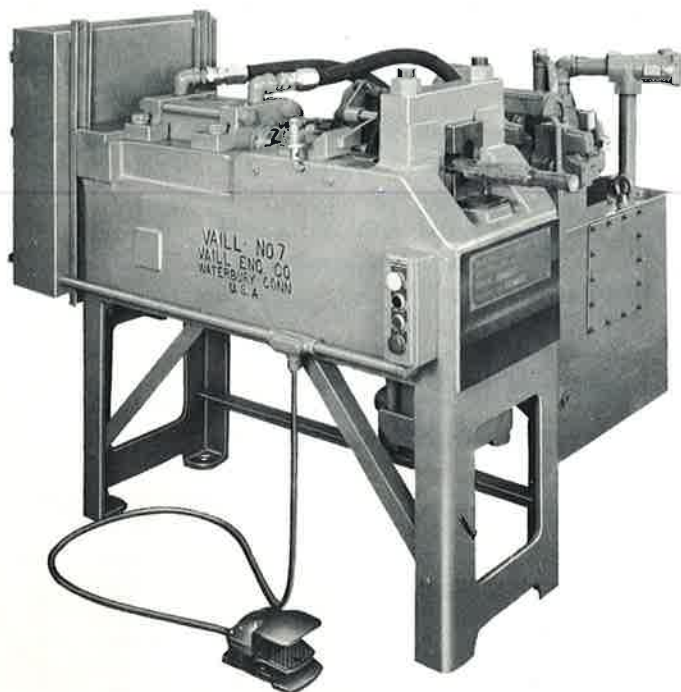


NUMBER 7

TUBE END FORMING MACHINE



**A hydraulically
operated floor
machine for end
forming 1/4 inch
to 3 1/2 inch
diameter tube**

FEATURES

The Vaill No. 7 machine is a floor mounted, hydraulically operated machine that uses No. 6A and 7B type tooling for forming larger size tubing. This unit is used where a fast, economical, high tonnage machine is required for forming end shapes restricted to 6 inches of length or under.* Its greatest use is for reductions which cannot be accomplished on the No. 511 rotary type machine as well as expansions of 1 1/2 inch depth or greater. Single or double flaring on larger diameters can also be accommodated along with flanging and coining. Flanging is done in two operations by either a first operation flare or when a large flange is required, a first operation curl. It is extensively used in the automotive and appliance field for exhaust pipes, mufflers, and shock absorber parts. A three position punch holder facilitates multiple operations by transferring the tube. A single station position can also be used. For longer stroke operations, refer to our No. 7S machine or the various C-Frame units.

*Consult factory for variations on this

HOW THE NO. 7 OPERATES

After the work piece is loaded, depression of the foot-switch or cycle button, will cause the cycle to complete automatically. This entails clamping, removal of the tube stop, then a forming operation with automatic retraction after which the clamp opens so the part can be removed. Either a limit switch or a hydraulic pressure switch will retract the work slide. The limit switch controls by position and the pressure switch by forming pressure. Both elements can be adjusted to suit the operation. A manual reverse button is installed for emergencies. A vernier-type tube stop is installed for good control of stock out to maintain repeatability from part to part.

A tube and tool lubrication system is also available at extra charge as on all Vaill equipment. An automatic retractor with variation can be supplied. For maximum economy, a choice of two power units are available. Power unit selection is based on production rates required.

OPEN BEAD

CLOSED BEAD

SINGLE FLARE

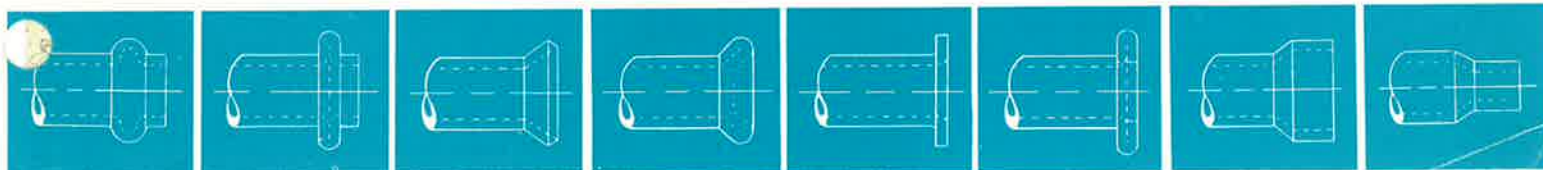
DOUBLE LAP
FLARE

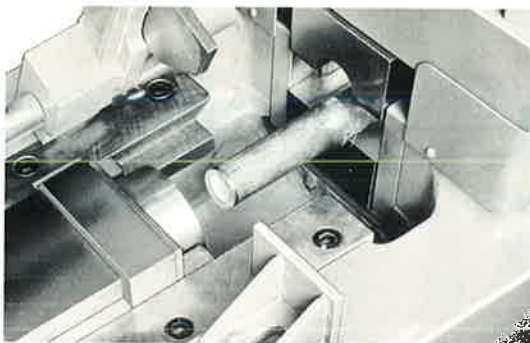
SINGLE FLANGE

DOUBLE LAP
FLANGE

EXPANSION

REDUCTION





NO. 7

SPECIFICATIONS

CAPACITY 21 TONS

range $\frac{1}{4}$ " to $3\frac{1}{2}$ "
 std. form stroke 6 inch
 form pressure 42,000 lbs
 form speed $2\frac{1}{2}$ /5.5 ips
 clamp stroke 2 inches
 clamp pressure 57,000 lbs
 clamp speed $2\frac{1}{4}$ ips

hydraulic power unit 18 gpm, 15 HP -- 40 gpm, 30 HP, (1500 psi)
 work center to floor 42 inches
 space occupied 55" x 60"
 shipping weight 5000 lbs/5600 lbs
 finish std. machine gray
 electrical requirements specify voltage required

Capacity Based on 1500 psi oil pressure maximum
 Higher tonnages on request

Operation Single stroke — Standard
 Double stroke — optional (on request)

Production Varies with length of work stroke and gallon per minute of hydraulic power unit

WORK STROKE INCHES	MACHINE CYCLE-sec		Ave. PRODUCTION pcs/hr	
	18 gpm	40 gpm	18 gpm	40 gpm
1	4.0	3.0	520	600
2	4.8	3.4	465	560
3	5.6	3.8	420	530
4	6.4	4.2	385	500
5	7.2	4.6	345	475
6	8.0	5.0	330	450

Production based on 100% efficiency and 3 second tube handling time.

guide to
 maximum
 cross-sectional
 areas for
 various
 operations

OPERATION	30,000 psi tensile	60,000 psi tensile	90,000 psi tensile
REDUCING EXPANDING SINGLE FLARING	CA = 2.0 sq. in. $3\frac{1}{2}$ " x .187"	CA = 1.0 sq. in. $3\frac{1}{2}$ " x .093"	CA = .66 sq. in. 3" x .065"
FLANGING	CA = 1.4 sq. in. $3\frac{1}{2}$ " x .125"	CA = .7 sq. in. $2\frac{3}{4}$ " x .083"	CA = .46 sq. in. 3" x .049"
BEADING DOUBLE FLARING	CA = .93 sq. in. $3\frac{1}{4}$ " x .093"	CA = .46 sq. in. 3" x .049"	CA = .31 sq. in. 2" x .049"
COINING	CA = .47 sq. in. $2\frac{3}{8}$ " x .065"	CA = .23 sq. in. $1\frac{5}{8}$ " x .049"	CA = .16 sq. in. $1\frac{1}{2}$ " x .035"

T = Tensile — P.S.I., CA = Crosssectional area — square inches, P = 42,000 lbs at 1500 psi, F = Factor

REDUCING
EXPANDING
SINGLE FLARING F = .7

BEADING
DOUBLE FLARING F = 1.5

FLANGING F = 1.0

COINING F = 3.0

FORCE EQUATION $P = CA \times T \times F$

These factors are conservative and should be used as a guide only

Flanging factor does not include forces required for coining

NOTE: The maximum O.D. of the finished operation is controlled by the mechanical properties of the
 and the $1\frac{1}{8}$ " clamp block opening.
 EX: $3\frac{1}{2}$ " O.D./3.9" O.D. maximum

Consult factory for variations of above

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 AND
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