indicator LED, and both the Actuation Time window and Interval Time window displays flashing (see **Figure 13**).

The second alarm is critical, as machine is no longer getting oil. If a second low pressure alarm goes off, refill reservoir with oil and purge air out of the system (refer to *Setup* section earlier in this document for more information). To clear an alarm, push Function Button (see **Figure 13**).

Turn spindle on and press Function Button (see **Figure 13**) to manually oil machine as needed.

Oil machine anytime it has been unused for more than 48 hours. For more information on proper lubrication, refer to machine operator manual.

Troubleshooting

Problem	Possible Solution
No pressure indicated on pressure gauge ***NOTE:*** *Pressure will only read on gauge while system is actuating.*	If no pressure is indicated while actuation is in progress: • Make sure oil is in reservoir • Check for leaks in system hoses and fittings
Pressure is indicated, but no oil is getting to the ways and ball screws/nuts	Check for blocked hoses and fittings on machine. All bearing surfaces and all ball nuts have an oil line; verify all are getting oil.
Automatic oiler has no power	Check that VFD is powered on (or that contactor C2 is activated), the spindle door is closed, and the spindle lockout key is in the *On* position.
	Measure AC voltage across wire 100, wire 142, and contactor. If 230 volts is present, re-check wiring inside oiler; if correct, replace control board.
	If 230 volts is not present and VFD will not power on, refer to machine operator manual.

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