1.65 g/ Cm3 in 0-10 cm layer, tire 15,5R38 tires on 23,1R26 possible to reduce the density of 6%, the same replacement tires 15,5R38 tires on 66h43.00LR25 possible to reduce the density of 7 ... 13 %. A similar pattern was obtained in the 10-20 cm layer, but with a smaller increment, and the layers 20-30, 30-40 and 40-50 cm densities did not significantly differ from control.

***Wheeled tractor, chassis, area of contact with supporting surface propulsion, tire, tire size, soil, layers of soil density*.**

UDC 681,508,
621.87

ECSPERYMENTALNE ANALYSIS OF CHANGES departures tower crane with boom hinge-jointed SYSTEM

VS Loveykin, PhD OH Shevchuk, MA

In the article the method of experimental studies departure changes crane with sharnirno- Rigid boom system and filing equipment vymiryuvalno- the used

Eksperyment, research, crane, vibrations sensor, force, motion, speed.

Resolutionska problem. Change departure hinge-articulated jib tower crane system is implemented in the mechanism of lifting boom system and mechanism for moving trolley [1].

Prand changing departure dynamic loads occur in metal levels and mechanisms as well as fluctuations in load which lasts for steady motion mode. To determine the real nature of the change dynamic loads, and whenWan cargo crane with hinged rigid-boom system is necessary to conduct experimental analysis
entFirst movement. Experimental analysis of changes in departure crane with hinge-Rigid boom system can be compared with the theoretical [2] to confirm the adequacy of the chosen theoretical model that describes the process of changing departure.

DFor experimental studies departure changes hinge-articulated boom system made its physical model [3], which reflects the change in the designated departure scale.

AnaLiz recent research. TrialLemma experimental study of lifting equipment was raised in many papers. So given [4-6] that experimental studies are conducted to obtain data on the nature of the change certain system settings. Experimental data is often compared with the theoretical to assess the adequacy of the adopted theoretical model that describes the phenomenon under study. The main task of the early experimental studies are experimental design. Planning experiment includes determining the minimum number of experiments needed to determine the analytical model of the process or phenomenon [7, 8].

In [9] described a technique for experimental research of motion hinge-articulated jib crane system by changing the flight load, and measurement and filing equipment is used.

RoseLook experimental setup with truck mounted crane hydraulic and measuring-equipment filing for studies to determine the dynamic loads on its operating equipment. The results of experimental studies in [10].

In [11] conducted an experimental study balancing model tower crane with a movable counterweight.

The comparison of the experimental results theoretical. In experimental studies departure changes hinge-articulated boom system important character changes kinematic and inertial characteristics of the main structural elements [12]. You also need to investigate the effect of load on the metal structure swinging boom systems and components of drive mechanisms, and changing voltage and electric current drive electric motors [13].

Metand dossurvey findings - SuTanotwist forinematychni, dynenomic, tand thnerhetychni characteristics boom system to be experimentally identify and select the right equipment for this.

Rezultaty dossurvey findings. Gkpaccount the vyschezaznachenot proponuyetbe experimentally measured the following parameters:

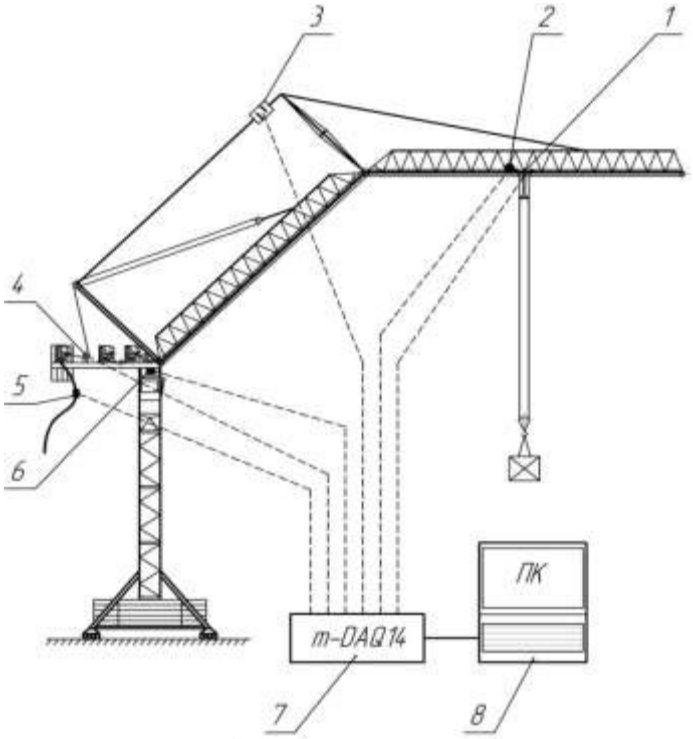
1) Kut deviation from vertical load;
2) Wvydkist moving trolley;
3) ZuSilla in vidtyazhtsi;

4) Wvydkist drum rotation mechanism for moving the boom system;

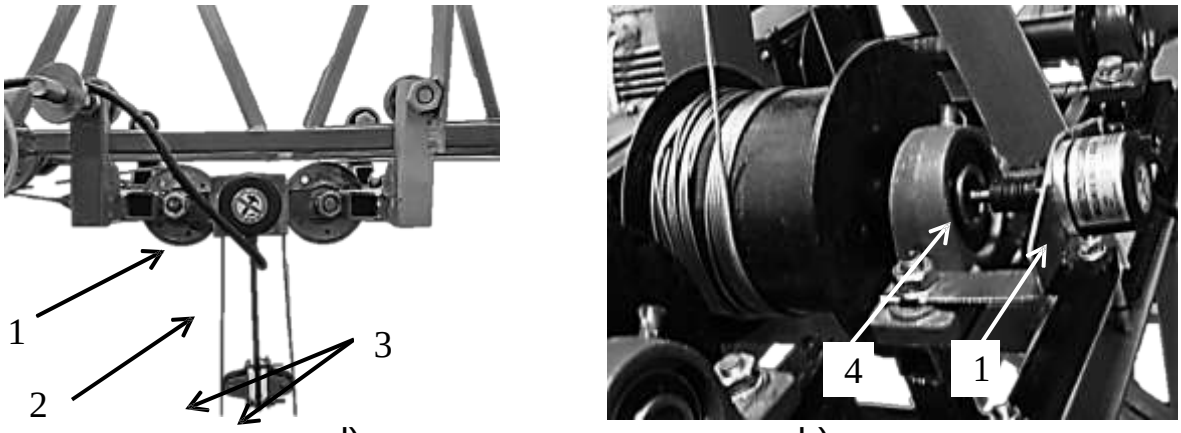
5) Power supply current and voltage electric motors;

6) Fluctuations in the tower.

Each sensor that is fixed on a physical model sharnirno- articulated boom system connected to a data acquisition device (7). For each sensor allocated individual channel (or more channels). During the experiment data acquisition device records the voltage on each channel and using the software installed on your computer (8) converts this information into text format file. Analyze the characteristics to be measured, choose the appropriate sensors and how to mount them on a model-hinged articulated boom system. The deflection angle from the vertical load and speed of rotation of the drum mechanism for moving the boom system will determine the angular encoder MOL-40 Megatron (Fig. 2). Functional data collection scheme shown in Fig. 1.



Ric. 1. Functional diagram data collection: 1 - enkodernyy sensor deviation from vertical load; 2 - enkodernyy sensor moving trolley; 3 - tensor gauge efforts vidtyazhtsi; 4 - enkodernyy sensor rotation drum winders boom system; 5 - sensors and power supply voltage AC drive motors; 6 - acceleration sensor (accelerometer); 7 - Data collection device; 8 - PC.

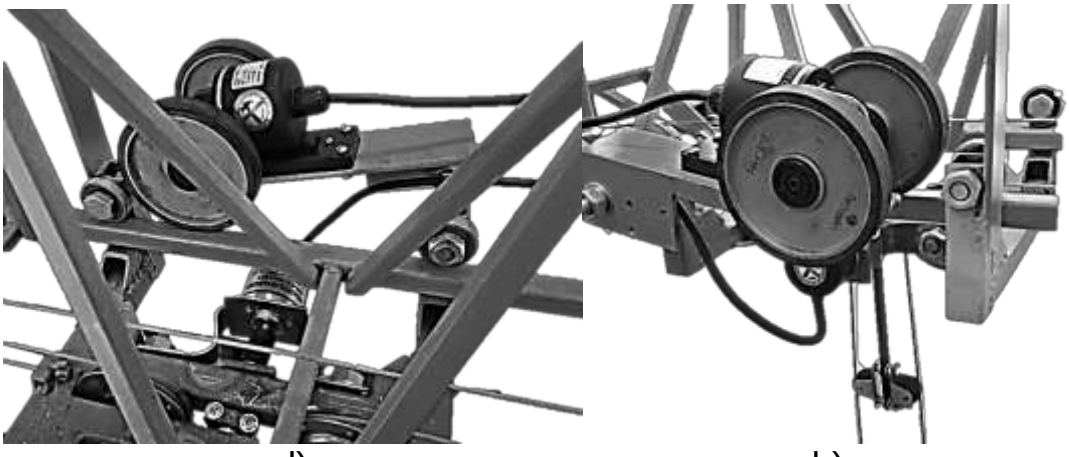


and) b)

Ric. 2. Installation of sensors on a physical model sharnirno-articulated boom system: a) to determine deviations goods; b) to determine the speed of rotation of the drum; 1 - sensor; 2 - arm; 3 - guide rollers; 4 - elastic compensating coupling.

DTo measure the deviation from vertical load produced arm (2) which performs freely swinging movement about the point of suspension cargo. Contact the beam with a rope going through the guide rollers (3) which run into the drive and cargo rope branches (Fig. 2a). Fig. 2b sensor through compensating elastic sleeve is attached to the rotation shaft drive sprocket lift boom system.

Wvydkist moving trolley measure encoder ENC Autonics (Fig. 3), which is pivotally mounted on a trolley
stillm so that the wheel gauge rolls freely on the lower section of the belt auxiliary boom system.



and) b)

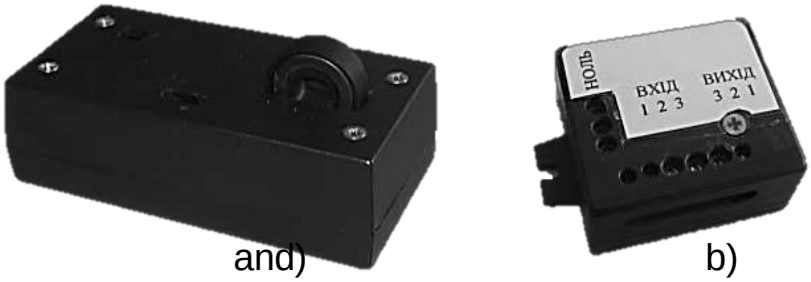
Ric. 3. Appearance sensor ENC Autonics, which is fixed at toandntazhnomu moHCCin fizychnoyi maboutdelhi Crane: and) youSee fromleft;
to) Right.

DTo measure the force used S-shaped vidtarovanyy strain gauges, which is fixed on vidtyazhtsi (Fig. 4a). Measurement of vibrations tower execute using the accelerometer (Fig. 4, B), which has three channels, corresponding to the three axes of the Cartesian coordinate system. The sensor consists of a sensing element MMA7260Q company Freescale Semiconductor, signal amplifier and voltage supply. Power accelerometer is performed using a galvanic cell.

a) b)

Ric. 4. Foreign appeara sensors: and) thatnzometra; to atacceleration (accelerometer).

DTo measure the electrical parameters using current sensors CSLA1CD 0612 MEX company Honeywell (Fig. 5 a) and sensor voltage (Fig. 5 b). All specifications shown above sensors are shown in table. 1.



and) b)

Ric. 5. Appearance of sensors: a) current; b) voltage.

In theB indicated values measured over time change departure boom system performed separately boom hoist system and moving trolley and collaborate with these mechanisms. Also, measurements should be carried out for cases of departure changes from minimum to maximum and vice versa. Measurements should be performed by real time with a frequency of surveys necessary to determine the experimental values of measurement parameters.

1. The characteristicsand sensors.

In theymiryu - tion paramete	MArch sensing element	Firma-manufacturer sensitive	Absolyut-on pohyb-Country measurem	Mezhi measurement	Mutlyvist
Curre	CSLA1CD 0612 MEX A	Honeywell	003 A	0 ... 57	0.05 In the/
OffRuga	-	-	-	Limited the maximal voltage AndSecurities	0.043 I / 0.020 I / 0,009 I /
Fromusyllya	DEF-A	Keli	100 N	0 ...10000 N	0.00021 In the/ H
The linear movement of	ENC	Autonics	1 mm	-	1aftern / mm
angular movement of	MOL-40	Megatron	01^0	-	3600 aftern / v
Acceleration Rennes	MMA7260Q	Freescale Semiconductor	0.03 m / s2	0 ... 60 m^2 / s	.078 · lnC2 / m

TechNight specifications of your collecting data shown in Fig. Are shown in Table 6. 2 [14].

2. TechNight specifications of your data collection.

Charactersjoints	Descriptio
Andnterfeys connection to a PC	USB 2.0
Entranceidnyy range signals,	4 dyferentsialnyh abab 8 aboutdnoprovidnyh
Gamenychna input voltage relative to AGND (ground), B	± 10 ± 15 (Prand toforlyuchenomu othersTurfB USB) ± 10 (disconnected interface USB)
Calcdnist ADC bits	14
Poppysymalna differentiation andFlax nonlinearity transformation, LSB	-1+ 1.5 ...
Poppysymalna integral nonlinearity transformation, LSB	± 1,5
Poppysymalna frequency	

sampling kHz	100

Buyvzhennya tab. 2

Charactersjoints	Aboutpiwith
Zhivlennya device from SheaUSB Maximum consumed us current, mA	250 (active mode)
Overall dimensionor dimensions	60x100x28
MassKg	0.10
YouMr connectors for pidklyuchen- of analog signals	DB-25F
In theidnosna humidity,%	5-90 (no condensation)
Temperature range, oC	5+ 40 ...
Materialkorpusa	Sectioneraser

DA collection of experimental data using an m-DAQ-14 (Fig. 6).

Ric. 6. Appearance of data collection.

Prand conducting experimental studies used power supplies and SPD05051 SPD12051 company Carlo Gavazzi (Fig. 7).

Ric. 7. Exterior power supplies and SPD05051 SPD12051.

TechNight characteristics PSUs SPD12051, shown in Fig. 7, are shown in Table. 3.

In thewe ELECTRIC POWER traffic control equipment for drive motors assembled in cabinet (Fig. 8). Management of the frequency converters is performed using a PC. The connection between the PC and the frequency converter is performed using information cable (used communication interface RS-232).

Ric. 8. The exterior cabinet with frequency converters.

3. TechNight characteristics PSUs SPD05051 and SPD12051.

Parameter	MArch PSU	
	SPD 05051	SPD 12051
Insulation resistance, MOhm	100	
Temperaturnyy range, oC	-10 ... + 71	
Restosna humidity,%	dat 95	
Nominal range of supply voltage, V	100-240	
Bidnosna error output voltage,%	± 1	
Ripple and noise output voltage mV	50	
Restosna frommines and toyhidnoyi Categories apruhy at changes and the working load limits,%	± 2	
	5	12
Rated output voltage, V	1	0.42
Rated output current, A		
Nominalnaspozhyvanapotuzhnist, W	18	

Conclusio
ns

This paper shows the physical quantities to be measured and the experimental methods offered their measurement using the selected equipment.

DTo register, read and record analog sensors proposed data collection. This system also allows you to convert an analog signal sensors in an array of digital information that can later be used to build graphical dependencies. Based on these relationships conclusions about the dynamics of boom system and how to best control the boom hoist system and move the trolley.

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In Article pryvedenы method of research эksperymentalnыh Changed vыleta bashennoho articulated crane with sharnyrno- strelovoy systemoy, as well as yzmerytelno- rehystryruyuschee equipment, kotoroe at this yspolzuetsya.

Эksperyment, Studies, crane, fluctuations, sensor usylye, motion, rotation frequency.

The paper deals with experimental studies of luffing of articulated jib tower crane and adopted necessary recording and measuring equipment.

Experiment, study, tap, vibration sensor, force, motion, speed.

UDC 631,371

AnalyteCHNE RESEARCH WORKING PROCESS KARTOPLESORTUVALOK

SV Smolinskyy, Ph.D.

In the article the sorting process analytical study of potato tubers on the surface of kartoplesortuvalok construction of a mathematical model workflow sorting.

Kartoplesorturoll, sorting, potato tubers.

Resolutionska problem. PotatoesI - one of the most important food in the diet of people around the world, but the level of mechanization in the potato is still quite high, and labor costs at harvest, post harvest and processing potatoes peredposadkoviy - significant. Important for high and stable yields of potatoes planting is sorted into fractions of planting material. In addition, the process of sorting potatoes also significantly affects the quality of storage of tubers. For mechanization of post-harvest processing of a crop of potatoes and sorted them into fractions Potato apply different design schemes and manufacturers.

The main types of sorting surfaces, which equip Potato is roller, conveyor,

hrohotna and drum. The most common working tools for sorting tubers kartopLee there is roLykov tand Maynsporterni, and Potatoesgrader to Farmerx gospodarleaf aboutladnuyut