Models 94804, 94806, 94808, 94810
4¼, 6, 8 & 10 IN. AIRMOTORS
WITH AIR BRAKE®
Series "B"

OWNERS MANUAL

IT IS THE RESPONSIBILITY OF THE OWNER AND/OR OPERATOR TO PROPERLY USE AND MAINTAIN THIS EQUIPMENT. CAREFULLY READ AND UNDERSTAND THE INSTRUCTIONS AND WARNINGS IN THIS MANUAL BEFORE OPERATING THIS EQUIPMENT.

If the operator is not fluent in English, the instructions and warnings shall be read and discussed in the operator's native language, making sure the operator comprehends the contents.

This equipment complies with OSHA Standards where applicable.

⚠ WARNING

DO NOT exceed the stated maximum working pressure of the airmotor or of the lowest rated component in your system.

DO NOT alter or modify any part of this equipment.

DO NOT operate this equipment with combustible gas.

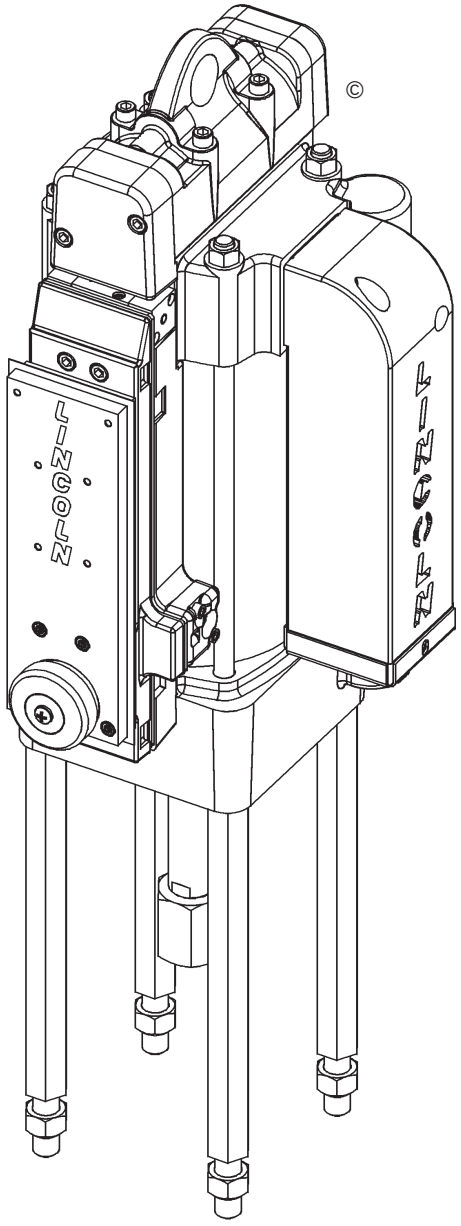
DO NOT attempt to repair or disassemble the equipment while the system is pressurized.

TIGHTEN all fluid connections securely before using this equipment.

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

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

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



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This manual contains **IMPORTANT WARNINGS** and **INSTRUCTIONS.** READ AND RETAIN FOR REFERENCE.

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St. Louis, Missouri 63120-1578
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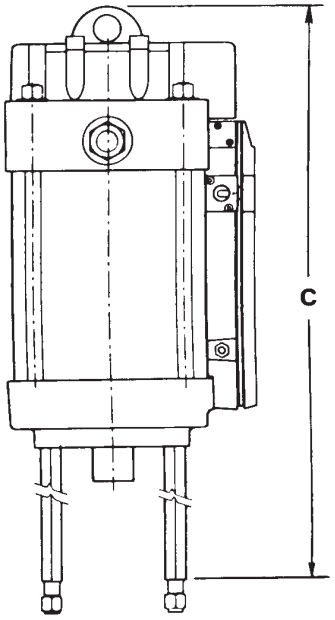
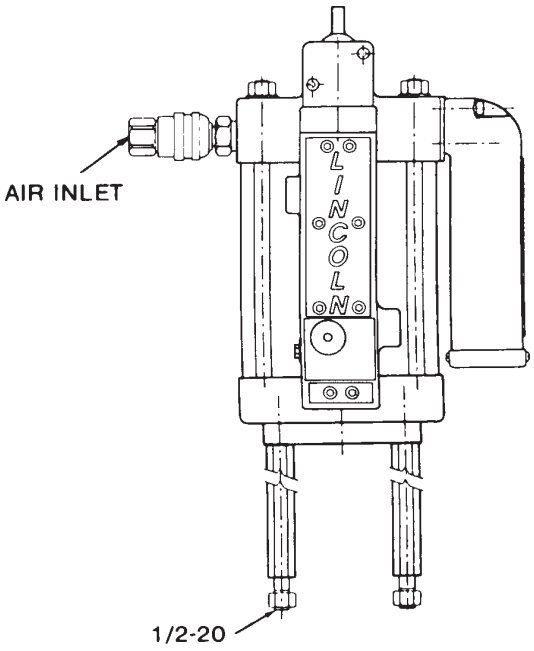
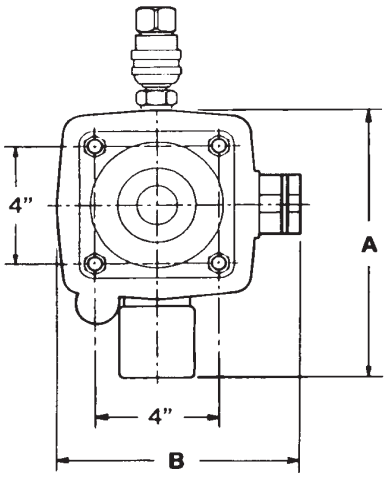






NOTE: Use only with 6 in. (152 mm) stroke Pump Tubes. DO NOT OPERATE with air contaminated with materials not compatible with BUNA-N seals.

SPECIFICATIONS

MODEL	CYLINDER DIAMETER IN. (MM)	EFFECTIVE PISTON AREA IN² (CM²)	OPERATING PRESSURE RANGE PSIG (BAR)	OPERATING TEMP. RANGE °C (°F)	MIN. I.D. OF AIR SUPPLY IN. (MM)	AIR INLET	AIR CONS. @ 100 PSIG (7 BAR) SCF/CYCLE (L(N)/CYCLE)
94810	10 (254)	78 (506)	©50-100 (3.4-7)		3/4 (20)	3/4" NPTF	3.6 (103)
94808	8 (203)	50 (324)	©50-100 (3.4-7)	-30 - +200	3/4 (20)	3/4" NPTF	2.6 (75)
94806	6 (152)	28 (182)	©40-100 (2.7-7)	(-34 - +93)	1/2 (12)	3/4" NPTF	1.6 (46)
94804	4¼ (108)	14 (92)	©40-200 (2.7-14)		1/2 (12)	1/2" NPTF	1.1 (32)

MODEL	MAX. RECOM. SPEED CPM	STROKE LENGTH IN. (MM)	WEIGHT LB. (KG)	SEALS MATERIAL	DIM. A IN. (MM)	DIM. B IN. (MM)	DIM. C IN. (MM)
94810			62 (28.1)		13-1/4 (337)	13-1/16 (332)©	22-3/4 (577)
94808			47 (21.2)	BUNA-N	11-1/4 (286)	11 (279)©	22-3/4 (577)
94806	75	6 (152)	34 (15.5)	and	9-1/4 (235)	10-11/16 (271)©	22-3/4 (577)
94804			26 (11.7)	*TEFLON	7-1/2 (191)	8-11/16 (221)©	23-5/8 (599)

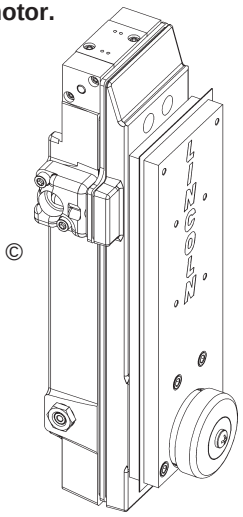
© Indicates change

*TEFLON® Seals used with Power Valve Spool (Item 13) and Relay Valve (Item 17).

SERVICE ASSEMBLIES & KITS

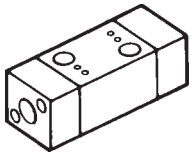
To reduce down-time and take advantage of the modular design of the airmotor, Lincoln recommends using the following Service Assemblies for repair of the airmotor. After removal, the faulty assembly can then be repaired using the corresponding Soft Parts Kit.

1. Air Brake* Subassembly P/N 85317© **Note: Will not fit 84803 3" Series III Airmotor.**

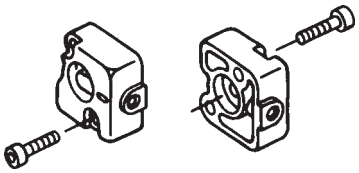


2. Soft Parts Kit P/N 84967 for repair of Air Brake' Subassembly. (See Parts List for contents.)

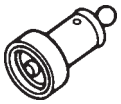
3. Relay Valve P/N 242787 Item 17 ©



4. Signal Valve Cap Kit P/N 243853 Item 31© (includes Item 32)



5. Air Signal Valve P/N 241768, Item 20 ©



6. Trip Indicator P/N 243852 Item 48 ©

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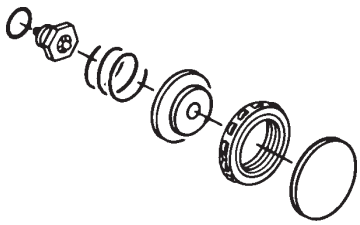
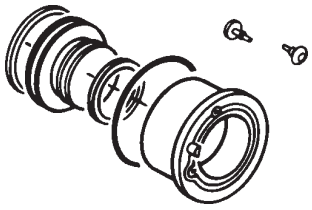
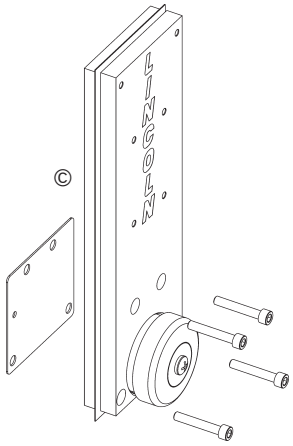
7. Stop Valve Repair Kit P/N 244091 Item 91 © (includes items 57, 58, 59, 60, 61)



8. Air Pump Repair Kit Item 92 © (includes items 55, 56, 62, 63, 64, 65)

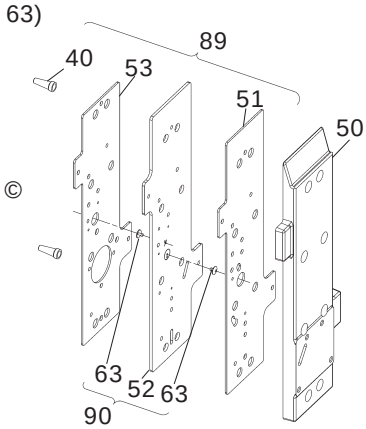


9. Bleed Assembly P/N 273428 © Item 67 © (includes items 73 through 88)



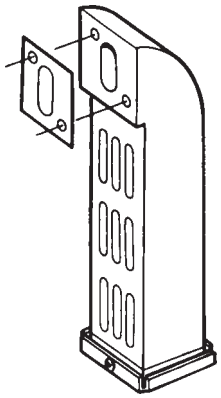
10. Gasket and Air Filter Kit Item 89 © P/N 244089 (Items 40, 51 8 53)

11. Gasket Plate with Check Valves Item 90 © P/N 244093 (Items 52 & 63)



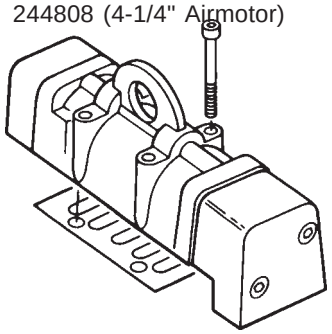
12. Cylinder Tube Soft Parts Kit (Includes "O"-rings, piston seal, etc.) P/N 84789 (10" Airmotor) P/N 84791 (8" Airmotor) P/N 84792 (6" Airmotor) P/N 84793 (4-1/4"Airmotor)

13. Muffler with Gasket P/N 242788



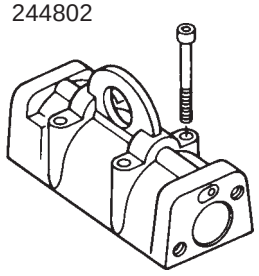
14. Muffler Element Kit P/N 84939 for repair of Muffler listed above. (Includes element, felts and gasket.)

15. Power Valve Subassembly P/N 244800 (10" Airmotor) P/N 244804 (8" Airmotor) P/N 244806 (6" Airmotor) P/N 244808 (4-1/4" Airmotor)



16. Soft Parts Kit P/N 84968 for repair of Power Valve Subassemblies listed above.

17. Power Valve Spool 8 Body P/N 244802



IMPORTANT: When replacing soft parts, replace all parts included in the soft parts kit.

WARNING

ALWAYS check equipment for proper operation before each use, making sure safety devices are in place and operating properly. DO NOT alter or modify any part of the equipment as this may cause a malfunction and result in serious bodily injury.

BEFORE CONNECTING AIRMOTOR TO AIR LINE

LINCOLN SERIES III AIRMOTORS are fully pneumatic and require a minimum specified size of air supply hose for proper operation. Check specification for minimum ID. of the air supply hose and select corresponding sizes of air controls and accessories for non-restrictive air flow. Lincoln filter, regulator with gauge and lubricators are available as combination units (FRL).

For 3/8" air line - Model 85387-6
For 1/2" air line - Model 85387-8
For 3/4" air line - Model 85387-12

If quick disconnect coupling should be used, install supplied coupler to insure proper airmotor operation.

NOTE: Whenever flammable materials are pumped, ground Airmotor according to Local Codes.

OPERATING PRECAUTIONS

Use Lincoln replacement parts to assure compatible pressure rating.

Heed ALL warnings.

DO NOT OPERATE Airmotor in excess of recommended pressure range.

Disconnect air line and relieve (vent) pressure when Airmotor sits idle for long periods of time and before servicing.

WARNING

ALWAYS read and follow the fluid and solvent manufacturer's recommendations regarding the use of protective clothing and equipment.

WARNING

To reduce the risk of serious bodily injury or property damage. NEVER exceed the maximum air or fluid working pressure of the lowest rated system component.

ATTACHING AIRMOTOR TO PUMPTUBE

1. Tightly attach the tie rods(Item 41) to the Airmotor lower casting. Use short threaded end of tie rods.
2. Mount Airmotor on top of pump tube outlet and tightly connect pump tube coupling nut to Airmotor Piston Rod (Item 5).
3. Hand tighten tie rods to the pump tube with four nuts (Item 42) supplied with Airmotor.
4. Connect air supply and slowly cycle pump several times using only enough air pressure to operate pump without stalling.
5. STOP pump on "UP" stroke and tighten four nuts to securely fasten Airmotor to pump tube.

SERVICE AND DISASSEMBLY PROCEDURE

WARNING

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

Tools Required ©

1. 7/64" (.109) Allen Wrench
2. 5/32" (.156) Allen Wrench
3. 3/16" (.189) Allen Wrench
4. 1/8" (.125) Allen Wrench
5. 9/64" (.1406) Allen wrench
6. 3/4" (.750) Open End Wrench (for 6" Airmotor)
7. 15/16" (.937) Open End Wrench (for 8" Airmotor
8. #1 Phillips screwdriver
9. 1/2" (.500) Open End Wrench
10. 1-1/8" (1.125) Open End Wrench (for 10" Airmotor)
11. 1/2" (.500) Box End Wrench
12. Pliers
13. 0-100 in. lb. Torque Wrench
14. 0 - 75 Ft. lb. Torque Wrench.

The modular design of the Airmotor and accessibility of vital operation parts make service available without taking Airmotor out of line or without complete disassembly.

Power Valve

1. Remove four screws (Items 27 & 34) with 3/16" hex wrench (2 on each side).
2. Remove End Caps (Items 10 & 14).
3. Push out Valve Spool (Item 13).
4. Remove Spool Bumpers (Item 9) (One from each end).
5. Remove "O" Ring (Item 11)(One from each end of valve body).
6. Remove four Screws (Item 37) with 3/16" hex wrench and lift valve body (Item 12).
7. Remove Gasket (Item 15) to complete valve disassembly.
8. To REASSEMBLE, REVERSE procedure.

Air Brake® Subassembly ©

1. Remove four Screws (item 23) (two on each end) with 3/16" Allen wrench and pull out Airbrake® Subassembly.
2. Remove two Screws (Item 39) with 7/64" Allen wrench and lift out Valve Body (item 17).
3. Remove four Screws (Item 32) with (two on each side of Air Brake® with1/ 8" Allen wrench and remove Signal Valve Caps (Item 31) and Air Signal Valves (Item 20).
4. Remove four (4) screws (item 80) with 9/64" Allen wrench to remove labyrinth sub-assembly from AirBrake.
5. Remove four Screws (Item 24) with 3/16" Allen wrench and lift off Upper Body (Item 50) and Upper Gasket (Item 51).
6. Remove Gasket Plate (Item 52) and Lower Gasket (Item 53).
7. Remove Air Filter (Item 40) in two locations.
8. Remove Pump Sleeve (Item 56) and Piston (Item 55).
9. Remove Diaphragm Seal and Retainer, Diaphragm, Spring and Stop Valve Assy. (Items 61, 57, 58, 59 & 60).
10. Remove Trip Indicator (Item 48).
11. To re-assemble, reverse the disassembly procedure with the following precautions

a. The upper and lower gaskets (items 51 & 53) should be coated with a film of light oil (SAE 10) before assembly.

b. When new umbrella valves (item 63) are installed, note that the gasket plate (item 52) has a circle and an "X" stamped into both sides of the gasket plate. The umbrella valve is installed into the plate from the circle side of the plate. One umbrella valve should be installed into each side of the plate so that the valve is within the circle and the stub end protrudes through the "X".

c. After installing the umbrella valve (item 63) the long rubber stem of the valve is to be removed, leaving the rubber ball end intact to secure the valve to the plate.

d. When installing the pump sleeve, (item 56) into the lower body, (item 54) the sleeve should be placed into the lower body as shown in Illustration 4. When properly installed the molded pin protruding from the pump sleeve will fit into a mating hole in gasket (item 53) and the gasket can then be installed properly over pins, (item 66). If the sleeve is not properly aligned as shown, the airbrake cannot be assembled properly.

Labyrinth Sub-Assembly Disassembly Procedure: ©

1. Use 9/64" Allen wrench to remove four screws (item 80) from the face of the labyrinth sub-assembly to remove it from the AirBrake assembly.
2. Remove screw (item 88) using a #1 Phillips screwdriver to remove the cover (item 87) over the selector knob.
3. Remove the selector bolt (item 86) and washers (item 85) to remove the selector knob. Use caution when removing the selector knob from the labyrinth assembly, a pin (item 82), spring (item 83), and 7 balls (item 81) are retained by the selector knob and could be lost.

© Indicates change

4. Remove gasket (item 74) from the backside of the labyrinth sub-assembly.
5. Using a 9/64" Allen wrench remove six screws (item 73) from the backside of the labyrinth sub-assembly.
6. Separate the labyrinth sub-base (item 75) from the labyrinth cover (item 78) exposing the labyrinth plate and gasket.
7. Remove the gasket (item 76) and plastic laminated labyrinth (item 77).
8. Remove seven O-rings (item 79) from the labyrinth cover (item 78).

Labyrinth Sub-Assembly Re-assembly Procedure:

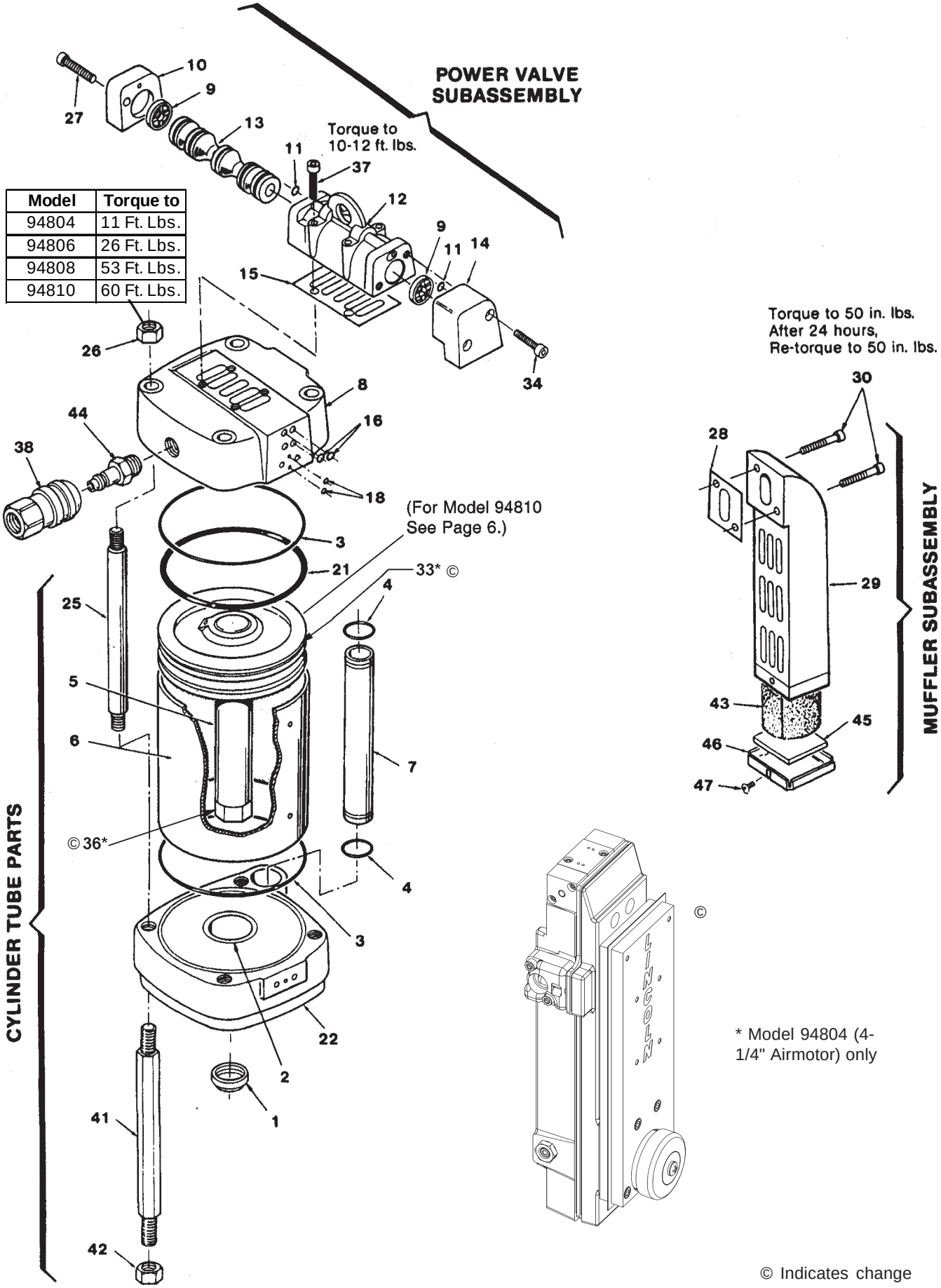
Re-assembly is basically the reverse of the disassembly procedure with the following precautions.

1. Insure that the plastic laminated labyrinth (item 77) is in good condition before re-assembly. The clear plastic laminate should be in sound condition without any tears or indications of separation from the brass labyrinth plate inside. Visually inspect the labyrinth plate for any sighs of blockage including, but not limited to, dirt, grease, oil, or water, which should be visible through the clear laminating material.
2. Keep all labyrinth components clean and free of grease, oil, and dirt, except as noted.
3. A very light coating of light grease may be used to retain the balls (item 79) in place when installing the selector knob (item 84).
4. When reassembling the labyrinth sandwich, install the six screws (item 73) but do not tighten. Install the selector knob (item 84) and selector bolt (item 86) before tightening the six screws (item 73). Tighten the six screws (item 73) to 12 in-lbs. Tighten the selector bolt (item 86) to 50 in-lbs.
5. When installing the labyrinth sub-assembly onto the AirBrake assembly use four screws (item 80) and tighten to 12 in-lbs.

Cylinder Tube and Muffler

1. Remove Air Brakes Subassembly (See previous instructions).
2. Remove two Screws (Item 30) with 3/16" hex wrench and pull off Mufler (Item 29).
3. Remove Gasket (Items 28).
4. Remove four Nuts (Item 26) with open end wrench.
5. Lift upward and remove Upper Casting (Item 8).
6. Remove four Tie Rods (Item 25).
7. Remove Air Tube (Item 7).
8. Lift upward and remove Cylinder Tube (Item 6).
9. Remove Piston and Piston Rod (Item 5).
10. Remove four Connecting Rods (Item 41) with open end wrench.
11. To REASSEMBLE, REVERSE procedure.

NOTE: Align two holes on the the Cylinder Tube (Item 6) with two holes on the Air Brake® Subassembly before tightening Tie Rods (Item 25) so that proper seal with O-rings is acheived.



Model	Torque to
94804	11 Ft. Lbs.
94806	26 Ft. Lbs.
94808	53 Ft. Lbs.
94810	60 Ft. Lbs.

* Model 94804 (4-1/4" Airmotor) only

© Indicates change

ILLUSTRATION 1

NOTE: Refer to Page 3 for Service Assemblies & Kits

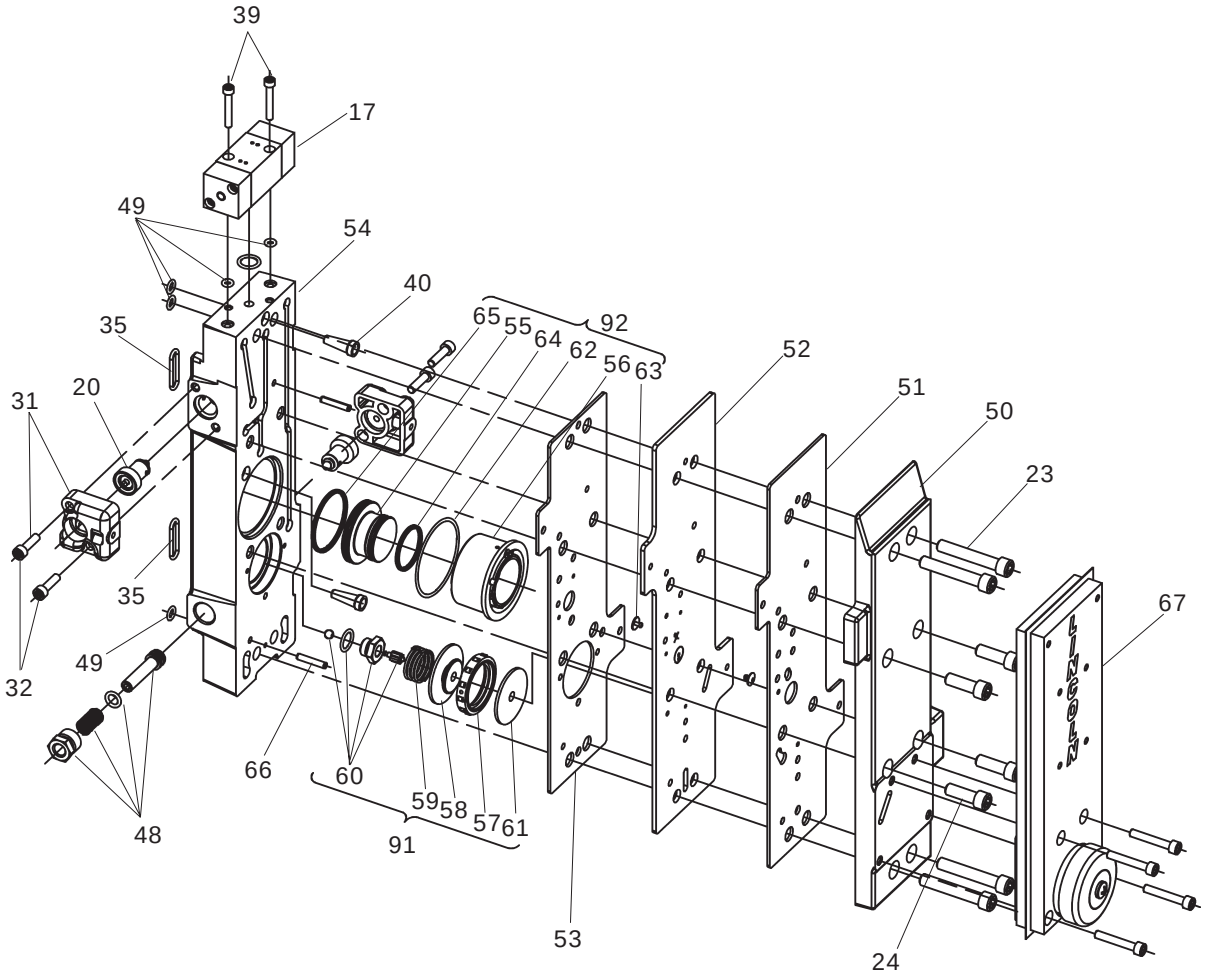
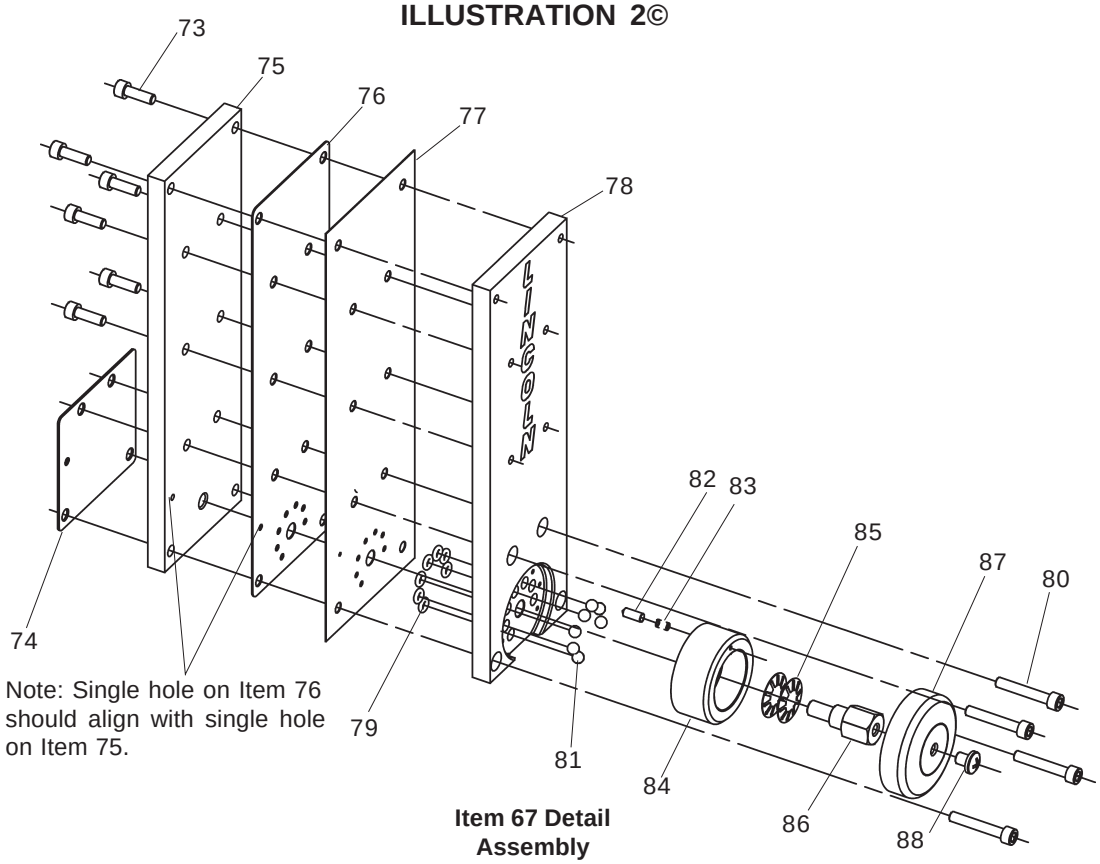


ILLUSTRATION 2©



Note: Single hole on Item 76 should align with single hole on Item 75.

Item 67 Detail Assembly

ILLUSTRATION 3©

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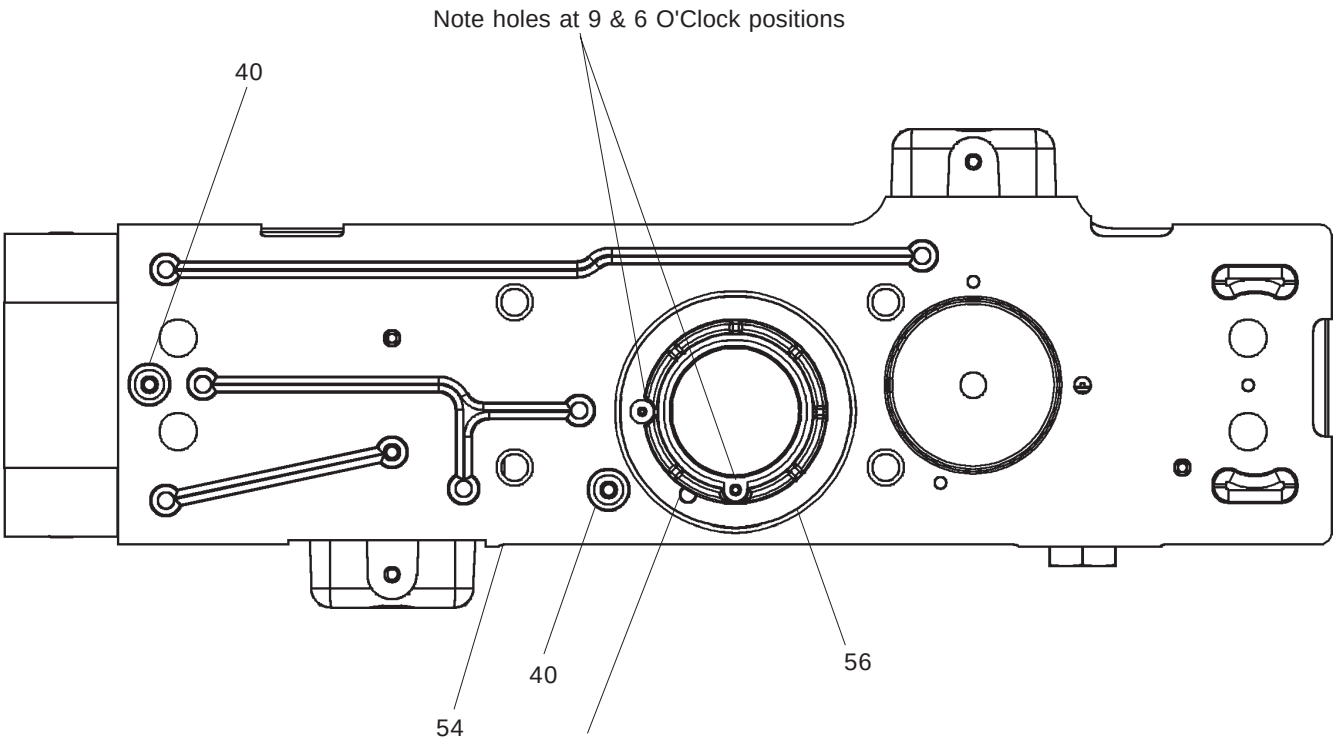
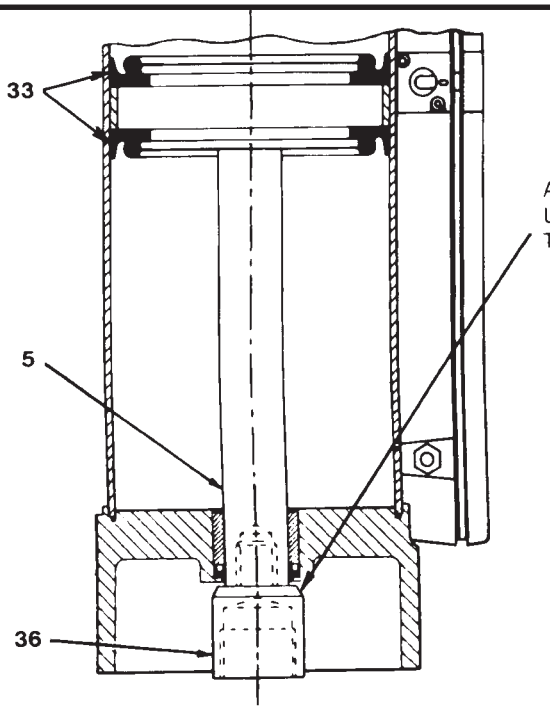
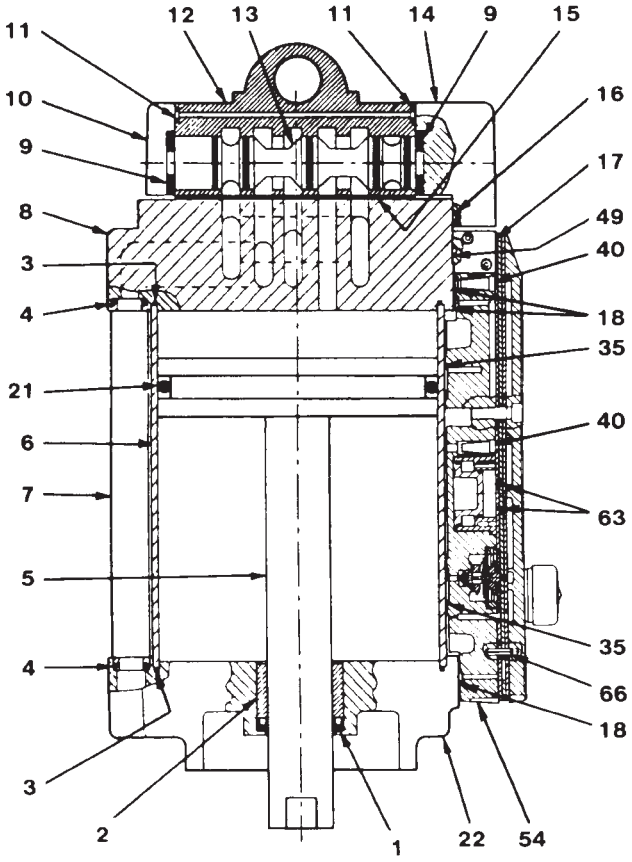


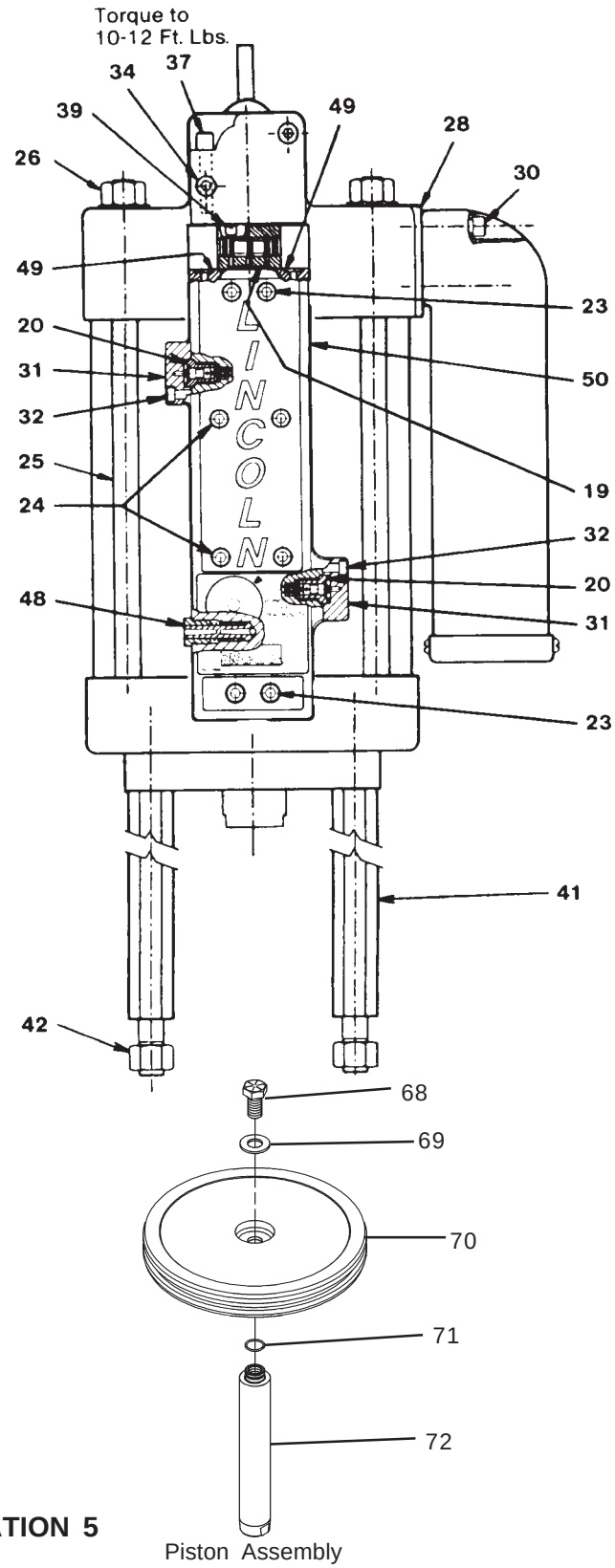
ILLUSTRATION 4©



MODEL 94804



MODELS 94806, 94808, & 94810



Piston Assembly
for Model 94810

ILLUSTRATION 5

PARTS LIST

Item No.	Description	Qty.	Model 94810 (10" Dia.)	Model 94808 (8" Dia.)	Model 94806 (6" Dia.)	Model 94804 (4¼" Dia)
1	"U" Cup (Buna-N)	1	(Note #12)	(Note #1)	(Note #2)	(Note #3)
2	Rod Bearing	1	247296	241732	241732	241733
3	Seal, Cylinder (Buna-N)	2	(Note #12)	(Note #1)	(Note #2)	(Note #3)
4	"O"-ring (Buna-N)	2	(Note #12)	(Note #1)	(Note #2)	(Note #3)
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	(Note #5)	(Note #5)	(Note #5)	(Note #5)
10	Cap, Valve	1	241755	241755	241755	241755
11	"O"-ring (Buna-N)	2	(Note #5)	(Note #5)	(Note #5)	(Note #5)
12	Body, Valve	1	(Note #13)	(Note #13)	(Note #13)	(Note #13)
13	Spool, Valve	1	(Note #13)	(Note #13)	(Note #13)	(Note #13)
14	Cap, Valve	1	247302	241759	241760	241761
15	Gasket	1	(Note #5)	(Note #5)	(Note #5)	(Note #5)
16	"O"-ring (Buna-N)	2	(Note #5)	(Note #5)	(Note #5)	(Note #5)
17	Relay Valve	1	242787	242787	242787	242787
18	"O"-ring (Buna-N)	3	(Note #6)	(Note #6)	(Note #6)	(Note #6)
19	"O"-ring (Buna-N)	1	(Note #6)	(Note #6)	(Note #6)	(Note #6)
20	Air Signal Valve	2	241768	241768	241768	241768
21	"O"-ring Piston(Buna-N)	1	(Note #12)	(Note #1)	(Note #2)	------
22	Lower Casting	1	247303	241773	241774	241775
23	Screw (¼-20 x 1½")	4	50051	50051	50051	50051
24	Screw (¼-20 x 7/8")	4	50850©	50850©	50850©	50850©
25	Tie Rod	4	247295	241766	241779	241767
26	Nut	4	247298	51018	51007	51001
27	Screw	2	244995	244995	244995	244995
28	Gasket	1	(Note #4)	(Note #4)	(Note #4)	(Note #4)
29	Muffler Body	1	241021	241021	241021	241021
30	Screw (¼-20 x 1½")	2	50051	50051	50051	50051
31	Signal Valve Cap Kit	2	243853©	243853©	243853©	243853©
32	Screw (8-32 x 5/8 ©)	4	(Note #8)	(Note #8)	(Note #8)	(Note #8)
33	Seal, Piston** ©	2	------	------	------	(Note #3)
34	Screw	2	247299	244993	241783	244994
35	"O"-ring (Buna-N)	2	(Note #6)	(Note #6)	(Note #6)	(Note #6)
36	Adapter** ©	1	------	------	------	241789

Parts List continues on next page. Parts List Notes on next page.

* Also available as individual parts.
**Used on 94804 (4-1/4") Airmotor only.

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PARTS LIST (CONTINUED FROM THE PREVIOUS PAGE)

Item No.	Description	Qty.	Model 94810 (10" Dia.)	Model 94808 (8" Dia.)	Model 94806 (6" Dia.)	Model 94804 (4¼" Dia)
37	Screw (¼-20 x 2¼")	4	244975	244975	244975	244975
38	Coupler	1	662012	655012	655012	655008
39	Screw	2	50816	50816	50816	50816
40	Air Filter	2	(Note #7)	(Note #7)	(Note #7)	(Note #7)
41	Tie Rod	4	241023	241023	241023	241023
42	Nut (½-20)	4	236203©	236203©	236203©	236203©
43	Muffler Element	1	(Note #4)	(Note #4)	(Note #4)	(Note #4)
44	Nipple	1	660112	653112	653112	653112
45	End Element	1	(Note #4)	(Note #4)	(Note #4)	(Note #4)
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	(Note #6)	(Note #6)	(Note #6)	(Note #6)
50	Upper Body	1	273383©	273383©	273383©	273383©
51	Upper Gasket (Nitrile)	1	(Note #7)	(Note #7)	(Note #7)	(Note #7)
52	Gasket Plate	1	(Note #9)	(Note #9)	(Note #9)	(Note #9)
53	Lower Gasket (Nitrile)	1	(Note #7)	(Note #7)	(Note #7)	(Note #7)
54	Lower Body	1	N/A	N/A	N/A	N/A
55	Piston	1	(Note #10)	(Note #10)	(Note #10)	(Note #10)
56	Pump Sleeve	1	(Note #10)	(Note #10)	(Note #10)	(Note #10)
57	Diaphragm Retainer	1	(Note #11)	(Note #11)	(Note #11)	(Note #11)
58	Diaphragm	1	(Note #11)	(Note #11)	(Note #11)	(Note #11)
59	Spring	1	(Note #11)	(Note #11)	(Note #11)	(Note #11)
60	Stop Valve Assembly	1	(Note #11)	(Note #11)	(Note #11)	(Note #11)
61	Diaphragm Seal	1	(Note #11)	(Note #11)	(Note #11)	(Note #11)
62	"O"-ring (Buna-N)	1	(Note #10)	(Note #10)	(Note #10)	(Note #10)
63	Umbrella Seal (Nitrile)	2	(Note #9 &10)	(Note #9 &10)	(Note #9 &10)	(Note #9 &10)
64	Quad Ring (Buna-N)	1	(Note #10)	(Note #10)	(Note #10)	(Note #10)
65	Quad Ring (Buna-N)	1	(Note #10)	(Note #10)	(Note #10)	(Note #10)
66	Spring Pin	2	243614	243614	243614	243614
67	Labyrinth Assembly©	1	273428©	273428©	273428©	273428©
68	Screw	1	272736	------	------	------
69	Washer	1	272737	------	------	------
70	Piston	1	272766	------	------	------
71	O-Ring (Buna-N)	1	(Note #12)	------	------	------
72	Piston Rod	1	272767			

N/A - Not Available

NOTES: 1. Included in 84791 Cylinder Tube Soft Parts Kit for Model 94808 (8" Airmotor).
2. Included in 84792 Cylinder Tube Soft Parts Kit for Model 94806 (6" Airmotor).
3. Included in 84793 Cylinder Tube Soft Parts Kit for Model 94804 (4¼" Airmotor).
4. Included in 84939 Muffler Element Kit.
5. Included in 84968 Soft Parts Kit for Power Valve Subassembly.
6. Included in 84967 Soft Parts Kit for Air Brake® Subassembly.
7. Included in 273427© Gasket and Air Filter Kit Item 89 ©.
8. Included in 243853 Signal Valve Cap Kit Item 31 ©.
9. Included in 244093 Gasket Plate with Check Valves Item 90©.
10. Included in 244092 Air Pump Repair Kit Item 92©.
11. Included in 244091 Stop Valve Repair Kit Item 91©.
12. Included in 84789 Cylinder Tube Soft Parts Kit for Model 94810 (10" Airmotor).
13. Included in 244802 Power Valve & Spool Body.

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PARTS LIST (CONTINUED FROM THE PREVIOUS PAGE)©

Item No.	Description	Qty.	Model 94810 (10" Dia.)	Model 94808 (8" Dia.)	Model 94806 (6" Dia.)	Model 94804 (4¼" Dia)
73	8-32 Soc. Hd. 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	273396	273396	273396	273396
78	Labyrinth Cover	1	273389	273389	273389	273389
79	O-Ring (Nitrile)	7	34499	34499	34499	34499
80	8-32 x 1 Soc. Hd. 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	243844	243844	243844	243844
89	Gasket & Filter Kit	1	273427	273427	273427	273427
90	Gasket Plate & 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

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Setting the AirBrake Trip Speed ©

Speed Settings:

R Run mode, airbrake is disabled. Air motor will continue to run at any speed.

A 35 to 45 Cycles per Minute, AirBrake will trip turning off the air motor when the air motor speed reaches a speed of 35 to 45 cycles per minute.

B 25 to 35 Cycles per Minute, AirBrake will trip turning off the air motor when the air motor speed reaches a speed of 25 to 35 cycles per minute.

C 20 to 30 Cycles per Minute, AirBrake will trip turning off the air motor when the air motor speed reaches a speed of 20 to 30 cycles per minute.

D 15 to 25 Cycles per Minute, AirBrake will trip turning off the air motor when the air motor speed reaches a speed of 15 to 25 cycles per minute.

E 10 to 20 Cycles per Minute, AirBrake will trip turning off the air motor when the air motor speed reaches a speed of 10 to 20 cycles per minute.

F 5 to 15 Cycles per Minute, AirBrake will trip turning off the air motor when the air motor speed reaches a speed of 5 to 15 cycles per minute.

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

1. Remove the selector cover (item 87) by removing screw (item 88) to gain access to the selector knob (item 84).
2. Select the RUN mode by positioning the selector knob pointer (a small round hole in the face of the selector knob) to the letter R on the face of the labyrinth cover (item 78).
3. With the pump and air motor operating normally, determine the speed of the pump by counting the number of strokes the pump makes per minute.
4. After determining the normal operating speed of the pump and air motor, consult the Setting legend on the face of the Labyrinth cover (item 78), and find the speed range that is closest to the normal operating speed of the air motor.
5. To allow for normal fluxuation in the operating speed of the air motor and pump, set the selector knob to the next highest speed setting.
6. Test the pump in operation to make sure that it is operating normally before leaving the pumping system unattended.

⚠ WARNING

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

AirBrake Operation ©

Selecting a speed range letter other than R, will activate the AirBrake, as discussed earlier. The AirBrake will "Trip", stopping the air motor from operating, if the threshold speed setting is exceeded. The air motor will not restart until it is intentionally reset. The cause of a pump OVERRUN may be anything that will allow the pump to run faster than normal such as, but not limited to the following.

Cavitation: Low fluid levels will allow the pump to cavitate, where the pump is trying to pump air instead of fluid into the fluid lines.

Broken Hose or Fitting: will cause a loss in fluid pressure allowing the pump to run faster than normal.

Increase in Air pressure: Either sudden or gradual, may cause a pump operating from an air supply system which is marginal or inadequate for the application, to rise as other equipment in the plant is shut down, thus making more air available to the pump to operate with. Unauthorized tampering with an air pressure regulator may also be a cause.

Increase in Demand: Fluid demand may be greater than expected.

A tripped condition can be determined if the air motor has stopped, the RED/ORANGE indicator pin will be out (see Illustration 6 below), the pump rod will be in the down position and air will be heard venting from the VENT HOLE in the lower body of the AirBrake. (See Illustration 7)

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

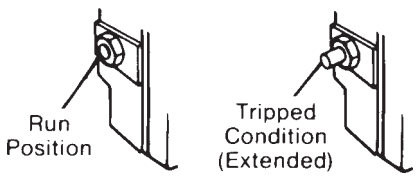

Illustration 6

Resetting the AirBrake after Tripping

1. Turn off the air supply to the air motor.
2. Press the Flush Reset Button (located on the right side of the Relay Valve item 17) with a screwdriver or other suitable object, (See Illustration 8, below), until the air motor shifts and the Indicator pin in item 48 retracts into the AirBrake. Hold the reset button until all air has been vented from the air motor. (On large air motors this may take several seconds.) Otherwise wait for about 2 minutes until all air has been vented before attempting a restart.
3. Turn on air supply and the air motor will restart.

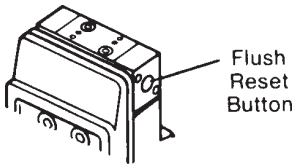

Illustration 8

4. If the cause of the AirBrake trip is cavitation or a broken fluid line the AirBrake may trip again very quickly.
5. When in the process of setting up a system and determining the speed of the pump/pump tube system use the RUN setting to prevent unnecessary tripping of the AirBrake while set-up is in progress or when trouble shooting the system. Be sure to reactivate the AirBrake by resetting to the desired run setting before leaving the pump system unattended.

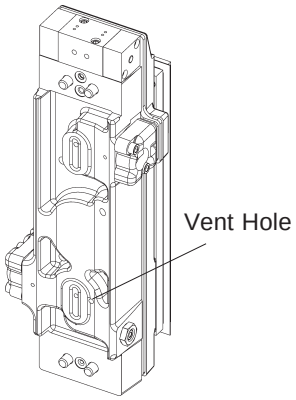

Illustration 7
Rear View of Air Brake

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TROUBLESHOOTING ©

PROBLEM	POSSIBLE CAUSE	SOLUTION
Airmotor 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 that FRL and quick disconnect couplings meet or exceed the minimum specified sizes and do not restrict airflow to the air motor.
Erratic or accelerated operation with short stroking. Air motor hesitates on up or down stroke.	Dirty or damaged Relay Valve (Item 17) or Air Signal Valve (Item 20) or stop valve assembly (Item 60).	Check valves and clean if necessary. Replace any damaged seals or worn parts.
	Pump Cavitation	Check Fluid Level. Ensure that pump inlet is not blocked or restricted or is large enough to handle flow into pump inlet.
Air Brake trips off even though airmotor 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. (A blocked labyrinth may be confirmed (in quiet locations) by turning the selector knob to the RUN mode setting immediately after the air motor has stopped. If a sudden rush of air escaping is heard, the labyrinth is either blocked installed incorrectly].
	Grease or dirt on balls (item 81) in labyrinth cover (Item 78).	Clean balls and labyrinth cover with solvent. Coat with very light film of light grease to hole balls in cover.
Air Brake trips even though air motor is operating below set trip speed (within three strokes).	Leaking Diaphragm (Item 58).	Replace Diaphragm.
	Leaking Upper Gasket (Item 51).	Replace Upper & Lower Gaskets (Items 51 & 53).
	Upper Piston Quad Ring (Item 64) is leaking.	Replace Quad Ring.
	Laminated labyrinth plate (item 77) is installed incorrectly.	Observe the laminated labyrinth plate and find single hole on item 76 and align with hole on Item 75. See Illustration #3.
AirBarke trips at proper speed (as indicated by the sound of air surging into the diaphragm chamber), but airmotor does not stop, indicator pin does not pop out.	Stop Valve vent hole in Lower Body (Item 54) is clogged or blocked. (See Illustration 7)	Unclog vent hole in lower body.
	Stop valve (Item 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,or reinstall if good into diaphragm (item 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 the minimum recommended air pressure for thr air motor installed.
Air Brake will not trip even though airmotor has been running above the trip speed for more than 1 minute.	Discharge Umbrella Valve (Item 63) is damaged or worn.	Replace both umbrella valves.
	Diaphragm seal is damaged, worn deformed or improperly installed.	Replace damaged or worn diaphragm seal, or reinstall if good into diaphragm (item 58) with twisting action to fully seat in mating hole.
	Leaking Upper Gasket (Item 51) or Lower Gasket (Item 53).	Replace gaskets (items 51 & 53)
	Stuck Metering Pump Piston (Item 55).	Install air pump repair kit, replacing items 55, 56, 63, 64 & 65.
	Inlet Air Filter (Item 40) is completely or partially clogged.	Clean or replace inlet air filter.

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