



MUNRO



2022 FORD F-150 LIGHTNING™ PLATINUM COST ASSESSMENT





FORD LIGHTNING™ PLATINUM DESCRIPTION

- The 2022 F-150 Ford Lightning™ Platinum all-electric full size pick-up truck which Munro analyzed is the 4x4 SuperCrew model with dual electric motors and extended range battery.
- The Platinum is powered by a 131 kWh battery offering 580-horsepower using two permanent magnet motors to deliver 775 lb-ft of torque. The 131kWh battery pack has an estimated 300-mile range.
- Additional features include the carbon black fixed extended running boards with enhanced lighting, spray-in bedliner, max trailer tow package and Ford’s “BlueCruiSe” Level 2 autonomous driver-assistance technology.

2022 Ford Lightning Platinum	
4x4 SuperCrew Extended Range	
Maximum Seating	5
Power (HP)	580 hp
Torque (lb-ft)	775
Motor Type	PMSM
Wheelbase (in)	145.5
Front Suspension	Independent double-wishbone with coil-over shock, stabilizer bar
Rear Suspension	Independent semi trailing arms, coil springs, stabilizer bar
Weight as Received (lbs)	
Overall Length (in)	232.7
Pickup Box	5.5-Ft. Styleside

FORD LIGHTNING™ PLATINUM COST ASSESSMENT REPORTS

These reports provide a comprehensive vehicle cost analysis that are highly advantageous for OEMs or Tier Suppliers looking to effectively compete the EV marketplace.

Each report is a consolidation of Munro's technical findings related to cost, features, performance, and technology implementation including Executive Summaries, Eye-Catching Features and Directional Cost Estimates.

Several Ford Lightning™ reports are available for purchase.

ZONE 1-4 REPORTS

- Zone 1 Body and Chassis
- Zone 2 Controlling Electronics (LV)
- Zone 3 Interiors and Safety
- Zone 4 Powertrain and Battery Pack, HV Cables

FOCUSED REPORTS

- Electric Drive Module (Motors, Gearbox and Inverters)
- Thermal Systems (Cooling & Heating)
- Electrical / Electronic Assessment
 - Selections from Zones 1-4, plus additional content including Communication Architecture and ECU details

Contact for pricing

NOTE

- Additional report bundling options are available at a reduced purchase price
- Custom reports are available upon request
- Please direct purchase inquiries to reports@leandesign.com

ZONE REPORTS

Zones 1 – 4 provide a system by system break down of the Ford Lightning™. Each report contains cost information down to the component level and supporting technical information as outlined below.

EXECUTIVE SUMMARIES

- The Executive Summary highlights the points of each report including Munro’s observations and cost summaries.
- Side by Side comparisons highlight prominent EVs and their associated specifications, features, integration strategies and other relevant data.

The screenshot displays three overlapping reports from the Munro EDM Side-by-Side Comparison tool for the 2022 Ford Lightning. The top report is an 'EDM Side-by-Side Comparison' for 'Battery Electric Vehicles (BEV)- Permanent Magnet (PM) Motors', featuring a table of motor specifications for various models including the Ford Lightning. The middle report is a 'Controlling Electronics Summary' detailing the ADAS features of the Lightning, such as the BlueCruise system. The bottom report is a '2022 Ford F-150 Lightning Overview', which provides a comprehensive list of vehicle specifications, including interior dimensions, weights, and exterior dimensions.

Parameters	Tesla Model 3 Rear	BMW i3	Chevrolet Bolt	Jaguar I-PACE	Nissan Leaf	Tesla Model Y Rear	Tesla Model S Plaid
Motor Type	PM	PM	PM	PM	PM	PM	PM
Total Motor Weight (lb)	11.0	10.0	10.0	10.0	10.0	10.0	10.0

Controlling Electronics Summary

ADAS

The Lightning can be equipped with Ford BlueCruise™ which allows hands-free driving on limited sections of divided highways. While BlueCruise™ is active, it functionally couples both adaptive cruise control and lane centering at the same time. These designated highways are referred to as Blue Zones. As for the hands-free aspect, there is a driver monitoring camera positioned between the instrument cluster and infotainment screen which does require the driver to be alert and ready to take the wheel should the vehicle disengage from BlueCruise™. It should be noted that BlueCruise™ does NOT make the vehicle fully autonomous. As such, the driver should always be ready to take control of the vehicle. As with most ADAS (Advanced Driver Assistance Systems), BlueCruise™ is more of a comfort feature than a safety feature. The system does illuminate certain parts of the instrument cluster with blue lights to indicate when the vehicle is in a Blue Zone. When not in a Blue Zone, the vehicle will only handle Adaptive Cruise Control.

The Lightning uses a conventional system:

- A forward-facing camera for adaptive cruise control
- A forward-facing radar for adaptive cruise control
- Two front corner radar for lane departure warning
- Two rear corner radar for blind spot monitoring
- Eight ultrasonic sensors on each side

2022 Ford F-150 Lightning Overview

- Ford's F-150 Lightning is an all-electric all-wheel drive full size pickup truck powered by either a 98 kWh (standard) or 131 kWh (extended) battery, delivering an EPA estimated range between 230 miles and 320 miles (depending on configuration) and standard seating for five passengers.
- The Lightning offers a 5.5' cargo bed with 52.8 ft³ of space. Dry storage of 14.1 ft³ is available under the hood.
- The Lightning is propelled by two permanent magnet electric motors with a combined 775 lb-ft of torque. Power is limited by the battery, with 452 hp for the standard and 580 hp with the extended range battery.
- The Lightning is equipped with "BlueCruise" Level 2 autonomous driver-assist technology.






Interior Dimensions		Weights	
• Passenger Capacity	5	• Base Curb Weight (lbs)	6,015 (est.)
• Cargo Volume (ft³)	14.1	• Extended-Range Curb Weight (lbs)	6,590
• Front Head Room (in)	40.8	Exterior Dimensions	
• Front Leg Room (in)	43.9	• Wheelbase (in)	145.5
• Front Shoulder Room (in)	66.7	• Length, Overall (in)	232.7
• Front Hip Room (in)	62.5	• Width, Max w/o mirrors (in)	80
• Second Head Room (in)	40.4	• Height, Overall (in)	78.3
• Second Leg Room (in)	43.6	• Track Width, Front (in)	68.1
• Second Shoulder Room (in)	66.0	• Track Width, Rear (in)	68.3
• Second Hip Room (in)	62.6	• Drag Coefficient	N/Avail

The model which this study is based on is the Mustang Mach-E Select Series

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EYE-CATCHING FEATURES

- Munro has identified specific observations of interest which are called "Eye-Catching Features." These observations represent advantages and/or disadvantages in cost, weight, feature content, or performance as related to design, material choices, assembly or manufacturing process selection.

<p>2022 Ford Lightning</p> <p>Cantilevered Harness</p> 	<p>Eye-Catching Features</p> 	<p>MUNRO</p>
<p>2022 Ford Lightning</p> <p>Symmetrical Chiller Bracket</p> 	<p>Eye-Catching Features</p> 	<p>MUNRO</p>
<p>Description:</p> <ul style="list-style-type: none"> The main wire harness clips The additional harness line clips rather than stac 	<p>2022 Ford Lightning</p> <p>Two-Tone Seat Covers</p> 	<p>Eye-Catching Features</p> <p>MUNRO</p>
<p>Description:</p> <ul style="list-style-type: none"> The chiller bracket has sym The bracket is fastened w into a U-nut on the other The remaining fastener sl 	<p>Description:</p> <ul style="list-style-type: none"> The seat covers have a two-tone finish with an Alcantara strip down the center Even though the leather around the Alcantara is stitched in place, it is not hemmed, which exposes a portion of the leather's B-Surface 	<p>Advantages:</p> <ul style="list-style-type: none"> Two-tone creates a unique look, especially for the vehicle's highest trim level to date Breaking up the leather into smaller panels allows greater flexibility in hide yield which in turn lowers material cost <p>Disadvantages:</p> <ul style="list-style-type: none"> Un-hemmed leather edges appear frayed, which is further exacerbated on contrasting colors Additional cutting and sewing operations add cost
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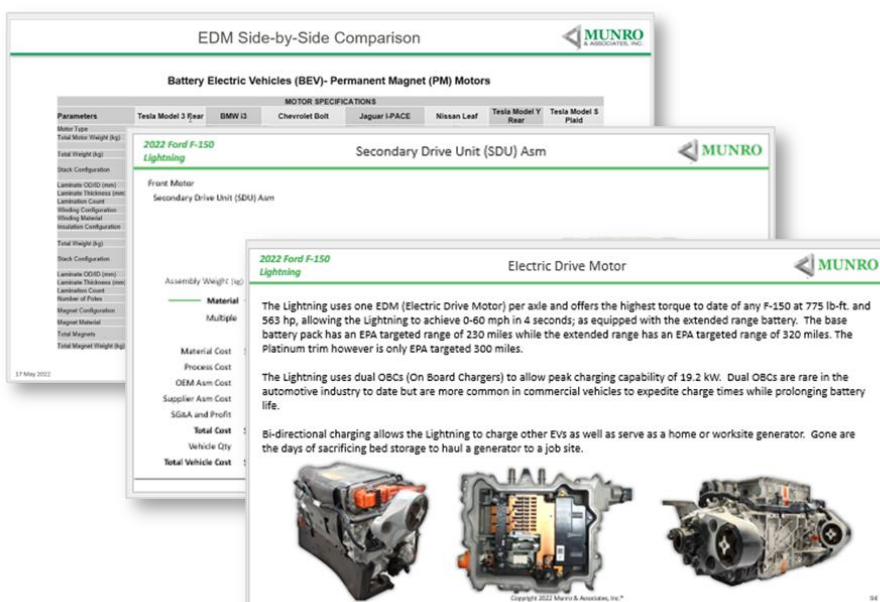
DIRECTIONAL COST ESTIMATES

- The Lightning is broken down into systems and components for Directional Cost Estimating. Directional Costing is Munro's proprietary methodology developed in response to the need for speed-driven results and is quickly gaining popularity. Directional Cost estimates rapidly provide the customer with approximate versus detailed costs, which are more expensive and time consuming to generate. This level of accuracy provides OEMs and Suppliers the ability to make sound comparisons and directional decisions.

FOCUSED REPORTS

ELECTRIC DRIVE MODULE (MOTORS, GEARBOX AND INVERTERS) REPORT

- The Electric Drive Module (EDM) cost assessment includes the Front Motor, Rear Motor, Inverter, Front Gear Box, Rear Gear Box, and several technical details of the motor design.



The image displays three overlapping screenshots from the Munro software interface, illustrating the Electric Drive Module (EDM) cost assessment process for the 2022 Ford F-150 Lightning.

Top Screenshot: EDM Side-by-Side Comparison
 This screen shows a comparison of Permanent Magnet (PM) Motors for Battery Electric Vehicles (BEV). The parameters being compared include Motor Type, Total Motor Weight (kg), Total Weight (kg), Stack Configuration, Lamination QDSD (mm), Lamination Thickness (mm), Lamination Count, Winding Configuration, Winding Material, Insulation Configuration, and Total Weight (kg). The vehicles listed are Tesla Model 3 Rear, BMW i3, Chevrolet Bolt, Jaguar I-PACE, Nissan Leaf, Tesla Model Y Rear, and Tesla Model S Plaid.

Middle Screenshot: Secondary Drive Unit (SDU) Asm
 This screen provides a detailed view of the Secondary Drive Unit (SDU) Assembly. It lists the Front Motor and Secondary Drive Unit (SDU) Asm. The Assembly Weight is noted as 140 kg. A cost breakdown is provided: Material (Multiple), Process Cost, OEM Asm Cost, Supplier Asm Cost, SG&A and Profit, Total Cost, Vehicle Qty, and Total Vehicle Cost.

Bottom Screenshot: Electric Drive Motor
 This screen details the Electric Drive Motor. It states that the Lightning uses one EDM (Electric Drive Motor) per axle and offers the highest torque to date of any F-150 at 775 lb-ft and 563 hp, allowing the Lightning to achieve 0-60 mph in 4 seconds. It also mentions the EPA targeted range of 230 miles for the base battery pack and 320 miles for the extended range battery, with the Platinum trim having a targeted range of 300 miles. The screen highlights that the Lightning uses dual OBCs (On Board Chargers) to allow peak charging capability of 19.2 kW, which is rare in the automotive industry. It also notes that dual OBCs are more common in commercial vehicles to expedite charge times while prolonging battery life. Bi-directional charging is mentioned as a feature that allows the Lightning to charge other EVs and serve as a home or worksite generator. The screen includes three images of the motor components and a copyright notice for Munro & Associates, Inc. (© 2022).

THERMAL SYSTEMS (COOLING & HEATING) REPORT

- Cost and description of associated thermal system components. Heat exchangers, coolant and AC tubing, cold plates, heat pump, AC compressor, etc..
- Includes coolant tube diagram(s), flow diagram, AC diagram and flow paths for all control valves.
- Electrical diagrams showcase the following components: heat pump (solenoids / sensors / pumps), cabin sensors, component temperature sensors (ADAS, motors, batteries etc.), and network communications



REPORT DELIVERY

- All reports and accompanying deliverables will be made available for easy access through a secure File Transfer Protocol (FTP) site.
- A user-friendly PDF format ensures that subscribers can easily locate a wide range of materials in addition to the reports.
- The large reports feature a linked table of contents, allowing users to easily navigate the report contents and quickly locate specific data.

FREQUENTLY ASKED QUESTIONS

- **Was Ford involved in the study?**

No. Neither Ford's proprietary costs nor any of Ford's suppliers' quoted costs were used in this study.

- **Is there any Ford proprietary (stolen) IP in this report?**

No. All data was developed through Munro's proven methodologies, analyzing Munro's purchased production-version Ford Lightning.

- **Are the components costed using country-specific costing centers?**

Yes. Munro uses country-specific labor rates, factory floor costs, utilities, taxes, and SG&A for OEM and Tier Suppliers.

- **Is this a Costing or Pricing report?**

This is a Costing Report. Pricing has too many variables.

LEGAL DISCLAIMERS & SALES CONDITION

- **How can I see the sample report before purchasing?**

Please contact reports@leandesign.com and we will provide sample information in digital PDF format. NOTE: Critical data will be blurred in the sample.

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- **If questions arise, is a Munro expert able to visit and explain the report's details?**

Munro will visit customers, if the customer pays for the travel and a daily fee.

- **If there are limited specific questions on the content of the report, is it possible for a Munro representative to support a phone call or e-mail communication?**

Yes, please contact reports@leandesign.com and we will respond with our answers.