



Panhard General Defense  
 Reconnaissance Armoured Buggy) [7]. 2013

CRAB (Combat  
 ( ) [6].

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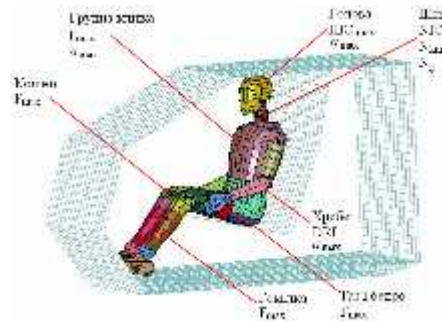
CRAB ( 8...10 ,  
 5 ),

( DARPA – Defense Advanced Research Projects Agency) [5].  
 2015

[8]

( -32 12,7

: 1) ; 2)



1- Hybrid

STANAG 4569 ( 1) [9].

( LS-DYNA ( 1).

1 -

	Head Impact Criterion	700 (t=15), 1000 (t=30)
	F <sub>z</sub>	4,0 (t=0), 1,1 (t=7)
	+	190
	-	57
		3,6 /
	Dynamic Response Index	17,7
	(-F <sub>z</sub> )	5,4

$$\frac{d...}{dt} + \dots \frac{\partial \hat{...}}{\partial x_i} = 0; \frac{d \hat{...}}{dt} = f_i + \frac{1}{\dots} \frac{\partial \hat{...}}{\partial x_j}; \frac{de}{dt} = -\frac{p}{\dots} \frac{\partial \hat{...}}{\partial x_i} + \frac{1}{\dots} s_{ij} \hat{v}_{ij},$$

$$i, j = 1, 2, 3; \dots; \hat{...}, s_{ij}, \hat{v}_{ij}$$

$$t - \dots; \hat{...}; f_i - \dots; e - \dots; -$$

( Johnson-Cook) [10]:  $\sigma_y = \left( A + B \bar{\epsilon}^n \right) \left( 1 + c \ln \dot{\epsilon}^* \right) \left( 1 - T^{*m} \right)$ ,  $A, B, C, n, m$  -

$$\bar{v}^p - \dots; \dot{v}^* = \dot{v}^p / \dot{v}_0$$

$$\dot{v}_0 = 1 \text{ s}^{-1}; T^* = (T - T_{room}) / (T_{melt} - T_{room}) -$$

[10]:

$$v^f = \left[ D_1 + D_2 \exp D_3 \hat{...} \right] \cdot \left[ 1 + D_4 \ln \dot{v}^* \right] \cdot \left[ 1 - T^* \right]$$

$$\hat{...}^* = p / \hat{...}_{eff} -$$

$$D = \sum \bar{v}^p N^f \quad 1 [10].$$

[10]:

$$p = \frac{\dots_0 \cdot C^2 \cdot \sim [1 + (1 - x_0/2)\sim - a/2\sim^2]}{\left[ 1 - (S_1 - 1)\sim - S_2 \frac{\sim^2}{\sim + 1} - S_3 \frac{\sim^3}{(\sim + 1)^2} \right]} + (x_0 + a\sim)E,$$

$v_s - v_p; S_1, S_2, S_3 -$

$v_s - v_p; x_0 -$

$; a -$

$x_0; \sim = \dots / \dots_0 - 1.$

( . Cowper-Symonds) [10]:

$$\dot{\epsilon}_T = \left[ 1 + \left( \frac{\dot{v}}{C} \right)^{1/p} \right] \left( \dot{\epsilon}_0 + S E_p v_{eff}^p \right) E_p = E_{tg} E / (E - E_{tg}); v_{eff}^p = \int_0^t \left( \frac{2}{3} \dot{v}_{ij}^p \right)^{1/2} dt,$$

$; \dot{v} -$

$; \dot{\epsilon}_0 -$

$\dot{\epsilon}_T -$

$; -$

$; E_{tg} -$

$$\dot{v}_{ij}^p = \dot{v}_{ij} - \dot{v}_{ij}^e.$$

LS-DYNA

LOAD\_BLAST,

CONWEP [11].

CONWEP

$$P(t) = P_{SO} \cdot (1 - (t - t_a) / t_d) \cdot \exp(-A \cdot (t - t_a) / t_d),$$

$P(t) -$

$t; P_{SO} -$

$; t_a -$

$; t_d -$

$; A -$

[12].

[13],

[14].

10%.

[9].

( 2, 3).

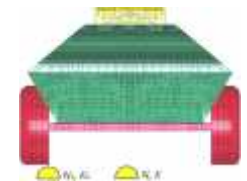
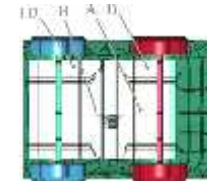
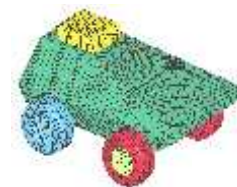
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- 36 .;

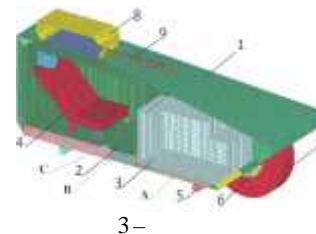
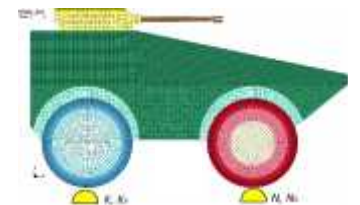
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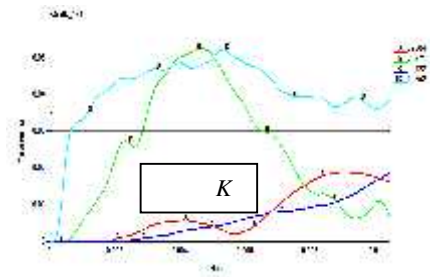
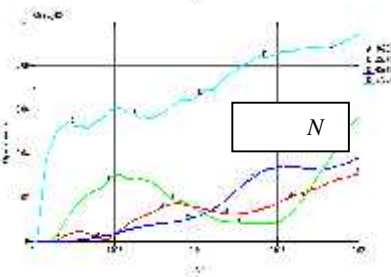
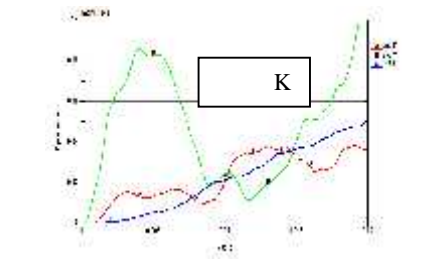
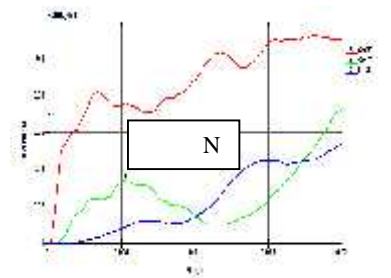
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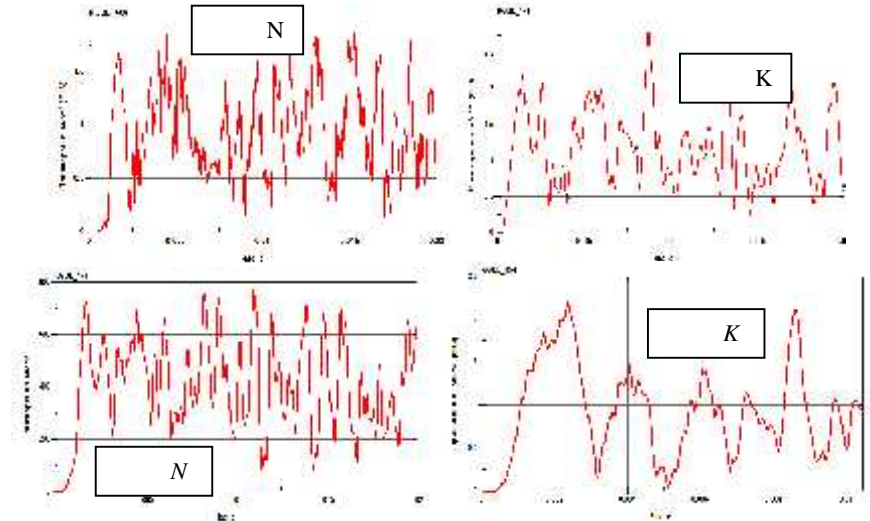
, / 3	7850	7850
,	210	210
,	1220	400
,	0,3	0,3
( )	0,1-0,2	0,25

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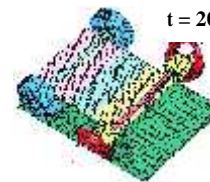
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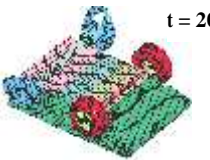
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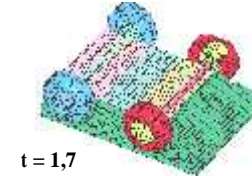
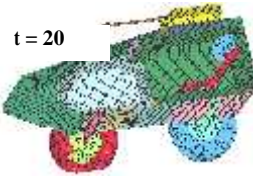
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63 p. 12. External blast load on structures – Empirical approach [Elektronnyy resurs]. – Rez-hym dostupu: <http://www.dynalook.com/> 13. Randers-Pehrson G. Airblast loading model for DYNA 2D and DYNA 3D / G. Randers-Pehrson, K. A. Bannister. – Army Research Laboratory, 1997. – 97 p. 14. Doslidzhennya navantazhennya vybukhom maketiv dnyshch boyovykh mashyn / [K.B. Krukovskyy-Sinevych, I.B. Chepkov, S.P. Bisyk, L.O. Volhin, V.A. Holub, O.Yu. Larin] – Mekhanika ta mashynobuduvannya. – Kharkiv: NTU "KhPI", 2012. – No 2. – P. 110-118.

(received) 05.03.2015

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( ) [1],

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