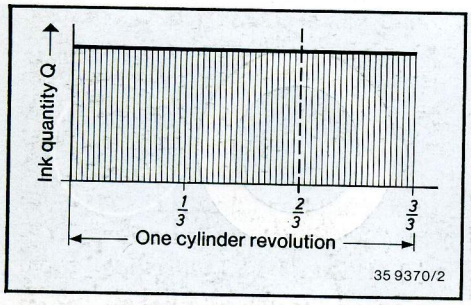
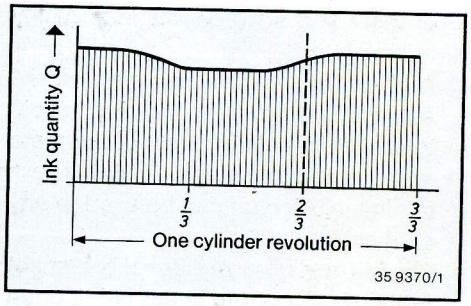
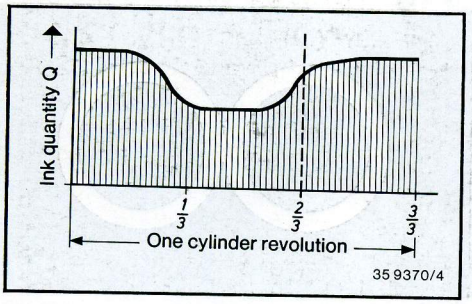
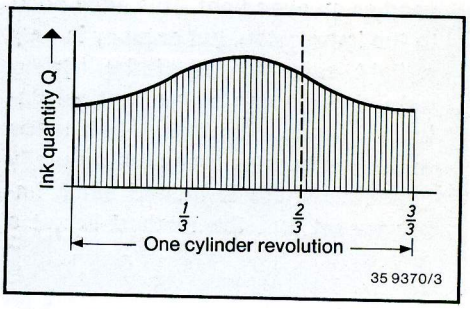
**Fig. 11** Even distribution of ink.
**Fig. 12** Distribution of ink disturbed by unfavourable layout of subject matter and effect of non-printing area corresponding to cylinder gap.

**Fig. 13** Restoring normal ink distribution conditions by reducing fluid supply.
**Fig. 14** Correcting ink distribution with the 360° cycle shift.




even distribution over the two cylinders assuming their diameters to be equal. (Fig. 8, 9, 10). This is indeed what occurs in the inking unit. The ink film is divided in the progression from one roller to the next until the desired film thickness on the forme rollers is obtained. This 50:50 splitting, long suspected in practice, has been confirmed by scientific research. Radio-active material was added to the ink and the emission from the individual rollers was measured with a Geiger counter. Starting from a known quantity of radio-active matter in the ink fountain, the thickness of the film on the rollers was then determined by calculation. It will, of course, always depend on the amount of ink the ductor supplies to the inking unit. Transfer of ink is an intermittent process in which a reciprocating feed roller rotates for some time at low speed in contact with the ductor from which it takes ink and then at higher speed in contact with a roller of the inking unit to which it delivers ink.

So much for the theory. Now, if the amount of fluid is reduced to the absolute minimum, this ideal condition is at least maintained to such an extent that few negative effects are observed in the printing process. However, as emulging of water and ink progresses beyond the acceptable limit, this condition interferes with the above pattern of ink film splitting in the inking unit. Unbalanced feed from the forme rollers to the forme and steady supply of fresh ink through the feed roller will produce periodic even the most skilful printer will not always be able to avoid harmful emulging.

The machine designers have provided an expedient in the form of a device with which the time of vibrator motion reversal at the start of the impression can be shifted within a range of 360° for better adaptation to the requirements of the forme. (Fig. 14). Fig. 15 shows the possible alteration.

While this corrective measure does not change the cycle of ink flow it produces a phase shift on the cylinder periphery, i. e. the plate, which gives the printer more latitude. In the case of very difficult work where loss of tone is to be expected, compromising will sometimes become necessary. The gist of the matter is that loss of tone primarily caused fluctuation of ink flow in the inking unit which ultimately results in disturbance of ink transfer to the plate. Unfavourable distribution of the subject matter over the plate and the existence of the non-printing area due to the cylinder gap will then cause accumulation of ink, mostly at the start of the impression. Fig. 11 shows the undisturbed and Fig. 12 the disturbed flow of ink.

If the subject matter is arranged on the plate in such a way that only $^2/_3$ of the plate length, measured from the leading edge, is utilized, then the distribution of ink will be as shown in fig. 12. As soon as the supply fluid is decreased and the badly emulged ink runs off, the balance will be restored and the curve will be as shown in fig. 13.

With sparse subject matter on the forme by the propensity of the ink to emulge