

setting

plate — blanket = .004" (.1 mm.) = scale setting .004" (~.10 mm.)
 blanket — impression cylinder = .004" (.1 mm.) = scale setting ± 0

These values are also based on the Roland slide rule and are listed in a table at the end of these notes providing information on all paper and carton calipers.

With this basic setting for cylinder circumference ratio slip or advance of the print contact zone due to blanket bulge is largely eliminated, provided paper stretch is kept within close limits, so that precise print length can be obtained. In the zone of highest impression force, approximately uniform surface velocities exist between plate — blanket and blanket — impression cylinder, respectively paper.

Where work travels several times through the offset machine the plates for the first colours are underlaid by .004-.008" (.1-.2 mm.) to equalize a possible paper stretch. If stronger carton is printed, for instance, it is right to underlay plates to about half the thickness of the stock being printed over bearer ring height. While any alteration in plate packing affects print length, alteration of the blanket packing remains without effect, but if blanket packing is unsuitable or faulty, print length may be affected. A heavy carton being printed in the machine results in greater impression cylinder circumference and causes an elongated print image, which has to be overcome in the manner described.

For quality and practical reasons it is recommended to set all offset machines in a works to standard cylinder circumference ratios, so that interchangeability and operation

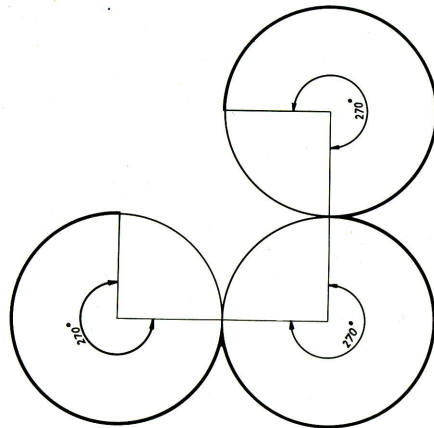
ational reliability of all Roland machines is ensured.

Roland machines are machined to finest tolerances and are manufactured with utmost care and precision. Careful handling and setting of the machines results in prolonged life and trouble-free running combined with highest output.

Print length

The printer's aim is to transfer the flat plate image precisely in correct length on to the sheet. Alterations in plate cylinder packing and the caliper of stock being printed affect print length. (Our examples are based on the cylinders of the Roland Parva.)

As a starting point we assume that the print image extends over 270° around the plate cylinder. Image on plate and printed sheet are identical.

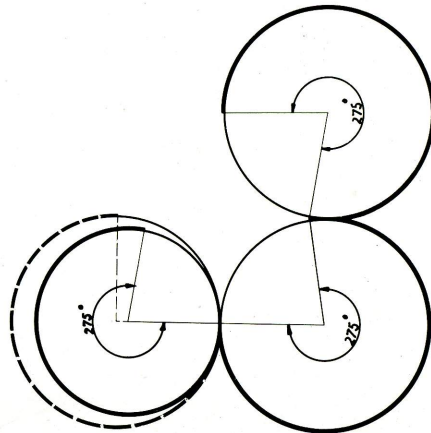


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Alteration of printed image caused by plate cylinder

A: plate packing is increased. To better illustrate the change the diagram exaggerates effects. The plate now no longer covers the same cylinder angle, as the cylinder has become larger. Angle has been reduced from 270° to 265°.

As cylinders are not driven by surface friction but by toothed wheels linking them, all cylinders always rotate with the same angle. The plate image of 265° is thus transferred on to the blanket cylinder and thence (as 265°) on to the sheet. The printed image has become too short.



B: plate packing is reduced. The plate extends over a greater cylinder angle, now 275° instead of 270° and a longer image is transferred on to the sheet, that is print length has become longer. e.g. an underlay sheet of .008" (.2 mm.) thickness is removed.

alteration in cylinder diameter = .016" (.4 mm.)
 alteration in cylinder circumference
 $.016'' \times 3.14 = .050'' (.4 \times 3.14 = 1.26 \text{ mm.})$
 alteration in print length
 $(\frac{3}{4} \text{ of circumference}) = .038'' (.94 \text{ mm.})$
 Elongation of print length is thus almost five times the thickness of the sheet removed from the packing.
 If an additional .008" (.2 mm.) thick underlay sheet is placed under the plate, print length will correspondingly be reduced by .038" (.94 mm.).

Alteration of print length due to impression cylinder (thickness of stock being printed)

C: starting with 270° image angle area, the printer works first with paper of .004" (.1 mm.) thickness and then with carton of .020" (.5 mm.) thickness. The angles of cylinders remain the same in both cases but the distance 1—2 is longer in the case of the carton than is the distance 1—3 in the case of the paper.

difference in distance 1—2 and 1—3:
 thickness difference in materials .016" (.4 mm.)
 difference in cylinder diameter .32" (.8 mm.)
 difference in cylinder circumference .32" $\times 3.14 = .100'' (.8 \times 3.14 = 2.51 \text{ mm.})$
 difference in distance $(\frac{3}{4} \text{ of circumference}) .075'' (1.88 \text{ mm.})$

On the carton sheet an elongation of .075" (1.88 mm.) could be measured while the sheet clings to the curvature of the cylinder and is thus stretched. With the sheet in flat plane, the image accepted on elongated surface is shortened by half the value of the elongation.

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