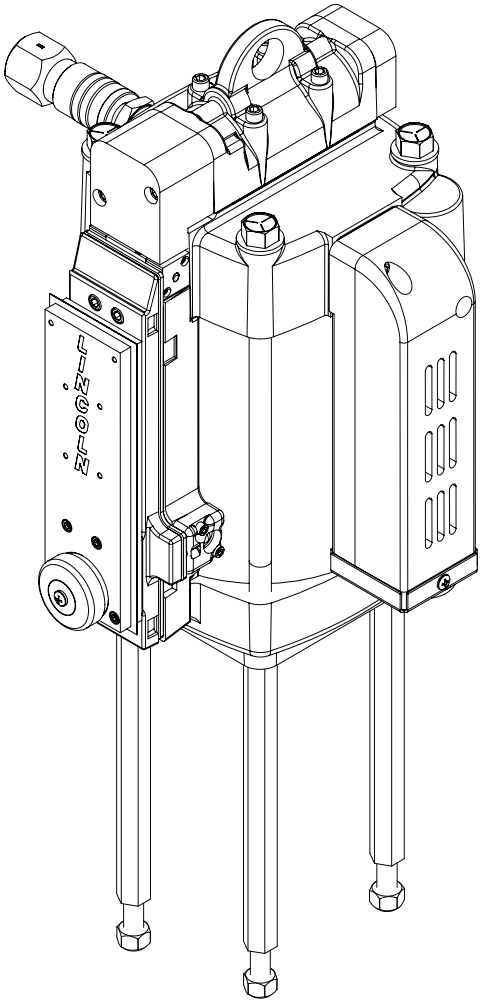
4 1/4, 6, 8 and 10 in Air motors with air brake

Models 94904, 94906, 94908, 94910, series “B”



Date of issue	**January 2018**
Form number	**404239**
Version	**2**

Contents

NOTE
Model shown with optional tamper resistant kit installed over air brake selector knob.

Safety

Read and carefully observe operating instructions before unpacking and operating air motor. Air motor must be operated, maintained and repaired exclusively by persons familiar with operating instructions. Local safety regulations regarding installation, operation and maintenance must be followed.

Operate pump only after safety instructions and this service manual are fully understood.

Explanation of signal words for safety

NOTE
Emphasizes useful hints and recommendations as well as information for efficient and trouble-free operation.

⚠ CAUTION
Indicates dangerous situation that can lead to light personal injury or property damage if precautionary measures are ignored.

⚠ WARNING
Indicates dangerous situation that can lead to severe or light personal injury if precautionary measures are ignored.

⚠ DANGER
Indicates dangerous situation that can lead to death or severe personal injury if precautionary measures are ignored.

⚠ WARNING

Do not exceed stated maximum working pressure of air motor or lowest rated component in your system.

Do not alter or modify any part of equipment.

Do not operate equipment with combustible gas.

Do not attempt to repair or disassemble equipment while system is pressurized.

Tighten all fluid connections securely before using equipment.

Always read and follow fluid manufacturer's recommendations regarding fluid compatibility, and use of protective clothing and equipment.

Check all equipment regularly and repair or replace worn or damaged parts immediately.

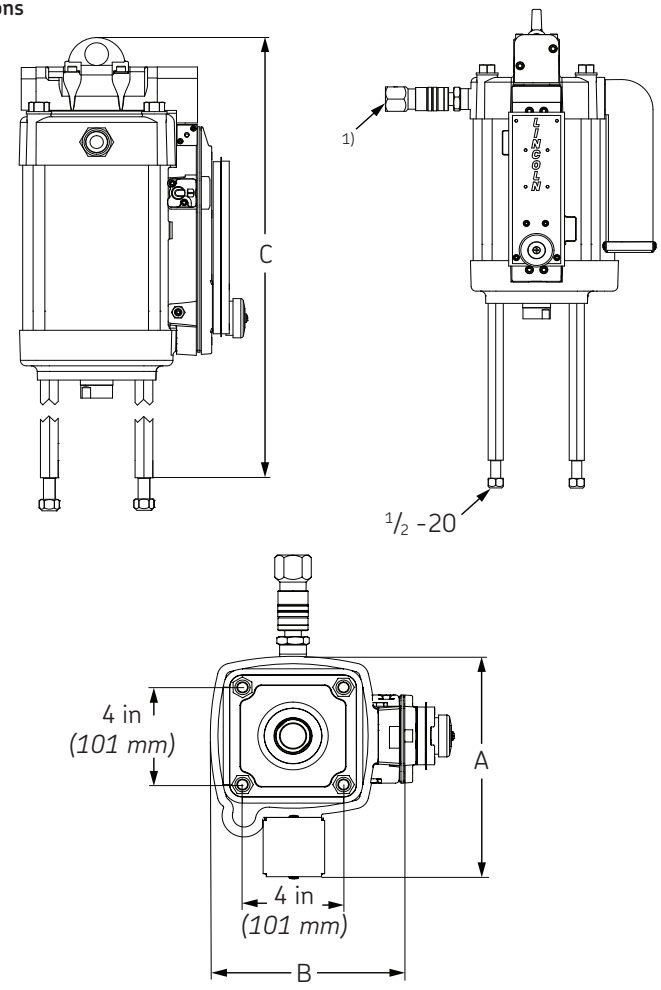
Failure to heed warnings including misuse, over pressurizing, modifying parts, using incompatible chemicals and fluids, or using worn or damaged parts, may result in serious personal injury and/or damage to equipment, fire, explosion, or property damage.

NOTE

Do not operate with air contaminated with materials that are not compatible with Buna-N seals. Use only with 6 in (*152 mm*) stroke pump tubes.

Fig. 1

Dimensions



1) Air inlet.

Specifications

Model	Cylinder diameter	Effective piston area	Operating pressure range	Operating temperature range	Minimum I.D. of air supply	Air Inlet	Air cons. at 100 psi (7 bar)
94910	10 in *(254 mm)*	78 in³ (506 cm³)	50–100 psi *(3,4–7 bar)*	–30 to 150 °F *(–34 to 66 °C)*	3/4 in *(20 mm)*	3/4 in NPTF	3.6 scf/cycle *(103 L(N)/cycle)*
94908	8 in (203 mm)	50 in³ (324 cm³)	50–100 psi *(3,4–7 bar)*	–30 to 150 °F *(–34 to 66 °C)*	3/4 in *(20 mm)*	3/4 in NPTF	2.6 scf/cycle *(75 L(N)/cycle)*
94906	6 in (152 mm)	28 in³ (182 cm³)	40–100 psi *(2,7–7 bar)*	–30 to 150 °F *(–34 to 66 °C)*	1/2 in *(12 mm)*	3/4 in NPTF	1.6 scf/cycle *(46 L(N)/cycle)*
94904	4 1/4 in (108 mm)	14 in³ (92 cm³)	40–200 psi *(2,7–14 bar)*	–30 to 150 °F *(–34 to 66 °C)*	1/2 in *(12 mm)*	1/2 in NPTF	1.1 scf/cycle *(32 L(N)/cycle)*

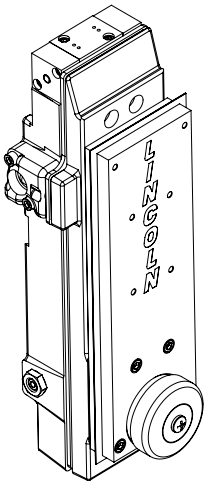
Model	Maximum recomended speed	Effective piston area	Weight	Seals material	Dimension "A"	Dimension "B"	Dimension "C"
94910	75 cpm 1)	6 in *(152 mm)*	62 lbs. *(28,1 kg)*	Buna-N and Teflon 2)	13 1/4 in *(337 mm)*	13 1/16 in *(332 mm)*	22 3/4 in *(577 mm)*
94908	75 cpm 1)	6 in *(152 mm)*	47 lbs. *(21,2 kg)*	Buna-N and Teflon 2)	11 1/4 in *(286 mm)*	11 in *(279 mm)*	22 3/4 in *(577 mm)*
94906	75 cpm 1)	6 in *(152 mm)*	34 lbs. *(15,5 kg)*	Buna-N and Teflon 2)	9 1/4 in *(235 mm)*	10 11/16 in *(271 mm)*	22 3/4 in *(577 mm)*
94904	75 cpm 1)	6 in *(152 mm)*	25 lbs. *(11,7 kg)*	Buna-N and Teflon 2)	7 1/2 in *(191 mm)*	8 11/16 in *(221 mm)*	23 5/8 in *(599 mm)*

1) 0.45 cpm with air brake engaged.
2) Teflon seals used with power valve spool (**13**) and relay valve (**17**).

Service assemblies and kits

Fig. 2

Air brake subassembly 85317



NOTE

Air brake assembly does not fit 84803 3 in *(76 mm)* series III air motor.

NOTE

Soft parts kit 84967 available for repair of air brake subassembly. Refer to **page 16** for details.

Fig. 3

Relay valve (17)

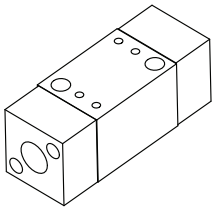


Fig. 4

Signal valve cap kit (31)

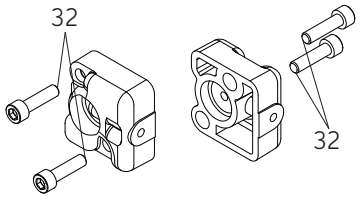


Fig. 5

Air signal valve (20)

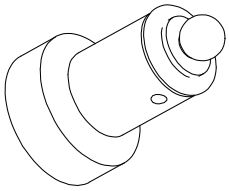


Fig. 6

Trip indicator (48)

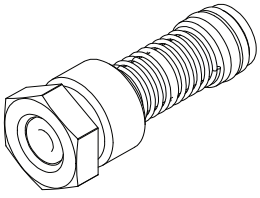


Fig. 7

Stop valve repait kit (91)

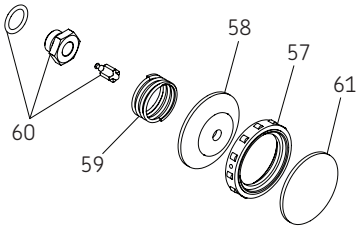


Fig. 8

Air pump repair kit (92)

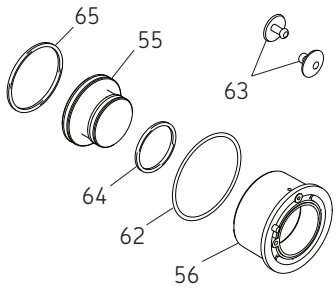


Fig. 9

Bleed assembly (67)

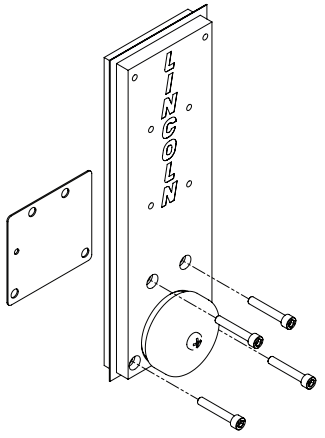
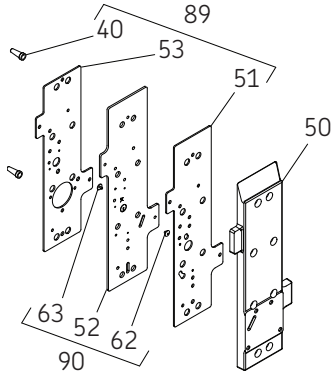


Fig. IPB1

Gasket and air filter (89) and gasket plate and check valves (90)



NOTE

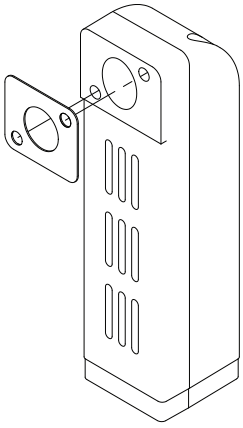
Cylinder tube soft parts kit 84789 (10 in airmotor), 84791 (8 in airmotor), 84792 (6 in airmotor), or 84793 (4 1/4 in airmotor).

NOTE

When replacing soft parts, replace all parts included in soft parts kit.

Fig. 10

Muffler with gasket 242788

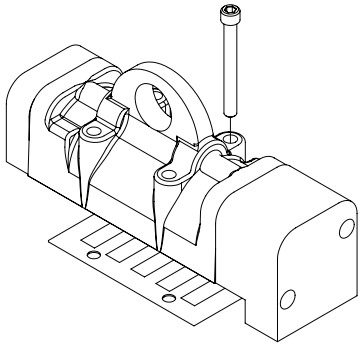


NOTE

Muffler element kit 84939 available for repair of muffler (includes element, felts and gasket).

Fig. 11

Power valve subassembly 244800, 244804, 244806 and 244808

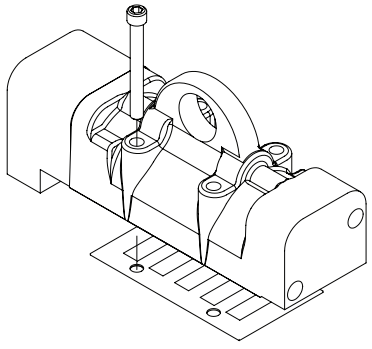


NOTE

Soft parts kit 84968 available for repair of power valve subassembly.

Fig. 12

Power valve spool and body 244802



⚠ WARNING

Do not alter or modify any part of equipment. **Always** check equipment for proper operation before each use. Verify safety devices are in place and operating properly.

Failure to comply may result in death or serious injury.

Before connecting air motor to air line

Lincoln series III air motors are fully pneumatic and require minimum specified size of air supply hose for proper operation. Check specifications for minimum ID of air supply hose, corresponding sizes of air controls and accessories that allow nonrestrictive air flow. Lincoln filter, regulator with gauge and lubricators are available as combination units (FRL).

It is recommended to use a 40 micron minimum pneumatic filter and pressure regulator with this system.

Special lubricant is used in assembly of air motors. It is not recommended to lubricate system after it has been installed. New lubricant will wash away factory lubricant and may result in air motor failing. Added lubrication could also result in critical small pneumatic paths being blocked resulting in malfunction.

For 1/2 in *(13 mm)* air line - Model 85387-8

For 3/4 in *(19 mm)* air line - Model 85387-12

If quick disconnect coupling should be used, install supplied coupler to ensure proper air motor operation.

NOTE

Ground air motor according to local codes when flammable materials are pumped.

Operating precautions

Use Lincoln replacement parts to assure compatible pressure rating.

Heed all warnings.

Do not operate air motor in excess of recommended pressure range.

Disconnect air line and relieve (vent) pressure before servicing and when idling air motor for long periods of time.

⚠ WARNING

Always read and follow fluid and solvent manufacturer's recommendations in regards to use of protective clothing and equipment.

Failure to comply may result in death or serious injury.

⚠ WARNING

Never exceed maximum air or fluid working pressure of lowest rated system component.

Failure to comply may result in serious bodily injury and/or property damage.

Attach air motor to pump tube

1. Tightly attach tie rods (**41**) to air motor lower casting. Use short threaded end of tie rods.
2. Mount air motor to top of pump tube outlet and tightly connect coupling nut to air motor piston rod (**5, 36** and **72**).
3. Attach tie rods to pump tube with four nuts (**42**). Leave nuts loose.
4. Connect air supply.
5. Slowly cycle pump several times using only enough air pressure to operate pump without pump stalling.
6. Stop pump on **up** stroke and tighten four nuts (**42**) to securely fasten air motor to pump tube.

Service and disassembly procedure

⚠ WARNING

Always disconnect air supply and relieve pressure before checking, servicing or repairing any part of air motor.

Failure to comply may result in death or serious injury.

Modular design of air motor and accessibility of vital operation parts make service available without taking air motor out of line or without complete disassembly.

Power valve

1. Remove four screws (**27** and **34**).
2. Remove end caps (**10** and **14**).
3. Push out valve spool (**13**).
4. Remove spool bumpers (**9**).
5. Remove o-ring (**11**).
6. Remove four screws (**37**) and lift valve body (**12**).
7. Remove gasket (**15**) to complete valve disassembly.
8. To reassemble, reverse procedure.

Air brake sub-assembly

1. Remove four screws (**23**) (two on each end) and pull out air brake subassembly.
2. Remove two screws (**39**) and lift out valve body (**17**).
3. Remove four screws (**32**) with (two on each side of air brake) and remove signal valve caps (**31**) and air signal valves (**20**).
4. Remove four (**4**) screws (**80**) to remove labyrinth sub-assembly from air brake.
5. Remove four screws (**24**) and lift off upper body (**50**) and upper gasket (**51**).
6. Remove gasket plate (**52**) and lower gasket (**53**).
7. Remove air filter (**40**) in two locations.
8. Remove pump sleeve (**56**) and piston (**55**).
9. Remove diaphragm seal and retainer, diaphragm, spring and stop valve assembly (**61**, **57**, **58**, **59** and **60**).
10. Remove trip indicator (**48**).
11. To re-assemble, reverse disassembly procedure with the following precautions:
    - **11.1** Upper and lower gaskets (**51** and **53**) should be coated with film of light oil (SAE 10) before assembly.
    - **11.2** When new umbrella valves (**63**) are installed, note gasket plate (**52**) has a circle and an **X** stamped into both sides. Umbrella valve is installed into plate from circle side of plate. One umbrella valve should be installed into each side of plate so that valve is within circle and stub end protrudes through **X**.
    - **11.3** After installing umbrella valve (**63**), long rubber stem of valve is to be removed, leaving rubber ball end intact to secure valve to plate.
    - **11.4** When installing pump sleeve (**56**) into lower body (**54**), sleeve should be placed into lower body as shown in **Fig. 4**. When properly installed moulded pin protruding from pump sleeve will fit into mating hole in gasket (**53**) and gasket can then be installed properly over pins, (**66**). If sleeve is not properly aligned as shown, air brake cannot be assembled properly.

Labyrinth sub-assembly disassembly procedure

1. Remove four screws (**80**) from face of labyrinth sub-assembly to remove labyrinth from air brake assembly.
2. Remove screw (**88**) to remove cover (**87**) over selector knob if so equipped.
3. Remove selector bolt (**86**) and washers (**85**) to remove selector knob. Use caution when removing selector knob from labyrinth assembly, pin (**82**), spring (**83**), and 7 balls (**81**) are retained by selector knob and could be lost.
4. Remove gasket (**74**) from backside of labyrinth sub-assembly.
5. Remove six screws (**73**) from backside of labyrinth sub-assembly.
6. Separate labyrinth sub-base (**75**) from labyrinth cover (**78**) exposing labyrinth plate and gasket.
7. Remove gasket (**76**) and plastic laminated labyrinth (**77**).
8. Remove seven o-rings (**79**) from labyrinth cover (**78**).

Labyrinth sub-assembly re-assembly procedure

Follow reverse directions of disassembly procedure with the following precautions to reassemle labyrinth subassembly:

1 Ensure plastic laminated labyrinth (**77**) is in good condition before re-assembly. Clear plastic laminate should be in good condition without any tears or indications of separation from brass labyrinth plate inside. Inspect labyrinth plate for any signs of blockage including, but not limited to, dirt, grease, oil or water that should be visible through clear laminating material.
2 Keep all labyrinth components clean and free of grease, oil and dirt, except as noted.
3 Very light coating of grease may be used to retain balls (**79**) in place when installing selector knob (**84**).
4 Install six screws (**73**) but do not tighten when reassembling labyrinth sandwich. Install selector knob (**84**) and selector bolt (**86**) before tightening six screws (**73**). Tighten six screws (**73**) to 12 in.lbf *(1,4 Nm)*. Tighten selector bolt (**86**) to 50 in.lbf *(5,6 Nm)*.
5 Use four screws (*80*) and tighten to 12 in.lbf *(1,4 Nm)* when installing labyrinth sub-assembly onto air brake assembly.
6 Do not cut or trim clear laminate plastic from labyrinth assembly.

Cylinder tube and muffler

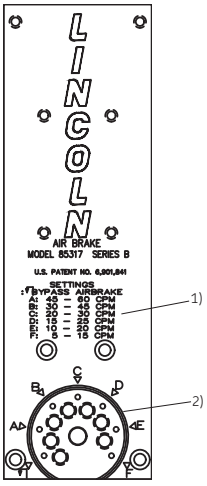
1 Remove air brakes subassembly (**Air brake subassembly**, **page 7**).
2 Remove two screws (**30**) and pull off muffler (**29**).
3 Remove gasket (**28**).
4 Remove four nuts (**26**).
5 Lift upward and remove upper casting (**8**).
6 Remove four tie rods (**25**).
7 Remove air tube (**7**).
8 Lift upward and remove cylinder tube (**6**).
9 Remove piston and piston rod (**5**).
10 Remove four connecting rods (**41**).
11 Reverse procedure to reassemble.

NOTE

Align two holes on cylinder tube (**6**) with two holes on air brake subassembly before tightening tie rods (**25**) so that proper seal with o-rings is achieved.

Setting air brake trip speed

Fig. 13



1) Speed setting legend.
2) Speed setting dial.

Speed settings

↰ Bypass air brake. In bypass mode air brake does not provide any protection to pump or air motor. Air motor will continue to run at any speed. See **Fig. 13**.

1 45 to 60 cycles/minute, air brake will trip turning off air motor when air motor speed reaches speed of 45 to 60 cycles/minute.

2 30 to 45 cycles/minute, air brake will trip turning off air motor when air motor speed reaches speed of 30 to 45 cycles/minute.

3 20 to 30 cycles/minute, air brake will trip turning off air motor when air motor speed reaches speed of 20 to 30 cycles/minute.

4 15 to 25 cycles/minute, air brake will trip turning off air motor when air motor speed reaches speed of 15 to 25 cycles/minute.

5 10 to 20 cycles/minute, air brake will trip turning off air motor when air motor speed reaches speed of 10 to 20 cycles/minute.

6 5 to 15 cycles/minute, air brake will trip turning off air motor when air motor speed reaches speed of 5 to 15 cycles/minute.

NOTE

Speed settings are not precision speed control settings for air motor. All speed settings are approximate and are not intended for use in precisely controlling speed of pump/pump tube combination. Precision control of pump operating speed is beyond scope of device.

Setting speed

1 Remove selector cover (**87**) by removing screw (**88**) to gain access to selector knob (**84**).

2 Select bypass mode by positioning selector knob pointer (small round hole in face of selector knob) to face of labyrinth cover (**78**).

3 Determine speed of pump by counting number of strokes pump makes per minute with pump and air motor operating normally.

4 After determining normal operating speed of pump and air motor, consult setting legend on face of labyrinth cover (**78**), and find speed range closest to normal operating speed of air motor.

5 To allow for normal fluctuation in operating speed of air motor and pump, set selector knob to next highest speed setting.

6 Test pump in operation to make sure it is operating properly before leaving pumping system unattended.

Air brake operation

NOTE

Always shut off air supply before servicing air motor. Air motor in tripped condition is under pressure and may restart unexpectedly for one or two cycles.

NOTE

Operating air motor at speeds greater than 45 cycles/minute is not recommended with air brake engaged. Operation at speeds greater than 45 cycles/minute will cause no harm to air brake, but may exceed limitations of timing circuit in air brake causing air brake to trip without apparent cause.

Selecting speed range letter other than bypass will activate air brake. Air brake will stop air motor from operating if threshold speed setting is exceeded. Air motor will not restart until intentionally reset. Cause of pump overrun may be anything that will allow pump to run faster than normal such as, but not limited to the following:

Cavitation

Low fluid levels will allow pump to cavitate. Pump will try to pump air instead of fluid into fluid lines.

Broken hose or fitting

Broken hose or fitting will cause loss in fluid pressure allowing pump to run faster than normal.

Increase in air pressure

May be caused by air supply system that is inadequate for application to rise as other plant equipment is shut down. This causes more air available to operate pump with. Unauthorized tampering with air pressure regulator may also be cause.

Increase in demand

Fluid demand may be greater than expected.

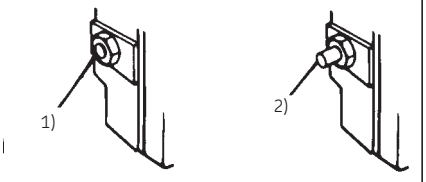
Tripped condition can be determined if air motor has stopped, **red/orange** indicator pin will be out (**Fig. 14**, **page 10**), pump rod will be in down position and air will be heard venting from vent hole in lower body of air brake (**Fig. 16**).

Before resetting, cause of overrun should be determined if possible before restarting pump. Check for low fluid levels, broken hose or fitting connections before restarting. If cause cannot be determined without starting pump, pump may be cautiously restarted and observed for any indications of problem before resuming normal operation.

Resetting air brake after tripping

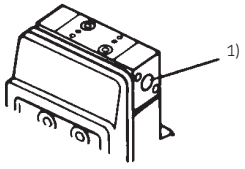
1. Turn off air supply to air motor.
2. Press flush reset button (located on right side of relay valve (**17**) with screwdriver or other suitable object, (**Fig. 15**), until air motor shifts and Indicator pin (**48**) retracts into air brake. Hold reset button until all air has been vented from air motor (On large air motors this may take several seconds). Otherwise wait until all air has been vented before attempting restart.
3. Turn on air supply and air motor will restart.
4. Air brake may trip again very quickly if cause of air brake trip is cavitation or broken fluid line
5. Use bypass setting to prevent unnecessary tripping of air brake when in process of setting up system and determining speed of pump/pump tube system or when trouble shooting system. Be sure to reactivate air brake by resetting to desired run setting before leaving pump system unattended.

Fig. 14



1) Run position.
2) Tripped condition (extended).

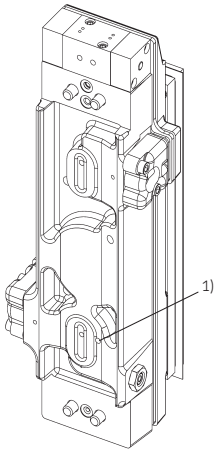
Fig. 15



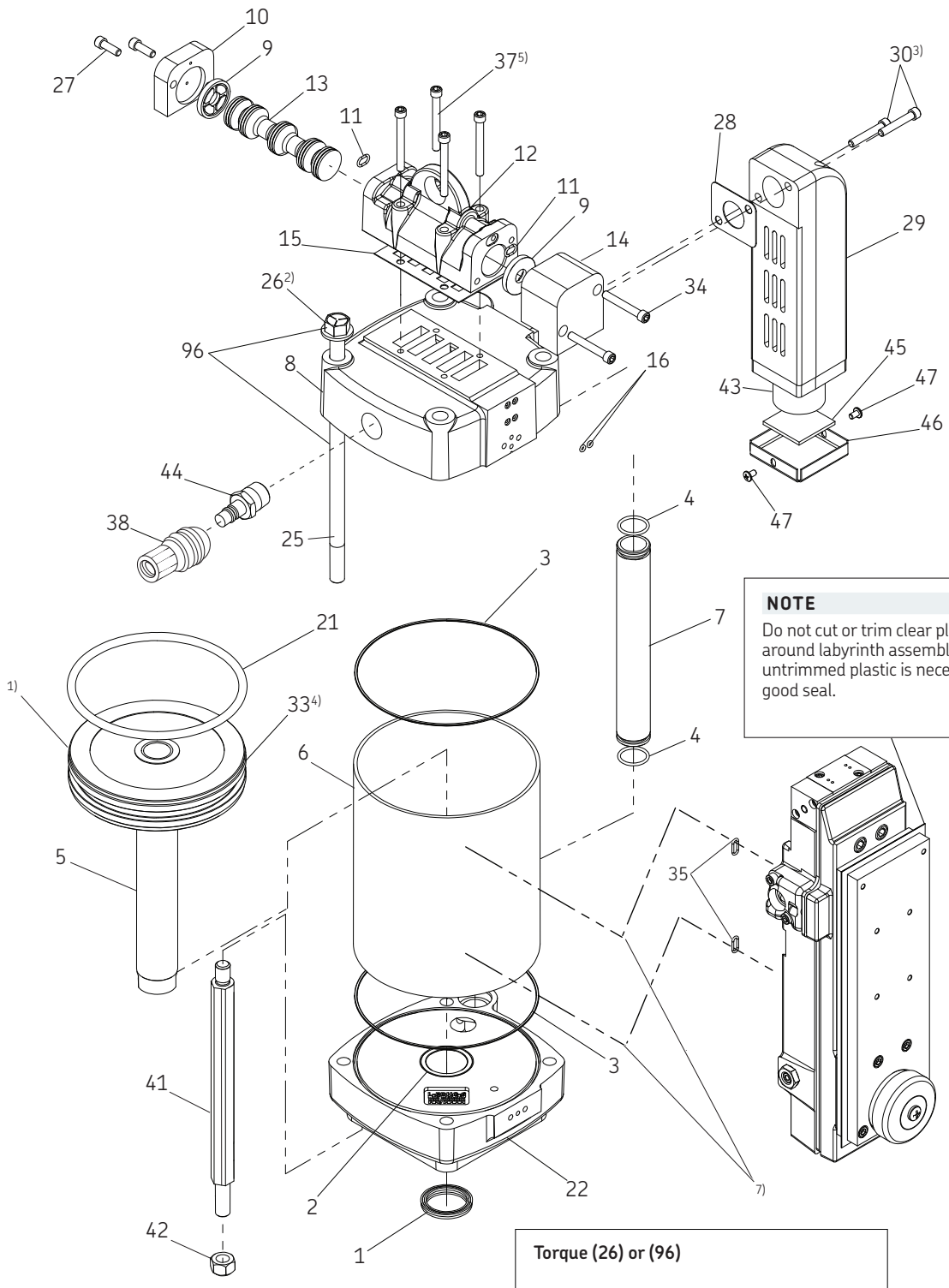
1) Flush reset button.

Fig. 16

Rear view of air brake



1) Vent hole.



NOTE

Do not cut or trim clear plastic laminate around labyrinth assembly. The border of untrimmed plastic is necessary to maintain a good seal.

Torque (26) or (96)

Model	Torque to
94904	11 ft. lbf. *(14 Nm)*
94906	26 ft. lbf. *(35 Nm)*
94908	53 ft. lbf. *(71 Nm)*
94910	60 ft. lbf. *(81 Nm)*

1) For model 94910, on **page 7**
2) Refer to table for torque instructions.
3) Torque to 50 in.lbf. *(5,7 Nm)*. After 24 hours, retorque to 50 in.lbf. *(5,7 Nm)*.
4) Model 94904 (4 1/4 in *(113 mm)*) air motor) only.
5) Torque to 10–12 ft.lbs. *(13,5 to 16,2 Nm)*.
6) Refer to **page 4** for service assemblies and kits.
7) Align two holes on the cylinder tube (**6**) with two holes on air brake before tightening tie rods (**41**) so that proper seal with o-rings is achieved.

Fig. IPB3

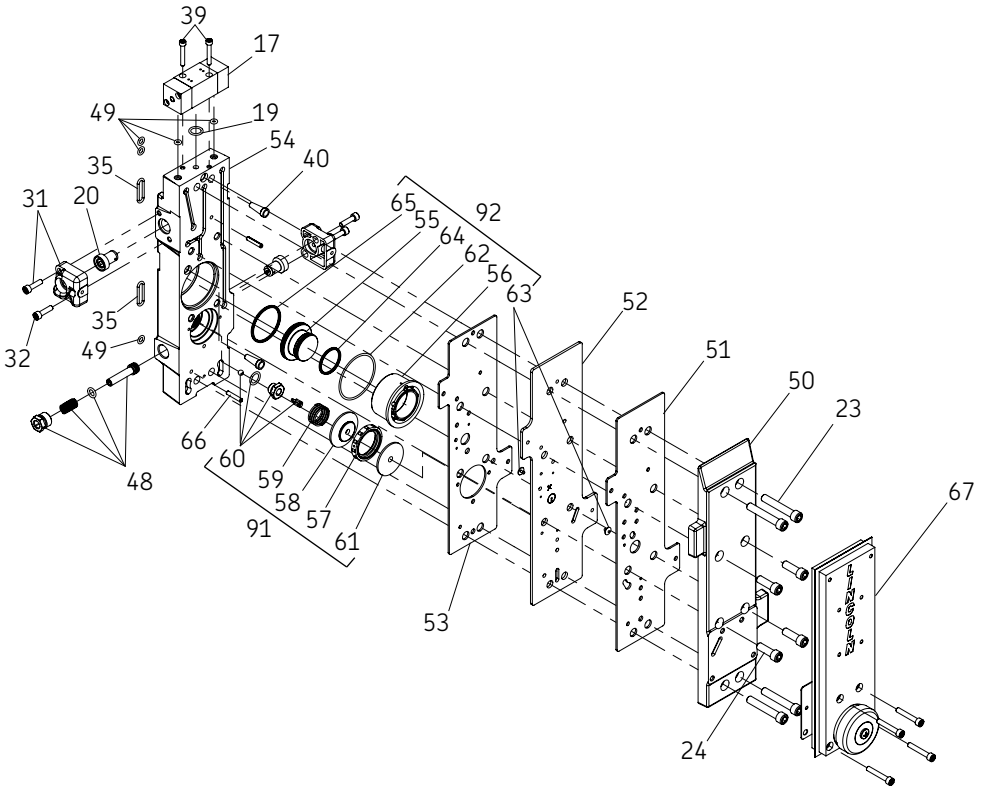
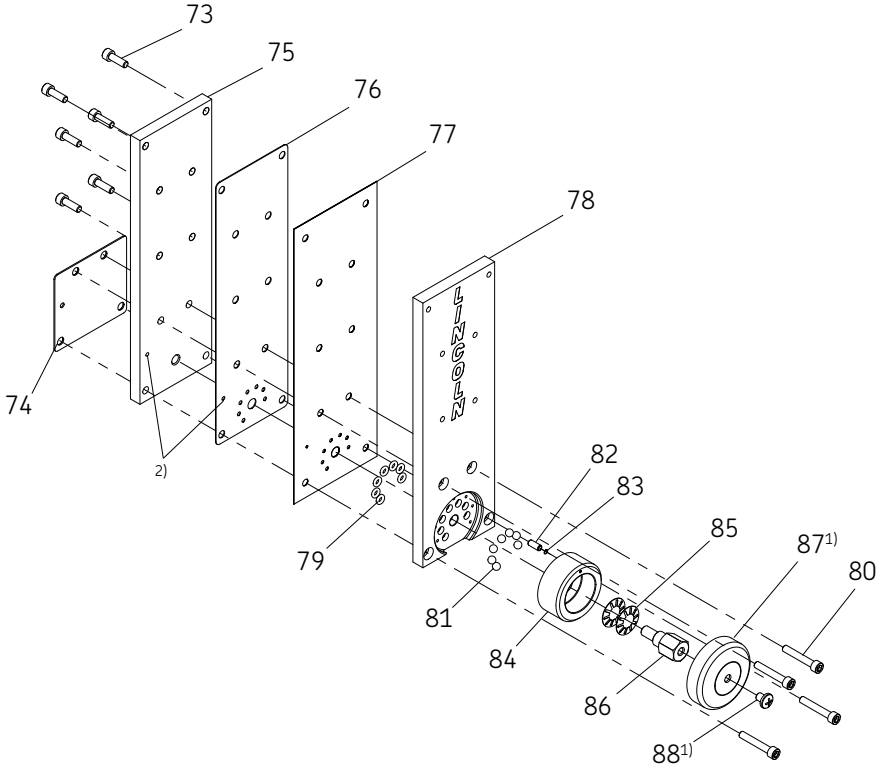


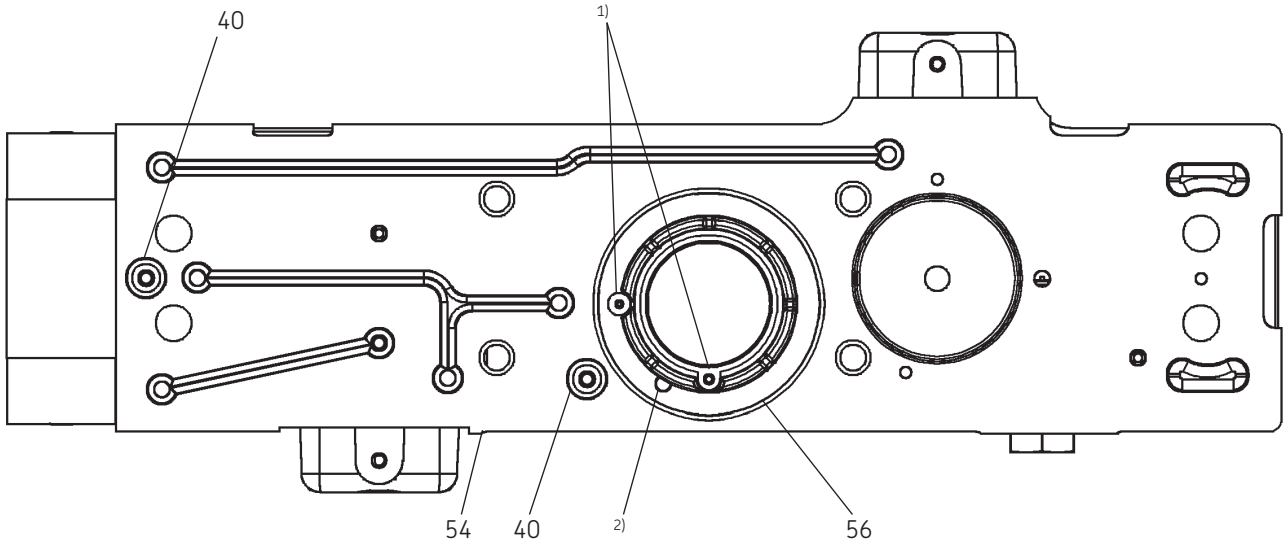
Fig. IPB4

Labyrinth assembly (67) detail



1) Optional tamper resistant cover.
2) Single hole on (**76**) should align with single hole on (**75**).

Fig. 17



1) Note holes at 9 and 6 o'clock positions.
2) Molded pin on pump sleeve. Position to about 7 o'clock position as shown.

Fig. IPB5

Piston assembly models 94906 and 94908

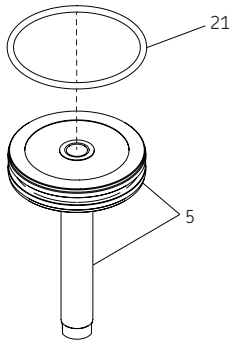


Fig. IPB5

Piston assembly models 94904

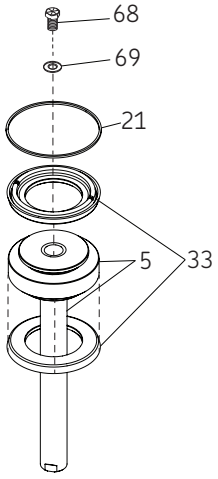


Fig. IPB6

Piston assembly model 94910

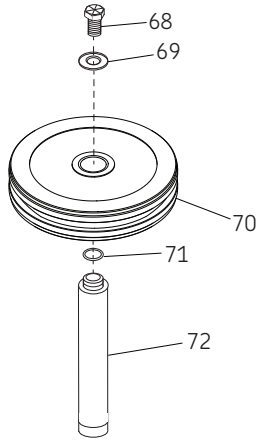
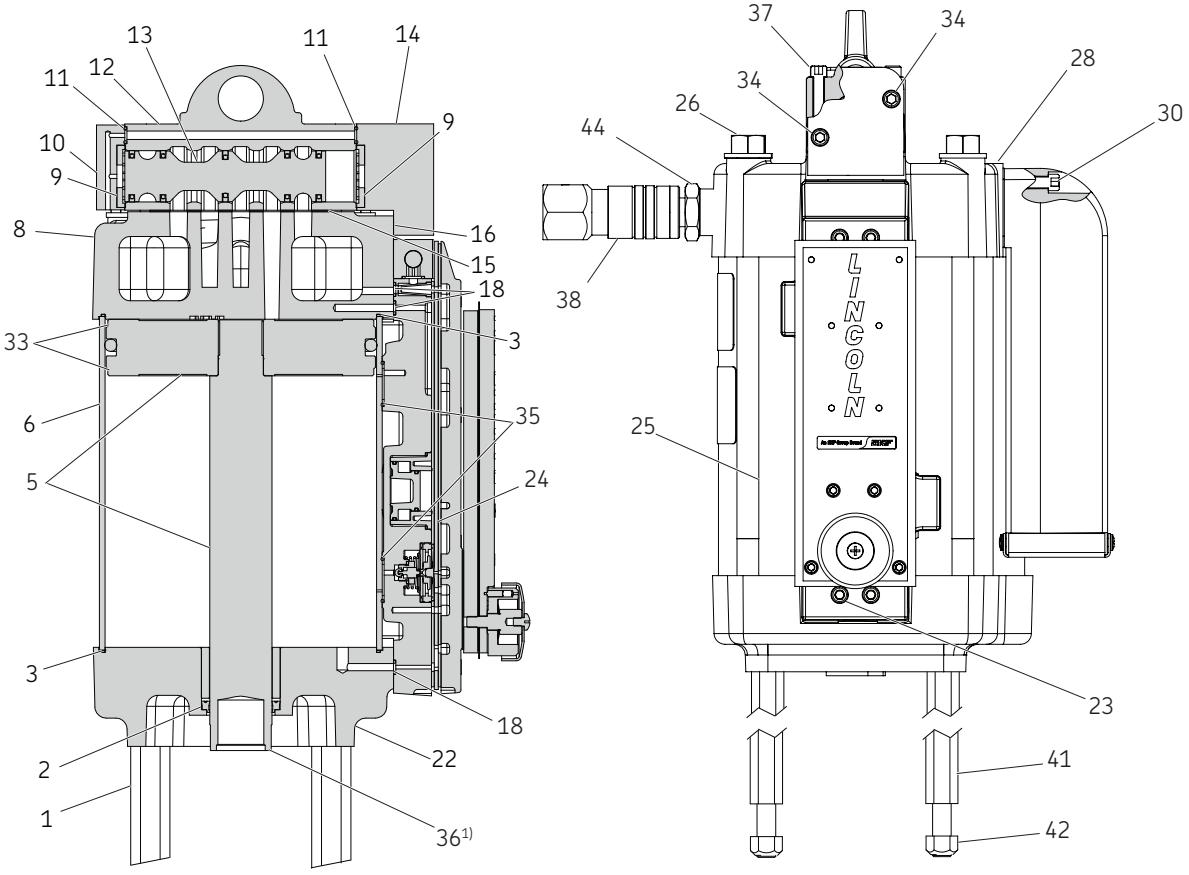


Fig. 18

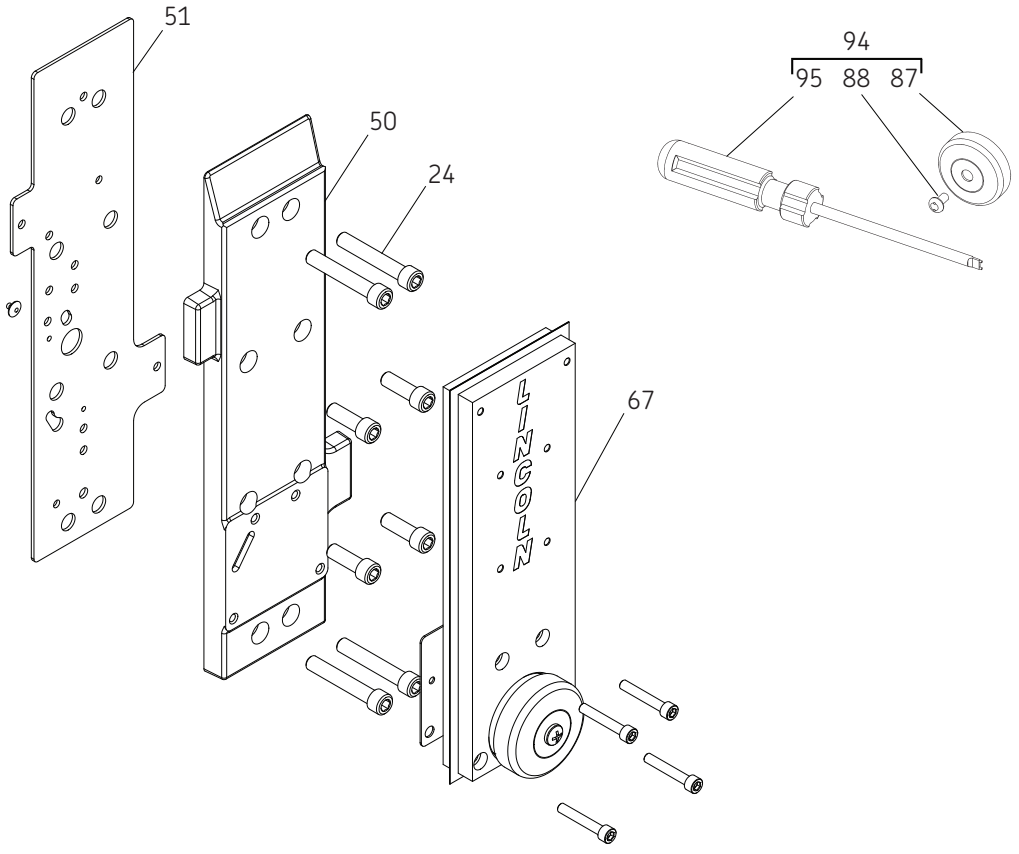
Model 94906 shown, others similar



[1)] Assemble adapter to piston rod using Loctite 242 Blue on threads. Torque to 60–65 ft. lbf. *(81– 88 Nm)*. Model 94904 only.

Fig. IPB7

Air brake upgrade kit (93)



[1] For repairs or upgrades to old style air brakes, bolt-on kit (**93**) will replace all necessary components on old style air brake to new configuration, utilizing new speed adjustment dial and related components (**Fig. 6**).

Optional tamper resistant selector knob cover kit (**94**) may be used to cover air brake selector knob to prevent un-authorized adjustment of air brake settings. Kit consists of cover, special screw and special driver for screw, as shown above. Cover prevents access to selector knob and requires special tool for removal. Tool is #10 drilled spanner driver.

Optional signal kit 244398 is used for sending fault signals to remote alarm locations (not shown).

Service parts list

Item	Description	Quantity	Model 94910 (10 in diameter)	Model 94908 (8 in diameter)	Model 94906 (6 in diameter)	Model 94904 (4 1/4 in diameter)
1	U-cup (Buna-N)	1	10)	3)	4)	5)
2	Rod bearing	1	247296	241732	241732	241733
3	Seal, cylinder (Buna-N)	2	10)	3)	4)	5)
4	O-ring (Buna-N)	2	10)	3)	4)	5)
5	Piston rod assembly	1	247449	241740	241741	241742
6	Cylinder tube	1	247448	241744	241745	241746
7	Air tube	1	247336	241748	241748	241749
8	Upper casting	1	247304	241750	241751	241752
9	Bumper, valve	2	7)	7)	7)	7)
10	Cap, valve	1	241755	241755	241755	241755
11	O-ring (Buna-N)	2	7)	7)	7)	7)
12	Body, valve	1	11)	11)	11)	11)
13	Spool, valve	1	11)	11)	11)	11)
14	Cap, valve	1	247302	241759	241760	241761
15	Gasket	1	7)	7)	7)	7)
16	O-ring (Buna-N)	2	7)	7)	7)	7)
17	Relay valve	1	242787	242787	242787	242787
18	O-ring (Buna-N)	3	8)	8)	8)	8)
19	O-ring (Buna-N)	1	8)	8)	8)	8)
20	Air signal valve	2	241768	241768	241768	241768
21	O-ring piston (Buna-N)	1	10)	3)	4)	5)
22	Lower casting	1	247303	241773	241774	241775
23	Screw (1/4-20 x 1-1/2 in)	4	50051	50051	50051	50051
24	Screw (1/4-20 x 7/8 in)	4	50850	50850	50850	50850
25	Tie rod	4	247295	12)	12)	12)
26	Nut	4	247298	12)	12)	12)
27	Screw	2	244995	244995	244995	244995
28	Gasket	1	6)	6)	6)	6)
29	Muffler body	1	241021	241021	241021	241021
30	Screw (1/2-20 x 1 1/2 in)	2	50051	50051	50051	50051
31	Signal valve cap kit[1)]	2	243853	243853	243853	243853
32	Screw (8-32 x 5/8 in)		9)	9)	9)	9)
33	Seal, Piston[2)]		12)	12)	12)	5)
34	Screw		247299	244993	241783	244994
35	O-ring (Buna-N)		8)	8)	8)	8)
36	Adapter[2)]		12)	12)	12)	241789

1) Also available as individual parts.
2) Used on 94904 (4-1/4 in) air motor only.
3) Included in 84791 cylinder tube soft parts kit for model 94908 (8 in air motor).
4) Included in 84792 cylinder tube soft parts kit for model 94906 (6 in air motor).
5) Included in 84793 cylinder tube soft parts kit for model 94904 (4 1/4 in air motor).
6) Included in 84939 muffler element kit.
7) Included in 84968 soft parts kit for power valve subassembly.
8) Included in 84967 soft parts kit for air brake subassembly.
9) Included in 243853 signal valve cap kit, Item 31.
10) Included in 84789 cylinder tube soft parts kit for model 94910 (10 in Air motor).
11) Included in 244802 power valve and spool body.
12) Not applicable.

Service parts list (continued)

Item	Description	Quantity	Model 94910 (10 in diameter)	Model 94908 (8 in diameter)	Model 94906 (6 in diameter)	Model 94904 (4 1/4 in diameter)
37	Screw (1/4-20 x 2 1/4 in)	4	244975	244975	244975	244975
38	Coupler	1	662012	655012	655012	655008
39	Screw, socket head cap (6-32 x 7/8 in)	2	50816	50816	50816	50816
40	Air filter	2	3)	3)	3)	3)
41	Tie rod	4	241023	279389	279389	279389
42	Nut (1/2-20)	4	236203	236203	236203	236203
43	Muffler element	1	1)	1)	1)	1)
44	Nipple	1	660112	653112	653112	653112
45	End element	1	1)	1)	1)	1)
46	Muffler plate	1	241027	241027	241027	241027
47	Screw, self tapping (10-32)	2	66962	66962	66962	66962
48	Trip indicator	1	243852	243852	243852	243852
49	O-ring (Buna-N)	4	2)	2)	2)	2)
50	Upper body	1	273383	273383	273383	273383
51	Upper gasket (Nitrile)	1	3)	3)	3)	3)
52	Gasket plate	1	4)	4)	4)	4)
53	Lower gasket (Nitrile)	1	3)	3)	3)	3)
54	Lower body	1	8)	8)	8)	8)
55	Piston	1	5)	5)	5)	5)
56	Pump sleeve	1	5)	5)	5)	5)
57	Diaphragm retainer	1	6)	6)	6)	6)
58	Diaphragm	1	6)	6)	6)	6)
59	Spring	1	6)	6)	6)	6)
60	Stop valve assembly	1	6)	6)	6)	6)
61	Diaphragm seal	1	6)	6)	6)	6)
62	O-ring (Buna-N)	1	5)	5)	5)	5)
63	Umbrella seal (Nitrile)	2	4) 5)	4) 5)	4) 5)	4) 5)
64	Quad ring (Buna-N)	1	5)	5)	5)	5)
65	Quad ring (Buna-N)	1	5)	5)	5)	5)
66	Spring pin	2	243614	243614	243614	243614
67	Labyrinth assembly	1	273428	273428	273428	273428
68	Screw	1	272736	8)	8)	8)
69	Washer	1	272737	8)	8)	8)
70	Piston	1	272766	8)	8)	8)
71	O-ring (Buna-N)	1	7)	8)	8)	8)
72	Piston rod	1	272767	8)	8)	8)

1) Included in 84939 muffler element kit.
2) Included in 84967 soft parts kit for Air Brake subassembly.
3) Included in 273427 gasket and air filter kit (**89**).
4) Included in 244093 gasket plate with check valves (**90**).
5) Included in 244092 air pump repair kit (**92**).
6) Included in 244091 stop valve repair kit (**91**).
7) Included in 84789 cylinder tube soft parts kit for model 94910 (10 in air motor).
8) Not available.

Service parts list (continued)

Item	Description	Quantity	Model 94910 (10 in diameter)	Model 94908 (8 in diameter)	Model 94906 (6 in diameter)	Model 94904 (4 1/4 in diameter)
73	8-32 x 1/2 in socket head cap screw	6	273385	273385	273385	273385
74	Gasket (nitrile/fiber)	1	273386	273386	273386	273386
75	Intermediate base	1	273387	273387	273387	273387
76	Gasket (nitrile/fiber)	1	273379	273379	273379	273379
77	Laminated labyrinth	1	276739	276739	276739	276739
78	Labyrinth cover	1	273389	273389	273389	273389
79	O-ring (nitrile)	7	34499	34499	34499	34499
80	8-32 x 1 socket head cap screw	4	273393	273393	273393	273393
81	Ball	7	69102	69102	69102	69102
82	Index pin	1	273391	273391	273391	273391
83	Spring compression	1	273392	273392	273392	273392
84	Selector knob	1	273380	273380	273380	273380
85	Washer, spring	2	243845	243845	243845	243845
86	Selector bolt	1	273381	273381	273381	273381
87	Selector cover	1	273382	273382	273382	273382
88	Screw	1	273757	273757	273757	273757
89	Gasket and filter kit	1	273427	273427	273427	273427
90	Gasket plate and check valves	1	244093	244093	244093	244093
91	Stop valve repair kit	1	244091	244091	244091	244091
92	Air pump repair kit	1	244092	244092	244092	244092
93	Air Brake upgrade kit	1	273429	273429	273429	273429
94	Tamper resistant cover kit	1	273835	273835	273835	273835
95	Drilled spanned driver	1	273834 [1]	273834 [1]	273834 [1]	273834 [1]
96	Tie bolts	4	[2]	279386	279385	279384

[1] Optional: Included in tamper resistant kit.
[2] Not available.

Troubleshooting

Problem	Possible cause	Solution
Air motor is not operating, air is coming from exhaust.	Inadequate air supply to air motor.	Check air supply and adjust to minimum recommended level. Check air supply hose and piping for minimum recommended size. Ensure FRL and quick disconnect couplings meet or exceed minimum specified sizes and do not restrict airflow to air motor.
Erratic or accelerated operation with short stroking. Air motor hesitates on up or down stroke.	Dirty or damaged relay valve (**17**) or air signal valve (**20**) or stop valve assembly (**60**).	Check valves and clean if necessary. Replace any damaged seals or worn parts.
	Pump cavitation.	Check fluid level. Ensure pump inlet is not blocked or restricted or is large enough to handle flow into pump inlet.
Air brake trips off even though air motor is operating below set trip speed (trips after three or more strokes).	Dirty or blocked labyrinth plate or components.	Clean or replace labyrinth components. Check for grease or oil blocking air passages in labyrinth subassembly. Blocked labyrinth may be confirmed (in quiet locations) by turning selector knob to **RUN** mode setting immediately after air motor has stopped. If sudden rush of air escaping is heard, labyrinth is either blocked or installed incorrectly.
	Grease or dirt on balls (**81**) in labyrinth cover (**78**).	Clean balls and labyrinth cover with solvent. Coat with very light film of light grease to hold balls in cover.
Air brake trips even though air motor is operating below set trip speed (within three strokes).	Leaking diaphragm (**58**).	Replace diaphragm.
	Leaking upper gasket (**51**).	Replace upper and lower gaskets (**51** and **53**).
	Upper piston quad ring (**64**) is leaking.	Replace quad ring.
	Laminated labyrinth plate (**77**) is installed incorrectly.	Observe laminated labyrinth plate and find single hole (**76**) and align with hole (**75**) (**Fig. 3**).
Air brake trips at proper speed (as indicated by sound of air surging into diaphragm chamber), but air motor does not stop. Indicator pin does not pop out.	Stop valve vent hole in lower body (**54**) is clogged or blocked. (**Fig. 17**)	Unclog vent hole in lower body.
	Stop valve (**60**) is damaged.	Check stop valve and replace if worn or damaged.
	Diaphragm seal is damaged, worn, deformed or improperly installed.	Replace damaged or worn diaphragm seal. If not damaged, reinstall into diaphragm (**58**) with twisting action to fully seat in mating hole.
	Inadequate air supply to air motor.	See above for checking air supply. Ensure that air regulator is set to air pressure at or greater than minimum recommended air pressure for air motor installed.
Air brake will not trip even though air motor has been running above trip speed for more than 1 minute.	Discharge umbrella valve (**63**) is damaged or worn.	Replace both umbrella valves.
	Diaphragm seal is damaged, worn deformed or improperly installed.	Replace damaged or worn diaphragm seal. If not damaged, reinstall into diaphragm (**58**) with twisting action to fully seat in mating hole.
	Leaking upper gasket (**51**) or lower gasket (**53**).	Replace gaskets (**51** and **53**)
	Stuck metering pump piston (**55**).	Install air pump repair kit, replacing items **55**, **56**, **63**, **64** and **65**.
	Inlet air filter (**40**) is completely or partially clogged.	Clean or replace inlet air filter.

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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