( / / :          / / :          )

HSM904

.

.

.

.

.                                    (%          )

.                                    ,              Y=1.873+0.024494D+2.499N

.

.                    HSM904                                              :

E-mail: a.najafi@modares.ac.ir                    :                    :              :          *

HSM904

450C

(        )

(        )

.(          )

:(                    )

:

Travel empty (      )

Preparation (

Pooling the

hook

Hook

Winching

Travel loaded

Release

Piling

Delays

Technical delay:

Operational delay:

Personal delay :

(% )

. %

:

$N = (t^2 * s^2)/E^2$

N=

t=

t

s=

E=

. ...

(Stepwise Regression)

)

.(

:(                    )                            .

$$Y \pm t_{n-2}5\% {}^{*} ((Mse {}^{*} 1/n) + 1 + ((x_i - x)^2 /SSx)^{0.5})$$

= MSe                                              .

=n

=x_i

)

= x                                                    (

=SSx                              .

.(                    )

| (    ) | | (    ) | | | | % |
|---|---|---|---|---|---|---|
| (    ) | ( ) | | ( ) | | ( ) | |
| ,   <T<   , | , | , | , | | | , |
| ,   <T<   , | , | , | , | | , | , |
| ,   <T>   , | , | , | , | | , | , |

(                    )

.                    "                    "

.

.                    .(                    )

.

.                              .

.                              .(                    )

(F=0.5)                                                    .

                                            :(MR)

MR=[(P-S)/(N*PH)] * F


    :(FLC)                                                          .


                  %


                                                       .
              :(t)                                              :

t=                  ]/
                                                          :(P)
                              [(1+i)*
                                                  %   ):(S)
              :                                                          (
  TOC= MR + FLC +t                          (SH)
              :(LC)
          )                                              SH=     *   =
                                                  :(PH)
          :                    (                    PH=     *   =
LC =
                                            )*        = %  ,       :
              :(MRH)                              U= (PH/SH)*100              (      /
    (                                )                              :(N)
  MRH/PH = TFC + TOC                              :(A)
                                        A=[ [(P-S)*(N+1)] /2N ]+ S


                                                                :(D)
                                        D=(P-S) / N
                                                      :(I)
                          .              I= A * (i)
                                                      :(T)
                                        T  = (D+ I) * 10%

          .
                                                                :(TFC/PH)
                                          TFC/PH = (D+I+T)/PH


                                                                :(TFC/SH)
          .                                TFC/SH= (D+I+T)/SH
                                                      :(OC) (     )


                  .

.

)

. (

.

. SPSS

. % : HSM904

$$Y = , + , N + , D$$

( ) = Y

. % = N

( ) = D

| | | |
|---|---|---|
| ( )/ = | | |
| *% , = , | | |
| ( , + ) * , = , | | |
| ( + , + , )/ = , | | TFC/PH |
| ( + + )= | | TFC/SH |
| / = | | |
| [( )/ ]* = | | |
| * = | | |
| [ *( + )]/ = | | |
| | | (LC) |
| | | (TOC) |

MRH/SH=( * ) + =

(**MRH**)

( )

:HSM904

$$MRH/PH = TFC + TOC = * ) +$$

( , =

:

$$( \quad , \quad * \quad ) + \quad + \quad =$$

.

:

$$( \quad * \quad ) + \quad + \quad =$$

:( )

$$/ \quad , \quad =$$

:( )

$$/ \quad , \quad =$$

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( )

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# Time study of skidder HSM 904

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## Abstract

Time study on the skidder recently bought by the Mazandaran Wood and Paper Industries Company was aimed at estimating the amount and cost of machine production in different conditions, management, harvest planning, replacement of new machines and defining new labor systems. Recently ten HSM904 skidders have been bought by Mazandaran Wood and Paper Industries Company. Time study on skidders have been carried out to obtain a mathematical model and to calculate the production cost. Our study shows that the time of traveling depends on skidding distance and the number of logs carried in each travel but there isn't any significant relation between volume and slope and travel time. Because the volume carried by a skidder has been less than the power of machine there isn't any significant relation between volume and travel time. The lack of a significant relation between volume of loading and travel time arise from the fact that the volume of the loading in each time has always been lower than the machine's power. Furthermore, low gradient of skid trail (less than 25%) cannot decrease the machine power significantly. A model for mathematical computation, $Y = 1.873 + 0.024494D + 2.499N$, was developed and hour production and hour cost were calculated to be 6.53 m$^3$ and is 384803 RLS. Training choker men, modifying dump and cable connection form and driver cabin also substantially improve efficiency, safety and helps better utilization of machine in northern forests of Iran.

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