

Pneumatic Fixtured Drills

Buckeye®



COOPER Power Tools

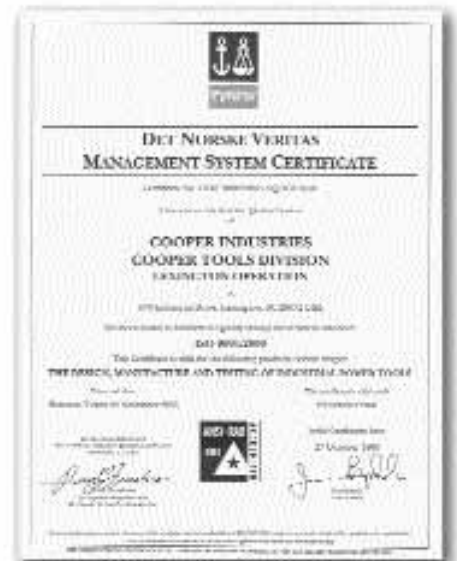
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ISO 9001

Quality System Certified

Cooper Power Tools Division has attained ISO 9001 Quality System Certification for seven of our facilities. The driving force behind the implementation of the Quality System is the commitment "to provide our customers with the **best value delivered** by offering only products and services **that meet or exceed their expectations**".



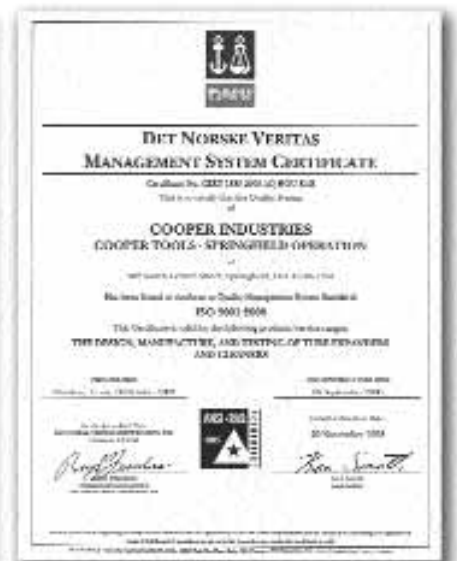
Lexington, South Carolina



Dayton, Ohio



Hicksville, Ohio



Springfield, Ohio



Braunschweig, Germany



Westhausen, Germany



Ozoir-la-Ferrière, France

Model No.	Description	Page	Model No.	Description	Page
21LD-702	Multiple Spindle	18	31LD-816	Tapper	16
21LD-703	Multiple Spindle	18	31LD-817	Tapper	16
21LD-772	Multiple Spindle	18	31LDH-803	Offset Head	18
21LD-773	Multiple Spindle	18	31LDH-806	Offset Head	18
21LD-800	Self-Feed Drill	6	31LDH-807	Offset Head	18
21LD-801	Self-Feed Drill	6	42LD-801	Self-Feed Drill	10
21LD-802	Self-Feed Drill	6	42LD-801	Multiple Spindle	20
21LD-803	Self-Feed Drill	6	42LD-802	Self-Feed Drill	10
21L-805	Self-Feed Drill	6	42LD-802	Multiple Spindle	20
21LD-815	Tapper	16	42LD-803	Self-Feed Drill	10
21LD-870	Self-Feed Drill	6	42LD-803	Multiple Spindle	20
21LD-871	Self-Feed Drill	6	42LD-805	Self-Feed Drill	10
21LD-872	Self-Feed Drill	6	42LD-805	Multiple Spindle	20
21LD-873	Self-Feed Drill	6	46LD-801	Self-Feed Drill	12
21LD-875	Self-Feed Drill	6	46LD-802	Self-Feed Drill	12
21LDH-801	Offset Head	14	46LD-802	Multiple Spindle	20
21LDH-802	Offset Head	14	46LD-803	Self-Feed Drill	12
21LDH-803	Offset Head	14	46LD-803	Multiple Spindle	20
21LDH-805	Offset Head	14	46LD-805	Self-Feed Drill	12
31LD-800	Self-Feed Drill	8	46LD-805	Multiple Spindle	20
31LD-801	Self-Feed Drill	8	46LD-806	Self-Feed Drill	12
31LD-801	Multiple Spindle	18	46LD-807	Self-Feed Drill	12
31LD-802	Self-Feed Drill	8	46LD-808	Self-Feed Drill	12
31LD-802	Multiple Spindle	18	46LD-815	Tapper	16
31LD-803	Self-Feed Drill	8	46LD-816	Tapper	16
31LD-805	Multiple Spindle	18	46LD-817	Tapper	16
31LD-805	Self-Feed Drill	8	46LD-818	Tapper	16
31LD-806	Self-Feed Drill	8	42LD-806	Self-Feed Drill	10
31LD-807	Self-Feed Drill	8	42LD-807	Self-Feed Drill	10

Warranty

Cooper warrants products and parts sold by it, insofar as they are of its own manufacture, against defects of material and workmanship, under normal use and service in accordance with its written instructions, recommendations, and ratings for installation, operation, maintenance, and service of products, for a period of **ONE YEAR FROM THE DATE OF INITIAL USE, BUT IN NO EVENT SHALL THE WARRANTY EXCEED 24 MONTHS FROM DATE OF DELIVERY TO DISTRIBUTOR.** Proof of Purchase with shipment date must be furnished by the user to validate the warranty. This warranty applies only to products manufactured by Cooper and specifically excludes products manufactured by others. Products not manufactured by Cooper are warranted only to the extent and in the manner warranted to Cooper by the manufacturer

Lubrication Products

Cooper Power Tools' products are classified as non-hazardous manufactured items, defined in the OSHA 1910.1200 Hazard Communication Standard as "Articles". These products, under conditions of normal use, do not release or cause exposure to a hazardous chemical. Under normal conditions of use, lubrication products sold separately for or used within these tools should not cause an exposure hazard. Refer to the Material Safety Data Sheet (M.S.D.S.) for Safety and Disposal Information. M.S.D.S. sheets are available upon request from Cooper Power Tools. Cooper is also aware of, and complies with, the

and then only to the extent Cooper is able to enforce such warranty. Cooper's warranty with respect to products manufactured by it is limited to the repair or replacement, as Cooper may elect, of any defective part regarding which the Distributor has given 5 days written notice from the discovery of such defect. Installation and transportation costs are not included. Cooper shall have the option of requiring the return to it of the defective material, transportation prepaid, for inspection. No allowance will be made for repairs without Cooper's approval. **COOPER MAKES NO OTHER WARRANTY OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, AND HEREBY DISCLAIMS ALL WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

provisions of section 611 amendments to the Clean Air Act of 1990. No ozone depleting chemicals have been used in the manufacture of our products. If you resell or distribute these products, you have the responsibility for ensuring that the Material Safety Data Sheets are provided to the purchaser. Proper lubrication is essential to the economical operation of pneumatic and electric tools. Cooper Power Tools perform better and their life is extended by using the recommended lubricants. All lubricants that are listed in the accessory section of this catalog have undergone extensive testing and are recommended for use with Cooper Power Tools products.

Cooper Power Tools has combined years of application experience with modern engineering expertise, in the development of the self-feed drills to bring industry this superior line of fixtured drilling equipment.

The modular construction of these units permits the user to select only the components that include features which are required for his application. Components are available to provide for successful precision drilling of virtually every material.

Rugged Construction

The rugged construction of these tools enables them to withstand heavy punishment while providing extra versatility, including the feature of both foot and nose mounting. They can also be mounted within optional aircraft type nose pieces.

Quiet Operation

Cooper Power Tools is particularly attentive to the design of the exhaust system for every tool. For operator comfort and improved working conditions, motor exhaust is efficiently muffled to insure that the lowest practical noise levels are maintained. Optional accessory mufflers are available for some tools to direct the exhaust away from the operator.

Automatic or Non-Automatic Control

Automatic and Non-Automatic refer to the control of the advance and return functions of the drill. With automatic control, a built-in four-way valve controls advance and return of the drill bit. The four-way valve may be actuated manually, at the tool or by momentary pressure signals generated at a remote location. On the non-automatic tool, remote valving must be used to control the advance and return of the drill. On both automatic and non-automatic models, motor (on-off) valve operates automatically. The motor starts as soon as forward motion occurs and stops when return travel is completed. A built-in, two-way valve (actuated when the drill reaches the bottom of its stroke) provides the pressure pilot signal to operate the four-way valve which returns the drill.

Stroke Length

In selecting a stroke length, it is necessary to consider depth of the hole to be drilled, length of the drill bit, and the drill bit travel required to contact the workpiece. Additional considerations will depend on other specific requirements of the application.

Drill Speeds (RPM)

A wide selection of drilling speeds are offered in order that the recommended surface feet-per-minute for each drill size and material

can be approximated. It should be noted, in selecting a drill speed for an application, that the specification chart lists the rated free speed of the tool. Actual drilling speed will depend on drill size and feed rate setting.

Hydraulic or Aircheck Feed Control (Accessory)

Feed rate control for the Aircheck type drill is accomplished by controlling the flow of air from the exhaust side of the feed piston and is sufficiently accurate for many of the easy-to-drill applications. When more accurate control of the feed rate is required on harder-to-drill materials, or when hole finish or breakthrough control is critical, it is advisable to use a Hydraulic Feed Control.

Dwell (46L Series)

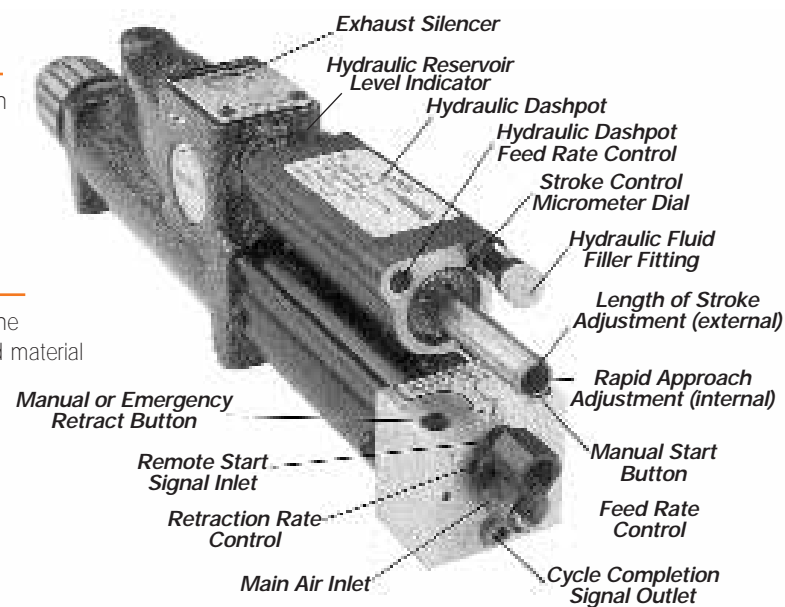
Dwell at the bottom of the stroke is advisable for blind hole applications where hole-bottom cleanup is important, or in countersink and counterbore operations. Also used where depth control is very important.

Auxiliary Signal

The Auxiliary Signal should be considered when a pneumatic signal is required to indicate that tool has moved to the required position. The signal can be used to actuate related equipment - start another drill or tapper, or perform an unclamp operation.

Piped Exhaust (Accessory)

The sound level of Buckeye self-feed drills is below the level where piped exhaust (strictly for noise control) is required, unless great quantities of tools are to be used on a single fixture. A Piped Exhaust Kit is offered for those applications where it is desirable to direct exhaust air to an exhaust manifold to eliminate the presence of oil contaminants in the air.



Drill Speed Guide

The table below is offered to assist in the selection of the proper spindle speeds to suit the most common drilling applications. This data is intended as a guide only, inasmuch as the operating conditions may vary widely.

Keep in mind that high speed air drills deliver maximum horsepower when they are loaded to a point where the listed free speed is reduced about one-half. It may also be necessary to deviate from these speeds in order to insure satisfactory cutting tool life.

Material	Surface Feet per Minute	Suggested Revolutions per Minute Required for Proper Surface Feet per Minute											
		Drill Size											
		1/16	1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4
Stainless Steel	30-40	2100	1100	700	550	400	350	300	250	230	200	190	175
Forged Steel	40-50	2700	1350	900	675	550	450	400	350	300	275	250	225
High Nickel Steel or Monel	40-50	2700	1350	900	675	550	450	400	350	300	275	250	225
Titanium Alloy Sheet	50-60	3300	1650	1100	850	650	550	450	400	375	325	300	275
High Carbon Steel	70-80	4600	2300	1500	1100	900	750	650	575	500	450	400	375
Malleable Iron	80-90	5200	2600	1700	1300	1000	850	750	650	575	525	475	425
Mild Steel	80-110	6100	3000	2000	1500	1200	1000	900	750	675	600	550	500
Mild Steel Sheet	80-110	6700	3350	2250	1650	1350	1100	950	850	750	675	600	550
Medium Hard Cast Iron	70-100	5200	2600	1700	1300	1000	850	750	650	575	525	475	425
Soft Cast Iron	100-150	7600	3800	2500	1900	1500	1100	950	850	750	700	700	650
Plastic and Bakelite	100-150	7600	3800	2500	2000	1500	1250	1100	950	850	750	700	650
High Tensile Bronze	70-150	6700	3300	2250	1650	1350	1100	950	850	750	675	600	550
Commercial Brass or Bronze	200-300	15000	7600	5100	3800	3000	2500	2200	2000	1700	1500	1400	1300
Aluminum	200-300	15000	7600	5100	3800	3000	2500	2200	2000	1700	1500	1400	1300
Aluminum Sheet	200-300	18000	9100	6100	4500	3500	3000	2500	2250	2000	1700	1500	1400
Magnesium	250-400	18500	9200	6100	4600	3600	3100	2600	2250	2000	1900	1800	1650
Wood	300-400	18500	9200	6100	4500	3600	3000	2600	2250	2100	2000	1900	1800

NOTE: This table is for use with High Speed Steel drills only. Carbon Steel drills should run at 40-50% of listed speeds.

Drill Horsepower and Thrust Chart

Material	Specification For	Drill Size								
		1/16	3/32	1/8	3/16	1/4	5/16	3/8	7/16	1/2
Brass	R.P.M.	4000	4000	4000	3000	2200	1800	1500	1300	1100
	Feed"/Rev.	.0004	.0005	.0008	.0012	.0017	.0021	.0025	.003	.0035
	H.P.	.010	.012	.022	.047	.100	.150	.200	.250	.300
Aluminum	Thrust (lbs.)	3	6	10	20	35	50	70	90	100
	R.P.M.	4000	4000	4000	4000	3000	2500	2000	1700	1500
	Feed"/Rev.	.0005	.0007	.0010	.0015	.0020	.0025	.0030	.0035	.0040
Cast Iron	H.P.	.010	.020	.040	.080	.140	.220	.300	.375	.450
	Thrust (lbs.)	2	3	6	12	20	40	60	80	100
	R.P.M.	4000	2850	2100	1400	1000	850	700	600	525
B1112 Mild Steel	Feed"/Rev.	.0005	.0007	.0010	.0015	.0020	.0022	.0027	.0030	.0035
	H.P.	.010	.020	.035	.060	.100	.125	.175	.210	.250
	Thrust (lbs.)	6	12	30	45	90	100	140	180	225
1045 Steel	R.P.M.	3600	2400	1800	1200	900	750	600	525	450
	Feed"/Rev.	.0005	.0007	.0010	.0015	.0022	.0027	.0032	.0037	.0045
	H.P.	.015	.025	.040	.075	.125	.175	.250	.300	.365
1045 Steel	Thrust (lbs.)	8	12	25	50	85	130	175	250	310
	R.P.M.	3600	2400	1800	1200	900	750	600	525	450
	Feed"/Rev.	.0005	.0007	.0010	.0015	.0022	.0027	.0032	.0037	.0045
1045 Steel	H.P.	.03	.05	.09	.15	.22	.25	.40	.60	.65
	Thrust (lbs.)	12	20	25	75	140	200	280	350	450

BUCKEYE®

21LD-800 Series

- .4 Horsepower
- 130 lbs. Thrust (578 N) @ 90 PSI
- 1-1/4" (32mm) & 2" (51mm) Stroke
- Cycle completion signal

21LD-870 Series Automatic

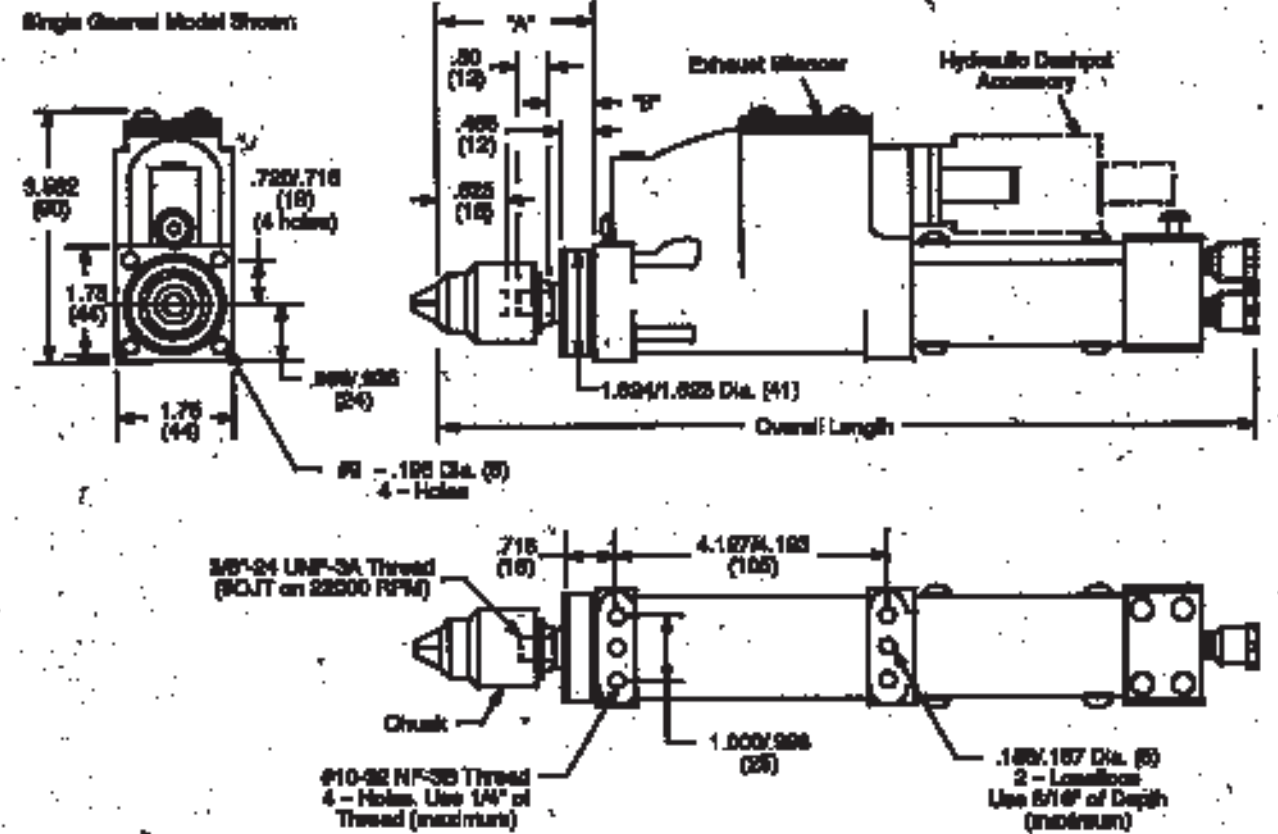
- Internal rear-head valves
- Automatic retract
- Manual start & retract
- Remote start
- 1" (25mm) stroke hydraulic dashpot standard



21L Series

Mounting Dimensions

Designer's full scale dimensional layouts available on request.



Models		Free Speed RPM	Nominal Drilling Capacities						Thrust @90PSI		Std. Chuck Capacity		Spindle
Stroke Length 1-1/4" (32mm)	2" (51mm)		Mild Steel in. mm	Alum. in. mm	Wood in. mm		lb.	N	in.	mm			

Automatic

21LD-870	21LD-800	22000	-	-	3/32	2.4	-	-	130	578	5/32	4.0	#0 JT
21LD-871	21LD-801	4750	1/8	3.2	3/16	4.8	3/16	4.8	130	578	1/4	6.4	3/8"-24
21LD-872	21LD-802	3500	5/32	4.0	7/32	5.6	1/4	6.4	130	578	1/4	6.4	3/8"-24
21LD-873	21LD-803	2800	3/16	4.8	1/4	6.4	5/16	7.9	130	578	1/4	6.4	3/8"-24
21LD-875	21LD-805	900	1/4	6.4	1/4	6.4	1/2	12.7	130	578	1/4	6.4	3/8"-24

SPECIFICATIONS:

Recommended Air Pressure: 90 PSI (6.2 bar)
 Air Inlet Size: 1/4" N.P.T.
 Remote Control Ports: 1/8" N.P.T.
 Recommended Hose Size: 3/8" (9.5 mm) I.D.
 Offset (side-to-center): 7/8" (22.2 mm)
 Tool Weight (maximum): 5.6 lbs. (2.5 kg)
 Optional Chucks: page 26

EXTRA COST ACCESSORIES:

Optional Outdrilling Dashpots: page 25
 L - Bracket: 1021862
 Aircraft Noses: page 31
 Collet Type Chucks: page 26
 Various 3-Jawed Chucks: page 27



STANDARD EQUIPMENT: The above models are supplied standard with a 1" stroke hydraulic dashpot, 1024850. See page 25 for more information.

Free Speed of Tool (RPM)	Overall Length				"A"		"B"	
	Stroke Length							
	1-1/4" (32mm)		2" (51mm)		in.	mm	in.	mm
22000	11.50	292	12.13	308	1.92	49	0.62	16
4750	11.69	297	12.44	316	2.19	56	0.62	16
3500	11.69	297	12.44	316	2.19	56	0.62	16
2800	11.69	297	12.44	316	2.19	56	0.62	16
900	12.75	324	13.50	343	3.28	83	1.71	43

BUCKEYE® 31LD-800 Series Automatic

- .6 Horsepower
- 200 lbs. Thrust (889 N) @ 90 PSI
- 3" (76mm) Stroke
- Cycle completion signal
- Internal rear-head valves
- Automatic retract
- Manual start & retract
- Remote start
- 2" (51mm) stroke hydraulic dashpot standard



Models	Stroke Length 3" (76mm)	Free Speed RPM	Nominal Drilling Capacities				Thrust @90PSI		Std. Chuck Capacity		Spindle
			Mild Steel in. mm	Alum. in. mm	Wood in. mm	lb. N	in. mm				
Automatic											
31LD-800		20000									
31LD-801		5000	1/8 3.2	3/16 4.8	1/4 6.4	200 889	3/8 9.5	3/8"-24			
31LD-802		3000	3/16 4.8	5/16 7.9	3/8 9.5	200 889	3/8 9.5	3/8"-24			
31LD-803		1850	3/16 4.8	3/8 9.5	1/2 12.7	200 889	3/8 9.5	3/8"-24			
31LD-805		1100	5/16 7.9	3/8 9.5	5/8 15.9	200 889	3/8 9.5	3/8"-24			
31LD-806		750	3/8 9.5	3/8 9.5	7/8 22.2	200 889	3/8 9.5	3/8"-24			
31LD-807		450	3/8 9.5	3/8 9.5	1 25.4	200 889	3/8 9.5	3/8"-24			

SPECIFICATIONS:
 Recommended Air Pressure: 90 PSI (6.2 bar)
 Air Inlet Size: 1/4" N.P.T.
 Remote Control Ports: 1/8" N.P.T.
 Recommended Hose Size: 3/8" (9.5 mm) I.D.
 Offset (side-to-center): 1" (25.4 mm)
 Tool Weight (maximum): 9.7 lbs. (4.4 kg)
 Optional Chucks: page 26

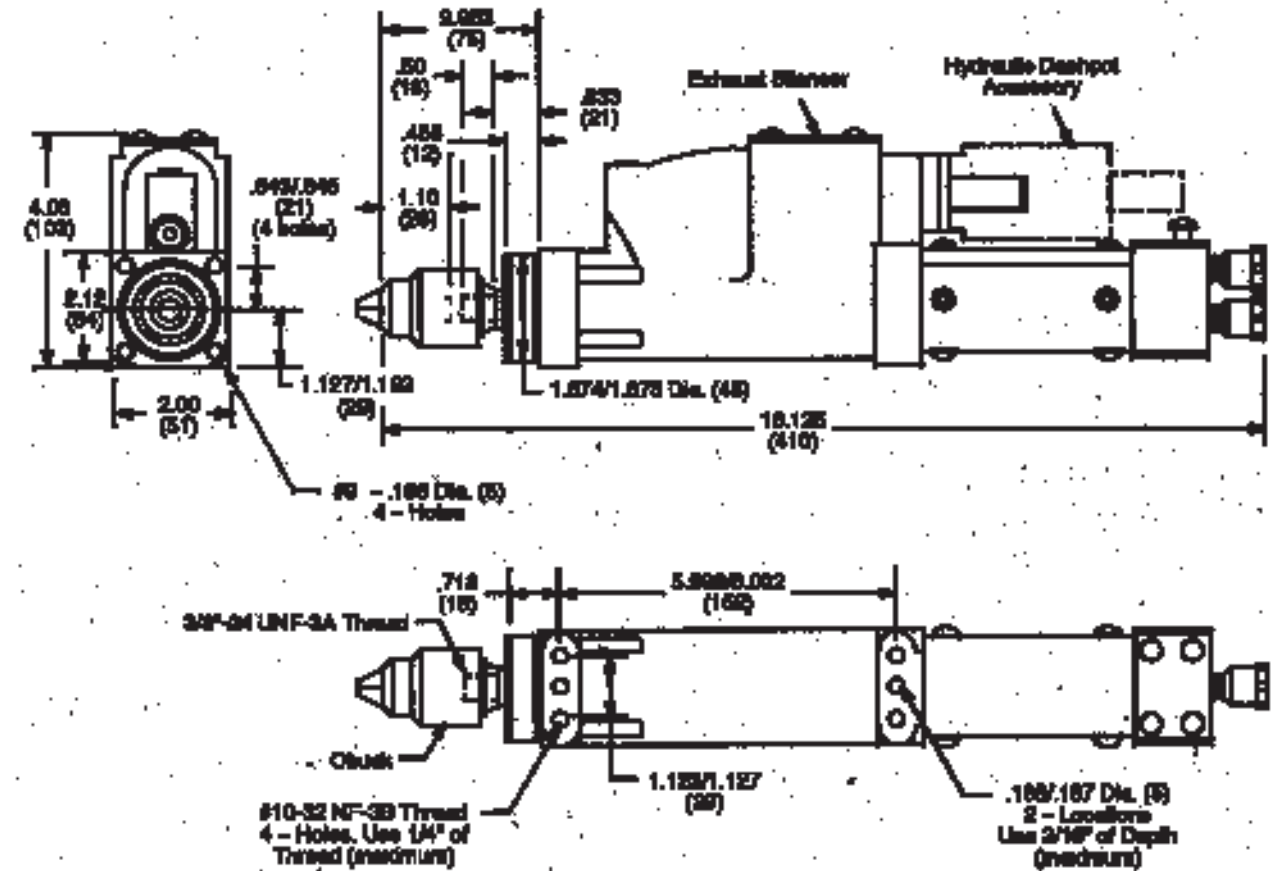
EXTRA COST ACCESSORIES
 Optional Outboard Dashpots: page 25
 L - Bracket: 1023793
 Aircraft Noses: page 31
 Collet Type Chucks: page 26
 Various 3-Jawed Chucks: page 27



STANDARD EQUIPMENT: The above models are supplied standard with 2" stroke hydraulic dashpot, 1024852. See page 25 for more information.

31L Series Mounting Dimensions

Designer's full scale dimensional layouts available on request.



BUCKEYE® 42LD-800 Series Automatic

- .9 Horsepower
- 250 lbs. Thrust (1111 N) @ 90 PSI
- 3" (76mm) Stroke
- Cycle completion signal
- Internal rear-head valves
- Automatic retract
- Manual start & retract
- Remote start
- 2" (51mm) stroke hydraulic dashpot standard



Models	Free Speed RPM	Nominal Drilling Capacities						Thrust @90PSI		Std. Chuck Capacity		Spindle
		Mild Steel		Alum.		Wood		lb.	N	in.	mm	
Stroke Length 3" (76mm)		in.	mm	in.	mm	in.	mm					
Automatic												
42LD-808	6000	1/8	3.2	1/8	3.2	3/16	4.8	250	1111	3/8	9.5	3/8"-24
42LD-801	5000	3/16	4.8	1/4	6.4	1/4	6.4	250	1111	3/8	9.5	3/8"-24
42LD-802	3000	1/4	6.4	3/8	9.5	3/8	9.5	250	1111	3/8	9.5	3/8"-24
42LD-803	1850	3/8	7.9	3/8	9.5	7/8	22.2	250	1111	3/8	9.5	3/8"-24
42LD-805	1100	3/8	9.5	3/8	9.5	1	25.4	250	1111	3/8	9.5	3/8"-24
42LD-806	750	3/8	9.5	3/8	9.5	1	25.4	250	1111	3/8	9.5	3/8"-24
42LD-807	450	3/8	9.5	3/8	9.5	1	25.4	250	1111	3/8	9.5	3/8"-24

SPECIFICATIONS:
 Recommended Air Pressure: 90 PSI (6.2 bar)
 Air Inlet Size: 1/4" N.P.T.
 Remote Control Ports: 1/8" N.P.T.
 Recommended Hose Size: 3/8" (9.5 mm) I.D.
 Offset (side-to-center): 1" (25.4 mm)
 Tool Weight (maximum): 9.6 lbs. (4.4 kg)
 Optional Chucks: page 26

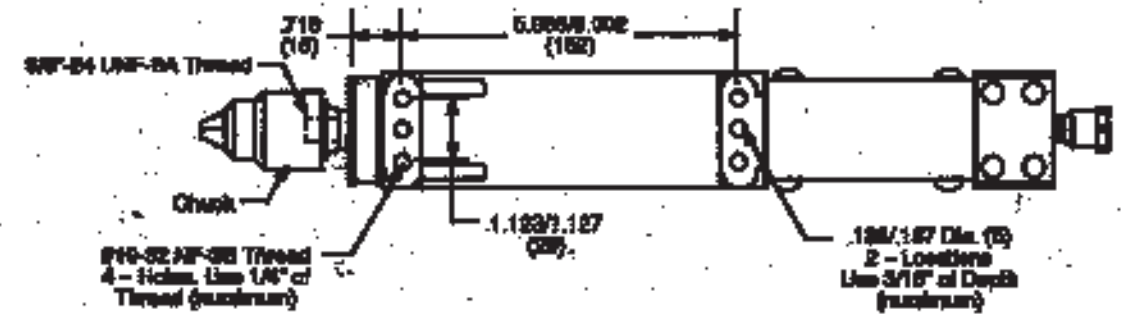
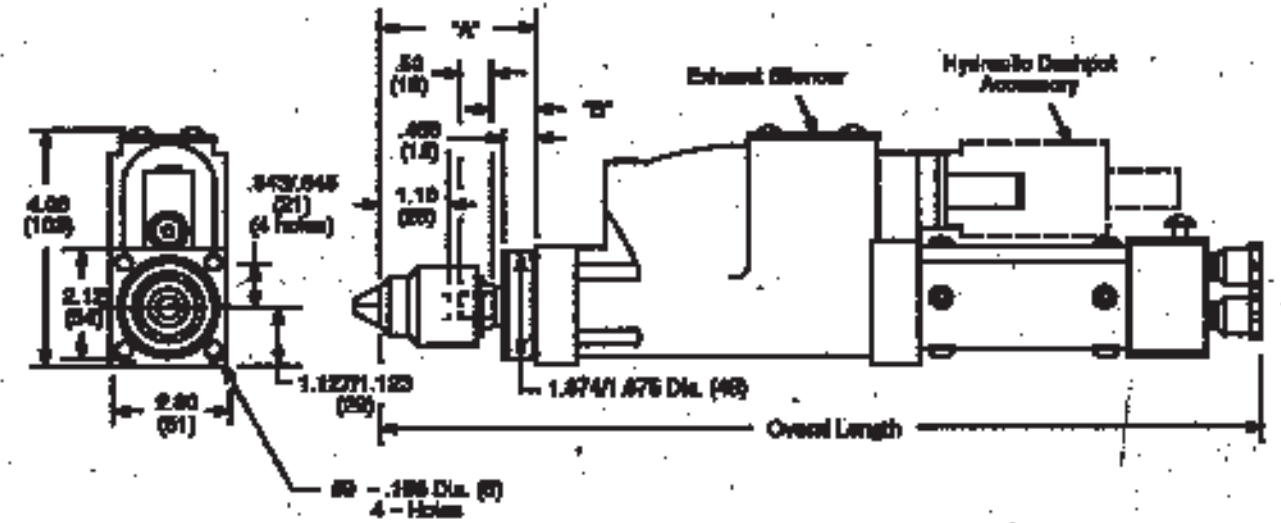
EXTRA COST ACCESSORIES
 Optional Outboard Dashpots: page 25
 L - Bracket: 1023793
 Aircraft Noses: page 31
 Collet Type Chucks: page 26
 Various 3-Jawed Chucks: page 27



STANDARD EQUIPMENT: The above models are supplied standard with 2" stroke hydraulic dashpot, 1024852. See page 25 for more information.

42L Series Mounting Dimensions

Designer's full scale dimensional layouts available on request.



Free Speed of Tool (RPM)	Overall Length Stroke Length 3" (76mm)		"A"		"B"	
	in.	mm	in.	mm	in.	mm
9000	17.06	433	3.97	101	2.43	62
6000	16.12	410	2.95	75	0.76	19
5000	16.12	410	2.95	75	0.76	19
3000	16.12	410	2.95	75	0.76	19
1850	16.12	410	2.95	75	0.76	19
1100	16.62	422	3.45	87	1.26	32
750	16.62	422	3.45	87	1.26	32
450	16.62	422	3.45	87	1.26	32

BUCKEYE® 46LD-800 Series Automatic

- 1.0 Horsepower
- 440 lbs. Thrust (1956 N) @ 90 PSI
- 4" (102mm) Stroke
- Built-in dwell control
- Internal rear-head valves
- Automatic retract
- Manual start & retract
- Remote start
- Cycle completion signal
- 3" (76mm) stroke hydraulic dashpot standard



Models	Free Speed RPM	Nominal Drilling Capacities				Thrust @90PSI		Std. Chuck Capacity		Spindle		
		Mild Steel		Alum.		Wood		Capacity				
Stroke Length 4" (102mm)		in.	mm	in.	mm	in.	mm	in.	mm			
Automatic												
46LD-802	3250	3/16	4.8	5/16	7.9	-	-	440	1956	1/2	12.7	1/2"-20
46LD-803	1800	3/16	4.8	3/8	9.5	-	-	440	1956	1/2	12.7	1/2"-20
46LD-805	900	5/16	7.9	3/8	9.5	-	-	440	1956	1/2	12.7	1/2"-20
46LD-806	600	3/8	9.5	3/8	9.5	-	-	440	1956	1/2	12.7	1/2"-20
46LD-807	430	3/8	9.5	3/8	9.5	-	-	440	1956	1/2	12.7	1/2"-20
46LD-808	285	1/2	12.7	5/8	15.9	-	-	440	1956	1/2	12.7	1/2"-20

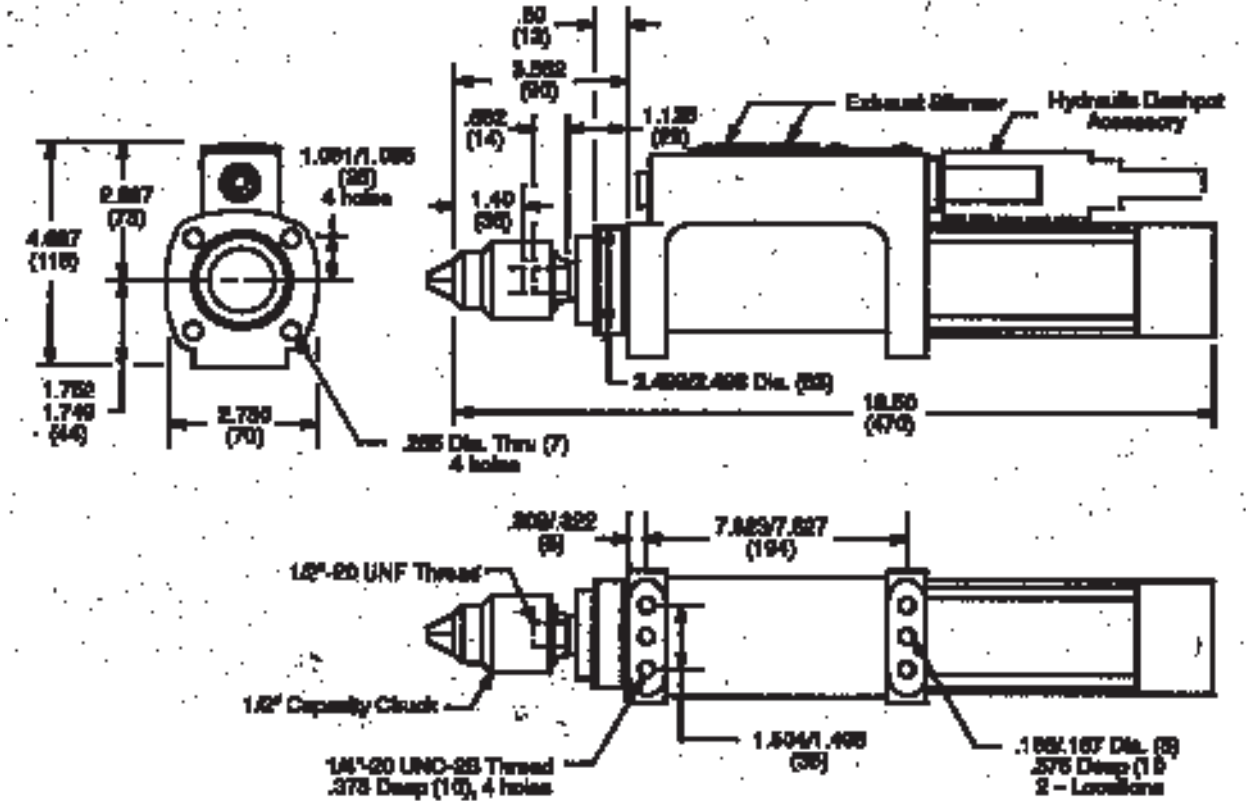
SPECIFICATIONS:
 Recommended Air Pressure: 90 PSI (6.2 bar)
 Air Inlet Size: 3/8" N.P.T.
 Remote Control Ports: 1/8" N.P.T.
 Recommended Hose Size: 1/2" (12.7 mm) I.D.
 Offset (side-to-center): 1-3/8" (35 mm)
 Tool Weight (maximum): 23 lbs. (10.4 kg)
 Optional Chucks: page 26

EXTRA COST ACCESSORIES
 Optional Outboard Dashpots: page 25
 L - Bracket: 1024262
 Aircraft Noses: page 31
 Collet Type Chucks: page 26
 Various 3-Jawed Chucks: page 27

STANDARD EQUIPMENT: The above models are supplied standard with 3" stroke hydraulic dashpot, 1023636. See page 25 for more information.

46L Series Mounting Dimensions

Designer's full scale dimensional layouts available on request.



BUCKEYE® 21LDH-800 Series Automatic

- .4 Horsepower
- 130 lbs. Thrust (578 N) @ 90 PSI
- 2" (51mm) Stroke
- Offset head with 1" (25mm) minimum drill center potential with adjacent units
- Cycle completion signal
- Internal rear-head valves
- Automatic retract
- Manual start & retract
- Remote start
- 1" (25mm) stroke hydraulic dashpot standard



BUCKEYE® 31LDH-800 Series Automatic

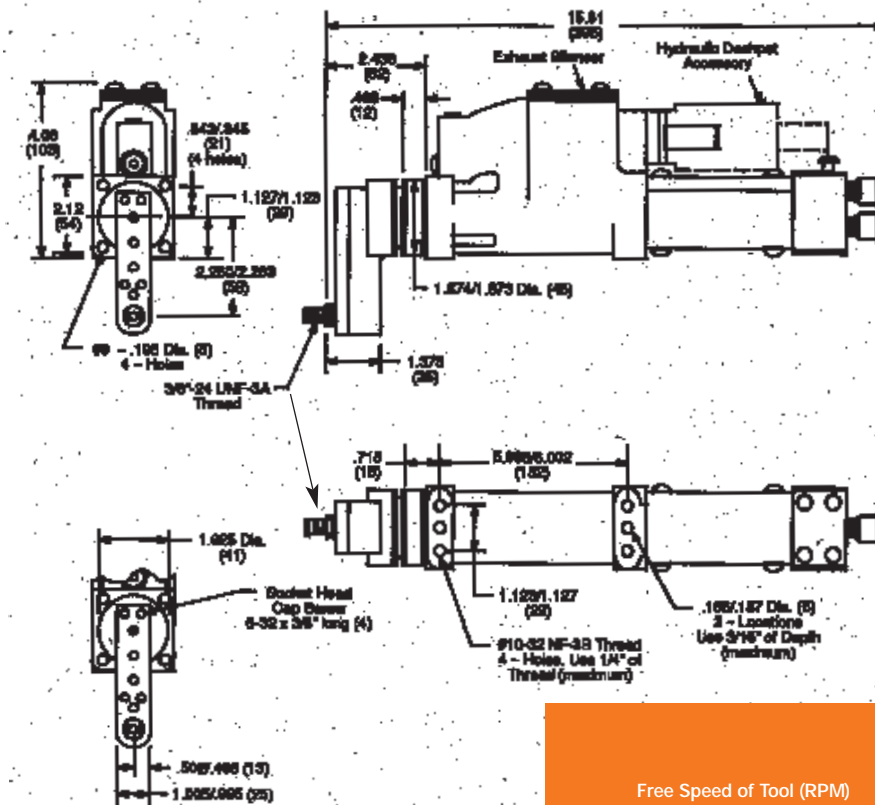
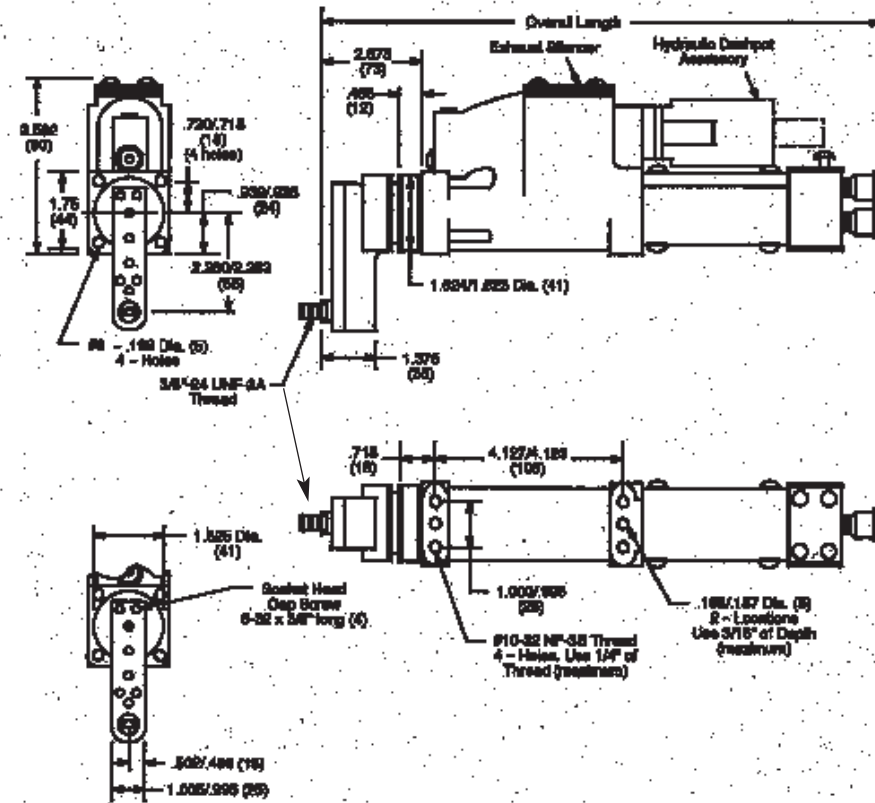
- .6 Horsepower
- 200 lbs. Thrust (889 N) @ 90 PSI
- 3" (76mm) Stroke
- Offset head with 1" (25mm) minimum drill center potential with adjacent units.
- Cycle completion signal
- Internal rear-head valves
- Automatic retract
- Manual start & retract
- Remote start
- 2" (51mm) stroke hydraulic dashpot standard



Models	Free Speed RPM	Nominal Drilling Capacities				Thrust @90PSI		Std. Chuck Capacity		Spindle		
		Mild Steel		Alum.		lb.	N	in.	mm			
21LDH-802	3500	5/32	4.0	7/32	5.6	1/4	6.4	130	578	1/4	6.4	3/8"-24
21LDH-803	2800	3/16	4.8	1/4	6.4	5/16	7.9	130	578	1/4	6.4	3/8"-24
31LDH-803	1850	3/16	4.8	3/8	9.5	1/2	12.7	200	889	3/8	9.5	3/8"-24
31LDH-806	750	3/8	9.5	3/8	9.5	7/8	22.2	200	889	3/8	9.5	3/8"-24
31LDH-807	450	3/8	9.5	3/8	9.5	1	25.4	200	889	3/8	9.5	3/8"-24

SPECIFICATIONS:
 Recommended Air Pressure: 90 PSI (6.2 bar)
 Air Inlet Size: 1/4" N.P.T.
 Remote Control Ports: 1/8" N.P.T.
 Recommended Hose Size: 3/8" (9.5 mm) I.D.
 Tool Weight (maximum): 11.25 lbs. (5.1 kg)
 Optional Chucks: page 26

EXTRA COST ACCESSORIES
 Optional Outboard Dashpots: page 45
 L - Bracket 21-LDH: 1021862
 L - Bracket 31-LDH: 1023793
 Aircraft Noses: page 31
 Collet Type Chucks: page 26
 Various 3-Jawed Chucks: page 27



21LH Series
Mounting Dimensions
 Designer's full scale dimensional layouts available on request.

31LH Series
Mounting Dimensions
 Designer's full scale dimensional layouts available on request.

Free Speed of Tool (RPM)	Overall Length Stroke Length 2" (51mm)	
	in.	mm
4750	13.13	333
3500	13.13	333
2800	13.13	333
900	13.09	332

BUCKEYE®

31LD Series

- .6 Horsepower
- 200 lbs. Thrust (889 N) @ 90 PSI
- 3" (76mm) Stroke
- 3/8" (9.5mm) Tap capacity
- 2" (51mm) stroke hydraulic dashpot standard

46LD Series

- 1.0 Horsepower
- 440 lbs. Thrust (1956 N) @ 90 PSI
- 4" (76mm) Stroke
- 5/8" (16mm) Tap capacity
- 3" (76mm) stroke hydraulic dashpot standard



Model	Speed RPM	Tap Range		Length		Weight		Thrust		Spindle	Offset (Side to Center)	
		in.	mm	in.	mm	lbs.	Kg	lbs.	N		in.	mm
31 Series Self-Feed Tappers												
31LD-816	750	1/4-3/8	6.4-9.5	20.3	517	11.0	5.0	200	889	3/8"-24	1.38	35
31LD-817	450	1/4-3/8	6.4-9.5	20.3	517	11.0	5.0	200	889	3/8"-24	1.38	35
46 Series Self-Feed Tappers												
46LD-818	285	1/2-5/8	13-16	24.0	610	26.5	12.0	440	1956	1/2"-20	1.38	35j22

SPECIFICATIONS:
 Recommended Air Pressure: 90 PSI (6.2 bar)
 Air Inlet Size (31LD): 1/4" N.P.T.
 Air Inlet Size (46LD): 3/8" N.P.T.
 Remote Control Ports: 1/8" N.P.T.
 Recommended Hose Size: 1/2" I.D. (12.7mm)

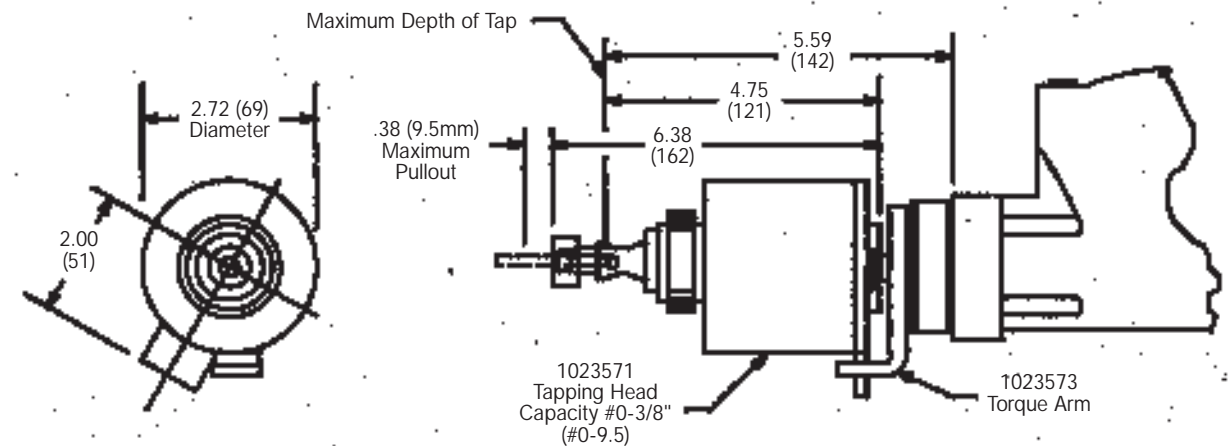
STANDARD EQUIPMENT:
 2" (51mm) Stroke Dashpot (31LD): 1024852
 3" (76mm) Stroke Dashpot (46LD): 1023636

Mounting Dimensions

Designer's full scale dimensional layouts available on request.

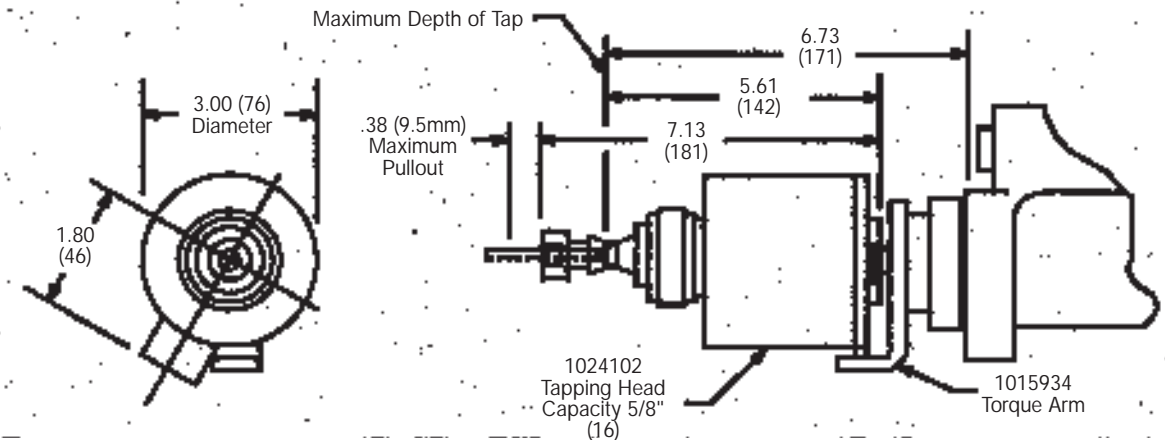
31L Series

For tool dimensions, refer to page 9. These dimensions are with pullout adjustment set at maximum.



46L Series

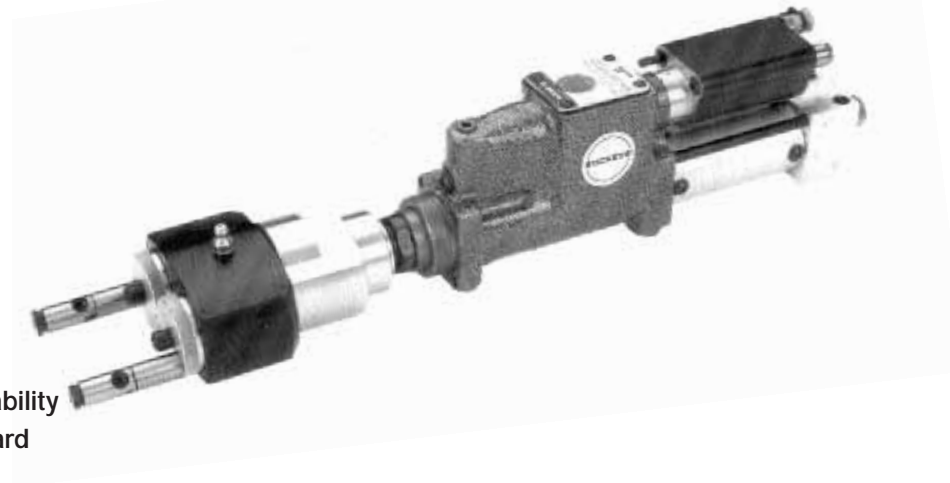
For tool dimensions, refer to page 13. These dimensions are with pullout adjustment set at maximum.



Self-Feed Multiple Spindle Head Drills

BUCKEYE® 21LD Series

- .4 Horsepower
- 130 lbs. Thrust (578 N) @ 90 PSI
- 1-1/4" (32mm) & 2" (51mm) Stroke
- Spindle position easily adjusts
- Heavy-duty roller thrust bearings
- Hardened precision-ground steel spindles
- Caged needle roller bearings for lateral stability
- 1" (25mm) stroke hydraulic dashpot standard



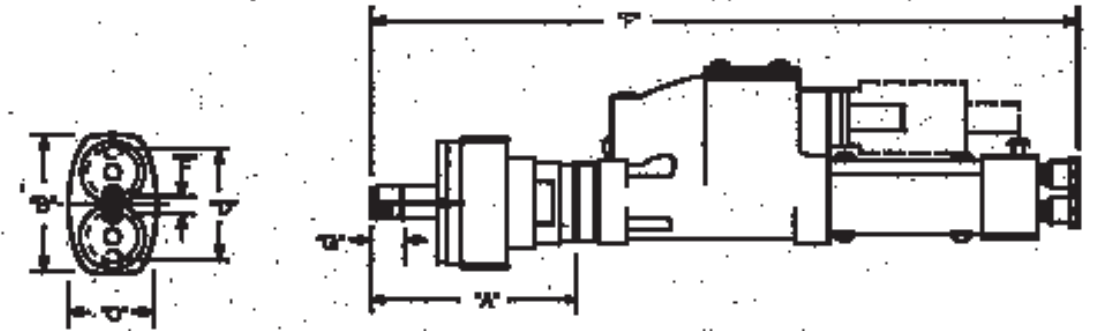
BUCKEYE® 31LD Series

- .6 Horsepower
- 200 lbs. Thrust (889 N) @ 90 PSI
- 3" (76mm) Stroke
- Spindle position easily adjusts
- Heavy-duty roller thrust bearings
- Hardened precision-ground steel spindles
- Caged needle roller bearings for lateral stability
- 2" (51mm) stroke hydraulic dashpot standard



21LD Series Mounting Dimensions

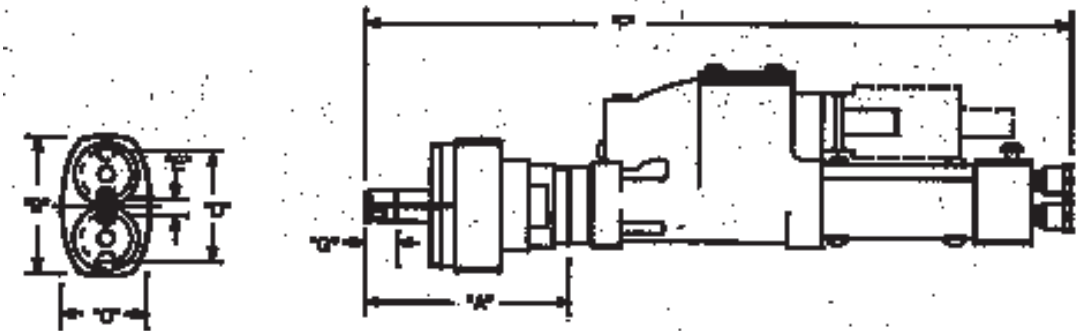
Designer's full scale dimensional layouts available on request.



Refer to page 7 for additional mounting dimensional information.

31LD Series Mounting Dimensions

Designer's full scale dimensional layouts available on request.



Refer to page 9 for additional mounting dimensional information.

Models Stroke Length			Free Speed RPM	Maximum Collet Size		Nominal Drilling Capacity Mild Steel		Maximum Torque per Spindle		Thrust @90 PSI	
1-1/4" (32mm)	2" (51mm)	3" (76mm)		in.	mm	in.	mm	in.-lb.	Nm	lb.	N

Type 400 Multiple Spindle Head

21LD-772-402			3500	.156	4.0	5/32	4.0	19.2	2.2	130	578
21LD-773-402	21LD-703-402		2800	.156	4.0	5/32	4.0	19.2	2.2	130	578

Type 650 Multiple Spindle Head

21LD-702-652			3500	.250	6.4	5/32	4.0	26.4	3.0	130	578
	31LD-802-652		3000	.250	6.4	3/16	4.8	26.4	3.0	200	889

Type 800 Multiple Spindle Head

	31LD-805-802		1100	.312	7.9	5/16	7.9	50.4	5.7	200	889
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SPECIFICATIONS:

Recommended Air Pressure:	90 PSI (6.2 bar)
Air Inlet Size:	1/4" N.P.T.
Remote Control Ports:	1/8" N.P.T.
Recommended Hose Size:	3/8" (9.5 mm) I.D.

STANDARD EQUIPMENT:

21LDH Series: Supplied standard with 1" stroke hydraulic dashpot, 1024850.
31LDH Series: Supplied standard with 2" stroke hydraulic dashpot, 1024852.

EXTRA COST ACCESSORIES

Collets:	page 43
L - Bracket 21LD:	1021862
L - Bracket 31LD:	1023793

NOTE: Contact factory for pricing and additional head configurations available.

Multiple Spindle Head Type	Code	Part Number	Dimensions													
			A		B		C		D		E		F		G**	
			in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
1-1/4" (32mm) Stroke Models																
400	-402	1025767	6.92	176	2.84	72	2.00	51	2.125	54	.375	9.5	16.42	417	.875	22
650	-652	1025768	7.09*	180	3.25	83	2.05	52	2.500	64	.500	13	16.59	421	.937	24
2" (51mm) Stroke Models																
400	-402	1025767	6.92	176	2.84	72	2.00	51	2.125	54	.375	9.5	17.17	436	.875	22
650	-652	1025768	7.09*	180	3.25	83	2.05	52	2.500	64	.500	13	17.34	440	.937	24
650	-652	1025771	6.64	169	3.25	83	2.05	52	2.500	64	.500	13	19.81	503	0.937	24
800	-802	1025772	7.44	189	4.00	102	2.50	64	3.125	79	.625	16	20.61	523	1.156	29
950	-952	1025773	8.09	205	4.87	124	3.05	77	3.750	95	.750	19	21.26	540	1.375	35

* NOTE: "A" Dimension for 900 RPM tool is 8.15" (207).

** NOTE: "G" Dimension indicates collet depth.

NOTE:

- 1) Specify collet diameter desired when placing an order. Price of collets not included in price of assembly package.
- 2) Assembly number includes all hardware needed to mount the chosen multi spindle onto the applicable self-feed drill.

Self-Feed Multiple Spindle Head Drills

BUCKEYE® 42LD Series

- .9 Horsepower
- 250 lbs. Thrust (1111 N) @ 90 PSI
- 3" (76mm) Stroke
- Spindle position easily adjusts
- Heavy-duty roller thrust bearings
- Hardened precision-ground steel spindles
- Caged needle roller bearings for lateral stability
- 2" (51mm) stroke hydraulic dashpot standard



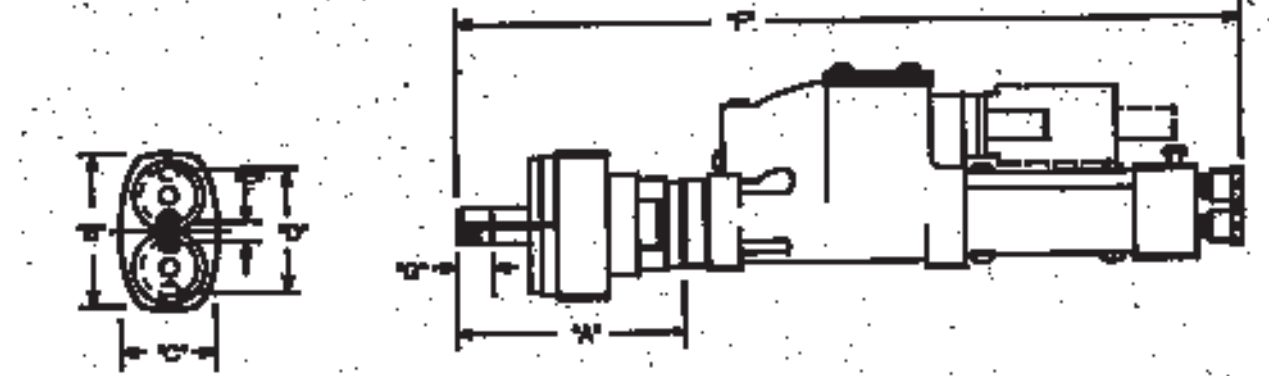
BUCKEYE® 46LD Series

- 1.0 Horsepower
- 440 lbs. Thrust (1956 N) @ 90 PSI
- 4" (102mm) Stroke
- Spindle position easily adjusts
- Heavy-duty roller thrust bearings
- Hardened precision-ground steel spindles
- Caged needle roller bearings for lateral stability
- 3" (76mm) stroke hydraulic dashpot standard



42LD Series Mounting Dimensions

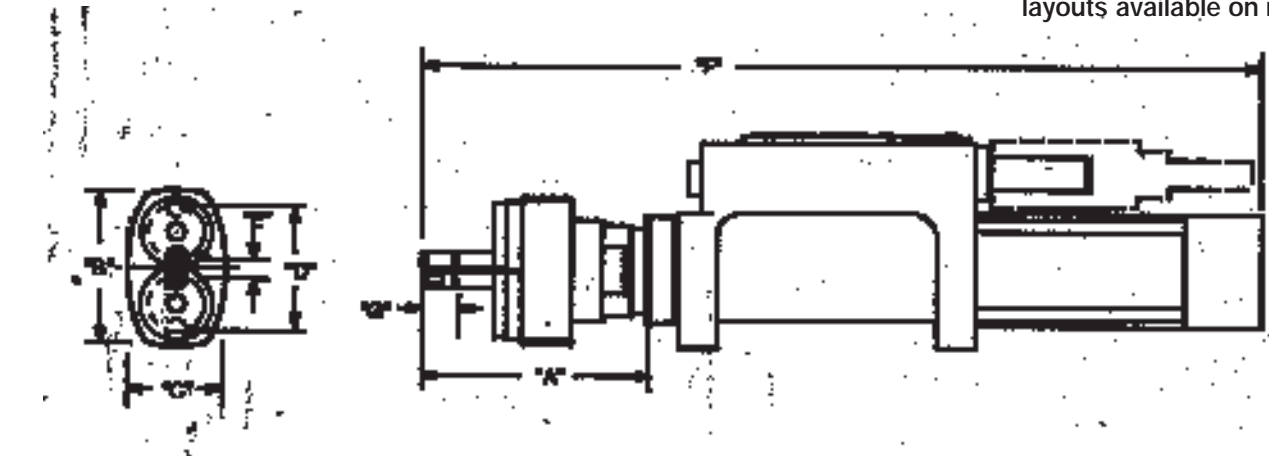
Designer's full scale dimensional layouts available on request.



Refer to page 11 for additional mounting dimensional information.

46LD Series Mounting Dimensions

Designer's full scale dimensional layouts available on request.



Refer to page 13 for additional mounting dimensional information.

Models		Free Speed RPM	Maximum Collet Size		Nominal Drilling Capacity Mild Steel		Maximum Torque per Spindle		Thrust @90 PSI	
Stroke Length	3" (76mm)		4" (102mm)	in.	mm	in.	mm	in.-lb.	Nm	lb.

Type 650 Multiple Spindle Head

42LD-801-652		5000	.250	6.4	1/8	3.2	26.4	3.0	250	1111
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Type 800 Multiple Spindle Head

42LD-802-802		3000	.312	7.9	3/16	4.8	50.4	5.7	250	1111
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Type 950 Multiple Spindle Head

46LD-803-952		1800	.375	9.5	3/16	4.8	79.2	8.9	440	1956
46LD-805-952		900	.375	9.5	5/16	7.9	79.2	8.9	440	1956

SPECIFICATIONS:

Recommended Air Pressure:	90 PSI (6.2 bar)
Air Inlet Size 42LD:	1/4" N.P.T.
Air Inlet Size 46LD:	3/8" N.P.T.
Remote Control Ports:	1/8" N.P.T.
Recommended Hose Size 42LD:	3/8" (9.5 mm) I.D.
Recommended Hose Size 46LD:	1/2" (13 mm) I.D.

EXTRA COST ACCESSORIES

Collets:	pages 26
L - Bracket 42LD:	1023793
L - Bracket 46LD:	1024262
NOTE: Contact factory for pricing and additional head configurations available.	

STANDARD EQUIPMENT:

42LD Series: Supplied standard with 2" stroke hydraulic dashpot, 1024852.
46LD Series: Supplied standard with 3" stroke hydraulic dashpot, 1023636.

Multiple Spindle Head		Part Number	Dimensions													
Type	Code		A		B		C		D		E		F		G*	
		in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	
650	-652	1025771	6.64	169	3.25	83	2.05	52	2.500	64	.500	13	19.81	503	0.937	24
800	-802	1025772	7.44	189	4.00	102	2.50	64	3.125	79	.625	16	20.61	523	1.156	29
950	-952	1025774	8.44	214	4.87	124	3.05	77	3.750	95	.750	19	23.11	587	1.375	35

* NOTE: "G" Dimension indicates collet depth.

NOTE:

- 1) Specify collet diameter desired when placing an order. Price of collets not included in price of assembly package.
- 2) Assembly number includes all hardware needed to mount the chosen multi spindle onto the applicable self-feed drill.

Multiple Spindle Drill Head Assembly

Buckeye Twin-Spindle adjustable center heads for use with Self-Feed tools for two hole drilling operations. Available as factory installed on tool order. For use on 21L, 31L, 42L, and 46L Self-Feed tools. Dashpot accessory is recommended for drilling metal. To order with a dashpot, add "D" to the model number. EXAMPLE: 21LD-XXX

Type 400

3/8" (9.5mm) to 2-1/8" (54mm) between holes.

- Drill sizes up to: 5/32" (4.0mm)
- Tap sizes up to: 5/32" (4.0mm)
- Maximum input: 10000 RPM

Type 650

1/2" (13mm) to 2-1/2" (64mm) between holes.

- Drill sizes up to: 1/4" (6.5mm)
- Tap sizes up to: 3/16" (5.0mm)
- Maximum input: 7000 RPM

Type 800

5/8" (16mm) to 3-1/8" (79mm) between holes.

- Drill sizes up to: 5/16" (8.0mm)
- Tap sizes up to: 1/4" (6.5mm)
- Maximum input: 6000 RPM

Type 950

3/4" (19mm) to 3-3/4" (95mm) between holes.

- Drill sizes up to: 3/8" (9.5mm)
- Tap sizes up to: 5/16" (8.0mm)
- Maximum input: 5000 RPM

Type 1250

1" (25mm) to 5" (127mm) between holes.

- Drill sizes up to: 1/2" (13mm)
- Tap sizes up to: 3/8" (10mm)

*Multiple Spindle Head	Part Number	Drill Cap. Mild Steel & Max. Collet Size	Dimensions												Max. Torque Per Spindle			
			A		B		C		D		E		G**		in-lb	mm		
Type	Code	in. mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm		

Use on 21L

400	-402	1025767	.156	4.0	6.92	176	2.84	72	2.00	51	2.125	54	.375	9.5	.875	22	19.2	2.2
650	-652	1025768	.250	6.4	7.09*	180	3.25	83	2.05	52	2.500	64	.500	13	.937	24	26.4	3.0

Use on 31L and 42L

650	-652	1025771	.250	6.4	6.64	169	3.25	83	2.05	52	2.500	64	.500	13	.937	24	26.4	3.0
800	-802	1025772	.312	7.9	7.44	189	4.00	102	2.50	64	3.125	79	.625	16	1.156	29	50.4	5.7
950	-952	1025773	.375	9.5	8.09	205	4.87	124	3.05	77	3.750	95	.750	19	1.375	35	79.2	8.9

Use on 46L

950	-952	1025774	.375	9.5	8.44	214	4.87	124	3.05	77	3.750	95	.750	19	1.375	35	79.2	8.9
1250	-122	1025775†	.500	13	11.69	297	6.50	165	4.02	102	5.000	127	1.000	25	2.000	51	120.0	13.6

* Note: "A" Dimension for 900 RPM tool is 8.15" (207mm).

** Note: "G" Dimension indicates collet depth.

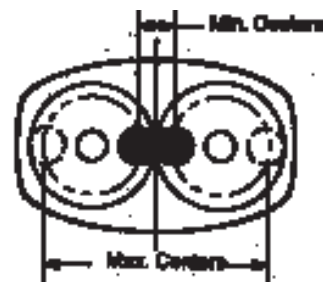
† NOTE: 21L-800 series tools require conversion parts to accept the multiple spindle drill head assembly. Contact the factory for details. 31L, 42L, and 46L series do not require conversion.

† Quotation required.

*Additional three, four, and five adjustable and fixed spindle heads are available upon request as well as multi-spindle tappers. Contact Technical Support for more information.

Spindle Centers

Type	Spindle Centers			
	Minimum		Maximum	
	inch	mm	inch	mm
400	.375	9.5	2.125	54
650	.500	12	2.500	64
800	.625	16	3.125	79
950	.750	19	3.750	95
1250	1.00	25	5.000	127



MULTIPLE SPINDLE HEADS† ORDERING INFORMATION:

- 1) The Multiple Spindle Heads (M.S.H.) are sold only as accessories to the Self-Feed tools.
- 2) When specifying the tool speed code be sure to take into account the maximum input RPM.
- 3) When ordering only a M.S.H. specify the assembly part number only.
- 4) When ordering a M.S.H. head with a Self-Feed tool, specify the head code number from the table below.
EXAMPLE: 31L-803-652 (1025771 multiple spindle head) or 21L-705-652 (1025768 multiple spindle head).
- 5) For other multiple spindle head options contact Cooper Power Tools.



Multiple Spindle Drill Head Collets

Bore Dia.	Drill Sizes			Collet Number†
	inch	No	mm	

Collets for Type 400†

.039		61	1.0	P1809.010
.043		57	1.1	P1809.011
.047	3/64	56	1.2	P1809.012
.052		55	1.3	P1809.013
.055		54	1.4	P1809.014
.059		53	1.5	P1809.015
.063	1/16	52	1.6	P1809.016
.067		51	1.7	P1809.017
.071		50	1.8	P1809.018
.075		48	1.9	P1809.019
.079	5/64	47	2.0	P1809.020
.083		45	2.1	P1809.021
.087		44	2.2	P1809.022
.091		43	2.3	P1809.023
.094	3/32	42	2.4	P1809.024
.098		40	2.5	P1809.025
.102		38	2.6	P1809.026
.106		36	2.7	P1809.027
.110	7/64	35	2.8	P1809.028
.114		33	2.9	P1809.029
.118		32	3.0	P1809.030
.122		31	3.1	P1809.031
.126	1/8		3.2	P1809.032
.130		30	3.3	P1809.033
.134		29	3.4	P1809.034
.138			3.5	P1809.035
.142	9/64	28	3.6	P1809.036
.146		26	3.7	P1809.037
.150		25	3.8	P1809.038
.154		23	3.9	P1809.039
.157	5/32	22	4.0	P1809.040
.161		20	4.1	P1809.041
.165		19	4.2	P1809.042
.169		18	4.3	P1809.043
.173	11/64	17	4.4	P1809.044
.177		16	4.5	P1809.045
.181		14	4.6	P1809.046
.185		13	4.7	P1809.047
.189	3/16	12	4.8	P1809.048
.193		10	4.9	P1809.049
.197		9	5.0	P1809.050
.201		7	5.1	P1809.051
.205	13/64	5	5.2	P1809.052
.209		4	5.3	P1809.053
.213		3	5.4	P1809.054
.216			5.5	P1809.055
.220	7/32	2	5.6	P1809.056
.224			5.7	P1809.057
.228		1	5.8	P1809.058
.232			5.9	P1809.059
.236	15/64		6.0	P1809.060
.240			6.1	P1809.061
.244			6.2	P1809.062
.248			6.3	P1809.063
.252	1/4		6.4	P1809.064
.256			6.5	P1809.065

Collets for Type 650†

.039		61	1.0	P1039.010
.043		57	1.1	P1039.011
.047	3/64	56	1.2	P1039.012
.052		55	1.3	P1039.013
.055		54	1.4	P1039.014
.059		53	1.5	P1039.015
.063	1/16	52	1.6	P1039.016
.067		51	1.7	P1039.017
.071		50	1.8	P1039.018
.075		48	1.9	P1039.019
.079	5/64	47	2.0	P1039.020
.083		45	2.1	P1039.021
.087		44	2.2	P1039.022
.091		43	2.3	P1039.023
.094	3/32	42	2.4	P1039.024
.098		40	2.5	P1039.025
.102		38	2.6	P1039.026
.106		36	2.7	P1039.027
.110	7/64	35	2.8	P1039.028
.114		33	2.9	P1039.029
.118		32	3.0	P1039.030
.122		31	3.1	P1039.031

Bore Dia.	Drill Sizes			Collet Number†
	inch	No	mm	

Collets for Type 650 (cont'd)

.126	1/8		3.2	P1039.032
.130		30	3.3	P1039.033
.134		29	3.4	P1039.034
.138			3.5	P1039.035
.142	9/64	28	3.6	P1039.036
.146		26	3.7	P1039.037
.150		25	3.8	P1039.038
.154		23	3.9	P1039.039
.157	5/32	22	4.0	P1039.040
.161		20	4.1	P1039.041
.165		19	4.2	P1039.042
.169		18	4.3	P1039.043
.173	11/64	17	4.4	P1039.044
.177		16	4.5	P1039.045
.181		14	4.6	P1039.046
.185		13	4.7	P1039.047
.189	3/16	12	4.8	P1039.048
.193		10	4.9	P1039.049
.197		9	5.0	P1039.050
.201		7	5.1	P1039.051
.205	13/64	5	5.2	P1039.052
.209		4	5.3	P1039.053
.213		3	5.4	P1039.054
.216			5.5	P1039.055
.220	7/32	2	5.6	P1039.056
.224			5.7	P1039.057
.228		1	5.8	P1039.058
.232			5.9	P1039.059
.236	15/64		6.0	P1039.060
.240			6.1	P1039.061
.244			6.2	P1039.062
.248			6.3	P1039.063
.252	1/4		6.4	P1039.064
.256			6.5	P1039.065

Collets for Type 800†

.039		61	1.0	P3464.010
.043		57	1.1	P3464.011
.047	3/64	56	1.2	P3464.012
.052		55	1.3	P3464.013
.055		54	1.4	P3464.014
.059		53	1.5	P3464.015
.063	1/16	52	1.6	P3464.016
.067		51	1.7	P3464.017
.071		50	1.8	P3464.018
.075		48	1.9	P3464.019
.079	5/64	47	2.0	P3464.020
.083		45	2.1	P3464.021
.087		44	2.2	P3464.022
.091		43	2.3	P3464.023
.094	3/32	42	2.4	P3464.024
.098		40	2.5	P3464.025
.102		38	2.6	P3464.026
.106		36	2.7	P3464.027
.110	7/64	35	2.8	P3464.028

Bore Dia.	Drill Sizes			Collet Number†
	inch	No	mm	

Collets for Type 800 (cont'd)

.114		33	2.9	P3464.029
.118		32	3.0	P3464.030
.122		31	3.1	P3464.031
.126	1/8		3.2	P3464.032
.130		30	3.3	P3464.033
.134		29	3.4	P3464.034
.138			3.5	P3464.035
.142	9/64	28	3.6	P3464.036
.146		26	3.7	P3464.037
.150		25	3.8	P3464.038
.154		23	3.9	P3464.039
.157	5/32	22	4.0	P3464.040
.161		20	4.1	P3464.041
.165		19	4.2	P3464.042
.169		18	4.3	P3464.043
.173	11/64	17	4.4	P3464.044
.177		16	4.5	P3464.045
.181		14	4.6	P3464.046
.185		13	4.7	P3464.047
.189	3/16	12	4.8	P3464.048
.193		10	4.9	P3464.049
.197		9	5.0	P3464.050
.201		7	5.1	P3464.051
.205	13/64	5	5.2	P3464.052
.209		4	5.3	P3464.053
.213		3	5.4	P3464.054
.216			5.5	P3464.055
.220	7/32	2	5.6	P3464.056
.22				

Bore Dia.	Drill Sizes			Collet Number
	inch	No	mm	
Collets for Type 950†				
.079	5/64	47	2.0	P1052.020
.083		45	2.1	P1052.021
.087		44	2.2	P1052.022
.091		43	2.3	P1052.023
.094	3/32	42	2.4	P1052.024
.098		40	2.5	P1052.025
.102		38	2.6	P1052.026
.106		36	2.7	P1052.027
.110	7/64	35	2.8	P1052.028
.114		33	2.9	P1052.029
.118		32	3.0	P1052.030
.122		31	3.1	P1052.031
.126	1/8		3.2	P1052.032
.130		30	3.3	P1052.033
.134		29	3.4	P1052.034
.138			3.5	P1052.035
.142	9/64	28	3.6	P1052.036
.146		26	3.7	P1052.037
.150		25	3.8	P1052.038
.154		23	3.9	P1052.039
.157	5/32	22	4.0	P1052.040
.161		20	4.1	P1052.041
.165		19	4.2	P1052.042
.169		18	4.3	P1052.043
.173	11/64	17	4.4	P1052.044
.177		16	4.5	P1052.045
.181		14	4.6	P1052.046
.185		13	4.7	P1052.047
.189	3/16	12	4.8	P1052.048
.193		10	4.9	P1052.049
.197		9	5.0	P1052.050
.201		7	5.1	P1052.051
.205	13/64	5	5.2	P1052.052
.209		4	5.3	P1052.053
.213		3	5.4	P1052.054
.216			5.5	P1052.055
.220	7/32	2	5.6	P1052.056
.224			5.7	P1052.057
.228		1	5.8	P1052.058
.232			5.9	P1052.059
.236	15/64		6.0	P1052.060
.240			6.1	P1052.061
.244			6.2	P1052.062
.248			6.3	P1052.063
.252	1/4		6.4	P1052.064
.256			6.5	P1052.065
.260			6.6	P1052.066
.264	17/64		6.7	P1052.067
.268			6.8	P1052.068
.272			6.9	P1052.069
.276			7.0	P1052.070
.280	9/32		7.1	P1052.071
.283			7.2	P1052.072

Bore Dia.	Drill Sizes			Collet Number
	inch	No	mm	
Collets for Type 950 (cont'd)				
.287			7.3	P1052.073
.291			7.4	P1052.074
.295			7.5	P1052.075
.299	19/64		7.6	P1052.076
.303			7.7	P1052.077
.307			7.8	P1052.078
.311	5/16		7.9	P1052.079
.315			8.0	P1052.080
.319			8.1	P1052.081
.323			8.2	P1052.082
.327	21/64		8.3	P1052.083
.331			8.4	P1052.084
.335			8.5	P1052.085
.339			8.6	P1052.086
.342	11/32		8.7	P1052.087
.346			8.8	P1052.088
.350			8.9	P1052.089
.354			9.0	P1052.090
.358	23/64		9.1	P1052.091
.362			9.2	P1052.092
.366			9.3	P1052.093
.370			9.4	P1052.094
.375	3/8		9.5	P1052.095
Collets for Type 1250†				
.252	1/4		6.4	P2847.064
.256			6.5	P2847.065
.260			6.6	P2847.066
.264	17/64		6.7	P2847.067
.268			6.8	P2847.068
.272			6.9	P2847.069
.276			7.0	P2847.070
.280	9/32		7.1	P2847.071
.283			7.2	P2847.072
.287			7.3	P2847.073
.291			7.4	P2847.074
.295			7.5	P2847.075
.299	19/64		7.6	P2847.076
.303			7.7	P2847.077
.307			7.8	P2847.078
.311	5/16		7.9	P2847.079
.315			8.0	P2847.080
.319			8.1	P2847.081
.323			8.2	P2847.082
.327	21/64		8.3	P2847.083
.331			8.4	P2847.084
.335			8.5	P2847.085
.339			8.6	P2847.086
.342	11/32		8.7	P2847.087
.346			8.8	P2847.088
.350			8.9	P2847.089
.354			9.0	P2847.090
.358	23/64		9.1	P2847.091

Bore Dia.	Drill Sizes			Collet Number
	inch	No	mm	
Collets for Type 1250 (cont'd)				
.362			9.2	P2847.092
.366	9		.3	P2847.093
.370			9.4	P2847.094
.375	3/8		9.5	P2847.095
.378			9.6	P2847.096
.382			9.7	P2847.097
.386			9.8	P2847.098
.390	25/64		9.9	P2847.099
.394			10.0	P2847.100
.398			10.1	P2847.101
.402			10.2	P2847.102
.406	13/32		10.3	P2847.103
.410			10.4	P2847.104
.414			10.5	P2847.105
.418			10.6	P2847.106
.422	27/64		10.7	P2847.107
.425			10.8	P2847.108
.429			10.9	P2847.109
.433			11.0	P2847.110
.437	7/16		11.1	P2847.111
.441			11.2	P2847.112
.445			11.3	P2847.113
.449			11.4	P2847.114
.453	29/64		11.5	P2847.115
.457			11.6	P2847.116
.461			11.7	P2847.117
.465			11.8	P2847.118
.469	15/32		11.9	P2847.119
.472			12.0	P2847.120
.476			12.1	P2847.121
.480			12.2	P2847.122
.484	31/64		12.3	P2847.123
.488			12.4	P2847.124
.492			12.5	P2847.125
.496			12.6	P2847.126
.500	1/2		12.7	P2847.127
.504			12.8	P2847.128
.508			12.9	P2847.129
.512			13.0	P2847.130

Hydraulic Dashpots



"D" Model Dashpot

To order with hydraulic dashpots listed in the following chart, add "D" to the model number after the "L". Example: 21LD-XXX.

An asterisk (*) indicates the standard hydraulic dashpot provided with the tool when ordered with a dashpot.

When ordering a non-standard dashpot, add termination "-D2" or "-D3" to the model number to indicate a 2" or 3" dashpot (where available). Example: 21LD-XXX-D2 (2").

Part Number	Stroke		Tool Used On
	In.	mm	
*1024850	1	25	21L
1024851	2	51	21L
*1024852	2	51	31L & 42L
*1023636	3	76	46L

Hydraulic Adjusting Wrench

Part Number:1022148

Exhaust Deflectors



1022922 Exhaust Deflector



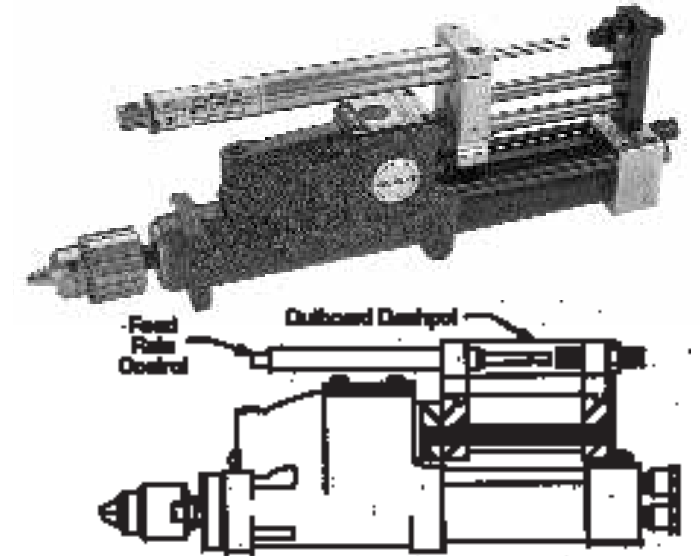
1024390 Deflector Assembly



1024078 Muffler

Part Number	Description	Tool Used On
1022922	Exhaust Deflector	21L, 31L, 42L
1024390	Deflector Assembly	21L, 31L, 42L
1024078	Muffler	21L, 31L, 42L

Outboard Dashpot (Optional)



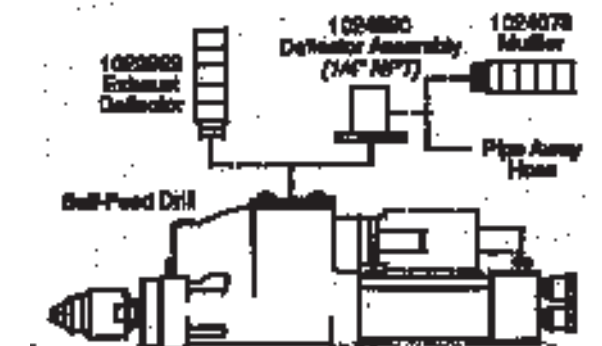
To order with outboard dashpots listed in the following chart, add "K" to the model number after the "L". Example: 21LK-XXX.

Note: The "K" style dashpot is not available on 46L series tools. The 46L series can only be equipped with the standard 3" (76mm) Hydraulic Dashpot (see chart above).

An asterisk (*) indicates the standard hydraulic dashpot provided with the tool when ordered with a dashpot.

When ordering a non-standard dashpot, add termination "-D2" or "-D3" to the model number to indicate a 2" or 3" dashpot (where available). Example: 21LK-XXX-D2 (2").

Part Number	Stroke		Tool Used On
	In.	mm	
*1024800	1	25	21L
1024801	1	25	31L & 42L
*1024802	2	51	31L & 42L
*1024822	3	76	31L & 42L



† Quotation required.

Chuck Body Assemblies

When ordering Chuck Body assemblies with the tool, add one of the three termination codes to the tool model (36, 01, or 62) as described below.

EXAMPLE: 21LD-802-01 would include 1/4" collet 208. Collet size variations from standard must be specified as a second line item order.



Part No.	Std. Collet	Mtg. Thread	Collet Range	Tool Used On
----------	-------------	-------------	--------------	--------------

300 Series - Termination 36

14-3050	1/4"	3/8"-24	3/64-1/4	21L, 31L, 42L
---------	------	---------	----------	---------------

200 Series - Termination 01

14-1151	1/4"	3/8"-24	1/8-3/8	21L, 31L, 42L
14-2131	1/4"	1/2"-20	1/8-3/8	46L

"K" Series - Termination 62

14-2132	3/8"	1/2"-20	1/8-1/2	46L
---------	------	---------	---------	-----

Series 200 Collets

When ordering a tool with a collet other than the standard included with one of the three termination codes, you must still order the tool with one of the termination codes plus a second item with the part number of the actual collet you need.



Part No.	Size	Capacity			
		Minimum		Maximum	
		in.	mm	in.	mm
203	3/32"	1/16	1.6	3/32	2.4
204	1/8"	3/32	2.4	1/8	3.2
205	5/32"	1/8	3.2	5/32	4.0
206	3/16"	5/32	4.0	3/16	4.8
207	7/32"	3/16	4.8	7/32	5.6
208	1/4"	7/32	5.6	1/4	6.4
209	9/32"	1/4	6.4	9/32	7.1
210	5/16"	9/32	7.1	5/16	7.9
211	11/32"	5/16	7.9	11/32	8.7
212	3/8"	11/32	8.7	3/8	9.5
213	6 mm	-	5.2	-	6.0
216	8 mm	-	7.2	-	6.0

† Quotation required

Series 300 Collets

When ordering a tool with a collet other than the standard included with one of the three termination codes, you must still order the tool with one of the termination codes plus a second item with the part number of the actual collet you need.



Part No.	Size	Capacity			
		Minimum		Maximum	
		in.	mm	in.	mm
301	3/64"	1/64	0.4	3/64	1.2
302	5/64"	3/64	1.2	5/64	2.0
303	3/32"	1/16	1.6	3/32	2.4
304	1/8"	3/32	2.4	1/8	3.2
305	5/32"	1/8	3.2	5/32	4.0
306	3/16"	5/32	4.0	3/16	4.8
307	7/32"	3/16	4.8	7/32	5.6
308	1/4"	7/32	5.6	1/4	6.4
310	6 mm	-	5.2	-	6.0
311	3 mm	-	2.2	-	-

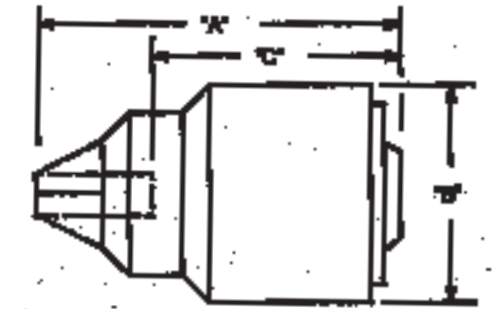
Series "K" Collets

When ordering a tool with a collet other than the standard included with one of the three termination codes, you must still order the tool with one of the termination codes plus a second item with the part number of the actual collet you need.



Part No.	Size	Capacity			
		Minimum		Maximum	
		in.	mm	in.	mm
120	1/8"	3/32	2.4	1/8	3.2
121	3/16"	5/32	4.0	3/16	4.8
122	1/4"	7/32	5.6	1/4	6.4
123	5/16"	9/32	7.1	5/16	7.9
124	3/8"	11/32	8.7	3/8	9.5
125	7/16"	13/32	10.3	7/16	11.1
126	1/2"	15/32	11.9	1/2	12.7
127	9/16"	17/32	13.5	9/16	14.3
133†	6mm	-	5.2	-	6.0
134	8mm	-	7.2	-	8.0
135	10mm	-	9.2	-	10.0
136†	12mm	-	11.2	-	12.0

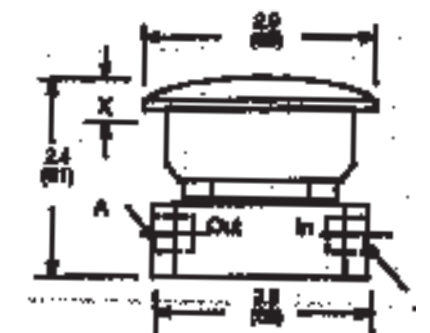
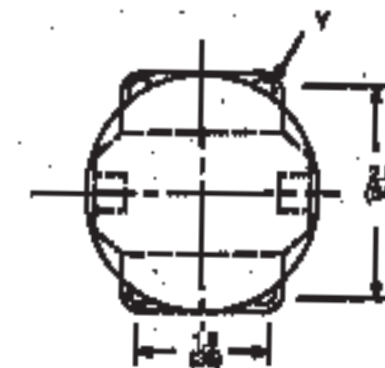
Industrial 3-Jaw Chucks



Number	Term	Mount	Cap.	"A"		"B"		"C"	
				in.	mm	in.	mm	in.	mm
21LD Series Only									
1005953	—	#OJT	5/32	1.09	28	0.850	22	0.59	15
21LD, 31LD, & 42LD Series									
1005078	-38	3/8-24	1/4	1.56	40	1.117	28	0.93	24
1001505	-42	3/8-24	1/4HD	1.71	43	1.290	33	1.02	26
1004422	-43	3/8-24	3/8HD	2.16	55	1.670	42	1.09	28
1001252	-51	3/8-24	3/8	1.93	49	1.420	36	1.09	28
1009726	-53	3/8-24	1/2	2.42	61	1.790	45	1.28	33
46LD Series									
1005398†	-38	1/2-20	1/4	1.75	44	1.320	34	1.08	27
1005000	-47	1/2-20	3/8	1.93	49	1.420	36	1.13	29
1005020†	-51	1/2-20	3/8	2.31	59	1.790	45	1.36	35
1000434	-53	1/2-20	1/2	2.42	61	1.790	45	1.28	33

† Quotation required

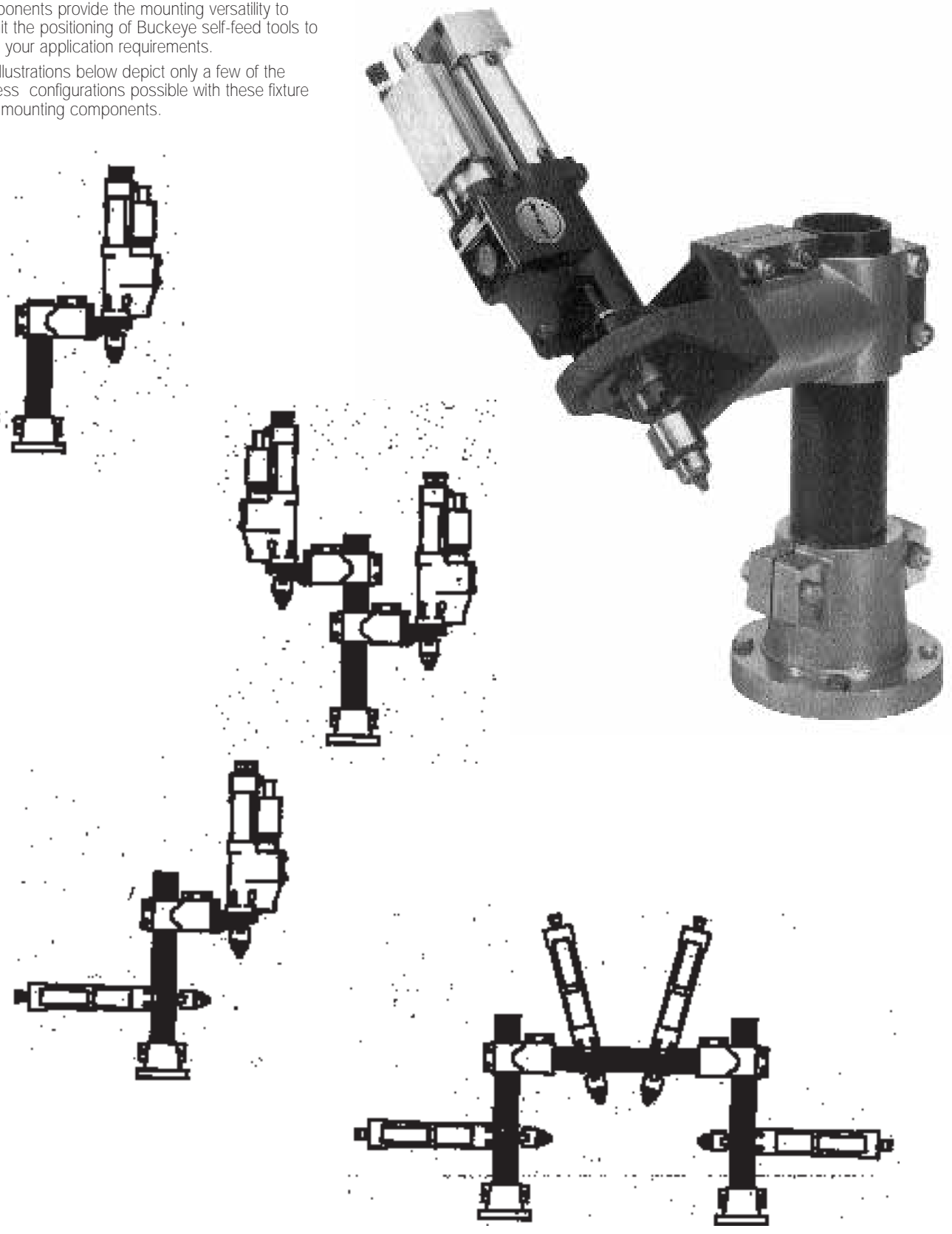
1022162 Remote Start Valve



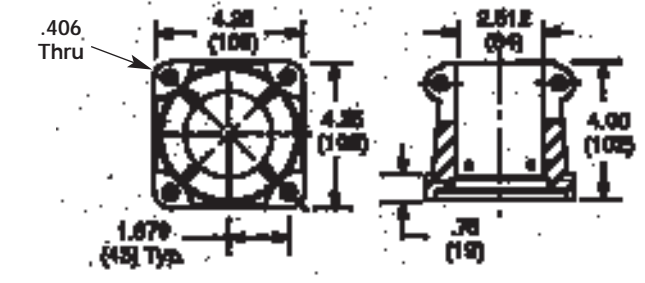
Dimension	Description
A	1/4" Outlet Port
P	1/4" Inlet Port
X	.2" (5.1mm) Travel
Y	.28" (7.1mm) Dia. - 4 Places

Cooper Power Tools' fixture post mounting components provide the mounting versatility to permit the positioning of Buckeye self-feed tools to meet your application requirements.

The illustrations below depict only a few of the endless configurations possible with these fixture post mounting components.

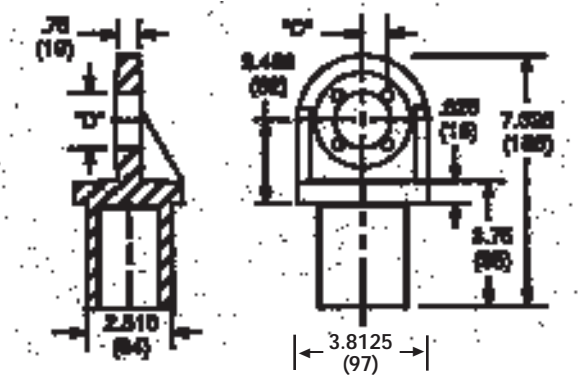


1110493 Base Mount Assembly

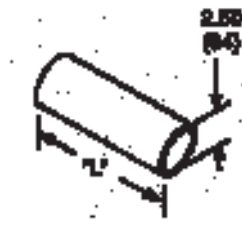


Tool Mount Assembly

Designed to hold Buckeye 21L, 31L, 42L and 46L Self-Feed Drills.



1110496-(XX) Mounting Tube

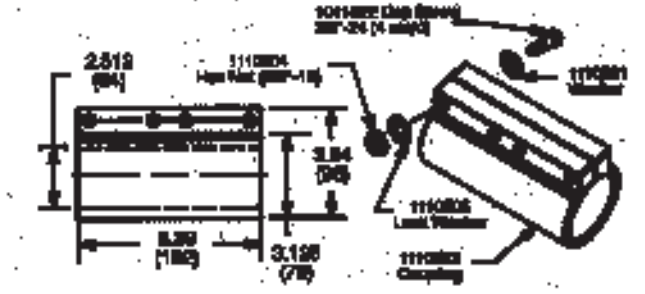


Tube Part No.	Length "L"	
	in.	mm
1110496-06†	6	152
1110496-12	12	305
1110496-18†	18	457
1110496-24	24	610
1110496-30†	30	762

* Longer tubes available upon request.
† Quotation required

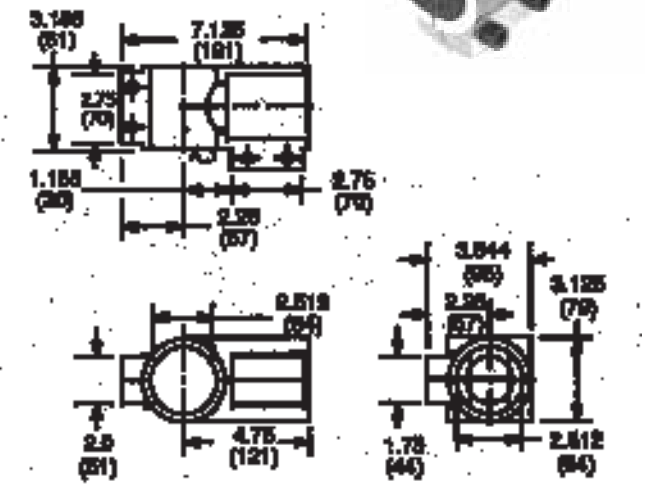
1110553 Coupling Assembly

Used in conjunction with mounting tubes to permit elongation of mounting assembly either horizontally or vertically.

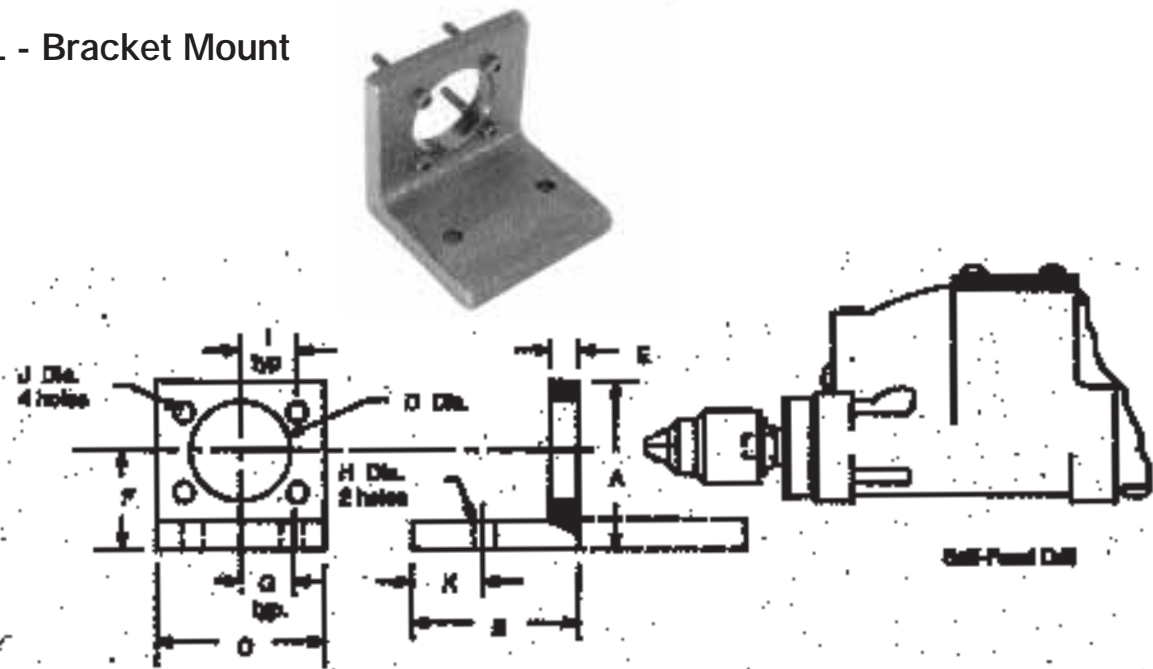


1110495 Tee Mount

Forms a right angle from mounting tube to allow for proper positioning of the tool to the workpiece.



L - Bracket Mount

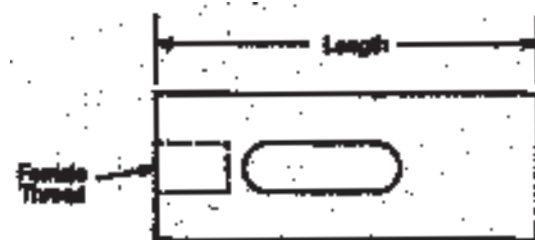


Part No.	Tool Series	Dimensions											
		A		B		C		D		E		F	
		in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
1021862	21L	3.00	76	3.00	76	3.00	76	1.626	41	.438	11	1.75	44
1023793	31L, 42L	3.00	76	3.00	76	3.00	76	1.875	48	.438	11	1.88	48
1024262	46L	4.13	105	3.50	89	3.88	99	2.502	64	.563	14	2.50	64

Part No.	Tool Series	Dimensions Continued									
		G		H		I		J		K	
		in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
1021862	21L	1.00	25	.328	8.3	0.719	18	.196	5.0	1.75	44
1023793	31L 42L	1.00	25	.328	8.3	0.844	21	.196	5.0	1.75	44
1024262	46L	1.48	38	.344	8.7	1.094	28	.265	6.7	2.13	54

Morse Taper Adapter (female thread)

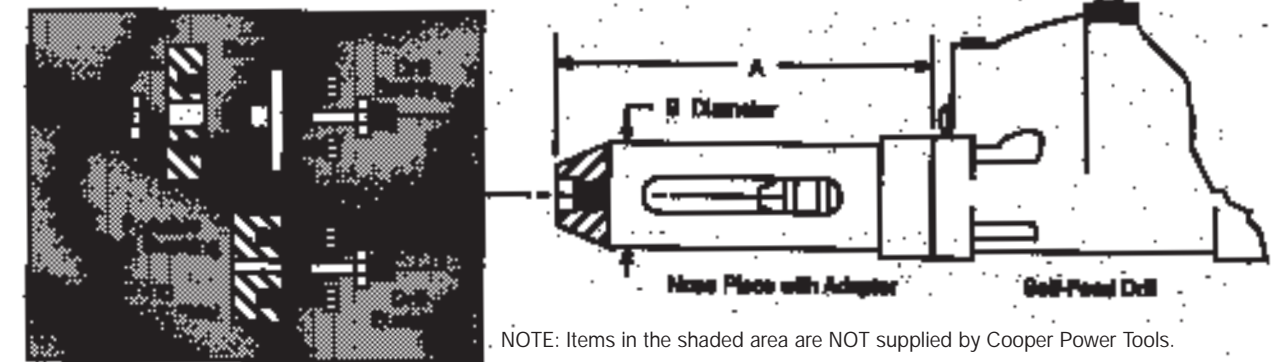
For use with 46L series tools only. Order as a second line item with a tool termination code of -40.



Part No.	Description	Thread	Length	
			in.	mm
529279†	#1 Morse Taper	1/2"-20	3.69	94
527989	#2 Morse Taper	1/2"-20	4.12	105

† Quotation required

Aircraft Nose Mount



NOTE: Items in the shaded area are NOT supplied by Cooper Power Tools.

Part No.	A		B		Series	Description
	in.	mm	in.	mm		
Tool Used On 21LD						
1025199	5.41	137	1.69	43	24000	Aluminum Material
1024259	6.50	165	1.69	43	21000	Aluminum Material
1024258	5.41	137	1.69	43	21000	Aluminum Material
1025302	7.00	178	1.69	43	21000	Aluminum Material
1025433	7.50	191	1.69	43	21000	Aluminum Material

Tool Used On 31LD, 42LD						
1025097	7.72	196	2.00	51	21000	Aluminum Material
1024260	7.72	196	2.00	51	22000	Aluminum Material
1024261	7.72	196	2.00	51	23000	Aluminum Material
1025351	7.44	189	2.00	51	21000	Steel Material (includes 1024823 Adapter)
1025352†	7.69	195	2.00	51	22000	Steel Material (includes 1024823 Adapter)
1025353	7.69	195	2.00	51	23000	Steel Material (includes 1024823 Adapter)
1025354†	7.69	195	2.00	51	24000	Steel Material (includes 1024823 Adapter)
1019119	7.72	196	2.00	51	21000	Aluminum Material (vacuum pick-up)
1019120†	7.72	196	2.00	51	22000	Aluminum Material (vacuum pick-up)
1019121†	7.72	196	2.00	51	23000	Aluminum Material (vacuum pick-up)
1019122†	7.72	196	2.00	51	24000	Aluminum Material (vacuum pick-up)

Tool Used On 46LD						
1024266†	10.22	260	2.48	63	22000	Steel Material (includes 1015949 Adapter)
1024265†	10.22	260	2.48	63	23000	Steel Material (includes 1015949 Adapter)
1024264†	10.22	260	2.48	63	24000	Steel Material (includes 1015949 Adapter)
1024263†	10.22	260	2.48	63	25000	Steel Material (includes 1015949 Adapter)

† Quotation Required

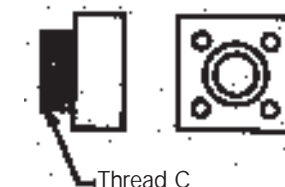
Aircraft Nose Adapters



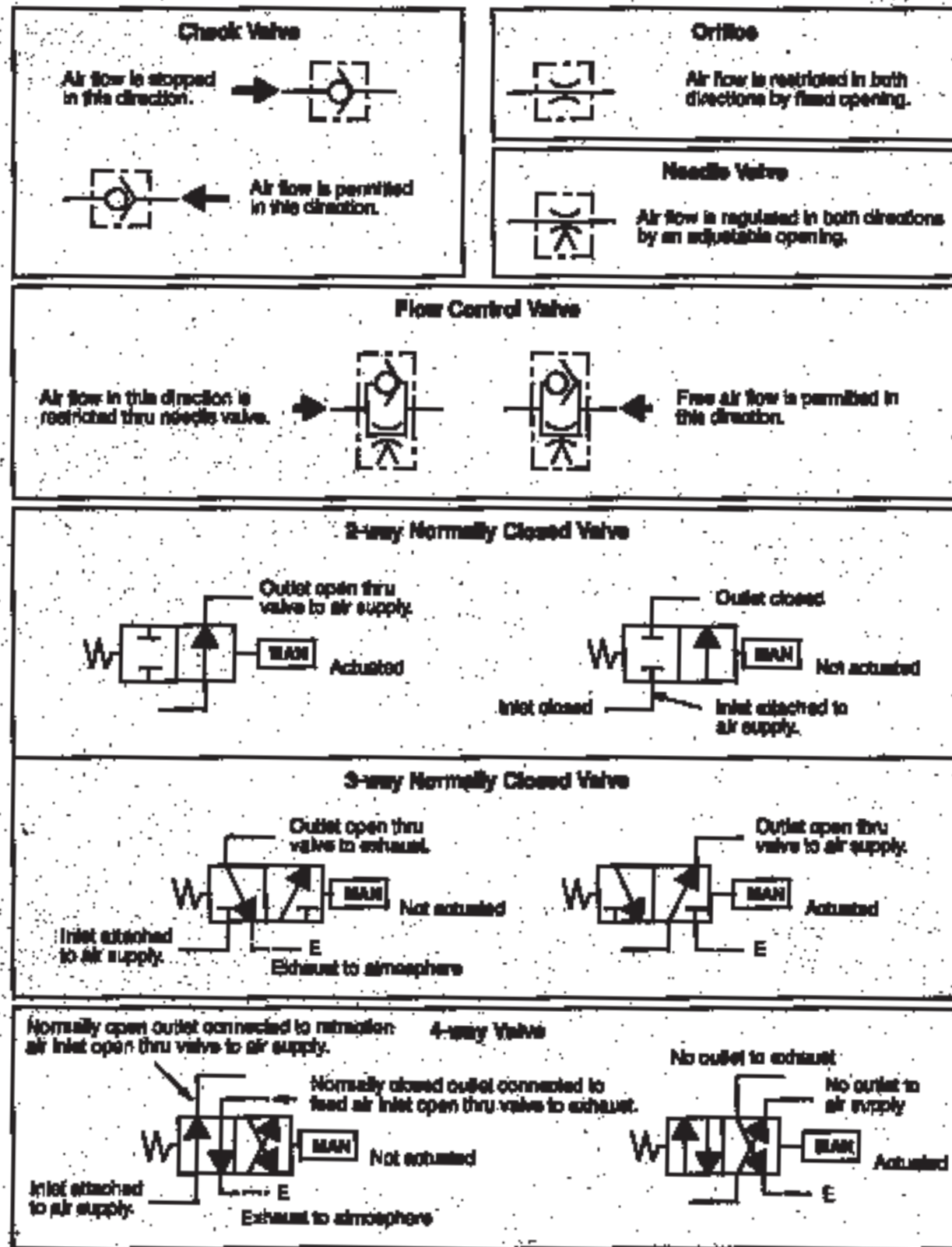
Part No.	Thread C	Description
Tool Used On 31L, 42L		
1024823	1.825"-18 L.H.	Threaded Adapter - Steel Material

Tool Used On 46L		
1015949	2.250"-20 L.H.	Threaded Adapter - Steel Material

NOTE: Adapters are included with the aircraft nose as required.



Valve Schematic Descriptions

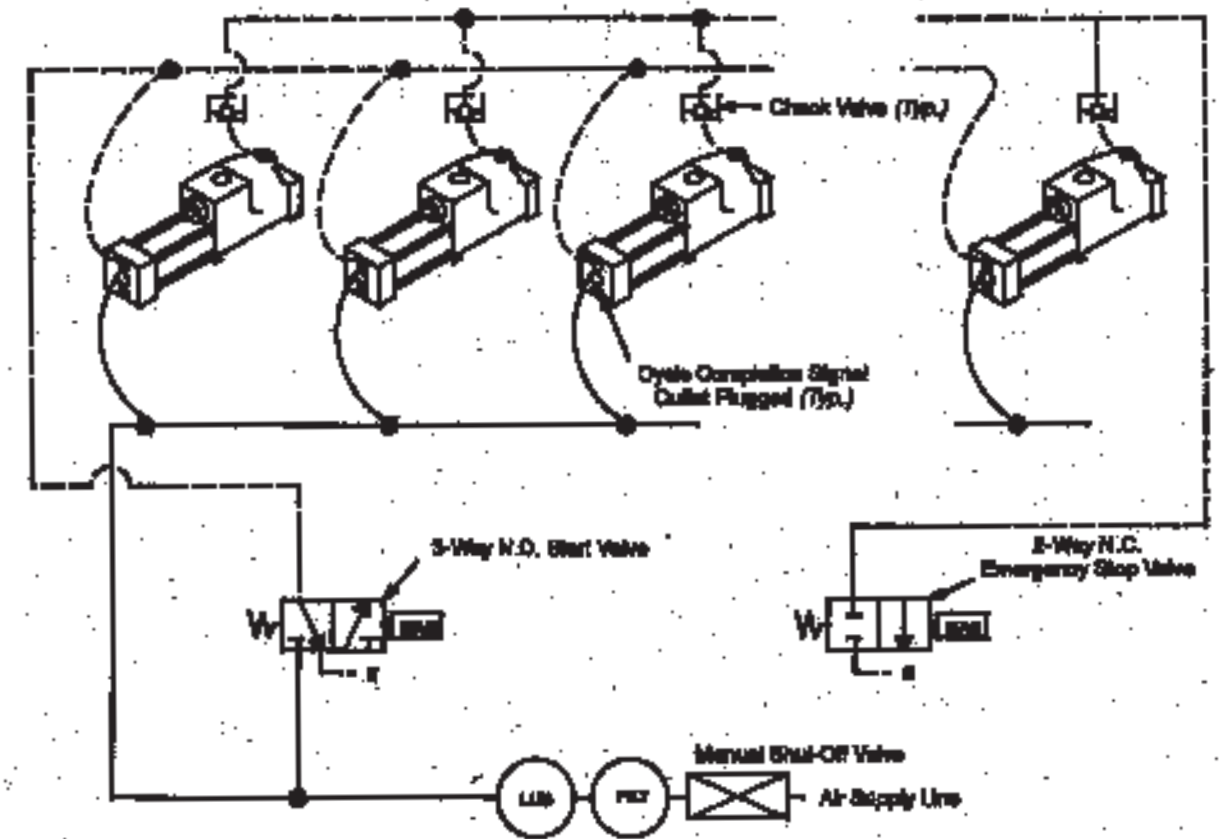


Multiple 800 Series Tools with Emergency Retract

SEQUENCE OF OPERATIONS

To start cycle: Momentarily depress start valve (green button) thus pressurizing the start signal inlet and pilot chamber in each tool. Tools retract automatically individually as front pilot valve is engaged.

To stop cycle: Remotely depress stop valve (red button) exhausting start signal circuit of each tool and retracting tools to normal start position.



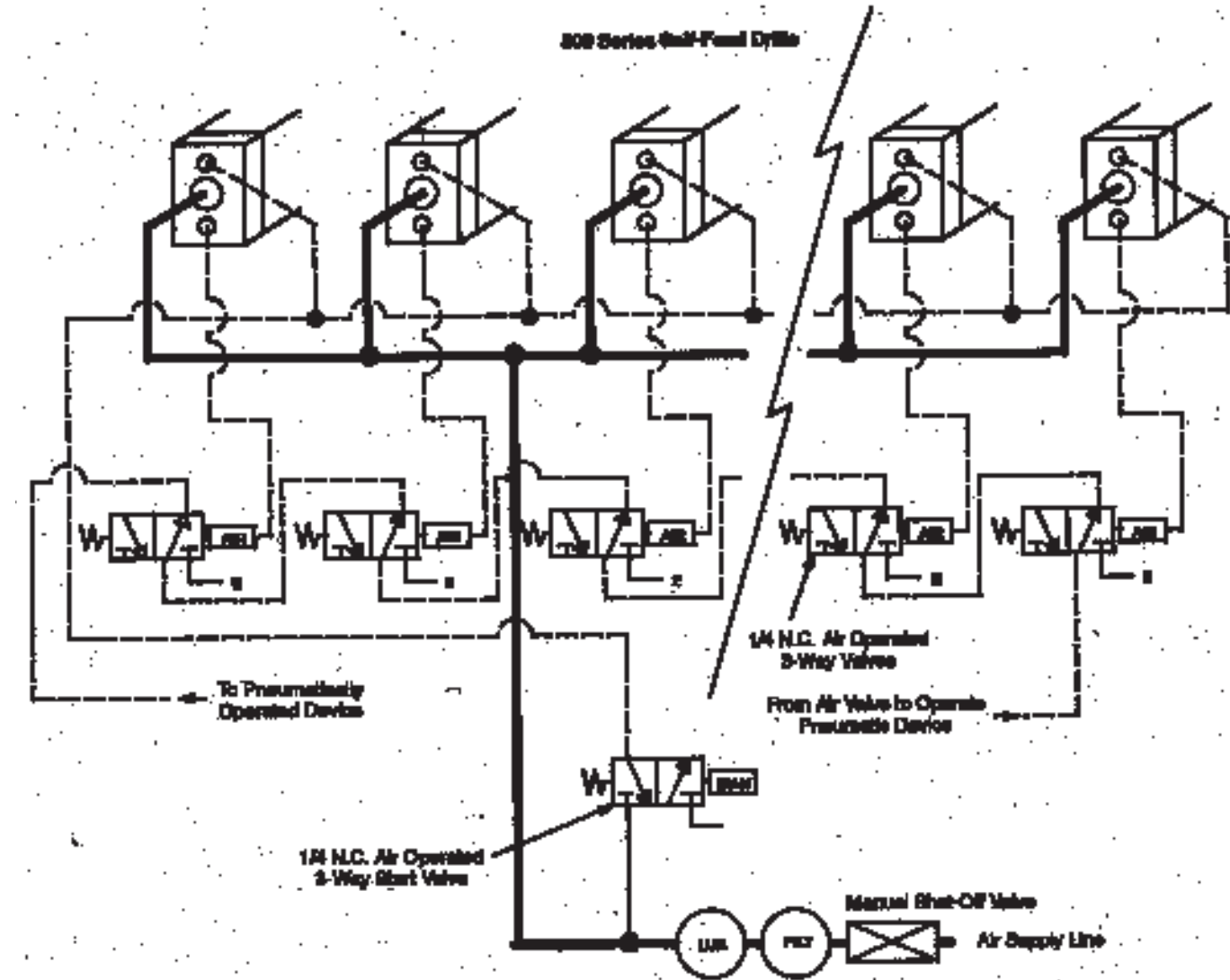
Required	Identification	Description
1	Check Valve	1/4" (6.4mm) check valve male pipe threads at both ends.
1	3-way N.C. start valve	1/4" (6.4mm) 3-way normally closed manually actuated valve (green palm button)
1	2-way N.C. emergency stop valve	1/4" (6.4mm) 2-way normally closed manually actuated valve (red palm button)

Component List

Multiple 800 Series Tools with Cycle Completion Circuit

SEQUENCE OF OPERATIONS

Momentarily depressing manual 3-way valve pressurizes the start signal inlets of the 800 series tools, thus starting the tools and exhausting the cycle completion signal outlets.



Required	Description
1	1/4" (6.4mm) 3-way normally closed palm button operated valve
One for each tool	1/4" (6.4mm) 3-way normally closed air operated valve

Multiple 800 Series Tools with Clamping Cylinder

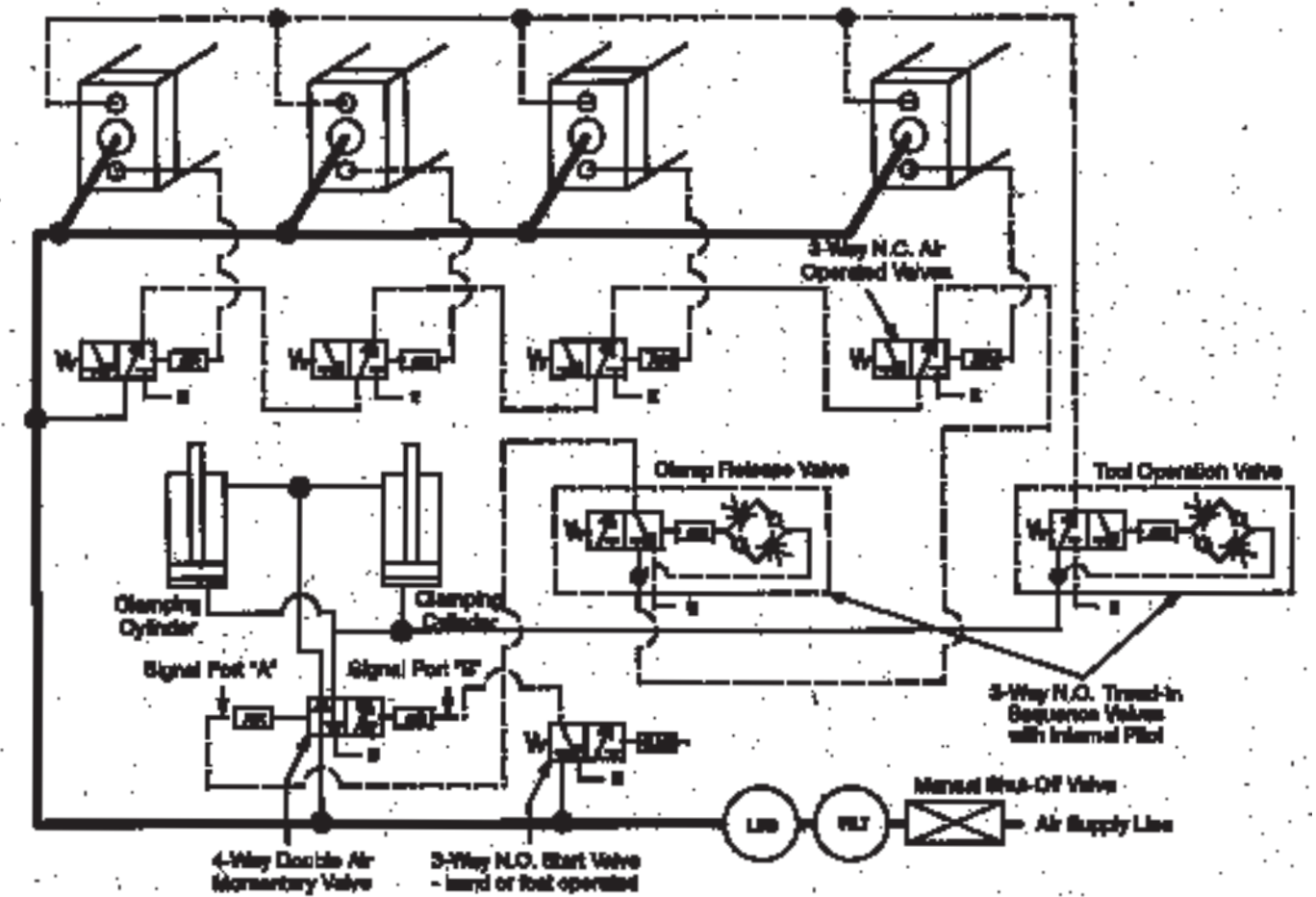
SEQUENCE OF OPERATIONS

Momentary depression of start valve pressurizes the "B" signal port of the 4-way valve, thus shifting it to operate the clamping cylinders. An air line leading from the clamp side of these cylinders sends pressurized air to the inlet port of the tool operation sequence valve. This normally open 3-way valve has the timed operator set for a time delay on operation, thus when pressure is applied to the inlet port, the valve remains open. At the same time air is metered through the sequence head. After the preset delay, inlet closes and outlet opens to exhaust. This action sends a momentary pressure to the start signal inlet of the self-feeding tools, thus starting their cycle of operation.

When the tools return to their fully retracted position, a continuous

pressure is sent from the cycle completion assembly to the operators of their respective 3-way air operated valves. As the last tool is completely retracted, the pressurized air series circuit is again open pressurizing the inlet of the clamp release valve.

This too is a normally open 3-way sequence valve that sends a momentary signal thru it when its inlet is pressurized. The outlet of the clamp release valve is connected to signal port "A" of the 4-way valve. When this outlet is momentarily pressurized it returns the 4-way valve to its normal position where air is exhausted from the clamp side of the clamping cylinders and air is sent into the release side. Thus releasing the clamp.



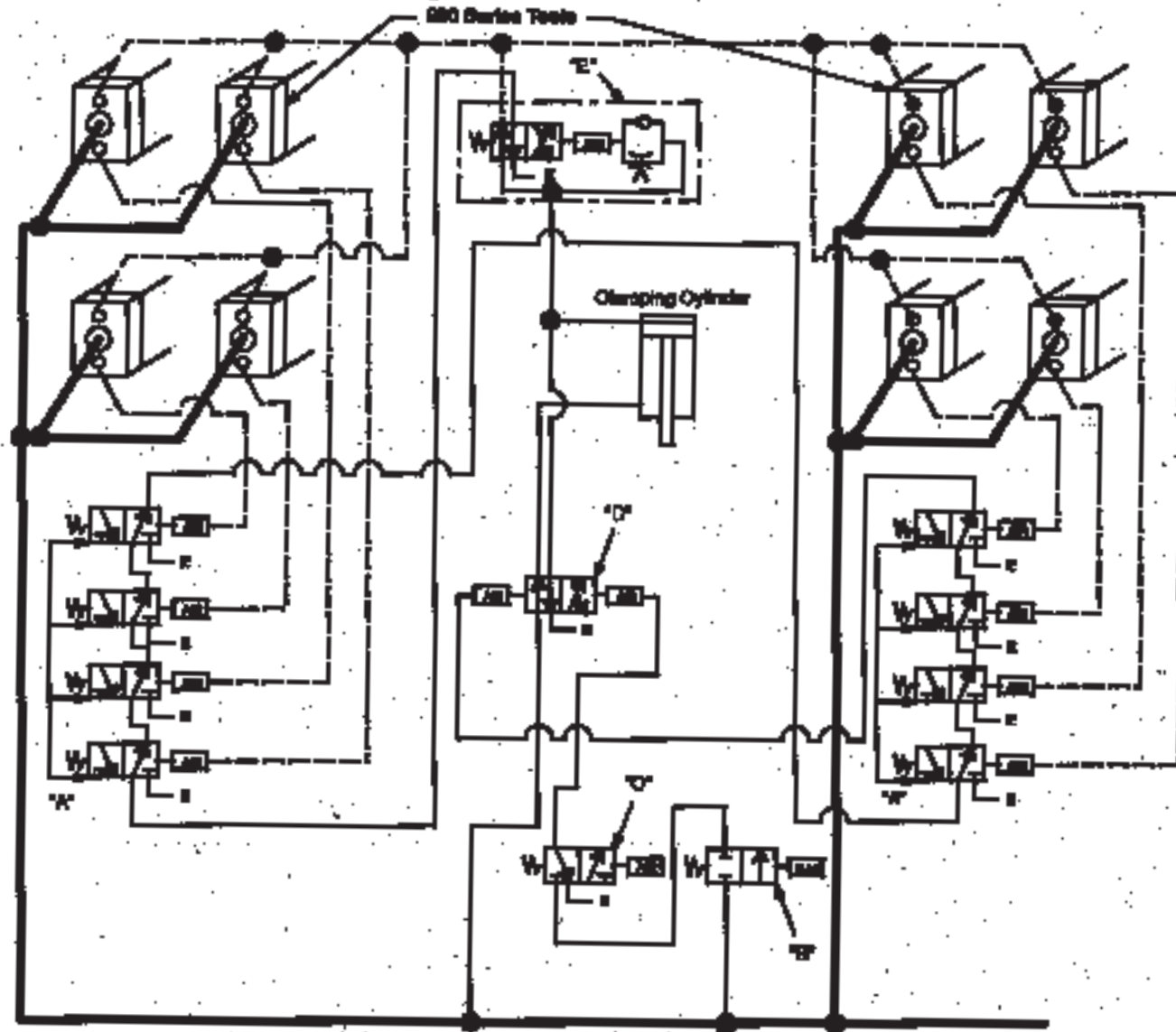
Required	Description
1 per tool	3-way N.C. air operated
2	3-way N.O. timed-in sequence
1	4-way double air momentary
1	3-way N.C. start

Two Groups Of Four 800 Series Tools Arranged To Sequence In Conjunction With Clamping Cylinder

SEQUENCE OF OPERATIONS

1. Push start button.
2. Clamp cylinder closes.
3. Tools feed and retract.
4. Clamp cylinder releases.

To stop cycle: Remotely depress stop valve (red button) exhausting start signal circuit of each tool and retracting tools to normal start position.



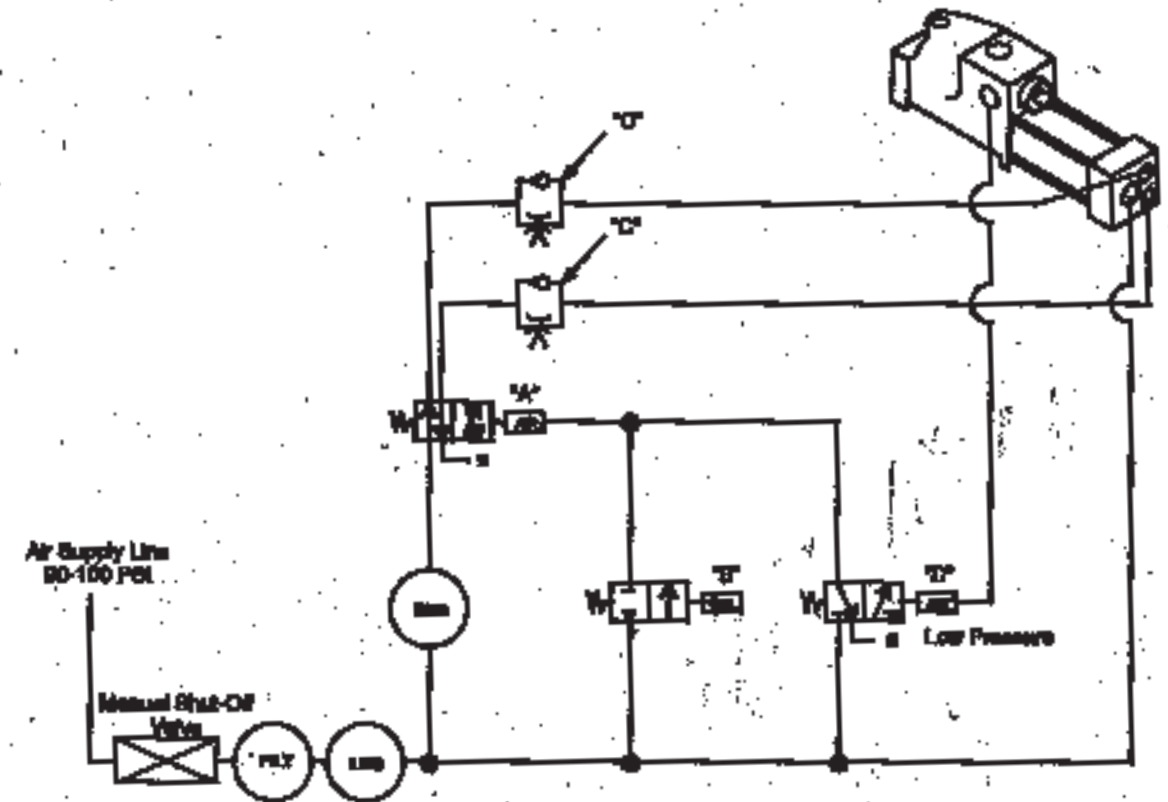
Symbol	Quantity	Description
Component List		
A	8	1/8" (3.2mm) 3-Way N.C. air operated valve
B	1	1/4" (6.4mm) 2-Way N.C. palm button valve
C	1	1/4" (6.4mm) 3-Way N.C. palm button valve
D	1	1/4" (6.4mm) 4-Way double air momentary valve
E	1	1/4" (6.4mm) 4-Way air operated timed sequence valve (TDF)

Self-Feeding Torque Control Shut Off Fastening Tools

SEQUENCE OF OPERATION

Valve "B" is momentarily actuated either manually or automatically. It in turn pressurizes the pilot chamber of valve "A", sending line pressure to the back side of the feed cylinder. As the piston starts its forward stroke it opens the built-in motor air valve and starts the motor. The motor exhaust will signal valve "D" to open, holding valve "A" in its present position until the screw is torqued up, and the motor shuts off. Valve "D" then shifts back to exhaust and allows valve "A" to shift, which retracts the tool. The tool then resets itself for the next cycle.

Feed rate of the tool must be adjusted to coincide with the advance of the fastener being driven. Therefore, it is recommended that a hydraulic dashpot be employed for precise feed rate control.



Symbol	Quantity	Description
Component List		
A	1	1/4" (6.4mm) 4-Way air actuated valve
B	1	1/4" (6.4mm) 2-Way N.C./Base, Grommet
C	2	1/8" (3.2mm) Flow control valve
D	1	1/4" (6.4mm) 3-Way N.C. air operated valve ultra low pilot

1021662 Hydraulic Filler Gun

Used with all tools equipped with a Dashpot.



45-0982 Push Type Grease Gun



Lubricants

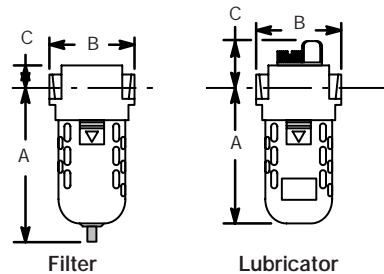
Part Number	Size	Description	M.S.D.S. No.
Oils			
540397	1 qt. plastic	Air Line Oil	CPT-153
533485	1 gal. metal	Air Line Oil	CPT-153
536333	1 gal. metal	High Film Strength Air Line Oil	CPT-154
26185	4 oz. tube	O-Ring Lubricant	CPT-144
1021775	1 qt.	Hydraulic Fluid	CPT-158
Greases			
513156	16 oz. can	Teflon Grease (Gear Cage)	CPT-145
540395	2 oz. tube	Teflon Grease (Gear Cage)	CPT-145
540394	8 oz. tube	Molykote Gear Grease (Angle Head)	CPT-146

NOTE: Under normal conditions of use, lubrication products sold separately for or used within these tools should not cause an exposure hazard. Refer to the Material Safety Data Sheet (M.S.D.S.) for Safety and Disposal information.

M.S.D.S. sheets shown in the above chart are available upon request from Cooper Power Tools.

Filters, Lubricators

Modular Construction



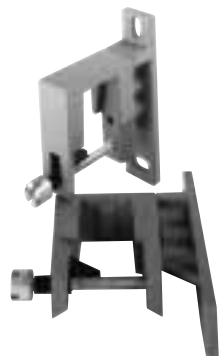
Model Number	NPT in.	Air Flow		Bowl Capacity		"A"		"B"		"C"	
		SCFM	m ³ /min	oz.	liter	in.	mm	in.	mm	in.	mm

Filters											
F02-M	1/4	35	9.9	5.0	0.15	5.6	142	3.0	76	0.9	23
F03-M	3/8	44	12.9	5.0	0.15	5.6	142	3.0	76	0.9	23

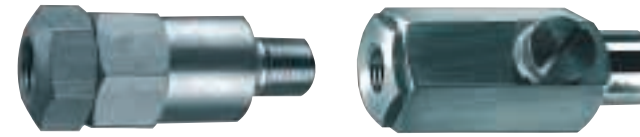
Lubricators - Economist (Standard Mist)											
L03-EP	3/8	48	6.2	5.0	0.15	4.8	122	3.0	76	1.6	41

Modular Sleeve & Bracket (with O-Ring)

Model: MS-102
Combination sleeve/wall mounting bracket as shown. Designed for mounting a single unit or combination of units directly to the wall. The sleeve and mounting bracket can be ordered assembled at the factory, or just the mounting bracket alone to be used on existing modular sleeves.



Airline Filter and Lubricator



Part Number	Description	NPT in.	Air Flow		Max. Pressure	
			SCFM	m ³ /min	psig	bar
45-0211	Filter w/cartridge*	1/4	17	8.0	100	6.9
45-0212	Filter cartridge	-	-	-	-	-
45-0201	Lubricator**	1/4	22	10	100	6.9
45-0301	Lubricator**	3/8	22	10	100	6.9

GENERAL: Use where inconvenient for standard filter or lubricator.

* NOTE: Filter will not remove water.

** NOTE: One ounce reservoir good for an average eight hour shift.



Air Hoses

Part Number	Hose I.D.		Fittings (NPT)		Length	
	in.	mm	in.	mm	ft.	m
A139856	3/16	4.7	1/8	1/8	6.0	1.8
45-1307	3/16	4.7	1/8	1/4	7.0	2.1
45-1408	1/4	6.4	1/4	1/4	8.0	2.4
45-1409	1/4	6.4	1/8	1/4	8.0	2.4
45-1508	5/16	7.9	1/4	1/4	8.0	2.4
45-1610	3/8	9.5	3/8	3/8	10	3.0
45-1810	1/2	12.7	3/8	1/2	10	3.0
45-1812	1/2	12.7	1/2	1/2	12	3.7
45-1825	1/2	12.7	1/2	1/2	25	7.6

GENERAL: 3/16" & 1/4" hoses have braided covers, all others have neoprene covers.

* NOTE: 3/8"-24 is a straight thread

Steel Handle Bushings

Part Number	Size
881276	*1/4 in. MPT x 1/4 in. FPT
841554	†1/4 in. MPT x 1/4 in. FPT
841553	3/8 in. MPT x 1/4 in. FPT
841552	3/8 in. MPT x 3/8 in. FPT
841551	1/2 in. MPT x 3/8 in. FPT
841555	1/2 in. MPT x 1/2 in. FPT
841556	3/4 in. MPT x 3/4 in. FPT

* Light duty for rotary tools

† Heavy duty for percussion tools.

Swivel Hose Couplings

Part Number	NPT in.
A20744	1/4
A20741	3/8
A20764	1/2



Air Pressure Gage Kit

Part Number	Description
A13157	Gage, needle, cap & case



Quick Disconnect Fittings

Fitting Type*	NPT in.	Nominal Size		
		1/4"	3/8"	1/2"

Coupler (male NPT)

	1/8	45-0710	-	-
	1/4	45-0711	45-0713	-
	3/8	45-0712	-	-
	1/2	-	-	45-0717

Coupler (female NPT)

3/8	45-0732	45-0734	45-0736
-----	---------	---------	---------

Nipple (male NPT)

	1/8	45-0720	-	-
	1/4	-	45-0724	-
	3/8	45-0722	45-0725	45-0726
	1/2	-	-	45-0727

Nipple (female NPT)

	1/4	-	45-0744	-
	3/8	45-0742	45-0745	45-0746
	1/2	-	-	45-0747

Nipple (with hose barbs)

	1/4**	45-0748	-	-
	1/2**	-	-	45-0753

* NOTE: Nipples of one size will not fit couplers of another size.

** NOTE: Indicates inside diameter of hose.

NOTE: 1/4" nominal will pass 49 cfm free air @ 90 psi, but pressure drop exceeds 10 psi with air flow over 30 cfm.

3/8" nominal will pass 90 cfm free air @ 90 psi, but pressure drop exceeds 10 psi with air flow over 53 cfm.

1/2" nominal will pass 168 cfm free air @ 90 psi, but pressure drop exceeds 10 psi with air flow over 109 cfm.



Activeswivel

Part No.	NPT in.	Air Flow		Max. Pressure		Weight	
		SCFM	m ³ /min	psig	bar	lbs.	kg
SW-102	1/4	25	7.1	150	10.4	0.20	0.09
SW-103	3/8	45	12.7	150	10.4	0.40	0.18
SW-104	1/2	65	18.4	150	10.4	0.80	0.36
SWR-102*	1/4	25	7.1	150	10.4	0.25	0.11

* NOTE: Equipped with built-in flow regulator.

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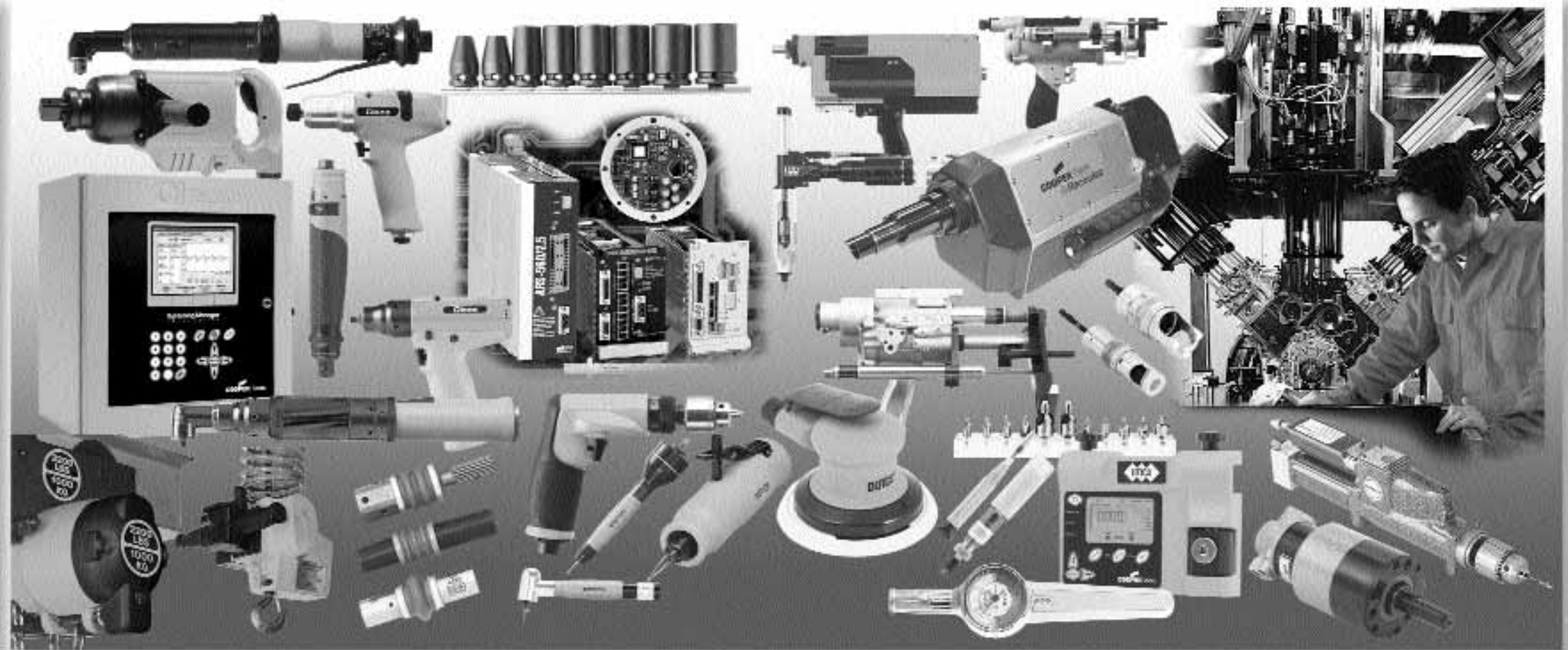
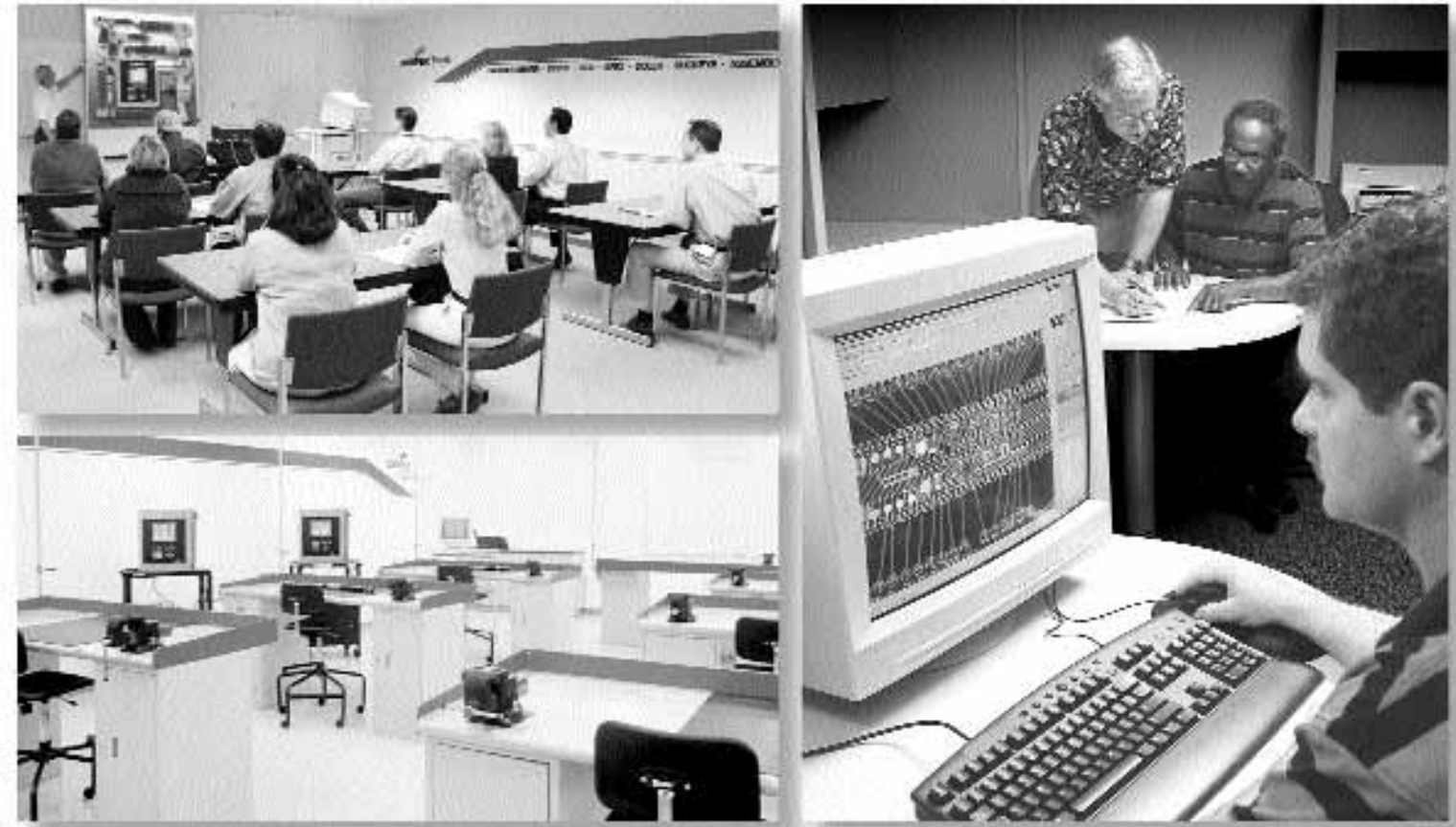
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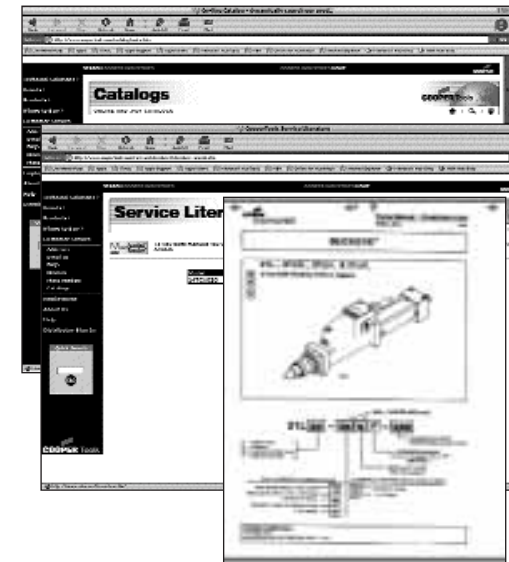
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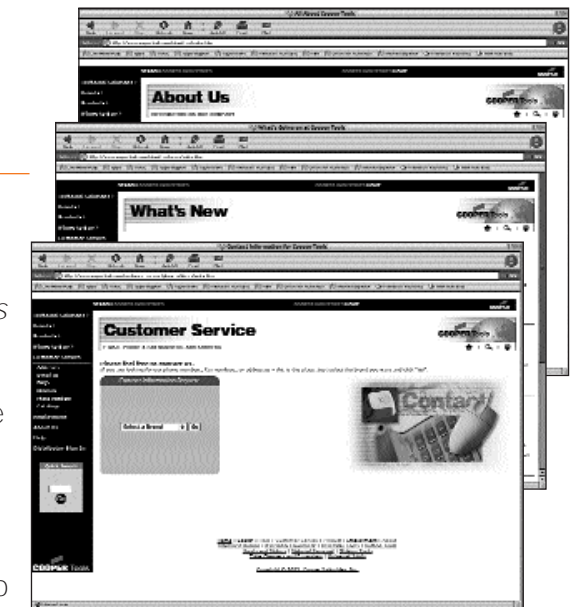
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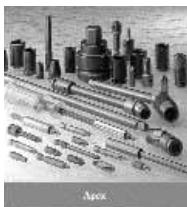
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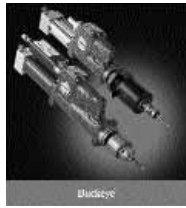


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