

MOTIV POWER SYSTEMS

Proven All-Electric Solutions



1/16/2020 | Motiv Power Systems | Proprietary and Confidential | page 8

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1/16/2020 | Motiv Power Systems | Proprietary and Confidential | page 9

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Proven All-Electric Solutions



1/16/2020 | Motiv Power Systems | Proprietary and Confidential | page 10

Intro to Motiv Power Systems

- Software and power electronics specialists in the commercial EV market with over 20 patent applications and 10 patents awarded protecting our IP
- Ford eQVM approved all-electric chassis built with commercially proven components
- Industry leading truck and bus body partners
- HQ in San Francisco Bay Area, chassis electrification in Indiana and Michigan

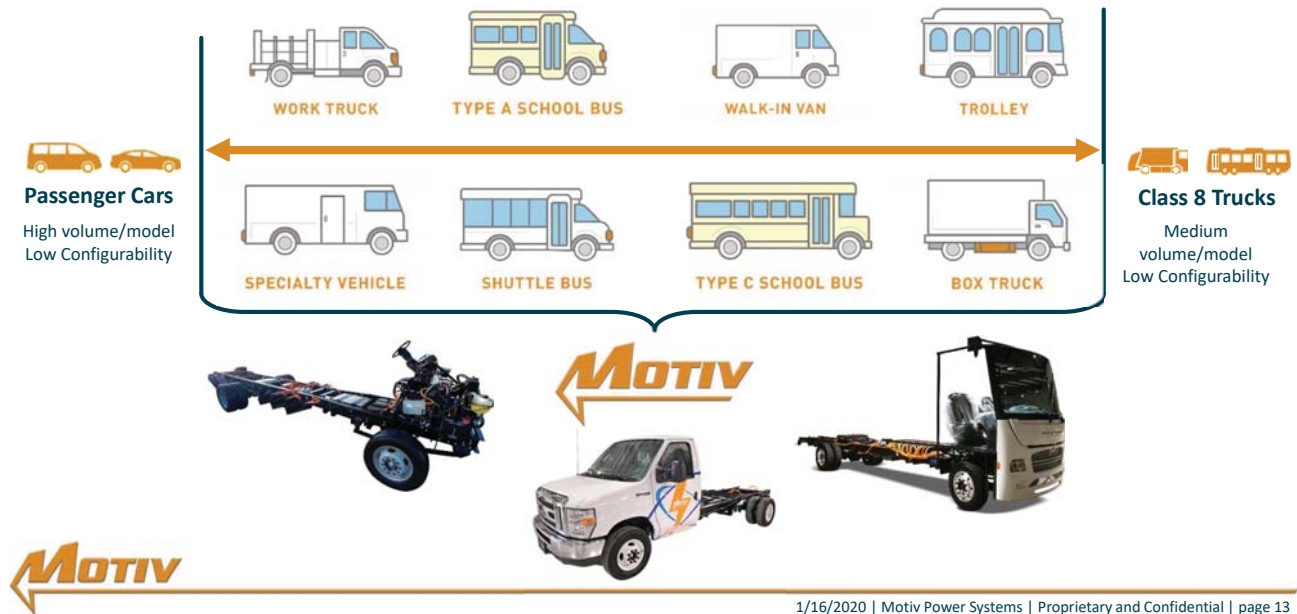


Motiv-powered All-Electric Trucks and Buses



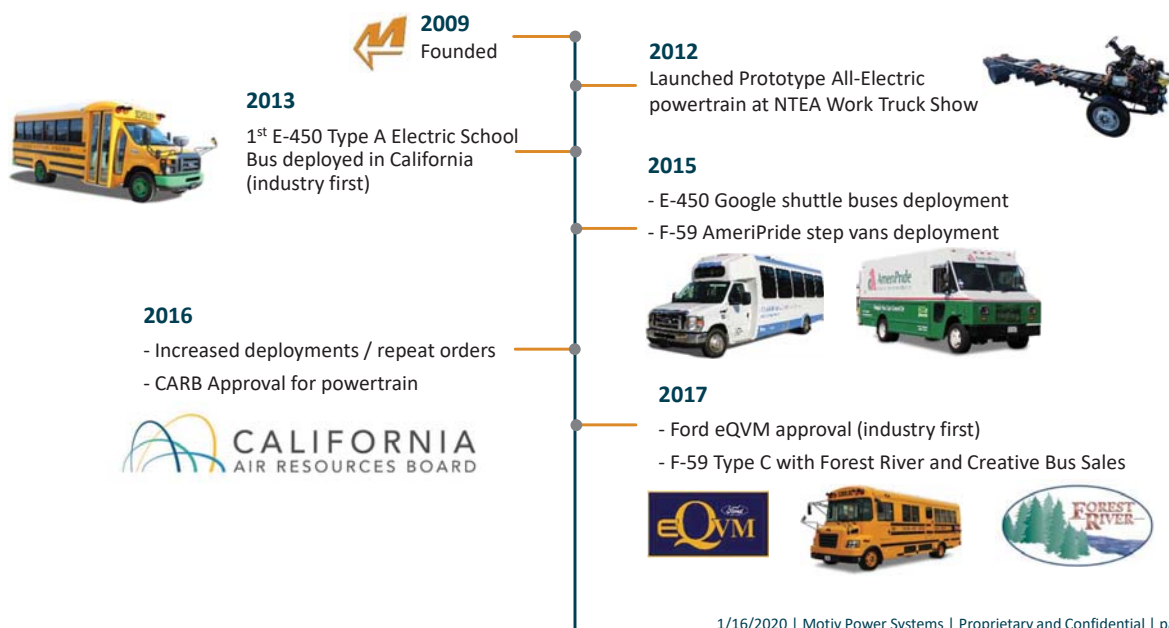
1/16/2020 | Motiv Power Systems | Proprietary and Confidential | page 12

Our Focus: Medium Duty Trucks and Buses



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History: Technology Development



1/16/2020 | Motiv Power Systems | Proprietary and Confidential | page 14

Our Values



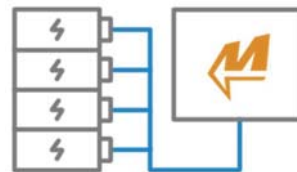
OEM APPROVED

OEM approved and compatible EV chassis to ensure robust design, reliability, and serviceability



CUSTOMER SUPPORT

Dedicated team of highly trained field technicians at your service to ensure post-deployment success



COMMERCIALY-PROVEN BATTERIES

BMW and FZSONICK battery packs have covered hundreds of millions of real world miles



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Proudly Engineered & Assembled in the USA

Motiv's headquarters are located in Foster City and Hayward California, where we engineer and manufacture our electric chassis components

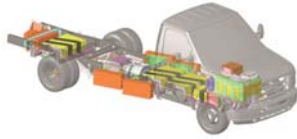
Our **chassis assembly plants** are in Michigan and Indiana

Our **industry leading truck and bus partners** are located in Indiana, Michigan, New York, Wisconsin, Iowa, Kansas, and California



1/16/2020 | Motiv Power Systems | Proprietary and Confidential | page 17

Electric Powered Intelligent Chassis (EPIC)



EPIC E-450

- 14,500 lbs GVWR
- 106 kWh
- 80 - 100 real world miles



EPIC F-59

- 22,000 lbs GVWR
- 106 or 127 kWh
- 80 - 120 real world miles



EPIC F-53

- 26,000 lbs GVWR
- 106, 127 or 170 kWh
- 80 - 120 real world miles

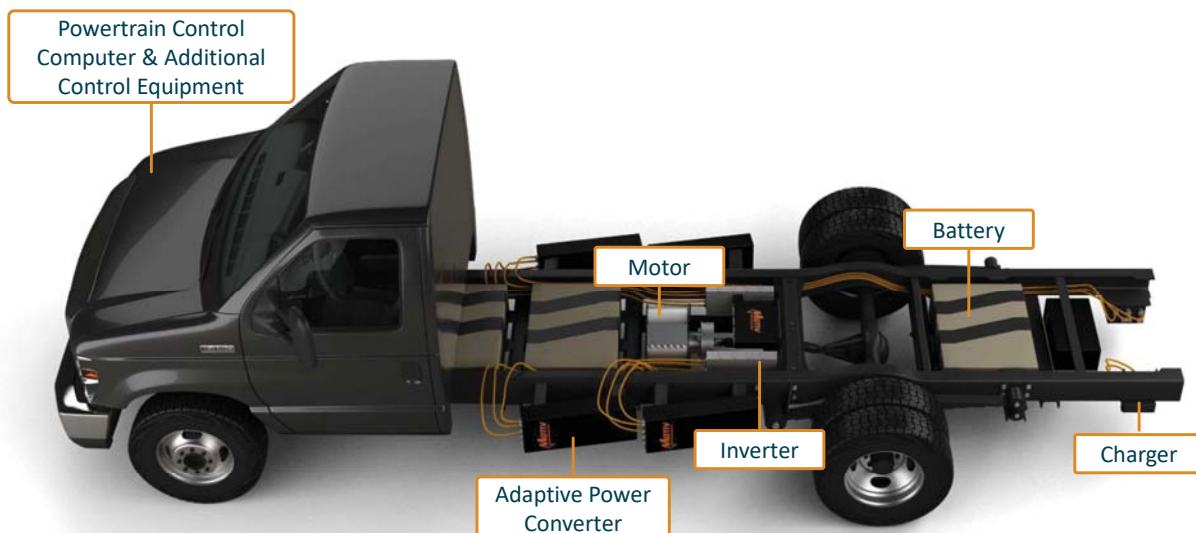


Based on popular Ford platforms



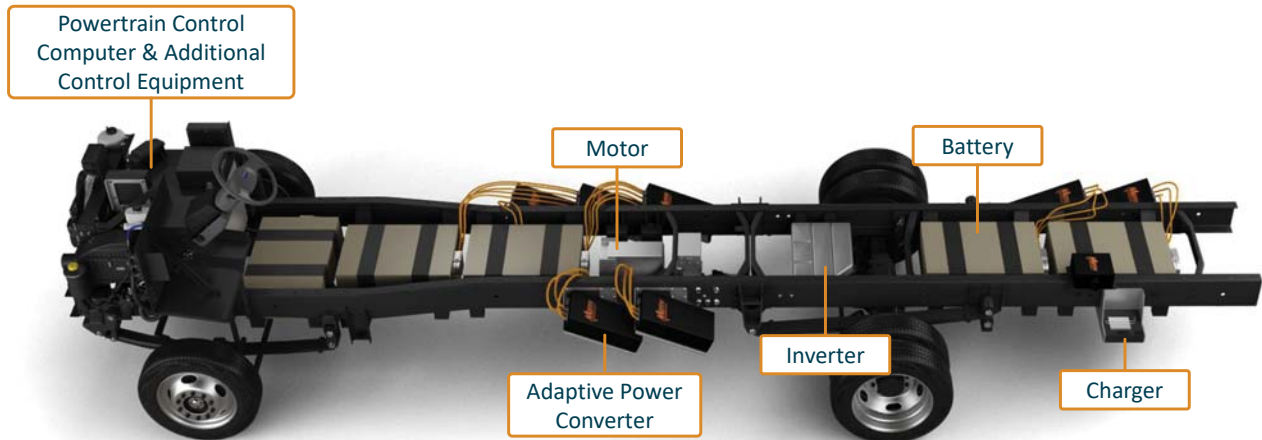
1/16/2020 | Motiv Power Systems | Proprietary and Confidential | page 21

Motiv's EPIC E-450



1/16/2020 | Motiv Power Systems | Proprietary and Confidential | page 22

Motiv's EPIC F-59



1/16/2020 | Motiv Power Systems | Proprietary and Confidential | page 23

Vehicle Applications and Body Partners

EPIC E-450
Class 4



EPIC F-59
Class 5/6



EPIC F-53
Class 6



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Real-World Proven Technology with Diverse Customers & Applications

>800,000

MOTIV MILES & COUNTING



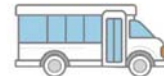
WALK-IN VAN
40%
OF MOTIV FLEET



SCHOOL BUS
41%
OF MOTIV FLEET



BOX TRUCK
5%
OF MOTIV FLEET



SHUTTLE BUS
7%
OF MOTIV FLEET



WORK TRUCK
4%
OF MOTIV FLEET



SPECIALTY VEHICLE
3%
OF MOTIV FLEET

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Case Study: Mountain View/Google Community Shuttles (E-450)

- Built on EPIC E-450 with 127kWh
- 4 shuttles deployed in 2015, 2 additional deployed in 2016
- 13 mile loop, 30 stops, 5-6 routes per day per vehicle, 65-85 miles per day
- >300,000 miles, >18,000 routes, >700,000 passengers
- Positive feedback from riders/residents of Mountain View



1/16/2020 | Motiv Power Systems | Proprietary and Confidential | page 27




Case Study:
Sacramento Area School Districts
(Type A School Buses, E-450)

- Built on EPIC E-450 with 106kWh
- 11 buses deployed in 2018
- Routes range from 45 – 70 miles
- > 75,000 miles to date
- Motiv provided driver training and mechanic training to maximize performance and reliability
- Positive driver feedback
- Fleet expansion planned for 2020

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1/16/2020 | Motiv Power Systems | Proprietary and Confidential | page 28



Case Study:
SoCal School Districts
(Type C School Buses, F-59)

- Built on EPIC F-59 127kWh with Starcraft Bus and Creative Bus Sales
- 21 buses deployed at nearly a dozen school districts across California
- Formal driver and mechanic trainings at deployment
- >50,000 miles to date

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Case Study: USPS Pilot Program (E-450)

- Built on EPIC E-450 with 106kWh
- 7 vehicles deployed in 2019
- Vehicles passed rigorous acceptance tests: gradeability, hill-hold, acceleration, and range tests in various scenarios
- 25,000 miles to date
- >95% uptime
- Positive driver feedback



F-59 Step Van with BMW Batteries – Validation Testing

- BMW batteries integrated on Motiv's EPIC F-59
- Real world range of 90 - 120 miles – based on driver behavior, HVAC usage and payload
- Extremely positive feedback from demos and events



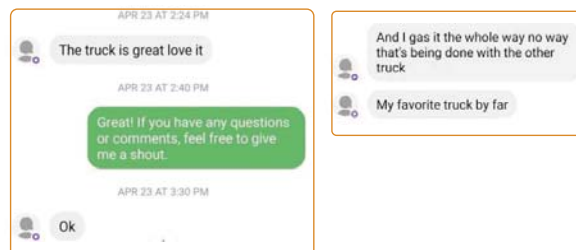
Trip #	Date	Notes	Top Speed (mph)	SOC (Start %)	Route Distance (mi)	SOC (End %)	Extrapolated Range (miles)
1	8/20/19	Route 2 65% Power (SW Limited)	61	87	52.7	34	99
2	8/20/19	Hill Test 65% Power (SW Limited)	65	33	13.9	19	99
3	8/21/19	Route 2 Heavy Traffic	61	98	52.7	47	103
4	8/21/19	Route 1	58	65	52.5	18	112
5	8/22/19	Route 2 Heavy Traffic	61	100	52.7	54	115
6	8/22/19	Route 1 Heavy Traffic	58	59	52.6	14	117



Recent Pilot with Large Fleet

Date	Route Distance	SOC (End)	Extrapolated Range (Mi)
4/17/2019	57	32%	86
4/18/2019	61	35%	95
4/19/2019	54	43%	96
4/22/2019	58	28%	82
4/23/2019	64	26%	86
4/24/2019	56	39%	92
4/25/2019	56	40%	94
4/26/2019	56	35%	88
5/1/2019	57	34%	91
5/2/2019	56	34%	86
5/3/2019	55	38%	90
5/6/2019	53	35%	82
5/7/2019	65	30%	94

- Box Truck built on EPIC E-450 with 106kWh
- Averaged 57 miles per day with extrapolated range capacity 85-95 miles
- Positive feedback from driver, depot manager, and fleet manager

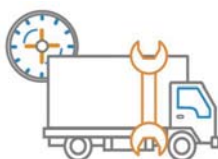


Our Proven Process to go Electric!



PROJECT PLANNING

- Review routes: range, route profile, and HVAC usage
- Look for funding programs
- Charging infrastructure review
- Total Cost of Ownership Analysis
- Evaluate vehicle options – focus on technology maturity, local presence and customer support infrastructure



PROJECT EXECUTION

- Ensure charging infrastructure is installed and powered before vehicle deliveries
- Formal driver and mechanic training
- High touch Customer Service to ensure a seamless deployment
- Usage reports detailing uptime, utilization and daily mileage/range
- Driver training refreshers as needed



CUSTOMER SUPPORT

- One of our Core Values: **Customer Support** extends all the way from pre sales to after sales
- Dedicated team of highly trained field technicians at your service to ensure post-deployment success



Motiv EVs vs Other EVs

1. Proven chassis and body

Fleets get proven chassis from Ford and reliable bodies from industry leading truck and bus builders

2. Ford eQVM, CARB, and GSA approval

First all-electric technology to get Ford eQVM approval



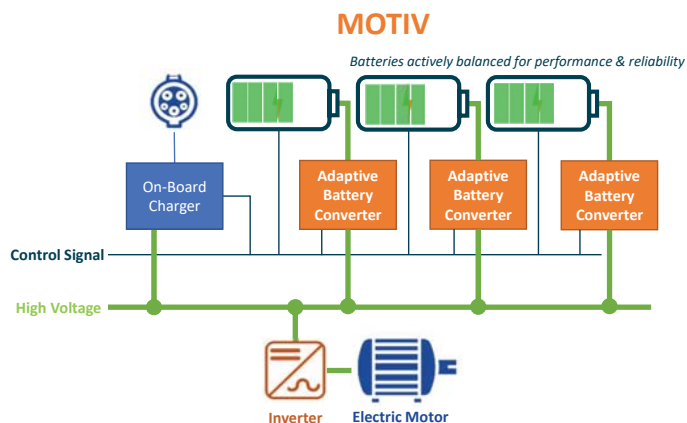
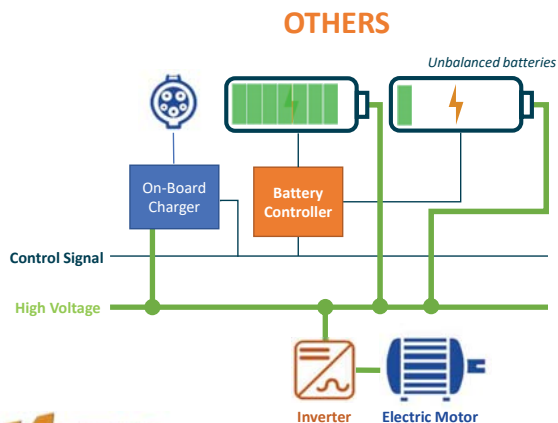
1/16/2020 | Motiv Power Systems | Proprietary and Confidential | page 35

Motiv EVs vs Other EVs

3. Scalable and modular approach with increased reliability

a) Better weight distribution, higher vehicle reliability, lower replacement cost, ability to scale & add batteries in the future - instead of using one or two large batteries, we use several modular battery packs

b) Battery balancing, health monitoring, independent operation for redundancy - while others simply connect batteries in parallel, we independently control them

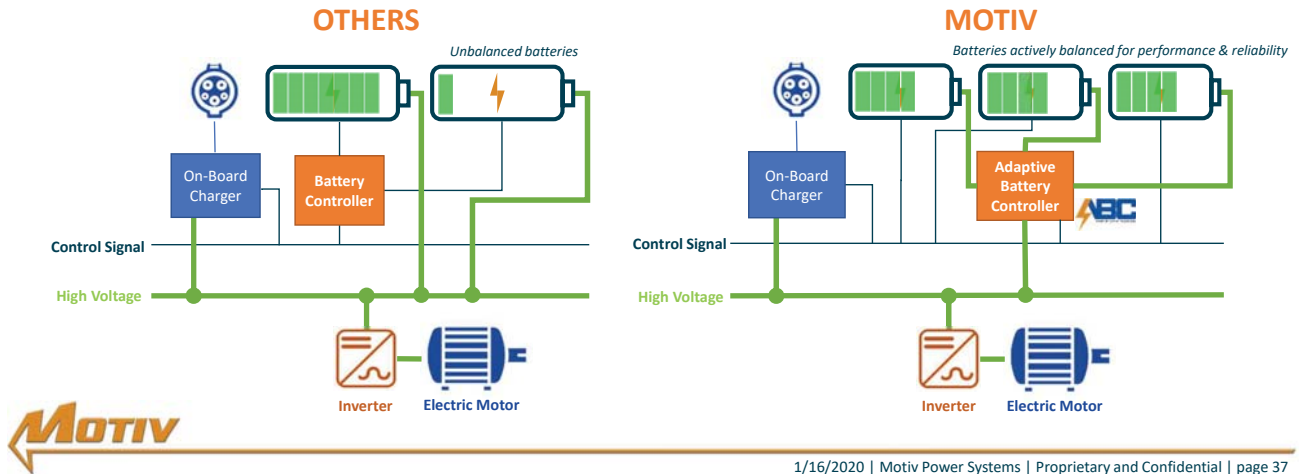


1/16/2020 | Motiv Power Systems | Proprietary and Confidential | page 36

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1/16/2020 | Motiv Power Systems | Proprietary and Confidential | page 37

Motiv EVs vs Other EVs

4. Safe, proven, and fully recyclable batteries

- Manufactured by FZSONICK in Italy since early 2000s for mobility and storage applications, fully recyclable
- 200 million miles in service – proven and reliable!
- Other customers include IVECO (DHL trucks), IRIZAR (European coach maker), ENEL, EDF, Bombardier
- No loss in performance -40F to 120F



FZSONICK Sodium Nickel Battery Packs

5. Larger motor, no transmission, and smoother driving

Our larger-than-most motor and patented control system provide a better driving experience



TM4/Avid Motors

6. Happy customers! >95% uptime vehicles deployed with latest generation hardware and software. 100% of surveyed drivers rated experience 4/5 or above



7. Financially stable partners and business model!



1/16/2020 | Motiv Power Systems | Proprietary and Confidential | page 38

Motiv EVs vs Other EVs

4. Safe, proven, and efficient lithium ion batteries

- Manufactured by BMW, featured in over 100,000 BMW i3 passenger cars
- Hundreds of millions of real-world miles in service – safe and reliable!



BMW i3 Battery Packs

5. Larger motor, no transmission, and smoother driving

Our larger-than-most motor and patented control system provide a better driving experience



TM4/Avid Motors

6. Happy customers! >95% uptime vehicles deployed with latest generation hardware and software.

100% of surveyed drivers rated experience 4/5 or above



7. Financially stable partners and business model!



Motiv EVs vs Other EVs

4. Safe, proven, and efficient batteries

- Lithium-ion (BMW) and Sodium nickel (FZSONICK) chemistry options available
- Hundreds of millions of real-world miles in service, safe and reliable!



BMW i3 Battery Packs



FZSONICK Sodium Nickel Battery Packs

5. Larger motor, no transmission, and smoother driving

Our larger-than-most motor and patented control system provide a better driving experience



TM4 Motors

6. Happy customers! >95% uptime vehicles deployed with latest generation hardware and software.

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7. Financially stable partners and business model!



Motiv EVs vs Other EVs

8. Customer Satisfaction

We take every step necessary to make sure your upgrade to Motiv all-electric is a smooth experience. We can help you through every step of the process including:



Securing Charging Infrastructure

We can help assess your current electrical infrastructure, make recommendations, and assist with implementation.

Helping customers prepare for charging infrastructure ensures a smooth and successful deployment.



Driver Training

Free driver training is provided at deployment to help maximize range, improve fleet efficiency, and promote driver satisfaction.



Navigating Subsidy Landscape

New funding programs that can offer significant financial benefits are available throughout North America.

We can help determine which programs you qualify for and assist with the application process.



Why Motiv-Powered EVs?

- When switching to **ALL-ELECTRIC**, you not only save the environment, but you also save on recurring fuel, maintenance, and operation costs.



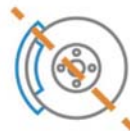
ELIMINATE
GASOLINE



ELIMINATE
TRANSMISSION SERVICING



ELIMINATE
OIL CHANGES



REDUCE
BRAKE WEAR



ELIMINATE
EXHAUST COMPONENTS



ELIMINATE
EMISSIONS TESTING



REDUCE
BELTS



ELIMINATE
IGNITION COMPONENTS



ELIMINATE
AIR FILTERS



ELIMINATE
VACUUM LINES



Why Motiv-Powered EVs?



For Fleet Managers

- Up to 85% O&M savings
- Local customer support
- Compliant with new regulations
- Real time data tracking



For Drivers

- Free driver training
- Comfortable and responsive
- No more fuel stops or idling
- Configurable regenerative braking



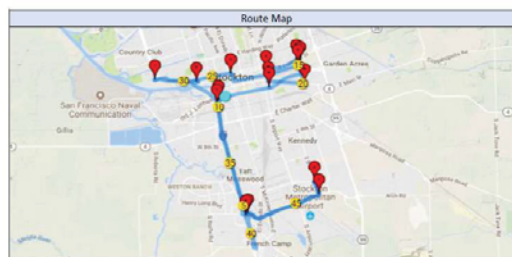
For Riders

- Healthier for communities
- Cleaner for the environment
- Comfortable, no vibrations
- No noise for quieter rides



Range: Route Analysis Available

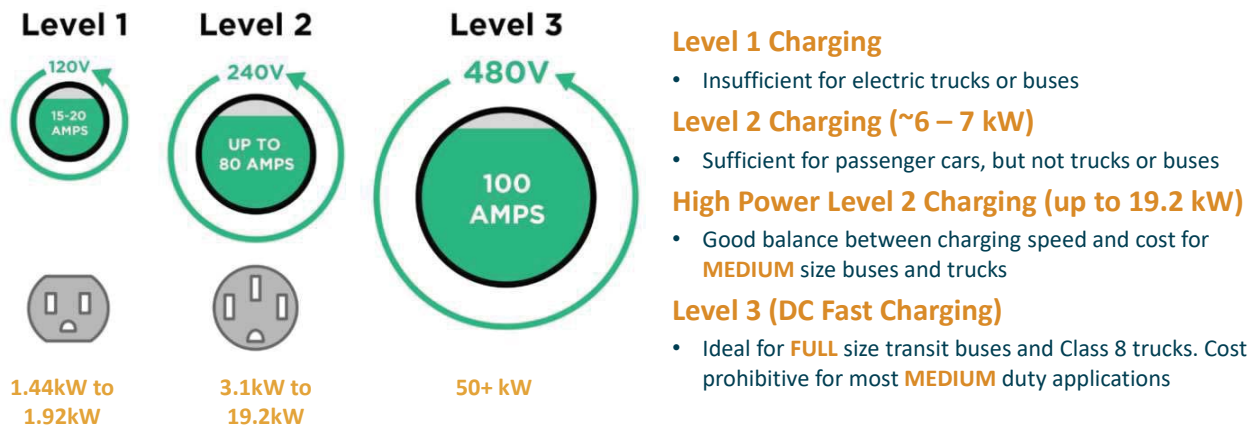
- Real world range varies based on driver behavior, terrain, and HVAC usage
- Motiv offers complimentary review of your exact routes and usage to confirm if EVs are suitable work for your routes
- Motiv provides continues support after deployment to ensure driver and operator satisfaction



Shift Time		50 Mile Trip		
Start	07:00	Miles Travelled	50	Available Range
End	11:00	Time Charged (min)		40
		State of Charge		
		44%		
Shift Time		120 Minute Charge		
Start	11:00	Miles Travelled		Available Range
End	13:00	Time Charged (min)	120	63.9
		State of Charge		
		71%		
Shift Time		50 Mile Trip		
Start	13:00	Miles Travelled	50	Available Range
End	17:00	Time Charged (min)		13.9
		State of Charge		
		15%		
Shift Time		450 Minute Charge		
Start	17:00	Miles Travelled		Available Range
End	00:30	Time Charged (min)	450	90
		State of Charge		
		100%		

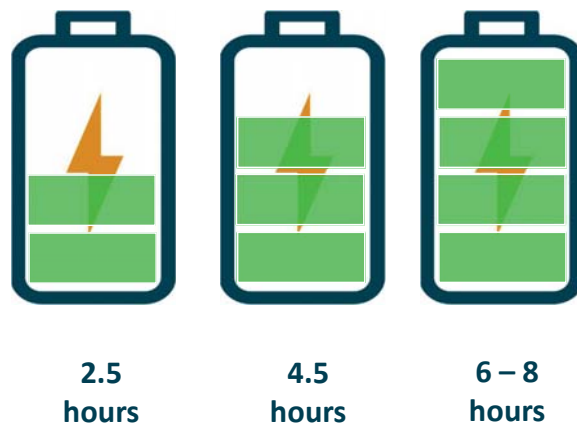


Charging Levels



Opportunity Charging | Level 2 Example

Strategically scheduled opportunity charge from 0 – 50% makes 130 - 140 daily miles possible



Telematics Capabilities

Data Collection from Vehicle

- Advanced Diagnostics to “deep dive” into vehicle performance
- White-label data collection platform available
- Able to integrate with existing fleet data collection platforms

Data Push to Vehicle

- Fleet Configuration Management to change vehicle settings (Top speed, regenerative braking levels, etc)
- Over-the-air updates send software with new features and fixes to all Motiv-powered vehicles



Motiv-Powered Shuttle Buses

Champion Challenger EV

- Based on Ford E-450
- Various seating configurations
- Body built by: Champion, MI, USA
- Assembled in USA
- No major components from China



Starcraft eQuest XL

- Based on Ford F-59
- Various seating configurations
- Body built by: Starcraft Bus, IN, USA
- Assembled in USA
- No major components from China



Motiv-Powered Trolleys

Hometown Trolley Villager

- Based on Ford F-53
- Body built by: Hometown Trolley, WI, USA
- Assembled in USA
- No major components from China



1/16/2020 | Motiv Power Systems | Proprietary and Confidential | page 51



1/16/2020 | Motiv Power Systems | Proprietary and Confidential | page 54