Dynamics and Flight Control laboratory course

Flight dashboard

Velocity indicator, km/h

G-load indicator

Angle of attack indicator

Bank angle indicator

Pitch angle indicator

Altimeter

Instrument landing system

Runway distance

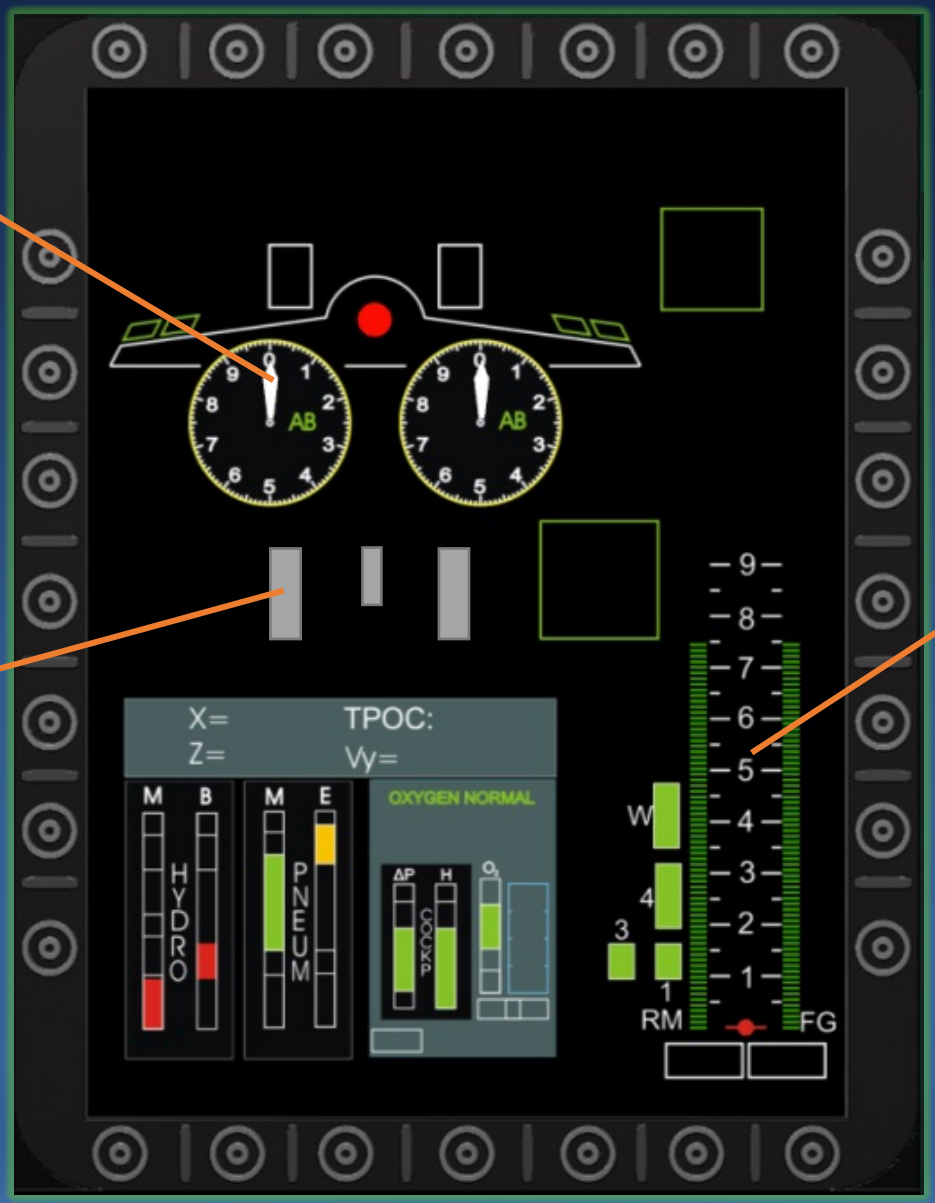
Current heading

Vertical speed indicator

Slide angle indicator

Engine throttle, %

Landing gear indicator



Fuel load, %

Glideslope side deviation

Current heading

Heading indicator

Glideslope

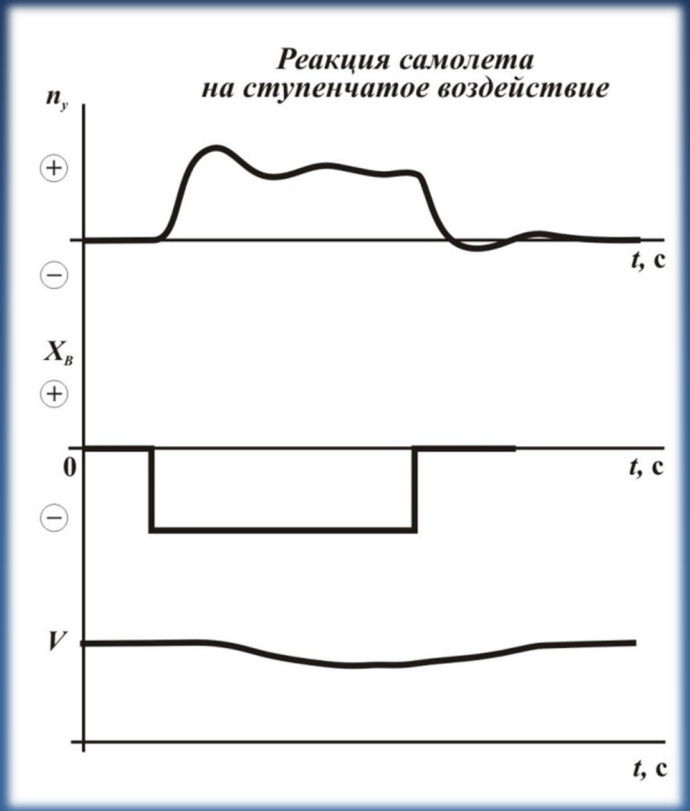
Runway distance

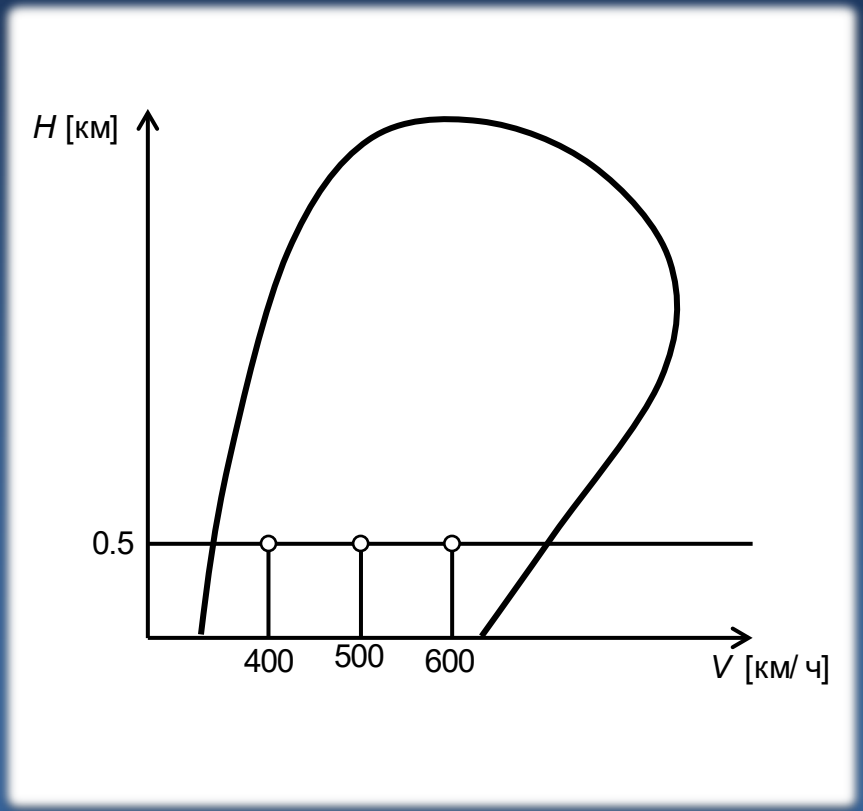
Runway

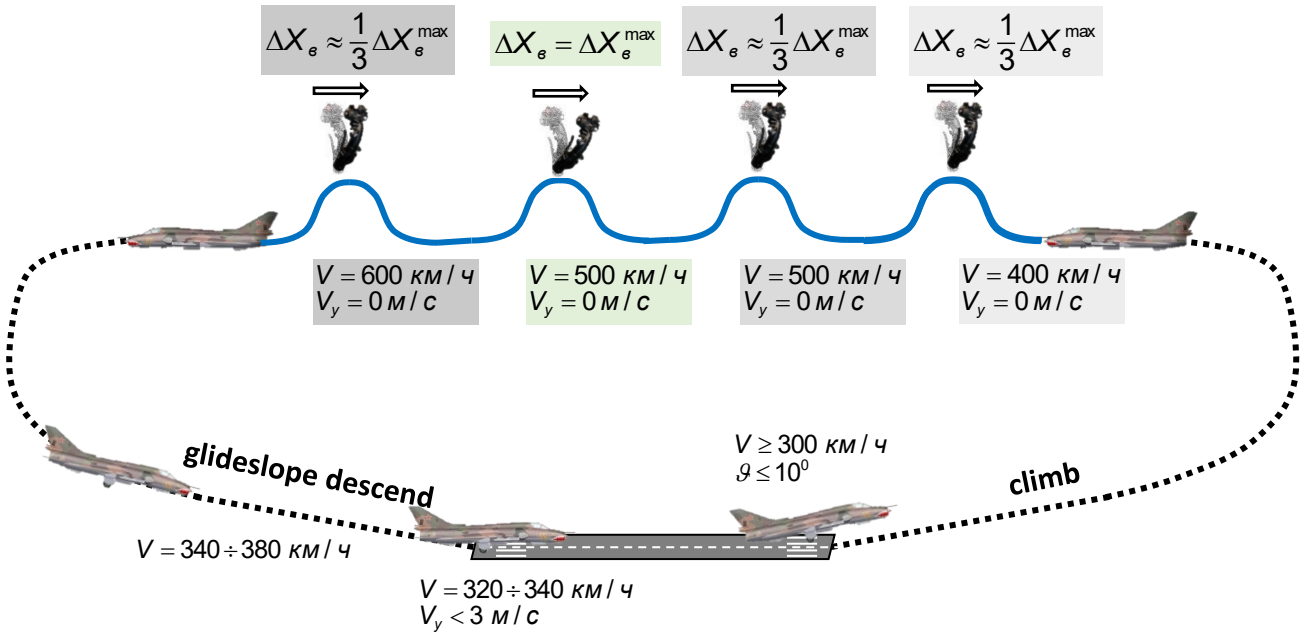
Aircraft

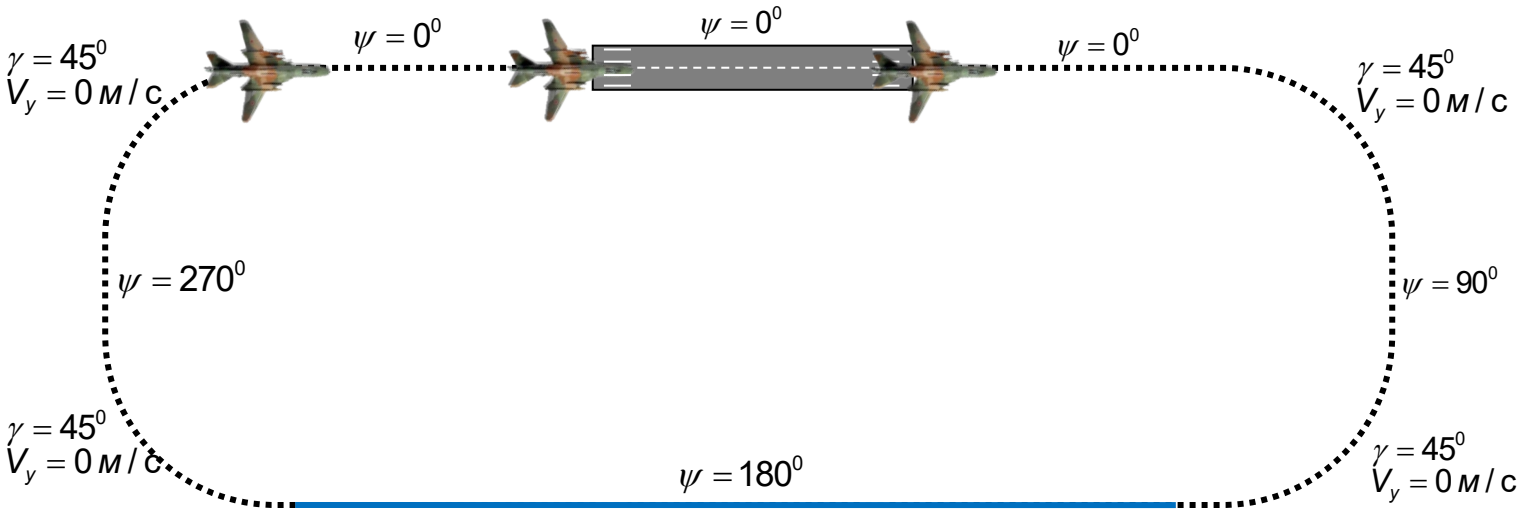
Laboratory work №4

Study of the aircraft longitudinal motion.
Assessment of longitudinal static stability and control characteristics

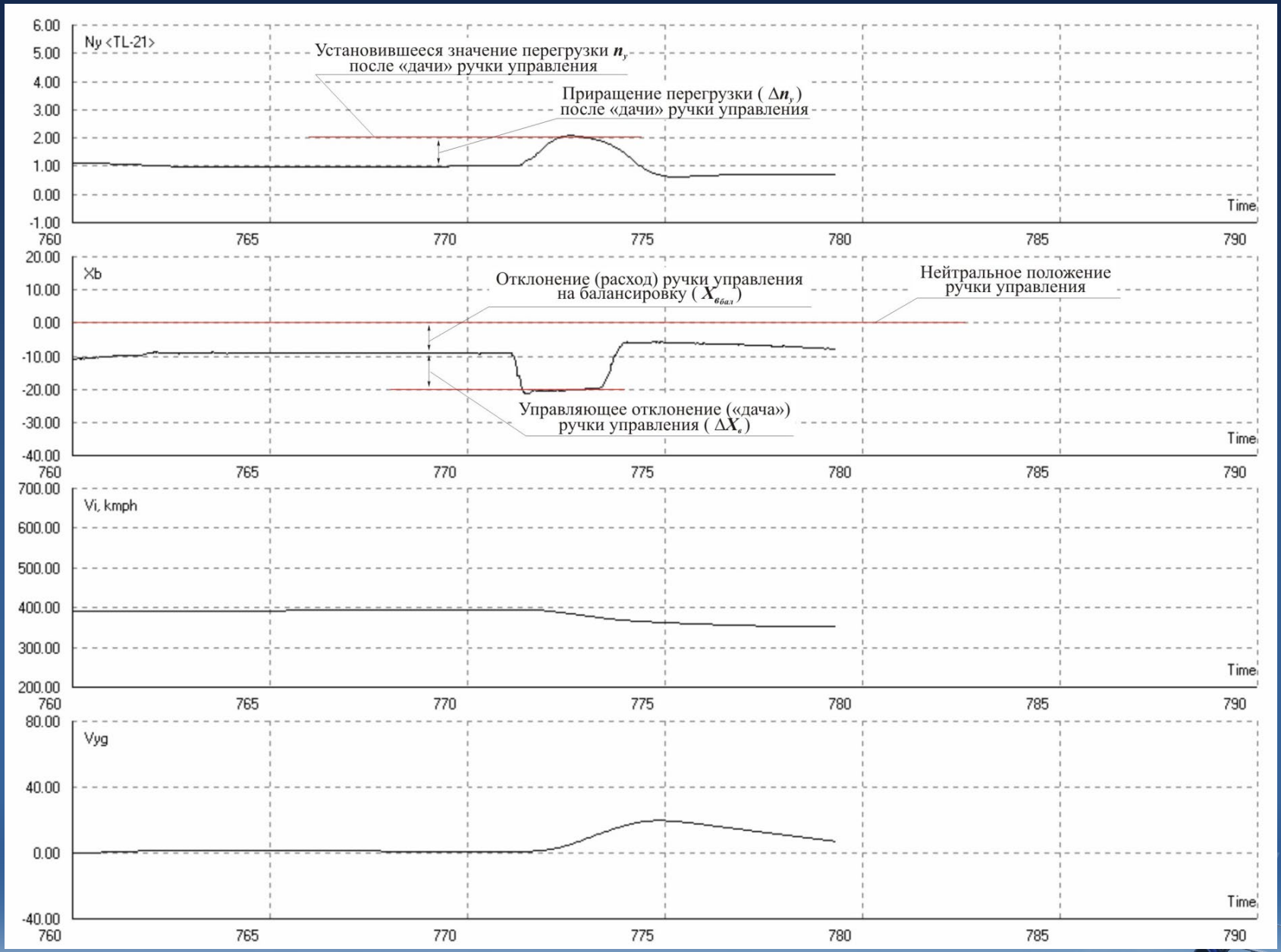




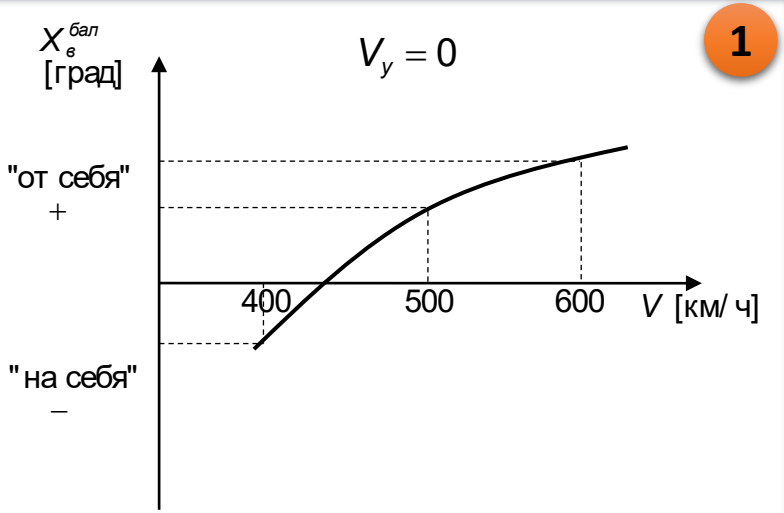

$\Delta X_в \approx \frac{1}{3}\Delta X_в^{max}$
$\Delta X_в = \Delta X_в^{max}$
$\Delta X_в \approx \frac{1}{3}\Delta X_в^{max}$
$\Delta X_в \approx \frac{1}{3}\Delta X_в^{max}$
$V = 600$ км / ч
$V_y = 0$ м / с
$V = 500$ км / ч
$V_y = 0$ м / с
$V = 500$ км / ч
$V_y = 0$ м / с
$V = 400$ км / ч
$V_y = 0$ м / с
glideslope descend
$V \geq 300$ км / ч
$\vartheta \leq 10^0$
climb
$V = 340 \div 380$ км / ч
$V = 320 \div 340$ км / ч
$V_y < 3$ м / с


$\gamma = 45^0$
$V_y = 0$ м / с
$\psi = 0^0$
$\psi = 0^0$
$\psi = 0^0$
$\gamma = 45^0$
$V_y = 0$ м / с
$\psi = 270^0$
$\psi = 90^0$
$\gamma = 45^0$
$V_y = 0$ м / с
$\psi = 180^0$
$\gamma = 45^0$
$V_y = 0$ м / с

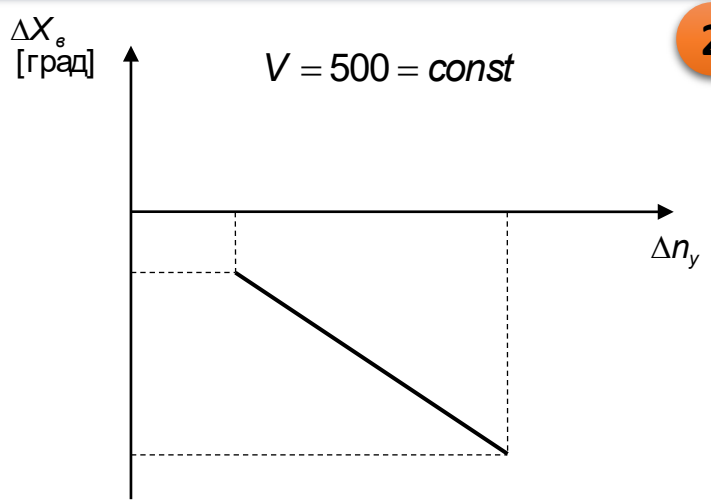
Registered parameters of aircraft movement



1

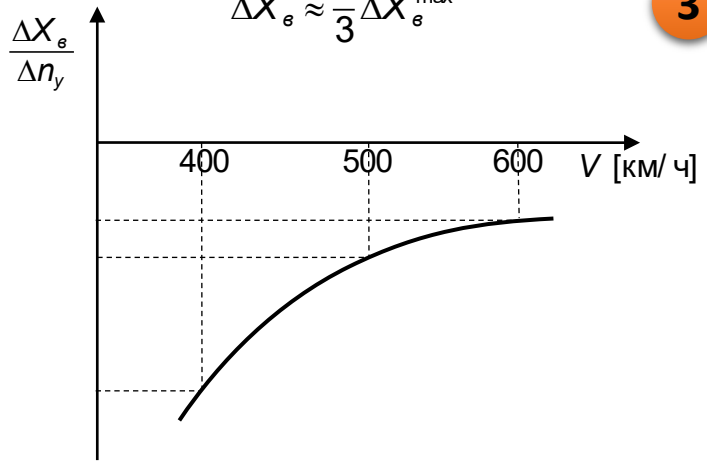


2



3

$$\Delta X_в \approx \frac{1}{3}\Delta X_в^{max}$$



4

Control comfort criteria

$$\frac{\left|\frac{\Delta X_в}{\Delta n_y}\right|_{max}}{\left|\frac{\Delta X_в}{\Delta n_y}\right|_{min}} \le 3.5$$