Mobile Mine Equipment Hourly Repair, Fuel and Tyre Cost

Hourly repair cost from a repair factor and the depreciable value, fuel use from engine power and load factor, tyre cost per hour and the total.

Input parameters

Unit system: SI

Parameter	Value	Unit
Repair factor	0.60000	
Depreciable value of the machine (excluding tyres)	4,500,000	
Engine brake power	1,700.0	kW
Engine load factor	50.000	%
Fuel use per kWh at full load	0.30000	L/kWh
Fuel price per litre	1.0000	
Cost of a set of tyres	240,000	
Tyre life	5,000.0	h

Calculated results

Parameter	Value	Unit
Repair cost per hour	270.00	
Fuel use	255.00	L/h
Fuel cost per hour	255.00	
Tyre cost per hour	48.000	
Repair, fuel and tyre cost per hour	573.00	

Notes for this case

• Costs are in whatever currency the value and prices are entered. The repair factors run from about 0.2 for electric-drive trucks to 1.6 for elevating scrapers; 0.3 L/kWh (0.06 US gal/hp·h) is the full-load fuel rate. Owning cost, labour and lubricants are not included.

Formula and method

$$R_c = \frac{F_r V_d}{10,000}, \quad C_f = EBP \cdot F_l \cdot SFC, \quad \text{tyres} = \frac{C_t}{t_t}$$

Variables

F_r	Repair factor	-
V_d	Depreciable value of the machine (excluding tyres)	-
EBP	Engine brake power	W
F_l	Engine load factor	-
SFC	Fuel use per kWh at full load	m³/J
p_f	Fuel price per litre	-
C_t	Cost of a set of tyres	-
t_t	Tyre life	s
R_c	Repair cost per hour	-
C_f	Fuel use	m³/s
fuel	Fuel cost per hour	-

$tyres$	Tyre cost per hour	-
$total$	Repair, fuel and tyre cost per hour	-

Method and standards

Hourly operating cost estimates.

Assumptions and limits

- Order-of-magnitude estimates; use site records when available.

Report details

Report reference	FCC-M3N5-4HG0 (the same inputs always give the same reference)
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Release checks	3 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/civil/mine-design/mine-equipment-owning-operating-cost

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.