

OPSS 127 Rate Schedule

The intent of this calculation is to represent the cost of owning and operating equipment in Ontario and is made up of direct and indirect costs. Profit is also included in the calculation that is represented in the schedule.

The information used is compiled from manufacturers, equipment dealers and other available data and published reports as sourced.

Equipment rates are calculated for each piece of equipment in the dataset, with the 127 Rate being the average of the rates. All equipment pricing is entered in as new in the year of manufacture, and is indexed to the equivalent calculation year dollars, allowing for a broader sample size of active equipment, or reliance on previous data if no new data is available.

In general, variables used in the calculation of the 127 Rates will be the average of values within the 12-month period of April 1, 2025, to March 31, 2026. Where data is not available within this timeframe, the most recent 12-month period will be used as the basis of calculation. Refer to Appendix A: 2026 Global Variables for the values of the variables used in the 2026 calculation.

Conversions

1 US gallon = 3.78541 litre

1 hp = 0.7457 kW

1 US gal/hp-hr = $(3.7854 \text{ litre/US gallon}) / (0.7457 \text{ kw/hp}) = 5.0763 \text{ litre/kw-hr}$

$$1 \text{ mile/gallon US} = \frac{1.609344 \frac{\text{km}}{\text{mile}}}{3.7852 \frac{\text{l}}{\text{US gal}}} = 0.425 \frac{\text{km}}{\text{l}} = 2.35 \frac{\text{l}}{\text{km}} \times 100 \text{ km} = 235.215 \frac{\text{litre}}{100\text{km}}$$

Litre/100 km = 235.215 / US mpg

Equipment Price

When costing information is requested from an Ontario equipment supplier, all factors that may affect price (freight, customs, PDI, etc.) are requested to be included in the price provided, which represents how much it costs to purchase the equipment in Ontario. Where costing information is obtained from sources outside Ontario, the price is converted into Canadian dollars, and the freight, customs etc. is assumed to be included for that location and relatively equal as if purchased in Ontario.

Only models typically available in Ontario, FOB Ontario are included in the calculations.

The following steps are used to develop the price of each piece of equipment used in the calculation:

$$MSRP_{base}(CAD\$) = MSRP_{base} \times \$ Exchange Rate_{base}$$

$$Discount_{base}(CAD\$) = MSRP_{base}(CAD\$) \times (1 - discount \%)$$

$$TEV_{base} = Discount_{base} + Shipping$$

$$TEV = TEV_{Base} \times \frac{MEPI_{calc}}{MEPI_{base}}$$

MSRP = Manufacturer's suggested retail pricing information was compiled from manufacturers, equipment dealers and distributors, and is based on equipment specifications for standard models, including all necessary attachments to perform the work. Costs are not included for optional components that may increase the weight, capacity, or power of a piece of equipment.

MEPI = Machinery Equipment Price Index (Construction) published monthly by Statistics Canada (Annual MEPI = average of most recent published 12-months of data as of April 1, typically February previous year to January current year)

Source: Statistics Canada. [Table 18-10-0284-01 Machinery and equipment price index, by industry of purchase, monthly](#)

TEV = Total Equipment Value is the discounted price of the equipment + shipping costs

Discount Rate

The approach assumes a universal discount rate of 15% for all trucks and 7.5% for all other equipment where price quotes are obtained for new equipment based on Manufacturer's suggested retail pricing. It is acknowledged that there may be significant variation in discounts provided by suppliers in a given equipment class.

Useful Life in Years

$$Useful Life (yrs) = (Useful Life (hrs))/(Annual hours)$$

Useful Life (yrs) is then rounded up to nearest integer.

Useful life and annual hours are based on historical data compiled from Equipment Watch Rental Rate Blue Book

Adjusted Annual Hours

Annual hours are adjusted slightly based on rounded useful life in years

$$\text{Adjusted Annual Hours} = (\text{Useful Life (hrs)})/(\text{Useful Life (Yrs)})$$

Adjusted Annual hours and then rounded up to nearest integer

Ownership Costs

Interest

The hourly interest rate is calculated in 2 steps:

Lifetime interest costs are calculated using the CUMIPMT (Cumulative Interest Paid) formula in excel, which calculates the cumulative interest paid on a loan between start period and end period. Syntax: CUMIPMT(rate, nper, pv, start period, end period, type)

- a. Rate = interest rate (decimal)
- b. Nper = useful life (yrs)
- c. Pv = TEV
- d. Start period = 1
- e. End period = useful life (yrs)
- f. Type = 0 – end of the period

$$\text{Hourly Interest Rate} = (\text{Total Interest})/(\text{Useful Life (hrs)})$$

In order to get a reasonable average rate, the effective business interest rate as published by the Bank of Canada is used.

Depreciation

Hourly depreciation is calculated using a uniform salvage value of 20%.

$$\text{Hourly Depreciation} = ([\text{TEV} \times (1 - \text{salvage\%})])/(\text{Useful Life (hrs)})$$

Overheads

$$\text{Annual Overhead total} = [\text{TEV} \times \text{Overhead (\%)}]$$

$$\text{Hourly Overhead} = (\text{Annual Overheads})/(\text{Adjusted Annual Hours})$$

Fixed overhead costs are 6%. On-road equipment includes an additional amount for license and additional insurance costs which varies by GVW and average TEV.

$$\begin{aligned} \text{On-Road} &= (\text{TEV} \times 4\% \text{ insurance}) + \text{License Fee (GVW)} \\ &+ (\text{TEV} \times 3\% \text{ Fixed Overhead Costs}) \end{aligned}$$

$$\text{Off-Road} = \text{TEV} \times 6\%$$

Operating Costs

Repairs

Lifetime repair costs are calculated as a percentage of the equipment price. The repair cost accounts for equipment repairs, maintenance, and major overhauls (including undercarriage wear, ground engaging tools, and designated attachments) performed in either the field or the shop.

$$\text{Repair Costs (lifetime)} = \text{TEV} \times \text{RCF} \times \text{LAF}$$

$$\text{Hourly Repair Costs} = (\text{Repair Costs (lifetime)})/(\text{Useful Life (hrs)})$$

RCF = Repair Cost Factor values are derived from industry papers and publications.

Mostly reliant on US Army Corps of Engineers [EP1110-1-8 Construction Equipment Ownership and Operating Expense Schedule](#)

LAF = Labour Adjustment Factor, is a decimal factor to account for variation in provincial labour costs from US based Repair Cost Factor (RCF). The current LAF is provided in Appendix A: 2026 Global Variables. Refer to Appendix B: Labour Adjustment Factor Calculation for further explanation on how the LAF is calculated.

Fuel

$$\text{Fuel Usage}(hr) = \text{Consumption Rate} \times \text{Engine Power} \times \text{Fuel Load Factor}$$

$$\text{Hourly Fuel Cost} = \text{Fuel Usage}(hr) \times \text{Cost of Fuel}$$

The average fuel cost is the 12-month average price between April 1 and March 31 and is generated from locations all around the province, so the variable distribution cost is accounted for in the averaged pump price. Fuel costs are based on data published by [Kalibrate](#). On this basis the calculation assumes distribution and delivery costs are included in the price of the fuel. Costs for fuel storage tanks and pumps are not included but are expected to be included in site overheads as appropriate or needed.

Cost of Fuel (Type)

- On-Road = Average retail price (incl. tax) – contractor discount (\$0.0400/litre)
- Off-Road = On-road – Road tax (\$0.09/litre)

Consumption Rates

- Diesel = 0.203 l/kw-hr = [0.040 gal/hp-hr * 5.0763 (see conversions above)]
- Gasoline = 0.305 l/kw-hr = [0.060 gal/hp-hr * 5.0763 (see conversions above)]
- Propane = 0.454 l/kw-hr = [0.089 gal/hp-hr * 5.0763 (see conversions above)]

Engine Power = rated model engine horsepower from manufacturer's equipment specifications.

Fuel Load Factor = an average percent of full-rated horsepower being used by the engine. It is necessary to modify the rated horsepower as engines and motors in actual production do not work at their full-rated horsepower at all times. Periods spent at idle, travel in reverse, traveling empty, close maneuvering at part throttle, and operating downhill are examples of conditions that reduce the Fuel Load Factors.

Fuel load factors vary between categories of equipment. The information used is compiled based on research from multiple data sources/published reports, including:

- "Development of a Fuel Consumption and Emissions Taxonomy for Nonroad Diesel Equipment." 95th Annual Meeting of the Transportation Research Board. Lewis, Phil, Heni Fitriani, and Yongwei Shan. n.d.
- "Construction Equipment Management for Engineers, Estimators, and Owners". Boca Raton: CRC Press. Gransberg, Douglas D., Calin M. Popescu, and Richard C. Ryan. 2006.
- "Air Quality/Greenhouse Gas Emissions Data from California Emissions Estimator Model", July 2013

- Various Load Factors [Source: (Caterpillar 2018)]
<https://www.holtcat.com/Documents/PDFs/2012PerformanceHandbook/Owning%20&%20Operating%20Costs%20-%20Sec%2020.pdf>
- [Fuel Consumption and Engine Load Factors of Equipment in Quarrying of Crushed Stone, 2016.](#)
- “The Five Factors of Fuel Efficiency” <https://www.quarrymagazine.com/Article/6493/The-five-factors-of-fuel-efficiency> Operator’s Technique] Hurdis, Jason R. 2015.
- “Construction Equipment Ownership and Operating Expense” US Army Corps of Engineers. 2016. Schedule. Vol. 1. Washington, DC

Diesel Exhaust Fluid (DEF)

DEF rates are a percentage of hourly fuel consumption (L/hr) and only apply to diesel engines, with Tier 4 engines.

$$\text{Hourly DEF Cost} = \text{Fuel Usage (hr)} \times \text{DEF Consumption (\%)} \times \text{DEF Cost/litre}$$

Assumptions:

- On-Road: All on-road diesel vehicles assumed to have DEF 2015 and newer
- Off-Road: All off-road diesel vehicle assumed to have DEF 2018 and newer
- Engines less than 56 kW (75 hp) do not require DEF
- DEF Consumption – assume 4% of fuel usage
- DEF \$/litre provided by bulk fuel supplier

The ministry calculation is based on the current legislated requirements of the Canadian Environmental Protection Act.

Filters, Oil & Grease (FOG)

The FOG cost is computed as a percentage of the hourly fuel costs.

$$\text{Hourly FOG Cost} = \text{Hourly Fuel Cost} \times \text{FOG Factor} \times \text{LAF}$$

FOG Factors = Mostly reliant on US Army Corps of Engineers [EP1110-1-8 Construction Equipment Ownership and Operating Expense Schedule](#)

LAF = Labour Adjustment Factor (see above)

Base Operating Rate (BOR)

$$\text{Hourly BOR} = \text{Hourly Ownership Cost} + \text{Hourly Operating Costs}$$

Where the two cost are the sum of the items in the table below:

Hourly Ownership Cost	Hourly Operating Cost
Hourly Interest Rate	Hourly Repair Costs
Hourly Depreciation Cost	Hourly Fuel Cost
Hourly Overhead	Hourly DEF Cost
	Hourly FOG Cost

127 Rate

$$127 \text{ Rate} = \text{Hourly BOR} + \text{Profit (20\%)}$$

Appendix A: 2026 Global Variables

Variable	Value
Diesel-Off Road (\$/litre)	1.3221
Diesel-On Road (\$/litre)	1.4121
DEF (\$/litre)	1.4641
Gasoline (\$/litre)	1.3540
Propane (\$/litre)	1.1181
Electricity (\$/kwh)	0.1766
Labour Adjustment Factor (LAF)	1.12
Interest Rate	5.16%
USD to CAD	1.3820
EUR to CAD	1.6016
Machinery Equipment Price Index (MEPI)	135.78

Appendix B: Labour Adjustment Factor Calculation

LAF = Labour Adjustment Factor, is a decimal factor to account for variation in provincial labour costs from US based Repair Cost Factor (RCF). Based on equipment sample data it is estimated that labour accounts for approximately 60% of the total repair costs.

LAF is used as an adjustment to the Repairs and FOG components of the 127 Rate.

$$LAF = Labour + Materials$$

$$\text{Where: } Labour = RCF \times 0.6 \times \frac{\text{Ontario Mechanics Wage (CAD)}}{\text{US Mechanic Wage (USD)} \times \text{Exchange Rate}}$$

$$Materials = RCF \times 0.4$$

Labour rates are compiled from current published Ontario Union Agreements. US rates are based on nationwide average mechanic wages published the U.S. Bureau of Labor Statistics (BLS).

According to BLS data, the most recent average (May 2024) US heavy equipment mechanics wage rate of \$46.68/hr USD (w/PRB), which is converted to CAD\$ using the average 2024 Canadian Government published currency exchange rate (i.e. exchange rate of \$1.3698 = \$63.94/hr CAD).

Union agreements for the province are reviewed and averaged. The ministry's average Ontario provincial mechanic's rate, corresponding to the most recent BLS date, including payroll burden (PRB) is \$76.41/hr.

Based on the above information, it was calculated that an Ontario mechanic wage is $(\$76.41 / \$63.94) = 1.195$ times higher than the US average mechanic's wage.

2025 LAF calculation:

$$Labour = 1 \times 0.6 \times \frac{\$76.41}{\$63.94}$$

$$Labour = 1 \times 0.6 \times 1.195$$

$$Labour = 0.72$$

$$Materials = 1 \times 0.4$$

$$LAF = Labour + Materials$$

$$LAF = 0.72 + 0.4$$

$$LAF = 1.12$$

Sources of information:

- Wages: U.S. Bureau Labor Statistics, [Mobile Heavy Equipment Mechanics, Except Engines \(bls.gov\)](#)
- Payroll Burden: U.S. Bureau Labor Statistics, [Employer Costs for Employee Compensation Archived News Releases : U.S. Bureau of Labor Statistics \(bls.gov\)](#)
- Exchange Rate: <https://www.bankofcanada.ca/rates/exchange/annual-average-exchange-rates/>