

Centro-Matic

Models 351-2414, 85684, 85686 and 85687, series "A"



Model 351-2414 shown

Date of issue	October 2022		
Form number	404047		
Version	4		



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Declaration of Incorporation*

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This Declaration of Incorporation is issued under sole responsibility of the manufacturer. Lincoln Industrial Corporation hereby declares that the partly completed machinery stated below:

Name: Series 20 pumps Model number(s): 85684, 85686 and 85687 (Series A) Description:Centro-Matic Year of CE: 2021

in its intended use, is in conformity with the relevant union harmonization legislation:

Machinery Directive 2006/42/EC (Article 13 Partly Completed Machinery)

Pressure Equipment Directive 2014/68/EU

Category: Sound Engineering Practice – (SEP PS = 241 bar)

and conforms to the following harmonized standards:

EN ISO 4413: 2010 Hydraulic fluid power - General rules and safety requirements for systems and their components

EN ISO 12100: 2010 Safety of machinery. General principles for design. Risk assessment and risk reduction

EN ISO 4414: 2010 Pneumatic fluid power. General rules and safety requirements for systems and their components

EN ISO 809:1998+A1:2009 Pumps and pump units for liquids common safety requirements

EN 1216:2001+A1:2009 Liquid pumps. Safety requirements. Procedure for hydrostatic testing The following EHSR (Essential Health and Safety Requirements) have been applied:

 $\begin{array}{c} 1.1.2a-1.1.2b-1.1.2c-1.1.3-1.1.5-\\ 1.2.5-1.3.2-1.3.3-1.3.4-1.3.6-1.3.7\\ -1.3.8-1.5.3-1.5.4-1.5.13-1.7-1.7.1\\ -1.7.1.1-1.7.3-1.7.4\end{array}$

The manufacturer maintains a technical construction file containing test reports and product documentation:

Technical file summary sheet number: RA403404

The partly completed machinery shown above should not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of the directive, where appropriate.

I, the undersigned of Lincoln Industrial Corporation, do hereby declare that the equipment specified above, in its intended use, conforms to the requirements of the above EC Directive(s).

Robert Collins Technical Compliance Manager St. Louis, MO, U.S.A. 2022/01/20

SKF

U.K. Declaration of Incorporation*

DOCUMENT NUMBER UK404047CA

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This U.K. Declaration of Incorporation is issued under sole responsibility of the manufacturer. Lincoln Industrial Corporation hereby declares that the partly completed machinery stated below:

Name: Series 20 pumps Model number(s): 85684, 85686 and 85687 (series A) Description: Centro-Matic Year of CE: 2021

in its intended use, is in conformity with the relevant union harmonization legislation:

EN ISO 4413: 2010 Hydraulic fluid power - General rules and safety requirements for systems and their components

EN ISO 12100: 2010 Safety of machinery. General principles for design. Risk assessment and risk reduction

EN ISO 4414: 2010

Pneumatic fluid power. General rules and safety requirements for systems and their components

EN ISO 809:1998+A1:2009 Pumps and pump units for liquids common safety requirements

EN 1216:2001+A1:2009 Liquid pumps. Safety requirements. Procedure for hydrostatic testing

along with the following Directive(s) that were also applied with the above legislation:

Supply of Machinery (Safety) Regulations 2008 (S.I. 2008:1597)

Pressure Equipment (Safety) Regulations 2016 (S.I. 2016:1105)

Category: Sound Engineering Practice – (SEP PS = 241 bar)

The following EHSR (Essential Health and Safety Requirements) have been applied:

 $\begin{array}{c} 1.1.2a-1.1.2b-1.1.2c-1.1.3-1.1.5-\\ 1.2.5-1.3.2-1.3.3-1.3.4-1.3.6-1.3.7\\ -1.3.8-1.5.3-1.5.4-1.5.13-1.7-1.7.1\\ -1.7.1.1-1.7.3-1.7.4\end{array}$

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I, the undersigned of Lincoln Industrial Corporation, hereby declare that the equipment specified above, in its intended use, conforms with the Essential Health and Safety Requirements of U.K. legislation Supply of Machinery (Safety) Regulations 2008 No. 1597 Annex I, Declaration of Incorporation by the time of placing it on the market.

Robert Collins Technical Compliance Manager St. Louis, MO, U.S.A. 2022/01/20

Indicates change.

Safety*

The assembly must be installed, maintained and repaired exclusively by persons familiar with the instructions.

Always disconnect power source (electricity, air or hydraulic) from the equipment when it is not being used.

This equipment generates high pressure. Extreme caution should be used when operating this equipment as material leaks from loose or ruptured components can inject fluid through the skin and into the body. If any fluid appears to penetrate the skin, seek attention from a doctor immediately. Do not treat injury as a simple cut. Tell attending doctor exactly what type of fluid was injected.

Any other use not in accordance with instructions will result in loss of claim for warranty or liability.

- Do not misuse, over-pressurize, modify parts, use incompatible chemicals, fluids, or use worn and/or damaged parts.
- Do not exceed the stated maximum working pressure of the equipment or of the lowest rated component in your system.
- Always read and follow the manufacturer's recommendations regarding fluid compatibility, and the use of protective clothing and equipment.
- Failure to comply may result in personal injury and/or damage to equipment.

Explanation of signal words for safety

NOTE

Emphasizes useful hints and recommendations as well as information to prevent property damage and ensure efficient trouble-free operation.

▲ CAUTION

Indicates a dangerous situation that can lead to light personal injury if precautionary measures are ignored.

Indicates a dangerous situation that could lead to death or serious injury if precautionary measures are ignored.

▲ DANGER

Indicates a dangerous situation that will lead to death or serious injury if precautionary measures are ignored.

A WARNING

Do not operate equipment without reading and fully understanding safety warnings and instructions. Failure to follow warnings and instructions may result in serious injury.

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△ CAUTION

Do not operate equipment without wearing personal protective gear.

Wear eye protection. Protective equipment such as dust mask, non-skid safety shoes, hard hat, or hearing protection used for appropriate conditions will reduce personal injuries.

Failure to comply may result in light personal injury.



△ WARNING



Do not allow any body part to be trapped by equipment. Body parts can be crushed by subassemblies during

operation.

Failure to comply may result in death or serious physical injury.

A WARNING



Do not allow fluid to leak onto floor when operating equipment. If spill occurs,

clean any fluid on floor before continuing operation.

Failure to comply may result in death or serious personal injury.

A WARNING

Do not use this equipment to supply, transport, or store hazardous substances and mixtures in accordance with annex I part 2-5 of the CLP regulation (EG 1272/2008) or HCS 29 CFR 1910.1200 marked with GHS01, GHS06 and GHS08 hazard pictograms shown:



NOTE

Refer to 8X-2317 pump manual 403513 for other safety considerations.

Overview

Models 351-2414, 85684, 85686 and 85687 are pumping units designed to operate centralized lubrication systems. They have high volume output, delivering 30 in³ (491 cm³) of lubricant per minute at typical Centro-Matic pressures. They are fully automatic when used with system controller. Pump is double acting, dispensing lubricant on both up and down strokes. Units are designed to be used with SL-V, SL-1, SL-11, SL-32 and SL-33 series injectors or a combination of listed injectors.

Appropriate use

- Pumps on these units are exclusively designed to pump and dispense lubricants using compressed air only.
- Do not exceed maximum specification ratings (> Table 1).
- Any other use not in accordance with instructions will result in loss of claims for warranty and liability.

Specifications

Pump ratio Output per cycle Output per minute

Pump air supply pressure Operating line pressure

Container capacity Air consumption Operating temperature range

Operation with system controller

When system controller times out, it initiates a lubrication cycle. Air solenoid is energized to deliver air to pump and air to vent valve. Pump begins dispensing lubricant through injectors to bearings.

When all bearings have received lubricant, pressure rises in system to actuate pressure switch. When pressure switch actuates, control is reset to de-energize solenoid valve cutting off air to pump and vent valve. Pump stops, pressure vents and pressure switch de-actuates. Controller begins timing toward next lubrication event.

Install pump

- **1** Place unit in approximate location; ensure grease and air connections are accessible.
- **2** Mark center locations of six holes at bottom of reservoir.
- **3** Drill six 1/2 in (*12.7 mm*) holes. Use of 7/16 in (*11 mm*) bolts offers some flexibility in securing reservoir to equipment.

Bare pump assembly

Please refer to manual **403513C** for bare pump assembly (**1**) (→ **Fig. IPB 1**, **page 15**).

Table 1

Do not connect lubricant outlet to a system not capable of 3 500 psi (241 bar) working pressure.

▲ WARNING

Do not use air line with less than a 1/4 in (6 mm) inner diameter hose capable of 100 psi (7 bar) operating pressure.

Failure to comply can cause death and/or serious personal injury.

50:1 0.35 in³ (6 *cm*³) 30 in³ (492 *cm*³)

50 to 70 psi (3.4 to 4.8 bar) normal: 2 500 psi (172 bar) maximum: 3 500 psi (241 bar)

60 lb bulk (27 kg) 4.3 ft³/min (*120 l/min*) -10 to +140 °F (-23 to +60 °C)

Fig. 1

Models





85684



85686



Model identification

Models 351-2414, 85684, 85686 and 85687 are the same except for orientation of reservoir cover in relation to reservoir fill port and vent port (\rightarrow Fig. 1).

Change cover orientation

To change orientation of reservoir cover:

- 1 Remove screws (2) and lock washers (3) which hold cover onto reservoir.
- **2** Lift entire reservoir cover with pump and follower out of reservoir.
- **3** Rotate follower and reservoir cover to position needed and push follower down as far as possible into reservoir.
- 4 Re-assemble screws (2) and lock washers (3).

Operation

Fill reservoir

To bulk fill reservoir (→ Fig. IPB 1, page 14).

- **1** Attach appropriate bulk-filling pump to buttonhead fitting **(13)** in lower inlet.
- 2 Fill reservoir until grease flows from high level vent port.
- **3** Remove bulk-filling pump.

Maintenance

- Keep area around pump clean.
- Clean filling port area prior to filling reservoir, as lubricants attract dirt and debris.
- Keep lubricants clean and free of dirt and debris.
- Keep grease pails clean and prevent foreign matter from entering grease pail or contaminating grease, as it adheres to pump.

▲ WARNING

Do not over pressurize reservoir when filling reservoir. Failure to comply may result in death or

serious injury.

WARNING Before performing maintenance or service, disconnect all forms of power supply to the

disconnect all forms of power supply to the pump assembly.

Failure to comply can cause death and/or serious personal injury.

In case of system malfunction

Refer to **Troubleshooting (page 13)** to determine cause of malfunction.



Safety unloader valve

Refer to (→Fig. IPB 1, page 15).

If pressure switch fails to operate, safety unloader valve (**45**) activates between 3 750 and 4 250 psi (*258 and 293 bar*) lubricant pressure to relieve supply line pressure.

NOTE

Tighten safety unloader to 10 lbf-ft (*13 Nm*) after replacement. Safety unloader is preset and non-adjustable.

▲ WARNING

Do not service safety unloader. Replace if defective.

Failure to comply may result in death or serious personal injury.

Outlet check inspection and repair

Refer to (→ Fig. 3 and Fig. IPB 1, page 15).

- 1 Remove hex head bolts (21) and lock washers (22).
- **2** Loosen union (**17**) and set vent valve assembly to side.
- 3 Remove outlet check assembly (16) by removing adapter (15) from pump outlet.
- 4 Remove adapter (15) from outlet check bushing (60).
- 5 Remove outlet connector (55) from outlet check bushing (60).
- 6 Remove ball check seat (58) from outlet connector (55).
- 7 Inspect all check components (57, 58, 59, 60) for presence of foreign material, scoring and/or other damage that may cause internal leakage.
 Replace components if damage is found.
- 8 Replace gaskets (56, 61) whenever outlet check assembly (16) is disassembled.
- 9 For assembly, torque outlet check assembly (16) to 100 lbf-ft (135 Nm).

NOTE

Inspect outlet check assembly **(16)** for debris. Sufficient lubricant pressure cannot be achieved without proper seal.

Remove any foreign material lodged beneath steel ball (57) or between outlet check bushing (60) and seat of pump check disc assembly (59).

Fig. 3 Outlet check assembly (16) 6155

▲ WARNING

Do not operate without safety unloader. Safety unloader must be installed before using pump. Safety unloader ships with pump assembly.

Failure to comply may result in death or serious personal injury.

▲ WARNING

Do not plug outlet of safety unloader. Plugging safety unloader outlet will result in pressure build up.

Failure to comply may result in death or serious personal injury.

Vent valve service

Refer to (→ Fig. 4 and Fig. IPB 1, page 15).

- **1** Remove air hose (**37**) and vent hose (**39**).
- 2 Remove hex head bolts (21) and lock washers (22).
- 3 Loosen union (17) and remove vent valve (43).
- 4 Position vent valve in vice and remove nipple (46) and elbow (44).
- 5 Position vent valve assembly (43) so vice jaws are gripping flats on vent valve base.
- 6 Remove air cylinder (47) and piston (48) and packing (49).
- 7 Remove packing assembly (51) from air cylinder (47).
- 8 Inspect needle (50) and valve seat (52) for foreign matter that can prevent needle (50) from sealing in valve seat (52).
- 9 Remove valve seat (52) from valve body (54) using a 3/4 in (19 mm) open end wrench on valve seat flats. Use an adjustable wrench over open end wrench if necessary due to accessibility of seat.
- **10**Clean and inspect for damage. Replace if valve seat (**52**) appears damaged by nicks, grooves or scoring.
- **11** Remove and replace check seat gasket (**53**).
- **12** Reverse above procedure to reassemble. Coat needle (**50**) and air cylinder (**47**) inside diameter with lubricant to assist with assembly.
- **13** Install valve seat (**52**) into valve body (**54**) and torque to 25 lbf-ft (39 Nm).
- **14** Install air cylinder (**47**) onto valve body (**54**) and torque to 100 lbf-ft (*135 Nm*).



NOTE

Replace packing (49) if air leakage is evident from weep hole on side of air cylinder (47). Replace packing assembly (51) if grease leakage is evident from weep hole on side of air cylinder (47).

Follower

Refer to (→ Fig. 5 and Fig. IPB 1, page 15).

- Remove hex head screws (2) and lock washers (3) that attach cover to reservoir.
- **2** Lift entire pump, vent valve and cover assembly out of reservoir.
- **3** Unscrew low level indicator (**36**) from follower plate (**73**).
- 4 Remove follower assembly (23) from pump tube. Wipe off excess grease allowing clean access to bolts that must be removed.
- **5** Loosen and remove locknuts (**72**) and follower plate (**73**) on top of follower.
- 6 Remove and replace follower foam (67).
- **7** Assemble follower by reversing disassembly procedure.

NOTE

For assembly, install long bolts (69) staggered with short bolts (70) as shown.

NOTE

Service unit if follower foam is damaged or fails to wipe sides of reservoir effectively.



Low level indicator

If indicator pin appears to drop prematurely or water is noticeable on top of follower then indicator seal o-ring (**30**) may be damaged (→ Fig. 6 and Fig. IPB 1, page 15).

- 1 Remove hex head screws (2) which attach cover to reservoir.
- 2 Inspect reservoir seal (5) for damage. Replace if damaged.
- **3** Remove entire pump, vent valve and follower assembly from reservoir.
- 4 Remove retaining ring (**31**) from indicator cable assembly (**36**).
- 5 Hold indicator plug (35) with a wrench and remove indicator nut (33).
- **6** Remove and replace o-ring (**30**).
- 7 Reverse procedure to reassemble. Torque indicator nut (33) to 20 lbf-ft (27 Nm).



Troubleshooting

Condition	Possible causes	Correction		
Pump does not operate.	No air to pump. Airmotor or pump tube malfunction.	Turn on or connect air supply to pump. Refer to pump service page.		
Air seepage from air exhaust while pump is not operating.	Airmotor malfunction.	Refer to pump service page.		
Pump runs excessively.	Pump tube malfunction.	Refer to pump service page.		
	Outlet check damage or contamination.	Repair check or remove contamination.		
	Vent valve damage or contamination.	Repair vent valve or remove contamination.		
	System component leaking.	Repair leaks		
	Injector bypassing.	Repair injectors.		
Lubricant leaking from weep hole of pump outlet casting.	Pump tube malfunction.	Refer to pump service page.		
Lubricant leaking from safety unloader valve.	Pressure of system set too high.	Adjust pressure switch setting.		
	Safety unloader damaged or contaminated.	Replace safety unloader.		
Air leaking from weep hole in vent valve.	Vent valve air seal damaged.	Replace air seal.		
Lubricant leaking from weep hole in vent valve.	Vent valve lubricant seal damaged.	Replace lubricant seal.		

Service parts

ltem	Description	Part	Quantity	ltem	Description	Part	Quantity
1 2 3	Bare pump assembly Hex head screw; 3/8-16 x 1 1/4 Lock washer; 3/8	8X-2317 50015 66220	1 8 8	37 38 39	Air hose Elbow Vent hose	237318 13129 275271	1 1
4	Cover	276849	1	40	Bushing, 1/4 NPTF(M) x 1/8 NPTF(F)	10461	2
5	Gasket	249355 ¹⁾		41	Tee	67102	1
6	Container assembly	276648		42	Nipple, 1/4 NPTF x 1/4 NPTF	10462	1
7	Elbow; 1/2 NPTF(F) x 1/2 NPTF(F)	249533	1	43	Vent valve assembly	8X-2320	1
8	Gasket	31010 ¹⁾	1	44	Elbow, 3/4 NPTF(M) x 1/2 NPTF(F)	10160	1
9	Nut	12538	1	45	Safety unloader [4 000 psi (<i>275 bar</i>)]	90942 ¹⁾	1
10	Elbow; 1 1/4 NPTF	276854	2	46	Nipple, 1/4 NPTF x 3/4 NPTF	14727	1
11	Vent pipe	67420	1	47	Air cylinder	14720	1
12	Bushing; 1 NPTF(M) x 3/8 NPTF(F)	276861	1	48	Piston	14721	1
13	Buttonhead fitting	276862	1	49	Packing (nitrile)	34229	1
14	Extension tube	276853	1	50	Needle	14722 ¹⁾	
15	Adapter	12213	1	51	Packing assembly (Fluorocarbon)	239330 ^{1) 2}	
16 17 18	Outlet check assembly Union Lock washer; ⁵ /16	81938 66645 66246	1 1 2	52 53 54	Valve seat Check seat gasket Valve body	14723 ¹⁾ 31047 ¹⁾ 239336	1 1
19	Hex head screw; 5/16-18 x 3/4	50016	2	55	Outlet connector	90860	1
20	Gasket	33152	1	56	Gasket	31001 ¹⁾	1
21	Hex head screw; 1/4-20 x 3/4	50169	4	57	Steel ball; 3/8 in (9 <i>mm</i>)	66001 ¹⁾	1
22	Lock washer; 1/4	66186	4	58	Ball check seat	10313 ¹⁾	1
23	Follower assembly	85690	1	59	Pump check disc assembly	80206 ^{1) 2)}	1
24	Vent assembly	276860	1	60	Outlet check bushing	90204 ^{1) 2)}	1
25	Vent fitting	249354	1	61	Gasket	31029 ¹⁾	1
26	Cover	276855	1	62	Cover	276892	1
27	Gasket	274540	1	63	Socket head screw; 10-24 x 1/2	50762	8
28	Hex head screw; 10-24 x 5/8	50088	5	64	O-ring (nitrile)	276893	1
29	Lock washer; #10	68991	5	65	Wiper cover	274318	1
30	0-ring (nitrile)	249532 ¹⁾	1	66	Wiper (fluorocarbon)	274321	1
31	Retaining ring	68888 ¹⁾	1	67	Follower foam	276894	1
32	Indicator bracket	361020	1	68	Spacer	241101	12
33	Indicator nut	16352	1	69	Hex head bolt; 1/4-20 x 4 1/2	241102	4
34	Washer	48548	1	70	Hex head bolt; 1/4-20 x 2 1/2	50062	4
35	Indicator plug	249357	1	71	Follower plate	276888	1
36	Cable assembly (low level indicator)	276852	1	72	Locknut; 1/4-20	51304	8
				73	Weighted follower plate	276891	1

Suggested service replacement components.
 Sold only as an assembly. Individual parts not available.



Warranty

The instructions do not contain any information on the warranty. This can be found in the General Conditions of Sales, available at: www.lincolnindustrial.com/technicalservice or www.skf.com/lubrication.

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October 2022 · Form 404047 Version 4