

ABSTRACT

METHOD FOR MEASURING BY ULTRA-SOUND THE RESIDUAL TENSION OF A PRE-STRESSED BAR

In order to measure in situ the residual tension F_1 of a pre-stressed bar braced between two anchorages, the two-way propagation time T_1 of an ultra-sonic wave between the two ends of the bar is measured, and F_1 is evaluated by the formula $F_1 = F_0 + k_b \cdot (T_1 - T_0)$. During a preliminary calibration carried out without demounting, the bar is subjected to a variable traction effort F . For each value, the two-way propagation time T of an ultra-sonic wave between the two ends of the bar is measured, a curve (C) associating the effort F with the time T is recorded, and the constant T_0 is determined as being the two-way propagation time measured for $F = 0$, the curve is approached in the neighborhood of the value $F = 0$ by a first straight line (D_1) of slope k_a , an upper portion of the curve is approached by a second straight line (D_2) of slope k_L , the constant F_0 is determined as being the traction effort F corresponding to the point of intersection of the first and second straight lines, and the constant k_b is determined according to the relationship $1/k_b = (1/k_L) - (1/k_a)$.

Figure 3