Hougen®-Ogura™

PUNCH PRO™ ELECTRO-HYDRAULIC HOLE PUNCHER

OPERATOR'S MANUAL

Model 75003

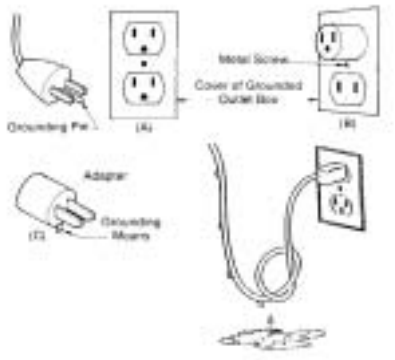
IMPORTANT SAFETY INSTRUCTIONS

WARNING: When using electric tools, basic safety precautions should always be followed to reduce the risk of fire, electric shock, and personal injury, including the following.

1. READ ALL INSTRUCTIONS

2. Grounding Instructions

2a. This tool should be grounded while in use to protect the operator from electric shock. The tool is equipped with a 3-conductor cord and 3-prong grounding type plug to fit the proper grounding type receptacle. The green (or green and yellow) conductor in the cord is the grounding wire. Never connect the green or green and yellow wire to a live terminal. If your unit is for use on 115V, it has a plug that looks like that shown in sketch (A). If it is for use on 230V, it has a plug that looks like that shown in sketch (D). An adapter, see sketches (B) and (C), is available for connecting sketch (A) type plugs to 2-prong receptacles. The green-colored rigid ear, lug, or the like extending from the adapter must be con nected to a permanent ground, such as a properly grounded outley box. No adapter is aavailable for a plug as shown in sketch (D). **NOTE: Use of a grounding adapter is prohibited in Canada by Part 1 of the Canadian Electrical Code.**



2b. Extension Cords

Use only 3-wire extension cords that have 3-prong grounding type plugs and 3-pole receptacles that accept the tool's plug. Replace or repair damaged cords. Make sure the conductor size is large enough to prevent excessive voltage drop will cause loss of power and possible motor damage

3. FOR ALL DOUBLE-INSULATED TOOLS

When servicing use only identical replace ment parts.

4. Keep Work Area Clean

Cluttered areas and benches invite injuries.

5. Consider Work Area Environment

Do not expose tool to rain
Do not use tool in damp or wet locations.Keep work area well lit.
Do not use tool in presence of flammable liquids or gases.

6. Guard Against Electric Shock

Prevent body contact with grounded sur faces. For example: pipes, radiators, ranges, refrigerator enclosures.

7. Keep Children Away

Do not let visitors contact tool or extension cord. All visitors should be kept away from work area.

8. Store Idle Tools

When not in use, tools should be stored in a dry high or locked-up place-out of reach of children.

9. Do Not Force Tool

It will do the job better and safer at the rate for which it was intended.

10. Use Right Tool

Do not force small tool or attachment to do the job of a heavy-duty tool. Do not use tool for purpose not intended.

11. Dress Properly

Do not wear loose clothing or jewelry. They can be caught in moving parts. Rubber gloves and non skid footwear are recommended when working outdoors. Wear protective hair covering to contain long hair.

12. Always wear safety glasses or googles.

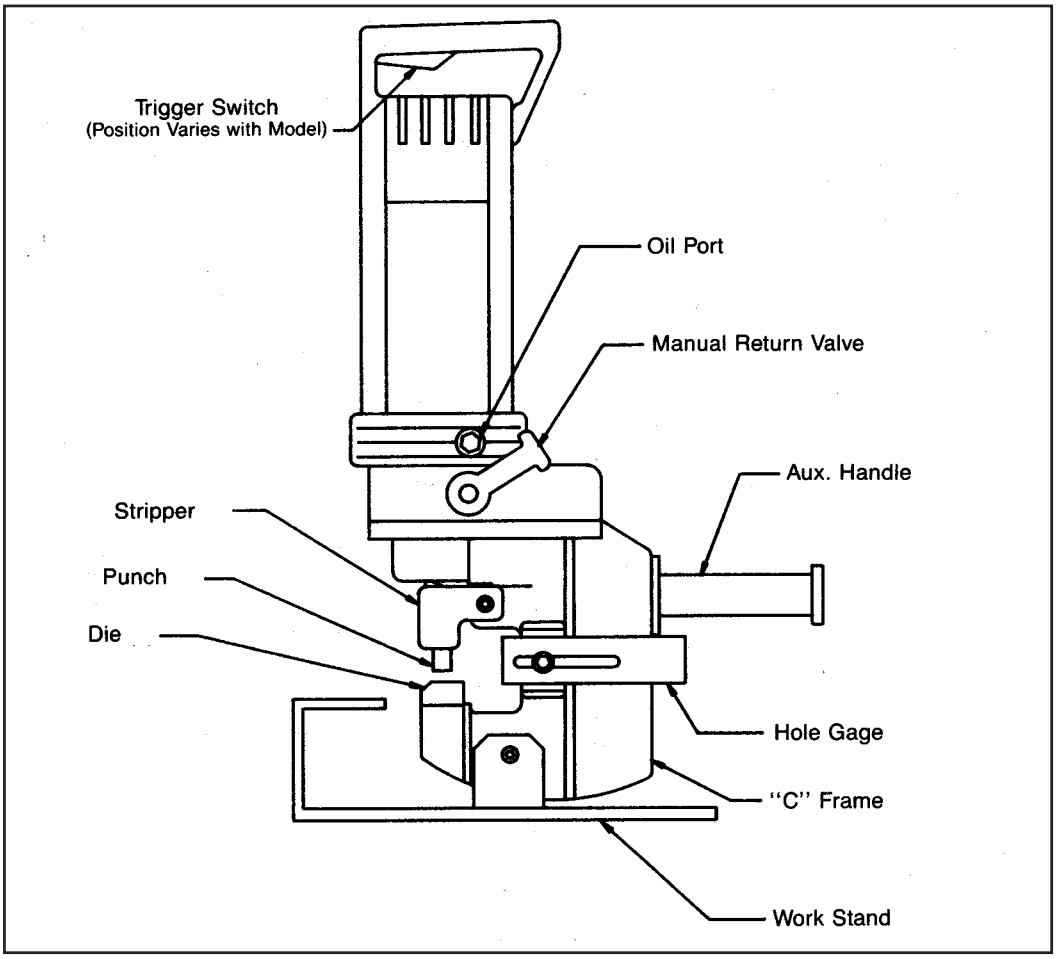
13 Do Not Abuse Cord.

Never carry tool by cord or yank it to disconect from receptacle. Keep cord from heat, oil and sharp edges.

PRINCIPLES OF OPERATION

The Hougen-Ogura Electro-hydraulic Hole Puncher is an integrated unit, containing the electric motor, hydraulic pump, and “C”-frame punching unit. It uses hydraulic power to force the punch through the workpiece, and a strong spring to return the punch piston to its “home” position. The patented design includes an automatic valve that releases the hydraulic pressure when the punch piston is at the bottom of its stroke. The automatic valve remains open until the punch piston has fully returned to the home position.

As a result of this design, the psiton will not return to its home position automatically unless the full stroke has been completed. Also, the punch will not begin another stroke unless the punch has fully returned to the home position, resetting the automatic valve. To allow the punch piston to be manually returned in the event that the punch cycle is stopped prior to completion, a manual return valve is provided. (See Item #15 on the parts breakdown.



HOLE LOCATOR GAGE ADJUSTMENT

The Hole locator Gage (6) can be set to hold the Hole Punches at a constant distance from the edge of the workpiece. The gage is held in place by one or two socket head caps screws. Before making any adjustment, first, unplug the power cord. To adjust the position of the gage, loosen the cap screw(s), tap the gage into the desired position and re-tighten the cap screw(s).

USING THE WORK STAND

All models can be used with an accesory work stand for bench or table mounting of the Hole Puncher. The stand is standard with all models. To install the stand, first unplug the power cord., then mount the unit to the stand with the supplied hardware.

When using the stand, periodically check to make sure that the punched material (slugs) are not stacking up between the exit hole in the “C”-frame and the stand. Keep this area clear of accumulated slugs.

OPERATING PROCEDURES

Read, understand and follow all safety instructions and operating procedures. If you do not understand the instructions or if conditions are not correct for proper operation, do not operate the machine. Consult your supervisor or other responsible person.

*Check that the trigger switch (33-5) is not locked on.

*Check that the manual return valve (15) is closed.

*Make sure that the proper punch and die are installed correctly. See **Die Selection** and **Proper Punches and Dies** in this Manual

*If you are using the hole locator gage (6), adjust it to the proper distance. See **Hole Locator Gage Adjsutment** in this manual.

*Plug the power cord into the proper power supply.

*Position the puncher at the proper location on the workpiece using the hole locator gage or by locating the point on the end of the punch into a center punch mark on the piece.

With everything in proper order, the switch can be activated to start the electric motor. The punch piston will move out and push the punch through the material. Keep the switch on until the punch has reached the end of its stroke and stops. Release the switch. The automatic return valve will open at the end of the stroke allowing the punch piston to retract to its home position. The punch piston must return completely before another hole can be punched.

If the punch stops in the midst of its stroke or does not come out of the material, open the manual return valve (15). Once the punch piston has returned to its home position, tighten the manual return valve.

INSTRUCTIONS -- FOOT SWITCH

Although the foot switch is guarded against inadvertent operation, it is best to position the foot pedal away from normal standing position. Place it in a position that requires deliberate effort to reach and activate the switch.

The trigger switch should be locked on only when ready to punch. Release the trigger switch immediately after punching to prevent operation by inadverent actuation of the foot switch.

HELPFUL HINTS FOR HOLE PUNCHING

Each of the punches is provided with a sharp point at its center. If the hole locations are center punched, the point on the end of the punch may be used to “find” the center punched spot.

Also, for accurate and easy positioning of the punch to a hole location, the switch can be intermittently pulsed on and off to jog the punch down to the work surface.

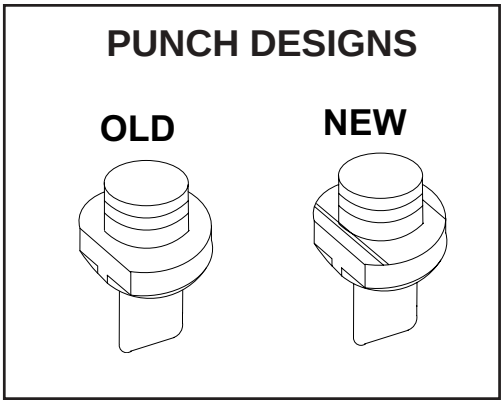
If the position is not satisfactory, open the manual return valve to retract the punch for another attempt. This operation can also be performed with the manual return valve “cracked” open slightly to prevent full punching pressure from being developed. In this manner, the punch can be easily brought right down to the surface without beginning to punch the hole. If the location is satisfactory, close the valve and finish the operation.

SPECIAL NOTICE REGARDING PUNCHES AND DIES

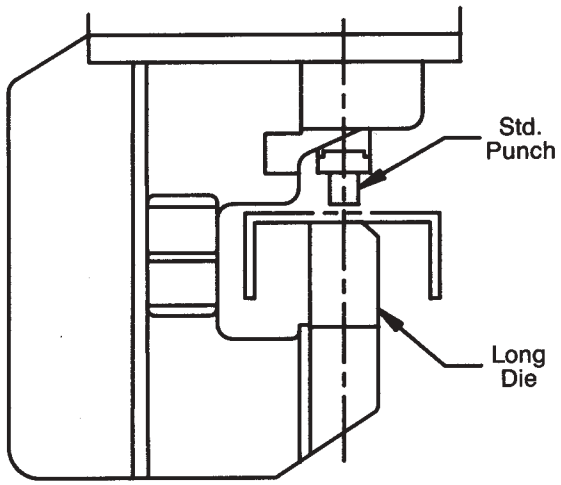
The exclusive Hougen-Ogura design offers the maximum in portability and tool life. The punch geometry, combined with controlled die clearance, reduces press tonnage requirements. Hougen-Ogura punches and dies are optimized to the design of each puncher model.

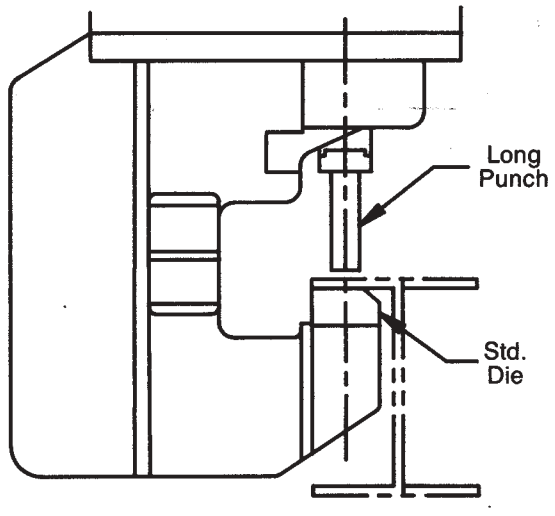
The use of incorrect punches or dies could result in unacceptable performance or damage to the machine and may void the warranty. Use only genuine Hougen-Ogura punches and dies.

PUNCH DESIGNS



MODEL 75003 DIE CONFIGURATIONS





Unplug the power cord. Be sure that the Punch Piston is fully retracted. If necessary, use the manual Return Valve (15) to retract the Punch Piston. The punch must be removed first. depending on the model, either loosen the lock nut and set screw with the wrenches supplied to allow the punch to drop out, or using the spanner provided, unscrew and remove the knurled punch retaining nut and the punch. The die can now be removed. The die is held in place by two socket head set screws, one on each side of the “C” -frame. If lock nuts are used, first loosen them, then loosen the set screws. It is not necessary to remove the set screws or lock nuts. Remove the die. When replacing the punch and die, make sure that the correct orientation of each is used. Shaped punches and dies must be properly aligned with each other. Many of the dies have a beveled edge which must be facing outward to provide clearance for the fillets in many beams and channels.

Round punches can be orientated in any direction, but if one of the beveled surfaces is facing the front, it wwill be easier to see where you are punching. The die must be installed first. Place it in the “C”-frame in the proper orientation. Make sure that it is seated properly and not resting on a locating shoulder. Tighten the set screws and (if used) the lock nuts. On the models using the knurled punch retaining nut, slip the punch into the nut, then carefully holding the cutting end of the punch, insert the punch into the hole in the end of the punch piston in the proper orientation, and tighten the nut. Insert a piece of material (steel) between the punch and die. Cycle the punch piston down until it puts pressure against the punch. This will ensure that the punch is well seated. With the spanner wrench, tighten the retaining nut. Before using the punch verify that the retaining nut is tight and orientation of the punch and die is correct.

SAFETY NOTE: PUNCH INSTALLATION
Prior to installing a new punch, first check the cavity in the punch piston to ensure it is free of any burrs or debris. Install the new punch, making sure that it is properly seated in the punch piston. If it is properly seated and the orientation is correct, hand tighten the retaining nut. Insert material between the punch and die and cycle the punch piston down until it puts pressure against the punch. This puts tension against the punch and the flat bar and ensures it is seated. Once it is properly seated, tighten the retaining nut or set screws and nuts.
Periodically check the retaining nut and make sure it is tightened according to instructions. Failure to do so, may cause serious damage to your unit and may cause personal injury

MAINTENANCE

In order to insure smoother operation and longer life of your hole puncher, the following maintenance should be done periodically, based on use.

1. Keep the machine clean. It is especially important to keep the sliding portion of the punch piston free from metal chips, scale, dirt, dust or other debris. To clean the punch piston, turn on the switch to move the punch piston almost to the bottom of its stroke. If necessary, cycle the punch several times to determine where the bottom of the stroke is, and to correctly position the punch piston. Unplug the poweer cord. Wipe any debris from the exposed part of the punch piston.

2. Regularly tighten all fasteners and replace any worn components.

3. Check power cord, if cracked or frayed, return the machine to an authroized repair center for replacement.

4. Check oil level, carefully using the procedure below.

NOTE: The internal components of the pump and piston area have very close clearances and are sensitive to damage from dust, dirt, contamination of the hydraulic fluid or improper handling. The disassembly of the pump housing reuires special toolsand training, and should beattempted by a qualified repair person. The improper servicing of electrical components can lead to conditions that could cause serious injury.
ANY ATTEMPT BY UNAUTHORIZED PERSONNEL TO SERVICE THE INTERNAL COMPONENTS OF THE PUMP AREA WILL VOID THE WARRANTY.

ADDING OIL

Use of the correct hydraulic oil is essential. Approved oils are Shell “TELLUS Oil” and Exxon “TERESSTIC”. Depending on the hole puncher model, either #32 or #46 viscosity must be used. Check the unit specifications. Make sure that the work area and all equipment are clean so that no dirt, dust or other foreign material can get into the hydraulic oil or pump area.

1. Locate the socket head cap screw (60) that plugs the oil port. It is just above the manual return lever on the right hand side of the Hole Puncher.

2. Lay the Hole Puncher on its left side so that the oil port is facing up.

3. Turn on the switch to move the punch piston almost to the bottom of its stroke. If necessary, cycle the punch several times to determine where the bottom of the stroke is, and to correctly position the punch piston. In this position, the maximum amount of oil has been drawn from the pump and the correct fill can be obtained.

4. Carefully open the oil port by removing the socket head cap screw (60).

5. Using the small squeeze bottle supplied with the Hole Puncher, carefully add hydraulic oil to completely fill the reservoir. Rock the Hole Puncher back and forth slightly several times to free any trapped air bubbles, then add additional oil if necessary.

6. Replace the cap screw and wipe up any excess oil.

7. Cycle the Hole Puncher several times with the Manual return Valve open, and again with the valve closed, to work any trapped air out of the system, then repeat the above procedure, making sure that the punch piston is lamost at the bottom of the stroke before removing the cap screw from the oil port.

8. Add additional oil as necessary. If the unit was extremely low on oil, it may be necessary to repeat the procedure several times.

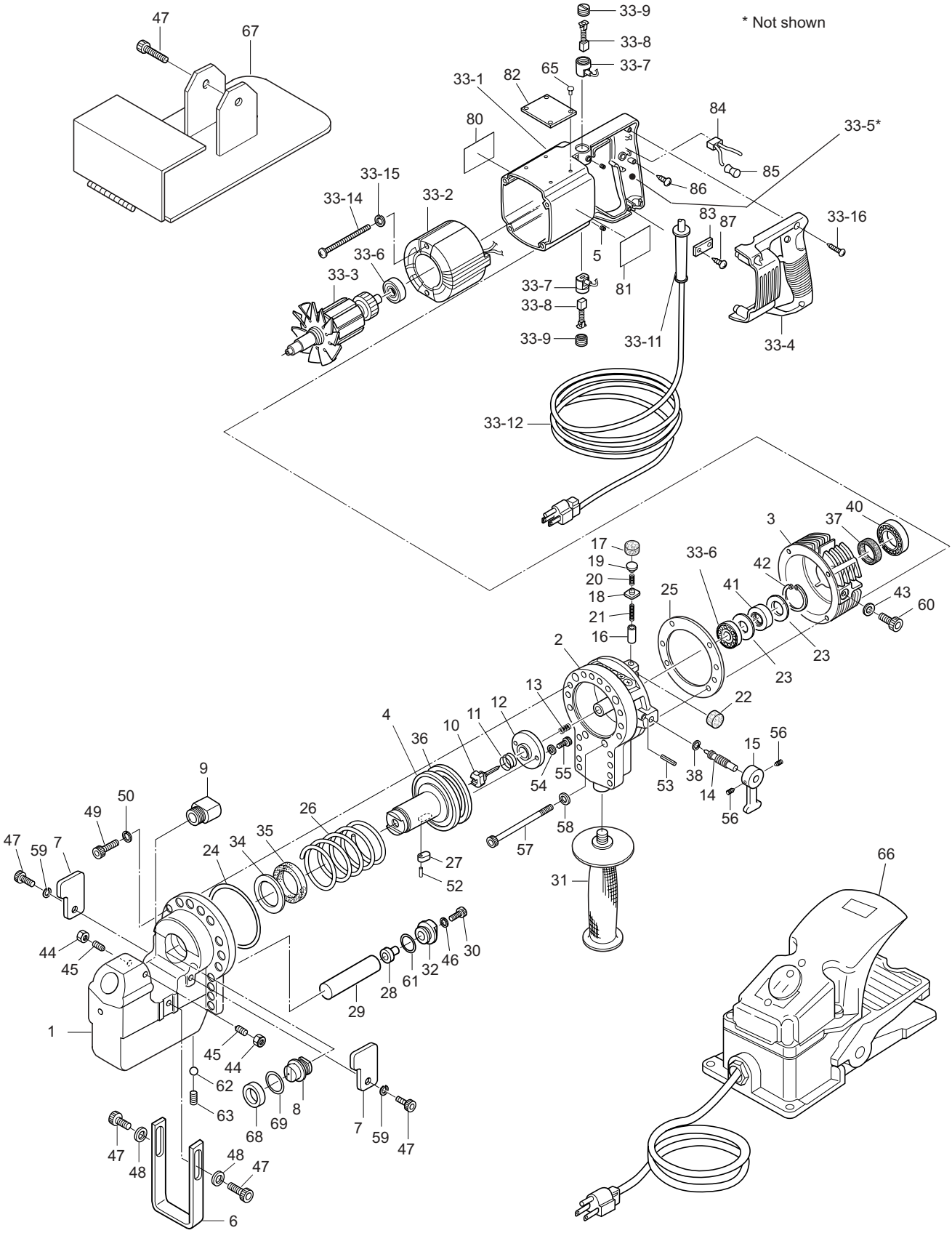
SELECTING PROPER DIES

Proper die selection is essential. Other than the obvious necessity of matching shaped punches and dies, there are two other basic selection factors that must be considered. The first is die clearance. Different material types and different material thicknesses require different clearances between the punch and die. In order to maintain the best posssible hole while remaining within the tonnage capacity of the machine, it is essential to choose the die with the proper clearance. the second is the die angle. Most structural shapes can be punched with the standard flat dies, but “I” -beams and most channels which have a 2-in-12 taper require the use of special 9-1/2 degree angled dies. Car and ship channel flanges and other structural shapes with a 2 degree taper can be punched with flat dies. Materials with a flange taper of less than 5 degrees can also be punched with the flat die, however, the hole will be slightly angled. Refer to specific information and tables within this manual for the proper punch and die combination.

Extension Cord Selection

Nameplate Ampere rating	LENGTH OF CORD IN FEET								
	115V	25 FT.	50 FT.	100 FT.	150 FT.	200 FT.	250 FT.	300 FT.	400 FT.	500FT
	230V	50 FT.	100 FT.	200 FT.	300 FT.	400 FT.	500 FT.	600 FT.	800 FT.	1000 FT
	0-2	18	18	18	16	16	14	14	12	12
	2-3	18	18	16	14	14	12	12	10	10
	3-4	18	18	16	14	12	12	10	10	8
	4-5	18	18	14	12	12	10	10	8	8
	5-6	18	16	14	12	10	10	8	8	8
	6-8	18	16	12	10	10	8	6	6	6
	8-10	18	14	12	10	8	8	6	6	4
	10-12	16	14	10	8	8	6	6	4	4
	12-14	16	12	10	8	6	6	6	4	2
	14-16	16	12	10	8	6	6	4	4	2
	16-18	14	12	8	8	6	4	4	2	2
	18-20	14	12	8	6	6	4	4	2	2

75003 EXPLODED VIEW



PARTS LIST - 75003

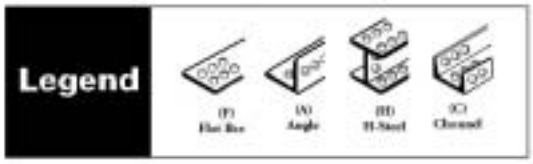
DET. #	PART#	DESCRIPTION	QTY.
1	75180	"C" CYLINDER	1
2	75181	CYLINDER	1
3	75127	PUMP HOUSING	1
4	75128	PUNCH PISTON	1
5	75318	SCREW SS M5 x 6MM	2
6	75182	HOLE LOCATOR	1
7	75131	STRIPPER (SHORT)	2
	75131L	STRIPPER (LONG)	2
8	75427	PUNCH (9/16 DIA.)	1
9	75466	DIE (LONG 9/16" "A" TYPE	1
	75467	DIE (LONG 9/16" "B" TYPE	1
10	75042	RELEASE VALVE	1
11	75043	VALVE RETURN SPRING	1
12	75183	STOP PLATE	1
13	75184	VALVE RELEASE SPRING	1
14	75046	RETURN VALVE	1
15	75047	RETURN LEVER	1
16	75048-A	PUMP PISTON 5.996MM x 13MM	1-3
	75048-B	PUMP PISTON 5.997MM x 13MM	1-3
	75048-C	PUMP PISTON 5.998MM x 13MM	1-3
	75048-D	PUMP PISTON 5.999MM x 13MM	1-3
	75048-E	PUMP PISTON 6.000MM x 13MM	1-3
	75048-F	PUMP PISTON 6.001MM x 13MM	1-3
	75048-G	PUMP PISTON 6.002MM x 13MM	1-3
	75048-H	PUMP PISTON 6.003MM x 13MM	1-3
	75048-I	PUMP PISTON 6.004MM x 13MM	1-3
	75048-J	PUMP PISTON 6.005MM x 13MM	1-3
17	75049	RUBBER PACKING	3
18	75050	CHECK VALVE	3
19	75051	SPRING RETAINER	3
20	75052	CHECK VALVE SPRING	3
21	75053	PISTON RETURN SPRING	3
22	75054	MAGNET	3
23	75055	SPACER	2
24	75185	"O" RING	1
25	75186	GASKET	1
26	75187	PUNCH RETURN SPRING	1
27	75135	PUNCH PISTON KEY	1
28	75136	BLADDER SCREW	1
29	75137	OIL BLADDER	1
30	75138	BLADDER RET. SCREW	1
31	75063	PUNCHER HANDLE	1
32	75188	BLADDER BUSHING SCREW	1
33-1	75811	MOTOR HOUSING	1
33-2	75816	FIELD	1
33-3	75141	ARMATURE	1
33-4	75812	SWITCH COVER	1
33-5	75143	SWITCH	1
33-6	75086	BALL BEARING	2
33-7	75814	BRUSH HOLDER	2
33-8	75813	CARBON BRUSH	2
33-9	75815	BRUSH CAP	2
33-11	75074	STRAIN RELIEF	1
33-12	75148	POWER CORD	1
33-14	75810	SCR-SHC M5 x 75MM	2
33-15	75150	HELI LOCK WASHER 5MM	2
33-16	75151	SCR-PANHEAD M4 x18MM	4
34	75152	BACK UP RING	1
35	75153	ROD SEAL PACKING	1
36	75154	PACKING	1
37	75084	OIL SEAL	1
38	75085	"O" RING	1
40	75087	BALL BEARING	1
41	75088	ROLLER BEARING	1
42	75089	RET. RING	1
43	75090	WASHER SEAL	1
44	75091	HEX NUT M6	2
45	75189	SCREW SS M6 x 15MM	2
46	75155	HELI. LOCK	1
47	75156	SOC. HD. SCREW M8 x 15MM	6
48	75157	FLAT WASHER 6MM	2
49	75158	SOC. HD. SCREW M8 x 20MM	18
50	75159	SERR. FLAT WASHER 8MM	18
52	75099	ROLL PIN 2.5MM x 10MM	1
53	75100	ROLL PIN 4MM x 20MM	1
54	75101	FLAT WASHER 4MM	2
55	75102	SOC. HD. SCR. M4 x 6MM	2
56	75160	SOC. HD. SCR. M6 x 8MM	2
57	75161	SOC. HD. SCR. M5 x 90MM	4
58	75105	FLAT WASHER 5MM	4
59	75162	HELI WASHER 6MM	2
60	75107	SOC. HD. SCR. M10 x 15MM	1
61	75190	"O" RING	1
62	75191	STEEL BALL	1
63	75192	SCREW SS M10 x 10MM	1
65	75109	RIVET	12
66	75110	FOOT SWITCH	1
67	75194	WORK STAND	1
68	75165	PUNCH RETAINING NUT	1
69	75164	"O" RING	1
80	75033	WARNING TAG	1
81	75034	CAUTION TAG	1
82	75029	NAME PLATE	1
83	75112	POWER CORD RETAINER	1
84	75163	FIILTER CAPACITOR	1
85	75113	WIRE CONN (LARGE)	1
86	75350	PAN HD. SCREW M4 x 8MM	1
87	75079	PAN HD. SCREW M4 x 10MM	1

ROUND PUNCHES AND DIES FOR 75003

ROUND PUNCHES				MATERIAL		DIE	
SIZE			PART NO.	THICKNESS	STYLE	SIZE	PART NO.
NOMINAL	ACTUAL	METRIC					
1/4"	(.256)	6.5MM	75421	5/64 (.078) TO 1/8" (.125) 14 TO 11 GAGE	F,A,H	DIE LD 1/4 A	75454
				>1/8 (.125) TO 1/4 (.250 10 TO 3 GAGE	F,A,H	DIE LD 1/4 B	75455
5/16"	(.315)	8MM	75422	5/64 (.078) TO 1/8" (.125) 14 TO 11 GAGE	F,A,H	DIE LD 5/16 A	75456
				>1/8 (.125) TO 1/4 (.250 10 TO 3 GAGE	F,A,H	DIE LD 5/16 B	75457
11/32"	(.335)	8.5MM	75423	5/64 (.078) TO 1/8" (.125) 14 TO 11 GAGE	F,A,H	DIE LD 11/32 A	75458
				>1/8 (.125) TO 1/4 (.250 10 TO 3 GAGE	F,A,H	DIE LD 11/32 B	75459
3/8"	(.394)	10MM	75424	5/64 (.078) TO 1/8" (.125) 14 TO 11 GAGE	F,A,H	DIE LD 3/8 A	75460
				>1/8 (.125) TO 1/4 (.250 10 TO 3 GAGE	F,A,H	DIE LD 3/8 B	75461
			75476 (LP)	5/64 (.078) TO 1/8" (.125) 14 TO 11 GAGE	F,A,H	DIE 3/8 A	75438
				>1/8 (.125) TO 1/4 (.250 10 TO 3 GAGE	F,A,H	DIE 3/8 B	75439
				19/64 (.297) MAX.	C	DIE 3/8 C	75450
7/16"	(.433)	11MM	75425	5/64 (.078) TO 1/8" (.125) 14 TO 11 GAGE	F,A,H	DIE LD 7/16 A	75462
				>1/8 (.125) TO 1/4 (.250 10 TO 3 GAGE	F,A,H	DIE LD 7/16 B	75463
			75477 (LP)	5/64 (.078) TO 1/8" (.125) 14 TO 11 GAGE	F,A,H	DIE 7/16 A	75440
				>1/8 (.125) TO 1/4 (.250 10 TO 3 GAGE	F,A,H	DIE 7/16 B	75441
				19/64 (.297) MAX.	C	DIE 7/16 C	75451
1/2"	(.512)	13MM	75426	5/64 (.078) TO 1/8" (.125) 14 TO 11 GAGE	F,A,H	DIE LD 1/2 A	75464
				>1/8 (.125) TO 1/4 (.250 10 TO 3 GAGE	F,A,H	DIE LD 1/2 B	75465
			75478 (LP)	5/64 (.078) TO 1/8" (.125) 14 TO 11 GAGE	F,A,H	DIE 1/2 A	75442
				>1/8 (.125) TO 1/4 (.250 10 TO 3 GAGE	F,A,H	DIE 1/2 B	75443
				19/64 (.297) MAX.	C	DIE 1/2 C	75452
9/16"	(.551)	14MM	75427	5/64 (.078) TO 1/8" (.125) 14 TO 11 GAGE	F,A,H	DIE LD 9/16 A	75466
				>1/8 (.125) TO 1/4 (.250 10 TO 3 GAGE	F,A,H	DIE LD 9/16 B	75467
			75479 (LP)	5/64 (.078) TO 1/8" (.125) 14 TO 11 GAGE	F,A,H	DIE 9/16 A	75444
				>1/8 (.125) TO 1/4 (.250 10 TO 3 GAGE	F,A,H	DIE 9/16 B	75445
				19/64 (.297) MAX.	C	DIE 9/16 C	75453
5/8"	(.625)	15.9MM	75428	5/64 (.078) TO 1/8" (.125) 14 TO 11 GAGE	F,A,H	DIE LD 5/8 A	75468
				>1/8 (.125) TO 1/4 (.250 10 TO 3 GAGE	F,A,H	DIE LD 5/8 B	75469
11/16"	(.688)	17.5MM	75429	5/64 (.078) TO 1/8" (.125) 14 TO 11 GAGE	F,A,H	DIE LD 11/16 A	75470
				>1/8 (.125) TO 1/4 (.250 10 TO 3 GAGE	F,A,H	DIE LD 11/16 B	75471
3/4"	(.750)	19MM	75430	5/64 (.078) TO 1/8" (.125) 14 TO 11 GAGE	F,A,H	DIE LD 3/4 A	75472
				>1/8 (.125) TO 1/4 (.250 10 TO 3 GAGE	F,A,H	DIE LD 3/4 B	75473
25/32"	(.787)	20MM	75431	5/64 (.078) TO 1/8" (.125) 14 TO 11 GAGE	F,A,H	DIE LD 25/32 A	75474
				>1/8 (.125) TO 1/4 (.250 10 TO 3 GAGE	F,A,H	DIE LD 25/32 B	75475

OBLONG PUNCHES AND DIES FOR 75003

OBLONG PUNCH				MATERIAL		DIE	
SIZE			PART NO.	THICKNESS	STYLE	SIZE	PART NO.
NOMINAL	ACTUAL	METRIC					
1/4+" X 1/2"	.256 X .512	6.5MM X 13MM	75638	5/64 (.078) TO 1/8 (.125) 14 TO 11 GA	F,A,H	DIE LD 1/4+ X 1/2 A	75656
				>1/8 (.125) TO 1/4 (.250) 10 TO 3 GA.	F,A,H	DIE LD 1/4+ X 1/2 B	75657
			75666 (LP)	5/64 (.078) TO 1/8 (.125) 14 TO 11 GA	F,A,H	DIE 1/4+ X 1/2 A	75643
				>1/8 (.125) TO 1/4 (.250) 10 TO 3 GA.	F,A,H	DIE 1/4+ X 1/2 B	75644
				19/64 ((.297)	C	DIE 1/4+ X 1/2 C	75653
11/32" X 1/2"	.335 X .512	8.5MM X 13MM	75639	5/64 (.078) TO 1/8 (.125) 14 TO 11 GA	F,A,H	DIE LD 11/32 X 1/2 A	75658
				>1/8 (.125) TO 1/4 (.250) 10 TO 3 GA.	F,A,H	DIE LD 11/32 X 1/2 B	75659
			75667 (LP)	5/64 (.078) TO 1/8 (.125) 14 TO 11 GA	F,A,H	DIE 11/32 X 1/2 A	75645
				>1/8 (.125) TO 1/4 (.250) 10 TO 3 GA.	F,A,H	DIE 11/32 X 1/2 B	75646
				19/64 ((.297)	C	DIE 11/32 X 1/2C	75654
7/16" X 5/8"	.433 X .650	11MM X 16.5MM	75640	5/64 (.078) TO 1/8 (.125) 14 TO 11 GA	F,A,H	DIE LD 7/16 X 5/8 A	75660
				>1/8 (.125) TO 1/4 (.250) 10 TO 3 GA.	F,A,H	DIE LD 7/16 X 5/8 B	75661
			75668 (LP)	5/64 (.078) TO 1/8 (.125) 14 TO 11 GA	F,A,H	DIE 7/16 X 5/8 A	75647
				>1/8 (.125) TO 1/4 (.250) 10 TO 3 GA.	F,A,H	DIE 7/16 X 5/8 B	75648
				19/64 ((.297)	C	DIE 7/16 X 5/8 C	75655
1/2+" X 3/4"	.512 X .768	13MM X 19.5MM	75641	5/64 (.078) TO 1/8 (.125) 14 TO 11 GA	F,A,H	DIE LD 1/2+ X 3/4 A	75662
				>1/8 (.125) TO 1/4 (.250) 10 TO 3 GA.	F,A,H	DIE LD 1/2+ X 3/4 B	75663
9/16" X 13/16"	.551 X .827	14MM X 21MM	75642	5/64 (.078) TO 1/8 (.125) 14 TO 11 GA	F,A,H	DIE LD 9/16 X 13/16 A	75664
				>1/8 (.125) TO 1/4 (.250) 10 TO 3 GA.	F,A,H	DIE LD 9/16 X 13/16 B	75665



Commercial / Industrial Limited Warranty

Hougen Manufacturing, Incorporated warrants its Portable Magnetic Drills, Electro-hydraulic Hole Punchers for a period of (1) one year and other products for ninety (90) days from date of purchase against defects due to faulty material or workmanship and will repair or replace (at its option) without charge any items returned. This warranty is void if the item has been damaged by accident or unreasonable use, neglect, improper service, or other causes not arising out of defects in material or workmanship. No other expressed warranty is given or authorized. Hougen Manufacturing, Inc. disclaims any implied warranty of MERCHANTABILITY or FITNESS for any period beyond the expressed warranty and shall not be liable for incidental or consequential damages. Some states do not allow exclusions of incidental or consequential damages or limitation on how long an implied warranty lasts and, if the law of such a state governs your purchase, the above exclusion and limitation may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

To obtain warranty service, return the item(s), transportation prepaid, to your nearest Factory Authorized Repair Center or to Hougen Manufacturing, Inc., 3001 Hougen Drive, Swartz Creek, Michigan 48473.

Hougen Drills (Rotabroach Cutters) are warranted against manufacturing defects only. Subject to Hougen Manufacturing inspection.

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Factory Warranty Repair Services can be obtained by sending your product to:

Hougen Manufacturing, Inc.
3001 Hougen Drive
Swartz Creek, MI 48473
Attn: Repair Department

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