**Chapter #17**

1- A crawler tractor costs $250,000 has an estimated salvage value of $ 50,000 and a 5 year life. Using double declining balance method of depreciation and sum of the year digit method, find the crawler’s yearly depreciation and book value at the end of each year.

Solution:

Double declining balance method:

Dn = (2/N) × Book value at beginning of year 2/N = 2/5 =0.4

|  |  |  |
| --- | --- | --- |
| Year | Depreciation $ | Book Value $ |
| 0 | 0 | 250000 |
| 1 | D1 = 0.4 × 250000 = 100000 | B1 = 250000 – 100000 = 150000 |
| 2 | D2 = 0.4 × 150000 = 60000 | B2 = 150000 – 60000 = 90000 |
| 3 | D3 = 0.4 × 90000 = 36000 | B3 = 90000 – 36000 = 54000 |
| 4 | D4 = 0.4 × 54000 = 21600 | B4 = 54000 – 21600 = 32400 |
| 5 | D5 = 0.4 × 32400 = 12960Or32400 – 5000 = 27400Use depreciation that result smallest book value | B5 = 32400 – 12960 = 19440OrB5 = 32400 – 27400 = 5000 Choose the smallest book value |

Sum of the year digit method:

Dn = (year digit/sum of year digits) × amount to be depreciated

Sum of year digit = 1 + 2 + 3 + 4 + 5 = 15

|  |  |  |
| --- | --- | --- |
| Year | Depreciation $ | Book Value $ |
| 0 | 0 | 250000 |
| 1 | D1 = 5/15 × (250000 – 5000) = 81666.67 | B1 = 250000 – 81666.67 = 168333.33 |
| 2 | D2 = 4/15 × (250000 – 5000) = 65333.33 | B2 = 168333.33 – 65333.33 = 103000 |
| 3 | D3 = 3/15 × (250000 – 5000) = 49000 | B3 = 103000 – 49000 = 54000 |
| 4 | D4 = 2/15 × (250000 – 5000) = 32666.67 | B4 = 54000 – 32666.67 = 21333.33 |
| 5 | D5 = 1/15 × (250000 – 5000) = 16333.33 | B5 = 21333.33 – 16333.33 = 5000 |

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2- find the hourly operating cost for the second year of life of the same tractor using the following additional data: rated power = 285 hp, fuel price = $1.0/gal, load conditions = sever, hours operated = 2000 hr/yr and operator cost = $20 / hr.

Solution:

• Fuel cost:

From table 17 – 1, fuel consumption factor = 0.046 gal/hr/hp

Estimated consumption = 0.046 gal/hr/hp × 285 hp = 13.11 gal/hr

Fuel cost = 13.11 gal/hr × $1.0 /gal = $13.11/hr

• Service cost:

From table 17 – 2, service cost factor = 50% of fuel cost

Service cost = 0. 5 × $13.11 = $ 6.56

• Tire cost = crawler 🡺 none

• Repair cost:

From table 17 – 3, typical life time repair cost factor = 95%

Life time repair cost = 0.95 × ( $250000 – $0) = $ 237500

Repair cost = $\frac{year digit}{sum of year digit}×\frac{life time repair cost}{hours operated}$ =

Repair cost = $\frac{2}{15}×\frac{\$237500}{2000hr}$ = $15.83/hr

• Operator wage = $20/hr

Total operating cost for second year = $13.11/hr + $6.56/hr + $ 15.83/hr + $20/hr

 = $55.5/hr

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