# 2022 LUCID Air

## GRAND TOURING

# BATTERY PACK, BATTERY CELL & EDM COST & BENCHMARKING ASSESSMENT

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## LUCID AIR OVERVIEW

- Lucid's "entire electric powertrain was designed and developed in-house, including the "wunderbox" electronic controller that manages the Air's 900-volt electrical system. It's bi-directional, so it can provide "jump charging" to other EVs. It can manage 19.2 kW of level-2 home charging, it upconverts DC fast-charging power from 400 volts in older stations, and it can accept 300kW (or more) of the latest 800-volt "juice." That makes the Lucid Air today's fastest charging EV, capable of adding 300 miles in 20 minutes."
  Source: MotorTrend.com

- "While the chemistry of the cylindrical batteries is conventional, the pack is designed to simplify automated assembly in a patented and award-winning injection-molded case that incorporates all the power-conducting bus bars. The cells connect to these bars via new lower-resistance ribbon connectors instead of wires, and heat is conducted away from the ends of the cells instead of from the sides. Lucid says this results in more efficient cooling and easier installation, and it eliminates heavy, costly adhesive in the pack."
  Source: MotorTrend.com

- The Lucid battery pack incorporates 300 cells per module. There are 22 modules with 6,600 total 2170 cells having an estimated total pack capacity of 117-120 kWh.

- Lucid integrates a differential inside the rotor of the electric permanent-magnet motor. This design requires two reduction gears, however a compact planetary unit on each side of the motor reduces weight resulting in a drive unit with triple the power density of the leading competitors.

## LUCID AIR GRAND TOURING DESCRIPTION

The Lucid Air is available in several trim levels

- Air Pure RWD coming soon
- Air Pure AWD 480 hp
- Air Touring 620 hp
- Air Grand Touring 819 hp
- Air Grand Touring Performance 1,050 hp
- Air Dream Edition 933 hp
- Air Dream Edition Performance 1,111 hp
- Air Sapphire 1,200+hp

| General Specifications | 2022 Lucid Air Grand Touring |
|---|---|
| Seating Capacity | 5 |
| Driving Assistance (optional) | DreamDrive™ Pro. - 32 on-board sensors, innovative driver-monitoring system, and on-board Ethernet networking |
| Height | 55.4 inches |
| Length | 195.9 inches |
| Wheelbase | 116.5 inches |
| Width (w/o mirrors) | 76.2 inches |
| Coefficient of Drag | 0.21 |
| Battery | 112 kWh (900V Battery System) |
| Curb Weight (19”/21” wheel) | 5203 lbs / 5236 lbs |
| Onboard Charger | Multi-functional, bi-directional (V2X) capability (coming soon) |
| Driving Range (19”/21” wheel) | 469 miles / 516 miles |

## LUCID AIR REPORTS

The Battery Pack, Rear Gearbox and Battery Cell reports are 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.

**The following three Lucid Air reports will be available for purchase:**

### 1. Battery Pack and HV Systems

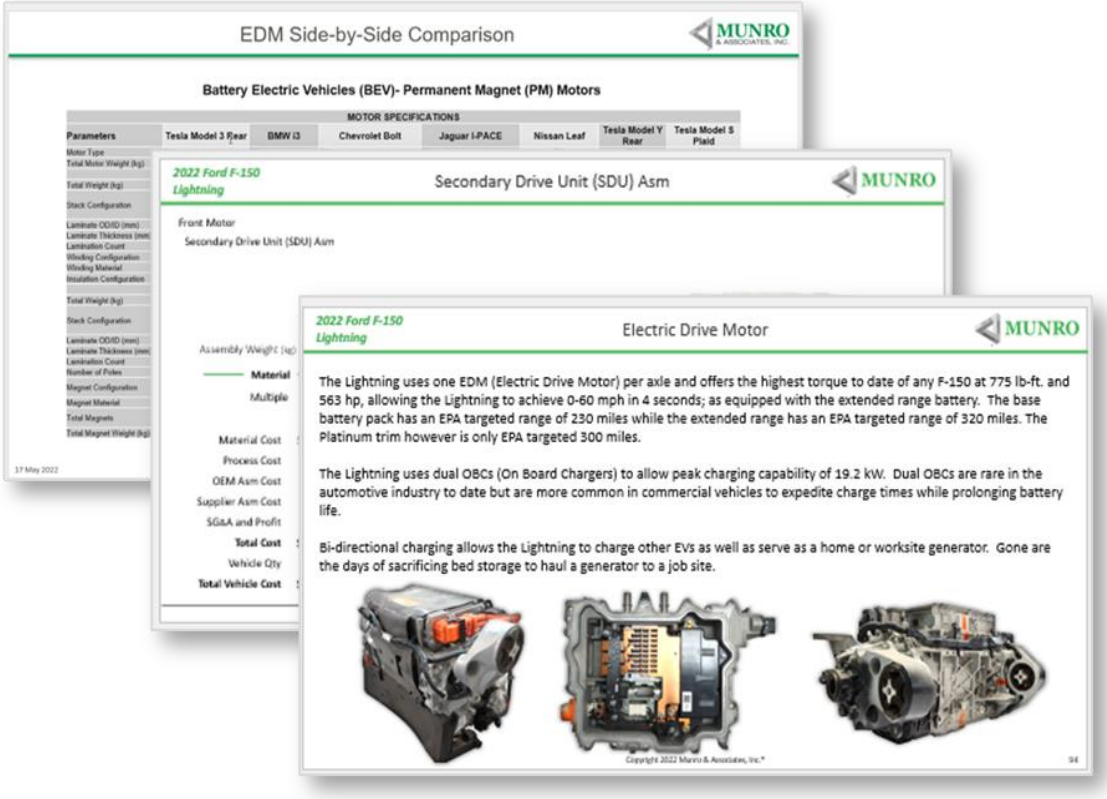
Analysis includes:

- Intra-battery pack components only. Thermal management, HV cables, shields, LV/HV Control modules outside the pack are not included.
- High-level summaries related to battery specifications, construction, thermal management, HV electrical topology and related qualitative information.
- Interesting observations, 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.
- CAD-Sketch highlighting major dimensional monuments such as overall battery pack Z-height, layering of the battery pack components and spatially correct illustrations of battery pack internals.
- Directional costs estimates, which provide the customer with approximate costs, 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.

## 2. Rear Motor, Inverter and Gearbox Report

Analysis includes:

- The Rear Motor, Inverter, Rear Gear Box, Housing, and several technical details of the motor design
- High-level summaries related to motor, gearbox and inverter specifications, key dimensions, construction, and related qualitative information
- Technical Information relating to architecture type, magnet, laminate and mount configurations
- Eye-Catching Features
- Directional cost estimates




*Example slide images from Ford F-150 Lightning Reports – also available from Munro

## 3. Battery Cell Report

This report is an in-depth analysis of the physical, chemical and electrical aspects of the battery cell as outlined below:

**Physical**

- Cell Weight and Cross Section
- Disassembly Weights and Dimensions
- Images of Anode and Cathode

**Chemical**

- Composition of Separator
- Composition of Anode and Cathode

**Electrical**

- Charge Capacity (Ah) and Efficiency
- Voltage vs Time and Voltage vs Current Curve on Charge/Discharge
- ΔT on Capacity Check
- Hybrid Pulse Power Characterization (HPPC)
- Pulse at 3 States of Charge Tests
- Cell Summary
  - Capacity
  - Energy
  - Nominal Voltage
  - Energy Density Volumetric vs Gravimetric
  - Cathode Areal Capacity
  - Cathode Gravimetric Capacity

## REPORT DELIVERY

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

## FREQUENTLY ASKED QUESTIONS

- **Is Lucid involved in the study?**

  No. Neither Lucid's proprietary costs nor any of Lucid's suppliers' quoted costs will be used in this study.

- **Is there any Lucid proprietary IP in this report?**

  No. All data will be developed through Munro's proven methodologies, analyzing a production-version Lucid Air

- **Are the components to be 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, wherever manufacturing location is identifiable.

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

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

## LEGAL DISCLAIMERS & SALES CONDITION

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  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 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?**

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